



# **SPECIFICATIONS**

# FOR

# ST. CLOUD HRA WILSON APARTMENTS ACCESSIBILITY UPGRADE

DATE: 9/28/21

**PROJECT NO. 2107** 

Daniel Tideman · Steve Paasch · Evan Larson 808 Courthouse Square · St.Cloud, MN 56303 (320)252-3740 · fax (320)255-0683 www.gltarchitects.com

# SECTION 00 01 05 - CERTIFICATION PAGE

# PROJECT MANUAL FOR St. Cloud HRA Accessibility Upgrades St. Cloud, MN

# PREPARED BY: GLTArchitects 808 Courthouse Square St. Cloud, MN 56303 (320)252-3740

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Architect under the laws of the State of Minnesota.

ARCHITECT

Date: September 28, 2021

Registration Number: 21740

END OF SECTION

# SECTION 00 01 10 - TABLE OF CONTENTS

#### INTRODUCTORY INFORMATION

Cover Page

#### **DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS**

- 00 01 05 Certification Page
- 00 01 10 Table of Contents

# **PROCUREMENT REQUIREMENTS**

- 00 11 13 Advertisement for Bids
- 00 21 13 Instructions to Bidders
- 00 25 13 Pre-Bid Meeting
- 00 41 13 Bid Form- Stipulated Sum

#### **CONTRACTING REQUIREMENTS**

Construction Agreement Exhibit A: Form HUD-5370– General Conditions for Construction Contracts Exhibit B: HUD Form 50071 – Certificate of Payments to Influence Federal Transactions Exhibit C: Disclosure of Lobbying Activities Exhibit D: Specific documentation pertaining to Section 3 that pertains to this contract. Exhibit E: Responsible Contractor Verification Exhibit I: Contractors Certification concerning Labor Standards Sub-Contractors Certification concerning Labor Standards Exhibit J: Wage Decision Bond Forms

# **DIVISION 01 - GENERAL REQUIREMENTS**

01 11 00 Summary of Work

00 61 00

- 01 25 03 Product Substitution Procedures
- 01 25 11 Substitution Request Form
- 01 26 00 Contract Modification Procedures
- 01 29 00 Payment Procedures
- 01 31 00 Project Management and Coordination
- 01 33 00 Submittal Procedures
- 01 43 00 Quality Assurance
- 01 50 00 Temporary Facilities and Controls
- 01 60 00 Product Requirements
- 01 70 00 Execution Requirements
- 01 74 00 Cleaning
- 01 77 00 Closeout Procedures and Submittals
- 01 78 35 Warranties and Bonds
- 01 78 39 Project Record Documents

St. Cloud HRA Wilson Apartments Accessibility Upgrade St. Cloud, MN

#### **DIVISION 02 – EXISTING CONDITIONS**

02 22 10 Selective Site and Building Demolition

## **DIVISION 03 - CONCRETE**

03 30 00 Cast-in-Place Concrete

# **DIVISION 06 - WOOD AND PLASTIC**

- 06 10 00 Rough Carpentry
- 06 40 23 Interior Architectural Woodwork

#### **DIVISION 07 - THERMAL AND MOISTURE PROTECTION**

07 92 00 Joint Sealants

#### **DIVISION 08 - DOORS AND WINDOWS**

- 08 11 13 Hollow Metal Doors and Frames
- 08 14 16 Flush Wood Doors
- 08 71 00 Door Hardware

#### **DIVISION 09 - FINISHES**

- 09 21 16 Gypsum Board Assemblies and Veneer Plaster
- 09 30 00 Tiling
- 09 65 00 Resilient Flooring
- 09 68 00 Carpeting
- 09 90 00 Painting and Coatings

# **DIVISION 10 - SPECIALTIES**

- 10 28 13 Toilet Accessories
- 10 44 00 Interior Signage

#### **DIVISION 11 – EQUIPMENT**

11 31 00 Appliances

#### **DIVISION 21 – FIRE SUPRESSION**

- 21 05 00 Common Work results for Fire Suppression
- 21 13 13 Wet-Pipe Sprinkler Systems

St. Cloud HRA Wilson Apartments Accessibility Upgrade St. Cloud, MN

# **DIVISION 22** – PLUMBING

- 22 05 29 Hangers and Supports for Plumbing Piping and Equipment
- 22 05 53 Identification for Plumbing Piping and Equipment
- 22 07 00 Plumbing Insulation
- 22 11 00 Facility Water Distribution
- 22 13 00 Facility Sanitary Sewerage
- 22 40 00 Plumbing Fixtures

## DIVISION 23 - HEATING, VENTILATION, AIR CONDITIONING

- 23 05 29 Hangers and Supports for HVAC Piping and Equipment
- 23 07 00 HVAC Piping and Equipment Insulation
- 23 21 13 Hydronic Piping
- 23 37 00 Air Outlets and Inlets
- 23 82 16 Air Coils

## **DIVISION 26 – ELECTRICAL**

- 26 05 00 Common Work Results for Electrical Communications
- 26 05 10 Selective Electrical Demolition
- 26 05 19 600 Volt Conductors and Cables
- 26 05 26 Grounding and Bonding for Electrical Systems
- 26 05 29 Supporting Devices
- 26 05 33 Raceways Fittings and Boxes
- 26 08 00 Testing and Commissioning of Electrical Systems
- 26 24 16 Panelboards
- 26 27 26 Wiring Devices

# DIVISION 28 - ELECTRONIC, SAFETY & SECURITY

- 28 05 00 Common Work Results for Safety and Security
- 28 05 15 Testing of Fire-Alarm System

END OF SECTION

# SECTION 00 11 13 - ADVERTISEMENT FOR BIDS

#### PART 1 - GENERAL

#### 1.1 PROJECT

- Wilson Apartments
   Accessibility Upgrades
   41 3<sup>rd</sup> Ave NE
   St. Cloud, MN 56301
   Remodel 6 apartments, 2 public toilet rooms and 2 tub rooms to be accessible.
  - OWNER
- B. St. Cloud Housing Redevelopment Authority (HRA) 1225 West St. Germain St. Cloud, MN 56301 Project Manager: Paul Soenneker (P): 320.202.3147 (F): 320.407.0423 Email: psoenneker@stcloudhra.com

#### 1.2 PRE-BID MEETING

- A. Pre-Bid Meeting will be held prior to date required for submission of Bids. Contractors are encouraged to attend in order to better understand Project, and for dissemination of information and clarification of intent of Construction Documents. Questions and responses will be published in an Addenda following conference.
- B. Pre-Bid Meeting will be held on October 6, 2021 at 3:00pm, local time, at the Wilson Apartments. Architect and Owner Representative will be at the meeting.

The Prebid meeting will be the only opportunity for bidders to access the site.

#### 1.3 BIDS DUE

A. Bids will be received by Tuesday, October 19, 2021 @ 2:00pm local time.

#### 1.4 PLACE DUE

- A. Submit bids to the attention of Paul Soenneker at St. Cloud HRA, located at 1223 West St. Germain Street, St. Cloud, MN 56301
- B. Bids will be opened in public and will be accepted by sealed envelope only.

## 1.5 TYPE OF BIDDING, AND CLASSES OF WORK

A. Owner will accept proposals from general contractors or roofing contractors for a prime contract for complete construction of entire Project.

#### 1.6 AVAILABILITY OF DOCUMENTS

- A. Drawings and specifications are on file at the following locations:
  - 1.) The office of GLTArchitects in St. Cloud, Minnesota.
  - 2.) The office of the Owner. St. Cloud HRA
  - 3.) MN Builders Exchange (Minneapolis and St. Paul Builders Exchanges)
  - 4.) St. Cloud Builders Exchange.

B. Digital copies of the plans and specifications are available at <u>http://www.questcdn.com</u>.

#### 1.7 CONTRACTS

A. Attention is called to the fact that this is a federally funded project and not less than the minimum salaries and wages as set forth in the Contract Documents must be paid on the project, and that the contractor must insure that the employees and applicants for employment are not discriminated against because of their race, creed, color, sex, nation origin, age, marital status or status with regard to public assistance or disability. HUD Section 3 requirements are in force and Section 3 contractors are encouraged to bid. Within 10 days after notification in writing of the Owner's intent to award Contract, accepted Bidder will be required to enter into a Contract with Owner on St. Cloud HRA Construction Agreement.

#### 1.8 BID SECURITY:

A. Prime Contract Bidders shall submit certified check or surety bond, payable to Owner, in amount of 5 percent of Bid. Surety must be authorized to do business in State of Minnesota. Bid security to be guarantee that Bidder will not withdraw bid without owner's consent. Bids to be valid for 30 days.

#### 1.9 PERFORMANCE BOND

A. Performance Bond is required in amount of 100 percent of Contract amount.

#### 1.10 REJECTION

- A. Owner reserves the right to reject any or all proposals and to waive Quoting formalities, and to award prime contracts to Contractor that Owner finds to their best advantage.
- B. Each Contractor agrees to waive any claim it has or may have against Owner, Architect, engineer, and their respective employees, arising out of or in connection with administration, evaluation, or recommendation of any Bid.

### 1.11 PRIOR APPROVAL

A. This Contract has a 7-calendar day prior approval clause for product Substitutions.

#### PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION

# SECTION 00 21 13 - INSTRUCTIONS TO BIDDERS

#### 1.1 DEFINITIONS

- A. Definitions set forth in General Conditions of the Contract for Construction are applicable to these Instructions to Bidders.
- B. Bidding Documents: Includes Advertisement for Bids or Invitation to Bid, Instructions to Bidders, and proposed Contract Documents including Addenda issued prior to receipt of Bids.
- C. Addenda: Written or graphic instruments issued prior to execution of Contract, which modify or interpret Bidding Documents, including Drawings and Specifications, by additions, deletions, clarifications, or corrections. Addenda will become part of Contract Documents when Construction Contract is executed.

#### 1.2 BIDDERS REPRESENTATION

- A. Each Bidder, by submitting Bid, represents that Bidder has read and understands Bidding Documents and that Subcontractors Bidder intends to use have carefully and thoroughly reviewed Drawings, Specifications, and other construction Contract Documents, and have found them complete and free from ambiguities and sufficient for purpose intended. If this is not the case, they have followed procedure as outlined in 1.4 below.
- B. Each Bidder, by submitting their Bid, represents that they have carefully examined site of Work and that from their own investigations they have satisfied themselves as to nature and location of Work and character, quality, quantities of materials and difficulties to be encountered, type and extent of equipment and other facilities needed for performance of Work, general and local conditions, and other items which may, in any way, affect Work or its performance.
- C. Each Bidder, by submitting Bid, represents that Bidder intends to perform this Contract within prescribed time period allocated for this Work.

#### 1.3 QUALIFICATION OF BIDDERS

A. Bidder and workers, employees, and Subcontractors they intend to use, are skilled and experienced in type of construction represented by construction Contract Documents Bid upon.

#### 1.4 EXAMINATION OF BIDDING DOCUMENTS

- A. Each Bidder shall examine Bidding Documents carefully and, not later than 7 days prior to date for receipt of Bids, shall make written request to Architect for interpretation or correction of ambiguity, inconsistency, or error therein which they may discover. Architect will issue any interpretation or correction as an Addendum. Only written interpretation or correction by Addendum shall be binding. Neither Bidder nor any of their employees, agents, intended suppliers, or Subcontractors shall rely upon verbal representations, allegedly authorized or unauthorized from Owner, Owner's employees or agents, including Architect, engineers, or consultants, in assembling Bid Amount.
- B. In case of conflict in or between Drawings and Specifications, estimate and agree to provide greater quantity or better quality of materials and Work unless Bidder has, before submission of Bid, asked for and obtained written decision of Architect as to which method or materials will be required.

#### 1.5 SUBSTITUTIONS

- A. Each Bidder represents that Bid is based upon the material and equipment described in Bidding documents.
- B. No substitution will be considered unless written request has been submitted to Architect for review at least 7 calendar days prior to date for receipt of Bids unless otherwise indicated. Each such request shall include complete description of proposed substitute, name of material or equipment for which it is to be substituted, drawings, cuts, performance and test data, and any other data or information necessary for a complete evaluation. All requests must have a stamped, self-addressed return envelope, and be made in duplicate. If Architect accepts any proposed substitution, such acceptance may be set forth in the Addendum. Final acceptance of substitute material will not occur until shop drawings and/or samples have been submitted and reviewed by Architect after contract award. Substitution submittals by facsimile will not be reviewed.

#### 1.6 BIDDING PROCEDURES

- A. Prepare Bids on copies of Bid Form provided in Project Manual and submit in per Instructions to Bidders.
- B. Submit Bids in duplicate on Bid Forms included in Project Manual. Reproduce Bid Form for actual use. Forms bound with Project Manual are reproduction masters and copies of Specifications from which forms have been removed will be considered a mutilated copy. Legibly write proposals in ink with Amounts given both in words and figures where so indicated. Submit Proposals per prescribed form. Modifications thereof, deviations, or omissions there from, may be considered sufficient cause for rejection. Proposals carrying riders or qualifications to Bid as submitted may be rejected as irregular. Where there is a difference between Amounts shown in words and figures, Amount in words prevails.
- C. Bid is invalid if it has not been deposited at designated location prior to time and date for receipt of Bids indicated in Advertisement for Bid or Invitation to Bid, or prior to extensions thereof issued to Bidders.
- D. Unless otherwise provided in supplements to these Instructions to Bidders, no Bidder shall modify, withdraw, or cancel their Bid, or any part thereof, for 30 days after time designated for receipt of Bids in Advertisement for Bids or Invitation to Bid.
- E. Prior to the receipt of Bids, Addenda may be mailed or delivered to each person or firm recorded by Architect as having received the Bidding documents, and will be available for inspection wherever the Bidding documents are kept available for that purpose. Addenda issued after receipt of Bids will be mailed or delivered only to the selected Bidder. All addenda issued prior to the time of Bidding shall be covered in the proposal and will become a part of the Contract. State the numbers of addenda included on the proposal form.
- F. Erasures or other changes in the Bids must be explained or noted over the signature of the Bidder.
- G. The Bidder shall state in the Bidder's proposal the number of calendar days from the date of notification to proceed that will be required to complete Project.
- H. The Bidder shall refer to the Advertisement or Invitation to Bid (Document 00 11 13) for Bid Security requirements.
- I. Each copy of the proposal must be signed in ink by Bidder.
- J. Bids, which are not signed by individuals making them, should have attached thereto a Power of Attorney evidencing authority to sign Bid in name of person for whom it is signed.
- K. Bids, which are signed for a co-partnership, should be signed by all of the co-partners or by an Attorney-in-Fact. If signed by an Attorney-in-Fact, there should be attached to Bid, a Power of Attorney evidencing authority to sign Bid.
- L. Bids which are signed for a corporation should have correct corporate name thereof signed in handwriting or in typewriting and signature of President or other authorized officer of corporation should be manually written below or written or typewritten corporate name following word "By \_\_\_\_\_\_." If such a Bid is manual

signed by an official other than President of Corporation, a certified copy of a resolution of Board of Directors evidencing authority of such official to sign Bid should be attached to it.

- M. If Bids are signed by any other legal entity, attach authority of person signing for such legal entity to Bid.
- N. Submit proposal and other required data in opaque, sealed envelope, plainly identified as:

Name of Project Name of Owner Address of Owner Bidder's Name and Address

O. If submitted by mail, enclose proposal envelope in another envelope addressed for mailing. Submit proposals at time and place shown on Advertisement or Invitation to Bid (Document 00 11 13).

#### 1.7 REJECTION OF BIDS

- A. Bidder acknowledges the right of Owner to reject any or all Bids and to waive any informality or irregularity in Bids received. In addition, Bidder recognizes the right of Owner to reject a Bid if Bidder failed to furnish required Bid security, or to submit data required by Bidding documents, or if Bid is in any way incomplete or irregular.
- B. Each Bidder agrees to waive claims it has or may have against Owner, Architect, engineer, and respective employees, arising out of or in connection with administration, evaluation, or recommendation of any Bid.

#### 1.8 SUBMISSION OF POST-BID INFORMATION

- A. Upon request by Architect, selected Bidder shall, within 7 days thereof, submit the following:
  - 1. Statement of costs for each major item of Work included in Bid.
  - 2. Designation of Work to be performed by Bidder with Bidder's forces.
  - 3. List of Subcontractors or other person or organizations (including those who are to furnish materials or equipment fabricated to special design) proposed for such portions of Work as may be designated, names of Subcontractors proposed for principal portions of Work.
    - a. Include in Subcontractor list phone numbers, fax numbers, and addresses.
  - 4. Bidder is required to establish, to satisfaction of Architect and Owner, reliability and responsibility of proposed Subcontractors to furnish and perform Work described in Specification Sections pertaining to such proposed Subcontractors' respective trades. Prior to Award of Contract, Architect will notify Bidder in writing if either Owner or Architect, after due investigation, has reasonable and substantial objection to any person or organization. Bidder may, at their option, withdraw Bid without forfeiture of Bid security. If Bidder submits acceptable substitute with increase in Bid price to cover difference in cost occasioned by such Substitution, Owner may, at Owner's discretion, accept increased Bid price or Owner may disqualify Bidder. Subcontractors and other persons and organizations proposed by Bidder and accepted by Owner and Architect, shall be used on Work for which they were proposed and accepted and shall not be changed except with written approval of Owner, Architect, and Contractor.

#### 1.9 CONTRACT AWARD

A. Owner reserves the right to make Contract award to Bidder that Owner finds to Owner's best advantage, including consideration of Unit Prices, Alternates, and completion time.

#### 1.10 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

A. Each Bidder shall furnish performance and labor and material payment bonds, each in the amount of 100 percent of their Contract Amount. Execute Bonds by acceptable surety company or companies authorized to execute such in the State of Minnesota and be written in favor of Owner. Provide Bonds within 10 days of

Notice of Award of execution of Contract by Owner. Bonds shall remain in force throughout life of Contract and warranty period.

B. Bidder shall require Attorney-in-Fact who executed required Bonds on behalf of Surety to affix thereto a certified and current copy of their Power of Attorney indicating monetary limit of such power.

END OF SECTION

# SECTION 00 25 13 - PRE-BID MEETING

#### PART 1 - GENERAL

#### 1.1 PURPOSE

A. A Pre-Bid Meeting will be held prior to date required for submission of Bids. Bidders are encouraged to attend in order to better understand Project, and for dissemination of information and clarification of intent of Bidding Documents. Questions and responses will be published in Addenda following the meeting; the Pre-Bid meeting will be the only opportunity for bidders to access the building and apartments.

#### 1.2 PREBID MEETING.

- A. Architect will conduct Pre-Bid Meeting. Owner will have a representative at the Meeting
   1. General Pre-Bid Meeting. Meeting will be held at 3:00 pm. on October 6<sup>th</sup>, 2021.
  - In Lobby, Wilson Apartments at 41 3<sup>rd</sup> Ave NE. St. Cloud, MN. part 2 products.
- B. NOT USED.
- 1.3 PART 3 -EXECUTION.
  - A. NOT USED

END OF SECTION

# DOCUMENT 00 41 13 - BID FORM - STIPULATED SUM

#### BID DUE DATE: October 19th, 2021

TO:	St. Cloud HRA 1225 West St. Germain Street St. Cloud, MN 56301
PROJECT:	Wilson Apartments – Accessibility Upgrades Interior Remodel of 6 Living Units, Public Toilets and Tub Rooms.
OWNER:	St. Cloud HRA 1225 West St. Germain Street St. Cloud, MN 56301
ARCHITECT:	GLTArchitects 808 Courthouse Square St. Cloud, MN 56303

The undersigned, having become familiar with site of proposed Project and Bidding and Contract Documents for Project noted above, hereby proposes to provide Work per Contract Documents at Sum stated below.

#### BASE BID

(\$\_\_\_\_\_) (Number) (Description)

Accompanying this proposal is the Bid Security specified in Advertisement for Bids, the same being subject to forfeiture in the event of default by the undersigned.

#### CONTRACT TIME

Work of this Contract will commence upon Notice to Proceed and will be Substantially Complete no later than June 17, 2022.

I agree to Substantial Completion of Project by \_\_\_\_\_

I agree to Final Completion of Project by \_\_\_\_\_

Notice to Proceed will be given on or about October 29, 2021.

#### ADDENDA

Bidder hereby acknowledges receipt of the following Addenda. Modifications to Bid Documents noted therein have been considered and costs thereto are included in Base Bid Sum.

Addendum Numbers

#### ACKNOWLEDGMENTS

Bidder, in submitting this Bid, certifies that Bid is based upon careful examination of Bidding and Contract Documents and waives all rights to plead any misunderstanding.

Bidder, in submitting this Bid, understands that Owner reserves the right to reject any or all Bids, to waive any informality or irregularity in any Bid received, and to accept any Alternate(s) in any order or combination.

Bidder, in submitting this Bid, acknowledges that Bidder has read and fully understands Project Manual Document 00 21 13 – Advertisement for Bids.

#### CONTRACTOR ON-SITE PERSONNEL

Project Manager's Name:

Superintendent's Name:

#### **BIDDER IDENTIFICATION**

THE UNDERSIGNED operates as:

- () incorporated in the State of Minnesota
- () a Partnership
- () a Proprietorship

# LEGAL NAME OF PERSON, FIRM OR CORPORATION

Legal Name:	
Address:	
Telephone:	Facsimile:
By:(Signature of Authorized Signing Officer)	_Title:
Company License No.:	
Corporate Seal:	

Federal ID Number (if applicable)

## END OF DOCUMENT

# General Conditions for Construction Contracts - Public Housing Programs

U.S. Department of Housing and UrbanDev elopment Office of Public and Indian Housing OMB Approval No. 2577-0157 (exp. 11/30/2023)

# Applicability. This form is applicable to any construction/development contract greater than \$150,000.

Public reporting burden for this collection of information is estimated to average 1 hour. This includes the time for collecting, reviewing, and reporting the data. The information requested is required to obtain a benefit. This form includes those clauses required by OMB's common rule on grantee procurement, implemented at HUD in 2 CFR 200, and those requirements set forth in Section 3 of the Housing and Urban Development Act of 1968 and its amendment by the Housing and Community Development Act of 1992, implemented by HUD at 24 CFR Part 135. The form is required for construction contracts awarded by Public Housing Agencies (PHAs). The form is used by Housing Authorities in solicitations to provide necessary contract clauses. If the form were not used, PHAs would be unable to enforce their contracts... There are no assurances of confidentiality. HUD may not conduct or sponsor, and an applicant is not required to respond to a collection of information unless it displays a currently valid OMB control number.

Clause		Page	age Clause		Page
1	Definitions	2	1	Administrative Requirements	
2.	Contractor's Responsibility for Work	2	25.	Contract Period	9
3.	Architect's Duties, Responsibilities and Authority	2	26.	Order of Precedence	9
4.	Other Contracts	3	27.	Payments	9
	Construction Requirements		28.	Contract Modifications	10
5.	Preconstruction Conference and Notice to Proceed	3	29.	Changes	10
6.	Construction Progress Schedule	3	30.	Suspension of Work	11
7.	Site Investigation and Conditions Affecting the Work	3	31.	Disputes	11
8.	Differing Site Conditions	4	32.	Default	11
9.	Specifications and Drawings for Construction	4	33.	Liquidated	12
10.	As-Built Drawings	5	34.	Termination of Convenience	12
11.	Material and Workmanship	5	35.	Assignment of Contract	12
12.	Permits and Codes	5	36.	Insurance	12
13.	Health, Safety, and Accident Prevention	6	37.	Subcontracts	13
14	Temporary Buildings and Transportation Materials	6	38.	Subcontracting with Small and Minority Firms, Women's Business Enterprise, and Labor Surplus Area Firms	13
15.	Availability and Use of Utility Services	6	39.	Equal Employment Opportunity	13
16	Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements	6	40.	Employment, Training, and Contracting Opportunities for Low-Income Persons, Section 3 of the Housing and Urban Development Act of 1968	14
17.	Temporary Buildings and Transportation Materials	7	41.	Interest of Members of Congress	15
18	Clean Air and Water	7	42	Interest of Members, Officers, or Employees and Former Members, Officers, or Employees	15
19.	Energy Efficiency	7	43.	Limitations on Payments Made to Influence	15
20.	Inspection and Acceptance of Construction	7	44.	Royalties and Patents	15
21.	Use and Possession Prior to	8	45.	Examination and Retention of Contractor's Records	15
22.	Warranty of Title	8	46.	Labor Standards-Davis-Bacon and Related Acts	15
23.	Warranty of	8	47.	Non-Federal Prevailing Wage Rates	19
24.	Prohibition Against Liens	9	48.	Procurement of Recovered Materials	19

#### 1. Definitions

- (a) "Architect" means the person or other entity engaged by the PHA to perform architectural, engineering, design, and other services related to the work as provided for in the contract. When a PHA uses an engineer to act in this capacity, the terms "architect" and "engineer" shall be synonymous. The Architect shall serve as a technical representative of the Contracting Officer. The Architect's authority is as set forth elsewhere in this contract.
- (b) "Contract" means the contract entered into between the PHA and the Contractor. It includes the forms of Bid, the Bid Bond, the Performance and Payment Bond or Bonds or other assurance of completion, the Certifications, Representations, and Other Statements of Bidders (form HUD-5370), these General Conditions of the Contract for Construction (form HUD-5370), the applicable wage rate determinations from the U.S. Department of Labor, any special conditions included elsewhere in the contract, the specifications, and drawings. It includes all formal changes to any of those documents by addendum, change order, or other modification.
- (c) "Contracting Officer" means the person delegated the authority by the PHA to enter into, administer, and/or terminate this contract and designated as such in writing to the Contractor. The term includes any successor Contracting Officer and any duly authorized representative of the Contracting Officer also designated in writing. The Contracting Officer shall be deemed the authorized agent of the PHA in all dealings with the Contractor.
- (d) "Contractor" means the person or other entity entering into the contract with the PHA to perform all of the work required under the contract.
- (e) "Drawings" means the drawings enumerated in the schedule of drawings contained in the Specifications and as described in the contract clause entitled Specifications and Drawings for Construction herein.
- (f) "HUD" means the United States of America acting through the Department of Housing and Urban Development including the Secretary, or any other person designated to act on its behalf. HUD has agreed, subject to the provisions of an Annual Contributions Terms and Conditions (ACC), to provide financial assistance to the PHA, which includes assistance in financing the work to be performed under this contract. As defined elsewhere in these General Conditions or the contract documents, the determination of HUD may be required to authorize changes in the work or for release of funds to the PHA for payment to the Contractor. Notwithstanding HUD's role, nothing in this contract shall be construed to create any contractual relationship between the Contractor and HUD.
- (g) "Project" means the entire project, whether construction or rehabilitation, the work for which is provided for in whole or in part under this contract.
- (h) "PHA" means the Public Housing Agency organized under applicable state laws which is a party to this contract.
- (j) "Specifications" means the written description of the technical requirements for construction and includes the criteria and tests for determining whether the requirements are met.
- (I) "Work" means materials, workmanship, and manufacture and fabrication of components.

#### 2. Contractor's Responsibility for Work

- (a) The Contractor shall furnish all necessary labor, materials, tools, equipment, and transportation necessary for performance of the work. The Contractor shall also furnish all necessary water, heat, light, and power not made available to the Contractor by the PHA pursuant to the clause entitled Availability and Use of Utility Services herein.
- (b) The Contractor shall perform on the site, and with its own organization, work equivalent to at least [ ] (12 percent unless otherwise indicated) of the total amount of work to be performed under the order. This percentage may be reduced by a supplemental agreement to this order if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of the PHA.
- (c) At all times during performance of this contract and until the work is completed and accepted, the Contractor shall directly superintend the work or assign and have on the work site a competent superintendent who is satisfactory to the Contracting Officer and has authority to act for the Contractor.
- (d) The Contractor shall be responsible for all damages to persons or property that occur as a result of the Contractor's fault or negligence, and shall take proper safety and health precautions to protect the work, the workers, the public, and the property of others. The Contractor shall hold and save the PHA, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire work, except for any completed unit of work which may have been accepted under the contract.
- (e) The Contractor shall lay out the work from base lines and bench marks indicated on the drawings and be responsible for all lines, levels, and measurements of all work executed under the contract. The Contractor shall verify the figures before laying out the work and will be held responsible for any error resulting from its failure to do so.
- (f) The Contractor shall confine all operations (including storage of materials) on PHA premises to areas authorized or approved by the Contracting Officer.
- (g) The Contractor shall at all times keep the work area, including storage areas, free from accumulations of waste materials. After completing the work and before final inspection, the Contractor shall (1) remove from the premises all scaffolding, equipment, tools, and materials (including rejected materials) that are not the property of the PHA and all rubbish caused by its work; (2) leave the work area in a clean, neat, and orderly condition satisfactory to the Contracting Officer; (3) perform all specified tests; and, (4) deliver the installation in complete and operating condition.
- (h) The Contractor's responsibility will terminate when all work has been completed, the final inspection made, and the work accepted by the Contracting Officer. The Contractor will then be released from further obligation except as required by the warranties specified elsewhere in the contract.

#### 3. Architect's Duties, Responsibilities, and Authority

(a) The Architect for this contract, and any successor, shall be designated in writing by the Contracting Officer.

- (b) The Architect shall serve as the Contracting Officer's technical representative with respect to architectural, engineering, and design matters related to the work performed under the contract. The Architect may provide direction on contract performance. Such direction shall be within the scope of the contract and may not be of a nature which: (1) institutes additional work outside the scope of the contract; (2) constitutes a change as defined in the Changes clause herein; (3) causes an increase or decrease in the cost of the contract; (4) alters the Construction Progress Schedule; or (5) changes any of the other express terms or conditions of the contract.
- (c) The Architect's duties and responsibilities may include but shall not be limited to:
  - (1) Making periodic visits to the work site, and on the basis of his/her on-site inspections, issuing written reports to the PHA which shall include all observed deficiencies. The Architect shall file a copy of the report with the Contractor's designated representative at the site;
  - (2) Making modifications in drawings and technical specifications and assisting the Contracting Officer in the preparation of change orders and other contract modifications for issuance by the Contracting Officer;
  - (3) Reviewing and making recommendations with respect to - (i) the Contractor's construction progress schedules; (ii) the Contractor's shop and detailed drawings; (iii) the machinery, mechanical and other equipment and materials or other articles proposed for use by the Contractor; and, (iv) the Contractor's price breakdown and progress payment estimates; and,
  - (4) Assisting in inspections, signing Certificates of Completion, and making recommendations with respect to acceptance of work completed under the contract.

#### 4. Other Contracts

The PHA may undertake or award other contracts for additional work at or near the site of the work under this contract. The Contractor shall fully cooperate with the other contractors and with PHA employees and shall carefully adapt scheduling and performing the work under this contract to accommodate the additional work, heeding any direction that may be provided by the Contracting Officer. The Contractor shall not commit or permit any act that will interfere with the performance of work by any other contractor or by PHA employees

#### **Construction Requirements**

#### 5. Pre-construction Conference and Notice to Proceed

- (a) Within ten calendar days of contract execution, and prior to the commencement of work, the Contractor shall attend a preconstruction conference with representatives of the PHA, its Architect, and other interested parties convened by the PHA. The conference will serve to acquaint the participants with the general plan of the construction operation and all other requirements of the contract. The PHA will provide the Contractor with the date, time, and place of the conference.
- (b) The contractor shall begin work upon receipt of a written Notice to Proceed from the Contracting Officer or designee. The Contractor shall not begin work prior to receiving such notice.

#### 6. Construction Progress Schedule

- (a) The Contractor shall, within five days after the work commences on the contract or another period of time determined by the Contracting Officer, prepare and submit to the Contracting Officer for approval three copies of a practicable schedule showing the order in which the Contractor proposes to perform the work, and the dates on which the Contractor contemplates starting and completing the several salient features of the work (including acquiring labor, materials, and equipment). The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period. If the Contractor fails to submit a schedule within the time prescribed, the Contracting Officer may withhold approval of progress payments or take other remedies under the contract until the Contractor submits the required schedule.
- (b) The Contractor shall enter the actual progress on the chart as required by the Contracting Officer, and immediately deliver three copies of the annotated schedule to the Contracting Officer. If the Contracting Officer determines, upon the basis of inspection conducted pursuant to the clause entitled Inspection and Acceptance of Construction, herein that the Contractor is not meeting the approved schedule, the Contractor shall take steps necessary to improve its progress, including those that may be required by the Contracting Officer, without additional cost to the PHA. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules in chart form as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained.
- (c) Failure of the Contractor to comply with the requirements of the Contracting Officer under this clause shall be grounds for a determination by the Contracting Officer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the Contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the Default clause of this contract.

#### 7. Site Investigation and Conditions Affecting the Work

(a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to, (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, electric power, and roads;(3) uncertainties of weather, river stages, tides, or similar physical conditions at the site; (4) the conformation and conditions of the ground: and (5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is

reasonably ascertainable from an inspection of the site, including all exploratory work done by the PHA, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the PHA.

(b) The PHA assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the PHA. Nor does the PHA assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its officers or agents before the execution of this contract, unless that understanding or representation is expressly stated in this contract.

#### 8. Differing Site Conditions

- (a) The Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Contracting Officer of (1) subsurface or latent physical conditions at the site which differ materially from those indicated in this contract, or (2) unknown physical conditions at the site(s), of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in the contract.
- (b) The Contracting Officer shall investigate the site conditions promptly after receiving the notice. Work shall not proceed at the affected site, except at the Contractor's risk, until the Contracting Officer has provided written instructions to the Contractor. If the conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performing any part of the work under this contract, whether or not changed as a result of the conditions, the Contractor shall file a claim in writing to the PHA within ten days after receipt of such instructions and, in any event, before proceeding with the work. An equitable adjustment in the contract price, the delivery schedule, or both shall be made under this clause and the contract modified in writing accordingly.
- (c) No request by the Contractor for an equitable adjustment to the contract under this clause shall be allowed, unless the Contractor has given the written notice required; provided, that the time prescribed in (a) above for giving written notice may be extended by the Contracting Officer.
- (d) No request by the Contractor for an equitable adjustment to the contract for differing site conditions shall be allowed if made after final payment under this contract.

#### 9. Specifications and Drawings for Construction

(a) The Contractor shall keep on the work site a copy of the drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment by the Contractor without such a determination shall be at its own risk and expense. The Contracting Officer shall furnish from time to time such detailed drawings and other information as considered necessary, unless otherwise provided.

- (b) Wherever in the specifications or upon the drawings the words "directed", "required", "ordered", "designated", "prescribed", or words of like import are used, it shall be understood that the "direction", "requirement", "order", "designation", or "prescription", of the Contracting Officer is intended and similarly the words "approved", "acceptable", "satisfactory", or words of like import shall mean "approved by", or "acceptable to"," or "satisfactory to" the Contracting Officer, unless otherwise expressly stated.
- (c) Where "as shown" "as indicated", "as detailed", or words
- of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word "provided" as used herein shall be understood to mean "provide complete in place" that is "furnished and installed".
- (d) "Shop drawings" means drawings, submitted to the PHA by the Contractor, subcontractor, or any lower tier subcontractor, showing in detail (1) the proposed fabrication and assembly of structural elements and (2) the installation (i.e., form, fit, and attachment details) of materials of equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by the Contractor to explain in detail specific portions of the work required by the contract. The PHA may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.
- (e) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with other contract requirements and shall indicate its approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor's approval may be returned for resubmission. The Contracting Officer will indicate an approval or disapproval of the shop drawings and if not approved as submitted shall indicate the PHA's reasons therefore. Any work done before such approval shall be at the Contractor's risk. Approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in accordance with (f) below.
- (f) If shop drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Architect approves any such variation and the Contracting Officer concurs, the Contracting Officer shall issue an appropriate modification to the contract, except that, if the variation is minor or does not involve a change in price or in time of performance, a modification need not be issued.
- (g) It shall be the responsibility of the Contractor to make timely requests of the PHA for such large scale and full size drawings, color schemes, and other additional information, not already in his possession, which shall be

required in the planning and production of the work. Such requests may be submitted as the need arises, but each such request shall be filed in ample time to permit appropriate action to be taken by all parties involved so as to avoid delay.

- (h) The Contractor shall submit to the Contracting Officer for approval four copies (unless otherwise indicated) of all shop drawings as called for under the various headings of these specifications. Three sets (unless otherwise indicated) of all shop drawings, will be retained by the PHA and one set will be returned to the Contractor. As required by the Contracting Officer, the Contractor, upon completing the work under this contract, shall furnish a complete set of all shop drawings as finally approved. These drawings shall show all changes and revisions made up to the time the work is completed and accepted.
- (i) This clause shall be included in all subcontracts at any tier. It shall be the responsibility of the Contractor to ensure that all shop drawings prepared by subcontractors are submitted to the Contracting Officer.
- 10. As-Built Drawings
- (a) "As-built drawings," as used in this clause, means drawings submitted by the Contractor or subcontractor at any tier to show the construction of a particular structure or work as actually completed under the contract. "As-built drawings" shall be synonymous with "Record drawings."
- (b) As required by the Contracting Officer, the Contractor shall provide the Contracting Officer accurate information to be used in the preparation of permanent as-built drawings. For this purpose, the Contractor shall record on one set of contract drawings all changes from the installations originally indicated, and record final locations of underground lines by depth from finish grade and by accurate horizontal offset distances to permanent surface improvements such as buildings, curbs, or edges of walks.
- (c) This clause shall be included in all subcontracts at any tier. It shall be the responsibility of the Contractor to ensure that all as-built drawings prepared by subcontractors are submitted to the Contracting Officer.
- 11. Material and Workmanship
- (a) All equipment, material, and articles furnished under this contract shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in this contract. References in the contract to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of, and as approved by the Contracting Officer, is equal to that named in the specifications, unless otherwise specifically provided in this contract.
- (b) Approval of equipment and materials.
  - (1) The Contractor shall obtain the Contracting Officer's approval of the machinery and mechanical and other equipment to be incorporated into the work. When requesting approval, the Contractor shall furnish to the Contracting Officer the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the

machinery and mechanical and other equipment. When required by this contract or by the Contracting Officer, the Contractor shall also obtain the Contracting Officer's approval of the material or articles which the Contractor contemplates incorporating into the work. When requesting approval, the Contractor shall provide full information concerning the material or articles. Machinery, equipment, material, and articles that do not have the required approval shall be installed or used at the risk of subsequent rejection.

- (2) When required by the specifications or the Contracting Officer, the Contractor shall submit appropriately marked samples (and certificates related to them) for approval at the Contractor's expense, with all shipping charges prepaid. The Contractor shall label, or otherwise properly mark on the container, the material or product represented, its place of origin, the name of the producer, the Contractor's name, and the identification of the construction project for which the material or product is intended to be used.
- (3) Certificates shall be submitted in triplicate, describing each sample submitted for approval and certifying that the material, equipment or accessory complies with contract requirements. The certificates shall include the name and brand of the product, name of manufacturer, and the location where produced.
- (4) Approval of a sample shall not constitute a waiver of the PHA right to demand full compliance with contract requirements. Materials, equipment and accessories may be rejected for cause even though samples have been approved.
- (5) Wherever materials are required to comply with recognized standards or specifications, such specifications shall be accepted as establishing the technical qualities and testing methods, but shall not govern the number of tests required to be made nor modify other contract requirements. The Contracting Officer may require laboratory test reports on items submitted for approval or may approve materials on the basis of data submitted in certificates with samples. Check tests will be made on materials delivered for use only as frequently as the Contracting Officer determines necessary to insure compliance of materials with the specifications. The Contractor will assume all costs of retesting materials which fail to meet contract requirements and/or testing materials offered in substitution for those found deficient.
- (6) After approval, samples will be kept in the Project office until completion of work. They may be built into the work after a substantial quantity of the materials they represent has been built in and accepted.
- (c) Requirements concerning lead-based paint. The Contractor shall comply with the requirements concerning lead-based paint contained in the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4821-4846) as implemented by 24 CFR Part 35.
- 12. Permits and Codes
- (a) The Contractor shall give all notices and comply with all applicable laws, ordinances, codes, rules and regulations. Notwithstanding the requirement of the Contractor to comply with the drawings and specifications in the contract, all work installed shall comply with all applicable codes and regulations as amended by any

waivers. Before installing the work, the Contractor shall examine the drawings and the specifications for compliance with applicable codes and regulations bearing on the work and shall immediately report any discrepancy it may discover to the Contracting Officer. Where the requirements of the drawings and specifications fail to comply with the applicable code or regulation, the Contracting Officer shall modify the contract by change order pursuant to the clause entitled Changes herein to conform to the code or regulation.

- (b) The Contractor shall secure and pay for all permits, fees, and licenses necessary for the proper execution and completion of the work. Where the PHA can arrange for the issuance of all or part of these permits, fees and licenses, without cost to the Contractor, the contract amount shall be reduced accordingly.
- 13. Health, Safety, and Accident Prevention
- (a) In performing this contract, the Contractor shall:
  - (1) Ensure that no laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his/her health and/or safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation;
  - (2) Protect the lives, health, and safety of other persons;
  - (3) Prevent damage to property, materials, supplies, and equipment; and,
  - (4) Avoid work interruptions.
- (b) For these purposes, the Contractor shall:
  - (1) Comply with regulations and standards issued by the Secretary of Labor at 29 CFR Part 1926. Failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act (Public Law 91-54, 83 Stat. 96), 40 U.S.C. 3701 et seq.; and
  - (2) Include the terms of this clause in every subcontract so that such terms will be binding on each subcontractor.
- (c) The Contractor shall maintain an accurate record of exposure data on all accidents incident to work performed under this contract resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment, and shall report this data in the manner prescribed by 29 CFR Part 1904.
- (d) The Contracting Officer shall notify the Contractor of any noncompliance with these requirements and of the corrective action required. This notice, when delivered to the Contractor or the Contractor's representative at the site of the work, shall be deemed sufficient notice of the noncompliance and corrective action required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to take corrective action promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not base any claim or request for equitable adjustment for additional time or money on any stop order issued under these circumstances.
- (e) The Contractor shall be responsible for its subcontractors' compliance with the provisions of this clause. The Contractor shall take such action with respect to any subcontract as the PHA, the Secretary of Housing and Urban Development, or the Secretary of Labor shall direct as a means of enforcing such provisions.

#### 14. Temporary Heating

The Contractor shall provide and pay for temporary heating, covering, and enclosures necessary to properly protect all work and materials against damage by dampness and cold, to dry out the work, and to facilitate the completion of the work. Any permanent heating equipment used shall be turned over to the PHA in the condition and at the time required by the specifications.

- 15. Availability and Use of Utility Services
- (a) The PHA shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the PHA or, where the utility is produced by the PHA, at reasonable rates determined by the Contracting Officer. The Contractor shall carefully conserve any utilities furnished without charge.
- (b) The Contractor, at its expense and in a manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. Before final acceptance of the work by the PHA, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.
- 16. Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements
- (a) The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed under this contract, and which do not unreasonably interfere with the work required under this contract.
- (b) The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during performance of this contract, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.
- (c) The Contractor shall protect from damage all existing improvements and utilities (1) at or near the work site and (2) on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. Prior to disturbing the ground at the construction site, the Contractor shall ensure that all underground utility lines are clearly marked.
- (d) The Contractor shall shore up, brace, underpin, secure, and protect as necessary all foundations and other parts of existing structures adjacent to, adjoining, and in the vicinity of the site, which may be affected by the excavations or other operations connected with the construction of the project.
- (e) Any equipment temporarily removed as a result of work under this contract shall be protected, cleaned, and replaced in the same condition as at the time of award of this contract.

- (f) New work which connects to existing work shall correspond in all respects with that to which it connects and/or be similar to existing work unless otherwise required by the specifications.
- (g) No structural members shall be altered or in any way weakened without the written authorization of the Contracting Officer, unless such work is clearly specified in the plans or specifications.
- (h) If the removal of the existing work exposes discolored or unfinished surfaces, or work out of alignment, such surfaces shall be refinished, or the material replaced as necessary to make the continuous work uniform and harmonious. This, however, shall not be construed to require the refinishing or reconstruction of dissimilar finishes previously exposed, or finished surfaces in good condition, but in different planes or on different levels when brought together by the removal of intervening work, unless such refinishing or reconstruction is specified in the plans or specifications.
- (i) The Contractor shall give all required notices to any adjoining or adjacent property owner or other party before the commencement of any work.
- (j) The Contractor shall indemnify and save harmless the PHA from any damages on account of settlement or the loss of lateral support of adjoining property, any damages from changes in topography affecting drainage, and from all loss or expense and all damages for which the PHA may become liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.
- (k) The Contractor shall repair any damage to vegetation, structures, equipment, utilities, or improvements, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

#### 17. Temporary Buildings and Transportation of Materials

- (a) Temporary buildings (e.g., storage sheds, shops, offices, sanitary facilities) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the PHA. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.
- (b) The Contractor shall, as directed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any federal, state, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

#### 18. Clean Air and Water

The contactor shall comply with the Clean Air Act, as amended, 42 USC 7401 et seq., the Federal Water Pollution Control Water Act, as amended, 33 U.S.C. 1251 et seq., and standards issued pursuant thereto in the facilities in which this contract is to be performed.

#### 19. Energy Efficiency

The Contractor shall comply with mandatory standards and policies relating to energy efficiency which are contained in the energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub.L. 94-163) for the State in which the work under the contract is performed.

#### 20. Inspection and Acceptance of Construction

- (a) Definitions. As used in this clause -
- (1) "Acceptance" means the act of an authorized representative of the PHA by which the PHA approves and assumes ownership of the work performed under this contract. Acceptance may be partial or complete.
  (2) "Inspection" means examining and testing the work performed under the contract (including, when appropriate, raw materials, equipment, components, and intermediate assemblies) to determine whether it conforms to contract requirements.
  (3) "Testing" means that element of inspection that determines the properties or elements, including functional operation of materials, equipment, or their components, by the application of established scientific principles and procedures.
- (b) The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work performed under the contract conforms to contract requirements. All work is subject to PHA inspection and test at all places and at all reasonable times before acceptance to ensure strict compliance with the terms of the contract.
- (c) PHA inspections and tests are for the sole benefit of the PHA and do not: (1) relieve the Contractor of responsibility for providing adequate quality control measures; (2) relieve the Contractor of responsibility for loss or damage of the material before acceptance; (3) constitute or imply acceptance; or, (4) affect the continuing rights of the PHA after acceptance of the completed work under paragraph (j) below.
- (d) The presence or absence of the PHA inspector does not relieve the Contractor from any contract requirement, nor is the inspector authorized to change any term or condition of the specifications without the Contracting Officer's written authorization. All instructions and approvals with respect to the work shall be given to the Contractor by the Contracting Officer.
- (e) The Contractor shall promptly furnish, without additional charge, all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by the Contracting Officer. The PHA may charge to the Contractor any additional cost of inspection or test when work is not ready at the time specified by the Contractor for inspection or test, or when prior rejection makes reinspection or retest necessary. The PHA shall perform all inspections and tests in a manner that will not unnecessarily delay the work. Special, full size, and performance tests shall be performed as described in the contract.

- (f) The PHA may conduct routine inspections of the construction site on a daily basis.
- (g) The Contractor shall, without charge, replace or correct work found by the PHA not to conform to contract requirements, unless the PHA decides that it is in its interest to accept the work with an appropriate adjustment in contract price. The Contractor shall promptly segregate and remove rejected material from the premises.
- (h) If the Contractor does not promptly replace or correct rejected work, the PHA may (1) by contract or otherwise, replace or correct the work and charge the cost to the Contractor, or (2) terminate for default the Contractor's right to proceed.
- (i) If any work requiring inspection is covered up without approval of the PHA, it must, if requested by the Contracting Officer, be uncovered at the expense of the Contractor. If at any time before final acceptance of the entire work, the PHA considers it necessary or advisable, to examine work already completed by removing or tearing it out, 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 its subcontractors, the Contractor shall defray all the expenses of the examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the contract, the Contracting Officer shall make an equitable adjustment to cover the cost of the examination and reconstruction, including, if completion of the work was thereby delayed, an extension of time.
- (j) The Contractor shall notify the Contracting Officer, in writing, as to the date when in its opinion all or a designated portion of the work will be substantially completed and ready for inspection. If the Architect determines that the state of preparedness is as represented, the PHA will promptly arrange for the inspection. Unless otherwise specified in the contract, the PHA shall accept, as soon as practicable after completion and inspection, all work required by the contract or that portion of the work the Contracting Officer determines and designates can be accepted separately. Acceptance shall be final and conclusive except for latent defects, fraud, gross mistakes amounting to fraud, or the PHA's right under any warranty or guarantee.

#### 21. Use and Possession Prior to Completion

- (a) The PHA shall have the right to take possession of or use any completed or partially completed part of the work. Before taking possession of or using any work, the Contracting Officer shall furnish the Contractor a list of items of work remaining to be performed or corrected on those portions of the work that the PHA intends to take possession of or use. However, failure of the Contracting Officer to list any item of work shall not relieve the Contractor of responsibility for complying with the terms of the contract. The PHA's possession or use shall not be deemed an acceptance of any work under the contract.
- (b) While the PHA has such possession or use, the Contractor shall be relieved of the responsibility for (1) the loss of or damage to the work resulting from the PHA's possession or use, notwithstanding the terms of the clause entitled Permits and Codes herein; (2) all maintenance costs on the areas occupied; and, (3) furnishing heat, light, power, and water used in the areas

occupied without proper remuneration therefore. If prior possession or use by the PHA delays the progress of the work or causes additional expense to the Contractor, an equitable adjustment shall be made in the contract price or the time of completion, and the contract shall be modified in writing accordingly.

#### 22. Warranty of Title

The Contractor warrants good title to all materials, supplies, and equipment incorporated in the work and agrees to deliver the premises together with all improvements thereon free from any claims, liens or charges, and agrees further that neither it nor any other person, firm or corporation shall have any right to a lien upon the premises or anything appurtenant thereto.

#### 23. Warranty of Construction

- (a) In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (j) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or workmanship performed by the Contractor or any subcontractor or supplier at any tier. This warranty shall continue for a period of (one year unless otherwise indicated) from the date of final acceptance of the work. If the PHA takes possession of any part of the work before final acceptance, this warranty shall continue for a period of (one year unless otherwise indicated) from the date that the PHA takes possession.
- (b) The Contractor shall remedy, at the Contractor's expense, any failure to conform, or any defect. In addition, the Contractor shall remedy, at the Contractor's expense, any damage to PHA-owned or controlled real or personal property when the damage is the result of—
   (1) The Contractor of the personal property of the personal personal property of the personal personal
  - The Contractor's failure to conform to contract requirements; or
  - (2) Any defects of equipment, material, workmanship or design furnished by the Contractor.
- (c) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for (one year unless otherwise indicated) from the date of repair or replacement.
- (d) The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect or damage.
- (e) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the PHA shall have the right to replace, repair or otherwise remedy the failure, defect, or damage at the Contractor's expense.
- (f) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall:
  - (1) Obtain all warranties that would be given in normal commercial practice;
  - (2) Require all warranties to be executed in writing, for the benefit of the PHA; and,
- (3) Enforce all warranties for the benefit of the PHA.
- (g) In the event the Contractor's warranty under paragraph (a) of this clause has expired, the PHA may bring suit at its own expense to enforce a subcontractor's, manufacturer's or supplier's warranty.

- (h) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defect of material or design furnished by the PHA nor for the repair of any damage that results from any defect in PHA furnished material or design.
- (i) Notwithstanding any provisions herein to the contrary, the establishment of the time periods in paragraphs (a) and (c) above relate only to the specific obligation of the Contractor to correct the work, and have no relationship to the time within which its obligation to comply with the contract may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to its obligation other than specifically to correct the work.
- (j) This warranty shall not limit the PHA's rights under the Inspection and Acceptance of Construction clause of this contract with respect to latent defects, gross mistakes or fraud.
- 24. Prohibition Against Liens

The Contractor is prohibited from placing a lien on the PHA's property. This prohibition shall apply to all subcontractors at any tier and all materials suppliers.

#### Administrative Requirements

25. Contract Period

this contract within calendar days of the effective date of the contract, or within the time schedule established in the notice to proceed issued by the Contracting Officer.

26. Order of Provisions

In the event of a conflict between these General Conditions and the Specifications, the General Conditions shall prevail. In the event of a conflict between the contract and any applicable state or local law or regulation, the state or local law or regulation shall prevail; provided that such state or local law or regulation does not conflict with, or is less restrictive than applicable federal law, regulation, or Executive Order. In the event of such a conflict, applicable federal law, regulation, and Executive Order shall prevail.

#### 27. Payments

- (a) The PHA shall pay the Contractor the price as provided in this contract.
- (b) The PHA shall make progress payments approximately every 30 days as the work proceeds, on estimates of work accomplished which meets the standards of quality established under the contract, as approved by the Contracting Officer. The PHA may, subject to written determination and approval of the Contracting Officer, make more frequent payments to contractors which are qualified small businesses.
- (c) Before the first progress payment under this contract, the Contractor shall furnish, in such detail as requested by the Contracting Officer, a breakdown of the total contract price showing the amount included therein for each principal category of the work, which shall substantiate the payment amount requested in order to provide a

basis for determining progress payments. The breakdown shall be approved by the Contracting Officer and must be acceptable to HUD. If the contract covers more than one project, the Contractor shall furnish a separate breakdown for each. The values and quantities employed in making up this breakdown are for determining the amount of progress payments and shall not be construed as a basis for additions to or deductions from the contract price. The Contractor shall prorate its overhead and profit over the construction period of the contract.

(d) The Contractor shall submit, on forms provided by the PHA, periodic estimates showing the value of the work performed during each period based upon the approved

submitted not later than \_\_\_\_\_ days in advance of the date set for payment and are subject to correction and revision as required. The estimates must be approved by the Contracting Officer with the concurrence of the Architect prior to payment. If the contract covers more than one project, the Contractor shall furnish a separate progress payment estimate for each.

- (e) Along with each request for progress payments and the required estimates, the Contractor shall furnish the following certification, or payment shall not be made: I hereby certify, to the best of my knowledge and belief, that:
  - The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the contract;
  - (2) Payments to subcontractors and suppliers have been made from previous payments received under the contract, and timely payments will be made from the proceeds of the payment covered by this certification, in accordance with subcontract agreements; and,
  - (3) This request for progress payments does not include any amounts which the prime contractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of the subcontract.

Name:

Title:

Date:

- (f) Except as otherwise provided in State law, the PHA shall retain ten (10) percent of the amount of progress payments until completion and acceptance of all work under the contract; except, that if upon completion of 50 percent of the work, the Contracting Officer, after consulting with the Architect, determines that the Contractor's performance and progress are satisfactory, the PHA may make the remaining payments in full for the work subsequently completed. If the Contractor's performance and progress are unsatisfactory, the PHA shall reinstate the ten (10) percent (or other percentage as provided in State law) retainage until such time as the Contracting Officer determines that performance and progress are satisfactory.
- (g) The Contracting Officer may authorize material delivered on the site and preparatory work done to be taken into consideration when computing progress payments.

Material delivered to the Contractor at locations other than the site may also be taken into consideration if the Contractor furnishes satisfactory evidence that (1) it has acquired title to such material; (2) the material is properly stored in a bonded warehouse, storage yard, or similar suitable place as may be approved by the Contracting Officer; (3) the material is insured to cover its full value; and (4) the material will be used to perform this contract. Before any progress payment which includes delivered material is made, the Contractor shall furnish such documentation as the Contracting Officer may require to assure the protection of the PHA's interest in such materials. The Contractor shall remain responsible for such stored material notwithstanding the transfer of title to the PHA.

- (h) All material and work covered by progress payments made shall, at the time of payment become the sole property of the PHA, but this shall not be construed as (1) relieving the Contractor from the sole responsibility for all material and work upon which payments have been made or the restoration of any damaged work; or, (2) waiving the right of the PHA to require the fulfillment of all of the terms of the contract. In the event the work of the Contractor has been damaged by other contractors or persons other than employees of the PHA in the course of their employment, the Contractor shall restore such damaged work without cost to the PHA and to seek redress for its damage only from those who directly caused it.
- (i) The PHA shall make the final payment due the Contractor under this contract after (1) completion and final acceptance of all work; and (2) presentation of release of all claims against the PHA arising by virtue of this contract, other than claims, in stated amounts, that the Contractor has specifically excepted from the operation of the release. Each such exception shall embrace no more than one claim, the basis and scope of which shall be clearly defined. The amounts for such excepted claims shall not be included in the request for final payment. A release may also be required of the assignee if the Contractor's claim to amounts payable under this contract has been assigned.
- (j) Prior to making any payment, the Contracting Officer may require the Contractor to furnish receipts or other evidence of payment from all persons performing work and supplying material to the Contractor, if the Contracting Officer determines such evidence is necessary to substantiate claimed costs.
- (k) The PHA shall not; (1) determine or adjust any claims for payment or disputes arising there under between the Contractor and its subcontractors or material suppliers; or, (2) withhold any moneys for the protection of the subcontractors or material suppliers. The failure or refusal of the PHA to withhold moneys from the Contractor shall in nowise impair the obligations of any surety or sureties under any bonds furnished under this contract.

#### 28. Contract Modifications

- (a) Only the Contracting Officer has authority to modify any term or condition of this contract. Any contract modification shall be authorized in writing.
- (b) The Contracting Officer may modify the contract unilaterally (1) pursuant to a specific authorization stated in a contract clause (e.g., Changes); or (2) for administrative matters which do not change the rights or

responsibilities of the parties (e.g., change in the PHA address). All other contract modifications shall be in the form of supplemental agreements signed by the Contractor and the Contracting Officer.

(c) When a proposed modification requires the approval of HUD prior to its issuance (e.g., a change order that exceeds the PHA's approved threshold), such modification shall not be effective until the required approval is received by the PHA.

#### 29. Changes

- (a) The Contracting Officer may, at any time, without notice to the sureties, by written order designated or indicated to be a change order, make changes in the work within the general scope of the contract including changes:
  (1) In the specifications (including drawings and designs);
  (2) In the method or manner of performance of the work;
  - (3) PHA-furnished facilities, equipment, materials.
  - services, or site; or, (4) Directing the acceleration in the performanc
  - (4) Directing the acceleration in the performance of the work.
- (b) Any other written order or oral order (which, as used in this paragraph (b), includes direction, instruction, interpretation, or determination) from the Contracting Officer that causes a change shall be treated as a change order under this clause; provided, that the Contractor gives the Contracting Officer written notice stating (1) the date, circumstances and source of the order and (2) that the Contractor regards the order as a change order.
- (c) Except as provided in this clause, no order, statement or conduct of the Contracting Officer shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment.
- (d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for the performance of any part of the work under this contract, whether or not changed by any such order, the Contracting Officer shall make an equitable adjustment and modify the contract in writing. However, except for a adjustment based on defective specifications, no proposal for any change under paragraph (b) above shall be allowed for any costs incurred more than 20 days (5 days for oral orders) before the Contractor gives written notice as required. In the case of defective specifications for which the PHA is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with the defective specifications.
- (e) The Contractor must assert its right to an adjustment under this clause within 30 days after (1) receipt of a written change order under paragraph (a) of this clause, or (2) the furnishing of a written notice under paragraph (b) of this clause, by submitting a written statement describing the general nature and the amount of the proposal. If the facts justify it, the Contracting Officer may extend the period for submission. The proposal may be included in the notice required under paragraph (b) above. No proposal by the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.
- (f) The Contractor's written proposal for equitable adjustment shall be submitted in the form of a lump sum proposal supported with an itemized breakdown of all increases and decreases in the contract in at least the following details:

- (1) Direct Costs. Materials (list individual items, the quantity and unit cost of each, and the aggregate cost); Transportation and delivery costs associated with materials; Labor breakdowns by hours or unit costs (identified with specific work to be performed); Construction equipment exclusively necessary for the change; Costs of preparation and/ or revision to shop drawings resulting from the change; Worker's Compensation and Public Liability Insurance; Employment taxes under FICA and FUTA; and, Bond Costs when size of change warrants revision.
- (2)Indirect Costs. Indirect costs may include overhead, general and administrative expenses, and fringe benefits not normally treated as direct costs.
- (3)Profit. The amount of profit shall be negotiated and may vary according to the nature, extent, and complexity of the work required by the change. The

allowability of the direct and indirect costs shall be determined in accordance with the Contract Cost Principles and Procedures for Commercial Firms in Part 31 of the Federal Acquisition Regulation (48 CFR 1-31), as implemented by HUD Handbook 2210.18, in effect on the date of this contract. The Contractor shall not be allowed a profit on the profit received by any subcontractor. Equitable adjustments for deleted work shall include a credit for profit and may include a credit for indirect costs. On proposals covering both increases and decreases in the amount of the contract, the application of indirect costs for the Contractor or subcontractor performing the work.

- (g) The Contractor shall include in the proposal its request for time extension (if any), and shall include sufficient information and dates to demonstrate whether and to what extent the change will delay the completion of the contract in its entirety.
- (h) The Contracting Officer shall act on proposals within 30 days after their receipt, or notify the Contractor of the date when such action will be taken.
- (i) Failure to reach an agreement on any proposal shall be a dispute under the clause entitled Disputes herein. Nothing in this clause, however, shall excuse the Contractor from proceeding with the contract as changed.
- (j) Except in an emergency endangering life or property, no change shall be made by the Contractor without a prior order from the Contracting Officer.

#### 30. Suspension of Work

- (a) The Contracting Officer may order the Contractor in writing to suspend, delay, or interrupt all or any part of the work of this contract for the period of time that the Contracting Officer determines appropriate for the convenience of the PHA.
- (b) If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted (1) by an act of the Contracting Officer in the administration of this contract, or (2) by the Contracting Officer's failure to act within the time specified (or within a reasonable time if not specified) in this contract an adjustment shall be made for any increase in the cost of performance of the contract (excluding profit) necessarily caused by such unreasonable suspension, delay, or interruption and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that performance would have

been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor or for which any equitable adjustment is provided for or excluded under any other provision of this contract.

(c) A claim under this clause shall not be allowed (1) for any costs incurred more than 20 days before the Contractor shall have notified the Contracting Officer in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension order); and, (2) unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of the suspension, delay, or interruption, but not later than the date of final payment under the contract.

#### 31. Disputes

- (a) "Claim," as used in this clause, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to the contract. A claim arising under the contract, unlike a claim relating to the contract, is a claim that can be resolved under a contract clause that provides for the relief sought by the claimant. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim. The submission may be converted to a claim by complying with the requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.
- (b) Except for disputes arising under the clauses entitled Labor Standards - Davis Bacon and Related Acts, herein, all disputes arising under or relating to this contract, including any claims for damages for the alleged breach thereof which are not disposed of by agreement, shall be resolved under this clause.
- (c) All claims by the Contractor shall be made in writing and submitted to the Contracting Officer for a written decision. A claim by the PHA against the Contractor shall be subject to a written decision by the Contracting Officer.
- (d) The Contracting Officer shall, within 60 (unless otherwise indicated) days after receipt of the request, decide the claim or notify the Contractor of the date by which the decision will be made.
- (e) The Contracting Officer's decision shall be final unless the Contractor (1) appeals in writing to a higher level in the PHA in accordance with the PHA's policy and procedures, (2) refers the appeal to an independent mediator or arbitrator, or (3) files suit in a court of competent jurisdiction. Such appeal must be made within (30 unless otherwise indicated) days after receipt of the Contracting Officer's decision.
- (f) The Contractor shall proceed diligently with performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under or relating to the contract, and comply with any decision of the Contracting Officer.

#### 32. Default

(a) If the Contractor refuses or fails to prosecute the work, or any separable part thereof, with the diligence that will insure its completion within the time specified in this contract, or any extension thereof, or fails to complete said work within this time, the Contracting Officer may, by written notice to the Contractor, terminate the right to proceed with the work (or separable part of the work) that has been delayed. In this event, the PHA may take over the work and complete it, by contract or otherwise, and may take possession of and use any materials, equipment, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any damage to the PHA resulting from the Contractor's refusal or failure to complete the work within the specified time, whether or not the Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by the PHA in completing the work.

- (b) The Contractor's right to proceed shall not be terminated or the Contractor charged with damages under this clause if—
  - (1) The delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include (i) acts of God, or of the public enemy, (ii) acts of the PHA or other governmental entity in either its sovereign or contractual capacity, (iii) acts of another contractor in the performance of a contract with the PHA, (iv) fires, (v) floods, (vi) epidemics, (vii) quarantine restrictions, (viii) strikes, (ix) freight embargoes, (x) unusually severe weather, or (xi) delays of subcontractors or suppliers at any tier arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and the subcontractors or suppliers; and
  - (2) The Contractor, within days (10 days unless otherwise indicated) from the beginning of such delay (unless extended by the Contracting Officer) notifies the Contracting Officer in writing of the causes of delay. The Contracting Officer shall ascertain the facts and the extent of the delay. If, in the judgment of the Contracting Officer, the findings of fact warrant such action, time for completing the work shall be extended by written modification to the contract. The findings of the Contracting Officer shall be reduced to a written decision which shall be subject to the provisions of the Disputes clause of this contract.
- (c) If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been for convenience of the PHA.

#### 33. Liquidated Damages

- (a) If the Contractor fails to complete the work within the time specified in the contract, or any extension, as specified in the clause entitled Default of this contract, the Contractor shall pay to the PHA as liquidated damages, the sum of <u>Contracting Officer insert amount</u>] for each day of delay. If different completion dates are specified in the contract for separate parts or stages of the work, the amount of liquidated damages shall be assessed on those parts or stages which are delayed. To the extent that the Contractor's delay or nonperformance is excused under another clause in this contract, liquidated damages shall not be due the PHA. The Contractor remains liable for damages caused other than by delay.
- (b) If the PHA terminates the Contractor's right to proceed, the resulting damage will consist of liquidated damages until such reasonable time as may be required for final

completion of the work together with any increased costs occasioned the PHA in completing the work.

(c) If the PHA does not terminate the Contractor's right to proceed, the resulting damage will consist of liquidated damages until the work is completed or accepted.

#### 34. Termination for Convenience

- (a) The Contracting Officer may terminate this contract in whole, or in part, whenever the Contracting Officer determines that such termination is in the best interest of the PHA. Any such termination shall be effected by delivery to the Contractor of a Notice of Termination specifying the extent to which the performance of the work under the contract is terminated, and the date upon which such termination becomes effective.
- (b) If the performance of the work is terminated, either in whole or in part, the PHA shall be liable to the Contractor for reasonable and proper costs resulting from such termination upon the receipt by the PHA of a properly presented claim setting out in detail: (1) the total cost of the work performed to date of termination less the total amount of contract payments made to the Contractor; (2) the cost (including reasonable profit) of settling and paying claims under subcontracts and material orders for work performed and materials and supplies delivered to the site, payment for which has not been made by the PHA to the Contractor or by the Contractor to the subcontractor or supplier; (3) the cost of preserving and protecting the work already performed until the PHA or assignee takes possession thereof or assumes responsibility therefore; (4) the actual or estimated cost of legal and accounting services reasonably necessary to prepare and present the termination claim to the PHA: and (5) an amount constituting a reasonable profit on the value of the work performed by the Contractor.
- (c) The Contracting Officer will act on the Contractor's claim within days (60 days unless otherwise indicated) of receipt of the Contractor's claim.
- (d) Any disputes with regard to this clause are expressly made subject to the provisions of the Disputes clause of this contract.

#### 35. Assignment of Contract

The Contractor shall not assign or transfer any interest in this contract; except that claims for monies due or to become due from the PHA under the contract may be assigned to a bank, trust company, or other financial institution. Such assignments of claims shall only be made with the written concurrence of the Contracting Officer. If the Contractor is a partnership, this contract shall inure to the benefit of the surviving or remaining member(s) of such partnership as approved by the Contracting Officer.

#### 36. Insurance

- (a) Before commencing work, the Contractor and each subcontractor shall furnish the PHA with certificates of insurance showing the following insurance is in force and will insure all operations under the Contract:
  - (1) Workers' Compensation, in accordance with state or Territorial Workers' Compensation laws.
  - (2) Commercial General Liability with a combined single limit for bodily injury and property damage of not less than\$ \_\_\_\_\_ [Contracting Officer insert amount]

per occurrence to protect the Contractor and each subcontractor against claims for bodily injury or death and damage to the property of others. This shall cover the use of all equipment, hoists, and vehicles on the site(s) not covered by Automobile Liability under (3) below. If the Contractor has a "claims made" policy, then the following additional requirements apply: the policy must provide a "retroactive date" which must be on or before the execution date of the Contract; and the extended reporting period may not be less than five years

- following the completion date of the Contract.
  (3) Automobile Liability on owned and non -owned motor vehicles used on the site(s) or in connection therewith for a combined single limit for bodily injury and property damage of not less than \$ \_\_\_\_\_\_
- [Contracting Officer insert amount] per occurrence. (b) Before commencing work, the Contractor shall furnish the
- PHA with a certificate of insurance evidencing that Builder's Risk (fire and extended coverage) Insurance on all work in place and/or materials stored at the building site(s), including foundations and building equipment, is in force. The Builder's Risk Insurance shall be for the benefit of the Contractor and the PHA as their interests may appear and each shall be named in the policy or policies as an insured. The Contractor in installing equipment supplied by the PHA shall carry insurance on such equipment from the time the Contractor takes possession thereof until the Contract work is accepted by the PHA. The Builder's Risk Insurance need not be carried on excavations, piers, footings, or foundations until such time as work on the superstructure is started. It need not be carried on landscape work. Policies shall furnish coverage at all times for the full cash value of all completed construction, as well as materials in place and/or stored at the site(s), whether or not partial payment has been made by the PHA. The Contractor may terminate this insurance on buildings as of the date taken over for occupancy by the PHA. The Contractor is not required to carry Builder's Risk Insurance for modernization work which does not involve structural alterations or additions and where the PHA's existing fire and extended coverage policy can be endorsed to include such work.
- (c) All insurance shall be carried with companies which are financially responsible and admitted to do business in the State in which the project is located. If any such insurance is due to expire during the construction period, the Contractor (including subcontractors, as applicable) shall not permit the coverage to lapse and shall furnish evidence of coverage to the Contracting Officer. All certificates of insurance, as evidence of coverage, shall provide that no coverage may be canceled or nonrenewed by the insurance company until at least 30 days prior written notice has been given to the Contracting Officer.

#### 37. Subcontracts

- (a) Definitions. As used in this contract -
  - (1) "Subcontract" means any contract, purchase order, or other purchase agreement, including modifications and change orders to the foregoing, entered into by a subcontractor to furnish supplies, materials, equipment, and services for the performance of the prime contract or a subcontract.

- (2) "Subcontractor" means any supplier, vendor, or firm that furnishes supplies, materials, equipment, or services to or for the Contractor or another subcontractor.
- (b) The Contractor shall not enter into any subcontract with any subcontractor who has been temporarily denied participation in a HUD program or who has been suspended or debarred from participating in contracting programs by any agency of the United States Government or of the state in which the work under this contract is to be performed.
- (c) The Contractor shall be as fully responsible for the acts or omissions of its subcontractors, and of persons either directly or indirectly employed by them as for the acts or omissions of persons directly employed by the Contractor.
- (d) The Contractor shall insert appropriate clauses in all subcontracts to bind subcontractors to the terms and conditions of this contract insofar as they are applicable to the work of subcontractors.
- (e) Nothing contained in this contract shall create any contractual relationship between any subcontractor and the PHA or between the subcontractor and HUD.

#### 38. Subcontracting with Small and Minority Firms, Women's Business Enterprise, and Labor Surplus Area Firms

The Contractor shall take the following steps to ensure that, whenever possible, subcontracts are awarded to small business firms, minority firms, women's business enterprises, and labor surplus area firms:

- (a) Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
- (b) Ensuring that small and minority businesses and women's business enterprises are solicited whenever they are potential sources;
- (c) Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses and women's business enterprises;
- (d) Establishing delivery schedules, where the requirements of the contract permit, which encourage participation by small and minority businesses and women's business enterprises; and
- (e) Using the services and assistance of the U.S. Small Business Administration, the Minority Business Development Agency of the U.S. Department of Commerce, and State and local governmental small business agencies.

#### **39. Equal Employment Opportunity**

During the performance of this contract, the Contractor/ Seller agrees as follows:

- (a) The Contractor/Seller shall not discriminate against any employee or applicant for employment because of of race color, religion, sex, sexual orientation, gender identity, disability, or national origin.
- (b) The Contractor/Seller shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, disability, or national origin. Such action shall
- include, but not be limited to, (1) employment, (2) upgrading demotion, (4) transfer, (5) recruitment or

recruitment advertising, (6) layoff or termination, (7) rates of pay or other forms of compensation, and (8) selection for training including apprenticeshin (c) The Contractor/Seller agrees to post in conspicuous

places available to employees and applicants for employment the notices to be provided by the Contracting Officer setting

forth the provisions of this nondiscrimination clause. (d) The Contractor/Seller shall, in all solicitations or

- (d) The Contractor/Selier shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor/Seller, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.
- (e) The Contractor/Seller shall send, to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, the notice to be provided by the Contracting Officer advising the labor union or workers' representative of the Contractor's commitments under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.

(f) The Contractor/Seller shall comply with Executive Order 11246, as amended, and the rules, regulations, and orders of the Secretary of Labor.

(g) The Contractor/Seller shall furnish all information and reports required by Executive Order 11246, as amended, Section 503 of the Rehabilitation Act of 1973, as amended, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto. The Contractor/Seller shall permit

access to its books, records, and accounts by the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(h) In the event of a that the Contractor/Seller is in noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be canceled, terminated or suspended in whole or in part and the contractor/seller may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(i)The contractor/seller will include the provisions of paragraphs (a) through (h) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each sub[contractor/seller] or vendor. The [contractor/seller] will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions in cluding sanctions for noncompliance: Provided, however, that in the event the [contractor/seller] becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the [contractor/seller] may request the United States to enter into such litigation to protect the interests of the United States.

- (j) Compliance with the requirements of this clause shall be to the maximum extent consistent with, but not in derogation of, compliance with section 7(b) of the Indian Self-Determination and Education Assistance Act and the Indian Preference clause of this contract.
- 40. Employment, Training, and Contracting Opportunities for Low-Income Persons, Section 3 of the Housing and Urban Development Act of 1968.

- (a) The work to be performed under this contract is subject to the requirements of section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u (section 3). The purpose of section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by section 3, shall, to the greatest extent feasible, be directed to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.
- (b) The parties to this contract agree to comply with HUD's regulations in 24 CFR Part 135, which implement section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the Part 135 regulations.
- (c) The contractor agrees to send to each labor organization or representative of workers with which the contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the contractor's commitments under this section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.
- (d) The contractor agrees to include this section 3 clause in every subcontract subject to compliance with regulations in 24 CFR Part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR Part 135. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR Part 135.
- (e) The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR Part 135 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR Part 135.
- (f) Noncompliance with HUD's regulations in 24 CFR Part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.
- (g) With respect to work performed in connection with section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be given to Indians, and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of section 3 and section 7(b)agree to comply with section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

#### 41. Interest of Members of Congress

No member of or delegate to the Congress of the United States of America shall be admitted to any share or part of this contract or to any benefit that may arise therefrom.

# 42. Interest of Members, Officers, or Employees and Former Members, Officers, or Employees

No member, officer, or employee of the PHA, no member of the governing body of the locality in which the project is situated, no member of the governing body of the locality in which the PHA was activated, and no other public official of such locality or localities who exercises any functions or responsibilities with respect to the project, shall, during his or her tenure, or for one year thereafter, have any interest, direct or indirect, in this contract or the proceeds thereof.

#### 43. Limitations on Payments made to Influence Certain Federal Financial Transactions

- (a) The Contractor agrees to comply with Section 1352 of Title 31, United States Code which prohibits the use of Federal appropriated funds to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: the awarding of any Federal contract; the making of any Federal grant; the making of any Federal loan; the entering into of any cooperative agreement; or the modification of any Federal contract, grant, loan, or cooperative agreement.
- (b) The Contractor further agrees to comply with the requirement of the Act to furnish a disclosure (OMB Standard Form LLL, Disclosure of Lobbying Activities) if any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a Federal contract, grant, Ioan, or cooperative agreement.

#### 44. Royalties and Patents

The Contractor shall pay all royalties and license fees. It shall defend all suits or claims for infringement of any patent rights and shall save the PHA harmless from loss on account thereof; except that the PHA shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified and the Contractor has no reason to believe that the specified design, process, or product is an infringement. If, however, the Contractor has reason to believe that any design, process or product specified is an infringement of a patent, the Contractor shall promptly notify the Contracting Officer. Failure to give such notice shall make the Contractor responsible for resultant loss.

#### 45. Examination and Retention of Contractor's Records

- (a) The PHA, HUD, or Comptroller General of the United States, or any of their duly authorized representatives shall, until 3 years after final payment under this contract, have access to and the right to examine any of the Contractor's directly pertinent books, documents, papers, or other records involving transactions related to this contract for the purpose of making audit, examination, excerpts, and transcriptions.
- (b) The Contractor agrees to include in first-tier subcontracts under this contract a clause substantially the same as paragraph (a) above. "Subcontract," as used in this clause, excludes purchase orders not exceeding \$10,000.
- (c) The periods of access and examination in paragraphs (a) and (b) above for records relating to (1) appeals under the Disputes clause of this contract, (2) litigation or settlement of claims arising from the performance of this contract, or (3) costs and expenses of this contract to which the PHA, HUD, or Comptroller General or any of their duly authorized representatives has taken exception shall continue until disposition of such appeals, litigation, claims, or exceptions.

#### 46. Labor Standards - Davis-Bacon and Related Acts

If the total amount of this contract exceeds \$2,000, the Federal labor standards set forth in the clause below shall apply to the development or construction work to be performed under the contract.

#### (a) Minimum Wages.

(1) All laborers and mechanics employed under this contract in the development or construction of the project(s) involved 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 regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination 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. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the regular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits in the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein; provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall

be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

- (2) (i) Any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefor only when all the following criteria have been met: (A) The work to be performed by the classification requested is not performed by a classification in the wage determination; and (B) The classification is utilized in the area by the construction industry; and (C) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
  - (ii) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employee Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary.
  - (iii) In the event the Contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator of the Wage and Hour Division for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary.
  - (iv) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (a)(2)(ii) or (iii) of this clause shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in classification.
- (3) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
- (4) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the

amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program; provided, that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

- (b) Withholding of funds. HUD or its designee shall, upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same prime Contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working in the construction or development of the project, all or part of the wages required by the contract, HUD or its designee may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the Contractor. disburse such amounts withheld for and on account of the Contractor or subcontractor to the respective employees to whom they are due,
- (c) Payrolls and basic records.
  - (1) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working in the construction or development of the project. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made, and actual wages paid. Whenever the Secretary of Labor has found, under 29 CFR 5.5(a)(1)(iv), that the wages of any laborer or mechanic include the amount of costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

- (2) (i) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Contracting Officer for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under subparagraph (c)(1) of this clause. This information may be submitted in any form desired. Optional Form WH-347 (Federal Stock Number 029-005-00014-1) is available for this purpose and may be purchased from the Superintendent of
  - Documents, U.S. Government Printing Office, Washington, D.C. 20402. The Contractor is responsible for the submission of copies of payrolls by all subcontractors. (Approved by the Office of Management and Budget under OMB Control Number 1214-0149.)
  - (ii) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
    - (A) That the payroll for the payroll period contains the information required to be maintained under paragraph (c) (1) of this clause and that such information is correct and complete;
    - (B) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3; and
    - (C) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
  - (iii) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirements for submission of the "Statement of Compliance" required by subparagraph (c)(2)(ii) of this clause.
  - (iv) The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 3729 of Title 31 of the United States Code.
- (3) The Contractor or subcontractor shall make the records required under subparagraph (c)(1) available for inspection, copying, or transcription by authorized representatives of HUD or its designee, the Contracting Officer, or the Department of Labor and shall permit such representatives to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to

make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

- (d) (1) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship and Training, Employer and Labor Services (OATELS), or with a State Apprenticeship Agency recognized by OATELS, or if a person is employed in his or her first 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 OATELS or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in this paragraph, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator of the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event OATELS, or a State Apprenticeship Agency recognized by OATELS, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
  - (2) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they 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. The ratio of trainees to journeymen on the job site shall not be greater than permitted under

the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed in the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate in the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate in the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate in the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

- (3) Equal employment opportunity. The utilization of apprentices, trainees, and journeymen under this clause shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.
- (e) Compliance with Copeland Act requirements. The Contractor shall comply with the requirements of 29 CFR Part 3, which are hereby incorporated by reference in this contract.
- (f) Contract termination; debarment. A breach of this contract clause may be grounds for termination of the contract and for debarment as a Contractor and a subcontractor as provided in 29 CFR 5.12.
- (g) Compliance with Davis-Bacon and related Act requirements. All rulings and interpretations of the Davis-Bacon and related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.
- (h) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this clause shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the PHA, HUD, the U.S. Department of Labor, or the employees or their representatives.
- (i) Certification of eligibility.
  - (1) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded contracts by the United States Government by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

- (2) No part of this contract shall be subcontracted to any person or firm ineligible for award of a United States Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (3) The penalty for making false statements is prescribed in the U. S. Criminal Code, 18 U.S.C. 1001.
- (j) Contract Work Hours and Safety Standards Act. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.
  - (1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics, including watchmen and guards, shall require or permit any such laborer or mechanic in any workweek in which the individual is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.
  - (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the provisions set forth in subparagraph (j)(1) of this clause, the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic (including watchmen and guards) employed in violation of the provisions set forth in subparagraph (j)(1) of this clause, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by provisions set forth in subparagraph (j)(1) of this clause.
  - (3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or subcontractor under any such contract or any Federal contract with the same prime Contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the provisions set forth in subparagraph (j)(2) of this clause.
- (k) Subcontracts. The Contractor or subcontractor shall insert in any subcontracts all the provisions contained in this clause, and such other clauses as HUD or its designee may by appropriate instructions require, and also a clause requiring the subcontractors to include these provisions in any lower tier subcontracts. The prime Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all these provisions.

#### 47. Non-Federal Prevailing Wage Rates

- (a) Any prevailing wage rate (including basic hourly rate and any fringe benefits), determined under State or tribal law to be prevailing, with respect to any employee in any trade or position employed under the contract, is inapplicable to the contract and shall not be enforced against the Contractor or any subcontractor, with respect to employees engaged under the contract whenever such non-Federal prevailing wage rate exceeds:
  - The applicable wage rate determined by the Secretary of Labor pursuant to the Davis-Bacon Act (40 U.S.C. 3141 et seq.) to be prevailing in the locality with respect to such trade;
- (b) An applicable apprentice wage rate based thereon specified in an apprenticeship program registered with the U.S. Department of Labor (DOL) or a DOLrecognized State Apprenticeship Agency; or
- (c) An applicable trainee wage rate based thereon specified in a DOL-certified trainee program.
- 48. Procurement of Recovered Materials.
- (a) In accordance with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, the Contractor shall procure items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR Part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition. The Contractor shall procure items designated in the EPA guidelines that contain the highest percentage of recovered materials practicable unless the Contractor determines that such items: (1) are not reasonably available in a reasonable period of time; (2) fail to meet reasonable performance standards, which shall be determined on the basis of the guidelines of the National Institute of Standards and Technology, if applicable to the item; or (3) are only available at an unreasonable price.
- (b) Paragraph (a) of this clause shall apply to items purchased under this contract where: (1) the Contractor purchases in excess of \$10,000 of the item under this contract; or (2) during the preceding Federal fiscal year, the Contractor: (i) purchased any amount of the items for use under a contract that was funded with Federal appropriations and was with a Federal agency or a State agency or agency of a political subdivision of a State; and (ii) purchased a total of in excess of \$10,000 of the item both under and outside that contract.

#### U.S. Department of Housing and Urban Development Office of Public and Indian Housing

EXHIBIT B

Public reporting burden for this information collection is estimated to average 30 minutes. This includes the time for collecting, reviewing, and reporting data. The information requested is required to obtain a benefit. This form is used to ensure federal funds are not used to influence members of Congress. There are no assurances of confidentiality. HUD may not conduct or sponsor, and an applicant is not required to respond to a collection of information unless it displays a currently valid OMB control number.

Applicant Name

Program/Activity Receiving Federal Grant Funding

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, Disclosure Form to Report Lobbying, in accordance with its instructions. (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all sub recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

I hereby certify that all the information stated herein, as well as any information provided in the accompaniment herewith, is true and accurate. **Warning:** HUD will prosecute false claims and statements. Conviction may result in criminal and/or civil penalties. (18 U.S.C. 1001, 1010, 1012; 31 U.S.C. 3729, 3802)

Name of Authorized Official	Title	
Signature		Date (mm/dd/yyyy)

EXHIBIT C

DISCLOSURE	Approved by OMB			
Complete this form to disclose	0348-0046			
(See reverse for public burden disclosure.)				
1. Type of Federal Action: 2. Status of	Federal Action:	3. Report Type:		
a. contract	a. bid/offer/application	a. initial filing		
b. grant	b. initial award	b. material change		
c. cooperative agreement	c. post-award	For Material Change Only:		
d. Ioan		year quarter		
e. loan guarantee		date of last report		
f. loan insurance				
4. Name and Address of Reporting Entity:	5. If Reporting E	ntity in No. 4 is a Subawarde	e, Enter Name	
Prime Subawardee	and Address o	f Prime:		
Tier, <i>if known</i> :				
Congressional District, if known:	Congressional	Congressional District, if known:		
6. Federal Department/Agency:	7. Federal Progra	7. Federal Program Name/Description:		
	CFDA Number,	CFDA Number, <i>if applicable</i> :		
9 Endered Antion Number if known		O Award Amount if language		
o. rederal Action Number, Il known:	9. Award Amoun	9. Award Amount, if known:		
	\$			
10. a. Name and Address of Lobbying Regist	rant b. Individuals Pe	rforming Services (including	address if	
(if individual, last name, first name, MI):	different from	different from No. 10a)		
	(last name, firs	(last name, first name, MI):		
<b>11.</b> Information requested through this form is authorized by title 31 U.S.C 1352. This disclosure of lobbying activities is a material representation	section Signature:			
upon which reliance was placed by the tier above when this transaction w	Print Name:	Print Name:		

information will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and	Title:			
not more than \$100,000 for each such failure.	Telephone No.:	Date:		
Federal Use Only:		Authorized for Local Reproduction Standard Form III (Rev. 7-97)		
#### INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

- 1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
- 2. Identify the status of the covered Federal action.
- 3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.
- 4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
- 5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.
- 6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizationallevel below agency name, if known. For example, Department of Transportation, United States Coast Guard.
- 7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
- 8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."
- 9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
- 10. (a) Enter the full name, address, city, State and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.
  - (b) Enter the full names of the individual(s) performing services, and include full address if different from 10 (a). Enter Last Name, First Name, and Middle Initial (MI).
- 11. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB Control Number. The valid OMB control number for this information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, DC 20503.

Section 3 Business	Self-Certification
--------------------	--------------------

2.	Company Address:			
	City:	State:	Zip:	County:
3.	Telephone:	En	nail Address:	
4.	Business License:		Federal II	D#:
5.	Type of Business:			······
<u>TY</u>	PES OF SECTION 3 BUSINE	SS ENTERPRISES		
Ple de	ease check "Yes" or "No". I signate your company as a	f you answer "YES' Section 3 Busines	' to one or mor s Enterprise.	e of the following questions, you may
1.	51% or more of your bus	iness is owned by a	a Section 3 resi	dent*; or
	□Yes □No Attach list of Section 3 ov	vners and income o	certifications	
2.	At least 75% of labor hou within five years of the d resident; or Yes INO Attach list of employees	rs are worked by p ate of first employ Section 2 employe	persons that are ment with the	e currently Section 3 residents* or business concerned were Section 3
3.	At least 25% of the busine currently live in Section 8 ☐Yes ☐No Attach list of subcontract	ess is owned by cu -assisted housing ed businesses, type	rrent public ho	using residents or residents who
<b>/ERIFI</b> nform	<b>CATION</b> – The company he ation provided on this forn	reby agrees to pro າ.	vide, upon req	uest, documents verifying the
declar est of ertific	re and affirm under penalty my knowledge. I understa ation status.	y of law that the st nd that falsifying i	atements made	e herein are true and accurate to the l incomplete statements will disqualif

Signature of Business Owner or Authorized Representative

Date

\*Section 3 resident is: 1) a public housing, or 2) a HCVP participant, or 3) a resident of another federally assisted housing program managed by the local PHA, or 4) a low-or very low-income person residing in the metropolitan area or Non-metropolitan County in which the Section 3 covered assistance is expended. The income guidelines for the St. Cloud HRA jurisdiction are on the back of this form.

	1Person	2 Person	3 Person	4 Person	5 Person
				\$26 500	\$31.040
Extra Low	\$16,600	\$19,000	\$21,960	\$20,500	
				\$29.500	\$42,700
Very Low	\$27,650	\$31,600	\$35,550	133,500	<b>•</b> <i>·</i> <b>·</b> <i>·</i> <b>·</b> <i>·</i> <b>· · · · · · · · · ·</b>
			+========	¢62.200	\$68,300
Low	\$44,250	\$50,600	\$56,900	\$03,200	<i>ç</i> 00,0

# SECTION 3 INCOMES LIMITS - FY 2021

.

# **RESPONSIBLE CONTRACTOR VERIFICATION OF COMPLIANCE** St. Cloud Housing and Redevelopment Authority

The purpose of this document is to certify contractor compliance with Minnesota Statutes, Section 16C.285, subdivision 3. Covered contractors must sign the certification below and if subcontractors will be used under the contract, must comply with subdivision 7 requirements as to subcontractors.

**Responsible Contractor, Minimum Criteria**. "Responsible Contractor" means a contractor that conforms to the responsibility requirements in the solicitation document for its portion of the work on the project and verifies that it meets the minimum criteria set forth below. Each contractor or subcontractor shall obtain from all subcontractors with which it will have a direct contractual relationship a signed statement under oath by an owner or officer verifying that they meet all of the minimum criteria in subdivision 3 prior to execution of a construction contract with each subcontractor.

- 1. The Contractor:
  - i. is in compliance with workers' compensation and unemployment insurance requirements;
  - ii. is in compliance with the Department of Revenue and the Department of Employment and Economic Development registration requirements if it has employees;
  - iii. has a valid federal tax identification number or a valid Social Security number if an individual; and
  - iv. has filed a certificate of authority to transact business in Minnesota with the secretary of state if a foreign corporation or cooperative.
- The contractor or related entity is in compliance with and, during the three-year period before submitting verification, has not violated section <u>177.24</u>, <u>177.25</u>, <u>177.41</u> to <u>177.44</u>, <u>181.03</u>, <u>181.101</u>, <u>181.13</u>, <u>181.14</u>, or <u>181.722</u>, and has not violated United States Code, <u>title 29</u>, <u>sections 201 to 219</u>, or United States Code, <u>title 40</u>, <u>section 3141 to 3148</u>. For purposes of this clause, a violation occurs when a contractor or related entity:
  - i. repeatedly fails to pay statutorily required wages or penalties on one or more separate projects for a total underpayment of \$25,000 or more within the three-year period, provided that a failure to pay is "repeated" only if it involves two or more separate and distinct occurrences of underpayment during the three-year period;
  - ii. has been issued an order to comply by the commissioner of labor and industry that has become final;
  - iii. has been issued at least two determination letters within the three-year period by the Department of Transportation finding an underpayment by the contractor or related entity to its own employees;
  - iv. has been found by the commissioner of labor and industry to have repeatedly or willfully violated any of the sections referenced in this clause pursuant to section <u>177.27</u>;
  - v. has been issued a ruling or findings of underpayment by the administrator of the Wage and Hour Division of the United States Department of Labor that have become final or have been upheld by an administrative law judge or the Administrative Review Board; or
  - vi. has been determined to have violated Minn. Stat. §§ 181.03 (prohibited wage practices and retaliation), 181.101 (payment of wages) or 609.52, subd. 2 (19) (criminal wage theft)
  - vii. has been found liable for underpayment of wages or penalties or misrepresenting a construction worker as an independent contractor in an action brought in a court having jurisdiction.

Provided that, if the contractor or related entity contests a determination of underpayment by the Department of Transportation in a contested case proceeding, a violation does not occur until the contested case proceeding has concluded with a determination that the contractor or related entity underpaid wages or penalties;\*

- 3. The contractor or related entity is in compliance with and, during the three-year period before submitting the verification, has not violated section <u>181.723</u> or chapter <u>326B</u>. For purposes of this clause, a violation occurs when a contractor or related entity has been issued a final administrative or licensing order;\*
- 4. The contractor or related entity has not, more than twice during the three-year period before submitting the verification, had a certificate of compliance under section <u>363A.36</u> revoked or suspended based on the provisions of section <u>363A.36</u>, with the revocation or suspension becoming final because it was upheld by the Office of Administrative Hearings or was not appealed to the office;\*
- 5. The contractor or related entity has not received a final determination assessing a monetary sanction from the Department of Administration or Transportation for failure to meet targeted group business, disadvantaged business enterprise, or veteran-owned business goals, due to a lack of good faith effort, more than once during the three-year period before submitting the verification; and\*
- 6. The contractor or related entity is not currently suspended or debarred by the federal government or the state of Minnesota or any of its departments, commissions, agencies, or political subdivisions that have authority to debar a contractor.

\*Any violations, suspensions, revocations, or sanctions, as defined in clauses 2 to 5 occurring prior to July 1, 2014, shall not be considered in determining whether a contractor or related entity meets the minimum criteria.

# Certification

By signing this document, I am certifying that I am an owner or officer of the contractor and am verifying under oath that:

- 1. Contractor is in compliance with Minnesota Statutes, Section 16C.285,
- 2. That contractor has in place, and will continue maintain, records required to be kept by an employer and those records will either be kept at the place where employees are working or kept in a manner that allows the employer to comply with the commissioner's demand within 72 hours (section 177.30)
- 3. Contractor has carefully reviewed the 2019 revisions to Chapter 181 (employee wage protections) including section 181.101 (wages—how often paid) and section 16C.285 subdivision 3 (responsible contractor), section 177.30 (maintenance of records) and is in full compliance with the amended statutes
- 4. I have included Attachment A-1, and
- 5. if contractor is awarded a contract, I or another owner or officer will also submit a HRA subcontractor compliance form prior to execution of the contract (applicable to prime contractors only). If subcontractors are subsequently added to the project Contractor must file a supplemental subcontractor compliance form.

Contractor Company Name

Date

Authorized Signature of Owner or Officer

Printed Name

Title

# ATTACHMENT A-1:FIRST-TIER SUBCONTRACTOR LIST (<u>Initial List)</u>

# SUBMIT WITH CONTRACTOR SOLICITATION RESPONSE

Minnesota Statutes, Section  $\underline{16C.285}$ , subdivision 5. A prime contractor or subcontractor shall include in its verification of compliance . . . a list of all of its first-tier subcontractors that it intends to retain for work on the project.

NAMES OF FIRST TIER SUBCONTRACTORS (Legal name of company as registered with the Secretary of State)	Company Address	Work To Be Performed

# Contractor's Certification Concerning Labor Standards and Prevailing Wage Requirements

EXHIBIT I

This is to certify that:		
	(Contractor's Company Nar	ne & Address)
has executed a contract with S	St. Cloud HRA	<b>,</b>
	(Grantee)	_
for the construction of		
	(Project)	
identified as Project Number	and acknov (Grant #)	vledges that:
<ol> <li>The Labor Standards Pro</li> <li>Correction of any of the a subcontractors and any lo</li> <li>Neither he/she nor any fin interest is designated as States pursuant to section part 5) or pursuant to section part 5) or pursuant to section part of the aforementi if such subcontractor or a subcontractor has a subs any of the aforementione</li> <li>Contractor agrees to obta (10) days after the execu Federal Labor Standards</li> </ol>	ovisions are included in the afore aforesaid conditions, including inf ower tier subcontractors is this co- rm, partnership or association in an ineligible contractor by the Co- n 5.6(b) of the regulations of the ction 3(a) of the Davis Bacon Act. foned contract has been or will be any firm, corporation, partnership stantial interest is designated as a d regulatory or statutory provisio ain and forward to the Grantee on tion of any subcontract, a Subco Provisions and Prevailing Wage	said contract. fractions by any of his/her ontractor's responsibility; which he/she has a substantial omptroller General of the United Secretary of Labor, part 5 (29 CFR, . As amended (40 U.S.C. 276a-2(a)). e subcontracted to any subcontractor or association in which such an ineligible contractor pursuant to ns. r Grantee's Representative within ten ntractor's Certification concerning e requirements.
Contractor's Federal ID# (or	<sup>.</sup> SSN)	
Type of Entity (Check One)	Single Proprietorship Corporation	Partnership Other Organization
List below the name, title and	address of the owner, partner	, or officers of the entity:
Name	Title	Address
Signature of Owner or Officer:	:	
Date Signed:		
Telephone Number:		

# **Sub-Contractor's Certification**

Concerning Labor Standards and Prevailing Wage Requirements

This is to certify that:		
	(Contractor's Compa	any Name & Address)
has executed a contract	with	
	(Contrac	ctor or Subcontractor)
for	in	the amount of \$
(Project)		
in the construction of the	above identified project, cert	ifies that:
<ol> <li>The Labor Standard</li> <li>Neither he/she nor a interest is designate States pursuant to s part 5) or pursuant to or by the Department</li> <li>No part of the afore if such subcontractor subcontractor has a any of the aforement</li> <li>Subcontractor agree of housing and Urba subcontract, a subc Requirements. HUE</li> </ol>	Is Provisions are included in the any firm, partnership or associate d as an ineligible contractor by section 5.6(b) of the regulations to section 3(a) of the Davis Bacon nt of Housing & Urban Developre mentioned contract has been or or or any firm, corporation, partner substantial interest is designate to be to obtain and forward to the of an Development, within 10 days ontractor's Certification Concern of form No, executed by the	e aforesaid contract. tion in which he/she has a substantial the Comptroller General of the United of the Secretary of Labor, part 5 (29 CFR, on Act. As amended (40 U.S.C. 276a-2(a)), ment. r will be subcontracted to any subcontractor tership or association in which such ed as an ineligible contractor pursuant to rovisions. contractor for transmittal to the Department after the execution of any lower tier ning Labor Standards and Prevailing Wage lower tier subcontractor in duplicate.
Contractor's Federal ID	# (or SSN)	_
Type of Entity (Check Or	e) Single Proprietors Corporation	ship Partnership Other Organization
List below the name, title	and address of the owner, p	artner, or officers of the entity:
Name	Title	Address
Signature of Owner or Of	fficer:	
Date Signed:		
Telephone Number:		

"General Decision Number: MN20210108 08/20/2021

Superseded General Decision Number: MN20200108

State: Minnesota

Construction Type: Building

County: Benton County in Minnesota.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.95 for calendar year 2021 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.95 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2021. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification	Number	Publication	Date
0		01/01/2021	
1		02/05/2021	
2		05/21/2021	
3		05/28/2021	
4		06/25/2021	
5		07/09/2021	
6		07/30/2021	
7		08/06/2021	
8		08/20/2021	

ASBE0034-001 06/01/2021

Rates Fringes
ASBESTOS WORKER/HEAT & FROST
INSULATOR......\$ 40.25 35.90

BOIL0647-008 03/01/2018

	Rates	Fringes
BOILERMAKER	\$ 37.22	27.14
BRMN0001-008 05/01/2018		
	Rates	Fringes
BRICKLAYER	\$ 35.89	20.84
BRMN0001-019 05/01/2018		
	Rates	Fringes
TILE FINISHER	\$ 25.13 \$ 25.89	5.54 24.34
CARP0930-006 04/29/2019		
	Rates	Fringes
CARPENTER	\$ 30.57	20.86
* ELEC0292-006 05/01/2021		
	Rates	Fringes
ELECTRICIAN Excludes Low Voltage Wiri Low Voltage Wiring Only	ng.\$ 47.94 \$ 41.42	25.93 18.16
ENGI0049-014 05/01/2020		
	Rates	Fringes
POWER EQUIPMENT OPERATOR Bulldozer Crane Drill Forklift Oiler Roller	\$ 40.93 \$ 42.35 \$ 40.93 \$ 40.93 \$ 38.30 \$ 40.93	21.70 21.70 21.70 21.70 21.70 21.70
IRON0512-016 05/03/2021		
	Rates	Fringes
IRONWORKER, REINFORCING IRONWORKER, STRUCTURAL	\$ 35.09 \$ 39.35	31.80 31.80
LABO0563-053 01/01/2021		
	Rates	Fringes
LABORER (ASBESTOS ABATEMENT (Removal from Ceilings, Floors, and Walls))	\$ 37.40	19.09
LABO0563-056 05/01/2020		

	Rates	Fringes
LABORER (Common or General)	\$ 29.19	18.12
LAB00563-057 05/01/2020		
	Rates	Fringes
LABORER (Mason Tender-Brick/Cement/Concrete)	\$ 33.68	18.07
LAB01091-024 05/01/2018		
	Rates	Fringes
LABORER (Pipelayer)	. \$ 35.68	16.92
PAIN0386-010 05/01/2014		
	Rates	Fringes
PAINTER (Spray)	\$ 25.08	13.99
PLAS0633-008 05/01/2021		
	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER.	\$ 35.76	20.88
PLUM0015-006 05/01/2021		
	Rates	Fringes
PLUMBER	.\$ 47.05	25.82
PLUM0539-011 05/01/2021		<b>_</b> _
	Rates	Fringes
PIPEFITTER	\$ 38.72	32.70
ROOF0096-020 06/01/2021		<b>_</b> _
	Rates	Fringes
ROOFER	\$ 35.39	19.81
SHEE0010-057 04/04/2020		
	Rates	Fringes
SHEET METAL WORKER	\$ 39.59	25.32
* UAVG-MN-0018 01/01/2019		
	Rates	Fringes
OPERATOR: Loader	\$ 35.26	20.30

\* UAVG-MN-0019 01/01/2019

PAINTER (Brush and Roller)	.\$ 28.45	16.81
SUMN2015-043 06/22/2018		
	Rates	Fringes
OPERATOR: Backhoe/Excavator/Trackhoe	.\$ 29.77	14.11
OPERATOR: Bobcat/Skid Steer/Skid Loader	<b>.\$</b> 32.03	14.80
SPRINKLER FITTER (Fire		

Rates Fringes

10.48

 TRUCK DRIVER:
 Dump Truck...
 \$ 23.43
 12.33

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Sprinklers)....\$ 30.09

#### 

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate)

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

#### Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

\_\_\_\_\_

#### WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

\* an existing published wage determination

- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

> Branch of Construction Wage Determinations Wage and Hour Division U.S. Department of Labor 200 Constitution Avenue, N.W. Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator U.S. Department of Labor 200 Constitution Avenue, N.W. Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board U.S. Department of Labor 200 Constitution Avenue, N.W. Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

## END OF GENERAL DECISION"

# SECTION 00 61 00 - BOND FORMS

### PART 1 - GENERAL

### 1.1 PERFORMANCE BOND

A. Owner requires Contractor to provide Performance Bond and Payment Bond. Use AIA Document A312. See Document 00 21 13, Article 1.10.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

# SECTION 01 11 00 - SUMMARY OF WORK

#### PART 1 - GENERAL

#### 1.1 WORK OF THIS CONTRACT

- A. Work of this Single Prime Contract consists of General Construction; including Mechanical and Electrical Work, at <u>Wilson Apartments</u>; 41 3<sup>rd</sup> Ave. NE., St. Cloud, <u>Minnesota</u>.
- B. Work of Contract is summarized by references to Contract, General Conditions, Supplementary Conditions, Specification Sections, Drawings, Addenda, and Modifications to Contract Documents issued subsequent to initial printing of this Project Manual, and including printed material referenced by any of these.
- C. It is recognized that Work of Contract is also unavoidably affected or influenced by governing regulations, natural phenomenon, including weather conditions, and other forces outside the Contract Documents.
- D. Work includes remodeling 6 Apartments on first floor, 2 Public Toilet Rooms and 3 Tub Rooms to make them accessible.

#### 1.2 CONTRACT METHOD

A. Owner will award Stipulated Sum Single Prime Contract (St. Cloud HRA Construction Agreement) for total Work of Project.

#### 1.3 PROJECT SCHEDULE FOR TIME OF COMPLETION

- A. Project construction will be based on the following schedule:
  - 1. Bid Opening: October 19<sup>th</sup>, 2021
  - 2. Construction Schedule:
    - a.) Phase I Unit 101
      - 1.) Begin Construction: January 10<sup>th</sup>, 2022
      - 2.) Substantial Completion: January 28th, 2022
    - b.) Phase II Unit 100, Toilet 120
      - 1.) Begin Construction: February 7<sup>th</sup>, 2022
      - 2.) Substantial Completion: February 25<sup>th</sup>, 2022
    - c.) Phase III Unit 103, Toilet 122
      - 1.) Begin Construction: March 7th , 2022
      - 2.) Substantial Completion: March 25<sup>th</sup>, 2022
    - d.) Phase IV Unit 109, Tub 208
      - 1.) Begin Construction: April 4<sup>th</sup>, 2022
      - 2.) Substantial Completion: April 22<sup>nd</sup>, 2022
    - e.) Phase V Unit 105, Tub 210
      - 1.) Begin Construction: May 2<sup>nd</sup>, 2022
      - 2.) Substantial Completion: May 20<sup>th</sup>, 2022
    - f.) Phase VI Unit 107
      - 1.) Begin Construction: May 31<sup>st</sup>, 2022
      - 2.) Substantial Completion: June 17th, 2022
  - 3. Date of Final Completion: July 1<sup>st</sup>, 2022.
- B. Owner-caused delays in this schedule will adjust schedule accordingly.

#### 1.4 COMMENCEMENT OF WORK

- A. Neither commence Work, nor allow Subcontractors or Sub-subcontractors to commence Work until:
  - 1. Contract (St. Cloud HRA Construction Agreement) has been fully executed; and Owner has issued a Notice to Proceed.
  - 2. Owner has approved Contractor's Performance Bond and Payment Bond (AIA A312), if required.
  - 3. Owner has approved evidence of Contractor's Liability Insurance, Owner's Protective Liability Insurance, and other required insurance to be purchased by Contractor.

#### 1.5 SEQUENCE OF WORK

A. Construct Work of this Contract in stages to accommodate Owner's occupancy requirements during construction period, and coordinate with Architect.

#### 1.6 WORK BY OWNER

- A. Work by Owner includes:
  - 1. Moving furniture and Owner's belongings.
  - 2. Entry Door locksets at apartments units and Tub Rooms.

#### 1.7 CONTRACTOR'S DUTIES

- A. Include items necessary for proper execution and completion of Work to produce intended results of Contract Documents.
- B. Include construction administration and supervision, labor, materials, articles, equipment, incidentals, items, tools, services, supplies, methods, operations, and skills in such quantities as may be necessary to complete Project within the intent of Contract Documents.

#### 1.8 OVERLAPPING AND CONFLICTING REQUIREMENTS

- A. Where compliance with 2 or more standards or requirements is indicated, and where overlapping requirements establish different or conflicting levels of quality; the most stringent requirement is intended, and will be enforced unless written approval is granted otherwise by Architect.
- B. Bidding Stage: Notify Architect in writing of overlapping and conflicting requirements for clarification by Addenda.
- C. Construction Stage: Refer to Architect for resolution of conflicting requirements and uncertainties as to which level of quality is more stringent, and receive written clarification from Architect before proceeding with questioned Work.

#### 1.9 CONTRACTOR USE OF SITE AND PREMISES

- A. Limit use of site and premises to allow:
  - 1. Owner occupancy.
  - 2. Use of site and premises by public.
  - 3. Construction operations and activities.
- B. Confine Work, including construction operations and activities, within construction limits directed by Owner.
- C. Emergency Building Exits During Construction: Maintain required building exits necessary for fire and life safety conditions. Review enclosures for temporary exit corridor construction with Architect and local fire and building officials to insure safety and compliance with applicable codes.

- D. Utility Outages and Shutdown: Obtain written permission from Owner at least 48 hours in advance of such occurrences. Provide and maintain proper shoring and bracing for existing underground utilities and sewers encountered during excavation Work, protect them from collapse or movement, or other types of damage until such time as they are to be removed, incorporated into new Work, or can be properly backfilled upon completion of Work.
  - 1. Limit such disruptions of services to a maximum of 1 hour. Prior to beginning excavation, contact utility companies for locations of existing underground services.
- E. Protect pavements, curbs, trees, landscaping, and existing construction during the course of Work. Repair or replace parts of same that become damaged.
- F. Keep vehicles clean to prevent depositing of dirt and debris on public streets or highways. Pay costs levied by public authorities having jurisdiction in connection with the cleaning of streets soiled by Work of this Contract.
- G. Assume full responsibility for protection and safekeeping of products and materials under this Contract. Store products on site.
- H. Provide and maintain access roads for delivery of materials and services to site.
- I. Keep driveways and entrances serving site clear and available to Owner and Owner's employees and agents at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.
- J. Schedule Work that will result in reduction of noise and disruption of normal classroom operations with Owner's Representative. Schedule noisy and disruptive Work of long duration during non-school hours.

#### 1.10 OWNER OCCUPANCY

- A. Full Occupancy: Owner will fully occupy Project site, except the rooms that are being remodeled and existing facilities during entire period of construction for conduct of normal operations.
  - 1. Cooperate with Owner to minimize conflict, and to facilitate Owner's operations.
  - 2. Schedule Work to accommodate this requirement.
    - a. A Certificate of Substantial Completion will be executed for Work for each phase prior to Owner occupancy.
    - b. Obtain Certificate of Occupancy from local building officials prior to Owner occupancy.
  - 3. Prior to partial Owner occupancy, make certain that mechanical and electrical systems are fully operational, and required inspections and tests have been successfully completed. Upon occupancy, Owner will provide operation and maintenance of mechanical and electrical systems in occupied portions of building.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

# SECTION 01 25 03 - PRODUCT SUBSTITUTION PROCEDURES

#### PART 1 - GENERAL

#### 1.1 SUMMARY

#### A. Section Includes:

- 1. Special definitions.
- 2. Methods of specifying.
- 3. Substitution procedures.

#### 1.2 DEFINITIONS

- A. Standard of Quality: Specified manufacturers, materials, products, and equipment have been used in preparing Contract Documents and thus establish minimum qualities for performance and appropriateness.
  - 1. Materials, products, and equipment described in Contract Documents establish a standard of required function, dimension, appearance, and quality.
  - 2. Comply with Specifications and reference standards as minimum requirements.
  - 3. Where a particular manufacturer and product is indicated, followed by a description of product (material and equipment) including special features or performance criteria, manufacturer agrees to make necessary modifications to manufacturer's "Standard or Custom Products" to fully comply with product described.
- B. Base Bid: Base on materials, products, and equipment described in Contract Documents.
  - 1. The phrase "or equal" is not used within this Project Manual and is not implied. Where non-specified manufacturers are allowed, the term "Approved Substitute" will be used. Make requests for substitutions to comply with procedures specified herein.
  - 2. It is understood and agreed by Contractors, Subcontractors, and material suppliers, that Bids and Contracts are based on products (material and equipment) and processes as specified or as revised by Addenda or Modification.
- C. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by Contractor and received 7 days before Bid Date are considered requests for substitutions. The following are not considered substitutions:
  - 1. Revisions to Contract Documents requested by Owner or Architect.
  - 2. Specified options of products and construction methods included in Contract Documents.
  - 3. Contractor's determination of, and compliance with, governing regulations and orders issued by governing authorities.

#### 1.3 SUBSTITUTION TIME FRAME AND CONSIDERATIONS

- A. Pre-Bid Substitutions (Prior Approval):
  - 1. Instructions to Bidders (AIA Document A701) specifies time restrictions for submitting requests for Substitutions during Bidding period to requirements specified in this Section.
  - 2. Submittal Time Limit: To be received by Architect not less than 7 days before Bid opening.
  - 3. Consideration: Substitution will only be considered if submitted by an [**invited**] [**bidding**] Contractor and each request includes information listed under "Conditions" Paragraph specified below.
- B. Post-Bid/Pre-Award Substitutions; Bid Adjustment Substitutions:
  - 1. Substitution Time Limit: Between Bid Opening date and Award of Contract date.
  - 2. Consideration: Substitution will only be considered if submitted by pending Contractor and substitution request is being made because specified product has become unavailable.

- a. Include with requests information listed under "Conditions" Paragraph specified below.
- C. Substitution Requests Made After Award of Contract:
  - 1. Consideration: Substitution will only be considered if submitted by Contractor and substitution request is being made because a specified product has become unavailable.
    - a. Include with requests information listed under "Conditions" Paragraph specified below.
- D. Failure to complete Document 01 25 11 Substitution Request Form, or to submit requested information in acceptable format, is grounds for rejection.
- E. Substitutions will not be considered when they are indicated or implied on Shop Drawings or Product Data submittals, without prior written approval from Architect, or when acceptance will require revision to Contract Documents.
- F. Architect may require testing of substitute material to assure compliance with Specifications, at Contractor's expense. When so directed, submit Samples for acceptance. Equipment, material, and articles installed or used without required acceptance shall be at risk of subsequent rejection.

#### 1.4 SUPPORTING INFORMATION FOR SUBSTITUTIONS

- A. Include the following supporting information: Name of product (material or equipment) for which substitution is being requested and a complete description of proposed substitute including drawings, Product Data, Shop Drawings, Samples, performance and test data, and other information necessary for an evaluation. Cross-reference submitted data to specified products for Architect's evaluation.
  - 1. Substitution Request Form: Submit completed Substitution Request Form with each request for substitution including the following information:
    - a. A statement indicating changes in other materials, equipment, or other Work that incorporation of this substitute would require.
    - b. Comparison of qualities of proposed substitution with specified product.
    - c. Changes required in other elements of Work because of substitution.
    - d. Effect on construction schedule.
    - e. Cost data comparing proposed substitution with specified product.
    - f. License, fees, or royalties required.
    - g. Availability of maintenance service and source of replacement materials.
- B. Alterations or changes to other Work are responsibility of Contractor proposing substitution, including redesign if determined by Architect.
  - 1. Burden of proof of merit of proposed substitute is upon proposer.
- C. It is understood and agreed by Bidders, Contractors, material suppliers, and tier Subcontractors, that Bids and Contracts are based on products (material and equipment) and processes as specified or as revised by addenda or modification.

#### 1.5 CONSIDERATION REQUIREMENTS

- A. Substitution request will be considered by Architect when the following conditions are satisfied:
  - 1. Extensive revisions to Contract Documents are not required.
  - 2. Proposed changes are in keeping with general intent of Contract Documents.
  - 3. Request is timely, fully documented, and properly submitted.
  - 4. Substitution Request Form is completed and attached. Additionally, one or more of the following are satisfied:
    - a. If specified product is not available.
    - b. Specified product or method of construction cannot be provided within Contract Time. Request will not be considered if product or method cannot be provided as a result of failure to pursue Work promptly, coordinate activities properly, or submit required submittals in a timely manner.

- c. Specified product or method of construction cannot receive necessary approval by governing authority and requested substitution can be approved.
- d. Substantial advantage is offered to Owner, in terms of cost, time, energy conservation, or other considerations of merit, after deducting offsetting responsibilities Owner may be required to bear as determined by Architect, which includes additional compensation to Architect for redesign and evaluation services, increased cost of other construction, or separate contractors, and similar considerations.
- e. Specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where Contractor certifies substitution will overcome incompatibility.
- f. Specified product or method of construction cannot be coordinated with other materials, and Contractor certifies proposed substitution can be coordinated.
- g. Specified product or method of construction cannot provide a warranty required by Contract Documents and Contractor certifies proposed substitution provides required warranty.
- B. Where proposed substitution involves more than one installer, installers shall cooperate to coordinate Work, provide uniformity and consistency, and assure compatibility of products.
- C. To determine if proposed substitution complies with function, appearance, quality, performance, and dimensional characteristics of specified item, Architect may:
  - 1. Require Sample units, technical Product Data, and independent test reports sufficient to establish compliance, cost of which shall be paid by submitting party.
- D. Substitution request not complying will be returned without action other than to record noncompliance with submittal requirements.

#### 1.6 CONTRACTOR'S/BIDDER'S REPRESENTATION

- A. Request for substitutions constitute representation that Contractor/Bidder:
  - 1. has investigated proposed product and determined that it is equal to or superior in all respects to specified product.
  - 2. will provide same or better warranties or bonds for substitution as for specified product.
  - 3. will coordinate installation of substitution, if accepted, into Work; and make other changes as required to make Work complete and meet the intent of Contract Documents.
  - 4. waives claims for additional costs, under Contractor/Bidder's responsibility, which may subsequently become apparent.
  - 5. will pay Owner for Architect's time required by substitutions to modify and coordinate documents as a result of change.

#### 1.7 ARCHITECT'S EVALUATION PROCESS

- A. Architect is sole judge of acceptability of proposed substitution.
- B. Architect will review requests for substitutions with reasonable promptness and respond as follows:
  - 1. Request additional information or documentation necessary for evaluation.
  - 2. Pre Award: Notify Bidders of decision to accept proposed substitution by written Addendum.
  - 3. Post Award: Notify Contractor in writing of decision to accept or reject proposed substitution.
- C. Accepted substitutions will be documented by Architect's Supplemental Instruction, or, if Contract Sum or Time is affected, by Modification (Construction Change Directive or Change Order), including manufacturers' names and catalog numbers.

#### PART 2 - PRODUCTS

NOT USED

St. Cloud HRA Wilson Apartments Accessibility Upgrade St. Cloud, MN PART 3 - EXECUTION

NOT USED

END OF SECTION

September 28, 2021 Project No. 2107

Date: \_\_\_\_\_

## SECTION 01 25 11-SUBSTITUTION REQUEST FORM

TO:	GLTARCHITECTS
	808 COURTHOUSE SQUARE
	ST. CLOUD, MN 56303

PROJECT: \_\_\_\_\_

Project No.: \_\_\_\_\_

We hereby submit for your consideration the following product instead of the specified item for the above-mentioned Project.

Specification	Section	and	Paragrapl	h

Drawings and Details affected:

Proposed Substitution/ Description: \_\_\_\_\_

Manu	ifactur	er s	Name:	

WHY IS SUBSTITUTION BEING SUBMITTED? (Select 1 of the following):

- Pre-Bid Substitution (Prior Approval): Include detailed analysis comparing proposed substitution against specified product, including redlined Specification Section showing differences.
- Specified product is not available. Explain in detail using attached letter.
- Cost savings to Owner. Indicate comparative cost analysis as attachment.
- Other. Explain:

#### EFFECTS OF PROPOSED SUBSTITUTION

(Attach complete explanations and technical data, including laboratory test, if applicable.)
Include complete information changes to Drawings and/or Specification that proposed substitution would require for its proper installation. Fill in blanks below:
A. Does the substitution affect dimensions shown on Drawings?

- B. Will the undersigned pay for changes to building design, including engineering and detailing costs caused by requested substitution?
- C. What affect does substitution have on other trades?

D. Differences between proposed substitution and specified item?

E. Manufacturer's guarantees of proposed and specified items are:

The undersigned states that function, appearance, and quality are equivalent or superior to specified item.

Subcontractor's signature and date:

#### SUBMITTED BY:

(included name, address, telephone, and contract person	Accepted Accepted as noted
of manufacturer/supplier of proposed substitution)	□ Not accepted □ Received too late
	☐ Incomplete Information
	□ No substitutions accepted for this
	Reviewed by/date:
	Comments:
Submitted by:	

For Architect's use:

Contractor's signature and date:

# SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

#### PART 1 - GENERAL

#### 1.1 ARCHITECT'S SUPPLEMENTAL INSTRUCTIONS (ASI)

A. Architect will advise of minor changes in Work not involving an adjustment to Contract Sum or Contract Time by issuing supplemental instructions to Contractor on AIA Document G710, Architect's Supplemental Instructions.

#### 1.2 PROPOSAL REQUEST (PR)

- A. Architect may issue to Contractor a proposal request on AIA Document G709 Proposal Request, which includes detailed description of proposed Contract change with supplemental or revised Drawings and Specifications, a change in Contract Sum, Contract Time, or both for executing change, and period of time during which requested price will be considered valid.
- B. Respond to proposed change describing full effect of Work. Include statement describing effect on Contract Sum, Contract Time, and effect on work by separate or other contractors. Include full documentation of how costs were figured, including labor and material cost, overhead, profit, tax, bond costs, and supervisor, and indicate period of time during which proposed change will be considered valid if different from that required in Proposal Request.

#### 1.3 CONTRACTOR PROPOSED CHANGES (CPC)

- A. Contractor may propose to Architect, on Contractor's official letterhead, a change in Contract, describing proposed change, and its full effect on Work.
- B. Include a statement describing reasons for change, effect on Contract Sum or Contract Time or both, with full documentation, including full documentation of how costs were figured, including labor and material cost, overhead, profit, tax, bond costs, and supervisor, and a statement describing effect on work by separate or other contractors.
- C. Architect will review proposed change with Owner, and if accepted, Architect will prepare a Change Order and distribute to Contractor and Owner for their acceptance and authorization.

#### 1.4 CHANGE ORDERS (CO)

- A. Architect will issue AIA Document G701 Change Orders for changes to Contract Sum or Contract Time.
- B. Architect will prepare Change Order and distribute to Contractor and Owner for their acceptance and authorization.

#### 1.5 CONSTRUCTION CHANGE DIRECTIVE (CCD)

- A. Architect may issue to Contractor a construction directive, on AIA Document G714 Construction Change Directive, authorized by Owner instructing Contractor to proceed with a change in Work, for subsequent inclusion by Change Order.
- B. Document will describe changes in Work, and designate method of determining changes in Contract Sum or Contract Time. Promptly execute change.
- C. After changes to Contract Sum and Contract Time have been determined, Architect will prepare Change Order and distribute to Contractor and Owner for Contractor's and Owner's acceptance and authorization.

St. Cloud HRA Wilson Apartments Accessibility Upgrade St. Cloud, MN PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

# SECTION 01 29 00 - PAYMENT PROCEDURES

#### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:
1. Administrative and procedural requirements governing Contractor's Applications for Payment.

#### 1.2 SCHEDULE OF VALUES

- A. Submit typed preliminary schedule on AIA Document G702 Application and Certificate for Payment and AIA Document G703-Continuation Sheet.
- B. Submit Schedule of Values in duplicate to Architect for approval within 5 business days after execution of Owner-Contractor Agreement.
- C. Format: Utilize Table of Contents of this Project Manual. Identify each line item with number and title of major Specification Sections. Identify site mobilization, bonds and insurance, and General Conditions.
- D. Include in each line item the amount of Allowances specified, if any. For Unit Prices, identify quantities taken from Contract Documents multiplied by unit cost to achieve total for item.
- E. Include within each line item, a directly proportional amount of Contractor's overhead and profit.

#### 1.3 APPLICATIONS FOR PAYMENT

- A. Preparation of Applications:
  - 1. Use data from approved Schedule of Values.
  - 2. Submit application on AIA Document G702 Application and Certification for Payment and AIA Document G703-Continuation Sheet. When Architect requires substantiating information, submit data justifying dollar amounts in question.
  - 3. Complete every entry on form, including notarization and execution by person authorized to sign legal documents on behalf of Contractor. Fill in Change Order Summary, including number of days of extension to Contract Time. Incomplete application will be returned without action.
    - a. Entries shall match data on Progress Schedule. Use updated schedules if revisions have been made.
    - b. Include amounts of Owner approved Change Orders and Construction Change Directives issued prior to last day of construction period covered by application.
  - 4. Submit executed copies of each Application for Payment to Architect through e-Builder.
  - 5. Waivers of Mechanics Lien:
    - a. Submit waivers of lien on forms, and execute in a manner, acceptable to Owner.
    - b. With each Application for Payment, except first, submit waivers of mechanics lien from every entity who may lawfully be entitled to file mechanics liens arising out of Contract and related to Work covered by previous payment.
    - c. Submit final Application for Payment with or preceded by final waivers from entity involved with performance of Work covered by application who could lawfully be entitled to lien.
- B. Submittal and Payment Dates:
  - 1. Submit Application for Payment to Architect on or before the last day of the month.
  - 2. Architect will act on Application for Payment no later than the 10th day of the following month.

#### 1.4 PROGRESS PAYMENTS

PAYMENT PROCEDURES

September 28, 2021 Project No. 2107

- A. The amount of each progress payment shall be computed as follows:
  - 1. Take that potion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of five percent (5%).
  - 2. Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing), less retainage of five percent (5 %).
  - 3. Subtract the aggregate of previous payments made by the Owner; and
  - 4. Subtract amounts, if any for which the Architect has withheld or nullified a Certificate for Payment as provided in Section 9.5 of AIA Document A201-2007.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

# SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

#### PART 1 - GENERAL

#### 1.1 PROJECT COORDINATION

- A. Coordinate construction operations included in various Specification Sections to assure efficient and orderly installation of each part of Work. Coordinate construction operations included under different Sections that depend on each other for proper installation, connection, and operation.
- B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of Work. Such administrative activities include the following:
  - 1. Preparation of schedules.
  - 2. Installation and removal of temporary facilities.
  - 3. Delivery and processing of submittals.
  - 4. Progress meetings.
  - 5. Project closeout activities.
- C. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
  - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.
- D. Verify that utility requirements of operating equipment are compatible with building utilities. Coordinate Work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- E. Coordinate space requirements and installation of mechanical and electrical Work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable. Place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- F. Conceal pipes, ducts, and wiring within the construction occurring in finished areas, except as otherwise indicated. Coordinate locations of fixtures and outlets with finish elements.
- G. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
  - 1. Prepare similar memoranda for Owner and separate Contractors where coordination of their Work is required.
- H. Coordinate completion and clean up of Work of separate Sections in preparation for Substantial Completion.
- I. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in compliance with Contract Documents, to minimize disruption of Owner's activities.

#### 1.2 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. Coordination Drawings: Submit coordination drawings where close and careful coordination is required for installation of products and materials fabricated off-site by separate entities, and where limited space availability necessitates maximum utilization of space for efficient installation of different components.
  - 1. Show interrelationship of components shown on separate Shop Drawings.
  - 2. Indicate required installation sequences.

#### PROJECT MANAGEMENT AND COORDINATION

- 3. Refer to the following mechanical and electrical Divisions for specific coordination drawing requirements for mechanical and electrical installations:
  - a. Division 21 05 00 Common Work Results for Fire Suppression.
  - b. Division 22 05 00 Common Work Results for Plumbing.
  - c. Division 23 05 00 Common Work Results for HVAC,
  - d. Division 26 05 00 Common Word Results for Mechanical.
- C. Staff Names: Within 15 days of Notice to Proceed, submit list of Contractor's principal staff assignments, including Superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities.
- D. Basic Coordination Schedules:
  - 1. Submit Project schedules showing relationship of Contractor and various Subcontractors in chronological sequence. Regular updating and reporting on Project schedule will indicate level of coordination that Contractor has achieved at critical stages in Work.

#### 1.3 OPENINGS, BLOCKING, BACKING, AND GROUNDS

- A. Provide openings, blocking, backing, and, where necessary, grounds, in walls and above ceilings necessary for installation of contracted Work and Owner-furnished products.
- B. Make suitable preparations for installation of Work including piping, conduit, hangers, inserts, anchors, grounds, and supports that are to be embedded in concrete, [masonry,] floors, [precast concrete,] partitions, or structural members, or that are to pass through or be attached thereto. Receive and install proper sleeves, boxes, receptacles, or chases for openings or recesses to receive Work occurring in or passing through such members. Locate accurately and secure firmly in place before erecting such masonry, concrete poured, or walls/ceilings enclosed.

#### 1.4 REQUEST FOR INFORMATION

- A. Requests for Information (RFIs) are encouraged as a documented means of communication between Contractor and Architect. Plan, schedule, coordinate, and sequence Work so RFI, if necessary, may be submitted to Architect in a timely manner so as not to delay progress of Work. Transmit submissions of and responses to RFI, with copies to Owner, via facsimile equipment.
- B. Limit RFI to 1 specific topic, question, or issue, and if at all possible, limit to 1 or 2 sentences. Submit RFIs sequentially on standard form on Contractor's letterhead. Include following information on each RFI:
  - 1. RFI number, date of issue, Architect's Project name and job number. Include this information on each separate sheet of attachments, if any (sketches, Subcontractor documentation, supporting information, etc.).
  - 2. Text on RFI.
  - 3. Indication if topic in question may have a possible impact on Contract Sum or Contract Time.
  - 4. Space for hand-printed response (1/3 to 1/2 of page).
  - 5. Space for respondent signature and date.
  - 6. Architect will have same time period to respond to an RFI as Shop Drawing review period.
  - 7. No damages for delay due to RFI response beyond allotted time will be allowed, unless Contractor can show that RFI was not foreseeable with proper planning, scheduling, coordination, and sequencing, and that Architect's late response delayed timely purchase or delivery of equipment or materials, or limited construction personnel from proceeding with their task(s) within previously listed "Progress Schedule" activity period(s).

#### 1.5 PRE-CONSTRUCTION MEETING

A. Architect will schedule a pre-construction meeting after Owner has issued the Notice to Proceed. Conduct meeting to review responsibilities and personnel assignments.

B. Attendance Required: Owner Representative, Architect and Architect's Consultants, Contractor and Contractor's Superintendent, major Subcontractors, manufacturers, suppliers, and other concerned parties.

#### 1.6 COORDINATION MEETINGS

- A. Conduct Project coordination meetings, in addition to specific progress meetings scheduled by Architect, at regularly scheduled times convenient for parties involved.
- B. Request representation at each meeting by every party currently involved in coordination or planning for 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.

#### 1.7 PROGRESS MEETINGS

- A. Architect will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies within 3 days to Contractor, Owner, participants, and those affected by decisions made.
- B. Attendance Required: Contractor's Superintendent, major Subcontractors and suppliers, Owner's Representative, Architect, Independent Laboratory representative, and as appropriate to agenda topics for each meeting.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION

# SECTION 01 33 00 - SUBMITTAL PROCEDURES

#### PART 1 - GENERAL

#### 1.1 SUMMARY

#### A. Section Includes:

- 1. Project start-up submittals.
- 2. Product Data, Shop Drawings, and Sample submittals.
- 3. Quality control submittals.
- 4. Contract closeout submittals.
- 5. Procedure for submitting, reviewing, and resubmitting.

#### 1.2 ADMINISTRATIVE (PROJECT START-UP) SUBMITTALS

- A. Certificate of Insurance: As defined in Supplementary General Conditions.
- B. Performance and Payment Bonds: Refer to Supplementary Conditions of the Contract and Section 00 61 00.
- C. Construction Schedule: Prepare and submit initial Construction Schedule in duplicate within 7 days after date of Owner-Contractor Agreement for Architect's review and approval. Submit schedule detailed enough to address Work activities, estimated duration of activities, and activities' interrelationships with other Work activities.
  - 1. Obtain Construction Schedule approval prior to initial Application for Payment, or payment will be withheld until process has been completed.
  - 2. Initial Submittal: Submit Construction Schedule in both critical path method (CPM) and horizontal bar chart form and activity listing with a separate line for each activity of Work, identifying first Work day of each week.
  - 3. Critical Path Method: Create network analysis system (logic diagram) using critical path method (CPM) in form acceptable to Owner and Architect.
    - a. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities.
    - b. Indicate early and late start finish, float dates, and duration of activities.
    - c. Show projected percentage of completion for each item of Work as of time of each progress Application for Payment.
    - d. Indicate product deliver dates, including those furnished by Owner that affects completion date.
  - 4. Updates: Submit 2 copies of revised Construction Schedule with each Application for Payment. Identify changes since previous submittal.
    - a. Submit 1 set of computer data disks that include same information if requested by Architect.
    - b. Distribute copies of revised schedules to affected parties.
    - c. Issuance of Certificate for Payment is conditioned upon receipt of an updated Construction Schedule with each Application for Payment.
  - 5. Compliance will be monitored and enforced by review of Construction Schedule. Unless otherwise indicated, failure to comply with Construction Schedule requirements is subject to reduction in amounts certified on subsequent Applications for Payment.
- D. Submittal Schedule: Provide Submittal Schedule for Product Data, Shop Drawings, and Samples to Architect coordinated with Construction Schedule for submittals and Architect's review period.
  - 1. Coordinate submittals of related items.
  - 2. Updates: Submit revised Submittal Schedule when changes occur and identify those changes since previous Submittal Schedule.

- E. Schedule of Values: Submittal as defined in General Conditions of Contract and this Section required before first Application for Payment.
  - 1. Submit Schedule of Values on AIA Form G703. Contractor's standard computerized forms will be considered on request.
  - 2. Format: Table of Contents of this Project Manual. Identify each line item with Specification Section number and title.
    - a. Provide separate line item for labor and materials for each Work category.
    - b. On separate line items identify Contractor's fee, general conditions, permits, and contingency.
  - 3. Updates: Submit revised Schedule of Values with each Application for Payment. Identify changes since previous submittal.
    - a. Applications for Payment will not be processed until Schedule of Values has been reviewed and accepted.
    - b. Revise Schedule of Values to list executed Change Orders. Keep Change Order amounts on separate line item until completion of Change Order Work.
    - c. At application for final payment, distribute executed Change Order amounts into appropriate line items.
- F. Application for Payment: As defined in General Conditions of the Contract and Section 01 29 00.
- G. Cash Flow Projection Schedule: Submit Cash Flow Projection Schedule to forecast cash flow requirements in form acceptable to Owner.
  - 1. Prepare Cash Flow Projection Schedule to comply with Construction Schedule.
  - 2. Update as appropriate and as requested by Owner.
- H. Subcontractors and Materials List: Submit Subcontractors and Materials List.
  - 1. Include only products included in original Bidding Documents, Addenda, and other Modifications.
  - 2. Subcontractors: Provide names, addresses, and telephone numbers of indicating by Specification Section number Work to be performed by each.
  - 3. Material Suppliers: Provide names, addresses, and telephone numbers, indicating by Specification Section number Work to be performed by each.
  - 4. Provide identification of materials and equipment by brand and model including.
    - a. Items proposed in compliance with specified reference standards.
    - b. Items proposed in compliance with descriptive specifications where a proprietary product is not indicated.
    - c. Items proposed in compliance with proprietary specifications.
- I. Before Work is started, file or record Construction Contract with proper county or state officials if such filing is required. Provide Owner with certification indicating filing has been accomplished or is not required.

#### 1.3 PRODUCT DATA, SHOP DRAWINGS, AND SAMPLE SUBMITTALS

- A. Product Data: Submit not less than the following information.
  - 1. Manufacturer's specifications and technical data including performance, construction, and fabrication.
  - 2. Clearly mark each copy to identify pertinent products or models.
  - 3. Show performance characteristics and capacities.
  - 4. Show dimensions and clearances required.
  - 5. Modify drawings and diagrams to delete information that is not applicable to this Project.
- B. Shop Drawings: Submit not less than the following information in a clear and thorough manner. Do not reproduce Contract Documents for use as Shop Drawings.
  - 1. Identify details by reference to sheet and detail, schedule, or room numbers indicated on Contract Drawings.
  - 2. Clearly show how product is to be incorporated into Project through Drawings, such as elevations, plans, sections, and details.
- C. Samples: Submit not less than the following information.

#### SUBMITTAL PROCEDURES

- 1. Submit colors, textures, and patterns for selection.
- 2. Submit Samples to illustrate functional characteristics of product, with integral parts and attachment devices. Coordinate submittal of different categories for interfacing Work.
- 3. Include identification on each Sample, giving full information.

#### 1.4 QUALITY ASSURANCE SUBMITTALS

- A. Submit per Section 01 43 00.
  - 1. Certificate of Manufacturer's Qualifications: Submittal required to document manufacturers' qualifications required in individual Specification Sections.
  - 2. Certificate of Installer's Qualifications: Submittal required to document installers' qualifications required in individual Specification Sections.
  - 3. Professional Certification: Submittal required to document professional certification of portions of Work required by Contract Documents.
- B. Source Quality Control: Tests and certifications as described in Source Quality Control Article in Part 2 of Specification Sections.
  - 1. Material Qualification Test: Submittal required directly from testing lab to indicate a proposed material complies with Contract Document requirements.
  - 2. Field Quality Control: Tests and certifications as described in Field Quality Control Article in Part 3 of Specification Sections within Contract Documents.
  - 3. Soils Engineer Certification: Submittal required from Soils Engineer or Soils Engineer's authorized technician indicating confirmation of required inspection and observed required by Contract Documents.

#### 1.5 CONTRACT CLOSEOUT SUBMITTALS

A. Submit per Section 01 77 00.

#### 1.6 PROCEDURES FOR SUBMITTING

- A. Timeline for Submittals: Transmit submittals within timeframe to prevent delay in construction activities or compromise review process. Comply with the following requirements.
  - Administrative (Project Start-up) Submittals: Submit not more than 30 days after Award of Contract.
     a. Schedule of Values: Submit not less than 30 days before first application of payment.
  - 2. Product Data, Shop Drawings, and Sample Submittals: Submit prior to starting fabrication and per Submittal Schedule.
  - 3. Quality Control Submittals: Make submittals promptly to not cause construction delay.
- B. Transmittal: Accompany submittals with completed Submittal Transmittal Form, Document 00 62 00.
- C. Failure to comply may result in return of submittal without review.
- D. Submit electronic files of Show Drawings. Submit copies as specified herein unless indicated otherwise in other Specifications Sections.
  - 1. Product Data.
  - 2. Shop Drawings.
- E. Submit 2 samples of color charts of products that are called out to be submitted.
- F. Locate the following information on each submittal where practical and on accompanying transmittal.
  - 1. Date of submission and dates of previous submissions.
  - 2. Project title.
  - 3. Contract identification.
  - 4. Names of Contractor, supplier, manufacturer.

- 5. Identification of products with reference to Specification Section number, including Material ID Code or paragraph number.
- 6. Reference to Drawing numbers.
- 7. Field dimensions required for communicating Design Intent.
- 8. Relation to adjacent or critical features of Work.
- 9. Applicable standards.
- 10. Identification of deviations from Contract Documents.
- 11. Identification of revisions on resubmittals.
- 12. 4 inch by 5 inch blank space for Contractor's and Architect's stamps.
- 13. Contractor's stamp, Subcontractor's stamp as applicable, initialed or signed, certifying prior review of submittal, verification of products, field measurements, field construction criteria, and coordination of information within submittal with requirements of Work and of Contract Documents.
  - a. Submittals not signed and dated by Contractor will be returned without review.
- G. Provide submittals for each portion of Work that are complete and accurate. Incomplete or partial submittals will be rejected and will require resubmittal.
  - 1. Submittals may be made of portions of Work, but make certain that each submittal is complete in respect to information necessary for proper review by Architect and Architect's consultants.
  - 2. Combine submittals to ensure "design intent" of system assembly.
  - 3. Cross out non-related material to submittal.
- H. Product Data, Shop Drawings, Samples, and Quality Control Submittals:
  - Determine and verify:

1.

- a. Field measurements.
- b. Field construction criteria.
- c. Catalog numbers and similar data.
- d. Conformance with Contract Documents.
- e. Coordination with other Work.
- 2. Coordinate each submittal with requirements of Work, Construction Schedule, and Contract Documents.
- 3. Notify Architect in writing, at time of submittal, of deviations in submittals from requirements of Contract Documents.

#### 1.7 PROCEDURE FOR REVIEWING

- A. General: Make submittals far enough in advance of dates scheduled for installation to provide time required for reviews; for possible revisions and resubmittals; and for placing orders and securing delivery.
- B. Architect's Review Time: In scheduling, allow at least 14 calendar days for review by Architect following Architect's receipt of submittal or as otherwise may be required under each Specification Section. Allow an additional 10 days for reviews involving Architect's consultants, or as otherwise may be required under each Specification Section.
- C. Submittals will be reviewed by Architect with the following actions:
  - 1. "Reviewed" indicates submittal conforms to "design intent" of Work. Contractor, at Contractor's discretion, may proceed with fabrication, procurement, and installation.
  - 2. "Make Corrections Noted" indicates submittal, after indicated corrections are made, would conform to "design intent" of Work. Contractor, at Contractor's discretion, may proceed with fabrication, procurement, and installation.
  - 3. "Revise and Resubmit" indicates noted revisions are such that a corrected copy is required for review to confirm revisions have been understood and made. Contractor, at Contractor's discretion, may proceed with fabrication, procurement, and installation. Contractor is responsible for correctly interpreting and implementing revisions.
  - 4. "Rejected" indicates submittal does not conform to "design intent". Resubmittal is required.

D. Review by Architect of submittals is not an authorization for Change Order. Follow procedures described elsewhere in Contract Documents for Items requiring Change Order.

#### 1.8 PROCEDURE FOR RESUBMITTING

- A. Make corrections or changes in submittals required by Architect and resubmit when Architect's stamp requires resubmittal.
- B. Resubmittal Review Fees: If Architect rejects (Rejected, Revise and Resubmit) Contractor's submittal more than 2 times for same Specification Section, Architect will be compensated for additional reviews.
  - 1. Amount of such compensation will be incorporated by Change Order and deducted from Contractor's Application for Payment.
- C. Shop Drawings and Product Data: Revise initial drawings or data, and resubmit as specified for initial submittal.
  - 1. Clearly identify changes made other than those requested by Architect by "clouding" or other suitable means acceptable to Architect. Only changes that are "clouded" and changes requested by Architect will be reviewed on resubmittal. Architect is not responsible for reviewing resubmittals that are not "clouded" on resubmittal.
- D. Samples: Submit new samples as required for initial submittal.
- E. Contractor is responsible for delays caused by resubmittal process.

#### PART 2 - PRODUCTS

#### NOT USED

#### PART 3 - EXECUTION

#### 3.1 SCHEDULE OF REQUIRED SUBMITTALS

A. General: The following lists of submittals are prepared for convenience of Contractor and may not be complete listing. Designation in parentheses is AIA Document number for submittal to be used. Other forms are noted when required.

#### 1.0 PRIOR TO AWARD:

- 1.1 List of Subcontractors and/or suppliers and manufacturers
- 1.2 Contractor's Qualification Statement (A305) if requested

#### 2.0 PRIOR TO CONTRACT EXECUTION:

- 2.1 Performance/Labor and Material Bond (A311)
- 2.2 Certificate of Insurance
- 2.3 Additional submittals as may be required by Contract Documents or requested by Owner or Architect

#### 3.0 WITHIN TEN DAYS AFTER CONTRACT EXECUTION:

- 3.1 Detailed cost breakdown on application for payment form G703, breakdown per Specification Sections with labor and material separated
- 3.2 Name of Project superintendent
- 3.3 Additional submittals as may be required by Contract Documents or requested by Owner or Architect
# 4.0 MONTHLY APPLICATION FOR PAYMENT:

- 4.1 Application and Certificate for Payment G702 and G703
- 4.2 Partial lien waivers if requested

## 5.0 AS WORK PROGRESSES:

- 5.1 Shop Drawings and Samples (See C-02 for quantities)
- 5.2 Instructions
- 5.3 Manuals
- 5.4 Guarantees
- 5.5 Test Results
- 5.6 Additional submittals as may be required by Contract Documents

## 6.0 PRIOR TO FINAL PAYMENTS:

- 6.1 Application and Certificate for Payment (G702 & G703 latest edition)
- 6.2 Consent of Surety Company to Final Payment (G707)
- 6.3 Contractor's Affidavit of Payment of Debts & Claims (G706A)
- 6.4 Contractor's Affidavit of Release of Liens (G706A)
- 6.5 Waivers of lien from Subcontractors and materials suppliers, "Standard Form"
- 6.6 Additional submittals as may be required by Owner or Architect.

# SECTION 01 43 00 - QUALITY ASSURANCE

## PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Prerequisites and procedures to assure quality of construction, field observation, and tests performed by manufacturer's representatives during installation.
  - 1. Manufacturer's Instructions.
  - 2. Manufacturer's Certificates.
  - 3. Manufacturer's Field Services

#### 1.2 QUALITY ASSURANCE

- A. Specific naming of codes or standards occurs on Drawings and in other Specifications Sections of these. Comply with laws, ordinances, and regulations of authorities having jurisdiction. Proof of compliance shall be signed approval by respective authorities having jurisdiction.
- B. Familiarity with Pertinent Codes and Standards: Verify that requirements of specifically named codes and standards are met, as well as requirements mandated by law, ordinance, and authority. Verify that items procured and installed in this Work meet or exceed specified requirements.
- C. Rejection or Non-Complying Items: Architect reserves the right to reject items incorporated into Work that fails to meet such minimum requirements.

#### 1.3 MANUFACTURER QUALIFICATIONS

A. Company specializing in manufacture of products specified in this Section with a minimum of 5 years documented experience, unless noted otherwise.

#### 1.4 FABRICATOR QUALIFICATIONS

A. Company specializing in fabrication of products specified in this Section with a minimum of 5 years documented experience, unless noted otherwise.

#### 1.5 INSTALLER QUALIFICATIONS

- A. Company specializing in installation of products specified in this Section with a minimum of 5 years documented experience, unless noted otherwise, certified in writing by manufacturer that installer is approved to install manufacturer's products.
- B. Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.

#### 1.6 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual Specification Sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, adjusting, and finishing in quantities specified for Product Data.
- B. Identify conflicts between manufacturers' instructions and Contract Documents.

## 1.7 MANUFACTURER'S CERTIFICATES

- A. When specified in individual Specification Sections, submit manufacturers' certificate to Architect for review in quantities specified for Product Data.
- B. Indicate that material or product conforms to or exceeds specified requirements. Submit supporting reference date, affidavits, and certifications as appropriate.
- C. Certificates and previous test results on material or products may be recent, but must be acceptable to Architect.

#### 1.8 MANUFACTURER'S FIELD SERVICES

- A. Submit qualifications of manufacturer's observer to Architect 30 days in advance of required observations. Observer is subject to approval of Architect.
- B. When specified in individual Specification Sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, testing, adjusting, and balancing of equipment as applicable, and to initiate instructions when necessary.
- C. Observers shall report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- D. Submit report in duplicate for Architect's review within 10 days of observation.

## 1.9 QUALITY ASSURANCE AND CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as a minimum quality for Work, except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform Work by persons qualified to produce workmanship of specified quality.
- F. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
- G. Readjust Work performed that does not meet technical or design requirements, but make no deviation from Contract Documents without specific and written approval from Architect.

## 1.10 FIELD SAMPLES

- A. Install field samples at Project site as required by individual Specifications Sections for review by Architect.
- B. Acceptable samples represent a quality level for Work.
- C. Where field sample is specified in individual Sections to be removed, clear area after Architect has accepted field sample.

#### PART 2 - PRODUCTS

NOT USED

#### QUALITY ASSURANCE

St. Cloud HRA Wilson Apartments Accessibility Upgrade St. Cloud, MN PART 3 - EXECUTION

NOT USED

END OF SECTION

September 28, 2021 Project No. 2107

# SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

## PART 1 - GENERAL

#### 1.1 QUALITY ASSURANCE

- A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, but not limited to:
  - 1. Building Code Requirements.
  - 2. Health and Safety Regulations.
  - 3. Utility Company Regulations.
  - 4. Police Department, Fire Department, and Rescue Squad Rules.
  - 5. Environmental Protection Regulations.
  - 6. Occupational Safety and Health Administration.
- B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library, "Temporary Electrical Facilities".
  - 1. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Service", prepared jointly by AGC and ASC, for industry recommendations.
  - 2. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electrical service. Install service per National Electric Code (NFPA 70).
- C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

#### 1.2 PROJECT CONDITIONS

- A. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities or permit them to interfere with progress. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on Project site.
- B. When disruption of existing service is required, do not proceed without Owner's and Architect's review. Provide alternate temporary service, when required.
- C. Environmental Requirements: Provide and maintain heat, fuel, materials, and services necessary to protect Work and materials against injury from extreme heat, cold, dry winds, dust, or dampness as follows:
  - 1. During performance of Work, provide sufficient heat to ensure heating of spaces meets requirements of individual Specification Sections.
  - 2. Suspend operations on Work when subject to damage by climatic conditions, flooding, or because of insufficient curing or drying of surfaces or materials.
  - 3. Take necessary action to protect site and Work from wind, flood, and storm damage.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

A. General: Provide new materials. If acceptable to Architect, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for use intended.

#### 2.2 EQUIPMENT

- A. General: Provide new equipment or undamaged previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.
- B. Electrical Power Cords: Grounded extension cords. Use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.
- C. First Aid Supplies: Comply with local and governing regulations.
- D. Fire Extinguishers: Hand-carried, portable, UL-rated, Class "A" fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried portable, UL rated, Class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for exposures.
  - 1. Comply with NFPA 10 and 241 for classifications, extinguishing agent and size required by location and class of fire exposure.

## PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Locate facilities where they serve Project adequately and result in minimum interference with performance of Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

## 3.2 TEMPORARY ELECTRICITY

- A. Contractor may connect to Owner's existing power service. Power consumption shall not disrupt Owner's need for continuous service.
- B. Owner will pay for cost of energy used. Exercise measures to conserve energy. Owner will backcharge Contractor if waste is observed.
- C. Provide artificial lighting adequate for proper execution of Work in all areas of Project.
- D. Provide adequate distribution equipment, wiring, and outlets to provide single-phase branch circuits for power and lighting.

#### 3.3 TEMPORARY FIRE PROTECTION

- A. Fire Extinguishers: Provide hand-carried, portable UL rated, Class A fire extinguishers for temporary Offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for fire exposures in sufficient quantity to comply with applicable safety regulations.
  - 1. Comply with NFPA 10 and 241 for classifications, extinguishing agents, and sizes required by location and class of fire exposure.

## 3.4 PROTECTION OF EXISTING FACILITIES

- A. Contractor, Subcontractors, or employees under their jurisdiction, will be responsible for damages to roofing, sheet metal, and roof structure while performing Work on roof.
- B. Carefully supervise Work to prevent injury to trees and plants that are to remain on property, and replace trees and plants that are damaged or destroyed due to construction operations.

C. Provide construction aids and equipment required by personnel and to facilitate execution of Work. Provide staging, runways, platforms, railings, trash containers, and other such equipment.

#### 3.5 TEMPORARY WATER SERVICE

- A. Contractor may connect to existing building water source required for construction operations.
  - 1. Owner will pay cost of water used. Exercise measures to conserve water. Owner will backcharge Contractor is waste is observed.

#### 3.6 TEMPORARY SANITARY FACILITIES

A. Existing building permanent facilities may be used during construction operations.

## 3.7 FIRST AID

A. Provide complete first aid kit and supplies for emergency purposes and have a qualified person on staff capable of rendering basic first aid requirements.

## 3.8 TEMPORARY BARRIERS

- A. Provide temporary barriers to prevent unauthorized entry to construction areas, to allow for Owner's use of site, and to protect existing facilities and adjacent properties from damage by construction operations and demolition.
- B. Protect non-owned vehicular traffic, stored materials, and existing structures from damage.

#### 3.9 ROADS, PARKING, AND TRAFFIC CONTROL

- A. Maintain site access roads within construction limits including areas to receive hoists and cranes, scaffolds, platforms, and other construction materials. Inclement weather may require additional grading, fill, rock base, or other measures.
  - 1. Coordinate location of temporary roads, storage areas, and parking areas with other contractors Subcontractors.
  - 2. Provide and maintain access to fire hydrants, free of obstructions.
  - 3. Provide means of removing mud from vehicle wheels before entering public streets.
- B. Maintain existing sidewalks on public property.
- C. Site parking may be utilized at locations as directed by Owner to accommodate construction personnel.

#### 3.10 SECURITY MEASURES

- A. Provide security and facilities to protect Work and Owner's operations from unauthorized entry, vandalism, or theft.
  - 1. Coordinate with Owner's security program.

#### 3.11 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection where specified in individual Specification Sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate Work areas to minimize damage.
  - 1. Provide protective coverings at walls, projections, jambs, sills, ceilings, and soffits of openings.
  - 2. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects by protecting with durable sheet materials.

## TEMPORARY FACILITIES AND CONTROLS

- 3. Prohibit traffic or storage on waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- 4. Prohibit traffic from landscaped areas.

# SECTION 01 60 00 - PRODUCT REQUIREMENTS

## PART 1 - GENERAL

#### 1.1 GENERAL

- A. Material and Equipment Incorporated into Work:
  - 1. Conform to applicable Specification Section and standards.
    - 2. Comply with size, make, type, and quality specified.

## B. Manufactured and Fabricated Products:

- 1. Design, fabricate, and assemble per industry standard engineering and shop practices.
- 2. Manufacture like parts of duplicate units to standard sizes and gauges for interchangeability.
- 3. Two or more items of same kind shall be identical, by same manufacturer.
- C. Supplementary materials not specifically described in each Section, but required for complete and proper installation of Work, shall be new, first quality of their respective kinds, and subject to review and acceptance by Architect.

## 1.2 DEFINITIONS

- A. Products: Items purchased for incorporation into Work, whether purchased for Project or taken from previously purchased stock.
  - 1. Includes terms material, equipment, systems, machinery, components, fixtures, and terms of similar intent for incorporation into Work.
  - 2. Does not include machinery and equipment used for preparation, fabrication, conveying, and erection of Work. Products may also include existing materials or components required for reuse.
  - 3. Named Products: Items identified by manufacturer's product name, including make or model designation, indicated in manufacturer's published product literature, that is current as of date of Contract Documents.
- B. Materials: Products that are substantially shaped, cut, worked, mixed, finished, refined, or otherwise fabricated, processed, or installed to form part of Work.
- C. Equipment: Products with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

#### 1.3 QUALITY ASSURANCE

- A. Source Limitations: Provide products of same kind, from single source, to fullest extent possible.
- B. Compatibility of Options: When Contractor is given option of selecting between 2 or more products for use on Project, select products compatible with products previously selected, even if previously selected products were also options.
- C. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on exterior.
  - 1. Labels: Locate required product labels and stamps on concealed surface, or where required for observation after installation, on accessible surface that is not conspicuous.
  - 2. Equipment Nameplates: Provide permanent nameplates on each item of service-connected or poweroperated equipment. Locate on easily accessible surface that is inconspicuous in occupied spaces. Provide the following information required on nameplate and other essential operating data:
    - a. Name of product and manufacturer.

- b. Model and serial numbers.
- c. Capacity.
- d. Speed.
- e. Ratings.
- D. Prior to requesting final testing, adjusting, and balancing, use adequate means to assure that Work is completed per specified requirements and is ready for requested testing, adjusting, and balancing.

## 1.4 BASIC PRODUCT REQUIREMENTS

- A. Do not use materials and equipment removed from existing premises, except as specifically permitted by Contract Documents.
- B. Provide interchangeable components of same manufacturer, for similar components.

## 1.5 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Products meeting those standards or description.
- B. Products Specified by Naming one or More Manufacturers: Products of manufacturers named and meeting Specifications, no options or substitutions allowed.
- C. Products Specified by Naming one or More Manufacturers With Provision for Substitutions: Submit request for substitution for manufacturers not named.

## 1.6 PRODUCT SUBSTITUTION PROCEDURES

A. Product Substitution Procedures: Refer to Section 01 25 03.

## 1.7 OWNER-FURNISHED PRODUCTS

A. Refer to Section 01 11 0 - Summary of Work.

#### 1.8 PRODUCT TRANSPORTATION AND HANDLING REQUIREMENTS

- A. Transport and handle products per manufacturer's written instructions.
- B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- D. Arrange deliveries of products per construction schedules and in ample time to facilitate inspection prior to installation.
- E. Coordinate deliveries to avoid conflict with Work and conditions at site, taking into consideration:
  - 1. Work of Contractor or Owner.
  - 2. Limitations of Storage Space
  - 3. Availability of equipment and personnel for handling products.
  - 4. Owner's use of premises.
- F. Deliver products in undamaged condition in original containers or packaging, and with identifying labels intact and legible.
- G. Clearly mark partial deliveries of component parts of equipment to identify the equipment, to permit easy accumulation of parts, and to facilitate assembly.

- H. Immediately on delivery, inspect shipment to ensure:
  - 1. Product complies with requirements of Contract Documents and reviewed submittals.
  - 2. Quantities are correct.
  - 3. Containers and packages are intact and labels are legible.
  - 4. Products are undamaged and properly protected.
- I. Architect reserves the right to observe delivered materials, to review accompanying bills of lading, and to reject the following:
  - 1. Materials not identifiable as accepted products of accepted manufacturer.
  - 2. Materials exhibiting shelf lives in excess of those stipulated by manufacturer.
  - 3. Materials not bearing appropriate label of Underwriters Laboratories (UL), where applicable.
  - 4. Materials in opened or excessively damaged containers.
  - 5. Materials exhibiting evidence of moisture, organic matter, or other adulterants.
- J. In event of damage or rejection by Architect for stipulated cause, immediately make repairs and replacements necessary to acceptance of Architect and at no additional cost to Owner.
- K. Do not request Owner to sign for and accept deliveries. Only Contractor may perform this task.

## 1.9 PRODUCT STORAGE AND PROTECTION REQUIREMENTS

- A. Store and protect products per manufacturer's written instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated products, place on sloped supports, above ground.
- C. Provide secure off-site storage and protection when site does not permit on-site storage or protection. Provide Architect with complete inventory of off-site stored items, and provide certificate of insurance for stored items.
- D. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
- E. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- F. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- G. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

## PART 2 - PRODUCTS

## 2.1 PRODUCT SELECTION

- A. General Product Requirements: Provide products that comply with Contract Documents, that are undamaged and, unless otherwise indicated, unused at time of installation.
  - 1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for complete installation and for intended use and effect.
- B. Standard Products: Provide standard products of types that have been produced and used successfully in similar situations on other projects and fully comply with requirements of Contract Documents.
- C. Visual Selection: Where specified product requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select product and manufacturer that comply with other specified requirements. Architect will select color, pattern, and texture from product line selected.

## 3.1 INSTALLATION OF PRODUCTS

- A. Comply with manufacturer's instructions and recommendations for installation of products in applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.
- B. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

# SECTION 01 70 00 - EXECUTION REQUIREMENTS

## PART 1 - GENERAL

#### 1.1 SYSTEM DESCRIPTION

- A. Performance Requirements:
  - 1. Cutting and Patching:
    - a. Structural Work Requirements: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.
    - b. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.
    - c. Visual Requirements: Do not cut and patch construction exposed on exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.

#### 1.2 QUALITY ASSURANCE

A. In preparing data required by this Section, use only personnel who are thoroughly trained and experienced in operation and maintenance of described items, completely familiar with requirements of this Section, and skilled in technical writing to extent needed for communicating essential data.

### PART 2 - PRODUCTS

#### 2.1 PATCHING MATERIALS

A. New Materials: As specified in Sections; match existing products and Work for patching and extending Work.

#### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine areas and conditions under which Work of this Section will be performed. Correct conditions detrimental to timely and proper completion of Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Each trade is responsible for examining substrates related to that trade's Work. Notify Contractor and Architect of unacceptable conditions.
- C. Commencement of Work indicates acceptance of conditions. Corrections required because of incomplete substrate examination or improper substrate conditions will be corrected at no cost to Owner.

#### 3.2 CUTTING AND PATCHING

- A. Each trade is responsible for cutting and patching required for their portion of Work.
- B. Execute cutting, fitting, and patching, including excavation and backfill, to complete Work, and to:
  - 1. Fit parts together, to integrate with other Work.
  - 2. Uncover Work to install ill-timed Work.

## EXECUTION REQUIREMENTS

- 3. Remove and replace defective and non-conforming Work.
- 4. Remove samples of installed Work for testing.
- 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- C. Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- D. After uncovering, inspect conditions affecting performance of Work.
- E. Beginning of cutting and patching means acceptance of existing conditions affecting performance of Work.
- F. Provide supports to assure structural integrity of surroundings, and devices and methods to protect other portions of Project from damage.
- G. Provide protection from elements for areas that may be exposed by uncovering Work; maintain excavations free of water.
- H. Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- I. Cut rigid materials using masonry saw or core drill. Pneumatic tools are not allowed without prior written approval.
- J. Restore Work with new products, using people skilled in relevant trades, per requirements of Contract Documents.
- K. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- L. At penetrations through fire-rated walls, ceilings, or floor construction, completely seal voids with fire-rated materials, full thickness of construction element per requirements of Section 07 84 00 Firestopping.

#### 3.3 REPAIR/REPLACEMENT OF DAMAGED WORK

- A. Protection of finished Work shall not relieve Contractor of his responsibility to repair or replace Work damaged by elements or by subsequent construction operations.
- B. Decisions on whether damaged Work will be repaired or replaced will be based on requirements that finished Work meets requirements specified for Work as covered in applicable Sections of this Specification; that is, if damaged Work cannot be repaired so that it matches new, undamaged Work, then it shall be replaced.
- C. In refinishing repaired or replaced Work, refinish entire surfaces as necessary to provide an even finish to match adjacent finishes. Use only workers skilled in trades relevant to materials and assemblies that require repairing or replacing.
  - 1. For continuous surfaces refinish to nearest intersection.
  - 2. For an assembly refinish entire unit.

## 3.4 EXISTING UTILITIES OR SERVICES

- A. Provide protection to prevent damage or interference to existing utility or service lines and mains.
- B. If there is damage to known existing utility or service line or main, responsible party shall repair or have damage repaired as directed by utility or service company, without additional cost to Contract.
- C. If unknown utility or service line or main is uncovered, stop Work in that area and notify utility or service company, Architect, and Owner to obtain information on how to proceed.

#### 3.5 INTEGRITY OF FIRE ASSEMBLIES

A. Seal, grout, fill, or otherwise protect spaces formed between fire or sound rated wall, floor, ceiling, or roof assemblies or penetrations through such assemblies by pipe, conduit, ductwork, other items, or voids provided for possible use of items in a manner to maintain fire or sound ratings.

## 3.6 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection where specified in individual Specification Sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate Work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

# SECTION 01 74 00 - CLEANING

## PART 1 - GENERAL

#### 1.1 QUALITY ASSURANCE

- A. Inspections: Conduct daily inspections, more often if necessary, to verify that requirements of cleanliness are being met.
- B. Codes and Standards: In addition to requirements specified herein, comply with pertinent requirements of authorities having jurisdiction.
- C. Use only a professional cleaning company experienced in commercial cleaning for final cleaning.

#### 1.2 PAYMENT WITHHELD

A. Architect reserves the right to withhold certification of payment requests for failure on part of Contractor to regularly clean Project per requirements of this Section.

#### PART 2 - PRODUCTS

#### 2.1 TRASH CONTAINERS

- A. Provide trash container service to remove rubbish from Project site. Determine locations of trash containers.
- B. Deposit rubbish in trash containers. Break down bulky materials (that is; crates, cartons, ductwork, and similar waste) to minimum volume before depositing them in trash containers. Segregate materials per requirements of trash container service. If materials aren't segregated per these requirements, then additional cost of non-segregated materials will be back-charged to Contractor at no additional cost to Owner.
- C. Deposit rubbish per applicable laws and regulations of regulatory agency having jurisdiction. Perform disposal of waste materials not permitted in trash containers, such as tires, paints, and similar waste.
- D. Burning of refuge on Project site is not allowed.
- E. Remove, hammer in, or bend over flush protruding nails or screws in boards, planks, timbers, etc.

#### 2.2 CLEANING UP

A. All trades are required to participate in clean-up procedures.

#### 2.3 COMPATIBILITY

A. Use cleaning materials and equipment that are compatible with surfaces being cleaned, as recommended by manufacturer of material to be cleaned.

#### PART 3 - EXECUTION

## 3.1 PROGRESS CLEANING

- A. General:
  - 1. Retain stored items in orderly arrangement allowing maximum access, not impeding drainage or traffic, and providing required protection of materials.

- 2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this Work.
- 3. Weekly, and more often if necessary, remove scrap, debris, and waste material from Project site.
- 4. Provide adequate storage for items awaiting removal from Project site, observing requirements for fire protection and protection of ecology.
- 5. Maintain Project site in neat and orderly condition.
- 6. As required preparatory to installation of succeeding materials, clean structures, or pertinent portions thereof, to degree of cleanliness recommended by manufacturer of succeeding material, using equipment and materials required to achieve required cleanliness.
- 7. Following installation of finish floor materials, clean finish floor daily, and more often if necessary, and while Work is being performed in spaces in which finish materials have been installed.
  - a. Clean, for the purpose of this subparagraph, means free from foreign material that, in opinion of Architect, may be injurious to finish floor material (vacuum clean).

#### 3.2 FINAL CLEANING

- A. Perform final cleaning of Project site and structure.
- B. Clean, for the purpose of this Article, means level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials, (Scrub and polish clean).
- C. General: Remove from Project job site tools, surplus materials, equipment, scrap, debris, and waste prior to completion of Work. Conduct final progress cleaning as described above.
- D. Site: Water and broom clean paved areas on Project site and public paved areas directly adjacent to Project site, unless otherwise directed by Architect. Remove resultant debris.
- E. Structures:
  - 1. Interior: Visually inspect interior surfaces and remove traces of soil, waste material, smudges, and other foreign matter in areas affected by Work of this Contract. Remove traces of splashed materials from adjacent surfaces. Remove paint drippings, spots, stains, and dirt from finished surfaces. Use only cleaning materials and equipment instructed by manufacturer of surface material.
  - 2. Glass: Clean glass inside and outside.
  - 3. Polished Surfaces: On surfaces requiring routine application of buffed polish, apply polish recommended by manufacturer of material being polished. Clean and shine glossy surfaces as intended by manufacturer.
  - 4. Carpet: Use only dry-chemical method for cleaning carpeting. Steam cleaning or water-based cleaning is not allowed on carpeting. Use only dry-chemical materials and methods fully approved by carpet manufacturer, as instructed in manufacturer's published literature.
- F. Timing: Schedule final cleaning as accepted by Architect to enable Owner to accept completely clean Project.

## 3.3 CLEANING DURING OWNER'S OCCUPANCY

A. Owner will perform progress and final cleaning of Project spaces occupied by Owner prior to Substantial Completion, completion by Contractor, and acceptance by Owner.

# SECTION 01 77 00 - CLOSEOUT PROCEDURES AND SUBMITTALS

## PART 1 - GENERAL

#### 1.1 QUALITY ASSURANCE

A. Prior to requesting inspection by Architect, use adequate means to assure that Work is completed per specified requirements and is ready for requested inspection.

## 1.2 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Prior to requesting inspection for certification of Substantial Completion, complete the following (List exceptions in the request):
  - 1. In Application for Payment that coincides with, or first follows, date Substantial Completion is claimed, showing 100 percent completion for portion of Work claimed as substantially complete. Include supporting documentation for completion as indicated in Contract Documents and statement showing accounting of changes to Contract Sum.
    - a. If 100 percent completion cannot be shown, include list of incomplete items, value of incomplete construction, and reasons Work is not complete.
  - 2. Advise Owner of pending insurance change-over requirements.
  - 3. Obtain and submit releases enabling Owner unrestricted use of Work and access to services and utilities; include occupational permits, operating certificates, and similar releases.
  - 4. Make final change-over of permanent locks and transmit keys to Owner. Advise Owner's personnel of change-over in security provisions.
  - 5. Complete start-up testing of systems, and instruction of Owner's operating and maintenance personnel.
  - 6. Discontinue or change-over and remove temporary facilities from Project site, along with construction tools, mock-ups, and similar elements.

#### 1.3 CONTRACT CLOSEOUT PROCEDURES

- A. At Substantial Completion, submit written certification to Architect that Contract Documents have been reviewed, Work has been inspected, and that Work is complete per Contract Documents and ready for Architect's inspection.
  - 1. Prepare comprehensive and complete list of corrective items, and verify that these items have been corrected prior to notifying Architect of completion. Make available copies of Contractor's list(s) to Architect upon request.
- B. Notify Architect in writing when Contractor feels Project is 100 percent complete and is ready to leave Project. Architect will then commence construction review and prepare a "Punch List", or list of minor corrective items to be issued to Contractor. For Owner's convenience, reviews may be phased for various portions of Work, as each distinct portion becomes 100 percent complete.
- C. Architect will arrange for consultants to make consultant's construction reviews. Contractor and principal superintendent, authorized to act on be half of Contractor, as well as principal Subcontractors that Architect may request to be present, shall accompany Architect, and possibly Architect's consultants, during construction reviews.
- D. Excessive amounts of corrective items, as judged by Architect, will be grounds to terminate construction review until such time as Contractor is deemed sufficiently complete to once again start the review. More than 4 minor items per typical room will be considered excessive. Cost of additional construction review visits will be backcharged to the contractor.
  - 1. Contractor has 30 calendar days in which to complete items after receiving "Punch List" from Architect.

- E. Notify Architect, in writing, at least 7 days in advance of time of acceptance inspection after completion of "Punch List" Work.
- F. Contractor, superintendent, and principal Subcontractors that Architect may request to be present, shall accompany Architect on acceptance inspection.
  - 1. If Work has been completed per Contract Documents, and no further corrective measures are required, Architect will issue Certificate of Substantial Completion, and recommend that Owner accept Project and file Notice of Completion.
- G. Provide "Certificate of Occupancy" from jurisdiction or municipality where Project is located at time of Substantial Completion Inspection.
- H. Architect will develop Certificate of Substantial Completion Form (AIA Document G704), for signatures of Architect, Contractor, and Owner.
  - 1. Date of Substantial Completion starts warranty period for entire Project.
- I. Owner will occupy entire Project and premises on date of Substantial Completion.
- J. Comply with requirements of Substantial Completion Document, and notify Architect in writing when punch list items have been completed, and final inspection can be scheduled.
- K. Architect will accompany Contractor on Final Completion Inspection.

## 1.4 CONTRACT CLOSEOUT SUBMITTALS

- A. As part of final Application for Payment, submit lien waiver covering total amount of Contract.
- B. Submit lien waivers from every entity who may lawfully be entitled to file mechanics lien arising out of Contract, including Suppliers, Subcontractors, and/or Sub-subcontractors.
- C. Execute "Contractor's Affidavit of Payment of Debts and Claims" (AIA Document G706), and "Contractor's Affidavit of Release of Liens" (AIA Document G706A).
- D. Submit Final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due. Execute the "Consent of Surety Company to Final Payment" (AIA Document G707).
- E. Contractor Requirements Prior to Project Acceptance:
  - 1. Deliver certifications to Architect that no new materials containing asbestos or other hazardous materials have been included in Work.
  - 2. Remove temporary facilities and materials from site and building as specified in Section 01 50 00 Temporary Facilities and Controls.
  - 3. Thoroughly clean entire Project site of construction debris as specified in Section 01 74 10.
  - 4. Submit complete, signed Record Documents to Architect as specified in Section 01 78 39.
  - 5. Submit complete, signed Operation and Maintenance Data to Architect as specified in Section 01 78 23.
  - 6. Submit complete, signed Warranties and Bonds to Architect as specified in General Conditions and in Section 01 78 35.

#### PART 2 - PRODUCTS

#### 2.1 MAINTENANCE MATERIALS

- A. Furnish maintenance materials to Owner in quantities specified in individual Specification Sections.
- B. Deliver maintenance materials to Owner's designated area on or prior to date of Substantial Completion. Provide Owner and Architect with a complete transmittal of inventory of items delivered.
- 2.2 EXTRA MATERIALS

- A. Furnish extra products and materials to Owner in quantities specified in individual Specification Sections.
- B. Deliver extra products and materials to Owner's designated area on or prior to date of Substantial Completion. Furnish Owner and Architect with complete transmittal of inventory of items delivered.

PART 3 - EXECUTION

NOT USED

# SECTION 01 78 35 - WARRANTIES AND BONDS

## PART 1 - GENERAL

#### 1.1 DEFINITIONS

- A. Standard Product Warranties: Pre-printed written warranties published by individual manufacturers for particular products specifically endorsed by manufacturer to Owner.
- B. Special Warranties: Written warranties required by or incorporated into Contract Documents, either to extend time limits provided by standard warranties, or to provide greater rights for Owner.

#### 1.2 WARRANTY AND BOND REQUIREMENTS

- A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure, or that must be removed and replaced to provide access for correction of warranted Work.
- B. Re-Instatement of Warranty: When Work covered by warranty has failed and been corrected by replacements or rebuilding, reinstate warranty by written endorsement. Reinstated warranty shall be equal to original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that Work covered by warranty has failed, replace or rebuild Work to an acceptable condition complying with requirements of Contract Documents. Contractor is responsible for cost of replacing or rebuilding defective Work regardless of whether Owner has benefited from use of Work through a portion of its anticipated useful service life.
- D. Owner's Recourse: Written warranties made to Owner are in addition to implied warranties, and shall not limit duties, obligations, rights, and remedies otherwise available under law, nor shall warranty periods be interpreted as limitations on time in which Owner can enforce such other duties, obligations, rights, and remedies.
  - 1. Rejection of Warranties: Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of Contract Documents.
- E. Owner reserves the right to refuse to accept Work for Project where special warranty, certification, or similar commitment is required on such Work, or part of Work, until evidence is presented that entitles required to countersign such commitments are willing to do so.

#### 1.3 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. When a special warranty is required to be executed by Contractor, or Contractor and Subcontractor, supplier, or manufacturer, prepare written document that contains appropriate terms and identification, ready for execution by required parties. Submit draft to Owner through Architect for approval prior to final execution.
  - 1. Refer to individual Specification Sections for specific content requirements, and particular requirements for submittal of special warranties.
- C. Form of Submittals:
  - 1. Bind in commercial quality, 8-1/2 inch by 11 inch, 3-ring side binders with hardback, cleanable, plastic covers.
  - 2. Label cover of each binder with typed or printed title "WARRANTIES AND BONDS", with title of Project; name, address, and telephone number of Contractor and equipment supplier; and name of responsible principal.

- 3. Table of Contents: Neatly typed, in sequence of Table of Contents of Project Manual, with each item identified with number and title of Specification Section in which specified, and name of product or Work item.
- 4. Separate warranties and bonds with index tab sheets keyed to Table of Contents listing. Provide complete information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer with name, address, and telephone number of responsible principal.
- D. Preparation of Submittals:
  - 1. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of applicable item or Work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Completion is determined.
  - 2. Verify that documents are in proper form, contain full information, and are notarized.
  - 3. Co-Execute submittals when required.
  - 4. Retain warranties and bonds until time specified for submittal.
- E. Time of Submittals:
  - 1. Submit warranties and bonds for equipment, or component parts of equipment put into service during construction with Owner's permission, within 10 days after acceptance.
  - 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
  - 3. For items of Work when acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, list date of acceptance as beginning of warranty period.
  - 4. Deliver manufacturer's warranties, guaranties, and bonds required by Contract Documents, to Architect, with Owner named as beneficiary. Where manufacturer's warranty or guarantee extends for longer time period than Contractor's warranty or guarantee, deliver manufacturer's warranties and guaranties in same manner.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

# SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

## PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Requirements for Project Record Documents:
  - 1. Throughout progress of Work of Contract, maintain accurate record of changes and modifications in Contract Documents, as described below.
  - 2. Purpose of Record Documents is to provide factual information regarding Work, both concealed and visible, which will enable future modification of design to proceed without lengthy and expensive site measurement, investigation, and examination.

#### 1.2 QUALITY ASSURANCE

A. Accuracy of Records: Thoroughly coordinate changes within Record Documents. Make adequate and proper entries in Specifications, Drawings, and other documents where such entry is required to properly show changes. Include "as-built" locations of site utilities shown on Drawings in diagrammatic way. Accuracy of records shall be such that future searches for items shown in Contract Documents may reasonably rely on information obtained from accepted Record Documents.

## 1.3 PAYMENT WITHHELD

A. Architect reserves the right to withhold certification of payment request for failure on part of Contractor to maintain Record Drawing in conformance with this Section.

#### 1.4 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. General: Architect's review and approval of current status of Record Documents will be prerequisite to Architect's review of requests for progress payment and request for final payment under Contract.
- C. Progress Submittals: Secure Architect's review and approval of Record Documents as currently maintained prior to submitting each request for progress payment.
- D. Final Submittal: Submit final Record Documents to Architect and secure Architect's acceptance prior to submitting request for final payment.

#### 1.5 PRODUCT HANDLING

- A. Maintain Record Documents in secure place in Contractor's job trailer. Protect Record Documents from deterioration and from loss and damage until completion of Work.
- B. In the event of loss of recorded data, use means necessary to again secure data to Architect's acceptance. Such means may include, if necessary in opinion of Architect, removal and replacement of concealing materials and, in such case, replacements shall be to standards originally specified in Contract Documents.

#### 2.1 RECORD DOCUMENTS

- A. Contractor's Job Set: Secure from Architect at beginning of Work, at no charge to Contractor, 1 complete set of Contract Documents. Contractor's Job Set is for Contractor's own use to collect and record pertinent information on a daily basis.
- B. Record Documents Set: Secure from Architect at beginning of Work, at no charge to Contractor, 1 complete set of Contract Documents. Transfer information to this set in final form on a weekly basis. This Record Document Set will also be turned in as Final Record Documents.

## PART 3 - EXECUTION

## 3.1 MAINTENANCE OF JOB SET

- A. Identification:
  - 1. Upon receipt of Job Set, identify documents with title "TEMPORARY RECORD DOCUMENTS: CONTRACTOR'S JOB SET".
  - 2. Upon receipt of Record Documents Set, identify appropriate to mylar media with title "RECORD DOCUMENTS" on each sheet of Drawings and on cover sheet of other documents.
- B. Preservation: Devise suitable method for protecting Job Set. Do not use Job Set for purposes other than entry of new data and for review by Architect upon request.
- C. Making Entries on Drawings:
  - 1. Job Set: Record information in clear and legible manner. Maintain Job Set on an ongoing basis. Record pertinent information and changes as they occur. Subcontractors are responsible for making entries as may be required under supervision of Contractor. Subcontractors shall date and sign their entries.
- D. Making Entries on Other Documents:
  - 1. Where directives issued by Architect cause changes, clearly indicate change by note, and reference approved Addenda and Change Orders.
  - 2. Where Contractor originated causes changes proposals reviewed by Architect, including inadvertent errors by Contractor that have been accepted by Architect, clearly indicate change by note.
  - 3. Make entries in pertinent documents as reviewed by Architect.
- E. Accuracy of Entries: Use proper instruments or tools for measurement as necessary, to determine actual locations of installed items.

#### 3.2 FINAL RECORD DOCUMENTS

- A. Submit Job Set Drawings as supporting documentation to Final Record Document drawings. If Job Set drawings have been damaged during course of Work, secure new copy of document from Architect. Carefully transfer change data to new copy and obtain acceptance of Architect. Additional copies of Contract Documents will be charged to Contractor at Architect's cost of reproduction plus handling.
- B. If documents, other than drawings, have been kept clean successfully during progress of Work, and if entries have been sufficiently orderly thereon and reviewed by Architect, these documents will be accepted by Architect as final portion of Record Documents. If such document is not so accepted by Architect, secure new copy of that document from Architect at Architect's usual charge for reproduction and carefully transfer change data to new copy an obtain acceptance of Architect.

C. Review and Approval: Submit completed total set of Record Documents to Architect as described above. Participate in review meeting or meetings as required by Architect, make required changes in Record Documents, and promptly deliver final Record Documents to Architect.

## 3.3 CHANGES SUBSEQUENT TO ACCEPTANCE

A. Contractor is not responsible for recording changes in Work subsequent to acceptance of Work by Architect, except for changes resulting from replacements, repairs, and alterations made by Contractor as part of Contractor's guarantee. No additional changes will be allowed without approval of Architect.

# SECTION 02 22 10 - SELECTIVE BUILDING COMPONENT DEMOLITION

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Site Demolition and removal of the following:
    - a. Building components for new work.
  - 2. Work does include mechanical and electrical work.

## 1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or recycled.
- B. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or recycled.

### 1.3 QUALITY ASSURANCE

- A. Comply with Section 01 43 00.
- B. Demolition Firm Qualifications: An experienced firm specializing in demolition work similar in material and extent to that indicated for this Project with a minimum of 5 years experience in this type of work.
- C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. Standards: Comply with ANSI A10.6 and NFPA 241.

#### 1.4 PROJECT CONDITIONS

- A. Owner will maintain occupancy area during Work of this Project. The units being remodeled will not be occupied during remodel and the units will be empty.
- B. Hazardous Materials: It is expected that hazardous materials will be encountered in Work
  - 1. Hazardous materials will be removed by Owner before start of Work.
  - 2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
  - 3. Hazardous materials include flooring and ceiling textile.
- C. Storage or sale of removed items or materials on-site is not permitted.

## PART 2 - PRODUCTS

NOT USED

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Comply with Section 01 70 00.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of site and building demolition required.

#### 3.2 PREPARATION

- A. Removed and Salvaged Items: Comply with the following:
  - 1. Clean salvaged items of dirt and demolition debris.
  - 2. Protect items from damage during construction and reinstall.

#### 3.3 PROTECTION

A. Existing Facilities: Protect adjacent walkways, building entries, and other building facilities during demolition operations.

#### 3.4 DEMOLITION, GENERAL

- A. General: Demolish indicated existing building components completely. Use methods required to complete Work within limitations of governing regulations and as follows:
  - 1. Do not use cutting torches.
  - 2. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- B. Remove debris from elevated portions by chute, hoist or other device that will convey debris to grade level in controlled descent.
- C. Building Components: Remove the following components, as whole units, intact and undamaged:
  - 1. Mirrors and medicine cabinets.
    - The elevator may be used to remove debris if the walls are protected with padded blankets.

#### 3.5 REPAIRS

- A. General: Promptly repair damage to adjacent construction caused by building demolition operations.
- B. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
- C. Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

#### 3.6 RECYCLING DEMOLISHED MATERIALS

- A. General: Separate recyclable demolished materials from other demolished materials to the maximum extent possible. Separate recyclable materials by type.
  - 1. Provide containers or other storage method approved by Architect for controlling recyclable materials until they are removed from Project site.
  - 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 demolition area. Do not store within drip line of remaining trees.
  - 4. Store components off the ground and protect from the weather.
  - 5. Transport recyclable materials off Owner's property and legally dispose of them.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling building demolition materials shall accrue to Contractor.

#### 3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
  - 1. Do not allow demolished materials to 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 demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

#### 3.8 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

# SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

## PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Interior Cast-in-place concrete, including reinforcement, concrete materials, mix design, placement procedures, and finishes.

#### 1.2 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. Product Data: For each manufactured material and product indicated.
- C. Design Mixes: For each concrete mix indicated.
- D. Shop Drawings: Include details of steel reinforcement placement including material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports.

## 1.3 QUALITY ASSURANCE

- A. Comply with Section 01 43 00.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- C. Comply with ACI 301, "Specification for Structural Concrete," including the following. In case of discrepancy, most stringent requirement will govern.
  - 1. General requirements, including submittals, quality assurance, acceptance of structure, and protection of in-place concrete.
  - 2. Formwork and form accessories.
  - 3. Steel reinforcement and supports.
  - 4. Concrete mixtures.
  - 5. Handling, placing, and constructing concrete.

## 1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle steel reinforcement to prevent bending and damage.

## PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Steel Reinforcement:
  - 1. Deformed-Steel Welded Wire Fabric: ASTM A 497, flat sheet.
- B. Concrete Materials:
  - 1. Portland Cement: ASTM C 150, Type I or II or I/II.
  - 2. Normal-Weight Aggregate: ASTM C 33, uniformly graded, not exceeding the following nominal sizes.
    - a. 1-1/2-inch for footings and slabs-on-grade of 6 inch thickness or greater.
    - b. 3/4 inch for other concrete except as noted otherwise.

- c. 1/2 inch topping aggregate.
- d. 3/8 inch to 3/4 inch smooth round stone at exposed aggregate. Crushed stone or aggregate containing iron is not acceptable.
- 3. Water: Fresh, clean, and potable per ASTM C 94.
- C. Admixtures:
  - 1. Air-Entraining Admixture: ASTM C 260.
  - 2. Water-Reducing Admixture: ASTM C 494, Type A.
  - 3. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
  - 4. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
  - 5. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
- D. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a No. 4 sieve and 10 to 30 percent passing a No. 100 sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.
- E. Vapor Retarder: Multi-ply reinforced polyethylene sheet, ASTM E 1745, Class C, not less than 7.8 mils thick; or polyethylene sheet, ASTM D 4397, not less than 10 mils thick.

## 2.2 CONCRETE MIXES

- A. Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases, as follows:
  - 1. Proportion normal-weight concrete per ACI 211.1 and ACI 301.
  - 2. Proportion lightweight structural concrete per ACI 211.2 and ACI 301.
- B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the laboratory trial mix basis.
- C. Proportion normal-weight concrete mix as follows:
  - 1. Compressive Strength (28 Days): 3000 psi interior slabs and walls.
  - 2. Minimum Slump of 3 inches and maximum Slump of 5 inches vertical surfaces.
  - 3. Maximum Slump for Concrete Containing High-Range Water-Reducing Admixture: 8 inches after admixture is added to concrete with 2- to 4-inch slump.
- D. Slab-on-Grade: Proportion normal-weight concrete mix as follows:
  - 1. Minimum Cementitious Materials Content: 470 lb/cu. yd. for 1-1/2 inch aggregate.
  - 2. Minimum Cementitious Materials Content: 520 lb/cu. yd. for 1 inch aggregate.
  - 3. Minimum Cementitious Materials Content: 540 lb/cu. yd. for 3/4 inch aggregate.
  - 4. Minimum Slump of 2 inches and maximum Slump of 5 inches vertical surfaces.
- E. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of the following percentages:
  - 1. 3/4 inch course aggregate: 5 to 8 percent.
  - 2. 1 inch course aggregate: 4 to 7 percent.
  - 3. 1-1/2 inch course aggregate: 3 to 6 percent.
  - 4. Air content of trowel-finished interior concrete floors shall not exceed 3.0 percent.

## 2.3 CONCRETE MIXING

- A. Ready-Mixed Concrete: Comply with ASTM C 94 and ASTM C 1116.
  - 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.
- B. Provide batch ticket for each batch discharged and used in Work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water added. Record approximate location of final deposit in structure.

## 3.1 INSTALLATION, GENERAL

- A. Steel Reinforcement: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
  - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Locate and install so as not to impair strength or appearance of concrete, at locations indicated or as approved by Architect. Construct contraction joints for a depth equal to at least 1/4 of concrete thickness, as follows:
  - 1. Joint locations: Maximum spacing of 30 feet in any direction unless indicated otherwise. Locate joints under partitions where practical.
  - 2. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
  - 3. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
    - a. Sawed joints may only be used if cuts are made within 12 hours of pour.
- C. Tolerances: Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

## 3.2 CONCRETE PLACEMENT

- A. Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.
- B. Do not add water to concrete during delivery, at Project site, or during placement, without Architect written approval.
- C. Consolidate concrete with mechanical vibrating equipment.

#### 3.3 FINISHING UNFORMED SURFACES

- A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on the surface.
  1. Do not further disturb surfaces before starting finishing operations.
- C. Scratch Finish: Apply scratch finish to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quarry tile, portland cement terrazzo, and other bonded cementitious floor finish, unless otherwise indicated.
- D. Float Finish: Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.
- E. Trowel Finish: Apply a hard trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.
- F. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set methods. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.

## St. Cloud, MN

G. Nonslip Broom Finish: Apply a nonslip broom finish to surfaces indicated and to exterior concrete platforms, walks, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

## 3.4 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection, and follow recommendations in ACI 305R for hotweather protection during curing.
- B. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.
- C. Cure formed and unformed concrete for at least 7 days as follows:
  - 1. Curing Compound: Apply uniformly in continuous operation by power spray or roller per manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

## 3.5 FIELD QUALITY CONTROL

- A. Trowel Finish: Finish surfaces to the following tolerances, measured within 24 hours per ASTM E 1155/E 1155M for a randomly trafficked floor surface:
  - 1. For areas scheduled to receive carpet: Specified overall values of flatness, F(F) 25; and levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and levelness, F(L) 15.
  - 2. For areas scheduled to receive thin-set floor finish: Specified overall values of flatness, F(F) 35; and levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and levelness, F(L) 17; for slabs-on-grade.
  - 3. For areas scheduled to receive vinyl composition tile, ceramic tile, terrazzo floor finish: Specified overall values of flatness, F(F) 35; and levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and levelness, F(L) 17; for slabs-on-grade.

# SECTION 06 10 00 - ROUGH CARPENTRY

## PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:1. Wood blocking.

## 1.2 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. Product Data: For each type of process and factory-fabricated product indicated.
  - 1. Include data for wood-preservative and fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that materials comply with requirements.
- C. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses.
- D. Research/Evaluation Reports: Treated wood products.

## 1.3 QUALITY ASSURANCE

A. Comply with Section 01 43 00.

## PART 2 - PRODUCTS

## 2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. For exposed lumber indicated to receive stained or natural finish, mark grade stamp on end or back of each piece, or omit grade stamp and provide certificates of grade compliance issued by grading agency.
  - 3. Provide dressed lumber, S4S, unless otherwise indicated.
  - 4. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.

## 2.2 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, provide materials that comply with performance requirements in AWPA C20 (lumber) and AWPA C27 (plywood). Identify fire-retardant-treated wood with appropriate classification marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.
  - 1. Use treatment for which chemical manufacturer publishes physical properties of treated wood after exposure to elevated temperatures, when tested by a qualified independent testing agency per ASTM D 5664, for lumber and ASTM D 5516, for plywood.
  - 2. Use treatment that does not promote corrosion of metal fasteners.
  - 3. Use Exterior type for exterior locations and where indicated.
  - 4. Use Interior Type A High Temperature (HT), unless otherwise indicated.

## 2.3 DIMENSION LUMBER

- A. General: Of grades indicated per the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated.
- B. Comply with Structural Drawings for species and grades of lumber required for Work.

## 2.4 MISCELLANEOUS MATERIALS

- A. Fasteners:
  - 1. Power-Driven Fasteners: CABO NER-272.
- B. Metal Framing Anchors: Made from hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.
  - 1. Research/Evaluation Reports: Provide products acceptable to authorities having jurisdiction and for which model code research/evaluation reports exist that show compliance of metal framing anchors, for application indicated, with building code in effect for Project.
  - 2. Allowable Design Loads: Meet or exceed those indicated per manufacturer's published values determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

## PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports where indicated on Drawings and to comply with requirements for attaching other construction.
- B. Securely attach rough carpentry Work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. CABO NER-272 for power-driven fasteners.
  - 2. Table 23-II-B-1, "Nailing Schedule," and Table 23-II-B-2, "Wood Structural Panel Roof Sheathing Nailing Schedule," in the Uniform Building Code.
- C. Framing Standard: Comply with AFPA's "Manual for Wood Frame Construction," unless otherwise indicated.

# SECTION 06 40 23 - INTERIOR ARCHITECTURAL WOODWORK

## 1.1 SUMMARY

- A. Section Includes.
  - 1. Plastic-laminate countertops.
  - 2. Shop finishing of woodwork.
  - 3. Shelving and clothes rods.
- B. Interior Architectural woodwork includes wood furring, blocking, shims and hanging strips unless concealed within other construction before woodwork installation.

## 1.2 SUBMITTALS

- A. Product Data: For cabinet hardware and accessories and finishing materials and processes.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devises and other components.
- C. Samples:
  - 1. Lumber and panel products for transparent finish for each species and cut, finished on one side and one edge.
  - 2. Lumber and panel products with shop-applied opaque finish, for each finish system and color, with exposed surface finished.
  - 3. Plastic-laminates, for each type, color, pattern ad surface finish.
  - 4. Thermoset decorative panels, for each type, color, pattern, and surface finish.
- D. Casework Samples:
  - 1. Provide a full sized cabinet which may become part of installed casework:
  - 2. Exposed cabinet hardware and accessories, one unit for each type and finish.

## 1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of woodwork.
- B. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards" for grades of interior architectural woodwork, construction, finishes and other requirements.

## 1.4 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, we Work is complete and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

## PART 2 - PRODUCTS

## 2.1 MATERIALS

A. Wood Species and Cut for Transparent Finish: Red oak, plain sawn or sliced.

## INTERIOR ARCHITECTURAL WOODWORK

## B. Wood Products:

- 1. Medium-Density Fiberboard: ANSI A208.2, Grade MD.
- 2. Particleboard: ANSI A208.1, Grade M-2.
- C. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.
- D. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard.

## 2.2 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural woodwork, except for items specified in Section 08 71 00 Door Hardware.
- B. Hinges: Concealed, 110 degree opening, self-closing,
- C. Pulls:
  - 1. Amerock 3" Pull, Blackrock.
- D. Catches: Magnetic catches, BHMA A156.9, B03141.
- E. Drawer Slides: BHMA A156.9, B05091.
  - 1. Standard Duty (Grade 1, Grade 2, and Grade 3): Side mounted and extending under bottom edge of drawer; full-extension type; epoxy-coated steel with polymer rollers.
  - 2. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Side mounted; full-extension type; zincplated steel ball-bearing slides.
  - 3. Box Drawer Slides: Grade 1; for drawers not more than 6 inches high and 24 inches wide.
- F. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
  - 1. Oil Rubbed Bronze.

## 2.3 MISCELLANEOUS MATERIALS

A. Adhesives, General: Do not use adhesives that contain urea formaldehyde.

## 2.4 FABRICATION

- A. General: Complete fabrication to maximum extent possible before shipment to Project site. Where necessary for fitting at site, provide allowance for scribing, trimming, and fitting.
  - 1. Interior Woodwork Grade: AWI custom grade.
  - 2. Shop cut openings to maximum extent possible. Sand edges of cutouts to remove splinters and burrs. Seal edges of openings in countertops with a coat of varnish.
- B. Wood Cabinets for Transparent Finish:
  - 1. AWI Type of Cabinet Construction: Flush overlay with eased square edges and recessed flat panel.
  - 2. Grain Direction: Vertically for drawer fronts, doors and fixed panels, unless indicated otherwise.
  - 3. Matching of Veneer Leaves: Book match.
  - 4. Veneer Matching within Panel Face: Balance match.
  - 5. Semi-exposed Surfaces Other Than Drawer Bodies: Compatible species to that indicated for exposed surfaces, stained to match.
- 6. Interior Surfaces: Provide melamine interior cabinet finishes.
- 7. Drawer Sides and Backs: Thermoset decorative panels.
- 8. Drawer Bottoms: Thermoset decorative panels.
- C. Plastic-Laminate Countertops:
  - 1. High-Pressure Decorative Laminate: Post forming grade.
  - 2. Manufacturer: Formica, Wilsonart or Nevamar.
  - 3. Color to be selected from full range of manufacturer's colors.

## 2.5 SHELVING AND CLOTHES RODS

- A. Shelving: Made from one of the following materials, 3/4 inch (19 mm) thick. Do not use particleboard or MDF that contains urea formaldehyde.
  - 1. Particleboard with radiuses and filled front edge. Melamine finishes on all surfaces.
    - 2. MDF with radiuses front edge. Melamine finishes on all surfaces.
- B. Shelf Brackets with Rod Support: BHMA A156.16, B04051; prefinished formed steel, regular duty.
- C. Clothes Rods: 1-1/2-inch diameter, wood.
  - Rod Flanges: Zinc-plated steel rod brackets. Acceptable manufacturers
    - a. Stanley Commercial Hardware.
    - b. Knape & Vogt Manufacturing
    - c. Approved Substitution.
- D. Adjustable Shelving Brackets
  - 1. Adjustable standards with brackets, regular duty.

## 2.6 SHOP FINISHING

1.

- A. Finish architectural woodwork at fabrication shop. Defer only final touchup, cleaning, and polishing until after installation.
- B. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply 2 coats to back of paneling.
- C. Transparent Finish:
  - 1. Grade: Premium
  - 2. AWI Finish System: Conversion varnish
  - 3. Staining: Match approved sample for color.
  - 4. Sheen: Satin, 31-45 gloss units measured on 60-degree gloss meter per ASTM D523.

## PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas. Examine shop-fabricated Work for completion and complete work as required, including removal of packing and Backpriming.
- B. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.
- C. Install woodwork level, plumb, true, and straight to a tolerance of 1/8 inch in 96 inches. Shim as required with concealed shims.

- D. Scribe and cut woodwork to fit adjoining Work, and refinish cut surfaces and repair damaged finish at cuts.
- E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.
- F. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation.
  - 1. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches on center with fasteners appropriate for anchoring to structure. No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.
- G. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
  - 1. Install countertops with no more than 1/8 inch in 96 inch sag, bow or other variation from a straight line.
  - 2. Secure backsplashes to tops with concealed metal brackets at 16 inches on center and to walls with adhesive.
  - 3. Caulk space between backsplash and wall with sealant specified in Section 07 92 00 Joint Sealants.

# END OF SECTION

# SECTION 07 92 00 - JOINT SEALANTS

# PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - Joint sealants for the following applications, including those specified by reference to this Section:
    a. Interior joints in vertical surfaces and horizontal nontraffic surfaces.

## 1.2 SYSTEM DESCRIPTION

- A. Performance Requirements:
  - 1. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
  - 2. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

## 1.3 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inchwide joints formed between two 6-inch- long strips of material matching appearance of exposed surfaces adjacent to joint sealants.
- C. Qualification data complying with requirements specified in "Quality Assurance Article. Include list of completed projects with project name, addresses, names of architects and owners, plus other information specified.
- D. Sealant Schedule:
  - 1. Submit schedule of sealant applications listing joint sealants proposed for this Work and materials to which joint sealants are specified to be applied. Obtain Architect's written approval of this sealant schedule before starting Work of this Section.
- E. Pre-construction field test reports.
- F. Compatibility and adhesion test reports.
- G. Product test reports.

## 1.4 QUALITY ASSURANCE

- A. Pre-construction Compatibility and Adhesion Testing: Submit samples of materials that will contact or affect joint sealants to joint-sealant manufacturers for testing per manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
  - 1. A minimum of 10 days prior to starting Work of this Section, submit test reports to Architect including results of test failures and passes.
- B. Pre-construction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to Project joint substrates per method in ASTM C1193 that is appropriate for types of Project joints.

- A. Warrant materials and workmanship against defects. Include coverage for installed joint sealant and accessories, which fail to achieve airtight and watertight seal, exhibit loss of adhesion or cohesion, or do not cure, after completion and final acceptance of Work.
  - 1. Repair defects, or replace with new materials, faulty materials or workmanship developed during guarantee period at no expense to Owner.
  - 2. Acrylic Latex and Butyl Sealant: 1 year warranty.
  - 3. Silicone Sealant and Adhesive: 20 year warranty.
  - 4. Polyurethane Sealant: 5 year warranty.

## PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

A. Subject to compliance with requirements, products that may be incorporated into Work include products listed in other Part 2 articles.

## 2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, 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 of Exposed Joint Sealants: Selected by Architect from manufacturer's full range unless indicated otherwise.
- C. Single-Component Mildew-Resistant Acid-Curing Silicone Sealant:
  - 1. For sealing interior joints at countertops, vanities, tubs, plumbing fixtures, and other locations subject to moisture.
  - 2. Type and Grade: S (single component) and NS (nonsag).
  - 3. Class: 25.
  - 4. Use Related to Exposure: NT (nontraffic).
  - 5. Color: White or Clear.
  - 6. Acceptable Products:
    - a. Dow Corning Corporation: 786 Mildew Resistant.
    - b. GE Silicones: Sanitary SCS1700.
    - c. Tremco: Tremsil 200 [White] [Clear].
    - d. Degussa Building Systems: Sonneborn OmniPlus.
    - e. Bostik Findley, Inc.: 9732 RTV.
    - f. Approved Substitutions.
- D. Single-Component, Neutral-Curing, Silicone Sealant:
  - 1. For silicone structural glazing at glass, anodized aluminum, granite, and most paints.
  - 2. Type and Grade: S (single component) and NS (nonsag).
  - 3. Class: 25.
  - 4. Use Related to Exposure: NT (nontraffic).
  - 5. Stain-Test-Response Characteristics: Nonstaining to porous substrates per ASTM C1248.
  - 6. Warranty: Special 20 year limited warranty.
  - 7. Acceptable Products:
    - a. Dow Corning Corporation; 790.
    - b. Approved Substitutions.

- A. Joint Cleaner: Non-corrosive and non-staining type, as recommended by joint sealant manufacturer; compatible with joint forming materials.
- B. Primer: Non-staining type, recommended by manufacturer to suit application.
- C. Joint Backer Rod: Soft, closed cell polyethylene rod designed for use with cold applied joint sealant passing ASTM C1253. Provide backer rod of size required for joint design.
  - 1. Acceptable Products:
    - a. Sof Rod by Nomaco.
    - b. Soft Backer Rod by Degussa Building Products.
- D. Bond Breaker: Pressure sensitive tape recommended by joint sealant manufacturer to suit application.

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants.
  - 1. Remove foreign material from joint substrates that could interfere with adhesion of joint sealant.
    - a. Clean 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 sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.
- B. Joint Priming: Prime joint substrates[, where recommended in writing by joint-sealant manufacturer,] based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that 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.

## 3.3 INSTALLATION

- A. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- B. Acoustical Sealant Application Standard: Acoustical sealants are specified in Section 09 21 16 Gypsum Board Assemblies.
- C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - 1. Do not leave gaps between ends of sealant backings.
  - 2. Do not stretch, twist, puncture, or tear sealant backings.
  - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
  - 1. Place sealants so they directly contact and fully wet joint substrates.
  - 2. Completely fill recesses in each joint configuration.
  - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants per requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
  - 1. Remove excess sealant from surfaces adjacent to joints.
  - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
  - 3. Provide concave joint configuration per Figure 5A in ASTM C1193, unless otherwise indicated.
- G. Clean off excess sealant or sealant smears adjacent to joints as Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

END OF SECTION

# SECTION 08 11 13 - HOLLOW METAL AND FRAMES

## PART 1 - GENERAL

## 1.1 SUMMARY

A. Section Includes:1. Standard hollow metal frames.

## 1.2 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. Product Data: For each product indicated. Include door designation, type, level and model, material description, label compliance, fire-resistance ratings, and finishes.
- C. Door Schedule. Use same reference designations indicated on Drawings.

## 1.3 QUALITY ASSURANCE

- A. Comply with Section 01 43 00.
- B. Hollow Metal Door and Frame Standard: Comply with ANSI A 250.8, unless more stringent requirements are indicated.
- C. Temperature Rise Rating: At stair well enclosures, provide doors that have Temperature Rise Rating of 450 degrees F maximum in 30 minutes of fire exposure.
- D. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated or required, provide fire-rated door and frame assemblies that comply with NFPA 80 "Standard for Fire Doors and Window", and have been tested, listed, and labeled per ASTM E152 "Standard Methods of Fire Tests of Door Assemblies" by a nationally recognized independent testing and inspection agency acceptable to authorities having jurisdiction.
- E. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated or required, comply with requirements of current code.

## PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products from 1 of the following manufacturers:
  - 1. Amweld Building Products, LLC.
  - 2. Ceco Door Products; an ASSA ABLOY Group Company.
  - 3. Curries Company; an ASSA ABLOY Group Company.
  - 4. Kewanee Corporation (The).
  - 5. Republic Builders Products Company.
  - 6. Steelcraft; an Ingersoll-Rand Company.
  - 7. Pioneer Industries, Inc.
  - 8. Approved Substitutions.

## 2.2 FRAMES

- A. General: ANSI A250.8; conceal fastenings, unless otherwise indicated.
  - 1. Material: Hot-Rolled Steel Sheets ASTM A 569/A 569M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- B. Frame Steel Sheet Thickness:1. Interior Frames: 0.0635-inch (16 gauge).
- C. Door Silencers: 3 silencers on single-door frames and 2 silencers on double-door frames.
- D. Supports and Anchors: Not less than 0.042-inch- thick zinc-coated steel sheet.
  - 1. Masonry Wall Anchors: 0.177-inch- diameter, steel wire complying with ASTM A 510 may be used in place of steel sheet.
- E. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Zinc-coat items that are to be built into exterior walls per ASTM A 153/A 153M, Class C or D as applicable.

## 2.3 FABRICATION

- A. General: Fabricate hollow metal frame units to comply with ANSI A250.8 free from defects including warp and buckle. Where practical, fit and assemble units in manufacturer's plant.
- B. Tolerances: Comply with SDI 117.
- C. Frame Construction:
  - 1. Fabricate frames with mitered or coped and continuously welded corners and seamless face joints. Provide temporary spreader bars.
- D. Reinforce frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.
- E. Astragals: As required by NFPA 80 to provide fire ratings indicated.
- F. Apply appropriate UL label to hollow metal doors and frames.

## 2.4 FINISHES

- A. Steel Finish: Factory priming for field-painted finish.
  - 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI A250.10 acceptance criteria.

## PART 3 - EXECUTION

- 3.1 INSTALLATION
  - A. Comply with Section 01 70 00.
  - B. Placing Frames: Comply with provisions in SDI 105, unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
    - 1. Wall Anchors: Provide at least three anchors per jamb. For openings 90 inches or more in height, install an additional anchor at hinge and strike jambs.
    - 2. Gypsum Board Partitions: For in-place partitions, install knock-down, drywall slip-on frames.
    - 3. Fire-Rated Frames: Install per NFPA 80.

## HOLLOW METAL DOORS AND FRAMES

C. After installation, remove protective wrappings from doors and frames and touch up prime coat with compatible air-drying primer.

END OF SECTION

# SECTION 08 14 16 - FLUSH WOOD DOORS

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes

- 1. Solid core doors as follows:
  - a. Doors with wood-veneer faces and factory finishing.
  - b. Factory fitting wood doors to frames and factory machining for hardware.

## 1.2 SUBMITTALS

- A. Product Data: For each type of door. Include factory-finishing specifications.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details; location and extent of hardware blocking, mortises, holes and cutouts, requirements for veneer matching, factory finishing, fire ratings, and other pertinent data.
- C. Samples: For each face material and finish.

## 1.3 QUALITY ASSURANCE

A. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."

## PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products by one of the following:
  - 1. Algoma Hardwoods, Inc.
  - 2. Buell Door Company Inc.
  - 3. Eggers Industries, Inc.
  - 4. Graham; an Assa Abloy Group company.
  - 5. Marshfield Door Systems, Inc.
  - 6. V-T Industries Inc.

## 2.2 DOOR CONSTRUCTION

- A. Doors for Transparent Finish:
  - 1. Grade: Premium, with Grade AA faces.
  - 2. Species and Cut: Red oak, plain sliced.
  - 3. Match between Veneer Leaves: Book match.
  - 4. Assembly of Veneer Leaves on Door Faces: Balance match unless indicated otherwise.
  - 5. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
- B. Interior Veneer-Faced Solid-Core Doors:
  - 1. Core: Either glued block or structural composite lumber.
  - 2. Construction: 5 plies with stiles and rails bonded to core, then entire unit abrasive planed before veneering.

## C. Fire-Rated Doors:

- 1. Construction: Construction and core specified above for type of face indicated or manufacturer's standard mineral-core construction as needed to provide fire rating indicated.
- 2. Edge Construction: Intumescent seals concealed by outer stile matching face veneer, and laminated backing for improved screw-holding capability and split resistance.
- 3. Pairs: Furnish formed-steel edges and astragals with intumescent seals for pairs of fire-rated doors, unless otherwise indicated.
- D. Blocking: For mineral core doors, provide blocking as needed to eliminate through-bolting hardware. For mineral-core doors use composite blocking with improved screw-holding capability.

## 2.3 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting. Comply with requirements in NFPA 80 for fire-rated doors.
- B. Factory machine doors for hardware that is not surface applied.
  - 1. Metal Astragals: Premachine astragals and formed-steel edges for hardware for pairs of fire-rated doors.

## 2.4 FACTORY FINISHING

- A. General: Finish doors at factory.
- B. Grade: Premium.
- C. Finish: Manufacturer's standard finish with performance comparable to AWI System TR-6 catalyzed polyurethane.
- D. Staining: Match existing.
- E. Sheen: Satin unless indicated otherwise.

## PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Install doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.
  - 1. Install fire-rated doors in corresponding fire-rated frames per NFPA 80.
  - 2. Comply with NFPA 80 for fire-rated doors.
- B. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- C. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

## END OF SECTION

# SECTION 08 71 00 DOOR HARDWARE

## PART 1 GENERAL

## 1.1 CONDITIONS

- A. Conditions of the contract (General and Supplementary Conditions) and Division One General Requirements, govern the work of this section.
- B. This section includes all material, and related service necessary to furnish all finish hardware indicated on the drawings or specified herein.
- C. Furnish UL listed hardware for all labeled and 20 min. openings in conformance with the requirements for the class of opening scheduled. Underwriters' requirements shall have precedence over specification where conflicts exist.
- D. All work shall be in accordance with all applicable state and local building codes. Code requirements shall have precedence over this specification where conflicts exist.

## 1.2 WORK INCLUDED

- A. This section includes the following:
  - 1. Furnish door hardware (for wood doors) specified herein, listed in the hardware schedule, and/or required by the drawings.
  - 2. Access Control components and or systems specified within this section.
- B. Where items of hardware are not definitely or correctly specified and is required for the intended service, such omission, error or other discrepancy should be directed to the Architect prior to the bid date for clarification by addendum. Otherwise furnish such items in the type and quantity established by this specification for the appropriate service intended.

## 1.3 RELATED WORK IN OTHER SECTIONS

- A. This section includes coordination with related work in the following sections:
  - 1. Division 8 Section "Hollow Metal Doors and Frames".
  - 2. Division 8 Section "Wood Doors"

## 1.4 REFERENCES

- A. Publications of agencies and organizations listed below form a part of this specification section to the extent referenced.
  - 1. DHI Recommended Locations for Builders' Hardware.
  - 2. NFPA 80 Standards for Fire Doors and Windows.
  - 3. NFPA 101 Code for Safety to Life from Fire in Buildings and Structures.
  - 4. UL Building Material Directory.
  - 5. DHI Door and Hardware Institute
  - 6. WHI Warnock Hersey
  - 7. BHMA Builders Hardware Manufacturers Association
  - 8. ANSI American National Standards Institute
  - 9. IBC 2012 International Building Code 2012 Edition (as amended by local building code)

## 1.5 SUBMITTALS

A. Within ten days after award of contract, submit detailed hardware schedule in quantities as required by Division 1 - General Conditions.

- B. Schedule format shall be consistent with recommendations for a vertical format as set forth in the Door & Hardware Institute's (DHI) publication "Sequence and Format for the Hardware Schedule". Hardware sets shall be consolidated to group multiple door openings which share similar hardware requirements. Schedule shall include the following information:
  - 1. Door number, location, size, handing, and rating.
  - 2. Door and frame material, handing.
  - 3. Degree of swing.
  - 4. Manufacturer
  - 5. Product name and catalog number
  - 6. Function, type and style
  - 7. Size and finish of each item
  - 8. Mounting heights
  - 9. Explanation of abbreviations, symbols, etc.
  - 10. Numerical door index, indicating the hardware set/ group number for each door.
- C. When universal type door closers are to be provided, the schedule shall indicate the application method to be used for installation at each door: (regular arm, parallel arm, or top jamb).
- D. The schedule will be prepared under the direct supervision of a certified Architectural Hardware Consultant (AHC) employed by the hardware distributor. The hardware schedule shall be signed and embossed with the DHI certification seal of the supervising AHC. The supervising AHC shall attend any meetings related to the project when requested by the architect.
- E. Check the specified hardware for suitability and adaptability to the details and surrounding conditions.
- F. Review drawings from related trades as required to verify compatibility with specified hardware. Indicate unsuitable or in compatible items, and proposed substitutions in the hardware schedule.
- G. Provide documentation for all hardware to be furnished on labeled fire doors indicating compliance with positive pressure fire testing UL 10C.
- H. Furnish manufacturers' catalog data for each item of hardware in quantities as required by Division 1 General Conditions.
- I. Submit a sample of each type of hardware requested by the architect. Samples shall be of the same finish, style, and function as specified herein. Tag each sample with its permanent location so that it may be used in the final work.
- J. Furnish with first submittal, a list of required lead times for all hardware items.
- K. After final approved schedule is returned, transmit corrected copies for distribution and field use in quantities as required by Division 1 General Conditions.
- L. Furnish approved hardware schedules, template lists, and pertinent templates as requested by related trades.
- M. After receipt of approved hardware schedule, Hardware supplier shall initiate a meeting including the owner's representative to determine keying requirements. Upon completion of the initial key meeting, hardware supplier shall prepare a proposed key schedule with symbols and abbreviations as set forth in the door and hardware institute's publication "Keying Procedures, Systems, and Nomenclature". Submit copies of owner approved key schedule for review and field use in quantities as required by Division 1 General Conditions. Wiring diagrams shall be included in final submittals transmitted for distribution and field use.

## 1.6 QUALITY ASSURANCE

A. Manufacturers and model numbers listed are to establish a standard of function and quality. Similar items by approved manufacturers that are equal in design, function, and quality, may be considered for prior

approval of the architect, provided the required data and physical samples are submitted for approval as set forth in Division One General Requirements.

- B. Where indicated in this specification, products shall be independently certified by ANSI for compliance with relevant ANSI/BHMA standards A156.1 A156.36 Standards for Hardware and Specialties. All products shall meet or exceed certification requirements for the respective grade indicated within this specification. Supplier shall provide evidence of certification when requested by the architect.
- C. Obtain each type of hardware (hinges, latch & locksets, exit devices, closers, etc.) from a single manufacturer, although several may be indicated as offering products complying with requirements.
- D. All hardware items shall be manufactured no earlier than 6 months prior to delivery to site.
- E. Hardware supplier shall be factory trained and certified by the manufacture to provide and support all computer managed locks and system components.
- F. Installation of hardware shall be installed or directly supervised and inspected by a skilled installer certified by the manufacturer of locksets, door closers, and exit devices used on the project, or with not less than 3 years' experience in successful completion of projects similar in size and scope.
- G. Provide hardware for all labeled fire doors, which complies with positive pressure fire testing UL 10C.
- H. Comply with all applicable provisions of the standards referenced within section 1.4 of this specification.
- I. Hardware supplier shall participate when reasonably requested to meet with the contractor and or architect to inspect any claim for incorrect or non-functioning materials; following such inspection, the hardware supplier shall provide a written statement documenting the cause and proposed remedy of any unresolved items.

## 1.7 DELIVERY, STORAGE AND HANDLING

- A. Hardware supplier shall deliver hardware to the job site unless otherwise specified.
- B. All hardware shall be delivered in manufacturers' original cartons and shall be clearly marked with set and door number.
- C. Coordinate with contractor prior to hardware delivery and recommend secure storage and protection against loss and damage at job site.
- D. Contractor shall receive all hardware and provide secure and proper protection of all hardware items to avoid delays caused by lost or damaged hardware. Contractor shall report shortages to the Architect and hardware supplier immediately after receipt of material at the job site.
- E. Coordinate with related trades under the direction of the contractor for delivery of hardware items necessary for factory installation.

## 1.8 PRE-INSTALLATION MEETING

- A. Schedule a hardware pre-installation meeting on site to review and discuss the installation of continuous hinges, locksets, door closers, exit devices, overhead stops, and electromechanical door hardware.
- B. Meeting attendees shall be notified 7 days in advance and shall include: Architect, Contractor, Door Hardware Installers (including low voltage hardware), Manufacturers representatives for above hardware items, and any other effected subcontractors or suppliers.
- C. All attendees shall be prepared to distribute installation manuals, hardware schedules, templates, and physical hardware samples.

## 1.9 WARRANTY

A. All hardware items shall be warranted against defects in material and workmanship as set forth in Division One General Requirements.

B. Repair, replace, or otherwise correct deficient materials and workmanship without additional cost to owner.

## PART 2 - PRODUCTS

## 2.1 FASTENERS

- A. All exposed fasteners shall be Phillips head or as otherwise specified, and shall match the finish of the adjacent hardware. All fasteners ex-posed to the weather shall be non-ferrous or stainless steel. Furnish correct fasteners to accommodate surrounding conditions.
- B. Coordinate required reinforcements for doors and frames. Seek approval of the architect prior to furnishing through-bolts. Furnish through-bolts as required for materials not readily reinforced.

## 2.2 BUTT HINGES

A. Acceptable manufacturers and respective catalog numbers:

		Ives	Stanley	<u>Hager</u>	<b>McKinney</b>
1.	Standard Weight, Plain Bearing	5PB1	F179	1279	T2714
2.	Standard Weight, Ball Bearing	5BB1	BB179	BB1279	TB2714
3.	Standard Weight, Ball Bearing, Non-Ferrous	5BB1	FBB191	BB1191	TB2314
4.	Heavy Weight, Ball Bearing	5BB1HW	FBB168	BB1168	T4B3786
5.	Heavy Weight, Ball Bearing, Non-Ferrous	5BB1HW	FBB199	BB1199	T4B3386

- B. Unless otherwise specified, furnish the following hinge quantities for each door leaf.
  - 1. 3 hinges for doors up to 90 inches.
  - 2. 1 additional hinge for every 30 inch on doors over 90 inches.
  - 3. 4 hinges for Dutch door applications.
- C. Unless otherwise specified, top and bottom hinges shall be located as specified in division 8 Section "Hollow Metal Doors and Frames". Intermediate hinges shall be located equidistant from others.
- D. Unless otherwise specified, furnish hinge weight and type as follows:
  - 1. Standard weight: plain bearing hinge 5PB1 for interior openings through 36 inches wide without a door closer.
  - 2. Standard weight: ball bearing hinge 5BB1 for interior opening over 36 through 40 inches wide without a door closer, and for interior openings through 40 inches wide with a door closer.
  - 3. Heavyweight: 4 ball bearing hinge 5BB1HW for interior openings over 40 inches wide, and for all vestibule doors.
  - 4. Heavyweight: 4 ball bearing hinge 5BB1HWss for exterior openings unless otherwise listed in groups.
- E. Unless otherwise specified, furnish hinges for exterior doors, fabricated from brass, bronze, or stainless steel. Unless otherwise specified, hinges for interior doors may be fabricated from steel.
- F. Unless otherwise specified, furnish hinges in the following sizes:
  - 1. 5" x 5" 2-1/4" thick doors
  - 2. 4-1/2" x 4-1/2" 1-3/4" thick doors
  - 3. 3-1/2" x 3-1/2" 1-3/8" thick doors
- G. Furnish hinges with sufficient width to accommodate trim and allow for 180-degree swing.
- H. Unless otherwise specified, furnish hinges with flat button tips with non-rising pins at interior doors, non-removable loose pins (NRP) at exterior and out-swinging interior doors.
- I. Unless otherwise specified, furnish all hinges to template standards.

## 2.3 LOCKS AND LATCHES

A. Acceptable manufacturers and respective catalog numbers:

Schlage

- 1. Grade 1 Cylindrical ND Series SPA
- 2. Grade 2 Cylindrical AL Series NEP
- 3. Grade 2 Tubular F Series ACC
- B. Unless otherwise specified, all locks and latches to have:
  - 1. 2-3/4" Backset
  - 2. 1/2" minimum throw latchbolt
  - 3. 1" throw deadbolt
  - 4. 6 pin cylinders
  - 5. ANSI A115.2 strikes
- C. Interconnected locks shall accommodate center to center dimensions of 4" or 5-1/2" between deadbolt and latch.
- D. Provide guarded latch bolts for all locksets, and latch bolts with sufficient throw to maintain fire rating of both single and paired door assemblies.
- E. Length of strike lip shall be sufficient to clear surrounding trim.
- F. Provide wrought boxes for strikes at inactive doors, wood frames, and metal frames without integral mortar covers.

## 2.4 CLOSERS

A. Acceptable manufacturers and respective catalog numbers:

	LCN	<u>Corbin</u>
1.	4050 /4050EDA	DC8000 A10 /DC8000 A3
2.	1450	DC6000 /DC6000 A3

- B. Door closers shall be independently certified by ANSI for compliance with ANSI A156.4, Grade 1 (2008/2013).
- C. Obtain door closers from a single manufacturer, although several may be indicated as offering products complying with requirements.
- D. Provide extra heavy duty arm (EDA / HD) when closer is to be installed using parallel arm mounting.
- E. Hardware supplier shall coordinate with related trades to insure aluminum frame profiles will accommodate specified door closers.
- F. Provide "SPECIAL TEMPLATE #1728 / #0723" closer arms as required to accommodate aluminum frame head details with "non-structural stops" when closers will be required to utilize parallel arm mounting positions. Frame mounting shoe shall be shortened, and pivot hub height shall be increased to permit frame mounted shoe to be positioned on frame rabbit (rather than the frame stop), and behind the frame stop rather than on top of the frame stop. Contact LCN Door Closers at: 877-671-7011 for pricing and design assistance.
- G. Closers shall use high strength cast iron cylinders, forged main arms, and 1 piece forged steel pistons.
- H. Unless otherwise specified, all door closers shall have and separate adjusting valves for sweeps, latch, and backcheck.
- I. Provide closers for all labeled doors. Provide closer series and type consistent with other closers for similar doors specified elsewhere on the project.
- J. Provide closers with adjustable spring power. Size closers to insure exterior and fire rated doors will consistently close and latch doors under existing conditions. Size all other door closers to allow for reduced opening force not to exceed 5 lbs.
- K. Install closers on the room side of corridor doors, stair side of stairways and interior side of exterior doors.
- L. Closers shall be furnished complete with all mounting brackets and cover plates as required by door and frame conditions, and by adjacent hardware.

- M. Door closers shall be provided with a powder coat finish to provide superior protection against the effects of weathering. Powder coat finish shall successfully pass a 100 hour salt spray test.
- N. Pressure Relief Valve, PRV, shall not be acceptable.

#### 2.5 KICK PLATES AND MOP PLATES

- A. Furnish protective plates as specified in hardware groups.
- B. Where specified, provide 10" kick plates, 34" armor plates, and 4" mop plates. Unless otherwise specified, metal protective plates shall be .050" thick; plastic plates shall be 1/8" thick.
- C. Protective plates shall be 2" less door width, or 1" less door width at pairs. All protective plates shall be beveled 4 sides and counter sunk. Protection plates over 16" shall not be provided for labeled doors unless specifically approved by door manufacturers listing.
- D. Where specified, provide surface mounted door edges. Edges shall butt to protective plates. Provide edges with cutouts as required adjacent hardware.
- E. Adjust dimensions of protection plates to accommodate stile and rail dimensions, lite and louver cutouts, and adjacent hardware. Where required by adjacent hardware, protection plates shall be factory drilled for cylinders or other mortised hardware.

#### 2.6 OVERHEAD STOPS

A. Acceptable manufacturers and respective catalog numbers:

		Glynn-Johnson	<u>Rixson</u>	Sargent
1.	Heavy Duty Surface Mount	GJ900 Series	9 Series	590
2.	Heavy Duty Concealed Mount	GJ100 Series	1 Series	690
3.	Medium Duty Surface Mount	GJ450 Series	10 Series	1540

- B. Unless otherwise specified, furnish GJ900 series overhead stop for hollow metal or 1-3/4" solid core doors equipped with regular arm surface type closers that swing more than 140 degrees before striking a wall, for hollow metal or 1-3/4" solid core doors that open against equipment, casework, sidelights, or other objects that would make wall bumpers inappropriate, and as specified in hardware groups.
- C. Furnish sex bolt attachments for wood and mineral core doors unless doors are supplied with proper reinforcing blocks.
- D. Provide special stop only ("SE" suffix) overhead stops when used in conjunction with electronic hold open closers.
- E. Do not provide holder function for labeled doors.

#### 2.7 WALL STOPS AND HOLDERS

A. Acceptable manufacturers and respective catalog numbers:

		Ives	<u>Hager</u>	<u>Burns</u>
1.	Wrought Convex Wall Bumper	WS406CVX	232W	570
2.	Wrought Concave Wall Bumper	WS406CCV	236W	575

B. Furnish a stop or holder for all doors. Furnish floor stops or hinge pin stops only where specifically specified.

#### 2.8 WEATHERSTRIP, GASKETING

A. Acceptable manufacturers and respective catalog numbers:

		Zero	Pemko	NGP	Reese
1.	Adhesive Gasket	188	188	5050	797

- B. Where specified in the hardware groups, furnish the above products unless otherwise detailed in groups.
- C. Provide Zero 188 smoke gaskets at all fire rated doors and smoke and draft control assemblies.

#### 2.9 SLIDING DOOR HARDWARE

A. Acceptable Manufacturers and respective catalog numbers:

		Grant
1.	Solid Core Bi-Pass Hardware Set	1230
2.	Track	1201
3.	Hanger	1205
4.	Concealed Floor Guide	7015
5.	Angle Stop	1018
6.	Bumper Stop	1213

- B. Provide complete hardware sets for each opening specified with sliding door hardware. Include track, ball-bearing hangers, door stops, fasteners, guides, and all hardware required for a complete installation.
- C. Hardware supplier shall coordinate with related trades to insure that wall pocket framing will accommodate specified hardware.

#### 2.10 FINISHES AND BASE MATERIALS

A. Unless otherwise indicated in the hardware groups or herein, hardware finishes shall be applied over base metals as specified in the following finish schedule:

630 (US32D - Stainless Steel)

630 (US32D - Stainless Steel)

FINISH AND BASE MATERIAL

HARDWARE	E ITEM	BHMA

- Butt Hinges: Interior 1.
- 2. Locks and Latches
- 3. Closers
  - 630 (US32D Stainless Steel) 630 (US32D – Stainless Steel)
- 4. Wall Stops and Holders

#### 2.11 **KEYING**

- A. Acceptable manufacturers and respective catalog numbers:
  - Schlage
  - 1. Everest
- B. Provide all locks and cylinders utilizing a patented keyway to prevent manufacturing and distribution of aftermarket key blanks by anyone other than factory authorized dealers.
- C. All locks under this section shall be keyed as directed by the owner to a new Patented Master Key System.
- D. Keying shall be by lock manufacturer where permanent records shall be kept.
- E. Furnish a total of 2 keys per cylinder. Actual cut keys to be determined by owner.
- F. Master keys and control keys to be delivered by registered mail to the owner. Change keys shall be delivered in a set up key cabinet. Construction keys shall be delivered to the contractor.

## PART 3 - EXECUTION

#### 3.1 **EXAMINATION**

A. Prior to installation of hardware, installer shall examine door frame installation to insure frames have been set square and plumb. Installer shall examine doors, door frames, and adjacent wall, floor, and ceiling for conditions, which would adversely affect proper operation and function of door assemblies. Do not proceed with hardware installation until such deficiencies have been corrected.

#### 3.2 **INSTALLATION**

A. Before hardware installation, general contractor/construction manager shall coordinate a hardware installation seminar with a 1 week notice to all parties involved. The seminar is to be conducted on the installation of hardware, specifically of locksets, closers, exit devices, continuous hinges and overhead stops. Manufacturer's representative of the above products to present seminar. Seminar to be held at the job site and attended by installers of hardware (including low voltage hardware) for aluminum, hollow metal and wood doors. Training to include use of installation manuals, hardware schedule, templates and physical products samples.

- B. Install all hardware in accordance with the approved hardware schedule and manufacturers instructions for installation and adjustment.
- C. Set units level, plumb and true to the line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- D. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accord with industry standards.
- E. Drill appropriate size pilot holes for all hardware attached to wood doors and frames.
- F. Shim doors as required to maintain proper operating clearance between door and frame.
- G. Unless otherwise specified, locate all hardware in accordance with the recommended locations for builders hardware for standard doors and frames as published by the Door and Hardware Institute.
- H. Use only fasteners supplied by or approved by the manufacturer for each respective item of hardware.
- I. Mortise and cut to close tolerance and conceal evidence of cutting in the finished work.
- J. Conceal push and pull bar fasteners where possible. Do not install through bolts through push plates.
- K. Install hardware on UL labeled openings in accordance with manufacturer's requirements to maintain the label.
- L. Apply self-adhesive gasketing on frame stop at head & latch side and on rabbet of frame at hinge side.
- M. Install hardware in accordance with supplemental "S" label instructions on all fire rated openings.
- N. Install wall stops to contact lever handles or pulls. Do not mount wall stops on casework, or equipment.
- O. Where necessary, adjust doors and hardware as required to eliminate binding between strike and latchbolt. Doors should not rattle.
- P. Overhead stops used in conjunction with electrified hold open closers shall be templated and installed to coincide with engagement of closer hold open position.
- Q. Install door closers on corridor side of lobby doors, room side of corridor doors, and stair side of stairways.
- R. Adjust spring power of door closers to the minimum force required to insure exterior and fire rated doors will consistently close and latch doors under existing conditions. Adjust all other door closers to insure opening force does not to exceed 5 lbs.
- S. Adjust "sweep", "latch", & "back check" valves on all door closers to properly control door throughout the opening and closing cycle. Adjust total closing speed as required to comply with all applicable state and local building codes.
- T. Install "hardware compatible" (bar stock) type weatherstripping continuously for an uninterrupted seal. Adjust templating for parallel arm door closers, exit devices, etc., as required to accommodate weatherstripping.
- U. Unless otherwise specified or detailed, install thresholds with the bevel in vertical alignment with the outside door face. Notch and closely fit thresholds to frame profile. Set thresholds in full bed of sealant.
- V. Compress sweep during installation as recommended by sweep manufacturer to facilitate a water resistant seal.
- W. Deliver to the owner 1 complete set of installation and adjustment instructions, and tools as furnished with the hardware.

## 3.3 FIELD QUALITY CONTROL

- A. After installation has been completed, the hardware supplier and manufacturers representative for locksets, door closers, exit devices, and overhead stops shall check the project and verify compliance with installation instructions, adjustment of all hardware items, and proper application according to the approved hardware schedule. Hardware supplier shall submit a list of all hardware that has not been installed correctly.
- B. After installation has been completed, the hardware supplier and manufacturers representative shall meet with the owner to explain the functions, uses, adjustment, and maintenance of each item of hardware. Hardware supplier shall provide the owner with a copy of all wiring diagrams. Wiring diagrams shall be opening specific and include both a riser diagram and point to point diagram showing all wiring terminations.

## 3.4 ADJUSTMENT AND CLEANING

- A. At final completion, and when H.V.A.C. equipment is in operation, installer shall make final adjustments to and verify proper operation of all door closers and other items of hardware. Lubricate moving parts with type lubrication recommended by the manufacturer.
- B. All hardware shall be left clean and in good operation. Hardware found to be disfigured, defective, or inoperative shall be repaired or replaced.

## 3.5 HARDWARE SCHEDULE

A. The following schedule of hardware groups are intended to describe opening function. The hardware supplier is cautioned to refer to the preamble of this specification for a complete description of all materials and services to be furnished under this section.

## HW GROUP # 1: BI-FOLD DOOR

QTY		DESCRIPTION	CATALOG NUMBER	MFR
1	EA	H.D. Aluminum Box Track HINGES HANGERS SUPPORTS/MOUNT PLATES BUMPER STOP ALIGNER	SERIES 9860	HAG
1	EA	DOOR PULL 6" ALUM.	3E	HAG

## HW GROUP #: 02 – SLIDING POCKET DOOR

QTY		DESCRIPTION	CATALOG NUMBER	MFR
1	EA	HD ALUMINUM BOX TRACK HANGERS SUPPORTS FLOOR GUIDES BUMPERS	SERIES 9878	HAG
1 1	EA EA	DOOR PULL SLIDING DOOR LOCK	SN10 911.26-820	HAG HAFELE

St. Cloud HRA Wilson Apartments Accessibility Upgrade St. Cloud, MN

## HW GROUP #: 03 - BEDROOM

QTY		DESCRIPTION	CATALOG NUMBER	MFR
		BUTT HINGES	AS REQUIRED	
1	EA	LOCKSET- PRIVACY	ND 40 S-RHO	SCH
1	EA	WALL STOP	AS REQUIRED	

## HW GROUP #: 04 - CLOSET

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	TRACK MOUNTED STOP	1213	GRA
2	EA	SLIDING HARDWARE SET	1230	GRA
2	EA	FLUSH PULL	222	IVE
2	EA	WALL STOP	WS 406	IVE

## HW GROUP #: 05- PUBLIC TOILET

QTY		DESCRIPTION	CATALOG NUMBER	MFR
	EA	BUTT HINGES	AS REQUIRED	
1	EA	LOCKSET-TOILET	ND85PD	SCH
1	EA	CLOSER	4050/4050EDA	LCN
1	EA	WALL STOP	AS REQUIRED	
1	EA	KICK PLATE	8400 10"X2" LDO	IVE

END OF SECTION 08 71 00

# SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Interior gypsum wallboard.
  - 2. Tile backing panels.
  - 3. Non-load-bearing steel framing.
  - 4. Ceiling texture patching.

## 1.2 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. Product Data: For each product indicated.
- C. Samples: For each textured finish indicated and on same backing indicated for Work.

## 1.3 QUALITY ASSURANCE

- A. Comply with Section 01 43 00.
- B. Fire-Test-Response Characteristics: For gypsum board assemblies with fire-resistance ratings, provide materials and construction identical to those tested in assembly indicated per ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
- C. Sound Transmission Characteristics: For gypsum board assemblies with STC ratings, provide materials and construction identical to those tested in assembly indicated per ASTM E 90 and classified per ASTM E 413 by a qualified independent testing agency.

## PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. Interior Metal Framing: Subject to compliance with requirements, provide products from 1 of the following manufacturers:
  - 1. Clark Steel Framing Systems.
  - 2. Dietrich Industries, Inc.
  - 3. Gold Bond Building Products.
  - 4. Unimast, Inc.
  - 5. Substitutions: Comply with Section 01 25 03.
- B. Gypsum Materials: Subject to compliance with requirements, provide products from 1 of the following manufacturers:
  - 1. G-P Gypsum Products.
  - 2. Gold Bond Building Products.
  - 3. United States Gypsum Company (USG).
  - 4. Substitutions: Comply with Section 01 25 03.
- C. Texture Finishes:

## GYPSUM BOARD ASSEMBLIES

- 1. Products: Subject to compliance with requirements, provide 1 of the following:
  - a. Polystyrene Aggregate Ceiling Finish:
    - 1) G-P Gypsum Corp.; GyProc Ceiling Texture/Polystyrene.
    - 2) National Gypsum Company; Gold Bond Perfect Spray.
    - 3) United States Gypsum Co.; SHEETROCK Ceiling Spray Texture, QT Polystyrene.

## 2.2 STEEL FRAMING

- A. Steel Framing, General: Comply with ASTM C 754 for conditions indicated.
  - 1. Steel Sheet Components: Metal complying with ASTM C 645 requirements.
    - a. Protective Coating:
      - 1) Interior Applications: manufacturer's standard corrosion-resistant zinc coating.
- B. Partition and Soffit Framing:
  - 1. Steel Studs and Runners: ASTM C 645, in depth indicated. Size stud gauge to properly accommodate applicable lateral forces.
    - a. Minimum Base Metal Thickness: 20 gauge.
  - 2. Deep-Leg Deflection Track: ASTM C 645 top runner with 3-inch- deep flanges. 22 gauge
  - 3. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

## 2.3 PANEL PRODUCTS

- A. Panel Size, General: Provide in maximum lengths and widths available that will minimize joints in each area and correspond with support system indicated.
- B. Gypsum Wallboard: ASTM C 36.
  - 1. Type X: In thickness indicated and with long edges tapered.
- C. Tile Backing Panels:
  - 1. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with core type and in thickness indicated.
    - a. Product: G-P Gypsum Corp.; Dens-Shield Tile Backer.

## 2.4 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
  - 1. Cornerbead: Use at outside corners.
  - 2. LC-Bead: Use at exposed panel edges.
  - 3. L-Bead: Use where indicated.
  - 4. U-Bead: Use where indicated.
  - 5. Expansion (Control) Joint: Use where indicated.

## 2.5 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475.
- B. Joint Tape:
  - 1. Interior Gypsum Wallboard: Paper.
  - 2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
  - 3. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

- 1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
- 2. Use drying-type, all-purpose compound for the following coat types unless noted otherwise:
  - a. Embedding and First Coat: For embedding tape and first coat on joints, flanges of trim accessories, and fasteners.
    - 1) Use setting-type compound for installing paper-faced metal trim accessories.
  - b. Fill and Second Coat: For second coat.
  - c. Finish and Third Coat: For third coat.
  - d. Skim and Final Coat for Level 5 finish.
- D. Joint Compound for Tile Backing Panels:
  - 1. Glass-Mat, Water-Resistant Backing Panel: As recommended by manufacturer.

## 2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Acoustical Sealant for Exposed and Concealed Joints: Nonsag, paintable, nonstaining, latex sealant complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies per ASTM E 90.
  - 1. Products:
    - a. Pecora Corp.; AC-20 FTR Acoustical and Insulation Sealant.
    - b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.
    - c. Approved substitutes.
- C. Acoustical Sealant for Concealed Joints: Nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.
  - 1. Products:
    - a. Ohio Sealants, Inc.; Pro-Series SC-170 Rubber Base Sound Sealant.
    - b. Pecora Corp.; BA-98.
    - c. Tremco, Inc.; Tremco Acoustical Sealant.
    - d. Approved substitutes.
- D. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
  - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
  - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- E. Sound Attenuation Blankets: Unfaced batt insulation. Full depth of studs.

## 2.7 TEXTURE FINISHES

- A. Primer: As recommended by textured finish manufacturer.
- B. Polystyrene Aggregate Ceiling Finish: Water-based, job-mixed, polystyrene aggregate finish with flame-spread and smoke-developed indices of not more than 25 when tested per ASTM E 84.
  - 1. Texture: Match existing.

## PART 3 - EXECUTION

## 3.1 EXAMINATION

A. Comply with Section 01 70 00.

## 3.2 STEEL FRAMING INSTALLATION

- A. General: Comply with ASTM C 754, and ASTM C 840 requirements that apply to framing installation.
- B. Partition and Soffit Framing:
  - 1. Where studs are installed directly against exterior walls, install isolation strip between studs and wall.
  - 2. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.
  - 3. Frame door openings to comply with GA-600 and with gypsum board manufacturer's applicable written recommendations, unless otherwise indicated. Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
    - a. Install 2 studs at each jamb, unless otherwise indicated.
    - b. Extend jamb studs through suspended ceilings and attach to underside of floor or roof structure above.
  - 4. Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
  - 5. Install control joints above strike and hinge sides of door openings, on both sides of wall or partition.

## 3.3 PANEL INSTALLATION

- A. Gypsum Board: Comply with ASTM C 840 and GA-216.
  - 1. Space screws a maximum of 12 inches on center for vertical applications.
  - 2. Space fasteners in panels that are tile substrates a maximum of 8 inches on center.
  - 3. On ceilings, apply gypsum panels before wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.
  - 4. On partitions/walls, apply gypsum panels vertically parallel to framing, unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
    - a. Stagger abutting end joints not less than one framing member in alternate courses of board.
  - 5. Single-Layer Fastening Methods: Apply gypsum panels to supports with steel drill screws.
  - 6. Multilayer Fastening Methods: Fasten base layers and face layers separately to supports with screws. Insert specific requirements for particular substrate in subparagraph below.
  - 7. Laminating to Substrate: Comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.
- B. Tile Backing Panels:
  - 1. Glass-Mat, Water-Resistant Backing Panel: Install with 1/4-inch gap where panels abut other construction or penetrations.

## 3.4 SOUND CONTROL ASSEMBLIES

- A. General: Maintain sound ratings through partitions that have a designed STC rating. General construction practices include requirements specified herein.
  - 1. Oversize pipe openings to allow approximately 1 inch air space around pipes. Pack openings to comply with systems specified under Section 07 84 00.
    - a. Do not use solid shims.

- 2. Pull, junction, and outlet boxes in corridors or area separation (party) walls: Separate boxes opening on opposite sides of wall by not less than 8 inches in concrete walls, 16 inches in masonry walls or not less than 1 stud space in frame construction walls.
- 3. Openings in pull, junction, or outlet boxes in corridor, area separation (party) or exterior walls, and area separation (party) ceilings: Seal shut to comply with Section 07 92 00.
- 4. Coordinate the following with Division 26 Electrical:
  - a. Provide flexible metal conduit at electrical connections made to vibrating or motor operated equipment.
  - b. Use rubber inserts where conduit is fastened to metal members.
- 5. Backside of pull, junction, or outlet boxes in corridor, area separation (party) or exterior walls, and area separation (party) ceilings: Fill with polyfoam.
- 6. Openings between pull, junction, or outlet boxes, and the gypsum board in area separation (party), corridor, and exterior walls: Seal with acoustical sealant material.

## 3.5 FINISHING

- A. Installing Trim Accessories: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim per manufacturer's written instructions.
- B. Finishing Gypsum Board Panels: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration.
  - 1. Prefill open joints and damaged surface areas.
  - 2. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
  - 3. Glass-Mat, Water-Resistant Backing Panels: Finish per manufacturer's written instructions.
- C. Gypsum Board Finish Levels: Finish panels to levels indicated below, per ASTM C 840, for locations indicated:
  - 1. Level 1: Embed tape at joints in ceiling plenum areas, concealed areas, and where indicated.
  - 2. Level 2: Embed tape and apply separate first coat of joint compound to tape, fasteners, and trim flanges where indicated.
  - 3. Level 3: Embed tape and apply separate first and fill coats of joint compound to tape, fasteners, and trim flanges where indicated.
  - 4. Level 4: Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges at panel surfaces that will be exposed to view, unless otherwise indicated.

## 3.6 APPLYING TEXTURE FINISHES

- A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.
- B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture matching existing ceiling finish free of starved spots or other evidence of thin application or of application patterns.
- C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray to prevent damage per texture finish manufacturer's written recommendations.

END OF SECTION

# SECTION 09 30 00 - TILING

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Floor tile.
  - 2. Glazed wall tile.
  - 3. Mable Threshold
  - 4. Aluminum trim

## 1.2 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. Product Data: For each product indicated.
- C. Samples:
  - 1. Each type, composition, color, and finish of tile.
  - 2. Assembled samples with grouted joints for each type, composition, color, and finish of tile.
  - 3. Stone thresholds in 6-inch lengths.

## PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. Ceramic Tile: Subject to compliance with requirements, provide products from 1 of the following manufacturers:
  - 1. American Olean; Div. of Dal-Tile International Corp.
  - 2. Daltile; Div. of Dal-Tile International Inc.
  - 3. Lone Star Ceramics Company.
  - 4. U.S. Ceramic Tile Company.
- B. Mortars, Adhesives, and Grouts: Subject to compliance with requirements, provide products from 1 of the following manufacturers:
  - 1. C-Cure.
  - 2. DAP, Inc.
  - 3. Hydroment from Bostik.
  - 4. Laticrete International, Inc.
  - 5. Mapei Corporation.
  - 6. W.R. Bonsal Company.
- C. Substitutions: Approved equals

## 2.2 TILE PRODUCTS

- A. Ceramic Wall Tile and Floor Tile: ANSI/TCA A137.1-1992. Conform to the following:
  - 1. Moisture Absorption: 0 to 0.5 percent
  - 2. Size: 12 inch by 12 inch by 1/4 inch thick.
  - 3. Edge: Square
  - 4. Surface Finish: Matte glazed.

- 5. Colors: 2 colors selected by Architect from price Group 1
- 6. Basis of Design: Daltile Heathland or approved equal.

## B. Ceramic Shower Floor: ANSI/TCA A137.1-1992.

- 1. Moisture Absorption: OTO 0.5 percent.
- 2. Size: 2"x2" x 1'4" thick.
- 3. Edge: Square.
- 4. Color: 1 color from Price Group 1.
- 5. Basis of Design: Daltile Keystone Mosaic or approved equal.

## 2.3 SETTING MATERIALS

- A. Comply with pertinent recommendations contained in current edition of Tile Council of America (TCA) "Handbook for Ceramic Tile Installation".
- B. Standard Latex-Portland Cement Mortar or Bond Coat: ANSI A118.4.
  - 1. Water emulsion acrylic latex additive: Add at Project site to prepackaged dry mortar mix recommended by latex manufacturer.
- C. Special tile setting mortars will be considered by Architect when complete technical data is submitted in advance.

## 2.4 GROUT MATERIALS

- A. Comply with pertinent recommendations contained in the Tile Council of America, latest Edition, "Handbook for Ceramic Tile Installation", in colors selected by Architect from standard colors available from the approved manufacturers.
- B. Sand-Portland Cement Grout:
  - 1. Materials:
    - a. Portland cement: Comply with ASTM C150, Type I or II.
    - b. Sand complying with ASTM C144.
    - c. Hydrated lime: Comply with ASTM C206.
    - d. Water: Clean, potable, free of foreign matter.
  - 2. Where this grout is indicated on Drawings, or is otherwise directed or required, provide a job-mix consisting of:
    - a. Joints less than 1/8 inch wide: 1 part cement to 1 part fine graded sand.
    - b. Joints 1/8 to 1/2 inch wide: 1 part cement to 2 parts fine graded sand.
    - c. Joints wider than 1/2 inches: 1 part cement to 3 parts fine graded sand.
    - d. Up to 1/5 part lime may be added.
- C. Provide other materials, not specifically described, but required for a complete and proper installation, subject to approval of Architect.

# 2.5 ACCESSORIES

- A. Aluminum Tim
  - 1. Transition between ceramic tile and carpet: Schluter Reno-TIC or equal
- B. Marble threshold between shower and bathroom: 4" x 60" x 5/8" white gray polished marble with 1 3/8" bevel on one side.
- C. Shower pan membrane.

# PART 3 - EXECUTION

## 3.1 PREPARATION

- A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.
- B. Fill cracks, holes, and depressions with trowelable leveling and patching compound per tile-setting material manufacturer's written instructions.
- C. Remove protrusions, bumps, and ridges by sanding or grinding.
- D. Blending: For tile exhibiting color variations, use factory blended tile or blend tiles at Project site before installing.
- E. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

## 3.2 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.
- B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.
- C. Extend tile Work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate Work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Grind cut edges of tile abutting trim, finish, or built-in items. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- E. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out 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 indicated.
- F. Lay out tile wainscots to next full tile beyond dimensions indicated.
- G. Expansion Joints: Locate expansion joints and other sealant-filled joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
  - 1. Locate joints in tile surfaces directly above joints in concrete substrates.
  - 2. At minimum, provide expansion joints at perimeter of interior quarry tile floors, freestanding columns, and where indicated on Drawings. Install expansion joints full depth of setting bed.
  - 3. Where not indicated, provide expansion joints over construction and expansion joints in substrate and not over 16 feet on center between.
  - 4. Prepare joints and apply sealants to comply with requirements in Section 07 92 00.
- H. Install tile on walls with the following joint widths:
  - 1. Glazed Wall Tile: 1/16 inch.
- I. Apply grout sealer to grout joints in tile floors per grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer that has gotten on tile faces by wiping with soft cloth.

St. Cloud HRA Wilson Apartments Accessibility Upgrade St. Cloud, MN

END OF SECTION

September 28, 2021 Project No. 2107

# SECTION 09 65 00 - RESILIENT FLOORING

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

- 1. Vinyl composition tile (VCT).
- 2. Sheet vinyl flooring.
- 3. Resilient base.
- 4. Transitions
- 5. Related accessories.

## 1.2 SUBMITTALS

- A. Comply with Section 01 33 0.
- B. Product Data: For each product indicated.
- C. Samples: Provide 2 each of the following Samples for verification of color and patterns specified.
  - 1. Tiles: Full-size units.
  - 2. Sheet Flooring: 18 inch square sections.

## 1.3 PROJECT CONDITIONS

- A. Maintain temperatures within range recommended by manufacturer in spaces to receive floor resilient flooring during the following time periods:
  - 1. 48 hours before installation.
  - 2. During installation.
  - 3. 48 hours after installation.
- B. Close spaces to traffic during floor covering installation.
- C. Close spaces to traffic for 48 hours after floor covering installation.
- D. Install resilient products after other finishing operations, including painting, have been completed.

## PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. VCT Flooring: Subject to compliance with requirements, provide products from 1 of the following manufacturers:
  - 1. Mannington, Inc.
  - 2. Armstrong World Industries.
  - 3. Tarkett, Inc.
- B. Sheet Vinyl: Subject to compliance with requirements, provide products from 1 of the following manufacturers:
  - 1. Armstrong World Industries.
  - 2. Azrock Commercial Flooring, DOMCO.
  - 3. Forbo Industries, Inc.

- 4. Mannington Mills, Inc.
- 5. Marley Flexco (USA), Inc.
- C. Resilient Base: Subject to compliance with requirements, provide products from 1 of the following manufacturers:
  - 1. Armstrong World Industries.
  - 2. Burke Mercer Flooring Products.
  - 3. Johnsonite, Inc.
  - 4. Vinyl Plastics, Inc.
- D. Substitutions: Comply with Section 01 25 03.

## 2.2 MATERIALS

- A. VCT Flooring: Vinyl Composition Tile (VCT): FS SS-T-312, Type IV; composition 1
  - 1. Size: 12 inches by 12 inches by 1/8 inch.
  - 2. Colors: Minimum of 2 colors as selected by Architect from manufacturer's standard color range.
  - 3. Feature Strips: Of same material as VCT, 1 inch wide.
- B. Sheet Vinyl Flooring (SVF): Homogenous, non-layered, non-asbestos, vinyl sheet with pattern, marbleization, and color extending throughout entire wear layer.
  - 1. Thickness: minimum of 0.085 inches
  - 2. Fame Resistance: ASTM E648, Class A
  - 3. Smoke Density: Less than 450 to comply with ASTM E662.
  - 4. Colors:
    - a. 2 colors selected by Architects.
  - 5. Seam Treatment: PVC welding rod as manufactured or recommended by manufacturer of sheet vinyl flooring.
    - a. Color match with sheet vinyl.
  - 6. Acceptable products: Mannington, Jump Start, vinyl floor or approved equal.
- C. Resilient Base (RB): FS SS-W-40, Type 2 vinyl, continuous. Use premolded external and internal corners.
  - 1. Resilient Flooring locations: Use top set, coved type base.
  - 2. Carpet flooring locations: Use top set, coved type base.
  - 3. Height: 4 inches high, 1/8 inch thick.
  - 4. Colors: Minimum of 2 colors as selected by Architect from manufacturer's standard color range.

## 2.3 ACCESSORIES

- A. Sub-Floor Filler: White premix latex; type recommended by adhesive material manufacturer to be compatible with adhesive, and VOC compliant.
- B. Primers and Adhesives: Waterproof types recommended by flooring manufacturer to suit application, and VOC compliant.
- C. Sealer and Wax: Types recommended by flooring manufacturer, and VOC compliant.
- D. PVC welding rods for sheet vinyl flooring.
- E. Rubber Resilient Reducer Strips: Provide transitions between the following materials:
  - 1. Resilient Flooring and Carpet: Roppe **#177** or approved substitutions.
  - 2. Resilient Flooring and Ceramic Tile: Roppe, Inc. # 183 or approved substitutes.
  - 3. Colors: Selected by Architect from manufacturer's full color range.

## PART 3 - EXECUTION

## 3.1 PREPARATION

- A. Comply with Section 01 70 00.
- B. Prepare substrates per manufacturer's written recommendations to ensure adhesion of resilient products.
- C. Concrete Substrates: Prepare per ASTM F 710.
  - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
  - 2. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
  - 3. Moisture Testing:
    - a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 pounds of water per 1000 square feet in 24 hours.
    - b. Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
- D. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- E. Use trowelable leveling and patching compound to fill cracks, holes, and depressions in substrates.
- F. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
  - 1. Do not install resilient products until they are same temperature as space where they are to be installed.
- G. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 INSTALLATION

- A. Lay out resilient flooring from center marks established with principal walls, discounting minor offsets.
  - 1. Lay resilient flooring square with room axis.
  - 2. Lay tiles so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than 1/2 tile at perimeter.
- B. Match tiles for color and pattern by selecting tiles from cartons in same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
  - 1. Lay tiles with grain direction alternating in adjacent tiles (basket-weave pattern.
- C. Scribe, cut, and fit resilient flooring to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, edgings, door frames, thresholds, and nosings.
- D. Extend resilient flooring into toe spaces, door reveals, closets, and similar openings.
- E. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on resilient flooring as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.
- F. Install resilient flooring on covers for telephone and electrical ducts and similar items in finished floor areas. Maintain overall continuity of color and pattern with pieces of resilient flooring installed on covers. Tightly adhere resilient flooring edges to substrates that abut covers and to cover perimeters.
- G. Adhere resilient flooring to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

- H. Perform the following operations immediately after completing resilient product installation:
  - 1. Remove adhesive and other blemishes from exposed surfaces.
  - 2. Sweep and vacuum surfaces thoroughly.
  - 3. Damp-mop surfaces to remove marks and soil.
    - a. Do not wash surfaces until after time period recommended by manufacturer.
- I. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.

END OF SECTION

# SECTION 09 68 00 - CARPETING

## PART 1 - GENERAL

## 1.1 SUMMARY

A. Section Includes:1. Broadloom carpet.

## 1.2 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. Product Data: For each product indicated.
- C. Samples: 12 inch by 12 inch for each for each carpet[, **cushion**,] and exposed accessory and for each color and pattern required.
- D. Product Schedule: Use same room and product designations indicated on Drawings and in schedules.
- E. Maintenance data.

## 1.3 DELIVERY, STORAGE, AND HANDLING

- A. Comply with Section 01 60 00.
- B. Comply with CRI 104, Section 5, "Storage and Handling."

## 1.4 PROJECT CONDITIONS

- A. General: Comply with CRI 104, Section 6.1, "Site Conditions; Temperature and Humidity."
- B. Environmental Limitations: Do not install carpet until wet Work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels indicated for Project when occupied for its intended use.
- C. Do not install carpet over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by manufacturer.

## 1.5 WARRANTY

A. Carpet Warranty: Manufacturer's standard form in which manufacturer agrees to replace carpet that does not comply with requirements or that fails within 10 years from date of Substantial Completion. Warranty does not include deterioration or failure of carpet from unusual traffic, failure of substrate, vandalism, or abuse. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, and delamination.

## PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products from 1 of the following manufacturers:
 1. Shaw.

- 2. Interface Flooring Systems, Inc.
- 3. Mannington.
- B. Substitutions: Comply with Section 01 25 03.
- C. Carpet:
  - 1. Basis of Design : Shaw, Emphatic II 30/36 or approved equal.
  - 2. Colors: 1 color selected by Architect from manufacturer's full color range.
  - 3. Installation: Direct Glue.

## 2.2 ACCESSORIES

- A. Sub-Floor Filler: White premix latex; type recommended by adhesive material manufacturer to suit application.
- B. Installation Adhesive: Water-resistant, non-staining type as recommended by carpet manufacturer, compatible with carpet material, and which complies with flammability requirements for installed carpet.
- C. Seaming Cement: Hot-melt seaming adhesive or similar product recommended by carpet manufacturer, for taping seams and buttering cut edges at backing to form secure seams and prevent pile loss at seams.
- D. Provide other materials not specifically described, but required for a complete and proper installation, subject to the approval of Architect.

## PART 3 - EXECUTION

## 3.1 PREPARATION

- A. Comply with Section 01 70 00.
- B. Immediately prior to installation of Work of this Section, thoroughly clean substrates and remove oil, grease, paint, varnish, hardeners, and other foreign matter that would adversely affect the bond of adhesive.
- C. Make substrates level and free of irregularities. Assure 1 constant floor height after carpet is installed, filling low spots and grinding high spots as required.
- D. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.
- E. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
- F. Vacuum clean substrate.

## 3.2 INSTALLATION

- A. Comply with CRI 104 for installation of carpet pertinent to type of installation.
- B. Maintain uniformity of carpet direction and lay of pile. At doorways, center seams under door in closed position. Bind or seal cut edges as recommended by carpet manufacturer.
- C. Install pattern parallel to walls and borders.

## 3.3 CLEANING

- A. Remove excess adhesive without damage from floor, base, and wall surfaces.
- B. Remove and dispose of debris and unusable scraps from site.

## CARPETING
C. Vacuum carpet surfaces using commercial machine with face-beater elements. Remove spots and replace carpet where spots cannot be removed. Remove protruding face yarn using sharp scissors.

#### 3.4 **PROTECTION**

A. Provide a heavy non-staining paper or plastic walkway over carpet in direction of traffic, maintaining intact until time of Substantial Completion.

# SECTION 09 90 00 - PAINTING AND COATINGS

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section includes:

Surface preparation and field painting of exposed interior items and surfaces.

#### B. Include List.

- 1. Paint and stain color record.
- 2. Interior hollow metal frames in remodeled rooms, new and existing.
- 3. Gypsum board walls and ceilings as scheduled.
- 4. Electric panels within apartments, commons areas, and other rooms exposed to the public.
- 5. Miscellaneous metal items.
- 6. Preparation of surfaces to be painted or finished under this Section.
- 7. Paint exposed surfaces of interior mechanical and electrical equipment and material, whether or not factory finished, occurring in finished spaces or adjacent to finished surfaces, including grills, registers, piping, ducts, piping, and duct insulation, conduit, panels, and cabinets.
- 8. Touch up of marred and minor damaged prefinished items.
- C. Do Not Include List.
  - 1. Gypsum board ceilings noted as SCT (Sprayed ceiling texture with integral color is done under Section 09 21 16).
  - 2. Prefinished doors and trim.
  - 3. Items specified as prefinished.
  - 4. Laminate.

#### 1.2 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. Product Data: For each product indicated.
- C. Samples: For each type of finish-coat material and color combination indicated.
  - 1. Submit 3 drawdown Samples of each product and color combination. Prepare drawdowns using a 4 mil WFT drawdown bar on Leneta form WD plain white coated cards size 3-7/8 inch by 6 inch.
  - 2. Label each card with the following:
    - a. Job name
    - b. Date
    - c. Product name
    - d. Product number
    - e. Color number as stated in the color schedule
    - f. Name, address, and phone number of the supplying facility.
    - g. Provide a list of material and application for each coat of each Sample. Label each Sample as to location and application.
  - 3. If so directed by Architect, submit Samples during progress of Work in form of actual application of approved materials on actual surfaces to be painted.
  - 4. Revise and resubmit each Sample as requested by Architect until required gloss, color, and texture is achieved. Such Samples, when approved by Architect, will become standards of color and finish for accepting or rejecting Work of this Section.

#### 1.3 PROJECT CONDITIONS

- A. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain storage containers in a clean condition, free of foreign materials and residue.
- B. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F.
- C. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg.
- D. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

#### 1.4 EXTRA MATERIALS

- A. Furnish extra paint materials from the same production run as the materials applied, and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.
  - 1. Quantity: 5 percent, but not less than 1 gallon or 1 case, as appropriate, of each material and color applied.
- B. Submit to Owner a complete record of manufacturers' color number designations of actual paints and coatings used for future reference for maintenance and repair.

#### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products from the following manufacturer:
  - 1. Benjamin Moore Company (Benjamin Moore).
  - 2. Sherwin-Williams (S-W)
- B. Subject to compliance with requirements, other acceptable manufacturers offering similar products are:
  - 1. Diamond Vogel Paint Co., Inc. (DV)
  - 2. Fuller O'Brien Paints. (F/O)
  - 3. Olympic Paints. (O)
  - 4. Pratt & Lambert Paints. (P&L)
  - 5. Pittsburgh Paint Company. (P)
  - 6. Sherwin-Williams Company. (SW)
- C. Specified products are based on products from Benjamin Moore Company unless indicated otherwise.

#### 2.2 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
- C. Proprietary Names: Use of specified manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of

other manufacturers, unless noted by the phrase "No Substitutions" or a similar phrase. Provide manufacturer's material data and certificates of performance for proposed substitutions.

- 1. If manufacturers other than those specified are used, Contractor is responsible for adjusting tint to compensate and match approved color.
- D. Colors: Selected by Architect from manufacturer's full range.
  - 1. Unless indicated otherwise, no more than 5 colors will be used.

#### 2.3 PREPARATORY COATS

- A. Interior Primer: Interior latex-based primer of finish coat manufacturer and recommended in writing by manufacturer for use with finish coat and on substrate indicated.
  - 1. Ferrous-Metal Substrates: Quick drying, rust-inhibitive metal primer.
  - 2. Zinc-Coated Metal Substrates: Galvanized metal primer.
  - 3. Where manufacturer does not recommend a separate primer formulation on substrate indicated, use paint specified for finish coat.

#### PART 3 - EXECUTION

#### 3.1 APPLICATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
- C. Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- D. Surface Preparation: Clean and prepare surfaces to be painted per manufacturer's written instructions for each particular substrate condition and as specified.
  - 1. Provide barrier coats over incompatible primers or remove and reprime.
  - 2. Cementitious Materials: Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
  - 3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
    - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
    - b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.
    - c. If transparent finish is required, backprime with spar varnish.
    - d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on back side.
    - e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.

- 4. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.
  - a. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.
- E. Material Preparation:
  - 1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
  - 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
- F. Exposed Surfaces: Include areas visible when permanent or built-in fixtures, grilles, convector covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
  - 1. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
  - 2. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
  - 3. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
  - 4. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
  - 5. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
- G. Sand lightly between each succeeding enamel or varnish coat.
- H. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
  - 1. Omit primer over metal surfaces that have been shop primed and touchup painted.
  - 2. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance.
- I. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators per manufacturer's written instructions.
  - 1. Apply paint to gypsum board substrates by air spray unless indicated otherwise.
- J. Minimum Coating Thickness: Apply paint materials no thinner than manufacturers recommended spreading rate. Provide total dry film thickness of the entire system as recommended by manufacturer.
- K. Mechanical and Electrical Work: Painting of mechanical and electrical Work is limited to items exposed in equipment rooms and occupied spaces.
- L. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
- M. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque 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.

#### 3.2 CLEANING AND PROTECTING

A. At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.

- B. Protect Work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- C. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their Work.
  - 1. After Work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

### 3.3 INTERIOR PAINT SCHEDULE

A. Gypsum Board walls:

a.

- 1. Vinyl-Acrylic Finish: 2 finish coats over a primer.
  - Primer: Interior gypsum board primer.
    - 1) BM Quick Dry Primer 201
    - 2) S-W PrepRite 200 Latex Wall Primer B28W200
  - b. Finish Coats: Interior low-luster acrylic enamel.
    - 1) BM Super Spec Latex Eggshell 274
    - 2) S-W ProMar 200 Latex Eg-shel B20W200 series
- B. Ferrous Metal:
  - 1. Acrylic Finish: 2 finish coats over a primer. On previously primed metal, primer may be omitted except for spot priming as needed.
    - a. Primer: Interior ferrous-metal primer.
      - 1) M04 Acrylic Metal Primer
      - 2) S-W Pro-Cryl Universal Primer B66\_310
    - b. Finish Coats: semigloss acrylic enamel.
      - 1) BM Super Spec 100% Acrylic Semi-gloss 281
      - 2) S-W ProClassic Waterborne Acrylic Semi-gloss B31W20 series

# SECTION 10 28 13 - TOILET ACCESSORIES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Toilet accessories.
  - 2. Bath accessories.
  - 3. Building accessories.

### 1.2 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. Product Data: Manufacturer's specifications and technical data including the following.
  - 1. Detailed specification of construction and fabrication.
  - 2. Manufacturer's installation instructions.
  - 3. Certified test reports indicating compliance with performance requirements specified herein.
- C. Shop Drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware and installation procedures.
- D. Samples: If requested by Architect.
  - 1. 1 sample of each item and model specified.
  - 2. 1 sample of finish for stainless steel, chrome plated, and aluminum accessories.
- E. Quality Control Submittals: Statement of qualifications.

#### 1.3 QUALITY ASSURANCE

- A. Comply with Section 01 43 00.
- B. Regulatory Requirements: Comply with provisions of the Americans with Disabilities Act, ANSI 117.1 and local building codes.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with Section 01 60 00.
- B. Packing and Shipping: Deliver products in original unopened packaging with legible manufacturer's identification.
- C. Storage and Protection: Comply with manufacturer's recommendations.1. Protect from elements and damage.

#### 1.5 SPECIAL WARRANTY

A. Special Warranty:

### TOILET ACCESSORIES

- 1. Provide guarantee from Contractor, manufacturer, and installer for installed products for a period of 15 years from date of Substantial Completion against conditions indicated below. When notified in writing from Owner, promptly and without inconvenience and cost to Owner, correct said deficiencies.
  - a. Deterioration of silver coating on mirrors.
  - b. Peeling, flaking or discoloration of chrome plating.

#### PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products from the following manufacturer:
   1. Bobrick Washroom Equipment, Inc.
- B. Subject to compliance with requirements, other acceptable manufacturers offering acceptable products are:
  - 1. A & J Washroom Accessories
  - 2. American Infant Care Products Inc.
  - 3. American Specialties, Inc.
  - 4. Bradley Corporation.
  - 5. Koala Corporation.
  - 6. World Dryer Corporation.
- C. Where model numbers are indicated by \*\*\*, manufacturer shall custom fabricate unit to conform to construction and detailing of specified model of other manufacturer.

#### 2.2 MANUFACTURED UNITS

- A. Drawings and Specifications are based on manufacturer's proprietary literature from Bradley Corporation. Other manufacturers shall comply with minimum levels of material and detailing indicated on Drawings or specified herein.
- B. Toilet Paper Holder: Surface mounted, single roll type with controlled delivery operation; cast aluminum, satin finish. In living room units.
  - 1. Acceptable manufacturers and product:
    - a. American Specialties, Inc.: No. 0263-1.
    - b. Bobrick Washroom Equipment, Inc.: No. B-273.
    - c. Bradley Corporation: No. 5071.
- C. Toilet Paper Holder, Multi-Roll: Surface mounted, dual roll type with controlled delivery operation; cast aluminum, satin finish. In public toilets.
  - 1. Acceptable manufacturers and product:
    - a. American Specialties, Inc.: No. 0264-1.
    - b. Bobrick Washroom Equipment, Inc.: No. B-274.
    - c. Bradley Corporation: No. 5241.
- D. Sanitary Napkin Disposal (SND-1): Surface mounted feminine napkin disposal, 22 gauge cabinet and doors, 304 stainless steel, satin finish all exposed surfaces; full length stainless steel piano hinge on each door; top door with handle to assist opening; bottom door, held in closed position with lock or latch, swinging downward for emptying; vinyl liner in container to receive soiled napkins, 4 inches deep. Hem exposed edges. In public toilets.
  - 1. Acceptable manufacturers and product:
    - a. American Specialties, Inc.: No. 0852.

- b. Bobrick Washroom Equipment, Inc.: No. B-270.
- c. Bradley Corporation: No. 4781-15.
- E. Paper Towel Dispenser: Surface mounted, hands free, automatic roll- Type Dispenser. Cover is High impact plastic. Infra-red sensor activated. Battery operated:
  - a. Bradley Washroom Equipment Inc. No. 2494

#### 2.3 GENERAL ACCESSORIES

- A. Soap Dispenser: Wall mounted, hands free soap dispenser with concealed mounting, 1.2 L capacity.
  - 1. Acceptable manufacturers and product:
    - a. Kimberly Clark Professional #921 48
    - b. Bobrick Washroom Equipment, Inc.: No. B-40.
    - c. Bradley Corporation: No. 655.
- B. Shower Shelf: Surface Mounted: Heavy-duty, 304 stainless steel, shower shelf:
  - 1. Size: 14" long.
  - 2. Acceptable manufacturers and product:
    - a. American Specialties, Inc.: No. XXXX.
    - b. Bobrick Washroom Equipment, Inc.: No. B-295 x14.
    - c. Bradley Corporation: No. XXXX.
  - 3. Mounting: Mounting screws.
- C. Medicine Cabinet: Surface-Mounted Unit: Nominal 17 inch by 27-inch unit designed for surface-mounting mounting; with hinged, framed mirror door concealing storage cabinet; and minimum of 2 adjustable shelves. Equip door with continuous hinge and spring-buffered, rod-type stop and magnetic door catch. Fabricate mirror frame, door, hinge, and shelves of stainless steel. Cabinet body is 1 piece drawn cold rolled steel with baked enamel finish.
  - 1. Acceptable manufacturers and product:
    - a. American Specialties, Inc.: Model \_\_\_\_\_ (To match size of Bobrack model)
    - b. Bobrick Washroom Equipment, Inc.: No. B-299.
    - c. Bradley Corporation: Model \_\_\_\_\_
- D. Mirror with Frame and Shelf (MIR-1): 1/4-inch float or plate glass, electro-copper plated mirror guaranteed for 15 years against silver spoilage. 304 stainless steel with satin finish angle frame, 22 gauge, approximately 5/8 by 5/8 inch with corners mitered, welded and ground smooth. 20-gauge galvanized steel back concealed mounting devices. 5-inch depth, 304 stainless steel shelf with satin finish and hemmed exposed edges. Permanently attach shelf to frame with concealed fasteners.
  - 1. Mirror sizes:
    - a. MIR-1B: 16 inches wide by 30 inches high.
  - 2. Acceptable manufacturers and product:
    - a. American Specialties, Inc.: No. 0605 Series.
    - b. Bobrick Washroom Equipment, Inc.: No. B-292 Series.
    - c. Bradley Corporation: No. 7805 Series.
- E. Mirror with Frame Without Shelf (MIR-2): <sup>1</sup>/<sub>4</sub> inch float or plate glass, electro-copper plated mirror guaranteed for 15 years against silver spoilage. 304 stainless steel with satin finish angle frame, 22 gauge, approximately 5/8 by 5/8 inch with corners mitered, welded and ground smooth. 20-gauge galvanized steel back, concealed mounting devices.
  - 1. Mirror Sizes:
    - a. 16 inches wide by 30 inches high.
  - 2. Acceptable manufactures and product:
    - a. American Specialties, Inc.: No. 0600 Series.

- b. Bobrick Washroom Equipment, Inc.: No. B-290 Series.
- c. Bradley Corporation: No. 780 Series.

#### 2.4 MISCELLANEOUS TOILET AND BATH ACCESSORIES

- A. Shower Seat (TBA-2): Folding molded plastic shower seat in "L" shape configuration approximately 32 inches long by 12-1/2 inches and 19-1/2 inches deep with 304 stainless steel tube frame, wall bracket, and piano hinge.
  - 1. Acceptable manufacturers and product:
    - a. American Specialties, Inc.: No. 8206-L R.
    - b. Bobrick Washroom Equipment, Inc.: No. B-5181 Left hand Right hand, verify.
    - c. Bradley Corporation: No. 956 for left hand configuration and No. 9561 for right hand configuration.
- B. Shower Curtain Rod and Hooks: Exposed mounting, 304 stainless steel, 18 gauge, 1-1/4-inch diameter curtain rod; 304 stainless steel, 20-gauge one-piece die formed mounting flanges, satin finish all exposed surfaces.
  - 1. Provide complete with stainless steel curtain hooks (4 per foot, plus 2 extra per rod).
  - 2. Acceptable manufacturers and product:
    - a. American Specialties, Inc.: No. 1214 Series with No. 1200-SHU hooks.
    - b. Bobrick Washroom Equipment, Inc.: No. B-6047 Series with No. 204-1 hooks.
    - c. Bradley Corporation: No. 9531 Series with No. 9536 hooks.
- C. Robe Hook: 1-piece brass casting with satin nickel-plated finish. Capable of withstanding 300 pound downward pull when properly installed. Provide with 12- gauge, case hardened concealed wall plate and related fasteners.
  - 1. Single Prong Unit:
    - a. Acceptable manufacturers and product:
      - 1) American Specialties, Inc.: No. 0740-Z.
      - 2) Bobrick Washroom Equipment, Inc.: No. B- 818.
      - 3) Bradley Corporation: Comparable product.
- D. Baby Changing Station: Horizontal, wall-mounted design, 35 inches by 20 inches by 4 inches deep in closed position, 20 inches wide when opened. Made of high-impact polyethylene
  - 1. Provide complete with safety straps and sanitary bed liner dispenser.
  - 2. Acceptable manufacturers and products:
    - a. Koala Corporation: Horizonal Baby Changing Station.
    - b. American Infant Care Products Inc.: Diaper Deck.
    - c. American Specialties, Inc: No. 0002, Baby Changing Station.
    - d. Bradley Corporation: No. 961 Baby Changing Station.
    - e. Approved Substitutes.

#### 2.5 GRAB BARS AND TOWEL BARS

- A. Grab Bars: Concealed mounting, 1-1/2-inch diameter, stainless steel, satin finish. Complete with proper type of anchor for construction conditions and normally anticipated loads. Provide grab bar manufacturer's standard concealed anchor plate for stud wall construction.
  - 1. Length: As indicated on Drawings.
  - 2. Where grab bars are mounted on dissimilar adjacent surfaces that do not meet on an equal plane, modify end post lengths as required to mount grab bars plumb and true.
  - 3. Provide special non-slip finish on grab bars where indicated.
  - 4. Acceptable manufacturers and product:

- a. American Specialties, Inc.: No. 3200 Series.
- b. Bobrick Washroom Equipment, Inc.: No. B-6206 Series with No. 256 series Anchor Plate.
- c. Bradley Corporation: No. 812 Series with 899-015 Series anchor plates.
- B. Towel Bars: Concealed mounting, 304 stainless steel support arm flange, and Flange, 18-gauge stainless steel concealed wall plate; 304 stainless steel, 3/4 inch square towel bar; satin finish exposed surfaces.
  - 1. Acceptable manufacturers and product:
    - a. American Specialties, Inc.: No. 7360S.
    - b. Bobrick Washroom Equipment, Inc.: No. B-6737.
    - c. Bradley Corporation: No. 9054.

#### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install accessories in locations indicated with anchor devices of types specified or required for given substrates. Fasten securely, true, plumb, and level. Drill holes to correct size and at locations that are concealed by accessory.
  - 1. Install recessed accessories into wall openings with wood screws through cabinet side into wood blocking or studs, or sheet metal screws into metal backing or studs.
  - 2. Install surface mounted accessories to hollow back up using toggle bolts and to metal or wood backing using proper type screws.

#### 3.2 CLEANING

A. Just prior to Date of Substantial Completion, clean and polish exposed surfaces.

#### 3.3 ADJUSTING

A. After completion of installation adjust accessories for proper operation.

# SECTION 10 44 00 INTERIOR SIGNAGE

#### 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 SCOPE

A. Furnish all material, labor and engineering services necessary to program facility and to fabricate and install signage.

#### 1.3 REFERENCES

A. Signs and their installation shall comply with applicable provisions of the latest edition of the following standards, and with requirements of authorities having jurisdiction:

 ADAAG - Americans with Disabilities Act Accessibility Guidelines; US Architectural and Transportation Barriers Compliance Board.
 International Code Council/American National Standards Institute A117.1-Standard on

- Accessible and Usable Buildings Facilities.
- 3. National Fire Protection Association 101 Life Safety Code.

#### 1.4 SUBMITTALS

- A. Signage schedule in manufacturer's format for verification of text/copy.
- B. Sample of sign types for verification of materials, color, pattern, overall quality and for adherence to drawings and requirements indicated.

#### 1.5 QUALIFICATIONS

A. Manufacturer specializing in manufacturing the products specified in this section with minimum five years experience. Obtain signs from one source and a single manufacturer.

#### 1.6 SUBSTITUTIONS

A. Bidder must obtain prior approval from the Architect and/or Owner to bid alternates or substitutions to the specification.

#### 1.7 DELIVERY, STORAGE, PROTECTION

A. Package to prevent damage or deterioration during shipment, handling, storage and installation. Products should remain in original packing until removal is necessary. Store products in a dry, indoor location.

#### 1.8 WARRANTY

A. Provide manufacturer's warranty against defects in materials or workmanship for minimum 5 years.

# PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

- A. Signage shall be of one of the following approved manufacturer or approved equal.
  - 1. Northstar Sign
  - 2. GSI
  - 3. Serigraphics Sign Systems, Inc.
  - 4. Fast Signs
  - 5. Mustang Signs & Graphics

#### 2.2 SIGN STANDARDS

A. It is the intent of these specifications to establish a sign standard for the Owner including primary room identification, restrooms, and all code compliant signage.

#### B. Typography:

- 1. Type style: see drawings. copy shall be a true, clean accurate reproduction of typeface(s) specified. Upper and lower case or all caps as indicated in Sign Type drawings and Signage Schedule. Letter spacing to be normal and interline spacing shall be set by manufacturer.
- 2. Arrows, symbols and logo art: To be provided in style, sizes, colors and spacing as shown in drawings.
- 3. Grade II Braille utilizing perfectly round, clear insertion beads.

### 2.3 SIGNS

- A. Architectural Signage System:
  - 1. The signage shall incorporate a decorative laminate face with applied graphics including all tactile requirements in adherence to ADA specifications.

#### B. Materials:

1. Sign face shall be 0.035" (nominal) standard grade, high pressure surface laminate. A painted sign face shall not be acceptable.

2. The sign core shall be a fiber reinforced resin material. The sign shall have a balanced construction with the core sandwiched between laminates to prevent warping. An acrylic core shall not be acceptable.

3. Tactile lettering shall be precision machined, raised 1/32", matte PETG and subsurface colored for scratch resistance.

- C. Color, Finishes and Message:
  - 1. Face/background color shall be standard grade, high pressure laminate, all colors and finishes.
  - 2. Color: White graphics/lettering on black background.
  - 3. Message Background:
    - a.) Accessible men's toilet with standard ADA graphics.
    - b) Accessible women's toilet with standard ADA graphics

- 4. Finishes are to meet current Federal ADA and any State requirements.
- D. Construction Room
  - 1. Size: Signs shall be 8" w x 10" h.
  - 2. Manufacturer shall provide a template containing layout, font, color and artwork.
  - 3. The signage shall utilize an acrylic sphere for Grade II Braille inserted directly into a scratch resistant, high pressure laminate sign face. Braille dots are to be pressure fit in high tolerance drilled holes. Braille dots shall be half hemispherical domed and protruding a minimum of 0.025".
  - 4. The laminate sign face shall be pressure laminated and precision machined together to a 90-degree angle. Edges shall be smooth, void of chips, burrs, sharp edges, mars and have a non-glare satin finish.
  - 5. Every sign shall be provided with appropriate mounting hardware. Hardware shall be finished and architectural in appearance and suitable for mounting surface.

### PART 3 - EXECUTION

### 3.1

### 3.2 CODE COMPLIANCE

A. It shall be the responsibility of the successful bidder to meet any and all local, state and federal code requirements in fabricating and installing signs.

#### 3.3 EXAMINATION

A. Installer shall examine signs for defects, damage and compliance with specifications. Installation shall not proceed until unsatisfactory conditions are corrected.

#### 3.4 INSTALLATION

- A. General: Installation locations shall be in accordance with ADA specifications. Locate signs where indicated using mounting methods in compliance with manufacturer's written instructions.
  - 1. The signage contractor will coordinate installation schedules with the Owner and/or General Contractor.
  - 2. Installation shall be performed by manufacturer's personnel trained and certified in manufacturer's methods and procedures.
  - 3. Signs shall be level, plumb and at heights indicted with sign surfaces free from defects.
  - 4. Upon completion of the work, signage contractor shall remove unused or discarded materials, containers and debris from site.

### 3.5 DELIVERY, STORAGE, PROTECTION

A. Package to prevent damage or deterioration during shipment, handling, storage and installation. Products should remain in original packaging until removal is necessary. Store products in a dry, indoor location.

# SECTION 11 31 00 - APPLIANCES

#### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Range Hood
  - 2. Power cords and plugs.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of product indicated. Include operating characteristics, dimensions of individual appliances and finishes for each appliance.
- B. Maintenance Data: For each product to include in maintenance manuals.
- C. Warranties: Special warranties specified in this Section.

### 1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain residential appliances through one source from a single manufacturer.
  - 1. Provide products from same manufacturer for each type of appliance required.
  - 2. To greatest extent possible, provide appliances by a single manufacturer for entire Project.
- B. Product Option: Information on Drawings and in Specifications establishes requirements for product's aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment and profiles of components and assemblies as they relate to sightlines, to one another and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing and in-service performance.
- C. Energy Ratings: Provide residential appliances that carry labels indicating energy-cost analysis (estimated annual operating costs) and efficiency information as required by the FTC Appliance Labeling Rule.

#### 1.4 WARRANTY

- A. Special Warranties: Manufacturer's standard form in which manufacturer of each appliance specified agrees to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Manufacturer's standard 5 years.

#### PART 2 - PRODUCTS

#### 2.1 APPLIANCES

A. All apartments (6)
1. Range Hood: Broan 41000 Series 21" Ductless under cabinet hood with light. Color: White.

#### PART 3 - EXECUTION

### 3.1 EXAMINATION

### APPLIANCES

- A. Examine conditions, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Examine roughing-in for piping systems to verify actual locations of piping connections before equipment installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION, GENERAL

- A. General Comply with manufacturer's written instructions.
- B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed.
- C. Freestanding Equipment, Place units in final locations after finished have been completed in each area. Verity that clearances are adequate to properly operate equipment.
- D. Utilities Refer to Divisions 22 and 26 for plumbing and electrical requirements.
- E. Provide and install power cords for all appliances.
- F. Hood is to be connect to wall switch.

#### 3.3 CLEANIGN AND PROTECTION

- A. Test each item of residential appliance to verify proper operation. Make necessary adjustments.
- B. Verity that accessories required have been furnished and installed.
- C. Remove packing material from residential appliances and leave units in clean condition, ready for operation.

St. Cloud HRA Wilson Apartments Accessibility Upgrade St. Cloud, MN

# LEFT BLANK INTENTIONALLY

## **DOCUMENT 00 01 10**

# **TABLE OF CONTENTS**

Section Title

#### INTRODUCTORY INFORMATION

00 01 10 Table of Contents

#### **DIVISION 21 - FIRE SUPPRESSION**

- 21 05 00 Common Work Results for Fire Suppression
- 21 13 13 Wet-Pipe Sprinkler Systems

# **DIVISION 22 - PLUMBING**

- 22 05 29 Hangers and Supports for Plumbing Piping and Equipment
- 22 05 53 Identification for Plumbing Piping and Equipment
- 22 07 00 Plumbing Insulation
- 22 11 00 Facility Water Distribution
- 22 13 00 Facility Sanitary Sewerage
- 22 40 00 Plumbing Fixtures

# DIVISION 23 - HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

- 23 05 29 Hangers and Supports for HVAC Piping and Equipment
- 23 07 00 HVAC Insulation
- 23 21 13 Hydronic Piping
- 23 37 00 Air Outlets and Inlets
- 23 82 16 Air Coils

# SECTION 21 05 00

# COMMON WORK RESULTS FOR FIRE SUPPRESSION

### PART 1 GENERAL

### 1.1 SUMMARY

A. Section includes pipe, fittings, valves, and connections for wet pipe and standpipe systems.

### 1.2 REFERENCES

- A. American Society of Mechanical Engineers:
  - 1. ASME B16.11 Forged Steel Fittings Socket-Welding and Threaded.
  - 2. ASME B16.25 Buttwelding Ends.
  - 3. ASME B16.3 Malleable Iron Threaded Fittings.
  - 4. ASME B16.4 Gray Iron Threaded Fittings.
  - 5. ASME B16.5 Pipe Flanges and Flanged Fittings.
  - 6. ASME B16.9 Factory-Made Wrought Steel Buttwelding Fittings.
- B. ASTM International:
  - 1. ASTM A234/A234M Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.
  - 2. ASTM A795 Standard Specification for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use.
- C. National Fire Protection Association:
  - 1. NFPA 13 Installation of Sprinkler Systems.
  - 2. NFPA 14 Standard for the Installation of Standpipe, Private Hydrants and Hose Systems.
  - 3. NFPA 24 Installation of Private Fire Service Mains and Their Appurtenances.
  - 4. NFPA 96 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.

### **1.3 SYSTEM DESCRIPTION**

A. Fire suppression system to be wet-sprinkler type. Refer to Section 21 13 13.

## 1.4 SUBMITTALS

A. Shop Drawings: Indicate pipe materials used, jointing methods, supports, and floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.

### 1.5 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of components and tag numbering.
- B. Operation and Maintenance Data: Submit spare parts lists.

## **1.6 QUALITY ASSURANCE**

A. Perform Work in compliance with all applicable codes and standards enforced by the Authority Having Jurisdiction, as well as all applicable laws, ordinances, and regulations.

- B. Perform Work in accordance with NFPA 13 and any insurance requirements
- C. All materials used to be UL listed.
- D. Commercial Cooking Equipment and Ventilation Applications: Perform work in accordance with NFPA 13, NFPA 96, Minnesota Mechanical Code, and Minnesota Fire Code.

## 1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience approved by manufacturer.
- C. Shop Drawings and calculations must be prepared by an individual that has obtained National Institute for Certification in Engineering Technologies, Automatic Sprinkler Systems, Level III certification or Special Hazards Suppression Systems, Level IV certification, as applicable to the project.
- D. The Qualified Fire Protection Engineer (QFPE) must review the shop drawings, hydraulic calculations and material submittals.
- E. The shop drawings must bear the Review Stamp of the QFPE prior to submitting the fire extinguishing system shop drawings.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store valves in shipping containers, with labeling in place.
- B. Furnish cast iron and steel valves with temporary protective coating.
- C. Furnish temporary end caps and closures on piping and fittings. Maintain in place until installation.

# 1.9 COORDINATION

- A. Fire Protection Contractor shall be required to coordinate installation requirements and construction schedules to install equipment in new or existing facilities.
- B. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are required.
- C. Coordinate connections with exterior utilities as required.
- D. Coordinate requirements for access panels and doors with General Contractor if fire suppression items installed in concealed locations require access.

# 1.10 WARRANTY

A. Furnish one year manufacturer warranty for basic fire suppression materials and methods.

### PART 2 PRODUCTS

# 2.1 VALVES

A. Gate Valves:

- 1. Up to and including 2 inches: Bronze body and trim, rising stem, hand wheel, solid wedge or disc, threaded ends.
- 2. Over 2 inches: Iron body, bronze trim, rising stem pre-grooved for mounting tamper switch, hand wheel, OS&Y, solid bronze or cast iron wedge, flanged ends.
- 3. Over 4 inches: Iron body, bronze trim, non-rising stem with bolted bonnet, solid bronze wedge, flanged ends, and iron body indicator post assembly.
- B. Globe Valves:
  - 1. Up to and including 2 inches: Bronze body, bronze trim, rising stem and hand wheel, inside screw, renewable rubber disc, threaded ends, with back seating capacity.
  - 2. Over 2 inches: Iron body, bronze trim, rising stem, hand wheel, OS&Y, plug-type disc, flanged ends, renewable seat and disc.
- C. Ball Valves:
  - 1. Up to and including 2 inches: Bronze two piece body, brass, chrome plated bronze, or stainless steel ball, Teflon seats and stuffing box ring, lever handle, threaded ends.
  - 2. Over 2 inches: Manufacturers: Cast steel body, chrome plated steel ball, Teflon seat and stuffing box seals, lever handle, flanged.
- D. Butterfly Valves:
  - 1. Bronze Body: Stainless steel disc, resilient replaceable seat, threaded or grooved ends, extended neck, hand wheel and gear drive and integral indicating device.
  - 2. Cast or Ductile Iron Body: Cast or ductile iron, chrome or nickel plated ductile iron or aluminum bronze disc, resilient replaceable EPDM seat, wafer, lug, or grooved ends. With extended neck, hand wheel and gear drive and integral indicating device.
- E. Check Valves:
  - 1. Up to and including 2 inches: Bronze body and swing disc, rubber seat, threaded ends.
  - 2. Over 2 inches: Iron body, bronze trim, swing check with rubber disc, renewable disc and seat, flanged ends with automatic ball check.
  - 3. 4 inches and Over: Iron body, bronze disc with stainless steel spring, resilient seal, threaded, wafer, or flanged ends.
- F. Drain Valves:
  - 1. Compression Stop: Bronze with hose thread nipple and cap.
  - 2. Ball Valve: Brass with cap and chain, 3/4 inch hose thread.

# 2.2 ABOVE GROUND PIPING

- A. Steel Pipe: ASTM A795 UL listed; Schedule 10 black unless noted otherwise.
  - 1. Steel Fittings: ASME B16.9, wrought steel, butt welded; ASME B16.25, butt weld ends; ASTM A234/A234M, wrought carbon steel and alloy steel; ASME B16.5, steel flanges and fittings; ASME B16.11, forged steel socket welded and threaded.
  - 2. Cast Iron Fittings: ASME B16.4, threaded fittings.
  - 3. Malleable Iron Fittings: ASME B16.3, threaded fittings.
  - 4. Mechanical Grooved Couplings: Malleable iron housing clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe.
    - a. Grooved Reducer Couplings: Not Allowed.

- 5. Mechanical Formed Fittings: Carbon-steel housing with integral pipe stop and O-ring pocked and O-ring uniformly compressed into permanent mechanical engagement onto pipe.
- 6. Piping 2 inches and less must be minimum schedule 40.
- 7. Piping larger than 2 inches must be schedule 10.
- 8. Steel piping with wall thickness less than schedule 40 must not be threaded.

# 2.3 PIPE HANGERS AND SUPPORTS

- A. Wet Sprinkler Systems: Conform to NFPA 13
- B. Standpipe Systems: Conform to NFPA 14.
- C. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron or carbon steel, adjustable, clevis.
- D. Hangers for Pipe Sizes 2 inch and Over: Carbon steel, adjustable, clevis.
- E. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- F. Wall Support for Pipe Sizes to 3 inches: Cast iron hook.
- G. Wall Support for Pipe Sizes 4 inches and Over: Welded steel bracket and wrought steel clamp.
- H. Vertical Support: Steel riser clamp.
- I. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

### PART 3 EXECUTION

### 3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs.
- B. Remove scale and foreign material, from inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.
- D. In exposed areas, prepare pipe, fittings, supports, and accessories for finish painting. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.

### 3.2 INSTALLATION

- A. Install piping in accordance with NFPA 13 for sprinkler systems and NFPA 14 for standpipe and hose systems, and NFPA 24 for service mains.
- B. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
- C. Install piping to conserve building space, to not interfere with use of space and other work.
- D. Group piping whenever practical at common elevations.
- E. Install pipe sleeve at piping penetrations through footings, partitions, walls, and floors. Seal pipe and sleeve penetrations to maintain fire resistance equivalent to fire separation.

- 1. Where piping penetrates floor, ceiling, or wall, close off space between pipe and adjacent work with insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- 2. For large holes in wall, floor, and ceiling assemblies: Infill, patch, and seal the annular space around pipe penetration. Match materials and finishes of adjacent work.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Refer to Section 23 05 16.
- G. Pipe Hangers and Supports:
  - 1. Install in accordance with NFPA 13 for wet sprinkler systems and NFPA 14 for standpipe systems.
  - 2. Install hangers to with minimum 1/2 inch space between finished covering and adjacent work.
  - 3. Place hangers within 12 inches of each horizontal elbow.
  - 4. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
  - 5. Support vertical piping at every floor. Support riser piping independently of connected horizontal piping.
  - 6. Where installing several pipes in parallel and at same elevation, provide multiple or trapeze hangers.
- H. Slope piping and arrange systems to drain at low points. Install eccentric reducers to maintain top of pipe level.
- I. Do not penetrate building structural members unless indicated.
- J. Where more than one piping system material is specified, install compatible system components and joints. Install flanges, union, and couplings at locations requiring servicing.
- K. Die cut threaded joints with full cut standard taper pipe threads with red lead and linseed oil or other non-toxic joint compound applied to male threads only.
- L. Install valves with stems upright or horizontal, not inverted. Remove protective coatings after installation.
- M. Install butterfly valves for shut-off or isolating service.
- N. Install drain valves at main shut-off valves, low points of piping and apparatus.
- O. Where inserts are omitted, drill through concrete slab from below and install through-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

### 3.3 CLEANING

A. Clean areas affected by Work. Clean after other construction is complete.

# SECTION 21 13 13

# WET-PIPE SPRINKLER SYSTEMS

### PART 1 GENERAL

## 1.1 SUMMARY

- A. Section includes wet-pipe sprinkler system, system design, installation, and certification.
- B. Related Sections:
  - 1. Section 21 05 00 Common Work Results for Fire Suppression: Product and execution requirements for pipe, fittings, valves, hangers, supports, identification, and painting for placement by this section.

### **1.2 REFERENCES**

- A. National Fire Protection Association:
  - 1. NFPA 13 Installation of Sprinkler Systems.
  - 2. NFPA 96 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.
  - 3. NFPA 101 Life Safety Code.
  - 4. NFPA 654 Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Solids.
- B. National Institute for Certification in Engineering Technologies:
  - 1. Level III Hydraulics and Water Supply Planning.

# **1.3 SYSTEM DESCRIPTION**

- A. Provide hydraulically designed system to NFPA 13 occupancy requirements. System to have a minimum safety factor of 5 PSI.
- B. Determine volume and pressure of incoming water supply from water flow test data. Revise design when test data become available prior to submittals.
- C. Interface system with building fire and smoke alarm system.
- D. Provide fire department connections as required by Authority Having Jurisdiction.
- E. Additional compensation will not be allowed for modification to the Construction Documents for additional piping, sprinklers, offsets, coordination, or additional hydraulic calculations.

### 1.4 SUBMITTALS

- A. Shop Drawings: Indicate layout of finished ceiling areas indicating sprinkler locations coordinated with ceiling installation. Indicate detailed pipe layout, hangers and supports, sprinklers, components and accessories. Indicate system controls.
- B. Product Data: Submit data on sprinklers, valves, and specialties, including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.
- C. Design Data: Submit design calculations.

## 1.5 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of sprinklers and deviations of piping from drawings. Indicate drain and test locations.
- B. Operation and Maintenance Data: Submit components of system, servicing requirements, record drawings, inspection data, replacement part numbers and availability, and location and numbers of service depot.

### **1.6 QUALITY ASSURANCE**

- A. Perform Work in accordance with NFPA 13.
- B. All materials used are to be UL listed.
- C. Perform Work in compliance with all applicable codes and standards enforced by the Authority Having Jurisdiction, as well as all applicable laws, ordinances, and regulations.

# 1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.
- C. Shop Drawings and calculations must be prepared by an individual that has obtained National Institute for Certification in Engineering Technologies, Automatic Sprinkler Systems, Level III certification or Special Hazards Suppression Systems, Level IV certification, as applicable to the project.
- D. The Qualified Fire Protection Engineer (QFPE) must review the shop drawings, hydraulic calculations and material submittals.
- E. The shop drawings must bear the Review Stamp of the QFPE prior to submitting the fire extinguishing system shop drawings.

### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store products in shipping containers until installation.
- B. Furnish piping with temporary inlet and outlet caps until installation.

### 1.9 WARRANTY

A. Furnish one year manufacturer warranty for all items included in the fire sprinkler systems.

### **1.10 EXTRA MATERIALS**

- A. Furnish extra sprinklers under provisions of NFPA 13.
- B. Furnish suitable wrenches for each sprinkler type.
- C. Furnish metal storage cabinet near system riser.

St. Cloud HRA Wilson Apartments Accessibility Upgrade St. Cloud, MN

# PART 2 PRODUCTS

### 2.1 WET-TYPE SPRINKLERS

- A. Manufacturers:
  - 1. Globe Sprinkler.
  - 2. Reliable Sprinkler.
  - 3. Tyco Sprinkler.
  - 4. Victaulic Sprinkler.
- B. Suspended Ceiling Type:
  - 1. Type: Concealed pendant type with matching escutcheon plate.
  - 2. Finish: Enamel, color white (or match existing).
  - 3. Fusible Link: Glass bulb type temperature rated for specific area hazard.
- C. Exposed Area Type:
  - 1. Type: Standard upright or pendent type.
  - 2. Finish: Brass (or match existing).
  - 3. Fusible Link: Glass bulb type temperature rated for specific area hazard.
- D. Sidewall Type (Type 1):
  - 1. Type: Recessed horizontal sidewall type with matching push on escutcheon plate.
  - 2. Finish: Chrome plated (or match existing).
  - 3. Fusible Link: Glass bulb type temperature rated for specific area hazard.
- E. Sidewall Type (Type 2):
  - 1. Type: Standard horizontal sidewall type.
  - 2. Finish: Brass (or match existing).
  - 3. Fusible Link: Glass bulb type temperature rated for specific area hazard.
- F. Escutcheon Plate: Finish to match sprinkler finish.
- G. Guards: Finish to match sprinkler finish.

#### 2.2 PIPE

- A. Refer to Section 21 05 00.
- B. Drains may be of any acceptable piping for fire sprinkler systems.

#### 2.3 FITTINGS

- A. Refer to Section 21 05 00.
- B. All fittings to be rated for a minimum of 125 PSI.

### 2.4 VALVES

- A. Refer to Section 21 05 00.
- B. All valves to be mechanically coupled, flanged, or threaded.
- C. System Riser Valves:
  - 1. Indicating Type Butterfly Valves.
  - 2. Outside Screw and Yoke Gate Valves.

- D. Electronic Supervision:
  - 1. Valves that shut down water flow to any areas of the sprinkler systems shall be electronically supervised.
  - 2. Valves for main or auxiliary drains do not need to be electronically supervised.

# 2.5 ELECTRICAL CHARACTERISTICS AND COMPONENTS

A. All wiring for the sprinkler system to be provided by the Sprinkler Contractor and installed by a licensed Electrician.

### PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Install in accordance with NFPA 13.
- B. Place pipe runs to minimize obstruction to other work.
- C. Install piping in concealed spaces above finished ceilings.
- D. Assembly Penetrations:
  - 1. Exposed Areas: Provide escutcheons for wall penetrations. Escutcheons to have chrome finish.
  - 2. Fire-rated Assemblies: Provide UL listed firestopping system with a fire rating no less than the rated assembly.
  - 3. Smoke-rated Assemblies: Provide UL listed smoke control system with a smoke rating no less than the rated assembly.
- E. Center sprinklers in two directions in ceiling tile and install piping offsets.
- F. Provide wire protection guards on all heads in storage areas, assembly hall and downward style heads in all other areas.
- G. Provide high temperature heads in all vehicle bays/garages.
- H. In areas which have finished ceilings, flush concealed pendent type sprinkler heads shall be used.
- I. Conceal piping in all applicable locations.
- J. Primarily in Assembly Halls, install main and branch piping above and through structure as high as possible.
- K. All exposed piping to be painted to match throughout the facility. Coordinate with Division 09.
- L. Hydrostatically testing
  - 1. New Construction: Test entire system.
- M. Require test be witnessed by Authority Having Jurisdiction.

### **3.2 INTERFACE WITH OTHER PRODUCTS**

A. Verify signal devices are installed and connected to fire alarm system.

St. Cloud HRA Wilson Apartments Accessibility Upgrade St. Cloud, MN

# 3.3 CLEANING

A. Refer to Section 21 05 00.

# 3.4 PROTECTION OF INSTALLED CONSTRUCTION

A. Apply masking tape or paper cover to protect concealed sprinklers, cover plates, and sprinkler escutcheons not receiving field paint finish. Remove after painting.

# SECTION 22 05 29

#### HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

#### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Pipe hangers and supports.
  - 2. Hanger rods.
  - 3. Inserts.
  - 4. Flashing.
  - 5. Sleeves.
  - 6. Mechanical sleeve seals.
  - 7. Formed steel channel.
  - 8. Firestopping relating to plumbing work.
  - 9. Firestopping accessories.
  - 10. Equipment bases and supports.
- B. Related Sections:
  - 1. Section 22 11 00 Facility Water Distribution: Execution requirements for placement of hangers and supports specified by this section.
  - 2. Section 22 13 00 Facility Sanitary Sewerage: Execution requirements for placement of hangers and supports specified by this section.
  - 3. Section 23 05 48 Vibration and Seismic Controls for HVAC Piping and Equipment: Product and execution requirements for vibration isolators.

### 1.2 REFERENCES

- A. American Welding Society:
  - 1. AWS D1.1 Structural Welding Code Steel.
- B. Manufacturers Standardization Society of the Valve and Fittings Industry:
  - 1. MSS SP 69 Pipe Hangers and Supports Selection and Application.

## 1.3 SUBMITTALS

A. NONE.

### 1.4 QUALITY ASSURANCE

- A. Perform Work in compliance with all applicable codes and standards enforced by the Authority Having Jurisdiction, as well as all applicable laws, ordinances, and regulations.
- B. Perform Work in accordance with AWS D1.1 for welding hanger and support attachments to building structure.

### 1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site in original factory packaging, labeled with manufacturer's identification.
- B. Protect from weather and construction traffic, dirt, water, chemical, and damage, by storing in original packaging.

### **1.7 FIELD MEASUREMENTS**

A. Verify field measurements prior to fabrication.

# 1.8 COORDINATION

A. Coordinate Work with other trades.

### PART 2 PRODUCTS

# 2.1 PIPE HANGERS AND SUPPORTS

- A. Manufacturers:
  - 1. Anvil International (Mueller Water Products, Inc.).
  - 2. Carpenter & Paterson Inc.
  - 3. Creative Systems Inc.
  - 4. Flex-Weld, Inc.
  - 5. Globe Pipe Hanger Products Inc.
  - 6. Michigan Hanger Co.
  - 7. Superior Valve Co.
- B. Plumbing Piping DWV:
  - 1. Conform to MSS SP 69.
  - 2. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron or Carbon steel, adjustable, clevis.
  - 3. Hangers for Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
  - 4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
  - 5. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hook.
  - 6. Wall Support for Pipe Sizes 4 inches and Larger: Welded steel bracket and wrought steel clamp.
  - 7. Vertical Support: Steel riser clamp.
  - 8. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
  - 9. Copper Pipe Support: Copper-plated, carbon-steel adjustable, ring.
  - 10. For Exterior and Humid Areas: Furnished hot-dipped galvanized or Type 304 stainless steel or better hangers, support, and hardware.
- C. Plumbing Piping Water:
  - 1. Conform to MSS SP 69.
  - 2. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron or Carbon steel, adjustable, clevis.

- 3. Hangers for Cold Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
- 4. Hangers for Hot Pipe Sizes 2 to 4 inches: Carbon steel, adjustable, clevis.
- 5. Hangers for Hot Pipe Sizes 6 inches and Larger: Adjustable steel yoke, cast iron roll, double hanger.
- 6. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- 7. Multiple or Trapeze Hangers for Hot Pipe Sizes 6 inches and Larger: Steel channels with welded spacers and hanger rods, cast iron roll.
- 8. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hook.
- 9. Wall Support for Pipe Sizes 4 inches and Larger: Welded steel bracket and wrought steel clamp.
- 10. Wall Support for Hot Pipe Sizes 6 inches and Larger: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron roll.
- 11. Vertical Support: Steel riser clamp.
- 12. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
- 13. Floor Support for Hot Pipe Sizes 4 inches and Smaller: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
- 14. Floor Support for Hot Pipe Sizes 6 inches and Larger: Adjustable cast iron roll and stand, steel screws, and concrete pier or steel support.
- 15. Copper Pipe Support: Copper-plated, Carbon-steel ring.
- 16. For Exterior and Humid Areas: Furnished hot-dipped galvanized or Type 304 stainless steel or better hangers, support, and hardware.
- D. Plumbing Piping Storm:
  - 1. Conform to MSS SP 69.
  - 2. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron or Carbon steel, adjustable, clevis.
  - 3. Hangers for Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
  - 4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
  - 5. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hook.
  - 6. Wall Support for Pipe Sizes 4 inches and Larger: Welded steel bracket and wrought steel clamp.
  - 7. Vertical Support: Steel riser clamp.
  - 8. For Exterior and Humid Areas: Furnished hot-dipped galvanized or Type 304 stainless steel or better hangers, support, and hardware.

### 2.2 HANGER RODS

A. Hanger Rods: Mild steel threaded both ends, threaded on one end, or continuous threaded.

### 2.3 INSERTS

A. Inserts: Malleable iron case of steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

### 2.4 FLASHING

A. See Division 07.

St. Cloud HRA Wilson Apartments Accessibility Upgrade St. Cloud, MN

# 2.5 SLEEVES

- A. Sleeves for Pipes Through Non-fire Rated Floors: 18 gage thick galvanized steel.
- B. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gage thick galvanized steel.
- C. Sealant: Acrylic.

# 2.6 MECHANICAL SLEEVE SEALS

- A. Manufacturers:
  - 1. Thunderline Link-Seal, Inc.
  - 2. NMP Corporation.
- B. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber-sealing elements to expand when tightened, providing watertight seal and electrical insulation.

# 2.7 FORMED STEEL CHANNEL

A. Product Description: Galvanized 12 gage thick steel. With holes 1-1/2 inches on center.

### 2.8 FIRESTOPPING

A. Refer to Division 07.

### 2.9 FIRESTOPPING ACCESSORIES

A. Refer to Division 07.

### PART 3 EXECUTION

### 3.1 EXAMINATION

A. Verify openings are ready to receive sleeves.

### 3.2 PREPARATION

- A. Obtain permission from Architect/Engineer before using powder-actuated anchors.
- B. Obtain permission from Architect/Engineer before drilling or cutting structural members.

### 3.3 INSTALLATION - INSERTS

- A. Install inserts for placement in concrete forms.
- B. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
- C. Provide hooked rod to concrete reinforcement section for inserts carrying pipe 4 inches and larger.
- D. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
- E. Where inserts are omitted, drill through concrete slab from below, and provide through-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

### 3.4 INSTALLATION - PIPE HANGERS AND SUPPORTS

- A. Install in accordance with MSS SP 69.
- B. Support horizontal piping as scheduled. Coordinate with Structural Drawings.
- C. Support vertical piping as scheduled.
- D. Install hangers with minimum 1/2 inch space between finished covering and adjacent work.
- E. Place hangers within 12 inches of each horizontal elbow.
- F. Use hangers with 1-1/2 inch minimum vertical adjustment.
- G. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.
- H. Where piping is installed in parallel and at same elevation, provide multiple pipe or trapeze hangers.
- I. Support riser piping independently of connected horizontal piping.
- J. Provide copper plated hangers and supports for copper piping.
- K. Design hangers for pipe movement without disengagement of supported pipe.
- L. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
- M. Provide clearance in hangers and from structure and other equipment for installation of insulation. Refer to Section 22 07 00.
- N. Provide vibration isolators type hangers or supports for pipes after vibration-isolated equipment is installed.
- O. Provide vibration isolators type hangers for pipes 2-inches or larger located below or within 50 feet of noise-sensitive rooms.

#### 3.5 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

A. Refer to Section 23 05 29 for installation requirements.

### 3.6 INSTALLATION - FLASHING

A. Refer to Division 07.

#### 3.7 INSTALLATION - SLEEVES

- A. Exterior watertight entries: Seal with mechanical sleeve seals.
- B. Set sleeves in position in forms. Provide reinforcing around sleeves.
- C. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- D. Extend sleeves through floors 1 inch above finished floor level. Caulk sleeves.
- E. Where piping penetrates floor, ceiling, or wall, close off space between pipe and adjacent work with insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

F. Install chrome plated steel escutcheons at finished surfaces.

### 3.8 INSTALLATION - FIRESTOPPING

- A. Install firestopping material at fire and smoke-rated construction perimeters and openings containing penetrating sleeves, piping, and other items that require firestopping.
- B. Refer to Division 07.

## 3.9 **PROTECTION OF FINISHED WORK**

A. Protect adjacent surfaces from damage by material installation.

## 3.10 SCHEDULES

HANGERS AND SUPPORTS (TABLE 313.1)	TYPES OF JOINTS	HORIZONTAL	VERTICAL
MATERIALS			
CAST	LEAD AND OAKUM	5 FEET, EXCEPT 10 FEET WHERE	BASE AND EACH FLOOR, NOT TO
		10 FOOT LENGTHS ARE	EXCEED 15 FEET
		INSTALLED (NOTES 1,2,3)	
CAST	COMPRESSION	EVERY OTHER JOINT, UNLESS	BASE AND EACH FLOOR, NOT TO
	GASKET	OVER 4 FEET THEN SUPPORT	EXCEED 15 FEET
		EACH JOINT (NOTES 1,2,3)	
CAST-IRON	SHEILDED	EVERY OTHER JOINT, UNLESS	BASE AND EACH FLOOR, NOT TO
HUBLESS	COUPLING	OVER 4 FEET THEN SUPPORT	EXCEED 15 FEET
		EACH JOINT (NOTES 1,2,3,4)	
COPPER TUBE	SOLDERED OR	1-1/2 INCHES AND SMALLER, 6	EACH FLOOR, NOT TO EXCEED 10
AND PIPE	BRAZED	FEET; 2 INCHES AND LARGER, 10	FEET (NOTE 5)
		FEET	
STEEL AND BRASS	THREADED OR	3/4 INCH AND SMALLER, 10	EVERY OTHER FLOOR, NOT TO
PIPE FOR WATER	WELDED	FEET; 1 INCH AND LARGER, 12	EXCEED 25 FEET (NOTE 5)
OR DWV		FEET	
STEEL, BRASS,	THREADED OR	1/2 INCH, 6 FEET; 3/4 INCH AND	1/2 INCH, 6 FEET; 3/4 INCH AND 1
AND TINNED	WELDED	1 INCH, 8 FEET; 1-1/4 INCHES	INCH, 8 FEET; 1-1/4 INCHES EVERY
COPPER PIPE FOR		AND LARGER, 10 FEET	FLOOR LEVEL
GAS			
SCHEDULE 40 PVC	SOLVENT	ALL SIZES, 4 FEET; ALLOW FOR	BASE AND EACH FLOOR; PROVIDE
AND ABS DWV	CEMENTED	EXPANSION EVERY 30 FEET	MID-STORY GUIDES; PROVIDE FOR
		(NOTES 3,6)	EXPANSION EVERY 30 FEET (NOTE
			6)
CPVC	SOLVENT	1 INCH AND SMALLER, 3 FEET; 1-	BASE AND EACH FLOOR; PROVIDE
	CEMENTED	1/4 INCHES AND LARGER, 4 FEET	MID-STORY GUIDES (NOTE 6)
COPPER	MECHANICAL	IN ACCORDANCE WITH	IN ACCORDANCE WITH
		STANDARDS ACCEPTABLE TO	STANDARDS ACCEPTABLE TO THE
		THE AUTHORITY HAVING	AUTHORITY HAVING JURISDICTION
		JURISDICTION	

STEEL AND BRASS	MECHANICAL	IN ACCORDANCE WITH	IN ACCORDANCE WITH
		STANDARDS ACCEPTABLE TO	STANDARDS ACCEPTABLE TO THE
		THE AUTHORITY HAVING	AUTHORITY HAVING JURISDICTION
		JURISDICTION	
PEX	COLD EXPANSION,	1 INCH AND SMALLER, 32	BASE AND EACH FLOOR; PROVIDE
	INSERT AND	INCHES; 1-1/4 INCHES AND	MID-STORY GUIDES
	COMPRESSION	LARGER, 4 FEET	
PEX-AL-PEX	METAL INSERT	1/2 INCH, 3/4 INCH, 1 INCH; ALL	BASE AND EACH FLOOR; PROVIDE
	AND METAL	SIZES 98 INCHES	MID-STORY GUIDES
	COMPRESSION		
PE-AL-PE	METAL INSERT	1/2 INCH, 3/4 INCH, 1 INCH; ALL	BASE AND EACH FLOOR; PROVIDE
	AND METAL	SIZES 98 INCHES	MID-STORY GUIDES
	COMPRESSION		
POLYPROPYLENE	FUSION WELD	1 INCH AND SMALLER, 23	BASE AND EACH FLOOR; PROVIDE
(PP)	(SOCKET, BUTT,	INCHES; 1-1/4 INCHES AND	MID-STORY GUIDES
	SADDLE,	LARGER, 4 FEET	
	ELECTROFUSION),		
	THREADED (METAL		
	THREADS ONLY),		
	OR MECHANICAL		

NOTES:

1. SUPPORT ADJACENT TO JOINT, NOT TO EXCEED 18 INCHES.

- 2. BRACE NOT TO EXCEED 40 FOOT INTERVALS TO PREVENT HORIZONTAL MOVEMENT.
- 3. SUPPORT AT EACH HORIZONTAL BRANCH CONNECTION.
- 4. HANGERS SHALL NOT BE PLACED ON THE COUPLING.
- 5. VERTICAL WATER LINES SHALL BE PERMITTED TO BE SUPPORTED IN ACCORDANCE WITH RECOGNIZED ENGINEERING PRINCIPLES WITH REGARD TO EXPANSION AND CONTRACTION, WHERE FIREST APPROVED BY THE AUTHORITY HAVING JURISDICTION.
- 6. SEE THE APPROPRIATE IAPMO INSTALLATION STANDARD FOR EXPANSION AND OTHER SPECIAL REQUIREMENTS.

### HANGER AND ROD SIZES (TABLE 313.6)

	· · ·
PIPE AND TUBE SIZE	ROD SIZE
(INCHES)	(INCHES)
1/2 - 4	3/8
5 - 8	1/2
10 - 12	5/8

# **SECTION 22 05 53**

### **IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT**

#### PART 1 GENERAL

# 1.1 SUMMARY

- A. Section Includes:
  - 1. Nameplates.
  - 2. Tags.
  - 3. Stencils.
  - 4. Pipe markers.
  - 5. Ceiling tacks.
  - 6. Labels.
  - 7. Lockout devices.
- B. Related Sections:
  - 1. NONE.

## **1.2 REFERENCES**

- A. American Society of Mechanical Engineers:
  - 1. ASME A13.1 Scheme for the Identification of Piping Systems.
- B. National Fire Protection Association:
  - 1. NFPA 99 Standard for Health Care Facilities.

#### **1.3 SYSTEM DESCRIPTION**

A. The Plumbing Contractor is responsible for items in this Section.

#### 1.4 SUBMITTALS

A. NONE.

#### 1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of tagged valves; include valve tag numbers.

#### 1.6 QUALITY ASSURANCE

- A. Perform Work in compliance with all applicable codes and standards enforced by the Authority Having Jurisdiction, as well as all applicable laws, ordinances, and regulations.
- B. Conform to ASME A13.1 for color scheme for identification of piping systems and accessories.

# 1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience .
#### **1.8 FIELD MEASUREMENTS**

A. Verify field measurements prior to fabrication.

#### PART 2 PRODUCTS

#### 2.1 NAMEPLATES

A. Product Description: Laminated three-layer plastic with engraved black letters on light contrasting background color.

#### 2.2 TAGS

- A. Plastic Tags:
  - 1. Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inches square.
- B. Metal Tags:
  - 1. Brass, Aluminum, or Stainless Steel with stamped letters; tag size minimum 1-1/2 inches square with finished edges.
- C. Information Tags:
  - Clear plastic with printed "Danger," "Caution," or "Warning" and message; size 3-1/4 x 5-5/8 inches with grommet and self-locking nylon ties.
- D. Tag Chart: Typewritten letter size list of applied tags and location in anodized aluminum or plastic laminated frame.

## 2.3 STENCILS

- A. Stencils: With clean cut symbols and letters of following size:
  - 1. Up to 2 inches Outside Diameter of Insulation or Pipe: 1/2 inch high letters.
  - 2. 2-1/2 to 6 inches Outside Diameter of Insulation or Pipe: 1-inch high letters.
  - 3. Over 6 inches Outside Diameter of Insulation or Pipe: 1-3/4 inches high letters.
  - 4. Ductwork and Equipment: 1-3/4 inches high letters.
- B. Stencil Paint: As specified in Section 09 90 00, semi-gloss enamel, colors and lettering size conforming to ASME A13.1.

#### 2.4 PLASTIC MARKERS

- A. Color and Lettering: Conform to ASME A13.1.
- B. Plastic Markers:
  - 1. Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Larger sizes may have maximum sheet size with spring fastener.
- C. Plastic Tape Markers:
  - 1. Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.
- D. Plastic Underground Markers:
  - 1. Bright colored continuously printed plastic ribbon tape, minimum 6 inches wide by 4 mil thick, manufactured for direct burial service.

## 2.5 CEILING TACKS

- A. Description: Steel or plastic with 3/4 inch diameter color-coded head.
- B. Color code as approved by Owner. If no preference by Owner, color as follows:
  - 1. Plumbing valves: Green.
  - 2. Refer to Section 23 05 53 for other equipment.

### 2.6 LABELS

A. Description: Laminated Mylar, size 1.9 x 0.75 inches, adhesive backed with printed identification and bar code.

### 2.7 LOCKOUT DEVICES

- A. Lockout Hasps:
  - 1. Reinforced nylon hasp with erasable label surface; size minimum 7-1/4 x 3 inches.
- B. Valve Lockout Devices:
  - 1. Nylon device preventing access to valve operator, accepting lock shackle.

### PART 3 EXECUTION

#### 3.1 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

### 3.2 INSTALLATION

- A. Install identifying devices after completion of coverings and painting.
- B. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive.
- C. Install labels with sufficient adhesive for permanent adhesion and seal with clear lacquer. For unfinished canvas covering, apply paint primer before applying labels.
- D. Install tags using corrosion resistant chain. Number tags consecutively by location.
- E. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.
- F. Identify water heaters, pumps, tanks, and water treatment devices with plastic nameplates. Identify in-line pumps and other small devices with tags.
- G. Identify control panels and major control components outside panels with plastic nameplates.
- H. Identify valves in main and branch piping with tags.
- I. Identify piping, concealed or exposed, with plastic markers, or plastic tape markers.
  - 1. Identify service, flow direction, and pressure.
  - 2. Install in clear view and align with axis of piping.
  - 3. Locate identification:
    - a. Not to exceed 20 feet on straight runs including risers and drops.
    - b. Adjacent to each valve and tee.
    - c. At each side of penetration of structure or enclosure.
    - d. At each obstruction.

- J. Provide ceiling tacks to locate valves above T-bar type panel ceilings. Locate in corner of panel closest to equipment.
- K. Plumbing system piping and components shall be clearly labeled.
- L. Provide equipment tags for each pump, tank, heat transfer unit and control valve and similar components.
- M. Label piping at each side of wall penetrations, and at 20 foot intervals, minimum.

# **END OF SECTION**

# SECTION 22 07 00

### **PLUMBING INSULATION**

### PART 1 GENERAL

# 1.1 SUMMARY

- A. Section Includes:
  - 1. Piping system insulation.
  - 2. Equipment insulation.
  - 3. Pipe insulation jackets.
  - 4. Equipment insulation jackets.
  - 5. Insulation accessories including vapor retarders and accessories.

#### B. Related Sections:

- 1. Section 22 05 29 Hangers and Supports for Plumbing Piping and Equipment: Product and Execution requirements for inserts at hanger locations.
- 2. Section 22 05 53 Identification for Plumbing Piping and Equipment: Product requirements for plumbing piping and equipment identification.
- 3. Section 23 07 00 HVAC Insulation: Pipe insulation thickness requirements.

#### **1.2 REFERENCES**

- A. ASTM International:
  - 1. ASTM C547 Standard Specification for Mineral Fiber Pipe Insulation.
  - 2. ASTM C795 Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel.
  - 3. ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials.

#### 1.3 SUBMITTALS

A. NONE.

### 1.4 QUALITY ASSURANCE

A. Perform Work in compliance with all applicable codes and standards enforced by the Authority Having Jurisdiction, as well as all applicable laws, ordinances, and regulations.

#### **1.5 QUALIFICATIONS**

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Applicator: Company specializing in performing Work of this section with minimum three years documented experience.

### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.
- B. Protect insulation from weather and construction traffic, dirt, water, chemical, and damage, by storing in original wrapping.

### **1.7 ENVIRONMENTAL REQUIREMENTS**

- A. Install insulation only when ambient temperature and humidity conditions are within range recommended by manufacturer.
- B. Maintain temperature during and after installation for minimum period as recommended by manufacturer.

#### **1.8 FIELD MEASUREMENTS**

A. Verify field measurements prior to fabrication.

#### PART 2 PRODUCTS

#### 2.1 PIPE: MAN MADE MINERAL FIBER

- A. Insulation: ASTM C547 Mineral Fiber Pipe Insulation, Type I, 850 degrees F
  - 1. Insulation Conductivity Rating: Maximum: 0.28 Btu-in/(h-ft2-F) at 100-degree-F mean rating temperature.
- B. Applications on Austenitic stainless steel: Conform to ASTM C795.
- C. Vapor Retarder Jacket:
  - 1. White Kraft paper with glass fiber yarn, bonded to aluminized film.
  - 2. Moisture vapor transmission: ASTM E96; 0.02 perm-inches.
- D. Vapor Retarder Lap Adhesive:
  - 1. Compatible with insulation.

#### 2.2 PIPE INSULATION AND EQUIPMENT JACKETS

- A. PVC Plastic Pipe Jacket:
  - 1. Product Description: One piece molded type fitting covers and sheet material, off-white color.
  - 2. Thickness: 10 mil.
  - 3. Connections: Brush on welding adhesive.

#### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Verify piping and equipment has been tested before applying insulation materials.
- B. Verify surfaces are clean and dry, with foreign material removed.

#### 3.2 INSTALLATION – PIPING

- A. Exposed Piping: Locate insulation and cover seams in least visible locations.
- B. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
- C. Manmade mineral fiber insulated pipes conveying fluids below ambient temperature:
  - 1. Furnish factory-applied or field-applied vapor retarder jackets. Secure factory-applied jackets with pressure sensitive adhesive self-sealing longitudinal laps and butt strips.

Secure field-applied jackets with outward clinch expanding staples and seal staple penetrations with vapor retarder mastic.

- 2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor retarder adhesive or PVC fitting covers.
- D. For hot piping conveying fluids over 140 degrees F, insulate flanges and unions at equipment.
- E. Manmade mineral fiber insulated pipes conveying fluids above ambient temperature:
  - 1. Furnish factory-applied or field-applied standard jackets. Secure with outward clinch expanding staples or pressure sensitive adhesive system on standard factory-applied jacket and butt strips or both.
  - 2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
- F. Inserts and Shields:
  - 1. Application: Piping or Equipment 2 inches diameter or larger.
  - 2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
  - 3. Insert location: Between support shield and piping and under finish jacket.
  - 4. Insert configuration: Minimum 6 inches long, of thickness and contour matching adjoining insulation; may be site fabricated or factory fabricated.
  - 5. Insert material: Compression resistant insulating material suitable for planned temperature range and service.
- G. Continue insulation through penetrations of building assemblies or portions of assemblies having fire resistance rating of one hour or less. Provide intumescent firestopping when continuing insulation through assembly. Finish at supports, protrusions, and interruptions. Refer to Division 07 for penetrations of assemblies with fire resistance rating greater than one hour.
- H. Exterior Applications: Provide vapor retarder jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor retarder cement. Cover with aluminum jacket with seams located at 3 or 9 o'clock position on side of horizontal piping with overlap facing down to shed water or on bottom side of horizontal equipment.
- I. Exterior insulated piping systems shall be jacketed with aluminum or stainless steel.
- J. Unprotected insulation at exterior conditions is not acceptable.

### 3.3 INSTALLATION - EQUIPMENT

- A. Factory Insulated Equipment: Do not insulate.
- B. Exposed Equipment: Locate insulation and cover seams in least visible locations.
- C. Apply insulation close to equipment by grooving, scoring, and beveling insulation. Fasten insulation to equipment with studs, pins, clips, adhesive, wires, or bands.
- D. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor retarder cement.
- E. Insulated equipment containing fluids below ambient temperature: Insulate entire system.

- F. Mineral fiber insulated equipment containing fluids below ambient temperature: Provide vapor retarder jackets, factory-applied or field-applied. Finish with glass-cloth and vapor barrier adhesive.
- G. For hot equipment containing fluids over 140 degrees F, insulate flanges and unions with removable sections and jackets.
- H. Mineral fiber insulated equipment containing fluids above ambient temperature: Provide standard jackets, with or without vapor retarder, factory-applied or field-applied. Finish with glass cloth and adhesive.
- I. Finish insulation at supports, protrusions, and interruptions.
- J. Nameplates and ASME Stamps: Bevel and seal insulation around. Do not insulate over.
- K. Equipment Requiring Access for Maintenance, Repair, or Cleaning: Install insulation for easy removal and replacement without damage.

### 3.4 SCHEDULES

- A. Plumbing Systems:
  - 1. Domestic Hot Water Systems:
    - a. Applications:
      - 1) Recirculating Systems:
        - a) All piping, including the supply, return, and water heater piping.
      - 2) Non-recirculating Systems:
        - a) First 8 feet of outlet piping for a constant temperature storage system.
        - b) Inlet pipe between storage tank and a heat trap.
        - 3) Pipes that are externally heated (such as heat trace or impedance heating).
    - b. Material: Man Made Mineral Fiber Insulation.
    - c. Thickness:
      - 1) Pipe diameter less than 1-1/2 inches: 1 inch.
      - 2) Pipe diameter 1-1/2 inches and greater: 1.5 inches.
  - 2. Domestic Cold Water Systems:
    - a. Material: Man Made Mineral Fiber Insulation.
    - b. Thickness: 1 inch.
  - 3. Plumbing Vents Within 10 feet of Exterior:
    - a. Material: Man Made Mineral Fiber Insulation.
    - b. Thickness: 1 inch.
  - 4. Roof Drainage:
    - a. Material: Man Made Mineral Fiber Insulation.
    - b. Thickness: 1 inch.
  - 5. As otherwise required by the current MN Commercial Energy Code.

#### **END OF SECTION**

# SECTION 22 11 00

### **FACILITY WATER DISTRIBUTION**

#### PART 1 GENERAL

### 1.1 SUMMARY

- A. Section Includes:
  - 1. Domestic water piping, above grade.
  - 2. Unions and flanges.
  - 3. Valves.
  - 4. Pipe hangers and supports.
  - 5. Thermometers.
  - 6. Flow control valves.
  - 7. Relief valves.
  - 8. Strainers.
  - 9. Backflow preventers.
  - 10. Water hammer arrestors.
- B. Related Sections:
  - 1. Section 22 05 29 Hangers and Supports for Plumbing Piping and Equipment: Product requirements for pipe hangers and supports for placement by this section.
  - 2. Section 22 05 53 Identification for Plumbing Piping and Equipment: Product requirements for pipe identification and valve tags for placement by this section.
  - 3. Section 22 07 00 Plumbing Insulation: Product and execution requirements for pipe insulation.
  - 4. Section 23 05 13 Common Motor Requirements for HVAC Equipment: Product requirements for motors for placement by this section.
  - 5. Section 23 05 48 Vibration and Seismic Controls for HVAC Piping and Equipment: Product requirements for vibration isolators for placement by this section.

#### 1.2 REFERENCES

- A. American National Standards Institute:
  - 1. ANSI Z21.22 Relief Valves for Hot Water Supply Systems.
- B. American Society of Mechanical Engineers:
  - 1. ASME B16.18 Cast Copper Alloy Solder Joint Pressure Fittings.
  - 2. ASME B16.22 Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
  - 3. ASME B31.9 Building Services Piping.
  - 4. ASME Section VIII Boiler and Pressure Vessel Code Pressure Vessels.
  - 5. ASME Section IX Boiler and Pressure Vessel Code Welding and Brazing Qualifications.
- C. American Society of Sanitary Engineering:
  - 1. ASSE 1010 Performance Requirements for Water Hammer Arresters.
  - 2. ASSE 1012 Performance Requirements for Backflow Preventer with Intermediate Atmospheric Vent.
  - 3. ASSE 1013 Performance Requirements for Reduced Pressure Principle Backflow Preventers and Reduced Pressure Fire Protection Principle Backflow Preventers.

- 4. ASSE 1052 Performance Requirements for Hose Connection Backflow Preventers.
- 5. ASSE 1061 Performance Requirements for Removable and Non-Removable Push-Fit Fittings.
- D. ASTM International:
  - 1. ASTM A53/A53M Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  - 2. ASTM A234/A234M Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.
  - 3. ASTM A395/A395M Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures.
  - 4. ASTM B88 Standard Specification for Seamless Copper Water Tube.
  - 5. ASTM D2464 Standard Specification for Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
  - 6. ASTM D2846/D2846M Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Hot- and Cold-Water Distribution Systems.
  - 7. ASTM D2855 Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.
  - 8. ASTM E1 Standard Specification for ASTM Thermometers.
  - 9. ASTM F441/F441M Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80.
  - 10. ASTM F442/F442M Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR).
  - 11. ASTM F1476 Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications.
  - 12. ASTM F2023 Standard Test Method for Evaluating the Oxidative Resistance of Crosslinked Polyethylene (PEX) Tubing and Systems to Hot Chlorinated Water.
- E. American Water Works Association:
  - 1. AWWA C651 Disinfecting Water Mains.
- F. Manufacturers Standardization Society of the Valve and Fittings Industry:
  - 1. MSS SP 67 Butterfly Valves.
  - 2. MSS SP 71 Cast Iron Swing Check Valves, Flanged and Threaded Ends.
  - 3. MSS SP 80 Bronze Gate, Globe, Angle and Check Valves.
  - 4. MSS SP 110 Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.
- G. National Electrical Manufacturers Association:
  - 1. NEMA 250 Enclosures for Electrical Equipment (1000 Volts Maximum).
- H. NSF International:
  - 1. NSF 14 Plastics Piping System Components and Related Materials.
  - 2. NSF 61 Drinking Water System Components Health Effects.
  - 3. NSF 372 Drinking Water Components Lead Content.
- I. Plumbing and Drainage Institute:
  - 1. PDI WH201 Water Hammer Arrester Standard.
- J. U. S. Department of Housing and Urban Development:

1. FHA Bulletin 76 – Use of Materials Bulletin No. 76: Chlorinated Poly (Vinyl Chloride) CPVC and Polybutylene (PB) Hot and Cold Water Distribution Piping.

### **1.3 SYSTEM DESCRIPTION**

- A. The Plumbing Contractor is responsible for items in this Section.
- B. Plumbing Contractor shall provide and install all water meters.
- C. Water distribution system to be copper, cross-linked polyethylene (PEX), and/or polypropylene random (PP-R).
- D. Pipe sizes indicated on drawings are based on ASTM B88 Type L copper tubing and ASTM A53/A53M, Schedule 40 steel pipe. For non-metallic pipe, contractor to verify nominal pipe size for equivalent pressure drop, flow rate, and velocity.

#### 1.4 SUBMITTALS

- A. Product Data:
  - 1. Domestic Water Specialties: Submit manufacturers catalog information, component sizes, rough-in requirements, service sizes, and finishes.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of valves and equipment.
- B. Operation and Maintenance Data: Submit spare parts list, exploded assembly views and recommended maintenance intervals.
- C. Pressure Test Report: Submit verification of pressure test report. Include test type, testing pressure, and length of time.
  - 1. PP-R: Provide completed test report for Manufacturer's standard testing procedure.

#### 1.6 QUALITY ASSURANCE

- A. Perform Work in compliance with all applicable codes and standards enforced by the Authority Having Jurisdiction, as well as all applicable laws, ordinances, and regulations.
- B. PEX: Cross-linked polyethylene (PEX) tubing systems together with recommended fittings must by tested by the manufacturer at 150 psi and 210 degrees F for a period of not less than 30 days by a qualified independent testing laboratory acceptable to the administrative authority.
- C. PP-R: Polypropylene (PP-R) pipe together with recommended fittings must by tested by the manufacturer at 540 psi hoop stress and 203 degrees F for a period of not less than 40 days by a qualified independent testing laboratory acceptable to the administrative authority.
- D. Lead-free: All fittings, valves, fixtures, and accessories that contact potable water shall be lead-free compliant per NSF 61 and NSF 372.

# 1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.
  - 1. PP-R Installer: Shall be factory-trained and carry proof of training during Inspections.

### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Accept valves and equipment on site in shipping containers with labeling in place. Inspect for damage.
- B. Provide temporary protective coating on cast iron and steel valves.
- C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

#### **1.9 ENVIRONMENTAL REQUIREMENTS**

A. Do not install underground piping when bedding is wet or frozen.

#### **1.10 FIELD MEASUREMENTS**

A. Verify field measurements prior to fabrication.

### 1.11 WARRANTY

- A. Polypropylene-Random Piping:
  - 1. Furnish ten-year manufacturer warranty for piping, fittings, and any incidental damage caused by material failure from manufacturer defect.
  - 2. Warranty shall cover labor and material costs of repairing and/or replacing defective materials and repairing any incidental damage caused by failure of the piping system due to defects in materials or workmanship.
  - 3. Manufacturer's pressure testing procedure shall be followed to validate the warranty.

#### PART 2 PRODUCTS

#### 2.1 DOMESTIC WATER PIPING, ABOVE GRADE

- A. Copper Tubing (2 inch diameter and smaller): ASTM B88, Type L, hard drawn.
  - 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
  - 2. Joints: Solder, lead free, 95-5 tin-antimony, or tin and silver, with melting range 430 to 535 degrees F.
  - 3. Joints: Push-fit complying with NSF 61 and ASSE 1061. Crimping tool approved by Manufacturer and local Authority Having Jurisdiction. For pipe sizes 3/8 to 2 inches only.

#### 2.2 UNIONS AND FLANGES

- A. Unions for Pipe 2 inches and Smaller:
  - 1. Copper Piping: Class 150, bronze unions with soldered.
  - 2. Dielectric Connections: Dielectric union connections are NOT permitted.
  - 3. PP-R Piping: PP-R.
  - 4. PEX Piping: PEX.

- B. Flanges for Pipe 2-1/2 inches and Larger:
  - 1. Ferrous Piping: Class 150, forged steel, slip-on flanges.
  - 2. PVC Piping: PVC flanges.
  - 3. PP-R Piping: PP-R flanges.
  - 4. Gaskets: 1/16 inch thick preformed neoprene gaskets.
- C. PVC Pipe Materials: For connections to equipment and valves with threaded connections, furnish solvent-weld socket to screwed joint adapters and unions, or ASTM D2464, Schedule 80, threaded, PVC pipe.

#### 2.3 DIELECTRIC FITTINGS

- A. Dielectric Waterway Connectors:
  - 1. Manufacturers:
    - a. ClearFlow (Elstel Perfection)
  - 2. Dissimilar metals shall be separated with a dielectric waterway connector
  - 3. Material: Electro-zinc-plated steel casing, insert plastic lining, threaded ends.

#### 2.4 BALL VALVES

- A. Manufacturers:
  - 1. Crane Valve, North America.
  - 2. Hammond Valve.
  - 3. Milwaukee Valve Company.
  - 4. NIBCO, Inc.
  - 5. Stockham Valves & Fittings.
- B. 2 inches and Smaller: MSS SP 110, one-piece bronze body, chrome plated brass ball, regular port, Teflon seats, blowout proof stem, solder or threaded ends with lever handle.
  - 1. PEX Applications: Ends may be compatible with approve fitting system.

#### 2.5 BUTTERFLY VALVES

- A. Manufacturers:
  - 1. Crane Valve, North America.
  - 2. Hammond Valve.
  - 3. Milwaukee Valve Company.
  - 4. NIBCO, Inc..
  - 5. Stockham Valves & Fittings.
  - 6. Victaulic Co.
- B. 2-1/2 inches and Larger: MSS SP 67, Class 150.
  - 1. Body: Cast or ductile iron, wafer lug or grooved ends, stainless steel stem, extended neck.
  - 2. Disc: Nickel-plated ductile iron.
  - 3. Seat: Resilient replaceable EPDM.
  - 4. Handle and Operator: 10 position lever handle.

#### 2.6 CHECK VALVES

- A. Horizontal Swing Check Valves:
  - 1. Manufacturers:

- a. Crane Valve, North America.
- b. Hammond Valve.
- c. Milwaukee Valve Company.
- d. NIBCO, Inc.
- e. Stockham Valves & Fittings.
- 2. 2 inches and Smaller: MSS SP 80, bronze body and cap, bronze seat, Buna-N disc, solder or threaded ends.
- 3. 2-1/2 inches and Larger: MSS SP 71, cast iron body, bolted cap, bronze or cast iron disc, flanged ends.

#### 2.7 PIPE HANGERS AND SUPPORTS

A. Refer to Section 22 05 29.

#### 2.8 STEM TYPE THERMOMETERS

- A. Thermometer: ASTM E1, adjustable angle, red appearing mercury, lens front tube, cast aluminum case with enamel finish, cast aluminum adjustable joint with positive locking device.
  - 1. Size: 9 inch scale.
  - 2. Window: Clear Lexan.
  - 3. Stem: Brass, 3/4 inch NPT, Length as required for proper fluid sensing.
  - 4. Accuracy: 2 percent.
  - 5. Calibration: Both degrees F and degrees C.
  - 6. Range:
    - a. Hot Water: 30 degrees F to 160 degrees F.
    - b. Cold Water: 0 degrees F to 100 degrees F.

# 2.9 FLOW CONTROL/BALANCING VALVES

- A. Manufacturers:
  - 1. Bell & Gossett (Xylem, Inc).
  - 2. Danfoss.
  - 3. Griswold Controls.
  - 4. Taco, Inc.
  - 5. Victaulic Co.
  - 6. ThermOmegaTech.
- B. Type: Flow control valve shall be manual balancing valve, or automatic thermostatic recirculation valve (TRV), Circuit Solver Model CSUA by ThermOmegaTech, or equal.
- C. Construction: Brass, bronze, or stainless steel body with union and isolation ball valve on inlet and outlet, and temperature and pressure test plugs.
- D. Calibration: When fully closed the TRV shall bypass a minimum of 0.1 GPM to maintain dynamic control of the hot water recirculation loop. Fully open TRV shall modulate towards a minimum closed position upon sensing a water temperature 3 degrees F or more above setpoint.
- E. Automatic Control Mechanism: TRV shall regulate the flow of recirculated domestic hot water based on water temperature entering the valve regardless of system operating

pressure. Thermal actuator shall be spring operated and self-cleaning, delivering closing thrust sufficient to keep orifice opening free of scale deposits. Thermal actuator shall be rated for a minimum of 200,000 cycles. Thermal actuator shall be factory adjustable from 105 degrees F to 140 degrees F as required by project conditions.

F. Accessories: Valve shall include internal/integrated check valve.

#### 2.10 RELIEF VALVES

- A. Pressure Relief:
  - 1. ANSI Z21.22 certified, bronze body, Teflon seat, steel stem and springs, automatic, direct pressure actuated.
- B. Temperature and Pressure Relief:
  - 1. ANSI Z21.22 certified, bronze body, Teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, temperature relief maximum 210 degrees F, capacity ASME certified and labeled.

### 2.11 BACKFLOW PREVENTERS

- A. Manufacturers:
  - 1. Apollo Valves (Aalberts Industries N.V.)
  - 2. Watts Water Technologies, Inc.
  - 3. Zurn Wilkins (Zurn Industries, LLC).
- B. Reduced Pressure Backflow Preventers:
  - 1. Comply with ASSE 1013.
  - 2. Bronze body, with bronze internal parts and stainless steel springs.
  - 3. Two independently operating, spring loaded check valves; diaphragm type differential pressure relief valve located between check valves; third check valve opening under back pressure in case of diaphragm failure; non-threaded vent outlet; assembled with two gate valves, strainer, and four test cocks.
- C. Double Check Valve Assemblies: Comply with ASSE 1012; Bronze body with corrosion resistant internal parts and stainless steel springs; two independently operating check valves with intermediate atmospheric vent.

#### 2.12 WATER HAMMER ARRESTORS

- A. ASSE 1010; copper construction, piston type sized in accordance with PDI WH-201.
- B. Pre-charged suitable for operation in temperature range 34 to 250 degrees F and maximum 150 psi working pressure.

#### PART 3 EXECUTION

#### 3.1 EXAMINATION

A. Verify excavations are to required grade, dry, and not over-excavated.

#### 3.2 PREPARATION

- A. Ream pipe and tube ends. Remove burrs.
- B. Remove scale and dirt, on inside and outside, before assembly.

### 3.3 INSTALLATION - THERMOMETERS AND GAGES

- A. Install thermometers in piping systems in sockets in short couplings. Enlarge pipes smaller than 2-1/2 inches for installation of thermometer sockets. Allow clearance from insulation.
- B. Provide instruments with scale ranges selected according to service with largest appropriate scale.
- C. Install gages and thermometers in locations where they are easily read from normal operating level. Install vertical to 45 degrees off vertical.
- D. Adjust gages and thermometers to final angle, clean windows and lenses, and calibrate to zero.

#### 3.4 INSTALLATION - HANGERS AND SUPPORTS

A. Refer to Section 22 05 29

### 3.5 INSTALLATION - ABOVE GROUND PIPING

- A. For non-metallic pipe, verify nominal pipe size of equivalent pressure drop, flow rate, and velocity.
- B. Install non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- D. Install piping to maintain headroom without interfering with use of space or taking more space than necessary.
- E. Group piping whenever practical at common elevations.
- F. Slope piping and arrange systems to drain at low points.
- G. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Refer to Section 23 05 16.
- H. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings. Refer to Section 22 07 00.
- I. Provide access where valves and fittings are not accessible.
- J. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- K. Provide support for utility meters in accordance with requirements of utility companies.
- L. Prepare exposed, unfinished pipe, fittings, supports, and accessories ready for finish painting. Refer to Division 09.
- M. Install domestic water piping in accordance with ASME B31.9.
- N. Sleeve pipes passing through partitions, walls and floors. Refer to Section 22 05 29.
  - 1. Where piping penetrates floor, ceiling, or wall, close off space between pipe and adjacent work with insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

- 2. For large holes in wall, floor, and ceiling assemblies: Infill, patch, and seal the annular space around pipe penetration. Match materials and finishes of adjacent work.
- O. Install firestopping at fire rated construction perimeters and openings containing penetrating sleeves and piping. Refer to Division 07.
- P. Install unions downstream of valves and at equipment or apparatus connections.
- Q. Install valves with stems upright or horizontal, not inverted.
- R. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.
- S. Install ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- T. Install butterfly valves for throttling, bypass, or manual flow control services.
- U. Provide check valves on discharge of water pumps.
- V. Provide flow controls in water circulating systems as indicated on Drawings.
- W. Install potable water protection devices on plumbing lines where contamination of domestic water may occur; on boiler feed water lines, janitor rooms, fire sprinkler systems, premise isolation, irrigation systems, flush valves, interior and exterior hose bibs.
- X. Pipe relief from valves, back-flow preventers and drains to nearest floor drain.
- Y. Install water hammer arrestors complete with isolation valve.
  - 1. Water hammer arrestor and isolation valve shall be installed in accessible locations.
    - a. Walls and hard ceilings are not considered accessible locations.
  - 2. Refer to Drawings for water hammer arrestor locations.
- Z. Water supply connections to fixtures or equipment which have inlets below the spill line, must be provided with an approved backflow preventer.
- AA. Valves shall be installed permitting the water supply to each individual fixture to be shut off without disrupting any other portion of the building. An accessible control valve shall be installed ahead of each slip joint connection at a plumbing fixture.
- BB. Lead-free: all fittings, valves, and fixtures and accessories that contact potable water shall be lead-free compliant per NSF 61 and NSF 372.
- CC. Where two separate handles control the hot and cold water, the left-handed control of the faucet where facing the fixture fitting outlet shall control the hot water. Faucets and diverter shall be connected to the water distribution system so that hot water corresponds to the left side of the fittings.
- DD. The installation of reduced pressure zone assemblies, double check valve assemblies, pressure vacuum breakers, spill-proof vacuum breakers, reduced pressure detector fire protection assemblies, or double check detector fire protection assemblies is permitted only when a testing and inspection program acceptable to the administrative authority is provided (see Minnesota Rules, chapter 4714, section 603.5.23). The administrative authority and water purveyor must be notified prior to installation. Devices must be tested upon initial installation and not less than annually, and records must be kept. Installations

must be at least 12-inches and not more than 5-feet above finished floor or ground level unless a permanent platform for access is provided.

- EE. Wall hydrants must meet ASSE Standard 1019. Where permitted by the administrative authority, wall hydrants may utilize non-removable ASSE 1052 backflow preventers or non-removable ASSE 1011 vacuum breakers and provision is made to protect from freezing (see Minnesota Rules, Chapter 4714, Sections 603.5.7, 312.6, and 301.1.2).
- FF. Water heaters must be accessible with sufficient clearance for maintenance and repair. Unlisted water heaters must have 12-inches minimum clearance on all sides. (see Minnesota Rules, Chapter 4714, Sections 507.26 and 504.3.2).
- GG. Provide isolation ball valves for all hot and cold water branches off service mains.
- HH. Provide isolation ball valves off of mains or branches to each bathroom group and provide service stops for each plumbing fixture served.
- II. Install water hammer arrestors complete with accessible isolation valves on the hot and cold water piping to bathroom fixture groups.

### 3.6 INSTALLATION – PEX SYSTEMS

A. PEX: Shall be installed by a factory-trained installer in accordance with the manufacturer's installation instructions.

### 3.7 FIELD QUALITY CONTROL

- A. Test domestic water piping system in accordance with local Authority Having Jurisdiction.
- B. PR-R: Test piping system in accordance with the Manufacturer's standard testing procedure.

#### 3.8 CLEANING

- A. Prior to starting work, verify system is complete, flushed, and clean.
- B. Verify pH of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
- C. Inject disinfectant, free chlorine in liquid, powder and tablet or gas form, throughout system to obtain residual from 50 to 80 mg/L.
- D. Bleed water from outlets to obtain distribution and test for disinfectant residual at minimum 15 percent of outlets.
- E. Maintain disinfectant in system for 24 hours.
- F. When final disinfectant residual tests less than 25 mg/L, repeat treatment.
- G. Flush disinfectant from system until residual concentration is equal to incoming water or 1.0 mg/L.
- H. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

#### **END OF SECTION**

# **SECTION 22 13 00**

## **FACILITY SANITARY SEWERAGE**

### PART 1 GENERAL

### 1.1 SUMMARY

- A. Section Includes:
  - 1. Sanitary sewer piping below grade.
  - 2. Sanitary sewer piping above grade.
  - 3. Pipe hangers and supports.
  - 4. Floor drains.
  - 5. Cleanouts.
- B. Related Sections:
  - 1. Section 22 05 29 Hangers and Supports for Plumbing Piping and Equipment: Product requirements for pipe hangers and supports for placement by this section.
  - 2. Section 22 05 53 Identification for Plumbing Piping and Equipment: Product requirements for pipe identification for placement by this section.
  - 3. Section 22 07 00 Plumbing Insulation: Product and execution requirements for pipe insulation.
  - 4. Section 23 05 13 Common Motor Requirements for HVAC Equipment: Product requirements for motors for placement by this section.
  - 5. Section 23 05 48 Vibration and Seismic Controls for HVAC Piping and Equipment: Product requirements for vibration isolators for placement by this section.

#### **1.2 REFERENCES**

- A. American Society of Mechanical Engineers:
  - 1. ASME A112.6.3 Floor Drains and Trench Drains.
  - 2. ASME A112.14.1 Backwater Valves.
  - 3. ASME A112.14.3 Grease Interceptors.
  - 4. ASME A112.14.4 Grease Removal Devices.
  - 5. ASME A112.36.2M Cleanouts.
- B. ASTM International:
  - 1. ASTM A74 Standard Specification for Cast Iron Soil Pipe and Fittings.
  - 2. ASTM A888 Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications.
  - 3. ASTM C1540 Standard Specification for Heavy-Duty Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings.
  - 4. ASTM D2564 Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
  - 5. ASTM D2665 Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings.
  - 6. ASTM D2855 Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.
- C. Cast Iron Soil Pipe Institute:

- 1. CISPI 301 Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications.
- 2. CISPI 310 Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications.

### 1.3 SUBMITTALS

- A. Product Data:
  - 1. Sanitary Drainage Specialties: Submit manufacturers catalog information, component sizes, rough-in requirements, service sizes, and finishes.
  - 2. Pumps: Submit pump type, capacity, certified pump curves showing pump performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable. Include electrical characteristics and connection requirements.

### 1.4 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of equipment and clean-outs.
- B. Operation and Maintenance Data: Submit frequency of treatment required for interceptors. Include, spare parts lists, exploded assembly views for pumps and equipment.

# 1.5 QUALITY ASSURANCE

A. Perform Work in compliance with all applicable codes and standards enforced by the Authority Having Jurisdiction, as well as all applicable laws, ordinances, and regulations.

### 1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

#### **1.8 ENVIRONMENTAL REQUIREMENTS**

A. Do not install underground piping when bedding is wet or frozen.

#### **1.9 FIELD MEASUREMENTS**

A. Verify field measurements prior to fabrication.

#### PART 2 PRODUCTS

#### 2.1 SANITARY SEWER PIPING, BELOW GRADE

- A. Cast Iron Pipe: CISPI 301, ASTM A888, hub-less, service weight.
  - 1. Fittings: Cast iron, CISPI 301.
  - 2. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield assemblies.
- B. Plastic Pipe: ASTM D2665, polyvinyl chloride (PVC) material.
  - 1. Fittings: PVC, ASTM D2665.

2. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.

### 2.2 SANITARY SEWER PIPING, ABOVE GRADE

- A. Cast Iron Pipe: CISPI 301, ASTM A888, hub-less, service weight.
  - 1. Fittings: Cast iron, CISPI 301.
  - 2. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield assemblies.
- B. PVC Pipe: ASTM D2665, polyvinyl chloride (PVC) material.
  - 1. Fittings: ASTM D2665, PVC.
  - 2. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.

#### 2.3 PIPE HANGERS AND SUPPORTS

A. Refer to Section 22 05 29.

### 2.4 FLOOR DRAINS

- A. Manufacturers:
  - 1. Wade.
  - 2. Jay R. Smith Manufacturing Co.
  - 3. Josam Co.
  - 4. MIFAB, Inc.
  - 5. Sioux Chief Manufacturing Co.
  - 6. Watts Water Technologies Co.
  - 7. Zurn Industries, LLC.
- B. Refer to plumbing fixture schedule for additional requirements.
- C. Floor Drain (FD-1): ASME A112.21.1; Cast iron floor drain, two-piece body with double drainage flange and ½" primer tap, WEJLOC<sup>®</sup> invertible flashing collar, weepholes, bottom outlet connection and nikaloy adjustable round super-flo strainer.

#### 2.5 CLEANOUTS

- A. Manufacturers:
  - 1. Jay R. Smith Manufacturing Co.
  - 2. Josam Co.
  - 3. MIFAB, Inc.
  - 4. Sioux Chief Manufacturing Co.
  - 5. Watts Water Technologies Co.
  - 6. Zurn Industries, LLC.
  - 7. Wade.
- B. Exterior Surfaced Areas: Epoxy coated cast iron access housing with anchor flanges and extra heavy-duty ductile iron cover.
- C. Exterior Unsurfaced Areas (Yard Cleanout): PVC threaded tee.
- D. Interior Finished Floor Areas: Epoxy coated cast iron floor cleanout with 5-inch round adjustable gasketed nickel bronze top, stainless steel carpet marker, removable gas tight gasketed brass cleanout plug, and no hub outlet.

- E. Interior Finished Wall Areas: Epoxy coated cast iron floor cleanout with 5-inch round adjustable gasketed heavy-duty stainless steel top, removable gas tight gasketed brass plug, and no hub outlet.
- F. Interior Finished Floor Areas: epoxy coated cast iron floor cleanout with 5-inch x 5-inch square adjustable gasketed heavy-duty stainless steel top, removable gas tight gasketed brass plug, and no hub outlet.
- G. Interior Finished Wall Areas: wall cleanout with two-piece expandable cleanout plug, stainless steel access cover, and vandal proof stainless steel screw.
- H. Interior Unfinished Accessible Areas: Cast iron stack cleanout with threaded brass raised head cleanout plug, and no hub connections.

#### PART 3 EXECUTION

#### 3.1 EXAMINATION

A. Verify excavations are to required grade, dry, and not over-excavated.

## 3.2 PREPARATION

- A. Ream pipe and tube ends. Remove burrs.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.
- D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

#### 3.3 INSTALLATION - HANGERS AND SUPPORTS

A. Refer to Section 22 05 29.

#### 3.4 INSTALLATION - BURIED PIPING SYSTEMS

- A. Verify connection size, location, and invert is as indicated on Drawings.
- B. Establish invert elevations, sloped for drainage to 1/4-inch per foot minimum of buried piping with not less than 5 ft of cover. Maintain gradients.
- C. Establish minimum separation of drainage piping from other services piping in accordance with local code.
- D. Remove scale and dirt on inside of piping before assembly.
- E. Excavate pipe trench in accordance with Division 31.
- F. Install pipe to elevation required to maintain slope.
- G. Place bedding material at trench bottom to provide uniform bedding for piping, level bedding materials in one continuous layer not exceeding 4 inches compacted depth.
- H. Install pipe on prepared bedding.
- I. Route pipe in straight line.

- J. Install trace wire continuous buried 6 inches below finish grade, above pipeline; coordinate with Division 31.
- K. All horizontal branch drains shall be uniformly pitched at ¼-inch per foot.
- L. The building sewer must be installed with a uniform slope of at least ¼-inch per foot. Where municipal sewer depth, structural features, or building arrangement preclude this slope, a slope of 1/8-inch per foot minimum may be utilized if approved by the authority having jurisdiction.
- M. All sinks, except for lavatories and private-use bar sinks, must be provided with 2-inch minimum vertical fixture drains. Laundry tubs, domestic clothes washers, and urinals also require 2-inch minimum vertical drains.
- N. Pipe Cover and Backfilling:
  - 1. Backfill trench in accordance with Division 31.
  - 2. Maintain optimum moisture content of fill material to attain required compaction density.
  - 3. After hydrostatic test, evenly backfill entire trench width by hand placing backfill material and hand tamping in 6 inches compacted layers to 6inches minimum cover over top of jacket. Compact to 95 percent maximum density.
  - 4. Evenly and continuously backfill remaining trench depth in uniform layers with backfill material.
  - 5. Do not use wheeled or tracked vehicles for tamping.

#### 3.5 INSTALLATION - ABOVE GROUND PIPING

- A. Establish invert elevations, slopes for drainage to 1/4 inch per foot minimum. Maintain gradients.
- B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Provide clearances at cleanout for snaking drainage system.
- C. Encase exterior cleanouts in concrete flush with grade.
- D. Install floor cleanouts at elevation to accommodate finished floor.
- E. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- F. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- G. Install piping to maintain headroom. Do not spread piping, conserve space.
- H. Group piping whenever practical at common elevations.
- I. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Refer to Section 23 05 16.
- J. Provide clearance in hangers and from structure and other equipment for installation of insulation. Refer to Section 22 07 00.
- K. Provide access where valves and fittings are not accessible.

- L. Install piping penetrating roofed areas to maintain integrity of roof assembly.
- M. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- N. Prepare exposed, unfinished pipe, fittings, supports, and accessories ready for finish painting. Refer to Division 09.
- O. Install bell and spigot pipe with bell end upstream.
- P. Sleeve pipes passing through partitions, walls, and floors.
  - 1. Where piping penetrates floor, ceiling, or wall, close off space between pipe and adjacent work with insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
  - 2. For large holes in wall, floor, and ceiling assemblies: Infill, patch, and seal the annular space around pipe penetration. Match materials and finishes of adjacent work.
- Q. Install firestopping at fire rated construction perimeters and openings containing penetrating sleeves and piping. Refer to Division 07.
- R. Support cast iron drainage piping at every joint.
- S. Installation standards for ABS and PVC allow the use of offsets, expansion joints, or restraints provided conditions of proper support and movement are met. Accordingly, aboveground horizontal and vertical plastic piping must be installed with restraint fittings or a minimum 24-inch, 45-degree offset every 30 feet.

### 3.6 FIELD QUALITY CONTROL

- A. Cast iron soil pipe and fittings must be marked with their country of origin, the collective trademark of the Cast Iron Soil Pipe Institute, and identification of the original manufacturer in addition to markings required by reference standards (See Minnesota Rules, Chapter 4714, Section 701.0). They shall also be listed by NSF International.
- B. Test sanitary waste and vent piping system in accordance with local Authority Having Jurisdiction.

#### END OF SECTION

# SECTION 22 40 00

### **PLUMBING FIXTURES**

### PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Water closets.
  - 2. Lavatories.
  - 3. Sinks.
  - 4. Showers.
- B. Related Sections:
  - 1. Section 22 11 00 Facility Water Distribution: Supply connections to plumbing fixtures.
  - 2. Section 22 13 00 Facility Sanitary Sewerage: Waste connections to plumbing fixtures.

# 1.2 REFERENCES

- A. American National Standards Institute:
  - 1. ANSI A117.1 Accessible and Usable Buildings and Facilities.
  - 2. ANSI Z124.1 Plastic Bathtub Units.
  - 3. ANSI Z124.2 Plastic Shower Units.
  - 4. ANSI Z358.1 Emergency Eyewash and Shower Equipment.
- B. Air-Conditioning and Refrigeration Institute:
  - 1. ARI 1010 Self-Contained, Mechanically Refrigerated Drinking-Water Coolers.
- C. American Society of Mechanical Engineers:
  - 1. ASME A112.6.1 Floor-Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use.
  - 2. ASME A112.18.1 Plumbing Supply Fittings.
  - 3. ASME A112.19.1 Enameled Cast Iron and Enameled Steel Plumbing Fixtures.
  - 4. ASME A112.19.2 Ceramic Plumbing Fixtures.
  - 5. ASME A112.19.3 Stainless Steel Plumbing Fixtures.
  - 6. ASME A112.19.4 Porcelain Enameled Formed Steel Plumbing Fixtures.
  - 7. ASME A112.19.5 Flush Valves and Spuds for Water Closets, Urinals, and Tanks.
- D. NSF International:
  - 1. NSF 61 Drinking Water System Components Health Effects.
  - 2. NSF 372 Drinking Water Components Lead Content.

#### 1.3 SUBMITTALS

A. Product Data: Submit catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.

#### 1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit fixture, trim, exploded view, and replacement parts lists.

### 1.5 QUALITY ASSURANCE

- A. Perform Work in compliance with all applicable codes and standards enforced by the Authority Having Jurisdiction, as well as all applicable laws, ordinances, and regulations.
- B. Provide products requiring electrical connections listed and classified by testing firm acceptable to Authority Having Jurisdiction as suitable for purpose specified and indicated.
- C. Lead-free: All fittings, valves, fixtures, and accessories that contact potable water shall be lead-free compliant per NSF 61 and NSF 372.

# 1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Accept fixtures on site in factory packaging. Inspect for damage.
- B. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

#### PART 2 PRODUCTS

### 2.1 TANK TYPE WATER CLOSETS

- A. (WC-1) Water Closet, ADA Compliant:
  - 1. Bowl:
    - a. Manufacturers:
      - 1) American Standard Brands.
      - 2) Kohler Co.
      - 3) Mansfield Plumbing.
      - 4) PROFLO.
      - 5) TOTO USA.
    - b. Basis of Design: PROFLO, Model: PF1606PAWH/PF1612PAWH.
    - c. Performance: 1.0 gpf HET, High Efficiency Toilet with Pressure Assist.
    - d. Color: White.
    - e. Construction:
      - 1) Two-piece vitreous china.
      - 2) Floor mount back outlet bowl.
      - 3) Elongated and ADA floor mount back outlet bowl.
      - 4) Equipped with Sloan Flushmate IV System.
      - 5) 2" fully glazed trapway.
      - 6) Siphon Jet Technology.
      - 7) EPA WaterSense Certified.
      - 8) Large 12-1/4" x 9-5/8" water surface.
      - 9) 4" rough-in.
      - 10) Closed coupled tank with cover.

- f. Dimensions:
  - 1) Rim Height: 17 inches (ADA Compliant).
  - 2) Length: 31-1/8 inches.
  - 3) Width: 20-7/8 inches.
- g. Compliance:
  - 1) ASME A112.19.2.
  - 2) ADA compliant.
- 2. Seat:

b.

- a. Manufacturers:
  - 1) Beneke Magnolia (Sanderson).
  - 2) Church (Bemis Manufacturing Co.).
  - 3) Olsonite (Bemis Manufacturing Co.).
  - 4) PROFLO.
  - Basis of Design: PROFLO, Model: PFTSEC2000WH.
- c. Construction:
  - 1) Heavy weight molded solid plastic.
  - 2) Closed front with cover.
  - 3) Molded in color matched bumpers.
  - 4) Patented dampening hinge system.
  - 5) New slide-off hinge for easy cleaning.
  - 6) Corrosion proof nuts and bolts.
  - 7) Slip resistant pads with variable positioning washers.
- d. Compliance:
  - 1) ANSI Z124.5, Class: Commercial Heavy Duty.

# 2.2 FLUSH VALVE WATER CLOSETS

- A. (WC-2) Water Closet, Floor Mount, Flush Valve, ADA Compliant:
  - 1. Bowl:

b.

- a. Manufacturers:
  - 1) American Standard Brands.
  - 2) Kohler Co.
  - 3) Mansfield Plumbing.
  - 4) PROFLO.
  - 5) TOTO USA.
  - Basis of Design: PROFLO, Model: PF1721.
- c. Mounting: Floor mount.
- d. Performance: 1.1 1.6 GPF, maximum (Low Consumption).
- e. Color: White.
- f. Construction:
  - 1) High efficiency, elongated, wall mount toilet flush valve.
  - 2) Vitreous china.
  - 3) Siphon jet flushing.
  - 4) Operates in the range of 1.1 gpf to 1.6 gpf.
  - 5) 7 1/2-inch by 8 1/2-inch water surface area.
  - 6) 1-1/2-inch top inlet spud.

- 7) Uses 20% less water than standard low consumption toilets when used with High Efficiency Flushometer Valve.
- g. Dimensions:
  - 1) Rim Height: 17 inches (ADA Compliant).
  - 2) Length: 25-1/8 inches.
  - 3) Width: 14-1/2 inches.
- h. Compliance:
  - 1) ASME A112.19.2.
  - 2) ADA compliant.
- 2. Flush Valve, Manual Operated:
  - a. Manufacturers:
    - 1) Sloan Valve Co.
    - 2) Zurn Industries, LLC.
  - b. Basis of Design: Sloan, Royal Model 111-1.6.
  - c. Performance:
    - 1) Flow: 1.6 GPF, maximum (low consumption).
  - d. Finish: Chrome-plated.
  - e. Flush Valve Construction:
    - 1) Quiet, Exposed, Diaphragm Type, Chrome Plated Water Closet Flushometer.
    - 2) PERMEX<sup>®</sup> Synthetic Rubber Diaphragm with Dual-Filtered Fixed Bypass.
    - 3) ADA compliant metal oscillating non-hold-open handle with triple seal handle packing.
    - 4) 1" IPS screwdriver Bak-Chek<sup>®</sup> angle stop.
    - 5) Free spinning vandal resistant stop cap.
    - 6) Adjustable Tailpiece.
    - 7) High Back Pressure Vacuum Breaker Flush Connection with One-piece Bottom Hex Coupling Nut.
    - 8) Spud Coupling and Flange for 1 ½" Top Spud.
    - 9) Sweat Solder Adapter with Cover Tube & Cast Wall Flange with Set Screw.
    - 10) High Copper, Low Zinc Brass Castings for Dezincification Resistance.
    - 11) Non-Hold-Open fixed metering bypass and no external volume adjustment to ensure water conservation.
    - 12) Flush Accuracy Controlled by CID<sup>™</sup> Technology.
    - 13) Diaphragm, Stop Seat and Vacuum Breaker molded from PERMEX Rubber Compound for Chloramine Resistance.
  - f. Compliance:
    - 1) ASME A112.19.2
    - 2) ADA compliant.
- 3. Seat:
  - a. Manufacturers:
    - 1) Beneke Magnolia (Sanderson).
    - 2) Church (Bemis Manufacturing Co.).
    - 3) Olsonite (Bemis Manufacturing Co.).
    - 4) PROFLO.
  - b. Basis of Design: PROFLO, Model: PFTSC0F2000WH.
  - c. Construction:

- 1) Style: Elongated, open front less cover.
- 2) Material: Heavy-duty, injection molded solid plastic toilet seat.
- External self-staining check hinge holds seat in any raised position up to 11° beyond vertical.
- 4) 304 Series stainless steel hardware.
- 5) Large, molded in bumpers.
- 6) Slip resistant pads.
- Elongated.
- d. Compliance:
  - 1) ANSI Z124.5, Class: Commercial Heavy Duty

#### 2.3 LAVATORIES

- A. (L-1) Lavatory, Wall Hung, ADA Compliant:
  - 1. Sink:
    - a. Manufacturers:
      - 1) American Standard Brands.
      - 2) Kohler Co.
      - 3) Mansfield Plumbing.
      - 4) PROFLO.
    - b. Basis of Design: PROFLO, Model PF5514WH.
    - c. Mounting: Wall-mounted with hangers.
    - d. Color: White.
    - e. Construction:
      - 1) Wall hung lavatory.
      - 2) ADA compliant.
      - 3) High back splash.
      - 4) Concealed arm carrier connection.
      - 5) Wall mount bracket included.
      - 6) Concealed front overflow.
    - f. Dimensions:
      - 1) Faucet Holes: 4" faucet drillings.
      - 2) Nominal Dimensions: 20" x 18".
    - g. Compliance:
      - 1) ASME A112.19.2.
      - 2) ADA compliant.
  - 2. Faucet:
    - a. Manufacturers:
      - 1) Bradley Corp.
      - 2) Chicago Faucets.
      - 3) Delta Faucet Co.
      - 4) Elkay Manufacturing Co. (Dayton).
      - 5) Moen, Inc.
      - 6) Sloan Valve Company.
      - 7) PROFLO.
    - b. Basis of Design: PROFLO, Model PFWSC3006CP.
    - c. Performance:

- 1) Flow: 1.2 GPM, maximum.
- 2) Rated Operating Pressure: 20 PSI 125 PSI.
- 3) Rating Operating Temperature: 40°F to 140°F
- d. Finish: Chrome-plated.
- e. Construction:
  - 1) Single handle lavatory faucet.
  - 2) Ceramic disc cartridge.
  - 3) Metal handle.
  - 4) With 50/50 pop-up.
  - 5) ADA compliant.
- f. Dimensions:
  - 1) Centers: 3-hole 4" on-center installation.
- g. Compliance:
  - 1) ASME A112.18.1.
  - 2) NSF 61
  - 3) NSF 372 Low-lead compliant.
  - 4) ICC A117.1 ADA compliant.
- 3. Thermostatic Mixing Valve, Point of Use:
  - a. Basis of Design: Leonard, Model: 170A-LF.
  - b. Manufacturers:
    - 1) Lawler Manufacturing Company, Inc.
    - 2) Leonard Valve Company.
    - 3) Zurn Industries, LLC.
  - c. Performance:
    - 1) Mixing Temperature Setpoint: Refer to Drawings.
    - 2) Minimum Flow: 0.25 GPM
    - 3) Maximum Pressure: 125 PSI.
    - 4) Maximum Hot Water Temperature: 200 degrees F.
    - 5) Approach Temperature: 5 degrees F.
    - 6) Temperature Adjustment Range: 90 degrees F to 140 degrees F.
  - d. Finish: Chrome Plated.
  - e. Construction:
    - 1) 3/8" inlets, 3/8" outlet, compression connections.
    - 2) Lead free bronze body.
    - 3) Locked temperature adjustment cap (vandal resistant).
    - 4) Copper encapsulated thermostat assembly with polymer thermoplastic shuttle.
    - 5) Stainless steel springs.
    - 6) Buna-N O-rings.
    - 7) Integral check valves on hot and cold inlets.
  - f. Compliance:
    - 1) ASSE 1070.
    - 2) Low-lead compliant.
- 4. Accessories:
  - a. Wheel handle angle stops.
  - b. Rigid supplies.

- c. Trap and waste insulated and offset to meet ADA compliance.
  - 1) Manufacturers:
    - a) Truebro (IPS Corp.).
    - b) Plumberex Specialty Products Co.
- 5. Wall Mounted Carrier:
  - a. Hanger to be included with sink.
- B. (L-2) Lavatory, Wall Hung, ADA Compliant:
  - 1. Sink:
    - a. Manufacturers:
      - 1) American Standard Brands.
      - 2) Kohler Co.
      - 3) Mansfield Plumbing.
      - 4) PROFLO.
    - b. Basis of Design: PROFLO, Model PF5514WH.
    - c. Mounting: Wall-mounted with hangers.
    - d. Color: White.
    - e. Construction:
      - 1) Wall hung lavatory.
      - 2) ADA compliant.
      - 3) High back splash.
      - 4) Concealed arm carrier connection.
      - 5) Wall mount bracket included.
      - 6) Concealed front overflow.
    - f. Dimensions:
      - 1) Faucet Holes: 4" faucet drillings.
      - 2) Nominal Dimensions: 20" x 18".
    - g. Compliance:
      - 1) ASME A112.19.2.
      - 2) ADA compliant.
  - 2. Faucet:
    - a. Manufacturers:
      - 1) American Standard
      - 2) Bradley Corp.
      - 3) Chicago Faucets.
      - 4) Delta Faucet Co.
      - 5) Elkay Manufacturing Co. (Dayton).
      - 6) Moen, Inc.
      - 7) Sloan Valve Company.
      - 8) PROFLO.
    - b. Basis of Design: Sloan, Model SF2350.
    - c. Performance:
      - 1) Flow: 0.5 GPM, maximum.
      - 2) Rated Operating Pressure: 20 PSI 125 PSI.
      - 3) Rating Operating Temperature: 40°F to 140°F
    - d. Finish: Chrome-plated.

- e. Construction:
  - 1) Touchless.
  - 2) Ceramic disc cartridge.
  - 3) Less pop-up drain.
  - 4) ADA compliant.
- f. Dimensions:
  - 1) Centerset installation.
- g. Compliance:
  - 1) ASME A112.18.1.
  - 2) NSF 61
  - 3) NSF 372 Low-lead compliant.
  - 4) ICC A117.1 ADA compliant.
- 3. Thermostatic Mixing Valve, Point of Use:
  - a. Basis of Design: Leonard, Model: 170A-LF.
  - b. Manufacturers:
    - 1) Lawler Manufacturing Company, Inc.
    - 2) Leonard Valve Company.
    - 3) Zurn Industries, LLC.
  - c. Performance:
    - 1) Mixing Temperature Setpoint: Refer to Drawings.
    - 2) Minimum Flow: 0.25 GPM
    - 3) Maximum Pressure: 125 PSI.
    - 4) Maximum Hot Water Temperature: 200 degrees F.
    - 5) Approach Temperature: 5 degrees F.
    - 6) Temperature Adjustment Range: 90 degrees F to 140 degrees F.
  - d. Finish: Chrome Plated.
  - e. Construction:
    - 1) 3/8" inlets, 3/8" outlet, compression connections.
    - 2) Lead free bronze body.
    - 3) Locked temperature adjustment cap (vandal resistant).
    - 4) Copper encapsulated thermostat assembly with polymer thermoplastic shuttle.
    - 5) Stainless steel springs.
    - 6) Buna-N O-rings.
    - 7) Integral check valves on hot and cold inlets.
  - f. Compliance:
    - 1) ASSE 1070.
    - 2) Low-lead compliant.
- 4. Accessories:
  - a. Wheel handle angle stops.
  - b. Rigid supplies.
  - c. Trap and waste insulated and offset to meet ADA compliance.
    - 1) Manufacturers:
      - a) Truebro (IPS Corp.).
      - b) Plumberex Specialty Products Co.
- 5. Wall Mounted Carrier:

a. Hanger to be included with sink.

# 2.4 SINKS

- A. (KS-1) Sink, Double Bowl, ADA Compliant.
  - 1. Sink:
    - a. Manufacturers:
      - 1) American Standard Brands.
      - 2) Elkay Manufacturing Co.
      - 3) Kohler Co.
      - 4) Mansfield Plumbing.
      - 5) PROFLO.
    - b. Basis of Design: PROFLO, Model: PFSR332263.
    - c. Construction:
      - 1) Stainless steel double bowl sink.
      - 2) Self-rimming.
      - 3) Sink clips included for counter tops up to  $\frac{3}{4}$ " thick.
      - 4) 22 gauge.
      - 5) Drain diameter 3 ½".
      - 6) Minimum cabinet size 36".
      - 7) Under spray coating and pads for sound deadening and insulation.
    - d. Dimensions:
      - 1) Overall Size: 33" x 22" x 6-1/8".
      - 2) Bowl Size: 14" x 15 ¾".
      - 3) Faucet Holes: 3 faucet holes, 1-1/2-inch diameter.
    - e. Compliance:
      - 1) ASME A112.19.3.
  - 2. Trim:
    - a. Basis of Design: PROFLO, Model: PFXC3101CP.
    - b. Manufacturers:
      - 1) Chicago Faucets.
      - 2) Delta Faucet Co.
      - 3) Elkay Manufacturing Co. (Dayton).
      - 4) Moen, Inc.
      - 5) American Standard.
      - 6) PROFLO.
    - c. Performance:
      - 1) Flow: 1.5 GPM, maximum.
    - d. Construction:
      - 1) Single handle kitchen faucet.
      - 2) Ceramic disc cartridge.
      - 3) Metal handle.
      - 4) Without side sprayer.
      - 5) 3-hole sink with 8" on-center installation.
    - e. Compliance:
      - 1) ASME A112.18.1.
      - 2) NSF 61.

- 3) NSF 372 Low-lead compliant.
- 4) ADA Compliant.
- 3. Accessories:
  - a. Wheel handle angle stops.
  - b. Rigid supplies.
  - c. Trap and waste insulated and offset to meet ADA compliance.
    - 1) Manufacturers:
      - a) Truebro (IPS Corp.).
      - b) Plumberex Specialty Products Co.

#### 2.5 SHOWERS

- A. (SH-1) Trim Only ADA Compliant:
  - 1. Manufacturers:
    - a. American Standard Plumbing.
    - b. Bradley Corp.
    - c. Chicago Faucet Co.
    - d. Delta Faucet Co., Commercial Div.
    - e. Kohler Co.
    - f. PROFLO.
    - g. Plumberex Specialty Products.
    - h. Sloan Valve Co.
    - i. Truebro.
  - 2. Basis of Design: See below.
    - a. Square Shower Floor Drain:
      - 1) Basis of Design: Watts, Model: SD.
    - b. Shower Faucet Trim:
      - 1) Basis of Design: Delta, Model: T13H332.
      - 2) Polished chrome plated finish Pressure Balance cartridge Temperature only controlled with handle Field adjustable to limit handle rotation into hot water zone.
      - 3) Integral checks in the cartridge prevent crossflow between hot and cold water inlets.
      - 4) Cartridge rated minimum 1.2 gpm @45 psi.
      - 5) Non-Removable Blue/Red visual cover indicator for cold, mixing and hot handle positions.
      - 6) Standard 24" stainless steel bar with ADA slide handshower and shower diverter valve-backflow protection provided by two integral check valves in handshower.
      - 7) ADA compliant diverter handle.
      - 8) Handheld Max: 1.5 gpm @ 80 psi. Handheld Min: 1.13 gpm @45 psi.
      - 9) Handle#: 2 metal lever handle ADA compliant.
      - 10) #3 Shower Showerhead, Arm and Flange.
      - 11) #3 Shower flow rate Max: 1.5 gpm @ 80 psi.
      - 12) #3 Shower flow rate Min: 1.13 gpm @ 45 psi.
    - c. MultiChoice<sup>®</sup> Universal Rough Valve Body:
      - 1) Basis of Design: Delta, Model: R10700-UNWS.

- 2) Forged brass body.
- 3) Can be tested with air (200 psi) or water (300 psi) without valve using supplied test cap.
- 4) Square plasterguard allows for right angle cuts.
- 5) Thin wall mounting.
- 6) For use with MultiChoice<sup>®</sup> Universal single or dual function trim.
- 7)  $\frac{1}{2}$  outlets and connections.
- 3. Accessories:
  - a. PVC shower floor drain with stainless steel safety grate.
  - b. Grab Bars.
  - c. ADA Compliant Seat.
  - d. Slide Bar.
  - e. Shower Curtain.
- 4. Compliance:
  - a. ASME A112.18.1.
  - b. ASSE 1016.
  - c. NSF 61.
  - d. NSF 372 Low-lead compliant.
  - e. ADA Compliant.

# 2.6 BATH TUB

- A. (BT-1) Bath Tub and Trim ADA Compliant:
  - 1. Manufacturers:
    - a. American Standard Plumbing.
    - b. Kohler Co.
    - c. Plumberex Specialty Products.
  - 2. Basis of Design:
    - a. American Standard Walk-In Bath 3252OD.709.SXX Soaking Tub.
      - 1) 52" L x 32" W x 40" D
      - 2) Floor loading 72 lb/sf.
      - 3) Field-verify left hand or right hand drain configuration.
      - 4) Coordinate color selection with Owner.
    - b. Square Shower Floor Drain:
      - 1) Basis of Design: Watts, Model: SD.
      - Bath Tub Faucet, Drain Waste and Overflow Trim with base product.
  - 3. Accessories:

c.

- a. Handshower Glide Bar
- b. 24" Grab Bar.
- c. ADA Compliant Seat.

# 2.7 LAVATORY INSULATION KIT

A. Product Description: Where Lavatories are noted to be insulated for ADA compliance, furnish the following: Safety Covers conforming to ANSI A177.1 and consisting of insulation kit of molded closed cell vinyl construction, 3/16 inch thick, white color, for insulating tailpiece, P-trap, valves, and supply piping. Furnish with weep hole and angle valve access covers.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Verify walls and floor finishes are prepared and ready for installation of fixtures.
- B. Verify electric power is available and of correct characteristics.
- C. Confirm millwork is constructed with adequate provision for installation of countertop lavatories and sinks.

### 3.2 PREPARATION

A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

#### 3.3 INSTALLATION

- A. Install Work in accordance with all applicable codes and standards enforced by the Authority Having Jurisdiction, as well as all applicable laws, ordinances, and regulations.
- B. Install each fixture with trap, easily removable for servicing and cleaning.
- C. Provide chrome plated rigid or flexible supplies to fixtures with screwdriver stops, reducers, and escutcheons.
- D. Install components level and plumb.
- E. Install and secure fixtures in place with wall supports or wall carriers and bolts.
- F. Seal fixtures to wall and floor surfaces with sealant as specified, color to match fixture.
- G. All flush valves installed shall be by the same manufacturer.
- H. All faucets installed shall be by the same manufacturer.
- I. Fixtures and valves of a given type shall be from a single manufacturer.

#### 3.4 INSTALLATION – WATER CLOSETS

- A. Solidly attach water closets to floor with lag screws. Flashing is not intended hold fixture in place.
- B. For ADA accessible water closets, install flush valve with handle to wide side of stall.

#### 3.5 INTERFACE WITH OTHER PRODUCTS

A. Review millwork shop-drawings. Confirm location and size of fixtures and openings before rough in and installation.

### 3.6 ADJUSTING

A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

#### 3.7 CLEANING

A. Clean plumbing fixtures and equipment.

## 3.8 PROTECTION OF FINISHED WORK

A. Do not permit use of fixtures before final acceptance.

# 3.9 SCHEDULES

- A. Fixture Mounting Heights: Refer to Architectural Drawings and Specifications.
- B. Fixture Rough-In: Refer to Drawings.

## END OF SECTION
# SECTION 23 05 29

### HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

### PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Pipe hangers and supports.
  - 2. Hanger rods.
  - 3. Inserts.
  - 4. Flashing.
  - 5. Equipment curbs.
  - 6. Sleeves.
  - 7. Mechanical sleeve seals.
  - 8. Formed steel channel.
  - 9. Firestopping relating to HVAC work.
  - 10. Firestopping accessories.
  - 11. Equipment bases and supports.
- B. Related Sections:
  - 1. Section 22 05 29 Hangers and Supports for Plumbing Piping and Equipment: Product and execution requirements for hanger and firestopping accessories.
  - 2. Section 23 21 13 Hydronic Piping: Execution requirements for placement of hangers and supports specified by this section.

### 1.2 REFERENCES

- A. American Society of Mechanical Engineers:
  - 1. ASME B31.1 Power Piping.
  - 2. ASME B31.5 Refrigeration Piping and Heat Transfer Components.
  - 3. ASME B31.9 Building Services Piping.
- B. ASTM International:
  - 1. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
  - 2. ASTM E119 Standard Test Method for Fire Tests of Building Construction and Materials.
  - 3. ASTM E814 Standard Test Method of Fire Tests of Penetration Firestop Systems.
  - 4. ASTM F708 Standard Practice for Design and Installation of Rigid Pipe Hangers.
- C. American Welding Society:
  - 1. AWS D1.1/D1.1M Structural Welding Code Steel.
- D. FM Global:
  - 1. FM Approvals Approval Guide.
- E. Manufacturers Standardization Society of the Valve and Fittings Industry:
  - 1. MSS SP-58 Pipe Hangers and Supports Materials, Design Manufacturer, Selection, Application, and Installation.
  - 2. MSS SP-69 Pipe Hangers and Supports Selection and Application.

- 3. MSS SP-89 Pipe Hangers and Supports Fabrication and Installation Practices.
- F. Underwriters Laboratories Inc.:
  - 1. UL 263 Standard for Fire Tests of Building Construction and Materials.
  - 2. UL 723 Standard for Tests for Surface Burning Characteristics of Building Materials.
  - 3. UL 1479 Standard for Fire Tests of Through-Penetration Firestops.
  - 4. UL Directory Certifications Directory Fire–Resistance-Rated Systems and Products.
- G. Intertek Testing Services (Warnock Hersey Mark):
  - 1. WH Directory Warnock Hersey (WH) Mark Directory.

### **1.3 SYSTEM DESCRIPTION**

A. The Mechanical Contractor is responsible for items in this Section.

### 1.4 SUBMITTALS

A. NONE.

## 1.5 QUALITY ASSURANCE

- A. Perform Work in compliance with all applicable codes and standards enforced by the Authority Having Jurisdiction, as well as all applicable laws, ordinances, and regulations.
- B. Perform Work in accordance with AWS D1.1/D1.1M for welding hanger and support attachments to building structure.

## 1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience .

### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site in original factory packaging, labeled with manufacturer's identification.
- B. Protect from weather and construction traffic, dirt, water, chemical, and damage, by storing in original packaging.

### **1.8 FIELD MEASUREMENTS**

A. Verify field measurements prior to fabrication.

### PART 2 PRODUCTS

### 2.1 PIPE HANGERS AND SUPPORTS

- A. Manufacturers:
  - 1. Anvil International (Mueller Water Products, Inc.).
  - 2. Carpenter & Paterson Inc.
  - 3. Creative Systems Inc.
  - 4. Flex-Weld, Inc.
  - 5. Globe Pipe Hanger Products Inc.

- 6. Michigan Hanger Co.
- 7. Superior Valve Co.
- B. Hydronic Piping:
  - 1. Conform to MSS SP-69.
  - 2. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron or carbon steel, adjustable, clevis.
  - 3. Hangers for Cold Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
  - 4. Hangers for Hot Pipe Sizes 2 to 4 inches: Carbon steel, adjustable, clevis.
  - 5. Hangers for Hot Pipe Sizes 6 inches and Larger: Adjustable steel yoke, cast iron roll, double hanger.
  - 6. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
  - 7. Multiple or Trapeze Hangers for Hot Pipe Sizes 6 inches and Larger: Steel channels with welded spacers and hanger rods, cast iron roll.
  - 8. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hooks.
  - 9. Wall Support for Pipe Sizes 4 inches and Larger: Welded steel bracket and wrought steel clamp.
  - 10. Wall Support for Hot Pipe Sizes 6 inches and Larger: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron roll.
  - 11. Vertical Support: Steel riser clamp.
  - 12. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
  - 13. Floor Support for Hot Pipe Sizes 4 Inches and Smaller: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
  - 14. Floor Support for Hot Pipe Sizes 6 inches and Larger: Adjustable cast iron roll and stand, steel screws, and concrete pier or steel support.
  - 15. Copper Pipe Support: Copper-plated, carbon steel ring.
  - 16. Plastic Pipe Support: rubber-lined or felt-lined clamps. Tape-lined on non-clamping hangers.
  - 17. For Exterior and Humid Areas: Furnished hot-dipped galvanized or Type 304 stainless steel or better hangers, support, and hardware.

### 2.2 HANGER RODS

A. Hanger Rods: Mild steel threaded both ends, threaded on one end, or continuous threaded.

### 2.3 INSERTS

A. Refer to Section 22 05 29.

# 2.4 FLASHING

A. Refer to Division 07

### 2.5 EQUIPMENT CURBS

A. Fabrication: Welded 18-gauge galvanized steel shell and base, mitered 3-inch cant, variable step to match roof insulation, factory installed wood nailer.

# 2.6 SLEEVES

A. Sleeves for Pipes Through Non-fire Rated Floors: 18 gage thick or Schedule 40 galvanized steel.

- B. Sleeves for Pipes Through Non-fire Rated Walls: Steel pipe or 18 gage or Schedule 40 thick galvanized steel.
- C. Sleeves for Pipes Through Beams and Footings: Steel pipe or 18 gage or Schedule 40 thick galvanized steel.
- D. Sleeves for Round Ductwork: Galvanized steel.
- E. Sleeves for Rectangular Ductwork: Galvanized steel.
- F. Sealant: Acrylic.

## 2.7 MECHANICAL SLEEVE SEALS

A. Refer to Section 22 05 29.

## 2.8 FORMED STEEL CHANNEL

A. Refer to Section 22 05 29.

## 2.9 FIRESTOPPING

A. Refer to Division 07.

## 2.10 FIRESTOPPING ACCESSORIES

A. Refer to Division 07.

### PART 3 EXECUTION

### 3.1 EXAMINATION

A. Verify openings are ready to receive sleeves.

### 3.2 PREPARATION

- A. Obtain permission from Architect/Engineer before using powder-actuated anchors.
- B. Obtain permission from Architect/Engineer before drilling or cutting structural members.

### 3.3 INSTALLATION - INSERTS

A. Refer to Section 22 05 29 for installation requirements.

### 3.4 INSTALLATION - PIPE HANGERS AND SUPPORTS

- A. Refer to Section 22 05 29 for installation requirements.
- B. Support piping as per Schedule included in this Section.

### 3.5 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

- A. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.
- B. Construct supports of steel members. Brace and fasten with flanges bolted to structure.

## 3.6 INSTALLATION - FLASHING

A. Refer to Division 07.

## 3.7 INSTALLATION - SLEEVES

- A. Where piping penetrates floor, ceiling, or wall, close off space between pipe and adjacent work with insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- B. Refer to Section 22 05 29 for additional installation requirements.

## 3.8 INSTALLATION - FIRESTOPPING

- A. Install firestopping material at fire and smoke-rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, and other items that require firestopping.
- B. Refer to Division 07.

## **3.9 PROTECTION OF FINISHED WORK**

A. Protect adjacent surfaces from damage by material installation.

## 3.10 SCHEDULES

A. Pipe Hanger Spacing:

PIPE MATERIAL	MAXIMUM HORIZONTAL SPACING Feet	MAXIMUM VERTICAL SPACING Feet
ABS pipe	4	10 (note 2)
Aluminum pipe and tubing	10	15
Brass pipe	10	10
Brass tubing, 1-1/4-inch diameter and smaller	6	10
Brass tubing, 1-1/2-inch diameter and larger	10	10
Cast-iron pipe	5 (note 1)	15
Copper or copper-alloy pipe	12	10
Copper or copper-alloy tubing, 1-1/4- inch diameter and smaller	6	10
Copper or copper-alloy tubing, 1-1/2- inch diameter and larger	10	10
CPVC pipe or tubing, 1 inch and smaller	3	10 (note 2)
CPVC pipe or tubing, 1-1/4-inch and larger	4	10 (note 2)
Lead pipe	Continuous	4
PB pipe or tubing	32 inches	4
PEX tubing	32 inches	10 (note 2)

Polypropylene (PP) pipe or tubing, 1 inch or smaller	32 inches (note 3)	10 (note 2)
Polypropylene (PP) pipe or tubing, 1- 1/4-inch or larger	4 (note 3)	10 (note 2)
PVC pipe	4	10
Steel tubing	8	10
Steel pipe	12	15

- B. Note 1: The maximum horizontal spacing of cast-iron pipe hangers shall be increased to 10 feet where 10-foot lengths of pipe are installed.
- C. Note 2: Mid-story guide (sliding point) required.
- D. Note 3: Hanger spacing may be increased per piping manufacturer's installation instructions.

## END OF SECTION

# SECTION 23 07 00

## **HVAC INSULATION**

### PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Piping system insulation.
  - 2. Pipe insulation jackets.
  - 3. Insulation accessories including vapor retarders and accessories.
- B. Related Sections:
  - 1. Section 23 05 29 Hangers and Supports for HVAC Piping and Equipment: Product and Execution requirements for inserts at hanger locations.
  - 2. Section 23 05 53 Identification for HVAC Piping and Equipment: Product requirements for HVAC piping and equipment identification.

### 1.2 REFERENCES

- A. ASTM International:
  - 1. ASTM C547 Standard Specification for Mineral Fiber Pipe Insulation.
  - 2. ASTM C553 Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
  - 3. ASTM C612 Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
  - 4. ASTM C795 Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel.
  - 5. ASTM C1136 Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
  - 6. ASTM E84 Standard for Test for Surface Burning Characteristics of Building Materials.
  - 7. ASTM E96/E96M Standard Test Method for Water Vapor Transmission of Materials.
- B. Sheet Metal and Air Conditioning Contractors' National Association:
  - 1. SMACNA HVAC Duct Construction Standard Metal and Flexible.
- C. National Fire Protection Association (NFPA).
- D. Underwriter's Laboratories (UL).
  - 1. UL 723 Standard for Test for Surface Burning Characteristics of Building Materials.
- E. 2015 MN Commercial Energy Code.

### **1.3 SYSTEM DESCRIPTION**

A. The Mechanical Contractor is responsible for items in this Section.

### 1.4 SUBMITTALS

A. Product Data: Submit product description, thermal characteristics, and list of materials and thickness for each service, and location.

### 1.5 QUALITY ASSURANCE

A. Perform Work in compliance with all applicable codes and standards enforced by the Authority Having Jurisdiction, as well as all applicable laws, ordinances, and regulations.

### 1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Applicator: Company specializing in performing Work of this section with minimum three years documented experience.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.
- B. Protect insulation from weather and construction traffic, dirt, water, chemical, and damage, by storing in original wrapping.

### **1.8 ENVIRONMENTAL REQUIREMENTS**

- A. Install insulation only when ambient temperature and humidity conditions are within range recommended by manufacturer.
- B. Maintain temperature during and after installation for minimum period as recommended by manufacturer.

## **1.9 FIELD MEASUREMENTS**

A. Verify field measurements prior to fabrication.

### PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Armacell, LLC (Armaflex).
- B. Aeroflex USA, Inc.
- C. K-Flex USA.
- D. Johns Manville.
- E. Knauf Insulation.
- F. Owens-Corning.

### 2.2 SURFACE BURNING CHARACTERISTICS

- A. For all insulation and related materials, provide UL Classified products per UL 723 and/or meeting ASTM E84, by a testing agency acceptable to the authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers with appropriate markings of applicable testing agency.
- B. Insulation Installed Indoors: Flame spread index of 25 or less, and smoke developed index of 50 or less.

C. Insulation Installed Outdoors: Flame spread index of 75 or less, and smoke developed index of 150 or less.

## 2.3 PIPE: MAN MADE MINERAL FIBER

- A. Insulation: ASTM C547 Mineral Fiber Pipe Insulation, Type I, 805 degrees F.
- B. Applications on Austenitic stainless steel: Conform to ASTM C795.
- C. Vapor Retarder Jacket:
  - 1. White Kraft paper with glass fiber yarn, bonded to aluminized film.
  - 2. Moisture vapor transmission: ASTM E96/E96M; 0.02 perm-inches.
- D. Vapor Retarder Lap Adhesive:
  - 1. Compatible with insulation.

## PART 3 EXECUTION

## 3.1 EXAMINATION

- A. Verify piping, equipment and ductwork has been tested before applying insulation materials.
- B. Verify surfaces are clean and dry, with foreign material removed.

### 3.2 INSTALLATION - PIPING

- A. Exposed Piping: Locate insulation and cover seams in least visible locations.
- B. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, [pump bodies,] and expansion joints.
- C. Manmade mineral fiber insulated pipes conveying fluids below ambient temperature:
  - 1. Furnish factory-applied or field-applied vapor retarder jackets. Secure factory-applied jackets with pressure sensitive adhesive self-sealing longitudinal laps and butt strips. Secure field-applied jackets with outward clinch expanding staples and seal staple penetrations with vapor retarder mastic.
  - 2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor retarder adhesive or PVC fitting covers.
- D. For hot piping conveying fluids over 140 degrees F, insulate flanges and unions at equipment.
- E. Manmade mineral fiber insulated pipes conveying fluids above ambient temperature:
  - 1. Furnish factory-applied or field-applied standard jackets. Secure with outward clinch expanding staples or pressure sensitive adhesive system on standard factory-applied jacket and butt strips or both.
  - 2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
- F. Inserts and Shields:
  - 1. Application: Piping or Equipment 2 inches diameter or larger.
  - 2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
  - 3. Insert location: Between support shield and piping and under finish jacket.

- 4. Insert configuration: Minimum 6 inches long, of thickness and contour matching adjoining insulation; may be site fabricated or factory fabricated.
- 5. Insert material: Compression resistant insulating material suitable for planned temperature range and service.
- G. Continue insulation through penetrations of building assemblies or portions of assemblies having fire resistance rating of one hour or less. Provide intumescent firestopping when continuing insulation through assembly. Finish at supports, protrusions, and interruptions. Refer to Division 07 for penetrations of assemblies with fire resistance rating greater than one hour.
- H. Exterior Applications: Provide vapor retarder jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor retarder cement. Cover with aluminum jacket with seams located at 3 or 9 o'clock position on side of horizontal piping with overlap facing down to shed water or on bottom side of horizontal equipment.

# 3.3 SCHEDULES

- A. Piping:
  - 1. Heating Systems:
    - a. Heating Water Supply and Return:
      - 1) Man Made Mineral Fiber Insulation:
        - a) Pipe Size Range: All.
        - b) Thickness: Per Pipe Insulation Schedule included in this Section.

SCHEDULE OF MINIMUM PIPE INSULATION THICKNESS (IN INCHES)								
Fluid Design Operating Temp	Nominal Pipe or Tube Size, in.							
Range	<1	1-<1-1/2	1-1/2 - <4	4 - <8	=>8			
Heating Systems (Hot Water)								
>350	4.5	5.0	5.0	5.0	5.0			
251 – 350	3.0	4.0	4.5	4.5	4.5			
201 – 250	2.5	2.5	2.5	3.0	3.0			
141 – 200	1.5	1.5	2.0	2.0	2.0			
105 – 140	1.0	1.0	1.5	1.5	1.5			
<105	0.5	0.5	1.0	1.0	1.0			

### END OF SECTION

# SECTION 23 21 13

## **HYDRONIC PIPING**

### PART 1 GENERAL

### 1.1 SUMMARY

- A. Section Includes:
  - 1. Heating water piping, above ground.
  - 2. Equipment drains and overflows.
  - 3. Unions and flanges.
  - 4. Pipe hangers and supports.
  - 5. Valves.
- B. Related Sections:
  - 1. Section 23 05 29 Hangers and Supports for HVAC Piping and Equipment: Product requirements for pipe hangers and supports, sleeves, [and firestopping] for placement by this section.
  - 2. Section 23 07 00 HVAC Insulation: Product requirements for Piping Insulation for placement by this section.

### **1.2 REFERENCES**

- A. American Society of Mechanical Engineers:
  - 1. ASME B16.18 Cast Copper Alloy Solder Joint Pressure Fittings.
  - 2. ASME B16.22 Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings.
  - 3. ASME B31.1 Power Piping.
  - 4. ASME B31.9 Building Services Piping.
  - 5. ASME BPVC Section IX Boiler and Pressure Vessel Code Welding and Brazing Qualifications.
- B. ASTM International:
  - 1. ASTM A53/A53M Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  - 2. ASTM A234/A234M Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.
  - 3. ASTM A395/A395M Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures.
  - 4. ASTM A536 Standard Specification for Ductile Iron Castings.
  - 5. ASTM B32 Standard Specification for Solder Metal.
  - 6. ASTM B88 Standard Specification for Seamless Copper Water Tube.
  - 8. ASTM D2464 Standard Specification for Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
  - 9. ASTM F2389 Standard Specification for Pressure-rated Polypropylene (PP) Piping Systems.
- C. American Welding Society:
  - 1. AWS D1.1/D1.1M Structural Welding Code Steel.
- D. Manufacturers Standardization Society of the Valve and Fittings Industry:

- 1. MSS SP-67 Butterfly Valves.
- 2. MSS SP-69 Pipe Hangers and Supports Selection and Application.
- 3. MSS SP-110 Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.

### **1.3 SYSTEM DESCRIPTION**

- A. The Mechanical Contractor is responsible for items in this Section.
- B. Pipe sizes indicated on drawings are based on ASTM B88 Type L copper tubing and ASTM A53/A53M, Schedule 40 steel pipe. For non-metallic pipe, contractor to verify nominal pipe size for equivalent pressure drop, flow rate, and velocity.
- C. Where more than one piping system material is specified, provide compatible system components and joints. Use non-conducting dielectric connections whenever jointing dissimilar metals in open systems.
- D. Provide flanges, union, and couplings at locations requiring servicing. Use unions, flanges, and couplings downstream of valves and at equipment or apparatus connections. Do not use direct welded or threaded connections to valves, equipment or other apparatus.
- E. Provide pipe hangers and supports in accordance with MSS SP-69.
- F. Use ball or butterfly valves, as indicated on Drawings, for shut-off and to isolate equipment, part of systems, or vertical risers.
- G. Use globe, ball, or butterfly valves, as indicated on Drawings, for throttling, bypass, or manual flow control services.
- H. Use spring loaded check valves on discharge of hydronic pumps.
- I. Use 3/4 inch ball valves with cap for drains at main shut-off valves, low points of piping, bases of vertical risers, and at equipment. Pipe to nearest floor drain.
- J. Flexible Connectors: Use at or near pumps, compressors, and other motor driven equipment where piping configuration does not absorb vibration. The coupling shall be placed in close proximity to the source of the vibration.

### 1.4 SUBMITTALS

- A. Product Data Polypropylene-Random Piping:
  - 1. Piping: Submit data on pipe materials, fittings, and accessories. Submit manufacturers catalog information.
  - 2. Valves: Submit manufacturers catalog information with valve data and ratings for each service.
  - 3. Hangers and Supports: Submit manufacturers catalog information including load capacity.
- B. Welders' Certificate: Include welders' certification of compliance with ASME BPVC Section IX, AWS D1.1/D1.1M, or equivalent.

### 1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of valves, equipment and accessories.

- B. Operation and Maintenance Data: Submit instructions for installation and changing components, spare parts lists, exploded assembly views.
- C. Pressure Test Report: Submit verification of pressure test report. Include test type, testing pressure, and length of time.
  - 1. PP-R: Provide completed test report for Manufacturer's standard testing procedure.

### **1.6 QUALITY ASSURANCE**

- A. Perform Work in compliance with all applicable codes and standards enforced by the Authority Having Jurisdiction, as well as all applicable laws, ordinances, and regulations.
- B. Perform Work in accordance with ASME B31.9 code for installation of piping systems and ASME BPVC Section IX for welding materials and procedures.
- C. Perform Work in accordance with AWS D1.1/D1.1M for welding hanger and support attachments to building structure.
- D. All casings used for coupling housing, fittings, valve bodies, and specialties shall be datestamped for quality assurance and traceability.

#### 1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Fabricator or Installer: Company specializing in performing Work of this section with minimum three years documented experience.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

#### **1.9 ENVIRONMENTAL REQUIREMENTS**

A. Do not install underground piping when bedding is wet or frozen.

#### **1.10 FIELD MEASUREMENTS**

A. Verify field measurements prior to fabrication.

## 1.11 COORDINATION

A. Coordinate trenching, excavating, bedding, and backfilling of buried piping systems with General Contractor.

## 1.12 WARRANTY

- A. Polypropylene-Random Piping:
  - 1. Furnish ten year manufacturer warranty for piping, fittings, and any incidental damage caused by material failure from manufacturer defect.

- 2. Warranty shall cover labor and material costs of repairing and/or replacing defective materials and repairing any incidental damage caused by failure of the piping system due to defects in materials or workmanship.
- 3. Manufacturer's pressure testing procedure shall be followed to validate the warranty.

# PART 2 PRODUCTS

## 2.1 HEATING WATER AND GLYCOL PIPING, ABOVE GROUND

- A. Steel Pipe: ASTM A53/A53M, Schedule 40, black, cut or rolled grooved ends.
  - 1. Fittings: ASTM A395/A395M and ASTM A536 ductile iron.
    - a. Where cast or wrought pattern is not available, factory-fabricated fittings from ASTM A53/A53M steel pipe may be used. Fittings shall be factory grooved and tested.
  - 2. Joints: Push-fit complying with NSF 61 and ASSE 1061. Crimping tool approved by Manufacturer and local Authority Having Jurisdiction. For pipe sizes 3/8 to 2 inches only.
- B. Copper Tubing: ASTM B88, Type L, hard drawn.
  - 1. Fittings: ASME B16.18, cast brass, or ASME B16.22 solder wrought copper.
  - 2. Joints: Solder, lead free, ASTM B32, 95-5 tin-antimony, or tin and silver, with melting range 430 to 535 degrees F.
- C. Polypropylene-Random (PP-R):
  - 1. Manufacturers:
    - a. Aquatherm.
    - b. Nitron (Nupi Americas, Inc.).
  - 2. Pipe: ASTM F2389, three-layer extrusion, including fiber layer (faser), standard dimension ratio SDR 11.
  - 3. Fittings: ASTM F2389, PP-R.
  - 4. Joints: Fusion-weld, including socket-fusion, elecrofusion, or butt-fusion.
  - 5. Valves: ASTM F2389, PP-R.
  - 6. Smoke and Fire Ratings: Where plenum-rated piping is required, pipe shall be either preinsulated or field insulated. Comply with ASTM E84.
    - a. Flame Spread Classification: Less than 25.
    - b. Smoke Development Rating: Less than 50.
  - 7. UV Protection: Pipe to be exposed to directly sunlight for more than 30 days shall be provided with a Factory applied, UV-resistant coating or alternative UV protection.
  - 8. Integral Thermal and Vapor Barrier: ASTM E84, UV resistant, CFC-free, non-porous, non-fibrous, and resist mold growth.
    - a. Up to 1 inch of required insulation: Factory-installed, thermal and vapor barrier insulation shall be provided.
    - b. Over 1 inch of required insulation: Additional overlap of factory-installed, thermal and vapor barrier insulation shall be provided.
    - c. Thick-wall, self-insulating fittings: Do not required an additional vapor barrier.
    - d. See Section 23 07 00 for insulation requirements.

## 2.2 UNIONS AND FLANGES

- A. Unions for Pipe 2 inches and Smaller:
  - 1. Ferrous Piping: Class 150, malleable iron, threaded.
  - 2. Copper Piping: Class 150, bronze unions with soldered.
  - 3. Dielectric Connections: Dielectric union connections are NOT permitted.
  - 4. PVC Piping: PVC.
  - 5. CPVC Piping: CPVC.
  - 6. PP-R Piping: PP-R
- B. Flanges for Pipe 2-1/2 inches and Larger:
  - 1. Ferrous Piping: Class 150, forged steel, slip-on flanges.
  - 2. Copper Piping: Class 150, slip-on bronze flanges.
  - 3. PVC Piping: PVC flanges.
  - 4. CPVC Piping: CPVC flanges.
  - 5. PP-R Piping: PP-R flanges.
  - 6. Gaskets: 1/16 inch thick preformed neoprene gaskets.
- C. PVC Pipe Materials: For connections to equipment and valves with threaded connections, furnish solvent-weld socket to screwed joint adapters and unions, or ASTM D2464, Schedule 80, threaded, PVC pipe.
- D. Unions or flanges for servicing and disconnect are not required in installations using grooved joint couplings.

### **2.3 DIELECTRIC FITTINGS:**

- A. Dielectric Waterway Connectors:
  - 1. Manufacturers:
    - a. ClearFlow (Elstel Perfection).
    - b. Victaulic.
  - 2. Dissimilar metals shall be separated with a dielectric waterway connector.
  - 3. Material: Electro-zinc-plated steel casing, insert plastic lining, threaded ends.
- B. Dielectric Waterway: Fittings shall be a copper-silicon casting conforming to UNS C87850, and UL classified in accordance with ANSI / NSF-61 for potable water service. Fittings shall have threaded ends, grooved ends, or a combination. Basis of Design: Victaulic Style 647.

### 2.4 BALL VALVES

- A. Manufacturers:
  - 1. Crane Valve, North America.
  - 2. Hammond Valve.
  - 3. Milwaukee Valve Company.
  - 4. NIBCO, Inc.
  - 5. Stockham Valves & Fittings.
- B. 2 inches and Smaller: MSS SP-110, 400 psi WOG, one piece bronze body, chrome plated brass ball, regular port, Teflon seats, blow-out proof stem, solder or threaded ends lever handle.

### 2.5 BUTTERFLY VALVES

A. Manufacturers:

- 1. Crane Valve, North America.
- 2. Hammond Valve.
- 3. Milwaukee Valve Company.
- 4. NIBCO, Inc.
- 5. Stockham Valves & Fittings.
- 6. Victaulic.
- B. 2-1/2 inches and Larger: MSS SP-67, Class 150.
  - 1. Body: Cast or ductile iron, wafer, lug, stainless steel stem, extended neck. Stem shall be offset from the disc centerline to provide complete 360-degree circumferential seating.
  - 2. Disc: Nickel-plated ductile iron.
  - 3. Seat: Resilient replaceable EPDM.
    - a. Pressure responsive for sizes through 12 inches.
  - 4. Handle and Operator: Infinite position lever handle with memory stop.

### 2.6 PIPE HANGERS AND SUPPORTS

A. Refer to Section 23 05 29.

### PART 3 EXECUTION

#### 3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare piping connections to equipment with flanges or unions.
- D. Unions or flanges for servicing and disconnect are not required in installations using grooved joint couplings.
- E. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.
- F. After completion, fill, clean, and treat systems. Refer to Section 23 25 00.

### **3.2 INSTALLATION - PIPE HANGERS AND SUPPORTS**

A. Install pipe hangers and supports in accordance with Section 23 05 29.

### 3.3 INSTALLATION - ABOVE GROUND PIPING SYSTEMS

- A. For non-metallic pipe, verify nominal pipe size for equivalent pressure drop, flow rate, and velocity.
- B. Install heating water piping in accordance with ASME B31.9 (and ASME B31.1 as applicable).
- C. Route piping parallel to building structure and maintain gradient.
- D. Install piping to conserve building space, and not interfere with use of space.
- E. Group piping whenever practical at common elevations.
- F. Sleeve pipe passing through partitions, walls and floors. Refer to Section 23 05 29.

- 1. Where piping penetrates floor, ceiling, or wall, close off space between pipe and adjacent work with insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- 2. For large holes in wall, floor, and ceiling assemblies: Infill, patch, and seal the annular space around pipe penetration. Match materials and finishes of adjacent work.
- G. Install firestopping at fire rated construction perimeters and openings containing penetrating sleeves and piping. Refer to Division 07.
- H. Install pipe identification in accordance with Section 23 05 53.
- I. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Refer to Section 23 05 16.
- J. Provide access where valves and fittings are not exposed. Coordinate size and location of access doors with .
- K. Slope hydronic piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe aligned.
- L. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welds.
- M. Prepare unfinished pipe, fittings, supports, and accessories, ready for finish painting.
- N. Valves: Install with stems upright or horizontal, not inverted.
- O. Insulate piping and equipment; refer to Section 23 07 00.

### 3.4 INSTALLATION – PP-R PIPING JOINTS

- A. Install fittings and joints using socket-fusion, electrofusion, or butt-fusion as applicable for the fitting or joint type. All fusion-weld joints shall be made in accordance with the pipe and fitting manufacturer's specifications and product standards.
- B. Fusion-weld tooling, welding machines, and electrofusion devices shall be as specified by the pipe and fittings manufacturer.
- C. Prior to joining, the pipe and fittings shall be prepared in accordance with ASTM F2389 and the manufacturer's specifications.
- D. Joint preparation, setting and alignment, fusion process, cooling times and working pressure shall be in accordance with the pipe and fitting manufacturer's specifications.

# 3.5 FIELD QUALITY CONTROL

- A. Final System Pressure Test: Test heating water piping system piping system in accordance with ASME B31.9 (and ASME B31.1 as applicable).
  - 1. Test Type: Hydrostatic
  - 2. Minimum Testing Pressure: 1.5 times design pressure. Refer to Drawing Schedules.
  - 3. Maximum Testing Pressure: 100 psig.
- B. PP-R: Test piping system in accordance with the Manufacturer's standard testing procedure.

## END OF SECTION

# SECTION 23 37 00

## AIR OUTLETS AND INLETS

### PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Exhaust and Return Registers and Grilles.
- B. Related Sections:
  - 1. Section 23 33 00 Air Duct Accessories: Volume dampers for inlets and outlets.

#### **1.2 REFERENCES**

- A. Air Movement and Control Association International, Inc.:
  - 1. AMCA 500 Laboratory Methods of Testing Louvers for Rating.
- B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
  - 1. ASHRAE 70 Method of Testing the Performance of Air Outlets and Air Inlets.
- C. Sheet Metal and Air Conditioning Contractors:
  - 1. SMACNA HVAC Duct Construction Standard Metal and Flexible.

# **1.3 SYSTEM DESCRIPTION**

A. The Mechanical Contractor is responsible for items in this Section.

## 1.4 SUBMITTALS

A. Product Data: Submit sizes, finish, and type of mounting. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

### 1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of air outlets and inlets.

### **1.6 QUALITY ASSURANCE**

- A. Perform Work in compliance with all applicable codes and standards enforced by the Authority Having Jurisdiction, as well as all applicable laws, ordinances, and regulations.
- B. Test and rate diffuser, register, and grille performance in accordance with ASHRAE 70.
- C. Test and rate louver performance in accordance with AMCA 500.

### **1.7 QUALIFICATIONS**

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

### PART 2 PRODUCTS

### 2.1 CEILING GRID CORE EXHAUST AND RETURN REGISTERS/GRILLES

- A. Manufacturers:
  - 1. E. H Price Company.

- 2. Krueger.
- 3. Nailor Industries, Inc.
- 4. Titus.
- 5. Tuttle and Bailey.
- B. (Type D) Grille:
  - 1. Type: Fixed grilles of 3/4 x 3/4 inch louvers.
  - 2. Fabrication: Steel with factory finish. Refer to Drawings for color.
  - 3. Frame: 1-1/4 inch margin with countersunk screw mounting.
  - 4. Damper: Integral, gang-operated, opposed-blade type with removable key operator, operable from face.

### 2.2 WALL EXHAUST AND RETURN REGISTERS/GRILLES

- A. Manufacturers:
  - 1. E. H Price Company.
  - 2. Krueger.
  - 3. Nailor Industries, Inc.
  - 4. Titus.
  - 5. Tuttle and Bailey.
- B. Frame: Surface mount type.
- C. Fabrication: Aluminum face with aluminum frame and baked enamel finish.
- D. Accessories: Filter frame for a standard 1-inch filter.

### PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify inlet and outlet locations.
- B. Verify ceiling and wall systems are ready for installation.

### 3.2 INSTALLATION

- A. Install diffusers to ductwork with airtight connection.
- B. Install balancing dampers on duct take-off to diffusers, grilles, and registers, whether or not dampers are furnished as part of diffuser, grille, and register assembly.
- C. Paint visible portion of ductwork behind air outlets and inlets matte black.

### **3.3 INTERFACE WITH OTHER PRODUCTS**

A. Check location of outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.

### **END OF SECTION**

# **SECTION 23 82 16**

# AIR COILS

## PART 1 GENERAL

### 1.1 SUMMARY

- A. Section Includes:
  - 1. Finned tube radiation.
- B. Related Sections:
  - 1. Section 23 07 00 HVAC Insulation: Execution requirements for insulation specified by this section.
  - 2. Section 23 21 13 Hydronic Piping: Execution requirements for connection of chilled water, hot water, and drain piping to units specified by this section.
  - 3. Section 26 05 03 Equipment Wiring Connections: Execution requirements for electric connection to units specified by this section.

## 1.2 REFERENCES

- A. Air-Conditioning, Heating, & Refrigeration Institute:
  - 1. AHRI 440 Performance Rating of Room Fan-Coils.
  - 2. AHRI 840 Standard for Unit Ventilators.
- B. Underwriter Laboratories Inc.:
  - 1. UL 1995 Heating and Cooling Equipment.

### **1.3 SYSTEM DESCRIPTION**

A. The Mechanical Contractor is responsible for items in this Section.

### 1.4 SUBMITTALS

- A. Shop Drawings: Indicate cross sections of cabinets, grilles, bracing and reinforcing, and typical elevations. Indicate schedules of equipment and enclosures typically indicating length and number of pieces of element and enclosure, corner pieces, end caps, cap strips, access doors, pilaster covers
- B. Product Data: Submit coil and frame configurations, dimensions, materials, rows, connections, and rough-in dimensions. Submit mechanical and electrical service locations, capacities and accessories or optional items.

### 1.5 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of components and locations of access doors in radiation cabinets required for access to valves.
- B. Operation and Maintenance Data: Submit manufacturers descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listings.

## 1.6 QUALITY ASSURANCE

A. Perform Work in compliance with all applicable codes and standards enforced by the Authority Having Jurisdiction, as well as all applicable laws, ordinances, and regulations.

## 1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Accept units on site in factory packing. Inspect for damage. Store under roof.
- B. Protect coil fins from crushing and bending by leaving in shipping cases until installation, and by storing indoors. Protect coils from entry of dirt and debris with pipe caps or plugs.

## PART 2 PRODUCTS

## 2.1 FINNED TUBE RADIATION

- A. Manufacturers:
  - 1. Rittling (Zehnder Group).
  - 2. SIGMA Corporation.
  - 3. Sterling Hydronics (Mestec, Inc.).
  - 4. Trane, Inc. (Ingersoll-Rand, Inc.).
  - 5. Vulcan Radiator (Mestec, Inc.).
- B. Heating Elements: Seamless copper tubing, mechanically expanded into evenly spaced aluminum fins, suitable for soldered fittings.
  - 1. Tubing and fin to be sized to meet required capacity per Drawings.
- C. Element Hangers: Quiet operating, ball bearing cradle type providing unrestricted longitudinal movement, on enclosure brackets.
- D. Enclosures: 0.0478 inch thick steel up to 18 inches in height, 0.598 inch steel over 18 inches in height, with easily jointed components. Support rigidly, on wall or floor mounted brackets [at least 3 feet on center maximum].
  - 1. Style: Refer to Drawing Schedules.
- E. Finish: Factory applied baked enamel. Coordinate with Architect for color.
- F. Access Doors: For otherwise inaccessible valves, furnish factory-made permanently hinged access doors, 6 x 7 inch minimum size, integral with cabinet.
- G. Capacity: Refer to Drawings, based on 65 degrees F entering air temperature, 145 degrees F average water temperature.

### PART 3 EXECUTION

### 3.1 EXAMINATION

A. Verify wall construction is ready for installation.

B. Verify concealed blocking and supports are in place and connections are correctly located.

### 3.2 INSTALLATION

- A. Protect coils to prevent damage to fins and flanges. Comb out bent fins.
- B. Install coils level.
- C. Make connections to coils with unions and flanges.
- D. Finned Tube Radiation: Locate on outside walls and run cover wall-to-wall unless otherwise indicated. Center elements under windows. Where multiple windows occur over units, divide element into equal segments centered under each window. Align cabinet joints with window mullions. Install wall angles where units butt against walls.
- E. Protection: Install finished cabinet units with protective covers during remainder of construction.

### 3.3 CLEANING

- A. After construction is completed, including painting, clean exposed surfaces of units. Vacuum clean coils and inside of cabinets.
- B. Touch-up marred or scratched surfaces of factory-finished cabinets, using finish materials furnished by manufacturer.
- C. Install new filters.

### **END OF SECTION**

# **SECTION 26 05 00**

## COMMON WORK RESULTS FOR ELECTRICAL

### PART 1 GENERAL

#### 1.1 SECTION SUMMARY

- A. Section Includes, but not limited to:
  - 1. General Requirements for Electrical
  - 2. Equipment and Materials
  - 3. General Workmanship and Installation Requirements for Electrical.

### **1.2 RELATED SECTIONS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 0 and Division 01 Specification Sections apply to this Section.
- B. Division 26: Electrical
- C. Where a Specification Section refers to other Sections under the Article on Related Sections, this is done for Contractor's convenience only. It shall in no way relieve the Contractor of responsibilities stated in other Sections of the Specifications, even though these Sections are not specifically referenced. The Contractor is responsible for all information contained in this Division's Specifications as well as for information contained in all other Divisions.

### **1.3 REGULATORY REQUIREMENTS**

- A. Meet or exceed all current applicable codes, ordinances and regulations for all installations. Promptly notify the Engineer, in writing, if the contract documents appear to conflict with governing codes and regulations. Contractor assumes all responsibility and costs for correcting non-complying work installed without notifying the Engineer.
- B. Higher quality of workmanship and materials indicated in the Contract Documents takes precedence over that allowed in referenced codes and standards.
- C. Perform all work in compliance with the currently adopted version of the following codes and standards for this project:
  - 1. Energy Codes and Standards:
    - a. International Energy Conservation Code (IECC)
    - b. Illuminating Engineering Society of North America (IESNA)
    - c. American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE 90.1)
  - 2. International Code Council:
    - a. International Building Code (IBC)
    - b. International Fire Code (IFC)
  - 3. National Fire Protection Association Codes and Standards:
    - a. NFPA 70 National Electrical Code
    - b. NFPA 72 Fire Alarm Code
    - c. NFPA 101 Life Safety Code
  - 4. National Electrical Safety Code (ANSI C2)

- 5. City, State and Local Building Codes and Ordinances
- 6. City, State and Local Fire Codes and Regulations
- 7. Occupational Safety and Health Administration Regulations (OSHA)
- 8. Americans with Disabilities Act (ADA)
- 9. Uniform Federal Accessibility Standards
- 10. State Department of Health Codes and Regulations
- 11. Elevator Code
- 12. Testing Agencies:
  - a. Underwriters Laboratory
  - b. Intertek ETL

# 1.4 REFERENCES

- A. Use the latest edition of the standard or the edition required by governing code where referenced in the specifications by the following abbreviations:
  - 1. ANSI American National Standards Institute:
    - a. C2 National Electrical Safety Code.
    - b. C62.41-IEEE Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits.
  - 2. ASHRAE American Society of Heating, Refrigerating and Air-Conditioning Engineers
  - 3. CBM Certified Ballast Manufacturer
  - 4. EPA-Environmental Protection Agency
  - 5. ETL Electrical Testing Laboratory
  - 6. ICEA Insulated Cable Engineers Association:
    - a. S-95-658 Thermoplastic-Insulated Wire and Cable.
    - b. S-65-375 Rubber-Insulated Wire and Cable.
  - 7. IEEE Institute of Electrical and Electronic Engineers:
    - a. 112 Standard Test Procedure for Polyphase Induction Motors and Generators.
    - b. 519 Recommended Practices and Requirements for Harmonic Control In Electric Power Systems.
  - 8. IES Illuminating Engineering Society
  - 9. LPI Lightning Protection Institute:
    - a. LPI175 Lightning Protection System Installation Standard.
  - 10. NBFU National Board of Fire Underwriters
  - 11. NECA National Electrical Contractor's Association:
    - a. NECA 1 Standard Practices for Good Workmanship In Electrical Contracting.
  - 12. NEC National Electrical Code
  - 13. NECA National Electrical Contractors Association:
    - a. NECA 101 Standard for Installing Steel Conduit (Rigid, IMC, EMT)
    - b. NECA 102 Standard for Installing Aluminum Rigid Metal Conduit.
    - c. NECA 111 Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC).
  - 14. NEMA National Electrical Manufacturers Association:
    - a. TC 2 Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
    - b. MG 1 Motors and Generators.
    - c. PB 2 Deadfront Distribution Switchboards.
    - d. ICS 2 Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2,000 Volts AC or 750 Volts DC.

- e. 250 Enclosures for Electrical Equipment (1,000 Volts Maximum).
- f. WC 5 (See ICEA S-95-658).
- g. WC 7 (See ICEA S-95-658).
- 15. NESC National Electric Safety Code
- 16. NFPA National Fire Protection Association
- 17. OSHA Occupational Safety and Health Administration:
  - a. 29 CFR 1910 Occupational Safety and Health Standards.
- 18. UL Underwriters' Laboratories, Inc.:
  - a. UL-6 Rigid Metal Conduit.
  - b. UL-83 Thermoplastic Insulated Wires and Cables.
  - c. UL-96 Lightning Protection Components.
  - d. UL-360 Liquid-Tight Flexible Steel Conduit.
  - e. UL-467 Electrical Grounding and Bonding Equipment.
  - f. UL 486D Insulated Wire Connector Systems for Underground Use or In Damp or Wet Locations.
  - g. UL-508 Industrial Control Equipment.
  - h. UL-651 Schedule 40 and 80 Rigid PVC Conduit.
  - i. UL-797 Electrical Metallic Tubing.
  - j. UL-810 Capacitors.
  - k. UL-891 Dead-Front Switchboards.
  - I. UL-913 Intrinsically Safe Apparatus and Associated Apparatus for Use In Class I, II, and III, Division 1, Hazardous (Classified) Locations.
  - m. UL-935 Fluorescent-Lamp Ballasts.
  - n. UL-1008 Transfer Switch Equipment.
  - o. UL-1012 Power Units Other Than Class 2.
  - p. UL-1029 High-Intensity-Discharge Lamp Ballasts.
  - q. UL-1277 Electrical Power and Control Tray Cables With Optional Optical Fiber Members
  - r. UL-1449 Surge Protection Devices
  - s. UL-1479 Fire Tests of Through-Penetration Firestops.
  - t. UL-1572 High Intensity Discharge Lighting Fixtures.

# 1.5 **DEFINITIONS**

- A. The terms defined below apply to all work included in Division 26.
  - The work The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.
  - 2. Furnish to obtain in new condition ready for installation into the work.
  - 3. Install to store, set in place, connect and place into operation into the work.
  - 4. Provide to furnish and install.
  - 5. Connect to bring service to the equipment and make final attachment including necessary switches, outlets, boxes, terminations, etc.
  - 6. Conduit includes in addition to conduit, all fittings, pull boxes, hangers and other supports and accessories related to such conduit.

- 7. Concealed hidden from sight in chases, furred spaces, shafts, hung ceilings, embedded in construction, in crawl spaces or buried.
- 8. Exposed: not installed underground nor concealed as defined above.
- 9. Building structure or building structural members consists of steel columns, steel beams, steel joists (top chord and at panel points), concrete walls and concrete block walls. Metal decking, joist bridging and bottom chords of bar joists shall not be construed as building structure nor as a building structural member for the purpose of support.
- B. The drawing and specifications constitute the Contract Documents. Any item noted in the specification or shown on the drawings is included in the Contract Documents.
- C. All electrical details and drawings are diagrammatic, unless specifically noted. Field-verify all dimensions and notify the Engineer of any conflicts of discrepancies, in writing, prior to installation.

# **1.6 QUALITY ASSURANCE**

- A. Regulatory Requirements:
  - 1. Initiate, maintain and supervise all safety precautions required with this work in accordance with the regulations of the Occupational Safety and Health Administration (OSHA) and other governing agencies.
- B. Environmental Requirements:
  - 1. Do not remove or disturb any asbestos containing materials from the project. Immediately stop work and notify the Owner if asbestos containing materials are suspected.
  - 2. Do not dispose of any PCB containing materials. Disposal of all PCB containing materials will be the responsibility of the Owner.
- C. Provide new, first quality material for all products specified. Do not reuse materials unless indicated or approved by the Engineer.
- D. Contractor shall have knowledge of latest edition of NFPA 70 (NEC) and additional governing codes. In addition to the work shown in the Contract Documents, Contractor shall provide all work to comply with these references. Additional services will not be awarded for Contractor to perform work to satisfy the AHJ inspection comments. All work is to be included in Base Bid.
- E. Provide equipment specified in this section that has been listed and labeled by a nationally recognized testing laboratory.
- F. Comply with ANSI as applicable to equipment specified in this section.
- G. Comply with NEMA as applicable to equipment specified in this section.

# **1.7 PROJECT/SITE CONDITIONS**

- A. Site Inspections:
  - 1. Before submitting a proposal on the work contemplated, examine the site of the proposed work and become thoroughly familiar with existing conditions and limitations. No extra compensation will be allowed because of misunderstanding as to the amount of work involved nor bidders lack of knowledge of existing conditions which could have been discovered or reasonably anticipated prior to bidding.

- 2. Conduits, pipes, ducts, lights, devices, speakers, etc., shown on the drawings as existing have been based on existing plans and casual site observations, and may not be installed as originally shown. It is the Contractor's responsibility to visit the site and make exact determination of the existence, location and condition of such facilities prior to submitting a bid.
- B. Correlation of Work:
  - Consult the drawings and specifications of all other Divisions for correlating information and lay out work so that it will coordinate with other trades. Verify dimensions and conditions (i.e., finished ceiling heights, footing and foundation elevations, beam depths, etc.) with the Architectural and Structural drawings. Notify the Architect/Engineer of any conflicts that cannot be resolved, in the field, by affected trades. Replacement of work due to lack of coordination and failure to verify existing conditions will be completed at no cost to the Owner.
  - 2. Install all conduit, cable tray, busduct, equipment, etc. allowing proper code and maintenance clearances and to avoid blocking passageways and access panels.
  - 3. Where work must be replaced due to the failure of the Contractor to verify the conditions existing on the job, such replacement must be accomplished at no cost to the Owner. This applies to shop fabricated work as well as to work fabricated in place.
  - 4. Throughout the course of the work, minor changes and adjustments to the installation may be requested by the Engineer. The Contractor shall make adjustments without additional cost to the Owner, where such adjustments are necessary to the proper installation and operation within the intent of the Contract Documents. This does not include work already completed.
  - 5. Obtain exact location of connection to equipment, furnished by others, from the person furnishing the equipment.
  - 6. Include the better quality, greater quantity or higher cost for an item or arrangement where a disagreement exists in the drawings and specifications.
- C. The Contract Documents shall govern in the instances where requirements indicated are greater than those stated in the governing codes and standards.

# 1.8 FIRESTOPPING

- A. Provide firestopping around all new penetrations, sleeves and openings through all partitions, walls and floors.
- B. Provide UL listed components installed by a certified and factory trained personnel.

# 1.9 SEQUENCING AND SCHEDULING

A. Refer to General Conditions and Requirements.

# 1.10 EQUIPMENT INSTRUCTIONS AND PARTS LITERATURE

A. Instruction and parts literature are generally packed with electrical equipment and devices. Contractor shall remove this literature from the packing container or equipment enclosure, identify the literature with the equipment to which it applies, and file the literature in loose-leaf binders with index tabs. Each binder shall have an index which lists each piece of equipment and the literature which applies to it. An index tab shall be provided for each piece of equipment.

B. Contractor shall establish a procedure with the other trades for receiving, identifying, and filing literature for devices which are removed from their packaging and installed by other trades.

## 1.11 SUBMITTALS

- A. Submit the following items consistent with Division 0 and Division 1. Refer to each Section under Division 26 for additional submittal requirements particular to that Section.
- B. Prior Approvals:
  - 1. Submit approval form for each request for prior approval.
  - 2. Submittals shall be formally presented to the Architect.
  - 3. Submittals presented to the Engineer prior to approval of Architect will not be reviewed or accepted.
  - 4. Submit hard copy, bound, written requests to use unspecified items, to the Engineer, no later than ten (10) calendar days prior to the bid opening. Submit detailed information for proposed material or equipment specific to the project, clearly indicating all options included in the submittal.
  - 5. Accepted substitutions will be incorporated in an Addendum to the Contract Documents.
  - 6. Contractor is responsible for dimensional differences, electrical requirements and any other resulting changes, when using accepted substitutions. Contractor is responsible for any additional costs incurred as a result of substitutions, including other contractors and Architect/Engineer fees.
  - 7. Material and equipment not specified or accepted in an Addendum will be removed and replaced at no cost or inconvenience to the Owner.
- C. Work Scope Change:
  - 1. If a work scope change is requested and Contractor would like to be awarded additional compensation or a deduct from original contract is requested, Contractor shall provide a schedule of values for all associated proposed work.
    - a. Pricing shall be grouped to represent each itemized work scope change.
    - b. Each piece of equipment shall be itemized, along with cost of item. Labor to install said item shall be presented on a separate line item.
    - c. Provide a final lump sum number for all work associated with the change and individual pricing for each item on the schedule of values.
    - d. Engineer may request additional breakdown for improved clarity and Contractor must comply prior approval for the additional compensation or credit.
    - e. Comply with the requirements set forth in Division 0 and Division 1.
  - Contractor shall provide actual manufacturer and distributer invoices showing cost of work affected by the work scope change upon request of Engineer and/or Owner representative.
  - 3. Contractor is solely responsible for delay's in schedule where Contractor is required to resubmit documentation, revise requested documentation or provide additional information associated to gaining approval for the work scope change.
- D. Shop Drawings and Manufacturer's Information:

- 1. Submit in accordance with the Division 0 and Division 1. Unless noted otherwise, submit drawings to the Engineer for review within 30 calendar days after award of Contract.
- 2. Provide separately-bound documents for each submittal for each section. Combination submittals will be returned to the Contractor without review and count as 1 submittal. Do not combine submittals from multiple sections.
- 3. Include project name, name of Architect, name of Engineer, contractor, sub-contractor, manufacturer, supplier and sales representative, include name, address, and phone number for the sales representative. Clearly identify section number and description of equipment submitted. Shop drawings not including all of this information will be returned without review and count as 1 submittal.
- 4. Examine all shop drawings noting capacity, arrangement and physical dimensions. Clearly mark all relevant items on catalog data and cross-out unrelated information.
- 5. Submittals for equipment provided by the Electrical Contractor shall bear a stamp or specific written certification from the Electrical Contractor, certifying the submittals have been reviewed and approved by the submitting Electrical Contractor.
- 6. Provide the following shop drawing and manufacturer information:
  - a. Product Data Sheets:
    - 1) Product and component data sheets which describe all equipment and devices to be provided.
    - 2) Include all features specified.
    - 3) Provide dimensioned prints with weights.
    - 4) Highlight or otherwise accentuate on each data sheet the specified product features and product numbers.
    - 5) Features or part numbers which do not apply shall be struck through, crossed out, blacked out, or otherwise identified as not applicable.
  - b. Composite Drawing:
    - 1) Include power and control wiring for all systems and equipment.
    - 2) Show basic systems on composite drawing.
    - 3) Use terminal numbers on drawings and schematics.
    - 4) Use separate drawings to show details of sub-systems.
    - 5) Identify sub-system drawing interface points on composite drawing and subsystem drawings; terminal numbers of interface points shall be the same on both drawings.
    - 6) Revise or redraw manufacturer's standard drawings to meet above requirements.
  - c. Record all Changes to Existing Systems:
    - Revise all wiring diagrams and schematic diagrams to show final installation:
      a) Includes all new and existing equipment diagrams.
  - d. Programmable Systems:
    - Description of programmable system operation, including but not limited to input/output functions, control capabilities, configuration procedures, starting setpoints, etc.
    - 2) Preliminary graphic screens and reports.a) This submittal shall occur prior to shipment of the system.
  - e. Manufacturers Installation Instructions:
    - 1) Include with shipment.

- 7. If the Engineer rejects (Make corrections noted/Submit corrected copy, Rejected/Submit specified item) two (2) times for material under the same section the Engineer will be compensated for the additional reviews. Compensation will be incorporated by Change Order and deducted from the Contractor's application for payment. Contractor is solely responsible for any project delays caused by having to resubmit submittals.
- E. Operating and Maintenance Manuals:
  - 1. Include all the information provided with the approved shop drawings and manufacturer's information.
    - a. Update and complete control system drawings and descriptions for all equipment.
    - b. All documentation shall include modifications made which reflect the final installation.
    - c. Provide all completed testing reports.
  - 2. Date the manuals with the day, month, and year they are provided to the Owner/Engineer.
  - 3. Provide manufacturers' user manuals and installation instructions.
  - 4. Provide 3 hard (paper) copies in a 3-ring binder. Provide a table of contents and each piece of equipment or sub-system shall be tabbed.
  - 5. Provide 2 digital copies in a PDF format saved to a compact disk or USB drive. The saved files shall be clearly identified and organized in a similar manner to the hard copies
    - a. Data saved on the disks shall be accessible and neatly organized.
    - b. Provide a table of contents which utilizes bookmarks and links. The links shall take the reader to a specific page when the reader clicks on the desired title in the table of contents. A link shall be provided for materials associated with each piece of equipment included in the O&M manual.
  - 6. Record all Changes to Existing Systems
  - 7. Insert revised documents into the Owner's existing operation and maintenance manuals in place of original documents, if such O&M's exist.
- F. Record Documents:
  - 1. Provide three sets of hard copy record documents and two digital pdf copy. Record Drawings shall be of the same size as the original published contract drawings.
  - 2. Shall be provided with the O&M's.
  - 3. Record drawings shall include all work scope changes, including addenda.
  - 4. Record drawings shall show locations of all above ceiling control devices, such as relays, contacts, control modules, monitor modules, power packs, fire/smoke detection equipment, etc.
  - 5. Refer to Division 0 and Division 1 for additional Record Drawing requirements.

# PART 2 PRODUCTS

# 2.1 EQUIPMENT AND MATERIALS

- A. All electrical and control equipment and materials shall be provided as specified in the Contract Documents.
- B. All equipment and materials shall be new and shall bear the Underwriters Laboratories (UL) label if such products are listed by UL.

C. Where applicable, equipment and materials shall conform to ANSI, ICEA, IEEE, and NEMA Standards.

## PART 3 EXECUTION

### 3.1 CONSTRUCTION LIGHTING & POWER SYSTEM - REMODELING

- A. Provide construction power and lighting that adheres to the NEC Article 590 "Temporary Installations"
- B. Refer to Division 1 for temporary electrical services.
- C. For remodeling work in the existing building, use existing building distribution systems for construction power.
- D. Replace all receptacles, switched, coverplates, etc., damaged by any Contractor during the course of construction.
- E. Materials furnished for the temporary light and power system remain Contractors property. Remove when there is no longer any need for temporary light and power or when directed by the Architect.
- F. Electrical energy costs shall be paid by the Owner.

## 3.2 PREPARATION

- A. Continuity of Service:
  - 1. No Division 26 systems are to remain inactive at the end of the workday. Assure that the systems are all operational at the end of each workday. Coordinate temporary outages with the Owner.
  - 2. Coordinate/schedule all work with the Owner to minimize any disruptions. Confine all interruptions to the smallest possible area. Provide temporary connections if required to provide continuity of service.
  - 3. Inspect all areas affected by the interruptions and return all automatically controlled equipment, electrically operated equipment to the same operating condition prior to the interruption.
- B. Use of Facility:
  - 1. Do not disturb normal use of the facility, except within the immediate construction area. Keep walks, driveways, entrances, etc. free and clear of equipment, material and debris.
  - 2. Store all equipment and material in a place and manner that minimizes congestion and is approved by the Owner.

### 3.3 INSTALLATION

- A. Material and Workmanship
  - 1. Provide new material and equipment, unless noted otherwise. Protect equipment and material from damage, dirt and the weather.
  - 2. Provide the highest quality workmanship and perform all work only by skilled mechanics. Install material and equipment in accordance with manufacturers' recommendations, instructions and current NECA standards.

- 3. The Engineer reserves the right to reject material or workmanship not in accordance with the specifications, before or after installation.
- 4. Engineer and Owner have the right to determine if equipment, boxes and covers are not accessible. Where electrical work is determined to be not accessible, Contractor shall modify the work as directed at no additional cost to the Owner.
- B. Cutting and Patching:
  - 1. Perform all cutting and patching necessary to work, unless specifically delegated to be performed under a different Division.
  - 2. Obtain special permission from the Engineer before cutting structural members or finished material.
  - 3. Perform all patching in a manner as to leave no visible trace and return the area affected to the condition of undisturbed work. Perform all patching by workers experienced, skilled, and licensed for the particular type of work involved. Inferior work will not be accepted.
  - 4. Patch all holes left as a result of demolition of electrical equipment and devices.
  - 5. Drill all holes in masonry with rotary drill. Impact tools are not allowed. Core drill all holes in masonry and concrete for electrical raceway. Provide and dispose of all water required for core drilling. Coordinate with other trades to prevent damage from water.
  - 6. Prevent the spread of dust, debris, and other material into adjacent areas.
  - 7. Replace all ceiling tiles damaged during installation of work, with new tile.
- C. Coordination:
  - 1. Coordinate the location of all outlets and associated equipment with architectural and mechanical systems before installation. Work which must be replaced due to the failure of the Contractor to verify the job conditions and coordinate with other disciplines shall be completed at no additional cost to the Owner.
  - 2. Coordinate all door swings in the field before locating devices.
  - 3. Coordinate all equipment dimensions before submitting equipment. This includes all shop fabricated work as well as work fabricated in place. It shall be assumed that equipment submitted has been coordinated by Contractor and the submission indicates Contractor verifies equipment will fit in allocated location space. If Contractor believes there is or finds a workspace issue, Contractor shall notify Engineer prior to submitting equipment. Replacement or modification of equipment and/or space due to lack of coordination and failure to verify existing conditions shall be completed by Contractor at no additional cost to the Owner.
  - 4. Contractor shall be responsible for obtaining exact location of connection to equipment furnished by others, from the person furnishing the equipment.
  - 5. Contractor is responsible for coordinating elevator equipment ratings with the elevator equipment supplier. Incorrect equipment installation due to failure to coordinate equipment ratings shall be replaced by Contractor at no additional cost to Owner.
  - 6. If conduit, wiring or equipment cannot be installed as specified, including but not limited to installing concealed or in designed space, Contractor shall notify Engineer with ample time to review the request before Contractor purchases and/or installs such equipment. Owner and Engineer can not be held responsible for delays in project for Contractor failure to provide ample notice to review and respond to the potential issue.

## 3.4 FIRESTOPPING

- A. Provide firestopping around all new penetrations, sleeves and openings through all partitions, walls and floors.
- B. Install firestopping on both sides of each partition, completely filling the void around the opening.
- C. Firestopping of interior of conduits and sleeves is by the contractor providing the cabling inside the conduit or sleeve.

## 3.5 ELECTRIC FIRE AND SMOKE DAMPERS

- A. Division 26 Contractor shall provide power to all smoke, fire, smoke/fire dampers which are rated for 120V AC or greater.
- B. Wiring for fire alarm and other life safety monitoring and alarm shall be provided under Division 28.
- C. Contractor is responsible for coordinating locations and requirements of the electric dampers with the equipment provider and the Mechanical Contract Documents. Not all dampers may be indicated in the Electrical Contract Documents.

## 3.6 RECEIVING AND STORING EQUIPMENT

- A. All equipment shall be handled and stored in accordance with the manufacturer's instructions.
- B. In general, equipment packaging is not designed to protect the contents for outdoor storage. As a minimum, Contractor shall store the equipment prior to installation in a clean, dry location free from excessive temperatures, humidity, or foreign materials normally encountered at a Site. If the storage facility is unheated, Contractor shall provide heating to protect equipment from condensation, which could cause components to corrode or to be otherwise damaged.

### 3.7 EQUIPMENT MOUNTING

A. Unless noted otherwise, equipment which is not free-standing shall not be mounted on wood panels, but shall be attached to concrete or masonry walls, support channels, or building structural steel.

### 3.8 FIELD QUALITY CONTROL

- A. Refer to Division 0 and Division 1 for additional requirements.
- B. Final Observation:
  - A final inspection of the electrical systems will be required before the Contract can be closed out. Request a final inspection by the Engineer after all systems are fully completed and operational. The Engineer will schedule an observation and generate a list of items to be corrected or completed before Contract Closeout. If the Contractor notifies the Engineer the work is ready for final observation, final evaluation of control systems, or commissioning exercise by the Contractor, and the Engineer finds the work is not complete enough to perform that observation, the Contractor will compensate the Engineer for his time. The Contractor will then perform the necessary work to complete the project and again request a Final Observation.

## 3.9 CLEAN UP

- A. Keep the premises free from accumulation of waste material or rubbish, caused by his employees or work, at all times. Remove rubbish, tools, scaffolding, and surplus materials from and about the building, and leave work areas "broom clean" or its equivalent upon completion of the work. Clean electrical equipment and remove temporary identification. In case of dispute the Owner will remove the rubbish and charge the cost to the Contractor.
- B. After tests have been made and accepted clean light fixtures, panels and other equipment installed by the Contractor, leaving the entire work area in a clean and complete working order.

### 3.10 PROTECTION

- A. Cover openings and equipment, where set, to prevent obstruction to conduits, breakage, misuse, or disfigurement of equipment. Cover openings in equipment immediately upon uncrating or receipt at the job site and keep covered until permanent connection is made.
- B. Contractor is responsible for any damage to electrical equipment or materials until final acceptance of the entire project by the Owner. Keep all equipment clean materials until final acceptance of the entire project by the Owner.
- C. If a portion of the project is to be occupied by the Owner prior to Substantial Completion of the entire project make arrangements with the Owner to transfer responsibilities for protection and housekeeping.

### **END OF SECTION**

# **SECTION 26 05 10**

## **SELECTIVE ELECTRICAL DEMOLITION**

#### PART 1 GENERAL

#### 1.1 SUMMARY

A. This Section includes all labor, material, equipment and services necessary and incidental to complete all the selective and or complete demolition and removal of electrical systems in the areas of remodeling or affected by remodeling, and the rework and extension of electrical systems indirectly affected by electrical system served "downstream" from the demolished electrical systems.

#### 1.2 REFERENCES

A. Sections 26 05 00 and all references contained therein form a part of this Section of the Specifications.

#### PART 2 PRODUCTS

## 2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work: As specified in individual Sections.

#### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Demolition Drawings are diagrammatic and based on casual field observation and existing record documents. Report discrepancies to Architect/Engineer before disturbing existing installation.
- B. Examine the building to determine actual conditions and extent of work prior to bidding the project. Refer any unclear details or conflicts to the Architect/Engineer for clarification prior to bidding the drawings.
- C. Refer to Mechanical, Plumbing and Architectural documents for additional demolition requirements which may be required to include in the bid.
- D. Verify that field measurements and circuiting arrangements are as shown on Drawings.
- E. Verify that abandoned wiring and equipment serve only abandoned facilities.
- F. Beginning of demolition means installer accepts existing conditions.

### 3.2 PREPARATION

- A. Coordinate phasing of the demolition work with the construction sequence schedule.
- B. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.
- C. Coordinate utility service outages with Utility Company.
- D. Identify and provide new supporting means for existing electrical equipment such as low voltage cabling, conduits, boxes, pull boxes, conduit bodies, and conduit racks that will need

additional support due to the demolition of the existing supports. This includes existing systems which are identified to require supports and become exposed when ceilings are removed.

- E. Contractor shall provide new supports for all existing electrical conduit, cabling, fixtures and devices which is not supported per the requirements of the NEC and becomes uncovered due to removal of ceilings or walls.
- F. Erect, and maintain temporary safeguards, including warning signs and lights and barricades for protection of the public, Owner, Contractor's employees, and existing improvements to remain.
- G. Provide temporary emergency lighting and illuminated exit signage as required by the Building Official or AHJ.
- H. Electrical Service:
  - 1. Maintain existing system throughout construction in service until new system is complete and ready for service.
  - 2. Disable system only to make switchovers and connections. Notify and obtain permission from Owner, Architect/Engineer at least 24 hours before partially or disabling system. Minimize outage duration.
  - 3. Make temporary connections to maintain service in areas adjacent to work area.
- I. Coordinate and sequence demolition so as not to cause shutdown of operation of surrounding areas.
- J. Conduct demolition to minimize interference with adjacent and occupied building areas.
- K. Perform noisy work before or after the Owner's working hours to minimum disruption.
- L. Contractor assumes responsibility if damage occurs to any and all devices to be reinstalled. If Contractor finds a damaged piece of equipment prior to demolition, Contractor shall note the equipment and notify the Owner's Representative and Engineer prior to removing the items. If Contractor does not provide the proper notification, Contractor will be held responsible for repairing or replacing the damaged equipment.

### 3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Owner reserves the right of first refusal to obtain material shown to be removed under this contract. Items not retained by the Owner become the property of the Contractor and must be removed from the premises and disposed at no additional costs to the Owner.
- B. Demolish electrical systems in walls, floors, and ceilings identified to be demolished.
- C. Demolish and extend existing electrical work under and this Section or as indicated on the Drawings. Remove devices, conduit, wire, boxes, and fastening devices to avoid any interference with new installation.
- D. Demolish and remove all electrical systems indicated for demolition. No portion of these systems may be abandoned in place.
- E. Remove, relocate, and extend existing installations to accommodate new construction or to maintain systems downstream from demolished area.
- F. Provide supports for all existing electrical equipment that was supported previously by demolished walls, floors, ceiling or other structures. Provide new supports from structural members not slated for demolition, prior to any demolition.
- G. Remove abandoned wiring to source of supply.
- H. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit in walls, floors, or columns back to a point where patching can be adequately performed and patch surfaces.
- I. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets which are not removed.
- J. Disconnect and remove abandoned panelboards and distribution equipment.
- K. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- L. Disconnect and remove abandoned luminaries. Remove brackets, stems, hangers, and other accessories.
- M. Repair adjacent construction and finishes damaged during demolition and extension work.
- N. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.
- O. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified. Relocate and reroute conduit and wiring as required for conduit concealed in walls or structure being altered as part of the remodeling. Maintain continuity to all devices in and downstream of remodeled work.
- P. Reroute existing raceway and wiring which is exposed due to removal of existing construction. Conceal new raceway and wiring and maintain operation.
- Q. If conductors are required to be removed from existing raceways, install with new conductors.
- R. Dispose of fluorescent lamps, ballasts, and other hazardous materials in accordance with State and Federal regulations.
- S. Seal all holes and openings left in smoke, sound or fire rated walls, ceilings, or floors. Completely fill with intumescent type fire rated barrier.
- T. When ceilings are to be removed and ceiling devices such as luminaires, receptacles, WAP's, fire alarm equipment, security equipment, and others is indicated to be removed and reinstalled, Contractor shall remove and store the equipment offsite until the project has advanced enough and the equipment can be reinstalled. The Contractor may elect to temporarily support the devices in place, however Contractor must coordinate this with all disciplines and Contractor is responsible for removing and/or relocating the equipment as needed during the course of work.

#### 3.4 EXISTING PANELBOARDS

- A. Identify circuits in existing panel affected by the Work. Where additional circuits are needed, reuse circuits available for reuse. Reuse breakers if possible. Provide new breakers for new equipment unless breakers are specifically noted on the plans to be reused.
- B. Tag unused circuits as spare and turn breakers and/or switches off.
- C. Where existing circuits are indicated to be reused, use sensing measuring devices to verify circuits feeding project area is not in use.
- D. Remove existing wire no longer in use from panel to equipment.
- E. Where existing panelboards are indicated to be demolished, extend any remaining live circuits to the nearest suitable panelboard.
- F. Clean out debris, dust and dirt from existing panelboards which are modified under this project.
- G. Provide updated panelboard schedules at the end of every work shift. Temporary panel schedules may be hand written and posted on or near the panelboard.
- H. Provide new updated machine typed directories in every panelboard modified under this project prior to substantial completion.

#### 3.5 CLEANING AND REPAIR

- A. Prior to reinstallation of used equipment, thoroughly inspect each item and report any defects to the Engineer/Architect in writing. Instructions for corrective measures will be given at the time and the Contract amount adjusted accordingly. If no defects are reported, the material will be included under the contractor's one year guarantee.
- B. Equipment: Clean exposed surfaces and interior. Check tightness of electrical connections.
- C. Luminaries:
  - 1. Where existing luminaries are indicated to be re-used, remove existing luminaries for cleaning. Use mild detergent to clean all exterior and interior surfaces; rinse with clean water and wipe dry.
  - 2. Replace ballasts, lamp holders or other parts which become damaged due to work during the construction period.
  - 3. Provide new lamps.
- D. Repair adjacent construction and finishes damaged during demolition and extension work.

#### 3.6 INSTALLATION

A. Install relocated materials and equipment as indicated on the drawings.

# SECTION 26 05 19

# 600 VOLT CONDUCTORS AND CABLES

#### PART 1 GENERAL

### 1.1 SUMMARY

- A. Section Includes, but not limited to:
  - 1. Wire
  - 2. Metal Clad (MC) Cable
  - 3. Nonmettalic (NM) Sheathed Cable
  - 4. Terminals and connectors
  - 5. Installation
  - 6. Splices, Taps, and Terminations
  - 7. Identification

# 1.2 REFERENCES

- A. Section 26 05 00: Common Work Results for Electrical
- B. Section 26 08 00: Testing and Adjustments to Electrical Systems

### 1.3 SUBMITTALS

A. Submit shop drawings and descriptive data in accordance with Section 26 05 00.

### PART 2 PRODUCTS

### 2.1 WIRE

- A. All wire and cable shall be:
  - 1. New and coiled or on reels.
  - 2. Each coil and/or reel shall have a label with the manufacturer's name, trade name of wire, size of wire, and UL label.
- B. Provide conductors with 90°C insulation system, 600 volt rating, U.L. approved and listed for specific application.
- C. Feeder and Branch Circuit Wire:
  - 1. Stranded conductor, unless noted otherwise.
    - a. Solid copper conductors shall be used for lighting and convenience receptacle circuits.
  - 2. THWN insulated for conductor sizes #4 AWG and smaller.
  - 3. XHHW or THWN insulation for conductor sizes #3 AWG and larger.
- D. Provide minimum No. 12 AWG conductor size, unless noted otherwise.
  - 1. Where noted conductors used for control to/from field devices may be less than 12AWG in size providing the following requirements are met:
    - a. Unless otherwise specified elsewhere in these specifications, control wiring shall be not less than No. 14 AWG.
    - b. Control wiring shall be sized such that the voltage drop under in-rush conditions does not adversely affect operation of the controls.

E. All conductors shall be copper; aluminum conductors will not be allowed.

### 2.2 METAL CLAD (MC) CABLE

- A. Provide MC cable only where specifically allowed.
- B. Provide UL Listed cable, rated for 600 volts and 90°C.
- C. Provide factory assembly of one or more conductors enclosed in a metallic sheath that consists of a continuous flexible corrugated aluminum interlocked armor.
- D. Separate equipment grounding conductor.
- E. Each conductor shall be separately insulated in the cable, including ground wire(s).

# 2.3 NONMETALLIC (NM) SHEATHED CABLE

- A. Provide NM cable only where specifically allowed per NEC, and as allowed by the Authority Having Jurisdiction, and NFPA 220-2006.
- B. Provide UL Listed cable, rated for 600 volts and 90°C.
- C. Provide factory assembly of one or more conductors enclosed in a nonmetallic sheath.

# 2.4 WIRE COLOR CODING

- A. Contractor may use color coding at his discretion, except for the following colors, which shall be used only as designated below for both power and control circuits.
  - 1. Control Circuits
    - a. Dark Blue Direct current circuits.
    - b. Light Blue Intrinsically safe conductors.
    - c. Green Grounding conductor.
    - d. White Neutral conductor.
  - 2. Power Circuits

	120/240V	208Y/120V	480Y/277V
Phase A	Black	Black	Brown
Phase B	Red	Red	Orange
Phase C		Blue	Yellow
Neutral	White	White	Gray
Ground	Green	Green	Green

- 3. Use solid colors through Size No. 8 AWG.
- 4. Use black conductors with tape color identification No. 6 AWG and larger.

### 2.5 TERMINALS AND CONNECTORS

- A. Tool compressed terminals and connectors shall be made of 1 piece seamless highly conductive copper with a uniform tin-plate coating to minimize corrosion.
- B. Step-down adapters shall be copper compression type.
- C. Electrical spring connectors:

- 1. Solderless, screw-on, reusable pressure cable type, with integral insulation, approved for application used.
- 2. The integral insulator shall have a skirt to completely cover the stripped conductors.
- D. Electrical push-in connectors:
  - 1. Nylon/PC housing material.
  - 2. Copper contacts with tin plating.
  - 3. Rated for 221 degree F.
  - 4. 2,3 or 4 port as needed per circuit. Do not provide unused ports.
  - 5. Sized per wire gauge.
  - 6. To be used with wire gauge 12 and smaller.
  - 7. UL Listed.
- E. Fork Terminals:
  - 1. Vinyl or nylon self-insulated locking type.
  - 2. Terminal insulation that supports wire insulation.
  - 3. Manufacturer:
    - a. Thomas & Betts Type FL
    - b. Burndy Type TP-LF
    - c. Panduit Type PNF
    - d. 3M Type MNG.
- F. Electrical Tape:
  - 1. UL Listed.
  - 2. Weather resistant.
  - 3. Moisture resistant vinyl.
  - 4. Rated for the voltage system which it is applied.
  - 5. Temperature rating suitable for the application on which it is applied.
- G. Motor Connection Kit:
  - 1. UL Listed.
  - 2. Qualified to ANSI standards.
  - 3. Rated to withstand 1000V.
  - 4. For use on in-line or stub motor lead splices.
  - 5. Resistant to abrasion.
  - 6. Installed per manufacturer's recommendations.
- H. Underground Splices for No. 10 AWG and Smaller:
  - 1. Solderless, screw-on, reusable pressure cable type, with integral insulation. Listed for wet locations, and approved for copper and aluminum conductors.
  - 2. The integral insulator shall have a skirt to completely cover the stripped conductors.
  - 3. The number, size, and combination of conductors used with the connector, as listed on the manufacturer's packaging, shall be strictly followed.
- I. Underground Splices for No. 8 AWG and Larger:
  - 1. Mechanical type, of high conductivity and corrosion-resistant material. Listed for wet locations, and approved for copper and aluminum conductors.

- 2. Insulate with materials approved for the particular use, location, voltage, and temperature. Insulation level shall be not less than the insulation level of the conductors being joined.
- 3. Splice and insulation shall be product of the same manufacturer.

# 2.6 CONDUCTOR PULLING COMPOUND

- A. Rated for use with the conductor insulation and conduit material.
- B. Non-conductive.
- C. Non-cementing.
- D. Dry to a fine lubricating powder or a thin film which does not harden in conduit.
- E. UL Listed.
- F. Rated for repeated exposure to high heat or freezing temperatures.

# PART 3 EXECUTION

### 3.1 WIRE INSTALLATION

- A. Install conductors in accordance with the NEC, as specified, and as shown on the drawings.
- B. Install all conductors in a continuous raceway system, except for NM type cable.
- C. Splice conductors only in outlet boxes, junction boxes, pullboxes, manholes, or handholes.
- D. Pulling compound shall be approved by the cable manufacturer.
- E. Conductors of different systems (e.g., 120 V and 277 V) shall not be installed in the same raceway.
- F. Examine all wire before installation. Do not use any wire with insulation that is damaged in any way.
- G. Do not pull wire into the conduit until the conduit system is complete. Pull all conductors into raceway at the same time.
- H. Adequate measures shall be employed to determine that the raceways are free of foreign material and moisture before pulling wire or cable.
- I. Test all cable and wire for continuity and for shorts prior to energizing any circuits.
- J. Conductors shall extend at least 3" past the point of the cover on any junction or pull box installed.
- K. For connections to motors, transformers, and vibrating equipment, stranded conductors shall be used only from the last fixed point of connection to the motors, transformers, or vibrating equipment.
- L. Conductors shall be without splice from termination to termination, unless indicated otherwise on the Drawings.
- M. Provide an equipment grounding conductor with each circuit.

- N. The use of a shared neutral on multiwire branch circuits will not be allowed. Each circuit shall be provided with it's own neutral conductor(s), unless noted otherwise in the Contract Documents.
- O. Contractor shall provide conductors of the appropriate rating and quantity for each circuit.
  - 1. Voltage Drop Calculations:
    - a. Wire shall be sized for a voltage drop no greater than 2% measured for circuits used to feed panelboard, distribution panels, switchboards and service equipment.
    - b. Wire shall be sized for a voltage drop no greater than 3% measured from the feeder panelboard or switchgear to it's point of load termination.
    - c. Contractor shall provide documentation of voltage drop calculations upon request of Engineer or Owner.
  - 2. Where multiple conductors are used in a shared raceway, conductor ratings shall be derated per the NEC.
  - 3. Where conductors sizes are specified in the Contract Documents, these sizes are based on copper conductors.

# 3.2 SPLICES, TAPS AND TERMINATIONS

- A. Splices to feeders and service entrance conductors are not permitted unless specifically noted on the plans.
- B. Electrical spring connectors shall be used for splices and taps in lighting and 120-volt receptacle circuits and motor leads #10AWG or smaller.
- C. Use pressure or compression type connectors for all splices or taps in copper conductors.
- D. Do not splice conductors of dissimilar metals together.

### 3.3 METAL CLAD (MC) CABLE INSTALLATION

- A. MC cable will only be allowed in the applications specifically as follows in this paragraph:
  - 1. Individual cable drops from a junction box to light fixtures.
    - a. Direct fixture to fixture connections are not allowed.
    - b. Maximum length of cable is a 6' connection to a light fixture.
  - Individual cable drop to ceiling mounted equipment, such as receptacles or ceiling fans.
     a. Maximum length of cable is a 4'.
  - 3. Receptacle circuit cabling concealed in walls.
- B. Where MC cable is allowed to be used as specified above, the following restriction on MC cable use shall be observed. These restriction are in addition to the requirements found in the NEC:
  - 1. Home run to panel shall consist of approved conduit and wire. (Unless otherwise noted).
  - 2. When permitted, secure MC cable "Home Runs" at panel by approved cable clamps and horizontal uni-strut for support.
  - 3. Do not install MC cable in block, brick walls, and in or under concrete slabs.
  - 4. Do not install MC cable within or supported from a communications cable tray/ladder.
  - 5. Do not use MC cable in areas where cable would be exposed.
  - 6. Provide MC cable only above lay-in grid ceilings.
  - 7. Route MC cable parallel and perpendicular to building structure.

8. All other wiring and cableing for systems shall be provided in a conduit system, unless noted otherwise in the Contract Documents.

# 3.4 NON-METALLIC SHEATHED (NM) SHEATHED CABLE INSTALLATION

- A. Type NM cable may be used as allowed by the NEC and the Authority Having Jurisdiction (AHJ). The Contractor shall be responsible for coordinating these requirements with the AHJ prior to bid and installation of such materials.
- B. Cables shall be concealed with-in walls, floors, or ceilings that provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire rated assemblies per NFPA.

# 3.5 IDENTIFICATION

- A. Control circuits may be color-coded using available colors, except gray and green. They shall be identified at each terminal at the respective control panel with a label. Imprinted labels shall be protected by a heat shrinkable sleeve.
- B. Each control circuit shall be identified at both ends with the same number; wire number shall be the same as the wire number shown on the Contractor's Equipment Drawings. Spare conductors shall also be identified.

# SECTION 26 05 26

# **GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS**

# PART 1 GENERAL

#### 1.1 SECTION INCLUDES

A. Equipment grounding

#### PART 2 EQUIPMENT

#### 2.1 GROUNDING CONNECTORS

- A. Clamps and pressure connectors.
  - 1. Clamps for connection to piping and conduit:
    - a. Approved Manufacturer:
      - 1) OZ Gedney type ABG
      - 2) Burndy "Hyground"
      - 3) Thomas & Betts "Blackburn" Series.
  - 2. Clamps for connection to enclosures and buswork:
    - a. Approved Manufacturer:
      - 1) OZ Gedney type KGM
      - 2) Burndy "Hyground"
      - 3) Thomas & Betts "Blackburn" Series.
  - 3. Bar taps for connection to bus bars which are UL listed (UL-467).
    - a. Approved Manufacturer:
      - 1) OZ Gedney type KGM
      - 2) Burndy "Hyground"
      - 3) Thomas & Betts "Blackburn" Series.
- B. Welded connections using non-reversable exothermic process:
  - 1. Approved Manufacturer:
    - a. Cadweld
    - b. Thermoweld.

#### PART 3 EXECUTION

#### 3.1 INSTALLATION

- A. Raceways provided for grounding electrode conductors shall be rigid nonmetallic.
- B. Conductor shall be connected to the equipment ground bus or to the enclosure if there is no ground bus.
- C. Separately derived systems shall be grounded in accordance with NFPA 70.
- D. The grounding bushings on conduits entering distribution equipment, shall be connected to the ground bus in accordance with the requirements of NFPA 70.
- E. All conductors used for grounding electrode bonding, equipotential bonding and between wall mounted grounding busses shall be copper.

# 3.2 EQUIPMENT GROUND

- A. Solidly ground all conduit systems, switch boxes, cabinets, motor frames, switchgear, transformers, and all other permanently installed equipment to form a continuous, permanent and effective grounding system. Bond expansion joints and metal raceway sections.
- B. An equipment grounding conductor shall be installed with each conduit run or cable, includes but not limited to feeder circuits, motor circuits, lighting circuits, and control circuits.

### 3.3 BONDING

A. Bond all systems per the NEC including raceway, cable tray, enclosures, metal piping systems, structural metal, etc..

### 3.4 SPECIAL REQUIREMENTS

A. Contractor shall determine if there are any other special grounding requirements for equipment furnished on this Project and shall provide grounding as recommended by the manufacturer.

#### 3.5 SPLICES AND TERMINATIONS

- A. In general, splices and terminations of the grounding electrode system shall be brazed, shall be exothermic welded, or shall be made with tool-compressed fittings.
- B. Connections to bus bars or equipment enclosures shall be made with tool-compressed lugs which are bolted to the equipment or with bar taps.
- C. Provide a #1/0 AWG (minimum) grounding conductor from each ground bar to electrical service grounding electrode.
- D. Connections to ground rods shall be exothermic welded. Provide adapter sleeves as required for #6 AWG conductors or smaller.
- E. Connections to copper water piping shall be made with ground clamps.

# SECTION 26 05 29

# SUPPORTING DEVICES

#### PART 1 GENERAL

#### 1.1 SECTION SUMMARY

- A. Manufactured Supporting Devices.
- B. Fabricated Supporting Devices.
- C. Installation.

### **1.2 DESCRIPTION OF WORK**

- A. Types of supports, anchors, sleeves and seals specified in this section include the following:
  - 1. Clevis hangers
  - 2. Riser clamps
  - 3. C-clamps
  - 4. I-beam clamps
  - 5. One-hole conduit straps
  - 6. Two-hole conduit straps
  - 7. Round steel rods
  - 8. Expansion anchors
  - 9. Toggle bolts
  - 10. Wall and floor seals
- B. Supports, anchors and sleeves furnished as part of factory-fabricated equipment, are specified as part of equipment assembly in other Division 26 sections.

### **1.3 QUALITY ASSURANCE**

- A. Provide supporting devices, of types, sizes, and ratings required that are manufactured by firms regularly engaged in the manufacture of such devices.
- B. Comply with NEC as applicable to construction and installation of electrical supporting devices.
- C. Comply with applicable requirements of ANSI/NEMA std Pub No. FB 1, "Fittings and Supports for Conduit and Cable Assemblies".
- D. Comply with National Electrical Contractors Association's "Standard of Installation" pertaining to anchors, fasteners, hangers, supports and equipment mounting.
- E. Provide electrical components which are UL-listed and labeled.

### PART 2 PRODUCTS

### 2.1 MANUFACTURED SUPPORTING DEVICES

A. Provide supporting devices; complying with manufacturer's standard materials, design and construction in accordance with published product information, and as required for a

complete installation; and as herein specified. Where more than one type of device meets indicated requirements, selection is Installers' option.

- B. Provide supports and anchors constructed of stainless steel, PVC or equivalent corrosion resistant material in chemical storage rooms.
- C. Structural flat surfaces:
  - Caddy snap close clamp with z shot-fire bracket; mechanical fastener appropriate for deck type; spring steel, snap close conduit opening, static load of 100lbs or greater;
     a. Conduit Sizes: ½" 1"
  - 2. Caddy bolt close clamp with z shot-fire bracket; mechanical fastener appropriate for deck type; spring steel, conduit strap with threaded openings and hex-head bolt, static load of 100lbs or greater;
    - a. Conduit Sizes: ½" 1"
  - One-hole conduit straps for supporting metal conduit; galvanized steel:
     a. Conduit sizes: ½" & ¾"
  - 4. Two-hole conduit straps for supporting metal conduit; galvanized steel:a. Conduit sizes: 1" and larger.
- D. Beam flange:
  - 1. Caddy clip for supporting conduit to beam flanges; spring steel, snap close conduit opening, static load of 75lbs or greater;
    - a. Conduit sizes: 1/2" & 3/4"
  - 2. Beam Clamp; steel; mechanical bolt fastener to beam; conduit strap with threaded holes and hex-head bolt.
    - a. Conduit sizes: 1/2" 2"
  - 3. Right angle conduit clamp: cast iron hot dipped galvanized; U-bolt with treaded ends and hex-head nuts.
    - a. Conduit sizes: 2" 4"
  - 4. One-hole conduit straps for supporting metal conduit; galvanized steel:
    a. Conduit sizes: ½" & ¾"
  - Two-hole conduit straps for supporting metal conduit; galvanized steel:
     a. Conduit sizes: 1" and larger.
- E. Rod Type Hangers:
  - 1. Clevis type hangers; galvanized steel; with diameter hole for round steel rod.
  - 2. Rods galvanized steel; hexagon nuts on both ends of rod:
    - a. Conduit size 1/2"-1.5" : Minimum rod size 3/8".
    - b. Conduit size 2" to 3.5": Minimum rod size 1/2".
    - c. Conduit size 4"-5": Minimum rod size 5/8".
  - 3. C-clamps for supporting rods to beam flanges; mechanical bolt fastener.
- F. Provide anchors of types, sizes and materials indicated; and having the following construction features:
  - 1. Expansion Anchors: 1/2".
  - 2. Toggle Bolts: Springhead; 3/16" x 4".
- G. Provide sleeves and seals, of types, sizes, and material indicated; having the following construction features:

- 1. Provide Schedule 40 galvanized steel pipe sleeves 1 1/2" larger than O.D. of pipe.
- 2. Set all sleeves true to line, grade and position and plumb or level after concrete is poured. Correct any deviation from proper position.
- 3. Provide minimum of three (3) concrete anchors for Schedule 40 pipe sleeves.
- 4. Provide factory-assembled wall and floor seals. Provide watertight seals around conduit, pipe, or tubing passing through concrete below grad floors and wall. Construct with steel sleeves, malleable iron body, neoprene sealing grommets and rings, metal pressure rings, pressure clamps, and cap screws.
- 5. Caulk spaces between pipe and floor sleeves inside the building with a waterproof caulking material. Caulk spaces between pipe and exterior partition sleeves with glass fiber insulation.
- 6. Furnish sealable penetration pockets compatible with the building roofing system where conduits pass through the roof. Turn pockets over to the General Contractor.
- 7. Provide fire barriers around conduit, pipe, tubing, bus ducts and cables passing through smoke and fire rated floors and walls. Provide CP 25, 303 and PSS7904 Series by 3M, or "Flame-Safe" system by Thomas and Betts Corp for fire seals.
- 8. Subject to compliance with requirements, provide water-tight seals.
- H. Provide channel strut system for supporting electrical equipment, 16-gage hot dip galvanized steel, or types and sizes indicated; construct with 9/16" dia. holes, 8" o.c. on top surface, with standard green finish, and with the following fittings which mate and match with channel provided:
  - 1. Fixture hangers
  - 2. Channel hangers
  - 3. End caps
  - 4. Beam Clamps
  - 5. Wiring stud
  - 6. Thinwall conduit clamps
  - 7. Rigid conduit clamps
  - 8. Conduit hangers
  - 9. U-bolts

# 2.2 FABRICATED SUPPORTING DEVICES:

- A. Provide sleeves of one of the following:
  - 1. Sheet-metal fabricated from galvanized sheet metal; round tube closed with snaplock joint, welded spiral seams, or welded longitudinal joint. Fabricate from the following gages: 3" and smaller, 20 gage; 4" to 6", 16 gage; over 6", 14 gage. Sheet metal sleeves shall not be used for cable.
  - 2. Steel-Pipe fabricated from Schedule 40 galvanized steel pipe; remove burrs.
  - 3. Iron-Pipe fabricated from cast-iron or ductile-iron pipe; remove burrs.
- B. Provide fire barrier sleeve seals for sleeves located in floor and firewalls. Provide approved fire barrier material.

# PART 3 EXECUTION

# 3.1 INSTALLATION OF SUPPORTING DEVICES

- A. Install hanger, anchors and sleeves in accordance with manufacturer's written instructions and with recognized industry practices to ensure supporting devices comply with requirements of NECA, NEC and ANSI/NEMA. Extend sleeves 3/4" above floor surface.
- B. Coordinate with other electrical work, including raceway and wiring work, as necessary to interface installation of supporting devices with other work.
- C. Install hangers, supports, clamps and attachments to support piping properly from building structure. Support suspended conduit runs threaded rod and galvanized conduit hangers. Attach the hanger rod to concrete structural members with malleable iron inserts, to existing or precast concrete structural members with self-drilling anchors, to structural steel with steel "C" clamps, and to wood with suitable sized lag screws and angles. Support multiple parallel conduit runs on trapeze hangers constructed of steel rod hangers and structural channel. Include three (3) nuts jam-locked, on all threaded rod hangers, to rigidly support the conduit. Install supports with maximum spacings indicated.
- D. Support surface mounted conduit runs with galvanized pipe straps. Fasten pipe straps to masonry surfaces with self-drilling anchors or toggle bolts. Fasten pipe straps to wood or sheetmetal surfaces with pan head sheetmetal screws.
- E. Support wall mounted electrical equipment on 3/4" thick C-D exterior fir plywood painted with two (2) coats of ASA-49 gray enamel.
- F. Provide stainless steel screws where electrical equipment is mounted on or attached to fire treated plywood. Hold equipment away from the plywood with either plastic or stainless steel washers or spacers.
- G. Support all ceiling mounted receptacles with a listed tile bridge spanning the suspended ceiling grid, plus a 1/4" threaded rod anchored to a structurally sound member directly above the outlet box.
- H. Tighten sleeve seal nuts until sealing grommet have expanded to form water-tight seal.
- I. Provide finish of supporting devices in the chemical storage room as follows:
  - 1. Provide PVC-coated galvanized concrete inserts and pipe straps.
  - 2. Provide stainless steel for all bolts, nuts, washers, and screws.
  - 3. Provide PVC-coated individual hangers and trapeze hangers.
  - 4. Provide individual galvanized rods with two (2) coats of epoxy paints.

# 3.2 LIGHT FIXTURE SUPPORTS

- A. Securely support all light fixtures directly from building structural members or 1-1/2" or larger steel ceiling framing channels. Use steel channel where it is necessary to span the building structural members for equipment support.
  - 1. Wood supporting members or wires will not be acceptable.
  - 2. Provide minimum ¼" diameter lag screws when anchoring into wood structural members. Penetrate wood structural members a minimum of 2" with all screws.
  - 3. Provide steel expandable type, anchors with minimum penetration of 1-1/2" when anchoring to concrete.

- 4. Do not suspend any conduit, light fixtures, or ballasts from metal roof deck or from the ceiling suspension wires. Support all lay-in fixtures independent of the ceiling support system.
  - a. In lay-in ceilings provide fastening clips on each corner of each fixture.
  - b. Where fixture suspension wires are required, wires shall be fastened to a structural member directly above or no greater than a 5 degree angle from the light fixture corner of which it is fastened to.
  - c. Fixture suspension wires shall be provided so that fixture is not allowed to drop more than 1" if ceiling would happen to collapse.
- B. Equip all fixtures using conduit stems with ball swivel hangers. In finished areas, provide canopies for the hangers.
- C. Support all surface mounted fixtures with a minimum of one hanger per fixture plus one per row. Support individual fixtures with a minimum of two hangers. Attach fixture hangers to the ceiling grid per code.
- D. Support all suspended fixtures with a minimum of two fixture hangers. Attach each hangar to a dedicated anchor. Locate hangars directly above the corners of the light fixtures.

# THIS PAGE INTENTIALLY LEFT BLANK

# SECTION 26 05 33

# **RACEWAYS, FITTINGS, AND BOXES**

### PART 1 GENERAL

### 1.1 SUMMARY

- A. Section Includes
  - 1. Conduit.
  - 2. Conduit fittings.
  - 3. Conduit accessories
  - 4. Pull and junction boxes.
  - 5. Fire stop material.
  - 6. Conduit Identification.
  - 7. Execution/Installation.

# 1.2 REFERENCES

- A. Section 07 84 00: Firestopping.
- B. Section 26 05 00: Common Work Results for Electrical
- C. Section 26 05 26: Grounding and Bonding for Electrical Systems
- D. Section 26 05 29: Supporting Devices
- E. Section 26 27 26: Wiring Devices

### 1.3 SUBMITTALS

- A. Submit shop drawings and descriptive data in accordance with Section 26 05 00 in addition to the requirements of this section.
- B. Precast concrete:
  - 1. Submit a coordinated set of shop drawings with the precast manufacturer, which indicates electrical box locations, cabinet locations and conduit routing locations.

# PART 2 PRODUCTS

# 2.1 STEEL RIGID METAL CONDUIT (RMC) AND FITTINGS.

- A. Provide hot-dip galvanized or electro-galvanized (inside and outside) conduit having a bichromate finish conforming to UL standard UL-6.
- B. Provide zinc coated, threaded type fittings, couplings, and bushings.

# 2.2 PVC-COATED STEEL RIGID METAL CONDUIT (RMC) AND FITTINGS.

- A. Hot dip galvanized or electro-galvanized rigid steel conduit.
- B. 40 mil. PVC coated inside surface and outside surface.
- C. Provide threaded type fittings, couplings and bushings with the same coating as the conduit.
- D. Provide brush-on PVC touch-up compound.

# 2.3 ELECTRICAL METALLIC TUBING (EMT) AND FITTINGS.

- A. Electro-galvanized tubing conforming to UL Standard UL797, with the interior having a smooth coating of aluminum lacquer or enamel.
- B. Do not thread tubing.
- C. Provide concrete-tight steel compression or set-screw type fittings, couplings and bushings. Cast or indentor type devices are not acceptable.

# 2.4 RIGID NON-METALLIC CONDUIT (RNMC) AND FITTINGS.

- A. Schedule 40/80 polyvinyl chloride (PVC) rigid plastic conduit conforming to NEMA Specifications TC-2.
- B. Provide plastic fittings, couplings, and bushings per manufacturer's recommendations for rigid non-metallic conduit, designed for use with solvent cement.

### 2.5 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC) AND FITTINGS.

- A. Metallic conduit covered with an extruded, polyvinyl chloride sheath.
- B. Provide steel or malleable iron, water-tight type fittings, couplings, and bushings approved for use with liquid-tight flexible metal conduit. Cast type devices are not acceptable.

### 2.6 FLEXIBLE METAL CONDUIT (FMC) AND FITTINGS.

- A. Hot-dip galvanized tubing conforming to U.L. Standard ULI.
- B. Provide steel or malleable iron type fittings, couplings and bushings. Cast type devices are not acceptable.

# 2.7 COPPER METAL CLAD (MC) CABLE

A. Refer to Section 26 05 19 – 600 Volt Conductors and Cables.

### 2.8 OUTLET AND JUNCTION BOXES

- A. Non-Metallic Boxes:
  - 1. Constructed of durable PVC material which will not rust or corrode.
  - 2. Designed for use with non-metallic sheathed cable.
  - 3. 2-hour fire rating.
  - 4. UL listed.
- B. Metallic Boxes:
  - 1. Galvanized code gauge metal outlet and junction boxes with screw-on covers of type, shape and size listed for each application.
  - 2. UL Listed.
- C. Provide gasketed covers in damp and dusty locations, and also where required to meet the listed use (i.e. wet locations).
- D. Provide cast metal boxes (FS and FD) for all locations where IMC and RMC is required under Section 26 05 33.

- E. Provide 4" square minimum trade size square boxes for all outlet and junction boxes. Provide appropriate mudrings, tile rings or raised covers, depending on the application and allowable installation.
- F. Provide 3½" deep boxes where installed in masonry, including precast construction. Provide 2½" minimum deep boxes where installed in non-masonry locations. Shallower boxes (1½", 1¼") are allowed only at locations where the wall cavity depth does not permit deeper boxes to be installed concealed within the wall.
- G. Refer to other sections for additional outlet box requirements specific to other systems.
- H. Provide boxes with the appropriate size and quantity of conduit knock outs. Knock outs may be pulled or reamed out to larger sizes on most steel boxes.
- I. Approved steel box manufacturers:
  - 1. Raco
  - 2. Steel City
- J. Approved cast metal box manufacturers
  - 1. Appleton
  - 2. Crouse-Hinds
  - 3. Killark
  - 4. Bell
  - 5. Red Dot
- K. Approved Non-metallic box manufacturers:
  - 1. Carlon Blue Box
  - 2. Pass & Seymour

### 2.9 INTERIOR PULLBOXES

- A. Provide listed metal boxes with removeable screw-on covers.
- B. Boxes with a dimension larger than 12" shall have a covers attached with hinges and stainless steel screws located within 1/2 inch of each corner opposite the hinges and spaced not more than 12 inches apart.
- C. Size pullboxes to adhere to the NEC.
- D. Provide enclosures that have a NEMA rating that meet or exceed the environment in which they are installed.

### 2.10 FLOOR BOXES

- A. Residential Single Gang:
  - 1. Non-metallic box, corrosion resistant and designed for floor material type of which it is to be installed in.
  - 2. Adjustable screws that adjusts depth from 0" to 1.75".
  - 3. Brass cover plate with flip open actuators. Actutors to flip flat, flush with floor when opened.
  - 4. UL listed and UL scrub water tested.

# 2.11 FIRE RETARDANT MATERIAL

- A. Fire stop foam.
- B. Fire stop sealant.
- C. 3-hour fire rating.
- D. UL Classified per UL-1479.
- E. Chase Technology Corp., Dow Corning, General Electric, 3M

# 2.12 DUCT SEALING COMPOUND

- A. Soft, fibrous, slightly tacky, non-hardening, and easily applied by hand at all working temperatures.
- B. Clean and non-staining.
- C. J.M. Clipper Corp. Duxseal, O-Z/Gedney DUX

# 2.13 CONDUIT SEALS

- A. Conduit seals shall be provided wherever conduits penetrate exterior concrete walls below grade, or cross hazardous location boundaries
  - 1. For conduits less than 60 inches below grade; OZ/Gedney Type FSK
  - 2. For conduits more than 60 inches below grade; OZ/Gedney Type WSK

### 2.14 WIREWAYS

- A. NEMA 12, minimum 14-gauge steel, ANSI 61 gray enamel finish inside and out over phosphatized surfaces.
- B. 14-gauge stainless steel for corrosive environments.
- C. Smooth, rounded edges on all sections and fittings.
- D. Hinge type with screw clamps which are galvanized or stainless steel.
- E. UL listed (UL-870).

### PART 3 EXECUTION

### 3.1 CONDUIT SIZES

- Provide proper size conduit based on the NEC maximum fill requirements, including any derating factors. Where conduit sizes are indicated on the plans, it is a minimum size allowed. It is the Contractor's responsibility to provide the proper conduit size, including any grounding conductors and flexible connections to equipment.
- B. Spare conduits shall be sized per noted in the Contract Documents. Where spare conduit sizes are not identified provide a minium size of 1.25".

# 3.2 INSTALLATION

A. Installation of conduit shall meet the requirements of the NEC and the National Electrical Contractors Association (NECA) conduit installation standards. Where the documents may conflict, the requirements of the NEC take precedence.

- B. Install all line voltage (120, 208, 277 and 480 volts) conductors in a continuous raceway system.
  - 1. Circuits of different voltage systems shall be installed in separate raceways, unless specifically noted otherwise in the Contract Documents.
- C. Provide pull and junction boxes as required by the NEC and as site pulling requirements dictate.
- D. Conduits entering boxes and equipment from a flat surface shall be provided with an offset 3" from the box to allow the conduit to be fastened securely to the flat surface it is ran on.
- E. Do not route any conduits across rooftops, unless specifically allowed and noted on the plans to do so. Where conduits are allowed to be routed across rooftops, install conductors in Rigid Metal Conduit and provide proper derating of the conductor ampacities to account for the high ambient temperature as required in NEC. Mount conduit on roof blocks specifically designed for the intended environment.
- F. Support all trapezes and all above-ground conduits from the building structure.
- G. Route all horizontal raceway above water piping, where possible.
- H. Do not support conduit with wire, nylon ties, nor perforated pipe straps. Remove wire used for temporary supports.
- I. Do not attach conduit to ceiling support wires.
- J. Run all exposed conduit in a neat, workmanlike manner parallel to the building lines, tight to the wall and ceiling surfaces, and firmly support with conduit clamps or hangers.
- K. Do not run conduits in the following:
  - 1. Columns except to feed column mounted devices.
  - 2. Through structural slabs, beams, or columns, unless approved by the Structural Engineer.
  - 3. Concrete topping.
  - 4. Through the same penetrations through floors and walls as mechanical piping unless noted otherwise or if approved by the Engineer.
- L. Place conduits at least 8" away from all hot piping and surfaces including domestic hot water lines.
  - 1. Boxes shall be a minimum of 3" from any process pipes, unless noted otherwise.
- M. Do not mount conduit on mechanical equipment except where necessary to connect electrical devices mounted on the equipment. Provide flexible conduit in all runs "bridging" vibration mountings.
- N. Do not run conduit on or directly in front of access doors, removable panels, equipment removal spaces, control devices or other spaces necessary for normal maintenance and repair of the equipment.
- O. Install all exterior underground branch circuit conduits continuous from the source to the load. Do not install in-ground boxes as pull boxes. Oversize the conduits if required.
- P. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system. Install exterior underground conduits to drain away from the building.

- Q. Provide suitable fittings to accommodate expansion, contraction and deflection where conduits cross seismic, control and expansion joints. Avoid crossing expansion joints where possible.
- R. Cap or plug conduit ends during construction. Cap or plug ends of conduit that are to remain empty and make watertight. Clean and swab conduits prior to pulling in conductors.
- S. Provide nylon pull string in all empty conduit with a stamped plastic label indicating future use.
- T. Where conduits are stubbed out above walls for use of future or low voltage cabling, provide a bushing on the end of the conduit to protect cabling.
- U. Expansion fittings shall be installed at building expansion joints and where the length of straight run requires it.
- V. Conduit and Penetration Sealing:
  - 1. Seal all conduits where they pass through exterior walls and where they enter exterior fixtures.
  - 2. Seal all conduits where temperature differential between adjacent spaces is greater than 30 degrees Fahrenheit.
  - 3. Seal all conduit penetrations of smoke or fire rated walls or floors with intumescent type fire barriers.

# 3.3 OUTLET AND JUNCTION BOX INSTALLATION

- A. Maintain accessibility to all outlet and junction boxes as required by the NEC.
- B. Provide recessed outlet boxes in all new construction, except mechanical and electrical rooms. Outlet boxes in mechanical and electrical rooms may be installed exposed.
- C. Provide concealed junction boxes in all new construction, except mechanical and electrical rooms. Junction boxes in mechanical rooms may be installed exposed.
- D. Mounting heights indicated on the drawings are from the center of the outlet box to the finished floor directly below the outlet. Exterior heights are from inside adjacent door, or if no door, from the first floor above grade, unless noted otherwise.
- E. Coordinate the location of all outlets with Architectural and Mechanical drawings before installation. Verify mounting heights and locations of all outlet boxes, including the following:
  - 1. Coordinate device locations with the Owner's final furniture plan(s) before rough-ins. It is advised for the Contractor to get a final signed document stating this coordination was performed.
  - 2. Outlets located on walls with baseboard radiation. Mount to the side of radiation covers.
  - 3. Switch boxes at doors. Verify door swings. Install switchboxes on the latch side of the door if possible.
  - 4. Outlet boxes at casework. Mount outlet boxes above counters and above backsplashes.
  - 5. Outlet boxes at undercounter refrigerators. Mount outlet boxes in the space reserved for the refrigerator.
  - 6. Outlet boxes for microwave units. Mount outlet boxes in the space reserved for the microwave.

- 7. Outlet boxes adjacent to marker boards or other wall-hung Architectural items. Verify top edge and bottom edge of wall-hung items and mount outlets on clear wallspace.
- F. Do not mount boxes back-to-back and nippled together.
  - 1. Boxes mounted on opposite sides of a wall shall be mounted on separate studs.
- G. Do not use through-wall boxes unless specifically called out on the plans.
- H. Field-gangable boxes are not allowed. Provide manufactured, multi-gang boxes.
- I. Provide separate switch boxes for lighting dimmer switches to maintain full dimmer rating, if derated wattage/ampere is below the designated circuit ampacity.
- J. Close openings in all outlet boxes during plaster and concrete work with plain paper or slip-on plastic or metal plates.
- K. Provide knockout closures to cap used knockout holes.
- L. Provide FS and FD boxes in wet, damp and exterior locations.
- M. Maintain vapor barriers around boxes and/or provide suitable boxes listed for use in vapor barriers.
- N. Provide air-tight seals for all boxes in air plenums that can allow air to pass through connecting conduit. Repair all damage to insulation and vapor barriers.
- O. Where boxes and concrete are installed in masonry, provide listed equipment or the means acceptable to the AHJ necessary to provide concrete-tight connections and boxes required by the NEC.
- P. Where receptacle and voice/data or TV boxes are to be provided accessible on the same side of a wall or surface, they shall be provided on the same stud or within 4" of each other.

### 3.4 INTERIOR PULLBOX INSTALLATION

- A. Provide concealed pullboxes in all new construction, except mechanical and electrical rooms. Pullboxes in mechanical and electrical rooms may be installed exposed.
- B. Terminate all conduits at cabinets and boxes with locknuts and bushings. Provide insulating bushings on all conduit 1" and larger.
- C. Provide pull boxes in accessible locations. Provide accessibility to the pullbox cover.
   Coordinate location of pull/junction boxes with other divisions (trades) prior to installation.
   Do not locate pull boxes in exposed finished spaces without the specific approval of the Engineer and Architect.
- D. Provide  $\frac{1}{2}$ " clear space behind boxes when mounting in wet or damp locations.
- E. Boxes above ACT ceilings shall not be more than 4' from the ceiling. Provide additional supporting hardware and stands to mount equipment if structural ceiling or supports is over 4' from the ACT ceiling.

### 3.5 CONDUIT BODY INSTALLATION

A. Provide conduit bodies in accessible locations. Provide accessiblility to the cover. Coordinate location of conduit bodies with other divisions (trades) prior to installation. Do not locate conduit bodies in exposed finished spaces without the specific approval of the Engineer and Architect.

# 3.6 OPENINGS

- A. Contractor shall review the size and location of all openings to be sure they meet the requirements of the equipment that is furnished and/or installed as a part of this Contract. Contractor shall be responsible for providing all required openings necessary for a complete installation. All required openings are not shown on the Drawings.
- B. All openings shall be filled with an approved sealant, caulking, or grout after the conduit or cable installation is complete.
- C. Openings through grating shall have the bars of the grating banded.
- D. Provide watertight seal around conduit in openings which are approved by the Architect, for all roof, below grade and exterior wall penetrations.
- E. Provide air tight seals for all raceway penetrating air plenums. Repair all damage to insulation and vapor barriers. Seal vapor barriers tight to conduit penetrating vapor barriers.

### 3.7 RACEWAY AND BOXES APPLICATIONS

- A. Conceal all conduit work in new construction, except conduit and boxes installed in the following spaces may be run exposed:
  - 1. Mechanical
  - 2. Electrical
- B. Outdoors (Non-Corrosive): Apply products as specified below, unless otherwise indicated:
  - 1. Exposed Conduit: RMC, RNMC SCH 80.
  - 2. Underground Conduit: RNMC SCH 40 or 80 with RMC elbows over 1", RMC PVC coated.
  - 3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
  - 4. Boxes and Enclosures, Aboveground: NEMA 3R.
  - 5. Concealed inside exterior masonry wall: RMC, IMC.
- C. Under interior slabs-on-grade:
  - 1. RMC, RNMC SCH 40.
- D. Embedding in precast or poured concrete walls, ceilings or floors:
  - 1. RMC, RNMC SCH 40.
- E. Interior (Non-Corrossive): Comply with the following indoor applications, unless otherwise indicated:
  - 1. Concealed in Ceilings, Interior Walls and Partitions: EMT
  - 2. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
  - 3. Damp or Wet Locations: Rigid metalic conduit.

- 4. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4, stainless steel in damp or wet locations.
- 5. Exposed, Not Subject to Physical Damage: EMT.
- 6. Exposed and Subject to Severe Physical Damage: RMC.
- F. Raceway Fittings: Compatible with raceways and suitable for use and location.
  - 1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.
  - 2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with that material. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer.

# 3.8 FLOORBOX INSTALLATION

- A. Install floorbox so the finished face is flush with the surrounding floor. Maintain vapor barrier(s) around each floorbox.
  - 1. Concrete sloped around box will not be acceptable, box shall be flush with the specified elevation of the room floor, or as recommended by Manufacturer.
- B. Provide multi-gang boxes wherever possible to accommodate all devices within an area. Maintain 24" separation from boxes if multi-ganging is not possible, or if the quantity of devices requires more gangs than are available from the floorbox manufacturer.
- C. Verify exact locations of floorboxes with the Architect, to ensure the boxes are at the equipment served, and to ensure accessibility.
- D. If not noted otherwise on the drawings, provide a 1" conduit from each box compartment ran up the nearest wall and stubbed out above the accessible ceiling. Number of bends in the conduit shall not exceed 270 degrees and the overall length of the run shall not exceed 30'. If the stipulations causes conflict with actual project conditions, Contractor shall contact Engineer prior to installation of conduit and floor.
- E. Residential floor boxes to be installed in the living areas only.

# THIS PAGE INTENTIALLY LEFT BLANK

# SECTION 26 08 00

# **TESTING AND COMMISIONING OF ELECTRICAL SYSTEMS**

### PART 1 GENERAL

### 1.1 SUMMARY

- A. The requirements of this Section apply to all sections of Division 26.
- B. All equipment checks, adjustments, tests, and system energization shall be performed as specified below. If any test specified will void the warranty of any equipment to be tested, the Engineer shall be notified and further instructions received before proceeding with the test.
- C. When the Work is complete, a final inspection will be made and the Contractor shall demonstrate that all equipment and systems conform to the Drawings and Specifications.

# **1.2 QUALIFICATION OF PERSONNEL**

- A. All personnel responsible for testing and commissioning equipment as a part of this Project shall be specially trained for the tasks they are to perform.
- B. Personnel operating test equipment shall have had previous training and experience in using the equipment and shall be thoroughly familiar with the equipment capabilities and limitations.
- C. All tests shall be made by or under the direct supervision of service personnel who are trained in the application and operation of the device being tested.
- D. Evidence of the experience of test personnel in the form of certificates of training or other acceptable documentation shall be made available upon request of the Engineer.
- E. The Engineer and Owner reserves the right to require the Contractor to provide different test personnel if those performing the tests do not demonstrate competency in their work.

# 1.3 COMMISIONING

- A. Owner will provide a commissioning agent outside of this Contract after Contractor performs all verification, testing and adjustments specified in the Contract Documents.
- B. All descriptions of work specified with-in the Contract documents shall be performed by Contractor under this Contract.
- C. Contractor shall make all adjustments to installed equipment as recommended by the Owner's Commissioning agent prior to completion of the project at no additional costs to the project.
- D. Contractor shall notify the Owner's representative when all work has been completed and all testing forms have been submitted to the Commissioning Agent. Contractor shall then provide a minimum of three week notice when project is ready for commissioning. After this time, the Owner's Commissioning agent will be engaged to perform their commissioning work. Contractor shall allow a minimum of an additional three weeks in their schedule for commissioning to be performed.

- E. If it is found all work has not been completed by the Owner's representative or the Commissioning agent, Contractor shall return to the project to complete all work and the time frames as requested above shall reset and the full time frames shall be enforced.
- F. Commissioning agent nor Owner can be held responsible for project delays if adequate notice has not been provided or if all work has not been completed and it is requested the process needs to re-start.
- G. Contractor shall allow adequate time in the construction schedule to perform adjustments and equipment modifications as requested by the Commissioning agent.
- H. Building and project site shall be vacant during the Commissioning processes. Contractor is responsible for coordinating with the Construction Manager to have the building vacant of Contractors and Owner(s), except for the Contractor escorting the Commissioning Agent.
- I. Electrical Contractor shall provide staff whom is knowledgeable of the lighting control systems to attend to the site with the Commissioning Agent. This person shall operate and modify controls as requested during the commissioning process. If Contractor representative is not present or does not have adequate knowledge of the control systems, Commissioning will end. Contractor shall work with commissioning agent to reschedule, all time frames will be reset to the full length, and Contractor will be responsible for paying the commissioning agent for the return trip(s).
- J. Fees Contractor is responsible for due to incompleteness or inadequate representation will be deducted from the project retainage.

# PART 2 PRODUCTS

### 2.1 MATERIALS

A. Miscellaneous testing equipment as detailed.

# PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Test the equipment and systems and demonstrate their proper operation to the Engineer.
  - 1. Do not test equipment until it has been fully prepared, connected, and made ready for normal operation. Repair any equipment damaged by improper operation or testing at no cost to the Owner, before final inspection and acceptance.
- B. Testing equipment used for a given test shall be recommended by the manufacturer for that particular test and shall be approved by the Engineer.
- C. All test equipment shall be provided by the Contractor.
- D. All equipment shall be given a thorough visual inspection by the installer to detect insofar as possible any loose or erroneous connections, damaged components, the presence of foreign objects or materials, poor workmanship, incorrect rating of protective devices, or other abnormal conditions.
- E. Every bolted or screwed connection or terminal shall have a torque wrench or torque screwdriver applied to assure tightness before any equipment is energized. This shall apply to

both factory made and field made connections and terminations. Any problem or damage resulting from a faulty connection or termination shall be the responsibility of the Contractor.

- F. Covers shall be installed on all pull boxes, junction boxes, and raceway fittings before the final inspection.
- G. Refer to each section under Division 26 for additional testing requirements specific to that section.
- H. Contractor shall demonstrate to the satisfaction of the Engineer that all systems are functioning as specified. Contractor shall make all adjustments necessary to obtain the proper operation of the above systems. This shall include but is not limited to adjusting limit switches and level controls; providing the necessary type and quantity of device, relay, and starter contacts; changing wire connections to device contacts; and calibrating signal devices.

# 3.2 SCHEDULING AND REPORTING

- A. All tests shall be scheduled 48 hours in advance with the Engineer and shall be conducted in his presence or the presence of his representative upon such request. Test results shall be tabulated neatly and legibly on Contractor provided test forms. Test reports shall include the pertinent readings or observations, a description of the method used, and a list of the equipment employed.
- B. If the materials or equipment fail under test, the test reports shall include the following:
  - 1. Pertinent readings or observations made up to the point of failure.
  - 2. Any abnormal readings.
  - 3. Any data which might indicate the cause of failure.
  - 4. The cause of the failure, if determined.
  - 5. Corrective measures taken.
- C. In all cases of test failure, the Contractor shall demonstrate that the corrective measures proposed are adequate before making any repairs, adjustments, or replacements.
- D. 3 copies of all test reports shall be submitted to the Engineer within 24 hours after completion of the test. In addition, 1 complete set of test reports shall be included in each Operation and Maintenance Manual.

### 3.3 OVERALL ELECTRICAL SYSTEM

- A. Conduct voltage tests at the time of energization of the distribution system. Perform corrective measures as required.
- B. Adjust all systems and leave in proper operating condition.
- C. Test all wiring and leave free of defective installation and unintentional grounds.
- D. Balancing Three Phase Loads:
  - Prior to turning the building over to the Owner turn on all equipment in the building, including lighting, and measure the current drawn on each hot leg of feeder supplying each distribution panel. If the current in any one leg varies more than 5% (plus or minus) from the arithmetic average of the current in all the hot legs, reconnect the branch circuits to obtain a balanced loading.

# 3.4 RECEPTACLE TESTING

- A. Receptacle Testing
  - 1. Perform visual test for integrity of each receptacle.
  - 2. Verify continuity of each receptacle grounding circuit.
  - 3. Verify proper polarity of each receptacle.

# 3.5 OCCUPANCY SENSOR TESTING

- A. Upon completion of the installation phase, test and adjust each occupancy sensor to insure proper operation.
- B. Control and testing of occupancy sensors shall be as follows, unless noted elsewhere:
  - 1. General rooms and offices: Set the time delay to OFF after 15 minutes of inactivity. Set the sensitivity of each device to trip the lights ON from anywhere in the room, but not so sensitive to trigger the lights on from motion outside the room.
  - 2. Corridors and hallway: Set the time delay to OFF after 20 minutes of inactivity. Set the sensitivity of each device to trip the lights ON from anywhere in the corridor/hall.
- C. For dual technology sensors, set the sensor to maintain an ON condition if either technology is triggered from within the room after an initial ON. Set the device to initiate an ON condition only if both technologies sense motion from within the room.
- D. Test all operational features of the system at this time.
- E. Where required, make appropriate correction(s) and adjustments.

# SECTION 26 24 16

# PANELBOARDS

### PART 1 GENERAL

### 1.1 SECTION SUMMARY

- A. Lighting and appliance loadcenters.
- B. Installation.
- C. Identification.

### 1.2 SUBMITTALS

- A. In addition to the requirements of this section, submit shop drawings and descriptive data in accordance with Division 1 and Section 26 05 00.
- B. Drawings submitted for approval of load center shall include the following information as applicable to each piece of equipment:
  - 1. Detailed top, front, and end views.
  - 2. Outline dimensions, including weights.
  - 3. Isometric or equivalent single line bussing diagram showing sizes, material, plating, and rating of phase, neutral, and ground buses.
  - 4. Electrical line diagrams and schematics.
  - 5. Metering and other wiring diagrams.
  - 6. Component device and material lists.
  - 7. Cutsheets for each individual breaker, fuse, compartment and accessory.
  - 8. Nameplate entries and schedules.
  - 9. Features and accessories furnished to meet Specification requirements.
  - 10. Cable access and exit areas, termination spaces, pull boxes.
- C. Operation and Maintenance Manuals shall be provided for each component. These manuals shall include but shall not be limited to the following:
  - 1. All shop drawing submittal information updated to show as-built conditions.
  - 2. Outline dimension prints, including weights.
  - 3. List of spares recommended for stock.
  - 4. Description of the operation, proper maintenance, and repair of all components.
  - 5. Local sources of service and supply.

### **1.3 QUALITY ASSURANCE**

A. All panelboards provided shall be of the same manufacturer.

### PART 2 EQUIPMENT

### 2.1 LIGHTING AND APPLIANCE LOAD CENTER

- A. NEMA PB1: Type 1
- B. Enclosure shall be fabricated of cold rolled steel for NEMA 1 and galvannealed steel.
- C. Indoor Type I enclosures shall have a flush, with finish to be gray baked enamel.

#### PANELBOARDS

- D. A directory label shall be provided with circuits identified as indicated on the schedule
- E. Bus bar connections to the branch circuit breakers shall be the distributed phase type and shall accept plug-on circuit breakers.
- F. 10,000 ampere rms symmetrical short circuit ratings shall be provided per the schedule. This rating shall be established by manufacturer testing of a representative load center with branch circuit breakers installed.
- G. Circuit Breakers:
  - 1. Plug-on thermal magnetic trip, with an integral crossbar to ensure simultaneous opening of all poles in multi-pole circuit breakers.
  - 2. Circuit breakers shall have an overcenter, tripfree, toggle-type operating mechanism with quick-make, quick-break action and positive handle indication.
  - 3. Handles shall have ON, OFF, and "Tripped" positions. In addition, trip indication shall include a VISI-TRIP indicator appearing in the window of the circuit breaker case
  - 4. Circuit breakers shall be UL Listed in accordance with UL standard 489 with current ratings as noted on the plans. Interrupting ratings shall be selected to provide the required load center short circuit current rating.
  - 5. Two- and three-pole circuit breakers 15-60 amperes intended for use with air conditioning, heating, and refrigeration equipment having motor group combinations and marked as such shall have the HACR marking.
  - 6. GFCI rated breakers:
    - a. Class A GFCI protection, HACR rated.
    - b. Sense current imbalance of 4 milliamps or greater.
    - c. Ground fault sensor to trip the circuit upon current imbalance.
    - d. Test pushbutton on breaker.
    - e. Trip indicator.
    - f. 1-pole breakers rated 15-30 amperes.
    - g. 2-pole breakers rated 15-60 amperes.
  - 7. AFCI rated breakers:
    - a. Trip indicator.
    - b. HACR, SWD rated.
    - c. Test pushbutton on breaker.
    - d. Selective arc trip sensing.
- H. Approved Manufactuer:
  - 1. Square D
  - 2. Cutler Hammer
  - 3. General Electric

# 2.2 EQUIPMENT IDENTIFICATION NAMEPLATES

- A. Minimum 1/8" thick laminated bakelite: White face with black lettering.
- B. Engrave characters with a minimum height of 1/4".
- C. Minimum plate size: 1" x 3.5". Provide larger plate if necessary to fit all lettering on it.

# PART 3 EXECUTION

#### 3.1 INSTALLATION

- A. Lighting and Appliance Load Centers:
  - 1. Mount load centers and cabinets to building structure or interior wall construction. Mount independent of conduit and raceways entering boxes.
  - 2. Mount load centers with topmost overcurrent device no higher than allowed by the NEC (6'-7") above finished floor.
  - 3. Provide 1" empty conduits from each flush mounted panelboard. When the floor is on grade, provide three (3) conduits into the ceiling cavity above. When the floor has accessible space below, provide three (3) conduits into the ceiling space above and two (2) conduits into the accessible space below the floor. Ends shall be capped and shall be tagged at both ends with permanent tags.
  - 4. Provide each circuit in the panel(s) with a circuit number securely fastened to the breaker for identification purposes.
  - 5. Provide a circuit directory completely machine typed on the interior of each panel door.
- B. Provide HACR, GFCI and AFCI rated breakers which meet the requirements of NFPA 70 in addition to where noted on the panelboard schedules.
- C. Load center schedule designations are as follows:
  - 1. Blank: Not intended for use.
  - 2. Space: Contains necessary bus and hardware for future addition of breakers.
  - 3. Spare: Contains a complete breaker installed, size as shown on schedule.
- D. Load center enclosures shall not be used for conductors feeding through, spliced, or tapping off to/from other enclosures or devices.

### 3.2 GROUNDING

A. Provide grounding per Section 26 05 26: Grounding and Bonding for Electrical Systems.

### 3.3 IDENTIFICATION

- A. Provide signage as required by the NEC in addition to the requirements of the Contract Documents.
- B. Provide identification nameplates as identified in the Contract Documents.
  - 1. Install nameplate parallel to equipment lines.
  - 2. Install nameplates outside covers using mechanical rivets or screws.
  - 3. Nampelate shall be attached in such a manner not to void the equipment's 3<sup>rd</sup> party testing agency approvals.

# THIS PAGE INTENTIALLY LEFT BLANK

# SECTION 26 27 26

### WIRING DEVICES

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Lighting Control Devices.
- B. Convenience receptacles.
- C. Wall plates.

### 1.2 SUBMITTALS

- A. In addition to the requirements of this section, submit shop drawings and descriptive data in accordance with Division 1 and Section 26 05 00.
- B. Submittals for pre-approval shall be submitted 2-weeks prior to the bid date. Manufacturer's of equipment looking for approval shall schedule a demonstration meeting at the Engineer's office to demonstrate the capabilities and quality of the devices. This meeting shall be scheduled 2-weeks prior to the bid date. Manufacturer/Contractor is responsible for scheduling around Engineer's prior engagements.

### 1.3 QUALITY

A. All wiring devices shall be products of the same manufacturer, unless specifically noted otherwise.

# 1.4 DEVICE COLORS

- A. Areas of Existing Construction:
  - 1. Match the color of the existing devices in the space. If multiple colors are provided in the space, match the most promenant color and face plate type.
- B. Wiring devices mounted on or flush to a finished ceiling shall match the color of the ceiling.

# PART 2 PRODUCTS

### 2.1 LIGHTING CONTROL DEVICES

- A. Switches:
  - 1. Heavy-duty, specification grade.
  - 2. Quiet, toggle type.
  - 3. Side and back wired.
  - 4. Rated 20 amperes under all loads, 1 HP at 120 volts, 2 HP at 240 volts.
  - 5. Single-pole, 2-pole, 3-way and/or 4-way as shown on the Drawings.
  - 6. Approved Manufacturers:
    - a. Cooper.
    - b. Hubbell.
    - c. Leviton.
    - d. Pass & Seymour.
    - e. Lutron.

- B. Line Voltage Dimmer:
  - 1. Provide solid state, suitable for mounting behind a standard depth faceplate and for operation on common neutral circuits.
  - 2. Provide sufficient capacity dimmer to accommodate the connected load of the light fixtures controlled by the dimmer. Provide 600 watt minimum size dimmers.
  - 3. Slide type dimmer control.
  - 4. Pushbutton for on/off control with preset feature to allow use to return lights to previous light level when turning the lights on.
  - 5. Approved Manufacturers:
    - a. Lutron.
    - b. Leviton.
    - c. Cooper/Arrow Hart.
    - d. Hubbell.
- C. Low Voltage Button Switch:
  - 1. For use in spaces with automated controls such as vacancy/occupancy detection, time of day and day light controls.
  - 2. Provide solid state, suitable for mounting behind a standard depth faceplate and for operation on common neutral circuits.
  - 3. Suitible for single-pole, 3-way and 4-way switching.
  - 4. Electrostatic discharge protection.
  - 5. Pushbutton for on/off control. Button function shall be identified with manufacturer engraving or similar means.
  - 6. Luminaire compatible control signal directly proportional to the desired light levels. Signal source method and control signal shall be coordinated with the controlled luminaires.
  - 7. Approved Manufacturers:
    - a. Lutron.
    - b. Leviton.
    - c. Cooper/Arrow Hart.
    - d. Hubbell.
- D. Low Voltage Dimmer:
  - 1. For use in spaces with automated controls such as vacancy/occupancy detection, time of day and day light controls.
  - 2. Provide solid state, suitable for mounting behind a standard depth faceplate and for operation on common neutral circuits.
  - 3. Provide sufficient capacity dimmer to accommodate the connected load of the light fixtures controlled by the dimmer.
  - 4. Suitible for single-pole, 3-way and 4-way switching.
  - 5. Electrostatic discharge protection.
  - 6. Pushbutton for on/off control.
  - 7. Pushbutton for dimming up/down control
    - a. Provide with preset feature to allow use to return lights to previous light level when turning the lights on.
  - 8. Button function shall be identified with manufacturer engraving or similar means.
- 9. 0-10 volt or luminaire compatible control signal directly proportional to the desired light levels. Signal source method and control signal shall be coordinated with the controlled luminaires.
- 10. Approved Manufacturers:
  - a. Lutron.
  - b. Leviton.
  - c. Cooper/Arrow Hart.
  - d. Hubbell.
- E. Occupancy/Vacancy Sensors, Wall mount:
  - 1. Dual sensing technologies, including passive infrared and either ultrasonic or sound detection.
  - 2. Sensor shall be designed so the use of the dual technologies activates the sensor without errounous activiations and detection of occupancy by either technology shall hold the lights on.
  - 3. 30 second to 30 minute adjustable time delay to turn off lights.
  - 4. Dense, wide angle coverage pattern.
  - 5. UL listed for use of line voltage or low voltage systems.
  - 6. Provide dry contacts internal to the device and/or separate relay packs to perform the specified control.
  - 7. Provide all power supplies and mounting hardware.
  - 8. Single-pole, 2-pole, 3-way and/or 4-way to peform the specified lighting control.
  - 9. Integral push button to override occupancy sensor controls:
    - a. Activation of button when lights are off shall turn lights on.
    - b. Activation of button when lights are on shall turn lights off.
    - c. Sensing technology shall control lights as specified above after button has been pressed.
    - d. Provide device with multiple buttons for spaces with multilevel/step and/or multizone lighting.
  - 10. Approved Manufacturers:
    - a. Watt Stopper.
    - b. Sensor Switch.
    - c. Levition
    - d. Lutron
    - e. Cooper
    - f. Hubbell.

#### 2.2 CONVENIENCE RECEPTACLES

- A. Duplex receptacles:
  - 1. Specification grade, 3-wire grounding type, NEMA 5-20R.
  - 2. Side wired.
  - 3. Rated 20 amperes, 125 volts.
  - 4. In addition to where noted in the Contract Documents, tamper resistant devices shall be provided where required by the NEC and other governing codes.
  - 5. Spring type grounding strap that holds mounting screws captive.
  - 6. Approved Manufacturers:

- a. Cooper.
- b. Hubbell.
- c. Leviton.
- d. Pass & Seymour.
- B. Ground Fault Circuit Interrupter Receptacles:
  - 1. Specification grade, 3-wire grounding type, NEMA 5-20R.
  - 2. Side wired.
  - 3. Rated 20 amperes, 125 volts.
  - 4. In addition to where noted in the Contract Documents, tamper resistant devices shall be provided where required by the NEC and other governing codes.
  - 5. LED trip indicator.
  - 6. Approved Manufacturers:
    - a. Cooper.
    - b. Hubbell.
    - c. Leviton.
    - d. Pass & Seymour.

# 2.3 COVERPLATES

- A. Interior Coverplates: Provide new coverplates over all boxes with the following minimum specifications:
  - 1. All finished areas and unfinished areas with recessed boxes: smooth, impact resistant thermoplastic or molded nylon wall plates.
  - 2. Unfinished areas over surface mounted boxes:
    - a. Surface mounted switches and receptacles in FS or FD cast device boxes provide raised metal cover to match the surface metal box.
    - b. Surface mounted switches in cast aluminum boxes shall have stainless steel coverplates with dimensions which match the box dimensions
  - 3. Provide appropriate covers over special purpose receptacles.
- B. Exterior Coverplates: Provide weatherproof "while in use", coverplates for outlets and switches as indicated in the Contract Documents.
  - 1. Provide weatherproof boots for all dropcords as indicated in the Contract Documents.
  - 2. Weatherproof switch coverplates: Cast aluminum or Lexan with cover and vinyl gasket for weatherproofing switch; or cast aluminum with lever and weatherproof gasket.
  - 3. Weatherproof receptacle coverplates: Specification grade, weatherproof, coverplate, gasketed corrosion resistant hood/cover rated for extra-duty, for exterior and wet area receptacles.
  - 4. Coverplates shall be NEMA 3R rated and shall be watertight when in use.
  - 5. Approved manufacturers:
    - a. Red Dot
    - b. Leviton
    - c. Pass and Seymour
- C. Wall plates for switches or manual starters which serve exhaust fans shall be engraved "EXHAUST FAN" with 1/8 inch high black letters.

# PART 3 EXECUTION

#### 3.1 WIRING DEVICES

- A. Provide new devices for all outlets indicated. Provide individual GFCI, isolated ground and surge suppression device for each duplex receptacle in ganged outlets.
- B. Wire each device by wrapping the conductors around the terminals and torquing the screw terminal tight.
- C. Mount all receptacles with the ground pin on the bottom.
- D. Replace all receptacles and plates that have been damaged, burned or discolored during construction, prior to Substantial Completion.
- E. Install wall plates after all painting has been completed.
- F. Mount wall mounted dimmers in separate boxes from switches.
- G. Test all wiring devices for continuity, proper polarity connections and grounding.
- H. Switches and convenience outlets shall be provided where shown on the Drawings.
- I. Mounting Hieghts, dimensions are to the center of the outlet box:
  - 1. Switches shall be on the latch side of doors, located 4 feet above floor, unless noted otherwise.
    - a. Door swing shall be verified with door installer before installing switch outlet boxes.
  - 2. Exterior receptacles shall be mounted at 2 feet above grade level, unless noted otherwise.
  - 3. Receptacle outlets in finished area shall be mounted 18 inches above floor, unless noted otherwise.
    - a. Where receptacles are to be installed on walls shared with a wall mounted radiation unit, receptacle shall be mounted so that the bottom of the receptacle box is 2" above the radiation unit.
  - 4. Interior surface mounted receptacles shall be mounted at 4 feet above floor level, unless noted otherwise.
- J. For all receptacles to be installed above counters installed above counters or work tables shall be mounted with long dimension perpendicular to the floor. Contractor shall verify countertop heights before installing boxes for convenience receptacles.
- K. All receptacle outlets shall be grounded to a separate grounding conductor that has green insulation.
- L. All switches, convenience receptacles, telephone outlets, manual starters, etc. in the finished areas shall be flush mounted. Flush boxes shall fit flush with the final finished wall in every case. Install metal box extenders and bond to the box where necessary.
- M. All boxes shall be plumb.
- N. Where indicated in the Contract Documents as WP, switches and receptacles shall have weatherproof cover plates.
- O. All receptacles on a GFCI breaker shall be identified with laminated plastic nameplates which read: "GFCI PROTECTED." Letters shall be 1/4 inch high white on a red background. Feed

through type GFCI receptacles which feed non-GFCI type receptacles where shown as GFCI type receptacles on the Contract Documents are not allowed, unless noted otherwise.

- 1. For double-duples and other multi-gang receptacles, one of the receptacles are to be a GFCI type receptacle and the remaining receptacles in the shared box may be fed through.
- P. Contractor shall be responsible for providing GFCI and Arc fault protection where required per the NEC. Not all instanances may be shown on the Contract Drawings. Protection may be provided either via an accessible wall device or a rated breaker at the feeding panelboard. Installation of a blank wall device with the protection features to feed devices without the protection features will not be allowed, unless specifically noted in the Contract Documents.

# 3.2 OCCUPANCY AND LIGHT LEVEL SENSORS

- A. Where occupancy sensors, daylight, or photocell sensors are to be used, Contractor shall provide a guarantee of sensor coverage and operation for the Contractor's proposed sensors and layout. It is the responsibility of the Contractor to work with the proposed manufacturer or product representative to determine sensor layout and quantities. The indicated sensor layout in the Contract Documents shall be revised to meet the manufacturer's recommended layout and sensor locations to achieve the guarantee of sensor coverage and operation.
- B. If Owner has a nuisance tripping problem for any lighting zone controlled by such sensor it is the Contractor's responsibility to resolve the issue. Contractor shall make adjustments to the sensor settings such as sensitivity levels and time delays.
- C. If it is determined the sensor is in a troublesome location such as mounted to close to windows, grills, HVAC equipment, fans, etc. Contractor shall move the device to a new location as recommended by the manufacturer.
  - 1. Occupancy/Vacancy sensors shall not be mounted 4' or closer to heaters, diffusers, air returns and other mechanical equipment.
- D. Where it is determined the quantity of supplied sensors is not sufficient, Contractor shall add additional sensors to offer the specified control with out erroneous tripping, false offs or slow activations.
- E. If it is determined by Owner and Engineer the model or type of sensor provided is inadequate for the space usage or is unable to provide the specified control, Contractor shall replace the sensor(s) with a different model and/or manufacturer at request of Owner at no additional cost. If additional sensors are needed to provide the adequate coverage per the new manufacturer or model recommendations, Contractor shall install the additional sensors at no additional cost to Owner.
- F. All sensor work shall be included in the bid/quote amounts. Contractor will not be awarded additional services to perform troubleshooting, programming, installations, repairs, relocations, etc. or any other work associated to the sensing devices in relation to delievering the specified lighting controls.

# 3.3 WALLBOX DIMMERS

A. Where dimmers are shown ganged with other dimmers and/or other devices, size outlet such that dimmers will not be underated. Provide separate boxes if necessary.

### 3.4 COVERPLATE IDENTIFICATION

- A. Provide ¼" high engraved black-infilled lettering laser etching engraved coverplates or thermal machine printed labels which are perminately installed.
  - 1. This requirement is for all receptacle and lighting devices.
- B. Provide identification on the plate immediately above the wiring device on the backside of the coverplate, unless noted otherwise.
- C. For floor box devices, provide a thermal machine printed label on the underside of the floor box cover.

#### **END OF SECTION**

# THIS PAGE INTENTIALLY LEFT BLANK

# SECTION 28 05 00

### COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY

#### PART 1 GENERAL

#### 1.1 SECTION SUMMARY

- A. Work consists of furnishing labor, materials, equipment and services required for the complete installation of work shown in the Contract Documents and as specified in Division 28.
- B. Include all parts and labor which are incidental and necessary for a complete and operable installation even though not specifically mentioned in the Contract Documents. Such items include nuts, bolts, anchors, brackets, sleeves, offsets in conduit, fittings, relays, etc.
- C. Some equipment and materials provided under Division 26 may require composite work crews because of trade jurisdiction. Where this occurs, include in the bid this portion of the composite crew labor costs. It is the Contractor's responsibility to review Division 26 Contract Documents to determine where these composite crews are required.
- D. Obtain all temporary and permanent permits and licenses required in connection with this Division's work. Pay all fees and expenses required for such permits and licenses.
- E. Request inspections as required by regulating agencies and/or regulations. Contractor shall include all charges for inspections by regulating agencies of installations of plans specifications in the Base Bid price.
- F. Include State and Local sales taxes in the bid. Keep accurate records of these taxes and furnish such records to the Owner upon request.
- G. Provide the Owner with a certificate of final inspection and approval by enforcement authorities.
- H. The fire alarm and detection system shall be designed and built by the Contractor.

#### **1.2 RELATED SECTIONS**

- A. Divisions 0 and 1 apply to all work of Division 28 and are an integral part of this Section. Where the conditions specified are at variance with other Divisions, Section 28 05 00 takes precedence. Section 28 05 00 specifies conditions, procedures, equipment and material particular to the electrical work and applies to all electrical work of the Contract Documents.
- B. Division 0 and 1 and 28 05 00 and all Addenda form a part of and apply to all contracts or subcontracts relating to Division 28 work. Copy these documents to all Sub-contractors receiving other Sections of Division 28.
- C. Where a Specification Section refers to other Sections under the Article on Related Sections, this is done for Contractor's convenience only. It shall in no way relieve the Contractor of responsibilities stated in other Sections of the Specifications, even though these Sections are not specifically referenced. The Contractor is responsible for all information contained in this Division's Specifications as well as for information contained in all other Divisions.

September 28, 2021 Project No. 2107

#### **1.3 REFERENCES**

- A. Meet or exceed all current applicable codes, ordinances and regulations for all installations. Promptly notify the Engineer, in writing, if the contract documents appear to conflict with governing codes and regulations. Contractor assumes all responsibility and costs for correcting non-complying work installed without notifying the Engineer.
- B. Higher quality of workmanship and materials indicated in the Contract Documents takes precedence over that allowed in referenced codes and standards.
- C. Perform all work in compliance with the currently adopted version of the following codes and standards for this project:
  - 1. National Electric Code
  - 2. State and Local Electrical Codes
  - 3. International Building Code
  - 4. International Fire Code
  - 5. International Mechanical Code
  - 6. State and Local Building Codes and Ordinances
  - 7. State Industrial Commission Regulations
  - 8. State and Local Fire Codes and Regulations
  - 9. State and Local Mechanical Codes
  - 10. State Elevator Code
  - 11. Occupational Safety and Health Administration Regulations
  - 12. Americans with Disabilities Act
  - 13. Uniform Federal Accessibility Standards
  - 14. State Board of Health
  - 15. NFPA 101 Life Safety Code
  - 16. State Energy Code
- D. Use the Standard where referenced in the specifications by the following abbreviations:
  - 1. AIA: American Insurance Association
  - 2. AIA: American Institute of Architects
  - 3. ANSI: American National Standards Institute
  - 4. ASTM: American Society of Testing and Materials
  - 5. EPA: Environmental Protection Agency
  - 6. FM: Factory Mutual Insurance Association
  - 7. IEEE: Institute of Electrical and Electronic Engineers
  - 8. IES: Illuminating Engineering Society of North America
  - 9. ICEA: International Cable Engineers Association
  - 10. NBS: National Bureau of Standards
  - 11. NEMA: National Electrical Manufacturers Association
  - 12. NFPA: National Fire Protection Association
  - 13. NSC: National Safety Council
  - 14. UL: Underwriter's Laboratories

#### 1.4 **DEFINITIONS**

A. The terms defined below apply to all work included in Division 28.

- 1. The work –The term 'Work' means the construction and services required by the Contract Documents whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.
- 2. Furnish to obtain in new condition ready for installation into the work.
- 3. Install to store, set in place, connect and place into operation into the work.
- 4. Provide to furnish and install.
- 5. Connect to bring service to the equipment and make final attachment including necessary switches, outlets, boxes, terminations, etc.
- 6. Conduit includes in addition to conduit, all fittings, pull boxes, hangers and other supports and accessories related to such conduit.
- 7. Concealed hidden from sight in chases, furred spaces, shafts, hung ceilings, embedded in construction, in crawl spaces or buried.
- 8. Exposed: not installed underground nor concealed as defined above.
- 9. Building structure or building structural members consists of steel columns, steel beams, steel joists (top chord and at panel points), concrete walls and concrete block walls. Metal decking, joist bridging and bottom chords of bar joists shall not be construed as building structure nor as a building structural member for the purpose of support.
- B. The drawing and specifications constitute the Contract Documents. Any item noted in the specification or shown on the drawings is included in the Contract Documents.
- C. All electrical details and drawings are diagrammatic, unless specifically noted. Field-verify all dimensions and notify the Engineer of any conflicts of discrepancies, in writing, prior to installation.

#### **1.5 QUALITY ASSURANCE**

- A. Regulatory Requirements:
  - 1. Initiate, maintain and supervise all safety precautions required with this work in accordance with the regulations of the Occupational Safety and Health Administration (OSHA) and other governing agencies.
- B. Environmental Requirements:
  - 1. Do not remove or disturb any asbestos containing materials from the project. Immediately stop work and notify the Owner if asbestos containing materials are suspected.
  - 2. Do not dispose of any PCB containing materials. Disposal of all PCB containing materials will be the responsibility of the Owner.
- C. Provide new, first quality material for all products specified. Do not reuse materials unless indicated or approved by the Engineer.
- D. Comply with the NEC as applicable to the construction and installation of equipment specified in this section.
- E. Provide equipment specified in this section that has been listed and labeled by a nationally recognized testing laboratory.
- F. Comply with ANSI as applicable to equipment specified in this section.
- G. Comply with NEMA as applicable to equipment specified in this section.

### **1.6 PROJECT/SITE CONDITIONS**

- A. Site Inspections:
  - 1. Before submitting a proposal on the work contemplated, examine the site of the proposed work and become thoroughly familiar with existing conditions and limitations. No extra compensation will be allowed because of misunderstanding as to the amount of work involved nor bidders lack of knowledge of existing conditions which could have been discovered or reasonably anticipated prior to bidding.
  - 2. Conduits, pipes, ducts, lights, devices, speakers, etc., shown on the drawings as existing have been based on existing plans and may not be installed as originally shown. It is the Contractor's responsibility to visit the site and make exact determination of the existence, location and condition of such facilities prior to submitting a bid.
- B. Correlation of Work:
  - Consult the drawings and specifications of all other Divisions for correlating information and lay out work so that it will coordinate with other trades. Verify dimensions and conditions (i.e., finished ceiling heights, footing and foundation elevations, beam depths, etc.) with the Architectural and Structural drawings. Notify the Architect/Engineer of any conflicts that cannot be resolved, in the field, by affected trades. Replacement of work due to lack of coordination and failure to verify existing conditions will be completed at no cost to the Owner.
  - 2. Install all conduit, cable tray, equipment, etc. allowing proper code and maintenance clearances and to avoid blocking passageways and access panels.
  - 3. Where work must be replaced due to the failure of the Contractor to verify the conditions existing on the job, such replacement must be accomplished at no cost to the Owner. This applies to shop fabricated work as well as to work fabricated in place.
  - 4. Throughout the course of the work, minor changes and adjustments to the installation may be requested by the Engineer. The Contractor shall make adjustments without additional cost to the Owner, where such adjustments are necessary to the proper installation and operation within the intent of the Contract Documents. This does not include work already completed.
  - 5. Equipment outlines shown on detail plans of 1/4"=1'-0" scale or larger and/or dimensions indicated on the plans are limiting dimensions. Do not install any equipment that exceeds the equipment outlines shown or reduces indicated clearances.
  - 6. Obtain exact location of connection to equipment, furnished by others, from the person furnishing the equipment.
  - 7. Drawings and specifications are complementary and what is called for in either on is as binding as if called for in both.
  - 8. Include the better quality, greater quantity or higher cost for an item or arrangement where a disagreement exists in the drawings and specifications.

#### 1.7 SEQUENCING AND SCHEDULING

A. Refer to General Conditions and Requirements.

#### **1.8 EQUIPMENT INSTRUCTIONS AND PARTS LITERATURE**

A. Instruction and parts literature are generally packed with electrical equipment and devices. Contractor shall remove this literature from the packing container or equipment enclosure, identify the literature with the equipment to which it applies, and file the literature in looseleaf binders with index tabs. Each binder shall have an index which lists each piece of equipment and the literature which applies to it. An index tab shall be provided for each piece of equipment.

B. Contractor shall establish a procedure with the other trades for receiving, identifying, and filing literature for devices which are removed from their packaging and installed by other trades.

# 1.9 SUBMITTALS

- A. Submit the following items consistent with Division 0 and Division 1. Refer to each Section under Division 26 for additional submittal requirements particular to that Section.
- B. Prior Approvals:
  - 1. Submit approval form for each request for prior approval.
  - 2. Submit hard copy, bound, written requests to use unspecified items, to the Engineer, no later than ten (10) calendar days prior to the bid opening. Submit detailed information for proposed material or equipment specific to the project, clearly indicating all options included in the submittal.
  - 3. Accepted substitutions will be incorporated in an Addendum to the Contract Documents.
  - 4. Contractor is responsible for dimensional differences, electrical requirements and any other resulting changes, when using accepted substitutions. Contractor is responsible for any additional costs incurred as a result of substitutions, including other contractors and Architect/Engineer fees.
  - 5. Material and equipment not specified or accepted in an Addendum will be removed and replaced at no cost or inconvenience to the Owner.
- C. Work Scope Change:
  - 1. If a work scope change is requested and Contractor would like to be awarded additional compensation or a deduct from original contract is requested, Contractor shall provide a schedule of values for all associated proposed work.
    - a. Schedule of values shall include all proposed material, labor and other associated costs. Provide a final lump sum number for all work associated with the change and individual pricing for each item on the schedule of values.
    - b. Engineer may request additional breakdown for improved clarity and Contractor must comply prior approval for the additional compensation or credit.
  - 2. Contractor shall provide actual manufacturer and distributer invoices showing cost of work affected by the work scope change upon request of Engineer and/or Owner representative.
  - 3. Contractor is solely responsible for delay's in schedule where Contractor is required to resubmit documentation, revise requested documentation or provide additional information associated to gaining approval for the work scope change.
- D. Shop Drawings and Manufacturer's Information:
  - 1. Submit in accordance with the Division 0 and Division 1. Unless noted otherwise, submit drawings to the Engineer for review within 30 calendar days after award of Contract.

- Provide separately-bound documents for each submittal for each section. Combination submittals will be returned to the Contractor without review and count as 1 submittal. Do not combine submittals from multiple sections.
- 3. Include project name, name of Architect, name of Engineer, contractor, sub-contractor, manufacturer, supplier and sales representative, include name, address, and phone number for the sales representative. Clearly identify section number and description of equipment submitted. Shop drawings not including all of this information will be returned without review, and count as 1 submittal.
- 4. Examine all shop drawings noting capacity, arrangement and physical dimensions. Clearly mark all relevant items on catalog data and cross-out unrelated information.
- 5. Submittals for equipment provided by the Electrical Contractor shall bear a stamp or specific written certification from the Electrical Contractor, certifying the submittals have been reviewed and approved by the submitting Electrical Contractor.
- 6. Provide the following shop drawing and manufacturer information:
  - a. Product Data Sheets :
    - 1) Product and component data sheets which describe all equipment and devices to be provided.
    - 2) Include all features specified.
    - 3) Provide dimensioned prints with weights.
    - 4) Highlight or otherwise accentuate on each data sheet the specified product features and product numbers.
    - 5) Features or part numbers which do not apply shall be struck through, crossed out, blacked out, or otherwise identified as not applicable.
  - b. Composite Drawing:
    - 1) Include power and control wiring for all systems and equipment.
    - 2) Show basic systems on composite drawing.
    - 3) Use terminal numbers on drawings and schematics.
    - 4) Use separate drawings to show details of sub-systems.
    - 5) Identify sub-system drawing interface points on composite drawing and subsystem drawings; terminal numbers of interface points shall be the same on both drawings.
    - 6) Revise or redraw manufacturer's standard drawings to meet above requirements.
  - c. Record all Changes to Existing Systems:
    - Revise all wiring diagrams and schematic diagrams to show final installation:
      a) Includes all new and existing equipment diagrams.
  - d. Programmable Systems:
    - 1) Description of programmable system operation, including but not limited to input/output functions, control capabilities, configuration procedures, starting setpoints, etc.
    - 2) Preliminary graphic screens and reports.
      - a) This submittal shall occur prior to shipment of the system.
  - e. Manufacturers Installation Instructions:
    - 1) Include with shipment.
- 7. If the Engineer rejects (Make corrections noted/Submit corrected copy, Rejected/Submit specified item) two (2) times for material under the same section the Engineer will be

compensated for the additional reviews. Compensation will be incorporated by Change Order and deducted from the Contractor's application for payment. Contractor is solely responsible for any project delays caused by having to resubmit submittals.

- E. Operating and Maintenance Manuals:
  - 1. Include all the information provided with the approved shop drawings and manufacturer's information.
    - a. Update and complete control system drawings and descriptions for all equipment.
    - b. All documentation shall include modifications made which reflect the final installation.
    - c. Provide all completed testing reports.
  - 2. Date the manuals with the day, month, and year they are provided to the Owner/Engineer.
  - 3. Provide manufacturers' user manuals and installation instructions.
  - 4. Provide 3 hard (paper) copies in a 3-ring binder. Provide a table of contents and each piece of equipment or sub-system shall be tabbed.
  - 5. Provide 2 digital copies in a PDF format saved to a compact disk or USB drive. The saved files shall be clearly identified and organized in a similar manner to the hard copies
    - a. Data saved on the disks shall be accessible and neatly organized.
    - b. Provide a table of contents which utilizes bookmarks and links. The links shall take the reader to a specific page when the reader clicks on the desired title in the table of contents. A link shall be provided for materials associated with each piece of equipment included in the O&M manual.
  - 6. Record all Changes to Existing Systems
  - 7. Insert revised documents into the Owner's existing operation and maintenance manuals in place of original documents, if such O&M's exist.
- F. Record Documents:
  - 1. Provide three sets of hard copy record documents and two digital pdf copy. Record Drawings shall be of the same size as the original published contract drawings.
  - 2. Shall be provided with the O&M's.
  - 3. Record drawings shall include all work scope changes, including addenda.
  - 4. Record drawings shall show locations of all above ceiling control devices, such as relays, contacts, control modules, monitor modules, fire/smoke detection equipment, etc.
  - 5. Refer to Division 0 and Division 1 for additional Record Drawing requirements.

# PART 2 PRODUCTS

# NOT USED

# PART 3 EXECUTION

# 3.1 PREPARATION

- A. Continuity of existing systems:
  - 1. No Division 28 systems are to remain inactive at the end of the workday. Assure that the systems are all operational at the end of each workday. Coordinate temporary outages with the Owner.

- 2. Coordinate/schedule all work with the Owner to minimize any disruptions. Confine all interruptions to the smallest possible area. Provide temporary connections if required to provide continuity of service.
- 3. Inspect all areas affected by the interruptions and return all automatically controlled equipment, electrically operated equipment to the same operating condition prior to the interruption.
- B. Use of Facility:
  - 1. Do not disturb normal use of the facility, except within the immediate construction area. Keep walks, driveways, entrances, etc. free and clear of equipment, material and debris.
  - 2. Store all equipment and material in a place and manner that minimizes congestion and is approved by the Owner.

# 3.2 INSTALLATION

- A. Material and Workmanship
  - 1. Provide new material and equipment, unless noted otherwise. Protect equipment and material from damage, dirt and the weather.
  - 2. Provide the highest quality workmanship and perform all work only by skilled mechanics. Install material and equipment in accordance with manufacturers' recommendations, instructions and current NECA standards.
  - 3. The Engineer reserves the right to reject material or workmanship not in accordance with the specifications, before or after installation.
- B. Cutting and Patching:
  - 1. Perform all cutting and patching necessary to work, unless specifically delegated to be performed by a different Division.
  - 2. Obtain special permission from the Engineer before cutting structural members or finished material.
  - 3. Perform all patching in a manner as to leave no visible trace and return the area affected to the condition of undisturbed work. Perform all patching by workers experienced, skilled, and licensed for the particular type of work involved. Inferior work will not be accepted.
  - 4. Patch all holes left as a result of demolition of electrical equipment and devices.
  - 5. Drill all holes in masonry with rotary drill. Impact tools are not allowed. Core drill all holes in masonry and concrete for electrical raceway. Provide and dispose of all water required for core drilling. Coordinate with other trades to prevent damage from water.
  - 6. Prevent the spread of dust, debris, and other material into adjacent areas.
  - 7. Replace all ceiling tiles damaged during installation of work, with new tile.

# 3.3 EXISTING CONSTRUCTION

- A. All modifications to the fire alarm and Security systems shall be staged to limit the frequency and duration of alarm system impairments. Systems shall be operable at all times, when feasible.
- B. The Contractor shall notify the Owner Representative in writing at least two working days in advance of any impairment. The maximum planned impairment duration shall be 8 hours.

- C. No more than one smoke compartment of a building will be allowed to be impaired at one time. For buildings which are not separated into smoke compartments no more than one floor of the building will be allowed to be impaired at one time.
  - 1. The impaired area of the building shall not be left unattended by the Contractor's personnel during an impaired state. Contractor shall provide firewatch personnel during an impairment period.
  - 2. If unavoidable or in the event of an unplanned incident, the Contractor shall notify the Owner's Representative of any impairment lasting more than 8 hours.

# 3.4 FIELD QUALITY CONTROL

- A. Final Inspection:
  - 1. A final inspection of the electrical systems will be required before the Contract can be closed out. Request a final inspection by the Engineer after all systems are fully completed and operational. The Engineer will schedule an inspection and generate a list of items to be corrected or completed before Contract Closeout. If the Engineer is requested to make a final inspection by the Contractor, and the Engineer finds the work is not complete enough to perform that inspection, the Contractor will compensate the Engineer for his time. The Contractor will then perform the necessary work to complete the project and again request a Final Inspection.

### 3.5 CLEAN UP

- A. Keep the premises free from accumulation of waste material or rubbish, caused by his employees or work, at all times. Remove rubbish, tools, scaffolding, and surplus materials from and about the building, and leave work areas "broom clean" or its equivalent upon completion of the work. Clean electrical equipment and remove temporary identification. In case of dispute the Owner will remove the rubbish and charge the cost to the Contractor.
- B. After tests have been made and accepted clean light fixtures, panels and other equipment installed by the Contractor, leaving the entire work area in a clean and complete working order.

#### 3.6 **PROTECTION**

- A. Cover openings and equipment, where set, to prevent obstruction to conduits, breakage, misuse, or disfigurement of equipment. Cover openings in equipment immediately upon uncrating or receipt at the job site and keep covered until permanent connection is made.
- B. Contractor is responsible for any damage to electrical equipment or materials until final acceptance of the entire project by the Owner. Keep all equipment clean materials until final acceptance of the entire project by the Owner.
- C. If a portion of the project is to be occupied by the Owner prior to Substantial Completion of the entire project make arrangements with the Owner to transfer responsibilities for protection and housekeeping.

# 3.7 ELECTRIC FIRE AND SMOKE DAMPERS

- A. Division 26 Contractor shall provide power to all smoke, fire, smoke/fire dampers which are rated for 120V AC or greater.
- B. Wiring for fire alarm and other life safety monitoring and alarm shall be provided under Division 28.
- C. Contractor is responsible for coordinating locations and requirements of the electric dampers with the equipment provider and the Mechanical Contract Documents. Not all dampers may be indicated in the Electrical Contract Documents.

# END OF SECTION

# **SECTION 28 05 15**

# **TESTING OF FIRE ALARM SYSTEMS**

#### PART 1 GENERAL

#### **1.1 DESCRIPTION OF WORK**

A. Testing of Fire Alarm Systems.

### PART 2 PRODUCTS

### 2.1 MATERIALS

A. Miscellaneous testing equipment as detailed.

### PART 3 EXECUTION

### 3.1 FIRE ALARM SYSTEM TESTING

- A. Make an inspection of the fire alarm system with the manufacturer's representative of the fire alarm equipment, including those components necessary to the direct operation of the system such as manual stations, thermal detectors, smoke detectors, flow switches and controls, whether or not manufactured by the manufacturer. The inspection to comprise examination and certification of such equipment for the following:
  - 1. The system functions properly;
  - 2. The type of equipment installed is that designated by the Engineer's specifications;
  - 3. The wiring connections to all equipment components have been installed in accordance with UL requirements;
  - 4. Equipment of the manufacturer has been installed in accordance with the manufacturer's recommendation and that all signaling devices of whatever manufacturer have been operated or tested to verify their operation: The supervisory wiring of those items of equipment connected to a supervised circuit is operating and that the regulations, if any, concerning such supervisory wiring, have been met to the satisfaction of inspecting officials.
- B. Inspection Certification: Upon completion of the inspection and when all of the above conditions have been complied with, the manufacturer is to issue to the Engineer:
  - 1. A copy of the inspecting technician's report showing location of each device and certifying the test results of each device.
  - 2. A certificate of verification confirming that the inspection has been completed and accepted by the authority having jurisdiction and showing the conditions upon which such inspection and certification have been rendered.
- C. Owners Instruction: The manufacturer to provide the services of a competent alarm system technician for the period of two working days, at a time convenient to the Owner, to instruct the staff in the operation and maintenance of the system.
- D. Provide a letter to the Owner and Fire Marshal certifying that the installed system is UL certified.

#### END OF SECTION

# THIS PAGE INTENTIALLY LEFT BLANK