

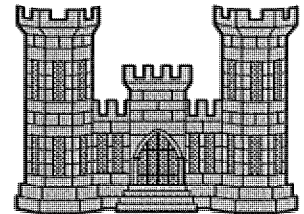
PROJECT MANUAL

RENOVATIONS TO TOILET ROOMS, #HVL02

AT
THE

NATIONAL GUARD ARMORY
2560 S. DELSEA DRIVE
VINELAND, NEW JERSEY 08360

MICHAEL L. CUNNIFF
BRIGADIER GENERAL
NJANG
THE ADJUTANT GENERAL



STATE OF NEW JERSEY
DEPARTMENT OF MILITARY
AND VETERANS AFFAIRS
101 EGGERT CROSSING ROAD
LAWRENCEVILLE, NEW JERSEY 08648

DATE: Aug 23, 2013
PROJECT NO: HVL 02
BID DATE: Sept 12, 2013

SPECIFICATIONS

for

RENOVATIONS TO TOILET ROOMS, #HVL02

at the

NEW JERSEY NATIONAL GUARD ARMORY

2560 DELSEA DRIVE, VINELAND, NEW JERSEY 08360

for the

STATE OF NEW JERSEY

DEPARTMENT OF MILITARY AND VETERANS AFFAIRS

101 EGGERTS CROSSING ROAD, LAWRENCEVILLE, NEW JERSEY



1515 Lower Ferry Road - PO Box 7371 - Trenton, NJ 08628

Tel: 609.883.7101 - Fax: 609.883.2694

John J. Veisz, AIA, CSBA

William D. Hopkins III, AIA, LEED AP

George R. Duthie, Jr., AIA, PP

No. 21AI00866900

No. 21AI01706000

No. 21AI01299200

FVHD PROJECT #4467

Dated: August 21, 2013.



John J. Veisz, AIA, CSBA, Principal

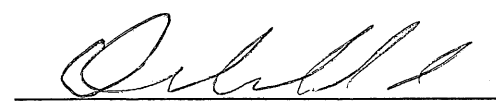
No. 21AI00866900

SunRose Engineers, Inc.

Consulting Engineers

1829 N. Black Horse Pike

Williamstown, NJ 08094



Daniel A. Loveland, Sr., P.E.

No. 24GE03895900

ADDENDUM NO.1

to
CONTRACT DOCUMENTS
for the
RENOVATIONS TO TOILET ROOMS

at the
NEW JERSEY NATIONAL GUARD ARMORY
2560 S. DELSEA DRIVE, VINELAND, NEW JERSEY 08360

for the
STATE OF NEW JERSEY
DEPARTMENT OF MILITARY AND VETERANS AFFAIRS
101 EGGERTS CROSSING ROAD, LAWRENCEVILLE, NEW JERSEY

NJDMAVA PROJECT NO: HVL02 / FVHD PROJECT NO. 4467

Issued: September 3, 2013




FRAYTAK VEISZ HOPKINS DUTHIE, P.C.
1515 Lower Ferry Road, PO Box 7371, Trenton, NJ 08628

FVHD PROJECT NO. 4334

John J. Veisz, AIA, CSBA	No. 21AI00866900
William D. Hopkins III, AIA, LEED AP	No. 21AI01706000
George R. Duthie, Jr., AIA, PP	No. 21AI01299200

 No. 21AI00866900
John J. Veisz, AIA, CSBA, Principal

SunRose Engineers Inc.
Consulting Engineers
1829 N. Black Horse Pike
Williamstown, NJ 08094

 No. 24GE03895900
Daniel A. Loveland, Sr., P.E., LEED A-P

Bids for this Project are due **September 12, 2013, 2:00 PM** (prevailing time).

INTENT

This Document supersedes all conflicting and contrary information in said Contract Documents. Said documents are hereby amended in certain particulars as described herein after. Unless specifically noted or specified hereinafter all work shall conform to the applicable provisions of the Contract Documents. Bidders must acknowledge receiving this document on Bid Proposal Form.

This Addendum includes: six (6) pages, and the following.

1. Revised Bid Form - Document 00310 (2-pages).
2. Pre-Bid Meeting Attendance Sheet (2-pages).
3. New Drawings:
 - a. Plumbing: AD1-P102, AD1-P103
 - b. Electrical: AD1-E101
4. Specifications:
 - a. Revised Sections: 01800, 04200
 - b. New Section: 10440

CLARIFICATIONS

1. Contractors can schedule additional site visits by calling Phil Fiore, DMAVA Vineland Armory Armorer at Tel.# 856.794.5793.
2. Construction documents were submitted to NJ DCA on August 28, 2013 for code compliant review. The Contractor who is awarded the project will be required to pay for the permit. The fee to be paid to NJ DCA is based upon the bid submitted by the contractor.
3. At the Pre-Bid Meeting, Representatives from DMAVA, FVHD Architects, USA Environmental and SunRose Engineers briefly outlined the project scope of work for the project which is outlined in Specification Sections 01010 and 01011.

REFER TO DRAWINGS

The following Drawing and Sketches are attached to this Addendum:

<u>DRAWING NO.</u>	<u>TITLE</u>
AD1-P102	FIRST FLOOR WATER PIPING PLAN
AD1-P103	FIRST FLOOR WASTE PIPING PLAN
AD1-E101	FIRST FLOOR ELECTRICAL PLAN

The following Drawings to be revised or corrected as follows:

<u>DRAWING NO.</u>	<u>CHANGES AND CORRECTIONS</u>
--------------------	--------------------------------

A101	GENERAL NOTES
------	---------------

Add the following note:

Q. REFER TO DRAWING A103 FOR CROSS REFERENCING OF TOILET ACCESSORIES & EQUIPMENT INDICATED ON THE PARTIAL FLOOR PLANS".

The following Drawings to be revised or corrected as follows:

<u>DRAWING NO.</u>	<u>CHANGES AND CORRECTIONS</u>
--------------------	--------------------------------

A101 (con't)

DEMOLITION NOTES

NOTE 4: In the second line, change "TOOTH-IN NEW CMU WALL", to read "TOOTH-IN NEW BRICK / CMU WALL"

NOTE 8: Change the third sentence, to read "ALL EXISTING FLOOR TILE SHALL BE SALVAGED AS MUCH AS POSSIBLE FOR REUSE".

NOTE 11: Add the following sentences:

"REMOVE EXG. SURFACE MOUNTED LIGHT FIXTURES AND REINSTALL LIGHT FIXTURES AFTER PLASTER CEILING IS REPLACED".

"CONTRACTOR SHALL PROTECT THE EXG. FLOORING, WOOD PANELING, WOOD COVE MOULDING AND ALL OTHER WORK FROM DAMAGE".

CONSTRUCTION NOTES

Change NOTE 1 to read: "PRIVACY PARTITION, 6'-0" HIGH. PROVIDE 5" WIDE FLOOR TO CEILING PLASTER BRACE".

Change NOTE 2 to read: "URINAL PRIVACY SCREENS SHALL EXTEND TO THE FLOOR FOR ADDITIONAL BRACING".

Add the following new notes:

NOTE 5: "KNEE WALL SHALL BE PROVIDED WITH METAL BRACE AT METAL STUDS. REFER TO SPECIFICATION SECTION 09250 FOR ADDITIONAL INFORMATION".

NOTE 6: "ALL PARTITIONS WHERE NEW METAL STUD WALL ASSEMBLY OR WALL INFILL IS NOT INDICATED, PROVIDE AND INSTALL CERAMIC TILE OVER THE EXISTING BRICK AND CERAMIC TILE WALLS. ALL MASONRY AND CERAMIC TILE WALLS SHALL BE CLEANED / PREPPED FOR NEW FINISH WORK. FOLLOW THE TCNA GUIDELINES FOR INSTALLING CERAMIC TILE OVER CERAMIC TILE".

NOTE 7: "AT ALL EXISTING RADIATORS TO REMAIN, SAND BLAST, PRIME AND SPRAY PAINT THE RADIATORS. THE 3-COAT FINISH PAINT SHALL BE V7400 SYSTEM 340 VOC DTM ALKYD ENAMEL PAINT AS MANUFACTURED BY RUST-OLEUM INDUSTRIAL BRANDS. COLOR AS SELECTED BY ARCHITECT".

NOTE 8: "AT ALL NEW RADIATORS, PRIME AND SPRAY PAINT THE RADIATORS. THE 3-COAT FINISH PAINT SHALL BE V7400 SYSTEM 340 VOC DTM ALKYD ENAMEL PAINT AS MANUFACTURED BY RUST-OLEUM INDUSTRIAL BRANDS. COLOR AS SELECTED BY ARCHITECT".

FIRST FLOOR - PARTIAL DEMOLITION PLAN

Add the following note to the floor area opposite the barrier-free toilet stall:

"REMOVE AND REPLACE THE CRACKED CERAMIC FLOOR TILE WITH SALVAGED CERAMIC TILE AND REPAIR THE CRACK IN THE CONCRETE FLOOR SLAB".

The following Drawings to be revised or corrected as follows:

<u>DRAWING NO.</u>	<u>CHANGES AND CORRECTIONS</u>
--------------------	--------------------------------

A101 (con't)	SECOND FLOOR - PARTIAL DEMOLITION PLAN
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Add the following notes to the threshold area at the Ex. Men's Toilet Rm.:

"REMOVE AND REPLACE THE MARBLE THRESHOLD".

Add the following note at the existing marble toilet stall pilasters and partitions:

"CAREFULLY REMOVE CERAMIC TILE ADJACENT TO THE TOILET PARTITION AND PILASTERS WHICH MAY BE RECESSED IN THE FLOOR CONSTRUCTION. REINSTALL THE REMOVED CERAMIC TILE AND INSTALL SALVAGED CERAMIC TILE".

FIRST FLOOR - PARTIAL FLOOR PLAN

MEN'S SHOWER / LOCKER ROOM

At the incline ramp, change Construction NOTE 2, to read NOTE 5.

At the barrier-free shower stall, add Construction Note "3" to the masonry partitions which create the shower stall.

A102	WALL PARTITION TYPES
------	----------------------

WALL TYPE 2:

Clarification: Where Wall Type 2 is at an exterior wall, provide R-19 foil face fiberglass batt insulation.

WALL TYPE 3:

Change composition of wall assembly to be: 4" brick (to match existing), cmu and wall finish per the Finish Schedule.

CEILING DETAIL - #4

Clarification: The ceramic tile extends slightly above the ceiling and does not extend up to the roof deck above.

A103	SIGNAGE DETAILS
------	-----------------

Add Sign Type 5: 6" x 6" sign with 3/8" radius corners of the international barrier-free pictogram of a person in a wheelchair.

* Sign Type 5 shall be mounted on the door to the barrier-free accessible toilet stalls and the barrier-free accessible lockers.

ACM-01	GENERAL NOTES
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Change "Specification Section 028213", to read "Specification Section 02821".

P102	FIRST FLOOR WATER PIPING PLAN
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Revise the Floor Plan as indicated on drawing AD1-P102 as indicated in Addendum No. 1.

The following Drawings to be revised or corrected as follows:

DRAWING NO. CHANGES AND CORRECTIONS

P103 FIRST FLOOR WASTE PIPING PLAN

Revise the Floor Plan as indicated on drawing AD1-P103 as indicated in Addendum No. 1.

E101 FIRST FLOOR ELECTRICAL PLAN

Revise the Floor Plan as indicated on drawing AD1-E101 as indicated in Addendum No. 1.

REFER TO SPECIFICATIONS

INDEX

Under Division 4 - Masonry, change the quantity of pages for Section 04200 to read 9-pages.

DIVISION 0 - BIDDING AND CONTRACT REQUIREMENTS

ADVERTISEMENT FOR BIDS

CLARIFICATION:

The subcontractor for the hazardous material abatement must have the following DPMC Classification:

CO92 - ASBESTOS REMOVAL / TREATMENT

DIVISION 0 - SECTION 00310 - BID FORM

Delete the Bid Form in its entirety and substitute with the attached revised document (2-pages).

DIVISION 0 - SECTION 00710 - GENERAL PROVISIONS

Page Paragraph

00710-21 28, A, C, D Delete subparagraphs A, C and D in their entirety.

28, B Delete subparagraph B in its entirety and substitute with the following:

- B. The CONTRACTOR for the Contract shall provide DMAVA and the Architect with the Contractor Superintendent's cell phone number.

DIVISION 1 - SECTION 01505 - TEMPORARY FACILITIES

Page Paragraph

01501-1 1.1, A Delete item #16 in its entirety.

DIVISION 1 - SECTION 01800 - TIME OF COMPLETION AND LIQUIDATED DAMAGES

Delete Section 01800 in its entirety and substitute with the attached revised document (3-pages).

DIVISION 4 - SECTION 04200 - UNIT MASONRY

Delete Section 04200 in its entirety and substitute with the attached revised document (9-pages).

DIVISION 9 - SECTION 09300 - TILE

<u>Page</u>	<u>Paragraph</u>	
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09300-3	2.3, A	Change "Furnish white marble thresholds", to read "Furnish marble thresholds in a color to match the existing marble thresholds".
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DIVISION 10 - SECTION 10440 - SPECIALTY SIGNS

Add new Section 10440 which is attached to this Addendum (4-pages).

END OF ADDENDUM NO. 1

ATTENDANCE SHEET

- ☒ Pre-Bid Conference
☐ Pre-Construction
☐ Progress Meeting
☐ Other _____

Date: Aug 27, 2013
 Project #: HVL-02
 Location: Vindond

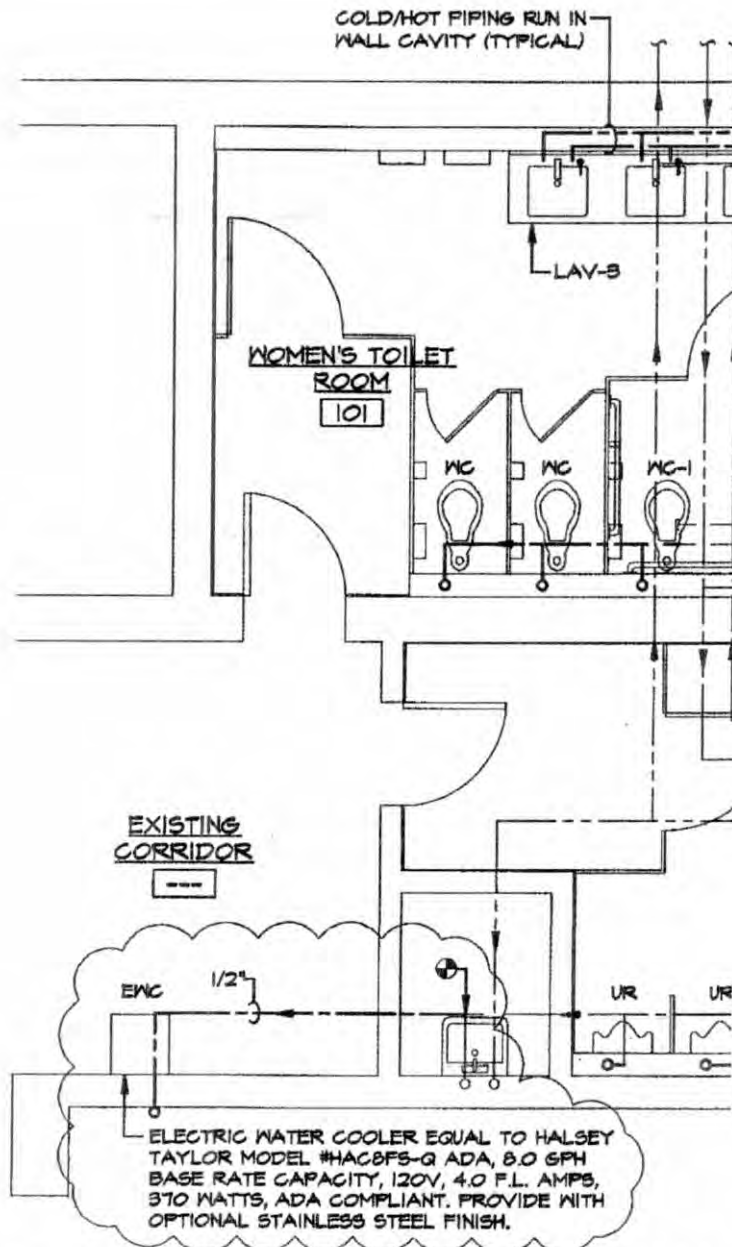
NAME	COMPANY	PHONE/FAX	EMAIL
FRANK MANCINELLI	FRAMAN MECHANICAL	732 661 0001 732 661 0002	FMANCINELLI@OUTCHARTER.COM
Tom Dykes LEVY CONSTRUCTION	LEVY CONSTRUCTION	856 547 0707 FX 856 547 2424	simon@levyconstruction.com
JASON ZELINKA	SHORE BUILDING CONTRACTORS	609 567 6404 609 567 2824	jason@shorebuildinginc.com
DAVID MAXWELL	MAXWELL CONST	609 646 6699 609 641 1857	dave@maxwellconstruction.net
PAM WARSON	JHWILLIAMS ENT.	856 793 7114 856 222 0017	jw@jimwilliamsbuilders.com
MAEK RUSKASKI	Aliano Brothers	856 794 9490 856 794 9492	alano brothers@aol.com
PAT SPARKS	MIBO CONSTRUCTION	856 809 1550 809 1552	miboinc@verizon.net
Jack Meltz			
Mimi Allen	Gaudelli Bros Inc	956 825 0636 856 327 8864-Fax	mimi@gaudellibros.com
Tina Lionelli	Capri Construction	856 692 4767-P 856 696 3624-F	capcob@comcast.net capco@comcast.net
Lee Manci	W.J. GROSS INC	856 415 1712 856 415 1709	wjgross@comcast.net wigestimating@gmail.com
Shannon Jewell	Dolan mech	856 629 9331 856 629 6545	dmi@dolanmechanical.com
John J. Kwawecz III	Fabbri Builders Inc	856 696 2024 856 794 3150	jkwawecz@fabbribuilders.com
ANDREW FABBRIZI	FABBRIZI BUILDERS	1 1 1 1 1	AFABBRIZI@FABBRIBUILDERS.COM
JAMES STILES	TCI CONST. & MGMT. CO. INC.	732 919 7818 732 919 7810	JimTCI1@gmail.com
ROBERT RAWS	G.M. WHITE, INC.	856 601 4499 856 601 9101	ESTIMATOR1a@gmail.com
Aldo FALASCA	FALASCA Mechanical	856 794 9644 F 856 794 2010 P FAX 856 507 0895	afalasca@falasca-mechanical.com
Wayne Owsley	Leeway Electric	856 507 0879	LeewayElectric@gmail.com

ATTENDANCE SHEET

- ☒ Pre-Bid Conference
☐ Pre-Construction
☐ Progress Meeting
☐ Other _____

Date: Aug 27, 2013
 Project #: HVL-02
 Location: Vindond

NAME	COMPANY	PHONE/FAX	EMAIL
Dean Arrighi	DMAVA	609-530-713 / 6880	dean.arrighi@state.nj.us
Mark Ramos	DMAVA		
Gary Rostrom	FVHD Architects	609-883-7101 / (P) 609 883 2694	grostrome@fvhd.com
JOHN DUGGAN	USA ENVIRONMENTAL MANAGEMENT, INC.	609-656-8101 / 609-656-8105	John_duggan@usam.com
Kyle Gordon	SunRise Engineers, Inc.	856-875-7001 / 856-875-7752	sunriseeng@comcast.net
Phil Fiore	DMAVA Vindond Army	856-794-5793	



FIRST FLOOR WATER PIPING PLAN

SCALE: 1/4" = 1'-0"

FVHDPG.COM

FVHDPG
Freytak Veliz Hopkins Duthie P.C.
ARCHITECTS
PLANNERS
ENGINEERS

200 S. 10TH AVE. SUITE 200
PHILADELPHIA, PA 19106
TEL: 215.576.1000
FAX: 215.576.1001
WWW.FVHDPG.COM

Project Name
**RENOVATIONS TO
TOILET RIMS
NJ NATL. GUARD
ARMORY**

Project Owner
**STATE OF NJ
DMAVA**

Project Address
**2500 S. DELSEA
DR., VINELAND, NJ
08300**

Project Number
HVL02 / 4487

Project Date
08-30-2013

Drawn by
DJF

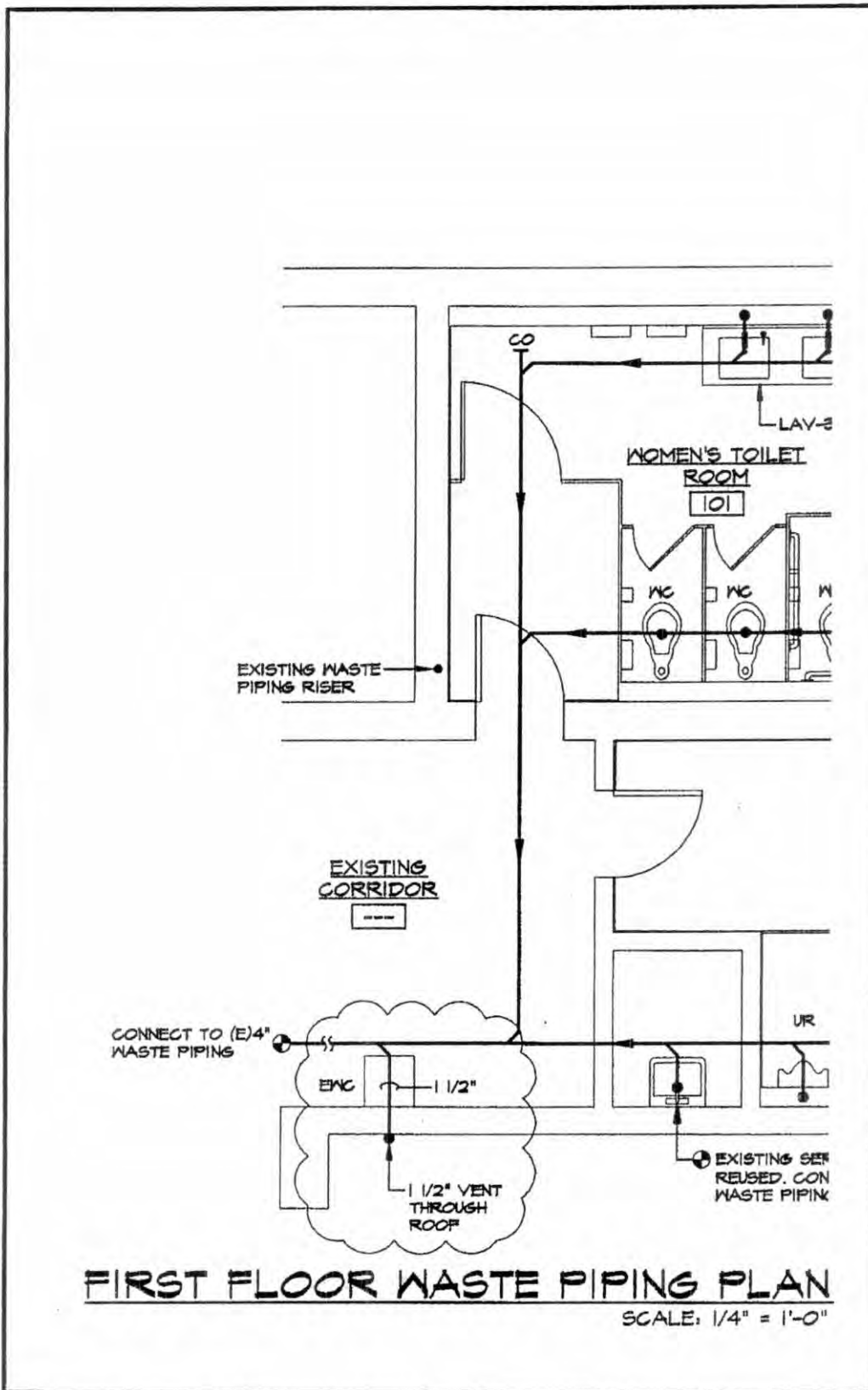
Reviewed by
KJG

Scale
AS NOTED

Working Notes
**FIRST FLOOR
WATER PIPING
PLAN**

Revision
No. Date Description

Drawing Number
AD1-P102



FVHDP.C.COM

FVHDP
Fraytak Velaz Hopkins Duthie P.C.

ARCHITECT
PLANNING
ENGINEERING
INTERIOR DESIGN
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL DESIGN
CONSTRUCTION MANAGEMENT

Project Name
**RENOVATIONS TO
TOILET RM8
NJ NAT'L GUARD
ARMORY**

Project Location
**STATE OF NJ
DMAVA**

Project Address
**2590 S. DELSEA
DR., VINELAND, NJ
08360**

Project Number
HVL02 / 4467

Project Date
06-30-2013

Designed By
CJF

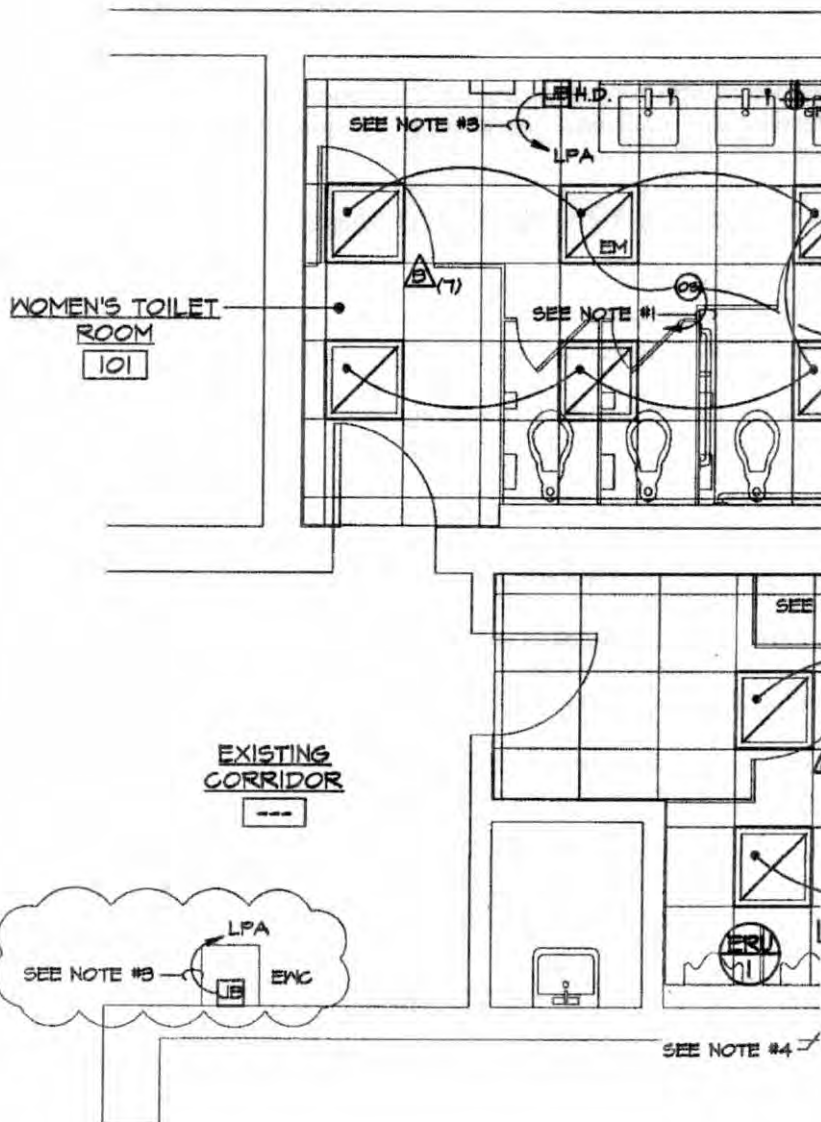
Drawn By
KJG

Check
AS NOTED

Project Name
**FIRST FLOOR
WASTE PIPING
PLAN**

Project
Rev. / Date / Description

Project Number
AD1-P108



FIRST FLOOR ELECTRICAL PLAN

SCALE: 1/4" = 1'-0"

FVHDP.C.COM

FVHDP
Fraytak Veitz Hopkins Duthie P.C.

200 S. VINTAGE AVE. SUITE 100
VINELAND, NJ 08360
TEL: 856.693.1111
FAX: 856.693.1112
WWW.FVHDP.COM

Project Name
**RENOVATIONS TO
TOILET RMS
NJ NATL. GUARD
ARMORY**

Project Number
**STATE OF NJ
DMAVA**

Project Address
**2500 S. DELSEA
DR., VINELAND, NJ
08360**

Project Number
HVLD2 / 4487

Project Date
08-30-2013

Drawn by
DJF

Checked by
KJG

Date
AS NOTED

Project Title
**FIRST FLOOR
ELECTRICAL
PLAN**

Project No. / Date / Revision

Drawing Number
AD1-E101

SECTION 01800 - TIME OF COMPLETION AND LIQUIDATED DAMAGES

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes the requirements for completion of interim milestone events and final completion of all work required by the contract documents.
- B. Related Sections:
 - 1. Items of Work attached to the "Certificate of Substantial Completion" and establishing "Final Completion Time" as per section 00800.
- C. This section also establishes the relation of liquidated damages for failure to complete the interim milestone events or final completion requirements within the time requirements stated herein.

1.2 TIME FOR COMPLETION AND LIQUIDATED DAMAGES

- A. It is understood that the Contractor has responsibility to complete its work in sequence with the work of the subcontractors and to allow the other subcontractors access to the work site so that it may complete its work within the times established.
- B. Completion of the Contract Work by the Contractor shall be time of the essence.
- C. The Contractor shall work overtime, additional shifts, weekends or holidays to complete the work on time with no additional cost to the Owner.
 - 1. Scarce resources will be no excuse for not completing the work on time.
 - 2. **The Vineland Armory is closed every other Friday. The exact schedule will be made available to all contractors when the schedule is formalized. The Contractor is to work nine (9) business days in a two (2) week period.**
 - a. **The facility is closed Saturdays, Sundays and all holidays, therefore the Contractor must work Monday through Friday.**
 - 3. **All questions pertaining to the contract, bonds and insurance shall be directed to Ms. Debbie Soto at the Construction Facilities Management Office (CFMO) Business Management Bureau (BMB) at Tel.# 609.530.7115.**
- D. Substantial or final completion of the work shall include, but is not limited to final inspection and acceptance by the Local Building Officials.
- E. **Milestone No. 1**
 - 1. Sign Contract, and submits Bonds and Insurance no later than **ten (10) calendar days** from **Notice of Award. Notice of Award on or about September 16, 2013.**
 - 2. **Contract must be signed and all bonds and insurance must be delivered to DMAVA, on or before September 30, 2013.**

3. **Notice to Proceed** shall take place within **three (3) business days** of date of signing Contract. **Notice to Proceed on or before October 3, 2013.**
- F. **Milestone No. 2**
1. **Time Critical submittals** for special equipment, fixtures, etc. shall be submitted within **twenty (20) calendar days from Notice to Proceed.**
 - a. The Contractor must submit all requests for substitutions fourteen (14) calendar days prior to the bid opening date in accordance with Specification Section 00100, Paragraph 12.
 2. Liquidated Damages - **\$500.00** / Calendar day of delay.
- G. **Milestone No. 3**
1. Submission of all remaining technical shop drawing submittals shall be submitted within **forth-five (45) calendar days from Notice to Proceed.**
 2. Liquidated Damages - **\$500.00** / Calendar day of delay.
- H. **Milestone No. 4**
- a. Physical work at the site shall commence, after NJ DCA approval and issuance of construction permits, on or about **October 1, 2013.**
- I. **Milestone No. 5**
1. Substantial Completion of the entire project shall be on or before **(120 Calendar Days from the Notice to Proceed), January 30, 2014.**
 2. Liquidated Damages - **\$500.00** / Calendar day of delay.
- J. **Milestone No. 6**
1. Final Completion of all Work including punch list items and closeout documents, no later than **(32 Calendar Days from Substantial Completion), March 3, 2014.**
 2. Liquidated Damages - **\$500.00** / Calendar day of delay.
- K. In accordance with N.J.S.A. 18A:18A-19, the Owner shall deduct from the Contract Price, for any wages paid by the Owner to any inspector or inspectors necessarily employed by for the work of this project, for any number of days in excess of the number of days or indicated dates allowed in milestones above. Such sums shall be part of the Liquidated Damages indicated herein after.
- L. The Liquidated Damages set for above shall be in addition to other consequential losses or damages the Owner may incur by reason of such delay, such as, but not limited to, the cost of additional architectural and engineering services resulting from the delay, additional costs to the Owner for payments to other Contractors resulting from delay, including acceleration costs by other contractors to recover the defaulting contractor's delay.

- M. The said Liquidated Damages are fixed and agreed upon by and between the Contractor and the Owner because of the impracticality and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain; and said amounts shall be retained from time to time by the Owner for the current periodical payments.
 - 1. The Liquidated Damages set for above are intended to compensate Owner for loss of use during the period of delay, for other delay during construction which may result further delay in substantial and/or final completion dates and for any acceleration costs by other contractors to recover the defaulting contractor's delay.
 - 2. In no way shall costs of Liquidated Damages be construed as a penalty to the Contractor.
- N. The Owner shall have the right to deduct the total amount any Liquidated Damages for which the Contractor may be liable from any monies otherwise due the Contractor, including any retainage under control of the Owner.
- O. The surety upon the Performance Bond furnished by the Contractor shall be liable for any such Liquidated Damages for the Contractor may be liable, to the extent that the Contractor shall not make settlement therefor with the Owner.

END OF SECTION 01800

SECTION 04200 - UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

- A. Extent of each type of masonry work is indicated on drawings and schedule.
- B. Types of masonry work required include:
 - 1. Concrete unit masonry.
 - 2. Brick masonry.
 - 3. Mortar and grout.
 - 4. Reinforcement, anchorage, and accessories.
- C. Related Work:
 - 1. Section 07900: Joint Sealer Assemblies.

1.3 QUALITY ASSURANCE

- A. Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.
- B. Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.
- C. Source Quality Control: Materials and fabrication procedures are subject to inspection and tests in mill, shop, and field, conducted by a qualified inspection agency. Such inspections and tests will not relieve Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements.
- D. Build mock-up(s) in size of approximately 18" long by 18" high, brick panel to confirm selection of brick and mortar match.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product data for each type of masonry unit, accessory, and other manufactured products, including certifications that each type complies with specified requirements.
- B. Samples for Verification Purposes: Submit the following samples:
 - 1. For selection of brick, submit products of all local manufacturers that the manufacturers consider to be their closest match. Resubmit until match meets approval of Architect.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver masonry materials to project in undamaged condition.
- B. Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes.
- C. Limit moisture absorption of concrete masonry units during delivery and until time of installation to the maximum percentage specified for Type I units for the average annual relative humidity as reported by the U.S. Weather Bureau Station nearest project site.
- D. Store cementitious materials off the ground, under cover and in dry location.
- E. Store aggregates where grading and other required characteristics can be maintained.
- F. Store masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.

1.6 REFERENCE STANDARDS

- A. Comply with the current applicable provisions of all codes, regulations, industry standards and specifications referenced in this section, unless otherwise modified by the requirements of the Contract Documents, including but not limited to the following:
 - 1. ACI 531 Building Code Requirements for Masonry Structures.
 - 2. ACI 531 Commentary on Building Code Requirements for Masonry Structures.
 - 3. ACI 530.1 Specification for Masonry Construction.
 - 4. ASTM C-129 Non-Load Bearing Masonry Units.
 - 5. ASTM C 140 Testing Concrete Masonry Units.
 - 6. ASTM C 216 Testing Facing Brick (Solid Masonry Units Made from Clay or Shale).
 - 7. ASTM C 270 Standard Specification for Mortar for Unit Masonry
 - 8. ASTM C 780 Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
 - 9. ASTM C 1586 Standard Guide for Quality Assurance of Mortars.
 - 10. BIA Technical Notes on Brick Construction.
 - 11. BIA Technical Notes on Brick Construction: Technical Note #46 "Maintenance of Brick Masonry.
 - 12. NCMA TEK Bulletins.

1.7 PROJECT CONDITIONS

- A. Do not apply uniform floor or roof loading for at least 12 hours after building masonry walls.
- B. Do not apply concentrated loads for at least 3 days after building masonry walls.
- C. Staining: Prevent grout or mortar or soil from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry.
- D. Perform the following construction procedures while masonry work is progressing. Temperature ranges indicated below apply to air temperatures existing at time of installation except for grout.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Manufacturer: Obtain masonry units from one manufacturer, of uniform texture and color for each kind required, for each continuous area and visually related areas.
 - 1. Brick: Subject to compliance with requirements, manufacturers of brick units which may be incorporated in the work include, but are not limited to, the following:
 - a. Church Brick Company.
 - b. Diener Brick Company.
 - c. Tri-State Brick & Building Materials, Inc.
 - d. The Belden Brick Company.
 - 2. Concrete Masonry Units: Subject to compliance with requirements, manufacturers of concrete masonry units which may be incorporated in the work include, but are not limited to, the following:
 - a. Anchor Concrete Products Inc.
 - b. Clayton Block Co., Inc.
 - c. EP Henry Corporation.
 - 3. Masonry Anchors, Joint Reinforcing, Accessories, etc.: Subject to compliance with requirements, manufacturers of masonry anchors, joint reinforcing, accessories which may be incorporated in the work include, but are not limited to, the following:
 - a. Heckman Building Products, Inc.
 - b. Hohmann & Barnard, Inc.

2.2 BRICK MADE FROM CLAY OR SHALE

- A. General: Comply with referenced standards and other requirements indicated below applicable to each form of brick required.
- B. Size: Provide bricks manufactured to the following actual dimensions:
 - 1. Match existing.
- C. Facing Brick: ASTM C 216, and as follows.
 - 1. Grade SW.
 - 2. Type: FBS.
 - 3. Compressive Strength: 8,000 psi, average, per ASTM C 67.
 - 4. Application: Use where brick is exposed, unless otherwise indicated.
 - 5. Texture and Color: Match Architect's sample / Match existing.
 - 6. Wherever shown to "match existing", provide face brick of matching color, texture and size as existing adjacent brickwork.
- D. Efflorescence: Provide brick tested and rated in compliance with ASTM C67.

2.3 CONCRETE MASONRY UNITS

- A. General: Comply with referenced standards and other requirements indicated below applicable to each form of concrete masonry unit required.
- B. Concrete Block: Provide units complying with characteristics indicated below for face size, exposed face and under each form of block included, for weight classification.
- C. Size: Manufacturer's standard units with nominal face dimensions of 16" long x 8" high (15-5/8" x 7-5/8" actual) x thicknesses indicated.
- D. Hollow Loadbearing Block: ASTM C 90 and as follows:
 - 1. Weight Classification: Lightweight.

2.4 MORTAR AND GROUT MATERIALS

- A. General: Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water repellent agents, anti-freeze compounds or other admixtures, unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
- B. Limit cementitious materials in mortar to portland cement-lime.
- C. Portland Cement: ASTM C 150, Type 1, except Type III may be used for cold weather construction. Provide natural color or white cement as required to produce required mortar color.
- D. Hydrated Lime: ASTM C 207, Type S.
- E. Aggregate for Mortar: ASTM C 144, except for joints less than 1/4 inch use aggregate graded with 100% passing the No. 16 sieve.
 - 1. White Mortar Aggregates: Natural white sand or ground white stone.
- F. Mortar: Use Type S mortar for exterior, above-grade loadbearing and non-loadbearing CMU walls; for interior loadbearing CMU walls; and for other applications where another type is not indicated.
- G. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification, for types of mortar required, unless otherwise indicated.
- H. Grout for Unit Masonry: Comply with ASTM C 476.
 - 1. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143.
- I. The proper use of ASTM C 270 and Test Method ASTM C 780 for evaluating masonry mortars produced in the laboratory and the construction site is in accordance with 1.ASTM C 1586.
- J. Aggregate for Grout: ASTM C 404.

- K. Water: Clean and potable.

2.4 JOINT REINFORCEMENT, TIES AND ANCHORING DEVICES

- A. Materials: Comply with requirements indicated below for basic materials and with requirements indicated under each form of joint reinforcement, tie and anchor for size and other characteristics:
- B. Hot-Dip Galvanized Steel Wire: ASTM A 82 for uncoated wire and with ASTM A 153, Class B-2 (1.5 oz. per sq. ft. of wire surface) for zinc coating applied after prefabrication into units.
- C. Joint Reinforcement: Provide welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet, with prefabricated corner and tee units, and complying with requirements indicated below:
1. Width: Fabricate joint reinforcement in units with widths of approximately 2 inch less than nominal width of walls and partitions as required to provide mortar coverage of not less than 5/8 inch on joint faces exposed to exterior and 1/2 inch elsewhere.
 - a. Wire Size for Side Rods: 9 gauge.
 - b. Wire Size for Cross Rods: 9 gauge.
 2. Truss design with continuous diagonal cross rods spaced not more than 16 inch o.c.
 3. Number of Side Rods: One side rod for each face shell of concrete masonry back-up.
 4. Configuration:
 - a. Applications of Single Wythe Wall width: Truss design, diagonal cross rods at not more than 16 inches on center.
 - 1) Basis of Design: Provide Hohmann & Barnard, Inc., No.# 120, Truss-Mesh, or approved equal.
 - b. Applications of more than one unit width (Composite Wall): Truss design, diagonal cross rods at not more than 16 inches on center:
 - 1) Basis of Design: Provide Hohmann & Barnard, Inc., No.# 140, Truss-Twin-Mesh, or approved equal.
- B. Anchor Bolts: Provide steel bolts with hex nuts and flat washers complying with ASTM A 307, Grade A, hot-dip galvanized to comply with ASTM C 153, Class C, in sizes and configurations indicated.
- C. Pencil rods at construction joints as shown: Dowels dipped in tar for 1/2 of length.
- D. Reinforcing Bars: Deformed steel, ASTM A 615, Grade 60 for bars No. 3 to No. 18.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Wetting Clay Brick: Wet brick made from clay or shale which have ASTM C 67 initial rates of absorption (suction) of more than 30 grams per 30 sq. in. per minute. Use wetting methods which ensure each clay masonry unit being nearly saturated but surface dry when laid.
- B. Do not wet concrete masonry units.
- C. Cleaning Reinforcing: Before placing, remove loose rust, ice and other coatings from reinforcing.
- D. Thickness: Build single-wythe walls to the actual thickness of the masonry units, using units of nominal thickness indicated.
- E. Build chases and recesses as shown or required for the work of other trades. Provide not less than 8 inch of masonry between chase or recess and jamb of openings, and between adjacent chases and recesses.
- F. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.
- G. Cut masonry units using motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining work. Use full-size units without cutting where possible. No discoloration of units caused by cutting will be acceptable.
- H. Pattern Bond:
 - 1. Brick: Running bond, unless otherwise shown.
 - 2. Concrete masonry units: Running bond, unless otherwise shown.
 - 3. Lay concealed masonry with all units in a wythe bonded by lapping not less than 2 inches.

3.2 CONSTRUCTION TOLERANCES

- A. Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4 inch in 10 feet, or 3/8 inch in a story height not to exceed 20 feet, nor 1/2 inch in 40 feet or more. For external corners, expansion joints, control joints and other conspicuous lines, do not exceed 1/4 inch in any story or 20 feet maximum, nor 1/2 inch in 40 feet or more. For vertical alignment of head joints do not exceed plus or minus 1/4 inch in 10 feet, 1/2 inch maximum.
- B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4 inch in any bay or 20 feet maximum, nor 1/2 inch in 40 feet or more. For top surface of bearing walls do not exceed 1/8 inch between adjacent floor elements in 10 feet or 1/16 inch within width of a single unit.
- C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 1/2 inch in any bay or 20 feet maximum, nor 3/4 inch in 40 feet or more.

- D. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4 inch nor plus 1/2 inch.
- E. Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch. Do not exceed head joint thickness indicated by more than plus or minus 1/8 inch.

3.3 LAYING MASONRY WALLS

- A. Layout walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to accurately locate openings, movement-type joints, returns and offsets. Avoid the use of less-than-half-size units at corners, jambs and wherever possible at other locations.
- B. Lay-up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other work.
- C. Stopping and Resuming Work: Rack back 1/2-unit length in each course; do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if required) and remove loose masonry units and mortar prior to laying fresh masonry.
- D. Built-in Work: As the work progresses, build-in items specified under this and other sections of these specifications. Fill in solidly with masonry around built-in items.
 - 1. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
 - 2. Fill cores in hollow concrete masonry units with grout 3 courses (24 inches) under bearing plates, beams, lintels, posts and similar items, unless otherwise indicated.
- E. Extend all interior walls full height to underside of structure of deck, unless otherwise indicated. Include compressible insulation at top to completely close space between wall and structure above.
- F. Support and protect masonry, indicated to remain, which surrounds removal area.
 - 1. Refer to BIA, Technical Note #46: "Maintenance of Brick Masonry", www.gobrick.com/Portals/25/docs/Technical%20Notes/TN46.pdf, for two recommended methods to properly support existing brickwork when installing new mechanically keyed through wall flashing, and as indicated below:
 - a. Method 1: Remove alternate sections of masonry in 2'-0" to 5'-0" (610 mm to 1.52m) lengths.
 - b. Method 2: Temporary braces can be installed to permit the removal of longer sections of masonry.

Note: The replaced masonry should be properly cured (5 to 7 days) before the intermediate masonry sections or supports are removed.

3.4 MORTAR BEDDING AND JOINTING

- A. Lay solid brick size masonry units with completely filled bed and head joint; butter ends with sufficient mortar to fill head joints and shove into place. Do not slush head joints.

- B. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or filled with concrete or grout. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under cells.
- C. Maintain joint widths shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8 inch joints.
- D. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials, unless otherwise indicated.
- E. Tool exposed joints slightly concave using a jointer larger than joint thickness, unless otherwise indicated.
- F. Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not pound corners or jambs to shift adjacent stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

3.5 HORIZONTAL JOINT REINFORCEMENT

- A. Provide continuous horizontal joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcing a minimum of 6 inches.
- B. Reinforce masonry openings greater than 1'-0" wide, with horizontal joint reinforcement placed in 2 horizontal joints approximately 8" apart, immediately above the lintel and immediately below the sill. Extend reinforcement a minimum of 2'-0" beyond jambs of the opening except at control joints.

3.6 ANCHORING MASONRY WORK

- A. Provide anchoring devices of the type indicated. If not indicated, provide standard type for facing and back-up involved.
 - 1. Strap anchors for masonry at existing walls.

3.7 REPAIR, POINTING AND CLEANING

- A. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings and adjacent work to provide a neat, uniform appearance, prepared for application of sealants.
- C. Clean exposed brick masonry surfaces by the bucket and brush hand cleaning method or by high pressure water method. Comply with requirements of BIA Technical Notes No. 20 "Cleaning Brick Masonry".

1. Use commercial cleaning agents in accordance with manufacturer's instructions.
- D. Clean exposed CMU masonry by dry brushing at the end of each day's work and after final pointing to remove mortar spots and droppings. Comply with recommendations in NCMA TEK Bulletin No. 28.
1. Prepare exposed to view CMU surfaces to receive paint coatings in accordance with specification section 09900.

END OF SECTION 04200

SECTION 10440 - SPECIALTY SIGNS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

- A. Extent of specialty signs is shown on the drawings.
- B. Forms of specialty signs required include the following:
 - 1. Panel signs (Room Identification Signs).
 - 2. Installation of all specialty signs.

1.3 QUALITY ASSURANCE

- A. Uniformity of Manufacturer: For each sign form and graphic image process indicated furnish products of a single manufacturer.
- B. All signs shall conform to the International Building Code and ICC/ANSI A117.1- 2003 requirements for accessible building elements.
 - 1. All signs to permanent rooms and spaces shall include Braille in accordance with N.J.A.C. 5:23-7.11 (j).

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for each type of sign required.
- B. Samples: Submit samples of each sign form and material showing finishes, colors, surface textures and qualities of manufacturer and design of each sign component including graphics.
 - 1. Submit full-size sample units, if requested by the Architect. Acceptable units may be installed as part of the work.
- C. Shop Drawings: Submit shop drawings for fabrication and erection of specialty signs. Include plans, elevations, and large scale details of sign wording and lettering layout. Show anchorages and accessory items. Furnish location template drawings for items supported or anchored to permanent construction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
 - 1. Americraft Inc.

2. Architectural Graphics Inc.
3. ASI Sign Systems, Inc.
4. Mohawk Sign Systems.
5. Designer Sign Company.
6. Brandon Signage Co.
7. Bayuk Graphic Systems, Inc.
8. or approved equal.

2.2 MATERIALS

- A. GENERAL: Provide manufacturer's standard plastic signage which comply with the requirements established in the International Building Code and ICC/ANSI 117.1 - 2003 Barrier Free Standards. All signs to permanent rooms and spaces shall include Braille in accordance with N.J.A.C. 5:23-7.11 (j).
 1. Acrylic sheet material to be cut to the desired sizes with radius or square corners as indicated, or as per approved shop drawings.
 2. Manufacturer's standard extruded aluminum and acrylic material, as indicated, for Barrier Free Accessible signage indicating International Symbol of Accessibility.
 3. "Helvetica Regular" letter style, Domed Grade II Braille and other pictograms as described herein.
 4. Colors: As selected by the Architect from manufacturer's standards after award of contract, or as specified herein.

2.3 FABRICATION

- A. Unframed Panel Signs: Fabricate unframed panel signs with edges mechanically and smoothly finished to conform with the following requirements:
 1. Edge Condition: Square cut.
 2. Corner Condition: Provide radius corners for each sign type.

2.4 SIGNAGE

- A. GENERAL: ALL signage MUST comply with the requirements established in the International Building Code and ICC/ANSI 117.1 - 2003. All signs to permanent rooms and spaces shall include Braille in accordance with N.J.A.C. 5:23-7.11 (j).

B. INTERIOR SIGNAGE:

1. Barrier Free Accessibility Signs and Directional Signage:
 - a. Basis of Design; "Vandal-resistant signs" as manufactured by Americraft Inc., Tel.# 800.237.3984.
 - 1) Provide injection molded process, 1/8" thick acrylic with non-glare clear front surface, graphics and colors on second surface (Back surface), with radius corners and stepped edging. Provide mounting holes with stainless steel screws. Colors to be selected by the Architect from manufacturer's available full range of colors.

- 2) Provide tactile plastic signs displaying international symbol of accessibility in tactile form and accompanied by Grade II Braille.
- 3) For Directional Signage indicate the route to the nearest accessible element.
- 4) Provide signage at the following locations and as indicated on the Contract Drawings:
 - a) Accessible toilet and bathing units including stalls.
 - b) Accessible lockers.

2. Signage Locations:

- a. Along the door on the latch side and shall be mounted as follows:
 - 1) 48" minimum to the lowest tactile character on the sign measured from the finish floor.
 - 2) 60" maximum to baseline of highest tactile character on the sign measured from the finish floor.
- b. Where there is no wall space on the latch side of the door, signs shall be placed on the nearest adjacent wall.

3. Graphic Content and Style: Provide sign copy to comply with the requirements indicated for sizes, styles, spacing, content, positions, materials, finishes and colors of letters, numbers, symbols and other graphic devices.

- a. Raised Copy Thickness: Not less than 1/32" from the sign face.
- b. Raised characters shall be in different color and meets the Barrier Free requirements for a 70% contrast ratio of colors. Colors shall be selected from manufacturer's available full range of colors.
- c. Raised characters and symbols for tactile signs shall be 5/8" high minimum and 2" high maximum. Sign size shall suit the required letters and numbers.

4. Braille Copy: Braille Copy shall be Grade II and shall conform to Specification 800, National Library Service, Library of Congress. Braille shall be raised integral .0625 diameter.

- a. Braille shall be separated 1/2" minimum from the corresponding raised characters or symbols.

5. Mounting: As directed by the Architect using required fasteners.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Locate sign units and accessories where shown or scheduled, using mounting methods of the type described and in compliance with the applicable Codes and regulation.

- B. Install sign units level, plumb and at the height indicated, with sign surfaces free from distortion or other defects in appearance.
- C. Wall Mounted Panel Signs: Attach panel signs to wall surfaces using the methods indicated below:
 - 1. Silicone Adhesive Mounting: Use liquid silicone adhesive recommended by the sign manufacturer to attach sign units to irregular, porous or vinyl-covered surfaces.
 - a. Use double-sided vinyl tape where recommended by the sign manufacturer to hold the sign in place until the adhesive has fully cured.
 - b. Fasteners and Anchors: Manufacturer recommended concealed types for indicated signage and substrate materials.

3.2 CLEANING AND PROTECTION

- A. At completion of the installation, clean soiled sign surfaces in accordance with the manufacturer's instructions. Protect units from damage until acceptance by the Owner.

END OF SECTION 10440

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RENOVTIONS TO TOILET ROOMS, #HVL02 AT THE NATIONAL GUARD ARMORY VINELAND, NEW JERSEY

GENERAL CONDITIONS

ALL CONTRACTS

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ADVERTISEMENT FOR BIDS

PROJECT: Bathroom Renovation and Plumbing Repairs
LOCATIONS: Vineland Armory, 2560 S. Delsea Drive, Vineland, NJ. 08360
PROJECT #: HVL 02
OWNER: STATE OF NEW JERSEY, DEPARTMENT OF MILITARY AND VETERANS AFFAIRS
EST. COST: \$ 500,000 to \$1,000,000

Sealed bid forms will be received in the New Jersey Department of Military and Veterans Affairs (NJDMAVA), Business Management Bureau, Contract Administration Office, located at 101 Eggert Crossing Road, Lawrenceville, NJ 08648 until **2:00 PM on Sept 12, 2013** and then publicly opened and read aloud. No bid will be accepted thereafter.

Mailing and/or Delivery: NJ Dept. of Military and Veterans Affairs
ATTN: CFMO- BMB
101 Eggerts Crossing Road
Lawrenceville, NJ 08648-2805
Tele: (609) 530-7115

Bid(s) will be received on the following prime contract(s):

C008 General Construction
C009 General Construction/Alterations and Additions
C030 Plumbing

All bidders must be prequalified in accordance with the statute (N.J.S.A. 52:35-3) Division of Property Management and Construction (DPMC). Current proof must be on file in DPMC and/or submitted to this office not later than TIME SCHEDULE FOR BID OPENING. Failure to do so may result in the disqualification of the bidder.

Copies of the contract documents and/or CD's will be available Aug 23, 2013 and may be examined or obtained at the Business Management Bureau's Office upon payment of a **NON- REFUNDABLE \$ 25.00 fee**, (company check or U.S. money order made payable to "Treasurer, State of New Jersey").

No bidder may withdraw his bid within ninety (90) calendar days after the actual date of the opening thereof. Each bidder must deposit with his bid, security in an amount and form subject to the conditions provided in the Instructions for Bidders. Successful bidder(s) must provide a 100% Performance Bond and 100% Payment Bond when the project is awarded.

Attention of bidders is particularly called to the requirements as to condition of employment to be observed and minimum wage rates to be paid under the contract.

Bidders are required to comply with the requirements of P.L. 1975, C.127 Affirmative Action Program, and P.L. 1945, C.169 Law Against Discrimination.

A NON-MANDATORY PRE-BID MEETING WILL BE HELD ON Aug 27, 2013 AT 10:00 AM at the project location, **Vineland Armory, Vineland, NJ**. Questions related to preparation of this bid should be directed to the Construction Facilities Management Office (CFMO) Business Management Bureau (BMB) at **609-530-7115** **between the hours of 8:00 AM AND 4:00 PM Monday thru Thursday**.

Lt. Col(R) *EDWARD R. SAIN, P.E.*
Contracting Officer
Department of Military and Veterans Affairs

00030

INSTRUCTION TO BIDDERS

ARTICLES

1. DEFINITIONS - NOTICES

- A. The CONTRACT documents consist of the Agreement, Instructions to Bidders, General Conditions and Supplementary Conditions of the CONTRACT, the Drawings and Specifications, Addenda, and Change Orders including all modifications thereof incorporated in the documents before his/her execution. Whenever the word "CONTRACT" is used herein, it means all of the above documents or such part of them as are clearly indicated.
- B. Whenever the word "State" or "Owner" is used herein, it means the State of New Jersey and specifically the New Jersey Department of Military and Veterans Affairs (NJDMAVA).
- C. Whenever the word "Contracting Officer" (C.O.) is used herein, it means the individual appointed by the Adjutant General to enter into CONTRACTs as his/her duly authorized representative.
- D. Whenever the word CONTRACTOR", "Prime CONTRACTOR", "Single CONTRACTOR" or CONTRACTOR " is used herein, it means the individual or firm undertaking to do all work contracted for under the CONTRACT.
- E. Whenever the word "Architect" or "Engineer" (A/E) is used herein, it means the Architect or Engineer engaged by the State and, when applicable by designation, shall be acting as the duly authorized representative of the C.O. to the extent described in "Architect or Engineer Status" in PART IV Article 2. In addition, in Design/Build projects, the Architect/Engineer shall be a representative of the Design/Build venture and acting on behalf of the CONTRACTOR of record.
- F. Whenever the word CONSTRUCTION MANAGER is used herein, it means a firm engaged by the state and designated to act as the duly authorized representative of the C.O. to the extent described in the "CONSTRUCTION MANAGER" status in Part IV Article 3.
- G. Whenever the word "CONTRACTOR" is used herein, it means an individual or firm undertaking to do all work Contracted for under the CONTRACT. It shall include the understanding that a duly licensed Architectural/Engineering firm is part of the firm or subcontracted to perform the design aspects of the CONTRACT.
- H. The term "Federally Funded Contract" applies to CONTRACTS where the National Guard Bureau (NGB) shall be participating by providing the funds. These funds shall be administered by the USP&FO.
- I. The term "Subcontractor", as employed here, includes individual or firm having a direct CONTRACT with the CONTRACTOR and it includes one who furnishes labor or material worked or one who merely furnished material not so worked.
- J. The entire above are treated throughout the CONTRACT as if each were the singular member and masculine gender.
- K. When the term "acceptable" or "approved" is used herein, it means that the material or work shall be acceptable to or approved by the C.O.
- L. The term "work" of the CONTRACTOR as used herein includes labor, materials, plant and equipment required to complete the CONTRACT.
- M. Written notice shall be deemed to have been duly served if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered or sent by

certified or registered mail to the last business address known to them who gives the notice, or delivered in person to said CONTRACTOR or his/her authorized representative on the work.

- N. Whenever the words "Contract Limit Lines" are used herein, his/her refer to the lines shown on the drawings, surrounding the CONTRACT work beyond which no construction work shall be performed unless otherwise noted in the CONTRACT Documents. The CONTRACTOR shall check and verify conditions outside of the CONTRACT limit lines to determine whether or not any conflict exists between elevations or other data shown on the drawings and existing elevations or other data outside of the CONTRACT limit lines.
- O. Whenever the words "Construction Site" or "Project" are used herein, his/her refer to the geographical grounds of the entire Department of Military & Veterans Affairs Property at which the CONTRACT work is performed.

2. QUALIFICATIONS OF BIDDER

- A. The State may make such investigations as it deems necessary to determine the ability of the CONTRACTOR to perform the work, and the BIDDER shall furnish to the State all such information and data for this purpose as the State may request. The State reserves the right to reject any bid if the evidence submitted by, or investigation of such BIDDER fails to satisfy the State that such BIDDER is properly qualified to carry out the obligations of the CONTRACT and to complete the work contemplated therein.
- B. CONTRACTORS, his/her Architects or sub-consultants must be pre-qualified (NOTICE OF CLASSIFICATION) in accordance with New Jersey State laws, rules and Regulations before his/her bid can be accepted and award made.
- C. CONTRACTORS who have been consistently rated as unsatisfactory from previous NJDMAVA projects may be disqualified for this and future projects.

3. AUTHORIZATION TO DO BUSINESS IN THE STATE OF NEW JERSEY

- A. If the successful BIDDER is a CORPORATION not organized under the laws of the State of New Jersey or is not authorized to do business in the State of New Jersey, the award of CONTRACT and payment of consideration thereunder shall be conditioned upon said CORPORATION promptly filing a certificate of doing business in the State of New Jersey and complying with the provisions of the law of the State of New Jersey in that regard.
- B. If any CORPORATION doing business with the State of New Jersey shall be or become delinquent in the payment of taxes to the State said taxes may be withdrawn from any monies due from the State to such a CORPORATION.

4. LAWS TO BE OBSERVED

- A. The CONTRACTOR shall keep fully informed of all Federal, State, and local laws, ordinances, and regulations, and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any manner affect those engaged or employed on the Work, or which in any way affect the conduct of Work.
- B. The CONTRACTOR shall at all times observe and comply with, and shall cause its agents and employees to observe and comply with, all such laws, ordinances, regulations, orders, and decrees and shall protect and indemnify the State and its representatives against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by the CONTRACTOR or the CONTRACTOR'S agents or employees, subcontractors or any suppliers or materialman. **If any discrepancy or inconsistency is discovered between the CONTRACT Documents and any such law, ordinance, regulation, order, or decree, the CONTRACTOR shall immediately report the same to the CONTRACTING OFFICER in writing.**

5. PERMITS, LAWS AND REGULATIONS

- A. Each CONTRACTOR shall obtain and pay for ALL necessary permits from State (i.e., D.C.A., D.E.P., D.O.H., Pinelands Commission, etc.) and Federal (Soil Erosion Conservation District, EPA, etc.) and arrange inspections with these agencies in accordance with the agency's policies. Each CONTRACTOR shall obtain any Federal or State permits which may be required and pay all costs, comply with Federal or State laws, ordinances, and regulations applying to this work provided his/her do not conflict with the CONTRACT Documents. All electrical and applicable mechanical work shall conform to the latest rules of the Underwriter's Laboratory concerned, Board of Fire Underwriters. On new construction and all alteration work, a Final Certificate of Inspection and or Occupancy from the Department of Community Affairs shall be provided at the expense of the CONTRACTOR(S). All plumbing and sewage disposal work shall conform to the regulations of the Uniform Construction Code, Department of Community Affairs and the State Board of Health.
- B. The CONTRACTOR shall submit a copy of his application to Department of Community Affairs for plan review (if not completed by NJDMAVA prior to bidding), permit issuance and inspection at the immediately following receipt of the Notice to Proceed.
- C. Each CONTRACTOR shall be responsible for and save harmless the State from all fines, penalties or loss incurred for, or by reason of, the violation and the local ordinance or regulation or law of the State while the said work is in process of construction.
- D. All work shall be conducted in accordance with the State Department of Labor and Industry Construction Safety Code, effective July 1, 1968, as promulgated by the Commission of Labor and Industry under the authority of the Construction Safety Act, P.L. 1962, Chapter 45, N.J.S.A. 34:5-166 to 34:5-181. Where the Construction Safety Code refers to designation of GENERAL CONTRACTOR for enforcing of compliance with the code, such designation shall be intended to refer to the CONTRACTOR. Particular emphasis is placed upon compliance with all requirements on Pages 8 and 9, Articles 3.14 and 3.15 of the code wherein CONTRACTOR shall be responsible for Safety Inspections and Project Protection.
- E. All CONTRACTORS shall comply with the Federal Occupational Safety and Health Act of 1970. F. All CONTRACTORS shall comply with regulations of the DCA Fire Official.
- G. All CONTRACTORS and his/her subcontractors shall be certified or licensed by the appropriate agency for the work to be performed. Evidence of such shall be presented when requested by this Department.

6. PREVAILING WAGE ACT

- A. Each CONTRACTOR or any Subcontractor shall comply with the State Prevailing Wage Act, Laws of 1963, Chapter 150, and all amendments thereto, and this Act is hereby made a part of every CONTRACT entered into on behalf of the State except those CONTRACTS which are not within the contemplation of the Act.
- (1) All workmen employed in the performance of every CONTRACT in excess of \$2,500 for any public work to which the Department of Military and Veterans Affairs is a party, shall be paid not less than the prevailing wage rate as designated by the Commission of Labor and Industry or his/her duly authorized deputy or representative.
- (2) In the event it is found that any workman, employed by any CONTRACTOR or any Subcontractor covered by any CONTRACT in excess of \$2,500 for any public work to which the Department of Military and Veterans Affairs is a party, has been paid a rate of wages less than the prevailing wage required to be paid by such CONTRACT, the C.O. may terminate the CONTRACTOR'S or

Subcontractor's right to proceed with the work, or such part of the work as to which there has been a failure to pay required wages and to prosecute the work to completion or otherwise.

The State shall furnish as part of the CONTRACT a copy of the Prevailing Wage Rates, which shall be paid (as designated by the Commission of Labor) to the workman, employed in the performance of the CONTRACT.

(3) Nothing contained in the Prevailing Wage Act shall prohibit the payment of more than the prevailing wage rate to any workman employed on a public work.

a. Each CONTRACTOR and Subcontractor performing public work for the Department of Military and Veterans Affairs are subject to the provisions of the Prevailing Wage Act shall post the prevailing wage rates for each craft and classification involved as determined by the Commissioner, including the effective date of any changes thereof, in prominent and easily accessible places at the site of the work or at such place or places as are used by them to pay workmen his/her wages.

b. The BIDDER'S signature on the PROPOSAL is his/her guarantee that neither his/her nor any subcontractor is currently listed or on record by the Commissioner as one who has failed to pay the prevailing wages according to the Prevailing Wage Act.

7. MINIMUM WAGES

A. The CONTRACTOR shall post at appropriate conspicuous points at the site of the project a schedule showing all determined minimum wage rates for the various classes of laborers and mechanics to be engaged in work on the project under this CONTRACT and all deductions, if any, required by law to be made from unpaid wages actually earned by the laborers and mechanics so engaged.

DAVIS-BACON ACT (40 U.S.C. 276A TO A-7) (1977 DEC)

B. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by the Copeland Regulations (29 CFR, Part 3), the full amount due at time of payment computed at wage rates not less than the aggregate of the basic hourly rates and the rates of payments, contributions, or costs for any fringe benefits contained in the wage determination decision of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the CONTRACTOR and such laborers and mechanics. A copy of such wage determination decision shall be kept posted by the CONTRACTOR at the site of the work in a prominent place where the workers can easily see it. The term "mechanics and laborers" shall be deemed to include apprentices and trainees not covered by an approved program as provided by the APPRENTICES AND TRAINEES Clause of the CONTRACT.

C. The CONTRACTOR may discharge his/her obligation under this Clause to workers in any classification for which the wage determination decision contains:

- (1) Only a basic hourly rate of pay, by making payment at not less than such basic hourly rate, except as otherwise provided in the Copeland Regulations (29 CFR, Part 3); or
- (2) Both a basic hourly rate of pay and fringe benefits payments, by making payment in cash, by irrevocably making contributions pursuant to a fund, plan, or program for, and/or by assuming an enforceable commitment to beat the cost of, bona fide fringe benefits contemplated by the Davis-Bacon Act, or by any combination thereof. Contributions made, or cost assumed, on other than a weekly basis shall be considered as having been constructively made or assumed, during a weekly period to the extent that his/her apply to such period. Where a fringe benefit is expressed in a wage determination in any manner other than as an hourly rate and the CONTRACTOR pays a cash equivalent or provides an alternative fringe benefit, he shall furnish information with his payrolls

showing how he determined that the cost incurred to make the cash payment or to provide the alternative fringe benefit is equal to the cost of the wage determination fringe benefit. In any case where the CONTRACTOR provides a fringe benefit different from any contained in the wage determination, he shall similarly show how he arrived at the hourly rate shown. In the event of disagreement between or among the interested parties as to an equivalent of any fringe benefit, the Contracting Officer shall submit the question, together with his recommendation, to the Secretary of Labor for final determination.

- D. The assumption of an enforceable commitment to bear the cost of fringe benefits, or the provision of any fringe benefits not expressly listed in section 1(B) (2) of the Davis-Bacon Act or in the wage determination decision forming a part of the CONTRACT, may be considered as payment of wages only with the approval of the Secretary of Labor may require the CONTRACTOR to set aside assets, in a separate account, to meet his obligations under any unfunded plan or program.
- E. The CONTRACTING OFFICER shall require that any class of laborers or mechanics, including apprentices and trainees, which is not listed in the wage determination decision and which is to be employed under the CONTRACT shall be classified or reclassified conforming to the wage determination decision and shall report the action taken to the Secretary of Labor. If the interested parties cannot agree on the proper classification or reclassification of a particular class of laborers and mechanics, including apprentices and trainees, to be used, the CONTRACTING OFFICER shall submit the question, together with his/her recommendation, to the Secretary of Labor for final determination.
- F. In the event it is found by the CONTRACTING OFFICER that any laborer or mechanic, including all apprentices and trainees, employed by the CONTRACTOR or any subcontractor directly on the site of the work covered by this CONTRACT has been or is being paid at a rate of wages less than the rate of wages required by paragraph (A) of this Clause, or by the APPRENTICES AND TRAINEES Clause of this CONTRACT, the CONTRACTING OFFICER may (i) by written notice to the Prime CONTRACTOR terminate his right to proceed with the work, or such part of the work as to which there has been a failure to pay said required wages and (ii) prosecute the work to completion by CONTRACT or otherwise, whereupon such CONTRACTOR and his/her sureties shall be liable to the Government for any excess costs occasioned the Government thereby.
- G. The CONTRACTING OFFICER'S failure to discharge his/her obligations under this clause may result in withholding of Federal funds which are otherwise authorized for payment to the CONTRACTOR under the terms of this CONTRACT.
- H. DISPUTES CONCERNING LABOR STANDARDS (1977 DEC)

Disputes arising out of the labor standards provisions of this CONTRACT shall be subject to the DISPUTES Clause except to the extent such disputes involved the meaning of classification or wage rates contained in the wage determination decision of the Secretary of Labor or the applicability of the labor provisions of this CONTRACT which questions shall be referred to the Secretary of Labor in accordance with the procedures of the Department of Labor.

8. OBLIGATION OF BIDDER

- A. At the time of the opening of bids each BIDDER shall be presumed to have inspected the site, to have read and become thoroughly familiar with the CONTRACT Documents (including all addenda). The failure or omission of any BIDDER to examine any form, instrument, document or site shall in no way relieve any BIDDER from any obligation with respect to his bid.
- B. **SITE INVESTIGATION** (1965 JAN) - The BIDDER acknowledges that they have investigated and satisfied themselves as to the conditions affecting the work, including but restricted to those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, river stages, tides or similar physical conditions at the site,

the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during prosecution of the work. The BIDDER further acknowledges that they have satisfied themselves as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered. Any failure by the BIDDER to acquaint themselves with the conditions of the site will not relieve them from responsibility for estimating properly the difficulty or cost of successfully performing the work. The State assumes no responsibility for any conclusions or interpretations made by the BIDDER on the basis of the information made available by the State.

9. PROPOSAL

- A. Sealed PROPOSALS for the work described shall be received in the Construction Facilities Management Office, Business Management Bureau, Department of Military and Veterans Affairs Building, 101 Eggert Crossing Road, Lawrenceville, New Jersey 08648. Bids must be received on the published date and prior to the time specified for opening bids.
- B. PROPOSALS based upon these CONTRACT Documents shall be held as made with full knowledge of conditions and requirements. BIDDERS are expected to visit project site and/or premises prior to time of submitting PROPOSALS for work herein described, and shall thoroughly inspect the conditions under which the CONTRACT is to be executed.
- C. PROPOSALS are to be made and submitted on the Bid Form included in the specifications. PROPOSALS shall be submitted in the self-addressed envelope provided. Envelope shall be marked in the left-hand corner with the name of the project. The words "BID FORMS ENCLOSED" shall be printed on the outside of the envelope.
- D. All amounts shall be stated in words as well as in figures. In case of a discrepancy, the written words shall govern.
- E. Persons or firms submitting bids shall be engaged in the lines of work called for in these CONTRACT Documents and shall be able to refer to work of a similar character performed by them. Pre-qualification by the State of New Jersey, Department of Treasury, Division of Real Property and Construction Management, is mandatory and evidence of such shall be provided prior to the award of a project.
- F. PROPOSALS shall be open for acceptance for ninety (90) calendar days after bid due date. At times, monies may not be available for all portions of the bids. NJDMAVA reserves the right to request the awarded BIDDER to extend the acceptance period. This shall be done in writing at the time of award.
- G. Bids not submitted on the appropriate forms and in accordance with the instructions contained herein and in the "Advertisement for Bids" may be rejected at the discretion of the CONTRACTING OFFICER.
- H. Each BIDDER is required to submit a Disclosure Statement with his bid pursuant to the requirements of the P.L. 1977 Chap. 33 which shall set forth the names and addresses of all stockholders or holders of an interest of ten percent (10%) or more in the corporation or partnership. Shall a separate corporation hold ten (10%) or more as a stockholder of the BIDDER'S corporation, than a separate Disclosure Statement shall be submitted for the Stockholding Corporation.

10. ADDENDA AND INTERPRETATIONS

- A. NJDMAVA shall be the sole interpreter of its plans, specifications, and other bid documents.
- B. No interpretations of the meaning of the plans, specifications or other pre-bid documents will be made to any BIDDER orally. Any oral interpretation, not documented in writing to all BIDDERS prior to bid opening or referenced in the bid proposal, shall be considered as privileged information and, as such, not binding upon the State. (It should be cautioned that NJDMAVA representatives and CONTRACTORS shall avoid this interaction to eliminate the perception of any wrong doing.)

- C. Every request for interpretation shall be in writing and addressed to the CONTRACTING OFFICER on projects under his/her direct control and to be given consideration must be received at least fourteen (14) calendar days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications, which, if issued, will be either mailed by certified mail with return receipt requested, or sent via facsimile with written confirmation of delivery or via email with written confirmation of email read by bidder, to all prospective BIDDERS (at the respective addresses furnished for such purposes), not later than seven (7) calendar days prior to the date fixed for the opening of bids, or by telegraphic notice. Failure of any BIDDER to receive any such addenda or interpretation shall not relieve such BIDDER from any obligation under his/her bid as submitted. All addenda so issued shall become part of the CONTRACT Documents and shall be acknowledged in the proposals.
- D. Responsibility of Receipt of Addenda: It shall be the responsibility of the BIDDER to assure himself that his bid is responsive to the Invitation to Bid as modified by any addenda which may have been issued prior to the opening of bids. Information as to addenda may be obtained at any time before the opening of bids by telephone inquiry to the Construction Facilities Management Office, Business Management Bureau, Trenton, New Jersey (609-530-7120).

11. MODIFICATION OF BIDS

Any BIDDER may modify his bid prior to the scheduled closing time for receipt of bids by rescinding the current bid, in writing, and resubmitting a bid in accordance with Part II Article 9, 1, PROPOSAL of this document. In order for rescission to be valid, the original request must be provided to NJDMAVA prior to the closing time for the receipt of bids.

12. APPROVED EQUALS

- A. CONTRACTORS shall submit all items, materials, equipment, etc. for APPROVED EQUAL(S) to the CONTRACTING OFFICER fourteen (14) calendar days prior to the bid date.
- B. If the items, materials, equipment, etc. are deemed approved equal, an ADDENDA shall be sent to all prospective BIDDERS giving them the opportunity to bid on that product or item.
- C. The CONTRACTING OFFICER is the sole determining individual of approved equal items.
- D. No items, materials, equipment, etc. shall be submitted or approved as equal after the bid date, nor shall any substitutions be accepted for installation once the bid is awarded and the CONTRACT executed unless circumstances force the substitution through no fault of the CONTRACTOR.
- E. No NJDMAVA representative or CONTRACTOR shall authorize an approved equal unless otherwise approved, in writing, by the Contracting Officer.

13. UNIT PRICES REQUIRED

- A. BIDDERS shall list unit prices for both additions and deductions as called for on the Bid Form and in the CONTRACT Documents. The maximum differential between add and deduct unit prices shall not exceed fifteen (15%) percent. Such unit prices may, at the discretion of the CONTRACTING OFFICER, be rejected. If any unit price is not applicable to any BIDDER, he shall write the words "Not Applicable" in the space provided for the unit price.
- B. Where unit prices have been established by the State on the Bid Form, BIDDERS agrees that such unit price shall prevail. All unit prices appearing on a Bid Form, upon acceptance by the State, shall become a part of the CONTRACT.
- C. All unit prices appearing in a bid proposal, upon acceptance by the State, may be used to evaluate the bids. If the CONTRACTING OFFICER determines that there is a probability of exercising the unit prices in a

Change Order, he/she may award a bid on the basis of the bid proposal including unit prices. Therefore, being low in the normal bids on the bid proposal shall not necessarily signify award.

14. BID SECURITY

- A. Each PROPOSAL shall be accompanied by a certified check or a bid bond prepared on the form of Bid Bond attached hereto duly executed by the BIDDER as principal made payable to the State of New Jersey.
- B. The bond shall equal ten (10%) percent of the amount of the proposal, as an evidence of good faith, and to the effect that, if the proposal of the BIDDER is accepted, the bidder will enter into the CONTRACT. The bond shall have surety thereon of a surety company approved by the State of New Jersey. If a Bid Bond is submitted, the same shall also provide that the surety shall be bound to issue the final bonds for the faithful performance and payment, in statutory form, if the BIDDER is awarded the CONTRACT.
- C. If the BIDDER, whose proposal is accepted, is unable to qualify for the Performance and Payment Bonds or fails to execute a CONTRACT in the time allowed, then such BIDDER and the Surety, in the case a Bid Bond has been submitted, shall be obligated to pay to the State of New Jersey the difference in money between the amount of the bid and the amount which the State legally CONTRACTs with another party to perform the work. The State reserves the right to retain any certified check deposited hereunder as reimbursement for the difference as aforesaid and return any balance to the BIDDER upon demand. The BIDDER shall make immediate payment to the State for any deficiency.
- D. Nothing contained herein shall be construed as a waiver of any other legal remedies the State may have by reason of default. Certified checks or bonds of unsuccessful BIDDERS will be returned after the CONTRACT is executed, or previous to such time at the discretion of the CONTRACTING OFFICER. Such checks or Bid Bonds will be returned to all except the three lowest BIDDERS, within ten (10) calendar days after the opening of bids. The remaining checks, or Bid Bonds will be returned promptly after the State and the accepted BIDDER have executed the CONTRACT, or, if no award has been made within ninety (90) calendar days after the date of the opening of bids, upon demand of the BIDDER at any time thereafter, so long as he has not been notified of the acceptance of his bid.
- E. CONTRACTORS electing to furnish a bid bond must submit the same in the forms as shown in Section 00412. Bid Bonds shall be on Statutory Form or in the form attached and supplied by bonding companies authorized to do business in New Jersey.

15. POWER OF ATTORNEY

Attorneys-in-fact who sign Bid Bonds or CONTRACTs must file with each bond a certified and effectively dated copy of his/her Power of Attorney.

16. FORMS – AFFIRMATIVE ACTION

The BIDDER awarded a CONTRACT shall submit the Affirmative Action form No. AA-201 no later than five (5) days after the bid opening. Failure to do so shall disqualify the awarded BIDDER and the CONTRACTING OFFICER shall award the bid to the next responsible BIDDER.

17. FORM OF NON-COLLUSION AFFIDAVIT

State Form of Non-Collusion Affidavit (FORM NJDMAVA 53) must be completed and submitted with all bid proposals. The required number of copies (as outlined in the advertisement) shall be included in the bidding documents. A sample copy appears on page 17.

18. UNCOMPLETED CONTRACTS

- A. The Certification of Uncompleted CONTRACTs must be completed and submitted with all bid proposals.
- B. Failure to include this document with the other bid documents could result in the bid being disqualified.
- C. **Bids shall not** be awarded where the bid proposal of this project added to the total of outstanding uncompleted CONTRACTs exceeds the pre-qualification limits of the CONTRACTOR.

19. MCBRIDE PRINCIPALS AND NORTHERN IRELAND ACT OF 1989

The required number of copies be included in bidding documents sample in Section 00492.

20. PERFORMANCE

- A. The State requires that each CONTRACTOR shall perform a minimum of thirty-five (35%) percent of the CONTRACT work by his/her own plant and forces.
- B. Plant and work **shall not include the administration of the CONTRACT** unless it can be shown that the administration process warrants consideration in the thirty-five (35%) percent. The CONTRACTOR shall be responsible for full-time supervision of the project regardless of the thirty-five (35%) rule.

21. AWARD & NOTICE TO PROCEED

- A. **The State reserves the right to accept or reject any or all bids.**
- B. Awards will be officially initiated when the words "**OK TO AWARD**" are annotated on the bid abstract. CONTRACTs shall become effective when signed and dated by the authorized representative of NJDMAVA.
- C. CONTRACTs, when awarded, shall be made for each DESIGN/BUILD only.
- D. CONTRACTORs shall perform his/her work to the satisfaction of the Department of Military and Veterans Affairs, Construction Facilities Management Office. CONTRACTOR(s) shall complete the work and furnish all material under his/her CONTRACT within the number of stated calendar days from date of **NOTICE TO PROCEED** issued by the CONTRACTING OFFICER.

Each BIDDER must bid on all items of the bid sheets. Failure to bid on any item shall disqualify the BIDDER.
Modification of the bid form in any manner shall disqualify the BIDDER.

Single Contract Award.

- E. Where a single CONTRACT is awarded, any references to PRIME CONTRACTORS shall be interpreted as referring to the CONTRACTOR. More specifically, but not limited to, are the references to the obligation of certain trades to perform certain services which are applicable to the mentioned CONTRACTORS in the case of multiple bidding which under the single CONTRACT are the sole exclusive obligation of the CONTRACTOR who shall be responsible for the entire project, its progress, coordination of all trades, any delays caused by any subcontractor to any other subcontractor or to the CONTRACTOR and workmanship.

22. METHOD OF AWARD

A. Applicable to Federal Funded Projects Only

1. Bidding procedure involving only base bids for Separate Prime Contract: If the proposal is within the amount of funds available to finance the CONTRACT, then award will be made to responsible BIDDER submitting the Low Base Bid for each branch or divisions of work.
2. Bidding procedures involving a Base Bid and Alternate Deductive Bids: If the Base Bid is within the amount of funds available to finance the construction CONTRACT, then CONTRACT award will be made to that responsible BIDDER submitting the low base bid. If the Base Bid exceeds the amount of funds available to finance the construction CONTRACT, then the State may reject all bids or may award the CONTRACT to that responsible BIDDER submitting the Low Combined Bid, consisting of the Base Bid with such Alternate Deductive Bids as are required to produce a net Bid amount within the availability of funds.
3. Bidding procedure involving a Base Bid and Alternate Additive or unit price Bids: If the Base Bid is within the amount of funds available to finance the construction CONTRACT and the State wishes to accept Alternate Additive Bids, then the CONTRACT will be made to the responsible BIDDER submitting the Low Combined Bid, consisting of the Base Bid plus Alternate Additive Bids. Under this procedure, if the State wishes to make award on only the Base Bid, then CONTRACT award will be made to that responsible BIDDER submitting the Low Base Bid.
4. Bidding Procedure Involving Prime and Single Contract Bidding:
 - a. Lowest Prime Contract Bids: If the sum total of the lump sum amount, base bids and alternates, bid by the lowest qualified BIDDERS under prime CONTRACT bidding, as determined under paragraph 1, 2, or 3 is less than the corresponding lump sum amount bid by the lowest responsible BIDDER under single CONTRACT bidding, CONTRACT award will be made to the lowest responsible BIDDER for each of the separate CONTRACTs listed on the Proposal Form.
 - b. Lowest Single Contract Bid: If the lump bid by the lowest qualified responsible BIDDER under Single CONTRACT bidding, as determined under paragraph A, B, C is less than the corresponding lump sum made by the lowest responsible BIDDER under Single CONTRACT bidding.

B. Applicable to State Funded Projects Only

The State of New Jersey reserves the right to award a CONTRACT upon basis of lump sum bid for the entire work or upon basis of any base bid or alternate (unit price) or any combination of base bids or alternates (Unit price) which may best serve the interest of the State.

The BID FORMS method of award shall stipulate what items shall be awarded and how the award shall be determined.

23. PROTESTS

- A. CONTRACTORS who may be aggrieved in connection with the solicitation or award of a CONTRACT or its pre-qualification status or classification status may protest to the CONTRACTING OFFICER.
- B. The protest shall be submitted in writing within five (5) calendar days after the date of award. The CONTRACTING OFFICER shall conduct a hearing to settle or resolve protest and if the protest is not resolved by mutual agreement, the CONTRACTING OFFICER shall issue a decision in writing within ten (10) calendar days.
- C. The CONTRACTING OFFICER shall have final authority for the interpretation of the specifications and a decision under this section shall be deemed a final agency action.

24. SECURITY FOR FAITHFUL PERFORMANCES

- A. The CONTRACTOR shall furnish a surety bond or bonds, simultaneously with his/her delivery of the executed CONTRACT, as security for faithful performance of this CONTRACT and for the payment of all persons performing labor on the project under this CONTRACT and furnish materials in connection with this CONTRACT, as specified in the General Conditions included herein. The surety on such bond or bonds shall be a duly authorized surety company satisfactory to the State and authorized to do business in the State of New Jersey.
- B. The cost of bonds shall be borne by the representative CONTRACTOR.

25. PROCUREMENT OF STEEL (Applicable to Federal Funded Projects Only)

The BIDDER assures by signing his bid that he will procure steel for use under the CONTRACT at the lowest possible current prices.

BID DOCUMENT SUBMISSION CHECKLIST

	Bidder Initials
1. Bid Form (Section 00310)	_____
2. Bid Bond (Section 00412)	_____
3. Disclosure Affidavit (Section 00470)	_____
4. Non-Collusion Affidavit (Section 00480)	_____
5. Notice of Classification (Section 00481) (Treasury determination)	_____
6. Certification of Uncompleted Contracts (Section 00490)	_____
7. Certification of Non-segregated Facilities (Section 00491)	_____
8. Certification MacBride Principles (Section 00492)	_____
9. Contractor Notification of Asbestos Management Plan (Section 00493)	_____
10. PL 2005, Chap 51 Contractor Certification and Disclosure (Section 00494)	_____
11. EO 117 Certification (Section 00495)	_____
12. Disclosure of Investment Activities in Iran (Section 00496)	_____

Signature: The undersigned hereby acknowledges and has submitted the above listed requirements.

Firm Name of Bidder: _____

By Authorized Representative:

Signature: _____

Print Name and Title: _____ Date: _____

BID FORM

State of New Jersey
Department of Military and Veterans Affairs
Construction Management Bureau
101 Eggerts Crossing Rd. Trenton, NJ 08648

Date _____

This Bid Form is to be returned in the self-addressed envelope. Bid in accordance with Proposal Form and specification

BASE BID: The Renovation of 3 bathrooms and 1 shower, conversion of one shower and the repair/replacement/installation of associated plumbing located at the Vineland Armory, 2560 S Delsea Dr. Vineland NJ. 08360

Written Amount _____

(\$ _____)

ADDITIVE BIDS: none

NOTE: Award shall be made to the lowest responsible bidder for BASE BID.

Bidders must sign all items. The State reserves the right to accept or reject this bid or any part thereof, if it is in the public interest to do so. This bid shall be valid for ninety (90) calendar days from date of bid opening.

SUBCONTRACTORS: The undersigned proposes to subcontract work in conjunction with this bid submitted pursuant to N.J.S.A 52:32-2 to the following named subcontractors qualified in accordance with N.J.S.A. 53:35-1 et seq:

Plumbing _____

HVAC _____

Electrical _____

Structural N/A _____

This bidder having examined the specifications with related documents and the sites of the proposed work and being familiar with all of the conditions surrounding the proposed project including the availability of materials and labor, hereby proposes to furnish all labor, materials and supplies, and to complete the work in accordance with the Contract Documents within the time set forth herein, and at the prices stated above. These prices are to cover all expenses incurred in performing the work required under the Contract Documents, of which this proposal is a part.

Bidder hereby agrees to commence work under this contract on or before a date to be specified in written "Notice to Proceed" of the Owner and to fully complete the project within

One hundred and twenty (120) calendar days.

Bidder further agrees to pay as liquidated damages, a sum for each consecutive working day thereafter as provided in Paragraph 23 of the General Conditions.

Bidder acknowledges receipt of the following Addenda

Addendum Number

Date of Addendum

BID SECURITY: Enclosed with this bid form is a bid security in the form of (Bid Bond) or (Certified Check) for the amount of _____

Dollars (\$ _____)

payable to the State of New Jersey. If this bid is accepted, the undersigned agrees that in the event of failure to furnish required bonds, this bid security shall be and remain the property of the State of New Jersey. Upon receipt of written notice of the acceptance of this bid, bidder will execute the formal contract within fourteen (14) calendar days.

PLEASE NOTE: () Certified Check or Bid Bond in amount of 10% of base bid required.

Certified Check \$ _____ Bid Bond \$ _____

The bid security attached in the sum of _____ (\$ _____) is to become the property of the State in the event the contract and bond are not executed within the time set forth, as liquidated damages for the delay and additional expense to the owner caused thereby.

Complete and submit with bid forms the following forms:

1. Non-Collusion Affidavit (DOD 53)
2. Bid Bond and Agreement of Surety (See PART III, 6A & B)
3. Disclosure Statement
4. Contractors Statement of Contingent or other Fees (SF119)
5. Certification of uncompleted contracts.

NOTE: If the bidder is a corporation, indicate State of Incorporation and if a partnership, give full names of partners.

Respectfully submitted:
(Seal – If bid is by a corporation) By

Name of Firm

Signature & Title

Business Address

Business Phone

BID BOND

BOND NO. _____

KNOWN ALL MEN BY THESE PRESENTS THAT (Insert name and address of CONTRACTOR)

as Principal, hereinafter called Principal, and (Insert name and address of Surety)

as Surety, hereinafter called Surety, are held and firmly bound unto the State of New Jersey, Department of Military and Veterans' Affairs, Eggert Crossing Road - CN340, Trenton, New Jersey, 08625-0340, as Obligee, hereinafter called Obligee, in the full and just sum of (Insert amount equal to 10% of proposal or proposals)

Dollars (\$ _____)

lawful money of the United States, for the payment of which sum, well and truly to be made, of which Principal and Surety bind themselves, his/her heirs, executors, administrators, successors, and assigns, jointly and severally by this instrument.

WHEREAS, Principal herewith submits proposal dated _____, 20____, for (Insert describe the work)

in accordance with proposed CONTRACT documents prepared by

which is by reference made a part of this bond the same as though set forth herein, and is hereinafter referred to as the CONTRACT.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the Principal shall be awarded the CONTRACT and Principal will, within the time required, enter into the CONTRACT and give a good and sufficient bond to secure the payment and performance of the CONTRACT, then this obligation shall be void and of no effect, otherwise Principal and Surety will pay unto the Obligee the difference in money between the amount of the bid of the Principal and the amount for which the Obligee legally CONTRACTs with another party to perform the work if the latter amount be in excess of the former.

Signed, sealed and delivered this _____ day of _____ 20____.

ATTEST: Principal

(Seal)

(Principal) Secretary Signature

By _____
Principal Signature

(Print or Type Name)

(Print or Type Name)

(Witness to Principal)

ATTEST: Surety

00412-1

(Seal)

(Surety) Secretary Signature

By _____
Attorney-in-fact Signature

(Print or Type Name)

(Print or Type Name)

(Witness as to Surety)

AGREEMENT OF SURETY

In consideration of the sum of One Dollar, lawful money of the United States, the receipt whereof is hereby acknowledged, and for other valuable considerations, (Insert name and address of Surety)

hereinafter called the Company, consent and agree that if the CONTRACT for (Insert Description of Contract)

for which the preceding proposal is made be awarded to (Insert name and address of Bidder)

hereinafter called the Bidder, the Company will become bound as Surety for its faithful payment and performance and will execute the final bonds required, and if the Bidder shall omit or refuse to execute such CONTRACT when notified or awarded then the Company will pay to the State of New Jersey, Department of Military and Veterans' Affairs, herein called the Obligee, the difference between the amount of the Bidder's Bid or proposal, and the lowest amount in excess of said bid, or proposal, for which the Obligee may be able to award CONTRACT within a reasonable time.

Signed, sealed and dated this day of , 20 .

(Seal)

(Surety) Secretary Signature

By _____
Attorney-in-fact Signature

(Print or Type Name)

(Print or Type Name)

00412-2

DISCLOSURE AFFIDAVIT

DEPARTMENT OF MILITARY AND VETERANS AFFAIRS
101 EGGERT CROSSING ROAD, PO BOX 340,
TRENTON, NEW JERSEY 08625

This form must be completed for ALL CONTRACTS with the State of New Jersey (NJ 52:25-24.2)

Bidder's Name:

Bid (Contract) No.:

Fed Tax I.D. (or S.S.):

Address: (Insert full address to include street, city, county, state and zip)

List the names and addresses of all individuals, partnerships, corporations or any other owner having 10% or greater interest in the corporation or partnership named above. If a listed owner is a corporation or partnership then list the name, percentage of ownership, and address of holders of 10% or more interest in that corporation or partnership. If additional space is necessary please list on reverse side. If there are no owners with 10% or greater interest in your company, enter "NONE" below.

Complete affidavit at bottom of form. If this has already been submitted to the Department of Military and Veterans Affairs, use the form for any changes and complete the affidavit.

Name

% OF

ADDRESS

(Type of Print name)

Ownership

Street, city/twp., county, state, zip

(Type President's Name)

(Type Corporate Secretary's Name)

I certify that:

- () List of stockholders has been submitted to NJDMAVA, and it is CURRENT AND CORRECT to the best of my knowledge, with the exceptions above.
- () The list of stockholders above is CURRENT AND CORRECT to the best of my knowledge.
- () There are no stockholders holding 10% or greater interest in this corporation or firm to the best of my knowledge.
- () Firm is sole ownership and not subject to corporate or partnership disclosure requirements.

ATTEST:

Subscribed and sworn to before me this

Day of 20

(Seal)

(Signature of Authorized Representative)

(Notary Public Signature)

(Signature of Corporate Secretary) Date Seal

Additional names if required

NAME

% OF

ADDRESS

(Type or Print Name)

Ownership

Street, city/twp., county, state, zip

00470

NON-COLLUSION AFFIDAVIT

PROJECT TITLE _____

Bid Due Date _____

STATE OF NEW JERSEY

as:

COUNTY OF _____

I, _____ of the City of _____
in the County of _____ and the State of _____

of full age, being sworn according to law on my oath depose and say that:

I am _____ of the firm of _____

the bidder making the proposal for the above named project, and that I executed the said Proposal with full authority so to do; that said bidder has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with the above named project; and that all statements contained in said Proposal and in this affidavit are true and correct, and made with full knowledge that the State of New Jersey relies upon the truth of the statements in said Proposal and in the statements contained in this affidavit in awarding the CONTRACT for the said project.

Subscribed and sworn to before me this _____

day of _____, 20 ____.

seal

Notary Public of

Bidder's Signature and Title

My Commission expires:

19

00480

NOTICE OF CLASSIFICATION

TO: _____

AMOUNT	TRADE(S) DATE	EFFECTIVE DATE	EXPIRATION
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In accordance with N.J.S.A. 13A:18A-27 et seq. (Department of Education) and N.J.S.A.52:35-1 (Department of Treasury) and any rules and regulations issued pursuant hereto, you are hereby notified of your classification to do State work in the Department(s) as noted above.

Very truly yours.
Bureau of CONTRACTOR Services

enclosures
cc. Records Section

00481

CERTIFICATION OF
UNCOMPLETED CONTRACTS

I certify that the amount of uncompleted work on the contracts is \$_____.

I further certify that the amount of this bid proposal, including all outstanding incomplete contracts does not exceed my pre-qualification dollar limit.

Respectfully submitted,

By_____

Affix
corporate

seal
here

Name of Firm

Signature

Title

Business Address

Phone

Sworn to and subscribed
before me this_____
date of 20_____.

Notary Public of

My Commission Expires:

20

00490

CERTIFICATION OF
NON-SEGREGATED FACILITIES

The bidder or Subcontractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The bidder or Subcontractor certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control where segregated facilities are maintained. The bidder or Subcontractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this contract. As used in this certification, the term "segregated facilities" means day waiting rooms, areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom or otherwise. The bidder or Subcontractor further agrees that (except where he has obtained identical certifications from proposed Subcontractors for specific time periods) he will obtain identical certifications from proposed Subcontractors prior to the award of Subcontracts exceeding \$10,000 which are not exempt from the provisions of Equal Opportunity Clause; that he will retain such certifications in his files; and that he will forward the following notice to such proposed Subcontractors (except where the proposed Subcontractors have submitted identical certification for specific time periods).

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENTS FOR CERTIFICATIONS OF NONSEGREGATED FACILITIES A Certification of Non-segregated facilities must be submitted prior to the award of a Subcontract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity Clause. The certification may be submitted either for each Subcontract or for all Subcontracts during a period (i.e. quarterly, semiannually, or annually) (1970 AUG) (Note: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001).

(Date)

(Signature of Bidder or Subcontractor)

(Type Firm Name)

(Type Business Address)

CERTIFICATION OF
MACBRIDE PRINCIPLES and
NORTHERN IRELAND ACT of 1989

The bidder hereby certifies:

1. Contractor has no business operations in Northern Ireland or
2. Contractor will take lawful steps in good faith to conduct any business operations they have in Northern Ireland in accordance with the MacBride principles of nondiscrimination as set forth in NJSA 52:18A-89.5 and in conformance with the United Kingdom's Fair Employment (Northern Ireland) Act of 1989 and permit compliance with those principles.

Name and Address of Contractor

Name and Title of Affiant

Subscribed and sworn before me this

_____ day of _____, 20_____.

Notary Public

OUTSIDE CONTRACTOR NOTIFICATION
OF ASBESTOS MANAGEMENT PLAN

Retain signed copy in contract documents folder

Company Name: _____

Company Officer: _____

Title: _____

Type of Business: _____

I have reviewed and understand the *NJDMAVA Asbestos Operations and Maintenance Plan* and the Facility Asbestos Materials Report as posted on the DMAVA page website at www.state.nj.us/military/installations/index.html I will not perform any renovation, remodeling, or construction in any area of a NJDMAVA facility without first thoroughly reading the NJDMAVA *Asbestos Operation and Maintenance Plan* for that facility and coordinating such activities through the ID-CMB. I will not disturb any area of a NJDMAVA facility where asbestos containing materials have been identified without first coordinating such activities through the ID-CMB. My company, business, or entity will perform our work in accordance with the NJDAMVA *Asbestos Operation and Maintenance Plan* or will inform the ID-CMB if unable to do so. In such case, the Asbestos Program Manager will give instructions as required prior to any asbestos-associated work.

Signature: _____
(Company Officer)

Date: _____

IMPORTANT NOTICE
NEW “PAY-TO-PLAY” RESTRICTIONS TO TAKE EFFECT
NOVEMBER 15, 2008

Governor Jon S. Corzine recently signed Executive Order No. 117, which is designed to enhance New Jersey’s efforts to protect the integrity of government contractual decisions and increase the public’s confidence in government. The Executive Order builds on the provisions of P.L. 2005, c. 51 (“Chapter 51”), which limits contributions to certain political candidates and committees by for-profit business entities that are, or seek to become, State government vendors.

Executive Order No. 117 extends the provisions of Chapter 51 in two ways:

1. The definition of “business entity” is revised and expanded so that contributions by the following individuals also are considered contributions attributable to the business entity:

- ♦ Officers of corporations and professional services corporations, with the term “officer” being defined in the same manner as in the regulations of the Election Law Enforcement Commission regarding vendor disclosure requirements (N.J.A.C. 19:25-26.1), with the exception of officers of non-profit entities;
- ♦ Partners of general partnerships, limited partnerships, and limited liability partnerships and members of limited liability companies (LLCs), with the term “partner” being defined in the same manner as in the regulations of the Election Law Enforcement Commission regarding vendor disclosure requirements (N.J.A.C. 19:25-26.1); and
- ♦ Spouses, civil union partners, and resident children of officers, partners, LLC members and persons owning or controlling 10% or more of a corporation’s stock are included within the new definition, except for contributions by spouses, civil union partners, or resident children to a candidate for whom the contributor is eligible to vote or to a political party committee within whose jurisdiction the contributor resides.

2. Reportable contributions (those over \$300.00 in the aggregate) to legislative leadership committees, municipal political party committees, and candidate committees or election funds for Lieutenant Governor are disqualifying contributions in the same manner as reportable contributions to State and county political party committees and candidate committees or election funds for Governor have been disqualifying contributions under Chapter 51.

Executive Order No. 117 applies only to contributions made on or after November 15, 2008, and to contracts executed on or after November 15, 2008.

Updated forms and materials are currently being developed and will be made available on the website as soon as they are available. In the meantime, beginning November 15, 2008, prospective vendors will be required to submit, ***in addition to the currently required Chapter 51 and Chapter 271 forms***, the attached Certification of Compliance with Executive Order No. 117.

**Certification on Behalf of A Company, Partnership or Organization and
All Individuals Whose Contributions are Attributable to the Entity
Pursuant to Executive Order No. 117 (2008)**

I hereby certify as follows:

On or after November 15, 2008, neither the below-named entity nor any individual whose contributions are attributable to the entity pursuant to Executive Order No. 117 (2008) has solicited or made any reportable contribution of money or pledge of contribution, including in-kind contributions or company or organization contributions, to the following:

- a) Any candidate committee and/or election fund of the Governor;
- b) A State political party committee;
- c) A legislative leadership committee;
- d) A county political party committee; or e)

A municipal political party committee.

I certify as an officer or authorized representative of the Company or Organization identified below that, to the best of my knowledge and belief, the foregoing statements by me are true. I am aware that if any of the statements are willfully false, I am subject to punishment.

Name of Company, Partnership or Organization:

Signed: _____ Title: _____

Print Name: _____ Date: _____

(circle one) (A) The Company, Partnership or Organization is the vendor;

or

(B) the Company, Partnership or Organization is a Principal (more than 10% ownership or control) of the vendor, a Subsidiary controlled by the vendor, or a Political Organization (e.g., PAC) controlled by the vendor.

**Please note that if the person signing this Certification is not signing on behalf of all individuals whose contributions are attributable to the entity pursuant to Executive Order No. 117 (2008), each of those individuals will be required to submit a separate individual Certification.*

Individual Certification of Compliance with
Executive Order No. 117 (2008)

I hereby certify as follows:

On or after November 15, 2008, I have not solicited or made any reportable contribution of money or pledge of contribution, including in-kind contributions or company or organization contributions, to the following:

- a) Any candidate committee and/or election fund of the Governor;
- b) A State political party committee;
- c) A legislative leadership committee;
- d) A county political party committee; or e)

A municipal political party committee.

I certify that, to the best of my knowledge and belief, the foregoing statements by me are true. I am aware that if any of the statements are willfully false, I am subject to punishment.

Signed: _____

Print Name: _____ Date: _____

**Public Law 2005, Chapter 51 Contractor Certification and Disclosure of
Political Contributions Solicitation No.:**

Formerly: 

Bidder: _____

The Bidder (Vendor) should complete the required Certification and Disclosure forms and submit them, together with a completed Ownership Disclosure form, **to the using agency, department or the Purchase Bureau**. Instructions for completing this form are at <http://www.state.nj.us/treasury/purchase/forms.htm#eo134>.

Part I: Certification

I hereby certify as follows:

1. On or after October 15, 2004, the below-named person or entity has not solicited or made any Contribution of money, pledge of Contribution, including in-kind Contributions, company or organization Contributions, as set forth below that would bar the award of a contract to the Bidder, pursuant to the terms of Public Law 2005, Chapter 51 (N.J.S.A. 19:44A-20.13-20.25, superseding Executive Order 134 (2004)).
 - a) Within the 18 months immediately preceding the Solicitation (exclusive of any contributions made prior to October 15, 2004), the below-named person or organization has not made a Contribution to
 - (i) Any candidate committee and/or election fund of any candidate for or holder of the public office of Governor; or
 - (ii) Any State or county political party committee.
 - b) During the term of office of the current Governor (exclusive of any Contributions made prior to October 15, 2004), the below-named person or organization has not made a Contribution to
 - (i) Any candidate committee and/or election fund of the governor; or
 - (ii) Any State or county political party committee nominating such Governor in the election preceding the commencement of said Governor's term.
 - c) Within the 18 months immediately prior to the first day of the term of office of the Governor (exclusive of any Contributions made prior to October 15, 2004), the below-named person or organization has not made a Contribution to
 - (i) Any candidate committee and/or election fund of the Governor; or
 - (ii) Any State or County political party committee of the political party nominating the successful gubernatorial candidate in the last gubernatorial election.
2. If the Bidder is awarded a contract pursuant to the solicitation for this bid proposal, the below-named person or organization will, on a continuing basis, continue to report any Contributions it makes during the term of the contract, and any extension(s) thereof.

00495-1

Public Law 2005,
Chapter 51

Formerly: 

Bidder: _____

Part II: Disclosure

Following is the required disclosure of all Contributions made from October 15, 2004, through the date of signing of this Certification and Disclosure to: (i) any entity designated and organized as a "political organization" under 26 U.S.C.A. § 527 that is also defined as "continuing political committee" under N.J.S.A. 19:44A-3(n) and N.J.A.C. 19:25-1 or (ii) any candidate committee and/or election fund of any candidate for or current holder of the public office of Governor; and any State or county political party committee. Such an entity is identified in the following chart as a "Committee."

Name and Address of Committee	Date of Contribution	Amount of Contribution	Type of Contribution i.e., Currency, Check, Loan, In Kind	Donor
Indicate "none" if no Contributions were made. Attach additional pages if necessary.				

#1

#1

Certification on behalf of a COMPANY or organization: I certify as an officer or authorized representative of the Company or Organization identified below that, to the best of my knowledge and belief, the foregoing statements by me are true. I am aware that if any of statements are willfully false, I am subject to punishment.

Name of Company or Organization: _____

#2

Signed: _____ Title: _____

Print Name: _____ Date: _____

(check one) (A)

The Company or Organization is the Bidder, or (B)

The Company or Organization is a Principal (more than 10% ownership or control) of the Bidder, a Subsidiary controlled by the Bidder, or a Political Organization (eg, PAC) controlled by the Bidder.

Certification by an individual – *for use by the individual Bidder, or as a Principal (more than 10% ownership or control) of the Bidder, or as the spouse or child of the Bidder:*

I certify that, to the best of my knowledge and belief, the foregoing statements by me are true. I am aware that if any of the statements are willfully false, I am subject to punishment.



#3

Signed: _____

Print Name: _____

Date: _____

Note: *A person may certify BOTH as an officer or authorized representative of the Bidder, AND in his or her individual capacity, as a Principal of the Bidder.*

Rev: 10/26/2005 DPP c51 - C&D

00495-3

DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN

PART 1: CERTIFICATION BIDDERS MUST COMPLETE PART 1 BY CHECKING EITHER BOX.
FAILURE TO CHECK ONE OF THE BOXES WILL RENDER THE PROPOSAL NON-RESPONSIVE.

Pursuant to Public Law 2012, c. 25, any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract must complete the certification below to attest, under penalty of perjury, that neither the person or entity, nor any of its parents, subsidiaries, or affiliates, is identified on the Department of Treasury's Chapter 25 list as a person or entity engaging in investment activities in Iran. The Chapter 25 list is found on the Division's website at <http://www.state.nj.us/treasury/purchase/pdf/Chapter25List.pdf>. Bidders must review this list prior to completing the below certification. Failure to complete the certification will render a bidder's proposal non-responsive. If the Director finds a person or entity to be in violation of law, s/he shall take action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the party.

PLEASE CHECK THE APPROPRIATE BOX:

☐ I certify, pursuant to Public Law 2012, c. 25, that neither the bidder listed above nor any of the bidder's parents, subsidiaries, or affiliates is listed on the N.J. Department of the Treasury's list of entities determined to be engaged in prohibited activities in Iran pursuant to P.L. 2012, c.25 ("Chapter 25 List"). I further certify that I am the person listed above, or I am an officer or representative of the entity listed above and am authorized to make this certification on its behalf. I will skip Part 2 and sign and complete the Certification below.

OR

☐ I am unable to certify as above because the bidder and/or one or more of its parents, subsidiaries, or affiliates is listed on the Department's Chapter 25 list. I will provide a detailed, accurate and precise description of the activities in Part 2 below and sign and complete the Certification below. Failure to provide such will result in the proposal being rendered as non-responsive and appropriate penalties, fines and/or sanctions will be assessed as provided by law.

PART 2: PLEASE PROVIDE FURTHER INFORMATION RELATED TO INVESTMENT ACTIVITIES IN IRAN

You must provide a detailed, accurate and precise description of the activities of the bidding person/entity, or one of its parents, subsidiaries or affiliates, engaging in the investment activities in Iran outlined above by completing the boxes below.

EACH BOX WILL PROMPT YOU TO PROVIDE INFORMATION RELATIVE TO THE ABOVE QUESTIONS. PLEASE PROVIDE THOROUGH ANSWERS TO EACH QUESTION. IF YOU NEED TO MAKE ADDITIONAL ENTRIES, CLICK THE "ADD AN ADDITIONAL ACTIVITIES ENTRY" BUTTON.

Name _____ Relationship to Bidder/Offeror _____
Description of Activities _____
Duration of Engagement _____ Anticipated Cessation Date _____
Bidder/Offeror Contact Name _____ Contact Phone Number _____

ADD AN ADDITIONAL ACTIVITIES ENTRY

Certification: I, being duly sworn upon my oath, hereby represent and state that the foregoing information and any attachments thereto to the best of my knowledge are true and complete. I attest that I am authorized to execute this certification on behalf of the above-referenced person or entity. I acknowledge that the State of New Jersey is relying on the information contained herein and thereby acknowledge that I am under a continuing obligation from the date of this certification through the completion of any contracts with the State to notify the State in writing of any changes to the answers of information contained herein. I acknowledge that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I recognize that I am subject to criminal prosecution under the law and that it will also constitute a material breach of my agreement(s) with the State of New Jersey and that the State at its option may declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print): _____ Signature: _____

Title: _____ Date: _____

CONTRACT AND BOND

ARTICLES

1. LEGAL JURISDICTION

- A. This CONTRACT shall be construed and governed in accordance with the Constitution and laws of the State of New Jersey. The State in entering into this CONTRACT does not waive its Sovereign Immunity, except as provided in the New Jersey Contractual Liability Act, NJSA 59:13-1 *et seq.*
- B. The rights or benefits provided the CONTRACTOR in this CONTRACT which exceed those provided under that Act and the obligations established under this CONTRACT which vary from those under the Act are contractual in nature and shall not be deemed to expand the waiver of Sovereign Immunity as set forth in that Act.

2. RELATIONSHIP OF THE FEDERAL GOVERNMENT (Federal Funded Contracts)

- A. This CONTRACT may be funded in part by the Federal Government.
- B. The Federal Government is not a party to this CONTRACT. As a condition to receiving and expending Federal funds, there are certain rights of Federal inspection, Federal approval or CONTRACT changes and modifications, and Federal approval of settlements or dispute actions that the Federal Government will exercise prior to authorization of Federal funds. Therefore, no inspection or acceptance, change, modification, settlement, dispute claim payment, or dispute action will be considered binding until the required federal approval is obtained.
- C. The Chief, National Guard Bureau or Secretary of the Veterans Administration, or his/her designated representative, is the approval authority. This paragraph does not abrogate any rights conferred on the Federal Government by law or other clause required due to the use of Federal funding.

3. APPROVAL (Federal - National Guard Bureau - Funding)

This CONTRACT and any subsequent terminations, modifications, or change orders (including those resulting from disputes and settlements of disputes) shall be subject to the written approval of the Chief, National Guard Bureau, or his duly authorized representative, and shall not be binding until so approved.

4. CONTRACT EXECUTION

- A. The CONTRACTOR shall have fifteen(15) calendar days to fully execute this CONTRACT. The fifteen (15) calendar days shall begin on the day the CONTRACTOR receives the CONTRACT from NJDMAVA.
- B. Execution of the CONTRACT shall include appropriate Performance and Payment Bonds, applicable insurance, signed CONTRACTs and all other forms, and signatures and notarization must be received within this time period. Shall the CONTRACTOR fail to execute the CONTRACT within this time frame, the CONTRACTOR shall be deemed in default of the bid bond. The CONTRACTING OFFICER shall then award the CONTRACT to the next lowest BIDDER and exercise any and all rights under the bid bond and the law to retrieve the difference in CONTRACT award.

- C. The CONTRACTING OFFICER, in his sole discretion and upon receipt of a written request from the CONTRACTOR no less than three (3) days prior to the expiration of the fifteen (15) day period established herein, may grant an extension of time for CONTRACT execution.

5. PERFORMANCE BOND AND PAYMENT BOND

- A. The BIDDER to whom the award is made shall furnish a Performance Bond in an amount at least equal to one hundred percent (100%) of the CONTRACT prices as security for the faithful performance of this CONTRACT and also a Payment Bond in an amount not less than one hundred percent (100%) of the CONTRACT price as security or the payment of all persons performing labor on the project under this CONTRACT and furnishing materials in connection with this CONTRACT.
- B. The Performance Bond and the Payment Bond shall be in separate instruments in accordance with local law. Before final acceptance each bond must be approved by the State and/or U.S. Government Agency of Office involved, when applicable, and shall be from a surety company authorized to do business in the State of New Jersey.
- C. It is recommended that the Performance Bond and Payment Bond provided herein be used to satisfy the requirements of the State. If a CONTRACTOR chooses to use his/her own bonds, then the language of the bond shall strictly conform to the sample enclosed in these General Conditions. Conditions that modify the intent of the State shall not be accepted.
- D. The respective CONTRACTORS shall pay for the cost of bonds.
- E. If at any time the State for justifiable cause, shall be or become dissatisfied with any Surety or Sureties then upon the Performance Bond or Payment Bond, the CONTRACTOR shall within five (5) calendar days after notice from the State so to do, substitute an acceptable bond(s) in such form and sum and signed by such other Surety or Sureties as may be satisfactory to the State. The CONTRACTOR shall pay the premiums on such bond. No further payments shall be deemed due nor shall be made to the CONTRACTOR until the new Surety or Sureties shall have furnished such an acceptable bond to the State.
- F. Date of Bond must not be prior to date of CONTRACT. Use:
- (1) Correct name of CONTRACTOR
 - (2) A Corporation, a Partnership or an Individual as case may be.
 - (3) Correct name of Surety.
 - (4) If CONTRACTOR is Partnership, all partners shall execute bond.
- F. IMPORTANT NOTE: Surety Companies executing bonds on U.S. funded projects must appear on the U.S. Treasury Department's most current list (Circular 570) and be authorized to transact business in the State of New Jersey.

Combined Bonds: Combined performance and payment bonds shall not be accepted. The CONTRACTOR is to provide separate Performance and Payment Bonds with separate bond numbers.

PERFORMANCE BOND

KNOWN ALL MEN BY THESE PRESENTS:

That we, the undersigned _____ as principal and _____ as sureties, are hereby held and firmly bound unto _____ in the penal sum of _____ dollars (\$ _____) for the payment of which will and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

"Signed this _____ day of _____ 20____."

"The condition of the above obligation is such that whereas, the above named principal did on the _____ day of _____ 20____, enter into a contract with _____ which said contract is made a part of this the bond the same as though set forth herein":

"Now, if the said Principal shall well and faithfully do and perform the things agreed by Owner to be done and performed according to the terms of said contract, and shall pay all lawful claims of subcontractors, materialmen, laborers, persons, firms or corporations for labor performed or materials, provisions, provender or other supplies or teams, fuels, oils, implements or machinery furnished, used or consumed in the carrying forward, performing or completing of said contract, we agreeing and assenting that this undertaking shall be for the benefit of any subcontractor, materialmen, laborer, person, firm or corporation having a just claim, as well as for the obligee herein; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated."

"The said surety hereby stipulates and agrees that no modifications, omission or additions in or to the terms of the said contract or in or to the plans and specifications therefore shall in anywise affect the obligation of said surety on its bond."

Provide, further, that no final settlement between the Owner and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

This bond is given in compliance with the requirements of the statutes of the State of New Jersey in respect to bonds or Contractors on public works, Revised Statutes of New Jersey, 1937, Sections 2A:44-143-147 and amendments thereof.

IN WITNESS WHEREOF, this instrument is executed in six (6) counterparts, each one of which shall be deemed an original, this the _____ day of _____ 20_____.

ATTEST:

_____	_____
(Principal) Secretary	Principal
	BY _____

	(Address)

(SEAL)

Witness as to Principal	

(Address)	

	Surety

ATTEST:

_____	BY _____
(Surety) Secretary	Attorney-in-Fact

	(Address)

Witness to Surety

(Address)

The Surety Company shall be one authorized to do business in New Jersey.

00606-4

PAYMENT BOND

KNOWN ALL MEN BY THESE PRESENTS:

That we, the undersigned _____ as principal and _____ as sureties, are hereby held and firmly bound unto _____ in the penal sum of _____ dollars (\$ _____) for the payment of which will and truly to be made, we Hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

"Signed this _____ day of _____ 20____."

"The condition of the above obligation is such that whereas, the above named principal did on the _____ day of _____ 20____, enter into a contract with _____ which said contract is made a part of this the bond the same as though set forth herein":

"Now, if the said Principal shall pay all lawful claims of subcontractors, materialman, laborers, persons, forms or other suppliers or teams, fuels, oils, implements or machinery furnished, used or consumed in the carrying forward, performing or completing of said contract, we agreeing and assenting that this undertaking shall be for the benefit of any CONTRACTOR, materialman, laborer, person, firm or corporation having a just claim, as well as for the obligee herein; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the surety for any and all claims hereunder shall in no event exceed the pen amount of this obligation as herein stated."

"The said surety hereby stipulates and agrees that no modifications, omission or additions in or to the terms of the said contract or in or to the plans and specifications therefore shall in anywise affect the obligation of said surety on its bond."

Provide, further, that no final settlement between the Owner and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

This bond is given in compliance with the requirements of the statutes of the State of New Jersey in respect to bonds or Contractors on public works, Revised Statutes of New Jersey, 1937, Sections 2A:44-143-147 and amendments thereof.

IN WITNESS WHEREOF, this instrument is executed in six (6) counterparts, each one of which shall be deemed an original, this the _____ day of _____ 20_____.

ATTEST:

Principal

BY _____

(Principal) Secretary

(Address)

(SEAL)

Witness as to Principal

(Address)

Surety

ATTEST:

BY _____

(Surety) Secretary

Attorney-in-Fact

(Address)

Witness to Surety

(Address)

The Surety Company shall be one authorized to do business in New Jersey.

00606-6

6. INSURANCE

- A. The CONTRACTORS shall hold the State harmless for any loss or damage to tools, equipment, scaffolding, staging towers and forms, materials stored on site, sheds or other structures erected for use by CONTRACTOR and Subcontractors, if being understood that the CONTRACTOR will, at his/her own expense, carry all insurance which may be required to provide the necessary protection against such loss or damage, which insurance shall contain a waiver of any right or subrogation against the State.
- B. Three (3) certified copies of each insurance policy or certificate of such insurance shall be delivered to the OWNER prior to the commencement of the work and shall contain the provision that the insurance shall not be canceled except upon a minimum of thirty (30) calendar days prior to written notice to the State Of New Jersey Department of Military and Veterans Affairs, Attn.: CONTRACTING OFFICER.
- C. The CONTRACTOR shall not commence work under this CONTRACT until he/she have obtained all the insurance required under this paragraph and such insurance has been approved by the State, nor shall the CONTRACTOR allow any Subcontractor to commence work on his/her subcontract until the insurance required of the Subcontractor has been so obtained and approved. Insurance obligations include the following:

(1) COMPREHENSIVE GENERAL LIABILITY

Comprehensive General Liability insurance for the benefit of The CONTRACTOR and any Subcontractors is to be written as broad as the standard coverage form currently in use in the State of New Jersey, which shall not be circumscribed by any endorsements limiting the breadth of coverage. The policy shall include endorsements (broad form) for Contractual Liability and Completed Operations; and an endorsement, which will eliminate the explosion, collapse and underground exclusion. Limits of liability shall not be less than \$1,000,000 per occurrence for bodily injury liability and \$1,000,000 per occurrence for property damage liability, or as a combined single limit of \$2,000,000.

(2) COMPREHENSIVE AUTOMOBILE LIABILITY

Comprehensive Automobile liability insurance covering owned, non-owned and hired vehicles shall be covered by all CONTRACTORS. The limits of liability shall not be less than \$1,000,000 per occurrence for bodily injury liability and \$500,000 for property damage liability.

(3) WORKERS' COMPENSATION

Workers compensation insurance applicable to the laws of the State of New Jersey and other State and Federal jurisdiction is required to protect the employees of the CONTRACTOR or any Subcontractor who will be engaged in the performance of the CONTRACT. The insurance shall include Employers Liability protection with a limit of liability of not less than \$500,000.

NOTE: THE FOLLOWING SHALL BE INCORPORATED FOR NEW CONSTRUCTION ONLY.

(5) BUILDERS' RISK

The State of New Jersey shall provide insurance protection for the benefit of the CONTRACTOR and Subcontractors in the form of a Builders Risk Policy, providing all risk protection for the structure on which the work in this CONTRACT is to be done to 100% of the insurable value thereof, including items of labor and materials connected therewith, whether in or adjacent to the structure insured, and materials in place or to be used as part of the permanent construction including surplus materials.

This policy may contain a deductible clause. The State of New Jersey agrees to indemnify the CONTRACTOR against any insurable loss to the extent that such loss exceeds \$5,000 per occurrence. In these instances, the CONTRACTOR shall assume responsibility for the first \$5,000 of any loss.

(6) LOSS REPORTING AND LOSS ADJUSTMENT

In the event of loss, the CONTRACTOR shall immediately notify the State of New Jersey, Department of Military & Veterans Affairs, in writing, and take any other appropriate steps as may be required under the Builders Risk policy in effect. Upon the occurrence of any loss or damage prior to the acceptance of the building by the State, the CONTRACTOR shall, at the State's option, replace and repair the damaged work as originally provided in the drawings and specifications at no additional compensation to that provided in the original CONTRACT.

All losses will be adjusted with, and payable to, the State of New Jersey, as trustee for the insured as his/her interests may appear. The CONTRACTOR shall be named jointly with the State in all policies of insurance, all of which shall be open to inspection, by the state.

The CONTRACTOR shall not include any cost for Builders Risk insurance premiums as described herein. However, this provision shall not relieve the CONTRACTOR from his/her obligation to complete, according to plans and specifications, the project covered by the CONTRACT, and the CONTRACTOR and his/her surety shall be obligated to full performance of the CONTRACTOR'S undertaking.

7. ASSIGNMENTS

The CONTRACTOR shall not assign the whole or any part of this CONTRACT without written consent of the State. Money due or to become due the CONTRACTOR hereunder shall not be assigned for any purposes whatever.

8. COVENANT AGAINST CONTINGENT FEES

- A. The CONTRACTOR warrants that no person or selling agency has been employed or retained to solicit or secure this CONTRACT upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the CONTRACTOR for the purpose of securing business.
- B. For breach or violation of this warranty the State shall have the right to annul this CONTRACT without liability or in its discretion to deduct from the CONTRACT price or consideration the full amount of such commission, percentage, brokerage, or contingent fee.

9. PROJECT SCHEDULE

- A. This CONTRACTOR shall submit a PROJECT SCHEDULE in Critical Path Method (CPM) format, ten (10) calendar days from receipt of the Notice To Proceed and prior to starting any work or submitting any work related submittals.
- B. This project schedule shall be a valid working document and its accuracy maintained at all times. The project schedule shall be posted at the work site and updated when the CONTRACTING OFFICER or his/her representative approves major changes. The CONTRACTOR (s) and his/her subcontractors are required to follow the project schedule in the execution of the CONTRACT.

- C. These specifications may contain a project schedule (timeline) established by NJDMAVA. This project schedule identifies time frames for major tasks and the overall completion time frame of the project. This schedule is only used to inform the BIDDER of the expected completion of this project in a timely manner. Should a (all) CONTRACTOR(s) see any problems with these dates, then his/her shall bring them to the attention of NJDMAVA prior to the bid date. Should a change be agreed upon, then a new project schedule shall be issued prior to the bid date. The major time frame of the schedule is all inclusive of any and all sub-tasks that shall be identified by the CONTRACTOR in his/her C.P.M. CONTRACTORS shall understand that this does not eliminate his/her responsibility to provide a detailed C.P.M. as outlined in the General Conditions of this document.
- D. This enclosed schedule shall not be resubmitted by the CONTRACTOR in lieu of producing his own detailed Critical Path Method (C.P.M.) format. The CONTRACTOR shall submit a C.P.M identifying greater detail of the tasks to be accomplished with special attention to those tasks that are critical and dependent upon the completion of other tasks/trades. The milestones for various stages of work shall be binding on all CONTRACTOR once the CONTRACT is executed.
- E. NJDMAVA may have his/her A/E or Construction Manager produce a detailed C.P.M. for complex projects. When this is done, this shall be used for project completion and the CONTRACTORS' C.P.M. shall be adjusted to coincide with it. Any additional costs associated with reducing time or adding labor to meet the deadlines established shall be at the expense of the CONTRACTOR(S).

10. AFFIRMATIVE ACTION

- A. The Department of Military & Veterans Affairs follows all laws established in N.J.S.A. 10.5-31 et seq., specially N.J.S.A. 10.5-36K Chapter 27, AFFIRMATIVE ACTION RULES. The CONTRACTOR shall become thoroughly familiar with all rules, regulations and forms associated with the State Law and execute the requirements of the same. The Affirmative Action rules on page 30-34 shall be reviewed and followed. Subsequent pages shall identify the forms needed during the length of the CONTRACT. The CONTRACTOR can obtain extra forms from the State's Affirmative Action Office.
- B. Execution of this CONTRACT by the CONTRACTOR demonstrates his/her willingness to comply with these laws and regulations. It is understood that NJDMAVA shall not interpret these laws or rules or intercede on the CONTRACTOR'S behalf regarding these laws or rules. It shall be assumed that the CONTRACTOR is thoroughly knowledgeable of the rules and in compliance at all times of the same.

EXHIBIT A

P.L. 1975, C. 127 (N.J.A.C. 17:27) MANDATORY AFFIRMATIVE ACTION LANGUAGE

PROCUREMENT, PROFESSIONAL AND SERVICE CONTRACTS

During the performance of this contract, the contractor agrees as follows:

The contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, sex, affectional or sexual orientation. The contractor will take affirmative action to ensure that such applicants are recruited and employed, and that employees are treated during employment, without regard to his/her age, race, creed, color, national origin, ancestry, marital status, sex, affectional or sexual orientation. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause;

The contractor or subcontractor, where applicable will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry, marital status, sex, affectional or sexual orientation;

The contractor or subcontractor, where applicable, will send to each labor union or representative or workers with which it has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer advising the labor union or workers, representative of the contractor's commitments under this act and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

The contractor or subcontractor, where applicable, agrees to comply with the regulations promulgated by the Treasurer pursuant to P.L. 1975, c. 127, as amended and supplemented from time to time and the Americans with Disabilities Act.

The contractor or subcontractor agrees to attempt in good faith to employ minority and female workers consistent with the applicable county employment goals prescribed by N.J.A.C. 17:27-5.2 promulgated by the Treasurer pursuant to P.L. 1975, c. 127, as amended and supplemented from time to time or in accordance with a binding determination of the applicable county employment goals determined by the Affirmative Action Office pursuant to N.J.A.C. 17:27-5.2 promulgated by the Treasurer pursuant to P.L. 1975, c. 127, as amended and supplemented from time to time.

The contractor or subcontractor agrees to inform in writing appropriate recruitment agencies in the area, including employment agencies, placement bureaus, colleges, universities, labor unions, that it does not discriminate on the basis of age, creed, color, national origin, ancestry, marital status, sex, affectional or sexual orientation, and that it will discontinue the use of any recruitment agency which engages in direct or indirect discriminatory practices.

The contractor or subcontractor agrees to revise any of its testing procedures, if necessary, to assure that all personnel testing conforms with the principles of job-related testing, as established by the statutes and court decisions of the State of New Jersey and as established by applicable Federal law and applicable Federal court decisions.

The contractor or subcontractor agrees to review all procedures relating to transfer, upgrading, downgrading and layoff to ensure that all such actions are taken without regard to age, creed, color, national origin, ancestry, marital status, sex, affectional or sexual orientation, and conform with the applicable employment goals, consistent with the statutes and court decisions of the State of New Jersey, and applicable Federal law and applicable Federal court decisions.

The contractor and its subcontractors shall furnish such reports or other documents to the Affirmative Action Office as may be requested by the office from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the Affirmative Action Office for conducting a compliance investigation pursuant to Subchapter 10-of the Administrative Code (NJAC 17:27).

EXHIBIT B

P.L. 1975, C. 127 (N.J.A.C. 17:27) MANDATORY AFFIRMATIVE ACTION LANGUAGE CONSTRUCTION CONTRACTS

During the performance of this contract, the CONTRACTOR agrees as follows:

- a. The CONTRACTOR, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, sex, affectional or sexual orientation. The CONTRACTOR will take affirmative action to ensure that such applicants are recruited and employed, and that employees are treated during employment, without regard to his/her age, race, creed, color, national origin, ancestry, marital status or sex. Such action shall include, but not be limited to the following: employment, up-grading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The CONTRACTOR agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause;
- b. The CONTRACTOR or subcontractor, where applicable will, in all solicitations or advertisements for employees placed by or on behalf of the CONTRACTOR, state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry, marital status, sex, affectional or sexual orientation;
- c. The CONTRACTOR or subcontractor, where applicable, will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer advising the labor union or workers, representative of the contractors commitments under this act and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- d. The CONTRACTOR or subcontractor, where applicable, agrees to comply with any regulations promulgated by the Treasurer pursuant to P.L. 1975, c. 127, as amended and supplemented from time to time .
- e. When hiring workers in each construction trade, the CONTRACTOR or subcontractor agrees to attempt in good faith to employ minority and female workers in each construction trade consistent with the applicable employment goal prescribed by N.J.A.C. 17:27-7.3; provided, however, that the Affirmative Action Office may, in its discretion, exempt a CONTRACTOR or subcontractor from compliance with the good faith procedures prescribed by the following provisions, A, B and C, as long as the Affirmative Action Office is satisfied that the CONTRACTOR is employing workers provided by a union which provides evidence, in accordance with standards prescribed by the Affirmative Action office, that its percentage of active "card carrying" members who are minority and female workers is equal to or greater than the applicable employment goal prescribed by N.J.A.C. 17:27-7.3, promulgated by the Treasurer pursuant to P.L. 1975, c. 127, as amended and supplemented from time to time. The CONTRACTOR or subcontractor agrees that a good faith, effort shall include compliance with the following procedures;
 - (A) If the CONTRACTOR or subcontractor has a referral agreement or arrangement with a union for a construction trade, the CONTRACTOR or subcontractor shall, within three days of the contract award, seek assurances from the union that it will cooperate with the CONTRACTOR or subcontractor as it fulfills its affirmative action obligations under this contract and in accordance with the rules promulgated by the Treasurer pursuant to P.L. 1975, c. 127, as supplemented and amended from time to time. If the CONTRACTOR or subcontractor is unable to obtain said assurances from the construction trade union at least five days prior to the commencement of construction work, the

minority and female workers consistent with the applicable employment goal. If the contractors or subcontractors prior experience with a construction trade union, regardless of whether the union has provided said assurances, CONTRACTOR or subcontractor agrees directly to attempt to hire indicates a significant possibility that the trade union will not refer sufficient minority and female workers consistent with the applicable employment goal, the CONTRACTOR or subcontractor agrees to be prepared to hire minority and female workers directly, consistent with the applicable employment goal ' by complying with the hiring procedures prescribed under (B) below; and the CONTRACTOR or subcontractor further agrees to immediately take said action if it determines or is so notified by the Affirmative Action Office that the union is not referring minority and female workers consistent with the applicable employment goal.

(B) If the hiring of a workforce consistent with the employment goal has not or cannot be achieved for each construction trade by adhering to the procedures of (b) above, or if the CONTRACTOR does not have a referral agreement or arrangement with a union for a construction trade, the CONTRACTOR or subcontractor agrees to take the Following actions consistent with the applicable county employment goals:

(1) To notify the Public Agency Compliance Officer, Affirmative Action Office, and at least one approved minority referral organization of its manpower needs, and request referral of minority and female workers;

(2) To notify any minority and female workers who have been listed as awaiting available vacancies;

(3) Prior to commencement of work, to request the local construction trade union, if the CONTRACTOR or subcontractor has a referral agreement or arrangement with a union for the construction trade, to refer minority and female workers to fill job openings;

(4) To leave standing requests for additional referral to minority and female workers with the local construction trade union, if the CONTRACTOR or subcontractor has a referral agreement or arrangement with a union for the construction trade, the State Training and Employment Service and other approved referral sources in the area until such time as the workforce is consistent with the employment goal;

(5) If it is necessary to lay off some of the workers in a given trade on the construction site, to assure, consistent with the applicable State and Federal statutes and court decisions, that sufficient minority and female employees remain on the site consistent with the employment goal; and to employ any minority and female workers so laid off by the CONTRACTOR on any other construction site in the area on which its workforce composition is not consistent with an employment goal established pursuant to rules implementing P.L. 1975, c. 127;

(6) To adhere to the following procedure when minority and female workers apply or are referred to the CONTRACTOR or subcontractor:

(i) If said individuals have never previously received any document or certification signifying a level of qualification lower than that required, the CONTRACTOR or subcontractor shall determine the qualifications of such individuals and if the contractors or subcontractors workforce in each construction trade is not consistent with the applicable employment goal, it shall employ such persons which satisfy appropriate qualification standards; provided however, that a CONTRACTOR or subcontractor shall determine that the individual at least possesses the skills and experience recognized by any worker's skills and experience classification determination which may have been made by a Public Agency Compliance Officer, union, apprentice program or a referral agency, provided the referral agency is acceptable to the Affirmative Action Office and provided further, that, if necessary, the CONTRACTOR or subcontractor shall hire minority and female workers who qualify as trainees pursuant to these regulations. All of the requirements of this paragraph, however, are limited by the provisions of (C) below.

(ii) If the contractors or subcontractor's work force is consistent with the applicable employment goal, the name of said female or minority group individual shall be maintained on a waiting list for the first consideration, in the event the contractors or subcontractors workforce is no longer consistent with the applicable employment goal.

(iii) If, for any reason, said CONTRACTOR or subcontractor determines that a minority individual or a female is not qualified or if the individual qualifies as an advanced trainee or apprentice, the CONTRACTOR or subcontractor shall inform the individual in writing with the reasons for the determination, maintain a copy in its files, and send a copy to the Public Agency Compliance Officer and to the Affirmative Action Office.

(7) To keep a complete and accurate record of all requests made for the referral of workers in any trade covered by the contract and on forms made available by the Affirmative Action Office and shall be submitted promptly to that office upon request.

(C) The CONTRACTOR or subcontractor agrees that nothing contained in (B) preceding provision shall preclude the CONTRACTOR or subcontractor from complying with the hiring hall or apprenticeship provisions in any applicable collective bargaining agreement or hiring hall arrangement, and, where required by custom or agreement, it shall send journeymen and trainees to the union for referral, or to the apprenticeship program for admission, pursuant to such agreement or arrangement; provided, however, that where the practices of a union or apprenticeship program will result in the exclusion of minorities and females or the failure to refer minorities and females consistent with the county employment goal, the CONTRACTOR or subcontractor shall consider for employment persons referred pursuant to said provisions (B) without regard to such agreement or arrangement; provided further, however, that the CONTRACTOR or subcontractor shall not be required to employ female and minority advanced trainees and trainees in numbers which result in the employment of advanced trainees and trainees as a percentage of the total workforce for the construction trade, which percentage significantly exceeds the apprentice to journey worker ratio specified in the applicable collective bargaining agreement, or in the absence of a collective bargaining agreement, exceeds the ratio established by practice in the area for said construction trade. Also, the CONTRACTOR or subcontractor agrees that, in implementing the procedures of the preceding provisions (B) it shall, where applicable, employ minority and female workers residing within the geographical jurisdiction of the union.

(D) The CONTRACTOR agrees to complete an Initial Project Manning Report on forms provided by the Affirmative Action Office or in the form prescribed by the Affirmative Action Office and submit a copy of said form no later than 3 days after signing a construction contract; provided, however, that the public agency may extend in a particular case the allowable time for submitting the form to no more than 14 days; and to submit a copy of the Monthly Project Manning Report once a month (by the seventh work day of each month) thereafter for the duration of this contract to the Affirmative Action Office and to the Public Agency Compliance Officer. The CONTRACTOR agrees to cooperate with the public agency in the payment of budgeted funds, as is necessary, for on-the-job and off-the-job programs for outreach and training of minority and female trainees employed on the construction projects.

(E) The CONTRACTOR and its subcontractors shall furnish such reports or other documents to the Affirmative Action Office as may be requested by the office from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the affirmative action office for conducting a compliance investigation pursuant to Subchapter 10 of the Administrative Code (NJAC 17:27).

GENERAL PROVISIONS

ARTICLES

1. CONTRACTING OFFICER STATUS (C.O.)

- A. The CONTRACTING OFFICER or his/her representative shall have general supervision and direction of the work. His/her are the agents of the State to the extent provided in the CONTRACT documents and all laws and rules and regulations issued thereunder. His/her have authority to stop the work, whenever such stoppage in his opinion may be necessary to insure the proper execution of the CONTRACT. Neither Project Officer nor Inspector, on behalf of the CONTRACTING OFFICER, is authorized to change any provision of the specification without written authorization (Change Order) of the CONTRACTING OFFICER, nor shall the presence or absence of an Inspector relieve the CONTRACTOR from any requirements of the CONTRACT.
- B. As the CONTRACTING OFFICER or his/her representative is, in the first instance, the interpreter of the conditions of the CONTRACT and the judge of its performance, his/her shall side neither with the State nor with the CONTRACTOR, but shall use his/her powers under the CONTRACT to enforce its faithful performance by both.

2. ARCHITECT OR ENGINEER STATUS (A/E)

- A. NJDMAVA may include Class C services as part of the design CONTRACT. These services shall be limited to reviewing shop drawings for compliance to the specifications and interpreting his/her scope of work when clarification is required from the CONTRACTOR.
- B. NJDMAVA may hire an A/E to act as a CONSTRUCTION MANAGER on the project. When acting in such a role his/her shall interpret the CONTRACT documents and shall judge the quantity, quality, fitness and acceptability of all parts of the work when acting as an agent for the CONTRACTING OFFICER. His/her shall certify CONTRACTOR'S invoices for work performed and materials delivered to the site, and shall be given access to any part of the work for inspection at all times.
- C. The A/E shall not have authority to give approval nor order changes in work which alter the terms or conditions of the CONTRACT, nor which involve additional cost. His/her may, however, make recommendations to the CONTRACTING OFFICER for such changes, whether or not costs are revised, and the CONTRACTING OFFICER may act, at his/her discretion, on the basis of the A/E's recommendations.
- D. Under no circumstances shall the A/E have authority to judge or validate an approved equal after the bid date.

3. CONSTRUCTION MANAGER STATUS (CM)

- A. NJDMAVA may hire a firm to act as a CONSTRUCTION MANAGER on the project. His/her shall interpret the CONTRACT documents and shall judge the quantity, quality, fitness and acceptability of all parts of the work when acting as an agent for the CONTRACTING OFFICER. His/her shall certify CONTRACTOR'S invoices for work performed and materials delivered to the site, and shall be given access to any part of the work for inspection at all times.
- B. The CONSTRUCTION MANAGER shall not have authority to give approval nor order changes in work which alter the terms or conditions of the CONTRACT, nor which involve additional cost. His/her may, however, make recommendations to the CONTRACTING OFFICER for such changes, whether or not costs

are revised, and the CONTRACTING OFFICER may act, at his/her discretion, on the basis of the CONSTRUCTION MANAGER recommendations.

- C. The CONSTRUCTION MANAGER shall not have the authority to authorize any approved equals after a bid date.

4. CONTRACTOR STATUS

- A. When the term CONTRACTOR is used in these General Conditions or within the CONTRACT documents, it shall also mean a CONTRACTOR. The CONTRACTOR shall be responsible for hiring a license architect to furnish drawings and specifications to fully construct the project as outlined in these documents.
- B. NJDMAVA may at any time hire his/her own A/E or CONSTRUCTION MANAGER to oversee the project and inspect the drawings and specifications of the CONTRACTOR. The CONTRACTOR shall be required to meet all applicable federal and state codes, rules, regulations and other guidelines as outlined by the State of New Jersey.

5. INTENTION

- A. The drawings and specifications, with the CONTRACT of which his/her form a part, are intended to provide for and comprise everything necessary for the proper and complete finishing of the work in every part notwithstanding that each and every item necessary may not be shown on the drawing or mentioned in the specifications.
- B. Contract Drawings and Specifications:
 - (1). Omissions from the drawings or specifications or the mis-description of details of work which are manifestly necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the CONTRACTOR from performing such omitted or mis-described details of the work but his/her shall be performed as if fully and correctly set forth and described in the drawings and specifications.
 - (2) The CONTRACTOR shall check all drawings furnished him immediately upon his/her receipt and shall promptly notify the CONTRACTING OFFICER of any discrepancies. It shall be understood that the CONTRACTOR(S) have reviewed the specifications in his/her entirety along with every page of the drawings for completeness. Should a conflict arise where items are omitted from one portion of the drawing but not on another, than the CONTRACTOR(S) shall notify the CONTRACTING OFFICER or his representative immediately. Failure to notify NJDMAVA shall not relieve the CONTRACTOR(S) of his/her responsibility to perform the necessary work or provide the appropriate item at no additional cost to the owner.
 - (3) Figures marked on drawings shall in general be followed in preference to scale measurements. Large-scale drawings shall in general govern small-scale drawings. The CONTRACTOR shall compare all drawings and verify the figures before laying out the work and will be responsible for any errors which might have been avoided thereby.
- C. Determination will be in the form of Addenda to the CONTRACT Document, which will be forwarded to all affected CONTRACTORS.
- D. Any provisions in any of the CONTRACT Documents which may be in conflict or inconsistent with any of the paragraphs in these General Conditions shall be void to the extent of such conflict or inconsistency unless the provision is specifically referenced as a supplement or change thereto.

- E. Each and every provision of law and clause required by law to be inserted in the CONTRACT shall be deemed to be inserted herein and the CONTRACT shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted then upon application of either party the CONTRACT shall forthwith be physically amended to make such insertion or correction.
- F. **Failure of any CONTRACTOR to thoroughly review all bid documents, drawings and specifications for their thoroughness during the bidding phase, shall not relieve the CONTRACTOR from performing all work at no additional expense to the owner.**

6. DRAWINGS, SPECIFICATIONS, SHOP DRAWINGS, AS-BUILT DRAWINGS

- A. Drawings and specifications apply to all parts of this CONTRACT and sub-contracts. The CONTRACTOR shall examine the drawings and specifications for all CONTRACTs on the project, whether bound in one document or separately, shall observe any work indicated or specified pertaining to his work and shall make due allowances to perform or carry out the applicable work.
- B. Unless otherwise provided in the CONTRACT Documents, the C.O. will furnish to the CONTRACTOR, free of charge, a minimum of one (1) copy of CONTRACT Documents for the execution of the work.
- C. The C.O. will furnish, with reasonable promptness, additional instructions, by means of supplemental drawings or otherwise, necessary for the proper execution of the work. All such drawings and instructions shall be consistent with the CONTRACT Documents, true development thereof, and reasonably inferable therefrom. The work shall be executed in conformity therewith and the CONTRACTOR shall do no work without proper drawings and instructions. In giving such additional instructions, the C.O. will have authority to make minor changes in work, not involving extra cost.
- D. Any CONTRACTOR so requesting may together with the C.O., jointly prepare a schedule, subject to change from time to time in accordance with the progress of the work, fixing the dates with the various detail and supplemental drawings will be required, and the C.O. will furnish them in accordance with the schedule.
- E. All drawings referred to, together with such supplementary details as may be furnished or approved from time to time as the work progresses, are understood as being included and a part of the CONTRACT to which his/her relate. The State may duplicate use, and disclose in any manner and for any purpose shop drawings delivered under this CONTRACT. This clause shall be included in all subcontracts hereunder at any time.
- F. On all work of a remodeling nature or installation within present buildings, it will be the responsibility of the CONTRACTOR, by personal inspection, to satisfy themselves as to the correctness of any information given which may affect the quantity, size, and quality of materials required for a satisfactorily completed CONTRACT, whether or not such information is indicated on the drawings or within the specifications.
- G. **All work that may be called for in the specifications and not shown on the drawings or shown on the drawings and not called for in the specifications shall be executed and furnished by the CONTRACTORS as if described in both.** Should any incidental work or materials be required but which are nevertheless, necessary for the proper carrying out of the intent therefore, the CONTRACTOR shall understand same to be implied and required and his/her shall perform all such work and furnish all such materials as fully as if his/her were particularly delineated or described.
- H. The CONTRACTOR shall not at any time after the execution of this CONTRACT, set up any claims whatever based upon insufficient data or incorrectly assumed conditions, nor shall his/her claim any misunderstanding with regard to the nature, conditions or character of the work to be done under the

- I. CONTRACT, and he/she shall assume all risks resulting from any changes in conditions which may occur during the progress of the work.
- J. No CONTRACTOR shall submit with such promptness as to cause no delay in his/her own work or that of any other Prime CONTRACTOR, a reproducible transparent copy of all shop or setting drawings, details, and schedules required for the work of the various trades; and the A/E, Construction Manager, and/or C.O. will pass upon them with reasonable promptness.
- K. The CONTRACTOR shall make any corrections if required by the A/E, Construction Manager, and/or C.O. and resubmit a reproducible transparent copy for approval. After final approval of the drawings has been received, the CONTRACTOR shall immediately send the A/E, Construction Manager, and/or C.O. a minimum of six (6) prints of the finally approved drawings, plus the required number of approved prints each to every other interested Prime CONTRACTOR. The A/E or Construction Manager, when applicable, will make proper distribution of all drawings as directed by the C.O.
- L. Attached to the CONTRACTOR's initial submission of such drawing or catalog data shall be an itemized schedule listing by dates when all other submissions will be forwarded to the A/E, Construction Manager or the C.O. Any list of drawings prepared by the A/E or Construction Manager is for the C.O.'s convenience only, and shall not be construed as limiting the number of drawings, which the CONTRACTOR shall furnish.
- M. If any CONTRACTOR desires to make any deviations or changes from the CONTRACT Documents, his/her shall obtain the consent of the C.O. to such changes in writing (Change Order) before submitting drawings showing such change. His/her shall have checked all drawings submitted by the CONTRACTOR before being submitted. The Project Title and Project Number must appear on all submissions. Drawings and specification references shall also be noted on all submissions. Failure to comply with these instructions will be sufficient reason to return such drawings to the CONTRACTOR without any action being taken.
- N. Each CONTRACTOR shall keep, at all times, a copy of all drawings and specifications on the work up to date and in good order, available to the C.O.
- O. All models, drawings, specifications, and copies thereof furnished by the CONTRACTOR are the property of the State. His/her are not to be used in other work, and with the exception of the signed CONTRACT set, are to be returned to the State at the completion of the work. All models are the property of the State.
- P. In the event there is no A/E or Construction Manager, all shop drawings will be sent to the CONTRACTING OFFICER.
- Q. The CONTRACTOR shall keep his/her prints of the CONTRACT Drawings up to date at all times by marking in colored markers the final location of any changes in the work, pipes, traps, conduits, ducts, footings, anchors, etc. The data shall be transferred regularly by the CONTRACTOR to transparencies furnished by the State and paid for by the CONTRACTOR.
- R. The CONTRACTOR shall submit the transparencies of all CONTRACT Drawings whether altered or not to the A/E or Construction Manager with CONTRACTOR certification as to the accuracy of the information prior to final payment. All as-built drawings shall be entitled "AS-BUILT" above the title block and dated. This information shall be checked, edited, and certified by the A/E, if applicable who shall then transpose such information to the original drawings and certify that such drawings reflect as-built status.
- S. Transparencies of A/E drawings, if desired for this purpose, may be obtained from the State. The CONTRACTOR shall pay for the cost of reproduction.
- T. The CONTRACTOR for general construction shall review and approve all shop drawings and submittals prior to submission. After review by the C.O., his/her shall re-distribute the shop drawings and submittals.

- U. The CONTRACTOR for general construction is to review all "as-built" drawings and verify their accuracy and assemble into one set of "as-builts" prior to submission to the NJDMAVA.
- V. ALL "AS-BUILTS" SHALL BE SUBMITTED TO NJDMAVA ON REPRODUCABLE TRANSPARENCIES AND ALSO ON DISC IN THE CURRENT VERSION OF AUTOCAD (no XREF's).

7. RESPONSIBILITY FOR WORK; DUTY TO DEFEND AND HOLD HARMLESS

- A. The CONTRACTOR shall be responsible for all damages due to his/her operations; to all parts of the work, both temporary and permanent; and to all adjoining property.
- B. BECAUSE THE BID SUBMITTED BY THE CONTRACTOR INCLUDES THE COST OF PROVIDING COMPREHENSIVE GENERAL LIABILITY INSURANCE COVERAGE FOR THE STATE AS A NAMED ASSURED AND BECAUSE THE STATE DESIRES TO TRANSFER ALL OF THE RISKS ATTENDING ALL ACTIVITIES IN CONNECTION WITH THIS PROJECT TO THE CONTRACTOR REGARDLESS OF WHICH PARTY, IF ANY, MAY BE AT FAULT, EACH CONTRACTOR SHALL DEFEND, PROTECT AND HOLD THE STATE HARMLESS FROM ALL SUITS, ACTIONS, DAMAGES, AND COSTS OF EVERY NAME AND DESCRIPTION RESULTING FROM THE WORK UNDER THIS CONTRACT OR ACTIVITIES OF ANY KIND AT THE PROJECT SITE OR AT THE LOCATION OF THE CONTRACTOR OR SUPPLIER.
- C. The CONTRACTOR shall provide in connection with his/her own work, all safeguards, rails, night-lights, and other means of protection against accidents.
- D. The CONTRACTOR shall make, use and provide all proper necessary and sufficient precautions, safeguards and protection against the occurrence or happening of any accident, injuries, damage or hurt to any person or property during the progress of the work.
- E. The CONTRACTOR shall, at his/her own expense, protect all finished work liable to damage, and keep the same protected until the project is completed and accepted by the C.O.
- F. In order to protect the lives and health of his/her employees under the CONTRACT, the CONTRACTOR shall comply with all pertinent provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc., and shall maintain an accurate record of all cases of death, occupational disease, the injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment on work under the CONTRACT. The CONTRACTOR alone shall be responsible for the safety, efficiency, and adequacy of his/her plant, appliances, and methods and for any damage or injury which may result from his/her failure or his/her improper construction, maintenance, or operation.
- G. In case of emergency, which threatens loss or injury of property and/or safety of life, the CONTRACTOR may be allowed to act without previous instructions from the C.O. in a diligent manner. The CONTRACTOR shall notify the C.O. immediately. Any claim for compensation by the CONTRACTOR due to such extra work shall be documented and promptly submitted to the C.O. for approval. Where the CONTRACTOR has not taken action but has notified the C.O. of any emergency threatening injury to persons or damage to the work or any adjoining property, his/her shall act as instructed or authorized by the C.O. The amount of reimbursement claimed by the CONTRACTOR on account of any emergency action shall be determined in the manner provided in these General Conditions.

8. USE OF PREMISES

- A. The CONTRACTOR shall comply with the rules and regulations of the Using Agency.

- B. The CONTRACTOR shall confine his/her apparatus, the storage of materials, and the operation of his/her workmen to limits indicated by law, ordinances, permits, CONTRACT limit lines as established, or directions of the C.O. and shall not unreasonably encumber the premises with his/her materials.
- C. No CONTRACTOR shall not load or permit any part of the structure to be so loaded with weight that will endanger its safety.
- D. The CONTRACTOR shall enforce the C.O.'s instructions regarding signs, advertisements, fire and smoking.
- E. WHEN THE PROJECT INVOLVES WORK ON AN EXISTING STRUCTURE, THE STATE'S SMOKE FREE ENVIRONMENT POLICY SHALL BE IN AFFECT. NO CONTRACTOR, SUBCONTRACTOR OR MATERIALMAN SHALL SMOKE ON STATE PROPERTY. WHEN THE WORK INVOLVES THE CONSTRUCTION OF A NEW FACILITY, THEN THE STATE'S SMOKE FREE ENVIRONMENT SHALL BE IN EFFECT WHEN THE BUILDING IS ENCLOSED WITH DOORS AND WINDOWS AND THE HVAC SYSTEM IS OPERATIONAL. AT NO TIME SHALL THERE BE SMOKING IN ANY STRUCTURE WHEN OCCUPIED BY STATE EMPLOYEES OR RESIDENTS.
- F. The CONTRACTOR agrees to the use and occupancy of a portion or unit of the project by the State before acceptance by the State, provided the State:

Secures written consent of the CONTRACTOR except in the event, in the opinion of the C.O., the CONTRACTOR is chargeable with unwarranted delay in final completion of punch list items or other Contract requirements and,

- (a) Secures endorsement from the insurance carrier and consent of the Surety permitting occupancy of the building or use of the project during the remaining period of construction, or
 - (b) When the project consists of more than one building and one of the buildings is occupied, secures permanent fire and extended coverage insurance, including a permit to complete construction. Consent of the Surety must also be obtained.
- G. The CONTRACTOR shall obtain from the Station Commander or CEO specific instructions, rules, and regulations regarding conduct of the CONTRACTOR during the construction so that security of the facility and safety of occupants will not be endangered.

9. SUPERINTENDENT - SUPERVISION - LAYING OUT

- A. At the site of the work the CONTRACTOR shall employ a Construction Superintendent or Foreman on the work site at all times during progress who shall have full authority to act for the CONTRACTOR. It is understood that such representative shall be acceptable to the C.O. and shall be one who is to be continued in that capacity for the particular job involved unless he ceases to be on the CONTRACTOR'S payroll. Any successor Construction Superintendent or Foreman must be acceptable to the C.O. Should, during the course of the CONTRACT, the C.O. find the superintendent unacceptable as evidence by just cause, than the CONTRACTOR shall remove and replace the superintendent.
- B. The various subcontractors shall have competent foremen in charge of his/her respective part of the work at all times. His/her are not to employ on the work any unfit persons or anyone not skilled in the work assigned to him.

- C. The CONTRACTOR shall give the work his/her special supervision, lay out his/her own work, do all the necessary leveling and measuring or employ a competent New Jersey licensed engineer or land surveyor satisfactory to the C.O. to do so.
- D. If, due to trade agreement, additional standby personnel are required to supervise equipment or temporary services used by other trades, the CONTRACTOR providing such stand-by services shall evaluate requirements and include the cost thereof in his bid.
- E. The CONTRACTOR and subcontractors shall rely on his/her own measurements for the performance of his/her work.
- F. The CONTRACTOR shall do all field engineering and layout. In addition, his/her shall establish and maintain all benchmarks related to all tasks and the project schedule.
- G. The C.P.M schedule shall be working document and maintained in a current status and posted in his/her field office.
- H. The CONTRACTOR shall employ a master mechanic at all times.

10. SUBCONTRACTOR COST OR PRICING DATA - PRICE ADJUSTMENTS (1970 JAN)

Insert the following Clause in all CONTRACTs, both formally advertised and negotiated, which exceed \$100,000:

- A. Paragraphs (B) and (C) of this Clause shall become operative with respect to any modification made pursuant to one or more provisions of this CONTRACT which involves aggregate increases and/or decreases in costs plus applicable profits expected to exceed \$100,000. The requirements of this Clause shall be limited to such modifications.
- B. The CONTRACTOR shall require subcontractors hereunder to submit cost or pricing data under the following circumstances:
 - (i) Prior to the award of any subcontract the amount of which is expected to exceed \$100,000 when entered into:
 - (ii) Prior to the pricing of any subcontract modification which involves aggregate increases and/or decreases in costs plus applicable profits expected to exceed \$100,000; except where the price is based on adequate price competition, established catalog or market prices of commercial items sold in substantial quantities to the general public or prices set by law or regulation.
- C. The CONTRACTOR shall require subcontractors to certify that to the best of his/her knowledge and belief the cost and pricing data submitted under (B) above is accurate, complete, and current as of the date of agreement on the negotiated price of the subcontract change or modification.
- D. The CONTRACTOR shall insert the substance of this Clause including this paragraph (D) in each subcontract which exceeds \$100,000.

11. FEDERAL FUNDS (APPLICABLE TO FEDERAL FUNDED , NGB, PROJECTS ONLY)

The CONTRACTOR must comply with regulations included in the CONTRACT Documents.

- A. Federal Public Law 88-204 as amended, provides that all laborers and mechanics employed on the project shall be paid wages at not less than those prevailing on similar construction in the locality as determined by the Secretary of Labor in accordance with the Davis Bacon Act as amended.
- B. In case of conflict between State and U.S. Department of Labor wage rates the higher rate for any given occupation will be the governing rate.
- C. CONTRACTORS and Subcontractors are advised that upon acceptance of his/her bids, his/her are obligated under the Davis-Bacon Act to pay not less than the established wage rate. Unless otherwise required by law, wage rates need not be listed for non-manual workers, including executive, supervisory, administrative, and clerical employees.
- D. Subject to Federal-State Agreement - This CONTRACT is subject to all terms and conditions in Agreement No. DAHA _____ dated _____ between the United States of America and the State of New Jersey attached hereto and made a part hereof.

12. SUBCONTRACTOR APPROVAL

- A. The CONTRACTOR shall within thirty (30) working days after award of the CONTRACT notify the C.O. in writing of the names of Subcontractors proposed for the principal parts of the work and for such other as the C.O. or any that the C.O. may within a reasonable time reject. No CONTRACT shall be entered into with any Subcontractor before his/her name has been approved in writing by the C.O.
- B. The CONTRACTOR agrees that he is fully responsible to the State for the acts and omissions of the Subcontractors and of persons either directly or indirectly employed by them as theirs is for the acts and omissions of persons directly employed by him/her.
- C. Nothing contained in the CONTRACT Documents shall create any contractual relation between any Subcontractor and the State.
- D. The CONTRACTOR agrees to bind every Subcontractor and every Subcontractor agrees to be bonded by the terms of the CONTRACT Documents, as far as applicable to his work.

13. EQUIPMENT - MATERIAL APPROVAL

- A. The CONTRACTOR shall submit to the C.O. for approval a list of all manufacturers, materials, and equipment whether specified in the CONTRACT or not; within thirty (30) calendar days after award of CONTRACT. No CONTRACT shall be entered into with any Vendor before his/her name has been approved in writing by the C.O.
- B. The CONTRACTOR shall provide the following information:
 - (1) Identifying information shall be properly completed.
 - (2) Note whether the item is included in the specifications and state specification section and paragraph.
 - (3) If a substitute item is being allowed for the substitution differs from that originally scheduled.
 - (4) If a credit is allowed for the substitution, the breakdown showing the amount of the credit must be included.

- (5) If the State approves the substitute item and the substitute item changes the scope of work under other CONTRACTs or trades from the original specifications, then the CONTRACTOR offering the substitute item shall be responsible for all added such involved by reason of the charge in the work or other trades, including redesign.
 - (6) The CONTRACTOR, when requesting approval of an out-of-state Subcontractor or material manufacturer or supplier, shall attach a statement to the form to the effect that exhaustive effort was made to use New Jersey firms and/or materials, etc. Preference shall be given to New Jersey manufacturers, firms, etc.
 - (7) It is further called to the attention of each Prime CONTRACTOR that the approval by the State of a Subcontractor or material supplier does not relieve the CONTRACTOR or the Subcontractor of the responsibility of complying with the drawings and specifications. The approval of a Subcontractor does not imply approval of any material.
- C. Where any particular brand or manufacturer is specified, it is to be regarded as a standard. Another brand or make equally as good in the opinion of the C.O. may be acceptable and approved if submitted with these General conditions.
- D. After the CONTRACT has been awarded, should the CONTRACTOR desire to use some other material other than that specified, his/her shall first make application to the C.O. in writing, naming the differences in cost in each case, otherwise his/her will be held to what is specified. No changes shall be made without the written consent of the C.O.
- E. In the event a CONTRACTOR should propose a substitution (IAW Section 2, Article 20) for the specified equipment or materials, it shall be his/her responsibility to submit proof of equality, have any tests performed which may be required by the C.O. and pay all costs of such tests.
- F. **This section of the specifications shall in no way authorize the use of approved equals.** Submission for approved equals shall be in accordance with Section II Article 12, page 7 of these specifications.

14. REPORTS, RECORDS AND DATA

- A. The CONTRACTOR shall submit to the C.O. such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records, and other data as the State may request concerning work performed or to be performed under this CONTRACT.
- B. These shall be submitted in triplicate with state invoices or as requested by the C.O. or his/her duly appointed representative.
- C. Any substantial change to the contract drawings, as determined by the C.O. shall be drawn by the CONTRACTOR in the current version of AutoCad (no XREF's) with backup discs provided to NJDMAVA.

15. CONSTRUCTION PROJECT SCHEDULE

- A. The CONTRACTOR for the CONTRACT shall be responsible for preparing and furnishing, before the first CONTRACT requisition date (or by the second Quality Review Board meeting, if applicable) a coordinated single project schedule which incorporates project schedules of all prime contractors engaged on the project. (When a DESIGN/BUILD has been awarded, this shall be a schedule including all tasks related to that CONTRACT). The schedule shall be a cost loaded "Primavera" C.P.M. schedule or equal in a form and in sufficient detail satisfactory to the C.O. The schedule shall not only include the multiple tasks and his/her

inter-relationships, but shall also clearly delineate the critical path and associated tasks of the project. The schedule shall be updated once each month and be submitted with the payment requisitions. The schedule must be approved by all prime contractors, when applicable, and NJDMAVA or his/her representative.

- B. The CONTRACTOR shall submit copies of his/her initial draft of this schedule to all subcontractors. Each subcontractor shall then prepare a project schedule for his/her own work, properly coordinated with the CONTRACTOR'S initial draft, and submit it to the CONTRACTOR for his/her preparation of a final draft of a single coordinated project schedule. The CONTRACTOR shall compare his updated schedule with the C.O.'s and determine what necessary actions shall be taken, when required, to keep the project on schedule IAW the C.O.'s time frame.
- C. C.O. will not process CONTRACT requisitions until final project schedule has been submitted and approved by the State.
- D. The coordinated progress schedule shall indicate each section of the specifications or work, dates on which various branches of the work will commence, anticipated delivery dates for critical items, approved C.P.M. dates for completion. All shall be predicated upon time of completion specified for the project.
- E. After the final schedule has been approved by the C.O., the CONTRACTOR shall prepare and distribute ten (10) copies to the C.O. and two (2) copies to each subcontractor, and two (2) copies to the A/E, if applicable.
- F. In the event the C.O. authorizes a new calendar date during the progress of the work, the CONTRACTOR shall furnish a revised schedule immediately with copies as indicated above.
- G. The CONTRACTOR shall furnish sufficient labor, construction plant and equipment to insure the prosecution of the work in accordance with the approved Progress Schedule. If, in the opinion of the C.O., or his representative, any subcontractor or the CONTRACTOR falls behind the Project Schedule, the CONTRACTOR shall take such steps as may be necessary to improve his/her progress; and the C.O. may require them to increase the number of shifts, days of work, invest in better construction methods and/or the amount of construction plant and equipment, all without additional cost to the State.
- H. Should a CONTRACTOR fail to supply the project schedule prior to the start of the job, then his/her work shall be delayed until it is provided. Any delays incurred will be without additional cost to the State and may incur liquidated damages to the CONTRACTOR.
- I. Should a CONTRACTOR fail to supply the progress schedule with the payment requisitions, then payment shall be held until the schedule is received.

16. UNIT SCHEDULE BREAKDOWN

A. The CONTRACTOR shall file, with the C.O., a unit schedule breakdown in sufficient detail and a Project Schedule (C.P.M.), to include the following, which will be used as the basis for determining the amount of payment to be made on a periodic basis for work completed and installed in accordance with CONTRACT documents.

- (1). Description of material or equipment and number of units involved.
- (2). Lump sum price for labor and lump sum price for equipment and/or material listed.
- (3.) Lump sum allowances included in the specification.
- (4). The total of items shall equal the lump sum CONTRACT price.

B. The Unit Schedule Breakdown shall be submitted for approval to the C.O. within ten (10) calendar days from date of written Notice To Proceed by the State.

17. PAYMENT

- A. The basis for computing monthly progress payments shall be the Project Schedule (CPM) and the Unit Schedule Breakdown.
- B. Subject to submission by the CONTRACTOR of written certifications required by them and their Subcontractors, partial payments will be made as work progresses not later than the thirtieth day of each calendar month for work done during the preceding calendar month on estimates certified to by the A/E, or Construction Manager if applicable, and the C.O.
- C. In preparing estimates, material delivered to and properly stored on the site and preparatory work done shall be taken into consideration. Estimates for monthly payments must be submitted for the project not later than the thirtieth day of each calendar month. These payments will be based on percentage of completion in comparison to the Project Schedule (CPM). The CONTRACTOR should take diligence to ensure that he/she is on time according to the Schedule and that his/her pay requests correspond to the project completion status.
- D. In making such partial payments for work, there will be retained ten (10%) percent of estimated amount until Final Acceptance and completion of all work covered by the CONTRACT. Provided that after eighty (80%) percent of the work has been completed, the CONTRACTOR may request a reduction in retainage to five (5%) percent. This request must be in writing and directed to the C.O. Should the C.O. determine that a reduction is warranted, then he shall direct the Construction Facilities Management Office Account Management Section to make the adjustment in future payment(s). Provided, further, that on completion and acceptance of each separate building, public work, or other division of the CONTRACT, on which the price is stated separately in the CONTRACT, payment may be made in full, including retaining percentages thereon, less authorized deductions.
- E. State's Right to Withhold Certain Amounts and Make Application thereof: The CONTRACTOR agrees that his/her will indemnify and save the State harmless from all claims growing out of the lawful demands of Subcontractors, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the furtherance of the performance of this CONTRACT. The CONTRACTOR shall, at the State's request, furnish satisfactory evidence that all obligations of the nature herein above designated have been paid, discharged, or waived. If the CONTRACTOR fails so to do, then the State may, after having served written notice on the said CONTRACTOR, either pay unpaid bills, of which the State has written notice, may direct, or withhold from the CONTRACTOR'S unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the CONTRACTOR shall be resumed, in accordance with the terms of this CONTRACT, but in no event shall the provisions of this sentence be construed to impose any obligations upon the State to either the CONTRACTOR or his/her Surety. In paying any unpaid bills of the CONTRACTOR, the State shall be deemed the agent of the CONTRACTOR, and any payment so made by the State, shall be considered as a payment made under the CONTRACT by the State to the CONTRACTOR and the State shall not be liable to the CONTRACTOR for any such payment made in good faith.
- F. All material and work covered by partial payments made shall thereupon become sole property of the State, but this provision shall not be construed as relieving the CONTRACTOR from sole responsibility for care and protection of materials and work upon which payments have been made or restoration of any damaged work, or as a waiver of right of the State to require fulfillment of all terms of the CONTRACT.
- G. The CONTRACTOR shall pay (a) for all transportation and utility services not later than the twentieth day of the calendar month following that in which services are rendered, (b) for all materials, tools, and other expendable equipment to the extent of ninety (90%) percent of the cost thereof, not later than the twentieth day of the calendar month following that in which such material, tools, and equipment are delivered at the site of the project, and the balance of the cost thereof not later than the thirtieth day following the completion

of that part of the work in or on which such materials, tools, and equipment are incorporated or used, and to each of his Subcontractors, not later than the fifth day following each payment to the CONTRACTOR, the respectable amounts allowed the CONTRACTOR on account of the work performed by his Subcontractors to the extent of each Subcontractor's interest herein.

- H. Upon completion of all CONTRACTs and Final Acceptance of all work required hereunder, the amount due the CONTRACTOR under the CONTRACT shall be paid within thirty (30) calendar days after issuance of Certificate of Final Acceptance of all CONTRACTs by the A/E, if applicable, and approval by the State, after the CONTRACTOR shall have furnished the State with a release in satisfactory form of all claims against the State arising under and by virtue of this CONTRACT, other than such claims, if any, as may be specifically excepted by CONTRACTOR from operation of release; provided, each such exception embraces no more than one claim, the basis and scope of which are clearly defined and amount stated; and, provided further, that the amounts of such excepted claims are not included in voucher for final payment.
- I. The acceptance by the CONTRACTOR of final payment shall be and shall operate as a release to the State of all claims and all liability to the CONTRACTOR for all things done or furnished in connection with this work. No payment, however, final or otherwise, shall be made with any intent of releasing the CONTRACTOR or his/her Sureties from any obligations under this CONTRACT or the Performance and Payment Bond.
- J. All request for payments under this CONTRACT shall be made on a State of New Jersey Payment Voucher as follows: If Federal/State -original and two (2) copies, if 100% Federal and if 100% State - original and two (2) copies. CONTRACTOR will be provided with forms.
- K. Should the Unit Schedule Breakdown reflect the actual work done but not correlate with the time in which it is suppose to be done in accordance with the Progress Schedule, then the C.O. shall withhold a percentage of the payment equal to the percentage of time added. This shall be withheld until such time as the delay is made up.
- L. The CONTRACTOR shall not receive final payment until he/she satisfactorily corrects deficiencies cited by the "National Guard Bureau's" or the United States Department Veterans Administration's final inspection, when applicable.
- M. The CONTRACTOR'S submittal of a State payment invoice shall include the certified weekly payroll records for the period of the invoice along with the Affirmative Action records required.

18. PAYMENTS WITHHELD

- A. The C.O. may withhold or, on account of subsequently discovered evidence, nullify the whole or a part of any certificate for payment to such extent as may be necessary to protect the State from loss on the account of:
 - (1) Defective work not remedied.
 - (2) Claims filed, or reasonable evidence indicating probable filing of claims.
 - (3) Failure of the CONTRACTOR to make payments promptly to Subcontractors or for material or labor.
 - (4) A reasonable doubt that the CONTRACT can be completed for the balance then unpaid.
 - (5) Damage to another CONTRACTOR.
 - (6) Failure to meet the timelines of the approved progress schedule.

(7) Failure to meet the Affirmative Action requirements.

(8) Failure to cleanup in accordance with Section 43 (D)

(9) Failure to make steady progress or

(10) Failure to make punch list repairs in an agreed upon time frame alteration or repair, as the case may be, and for added administrative and inspection costs to the State on account of the delay; provided, however, that the said liquidated damages provided for herein shall be in addition to other consequential losses or damages that the State may incur by reason of such delay, such as, but not limited to, added costs of the project and the cost of furnishing temporary services, if any. Any such sums for which the CONTRACTOR is liable may be deducted by the State from any monies due or to become due to the CONTRACTOR.

B. When all the above grounds are removed, certificates will at once be issued for amounts withheld because of them.

19. AUDIT BY DEPARTMENT OF MILITARY AND VETERANS AFFAIRS

Insert the following clause in all CONTRACTs (except those entered into by formal advertising which are not expected to exceed \$100,000).

- A. GENERAL: The Contracting Officer or his/her representatives shall have the audit and inspection rights described in the applicable paragraphs (B), (C) and (D) below.
- B. EXAMINATION OF COSTS: If this is a cost reimbursement type, incentive, time and materials, labor hour, or price re-determinable CONTRACT, or any combination thereof, the CONTRACTOR shall maintain, and the C. O. or his/her representatives shall have the right to examine books, records, documents, and other evidence and accounting procedures and practices, sufficient to reflect properly all direct and indirect costs of whatever nature claimed to have been incurred and anticipated to be incurred for the performance of this CONTRACT. Such right of examination shall include inspection at all reasonable times of the CONTRACTOR'S plant, or such parts thereof, as may be engaged in the performance of this CONTRACT.
- C. COST OR PRICING DATA: If the CONTRACTOR submitted cost or pricing data in connection with the pricing of this CONTRACT or any change or modification thereto, unless such pricing was based on adequate price competition, established catalog or market prices of commercial items sold in substantial quantities to the general public, or prices set by law or regulation, the C.O. or his/her representatives who are employees of the United States Government shall have the right to examine all books, records, documents and other data of the CONTRACTOR related to the negotiation, pricing or performance of such CONTRACT, change or modification, for the purpose of evaluating the accuracy, completeness and currency of the cost or pricing data submitted. Additionally, in the case of pricing any change or modification exceeding \$100,000 to formally advertised CONTRACTs, the Comptroller General of the United States or his/her representatives who are employees of the United States Government shall have such rights. The right of examination shall extend to all documents necessary to permit adequate evaluation of the cost of pricing data submitted, along with the computations and projections used therein.
- D. REPORTS: If the CONTRACTOR is required to furnish CONTRACTOR Cost Data Reports (CCDR), CONTRACT Fund Status Reports (CFSR), or Cost Performance Reports (CPR) the C. O. or his/her representatives shall have the right to examine books, records, other documents, and supporting materials, for the purpose of evaluating (i) the effectiveness of the CONTRACTOR'S policies and procedures to produce data compatible with the objective of these reports, and (ii) the data reported.

- E. AVAILABILITY: The materials described in (B), (C) and (D) above shall be made available at the office of the CONTRACTOR, at all reasonable times, for inspection, audit, or reproduction, until the expiration of three (3) years from the date of final payment under this CONTRACT or such lesser time specified in Appendix M of the Defense Acquisition Regulation and for such longer period, if and, as is required by applicable statute, or by other clauses of this CONTRACT, or by (1) and (2) below:
- (1) If this CONTRACT is completely or partially terminated, the records relating to the work terminated shall be made available for a period of three (3) years from the date of any resulting final settlement.
 - (2) RECORDS WHICH RELATE TO APPEALS UNDER THE DISPUTES CLAUSE OF THIS CONTRACT, OR LITIGATION, OR THE SETTLEMENT OF CLAIMS ARISING OUT OF THE PERFORMANCE OF THIS CONTRACT, SHALL BE MADE AVAILABLE UNTIL SUCH APPEALS, LITIGATION, OR CLAIMS HAVE BEEN DISPOSED OF. FAILURE OF THE CONTRACTOR OR HIS /HER REPRESENTATIVES TO MAINTAIN AND MAKE AVAILABLE SUCH RECORDS SHALL CONCLUSIVELY BAR THE CONTRACTOR FROM MAKING ANY CLAIM CONCERNING ANY ITEM OR SUBJECT FOR WHICH RECORDS HAVE NOT BEEN MAINTAINED OR MADE AVAILABLE.
- F. The CONTRACTOR shall insert a clause containing all the provisions of the above Clause, including this paragraph (F), in all subcontracts exceeding \$10,000 hereunder, except altered as necessary for proper identification of the contracting parties and the C.O. under the State prime CONTRACT.

20. MATERIAL - WORKMANSHIP - LABOR

- A. All material and work shall conform to the best practice. Only the best of the several kinds of materials shall be used, and the work carefully carried out in strict accordance with the general and detail drawings, under the supervision of the C.O. The Department of Military & Veterans Affairs shall be the sole determiner of "Industry Standards" for projects under its jurisdiction. The C.O. shall have full power at any time to reject such work or materials which does not, in his opinion, conform to the true intent and meaning of the CONTRACT Documents or meet the industry standard.
- B. Preference shall be given at all times to materials that are manufactured or produced in the State, where such preference is possible and will best serve the interests of the State.
- C. All work when completed in a substantial and workmanlike manner to the satisfaction of the C.O., shall be accepted by him in writing. Unless otherwise specified, all materials used shall be new.
- D. The CONTRACTOR shall furnish and pay all necessary transportation, scaffolding, centering, forms, water, labor, tools, light and power, and mechanical appliances, and all other means, materials, and supplies for properly prosecuting his/her work under CONTRACT, unless expressly specified otherwise.
- E. The CONTRACTOR shall furnish necessary materials in ample quantities and as frequently as required to avoid delay in the progress of the work, and shall so store them as to prevent interference with other branches of work not under his/her CONTRACT.
- F. The CONTRACTOR shall employ qualified and competent craftsmen in his/her respective lines of work. All such employees shall be subject to approval by the C.O. Should the C.O. deem any employee incompetent or negligent or for any cause unfit for his/her duties, the CONTRACTOR shall dismiss them, and his/her shall not again be employed on the work. No CONTRACTOR will be required to employ for any work any person against whom his/her have a reasonable objection.

- G. It is understood by CONTRACTOR and Subcontractors engaged in this CONTRACT, that in the employment of both skilled and unskilled labor, preference shall be given to residents of the State of New Jersey and that all such labor shall at all times be satisfactory to the C.O.
- H. Any work necessary to be performed after regular working hours, on Saturdays, Sundays, or Legal Holidays, shall be performed without additional expense to the State, including reimbursement to the State for armorer standby or overtime cost.
- I. No materials or supplies for the work shall be purchased by the CONTRACTOR or by any Subcontractor subject to any liens, claims, or other encumbrance or other agreement by which an interest is retained by the seller. The CONTRACTOR warrants that his/her have good title to all materials and supplies used by them in the work, free from all liens, claims or encumbrances.

21. DEFECTIVE WORK AND MATERIALS

- A. Any materials or work found to be defective, or not in strict conformity with the requirements of the CONTRACT Documents, or defaced or damaged through the negligence of the CONTRACTOR, his/her Subcontractor or employees, or through action of fire or the weather or any causes, shall be removed immediately and new materials or work substituted therefore without delays by the CONTRACTOR involved.
- B. No previous inspection or certificate on hand shall be held as an acceptance of defective work or materials or to relieve the CONTRACTOR from the obligation to finish sound materials and to perform good satisfactory work. The C.O. is to be the final judge of the materials and work finished.
- C. If the C.O. deems it inexpedient to correct work damaged or not done in accordance with the CONTRACT, the difference in value between such work, and that specified, together with a fair allowance for consequential damage, shall be deducted from the CONTRACT price.

22. INSPECTION OF WORK

- A. The C.O. and DCA shall at all times have access to the work whether it is in preparation or in progress, and the CONTRACTOR shall provide proper facilities for such access and for inspection.
- B. Should it be considered necessary or advisable by the State, or by the representatives of the Chief, National Guard Bureau or Secretary of the Veterans Administration, at any time before final acceptance of the entire work to make an examination of work already completed, by removing or tearing out same, the CONTRACTOR shall on request promptly furnish all necessary facilities, labor and material. If such work is found to be defective or nonconforming in any material respect due to the fault of the CONTRACTOR or his/her subcontractors, his/her shall defray all the expenses of such examination and reconstruction. If, however, such work is found to meet the requirements of the CONTRACT, an equitable adjustment shall be made in the CONTRACT price to compensate the CONTRACTOR for the additional services involved in such examination and reconstruction; and if completion of the work has been delayed thereby, his/her shall, in addition, be granted a suitable extension or time. Federal funding support of the cost for examination and replacement of satisfactorily completed work that requires removal or that is damaged due to inspection requirements is subject to prior approval by the Chief, National Guard Bureau or Secretary of the Veterans Administration or his/her duly authorized representatives.
- C. All materials and equipment used in the construction of the project shall be adequately tested according to standards of the trade, or as required by the State, all at the expense of the CONTRACTOR, except as otherwise provided herein.

- D. On Federally funded projects, the authorized representative and agents of the Federal Department or Agency shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records.
- E. Before a certificate of substantial completion can be issued, the General Construction CONTRACTOR shall arrange for an inspection of the project by DCA, where and when applicable, with regard to all life safety systems including but not limited to: Fire alarm systems, sprinkler systems; provisions for panic egress; emergency lighting; and so forth. The General Construction CONTRACTOR shall coordinate the inspection with all of the other Prime Contractors of the project so that the life safety inspection shall be inclusive of all systems.
- F. Inspection:
- (1) Except as otherwise provided in subparagraph (3) hereof, all material and workmanship (if not otherwise designated by the specifications) shall be subject to inspection, examination, and testing by representatives of the C.O. at any and all times during manufacture and/or construction (and at any and all places where such manufacture and/or construction are carried on). The State shall have the right to reject defective material and workmanship or require its correction. Rejected workmanship shall be satisfactorily replaced with proper material without charge therefor, and the CONTRACTOR shall promptly segregate and remove the rejected material from the premises. If the CONTRACTOR fails to proceed at once with the replacement of rejected material and/or the correction of defective workmanship, the State may, by CONTRACT or otherwise, replace such material and/or correct such workmanship and charge the cost thereof to the CONTRACTOR, or the State may terminate the right of the CONTRACTOR to proceed as provided in this CONTRACT, the CONTRACTOR and Surety being liable for any damage to the same extent as provided in said Articles for terminations thereunder.
 - (2) The CONTRACTOR shall furnish promptly, without additional charge, all reasonable facilities, labor, and materials necessary for the safe and convenient inspections and tests that may be required by the C. O. or the State. All inspections and tests by the State shall be performed in such manner as not unnecessarily to delay work. Special, full size, and performance tests shall be as described in the specifications. The CONTRACTOR shall be charged with any additional cost of inspection when material and workmanship is not ready at the time inspection is requested by the CONTRACTOR.
 - (3) Inspection of material and finished articles to be incorporated in the work at the site may be made by C.O. or his/her representative and by the Department of Community Affairs at the place of production, manufacture, or shipment, whenever the quantity justifies it, unless otherwise stated in the specifications; and such inspection and acceptance shall be in writing, and unless otherwise stated in the specifications, shall be final, except as regards latent defects, departures from specific requirements of the CONTRACT and the specifications and drawings made a part thereof, damage or loss in transit, fraud, or such gross mistakes as amount to fraud. Subject to the requirement contained in the preceding sentence, the inspection of material and workmanship for final acceptance as a whole or in part, shall be made at the site. Nothing contained in this paragraph (3) shall in any way restrict the State's rights under any warranty or guarantee.

23. CHANGE ORDERS (ADDITIONS - DEDUCTIONS - DEVIATIONS)

- A. The C.O. at his/her discretion, may at any time during the progress of the work authorize additions, deductions or deviations from the work described in the CONTRACT Documents as herein below set forth; and the CONTRACT shall not be vitiated or the Surety released thereby.
- B. Federal funding support for any change or extra is subject to prior approval by the Chief, National Guard Bureau, or Secretary of the Veterans Administration or his/her duly authorized representative.
- C. Additions, deductions, deviations may be authorized as follows at the C.O.'s option;

- (1) On the basis of unit price specified.
- (2) On a lump sum basis.
- (3) On a time and material basis.
- (4) Standby time or overtime.

D. All pricing must be submitted on DMAVA Change Order Forms in triplicate.

E. The value of any change in the CONTRACT under C-1, 2, 3, 4 shall be determined as follows:

- a. On the basis of unit prices specified.

When a Change Order is authorized on the basis of a unit price included in the CONTRACT or subsequently agreed upon the unit price only is used to determine the cost of the work.

- b. On a lump sum basis.

When a Change Order is authorized on a lump sum basis, the lump sum price submitted by the CONTRACTOR must include a breakdown for labor, material, insurance, profit, overhead and bond.

- c. On a time and material basis.

When a Change Order is authorized on a time and material basis, the payment for such work is to be performed by a CONTRACTOR, shall include the cost for labor and materials to which may be added ten (10%) percent for overhead, ten (10%) percent for profit and one (1%) percent for bond. Where such work is to be performed by a Subcontractor of the CONTRACTOR, then, and in that event, the CONTRACTOR may add an additional ten (10%) percent only of the cost of labor and materials to be paid to them for his/her overhead. Payment for work done on a time and material basis shall be limited to the maximum (upset) price established.

- d. Standby time or overtime.

When a Change Order is authorized for standby time, overhead and profit is to be limited to ten (10%) percent of the net labor cost to cover the CONTRACTOR'S overhead, profit, and bond. The limit of ten (10%) percent shall apply whether or not a Subcontractor is involved. Any claim for standby time will be rejected unless documented by the time sheets signed by the C.O.

F. When a Change Order is authorized for overtime and the work to be performed is a contractual obligation the State will pay for only the premium portion of the labor cost plus ten (10%) percent for overhead and profit, and one (1%) percent for bond.

G. All Change Orders shall be subject to audit by the C.O.

H. CONTRACTORS are not authorized to add separate administrative, internal engineering or other similar cost since the overhead allowed shall be determined to be sufficient to cover these administrative costs.

I. Should a CONTRACTOR request a Change Order or imply there could be one, his/her shall be required to submit a formal request to the C. O. within ten (10) days of identifying such request. This request shall include an itemized breakdown of the work involved and related cost. Should the CONTRACTOR fail to provide this documentation, then the C. O. shall not review this issue at any time in the future.

J. In order to avoid delays to the progress of the work, the C.O. at his/her discretion, may authorize any CONTRACTOR, in writing, to proceed and the CONTRACTOR shall so proceed with such addition, deduction, or deviation prior to the issuance of a formal Change Order. CONTRACTORS shall submit his/her proposals for any change in the work within twenty (20) calendar days from the date of authorization

to proceed with the work. Should the C.O. and the CONTRACTOR not agree on costs of a change order, then the CONTRACTOR shall proceed with such work as not to delay the project. This shall not waive his/her rights to any claims under the provisions of this CONTRACT and shall not delay the C.O. from making a good faith effort to resolve the dispute.

- K. All such work shall be executed under the conditions of the original CONTRACT, except that any claims for extension of time caused thereby shall be adjusted at the time of ordering such change. Except as provided herein before and except in an emergency endangering life or property, no change shall be made unless in pursuance of a written order; and no claim for an addition to the CONTRACT sum shall be valid unless so ordered. Should the CONTRACTOR perform extra work without first obtaining an order from the C.O., such action may be construed by the State as a waiver of any and all claims to extra payment therefore.
- L. When work is deleted, the Prime CONTRACTOR shall submit a credit based upon an estimate which includes a bill of material and a breakdown of labor costs to which shall be added one (1%) percent for bond. When credits are involved, documented cancellation and/or restocking charges may be included.
- M. When work is added and deleted on the same Change Order, resulting in net additional costs, the CONTRACTOR shall first prepare a bill-of-material and labor breakdown showing separate net costs of the added and deleted work. He shall then subtract the net cost of the selected work from the net cost of the added work and escalate the DIFFERENCE by adding ten (10%) percent for overhead, ten (10%) percent for profit (both based on base amount) and one (1%) percent for bond.
- N. When similar materials are to be added and deleted on the same Change Order, the difference in material quantities shall be determined before pricing and escalation. Labor costs in the same trade shall be handled in the same manner, the difference in labor hours shall be determined before pricing and escalation.
- O. When work is added and deleted on the same Change Order, resulting in net credit, the CONTRACTOR shall first determine the net cost of the deleted materials, labor, and equipment comprising the credit. They shall next determine the total cost of the added material, labor and equipment rental, including escalation. The total cost of the added work shall then be subtracted from the net cost of the deleted work and the resulting difference shall become the amount of the credit Change Order.
- P. When work is added by a CONTRACTOR in which a Subcontractor is used, the Subcontractor shall submit an estimate to the CONTRACTOR on their own stationery with supporting documentation which includes a bill of material and a breakdown of labor costs to which may be added ten (10%) percent for overhead and ten (10%) percent for profit. The CONTRACTOR will be allowed to add ten (10%) percent and one (1%) percent for bond to the estimate of the Subcontractor.
- Q. When work is deleted by a CONTRACTOR in which a Subcontractor is used the Subcontractor shall submit to the CONTRACTOR a credit based upon an estimate on his own stationery with supporting documentation which includes a bill of material and a breakdown of labor costs. When credits are involved, documented cancellation and/or restocking charges may be included. The CONTRACTOR shall add one (1%) percent for bond to the estimate of the Subcontractor.
- R. The State reserves the right to accept or reject any combination of add or deduct alternates. Under no circumstances does the sequential order of add or deduct alternates imply his/her will be awarded in such order.
- S. No Change Order shall be approved if funding is not available from the State or Federal Government. CONTRACTORS proceeding with work that is not approved under DMAVA's Change Order process shall do so at his/her sole risk without any implied cost to the State.
- T. When Change Orders are identified, NJDMAVA shall have ten (10) calendar days to review and process Change Orders.

24. ALLOWANCES

- A. The CONTRACTOR shall include in his proposal the cash allowances stated in the CONTRACT Documents.
- B. The CONTRACTOR shall purchase the "Allowed Materials" as directed by the C.O. on the basis of the lowest and best bid of at least three (3) competitive bids. If the actual price purchasing of the "Allowed Materials" is more or less than the "Cash Allowance", the CONTRACT price shall be adjusted accordingly. The adjustment in CONTRACT price shall be made on the basis on the purchase price without additional charges for overhead, profit, insurance, or any other incidental expenses.
- C. The cost installation of the "Allowed Materials" shall be included in the applicable sections of the CONTRACT specifications covering this work.

25. TIME OF COMPLETION - DELAY - LIQUIDATED DAMAGES

- A. In the event of the failure of the CONTRACTOR to complete the said work within the time stated in his/her proposal, the CONTRACTOR shall be liable to the State in the sum of one hundred (\$100.00) dollars per day, or the sum equal to 1/20th of one percent of the total consideration provided for under this Contract, per day, or for the sum of total costs incurred by NJDMAVA to maintain staffing of the project beyond its completion date, whichever is greater for each and every day that the paid work shall be and remain incomplete, which said sum shall be treated as liquidated damages and not a penalty, for the loss to the State of the use of the premises in a completed state of construction, alteration or repair, as the case may be, and for added administrative and inspection costs to the State on account of the delay; provided, however, that the said liquidated damages provided for herein shall be in addition to other consequential losses or damages that the State may incur by reason of such delay, such as, but not limited to, added costs of the project and the cost of furnishing temporary services, if any. Any such sums for which the CONTRACTOR is liable may be deducted by the State from any monies due or to become due to the CONTRACTOR.
- B. It is hereby understood and mutually agreed, by and between the CONTRACTOR and the State, that the date of beginning and the time for completion as specified in the CONTRACT of the work to be done hereunder are ESSENTIAL CONDITIONS of this CONTRACT; and it is further mutually understood and agreed that the work embraced in this CONTRACT shall be commenced on a date to be specified in the "Notice to Proceed."
- C. The CONTRACTOR agrees that said work shall be prosecuted regularly, diligently, and uninterruptedly at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the CONTRACTOR and the State that the time for the completion of the work herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.
- D. If the said CONTRACTOR shall neglect, fail, or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the C.O., then the CONTRACTOR does hereby agree, as a part consideration for the awarding of this CONTRACT, to pay to the State the amount specified in paragraph A above, not as a penalty but as liquidated damages for such breach of CONTRACT as hereinafter set forth, for each and every calendar day that the CONTRACTOR shall be in default after the time stipulated in the CONTRACT for completing the work.
- E. The Said amount is fixed and agreed upon by and between the CONTRACTOR and the State because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the State would in such event sustain, and said amount is agreed to be the amount of damages which the State would sustain and said amount shall be retained from time to time by the State from current periodical estimates.

- F. It is further agreed that time is of the essence of each and every portion of the CONTRACT and of the specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the CONTRACT and additional time is allowed for the completion of any work, the new time limit fixed by such extension should be of the essence of this CONTRACT PROVIDED that the CONTRACTOR shall not be charged with liquidated damages, or any excess cost when the Owner determines that the CONTRACTOR is without fault and the CONTRACTOR'S reasons for the time extension are acceptable to the owner; provided further, that the CONTRACTOR shall not be charged with liquidated damages of any excess cost when the delay in the completion of the work is due:
- (1) To any preference, priority, or allocation order duly issued by the Government.
 - (2) To unforeseeable cause beyond the control and without the fault or negligence of the CONTRACTOR, including, but not restricted to, acts of God, or of the public enemy, acts of the State, acts of another CONTRACTOR in the performance of a CONTRACT with the State which acts are contrary to the terms of such CONTRACT, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and severe weather; and
 - (3) To any delays of Subcontractors or suppliers occasioned by any of the causes specified in subsections (1) and (2) of this article:
- G. Provided, further, that the CONTRACTOR shall, within ten (10) days from the beginning of such delay, unless the C.O. shall grant a further period of time prior to the date of final settlement of the CONTRACT, notify the State, in writing of the causes of the delay and any costs involved. The C.O. shall first ascertain the facts and extent of the delay and notify the CONTRACTOR within ten (10) working days that good cause has been shown to warrant the granting of such extension or deny the delay.
- I. Should the State be prevented or enjoined from proceeding with work either before or after the start of construction by reason of any litigation or other reason beyond the control of the State to include delays caused by other state or federal agencies, the CONTRACTOR shall not be entitled to make or assert claim for damage by reason of said delay; but time for completion of the work will be extended to such reasonable time as State may determine will compensate for time lost by such delay with such determination to be set forth in writing.

26. CONSTRUCTION SIGN

- A. The CONTRACTOR shall construct and install a construction sign as indicated on the drawings or as provided after the project is started. Lettering shall be as shown on the drawings and shall include the names of the subcontractors engaged on the project, and, if applicable, such State personnel as directed. The sign shall be securely installed to remain rigid and plumb, shall be maintained in good condition throughout the construction period, and shall be removed when directed by the A/E.
- B. The construction sign shall indicate, when applicable, that the Federal Government is participating in the development of the project.

27. TEMPORARY DRIVES AND WALKS

- A. The CONTRACTOR for general construction shall provide, maintain and remove, when no longer required, all temporary driveways, parking areas and walkways that may be necessary to allow access to all parts of the structure and for handling of materials and equipment. The CONTRACTOR shall maintain temporary access to parts of the structure and for handling of materials and equipment and keep temporary access and parking facilities clean and provide dust control by means of application of water or road oil as required.

- B. Should the CONTRACTOR for the General Construction Contract elect to place any materials that will be incorporated into the permanent driveways, parking areas or walks, his/her shall not do so without having prepared the subgrade as may be elsewhere required by the specifications nor will he be relieved from any responsibility for providing additional materials or of reworking the subgrade, if required to make the improvements conform fully with the specifications.
- C. The CONTRACTOR for the General Construction Contract shall obtain permission in writing from NJDMAVA before using any existing driveways or parking areas for construction purposes. He/she shall maintain such driveways and areas in good condition during the construction period, and at completion of the project, shall leave them in same condition as at the start of the work.

28. TEMPORARY BUILDINGS AND SANITARY FACILITIES

- A. The CONTRACTOR for the Contract shall provide a convenient office space on the job sufficient to accommodate the State representative assigned to the project. At a minimum, a construction trailer shall be maintained on the construction site for the duration of the project.
- B. The CONTRACTOR for the Contract shall have a pay station telephone installed for the use of all prime contractors.
- C. The CONTRACTOR for Construction shall provide temporary office facilities of not less than 400 square feet for use by the state representative. This office space shall be in a construction trailer unless otherwise approve in writing by the C.O. This space shall be for the exclusive use of the state or his/her representative. The CONTRACTOR shall level the trailer and provide a skirt and steps. The office space shall include the following:
 - (1) two (2) desks and chairs and two (2) 30' x 60' minimum reference type boards.
 - (2) Two (2) four-drawer lockable file cabinets.
 - (3) An area for meetings with a conference table and chairs adequate for twelve (12) people minimum.
 - (4) Toilet facilities within the office space.
 - (5) CONTRACTOR shall maintain these areas in a neat and sanitary condition.
 - (6) Heat and Air Conditioning
 - (7) Necessary power, lighting and two telephone lines. CONTRACTOR shall pay all utility and telephone charges.
 - (8) A hanging type drawing file
 - (9) The following equipment shall be provided with specifications provided and approved by the C.O.:
 - (a) Computer
 - (b) Photocopy machine
 - (c) Fax machine
 - (d) Refrigerator
 - (e) Coffee Machine
 - (f) Water Cooler
 - (10) All equipment and furniture shall become the property of the state at the completion of the project.
- D. The CONTRACTOR, from the commencement of the job, shall provide sufficient and sanitary toilet room facilities for the use of all persons at work. These are to be kept in sanitary conditions and at the completion of the job are to be cleaned out and removed. Sanitary facilities shall conform with the Board of Health, State and local requirements.

29. TEMPORARY WATER

- A. The Plumbing CONTRACTOR shall provide, protect and maintain an adequate water supply for the use of all CONTRACTORS on the project during the period of construction, either by means of the permanent water supply line, or by the installation of a temporary water supply line. This water supply line shall be made available within fifteen (15) days after written request has been made to the Plumbing CONTRACTOR by any CONTRACTOR requiring this service, with copies to the C.O. If the source of water supply is a well, provisions covering the supply of water will include the installation of necessary power driven pumping facilities by the Plumbing CONTRACTOR, as well as protection of well from contamination. The water supply shall be tested periodically by the Plumbing CONTRACTOR and, if necessary, shall be chlorinated and filtered.
- B. The Plumbing CONTRACTOR will be required to install a valved temporary water supply connection at a point approximately ten feet (10') from the buildings and provide a meter, if required. The plumbing CONTRACTOR in conjunction with the local water authority shall determine the actual location of the point to which the water is brought. The plumbing CONTRACTOR shall install either the permanent service or the temporary water line from a point in the street to the valved location ten (10') feet from the building. At this point, each CONTRACTOR shall install, valve, maintain and protect such temporary water lines, as his/her will require performing the work under his/her CONTRACT.
- C. If there is a charge for water, said charges shall be paid by the General Construction CONTRACTOR. When temporary water lines are no longer required his/her shall be removed by the CONTRACTORS responsible for his/her installation and any part, or parts of the ground or building, disturbed or damaged, shall be restored to the original condition by the said CONTRACTORS. The Plumbing CONTRACTOR shall install his/her permanent water lines to the boiler room and heating equipment in sufficient time to be available for supplying water for testing and operation of the heating system when needed to supply heat on the project.
- D. If the Plumbing CONTRACTOR fails to carry out his responsibility in the supplying of the water, as set forth herein, he/she shall be held responsible for such failure and the C.O. shall have the right to take such action as he deems proper for the protection and conduct of the work and shall deduct the cost involved from the amount due the Plumbing CONTRACTOR.
- E. The Plumbing CONTRACTOR may use existing exterior hydrants and bibs on the state's property and will reimburse the State for the usage.
- F. The Plumbing CONTRACTOR shall maintain all services to existing buildings, without interruption, for the duration of construction.

30. TEMPORARY LIGHT AND POWER

- A. The CONTRACTOR shall extend electrical service to the building or buildings at locations approved by the C.O. Initial temporary service shall be three (3) phase or single phase depending upon which phase is closest to the project. This service shall be installed with fifteen (15) working days after written request has been made to the CONTRACTOR by any subcontractor requiring such service with copies to the C.O. When the CONTRACT calls for 3-phase permanent service, the CONTRACTOR shall install same within six (6) months to permit use by other subcontractors. Electrical characteristics shall be provided to meet all temporary light and power requirements as herein and hereinafter specified or as included under General Conditions. The Electrical subcontractor shall provide the necessary distributing facilities and meter.

- B. The CONTRACTOR shall extend the service into the building and shall provide receptacles and lighting as described herein and one (1) 5 H.P. 208 v, or 220 or 230 volts power outlet for each building and one (1) separate power outlet for each subcontractor for the proper conduct of his/her work. Power outlets shall be fed independently of the temporary lighting system. The extension of service shall include the necessary wiring of sufficient capacity to the location of the well for the operation of the well pump in the event a water well is the source of water supply for the project. Where services of a type other than herein mentioned is required, the subcontractor requiring same shall install and pay all costs of such special service. The sized and the incoming service and main distribution switch and panel shall be sized as any service by NEC requirements.
- C. The CONTRACTOR shall provide double sockets at a maximum of thirty feet (30') on centers in large areas. One socket shall contain a 150 watt lamp and the other socket shall be a grounding type to accept a receptacle plug for small single phase loads to be used for short periods of time. The CONTRACTOR shall provide double sockets of the type described above in all individual rooms, one double socket for each 500 sq. ft. or fraction thereof of room area (for example: a room 30' X 30' - 900 sq. ft. would require two double sockets).
- D. The CONTRACTOR shall provide all electrical service for operation of elevator equipment and/or handicap lifts.
- E. The CONTRACTOR shall pay for cost of all electric energy used on distribution lines installed by the Electrical subcontractor until the project is accepted by the C.O. The CONTRACTOR shall provide and pay for all maintenance, servicing, operation and supervision of the service and distribution facilities. His/her shall also maintain and service any electrical equipment installed by the CONTRACTOR and necessary for maintaining heat after same is required in the building.
- F. When the temporary electrical lines are no longer required his/her shall be removed by the CONTRACTOR and he shall restore to his/her original condition any part, or parts, of the ground or building, disturbed or damaged.
- G. The CONTRACTOR who fails to carry out his responsibility in the supplying of uninterrupted light and power, as set forth in this CONTRACT, shall be held responsible for such failure and the C.O. shall have the right to take such action as he deems proper for the protection and conduct of the work and shall deduct the costs involved from the amount due the CONTRACTOR at fault.
- H. There shall be no additional cost to the State or other Prime Contractors because of standby requirements due to conflict in the normal working hours of the various trades. The CONTRACTOR shall provide temporary light and power required to meet normal working hours and days of all trades. Refer to Article 9,
- I. The CONTRACTOR shall observe the requirements of the Federal Occupational Safety and Health Act of 1970 with regard to temporary light and power.
- J. The CONTRACTOR shall maintain all services to the existing buildings, without interruption, for the duration of construction, unless interruption is agreed to in writing in advance by the C.O.
- K. The CONTRACTOR shall provide power to the owner's construction trailer and one trailer for the CONTRACTOR. If the primes should have more than one trailer, his/her shall pay the additional costs. The CONTRACTOR for general construction shall pay the monthly consumption costs.

31. TEMPORARY HEAT AND AIR CONDITIONING

- A. Prior to the building being enclosed by walls and roofs, if the outside temperature shall fall below 40 degrees F., at any time during the day or night, and the work in progress requires heat for execution and protection, the respective CONTRACTOR(S) responsible for such phases of work shall furnish acceptable means to provide sufficient heat to maintain a temperature of 40 degrees F. for that portion of the work for which his/her are directly responsible.
- B. Heating of field office, storage spaces, concrete and masonry materials and working area heating required prior sufficient herein, shall be provided by CONTRACTOR(S) under respective specification headings affected.
- C. As soon as the building or major unit thereof, is generally enclosed by walls and roof, as determined by the C.O., the responsibility for supplying working area heat or air conditioning shall be by the CONTRACTOR and he/she shall furnish sufficient heat or air conditioning during the day or night. The CONTRACTOR shall furnish sufficient heat by the use and maintenance of LP gas heaters to maintain a temperature of 45 degrees Fahrenheit, within the enclosed area of the building at all times, and remove same when no longer required. The CONTRACTOR will be held responsible for freeze-ups for the duration of the sixty-(60) calendar day period following enclosure of the building. His/her shall remove soot smudges and other deposits from walls, ceilings, and all exposed surfaces, which are the result of heating equipment including the permanent heating system during the period of its use for supplying heat. His/her shall not do any finish work until the areas are properly cleaned. The CONTRACTOR shall provide or arrange, at his/her expense, supervision of the LP gas heaters at all times prior to start of the permanent heating CONTRACTOR'S obligation, which shall be sixty (60) calendar days after the acknowledged enclosure of the building or buildings. The CONTRACTOR shall furnish and pay for all fuel.
- D. All heating equipment shall be NBFU approved and connected to approved flues to the atmosphere. Gas cylinders within the building shall not exceed 100 lb. capacity, shall have Interstate Commerce Commission approval and shall be fitted with a permanent cap to protect the valve when not in use. Heaters shall be approved by a recognized testing laboratory and must be equipped with a positive shut-off safety valve. Cylinders and heaters shall stand at least six feet (6'- 0") apart and be connected with two (2) braid neoprene hoses that will withstand 250 psi test pressure.
- E. When cylinders and heaters are on the same floor, not more than one (1) cylinder shall feed 400-sq. ft. of heated floor space. If cylinders feed heaters installed on a floor above, the area of heated floor may be increased to 600 sq. ft. Storage of cylinders within the building will not be permitted at any time. Fire extinguishers shall be provided on each floor where heaters are used, and the area must be ventilated.
- F. The CONTRACTOR shall train at least two (2) dependable persons to supervise heating installation at construction site.
- G. The CONTRACTOR shall provide air conditioning by using the HVAC supplied by the Heating and Air Conditioning subcontractor. The building shall be maintained at a temperature of 10 degrees below the outside air temperature or low enough to protect heat from affecting any and all finishes or items of equipment. The cost of running the Air Conditioning equipment shall be born by the CONTRACTOR. Use of the equipment shall not constitute acceptance of the same by the C.O. nor shall it imply that any warrantee is in effect.
- H. Sixty (60) calendar days after the building, or major unit thereof, is (are) enclosed and the C.O. has determined that heat or air conditioning is required for the proper execution of the construction work, the permanent Heating subcontractor shall provide the heat and air conditioning. A building, or major unit thereof, shall be considered "enclosed" when (a) the exterior walls have been erected; (b) a temporary roof or permanent roof is installed and in watertight condition; (c) temporary or permanent doors hung and

window openings are closed with either permanent or temporary weathertight enclosures (cardboard, muslin and light canvas materials are not acceptable, however any impervious transparent material is acceptable). A major unit of building as referred to herein shall be: (1) an entire separate structure; (2) a full enclosed wing which shall have a floor area equal to at least 50 percent of the total floor area of the project; or (3) a section which shall have a floor area equal to at least 50 percent of the total floor area on the project. Regardless of whether the boiler room is within the confines of the major unit or not, it shall be enclosed and floor installed at the time the attention of the permanent heating subcontractor is directed to his obligations to supply heat. The boiler room floor area shall not be considered in determining the area comprising the major unit. The above sixty-(60) day period shall apply only to the enclosed portion of this building.

- I. When the building or a major unit, including the boiler room area, is enclosed as herein defined and appropriate notice given, it shall be the obligation of the C.O., or his/her representative, to acknowledge thereof at a weekly job conference, at the site, and to send written confirmation of such notice to all the CONTRACTOR. If the C.O. at the site concurs that the building or major unit is properly enclosed, then at the end of sixty (60) calendar days from the date of job conference at which such notice was given, the supply of heat and the responsibility for freeze-ups shall become the responsibility and obligation of the CONTRACTOR providing the permanent heating system. Confirmation of this responsibility and obligation shall be incorporated in the minutes of the weekly job conference as prepared by the C.O., if applicable, copies of which shall be sent to all subcontractors engaged on the project who shall give due attention to his/her obligations in the connection.
- J. The CONTRACTOR shall continue to provide acceptable means of heat until the obligation of the permanent Heating subcontractor to supply heat shall become effective as herein stated. If the permanent heating system is not acceptable to the C.O., for providing temporary heat, the CONTRACTOR shall continue to provide temporary heat as described above, as ordered by the C.O. and at the expense of the CONTRACTOR responsible for installing the permanent heating system.
- K. At the termination of the sixty (60) day interval after notice has been given that the building, or major unit, is enclosed, the permanent Heating subcontractor shall operate the permanent heating system, if its installation has been completed to the extent necessary to make its use possible. The permanent Heating subcontractor shall provide such heat to a minimum temperature of 45 degrees F., or to such higher temperature not exceeding 75 degrees F. as may be directed by the C.O. for the proper conduct and protection of the work until such time as his/her work is completed and accepted and is relieved of this requirement by the C.O., in writing. Should the permanent Heating subcontractor fail to meet his/her obligation then the C.O. at his discretion, will take any action his/her deem necessary to have the heating system operated and all costs involved shall be deducted from any monies due the permanent Heating subcontractor. The permanent Heating subcontractor shall pay for and be responsible for the maintenance, operation and supervision of the heating system throughout the period that the heat is needed and until final acceptance by the C.O. of the work under his/her CONTRACT regardless of the CONTRACT completion date.
- L. When the heating system provided by the permanent Heating subcontractor is the source of the heat, the CONTRACTOR shall be responsible for paying for all water, electricity, and fuel required for the operation of the permanent heating system, except fuel during the test period as required by the C.O. The permanent Heating subcontractor shall arrange, at his/her own cost, with the Plumbing and Electrical Contractors for making such temporary connections as required for the operation of the heating system. When the heating system provided by the permanent Heating subcontractor is designed for tie-in to existing steam lines for source of heat, the State will provide steam for temporary heat through the project permanent heating system at no additional cost to the permanent Heating subcontractor. The permanent Heating subcontractor shall arrange, at his/her own cost, for connections as specified under paragraph above.
- M. Where electricians are required to supervise and maintain electrical equipment required for the provision of heat, the payment for the services of the supervisor or maintenance personnel shall be the responsibility of the CONTRACTOR for the operation of the heating system in supplying temporary heat, it shall be the responsibility of the CONTRACTOR to provide a motor driven generator unit of sufficient capacity, voltage

and phasing to provide uninterrupted service for the operation of the heating system. The CONTRACTOR shall pay the cost of all fuel consumed in the operation of the generating unit for supplying temporary heat. The CONTRACTOR shall provide uninterrupted electrical service to the heating, water and pumping equipment.

- N. Valves, traps and other parts of the heating system which are permanently installed by the CONTRACTOR and used for supplying heat during the construction period need not be replaced, providing the system was in acceptable condition prior to its use, and further, that the system is properly cleaned and adjusted to operate after the permanent system is in use and to the satisfaction of the C.O.
- O. If plastering or parging or finishing of any surfaces is necessary to enable the CONTRACTOR to install the heating system in a manner to permit its use for supplying heat during the construction period, the finishing, plastering and parging of such surfaces shall be done by the CONTRACTOR sufficiently in advance of the work of the CONTRACTOR so as not to delay the installation of the permanent system. In the installation of permanent piping and heating units in a particular area the permanent
- P. The CONTRACTOR shall install temporary piping and pay the heating units and cost of such temporary installation.
- Q. If additional heat is required beyond that specified therein, the CONTRACTOR shall pay for additional costs at no expense to the State.
- R. Any other equipment used for the provision of temporary heat (fans, pumps, etc.) which shall be part of the permanent heating system shall be fully cleaned, refurbished and have filters replaced prior to final acceptance of the C.O.

32. TEMPORARY ENCLOSURES, GLASS BREAKAGE AND CLEANING (IF REQUIRED)

- A. Whenever necessary, in order to maintain proper temperatures for the prosecution of the work, or for the protection thereof, the General CONTRACTOR shall furnish and maintain temporary enclosures for all openings in exterior walls that are not enclosed with finishing materials. Window sash may be installed and glazed. Temporary wood doors shall be provided at door openings.
- B. The General CONTRACTOR shall be responsible for all breakage of glass after same has been installed, no matter by whom or what caused, and shall replace all broken, scratched or otherwise damaged glass before the completion and acceptance of the work.
- C. The General CONTRACTOR shall wash all glass on both sides at completion, or when directed, removing all paint spots, stains, plaster, etc.
- D. The General CONTRACTOR shall provide and maintain necessary temporary dustproof partitions around areas of work in any existing building.
- E. Chemical fire extinguishers shall be provided by the CONTRACTOR for general construction and meet all O.S.H.A. requirements.

33. HOISTING FACILITIES

The CONTRACTOR shall be responsible for hoisting and distributing his/her own material and equipment throughout the project.

34. FIRE PROTECTION

- A. The CONTRACTOR shall perform his/her work on or about the premises in a careful manner with full consideration to fire protection as required by the State DCA Fire Official, National Fire Protection Association Code, U.C.C. Codes, and The National Board of Fire Underwriters having jurisdiction. Fire resistant materials shall be used for temporary enclosures.
- B. Chemical extinguishers approved by the C.O. shall be provided by the CONTRACTOR during the progress of the work where and as required by the State Fire Marshall, the Local Fire Department, and the National Board of fire Underwriters, except in storage sheds, warehouses, CONTRACTOR'S Offices, workmen's temporary. Chemical extinguisher shall also meet all O.S.H.A. requirements.
- C. The CONTRACTOR shall maintain an active program of fire prevention to keep workman fire conscious during the entire life of the CONTRACT. His/her shall designate one member of his/her organization to execute and coordinate fire control measures of his/her own organization, that of all Subcontracting under his/her jurisdiction and that of all other subcontractors at the site. His/her shall report to the C.O. any lack of cooperation or refusal to participate on the part of the CONTRACTOR or Subcontractor with regard to the fire prevention program.
- D. Each Subcontractor shall cooperate with the CONTRACTOR in carrying out the above program.
- E. The CONTRACTOR shall be responsible for periodic cleaning up of the building and premises to eliminate fire hazards, and his/her shall remove all of his/her refuse from the project site. Should a dispute arise relative to responsibility, the decision of the C.O. shall be final and binding. If a CONTRACTOR fails to remove debris from the site within three (3) working days after his/her have been given written notice to do so by the C.O., the C.O. will have the debris removed by others and the cost backcharged to the CONTRACTOR(s) responsible.
- F. Storage of flammable material will not be permitted in the new structure or existing buildings unless written permission is obtained from the C.O. Storage of all such materials shall be the interested CONTRACTOR'S responsibility.
- G. On-site open burning of rubbish, garbage, trade waste, leaves or plant life is strictly prohibited in accordance with New Jersey Air Pollution Control Code, effective October 11, 1971, as promulgated by New Jersey Department of Environmental Protection.

35. PROTECTION - PUMPING - WEATHER CONDITIONS

- A. The CONTRACTOR shall protect all trees, shrubs, lawns and all landscape work from damage and shall provide such guards and covering as necessary. All damaged items shall be repaired or replaced at the CONTRACTOR'S expense to the satisfaction of the C.O. Special precaution shall be taken to protect the floors from damage at all times.
- B. It shall be the responsibility of the CONTRACTOR at all times to protect the building excavations, trenches up to 10 feet from the building and the building from water damage, including damage by rainwater, ground water, backing up of drains, downspouts or sewers. The CONTRACTOR shall construct and maintain all necessary drainage and do all pumping required to keep the structure free from water and shall perform any pumping necessary for the full and proper execution of the construction work and protection of the building including all equipment installed therein.
- C. Beyond a point ten feet from the building, it shall be the responsibility of the CONTRACTOR installing underground pipes, conduits, cables, or heat transmission lines to protect the trenches by shoring or other

methods and perform all pumping required to dispose of the surface and subsurface water to permit the satisfactory performance of the work. The CONTRACTOR shall provide his/her own pumping equipment of adequate capacity and shall be responsible for all fuel, cost of operators and supervision.

- D. The CONTRACTOR shall remove all snow and ice as may be required for the proper protection and prosecution of his/her CONTRACT and to provide access to the building for the other subcontractors.
- E. In the event of temporary suspension of work, or during inclement weather, or whenever the C.O. shall direct, the CONTRACTOR shall cause his/her subcontractors to protect carefully his/her work and materials against damage from the weather. If, in the opinion of the C.O., any work or materials shall have been damaged by reason of failure on the part of the CONTRACTOR or any of his/her Subcontractors so to protect his/her work, such materials shall be removed and replaced at the expense of the CONTRACTOR.
- F. Unless otherwise shown in the CONTRACT documents, the CONTRACTOR shall provide minimum protection of the construction area by means of enclosure by four foot high snow fence.

EXCAVATION, TRENCHING AND BACKFILL (ALL TRADES):

- (1). The CONTRACTOR shall do all excavation of earth that may be required for the installation of his/her work. The CONTRACTOR and subcontractors shall also do all the necessary backfilling, rough grading, removal of surplus earth of other materials, repaving or replacing of hard surfaced areas which he disturbs. Remove all water that may accumulate in any excavation necessary for this work and furnish sheet piling where required. They shall resod or reseed grass area he disturbs.
- (2). The CONTRACTOR and/or his/her subcontractors shall be fully responsible for any accident that may occur to any person or property during the hours of the work and shall fully defend, protect and hold the owner harmless from all claims.
- (3). The CONTRACTOR and/or his/her subcontractors shall furnish all plant, labor, equipment, appliances, and materials and perform all operations in connection with the excavation, trenching and backfilling for all piping requiring trenching as indicated on the drawings and which is installed under this specification.
- (4). Where streets, roads or any other property other than that of the owner must be disturbed it shall be the responsibility of this CONTRACTOR to make all necessary arrangements, obtain all permits and pay required fees.
- (5) EXCAVATION: The CONTRACTOR and their subcontractors shall perform all excavation of every description and of whatever substances encountered, to the proper depth as required for his work or as otherwise specified. During excavation, materials suitable for backfilling shall be piled in an orderly manner a sufficient distance from the banks of the trench to avoid overloading and prevent slides or cave-ins. All excavated materials not required or suitable for backfill shall be removed and wasted as indicated on the drawings or as directed by the C.O. Such grading shall be done as may be necessary to prevent surface water from flowing into trenches or other excavation and any water accumulating therein shall be removed by pumping or other approved methods. Such sheeting and shoring shall be done as may be necessary for the protection of the work and for the safety of personnel. Unless otherwise indicated, excavation shall be by open-cut except that short section of a trench may be tunneled; if, in the opinion of the C.O., the pipe can be safely and properly installed and backfill can be properly tamped in such section. Earth excavation shall comprise all materials not classified as rock excavation, and shall include clay, silt, sand, muck, gravel, hard pan, loose shale, loose stone in masses and boulders measuring less than that defined as rock.
- (6). TRENCH EXCAVATION: Trenches shall be of necessary width for the proper laying of the pipe, and the banks shall be accurately graded and machine tamped to provide uniform bearing and support for each section of the pipe on undisturbed soil at every point along its entire length, except for the portions of the

pipe sections where it is necessary to excavate the bell holes and for the proper sealing of pipe joints. Bell holes and depression for joints shall be dug after the trench bottom has been graded, and in order that the pipe rest upon a prepared bottom for as nearly its full length as practicable, bell holes and depressions shall be only such length, depth, and width as required for properly making the particular type of joint. Except where rock is encountered care shall be taken not to excavate below the depth indicated. Over depths in the rock excavation and unauthorized overdepths shall be backfilled with loose, granular, moist earth, and thoroughly machine tamped. Whenever wet or otherwise unstable soil that is incapable of properly supporting the pipe, as determined by the Contracting Officer, is encountered in the bottom of the trench, such soil shall be removed to the depth required and the trench backfilled to the proper grade with crushed stone, coarse sand, fine gravel, or other suitable material.

- (7) PROTECTION OF EXISTING UTILITIES: Existing utilities shall be protected from damage during the excavation and backfilling of trenches and, if damaged, shall be repaired by the CONTRACTOR at his/her expense.
- (8). BACKFILLING: The trenches shall not be backfilled until all required pressure tests are performed and until the piping installed conforms to the requirements specified in the various sections of the specifications. The trenches shall be carefully backfilled with clay, sand and gravel, soft shale, or other approved materials, free from large clogs of earth or stones, deposited in six inch (6") layers and thoroughly and carefully tamped until the pipe has a cover of not less than one foot (1') for water and gas piping and two feet (2') for sanitary and storm sewers and all others. Where piping is specially coated for protection against corrosion, care shall be taken not to damage the coating. The remainder of the backfill materials shall then be laid into the trench in one foot (1') layers and tamped. Setting the backfill with water will be permitted and will be a requirement when so directed by the C.O. Any trenches improperly backfilled, or where settlement occurs, shall be reopened to the depth with the surface restored to the required grade and compaction, mounded over, and smoothed off. Open trenches across roadways, or other areas to be paved shall be backfilled in six inch (6") layers, and each layer shall be moistened and compacted to a density at least equal to that of the surrounding earth filled trench with adjoining earth to provide the required bearing value, so the paving of the area can proceed immediately after backfilling is completed. Along all the mounding over the trenches left in a uniform and neat condition to the satisfaction of the C.O.
- (9). TESTS FOR DISPLACEMENT OF SEWERS: Storm and sanitary sewers will be checked by the C.O. to determine whether any displacement of the pipe has occurred after the trench has been backfilled to two feet (2') above the pipe and tamped as specified. The tests will be as follows: A light will be flashed between manholes or between sections of pipe by means of flashlight to determine if the interior of the pipe line shows poor alignment, displaced pipe, or other defects. The CONTRACTOR at his expense shall remedy the defects designated by the C.O.

36. SAMPLES

The CONTRACTOR shall furnish for approval all samples as directed. The work shall be in accordance with approved samples. Such samples shall be submitted promptly to the C.O. at the beginning of the work, so as to give the C.O. ample time to examine them. Any list of samples prepared by the CONTRACTOR is for the C.O.'s convenience only, and shall not be construed as limiting the number of samples which the CONTRACTOR shall furnish.

37. TESTING OF EQUIPMENT

- A. When mechanical, electrical and/or other equipment is installed, it shall be the responsibility of the CONTRACTOR to operate it for a satisfactory period of time as required by the C.O. for proper testing of

- B. the equipment and instructing the State's operating personnel. Fuel, power and any other items and/or services required for proper testing of equipment and for the period of instructing personnel shall be provided at the expense of the CONTRACTOR.
- C. Tests shall be conducted in the presence of the State inspector. Test results shall be submitted and approved by the C.O. prior to acceptance of the installation.
- D. All subcontractors installing any equipment shall thoroughly train the State's operating personnel in the operation, adjustment, and maintenance of all equipment.
- E. DMAVA shall require witnessing of all certification and/or testing of major pieces of equipment. Notice of such testing shall be given to DMAVA five (5) days in advance of all tests.

38. CONCRETE AND OTHER STRUCTURAL TESTING

- A. Concrete testing shall be performed by a testing company selected by the CONTRACTOR, approved by the C.O., and paid for by the CONTRACTOR. The testing laboratory will perform the following work:
 - (1) Design mixes for controlled concrete.
 - (2) Take and test cylinders of concrete as poured. Four (4) test specimens will be made for each 50 cubic yards of concrete placed or not less than four (4) cylinders for each day's pour.
 - (3) Plant inspection at batching plant.
 - (4) Field inspection of all concrete when being poured.
 - (5) Make slump tests in the field in accordance with ATSM requirements.
 - (6) Submit reports to the State and the Engineer.
- B. A testing company selected by the CONTRACTOR, approved by the C.O. and paid for by the CONTRACTOR shall perform other structural testing and inspection, when determined as necessary by the C.O.
- C. Each CONTRACTOR shall cooperate fully with the testing company and supply materials for testing as required.
- D. Required testing shall include, but not be limited to, soils, concrete, steel and fireproofing.

39. OPENING-CHANNELS-CUTTING-ETC.

- A. The CONTRACTOR shall be responsible for furnishing and setting of sleeves, built-in items, anchors, inserts, etc. for his/her work. The CONTRACTOR shall build these items into the construction.
- B. The CONTRACTOR shall build recesses, channels, chases, openings and flues and leave holes where shown on drawings or where directed for steam, water or other piping, electrical conduits, switch boxes, panelboards, flues and ducts, or any other feature of the heating and ventilation work. All subcontractors requiring such recesses, channels, chases, openings, etc. shall furnish to the CONTRACTOR through the Project Manager complete detail drawings for all chases and openings required in connection with the work. Such information shall be furnished in complete form and in ample time to allow the construction work to

proceed without interruption or delay. At least three (3) copies of such drawings shall be furnished to the C.O.

- C. The CONTRACTOR shall close, build in and finish around or over all openings, chases, channels, pockets, etc. after installation has been completed.
- D. In the event that any CONTRACTOR fails to furnish the information as above required in time, said CONTRACTOR shall at his/her own expense do all cutting, rebuilding and finishing and shall employ the CONTRACTOR for such work.
- E. Positive instructions in writing shall be obtained from the C.O. before cutting or boring any floor beams, floor constructions or supporting members.

40. CUTTING-PATCHING-DIGGING

- A. The CONTRACTOR shall do all cutting, fitting or adjusting of his/her work that may be required to make its several parts come together properly, and fit it to receive or be received by work of other subcontractors shown upon, or reasonably implied by the CONTRACT documents for the completed structure and his/her shall make good after them, as the C.O. may direct.
- B. Any cost caused by defective work or failure to coordinate shall be borne by the CONTRACTOR responsible thereof.
- C. The CONTRACTOR shall not endanger the work of others by cutting, digging or otherwise altering the work of any other CONTRACTOR save with the consent of the C.O.
- D. The General CONTRACTOR shall have the final responsibility for the following: clean-up of premises and patching of all work. If the cleanup is not accomplished within twenty-four (24) hours of written notice from C.O. or General CONTRACTOR, DMAVA shall have the option to withhold final payment in accordance with Article 19 (PAYMENT WITHHELD) of this document.

41. JOB MEETING

- A. The CONTRACTOR and any subcontractors, material man or vendor whose presence is necessary, shall attend job meetings when called by the A/E, the Construction Manager or the C.O. for the purpose of discussing the execution of the work, unless excused in writing by the A/E, the Construction Manager or the C.O.
- B. Meetings will be held at least once every week at the time and place designated by the C.O. All decisions, instructions and interpretations given by the C.O. at these meetings shall be binding and conclusive on the CONTRACTOR. The proceedings of these meetings will be recorded by the C.O. or his representative; and each CONTRACTOR will be furnished a reasonable number of copies for his use and for distribution to the various subcontractors, materialmen and vendors involved.
- C. The CONTRACTOR for general construction shall attend the Quality Review Board meetings which when applicable, shall be held a minimum of once a month.

42. PHOTOGRAPHS

- A. With each monthly application for payment, until the exterior of the building is completed, the General CONTRACTOR shall submit progress photographs of the building in duplicate, giving two (2) views of each

building as selected by the A/E, or the Construction Manager and/or C.O., taken from the same points each month.

- B. The photographs shall be 8" x 10" in color, and the photographs and negatives shall bear the date of the exposure, the name of the project, the CONTRACTOR and the CO..
- C. The photographs are to be submitted monthly at the project meetings. The photographic record shall include but not be limited to:
 - (1) All new structures on site.
 - (2) All site work.
 - (3) Landscaping.
 - (4) All representative interior space.
 - (5) Work that shall be enclosed.

43. WORK FURNISHED BY OTHER

- A. The State may, and reserves the rights to, enter upon the premises at any and all times during the progress of the work, or cause others to do so, for the purpose of installing any apparatus or carrying on any construction not included in this specification. The CONTRACTOR shall not commit or permit any act which will interfere with the performance of work by the CONTRACTOR or by State employees.
- B. The CONTRACTOR shall examine all work or materials not included in his/her CONTRACT, the installation of which will affect the work in his/her CONTRACT, and should the same be imperfect, incorrect or insecure, his/her shall notify the C.O. immediately in order that the same may be rectified.

44. USE OF PREMISES AND REMOVAL OF DEBRIS

- A. Each CONTRACTOR expressly undertakes at his/her own expense:
 - 1. To take every precaution against injuries to persons or damage to property;
 - 2. To store his apparatus, materials, supplies, and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of his/her work or the work of any other persons;
 - 3. To place upon the work or any part thereof only such loads as are consistent with the safety of that portion of the work.
 - 4. To clean up frequently all refuse, rubbish, scrap materials, and debris caused by his/her operations, to the end that at all times the work shall present a neat, orderly and workmanlike appearance.
 - 5. To remove all surplus material, false work, temporary structures, including foundations thereof, plant of any description, and debris of every nature resulting from his operations, and to put the site in a neat, orderly condition before final payment;
 - 6. In case of dispute, the State may remove the rubbish and charge the cost to the several CONTRACTORS as the C.O. shall determined to be just.
 - 7. All materials of any kind or character belonging to the CONTRACTOR which shall remain upon the premises where the work is being performed after the expiration of sixty (60) calendar days from the date of certificate of final acceptance issued by the State of the CONTRACTOR shall become absolutely the property of the State, subject to be used and disposed of by the State as the State may deem proper.

8. The CONTRACTOR shall provide dumpsters for use by all subcontractors. The CONTRACTOR shall place his/her debris in the dumpster(s).
9. If medical waste or hazardous materials are discovered, then the CONTRACTOR shall notify the C.O. immediately. The subcontractors' responsibility for removal of this debris is not eliminated because it is classified as hazardous.
- C. The CONTRACTOR shall have the final responsibility for clean-up and/or patching of all work and the removal of debris. Should his/her fail to clean up or patch any portion of the site, then the C.O. will proceed to make the necessary repairs and clean up the area and charge the CONTRACTOR for the amount of work performed.

45. FEDERAL EXCISE TAXES AND STATE SALES TAX

- A. Under Chapter 32 of the Internal Revenue Code an exemption covering this exemption is on file with the Director of Purchase and Property and is Number A- 257217. Excise taxes are not to be included in the proposal.
- B. CONTRACTORS are exempt from sales tax on State work.

46. PATENTS

- A. The CONTRACTOR shall hold and save the State and its officers, agents, servants, and employees harmless from liability of any nature or kind, including cost and expenses for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the CONTRACT, including its use by the State, unless otherwise specifically stipulated in the CONTRACT Documents.
- B. License or Royalty Fees: License and/or Royalty Fees for the use of a process, which is authorized by the State, must be reasonable. Payment of such fees shall be made directly to the holder of the patent and his/her authorized licensee by the State. Such payments shall not be made through the CONTRACTOR.
- C. If the CONTRACTOR uses any design, device or materials covered by letters, patent or copyright, his/her shall provide for such use by suitable agreement with the State of such patented or copyrighted design, device or material. It is mutually agreed and understood that, without exception, the CONTRACT prices shall include all royalties, or costs arising from the use of such design, device or materials, in any way involved in the work. The CONTRACTOR and/or his/her Sureties shall indemnify and save harmless the owner of the project from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyright in connection with work agreed to be performed under this CONTRACT, and shall indemnify the State for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

47. SUBSURFACE CONDITIONS FOUND DIFFERENT

- A. Should the CONTRACTOR encounter subsurface and/or latent conditions at the site materially differing from those shown on the plans or indicated in the specifications, his/her shall immediately give written notice to the C.O. of such conditions before his/her are disturbed.

- B. The C.O. will thereupon promptly investigate the conditions, and if his/her find that his/her materially differ from those shown on the plans or indicated in the specifications, his/her will at once make such changes in the plans and/or specifications as his/her may find necessary. Any increase or decrease of cost resulting from such changes may, in the sole discretion of the C.O., be adjusted in the manner provided in Articles 24 and 25 of the General Conditions.

48. UNCLASSIFIED EXCAVATION

- A. All excavation work under all CONTRACT's shall be considered unclassified excavation. Unclassified excavation shall consist of the removal of earth, rock, abandoned utilities, foundations and all other materials encountered of whatever nature.
- B. When explosives are used, work shall be executed by experienced powdermen who are licensed, or otherwise authorized to use explosives. Explosives shall be stored, handled and used in accordance with
- C. Local regulations and the "Manual of Accident Prevention in Construction" of the Associated General Contractors of America, Inc. Any damage to foundations or other work caused by the use of explosives shall be corrected at the CONTRACTOR's expense.

49. SOIL BORINGS

Where data pertaining to test pits, test borings, or any like information orally, by drawings or in writing, are given, his/her are for general information only and shall not relieve the CONTRACTOR, bidding on this work, from the responsibility for making such investigations as may be necessary to insure that his/her bid is based on actual conditions.

50. PAY LIMITS FOR ADDITIONS OR DEDUCTIONS

- A. The method of measurement and establishment of pay limits for additions or deductions for excavation shall be as follows:
- (1) BASEMENT EXCAVATIONS: Pay limit for excavation shall be in accordance with cross sections limited by vertical parallel planes extending twenty-four inches (24") outside of foundation walls shown on CONTRACT drawings, and horizontal plane along bottom of basement concrete slab or footing.
- (2) ALL PIPELINES AND UNCASED UTILITIES: Pay limit for trench excavation shall be limited to width of thirty-six inches (36") or the largest diameter of pipe barrel plus twenty-four inches (24"), whichever is greatest, and depth at bottom of pipe barrel. When rock is encountered, CONTRACTOR shall excavate to six inches (6") below bottom of pipe barrel. A compacted granular fill bed for the pipe shall be provided by CONTRACTOR. No additional payment will be made for this additional six inches (6") of granular fill.
- (3) ENCASED ELECTRICAL CONDUIT, STEAM TRANSMISSION LINES, UNFORMED FOUNDATION FOOTINGS: Width and depth of trench shall be limited to same width and elevations of structure shown on CONTRACT drawings.
- (4) Where unsuitable foundation material is encountered, the CONTRACTOR shall excavate to elevations as directed by the C.O. Unit prices for additional excavation and replacement with approved compacted granular fill, stated in the proposal form, shall be used as a basis for additional payment by the State.

51. QUANTITIES OF ESTIMATE

- A. Wherever the estimated quantities of work to be done and materials to be furnished under the CONTRACT are shown in any of the documents including the proposal, his/her are given for use in comparing bids and the right is especially reserved except as herein otherwise specifically limited, to increase or decrease as may be deemed reasonably necessary or desirable by the State to complete the work contemplated by this CONTRACT, and such increase or decrease shall in no way vitiate this CONTRACT, nor shall any such increase or decrease give cause for claims or liability for damages.

52. LANDS AND RIGHTS-OF-WAY

Prior to the start of construction, the State shall obtain all lands and rights-of-way necessary for the carrying out and completion of work to be performed under this CONTRACT.

53. CUT OVERS

All cutovers of existing mechanical services shall be done at a time convenient to the C.O. so as not to interfere with facility operations (water line cut-line by wet tap will be permissible during regular working hours).

54. BUY AMERICAN ACT (1966 OCT)

- A. AGREEMENT: In accordance with the Buy American Act (41 U.S.C. 10a-10d), the CONTRACTOR agrees that only domestic construction material will be used (by the CONTRACTOR, subcontractors, materialmen, and suppliers) in the performance of this CONTRACT, except for nondomestic construction material listed in the "Nondomestic Construction Materials" Clause, if any, of this CONTRACT.
- B. DOMESTIC CONSTRUCTION MATERIAL: "Construction material" means any article, material, or supply brought to the construction site for incorporation in the building or work. An unmanufactured construction material is a "domestic construction material" if it has been mined or produced in the United States. A manufactured construction material is a "domestic construction material" if it has been manufactured in the United States and if the cost of its components which have been mined, produced, or manufactured in the United States exceeds 50% of the cost of all its components. "Component" means any article, material, or supply directly incorporated in a construction material.
- C. DOMESTIC COMPONENT: A component shall be considered to have been "mined, produced, or manufactured in the United States" (regardless of its source in fact) if the article, material, or supply in which it is incorporated was manufactured in the United States and the component is of a class or kind determined by the Government to be not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities and of a satisfactory quality.

55. WATCHMEN

- A. The CONTRACTOR may provide watchmen service throughout the period of construction to adequately protect the work, stored materials and temporary structures located on the premises. Additionally, watchmen shall be used to prevent unauthorized persons from entering upon the construction site.
- B. Watchman may be employed to cover a twenty-four hour, seven day per week schedule. It may be necessary to employ more than one watchman because of the size of the facility or project. The watchman must use a designated roving patrol as established by the General CONTRACTOR. His/her shall maintain a log of his/her activities and unusual events.

- C. It shall be the responsibility of all primes to provide the watchman with a list of names of individuals who shall be working overtime and weekends prior to said time.
- D. The watchman shall be provided an Standard Operating Procedures Manual as prepared by the General CONTRACTOR and at a minimum the SOP shall include:
 - (1) Emergency telephone numbers for Police, Fire and ambulance
 - (2) CONTRACTOR emergency telephone numbers
 - (3) NJDMAVA emergency personnel and telephone numbers
 - (4) Procedures indicating action to be taken upon the discovery of theft.
- E. Employment of a Watchman shall commence on the first day that equipment and material are stored on site.
- F. The CONTRACTOR and their subcontractors shall adequately secure and protect his own tools, equipment, materials and supplies.

THE FOLLOWING ARTICLES, 56 to 67 INCLUSIVE, ARE APPLICABLE TO FEDERALLY FUNDED PROJECTS ONLY.

56. INTEREST OF MEMBER OF OR DELEGATE TO CONGRESS

No member of or Delegate to Congress shall be admitted to any share or part of this CONTRACT or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this CONTRACT if made with a corporation for its general benefit.

57. OTHER PROHIBITED INTERESTS

- A. No official of the Owner who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept or approve, or to take part in negotiating, making, accepting, or approving any architectural, engineering, inspection of construction, or material supply CONTRACT or any Subcontract in connection with the construction of the project, shall become directly or indirectly interested personally in this CONTRACT or in any part hereof.
- B. No officer, employee, architect, attorney, engineer, or inspector of or for the State who is authorized in such capacity and on behalf of the State to exercise any legislative, executive, supervisory, or other similar function in connection with the construction of the project, shall become directly or indirectly interested personally in this CONTRACT or in any part thereof, any material supply CONTRACT, subcontract, insurance CONTRACT, or other CONTRACT pertaining to the project.

58. WITHHOLDING OF FUNDS (1977 DEC)

- A. The C. O. may withhold or cause to be withheld from the State prime CONTRACTOR so much of the accrued payments or advances as may be considered necessary (i) to pay laborers and mechanics, including apprentices, trainees, watchmen, and guards, employed by the CONTRACTOR or any subcontractor on the work the full amount of wages required by the CONTRACT, and (ii) to satisfy any liability of the CONTRACTOR and any subcontractor for liquidated damages under paragraph (B) of the Clause entitled CONTRACT WORK HOURS AND SAFETY STANDARDS ACT OVERTIME COMPENSATION.
- B. If the CONTRACTOR or any subcontractor fails to pay any laborer, mechanic, apprentice, trainee, watchman, or guard employed or working on the site of the work, all or part of the wages required by the

CONTRACT, the C.O. may, after written notice to the State prime CONTRACTOR, take such action as may be necessary to cause suspension of any further payments of advances until such violations have ceased.

59. PAYROLLS AND BASIC RECORDS (1977 DEC)

- A. The CONTRACTOR shall maintain payrolls and basic records relating thereto during the course of the work and shall preserve them for a period of three (3) years thereafter for all laborers and mechanics, including apprentices, trainees, watchmen, and guards, working at the site of the work. Such records shall contain the name and address of each such employee, his/her correct classification, rate of pay (including rates of contributions for, or costs assumed to provide, fringe benefits), daily and weekly number of hours worked, deductions made and actual wages paid. (NOTE: Watchmen and guards are reflected on payroll records for Contract Work Hours and Safety Standards Act purposes only.) Whenever the CONTRACTOR has obtained approval from the Secretary of Labor as provided in paragraph (C) of the Clause entitled DAVIS-BACON ACT, he shall maintain records which show the commitment, its approval, written
- B. Communication of the plan or program to the laborers or mechanics affected, and the costs anticipated or incurred under the plan or program.
- C. The CONTRACTOR shall submit weekly a copy of all payrolls to the CO.. The State prime CONTRACTOR shall be responsible for the submission of copies of payrolls of all subcontractors. The copy shall be accompanied by a statement signed by the CONTRACTOR indicating that the payrolls are correct and complete, that the wage rates contained therein are not less than those determined by the Secretary of Labor, and that the classifications set forth for each laborer or mechanic, including apprentices and trainees, conform with the work he performed. Weekly submission of the "Statement of Compliance" required under this CONTRACT and the Copeland Regulations of the Secretary of Labor (29 CFR, Part 3) shall satisfy the requirement for submission of the above statement. The CONTRACTOR shall submit also a copy of any approval by the Secretary of Labor with respect to fringe benefits which is required by paragraph (C) of the Clause entitled DAVIS-BACON ACT.
- D. The CONTRACTOR shall make the records required under this Clause available for inspection by authorized representatives of the C.O. and the Department of Labor, and shall permit such representatives to interview employees during working hours on the job.

60. APPRENTICES AND TRAINEES (1977 DEC)

- A. Apprentices will be permitted to work at less than the predetermined rate for the work his/her performed when his/her are employed and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his first ninety (90) days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen in any craft classification employed on this CONTRACT shall not be greater than the ratio permitted to the CONTRACTOR as to his/her entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not a trainee as defined in paragraph (B) of this Clause or is not registered or otherwise employed as stated above, shall be paid the wage rate determined by the Secretary of Labor for the classification of work he actually performed. The CONTRACTOR or subcontractor shall furnish to the Contracting Officer written evidence of the registration of his program and apprentices as well as the appropriate ratios and wage rates (expressed in percentages of the journeyman hourly rates), for the area of construction prior to using apprentices on the CONTRACT work. The wage rate paid apprentices shall be not less than the appropriate percentage of the journeyman's rate contained in the applicable wage determination.

- B. Trainees will be permitted to work at less than the predetermined rate for the work performed when his/her are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification, by the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training. The ratio of trainees to the journeyman on this CONTRACT shall not be greater than permitted under the plan approved by the Bureau of Apprenticeship and Training. Every trainee must be paid at not less than the rate specified in the approved program for his level of progress. Any employee listed on the payroll at a trainee rate who is not registered and not participating in a training plan approved by the Bureau of Apprenticeship and Training shall be paid not less than the wage rate determined by the Secretary of Labor for the classification of work he actually performed. The CONTRACTOR or subcontractor shall furnish the C.O. written evidence of the certification of his program, the registration of the trainee, and the ratios and wage rates prescribed in that program. In the event the Bureau of Apprenticeship and Training withdraws the approval of a training program, the CONTRACTOR shall no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- C. The utilization of apprentices, trainees, and journeymen under this Clause shall be in conformity with the equal employment opportunity requirements of this CONTRACT.

61. COPELAND ("ANTI-KICKBACK") ACT-NONREBATE OF WAGES

The regulations of the Secretary of Labor applicable to contractors and subcontractors (29 CFR, Part 3) made pursuant to the Copeland Act, as amended (40 U.S.C. 276c) and to side in the enforcement of the Anti-Kickback Act (18 U.S.C. 874) are made a part of this CONTRACT by reference. The CONTRACTOR will comply with these regulations and any amendments or modifications thereof and the prime CONTRACTOR will be responsible for the submission of affidavits required of subcontractors thereunder; the foregoing shall apply except as the Secretary of Labor may specifically provide for reasonable limitations, variations, tolerances and exemptions.

62. CONTRACT TERMINATION: DEBARMENT

- A. A breach of Articles 67 through 78 as well as a breach of any other material provisions of this contract may be grounds for termination of the CONTRACT and for debarment as provided in 29 CFR. 5.6.
- B. Title 29 of Code of Federal Regulations, part 5.6 as printed in the Federal Register of January 4, 1964 may be obtained from General Services Administration, Washington, D.C.

63. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT-OVERTIME COMPENSATION (40 U.S.C. 327-333) (1977 DEC)

- A. This Contract is subject to the Contract Work Hours and Safety Standards Act and to the applicable rules, regulations, and interpretations of the Secretary of Labor.
- B. The CONTRACTOR shall not require or permit any laborer or mechanic, including apprentices, trainees, watchmen, and guards in any workweek in which he is employed on any work site under this CONTRACT to work in excess of eight (8) hours in any calendar day or in excess of forty (40) hours in such workweek on work subject to the provisions of the CONTRACT Work Hours and Safety Standards Act unless such laborer or mechanic, including apprentices, trainees, watchmen, and guards, receives compensation at a rate not less than one and one-half times his basic rate or pay for all such hours worked in excess of eight (8) hours in any calendar day or in excess of forty (40) hours in such workweek, whichever is the greater number of overtime hours. The "basic rate of pay," as used in this Clause, shall be the amount paid per hour, exclusive of the CONTRACTOR'S contribution or cost for fringe benefits and any cash payment made in lieu of providing fringe benefits, or the basic hourly rate contained in the wage determination, whichever is greater.

- C. In the event of any violation of the provisions of paragraph (A), the CONTRACTOR shall be liable to any affected employee for any amount due, and to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including an apprentice, trainee, watchman, or guard, employed in violation of the provisions of paragraph (A) in the sum of \$10 for each calendar day on which such employee was required or permitted to be employed on such work in excess of eight (8) hours or in excess of the standard workweek of forty (40) hours without payment of the overtime wages required by paragraph (A).

64. CONVICT LABOR

In connection with the performance of work under this CONTRACT, the CONTRACTOR agrees not to employ any person undergoing sentence of imprisonment, as provided by Public Law 89-176, September 10, 1965 (18 USC 4082 (c) (2) and Executive Order 11755, December 29, 1973.

65. CONTRACTOR WILL COMPLY WITH THE NEW JERSEY STATUTES AND ALL RULES AND REGULATIONS ISSUED THEREUNDER PROHIBITING DISCRIMINATION IN EMPLOYMENT.

EQUAL OPPORTUNITY (FEDERALLY ASSISTED CONSTRUCTION) (1972 AUG)

NONDISCRIMINATION IN EMPLOYMENT - In connection with the performance of work under this CONTRACT, the CONTRACTOR agrees not to discriminate against any employee or applicant for employment because of sex, race, creed, color, or national origin; and further agrees to insert the foregoing provision in all subcontracts hereunder except subcontracts for standard commercial supplies or for raw materials.

EQUAL OPPORTUNITY FEDERALLY ASSISTED CONSTRUCTION (1978 SEP)- If, during any twelve (12) month period (including the 12 months preceding the award of this CONTRACT), the CONTRACTOR has been or is awarded Federal contracts or federally assisted contracts and/or subcontracts which have an aggregate value in excess of \$10,000, the CONTRACTOR shall comply with (1) through (7) below. Upon request, the CONTRACTOR shall provide information necessary to determine the applicability of this Clause.

The CONTRACTOR hereby agrees that it will incorporate or cause to be incorporated into any CONTRACT for construction work, or modification thereof, as defined in the Regulations of the Secretary of Labor at 42 CFR Chapter 60, which is paid for in whole or in part with funds obtained from the Federal Government or borrowed on the credit of the Federal Government pursuant to a grant, CONTRACT, loan, insurance, or guarantee, or undertaken pursuant to any Federal program involving such grant, CONTRACT, loan, insurance, or guarantee, the following Equal Opportunity Clauses:

During the performance of this CONTRACT, the CONTRACTOR agrees as follows:

- (1) The CONTRACTOR will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The CONTRACTOR will take affirmative action to ensure that applicants are employed, and that employees are treated equally during employment, without regard to his/her race, color, religion, sex, or national origin. Such action shall include but not be limited to the following: Employment, upgrading, demotion or transfer, recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The CONTRACTOR agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The CONTRACTOR will, in all solicitations or advertisements for employees place by or on behalf of the CONTRACTOR, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

(3) The CONTRACTOR will send to each labor union or representative of workers with which he has a collective bargaining agreement or other Contract or understanding, a notice to be provided advising the said labor union or worker's representatives of the CONTRACTOR'S commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The CONTRACTOR will comply with all provisions of Executive Order 11375 of October 13, 1967, and by rules, regulations, and relevant orders of the Secretary of Labor.

(5) The CONTRACTOR will furnish all information and reports required by Executive Order 11246 of September 24, 1965, as amended by Executive Order 11375 of October 13, 1967, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and

accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and relevant orders.

(6) In the event of the CONTRACTOR'S noncompliance with the nondiscrimination clauses of this CONTRACT or with any of the said rules, regulations, or, this CONTRACT may be canceled, terminated, or suspended in whole or part and the CONTRACTOR declared ineligible for further Government CONTRACTs or Federally assisted construction CONTRACTs in accordance with Executive Order 11246 of September 25, 1965 as amended by Executive Order 11375 of October 1967, and such sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, as amended by Executive Order 11375 of October 13, 1967, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(a) The CONTRACTOR will include the portion of the sentence immediately preceding Paragraph (1) and the provisions of Paragraphs (1) through (7) in every subcontract or purchase order unless exempt by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, as amended by Executive Order 11375 of October 13, 1967, so that such provisions will be binding upon each Subcontractor or vendor. The CONTRACTOR will take such action with respect to and subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event a CONTRACTOR becomes involved in, or is threatened with, litigation with a Subcontractor or vendor as a result of such direction by the administering agency, may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event a CONTRACTOR becomes involved in, or is threatened with, litigation with a Subcontractor or vendor as a result of such direction by the administering agency, may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event a CONTRACTOR becomes involved in, or is threatened with, litigation with a Subcontractor or vendor as a result of such direction by the administering agency, the CONTRACTOR may request the United States to enter into such litigation to protect the interests of the United States. The applicant further agrees that it will be bound by the above Equal Opportunity clause with respect to its own employment practices when it participates in Federally assisted construction work: Provided that if the applicant so participating is a State or local government, the above Equal Opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the CONTRACT. The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of CONTRACTORS and Subcontractors with the Equal Opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that will furnish the administering agency and the Secretary of Labor such information as his/her may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing

compliance. The applicant further agrees that it will refrain from entering into any CONTRACT or CONTRACT modification subject to Executive Order 11246 of September 24, 1965, as amended by Executive Order 11375 of October 13, 1967. With a CONTRACTOR debarred from, or who has not demonstrated eligibility for, Government contracts and Federally assisted construction CONTRACTs pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the Equal Opportunity clause as may be imposed upon CONTRACTORS and Subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any (CONTRACT, loan, insurance, guarantee): refrain from extending any further assistance to the applicant under the program with respect to which the failure or refusal occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

66. GRATUITIES

- A. The State may, by written notice to the CONTRACTOR, terminate the right of the CONTRACTOR to proceed under this CONTRACT if it is found, after notice and hearing, by the Secretary or Governor or the Duly authorized representative of either, that gratuities (in the form of entertainment, gifts, or otherwise) were offered or given by the CONTRACTOR, or any agent or representative of the CONTRACTOR, to any officer or employee of the State with a view toward securing a CONTRACT or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performance, of such CONTRACT: Provided, that the existence of the facts upon which the Secretary or Governor or the duly authorized representative of either makes such findings shall be in issue and may be reviewed in any competent court.
- B. In the event this CONTRACT is terminated as provided in paragraph (A) hereof, the State shall be entitled (1) to pursue the same remedies against the CONTRACTOR as it could pursue in the event of a breach of the CONTRACT by the CONTRACTOR, and (2) as a penalty in addition to any other damages to which it may be entitled by law, to exemplary damages in an amount (as determined by the Secretary or Governor or the duly authorized representative of either) which shall be not less than three (3) nor more than ten (10) times the costs incurred by the CONTRACTOR in providing any such gratuities to any such officer or employee.
- C. The rights and remedies of the State provided in this Clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this CONTRACT.

67. AMERICAN WITH DISABILITIES ACT

EQUAL OPPORTUNITY FOR INDIVIDUALS WITH DISABILITIES

The CONTRACTOR and the State do hereby agree that the provisions of Title II of the Americans With Disabilities Act of 1990 (the "Act") (42 U.S.C. §12101 et seq.), which prohibits discrimination on the basis of disability by public entities in all services, programs, and activities provided or made available by public entities, and the rules and regulations promulgated pursuant thereunto, are made a part of this CONTRACT. In providing any aid, benefit, or service on behalf of the STATE pursuant to this CONTRACT, the CONTRACTOR agrees that the performance shall be in strict compliance with the Act. In the event that the CONTRACTOR, its agents, servants, employees, or subcontractors violate or are alleged to have violated the Act during the performance of this CONTRACT, the CONTRACTOR shall defend the STATE in any action or administrative proceeding commenced pursuant to this Act. The CONTRACTOR shall indemnify, protect, and save harmless the STATE, its agents, servants, and employees from and against any and all suits, claims, losses, demands, or damages of whatever kind or nature arising out of or claimed to arise out of the alleged violation. The CONTRACTOR shall, at his/hers its own expense, appear, defend, and pay any and all charges for legal services and any and all

costs and other expenses arising from such action or administrative proceeding or incurred in connection therewith. In any and all complaints brought pursuant to the STATE'S grievance procedure, the CONTRACTOR agrees to abide by any decision of the STATE, which is rendered pursuant to, said grievance procedure. If any action or administrative proceeding results in an award of damages against the STATE or if the STATE incurs any expense to cure a violation of the ADA which has been brought pursuant to its grievance procedure, the CONTRACTOR shall satisfy and discharge the same at its own expense.

The STATE shall, as soon as practicable after a claim has been made against it, give written notice thereof to the CONTRACTOR along with full and complete particulars of the claim. If any action or administrative proceeding is brought against the STATE or any of its agents, servants and employees, the STATE shall expeditiously

forward or have forwarded to the CONTRACTOR every demand, complaint, notice, summons, pleading or other process received by the STATE or its representatives.

It is expressly agreed and understood that any approval by the STATE of the services provided by the CONTRACTOR pursuant to this CONTRACT will not relieve the CONTRACTOR of the obligation to comply with the Act and to defend, indemnify, protect, and save harmless the STATE pursuant to this paragraph.

It is further agreed and understood that the STATE assumes no obligation to indemnify or save harmless the CONTRACTOR, its agents, servants, employees and subcontractors from any claim which may arise out of his/her performance of this Agreement. Furthermore, the CONTRACTOR expressly understands and agrees that the provisions of this indemnification clause shall in no way limit the CONTRACTOR'S obligations assigned in this Agreement, nor shall his/her be construed to relieve the CONTRACTOR from any liability, nor preclude the STATE from taking any other actions available to it under any other provisions of this Agreement or otherwise at law.

68. ADDITIONAL GENERAL MECHANICAL CONDITIONS FOR PLUMBING, HEATING AND VENTILATING, AND ELECTRICAL WORK

A. GENERAL:

- (1) All trades shall perform work in accordance with the requirements of local codes and in accordance with any authority having jurisdiction.
- (2) Where the words "furnish", "provide", or "install" are mentioned in these specifications, either singularly or in combination, his/her are to be interpreted to mean "furnish and install" unless specifically noted otherwise.
- (3) These words are further to be interpreted to be prefixed to all materials, equipment and apparatus hereinafter mentioned in these specifications, shown on the drawings either in abbreviated or in schedule form.
- (4) Where the word "CONTRACTOR" is mentioned in this article of the specifications or on the drawings, it shall mean the particular Mechanical or Electrical CONTRACTOR under that section, unless specifically noted otherwise.
- (5) Where the term "mechanical trades", "mechanical CONTRACTOR" are used, his/her shall refer to the Plumbing, Heating and Ventilating and Electrical Contractors.

B. DEFINITIONS:

- (1) "Furnish" or "Provide": to furnish, erect, install, and connect up complete and ready for regular operation particular work referred to, unless specifically indicated or specified otherwise.
- (2) "Work": Labor, materials, equipment, apparatus, controls, accessories, and other items customarily furnished for proper and complete installation of work.
- (3) "Piping": Pipe, fittings, flanges, valves, controls, hangers, traps, drains, insulation, and items necessary or required in connection with or relating to such piping.
- (4) "Wiring": Conduit, fittings, wire, junction and outlet boxes, switches, cutouts, and receptacles, and items necessary or required in connection with or relating to such wiring.
- (5) "Concealed": Embedded in masonry or other construction, installed behind wall furring, within double partitions or hung ceiling, in trenches, in crawl spaces, below floor or below grade.
- (6) "Exposed": Not installed underground or "Concealed" as defined above.
- (7) "Indicated" or "Shown": As indicated or shown on drawing.
- (8) "Noted": As indicated on drawings and/or specified.

C. EXAMINATION OF THE BUILDING SITE:

- (1) The CONTRACTORS shall visit the building site before submitting his/her proposals to fully acquaint themselves with all existed and limiting conditions.
- (2) Any existing or limiting conditions discovered on the site visit, and found to be in direct conflict with the intent of the drawings and specifications must be called to the CONTRACTING OFFICER'S attention for immediate adjustment.
- (3) The CONTRACTORS shall assume full responsibility for the cost of additional work arising out of his/her failure to examine the building site.

D. PERMITS AND FEES

- (1) The CONTRACTORS shall make application and obtain approval of all work shown on the drawings and specifications of his/her trades, from all authorities having jurisdiction.
- (2) The CONTRACTOR shall secure all permits, licenses, and pay all charges or fees necessary and incidental to the due and lawful prosecution of theirwork, including those of the local water, gas and electric companies.
- (3) The CONTRACTORS shall note that "BOCA", New Jersey Uniform Construction Code, New Jersey Department of Environmental Protection and the Department of Community Affairs rules and regulations of all authorities shall govern and take precedence over the drawings and specifications, except where drawings and specification require materials and workmanship of higher quality than required by the rules and regulations, the CONTRACT Drawings and Specifications shall apply.
- (4) If any existing work remaining in place or any new work must be corrected to meet provisions of rules and regulations, such correction must be made by the CONTRACTORS at no increase of the CONTRACT sum.

- (5) The CONTRACTORS shall give all requisites or notices required relating to his/her work to the CONTRACTING OFFICER.
- (6) Upon completion of his/her work, but before final acceptance of the work by the owner, the CONTRACTORS shall submit to the C. O. all necessary certificates of approval.

E. MATERIAL AND EQUIPMENT SCHEDULE:

- (1) Within ten (10) calendar days after award of the CONTRACT and before commencement of purchase or installation of any material or equipment, a complete schedule of the materials and equipment proposed for installation shall be prepared by the contractors and submitted to the C.O. for approval. Any scheduled materials, fixtures and equipment not conforming to the specification or drawings may be rejected.
- (2) No consideration will be given to partial lists submitted from time to time.
- (3) The CONTRACTOR shall assume full responsibility for rejections, delays, corrections and additional costs resulting from his failure to obtain advance approval of his material and equipment schedule.
- (4) All mechanical and electrical equipment shall bear the seal of approval of the National Board of Fire Underwriters, the National Electrical Code and State of New Jersey codes.

F. MATERIAL AND EQUIPMENT SUBSTITUTIONS

- (1) Materials and equipment as identified on the drawings and/or in these specifications by the manufacturers or specific trade names shall be furnished as identified, except where permission for substitution (as per the Approved Equal Article) is obtained from the C.O.
- (2) Substitutions of material and equipment other than identified on the drawings, in these specifications, or approved under the Approved Equal Article may be made by this CONTRACTOR at the discretion of the C.O. These will only be requested and approved under certain circumstances, e.g., item is no longer manufactured, manufacturer is no longer in business, conflict with what is specified and what actually can be bought, etc. The CONTRACTOR shall then submit for substitution under the following procedure
 - a. Make written request to the C.O. stating reason for substitutions.
 - b. Support request with duplicate copies of complete description, capacities, dimensions, weights of proposed product.

State any CONTRACT credit to owner for acceptance of such substitution.

- (3) Substitute material or equipment will be accepted with the CO's written approval only.
- (4) The CONTRACTORS shall bear the entire responsibility and all additional costs involved for any redesign required, architecturally, structurally or mechanically to suit any equipment which he may offer as a substitute for approval and installations.

G. MANUFACTURER'S SERVICE:

The CONTRACTORS shall provide, if required, at the appropriate time or as directed by the C.O., the services of a competent factory trained engineer of the particular manufacturer of the equipment or item involved to inspect, adjust and place in proper operating condition any and all such item of manufacturer. No additional compensation will be allowed the CONTRACTORS for such services.

H. OPERATING INSTRUCTIONS:

- (1). The CONTRACTORS shall provide for each item of equipment or apparatus furnished under this CONTRACT, a triplicate set of printed instructions obtained from the manufacturer covering the proper operation, care, lubrication, cleaning, servicing, adjusting, etc., of the items involved, together with special safety instructions.
- (2). The CONTRACTOR or individual primes shall pay particular attention in instructing the owner's representative(s), who will operate the plant, in all such details required to operate all pieces of equipment. The instruction shall include identifying the proper preventive maintenance programs.

H. CHARTS AND DIAGRAMS:

- (1). CONTRACTOR shall install where directed charts and diagrams, framed and glass-covered of approved size, giving the number, location and function of each valve, identifications of each pipe line, and an electrical single line diagram.
- (2). Included in the above are to be:
 - a. Two (2) valve charts and piping diagrams for each trade.
 - b. Temperature and other control diagrams shall be mounted in each equipment room for the equipment located therein.
 - c. Diagram of all feeders showing the wiring connections from incoming service to main distribution switchgear, light and power panels and motor controllers.

J. SLEEVE AND HANGER DRAWINGS:

- (1). The CONTRACTORS shall prepare sleeve and hanger drawings showing types, sizes and locations of all sleeves and hangers, required for his work.
- (2). The CONTRACTORS shall submit to the CO four (4) copies of his/her sleeve and hanger drawings for record only.
- (3) Two (2) copies of sleeve and hanger drawings shall be furnished to the General CONTRACTOR.

K. MOVING OF EQUIPMENT:

The CONTRACTOR shall investigate each space into and through which equipment must be moved. Equipment shall be shipped from manufacturer in sections of size suitable for moving through restricted spaces.

L. ACCESSIBILITY:

All work shall be installed so that all parts required are readily accessible for inspection, operation maintenance and repair. Minor deviations from the drawings may be made to accomplish this, but changes of magnitude shall not be made without prior written approval from the C.O.

M. EQUIPMENT BASES:

- (1). CONTRACTOR shall submit for approval of the C.O., detail drawings of all equipment foundations and shall furnish all templates for his foundations.

- (2). Each CONTRACTOR shall construct the required forms from drawings and will supply and pour the concrete. It is the duty of this CONTRACTOR to place any templates and anchor bolts and to supervise the construction of these foundations. Each CONTRACTOR will refer to the General Specification for types and mixes of concrete.

N. ACCESS DOORS:

- (1). The CONTRACTOR shall provide Access doors in masonry walls whose work required the access. All trades are to furnish doors of same manufacture. Type to be approved by the C.O.
- (2). Furnish access doors to the General CONTRACTOR for installation under another section of the specifications. Access doors are not required in areas having removable section-hung ceiling.
- (3). Frame and door shall finish flush with finished surface. Fabricate doors from No. 14 gauge sheet steel; frames No. 16 gauge sheet steel, and equipped with concealed hinges, permitting at least 175 degrees opening, and two (2) concealed screw driver operated came locks.
- (4). Fabricate access doors of minimum 14 gauge steel with rounded corners for installation in tile and masonry walls with maximum of 3/4 inch wide trim and masonry anchors.
- (5). Minimum door size: 12 X 12 inch at easily accessible valves and cleanouts; 18 X 18 inch where partial body access is required; 24 X 24 inch where entire body access is necessary.
- (6). Group together concealed boxes, controls, valves, dampers, and other mechanical and electrical equipment requiring access for operation, maintenance and repair, to reduce number of access doors required.
- (7). Where electric motors or heaters are installed in hung ceilings, provide disconnect switch in hung ceiling within reach from access door.

O. ELIMINATION OF NOISE AND VIBRATION:

- (1). All equipment and accessories shall operate without objectionable noise and vibration.
- (2). Should operation of any one or more of the systems produce noise or vibration which is, in the opinion of the C.O., objectionable, the CONTRACTOR shall, at his/her own expense, make changes in equipment and do all work necessary to eliminate the objectionable noise or vibration.

P. CLEANING:

All apparatus, accessories and piping, after installation, shall be thoroughly cleaned of all dirt, grease and foreign matter, and left in a condition satisfactory to the C.O. for delivery to the owner for his operation.

Q. PAINTING

- (1). Except for shop coats and finish coats, as may be herein specified, all painting will be done by others.
- (2). All concealed supports and ironwork not otherwise protected against corrosion shall be given two (2) coats of bituminous base paint.
- (3). The CONTRACTORS shall, however, thoroughly clean all his/her work and leave same in a neat and workmanlike condition for the application of paint.

R. ELECTRIC WIRING:

- (1). The Electrical CONTRACTOR shall be required to bring a service outlet and wiring within 2'-0" of each piece of equipment installed by other trades and CONTRACTs.
- (2). All electric work including labor and materials, from these outlets to place equipment into complete operation shall be done under the CONTRACT furnishing and installing the equipment.

S. MOTORS:

- (1). Unless otherwise indicated on the drawings or herein specified, electric motors 1/2 horsepower and larger shall be 3 phase motor. Electric motors less than 1/2 horsepower shall be 120 volts, single phase.
- (2). All motors shall be of special design for quiet operation and voltage specified, guaranteed to operate continuously at full load with a temperature rise in any part not exceeding 40 degrees C. or for two (2) hours at 25% overload, with a temperature rise not exceeding 55 degrees C. All temperatures shall be measured by a thermometer based on a room temperature of 25 degrees C. The motors shall be capable of carrying 50% overload for short periods without injurious heating.
- (3). Fractional horsepower motors shall be of the sealed prelubricated ball bearing type. Larger size motors shall have ball bearings with pressure grease fittings and drain parts, unless otherwise indicated.
- (4). All motors shall be approved by the Underwriters' Laboratories Inc., for the service and location intended. In general, motors shall be open drip- proof type in dry nonhazardous location, and weather-protected Type II here exposed to dampness or weather. Motors, located here exposed to dampness or weather, shall be provided with watertight connection boxes.
- (5). All motors shall conform to the design, construction and performance requirements of Standard C-50 for "Rotating Electrical Machinery" of the American Standards Association, and shall comply with the regulation of the National Electrical Code.
- (6). Direct connected motors shall be provided with acceptable type couplings, and the motors must be dowelled into the base plates at least at two (2) points. Motors connected to belt-driven apparatus shall be provided with slotted slide base with take-up screws.
- (7). All motors for pumps, compressors, air conditioning drives, and similar type applications where moisture or dust is present shall be provided with vacuum-impregnated epoxy encapsulation of the windings.
- (8). Motors shall be capable of withstanding momentary overloads of 50% without injurious heating. His/her shall operate without excessive heating, flashing or sparking under any conditions within the required capacity of load and speed. All motors shall operate quietly, and shall be replaced if, in the Contracting Officer's opinion, his/her do not operate quietly.
- (9). All motors shall be equipped with ball bearings unless specified otherwise in other sections of these specifications.
- (10). Motors for single-phase operation shall be of the capacitor type and those for three-phase operation shall be polyphase motors of the squirrel cage induction or wound rotor inductor type.
- (11) Direct connected fan motors shall have speeds as indicated on the plans or specifications. V-Belt connected motors shall have a maximum synchronous speed of 1800 rpm.

- (12). Motors requiring high starting torque are to be wound to suit such requirements and are to be high starting torque, low starting current type.
- (13). Fans, blowers, centrifugal pumps, and similar application shall be NEMA design B motors.
- (14). Reciprocating pumps, compressor, air conditioning drives, and conveyors shall be NEMA design C motors.
- (15). Motors shall be as manufactured by G.E., Westinghouse, U.S. Motors, Electro-Dynamic or Reliance.

T. MOTORS CONTROLLERS AND STARTERS:

- (1). Unless otherwise herein specified, the CONTRACTOR will provide all motor controllers and starters providing said motor. Motor controllers and starters shall be as manufactured by General Electric, Westinghouse or Allen Bradley.
- (2). Motor controllers and starters shall be of a type suitable for use in connection with each motor to be controlled. All starters shall have pilot light and shall be "hand-off automatic" type.
- (3). Controllers shall be of the fully enclosed type, floor or wall mounted except where mounted in a Motor Control Center. Each enclosure shall be furnished with a schematic-wiring diagram pasted inside the door.
- (4). All controllers shall have thermal overload protection in three phases for three-phase motors, and in the phase leg for single-phase motors.
- (5). All magnetic controllers must provide low voltage protection for the motors.
- (6). All component parts of each controller (switches or breakers, starters, resistors, etc.) shall be in one (1) ventilated enclosure.
- (7). Controllers shall be of the combination type with fused or nonfused safety type disconnect switched as required by the local electrical code.
- (8). Across-the-line magnetic type starters shall be used for all motors except where reduced voltage type starters are indicated on plans or specifications.
- (9). Reduced voltage starters shall be of the auto-transformer type unless otherwise indicated on the drawings.
- (10). Each three-phase motor controller shall be provided with control transformer.
- (11). Starters for single-phase motors shall be manual across-the-line type with thermal overload protection except where remote push buttons are called for, in which case magnetic type starter shall be used.
- (12). Remote controls shall be of the four (4) wire type with "Start" and "Stop" push button, and pilot light to indicate "on" and "off" operation of motors. When motors are remotely controlled, additional push button stations with the pilot lights shall be installed integrally in the controller door.
- (13). The CONTRACTORS shall deliver to the electrical CONTRACTOR all necessary wiring diagrams and instructions for power connections and wiring to his equipment.

- (14). Except where equipment is factory mounted and wired, the CONTRACTORS shall deliver the motor controllers and starters to be provided under his/her CONTRACT to the electrical CONTRACTOR at the job site, who will mount same and provide all power and control wiring.

U. VALVE TAGS:

Each valve on main or branch line of piping shall have 1-1/2" diameter brass tag with black filled engraved numbers and letters. Tag shall be affixed to valve by means of a brass "S" hook. Tags on different services shall be identifiable by a letter and number designation.

V. PIPE SLEEVES:

- (1). The individual Mechanical CONTRACTOR shall furnish and set all sleeves used to accommodate pipes or conduits passing through walls, floors and partitions. Unless otherwise specified, sleeves shall be standard weight steel pipe.
- (2). Sleeves shall be of sufficient size to pass conduit, pipe or with insulation so as not to present any undue friction with one inch (1") minimum clearance.
- (3). Sleeves in exterior walls shall be either galvanized steel or cast iron with an intermediate flange. Sleeves shall finish flush with walls. Spaces between pipe or conduit and sleeve or insulation and sleeve shall be packed with oakum and caulked with lead or plastic compound.
- (4). Sleeves for concealed pipes in chases shall terminate flush with floor. Sleeves for pipes exposed to view shall project one inch (1") above finished floor. Sleeves passing through wall shall terminate flush with wall surface. Sleeves in equipment spaces shall project two inches (2") above finished floor.
- (5). Sleeves shall be set before concrete is cured and before masonry construction is finished. Any subsequent cutting and repair of construction because of failure to set sleeves in time shall be done at CONTRACTOR'S expense.
- (6). Sleeves passing through waterproofed floors or walls shall be enclosed with caulking type plate. Plate shall be split type, complete with floor gasket and flanged ends for bolting halves together. The bell end of the plate shall be tightly packed with oakum.
- (7). Pipes and conduit passing through roof decks shall be installed with a base-flashing fitting.

W. ESCUTCHEONS:

Escutcheons shall be provided at all exposed finished surfaces pierced by sleeves. His/her shall fit around insulation or around pipe if uninsulated and shall extend against the finished surface of wall, floor, or ceiling so that embedded sleeve is completely concealed. Escutcheons shall be solid nickel-plated cast iron with set screws and attached to projecting sleeves or pipes and not to pipe covering.

X. FLASHING:

CONTRACTOR shall provide all cap flashing for the trade involved, unless otherwise specified. Base flashing will be provided under another division of these specifications.

Y. BUTTONS AND TABS:

Furnish buttons or tabs, as approved, to indicate location of mechanical and electrical equipment in removable type ceilings.

AA. SUPPORTS FROM OVERHEAD CONSTRUCTION:

Where overhead construction does not permit fastening of supports for equipment, furnish additional framing, subject to approval by C.O.

BB. REAMING:

The ends of all pipes shall be fully reamed or filed out to the full size of the bore before being made up with the fittings.

CC. CONNECTION OF EQUIPMENT FURNISHED BY OTHERS:

- (1). All equipment noted on the drawings as furnished by the owner or by other trades will be rigged in place, set and installed under separate CONTRACTs or under other sections of this specification. All wiring and piping technically and internally or integrally a part of the equipment will be previously executed, or executed under separate CONTRACTs, unless otherwise specifically shown and/or specified in these drawings and specifications.
- (2). The mechanical and electrical trades shall make all necessary supply, inlet and outlet connections to equipment furnished by the owners or installed under separate CONTRACT as called for on the drawings and as required.
- (3). CONTRACT drawings only indicate the services to various pieces of owner's equipment. The mechanical and electrical trades shall make all connections to such equipment as required. The CONTRACTOR will furnish all power and control wiring to such equipment.

DD. AS-BUILT DRAWINGS:

The CONTRACTOR shall keep on the job site, one (1) set of drawings upon which, any changes in the work, which may arise due to field conditions or other causes, shall be recorded. These drawings shall be kept in good condition and shall be turned over to the C.O. upon completion of the work. Final payment will be withheld until such drawings are turned over to the C.O.

EE. UNDERWRITERS' LABORATORIES CERTIFICATION:

All mechanical and electrical equipment shall bear the UL label of approval where such inspection service is furnished for the particular type of equipment.

FF. FINAL TESTS:

- (1). Before an application for final acceptance of the work will be considered, all tests deemed necessary to show proper execution to the work shall have been performed and completed in the presence of the CO. Scheduling of all testing procedures shall be arranged to suit the convenience of the C.O.
- (2). Where electricity-utilizing equipment, supplied by other trades, is energized, controlled or otherwise made operative by electric work wiring systems, the testing which will prove the proper functional performance of such wiring systems shall be conducted specifically by the trade responsible for the mechanical equipment. The electrical work shall, however, include cooperation in such testing and the making available to any necessary electrical testing equipment.

- (3). Testing to show the proper functioning of lighting fixtures and lamps, supplied by other trades or any other parties, shall be completely included in the electrical work.
- (4). Any defects or deficiencies discovered in any of the electrical work shall be corrected in an approved manner without additional cost.

GG. DEMOLITION:

- (1). The CONTRACTOR shall disconnect, remove and cap all existing outside and underground utilities which are abandoned as a result of this CONTRACT, as shown on drawings or specified within specification. All transformers and meters shall be the property of the owners.
- (2). Electrical - Disconnect and store on the job site overhead wiring, transformers and conduit as indicated on drawings. Trench disconnects and removes underground electric wires and conduit as indicated on drawings and backfill in accordance with specifications.
- (3). Plumbing - All abandoned underground piping (except clay) shall be trenched, removed and backfilled. All underground clay pipe may be trenched, crushed and backfilled. See Trench and Backfilling in specifications.

69. ELECTRIC WELDING EQUIPMENT, TERRAZZO GRINDERS, PIPE THREADING EQUIPMENT, FLOOR SANDERS

- A. The CONTRACTOR shall provide at locations acceptable to subcontractors involved two (2) outlets - 208, 220, 230, volts 60 cycle - three phase (single phase if 3-phase not available) 7-1/2 H.P. maximum capacity for each of the Prime Contractors using the referenced equipment. Should any subcontractor desire additional outlets or service of this type beyond the specified two (2) outlets or service of a greater capacity or of different characteristics or for any other power equipment, his/her shall arrange with the CONTRACTOR for the installation and pay all costs involved.
- B. The CONTRACTOR who is obligation to employ standby personnel by trade agreement to which his/her are a party shall determine and include all such costs thereof in his/her bid proposal.
- C. Any conflict arising between the prime contractors with regard to financial obligations for standby personnel or standby supervisory employees when the maximum number of units are provided, shall be resolved between the parties involved in direct proportion to the number of units on the site by the respective contractors.
- D. No CONTRACTOR shall at any time set up claim for an extra relating to costs of standby maintenance or standby supervision for electric motor driven equipment. The State under no condition will entertain or consider an extra in this regard.
- E. The provisions required hereunder are in addition to the provisions required under Light and Power.

70. APPROVAL

Any sum or sums allowed to the CONTRACTOR under the provisions of this CONTRACT or under the State arbitration proceedings or under other State procedure shall be paid subject to the approval of the CONTRACTING OFFICER, Chief, National Guard Bureau or agent of the Veterans Administration as part of the cost of the work herein contracted for and shall be deemed to be within the contemplation of this CONTRACT.

71. COOPERATION - THREE DAY'S NOTICE, ETC.

- A. The CONTRACTOR shall cooperate with each other and secure the effective cooperation of the different craftsmen employed on the work, so that no portion of the work is delayed or slighted because of the failure of any workmen in any part to do his duty. Should it at any time appear that this is happening, then the CONTRACTOR shall immediately discharge the delinquents and employ others to finish the work.
- B. All subcontractors shall coordinate his/her work with adjacent work and with other trades so as to accelerate general progress of the work and assure correctness.
- C. Each CONTRACTOR shall lay out and install his/her work at such time or times and in such manner as to facilitate general progress of project.
- D. It is agreed that in event of any dispute arising as to possible or alleged interference among various CONTRACTORS which may retard progress of work, same will be adjusted by the C.O. whose decision as to parties at fault and as to manner in which matter may be adjusted shall be binding and conclusive to all parties.
- E. Each trade shall afford other trades every reasonable opportunity for installation of his/her work and for storage of his/her materials.
- F. If the CONTRACTOR for general construction or any other contractor delays the project or interferes with the progress of any other CONTRACTOR, the C.O. may order or direct the CONTRACTOR at fault to accelerate work at any particular point; and such CONTRACTOR shall provide workmen at such point or points and execute such portion of their work as may be required to enable others to hasten and properly engage and carry on their work at no expense to the State.
- G. Should any CONTRACTOR fail to comply with such notice, should his/her fail or refuse to make good condemned work, or should his/her neglect or refuse to diligently prosecute the work, or any part thereof, then the C.O. may, after three (3) calendar day's notice in writing to the CONTRACTOR and his/her Sureties cost thereof, together with any loss or damage that may accrue from such neglect, failure or refusal, shall be deducted from the amount of the CONTRACT. The expense of carrying on such work or operation shall be paid by the State, to such person or persons as present certificates from the C.O. therefore without entailing any personal liability upon the officers issuing certificates or making such payments. Should the infraction continue, then the C.O. shall terminate the CONTRACT and seek recourse from the surety as outlined in these General Conditions.
- H. If, through acts of neglect on the part of the CONTRACTOR, any Subcontractor shall suffer loss or damage on the work, the CONTRACTOR agrees to settle with such other Subcontractors by agreement or arbitration if such other Subcontractor will so settle. If such other Subcontractor shall assert any claim against the State on account of any damage alleged to have been sustained, the C.O. shall notify the CONTRACTOR who shall indemnify and save harmless the State against any such claim.
- I. The CONTRACTOR shall coordinate his/her operations with those of other subcontractor. Cooperation will be required in the arrangement for the storage of materials and in the detailed execution of the work. The CONTRACTOR, including his/her Subcontractors shall keep informed of the progress and the detail work. The Project Manager shall immediately report a lack of progress or defective workmanship on the part of other CONTRACTOR. Failure of a CONTRACTOR to keep informed of workmanship by others shall be construed as acceptance by them of the status of the work as being satisfactory for proper coordination with his/her own work.

72. COORDINATION OF WORK - RIGHTS OF OTHER CONTRACTORS

- I. The General CONTRACTOR shall be responsible for coordinating the entire building operation from the beginning of the work until acceptance by the State.
- J. The various other prime contractors shall coordinate his/her own work and shall cooperate with each other under the overall direction of the CONTRACTOR for general construction.
- K. In case the CONTRACTOR, by his/her own act or neglect or the act or neglect of any person or persons in his/her employ, shall unnecessarily delay, in the opinion of the CONTRACTING OFFICER, Architect/Engineer, and/or the Construction Manager, the work of the owner or other CONTRACTORS, by not coordinating or properly cooperating with them or by not affording them sufficient opportunity or facility to perform work as may be specified, the CONTRACTOR shall, in that case, pay all costs and expenses incurred by such other CONTRACTORS due to any such delays and his/her hereby authorize the owner to deduct the amount of such costs and expenses from any monies due or to become due the CONTRACTOR under this Contract, based on the investigations and recommendations of the Architect/Engineer or the C.O. Nothing contained in this paragraph shall, however, relieve said CONTRACTOR from any liability or damage resulting to the owner on account of such delay or delays. It is the intent of the parties that the other CONTRACTORS on this project shall be third party beneficiaries of this provision and may bring an action directly against the CONTRACTOR for any and all damages occasioned by any act or neglect by the CONTRACTOR. This provision shall not give such third party beneficiaries any right of action against the State or the C.O.
- L. The G.C. Shall schedule and hold bi-weekly meetings with subcontractors and distribute minutes for these meetings. The meeting date and time shall be provided to the C.O. or his/her representative for his/her attendance.
- M. DMAVA shall determine and approve the date, time and location for the first project or coordination meeting. DMAVA shall also establish and approve what CONTRACTOR (s) or subcontractor(s) shall be required at meetings.
- N. The General CONTRACTOR shall coordinate all work to be performed by utility companies such as Gas and Electric, telephone, cable, water and sewer. This includes any work related to the project performed by local, county or state agencies.
- O. The CONTRACTOR for general construction shall have coordination responsibilities to include but not be limited to the following:
 - (1) Scheduling and holding subcontractor coordination meetings at least once every two weeks. The CONTRACTOR shall produce and distribute minutes for these meetings. The meeting schedule shall be provided to the State, the A/E or the Construction Manager for his/her project representatives attendance.
 - (2) The HVAC Prime CONTRACTOR shall prepare Mylar backgrounds for the use of all other Prime Contractors to prepare his/her coordination drawings under the supervision of the CONTRACTOR. Minimum scale of the drawings shall be 3/8" = 1' 0".
 - (3) CONTRACTOR to coordinate all work to be performed by utility companies including a provision for the new main electrical service, new roadway and parking lot lighting, temporary telephone lines and the location and installation of new telephone lines and the installation of a new gas line from the street to the building.

73. CLAIMS/DISPUTES/MEDIATION/ LITIGATION

- A. The CONTRACTING OFFICER shall be, in the first instance, the interpreter of the requirements of this CONTRACT and the judge of the CONTRACTOR's performance hereunder. The extent and character of the work shall be subject to the general supervision, direction, control and approval of the CONTRACTING OFFICER to whom the CONTRACTOR shall report and be responsible.
- B. Disputes between the parties will be resolved in accordance with the following process:
 - a. Written notice by the CONTRACTOR of his/her claim and a request for a CONTRACTING OFFICER's Hearing.
 - b. CONTRACTING OFFICER's hearing
 - c. Mediation
 - d. Litigation
- C. Except as otherwise provided in this CONTRACT, disputes and claims concerning questions of fact or law arising under this CONTRACT which are not disposed of by mutual agreement shall be governed by the provisions of N.J.S. 59:13-1, et. Seq., the "New Jersey Contractual Liability Act."
- D. The CONTRACTOR hereby agrees that only the law of New Jersey applies to all disputes arising out of this project and that all claims of every nature by or against the CONTRACTOR shall be brought only in the Superior Court of New Jersey and no other state. The CONTRACTOR hereby agrees to submit to the jurisdiction of the Superior Court of New Jersey even though all or any portions of the work may be performed outside New Jersey. The CONTRACTOR agrees to reference the applicability of the New Jersey Contractual Liability Act in all subcontracts and insert this paragraph in all subcontracts.

CONTRACTING OFFICER'S HEARINGS

- A. The CONTRACTOR may at anytime request a hearing of any claim, dispute or matter in question arising out of or relating to this CONTRACT. The CONTRACTING OFFICER's decision shall be the final decision of DMAVA.
- B. The CONTRACTOR may also request a CONTRACTING OFFICER's hearing should they have any claims, dispute or matter in question arising out of or relating to their CONTRACT. The CONTRACTOR will be required to participate in such hearing either as a party to the dispute or as a CONTRACTING OFFICER's witness.
- C. Based upon the Hearing Officer's findings of fact the CONTRACTING OFFICER will make a decision. Such action on the part of the CONTRACTING OFFICER shall be expeditiously taken. Except as otherwise provided in this CONTRACT, disputes and claims concerning a question of fact arising under this CONTRACT which are not disposed of by mutual agreement shall be reviewed by the CONTRACTING OFFICER who shall reduce a decision to writing and notify the CONTRACTOR. Pending such final decision the CONTRACTOR shall have no recourse to Court actions, assuming that the aforesaid administrative procedures take place within reasonable amount of time.
- D. Pending final decision of such claim or dispute, the CONTRACTOR and consultants shall proceed diligently with the performance of his/her CONTRACT responsibilities.

MEDIATION

- A. The parties of this CONTRACT agree to use mediation as the first step in resolving disputes prior to arbitration or litigation. Any party or parties to a dispute under this CONTRACT may initiate mediation. Parties desiring the mediation of a dispute shall initiate a written request and forward it to

the C. O. The C.O. shall respond in writing within thirty (30) days. His/her will jointly agree to seek a mediator through the American Arbitration Association, firms engaged in mediation services or through other state agencies who have certified mediators in his/her employment. The C.O. shall request a list of names from the organization agreed upon. Qualifications of the mediator(s) will be reviewed by both parties and be in agreement on a choice. Each party agrees to jointly select a single mediator; however, a mediation team may be used if agreed upon by both parties.

- B. No person shall serve as a mediator in any dispute under this CONTRACT if the person(s) has any financial or personal interest in the result of the mediation. Prior to accepting an appointment, the prospective mediator shall disclose any circumstance likely to create a presumption of bias or prevent a prompt meeting with the parties. The person or firm must present evidence of credentials and experience so all parties can make an educated selection. In the event that a mediator becomes unwilling or unable to serve, his/her shall give written notice to the parties involved at least thirty (30) days in advance of ceasing services.
- C. Persons of his/her choice may represent any party to the dispute. The name(s) and address (es) from the CONTRACTOR(s) shall be communicated to the C.O. at least thirty (30) days in advance of any meetings. The mediator shall fix the time and place of the mediation session(s).
- D. At least ten (10) days in advance, DMAVA and the CONTRACTOR shall provide the mediator with a brief memorandum setting forth its position with regard to the issues that need to be resolved. These memoranda may be distributed to the parties at the direction of the mediator.
- E. The mediator does not have the authority to impose a settlement upon the parties but will attempt to help the parties reach a satisfactory resolution of his/her dispute. The mediator is authorized to conduct joint and separate meetings with the parties and to make oral and written recommendations for settlement. The mediator may obtain expert advice when delineation of technical information is required. The parties must agree to this and be willing to assume expenses associated with obtaining such advice. Once expert advice is agreed to, the mediator shall make the necessary arrangements for obtaining the advice. The mediator is authorized to end mediation if, in his/her opinion, further efforts would not contribute to a resolution.
- F. Mediation sessions are private and the information confidential. The mediator shall not disclose any information discussed by the parties or witnesses in the course of the mediation. All records, reports or other documents received by a mediator during the course of a session or sessions shall be confidential. The mediator shall not be compelled to divulge such records or to testify in regard to the mediation in any adversary proceeding or judicial forum. the parties shall maintain the confidentiality of the mediation and shall not rely on, or introduce as evidence in any arbitral, judicial or other proceeding:
 - (a) views expressed or suggestions made by the other party with respect to a possible settlement of the dispute;
 - (b) admission made by the other party in the course of the mediation proceedings;
 - (c) proposals made or view expressed by the mediation; or
 - (d) the fact that the other party had or had not indicated willingness to accept a proposal for settlement made by the mediator.
- G. There shall be no stenographic record of the mediation process. Other persons may attend only with agreement from all parties involved.
- H. Termination of mediation shall be made when:
 - (a) the execution of a settlement agreement by the parties;
 - (b) by a written declaration of the mediator to the effect that further efforts at mediation are not longer worthwhile; or
 - (c) by a written declaration of a party or parties to the effect that the mediation proceedings are terminated.

- I. The mediator shall not be a necessary party to a judicial proceeding relating to the mediation. The mediator shall not be liable to any party for any act or omission in connection with any mediation conducted under this agreement.

LITIGATION

- A. If the parties to a dispute for damages identified in Article 83 do not mutually agree to mediation or arbitration as set forth, the parties to the dispute agree to litigate the matter in a court of law of this State having jurisdiction.
- B. No litigation, arising out of or relating to such a dispute, shall include by consolidation, joinder or any other manner, the State or the Government when the State or the Government has no direct responsibility in the dispute or for the damages arising therefrom.
- C. Nothing contained herein shall, however, relieve said CONTRACTOR or his/her subcontractor(s), or the Architect-Engineer, from any liability or damage resulting to the State on account of such dispute damages.

INDEMNIFICATIONS

- A. The CONTRACTOR agrees to: Except as set forth in Article 10 above, defend, indemnify, protect and save harmless the State and the Government and its agents, servants, and employees from and against any and all suits, claims, demands, or damages of whatsoever kind of nature arising solely out of any negligent act, error or omission of the CONTRACTOR or his/her subcontractors, its agents, servants and employees, in the performance of professional services under the CONTRACT, including but not limited to reasonable expenditures for and costs of investigations, hiring of expert witnesses, court costs, counsel fees, settlements, judgments or awards.
- B. The CONTRACTOR shall be liable to the State for any reasonable costs incurred by it to correct, modify or redesign any drawings submitted by his/her Architect-Engineer that are found to be defective or not in accordance with the provisions of this agreement as a result of negligent act, error or omission on the part of his/her Architect-Engineer, agents, servants or employees. The CONTRACTOR's Architect-Engineer shall be given reasonable opportunity to correct any deficiencies.

74. DISPUTES BETWEEN CONTRACTOR'S AND THEIR SUBCONTRACTOR(S)

- A. The CONTRACTOR agrees to make no claim for damages against the State or Government when the State or Government has no direct responsibility for said damages, by reason of any act, error or omission, by any CONTRACTOR, or in connection with such CONTRACTOR.
- B. These provisions shall not require the CONTRACTOR to consider modifications of any nature proposed which affect esthetics or safety; to consider modifications or substitution unless accompanied by engineering and other technical data required to permit proper evaluation and unless the CONTRACTOR has undertaken to reimburse the Architect-Engineer for all cost involved in the evaluation; to provide interpretation of the CONTRACT Documents or review shop drawings within less than a reasonable time (including time required for testing and consultation with consultants); to consider shop drawings which are not accompanied by data and other related shop drawings as required to permit proper review; or to act on shop drawings within a normal time when his/her are submitted in unusually great volume rather than spaced in a reasonable manner. In no case shall the Architect-Engineer be required to perform his services in a manner, which is at variance with his/her own professional judgment.

75. RIGHT OF THE OWNER TO TERMINATE CONTRACT

- A. In the event that any of the provisions of this CONTRACT are violated by the CONTRACTOR, or by any of his/her Subcontractors, the C.O. may serve written notice upon the CONTRACTOR and the Surety of his intention to terminate the CONTRACT.
- B. Such notices shall contain the reasons for such intention to terminate the CONTRACT.
- C. The CONTRACT shall be terminated unless within five (5) working days after the serving of such notice upon the CONTRACTOR, such violation or delay shall cease and satisfactory arrangements of correction be made. Should the violation or delay not be resolved then the C.O. shall, upon the expiration of said **five (5) working days**, cease and terminate the CONTRACT.
- D. In the event of any such termination, the C.O. shall immediately serve notice thereof upon the Surety and the CONTRACTOR, and the Surety shall have the right to take over and perform the CONTRACT; provided, however, that if the Surety does not commence performance thereof within five (5) working days from the date of the mailing to such Surety of Notice of Termination, the C.O. may take over the work and prosecute the same to completion by CONTRACT or by "NJDMAVA's Construction Force" and at the expense of the CONTRACTOR and the CONTRACTOR and his/her Surety shall be liable to the State for any excess cost occasioned by the State and any other such damages caused by the breach including liquidated damages caused by the delay to the date of completion thereby, and in such event the State may take the site of the work and necessary therefore.

76. ASSIGNMENT OF CLAIMS

- A. Pursuant to the provisions of the Assignment of Claims Act of 1940, as amended (31 U.S. Code 203, 41 U.S. Code 15), if this CONTRACT provides for payments aggregating \$1,000 or more, claims for money due or to become due the CONTRACTOR from the State or Government under this CONTRACT may be assigned to a bank, trust company, or other financing institution, including any Federal-lending agency, and may thereafter be further assigned and reassigned to any such institution. Any such assignment or reassignment shall cover all amounts payable under this CONTRACT and not already paid, and shall not be made to more than one party, except that any such assignment or reassignment may be made to one party as agent or trustee for two or more parties participating in such financing.
- B. Notwithstanding any provisions of this CONTRACT, payments to an assignee of any moneys due or to become due under this CONTRACT shall not, to the extent provided in said Act, as amended, be subject to reduction or set-off.

77. SUBSTANTIAL COMPLETION

- A. On the request of the State, the A/E, the CONTRACTOR, and the C.O. shall make a joint inspection of the work and if all determine that the work is substantially completed and shall prepare a certificate of substantial completion. The Veterans Administration Engineer may also, in the case of Veterans facilities, be present at this inspection. Such certification shall in no way relieve the CONTRACTOR of any contractual obligation.
- B. Standard guarantee periods for equipment, workmanship, and materials shall commence on the date of substantial completion for the project or portions thereof so certified unless specified to the contrary as a condition of partial acceptance and approved in writing by the C.O.

78. PUNCH LISTS

- A. At the request of the CONTRACTOR, when he believes his work to be completed, and with concurrence of the A/E or Construction Manager, the C.O. shall direct the A/E or Construction Manager to inspect the facility and develop a punchlist.
- B. The Project Manager shall develop this punchlist by conducting a walk thru of the entire facility and identifying any and all work that must be accomplished to allow NJDMAVA to take Final Acceptance of the facility. Once this punchlist is develop and prior to it being given to any CONTRACTOR, NJDMAVA C.O. shall conduct a walk thru to verify its accuracy and to add items believed to have been missed.
- C. Once the punch list is completed and validated, it shall be forwarded to the CONTRACTOR for completion. The CONTRACTOR shall commence completion of the punchlist within five (5) working days of receipt of the list. Every effort shall be made to complete the list in the minimum amount of time. Once the punchlist items are repaired, the A/E, Construction Manager and the C.O. shall re-inspect for completion. Should items be found incomplete, his/her shall be so noted and the CONTRACTOR directed to complete them.
- D. NJDMAVA shall make the sole determination that the project is complete and ready for inspection and development of the punchlist. The C.O. shall not accept a building as complete if it would be obvious to a laymen that there is still work to be done in the normal execution of the CONTRACT. The CONTRACTOR shall make a good faith effort to complete every item of work that is required in the normal execution of his/her CONTRACT before making any requests for an inspection and punchlist.
- E. NJDMAVA's inspection and development of a punchlist in no way eliminates the CONTRACTORS responsibility to meet the requirements of DCA for final inspection and the issuance of a Temporary Certificate of Occupancy or Certificate of Occupancy. All items identified by DCA shall be completed by the CONTRACTORS in accordance with the applicable codes and regardless of not being identified on any punchlist.

79. FINAL ACCEPTANCE

- A. Once all punchlist items have been completed NJDMAVA shall accept the building and its systems and order the CONTRACTOR to submit it final invoice and Final Acceptance Certificate. The Project Manager and the C.O. shall sign off this form and a copy shall be sent to the CONTRACTOR. The date of this document shall be the date that all warranties shall commence.
- B. Should the CONTRACT be such that there are mulitple phases to the project and acceptance of each phase shall be a logical step then the C.O. shall issue a memorandum for record indicating final acceptance of a particular phase. This shall not eliminate the CONTRACTORS obligation to finish the remainder of his/her CONTRACT nor shall it be construed as allowing the warrantee period to start on portions of the CONTRACT not completed.
- C. The C.O. shall be the sole deteminer of any final acceptance being initiate against any phase of the project.

80. GUARANTEE

- A. Neither the final certificate of payment nor any provision in the CONTRACT Documents nor partial or entire occupancy of the premises by the State shall constitute an acceptance of work not done in accordance with the CONTRACT Documents or relieve the CONTRACTOR of liability in respect to

any express or implied warranties or responsibility for faulty materials or workmanship. The State will give notice of observed defects with reasonable promptness.

- B. In addition to guarantee otherwise specified in other sections of the specifications, the CONTRACTOR and each individual Subcontractor shall guarantee and warrant in writing the work to be performed and all materials to be furnished under this CONTRACT against defects in materials or workmanship and pay for any damage to other work resulting therefrom. All guarantees, bonds, etc. required by the specifications shall be in writing in requisite legal form, and delivered to the C.O. at the time of submission of requisition for final payment. All Subcontractors' guarantees, bonds, etc. shall be underwritten by the CONTRACTOR, who shall obtain and deliver same to the C.O. before the work shall be deemed finished and accepted. Such guarantees shall be for a period of one (1) year from final acceptance.
- C. The CONTRACTOR shall, at his/her own expense and without cost to the State, within a reasonable time after receipt of written notice thereof, make good any defects in material or workmanship which may develop during stipulated guarantee period, and any damage to other work caused by such defects, or the repairing of same.
- D. The CONTRACTOR shall furnish a written statement from each manufacturer of equipment and materials used in the project that all such equipment and materials are the latest models manufactured at the time of installation of the work and that, for a period of seven (7) years, all components and replacement parts of such equipment and materials will be available for purchase by the Owner.

81. AUDIT BY OFFICE OF THE STATE COMPTROLLER

- A. In accordance with N.J.A.C. 17:44-2.2, the CONTRACTOR shall maintain all documentation related to products, transactions, or services under this contract for a period of five (5) years from the date of final payment. Such records shall be made available to the New Jersey Office of the State Comptroller upon request.

SECTION 00850 - CONTRACT DRAWINGS

- 1.1 All Drawings listed on drawing No. G001, "Title Drawing," dated August 21, 2013, unless otherwise revised or amended (via Addenda, Bulletin, etc.), shall form a part of the Contract Documents.

END OF SECTION 00850

DIVISION 1 - GENERAL REQUIREMENTS

DIVISION 1

GENERAL REQUIREMENTS

1.1 NOTICE TO BIDDERS

- A. Bidders shall familiarize themselves with the conditions of the job, the plans and specifications, etc. All questions pertaining to the project plans and specifications shall be submitted in writing as RFIs via email to Gary Rostron @ grostron@fvhdpc.com.
- B. RFI cutoff is **Sept 4, 2013**. RFI responses will be returned NLT Sept. 9 2013.

1.2 STORAGE OF MATERIALS

- A. The contractor may store their materials and equipment in the facility at job location without hindering the operation of the facility. The Contractor is responsible for the security of their material and equipment at all times.

1.3 APPLICABLE DRAWING AND SPECIFICATIONS

- A. The drawing accompanying this specification shows the general arrangement and extent of the work to be done but the exact location and arrangement of all parts shall be determined as the work progresses, to conform in the best possible manner with its surroundings; the work in all its details being subject to the approval of the Contracting Officer, whose decision on all points of difference shall be final and binding on the contractor.
- B. Should any errors or omissions be discovered on the drawings or in the specifications prior to bidding, each bidder shall be required to call same to the attention of the Contracting Officer (c.o.) in time to have an addendum sent out to cover same.
- C. Attention is called to the fact that it is the intention of the drawings and specifications to provide all labor and material required to complete the work as outlined on the drawing and as specified. It is NOT THE INTENTION OF THE DRAWING OR SPECIFICATIONS TO COVER EACH AND EVERY PIECE OF MATERIAL REQUIRED TO COMPLETE THE JOB. Items or work required, which are not shown or specified, shall be included in the bid without additional cost to the owner. Any other item or work which is obviously required to complete the installation shall also come under this category.
- D. An ERROR shall be defined as the absence of any indication on the drawings or in the specifications for providing or installing of any major item of materials or work which the Government desires to be installed. It shall be further understood that when materials are shown and specified, it is assumed that the work required shall be complete in every detail.

1.4 MATERIALS

- A. All materials shall be new and of the best grade of their respective kinds free from all defects and of the make, brand and quality specified. All like materials used in the installation shall be of the same manufacturer.
- B. The contractor shall store his materials and equipment in the facility at job location without hindering the progress of the work or the operation of the facility. The State will not be responsible for the losses by the contractor due to inadequacy of his security measures.

1.5 WORKMANSHIP

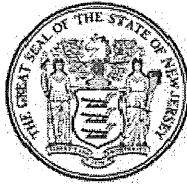
- A. It shall be the responsibility of the Contractor to familiarize himself with the requirements, so that all of his work will complement the finished project. Any new work which is not, in the opinion of the Contracting Officer, or his representatives, installed in a neat and skilled craftsman-like manner, shall be immediately removed and done over and any damage caused to the or property shall be repaired by men skilled in the required trades at no additional expense to the Government.

1.6 SECURITY

- A. Determine and provide sufficient means to safeguard, protect, and secure materials, tools, equipment, etc. from unauthorized persons. This facility has a large number of personnel and the public which utilize the grounds. The State will not be responsible for the losses by the contractor due to inadequacy of his security measures.
- B. The Facility Engineer is responsible for the security of this facility including all State and Federal property therein. Cooperate with the Facility Engineer to insure that his security requirements and measures are not violated.

1.7 INSPECTION

- A. The Project Officer and the Construction Supervisor will be notified for inspections by the contractor.



STATE OF NEW JERSEY
Department of Labor and Workforce Development
Division of Wage and Hour Compliance - Public Contracts Section
PO Box 389
Trenton, NJ 08625-0389

PREVAILING WAGE RATE DETERMINATION

The New Jersey Prevailing Wage Act (N.J.S.A. 34:11-56.25 et seq.) requires that the Department of Labor and Workforce Development establish and enforce a prevailing wage level for workers engaged in public works in order to safeguard their efficiency and general well being and to protect them as well as their employers from the effects of serious and unfair competition.

Prevailing wage rates are wage and fringe benefit rates based on the collective bargaining agreements established for a particular craft or trade in the locality in which the public work is performed. In New Jersey, these rates vary by county and by the type of work performed.

Applicable prevailing wage rates are those wages and fringe benefits in effect on the date the contract is awarded. All pre-determined rate increases listed at the time the contract is awarded must also be paid, beginning on the dates specified. Rates that have expired will remain in effect until new rates are posted.

Prevailing Wage Rate

The prevailing wage rate for each craft will list the effective date of the rate and the following information:

W = Wage Rate per Hour

B = Fringe Benefit Rate per Hour*

T = Total Rate per Hour

- * Fringe benefits are an integral part of the prevailing wage rate. Employers not providing such benefits must pay the fringe benefit amount directly to the employee each payday. Employers providing benefits worth less than the fringe benefit amount must pay the balance directly to the employee each payday.

Unless otherwise stated in the Prevailing Wage Rate Determination, the fringe benefit rate for overtime hours remains at the straight time rate.

When the Overtime Notes in the Prevailing Wage Rate Determination state that the overtime rates are "inclusive of benefits," the benefit rate is increased by the same factor as the wage rate (i.e. multiplied by 1.5 for time and one-half, multiplied by 2 for double time, etc.).

Apprentice Rate Schedule

An "apprentice" is an individual who is registered with the United States Department of Labor - Office of Apprenticeship and enrolled in a certified apprenticeship program during the period in which they are working on the public works project.

The apprentice wage rate is a percentage of the journeyman wage rate, unless otherwise indicated. The apprentice benefit rate is the full journeyman benefit rate, unless otherwise indicated.

If there is no apprentice rate schedule listed, the individual must be paid at least the journeyman rate even if that individual is in a certified apprentice program for that trade.

If there is no ratio of apprentices to journeymen listed for a particular craft, then the ratio shall be one (1) apprentice to every four (4) journeymen.

Comments/Notes

For each craft listed there will be comments/notes that cover the definition of the regular workday, shift differentials, overtime, recognized holidays, and any other relevant information.

Public Works Contractor Registration

The Public Works Contractor Registration Act (N.J.S.A. 34:11-56.48, et seq.) requires that **all** contractors, subcontractors, or lower tier subcontractors who are working on or who bid on public works projects register with the Department of Labor and Workforce Development. Applications are available at www.nj.gov/labor (click on Wage & Hour and then go to Registration & Permits).

Pursuant to N.J.S.A. 34:11-56.51:

No contractor shall bid on any contract for public work as defined in section 2 of P.L.1963, c. 150 (C.34:11-56.26) unless the contractor is registered pursuant to this act. No contractor shall list a subcontractor in a bid proposal for the contract unless the subcontractor is registered pursuant to P.L.1999, c.238 (C.34:11-56.48 et seq.) at the time the bid is made. No contractor or subcontractor, including a subcontractor not listed in the bid proposal, shall engage in the performance of any public work subject to the contract, unless the contractor or subcontractor is registered pursuant to that act.

Snow Plowing

Snow plowing contracts are not subject to the New Jersey Prevailing Wage Act or the Public Works Contractor Registration Act.

THE PARTICULAR PREVAILING WAGE SCHEDULES
INCLUDED IN THIS CONTRACT ARE NOT REPRINTED HERE
DUE TO SIZE.

SECTION 01011 - PROJECT SCOPE OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The work of this Section applies to all Construction Contract Documents including drawings, Division 1 - Miscellaneous Requirements Sections, and Specifications sections included in Part-2 through Part-6.

1.2 SUMMARY

- A. Section Includes:
 - 1. Project description.
 - 2. Contracts scope description.
 - 3. Contractor's use of the premises.
 - 4. Preconstruction meeting.
 - 5. Security procedures.

1.3 PROJECT DESCRIPTION

- A. The project consists of Renovations to Toilet Rooms and convert the Second Floor Men's Shower Room into a Women's Toilet Room, and all associated Work to the New Jersey National Guard Armory for the State of New Jersey Department of Military and Veteran's Affairs, Vineland, Cumberland County, New Jersey.
- B. Contract Documents prepared by Fraytak Veisz Hopkins Duthie, P.C. Architects / Planners, (Project Number: FVHD-4467) and its Consulting Engineers:
 - 1. Consulting Electrical Engineer: SunRose Engineers Inc. Williamstown, NJ.
- C. The project must be Phased so as to keep toilet facilities operational while the the Work is on-going.
 - 1. Phase 1: Second Floor Men's and Women's Toilet facilities.
 - 2. Phase 2: First Floor Men's and Women's Toilet and Shower facilities.

1.4 CONTRACTS SCOPE DESCRIPTION

- A. The work consists of but is not limited to the following:
 - 1. First Floor: Men's Toilet / Shower Room and Women's Toilet Room:
 - a. **Protect existing ceramic tile floor from damage.** The only ceramic tile which will be removed is in the Men's Shower Room (raised curb and floor in the shower area), as indicated on the drawings.
 - 1) Contractor will salvage as much of the ceramic tile for reuse.

- b. Remove and replace all existing plumbing fixtures associated piping & accessories, toilet partitions, ceilings and light fixtures, as indicated on the drawings.
 - c. **Salvage all existing wood moldings and door trim for reuse.**
 - d. Remove and discard the ceramic wall tile in the Women's Toilet Room, as indicated on the drawings.
 - e. Remove and replace the solid core wood door and hardware between the Men's Toilet Room and Shower Room, as indicated on the drawings.
2. Second Floor:
- a. Men's Toilet Room:
 - 1) **Protect existing ceramic tile floor from damage.** Contractor will salvage as much of the ceramic tile at the doorway to the shower area for reuse.
 - 2) Remove and replace all existing plumbing fixtures associated piping & accessories, urinal privacy partitions, ceilings and light fixtures, as indicated on the drawings.
 - 3) Salvage, carefully disassemble the existing toilet partitions, wood doors panels and all associated hardware and accessories wrap and move to a location within the building as determined by the Owner's representative.
 - 4) **Salvage all existing wood moulding and door trim for reuse.**
 - b. Men's Shower Room: Convert to Women's Toilet Room:
 - 1) **Protect existing ceramic tile floor from damage.** The only ceramic tile which will be removed is in the Shower Room (raised curb and floor in the shower area), as indicated on the drawings.
 - a) Contractor will salvage as much of the ceramic tile for reuse.
 - 2) Selective demolition of the plaster ceiling in the Drill Room (First Floor) area below the shower area. Demolish the existing concrete slab on wire lath at the proposed Second Floor Women's Toilet Room. Provide and install new metal floor deck and concrete slab, replace plaster ceiling to match existing and provide access panels.
 - 3) Remove and replace all existing plumbing fixtures, associated piping & accessories, ceiling and light fixtures, as indicated on the drawings.
 - 4) Provide toilet partitions, as indicated on the drawings.
 - 5) Provide new masonry opening, door and reuse existing wood door trim between the corridor and the toilet room, as indicated on the drawings.

3. Mechanical exhaust in all toilet & shower room and associated roof repair work, as indicated on the drawings.
4. All other indicated work.

B. Single Overall Contract: This contract includes:

1. All work in accordance with drawings, Parts 2 through 6 specification sections and in accordance with Contract Documents.
2. Work that is primarily architectural in nature plus work traditionally recognized as general construction in accordance with drawings and as listed as a part of Part 2 specification sections, unless otherwise indicated below:
 - 1) Also includes both administrative and coordination responsibilities.
 - a) General Construction Contractor is responsible for all coordination between his work and work of all subcontractors.
 - 2) All Concrete work in accordance with Part 2 specification sections.
 - 3) Installation of miscellaneous steel lintels, (less than 200 lbs. In weight), which shall be supplied by the Structural Steel Work Subcontractor.
 - 4) Furnishing and installation of metal fabrications, in accordance with Division 2 sections.
 - 5) Perform all existing roof cutting, alterations, repair, and flashing work associated with General Construction Work where indicated or required.
 - a) Roofing work shall be performed in accordance with requirements of existing roofing system warranty and in accordance with the Contract Documents.
 - b) Coordination of all required structural framing and supports for mechanical and electrical work whether shown or not.
3. Structural and Miscellaneous Steel Work includes:
 - a. Fabrication and erection of misc. structural steel framing, metal deck and miscellaneous metal fabrications in accordance with section Part-3 specification sections.
4. Plumbing, Drainage and Sprinkler System Work includes:
 - a. Piping servicing domestic water piping, drainage and sprinkler systems and connection of equipment tied into the above types of systems and including all work in accordance with drawings and Part-4 specification sections.
 - 1) Work shall include demolition and removals as indicated or required to allow for new construction.

- 2) Work shall include reinstallation, cutting, patching, finishing and repair work associated with Plumbing, Drainage and Sprinkler system work and as indicated or required including work at existing roofs; cutting, alterations, replacement and flashing work where indicated or required.
 - a) Roofing work shall be performed in accordance with requirements of existing roofing system's warranty and the Contract Documents.

5. Heating, and Ventilating Work includes:

- a. Heating, and ventilating systems as well as the temperature control systems and including all work in accordance with drawings and Part-5 specification sections.
 - 1) Work shall include demolition and removals as indicated or required to allow for new construction.
 - 2) Work shall include reinstallation, cutting, patching, finishing and repair work associate with H&V work, as indicated or required including performing work at existing roofs; cutting existing roof decking, provide and install structural steel support, and all other roof flashing work where indicated or required.
 - a) Furnishing and installing all required structural framing and supports for roof top mechanical equipment at existing buildings whether shown or not.
 - b) Structural framing shall be as per typical roof framing conditions as shown on architectural drawings and/or as per approved shop drawings by the Architect.
 - c) Roofing work shall be performed in accordance with requirements of existing roofing system's warranty and the Contract Documents.

6. Electrical Work includes:

- a. The work necessary for electrical power distribution, lighting, and the connections to equipment tied into such systems and including all work in accordance with drawings and Part-6 specification sections.
 - 1) **Work shall include power distribution and wiring for all indicated electrically operated equipment and fixtures, (in Parts 2, 4, 5 and 6), and whether shown or not on drawings.**
 - 2) Work shall include demolition and removals as indicated or required to allow for new construction.
 - 3) Work shall include reinstallation, cutting, patching, finishing and repair work associate with Electrical work and as indicated or required including performing work at existing roofs; cutting existing roof decking, and all other roof flashing work:

a) Roofing work shall be performed in accordance with requirements of existing roofing system's warranty and the Contract Documents.

1.5 CONTRACTOR'S USE OF THE PREMISES

- A. The space available to the Contractor for the performance of the work, either exclusively or in conjunction with others performing other construction as part of the project, is shown on the drawings.
 - 1. Other areas are off limits to all construction personnel.
- B. The following building facilities may not be used by construction personnel:
 - 1. Toilet facilities.
 - 2. Food service facilities, including dining areas.
- C. The Owner will occupy the building during the construction period.
 - 1. The Owner will endeavor to cooperate with the Contractor's operations when the Contractor has notified the Owner in advance of need for changes in operations in order to accommodate construction operations.
 - 2. Conduct the work so as to cause the least interference with the Owner's operations.
- D. Coordinate with Local Authorities as to which routes are capable of handling heavy truck traffic.
- E. Signs: Provide signs adequate to direct visitors.
 - 1. Do not install, or allow to be installed, signs other than specified sign(s) and signs identifying the principal entities involved in the project.
- F. All deliveries by the Contractor shall be coordinated with the Owner's Representative, prior to the delivery date.

1.6 PRECONSTRUCTION MEETING

- A. A preconstruction meeting will be held at a time and place designated by the Architect for the purpose of identifying responsibilities of the Owner's / Architect's personnel and explanation of administrative procedures.
- B. The Contractor shall also use this meeting for the following minimum agenda:
 - 1. Construction schedule.
 - 2. Use of areas of the site.
 - 3. Delivery and storage.
 - 4. Safety.
 - 5. Security.
 - 6. Cleaning up.
 - 7. Subcontractor procedures relating to:
 - a. Submittals.
 - b. Change orders.

- c. Applications for payment.
- d. Record documents.

C. Attendees shall include:

- 1. The Owner / Owner's representative.
- 2. The Architect, and any Consultants.
- 3. DMAVA Construction Manager.
- 4. The Prime Contractor and their superintendent.
- 5. Major subcontractors, suppliers, and fabricators.
- 6. Others interested in the work.

1.7 SECURITY PROCEDURES

- A. Limit access to the site and building to persons involved in the work.
- B. Provide secure storage for materials for which the owner has made payment and which are stored on site.
- C. Secure completed work as required to prevent loss.

END OF SECTION 01011

SECTION 01020 - ALLOWANCES

PART 1 - GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

- A. Definitions and Explanations: Certain requirements of the work related to each allowance are shown and specified in the contract documents. The allowance has been established in lieu of additional requirements for that work, and further requirements thereof (if any) will be issued by change order.
- B. The types of allowances scheduled herein for the work include the following:
 - 1. Lump sum allowances.
- C. Selection and Purchase: At the earliest feasible date after the award of the Contract, advise the Architect of the scheduled date when the final selection and purchase of each product or system described by each Allowance must be accomplished in order to avoid delays in the performance of the work. Obtain and submit proposals for the work of each Allowance, as required by the Architect for use in making the final selections; include whatever recommendations for selection may be relevant to the proper performance of the work. Purchase products and systems as specifically selected (in writing) by the Architect.
 - 1. Submit proposals and recommendations, for the purchase of the products or systems of Allowances, in the form specified for change orders.
- D. Change Order Data: Where applicable, include in each change order proposal both the quantity of the products being purchased and the unit cost, along with the total amount of the purchase to be made. Where requested, furnish survey-of-requirements data to substantiate the quantity. Indicate applicable taxes, delivery charges, and amounts of applicable trade discounts.
- E. Lump-Sum Allowances: The amounts herein specified are the net amounts available for purchase of the materials specified, including taxes (if any), and each change order amount shall be based thereon. **All other costs associated with the performance of the work under the Allowance, including but not limited to insurance, storage, handling, overhead, profit, etc., are not a part of the allowance, and shall be included in the lump sum bid / or base bid Contract amount.**
 - 1. In the event the actual purchase amount of materials, plus taxes (if any) exceeds the specified allowance, the Owner will pay the excess; should the actual purchase amount, plus taxes (if any) be less than the specified Allowance, the Contractor shall credit the Owner with the difference.
 - 2. The actual purchase amount, plus taxes (if any) shall be substantiated by certified bills of sale to be submitted with the change order.
- F. Change Order Mark-Up: Except as otherwise indicated, comply with the provisions of the General Conditions and the Supplementary General Conditions.
- G. Excess Materials: Submit invoices or delivery slips to indicate the actual quantities of materials delivered to the site for use in fulfillment of each allowance. Where economically feasible, and so requested by the Architect, return unused materials to the

manufacturer/supplier for credit to the Owner, after the installation has been completed and accepted. Where not economically feasible to return for credit, and so requested by the Architect, prepare unused materials for the Owner's storage, and delivery to the Owner's storage space as directed. Otherwise, disposal of excess materials is the Contractor's responsibility.

1.2 SCHEDULE OF ALLOWANCES

A. General: The following allowance amounts are included in the Contract Sum, for the corresponding units of work as described.

1. General Construction Work

- a. A sum of \$12,000.00 for work not specifically shown on the drawings, the work shall be performed as directed in the field.

2. Plumbing and Drainage Work

- a. A sum of \$10,000.00 for work not specifically shown on the drawings, the work shall be performed as directed in the field.

4. Heating Work

- a. A sum of \$1,500.00 for work not specifically shown on the drawings, the work shall be performed as directed in the field.

5. Electrical Work

- a. A sum of \$1,500.00 for work not specifically shown on the drawings, the work shall be performed as directed in the field.

b. Moving outlets:

1. The Owner, through the Architect, reserves the right to move any outlet a distance of 10 feet before roughing in without additional expense to the Owner.

END OF SECTION 01020

SECTION 01040 - COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The work of this Section applies to all Construction Contract Documents including drawings, Division 1 - Miscellaneous Requirements Sections, and Specifications Sections included in Part-2 through Part-6.

1.2 REQUIREMENTS INCLUDED

- A. Coordination of submittals.
- B. Coordination meetings.
- C. Coordination drawings.
- D. Coordination of project closeout.
- E. Administrative/supervisory personnel.
- F. Coordination of trades.
- G. Coordination of space.
- H. Coordination of field measurements and field conditions.

1.3 GENERAL REQUIREMENTS

- A. The Prime Contractor shall coordinate his activities with the activities of his subcontractors.
- B. If necessary, inform each party involved, in writing, of procedures required for coordination; include requirements for giving notice, submitting reports, and attending meetings.
 - 1. Inform the Architect when coordination of his work is required.

1.4 COORDINATION OF SUBMITTALS

- A. Coordinate and correlate the submittals on each work item and on interrelated work items to ensure their timeliness, completeness, consistency, compatibility and compliance with the Contract Documents.
- B. Prepare and submit special coordination drawings where close and careful coordination of information is required for proper fabrication or installation of materials, products or equipment by separate entities. Coordination drawings may also be required where limited space availability necessitates close and careful coordination for efficient and proper installation of different components.
 - 1. Show interrelationships of components shown on separate shop drawings.
 - 2. Indicate required installation sequences.
 - 3. (See also the requirements for the general coordination drawings under 1.7 below).

- C. Coordinate any request for substitution to ensure compatibility of its space requirements, its operating characteristics and elements and its effects on other work. Prior to proposing a substitution for any item, verify that its size , configuration, supports and connections will coordinate with all other work and that it will fit within the allotted space while allowing for proper operating, maintenance and circulation space.
- D. Comply with requirements for requests for submittal of substitution indicated in Section 00800.

1.5 COORDINATION MEETINGS

- A. The General Construction Work Contractor shall hold additional coordination meetings and conferences with other prime work contractors, subcontractors and others involved in the Work as needed to ensure coordination of work.
 - 1. Notify the Architect of such coordination meetings.
- B. Regular project site meetings shall be in accordance with specification section 00870 and 01200.

1.6 COORDINATION OF TRADES

- A. Coordinate construction activities included under various sections of these Specifications to ensure efficient and orderly installation of each part of the Work and to prevent interferences among parts of the Work. Coordinate work items and construction operations included under different sections of the Specifications that are dependent upon one another for proper installation, connection and operation.
 - 1. Where installation of one part of the Work is interrelated with installation of other components, schedule construction activities in the sequence required to obtain the best results.
 - 2. Where availability of space is limited, coordinate installation of different components to prevent interferences and to ensure proper accessibility for required maintenance, service and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Where necessary, prepare memoranda outlining special procedures required for coordination. Include such items as required notices, reports and attendance at meetings. Distribute these coordination memoranda to all parties involved in the work being coordinated.
 - 1. Prepare similar memoranda for the Owner and subcontractor(s) where coordination with construction or operations by them is required.
 - 2. Provide copies of such coordination memoranda to the Architect.
- C. Coordinate the scheduling and timing of required administrative activities with other construction activities to avoid conflicts and ensure orderly progress of the Work. Administrative activities include:

1. Preparation and updating of schedules.
2. Preparation and processing of submittals.
3. Preparation and processing of requests for information.
4. Project meetings.
5. Testing and inspection activities.
6. Project close-out activities.

1.7 COORDINATION DRAWINGS

- A. General Requirements: Prepare coordination drawings where limited space available may cause conflicts in the locations of installed products, and where required to coordinate installation of products.
1. In preparing the coordination drawings, large scale details as well as cross and longitudinal sections shall be developed as required to fully delineate all conditions. Particular attention shall be given to the locations, size and clearance dimensions of equipment items, shafts and similar features.
 2. In preparing the coordination drawings, minor changes in duct, pipe or conduit routing that do not affect the intended functions may be made as required to avoid space conflicts, when mutually agreed, but items may not be resized or exposed items relocated or other features affecting the function or aesthetic effect of the building changed without the Architect's prior review and acceptance. It should be assumed that no changes shall be made in any wall or chase locations, ceiling heights, door swings or locations, or other openings. If conflicts or interferences cannot be satisfactorily resolved, then the Architect shall be notified and their determinations obtained. Any conflicts or design deviations shall be specifically identified on drawings submitted to them.
 3. The coordination drawings shall be submitted, in all cases, in ample time to avoid construction delay. The coordination drawings submitted may lack complete data in certain instances pending receipt of shop drawings, but sufficient space shall be allotted for the items missing, as evidenced by the sign-off of the party responsible for the missing items. When the missing information is available, it shall be promptly incorporated in the composite drawings.
 4. Cost and time impacts of relocating any duct, pipe, conduit, or other material that has been installed without proper coordination between all trades involved will be charged to the Prime General Contractor. If any improperly coordinated work or work installed that is not in conformance with the approved coordination composites necessitates additional work, the cost and time impacts of all such additional work shall likewise be the responsibility of the Prime General Contractor. The Architect shall be the sole judge in determining all responsibilities.
 5. All changes in the scope of work due to revisions formally issued and approved shall be shown on the composite drawings.
 6. All work on the coordination drawings shall be performed by a competent draftsmen and shall be clear and fully legible. The Architect shall be the judge of the legibility of the composite drawings.
 7. In particular, prepare the following coordination drawings:

- a. Drawings showing all piping, duct, electrical ductbanks, and similar items, but not electrical conduit less than 4 inches in diameter.
 - b. Complete architectural, mechanical and electrical reflected ceiling layouts, (including ductwork, conduits, piping, lighting, etc.).
 - c. Special coordination drawings are to be provided for the following:
 - 1) Where space is limited, show plan and cross-section dimensions of space available, including structural obstructions and ceilings as applicable.
- B. The Prime Contractor shall prepare the coordination drawings required for his work.
- C. The Prime General Construction Work, shall prepare the coordination drawings.
- D. Layout Drawings: As soon as practical, but in no case starting later than thirty (30) days after the HVAC Work Subcontractor has received the notice to proceed, the HVAC Work Subcontractor shall prepare layout drawings of all duct work and piping at not less than 3/8" scale.
1. These drawings shall show registers, grilles, diffusers and similar features, as well as locations of all units, valves, dampers and other items requiring access for service and maintenance.
 2. The drawings shall also show roof, floor and wall openings, reflected ceiling layouts, structural beams, framing and miscellaneous structural steel supports, ceiling heights, walls, floor to floor dimensions, structural columns, doors and other major architectural and structural features as shown on the architectural and structural drawings and as per approved shop drawings.
- E. Composite Drawings:
1. The HVAC Work Subcontractor shall, as scheduled by the General Contractor, produce a mylar, two (2) prints and one (1) sepia of each layout drawing as described.
 2. The sepia will be retained for his records while the mylar and two (2) prints will be formally transmitted to the Plumbing Subcontractor, with copies of the transmittal to the Architect.
 3. These drawings must be hand delivered or sent via a reliable mailing service that provides receipts and guarantees 24-48 hour delivery.
 - a. Common carrier mailing will not be acceptable.
 4. The Plumbing Work Subcontractor, upon receipt of these mylars, will transfer the work from his shop drawings to the mylars, at the same time indicating where conflicts exist between his work and the work already shown on the mylars.
 - a. The Plumbing Work Subcontractor will utilize a green colored pencil for the layout of his work.
 - b. After completion, the Plumbing Subcontractor will forward the mylars and two (2) prints to the Electrical Subcontractor while retaining a sepia for his records.
 - c. The same mailing procedures will pertain.

5. The Electrical Work Subcontractor will duplicate the procedure outlined above, utilizing orange colored pencil for his layout.
 - a. After completion the Electrical Subcontractor will forward the drawings as specified above to the Fire Protection Work Subcontractor, (Plumbing Work Subcontractor), if applicable, who will layout his work with a red pencil and, after completion, forward the drawings to the General Contractor, retaining a sepia for his records.
6. The General Construction Work Contractor shall then have the instrumentation (ATC) Work Subcontractor review the completed composite drawings and attest to his concurrence that his work can be installed without conflict.
7. The General Construction Work Contractor will schedule coordination meetings on the job site to review the coordination drawings.
 - a. These meetings will be attended by a representative from each of the Subcontractors involved in the coordination process.
 - b. At these meetings, these Subcontractors will indicate where conflicts exist and resolve the conflicts through mutual agreement.
 - c. Should an impasse occur, the Architect will determine the resolution.
8. When all conflicts are resolved, the Subcontractors will indicate their agreement by signing these final composite drawings.
9. The drawings shall be signed-off by each of the involved Subcontractors, indicating their awareness of and agreement with the indicated routing and layouts and their interrelationship with the adjoining or contiguous work. The General Contractor shall then sign these final composite drawings.
10. The final composite drawings shall be completed and signed-off by all parties no later than ninety (90) days after the General Construction Work Contractor has received the Notice to Proceed.
 - a. After the final composite drawings have been agreed upon and signed by the Subcontractors and by the General Construction Work Contractor, the General Construction Work Contractor shall provide and distribute prints to each of the Subcontractor, and four (4) sets of prints to the Architect for reference and record purposes.
 - b. The record copies of the signed-off final composite drawings shall be retained by the General Construction Work Contractor and each Subcontractor as working reference documents.
 - c. All shop drawings, prior to their submittal to the Architect, shall be compared with these composite drawings and developed accordingly.
 - 1) Any revisions to the composite drawings which may become necessary during the progress of the work shall be noted by the General Construction Work Contractor and by each affected (Sub)Contractor and shall be neatly

and accurately recorded on their record copies.

11. The General Construction Work Contractor and each (Sub) Contractor shall be responsible for the up-to-date maintenance of his record copies of the composite drawings and for having one up-to-date copy available at the site.
12. The composite drawings, incorporating any subsequent changes thereto, shall be utilized by the General Construction Work Contractor or each (Sub)Contractor in the development of his record drawings.
13. Following sign-off of the final composite drawings, no deviations will be permitted without prior review and acceptance by the Architect.
 - a. Unauthorized deviations will be subject to removal and correction at no additional cost to the Owner.
14. In areas where no HVAC work occurs, but where other mechanical and electrical installations are required, each involved Subcontractor or Prime Contractor shall be responsible for his own work and shall cooperate, as directed by the General Construction Work Contractor, in preparing similar layout and composite drawings.

1.8 COORDINATION OF PROJECT CLOSEOUT

- A. Coordinate completion and clean-up work and administrative activities in preparation for Substantial Completion and occupancy of the Work or of designated portions of the Work.
- B. After Owner occupancy, coordinate access for completion or correction of the work not in conformance with the Contract Documents to minimize disruption of Owner's activities.
- C. Assemble and coordinate closeout submittals specified in Section 01700.
- D. Reproducible coordination drawings on mylar are to be turned over to the Owner at the completion of the Project.

1.9 REQUIRED ADMINISTRATIVE/SUPERVISORY PERSONNEL

- A. General: In addition to the other administrative and supervisory personnel required for the performance of the Work, each Prime Contractor shall provide specific coordinating personnel as specified herein.
- B. Project Manager / Superintendent: A full time on site Project Manager, with a minimum of eight (8) years experience, including project management experience on a similar type of projects.
 1. The Contractor for General Construction Work shall provide a full-time staff member or members, (Project Manager / Superintendent), experienced in coordination of mechanical and electrical work on projects of this type and scale, including administration and supervision.
 - a. Responsibilities:
 - 1) Coordinate all mechanical, plumbing, and electrical work, and coordinate that work with the other work of the project.

- 2) Where space is limited, coordinate arrangement of mechanical, electrical, and other work to fit.
 - 3) Coordinate cutting and patching activities and sequencing.
 - 4) Coordinate use of temporary facilities.
 - b. Prepare coordination drawings where required and where indicated.
 - c. Provide information to the entity preparing the progress schedule.
 - d. Participate in progress meetings; report progress, changes required in schedules, and unresolved problems.
 - e. Review submittals for compliance with the contract documents and for coordination with other work.
 - f. Check field dimensions, clearances, relationships to available space, and anchors.
 - g. Check compatibility with equipment, other work, electrical characteristics, and operational control requirements.
 - h. Check motor voltages and control characteristics.
 - i. Coordinate controls, interlocks, wiring of switches, and relays.
 - j. Coordinate wiring and control diagrams.
 - k. Review the effect of changes on other work.
 - l. Obtain and distribute installation data on each item of equipment requiring mechanical or electrical connections; include:
 - 1) Electrical power characteristics.
 - 2) Control wiring requirements.
 - m. Observe and maintain record of tests and inspections.
 - n. Observe work for compliance with contract documents and notify the applicable contractor in writing of observed defects in the work.
 - o. Coordinate and observe startup and demonstration of equipment and systems.
 - p. Coordinate maintenance of record documents.
 - q. Assist the Architect with final inspections.
- 2. Other Prime Contractors / Subcontractors shall provide staff for coordination between trades. Staff requirements noted above represent the minimum full-time on site staff required.
 - 3. Staffing is subject to Owner / Architect's approvals.
 - 4. Staff members may not be removed or replaced without Owner/Architect's approvals.
 - 5. Staff name(s), duties and resumes are to be submitted to the Architect for approval within fifteen (15) days of the Notice to Proceed.

1.10 COORDINATION OF TRADES

- A. Coordinate work with other trades to eliminate any possible interference before any piping, conduit, equipment, devices, controls, supports, ductwork and fixtures are installed.
- B. Where multiple items of mechanical and electrical equipment, devices, piping, conduits, supporting metal work, hangers, pull boxes, outlets, ductwork or controls are shown on any of the Contract Documents of the various trades in the same location, coordinate and adjust items to fit within designated location(s).
- C. Provide and install necessary offsets, bends, turns and modifications in piping, ductwork, conduit and devices required to install the work without interference with that of other trades or structure, without additional cost to the Owner.

- D. For products specified to be furnished by one Contractor and installed by another Contractor:
 - 1. Contractor specified to furnish (or remove) product shall be responsible for delivery to (or return from) the project site, and shall pay transportation costs.
 - 2. Contractor specified to install product shall be responsible for coordinating product delivery, loading or unloading, storing, protecting and installing product as required.

1.11 COORDINATION OF SPACE

- A. Coordinate use of available space and sequence of installation for work (e.g., mechanical and electrical work) which is indicated diagrammatically or schematically on the Drawings. Prevent physical interference of components. Follow routing shown for pipes, ducts and conduits, taking into account the limitations of available space; make runs parallel with lines of building. Utilize space efficiently to ensure proper installations (including installation of other work) and accessibility for maintenance, service and repairs.
- B. Detailed drawings of proposed departures from spatial arrangements or locations indicated in the Contract Documents, due to field conditions or other causes, shall be submitted to the Architect for review. No such departures shall be made without prior review by the Architect.
- C. Where required for coordination, the Architect will have the authority to order, as changes in the Work, changes in locations and sizes of piping, ductwork conduit, raceways and ducts. Such changes shall be made without adjustment to the Contract Sum or Contract Time.
- D. Field verify measurements of existing items and work which precedes each sequence. Ensure proper fit and location.
- E. In finished areas, conceal pipes, ducts and wiring in the construction.
- F. Coordinate locations of fixtures and outlets with finish elements.

1.12 COORDINATION OF FIELD MEASUREMENTS AND FIELD CONDITIONS

- A. Prior to ordering materials or equipment or performing work, the Contractor and/or Subcontractors shall verify Contract Document and submittal dimensions and weights affecting their work and other contractor's work associated with field measurements and field conditions at the project site, and shall be responsible for their accuracy and correctness.
- B. Differences discovered from dimensions or weights indicated in the Contract Documents or submittals shall be submitted in writing to the Architect for review, before proceeding with the work.
- C. Commencing work implies acceptance of surfaces, areas, preceding work and other field conditions, and verification of dimensions, by the Contractor.
- D. No Change Order will be issued in cases where discrepancies in dimensions are discovered after work has been commenced or where the Contractor has failed to properly investigate and take into account field measurements and existing field conditions.

- E. Inspection of Conditions: Require the Installer of each major component to inspect both substrate and conditions under which his work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- F. Recheck measurements and dimensions, before starting each installation.
 - 1. Submit to the Architect for review any change in dimensions shown on the Contract Documents or submittals affecting physical size, shape or location of any part of the work, whether due to field conditions or other causes.
- G. Passage of equipment:
 - 1. Establish passage clearances required to deliver, install and erect all equipment. Wherever necessary, provide equipment in sections or knocked down in order to allow passage of equipment through available openings.
 - 2. If any structure, equipment or system must be altered to allow passage of equipment, the person or entity responsible for providing that structure, equipment, or system shall restore it to its original condition, without additional cost to the Owner.
 - 3. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- H. Verify the size of shafts and chases, the adequacy of partition thickness and the clearance in double partitions and hung ceilings for proper installation of work.
 - 1. (Sub)Contractors shall cooperate in arranging their work with other (Sub)contractors whose work is in the same spaces.
 - 2. The amount of space occupied by each trade's work shall be kept to the minimum required.
 - 3. Arrange for chases, slots and openings in other building components during progress of construction, to allow for timely installation of work.
- I. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- J. Provide attachment and connection devices and methods necessary for securing work. Secure work true to line and level. Allow for expansion and building movement.
- K. Provide all appropriate structural supports, hangers, and associated assemblies which include but are not limited to materials, finishes, equipment, fixtures, piping, raceways, mechanical and electrical components. This work shall be in conformance with requirements of the Contract Documents whether or not indicated by a reference in specification or as may be in detail shown on drawings and schedules.
- L. Visual Effects: Provide uniform joint widths in exposed work. Arrange joints in exposed work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- M. Install each component during weather conditions and construction status that will ensure

best possible results. Isolate each part of completed construction from incompatible material as necessary to prevent deterioration.

- N. Coordinate temporary enclosures with required inspections and tests, to minimize necessity of uncovering completed construction for that purpose.
- O. Where mounting heights are not indicated:
 - 1. Install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision.
 - 2. Install mechanical and electrical systems, materials and equipment to provide maximum possible headroom. Maintain maximum headroom and space conditions. Where headroom or space conditions (less than 8'-0") appear inadequate, the Architect shall be notified before proceeding with the work.

END OF SECTION 01040

SECTION 01050 - ALTERATIONS, CUTTING, PATCHING AND REFINISHING WORK

PART 1 - PRODUCTS

1.1 RELATED DOCUMENTS

- A. The work of this Section applies to all Construction Contract Documents including drawings, Division 1 - Miscellaneous Requirements Sections, and Specifications Sections included in Part-2 through Part-6.

1.2 DESCRIPTION

- A. Work included: Alterations, removals and demolition required for this work include, but are not necessarily limited to:
 - 1. Alterations, cutting, patching, removal and preparation work to be done as noted on drawings and as required to complete construction.
 - 2. Patching and refinishing of existing surfaces damaged or left unfinished as a result of this work, including site work and existing ground surfaces; concrete surfaces, bituminous paving surfaces, etc.
 - 3. Protection.
 - 4. Asbestos.
 - a. The Contractor's prequalified abatement subcontractor shall perform the asbestos abatement work. No General Construction Work may commence until the area of abatement has been cleared by the Environmental Consultant.
 - b. The Contractor shall review and familiarize themselves with the Owners Asbestos Hazard Emergency Response Act (AHERA) report prior to the commencement of any demolition activity. Also, the Contractor will be provided with an inventory of all ACM (Asbestos Containing Materials) in the building where they are working, and will be required to sign a form (provided by the Owner) that they are in receipt of the inventory.
 - c. Contractor is herein cautioned that asbestos may be within concealed spaces where work will be taking place. The Contractor shall immediately notify the Environmental Consultant if any concerns or conditions arise in regards to potential asbestos containing building materials (ACBM's) in order that the Environmental Consultant may verify same and take appropriate action. The Contractor shall not proceed with the work until the material has been abated by his subcontractor and air sampling clearance levels have been achieved as set forth by the Environmental Consultant.
 - d. The Contractor shall employ personnel who are trained in accordance with OSHA workplace standards as they pertain to asbestos.
 - 5. This project shall be subject to the requirements of the EPA "Renovation, Repair and Painting" rule including the following:

- a. The Contractor must be lead safe trained and certified. The Contractor will be required to submit a copy of their EPA certificate prior to the start of the work.
 - b. The Contractor shall at all times employ lead safe practices as identified in the rules.
- B. Related Sections:
 - 1. Section 00870: Miscellaneous Requirements.
 - 2. Section 01010: Summary of the Work.
 - 3. Section 01040: Coordination.
 - 4. Section 02070: Selective Demolition.
 - 5. Divisions 2 through 16 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
 - a. Requirements in this Section apply to mechanical and electrical installations. Refer to Divisions 15 and 16 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.3 SUBMITTALS

- A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
 - 1. Location and Extent of Work: Submit key plan indicating room location where work to take place. Describe cutting and patching, indicate methods and show how they will be performed.
 - 2. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
 - 3. Products: List products to be used and firms or entities that will perform the Work. Provide samples and field mock-up as requested by the Architect.
 - a. Samples shall match existing surfaces and colors.
 - b. Obtain Architect's approval prior to proceeding with work.
 - 4. Schedule and Dates: Provide work schedule, indicate when cutting and patching will be performed.
 - 5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
 - 6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, obtain approval of cutting and patching proposal before cutting

and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.4 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Coordinate cutting of operating elements with other plumbing, HVAC, electrical or other trades.
- C. Miscellaneous Building Elements: Do not cut and patch any building elements or related components in a manner that could change their operation, load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
 - 1. Engage experienced installers or fabricators for all work.
- E. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.5 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties. Confirm existing warranties with Owner prior to starting of work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
 - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.
- B. Inspection:
 - 1. Prior to start of any work the General Construction Work Contractor shall verify all existing work area conditions; building lines, lengths, corners and all other dimensions.
 - 2. The General Construction Work Contractor shall submit information and survey to other Subcontractors, the Architect for all required coordination of new construction and all other related site work.
 - 3. Prior to work of this section, verify information and survey submitted by the General Construction Work Contractor, carefully inspect the existing conditions and verify that materials and surfaces to be altered or removed are the same as noted on the drawings.
- C. Discrepancies:
 - 1. In the event of discrepancy of existing conditions, surfaces, etc., immediately notify the Architect.
 - 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid interruption of services to occupied areas.

3.3 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. The Contractor shall provide cutting, patching, relocations, and or re-installations of existing construction to provide for installation of other components or performance of other construction associated with his work, and subsequently patch and finish as required to restore surfaces to their original condition. Work shall be performed whether or not shown on drawings.
2. The General Construction Work Contractor shall provide all required and necessary pockets in concrete and masonry walls including all required cutting, and preparation work to allow for installation of new framing, supports, lintels, etc. The General Construction Work Contractor shall subsequently patch as required to restore and prepare surfaces to receive new finishes.
3. All repairing, patching, piecing out, filling in, restoring and refinishing shall be neatly done by craftsmen skilled in their respective trades and completed in proper manner to leave same in condition satisfactory to the Architect.
4. All new work shall be installed plumb, level, true, and shall be shimmed as required to cover any irregularities in substrates.

B. Cutting:

1. Before cutting is started in any location the Contractor shall carefully investigate conditions as to human and structural safety, existing piping, wiring and items concealed, and wherever same interfere with the work they shall be properly relocated, rerouted or removed as the case may be, at no increase to contract price.
2. Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
3. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
4. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
5. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
6. Do not disturb any structural work, plumbing, steam, gas, or electric work without approval of Architect.
7. Mechanical and Electrical Services:

- a. Cut off pipe or conduit in walls or partitions to be removed shall be performed by respective trade.
 - b. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting shall be performed by respective trade.
8. Proceed with patching after construction operations requiring cutting are complete.
 - a. Remove, cut, alter, replace, patch and repair existing work as necessary to install new work.
9. Existing work disturbed or removed as a result of performing required new work, shall be patched, repaired, reinstalled or replaced with new work, and refinished and left in as good condition as existing before commencing work.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate or minimize evidence of patching and refinishing.
 3. Floors and Walls: Where walls and partitions are removed which extend one finished area into another, patch and repair floor and wall surfaces in the existing and new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Cut, remove, patch, repair, install new including hanging assemblies and finish ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

3.4 CLEAN-UP

- A. Areas where demolition is in progress within or adjacent to Owner occupied areas shall be broom cleaned at the end of each working day.
- B. Do not burn materials or debris on premises.

- C. Do not allow demolished materials to accumulate inside or outside of existing building.
- D. Remove from the site all rubbish and debris resulting from work of this section.
- E. If the Contractor fails to clean-up their debris within 24 hours, the Owner has the right to clean-up the debris left by the Contractor. All associated clean-up costs, incurred by the Owner, will be back-charged to the Contractor.

3.5 PROTECTION

- A. Contractor shall provide all other necessary temporary enclosures, guard rails, barricades, etc. to adequately protect all workmen and public from possible injury. Provide all necessary temporary partitions, enclosures, coverings of approved materials and construction for the exclusion of weather and for confining dust and debris.
- B. Contractor shall be responsible for the protection of the existing building, facilities and improvements within the areas where work is being done. Any disturbance or damage to the work, the existing building, and improvements, equipment or any impairments of facilities resulting from his work, shall be promptly restored, repaired, or replaced by the responsible Contractor at no extra cost to the Owner.
- C. Adequate protection of persons and property shall be provided at all times, including Saturdays, Sundays and holidays, and during time work is being performed and after working hours. Protection shall include barricade fencing, traffic control, dust partitions, weather protection and other means as required.
- D. Preserve and protect all existing vegetation such as trees, shrubs, and grass on or adjacent to the site and along access to the site. Be responsible for all unauthorized cutting or damaging of trees and shrubs, including damage due to careless operation of equipment, stock-piling of materials or tracking of grass areas by equipment.

3.6 SALVAGE

- A. Partial Removal: Items of salvable value to Contractor may be removed from structure as work progresses. Salvage items must be transported from site as they are removed.
 - 1. Storage or sale of removed items on site will not be permitted.
- B. Items designated on drawings or in specifications to remain the property of the Owner, or to be re-used, shall be removed, and securely stored with care to prevent damage. Repair or replace such items damaged in removal.
- C. Before transporting non-designated, removed items from the site, contact Architect for decision as to what items if any are to remain the property of the Owner. Items retained by the Owner will be transported by him to his storage area.

3.7 STANDARDS

- A. All demolition work shall be performed in accordance with the applicable rules and regulations and the Codes and Ordinances of local, State and Federal authorities, and in accordance with the requirements of public utility corporations.

- B. Work shall satisfy requirements of the Occupational Safety and Health Act of 1970 with amendments.
- C. Work not affected by more stringent requirements of regulatory agencies shall satisfy the provisions of ANSI-A10.6-1969 - American National Standard Safety Requirements for Demolition.
- D. Confine the movement and storage of vehicles, equipment and materials to such routes and locations as may be designated by the Owner and Architect.
- E. The building and grounds will be maintained in a clean and orderly manner so as to conform with all local fire safety regulations and in accordance with the latest editions of the Safety Code of the National and State Board of Fire Underwriters.

3.8 INGRESS, EGRESS AND CIRCULATION

- A. The Prime Contractor shall be responsible for performing his construction activities in such manner to maintain ingress and egress for visitors and occupants of Owner-occupied areas and to continuously maintain all required emergency exits from and circulation between existing facilities. Passageways for emergency exits shall be kept continuously free from debris, construction equipment, tools, stockpiles or materials, and other hazards to speedy evacuation. The Contractor shall provide all necessary temporary work as prudence and good practice may dictate and in accordance with Applicable Law and Authorities having jurisdiction to obtain and maintain all such ingress, egress and circulation requirements. The Prime Contractor shall be responsible for providing coordination of this temporary work between subcontractors, as directed by the Architect. All temporary work shall be removed when no longer required.

3.9 NON-INTERFERENCE WITH OWNER'S OPERATIONS

- A. **Work under this Contract will be performed when the existing building is occupied and work will be Phased to keep some toilet facilities operational while the others are being reconstructed.** Coordinate with Owner's schedule and operation, obtain Owner's approval prior to proceeding with work.
- B. Contractor shall acquaint himself with the general character of the Owner's operations prior to commencing work and shall schedule his work to avoid interference therewith. The sequence of alteration operations shall be in accordance with a schedule of contract operations approved by the Owner and Architect.
- C. The Contractor shall not start work until the schedule has been approved in writing by the Architect and the Owner. The Contractor shall not perform work in occupied areas without giving the Owner 72 hours written notice of his intention to work in occupied areas.
- D. The Contractor shall expedite placing orders and submission of shop drawings for equipment required to complete work under this Contract to insure delivery of all equipment with adequate time allowed to complete the installations to conform to the project completion date.

3.10 REMOVAL AND DISPOSAL OF DEBRIS, RUBBLE, TRASH, ETC.

- A. The Contractor shall be responsible for collection and disposal of debris of all kinds, unsanitary, rubble, trash, combustible materials, etc. created by and in the execution of his contract and operations, on a daily basis. Provide clean up in accordance with Article 3.4 above. If hazardous or other harmful waste materials are discovered, those materials shall be removed and disposed of by the Contractors subcontractor.
1. Disposal shall be to trash receptacles, hoppers, containers, dumpsters, etc. provided by the Prime Contractor for General Construction Work.
 2. Disposal shall include all debris created by or connected with the operations of other prime contractors, his subcontractors and material suppliers.
 3. General Construction Work Contractor shall pay all costs, fees and permits attendant to the loading, unloading, cartage, dumping and off-site disposal of all indicated materials, rubbish and/or debris. The complete removal and disposal shall be performed with such frequency as to maintain the grounds around the building free from debris.
 - a. Areas designated as "Loading Area" will be the only place that this Contractor will be allowed to load and off load usable materials and/or debris.
 - b. He shall, at no time, block the fire exits of the building.
 - c. He will erect a snow fence around the area at the start of the job; remove same at completion of the work.
 - d. He will further repair any damage done to sidewalks, pavements and lawn areas upon completion of the work at no additional cost to the Owner.

END OF SECTION 01050

SECTION 01200 - PROJECT MEETINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for project meetings including but not limited to:
 - 1. Pre-Construction Conference
 - 2. Pre-Installation Conferences
 - 3. Coordination Meetings
 - 4. Progress Meetings
- B. Construction Schedule requirements is specified in another Division 1, Section.

1.3 PRE-CONSTRUCTION CONFERENCE

- A. The Architect will schedule a pre-construction conference and organizational meeting at the Project site or other convenient location no later than 15 calendar days after execution of the Agreement and prior to commencement of construction activities. Conduct the meeting to review responsibilities and personnel assignments.
- B. Attendees: The Owner, Architect, and their consultants, Prime Contractor and their superintendent, major subcontractors, manufacturers, suppliers and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the work.
- C. Agenda: Discuss items of significance that could effect progress including such topics as:
 - 1. Tentative construction schedule
 - 2. Critical work sequencing
 - 3. Designation of responsible personnel
 - 4. Procedures for processing field decisions and Change Orders
 - 5. Procedures for processing Applications for Payment
 - 6. Distribution of Contract Documents
 - 7. Submittal of Shop Drawings, Product Data, and Samples
 - 8. Preparation of record documents
 - 9. Use of the premises
 - 10. Office, Work, and storage areas
 - 11. Equipment deliveries and priorities
 - 12. Safety Procedures
 - 13. First Aid
 - 14. Security
 - 15. Housekeeping
 - 16. Working hours

1.4 PRE-INSTALLATION CONFERENCES

- A. The Prime Contractor to conduct a pre-installation conference at the site before each construction activity that requires coordination with other construction. The installer and representative of manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise the Architect of scheduled meeting dates.
1. Review the progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for:
 - a. Contract Documents
 - b. Options
 - c. Related change orders
 - d. Purchases
 - e. Deliveries
 - f. Shop Drawings, product data and quality control samples
 - g. Possible conflicts
 - h. Compatibility problems
 - i. Time schedules
 - j. Weather limitations
 - k. Manufacturer's recommendations
 - l. Compatibility of materials
 - m. Acceptability of substrates
 - n. Temporary facilities
 - o. Space and access limitations
 - p. Governing regulations
 - q. Safety
 - r. Inspection and testing requirements
 - s. Required performance results
 - t. Recording requirements
 - u. Protection
 2. Record significant discussions and agreements and disagreements of each conference along with the approved schedule. Distribute the record of the meeting to everyone concerned, promptly, including the Owner, the Architect.
 3. Do not proceed if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of work and reconvene the conference at the earliest feasible date.

1.5 COORDINATION MEETINGS

- A. The Contractor for General Construction will conduct project coordination meetings at regularly scheduled times convenient for all parties involved. Project coordination meetings are in addition to specific meetings held for other purposes, such as regular progress meetings and special pre-installation meetings.
- B. Request representation at each meeting by every party currently involved in coordination or planning for the construction activities involved.

- C. Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.6 PROGRESS MEETINGS

- A. Regular Progress Meetings: The Architect will schedule and conduct regular progress meetings as follows:
 - 1. Bi-weekly meeting with the Owner, Architect, Contractor and Subcontractors.
 - a. Weekly meetings between the Contractor and Subcontractors will be the responsibility of the Contractor and the Architect will not attend.
- B. Special Meetings will be conducted as required by the progress of the work
- C. Location of the meetings: Meetings shall be conducted at a location in the building to be determined by the Owner's Representative.
- D. Attendance: Attendance at Construction Meetings shall be as follows:
 - 1. The Owner shall be in attendance at bi-weekly meetings and at any special meetings as appropriate to the agenda.
 - 2. The Architect and his professional consultants, as needed, at bi-weekly meetings and at any special meetings an appropriate to the agenda.
 - 3. The Contractor at all construction meetings.
 - 4. Subcontractors as appropriate to the agenda.
 - 5. Suppliers as appropriate to the agenda.
 - 6. The Owner's Representative at all construction meetings.
- E. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the project.
- F. Contractor's Construction Schedule :
 - 1. Review the present and future needs of each entity present, including such items as:
 - a. Interface requirements
 - b. Time
 - c. Sequences
 - d. Deliveries
 - e. Off-site fabrication problems
 - f. Access
 - g. Site utilization
 - h. Temporary facilities and services
 - i. Hours of work
 - j. Hazards and risks

- k. Housekeeping
 - l. Quality and work standards
 - m. Change orders
 - n. Documentation of information for payment requests
- G. Reporting: No later than 3 business days after each progress meeting date, distribute copies of minutes of the meeting to each party present and to other parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
- H. Schedule Updating: Revise the construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.
- I. Attendance by the Contractor is mandatory, whether the meetings are weekly, bi-weekly or at whatever interval is determined by the Architect.
 - 1. Unless given prior approval by the Architect not to attend meetings, Contractor will be fined \$250.00 for each regularly scheduled meeting for which he is not represented by a person in authority who can speak for and/or make decisions for the Contractor.
 - 2. Fine amounts shall be withheld and deducted from the Contract Sum.

END OF SECTION 01200

SECTION 01330 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Sections include the following:
 - 1. Refer to Divisions 02 through 16 Sections for specific requirements for submittals in those Sections.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Architect's responsive action.
- B. Informational Submittals: Written information that does not require Architect's action. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Submittals Schedule: Comply with Contract requirements for list of submittals and time requirements for scheduled performance of related construction activities.
- C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow fourteen (14) days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. The Architect

will advise the Contractor when a submittal being processed must be delayed for coordination.

2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow fourteen (14) calendar days for review of each resubmittal.
4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow twenty-one (21) calendar days for initial review of each submittal.
5. Insert list of submittals below requiring sequential review, or delete and identify submittals in Sections where they are specified. Structural, mechanical, plumbing, and electrical components are examples of the Work that often require sequential review.
6. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow fourteen (14) days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.

D. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 08100.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 08100.01.A).
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Other necessary identification.

E. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.

F. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial

submittal may serve as final submittal.

1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
2. Additional copies submitted for maintenance manuals will be marked with action taken and will be returned.

G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review received from sources other than Contractor.

1. Transmittal Form: Provide locations on form for the following information:

- a. Project name.
- b. Date.
- c. Destination (To:).
- d. Source (From:).
- e. Names of subcontractor, manufacturer, and supplier.
- f. Category and type of submittal.
- g. Submittal purpose and description.
- h. Specification Section number and title.
- i. Drawing number and detail references, as appropriate.
- j. Transmittal number, numbered consecutively.
- k. Submittal and transmittal distribution record.
- l. Remarks.
- m. Signature of transmitter.

2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.

H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked.

I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

1. Use for Construction: Use only final submittals with mark indicating action taken by Architect.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
 - 1. Submit electronic submittals directly to extranet specifically established for Project.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Standard color charts.
 - e. Manufacturer's catalog cuts.
 - f. Mill reports.
 - g. Standard product operation and maintenance manuals.
 - h. Compliance with specified referenced standards.
 - i. Testing by recognized testing agency.
 - j. Application of testing agency labels and seals.
 - k. Notation of coordination requirements.
 - 4. Submit Product Data before or concurrent with Samples.
 - 5. Number of Copies: Submit six copies of Product Data, unless otherwise indicated. Architect will return two copies. Mark up and retain one returned copy as a Project Record Document.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shopwork manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Design calculations.
 - j. Compliance with specified standards.

- k. Notation of coordination requirements.
 - l. Notation of dimensions established by field measurement.
 - m. Relationship to adjoining construction clearly indicated.
 - n. Seal and signature of professional engineer if specified.
- 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
- 3. Number of Copies: Submit six copies where copies are required. Architect will retain two copies; remainder will be returned. Mark up and retain one returned copy as a Project Record Drawing.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
 - 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 - 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of appropriate Specification Section.
 - 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 - 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit two full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
 - 5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

- a. Number of Samples: Submit four sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 - 1. Type of product. Include unique identifier for each product.
 - 2. Number and name of room or space.
 - 3. Location within room or space.
 - 4. Number of Copies: Submit six copies of product schedule or list, unless otherwise indicated. Architect will return two copies.
 - a. Mark up and retain one returned copy as a Project Record Document.
- F. Comply with Contract requirements for "Construction Progress Documentation", "Payment Procedures" and "Payment Procedures."
- G. Subcontractor List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.
 - 4. Number of Copies: Submit six copies of subcontractor list, unless otherwise indicated. Architect will return two copies.
 - a. Mark up and retain one returned copy as a Project Record Document.

2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
 - 1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated.

Architect will not return copies.

2. **Certificates and Certifications:** Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 3. **Test and Inspection Reports:** Comply with requirements specified in Division 01 Section "Quality Requirements."
- B. **Coordination Drawings:** Comply with requirements specified in Division 01 Section 01040.
 - C. **Qualification Data:** Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
 - D. **Welding Certificates:** Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
 - E. **Installer Certificates:** Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
 - F. **Manufacturer Certificates:** Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
 - G. **Product Certificates:** Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
 - H. **Material Certificates:** Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
 - I. **Material Test Reports:** Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
 - J. **Product Test Reports:** Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
 - K. **Research/Evaluation Reports:** Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 1. Name of evaluation organization.
 2. Date of evaluation.
 3. Time period when report is in effect.
 4. Product and manufacturers' names.
 5. Description of product.

6. Test procedures and results.
 7. Limitations of use.
- L. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."
- M. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- N. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- O. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- P. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- Q. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
- R. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
1. Preparation of substrates.
 2. Required substrate tolerances.
 3. Sequence of installation or erection.
 4. Required installation tolerances.
 5. Required adjustments.
 6. Recommendations for cleaning and protection.
- S. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
1. Name, address, and telephone number of factory-authorized service representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.

4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- T. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.
- U. Material Safety Data Sheets (MSDS's): Submit information directly to Owner; do not submit to Architect.
1. Architect will not review submittals that include MSDS's and will return the entire submittal for resubmittal.

2.3 DELEGATED DESIGN

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit three copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW AND GENERAL REQUIREMENTS

- A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been

reviewed, checked, and approved for compliance with the Contract Documents.

- C. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- D. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

3.2 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required and return it. The Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
 - 1. Submittals returned to the Contractor marked "Approved" allow the Contractor to proceed with the work.
 - 2. Submittals returned to the Contractor "Approved as Noted"; "Resubmit For Record":
 - a. Contractor may proceed with work, however noted items by the Architect / Engineer (or any affected portion of the submittal), must be corrected and resubmitted to the Architect's office within ten (10) working days of contractor's receipt of the original submittal. Final acceptance of all work is subject to the Contractor's compliance with requirements of the Contract Documents.
 - 3. Submittals returned marked "Returned for Corrections" require the Contractor to resubmit corrected or alternate data in accordance with the corrections indicated.
 - a. The originals of the reproducible transparencies marked "Returned for Corrections" shall be corrected until approval is obtained. The Contractor shall provide such number of prints of transparencies marked "Approved" as required for the expeditious execution of the work.
 - 4. Submittals returned marked "No Action Taken":
 - a. The Contractor may not proceed with the work. The Architect / Engineer will not review submittals so marked until the Contractor has properly completed the submittal or corrected the reasons stated thereon.
 - b. Reasons for "No Action Taken" on a submittal include, but are not limited to the Contractor's failure to:
 - 1) Submit an approved sub-contractor or supplier.
 - 2) Indicate job specific product data such as catalog number, size, type or material on each submittal.
 - 3) Submit complete data, test reports or similar information as required by the Contract Documents.
 - 4) Obtain prior approval for substitution.
 - 5) Submit documents in a legible or orderly fashion.
 - 6) Adhere to any submittal requirements set forth in the Contract Document.

- 7) Submit only submittals which are called for in the Contract Documents, other submittals will not be reviewed by the Architect / Engineer.

3.3 REQUESTS FOR SUBSTITUTIONS

- A. Unless otherwise indicated in the Contract Documents, substitutions may be considered after the award of Contracts. Subsequent requests will be considered only when, through no fault of the Contractor, none of the specified products are available.
- B. Submission of request for substitution shall constitute a representation by the Contractor that he/she:
 1. Has investigated the proposed product and determined that it is equal to or better than the specified product.
 2. Will provide the same variety for the proposed product as for the specified product.
 3. Will coordinate the installation and make other changes which may be required for the work to be complete in all respects, including:
 - a. Re-design.
 - b. Additional components and capacity required by other work affected by the change.
 - c. Waives all claims for additional costs and time extensions which subsequently may become apparent and which are caused by the change.
 - d. Substitutions will not be considered when acceptance would require substantial revision of the contract documents.
 - e. Substitutions will not be considered when they are indicated or implied on shop drawings or product data submittals without separate written request.
 - f. Substitution requests will not be considered when submitted directly by subcontractor or supplier.
 - g. When the proposed substitution is not accepted, Contractor must provide the product (or one of the products, as the case may be) specified.
 - h. The Contractor will be notified in writing within a reasonable time, verbal acceptance will not be valid.
 - i. Acceptable substitutions will be added to the contract documents by appropriate modifications.
 - j. Requests for substitution will be reviewed by the Architect/ Engineer upon receipt of all the information requested in the following paragraph. Failure to provide the required information shall be cause for rejection of substitution request.
 4. Submittal for Substitutions:

- a. The Contractor shall begin the submission process as soon as possible after the Award Notice, but in no event later than fifteen (15) calendar days after Notice to Proceed.
- b. The Contractor shall sequence and time his submissions in a reasonable and orderly fashion. He/she will allow for sufficient time for the Architect's re-view as well as the transmission of same amongst all project participants.
- c. In the case of color selections, the Contractor is responsible for the completion of all required and related submissions, including samples, prior to the Owner's selection of colors. Exceptions can be made for certain long lead items so identified on the submittal log.
- d. The Contractor shall complete the entire submission process as soon as possible but in no event later than thirty (30) calendar days after Notice to Proceed, unless otherwise authorized by the Architect, Engineer and/or the Owner.
 - 1) Exceptions may be made if so noted on the submission log, with good reason, and subject to the Architect's / Engineer's approval.
 - 2) Upon receipt by the Architect, he will review same and advise the Contractor if the log is acceptable.
 - 3) At no time will the Contractor unduly burden the Architect/Engineer with excessive or unreasonable submittals made at one time.
 - 4) In advertent omission of any required submittal item from the log does not relieve the Contractor of his obligation to make timely submissions of same. The Contractor shall keep his submission log up to date at all times. He will provide an updated copy to the Architect, at any time, upon request.
 - 5) Submit three (3) copies of requests for substitutions, fully identified for product, material or method being replaced by substitution, including related specification section and drawing number(s), and fully documented to show compliance with requirements for substitutions. Submit the following:
 - a) Complete product data, drawings, and descriptions of materials and methods where applicable. Provide manufacturer's name and address, trade name, and model number of product (if applicable), and name of fabricator or supplier (if applicable).
 - b) Samples where applicable or requested.
 - c) Detailed comparison of significant qualities (size, weight, durability, performance and similar characteristics, and including visual effect where applicable) for proposed substitution in comparison with original requirements.
 - d) List, with addresses, of three (3) projects where proposed substitution has been used previously and successfully in a similar application.

- e) Coordination information, indicating every required change in every other element of the work which is affected by substitution, extended to include work by Owner and separate Contractors.
- f) A complete statement of effect substitution will have upon schedule of the work, including its effect (if any) on Contract Time (in comparison with compliance with requirements without approval of proposed substitution).
- g) Cost information, including a proposal of net change in Contract Sum (if any).
- h) Certification by Contractor to the effect that, in his opinion and after his thorough evaluation, proposed substitution will result in total work which is equal to or better than the work originally required by Contract Documents, in every respect of significance except as specifically stated in certification; and that it will perform adequately in application indicated, regardless of equality and exceptions thereto.
- i) Include in certification, Contractor's waiver of rights to additional payment and time which may subsequently be necessitated, by failure of substitution to perform adequately and for required work to make corrections thereof.

5. Approval of Substitutions:

- a. Requests for substitution will be reviewed for compliance with the specifications based upon the data provided by the Contractor. Approval or rejection will be based on samples, technical data and other items submitted and will be reviewed once and only once for each such request.
- b. Change Order Form: Submit requests for substitutions which propose a change in either the Contract Sum or Contract Time by procedures required for change order.

END OF SECTION 01330

SECTION 01400 - MATERIAL TESTING / QUALITY CONTROL SERVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for material testing and quality control services.

- 1. **Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.**

- B. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.

- 1. Quality Control Services is the responsibility of the Contractor.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-control services required by Architect, and the Owner or authorities having jurisdiction are not limited by provisions of this Section.

- C. Related Sections include the following:

- 1. Division 1 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections in AIA Document A201 and Section 01200.
 - 2. Division 1 Section "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.
 - 3. Divisions 2 through 16 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

- A. Quality Control Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Architect

- C. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.4 DELEGATED DESIGN

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

1.5 REGULATORY REQUIREMENTS

- A. Copies of Regulations: Obtain copies of referenced regulations which also available in Local Public Libraries.

1.6 SUBMITTALS

- A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Delegated-Design Submittal: When requirement is indicated in specific technical section and/or when requested by the Architect, in addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.
- C. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Description of test and inspection.
 - 3. Identification of applicable standards.
 - 4. Identification of test and inspection methods.
 - 5. Number of tests and inspections required.
 - 6. Time schedule or time span for tests and inspections.
 - 7. Entity responsible for performing tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.
- D. Reports: Prepare and submit certified written reports that include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.

7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Ambient conditions at time of sample taking and testing and inspecting.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- E. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.7 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
1. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade-union jurisdictional settlements and similar conventions.
- G. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.

1. Preconstruction Testing: Testing agency shall perform preconstruction testing for compliance with specified requirements for performance and test methods.
2. Contractor responsibilities include the following:
 - a. Provide test specimens and assemblies representative of proposed materials and construction. Provide sizes and configurations of assemblies to adequately demonstrate capability of product to comply with performance requirements.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Fabricate and install test assemblies using installers who will perform the same tasks for Project.
 - d. When testing is complete, remove assemblies; do not reuse materials on Project.
3. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect and the Owner with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.8 QUALITY CONTROL

- A. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.
 1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 - a. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- B. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.
- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.

1. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - a. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - b. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 - c. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 - d. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
 - e. Do not perform any duties of Contractor.
2. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
 - a. Access to the Work.
 - b. Incidental labor and facilities necessary to facilitate tests and inspections.
 - c. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 - d. Facilities for storage and field-curing of test samples.
 - e. Delivery of samples to testing agencies.
 - f. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 - g. Security and protection for samples and for testing and inspecting equipment at Project site.
3. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
 - a. Schedule times for tests, inspections, obtaining samples, and similar activities.
4. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for commencement of the Work.

- a. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.
 - 2. Comply with the Contract Document requirements for Division 1 Section "Cutting and Patching."
 - 3. Protect construction exposed by or for quality-control service activities.
 - 4. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01400

SECTION 01410 - REFERENCES AND INDUSTRY STANDARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The work of this Section applies to all Construction Contract Documents including drawings, Division 1 - Miscellaneous Requirements Sections, and Specifications Sections included in Part-2 through Part-6.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved:" The term "approved," when used to convey Architect's action on Contractor's submittals, applications, and requests, is limited to Architect's duties and responsibilities.
- C. "Directed:" Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by Architect, requested by Architect, and similar phrases.
- D. "Indicated:" The term "indicated" refers to graphic representations, notes, or schedules on Drawings or to other paragraphs or schedules in Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference.
- E. "Regulations:" The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish:" The term "furnish" means to supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install:" The term "install" describes operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide:" The term "provide" means to furnish and install, complete and ready for the intended use.
- I. "Installer:" An installer is the Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
- J. The term "experienced," when used with an entity, means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction, subject to verification by and approval of the Architect.
 - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name,

such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

- K. "Project site(s)" is the space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.
- C. Conflicting Requirements: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.
 - 1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.
- D. Copies of Standards: Each entity engaged in construction on Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source and make them available on request.
- E. Abbreviations and Acronyms for Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale Research's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S." .

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01410

SECTION 01505 - TEMPORARY FACILITIES

1.1 RESPONSIBILITIES OF CONTRACTOR

A. Contractor is responsible for the following temporary facilities and services:

1. Installation, operation, maintenance and removal of each temporary facility usually considered as its own normal construction activity.
2. Plug in electric cords, extensions cords, supplementary plug in task lighting and special lighting necessary exclusively for his/ her own activities.
3. His/Her own storage and fabrication sheds.
4. All hoisting requirements for his/her work.
5. Collection and disposal of their own debris, hazardous, unsanitary or other harmful waste material from their operations, on a daily basis to trash receptacles, hoppers, containers, dumpsters, etc. furnished by the Contractor. In addition, refer to Section 01524 Construction Waste Management.
6. The secure lockup of his/her own tools, materials and equipment.
7. Construction aids and miscellaneous services and facilities necessary exclusively for his/her own construction activities.
8. Temporary storage provisions for work, including offsite provisions, if required.
9. Containerized bottled drinking water units for his/her personnel.
10. Fire protection provisions related to work including fire extinguishers.
11. All personnel safety equipment and provisions for his/her personnel.
12. Temporary insulated enclosure of the building, when required.
13. Environmental protections.
14. Dust and fume control
15. Other temporary facilities and services stated as their responsibility elsewhere in the Project Documents.
16. Temporary toilets in sufficient quantity to suit project needs and including disposable supplies.

1.2 COMPRESSED AIR

A. Contractor shall furnish his own equipment and energy source to provide compressed air required for the completion of work under his/her contract.

1.3 REMOVAL AND RESTORATION OF TEMPORARY FACILITIES

- A. At the completion of the work prior to final payment, Contractor shall remove temporary facilities and work which he has been responsible. Refer to section 01700 for additional requirements.

1.4 UTILITY CONSUMPTION

- A. The Owner shall be responsible and pay all utility costs for electric and water consumption during the construction period.

END OF SECTION 01505

SECTION 01524 - CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.
- B. Related Sections include the following:
 - 1. All of Division 1 and attached specifications and drawings that make a part of this contract.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

1.4 SUBMITTALS

- A. Waste Management Plan: Submit 4 copies of plan within 30 days of date established for the Notice to Proceed.
- B. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- C. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

- D. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- E. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 1. Review methods and procedures related to waste management including, but not limited to, the following:
 - 1. Review and discuss waste management plan.
 - 2. Review requirements for documenting quantities of each type of waste and its disposition.
 - 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - 5. Review waste management requirements for each trade.

1.6 WASTE MANAGEMENT PLAN

- A. General: Develop plan consisting of waste identification, and waste reduction work plan. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing, and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - 1. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 2. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.

3. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
4. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
5. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement waste management plan as approved by Owner / Architect. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 1. Comply with Division 1 Section "Temporary Facilities" for operation, termination, and removal requirements.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 1. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 2. Comply with Division 1 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Sale and Donation: Not permitted on Project site.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.

- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 3. Stockpile materials away from construction area.
 4. Store components off the ground and protect from the weather.
 5. Remove recyclable waste off Owner's property and transport to recycling receiving or processor.

3.4 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 2. Polystyrene Packaging: Separate and bag materials.
 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Wood Materials:
1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.

3.5 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

- B. Burning: Do not burn waste materials on site.
- C. Burying: Do not bury waste materials on site.
- D. Disposal: Transport waste materials off Owner's property and legally dispose of them.
- E. Washing waste materials into sewers or drains is not permitted.

END OF SECTION 01524

SECTION 01600 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The work of this Section applies to all Construction Contract Documents including drawings, Division 1 - Miscellaneous Requirements Sections, and Specifications sections included in Part-2 through Part-6.

1.2 SUMMARY

- A. Section Includes:
 - 1. General product requirements, including:
 - a. General specification requirements for all products.
 - b. General requirements and procedures for maintenance materials and tools.
 - 2. General requirements for product documentation, including:
 - a. Requirements and procedures for schedule of products.
 - b. General requirements for operation and maintenance data.
 - 3. General procedures for products including:
 - a. Procedures for transportation and handling.
 - b. Procedures for delivery and receiving.
 - c. Procedures for storage.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Components required to be supplied in quantity within a specification section shall be identical, interchangeable, and made by the same manufacturer.
- B. Do not use products removed from existing construction.

2.2 MAINTENANCE MATERIALS AND TOOLS

- A. Maintenance Materials: Parts and materials for repair and maintenance; specific items required are specified in product sections.
 - 1. Provide products and tools which are identical to those used in the work; if necessary to obtain identical items, order at the same time as products to be installed or tools to be used in the work.
- B. Package appropriately and label to show type and quantity of contents.

- C. Deliver, handle, and store in the same manner as products to be installed.
- D. Do not turn over to the Owner until date of substantial completion, unless otherwise approved by the Owner.
- E. Deliver to the Owner; unload.
- F. Obtain receipt prior to final payment.

PART 3 - EXECUTION

3.1 PRODUCTS

- A. It is the Contractor's responsibility to select products which comply with the contract documents and which are compatible with one another, with existing work, and with products selected by other Contractors.
 - 1. Verify that electrical characteristics of products are compatible with electrical systems; notify architect of all discrepancies.
 - 2. Where visual matching to an established physical sample is required, the Architect's decision will be final.
- B. Do not use any substitute products which have not been approved in accordance with the requirements of the contract documents.
- C. Where the specification is silent on whether substitutions will be considered, substitutions will be considered only when submitted in accordance with specification section 00800.
- D. Products Specified by Reference Standard: Use any product meeting the specification. Provisions of reference standards shall not modify the responsibilities of the Owner or Architect as defined in the contract documents.
- E. Products Specified by Performance Requirements: Use any product meeting the specification.
- F. Products Specified to Match a Physical Sample: Use any product that matches; obtain the Architect's approval.
- G. Products Specified by Listing a Brand Name Product(s) made by listed Manufacturer(s) as the "Basis of Design":
 - 1. Pursuant to N.J.S.A. 18A:18A-15(d) indicated basis of design brand name product(s) or equivalent made by one of the manufacturers listed will be acceptable and as determined by the Architect.
- H. Products Specified by Listing Brand Name Product(s) Accompanied by Language Indicating that Substitutions Are Allowed: Provide a product meeting the specification; submit substitution request for any brand-name product, that is not listed, in accordance with section 00800.

- I. Products Specified by Listing Manufacturer(s): Provide a product meeting the specification and made by one of the manufacturers listed. Approval of substitutions will be in accordance with section 00800.

3.2 SCHEDULE OF PRODUCTS

- A. Prepare a complete schedule of products used, including the following for each product:
 1. Manufacturer's name.
 2. Brand or trade name.
 3. Model number, if applicable.
 4. Reference standard, if more than one is applicable.
 5. Arrange products in the schedule by specification sections; indicate paragraph where specified.
- B. Prepare and submit a preliminary schedule within 15 working days after award of contract; resubmit when revised; submit final schedule prior to final payment. See additional requirements and milestone dates in section 01800.
- C. Schedule of products shall not be used to obtain approval of substitute products; make separate request for substitution.

3.3 OPERATION AND MAINTENANCE DATA

- A. Provide operation and maintenance data as specified in individual product sections.
 1. Provide data sufficient for operation and maintenance by Owner without further assistance from the manufacturer.
 2. Provide completed data in time for use during Owner instruction.
- B. Data Required For Products - General:
 1. Name of manufacturer and product.
 2. Name, address, and telephone number of subcontractor or supplier.
 3. Local source of replacements.
 4. Local source of replaceable parts and supplies.
- C. Product Data: Where product data is specified for inclusion in operation and maintenance data, provide manufacturer's data sheets marked to indicate specific product and product options actually installed; delete inapplicable data.
- D. Project Record Documents: Provide an additional copy of applicable record documents for inclusion with the operation and maintenance data.
- E. Coordination Drawings: When coordination drawings are prepared, include a copy with the operating and maintenance data.

- F. Custom Manufactured Products: Provide all information needed for reordering.
- G. Finish Materials: Manufacturer's product data, color/texture designations, and manufacturer's instructions for care, cleaning, and maintenance.
- H. Products Exposed to Weather and Products for Moisture Protection: Manufacturer's product data, recommended inspection schedule and procedures, maintenance and repair procedures, and maintenance materials required.
- I. Equipment: Provide at least the following information:
 - 1. Product data giving equipment and function description, with normal operating characteristics and limiting conditions.
 - 2. Starting, operating, and troubleshooting procedures.
 - 3. Cleaning and maintenance requirements and procedures.
 - 4. External finish maintenance requirements.
 - 5. List of maintenance materials required.
 - 6. List of special tools required.
 - 7. Parts list: List all replaceable parts, with ordering data.
 - 8. Recommended quantity of spare parts to be maintained in storage.
- J. Systems: Provide overall function description, with diagrams, prepared especially for this project.
- K. Form of Data: Prepare data in the form of an instructional manual.
 - 1. Arrange contents logically, using section numbers and sequence of sections indicated on the table of contents of this project manual.
 - 2. When multiple volumes are used, arrange by related subjects; identify contents in cover title.
 - 3. Assemble into 3-ring binders with maximum 2-inch ring size.
 - a. Hardback, cleanable plastic covers.
 - b. Identify each book with title "Operation and Maintenance Instructions" and project name.
 - c. Page size 8-1/2 by 11 inches, maximum.
 - d. Prepare special typewritten data on minimum 20-pound paper.
 - e. Provide tabbed divider for each product and system.
 - f. Drawings: Bind in with other data; provide reinforced binding edge; fold larger drawings to size of pages.
 - 1) Do not use pockets or loose drawings.
 - 4. Provide table of contents for each volume listing:
 - a. Name of the project.
 - b. Name, address, telephone number, and contact name of:
 - 1) Architect.
 - 2) Contractor.
 - c. Index of products and systems included in volume.

3.4 TRANSPORTATION AND HANDLING

- A. Require supplier to package finished products in a manner which will protect from damage during shipping, handling, and storage.
- B. Transport products by methods which avoid damage.
- C. Deliver in dry, undamaged condition in manufacturer's unopened packaging.
- D. Provide equipment and personnel adequate to handle products by methods which prevent damage.
- E. Provide additional protection during handling where necessary to prevent damage to products and packaging.
- F. Lift large and heavy components at designated lift points only.

3.5 DELIVERY AND RECEIVING

- A. Arrange deliveries of products to allow time for inspection prior to installation.
- B. Coordinate delivery to avoid conflict with the work and to take into account both the conditions at the site and the availability of personnel, handling equipment, and storage space.
- C. Clearly mark partial deliveries to identify contents, to permit easy accumulation of entire delivery, and to facilitate assembly.
- D. Promptly inspect shipments and remedy damage, incorrect quantity, incompleteness, improper or illegible labeling, and noncompliance with requirements of contract documents and approved submittals.

3.6 STORAGE

- A. No indoor storage areas are available on site.
- B. General Storage Procedures:
 - 1. Store products immediately on delivery.
 - 2. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible.
 - 3. Store in a manner to prevent damage to the stored products and to the work.
 - 4. Store moisture-sensitive products in weathertight enclosures.
 - 5. Store indoors if necessary to keep temperature and humidity within ranges required by manufacturer.
 - 6. Store unpacked and loose products on shelves, in bins, or in neat groups of like items.

7. Arrange storage to provide access for inspection and inventory.
 8. Periodically inspect and remedy damage and noncompliance with required conditions.
- C. Loose Granular Materials: Store on solid surfaces in well-drained area; prevent mixing with foreign materials.
- D. Exterior Storage:
1. Cover products subject to weather damage with impervious sheet covering; provide ventilation to avoid condensation.
 2. Provide surface drainage to prevent runoff or ponded water from damaging stored products.
 3. Prevent damage and contamination from refuse and chemically injurious materials and liquids.
 4. Store fabricated products on substantial platforms, blocking, or skids above the ground, sloped to drain.

END OF SECTION 01600

SECTION 01700 - PROJECT CLOSEOUT DOCUMENTS AND PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The work of this Section applies to all Construction Contract Documents including drawings, Specifications, Division 1 - Miscellaneous Requirements Sections, and Specification Sections included in Part-2 through Part-6.

1.2 SUMMARY

- A. Section Includes:
 - 1. Maintenance of Project Record Documents,
 - 2. Record drawings, including As-Built drawings,
 - 3. Record project manual (specifications),
 - 4. Operation and Maintenance Manuals,
 - 5. Warranties,
 - 6. Extra Materials,
 - 7. Submittals required prior to requesting for determining dates of substantial and final completion, and also prior to release of final payment(s),
 - 8. Transmittal of Closeout Project Documents to the Owner,
 - 9. Instructions of Owner's personnel,
 - 10. Final Cleaning.
- B. GENERAL REQUIREMENTS
 - 1. All submittals shall indicate reference to the appropriate Architect's Project Number.
- C. As-Built Drawings:
 - 1. Full-size paper set.
 - 2. Two (2) CD-Roms.

1.3 MAINTENANCE OF PROJECT RECORD DOCUMENTS

- A. Do not use record documents of any type for construction purposes.
- B. Maintain record documents in a secure location at the site while providing for access by the Contractor and the Architect during normal working hours; store in a fire-resistive room or container outside of normal working hours.
- C. Record information as soon as possible after it is obtained.
- D. Assign a person or persons responsible for maintaining record documents.
- E. Record the following types of information on all applicable record documents:
 - 1. Dimensional changes.
 - 2. New and revised details.
 - 3. Actual routing of piping and conduit.

4. Revisions to electrical circuits.
5. Actual equipment locations.
6. Sizes and routing of ducts.
7. Locations of utilities concealed in construction.
8. Particulars on concealed products which will not be easy to identify later.
9. Changes made by modifications to the contract; note identification numbers if applicable.
10. New information which may be useful to the Owner, but which was not shown in either the contract documents or submittals.

1.4 RECORD AND AS-BUILT DRAWINGS

- A. During the progress of the installation, the Contractor shall keep a careful record of all changes and variations in the arrangement of his work from the layout shown on the Contract Drawings in order that the Owner may be provided with a complete set of all plans (As-Built) showing the work as actually installed.
 1. The Contractor shall maintain complete two (2) sets of opaque prints of the contract drawings, marked to show changes which occur due to his work.
 2. Where the actual work differs from that shown on the drawings, mark this set to show the actual work.
 3. Mark location of concealed items before they are covered by other work.
 4. Mark either record contract drawings or shop drawings, whichever are best suited to show the change.
 5. Where changes are marked on record shop drawings, mark cross-reference on the applicable contract drawing.
 6. When the Contractor is required by a provision of a modification to prepare a new drawing, rather than to revise existing drawings, obtain instructions from the Architect as to the drawing scale and information required.
 7. Keep drawings in labeled, bound sets.
 - a. Mark with red pencil.
 - b. Mark work of separate contracts with different colors of pencils.
 8. Incorporate new drawings into existing sets, as they are issued.
 9. Where record drawings are also required as part of operation and maintenance data submittals, make copies from the original record drawing set.
 10. As-Built Drawing Format to be submitted to the Architect:
 - a. One (1) complete, legible full-size paper (hard copy) As-Built drawing set with the following information on each page:
 - 1) Note: "As-Built" drawing,
 - 2) Contractor's Firm name,
 - 3) Date.

- b. Two (2) copies, pdf format CD-Rom, scanned As-Built drawings of the hard copy furnished to the Owner (indicated above) shall be furnished to the Owner and the Architect and as directed by the Architect.
- 11. Mechanical/ Electrical As-Built drawings must be submitted to the Engineer with a copy of the transmittal to the Architect. Approval must be obtained before issuing Final Certificate of Payment.
- B. Record drawings shall be provided for **all work** including but not limited to the following:
 - 1. General Construction Work
 - 2. Plumbing and Drainage Work
 - 3. HVAC Work
 - 4. Electrical Work

1.5 PROJECT SPECIFICATION MANUAL

- A. The Contractor shall maintain a complete copy of the project specification manual, marked to show changes which occur due to his work.
- B. Where the actual work differs from that shown in the project manual, mark the record copy to show the actual work.
 - 1. Include a copy of each addendum and modification to the contract.
 - 2. In addition to the types of information required on all record documents, record the following types of information:
 - a. Product options taken, when the specification allows more than one.
 - b. Product substitutions.
 - c. Proprietary name and model number of actual products furnished, for each product, material, and item of equipment specified.
 - d. Name of the supplier and installer, for each product for which neither a product data submittal nor a maintenance data submittal was specified.

1.6 OPERATION AND MAINTENANCE MANUALS

- A. Assemble a complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:
 - 1. Operation Data:
 - a. Emergency instructions and procedures.
 - b. System, subsystem, and equipment descriptions, including operating standards.
 - c. Operating procedures, including startup, shutdown operations.
 - d. Description of controls and sequence of operations.
 - e. Piping diagrams.
 - 2. Maintenance Data:
 - a. Manufacturer's information, including list of spare parts.

- b. Name, address, and telephone number of Installer or supplier.
 - c. Maintenance procedures.
 - d. Maintenance and service schedules for preventive and routine maintenance.
 - e. Maintenance record forms.
 - f. Sources of spare parts and maintenance materials.
 - g. Copies of warranties and bonds.
- B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL", Project name, and subject matter of contents.
- C. Operation and Maintenance Manuals must be submitted to the engineer with a copy of the transmittal to the Architect. Approval must be obtained before issuing Final Certificate of Payment.

1.7 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

1.8 SUBMITTAL REQUIREMENTS - SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, final certifications, and similar documents.

4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, and similar final record information.
 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 8. Complete startup testing of systems.
 9. Submit test/adjust/balance records.
 10. Terminate and remove temporary facilities from Project site, along with construction tools, and similar elements.
 11. Advise Owner of changeover in heat and other utilities.
 12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 13. Complete final cleaning requirements, including touch-up painting.
 14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.9 SUBMITTAL REQUIREMENTS - FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
1. Submit a final Application for Payment according to the requirements of the Contract Documents.
 2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified

copy of the list shall state that each item has been completed or otherwise resolved for acceptance and signed by Contractor.

3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Provide statement signed by Owner's representatives stating that they have received required training.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected. The cost of additional inspections required by the Architect or his consultants due to Contractor's failure to complete the punch list will be paid by the Contractor and will be deducted from the Contractor's final payment.
- C. The Contractor is required to obtain all final releases from governmental and regulatory agencies having jurisdiction over the project with the assistance from the Architect / Engineer and Owner (if required).

1.10 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit three copies of list to the Architect. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order, **starting with exterior areas first and proceeding from lowest floor to highest floor**, as applicable.
 2. Organize items applying to each space by major element, including categories for ceilings, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.

1.11 PROJECT RECORD DOCUMENTS

- A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

- B. Record Drawings: Maintain and submit one set of blue - or black-line white prints of Contract Drawings and Shop Drawings.
1. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
 - a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
 - b. Accurately record information in an understandable drawing technique.
 - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 - d. Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.
 2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
 3. Mark important additional information that was either shown schematically or omitted from original Drawings.
 4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
 5. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.
- C. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Note related Change Orders, Record Drawings and Product Data, where applicable.
- D. Record Product Data: Submit one copy of each Product Data submittal. Mark one set to indicate the actual product installation where installation varies substantially from that indicated in Product Data.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, Record Drawings, and Record Specifications, where applicable.
- E. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1.12 DEMONSTRATION AND TRAINING

- A. Instruction: Instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
1. Provide instructors experienced in operation and maintenance procedures.
 2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
 3. Schedule training with Owner, through Architect, with at least seven calendar days advance notice.
 4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.
- B. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections. For each training module, develop a learning objective and teaching outline. Include instruction for the following:
1. System design.
 2. Review of documentation.
 3. Operations.
 4. Adjustments.
 5. Troubleshooting.
 6. Maintenance.
 7. Repair.

1.13 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
1. Refer to other Division 1 - specification sections for additional cleaning as required and where applicable.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Clean transparent materials, including mirrors and glass windows. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - j. Remove labels that are not permanent.
 - k. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - (1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - l. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - m. Replace parts subject to unusual operating conditions.
 - n. Plumbing Work Subcontractor shall clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - o. Heating, Ventilating Work Subcontractor shall clean exposed surfaces of diffusers, registers, and grills.

- p. Electrical Work Subcontractor shall clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
- q. Leave Project clean and ready for occupancy.
- r. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

1.14 TRANSMITTAL TO OWNER

- A. Collect, organize, label, and package ready for reference.
 - 1. Provide cardboard file boxes for submittals.
 - 2. Provide cardboard drawing tubes with end caps for transparencies.
 - 3. Bind print sets with durable paper covers.
 - 4. Label each document (and each sheet of drawings) with "PROJECT RECORD DOCUMENTS - This document has been prepared using information furnished by _____" [insert the contractor's name], and the date of preparation.
- B. Submit to the Architect for transmittal to the Owner, unless otherwise indicated.

1.15 REMOVE TEMPORARY FACILITIES

- A. At the completion of the work prior to final payment, remove all temporary facilities entirely from the site, including, but not limited to, the following:
 - 1. Trailers, temporary toilets, temporary enclosures, dust barriers and other temporary protection devices.

1.16 SUBMITTALS REQUIRED PRIOR TO FINAL PAYMENT

- A. Contractor must satisfy all requirements of sections 01700 and 01900 prior to submitting for Final Payment. Submittals required prior to final payment shall be in accordance with "Checklist" include, but are not limited to, the following items:
 - 1. Completed Operations Insurance Certificate - ACORD Form.
 - 2. Affidavit of Payment of Debts and Claims - AIA Document G706.
 - 3. Affidavit of Release of Liens - AIA Document G706A.
 - 4. Consent of Surety Company to Final Payment - AIA Document G707.
 - 5. Certification of Wages in accordance with New Jersey Prevailing Wage Act, N.J.S.A. 34:11-56.25.

6. 10% one year Maintenance Bond.
7. Manufacturers' product warranties (two original signed copies), Special written guarantees and warranties, maintenance warranty, etc. in accordance with Section 01900, various specification sections and the table of contents of the Project Manual. This is in addition to the one-year guarantee covered by the Maintenance Bond and in addition to the Contractor's one-year guarantee.
 - a. Guarantee shall be signed and sealed by Officer of the Contracting Firm and shall be notarized.
8. Project Record Drawings, (As-Built Drawings), Record Specifications, Record Product Data, and Miscellaneous Record Submittals.
 - a. **Note: As-Built Drawings shall be submitted to the Engineer(s).**
9. Operation and Maintenance Manuals and Instructions.
 - a. **Note: Operation and Maintenance Manuals shall be submitted to the Engineer(s).**
10. Balancing Reports for Heating, Ventilating systems.
11. Certificate of Occupancy / Copies of all Building Department inspection approvals.
12. In accordance with requirements of N.J.S.A. 52:32-44. Contractor must submit accurate list of all subcontractors and suppliers. Contractor must provide a certification that all proofs of business registration for all subcontractors and suppliers are maintained on his file.
13. All approvals and final releases from governmental and regulatory agencies have jurisdiction including, but not limited to: NJDCA, NJDEP, etc., as required.

END OF SECTION 01700

SECTION 01800 - TIME OF COMPLETION AND LIQUIDATED DAMAGES

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes the requirements for completion of interim milestone events and final completion of all work required by the contract documents.
- B. Related Sections:
 - 1. Items of Work attached to the "Certificate of Substantial Completion" and establishing "Final Completion Time" as per section 00800.
- C. This section also establishes the relation of liquidated damages for failure to complete the interim milestone events or final completion requirements within the time requirements stated herein.

1.2 TIME FOR COMPLETION AND LIQUIDATED DAMAGES

- A. It is understood that the Contractor has responsibility to complete its work in sequence with the work of the subcontractors and to allow the other subcontractors access to the work site so that it may complete its work within the times established.
- B. Completion of the Contract Work by the Contractor shall be time of the essence.
- C. The Contractor shall work overtime, additional shifts, weekends or holidays to complete the work on time with no additional cost to the Owner.
 - 1. Scarce resources will be no excuse for not completing the work on time.
 - 2. **The Armory is closed every other Friday. The exact schedule will be made available to all contractors when the schedule is formalized.**
 - 3. **The Contractor shall include the cost of any premium time shift work which may be required in their bid.**
- D. Substantial or final completion of the work shall include, but is not limited to final inspection and acceptance by the Local Building Officials.
- E. **Milestone No. 1**
 - 1. Sign Contract, no later than **twenty (20) calendar days** from **Notice of Award**. **Notice of Award on or about November 12, 2013.**
 - 2. Contractor submits Bonds and Insurance **ten (10) calendar days** from **Notice of Award**.
 - 3. **Notice to Proceed** shall take place within **three (3) business days** of date of signing Contract. **Notice to Proceed on or about December 4, 2013.**

F. **Milestone No. 2**

1. **Time Critical submittals** for special equipment, fixtures, etc. shall be submitted within **twenty (20) calendar days from Notice to Proceed.**
2. Liquidated Damages - \$500.00 / Calendar day of delay.

G. **Milestone No. 3**

1. Submission of all remaining technical shop drawing submittals shall be submitted within **forth-five (45) calendar days from Notice to Proceed.**
2. Liquidated Damages - \$500.00 / Calendar day of delay.

H. **Milestone No. 4**

- a. Physical work at the site shall commence on or about **December 9, 2013.**

I. **Milestone No. 5**

1. Substantial Completion of the entire project shall be on or before **(120 Calendar Days from the Notice to Proceed), April 2, 2014.**
2. Liquidated Damages - \$500.00 / Calendar day of delay.

J. **Milestone No. 6**

1. Final Completion of all Work including punch list items and closeout documents, no later than **(30 Calendar Days from Substantial Completion), May 1, 2014.**
2. Liquidated Damages - \$500.00 / Calendar day of delay.

K. In accordance with N.J.S.A. 18A:18A-19, the Owner shall deduct from the Contract Price, for any wages paid by the Owner to any inspector or inspectors necessarily employed by for the work of this project, for any number of days in excess of the number of days or indicated dates allowed in milestones above. Such sums shall be part of the Liquidated Damages indicated herein after.

L. The Liquidated Damages set for above shall be in addition to other consequential losses or damages the Owner may incur by reason of such delay, such as, but not limited to, the cost of additional architectural and engineering services resulting from the delay, additional costs to the Owner for payments to other Contractors resulting from delay, including acceleration costs by other contractors to recover the defaulting contractor's delay.

M. The said Liquidated Damages are fixed and agreed upon by and between the Contractor and the Owner because of the impracticality and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, and said amounts shall be retained from time to time by the Owner for the current periodical payments.

1. The Liquidated Damages set for above are intended to compensate Owner for loss of use during the period of delay, for other delay during construction which may result further delay in substantial and/or final completion dates and for any acceleration costs

by other contractors to recover the defaulting contractor's delay.

2. In no way shall costs of Liquidated Damages be construed as a penalty to the Contractor.
- N. The Owner shall have the right to deduct the total amount any Liquidated Damages for which the Contractor may be liable from any monies otherwise due the Contractor, including any retainage under control of the Owner.
- O. The surety upon the Performance Bond furnished by the Contractor shall be liable for any such Liquidated Damages for the Contractor may be liable, to the extent that the Contractor shall not make settlement therefor with the Owner.

END OF SECTION 01800

SECTION 01900 - GUARANTEES AND WARRANTIES

PART 1 - GENERAL

1.1 ALL CONTRACTS

- A. Period for all guarantees and warranties shall commence at date of substantial completion for the entire project, as determined by the Architect.
- B. The Contractor's guarantee on all work, covered by Maintenance Bond **One (1) Yr.**
 - 1. The Maintenance Bond shall represent a continuing obligation of the Prime Contractor and his Subcontractor(s) to repair/replace defective materials and/or labor of products installed in the project for one (1) year from the date of Substantial Completion.
- C. Provide all required warranties indicated in specification sections which include but not limited to the following:

1.2 GENERAL CONSTRUCTION WORK

- A. Agreement to Maintain Roofing
 - 1. Roofing Contractor shall agree to maintain the roof systems and related roof sheet metal work in a weathertight and watertight condition for a period of **five (5) years** starting from the date of Owner's acceptance in accordance with special Maintenance Contract outlined herein.
 - 2. During the Maintenance Period, the Roofing Contractor agrees that within 24 hours of receipt of notice from the Owner he will inspect and make immediate emergency repairs to defects or to leaks in the roof systems and related flashing work. He further agrees that within a reasonable time, he will restore the affected items to the standard of the original specifications. All emergency and permanent work during the life of the agreements to maintain the roof systems will be done without cost to the Owner, except in the event it is determined that such leaks were caused by abuse, lightning, hurricanes, tornado, hailstorm, other unusual climatic phenomena of the elements, or failure of related work (except related roof sheet metal work included under the Agreement) installed by other parties.
 - 3. Agreement to maintain roofing system shall be in a written form acceptable to the Owner.
- B. Joint Sealers as specified in Section 07900 **Five (5) Yrs.**
 - 1. Special Installer's Warranty: Written warranty, signed by Installer agreeing to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - a. Warranty Period: **Five (5) years** from date of Substantial Completion.
 - 2. Special Manufacturer's Warranty: Written warranty, signed by elastomeric sealant manufacturer agreeing to furnish elastomeric joint sealants to repair or replace those

that do not comply with performance and other requirements specified in this Section within specified warranty period.

- a. Warranty Period: **Five (5) years** from date of Substantial Completion.
- b. Submit two (2) copies of written guarantee for all sealant work of this section signed by the Contractor and the sealant manufacturer for a period of **five (5) years** from the date of acceptance by the Owner.
- c. Guarantee shall further state that all exterior sealant will be guaranteed against:
 - 1) Adhesive or cohesive failure in joints where movement is under maximum 25% extension or compression.
 - 2) Any crazing greater than 3 mils in depth developing on surface of material.

C. Wood Doors as specified in Section 08211 **Life of Installation.**

1. Submit written agreement in door manufacturer's standard form signed by the manufacturer and contractor, agreeing to repair or replace defective doors which have warped (bow, cup or twist) or which show photographing of construction below its face veneers, or do not conform to tolerance limitations of NWMA.
2. The warrant shall also include refinishing and reinstallation as may be required due to repair or replacement of defective doors.

D. Finish Hardware as specified in Section 08700.

1. Guarantee workmanship and material provided against defective manufacture. Repair or replace defective workmanship and material appearing within period of **one (1) year** after substantial completion.
2. Provide **twenty-five (25) year** factory warranty on door closers against defects in material and workmanship from date of occupancy of project.
3. Provide **five (5) year** factory warranty on exit devices, locksets and overhead stops against defects in material and workmanship from date of occupancy of project.

E. Acoustical Ceilings and Suspension System as specified in Section 09510 ... **Thirty (30) Yrs**

1. Special Manufacturer's Warranty: Written warranty, signed by the ceiling manufacturer agreeing to furnish ceiling materials and replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
2. Warranty Period: **Thirty (30) year** System Performance Guarantee against visible sag, Mold/Mildew and Bacteria Growth.

F. Solid Plastic Toilet and Bath Partitions as specified in Section 10161.... **Twenty-five (25) Yrs.**

1. Submit manufacturer's written guarantee to the Architect and the Owner which guarantees its plastic against breakage, corrosion and delamination under normal conditions for **twenty-five (25) years** from date of receipt by the customer. If

materials are found to be defective during that period for reasons listed above, the materials will be replaced free of charge (labor not included in warranty).

G. Metal Lockers as specified in Section 10500 **Lifetime.**

1. The manufacturer warrants to the Owner that all items pertaining to the lockers shall be free of defective material or faulty workmanship for the **life of the product** when used in accordance with the manufacturer's specification and/or operating instructions.
 - a. This warranty applies to the original purchaser only.
 - b. Warranty excludes consequential, incidental or any other damages directly or indirectly resulting from failure or loss of use of products.

H. Toilet and Bath Accessories as specified in Section 10800.

1. Hand Dryer - Dyson Airblade: Manufacturer's standard warranty from date of substantial completion:
 - a. **Five (5) years** on parts.
 - b. **One (1) year limited** - labor.
2. Washroom Accessories: Warranty is limited to replacing or repairing, at the manufacturer's option, transportation charges prepaid by the purchaser, any washroom accessory unit or part thereof which their inspection shall show to have been defective within the limitation of the warranty. Period of warranty is measured from the date of their invoice as follows:
 - a. Complete unit (except mirrors) - **One (1) year**.
 - b. Stainless Steel Mirror Frames - **Fifteen (15) years** - against corrosion.
 - c. Plate Glass Mirrors - **Fifteen (15) years** - against silver spoilage.
 - d. Tempered Glass Mirrors - **Five (5) years** - against silver spoilage.
 - e. Laminate Glass - **Five (5) years** - against silver spoilage.
 - f. Hand Dryers - **Ten (10) years**.
 - g. Polished #8 Architectural Grade Finish on 304 Series Stainless Steel - **One (1) year** against corrosion.
 - h. Bright Annealed Finish on 430 Series Stainless Steel - **One (1) year** against corrosion.

* Warranty does not cover installation labor charges and does not apply to any units which have been damaged by accident, abuse, improper installation, improper maintenance, or altered in any way.

1.3 PLUMBING & DRAINAGE WORK

A. Permanent Plumbing and Drainage components **One (1) Yr.**

1. Unconditional guarantee, in writing, all materials, equipment and workmanship for a period of one (1) year from date of acceptance.

1.4 HEATING, VENTILATING AND AIR CONDITIONING WORK

A. Permanent Heating System components. **One (1) Yr.**

1. Provide a written guarantee on all equipment, materials and work required for operation of the permanent heating ventilating and air conditioning system by the Owner, starting from date of substantial completion of the project.

1.5 ELECTRICAL WORK

- A. Permanent Electrical System Work components **One (1) Yr.**

1. Unconditional guarantee, in writing, all materials, equipment and workmanship for a period of one (1) year from date of acceptance.

END OF SECTION 01900

TECHNICAL SECTIONS

SECTION 02070 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

- A. Extent of selective demolition work is indicated on drawings.
- B. Types of Selective Demolition Work: Demolition requires the selective removal and subsequent offsite disposal of the following:
 - 1. Portion(s) of building structure, indicated on drawings and as required, to accommodate new construction.
 - 2. Removal of interior partition(s), as indicated on drawings.
 - 3. Removal of doors, as indicated on drawings.
 - 4. Removal and salvage of wood door frames / trim and door hardware, as indicated on drawings.
 - 5. Removal of existing concrete slab on wire lath of Second Floor Men's Shower Room, as indicated on the drawings.
 - 6. Removal and salvage of ceramic tile, as indicated on drawings.
 - 7. Removal of metal toilet partitions, as indicated on drawings.
 - 8. Removal and salvage of marble toilet partitions, wood toilet stall doors and all associated hardware, as indicated on drawings.
 - 9. Removal of plumbing fixtures, as indicated on drawings.
 - 10. Removal of electrical fixtures and devices, as indicated on drawings.
 - 11. Removal of toilet accessories, as indicated on drawings.
 - 12. Other removals, as indicated on drawings.
 - 13. Removal and protection of existing fixtures and equipment items indicated as "salvage".
- C. Removal Work Specified Elsewhere:
 - 1. Limited roofing removal is specified in Division 7.
 - 2. Cutting non-structural concrete floors and masonry walls for above grade piping, conduit, and ducts, is included with the work of the respective mechanical and

electrical Divisions 15 and 16 specification sections.

3. Removal of asbestos containing materials, as indicated on USA Environmental drawings and specifications.

D. Related Work Specified Elsewhere:

1. Remodeling construction work and patching is included within the respective sections of specifications, including removal of materials for re-use and incorporated into remodeling or new construction.

1.3 SUBMITTALS

- A. Proposed Demolition Activities: Submit schedule indicating proposed methods and sequence of operations for selective demolition work to Owner's Representative for review prior to commencement of work. Provide starting and ending dates for each activity as appropriate.

1. Include coordination for shut-off, capping, and continuation of utility services as required, together with details for dust and noise control protection.
2. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.
3. Sequence construction so as to minimize obstruction of exits and provide temporary alternate exits, as required by authorities having jurisdiction.
4. Coordinate with Owner's continuing occupation of portions of existing building, and with Owner's reduced usage during summer months.

- B. Photographs: Photograph existing conditions of structure, surfaces, equipment or surrounding properties which could be misconstrued as damage resulting from selective demolition work; file with Owner's Representative prior to starting work.

C. Project Record Documents:

1. Indicate unanticipated structural, electrical, or mechanical conditions.

1.4 JOB CONDITIONS

- A. Occupancy: Owner will be continuously occupying areas of the building immediately adjacent to areas of selective demolition. Conduct selective demolition work in accordance with the Phasing Plan and in a manner that will minimize need for disruption of Owner's normal operations. Provide minimum of 72 hours advance notice to Owner of demolition activities which will severely impact Owner's normal operations.

- B. Condition of Structures: Owner assumes no responsibility for actual condition of items or structures to be demolished.

1. Conditions existing at time of commencement of contract will be maintained by Owner insofar as practicable. However, variations within structure may occur by Owner's removal and salvage operations prior to start of selective demolition work.

- C. Protections: Provide temporary barricades and other forms of protection as required to protect Owner's personnel and general public from injury due to selective demolition work.
 - 1. Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to and from occupied portions of building.
 - 2. Protect existing finish work, from being damaged during the project, which is to remain in place and becomes exposed during demolition operations.
 - 3. **Protect floors with suitable coverings, as necessary, to not damage the existing ceramic tile flooring to remain during demolition and new construction work.**
 - 4. Construct temporary insulated solid dustproof partitions, where required, to separate areas where noisy or extensive dirt or dust operations are performed. Equip partitions with dustproof doors and security locks, if required.
 - 5. Remove protections at completion of work.
- D. Damages: Promptly repair damages caused to adjacent facilities by demolition work at no cost to Owner.
- E. Traffic: Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
 - 1. Do not close, block or otherwise obstruct streets, walks or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- F. Explosives: Use of explosives will not be permitted.
- G. Utility Services: Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.
 - 1. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.
- H. Environmental Controls: Use temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION

3.1 INSPECTION

- A. Prior to commencement of selective demolition work, inspect areas in which work will be performed.
 - 1. **Photograph existing conditions of structure, surfaces, equipment or surrounding properties which could be misconstrued as damage resulting from selective demolition work; file with Owner's Representative prior to starting work.**
 - 2. Commencement of work shall constitute acceptance of conditions. Any necessary remedial work required to correct any unsatisfactory conditions, found after the start of installation, will be provided at no cost to the Owner.
 - 3. Prior to the commencement of work review the demolition activities with the Owner's representatives and Architect to identify additional salvage items requested by the Owner.

3.2 PREPARATION

- A. Provide interior shoring, bracing, or support to prevent movement, settlement or collapse of structures to be demolished and adjacent facilities to remain.
 - 1. Cease operations and notify the Owner's Representative immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.
- B. Cover and protect furniture, equipment and fixtures to remain from soiling or damage when demolition work is performed in rooms or areas from which such items have not been removed.
- C. Erect and maintain dust-proof partitions and closures as required to prevent spread of dust or fumes to occupied portions of the building.
 - 1. Where selective demolition occurs immediately adjacent to occupied portions of the building, construct dust-proof partitions of minimum 4" studs, 5/8" drywall (joints taped) on occupied side, 1/2" fire-retardant plywood on demolition side, and fill partition cavity with sound-deadening insulation.
 - 1. Provide weatherproof closures for exterior openings resulting from demolition work.
- D. Locate, identify, stub off and disconnect utility services that are not indicated to remain.
 - 1. Provide by-pass connections as necessary to maintain continuity of service to occupied areas of building. Provide minimum of 72 hours advance notice to Owner if shut-down of service is necessary during change-over.

3.3 DEMOLITION

- A. Perform selective demolition work in a systematic manner. Use such methods, as required, to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.

1. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.
 - a. The Contractor shall use caution when cutting into existing masonry walls (Single wythe or cavity wall construction) as there may be undocumented utilities within the cavity or built into the cores of cmu wall construction. The Contractor shall pay for restoring / repairing the existing work if utilities are cut and proper selective demolition investigation work was not performed. Refer to Section 01050.
 2. Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors or framing.
 3. Provide services for effective air and water pollution controls as required by authorities having jurisdiction.
 4. For interior slabs on grade or supported, use removal methods that will not crack or structurally disturb adjacent slabs or partitions. Use power saw where possible.
- B. If unanticipated mechanical, electrical or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Owner's Representative / Architect in written, accurate detail. Pending receipt of directive from Owner's Representative / Architect rearrange selective demolition schedule as necessary to continue overall job progress without delay.

3.4 SALVAGE MATERIALS

- A. Salvage Items: Where indicated on Drawings as "Salvage-Deliver to Owner", carefully remove indicated items, clean, package, store and turn over to Owner and obtain receipt.
1. Unless otherwise indicated all materials, items, equipment, etc. resulting from demolition work shall be removed from the site at the Contractor's expense.
- B. Historic artifacts, including cornerstones and their contents, commemorative plaques and tablets, antiques, and other articles of historic significance remain the property of the Owner. Notify Owner's Representative if such items are encountered and obtain acceptance regarding method of removal and salvage for Owner.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove debris, rubbish and other materials resulting from demolition operations from building site. Transport and legally dispose of materials off site.
- B. If additional undocumented hazardous materials are encountered during demolition operations, notify the environmental consulting engineer and the General Contractor's abatement contractor immediately, comply with applicable regulations, laws, and ordinances concerning removal, handling and protection against exposure or environmental pollution.
- C. Burning of removed materials is not permitted on project site.

3.6 CLEAN-UP AND REPAIR

- A. Upon completion of demolition work, remove tools, equipment and demolished materials from site. Remove protections and leave interior areas broom clean.
- B. Repair demolition performed in excess of that required. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition work. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

END OF SECTION 02070

SECTION 02821 - REMOVAL AND DISPOSAL OF ASBESTOS-CONTAINING MATERIALS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Section, apply to this Section.

1.2 CONTRACTOR REQUIREMENTS AND QUALIFICATIONS

- A. All work involving the removal and disposal of asbestos-containing materials shall be accomplished by a State of New Jersey, Department of Labor and Workforce Development, licensed Asbestos Abatement Contractor.
- B. Bidders for contracts exceeding \$20,000 must be prequalified by the State of New Jersey, Department of the Treasury, Division of Property Management and Construction for C-092 Asbestos Removal/Treatment and with the State of New Jersey, Schools Development Authority for Asbestos Removal/Treatment.
- C. All employees shall possess and maintain on their person a valid asbestos worker or supervisor certification issued by the State of New Jersey, Department of Labor and Workforce Development, while working on this project.
- D. The Contractor shall furnish evidence that each worker and supervisor has been given medical examinations and respiratory fit tests within the previous twelve months in accordance with United States Department of Labor, Occupational Safety and Health Administration (OSHA) 29 CFR 1910 and 29 CFR 1926 requirements.
- E. The Contractor shall be responsible for securing the work area(s) at the end of the shift, and all on-site waste containers/dumpsters. In addition, failure to comply with all site health and safety requirements, these Technical Specifications, and all applicable local, State and Federal regulations will require issuance of a Stop Work order by the Owner's Representative.
- F. Prior to commencement of work, the Contractor shall inspect areas in which work is to be performed. Prepare a listing of damage to structure, surfaces, equipment or of surrounding properties which could be misconstrued as damage resulting from the work. Photograph or videotape existing conditions as necessary to document conditions. Submit a copy of these photos or tapes to the Owner's Representative prior to starting work.
- G. All electrical connections, except to outlets and extension cords, will require the Contractor to utilize a licensed Electrician.
- H. In buildings required by the Uniform Construction Code (UCC) to be of noncombustible construction, all materials used to construct separation barriers must meet the UCC, building subcode requirements for that building. Polyethylene sheeting shall be a nominal six (6) mil and must be flame resistant.

1.3 NOTIFICATIONS

- A. Send written notification as required by USEPA, National Emission Standards for Hazardous Air Pollutants (NESHAP), Asbestos Regulations (40 CFR, Part 61, Sub-part M), to the regional asbestos NESHAP Contact at least 10 business days prior to beginning any work on asbestos-containing materials. Send notification to the following address for REGION 2, as applicable:

1. United States Environmental Protection Agency- Region 2
Division of Enforcement and Compliance Assistance
Air Compliance Branch (DECA-ACB)
290 Broadway - 21st Floor
New York, NY 10007-1866

Send written notifications to the State Agencies listed, as applicable:

2. New Jersey Department of Environmental Protection
Division of Solid and Hazardous Waste
P.O. Box 414
Trenton, NJ 08625-0414
3. New Jersey Department of Community Affairs
Division of Codes and Standards
Asbestos Safety Unit
101 South Broad Street
P.O. Box 816
Trenton, NJ 08625-0816
4. New Jersey Department of Health and Senior Services
Indoor Environments Program
Consumer and Environmental Health Services
P.O. Box 360
Trenton, NJ 08625-0360
5. New Jersey Department of Labor & Workforce Development
Division of Public Safety & Occupational Safety & Health
Asbestos Control & Licensing Section
1 John Fitch Plaza
P.O. Box 949
Trenton, NJ 08625-0949

1.4 CONTRACTOR SUBMITTALS

- A. The Asbestos Abatement Contractor shall submit the following information to the Owner's representative prior to mobilization at the worksite:
1. Notification forms submitted to State and Federal agencies;
 2. Written description of emergency procedures to be followed in case of injury or fire. Include information regarding evacuation procedures, source of medical assistance and procedures to be used by medical personnel;

3. Inspection report of existing site conditions;
 4. Supervisor's license;
 5. Worker's license;
 6. Telephone numbers and locations of emergency response personnel;
 7. Written Respiratory Protection Program and proof of OSHA compliance with 29 CFR 134;
 8. Notarized certification signed by an officer of the abatement company that personnel exposure measurements, medical surveillance and worker-training records are maintained in conformance with 29 CFR 1926;
 9. Material Safety Data Sheets (MSDS) for all chemical agents brought onto the site.
- B. After completion of work on this project the Asbestos Abatement Contractor shall submit the following information to the Owner:
1. Daily activity reports and personnel sign-in sheets
 2. Minutes of meetings
 3. Visitations; authorized and unauthorized
 4. Special or unusual events
 5. Waste material disposal manifests

1.5 DEFINITIONS

- A. The following words, terms and abbreviations, when used in this section, shall have the following meanings unless the context clearly indicates otherwise.
1. Abatement - Procedures to control fiber release from asbestos-containing materials; which include removal, encapsulation, enclosure, repair, demolition and renovation activities.
 2. Airlock - A serial arrangement of rooms whose doors are spaced a minimum of four (4) feet apart so as to permit ingress or egress through one (1) room without interfering with the next and constructed in such a manner as to prevent or restrict the free flow of air in either direction.
 3. Air Monitoring - The process of measuring the fiber content of a known volume of air collected during a specific period of time. The procedure utilized for asbestos follows the NIOSH Method 7400. For clearance air monitoring, electron microscopy methods may be utilized for lower limits of

detection and specific fiber identification.

4. Amended Water - Water to which a surfactant has been added.
5. Asbestos - The asbestiform varieties of serpentinite (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite, anthophyllite, and actinolite-tremolite. For purposes of determining respiratory and worker protection both the asbestiform and non- asbestiform varieties of the above minerals and any of these materials that have been chemically treated and/or altered shall be considered as asbestos.
6. Asbestos-Containing Material (ACM) - Material composed of asbestos of any type and in an amount greater than 1% by weight, either alone or mixed with other fibrous or non-fibrous materials.
7. Asbestos-Containing Waste Materials - Any material that is or suspected of being or any material contaminated with an asbestos-containing material, which is to be removed from a work area for disposal.
8. Authorized Personnel - The Owner, the Owner's representative, Asbestos Abatement Contractor personnel, Asbestos Safety Control Monitor personnel, emergency personnel, or a representative of any Federal, State or local regulatory agency or other personnel under contract for or having jurisdiction over the project.
9. Barrier - Any surface that seals off the work area to inhibit the movement of fibers.
10. Breathing Zone - A hemisphere forward of the shoulders with a radius of approximately 6 to 9 inches.
11. Building Owner - The Owner or his authorized representative.
12. Category I Non-friable ACM - Asbestos-containing packing, gaskets, resilient floor covering and asphalt roofing products containing more than one (1) percent asbestos as determined using the method specified in appendix A, subpart F, 40 CFR part 763, section 1, Polarized Light Microscopy.
13. Category II Non-friable ACM - Any material, excluding Category I non-friable ACM, containing more than 1 percent asbestos as determined using the methods specified in appendix A, subpart F, 40 CFR part 763, section 1, Polarized Light Microscopy that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.
14. Ceiling Concentration - The concentration of an airborne substance that shall not be exceeded.
15. Clean Room - An uncontaminated area or room which is a part of the worker decontamination enclosure system with provisions for storage of worker's street clothes and clean protective equipment.

16. Contractor - The Asbestos Abatement Contractor licensed by the State of New Jersey, Department of Labor.
17. Critical Barrier - Two layers of nominal six (6) mil polyethylene sheeting that completely seals off the work area to prevent the distribution of fibers to the surrounding area, such as the opening between the top of a wall and the underside of ceiling construction, electrical outlets, non-removable lights, HVAC systems, windows, doorways, entranceways, ducts, grilles, grates, diffusers, wall clocks, speaker grilles, floor drains, sink drains, etc.
18. Curtained Doorway - A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms, typically constructed by placing three (3) weighted overlapping sheets of plastic over an existing or temporarily framed doorway, securing each along the top of the doorway, securing the vertical edge of the two outer sheets along one vertical side of the doorway and securing the vertical edge of the middle sheet along the opposite vertical side of the doorway. Other effective designs are permissible.
19. Decontamination Enclosure System - A series of connected rooms, separated from the work area and from each other by air locks, for the decontamination of workers and equipment.
20. Disposal Bag - six (6) mil thick leak-tight plastic bags used for transporting asbestos waste from work and to disposal site. Each is labeled as follows:

**DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
AVOID BREATHING AIRBORNE ASBESTOS FIBERS
AND
ASBESTOS, NA2212, RQ
AND
CLASS 9 LABEL**

The Contractor shall also label all disposal bags and/or containers with the name of the waste generator (Owner) and the location from which the waste was generated; all in accordance with the USEPA NESHAPS regulation - 40 CFR Part 651, Subpart M.

21. Encapsulant - A liquid material which can be applied to asbestos-containing material which controls the possible release of asbestos fibers from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant).
22. Encapsulation - The application of an encapsulant to asbestos-containing materials to control the release of asbestos fibers into the air.

23. Filter - A media component used in respirators to remove solid or liquid particles from the inspired air.
24. Flame-Resistant Polyethylene Sheeting - A single polyethylene film in the largest sheet size possible to minimize seams, nominal six (6) mil thick, conforming to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-Resistant Textiles and Films.
25. Friable Asbestos Material - Material that contains more than 1% asbestos by weight and that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.
26. HVAC - Heating, Ventilation and Air Conditioning system.
27. HEPA Filter - A High Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97% of asbestos fibers greater than 0.3 microns in length.
28. HEPA Filter Vacuum Collection Equipment (or vacuum cleaner) - High efficiency particulate air filtered vacuum collection equipment with a filter system capable of collecting and retaining asbestos fibers. Filters should be of 99.97% efficiency for retaining fibers of 0.3 microns or larger.
29. Negative Pressure - Air pressure lower than surrounding areas, generally caused by exhausting air from a sealed space (work area).
30. Negative Pressure Respirator - A respirator in which the air pressure inside the respirator inlet covering is positive during exhalation in relation to the air pressure of the outside atmosphere and negative during inhalation in relation to the air pressure of the outside atmosphere.
31. Negative Pressure Air Filtration Device (AFD) - A local exhaust system device, utilizing HEPA filtration capable of maintaining a negative pressure inside the work area and a constant air flow from adjacent areas into the work area and exhausting that air outside the work area.
32. Owner's Representative(s) - USA Environmental Management, Inc., represented on-site by an Industrial Hygiene Technician (IHT) for all non-permitted work and an Asbestos Safety Technician (AST), certified by the New Jersey Department of Community Affairs, for all permitted work. The IHT/AST shall ensure compliance with these Technical Specifications; all applicable local, State and Federal Regulations.
33. Personal Monitoring - Sampling of the asbestos fiber concentrations within the breathing zone of an employee.
34. Prior Experience - Experience required of the contractor on asbestos projects of similar nature and scope to insure capability of performing the asbestos

abatement in a satisfactory manner. Similarities shall be in areas related to material composition, project size, abatement methods required, number of employees and the engineering, work practice and personal protection controls required.

35. Regulated Asbestos-Containing Material (RACM) - (a) Friable asbestos material, (b) Category I Non-friable ACM that has become friable, (c) Category I Non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or (d) Category II Non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.
36. Removal - The stripping of any asbestos-containing materials from surfaces or components of a facility.
37. Renovation - Altering in any way one or more facility components. Operations in which load-supporting structural members are wrecked or taken out are excluded.
38. Respirator - A device designed to protect the wearer from the inhalation of harmful atmospheres.
39. Shower Room - A room between the clean room and the equipment room in the worker decontamination enclosure with hot and cold or warm running water controllable at the tap and suitably arranged for complete showering during decontamination.
40. Surfactant - A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.
41. Time Weighted Average (TWA) - The average concentration of a contaminant in air during a specific time period.
42. Visible Emissions - Any emissions containing particulate asbestos material that are visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.
43. Water Column (w.c.) - A unit of measurement for pressure differential.
44. Wet Cleaning - The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops or other cleaning utensils that have been dampened with amended water or diluted removal encapsulant and afterwards thoroughly decontaminated or disposed of as asbestos contaminated waste.
45. Work Area - Designated rooms, spaces, or areas of the project in which asbestos abatement actions are to be undertaken or which may become contaminated as a result of such abatement actions. A contained work area

is a work area that has been sealed, plasticized and equipped with a negative pressure air-filtration system.

46. Worker decontamination enclosure - A decontamination system consisting of a clean room, a shower room, and an equipment room separated from each other and from the work area by airlocks and curtained doorways. This system is used for all worker entrances and exists to and from the work area and for equipment pass out for small jobs.

1.6 CODES & STANDARDS RELATIVE TO ASBESTOS ABATEMENT

- A. Except to the extent that more explicit or more stringent requirements are written directly into the Contract Documents, all applicable codes, regulations and standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies are bound herewith.
- B. The Contractor shall assume full responsibility and liability for the compliance with all applicable Federal, State, and local regulations pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable federal, state and local regulations. The Contractor shall hold the Owner and the Owner's representative harmless for failure to comply with any applicable work, hauling, disposal, safety, health or other regulation on the part of himself, his employees, or subcontractors.
- C. State of New Jersey requirements which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:

1. Asbestos Licenses and Permits

New Jersey Department of Labor & Workforce Development
Division of Public Safety & Occupational Safety & Health
Asbestos Control & Licensing Section
1 John Fitch Plaza
P.O. Box 949
Trenton, NJ 08625-0949

2. Asbestos Hazard Abatement Sub-code - N.J.A.C. 5:23-8

New Jersey Department of Community Affairs
Division of Codes and Standards
Asbestos Safety Unit
101 South Broad Street
P.O. Box 816
Trenton, NJ 08625-0816

3. Asbestos Training Courses - N.J.A.C. 8:60 and 12:120

New Jersey Department of Health and Senior Services
Indoor Environments Program

Consumer and Environmental Health Services
P.O. Box 360
Trenton, NJ 08625-0360

4. Disposal Regulations - N.J.A.C. 7:26

New Jersey Department of Environmental Protection
Division of Solid and Hazardous Waste
P.O. Box 414
Trenton, NJ 08625-0414

D. Standards which apply to asbestos abatement work of hauling and disposal of asbestos waste materials include but are not limited to the following:

1. American National Standards Institute (ANSI)
25 West 43rd Street, 4th floor
New York, NY 10036

- *Fundamentals Governing the Design and Operation of local Exhaust Systems Publication Z9.2-79.*
- *Practices for Respiratory Protection Publication Z88.2-80.*

2. American Society for Testing and Materials (ASTM)
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959

- *Safety and Health Requirements Relating to Occupational Exposure to Asbestos E 849-82.*
- *Specification for Encapsulants for Friable Asbestos Containing Building Materials Proposal P-189.*

1.7 OCCUPIED BUILDING CONTINGENCY OPERATIONS

This section covers the responsibilities of the Owner, Contractor and Asbestos Safety Control Monitor for the safe performance of asbestos abatement activities conducted in occupied facilities.

- A. The Building Owner shall notify building occupants in writing 20 business days prior to the commencement of an asbestos abatement project. The Building Owner shall outline in writing any procedures and/or precautions that are deemed necessary in order to protect the health, safety and welfare of the occupants. This notification shall include, but not be limited to: relocation plans, if any; entrances and exits that may be temporarily blocked and alternate routes to be used and the name and telephone number of the Owner's representative for the occupant to call in case of an emergency or to answer any questions with regard to the project. This notification shall accompany the application for a construction permit for asbestos abatement and shall be on file with the enforcing agency.
- B. This notification shall also be posted seven (7) days prior to the preparation of the work area, in visible locations, for the benefit of the affected occupants of the work place, and in areas immediately adjacent to the asbestos abatement project. It shall

be the Owner's responsibility to ensure that these postings are maintained throughout the project.

1.8 OCCUPIED BUILDING CONTINGENCY PLAN

An Occupied Building Contingency plan during abatement shall be implemented as described below. These are the minimum requirements which shall be enforced by asbestos safety control monitors. These requirements shall not limit the asbestos safety control monitors from instituting additional requirements, if necessary, for the protection of the building occupants.

- A. The Contractor shall be required to maintain a negative pressure differential of 0.05" w.c. If the pressure drops below 0.05 inches w.c., the following procedures shall be implemented:
 - 1. The Asbestos Safety Technician and the Contractor supervisor shall investigate and evaluate the engineering controls to determine the source of the pressure loss.
 - 2. The Contractor shall institute corrective action such as: additional sealing, critical barrier maintenance and construction, changing of exhaust unit filters, adjustment of make-up air, operation of additional exhaust units or other necessary measures to reestablish an acceptable pressure differential.
- B. If the pressure differential drops below 0.01 inches w.c., the following procedures shall be implemented:
 - 1. The Contractor shall cease abatement activity in the work area.
 - 2. The Asbestos Safety Control Monitor shall notify the building Owner to evacuate the pressurized space(s). The pressurized space(s) shall include all space outside the work area which is pressurized to maintain the required pressure differential relative to the work area and is isolated from the rest of the building in terms of air flow. The pressurized space may include the entire building exclusive of the work area or any part of the building that is pressurized to isolate it from the work area.
 - 3. The Asbestos Safety Technician and the Contractor Supervisor shall investigate and evaluate the engineering controls and determine the source of the pressure loss.
 - 4. The Contractor shall institute corrective action such as: additional sealing, critical barrier maintenance and construction, changing of exhaust unit filters, adjustment of make-up air, operation of additional exhaust units or other necessary measures to reestablish an acceptable pressure differential.
 - 5. Re-occupancy on any given day/shift shall not be permitted in any area unless a pressure differential of 0.05 inches w.c. or greater is reestablished.
 - 6. If a pressure differential of 0.05 inches w.c. or greater is not reestablished

within 24 hours of the first reading below 0.01 inches w.c., then the building shall be evacuated.

C. If air levels exceed 0.010 f/cc, the following procedures shall be implemented:

1. The Asbestos Safety Technician and the Contractor supervisor shall investigate and evaluate the engineering controls to determine the source of the high air level.
2. An additional/second PCM air sample shall be taken. The additional/second PCM sample may be split, and if the result of the air sample is less than or equal to 0.010 f/cc the contingency plan is terminated. If the result of the air sample exceeds 0.010 f/cc, the Contractor, in consultation with the asbestos safety control monitor, shall choose the option of cleaning and retesting by PCM analysis or analyzing the split sample by TEM analysis. If the result of the TEM analysis exceeds 0.010 f/cc, then cleaning shall be undertaken.
3. The decision as to the timing of the cleaning activity shall be made by the asbestos safety control monitor firm in consultation with the building Owner and the Contractor.
4. Cleaning shall include, but not limited to, wet wiping and misting the air. Cleaning the affected area shall be continued outside of containment and PCM sampling shall also be continued until the result in the area is equal to or less than 0.010 f/cc by PCM analysis.
5. If laboratory analysis of air samples does not yield a reading less than or equal to 0.010 f/cc within 24 hours of receipt of the first test result above 0.010 f/cc, then the building shall be evacuated.
6. Re-occupancy shall not be permitted in any area where PCM analysis reveals results greater than 0.010 f/cc, unless TEM results indicate asbestos fibers are equal to or less than 0.010 f/cc. In the case of re-occupancy, all air samples used to make the determination to allow reentry shall be analyzed by an accredited laboratory.

D. If a power outage occurs during active abatement work, the building occupants shall be evacuated until the air samples determine that the occupied spaces are safe, and power has been restored. If a power outage occurs when the building is unoccupied, occupancy will not be permitted until air samples determine that the spaces to be occupied are safe and power has been restored.

E. Security shall be required as follows:

1. The Owner shall be responsible to provide access to and to close the building each day of the intended work, The Contractor shall be responsible to ensure protection against damage or vandalism to separation barriers, engineering systems, monitoring devices, work-related equipment or any other equipment.

- F. The Owner shall provide continuous unlimited access for the asbestos safety technician in all occupied spaces for installation, maintenance, and data collection from monitoring systems.

PART 2 – SCOPE OF WORK

2.1 SUMMARY OF WORK

This section covers the furnishing of all labor, materials, facilities, equipment, services, permits and agreements necessary to perform the work required for asbestos abatement in accordance with these Technical Specifications, United States Environmental Protection Agency (USEPA) and OSHA regulations, NIOSH recommendations, State of New Jersey regulations and other applicable federal, state and local government regulations. Wherever there is a conflict or overlap of the above references the most stringent provisions shall apply. It shall be the Contractor's responsibility to verify exact quantities and locations of all asbestos-containing materials. The quantities shown are for informational purposes only. It is USA Environmental Management, Inc., understanding that the Contractor has verified the materials and quantities to be removed under this scope of work and has priced the work accordingly.

2.2 DESCRIPTION OF THE WORK

All work shall be conducted within the DMAVA Vineland Facility Main Armory Building in association with the Toilet Room Renovations. The DMAVA Vineland Facility is located at 2560 South Delsea Drive, Vineland, New Jersey.

- A. The Contractor shall remove and dispose of:

1. Approximately 25 linear feet of asbestos-containing pipe insulation as noted on the Contract Drawings included with this section using the "wrap and cut" abatement methods. The material is located within a finished wall chase. The Contractor shall be responsible for opening the wall chase while under containment to access the ACM. Contractor shall use extreme care while opening the wall chase, as repair of the finished chase wall to match existing finishes is required at the completion of this work.
2. Approximately nine (9) linear feet of asbestos-containing pipe insulation using limited containment glove bag method. The material is located above the exposed ceiling line. Contractor shall be responsible to repair all exposed ends of the asbestos pipe insulation that will remain in place with wettable cloth. Contractor shall reinsulate all abated piping.

- B. Refer to the Contract Drawings for the approximate quantities and location of all asbestos-containing materials to be removed, within the scope of this Contract. Please keep in mind that all quantities noted are approximate and the contractor shall be responsible to verify quantities noted.

2.3 ADDITIONAL INFORMATION

- A. The Contract Drawings are designed to compliment the Technical Specifications. Wherever conflicts arise between the Contract Drawings and the Technical Specifications, the more stringent shall apply.
- B. Prepare all asbestos-containing materials for transportation and disposal in accordance with NEHAPS, OSHA and the United States Department of Transportation (USDOT) asbestos waste handling requirements.
- C. The Contractor shall be aware that electrical, communication, other utility lines and HVAC duct systems may exist in proximity to some locations where asbestos-containing material is to be removed. The Contractor shall exercise caution with his/her activities during preparation, removal, clean-up and final cleaning operations associated with asbestos abatement in these work areas, to prevent damaging said electrical, communication, other utility lines and HVAC ductwork. Where possible, the Contractor shall cautiously move and secure the aforementioned items.
 - 1. Should the Contractor damage any electrical, communication, other utility lines and/or HVAC system components, the Contractor shall be responsible for either the cost to the Owner to repair/replace damaged lines/HVAC system or shall arrange for the lines/HVAC systems to be repaired/replace to the Owner's specifications with no additional cost to the Owner.
 - 2. The Owner shall be the **SOLE** deciding factor as to which option referenced above the Contractor shall implement to repair/replace electrical, communication, other utility lines and/or HVAC system components that is damaged as a result of the asbestos abatement activities in these work area locations.
 - 3. Damage caused by the Contractor to surfaces, finishes and building components shall be restored to their existing conditions, The Contractor shall be responsible for either the cost to the Owner to restore damaged surfaces, finishes and building components or shall arrange for the restoration to the Owner's specifications with no additional cost to the Owner.
- D. The Contractor shall utilize proper protective equipment (PPE) such as safety glasses, disposable gloves, protective suits, safety shoes and HEPA cartridge equipped full-face respirators and other appropriate personal protective equipment when handling asbestos contaminated materials during pre-cleaning activities. The Contractor shall utilize proper PPE, including, but not limited to those items noted above, when complying with any Variance (i.e., electrical) submitted by the ASCM and approved by the State of New Jersey, Department of Community Affairs.
- E. Security shall be required as follows:
 - 1. The Owner shall be responsible to provide access to and to close the building each day of the intended work, The Contractor shall be responsible to ensure protection against damage or vandalism to separation barriers,

engineering systems, monitoring devices, work-related equipment or any other equipment.

- F. The Owner shall provide continuous unlimited access for the IHT/AST in all occupied spaces for installation, maintenance, and data collection from monitoring systems.
- G. The Contractor shall coordinate the location of all waste vehicles with the Owner. The Owner shall approve all locations of waste vehicles prior to the waste vehicle's arrival.

2.4 STANDARD OPERATING PROCEDURES

- A. The Contractor shall develop and implement a written standard operating procedure for abatement work to ensure maximum protection and safeguard from asbestos exposure of the workers, visitors, general public and the environment.
- B. The standard operation procedure shall ensure:
 - 1. Proper protective clothing and respiratory protection prior to entering the work area.
 - 2. Safe work practices in the work place, including provisions for inter-room communications, exclusion of eating, drinking, smoking or breaking of respiratory protection in any way.
 - 3. Packing, labeling, loading, transporting and disposal of asbestos-containing materials in a way that minimizes exposure and contamination.
 - 4. Proper exit practices from the workspace to the outside through the decontamination facility.
 - 5. Emergency evacuation for medical or safety to minimize exposure.
 - 6. Safety from accidents in the work area, especially from electrical shocks, slippery surfaces and entanglements in loose hoses, temporary wiring and other equipment.
 - 7. Provisions for effective supervision and personnel air monitoring during work.
 - 8. Engineering systems that minimize exposure to fibers in the work place.
- C. Perform OSHA 8-hour Time Weighted Average personal exposure air monitoring in accordance with 29 CFR 1926.1101. OSHA monitoring is solely the responsibility of the Contractor, and the Contractor shall ensure that the Contractor's Supervisor performs OSHA monitoring in accordance with 29 CFR 1926.1101. The Owner's Representative is not responsible for the Contractor's compliance with OSHA monitoring.

- D. Provide Personal Protective Equipment (PPE) to the Owner's Representative and inspector's representing Federal, State and local agencies, as required to perform progress inspections of the work.

2.5 NOTIFICATIONS, WARNING SIGNS, LABELS AND POSTERS

- A. At the entrance the work area and/or decontamination unit, the Contractor's ingress/egress point to the building and the exterior door that leads from the exterior of the building for the waste removal route, and all sides of the waste dumpster, post an approximate 20 inch by 14 inch manufactured caution sign displaying the following legend with letter sized and styles of a visibility required by 29 CFR 1926:

**DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED
IN THIS AREA**

- B. Disposal/Waste Bags/Containers shall be labeled as follows:

**DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
AVOID BREATHING AIRBORNE ASBESTOS FIBERS
AND
ASBESTOS, NA2212, RQ
AND
CLASS 9 LABEL**

In addition, the Contractor shall also label all disposal bags and/or containers with the name of the waste generator (Owner) and the location from which the waste was generated; all in accordance with the USEPA NESHAPS regulation - 40 CFR Part 651, Subpart M.

- C. Provide other signs, labels, warnings and posted instructions that are necessary to protect, inform and warn people of the hazard from asbestos exposure. Post in a prominent and convenient place for the workers a copy of the latest applicable regulations from OSHA, USEPA and NIOSH.
- D. Post 10-day Notifications to the USEPA, New Jersey Department of Community Affairs (when applicable), New Jersey Department of Labor and Workforce Development, New Jersey Department of Environmental Protection and New Jersey Department of Health and Senior Services, at the entrance to the work area(s).
- E. Post Construction Permits, if applicable, at the entrance to the work area(s).

2.6 DECONTAMINATION UNITS

- A. Description of Work:

1. Provide personnel decontamination unit for each work area.

B. Personnel Decontamination Unit:

1. Provide a personnel decontamination unit consisting of a serial arrangement of connected rooms or spaces, clean room, shower room and equipment room. Do not allow parallel routes for entry or exit. Provide temporary lighting within decontamination units as necessary to reach a lighting level of 100 foot candles.
2. Clean room: Provide a room that is physically and visually separated from the rest of the building for the purpose of changing into protective clothing.
 - a. Construct using two (2) individual layers of polyethylene sheeting, at least six (6) mil in thickness on all sides.
 - b. Locate so that access to the work area from the changing room is through shower room.
 - d. Separate changing room from the building by a three (3) sheet plastic, weighted, flapped doorway.
 - e. Require workers to remove all street clothes in this room, dress in clean disposable coveralls, and respiratory protective equipment. Do not allow asbestos contaminated items to enter this room. Require workers to enter this room either from outside the structure dressed in street clothes, or naked from the showers.
 - f. Maintain floor of clean room dry and clean at all times. Do not allow overflow water from shower to wet floor in clean room.
 - g. Damp wipe all surfaces twice after each shift change with a disinfectant solution.
 - h. Provide posted information for all emergency phone numbers and procedures.
3. Shower Room: Provide a completely watertight operational shower to be used for transit by cleanly dressed workers heading for the equipment room/work area from the clean room, or for showering by workers headed out of the work area after undressing in the equipment room.
 - a. Construct room by providing a shower pan and shower walls in a configuration that will cause water running down walls to drip into pan.
 - b. Provide a three (3) tier plastic flapped doorway at the entrance to the shower chamber.
 - c. Provide shower head and controls.
 - d. Provide temporary extensions of existing hot and cold water and drainage, as necessary for a complete and operational shower.
 - e. Provide a soap dish and a continuously adequate supply of soap and maintain in sanitary condition.
 - f. Arrange so that water from showering does not splash into the clean or equipment rooms.
 - g. Separate from equipment room by a three (3) sheet plastic,

weighted, flapped doorway.

4. Equipment Room (contaminated area): Require work equipment, footwear and additional contaminated work clothing to be left here. This is a change and transit area for workers.
 - a. Separate this room from the work area by a three (3) sheet plastic, weighted, flapped doorway.
5. Decontamination Sequence: The Contractor shall require that all workers adhere to the following sequence when entering or leaving the work areas.
 - a. Entering Work Area: Worker enters clean room and removes street clothing, puts on clean disposable coveralls and respirator, and passes through the shower room into the equipment room. Any additional clothing and equipment left in equipment room needed by the worker are put on in the equipment room. Worker proceeds to the work area.
 - b. Exiting Work Area: Before leaving the work area, require the worker to remove all gross contamination and debris from coveralls and feet.
 - c. The worker then proceeds to the equipment room and removes all clothing except respiratory protection equipment.
 - d. Extra work clothing such as boots, hard hats, goggles, gloves, etc., are to be stored in the contaminated end of the equipment room.
 - e. Disposable coveralls are placed in a bag for disposal with other material.
 - f. Require that decontamination procedures be followed by all individuals leaving the work area.
 - g. After showering, the worker moves to the clean room and dresses in either new coveralls for another entry or street clothes if leaving.

C. Construction of the Decontamination Units:

1. Walls and Ceiling: Construct airtight walls and ceiling using two (2) layers of polyethylene sheeting, at least six (6) mil in thickness. Attach to existing building elements or a temporary framework.
2. Floors: Use two (2) layers of six (6) mil polyethylene sheeting to cover floors in all areas of the decontamination units.
3. Flap Doors: Fabricate from three (3) overlapping sheets with openings a minimum of four (4) feet wide. Configure so that sheeting overlaps adjacent surfaces. Weigh sheets at bottoms as required so that they quickly close after being released. Put arrows on sheets to indicate direction of overlap and/or travel. Provide a minimum of four (4) feet between entrance and exit of any room.

D. Cleaning of Decontamination Units:

1. Clean debris and residue from inside of decontamination units on a daily

basis or as otherwise indicated. Damp wipe or hose down all surfaces after each shift change. Clean debris from shower pans on a daily basis.

E. Signs:

1. Post an approximately 20" x 14" manufactured caution sign at each entrance to the work areas displaying the following legend with letter sizes and styles of a visibility required by 29 CFR, Part 1926:

Provide signs in both English and Spanish.

LEGEND:

**DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED
IN THIS AREA**

Provide spacing between respective lines at least equal to the height of the respective upper line.

2.7 CONTAINMENT WORK AREA PREPARATION

- A. The Contractor shall ensure all HVAC systems within the proposed work area are shut-down prior to the Contractor commencing with preparation activities, relative to asbestos abatement.
- B. Electric systems within each work area(s) shall be shut-down. If approved by the ASCM, electric systems within the work area may be used if they are ground fault circuit interrupter (GFCI) protected, cleanable and precautions are used to protect the safety of all within the work area. Temporary lighting shall be incorporated in the work area(s), and shall be the responsibility of the Contractor.
- C. The Contractor shall ensure that prior to abatement preparation, all moveable items within each work area(s) have been removed from the work area. Items that cannot be removed from the work area(s) shall be cleaned and sealed airtight with two (2) layers of six (6) mil flame resistant rated polyethylene sheeting. The Contractor shall clean all residual dust and debris from the floor and other horizontal surfaces within each work area using HEPA filter equipped vacuums, prior to the installation of the Full Containment.
- D. The Contractor shall restrict access to the area where abatement is to take place. Construct a separation barrier, as indicated on the Contract drawings, in advance of the start of work. The separation barrier shall consist of a minimum of one-half (1/2) inch plywood on two (2) inch by four (4) inch wood studs spaced sixteen (16) inches on center or one-half (1/2) gypsum board on comparable metal framing. All seams for the separation barrier shall be caulked to render the barrier air tight. The separation barrier shall be covered on both sides with a minimum of two (2) layers of six (6) mil flame resistant polyethylene sheeting. Materials utilized in the construction of the separation barrier shall comply with UCC requirements.

Emergency kick-out panels shall be installed in occupancy barriers where necessary.

- E. The Contractor shall construct a Worker Decontamination Unit contiguous to the work area for use by abatement personnel for personal decontamination.
- F. The Contractor shall install sufficient negative air filtration devices (AFDs) within each work area(s). The AFDs shall be exhausted to the exterior of the building.
 - 1. The Contractor shall install sufficient negative AFDs to supply the asbestos work area with a minimum of four (4) air changes per hour. Calculations shall be derived from field measurements of the installed AFDs on-site, prior to beginning work.
 - 2. The Contractor shall provide HEPA, secondary and pre-filters for all AFDs. All HEPA filters shall not have more than the manufacture's hours of usage time. The pre-filter shall be changed every four (4) hours or sooner as required during abatement.
 - 3. The Contractor shall be responsible for the complete operation and maintenance of the AFDs and components.
 - 4. Mechanically affix all exhaust duct to the AFDs and seal with duct tape. Install AFD units as per design. Exhaust AFDs to the exterior of the building.
 - 5. For full containment – occupied building conditions, the exhaust capacity from the work area shall be sufficient to establish a pressure differential between the work area and all adjacent spaces greater than or equal to 0.05 inches water column ("w.c.).
 - 6. All permitted work being performed in accordance with N.J.A.C. 5:23-8 shall require the Contractor to install a digital manometer that provides a continuous strip chart record. The Contractor shall install the digital manometer(s) near the entrance(s) to the work area and between the work area(s) and any interior spaces from which make-up air is drawn. The exhaust capacity from the work area shall be sufficient as to establish a pressure differential between the work area and all adjacent spaces greater than or equal to 0.05" w.c. The Contractor's supervisor shall be qualified and proficient in both the operation of the manometer unit and in calculating to determine the number of AFDs necessary to achieve and maintain the required 0.05" w.c. in the work area. The Contractor shall be responsible to ensure that the manometer(s) remains functional at all times. The Contractor shall calibrate at the beginning of each shift and ensure manometer(s) have sufficient tape and ink to carryover into the next work day.
- G. Contact the Owner's representative for inspection and approval of the abatement work area prior to commencement of the abatement asbestos-containing materials.
- H. Removal shall commence closest to the decontamination unit.
- I. The Owner's representative shall perform a visual inspection and conduct final

clearance air monitoring of the work area. If analytical results are obtained that are higher than the allowable threshold, the Contractor shall re-clean the work area and the Owner's representative shall re-test the area. This sequence shall be repeated until the final test results are acceptable.

- J. Upon receipt of acceptable final air tests, the Contractor shall demobilize all critical and separation barriers, decontamination unit and engineering controls from the abatement area. All waste containers shall be off-site and en-route to an USEPA ID #27 approved landfill for final disposal.
- K. The Owner's Representative will perform a final visual inspection of the abatement work area, with all waste off the premises. If the inspection is satisfactory, the Contractor shall file for and obtain a Certificate of Occupancy from the local New Jersey Department of Community Affairs for all PERMITTED WORK referenced herein.

2.8 LIMITED CONTAINMENT REQUIREMENTS

A. RELATED DOCUMENTS

- 1. Contract Drawing and General Provisions of Contract, including General and Supplementary Conditions and other Technical Sections, apply to work of this Section.

B. DESCRIPTION OF THE WORK

- 1. This Section describes the procedures to remove asbestos-containing insulating materials utilizing glove bag and wet methods.

C. PRODUCTS

- 1. Amended Water
- 2. Wettable/Adhesive Lagging Cloth
- 3. Encapsulant
- 4. Disposal Bags
- 5. Six (6) mil polyethylene sheeting
- 6. HEPA vacuum
- 7. Duct Tape
- 8. Glove bags

D. GLOVE BAG REMOVAL PROCEDURES:

- 1. The glove bag shall consist of a six (6) mil bag fitted with long sleeve gloves, a tool pouch and a two-inch (2") opening used for water application. In addition to the glove bag, several other tools and materials are required to perform the project. These materials are listed below:
 - a. glove bag(s)
 - b. pump-up garden sprayer (2-3 gallon size)
 - c. amended water (surfactant)

- d. duct tape (3-inch width)
- e. polyethylene disposal bags (6 mil)
- f. smoke tubes with aspiration bulb
- g. HEPA-filtered vacuum cleaner
- h. bone saw or dry wall saw
- i. utility knife with retractable blade
- j. wire cutters
- k. tin snips (if aluminum jacket or bands are present)
- l. polyethylene plastic (roll of 4 or 6 mil)
- m. NIOSH approved HEPA-filtered respirators
- n. disposable full-body suits with hood and foot covering
- o. small scrub brush
- p. stapler
- q. disposable cloths
- r. wettable cloth
- s. asbestos caution signs and labels

2. Preparation Procedures

- a. A minimum of two (2) persons shall be required to perform glove bag work. Each person shall have received training in the proper use of the glove bag.
- b. Before any work begins, all necessary materials and supplies shall be brought to the work area.
- c. The Contractor shall control access to the work area. Only persons necessary for the abatement work shall be permitted in the work area.
- d. Forced-air heating and ventilation systems within the work area shall be turned off and sealed as required. All windows, doors, vent openings, drains or other openings that lead from the work area shall be sealed with a minimum of two (2) thicknesses of six (6) mil polyethylene sheeting. The Contractor shall ensure that all access doors leading from the work area are properly double sealed.
- i. The work area shall be defined as floors, walls, windows, doorways stairwells, chases, or other openings and surfaces within ten (10) feet of the material being removed.
- e. All moveable items and equipment, etc., shall be moved from the immediate area of removal or be properly sealed. Non-removable items shall be individually enclosed with a minimum of two (2) layers of six (6) mil polyethylene sheeting.
- f. A negative air enclosure shall be constructed around each glove bag work area. A hard barrier type negative air enclosure shall be installed in occupied areas.
- g. The Contractor shall establish a "clean" room or area removed from

the adjoining work area where workers can store their personal belongings and change into work clothing at the start of work.

- h. Each worker shall wear two (2) disposable full-body coveralls and, at a minimum, a NIOSH approved dual cartridge respirator equipped with HEPA filter cartridges during actual removal work.

3. Removal Procedures

- a. Check the pipe where the work will be performed. If it is damaged (broken, lagging, hanging, etc.), the pipe shall be wrapped in polyethylene plastic and "candy striped" with duct tape. The Contractor shall take all necessary precautions to ensure that pipe lagging is not jarred loose by the activity. The Contractor shall clean up the floor and other surfaces where debris has accumulated which may contain asbestos. If the pipe is undamaged, one (1) layer of duct tape shall be placed around the pipe on each end where the glove bag will be attached. This shall serve as a surface on which to seal the ends of the glove bag. It shall also function to minimize the chance of releasing fibers when the tape at the ends of the glove bag is peeled off at the completion of the job.
- b. Slit top of the glove bag open (if necessary) and cut down the sides to accommodate the size of the pipe (about two (2) inches longer than the pipe diameter). Install according to manufacturer's instructions.
- c. Place the necessary tools into the pouch located inside the glove bag. Tools shall include bone saw, utility knife, disposable cloths, scrub brush, wire cutters, tin snips and wettable cloth.
- d. One (1) strip of duct tape shall be placed along the edge of the open top slit of the glove bag for reinforcement.
- e. Place the glove bag around the section of pipe to be worked on and staple the top together through the reinforcing duct tape. Staple at intervals of approximately one (1) inch. Next, fold the stapled top flap back and tape it down with a strip of duct tape. An adequate seal shall be provided along the top. Next, duct tape ends of the glove bag to the pipe itself, previously covered with plastic or duct tape.
- f. Using the smoke tube and aspiration bulb, place the tube into the water sleeve (two (2) inch opening to glove bag). By squeezing the bulb, fill the bag with visible smoke. Remove the smoke tube and twist the water sleeve closed. While holding the water sleeve tightly, gently squeeze the glove bag and look for smoke leaking out; especially at the top end of the glove bag. If leaks are found, they shall be taped closed using duct tape and the bag shall be re-tested.
- g. Insert the wand from the water sprayer through the water sleeve. Using duct tape, tape the water sleeve tightly around the wand to

prevent fiber leakage.

- h. One (1) person shall place his hands into the long-sleeved gloves while the second person directs the water spray at the work.
- i. If the section of pipe is covered with an aluminum jacket, or bands, this is removed first using the wire cutters to cut any bands and the tin snips to remove the aluminum. It is important to fold the sharp edges in to prevent cutting the bag when it is placed in the bottom. Use caution to prevent cuts in the bag, the edges are sharp.
- j. With the insulation exposed, using the bone saw, or dry wall saw, cut the insulation at each end of the section to be removed.

NOTE: A bone saw is a serrated heavy-gauge wire with ring-type handles at each end. Throughout this process, water is sprayed on the cutting area to keep dust to a minimum.

- k. Once the ends are cut, the section of insulation should be slit from end to end using the utility knife. The cut should be made along the bottom of the pipe and water continuously supplied. The Contractor shall take adequate care when using the knife so not to puncture the bag. Some insulation may have wire to be clipped as well.
- l. Rinse all tools with water inside the bag and place back into pouch.
- m. The insulation can now be lifted off the pipe and gently placed in the bottom of the bag.
- n. Using the scrub brush, rags and water, scrub and wipe down the exposed pipe.
- o. Wet the donut shaped pieces of wettable cloth over the exposed pipe.
- p. Remove the water wand from the water sleeve and attach the small nozzle from the HEPA-filtered vacuum. Turn on the vacuum only briefly to collapse the bag.
- q. Remove the vacuum nozzle and twist the water sleeve closed and seal with duct tape.
- r. From the outside of the bag, pull the tool pouch away from the bag. Place duct tape over the twisted portion and then cut the tool bag from the glove bag, cutting through the twisted/taped section. In this manner, the contaminated tools may be placed directly into the next glove bag without cleaning. Alternatively, the tool pouch with the tools can be placed in a bucket of water, opened under water, and the tools cleaned and dried without releasing asbestos into the air.

NOTE: Rags and scrub brushes cannot be cleaned in this manner and

should be discarded with the asbestos waste. If more than one (1) adjacent section of pipe is to be removed, the glove bag may be loosened at each end and slid along the pipe to the next section. In this case, the tools would remain in the bag for continued use.

- s. With the removed insulation in the bottom of the bag, twist the bag several times and tape it to keep the material in the bottom during removal of the glove bag from the pipe.
- t. Slip a six (6) mil disposal bag over the glove bag (still attached to the pipe). Remove the tape and open the top of the glove bag and fold it down in the disposal bag.
- u. Encapsulate any exposed end risers or open ends with approved encapsulant as specified and cover with a membrane wrap. Follow manufacturer's instructions for installation.

4. Clean-up Procedures

- a. At the conclusion of removal work, clean all ladders, scaffolds, and other equipment used during removal. These shall be cleaned with disposable wipe cloths wetted with amended water and moved off the plastic.
- b. The protective plastic enclosures shall be dampened with a fine spray of amended water and carefully rolled up, keeping the top surface to the inside. This plastic, along with all wipe cloths, shall be disposed of as contaminated waste and placed into six (6) mil plastic waste bags and properly sealed and labeled.
- c. Similarly, all plastic used to seal doors, windows, vents, or non-removable items shall be wet wiped, removed and disposed of as contaminated waste.
- d. HEPA vacuum and wet clean all surfaces adjacent to the plastic enclosure and wipe all surfaces with disposable cloths. When these surfaces have been allowed to dry, repeat the process described above.
- e. At the conclusion of cleaning activities the worker will carefully remove the outer disposable suit, keeping the outer surface to the inside. This suit is placed into a waste bag for disposal. Decontamination procedures shall be followed.
- f. Using clean, dampened cloths, each worker shall carefully wipe his face, hands and exterior surface of his respirator before leaving the work area and enter the decontamination chamber for proper decontamination and showering.
- g. Asbestos-containing material shall be disposed of as specified.

- h. Personal air sampling shall be conducted in accordance with OSHA regulations by the Contractor for the Contractor's employees.
- i. A visual inspection shall be completed, upon notification to the Owner's representative that the work is finished, thereby allowing for Final Clearance Air Sampling of the work area to commence if all is satisfactory.
- j. Reinsulation of the abated pipes shall be accomplished in accordance with the latest state-of-the-art procedures.

2.9 **"WRAP AND CUT" OF INSULATED PIPE AND PPE FITTINGS PROCEDURES**

- A. All work shall be conducted in strict accordance with applicable federal, state and local regulations and shall be coordinated through the AST/IHT.
- B. Selective demolition to access the material within the permanent wall chase shall be coordinated with the general contractor to insure restoration in accordance with these specifications is conducted as required.
- C. The Contractor shall adequately wet all ACM with amended water and wrap all exposed thermal system insulation with two (2) individual layers of six (6) mil polyethylene sheeting. Each layer shall be sealed with high grade duct tape, and "candy-striped" around the pipe system to generate an air-tight seal.
- D. Upon the wetting, wrapping and sealing of thermal system insulation the Contractor shall cut the pipe at existing openings into manageable sections. These wetted, wrapped and sealed sections shall be properly labeled and disposed of as asbestos waste.
 - 1. Where no openings are present, the Contractor shall perform glove bag abatement to remove approximately three (3) inches of thermal system insulation to facilitate the cutting of the pipe as described.
- E. The Contractor shall remove all asbestos-containing materials from the work site in double six (6) mil polyethylene waste bags or impermeable packages. All asbestos materials shall be adequately wet with amended water using a fine low pressure sprayer or other wetting mechanism. The surfactant used by the Contractor shall be available at all times at the work site. The Contractor shall assure that all asbestos waste materials are sufficiently saturated with amended water to prevent fiber emission and/or visible emissions.
- F. The Contractor shall apply an approved asbestos abatement encapsulant to all surfaces within the work area. The encapsulating agent shall be compatible with and shall not affect the adherence or performance of any replacement materials. In no instance shall latex paint be used or added to an approved encapsulant product.
- G. Critical barriers, decontamination and negative air pressure systems shall remain

operational until final air tests indicate acceptable clearance criteria and authorization to disassemble the containment structure is obtained from the Owner's representative.

- H. All asbestos waste bags, pipe sections and other waste packages shall be labeled with the prescribed Federal OSHA warning signs and shall include site specific waste generator information.
- I. The Contractor shall provide a fully enclosed, watertight waste container complete with a locking device for storage of all contaminated waste removed from the site. The waste container shall have asbestos warning signs affixed to all sides and doors. A perimeter warning band shall be placed near the trailer location and the exterior route of travel during waste transfer activities.
- J. The Contractor shall be responsible for coordination of waste removal immediately upon completion of the project.
- K. Selective demolition to access the material within the permanent wall chase shall be coordinated with the general contractor to insure restoration in accordance with these specifications is conducted as required.

2.10 WORK AREA CLEAN UP

- A. All surfaces and Contractor equipment in the work area(s) shall be cleaned after completion of the removal activities.
- B. All ceiling support system components and other ceiling-mounted, mechanical, electrical equipment etc. left in place in the work area shall be cleaned using a HEPA-filter equipped vacuum and wet cleaned with the water/surfactant mixture.
- C. Walls shall be wet cleaned.
- D. The polyethylene sheeting applied to the walls and floor shall be sprayed with the water/surfactant mixture, rolled up keeping the top surface to the inside and placed into six (6) mil asbestos disposal bags for disposal as asbestos contaminated waste.
- E. Lastly, the walls and floor in the work area shall be cleaned with a HEPA-filter equipped vacuum.
- F. AFDs, critical barriers and decontamination units shall remain. Upon issuance of a satisfactory Clean-up Inspection, the Owner's representative shall proceed with the collection of final clearance air samples.

2.11 ASBESTOS WASTE HANDLING AND DISPOSAL

- A. Disposal bags shall be six (6) mil, leak tight, and labeled in accordance with OSHA, NESHAPS, and the United States Department of Transportation (USDOT) regulations.
- B. Load all asbestos-containing waste material in disposal bags or leak-tight drums. All

materials are to be contained in one (1) of the following:

Two (2), six (6) mil disposal bags, or,
Two (2), six (6) mil disposal bags and a fiberboard drum, or
Two (2), six (6) mil disposal bags, and sealed steel drum.

- C. Two (2) layers of six (6) mil flame resistant polyethylene sheeting shall be utilized for wrapping large components not suited for disposal bags or drums.
- D. Duct tape shall be used to seal disposal bags and wrapped components.
- E. The Contractor's vehicle and/or dumpster shall be lined with a critical barrier of two (2) layers of six (6) mil flame resistant polyethylene sheeting. The Contractor's vehicle and/or dumpster utilized to transport the asbestos waste off-site, and the Waste Hauler shall be licensed by the New Jersey Department of Environmental Protection.
- F. Contractor shall remove waste from work area to waste dumpster only during times of minimum occupancy (i.e., at the end of the work shift when building occupancy is anticipated to be at it's minimum).
- G. Maintain records of waste shipments in accordance with NESHAPS 40 CFR Part 61, section 61.150, (d) 1-5 and (e).
- H. Notify the USEPA ID #27 approved landfill within 10-days prior to transportation of the asbestos-containing waste to the landfill. Provide the name and address of the landfill. Retain manifest from the landfill for all materials disposed. At the completion of asbestos abatement forward all manifests to the Owner.
- I. On-site activities shall not be considered complete until all waste is off-site, upon demobilization of the work area(s), after receipt of satisfactory final clearance air sample results.

PART 3 – AIR MONITORING

3.1 DESCRIPTION OF THE WORK

- A. This Section describes air monitoring to verify that the building beyond the work area and the outside environment remains uncontaminated. This Section also sets forth airborne fiber levels both inside and outside the work area as action levels, and describes the action required by the Contractor if an action level is met or exceeded.
- B. AIR MONITORING REQUIRED BY OSHA IS WORK OF THE CONTRACTOR AND IS NOT COVERED IN THIS SECTION.

3.2 BACKGROUND AIR MONITORING

- A. The Owner's Representative conduct background environmental/daily air

monitoring to detect faults in the work area isolation, such as:

1. Contamination of the building outside of the work area with airborne asbestos fibers,
 2. Failure of filtration or rupture in the differential pressure system,
- B. Should any of the above occur, immediately cease asbestos abatement activities until the fault is corrected. Do not recommence work until authorized by the Owner's Representative.
- C. Fiber Concentrations Outside the Work Area(s):
1. If any air sample taken outside of the work area(s) exceeds 0.010 fibers per cubic centimeter, immediately and automatically stop all work except corrective action.
 2. The Owner's Representative will determine the source of the high reading and so notify the Contractor in writing.
 3. If the high reading was the result of a failure of work area isolation measures, initiate the following actions:
 - a. Immediately erect new critical barriers to isolate the affected area(s) from the balance of the building. Erect critical barriers at the next existing structural isolation of the involved space (e.g., wall, ceiling, floor).
 - b. Clean and decontaminate the affected area utilizing wet wiping and HEPA vacuuming techniques.
 - c. Require that respiratory protection be worn in affected areas until the area is cleared for re-occupancy via air sampling.
 - d. Leave critical barriers in place until completion of work and ensure that the operation of the pressure differential system in the work area results in a flow of air from the balance of the building into the affected area.
 - e. If the exit from the clean room of the personnel decontamination unit enters the affected area, establish a decontamination facility consisting of a shower room and changing room at entry point to affected area.
 - f. After certification of visual inspection, by the Owner's Representative, in the work area remove critical barrier separating the work area from the affected area.
 - g. Final air samples will be taken within the entire area as set forth in Part 3.3.
 4. If the high reading was the result of other causes, initiate corrective action as determined by the Owner's Representative.
 5. The Contractor shall complete corrective work with no change in the Contract sum.

- D. Daily Air Monitoring shall be performed from the start of work to project decontamination, per shift. The Owner's Representative shall collect, at a minimum, air samples from locations adjacent to the work area, including critical barriers, the clean room of the decontamination unit and the waste removal route.
- E. In occupied buildings one additional sample will be collected at the start of the work shift and one every four hours thereafter, and one at the end of the work day for every 10,000 sf of occupied space adjacent to the work area. One additional sample shall be collected within the work area. Additional samples shall be taken in areas where the potential for fiber migration exists. These areas shall include, but not limited to, stairwells, communicating shafts, elevators, plenums and ducts. During periods of waste removal the AST shall perform air monitoring in the route of travel. If the results exceed 0.10 f/cc the route shall be wet wiped using amended water, HEPA vacuumed and retested until the air sample results are acceptable.
- F. Phase Contrast Microscopy (PCM) sampling and analysis will be performed using the latest revision of NIOSH Method 7400. Where required, this analysis will be carried out at the job site so that results can be obtained within four hours from start of sampling. The analyst shall be listed in the Asbestos Analyst Registry of the AIHA for PCM analysis.

3.3 FINAL CLEARANCE AIR MONITORING

- A. The Owner's Representative shall collect final clearance air samples at the completion of the abatement activities and after a satisfactory clean-up inspection.
- B. Engineering controls, critical barriers and the decontamination unit shall remain during final clearance air sampling.
- C. All final clearance air samples will be taken using aggressive sampling techniques as follows:
 - 1. Before sampling pumps are started, the exhaust from forced-air equipment (leaf blower with 1 HP electric motor) will be swept against all walls, ceilings, floors, ledges and other surfaces in the room. This procedure will be continued for five (5) minutes per 10,000 cubic feet of air volume.
 - 2. One 20" diameter fan per 10,000 cubic feet of room volume will be mounted in a central location at approximately 2 meters above the floor, directed towards the ceiling and operated at low speed for the entire period of sample collection.
 - 3. Air samples will be collected in areas subject to normal air circulation away from room corners, obstructed locations, and sites near windows, doors or vents.
- D. A minimum of five (5) samples will be collected from the work area and analyzed in accordance with the method set forth in the AHERA Regulation 40 CFR Part 763 Appendix A.

1. For work area(s) where more than 10 LF/25 SF of asbestos-containing materials have been removed, final clearance samples shall be collected/analyzed utilizing Transmission Electron Microscopy (TEM).
2. For work area(s) where less than 260 LF of asbestos-containing materials have been removed, final clearance samples shall be collected/analyzed utilizing PCM if the work area(s) was a limited containment.
3. TEM samples shall be analyzed at a laboratory accredited by the American Industrial Hygiene Association, participating in the National Voluntary Laboratory Accreditation Program (NVLAP). Analytical results shall be available to the Owner's Representative within six (6) hours upon receipt by the laboratory. PCM samples shall be analyzed on-site, in accordance with the most recent revision to NIOSH method 7400.
4. Acceptable Clearance Criteria for work area demobilization and re-occupancy shall be as follows:
 - a. TEM: Average of less than 70 Structures per millimeter squared for all five (5) samples analyzed.
 - b. PCM: Less than 0.01 fibers per cubic centimeter.

PART 4 – PROJECT COMPLETION

4.1 FINAL INSPECTION

- A. The Owner's Representative shall perform a final inspection of the work area in accordance with New Jersey Department of Labor and Workforce Development requirements. If analytical results are obtained that are higher than the allowable threshold the Contractor shall re-clean the work area and the Owner's Representative shall re-test the area. This sequence shall be repeated until the final test results are acceptable.
 1. The Contractor shall be financially responsible for additional cleaning, IHT/AST services and final clearance air sampling and analysis at no cost to the Owner.
- B. Upon receipt of acceptable final air tests the Contractor shall demobilize all critical and separation barriers, decontamination unit and engineering controls from the abatement work areas. All waste containers shall be off-site and en-route to an USEPA ID #27 approved landfill for final disposal.
- C. The Owner's Environmental Representative will perform a final visual inspection of the abatement work area(s) to document the project has been completed in accordance with these Technical Specifications and all applicable Local, State and Federal regulations.

END OF SECTION 02 8213

SECTION 03300 - CONCRETE WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 SUMMARY

- A. Extent of concrete work is shown on drawings.
- B. Concrete ramp in the Men's Shower Room.
- C. Concrete infill of unused plumbing cores in existing concrete floor slab.
- D. Concrete slab infill at new door opening in existing masonry wall.
- E. Concrete base at new lockers.

1.3 SUBMITTALS

- A. Product Data: Submit data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds and others as required by Architect.
- B. Samples: Submit samples of materials as requested by Architect, including names, sources and descriptions.
- C. Materials Certificates: Provide materials certificates in lieu of materials laboratory test reports when permitted by Architect. Materials certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with, or exceeds, specified requirements. Provide certification from admixture manufacturers that chloride content complies with specification requirements.

1.4 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following codes, specifications and standards, except where more stringent requirements are shown or specified:

ASTM C94/C94M "Ready-Mix-Concrete Manufacturers Qualifications"

ACI 301/301M "Structural Concrete for Buildings."

ACI 117 "Tolerances for Concrete Construction and Materials"

ACI 306-66 "Recommended Practice for Cold Weather Concreting."

ACI 305-77 "Recommended Practice for Hot Weather Concreting."

ACI 211.1-77 "Recommended Practice for Selecting Proportions for Normal and Heavyweight Concrete."

ACI 304-73	"Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete."
ACI 311	"Recommended Practice for Concrete Inspection."
ACI 347	"Recommended Practice for Concrete Formwork."
ACI 308.1	"Standard Specification for Curing Concrete".
Concrete Reinforcing Steel Institute, "Manual of Standard Practice."	

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings.
- B. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
- B. Steel Wire: ASTM A 82, plain, cold-drawn steel.
- C. Welded Wire Fabric: ASTM A 185, welded steel wire fabric.
- D. Welded Deformed Steel Wire Fabric: ASTM A 497.
- E. Supports for Reinforcement: Bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI specifications.

2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I or Type II.
 - 1. Use one brand of cement throughout project, unless otherwise acceptable to Architect.
- B. Normal Weight Aggregates: ASTM C 33, and as herein specified. Provide aggregates from a single source for exposed concrete.
- C. Water: Drinkable.
- D. Water-Reducing Admixture: ASTM C 494, Type A, and containing not more than 0.05 percent chloride ions.

1. Products: Subject to compliance with requirements, provide one of the following:

"WRDA" Hycol"; W.R. Grace.
"Eucon WR-75" or "Eucon WR-89"; Euclid Chemical Co.
"Pozzolith 322N"; Master Builders.
"Plastocrete"; Sika Corp.

- E. High-Range Water-Reducing Admixture (Super Plasticizer) ASTM C 494, Type F or Type G and containing not more than 0.05 percent chloride ions.

1. Products: Subject to compliance with requirements, provide one of the following:

"Daracem 100" or "WRDA-19"; W.R. Grace.
"Eucon 37"; Euclid Chemical Co.
"Rheobuild 1000"; Master Builders.
"Sika 86"; Sika Corporation.

- F. Water-Reducing, Non-Chloride Accelerator Admixture: ASTM C 494, Type E, and containing not more than 0.024 percent chloride ions.

1. Products: Subject to compliance with requirements, provide one of the following:

"Accelguard 80"; Euclid Chemical Co.
"Daraset"; W.R. Grace

- G. Water-Reducing, Retarding Admixture: ASTM C 494, Type D and containing not more than 0.05 percent chloride ions.

1. Products: Subject to compliance with requirements, provide one of the following:

"Pozzolith Retarder"; Master Builders.
"Eucon Retarder 75"; Euclid Chemical Co.
"Daratard 17"; W.R. Grace.
"Plastocrete 161R"; Sika Corporation.

- H. Prohibited Admixtures: Calcium chloride thiocyanates or admixtures containing more than 0.05 percent chloride ions are not permitted.

2.4 RELATED MATERIALS

- A. Non-Shrink Grout: CRD-C 621, factory pre-mixed grout.

1. Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

- a. Non-metallic:

"Masterflow 713"; Master Builders
"Euco-NS"; Euclid Chemical Co.
"Five Star Grout"; U.S. Grout Corporation.

- B. Absorptive Cover: Burlap cloth made from jute or kenaf weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.

C. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.

1. Waterproof paper.
2. Polyethylene film.
3. Polyethylene-coated burlap.

2.5 PROPORTIONING AND DESIGN OF MIXES

- A. Prepare design mixes for each type and strength of concrete by field experience methods as specified in ACI 301.
- B. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by Architect.
- C. Design mixes to provide normal weight concrete with the following properties, as indicated on drawings and schedules:
- D. 3000 psi 28-day compressive strength; W/C ratio, 0.51 maximum,
- E. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results or other circumstances warrant; at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be admitted to and accepted by Architect before using in work.
- F. Admixtures:
1. Use water-reducing admixture or high range water-reducing admixture (super plasticizer) in concrete as required for placement and workability.
 2. Use high-range water-reducing admixture in pumped concrete, concrete for industrial slabs, architectural concrete, concrete required to be watertight and concrete with water/cement ratios below 0.50.
 3. Use admixtures for water-reducing and set-control in strict compliance with manufacturer's directions.
- G. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
1. Ramps, slabs and sloping surfaces: Not more than 3".
 2. Concrete containing HRWR admixture (super-plasticizer): Not more than 8" after addition of HRWR to site-verified 2"-3" slump concrete.
 3. Other concrete: Not less than 1" nor more than 4"

2.6 CONCRETE MIXING

- A. Ready-Mix Concrete: Comply with requirements of ASTM C94, and as herein specified.
- B. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.

PART 3 - EXECUTION

3.1 FORMS

- A. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structure are of correct size, shape, alignment, elevations and position.
- B. Construct forms to sizes, shapes, lines and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, sinkages, keywarp, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features, required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.

3.2 PLACING REINFORCEMENT

- A. Clean reinforcement of loose rust and mill scale, earth, ice and other materials which reduce or destroy bond with concrete.
- B. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required.
- C. Place reinforcement to obtain at least minimum coverages for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- D. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

3.3 INSTALLATION OF EMBEDDED ITEMS

- A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of items to be attached thereto.
- B. Edge Forms and Screed Strips for Slabs: Set edge forms, or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface. Provide and secure units sufficiently strong to support types of screed strips by use of strike-off templates or accepted compacting type screeds.

3.4 CONCRETE PLACEMENT

- A. Preplacement inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.

1. Apply temporary protective covering to lower 2' of finished walls adjacent to poured floor slabs and similar conditions, and guard against spattering during placement.
- B. General: Comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete", and as herein specified.
- C. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.
- D. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
- E. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
- F. Bring slab surfaces to correct level with straightedge and strikeoff. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
- G. Maintain reinforcing in proper position during concrete placement operations.
- H. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which would be caused by frost, freezing actions or low temperatures, in compliance with ACI 306.
- I. Do not use calcium chloride, salt and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.
- J. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305.

3.5 MONOLITHIC SLAB FINISHES

- A. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with ceramic tile, and as otherwise indicated.
- B. After screeding, consolidating and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened. Consolidate surface by hand-floating. Check and level surface plane to tolerances of Ff18 - Fl15. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.
- C. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed-to-view, and slab surfaces to be covered with ceramic or other thin film finish coating system.
- D. After floating, begin first trowel finish operation. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with surface leveled to tolerances of F f 25 - Fl 17. Grind smooth surface defects which would telegraph through supplied floor covering system.

3.6 CONCRETE CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.
- C. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 308.1 (latest edition) procedures. Avoid rapid drying at end of final curing period.
- D. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing and by combinations thereof, as herein specified.
- E. Provide moisture curing by following methods.
 - 1. Keep concrete surface continuously wet by covering with water.
 - 2. Continuous water-fog spray.
 - 3. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 12" lap over adjacent absorptive covers.
- F. Provide moisture-cover curing as follows:
 - 1. Cover concrete surfaces with moisture-retaining cover for curing concrete, place in widest practicable width with sides and ends lapped at least 12" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
- G. **Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, dampproofing, membrane roofing, flooring (such as ceramic or quarry tile, glue-down carpet), painting and other coatings and finish materials, unless otherwise acceptable to Architect.**
- H. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of appropriate curing method.
- I. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture retaining cover, unless otherwise directed.

3.7 CONCRETE SURFACE REPAIRS

- A. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness using a template having required slope.
- B. Repair finished unformed surfaces that contain defects which affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01" wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling,

pop-outs, honeycomb, rock pockets and other objectionable conditions.

- C. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.
- D. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to Architect.
- E. Underlayment Application: Leveling of floors for subsequent finishes may be achieved by use of specified underlayment material.

END OF SECTION 03300

SECTION 04200 - UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

- A. Extent of each type of masonry work is indicated on drawings and schedule.
- B. Types of masonry work required include:
 - 1. Concrete unit masonry.
 - 2. Mortar and grout.
 - 3. Reinforcement, anchorage, and accessories.
- C. Related Work:
 - 1. Section 07900: Joint Sealer Assemblies.
 - 2. Section 09900: Painting of exposed to view CMU surfaces.

1.3 QUALITY ASSURANCE

- A. Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.
- B. Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.
- C. Source Quality Control: Materials and fabrication procedures are subject to inspection and tests in mill, shop, and field, conducted by a qualified inspection agency. Such inspections and tests will not relieve Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product data for each type of masonry unit, accessory, and other manufactured products, including certifications that each type complies with specified requirements.
- B. Samples for Verification Purposes: Submit the following samples:
 - 1. Unit masonry samples for type of exposed masonry unit required.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver masonry materials to project in undamaged condition.

- B. Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes.
- C. Limit moisture absorption of concrete masonry units during delivery and until time of installation to the maximum percentage specified for Type I units for the average annual relative humidity as reported by the U.S. Weather Bureau Station nearest project site.
- D. Store cementitious materials off the ground, under cover and in dry location.
- E. Store aggregates where grading and other required characteristics can be maintained.
- F. Store masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.

1.6 REFERENCE STANDARDS

- A. Comply with the current applicable provisions of all codes, regulations, industry standards and specifications referenced in this section, unless otherwise modified by the requirements of the Contract Documents, including but not limited to the following:
 - 1. ACI 531 Building Code Requirements for Masonry Structures.
 - 2. ACI 531 Commentary on Building Code Requirements for Masonry Structures.
 - 3. ACI 530.1 Specification for Masonry Construction.
 - 4. ASTM C-129 Non-Load Bearing Masonry Units.
 - 5. ASTM C 140 Testing Concrete Masonry Units.
 - 6. ASTM C 270 Standard Specification for Mortar for Unit Masonry
 - 7. ASTM C 780 Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
 - 8. ASTM C 1586 Standard Guide for Quality Assurance of Mortars.
 - 9. NCMA TEK Bulletins.

1.7 PROJECT CONDITIONS

- A. Do not apply uniform floor or roof loading for at least 12 hours after building masonry walls.
- B. Do not apply concentrated loads for at least 3 days after building masonry walls.
- C. Staining: Prevent grout or mortar or soil from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry.
- D. Perform the following construction procedures while masonry work is progressing. Temperature ranges indicated below apply to air temperatures existing at time of installation except for grout.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Manufacturer: Obtain masonry units from one manufacturer, of uniform texture and color for each kind required, for each continuous area and visually related areas.

1. Concrete Masonry Units: Subject to compliance with requirements, manufacturers of concrete masonry units which may be incorporated in the work include, but are not limited to, the following:
 - a. Anchor Concrete Products Inc.
 - b. Clayton Block Co., Inc.
 - c. EP Henry Corporation.
2. Masonry Anchors, Joint Reinforcing, Accessories, etc.: Subject to compliance with requirements, manufacturers of masonry anchors, joint reinforcing, accessories which may be incorporated in the work include, but are not limited to, the following:
 - a. Heckman Building Products, Inc.
 - b. Hohmann & Barnard, Inc.

2.2 CONCRETE MASONRY UNITS

- A. General: Comply with referenced standards and other requirements indicated below applicable to each form of concrete masonry unit required.
- B. Concrete Block: Provide units complying with characteristics indicated below for face size, exposed face and under each form of block included, for weight classification.
- C. Size: Manufacturer's standard units with nominal face dimensions of 16" long x 8" high (15-5/8" x 7-5/8" actual) x thicknesses indicated.
- D. Hollow Loadbearing Block: ASTM C 90 and as follows:
 1. Weight Classification: Lightweight.

2.3 MORTAR AND GROUT MATERIALS

- A. General: Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water repellent agents, anti-freeze compounds or other admixtures, unless otherwise indicated.
 1. Do not use calcium chloride in mortar or grout.
- B. Limit cementitious materials in mortar to portland cement-lime.
- C. Portland Cement: ASTM C 150, Type 1, except Type III may be used for cold weather construction. Provide natural color or white cement as required to produce required mortar color.
- D. Hydrated Lime: ASTM C 207, Type S.
- E. Aggregate for Mortar: ASTM C 144, except for joints less than 1/4 inch use aggregate graded with 100% passing the No. 16 sieve.
 1. White Mortar Aggregates: Natural white sand or ground white stone.

- F. Mortar: Use Type S mortar for exterior, above-grade loadbearing and non-loadbearing CMU walls; for interior loadbearing CMU walls; and for other applications where another type is not indicated.
- G. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification, for types of mortar required, unless otherwise indicated.
- H. Grout for Unit Masonry: Comply with ASTM C 476.
 - 1. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143.
- I. The proper use of ASTM C 270 and Test Method ASTM C 780 for evaluating masonry mortars produced in the laboratory and the construction site is in accordance with 1.ASTM C 1586.
- J. Aggregate for Grout: ASTM C 404.
- K. Water: Clean and potable.

2.4 JOINT REINFORCEMENT, TIES AND ANCHORING DEVICES

- A. Materials: Comply with requirements indicated below for basic materials and with requirements indicated under each form of joint reinforcement, tie and anchor for size and other characteristics:
- B. Hot-Dip Galvanized Steel Wire: ASTM A 82 for uncoated wire and with ASTM A 153, Class B-2 (1.5 oz. per sq. ft. of wire surface) for zinc coating applied after prefabrication into units.
- C. Joint Reinforcement: Provide welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet, with prefabricated corner and tee units, and complying with requirements indicated below:
 - 1. Width: Fabricate joint reinforcement in units with widths of approximately 2 inch less than nominal width of walls and partitions as required to provide mortar coverage of not less than 5/8 inch on joint faces exposed to exterior and 1/2 inch elsewhere.
 - a. Wire Size for Side Rods: 9 gauge.
 - b. Wire Size for Cross Rods: 9 gauge.
 - 2. Truss design with continuous diagonal cross rods spaced not more than 16 inch o.c.
 - 3. Number of Side Rods: One side rod for each face shell of concrete masonry back-up.
 - 4. Configuration:
 - a. Applications of Single Wythe Wall width: Truss design, diagonal cross rods at not more than 16 inches on center.
 - 1) Basis of Design: Provide Hohmann & Barnard, Inc., No.# 120, Truss-Mesh, or approved equal.

- B. Anchor Bolts: Provide steel bolts with hex nuts and flat washers complying with ASTM A 307, Grade A, hot-dip galvanized to comply with ASTM C 153, Class C, in sizes and configurations indicated.
- C. Pencil rods at construction joints as shown: Dowels dipped in tar for ½ of length.
- D. Reinforcing Bars: Deformed steel, ASTM A 615, Grade 60 for bars No. 3 to No. 18.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Do not wet concrete masonry units.
- B. Cleaning Reinforcing: Before placing, remove loose rust, ice and other coatings from reinforcing.
- C. Thickness: Build single-wythe walls to the actual thickness of the masonry units, using units of nominal thickness indicated.
- D. Build chases and recesses as shown or required for the work of other trades. Provide not less than 8 inch of masonry between chase or recess and jamb of openings, and between adjacent chases and recesses.
- E. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.
- F. Cut masonry units using motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining work. Use full-size units without cutting where possible. No discoloration of units caused by cutting will be acceptable.
- G. Pattern Bond:
 - 1. Concrete masonry units: Running bond, unless otherwise shown.
 - 2. Lay concealed masonry with all units in a wythe bonded by lapping not less than 2 inches.

3.2 CONSTRUCTION TOLERANCES

- A. Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4 inch in 10 feet, or 3/8 inch in a story height not to exceed 20 feet, nor ½ inch in 40 feet or more. For external corners, expansion joints, control joints and other conspicuous lines, do not exceed 1/4 inch in any story or 20 feet maximum, nor ½ inch in 40 feet or more. For vertical alignment of head joints do not exceed plus or minus 1/4 inch in 10 feet, ½ inch maximum.
- B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4 inch in any bay or 20 feet

maximum, nor 1/2 inch in 40 feet or more. For top surface of bearing walls do not exceed 1/8 inch between adjacent floor elements in 10 feet or 1/16 inch within width of a single unit.

- C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 1/2 inch in any bay or 20 feet maximum, nor 3/4 inch in 40 feet or more.
- D. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4 inch nor plus 1/2 inch.
- E. Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch. Do not exceed head joint thickness indicated by more than plus or minus 1/8 inch.

3.3 LAYING MASONRY WALLS

- A. Layout walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to accurately locate openings, movement-type joints, returns and offsets. Avoid the use of less-than-half-size units at corners, jambs and wherever possible at other locations.
- B. Lay-up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other work.
- C. Stopping and Resuming Work: Rack back 1/2-unit length in each course; do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if required) and remove loose masonry units and mortar prior to laying fresh masonry.
- D. Built-in Work: As the work progresses, build-in items specified under this and other sections of these specifications. Fill in solidly with masonry around built-in items.
 - 1. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
 - 2. Fill cores in hollow concrete masonry units with grout 3 courses (24 inches) under bearing plates, beams, lintels, posts and similar items, unless otherwise indicated.
- E. Extend all interior walls full height to underside of structure of deck, unless otherwise indicated. Include compressible insulation at top to completely close space between wall and structure above.
- F. Support and protect masonry, indicated to remain, which surrounds removal area.
 - 1. Temporary braces can be installed to permit the removal of longer sections of masonry.

Note: The replaced masonry should be properly cured (5 to 7 days) before the intermediate masonry sections or supports are removed.

3.4 MORTAR BEDDING AND JOINTING

- A. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or filled with concrete

or grout. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under cells.

- B. Maintain joint widths shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8 inch joints.
- C. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials, unless otherwise indicated.
- D. Tool exposed joints slightly concave using a jointer larger than joint thickness, unless otherwise indicated.
- E. Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not pound corners or jambs to shift adjacent stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

3.5 HORIZONTAL JOINT REINFORCEMENT

- A. Provide continuous horizontal joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcing a minimum of 6 inches.
- B. Reinforce masonry openings greater than 1'-0" wide, with horizontal joint reinforcement placed in 2 horizontal joints approximately 8" apart, immediately above the lintel and immediately below the sill. Extend reinforcement a minimum of 2'-0" beyond jambs of the opening except at control joints.

3.6 ANCHORING MASONRY WORK

- A. Provide anchoring devices of the type indicated. If not indicated, provide standard type for facing and back-up involved.
 - 1. Strap anchors for masonry at existing walls.

3.7 REPAIR, POINTING AND CLEANING

- A. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings and adjacent work to provide a neat, uniform appearance, prepared for application of sealants.
- C. Clean exposed CMU masonry by dry brushing at the end of each day's work and after final pointing to remove mortar spots and droppings. Comply with recommendations in NCMA TEK Bulletin No. 28.
 - 1. Prepare exposed to view CMU surfaces to receive paint coatings in accordance with specification section 09900.

END OF SECTION 04200

SECTION 05300 - METAL DECKING

PART 1 - GENERAL

1.1 SUMMARY

- A. Extent of metal decking is indicated on drawings, including basic layout and type of deck unit required.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications and installation instructions for type of decking and accessories. Include manufacturer's certification as may be required to show compliance with these specifications.
- B. Shop Drawings: Submit detailed drawings showing layout and type of deck panels, anchorage details and conditions requiring closure panels, pour stops, supplementary framing, special jointing or other accessories.

1.3 QUALITY ASSURANCE

- A. Code and Standards: Comply with provisions of the following codes and standards, except as otherwise indicated or specified:
 - 1. AISI "Specification for the Design of Cold-Formed Steel Structural Members - Allowable Stress Design".
 - 2. AWS D1.3 "Structural Welding Code - Sheet Steel".
 - 3. SDI "Design Manual for Floor Decks"
- B. Qualification of Field Welding: Qualify welding processes and welding operators in accordance with "Welder Qualification" procedures of AWS D1.1.
- C. Welded decking in place is subject to inspection and testing. Expense of removing and replacing portions of decking for testing purposes will be borne by Owner if welds are found to be satisfactory. Remove work found to be defective and replace with new acceptable work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
 - 1. Metal Roof Deck Units: United Steel Deck, Inc.
 - 2. Composite Metal Floor Deck Units: United Steel Deck, Inc.
 - 3. Or approved equal.

2.2 MATERIALS

- A. Steel for Galvanized Metal Deck Units: ASTM A 446, Grade A.
- B. Sheet Metal Accessories: ASTM A 526, commercial quality, galvanized.
- C. Galvanizing: ASTM A 525, G60.
- D. Galvanizing Repair Paint: High zinc-dust content paint for repair of damaged galvanized surfaces complying with Military Specifications MIL-P-21035 (Ships).
- E. Flexible Closure Strips: Manufacturer's standard vulcanized, closed-cell, synthetic rubber.

2.3 FABRICATION

- A. General: Form deck units in lengths to span three (3) or more supports, with flush, telescoped or nested 2" laps at ends and interlocking or nested side laps, unless otherwise indicated.
- B. Deck Units: Provide deck configurations complying with SDI and AISI "Deck Specifications" of metal thickness, depth and width as shown.
- C. Metal Closure Strips: Fabricate metal closure strips, at openings between decking and other construction, of not less than 0.045" min. (18 gage) sheet steel. Form to provide tight-fitting closures at open ends of cells or flutes and sides of decking.
- D. Open-beam composite units: Fabricate deck with integral embossing or raised pattern to furnish mechanical bond with concrete slabs. Fabricate open beam units with fluted sections having interlocking side laps of metal thickness depth and width as shown.
- E. Pour Stops: Fabricate metal pour stops, to form all edges of concrete slabs, of a minimum thickness not less than 0.045" (18 gage) sheet steel. Form to provide tight closure to full height of concrete slab.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install deck units and accessories in accordance with manufacturer's recommendations and final shop drawings, and as specified herein.
- B. Place deck units on existing supporting steel framework and adjust to final position with ends accurately aligned and bearing on supporting members before being permanently fastened. Do not stretch or contract side lap interlocks.
- C. Place deck units in straight alignment for entire length of run of cells and with close alignment between cells at ends of abutting units.
- D. Place deck units flat and square, secured to adjacent framing without warp or excessive deflection.
- E. Coordinate and cooperate with structural steel erector in locating decking bundles to prevent overloading of structural members.

F. Fastening Deck Units:

1. Fasten deck units to steel supporting members by not less than 5/8" diameter fusion welds or elongated welds of equal strength, spaced not more than 12" o.c. In addition, secure deck to each supporting member in ribs where side laps occur.

G. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds methods used in correcting welding work.

H. Cutting and Fitting: Cut and neatly fit deck units and accessories around other work projecting through or adjacent to the decking, as shown.

I. Mechanically fasten side laps of adjacent deck units between supports, at intervals not exceeding 36" o.c. using self-tapping No. 8 or larger machine screws, unless a closer spacing or a larger screw is called for on the drawing.

J. Joint Covers: Provide metal joint covers at abutting ends and changes in direction of floor deck units, except where taped joints are required.

K. Touch-Up Painting: After deck installation, wire brush, clean and paint scarred areas, welds and rust spots on top and bottom surfaces of decking units and supporting steel members.

1. Touch-up galvanized surfaces with galvanizing repair paint applied in accordance with manufacturer's instructions.
2. Touch-up painted surface with same type of shop paint used on adjacent surfaces.

L. Touch-Up Painting: Cleaning and touch-up painting of field welds, abraded areas and rust spots, as required after erection and before proceeding with field painting, is included in Division 9 under Painting.

M. Pour Stops: Weld continuous pour stops to supporting decking units or structural steel supports with a minimum 1" long weld at 12" on center. Install pour stop with a minimum of 2" of bearing on supports.

N. Shear Connectors: Weld shear connectors to supports through decking units in accordance with manufacturer's instructions. Do not weld shear connectors through two layers (lapped ends) of decking units. Weld only on clean, dry deck surfaces.

3.2 QUALITY CONTROL

A. The Owner will employ a testing laboratory satisfactory to the Architect to perform the following tests and to submit testing and inspection reports.

1. Welding: Inspect welding to determine if welds are at proper locations, are proper size and material, and meet AWS standards.
2. Sidelap Connections: Inspect sidelap connections to determine if the connections are in accordance with contract documents.
3. Shear Connectors: All shear connectors shall be visually inspected and tapped with a hammer. All/any studs which do not appear to have a sound weld or which produce a dull sound rather than a ringing sound when tapped shall be further tested as follows:

- a. The stud shall be struck with a hammer and bent approximately 15 degrees off perpendicular towards the nearest end of the beam. Studs meeting this test without coming loose shall remain on the beam. Studs failing this test shall be replaced.

END OF SECTION 05300

SECTION 05400 - MISCELLANEOUS STRUCTURAL STEEL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

- A. Definition: Miscellaneous structural steel include items made from iron and steel shapes, plates, bars, strips, tubes, pipes which are not a part of Structural Steel or other metal fabrication systems specified elsewhere.
- B. Extent of miscellaneous structural steel fabrications is indicated on drawings and schedules.
 - 1. Work of this section shall include miscellaneous structural steel framing and supports for floor, wall and roof openings whether or not shown on structural drawings.
 - a. Refer to architectural, mechanical and electrical drawings for the following:
 - 1) Locations and sizes of roof penetrations, roof top supported mechanical and electrical equipment, etc.
 - 2) Locations and sizes of floor penetrations; ducts, piping, raceways, etc.
 - b. All miscellaneous structural steel supports shall be in accordance with typical structural steel details and schedules shown on structural steel drawings and/or as directed by the Architect.
 - c. All miscellaneous structural steel supports shall meet indicated load requirements and/or as directed by the Architect.
 - d. In existing building where renovation work is indicated, refer to Division 1 sections for miscellaneous structural steel framing and supports which may be assigned to other trades.
- C. Types of work in this section include metal fabrications for:
 - 1. Loose Steel lintels, bearing and leveling plates and miscellaneous steel framing and supports.
- D. Other Related Work:
 - 1. Masonry Work: Section 04200.
 - 2. Metal Fabrications: Section 05500.
 - 3. Painting: Section 09900.

1.3 QUALITY ASSURANCE

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrications might delay work.
- B. Professional Engineer Qualifications: A professional engineer legally authorized to practice in the jurisdiction where Project is located and experienced in providing engineering services of the kind indicated that have resulted in the installation of structural steel stair assemblies, similar to this Project in material, design, and extent and that has a record of successful in-service performance.
 - 1. Conform to all applicable state and local Codes for design loads and all other requirements.
- C. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code-Steel," and AWS D1.3, "Structural Welding Code-Sheet Steel."

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications, anchor details and installation instructions for products used in miscellaneous metal fabrications, including paint products and grout.
- B. Shop Drawings: Submit shop drawings for fabrication and erection of miscellaneous steel fabrications. Include plans, elevations and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor and bolt installation by others.
 - 1. Submit shop drawings for miscellaneous steel framing and supports. Signed and sealed shop drawings shall be submitted by a qualified professional Structural Engineer, licenced in the state where project is located.
- C. Where materials or fabrications are indicated to comply with certain requirements for design loadings, include structural computations, material properties and other information needed for structural analysis.
- D. Samples: Submit 2 sets of representative samples of materials and finished products as may be requested by Architect.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Metal Surfaces, General: For fabrication of miscellaneous structural steel work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.
- B. Steel
 - 1. Steel Plates, Shapes and Bars: ASTM A 36.
 - 2. Steel Tubing: Cold-formed, ASTM A 500; or hot-rolled, ASTM A 501.

3. Structural Steel Sheet: Hot-rolled, ASTM A 570; or cold-rolled ASTM A 611, Class 1; of grade required for design loading.
 4. Galvanized Structural Steel Sheet: ASTM A 446, of grade required for design loading. Coating designation as indicated, or if not indicated, G90.
 5. Steel Pipe: ASTM A 53; Type and grade (if applicable) as selected by fabricator and as required for design loading; black finish unless galvanizing is indicated; standard weight (schedule 40), unless otherwise indicated.
 6. Gray Iron Castings: ASTM A 48, Class 30.
 7. Malleable Iron Castings: ASTM A 47, grade as selected by fabricator.
- C. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.
- D. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A 153.
- E. Grout:
1. Metallic Non-Shrink Grout: Pre-mixed, factory-packaged, ferrous aggregate grout complying with CE CRD-C588, Type M.
 2. Non-Shrink Non-Metallic Grout: Pre-mixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with CE CRD-C621. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.
- F. Fasteners:
1. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.
 2. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.
 3. Lag Bolts: Square head type, FS FF-B-561.
 4. Machine Screws: Cadmium plated steel, FS FF-S-92.
 5. Wood Screws: Flat head carbon steel, FS FF-S-111.
 6. Plain Washers: Round, carbon steel, FS FF-W-92.
 7. Masonry Anchorage Devices: Expansion shields, FS FF-S-325.
- G. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class and style as required.
1. Lock Washers: Helical spring type carbon steel, FS FF-W-84.
- H. Paint:
1. Surface Preparation: SSPC-2P6 commercial Blast Cleaning.
 2. Primer: Tnemec Series 90-97 Tneme-Zinc, or equal, @ 2.5 - 3.5 mils (dry)
 3. Primer selected must be compatible with finish coats of paint. Coordinate selection of metal primer with finish paint requirements specified in Section 09900.

2.2 FABRICATION, GENERAL

- A. Workmanship: Use materials of size and thickness indicated, or if not indicated, as required to produce strength and durability in finished product for use intended. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of work.
- B. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32" unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- C. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.
- D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts.
- E. Provide for anchorage of type indicated, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.
- F. Galvanizing:
 - 1. Provide a zinc coating for exterior items and those items indicated or specified to be galvanized, as follows:
 - a. ASTM A 153 for galvanizing iron and steel hardware.
 - b. ASTM A 123 for galvanized rolled, pressed and forged steel shapes, plates, bars and strip 1/8" thick and heavier.
 - c. ASTM A 386 for galvanizing assembled steel products.
- G. Fabricate joints which will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.
- H. Shop Painting
 - 1. Shop paint miscellaneous structural steel, except members or portions of members to be embedded in concrete or masonry, surfaces and edges to be field welded, and galvanized surfaces, unless otherwise indicated.
 - 2. Remove scale, rust and other deleterious materials before applying shop coat. Clean off heavy rust and loose mill scale in accordance with SSPC SP-6.
 - 3. Immediately after surface preparation, brush or spray on primer in accordance with manufacturer's instructions. Use painting methods which will result in full coverage of joints, corners, edges and exposed surfaces.
 - 4. Apply one shop coat to fabricated metal items, except apply two coats of paint to surfaces inaccessible after assembly or erection. Change color of second coat to distinguish it from the first.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.
 - 1. Coordinate work of this section with other work affected by other trades.
 - 2. Obtain locations, opening sizes, weighs and other required information from affected trades.
 - 3. Comply with coordination requirements indicated in Division 1 Sections.

3.2 INSTALLATION

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; including, threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.
- B. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment and elevation, plus, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete masonry or similar construction.
- C. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch-up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.
- D. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work.
- E. Set loose lintels weighing more than 200 pounds, leveling and grouting as for plates. Deliver loose lintels weighing less than 200 pounds to the General Construction Contractor, allow sufficient time for scheduling his installations.

3.3 ADJUST AND CLEAN

- A. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting.
- B. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- C. For galvanize surfaces: Clean field welds, bolted connections and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

END OF SECTION 05400

SECTION 05500 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary \ Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

- A. Definition: Metal fabrications include items made from iron and steel shapes, plates, bars, strips, tubes, pipes and castings which are not a part of structural steel or other metal systems specified elsewhere and non-ferrous items listed herein.
- B. Types of work in this section include metal fabrications for assemblies which include but are not limited to the following:
 - 1. Rough hardware.
 - 2. Miscellaneous structural shapes.
- C. Related Work:
 - 1. Miscellaneous Structural Steel is specified in Section 05400 (Part 3).
 - 2. Concrete work: Section 03300.
 - 3. Masonry work: Section 04200.
 - 4. Painting: Section 09900.

1.3 QUALITY ASSURANCE

- A. Codes and Standards:

ASTM A108-99 - Standard Specification for Steel Bars, Carbon, Cold-Finished, Standard Quality.

ASTM A123 - Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.

ASTM A276-03 - Standard Specification for Stainless Steel Bars and Shapes.

ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

ASTM A563-00 - Standard Specification for Carbon and Alloy Steel Nuts.

ASTM A569/A569M-91a - Standard Specification for Steel, Carbon (.15 Maximum, Percent), Hot-Rolled Sheet and Strip Commercial Quality (superseded by A1011).

ASTM A780-01 - Standard Practice for Repair of Damaged and Un-coated Areas of Hot-Dip Galvanized Coatings.

ASTM A1011/A1011M-03 - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.

ASTM F844-00 - Standard Specification for Washers, Steel, Plain (Flat), Unhardened for General Use.

AWS D1.1/D1.1M: Structural Welding Code - Steel, Welding qualification procedures and personnel.

- B. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrications might delay work.
- C. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- D. Regulatory Requirements: Products and finished installations to be used by persons with disabilities must comply with requirements of the Uniform Construction Code, American National Standard, Accessible and Usable Buildings and Facilities, ICC / ANSI A117.1.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications, anchor details and installation instructions for products used in miscellaneous metal fabrications, including paint products and grout.
- B. Shop Drawings: Submit shop drawings for fabrication and erection of miscellaneous metal fabrications. Include plans, elevations and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor and bolt installation by others.
- C. Where materials or fabrications are indicated to comply with certain requirements for design loadings, include structural computations, material properties and other information needed for structural analysis.
- D. Samples: Submit 2 sets of representative samples of materials and finished products as may be requested by Architect.
- E. Mill test reports: Reports indicating metals to be furnished comply with project requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Metal Surfaces, General: For fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.
- B. Aluminum: Comply with the following standards for the forms and types of aluminum for the required items of work.
 - 1. Alloy and Temper: Provide alloy and temper as recommended by the aluminum producer or finisher, with not less than the strength and durability properties specified in ASTM B 632/B 632 M, alloy 6061-T6.

2. Welding Electrodes and Filler Metal: Type and alloy of filler metal and electrodes as recommended by producer of the metal to be welded, and as required for color match, strength and compatibility in the fabricated items.
3. Fasteners: Finish of basic metal and alloy, matching finished color and texture as the metal being fastened, unless otherwise indicated. Unless otherwise shown, provide Phillips flat-head screws for exposed fasteners.
4. Bituminous Paint: SSPC-Paint (cold-applied asphalt mastic).
5. Protective Lacquer: Clear non-yellowing, of type recommended by metal producer for protection of the finished metal surfaces.
6. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.
7. Aluminum Plate and Sheet: ASTM B 209, Alloy 6061-T6.
8. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6.
9. Aluminum Castings: ASTM B 26/B 26M, Alloy 443.0-F.

C. Steel

1. Steel Plates, Shapes and Bars: ASTM A 36/A 36M.
2. Structural Steel Sheet: Hot-rolled, ASTM A 570; or cold-rolled ASTM A 611, Class 1; of grade required for design loading.
3. Galvanized Structural Steel Sheet: ASTM A 446, of grade required for design loading. Coating designation as indicated, or if not indicated, G90.

D. Gray Iron Castings: ASTM A 48, Class 30.

E. Malleable Iron Castings: ASTM A 47, grade as selected by fabricator.

F. Stainless Steel Sheet, Strip, Plate and Flat Bars: ASTM A 666 , Type 304, unless otherwise indicated.

1. Stainless Bars and Shapes: ASTM A 276, Type 304.

G. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.

H. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A 153.

I. Grout:

1. Non-Shrink, Metallic Grout: Pre-mixed, factory-packaged, ferrous-aggregate grout complying with CE CRD-C588, Type M, and ASTM C 1107, specifically recommended

by manufacturer for heavy-duty loading applications and not to be used in wet areas or on exterior applications.

2. Non-Shrink, Non-Metallic Grout: Pre-mixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with CE CRD-C621, and ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.

J. Fasteners:

1. General: Provide zinc-plated fasteners complying with ASTM B 633, Class Fe/Zn 5, for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.
2. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A, with hex nuts, ASTM A 563; and where needed, flat washers.
3. Weathering Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 325, Type 3, with hex nuts, ASTM A 563, Grade C3; and where needed, flat washers.
4. Lag Screws: Square head type, ASME B18.2.1.
5. Machine Screws: Cadmium plated steel, ASME B18.6.3.
6. Wood Screws: Flat head, carbon steel, ASME B18.6.1.
7. Plain Washers: Round, carbon steel, ASME B18.22.1.
8. Masonry Anchorage Devices: Expansion shields, FS FF-S-325.
9. Expansion Anchors: Anchor bolt and sleeve assembly; Carbon-steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.
10. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class and style as needed.
11. Lock Washers: Helical, spring type, carbon steel, ASME B18.21.1.
12. Anchor Bolts: ASTM F 1554, Grade 36, of dimension indicated; with nuts, ASTM A 563; and where indicated, flat washers.

- K. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

- L. Cast-in-Place in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

M. Post-Installed Anchors:

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5, unless otherwise indicated.
2. Material for Exterior Locations and where Stainless Steel is indicated: Alloy Group 1 (A1) stainless-steel bolts, ASTM F 593 and nuts, ASTM F 594.

N. Paint:

1. Metal Primer Paint: Red lead mixed pigment, alkyd varnish, linseed oil paint, FS TT-P-861, Type II; or red lead iron oxide, raw linseed oil, alkyd paint, Steel Structures Painting Council (SSPC) Paint 2-64; or basic lead silico chromate base iron oxide, linseed oil, alkyd paint, FS TT-P-615, Type II.
2. Primer selected must be compatible with finish coats of paint. Coordinate selection of metal primer with finish paint requirements specified in Section 09900.
3. Galvanizing Repair Paint: High-zinc-dust content paint for regalvanizing welds in galvanized steel, complying with the Military Specifications MIL-P-21035 (Ships) or SSPC-Paint-20 and compatible with paints specified to be used over it.

2.2 FABRICATION, GENERAL

A. Workmanship

1. Use materials of size and thickness indicated, or if not indicated, as required to produce strength and durability in finished product for use intended. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of work.
2. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32" unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
3. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.
4. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts.
5. Provide for anchorage of type shown, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.
6. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.

B. Galvanizing:

1. Provide a zinc coating for exterior steel items and those items indicated or specified to be galvanized, as follows:

- a. ASTM A 153 for galvanizing iron and steel hardware.
 - b. ASTM A 123 for galvanized rolled, pressed and forged steel angles, corner guards, other indicated shapes, plates, bars, bollards and strip 1/8" thick and heavier.
 - c. ASTM A 386 for galvanizing assembled steel products.
- C. Fabricate joints which will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.
- D. Shop Painting
- 1. Shop paint miscellaneous metal work, except members of portions of members to be embedded in concrete or masonry, surfaces and edges to be field welded, and galvanized surfaces, unless otherwise indicated.
 - 2. Remove scale, rust and other deleterious materials before applying shop coat. Clean off heavy rust and loose mill scale in accordance with SSPC SP-2 "Hand Tool Cleaning", or SSPC SP-3 "Power Tool Cleaning", or SSPC SP-7 "Brush-Off Blast Cleaning".
 - 3. Remove oil, grease and similar contaminants in accordance with SSPC SP-1 "Solvent Cleaning".
 - 4. Immediately after surface preparation, brush or spray on primer in accordance with manufacturer's instructions, and at a rate to provide uniform dry film thickness of 2.0 mils for each coat. Use painting methods which will result in full coverage of joints, corners, edges and exposed surfaces.
 - 5. Apply one shop coat to fabricated metal items, except apply two (2) coats of paint to surfaces inaccessible after assembly or erection. Change color of second coat to distinguish it from the first.

2.3 MISCELLANEOUS METAL FABRICATIONS

- A. Rough Hardware
- 1. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items as specified in Division-6 sections.
 - 2. Fabricate items to sizes, shapes and dimensions required. Furnish malleable-iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.
- B. Miscellaneous Structural Shapes, Framing and Supports, Etc.
- 1. Provide miscellaneous steel framing and supports which are not a part of structural steel framework, as required to complete work.

2. Fabricate miscellaneous units to sizes, shapes and profiles indicated or, if not indicated, of required dimensions to receive adjacent other work to be retained by framing. Except as otherwise indicated, fabricated from structural steel shapes, plates and steel bars of welded construction using mitered joints for field connection. Cut, drill and tap units to receive hardware and similar items.
3. Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed.
4. Galvanize exterior miscellaneous frames and supports.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

3.2 INSTALLATION

A. General

1. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; including, threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.
2. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location; alignment and elevation, plus, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete masonry or similar construction.
3. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch-up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.
4. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work.

B. Setting Loose Lintels and Plates:

1. Clean concrete and masonry bearing surfaces of any bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of bearing plates.

2. Set Loose Lintels, leveling and bearing plates on wedges, or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if protruding, cut-off flush with the edge of the bearing plate before packing with grout. Use metallic non-shrink grout in concealed locations where not exposed to moisture; use non-metallic non-shrink grout in exposed locations, unless otherwise indicated.
3. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.3 ADJUST AND CLEAN

- A. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting. Apply by brush or spray to provide a minimum dry film thickness of 2.8 mils.
- B. For galvanize surfaces: Clean field welds, bolted connections and abraded areas and apply galvanizing repair paint.

END OF SECTION 05500

SECTION 06100 - CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Types of work in this section include rough carpentry for:
 - 1. Wood nailers and blocking.

1.3 SUBMITTALS

- A. Material Certificates: Where dimensional lumber is provided to comply with minimum allowable unit stresses, submit listing of species and grade selected for each use, and submit evidence of compliance with specified requirements. Compliance may be in form of a signed copy of applicable portion of lumber producer's grading rules showing design values for selected species and grade. Design values shall be as approved by the Board of Review of American Lumber Standards Committee.
- B. Wood Treatment Data: Submit chemical treatment manufacturer's instructions for handling, storing, installation and finishing of treated material.
- C. Fire-Retardant Treatment: Include certification by treating plant that treated material complies with specified standard and other requirements.

1.4 PRODUCT HANDLING

- A. Delivery and Storage: Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber; provide for air circulation within and around stacks and under temporary coverings including polyethylene and similar materials.
- B. Do not deliver finish carpentry materials, until painting, wet work, grinding and similar operations which could damage, soil or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, finish carpentry materials must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

1.5 PROJECT CONDITIONS

- A. Coordination: Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow attachment of other work.
- B. Maintain temperature and humidity in installation areas as required to maintain moisture content of installed finish carpentry within a 1.0 percent tolerance of optimum moisture content, from date of installation through remainder of construction period. The fabricator of woodwork shall determine optimum moisture content and required temperature and humidity conditions.

PART 2 - PRODUCTS

2.1 LUMBER, GENERAL

- A. Lumber Standards: Manufacture lumber to comply with PS 20 "American Softwood Lumber Standard" and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.
- B. Inspection Agencies: Inspection agencies and the abbreviations used to reference with lumber grades and species include the following:

WWPA - Western Wood Products Association.

- C. Factory-mark each piece of lumber with type, grade, mill and grading agency, except omit marking from surfaces to be exposed with transparent finish or without finish.
- D. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified for each use.
- E. Provide dressed lumber, S4S, unless otherwise indicated.
- F. Provide seasoned lumber with 19 percent maximum moisture content at time of dressing.

2.2 MISCELLANEOUS LUMBER

- A. Provide wood for support or attachment of other work including nailers, blocking, and similar members. Provide lumber of sizes indicated or required, worked into shapes shown, and as follows:
 - 1. Moisture content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.
 - 2. Grade: Construction Grade light framing size lumber of any species or board size lumber as required. Provide construction grade boards or No. 2 Boards.

2.3 MISCELLANEOUS MATERIALS

- A. Fasteners and Anchorages: Provide size, type, material and finish as indicated and as recommended by applicable standards, complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers and anchoring devices. Provide metal hangers and framing anchors of the size and type recommended by the manufacturer for each use including recommended nails.
- B. Where rough carpentry work is exposed to weather, in area of high relative humidity, provide fasteners and anchorages with a hot-dip zinc coating (ASTM A 153).
- C. Building Paper: ASTM D 226, Type I; asphalt saturated felt, non-perforated, 15-lb. type.

2.4 WOOD TREATMENT BY PRESSURE PROCESS

- A. Fire-Retardant Treatment: Where fire-retardant treated wood ("FRT") is indicated or required, pressure impregnate lumber and plywood with fire-retardant chemicals to comply with

AWPA C20 and C27, respectively, identify "FRT" lumber with appropriate classification marking of Underwriters Laboratories, Inc., U.S. Testing, Timber Products Inspection or other testing and inspecting agency acceptable to authorities having jurisdiction.

1. Fire treated wood shall have a flame spread of 25 or less and shall be dried to 19% moisture content for lumber and 15% for plywood. Exposed wood or wood subject to high humidity conditions shall be identified that the moisture content shall not exceed 28% when tested at 92% relative humidity in accordance with ASTM D3201.
2. Treatment products: The following products, provided they comply with requirements of the contract documents will be among those considered acceptable:
 - a. "Dricon"; Hickson Corporation.
 - b. "Flame Proof LHC"; Osmose Wood Preserving, Inc.
3. Treat members shown on drawings and/or as required to meet the all State and Local Codes and Regulations.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.
- B. Set carpentry work to required levels and lines, with members plumb and true to line and cut and fitted.
- C. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards.
- D. Countersink nail heads on exposed carpentry work and fill holes.
- E. Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.

3.2 WOOD NAILERS AND BLOCKING

- A. Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.
- B. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated.

END OF SECTION 06100

SECTION 06400 - ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

- A. Extent of each type of architectural woodwork is indicated on drawings and in schedules.
- B. Type of architectural woodwork includes the following:
 - 1. Removal of existing wood trim, sand, prep, and refinish standing and running trim.
- C. Wood doors are specified in Section 08211.

1.3 QUALITY ASSURANCE

- A. AWI Quality Standard: Comply with applicable requirements of "Architectural Woodwork Quality Standards" published by the Architectural Woodwork Institute (AWI), except as otherwise indicated.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product data for each product and process specified as work of this section and incorporated into items of architectural woodwork during fabrication, finishing, and installation.
- B. Shop Drawings: Submit shop drawings showing location of each item, dimensioned plans and elevations, large scale details, attachment devices and other components.
- C. Samples: Submit the following samples:
 - 1. Existing trim with stain and transparent finish; finished on one side and one edge.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect woodwork during transit, delivery, storage and handling to prevent damage, soiling and deterioration.
- B. Do not deliver woodwork, until painting, wet work, grinding and similar operations which could damage, soil or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, woodwork must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

1.6 PROJECT CONDITIONS

- A. Conditioning: Do not install woodwork until required temperature and relative humidity have been stabilized and will be maintained in installation areas.

- B. Maintain temperature and humidity in installation area as required to maintain moisture content of installed woodwork within a 1.0 percent tolerance of optimum moisture content, from date of installation through remainder of construction period. Require Woodwork Manufacturer to establish optimum moisture content and required temperature and humidity conditions.

PART 2 - PRODUCTS

2.1 BASIC MATERIALS AND FABRICATION METHODS

- A. General: Except as otherwise indicated, comply with the following requirements for architectural woodwork not specifically indicated as prefinished standard products.
- B. Wood Moisture Content: Maintain temperature and relative humidity during storage and refinishing operations so that moisture content values for woodwork at time of installation do not exceed the following:
 - 1. Interior Wood finish: 5% - 10%.
- C. Interior Wood for Transparent Finish:
 - 1. Solid Wood Trim.
 - 2. Match Existing Adjacent Wood Work: Where indicated or required, provide wood in finishes to match existing adjacent wood trim work, and other architectural wood work, and as directed by the Architect.

2.2 FABRICATION

- A. Quality Standards: For following types of architectural woodwork; comply with indicated standards as applicable.
 - 1. Standing and Running Trim: AWI Section 300
- B. Design and Construction Features: Comply with details shown for profile and construction of architectural woodwork; and, where not otherwise shown, comply with applicable Quality Standards, with alternate details as approved by Architect.
- C. Measurements: Before proceeding with fabrication of woodwork required to be fitted to other construction, obtain field measurements and verify dimensions and shop drawing details as required for accurate fit.
 - 1. Where sequence of measuring substrates before fabrication would delay the project, proceed with fabrication (without field measurements) and provide ample borders and edges to allow for subsequent scribing and trimming of woodwork for accurate fit.

2.3 INTERIOR ARCHITECTURAL WOODWORK

- A. Quality Standard: Comply with AWI Section 300.
- B. Standing and Running Trim:
 - 1. Grade: Premium

2. Fabricate standing and running trim including jambs to dimensions, profiles and details shown or to match existing.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Condition woodwork to average prevailing humidity conditions in installation areas prior to installing.
- B. Pre-Installation Meeting: Meet at project site prior to delivery of architectural woodwork and review coordination and environmental controls required for proper installation and ambient conditioning in areas to receive work. Include in meeting the Contractor; Architect and other Owner Representatives (if any); installers of architectural woodwork, wet work such as plastering, other finishes, painting, mechanical work and electrical work; and firms or persons responsible for continued operation (whether temporary or permanent) of HVAC system as required to maintain temperature and humidity conditions. Proceed with woodwork installation only when everyone concerned agrees that required ambient conditions can be maintained.
- C. Deliver concrete inserts and similar anchoring devices to be built into substrates, well in advance of time substrates are to be built.
- D. Prior to installation of architectural woodwork, examine shop fabricated work for completion, and complete work as required, including back priming and removal of packing.

3.2 INSTALLATION

- A. Install woodwork plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level and with no variations in flushness of adjoining surfaces.
- B. Scribe and cut woodwork to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.
- C. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns, miter at corners and comply with referenced Quality Standards for joinery.
- D. Anchor woodwork to anchors or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fasteners heads are required, use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork, and matching final finish where transparent finish is indicated.

3.3 ADJUSTMENT, CLEANING, FINISHING, AND PROTECTION

- A. Repair damaged and defective woodwork where possible to eliminate defects functionally and visually; where not possible to repair replace woodwork. Adjust joinery for uniform appearance.

- B. Clean woodwork on exposed and semi-exposed surfaces. Touch-up shop-applied finishes to restore damaged or soiled areas.
- C. Complete the finishing work specified as work of this section, to whatever extent not completed at shop or prior to installation of woodwork.
- D. Refer to the Division-9 Sections for final finishing of installed architectural woodwork.
- E. Provide final protection and maintain conditions, in a manner acceptable to Fabricator and Installer, which ensures architectural woodwork being without damage or deterioration at time of substantial completion.

END OF SECTION 06400

SECTION 07200 - BUILDING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

- A. Work included in this Contract: Contractor shall include all labor, materials, services, installation, equipment, etc., necessary to complete all building insulation (except roof insulation) to achieve complete and tight building thermal barrier to prevent the passage of exterior air into conditioned spaces and prohibit the formation of condensation.
 - 1. Provide indicated types of insulation as shown on drawings, as specified herein, and/or as required by all job conditions and building assemblies, whether clearly shown or not to achieve included work.
 - 2. Insulation types include but are not limited to the following:
 - a. Blanket type building insulation with foil facing for concealed application,
 - 3. Related Work:
 - a. Metal stud/gypsum drywall: Section 09250.

1.3 QUALITY ASSURANCE

- A. Thermal Conductivity: Thicknesses shown are for thermal conductivity (k-value at 75°F) specified for each material. Provide adjusted thicknesses as directed for equivalent use of material having a different thermal conductivity. Where insulation is identified by "R" value, provide appropriate thicknesses.
- B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 1. Surface-Burning Characteristics: ASTM E 84.
 - 2. Fire-Resistance Ratings: ASTM E 119.
 - 3. Combustion Characteristics: ASTM E 136.
- C. Fire and Insurance Ratings: Comply with fire-resistance, flammability and insurance ratings indicated, and comply with governing regulations as interpreted by authorities.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product literature and installation instructions for each type of insulation required. Include data substantiating that materials comply with specified requirements.

- B. Samples: Submit triplicate samples of the following listed items, in accordance with Contract Documents. Obtain Architect's approval before proceeding with ordering or fabrication of items of this section:

- 1. Each type of insulation specified - 12 inches square.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. General Protection and Handling: Protection from Deterioration: Do not allow insulation materials to become wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- 1. Glass-Fiber Insulation:
 - a. CertainTeed Corporation.
 - b. Johns Manville.
 - c. Owens Corning.
 - d. Guardian Building Products, Inc.
 - e. Knauf Insulation.
 - f. or approved equal.

- B. Mineral/Glass Fiber Blanket/Batt Insulation

- 1. Inorganic fibers formed into flexible resilient blankets or semi-rigid resilient sheets:
 - a. Reinforced-Foil-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (reflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work.
- B. Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.
 - 1. Apply a single layer of insulation of required thickness, unless otherwise shown or required to make up total thickness.

2. Provide complete and tight building thermal barrier, to prevent the passage of exterior air into conditioned spaces and prohibit the formation of condensation.
3. Provide indicated types of insulation as shown on drawings, as specified herein, and/or as required by all job conditions, building assemblies, and whether clearly shown or not.

C. Batt Insulation

1. General:
 - a. Set vapor barrier faced units with vapor barrier to warm side of construction.
 - b. Tape joints and ruptures in vapor barriers, and seal each continuous area of insulation to surrounding construction to ensure vapor-tight installation.
 - c. Insert and secure insulation to fill voids to create barrier to prevent the pass of air and moisture.

- D. All installations of insulation and work of this section shall meet approval of Architect and all code authorities having jurisdiction at no additional cost to the Owner.

END OF SECTION 07200

SECTION 07315 - REPAIR TO SLATE ROOF SHINGLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 INSTALLATION ASSURANCE

- A. Repair work to slates shall be performed by skilled and experienced roofers who will fit and fasten each slate. Each roofer proposed for the Project should be interviewed to determine that person's relevant experience.
- B. The roofer awarded the Project shall order the slate within thirty (30) days of receiving a contract. The Architect shall promptly receive written confirmation of said order the contractor / slate company.

1.3 PROJECT CONDITIONS

- A. The roofer shall proceed with repair work on the slate shingles only after all penetrating work has been completed correctly, the substrate is dry, and weather conditions are favorable.

PART 2 - PRODUCTS

2.1 ROOFING SLATE

- A. Material:
 - 1. Classification: Slate shall meet the requirements of Grade S1 per ASTM C-406-06.
 - 2. Color(s) / Blend: Match existing.
 - 3. Size: Match existing.
 - 4. Shape: Slate shingles shall be rectangular unless otherwise specified.
 - 5. Exposure: A function of shingle length and headlap. Graduated exposures are available.
 - 6. Headlap: A function of roof pitch. 3 inch headlap is standard.
 - 7. Thickness: Select nominal thicknesses of 1/4 inch, 3/8 inch, 1/2 inch, 3/4 inch or custom thickness. Contact the slate company for various weights per square.
 - 8. Nail Holes: Each slate shall be machine punched or drilled for two nails located for proper headlap.
- B. Physical Requirements
 - 1. Slates with a strong grain must be produced "on the grain", that is, the direction of the grain of the stone must be parallel to the long dimension of the shingle. Slates shall be

randomly selected from each shipment and tested for grain direction to ensure proper fabrication.

2. Slates with broken corners on the exposed ends shall not be installed when either the base or leg of the right triangular piece broken off is greater than 1 ½ -inches. Slates with broken corners are acceptable for cutting stock.
3. The curvature of shingles shall not exceed 1/8 inch in 12 inches. Curved slates shall be trimmed and holed to permit them to be laid with the convex side facing up.
4. "Knots" and "knurls" are rounded defects that affect the smoothness of split. They are acceptable on the exposed portion of the top face but on other parts will prevent close contact of shingles. Shingles having knots or knurls on the covered portions projecting in excess of 1/16 inch shall not be used if they prevent proper fit and contact.
5. Slates shall be free from ribbons.
6. Not more than 1% of broken slates, including those having cracks materially precluding ringing when sounded, shall be accepted.
7. Face dimensions shall not differ from those specified by more than 1/8 inch.

C. Slate Supplier:

1. Basis of Design: Provide slate as manufactured by: Vermont Structural Slate Co., Fair Haven, VT, Tel.# 800.343.1900/802.265.4933, www.vermontstructuralslate.com; or approved equal.

2.2 ROOFING FELT

- A. The roofer shall use 30 pound asphalt saturated rag felt per ASTM D 226.

2.3 NAILS

- A. The roofer shall use large head slaters' solid copper nails, 1 ½-inch or longer for field, and 2-inch for slates on hips and ridges. Nails should adequately penetrate the roof deck.

2.4 CAULKING

- A. The roofer shall use approved waterproof elastic slaters' cement, color to match slate.

PART 3 - EXECUTION

3.1 ROOFING FELT INSTALLATION

- A. The Roofer shall lay the felt in horizontal layers, with joints lapped toward the eaves at least 2-inches. The felt shall be well secured along laps and at ends as necessary to properly hold the felt in place and protect the structure until the slate has been installed.
- B. The Roofer shall lap the felt over all hips and ridges at least 12-inches to form double thickness.

- C. The Roofer shall lap the felt 2-inches over the metal of any valleys.

3.2 MEMBRANE WATERPROOFING INSTALLATION

- A. Ice Protection Underlayment: Basis of Design; Provide "WinterGuard HT" self-adhering waterproofing underlayment, glass fiber reinforcement impregnated and coated with rubberized asphalt, 45 mil total thickness, as manufactured by CertainTeed Corporation, or "StormGuard", as manufactured by GAF-ELK Corp.; or approved equal.

3.3 SLATE INSTALLATION

- A. Nails shall not be driven as to produce strain on slates. The slate shall be loose when fully nailed. If this is not executed properly, building movement could draw the nail head through the slate.
- B. Because roofing slate varies in terms of color shade, texture and weathering characteristics, the roofer shall draw slates from several pallets at once (shuffle) so as to blend the material on the roof.
- C. Exposed nails are only permissible at the top courses where unavoidable. Exposed nail heads shall be covered with elastic cement. Hip slates and ridge slates shall be laid in elastic cement spread thickly over unexposed surface of under courses, nailed securely in place, and pointed with elastic cement.
- D. All penetrations such as pipes and ventilators shall have slate neatly fitted around them.
- E. Entire surfaces of all roofs, except as noted, shall be covered with slate in a proper and weatherproof manner. Upon completion, all slates must be sound, whole and clean. The roof must be left watertight and neat in every respect, and subject to the Architect's approval.
- F. The Owner shall be furnished with a stock of 2% extra slates for future roof repairs.

END OF SECTION 07315

SECTION 07500 - BUILT-UP ROOFING AND MISCELLANEOUS REPAIRS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. The requirements of this section apply to the work specified in all roofing sections work and include also the following work:

- 1. Roofing alterations and repair work to existing warranted built-up roofing system.

1.2 QUALITY ASSURANCE

- B. Roofing and associated work, including work of all sections listed in 1.1 above, must be included in a single subcontract, so that there will be undivided responsibility for the specified performance of all component parts.

- C. Installer Prequalification: Installer must be a recognized Roofing Contractor, skilled and experienced in the types of work required, and equipped to perform workmanship in accordance with recognized standards.

- 1. Minimum Experience: Not less than five (5) years experience in applications for indicated roofing systems, and in roofing projects of magnitude equivalent to the required work.

- 2. Maintenance Proximity: Not more than two hours normal travel time from Installer's maintenance plant to project site.

- a. Optional Proximity: At Contractor's option, and with Owner's prior acceptance of Installer's certification that work of the Maintenance Agreement will be performed by a designated roofing contractor whose plant is located not more than two hours normal travel time from project site, the above requirements will be waived.

- D. Product Bid: The product bid must have past performance of installation on a roof in the state where project is located for a minimum of five (5) years, under the same name of manufacturer as bid.

- E. Alterations to existing warranted roof: Contractor shall make necessary tie ins and alterations to existing roof in accordance with details indicated and "Basis of Design" product requirements so as to maintain original warranty on existing roof and/or achieve complete weather tight conditions.

1.3 SUBMITTALS

- A. Submit certification that the roof materials furnished for roof alterations and tie-ins is Tested and Approved by Factory Mutual as a Class 1-SH roof system with 1-90 Wind Uplift Requirements, or Listed by Underwriters Laboratories or Warnock Hersey for external fire tests of ASTM E - 108 Class A.

- B. Product Data for each type of product specified include manufacturer's technical product data, installation instructions, and recommendations for each type of roofing product required. Include data substantiating that materials comply with specified requirements.

- C. For all modified bituminous sheet roofing include independent test data according to ASTM designation D-5147-91 "Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material" substantiating that materials comply with specified requirements. A separate Certificate of Analysis for each production run of material shall indicate the following information:
1. Material type.
 2. Lot number.
 3. Production dates.
 4. Dimension and Mass.
 5. Physical and Mechanical Properties.
- D. Shop Drawings: Submit roofing membrane layout drawings showing the outline of existing roof and locations of flashings and tie-ins, seam locations, specific roofing details illustrating relationships with adjacent construction, and flashing details at indicated tie-in conditions.
1. Submit shop drawings of manufactured and/or fabricated sheetmetal work.
 2. Contract Drawing Detail Approval: If the roofing manufacturer takes exception to the contract document details, the manufacturer shall provide the roofing contractor with acceptable details to be submitted to the Architect for approval. This Project must receive Architect's approval through this process prior to shipment of materials to the project site. All roofing work required by the roofing system manufacturer shall be included in the contract at no additional cost to the Owner.
- E. Samples: Samples of each material specified, properly labeled.
1. Roof membrane: For project records, submit 8- by 10-inch samples of membrane cut from rolls of each type of material used on the project.
 2. Flashing membrane: Submit 12-inch-square samples of sheet material to be used for base flashings.
 3. Fasteners: Submit (2) of each type.
 4. Adhesives: Submit samples for each type to be used.

1.4 JOB CONDITIONS

- A. Roofing Conference: Prior to the installation of the roofing and associated work, meet at the project site with the Installer, the Installers of each component of associated work, and the Architect and other representatives directly concerned with performance of the work, including, where applicable, product manufacturers and the Owner. Record (by Contractor) the discussions of the conference and the decisions and agreements, or disagreements reached, and furnish a copy of the record to each party attending. Review foreseeable methods and procedures related to the roofing work including, but not necessarily limited to, the following:
1. Review Project requirements (drawings, specifications and other contract documents).
 2. Review status of existing conditions and substrate (by the Roofing Installer), including extent of moisture penetration in existing work, drying and similar considerations.

3. Review availability of materials, tradesmen, equipment and facilities needed to make progress and avoid delays.
4. Review weather and forecasted weather conditions, and procedures for coping with unfavorable conditions.
5. Review regulations concerning Code compliance, environmental protection, health, safety, fire and similar considerations.
6. Establish units of work, including preparation, such that each unit may be completed prior to end of each day's work.

B. Weather Condition Limitations:

1. During periods of inclement weather, Contractor shall use wet power vacuums, on the day following each rain, to remove standing water so as not to delay his operations.
2. Proceed with roofing and associated work only when weather conditions will permit unrestricted use of materials and quality control of the work being installed, complying with the requirements and the recommendations of the roofing materials manufacturers.
3. Proceed only when the Contractor is willing to guarantee the work as required and without additional reservations and restrictions.
4. Protect existing work and property from damage during the course of the work. Be prepared for all weather and other contingencies as prudence may dictate. Maintain on the site at all times sufficient and proper materials for temporary roofing and other protection when weather conditions prevent continuance of work and do not permit completion of each unit of work prior to the end of each working day. Temporary protection and roofing work must be provided at no additional cost to the Owner.
5. Remove and discard materials which have been used for temporary roofs, protection, water seals, and related work. Do not incorporate used materials into the work.

- C. Storage of Materials and Property:** Do not overstress roof decks and supporting structures. Avoid placing loads at midspans of framing. All superimposed loads shall be well distributed. Do not store more material on roofs than can be installed in one and one-half working days. Store materials, except membrane, in dry area and protect from water and direct sunlight. Damaged materials shall be replaced at Contractor's expense. Protect adjacent work from damage due to roofing operations and related work. Provide temporary protection against walls adjacent to roofing work; remove protection upon completion.

PART 2 - PRODUCTS

2.1 GENERAL ROOFING MATERIALS

- A. Refer to other sections for roofing replacement work and all requirements of roofing materials, products and systems.
- B. Alterations and Repair Work for Built-up Roofing:

1. Provide all Roofing materials, flashings, primers, adhesives and all other required accessories to meet or exceed the existing roofing assembly and maintain the existing warranty. All roofing materials shall be UL Class A, FM Class 1-SH listed and shall comply with the International Building Code, and CGSB 37-GP-56M standards.
2. Wood Cants and Curbs: Lumber; #2 grade free from warping and visible decay; fire retardant treated, and marked.
3. Mechanical Fasteners: Manufacturer's standard FM approved fasteners for this type of application.
4. Other Materials and Accessories: Manufacturer's standard and/or approved products for indicated applications.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Coordinate the installation of roofing materials and associated work so as to provide a complete system complying with the combined recommendations of manufacturers and installers involved in the work.
- B. Protect other work from spillage of roofing materials, and prevent materials from entering and clogging drains and conductors. Replace or restore other work which is soiled or otherwise damaged by the performance of the roofing and associated work.

3.2 PERFORMANCE REQUIREMENTS

- A. Initial Weather Resistance: It is required that the roofing and associated work be durable in normal weather exposure and not leak water during rainstorms. After completion of the roofing and associated work, and either during or immediately after a rainstorm, (and just before final acceptance of the work) the Installer shall meet with the Contractor at the project and inspect the building for evidence of leaks in the roofing and associated work. Prepare a written report without delay (by Contractor) covering the inspection, and submit to Owner (with copy to Architect). Should no rain occur between the time the roof is completed and when all punch list items have been corrected, this requirement shall be waived.
- B. Repair or replace roofing and associated work as required to eliminate leaks or other inability of roofing to initially withstand normal weather exposure.
 1. Abnormal weather exposure is recognized to include hailstorms, lightning strikes, hurricane and tornadic winds, and other unusual phenomena of the weather as frequently covered by building insurance.
- C. **Alterations and Repairs to Existing Roofs:**
 1. Examine substrate surfaces to receive roofing system and associated work and conditions under which roofing will be installed. Do not proceed with roofing until unsatisfactory conditions have been corrected in a manner acceptable to Installer.
 2. Verify that deck is securely fastened with no projecting fasteners and with no adjacent

units in excess of 1/16 inch out of plane.

3. Cooperate with inspection and test agencies engaged or required to perform services in connection with roofing system installation.
4. Insurance/Code Compliance: Install roofing and flashing work (and test where required to show) compliance with governing regulations.
5. Coordinate the installation of roofing sheets, flashings, stripping, coatings and surfacing, so that felts are not exposed to precipitation nor exposed overnights. Provide cut-offs at the end of each day's work, to cover exposed felts and insulation with a course of coated felt with joints and edges sealed with roofing cement. Remove cut-offs immediately before resuming work. Glaze coats installed ply-sheet courses at the end of each day's work where final surfacing has not been installed.
6. Substrate Joint Penetrations: Do not allow adhesive to penetrate substrate joints and enter building or damage existing or new insulation, vapor barriers (retarders) or other construction.
7. General Requirements: Apply roofing membrane in accordance with roofing material manufacturer's instructions. Application of roofing shall immediately follow application of base sheet and/or insulation as a continuous operation.

D. Aluminum Reflective Coating System::

1. Prepare all surfaces by sweeping clean of dust, dirt, oil and loose particles.
2. Repair all cracks and blisters by spreading "Karnak # 19AF Flashing Cement over the damaged areas, then embed Karnak Cotton, Glass or Poly-Mat reinforcement and apply another coat of flashing cement over the entire patch.
3. Provide manufacturer's recommended prime coating and other materials prior application of aluminum roof coating. Allow primers to cure 3-5 days or as per manufacturer's recommendation.
4. Mix and apply aluminum roof coating in accordance with manufacturer's instructions and recommended rates of application and use of special tools and equipment.

C. Restoration of Cast Stone Coping:

1. PREPARATION: Test Application: Prior to performance of water repellent work, including bulk purchase/delivery of products, prepare a small application in an unobtrusive location and in a manner acceptable to Architect, for purpose of demonstrating final effect (visual and physical/chemical) of planned installation. Proceed with work only after Architect's acceptance of test application, or as otherwise directed.
 - a. Revision of planned installation, if any and as requested by Architect, will be by change order where it constitutes a departure from requirements of contract documents at time of contracting.
 - b. Clean substrate of substances which might interfere with penetration/adhesion of water repellents. Test for moisture content, in accordance with repellent

manufacturer's instructions, to ensure that surface is sufficiently dry.

- c. Coordination with Sealants: Delay application of water repellents until installation of backer rod and sealants, in accordance with requirements of Specification Section 07900, has been completed in joints adjoining surfaces to be coated with repellent.
 - d. Protect adjoining work, including sealant bond surfaces, from spillage or blow-over of water repellent. Cover adjoining and nearby surfaces of aluminum and glass where there is possibility of water repellent being deposited on surfaces. Cover live plant materials with drop cloths. Clean water repellent from adjoining surfaces immediately after spillage. Comply with manufacturer's recommendations for cleaning.
2. INSTALLATION: Apply a heavy saturation spray coating of water repellent on surfaces indicated for treatment using low pressure spray equipment. Comply with manufacturer's instructions and recommendations, using airless spraying procedure unless.

END OF SECTION 07500



The Garland Company, Inc.

Warranty Number 0400424

Effective Date 06/17/2004

Twenty (20) Years High Performance Built-Up Roofing System Warranty No Dollar Limit

Owner's Name & Address

State of NJ Dept. of Military and Veterans Affairs
101 Eggert Crossing Rd.
Lawrenceville, NJ 08648

Contractor's Name & Address

Knight Contracting
395A Millstone Rd.
Clarksburg, NJ 08510

Building Name Vineland Armory
Roof Identification All flat roof sections - BDE & Porch
Completion Date 09/15/2001

Roofing System Stressply E
Flashing System VP 40, Stressply E
Square Footage 10,000

MANUFACTURER RESPONSIBILITIES

The Garland Company, Inc. (hereinafter referred to as "Garland"), a Corporation of the State of Ohio, warrants to the above named owner that, when the above specified roofing system is installed in accordance with current Garland approved specifications, Garland will pay all authorized costs of repairs to the roofing system necessary to stop any leaks which occur during a period of twenty (20) years, from the completion date, subject to the terms of this warranty. Leaks which occur only as a result of any of the following will be repaired:

- A. Deterioration of the roofing system or flashing system resulting from ordinary wear and tear by the elements.
- B. Workmanship on the part of the approved roofing contractor in the application of the roofing system.
- C. Splits or breaks in the roofing system not caused by structural movement or failure or movement of any material underlying the roofing system or base flashing.
- D. Blisters, wrinkles, ridges, fishmouths or open laps in the roofing system.
- E. Slippage of the roofing system or flashing system.

The original cost does not include the cost of removing any preexisting roofing. The costs of removal or replacement of all roofing system components except the above mentioned roofing system shall be borne by owner.

APPLICABILITY OF WARRANTY

This warranty is valid only when applied by a Garland approved roofing contractor for approved roofing system specifications. All repairs, changes, alterations, modifications and additions to the roofing system must be authorized in advance in writing by Garland. This warranty is not assignable, directly or indirectly as a result of the sale of the premises or otherwise. This warranty shall not be applicable if, in the sole judgment of Garland, any of the following shall occur:

- A. The roofing system is damaged by natural disasters including, but not limited to, fire, floods, lightning, hail, earthquakes, wind damage, etc..
- B. The roofing system is damaged by structural movement or failure or movement of any material underlying the roofing system or base flashing.
- C. The roofing system is damaged by acts of negligence, misuse or accidents including, but not limited to, use of roof for other than waterproofing the building, vandalism, civil disobedience or acts of war.
- D. Discoloration, cosmetic deterioration or change in the visual appearance of the roofing system or Garland's top coating.
- E. Damage to the roofing system resulting from:
 - 1. Infiltration or condensation of moisture in, through, or around walls, copings, building structure or underlying or surrounding areas.
 - 2. Lack of positive drainage.
 - 3. Movement or deterioration of metal adjacent or built into the roofing system or base flashing.
 - 4. Chemical contaminate attacks on the roofing system which have not been approved or accepted by Garland.
 - 5. Building design or construction.
 - 6. Traffic or storage of materials on roof.
 - 7. Defects in, failure or improper application of the underlying material used as a base which the roof is applied.
 - 8. Acts of parties other than manufacturer or authorized roofing contractor.
- F. Failure of owner to properly notify Garland in writing and receive written approval of:
 - 1. Changes in the usage of the building.
 - 2. Modifications or additions to the roofing system.
- G. Failure of owner to properly maintain the roof.
- H. Failure of owner to comply with each and every term or condition stated herein.





The Garland Company, Inc.

Garland assumes no responsibility for damage that occurs to the structure or interior of the structure, including the contents therein, from any type of leaks or any other consequential damages. Garland's sole responsibility is the costs of repairs of the above mentioned roofing system.

OWNER RESPONSIBILITIES

In the event of a leak, owner will notify Garland immediately in writing after discovery of the leak. Garland will inspect the roofing system. If it is determined that the roof leaks were the direct result of warrantable items as delineated within the terms of this warranty, Garland will perform the repairs required to correct the roof leaks at no cost to owner.

Owner will notify Garland in writing within thirty (30) days of any proposed modification, repair or addition, on or through the roofing system or base flashing for each situation occurring after the completion date of this warranty prior to the commencement of same. Owner will also notify Garland in writing within thirty (30) days of changes in the original usage of the building. Drawings or plans showing the location of the proposed changes in the original usage of the building must be provided and approved by Garland.

ALL IMPLIED WARRANTIES INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXCLUDED FROM THE SALE OF PRODUCTS COVERED BY THIS WARRANTY .

Garland recommends owner participation in the Garland Roof Maintenance and Inspection Program.

This warranty becomes effective only upon full payment of all bills for supplies and installation of the Garland roofing system.

This warranty shall be construed under and in accordance with the laws of the State of Ohio. This warranty constitutes the sole and only warranty of the parties hereto and supersedes any prior understandings or written or oral warranties between the parties respecting the subject matter within.

In the event that any one or more of the provisions contained in this warranty shall for any reason be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provision thereof, and this warranty shall be construed as if the invalid, illegal or unenforceable provision had never been contained therein.

The Garland Company, Inc.
3800 East 91st Street, Cleveland, Ohio 44105

By G. R. Olivier
Title Secretary
Date 06/17/2004

Warranty Acceptance:

Owner hereby accepts and agrees to the terms and conditions set forth in this warranty.

Owner

DMAVA

Signed By

Louis C. Cuccinelli Jr

Date

6-25-04



SECTION 07800 - ROOF SPECIALTIES AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

- A. Extent and locations of roof accessories is indicated on the drawings and by provisions of this section.
- B. Types of units specified in this section include the following:
 - 1. Prefabricated curb and support units
- C. Related Sections:
 - 1. Refer to roofing system sections, for roofing accessories to be built into roofing system (not work of this section).
 - 2. Section 06100: Carpentry.
 - 3. Section 07600: Flashing, Sheet Metal and Roof Accessories.
 - 4. Section 07900: Joint Sealer Assemblies.
 - 5. Division 15: Mechanical related work.

1.3 SUBMITTALS

- A. Product Data; Roof Accessories: Submit manufacturer's technical product data, rough-in diagrams, details, installation instructions and general product recommendations.
- B. Samples; Roof Accessories: Submit 2 samples, min. 8" square, of each exposed metal and plastic sheet materials, and 2 samples, min. 24" long, of formed or extruded exposed metal member; color and finish as specified.
- C. Coordination Drawings: Submit coordination drawings for items interfacing with or supporting mechanical or electrical equipment, ductwork, piping, or conduit. Indicate dimensions and locations of items provided under this section, together with relationships and methods of attachment to adjacent construction and to mechanical/electrical items.

1.4 QUALITY ASSURANCE

- A. Standards: Comply with SMACNA "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap-flashing to coordinate with type of roofing indicated. Comply with "NRCA Roofing and Waterproofing Manual" details for installation of units.
- B. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.

PART 2 - PRODUCTS

2.1 GENERAL PRODUCT REQUIREMENTS

- A. Provide manufacturers' standard units, modified as necessary to comply with requirements. Shop fabricate each unit to greatest extent possible.

2.2 MATERIALS, GENERAL

- A. Zinc-Coated Steel: Commercial quality with 0.20 percent copper, ASTM A 525, G90 hot-dip galvanized, mill phosphatized.
 - B. Stainless Steel: AISI TYPE 302/304, ASTM A 167, 2D annealed finish except as otherwise indicated, temper as required for forming and performance.
 - C. Aluminum Sheet: ASTM B 209, alloy 3003, temper as required for forming and performance; anodized finish, except mill finish prepared for painting where indicated for field painting.
 - D. Extruded Aluminum: Manufacturer's standard extrusions of sizes and general profiles indicated, alloy 6063-T52; 0.078" minimum thickness for primary framing and curb member legs, 0.062" for secondary legs;
 - E. Insulation: Manufacturer's standard rigid or semi-rigid board of glass fiber of thicknesses indicated.
 - F. Wood Nailers: Softwood lumber, fire retardant treated wood, not less than 1-1/2" thick. Refer to Specification Section 06100.
 - G. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other noncorrosive metal as recommended by manufacturer. Match finish of exposed fasteners with finish of material being fastened.
 - 1. Where removal of exterior exposed fasteners affords access to building, provide non-removable fastener heads.
 - H. Gaskets: Tubular or fingered design of neoprene or polyvinyl chloride, or block design of sponge neoprene.
 - I. Bituminous Coating: FS TT-C-494A or SSPC-Paint 12, solvent type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coating.
 - J. Mastic Sealant: Polyisobutylene; non-hardening, non-skinning, non-drying, non-migrating sealant.
 - K. Elastomeric Sealant: Generic type recommended by unit manufacturer, which is compatible with joint surfaces; comply with FS TT-S-00227E, TT-S-00230C, or TT-S-001543A.
 - L. Roofing Cement: ASTM D 2822, asphaltic.
- ### **2.3 PREFABRICATED CURBS / EQUIPMENT SUPPORTS**
- A. Comply with loading and strength requirements as indicated where units support other work. Coordinate dimensions with rough-in sheets or shop drawings of equipment to be supported.

Fabricate of structural quality sheet steel (ASTM A 570, Grade as required) which has been prepared for painting and factory-primed and painted with 2-mil thickness of baked-on synthetic enamel, after fabrication.

1. Fabricate with welded or sealed mechanical corner joints. Provide complete with cant strips and base profile coordinated with roof insulation thickness. Provide preservative-treated wood nailers at tops of curbs, coordinate with thickness of insulation and roof flashing as indicated, tapered as necessary to compensate for roof deck slopes of 1/4" per ft. and less.
 2. Except as otherwise indicated or required for strength, fabricate units of minimum 14-gauge (0.0747") metal, and to minimum height of 12".
 3. Sloping Roofs: Where slope of roof deck exceeds 1/4" per ft., fabricate curb/support units with height tapered to match slope, to result in level installation of tops of units.
- B. Manufacturers: Subject to compliance with requirements, manufacturers offering prefabricated curbs/equipment supports which may be incorporated in the work include the following:
1. Custom Curb, Inc.; Chattanooga, TN
 2. The Pate Company; Broadview, IL
 3. ThyCurb Div./ThyBar Corp.; Addison, IL
 4. or approved equal.

2.7 ALUMINUM FINISHES

- A. General: Comply with Aluminum Association's (AA) "Designation System for Aluminum Finishes" for finish designations and application recommendations.
- B. High-Performance Organic Coating Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's instructions.
1. Fluoropolymer 2-Coat Coating System: Manufacturer's standard 2-coat, thermocured system composed of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 605.2.
 - a. Color and Gloss: As selected by Architect from manufacturer's full range of choices for color and gloss.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with manufacturer's instructions and recommendations. Coordinate with installation of roof deck and other substrates to receive accessory units, and vapor barriers, roof insulation, roofing and flashing; as required to ensure that each element of the work performs properly, and that combined elements are waterproof and weathertight. Anchor units securely to supporting structural substrates, adequate to withstand lateral and thermal stresses as well as inward and outward loading pressures.

- B. Except as otherwise indicated install roof accessory items in accordance with construction details of "NRCA Roofing and waterproofing Manual".
- C. Isolation: Where metal surfaces of units are to be installed in contact with non-compatible metal or corrosive substrates, including wood, apply bituminous coating on concealed metal surfaces, or provide other permanent separation.
- D. Flange Seals: Except as otherwise indicated, set flanges of accessory units in a thick bed of roofing cement, to form a seal.
- E. Cap Flashing: Where cap flashing is required as component of accessory, install to provide adequate waterproof overlap with roofing or roof flashing (as counter-flashing). Seal with thick bead of mastic sealant, except where overlap is indicated to be left open for ventilation.

3.2 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces in accordance with manufacturer's instructions. Touch up damaged metal coatings.

END OF SECTION 07800

SECTION 07900 - JOINT SEALER ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Part 1 through Part 6 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes joint sealant assemblies for the following applications which include performances of materials, installation requirements, as indicated herein in this specification and as specified by cross - references in other Part s 1 through 6 specification sections.
- B. Exterior joints in the following vertical surfaces and nontraffic horizontal surfaces:
 - 1. Other joints as indicated.
- C. Exterior joints in the following horizontal traffic surfaces:
 - 1. Other joints as indicated.
- D. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:
 - 1. Perimeter joints of exterior openings where indicated.
 - 2. Tile control and expansion joints.
 - 3. Vertical control joints on exposed surfaces of interior unit masonry and concrete walls and partitions.
 - a. Perimeter joints between interior wall surfaces and frames of interior doors, windows.
 - b. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - c. Other joints as indicated.
 - 4. Interior joints in the following horizontal traffic surfaces:
 - a. Control and expansion joints in tile flooring.
 - b. Other joints as indicated.
- E. Preparation of all joints to be sealed.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.
 - 1. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

2. Preconstruction Compatibility and Adhesion Testing: Submit to joint sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - a. Use manufacturers standard test methods to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - b. Testing will not be required if joint sealant manufacturers submit joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.
 - c. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates as follows:
 - (1) Locate test joints where indicated or, if not indicated, as directed by Architect.
 - (2) Conduct field tests for each application indicated below:
 - (a) Each type of elastomeric sealant and joint substrate indicated.
 - (b) Each type of nonelastomeric sealant and joint substrate indicated.
 - (3) Notify Architect seven days in advance of dates and times when test joints will be erected.
 - (4) Sealant Manufacturer Responsibility:
 - (a) Manufacturer shall provide Technical Representative to perform Sealant Joint Field Pull Test. Manufacturer Sales representative is not acceptable to perform Field Pull Test.
 - (b) Technical Representative performing Field Pull Test must be an employee of the Sealant Manufacturer. Outside Sales Agent or Contract Technical Representative is not acceptable to perform Field Pull Test.
 - (5) Test Method: Test joint sealants by hand-pull method described below:
 - (a) Install joint sealants in 60-inch long joints using same materials and methods for joint preparation and joint-sealant installation required for the completed Work. Allow sealants to cure fully before testing.
 - (b) Make knife cuts from one side of joint to the other, followed by two cuts approximately 2 inches long at sides of joint and meeting cross cut at one end. Place a mark 1 inch from cross-cut end of 2-inch piece.
 - (c) Use fingers to grasp 2-inch piece of sealant between cross-cut end and 1-inch mark; pull firmly at a 90-degree angle or more in direction of side cuts while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing

adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.

- (d) For joints with dissimilar substrates, check adhesion to each substrate separately. Do this by extending cut along one side, checking adhesion to opposite side, and then repeating this procedure for opposite side.
 - (6) Report whether sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
 - (7) Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.
- 3. Mockups: Before installing joint sealants, apply elastomeric sealants as follows to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution:
 - a. Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this Section.
 - b. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."
- 4. PROJECT CONDITIONS
 - a. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:
 - (1) When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
 - (2) When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40°F.
 - (3) When joint substrates are wet.
 - b. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
 - c. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

B. Special Project Warrantee and Guarantee:

- 1. Special Installer's Warranty: Written warranty, signed by Installer agreeing to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

- a. Warranty Period: Five (5) years from approved date of Substantial Completion.
- 2. Special Manufacturer's Warranty: Written warranty, signed by elastomeric sealant manufacturer agreeing to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - a. Warranty Period: Five (5) years from approved date of Substantial Completion.
- 3. Guarantee shall further state that all exterior sealant will be guaranteed against:
 - a. Adhesive or cohesive failure in joints where movement is under maximum 25% extension or compression.
 - b. Any crazing greater than 3 mils in depth developing on surface of material.

1.4 SUBMITTALS

- A. Product Data from manufacturers for each joint sealer product required, including instructions for joint preparation and joint sealer application, include color samples showing full range of colors available, for each product exposed to view.
 - 1. Product Certificates: Signed by manufacturers of joint sealants certifying that products furnished comply with requirements and are suitable for the use indicated.
- B. Product Test Reports: From a qualified testing agency indicating sealants comply with requirements, based on comprehensive testing of current product formulations.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.
- B. Store and handle materials in compliance with manufacturers' recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.6 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealers under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealer manufacturers.
 - 2. When ambient and substrate temperature conditions are outside the limits permitted by joint sealer manufacturer or below 40°F (4.4°C).
 - 3. When joint substrates are wet due to rain, frost, condensation, or other causes.

- B. Joint Width Conditions: Do not proceed with installation of joint sealers where joint widths are less than allowed by joint sealer manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealers until contaminants capable of interfering with their adhesion are removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealers, joint fillers and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Colors: Provide color of exposed joint sealers indicated or, if not otherwise indicated, as selected by Architect from manufacturer's available full range of standard and optional colors.
- C. Grade of Sealant: For each application, provide the grade of sealant (nonsag, self-leveling, no track, knife grade, etc.) as recommended by the manufacturer for the particular condition of installation (location, joint shape, ambient temperature, and similar conditions) to achieve the best possible overall performance. Grades specified herein are for normal condition of installation.

2.2 MISCELLANEOUS MATERIALS

- A. Joint Primer/Sealer: Provide the type of joint primer/sealer recommended by the sealant manufacturer of the joint surfaces to be primed or sealed.
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.
- C. Sealant Backer Rod: Provide materials which in compliance with ASTM D 1056; compressible rod stock of polyethylene foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable non-absorptive material as recommended for compatibility with sealant by the sealant manufacturer.
 - 1. Materials shall be capable of remaining resilient at temperatures down to minus 26°F.
- D. Joint Fillers:
 - 1. Joint Fillers for Interior Concrete Slabs: Provide "Cerammar" flexible foam expansion joint, as manufactured by W.R. Meadows, Inc., Hampshire, IL, Tel.# 800.342.5976, www.wrmeadows.com; or approved equal.
 - a. Flexible foam expansion joint filler composed of a unique synthetic foam of isomeric polymers in a very small, closed-cell structure. Gray in color, Cerammar is a lightweight, flexible, highly resilient material offering recovery qualities of over 99%. The compact, closed-cell structure will absorb almost no water.
 - b. Non-impregnated and will not stain or bleed.

- c. Non-gassing.
- a. Complies with:
 - (1) ASTM D 5249, Type 2,
 - (2) ASTM D 1752, Sections 5.1 - 5.4, with compression requirement modified to 10 psi minimum and 25 psi maximum,
 - (3) ASTM D 7174-05.

2.3 SEALANTS

- A. Sealant Type 2: For sealing exterior joints, provide a Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. "Spectrum 1 / Spectrum 800"; Tremco, an RPM Co.
 - b. "SikaSil - WS290"; Sika Corporation
 - c. "Dow Corning 790 Silicone Building Sealant; Dow Corning
- B. Sealant Type 3: For all interior joints, provide a one-part, non-sag, moisture-curing polyurethane rubber sealant, complying with ASTM C 920, Type S, Grade NS, Class 25, Use NT, M, A, O and as recommended by manufacturer for general use as an interior exposed building construction conditions sealant.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. "Dynatrol I-XL"; Pecora Corporation.
 - b. "Dymonic or Dymonic FC for cold weather"; Tremco, an RPM Co.
 - c. "Chem-Calk 900 /915/945"; Bostik Inc.
 - d. "Sikaflex 1a or Sikaflex 15LM"; Sika Corporation.
- C. Sealant Type 4: For all joints at plumbing fixtures, provide one-part, neutral-curing, silicone rubber sanitary sealant, complying with ASTM C920; and containing fungicide for mildew resistance recommended by manufacturer for use at joints for plumbing fixtures; tub and shower, sinks countertops, appliances, etc.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. "898 silicone"; Pecora Corporation.
 - b. "Tremsil 200"; Tremco, an RPM Co.
 - c. "786 Mildew Resistant"; Dow Corning.
 - d. "Sikasil N-Plus"; Sika Corporation.
- D. Sealant Type 5: For all interior joints between drywall partitions, CMU walls, hollow metal framing, cabinet heater, other metal mechanical or electrical assemblies, (sealant work performed by other trades and cross- referenced to the work of this section), etc., where all adjacent surfaces will receive paint:

1. Latex Sealant: Non-elastomeric, one part, non-sag, paintable latex sealant recommended for exposed joints applications, complying with ASTM C 834, Type P(opaque sealants), Grade NF.
2. Products: Subject to compliance with requirements, provide one of the following:
 - a. "AC-20 plus silicone"; Pecora Corporation.
 - b. "Tremflex 834"; Tremco, an RPM Co.
 - c. "Sonolastic Sonolac"; Sonneborn Building Products Div., ChemRex, Inc.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealers, with Installer present, compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealer -performance. Do not proceed with installation of joint sealers until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers and the following requirements:
- B. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealer, including dust; paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; old joint sealers; oil; grease; waterproofing; water repellants; water; surface dirt; and frost.
- C. Clean concrete, masonry, unglazed surfaces of ceramic tile and similar porous joint substrate surfaces, by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
- D. Remove laitance and form release agents from concrete.
- E. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile; and other nonporous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealers.
- F. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealer manufacturer based on preconstruction joint sealer-substrate tests or prior experience. Apply primer to comply with joint sealer manufacturer's recommendations. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces.
- G. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

- H. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of joint fillers.
 - 2. Do not stretch, twist, puncture, or tear joint fillers.
 - 3. Remove absorbent joint fillers which have become wet prior to sealant application and replace with dry material.
- I. Install bond breaker tape between sealants and joint fillers, compression seals, or back of joints where adhesion of sealant to surfaces at back of joints would result in sealant failure.
- J. Install compressible seals serving as sealant backings to comply with requirements indicated above for joint fillers.
- K. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.

3.3 CLEANING

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.

END OF SECTION 07900

SECTION 08211 - WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Related Sections:
 - 1. Section 01800: Time of Completion and Liquidated Damages.
 - 2. Section 04200: Unit Masonry.

1.2 SUMMARY

- A. Extent and location of type of flush wood door is indicated on drawings and in the door schedule.
- B. Construction: Five plies with stiles and rails bonded to core, then entire unit abrasive plained before veneering. Assembly of face veneer and crossband to core in accordance with WDMA.
 - 1. Solid core wood doors with solid hardwood edging.
- C. Shop-priming of wood doors is included in this section.
- D. Factory-finishing of wood doors is included in this section.
- E. Factory-prefitting to frames and factory-premachining for hardware for wood doors is included in this section.

1.3 QUALITY ASSURANCE

- A. Construction per WDMA I.S. 1A - 11.
- B. Door Construction Field Examination: Upon direction of the Architect, the Contractor may be instructed to destroy a randomly selected wood door or panel by sawing it in half, vertically and horizontally, to verify conformance of the contract requirements. If the door(s) do not meet the specifications, all of the doors delivered for the project will be rejected, and the doors shall be replaced at the Contractor's expense. Further door inspection, to insure conformity to specifications, shall also be at the expense of the Contractor.
 - 1. All such delays as a result of the fabrication and delivery of non-compliant doors which vary from the processed shop drawing submittal will be the responsibility of the Contractor (refer to Section 01800 for Liquidated Damages).

1.4 REFERENCE STANDARDS

- A. Comply with the applicable requirements of the following standards unless otherwise indicated.

1. Window & Door Manufacturers Association (WDMA)
 - a. I.S. 1A - 11 Architectural Wood Flush Doors (WDMA).
 - b. Standard Procedures and Recommendations for Factory Machining Flush Wood Doors for Hardware.
2. American National Standards Institute
 - a. ANSI A115. W Series, Wood Door Hardware Standards.
3. Underwriter's Laboratories, Inc. (UL)
 - a. UL 10C Fire Test
4. American Society for Testing and Materials:
 - a. ASTM 2074-00 (Category A Positive Pressure) Fire Tests of Door Assemblies.

1.5 SUBMITTALS

- A. **The shop drawing submittal will not be reviewed by the Architect unless a complete shop drawing submittal (technical data, details of core and edge construction, location and extent of hardware blocking, fire ratings, factory finish samples, 8" x 10" minimum for finish and 4" x 5" minimum for construction assembly) are made as one complete submittal, by the Contractor, and will be returned to the Contractor if incomplete.**
 1. **Subsequent delays as a result of an incomplete submittal will be the responsibility of the Contractor (refer to Section 01800 for Liquidated Damages).**
- B. Product Data: Door manufacturer's technical data for each type of door, including details of core and edge construction, and factory-finishing specifications.
 1. Include certifications as may be required to show compliance with specifications.
 2. **The door manufacturer's shop drawing literature which may include language for the substitution of door construction at the option of the manufacturer is not permitted. Doors which are switched will be rejected and all costs associated with the manufacturing of the door type(s) specified will be by the Contractor/Manufacturer.**
- C. Shop Drawings: Submit shop drawings indicating location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, fire ratings, requirements for factory finishing and other pertinent data.
 1. For factory-premachined doors, indicate dimensions and locations of cutouts for locksets.
- D. Samples: Submit samples, 8" x 10" minimum for finish and 4" x 5" minimum for construction assembly, for the following:
 1. Doors for Transparent Finish: Flat samples illustrating finish and color of wood grain for each species of veneer and solid hardwood lumber required, to match existing door grain and finish.

2. Factory-Finished Doors: Each type of factory finish required to match existing door finish.

E. Warranties and Certification Markings: Furnish with shop drawings:

1. Door supplier must attest, in writing addressed to Architect, that the order has been placed in conformance with specification requirements in all respects.
2. All doors shall carry a "Lifetime" guarantee, including rehang and finish for all door(s) which do not comply with the manufacturer's warranty.
3. Copy of Warranty shall be given to the Architect and Owner prior to the completion of the project.
4. All doors shall be factory marked, on the top of the door, showing the order number, item number on the order, size of finished door, material, and core construction, for future information should replacement of the door be necessary.

F. The Wood Door Supplier shall provide a letter indicating all of the following:

1. The wood door supplier has completely reviewed the contract documents (drawings, specifications and addenda) and has worked with the distributor in the preparation and submission of a complete shop drawing submittal to the Architect.
2. The wood door supplier shall attest that the order has been placed in accordance with the contract document drawings, specifications and addenda,
3. The wood doors ordered and delivered to the job site are in conformance with the requirements of the job and per the approved shop drawings.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Protect doors during transit, storage and handling to prevent damage, soiling and deterioration. Comply with requirements of referenced standards and recommendations in WDMA pamphlet "How to Store, Handle, Finish, Install, and Maintain Wood Doors", as well as with manufacturer's instructions.
- B. Protect all doors from damage and moisture under cover. Use wood blocking under horizontally stored doors. At no time will doors be allowed to come in contact with floor or water.
 1. The location where the doors are being stored on the job site shall be between 25 - 55% relative humidity. The Contractor shall forward independent certified testing that confirms compliance.
- C. All doors not finished at factory must be sealed on all surfaces within one (1) week after arrival at jobsite.
- D. Remove all damaged doors from jobsite prior to completion of project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Provide wood doors as manufactured by Algoma Hardwood Inc., Algoma WI, Tel.# 302.379.2519, www.algomahardwoods.com; or approved equal.
1. Products specified herein have been selected because of their quality of construction, configuration, design, function, available finishes, components, accessories, dimensions, shape and style.
 2. Comparable products from other manufacturers will be considered if it can be clearly shown that their products are tested, equal to or will exceed the construction quality requirements, intended performances and all other design attributes listed above and provided that deviations in dimensions and profiles are minor and do not materially detract from the design concept or intended performances as judged solely by the Architect.
 - a. Marshfield DoorSystems, Marshfield, WI, Tel.# 800.869.3667, www.marshfelddoors.com.
 - b. Eggers Industries; Architectural Flush Doors Division, Neenah, WI, Tel.# 920.722.6444, www.eggersindustries.com.
 - c. VT Industries, Architectural Wood Doors, Holstein, IA, Tel.# 800.827.1615, www.vtindustries.com/doors.
 - d. Graham Wood Doors, Mason City Iowa, Tel.# 641.423.2444, www.grahamdoors.com.
 3. The use of one manufacturer's catalog numbers, and the specific requirements set forth in drawings and specifications are not intended to preclude the use of other manufacturer's products or procedures which may be equivalent, but are given for the purpose of establishing a standard of design and quality for materials, construction and workmanship.
 4. **Substitutions: Substitution of products will only be considered when the Contractor /Door Supplier have submitted, to the Architect, all appropriate documents and in the time frame as outlined in the requirements indicated in Specification Section 00800.**

2.2 MATERIALS AND COMPONENTS

- A. General: Provide wood doors complying with applicable requirements of referenced standards for kinds and types of doors indicated and as specified.
- B. Solid Core Doors for Transparent Finish: Comply with the following requirements:
1. Faces: Veneer leaves shall match existing and veneers assembled in Running Match, Grade 'A', plain sliced red oak for transparent finish; CS-171, Type II. Stain color shall match existing stain color.
 - a. **At existing buildings, provide veneer faces to match the species of the existing veneer.**

2. Construction: Premium Construction Grade, SCLC-5 Bonded (5-ply, with no added urea-formaldehyde glues).

C. Edges

1. Vertical stiles of same species to the face veneer, with a minimum of 1/4 inch solid hardwood after trimming.
 - a. Manufacturers standard construction with hardwood outer.

D. Core: Structural Composite Lumber Core consisting of an engineered wood product that is made by fusing a network of wood strands together with a water-resistant adhesive to produce a strong, solid and stable product that has true structural properties with excellent screw holding properties and very high split resistance.

1. Core Edge Interface: Vertical and horizontal edges of solid core doors must be securely bonded to the core with waterproof glue containing no added urea formaldehyde resin.

2.3 GENERAL FABRICATION REQUIREMENTS

- A. Fabricate wood doors to produce doors complying with following requirements:
- B. In sizes indicated for job-site fitting.
- C. Factory-prefit and premachine doors to fit frame opening sizes indicated with the following uniform clearances and bevels:
 1. Comply with tolerance requirements of WDMA for prefitting. Comply with final hardware schedules and door frame shop drawings and with hardware templates.
 2. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before proceeding with factory premachining.
 3. Pre-fit and pre-machine wood doors at factory. Machining shall be in accordance with necessary templates supplied by the Builders Hardware supplier, in accordance with the approved Finish Hardware Schedule for this project. Each door shall be machined for all necessary mortise hardware (ie, locks, hinges, closers, etc.) but face or thru bolt holes shall be done in the field, if such machining is not called for on templates, or is not normally machined at factory. No field preparation will be allowed.
 4. Sizing of single doors to be undersized for nominal 1/4 inch, with edges beveled on two edges, as required by the frame manufacturer. Pairs of doors will be undersized 3/16 inch to permit no more than 1/8 inch gap between door leaves. Beveling same as single doors. Door edges beveled 1/8 inch in 2 inch thickness of door.
 5. Door clearances are to be 1/8 inch at top and the bottom shall be a maximum of 1/2 inch, or as required by job condition or labeling requirements.
- D. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of doors required.
- E. Factory Finish and Uniform Range of Veneers

1. Prefinish wood doors at factory only.
2. All face veneer shall have uniform range of colors, as specified by Architect, in selection of the range of color of the veneer, to match existing doors.
3. Comply with recommendations of WDMA for factory finishing of doors, including final sanding, immediately before application of finishing materials.
6. Provide finish WDMA, #TR-6, transparent water-based stain and ultraviolet (UV) cured water based polyurethane sealer and topcoat material, color to match existing doors.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install doors using finish hardware in accordance with approved hardware schedule. Protect doors from damage until completion of Project. Install surface applied hardware on wood doors using all thread screws inserted in pilot drilled holes filled with white acrylic glue.
- B. Manufacturer's Instructions: Install wood doors to comply with manufacturer's printed instructions and of referenced WDMA standard and indicated in the printed instructions provided by the manufacturer.
- C. Job-Fit Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted with fire-rated doors.
 1. Machine doors for hardware. Seal cut surfaces after fitting and machining.
- D. Fitting Clearances for Non-Rated Doors: Provide 1/8" at jambs and heads; 1/16" per leaf at meeting stiles for pairs of doors; and 1/8" from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4" clearance from bottom of door to top of threshold.
- E. Factory-Finished Doors: Restore finish before installation, if fitting or machining is required at the job site.

3.2 ADJUSTING AND PROTECTION

- A. Operation: Rehang or replace doors which do not swing or operate freely.
- B. Finished Doors: Refinish or replace doors damaged during installation.
 1. Protect doors, as recommended by door manufacturer, to ensure that wood doors will be without damage or deterioration at time of Substantial Completion.

END OF SECTION 08211

SECTION 08305 - ACCESS DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Flush, Non-Rated, Standard Access Panel(s).
- B. Type of construction in which access door(s) are installed include:
 - 1. Plaster on wire lath.
- C. Exact location(s) and size of access door(s) are indicated on the drawings.
- D. Related Sections:
 - 1. Section 09200: Lath and Plaster
 - 2. Section 09900: Painting of access door(s).
 - 2. General requirements for access doors: Division 15.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for each access door assembly, including setting drawings, templates, instructions and directions for installation of anchorage devices.
 - 1. Include complete schedule, including type, general location(s), size, and ceiling construction details, finishes, latching or locking provisions, and other data pertinent to installation.
- B. Verification: Obtain specific locations and sizes for required access doors from trades requiring access to concealed equipment, and indicate on submittal schedule.
- C. Shop Drawings: Submit shop drawings for fabrication and installation of access doors and frames, including details of each frame type, elevations of door design types, anchorage and accessory items.
- D. Samples: 3" x 5" minimum size, of each panel face material showing factory-finished color and texture.

1.4 QUALITY ASSURANCE

- A. Test Reports: Submit manufacturer's test reports which demonstrate that products comply with required fire ratings.

- B. Size Variations: Obtain Architect's acceptance of manufacturer's standard size units which are different than actual opening size necessary for access.
- C. Coordination: Furnish inserts and anchoring devices which must be built into other work for installation of access doors. Coordinate delivery with other work to avoid delay.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering access doors which may be incorporated in the work include, but are not limited to, the following:
 - 1. Bilco Company.
 - 2. J. L. Industries.
 - 3. Milcor/Lima Register.
 - 4. Bar-Co., Inc.
 - 5. Nystrom Building Products
 - 6. Or approved equal.

2.2 MANUFACTURED UNITS

- A. Access Door Assembly 1: Basis of Design: "NP" 16" x 16" Flush, Non-Rated, Standard Access Panel(s) as manufactured by Nystrom Building Products, Tel.# 800.781.7850, www.nystrom.com; or approved equal.
 - 1. Location: Ceiling.
 - 2. Type: Flush door panel with concealed frame.
 - 3. Substrate: Plaster on wire lath.
 - 4. Frame: 16 gauge steel.
 - 5. Door: 14 gauge steel flush panel.
 - 6. Hinge: Concealed spring pin hinge (door to open a minimum of 175 degrees.
 - 7. Locking device: Screwdriver cam latch.
 - 8. Finish: Phosphate dipped and prime coated.

2.3 MATERIALS AND FABRICATION

- A. General: Furnish each access door assembly manufactured as an integral unit, complete with all parts and ready for installation.
- B. Steel Access Doors and Frames: Fabricate units of continuous welded steel construction, unless otherwise indicated. Grind welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of support shown.
- C. Frames: Fabricate from 16 gauge steel.
- D. Fabricate frame with 22 gauge galvanized plaster casing bead around perimeter of frame for units installed in full-bed plaster applications.

- E. Flush Panel Doors: Fabricate from not less than 14 gauge sheet steel, with concealed spring pin hinges set to open 175 degrees. Finish with manufacturer's factory-applied prime paint.
- F. Locking Devices: Furnish flush, screwdriver-operated cam locks of number required to hold door in flush, smooth plane when closed.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturer's instructions for installation of access doors.
- B. Coordinate installation with work of other trades.
- C. Set frames accurately in position and securely attach to supports with face panels plumb or level in relation to adjacent finish surfaces.
- D. Paint to match adjacent ceiling finish.

3.2 ADJUST AND CLEAN

- A. Adjust hardware and panels after installation for proper operation.
- B. Remove and replace panels or frames which are warped, bowed or otherwise damaged.

END OF SECTION 08305

SECTION 08700 - FINISH HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this section

1.2 DESCRIPTION OF WORK

- A. The work in this section includes providing all labor, materials, appliances, and services required to completely furnish and deliver all finish hardware and related work, complete in accordance with the Architect's drawings and specifications, including, but not limited to the following:
 - 1. All finish hardware for aluminum/FRP, hollow metal and wood doors in aluminum and hollow metal frames.
 - 2. All keying and cylinders.
 - 3. Furnish all finish hardware necessary to complete the project, whether particularly mentioned or not, and match in quality and finish the material specified.

1.3 WORK NOT INCLUDED

- A. Furnish finish hardware, except for certain noted items, under other sections for the following items:
 - 1. Toilet partitions
 - 2. Windows
 - 3. Washroom accessories
 - 4. Millwork
 - 5. Factory fabricated mechanical or electrical equipment.

1.4 RELATED WORK IN OTHER SECTIONS

- A. Refer to the following sections for these related items:
 - 1. Aluminum/FRP Doors and Frames - Section 08410
 - 2. Electrical - Section 16000

1.5 QUALITY ASSURANCE

- A. Manufacturer: Obtain each kind of material (latch and locksets, hinges, closers, etc.) from only one manufacturer of the respective item, although several may be indicated as offering products complying with requirements.
- B. Supplier: A recognized supplier, who has been furnishing Builders Hardware, in the project's vicinity, for a period of not less than 3 years, and who is, or employs an experienced Architectural Hardware Consultant who is a recognized member of the Door and Hardware Institute, available at reasonable times during the course of the work, for consultation about the project's material requirements to the Owner,

Architect, and Contractor. All hardware is to be supplied by one dealer.

- D. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA 80. Provide only material which has been tested and listed by Underwriter's Laboratories, or other approved Testing Laboratories, for the types and sizes of doors required, and complies with requirements of Door and Frame labels.
- E. Where applicable, all hardware shall be in conformance with the State of New Jersey "Barrier-Free" sub code and CABO/ANSI 117.1

1.6 SUBMITTALS

- A. Submittals shall conform to the requirements specified in Part 1.
- B. The hardware dealer shall submit to the Architect and/or Owner, at least six (6) copies of a detailed Hardware Schedule and Catalog Cut Sheets. These schedules shall be complete and describe in detail the finish hardware for all door openings, or occurrences of finish hardware. These schedules are to be checked and approved by the Contractor and Architect. No hardware is to be ordered nor templates issued, prior to the receipt, by the Hardware Dealer, of these approved schedules. Upon approval of the schedules, the Contractor shall supply the Architect with six (6) final copies.
- C. The finish hardware schedules submitted shall include information as indicated below. These schedules are intended for coordination of the work.
- D. Final finish hardware content: Based on materials indicated, organize schedule into "Hardware Sets", indicating complete destinations of every item required for each door or opening. Include the following information:
 - 1. Type, style, function, size and finish of each item.
 - 2. Name and manufacturer of each item including catalog cuts of each item.
 - 3. Fastenings and other pertinent information.
 - 4. Location of Hardware Set, cross-referenced to indications on drawings, both on floor plan and in door and frame schedule.
 - 5. Explanation of all abbreviations, symbols, codes, etc., contained in the schedule.
 - 6. Mounting locations for hardware.
- E. Submittal Sequence: Submit detailed finish hardware scheduled within 30 days of award of contract.

1.7 DELIVERY AND PACKAGING

- A. All items of finish hardware shall be delivered to the project site or applicable fabricators of doors and frames.
- B. Package each item of hardware and each lockset, separately in individual containers, complete with necessary screws, keys, instructions, and installation template for

spotting mortising tools. Mark each container with item number corresponding to the number shown on the hardware schedule.

- C. Furnish wrapping for all knobs, handles, and pulls for protection during construction.

1.8 WARRANTY

- A. Guarantee workmanship and material provided against defective manufacture. Repair or replace defective workmanship and material appearing within period of one year after substantial completion.
- B. Provide twenty five year factory warranty on door closers against defects in material and workmanship from date of occupancy of project.

1.9 JOB CONDITIONS

- A. Field Service: Hardware Supplier: Assign a competent representative, acceptable to the Architect to be at the jobsite each time a major shipment of finish hardware is received. Such representative shall assist in "checking in" these shipments and shall secure a receipt covering the contents of each shipment. In addition, such representative shall be available for immediate call to the jobsite when, in the opinion of the Architect, their presence is necessary.
- B. Templates: Following approval of the Hardware Schedule by the Architect, furnish and deliver template information to the fabricators of items to which finish hardware is to be applied in ample time to avoid delays in such work of said fabricators. Provide drawings, schedules and detailed information to other trades as necessary for them to accommodate and prepare their work to receive the finish hardware.
- C. Cooperation and Coordination:
 - 1. Cooperate and coordinate work with that of other trades supplying materials or performing work in contact with, connecting to, underlying, or overlaying the work of this Section.
 - 2. Provide complete data of requirements for work of this Section to those other trades whose work is affected by or dependent upon the work of this Section.
 - 3. Furnish all items to be built into other work in ample time to avoid delaying the progress of such work.
 - 4. Examine all drawings covering the work of this Section and refer to all other drawings, including mechanical and electrical drawings, which may affect the work of this Section or require coordination by this trade.
- D. Existing Conditions: Hardware supplier: Verify all existing conditions in the field to ensure compatibility with finish hardware specified in Hardware Sets herein, prior to submission. Any discrepancies between the existing field conditions and finish hardware specified shall be brought to the attention of the Architect immediately. Hardware supplier shall not order any finish hardware until all discrepancies are rectified and the Architect grants written approval.

1.10 GENERAL

- A. The material called for under this section shall provide for all of the hardware required, whether the same is particularly specified or not. If the hardware for any particular location is not described herein, it should be provided and shall be like that specified for similar locations so far as practicable. If no similar locations are specified, such hardware must be of a suitable type approved by the Architect.
- B. Provide screws of proper type and compatible material, with shields, anchors, plugs, toggle nuts, etc., as required for the attachment of all items of hardware herein specified. All exposed screws shall have flat head, Phillips-type heads and shall be finished to match the item of hardware for which it is intended.

1.11 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of door hardware to include in maintenance manuals, include final hardware and keying schedule.

1.12 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Manufacturers: The following listed material is intended to serve as a guide for the requirements of this project. Hardware manufactured by other than those manufacturers specifically described or listed in this specification will be considered, providing it is equal in every respect. Any request for deviation from this specification as to the manufacturer, type, size, material or finish of any item, or its components, must be submitted to the Architect, in writing, at least ten (10) days from notice to proceed. If no such requests are received and approved in writing, no deviation from this specification will be allowed.
- B. Quality: All hardware shall be uniform in color, and free from any imperfections affecting serviceability, or marring its appearance.
- C. Finishes: As listed in hardware sets and as follows:

Polished Brass	US3 / 605
Sprayed Gold Lacquer	Gold / 696
- D. Types of Hardware: The numbers listed in the specification are taken from the catalogs of the following manufacturers, with type of hardware required noted. In each case of the specific size change or lock function requirements, this additional information will be so noted in the Hardware Sets.

2.2 BUTT HINGES

- A. Conform to ANSI A156.1, five-knuckle exposed tip design, bearing type as specified

with NRP (non-removable pin) feature at exterior and interior reverse bevel doors with locks.

- B. Unless otherwise scheduled, supply one (1) hinge for every 30" of door height.
- C. Size: 4 1/2" x 4 1/2" for doors up to 3'-0" in width, 5" x 4 1/2" for doors over 3'-0" in width. Provide heavy weight hinges (.180) at all high traffic doors where specified. Provide hinges with Phillips flat-head screws unless specified otherwise.
- D. Width of hinges shall be sufficient to clear trim and wall conditions as shown on the drawings.
- E. Manufacturers:
 - 1. Basis of Design: Provide products manufactured by McKinney, or approved equal.
 - 2. Subject to compliance with indicated requirements, manufacturers offering products which may be incorporated in the work include the following:
 - a. Hager
 - b. Bommer
 - c. or approved equal
- F. Drill 5/32 inch hole and use No. 12, 1-1/4 inch steel threaded to the head wood screws for hinges on wood doors.

2.3 DOOR CLOSERS

- A. Closers shall have non-ferrous covers, heavy duty forged steel arms, and separate valves for adjusting backcheck, delayed action, closing and latching cycles and adjustable spring to provide sizes 1 through 6.
- B. Provide non-sized closers, adjustable to meet maximum opening force requirements of ADA.
- C. Provide drop plates, brackets, or adapters for arms as required to suit details.
- D. Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors. Where possible install closers on door for optimum aesthetics.
- E. Provide closers meeting the requirements of UBC 7-2 and UL 10C positive pressure tests.
- F. Manufacturers:
 - 1. Basis of Design: Provide products manufactured by Norton 7500 Series or approved equal.
 - 2. Subject to compliance with indicated requirements, manufacturers offering products which may be incorporated in the work include the following:
 - a. LCN 4040XP series
 - b. Yale 4400 Series
 - c. Corbin Russwin DC8000 Series
 - d. or approved equal

2.4 DOOR TRIM AND PROTECTION PLATES

- A. Kick plates 10 inches high, mop plates 6 inches high, both by 2 inches or 1 inch less than door width (LDW) as specified. .050 gauge thick bronze, brass, or stainless steel as specified. Beveled four edges (B4E).
- B. For doors with louvers or narrow bottom rails, kick plate height to be 1 inch less than the dimension shown from the bottom of the door to the bottom of the louver or glass.
- C. Push plates, pull plates, door pulls and miscellaneous door trim as specified in the hardware sets.
- D. Armor plates and door edge plates .050 gauge, size as specified in the hardware sets.
- E. Manufacturers:
 - 1. Basis of Design: Provide products manufactured by Rockwood or approved equal.
 - 2. Subject to compliance with indicated requirements, manufacturers offering products which may be incorporated in the work include the following:
 - a. Trimco
 - b. Hiawatha
 - c. or approved equal

2.5 DOOR STOPS AND HOLDERS

- A. Conventional Stops:
 - 1. Provide wall stops as applicable for each door leaf except where floor stops are specified in hardware sets, or where conditions require the use of an overhead stop.
 - 2. Provide convex or concave design as indicated.
 - 3. Manufacturers:
 - a. Basis of Design: Provide products manufactured by Rockwood or approved equal.
 - b. Subject to compliance with indicated requirements, manufacturers offering products which may be incorporated in the work include the following:
 - 1. Trimco
 - 2. Hiawatha
 - 3. or approved equal

2.6 SILENCERS

- A. Furnish door silencers at all openings without gasketing. Provide two at each pair of doors and three for each single door.
- B. Manufacturers:

1. Basis of Design: Provide products manufactured by Rockwood or approved equal.
2. Subject to compliance with indicated requirements, manufacturers offering products which may be incorporated in the work include the following:
 - a. Trimco
 - b. Hiawatha
 - c. or approved equal

2.7 HARDWARE SUPPLIER'S RESPONSIBILITY

- A. The finish hardware listed herein shall in no way be construed as a complete hardware schedule and shall be considered as an indication of the finish hardware requirements desired by the Owner. It shall be the finish hardware supplier's responsibility to examine the drawings and door schedule, and provide all necessary or additional hardware as required, but not specified herein. Such items of finish hardware shall be of the same type, quality, and quantity as that scheduled for similar doors used for similar purposes in other parts of the building. A schedule of fabrication and delivery shall be executed to avoid any delay of the entire project.

2.8 HARDWARE SET NUMBERS

- A. All doors shall be equipped with finish hardware of the types listed and in accordance with the following set numbers. The contractor is to refer to the schedule and plans for the total number of each set required. Sets, as listed herein, shall be supplied as complete units and must include all components. No omissions will be accepted.

Manufacturer Abbreviations

1. MK - McKinney
2. RO - Rockwood
3. NO - Norton

Set: 1.0

Doors: 202

3 Hinge	T4A3786 4 1/2" x 4 1/2"	US3	MK
1 Push Plate	70C	US3	RO
1 Pull Plate	110x70C	US3	RO
1 Door Closer	7500	696	NO
2 Kickplate	K1050 10" high 4BE	US3	RO
1 Wall Stop	406	US3	RO
3 Silencer	608		RO

Set: 2.0

Doors: 102A

3 Hinge	T4A3786 4 1/2" x 4 1/2"	US3	MK
1 Push Plate	70C	US3	RO
1 Pull Plate	110x70C	US3	RO
1 Door Closer	CLP7500	696	NO
2 Kickplate	K1050 10" high 4BE	US3	RO
3 Silencer	608		RO

PART 3. EXECUTION**3.1 INSTALLATION**

- A. Mount Hardware units at heights indicated in "recommended locations for Builders Hardware for Standard Steel Doors and Frames", by the Door and Hardware Institute, except as specifically indicated, required to comply with governing regulations, or may be otherwise directed by the Architect.
- B. Install each hardware item in compliance with the manufacturer's instruction and recommendations. Wherever cutting and fitting is required to install finish hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protection with finishing work specified in the Division 9 sections. Do not install surface-mounted items until finishes have been completed on the substrate.
- C. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

3.2 ADJUST AND CLEAN

- A. Adjust and check each operating item of finish hardware and each door to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.
- B. Final adjustment: Wherever finish hardware installation is made more than one month prior to acceptance of occupancy of a space or area, return to the work site during the week prior to acceptance or occupancy, and make final check and adjustment of all finish hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of finish hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- C. Instruct Owner's personnel in proper adjustment and maintenance of finish hardware finishes during the final adjustment of finish hardware.
- D. Continued Maintenance Service: Approximately six months after the acceptance of finish hardware in each area, the installer, accompanied by the representative of the lock and latch manufacturer shall return to the project and re-adjust every item of finish hardware to restore proper function of doors and finish hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace finish hardware items that have deteriorated or failed due to faulty design, materials or installation of finish hardware units.

END OF SECTION 08700

SECTION 09250 - GYPSUM DRYWALL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Extent of each type of gypsum drywall construction required is indicated on Drawings.
- B. This Section includes the following types of gypsum board construction:
 - 1. Gypsum drywall including screw-type metal support system
 - 2. Gypsum backing board
 - 3. Drywall finishing (joint tape and compound treatment)
 - 4. Knee Wall Brace Kit.

1.3 QUALITY ASSURANCE

- A. Manufacturer: Obtain gypsum board products from a single manufacturer, or from manufacturers recommended by the prime manufacturer of gypsum boards.
- B. Single Source Responsibility: Obtain each type of gypsum board and related joint treatment materials from a single manufacturer.
- C. Structural Performance Characteristics for drywall shaft system: Provide drywall shaft systems designed and tested by manufacturer to withstand the following lateral design loadings (air pressures), applied transiently and cyclically, for maximum heights of partitions required, within the following deflection limits:
 - 1. Lateral Loading: 5 psf.
 - 2. Deflection Limit: 1/240 of partition height.
- D. Fireblocking and Draftstopping: Comply with the International Building Code requirements for installation of fireblocking and / or draftstopping, to prevent the fire passage of flame and product of combustion through concealed spaces or openings in gypsum board systems, in the event of fire.

1.4 REFERENCES

- A. Gypsum Board Standard: Comply with applicable requirements of ANSI/ASTM C 840 for application and finishing of gypsum board unless otherwise indicated.
- B. Gypsum Wallboard Standard: ASTM C 1396.
- C. Steel Framing Standard: Comply with applicable requirements of ASTM C 754 for installation of steel framing for gypsum board.
- D. Gypsum Board Terminology Standard: ASTM C11.

- E. Application and Finishing of Gypsum Panel Products: GA-216.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's product specifications and installation instructions for each gypsum drywall component, including other data as may be required to show compliance with these specifications.
- B. Shop drawings: Submit shop drawings for wall metal stud framing for structural heavy gauge wall studs supporting other equipment, items, cabinets, etc.
 - 1. Show layout, spacings, sizes, thicknesses, and types of metal framing, fabrication, fastening and anchorage details, including mechanical fasteners.
 - 2. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachments to other units of Work.
 - 3. Indicate manufacturer's design thickness to meet structural performance requirements for each wall mounted item, equipment, cabinet, etc.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion and damage from construction traffic and other causes. Neatly stack gypsum boards flat to prevent sagging.
- C. Handle gypsum boards to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

1.7 PROJECT CONDITIONS

- A. Environmental Conditions, General: Establish and maintain environmental conditions for application and finishing gypsum board to comply with ASTM C 840 and with gypsum board manufacturer's recommendations.
 - 1. Minimum Room Temperatures: When ambient outdoor temperatures are below 55°F maintain continuous, comfortable building working temperature of not less than 55°F for 48 hours prior to application and continuously thereafter until drying is complete.
 - 2. Ventilate building spaces as required to remove water in excess of that required for drying joint treatment material immediately after its application. Avoid drafts during dry, hot weather to prevent materials from drying too rapidly.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, manufacturers

offering products which may be incorporated in the Work include, but are not limited to, the following:

B. Metal Support Systems

1. Allied Structural Industries
2. Gold Bond Building Products Div.
3. Marino Industries Corp.
4. United States Gypsum Co.

C. Gypsum Boards and Related Products:

1. Celotex Corp.
2. Georgia-Pacific Corp.
3. Gold Bond Building Products Div., National Gypsum Co.
4. United States Gypsum Co.
5. Lafarge North America Inc.

2.2 METAL SUPPORT MATERIALS

A. General: Provide components which comply with ASTM C 754 for materials and sizes, unless otherwise indicated.

B. Ceiling Support Materials and Systems

1. General: Size ceiling support components to comply with ASTM C 754 unless otherwise indicated.
2. Main Runners: Steel channels with rust inhibitive paint finish, hot or cold-rolled.
3. Hanger Wire: ASTM CA 641, soft, Class 1 galvanized.
4. Hanger Anchorage Devices: Devices applicable to the indicated method of structural anchorage for ceiling hangers and whose suitability for use intended has been proven through standard construction practices or by certified test data. Size devices for 3x calculated load supported.
5. Furring Member: ASTM C 645; 0.0179" minimum thickness of base metal, hat-shaped.
6. Furring Anchorages: 16 gauge galvanized wire ties, manufacturer's standard wire type clips, bolts, nails or screws as recommended by furring manufacturer and complying with C 754.
7. Direct Suspension Systems: Manufacturer's standard zinc coated or painted steel system of furring runners, furring tees, and accessories designed for concealed support of gypsum drywall ceilings, of proper type for use intended.

C. Wall/Partition Support Materials

1. Studs ASTM C 645, 25 gauge unless otherwise indicated. 20 gauge minimum wherever structural or other gauge studs are called for, for use with impact resistant type gypsum wallboard, and to comply with applicable published instructions and

recommendations of gypsum board manufacturer or, if not available, of "Gypsum Construction Handbook" published by United States Gypsum Company.

- a. Depth of Section: 3-5/8 inch, except as otherwise indicated.
 - b. Runners: Match studs; type recommended by stud manufacturer for floor and ceiling support of studs, and for vertical abutment of drywall work at other work.
 - c. Provide structural heavy gauge studs and bracing to support loads of wall mounted items, equipment, cabinets, etc. coordinate with other trades for weight requirements and mounting locations.
2. Furring Members: ASTM C 645, 25 gauge hat-shaped.
 3. Fasteners for Stud Members: Provide fasteners of type, material, size, recommended by furring manufacturer for the substrate and application indicated.
- D. Knee Wall Brace Kit:
1. Basis of Design: "SKB" Knee Brace Kit as manufactured by Pittcon Softforms® LLC, Riverdale, MD, Tel.# 800.637.7638 / 301.927.1000, or approved equal.
 2. The welded steel assembly consists of a 2" x 2" steel tube, 1/8" thick wall and a 3 1/2" x 5" x 1/4" thick steel base plate with four (4) holes of 7/16" diameter. The assembly shall be painted with a flat black primer providing a corrosive resistant surface compatible with plaster, joint compounds and interior finishes.
 - a. Manufacturer recommends anchoring the base plate using 3/8" x 3 1/2" masonry fasteners with expanded shields for mounting in concrete floor.

2.3 GYPSUM BOARD

- A. Gypsum Backing Board for Multi-Layer Applications: ASTM C 1396 and as follows:
1. Type: Regular, unless otherwise indicated.
 2. Edges: Manufacturer's standard.
 3. Thickness: 5/8 inch where indicated.
- B. Water-Resistant Gypsum Board and Tile Backer: ASTM C 1396, and as follows:
1. Thickness: 5/8 inch, unless otherwise indicated.
 2. Provide at showers, toilet rooms and where indicated.
 3. Basis of Design: "Dens-Shield Tile Backer"; Georgia-Pacific Corp. or approved equal.
 - a. Provide manufacturer's standard **20-year warranty** which starts at approved date of substantial completion.
 - b. Provide manufacturer's recommended accessories and joint finishing materials.

2.4 GYPSUM BOARD CEILING SUSPENSION SYSTEM

- A. Heavy-Duty Drywall Furring Tee's: Provide heavy-duty furring system which comply with ASTM C645 and has G40 minimum protective for hot-dipped galvanized process and .0179 steel thickness before application of protective coating.
 - 1. Structural Classification: Comply with ASTM C635 for heavy-duty system.
 - 2. Provide manufacturer's standard suspension system accessories required for each condition indicated on the contract documents.
- B. The following system indicated, is the "Basis of Design", other manufacturer's will be considered for substitution, provided they comply with the contract documents and are submitted as per the requirements of Section 00800;
 - 1. "Perimeter Solutions"; Armstrong World Industries, Inc.; "Drywall Suspension System"; USG Corp. or approved equal.
 - 2. Main Beam: Double-web steel construction, hot dipped galvanized, 1-1/2" web height with rectangular top bulb, and prefinished 1-1/2" flange; (Item No. HD8906). For fire rated ceilings provide main beam formed to include integral splice for expansion relief. Web is to be formed to receive override cross tee.
 - 3. Primary Furring Cross Tees: Double-web, hot-dipped galvanized steel, 1-1/2" web height with rectangular bulb and hot-dipped 1-1/2" knurled flange.
 - 4. Secondary Framing Cross Tees: Double-web, hot-dipped galvanized steel, 1-1/2" web height with rectangular bulb and hot-dipped 15/16" flange.
 - 5. Hanger Wire: Hot dipped galvanized steel, 12 gauge, tested to exceed 500 lbs. pull out force.
 - 6. Accessories: Manufacturer's standard angle clips, direct ceiling clips, acoustical transition clips and other accessories required to allow for use of complete grid system at indicated transitions for walls and ceilings.

2.5 JOINT TREATMENT MATERIALS (GYPSUM BOARD APPLICATION)

- A. General: Provide materials complying with ASTM C 475, ASTM C 840, and recommendations of manufacturer of both gypsum board and joint treatment materials for the application indicated.
- B. Joint Tape: Manufacturer's recommended types for indicated applications. Use types compatible with joint compounds.
- C. Joint Compounds: Provide manufacturer's recommended types for indicated applications.
 - 1. For interior repair and patching work, provide chemical-hardening-type for bedding and filling, ready-mixed vinyl type or vinyl type powder type for topping.

2.6 MISCELLANEOUS MATERIALS

- A. General: Provide auxiliary materials for gypsum drywall construction which comply with

referenced standards and the recommendations of the manufacturer of the gypsum board.

- B. Gypsum Board Screws: ASTM C 954 or ASTM C 1002
- C. Acoustical Sealant: Water base type, non-drying, non-bleeding, non-staining type; permanently elastic, as recommended by gypsum board manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to which drywall construction attaches or abuts, preset hollow metal frames, cast-in-anchors, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of drywall construction. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION OF METAL SUPPORT SYSTEMS

- A. Ceiling Anchorages: Coordinate installation of ceiling suspension system with installation of overhead structural systems to ensure that inserts and other structural anchorage provisions have been installed to receive ceiling anchors in a manner that will develop their full strength and at spacing required to support ceiling.
 - 1. Furnish concrete inserts and other devices indicated, to other trades for installation well in advance of time needed for coordination with other construction.

3.3 INSTALLATION OF METAL SUPPORT SYSTEMS

- A. Do not bridge building expansion and control joints with steel framing or furring members; independently frame both sides of joints with framing or furring members or as indicated.
- B. Provide furring and shims as required to install new work over existing substrates so that new work will be installed plumb, level and true.
- C. Ceiling Support Suspension Systems
 - 1. Secure hangers to structural support by anchorage devices or fasteners.
 - 2. Space main runners 4'-0" o.c. and space hangers 4'-0" o.c. along runners, except as otherwise shown.
 - 3. Level main runners to a tolerance of 1/4" in 12'-0", measured both lengthwise on each runner and transversely between parallel runners.
 - 4. Wire-tie or clip furring members to main runners and to other structural supports as indicated.
 - 5. Direct-hung Metal Support System: Attach perimeter wall track or angle wherever support system meets vertical surfaces. Mechanically join support members to each other and butt-cut to fit into wall track.

6. Space furring member 16" o.c. except as otherwise indicated.
7. Install auxiliary framing at termination of drywall work, and at openings for light fixtures and similar work, as required for support of both the drywall construction and other work indicated for support thereon.

D. Wall-Partition Support Systems:

1. Install supplementary framing, blocking and bracing at terminations in the work and for support of fixtures, equipment services, heavy trim, furnishings, and similar work to comply with details indicated or, if not otherwise indicated, to comply with applicable published recommendations of gypsum board manufacturer or, if not available, of "Gypsum Construction Handbook" published by United States Gypsum Company.
2. Isolate stud system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support and avoid axial loading.
3. Install runners tracks at floors, ceilings and structural walls and columns where gypsum drywall stud system abuts other work, except as otherwise indicated. Ramset to precast plank.
4. Extend partition stud system through acoustical ceilings and elsewhere as indicated to the structural support and substrate above the ceiling.
5. Frame openings with vertical studs securely attached by screws at each jamb either directly to frames or to jamb anchor clips on door frame; install runner track sections (for jack studs) at head and secure to jamb studs.
6. Space studs 16 inches o.c. except as otherwise indicated.
7. Extend vertical jamb studs through suspended ceilings and attach to underside of floor or roof structure above.
8. Provide runner tracks of same gauge as jamb studs. Space jack studs same as partition studs.
9. Cut studs 1/2" short of full height to provide perimeter relief.
10. Do not fasten studs to top track to allow independent movement of studs and track.

3.4 APPLICATION AND FINISHING OF GYPSUM BOARD, GENERAL

- A. Pre-Installation Conference: Meet at the project site with the installers of related work and review the coordination and sequencing of work to ensure that everything to be concealed by gypsum drywall has been accomplished, and that chases, access panels, openings, supplementary framing and blocking and similar provisions have been completed.
- B. Locate exposed end-butt joints as far from center of walls and ceilings as possible, and stagger not less than 24 inches in alternate courses of board.
- C. Install ceiling boards across framing in the manner which minimizes the number of end-butt

joints, and which avoids end joints in the central area of each ceiling. Stagger end joints at least 24 inches.

- D. Install wall/partition boards in manner which minimizes the number of end-butt joints or avoids them entirely where possible.
- E. Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16 inch open space between boards. Do not force into place.
- F. Locate either edge or end joints over supports, except in horizontal applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Position boards so that like edges abut, tapered edges against tapered edges and mill-cut or field-cut ends against mill-cut or field-cut ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.
- G. Attach gypsum board to framing and blocking provided for additional support at openings and cutouts.
- H. Cover both faces of steel stud partition framing with gypsum board in concealed spaces (above ceilings, etc.)
- I. Form control joints and expansion joints at locations indicated (@ 30'-0" o.c. or 900 sf), with space between edges of boards, prepared to receive trim accessories.
- J. Isolate perimeter of non-load-bearing drywall partitions at structural abutments. Provide 1/4 inch to 1/2 inch space and trim edge with "U" bead edge trim. Seal joints with acoustical sealant.
- K. Floating Construction: Where feasible, including where recommended by manufacturer, install gypsum board over wood framing, with "floating" internal corner construction.
- L. Space fasteners in gypsum boards in accordance with referenced gypsum board application and finishing standard and manufacturer's recommendations.

3.5 METHODS OF GYPSUM BOARD APPLICATION

- A. Single-Layer Application: Install gypsum wallboard as follows:
 - 1. On ceilings apply gypsum board prior to wall/partition board application to the greatest extent possible.
 - 2. On partitions/walls apply gypsum board vertically (parallel to framing), unless otherwise indicated, and provide sheet lengths which will minimize end joints.

3.6 FINISHING OF DRYWALL

- A. General: Apply joint treatment at gypsum board joints (both directions); flanges of corner bead, edge trim, and control joints; penetrations; fastener heads, surface defects and elsewhere as required to prepare work for decoration.
- B. Prefill open joints and rounded or beveled edges, if any, using setting-type joint compound.

- C. Apply joint tape at joints between gypsum boards, except where trim accessories are indicated.
- D. Apply joint compounds in 3 coats (not including prefill of openings in base), and sand between last 2 coats and after last coat.
- E. Gypsum Board Finish Levels: Finish panels to levels indicated below, according to ASTM C 840:
 - 1. Level 2: In garages, warehouse storage areas and other similar areas where the final surface appearance is not of concern, Level 2 finish is the recommendation. Level 2 may be specified where moisture resistant gypsum board is used as a tile substrate.
 - a. All joints and interior angles shall have tape embedded in joint compound and wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles.
 - b. Joint compound is applied over all fastener heads and beads. The surface is left free of excess joint compound. Ridges and tool marks are acceptable for a Level 2 finish.

3.7 CLEANING AND PROTECTION

- A. Remove temporary coverings used to protect other work.
- B. Provide final protection and maintain conditions, in a manner suitable to Installer, which ensures gypsum drywall construction being without damage or deterioration at time of Substantial Completion.

END OF SECTION 09250

SECTION 09300 - TILE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

- A. Definition: Tile includes ceramic surfacing units made from clay or other ceramic materials.
- B. Extent of tile work is indicated on drawings and schedules.
- C. Types of tile work in this section include the following:
 - 1. Ceramic Mosaic Tile.
 - 2. Ceramic Base
 - 3. Glazed wall tile.
 - 4. Marble thresholds.

1.3 QUALITY ASSURANCE

- A. Tile manufacturing standard: ANSI 137.1. Furnish tile complying with Standard Grade requirements unless indicated otherwise.
- B. Proprietary Materials: Handle, store, mix and apply proprietary setting and grouting materials in compliance with manufacturer's instructions.
- C. Source of Materials: Provide materials obtained from one source for each type and color of tile, grout, and setting materials.
- D. Slip-Resistant Tile: All tile shall be slip-resistant type in accordance with International Building Code - New Jersey Edition, ICC/ANSI A117.1.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical information and installation instructions for materials required, except bulk materials.
- B. Samples for Initial Selection Purposes: Submit manufacturer's color charts consisting of actual tiles or sections of tile showing full range of colors, textures and patterns available for each type of tile indicated. Include samples of grout and accessories involving color selection.
- C. Samples for Verification Purposes: Submit the following:
 - 1. Samples for each type of tile and for each color and texture required, not less than 12" square, on plywood or hardboard backing and grouted.
 - 2. Full size samples for each type of trim, accessory and for each color.

3. 6" long samples of stone thresholds.
 4. Samples of metal edge strip.
- D. Certification: Furnish Master Grade Certificates for each shipment and type of tile, signed by manufacturer.
- E. Slip-Resistant Tile: Submit manufacturer's test data for slip-resistant tile. Tests shall be in conformance with indicated applicable codes and regulations.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Prevent damage or contamination to materials by water, freezing, foreign matter or other causes.

1.6 PROJECT CONDITIONS

- A. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.
- B. Maintain temperatures at not less than 50°F (10°C) in tiled areas during installation and for 7 days after completion, unless higher temperatures are required by referenced installation standard or manufacturer's instructions.

1.7 MAINTENANCE MATERIALS

- A. Furnish extra materials that match and are from the same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Tile and Trim Units: Furnish quantity of full-size units equal to 3% of amount installed for each type, composition, color, pattern and size indicated.
 2. Grout: Furnish quantity of grout equal to 3% of amount installed for each type, composition, color indicated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
1. Manufacturers of Unglazed Ceramic Mosaic Tile:
 - a. American Olean Tile Co., Inc.
 - b. Dal-Tile Corp
 - c. or approved equal.

2. Manufacturers of Glazed Wall Tile:

- a. American Olean Tile Co., Inc.
- b. Dal-Tile Corp.
- c. Summitville Tiles, Inc.
- d. or approved equal.

2.2 TILE PRODUCTS

A. Ceramic Mosaic Tile: Provide factory-mounted flat tile complying with the following requirements:

1. Type: Porcelain.
2. Wearing Surface: Slip-resistant tile without abrasive content.
3. Nominal Facial Dimensions: Pattern as indicated or selected from manufacturers current publications. (*i.e.*, Daltile: "Design with Confidence") Pattern shall be **"Keystones Blends - "Block Random"**. Colors as selected by Architect to closely match the existing floor tile.
 - a. For patching and repair work where match existing tile is required, provide sizes to match existing tile.
4. Nominal Thickness: 1/4" inch.
5. Face: Plain with cushion edges.

B. Glazed Wall Tile: Provide flat tile complying with the following requirements:

1. Nominal Facial Dimensions: 4-1/4" x 8-1/2".
2. Nominal Thickness: 5/16".
3. Face: Plain with cushion edge.
4. Colors as selected by Architect.

C. Trim Units: Provide tile trim units to match characteristics of adjoining flat tile and to comply with following requirements:

1. Size: As indicated, coordinated with sizes and coursing of adjoining flat tile.
2. Provide rounded external corners, and trim shapes at head, jamb and sills of openings of same material and finish as field tile, and as follows:
 - a. Base: Sanitary cove units 6" x 6".
 - b. Internal Corners: Field-buttet square, except use square corner, combination angle and stretcher type cap.
 - c. Radius Bullnose, as indicated on drawings.

2.3 THRESHOLDS

A. Stone Thresholds: Provide sound Group "A" marble threshold of profile indicated with an abrasive hardness of not less than 10.0, when tested in accordance with ASTM C 241. Maximum height 1/2" above finished floor. Furnish white marble for thresholds, unless otherwise indicated.

2.4 COLOR AND PATTERN

- A. As selected by Architect from manufacturer's full color line (including premium colors - Groups 2 through 5) and patterns of each type tile specified. Patterns shall be defined as using not more than 3 different colors of tile in any given area, applied in stripes, diagonals, checkerboard pattern or 45 degree layouts and other designs as determined by the Architect. All selections shall be made from manufacturer's full product lines (including premium colors).

2.5 SETTING AND GROUTING MATERIALS

- A. Portland Cement Mortar Installation Materials: Provide materials to comply with ANSI Standards as required for installation method designated, unless otherwise indicated.
- B. Latex-Portland Cement Grout: Proprietary compound composed of portland cement with latex additive for a more flexible and less permeable grout. Color as selected by Architect from manufacturer's standard.
 - 1. Provide product with latex additive which is compatible with latex additive in latex Portland cement mortar.
 - 2. Products offered by manufacturers to comply with requirements include the following:
 - a. Latex Modified Floor Grout: Mapei Corporation.
 - b. Laticrete Dry Bond: Laticrete International, Inc.

2.6 MISCELLANEOUS MATERIALS

- A. Tile Cleaner: Product specifically acceptable to manufacturer of tile and grout manufacturer for application indicated and as recommended by National Tile Promotion Federation, 112 North Alfred St., Alexandria, VA 22134 or Ceramic Tile Institute, 700 N. Virgil Ave., Los Angeles, CA 90029. Provide a neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- B. Grout and Tile Sealer: Manufacturer's standard product for sealing tile and grout joints that does not change color or appearance of grout.
 - 1. Provide colorless and stain resistant penetrating sealer with Ph factor between 7 and 10, that does not affect color or physical properties of tile surfaces.
 - 2. Products:
 - a. Custom Building Products; Surfaceguard Tile and Grout Sealer.
 - b. Summitville Tiles, Inc.; SL-15, Invisible Seal Penetrating Grout and Tile Sealer.
 - c. Or approved equal.
 - 3. Apply grout sealer to cementitious grout joints according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

C. **WATERPROOFING MATERIALS:**

1. Sheet Membrane: 0.030 inch thick chlorinated polyethylene (CPE) sheet with nonwoven polyester laminated to both sides, 60 inches wide.
2. Products: The following products, provided they comply with requirements of the contract documents, will be among those considered acceptable:
 - a. "Dal-Seal TS"; by Dal-Tile Corporation, or approved equal.

D. **Leveling and Patching Compounds:** Latex types as recommended by flooring manufacturer.

PART 3 - EXECUTION

3.1 TILE INSTALLATION STANDARDS

- A. ANSI Tile Installation Standard: Comply with applicable parts of ANSI 108 series of tile installation standards included under "American National Standard Specifications for installation of ceramic tile.
- B. TCNA Installation Guidelines: TCNA "Handbook for Ceramic Tile Installation (latest edition)"; comply with TCNA installation methods indicated or, if not otherwise indicated, as applicable to installation conditions shown.
- C. Comply with manufacturer's instructions for mixing and installation of proprietary materials.

3.2 INSTALLATION

- A. Extend tile work into recesses and under or behind equipment and fixtures, to form a complete covering without interruptions, except as otherwise shown. Terminate work neatly at obstructions, edges and corners without disrupting pattern or joint alignments.
- B. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures and other penetrations so that plates, collars, or covers overlap tile.
- C. For tile mounted in sheets make joints between tile sheets same width as joints within tile sheets so that extent of each sheet is not apparent in finished work.
- D. Set marble thresholds in same type of setting bed as field tile, unless otherwise indicated.
- E. Jointing Pattern: Unless otherwise shown, lay tile in grid pattern. Align joints when adjoining tiles on floor, base, walls and trim are same size. Layout tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise shown.
- F. Expansion Joints: Locate expansion joints and other sealant filled joints, including control, contraction and isolation joints, where indicated or where joints occur in substrate. Do not saw cut joints.
- G. Grout tile to comply with the referenced standards, using grout material as indicated.

1. Where pregrouted sheets are used, field-grout perimeter of individual sheets with same elastomeric material as used in factory pregrouted sheets.

3.3 FLOOR INSTALLATION METHODS

- A. Ceramic Mosaic Tile: Install tile to comply with requirements indicated below for setting bed methods, TCNA installation methods related to types of subfloor construction, and grout types and in accordance with applicable ANSI installation specifications:

1. Concrete Subfloors, Interior, slab on grade or above-ground: TCNA F112 (bonded)
 - a. On-ground Mortar: Latex portland cement paste on cured bed: ANSI A118.1 or better or ISO C1 or better.
 - b. Above-ground Mortar: Latex portland cement paste on cured bed: ANSI A118.4 or better or ISO C2S1 or better.
 - c. Grout: Latex portland cement; ANSI 118.6 or better or ISO CG1 or better.
2. Elevated slabs, or where indicated: TCNA F122A, thin set, with membrane.
 - a. Mortar: Latex portland cement; ANSI A118.4 or better or ISO C2S1 or better unless ANSI A118.1 or ISO C1 is recommended by membrane manufacturer.
 - b. Grout: Latex portland cement; ANSI A118.6 or better or ISO CG1 or better.

3.4 WALL TILE INSTALLATION METHODS

- A. Install types of tile designated for wall application to comply with requirements indicated below for setting bed methods, TCNA installation methods related to subsurface wall conditions, and grout types and in accordance with applicable ANSI installation specifications:

1. Masonry or Concrete, Interior: TCNA W202I.
 - a. Mortar: Latex portland cement; ANSI 118.4 or better or ISO C2 or better.
 - b. Grout: Latex portland cement; ANSI 118.6 or better or ISO CG1 or better.
2. Gypsum Board, Interior: TCNA W242.
 - a. Organic Adhesive; ANSI 136.1 (Type I or II) or ISO D1 or better.
 - b. Grout: Latex portland cement; ANSI 118.6 or better or ISO CG1 or better.

3.5 CLEANING AND PROTECTION

- A. Cleaning: Upon completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 1. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's printed instructions, but no sooner than 14 days after installation. Protect metal surfaces, cast iron and vitreous plumbing fixtures from effects of acid cleaning. Flush surface with clean water before and after cleaning.

- B. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, or otherwise defective tile work.
- C. Protection: When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage and wear.
 - 1. Prohibit foot and wheel traffic from using tiled floors for at least 7 days after grouting is completed.
 - 2. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION 09300

SECTION 09510 - ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Extent of type of acoustical ceiling is shown and scheduled on drawings.
- B. Type of acoustical ceilings specified in this section includes the following:
 - 1. Lay in acoustical ceiling board, exposed suspension system.

1.3 QUALITY ASSURANCE

- A. Installer: Firm with not less than three years of successful experience in installation of acoustical ceilings similar to requirements for this project and which is acceptable to manufacturer of acoustical units, as shown by current written statement from manufacturer.
- B. Fire Resistance Ratings: As indicated by reference to design designation in UL "Fire Resistance Directory" for floor, roof or beam assemblies in which acoustical ceilings function as a fire protective membrane; tested per ASTM E 119. Provide protection materials for lighting fixtures and air ducts to comply with requirements indicated for rated assembly.
- C. Surface Burning Characteristics: As follows, tested per ASTM E 84.
 - 1. Flame Spread: 25 or less.
 - 2. Smoke Developed: 50 or less.
- D. All acoustical ceilings shall be installed to conform to the requirements of International Building Code for Category C and the recommendation of the Ceiling and Interior Systems Construction Association (CISCA) for Zone 2 seismic design and comply with installation requirements for areas subject to light to moderate seismic activity.
- E. General Contractor shall provide adequate ventilation and humidity control before, during and after ceiling installation to prevent damage (sagging, etc.) to ceilings prior to Owner's acceptance of building.
- F. Warranty:
 - 1. Provide manufacturer's special project warranty against sagging or warping of acoustic ceiling boards for a period of **thirty (30) years** which starts on approved date of substantial completion.
- G. Unless otherwise approved by the Architect, all Acoustical Ceiling Board type and Suspended Grid System type shall be by a single manufacturer.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required including certified test reports to show compliance with requirements of these specifications.
 - 1. Include manufacturer's recommendations for cleaning and refinishing acoustical units, including precautions against materials and methods which may be detrimental to finishes and acoustical performance.
- B. Samples: Submit manufacturer's standard size samples of acoustical units, but not less than 6" square, and of exposed ceiling suspension members including wall and special moldings. Provide samples showing full range of colors, textures and patterns available for each type of component required.
- C. Shop Drawings: Submit shop drawings for acoustical ceilings, including layout of system components and details of connections between elements of system and between system and other building components.
- D. Certificates: Submit certificates from manufacturers of acoustical ceiling units and suspension systems attesting that their products comply with specification requirements.
- E. Testing Reports: Submit testing reports which indicate compliance with indicated requirements.
- F. Deliver extra materials to Owner. Furnish extra materials described below matching products installed, packaged with protective covering for storage and identified with appropriate labels.
 - 1. Acoustical Ceiling Units: Furnish quantity of full size units equal to 2.0% of each type of acoustical unit and suspension system installed.
 - 2. Exposed Suspension System Components: Furnish quantity of each exposed component equal to 2.0% of amount installed.

1.5 PROJECT CONDITIONS

- A. Space Enclosure: Do not install interior acoustical ceilings until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Provide Acoustical Ceiling Board (AACB) and Metal Suspension System as manufactured by Armstrong World Industries; United States Gypsum Co. or approved equal.
- B. Products specified herein have been selected because of their quality of construction, configuration, design, function, available finishes, components, accessories, dimensions, shape and style.

1. Comparable products of the following manufacturers will be considered if it can be clearly shown that their products are equal to or will exceed the construction quality requirements and other design attributes listed as performance of the "Basis of Design" Systems.

- a. CertainTeed Ceilings.

2. The use of one manufacturer's catalog numbers, and the specific requirements set forth in drawings and specifications, are not intended to preclude the use of other manufacturer's products or procedures which may be equivalent, but are given for the purpose of establishing a standard of design and quality for materials, construction and workmanship.

- C. Substitute products will be considered for substitution only when submitted to the Architect as per the requirements of Specification Section 00800.

2.2 ACOUSTICAL CEILING BOARDS

- A. See reflected ceiling plans for sizes and locations.
- B. Where AACB is indicated: 24" x 24" x 5/8" thick, square edge, NRC.55; CAC 38; Class 25; Sag Resistance; Humiguard Max Performance, mineral fiber composition with ceramic binders. Armstrong Fine Fissured Ceramaguard (Item# 607) white finish; USG Radar Ceramic ClimaPlus (Item# 56644), or approved equal.

2.3 METAL SUSPENSION SYSTEMS, GENERAL

- A. Standard for Metal Suspension Systems: Provide metal suspension systems of type, structural classification and finish indicated which comply with applicable ASTM C 635 requirements.
- B. Finishes and Colors: Provide manufacturer's standard factory-applied finish for type of system indicated. For exposed suspension members and accessories with painted finish, provide color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's full range of standard colors.
- C. Attachment Devices: Size for 5 times design load indicated in ASTM C 635, Table 1, Direct Hung.
- D. Concrete Inserts: Inserts formed from hot-dipped galvanized sheet steel and designed for attachment to concrete forms and for embedment in concrete, with holes or loops for attachment at hanger wires.
- E. Hanger Wire: Galvanized carbon steel wire, ASTM A 641, soft temper, prestretched, Class 1 coating, sized so that stress at 3-times hanger design load (ASTM C 635, Table 1, Direct Hung), will be less than yield stress of wire, but provide not less than 12gage (0.106").
- F. Type of System: Either direct-hung or indirect-hung suspension system, at Contractor's option.
 1. Carrying Channels: 1-1/2 inch steel channels, hot-rolled or cold-rolled, not less than 0.475 lbs. per lineal foot.

- G. Edge Moldings and Trim: Metal types and profiles indicated or, if not indicated, provide manufacturer's standard molding for edges and penetrations of ceiling which fits with type of edge detail and suspension system indicated. Provide 7/8" edge at wall angle and reveal edges.
- H. Hold-Down Clips: For interior ceilings composed of lay-in panels weighing less than 1 lb. per sq. ft., or where indicated, provide hold-down clips spaced 2'-0" o.c. on all cross tees.

2.5 EXPOSED METAL SUSPENSION SYSTEMS

- A Double Web Suspension System: For use where AACB ceilings are indicated. Manufacturer's standard system fabricated from roll-formed prefinished hot dipped galvanized steel with 15/16" wide exposed faces of aluminum cap on flanges of structural members cap and other characteristics as follows:
 - 1. Structural Classification: Intermediate-Duty System.
 - 2. Finish: Painted, in colors as selected from manufacturer's full line of colors. Provide white color unless indicated otherwise.
 - 3. Basis of Design: Armstrong World Industries "Prelude Plus XL Fire Guard"; USG "Donn Brand DX/DXL", or approved equal.

2.6 MISCELLANEOUS MATERIALS

- A Acoustical Sealant: Resilient, non-staining, non-shrinking, non-hardening, non-skinning, non-drying, non-sag sealant intended for interior sealing of concealed construction joints.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine conditions under which acoustical ceiling work is to be performed and notify Architect in writing of unsatisfactory conditions. Do not proceed with work until unsatisfactory conditions have been corrected in an acceptable manner.

3.2 PREPARATION

- A. Coordination: Furnish layouts for inserts, clips, or other supports required to be installed by other trades for support of acoustical ceilings.
- B. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half width units at borders, and comply with reflected ceiling plans wherever possible.

3.3 INSTALLATION

- A. General: Install materials in accordance with manufacturer's printed instructions, and to comply with governing regulations, fire-resistance rating requirements as indicated, and Cisca standards applicable to work.

- B. Arrange acoustical units and orient directionally-patterned units (if any) in manner shown by reflected ceiling plans.
 - 1. Install tile with pattern running in one direction, unless otherwise indicated.
- C. Install suspension systems to comply with ASTM C 636, with hangers supported only from building structural members. Locate hangers not less than 6" from each end and spaced 4'-0" along each carrying channel or direct-hung runner, unless otherwise indicated, leveling to tolerance of 1/8" in 12'-0".
 - 1. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eye-screws, or other devices which are secure and appropriate for substrate, and which will not deteriorate or fail with age or elevated temperatures.
- D. Install edge moldings of type indicated at perimeter of acoustical ceiling area and at locations where necessary to conceal edges of acoustical units.
 - 1. Sealant Bed: Apply continuous ribbon of acoustical sealant, concealed on back of vertical leg before installing moldings.
 - 2. Screw-attach moldings to substrate at intervals not over 16" o.c. and not more than 3" from ends, leveling with ceiling suspension system to tolerance of 1/8" in 12'-0". Miter corners accurately and connect securely.
 - 3. Install acoustical panels in coordination with suspension system, with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at borders and at penetrations.
 - 4. Install hold-down clips in areas indicated, and in areas where required by governing regulations or for fire-resistance ratings; space as recommended by panel manufacturer, unless otherwise indicated or required.
- E. Cooperate with other trades and Contractors for installation of their materials and equipment, particularly with those installing the ductwork, ceiling diffusers and lighting fixtures so that diffusers, lighting fixtures and other items are located on center lines of tile or on centers of joints as shown on approved shop drawings.
 - 1. Provide additional hanger wires to support cubicle curtain tracks, and other superimposed loads. Locate the supplemental hangers within 6 inches of each corner of the item being supported.
 - 2. Where light fixtures, or other recessed items occur in ceilings, frame acoustical material properly to permit installation of such recessed items and do all necessary cutting and fitting of acoustical materials and suspension systems to accommodate same. Cut neatly around all pipes passing through ceilings. Build in fixture frames and yokes in cooperation with Electrical Subcontractor.

3.4 CLEANING

- A. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members; comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage. General Contractor is responsible for cleaning

or replacement of all damaged tile, regardless of how the damage was caused and regardless of by which Contractor.

END OF SECTION 09510

SECTION 09900 - PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

- A. Extent of painting work is indicated on drawings and schedules, and as herein specified.
- B. Work includes painting and finishing of interior exposed items and surfaces throughout project, except as otherwise indicated.
 - 1. Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatment specified under other sections of work.
- C. "Paint" as used herein means all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.
- D. Surfaces to be Painted: Except where natural finish of material is specifically noted as a surface not to be painted, paint exposed surfaces whether or not colors are designated in "schedules". Where items or surfaces are not specifically mentioned, paint the same as similar adjacent materials or areas. If color or finish is not designated, Architect will select these from standard colors or finishes available.
- E. Following categories of work are not included as part of field-applied finish work.
 - 1. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under various sections for structural steel, steel windows, miscellaneous metal, hollow metal work, and similar items. Also, for fabricated components such as architectural woodwork, wood casework, and shop fabricated or factory built mechanical and electrical equipment or accessories. This is in addition to the prime coat specified herein.
 - 2. Pre-Finished Items: Unless otherwise indicated, do not include painting when factory-finishing or installer-finishing is specified for such items as (but not limited to) metal toilet enclosures, prefinished partition systems, acoustic materials, architectural woodwork and casework, and shop fabricated or factory built mechanical and electrical equipment, including light fixtures, switchgear and distribution cabinets.
 - 3. Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundation spaces, furred areas, utility tunnels, pipe spaces, duct shafts and elevator shafts.
 - 4. Finished Metal Surfaces: Unless otherwise indicated, metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not require finish painting.

5. Operating Parts: Unless otherwise indicated, moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts will not require finish painting.
 6. Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment, identification, performance rating, name, or nomenclature plates.
- F. Mechanical and Electrical Work: Painting of mechanical and electrical work is specified herein.
1. Painting of mechanical and electrical work is limited to those items exposed to view.
 2. Mechanical items to be painted include, but are not limited to, the following:
 - a. Piping, pipe hangers and supports.
 - b. Ductwork, insulation.
 - c. Access doors and service panels.
 3. Electrical items to be painted include, but are not limited to, the following:
 - a. Conduit and fittings.

1.3 QUALITY ASSURANCE

- A. Single Source Responsibility: Provide primers and other undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.
- B. Coordination of Work: Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information or characteristics of finish materials provided for use, to ensure compatible prime coats are used.
- C. Industry Standards: Comply with industry standard established by the Painting and Decorating Contractors of America PDCA for applications, methods and recommendations and use of tools and equipment for paint and stain coatings, primers and block fillers.
- D. Lead and Chromate Contents:
1. All paint products must be free of any lead or chromate contents.
- E. Volatile Organic Compound Compliant (VOC.):
1. All paint products must meet the State VOC environmental regulations and the following:
 - a. Chemical Components of Interior Paints and Coatings: Provide products that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and the following chemical restrictions:
 - (1) Primer, Sealer and Undercoater: VOC content of not more than 200 g/L.

- (2) Specialty Primer, Sealer and Undercoater: VOC content of not more than 350 g/L.
- (3) Rust Preventative Coating: VOC content of not more than 400 g/L.
- (4) Flat Paints and Coatings: VOC content of not more than 100 g/L.
- (5) Non-Flat Paints and Coatings: VOC content of not more than 150 g/L.
- (6) Nonflat High Gloss Coatings: VOC content of not more than 250 g/L.
- (7) Varnishes and Sanding Sealers: VOC content of not more than 350 g/L.
- (8) Stains: VOC content of not more than 250 g/L.
- (9) Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).

2. Restricted Components: Paints and coatings shall not contain any of the following:

- a. Acrolein.
- b. Acrylonitrile.
- c. Antimony.
- d. Benzene.
- e. Butyl benzyl phthalate.
- f. Cadmium.
- g. Di (2-ethylhexyl) phthalate.
- h. Di-n-butyl phthalate.
- i. Di-n-octyl phthalate.
- j. 1,2-dichlorobenzene.
- k. Diethyl phthalate.
- l. Dimethyl phthalate.
- m. Ethylbenzene.
- n. Formaldehyde.
- o. Hexavalent chromium.
- p. Isophorone.
- q. Lead.
- r. Mercury.
- s. Methyl ethyl ketone.
- t. Methyl isobutyl ketone.
- u. Methylene chloride.
- v. Naphthalene.
- w. Toluene (methylbenzene).
- x. 1,1,1-trichloroethane.
- y. Vinyl chloride..

- G. Paint Coordination: Provide finish coats which are compatible with prime paints used. Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information on characteristics of finish materials proposed for use, to ensure compatible prime coats are used. Provide barrier coats over incompatible primers or

remove and reprime as required. Notify Architect in writing of any anticipated problems using specified coating systems with substrates primed by others.

1. At galvanized surfaces, primer shall be a zinc dust-zinc oxide coating.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical information including paint label analysis and application instructions for each material proposed for use.
- B. Samples: Prior to beginning work, Contractor shall furnish color chips (2 fan decks) for surfaces to be painted. Use representative colors when preparing samples for review. Submit samples for Architect's review of color and texture only. Provide a listing of material and application for each coat of each finish sample.
 1. On 12" x 12" hardboard, provide two samples of each color and material, with texture to simulate actual conditions. Resubmit samples as requested by Architect until acceptable sheen, color, and texture is achieved.
- C. Acknowledgment of Contract Documents: Contractor / Installer shall submit to the Architect certifications signed by each of the Contractor and Installer attesting acknowledgment of requirements of the Contract Documents for specific project requirements indicated in this specifications.
 1. Contractor / Installer shall not proceed with painting work of this section until submittal of required certifications are completed.
 2. Any work performed prior to completion of this submittal shall be subject to total rejection by the Architect. All rejected work shall be rectified without any additional cost to the Owner.

1.5 DELIVERY AND STORAGE

- A. Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label, and following information:
 - Name or title of material.
 - Fed. Spec. number, if applicable.
 - Manufacturer's stock number and date of manufacturer.
 - Manufacturer's name.
 - Contents by volume, for major pigment and vehicle constituents.
 - Thinning instructions.
 - Application instructions.
 - Color name and number.

1.6 JOB CONDITIONS

- A. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45°F (7°C) and 95°F (35°C), unless otherwise permitted by paint manufacturer's printed instructions.

- B. Do not apply paint in snow, rain, fog or mist, or when relative humidity exceeds 85%, or to damp or wet surfaces, unless otherwise permitted by paint manufacturer's printed instructions.
- C. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include but are not limited to the following:
 - 1. M A B
 - 2. Duron Inc.
 - 3. PPG Architectural Coatings
 - 4. The Sherwin-Williams Company

2.2 COLORS AND FINISHES

- A. Prior to beginning work, Contractor shall furnish color chips for surfaces to be painted from manufacturers full line of products. This shall include custom colors.
 - 1. Final acceptance of colors will be from samples supplied on the job.
- B. Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated.

2.3 MATERIALS

- A. Material Quality: Provide best quality grade of various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable.
- B. Provide undercoat paint recommended and produced by the same manufacturer as the finish coats. Use only thinners approved by the paint manufacturer, and use only within recommended limits.

2.4 INTERIOR PAINT SCHEDULE

- A. Semi-Gloss (Satin) Enamel:
 - 1. 1st Coat: Sherwin Williams, Pro Industrial Pro-Cryl Universal Primer, B66W310.
 - 2. 2nd Coat: Acrylic Enamel, Sherwin Williams, Pro Industrial Zero VOC Acrylic, B66W651.
 - 3. 3rd Coat: Acrylic Enamel, Sherwin Williams, Pro Industrial Zero VOC Acrylic, B66W651.

4. Apply to following interior surfaces: Hollow metal work, miscellaneous steel and ferrous metal fabrications.
5. Apply as many coats as necessary to produce a uniform substrate and finish appearance.

B. Egg-Shell / Satin Enamel - Acrylic Latex:

1. Base Coats: Enamel Undercoat ; Primer-Sealer to suit substrate; PrepRite Block Filler for Concrete Masonry, B25W25.
 - * Block Filler shall be Level 3 - Premium Fill; one or multiple coats for high performance block filler in accordance with PDCA industry standards.
2. 2nd Coat: Sherwin Williams, ProMar 200 Zero VOC Eg-Shel, B20-2600 Series.
3. 3rd Coat: Sherwin Williams, ProMar 200 Zero VOC Eg-Shel, B20-2600 Series.
4. Apply to the following interior surfaces: Concrete masonry units, gypsum drywall and other interior assemblies to receive paint.
5. Apply as many coats as necessary to produce a uniform substrate and finish appearance.

C. Transparent Waterborne Varnish Finish:

1. Stain Coat (if required): Oil base penetrating stain, color as selected by Architect.
2. 1st Coat: Polyurethane varnish: Sherwin Williams, Woodclassics Waterborne Polyurethane Varnish A68 Series.
3. 2nd Coat: Polyurethane varnish: Sherwin Williams, Woodclassics Waterborne Polyurethane Varnish A68 Series.
4. 3rd Coat: Sherwin Williams, Woodclassics Waterborne Polyurethane Varnish A68 Series.
5. Apply to Architectural woodwork.
6. Apply as many coats as necessary to produce a uniform substrate and finish appearance.

2.5 EXTRA STOCK

- A. Contractor shall provide one gallon of extra stock for each color/type selected for use on the project. Provide unopened containers clearly marked with manufacturers color number and name.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Applicator must examine areas and conditions under which painting work is to be applied and notify Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions, including rotted or otherwise defective materials, have been observed by all concerned and corrected in a manner acceptable to Applicator.
- B. Starting of painting work will be construed as Applicator's acceptance of surfaces and conditions within any particular area.
- C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.

3.2 SURFACE PREPARATION

- A. General:
 - 1. Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as herein specified, for each particular substrate condition.
 - 2. Provide barrier coats over incompatible primers or remove and reprime as required. Notify Architect in writing of any anticipated problems in using the specified coating systems with substrates primed by others.
 - 3. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items.
 - 4. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly-painted surfaces.
 - 5. Painting of materials shall commence only when the moisture content of the materials complies with manufacturer's recommendations as follows:
 - a. Concrete and masonry - 22% maximum.
 - b. Gypsum drywall - 12% maximum.
 - c. Plaster - 15% maximum.
 - d. Wood (interior) - 8% maximum.
- B. Cementitious Materials:
 - 1. Prepare cementitious surfaces of concrete, concrete block, cement plaster and gypsum drywall board to be painted by removing efflorescence, chalk, dust, dirt, grease, oils, and by roughening as required to remove glaze.
 - 2. Determine alkalinity and moisture content of surfaces to be painted by performing appropriate tests. If surfaces are found to be sufficiently alkaline to cause blistering and

burning of finish paint, correct this condition before application of paint. Do not paint over surfaces where moisture content exceeds that permitted in manufacturer's printed directions.

3. Clean concrete floor surfaces scheduled to be painted with a commercial solution of muriatic acid, or other etching cleaner. Flush floor with clean water to neutralize acid, and allow to dry before painting.

C. Wood:

1. Clean wood surfaces to be painted of dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those finished surfaces exposed to view, and dust off. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer, before application of priming coat. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood-filler. Sandpaper smooth when dried.
2. Prime, stain, or seal wood required to be job-painted immediately upon delivery to job. Prime edges, ends, faces, undersides, and backsides of such wood, including cabinets, counters, cases, paneling.
3. When transparent finish is required, use spar varnish for backpriming.

D. Ferrous Metals:

1. Clean ferrous surfaces, which are not galvanized or shop-coated, of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning.
2. Touch-up shop-applied prime coats wherever damaged or bare, where required by other sections of these specifications. Clean and touch-up with same type shop primer.
3. Galvanized Surfaces: Clean free of oil and surface contaminants with non-petroleum based solvent.

3.3 MATERIALS PREPARATION

- A. Mix and prepare painting materials in accordance with manufacturer's directions.
- B. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.
- C. Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
- D. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.4 APPLICATION

- A. General: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
- B. Where finish schedule calls for walls, floors or ceilings to be painted, paint all new and existing surfaces in same area. Paint from corner to corner on walls, floors, or ceilings, or to a major change in direction of surface to be painted. Provide crisp, clean, sharp lines where new painted surfaces abut existing painted surfaces.
- C. **Apply additional coats when undercoats, stains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance. Give special attention to insure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.**
- D. **Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.**
- E. Sand lightly between each succeeding enamel or varnish coat.
- F. Scheduling Painting: Apply first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
- G. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
- H. **Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate, to establish a total dry film thickness as recommended by coating manufacturer and an acceptable finished appearance in finish, color and appearance as determined by the Architect.**
- I. Primer Coat: Apply primer coat of material which is required to be painted or finished, and which has not been prime coated by others.
 - 1. **Re-coat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.**
- J. **Block Fillers: Apply block fillers using manufacturer's recommended application techniques with sufficient material and coats to achieve a pinhole-free, "Level 3 - Premium Fill Surface", and in accordance with PDCA 's industry standards.**
- K. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will not be acceptable.
- L. Transparent (Clear) Finishes: Use multiple coats to produce glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections.

1. Provide satin finish for final coats, unless otherwise indicated.
- M. Completed Work: Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

3.5 CLEAN-UP AND PROTECTION

- A. Clean-Up: During progress of work, remove from site discarded paint materials, rubbish, cans and rags at end of each work day.
- B. Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- C. Protection: Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.
1. Provide "Wet Paint" signs as required to protect newly-painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.
 2. At completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

END OF SECTION 09900

SECTION 10161 - SOLID PLASTIC TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Extent of **minimum Class "C"**, fire-rated solid toilet compartments is indicated on drawings.
- B. Style of toilet compartments and room entrance with privacy door:
 - 1. Floor-anchored, overhead braced.
- C. Styles of screens include:
 - 1. Urinal screens: Panelaster.
 - 2. Room entrance privacy screens (without door) & screens between lav's. and urinals: Floor to Ceiling.
- D. Related Work: Toilet accessories, as specified elsewhere in Division 10.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's detailed technical data for materials, fabrication, and installation, including catalog cuts of anchors, hardware, fastenings, and accessories.
- B. Shop Drawings: Submit shop drawings for fabrication and erection of toilet partition assemblies not fully described by product drawings, templates, and instructions for installation of anchorage devices built into other work.
- C. Samples: Submit full range of color samples for each type of unit required. Submit 4" square samples of each color and finish on same substrate to be used in work, for color verification after selections have been made.
- D. Test Reports: Submit manufacturer's reports of testing of rigid plastic products indicating compliance with indicated performance requirements.

1.4 QUALITY ASSURANCE

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible, to ensure proper fitting of work. However, allow for adjustments within specified tolerances where ever taking of field measurements before fabrication might delay work.
- B. Coordination: Furnish inserts and anchorages which must be built into other work for installation of toilet partitions and related work; coordinate delivery with other work to avoid delay.

- C. Manufacturer's Qualifications: A company regularly engaged in manufacture of products specified in this section, and whose products have been in satisfactory use under similar service conditions for not less than 5 years.
- D. Installer's Qualifications: A company regularly engaged in installation of products specified in this section, with a minimum of 5 years of experience.
- E. Smoke Density / Self-Ignition: Provide products which have been tested in accordance with ASTM D-2843 for smoke density, ASTM D-1920 for self-ignition, in compliance of the International Building Code (Class C) for indicated materials and in accordance with the following:
 - 1. Flame Spread: 76-200
 - 2. Smoke Developed: 0-450.
- F. Regulatory Requirements: Products and finished installations to be used by persons with disabilities must comply with requirements of the Uniform Construction Code, American National Standard, Accessible and Usable Buildings and Facilities, ICC / ANSI A117.1-2003.

1.5 WARRANTY

- A. Manufacturer's Warranties: Provide manufacturer's standard **twenty-five (25) year** warranty for all solid plastic compartments, products and all other assemblies.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Provide products as manufactured by Scranton Products, Scranton, PA, Tel.# 800.445.5148, www.scrantonproducts.com, from their full line of standard textures and colors
 - 1. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include the following:
 - a. Metpar Corp., Westbury, NY, Tel.# 516.333.2600, www.metpar.com.
 - b. Global Partitions, Eastanollee, GA, Tel.# 706.827.2700, www.globalpartitions.com.
 - c. Bradley, Menomonee Falls, WI, Tel.# 800.272.3539, www.bradleycorp.com.
 - d. or approved equal.

2.2 MATERIALS

- A. General: Provide materials which have been selected for surface flatness and smoothness. Exposed surfaces which exhibit pitting, seam marks, roller marks, stains, discolorations, or other imperfections on finished units are not acceptable.
- B. Solid Plastic: One piece seamless, one inch thick solid HDPE plastic with a homogenous color throughout fabricated from polymer resins.
- C. Interior Wall and Ceiling requirements by Occupancy (IBC, Table 803.9):

1. **Minimum of Class C fire rating for Use Groups: A-3 thru A-5, Educational, Business & Mercantile in both sprinklered and non-sprinklered building of "Rooms and Enclosed Spaces".**

2.3 FABRICATION

- A. General: Furnish standard doors, panels, screens, and pilasters fabricated for partition system, unless otherwise indicated. Furnish units with cutouts, drilled holes, and internal reinforcement to receive partition-mounted hardware, accessories, and grab bars, as indicated.
- B. Overhead-Braced Partitions: Furnish galvanized steel supports and leveling bolts at pilasters, as recommended by manufacturer to suit floor conditions. Make provisions for setting and securing continuous extruded aluminum anti-grip overhead-bracing at top of each pilaster. Furnish shoe at each pilaster to conceal supports and leveling mechanism.
- C. Wall-Hung Screen: Furnish panel units in sizes indicated, of same construction and finish as partition system panels.
- D. Minimum requirements for partitions are as follows:
 1. Doors: 1-inch thick equipped with gravity type hinges and push-pull hardware. Provide out-swinging, over-sized doors at water closet compartments for handicapped users.
 2. Pilasters: Adjustable, 1 inch thick; provide overhead headrail bracket.
 3. Fasteners: Stainless steel 1/4 inch tamper proof shoulder screws and barrel nuts.
 4. #14 Screw: Stainless steel #14 x 1-1/2 inch screw used along with plastic anchors for attachments to floor and building walls.
 5. End Cap: Aluminum cap fastened to the ends of headrail bracing.
 6. Headrail Bracket: 16 gauge stainless steel used to connect headrail bracing.
 7. Door Pull: Heavy duty Zamac chrome-plated used on outswinging doors only. Provide on inside and outside of door.
 8. Latch: Anodized aluminum with bright-dip finish. Specially black hard coat slide bolt for extra long wear.
 9. Strike: Heavy-duty aluminum extrusion with bright-dip anodized finish: rubber door stop.
 10. Bumper/Coat Hook: Heavy Zamac chrome-plated with rubber bumper. All doors are furnished with hook. Bumper functions as a stop on inswinging doors. Mounting height to be 48" above finish floor.
 11. Door Stop: Zamac chrome-plated used on out-swinging doors only as a stop.
 12. The Architect shall have the option to select brackets, hinges and shoes as follows:

- a. Wall Brackets shall be 54" long and made of extruded PVC plastic in color to match toilet partition panel. Plastic brackets are fastened to the pilaster with stainless steel tamper resistant torx head screws and fastened to the panels with stainless steel tamper resistant torx head sex bolts.
 - b. Hinges: Manufacturer's Stealth™ integral hinge system. Pilaster to be machined to accept door, and chrome plated Stealth™ integral hinge mechanism anchored to the door and pilaster. Door closures to be factory set to accommodate all conditions and allow for a positive opening and closing action free of impediment.
 - c. Shoes: 20 gauge stainless steel construction to secure the pilaster to the floor.
13. Provide manufacturer's special hardware and accessories to accommodate all loads and conditions of partitions and screens.

2.4 COLORS AND FINISHES

- A. Basis of Design: "Mosaic Series, Sandstone with Orange Peel texture".
- 1. Stainless steel items shall have a polished finish.
 - 2. Aluminum items shall have a natural color anodized finish.
 - 3. Chrome plated items shall have a polished finish.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with manufacturer's recommended procedures and installation sequence. Install partitions rigid, straight, plumb, and level. Provide clearances of not more than 1/2" between pilasters and panels, and not more than 1" between panels and walls. Secure panels to walls with not less than two stirrup brackets attached near top and bottom of panel. Locate wall brackets so that holes for wall anchorages occur in masonry or tile joints. Secure panels to pilasters with not less than two stirrup brackets located to align with stirrup brackets at wall. Secure panels in position with manufacturer's recommended anchoring devices.
- B. Overhead-Braced Partitions: Secure pilasters to floor and level, plumb, and tighten installation with devices furnished. Secure overhead-brace to each pilaster with not less than two fasteners. Hang doors and adjust so that tops of doors are parallel with overhead-brace when doors are in closed position.
- C. Screens: Attach with concealed anchoring devices, as recommended by manufacturer to suit supporting structure. Set units to provide support and to resist lateral impact.

3.2 ADJUST AND CLEAN

- A. Hardware Adjustment: Adjust and lubricate hardware for proper operation. Set hinges on inswinging doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on outswinging doors (and entrance swing doors) to return to fully closed position.

- B. Clean exposed surfaces of partition systems using materials and methods recommended by manufacturer, and provide protection as necessary to prevent damage during remainder of construction period.

END OF SECTION 10161

SECTION 10500 - METAL LOCKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

- A. Extent of metal lockers is shown on drawings.
- B. Types of products in this section includes the following:
 - 1. Heavy Duty Ventilated Lockers (Locker Rooms).
 - 2. Barrier Free Accessible Lockers.
 - 3. Locker Room Benches.
- C. Concrete base shall be in accordance with Section 03300.

1.3 QUALITY ASSURANCE

- A. Uniformity: Provide each type of metal locker as produced by a single manufacturer, including necessary mounting accessories, fittings, and fastenings.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for metal locker units.
- B. Samples: Submit color samples on squares of same metal to be used for fabrication of lockers.
- C. Shop Drawings: Submit shop drawings for metal lockers and locker room benches, verifying dimensions affecting locker installations. Show lockers in detail, method of installation, fillers, trim, base, and accessories. Include locker numbering sequence information.
- D. Color Charts: Provide color charts showing manufacturer's available full range of standard and optional colors.

1.5 JOB CONDITIONS

- A. Do not deliver metal lockers and locker room benches until building is enclosed and ready for locker installation. Protect from damage during delivery, handling, storage, and installation.

1.6 WARRANTY

- A. The manufacturer warrants to the Owner that all items pertaining to the lockers shall be free of defective material or faulty workmanship for the life of the product when used in accordance with the manufacturer's specification and/or operating instructions.

1. This warranty applies to the original purchaser only.
2. Warranty excludes consequential, incidental or any other damages directly or indirectly resulting from failure or loss of use of products.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Provide products as manufactured by Republic Storage Systems Company, Inc., Canton, OH, Tel.# 800.477.1255, www.republicstorage.com.
- B. Subject to compliance with requirements of the "Basis of Design", manufacturers offering products which may be incorporated in the work include but not limited to the following:
 1. Penco Products Inc., Skippack, PA, Tel.# 800.562.1000, www.pencoproducts.com.
 2. Lyon Workspace Products, Aurora, IL, Tel.# 800.323.0082 / 630.892.8941, www.lyonworkspace.com.
 3. or approved equal.
- C. Products specified herein have been selected because of their quality of construction, configuration, design, function, available finishes, components, accessories, dimensions, shape and style.
 1. Comparable products of other manufacturers will be considered if it can be clearly shown that their products are equal to or will exceed the construction quality requirements and other design attributes listed above.
 2. The use of one manufacturer's catalog numbers, and the specific requirements set forth in drawings and specifications, are not intended to preclude the use of other manufacturer's products or procedures which may be equivalent, but are given for the purpose of establishing a standard of design and quality for materials, construction and workmanship.
- D. Substitute products will be considered for substitution only when submitted to the Architect, as per the requirements of Specification Section 00800.

2.2 MATERIALS

- A. Sheet Steel: Mild cold-rolled and leveled steel, free from buckle, scale, and surface imperfections.
- B. Fasteners: Cadmium, zinc, or nickel plated steel; exposed bolt heads, slotless type; self-locking nuts or locker washers for nuts on moving parts.
- C. Equipment: Hooks and hang rods of cadmium-plated or zinc-plated steel or cast aluminum.

2.3 FABRICATION, GENERAL

- A. Construction: Fabricate lockers square, rigid, and without warp, with metal faces flat and free of dents or distortion. Make all exposed metal edges safe to touch. Weld frame members together to form rigid, one-piece structure. Bolt, or rivet other joints and connections as standard with manufacturer. Grind exposed welds flush. Do not expose bolts or rivet heads on fronts of locker doors or frames.
- B. Frames: Fabricate of 16-gauge channels, minimum, with continuous stop/strike formed on vertical members.
- C. Finishing: Chemically pretreat metal with manufacturer's standard degreasing and phosphatizing process. Apply baked-on enamel finish to all surfaces, exposed and concealed, at a minimum of 300°F, for 30 minutes, except plates and non-ferrous metal.
- D. Color: Provide locker units in colors as selected by Architect from manufacturer's available full range of colors. Allow for two (2) colors.

2.4 HEAVY DUTY VENTILATED LOCKERS (SHOWER ROOMS)

- A. Basis of Design: "Heavy Duty Ventilated Lockers"; Republic Storage Systems Company, Inc., or approved equal.
 - 1. Body: Provide locker body components made of cold rolled steel specially formed for added strength and rigidity and to ensure tight joints at fastening points.
 - a. Uprights shall be of 16 gauge cold rolled sheet steel perforated with visual rectangular slots 5/8" wide by 1-1/8" high in such quantity and pattern as to ensure maximum ventilation. Solid sheet steel sections shall occur at all shelf or compartment divider locations to provide secure shelf attachment and support.
 - b. Locker backs shall be formed from 18 gauge cold rolled sheet steel with right angle flanges on each vertical side for stiffness, ease of assembly and to provide corner rigidity to the locker unit.
 - c. Tops, bottoms, shelves and compartment dividers shall be formed from 16 gauge cold-rolled steel fully flanged on all sides for added stiffness. Shelves shall have an additional return flange on the front edge creating a channel shape to rigidize the impact surface.
 - 2. Assembly: Shall be by riveting with washer backup to provide solid, shake-proof permanent fastening while still permitting fastener removal by drilling to allow future rearrangement of lockers or replacement of damaged parts.
 - 3. Door Frames: Provide 16 gauge formed into deep, 1" face channel shapes with a continuous vertical door strike integral with the frame on both sides of the door opening. Cross frame members of 16 gauge channel shapes, including intermediate cross frame on double and triple-tier lockers shall be securely welded to vertical framing members to ensure a square and rigid assembly.
 - 4. Doors: Doors shall be formed from one piece, 14 gauge, cold rolled sheet steel. Formations shall consist of a full channel shape on the lock side of adequate depth to

fully conceal the lock bar, channel formation on the hinge side and right angle formations across the top and bottom. Doors shall be adequately perforated for free air flow while leaving sufficient metal for door strength and rigidity utilizing visual rectangular slots 5/8" wide by 1-1/8" high.

5. Hinges: Shall be at least a 2" high, 5-knuckle, full loop, tight pin style, securely welded to frame and riveted to the inside of the door flange. Hinges shall be attached with two rivets. Locker doors 42" high and less shall have two hinges. Doors over 42" shall have three hinges. An extra hinge shall be provided on 24" wide single and double tier doors.
6. Locking Devices: Shall be positive automatic pre-locking type, whereby locker may be locked while door is open, then closed without unlocking and without damaging the locking mechanism.
7. Latching: One-piece, pre-lubricated, spring steel latch completely contained within the lock bar, under tension, to provide a rattle-free operation. The lock bar shall be of pre-painted, double-channel steel construction. The lock bar shall be securely contained in the door channel by self-lubricating polyethylene guides that isolate the lock bar from metal-to-metal contact with the door. There shall be three latching points for lockers over 42" in height and two latching points for all tiered lockers 42" and under in height. The lock bar travel is to be limited by contacting resilient high-quality elastomeric cushioning devices concealed inside the lock bar.
8. Recessed Handle: A non-protruding 14 gauge lifting trigger shall be provided for actuating the lock bar when opening the door. It shall be contained in a formed 20 gauge stainless steel pocket with the exposed portion encased in a molded ABS thermoplastic cover that provides isolation from metal-to-metal contact. The trigger is an integral part of the steel slide plate which transfers the lifting force to the lock bar. The stainless steel pocket shall contain a recessed mounting area for the lock type specified and also mounting for the number plate.
9. Frame Hooks and Silencer: Frame hooks to accept latching shall be of heavy gauge steel, set close in to avoid snagging of clothing and welded to the door frame. A continuous vertical door strike on the door frame shall protect frame hooks from door slam damage. A large Latch Guard-type soft rubber silencer bonded to a steel backing plate shall be riveted in place at each frame hook on tiered lockers. A rubber silencer shall be located at each frame hook on box lockers.
10. Number Plates: Each locker shall have a polished aluminum number plate with black numerals not less than 1/2" high. Plates to be attached with rivets to the lower surface within the recessed handle pocket. Mount box locker number plates on door faces.
11. Locks : All lockers shall be furnished with the following:
 - a. Provisions for Combination Padlock, with shackle diameter no less than 9/32". Combination Padlocks shall be Provided by the Owner.

2.5 LOCKER ACCESSORIES

- A. Provide locker accessories as shown or as required for each indicated locker type. Locker accessories shall include but not limited to the following:
1. Continuous Sloping Tops: Lockers shall be provided with continuous sloping tops formed from 20 gauge minimum sheet steel with a slope that has a rise equal to 1/3 the locker depth (approximately 18 degrees). Tops shall be provided in lengths as long as practical and provided with slip joints without visible fasteners at splice locations. Necessary end panels (or hip ends) and mitered corners shall be provided. Tops shall be finished to match lockers.
 2. Trim: Provide trim at jambs and head of recessed lockers, consisting of not less than 18-gauge cold-rolled steel, 3" wide as necessary. Factory-finish trim to match lockers. Secure trim to lockers with concealed fastening clips.
 3. Filler Panels: Provide filler panels where indicated, of not less than 18-gauge steel sheet, factory-fabricated and finished to match locker units.
 4. Boxed end Panels: Provide boxed end panels on all exposed end lockers, of not less than 16 gauge sheet steel to match locker depth and height and shall have a 1" edge dimension. Double-row end panels shall have a zee reinforced members. All panels shall be installed with concealed fasteners, and shall have finish to match lockers.

2.6 BARRIER FREE ACCESSIBLE

- A. Regulatory Requirements: Except for more stringent requirements as indicated or imposed by governing regulations (which must be complied with) comply with the following:
1. The New Jersey Uniform Construction Code and International Building Code, New Jersey Edition (Latest Editions).
 2. Barrier Free requirements in accordance with American National Standards, CABO/ANSI A117.1- 2003.
- B. Locations: Provide barrier free accessible lockers where shown or if not shown to be located in an unobstructed position that maintains full clearance from the wall or other obstacles and allows a sufficient turning radius for easy access and exit by parallel or frontal approach.
1. Handle: Provide a shape that is easy to grasp with one hand and does not require tight grasping, tight pinching or twisting of the wrist to operate.
 2. Shelf and bottom location: Provide shelf in accessible locker, height shall conform to parallel or forward reach requirements so is may be reached from a seated position.
 - a. In addition to the upper shelf requirement, the bottom of the locker must have a shelf located at a heights conforming to parallel or forward reach requirements so that any item placed or dropped on the bottom shelf is accessible.

2.7 LOCKER ROOM BENCHES

- A. Manufacturer's standard units with laminated hardwood tops approximately 9-1/2" wide by 1-1/4" thick / 20" wide x 42" long (ADA compliant) x 1 1/2" thick, in lengths as indicated, and all corners rounded and sanded.
 - 1. Apply manufacturer's standard clear coating to bench tops and baked enamel finish to pedestals.
- B. Pedestals: (Extra Heavy Duty) Base shall be bell shaped casting 7-3/4" diameter, threaded for 1-1/2" pipe with provisions for concealed fasteners. Provide 1/2" x 5" lag screw and lead shield for fastening to subfloor. Top flange shall be 1-1/2" pipe flange 4-1/2" in diameter with provisions for 4 wood screws for fastening to bench top. Pedestal column shall be standard 1-1/2" steel pipe threaded on both ends to provide at least 1 inch height adjustment. Overall height of pedestal shall be 16-1/4 inches. Provide baked epoxy finish on pedestal to color as selected by Architect.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install metal lockers at locations shown in accordance with manufacturer's instructions for plumb, level, rigid, and flush installation.
- B. Space fastenings about 48" o.c., unless otherwise recommended by manufacturer, and apply through back-up reinforcing plates where necessary to avoid metal distortion; conceal fasteners insofar as possible.
- C. Install trim, sloping top units, and metal filler panels where indicated or required, using concealed fasteners to provide flush, hairline joints against adjacent surfaces.
- D. Install benches in compliance with manufacturer's instructions.

3.2 ADJUST AND CLEAN

- A. Adjust doors and latches to operate easily without binding. Verify that integral locking devices are operating properly.
- B. Touch-up marred finishes, but replace units which cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

END OF SECTION 10500

SECTION 10800 - TOILET AND BATH ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

- A. Extent of each type of toilet accessory is indicated on drawings and schedules.
- B. Types of toilet accessories required include but not limited to the following:
 - 1. Mirrors
 - 2. Grab bars
 - 3. Soap dispensers
 - 4. Towel dispensers
 - 5. Toilet tissue dispensers
 - 6. Napkin disposals
 - 7. Shower curtains, rods and hooks
 - 8. Hand dryers

1.3 QUALITY ASSURANCE

- A. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry; coordinate delivery with other work to avoid delay.
- B. Accessory Locations: Coordinate accessory locations with other work to avoid interference and to assure proper operation and servicing of accessory units.
- C. Products: Provide products of same manufacturer for each type of accessory unit and for units exposed in same areas, unless otherwise acceptable to Architect.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for each toilet accessory.
- B. Setting Drawings: Provide setting drawings, templates, instructions, and directions for installation of anchorage devices and cut-out requirements in other work.

1.5 WARRANTY

- A. Bradley Washroom Accessories: Warranty is limited to replacing or repairing, at the manufacturer's option, transportation charges prepaid by the purchaser, any washroom accessory unit or part thereof which their inspection shall show to have been defective within the limitation of the warranty. Period of warranty is measured from the date of their invoice as follows:

1. Complete unit (except mirrors) - **One (1) year**.
2. Stainless Steel Mirror Frames - **Fifteen (15) years** - against corrosion.
3. Plate Glass Mirrors - **Fifteen (15) years** - against silver spoilage.
4. Tempered Glass Mirrors - **Five (5) years** - against silver spoilage.
5. Polished #8 Architectural Grade Finish on 304 Series Stainless Steel - **One (1) year** against corrosion.
6. Bright Annealed Finish on 430 Series Stainless Steel - **One (1) year** against corrosion.

Warranty does not cover installation labor charges and does not apply to any units which have been damaged by accident, abuse, improper installation, improper maintenance, or altered in any way.

- B. Hand Dryer - Xlerator by Excel Dryer Inc: Manufacturer's standard limited warranty to be free from defects for a period of **five (5) years**. Warranty shall include labor performed at factory as well as the repair or exchange of defective parts, at manufacturer's option.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Catalog numbers used herein are Bradley Washroom Accessories, see drawings for schedule and additional information. Similar products for other indicated manufacturers will be acceptable.
- B. Subject to compliance with requirements, manufacturers offering toilet accessories which may be incorporated in the work include one of the following:
 1. American Specialties, Inc.
 2. Bobrick Washroom Equipment, Inc.
 3. or approved equal

2.2 MATERIALS, GENERAL

- A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22 gauge (.034") minimum, unless otherwise indicated.
- B. Brass: Leaded and unleaded, flat products, FS QQ-B-613; Rods, shapes, forgings, and flat products with finished edges, FS QQ-B-626.
- C. Sheet Steel: Cold-rolled, commercial quality ASTM A 366, 20-gauge (.040") minimum, unless otherwise indicated. Surface preparation and metal pretreatment as required for applied finish.
- D. Galvanized Steel Sheet: ASTM A 527, G60.
- E. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B 456, Type SC 2.
- F. Baked Enamel Finish: Factory-applied, gloss white, baked acrylic enamel coating.

- G. Mirror Glass: ASTM C-1048, Type I, Class 1, Quality q2, 1/4" thick, with silver coating, copper protective coating, and non-metallic paint coating complying with FS DD-M-411. Provide tempered safety glass for all mirrors.
- H. Galvanized Steel Mounting Devices: ASTM A 153, hot-dip galvanized after fabrication.
- I. Fasteners: Screws, bolts, and other devices of same material as accessory unit or of galvanized steel where concealed.

2.3 PRODUCT DESCRIPTIONS

- A. Mirror Units: #780 Series, Mirror plates shall be of No. 1 quality 1/4" polished safety glass, silvered and electrolytically copper backed.
 - 1. Frames shall be 3/4" x 3/4", type 304, 18 gauge satin finish stainless steel angle with mitered corners, welded and polished smooth, with 20 gauge angle stiffeners welded to frame, 20 gauge galvanized steel back with formed edges secured to frame with concealed screws and equipped with integral 18 gauge cold rolled steel all welded construction wall hangers.
 - 2. Mirror units shall guaranteed by the manufacturer for a period of 15 years which starts on approved date of installation.
 - 3. Sizes as indicated on drawings and schedules.
- B. Grab Bars: (Provide quantity and types indicated)
 - 1. Stainless Steel Type: Provide grab bars with wall thickness not less than 18 (.050") gauge and as follows:
 - a. Mounting: Concealed, manufacturer's standard flanges and anchorages.
 - b. Clearance: 1-1/2" clearance between wall surface and inside face of bar.
 - c. Gripping Surfaces: Manufacturer's non-slip texture.
 - d. Heavy-Duty Size: Outside diameter of 1-1/2".
- C. Soap Dispensers: (Provide one at each lavatory)
 - 1. Liquid Soap Dispenser, Vertical Tank Type: No. 6562, fabricate for surface mounting, sized for 40 fluid ounces minimum capacity. Provide push-in corrosion-resistant chrome plated brass housing valve with ABS plastic mechanism, designed to dispense soap in liquid form and measured quantity by pump action. Provide body fabricated of type 304 stainless steel, 20 gauge, in #4 finish.
 - 2. Liquid Soap Dispenser, Vertical Tank Type: Model No. 6A00-11, surface mounted, battery operated automatic soap dispenser, 27 fluid ounces capacity. Designed to dispense soap in gel and liquid alcohol, liquid soap form. Provide body fabricated of type 304 stainless steel, 20 gauge, in #4 finish.
- D. Towel Dispensers: (Provide quantity as indicated, minimum one each toilet room)
 - 1. No. 250-15 fabricate of stainless steel, 22 gauge satin finish stainless steel, sized to dispense not less than 300 C-fold or 500 multi-fold paper towels without use of special adapters, door equipped with tumbler lockset.

- E. Toilet Tissue Dispensers: (Provide one at each water closet and as indicated).
1. No. 505 surface-mounted single roll, chrome plated over nickel and copper, with one post hinged, tension device to accommodate standard sheet roll.
 2. No. 522 surface-mounted double standard core toilet tissue rolls, chrome plated over nickel and copper, with push button unlocks support arm with tension spring controls delivery and to accommodate standard sheet rolls.
 3. No. 5402 surface-mounted dual-rolls, satin-finish stainless steel. Vandal-resistant, polyethylene spindles. Bottom hinged front panel is secured with tumbler lock. Holds two standard sheet rolls.
- F. Napkin Disposals: Surface mounted, Model 4722-15, one toilet compartment, fabricated of type 304, 22 gauge stainless steel with exposed surfaces in satin finish. Self-closing push flap door and stainless steel removable receptacle with tumbler lock. Overall dimensions - 10-3/4" w x 15-1/8" h x 4" d.

2.4 MISCELLANEOUS ACCESSORIES

- A. Shower Curtain Rod, Heavy-Duty: No. 9539, 1-1/4" o.d. 18 gauge (.050") stainless steel, satin finish; furnish 3" o.d. minimum 20 gauge stainless steel flanges with satin finish, designed for exposed fasteners.
- B. Duck Shower Curtain: No. 9537, 42" wide x 72" high, 8 oz. 100% cotton duck material with hemmed edges and corrosion resistant metal grommets on 6" centers through top hem. Furnish in white color unless otherwise indicated.
- C. Shower Curtain Hooks: No. 9536, Chrome plated or stainless steel spring wire curtain hooks with snap fasteners, sized to accommodate curtain size specified above.
- D. Towel Hook: No. 932, Die cast, high quality Zamac zinc alloy. Copper, nickel plated with a highly polished chrome finish.
- E. Hand Dryer: Model No. XL-W, Xlerator, as manufactured by Excel Dryer Inc., surface mounted, heavy duty, die-cast zinc alloy, rib reinforced, lightweight, rustproof, with infrared optical sensor. Color shall be electrostatically applied epoxy paint - white.

2.5 FABRICATION

- A. General: No names or labels are permitted on exposed faces of toilet and bath accessory units. On either interior surface not exposed to view or on back surface, provide identification of each accessory item by either a printed, waterproof surface not exposed to view or on back surface, provide identification of each accessory item by either a printed, waterproof label or a stamped nameplate indicating manufacturer's name and product model number.
- B. Surface-Mounted Toilet Accessories, General: Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage wherever possible.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions under which work is to be installed and notify the Architect in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in an acceptable manner.

3.2 INSTALLATION

- A. Install toilet accessory units in accordance with manufacturers' instructions, using fasteners which are appropriate to substrate and recommended by manufacturer of unit. Install units plumb and level, firmly anchored in locations and at heights indicated.
- B. Use all metal type fasteners such as anchors, plates, screws, bolts and expansion shields, type as required by the construction to which accessories are to be secured. Exposed hardware shall match finish of the accessory.

3.3 ADJUSTING AND CLEANING

- A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.
- B. Clean and polish all exposed surfaces after removing temporary labels and protective coatings.

END OF SECTION 10800

SECTION 15055 - BASIC PIPING MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 SUMMARY:

- A. This Section specifies piping materials and installation methods common to more than one section of Division 15 and includes joining materials, piping specialties, and basic piping installation instructions.
- B. Related Sections:
 - 1. Division 15 Basic Mechanical Requirements section applies to the work at this Section.
 - 2. Piping materials and installation methods peculiar to individual systems are specified within their respective system specification sections of Divisions 2 and 15.
 - 3. Valves are specified in a separate section and in individual piping system sections of Division 15.
 - 4. Supports and Anchors are specified in a separate section of Division 15.
 - 5. Mechanical Identification is specified in a separate section of Division 15.
 - 6. Fire Barrier Penetration Seals are specified in Division 7.

1.3 SUBMITTALS:

- A. Refer to Division 1 and Basic Mechanical Requirements for administrative and procedural requirements for submittals.
- B. Product Data: Submit product data on the following items:
 - 1. Escutcheons
 - 2. Dielectric Unions and Fittings

1.4 QUALITY ASSURANCE:

- A. Soldering and Brazing procedures shall conform to ANSI B9.1 Standard Safety Code for Mechanical Refrigeration.

1.5 DELIVERY, STORAGE, AND HANDLING:

- A. Provide factory-applied plastic end-caps on each length of pipe and tube, except for concrete, corrugated metal, hub-and-spigot, clay pipe. Maintain end-caps through shipping, storage and handling to prevent pipe-end damage and prevent entrance of dirt, debris, and moisture.
- B. Protect stored pipes and tubes. Elevate above grade and enclose with durable, waterproof wrapping. When stored inside, do not exceed structural capacity of the floor.

- C. Protect flanges, fittings, and specialties from moisture and dirt by inside storage and enclosure, or by packaging with durable, waterproof wrapping.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. Manufacturer Uniformity: Conform with the requirements specified in Basic Mechanical Requirements, under "Product Options."
- B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering piping materials and specialties which may be incorporated in the work include, but are not limited to, the following:
 - 1. Pipe Escutcheons:
 - a. Chicago Specialty Mfg. Co.
 - b. Sanitary-Dash Mfg. Co.
 - c. Grinnell
 - 2. Dielectric Waterway Fittings:
 - a. Epco Sales, Inc.
 - b. Victaulic Company of America
 - 3. Dielectric Unions:
 - a. Eclipse, Inc.
 - b. Perfection Corp.
 - c. Watts Regulator Co.

2.2 PIPE AND FITTINGS:

- A. Refer to the individual piping system specification sections in Division 15 for specifications on piping and fittings relative to that particular system.

2.3 JOINING MATERIALS:

- A. Brazing Materials: Comply with SFA-5.8, Section II, ASME Boiler and Pressure Vessel Code for brazing filler metal materials appropriate for the materials being joined.
- B. Soldering Materials: Refer to individual piping system specifications for solder appropriate for each respective system.

2.4 PIPING SPECIALTIES:

- A. Escutcheons: Chrome-plated, stamped steel, hinged, split-ring escutcheon, with set screw. Inside diameter shall closely fit pipe outside diameter, or outside of pipe insulation where pipe is insulated. Outside diameter shall completely cover the opening in floors, walls, or ceilings.
- B. Unions: Malleable-iron, Class 150 for low pressure service and class 250 for high pressure service; hexagonal stock, with ball-and-socket joints, metal-to-metal bronze seating surfaces; female threaded ends.

- C. Dielectric Unions: Provide dielectric unions with appropriate end connections for the pipe materials in which installed (screwed, soldered, or flanged), which effectively isolate dissimilar metals, prevent galvanic action, and stop corrosion.
- D. Dielectric Waterway Fittings: Electroplated steel or brass nipple, with an inert and non-corrosive, thermoplastic lining.
- E. Sleeves:
 - 1. Sheet-Metal Sleeves: 10 gage, galvanized sheet metal, round tube closed with welded longitudinal joint.
 - 2. Steel Sleeves: Schedule 40 galvanized, welded steel pipe, ASTM A53, Grade A.

PART 3 - EXECUTION

3.1 PREPARATION:

- A. Ream ends of pipes and tubes, and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris for both inside and outside of piping and fittings before assembly.

3.2 INSTALLATIONS:

- A. General Locations and Arrangements: Drawings (plans, schematics, and diagrams) indicate the general location and arrangement of the piping systems. Location and arrangement of piping layout take into consideration pipe sizing and friction loss, expansion, pump sizing, and other design considerations. So far as practical, install piping as indicated. Refer to individual system specifications for requirements for coordination drawing submittals.
- B. Conceal all pipe installations in walls, pipe chases, utility spaces, above ceilings, below grade or floors, unless indicated otherwise.
- C. Install piping free of sags or bends and with ample space between piping to permit proper insulation applications.
- D. Install exposed piping at right angles or parallel to building walls. Diagonal runs are not permitted, unless expressly indicated on the Drawings.
- E. Install piping tight to slabs, beams, joists, columns, walls and other permanent elements of the building. Provide space to permit insulation applications, with 1" clearance outside the insulation. Allow sufficient space above removable ceiling panels to allow for panel removal.
- F. Locate groups of pipes parallel to each other, spaced to permit applying full insulation and servicing of valves.
- G. Install drains at low points in mains, risers, and branch lines consisting of a tee fitting, 3/4" ball valve, and short 3/4" threaded nipple and cap.
- H. Fire Barrier Penetrations: Where pipes pass through fire rated walls, partitions, ceilings, or floors, the fire rated integrity shall be maintained. Refer to Division 7 for special sealers and materials

3.3 FITTINGS AND SPECIALTIES:

- A. Use fittings for all changes in direction and all branch connections.
- B. Remake leaking joints using new materials.
- C. Install unions adjacent to each valve, and at the final connection to each piece of equipment and plumbing fixture having 2" and smaller connections, and elsewhere as indicated.
- D. Install dielectric fittings to connect piping materials of dissimilar metals in wet piping systems.

3.4 JOINTS:

- A. Steel Pipe Joints:
 - 1. Pipe 2" and Smaller: Thread pipe with tapered pipe threads in accordance with ANSI B2.1. Cut threads full and clean using sharp dies. Ream threaded ends to remove burrs and restore full inside diameter. Apply pipe joint lubricant or sealant suitable for the service for which the pipe is intended on the male threads at each joint and tighten joint to leave not more than 3 threads exposed.
- B. Non-ferrous Pipe Joints:
 - 1. Brazed And Soldered Joints: For copper tube and fitting joints, braze joints in accordance with ANSI B31.1.0 - Standard Code for Pressure Piping, Power Piping and ANSI B9.1 - Standard Safety Code for Mechanical Refrigeration.
 - 2. Thoroughly clean tube surface and inside surface of the cup of the fittings, using very fine emory cloth, prior to making soldered or brazed joints. Wipe tube and fittings clean and apply flux. Flux shall not be used as the sole means for cleaning tube and fitting surfaces.
 - 3. Mechanical Joints: Flared compression fittings may be used for refrigerant lines 3/4" and smaller.
- C. Joints for other piping materials are specified within the respective piping system sections.

3.5 FIELD QUALITY CONTROL:

- A. Testing: Refer to individual piping system specification sections.

END OF SECTION 15055

SECTION 15100 - VALVES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to this section.
- B. Requirements of the following Division 15 Sections apply to this section:
 - 1. "Basic Mechanical Requirements."
 - 2. "Basic Mechanical Materials and Methods."
 - 3. "Basic Piping Materials and Methods."

1.2 SUMMARY

- A. This Section includes general duty valves common to most mechanical piping systems.
 - 1. Special purpose valves are specified in individual piping system specifications.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data, including body material, valve design, pressure and temperature classification, end connection details, seating materials, trim material and arrangement, dimensions and required clearances, and installation instructions.

1.4 QUALITY ASSURANCE

- A. Single Source Responsibility: Comply with the requirements specified in Division 1 Section "MATERIALS AND EQUIPMENT," under "Source Limitations."
- B. American Society of Mechanical Engineers (ASME) Compliance: Comply with ASME B31.9 for building services piping and ASME B31.1 for power piping.
- C. Manufacturers Standardization Society of the Valve and Fittings Industry (MSS) Compliance: Comply with the various MSS Standard Practices referenced.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Preparation For Transport: Prepare valves for shipping as follows:
 - 1. Ensure valves are dry and internally protected against rust and corrosion.
 - 2. Protect valve ends against damage to threads.
 - 3. Set valves in best position for handling. Set gate valves closed to prevent rattling; set ball valves open to minimize exposure of functional surfaces.
- B. Storage: Use the following precautions during storage:

1. Protect valves from weather. Store valves indoors.

PART 2 - PRODUCTS

2.1 VALVE FEATURES, GENERAL

- A. Valve Design: Rising stem or rising outside screw and yoke stems.
 1. Nonrising stem valves may be used where headroom prevents full extension of rising stems.
- B. Pressure and Temperature Ratings: As scheduled and required to suit system pressures and temperatures.
- C. Sizes: Same size as upstream pipe, unless otherwise indicated.
- D. Operators: Provide the following special operator features:
 1. Handwheels, fastened to valve stem, for valves other than quarter turn.
 2. Lever handles, on quarter-turn valves 6-inch and smaller.
- E. Bypass and Drain Connections: Comply with MSS SP-45 bypass and drain connections.
- F. End Connections: As indicated in the valve specifications.
 1. Threads: Comply with ANSI B1.20.1.
 2. Solder-Joint: Comply with ANSI B16.18.
 - a. Caution: Where soldered end connections are used, use solder having a melting point below 840 deg F for gate, globe, and check valves; below 421 deg F for ball valves.

2.2 GATE VALVES

- A. Gate Valves, 2-Inch and Smaller: MSS SP-80; Class 125, body and bonnet of ASTM B 62 cast bronze; with threaded or solder ends, solid disc, copper-silicon alloy stem, brass packing gland, "Teflon" impregnated packing, and malleable iron handwheel. Provide Class 150 valves meeting the above where system pressure requires.
- B. Gate Valves, 2-1/2-Inch and Larger: MSS SP-70; Class 125 iron body, bronze mounted, with body and bonnet conforming to ASTM A 126 Class B; with flanged ends, "Teflon" impregnated packing, and two-piece backing gland assembly.

2.3 BALL VALVES

- A. Ball Valves, 1 Inch and Smaller: Rated for 150 psi saturated steam pressure, 400 psi WOG pressure; two-piece construction; with bronze body conforming to ASTM B 62, standard (or regular) port, chrome-plated brass ball, replaceable "Teflon" or "TFE" seats and seals, blowout-proof stem, and vinyl-covered steel handle. Provide solder ends for condenser water, chilled water, and domestic hot and cold water service; threaded ends for heating hot water and low-pressure steam.
- B. Ball Valves, 1-1/4-Inch to 2-Inch: Rated for 150 psi saturated steam pressure, 400 psi WOG pressure; 3-piece construction; with bronze body conforming to ASTM B 62, conventional port, chrome-plated brass ball, replaceable "Teflon" or "TFE" seats and seals, blowout proof stem, and vinyl-covered steel handle. Provide solder ends

for condenser water, chilled water, and domestic hot and cold water service; threaded ends for heating hot water and low-pressure steam.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine valve interior through the end ports for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks used to prevent disc movement during shipping and handling.
- B. Actuate valve through an open-close and close-open cycle. Examine functionally significant features, such as guides and seats made accessible by such actuation. Following examination, return the valve closure member to the shipping position.
- C. Examine threads on both the valve and the mating pipe for form (i.e., out-of-round or local indentation) and cleanliness.
- D. Prior to valve installation, examine the piping for cleanliness, freedom from foreign materials, and proper alignment.
- E. Replace defective valves with new valves.

3.2 VALVE ENDS SELECTION

- A. Select valves with the following ends or types of pipe/tube connections:
 - 1. Copper Tube Size, 2-Inch and Smaller: Solder ends.
 - 2. Steel Pipe Sizes, 2-Inch and Smaller: threaded.
 - 3. Pipe Sizes 2-1/2 Inch and Larger: grooved end or flanged.

3.3 VALVE INSTALLATIONS

- A. General Application: Use ball valves for shut-off duty.
- B. Locate valves for easy access and provide separate support where necessary.
- C. Install valves and unions for each fixture and item of equipment arranged to allow equipment removal without system shutdown.
- D. Install valves in horizontal piping with stem at or above the center of the pipe.
- E. Install valves in a position to allow full stem movement.

3.4 SOLDER CONNECTIONS

- A. Cut tube square and to exact lengths.
- B. Clean end of tube to depth of valve socket with steel wool, sand cloth, or a steel wire brush to a bright finish. Clean valve socket in same manner.
- C. Apply proper soldering flux in an even coat to inside of valve socket and outside of tube.

- D. Open gate valves to full open position.
- E. Insert tube into valve socket, making sure the end rests against the shoulder inside valve. Rotate tube or valve slightly to ensure even distribution of the flux.
- F. Apply heat evenly to outside of valve around joint until solder will melt upon contact. Feed solder until it completely fills the joint around tube. Avoid hot spots or overheating valve. Once the solder starts cooling, remove excess amounts around the joint with a cloth or brush.

3.5 THREADED CONNECTIONS

- A. Note the internal length of threads in valve ends, and proximity of valve internal seat or wall, to determine how far pipe should be threaded into valve.
- B. Align threads at point of assembly.
- C. Apply appropriate tape or thread compound to the external pipe threads (except where dry seal threading is specified).
- D. Assemble joint, wrench tight. Wrench on valve shall be on the valve end into which the pipe is being threaded.

3.6 FIELD QUALITY CONTROL

- A. Tests: After piping systems have been tested and put into service inspect valves for leaks. Adjust or replace packing to stop leaks; replace valves if leak persists.

3.7 ADJUSTING AND CLEANING

- A. Cleaning: Clean mill scale, grease, and protective coatings from exterior of valves and prepare valves to receive finish painting or insulation.

END OF SECTION 15100

SECTION 15140 - SUPPORTS AND ANCHORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawing and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements of the following Division 15 Sections apply to this section:
 - 1. "Basic Mechanical Requirements."
 - 2. "Basic Mechanical Materials and Methods."
 - 3. "Basic Piping Materials and Methods."

1.2 SUMMARY

- A. This section includes the following:
 - 1. Horizontal-piping hangers and supports.
 - 2. Vertical-piping clamps.
 - 3. Hanger-rod attachments.
 - 4. Building attachments.
 - 5. Saddles and shields.
 - 6. Miscellaneous materials.
 - 7. Anchors.
 - 8. Equipment supports.
- B. Related sections: The following sections contain requirements that relate to this section:
 - 1. Division 15 Section "Mechanical Insulation" for pipe insulation.

1.3 DEFINITIONS

- A. Terminology used in this section is defined in MSS SP-90.

1.4 SUBMITTALS

- A. General: Submit the following in accordance with conditions of contract and Division 1 specification sections.
 - 1. Product data, including installation instructions for each type of support and anchor. Submit pipe hanger and support schedule showing Manufacturer's figure number, size, location, and features for each required pipe hanger and support.

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable plumbing codes pertaining to product materials and installation of supports and anchors.

- B. NFPA Compliance: Hangers and supports shall comply with NFPA standard No. 13 when used as a component of a fire protection system.
- C. UL and FM Compliance: Hangers, supports, and components shall be listed and labeled by UL and FM where used for fire protection piping systems.
- D. Nationally Recognized Testing Laboratory and NEMA Compliance (NRTL): Hangers, supports, and components shall be listed and labeled by a NRTL where used for fire protection piping systems. The term "NRTL" shall be as defined in OSHA Regulation 1910.7.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

- A. Hangers and support components shall be factory fabricated of materials, design, and manufacturer complying with MSS SP-58.
 - 1. Components shall have galvanized coatings where installed for piping and equipment that will not have field-applied finish.
 - 2. Pipe attachments shall have nonmetallic coating for electrolytic protection where attachments are in direct contact with copper tubing.

2.2 MISCELLANEOUS MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36.
- B. Cement Grout: Portland cement (ASTM C 150, Type I or Type III) and clean uniformly graded, natural sand (ASTM C 404, Size No. 2). Mix ratio shall be 1.0 part cement to 3.0 parts sand, by volume, with minimum amount of water required for placement and hydration.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substates and conditions under which supports and anchors are to be installed. Do not proceed with installing until unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF HANGERS AND SUPPORTS

- A. General: Install hangers, supports, clamps and attachments to support piping properly from building structure; comply with MSS SP-69 and SP-89. Arrange for grouping of parallel runs of horizontal piping supported together on field-fabricated, heavy-duty trapeze hangers where possible. Install supports with maximum spacings complying with MSS SP-69. Where piping of various sizes is supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe as specified above for individual pipe hangers.
- B. Install building attachments within concrete or to structural steel. Space attachments within maximum piping span length indicated in MSS SP-69. Install additional attachments at concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping.

- C. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- D. Field-Fabricated, Heavy-Duty Steel Trapezes: Fabricate from steel shapes selected for loads required; weld steel in accordance with AWS D-1.1.
- E. Support fire protection systems piping independently from other piping systems.
- F. Install hangers and supports to allow controlled movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.
- G. Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.
- H. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes, and so that maximum pipe deflections allowed by ASME B31.9 Building Services Piping Code is not exceeded.
- I. Insulated Piping: Comply with the following installation requirements.
 - 1. Clamps: Attach clamps, including spacers (if any), to piping with clamps projecting through insulation; do not exceed pipe stresses allowed by ASME B31.9.
 - 2. Saddles: Install protection saddles MSS Type 39 where insulation without vapor barrier is indicated. Fill interior voids with segments of insulation that match adjoining pipe insulation.
 - 3. Shields: Install protective shields MSS Type 40 on cold water piping that has vapor barrier. Shields shall span an arc of 180 degrees and shall have dimensions in inches not less than the following:

<u>NPS</u>		<u>LENGTH</u>	<u>THICKNESS</u>
1/4 THROUGH 3-1/2	12	0.048	
4		12	0.060
5 & 6		18	0.060
8 THROUGH 14		24	0.075
16 THROUGH 24		24	0.105

- 4. Insert material shall be at least as long as the protective shield.

3.3 INSTALLATION OF ANCHORS

- A. Install anchors at proper locations to prevent stresses from exceeding those permitted by ASME B31.9 and to prevent transfer of loading and stresses to connected equipment.
- B. Fabricate and install anchors by welding steel shapes, plates, and bars to piping and to structure. Comply with ASME B31.9 and with AWS Standards D1.1.
- C. Where expansion compensators are indicated, install anchors in accordance with expansion unit manufacturer's written instructions to control movement to compensators.
- D. Anchor Spacings: Where not otherwise indicated, install anchors at ends of principal pipe runs, at intermediate points in pipe runs between expansion loops and bends. Make provisions for preset of anchors as required to accommodate both expansion and contraction of piping.

3.4 EQUIPMENT SUPPORTS

- A. Fabricate structural steel stands to suspend equipment from structure above or support equipment above floor.
- B. Grouting: Place grout under supports for piping and equipment.

3.5 METAL FABRICATION

- A. Cut, drill, and fit miscellaneous metal fabrications for pipe anchors and equipment supports. Install and align fabricated anchors in indicated locations.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1 for procedures of manual shielded metal-arc welding, appearance and quality of welds made, methods used in correcting welding work, and the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Finish welds at exposed connections so that no roughness shows after finishing, and so that contours welded surfaces to match adjacent contours.

3.6 ADJUSTING

- A. Hanger Adjustment: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Touch-Up Painting: Immediately after erection of anchors and supports, clean field welds and abraded areas of shop paint and paint exposed areas with same material as used for shop painting to comply with SSPC-PA-1 requirements for touch-up of field-painted surfaces.
 - 1. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- C. For galvanized surfaces clean welds bolted connections and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

END OF SECTION 15140

SECTION 15250 - MECHANICAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- B. Division-15 Basic Mechanical Materials and Methods sections apply to work of this section.

1.2 DESCRIPTION OF WORK:

- A. Extent of mechanical insulation required by this section is indicated on drawings and schedules, and by requirements of this section.
- B. Types of mechanical insulation specified in this section include the following:
 - 1. Piping Systems Insulation:
 - a. Fiberglass.
- C. Refer to Division-15 section "Supports and Anchors" for protection saddles, protection shields, and thermal hanger shields; not work of this section.
- D. Refer to Division-15 section "Mechanical Identification" for installation of identification devices for piping, ductwork, and equipment; not work of this section.

1.3 QUALITY ASSURANCE:

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of mechanical insulation products, of types and sizes required, whose products have been in satisfactory use in similar services for not less than 3 years.
- B. Installer's Qualifications: Firm with at least 5 years successful installation experience on projects with mechanical insulations similar to that required for this project.
- C. Flame/Smoke Ratings: Provide composite mechanical insulation (insulation, jackets, coverings, sealers, mastics and adhesives) with flame-spread index of 25 or less, and smoke-developed index of 50 or less, as tested by ASTM E 84 (NFPA 255) method.

1.4 SUBMITTALS:

- A. Product Data: Submit manufacturer's technical product data and installation instructions for each type of mechanical insulation. Submit schedule showing manufacturer's product number, k-value, thickness, and furnished accessories for each mechanical system requiring insulation.
- B. Maintenance Data: Submit maintenance data and replacement material lists for each type of mechanical insulation. Include this data and product data in maintenance manual.

1.5 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver insulation, coverings, cements, adhesives, and coatings to site in containers with manufacturer's stamp or label, affixed showing fire hazard indexes of products.
- B. Protect insulation against dirt, water, and chemical and mechanical damage. Do not install damaged or wet insulation; remove from project site.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
 - 1. Armstrong World Industries, Inc.
 - 2. Knauf Fiber Glass GmbH.
 - 3. Manville Products Corp.
 - 4. Owens-Corning Fiberglas Corp.

2.2 PIPING INSULATION MATERIALS:

- A. Fiberglass Piping Insulation: ASTM C 547, Class 1 unless otherwise indicated.
- B. Jackets for Piping Insulation: ASTM C 921, Type I for piping with temperatures below ambient, Type II for piping with temperatures above ambient. Type I may be used for all piping at Installers option.
 - 1. Encase pipe fittings insulation with one-piece premolded PVC fitting covers, fastened as per manufacturer's recommendations.
- C. Staples, Bands, Wires, and Cement: As recommended by insulation manufacturer for applications indicated.
- D. Adhesives, Sealers, and Protective Finishes: As recommended by insulation manufacturer for applications indicated.

PART 3 - EXECUTION

3.1 INSPECTION:

- A. Examine areas and conditions under which mechanical insulation is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 PLUMBING PIPING SYSTEM INSULATION:

- A. Insulation Omitted: Omit insulation on chrome-plated exposed piping (except for handicapped fixtures), air chambers, unions, strainers, check valves, balance cocks, flow regulators, drain lines from water coolers, drainage piping located in crawl spaces or tunnels, buried piping, fire protection piping, and pre-insulated equipment.

B. Cold Piping:

1. Application Requirements: Insulate the following cold plumbing piping systems:
 - a. Potable cold water piping.
 - b. Plumbing vents within 6 lineal feet of roof outlet.
2. Insulate each piping system specified above with one of the following types and thicknesses of insulation:
 - a. Fiberglass: 1" thickness.

C. Hot Piping:

1. Application Requirements: Insulate the following hot plumbing piping systems:
 - a. Potable hot water piping.
 - b. Potable hot water recirculating piping.
2. Insulate each piping system specified above with one of the following types and thicknesses of insulation:
 - a. Fiberglass: 1" thick for pipe sizes up to and including 6", 1-1/2" thick for pipe sizes over 6".

3.3 INSTALLATION OF PIPING INSULATION:

- A. General: Install insulation products in accordance with manufacturer's written instructions, and in accordance with recognized industry practices to ensure that insulation serves its intended purpose.
- B. Install insulation on pipe systems subsequent to installation of heat tracing, painting, testing, and acceptance of tests.
- C. Install insulation materials with smooth and even surfaces. Insulate each continuous run of piping with full-length units of insulation, with a single cut piece to complete run. Do not use cut pieces or scraps abutting each other.
- D. Clean and dry pipe surfaces prior to insulating. Butt insulation joints firmly together to ensure a complete and tight fit over surfaces to be covered.
- E. Maintain integrity of vapor-barrier jackets on pipe insulation, and protect to prevent puncture or other damage.
- F. Cover valves, fittings and similar items in each piping system with equivalent thickness and composition of insulation as applied to adjoining pipe run. Install factory molded, precut or job fabricated units (at Installer's option) except where specific form or type is indicated.
- G. Extend piping insulation without interruption through walls, floors and similar piping penetrations, except where otherwise indicated.
- H. Butt pipe insulation against pipe hanger insulation inserts. For hot pipes, apply 3" wide vapor barrier tape or band over the butt joints. For cold piping apply wet coat of vapor barrier lap cement on butt joints and seal joints with 3" wide vapor barrier tape or band.

3.4 EXISTING INSULATION REPAIR:

- A. Repair damaged sections of existing mechanical insulation, both previously damaged or damaged during this construction period. Use insulation of same thickness as existing insulation, install new jacket lapping and sealed over existing.

3.5 PROTECTION AND REPLACEMENT:

- A. Replace damaged insulation which cannot be repaired satisfactorily, including units with vapor barrier damage and moisture saturated units.
- B. Protection: Insulation Installer shall advise Contractor of required protection for insulation work during remainder of construction period, to avoid damage and deterioration.

END OF SECTION 15250

SECTION 15300 - FIRE PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to this section.
- B. The requirements of the following Division-15 Sections apply to this Section:
 - 1. Basic Mechanical Requirements.
 - 2. Basic Piping Materials and Methods.
 - 3. Supports and Anchors.

1.2 SUMMARY

- A. This Section specifies automatic sprinkler systems and standpipe and hose systems for buildings and structures. Materials and equipment specified in this Section include:
 - 1. Pipe, fittings, valves, and specialties.
 - 2. Sprinklers, and accessories.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division-15 Section "Mechanical Identification" for labeling and identification of fire protection piping system and components.

1.3 DEFINITIONS

- A. Pipe sizes used in this Specification are Nominal Pipe Size (NPS).
- B. Other definitions for fire protection systems are listed in NFPA Standards 13, 14, and 24.
- C. Working Plans as used in this Section means those documents (including drawings and calculations) prepared pursuant to the requirements contained in NFPA 13 for obtaining approval of the authority having jurisdiction.

1.4 SYSTEM DESCRIPTION

- A. Fire protection system is a "Wet-Pipe" system employing automatic sprinklers attached to a piping system containing water and connected to a water supply so that water discharges immediately from sprinklers opened by fire.

1.5 SUBMITTALS

- A. Product Data for each type sprinkler head, valve, piping specialty, fire protection specialty, fire department connection, hose and rack, and hose cabinet specified.
- B. Shop Drawings prepared in accordance with NFPA 13 identified as "Working Plans," including hydraulic calculations where applicable, and which have been approved by the authority having jurisdiction.

- C. Maintenance Data for each type sprinkler head, valve, piping specialty, fire protection specialty, fire department connection, hose and rack, and hose cabinet specified, for inclusion in operating and maintenance manual specified in Division 1 and Division-15 Section "Basic Mechanical Requirements."
- D. Test Reports and Certificates include "Contractor's Material & Test Certificate for Aboveground Piping" and "Contractor's Material & Test Certificate for Underground Piping" as described in NFPA 13.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Installation and alterations of fire protection piping, equipment, specialties, and accessories, and repair and servicing of equipment shall be performed only by a qualified installer. The term qualified means experienced in such work (experienced shall mean having a minimum of 5 previous projects similar in size and scope to this project), familiar with all precautions required, and has complied with all the requirements of the authority having jurisdiction. Upon request, submit evidence of such qualifications to the Architect. Refer to Division-1 Section: "Definitions and Standards" for definitions for "Installers."
- B. Regulatory Requirements: Comply with the requirements of the following codes:
 - 1. NFPA 13 - Standard for the Installation of Sprinkler Systems.
 - 2. NFPA 14 - Standard for the Installation of Standpipe and Hose Systems.
 - 3. NFPA 1961 - Standard for Fire Hose.
 - 4. NFPA 1963 - Screw Threads and Gaskets for Fire Hose Connections.
 - 5. UL and FM Compliance: Fire protection system materials and components shall be Underwriter's Laboratories listed and labeled, and Factory Mutual approved for the application anticipated.

1.7 SEQUENCING AND SCHEDULING

- A. Schedule rough-in installations with installations of other building components.

PART 2 - PRODUCTS

2.1 PIPE AND TUBING MATERIALS:

- A. General: Refer to Part 3 Article "PIPE APPLICATIONS" for identification of systems where the below specified pipe and fitting materials are used.
- B. Copper Tubing - Drawn Temper: ASTM B 88, Type L.
- C. Steel Pipe: ASTM A 120, Schedule 40, seamless, black steel pipe, plain ends.
- D. Steel Pipe: ASTM A 120, Schedule 10, seamless, black steel pipe, plain ends.

2.2 FITTINGS

- A. Cast-Iron Threaded Fittings: ANSI B16.4, Class 250, standard pattern, for threaded joints. Threads shall conform to ANSI B1.20.1.

- B. Malleable-Iron Threaded Fittings: ANSI B16.3, Class 300, standard pattern, for threaded joints. Threads shall conform to ANSI B1.20.1.

2.3 AUTOMATIC SPRINKLERS

- A. Sprinkler Heads: fusible link type, and style as indicated or required by the application. Unless otherwise indicated, provide heads with nominal 1/2 inch discharge orifice, for "Ordinary" temperature range.
- B. Sprinkler Head Finishes: Provide heads with the following finishes:
 - 1. Upright, Pendent, and Sidewall Styles: chrome plated in finish spaces, exposed to view; rough bronze finish for heads in unfinished spaces and not exposed to view. Heads shall be wax-coated where installed exposed to acids, chemicals, or other corrosive fumes.
 - 2. Concealed Style: rough brass, with painted white cover plate.
 - 3. Flush Style: bright chrome, with painted white escutcheon plate.
- C. Sprinkler Head Cabinet and Wrench: finished steel cabinet, suitable for wall mounting, with hinged cover and space for 6 spare sprinkler heads plus sprinkler head wrench. Provide a separate cabinet for each style sprinkler head on the project.

PART 3 - EXECUTION

3.1 PIPE APPLICATIONS

- A. Install Schedule 40 steel pipe with threaded joints and fittings for 2 inch and smaller, and with welded joints for 2-1/2 inch and larger.

3.2 PIPING INSTALLATIONS

- A. Locations and Arrangements: Drawings (plans, schematics, and diagrams) indicate the general location and arrangement of piping systems. So far as practical, install piping as indicated.
 - 1. Deviations from approved "Working Plans" for sprinkler piping, require written approval of the authority having jurisdiction. Written approval shall be on file with the Architect prior to deviating for the approved "Working Plans."
- B. Install sprinkler piping to provide for system drainage in accordance with NFPA 13.
- C. Use approved fittings to make all changes in direction, branch takeoffs from mains, and reductions in pipe sizes.
- D. Install unions in pipes 2 inch and smaller, adjacent to each valve. Unions are not required on flanged devices or in piping installations using grooved mechanical couplings.
- E. Hangers and Supports: Comply with the requirements of NFPA 13 and NFPA 14. Hanger and support spacing and locations for piping joined with grooved mechanical couplings shall be in accordance with the grooved mechanical coupling manufacturer's written instructions, for rigid systems. Provide protection from damage where subject to earthquake in accordance with NFPA 13.

3.3 PIPE JOINT CONSTRUCTION

- A. Threaded Joints: conform to ANSI B1.20.1, tapered pipe threads for field cut threads. Join pipe, fittings, and valves as follows:
 - 1. Note the internal length of threads in fittings or valve ends, and proximity of internal seat or wall, to determine how far pipe should be threaded into joint.
 - 2. Align threads at point of assembly.
 - 3. Apply appropriate tape or thread compound to the external pipe threads.
 - 4. Assemble joint to appropriate thread depth. When using a wrench on valves place the wrench on the valve end into which the pipe is being threaded.
 - 5. Damaged Threads: Do not use pipe with threads which are corroded, or damaged. If a weld opens during cutting or threading operations, that portion of pipe shall not be used.
- B. End Treatment: After cutting pipe lengths, remove burrs and fins from pipe ends.

3.4 VALVE INSTALLATIONS

- A. General: Install fire protection specialty valves, fittings, and specialties in accordance with the manufacturer's written instructions, NFPA 13 and 14, and the authority having jurisdiction.
- B. Gate Valves: Install supervised-open gate valves so located to control all sources of water supply except fire department connections. Where there is more than one control valve, provide permanently marked identification signs indicating the portion of the system controlled by each valve. Refer to Division-15 Section "Mechanical Identification" for valve tags and signs.
- C. Install check valves in each water supply connection.

3.5 SPRINKLER HEAD INSTALLATIONS

- A. Use proper tools to prevent damage during installations.

3.6 FIELD QUALITY CONTROL

- A. Flush, test, and inspect sprinkler piping systems in accordance with NFPA 13.
- B. Replace piping system components which do not pass the test procedures specified, and retest repaired portion of the system.

END OF SECTION 15300

SECTION 15411 - WATER DISTRIBUTION PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.
- B. Requirements of the following Division 15 Sections apply to this section:
 - 1. "Basic Mechanical Requirements."
 - 2. "Basic Mechanical Materials and Methods."
 - 3. "Basic Piping Materials and Methods."
 - 4. "Supports and Anchors."

1.2 SUMMARY

- A. This Section includes potable cold water, hot water, and circulation hot water piping, fittings, and specialties within the building to a point 5 feet outside the building.
- B. Related Sections: The following Sections contain requirements that relate to this section.
 - 1. Division 15 Section "Mechanical Identification" for labeling and identification of piping system.

1.3 DEFINITIONS

- A. Water Distribution Pipe: A pipe within the building or on the premises that conveys water from the water service pipe or meter to the points of usage.
- B. Water Service Pipe: The pipe from the water main or other source of potable water supply to the water distributing system of the building served.
- C. Pipe sizes used in this Specification are nominal pipe size (NPS).

1.4 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specifications Sections.
 - 1. Test reports specified in Part 3 of this Section.

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with the provisions of the following codes:
 - 1. ASME B31.9 "Building Services Piping" for materials, products, and installation. Safety valves and pressure vessels shall bear the appropriate ASME label.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store pipe in a manner to prevent sagging and bending.

PART 2 - PRODUCTS

2.1 PIPE AND TUBE MATERIALS, GENERAL

- A. Pipe and Tube: Refer to Part 3, Article "Application, General," for identification of systems where the below materials are used.
- B. Copper Tube: ASTM B 88, Type L Water Tube, drawn temper.

2.2 FITTINGS

- A. Wrought Copper Solder-Joint Fittings: ANSI B16.22, streamlined pattern.
- B. Wrought Copper and Bronze Grooved-End Fittings: ASTM B 75 Tube and ASTM B 584 Bronze Castings.
- C. Unions: ASME B16.39, malleable iron, Class 150, hexagonal stock, with ball-and-socket joints, metal-to-metal bronze seating surfaces, female threaded ends. Threads shall conform to ASME B1.20.1.
- D. Dielectric Unions: Threaded, solder, or grooved-end connections as required to suit application; constructed to isolate dissimilar metals, prevent galvanic action, and prevent corrosion.
- E. Flexible Connectors: Stainless-steel bellows with woven, flexible, bronze wire reinforced protective jacket; minimum 150 psig working pressure, maximum 250 deg F operating temperature. Connectors shall have flanged or threaded-end connections to match equipment connected and shall be capable of 3/4-inch misalignment.

2.3 JOINING MATERIALS

- A. Solder Filler Metal: ASTM B 32, 95-5 Tin-Antimony.

2.4 GENERAL-DUTY VALVES

- A. General-duty valves (i.e., gate, globe, check, ball, and butterfly valves) are specified in Division 15 Section "Valves." Special duty valves are specified below by their generic name; refer to Part 3 Article "Valve Application" for specific uses and applications for each valve specified.

2.5 PIPING SPECIALTIES

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine rough-in requirements for plumbing fixtures and other equipment with water connections to verify actual locations of piping connections prior to installation.

3.2 PIPE APPLICATIONS

- A. Install Type L, drawn copper tube with wrought copper fittings and solder joints for pipe sizes 4 inches and smaller, above ground, within building.

3.3 PIPING INSTALLATION

- A. General Locations and Arrangements: Drawings (plans, schematics, and diagrams) indicate the general location and arrangement of the piping systems. Location and arrangement of piping layout take into consideration pipe sizing and friction loss, expansion, pump sizing, and other design considerations. So far as practical, install piping as indicated.
- B. Use fittings for all changes in direction and branch connections.
- C. Install exposed piping at right angles or parallel to building walls. Diagonal runs are not permitted unless expressly indicated.
- D. Install piping free of sags or bends and with ample space between piping to permit proper insulation applications.
- E. Conceal all pipe installations in walls, pipe chases, utility spaces, above ceilings, below grade or floors, unless indicated to be exposed to view.
- F. Install piping tight to slabs, beams, joists, columns, walls, and other permanent elements of the building. Provide space to permit insulation applications, with 1-inch clearance outside the insulation. Allow sufficient space above removable ceiling panels to allow for panel removal.
- G. Locate groups of pipes parallel to each other, spaced to permit applying full insulation and servicing of valves.

- C. Install drains at low points in mains, risers, and branch lines consisting of a tee fitting, 3/4-inch ball valve, and short 3/4-inch threaded nipple and cap.
- D. Fire Barrier Penetrations: Where pipes pass through fire-rated walls, partitions, ceilings, and floors, maintain the fire-rated integrity. Refer to Division 7 for special sealers and materials.
- E. Install piping with 1/32-inch-per-foot (1/4 percent) downward slope towards drain point.

3.4 HANGERS AND SUPPORTS

- A. General: Hanger, support, and anchor devices conforming to MSS SP-69 are specified in Division 15 Section "Supports and Anchors." Conform to the table below for maximum spacing of supports:
- B. Pipe Attachments: Install the following:
 - 1. Adjustable steel clevis hangers, MSS Type 1, for individual horizontal runs less than 20 feet in length.
- C. Install hangers for horizontal piping with the following maximum spacing and minimum rod sizes:

<u>Nom. Pipe Size - In.</u>	<u>Steel Pipe Max. Span - Ft.</u>	<u>Copper Tube Max. Span - Ft.</u>	<u>Min. Rod Dia. - In.</u>
Up to 3/4	7	5	3/8
1	7	6	3/8
1-1/4	7	7	3/8
1-1/2	9	8	3/8
2	10	8	3/8
2-1/2	11	9	1/2
3	12	10	1/2
3-1/2	13	11	1/2
4	14	12	5/8 (1/2 for copper)
5	16	13	5/8 (1/2 for copper)
6	17	14	3/4 (5/8 for copper)
8	19	16	7/8 (3/4 for

10	22	18	copper) 7/8 (3/4 for
12	23	19	copper) 7/8 (3/4 for copper)

3.5 PIPE AND TUBE JOINT CONSTRUCTION

- A. Soldered Joints: Comply with the procedures contained in the AWS "Soldering Manual."
- B. Threaded Joints: Conform to ASME B1.20.1, tapered pipe threads for field-cut threads. Join pipe fittings and valves as follows:
 - 1. Note the internal length of threads in fittings or valve ends, and proximity of internal seat or wall, to determine how far pipe should be threaded into joint.
 - 2. Align threads at point of assembly.
 - 3. Apply appropriate tape or thread compound to the external pipe threads (except where dry seal threading is specified).
 - 2. Assemble joint wrench tight. Wrench on valve shall be on the valve end into which the pipe is being threaded.
 - a. Damaged Threads: Do not use pipe with corroded or damaged threads. If a weld opens during cutting or threading operations, that portion of pipe shall not be used.

3.6 VALVE APPLICATIONS

- A. General-Duty Valve Applications: The Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
 - 1. Shut-off duty: Use ball valves.

3.7 INSTALLATION OF VALVES

- A. Shutoff Valves: Install shutoff valves on inlet of each plumbing equipment item, on each supply to each plumbing fixture, and elsewhere as indicated. For shutoff valves 2 inches and smaller, use ball valves; for shutoff valves 2-1/2 inches and larger, use gate or butterfly valves.
- B. Drain Valves: Install drain valves on each plumbing equipment item, located to drain equipment completely for service or repair. Install drain valves at the base of each riser, at low points of horizontal runs, and elsewhere as required to drain distribution piping system completely. For drain valves 2 inches and smaller, use ball valves; for drain valves 2-1/2 inches and larger, use gate or butterfly valves.

3.9 EQUIPMENT CONNECTIONS

- A. Piping Runouts to Fixtures: Provide hot and cold water piping runouts to fixtures of sizes indicated, but in no case smaller than required by plumbing code.
- B. Mechanical Equipment Connections: Connect hot and cold water piping system to mechanical equipment as indicated. Provide shutoff valve and union for each connection; provide drain valve on drain connection. For connections 2-1/2 inches and larger, use flanges instead of unions.

3.11 FIELD QUALITY CONTROL

- A. Inspections: Inspect water distribution piping as follows:
 - 1 Do not enclose, cover, or put into operation water distribution piping system until it has been inspected and approved by the authority having jurisdiction.
 - 2. During the progress of the installation, notify the plumbing official having jurisdiction at least 24 hours prior to the time such inspection must be made. Perform tests specified below in the presence of the plumbing official.
 - a. Rough-in Inspection: Arrange for inspection of the piping system before concealed or closed in after system is roughed in and prior to setting fixtures.
 - b. Final Inspection: Arrange for a final inspection by the plumbing official to observe the tests specified below and to ensure compliance with the requirements of the plumbing code.
 - 3. Reinspections: Whenever the plumbing official finds that the piping system will not pass the test or inspection, make the required corrections and arrange for reinspection by the plumbing official.
 - 4. Reports: Prepare inspection reports signed by the plumbing official.
- B. Test water distribution piping as follows:
 - 1. Test for leaks and defects all new water distribution piping systems and parts of existing systems that have been altered, extended or repaired. If testing is performed in segments, submit a separate report for each test, complete with a diagram of the portion of the system tested.
 - 2. Leave uncovered and unconcealed all new, altered, extended, or replaced water distribution piping until it has been tested and approved. Expose all such work for testing that has been covered or concealed before it has been tested and approved.
 - 3. Cap and subject the piping system to a static water pressure of 50 psig above the operating pressure without exceeding the pressure rating of the piping system materials. Isolate the test source and allow to stand for 4 hours. Leaks and loss in test pressure constitute defects that must be repaired.
 - 4. Repair all leaks and defects with new materials and retest system or portion thereof until satisfactory results are obtained.
 - 3. Prepare reports for all tests and required corrective action.

3.12 ADJUSTING AND CLEANING

- A. Clean and disinfect water distribution piping as follows:
 - 1. Purge all new water distribution piping systems and parts of existing systems that have been altered, extended, or repaired prior to use.
 - 2. Use the purging and disinfecting procedure proscribed by the authority having jurisdiction or, in case a method is not prescribed by that authority, the procedure described in either AWWA C651, or AWWA C652, or as described below:
 - a. Flush the piping system with clean, potable water until dirty water does not appear at the points of outlet.
 - b. Fill the system or part thereof with a water/chlorine solution containing at least 50 parts per million of chlorine. Isolate (valve off) the system or part thereof and allow to stand for 24 hours.
 - c. Drain the system or part thereof of the previous solution and refill with a water/chlorine solution containing at least 200 parts per million of chlorine and isolate and allow to stand for 3 hours.
 - d. Following the allowed standing time, flush the system with clean, potable water until chlorine does not remain in the water coming from the system.
 - e. Submit water samples in sterile bottles to the authority having jurisdiction. Repeat the procedure if the biological examination made by the authority shows evidence of contamination.
- B. Prepare reports for all purging and disinfecting activities.

3.13 COMMISSIONING

- A. Fill the system. Check compression tanks to determine that they are not air bound and that the system is completely full of water.
- B. Before operating the system, perform these steps:
 - 1. Close drain valve, hydrants, and hose bibbs.
 - 2. Open valves to full open position.
 - 3. Remove and clean strainers.
 - 4. Check pumps for proper direction of rotation. Correct improper wiring.
 - 5. Lubricate pump motors and bearings.

END OF SECTION 15411

SECTION 15420 - DRAINAGE AND VENT SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.
- B. Requirements of the following Division 15 Sections apply to this section:
 - 1. Basic Mechanical Requirements.
 - 2. Basic Mechanical Materials and Methods.
 - 3. Supports and Anchors.

1.2 SUMMARY

- A. This Section includes building sanitary and storm drainage and vent piping systems, including drains and drainage specialties.
- B. Related Sections: The following sections contain requirements that relate to this section:
 - 1. Division 15 Section "Mechanical Identification," for labeling and identification of drainage and vent piping.

1.3 DEFINITIONS

- A. Building Drain: That part of the lowest piping of a drainage system which receives the discharge from soil, waste, and other drainage pipes inside the walls of the building and conveys it to the building sewer.
- B. Building Sewer: That part of the drainage system which extends from the end of the building drain and conveys its discharge to a public sewer, private sewer, individual sewage disposal system, or other point of disposal.
- C. Drainage System: Includes all the piping within a public or private premises which conveys sewage, rain water or other liquid wastes to a point of disposal. It does not include the mains of public sewer systems or a private or public sewage treatment or disposal plant.
- D. Vent System: A pipe or pipes installed to provide a flow of air to or from a drainage system, or to provide a circulation of air within such system to protect trap seals from siphonage and back pressure.

1.4 SUBMITTALS

- A. Product data for the following products:
 - 1. Drainage piping specialties
 - 2. Floor drains & grates

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: comply with the provisions of the following:
 - 1. National Standard Plumbing Code.

1.6 SEQUENCING AND SCHEDULING

- A. Coordinate flashing materials installation of roofing, waterproofing, and adjoining substrate work.
- B. Coordinate the installation of drains in poured-in-place concrete slabs, to include proper drain elevations, installation of flashing, and slope of slab to drains.
- C. Coordinate with installation of sanitary and storm sewer systems as necessary to interface building drains with drainage piping systems.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering drainage and vent systems which may be incorporated in the work include, but are not limited to, the following:
 - 1. Drainage Piping Specialties, including backwater valves, expansion joints, drains, trap primers, and vandal-proof vent caps:
 - a. Ancon Inc.
 - b. Josam Mfg. Co.
 - c. Smith (Jay R) Mfg. Co.
 - d. Tyler Pipe; Subs. of Tyler Corp.
 - e. Zurn Industries Inc; Hydromechanics Div.

2.2 ABOVE GROUND DRAINAGE AND VENT PIPE AND FITTINGS

- A. Hubless Cast-Iron Soil Pipe: CISPI Standard 301, Service weight, cast-iron soil pipe and fittings, with neoprene gaskets conforming to CISPI Standard 310.

2.3 DRAINAGE PIPING SPECIALTIES

- A. Cleanout Plugs: Cast-bronze or brass, threads complying with ANSI B2.1, countersunk head.
- B. Floor Cleanouts: Cast-iron body and frame, with cleanout plug and adjustable round top as follows:
 - 1. Nickel-Bronze Top: Manufacturer's standard cast unit to receive floor material as specified in the contract documents.
- C. Wall Cleanouts: Cast-iron body adaptable to pipe with cast-bronze or brass cleanout plug; stainless steel cover including screws.

- D. Vent Flashing Sleeves: Cast-iron calking type roof coupling for cast-iron stacks, cast-iron threaded type roof coupling for steel stacks, and cast-bronze stack flashing sleeve for copper tubing.
- E. Frost-Proof Vent Caps: Construct of galvanized iron, copper, or lead-coated copper, sized to provide 1 inch air space between outside of vent pipe and inside of flashing collar extension.

2.4 FLOOR DRAINS & GRATES

- A. Floor drain type designations and sizes are indicated on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify existing grades, inverts, utilities, obstacles, and topographical conditions prior to installations.
- B. Examine rough-in requirements for plumbing fixtures and other equipment having drain connections to verify actual locations of piping connections prior to installation.
- C. Examine walls, floors, roof, and plumbing chases for suitable conditions where piping and specialties are to be installed.
- D. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PIPE APPLICATIONS - ABOVE GROUND, WITHIN BUILDING

- A. Install hubless cast iron piping.

3.3 INSTALLATION

- A. General Locations and Arrangements: Drawings (plans, schematics, and diagrams) indicate the general location and arrangement of the piping systems. Location and arrangement of piping layout take into account many design considerations. So far as practical, install piping as indicated.
- B. Use fittings for all changes in direction and all branch connections.
- C. Install exposed piping at right angles or parallel to building walls. Diagonal runs are not permitted, unless expressly indicated.
- D. Install piping free of sags or bends and with ample space between piping to permit proper insulation applications.
- E. Conceal all pipe installations in walls, pipe chases, utility spaces, above ceilings, below grade or floors, unless indicated to be exposed to view.
- F. Install piping tight to slabs, beams, joists, columns, walls, and other permanent elements of the building. Allow sufficient space above removable ceiling panels to allow for panel removal.
- G. Fire Barrier Penetrations: Where pipes pass through fire rated walls, partitions, ceilings and floors, maintain the fire rated integrity. Refer to Division 7 for special

sealers and materials.

- H. Make changes in direction for drainage and vent piping using appropriate 45 degree wyes, half-wyes, or long sweep quarter, sixth, eighth, or sixteenth bends. Sanitary tees or short quarter bends may be used on vertical stacks of drainage lines where the change in direction of flow is from horizontal to vertical, except use long-turn tees where two fixtures are installed back to back and have a common drain. Straight tees, elbows, and crosses may be used on vent lines. No change in direction of flow greater than 90 degrees shall be made. Where different sizes of drainage pipes and fittings are connected, use proper size, standard increasers and reducers. Reduction of the size of drainage piping in the direction of flow is prohibited.
- I. Install building drain pitched down at minimum slope of 1/4 inch per foot (2 percent) for piping 3 inch and smaller, and 1/8 inch per foot (1 percent) for piping 4 inch and larger.

3.4 HANGERS AND SUPPORTS

- A. General: Hanger, supports, and anchors devices are specified in Division 15 Section "Basic Mechanical Materials and Methods." Conform to the table below for maximum spacing of supports:
- B. Install the following pipe attachments:
 - 1. Adjustable steel clevis hangers for individual horizontal runs less than 20 feet in length.
- C. Install hangers at the following intervals:

<u>PIPE MATERIAL</u>	<u>MAX HORIZ SPACING IN FEET</u>	<u>MAX VERT SPACING IN FEET</u>
ABS Pipe	4	4
Cast-Iron Pipe	5	15
Copper Tubing - 1-1/4 inch and smaller	10	
Copper Tubing - 1-1/2 inch and larger	10	10
PVC Pipe	4	4

3.5 INSTALLATION OF PIPING SPECIALTIES

- A. Above Ground Cleanouts: Install in above ground piping and building drain piping as indicated, and:
 - 1. as required by plumbing code;
 - 2. at each change in direction of piping greater than 45 degrees;
 - 3. at minimum intervals of 50' for piping 4" and smaller and 100' for larger piping;
 - 4. at base of each vertical soil or waste stack.
- B. Cleanouts Covers: Install floor and wall cleanout covers for concealed piping, types as indicated.
- C. Flashing Flanges: Install flashing flange and clamping device with each stack and cleanout passing through waterproof membranes.
- D. Vent Flashing Sleeves: Install on stacks passing through roof, secure over stack flashing in accordance with manufacturer's instructions.

- E. Frost-Proof Vent Caps: Install frost-proof vent caps on each vent pipe passing through roof. Maintain 1 inch clearance between vent pipe and roof substrate.

3.6 CONNECTIONS

- A. Piping Runouts to Fixtures: Provide drainage and vent piping runouts to plumbing fixtures and drains, with approved trap, of sizes indicated; but in no case smaller than required by the plumbing code.

3.7 FIELD QUALITY CONTROL

- A. Inspections

1. Do not enclose, cover, or put into operation drainage and vent piping system until it has been inspected and approved by the authority having jurisdiction.
2. During the progress of the installation, notify the plumbing official having jurisdiction, at least 24 hours prior to the time such inspection must be made. Perform tests specified below in the presence of the plumbing official.
 - a. Rough-in Inspection: Arrange for inspection of the piping system before concealed or closed-in after system is roughed-in, and prior to setting fixtures.
 - b. Final Inspection: Arrange for a final inspection by the plumbing official to observe the tests specified below and to insure compliance with the requirements of the plumbing code.
3. Reinspections: Whenever the piping system fails to pass the test or inspection, make the required corrections, and arrange for reinspected by the plumbing official.
4. Reports: Prepare inspection reports, signed by the plumbing official.

- B. Piping System Test Test drainage and vent system in accordance with the procedures of the authority having jurisdiction, or in the absence of a published procedure, as follows:

1. Test for leaks and defects all new drainage and vent piping systems and parts of existing systems, which have been altered, extended or repaired. If testing is performed in segments, submit a separate report for each test, complete with a diagram of the portion of the system tested.
2. Leave uncovered and unconcealed all new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose all such work for testing, that has been covered or concealed before it has been tested and approved.
3. Rough Plumbing Test Procedure: Except for outside leaders and perforated or open jointed drain tile, test the piping of plumbing drainage and venting systems upon completion of the rough piping installation. Tightly close all openings in the piping system, and fill with water to the point of overflow, but not less than 10 feet head of water. Water level shall not drop during the period from 15 minutes before the inspection starts, through completion of the inspection. Inspect all joints for leaks.
4. Finished Plumbing Test Procedure: After the plumbing fixtures have been set and their traps filled with water, their connections shall be tested and proved gas and water-tight. Plug the stack openings on the roof and building drain where it leaves the building, and introduce air into the system equal to a pressure of 1" water column. Use a "U" tube or manometer inserted in the trap of a water closet to measure this pressure. Air pressure shall remain constant without the introduction of additional air throughout the period of inspection. Inspect all plumbing fixture connections for gas and water leaks.
5. Repair all leaks and defects using new materials and retest system or portion

- thereof until satisfactory results are obtained.
6. Prepare reports for all tests and required corrective action.

3.8 ADJUSTING AND CLEANING

- A. Clean interior of piping system. Remove dirt and debris as work progresses.
- B. Clean drain strainers, domes, and traps. Remove dirt and debris.

3.9 PROTECTION

- A. Protect drains during remainder of construction period, to avoid clogging with dirt and debris, and to prevent damage from traffic and construction work.
- B. Place plugs in ends of uncompleted piping at end of day or whenever work stops.

END OF SECTION 15420

SECTION 15440 - PLUMBING FIXTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements of the following Division 15 Sections apply to this Section:
 - 1. "Basic Mechanical Requirements."
 - 2. "Electrical Requirements for Mechanical Equipment."
 - 3. "Basic Mechanical Materials and Methods."
 - 4. "Basic Piping Materials and Methods."

1.2 SUMMARY

- A. This Section includes plumbing fixtures and trim, fittings, and accessories, appliances, appurtenances, equipment, and supports associated with plumbing fixtures.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 15 Section "Valves" for valves used as supply stops.
- C. Products furnished but not installed under this Section include:
 - 1. Plumbing fittings (including faucets) and piping indicated, for fixtures, appliances, appurtenances, and equipment specified in other sections.
- D. Products installed but not furnished under this Section include:
 - 1. Accessories, appliances, appurtenances, and equipment specified in other sections, requiring plumbing services or fixture-related devices, as indicated.

1.3 DEFINITIONS

- A. Accessible: Describes a plumbing fixture, building, facility, or portion thereof that can be approached, entered, and used by physically handicapped people.
- B. Accessory: Device that adds effectiveness, convenience, or improved appearance to a fixture but is not essential to its operation.
- C. Appliance: Device or machine designed and intended to perform a specific function.
- D. Appurtenance: Device or assembly designed to perform some useful function when attached to or used with a fixture.
- E. Equipment: Device used with plumbing fixtures or plumbing systems to perform a certain function for plumbing fixtures but that is not part of the fixture.
- F. Fitting: Fitting installed on or attached to a fixture to control the flow of water into or out of the fixture.

- G. Fixture: Installed receptor connected to the water distribution system, that receives and makes available potable water and discharges the used liquid or liquid-borne wastes directly or indirectly into the drainage system. The term "Fixture" means the actual receptor, except when used in a general application where terms "Fixture" and "Plumbing Fixture" include associated trim, fittings, accessories, appliances, appurtenances, support, and equipment.
- H. Roughing-In: Installation of piping and support for the fixture prior to the actual installation of the fixture.
- I. Support: Device normally concealed in building construction, for supporting and securing plumbing fixtures to walls and structural members. Supports for urinals, lavatories, and sinks are made in types suitable for fixture construction and the mounting required. Categories of supports are:
 - 1. Carrier: Floor-mounted support for wall-mounted water closet, and support fixed to wall construction for wall-hung fixture.
 - 2. Chair Carrier: Support for wall-hung fixture, having steel pipe uprights that transfer weight to the floor.
 - 3. Chair Carrier, Heavy Duty: Support for wall-hung fixture, having rectangular steel uprights that transfer weight to the floor.
 - 4. Reinforcement: Wood blocking or steel plate built into wall construction, for securing fixture to wall.
- J. Trim: Hardware and miscellaneous parts, specific to a fixture and normally supplied with it required to complete fixture assembly and installation.

1.4 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of plumbing fixture specified, including fixture and trim, fittings, accessories, appliances, appurtenances, equipment, supports, construction details, dimensions of components, and finishes.

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with requirements of ANSI Standard A117.1, "Buildings and Facilities -- Providing Accessibility and Useability for Physically Handicapped People," and Public Law 90-480, "Architectural Barriers Act, 1968," with respect to plumbing fixtures for the physically handicapped.
- B. Regulatory Requirements: Comply with requirements of ATBCB (Architectural and Transportation Barriers Compliance Board) "Uniform Federal Accessibility Standards (UFAS) - 1985-494-187" with respect to plumbing fixtures for the physically handicapped.
- C. Listing and Labeling: Provide electrically operated fixtures specified in this Section that are listed and labeled.
 - 1. The terms "listed" and "labeled" shall be as defined in the National Electrical Code, Article 100.
 - 2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.
- D. Design Concept: The drawings indicate types of plumbing fixtures and are based on the specific descriptions, manufacturers, models, and numbers indicated. Plumbing fixtures having equal performance characteristics by other manufacturers may be considered

provided that deviations in dimensions, operation, color or finish, or other characteristics are minor and do not change the design concept or intended performance as judged by the Architect. Burden of proof for equality of plumbing fixtures is on the proposer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver plumbing fixtures in manufacturer's protective packing, crating, and covering.
- B. Store plumbing fixtures on elevated platforms in a dry location.

1.7 EXTRA MATERIALS

- A. Deliver extra materials to Owner. Furnish extra materials described below matching products installed, packaged with protective covering for storage, and identified with labels clearly describing contents.
 - 1. Faucet Washers and O-rings: Furnish quantity of identical units not less than 10 percent of amount of each installed.
 - 2. Faucet Cartridges and O-rings: Furnish quantity of identical units not less than 5 percent of amount of each installed.
 - 3. Flushometer Repair Kits: Furnish quantity of identical units not less than 10 percent of amount of each flushometer installed.
 - 4. Provide a hinged-top wood or metal box, or individual metal boxes, having a separate compartment for each type and size of above extra materials.
 - 5. Water Closet Tank Repair Kits: Furnish quantity of identical flush valve units not less than 5 percent of amount of each type installed.
 - 6. Toilet Seats: Furnish quantity of identical units not less than 5 percent of amount of each type toilet seat installed.
 - 7. Filter Cartridges: Furnish quantity of identical filter cartridges not less than 50 percent of amount of each type and size installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Provide plumbing fixtures, trim, and accessories as schedules and /or specified on the drawings.

2.2 PLUMBING FIXTURE SUPPORTS

- A. Supports: ASME A112.6.1M, categories and types as required for wall-hanging fixtures specified, and wall reinforcement.
- B. Support categories are:
 - 1. Carriers: Supports for wall-hanging water closets and fixtures supported from wall construction. Water closet carriers shall have an additional faceplate and coupling when used for wide pipe spaces. Provide tiling frame or setting gage with carriers for wall-hanging water closets.
 - 2. Chair Carriers: Supports with steel pipe uprights for wall-hanging fixtures. Urinal chair carriers shall have bearing plates.
 - 3. Chair Carriers, Heavy Duty: Supports with rectangular steel uprights for wall-hanging fixtures.
 - 4. Reinforcement: 2-inch by 4-inch wood blocking between studs or 1/4-inch by

6-inch steel plates attached to studs, in wall construction, to secure floor-mounted and special fixtures to wall.

- C. Support Types: Provide support of category specified, of type having features required to match fixture.
- D. Provide supports specified as part of fixture description, in lieu of category and type requirements above.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in for potable cold water and hot water supplies and soil, waste, and vent piping systems to verify actual locations of piping connections prior to installing fixtures.
- B. Examine walls, floors, and cabinets for suitable conditions where fixtures are to be installed.
- C. Do not proceed until unsatisfactory conditions have been corrected.

3.2 APPLICATION

- A. Install plumbing fixtures and specified components, in accordance with designations and locations indicated on Drawings.
- B. Install supports for plumbing fixtures in accordance with categories indicated, and of type required:
 - 1. Carriers for following fixtures:
 - a. Wall-hanging water closets.
 - b. Wall-hanging fixtures supported from wall construction.
 - 2. Chair carriers for the following fixtures:
 - a. Wall-hanging urinals.
 - b. Wall-hanging lavatories and sinks.
 - c. Wall-hanging drinking fountains and electric water coolers.
 - 3. Heavy-duty chair carriers for the following fixtures:
 - a. Accessible lavatories.
 - b. Fixtures where specified.
 - 4. Reinforcement for the following fixtures:
 - a. Floor-mounted lavatories required to be secured to wall.
 - b. Floor-mounted sinks required to be secured to wall.
 - c. Recessed, box-mounted electric water coolers.

3.3 INSTALLATION OF PLUMBING FIXTURES

- A. Install plumbing fixtures level and plumb, in accordance with fixture manufacturers' written installation instructions, roughing-in drawings, and referenced standards.

- B. Fasten wall-hanging plumbing fixtures securely to supports attached to building substrate when supports are specified, and to building wall construction where no support is indicated.
- C. Fasten floor-mounted fixtures and special fixtures having holes for securing fixture to wall construction, to reinforcement built into walls.
- D. Fasten counter-mounting-type plumbing fixtures to casework.
- E. Secure supplies behind wall or within wall pipe space, providing rigid installation.
- F. Install stop valve in an accessible location in each water supply to each fixture.
- G. Install trap on fixture outlet except for fixtures having integral trap.
- H. Install escutcheons at each wall, floor, and ceiling penetration in exposed finished locations and within cabinets and millwork. Use deep pattern escutcheons where required to conceal protruding pipe fittings.
- I. Seal fixtures to walls, floors, and counters using a sanitary-type, one-part, mildew-resistant, silicone sealant in accordance with sealing requirements specified in Division 7 Section "Joint Sealers." Match sealant color to fixture color.

3.4 CONNECTIONS

- A. Piping installation requirements are specified in other sections of Division 15. The Drawings indicate general arrangement of piping, fittings, and specialties. The following are specific connection requirements:
 - 1. Install piping connections between plumbing fixtures and piping systems and plumbing equipment specified in other sections of Division 15.
 - 2. Install piping connections indicated between appliances and equipment specified in other sections, direct connected to plumbing piping systems.

3.5 FIELD QUALITY CONTROL

- A. Inspect each installed fixture for damage. Replace damaged fixtures and components.
- B. Test fixtures to demonstrate proper operation upon completion of installation and after units are water pressurized. Replace malfunctioning fixtures and components, then retest. Repeat procedure until all units operate properly.

3.6 ADJUSTING AND CLEANING

- A. Operate and adjust faucets and controls. Replace damaged and malfunctioning fixtures, fittings, and controls.
- B. Operate and adjust disposers, hot water dispensers, and controls. Replace damaged and malfunctioning units and controls.
- C. Adjust water pressure at drinking fountains, electric water coolers, and faucets, shower valves, and flushometers having controls, to provide proper flow and stream.
- D. Replace leaking and dripping faucets and stops.
- E. Clean fixtures, fittings, and spout and drain strainers with manufacturers' recommended cleaning methods and materials.

- F. Review the data in Operating and Maintenance Manuals. Refer to Division 1 Section "Project Closeout."

3.7 PROTECTION

- A. Provide protective covering for installed fixtures and fittings.
- B. Do not allow use of fixtures for temporary facilities, except when approved in writing by the Owner.

END OF SECTION 15440

SECTION 15010 - BASIC MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this and the other sections of Division 15.

1.2 SUMMARY

- A. This Section includes general administrative and procedural requirements for mechanical installations. The following administrative and procedural requirements are included in this Section to expand the requirements specified in Division 1:
 - 1. Submittals.
 - 2. Coordination drawings.
 - 3. Record documents.
 - 4. Maintenance manuals.
 - 5. Rough-ins.
 - 6. Mechanical installations.
 - 7. Cutting and patching.
- B. Related Sections: The following sections contain requirements that relate to this section:
 - 1. Division 15 Section "ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT," for factory-installed motors, controllers, accessories, and connections.
 - 2. Division 15 Section "BASIC MECHANICAL MATERIALS AND METHODS," for materials and methods common to the remainder of Division 15.

1.3 SUBMITTALS

- A. General: Follow the procedures specified in Division 1 Section "SUBMITTALS."
- B. Increase, by the quantity listed below, the number of mechanical related shop drawings, product data, and samples submitted, to allow for required distribution plus two copies of each submittal required, which will be retained by the Mechanical Consulting Engineer.
 - 1. Shop Drawings - Initial Submittal: 1 additional blue- or black-line prints.
 - 2. Shop Drawings - Final Submittal: 1 additional blue- or black-line prints.
 - 3. Product Data: 1 additional copy of each item.
- C. Additional copies may be required by individual sections of these Specifications.

1.4 RECORD DOCUMENTS

- A. Prepare record documents in accordance with the requirements in Division 1 Section "PROJECT CLOSEOUT." In addition to the requirements specified in Division 1, indicate the following installed conditions:
 - 1. Ductwork mains and branches, size and location, for both exterior and interior; locations of dampers and other control devices; filters, boxes, and terminal units requiring periodic maintenance or repair.
 - 2. Equipment locations (exposed and concealed), dimensioned from prominent building lines.
 - 3. Approved substitutions, Contract Modifications, and actual equipment and materials

- installed.
- 4. Contract Modifications, actual equipment and materials installed.

1.5 MAINTENANCE MANUALS

- A. Prepare maintenance manuals in accordance with Division 1 Section "PROJECT CLOSEOUT." In addition to the requirements specified in Division 1, include the following information for equipment items:
 - 1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
 - 2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
 - 3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
 - 4. Servicing instructions and lubrication charts and schedules.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 ROUGH-IN

- A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.
- B. Refer to equipment specifications in Divisions 2 through 16 for rough-in requirements.

3.2 MECHANICAL INSTALLATIONS

- A. General: Sequence, coordinate, and integrate the various elements of mechanical systems, materials, and equipment. Comply with the following requirements:
 - 1. Coordinate mechanical systems, equipment, and materials installation with other building components.
 - 2. Verify all dimensions by field measurements.
 - 3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for mechanical installations.
 - 4. Coordinate the installation of required supporting devices and sleeves.
 - 5. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work.
 - 6. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
 - 7. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual

- system requirements, refer conflict to the Architect.
8. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
 9. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.
 10. Install access panel or doors where units are concealed behind finished surfaces. Access panels and doors are specified in Division 8 Section "ACCESS DOORS" and Division 15 Section "BASIC MECHANICAL MATERIALS AND METHODS."
 11. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.

3.3 CUTTING AND PATCHING

- A. General: Perform cutting and patching in accordance with Division 1 Section "CUTTING AND PATCHING." In addition to the requirements specified in Division 1, the following requirements apply:
 1. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.
- B. Perform cutting, fitting, and patching of mechanical equipment and materials required to:
 1. Uncover Work to provide for installation of ill-timed Work.
 2. Remove and replace defective Work.
 3. Remove and replace Work not conforming to requirements of the Contract Documents.
 4. Install equipment and materials in existing structures.
 5. Upon written instructions from the Architect, uncover and restore Work to provide for Architect/Engineer observation of concealed Work.
- C. Cut, remove and legally dispose of selected mechanical equipment, components, and materials as indicated or otherwise as required to demolish the existing systems no longer required, including but not limited to removal of mechanical piping, heating units, plumbing fixtures and trim, and other mechanical items made obsolete by the new Work.
- D. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.
- E. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.
 1. Patch existing finished surfaces and building components using new materials matching existing materials and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.
 - a. Refer to Division 1 Section "DEFINITIONS AND STANDARDS" for definition of "experienced Installer."
 2. Patch finished surfaces and building components using new materials specified for the original installation and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.
 - a. Refer to Division 1 Section "DEFINITIONS AND STANDARDS" for definition of "experienced Installer."

END OF SECTION 15010

SECTION 15030 - ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- B. Related Sections: Separate electrical components and materials required for field installation and electrical connections are specified in Division 16.

1.2 SUMMARY:

- A. This section specifies the basic requirements for electrical components which are an integral part of packaged mechanical equipment. These components include, but are not limited to factory installed motors, starters, and disconnect switches furnished as an integral part of packaged mechanical equipment.
- B. Specific electrical requirements (i.e. horsepower and electrical characteristics) for mechanical equipment are scheduled on the Drawings.

1.3 REFERENCES:

- A. NEMA Standards MG 1: Motors and Generators
- B. NEMA Standards ICS 2: Industrial Control Devices, Controllers, and Assemblies.
- C. NEMA Standard 250: Enclosures for Electrical Equipment
- D. NEMA Standard KS 1: Enclosed Switches
- E. Comply with National Electrical Code (NFPA 70).

1.4 SUBMITTALS:

- A. No separate submittal is required. Submit product data for motors, starters, and other electrical components with submittal data required for the equipment for which it serves, as required by the individual equipment specification sections.

1.5 QUALITY ASSURANCE:

- A. Electrical components and materials shall be UL labeled.

PART 2 - PRODUCTS

2.1 MOTORS:

- A. The following are basic requirements for simple or common motors. For special motors, more detailed and specific requirements are specified in the individual equipment

specifications.

1. Torque characteristics shall be sufficient to satisfactorily accelerate the driven loads.
2. Motor sizes shall be large enough so that the driven load will not require the motor to operate in the service factor range.
3. 2-speed motors shall have 2 separate windings on poly-phase motors.
4. Temperature Rating: Rated for 40 deg. C environment with maximum 50 deg. C temperature rise for continuous duty at full load (Class A Insulation).
5. Starting capability: frequency of starts as indicated by automatic control system, and not less than 5 evenly time spaced starts per hour for manually controlled motors.
6. Service Factor: 1.15 for poly-phase motors and 1.35 for single phase motors.
7. Motor construction: NEMA Standard MG 1, general purpose, continuous duty, Design "B", except "C" where required for high starting torque.
 - a. Frames: NEMA Standard No. 48 or 54; use driven equipment manufacturer's standards to suit specific application.
 - b. Bearings:
 - 1) ball or roller bearings with inner and outer shaft seals;
 - 2) re-greasable, except permanently sealed where motor is normally inaccessible for regular maintenance;
 - 3) designed to resist thrust loading where belt drives or other drives produce lateral or axial thrust in motor;
 - 4) for fractional horsepower, light duty motors, sleeve type bearings are permitted.
 - c. Enclosure Type:
 - 1) open drip-proof motors for indoor use where satisfactorily housed or remotely located during operation;
 - 2) guarded drip-proof motors where exposed to contact by employees or building occupants;
 - 3) weather protected Type I for outdoor use, Type II where not housed;
 - d. Overload protection: built-in thermal overload protection and, where indicated, internal sensing device suitable for signaling and stopping motor at starter.
 - e. Noise rating: "Quiet"
 - f. Noise rating: "Quiet" rating on motors located in occupied spaces of building.
 - g. Efficiency: "Energy Efficient" motors shall have a minimum efficiency as scheduled in accordance with IEEE Standard 112, test method B. If efficiency not specified, motors shall have a higher efficiency than "average standard industry motors", in accordance with IEEE Standard 112, test method B.
 - h. Nameplate: indicate the full identification of manufacturer, ratings, characteristics, construction, special features and similar information.

PART 3 - EXECUTION (Not Applicable).

END OF SECTION 15030

SECTION 15050 - BASIC MECHANICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements specified in Division 15 Section "Basic Mechanical Requirements" apply to this Section.

1.2 SUMMARY

- A. This Section includes limited scope general construction materials and methods for application with mechanical installations as follows:
 - 1. Mechanical equipment nameplate data.
 - 2. Selective demolition including:
 - a. Nondestructive removal of materials and equipment for reuse or salvage as indicated.
 - b. Dismantling mechanical materials and equipment made obsolete by these installations.
 - 3. Miscellaneous metals for support of mechanical materials and equipment.
 - 4. Wood grounds, nailers, blocking, fasteners, and anchorage for support of mechanical materials and equipment.
 - 5. Joint sealers for sealing around mechanical materials and equipment; and for sealing penetrations in fire and smoke barriers, floors, and foundation walls.
 - 6. Access panels and doors in walls, ceilings, and floors for access to mechanical materials and equipment.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Schedules indicating proposed methods and sequence of operations for selective demolition prior to commencement of Work. Include coordination for shut-off of utility services.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle joint sealer materials in compliance with the manufacturers' recommendations to prevent their deterioration and damage.

1.5 PROJECT CONDITIONS

- A. Conditions Affecting Selective Demolition: The following project conditions apply:

1. Protect adjacent materials indicated to remain.
2. When services must be interrupted, install temporary services for construction.

1.6 SEQUENCE AND SCHEDULING

- A. Coordinate the shut-off and disconnection of utility services with the Owner's agent.
- B. Notify the Architect / Engineer at least 5 days prior to commencing demolition operations.

PART 2 - PRODUCTS

2.1 MECHANICAL EQUIPMENT NAMEPLATE DATA

- A. Nameplate: For each piece of power operated mechanical equipment provide a permanent operational data nameplate indicating manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliance, and similar essential data. Locate nameplates in an accessible location.

2.2 MISCELLANEOUS METALS

- A. Steel plates, shapes, bars, and bar grating: ASTM A 36.
- B. Cold-Formed Steel Tubing: ASTM A 500.
- C. Hot-Rolled Steel Tubing: ASTM A 501.
- D. Steel Pipe: ASTM A 53, Schedule 40, welded.
- E. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout, recommended for interior and exterior applications.
- F. Fasteners: Zinc-coated, type, grade, and class as required.

2.3 MISCELLANEOUS LUMBER

- A. Framing Materials: Standard Grade, light-framing-size lumber of any species. Number 3 Common or Standard Grade boards complying with WCLIB or AWPB rules, or Number 3 boards complying with SPIB rules. Lumber shall be preservative treated in accordance with AWPB LP-2, and kiln dried to a moisture content of not more than 19 percent.
- B. Construction Panels: Plywood panels; APA C-D PLUGGED INT, with exterior glue; thickness as indicated, or if not indicated, not less than 15/32 inches.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, effecting the proper execution of the work. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 SELECTIVE DEMOLITION

- A. General: Demolish, remove, demount, and disconnect abandoned mechanical materials and equipment no longer required and which is made obsolete by the new work.
- B. Disposal and Cleanup: Remove from the site and legally dispose of demolished materials and equipment not indicated to be salvaged.
- C. Mechanical Materials and Equipment: Demolish, remove, demount, and disconnect the following items:
 - 1. Inactive and obsolete piping, fittings and specialties, equipment, ductwork, controls, fixtures, and insulation.
 - a. Piping and ducts embedded in floors, walls, and ceilings may remain if such materials do not interfere with new installations. Remove materials above accessible ceilings. Drain and cap piping and ducts allowed to remain.
 - 2. Perform cutting and patching required for demolition in accordance with Division 1 Section "Cutting and Patching."

3.3 ERECTION OF METAL SUPPORTS AND ANCHORAGE

- A. Cut, fit, and place miscellaneous metal fabrications accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.
- B. Field Welding: Comply with AWS "Structural Welding Code."

3.4 ERECTION OF WOOD SUPPORTS AND ANCHORAGE

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorage accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.
- B. Select fastener sizes that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood members.
- C. Attach to substrates as required to support applied loads.

END OF SECTION 15050

SECTION 15190 - MECHANICAL IDENTIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- B. This section is Division-15 Basic Mechanical Materials and Methods section, and is part of each Division-15 section making reference to identification devices specified herein.

1.2 DESCRIPTION OF WORK:

- A. Extent of mechanical identification work required by this section is indicated on drawings and/or specified in other Division-15 sections.
- B. Types of identification devices specified in this section include the following:
 - 1. Plastic Tape.
 - 2. Engraved Plastic-Laminate Signs.
- C. Mechanical identification furnished as part of factory-fabricated equipment, is specified as part of equipment assembly in other Division-15 sections.
- D. Refer to Division-16 sections for identification requirements of electrical work; not work of this section.

1.3 QUALITY ASSURANCE:

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacturer of identification devices of types and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.
- B. Codes and Standards:
 - 1. ANSI Standards: Comply with ANSI A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.

PART 2 - PRODUCTS

2.1 MECHANICAL IDENTIFICATION MATERIALS:

- A. General: Provide manufacturer's standard products of categories and types required for each application as referenced in other Division-15 sections. Where more than single type is specified for application, selection is Installer's option, but provide single selection for each product category.

2.2 PLASTIC TAPE:

- A. General: Provide manufacturer's standard color-coded pressure-sensitive

(self-adhesive) vinyl tape, not less than 3 mils thick.

- B. Width: Provide 1-1/2" wide tape markers on pipes with outside diameters (including insulation, if any) of less than 6", 2-1/2" wide tape for larger pipes.
- C. Color: Comply with ANSI A13.1, except where another color selection is indicated.

2.3 ENGRAVED PLASTIC-LAMINATE SIGNS:

- A. General: Provide engraving stock melamine plastic laminate, complying with FS L-P-387, in the sizes and thicknesses indicated, engraved with engraver's standard letter style of the sizes and wording indicated, black with white core (letter color) except as otherwise indicated, punched for mechanical fastening except where adhesive mounting is necessary because of substrate.
- B. Thickness: 1/16" for units up to 20 sq. in. or 8" length; 1/8" for larger units.
- C. Fasteners: Self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate the substrate.

2.4 LETTERING AND GRAPHICS:

- A. General: Coordinate names, abbreviations and other designations used in mechanical identification work, with corresponding designations shown, specified or scheduled. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturers or as required for proper identification and operation/maintenance of mechanical systems and equipment.
 - 1. Multiple Systems: Where multiple systems of same generic name are shown and specified, provide identification which indicates individual system number as well as service (as examples; Boiler No. 3, Air Supply No. 1H, Standpipe F12).

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS:

- A. Coordination: Where identification is to be applied to surfaces which require insulation, painting or other covering or finish, including valve tags in finished mechanical spaces, install identification after completion of covering and painting. Install identification prior to installation of acoustical ceilings and similar removable concealment.

3.2 DUCTWORK IDENTIFICATION:

- A. General: Identify air supply, return, exhaust, intake and relief ductwork with duct markers; or provide stenciled signs and arrows, showing ductwork service and direction of flow, in black or white (whichever provides most contrast with ductwork color).
- B. Location: In each space where ductwork is exposed, or concealed only by removable ceiling system, locate signs near points where ductwork originates or continues into concealed enclosures (shaft, underground or similar concealment), and at 50' spacings along exposed runs.

3.3 PIPING SYSTEM IDENTIFICATION:

- A. General: Install pipe markers of one of the following types on each system indicated to receive identification, and include arrows to show normal direction of flow:
- B. Locate pipe markers and color bands as follows wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums) and exterior non-concealed locations.
 - 1. Near each valve and control device.
 - 2. Near each branch, excluding short take-offs for fixtures and terminal units; mark each pipe at branch, where there could be question of flow pattern.
 - 3. Near locations where pipes pass through walls or floors/ ceilings, or enter non-accessible enclosures.
 - 4. At access doors, manholes and similar access points which permit view of concealed piping.
 - 5. Near major equipment items and other points of origination and termination.
 - 6. Spaced intermediately at maximum spacing of 50' along each piping run, except reduce spacing to 25' in congested areas of piping and equipment.
 - 7. On piping above removable acoustical ceilings, except omit intermediately spaced markers.

3.4 MECHANICAL EQUIPMENT IDENTIFICATION:

- A. General: Install engraved plastic laminate sign or plastic equipment marker on or near each major item of mechanical equipment and each operational device, as specified herein if not otherwise specified for each item or device.
- B. Lettering Size: Minimum 1/4" high lettering for name of unit where viewing distance is less than 2'-0", 1/2" high for distances up to 6'-0", and proportionately larger lettering for greater distances. Provide secondary lettering of 2/3 to 3/4 of size of the principal lettering.

3.5 ADJUSTING AND CLEANING:

- A. Adjusting: Relocate any mechanical identification device which has become visually blocked by work of this division or other divisions.
- B. Cleaning: Clean face of identification devices, and glass frames of valve charts.

END OF SECTION 15190

SECTION 15891 - METAL DUCTWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements of the following Division 15 Sections apply to this section:
 - 1. "Basic Mechanical Requirements."
 - 2. "Basic Mechanical Materials and Methods."

1.2 SUMMARY

- A. This Section includes rectangular, round, and flat-oval metal ducts and plenums for heating, ventilating, and air conditioning systems in pressure classes from minus 2 inches to plus 10 inches water gage.
- B. Related Sections: The following sections contain requirements that relate to this Section:
 - 1. Division 15 Section "Duct Accessories" for flexible duct materials, dampers, duct-mounted access panels and doors, and turning vanes.
 - 2. Division 15 Section "Diffusers, Registers, and Grilles."
 - 3. Division 15 Section "Testing, Adjusting, and Balancing."

1.3 DEFINITIONS

- A. Sealing Requirements Definitions: For the purposes of duct systems sealing requirements specified in this Section, the following definitions apply:
 - 1. Seams: A seam is defined as joining of two longitudinally (in the direction of airflow) oriented edges of duct surface material occurring between two joints. All other duct surface connections made on the perimeter are deemed to be joints.
 - 2. Joints: Joints include girth joints; branch and subbranch intersections; so-called duct collar tap-ins; fitting subsections; louver and air terminal connections to ducts; access door and access panel frames and jambs; duct, plenum, and casing abutments to building structures.

1.4 SYSTEM PERFORMANCE REQUIREMENTS

- A. The duct system design, as indicated, has been used to select and size air moving and distribution equipment and other components of the air system. Changes or alterations to the layout or configuration of the duct system must be specifically approved in writing. Accompany requests for layout modifications with calculations showing that the proposed layout will provide the original design results without increasing the system total pressure.

1.5 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data including details of construction relative to materials, dimensions of individual components, profiles, and finishes for the following items:
 - 1. Sealing Materials.
 - 2. Fire-Stopping Materials.
- C. Shop drawings from duct fabrication shop, drawn to a scale not smaller than 1/4 inch equals 1 foot, on drawing sheets same size as the Contract Drawings, detailing:
 - 1. Fabrication, assembly, and installation details, including plans, elevations, sections, details of components, and attachments to other work.
 - 2. Duct layout, indicating pressure classifications and sizes in plan view. For exhaust ducts systems, indicate the classification of the materials handled as defined in this Section.
 - 3. Fittings.
 - 4. Reinforcing details and spacing.
 - 5. Seam and joint construction details.
 - 6. Penetrations through fire-rated and other partitions.
 - 7. Hangers and supports, including methods for building attachment, vibration isolation, and duct attachment.
- D. Record drawings including duct systems routing, fittings details, reinforcing, support, and installed accessories and devices, in accordance with Division 15 Section "Basic Mechanical Requirements" and Division 1.

1.6 QUALITY ASSURANCE

- A. NFPA Compliance: Comply with the following NFPA Standards:
 - 1. NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilating Systems," except as indicated otherwise.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver sealant and fire-stopping materials to site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.
- B. Store and handle sealant fire-stopping materials in compliance with manufacturers' recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

PART 2 - PRODUCTS

2.1 SHEET METAL MATERIALS

- A. Sheet Metal, General: Provide sheet metal in thicknesses indicated, packaged and marked as specified in ASTM A 700.
- B. Reinforcement Shapes and Plates: Unless otherwise indicated, provide galvanized steel reinforcing where installed on galvanized sheet metal ducts. For aluminum and stainless steel ducts provide reinforcing of compatible materials.

- C. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for 36-inch length or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.2 SEALING MATERIALS

- A. Joint and Seam Sealants, General: The term sealant used here is not limited to materials of adhesive or mastic nature, but also includes tapes and combinations of open weave fabric strips and mastics.
- B. Joint and Seam Tape: 2 inches wide, glass-fiber-fabric reinforced.
- C. Joint and Seam Sealant: One-part, nonsag, solvent-release-curing, polymerized butyl sealant complying with FS TT-S-001657, Type I; formulated with a minimum of 75 percent solids.

2.3 FIRE-STOPPING

- A. Refer to Division 7 Section "Joint Sealers" for fire-stopping.

2.4 HANGERS AND SUPPORTS

- A. Building Attachments: Concrete inserts, powder actuated fasteners, or structural steel fasteners appropriate for building materials.
- B. Hangers: Galvanized sheet steel, or round, uncoated steel, threaded rod.
 - 1. Hangers Installed In Corrosive Atmospheres: Electro-galvanized, all-thread rod or hot-dipped-galvanized rods with threads painted after installation.
 - 2. Straps and Rod Sizes: Conform with Table 4-1 in SMACNA HVAC Duct Construction Standards, 1985 Edition, for sheet steel width and gage and steel rod diameters.
- C. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- D. Trapeze and Riser Supports: Steel shapes conforming to ASTM A 36.

2.5 RECTANGULAR DUCT FABRICATION

- A. General: Except as otherwise indicated, fabricate rectangular ducts with galvanized sheet steel, in accordance with SMACNA "HVAC Duct Construction Standards," Tables 1-3 through 1-19, including their associated details. Conform to the requirements in the referenced standard for metal thickness, reinforcing types and intervals, tie rod applications, and joint types and intervals.
 - 1. Fabricate rectangular ducts in lengths appropriate to reinforcement and rigidity class required for pressure classification.
 - 2. Provide materials that are free from visual imperfections such as pitting, seam marks, roller marks, stains, and discolorations.
- B. Static Pressure Classifications: Except where otherwise indicated, construct duct systems to the following pressure classifications:
 - 1. Supply Ducts: 3 inches water gage.
 - 2. Return Ducts: 2 inches water gage, negative pressure.

- 3. Exhaust Ducts: 2 inches water gage, negative pressure.
- C. Crossbreaking or Cross Beading: Crossbreak or bead duct sides that are 19 inches and larger and are 20 gage or less, with more than 10 sq. ft. of unbraced panel area, as indicated in SMACNA "HVAC Duct Construction Standard," Figure 1-4, unless they are lined or are externally insulated.

2.6 RECTANGULAR DUCT FITTINGS

- A. Fabricate elbows, transitions, offsets, branch connections, and other duct construction in accordance with SMACNA "HVAC Metal Duct Construction Standard," 1985 Edition, Figures 2-1 through 2-10.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION, GENERAL

- A. Duct System Pressure Class: Construct and install each duct system for the specific duct pressure classification indicated.
- B. Install ducts with the fewest possible joints.
- C. Use fabricated fittings for all changes in directions, changes in size and shape, and connections.
- D. Install couplings tight to duct wall surface with projections into duct at connections kept to a minimum.
- E. Locate ducts, except as otherwise indicated, vertically and horizontally, parallel and perpendicular to building lines; avoid diagonal runs. Install duct systems in shortest route that does not obstruct useable space or block access for servicing building and its equipment.
- F. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- G. Install insulated ducts with 1-inch clearance outside of insulation.
- H. Conceal ducts from view in finished and occupied spaces by locating in mechanical shafts, hollow wall construction, or above suspended ceilings. Do not encase horizontal runs in solid partitions, except as specifically shown.
- I. Coordinate layout with suspended ceiling and lighting layouts and similar finished work.

3.2 SEAM AND JOINT SEALING

- A. General: Seal duct seams and joints as follows:
- B. Pressure Classifications Greater Than 3 Inches Water Gage: All transverse joints, longitudinal seams, and duct penetrations.
- C. Pressure Classification 2 and 3 Inches Water Gage: All transverse joints and longitudinal seams.
 - 1. Pressure Classification Less than 2 Inches Water Gage: Transverse joints only.
- D. Seal externally insulated ducts prior to insulation installation.

3.3 HANGING AND SUPPORTING

- A. Install rigid round, rectangular, and flat oval metal duct with support systems indicated in SMACNA "HVAC Duct Construction Standards," Tables 4-1 through 4-3 and Figures 4-1 through 4-8.
- B. Support horizontal ducts within 2 feet of each elbow and within 4 feet of each branch intersection.
- C. Upper attachments to structures shall have an allowable load not exceeding 1/4 of the failure (proof test) load but are not limited to the specific methods indicated.

3.4 CONNECTIONS

- A. Equipment Connections: Connect equipment with flexible connectors in accordance with Division 15 Section "Duct Accessories."
- B. Branch Connections: Comply with SMACNA "HVAC Duct Construction Standards," Figures 2-7 and 2-8.
- C. Outlet and Inlet Connections: Comply with SMACNA "HVAC Duct Construction Standards," Figures 2-16 through 2-18.

3.5 FIELD QUALITY CONTROL

- A. Remake leaking joints as required and apply sealants to achieve specified maximum allowable leakage.

3.6 FIELD QUALITY CONTROL

- A. Disassemble, reassemble, and seal segments of the systems as required to accommodate leakage testing, and as required for compliance with test requirements.
- B. Determine leakage from entire system or section of the system by relating leakage to the surface area of the test section.
- C. Maximum Allowable Leakage: As described in latest edition of the ASHRAE Handbook, "Fundamentals" Volume. ,
- D. Remake leaking joints as required and apply sealants to achieve specified maximum allowable leakage.

3.7 ADJUSTING AND CLEANING

- A. Adjust volume control devices as required by the testing and balancing procedures to achieve required air flow. Refer to Division 15 Section "TESTING, ADJUSTING, AND BALANCING" for requirements and procedures for adjusting and balancing air systems.
- B. Vacuum ducts systems prior to final acceptance to remove dust and debris.

END OF SECTION 15891

SECTION 15990 - TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.
- B. Related Sections:
 - 1. General requirements for testing agencies are specified in the Division-1 Section Quality Control Services.
 - 2. Other Division-15 Sections specify balancing devices and their installation, and materials and installations of mechanical systems.
 - 3. Individual Division-15 system sections specify leak testing requirements and procedures.

1.2 SUMMARY:

- A. This Section specifies the requirements and procedures total mechanical systems testing, adjusting, and balancing. Requirements include measurement and establishment of the fluid quantities of the mechanical systems as required to meet design specifications, and recording and reporting the results.
- B. Test, adjust, and balance the following mechanical systems:
 - 1. Supply air systems;
 - 2. Exhaust air systems;
 - 3. Verify temperature control system operation.

1.3 DEFINITIONS:

- A. Systems testing, adjusting, and balancing is the process of checking and adjusting all the building environmental systems to produce the design objectives. It includes:
 - 1. adjustment of total system to provide design quantities;
- B. Test: To determine quantitative performance of equipment.
- C. Adjust: To regulate the specified fluid flow rate and air patterns at the terminal equipment (e.g., reduce fan speed, throttling).
- D. Balance: To proportion flows within the distribution system (submains, branches, and terminals) according to specified design quantities.
- E. Procedure: Standardized approach and execution of sequence of work operations to yield reproducible results.
- F. Report forms: Test data sheets arranged for collecting test data in logical order for submission and review. These data should also form the permanent record to be used as the basis for required future testing, adjusting, and balancing.

- G. Terminal: The point where the controlled fluid enters or leaves the distribution system. These are supply inlets on water terminals, supply outlets on air terminals, return outlets on water terminals, and exhaust or return inlets on air terminals such as registers, grilles, diffusers, louvers, and hoods.
- H. Main: Duct or pipe containing the system's major or entire fluid flow.
- I. Submain: Duct or pipe containing part of the systems' capacity and serving two or more branch mains.
- J. Branch main: Duct or pipe serving two or more terminals.
- K. Branch: Duct or pipe serving a single terminal.

1.4 SUBMITTALS:

- A. Agency Data:
 - 1. Submit proof that the proposed testing, adjusting, and balancing agency meets the qualifications specified below.
- B. Engineer and Technicians Data:
 - 1. Submit proof that the Test and Balance Engineer assigned to supervise the procedures, and the technicians proposed to perform the procedures meet the qualifications specified below.
- C. Maintenance Data: Submit maintenance and operating data that include how to test, adjust, and balance the building systems. Include this information in maintenance data specified in Division 1 and Section 15010.
- D. Certified Reports: Submit testing, adjusting, and balancing reports bearing the seal and signature of the Test and Balance Company. Divide the contents of the report into the below listed divisions, separated by divider tabs:
 - a. General Information and Summary
 - b. Air Systems

1.5 QUALITY ASSURANCE:

- A. Agency Qualifications:
 - 1. Employ the services of an independent testing, adjusting, and balancing agency meeting the qualifications specified below, to be the single source of responsibility to test, adjust, and balance the building mechanical systems identified above, to produce the design objectives. Services shall include checking installations for conformity to design, measurement and establishment of the fluid quantities of the mechanical systems as required to meet design specifications, and recording and reporting the results.
 - 2. The independent testing, adjusting, and balancing agency certified by National Environmental Balancing Bureau (NEBB) in those testing and balancing disciplines required for this project, and having at least one Professional Engineer registered in the State in which the services are to be performed, certified by NEBB as a Test and Balance Engineer.
- B. Codes and Standards:
 - 1. NEBB: "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems."

2. AABC: "National Standards For Total System Balance".
3. ASHRAE: ASHRAE Handbook, 1984 Systems Volume, Chapter 37, Testing, Adjusting, and Balancing.

1.6 PROJECT CONDITIONS:

- A. Systems Operation: Systems shall be fully operational prior to beginning procedures.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PRELIMINARY PROCEDURES FOR AIR SYSTEM BALANCING:

- A. Before operating the system, perform these steps:
 1. Obtain design drawings and specifications and become thoroughly acquainted with the design intent.
 2. Obtain copies of approved shop drawings of all air handling equipment, outlets (supply, return, and exhaust) and temperature control diagrams.
 3. Compare design to installed equipment and field installations.
 4. Walk the system from the system air handling equipment to terminal units to determine variations of installation from design.
 5. Check filters for cleanliness.
 6. Check dampers (both volume and fire) for correct and locked position, and temperature control for completeness of installation before starting fans.
 7. Prepare report test sheets for both fans and outlets. Obtain manufacturer's outlet factors and recommended procedures for testing. Prepare a summation of required outlet volumes to permit a crosscheck with required fan volumes.
 8. Determine best locations in main and branch ductwork for most accurate duct traverses.
 9. Place outlet dampers in the full open position.
 10. Prepare schematic diagrams of system "as-built" ductwork and piping layouts to facilitate reporting.
 11. Lubricate all motors and bearings.
 12. Check fan belt tension.
 13. Check fan rotation.

3.2 MEASUREMENTS:

- A. Provide all required instrumentation to obtain proper measurements, calibrated to the tolerances specified in the referenced standards. Instruments shall be properly maintained and protected against damage.
- B. Provide instruments meeting the specifications of the referenced standards.
- C. Use only those instruments which have the maximum field measuring accuracy and are best suited to the function being measured.
- D. Apply instrument as recommended by the manufacturer.
- E. Use instruments with minimum scale and maximum subdivisions and with scale ranges proper for the value being measured.
- F. When averaging values, take a sufficient quantity of readings which will result in a

repeatability error of less than 5 percent. When measuring a single point, repeat readings until 2 consecutive identical values are obtained.

- G. Take all reading with the eye at the level of the indicated value to prevent parallax.
- H. Use pulsation dampeners where necessary to eliminate error involved in estimating average of rapidly fluctuation readings.
- I. Take measurements in the system where best suited to the task.

3.3 PERFORMING TESTING, ADJUSTING, AND BALANCING:

- A. Perform testing and balancing procedures on each system identified, in accordance with the detailed procedures outlined in the referenced standards.
- B. Retest, adjust, and balance systems subsequent to significant system modifications, and resubmit test results.

3.4 RECORD AND REPORT DATA:

- A. Record all data obtained during testing, adjusting, and balancing in accordance with, and on the forms recommended by the referenced standards, and as approved on the sample report forms.
- B. Prepare report of recommendations for correcting unsatisfactory mechanical performances when system cannot be successfully balanced.

END OF SECTION 15990

SECTION 16010 - BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this and the other sections of Division 16.

1.2 SUMMARY

- A. This Section includes general administrative and procedural requirements for electrical installations. The following administrative and procedural requirements are included in this Section to expand the requirements specified in Division 1:
 - 1. Submittals.
 - 2. Record documents.
 - 3. Maintenance manuals.
 - 4. Rough-ins.
 - 5. Electrical installations.
 - 6. Cutting and patching.
- B. Related Sections: The following sections contain requirements that relate to this section:
 - 1. Division 15 Section "ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT," for factory-installed motors, controllers, accessories, and connections.

1.3 SUBMITTALS

- A. General: Follow the procedures specified in Division 1 Section "SUBMITTALS."
- B. Increase, by the quantity listed below, the number of electrical related shop drawings, product data, and samples submitted, to allow for required distribution plus two copies of each submittal required, which will be retained by the Electrical Consulting Engineer.
 - 1. Shop Drawings - Initial Submittal: 1 additional blue- or black-line prints.
 - 2. Shop Drawings - Final Submittal: 1 additional blue- or black-line prints.
 - 3. Product Data: 1 additional copy of each item.
 - 4. Samples: 1 addition as set.
- C. Additional copies may be required by individual sections of these Specifications.

1.4 RECORD DOCUMENTS

- A. Prepare record documents in accordance with the requirements in Division 1 Section "PROJECT CLOSEOUT." In addition to the requirements specified in Division 1, indicate installed conditions for:
 - 1. Major raceway systems, size and location, for both exterior and interior; locations of control devices; distribution and branch electrical circuitry; and fuse and circuit breaker size and arrangements.
 - 2. Equipment locations (exposed and concealed), dimensioned from prominent building lines.
 - 3. Approved substitutions, Contract Modifications, and actual equipment and

materials installed.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 ROUGH-IN

- A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.
- B. Refer to equipment specifications in Divisions 2 through 16 for rough-in requirements.

3.2 ELECTRICAL INSTALLATIONS

- A. General: Sequence, coordinate, and integrate the various elements of electrical systems, materials, and equipment. Comply with the following requirements:
 - 1. Coordinate electrical systems, equipment, and materials installation with other building components.
 - 2. Verify all dimensions by field measurements.
 - 3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for electrical installations.
 - 4. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
 - 5. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect.
 - 6. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
 - 7. Install electrical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
 - 8. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.

3.3 CUTTING AND PATCHING

- A. General: Perform cutting and patching in accordance with Division 1 Section "CUTTING AND PATCHING." In addition to the requirements specified in Division 1, the following requirements apply:
 - 1. Perform cutting, fitting, and patching of electrical equipment and materials required to:

- a. Uncover Work to provide for installation of ill-timed Work.
 - b. Remove and replace defective Work.
 - c. Remove and replace Work not conforming to requirements of the Contract Documents.
 - d. Install equipment and materials in existing structures.
 - e. Upon written instructions from the Architect, uncover and restore Work to provide for Architect observation of concealed Work.
2. Cut, remove, and legally dispose of selected electrical equipment, components, and materials as indicated, including but not limited to removal of electrical items indicated to be removed and items made obsolete by the new Work.
3. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.
4. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.
5. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.
6. Patch existing finished surfaces and building components using new materials matching existing materials and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.
 - a. Refer to Division 1 Section "DEFINITIONS AND STANDARDS" for definition of experienced "Installer."
7. Patch finished surfaces and building components using new materials specified for the original installation and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.
 - a. Refer to Division 1 Section "DEFINITIONS AND STANDARDS" for definition of experienced "Installer."

END OF SECTION 16010

SECTION 16050 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements specified in Division 16 Section "Basic Electrical Requirements" apply to this Section.

1.2 SUMMARY

- A. This Section includes limited scope general construction materials and methods for application with electrical installations as follows:
 - 1. Selective demolition including:
 - a. Nondestructive removal of materials and equipment for reuse or salvage as indicated.
 - b. Dismantling electrical materials and equipment made obsolete by these installations.
 - 2. Miscellaneous metals for support of electrical materials and equipment.
 - 3. Wood grounds, nailers, blocking, fasteners, and anchorage for support of electrical materials and equipment.
 - 4. Joint sealers for sealing around electrical materials and equipment; and for sealing penetrations in fire and smoke barriers, floors, and foundation walls.

1.3 PROJECT CONDITIONS

- A. Conditions Affecting Selective Demolition: The following project conditions apply:
 - 1. Protect adjacent materials indicated to remain. Install and maintain dust and noise barriers to keep dirt, dust, and noise from being transmitted to adjacent areas. Remove protection and barriers after demolition operations are complete.
 - 2. Locate, identify, and protect electrical services passing through demolition area and serving other areas outside the demolition limits. Maintain services to areas outside demolition limits. When services must be interrupted, install temporary services for affected areas.

1.4 SEQUENCE AND SCHEDULING

- A. Coordinate the shut-off and disconnection of electrical service with the Owner.
- B. Notify the Architect at least 5 days prior to commencing demolition operations.

PART 2 - PRODUCTS

2.1 MISCELLANEOUS METALS

- A. Steel plates, shapes, bars, and bar grating: ASTM A 36.
- B. Cold-Formed Steel Tubing: ASTM A 500.
- C. Hot-Rolled Steel Tubing: ASTM A 501.
- D. Steel Pipe: ASTM A 53, Schedule 40, welded.
- E. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout, recommended for interior and exterior applications.
- F. Fasteners: Zinc-coated, type, grade, and class as required.

2.2 MISCELLANEOUS LUMBER

- A. Framing Materials: Standard Grade, light-framing-size lumber of any species. Number 3 Common or Standard Grade boards complying with WCLIB or AWPB rules, or Number 3 boards complying with SPIB rules. Lumber shall be preservative treated in accordance with AWPB LP-2, and kiln dried to a moisture content of not more than 19 percent.
- B. Construction Panels: Plywood panels; APA C-D PLUGGED INT, with exterior glue; thickness as indicated, or if not indicated, not less than 15/32 inches.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting installation and application of joint sealers and access panels. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 SELECTIVE DEMOLITION

- A. General: Demolish, remove, demount, and disconnect abandoned electrical materials and equipment no longer required and /or made obsolete by the new work.
- B. Disposal and Cleanup: Remove from the site and legally dispose of demolished materials and equipment not indicated to be salvaged.
- C. Electrical Materials and Equipment: Demolish, remove, demount, and disconnect the following items:
 - 1. Inactive and obsolete raceway systems, controls, and fixtures.
 - a. Raceways embedded in floors, walls, and ceilings may remain if such materials do not interfere with new installations. Remove materials above accessible ceilings.
 - 2. Perform cutting and patching required for demolition in accordance with Division 1 Section "Cutting and Patching."

3.3 ERECTION OF METAL SUPPORTS AND ANCHORAGE

- A. Cut, fit, and place miscellaneous metal fabrications accurately in location, alignment, and

elevation to support and anchor electrical materials and equipment.

- B. Field Welding: Comply with AWS "Structural Welding Code."

3.4 ERECTION OF WOOD SUPPORTS AND ANCHORAGE

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorage accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- B. Select fastener sizes that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood members.
- C. Attach to substrates as required to support applied loads.

END OF SECTION 16050

SECTION 16110 - RACEWAYS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements of the following Division 16 Sections apply to this Section:
 - 1. "Basic Electrical Requirements."
 - 2. "Basic Electrical Materials and Methods."

1.2 SUMMARY

- A. This Section includes raceways for electrical wiring. Types of raceways in this section include the following:
 - 1. Electrical metallic tubing (EMT).
 - 2. Flexible metal conduit.
 - 3. Liquidtight flexible conduit.
 - 4. Rigid metal conduit.

1.3 QUALITY ASSURANCE

- A. Electrical Component Standard: Components and installation shall comply with NFPA 70 "National Electrical Code."
- B. NEMA Compliance: Comply with applicable requirements of NEMA standards pertaining to raceways.
- C. UL Compliance and Labeling: Comply with applicable requirements of UL standards pertaining to electrical raceway systems. Provide raceway products and components listed and labeled by UL, ETL, or CSA.

1.4 SEQUENCING AND SCHEDULING

- A. Coordinate with other Work, including metal and concrete deck installation, as necessary to interface installation of electrical raceways and components with other Work.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

- A. Rigid Steel Conduit: ANSI C80.1.
- B. Electrical Metallic Tubing and Fittings: ANSI C80.3.
- C. Flexible Metal Conduit: UL 1, zinc-coated steel.

- D. Liquidtight Flexible Metal Conduit and Fittings: UL 360. Fittings shall be specifically approved for use with this raceway.

2.2 CONDUIT BODIES

- A. General: Types, shapes, and sizes as required to suit individual applications and NEC requirements. Provide matching gasketed covers secured with corrosion-resistant screws.
- B. Metallic Conduit and Tubing: Use metallic conduit bodies. Use bodies with threaded hubs for threaded raceways.
- C. Conduit Bodies 1 Inch and Smaller: Use bodies with compression-type EMT connectors.

PART 3 - EXECUTION

3.1 WIRING METHOD

- A. Indoors: Use the following wiring methods:
 - 1. Connection to Vibrating Equipment: Including transformers and hydraulic, pneumatic or electric solenoid or motor-operated equipment: flexible metal conduit.
 - 2. Exposed: electrical metallic tubing.
 - 3. Concealed: electrical metallic tubing, electrical nonmetallic tubing, or rigid nonmetallic conduit.

3.2 INSTALLATION

- A. General: Install electrical raceways in accordance with manufacturer's written installation instructions, applicable requirements of NEC, and as follows:
- B. Conceal Conduit and EMT, unless indicated otherwise, within finished walls, ceilings, and floors. Install raceways level and square and at proper elevations.
- C. Complete installation of electrical raceways before starting installation of conductors within raceways.
- D. Provide supports for raceways as specified elsewhere in Division 16.
- E. Prevent foreign matter from entering raceways by using temporary closure protection.
- F. Make bends and offsets so the inside diameter is not effectively reduced. Unless otherwise indicated, keep the legs of a bend in the same plane and the straight legs of offsets parallel.
- G. Use raceway fittings that are of types compatible with the associated raceway and suitable for the use and location.
- H. Run concealed raceways with a minimum of bends in the shortest practical distance considering the type of building construction and obstructions except as otherwise indicated. This does not apply to conduits in crawl spaces.
- I. Install exposed raceways parallel and perpendicular to nearby surfaces or structural members and follow the surface contours as much as practical.

- J. Run exposed, parallel, or banked raceways together. Make bends in parallel or banked runs from the same center line so that the bends are parallel. Factory elbows may be used in banked runs only where they can be installed parallel. This requires that there be a change in the plane of the run such as from wall to ceiling and that the raceways be of the same size. In other cases provide field bends for parallel raceways.
- K. Join raceways with fittings designed and approved for the purpose and make joints tight. Where joints cannot be made tight, use bonding jumpers to provide electrical continuity of the raceway system. Make raceway terminations tight. Where terminations are subject to vibration, use bonding bushings or wedges to assure electrical continuity. Where subject to vibration or dampness, use insulating bushings to protect conductors.
- L. Tighten set screws of threadless fittings with suitable tool.
- M. Terminations: Where raceways are terminated with locknuts and bushings, align the raceway to enter squarely and install the locknuts with dished part against the box. Where terminations cannot be made secure with one locknut, use two locknuts, one inside and one outside the box.
- N. Where terminating in threaded hubs, screw the raceway or fitting tight into the hub so the end bears against the wire protection shoulder. Where chase nipples are used, align the raceway so the coupling is square to the box, and tighten the chase nipple so no threads are exposed.
- O. Flexible Connections: Use short length (maximum of 6 ft.) of flexible conduit for recessed and semirecessed lighting fixtures, for equipment subject to vibration, noise transmission, or movement; and for all motors. Use liquidtight flexible conduit in wet locations. Install separate ground conductor across flexible connections.
- P. Do not install aluminum conduit embedded in or in contact with concrete.

3.3 ADJUSTING AND CLEANING

- A. Upon completion of installation of raceways, inspect interiors of raceways; clear all blockages and remove burrs, dirt, and construction debris.

END OF SECTION 16110

SECTION 16120 - WIRES AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements of the following Division 16 Sections apply to this section:
 - 1. Basic Electrical Requirements.

1.2 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with provisions of the following code:
- B. NFPA 70 "National Electrical Code."
 - 1. Conform to applicable codes and regulations regarding toxicity of combustion products of insulating materials.
- C. UL Compliance: Provide components which are listed and labeled by UL under the following standards.
 - 1. UL Std. 4 Armored Cable.
 - 2. UL Std. 83 Thermoplastic-Insulated Wires and Cables.
 - 3. UL Std. 486A Wire Connectors and Soldering Lugs for Use with Copper Conductors.
 - 4. UL Std. 486B Wire Connectors for Use with Aluminum Conductors.
- D. NEMA/ICEA Compliance: Provide components which comply with the following standards:
 - 1. WC-5 Thermoplastic-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
 - 2. WC-7 Cross Linked Thermosetting Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
 - 3. WC-8 Ethylene-Propylene-Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
- E. IEEE Compliance: Provide components which comply with the following standard.
 - 1. Std. 82 Test procedures for Impulse Voltage Tests on Insulated Conductors.

PART 2 - PRODUCTS

2.1 WIRES AND CABLES

- A. General: Provide wire and cable suitable for the temperature, conditions and location where installed.
- B. Conductors: Provide solid conductors for power and lighting circuits no. 10 AWG and

smaller. Provide stranded conductors for sizes no. 8 AWG and larger.

- C. Conductor Material: copper for all wires and cables.
- D. Conductor Material: use the following material for sizes indicated.
 - 1. No. 6 AWG and Smaller: copper
 - 2. No. 4 AWG and Larger: copper.
- E. Insulation: Provide THHN/THWN insulation for all conductors size 500MCM and larger, and no. 8 AWG and smaller. For all other sizes provide THW, THHN/THWN or XHHW insulation as appropriate for the locations where installed.
- F. Color Coding for phase identification in accordance with Table 1 in Part 3 below.
- G. Jackets: Factory-applied nylon or PVC external jacketed wires and cables for pulls in raceways over 100-feet in length, for pulls in raceways with more than three equivalent 90 deg. bends, for pulls in conduits underground or under slabs on grade, and where indicated.
- H. Cables: Provide the following type(s) of cables in NEC approved locations and applications where indicated. Provide cable UL listed for particular application:
 - 1. Armored Cable: Types AC and ACL.
 - 2. Metal-Clad Cable: Type MC:

2.2 CONNECTORS FOR CONDUCTORS

- A. Provide UL-listed factory-fabricated, solderless metal connectors of sizes, ampacity ratings, materials, types and classes for applications and for services indicated. Use connectors with temperature ratings equal to or greater than those of the wires upon which used.

PART 3 - EXECUTION

3.1 WIRING METHOD

- A. Use the following wiring methods as indicated:
 - 1. Wire: install all wire in raceway.
 - 2. Metal Clad Cable, Type MC: where indicated and elsewhere, where permitted by Code.

3.2 INSTALLATION OF WIRES AND CABLES

- A. General: Install electrical cables, wires, and connectors in compliance with NEC.
- B. Coordinate cable installation with other Work.
- C. Pull conductors simultaneously where more than one is being installed in same raceway. Use UL listed pulling compound or lubricant, where necessary.
- D. Use pulling means including, fish tape, cable, rope, and basket weave wire/cable grips which will not damage cables or raceways. Do not use rope hitches for pulling attachment to wire or cable.
- E. Conceal all cable in finished spaces.

- F. Install exposed cable parallel and perpendicular to surfaces or exposed structural members, and follow surface contours, where possible.
- G. Keep conductor splices to minimum.
- H. Install splice and tap connectors which possess equivalent or better mechanical strength and insulation rating than conductors being spliced.
- I. Use splice and tap connectors which are compatible with conductor material.
- J. Provide adequate length of conductors within electrical enclosures and train the conductors to terminal points with no excess. Bundle multiple conductors, with conductors larger than no 10 AWG cabled in individual circuits. Make terminations so there is no bare conductor at the terminal.
- K. Tighten electrical connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL 486A and UL 486B.

3.3 FIELD QUALITY CONTROL

- A. Prior to energizing, check installed wires and cables with megohm meter to determine insulation resistance levels to assure requirements are fulfilled.
- B. Prior to energizing, test wires and cables for electrical continuity and for short-circuits.
- C. Subsequent to wire and cable hook-ups, energize circuits and demonstrate proper functioning. Correct malfunctioning units, and retest to demonstrate compliance.
- D. TABLE 1: Color Coding for Phase Identification:

- 1. Color code secondary service, feeder, and branch circuit conductors with factory applied color as follows:

<u>208y/120Volts</u>	<u>Phase</u>	<u>480y/277 Volts</u>
Black	A	Yellow
Red	B	Brown
Blue	C	Orange
White	Neutral	White
Green	Ground	Green

END OF SECTION 16120

SECTION 16143 - WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements of the following Division 16 Sections apply to this section:
 - 1. Basic Electrical Requirements.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Receptacles
 - 2. Ground Fault Circuit Interrupter Receptacles
 - 3. Plugs
 - 4. Plug Connectors
 - 5. Snap Switches
 - 6. Incandescent Lamp Dimmer-Switches
 - 7. Fluorescent Lamp Dimmer-Switches
 - 8. Wall Plates
 - 9. Floor Service Outlets

1.3 SUBMITTALS

- A. Product data for each type of product specified.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with provisions of the following codes.
- B. NFPA 70 "National Electrical Code".
 - 1. UL and NEMA Compliance: Provide wiring devices which are listed and labeled by UL and comply with applicable UL and NEMA standards.

1.5 SEQUENCE AND SCHEDULING

- A. Schedule installation of finish plates after the surface upon which they are installed has received final finish.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers

offering products which may be incorporated in the work include, but are not limited to, the following:

1. Bryant Electric Co.
2. Challenger-Circle F
3. Crouse-Hinds Co.
4. Eagle Electric Mfg. Co.
5. General Electric Co.
6. Hubbell Inc.
7. Pass and Seymour Inc.
8. Slater Electric Co.
9. Square D Co.
10. Steel City; Midland-Ross Corp.
11. Walker Division-Butler Mfg. Co.

2.2 WIRING DEVICES:

- A. General: Provide wiring devices, in types, characteristics, grades, colors, and electrical ratings for applications indicated which are UL listed and which comply with NEMA WD 1 and other applicable UL and NEMA standards. Provide ivory color devices and wall plates except as otherwise indicated. Verify color selections with Architect.
- B. Receptacles: Comply with UL 498 and NEMA WD 1.
- C. Receptacles, Industrial Heavy Duty: Provide pin and sleeve design receptacles conforming to UL 498. Comply with UL 1010 where installed in hazardous locations. Provide features indicated.
- D. Ground-Fault Interrupter (GFI) Receptacles: as indicated in Table 1 in Part 3 below; provide "feed-thru" type ground-fault circuit interrupter, with integral heavy-duty NEMA 5-20R duplex receptacles arranged to protect connected downstream receptacles on same circuit. Provide unit designed for installation in a 2-3/4 inch deep outlet box without adapter, grounding type, Class A, Group 1, per UL Standard 94.3.
- E. Plugs: 20-amperes, 125-volts, 3-wire, grounding, armored cap plugs, parallel blades with cord clamp, and 0.4 inch cord hole; match NEMA configuration with power source's.
- F. Plug Connectors: 20-amperes, 125-volts, bakelite-body armored connectors, 3-wire, grounding, parallel blades, double wipe contact, with cord clamp, and 0.4 inch cord hole, match NEMA configuration to mating plug's. Arrange as indicated.
- G. Snap Switches: quiet type AC switches as indicated in Table 2 in Part 3 below. Comply with UL 20 and NEMA WD1.
- H. Combination Switch and Receptacle: general-duty 3-way quiet switch, 20-amperes, 120-277 volts AC, with toggle switch handle, and 3-wire grounding receptacle, 15-amperes, 120-volts, equip with plaster ears, and with break-off tab feature which allows wiring with separate or common feed, with NEMA configuration 5-15R.

2.3 WIRING DEVICE ACCESSORIES

- A. Wall plates: single and combination, of types, sizes, and with ganging and cutouts as indicated. Provide plates which mate and match with wiring devices to which attached. Provide metal screws for securing plates to devices with screw heads colored to match finish of plates. Provide wall plate color to match wiring devices except as otherwise indicated. Provide wall plates with engraved legend where

indicated. Conform to requirements of Section "Electrical Identification."

PART 3 - EXECUTION

3.1 INSTALLATION OF WIRING DEVICES AND ACCESSORIES:

- A. Install wiring devices and accessories as indicated, in accordance with manufacturer's written instructions, applicable requirements of NEC and in accordance with recognized industry practices to fulfill project requirements.
- B. Coordinate with other Work, including painting, electrical boxes and wiring installations, as necessary to interface installation of wiring devices with other Work.
- C. Install wiring devices only in electrical boxes which are clean; free from building materials, dirt, and debris.
- D. Install galvanized steel wallplates in unfinished spaces.
- E. Install wiring devices after wiring work is completed.
- F. Install wall plates after painting work is completed.
- G. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for wiring devices. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Standard 486A. Use properly scaled torque indicating hand tool.

3.2 PROTECTION

- A. Protect installed components from damage. Replace damaged items prior to final acceptance.

3.3 FIELD QUALITY CONTROL

- A. Testing: Prior to energizing circuits, test wiring for electrical continuity, and for short-circuits. Ensure proper polarity of connections is maintained. Subsequent to energizing, test wiring devices and demonstrate compliance with requirements, operating each operable device at least six times.
- B. Test ground fault interruptor operation with both local and remote fault simulations in accordance with manufacturer recommendations.

END OF SECTION 16143