PROJECT MANUAL

SUMMER 2020 PROJECTS
High School Locker Room Additions & Renovations
Elementary School Reroofing
Fire Alarm Replacement

EVERGREEN LOCAL SCHOOLS
14544 County Road 6
Metamora, Ohio 43540

April 21, 2020

Kraig A. Beilharz
Registered Architect #9482

BEILHARZ
ARCHITECTS
INCORPORATED

Project B7-4569

PROJECT MANUAL CONTENTS

PROCUREMENT AND CONTRACTING REQUIREMENTS

SPECIFICATIONS

GENERAL REQUIREMENTS

FACILITY CONSTRUCTION

Division 02 – Existing Conditions

Division 03 – Concrete

Division 04 – Masonry

Division 05 – Metals

Division 06 – Wood, Plastics, and Composites

Division 07 – Thermal and Moisture Protection

Division 08 – Openings

Division 09 – Finishes

09 2900 Gypsum Board
09 3013 Ceramic Tiling
09 5100 Acoustical Ceilings
09 6500 Resilient Flooring
09 6723 Resinous Flooring
09 6800 Carpeting
09 8100 Acoustic Insulation
09 9000 Painting and Coating

Division 10 – Specialties
10 1100 Visual Display Units
10 1402 Interior Signage
10 2117 Phenolic-Core Compartments
10 2800 Toilet and Bath Accessories
10 4400 Fire Protection Specialties
10 5113 Metal Lockers
10 5623 Wire Storage Shelving

Division 12 – Furnishings
12 6613 Telescoping Bleachers

FACILITY SERVICES

Division 21 – Fire Suppression
21 0500 Common Work Results for Fire Suppression
21 1100 Fire Suppression Piping
21 1300 Fire Suppression Sprinkler Systems

Division 22 – Plumbing
22 0500 Common Work Results for Plumbing
22 0529 Plumbing Hangers and Supports
22 0700 Plumbing Insulation
22 1000 Plumbing Piping
22 1116 Domestic Water Piping
22 1316 Sanitary Waste and Vent Piping
22 1400 Drainage Piping
22 2123 Natural Gas Piping
22 4000 Plumbing Fixtures

Division 23 – Heating, Ventilating, and Air Conditioning (HVAC)
Refer to Drawings

Division 26 – Electrical
Refer to Drawings

END OF CONTENTS

ADVERTISEMENT FOR BIDS

Sealed Bids will be received by Evergreen Local School District, 14544 County Road 6, Metamora, Ohio 43540 until **12:00 Noon, Tuesday, May 12, 2020**, when they will be opened and read, for the **Evergreen Local Schools Summer 2020 Projects**, in accordance with the Drawings and Specifications prepared by Beilharz Architects, Inc.

Pre-bid inspections will be available from 8:00 a.m. to Noon, Tuesday, April 28, 2020. Appointments for half-hour time slots may be made by contacting kraigb@beilharzarchitects.com.

Contract Documents may be reviewed without charge at various plan rooms obtaining documents and by appointment at the office of the Architect. Contract Documents may be purchased from Newfax Corporation, 333 W. Woodruff, Toledo, OH 43604, 419-241-5157 or 800-877-5157, www.newfaxcorp.com, at the cost of reproduction and shipping. Addenda will be distributed to registered plan holders only.

All bids must be accompanied by a Bid Guaranty in the form of either a Bid Guaranty and Contract Bond for the full amount of the bid (base bid plus all add alternates) or a certified check, cashier's check, or an irrevocable letter of credit in an amount equal to 10% of the bid (base bid plus all add alternates), in accordance with the Instructions to Bidders.

Each Contractor will be required to furnish an Affidavit of Contractor or Supplier on Non-Delinquency of Personal Property Tax (O.R.C. 5719.042).

No bidder may withdraw its bid for a period of 60 days after the opening thereof. The Owner reserves the right to waive irregularities in bids, to reject any or all bids, and to conduct such investigation as necessary to determine the responsibility of any bidder.

This notice is posted on the Board of Education's internet web site at evgvikings.org; click on "What's New".

Advertising Date: April 21, 2020.

INSTRUCTIONS TO BIDDERS

1. EXAMINATION OF CONTRACT DOCUMENTS AND PROJECT SITE:

A. Each Bidder shall visit the site prior to the bid date and shall be responsible for having ascertained pertinent local conditions such as location, accessibility, and general character of the site, the character and extent of the existing work within or adjacent to the site, and any other work being performed thereon at the time.

   1. Obtain all relevant information of conditions relating to transportation, handling and storage of materials, availability of electric power, utility company requirements, existing structures and equipment and all other facilities in the area which will impact the performance of work.

B. Each Bidder shall examine all Contract Documents for requirements which may affect the Bidder's Work in any way.

C. Failure of a Bidder to be acquainted with all available information will not be considered as a basis for additional compensation or extension of time, nor relief from responsibility for proper performance of the work.

D. Site visits may be arranged by contacting the Architect by email (kraigb@beilharzarchitects.com).

E. Bidders visiting the site must first check in at the school office at each building.

2. PROJECT SCHEDULE:

A. Refer to Section 01 1000 – Summary of Work.

3. BIDDERS' QUESTIONS:

A. Questions and technical communications during bidding should be directed to the Architect by email (architects@beilharzarchitects.com). Other communications of an administrative nature should be directed to the Architect by email (architects@beilharzarchitects.com). A list of bidders and plan holders will be posted on the Architect's web site at www.beilharzarchitects.com.

B. If a Bidder finds any perceived ambiguity, conflict, error, omission or discrepancy on or between any of the Contract Documents, submit a written request for interpretation or clarification to the Architect as directed above. Failure of a Bidder to make such request prior to bidding will result in rejection of claims for additional compensation or extension of time based on insufficiency of the Contract Documents.

C. Questions submitted later than 4 business days prior to the scheduled bid opening may not be answered.

D. Requests for Product Substitutions: Refer to Section 01 6000. Product substitution requests must be made by Prime Bidders only.

E. Information affecting all bidders will be distributed by written Addendum. The receipt of each Addendum shall be acknowledged in the space provided on the Bid Form. A list of Addenda issued will be posted on the Architect's web site at www.beilharzarchitects.com.

F. Statements made orally by the Architect or Owner, or in any form other than a written Addendum, will not be binding.

G. All Addenda will be issued, except as hereafter provided, and mailed or otherwise furnished to all plan holders of record, at least 72 hours prior to the published time for the opening of bids, excluding Saturdays, Sundays and legal holidays. If any Addendum is issued within such 72 hour period, then the time for opening of bids shall be extended one week with no further advertising of bids required.

H. If a Bidder fails to indicate receipt of all Addenda through the last Addendum issued by the Architect on its Bid Form, the bid of such Bidder will be deemed to be responsive only if:
   1. The bid received clearly indicates that the Bidder received the Addendum, such as where the Addendum added another item to be bid upon and the Bidder submitted a bid on that item; or
   2. The Addendum involves only a matter of form or is one which has either no effect or has merely a trivial or negligible effect on price, quantity, quality, or delivery of the item bid upon.

4. BID FORMS:

A. Submit bids in duplicate on Bid Forms issued with the bidding documents. Fill in all blank spaces, typewritten or in ink. Submit original Bid Forms as follows:
   1. Corporation: State full legal name of corporation and State of Incorporation; apply original signature of authorized officer or officers; type or print name and corporate title beneath each signature.
   2. Partnership: State the full names of all partners; apply original signature of authorized partner or other representative; type or print name and title beneath signature.
   3. Sole Proprietor: Apply original signature of bidder; type or print name and title beneath signature, followed by the words "Sole Proprietor".
   4. When requested by Owner, furnish evidence of agency or authority of any person signing on behalf of another.

B. Submit two originals, or one original and one photocopy, of all attachments to Bid Forms.

C. Submit only the Bid Forms and required attachments. Do not submit Project Manuals or sets of Drawings as part of the bid.

D. The bid will be rejected if it contains an alteration or erasure, unless alteration is made by crossing out without obscuring the original information, and the correct information

is printed in ink or typed adjacent thereto and initialed in ink by the person signing the bid.

E. The Bidder shall take the following precautions in preparing the bid:
   1. Sign the Bid Form and ensure that all blank spaces are filled in with requested information and that the Bid Guaranty is included in a sealed opaque envelope addressed as provided herein.
   2. Where the Bid Form provides for quoting either an addition or deduction for an Alternate item, indicate whether the sum named is an addition or deduction.
   3. Where the Bid Form provides for quoting a unit price, the Bidder should quote the unit price.
   4. When applicable, make sure that the Bid Guaranty is properly executed and signed by:
      a. The Bidder.
      b. The Surety or Sureties.
   5. Make sure that the amount of the Bid Guaranty is for a specific sum in an amount equal to the base bid amount plus all add alternates or is left blank.

5. MODIFICATION AND WITHDRAWAL OF BIDS:

A. Modification: A Bidder may modify its bid by written communication to the Owner at any time prior to the scheduled closing time for receipt of bids, provided such written communication is received by the Owner prior to the closing time. The written communication shall not reveal the bid price, but should provide the addition or subtraction or other modification so that the final prices or terms will not be known until the sealed bid is opened.

B. Withdrawal Prior to Bid Closing: Bids may be withdrawn pursuant to a written request submitted by Bidder or Bidder's agent and received by the Owner prior to the time fixed for closing of bids, without prejudice to the right of the Bidder to file a new bid. Withdrawn bids will be returned unopened. Negligence on the part of the Bidder in preparing a bid confers no right for withdrawal of bid after it has been opened.

C. Withdrawal After Bid Closing: A Bidder may withdraw its bid after the bid closing time when all of the following apply:
   1. The price bid was substantially lower than the other bids.
   2. The reason for the bid being substantially lower was a clerical mistake, rather than a mistake in judgment, and was due to an unintentional and substantial error in arithmetic or an unintentional omission of a substantial quantity of work, labor, or material.
   3. The bid was submitted in good faith.
   4. The Bidder provides written notice to the Owner within two business days after the bid opening for which the right to withdraw is claimed.

D. Bids shall remain valid and no bid may be withdrawn, except as permitted by applicable law, for a period of 60 days after the day set for the opening thereof, unless a longer period is stated on the Bid Form.

6. BID GUARANTY AND CONTRACT BOND:

A. Each bid shall be accompanied by a Bid Guaranty in one of the following forms, in the name of or payable to the order of the Owner. Any bid which is not accompanied by a completed Bid Guaranty in one of these forms will be considered "NO BID" and will be returned to the maker unrecorded.
   1. A completed Bid Guaranty and Contract Bond with a satisfactory Surety Company, on the form included in this Project Manual.
   2. A certified check, cashier's check, or irrevocable letter of credit made payable to the Owner in the amount of 10% of the maximum amount of the bid, including add alternates and excluding deduct alternates.
      a. The successful Bidder who, as a Bid Guaranty, submits a certified check, cashier's check, or irrevocable letter of credit in an amount equal to 10% of the amount of the bid, shall furnish to the Architect a Contract Bond as prescribed in Ohio Revised Code Section 153.57 in an amount equal to 100% of the Contract Sum, on the form included in this Project Manual, within 3 days of being notified of the Owner's intent to award the contract to the successful Bidder.

B. For purposes of these Instructions to Bidders, a satisfactory surety company for the issuance of either a Bid Guaranty and Contract Bond or a Contract Bond is a surety company ("Surety") authorized by the Ohio Department of Insurance to transact business in the State of Ohio. The bond must be issued by a Surety capable of demonstrating a record of competent underwriting, efficient management, adequate reserves, and sound investments. These criteria will be deemed to be met if the Surety currently has an A.M. Best Company Policyholders Rating of "A-" or better and has or exceeds the Best Financial Size Category of Class VI; other sureties may be determined acceptable by the Owner.

C. All bonds shall be signed by an authorized agent of an acceptable Surety and by the Bidder. Affix Corporate Seals to all copies. The name and address of the Surety and the name and address of the Surety's Agent must be typed or printed on each bond.

D. Surety bonds shall be supported by credentials showing the Power of Attorney of the agent including the monetary limit of the power, a certificate showing the legal right of the Surety to do business in the State of Ohio, and a financial statement of the Surety.

E. All bid securities, except those of the two lowest qualified bidders, will be returned to their makers within 10 days after bid opening. All such retained securities will be returned immediately after signing of the Contract by the successful bidder.

7. ATTACHMENTS TO BID FORM:

A. Out-of-State Corporations: Corporations incorporated in jurisdictions other than the state of Ohio shall submit with the bid a Certificate of Good Standing from the Ohio Secretary of State and the name and address of the Ohio Statutory Agent.

B. Hourly Rates and Markups: Each bidder shall submit the following on the form provided in the Project Manual. The Owner reserves the right to reject any bid not including this information. This data will be included by reference in the Owner-Contractor Agreement and shall form the basis for Change Order pricing and evaluation for this project.
   1. Hourly labor rates for each classification of labor performed by the Contractor's own forces.
   2. Hourly usage rates for each classification of construction equipment owned by the Contractor.
   3. Proposed percentage markup on materials, supplies, and equipment rentals. Refer to Section 01 2900 for limitations.
   4. Proposed percentage markup on subcontracts. Refer to Section 01 2900 for limitations.

8. BID OPENING:

A. Bids will be publicly opened and read aloud at the date, time, and place stated in the Advertisement for Bids.

B. Bid results will not be available from the Architect for at least 24 hours after the bid opening, excluding weekends and holidays.

9. BID EVALUATION CRITERIA:

A. The Owner reserves the right to reject all bids or any bid, and to award the Contract to the lowest responsible Bidder as determined by the Owner. The Owner also reserves the right to reject any alternate prices for additions to, or deductions from, the Base Bid, or to accept any or all of such alternate prices in any order.

B. The Owner reserves the right to waive, or allow any Bidder a reasonable opportunity to cure, a minor irregularity or technical deficiency in a bid, provided the amount of the bid is not affected and the Bidder does not thereby gain a competitive advantage.

C. Factors which may be considered by the Owner in evaluating bids may include, without limitation:
   1. Whether the bid responds to the Contract Documents in all material respects. Noncompliance with any requirement of the Contract Documents may cause a bid to be rejected.
   2. The experience, financial condition, bonding experience, licenses and certifications of the Bidder.
   3. The conduct and performance of the Bidder on previous contracts, including compliance with applicable laws, rules, and regulations.
   4. The management skills of the Bidder, and the ability of the Bidder to perform the Work in accordance with the Contract Documents.
   5. The experience and capabilities of the Bidder's key personnel and subcontractors to be employed on the Project.
   6. The equipment and facilities of the Bidder.

7. Additional factors as the Owner may determine to be appropriate.

D. The Owner may obtain from the lowest Bidder, and such other Bidders determined to be appropriate, any information determined to be relevant to the consideration of the above factors. The Owner may also obtain such information from, and verify such information with, third parties as may be considered relevant. By submitting a bid, each Bidder authorizes the Owner to obtain relevant third party information including, but not limited to, references and credit reports.

E. Each Bidder's information will be considered separately and not comparatively. If the lowest Bidder is determined not to be responsible, the bid will be rejected and the Bidder will be notified of such action. Each next lowest Bidder will then be considered in sequence until the Contract is awarded or all bids are rejected.

F. By submitting its bid, the Bidder agrees that the Owner's determination of responsiveness and responsibility shall be final and conclusive, and that if the Bidder, or any person at the Bidder's urging, directly or indirectly challenges such determination in any legal proceeding and such challenge is not successful, the Bidder will reimburse the Owner for all legal fees and expenses incurred by the Owner that are related to such challenge, including the cost of collection.

G. The Owner further reserves the right to disqualify bids, before or after opening, upon evidence of collusion with intent to defraud or other illegal practices on the part of the Bidder.

H. The Bidder acknowledges that although there is an estimate for the cost of the Project, the market conditions may and frequently do result in the estimate being different from the sum of the bids received, either higher or lower. The Bidder understands that the Owner has included alternates, which may include deduct alternates as well as add alternates, to give it the flexibility in building the Project with the funds that are available. The Bidder further understands and acknowledges that use of add and deduct alternates is a long held customary practice in the construction industry in the State of Ohio. The Bidder also acknowledges that the Owner will not make a decision about what alternates on which to base the award of contracts until the bids are received, and the Owner can compare its available funds with the base bids and the cost or savings from selecting different alternates. The Bidder understands that the award to the lowest responsible and responsive Bidder will be based on the lowest base bid plus selected alternates, and may result in an award to a Bidder other than the Bidder that submitted the lowest base bid. Refer to Section 01 2300 for further provisions related to Alternates.

10. REGULATORY REQUIREMENTS:

A. Sales and Use Taxes: Refer to Section 01 4000.

B. Statement of Personal Property Tax Status: After award of contract, and as a condition of entering into the contract, the successful bidder shall submit an Affidavit of Personal

Property Taxes disclosing the amount, if any, of delinquent personal property taxes on the general tax list of personal property of any county in which the Owner has territory.

11. EXECUTION OF CONTRACT:

A. Notice of Intent to Award Contract. The successful Bidder will be notified of the award of the contract and provided with three copies of the Agreement between Owner and Contractor ("Agreement") in the form described in the Project Manual.

B. The successful Bidder shall sign and return the original forms to the Owner, or as otherwise directed, for execution by the Owner. The contract will be submitted to the Owner at its next regularly scheduled Board meeting for approval by the Owner. The successful Bidder will be provided with a fully executed copy of the Agreement for its records.

C. If the successful Bidder does not return the executed contracts to the Owner within 5 business days of its receipt of the contracts from the Owner, the Owner reserves the right to reject the bid and award the contract to the next low responsible Bidder.

12. EQUAL EMPLOYMENT OPPORTUNITY/NONDISCRIMINATION:

A. Minority, female, and disadvantaged businesses will be afforded full opportunity to submit bids, and Bidders will not be discriminated against on the grounds of race, color, religion, sex, age, handicap, ancestry, or national origin in the consideration of an award. The successful Bidder(s) shall include a provision in any subcontract entered into for the Project that requires that each of its Subcontractors not discriminate against any employee or applicant for employment on the basis of race, religion, color, sex, age, handicap, ancestry, or national origin in any actions that it takes. Such actions include, without limitation, employment, upgrading, demotion, transfer recruitment or recruiting advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeships.

END OF DOCUMENT

AVAILABLE INFORMATION

1. GENERAL REQUIREMENTS:

A. The information described herein is made available as a convenience to bidders and does not relieve any bidder from the responsibility of investigating the accuracy and completeness of the information provided.

B. By making this information available to bidders, neither Owner nor Architect make any warranty nor assume any liability relating thereto.

C. The information described herein is specifically excluded from the Contract Documents.

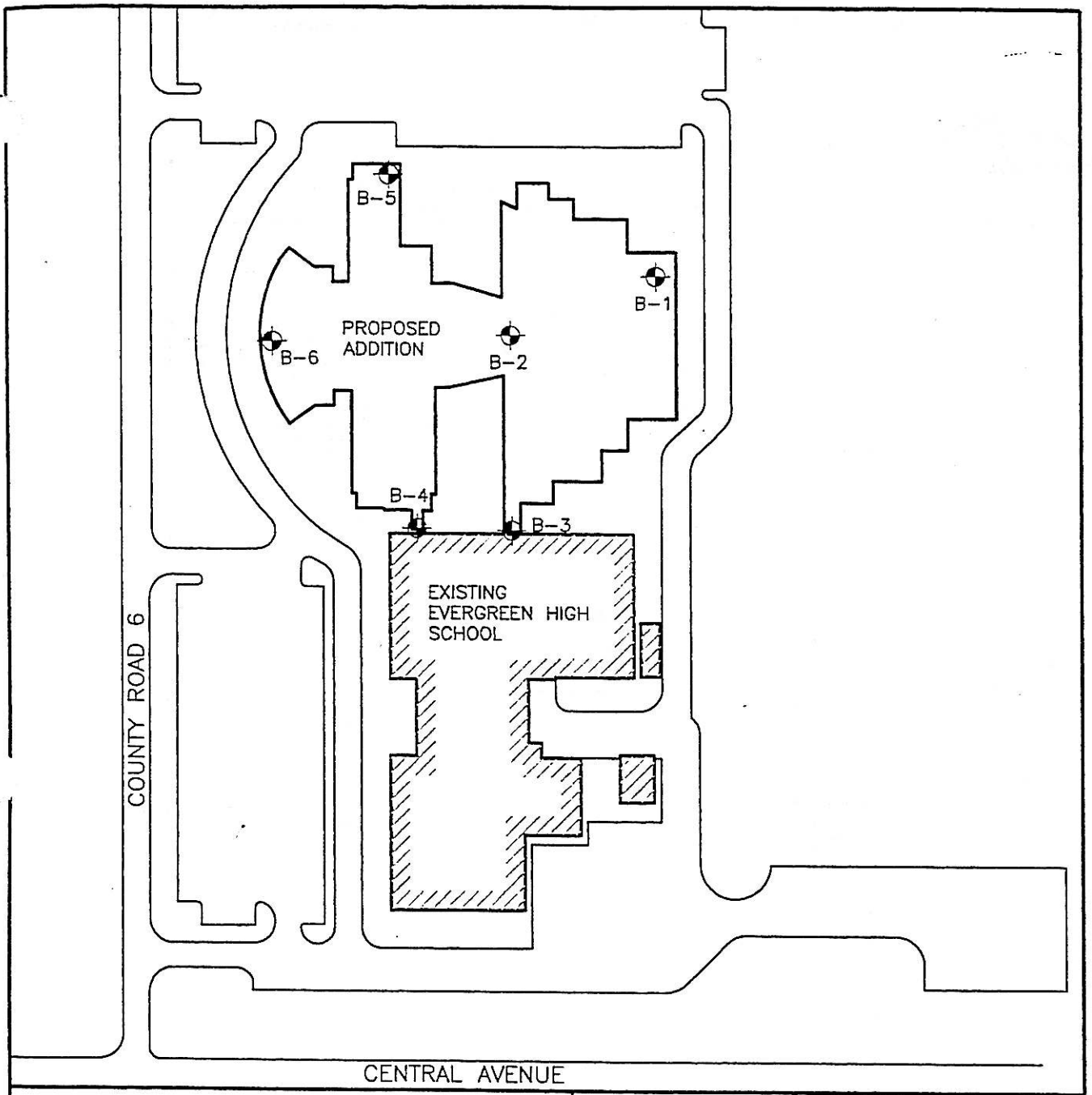
2. GEOTECHNICAL DATA:

A. A partial geotechnical report, including soil boring data, follows this document.

B. Contractors may rely upon the accuracy of the technical data contained in this report, but not upon non-technical data, interpretations, or opinions contained therein.

C. Contractor shall assume full responsibility with respect to subsurface conditions at the site.

END OF DOCUMENT



TEST BORING LOCATION
B-1

N

NOT TO SCALE

PLATE 1.0
TEST BORING LOCATION PLAN
EVERGREEN HIGH SCHOOL ADDITION
14544 COUNTY ROAD 6
METAMORA, OHIO

DRAWN WBR/4-27-00	CHECKED
REVISED	APPROVED
JOB NO. 39674.01	
DRAWING NUMBER 39674-01G	TOLTEST, INC.

4.0 GENERAL SITE AND SUBSURFACE CONDITIONS

4.1 General Site Conditions

The following surface materials were encountered at the boring locations. Boring B-1 encountered 14-inches of crushed stone. Borings B-2 and B-5 encountered 6-inches and 8-inches of crushed stone overlying 2.3 feet and 0.5 feet of soil fill, respectively. Borings B-3 and B-4 contained 3-inches and 4-inches of asphalt pavement overlying 9-inches and 4-inches of crushed stone, respectively and Boring B-6 encountered 13 inches of topsoil.

4.2 General Soil Conditions

In general, the borings encountered two strata below the surface materials. The stratigraphy encountered in each of the borings is presented on the Logs of Test Borings (Figures 1 – 7).

Stratum I consists of brown lean clay with varying amounts of sand and gravel to depths ranging from approximately 11 to 13 feet. In Boring B-3 this Stratum extended to a depth of 18 feet. Standard Penetration Test (SPT) resistances (N-values) ranged from 4 to 32 blows per foot (bpf), with an average value of approximately 16 bpf. These values are indicative of soils with soft to hard consistency. The natural moisture contents of this stratum ranged from 14 to 25 percent, with an average of approximately 17 percent. Atterberg Limits tests performed on samples B-2 (ST-1) and B-6 (ST-1) indicated a Liquid Limit of 28 and a Plasticity Index of 12 for both samples tested. These values correspond to "CL" type soils, in accordance with the Unified Soil Classification System (USCS).

Underlying Stratum I, **Stratum II** was encountered and consisted of grey lean clay with varying amounts of sand and gravel. The SPT N-values ranged from 14 to 24 bpf with an average value of approximately 18 bpf. These values are indicative of soils with stiff to very stiff consistency. The moisture contents of this stratum ranged from 13 to 15 percent, with an average of approximately 14 percent. These soils are classified as "CL" type soils in accordance with the USCS.

Borings B-1 through B-6 were advanced to the planned termination depth of 20 feet.

4.3 Groundwater Conditions

Groundwater was not encountered during drilling or upon completion of drilling operations. It should be noted that the borings were drilled and backfilled within the same day, and stabilized water levels may not have occurred over this limited time period.

Based on soil characteristics and coloration in the native soils encountered in the borings, it is our opinion that the "normal" groundwater table will generally be encountered at a depth of 10 to 12 feet below the ground surface. However, significant seepage into short-term excavations is not expected due to the predominantly clay profile. It should be noted that groundwater levels will tend to fluctuate with seasonal and climatic influences. Therefore, groundwater levels may vary from those encountered during this investigation at different times of the year.

LOG OF TEST BORING

Boring No.: B-1

TolTest, Inc.

Project: Evergreen High School Addition

Project Location: Metamora, OH

TolTest Project No.: 39674.01

Boring Location: See Plate 1.0

Drill Date: 4/1/00

Ground Surface Elev.: N/A

Depth	Material Description	Strata	Sample Type	Sample Number	Blows per 6"	N-Value	Recovery (inches)	Dry Density (pcf)	Unconfined Comp. Strength (psf)	Moisture Content Percent (10 20 30 40 50) / SPT N-Value Blows Per Foot (10 20 30 40 50)
	CRUSHED STONE - 14 Inches									
1										
2	Moist Stiff Grey/Brown LEAN CLAY w/Sand (CL)			SS-1	2-3-6	9	18		*6000	16.4
3										
4	Moist Medium Stiff Brown LEAN CLAY w/Sand and Trace Gravel (CL)			SS-2	4-4-4	8	18	108.7	4860	20.2
5										
6										
7	Moist Stiff Brown LEAN CLAY w/Trace Sand and Gravel (CL)			SS-3	5-6-7	13	18		*6750	16.4
8	-Very Damp Very Stiff w/Sand									
9				SS-4	5-8-13	21	18	119.7	12445	14.5
10										
11										
12										
13	-Stiff Grey									
14				SS-5	3-6-8	14	18		*7500	14
15										
16										
17										
18										
19	-Very Stiff			SS-6	5-7-9	16	18		*9000+	13.6
20										
	Bottom of Boring									
21										

WATER LEVEL OBSERVATIONS

Initial: None

At Completion: None

After Completion: None

Water Used In Drilling: N/A

NOTES: "*" - Unconfined Strengths were derived
- from a calibrated pocket penetrometer.
-
-
-

Rig No.: 550

Drillers: TB/JW

Drill Method: 2 3/4" HSA

Sampling Method: SS

Figure No.: 1

LOG OF TEST BORING

Boring No.: B-5

TolTest, Inc.

Project: Evergreen High School Addition

Project Location: Metamora, OH

TolTest Project No.: 39674.01

Boring Location: See Plate 1.0

Drill Date: 4/1/00

Ground Surface Elev.: N/A

Depth	Material Description	Strata	Sample Type	Sample Number	Blows per 6"	N-Value	Recovery (inches)	Dry Density (pcf)	Unconfined Comp. Strength (psf)	Moisture Content Percent (10 20 30 40 50) / SPT N-Value Blows Per Foot (10 20 30 40 50)
	CRUSHED STONE - 8 Inches									
1	FILL - Very Moist Loose Brown POORLY GRADED SAND									
2	Moist Medium Stiff Brown LEAN CLAY w/Sand and Trace Gravel (CL)			SS-1	2-3-4	7	18		*5000	19.7
3										
4	Moist Very Stiff Brown LEAN CLAY w/Sand and Trace Gravel (CL)			SS-2	5-8-10	18	18	117.8	12265	15.2
5										
6										
7				SS-3	6-6-10	16	18		*9000+	15.1
8										
9				SS-4	6-11-15	26	18		*9000+	14.5
10										
11										
12	-Grey									
13										
14				SS-5	5-8-11	19	18		*9000+	13.8
15										
16										
17										
18										
19				SS-6	4-8-12	20	18		*9000+	13.1
20										
	Bottom of Boring									
21										

TER LEVEL OBSERVATIONS

al: None

Completion: None

er Completion: None

ter Used In Drilling: N/A

NOTES: "*" - Unconfined Strengths were derived
- from a calibrated pocket penetrometer.
-
-
-

Rig No.: 550

Drillers: TB/JW

Drill Method: 2 3/4" HSA

Sampling Method: SS

Figure No.: 5

COMBINED BID FORM

(Submit two copies of Bid Form and all attachments)

ITEMS:
- ☐ High School Locker Room Work
- ☐ Elementary School Reroofing Work
- ☐ Fire Alarm Replacement Work

☐ The undersigned Bidder does not wish to be considered for the award of any of the individual contract items included in the Combined Bid. Submit only this Bid Form.

☐ The undersigned Bidder does wish to be considered for the award of individual contract items included in the Combined Bid. Submit this Bid Form and attach separate Bid Forms for each contract item to be considered individually.

BIDDER: _____

PROJECT:
Evergreen Local Schools
Summer 2020 Projects

BIDS DUE AT:
Evergreen Local Schools
14544 County Road 6
Metamora OH 43540

BIDS DUE BY: Tuesday, May 12, 2020, 12:00 Noon EDT

Having read the bid documents and specifications and examined the drawings prepared by the Architect, Beilharz Architects, Inc., Defiance, Ohio, for the item of work described above, and having inspected the site and the conditions affecting and governing the construction of the said project, and acknowledging that the bid documents, specifications and drawings are adequate for the performance of the Work, the undersigned hereby proposes to furnish all materials and perform all labor, as described in the specifications and shown on the drawings, for the following sum. Bid shall be good for 60 days.

BASE BID:
Complete Work as Indicated Above for the Stipulated Sum of $_____

ALTERNATE 1.1:
Bleacher Seating ..... ADD $_____

ALTERNATE 1.2:
Restroom E113 Fixtures ..... ADD $_____

ALTERNATE 1.3:
Gymnasium Rooftop Units ..... ADD $_____

ALTERNATE 2.1:
Additional Insulation ..... ADD $_____

ALTERNATE 2.2:
A. Membrane Upgrade, White ..... ADD $_____

B. Membrane Upgrade, Black ..... ADD $_____

ALTERNATE 2.3:
Gutter Replacement ..... ADD $_____

UNIT COST BID 2.1:

Roof Insulation Replacement ..... ADD $_____/ Sq. Ft.

ALTERNATE 3.1:

New Fire Alarm Wiring ..... ADD $_____

Fire Alarm Substantial Completion (Elementary School) ..... _____

Fire Alarm Substantial Completion (Middle/High School) ..... _____

Addenda received and included in this Bid: No. _____, _____, _____, _____, _____.

☐ All Allowances identified in Section 01 2100 are included in the Base Bid amount.

Attachments to Bid Form (submit 2 copies):

- ☐ Bid Guaranty and Contract Bond (or certified check)
- ☐ Out-of-State Corporation Information
- ☐ Hourly Rates and Markups

SIGNED:

_____	_____
(Signature)	(Name of Company or Corporation)
_____	_____
(Printed Name)	(Business Address)
_____	_____ _____
(Title)	(Date of Signature) (Phone)

BID FORM

(Submit two copies of Bid Form and all attachments)

ITEM: **HIGH SCHOOL LOCKER ROOM WORK**

BIDDER: _____

PROJECT:
Evergreen Local Schools
Summer 2020 Projects

BIDS DUE AT:
Evergreen Local Schools
14544 County Road 6
Metamora OH 43540

BIDS DUE BY: **Tuesday, May 12, 2020, 12:00 Noon EDT**

Having read the bid documents and specifications and examined the drawings prepared by the Architect, Beilharz Architects, Inc., Defiance, Ohio, for the item of work described above, and having inspected the site and the conditions affecting and governing the construction of the said project, and acknowledging that the bid documents, specifications and drawings are adequate for the performance of the Work, the undersigned hereby proposes to furnish all materials and perform all labor, as described in the specifications and shown on the drawings, for the following sum. Bid shall be good for 60 days.

BASE BID:

Complete High School Locker Room Work
for the Stipulated Sum of ..... $_____

ALTERNATE 1.1:

Bleacher Seating ..... ADD $_____

ALTERNATE 1.2:

Restroom E113 Fixtures ..... ADD $_____

ALTERNATE 1.3:

Gymnasium Rooftop Units ..... ADD $_____

Addenda received and included in this Bid: No. _____, _____, _____, _____, _____.

☐ All Allowances identified in Section 01 2100 are included in the Base Bid amount.

Attachments to Bid Form (submit 2 copies):

- ☐ Bid Guaranty and Contract Bond (or certified check)
- ☐ Out-of-State Corporation Information
- ☐ Hourly Rates and Markups

SIGNED: _____ _____
(Signature) (Name of Company or Corporation)

_____ _____
(Printed Name) (Business Address)

_____ _____ _____
(Title) (Date of Signature) (Phone)

BID FORM

(Submit two copies of Bid Form and all attachments)

ITEM: **ELEMENTARY SCHOOL REROOFING WORK**

BIDDER: _____

PROJECT:
Evergreen Local Schools
Summer 2020 Projects

BIDS DUE AT:
Evergreen Local Schools
14544 County Road 6
Metamora OH 43540

BIDS DUE BY: **Tuesday, May 12, 2020, 12:00 Noon EDT**

Having read the bid documents and specifications and examined the drawings prepared by the Architect, Beilharz Architects, Inc., Defiance, Ohio, for the item of work described above, and having inspected the site and the conditions affecting and governing the construction of the said project, and acknowledging that the bid documents, specifications and drawings are adequate for the performance of the Work, the undersigned hereby proposes to furnish all materials and perform all labor, as described in the specifications and shown on the drawings, for the following sum. Bid shall be good for 60 days.

BASE BID:

Complete Elementary School Reroofing Work
for the Stipulated Sum of ..... $_____

ALTERNATE 2.1:

Additional Insulation ..... ADD $_____

ALTERNATE 2.2:

A. Membrane Upgrade, White ..... ADD $_____

B. Membrane Upgrade, Black ..... ADD $_____

ALTERNATE 2.3:

Gutter Replacement ..... ADD $_____

UNIT COST BID 2.1:

Roof Insulation Replacement ..... ADD $_____/ Sq. Ft.

Addenda received and included in this Bid: No. _____, _____, _____, _____, _____.

Attachments to Bid Form (submit 2 copies):

- ☐ Bid Guaranty and Contract Bond (or certified check)
- ☐ Out-of-State Corporation Information
- ☐ Hourly Rates and Markups

SIGNED:

_____ (Signature)	_____ (Name of Company or Corporation)
_____ (Printed Name)	_____ (Business Address)
_____ (Title)	_____ (Date of Signature) _____ (Phone)

BID FORM

(Submit two copies of Bid Form and all attachments)

ITEM: **FIRE ALARM REPLACEMENT WORK**

BIDDER: _____

PROJECT:
Evergreen Local Schools
Summer 2020 Projects

BIDS DUE AT:
Evergreen Local Schools
14544 County Road 6
Metamora OH 43540

BIDS DUE BY: **Tuesday, May 12, 2020, 12:00 Noon EDT**

Having read the bid documents and specifications and examined the drawings prepared by the Architect, Beilharz Architects, Inc., Defiance, Ohio, for the item of work described above, and having inspected the site and the conditions affecting and governing the construction of the said project, and acknowledging that the bid documents, specifications and drawings are adequate for the performance of the Work, the undersigned hereby proposes to furnish all materials and perform all labor, as described in the specifications and shown on the drawings, for the following sum. Bid shall be good for 60 days.

BASE BID:

Complete Fire Alarm Work for the Stipulated Sum of ..... $_____

ALTERNATE 3.1:

New Fire Alarm Wiring ..... ADD $_____

Fire Alarm Substantial Completion (Elementary School) ..... _____

Fire Alarm Substantial Completion (Middle/High School) ..... _____

Addenda received and included in this Bid: No. _____, _____, _____, _____, _____.

Attachments to Bid Form (submit 2 copies):

- ☐ Bid Guaranty and Contract Bond (or certified check)
- ☐ Out-of-State Corporation Information
- ☐ Hourly Rates and Markups

SIGNED: _____ _____
(Signature) (Name of Company or Corporation)

_____ _____
(Printed Name) (Business Address)

_____ _____ _____
(Title) (Date of Signature) (Phone)

BID GUARANTY AND CONTRACT BOND

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned,

_____
(Name and Address of Contractor)

as Principal and _____
(Name of Surety)

as Surety, are hereby held and firmly bound unto the Board of Education of Evergreen Local School District, hereinafter called the Obligee, in the penal sum of the dollar amount of the bid submitted by the Principal to the Obligee on _____
(Date)

to undertake the project known as: _____

_____ .

The penal sum referred to herein shall be the dollar amount of the Principal's bid to the Obligee, incorporating any additive or deductive alternate proposals made by the Principal on the date referred to above to the Obligee, which are accepted by the Obligee. In no case shall the penal sum exceed the amount of

_____ Dollars ($_____).

(If the above line is left blank, the penal sum will be the full amount of the Principal's bid, including add alternates. Alternatively, if completed, the amount stated must not be less than the full amount of the bid, including add alternates, in dollars and cents. A percentage is not acceptable.)

For the payment of the penal sum well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that whereas the above named Principal has submitted a bid on the above referred project:

NOW, THEREFORE, if the Obligee accepts the bid of the Principal and the Principal fails to enter into a proper contract in accordance with the bid, plans, details, specifications and bills of material; and in the event the Principal pays to the Obligee the difference not to exceed ten percent of the penalty hereof between the amount specified in the bid and such larger amount for which the Obligee may in good faith contract with the next lowest bidder to perform the work covered by the bid; or in the event the Obligee does not award the contract to the next lowest bidder and resubmits the project for bidding, the Principal will pay the Obligee the difference not to exceed ten percent of the penalty hereof between the amount specified in the bid, or the costs, in connection with the resubmissions, of printing new contract documents, required advertising and printing and mailing notices to prospective bidders, whichever is less, then this obligation shall be void, otherwise to remain in full force and effect. If the Obligee accepts the bid of the Principal and the Principal within ten days after the awarding of the contract, enters into a proper contract in accordance with the bid, plans, details, specifications and bills of material, which said contract is made a part of this bond the same as though set forth herein; and

IF THE SAID Principal shall well and faithfully perform each and every condition of such contract; and indemnify the Obligee against all damage suffered by failure to perform such contract according to the provisions thereof and in accordance with the plans, details, specifications and bills of material therefor; and shall pay all lawful claims of subcontractors, materialmen, and laborers, for labor performed and materials furnished in the carrying forward, performing or completing of said contract; we agreeing and assenting that this undertaking shall be for the benefit of any materialman or laborer having a just claim, as well as for the Obligee herein; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

THE SAID Surety hereby stipulates and agrees that no modifications, omissions, or additions, in or to the terms of said contract or in or to the plans and specifications therefor shall in any ways affect the obligations of said Surety on this bond, and it does hereby waive notice of any such modifications, omissions or additions to the terms of the contract or to the work or to the specifications.

SIGNED AND SEALED this _____ day of _____ , _____ .

PRINCIPAL:

_____
(Name of Company or Corporation)

_____
(Street Address)

_____
(City, State, ZIP)

By: _____
(Signature)

_____
(Printed Name)

_____
(Title)

SURETY:

_____
(Name of Company or Corporation)

_____
(Street Address)

_____
(City, State, ZIP)

By: _____
(Signature of Attorney-in-Fact)

_____
(Printed Name)

_____
(Agency Name)

_____
(Street Address)

_____
(City, State, ZIP)

_____
(Telephone Number)

_____
(Fax Number)

_____
(Email)

HOURLY RATES AND MARKUPS

(Attach additional sheets if needed)

BIDDER: _____

LABOR RATES:

Classification	Hourly Rate

EQUIPMENT RATES:

Classification	Hourly Rate

MARKUPS:

(including overhead and profit; maximum 10 percent add, minimum 5 percent deduct)

	Add Change Orders	Deduct Change Orders
Materials and Supplies:	%	%
Equipment Rental:	%	%
Subcontracts:	%	%

CONTRACT BOND
(O.R.C. § 153.57)

INSTRUCTIONS: The Contract Bond form is to be used ONLY by a bidder that is determined to be the lowest responsible bidder and that submits a form of bid guaranty other than the combined Bid Guaranty and Contract Bond with its bid. If a bidder submits a combined Bid Guaranty and Contract Bond, then the bid guaranty becomes the contract bond when the contract is awarded.

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned, _____

_____
(Name and Address of Contractor)

as Principal and _____
(Name of Surety)

as Surety, are hereby held and firmly bound unto the Board of Education of the Evergreen Local School District, Fulton County, Ohio, as Obligee, in the penal sum of _____

_____ Dollars ($_____),
for the payment of which well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that whereas the above named Principal did on the _____ day of _____, 20___, enter into a contract with the Board of Education of the Evergreen Local School District, Fulton County, Ohio, for the

_____ Bid Package(s)

in connection with the construction of _____,
(Project)
which said contract is made a part of this bond the same as though set forth herein;

Now, if the said Contractor shall well and faithfully do and perform the things agreed by the Contractor to be done and performed according to the terms of said contract; and shall pay all lawful claims of subcontractors, materialmen, and laborers, for labor performed and materials furnished in the carrying forward, performing, or completing of said contract; we agreeing and assenting that this undertaking shall be for the benefit of any materialman or laborer having a just claim, as well as for the Obligee herein; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

The said Surety hereby stipulates and agrees that no modifications, omissions, or additions, in or to the terms of said contract or in or to the plans and specifications therefor shall in any wise affect the obligations of said Surety on its bond, and does hereby waive notice of any

such modifications, omissions or additions to the terms of the contract or to the work or to the specifications.

SIGNED AND SEALED this _____ day of _____ , _____ .

PRINCIPAL:

_____
(Name of Company or Corporation)

_____
(Street Address)

_____
(City, State, ZIP)

By: _____
(Signature)

_____
(Printed Name)

_____
(Title)

SURETY:

_____
(Name of Company or Corporation)

_____
(Street Address)

_____
(City, State, ZIP)

By: _____
(Signature of Attorney-in-Fact)

_____
(Printed Name)

_____
(Agency Name)

_____
(Street Address)

_____
(City, State, ZIP)

_____
(Telephone Number)

_____
(Fax Number)

_____
(Email)

AFFIDAVIT OF CONTRACTOR OR SUPPLIER ON NON-DELINQUENCY OF PERSONAL PROPERTY TAX

O.R.C. 5719.042

STATE OF OHIO

TO: Evergreen Local School District
Defiance, Ohio 43512

The undersigned, being first duly sworn, having bid on a contract by you for

_____
(Name of Project)

hereby states that we are not charged at the time the bid was submitted with any delinquent personal property taxes on the general tax list of personal property of any county in which you as a taxing district have territory and that we were not charged with delinquent personal property taxes on any such tax list.

In consideration of the award of the above contract, the above statement is incorporated in said contract as a covenant of the undersigned.

_____
(Name of Company or Corporation)

_____
(Street Address)

_____
(City, State, ZIP)

By: _____
(Signature)

_____
(Printed Name)

_____
(Title)

Sworn to before me and subscribed in my presence this _____ day of _____, 20 ____.

_____
(Notary Public)

My commission expires:

_____

APPLICATION AND CERTIFICATE FOR PAYMENT

TO OWNER: **Evergreen Local Schools**
14544 County Road 6
Metamora OH 43540

PROJECT: **Evergreen Local Schools**
Summer 2020 Projects
Metamora OH 43540

APPLICATION NO:
PERIOD TO:
ARCHITECT'S PROJECT NO: **B7-4569**

FROM CONTRACTOR:

VIA ARCHITECT: **Beilharz Architects, Inc.**
701½ West First Street
Defiance, OH 43512

CONTRACT FOR:
CONTRACT DATE:

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
Schedule of Values, Document G703, is attached.

1. **ORIGINAL CONTRACT SUM** $ _____
2. **CHANGE ORDERS**
   a. Changes Approved in Previous Months $ _____
      C.O. # _____
   b. Changes Approved This Month $ _____
      C.O. # _____
   c. **Net change by Change Orders** $ _____
3. **CONTRACT SUM TO DATE** (Line 1 + Line 2c) $ _____
4. **WORK COMPLETED TO DATE**
   a. Labor Completed to Date $ _____
   b. Material Completed to Date $ _____
   c. Stored Material $ _____
   d. **Total Completed and Stored to Date** $ _____
   e. Percent Complete (Line 4d/Line 3) _____ %
5. **RETAINAGE**
   a. Completed Labor (8% of Line 4a) $ _____
      (same as previous application if Line 4e on previous application is >50%)
   b. Stored Material (8% of Line 4c) $ _____
   c. **Total Retainage** $ _____
6. **TOTAL EARNED LESS RETAINAGE** $ _____
   (Line 4d less Line 5c)
7. **LESS PREVIOUS CERTIFICATES FOR PAYMENT**
   (Line 6 from prior Certificate) $ _____
8. **CURRENT PAYMENT DUE**
   (Line 6 less Line 7) $ _____
9. **BALANCE TO FINISH, INCLUDING RETAINAGE**
   (Line 3 less Line 6) $ _____

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:
By: _____ Date: _____
State of Ohio
County of: _____
Subscribed and sworn to before me
this _____ day of _____, 20_____

Notary Public:
My Commission expires:

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED $ _____
(Attach explanation if amount certified differs from amount applied for. Initial all figures on this Application and on the Continuation Sheet that are changed to conform to the amount certified.)

Beilharz Architects, Inc.

By: _____ Date: _____
This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

SCHEDULE OF VALUES

CONTRACTOR:
CONTRACT FOR:

APPLICATION NO:
APPLICATION DATE:

PROJECT: **Evergreen Local Schools**
ARCHITECT'S PROJECT NO: **B7-4569**

SECTION NO.	DESCRIPTION OF WORK	LABOR					MATERIALS						TOTAL COMPLETED AND STORED TO DATE	%
		SCHEDULED VALUE	WORK COMPLETED		TOTAL COMPLETED TO DATE	%	SCHEDULED VALUE	WORK COMPLETED		TOTAL COMPLETED TO DATE	%	MATERIALS PRESENTLY STORED		
			PREVIOUS APPLICATION	THIS PERIOD				PREVIOUS APPLICATION	THIS PERIOD					
00 6113	**Bonds**													
00 7200	**Insurance**													
01 1000	**General Requirements**													
01 2100	**Allowances**													
01 3300	**Submittals**													
01 7000	**Progress Cleaning**													
01 7700	**Final Cleaning**													
01 7700	**Punch List Work**													
01 7700	**Project Record Submittals**													
01 7700	**Training**													
	SHEET TOTALS													
	PROJECT TOTALS													

SCHEDULE OF VALUES

CONTRACTOR:
CONTRACT FOR:

APPLICATION NO:
APPLICATION DATE:

PROJECT: **Evergreen Local Schools**
ARCHITECT'S PROJECT NO: **B7-4569**

SECTION NO.	DESCRIPTION OF WORK	LABOR					MATERIALS						TOTAL COMPLETED AND STORED TO DATE	%
		SCHEDULED VALUE	WORK COMPLETED		TOTAL COMPLETED TO DATE	%	SCHEDULED VALUE	WORK COMPLETED		TOTAL COMPLETED TO DATE	%	MATERIALS PRESENTLY STORED		
			PREVIOUS APPLICATION	THIS PERIOD				PREVIOUS APPLICATION	THIS PERIOD					
	SHEET TOTALS													
	PROJECT TOTALS													

STATE OF OHIO
DEPARTMENT OF TAXATION
CONSTRUCTION CONTRACT EXEMPTION CERTIFICATE

Identification of Contract:

Contractee's (Owner's) name: Evergreen Local School District

Exact location of job/project: 14544 County Road 6 (High School) and 14844 County Road 6 (Elementary School), Metamora OH 43540

Name of job/project as it appears on contract documentation: Evergreen Local Schools Summer 2020 Projects

The undersigned hereby certifies that the tangible personal property purchased under this exemption certificate was purchased for incorporation into:

- ☒ real property under a construction contract with the United States government, its agencies, the State of Ohio, or an Ohio political subdivision.
- ☐ real property which is owned, or will be accepted for ownership at the time of completion, by the United Stales government, its agencies, the State of Ohio, or an Ohio political subdivision.
- ☐ a house of public worship or religious education.
- ☐ a building used exclusively for charitable purposes by a nonprofit organization operated exclusively for charitable purposes as defined in section 5739.02(B)(12) of the Revised Code.
- ☐ the original construction of a sports facility under section 307.696 of the Revised Code.
- ☐ a hospital facility entitled to exemption under section 140.08 of the Revised Code.

The original of this certificate must be signed by the owner/contractee and/or government official and must be retained by the prime contractor. Copies must be maintained by the owner/contractee and all subcontractors. When copies are issued to suppliers when purchasing materials, each copy must be signed by the contractor or subcontractor making the purchase.

Prime Contractor		**Owner/Contractee**	
Name		Name	Evergreen Local School District
Signed by		Signed by	
Title		Title	
Address		Address	14544 County Road 6
City, State, Zip		City, State, Zip	Metamora OH 43540
Date		Date	
Subcontractor		**Political Subdivision**	
Name		Name	same as Owner
Signed by		Signed by	
Title		Title	
Address		Address	
City, State, Zip		City, State, Zip	
Date		Date	

CONTRACTOR'S AFFIDAVIT OF PAYMENT OF DEBTS AND CLAIMS AND RELEASE OF LIENS

OWNER:	**Evergreen Local Schools** **14544 County Road 6** **Metamora OH 43540**	PROJECT:	**Evergreen Local Schools** **Summer 2020 Projects**
		ARCHITECT'S PROJECT NO:	**B7-4569**
		CONTRACT FOR:	
ATTN:		CONTRACT DATE:	

STATE OF: _____

COUNTY OF: _____

The undersigned hereby certifies that, except as listed below, payment has been made in full and all obligations have otherwise been satisfied for all materials and equipment furnished, for all work, labor, and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Contract referenced above for which the Owner or Owner's property might in any way be held responsible or encumbered.

EXCEPTIONS:

The undersigned hereby futher certifies that to the best of the undersigned's knowledge, information and belief, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services who have or may have liens or encumbrances or the right to assert liens or encumbrances against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

- ❑ Consent of Surety to Final Payment (required whenever Surety is involved) on AIA Document G707, Consent of Surety, or equivalent.
- ❑ Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
- ❑ Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required in accordance with Section 01 2900.

CONTRACTOR:
(name and address)

By: _____
(signature of authorized representative)

_____
(printed name and title)

Subscribed and sworn to before me on: _____
(date)

Notary Public: _____

My Commission Expires: _____

GENERAL CONDITIONS

A. AIA Document A201-2017, General Conditions of the Contract for Construction, hereinafter referred to as "General Conditions," is hereby made part of the Contract Documents, as if attached hereto or repeated herein. Bidders and Contractors shall consult this document and become thoroughly familiar with its contents before submitting bids or proposals. Copies are available for purchase from the American Institute of Architects, www.aiacontracts.org, phone 800-942-7732.

B. AIA General Conditions are hereinafter supplemented and amended by Supplementary Conditions. All supplementary provisions shall be considered as added thereto. Where any article is amended, deleted or superseded hereby, unaltered provisions of such article shall remain in effect.

C. In case of conflict, Supplementary Conditions shall take precedence.

END OF DOCUMENT

SUPPLEMENTARY CONDITIONS

1. MODIFICATIONS TO GENERAL CONDITIONS

A. These Supplementary Conditions supplement, modify, change, delete from, or add to the General Conditions. Where a portion of the General Conditions is modified or deleted by Supplementary Conditions, the unaltered portions of the General Conditions remain in effect.

2. ARTICLE 1 – GENERAL PROVISIONS

A. 1.1 Basic Definitions

1. Revise the last sentence of 1.1.1 to read as follows: Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, sample forms, or other information furnished by the Owner in anticipation of receiving bids or proposals.

2. Add the following at the end of 1.1.2: The Contractor acknowledges and agrees that the Contract Documents are sufficient to provide for the completion of the Work and include all Work, whether or not shown or described, which reasonably may be inferred to be required or useful for the completion of the Work in accordance with all applicable laws, codes, and professional standards.

3. Modify 1.1.5 – The Drawings: Add the following:
   a. Refer to the List of Drawings for a listing of Drawings issued.
   b. All Drawings issued, including but not limited to architectural, structural, mechanical, electrical, and civil/site Drawings, are included in the Contract Documents for each Prime Contract.
   c. The word "Plans" shall be construed to include all Drawings, except in the context of a horizontal section view of the Project or a specific portion thereof.

4. Modify 1.1.6 – The Specifications: Add the following:
   a. The requirements of each Section of Division 01 apply to all Specification Sections.

5. Add the following definitions:
   a. 1.1.9 – Project Manual: The Project Manual is the written document assembled for the Work which may include Procurement and Contracting Requirements, Conditions of the Contract, and Specifications. Refer to the Project Manual Contents for a complete listing.
   b. 1.1.10 – The Architect: The Architect is Beilharz Architects, Inc., 701½ West First Street, Defiance, Ohio 43512, phone 419-782-6211.
   c. 1.1.11 – The Owner: The Owner is the Board of Education of Evergreen Local School District, 14544 County Road 6, Metamora, Ohio 43540.

d. 1.1.12 – Contractor: The term "Contractor" shall refer to each Contractor with which the Owner has entered into a written agreement for Work related to the Project and shall apply to each such Contractor, unless a reference is made to a specific Contractor by trade. The terms "General Contractor," "Plumbing Contractor," "HVAC Contractor," "Electrical Contractor," etc. shall mean "the Contractor." Responsibility for completion of all portions of the Project, except where specifically noted otherwise, shall be borne by the Contractor. The Contractor may use the reference to separate contracts, and to Plumbing, Electrical and other contractors, as an aid in establishing major subcontract responsibilities, but by so doing shall in no way relieve himself of the final responsibility for proper completion of the Work.

B. 1.2 Correlation and Intent of the Contract Documents

1. Modify 1.2.2 by replacing the period at the end of the paragraph with a comma and adding the following: "nor shall the Architect by reason thereof become an arbiter to establish subcontract limits between Subcontractors of any Prime Contractor. Where responsibility for particular work is assigned to a particular trade or contract, that trade or contract shall not be released from that responsibility by reason of the location of the assigning of responsibility. The Contractor shall be responsible for all work assigned to him, even though that responsibility may be shown only in that portion of the Contract Documents typically pertaining to another contract or trade."

2. Add the following after 1.2.3:
   a. 1.2.3.1 – Furnish, Install, Provide: Wherever the words "furnish," "install," "provide," or equivalent words are used, without further limitation, they shall be construed to mean the responsibility to supply and place in position for use the devices, equipment or material named, together with all associated devices, equipment, materials, wiring, piping, and related components as may be required for a complete and operating installation.
   b. 1.2.3.2 – Warranty and Guarantee: The words "warranty" and "guarantee" shall have the same meaning and shall be defined as "legally enforceable assurance of the duration of satisfactory performance or quality of a product or work."

3. Add 1.2.4 – Complete sets of Contract Documents are intended, and the Contract will include all documents referenced in the List of Drawings and Project Manual Contents. It is the Contractor's responsibility to request missing documents from the Architect in writing before submitting a bid.

4. Add 1.2.5 – Reference to standards, codes, or specifications, or to manufacturer's specifications, instructions, recommendations, requirements or directions, require that the Contractor become fully and adequately informed of the contents of such documents, and shall properly apply the information therein so that the best possible intended use of the item, material or technique is achieved.

C. 1.7 Digital Data Use and Transmission

1. Modify 1.7 by inserting "or equivalent" after the title of the AIA Document.

D. 1.8 Building Information Models Use and Reliance

1. Modify 1.8 by inserting "or equivalent" after the title of each AIA Document.

3. ARTICLE 2 – OWNER

A. 2.1 General

1. Revise 2.1.2 to read as follows: The Owner will prepare a Notice of Commencement for the Project in accordance with the Ohio Revised Code and furnish a copy to the Contractor or a subcontractor or supplier within a reasonable time upon receipt of a written request. The Contractor shall furnish a copy of the Notice of Commencement to a Subcontractor or supplier within fifteen days after receipt of a written request.

B. 2.2 Evidence of the Owner's Financial Arrangements

1. Replace 2.2.1 through 2.2.4 with the following: The Owner shall attach to the Agreement with the Contractor, the certificates of available resources required by Ohio Revised Code Sections 5705.41 and 5705.412, as evidence of available funds to fulfill the Owner's obligations under the Contract.

C. 2.3 Information and Services Required of the Owner

1. Add the following at the end of 2.3.6: The Contractor may purchase additional copies of the Contract Documents at the cost of reproduction and delivery.

D. 2.5 Owner's Right to Carry Out the Work

1. Add 2.5.1 – Notwithstanding anything to the contrary in the Contract and without limiting Owner's rights and remedies, it is agreed and understood by the Contractor that if there is a work stoppage or delay of Contractor's work, directly or indirectly, involving Contractor's employees, and if any such work stoppage or delay is not resolved to the satisfaction of the Owner within seven calendar days from the commencement of said work stoppage or delay, the Owner may terminate the Contract for cause as provided in Section 14.2.

4. ARTICLE 3 – CONTRACTOR

A. 3.1 General

1. Add 3.1.4 – The award of separate Contracts for the Project requires sequential, coordinated, and otherwise interrelated Contractor operations and may involve delays in the progress of any individual Contractor's Work. Each Contractor with whom the Owner executes a Contract shall cooperate with the Architect and other Contractors to minimize interference, disruption, hindrance, or delay of any Work on the Project.

B. 3.2 Review of Contract Documents and Field Conditions by Contractor

1. Modify 3.2.2, 3.2.3, and 3.2.4; change "request for information" to "request for interpretation."
2. Add 3.2.5 – If, in the Contractor's opinion, any portion of the Work is indicated or specified in a manner that makes it impossible to produce work of the required quality, the Contractor shall report this to the Architect as a request for interpretation in such form as the Architect may require, before proceeding with that portion of the Work. If Contractor fails to make such request, no excuse will be entertained for failure to carry out that portion of the Work in a satisfactory manner.
3. Add 3.2.6 – If the Contract Documents disagree as to the quality or quantity of Work required, the better quality or greater quantity shall be provided, but not before referring the points in question to the Architect for approval.

C. 3.3 Supervision and Construction Procedures

1. Add 3.3.4 – Contractor shall not erect vertically and independently to a height greater than one scaffold from the foundation, masonry walls, structural steel, or any other building feature dependent on connection with other portions of the structure for support or anchorage without sufficient bracing, tying, or other approved method. The Contractor shall be responsible for the design and erection of all bracing, shoring, and sheathing as required for safety and the proper execution of the work, and shall remove such components when the work is completed.

D. 3.10 Contractor's Construction and Submittal Schedules

1. Modify 3.10.3; change "submitted to" to "approved by."

E. 3.11 Documents and Samples at the Site

1. Modify 3.11; delete the word "field" from the phrase "indicate field changes."

F. 3.12 Shop Drawings, Product Data and Samples

1. Add the following at the end of 3.12.7: Work commenced by Contractor prior to final approval of the Shop Drawings or other submittals is at the risk that no payment will be approved or made by the Owner for such Work.
2. Add the following at the end of 3.12.10: The Contractor shall defend, indemnify and hold harmless the Owner, Architect, and Architect's consultants from and against all claims, losses, liabilities and damages arising out of or resulting from any professional services rendered by or on behalf of the Contractor, or failure to render such services. The Contractor shall require that any design professionals retained to provide such services provide similar indemnities in favor of the Owner, Architect, and Architect's consultants.

G. 3.13 Use of Site

1. Add 3.13.1 – Before commencing work, Contractor shall verify with Owner and receive Owner's permission to use areas in the immediate vicinity of construction for storage of materials and for activities related to construction. Contractor shall confine construction activities to these agreed areas.

H. Add 3.19 Workmanship

1. Add 3.19.1 – Work shall be of the specified quality and conform to normal industry standards. Work of substandard quality (as determined by the Architect or inspecting authorities) shall be removed and replaced to conform to the quality standards of the trades concerned, or otherwise corrected to the satisfaction of the complainant, at Contractor's expense.

5. ARTICLE 4 – ARCHITECT

A. 4.2 Administration of the Contract

1. Add 4.2.2.1 – The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for site visits made necessary by the fault of the Contractor or by defects and deficiencies in the Work.
2. Modify 4.2.14; change "request for information" to "request for interpretation" at both locations.

6. ARTICLE 5 – SUBCONTRACTORS

A. 5.3 Subcontractual Relations

1. Add 5.3.1 – Nothing contained in the Contract Documents shall be construed as creating any contractual relationship between any Subcontractor and the Owner. The Divisions and Sections of the Specifications are not intended to control the Contractor in dividing the Work among Subcontractors or to limit the work performed by any trade. The Contractor shall be as fully responsible to the Owner for the acts and omissions of Subcontractors and of persons employed by them, as for the acts and omissions of persons directly employed by the Contractor. The Contractor shall be responsible for the coordination of the trades, Subcontractors and Suppliers, and persons engaged upon the Contractor's work. The Contractor shall, without additional expense to the Owner, utilize the services of specialty Subcontractors on those parts of the work which are required by the Contract Documents to be performed by specialty Subcontractors. The Owner or Architect shall not undertake to settle any differences between the Contractor and Subcontractors, or between Subcontractors. The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to give the Contractor the same power as regarding termination of any subcontract that the Owner may exercise over the Contractor under any provisions of the Contract Documents.

2. Add 5.3.2 – If any Contractor, Subcontractor, or Sub-subcontractor desires to obtain the services of any other Contractor, Subcontractor or Sub-subcontractor, the party hired to do the work shall become a Subcontractor or Sub-subcontractor under the party hiring them, and shall be subject to all provisions of the Contract Documents which pertain to Subcontractors and Sub-subcontractors, as applicable.

7. ARTICLE 7 – CHANGES IN THE WORK

A. 7.2 Change Orders

1. Add 7.2.2 – Agreement on any Change Order shall constitute a final settlement of all matters related to the change in the Work that is the subject of the Change Order, including, but not limited to, all direct and indirect costs and cumulative impact associated with such change, and all adjustments to the Contract Sum and the Contract Time.

8. ARTICLE 8 – TIME

A. 8.2 Progress and Completion

1. Add 8.2.4 – The Contractor shall obtain insurance and permits, file documents and notices as required and necessary, and perform other duties required under the Contract Documents, in a timely manner so as not to impede progress of the Work.

B. 8.3 Delays and Extensions of Time

1. Modify 8.3.3 by replacing the period at the end of the paragraph with a comma and adding the following: "except that extensions of time arising from adjustments to the Construction Schedule affecting multiple Contractors, and not made primarily for the convenience of the Owner, shall not be grounds for claims for Consequential Damages as defined in Section 15.1.7."
2. Add 8.3.4 – Extensions of Contract Time will be granted for legitimate cause to the Contractor on an individual basis. Granting of a time extension to one contractor does not imply, constitute, or require granting similar time extensions to other contractors.

9. ARTICLE 9 – PAYMENTS AND COMPLETION

A. 9.9 Partial Occupancy or Use

1. Add 9.9.4 – If it becomes necessary at any time during construction to move materials which are to enter into the construction, or equipment which has been temporarily placed, the Contractor furnishing said materials or equipment shall, when directed by the Owner, move them or cause them to be moved without charge to Owner. Once such materials and equipment are stored at the site they may not be removed from the site without the Owner's permission.

10. ARTICLE 10 – PROTECTION OF PERSONS AND PROPERTY

A. 10.2 Safety of Persons and Property

1. Revise 10.2.1 by renumbering .3 to .4 and adding a new .3: materials, equipment, and completed Work of Separate Contractors; and

B. 10.3 Hazardous Materials and Substances

1. Add the following at the end of 10.3.1: Hazardous substance shall mean any substance that is toxic, ignitable, reactive, or corrosive and that is regulated by any local, state, or federal government agency or entity; any and all material or substance that is defined as "hazardous waste", "extremely hazardous waste", or a "hazardous substance" under any local, state, or federal law or regulation; and all petroleum products.
2. Add the following at the end of 10.3.5 – Contractor shall not cause or permit any hazardous substance, including those necessary for execution of the Work, to be used, stored, generated, or disposed of on or in the site without first obtaining Owner's written consent. Regardless of whether Contractor has obtained Owner's written consent, if any contamination of any kind whatsoever occurs during Contractor's use of the site, or if Contractor violates any local, state, or federal law or regulation relating to hazardous substances or environmental contamination, Contractor shall indemnify and hold harmless the Owner from any and all claims, damages, fines, judgments, penalties, costs, liabilities, or losses, including without limitation, any and all sums paid for settlement of claims, attorney's fees, consultant fees, and expert fees arising during or after the Contract period.
3. Add 10.3.7 – Contractor shall have no liability for environmental damages resulting from hazardous materials not addressed in the Contract Documents which were present at the site prior to the date of commencement of the Work.
4. Add 10.3.8 – Upon request of the Owner, the Contractor and each direct Subcontractor to the Contractor shall certify that all materials are free of asbestos fibers and other hazardous carcinogenic ingredients.

C. 10.4 Emergencies

1. Revise 10.4 to read as follows: In case of an emergency which threatens loss or injury of property and/or safety of life, the Contractor shall act, in the absence of previous instructions from the Owner or the Architect, as the situation may warrant, and shall notify the Architect immediately thereafter of the nature of the emergency and the action taken. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 7 and Article 15.

D. Add 10.5 Contractor Responsibilities

1. Add 10.5.1 – The Contractor shall be the custodian of the building and premises and shall (1) provide protection as required against rain, wind, and storms to maintain work free from damage by same; (2) provide temporary closures to protect against intrusion of building once enclosure is attained; and (3) furnish and maintain temporary stairs, ladders, ramps, and similar access facilities, as required for safe and proper execution of the work of all trades.
2. Add 10.5.2 – The Contractor shall be fully responsible for initiating and maintaining all procedures necessary to prevent damage to physical property or personnel. Contractor shall be especially careful to maintain optimum fire safety programs at all times, including control of rubbish, fire watches, fire-fighting equipment, maintenance of exit ways and alarm systems, and all other techniques necessary.
3. Add 10.5.3 – The Contractor shall comply with all applicable provisions of the Occupational Safety and Health Act, and shall be responsible for fines and costs incurred as a result of violations or alleged violations.
4. Add 10.5.4 – The Contractor shall provide and maintain protection of approved type for all floors, passageways, and other surfaces subject to damage, involved in the execution of the work.
5. Add 10.5.5 – The Contractor shall provide and maintain suitable temporary walks, passageways, barricades, fences, railings, and similar facilities, and all necessary lights, signs, and warnings, as required by law and necessary for the protection of the public and others having access to the site.
6. Add 10.5.6 – The Contractor shall make good any such loss or damage without expense to Owner.
7. Add 10.5.7 – The Contractor shall make good any loss or damage due to water leakage caused by the Contractor's and Subcontractors' work without expense to the Owner.
8. Add 10.5.8 – Methods of protection shall be subject to the approval of the Architect and protection shall be maintained until the completion of the Work or until removal is directed by the Architect.
9. Add 10.5.9 – The Contractor shall post warning signs at each entrance to the construction site prohibiting anyone from entering upon the premises with firearms or concealed firearms, and shall enforce this prohibition with respect to its employees, Subcontractors, Suppliers, and other parties under its control.

11. ARTICLE 13 – MISCELLANEOUS PROVISIONS

A. 13.4 Tests and Inspections

1. Add 13.4.7 – When any work is being performed away from the site, the Contractor shall notify the Architect, within a reasonable time in advance, of the location where such work is being done, and when it will be ready for inspection, so that the Architect may inspect the same from time to time prior to delivery, at Owner's request.
2. Add 13.4.8 – The Contractor shall not be relieved of responsibility for proper completion of the Work in accordance with the Contract Documents due to the Architect's observation of faulty Work or Work not in accordance with the Contract Documents.

12. ARTICLE 15 – CLAIMS AND DISPUTES

A. 15.2 Initial Decision

1. Replace 15.2.6 with the following: When a written decision of the Initial Decision Maker states that the decision is final but subject to mediation or binding dispute resolution, failure to demand mediation or to file binding dispute resolution proceedings within 30 days after the date on which the party making the demand receives the written decision shall result in the decision becoming final and binding upon the Owner and the Contractor, unless in conflict with applicable law. If the Initial Decision Maker renders a decision after mediation or binding dispute resolution has been initiated, such decision may be entered as evidence, but shall not supersede the proceedings, unless the decision is acceptable to all parties concerned.

END OF DOCUMENT

SECTION 01 1000 – SUMMARY OF WORK

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Contract description.
   2. Project estimate.
   3. Contract time schedule.
   4. Liquidated damages.
   5. Scope of Work.
   6. Work by Owner.
   7. Owner-supplied Products.
   8. Work restrictions.
   9. Use of site.

1.02 CONTRACT DESCRIPTION:

A. Award of Contracts: Contracts will be written with the following Prime Contractors:
   1. High School Locker Room Work.
   2. Elementary School Reroofing Work.
   3. Fire Alarm Replacement Work.

B. Form of Contract: Document A101-2017, Standard Form of Agreement Between Owner and Contractor.
   1. Insurance: Insurance requirements will be included in the Agreement using AIA Document A101-2017 Exhibit A.
      a. Commercial General Liability and all other liability coverage shall have policy limits of not less than $1,000,000 per each occurrence, accident, employee, or claim, $1,000,000 in the aggregate, and $1,000,000 aggregate for products-completed operations hazard.
         (1) If the Contract Sum is greater than $1,000,000, the combined limits for insurance coverage shall be increased in accordance with the table below. If the Contractor has more than one contract relating to the Project, the Contract Sum for the purposes herein shall be the total of all the contract sums for the Contractor's contracts relating to the Project.

Initial Contract Sum	Required Insurance Coverage Limit
$1,000,000 to $3,000,000	$3,000,000
$3,000,000 or greater	$5,000,000

(2) The Commercial General Liability insurance shall include coverage for property damage resulting from defective work of Contractor and Subcontractors.

b. The Contractor shall purchase and maintain insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.

1.03 PROJECT ESTIMATE:

A. In accordance with Section 153.12, ORC, the estimate of construction cost for this project, for the prime contracts described above, is as follows:
   1. High School Locker Room Work: $1,900,000.
   2. Elementary School Reroofing Work: $905,000.
   3. Fire Alarm Replacement Work: $150,000.

1.04 CONTRACT TIME SCHEDULE:

A. Schedule of Completion Dates:

   1. Award of Contract: Owner intends to award contracts within 30 days after receipt of bids. Contract awards made later than 60 days after receipt of bids are subject to consent of the Contractor.

   2. Notice to Proceed:

      a. High School Locker Room Work.
         (1) Phase I: North Addition/Renovation: May 26, 2020.
         (2) Phase II: South Addition/Renovation: January 4, 2021.

      b. Elementary School Reroofing Work: May 26, 2020.

      c. Fire Alarm Replacement Work. May 26, 2020.

   3. Substantial Completion:

      a. High School Locker Room Work.
         (1) Phase I: North Addition/Renovation: December 18, 2020.
            (a) District will utilize existing south locker rooms from August 1, 2020 to December 18, 2020.
         (2) Phase II: South Addition/Renovation: July 16, 2021.

      b. Elementary School Reroofing Work. August 7, 2020.

      c. Fire Alarm Replacement Work. August 7, 2020.

   4. Final Completion: 7 days after Substantial Completion.

B. Description of Completion Dates:

   1. Award of Contract: The date that Contractor is notified of Owner's intent to enter into contract. At this time, the Contractor shall begin generating all required submittals and ordering long lead-time materials.

2. Notice to Proceed: The date that Contractor is allowed to commence work in the subject area. Notification shall be made by separate communication from the above Schedule.

3. Substantial Completion: The date by which the subject area is sufficiently completed to be fully occupied by the Owner. The Architect will perform a walk-through review of the work and compile an itemized punch list of non-conforming or unsatisfactory work.
   a. The Contractor shall obtain the Certificate of Occupancy from local governing authorities by this date.

4. Final Completion: The date by which all punch list items and any other required work in subject area is 100% complete. Contractor's superintendent for the subject area may not leave until this date.
   a. For a work item to be considered complete, all contract closeout submittals must be received by the Architect. If necessary, and only if actual work has been completed on items, seven additional calendar days will be allowed for contract closeout submittals.
   b. In the event the date of Substantial Completion is modified by Change Order, the date of Final Completion shall be correspondingly modified by the same number of days unless specifically provided otherwise.

1.05 LIQUIDATED DAMAGES:

A. In the event the Contractor has failed to achieve Substantial Completion by the specified date, the Owner shall be entitled to retain or recover from the Contractor as liquidated damages, and not as a penalty, the amount scheduled below for each day until Substantial Completion has been achieved or until the specified date for Final Completion, whichever occurs first.
   1. Subject Area: 0.067% of the Contract Sum per calendar day (annual rate of 24%); minimum $25 per calendar day.

B. In the event Substantial Completion has not been achieved by the date specified for Final Completion, liquidated damages for Substantial Completion as specified above shall accrue for the period between the specified dates for Substantial Completion and Final Completion. Beginning with the specified date for Final Completion, the Owner shall be entitled to retain or recover from the Contractor as liquidated damages, and not as a penalty, the amount scheduled below for each day until Final Completion has been achieved.
   1. Subject Area: 0.115% of the Contract Sum per calendar day (annual rate of 42%); minimum $50 per calendar day.

C. In the event Substantial Completion has been achieved by the specified date, but Final Completion has not been achieved by the specified date, the Owner shall be entitled to retain or recover from the Contractor as liquidated damages, and not as a penalty, the amount scheduled below for each day until Final Completion has been achieved.
   1. Subject Area: 0.115% of the Contract Sum per calendar day (annual rate of 42%); minimum $50 per calendar day.

D. Completion Date Conflicts:
   1. Bids shall be based solely on the Contract Time Schedule indicated. Do not include any anticipated liquidated damages costs in the Base Bid price.
   2. If, in any bidder's opinion, the Contract Time Schedule dates do not seem obtainable, such bidder may submit a proposal for revised completion dates, along with any cost adjustments necessary, on a separate sheet attached to the Bid Form.

1.06 SCOPE OF WORK:

A. Unless specifically noted otherwise, all work shown on the Drawings and described in the Specifications shall be furnished and installed by the appropriate Prime Contractor. Questions concerning the extent of responsibility of any Contractor, or the division of responsibilities between Contractors, shall be brought to the attention of the Architect before bid submission in accordance with the Instructions to Bidders. Each Prime Contractor shall be responsible for the work assigned to them by the Contract Documents, regardless of the location of the assignment.

B. Separate sets of Drawings are issued for each Prime Contract.

C. General Conditions, Supplementary Conditions, and all Sections of Division 01 apply to all contracts.
   1. Refer to Section 01 5000 for responsibilities of each Contractor for temporary facilities and controls.

PART 2 PRODUCTS

2.01 WORK BY OWNER:

A. The following work will be performed by others under separate contract and shall not be included under this contract.
   1. Testing and inspecting services identified in Section 01 4520.
   2. Floor waxing.

2.02 OWNER-SUPPLIED PRODUCTS:

A. Items indicated to be relocated are located in Owner's existing facilities. Inspect and verify items prior to bidding; notify Architect of discrepancies affecting planned installation including, but not limited to, dimensions, clearances, and plumbing and electrical coordination. Remove and install in new locations as scheduled, including utility disconnection and reconnection. Furnish and install all required structural

framing, backing, and support, plumbing rough-in and final connections; and electrical power feeds, communications cabling, and final connections.

B. The following items will be furnished by others under separate contract, and material costs shall not be included in this contract. Receive and unload Products at site; inspect for completeness or damage, jointly with Owner. Handle, store, install, and finish Products. Furnish and install the indicated accessories and related items as required for complete installation, including structural framing, backing, and support. Coordinate installation requirements with the supplier as required.
   1. Toilet paper, soap, and paper towel dispensers, as scheduled.

PART 3 EXECUTION

3.01 WORK RESTRICTIONS:

A. The Owner will occupy the premises during the entire period of construction for the conduct of normal operations.

B. Schedule, coordinate and perform all Work to minimize disruption to Owner's activities.
   1. Allow for Owner occupancy and use by the public.
   2. Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, the public, and emergency vehicles 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 and to avoid peak traffic hours.
   3. Maintain means of egress from existing building exits at all times designated for public occupancy.
   4. Shutdowns of existing systems shall be limited to minimum time required and scheduled with other involved parties. Provide two days written notice of shutdown to Architect and Owner. Shutdowns shall not interfere with scheduled activities.

C. Interior work shall not be performed during regular school hours, except in designated construction areas.

D. Exterior work may be performed during regular school hours, but masonry sawing, drilling, and similar noise and fume generating activities shall be performed outside of regular school hours.
   1. Coordinate shutdown of air intake systems with Owner to minimize fumes entering building.

E. Special Requirements for Reroofing Work:
   1. Workers may access roof areas only from the building exterior. Interior ladders and roof hatches may not be used unless specifically approved by the Owner.
   2. Operations requiring the use of power equipment may be performed only over unoccupied areas of the building. Work over occupied building areas is limited to the use of hand tools only.

F. Maintain strict separation of the school activities of students and staff from the activities of the construction project.
   1. The Owner intends to instruct students, teachers, and staff to refrain from communications with Contractors' personnel working on this Project. All communication with Owner and staff shall be through the Architect.

3.02 USE OF SITE:

A. The Lead Contractor designated in Section 01 3100, in cooperation with the other prime Contractors, shall prepare a proposed Project Use Site Plan, also referred to as a Site Logistics Plan, for approval by Architect and Owner.

B. Confine operations at the site to areas within the boundaries indicated and approved on the Project Use Site Plan, and as permitted by law, ordinances, and permits. Site shall not be unreasonably encumbered with materials, products, or construction equipment.

C. The Project Use Site Plan shall include access to proposed buildings for construction purposes, storage of materials and products, employee parking, temporary facilities including offices, storage, and workshop sheds or portable trailers, and unloading space.

D. Where a temporary fence is to be provided, show any additional area needed in the Contractor's use of the site beyond that which may be indicated on the Drawings. Where additional fencing is required, such fencing shall be included at no additional cost to the Owner.

E. The Owner will designate which portions of existing parking lots and other site areas can be used for construction activities. Damage to existing parking lots, unpaved areas, or other existing site features shall be repaired at the expense of the Contractor responsible for damage.

END OF SECTION

SECTION 01 2100 – ALLOWANCES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Allowance procedures.
   2. Schedule of allowances.

B. Related Sections:
   1. Section 01 2900 – Payment Procedures.

1.02 ALLOWANCE PROCEDURES:

A. All overhead and profit, bonds and insurance related to the Work performed under each Allowance shall be included in the Contract Sum. Only direct Labor and Material costs authorized in writing may be charged to the Allowance.

B. Include each Allowance as a separate line item on the Schedule of Values.

C. Progress Payments may be made against Allowance expenditures, based upon approved monthly invoices.

D. Difference in cost between allowance and actual approved expenditures will be adjusted by Change Order. All money not spent will be returned to the Owner.

1.03 SCHEDULE OF ALLOWANCES:

A. High School Locker Room Contract: Include the stipulated sum of $5000 for patching of concrete floors and masonry walls in accordance with Architect's instructions.
   1. Costs Included in Allowance: Direct cost to Contractor of labor and materials.
   2. Costs Not Included in Allowances But Included in Contract Sum: Overhead, profit and indirect costs.
   3. Expenditures from the allowance may be made only by written authorization from the Architect.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 2200 – UNIT PRICES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Unit price procedures.
   2. Unit price schedule.

B. Related Sections:
   1. Section 01 2900 – Payment Procedures.

1.02 UNIT PRICE PROCEDURES:

A. Contracts will be awarded on a Stipulated Sum basis and shall not be considered a unit price contract. Unit prices will be used only for changes in the work.
   1. Obtain written authorization from Architect before proceeding with the additional work.
   2. All items of work not listed as unit price items on the Bid Form shall be included in the Base Bid, and no additional compensation will be allowed.

B. Architect will take measurements and compute quantities accordingly. Provide and assist in the taking of measurements.

C. Adjustment of the Contract Sum resulting from unit prices will be made by Change Order. Payment for unit price work in excess of contract quantities may be included in Applications for Payment only after final reconciliation and approval of Change Order.

D. Payment Includes: Full compensation for required labor, materials, Products, tools, equipment, plant, transportation, delivery and handling, services and incidentals; erection, application, or installation of an item of Work; overhead and profit; and applicable taxes.

E. Defect Assessment: Replace the Work, or portions of the Work, not conforming to specified requirements. If, in the opinion of the Architect, it is not practical to remove and replace the Work, the Architect will direct an appropriate remedy or adjust payment.

1.03 UNIT PRICE SCHEDULE:

A. Bid Forms: Refer to Bid Forms for unit price items.

B. Roof Insulation Replacement (Elementary School Reroofing): Where existing roof insulation is damaged or otherwise deteriorated as determined by the Architect, remove existing insulation and install new insulation in accordance with Section 07 2216.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 2300 – ALTERNATES

PART 1 GENERAL

1.01 ALTERNATES:

A. Each Bidder shall include the cost of all Alternates listed on the Bid Form. A Bidder's failure to include on its Bid Form the cost of an Alternate selected by the Owner and applicable to the Bidder's work may render the bid non-responsive and be grounds for rejection of the bid. Otherwise, the failure to include the cost of an alternate will not be deemed material.
   1. An Alternate which results in no net change to the Base Bid should be noted as "N/C".
   2. An Alternate which does not apply to the scope of work of a bidder should be noted as "N/A".

B. At the time of awarding the contract, the Owner will select or reject Alternates as it determines is in its best interest. Owner reserves the right to select, in any order, any or all Alternates, or to reject all Alternates. Accepted Alternates will be identified in Owner-Contractor Agreement.

C. The Bidder agrees to hold the prices stated for Alternates on the Bid Form for a period of 90 days after the bid opening. Following that 90-day period, during the progress of the Work, the Owner reserves the right to reinstate any Alternate not initially included in the Contract at the price bid by the Contractor provided that such action is taken in sufficient time so as not to delay the progress of the Work or cause the Contractor additional expense.

D. Coordinate related work and modify or adjust surrounding work as required to ensure that work affected by each accepted Alternate is complete and fully integrated into the project.

E. Include as part of each Alternate all miscellaneous devices, accessories, appurtenances, and similar items incidental to or required for a complete installation, whether or not mentioned as part of the Alternate.

1.02 SCHEDULE OF ALTERNATES:

A. High School Locker Room Additions and Renovations:

   1. Alternate 1.1: Bleacher Seating
      a. Base Bid Item: Omit bleachers from Films E142.
      b. Alternate Item: Include Q28 bleachers in Films E142; refer to Sheet AE101 and Section 12 6613.

   2. Alternate 1.2: Restroom E113 Fixtures
      a. Base Bid Item: Existing water closets, urinals, and lavs to remain in Restroom E113.

b. Alternate Item: Remove existing water closets, urinals, and lavs in Restroom E113; install new fixtures. Connect to existing water supply and drain piping. Refer to Section 22 4000.

3. Alternate 1.3: Gymnasium Rooftop Units
   a. Base Bid Item: Existing rooftop HVAC units serving Gymnasium E150 to remain.
   b. Alternate Item: Remove existing rooftop HVAC units serving Gymnasium E150; install new units. Roofing installer shall flash curbs into existing roofing. Disconnect and reconnect gas and electrical service to units; modify as required. Refer to HVAC drawings.

B. Elementary School Reroofing:

1. Alternate 2.1: Additional Insulation
   a. Base Bid Item: Adhere new roof membrane to existing insulation. Refer to Section 07 5000.
   b. Alternate Item: Add one 1" layer of roof insulation to all areas being reroofed; mechanically attached to roof deck, with joints offset from joints in existing insulation. Refer to Section 07 2216.

2. Alternate 2.2: Membrane Upgrade
   a. Base Bid Item: Reinforced 0.060 inch EPDM membrane, black color, with 20 year warranty; refer to Section 07 5000.
   b. Alternate Item: 0.090 inch EPDM membrane with 30 year warranty; refer to Section 07 5000.
      (1) Alternate 2.2A: White color.
      (2) Alternate 2.2B: Black color.

3. Alternate 2.3: Gutter Replacement
   a. Base Bid Item: Remove and reinstall existing gutters as required for reroofing.
   b. Alternate Item: Except at metal roof area, remove existing gutters and install new; refer to Section 07 7100.

C. Fire Alarm Replacement Work:

1. Alternate 3.1: New Fire Alarm Wiring
   a. Base Bid Item: Reuse existing fire alarm wiring where practicable; extend and supplement with new wiring as required.
   b. Alternate Item: Remove existing fire alarm wiring and install new.
      (1) If the work cannot be completed by the Substantial Completion date specified in Section 01 1000, an alternate completion date may be proposed on the Bid Form.
      (2) Implement a fire watch plan acceptable to local fire department and other authorities having jurisdictions at all times when the fire alarm system is not operable in one or both buildings or portions thereof.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 2900 – PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Contract modification procedures.
   2. Schedule of values.
   3. Notices of commencement and furnishing.
   4. Application for payment.

B. Related Sections:
   1. Section 01 2100 – Allowances.
   2. Section 01 2200 – Unit Prices.
   3. Section 01 2300 – Alternates.
   4. Section 01 7700 – Closeout Requirements.
   5. Section 01 8113 – Sustainable Design Requirements.

1.02 CONTRACT MODIFICATION PROCEDURES:

A. The Owner shall have the right at any time, with reasonable notice to Contractor and resulting adjustment to Contract Sum or Contract Time, if any, to require alterations, additions to or deductions from the Work described in the Contract Documents.

B. Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time by issuing an Order for Minor Changes.

C. Architect may issue a Request for Proposal which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications. Contractor shall promptly prepare and submit a detailed itemized proposal for revising the Contract Sum or Contract Time, or both, to incorporate the proposed change. Do not proceed with the proposed changes until a Construction Change Directive or Change Order is issued.

D. Architect may issue a Construction Change Directive approved by the Owner, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Sum or Contract Time. Promptly execute the change.
   1. Maintain detailed records of work performed. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.

E. Contractor may propose changes by submitting a request for change to the Architect, describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, and the effect on the Contract Sum and Contract

Time with full documentation, and a statement describing the effect on Work by separate or other Contractors. Document any requested substitutions in accordance with Section 01 6000. Architect and Owner reserve the right to accept or reject such proposed changes, or to request modifications thereto.

F. Accompany all proposals, whether Contractor initiated or in response to a Request for Proposal or Construction Change Directive, with a detailed itemized breakdown including the following:
   1. Materials: Indicate quantities and unit costs.
   2. Labor: Indicate man hours of labor and hourly rates for each classification of labor involved.
   3. Direct Costs: Fuel, supplies, scaffolding, construction equipment, insurance, taxes and related items.
   4. Overhead and Profit: In no case will a rate greater than 10 percent of the sum of the above items be approved for an amount to include overhead, profit, insurance, and bonds.
      a. For deduct change orders, the rate shall be a minimum of 5 percent of the sum of the above items.

G. Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

1.03 SCHEDULE OF VALUES:

A. Submit Schedule of Values within 15 days after Notice to Proceed. Revise and resubmit as required by Architect prior to initial Application for Payment.

B. Submit on forms provided with this Project Manual. Electronic copies of the form are available from the Architect on request. Utilize the Table of Contents of this Project Manual. Identify each line item with the number and title of the specification Section.

C. Include separate line items for each of the following: General Requirements, bonds, insurance, submittals, progress cleaning, final cleaning, punch list work, project record submittals, and specified training.

D. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including construction progress schedules, schedule of submittals, and lists of subcontractors, products, principal suppliers and fabricators.

E. Obtain itemized quotations from Subcontractors and suppliers performing work under multiple Sections. “Package bids” will not release Contractor from the responsibility of furnishing values for each Section of the Work.

F. Include cash Allowances, where used, as separate line items. For unit cost Allowances, identify quantities on which item totals are based.

G. Revise schedule with each Application for Payment to list approved Change Orders.

H. Architect reserves the right to use the Schedule of Values for guidance in evaluating Change Order proposals and claims submitted by the Contractor.

1.04 NOTICES OF COMMENCEMENT AND FURNISHING:

A. Owner will prepare a Notice of Commencement (NOC) in accordance with the Ohio Mechanics' Lien Law (Section 1311 O.R.C.) and deliver a copy to the General Contractor.

B. Lead Contractor designated in Section 01 3100 shall post the NOC at the job site adjacent to the building permit, plan approval certificate, or zoning permit, and shall distribute copies upon request to Prime Contractors, Subcontractors and suppliers.

C. If the Contractor has not received an NOC within 10 days after construction begins, the Contractor shall deliver to the Owner a written request for a Notice of Commencement.

D. Prior to submitting each Application for Payment, deliver to the Owner a written request for a list of all parties who have requested NOCs from the Owner or delivered Notices of Furnishing to the Owner.

1.05 APPLICATION FOR PAYMENT:

A. Submit three copies of each Application for Payment to the Architect on the forms provided with this Project Manual. No other Application for Payment document will be processed. Electronic copies of the form are available from the Architect on request.

B. Submit sequentially numbered typewritten applications. Notarize each copy, keeping embossed seals away from areas intended for Architect's signature and notations.

C. Content and Format: Rounding to whole dollar amounts is preferred.
   1. Value of labor, materials, and equipment incorporated in the Work or delivered and stored at the site. Utilize Schedule of Values for listing items of Work.
   2. Deduction of retainage.
   3. Deduction of all previously approved payments.
   4. New amount applied for.

D. Contractor shall pay for transportation, services, materials, tools, expendables, and Subcontractor work. Each payment shall be in an amount equal to the percentage of completion allowed to the Contractor for each item or category, less the percentage retained from payments to the Contractor. Contractor shall make payments to Subcontractors.

E. Change Orders for additional work may be included in progress payments after approval by all parties.

F. Payment Period: Progress payments will be made at monthly intervals, from the date of the Notice to Proceed to the date specified for Substantial Completion. Each

monthly payment shall be in an amount determined in accordance with Paragraph 9.3 of the General Conditions and the Supplementary Conditions.

1. After the payment of the last scheduled progress payment, no further progress payments will be made until the Certificate of Substantial Completion has been issued. In the event that changes in the work result in an extension of time, the number of scheduled progress payments may be changed in accordance with the extension of time granted by Change Order.
2. After Substantial Completion, no further payment will be made until the final Application for Payment is approved.

G. Retainage: In making progress payments, 8 percent of the total labor performed to date, and 8 percent of stored materials, will be retained.

1. After the work is 50 percent complete, as evidenced by approved Applications for Payment of at least 50 percent of the Contract Sum, no additional labor retainage shall be made, and all funds retained in accordance with this Section pursuant to Sections 153.12 and 153.14 of the Ohio Revised Code shall be deposited in the escrow account designated in Section 153.63 of the Revised Code.
2. At Substantial Completion, provided there exists no other reason to withhold retainage, the retained percentages held in connection with the partial payments shall be released from escrow and paid to the Contractor, withholding only that amount necessary to assure completion.
3. Within 30 days of Final Completion, funds in escrow account not heretofore paid, with accumulated interest, shall be paid to the Contractor in accordance with Section 153.63 (A) (2) of the Ohio Revised Code.

H. Initial Application for Payment: Submittals that must precede or coincide with submittal of the first Application for Payment include the following:

1. Certificates of insurance.
2. Construction schedule in accordance with Section 01 3200.
3. Submittal Schedule, List of Subcontractors, and List of Products in accordance with Section 01 3300.

I. Submit the following additional forms in duplicate with each Application for Payment. Applications will not be processed without receipt of the proper forms.

1. Updated construction progress schedule in accordance with Section 01 3200.
2. Waivers of Lien on a form acceptable to Owner, for the Prime Contractor and each of the following:
   a. All parties who have filed Notices of Furnishing with the Contractor or Owner.
   b. All parties who have requested Notices of Commencement from the Contractor or Owner.
   c. All Subcontractors performing work or suppliers providing material during the period covered by the application.

J. Submit the following additional forms in duplicate with final Application for Payment. Applications will not be processed without receipt of the proper forms.
   1. Waivers of Lien on a form acceptable to Owner, for the Prime Contractor and each of the following:
      a. All parties who have filed Notices of Furnishing with the Contractor or Owner.
      b. All parties who have requested Notices of Commencement from the Contractor or Owner.
      c. All Subcontractors performing work or suppliers providing material during the 21 days preceding the date of the application.
   2. Closeout submittals in accordance with Section 01 7700.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 3100 – PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Project coordination.
   2. Requests for interpretation.
   3. Facility services coordination.
   4. Project meetings.
   5. Alteration project procedures.

1.02 PROJECT COORDINATION:

A. The High School Locker Room Contractor is designated as the "Lead Contractor" and shall have primary responsibility for coordinating Prime Contractors with each other and with materials furnished by others.

B. Each Prime Contractor shall assign one person who will be on site whenever the work of any trade is in progress and who will have authority to speak and act on behalf of the Contractor. This person shall supervise and direct the work using their best skill and attention, and shall coordinate their work with other Contractors and Subcontractors.
   1. Communications to the Contractor's superintendent shall be as binding as if given directly to the Contractor.
   2. Upon Notice to Proceed, Contractor shall notify the Owner of the proposed superintendent, and if requested by the Owner shall also submit a summary of qualifications and experience, including references.
   3. Contractor shall not change their superintendent without prior written notice to the Owner, including justification for the change and identification and qualifications of the proposed replacement.
   4. Owner reserves the right to reject proposed superintendents within 30 days, in which case Contractor shall provide an acceptable replacement without adjustment of Contract Sum or Contract Time.

C. Each Contractor shall coordinate all suppliers and Subcontractors included in their scope of work, and provide adequate labor, equipment and materials as needed.

D. Maintain a constant check on the progress of the Project; coordinate and sequence work with that of others to facilitate progress of the Project; provide reasonable advance notification to all parties concerned of any special provisions regarding the placing, setting, or preparation of work that will affect the work of any other Contractor; afford others every reasonable opportunity for installation and execution of their work and storage of their materials.

E. Alterations to work already placed and necessitated by Contractors' failure to properly coordinate work shall be accomplished at the expense of the negligent Contractor.

F. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

G. Provide on-site supervision for material delivery, off-loading, storage, protection, installation and coordination with other Contractors affected by this work.

H. Before installing any work, and before purchasing any equipment, carefully check Contract Documents for conflicts or lack of coordination between or among required Work, Contract Documents, and job conditions; immediately report same to Architect in writing.
   1. If Contractor fails to bring such lack of coordination between or among Contract Documents, work of other trades, and job conditions to Architect's attention in writing before work is performed or before equipment is purchased, resulting conflicts shall be corrected as directed by the Architect, without adjustment of Contract Sum or Contract Time.

I. Coordinate completion and clean up of Work of separate sections in preparation for Substantial Completion.

J. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.03 REQUESTS FOR INTERPRETATION (RFI):

A. In the event the Contractor determines that some portion of the Contract Documents requires clarification or interpretation, the Contractor shall submit a Request for Interpretation in writing on forms approved by the Architect.

B. The Contractor shall clearly and concisely set forth the issue for which clarification or interpretation is sought and why a response is needed, the date by which a response is requested, and shall include his interpretation or understanding of the contract requirements along with reasons why such an understanding was reached.

C. RFIs shall be submitted by Prime Contractors only and shall not be used for routine project communication, to transmit submittals, to request substitutions, or for other correspondence. Documents which are not RFIs will be returned for resubmittal on the proper form.

D. Minor detail items related to shop drawing submittals shall be highlighted on the shop drawings and do not require an RFI.

E. Submit each RFI in sufficient time to avoid delaying the project, allowing minimum one week for Architect's response. If the Architect determines that a longer time is necessary to provide an adequate response, the Architect will advise of the anticipated

response time within one week of receipt of the RFI. Contractor will not be entitled to time extension due to the Architect's response time.

F. Responses to RFIs shall be considered interpretations and clarifications of the contract requirements and do not change the Contract Documents. In the event the Contractor believes that a response constitutes a change to the Contract Documents, Contractor shall promptly give written notice.

G. If a Contractor submits an excessive number of RFIs where the requested information is available to the Contractor from the Contract Documents, field observations, or prior Project correspondence or documentation, the Owner shall be entitled to deduct from the Contract Sum all reasonable costs charged by the Architect to the Owner for additional services required for the processing of such RFIs.

1.04 FACILITY SERVICES COORDINATION:

A. Contract Documents: Facility Services work (Fire Suppression, Plumbing, HVAC, Electrical, Communications, and Electronic Safety and Security) may be shown throughout the Drawings. Information required for proper coordination of the work may be contained in specifications of other trades. Become thoroughly familiar with all documents referenced in the Project Manual Contents and List of Drawings and coordinate the Work with all provisions thereof.

B. System Layout: Facility Services drawings are diagrammatic and are intended to show the approximate locations of components. Field verify dimensions shown on the Drawings. Do not scale drawings to obtain exact dimensions.

1. Coordinate space requirements and installation of work 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.
2. The exact location of items not located by dimensions on the Drawings shall be determined in the field with consideration given to appearance, clearances, and potential conflicts, and is subject to approval by the Architect.
3. Before beginning installation, verify required clearances for the erection of finish beams, columns, pilasters, walls, casework, and other structural or architectural members as shown on the Drawings. If any work is installed and it later develops that the architectural design cannot be followed, the Contractor installing the conflicting work shall bear the expense of making such changes as the Architect may direct to facilitate completion of the architectural work in accordance with the Contract Documents.
4. Report actual and potential interferences and conflicts among Facility Services work and the work of other trades to the Architect as soon as they are discovered. Readjustment shall be made as directed by the Architect, at the expense of the Contractor causing such conflict. The Architect's decision shall be final in regard to the arrangement of conflicting work, regardless of which was first installed.

5. Field verify exact locations of apparatus, fixtures, and equipment supplied by the Owner and others, and install the work accordingly. Should the Contractor fail to ascertain such locations before proceeding with the work, the work shall be changed at the Contractor's expense when so ordered.
6. Throughout the course of the work, up to the time of roughing-in and installation, minor changes and adjustments to the installation may be requested by the Architect. The Contractor shall make such adjustments without modification to the Contract Sum or Contract Time, where such adjustments are necessary to facilitate proper installation and operation within the intent of the Contract Documents. This does not include work already completed.
7. Position pumps, tanks, fans, motors, air handling units, fixtures, equipment, devices, switches, outlets, and related components, to avoid interferences with and to assure proper coordination with work of other trades, wall, floor and ceiling patterns, and architectural features. Coordinate recessed devices and fixtures with wall, floor and ceiling patterns.
8. Equipment and piping shall not be installed or run above electrical switchgear or panelboards, nor in or above the access space in the immediate vicinity of the electrical switchgear or panelboards, in accordance with the applicable electrical code. Failure to notify the Architect of conflict and to provide adequate coordination will result in costs incurred at the expense of the negligent Contractor.
9. Maintain service access clearances to equipment as indicated on submittals. Verify that filter replacement, scheduled maintenance, and repair parts replacement can be performed without obstruction by other systems or components.
10. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

C. Utility Coordination: Contact each utility company providing service to the project and determine or verify their requirements.
   1. Make all arrangements with each utility company and pay all service charges associated with temporary or new services or modifications to existing services.
   2. Utility tie-ins shall be arranged with local utility company and other involved parties for minimum interruption of service.

D. Equipment Requirements: Verify utility requirements and characteristics 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.
   1. The current to building for light and power will be 60 cycle, A.C. Each Contractor shall verify voltage, amperage, and phase requirements for their work with the service available at the building.

2. All Contractors are cautioned to check with Electrical Contractor to order electrically operated items so that they will operate on the voltage, amperage, and phase provided for them.
3. All Contractors are cautioned to check with Plumbing Contractor to order gas fired items so that they will operate on the type of gas and available pressure provided for them.
4. Any item delivered to the job which will not operate on the current or fuel provided will be rejected or the Contractor furnishing the item will stand the expense of changing the wiring or piping to accommodate the equipment.

E. Structural Supports: Except as otherwise noted, the Lead Contractor will furnish the main supporting structure and provide floor, wall, and roof openings, as shown on the structural Drawings.
1. Coordinate requirements for floor, wall, and roof openings, including openings not shown on the Drawings, with the Lead Contractor before the structure is erected. Perform cutting and patching, where required, in accordance with Section 01 7000.
2. Where equipment is supported by the building structure, the structural Drawings indicate supports and other design considerations which are based on the use of the scheduled equipment. Where products of another listed manufacturer are supplied, or where substitutions are approved, coordinate dimensions, clearances, structural supports, and other conditions as required for proper installation.
3. Provide supplemental framing, rods, supports, and hangers required to install or mount equipment indicated, and as necessary to provide a complete working system. Do not support equipment, piping, conduit, or any other components from roof deck, or from open web framing members at any locations other than panel points.
4. Provide cross bracing for suspended equipment to prevent swaying.

F. Access Panels: Where valves, traps, water hammer arresters, dampers, electrical equipment, or other specialties are concealed in construction or behind a wall or ceiling surface, Contractor installing components requiring access shall furnish and install an access panel of adequate size to permit adjustment or service of concealed device.
1. Access panels shall be of a design suitable for installation in the material forming the finished surface in which each is mounted. Where doors are installed in fire-rated construction, they shall have the appropriate required rating.
2. Each access panel in masonry, plaster, or gypsum board surfaces shall have a flush metal frame and flush hinged steel door with flush screwdriver-operated latch.
3. Coordinate access panel locations with the work of other trades. Wherever practicable, group components requiring access to be accessible from a single panel and eliminate as many access panels as possible.

4. Where acoustical ceiling systems with removable panels are used, access doors need not be supplied. Indicate the presence and type of concealed components with a color coded sticker on the ceiling grid.

G. Identification and Labeling: Where room numbers are used for identification of Facility Services components, utilize the Owner's final room names and numbers, which may vary from room names and numbers on the Drawings. Coordinate with interior signage and other permanent room identification.

H. Scope of Work Coordination:
   1. Certain motors, disconnects, starters, controls, multispeed switches, etc., are provided by HVAC and Plumbing Contractors, who unless otherwise noted, will also provide all controls and control and main line wiring from outlet boxes and final connections. Electrical Contractor shall verify requirements for all other trades to avoid duplicating work to be provided by others.
   2. The Electrical Contractor shall furnish all necessary starters and disconnect switches, except on equipment which is to be provided with starters or disconnect switches as part of the assembly. The Electrical Contractor shall furnish all power wiring through starters and disconnect switches to motors.
   3. Request copies of approved submittals from other Contractors whose work connects to or interfaces with the work of the Contractor. Alterations to installed work required because of failure to obtain shop drawings and related submittals will not be considered as a basis for adjustment of Contract Sum or Contract Time.

1.05 PROJECT MEETINGS:

A. Preconstruction Meeting: Architect will schedule a meeting after Notice of Award.
   1. Attendance Required: Owner, Architect, and all Prime Contractors.
   2. Agenda:
      a. Execution of Owner-Contractor Agreement.
      b. Submission of executed bonds and insurance certificates.
      c. Distribution of Contract Documents.
      d. Submission of list of Subcontractors, list of Products, schedule of values, and project schedule.
      e. Designation of personnel representing the parties in Contract, and the Architect.
      f. Procedures and processing of field decisions, submittals, substitutions, applications for payment, change procedures, and contract closeout procedures.
      g. Use of premises by Owner and Contractor.
      h. Construction facilities, controls, and temporary utilities provided by Owner.
      i. Security and housekeeping procedures.
      j. Procedures for maintaining record documents.
      k. Scheduling.

3. Lead Contractor shall record minutes and distribute copies within two days after meeting to Architect, Owner, participants, and those affected by decisions made.

B. Progress Meetings: Lead Contractor shall schedule and administer meetings throughout progress of the Work at maximum monthly intervals, scheduled to coordinate with preparation of payment requests. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings. Notify parties, including Architect, at least four days in advance.

1. Attendance Required: Representatives of each Prime Contractor, major Subcontractors and suppliers, as appropriate to agenda topics for each meeting.

2. Agenda:
   a. Review minutes of previous meetings.
   b. Review of Work progress.
   c. Field observations, problems, and decisions.
   d. Identification of problems which impede planned progress.
   e. Review of submittals schedule and status of submittals.
   f. Review of off-site fabrication and delivery schedules.
   g. Maintenance of progress schedule.
   h. Corrective measures to regain projected schedules.
   i. Planned progress during succeeding work period.
   j. Coordination of projected progress.
   k. Maintenance of quality and work standards.
   l. Effect of proposed changes on progress schedule and coordination.
   m. Other business relating to Work.

3. Lead Contractor shall record minutes and distribute copies within two days after meeting to Architect, Owner, participants, and those affected by decisions made.

C. Preinstallation Meetings: When required in individual specification sections, convene a preinstallation meeting prior to commencing work of the section.

1. Require attendance of parties directly affecting, or affected by, work of the specific section.

2. Notify Architect four days in advance of meeting date.

3. Prepare agenda and preside at meeting:
   a. Review conditions of installation, preparation and installation procedures.
   b. Review coordination with related work.

4. Lead Contractor shall record minutes and distribute copies within two days after meeting to Architect, Owner, participants, and those affected by decisions made.

1.06 ALTERATION PROJECT PROCEDURES:

A. Existing Conditions: Existing equipment, sewers, piping, ducts, conduit, and other existing items in place shown or noted on the Drawings, may be relied upon only for general layout. Field verify all measurements, grades, relative elevations and

locations, and obtain additional information as necessary to assure the proper fit and coordination of new work with existing.

B. Where there are alterations or additions to an existing structure, each respective Contractor and subcontractor shall be responsible for removal, rerouting, or replacement of all existing facilities and services as may be necessary to permit installation of new work or alterations to old work.
   1. Where building systems or utility services must be disrupted to permit connections and modifications, notify Architect in advance and coordinate scheduling with Owner to cause the least possible inconvenience and shortest delay.
   2. Where existing equipment, piping, or miscellaneous related items are permanently abandoned, each component exposed to view or accessible in concealed locations shall be removed completely. Concealed inaccessible piping and conduit shall be plugged or capped at a point well behind the proposed new finished closures or surfaces.

C. Existing Hazardous Materials: If the existence of asbestos or other hazardous material in the structure or building is observed during the course of construction or work, promptly notify the Owner. The Owner will consult with their consultant regarding removal or encapsulation of the asbestos material. Do not perform any work which may affect the hazardous material prior to receipt of special instructions from the Owner.

D. Materials: As specified in Product sections; match existing Products and work for patching and extending work.

E. Employ skilled and experienced installers to perform cutting and patching in accordance with Section 01 7000.

F. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.

G. Remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition.

H. Refinish existing visible surfaces to remain in renovated rooms and spaces, to renewed condition for each material, with a neat transition to adjacent finishes.

I. Where new Work abuts or aligns with existing, provide a smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.

J. When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division and submit recommendation to Architect for review.

K. Where a change of plane of ¼ inch or more occurs, submit recommendation for providing a smooth transition to Architect for review.

L. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.

M. Finish surfaces as specified in individual Product sections.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 3200 – CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.01 SECTION INCLUDES:

A. Construction progress documentation.

1.02 CONSTRUCTION PROGRESS DOCUMENTATION:

A. Submit initial construction schedule in triplicate within 15 days after date of Notice of Award.

B. Revise and resubmit as required.

C. Submit revised schedules with each Application for Payment, identifying changes since previous version.

D. Distribute initial schedule and each revision to all Prime Contractors and each Subcontractor. Coordinate with schedules received from other Prime Contractors.

E. Submit a horizontal bar chart with separate line for each section of Work, identifying first work day of each week. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, critical path, float dates, and duration.

F. Indicate estimated percentage of completion for each item of Work at each submission.

G. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and required by Allowances.

H. Schedule shall begin with Notice to Proceed and conclude with the date of final completion of the project. Float or slack time within the construction schedule is not for the exclusive use or benefit of either the Owner or Contractor but is a jointly owned, expiring project resource available to both parties as needed to meet contract milestones and the contract completion date.

I. No time extensions will be granted nor delay damages paid until a delay occurs that impacts the project's critical path, consumes all available float or contingency time, and extends the work beyond the contract completion date.

   1. Delays arising from multiple causes which may have concurrent or interrelated effects on the progress of the Work shall be combined into a single unit for the purposes of determining the appropriate time extension, if any.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 3300 – SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. General requirements for submittals.
   2. List of subcontractors and products.
   3. Shop drawings, product data and samples.
   4. Manufacturer's installation instructions and certificates.

B. Related Sections:
   1. Section 01 6000 – Product Requirements: Submittals for substitutions.
   2. Section 01 7700 – Closeout Requirements: Contract warranties, operation and maintenance data, and closeout submittals.

1.02 GENERAL REQUIREMENTS FOR SUBMITTALS:

A. Electronic Submittals: Submittals (except samples, color selectors, and submittals requiring certification by a registered professional) shall be submitted in electronic format.
   1. Only PDF files will be accepted, unless otherwise approved in advance.
   2. For submittals to be reviewed by Architect's consultants, confirm in advance that electronic submittals will be accepted.
   3. For submittals to be distributed to governing authorities, electronic submittals shall be used for review by Architect and Architect's consultants. If requested, provide the number of paper submittals required for use by authorities having jurisdiction.
   4. Submittals shall be accompanied by a statement from the Contractor indicating approval.
   5. Submittals will be returned in electronic format. Architect's notations may be included in the submittal file or in a separate document, and shall be distributed with all copies of the reviewed submittals.

B. Paper Submittals:
   1. Transmit each submittal with Transmittal Letter, AIA Form G810 or equivalent. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
   2. Apply Contractor's stamp, signed or initialed, indicating approval.
   3. Submit three copies, unless individual specification sections require a greater number of copies. One copy will be returned to the Contractor. Additional copies will not be processed or returned.
      a. For Division 23 submittals, submit one additional copy which will be retained by HVAC Consultant.

b. For Division 26 through 28 submittals, submit one additional copy which will be retained by Electrical Consultant.

C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, date, and specification section number, as appropriate.

D. Use standard letter, tabloid, and architectural page sizes only. Provide space on first page for Contractor, Architect, and professional subconsultant review stamps, minimum 1½ x 3 inch each space.

E. Where items are identified in the Contract Documents by number, letter or similar mark, include the same identification on submittals. Arrange items within the submittal in the same sequence as the identification in the Contract Documents, unless another sequence is approved in advance by the Architect.

F. By approving and submitting submittals, the Contractor represents that he has reviewed and verified field dimensions, quantities, adjacent construction Work, field construction criteria, materials, catalog numbers, specified design requirements and performance requirements, and similar data, and coordinated information in accordance with the requirements of the Work and Contract Documents.

G. Submittals stamped "For Approval Only" or "Not For Construction" will not be accepted.

H. Where individual specification sections require submittals to be prepared under the supervision of a Professional Engineer or other registered professional, apply the registered professional's seal and signature to such submittals.

I. All responsibility for the submittal shall be that of the submitter. The contractual relationship, duties, and responsibilities of the parties in Contract nor those of the Architect shall not be altered from the Contract Documents by mention or inference otherwise in any submittal.

J. Identify deviations from Contract Documents, and Product or system limitations which may be detrimental to successful performance of the completed Work.

K. Correct returned submittals marked "Revise and Resubmit" or "Not Approved"; identify all changes made since previous submission. Review of revised submittals will be limited to previously noted items, unless other changes are specifically called out. Direct specific attention in writing on resubmittals to revisions other than the corrections requested on previous submissions.

L. Distribute copies of reviewed submittals as appropriate, including distribution to separate Contractors whose work connects to or interfaces with the submittal item. Instruct parties to promptly report any inability to comply with provisions.

M. Submittals not requested will not be acknowledged or processed.

N. Submittals for Review: Architect's review of submittals is limited to conformance with the design concept and to compliance with requirements of the Contract Documents.
   1. Contractor assumes all responsibility for quantities, field dimensions, fabrication, installation, construction means, methods, techniques, sequences, procedures, safety precautions and programs, and coordination with Work by others. The content of the submittal and wording of the Contractor's review stamp shall not serve to limit responsibility for the above items.
   2. Architect will accept no responsibility for the review of submittals even though they are marked to indicate approval. Architect's review and approval in no way relieves the Contractor of full responsibility for completion of the Work in accordance with the Contract Documents.
   3. For submittals requiring approval by governing authorities, Architect's approval of the submittal is contingent upon and subject to approval by authorities having jurisdiction.
   4. Architect's notations and remarks added to submittals are to ensure compliance with Contract Documents and do not constitute, imply or require a contract modification.
   5. Architect's review of submittals is a gratuitous assistance, and the Architect does not thereby nor by any other act or omission assume responsibility for errors or omissions. Such errors or omissions shall be made good by the Contractor, irrespective of the receipt, checking, review, or approval of submittals by the Architect, and even though the Work is performed in accordance with approved submittals.

O. Submittals for Information: The following categories of submittals, and additional submittals identified in individual specification sections, will not be approved by the Architect or returned to the Contractor, but will be retained for record purposes. When requested by Contractor, Architect will acknowledge receipt. Submittals may be rejected for not complying with requirements.
   1. Manufacturer certificates, material certificates, material safety data sheets, and material test reports.
   2. Manufacturer's guide specifications.
   3. Installer certificates, welding certificates, and installer qualification data.
   4. Work plans, waste management plans, storm water pollution prevention plans, and similar representations of construction means, methods, sequences, and procedures.
   5. Insurance certificates and bonds.
   6. Test reports.
   7. Environmental product declarations.
   8. Engineering calculations.
   9. Installation instructions and maintenance recommendations.
   10. Manufacturer's field reports.
   11. Construction photographs.

1.03 SUBMITTAL SCHEDULE:

A. Prepare a complete schedule of submittals within 10 days of Notice to Proceed.

1. Coordinate Submittal Schedule with the list of subcontracts, Schedule of Values, and the list of products as well as the Construction Schedule.

2. Organize the schedule by Project Manual Contents. Provide the following information for each specification Section:
   a. Scheduled date for the first submittal.
   b. Name of Subcontractor.
   c. For each submittal for review, including revised submittals, allow 15 working days excluding delivery time.

3. Allow time for review by Architect and Architect's consultants, including delivery time. Allow time for one resubmittal after the initial submittal without delaying the Construction Schedule.

4. Review of submittals and resubmittals will be prioritized by date indicated on the Submittal Schedule.

5. Alterations or additional work required because of Contractor's failure to make timely submittals shall be corrected without additions to the Contract Sum.

B. Prioritize the submittal of critical schedule items, long lead items, items requiring coordination between Contractors, and submittals that may affect final plan approval. These items include, but are not limited to, the following:

1. Section 05 1200 – Structural Steel Framing.

2. Section 05 2100 – Steel Joist Framing.

3. Section 12 6613 – Telescoping Bleachers.

4. Section 21 1300 – Fire Suppression Sprinkler Systems.

5. Section 28 4621 – Emergency Voice Communication/Addressable Fire Alarm Systems.

1.04 LIST OF SUBCONTRACTORS:

A. Within 15 days after date of Notice to Proceed, submit list of Subcontractors proposed for use, with addresses and telephone numbers. Indicate all sections of Work to be performed by each Subcontractor.

B. Sections of Work for which a Subcontractor is not listed will be construed to be done by the Prime Contractor.

C. Notify the Architect in writing in advance of any proposed changes to the list of Subcontractors.

1.05 LIST OF PRODUCTS:

A. Within 15 days after date of Notice to Proceed, submit list of major Products proposed for use, with name of manufacturer, trade name, and model number of each Product.

B. For Products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

C. Notify the Architect in writing in advance of any proposed changes to the list of Products.

1.06 SHOP DRAWINGS:

A. Prepare neat, legible, accurate drawings at scales adequate to fully illustrate all pertinent data. Where applicable, include plan, elevation, and section views complete with dimensions, notes, and other data sufficient to demonstrate compliance with requirements of Contract Documents and to show relationships and connections to adjacent materials and related work by others.

B. Electronic Base Drawings: Contractors may obtain drawings from the Architect in Revit or Autocad format for use in preparing shop drawings. Drawings will remain the property of the Architect, and will be subject to a License Agreement which must be completed prior to distribution of the Drawings.
   1. Drawings prepared by Architect's consultants may or may not be available. Contact each consultant for availability and pricing.
   2. The Architect makes no representation regarding the accuracy or completeness of electronic drawings. Addenda, Change Orders, and other revisions may or may not be included. Electronic drawings are not contract documents, and in case of discrepancy or conflict, the contract documents shall govern.
   3. Use of electronic drawings does not relieve the Contractor of duty to check, confirm, and coordinate all dimensions and details, field verify dimensions and conditions, and coordinate the work with that of other Contractors.

C. Submit for review. After review, produce copies and distribute as required for fabrication and construction, and for record documents purposes as described in Section 01 7700.

D. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

E. Structural Calculations: State specific loads on which calculations are based. References to code requirements without listing specific loads are not sufficient.

F. Wiring Diagrams: When specified in individual specification sections, submit detailed point-to-point wiring diagrams indicating each component, locations and quantities, and interconnecting wiring between components. Manufacturer's generic system layouts are not normally sufficient without modification to indicate specific Project requirements.

1.07 PRODUCT DATA:

A. Identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to this Project.

B. Submit for review. After review, distribute as required for fabrication and construction, and for record documents purposes as described in Section 01 7700.

C. Indicate electrical characteristics, including voltage, amperage, and phase.

D. Indicate special utility characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

1.08 SAMPLES:

A. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

B. Submit samples of the precise article proposed to be furnished.

C. Submit samples whenever a choice of color or pattern is available in a specified material or Product. Include the full range of manufacturer's standard colors, textures, and patterns for selection.

D. Include identification on each sample, with full Project information.

E. Submit the number of samples specified in individual specification sections, or two samples where not otherwise specified; one of which may be retained by Architect.

F. Reviewed samples which may be used in the Work are indicated in individual specification sections.

1.09 MANUFACTURER'S INSTALLATION INSTRUCTIONS:

A. Maintain on site one printed or electronic copy of manufacturer's instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing.

B. When specified in individual specification sections, or upon request, submit instructions to Architect for information.

C. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.10 MANUFACTURER CERTIFICATES:

A. When specified in individual specification sections, or upon request, submit certification by manufacturer to Architect.

B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 3556 – BACKGROUND CHECK PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES:

A. Criminal background checks for construction workers.

1.02 ADMINISTRATIVE REQUIREMENTS:

A. During the course of construction projects, the Owner desires to protect its students and employees from individuals who may have criminal records. The Owner requires that all construction workers on its property must undergo a criminal background investigation and FBI check ("Criminal Background Check") to identify any workers that have been convicted of or pleaded guilty to any criminal violations listed in Ohi Revised Code (ORC) 3319.39.

B. Except as provided in paragraphs D and E of this requirement, no construction worker shall be permitted to perform work on a construction project undertaken by the Owner if the worker has been convicted of or pleaded guilty to any of the following:

1. A violation of the following Ohio Revised Code sections:

ORC Section	Violation
2903.01, 2903.02	murder or aggravated murder
2903.03, 2903.04	voluntary or involuntary manslaughter
2903.11, 2903.12, 2903.13	assault, felonious assault, aggravated assault
2903.16	failing to provide for a functionally impaired person
2903.21	aggravated menacing
2905.01, 2905.02	kidnapping, abduction
2905.04, 2905.05	child stealing or child enticement
2907.02	rape
2901.03	sexual battery
2907.12	felonious sexual penetration
2907.05, 2907.06	sexual imposition or gross sexual imposition
2907.04	corruption of a minor
2907.07	importuning
2907.08	voyeurism

2907.09	public indecency
2907.23, 2907.25	prostitution or procuring prostitution
2907.21, 2907.22	compelling or promoting prostitution
2907.32, 2907.321	pandering obscenity and/or child pornography
2907.31	disseminating matter harmful to juveniles
2907.322	pandering any sexually oriented materials involving or depicting minors
2907.323	use of minor in nudity-oriented materials or performance
2911.01, 2911.02	robbery or aggravated robbery
2911.11, 2911.12	burglary or aggravated burglary
2919.22	endangering children
2919.24	contributing to unruliness or delinquency of child
2923.12	carrying concealed weapon
2923.13	having weapon while under disability
2925.02	corrupting another with drugs
2925.03	trafficking in drugs
3716.11	placing harmful objects or substances in food
3319.31	any other drug abuse offense which is not a minor misdemeanor

2. A violation of any existing or former law of this State, any other State, or the United States, if the offense is substantially equivalent to any of the offenses described above.

C. The Owner may permit a construction worker to work conditionally until the Criminal Background Check is completed and the Owner receives the results of the check. If the results of the Criminal Background Check indicate that, pursuant to this policy, the worker does not qualify to work on an Owner project, the Contractor shall immediately remove the worker from the site.

D. Except as provided in paragraph E of this requirement, a construction worker who has been convicted of or pleaded guilty to a violation of ORC Sections 2903.13, 2903.16, or 2903.21 may be permitted to work if all of the following conditions are met:

1. The offense was a misdemeanor.
2. The victim of the offense was not a person under 18 years of age.

3. At least 5 years have elapsed since the worker was fully discharged from imprisonment, probation, and parole, or the worker has had the record of his/her conviction sealed pursuant to ORC 2953.32.
4. The worker provides written confirmation by a Court, his/her parole officer, and/or counselor that the worker has been rehabilitated.
5. The worker's hiring will not jeopardize in any way the health, safety, or welfare of the persons served by the Owner. The following factors must be considered in determining whether the worker's hiring will jeopardize the persons served by the Owner:
   a. The worker's age at the time of the offense.
   b. The age and ability of the victim, including whether the victim is an individual with physical or mental disabilities.
   c. The nature and seriousness of the offense.
   d. The circumstances under which the offense was committed.
   e. The degree to which the worker participated in the offense.
   f. The time elapsed since the worker was fully discharged from imprisonment, probation, and parole.
   g. The likelihood that the circumstances leading to the offense will recur.
   h. Whether the worker is a repeat offense. "Repeat offender" means a person who has been convicted of or pleaded guilty to the commission of any of the offenses listed in paragraph B of this requirement two or more times in separate criminal actions. Convictions or guilty pleas resulting from or connected with the same act, or resulting from offenses committed at the same time, shall be counted as one conviction or guilty plea.
   i. The extent to which the job assigned this worker is employed provides an opportunity for the commission of an offense listed in paragraph B of this requirement.
   j. The worker's employment record.
   k. The worker's efforts at rehabilitation and the results of those efforts.
   l. Whether any criminal proceedings are pending against the worker.

E. It is the worker's responsibility to provide written proof that the conditions specified in paragraph D of this requirement are met. If the worker fails to provide such proof or if the Owner determines that the proof offered by the worker is inconclusive, the worker shall not be allowed to work on an Owner project. Any doubt shall be resolved in favor of protecting the persons served by the Owner.

F. A conviction of or a plea of guilty to an offense listed in paragraph B of this requirement shall not prevent a worker from working on an Owner project if the worker has been granted an unconditional pardon for the offense pursuant to law. For purposes of this policy, "unconditional pardon" includes a conditional pardon with respect to which all conditions have been performed or have transpired.

G. This construction project requirement applies to all employees of a Contractor holding a construction contract awarded by the Owner, who are performing work at the

construction site, and the employees of all subcontractors to a Contractor who will be performing work on site. The employees of material suppliers will only be subject to this requirement if they are delivering materials and equipment to the building while school is in session. The Owner may request that a specific employee obtain the required Criminal Background Check if it has not already done so, and the Contractor shall comply with this request without delay.

H. The Criminal Background Check can be obtained from any entity with the facilities to process the check; however, the results of the check must be provided to the Owner to secure the proper identification as follows:

   1. The cost to obtain the Criminal Background Check is the responsibility of each Contractor on the Project.

   2. If an employee has had a criminal background check within the last 12 months prior to the date of contract award, which showed no violations of the laws listed in paragraph B above, the employee or its employer must provide the results of that check to the Owner to obtain the proper identification described in the next section.

   3. If the Contractor provides evidence that any of its employees have requested a criminal background check and received satisfactory results for the employees, the Contractor assumes full responsibility that nothing has changed with respect to the employee's background since the check was first conducted.

I. The Owner will issue an identification badge for each worker subject to this requirement after the results of the criminal background check have been provided to the Owner. The badge will be issued within 3 business days of receipt of the required documentation by the Owner; temporary badges will be issued for any interim period. This identification badge must be worn at all times while a worker is on the construction site. If a worker arrives at the site without a badge, the worker must report immediately to the Owner and will be provided with a temporary badge. A temporary badge will be provided for no more than two days in succession, unless the Owner agrees to a longer period of time, in its sole discretion.

J. Each construction worker is responsible for maintaining a current criminal background check and identification badge. If a worker loses his or her badge, a temporary or replacement badge must be obtained from the Owner immediately.

K. Each Bidder awarded a contract for work on the Project must certify that it is aware of this requirement and will comply with it. Failure to comply with this requirement may be determined to be a material breach of the construction contract and grounds for termination of the contract.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 4000 – QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Regulatory requirements.
   2. References.
   3. Quality assurance and control.

B. Related Sections:
   1. Section 01 3300 – Submittal Procedures: Submittals of manufacturer's instructions and certificates.
   2. Section 01 6000 – Product Requirements: Requirements for material and product quality.

1.02 REGULATORY REQUIREMENTS:

A. General Requirements:
   1. Perform Work in conformance with the codes and standards listed in this Section, and with the requirements of federal, state and local authorities having jurisdiction.
   2. It is the Contractor's responsibility to become familiar with all regulatory requirements which may affect the Work.
   3. Standards which apply to specific portions of the Work are listed in individual specification sections.
   4. Comply with regulatory requirements in effect on the date for receiving bids, or on date of Contract Documents if there were no bids, except where a specific date is established.
   5. In the event of conflict between regulatory requirements and the Contract Documents, comply with regulatory requirements, but not before referring the points in question to the Architect for approval.

B. Codes and Regulations:
   1. Building Code: Ohio Building Code.
   2. Handicapped Accessibility Code: ICC A117.1.
   3. Mechanical Code: Ohio Mechanical Code.
   4. Plumbing Code: Ohio Plumbing Code.
   5. Electrical Code: National Electrical Code, NFPA 70.

6. All work involving refrigerants, including servicing of and modifications to existing systems, shall comply with the Clean Air Act and current Amendments, and applicable EPA regulations.

C. Standards: Ensure products and installation are in conformance with applicable recommendations and requirements of the following:

1. Factory Mutual Engineering.
2. Owner's insurance underwriter.
3. Americans with Disabilities Act (ADA) Standards for Accessible Design.
4. National Electrical Manufacturers Association (NEMA).
5. National Fire Protection Association (NFPA).
6. Occupational Safety and Health Administration (OSHA).
7. Underwriters Laboratories (UL).
8. Local utility companies.
9. Products requiring electrical connection shall be listed and classified by Underwriters Laboratories, Inc., or other testing firm acceptable to the authority having jurisdiction, as suitable for the purpose specified and indicated.

D. Taxes:

1. Bidders and Contractors shall be responsible for informing themselves of tax laws, requirements, regulations, and interpretations as they apply to this project.
2. The Owner is a political subdivision of the State of Ohio. Building materials that the Contractor purchases for incorporation into the improvements will be exempt from the state sales and use taxes, if the Contractor provides a properly completed sales tax exemption certificate executed by the Contractor and the Owner to the vendors or Suppliers at the time of the acquisition of the materials. The Owner will execute properly completed certificates on request.
   a. Contractor shall not charge Owner, and Owner shall not be liable for payment of, taxes from which Owner is exempt by law.
   b. Purchases by the Contractor of expendable items such as form lumber, tools, oils, fuel, or equipment rentals are subject to the application of the Ohio Sales or Use Tax.
3. Contractor shall pay all income taxes and payroll taxes required by local jurisdictions.

E. Permits and Fees:

1. The Architect will apply for Building Plan Approval from the Ohio Department of Commerce, including General, Mechanical, Electrical, Plumbing, Sprinkler, and Fire Alarm work. Contractor will not be responsible for initial filing fees.
   a. All communications related to plan approval, including shop drawing submittals, are required to be made through the Architect.
   b. Coordinate shop drawing submittals and correction letter responses with the project schedule, planned not to exceed the allowable number of resubmittals. Fees for additional resubmittals resulting from delinquent, incomplete, or incorrect information will be the responsibility of the Contractor.

2. Prior to beginning work, Contractor shall conduct a meeting with the building inspector, fire chief, and Owner to develop an approved egress plan for existing building exits affected by new construction. Include costs for temporary construction necessary to implement the plan.

3. Except as noted above, each Contractor shall procure from the proper authorities and pay all fees for permits, taps, licenses, inspections, and other charges applicable to their Work, as required by state laws, city and county ordinances, and regulations pertaining to the work.
   a. All costs shall be borne by the Contractor responsible for the work.
   b. Arrange for inspections to be performed, giving notice to inspecting authorities in ample time so that work can be inspected and approved as it progresses.
   c. Do not cover or conceal work requiring inspection until inspection has been performed.
   d. At the conclusion of the installation, secure a certificate of final inspection and approval by enforcement authorities.

1.03 REFERENCES:

A. For Products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except where more rigid requirements are indicated in the Contract Documents or are required by applicable codes.

B. Conform to edition of reference standard current on date of Contract Documents, except where a specific edition is established by code.

C. Obtain copies of standards where required by product specification sections.

D. Submit one copy of any referenced standard when requested by Architect.

E. The contractual relationship, duties, and responsibilities of the parties in Contract nor those of the Architect shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.04 QUALITY ASSURANCE AND CONTROL:

A. General Requirements:

1. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.

2. Comply with manufacturer's instructions, including each step in sequence.

3. Should manufacturer's instructions conflict with Contract Documents, request clarification from Architect before proceeding.

4. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

5. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

B. Personnel:

1. Perform work by persons qualified to produce workmanship of specified quality.

2. The Owner may direct the removal and replacement of any Contractor personnel for the following:
   a. Consistently poor workmanship or production of low quality work.
   b. Failure to actively cooperate with the Owner, Architect, or other Contractors in the construction effort.
   c. Theft, vandalism or fraudulent acts.
   d. Dangerous or unsafe practices.
   e. Use of alcohol or drugs; possession or sale of illegal substance of any kind.
   f. Any activity in, on, or about the premises, or in connection with the work, that violates any ordinance, statute, or other regulation of any governmental body having jurisdiction over the premises.
   g. Other activity, though lawful, which in the Owner's opinion is not proper construction practice or suitable for an educational environment, including, without limitation, smoking on school property.
   h. Any visible or audible actions initiated or responded to by any employees or Contractors on this Project toward any students, teachers, or staff members at the school system.

3. Upon receipt of a written directive from the Owner requiring removal of an employee for one of the above causes, immediately remove the employee from the Project. The removal or replacement of an employee for the above causes shall not be cause for additional compensation. Any such dismissed worker shall not be reemployed in any other capacity for work on the Project.

C. Tolerances:

1. Monitor tolerance control of installed Products to produce acceptable Work. Do not permit tolerances to accumulate.

2. Comply with manufacturer's tolerances. Should manufacturer's tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
3. Adjust Products to appropriate dimensions; position before securing Products in place.

D. Manufacturers' Field Services and Reports:

1. 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, adjustment and balancing of equipment, as applicable, and to initiate instructions when necessary.
2. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
3. Submit report in duplicate within 30 days of observation to Architect for information.

E. Mockups:

1. When specified in individual specification sections, construct full-size representations of construction, materials, and finishes to demonstrate aesthetic effects, quality of workmanship, and coordination of elements.
2. Build mockups in locations and size indicated, or if not indicated, as directed by Architect.
3. Notify Architect minimum 7 days in advance of scheduled date for construction of mockup.
4. Construct mockup using workers to be employed for the construction illustrated by the mockup, and under the direction of the supervisory personnel who will direct the work.
5. Demonstrate the proposed range of aesthetic effects and workmanship.
6. Obtain Architect's approval of mockups before starting fabrication or construction of the work, allowing minimum 7 days for initial review and each subsequent review of each mockup.
7. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 4210 – ABBREVIATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES:

A. Definition of abbreviations used in the Contract Documents.

1.02 ABBREVIATIONS – TERMS:

A. Listed below are terms and abbreviations which may be found in the Contract Documents. Common English language terms have not been included. Refer also to Drawings and individual specification Sections for terms and abbreviations specific to those documents. Acronyms used to refer to associations and organizations are listed separately below. Where multiple definitions are listed for an abbreviation, refer to the context for the intended meaning. For abbreviations not listed, and where the intended meaning is not obvious, request interpretation from the Architect.

AC	air conditioning; alternating current
A.B.	anchor bolt
ACC.	accessible
ACOUST.	Acoustical
ADA	Americans with Disabilities Act, Standards for Accessible Design
ADJ.	adjacent; adjustable
A.F.F.	above finished floor
A.F.G.	above finished grade
AFUE	annual fuel utilization efficiency
AHU	air handling unit
ALT.	alternate
ALUM.	aluminum
AMP	ampere
ANOD.	anodized
APPROX.	approximate
ARCH.	Architect
ASSY.	assembly
ATTN.	attention
AUTO.	automatic
AUX.	auxiliary
AWG	American wire gauge
B&B	balled and burlapped
BD.	board
B.F.F.	below finished floor
BHP	brake horsepower
BLDG.	building
BLKG.	blocking
BLKHD.	bulkhead
BM	beam; benchmark
BN	bullnose
BOT.	bottom
BRG.	bearing
BSMT.	basement
BTU	British thermal unit
BTUH	British thermal unit per hour
C	Celsius; channel
CAB.	cabinet
CAP.	capacity
CAT.	catalog
CATV	community antenna (cable) television
CAV.	cavity
CB	catch basin; cementitious (backer) board
CCF	hundred cubic feet
CFM	cubic feet per minute
CHW	chilled water; circulating hot water
CI	cast iron; curb inlet
CJ	construction joint; control joint
CKT.	circuit
CL	center line; class
CLG.	ceiling; cooling
CLOS.	closet; closure
CMU	concrete masonry unit
CO	cased opening; cleanout; company
COEFF.	coefficient
COL.	column
CONC.	concrete; concentric
COND.	condenser; condensate
CONF.	conference
CONN.	connection
CONT.	continue; continuous
CONTR.	contract; contractor
CONV.	convert; conventional
COORD.	coordinate
CORR.	corridor; correct

CPT	carpet
CPVC	chlorinated polyvinyl chloride
CT	ceramic tile; countertop; current transformer
CTR.	center
CU	cubic; copper; coefficient of utilization
CUH	cabinet unit heater
CW	cold water
CYL.	cylinder
D	deep; depth; penny (nail)
DAT.	datum
DB	decibel; dry bulb
DBL.	double
DC	direct current
DDC	direct digital control
DEG.	degree
DEL.	delete; deliver
DEPT.	department
DET.	detail
DF	drinking fountain
DI	ductile iron
DIA.	diameter
DIAG.	diagonal; diagram
DIFF.	difference; diffuser
DIM.	dimension
DISC.	disconnect
DISP.	dispenser; disposal
DIST.	distance; district; distribution
DL	dead load
DOC.	document
D.P.	down pipe
DR.	door
DW	dishwasher
DWG.	drawing
DWV	drain, waste and vent
EA.	each
E.C.	Electrical Contractor
EIFS	exterior insulation and finish system
EJ	expansion joint
EL.	elevation
ELEC.	electric
ELEV.	elevator
EP	edge of paving; electrical panel
EPDM	ethylene propylene diene monomer
EPS	expanded polystyrene
EQUIP.	equipment
EQUIV.	equivalent
ESMT.	easement
ESP	external static pressure
EST.	estimate
EW	each way
EWC	electric water cooler
EXH.	exhaust; exhibit
EXIST.	existing
EXP.	expansion; exposed
EXT.	exterior; extinguisher
F	Fahrenheit; female
FACP	fire alarm control panel
FC	footcandle
FCO	floor cleanout
FD	floor drain
FDN.	foundation
FE	fire extinguisher
FFE	finish floor elevation
FH	fire hydrant
FHMS	flat head metal screw
FIG.	figure
FIN.	finish
FIXT.	fixture
FL	flow line
FLA	full load amps
FLG.	flange; flashing
FLR.	floor
FLUOR.	fluorescent
FOUND.	foundation
FP	fire protection
FR	fire rating
FRP	fiber reinforced polyester
FRTW	fire retardant treated wood
FS	Federal Specification
FT	feet; foot
FTG.	footing
FURN.	furnace; furnish; furniture
FXT.	fixture
GA	gage
GAL.	gallons
GALV.	Galvanized
GBF	granular backfill
G.C.	General Contractor
GCO	grade cleanout
GF	gas furnace
GFCI	ground fault circuit interrupter
GL	glass
GLULAM	glued laminated wood
GPM	gallons per minute
GYP.	gypsum
H	height
HB	hose bibb
HC	HVAC Contractor; hollow core
HDO	high density overlay
HDW.	hardware
HID	high intensity discharge
HM	hollow metal
HORIZ.	horizontal
HP	high pressure; horsepower

HPS	high pressure sodium
HT.	height
HVAC	heating, ventilating and air conditioning
HW	hot water
ID	inside diameter; identification
IN.	inches
INCAND.	incandescent
INCL.	included
INSUL.	insulation
INT.	interior
INV.	invert
IPS	international pipe standard; iron pipe size
IR	infrared
JAN.	janitor
JST.	joist
JT	joint
KD	kiln dried; knocked down
KIT.	kitchen
KO	knockout
KSF	thousand square feet
KVA	kilovolt amperes
KW	kilowatt
L	angle; liter
LAM.	laminate
LAV	lavatory
LB	pound; load bearing
LDG.	landing; loading
LED	light emitting diode
LF	linear feet (foot)
LH	left hand
LL	live load; lead lined
LLH	long leg horizontal
LLV	long leg vertical
LONG.	longitudinal
LPG	liquid petroleum gas
LRA	locked rotor amps
LTWT	lightweight
LTG.	lighting
MAINT.	maintenance
MAN.	manual
MATL.	material
MAX.	maximum
MBH	thousand BTU per hour
M.C.	HVAC Contractor; moisture content
MCA	minimum circuit amps
MDO	medium density overlay
MECH.	mechanical
MED.	medium; medical
MFR.	manufacturer
MH	manhole
MIN.	minimum; minute
MISC.	miscellaneous
MLDG.	molding
M.O.	masonry opening; motor operated
MOD	motor operated damper
MON.	monument
MSB	mop service basin
MT.	mount
MTD.	mounted
MTG.	mounting
MTL.	metal
NC	noise criteria; normally closed
NEC	National Electrical Code (NFPA 70)
NIC	not in contract; noise isolation class
NO	number; normally open
NOC	notice of commencement
NRC	noise reduction coefficient
N.T.S.	not to scale
OA	outside air; overall
OAI	outside air intake
OC	on center
OCC.	occupant
OD	outside diameter
OH	overhead
OPG.	opening
OPP.	opposite
OPT.	optional; optimum
OZ.	ounce
P	pole
PART.	partial
PC	Plumbing Contractor; point of curve
PEND.	pendant
PERF.	perforated
PERIM.	perimeter
PERM.	permanent
PERP.	perpendicular
PH	phase
PI	point of intersection
PIV	post indicator valve
PKG	package; parking
PL	plate; property line
P. LAM.	plastic laminate
PLBG.	plumbing
PLYWD.	plywood
PNL.	panel
PORC.	porcelain
PORT.	portable
POS	positive; position
PREF.	preference
PREFAB.	prefabricated
PREFIN.	prefinished
PRELIM.	preliminary
PREV.	previous
PROJ.	project

PSF	pounds per square foot
PT	preservative treated
PVC	polyvinyl chloride
QT	quarry tile
QTY.	quantity
R	radius; thermal resistance
RA	return air
RCB	rubber cove base
RD	roof drain
REBAR	reinforcing steel bars
RECIRC.	recirculation
RECEPT.	reception; receptacle
RECT.	rectangular
REF.	reference; refrigerator
REFL.	reflected
REINF.	reinforcing; reinforced
REQD.	required
RESIL.	resilient
REV.	revision
RH	right hand; relative humidity
RM.	room
R.O.	rough opening
RPM	revolutions per minute
RS	rough sawn; rapid start
RSB	rubber straight base
RTU	rooftop unit
R/W	right of way
S4S	surfaced four sides
SA	supply air
SAN.	sanitary
SAT	suspended acoustical tile
SC	Site Contractor; solid core; shading coefficient
SCHED.	schedule
SCWD	solid core wood
SENS	sensible
SF	square feet (foot)
SGFT	structural glazed facing tile
SHT.	sheet
SIM.	similar
SM.	small
SP	static pressure
SPKR.	speaker
SQ.	square
SS	service sink; stainless steel
ST	storm
STC	sound transmission class
STD.	standard
STL.	steel
STOR.	storage
STRUCT.	structural
SURF.	surface
SUSP.	suspended
SV	sheet vinyl
SW	switch
SWR.	sewer
SYM.	symbol; symmetrical
SYS.	system
T&G	tongue and groove
TAN.	tangent
TB	through bolt; test boring
TC	top of curb
TEL.	telephone
TEMP.	temporary; temperature; tempered
TERM.	terminal
THK.	thickness
TOIL.	toilet
TP	top of pavement; telephone pole; toilet paper
TRANS.	transparent; transverse; transom
TS	tube steel
TYP.	typical
U	heat transfer coefficient
UC	under cabinet
UG	underground
UH	unit heater
UNO	unless noted otherwise
UR.	urinal
UTIL.	utility
UV	unit ventilator; ultraviolet
V	volt
V.B.	vapor barrier
VCT	vinyl composition tile
VERT.	vertical
VFY.	verify
VNR	veneer
VOC	volatile organic compound
VOL.	volume
VTR	vent through roof
VWC	vinyl wall covering
W	watt; width; west; wall
W/	with
W/O	without
WC	water closet; water column
WCO	wall cleanout
WD	wood
WDW.	window
WH	wall hydrant; water heater
WOLM.	preservative treated
WT	weight
WWF	welded wire fabric
XFMR	transformer
XFR	transfer
XPS	extruded polystyrene
YD	yard

1.03 ABBREVIATIONS – ASSOCIATIONS AND ORGANIZATIONS:

AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
ABAA	Air Barrier Association of America
ACI	American Concrete Institute
ADC	Air Diffusion Council
AFPA	American Forest and Paper Association
AGA	American Gas Association
AHA	American Hardboard Association
AHRI	Air Conditioning, Heating, and Refrigeration Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ALA	American Laminators Association
ALSC	American Lumber Standards Committee
ANSI	American National Standards Institute
APA	The Engineered Wood Association
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Sanitary Engineering
ASTM	American Society for Testing and Materials
AWI	Architectural Woodwork Institute
AWPA	American Wood Protection Association
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builder's Hardware Manufacturer's Association
BIA	Brick Institute of America
BICSI	Building Industry Consulting Service International
CDHS	California Department of Health Services
CISCA	Ceilings and Interior Systems Contractors Association
CISPI	Cast Iron Soil Pipe Institute
CPSC	Consumer Products Safety Commission
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
DHI	Door Hardware Institute
DIN	Deutsches Institut für Normung
DOC	Department of Commerce
ECIA	Electronic Components Industry Association
EPA	Environmental Protection Agency
FCC	Federal Communications Commission
FM	Factory Mutual Engineering Corporation
FSC	Forest Stewardship Council
GA	Gypsum Association
HMMA	Hollow Metal Manufacturers Association
HPVA	Hardwood Plywood and Veneer Association
IAPMO	International Association of Plumbing and Mechanical Officials
ICC	International Code Council
ICC-ES	International Code Council Evaluation Service
ICEA	Insulated Cable Engineers Association
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IETF	Internet Engineering Task Force

ISO	International Organization for Standardization
MBMA	Metal Building Manufacturers Association
MIC	Masonry Industry Council
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry
NAAMM	National Association of Architectural Metal Manufacturers
NCMA	National Concrete Masonry Association
NCPWB	National Certified Pipe Welding Bureau
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NFRC	National Fenestration Rating Council
NFSHSA	National Federation of State High School Associations
NHLA	National Hardwood Lumber Association
NJATC	National Joint Apprenticeship and Training Committee for the Electrical Industry
NLGA	National Lumber Grades Authority
NRCA	National Roofing Contractors Association
NSF	National Sanitation Foundation
NSI	Natural Stone Institute
NTMA	National Terrazzo & Mosaic Association
NWWDA	National Wood Window and Door Association
OBC	Ohio Building Code
ODOT	Ohio Department of Transportation
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PDI	Plumbing and Drainage Institute
PS	Product Standards
RFCI	Resilient Floor Covering Institute
SDI	Steel Deck Institute
SDI	Steel Door Institute
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SPIB	Southern Pine Inspection Bureau
SPRI	Single Ply Roofing Industry
SSPC	Society for Protective Coatings
TCNA	Tile Council of North America
TIA	Telecommunications Industry Association
TPS	Technical Preservation Services, National Park Service
UBC	Uniform Building Code
UL	Underwriters Laboratories
USC	University of Southern California
USGBC	U. S. Green Building Council
WDMA	Window and Door Manufacturers Association

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 4520 – TESTING AND INSPECTING SERVICES

PART 1 GENERAL

1.01 SECTION INCLUDES:

A. Testing and inspecting services.

1.02 TESTING AND INSPECTING SERVICES:

A. Coordinate inspection and testing work with independent testing firm employed by Owner. The testing firm will perform inspections, tests, and other services scheduled in this Section and as required by the Architect.
   1. At Owner's option, more than one firm may be employed.
   2. Testing required by individual specification Sections and not scheduled below, shall be performed at the Contractor's expense by a qualified independent testing firm acceptable to Architect and Owner.

B. Inspecting, testing, and source quality control may occur on or off the project site. Perform off-site inspecting or testing as required by the Architect.

C. The testing firm shall promptly submit reports indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
   1. Non-compliance of any portion of Work with Contract Document requirements shall be cause for rejection of that portion of Work.
   2. Retesting required because of non-conformance to specified requirements shall be performed by the same testing firm at Contractor's expense on instructions from the Architect.
   3. The testing firm is not authorized to revoke, alter, relax, enlarge, or release any requirement of the Contract Documents.

D. Cooperate with testing firm; furnish samples of materials, design mix, manufacturer or supplier certifications, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
   1. Notify Architect and testing firm 48 hours prior to expected time for operations requiring services.
   2. Make arrangements with testing firm and pay for additional samples and tests required for Contractor's use.

E. Testing or inspecting does not relieve Contractor from performing work in full compliance with Contract Documents.

1.03 SUBMITTALS:

A. The testing firm shall distribute copies of each test report to the Architect and Contractor.

B. The first copy of each type of report, and all test reports indicating non-compliance with specified requirements, shall be submitted promptly, but not more than 72 hours after test results are available.

C. Remaining test reports shall be submitted at maximum biweekly intervals.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 SCHEDULE OF TESTING AND INSPECTING SERVICES:

A. Except for code required special inspections, scope of testing work is subject to modification at the discretion of the Owner. Provide periodic special inspections except where continuous special inspection is specifically indicated or required by code.

B. Earthwork Testing: Site and Building Excavating and Backfilling.

1. Testing firm shall employ a full-time Soils Engineer and Soils Laboratory qualified in soils testing and evaluation to observe site grading, placement of fill, and excavation and backfill for building pad, site drainage system, and site utilities, and perform the activities scheduled below.

2. Analyze native and imported fill and backfill material and top soil proposed for use to determine suitability for use and compliance with Contract Documents.
   a. Test fill and backfill material to determine soil classification, plasticity index, optimum moisture content, and dry density.

3. Field test natural grades to be retained, areas of cut, and areas of controlled fill and backfill to determine moisture content, percent of compaction and compliance with specified values.
   a. Number of Tests: Minimum number as scheduled below, and additional tests at the discretion of the Soils Engineer.
      (1) Building Area: One test for every 500 cubic yards of fill and backfill, or in areas of natural grade or cut one test for every 10,000 square feet, located to give equal coverage to all portions of the building subgrade.
      (2) General Site Areas: One test for every 2000 cubic yards of fill and backfill, or in areas of natural grade or cut one test for every acre, located to give equal coverage to all earthwork areas.
      (3) Exterior Slabs and Walks: One test for each air slab location, and one test for every 50 lineal feet of walk.

4. Observe building foundation excavation and subgrade preparation; confirm size, depth, and suitability of the excavated areas; test soil bearing capacity to verify

compliance with specified values; test porous fill to determine soil classification, depth, and percent of compaction.

a. Test soil bearing capacity of one column footing per 5000 square feet of building area, and every 100 lineal feet of wall foundation. Test results must indicate in-place soil bearing capacity.

C. Concrete Testing:

1. Testing firm shall test all Portland Cement concrete. The firm's personnel shall obtain samples and adequately protect all samples during storage and transporting.
   a. Check batching and mixing operation periodically for compliance with the Contract Documents.
   b. Review the manufacturer's mill test certificate for each shipment of cement and reinforcing steel, or conduct laboratory tests or spot checks of these materials as received.
   c. Mold and test concrete field cylinders as scheduled.

2. Observe placement of reinforcing bars and mesh; verify size, spacing, lap dimensions, chairs and supports, concrete cover and surface condition of reinforcing is as specified; verify adequacy of formwork and ties to prevent movement during concrete placement.

3. Test concrete materials as follows:
   a. Aggregate: ASTM C33.
   b. Cement: ASTM C150; accompany all cement used on the job with a testing agency certificate indicating compliance of cement with all tests.

4. Test concrete for slump and strength as follows:
   a. Secure composite samples in accordance with ASTM C172 from each mix design placed in any one day, or from each 100 cubic yards of concrete placed in continuous pours, whichever is less.
   b. Cast cylinder specimens from each sample; cure cylinders in accordance with ASTM C39. Test cylinders for 7-day and 28-day strength. Test reports shall include temperature of air and concrete at site, mix proportions and all data necessary to determine compliance with Contract Documents.
   c. Determine slump of the concrete for each sample and whenever consistency of concrete appears to vary; test in accordance with ASTM C143.
   d. Test a portion of the air-entrained concrete samples to determine the amount of entrained air, in accordance with either ASTM C231 or ASTM C173.
      (1) Should these tests indicate at any time that air content is not within specified limits, the Contractor at his expense shall modify the materials as necessary to achieve compliance.

5. If the average strength of test cylinders for any portion of the structure constitutes a failure as defined in ACI 318, or if slump is beyond tolerances, the Architect may require changes in the concrete mix proportions at the Contractor's expense,

may require additional testing in accordance with ASTM C42, or may declare all concrete work, of which the non-complying cylinders are representative samples, in violation of the Contract Documents.

6. If the work is in violation of the Contract Documents, or if there is a likelihood of the concrete having been frozen, the Contractor shall make loading tests at his expense, if so directed by the Architect. If the unit area or member under consideration fails to pass the loading test or shows evident signs of failure, the Contractor shall remove and rebuild the defective construction at his expense, or shall provide at his expense such additional construction as the Architect considers necessary to make the structure sound.
   a. Conduct loading tests in the presence of representatives of the Owner and Architect in accordance with Chapter 20 of ACI 318.

D. Masonry Testing: ACI 530.

1. Test compressive strength of mortar and grout in accordance with ASTM C109 and ASTM C780. Cast one set of 3 specimens for each 5000 square feet of masonry wall construction for each type of mortar and grout.
   a. Mortar: 2 inch cubes.
   b. Grout: 3 x 3 x 6 inch mockups.
2. A qualified inspector shall observe masonry construction and grouting, and submit reports using NCMA TEK 18-3 Level B as a guideline.
3. Provide full-time on-site observation of flashing and weep installation. Provide photograph or video record of flashing installation at each typical condition, and at each lap, interruption, or penetration of flashing. Submit one copy to Architect, with locations identified on plan or elevation drawing.

E. Structural Steel Inspection: AISC 360.

1. An inspector qualified to inspect bolted steel connections in accordance with the Specifications of the RCSC shall inspect bolted connections.
   a. Snug Tight Joints Not Designated as Slip Critical: Inspect 25 percent of all connections.
   b. Other Connection Types: Inspect all connections.
2. Visually check connections for the use of proper bolt type, size and washer installation; determine that all plies of the connected material are in firm contact and that the provisions of the RCSC Specification have been satisfied.
3. Contractor shall re-tighten all bolts in any connection which fail inspection and resubmit the connection for re-inspection. All costs for re-tightening and re-inspection of the connection shall be borne by the Contractor.
4. Steel Joists: Periodically inspect bridging, and welded or bolted end connections, in accordance with SJI.

F. Firestopping:

1. Inspect tested and listed penetration systems in accordance with ASTM E2174.
2. Inspect tested and listed joint systems in accordance with ASTM E2393.

G. Paving Testing:

1. Testing firm shall employ an Engineer qualified to perform pavement testing services in accordance with AASHTO and ASTM standards.
2. Review mix designs submitted by Contractor.
3. Test aggregate base course for compliance with specified physical requirements and sieve analysis. Observe installation for compacted thickness, cross section, and grade. Conduct field density tests to determine optimum moisture content and percent of compaction.
   a. Aggregate: ASTM D1241.
   b. Field Density: ASTM D1557; number at discretion of Engineer, minimum one test per 40,000 square feet.
4. Test asphaltic concrete mix for asphalt cement content, gradation, Marshall stability, air voids, and physical requirements. Observe asphaltic concrete placement for number of lifts, procedure employed and compliance with indicated cross section and grade. Perform field density and extraction tests to determine percent of compaction.
   a. Asphaltic Concrete Mix: ASTM D2172 or AASHTO T164, and AASHTO T30.
   b. Optimum Asphalt Cement: Marshall Method or other AASHTO approved methods.

END OF SECTION

SECTION 01 4527 – EMERGENCY RESPONDER RADIO COVERAGE TESTING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Radio frequency testing for emergency responder radio coverage.

1.02 ABBREVIATIONS:

A. AHJ: Authority Having Jurisdiction.

B. DAQ: Delivered Audio Quality.

C. ER: Emergency Responders.

D. RF: Radio Frequency.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Submittals for Information:
   1. Statement of qualifications.
   2. List of frequencies to be tested.
   3. Cut sheets of the instruments used for testing. Instruments are subject to approval by Owner and Architect.
   4. Contact information of ER officials and AHJ.
   5. Description of proposed testing procedures and method of documentation.

1.04 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Test Reports: Include in O&M manuals.
   1. Verify formatting requirements with AHJ.
   2. Provide numeric data in spreadsheet format.
   3. Provide building floor plans with test grid and locations indicated. For each test area, indicate "Pass" or "Fail" results for each frequency tested.
   4. Indicate date, time, temperature, humidity, and weather conditions during testing.
   5. Provide narrative report summarizing test methodology, instruments utilized, overall test results, and conclusion of facility conformance or non-conformance to applicable code requirement.

1.05 QUALITY ASSURANCE:

A. Qualifications: Testing firm shall meet one of the following:
   1. Firms regularly engaged and familiar with RF testing systems and RF transmission principles with minimum 3 years' experience and 5 projects of similar type.
   2. Professional Engineer on staff, licensed in the state where the Project is located.
   3. Registered Communications Distribution Designer (RCDD) on staff.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 PREPARATION:

A. Before testing, verify and coordinate the following with the AHJ:
   1. All frequencies used by emergency responders within the jurisdiction.
   2. Locations of receiver base stations, repeaters, or boosters in the radio system, if any.
   3. AHJ representation during testing, either on site or at receiver base station.
   4. Waiver of radio coverage in accordance with Ohio Fire Code 510.1, Exception 1 or 2, if applicable.

3.02 TESTING:

A. Test radio frequencies used by the ER for two-way coverage on each floor of the building.

B. Measurements in 95 percent of all areas on each floor of the building shall meet a minimum signal strength of -95 dBm both into and out of the building.

C. RF Signal Strength Test:

   1. Conduct test using a spectrum analyzer calibrated within the last 12 months, utilizing antennas similar to those in use by the ER.

   2. Where signal strength out of the building cannot be efficiently measured, conduct a DAQ test using a calibrated portable radio of the latest brand and model used by the ER talking through the ER's radio communications system.

   3. Divide each floor of the building into a grid of 20 approximately equal test areas.

   4. Select a test location approximately in the center of the test area to represent the test area, with the radio enabled to verify two-way communications to and from the outside of the building through the ER's radio communications system. Failure in the selected test location shall be considered failure of the test area.

   5. Take measurements at 3 feet to 4 feet above the floor with antenna in a vertical position, to simulate portable radios worn on the belt or turnout coat pocket.

   6. Maximum one test area, or 5 percent of nonadjacent test areas, shall be allowed to fail the test per floor.

   7. In the event two or more test areas, or more than 5 percent, fail the test, the floor may be divided into 40 approximately equal test areas and retested. Maximum one test area, or 5 percent of nonadjacent test areas, per floor shall be allowed to fail the 40 area test.

D. Voice Signal Quality Test:

1. Take DAQ readings at the same time as RF signal strength measurements.
2. DAQ Scale:
   a. DAQ 1.0: Unusable. Speech present but not understandable.
   b. DAQ 2.0: Speech understandable with considerable effort. Requires frequent repetition due to noise or distortion.
   c. DAQ 3.0: Speech understandable with slight effort. Requires occasional repetition due to noise or distortion.
   d. DAQ 3.4: Speech understandable without repetition. Some noise or distortion present.
   e. DAQ 4.0: Speech easily understandable; little noise or distortion.
   f. DAQ 4.5: Speech easily understandable; rare noise or distortion.
   g. DAQ 5.0: No noise or distortion discernable.
3. A DAQ level of 3.0 or better throughout the building shall be deemed acceptable and passing.

END OF SECTION

SECTION 01 5000 – TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Temporary Utilities: Electricity; lighting; heat and ventilation; telephone service; water.
   2. Construction Facilities: Temporary buildings; sanitary facilities.
   3. Access facilities.
   4. Work in occupied facilities.
   5. Temporary barriers, enclosures, fencing, and security.
   6. Temporary Controls: Fire protection; snow removal; water control.

B. Related Sections:
   1. Section 01 7000 – Execution Requirements: Progress cleaning, waste management and disposal; protecting installed construction.
   2. Section 01 7700 – Closeout Requirements: Final cleaning.

1.02 REGULATORY REQUIREMENTS:

A. Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:
   1. Building code requirements.
   2. Health and safety regulations.
   3. Utility company regulations.
   4. Police, fire department, and rescue squad rules.
   5. Environmental protection regulations.

B. Engage the appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.
   1. Arrange with company and existing users for a time when service can be interrupted.
   2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked in services.

C. Provide plan approvals and permits for temporary buildings, where required by authorities having jurisdiction.

D. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.03 PROJECT CONDITIONS:

A. Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on site.

B. Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of permanent service.

1.04 TEMPORARY ELECTRICITY:

A. Connect to Owner's existing power service. Do not disrupt Owner's need for continuous service. Exercise measures to conserve energy.

B. Provide grounding and ground fault circuit protection as required.

C. Provide adequate distribution equipment, wiring, and outlets to provide circuits for power and lighting.
   1. Provide load center panel with main disconnect and minimum six 20 ampere circuits at the point of service.
   2. Provide 20 ampere duplex outlets on single phase branch circuits for power tools and fractional horsepower motors for every 2500 sq ft of active work area, located so that extension cords need not exceed 100 feet. Install outlets in outlet boxes with cover plates.
   3. Provide 20 ampere single phase branch circuits for lighting.
   4. Provide temporary service to field offices.

D. Use of temporary electrical power system for welding operations is prohibited.

E. Electrical Power Cords: Grounded extension cords; hard service type 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. Do not exceed safe length voltage ratio.

F. Upon changeover to permanent electrical service, remove portions of the temporary electrical service no longer needed, including power and lighting distribution and utilization equipment and wiring.

1.05 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES:

A. Provide and maintain lighting for construction operations to achieve a minimum lighting level of 5 footcandles. Provide additional lighting for performance of tasks.
   1. At corridors, provide minimum one 3400 lumen fixture at 20 foot maximum spacing.
   2. Provide lighting at each fire extinguisher location, electric panel, mechanical equipment location, corridor and building entrance.

B. Provide and maintain lighting to exterior staging and storage areas after dark for security purposes to achieve a minimum lighting level of 1 footcandle.

C. Provide and maintain lighting to interior work areas after dark for security purposes to achieve a minimum lighting level of 0.25 footcandles.

D. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.

E. Provide guard cages or tempered glass enclosures where exposed to breakage. Provide wet location rated fixtures where exposed to moisture.

F. Maintain lighting and provide routine repairs. Relocate temporary lighting as required during progress of the work.

G. Permanent lighting may be utilized during construction. Relamp as necessary so that all lamps are operable at Substantial Completion.

1.06 TEMPORARY HEAT AND VENTILATION:

A. Utilize Owner's existing HVAC equipment, extend and supplement with temporary heating and ventilation equipment as needed to maintain specified conditions for construction operations. Owner will pay cost of energy used. Exercise measures to conserve energy.

B. Maintain temperature and humidity as required by specific construction activities, as specified in individual specification sections.

C. Provide temporary heat where needed for performance of the work, for curing or drying of recently installed work, and for protection of work in place from adverse effects of low temperatures or high humidity.

1. After building enclosure, maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress and 60 degrees F in areas where finished work has been installed.

D. Ventilate enclosed areas to assist curing of materials, to dissipate humidity, to attain and maintain specified moisture levels, to prevent accumulation of dust, fumes, vapors, or gases, and to prevent temperatures of enclosed areas from exceeding ambient outdoor temperatures by more than 10 degrees F when ambient outdoor temperatures are above 70 degrees F.

1. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations.

E. Temporary Heat Prior to Building Enclosure:

1. The facility is not considered enclosed until the permanent building shell is essentially completed with exterior openings, windows, and doors closed by permanent or temporary closures.

2. Until the facility is enclosed, provide heating for materials to prevent damage from frost or freezing and to permit construction to continue and progress uninterrupted.
3. Provide, maintain, and supervise the operation of UL approved portable direct fired heaters, fired with LP gas, kerosene, #1, or #2 fuel oil. Salamanders and electric heaters will not be permitted. Observe necessary safety precautions; do not use LP gas fired heaters in low places of construction, such as pits, tunnels, etc., which can collect heavier than air gas or fumes.
4. Do not use equipment producing carbon monoxide where fumes can contact freshly placed concrete or mortar.

F. Temporary Heat and Ventilation After Building Enclosure: Provide equipment with capacity to maintain minimum 50 degrees F space temperature, and to maintain minimum 60 degrees F space temperature once the space temperature has been raised above 60 degrees F, using one or more of the following methods:

1. Existing System: Extend and supplement existing HVAC equipment with portable units and new HVAC equipment as scheduled. Utilize and maintain existing controls, venting, power and fuel connections, and necessary ductwork and piping for safe and proper operation.
   a. Provide and pay for maintenance, lubrication, regular replacement of filters, and replacement of worn or consumed parts as necessary.
   b. Prior to Substantial Completion, install new filters; clean and restore equipment to previously existing condition except for ordinary wear.
2. Portable Units: Provide, maintain, and supervise the operation of approved temporary portable units, such as oil or gas fired unit heaters, furnaces, direct fired make-up air units, or similar equipment. Salamanders and electric heaters will not be permitted. Utilize natural gas fired units when natural gas is available. Units shall be properly vented, piped, and wired. Provide thermostat for temperature control and all required safety controls.
3. Permanent System Components: Assemble and set in place permanent HVAC system components.
   a. Install each unit complete with safety controls, filters, venting, power and fuel connections, room thermostat and necessary ductwork and piping for safe and proper operation.
   b. Supplement permanent system components with portable units as necessary to maintain required temperature and humidity.
   c. Where necessary, relocate equipment during construction to prevent interference with performance of the work.
   d. Provide and pay for operation, maintenance, lubrication, frequent and regular replacement of filters, and replacement of worn or consumed parts as necessary.

e. Prior to Substantial Completion, install permanent filters; clean and restore equipment to new conditions except for ordinary wear.
f. Provide warranty coverage for the specified time period beginning on the Date of Substantial Completion. Confirm that temporary use of equipment does not compromise specified warranties. Provide extended warranty coverage where necessary.

G. Temporary Dehumidification: Provide temporary dehumidification equipment where equipment used for temporary heat and ventilation is not adequate to maintain specified humidity, and where necessary to achieve specified moisture emissions rates in flooring substrates prior to finish flooring application. Provide, maintain, and supervise the operation of portable dessicant dehumidifiers, mechanical dehumidifiers, or similar equipment; equip with high volume blowers and inflatable plastic ducts. Adjust equipment and duct locations daily to assure even dehumidification.

1.07 TEMPORARY TELEPHONE AND INTERNET SERVICE:

A. Provide, maintain, and pay for telephone service where required in connection with the work. Use of Owner's existing telephone service is not permitted. Use of cellular mobile phone system is acceptable, if adequate reception can be maintained.

B. Provide, maintain, and pay for internet service where required in connection with the work. Use of Owner's internet service is not permitted. Use of cellular data system is acceptable, if adequate reception can be maintained.

C. Post a list of emergency telephone numbers at a clearly marked location accessible to all construction personnel, including but not limited to fire, police, ambulance, poison control, and each utility company providing service to the site.

D. Contractor and each subcontractor shall provide cell phone service with minimum one phone for the on-site superintendent.

1.08 TEMPORARY WATER SERVICE:

A. Provide and maintain suitable quality water service for construction operations, temporary toilets, wash facilities, and drinking water. Connect to Owner's existing water system. Exercise measures to conserve water.

B. Provide temporary piping system of sufficient capacity to meet needs of construction operations, with minimum 1 inch piping and vacuum breakers. Comply with local utility regulations. Sterilize temporary water piping prior to use.

C. Extend branch piping with outlets located so water is available in areas where construction is in progress, using maximum 100 ft hoses with threaded connections.

D. Water Hoses: Minimum ¾ inch, heavy duty, abrasion resistant, flexible rubber hoses 100 feet long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

E. Provide temporary pipe insulation to prevent freezing. Replace piping and hoses damaged by freezing or other causes.

1.09 TEMPORARY BUILDINGS:

A. Temporary buildings, where provided, shall meet the following requirements.

B. Offices: Prefabricated mobile units; weather tight, with lighting, electrical outlets, heating and cooling equipment, equipped with sturdy furniture, drawing rack, shelving, bulletin board, and drawing display table with minimum 36 x 48 inch top. Provide space for project meetings with table and chairs to accommodate minimum one representative of the Architect, Owner, and each Prime Contractor. Provide first aid kit and portable fire extinguisher.

C. Sheds: Weather tight, substantial, of sufficient size to hold on-site materials which are subject to weather damage. Raise floors minimum 6 inches above ground on heavy joists or sleepers.

D. Locate temporary buildings in approved locations, a minimum distance of 30 ft from existing and new structures.

E. Provide walks for access to office from parking areas and from building.

1.10 TEMPORARY SANITARY FACILITIES:

A. Provide and maintain temporary toilets in quantity and location required by applicable codes and regulations.

B. Existing facility use is not permitted.

C. Maintain facilities daily in clean and sanitary condition. Provide toiletry supplies.

1.11 ACCESS FACILITIES:

A. Temporary Roads and Paving:
   1. Construct and maintain temporary roads and access paths from public thoroughfares to work areas. Locate in same locations as permanent facilities where possible; extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.
   2. Where temporary roads intersect public roads, comply with requirements of applicable traffic authorities. Provide warning signs for public traffic, and “Stop” signs for entrance onto public roads.
   3. Coordinate temporary roads and paving with grading and compaction of subgrade, installation and stabilization of subbase, and installation of base and finish courses of permanent paving. Minimize exposure of incomplete work to deterioration.

B. Construct and maintain culverts, ramps, steps, platforms, scaffolds, and other means of access so that no portion of the Work is delayed or handicapped due to a lack of such facilities.

C. Provide and maintain access to fire hydrants, free of obstructions.

D. Where traffic must cross open trenches, provide steel plates of suitable strength, thickness and anchorage to permit traffic to cross trench. Shore and brace trench to prevent damage to traffic and utilities installed in trench.

E. Vehicular Access and Parking:
   1. Limit construction traffic on existing on-site roads to designated routes.
   2. Limit parking for private vehicles of Contractor and Subcontractor personnel to designated areas.
   3. Construct and maintain temporary gravel parking areas to accommodate construction personnel.
   4. When site space is not adequate, provide additional off-site parking.

F. Staging Areas and Material Storage:
   1. Construct and maintain temporary gravel areas to accommodate staging and outdoor storage of construction materials.
   2. Locate to coincide with permanent paved areas where applicable. Coordinate with grading and compaction of subgrade, installation and stabilization of subbase.

G. At lawn areas, remove gravel from site after parking or material storage is no longer required; finish grade and seed areas in accordance with Sections 31 2000 and 32 9200.

1.12 ISOLATION OF WORK AREAS IN OCCUPIED FACILITIES:

A. Provide temporary partitions and ceilings as indicated and as necessary to separate work areas from Owner occupied areas, to prevent penetration of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.
   1. Construction: Framing and plywood or gypsum board sheet materials with closed joints and sealed edges at intersections with existing surfaces. Paint surfaces exposed to view from Owner occupied areas.

B. Prevent dust, fumes, and odors from entering occupied areas.
   1. Disconnect supply and return ductwork in work area from HVAC system serving occupied areas.
   2. Maintain negative air pressure within work area using HEPA-equipped air filtration units.
   3. Use vacuum collection attachments on dust producing equipment.
   4. Where limited work is required within occupied areas, use portable dust containment devices.
   5. Perform progress cleaning and final cleaning using vacuum equipment equipped with HEPA filters.

1.13 TEMPORARY BARRIERS:

A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and public walkways required by governing authorities for public rights-of-way and for public access to existing buildings.

C. Provide protection for plant life designated to remain. Replace damaged plant life.

D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

E. Provide and maintain barrels with reflective tape and battery operated flashers to direct vehicular traffic away from construction areas.

F. Provide barriers as required by applicable regulations at edges of openings and other hazards, painted with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against.

1.14 EXTERIOR ENCLOSURES:

A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

B. Close openings of 25 square feet or less with plywood or similar materials. Close larger openings with plywood or fire retardant reinforced polyethylene securely attached to fire retardant treated wood framing.

C. Close openings through floors, roofs, and horizontal surfaces with load bearing, wood framed construction.

D. Maintain required exits for protection of life and property.

1.15 TEMPORARY FENCING:

A. Construction: Commercial grade chain link fence.

B. Provide 6 ft high fence around construction area and material storage areas; equip with vehicular and pedestrian gates with locks.

C. Where required due to construction operations and sequence, relocate or remove and reinstall temporary fencing. Repair damaged fencing.

D. Where construction sequence requires multiple relocations of temporary fencing, relocatable sections of fencing in maximum 12 foot lengths may be used, subject to approval.

1.16 SECURITY:

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

B. Limit entry into construction areas to the following:
   1. Prime Contractors and their employees and Subcontractors.
   2. Architect, Owner, and persons authorized by them.
   3. Regulatory agency personnel legally entitled to inspect the project.

C. Limit construction personnel to designated construction areas and access routes.
   1. Limit construction activities to Owner's property, street and highway rights-of-way, and permanent easements.
   2. Do not enter on or occupy with workers, tools, equipment, or material any ground outside the designated construction areas without written consent of the Owner of such property.
   3. Provide approved temporary signage as required to provide directional information to construction personnel and visitors.

1.17 TEMPORARY FIRE PROTECTION:

A. Provide and maintain portable fire extinguishers, readily accessible throughout areas where work is in progress, in accordance with applicable fire code and local fire department regulations. At minimum, provide one 20 lb. ABC extinguisher for each 3000 square feet of floor area.

B. Locate fire extinguishers where convenient and effective for their intended purpose. Provide additional extinguishers at locations where hazardous work is in progress, including but not limited to painting, welding, or using torches or open flames for heating or cutting.

C. Store combustible materials in containers in fire safe locations.

D. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways, and access routes for fighting fires.

E. Prohibit smoking in hazardous fire exposure areas.

F. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.

G. At the earliest feasible date in each area of the project, complete installation of permanent fire protection facilities, including connected services, and place into operation and use. Instruct key personnel on use of facilities.

1.18 SNOW REMOVAL:

A. Owner will provide snow removal from Owner occupied roads, parking areas and building entrances.

B. Remove snow from construction roads and parking areas, work areas, material storage areas and field offices as required.

C. Do not allow the accumulation or drifting of snow on roof areas in excess of design loads.

1.19 WATER CONTROL:

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment. Architect reserves the right to require additional pumping equipment without adjustment of Contract Sum.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion. Provide temporary soil erosion and sediment control in accordance with ODOT SS 832 and Section 01 5710.

C. Control surface drainage at all areas to limit runoff onto adjacent properties to existing locations and quantities.

1.20 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS:

A. Maintain temporary utilities, equipment, and facilities as long as needed for safe and proper completion of the Work.

B. Relocate temporary utilities, equipment, and facilities as necessary to correct interference with permanent construction or to facilitate operations of other trades.

C. Remove temporary utilities, equipment, facilities, and materials as rapidly as progress of the Work allows. Perform final removal prior to Final Application for Payment.

D. Remove underground installations to a minimum depth of 3 ft. Grade site as indicated.

E. Clean and repair damage caused by installation or use of temporary work.

F. Restore existing facilities to original condition. Restore permanent facilities used during construction to specified condition. Repair damage to existing pavement and roads caused by construction operations.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 5710 – TEMPORARY EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Temporary measures to control sediment and erosion.

B. Related Sections:
   1. Section 31 2000 – Earth Moving.
   2. Section 32 9200 – Lawns and Grass.

1.02 SUBMITTALS FOR INFORMATION: In accordance with Section 01 3300.

A. Storm Water Pollution Prevention Plan (SWPPP): Indicate placement, location, description and quantities of temporary and permanent erosion control items.
   1. Where applicable, submit SWPPP to all authorities having jurisdiction for approval. Submit proof of approval to Architect.

B. Maintenance Inspection Reports: Complete within 7 days of each inspection, using ODOT SS 832 Appendix A or similar form approved by governing authorities. Maintain log on site. Indicate date of inspection, name of inspector, amount and date of last rainfall; for each control feature, indicate whether the control feature has been installed, whether it is effective, condition, whether remediation is required, whether final stabilization has been achieved, and whether the control feature has been removed. Note comments and actions required.

1.03 REGULATORY REQUIREMENTS:

A. Conform to applicable requirements of state Environmental Protection Agency and other governing authorities.

B. Where applicable, obtain permits related to the work of this Section, including but not limited to the National Pollutant Discharge Elimination System (NPDES) Permit; pay required fees. Provide Notice of Intent and Notice of Termination as required and at the times required to not delay the progress of the work.

C. Cooperate with regulatory agency or authority and provide data as requested.

D. In the event that an assessment or fine is made or levied against the Owner as a result of Contractor's refusal or failure to comply with permit requirements, the Owner shall pay the cost of such assessment or fine and deduct the amount from the Contract Sum as liquidated damages.

1.04 PROJECT CONDITIONS:

A. Take all control measures necessary to prevent damage from flooding, erosion, and sedimentation to on-site and off-site areas throughout the entire construction period,

in accordance with ODOT SS 832, and applicable requirements of authorities having jurisdiction.

B. Where permanent control provisions are part of the work, coordinate temporary control features to provide economical, effective and continuous erosion control during and after construction.

C. Limit surface area of erodible earth during site preparation and earthwork activities; preserve existing vegetation where practical.

D. Excess soil stockpiled on site shall be removed or permanently stabilized prior to Substantial Completion.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Temporary Seeding and Mulching: ODOT 659.09, Type 7; annual ryegrass.

B. Filter Fabric Fence: ODOT 712.09, Type C.

C. Dikes: Suitable material in accordance with ODOT 203.

D. Bale Filter Dikes: Straw or hay bales.

E. Slope Drains: Pipe, pipe caps, coarse aggregate, riprap, rock channel protection or other materials.
   1. Pipe Caps: Designed to connect to pipe, with one minimum ¼ inch diameter hole per square inch of cross sectional end area.

F. Rock Check Dams: ODOT 703.19, Type C or D without filter.

G. Sediment Dams or Basins: ODOT 703.19, Type C or D with filter.

PART 3 EXECUTION

3.01 INSTALLATION OF CONTROL FEATURES:

A. Temporary Seeding and Mulching: Apply in accordance with ODOT 659 to inactive cleared and grubbed areas scheduled to remain idle for more than 45 days, within 7 days following clearing and grubbing operations, or within 2 days for areas within 50 feet of a body of water.
   1. Prepare seed bed and apply fertilizer at ½ the rate indicated in ODOT 659.
   2. Apply seed at a rate of 2 pounds per 1000 square feet. Do not place seed on frozen ground.
   3. Maintain seeded areas, including watering and mowing.
   4. Perform permanent seeding in accordance with Section 32 9200 within 7 days after obtaining final grade.

B. Perimeter Controls: Install concurrent with clearing and grubbing operations.
   1. Construct perimeter filter fabric fences in accordance with ODOT Standard Drawings to prevent sheet flow runoff to water bodies, wetlands, areas beyond construction limits, and other designated areas.
   2. Construct dikes to prevent sheet flow runoff from entering construction limits, and barren areas within construction limits.

C. Inlet Protection: Construct filter fabric fences around storm drain inlets and manholes in accordance with ODOT Standard Drawings, as soon as the inlet is completed. Excavate 6 inch trench around inlet; construct 2x4 wood frame with posts driven 6 inches below the excavated trench bottom. Place fabric around frame with 6 inches of fabric in trench; stretch fabric tightly and secure to frame, overlapping one side so that fabric ends are not attached to the same post. Backfill excavated soil onto fabric and compact tightly.

D. Slope Protection: ODOT 670; divert water from bare soil and protect cut and fill slopes.
   1. Construct dikes at top of fill slopes to protect side slopes from erosion.
   2. Construct dikes and slope drains when no filling activity occurs for 3 or more weeks and when slope height is greater than 8 feet.
   3. Construct ditches at top of cut slopes prior to beginning slope cutting operations to reduce runoff potential.

E. Ditch Checks: Construct in accordance with ODOT Standard Drawings across the width of the ditch, concurrent with ditch cutting operations, to protect ditches from erosion and to filter sediment from flowing water.
   1. Drainage Area 2 Acres or Less: Filter fabric fence.
   2. Drainage Area 2 to 5 Acres: Rock check dam.

F. Bale Filter Dikes: Construct in accordance with ODOT Standard Drawings, concurrent with grubbing operations. Locate a few feet from the toe of a slope to filter or divert sediment to an appropriate control before entering a body of water or leaving construction limits. Utilize bale filter dikes to collect sediment for a maximum of:
   1. ¼ acre without an outlet.
   2. Slope length of 100 feet at a maximum slope of 2:1.
   3. Use outlet or pit every 100 feet for a 2:1 slope. Use greater spacing for flatter slopes.

G. Sediment Dams or Basins: Construct in accordance with ODOT 203 at the first step of grading and within 7 days of commencing grubbing operations.
   1. Construct basins and dams at concentrated and critical flow locations to settle sediment out before leaving construction limits.
   2. Construct basins at bottom of ravines, at culvert inlets and outlets, along or at the end of ditches, and at concentrated sediment exit points. Size basins to provide a minimum quantity of 67 cubic yards for each acre of drainage area.

3.02 MAINTENANCE AND REMOVAL OF CONTROL FEATURES:

A. Inspections: Inspect erosion control features every 7 days and within 24 hours of any rainfall of more than ½ inch. Repair damaged, failed and non-functional control features; install additional control features; make adjustments to meet field conditions and prepare for anticipated future work, as required.

B. Maintain temporary controls in place until drainage areas are fully stabilized; remove remaining items at Substantial Completion.

C. Remove accumulations of silt and sediment in accordance with ODOT 203.05; dispose of off-site.

D. Filter Fabric Fences, Dikes and Bale Filter Dikes: Remove trapped sediment and clean when sediment reaches half the height of the lowest section. Maintain control features until up slope permanent grass coverage is minimum 70 percent.

E. Sediment Dams and Basins: Remove deposited sediment when initial volume has been reduced by half. Remove dams and basins concurrent with permanent seeding and mulching operations.

END OF SECTION

SECTION 01 6000 – PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Basic product requirements.
   2. Product options.
   3. Substitution procedures.
   4. Product delivery requirements.
   5. Product storage and handling requirements.

1.02 BASIC PRODUCT REQUIREMENTS:

A. Provide new equipment and materials meeting quality standards of the manufacturer. Defective, damaged, reconditioned, or substandard equipment and materials are not acceptable. Remove unacceptable materials incorporated in the Work, replace with sound materials meeting specified criteria, and perform related corrective work to meet approval of Architect.

B. Provide all equipment and materials required for complete assemblies and systems. Omissions of specific reference to incidental parts or accessories required does not constitute a release from furnishing such items.

C. Products of the same type shall be provided by the same manufacturer unless specifically approved by the Architect.

D. Products requiring electrical connection shall be listed and classified by Underwriters Laboratories, Inc., or other testing firm acceptable to the authority having jurisdiction, as suitable for the purpose specified and indicated.

E. Do not use materials containing asbestos.

F. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.

G. Provide interchangeable components of the same manufacture, for components being replaced.

H. Finishes:
   1. Where multiple colors, patterns, or finishes are available, selection will be made from manufacturer's standard range unless specifically indicated otherwise. Submit samples for selection under the provisions of Section 01 3300.
   2. If not otherwise specified, provide equipment with manufacturer's standard baked enamel finish or equal. Do not field paint equipment unless specifically noted in the Contract Documents.

1.03 PRODUCT OPTIONS:

A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers, Fabricators, or Installers: Products of manufacturers, fabricators, or installers named and meeting specified criteria, standards and description. Submit a request for substitution in accordance with the following article for any manufacturer, fabricator, or installer not named.
   1. Where a manufacturer is listed by name only without model numbers or specific product reference, a request for substitution is not required. Where products of another manufacturer are listed by model number, provide the closest equivalent product meeting the specified requirements.
   2. All Products must meet specified criteria, standards and descriptions. For manufacturers listed by name only without model numbers or specific product reference, standard products may require modifications and accessories, which shall be included.
   3. Drawings and details incorporate design parameters specific to the products of manufacturers listed by model number in the specifications and schedules. Where equivalent products of other listed manufacturers are provided, coordinate related work and the work of other trades with the requirements of the products provided. Items requiring coordination include, but are not limited to, unit dimensions and clearances, roof openings and curbs, unit weight and structural supports, housekeeping pad dimensions, piping, venting, electrical requirements, controls, panelboard and light fixture dimensions and clearances, motor controls and connections, and equipment connections.
   4. Where a product listed by model number or specific product reference has been superseded or replaced by a different Product from the same manufacturer, provide the replacement Product, but not before submitting product data in accordance with Section 01 3300 for approval, specifically indicating all differences between the specified Product and the replacement Product.

C. The phrase "or equal" or similar language does not exempt substitutions from compliance with the following Substitution Procedures. No substitutions are permitted unless specifically approved in writing for this Work by the Architect.

1.04 SUBSTITUTION PROCEDURES:

A. Architect will consider requests for Substitutions only prior to receipt of bids or within 15 days after date of Notice to Proceed. Due to time constraints, requests made later than 5 business days prior to the scheduled bid opening may not be reviewed. Submit request for Substitution to the Architect.

B. Requests for Substitutions may be made by Prime Bidders/Contractors only. Requests made by others will not be considered unless made jointly with a Prime Bidder/Contractor.

C. Bids shall include specified Products only, unless Substitution is approved by Addendum issued prior to receipt of bids.

D. Substitutions requested more than 15 days after date of Notice to Proceed may be considered or rejected without consideration, at the discretion of the Architect, and are limited to the following circumstances:

   1. Specified Products become unavailable through no fault of the Contractor. Such Substitutions shall not result in additions to the Contract Sum or Contract Time.

   2. The Substitution offers the Owner a substantial advantage in initial cost, life cycle cost, time, energy conservation, sustainable design, or other considerations, after deducting costs for redesign and coordination. Requests for such Substitutions shall include detailed information on the changes to the Contract Sum and Contract Time, including that of separate Contractors.

   3. None of the specified Products can meet the requirements of the Contract Documents, or receive necessary approval by a governing authority, and the Contractor certifies that the Substitution will meet the requirements. Such Substitutions shall not result in additions to the Contract Sum or Contract Time, except to the extent caused by regulatory requirements enacted or modified after the bid date.

E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals without separate written request, or when acceptance will require revision to the Contract Documents.

F. Substitutions will be reviewed for general conformance with the intent of the Contract Documents but not for detailed compliance with all specified requirements. Approval of substitutions does not relieve the Contractor of the responsibility to comply with the Contract Documents, unless the variation is specifically identified in the substitution request.

G. Substitutions incorporated in the Work without Architect's approval shall be removed and replaced with specified Products without additions to the Contract Sum or Contract Time.

H. Substitution Submittal Procedure: Submit Substitution Request Form attached, or provide a cover letter with equivalent information. Limit each request to one proposed Substitution.

   1. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents. Documentation shall specifically note variations from specified Products in function, dimensions, weight, appearance, quality, code compliance, durability, availability of service and parts, and interfaces with related construction.

   2. Submit product data, certified test results, and other supporting data sufficient to demonstrate the proposed Product equivalence. Burden of proof is on proposer.

At Architect's option, installation references and samples of actual products may be required.

3. For products specified to receive warranty coverage, Substitution request shall include a preliminary copy of the specific warranty.
4. Submittal of a Substitution request, or incorporation in the Work of an approved Substitution, constitutes a representation that the submitter:
   a. Has personally investigated proposed Product and determined that it meets or exceeds the function, appearance, sustainable design requirements, and quality level of the specified Product.
   b. Will provide the same warranty for the Substitution as for the specified Product.
   c. Will coordinate installation and make changes to other Work, including the Work of separate Contractors, which may be required for the Work to be complete without additions to the total Contract Sum or Contract Time.
   d. Waives claims for additional costs or time extension which may subsequently become apparent.
   e. Will reimburse Owner and Architect for review or redesign services if re-approval by authorities is required.
5. Architect will notify submitter of decision to accept or reject request. Architect's decision is final.
6. Architect reserves the right to reject requests not containing sufficient information to enable Architect to completely evaluate the request without delay in the scheduled bid opening.

1.05 PRODUCT DELIVERY REQUIREMENTS:

A. Schedule deliveries to coordinate with installation schedule, to minimize long term storage at site and to minimize possibility of damage, deterioration, theft and other losses.

B. Transport and handle Products in accordance with manufacturer's instructions.

C. Accept Products at site, including unloading and uncrating. Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.

1.06 PRODUCT STORAGE AND HANDLING REQUIREMENTS:

A. Store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible.

B. Store sensitive Products in weather tight, climate controlled enclosures.

C. For exterior storage of fabricated Products, place on sloped supports, above ground.

D. Provide off-site storage and protection when site does not permit on-site storage or protection.

E. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation or potential degradation of Product.

F. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

G. Provide equipment and personnel to store and handle Products by methods to prevent soiling, disfigurement, or damage.

H. Arrange storage of Products to prevent overcrowding and to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

I. Do not exceed manufacturer's shelf life limitations. Discard and replace Products not installed prior to stated expiration date.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 ATTACHMENTS:

A. Substitution Request Form.

END OF SECTION

SUBSTITUTION REQUEST FORM

Specified Product:

_____	_____	_____
Section	Paragraph	Description

Proposed Substitution: _____

Attachments: _____

The undersigned requests consideration of this Substitution and certifies that the attached product data and other supporting information indicates all variations from the specified Product, in accordance with the requirements and representations of Section 01 6000, and that the following statements are correct unless modified by attachments:

1. The Prime Bidder/Contractor has personally investigated proposed Product and determined that it meets or exceeds the function, appearance, sustainable design requirements, and quality level of the specified Product.
2. The same warranty will be provided for the Substitution as for the specified Product.
3. Installation will be coordinated with other Work, including the Work of separate Contractors, without additions to the total Contract Sum or Contract Time.
4. The Prime Bidder/Contractor will pay for changes to the building design if additional design or detailing is required to properly integrate the Substitution into the Work, and for additional services required to obtain the approval of governing authorities.

SUBMITTER:
(if other than Prime Bidder/Contractor)

_____
Name of Company or Corporation

_____
Phone

_____
email

By: _____
Signature

_____
Printed Name

PRIME BIDDER/CONTRACTOR:
(must be completed)

_____
Name of Company or Corporation

_____
Phone

_____
email

By: _____
Signature

_____
Printed Name

ARCHITECT'S RESPONSE:

___ Addendum or contract modification to be issued
___ Additional information needed
___ Not approved
___ Received too late

By: _____ Date: _____

Notes: _____

SECTION 01 7000 – EXECUTION REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Examination.
   2. Preparation.
   3. Field engineering.
   4. Execution.
   5. Progress cleaning.
   6. Construction waste management and disposal.
   7. Protecting installed construction.

B. Related Sections:
   1. Section 01 7700 – Closeout Requirements: Final cleaning.
   2. Section 02 4119 – Selective Demolition.

1.02 SUBMITTALS FOR INFORMATION: In accordance with Section 01 3300.

A. Construction Waste Management Plan: Identify material types and estimated quantities for recycling, reuse, or sorting. Describe separation requirements, on-site storage requirements, destinations and transportation methods for each type of material. For waste that cannot be recycled, identify disposal locations and methods.
   1. Provide copy of construction waste management plan to each worker, subcontractor, and supplier when they first begin work on site. Provide periodic training and enforcement as necessary.

1.03 EXAMINATION:

A. Verify that existing site conditions, field measurements, and substrate surfaces are acceptable for subsequent Work. Beginning new Work indicates acceptance of existing conditions.

B. Verify that existing substrate is capable of structural attachment of new Work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Verify that utility services are available, of the correct characteristics, and in the correct location.

1.04 PREPARATION:

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

1.05 FIELD ENGINEERING:

A. Locate and preserve survey control and reference points, and establish elevations, lines and levels, under the supervision of experienced engineering and surveying personnel utilizing recognized engineering survey practices.

B. Where existing survey control points are indicated on Drawings, verify locations prior to starting work. Protect and maintain survey control points at all times; preserve permanent reference points during construction.

C. Arrange for replacement of dislocated or destroyed survey control points, or relocation required by changes in grade or other reasons, based on original survey control. Permanent points removed or destroyed during progress of the Work shall be reinstalled at the expense of the party responsible for their removal.

D. Verify setbacks and easements; confirm Drawing dimensions and elevations.

1.06 EXECUTION:

A. Install, erect, and apply Products in accordance with manufacturer's instructions and recommendations. In the event of conflict with requirements of the Contract Documents, request resolution in accordance with Section 01 3100.

B. Cutting and Patching:

1. New Construction: Provide chases, openings, and recesses in new construction, where required by the work of each trade; provide and set in place all boxes, sleeves, inserts, and similar components.

2. Existing Walls, Floors and Ceilings: Work shall be done by persons skilled and experienced in the applicable trade. Finish work shall match material and quality of adjacent construction to the approval of the Architect.

3. Existing Roofs: Where cutting and patching is required in existing roofing, such work shall be done by the Roofing Installer as part of his work, and shall be included in his bid. Curbs, sleeves, and related items shall be furnished by the Contractor requiring same.

   a. For work affecting existing roofing covered by a manufacturer's warranty, the manufacturer shall approve the Roofing Installer. Maintain existing warranty coverage.

4. Slabs, Walks, and Pavements: Saw cut existing materials to provide a neat joint at removal limits, except where removal terminates at an existing joint. Pin new concrete to existing with #5 bars, minimum 24 inches long, spaced at 18 inches o.c. and embedded minimum 12 inches into existing concrete.

5. Submit written request in advance of cutting or altering elements which may affect:
   a. Structural integrity of element.
   b. Integrity of weather-exposed or moisture-resistant elements.
   c. Efficiency, performance, maintenance, useful life, or safety of element.
   d. Visual qualities of elements exposed to view.
   e. Work of Owner or separate Contractor.
6. Execute cutting, fitting, and patching, including excavation and fill, to complete Work, and to:
   a. Fit the several parts together, to integrate with other Work.
   b. Uncover work to install or correct ill-timed Work.
   c. Remove and replace defective and non-conforming Work.
   d. Remove samples of installed Work for testing.
   e. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
7. Execute work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
8. Minimize cutting and patching in construction with fire or smoke separation requirements, where shown on the Drawings. Execute work by methods which will not reduce fire ratings or permit passage of smoke.
9. Cut masonry and concrete materials using masonry saw or core drill.
10. Do not cut, notch, or bore holes in metal framing members without approval; utilize factory punch-outs or holes where present. Do not cut or notch flanges.
11. Restore Work with new Products in accordance with requirements of Contract Documents.
12. Refinish surfaces to match adjacent finishes in all respects, including color, size and texture. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.
13. Identify hazardous substances and conditions exposed during the Work to the Architect for decision or remedy.

C. Above-Ceiling Work: Where work is required above existing suspended ceilings scheduled to remain, or where new suspended ceilings are installed before overhead work is complete, remove and protect ceiling panels as required for access to work areas. Use caution to avoid damage to ceiling grid. Reinstall ceiling panels when work is complete and tested. Coordinate and pay for repair or replacement of grid, panels, and related components damaged during performance of the work.

D. Items Removed for Reinstallation:

1. Items removed which are to be relocated, reused, or reinstalled in existing locations, shall be stored on site in approved locations until progress of the work permits reinstallation.
2. Contractor removing the items shall be responsible for their storage and protection.

1.07 PROGRESS CLEANING:

A. Maintain areas free of waste materials, debris, packaging materials, and rubbish. Maintain site in clean and orderly condition.

B. Clean dirt, debris, and mud from on-site locations as directed. Clean and wash down construction vehicles prior to leaving the site as required to minimize tracking of dirt, debris, and mud onto public roads. Clean dirt, debris, and mud from public roads as directed.

C. Remove debris and rubbish from pipe chases, plenums, shafts, trenches, and other limited access or remote spaces, prior to enclosing the space.

D. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust. Clean surfaces of installed products in accordance with manufacturer's instructions.

E. Collect non-hazardous waste materials, debris, packaging materials, and rubbish on a daily basis and place in dumpsters or approved locations for recycling or salvage.

F. Clean and organize work areas daily. Maintain cleanliness in all work areas to assist other Contractors, suppliers, and the Owner in the timely installation of equipment and implementation and completion of concurrent responsibilities.

1.08 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL:

A. Provide and maintain containers of adequate size to receive scrap construction materials, packaging and debris generated by performance of the work.
   1. Do not dispose of construction waste materials in trash receptacles or recycling containers designated for Owner's use.
   2. Do not allow waste materials to accumulate on site. Change out loaded containers for empty containers as demand requires.
   3. Remove and promptly dispose of contaminated or vermin infested materials.
   4. Post approved temporary signage at waste collection areas to assist workers in achieving waste management goals.

B. Recyclable and Recoverable Material: Materials may be separated, stored, protected, and handled at the project site, or transported off-site for separation. Arrange for regular collection, transport, and delivery to respective approved recycling centers to keep site clear and prevent contamination of materials.

C. Salvaged Materials: Temporarily store on site in approved locations, neatly stacked and arranged; remove from the Owner's property promptly. Salvaged material shall not be sold on site.

D. Hazardous Substances: Collect and remove from site daily, and dispose of off-site in a legal location and manner, all hazardous substances in aerosol cans, tubes, pails, buckets, barrels, canisters or other factory packaged containers. Do not dispose of hazardous substances on-site or in containers for materials to be recycled, salvaged, or disposed of in landfills.

1.09 PROTECTING INSTALLED CONSTRUCTION:

A. Protect equipment and materials from damage during installation. Replace or repair equipment, material or facilities damaged by the Contractor during, or due to, or in the performance of the Work, as directed by the Architect.

B. Protect installed Work; provide special protection where specified in individual specification sections.
   1. Provide temporary and removable protection for installed Products. Control activity in immediate work area to prevent damage.
   2. At the end of each work day, protect all work likely to be damaged from weather, rain, wind, storms, frost, heat, and other causes of injury or damage.
   3. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
   4. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
   5. Upon installation of finish materials and construction exposed to view, and where existing work and finish materials are not indicated to be removed or modified by the work of this project, protect such construction against damage or injury, using materials that may be easily removed without leaving residue or permanent stains.
   6. During construction, cap, plug, or cover open ends of ducts, piping, and conduit, and equipment openings, to prevent entry of foreign material.

C. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, follow recommendations for protection from waterproofing or roofing material manufacturer.

D. Prohibit traffic from landscaped areas.

E. Properly and carefully repair materials and finishes which are cut, damaged, disturbed or interfered with to match adjacent and surrounding surfaces, to the approval of the Architect. If repairs cannot be made satisfactorily, replace or refinish with new materials.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 7700 – CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Final cleaning.
   2. Training and demonstration.
   3. Closeout procedures.
   4. Project record documents.
   5. Operation and maintenance data.
   6. Warranties.
   7. Spare parts and maintenance materials.

B. Related Sections:
   1. Section 01 2900 – Payment Procedures.
   2. Section 01 3100 – Project Management and Coordination.
   3. Section 01 7000 – Execution Requirements: Progress cleaning.

1.02 FINAL CLEANING:

A. Execute final cleaning prior to final project assessment. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of work to the condition expected from a commercial cleaning and maintenance program. Comply with manufacturer's instructions.

B. Upon completion of the work, remove debris, tools, machines, construction equipment, and other items pertaining to the work.

C. The following are examples, but not by way of limitation, of cleaning levels required.
   1. Remove labels not required as permanent labels.
   2. Clean transparent and reflective materials, including glass (both sides) and mirrors, to a polished condition; remove vision-obscuring materials and substances. Replace broken glass and damaged materials. Restore reflective surfaces to original reflective condition.
   3. Clean exposed hard-surfaced materials to a dirt-free condition, free of dust, stains, films, and noticeable distracting substances.
   4. Except as otherwise indicated, avoid disturbance of natural weathering of exterior surfaces.
   5. Wipe surfaces of mechanical and electrical equipment clean; remove excess lubrication and other substances.
   6. Remove spatters or other deposits of paint, plaster, mortar, concrete, adhesives, roofing, dirt, soil, oil, or any other material foreign to the surface involved.
   7. Vacuum clean carpeted and soft surfaces.

8. Clean plumbing fixtures to a sanitary condition, free of stains, including those resulting from water exposure.
9. Clean light fixtures to function with full efficiency.
10. Wet mop hard surface floors. Clean concrete floors in unfinished spaces broom clean.
11. Replace filters of operating equipment.
12. Clean debris from roofs, gutters, down pipes, and drainage systems.
13. Clean site, including landscaped and developed areas, free from litter and foreign substances; sweep paved areas broom clean, remove stains, petrochemical spills, and other foreign deposits; rake clean ground surfaces not landscaped or paved, to a smooth, even textured surface.
14. Remove waste and surplus materials, rubbish, and construction facilities from the site; dispose of lawfully.

D. Removal of Protection: Remove temporary protection and facilities installed during construction to protect previously completed installations during the remainder of the construction period.

E. Comply with governing regulations and safety standards for cleaning operations.

F. Additional cleaning required after final cleaning due to punch list work and warranty repairs shall be performed by the Contractor responsible for the additional work.

1.03 TRAINING AND DEMONSTRATION:

A. Where specified in individual Sections, require manufacturer to provide authorized representative to demonstrate operation of equipment and systems and instruct Owner's personnel.

B. Training and demonstration sessions shall be held at the project site, or in suitable facilities elsewhere provided by the Owner. Online or distance learning is subject to Owner approval, and is limited to software, programming, and similar subject matter not requiring physical access to equipment.

C. Minimum two weeks in advance of each training session, submit the following to the Architect for Owner's approval:
1. Preliminary schedule listing dates and times for each session. Owner will provide list of personnel to receive instructions, and will coordinate their attendance at the approved times.
2. List of personnel providing training, including a summary of credentials and experience for each presenter.
3. Outline syllabus of training sessions, including list of topics and approximate time allocations.
4. Completed operation and maintenance manuals for the applicable equipment or system. Owner will make these available for reference during training sessions.
5. Certification that equipment or system has been inspected and is fully operational, and all specified testing, adjusting and balancing has been performed.

D. Where the number of hours of training is specified, this is a minimum requirement and shall be extended if necessary for adequate coverage of the subject matter in accordance with the approved syllabus and specified requirements.
   1. Initial training and demonstration must be completed prior to Substantial Completion. For equipment requiring seasonal operation, a portion of the training and demonstration may be delayed up to 6 months subject to Owner's approval.
   2. With Owner approval, training may be suspended prior to completion of the specified number of hours, with the remaining hours available on Owner request up to one year after Substantial Completion or throughout the warranty period, whichever is longer.

E. Use operation and maintenance manuals as the basis of instruction; review contents with personnel in full detail. Prepare and insert additional data in manuals when need for additional data becomes apparent during instructions. Provide all materials required for instruction.

F. Demonstrate start-up, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each major component or subsystem as applicable.

G. Record training and demonstration sessions, and provide minimum two copies to Owner on digital media in approved video format. Label and organize media for convenient storage and reference.

H. Within one week after completion, submit report listing date and time of each session, number of hours, and name of each person in attendance.

1.04 CLOSEOUT PROCEDURES:

A. At Substantial Completion, submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents (except for punch list items attached to certification) and ready for Architect's review.

B. Submit the following to Architect. Final Application for Payment will not be processed until all submittals are received.
   1. Reports of training and demonstration sessions in accordance with this Section.
   2. Closeout Submittals in accordance with this Section, including project record documents, operation and maintenance data, and warranties.
   3. Receipt signed by Owner, acknowledging delivery of spare parts and maintenance materials. List specific items and quantities.
   4. Copy of Certificate of Plan Approval, Certificate of Occupancy, and other required regulatory approvals, with signatures of all inspectors. Originals shall remain on site; obtain receipt from Owner.
   5. Affidavit of Payment of Debts and Claims (00 6520).
   6. Consent of Surety to Final Payment (AIA Document G707).
   7. Final Waiver of Lien from each subcontractor.
   8. Certificates of Insurance for Prime Contractor and each subcontractor.

C. Submit final Application for Payment in accordance with Section 01 2900.

1.05 PROJECT RECORD DOCUMENTS:

A. Maintain one set of the following record documents on site; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed submittals including shop drawings and product data.
   6. Manufacturer's instructions for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction. Label each document "Project Record Documents" in stamped or printed letters, on front cover or other conspicuous place.

D. Record information concurrent with construction progress, before internal or hidden construction is concealed.

E. Make documents available to Architect at all times.

F. Record Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
   1. Manufacturer's name, product model and number, and supplier.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

G. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish floor datum.
   2. Measured horizontal and vertical location of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   4. Changes made by Addenda and modifications.
   5. Field changes of dimension and detail.
   6. Details not on original Contract drawings.

H. Record Submittals: Approved product data and manufacturer's installation instructions, marked to record field changes.

I. Remove Architect title block and seal from all documents.

J. Submit to Architect prior to or together with final Application for Payment.

1.06 OPERATION AND MAINTENANCE DATA:

A. General Requirements:

1. Submit to Architect for review; allow sufficient time for review and revision prior to final Application for Payment. Upon approval, submit final copies to Owner and Architect.

2. Submittals to Architect and Owner shall be in electronic format. At Owner's option, also submit up to two hard copy sets.

3. Electronic Submittals: Data submitted in electronic format shall be limited to PDF files on DVD or USB drive, unless otherwise approved in advance by Architect.

4. Hard Copy Submittals:
   a. Submit data bound in 8½ x 11 inch format, organized in three-ring binders with durable rigid covers. Provide multiple volumes where appropriate; organized and labeled in a coordinated set with matching appearance.
   b. Prepare binder cover with printed title of manual and title of project. Identify subject matter of binder on cover and spine.
   c. Include a Table of Contents for each volume.
   d. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titles clearly printed under reinforced plastic tabs.

B. Operation and Maintenance Manuals:

1. Directory: List names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, suppliers, and maintenance providers.

2. Operation and Maintenance Instructions: Arrange by system and subdivide by specification section. For each category, identify the following as applicable to the Product or system:
   a. Significant design criteria.
   b. List of products, clearly identifying specific product or part installed, with options and accessory items indicated.
   c. Schematic drawings, wiring diagrams, and flow diagrams for each system, with parts list for each component.
   d. Step-by-step procedures for start-up, seasonal changeover, and shut-down of each system and piece of equipment.
   e. Operating instructions.
   f. Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
   g. Maintenance instructions for equipment and systems, including lubrication and filter replacement requirements, recommended service intervals, and troubleshooting procedures.
   h. Information required for reordering specially manufactured products.

3. Project Documents and Certificates: Include the following:
   a. Test reports for each item with specified field or laboratory testing.
   b. Warranty documents in accordance with this Section. Indicate names, addresses, telephone numbers, and procedures for filing a claim and obtaining warranty services.
   c. Sprinkler installer's material and test certificate.
   d. HVAC testing and balancing reports in accordance with Section 23 0593.

1.07 WARRANTIES:

A. General Requirements:
   1. Execute and assemble transferable warranty documents from subcontractors, suppliers, and manufacturers. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of warranty on Work that incorporates products.
   2. Include in Operation and Maintenance Manuals.
   3. For items of Work delayed beyond date of Substantial Completion, provide updated submittal prior to or together with final Application for Payment, listing date of actual completion as start of warranty period.
   4. Written warranties made to Owner are in addition to contractual, implied, and expressed warranties, and shall not limit duties, obligations, rights and remedies otherwise required by Contract Documents and available under law.
   5. Warranty claims shall be resolved in the same venue and using the same dispute resolution method as provided for the Prime Contract.

B. Contractor's Warranty: Contractor shall provide warranties, and shall correct nonconforming Work, in accordance with the General Conditions.

C. Specific Warranties: Provide written documentation for each warranty specified in individual specification sections.
   1. At the time of shop drawing and product data submittal, submit a preliminary copy of each specific warranty for review in accordance with Section 01 3300.
   2. Provide full warranty for parts and labor, without dollar amount limitation or proration based on period of use, unless specifically indicated in individual specification sections.
   3. Warranty periods begin on the Date of Substantial Completion, unless specifically indicated in individual specification sections. Where manufacturer warranties begin at an earlier date, such as the date of shipment or installation, coordinate procurement and scheduling so that specified warranty periods are not compromised. Provide extended warranty coverage where necessary.
      a. In the event that items of Work covered by a warranty have punch list work remaining on the Date of Substantial Completion, the warranty period shall not begin until all such work is complete.
   4. Where Warranties from Subcontractors, suppliers or manufacturers are limited to material only, Contractor shall include warranty coverage for labor, shipping,

equipment, and other costs required to remove defective Work and install replacement materials.

5. Warranty provisions requiring Owner to provide notice to manufacturer shall allow a minimum time period of 30 days for such notice.
6. If the terms of a warranty require Owner signature, registration, or other action prior to commencement of warranty coverage, Contractor shall take all necessary steps to ensure validity of the warranty, and shall indemnify Owner for loss of warranty coverage caused by failure to do so.

D. Manufacturer Warranties: Where a manufacturer provides a standard product warranty that exceeds the duration of the Contractor's warranty or a Specific Warranty, Contractor shall take all necessary actions to ensure that the manufacturer warranty remains in effect beyond the expiration of the shorter warranty periods.

1.08 SPARE PARTS AND MAINTENANCE MATERIALS:

A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification sections.

B. Extra materials shall be from the same lot as installed materials.

C. Provide protective covering for storage; identify with appropriate labels.

D. Deliver to project site and place in location as directed.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 02 4119 – SELECTIVE DEMOLITION

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Minor demolition and removal for remodeling.

B. Related Sections:
   1. Section 01 3100 – Project Management and Coordination: Alteration project procedures.
   2. Section 01 5000 – Temporary Facilities and Controls: Temporary enclosures.
   3. Section 01 7000 – Execution Requirements: Cutting and patching; items removed for reinstallation; progress cleaning; construction waste management and disposal.

1.02 REGULATORY REQUIREMENTS:

A. Comply with all applicable codes and regulations in addition to being responsible for the prevention of any damage to the adjoining materials and site.

B. Permits: Secure and pay for all necessary permits required for this portion of the work.

C. Do not close or obstruct egress width to any building or site exit unless approved in writing.

D. Do not disable or disrupt building fire or life safety systems without 3 days prior written notice to Owner.

E. Comply with requirements of Ohio Environmental Protection Agency and U.S. EPA.
   1. If notification of demolition or renovation is required, provide all required documentation to the appropriate agency.
   2. If testing, inspection, or analysis of potential asbestos-containing material is required, employ a certified Asbestos Hazard Evaluation Specialist to perform such work.
      a. This Contractor's bid shall be submitted on the basis that the amount of regulated asbestos-containing material (RACM) to be removed or disturbed, if any, will be less than the quantity regulated by the National Emission Standards for asbestos.
      b. If testing, inspection, or analysis reveals quantities of RACM sufficient to subject the project to the requirements of the National Emission Standards for asbestos, promptly notify the Architect and the Owner, and do not disturb any materials identified as RACM. The Owner will issue special instructions relating to the disposition of such material. The Owner reserves the right to contract independently for the removal of any or all hazardous materials.

3. If required to do so, employ an individual trained in the provisions of the National Emission Standards for asbestos. This individual shall be on site at all times during the removal of RACM.

1.03 PROJECT CONDITIONS:

A. Provide labor, materials, equipment, insurance and services necessary for the proper and entire completion of the demolition work required for the project.

B. Visit the site prior to bidding and ascertain pertinent local conditions such as location, accessibility and general character of the site, the character and extent of the existing work within or adjacent to the site, and any other work being performed thereon at the time.

C. Include the removal and disposition (or the incorporation in the new work, as the case may be) of all existing portions of the work which are indicated as being removed, or when it becomes necessary to remove such in order to properly complete the new work as shown.

D. Maintain adequate safety measures at all times to protect the existing building, adjacent buildings, their occupants, employees, pedestrians and anyone who may have occasion to frequent the premises in the course of maintaining normal operations. There shall be complete cooperation among Architect, Owner and Contractors to see that all safety requirements are carried out.

E. Where adjoining construction or site improvements are in a condition that might be misconstrued as damage caused by demolition operations, prepare photographs or video of sufficient detail to document existing conditions; deliver to Architect prior to beginning demolition.

F. Furnish all necessary shoring, signs, barricades, dust curtains, etc., to ensure the safety of persons in adjacent areas and other workers in same area.

G. During working hours the Contractor shall be on the job personally or shall be represented by a competent superintendent. The Contractor shall coordinate all trades and subcontractors and provide adequate labor, equipment and materials as needed.

H. Conduct demolition to minimize interference with occupied building areas.

I. Cease operations immediately if structure appears to be in danger; notify Architect. Do not resume operations until directed.

J. Ownership of Removed Materials:
   1. Salvageable and reusable equipment and materials removed are the property of Owner, and shall be delivered to the locations directed by Owner.
   2. Removed materials that are obviously not reusable shall be removed from the site and disposed of.
   3. Items in question shall be brought to the attention of the Owner's representative, who shall determine whether they are to be salvaged or removed from the site and disposed of.

1.04 SEQUENCING AND SCHEDULING:

A. Perform and complete demolition work in a timely manner so as not to disrupt adjacent activities any longer than necessary.

B. Coordinate scheduling of noisy, odor-producing and dusty work with Owner to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Provide labor, materials, tools, and equipment as necessary to complete demolition work.

PART 3 EXECUTION

3.01 PREPARATION:

A. Provide, erect and maintain temporary barriers and partitions where indicated and where required to prevent spread of dust, odors and noise to occupied areas, in accordance with Section 01 5000.

B. Erect and maintain weatherproof closures for exterior openings in roofs, windows, and walls in accordance with Section 01 5000.

C. Protect existing materials and surfaces which are not to be demolished.

D. Prevent movement of structure; provide bracing and shoring.

E. Notify affected utility companies and utilities protection services at least two full working days before starting work; comply with their requirements. Mark site to indicate proposed excavation area.

F. Mark location and termination of utilities.

G. Provide appropriate temporary signage including signage for exit or building egress.

3.02 DEMOLITION:

A. Disconnect, remove, cap and identify designated utilities within demolition areas.

B. Demolish in an orderly and careful manner. Protect existing supporting structural members.

C. Removal of Site Construction: ODOT 202.

D. Removal of Slabs, Walks, and Pavements: Saw cut existing materials to provide a neat joint at removal limits, except where removal terminates at an existing joint.

E. Removal of Concrete and Masonry Walls: Saw cut existing materials to provide a neat joint at removal limits.
   1. Where wall to be removed is in plane with wall to remain, saw cut and remove material to nearest vertical masonry joint (minimum 8 inches) outside indicated limits of removal.
   2. Where new opening is to be provided at existing wall, saw cut vertical edge of new opening and remove material to nearest vertical masonry joint (minimum 8 inches) outside indicated limits of removal. Saw cut head and sill of new opening and remove material to first horizontal masonry course outside the indicated limits of removal.
   3. Where wall to be removed is perpendicular to wall to remain, saw cut block and remove material flush with surface to remain.
   4. Where concrete block is removed from existing floor slab to remain, fully remove bed joint material and leave concrete floor surface suitable for the installation of new floor material.

F. Removal of Ceiling Systems: Where suspended ceilings are indicated to be removed, removal shall include light fixtures, grilles and diffusers, suspension system, hanger wire, clips, anchors, hangers, and blocking.

G. Removal of Resilient Flooring: Where resilient tile or sheet flooring is indicated to be removed, removal shall include removal of mastics and adhesives in accordance with RFCI Recommended Work Practices.

H. Removal of Casework: Where casework is indicated to be removed, removal shall include countertops, plumbing fixtures, anchors, hangers, blocking, and backsplashes or sealant on adjacent surfaces.

I. Removal of Plumbing and HVAC Work:
   1. Verify that abandoned piping and ductwork serve only abandoned facilities.
   2. Disconnect piping and duct systems in walls, floors and ceilings scheduled for removal. Cap existing components to remain at point of disconnection.
   3. Reroute, extend, and reconnect existing systems to maintain integrity of branch or loop serving components not removed.
   4. In building areas to remain, remove abandoned systems to source of supply.
   5. Disconnect and remove abandoned equipment and components, including devices, fasteners, and support framing.
   6. Maintain access to existing equipment and components which remain active. Modify installation or provide access panel as appropriate.

J. Disposal: Remove demolished materials from site except items to be retained by Owner or reinstalled in the work, or as specifically noted otherwise. Do not burn or bury materials on site. Pay fees for transportation and disposal of removed materials.
   1. Dispose of materials removed from the site in a legal location and manner.
   2. Remove and dispose of mercury-containing switches and thermostats in accordance with EPA regulations. Transport in accordance with ODOT regulations.

3. Do not dispose of demolished materials, excavated materials, trees, brush, or other debris in wetlands, flood plains, stream corridors, environmentally sensitive areas, surface waters or storm sewers, even with the permission of the property owner.
4. Do not engage in open burning of debris removed from the project, except in compliance with the regulations of all authorities having jurisdiction, and with all required permits.

K. Remove materials as work progresses. Upon completion of work, leave areas in clean condition.

L. Remove temporary work.

3.03 MINOR ELECTRICAL DEMOLITION FOR REMODELING:

A. Examination:
1. Verify field measurements and circuiting arrangements are as shown on Drawings.
2. Verify that abandoned wiring and equipment serve only abandoned facilities.
3. Demolition drawings are based on superficial field observation and existing record documents, where available. Report discrepancies to Architect before disturbing existing installation.
4. Beginning of demolition means installer accepts existing conditions.

B. Preparation:
1. Disconnect electrical systems in walls, floors and ceilings scheduled for removal.
2. If electrical panels attached to surfaces to be demolished contain circuits serving equipment or devices to remain, relocate panel to approved location in area not affected by demolition; rewire circuits to new panel location.
3. Coordinate utility service outages with Utility Company and Owner.
4. Provide temporary wiring and connections to maintain existing systems in service during construction.
5. Where new systems are installed in place of existing systems, maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Obtain permission from Owner before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

C. Demolition:
1. Remove, reroute, or replace existing facilities and services as required to permit installation of new work or alterations to old work.
2. Remove abandoned wiring to source of supply.
3. Remove exposed abandoned conduit, including abandoned conduit above accessible ceilings. Plug or cap conduit at a point well behind the proposed new finished closures or surfaces.

4. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned or removed. Provide blank cover for abandoned boxes which are not removed.
5. Where devices, luminaires, or equipment are removed, reconnect existing loads not removed, if any, to existing circuit; verify circuit integrity and operation.
6. Disconnect and remove abandoned panelboards and distribution equipment, including fasteners and support framing.
7. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
8. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers and other accessories.
   a. Remove and dispose of lamps and ballasts in accordance with EPA regulations. Transport in accordance with ODOT regulations. Ballasts labeled "Contains No PCBs" may be containerized and recycled.
9. Repair adjacent construction and finishes damaged during demolition work.
10. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.

D. Clean and repair existing materials and equipment which remain or are to be reused.
   1. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.
   2. Luminaires: Clean existing luminaires in place. Use mild detergent to clean all exterior and interior surfaces; rinse with clean water and wipe dry. Replace non-working lamps and ballasts, and broken electrical parts.

3.04 PROTECTION:

A. Exercise caution to avoid damage to existing surrounding materials and structures which are to remain.

B. Prevent damage to adjoining properties, existing buildings, pavement, sidewalks, landscaping, and similar features. Make all necessary repairs where required and do all patching to meet existing conditions.

END OF SECTION

SECTION 03 1000 – CONCRETE FORMING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Concrete forming and accessories.

B. Related Sections:
   1. Section 03 3000 – Cast-in-Place Concrete.
   2. Section 07 2100 – Thermal Insulation: Insulation for foundations and floor slabs.

1.02 QUALITY ASSURANCE:

A. Perform concrete work in accordance with ACI 301. Maintain one copy on site.

B. Perform formwork in accordance with ACI 347.

PART 2 PRODUCTS

2.01 FORMING MATERIALS:

A. Wood Form Materials:
   1. Plywood for Surfaces Exposed to View: APA High Density Overlay Plyform Class I Exterior, thickness in accordance with APA V345; sound undamaged sheets with clean, true edges.
   2. Plywood for Surfaces Not Exposed to View: APA B-B Plyform Class I Exterior, thickness in accordance with APA V345; sound undamaged sheets with clean, true edges.
   3. Lumber: Kiln dried softwood; grade as required for loading conditions.

B. Prefabricated Forms: Preformed steel or glass fiber reinforced plastic; matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.

C. Permanent Forms: Metal deck, minimum 26 gauge; preservative treated plywood, minimum ½ inch; or other materials of equivalent durability and loadbearing capacity.

2.02 FORMING ACCESSORIES:

A. Form Ties: Metal snap-off type, free of defects that could leave holes larger than 1 inch in concrete surface.

B. Form Release Agent: Colorless mineral oil which will not stain concrete, absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete.

   1. Manufacturers: In accordance with Section 01 6000.
      a. Euclid Chemical Company; Eucoslip VOX.

b. Laticrete International; Debond Form Coating.
c. Sonneborn Building Products; Cast-Off WB.

2. VOC Content: Maximum 340 gm/liter.

C. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

D. Waterstops: Polyvinyl chloride (PVC), minimum 1750 psi tensile strength, minimum 50 degrees F to 175 degrees F working temperature range, 6 inch wide, 3/8 inch web thickness, maximum possible lengths, split type with ribbed profile and center bulb, preformed corner sections, heat welded jointing.

1. Manufacturers: In accordance with Section 01 6000.
   a. Sika Corporation; Greenstreak No. 724.
   b. Paul Murphy Plastics Company; SR-6380.
   c. Vinylex Corporation; RSB6-38.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify lines, levels, and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

3.02 PREPARATION:

A. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

3.03 FORMING:

A. Formwork Erection: Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301.
   1. Earth forms are permitted only at footings and grade beams excavated from undisturbed soil, where soil conditions are sufficiently stable to eliminate the possibility of slide-in. Hand trim sides and bottom of earth forms. Remove loose soil prior to placing concrete.
   2. Construct formwork so that concrete members are of the correct size, shape, alignment, elevation, and position.
   3. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
   4. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
   5. Align joints and make watertight. Keep form joints to a minimum.
   6. Obtain approval before framing openings in structural members which are not indicated on Drawings.

7. Install permanent forms for air slabs as shown on Drawings to provide minimum 3 inch void space between form and subgrade. Protect forms from crushing or collapse.
8. Coordinate formwork erection with work of other sections requiring attachment of components to formwork.
9. If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement, request instructions from Architect before proceeding.

B. Application of Form Release Agent:
1. Apply form release agent on formwork in accordance with manufacturer's recommendations.
2. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
3. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings which are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

C. Inserts, Embedded Parts, and Openings:
1. Provide formed openings where required for items to be embedded in or passing through concrete work.
2. Locate and set in place items which will be cast directly into concrete.
3. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, raceways, conduits, ducts, other inserts, and components of other Work.
4. Install accessories in accordance with manufacturer's instructions, straight, level, and plumb. Ensure items are not disturbed during concrete placement.
5. Install waterstops in accordance with manufacturer's instructions continuous without displacing reinforcement. Seal joints watertight.
6. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow drainage.
7. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted to joints which will not be apparent in exposed concrete surfaces.

D. Form Cleaning:
1. Clean forms as erection proceeds, to remove foreign matter within forms.
2. Clean formed cavities of debris prior to placing concrete.
3. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
4. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

E. Formwork Tolerances: Maintain tolerances required by ACI 301.

F. Form Removal:
   1. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
   2. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
   3. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.

3.04 FIELD QUALITY CONTROL:

A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.

END OF SECTION

SECTION 03 3000 – CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Cast-in-place concrete construction:
      a. Footings and foundation walls.
      b. Floors and slabs on grade.
      c. Sidewalks and curbs.
      d. Control, expansion, and contraction joint devices associated with concrete work, including joint sealants.
   2. Concrete reinforcing.
   3. Concrete curing.

B. Products Installed But Not Furnished Under This Section:
   1. Section 05 1200 – Structural Steel Framing: Anchor bolts.
   2. Section 05 5000 – Metal Fabrications: Fabricated metal items for casting into concrete.
   3. Divisions 21 through 28: Facility Services items for casting into concrete.

C. Related Sections:
   1. Section 01 4520 – Testing and Inspecting Services.
   2. Section 03 1000 – Concrete Forming.
   3. Section 03 3500 – Concrete Finishing.
   4. Section 04 0500 – Common Work Results for Masonry: Grout for base plates and bearing plates.
   5. Section 07 2100 – Thermal Insulation: Insulation for foundations and floor slabs.
   6. Section 32 3113 – Chain Link Fences and Gates.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings:
   1. Reinforcing: Indicate bar sizes, spacings, locations, and quantities of reinforcing steel and wire fabric, bending and cutting schedules, and supporting and spacing devices.
   2. Joint Layout: Indicate layouts and joint locations for slabs and sidewalks. Indicate locations of construction joints.

B. Product Data: Provide data on concrete mix designs, joint devices, attachment accessories, vapor retarders, and admixtures.

1.03 QUALITY ASSURANCE:

A. Perform concrete work in accordance with ACI 301.

B. Perform steel reinforcement in accordance with ACI SP-66 and CRSI 63, 65, and Manual of Practice.

C. Acquire cement and aggregate from same source for all work.

1.04 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Deliver packaged materials in manufacturer's packaging including application instructions.

1.05 ENVIRONMENTAL REQUIREMENTS:

A. Conform to ACI 305R when concreting during hot weather. Provide precautions against plastic shrinkage where indicated by air temperature, relative humidity, concrete temperature, and wind velocity.

B. Conform to ACI 306R when concreting during cold weather.

PART 2 PRODUCTS

2.01 REINFORCING:

A. Reinforcing Steel: ASTM A615, 60 ksi yield grade; deformed billet steel bars, unfinished.

B. Welded Steel Wire Fabric: ASTM A1064, Plain Type; in flat sheets; unfinished.

2.02 REINFORCING ACCESSORIES:

A. Tie Wire: Minimum 16 gauge annealed type.

B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions, including load bearing pad on bottom to prevent vapor retarder puncture. Metal accessories shall be galvanized.

C. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: Plastic coated steel type; size and shape as required.

2.03 REINFORCING FABRICATION:

A. Fabricate concrete reinforcing in accordance with ASTM A184, CRSI Manual of Practice, and ACI SP-66.

B. Locate reinforcing splices not indicated on drawings, at point of minimum stress.

C. Remove rust scale and coatings which may reduce bond from reinforcing prior to fabrication.

D. Cold bend reinforcing bars to minimum bend diameters in accordance with ACI 301.

E. Extend horizontal bars in walls and footings minimum 12 inches around corners.

2.04 CONCRETE MATERIALS:

A. Cementitious Materials:

1. Portland Cement: ASTM C150, Type I – Normal.

2. Fly Ash: ASTM C618; Type C or Type F.
   a. Interior Concrete Slabs: Fly ash may be substituted for up to 15 percent of the cement content for each concrete mix.
   b. Other Locations: Fly ash may be substituted for up to 25 percent of the cement content for each concrete mix.

3. Ground Granulated Blast Furnace Slag (GGBFS): ASTM C989, Grade 100 minimum. GGBFS may be substituted for up to 35 percent of the cement content for each concrete mix.

B. Fine and Coarse Aggregates: ASTM C33.

C. Water: ASTM C1602; clean, potable and not detrimental to concrete.

2.05 ADMIXTURES:

A. Manufacturers: In accordance with Section 01 6000. Admixtures shall be the products of a single manufacturer.
   1. GCP Applied Technologies.
   2. Master Builders Solutions.
   3. Premiere Concrete Admixtures.
   4. Sika Corporation.

B. Air Entrainment: ASTM C260, neutralized vinsol resin.

C. Chemical: ASTM C494.
   1. Type A – Water Reducing.
   2. Type B – Retarding.
   3. Type C – Accelerating.
   4. Type D – Water Reducing and Retarding.
   5. Type E – Water Reducing and Accelerating.

D. Plasticizing: ASTM C1017.

E. Admixtures containing more than 0.1 percent chloride ions are not approved.

2.06 ACCESSORIES:

A. Vapor Retarder: ASTM E1745, Class B; minimum 10 mil thickness.

1. Water Vapor Permeance: ASTM E154; maximum 0.025 perms.

B. Non-Shrink Grout for Dowels to Existing Concrete: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of

developing minimum compressive strength of 2400 psi in 48 hours and 7000 psi in 28 days.

1. Manufacturers: In accordance with Section 01 6000.
   a. Master Builders; Set Grout.
   b. Sonneborn Building Products; Sonogrout.
   c. Sika Corporation; Sika Grout 212.

C. Bonding Agent: Polymer resin emulsion.

1. Manufacturers: In accordance with Section 01 6000.
   a. GCP Applied Technologies; Daraweld-C.
   b. Master Builders Solutions; MasterEmaco A660.
   c. Sika Corporation; Sika Bond.

2.07 JOINT DEVICES AND FILLER MATERIALS:

A. Joint Filler: One of the following at Contractor's option; ½ inch thick.

1. ASTM D994 or ASTM D1751; asphalt impregnated fiberboard or felt.

2. ASTM D4819; closed cell polyethylene.

3. ASTM D8139; closed cell polypropylene.

B. Bond Breaker: No. 15 asphalt saturated felt.

C. Construction Joint Devices: Galvanized steel with mill finish, minimum 20 gauge; 8 inch thick, formed to tongue and groove profile, knockout holes spaced at 6 inches, ribbed steel spikes with tongue to fit top screed edge.

1. Manufacturers: In accordance with Section 01 6000.
   a. Heckmann Building Products, No. 95.

D. Joint Sealant: ASTM C920 Type M, Grade P, Class 25, Use T; cold applied two part polyurethane, self leveling; with corresponding primer.

1. Manufacturers: In accordance with Section 01 6000.
   a. Master Builders Solutions; MasterSeal SL 2.
   b. Quaker Sealants & Coatings Company; QSC-231.
   c. Sika Corporation; Sikaflex-2c SL.
   d. Tremco, Inc.; THC 901.

2.08 CONCRETE MIXES:

A. Mix concrete in accordance with ACI 304. Deliver concrete in accordance with ASTM C94. Do not mix concrete more than 90 minutes.

B. Select proportions for normal weight concrete in accordance with ACI 301 Method 1.

C. Provide concrete to the following criteria:

1. Exterior Concrete, and Concrete Exposed to Weather:
   a. Compressive Strength (28 day): Minimum 4500 psi.
   b. Air Entrained: In accordance with ACI 301.
   c. Slump (plus or minus 1 inch): 3 inches.

2. Concrete Fill for Overexcavated Areas and Utility Trench Backfilling:
   a. Compressive Strength (28 day): Minimum 1500 psi.
   b. Aggregate Size (maximum): ½ inch.
   c. Slump (maximum): 6 inches.

3. Exterior Foundation Walls:
   a. Compressive Strength (28 day): Minimum 4000 psi.
   b. Air Entrained: In accordance with ACI 301.
   c. Slump (plus or minus 1 inch): 3 inches.

4. Interior Foundations:
   a. Compressive Strength (28 day): 3500 psi.
   b. Aggregate Size (maximum): 1½ inch.
   c. Slump (plus or minus 1 inch): 3 inches.

5. Interior Concrete Slabs, and Concrete Work Not Otherwise Scheduled:
   a. Compressive Strength (28 day): 3500 psi.
   b. Aggregate Size (maximum): 1 inch.
   c. Slump (plus or minus 1 inch): 3 inches.

D. Maximum Size of Coarse Aggregate: In accordance with ACI 301 unless noted otherwise.

E. Use accelerating admixtures in cold weather only when approved by Architect. Use of admixtures will not relax cold weather placement requirements.

F. The use of calcium chloride is not permitted.

G. Use set retarding admixtures during hot weather only when approved by Architect.

H. Add air entraining agent to normal weight concrete mix for work exposed to exterior.

I. Air entrainment at floor slabs scheduled to receive floor sealer shall not exceed 3%.

2.09 CURING MATERIALS:

A. Liquid Membrane Curing Compound: ASTM C309, Type I, Class B; dissipating type. Clean thoroughly with power scrubber and industrial strength detergents prior to installing floor coverings.

1. Manufacturers: In accordance with Section 01 6000.
   a. Euclid Chemical Co.; Kurez DR VOX.
   b. Laticrete International.
   c. Tamms Industries.

d. W. R. Meadows, Inc.

B. Absorptive Mats: ASTM C171, burlap-polyethylene, minimum 8 oz/sq yd, or reinforced water-resistant laminated paper, bonded to prevent separation during handling and placing.

C. Water: Potable, not detrimental to concrete.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that anchors, seats, plates, reinforcement, and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

B. Verify that underslab construction, including mechanical and electrical work, is installed complete, backfilled, inspected, and approved.

3.02 PREPARATION:

A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

B. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels, and pack solid with non-shrink grout.

C. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

D. Coordinate floor slab elevations and hold downs with finish flooring materials scheduled.

3.03 PLACING REINFORCING:

A. Verify that reinforcing is free of dirt and form release agents.

B. Place, support, and secure reinforcement against displacement. Do not deviate from required position.

C. Splice reinforcing bars minimum 12 inches and 36 bar diameters.

D. Place welded wire fabric in maximum lengths. Lap adjacent sheets minimum 6 inches; secure lapped edges together at maximum 48 inches o.c. Hold fabric back minimum 2 inches from construction joints and expansion joints.

E. Do not displace or damage vapor retarder.

F. Accommodate placement of formed openings.

G. Maintain concrete cover around reinforcing in accordance with ACI 318.

H. Maintain clear distance between reinforcing bars, minimum 1 inch and 1-1/3 times the maximum coarse aggregate size.

I. Tolerances: In accordance with ACI 301.

3.04 PLACING CONCRETE:

A. Place concrete in accordance with ACI 301.

B. Notify Architect minimum 48 hours prior to commencement of operations.

C. Ensure reinforcement, inserts, embedded parts, and joint devices are not disturbed during concrete placement.

D. Install vapor retarder under interior slabs on grade, in accordance with ASTM E1643. Lap joints minimum 6 inches and seal watertight by taping edges and ends.

1. Seal overlapping joints, perimeter joints, openings and penetrations with continuous strip of vapor retarder tape. Seal perimeter to adjoining construction. Seal joints airtight at penetrations.

E. Repair vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.

F. Place slabs on grade and sidewalks in pattern indicated and as approved by Architect.

1. Separate slabs from vertical surfaces with ½ inch thick joint filler.
   a. Place joint filler in slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
   b. Extend joint filler from bottom of slab to within ½ inch of finished slab surface.

2. Provide expansion joints with ½ inch thick joint filler at maximum 20 ft o.c. both ways in exterior sidewalks. Align joints with joints in adjacent curbs.
   a. Place joint filler in slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
   b. Extend joint filler from bottom of slab to within ½ inch of finished slab surface.

3. Provide control joints in slabs at maximum 20 ft o.c. unless noted otherwise, in curbs at maximum 10 ft o.c., and in exterior sidewalks to subdivide concrete into areas of minimum 16 sq ft and maximum 36 sq ft, or as detailed.
   a. Control joints may be tooled or saw cut at Contractor's option.

4. Install construction joint devices in coordination with slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete. Thicken slab to full depth of construction joint device.

G. Place concrete continuously between predetermined expansion and construction joints.

1. Install waterstops in construction joints located in foundation walls and footings.

2. Do not locate joints in footings or column piers.

H. Do not interrupt successive placement. Do not permit cold joints to occur. Do not permit horizontal joints in walls or piers.

I. Saw cut joints within 24 hours after placing. Use 3/16 inch thick blade, cut into ¼ depth of slab thickness.

J. Apply sealant to exposed exterior and interior joints in accordance with manufacturer's instructions.

K. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

L. Provide mechanical equipment for conveying concrete to assure a continuous flow of concrete at the delivery end. Provide runways for wheeled concrete conveying equipment from the concrete delivery point to the locations of final deposit. Keep interior surfaces of conveying equipment, including chutes, free of hardened concrete, debris, water, snow, ice, and other deleterious materials.

M. Cold Weather Placing: Do not use frozen materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials. Ascertain that forms, reinforcing steel, and adjacent concrete surfaces are entirely free of frost, snow, and ice before placing concrete.

N. Remove excess and unsuitable concrete from project site and dispose of in an acceptable location.

3.05 CURING AND PROTECTION:

A. Cure concrete surfaces in accordance with ACI 308.

B. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, excessive temperature changes, and mechanical injury.

C. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

D. Schedule of Curing Methods:
   1. Cure horizontal surfaces by ponding, spraying, absorptive mat, or membrane curing compound.
   2. Cure vertical surfaces by spraying or membrane curing compound.

E. Concrete Curing:
   1. Ponding: Maintain 100 percent coverage of water over floor slab areas continuously for 4 days.
   2. Spraying: Spray water over surfaces and maintain wet for 7 days.
   3. Absorptive Mat: Saturate material and place over floor slab areas, lapping ends and sides; maintain in place for 7 days.
   4. Membrane Curing Compound: Apply curing compound in accordance with manufacturer's instructions in two coats with second coat applied at right angles to first.

F. Protect finished concrete surfaces from damage by subsequent construction operations.

G. Do not permit traffic over unprotected surfaces.

3.06 FIELD QUALITY CONTROL:

A. Testing firm will perform concrete testing in accordance with Section 01 4520.
   1. Provide free access to Work and cooperate with testing firm.
   2. Submit proposed mix design of each class of concrete to testing firm for review prior to commencement of Work.
   3. Tests of cement and aggregates may be performed to ensure conformance with specified requirements.

B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances, or specified requirements. Repair or replacement of defective concrete will be determined by the Architect.

3.07 PATCHING:

A. Allow Architect to inspect concrete surfaces upon removal of forms.

B. Excessive honeycomb, voids over ½ inch diameter, or embedded debris in concrete is not acceptable. Notify Architect upon discovery.

C. Patch imperfections and tie holes in concealed surfaces in accordance with ACI 301.

D. Patch, fill, touch-up, and repair surface defects as directed by Architect for each individual area.
   1. Repair exposed concrete surfaces containing defects which adversely affect the appearance of the finish. Remove and replace the concrete having defective surfaces if the defects cannot be repaired to the satisfaction of the Architect. Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, holes left by tie rods and bolts, fins and other projections on the surface, stains, and other discolorations that cannot be removed by cleaning.
   2. Repair concrete surfaces containing defects which may adversely affect the durability of the concrete. Remove and replace the concrete having defective surfaces if the defects cannot be repaired to the satisfaction of the Architect. Surface defects include cracks in excess of 0.01 inch wide, cracks of any width and other surface deficiencies which penetrate to the reinforcement or completely through non-reinforced sections, crazing, honeycomb, rock pockets, and spalls, except minor breakage at corners.

END OF SECTION

SECTION 03 3500 – CONCRETE FINISHING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Concrete finishing and surface treatment.

B. Related Sections:
   1. Section 03 3000 – Cast-in-Place Concrete.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Provide data on finishing materials.

1.03 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Deliver packaged materials in manufacturer's packaging including application instructions.

1.04 ENVIRONMENTAL REQUIREMENTS:

A. During concrete floor finishing, provide temporary heat to maintain ambient temperature of minimum 50 degrees F; provide ventilation sufficient to prevent injurious gases from temporary heat or other sources affecting concrete.

PART 2 PRODUCTS

2.01 FINISHING MATERIALS:

A. Sealer:
   1. Manufacturers: In accordance with Section 01 6000.
      a. Sika Corporation; Sikafloor 90.
      b. Sealed Air Corporation; JonCrete High Gloss Sealer.
      c. W. R. Meadows; Tiah.

PART 3 EXECUTION

3.01 CONCRETE FINISHING AND SURFACE TREATMENT:

A. Provide concrete surfaces with finishes in accordance with the definitions in ACI 301. Finish concrete flatwork surfaces in accordance with ACI 301 and ACI 302.
   1. Concealed Formed Concrete: Rough form finish.
   2. Exposed Formed Concrete: Smooth form finish.
   3. Interior Slabs: Troweled finish. Apply sealer where exposed.
   4. Exterior Slabs and Sidewalks: Broom finish.

B. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at ¼ inch per ft.
   1. In areas scheduled to receive ceramic tile flooring, maintain level floor elevation beyond a 48 x 48 inch square centered on the floor drain. Locate top of drain ½ inch below floor level; slope floor surface uniformly in 4 directions.

C. Tool exposed slab edges, expansion joints, and tooled control joints with ¼ inch radius edging tool.

D. Floor Sealer: Apply on floor surfaces as scheduled in accordance with manufacturer's instructions.

3.02 FLOOR FINISHING TOLERANCES:

A. Maximum Variation of Surface Flatness: ¼ inch in 10 ft, ACI 301 Class B.

B. Correct defects by grinding or removal and replacement of the defective work. Re-measure corrected areas by the same process.

END OF SECTION

SECTION 04 0500 – COMMON WORK RESULTS FOR MASONRY

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Mortar and grout for masonry.
   2. Reinforcement, anchorage, flashings and accessories for masonry.
   3. Non-shrink grout for setting base plates and bearing plates.

B. Related Sections:
   1. Section 01 5000 – Temporary Facilities and Controls: Temporary heat.
   2. Section 03 3000 – Cast-in-Place Concrete.
   3. Section 04 2000 – Unit Masonry.
   4. Section 05 1200 – Structural Steel Framing.
   5. Section 08 1100 – Metal Doors and Frames.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Submit for each type of reinforcing, anchorage, flashing, and accessory product.

B. Samples: Submit two samples of mortar, illustrating mortar color and color range.

1.03 REGULATORY REQUIREMENTS:

A. Perform Work in accordance with ACI 530 and ACI 530.1.

1.04 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Store bulk materials and aggregates to prevent deterioration or intrusion of foreign material. Remove unsuitable materials from the job site.
   1. When air temperature is below 40 degrees F, cover with plastic or canvas to prevent wetting and freezing.

B. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.05 FIELD CONDITIONS:

A. Cold Weather Construction (below 40 degrees F): Follow MIC Hot & Cold Weather Masonry Construction.
   1. Below 40 Degrees F: Heat mixing water and maintain mortar temperature between 40 and 120 degrees F until placed. Cover construction with plastic or canvas for 24 hours after laying masonry units; prevent wetting and freezing.
   2. Below 32 Degrees F: Heat sand and mixing water and maintain mortar temperature between 40 and 120 degrees F until placed. Thaw frozen materials

prior to use. Provide enclosures and temporary heat, or insulated blankets, to maintain masonry above 32 degrees F for 24 hours after laying masonry units.

3. Below 20 Degrees F: In addition to above, heat masonry units to 20 degrees F before placing. Provide enclosures and temporary heat to maintain masonry and air temperature within enclosure above 32 degrees F for 24 hours after laying masonry units.

B. Hot Weather Construction (above 90 degrees F): Follow MIC Hot & Cold Weather Masonry Construction.
   1. Store materials in cool or shaded areas. Limit open mortar beds to maximum 4 foot length; set units within one minute of spreading mortar. Protect wall from rapid evaporation by covering, fogging, damp curing or other approved means.

PART 2 PRODUCTS

2.01 MORTAR MATERIALS:

A. Portland Cement: ASTM C150, Type I, gray color.
   1. When air temperature is below 40 degrees F, use ASTM C150, Type III.

B. Masonry Cement: ASTM C91 or ASTM C1329; Type as required for mortar mix scheduled, gray color.

C. Mortar Aggregate: ASTM C144, standard masonry type.

D. Hydrated Lime: ASTM C207, Type S.

E. Quicklime: ASTM C5, non-hydraulic type.

F. Water: Clean and potable.

G. Bonding Agent: Internally plasticized, high polymer resin.
   1. Manufacturers: In accordance with Section 01 6000.
      a. GCP Applied Technologies; Daraweld-C.
      b. Dayton Superior Corp.
      c. W. R. Bonsal Co.

H. Admixtures: Calcium chloride and other admixtures shall not be used.

2.02 MORTAR COLOR:

A. Manufacturers: In accordance with Section 01 6000.
   1. Cemex; Richcolor.
   2. Euclid Chemical Co.; Concentrated Mortar Colors.
   3. Fairborn Cement Co.; Miamicolor.
   4. Lehigh Cement Company.
   5. Solomon Colors, Inc.
   6. UPCO Company; Hydroment.
   7. York Building Products; Workrite.

B. Pigment: Mineral oxide, not exceeding 10 percent of portland cement by weight.

C. Color: Match existing.

D. Schedule: Use colored mortar at all exposed exterior face brick.

2.03 MORTAR MIXES:

A. Mortar for Foundation Walls and Masonry in Contact with Earth: ASTM C270, Type M using the Property specification.

B. Mortar for Load Bearing and Non-Load Bearing Walls and Partitions: ASTM C270, Type S using the Property specification.

C. Mortar for Masonry Veneer: ASTM C270, Type S using the Property specification.

2.04 MORTAR MIXING:

A. Thoroughly mix mortar ingredients in accordance with ASTM C270 in quantities needed for immediate use.

B. Maintain sand uniformly damp immediately before the mixing process.

C. Add mortar color in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.

D. Do not use anti-freeze compounds to lower the freezing point of mortar.

E. If water is lost by evaporation, re-temper only within two hours of mixing.

F. Use mortar within two hours after mixing at temperatures of 90 degrees F, or two-and-one-half hours at temperatures under 40 degrees F.

2.05 GROUT MATERIALS:

A. Cementitious Materials:
   1. Portland Cement: ASTM C150, Type I – Normal.
   2. Fly Ash: ASTM C618; Type C or Type F. Fly ash may be substituted for up to 25 percent of the total cement content for each mix.

B. Hydrated Lime: ASTM C207, Type S.

C. Grout Aggregate: ASTM C404.
   1. Fine Aggregate: Clean, sharp natural sand free from loam, clay lumps, or other deleterious substances.
   2. Coarse Aggregate: Clean, uncoated pea gravel containing no clay mud, loam, or foreign matter. Maximum aggregate size ¾ inch.

D. Water: Clean and potable.

E. Chemical Admixtures: In accordance with Section 03 3000.

2.06 GROUT MIXES:

A. Grout for Bond Beams, Lintels, Bearing Plates, and Masonry Cores: ASTM C476; 3000 psi strength at 28 days.

B. Non-Shrink Grout for Column Base Plates: ASTM C1107, Class B; non-catalyzed, multipurpose construction type containing mineral aggregate; Portland Cement-based; minimum compressive strength 9000 psi at 28 days; flowable, stiff, or plastic consistency.

1. Manufacturers: In accordance with Section 01 6000.
   a. Euclid Chemical Co.; Hi-Flow Grout.
   b. Laticrete International; Crystex.
   c. Master Builders Solutions; MasterFlow 928.

2.07 GROUT MIXING:

A. Mix transit mixed grout in accordance with ASTM C94.

B. Mix field mixed grout in accordance with ASTM C476.

C. Thoroughly mix grout ingredients in quantities needed for immediate use.

D. Do not use anti-freeze compounds to lower the freezing point of grout.

E. Non-Shrink Grout: Mix in accordance with manufacturer's instructions.

2.08 REINFORCING MATERIALS:

A. Steel Wire: ASTM A82, cold drawn.
   1. Finish: ASTM A153 Class B2, hot dip galvanized after fabrication to 1.50 oz/sq ft.

B. Steel Sheet: ASTM A653; G60 galvanized coating.

C. Steel Bars, Plates and Shapes: ASTM A36.

D. Reinforcing Steel: ASTM A615, 60 ksi yield grade, deformed billet bars, uncoated finish.

2.09 HORIZONTAL JOINT REINFORCING:

A. Manufacturers: In accordance with Section 01 6000.
   1. Dur-O-Wal, Inc.
   2. Heckmann Building Products.
   3. Hohmann & Barnard.
   4. Masonry Reinforcing Corporation of America; Wire-Bond.

B. General Requirements: ASTM A951; ladder type with cross ties at 16 inches o.c.; width of reinforcing approximately 2 inches less than nominal wall thickness; minimum 10 foot lengths, with prefabricated corners and tees.

C. Single Wythe Walls: Steel wire, minimum 9 gauge deformed side rods and 9 gauge smooth cross rods. (Dur-O-Wal Ladur series; Heckmann 1100 series; H&B 220 Lox All Ladder Mesh; Wire-Bond Series 200)

D. Multiple Wythes Constructed Separately: Adjustable type; steel wire, minimum 9 gauge deformed side rods and 9 gauge smooth cross rods, with 3/16 inch eyes and 3/16 inch double legged adjustable pintles. (Dur-O-Wal D/A 360 Ladur-Eye; H&B 270 Lox-All Adjustable Eye-Wire; Wire-Bond Series 800)

E. Multiple Wythes Constructed Simultaneously: Steel wire, three minimum 9 gauge deformed side rods and 9 gauge smooth cross rods. (Dur-O-Wal Ladur series; H&B 235 Lox All Cavity Ladder-Tri-Mesh; Wire-Bond Series 200)

F. Where cavity dimension between wythes exceeds 4½ inches, provide calculations and adjust wire sizes as required by applicable building code.

2.10 TIES AND ANCHORAGE DEVICES:

A. Manufacturers: In accordance with Section 01 6000.
   1. Dur-O-Wal, Inc.
   2. Heckmann Building Products.
   3. Hohmann & Barnard.
   4. Masonry Reinforcing Corporation of America; Wire-Bond.
   5. Williams Products, Inc.

B. Mesh Wall Ties: ½ x ½ inch wire mesh fabricated from minimum 16 gauge steel wire; width of mesh approximately 1 inch less than wall thickness. (Heckmann Wire Mesh 269; H&B MWT Mesh Wall Tie; Wire-Bond 1900)

C. Rigid Steel Anchors: Z-shape steel bars, size 1½ x ¼ x 24 inch with 2 inch bends each end. (Heckmann 272; H&B 344 Rigid Partition Anchor; Wire-Bond 3000Z)

D. Wire Ties: Z-shape, ¼ inch steel wire; 8 inch long with 2 inch bends each end. (Dur-O-Wal D/A 500; Heckmann 250; Wire-Bond 1600)

E. Column Anchors: L-shape steel bars, size 7 x 2 x 1/8 inch with 1½ inch bend one end; 5/8 x 1 inch flange slot, 1 inch from straight end; one pair per column. (Heckmann 189; H&B 365 with custom dimensions; Wire-Bond 2801)

F. Rebar Positioners: Steel wire, minimum 9 gauge, shaped to hold vertical reinforcing in intended position. (Heckmann 376; H&B RB Rebar Positioners; Wire-Bond 3400 series)

G. Preformed Control Joints for Concrete Masonry Units: ASTM D2287, PVC material; approximately 1 inch less than wall thickness. Provide with corner and tee accessories; cement fused joints. (Dur-O-Wal Rapid Poly-Joint, Series D/A 2000; H&B VS Series; Williams Everlastic 1056; Wire-Bond PVC Control Joint)

H. Compressible Joint Filler: ASTM D1056, closed cell neoprene material, oversized 50 percent to joint width; self-expanding; 3 inch width by maximum lengths. (Dur-O-Wal Rapid Soft-Joint, D/A 2015; H&B NS Series; Wire-Bond 3300)

I. Grout Stop Screen: Corrosion proof monofilament polypropylene mesh. (Dur-O-Wal Dur-O-Stop D/A 1000 series; H&B MGS Mortar/Grout Screen; Wire Bond 3612)

2.11 FLASHINGS:

A. Membrane Flashing: Rubberized membrane bonded to cross-laminated polyethylene film; 0.040 inch total thickness; flexible, self-sealing, self-healing, fully adhering.

1. Manufacturers: In accordance with Section 01 6000.
   a. GCP Applied Technologies; Perm-A-Barrier Wall Flashing.
   b. Dur-O-Wal, Inc.; Dur-O-Barrier.
   c. Hohmann & Barnard; Textroflash.

B. Metal Flashing: Flexible stainless steel sheet, Type 304, minimum 3 mil thick, bonded to polymeric fabric; self-adhering; with prefabricated end dams and corners.

1. Manufacturers: In accordance with Section 01 6000.
   a. Hohmann & Barnard; Mighty-Flash SA.

C. Drip Edge: ASTM A167, Type 304 stainless steel sheet, minimum 26 gauge, with hemmed edge; minimum 8 foot lengths.

1. Manufacturers: In accordance with Section 01 6000.
   a. Dur-O-Wal, Inc.; Drip Edge Flashing.
   b. Heckmann Building Products; 1008.
   c. Hohmann & Barnard; MFL Metal Flashing.
   d. Masonry Reinforcing Corporation of America; Wire-Bond 4165 Drip Edge Flashing.
2. Where indicated, provide 2 inch vertical back leg.

D. Accessories: Provide surface conditioner, primer, termination bars, and sealant approved by flashing manufacturer.

2.12 ACCESSORIES:

A. Building Paper: ASTM D226, Type I; No. 15 asphalt saturated felt.

B. Bond Break Wrap: Asphalt impregnated cellular paper, ¼ inch minimum thickness.

1. Manufacturers: In accordance with Section 01 6000.
   a. Williams Products, Inc.; Column Boxboard.

C. Weeps and Cavity Protection: High density nonwoven polyethylene mesh.

1. Manufacturers: In accordance with Section 01 6000.
   a. Archovations, Inc.; CavClear.

b. Hohmann & Barnard; Mortar Trap.
c. Keene Building Products; Driwall.
d. Mortar Net USA, Ltd.

2. Weeps: 3/8 inch wide, full height of head joint, 1/8 inch less than thickness of outer wythe; color as selected.

3. Cavity Protection Material: Shaped to maintain drainage at weep holes without clogging by mortar droppings; minimum 10 inch height, or full height of cavity at Contractor's option; thickness to match cavity air space.

D. Cleaning Solution: As recommended for application by masonry unit and mortar manufacturers, not harmful to masonry work or adjacent materials; not containing hydrochloric acid or salts that form hydrochloric acid in solution.

1. Manufacturers: In accordance with Section 01 6000.
a. ProSoCo, Inc.
b. Diedrich Technologies, Inc.
c. EaCo Chem.

PART 3 EXECUTION

3.01 PREPARATION:

A. Apply bonding agent to existing concrete and masonry surfaces.

B. Plug clean-out holes with masonry units. Brace masonry for wet grout pressure.

C. Non-Shrink Grout:
1. Surface Preparation: Clean areas to be grouted and keep free of oil, grease, dirt, and contaminants. Remove loose materials. Provide relief openings where required to avoid entrapment of air. Metal components in contact with grout shall be de-rusted and free of paint or oils. Concrete in contact with grout shall be thoroughly saturated with water a minimum of 12 hours prior to grout placement. Remove excess water from holes and voids just prior to grout placement.
2. Forming: Follow forming procedures which allow for complete filling of the space to be grouted and venting to avoid air entrapment. Anchor support elements to prevent movement. Remove support only after grout has hardened sufficiently. Pre-treat wood surfaces with form oil. Cut back edges of concrete which are less than one inch thick to form a uniform unit.

3.02 INSTALLATION:

A. Install mortar, reinforcement and anchorage, flashings and accessories in accordance with the requirements of the unit masonry Sections.

B. Work grout into masonry cores and cavities to eliminate voids.

C. Grout masonry units 6 inches and smaller, and spaces less than 2 inches in width, with fine grout using low lift grouting techniques. Grout masonry units 8 inches and

larger, and spaces 2 inches or greater in width, with coarse grout using high or low lift grouting techniques.

D. Low Lift Grouting: Place each grout pour to a height of maximum 60 inches and rod for grout consolidation.

E. High Lift Grouting:
   1. Provide cleanout opening no less than 4 inches high at the bottom of each cell to be grouted by cutting one face shell of masonry unit.
   2. In multiple wythe walls, omit every second masonry unit in one of the wythes for cleanout and cell inspection purposes.
   3. In multiple wythe walls, construct vertical grout barriers or dams between wythes, with masonry units every 30 ft maximum.
   4. Clean out masonry cells and cavities with compressed air. Remove debris.
   5. After cleaning, seal openings with masonry units.
   6. Pump grout into spaces. Maintain water content in grout to intended slump without aggregate segregation.
   7. Limit grout lift to 60 inches and rod for grout consolidation prior to placing additional lifts to a maximum pour height of 24 feet.

F. Non-Shrink Grout: Place grout mixture into prepared areas from one side to the other, rapidly and continuously. Trowel grouted surface smooth, splay neatly to 45 degrees.
   1. Curing: Wet cure exposed shoulders for minimum 72 hours.

G. Do not displace reinforcement while placing grout.

H. Remove excess mortar from grout spaces.

I. When grouting is stopped for more than one hour, terminate grout 1½ inch below top of upper masonry unit to form a positive key for subsequent grout placement.

J. At bearing points, stop grout pours 1½ inch below the uppermost masonry unit.

END OF SECTION

SECTION 04 2000 – UNIT MASONRY

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Concrete masonry units.
   2. Brick units.
   3. Masonry systems:
      a. Single wythe.
      b. Multiple wythe.
      c. Cavity wall.

B. Products Installed But Not Furnished Under This Section:
   1. Section 05 1200 – Structural Steel Framing: Placement of steel anchors for columns, beams, and lintels; placement of loose steel lintels.
   2. Section 05 2100 – Steel Joist Framing: Placement of steel bearing plates for joists.
   3. Section 05 5000 – Metal Fabrications: Placement of fabricated metal items.
   4. Section 08 1100 – Metal Doors and Frames: Placement of anchors for hollow metal door frames.
   5. Section 08 4113 – Aluminum Entrances and Storefronts: Placement of anchors for aluminum storefront systems.

C. Related Sections:
   1. Section 01 4520 – Testing and Inspecting Services.
   2. Section 04 0500 – Common Work Results for Masonry: Mortar and grout.
   3. Section 07 2100 – Thermal Insulation: Insulation for cavity spaces.
   4. Section 07 9200 – Joint Sealants: Backer rod and sealant at control joints.
   5. Section 09 9000 – Painting and Coating.

1.02 PREINSTALLATION MEETING: In accordance with Section 01 3100.

A. Attendance: Masonry Installer, Contractor, Owner, Architect, and Testing Agency.

B. Review methods and procedures related to masonry construction, including approved submittals and manufacturer's written instructions.

C. Review mockup requirements, location, and scheduling.

D. Review schedule and planned sequence of installation; availability of materials and labor; equipment, facilities, and temporary protection.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate reinforcing bar sizes, spacings, locations, quantities, bending and cutting schedules, supporting and spacing devices, and accessories.

B. Samples: Submit four units of each type of brick to illustrate color, texture, and extremes of color range

C. Test Reports: In accordance with Section 01 4520.

1.04 QUALITY ASSURANCE:

A. Regulatory Requirements: Perform Work in accordance with ACI 530 and ACI 530.1.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience. All concrete masonry units shall be the products of one manufacturer.

1.05 MOCKUP:

A. Construct a mockup panel sized 4 ft long by 4 ft high, which includes each type of exterior unit masonry, mortar, and accessories.

B. Locate where directed.

C. Do not place order for unit masonry materials until mockup is approved.

D. Mockup may not remain as part of the Work.

1.06 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Accept units on site. Inspect for damage.

B. Protect masonry units from breakage and from damage to surfaces which will be exposed.

C. Store masonry units on platforms or pallets above grade, protected from soil contact and from water, snow, and ice.

1.07 ENVIRONMENTAL REQUIREMENTS:

A. Cold Weather Construction (below 40 degrees F) and Hot Weather Construction (above 90 degrees F): Follow MIC Hot & Cold Weather Masonry Construction and Section 04 0500.

1.08 COORDINATION: In accordance with Section 01 3100.

A. Coordinate the masonry work with installation of bearing plates, door and window frame anchors, and other work.

B. Provide minimum 72 hour notice to roofing installer prior to proceeding with masonry work and flashing at interface with roofing systems.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS:

A. Hollow and Solid Load Bearing Block Units (CMU): ASTM C90, normal weight; natural color.

   1. Manufactured Lintels: ASTM C1623, normal weight.

B. Size and Shape: Nominal modular face size of 8 x 16 inches; thickness as indicated. Provide special units for square external corners, bull nose corners, jamb units, bond beams, and other conditions as shown or required.

C. Compressive Strength: ASTM C140; minimum 1900 psi on net area of unit.

D. Drying Shrinkage: ASTM C426; maximum 0.065 percent.

E. Concrete block shall be free from carbonaceous materials and iron oxides to ensure freedom from staining and popping. Exposed face texture shall be uniform.

2.02 BRICK UNITS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Belden Brick Co.
      a. Field Brick: 8601 Dark Smooth A.
      b. Accent Brick: Match existing.

B. Face Brick: ASTM C216, Type FBS, Grade SW.

C. Performance Requirements:
   1. Compressive Strength: Minimum 3000 psi.
   2. Initial Rate of Absorption: ASTM C67; maximum 40 g per minute.
   3. Efflorescence: ASTM C67; not effloresced.

D. Size and Shape: Utility brick; nominal size 4 x 4 x 12 inches. Provide special units for conditions shown or required.

2.03 ACCESSORIES:

A. Reinforcement and Anchorage: As specified in Section 04 0500.

B. Mortar and Grout: As specified in Section 04 0500.

C. Flashings and Accessories: As specified in Section 04 0500.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that field conditions are acceptable and are ready to receive work.

B. Verify that items provided by other sections of work are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION:

A. Direct and coordinate placement of metal anchors supplied under other Sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COURSING:

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Bond Pattern:
   1. Concrete Masonry Units: Running bond.
   2. Utility Brick Units: Match existing.

D. Mortar Joints: Concave.

E. Typical Coursing:
   1. Concrete Masonry Units: One unit and one mortar joint to equal 8 inches.
   2. Utility Brick Units: Two units and two mortar joints to equal 8 inches.

3.04 PLACING AND BONDING:

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints. Lay hollow masonry units in full bed of mortar at starting course above footings and foundation walls, and where grouted cores are scheduled.

C. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.

D. Remove excess mortar as work progresses.

E. Interlock intersections and external corners.

F. Install corner units with flush ends at external corners. Install bull nose concrete masonry units at wall ends and where unit ends are fully or partially exposed at jambs. Install jamb units at control joints and bonding angles, and where door and storefront frames extend full width of wall.

G. Lay masonry units with core cells vertically aligned, clear of mortar and unobstructed.

H. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

I. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

J. Avoid the use of less than half size units at corners, intersections, jambs, and wherever possible at other locations.

K. Cut mortar joints flush where resilient base is scheduled.

L. Isolate masonry work from structural steel columns with column bond break wrap and control joint.

M. Isolate top joint of non-load bearing masonry partitions from horizontal structural framing members and decks with compressible joint filler.

3.05 WEEPS:

A. Install weeps in place of mortar in head joints on all exterior walls at minimum 16 inches o.c. and maximum 24 inches o.c. horizontally above wall flashings, above shelf angles, at bottom of walls, above bond beams, and at lintels.

B. Recess weep material approximately 1/8 inch from face of masonry.

C. Do not permit mortar to drop or accumulate into cavity air space or to plug weeps.

D. Install cavity protection material above weeps to prevent accumulation of mortar and to maintain drainage.

3.06 REINFORCEMENT AND ANCHORAGE:

A. Horizontal Joint Reinforcement:
   1. Install horizontal joint reinforcement 16 inches o.c. vertically. Locate longitudinal wires over face shell mortar beds and fully embed in mortar.
   2. Minimum Mortar Cover: 5/8 inch on exterior face of walls, ½ inch elsewhere.
   3. Place joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 24 inches each side of opening.
   4. Place joint reinforcement continuous in first two joints below top of walls, at roof level, at floor slab level, and in first and second joints above bottom of walls.
   5. Lap joint reinforcement ends minimum 6 inches.

B. Wall Intersection Reinforcement:
   1. Where non-load bearing walls intersect load-bearing or non-load bearing walls, install mesh wall ties at 16 inches o.c. vertically. Extend minimum 8 inches into each wall.
   2. Where load-bearing walls intersect load-bearing walls, install rigid steel anchors at 24 inches o.c. vertically. Embed ends in grouted cores.

C. Opening Reinforcement: Install wire ties at 8 inches o.c. horizontally at masonry opening sills, lintels, and where indicated on the drawings.

D. Anchorage to Structural Framing: Install column anchors at 24 inches o.c. vertically on both sides of structural steel columns in masonry walls.

3.07 FLASHINGS:

A. Extend flashings horizontally on all exterior walls at first course above finish grade, at top of wall, above counterflashings, and above ledge or shelf angles and lintels.
   1. At through wall flashing locations above adjacent roof, use metal flashing. At other locations, use membrane flashing or metal flashing.

B. Apply surface conditioner and primer to substrate, and apply termination mastic at top edges, seams, and penetrations, in accordance with flashing manufacturer's recommendations.

C. Turn flashing up minimum 8 inches, and minimum 6 inches above top of cavity protection material; bed into mortar joint of masonry.

D. Lap end joints minimum 6 inches and seal watertight.

E. Turn flashing, fold to form end dam, and seal watertight at corners, bends, penetrations, terminations, and interruptions.

F. Remove and discard release paper from self-adhesive flashings. Position each piece carefully and press firmly into place with hand roller, giving special attention to edges, seams, and penetrations. Fully adhere flashing to substrate to prevent water from migrating under flashing.

G. Install drip edge under flashing at lintels, sills and exposed locations. Apply sealant to underside in accordance with Section 07 9200.

3.08 LINTELS:

A. Install loose steel lintels over openings where scheduled. Maintain minimum 8 inch bearing on each side of opening.

B. Provide masonry lintels where scheduled and where openings of more than 16 inches are shown in concrete masonry walls without structural steel or other supporting lintels.

   1. Field Fabricated Lintels:
      a. Lay units in bond pattern to match adjacent wall.
      b. Provide temporary shoring as required to support lintel and imposed loads until reinforcing, grouting and curing is complete.

   2. Manufactured Lintels: At exposed locations, saw cut 3/8 x 3/8 inch joints and apply mortar to match adjacent bond pattern and joint appearance.

3.09 GROUTED COMPONENTS:

A. Bond Beams and Masonry Lintels:
   1. Reinforce with 2 continuous No. 5 bars, 1 inch from bottom web, except where other reinforcement is detailed.
   2. Maintain bars in position with No. 3 spacer bars at 48 inches o.c.
   3. Lap splices 24 bar diameters.

4. Install bent corner bars at corners and lap splices minimum 30 inches.
5. Where structural steel interrupts the integrity of a bond beam, bend horizontal reinforcing minimum 24 inches vertically, and weld to the structural steel member.

B. Grouted Cores:
1. Reinforce masonry unit cores with reinforcing bars and grout as shown on the Drawings.
2. Retain vertical reinforcing in position at top and bottom of cells and at intervals not exceeding 192 bar diameters. Splice reinforcement in accordance with Section 03 3000.

C. Support and secure reinforcing bars from displacement, using rebar positioners. Maintain position within ½ inch of dimensioned position.

D. Place and consolidate grout fill in accordance with Section 04 0500 without displacing reinforcing.

E. At bearing locations, fill two courses of masonry cores with grout for minimum 12 inches both sides of opening.

3.10 CONTROL JOINTS:

A. Provide control joints in all exterior walls above grade, interior walls, and veneers.

B. Do not continue horizontal joint reinforcement through control joints.

C. Install preformed control joint devices and compressible joint filler in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

D. Locate control joints as shown on the Drawings, at maximum 25 ft intervals not to exceed 1½ times the wall height, at each corner within a distance of half the wall height, and at changes in wall height, changes in wall thickness, at construction joints in adjacent work, at pipe chases, and at columns.

E. Locate control joints at one side of wall openings, and at both sides of wall openings over 76 inches wide. Offset control joints above openings to align with the end of lintels above opening; provide horizontal slip plane.

F. Extend each control joint through full thickness of wall without offsets.

G. Saw cut 3/8 x 3/8 inch score in both faces of bond beam block in line with control joint.

3.11 BUILT-IN WORK:

A. As work progresses, install built-in metal door and storefront frames, wood nailing strips, anchor bolts, plates, and other items to be built into the work and furnished under other Sections.

B. Install built-in items plumb and level.

C. Bed anchors of metal door and storefront frames in adjacent mortar joints. Fill frame voids solid with grout.

D. Do not build in organic materials subject to deterioration.

3.12 TOLERANCES:

A. Maximum Variation from Alignment of Columns: ¼ inch.

B. Maximum Variation from Unit to Adjacent Unit: 1/32 inch.

C. Maximum Variation from Plane of Wall: ¼ inch in 10 ft and ½ inch in 20 ft or more.

D. Maximum Variation from Plumb: ¼ inch.

E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and ¼ inch in 10 ft; ½ inch in 30 ft or more.

F. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.

G. Maximum Variation from Cross Sectional Thickness of Walls: ¼ inch.

3.13 CUTTING AND FITTING:

A. Cut and fit for chases, pipes, conduits, sleeves, and grounds. Coordinate with other sections of work to provide correct size, shape, and location.

B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.14 FIELD QUALITY CONTROL:

A. Testing firm will perform masonry testing and on-site observation in accordance with Section 01 4520.

B. Provide access to roofing installer for observation of masonry work and flashing at interface with roofing systems.

3.15 CLEANING:

A. Remove excess mortar and mortar smears as work progresses.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces and all exterior masonry with cleaning solution. Rinse thoroughly with water. Do not allow cleaning solution to dry on masonry.

D. Use non-metallic tools in cleaning operations.

3.16 PROTECTION:

A. At the end of each work day, cover top of exposed walls with plastic or canvas secured in place to prevent the entrance of water.

B. Protect finished work from damage by all trades.

C. Without damaging completed work, provide protective boards at exposed external corners which may be damaged by construction activities.

D. Protect glazing assemblies and other non-masonry work during masonry cleaning.

END OF SECTION

SECTION 05 1200 – STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Structural steel framing members.
   2. Base plates.
   3. Anchor bolts, fasteners, and welded connections.

B. Products Furnished But Not Installed Under This Section:
   1. Section 03 3000 – Cast-In-Place Concrete: Anchor bolts.
   2. Section 04 2000 – Unit Masonry: Anchors for columns, beams, and lintels; loose lintels.

C. Related Sections:
   1. Section 01 4520 – Testing and Inspecting Services.
   2. Section 04 0500 – Common Work Results for Masonry: Grouting under base plates and bearing plates.
   3. Section 05 2100 – Steel Joist Framing: Joist bearing plates.
   4. Section 05 5000 – Metal Fabrications: Steel fabrications affecting structural steel work.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Prepare in accordance with AISC Manual of Structural Steel Detailing.

   1. Indicate profiles, sizes, spacing, yield strength of steel, primer, locations of structural members, openings, attachments, and fasteners. Clearly indicate Architect's designation for each member.
      a. Bolted Connections: Indicate diameters of bolt holes; types, sizes, and strengths of bolts.
      b. Welded Connections: Indicate shop and field welded connections with AWS A2.0 welding symbols. Indicate net weld lengths and arc-welding electrode designation.
      c. Indicate cambers and loads.

   2. Erection Diagrams: Include elevations and cross sections which will locate all members by piece mark and provide essential dimensions and necessary erection information.

   3. Detail Sheets: 11x17 inch sheet size. Indicate dimensions and fabrication information for maximum two members per sheet.

1.03 QUALITY ASSURANCE:

A. Perform Work in accordance with AISC 303 and AISC 360.

B. Fabricator Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

C. Erector Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

D. Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

E. Design connections not detailed on the Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.
   1. Account for eccentricity in all connection designs.

1.04 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Coordinate delivery schedule of built-in items, such as anchors and lintels, with installer.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Structural Steel Members:
   1. W Shapes: ASTM A992.
   2. Structural Tubing: ASTM A500, Grade B.
   3. Pipe: ASTM A53, Grade B.
   4. Other Shapes, Channels, Angles, Bars and Plates: ASTM A36 or ASTM A572, Grade 50.
   5. Include beam bearing plates, column base and top plates, lintel plates, and other components indicated.

B. Bolts, Nuts, and Washers: High strength, ASTM F3125 Grade A325 or Grade A490, marked with radial lines to indicate strength. ASTM A307 bolts may be used only for temporary field connections or bracing.

C. Anchor Bolts: ASTM F1554, Grade 36.

D. Welding Materials: AWS D1.1; type required for materials being welded.
   1. Welding Electrodes: E70XX.

E. Shop and Touch-Up Primer: SSPC 25, Type I.

F. Touch-Up Primer for Galvanized Surfaces: SSPC 20.

G. Bituminous Coating: Cold applied asphalt mastic.

H. All materials shall be new and free from rust.

2.02 FABRICATION:

A. Shop fabricate all items to maximum practical extent, complete and ready for installation.

B. Where shop welding is indicated, continuously seal joined members by continuous welds or by intermittent welds and plastic filler. Grind exposed welds smooth.

C. Fabricate connections for bolt, nut, and washer connectors.

D. Develop required camber for members.

E. Drill or punch all holes required for the attachment of work of other trades.

2.03 FINISH:

A. Prepare structural component surfaces in accordance with SSPC procedures.

B. Shop prime structural steel members.
   1. Do not prime surfaces that will be embedded in concrete or grout, or connections that will be field welded or high strength bolted.

C. Where indicated, galvanize structural steel members to ASTM A123, Grade 65, 1.50 oz/sq ft.
   1. Steel members used as lintels in exterior walls shall be galvanized.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions prior to beginning fabrication or erection.

3.02 ERECTION:

A. Allow for all loading conditions during erection, including dead, live, wind, and snow loads and temporary construction loads. Provide sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.

B. Align structure within allowable erection tolerances prior to making final connections.

C. Field weld components indicated on shop drawings.

D. Field connect members with threaded fasteners; tighten to required resistance using the Research Council on Structural Connections (RCSC) turn-of-nut tightening method except where otherwise indicated or approved. Verify that contact surfaces are free of oil, grease, rust, mill scale, and other harmful substances.

E. Do not field cut or alter structural members without approval of Architect.

F. Connect structural members to masonry and concrete using embedded anchors. Expansion bolts are permitted only in existing masonry walls where embedded anchors cannot be readily installed.

G. Where members scheduled to be painted will be inaccessible after erection, field paint in accordance with Section 09 9000 prior to erection.

H. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete or grout.

I. Apply bituminous coating to unprimed surfaces embedded in concrete or grout, minimum 15 mil dry film thickness.

J. Grout under base plates and bearing plates in accordance with Section 04 0500. Trowel grouted surfaces smooth, splay neatly to 45 degrees.

3.03 ERECTION TOLERANCES:

A. Maximum Variation from Plumb: ¼ inch per story, non-cumulative.

B. Maximum Offset from True Alignment: ¼ inch.

3.04 FIELD QUALITY CONTROL:

A. Testing firm will perform high strength bolt inspection in accordance with Section 01 4520.

END OF SECTION

SECTION 05 2100 – STEEL JOIST FRAMING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Open web steel joists, with bridging, attached seats and anchors.
   2. Loose bearing plates and anchors for site placement.

B. Products Furnished But Not Installed Under This Section:
   1. Section 04 2000 – Unit Masonry: Bearing plates and anchors.

C. Related Sections:
   1. Section 04 0500 – Common Work Results for Masonry: Grouting base plates and bearing plates.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Submit the number of sets required for plan approval, with original design professional signature and embossed seal.
   1. Indicate joist manufacturer, grades of steel, standard designations, configuration, sizes, length of each joist, spacing, locations of joists, joist leg extensions.
   2. Indicate panel point spacing, size of all members, primer, and shop welding details.
   3. Indicate joist erection coding, bridging, connections, and attachments.
   4. Indicate cambers.

1.03 QUALITY ASSURANCE:

A. Perform Work in accordance with SJI Specifications and tables, including headers and other supplementary framing.

B. Erector Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING:

A. Deliver, store, protect, and handle products to site under provisions of Section 01 6000 and in accordance with SJI requirements.

B. Coordinate delivery schedule of built-in items, such as bearing plates and anchors, with installer.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Steel: In accordance with SJI Specifications.

B. Structural Steel for Bridging, Supplementary Framing, and Joist Leg Extensions: ASTM A36.

C. Bearing Plates: ASTM A36.

D. Bolts, Nuts and Washers: ASTM F3125 Grade A325; plain, uncoated finish.

E. Anchor Bolts, Nuts and Washers: ASTM F1554, Grade 36.

F. Welding Materials: AWS D1.1; type required for materials being welded.

G. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide; or manufacturer's standard shop primer with equivalent performance characteristics.

2.02 FABRICATION:

A. Open Web Joist Members: SJI Type K and KCS; parallel chord; underslung ends with top chord bearing.

B. Joist Substitutes: SJI Type K; depth to coordinate with bearing depth of adjacent open web joists.

C. Provide bottom chord extensions on column lines.

D. Fabricate to achieve end bearing of 2½ inches on steel; 4 inches on masonry; or as indicated on Drawings.

E. Develop camber in accordance with SJI Specifications for all joists. Camber is not optional.

F. Provide bridging for all joists in accordance with SJI Specifications for size, type, and spacing.
   1. Provide bridging anchors at ends of bridging lines.

G. Factory install additional web members required for concentrated loads not located at panel points, and other special loading conditions indicated on the Drawings.

2.03 FINISH:

A. Prepare joist component surfaces in accordance with SSPC procedures.

B. Shop prime joists.
   1. Do not prime surfaces that will be embedded in concrete or grout, or connections that will be field welded.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions prior to beginning fabrication or erection.

B. Verify that supports are properly installed and braced prior to beginning erection.

3.02 ERECTION:

A. Coordinate placement of anchors in masonry construction for securing bearing plates.

B. Erect and bear joists on supports.

C. Erect joists in accordance with SJI Specifications and OSHA requirements.
   1. For joists 40 feet and longer, install one row of bolted diagonal bridging near mid-span before slackening hoisting lines.
   2. Field bolt top chords to steel columns. Field bolt bottom chord extensions to steel columns after dead loads are in place.

D. Allow for erection loads. Provide sufficient temporary bracing to maintain framing safe, plumb, and in true alignment.

E. Do not apply construction or erection loads until completion of bridging installation and anchorage.

F. After joist alignment and installation of framing, field weld joist seat to bearing plates or structural framing. For joists 40 feet and longer, field bolt joist seat to bearing plates or structural framing.

G. Position and field weld joist chord extensions and wall attachments.

H. Do not permit erection of decking until completion of erection and installation of permanent bridging and bracing.

I. Do not field cut or alter structural members without approval of joist manufacturer.

J. After erection, prime welds, abrasions, and surfaces not shop primed.

3.03 ERECTION TOLERANCES:

A. Maximum Variation from Plumb: ¼ inch.

B. Maximum Offset from True Alignment: ¼ inch.

END OF SECTION

SECTION 05 3123 – STEEL ROOF DECKING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Steel roof deck and accessories.

B. Related Sections:
   1. Section 22 1400 – Drainage Piping: Roof drain assemblies.

1.02 PERFORMANCE REQUIREMENTS:

A. Design metal deck in accordance with SDI Design Manual.

B. Calculate to structural working stress design and maximum vertical deck deflection of 1/240.

C. Lateral deflection of diaphragm shall not exceed 1/500 of the story height.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate manufacturer, deck plan, lap dimensions and connections, support locations, projections, openings and reinforcement, pertinent details, and accessories. Where mechanical fasteners are proposed, include manufacturer's test data and design charts with proposed fastener spacing.

B. Product Data: Provide deck profile characteristics and dimensions, structural properties, and finishes.

1.04 QUALITY ASSURANCE:

A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

B. Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

C. Design special conditions not detailed on the Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.

1.05 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Cut plastic wrap to encourage ventilation and avoid condensation.

B. Store deck on dry wood sleepers; slope for positive drainage.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. New Millennium Building Systems, LLC.

B. United Steel Deck, Inc.

C. Vulcraft Division, Nucor Corp.

D. Wheeling Corrugating Co.

2.02 MATERIALS:

A. Sheet Steel: ASTM A1008, Grade C; chemical cleaned and phosphate treated; shop primed with one coat of oven cured primer.

B. Framing Angles: ASTM A36.

C. Welding Materials: AWS D1.1; type required for materials being welded.
   1. Welding Electrodes: E70XX.

D. Shop and Touch-Up Primer:
   1. Deck: Manufacturer's standard, medium gray color.
   2. Framing Angles: SSPC 15, Type 1, red oxide.

2.03 ACCESSORIES:

A. Flute Closures: Closed cell foam rubber; profiled to fit tight to deck.

B. Sump Pans, Sump Plates, Metal Closures: Fabricated of metal of same type and finish as deck; minimum 14 gauge thickness.
   1. Sump Pans: Minimum 29 x 33 inch with 1½ inch recess; with minimum 3 inch bearing flanges; with sump surface level in relationship to roof slope.

C. Screws: Stainless steel, self tapping.

D. Mechanical Fasteners: Powder-actuated or pneumatically-driven.

2.04 FABRICATION:

A. Metal Deck: Sheet steel, configured as follows:
   1. Span Design: Multiple; minimum three spans per sheet.
   2. Minimum Metal Thickness Excluding Finish: 20 gauge.
   3. Nominal Height: 1½ inch, fluted profile, SDI Type WR.
   4. Formed Sheet Width: 30 inch or 36 inch.
   5. Side Joints: Lapped.
   6. Flute Sides: Plain vertical face.

B. Shop cut all openings 16 square feet in area or larger.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Examine support framing and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of this work.

3.02 ERECTION:

A. Erect metal deck in accordance with SDI 30 and manufacturer's instructions.

B. Deliver deck to roof in quantities required for immediate installation. Do not store deck on roof. Do not use deck units as a working platform or storage area until units are permanently attached in position.

C. Field cut for openings less than 16 square feet in area, and all skew cuts. Provide openings for all roof deck penetrations shown on the Drawings.

D. Bear deck on steel supports with 1½ inch minimum bearing. Align and level. Position end laps over supports; lap sheets 2 inches minimum.

E. Attach deck to steel support members at ends and intermediate supports with welds, screws or mechanical fasteners, spaced in accordance with SDI Diaphragm Design Manual.
   1. Welds: Minimum ½ inch diameter puddle welds at maximum 12 inches o.c. parallel with the deck flute, and at each transverse flute. Weld in accordance with AWS D1.1 and D1.3.
   2. Screws: Minimum No. 12 size at maximum 12 inches o.c. parallel with the deck flute, and at each transverse flute.
   3. Mechanical Fasteners: Minimum 5/16 inch diameter head size, spacing in accordance with manufacturer's recommendations.
   4. At roof corners, space attachments at 6 inches oc maximum. The corner area is defined as the square roof section with sides equal to 40 percent of the building height or 10 percent of the lesser building plan dimension, whichever is less. The minimum length of the side is 10 feet.

F. Fasten side laps at 24 inches oc maximum, using welds, screws, or mechanically crimped connections.

G. Reinforce deck openings up to 36 inches in size with 3½ x 3½ x ¼ inch steel framing angles. Place framing angles perpendicular to flutes. Shop weld 6 inch length of steel angle perpendicular to each end of main framing angle. Bear end angles on top chord of steel joists and field weld continuous to top chord.
   1. Where roof openings are provided for mechanical or other equipment, verify opening size and location with equipment supplier.

H. Install sheet steel closures and angle flashings to close openings between deck and walls, columns, and openings.

I. Install single row of flute closures above walls and partitions extending to underside of deck.

J. Roof Sump Pans: Position with flange bearing on top surface of deck. Weld at each deck flute.

K. Where deck is scheduled to be exposed from occupiable space below, repair ragged cuts, bent deck, and visible damage.

L. After erection, prime welds, abrasions, and surfaces not shop primed, on both top and underside of deck.

M. Do not permit the hanging or supporting of any items from the deck, including suspended ceilings, unless specifically approved by the Architect.

N. Provide notice to roofing installer at least 48 hours prior to completion of roof deck installation.

END OF SECTION

SECTION 05 5000 – METAL FABRICATIONS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Shop fabricated steel items.

B. Related Sections:
   1. Section 03 3000 – Cast-In-Place Concrete: Placement of metal fabrications in concrete.
   2. Section 04 2000 – Unit Masonry: Attachment of metal fabrications to masonry.
   3. Section 05 1200 – Structural Steel Framing: Beam bearing plates and column base plates; anchor bolts for structural steel columns.
   4. Section 05 2100 – Steel Joist Framing: Joist bearing plates.
   5. Section 09 9000 – Painting and Coating.

1.02 PERFORMANCE REQUIREMENTS:

A. Conform to applicable building code for applicable loads.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate materials, finishes, profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   1. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Steel Sections and Plates: ASTM A36.

B. Steel Tubing: ASTM A500, Grade B.

C. Pipe: ASTM A53, Grade B, Schedule 40.

D. Steel Sheet: ASTM A653, galvanized to G90 designation.

E. Bolts, Nuts, and Washers: ASTM A307, galvanized to ASTM A153 for galvanized components.

F. Welding Materials: AWS D1.1; type required for materials being welded.
   1. Welding Electrodes: E70XX.

G. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.

H. Touch-Up Primer for Galvanized Surfaces: SSPC 20.

I. All materials shall be new and free from rust.

2.02 FABRICATION:

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured. Miter members at changes of direction, except where specifically noted otherwise.

C. Continuously seal joined members by continuous welds or by intermittent welds and plastic filler.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Exposed Mechanical Fastenings: Flush countersink screws or bolts, unobtrusively located, consistent with design of component, except where specifically noted otherwise.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

G. Drill or punch all holes required for the attachment of work of other trades.

2.03 FABRICATION TOLERANCES:

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

2.04 FINISHES:

A. Surfaces to be Primed: Prepare in accordance with SSPC procedures.
   1. Do not prime surfaces that will be embedded in concrete or grout, or connections that will be field welded.
   2. Prime paint items with one coat.

B. Surfaces to be Galvanized: Apply galvanized coating after fabrication to ASTM A123, minimum 1.25 oz/sq ft.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION:

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply items required to be cast into concrete or embedded in masonry with setting templates. Coordinate work with installer.

3.03 INSTALLATION:

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components indicated on shop drawings. Perform field welding in accordance with AWS D1.1.

D. Obtain approval prior to site cutting or making adjustments not scheduled.

E. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.04 SCHEDULE:

A. The following Schedule is a list of principal items only. Refer to Drawing details for items not specifically scheduled.

B. Loose Lintels: Steel sections as indicated.

1. Exterior Walls: Galvanized finish.

2. Interior Walls: Prime paint finish.

C. Supplemental Support Framing: Light gauge galvanized steel channel framing systems.

1. Manufacturers: In accordance with Section 01 6000.
   a. Tyco Electrical & Metal Products; Unistrut.
   b. Cooper B-Line, Inc.; 4Dimension.
   c. Thomas & Betts; Superstrut.

D. Roof Opening Frames: As detailed; steel angles; prime paint finish.

E. Steel Guard Posts: As detailed; steel pipe, 8 foot minimum length; concrete filled, crowned cap; prime paint finish.

F. Bonding Angles: As detailed; steel angle sections; prime paint finish.

END OF SECTION

SECTION 06 0573 – WOOD TREATMENT

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Preservative treatment of wood.

B. Related Sections:
   1. Section 06 1050 – Miscellaneous Rough Carpentry.

PART 2 PRODUCTS

2.01 PRESERVATIVE TREATMENT:

A. Wood Preservative (Pressure Treatment): AWPA P5 and AWPA T1; water borne preservative with 0.25 percent retainage. Kiln dry after treatment to specified moisture content, maximum 19 percent.

B. Wood Preservative (Surface Application for Site Treatment and Touch-up): Clear type, compatible with pressure treatment preservative.

PART 3 EXECUTION

3.01 SITE APPLIED WOOD TREATMENT:

A. Apply preservative treatment in accordance with manufacturer's instructions and AWPA M4.

B. Brush apply two coats of preservative treatment on wood in contact with cementitious materials, roofing, and metal flashings.

C. Treat site-sawn cuts in factory treated wood.

D. Allow preservative to dry prior to erecting members.

3.02 SCHEDULES:

A. Preservative Treated Wood Locations: Framing and blocking above grade in contact with cementitious materials, roofing, and metal flashings.
   1. Exterior, Roof, and Parapet Locations: AWPA Use Category UC3B.
   2. Applications Not Otherwise Scheduled: AWPA U1 Table 3-1.

END OF SECTION

SECTION 06 1050 – MISCELLANEOUS ROUGH CARPENTRY

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Miscellaneous framing and sheathing.
   2. Roof curbs and perimeter nailers.
   3. Blocking in wall and roof openings.
   4. Concealed wood blocking for support of door stops, visual display boards, toilet and bath accessories, lockers, mechanical and electrical items, and other accessories.

B. Related Sections:
   1. Section 01 5000 – Temporary Facilities and Controls: Temporary enclosures and barriers.
   2. Section 06 0573 – Wood Treatment.

1.02 QUALITY ASSURANCE:

A. Perform Work in accordance with the following agencies:
   1. Lumber Grading Agency: Certified by ALSC.
   2. Plywood Grading Agency: Certified by APA.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Lumber Grading Rules: AFPA, SPIB, and NLGA.

B. Miscellaneous Framing and Blocking: Southern Pine or Spruce-Pine-Fir, Utility or better grade, 2 to 4 inches thick, 19 percent maximum moisture content.
   1. At Contractor's option, a flexible wood backing plate system fabricated from ¾ inch fire-retardant treated plywood may be used for blocking.
   2. In metal stud frame construction, metal backing in accordance with Section 09 2210 may be used for blocking.

C. Wood Panel Materials: DOC PS 1 or DOC PS 2.
   1. Miscellaneous Sheathing (Exterior): APA Rated Sheathing, preservative treated, Span Rating 48/24, Exposure Durability 1; sanded faces; thickness as indicated, 48 x 96 inch sized sheets, square edges.
   2. Miscellaneous Sheathing (Interior): APA Rated Sheathing, Span Rating 48/24, Exposure Durability 1; sanded faces; thickness as indicated, 48 x 96 inch sized sheets, square edges.

D. Exterior Fencing: Western Red Cedar, Clear A grade, nominal dimensions as indicated; kiln dried to 15 percent maximum moisture content.

2.02 ACCESSORIES:

A. Fasteners and Anchors:

1. Fasteners: Hot dipped galvanized steel for high humidity and treated wood locations, and all exterior locations; unfinished steel elsewhere.

2. Anchors:
   a. Toggle bolt type for anchorage to hollow masonry.
   b. Expansion shield and lag bolt type for anchorage to solid masonry or concrete.
   c. Bolt or ballistic fastener for anchorage to steel.

B. Adhesive: Waterproof, solvent base, air cure type, cartridge dispensed.

PART 3 EXECUTION

3.01 FRAMING:

A. Set structural members level and plumb, in correct position. Accurately saw-cut members to seat square on bearings. Fit closely into proper location.

B. Frame, anchor, tie and brace members to develop strength and rigidity required for intended purposes. Do not stress members in excess of design strength. Secure members permanently in position with proper fastenings to render parts rigid.

C. Place horizontal members with crown side up.

D. Space framing 16 inches o.c., except where indicated otherwise.

E. Construct load bearing members full length without splices.

F. Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members.

G. Coordinate curb installation with installation of roof deck and support of roof openings, roofing installation, and related construction.

H. Coordinate installation of blocking with requirements of items to be anchored thereto or supported thereby.

I. Secure sheathing with longer edge perpendicular to framing members and with ends staggered and sheet ends over bearing.

J. Attach sheathing with adhesive and drywall screws.

3.02 TOLERANCES:

A. Framing Members: ¼ inch from true position, maximum.

B. Surface Flatness of Horizontal Sheathing: ¼ inch in 10 feet maximum, and ½ inch in 30 feet maximum.

END OF SECTION

SECTION 07 2100 – THERMAL INSULATION

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Foundation and slab insulation.
   2. Cavity wall insulation.
   3. Insulating foam sealants and sealing tapes.

B. Related Sections:
   1. Section 03 3000 – Cast-in-Place Concrete.
   2. Section 04 2000 – Unit Masonry.
   3. Section 07 2216 – Roof Insulation.
   4. Section 08 4113 – Aluminum Entrances and Storefronts.
   5. Section 09 8100 – Acoustic Insulation.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Submit product data for each type of product, indicating compliance with specified performance characteristics and physical properties.

1.03 QUALITY ASSURANCE:

A. Regulatory Requirements:
   1. Fire Performance Characteristics: Provide insulation materials whose fire performance characteristics have been determined in accordance with the test methods indicated below, by testing organizations acceptable to regulatory agencies having jurisdiction.
      a. Surface Burning Characteristics: ASTM E84.
      b. Fire Resistance Ratings: ASTM E119.
      c. Combustion Characteristics: ASTM E136.
   2. CFC Compliance: Provide insulation materials which are not produced with, and do not contain, CFC compounds regulated by the U.S. Environmental Protection Agency.

1.04 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Deliver materials in manufacturer's original, unopened, undamaged packaging with identification labels intact. Store materials protected from exposure to harmful conditions.

B. Handle boards carefully so corners are not broken off or boards otherwise damaged.

C. Shield boards from exposure to direct sunlight with opaque light-colored tarp.

PART 2 PRODUCTS

2.01 BOARD INSULATION:

A. Foundation Perimeter Insulation: ASTM C578, Type IV, rigid extruded polystyrene board.

1. Manufacturers: In accordance with Section 01 6000.
   a. Dow Chemical Company; Styrofoam SE.
   b. Kingspan Insulation LLC; GreenGuard CM.
   c. Owens-Corning Fiberglas Corporation; Foamular 250.
2. Board Size: 3 inches thick; 24 x 96 inch sheets; square edges.
3. R Value: ASTM C518, minimum 5.0 per inch at 75 degree F mean temperature.

B. Cavity Wall Insulation: ASTM C578, Type IV, rigid extruded polystyrene board.

1. Manufacturers: In accordance with Section 01 6000.
   a. Dow Chemical Company; Styrofoam Cavitymate Plus.
   b. Kingspan Insulation LLC; GreenGuard Scoreboard.
   c. Owens-Corning Fiberglas Corporation; Foamular 250.
2. Board Size: 3 inches thick; square edges; 16 x 96 inch sheets, or 48 x 96 inch sheets scored at 16 and 24 inches o.c.
3. R Value: ASTM C518, minimum 5.0 per inch at 75 degree F mean temperature.
4. Joint Tape: Provided by or approved by insulation board manufacturer.

2.02 INSULATING FOAM SEALANTS AND SEALING TAPES:

A. Insulating Foam Sealants: ASTM C1029, Type II; ASTM C1620; AAMA 812; single component, minimal expanding, low pressure build, semi-rigid closed cell polyurethane foam.

1. Manufacturers: In accordance with Section 01 6000.
   a. Dow Chemical Company; Great Stuff Pro.
   b. Hilti Corp.; CF-812.
   c. Tremco, Inc.; TremGlaze LEF.
2. Density: ASTM D1622; minimum 1.5 pcf.

B. Sealing Tapes: AAMA 711; flexible, self-sealing, self-healing, fully adhering membrane flashing with butyl or rubberized asphalt adhesive; minimum 0.025 inch thick; minimum 4 inch width or as required for application.

1. Manufacturers: In accordance with Section 01 6000.
   a. Dow Chemical Company; Weathermate.
   b. GCP Applied Technologies; Perm-A-Barrier.
   c. Henry Co.; Blueskin SA.
   d. Protecto Wrap Co.; BT25XL.

e. W. R. Meadows, Inc.; Air-Shield.

2. Water Vapor Permeance: ASTM E96; maximum 0.02 perm.

3. Accessories: Provide surface conditioner and primer approved by manufacturer.

2.03 ACCESSORIES:

A. Adhesive: Type recommended by insulation manufacturer.

B. Mechanical Fasteners: Type recommended by insulation manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Site Verification of Conditions: Verify substrate conditions are acceptable for product installation in accordance with manufacturer's instructions.

B. Verify substrate and adjacent materials are flat and free of irregularities and foreign materials that may impede adhesive bond, and within manufacturer's recommended temperature range.

C. Verify floor slab grade is well tamped, drained and covered with specified vapor retarder.

3.02 INSTALLATION:

A. General:
   1. Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions, and product carton instructions.
   2. Install building insulation to comply with thermal and acoustical requirements.
   3. Fit insulation to areas and conditions required, to form a complete thermal barrier around indicated areas without voids.
   4. Coordinate insulation installation over or within three inches of lighting fixtures, fans, or other heat-generating electrical devices with manufacturer's recommendations and regulations of authorities having jurisdiction.

B. Foundation Perimeter Insulation: Place insulation boards from a point establishing the top of the proposed floor as indicated on the Drawings. Taper top of insulation at a minimum 60 degree angle. Place boards horizontally below floor slab.
   1. Butt edges and ends tight to adjacent board and to protrusions. Stagger end joints.
   2. Cut insulation to fit snugly around pilasters, projections, curves, and irregularities. Fill voids with insulation.

C. Cavity Wall Rigid Insulation: Apply insulation boards horizontally to outside face of masonry backup units.
   1. Apply vertical strips of adhesive spaced approximately 12 inches o.c. on inside of insulation board.

2. Apply insulating foam sealant to edges of insulation board to provide continuous air barrier.
3. Fit insulation between wall ties and other obstructions with joints staggered and edges butted tightly.
   a. Press units firmly against wythe of masonry or other construction.
   b. Wedge insulation from outside masonry wythe with small fragments of masonry materials spaced 24 inches o.c. both ways; maintain continuous air space.
4. Tape joints and seams with manufacturer's recommended joint tape.

D. Insulating Foam Sealants: Apply in accordance with manufacturer's recommendations to voids between door and window frames and adjacent construction, perimeter of roof penetrations (except flues), and similar cavities in thermal assemblies.
   1. Clean surfaces prior to application; remove oil and chemical substances that may prevent adhesion.
   2. Protect adjacent surfaces subject to damage from overspray or accidental contact.
   3. After initial curing, trim and remove excess material. Apply joint sealant or other protective material promptly to limit ultraviolet exposure.

E. Sealing Tapes: Apply in accordance with manufacturer's recommendations and ASTM E2112 to perimeter of door and window frames; seal to adjacent construction. Extend onto face of wall minimum 3 inches or as required by manufacturer's recommendations.
   1. Test surface for adhesion; apply surface conditioner and primer where necessary.
   2. Remove and discard release paper from self-adhesive tape. Position each piece carefully and press firmly into place with hand roller, giving special attention to edges, seams, and penetrations. Fully adhere tape to substrate to prevent water from migrating under tape.

3.03 PROTECTION:

A. Protect installed products from harmful weather exposure and physical abuse, where possible by non-delayed installation of concealing work or, where that is not possible, by temporary covering or enclosure. Installer shall advise Contractor of exposure hazards, including possible sources of deterioration and fire hazard.

END OF SECTION

SECTION 07 2216 – ROOF INSULATION

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Roof insulation.
   2. Vapor retarders for roof assemblies.

B. Related Sections:
   1. Section 01 2200 – Unit Prices.
   2. Section 01 2300 – Alternates.
   3. Section 05 3123 – Steel Roof Decking.
   4. Section 06 1050 – Miscellaneous Rough Carpentry: Wood nailers, curbs, and blocking.
   5. Section 07 5000 – Membrane Roofing.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate tapered insulation layout plan.

B. Product Data: Submit for each type of product, indicating conformance with specified performance characteristics and physical properties.

1.03 ENVIRONMENTAL REQUIREMENTS:

A. Do not apply roofing system components during inclement weather, or to damp or frozen surfaces.

B. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

1.04 WARRANTY: In accordance with Section 01 7700.

A. Coordinate with Section 07 5000 to ensure that insulation is included in the roof membrane manufacturer warranty.

PART 2 PRODUCTS

2.01 ROOF INSULATION BOARD:

A. Manufacturers: In accordance with Section 01 6000.
   1. Manufacturer of membrane roofing in accordance with Section 07 5000.
   2. Atlas Energy Products; ACFoam-III.
   3. Firestone Building Products Co.; Resista.
   4. Hunter Panels; H-Shield CG.
   5. Johns Manville Roofing Systems; ENRGY 3 CGF.

B. General Requirements: Selected from listed manufacturers and products, and meeting all of the following criteria:
   1. Approved by roof system manufacturer for the specified warranty coverage.
   2. UL and FM approved in combination with membrane material.
   3. Approved by applicable building code agency.
   4. Insulation board not listed as approved for use in Class A roofing assemblies without use of separate thermal barrier, shall be installed over substrate board in accordance with Section 07 2600.
   5. All roof insulation shall be of the same type and manufacturer.

C. Polyisocyanurate Insulation: ASTM C1289, Type II; rigid board, both faces surfaced with inorganic polymer coated glass fiber mat facer; produced with non-HCFC blowing agent.
   1. Board Configuration: 48 x 96 inches or 24 x 96 inches; square edges. For adhesive application, maximum board dimension shall be 48 inches.
   2. Board Thickness: As indicated.
   3. LTTR Value: ASTM C1289, 15 year time weighted average; minimum 5.6 per inch.
   4. Density: ASTM D1622, nominal 2.0 lb/cu ft.
   5. Compressive Strength: ASTM D1621, minimum 20 psi.
   6. Tapered Insulation: Custom fabricated to slope indicated on Drawings. Apply in multiple layers when recommended by manufacturer.
      a. Minimum Thickness: ¾ inch at lowest point. Maintain specified minimum R and LTTR values except at roof drains.

2.02 VAPOR RETARDERS:

A. Reinforced Vapor Retarder for Roof Assemblies: Non-woven nylon, fiberglass, or polyester scrim laminated between two layers of polyethylene, polyester, or polypropylene; minimum 6 mil nominal thickness; fire rated type where required by roof assembly classification; largest practical widths to minimize seams. Materials shall be approved by the roofing manufacturer.

   1. Manufacturers: In accordance with Section 01 6000.
      a. Reef Industries, Inc.; Griffolyn Type 65.
      b. Lamtec Corp.; WMP-VR-R Plus.
      c. Raven Industries, Inc.; Dura-Skrim.
      d. Manufacturer of roofing system.

   2. Water Vapor Permeance: ASTM E96; maximum 0.05 perm.

   3. Accessories: Factory fabricated pipe boots.

B. Vapor Retarder Tape: Pressure sensitive self-adhesive type for sealing joints and penetrations; approved by vapor retarder manufacturer.

2.03 ACCESSORIES:

A. Insulation Fasteners: Hot dipped galvanized steel; appropriate for purpose intended; approved by Factory Mutual and system manufacturer in combination with roof deck and insulation type; with smooth edge plates or anchor bars designed to prevent fastener backout.
   1. Length: As required for thickness of material, including substrate board where used, and ¾ inch deck penetration.
   2. Where deck is scheduled to be exposed from occupiable space below, fastener length must be less than the sum of the nominal deck height and the thickness of materials above deck.

B. Insulation Adhesive: Two component low-rise adhesive for spray application, as approved by roofing manufacturer and insulation manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify surfaces are dry and free of snow and ice.

B. Verify deck is supported and secure, clean and smooth, free of depressions, waves, or projections, properly sloped as indicated on Drawings.

3.02 PREPARATION:

A. Clean substrate of dust, debris, and other foreign substances.

3.03 INSTALLATION:

A. Place insulation in accordance with insulation manufacturer's instructions and roofing manufacturer's recommendations.

B. High School Building Additions:
   1. Loose lay vapor retarder in a single layer over entire roof area extending to roof edges and perimeter walls and parapets. Extend vapor retarder to extremities of areas to be protected from vapor transmission. Firmly attach vapor retarder to substrates with adhesives as recommended by vapor retarder manufacturer. Locate joints over solid substrates.
      a. Provide minimum 2 inch side laps and 6 inch end laps. Seal overlapping joints, perimeter joints, openings and fastener penetrations with continuous strip of vapor retarder tape to form a continuous vapor retarder assembly. Seal joints airtight at penetrations.
      b. Repair tears and punctures in vapor retarders immediately before concealment by other work. Cover with vapor retarder tape or another layer of vapor retarder.
      c. Install boots at pipe penetrations; seal in accordance with manufacturer's instructions.

2. Place insulation board in minimum two layers with joints offset minimum 12 inches from joints of adjacent layers. Mechanically fasten or adhere each layer to substrate at Contractor's option in accordance with insulation manufacturer's instructions and roof system warranty requirements.
    a. Mechanical Application: Fastener density in accordance with Factory Mutual requirements; increase fastener density at corners and perimeters.
    b. Adhered Application: For each layer, spray uniform coat of adhesive to substrate at manufacturer's recommended rate. Set insulation board into adhesive using uniform pressure.

C. Elementary School Reroofing Alternate: Place insulation board in single layer with joints offset minimum 12 inches from joints of existing layer. Mechanically fasten to existing roof deck in accordance with insulation manufacturer's instructions and roof system warranty requirements.

1. Mechanical Application: Fastener density in accordance with Factory Mutual requirements; increase fastener density at corners and perimeters.

D. Tapered Insulation: Place to the required slope pattern in accordance with shop drawing layout and manufacturer's instructions.

1. Where multiple layers are required, place layers with joints offset minimum 12 inches from joints of adjacent layers.

2. Lay tapered boards for a minimum distance of 24 inches back from roof drains for positive drainage.

E. Place boards perpendicular to deck flutes with edges over flute surface for bearing support.

F. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof. Do not allow gaps between adjacent boards, or between boards and adjacent components.

G. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the day.

H. Inspect completed insulation work for damage, including moisture, cupping, warping, and physical harm. Replace damaged materials.

END OF SECTION

SECTION 07 5000 – MEMBRANE ROOFING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Fully adhered single ply roof system.
   2. Preparation for reroofing.

B. Related Sections:
   1. Section 01 2200 – Unit Prices.
   2. Section 01 2300 – Alternates.
   3. Section 06 1050 – Miscellaneous Rough Carpentry: Wood nailers, curbs, and blocking.
   4. Section 07 2100 – Thermal Insulation.
   5. Section 07 2216 – Roof Insulation.
   6. Section 07 7100 – Roof Specialties.
   7. Section 22 1400 – Drainage Piping: Roof drains.
   8. Division 23 – HVAC: Prefabricated curbs for mechanical equipment.

1.02 DESIGN REQUIREMENTS:

A. Conform to applicable building code for roof assembly fire hazard requirements.

B. ASTM E108/UL 790: Class A Fire Hazard Classification.

C. FM 4470: Roof Assembly Classification, of Class 1 construction, wind uplift requirement of 1-60, in accordance with FM Construction Bulletin 1-28.

D. Ground Roughness Factor: C.

1.03 PERFORMANCE REQUIREMENTS:

A. System Integrity: Roof assembly, including flashings and accessories, shall not permit the passage of liquid water, and shall withstand wind loads, thermally induced movement, and exposure to weather and ultraviolet radiation without failure.

B. Material Compatibility: Provide roofing materials that are compatible with one another and with adjacent materials under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.

1.04 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate layout of membrane sheets, location and type of field splices; termination, penetration and attachment details showing specific wall and deck

construction, entire roof assembly and additional blocking as required; conditions of interface with other materials; walkway layout pattern.

1. Standard catalog cuts, if used, shall be supplemented by additional detail drawings approved by membrane manufacturer as necessary to show project specific conditions. Submit proof of manufacturer approval to Architect.
2. Field changes to approved shop drawings will not be considered unless accompanied by written approval from membrane manufacturer.

B. Product Data:
   1. Provide characteristics on membrane materials, flashing materials, walkways, and accessories.
   2. Indicate installation requirements for membrane, including procedures and materials for flashing, splicing and bonding.
   3. The membrane manufacturer shall provide the Installer and Architect with a comprehensive listing of chemicals, solutions, oils, compounds, or materials which may be injurious to the sheet membrane, including those materials normally found to exist in the roof environment or likely to occur on this roof.

C. Installer Certificates: Submit evidence of approval, authorization, or license from membrane manufacturer to install specified system, including documentation of specified training. Provide list of completed projects with project names and addresses, and architect and owner contact information.

D. Manufacturer's Approval: Submit membrane manufacturer's approval of all components of the roof assembly, including insulation and roof edge securement; project review and acceptance for warranty, including approval of installer.

E. Warranty Form: At time of shop drawing submittal, submit preliminary copy of manufacturer's warranty.

F. Manufacturer's Field Reports: Submit under provisions of Section 01 4000. Indicate procedures followed, ambient temperatures, humidity, wind velocity during applications, and items requiring corrective action.

1.05 QUALITY ASSURANCE:

A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.

B. Provide proper attachment of roofing to accessory or related work in contact with, or which becomes an integral part of the roofing or flashing system, including when such accessory or related work is provided under other Sections.

C. Membrane Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.

D. Installer Qualifications: Company specializing in performing the work of this Section with minimum five years documented experience; approved by membrane manufacturer.

1. Provide adequate number of qualified roofers who are experienced and thoroughly trained in the techniques required to properly install the specified roofing system and related work.

2. Installer's Project Superintendent shall have experience installing the specified roofing system with minimum 5 years experience on projects of similar size and scope, shall be familiar with the requirements of this project, and shall provide on-site supervision at all times when roofing system work is in progress. Training shall include completion of membrane manufacturer's in-house training course and on-site training.

E. Preinstallation Meeting: In accordance with Section 01 3100.

1. Schedule after approval of submittals and prior to completion of roof deck installation.

2. Attendance: Installer; Owner; Architect; Owner's insurer, if applicable; membrane manufacturer's representative; installers of roof deck, vapor retarder, insulation, roof specialties, roof-mounted equipment, and other work interfacing with or affecting roofing.

3. Agenda:
   a. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
   b. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
   c. Review loading limitations of deck during and after roofing.
   d. Review flashings, special roofing details, roofing drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
   e. Review governing regulations and requirements for insurance, certificates, and inspection and testing, if applicable.
   f. Review temporary protection requirements for roofing system during and after installation.
   g. Review roof observation and repair procedures after roofing installation.

1.06 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Store materials, except membrane, between 60 degrees F and 80 degrees F. If exposed to lower temperature, restore to minimum 60 degrees F before using.

B. Store materials, except membrane, in dry area and protect from water and direct sunlight.

1.07 ENVIRONMENTAL REQUIREMENTS:

A. Do not apply roofing system during inclement weather, or to damp or frozen surfaces.

B. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

1.08 COORDINATION: In accordance with Section 01 3100.

A. Coordinate the work of this section with that of other sections to assure the timely integration of the work into the building construction.

B. Coordinate the work with installation of associated metal flashings as the work of this section proceeds.

C. Observe masonry construction and installation of flashings at interface with roofing systems.

D. Schedule the work to prevent using newly constructed roofing for storage, walking surface, or material or equipment movement.

1.09 WARRANTY: In accordance with Section 01 7700.

A. Correct defective Work within a two year period after Date of Substantial Completion for damage resulting from failure to prevent penetration of water.

1. Obligations of the Surety under the Contract Bond do not extend beyond the two year correction period.

B. Warranty Coverage Requirements:

1. Elementary School Base Bid and High School Building Additions: 20 year warranty; 72 mph wind speed coverage.

2. Elementary School Alternate: 30 year warranty; 100 mph wind speed coverage; coverage for 2 inch hail and incidental punctures.

3. Provide manufacturer "total system" warranty without dollar amount limitation for roofing assembly including insulation, flashing, roof edge securement, and accessories, covering leaks, failures, and wind damage.

a. Coordinate with Sections 07 2216 and 07 7100, and related sections, to ensure that insulation, roof edge securement, and accessories are included in warranty.

4. Wind Speed Coverage: Measured at 10 meters above ground. Reference to "gale force winds" or similar language without a specific wind speed and elevation will not be accepted.

5. Warranty claims may be excluded only for the following:

a. Abuse or misuse of roof system by the Owner.

b. Acts of God and other "natural disasters" except wind as limited above.

c. Fire (after occupancy).

6. Warranty coverage shall commence on date of inspection and approval by manufacturer's representative. After inspection and approval, warranty exclusions for improper design and installation will not be accepted.
7. Warranty provisions requiring Owner to provide notice of leaks to manufacturer shall allow a minimum time period of 30 days for such notice.
8. For warranty repair work, provide full labor and materials required to restore roof system to weathertight condition without cost to the Owner.

PART 2 PRODUCTS

2.01 MEMBRANE MATERIALS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Carlisle Syntec Incorporated; Sure-Seal EPDM; Design "A" Fully-Adhered Roofing System.
   2. Firestone Building Products Co.; Rubbergard Fully-Adhered EPDM Sheet Roofing System.
   3. Genflex Roofing Systems, LLC; GenFlex II EPDM Fully Adhered Roof System.
   4. Johns Manville Roofing Systems; Fully Adhered EPDM Single Ply Roofing System.
   5. Versico Incorporated; Versigard Fully Adhered Roofing System.

B. EPDM (Ethylene Propylene Diene Monomer) Membrane: ASTM D4637, Type II.
   1. Elementary School Base Bid and High School Building Additions: Black color; polyester reinforced membrane, 0.060 inch nominal thickness.
   2. Elementary School Alternate: Black or white color; non-reinforced membrane, 0.090 inch nominal thickness.
   3. General Requirements:
      a. Provide fire retardant membrane where required to meet specified fire hazard classification in combination with the membrane type, insulation type, roof slope, and related project conditions.
      b. Provide recovery board where recommended or required by manufacturer in combination with the membrane type, insulation type, roof slope, and related project conditions.
      c. Provide membrane in largest sheet lengths possible as determined by job conditions; minimum sheet size 10 x 100 feet.
      d. Membrane materials shall conform to the minimum physical properties published in the roofing system manufacturer's product literature where they exceed the Performance Requirements of this Section.

4. Performance Requirements:
   a. Water Vapor Permeance: ASTM E96; maximum 0.03 perms.
   b. Water Absorption: ASTM D471; maximum 5.5 percent.
   c. Linear Dimensional Change: ASTM D1204; maximum 1.0 percent.
   d. Low Temperature Brittleness: ASTM D2136 or D2137; pass at –49 degrees F.
   e. Elongation at Break: ASTM D751; minimum 350 percent.
   f. Puncture Resistance: ASTM D5602; minimum 250 lbf.
   g. Reinforced 0.060 Inch Membrane:
      (1) Thickness Over Reinforcing Scrim: ASTM D638; minimum 0.020 inch, top and bottom.
      (2) Breaking Strength: ASTM D751; minimum 180 lbf.
      (3) Tearing Strength: ASTM D624; minimum 60 lbf.
   h. Unreinforced 0.090 Inch Membrane:
      (1) Tensile Strength: ASTM D751; minimum 1350 lbf.
      (2) Tearing Strength: ASTM D624; minimum 170 lbf.

C. Seaming Materials: As recommended by membrane manufacturer.

D. Flexible Flashings: Same material as membrane; minimum 0.060 inch thick.

E. Stack Boots: Flexible boot and collar with clamps for pipe stacks through membrane.

2.02 ACCESSORIES:

A. Provide bonding adhesive, splicing cement, cleaner, primer, lap sealant, water cut-off mastic, prefabricated pipe seals, overnight seal, pourable sealer, anchor bars and other related items as recommended and furnished by the membrane manufacturer for conditions of construction and as required for warranty and performance requirements.
   1. Adhesive and seam tape may be factory applied or field applied.

B. Expansion Joint Cover: Non-reinforced foam supported elastomeric bellows with bifurcated waterproof attachment to metal flanges; with splicing materials and prefabricated intersections.

C. Rubber Walkways: 24 x 24 x 1½ inch thick with 1 inch radius corners; with protection membrane.

D. Cap Sheet: Epichlorohydrin or neoprene membrane.

E. Temporary Protection: Polyethylene sheet, fiber reinforced plastic sheet, or other materials with equivalent weather resistance; provide weights to retain sheeting in position.

F. Provide additional accessories, such as preservative treated wood blocking, where required by manufacturer's standards, even when not otherwise indicated or specified.

PART 3 EXECUTION

3.01 PREPARATION FOR REROOFING (ELEMENTARY SCHOOL):

A. Remove existing flashings and roofing membrane.
   1. Perform removal work under provisions of Section 02 4119.
   2. Remove metal counter flashings not scheduled to remain. Fold up metal counter flashings scheduled to remain, to permit access to top edge of base flashings.
   3. Remove roofing membrane, perimeter base flashings, and flashings around roof protrusions.
   4. Inspect existinginsulation and fasteners for damage. Remove and replace damaged insulation in accordance with Section 01 2200 and Section 07 2216.
   5. Remove damaged portions of existing construction exposed by removal work.

B. Do not remove existing roofing materials when weather conditions threaten the integrity of the building contents or intended continued occupancy.
   1. Remove only existing roofing materials that can be replaced with new materials as weather permits.
   2. Maintain continuous temporary protection prior to and during installation of new roofing system to keep building weather tight. Turn protective covers up over parapets and curbing. Retain in position with weights. Provide for surface drainage to existing drainage facilities.
   3. Schedule removal work to coincide with commencement of installation of new roofing system.

C. Remove and reinstall roof mounted mechanical and electrical equipment where required for performance of indicated roofing work. Disconnect and reconnect wiring, ducts, piping, and other connections to equipment, as necessary. Contractor shall employ skilled and experienced mechanical and electrical Subcontractors approved by the Architect and Owner to perform this work.

D. Where installation of additional insulation layer reduces clearances above roof to less than minimum dimensions indicated, provide extensions or blocking, remove and reset curbs, or provide new curbs, as required to maintain minimum dimensions.

E. Coordinate the work with other affected mechanical and electrical work associated with roof penetrations.

F. Roofing installer shall bear full responsibility for water intrusion during performance of the reroofing work, including damage to existing equipment, finishes, and building contents. Coordinate and pay for repairs as necessary.

3.02 EXAMINATION:

A. Verify that surfaces and site conditions are ready to receive work and that no conditions exist which may adversely affect installation, permanence, or quality of work.

B. Verify that blocking, curbs, and nailers are installed at required locations and securely anchored.

C. Verify substrate is clean and smooth, free of depressions, waves, or projections, properly sloped as indicated on Drawings.

D. Verify surfaces are dry and free of snow and ice.

E. Perform fastener pullout tests to determine required fastener spacings.

F. Verify roof openings, curbs, pipes, sleeves, and vents through roof are solidly set, and required accessories are in place.

G. Apply insulating foam sealant to perimeter voids at roof penetrations (except flues) in accordance with Section 07 2100 to maintain continuity of thermal barrier.

H. Verify that no substances listed in the contamination profile exist on the roofing area which cannot be positively isolated from the membrane.

I. Verify that manufacturer's approval of all roof components has been obtained prior to beginning work.

3.03 PREPARATION:

A. Do not place materials on the roof in a manner which would cause induced loads to exceed the roof deck design load at any point.

B. Clean substrate of dust, debris, and other foreign substances. Remove sharp projections.

C. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof drain plugs when no roof work is taking place or when rain is forecast.

3.04 MEMBRANE APPLICATION:

A. Install membrane in accordance with manufacturer's recommended procedures, specifications, approved shop drawings, and observing manufacturer's cautions and as required to meet or exceed specified wind rating.

B. Isolate all materials and substances which may have a detrimental effect on the membrane.

C. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

D. Shingle joints on sloped substrate in direction of drainage.

E. Moderate Slope Areas (1:12 and Steeper) and Vertical Surfaces: Give special attention to the alignment of seams; maintain horizontal seams level, parallel with eaves, and aligned with building lines.

F. Accurately align sheets and maintain uniform side and end laps of dimensions required by manufacturer, minimum 3 inches. Stagger end laps. Seal permanently waterproof

using methods approved by manufacturer. Manually verify entire length of each seam for voids and deficiencies; correct as recommended by manufacturer.

1. Adhesive: Apply splicing cement to membrane lap area; apply external lap sealant and secondary sealant in seam.
2. Tape: Apply splice tape and external lap sealant.
3. Flashing: Overlay splice with minimum 6 inch wide flashing set in splicing cement, with external lap sealant continuous at all edges.
4. Heat Welding: Use approved automatic heat welding equipment. In areas inaccessible to machine, use hand held heat gun and teflon roller.

G. Securely fasten membrane at terminations and perimeter. Provide base flashing at perimeters and edges of membrane abutting parapets, walls, curbs, or other construction. Provide prefabricated pipe seals for pipe and conduit penetrations, properly cemented to membrane and sealed to pipe or conduit with stainless steel clamp and top bead of sealant.

1. At parapets adjacent to roof, extend base flashing or membrane up parapet, over top of wall, and terminate approximately 2 inches down the opposite side.
2. At independent parapets, provide membrane flashing over top of wall and extend down both sides approximately 2 inches.
3. Counter flash cap flashing and copings with membrane lap flashing.

H. Install rubber walkways at all traffic concentration points (roof access doors, rooftop HVAC equipment, and similar locations) regardless of traffic frequency. Discontinue walkways over flashing or field seams for inspection purposes. Adhere pads to continuous protective membrane, which is fully adhered to primary roofing membrane.

1. Provide minimum 2 inch and maximum 6 inch spaces between walkway components for roof drainage.

I. Install 10 x 10 foot cap sheet adhered to primary membrane at kitchen upblast exhaust fans. Cap sheet may be omitted where membrane manufacturer submits written certification that primary membrane is resistant to exposure to grease, oil, and petroleum products.

J. Coordinate installation of roof drains, sumps, and related flashings.

K. Install accessories and related items in accordance with manufacturer's instructions.

L. Seal flashings and flanges of items penetrating membrane.

3.05 DAILY SEAL:

A. Temporarily seal any loose edge of membrane with overnight seal. Ensure that water does not flow beneath any completed sections of the membrane system.

1. Mix the two components thoroughly according to the instructions on the label.
2. Apply the overnight seal in accordance with manufacturer's recommendations. If necessary, use a trowel to spread material to achieve complete seal. When applying to existing built-up roof surfaces, adjust application rate to allow for surface penetration.

3. After embedding membrane in overnight seal, CHECK FOR CONTINUOUS CONTACT. Weight the edge, providing continuous pressure over the length of the cutoff, with 2½ inch rubber tubing filled with dry sand.
4. When work is resumed, pull sheet free before continuing installation.

3.06 FIELD QUALITY CONTROL:

A. Inspection: Manufacturer's representative shall inspect installation minimum 3 times during progress of the work or biweekly, whichever is more frequent, and certify compliance with manufacturer's installation requirements.

B. Correct identified defects or irregularities.

3.07 PROTECTION: In accordance with Section 01 7000.

A. Perform progress cleaning daily. Do not burn debris on the site. Dispose of all rubbish and scrap materials off-site in a legal manner.

B. Protect landscaping, lawn areas, walks and drives, and building surfaces.

C. Provide barricades, covered walkways and traffic direction as required to prevent personal injury.

D. Where traffic must continue over finished roof membrane, protect surfaces.

E. Coordinate and pay for repairs to existing components and the work of other sections damaged by performance of the work.

F. Correct deficiencies and perform repairs as necessary to restore roofing system to a condition free of damage and deterioration at the time of Substantial Completion.

END OF SECTION

SECTION 07 7100 – ROOF SPECIALTIES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Fascias and coping caps.
   2. Gutters.
   3. Sheet metal flashings.
   4. Curbs and equipment supports.

B. Related Sections:
   1. Section 06 1050 – Miscellaneous Rough Carpentry.
   2. Section 07 5000 – Membrane Roofing.
   3. Section 07 9200 – Joint Sealants.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.

B. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.

1.03 QUALITY ASSURANCE:

A. Perform Work in accordance with SMACNA Architectural Sheet Metal Manual and NRCA Roofing and Waterproofing Manual.

B. Roof edge securement, except gutters, for low slope membrane roofs shall be designed in accordance with SPRI ES-1, for wind speeds determined by the applicable building code.

1.04 DELIVERY, STORAGE, AND PROTECTION: In accordance with Section 01 6000.

A. Do not store materials with strippable film in areas exposed to direct sunlight.

B. Prevent contact with substances which may discolor prefinished surfaces.

1.05 WARRANTY: In accordance with Section 01 7700.

A. Provide minimum 10 year manufacturer warranty for prefinished surfaces to cover pre-finished color coat against chipping, cracking or crazing, blistering, peeling, chalking, or fading.

B. Coordinate with Section 07 5000 to ensure that roof edge securement is included in the roof membrane manufacturer warranty.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Galvanized Sheet Steel: ASTM A755, galvanized to G90 coating class.

B. Aluminum: ASTM B209.

2.02 COMPONENTS:

A. Fascias and Coping Caps: SPRI ES-1; formed aluminum, 0.063 inch thick, or galvanized sheet steel, 22 gauge; maximum 10 ft lengths; shaped to match existing.

1. Manufacturers: In accordance with Section 01 6000.
   a. Roof membrane manufacturer.
   b. Architectural Products Co.
   c. Metal-Era, Inc.
   d. OMG Roofing Products.

2. Coping Cap Anchor Plates: Galvanized sheet steel, 22 gauge, minimum 12 inch lengths; locate at 5 ft o.c. maximum.

3. Backing Plates: Material and profile to match fascia or coping cap, except without hems; minimum 6 inch lengths; locate at each joint.

4. Cleats: Galvanized sheet steel, 22 gauge, maximum 10 ft lengths, spliced at backing plates only; shaped to engage bottom hem of fascia or coping cap.

5. Fasteners: No. 8 screws with neoprene washers; hot dipped galvanized steel.

6. Accessories: Prefabricated soldered and mitered corners; end closures; attachment clips.

7. Finish: 70 percent PVDF fluoropolymer; color to match existing.

B. Sill Flashing: Formed aluminum, 0.050 inch thick, maximum 10 ft lengths, shaped as indicated.

1. Backing Plates: Formed aluminum, minimum 24 gauge, continuous lengths, shaped to match flashing; secured to flashing at 5 ft o.c. maximum.

2. Accessories: Prefabricated welded and mitered corners; end closures; attachment clips.

3. Finish: Anodized; color to match adjacent storefront systems.

C. Gutters: Formed aluminum, 0.050 inch thick; shaped as indicated; minimum 10 ft lengths except at one end of run.

1. Gutter Expansion Joints: As detailed; lap type; locate at maximum 50 ft o.c.

2. Gutter Outlets: 1/8 inch less than inside dimension of down pipe; minimum 4 inch length.

3. Brackets and Spacers: Minimum ¼ x 2 inch.

4. Accessories: Prefabricated soldered and mitered corners; end closures; hangers; wire basket strainers.
5. Finish: 70 percent PVDF fluoropolymer; color to match existing.

D. Through-Wall Flashing and Reglet: Formed aluminum, 0.050 inch thick, or galvanized sheet steel, 24 gauge; maximum 10 ft lengths; shaped as indicated.

1. Counterflashing and Hook Strips: Formed aluminum, 0.024 inch thick, or galvanized sheet steel, 24 gauge; maximum 10 ft lengths; shaped as indicated.
2. Accessories: Secure counterflashing with wedges and fill reglet with sealant in accordance with Section 07 9200.
3. Finish: 70 percent PVDF fluoropolymer; color as selected.

2.03 CURBS AND EQUIPMENT SUPPORTS:

A. Manufacturers: In accordance with Section 01 6000.

1. Pate Company.
2. Thybar Corp., Thycurb Division.
3. Kentuckiana Curb Company.

B. General Requirements: Galvanized steel, minimum 18 gauge; continuous wood nailer and removable counterflashing; continuously welded corners; internal reinforcement; fabricated for roof pitch to provide a level top surface; field verify required dimensions.

C. Equipment Curbs: Unitized construction with integral base plate; nailer sized to overhang base section by 1 inch on all sides to allow for field insulation; factory insulated with 1½ inch thick rigid insulation with internal metal liner. (Pate PC-2b series)

1. Curb Height:
   a. Outside Air Intakes: 24 inches above finished roof.
   b. Roof Mounted Kitchen Hood Fans: As required to locate fan discharge minimum 40 inches above roof.
   c. Other Curbs: 12 inches above finished roof.

D. Pipe Curb Assemblies: Unitized construction with integral base plate; factory insulated; raised cant with vertical dimension equal to roof insulation thickness; acrylic clad thermoplastic counterflashing cover with pipe collars, boots and stainless steel clamps. (Pate PCA-5 series)

2.04 ACCESSORIES:

A. Fasteners: Concealed; hot dipped galvanized steel or stainless steel; size and type as required to penetrate substrate material minimum 1¼ inch; maximum 24 inch o.c. spacing.
   1. Nails: Roofing nails with annular threads and minimum 3/16 inch diameter heads.
   2. Bolts: Round head, ¼ inch minimum diameter.
   3. Rivets: 1/8 inch minimum diameter; compatible with materials being fastened.

B. Sealant: As specified in Section 07 9200.

C. Solder: 50% block tin and 50% lead.

D. Flux: Muratic acid, diluted with equal parts of water.

E. Splash Blocks: Precast concrete.

2.05 FABRICATION:

A. Conform to SMACNA Architectural Sheet Metal Manual and NRCA Roofing and Waterproofing Manual.

B. Hem exposed edges minimum ½ inch.

C. Make all flat and lap seams in direction of flow.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify that deck, curbs, roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.

3.02 INSTALLATION:

A. Install components in accordance with manufacturer's instructions.

B. Conform to SMACNA Architectural Sheet Metal Manual and NRCA Roofing and Waterproofing Manual.

C. Install components to provide for expansion and contraction of components and adjacent materials. Provide oversized or slotted holes with gasketed fasteners where necessary to accommodate thermal movement.

D. Coordinate installation of components with installation of roof membrane and base flashings.

E. Install gutters level and properly supported, located to collect rainwater and melting snow and ice runoff; lap joints in direction of flow, riveted and sealed watertight.

F. Curbs and Equipment Supports: Secure to metal deck or wood blocking in accordance with manufacturer's recommendations, using minimum 3 fasteners per side, spaced at 12 inches o.c. maximum.

G. Coordinate installation of sealants and coatings with work of this section to ensure water tightness.

H. Touch up minor scratches and abrasions in finish work. Replace damaged components.

END OF SECTION

SECTION 07 8400 – FIRESTOPPING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Firestop systems for penetrations through fire resistance rated assemblies.

B. Related Sections:
   1. Section 01 4520 – Testing and Inspecting Services.
   2. Section 03 3000 – Cast-in-Place Concrete.
   3. Division 21 – Fire Suppression.
   4. Division 22 – Plumbing.
   5. Division 23 – Heating, Ventilating, and Air Conditioning.
   6. Division 26 – Electrical.
   7. Division 27 – Communications.
   8. Division 28 – Electronic Safety and Security.

1.02 PERFORMANCE REQUIREMENTS:

A. Provide systems in accordance with UL Fire Resistance Directory that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire resistance rating of assembly penetrated.

B. F-Rated Systems: ASTM E814 or UL 1479; F-rating equal to or exceeding fire resistance rating of construction penetrated.

C. T-Rated Systems: ASTM E814 or UL 1479; provide for systems protecting penetrating items exposed to potential contact with adjacent materials in occupiable floor areas as follows:
   1. Penetrations located outside wall cavities.
   2. Penetrations located outside fire resistive shaft enclosures.
   3. Penetrations located in construction containing fire protection rated openings.
   4. Penetrating items larger than 4 inch diameter nominal pipe size or 16 square inch overall cross-sectional area.

D. For systems exposed to view, traffic, moisture, and physical damage, provide products that after curing do not deteriorate when exposed to these conditions both during and after construction.
   1. Piping Penetrations for Plumbing and Wet-Pipe Sprinkler Systems: Moisture resistant.
   2. Penetrations Involving Insulated Piping: Provide systems not requiring removal of insulation.

3. For floor penetrations with annular spaces exceeding 4 inches in width and exposed to possible loading and traffic, provide systems capable of supporting floor loads involved either by installing floor plates or by other means.

E. For systems exposed to view, provide products with flame spread ratings of less than 25 and smoke developed ratings of less than 450, as determined per ASTM E84.

F. Compatibility: Provide systems compatible with each other, with substrates forming openings, and with penetrating items, under conditions of service and application.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Contractor shall receive and organize the firestopping submittals of all trades into a single submittal. Submit copies in addition to the number required by Section 01 3300, as required for distribution to governing authorities.

B. Shop Drawings: Where project conditions require modification of qualified testing agency's illustration to suit a particular condition, submit illustration, with modifications marked, approved by manufacturer's fire protection engineer.

C. Product Data: Documentation, including certified test reports and illustrations from qualified testing agency acceptable to authorities having jurisdiction, applicable to each system configuration for construction and penetrating items.

1.04 QUALITY ASSURANCE:

A. Installer Qualifications: Trained and approved by manufacturer; specializing in installation of work similar to that required for this project.

1.05 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Prevent deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.06 ENVIRONMENTAL REQUIREMENTS:

A. Do not install systems when ambient or substrate temperatures are outside limits recommended by manufacturer, or when substrates are wet.

B. Ventilate systems per manufacturer's instructions, by natural or mechanical means as required.

1.07 COORDINATION:

A. Coordinate construction of openings and penetrating items to ensure that systems are installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core drilled holes, or cut openings to accommodate systems.

C. Do not cover up system installations that will become concealed by subsequent construction until required inspections have been performed.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Intumescent Sealants: Single component latex formulations that after cure do not re-emulsify during exposure to moisture.

1. Manufacturers: In accordance with Section 01 6000.
   a. Johns Manville Fire Protection Systems; Firetemp CI Caulk and Firetemp SI Spray.
   b. Hilti Construction Chemicals, Inc.
   c. Nelson Firestop Products.
   d. Pecora Corporation.
   e. Specified Technologies, Inc.
   f. 3M Fire Protection Products.

B. Packing Material: Mineral wool insulation, minimum 4 pcf density.

1. Manufacturers: In accordance with Section 01 6000.
   a. Hilti Construction Chemicals, Inc.
   b. Owens-Corning Fiberglas Corporation; Paroc Safing Insulation.
   c. Rock Wool Manufacturing Co.; Delta Safing Board.
   d. Thermafiber, Inc.; Thermafiber Safing Insulation.

2.02 ACCESSORIES:

A. Provide accessories as required to install materials and to comply with performance requirements. Use only components approved by manufacturer and qualified testing agency.

B. Permanent Forming, Damming and Backing Materials:
   1. Sealants used in combination with other materials to prevent leakage of fill materials in liquid state.
   2. Fire rated form board.
   3. Fillers for sealants.

C. Other Accessories: Temporary forming materials, substrate primers, retaining angles, support plates, collars and steel sleeves.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify substrate conditions for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance.

3.02 PREPARATION:

A. Surface Cleaning: Clean out openings immediately before installation.
   1. Remove from surfaces of opening substrates, and from penetrating items, foreign materials that could interfere with adhesion.
   2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with system materials. Remove loose particles remaining from cleaning operation.
   3. Remove laitance and form release agents from concrete.

B. Priming: Prime substrates where recommended by manufacturer, using recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking: Use masking tape to prevent system materials from contacting adjoining surfaces that will remain exposed and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to removed smears from firestop system materials. Remove tape as soon as possible without disturbing seal of system to substrates.

3.03 INSTALLATION:

A. Install systems in accordance with performance requirements and manufacturer's instructions.

B. Install systems to comply with listed fire rated assemblies in accordance with ASTM and UL requirements.

C. Install forming, damming and backing materials and other accessories of types required to support fill materials during application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
   1. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

D. Install fill materials for firestop systems by proven techniques to produce the following results:
   1. Fill voids and cavities as required to achieve fire ratings indicated.
   2. Apply materials to contact and adhere to substrates formed by openings and penetrating items.
   3. Finish fill materials that will remain exposed, to produce smooth, uniform surfaces flush with adjoining finishes.

3.04 IDENTIFICATION:

A. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive vinyl labels. Attach labels permanently to both sides of penetrated construction where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:
   1. Preprinted Copy: "Warning – Through-Penetration Firestop System – Do Not Disturb. Notify Building Management if Damaged.
   2. Contractor's name, address and phone number.
   3. Testing agency's system designation.
   4. Manufacturer's name.
   5. Installer's name and date of installation.

3.05 FIELD QUALITY CONTROL:

A. Testing firm will perform field testing of tested and listed penetrations and joints in accordance with Section 01 4520.

B. Correct identified defects.

3.06 CLEANING AND PROTECTION:

A. Clean excess fill materials adjacent to openings as work progresses using methods and cleaning materials approved by manufacturer and that do not damage materials in which openings occur.

B. Protect installed products from damage during construction operations until final completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated materials and install new materials to produce systems complying with specified requirements.

3.07 SCHEDULES:

A. For each location where a fire rated assembly is penetrated, provide a UL listed through-penetration firestop system as scheduled below or as appropriate for project conditions, complying with specified requirements and suitable for penetration conditions indicated.

B. Metallic Pipe, Conduit or Tubing:
   1. Masonry Walls (Single Penetration): UL C-AJ-1226, C-AJ-1259, C-AJ-1281, or C-AJ-5091.
   2. Masonry Walls (Multiple Penetrations): UL C-AJ-1284.
   3. Concrete Floor on Metal Deck: UL F-A-1012.
   4. Stud Walls (Single Penetration): UL W-L-1149, W-L-1344, or W-L-5029.
   5. Stud Walls (Multiple Penetration): UL W-L-1249.

C. Nonmetallic Pipe, Conduit or Tubing:
   1. Masonry Walls: UL C-AJ-2223.
   2. Concrete Floor on Metal Deck: UL F-A-2036 or F-A-2213.

3. Stud Walls (Through Penetrations): UL W-L-2078 or W-L-2169.
4. Stud Walls (Tee Penetrations Connected to Vertical Piping): UL W-L-2179.

D. Insulated Pipes: Refer to Section 22 0700 and Division 23 for insulation requirements.
1. Masonry Walls: UL C-AJ-5123.
2. Stud Walls: UL W-L-5088.

E. HVAC Ducts:
1. Masonry Walls (Round Ducts): C-AJ-7040.
2. Masonry Walls (Rectangular Ducts): UL C-AJ-7041.
3. Stud Walls (Round Ducts): UL W-L-7031.
4. Stud Walls (Rectangular Ducts): UL W-L-7030.
5. Penetrations Through Non-Rated Floor-Ceiling Assemblies: Mineral wool safing insulation or other approved noncombustible material.

F. Electrical Cables Not in Conduit:
1. Masonry Walls: UL C-AJ-3140.
2. Concrete Floor on Metal Deck: UL F-A-3003.
3. Stud Walls: UL W-L-3121 or W-L-3210.

G. Wall Head Joints: UL 2079.
1. Metal Stud Wall Head at Metal Floor or Roof Deck: UL HW-D-0047.
2. Masonry Wall Head at Metal Floor or Roof Deck: UL HW-D-0064.

H. Openings Without Penetrating Items:
1. Without Support Plates: UL C-AJ-0062.
2. With Support Plates: UL C-AJ-0063.

END OF SECTION

SECTION 07 9200 – JOINT SEALANTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Sealing of interior and exterior joints.
   2. Sealing of glazing joints.

B. Related Sections:
   1. Caulking and sealant work performed under other Sections shall be performed in accordance with the provisions of this Section.
   2. Section 03 3000 – Cast-in-Place Concrete: Joint fillers and sealants for floors, sidewalks and pavements.
   3. Section 07 2100 – Thermal Insulation: Insulating foam sealants.
   4. Section 08 8000 – Glazing.
   5. Section 09 8100 – Acoustic Insulation: Acoustical sealants.
   6. Section 22 4000 – Plumbing Fixtures: Caulking around plumbing fixtures.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Provide manufacturer's standard details and installation instructions; identify substrates requiring primers, type of primer recommended by manufacturer, and surface preparation required.

B. Samples: Submit full range of colors for selection.

1.03 QUALITY ASSURANCE:

A. Installer Qualifications: Firm regularly engaged in installation of sealers of the type specified for not less than 5 years; all work performed by workers thoroughly skilled and specially trained in the techniques required.

1.04 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Store materials between 40 and 90 degrees F, and under conditions and for a period of time not longer than that recommended by manufacturer.

1.05 ENVIRONMENTAL REQUIREMENTS:

A. Install sealants when air and substrate temperatures are over 40 degrees F and rising, but less than 100 degrees F, unless specific installation instructions are obtained from manufacturer.

1.06 WARRANTY: In accordance with Section 01 7700.

A. Exterior Joints: Correct defective Work within a 5 year period after Date of Substantial Completion for damage resulting from adhesive or cohesive failure, and failure to prevent infiltration of water or air through the sealed joint.
   1. Obligations of the Surety under the Contract Bond do not extend beyond the initial two years of the correction period.

PART 2 PRODUCTS

2.01 JOINT SEALERS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Tremco, Inc.
   2. Dow Chemical Co.
   3. Master Builders Solutions.
   4. Momentive Performance Materials, Inc.
   5. Pecora Corporation.
   6. Schnee-Morehead, Inc.
   7. Sherwin-Williams Co.
   8. Sika Corporation.

B. Polyurethane Sealants: ASTM C920.
   1. One-Part Polyurethane: Type S, Grade NS, Class 50, Use NT, T, M, A, O, and I; paintable. (Tremco Dymonic 100; Sikaflex 15 LM)
   2. One-Part Modified Polyurethane: Type S, Grade NS, Class 35, Use NT, M, A, and O; paintable. (Tremco Dymonic FC; MasterSeal NP1)
   3. Multi-Component Polyurethane: Type M, Grade NS, Class 50, Use T, I, M, A, and O. (Tremco Dymeric 240FC; Sikaflex 2c NS)

C. Silicone Sealants: ASTM C920.
   1. Exterior Type: Type S, Grade NS, Class 100/50, Use NT, M, G, A, and O. (Tremco Spectrem 1; Dowsil 790)
   2. Sanitary Type: Type S, Grade NS, Class 25. (Momentive GE SCS1700 series; Dowsil 786; Tremco Tremsil 200)
   3. Glazing Type: Type S, Grade NS, Class 25, Use NT, G, A, and O. (Tremco Proglaze; Tremco Tremsil 600; Dowsil 790)

D. Acrylic Latex Caulk: ASTM C834; paintable. (Tremco Tremflex 834; Sherwin-Williams Magnum XL; Pecora AC-20)

E. Butyl Caulk: ASTM C1311; non-skinning isobutylene-isoprene copolymer. (SikaLastomer 511; Tremco Butyl Sealant)
   1. Tape Mastic: AAMA 800; isobutylene-isoprene copolymer tape. (SikaLastomer 65; Schnee-Morehead SM5227)

F. Colors:
   1. Vertical Joints in Masonry: Match masonry unit color, or slightly darker.
      a. At locations with horizontal masonry bands of multiple colors, two sealant colors will be selected for alternating application.
   2. Horizontal Joints in Masonry: Match mortar color.
   3. Joints Around Windows, Doors and Other Openings: Match color of frame material.
   4. Other Locations: As selected from manufacturer's standard colors.

2.02 ACCESSORIES:

A. Primers: As recommended by sealant and glazing system manufacturers. Provide primers where indicated, where recommended by manufacturer, and also where preconstruction tests indicate the need for primers to obtain optimum adhesion.

B. Backer Rod: ASTM C1330; round, flexible, closed cell polyethylene, or as recommended by sealant manufacturer; chemically inert, solvent resistant.
   1. Size: Diameter 15% greater than joint width, continuous lengths.

C. Glazing Tape: As specified in Section 08 8000.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that dimensions are correct and substrate is in proper condition for installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Do not begin installation until substrates are clean, dry, and free of loose aggregate, laitance, paint, corrosion, oil, grease, tar, asphalt, mastic compounds, wax, waterproofing agents, release agents, and other deleterious substances.

3.02 PREPARATION:

A. Preconstruction Field Adhesion Testing: ASTM C1193.

   1. Conduct field tests for adhesion of joint sealants to actual substrates using proposed joint preparation methods, for each type of sealant and substrate, prior to general installation.

   2. Alteration and Repair Projects: Include areas typical of those requiring removal of existing sealants.

   3. Use manufacturer's standard field adhesion test methods and joint preparation methods to verify proper priming and preparation techniques required to obtain optimum adhesion of sealants to substrate.

   4. Repeat testing until satisfactory adhesion is achieved. Evaluate and report results.

   5. Approved results shall become the standard of acceptability for the project.

B. Remove foreign substances from substrate. Clean substrate in accordance with manufacturer's instructions and the following general methods:

1. Porous Surfaces:
   a. Remove laitance by acid washing, grinding or mechanical abrading.
   b. Remove form oils by sandblasting.
   c. Vacuum or blow out joints with oil-free compressed air to remove loose particles.

2. Non-Porous Surfaces:
   a. Remove protective coatings using solvent recommended by sealant manufacturer.
   b. If surface has been treated or coated with a special coating, contact sealant manufacturer for recommendations.

C. Mask adjacent finished surfaces and adjacent porous surfaces that would be damaged by primer, sealant, or cleaning agents.

D. Prime surfaces to receive sealant in accordance with manufacturer's instructions, and allow to dry before installing sealant. Do not apply primer to surfaces outside of joint. Prime surfaces prior to installing backer rod or bond-breaker tape.

E. Install joint backing. Do not puncture, twist, compress less than 25 percent or more than 50 percent, or stretch backer during installation.

1. Install joint backing to control joint depth as indicated and to prevent 3-sided bond.

2. Install to control depth at midpoint of sealant as follows, unless otherwise indicated. Do not exceed sealant manufacturer's recommended maximum width.
   a. Joint Width ¼ to ½ Inch: Depth equal to width.
   b. Joint Width Greater Than ½ Inch: ½ inch depth.

3.03 APPLICATION:

A. Install sealants in accordance with manufacturer's instructions and ASTM C1193.

B. Gun Grade Sealants: Extrude sealant to completely fill joint using proper gun and nozzle. Tool to compress sealant against sides of joint and eliminate air bubbles. Leave a neat, slightly recessed concave surface, unless otherwise indicated.

C. Self Leveling Sealants: Pour sealant to fill joint, slightly recessed below adjacent surfaces.

D. Curing:
1. Cure sealants in compliance with manufacturer's instructions to obtain high early bond strength, internal cohesive strength, and surface durability.
2. Where joints are scheduled to be painted, allow sealant to cure before painting over joint.

3. Advise the Contractor of procedures required for curing and protection during the construction period, to prevent deterioration or damage (other than normal wear and weathering) at Substantial Completion.

3.04 CLEANING:

A. Clean primer and sealant from adjacent surfaces. Wipe fresh sealant immediately from adjacent surfaces. Do not use cleaning agents which may damage finishes.

B. Remove masking tape from completed joints.

3.05 SCHEDULE:

A. General Purpose Interior and Exterior Applications: Multi-component polyurethane.
   1. Joints and recesses between adjacent construction and frames, sills, and subsills of doors, storefront, louvers, and similar items.
   2. Around both exterior and interior surfaces of penetrations in exterior walls.
   3. Under door thresholds, and at bottom of door frames.
   4. Wherever necessary to prevent infiltration of water or air into or through exterior building enclosure.

B. Expansion and Control Joints: Silicone sealant, exterior type.
   1. Expansion and control joints in brick.
   2. Expansion and control joints in concrete masonry.
      a. At locations scheduled for paint, use one-part polyurethane.
   3. Masonry joints beneath shelf angles.

C. Concealed Exterior Locations: Butyl caulk and tape mastic.
   1. Metal to metal joints within sheet metal roofing and flashing assemblies.

D. Other Exterior Applications: One-part modified polyurethane.
   1. Between adjacent construction and copings, fascias, and other flashings.
   2. Metal flashing inserted into reglet.
   3. Top edge of surface mounted counterflashing.
   4. Joints between new and existing exterior construction.

E. Interior Wet Areas: Silicone sealant, sanitary type.
   1. Between adjacent construction and plumbing fixtures, and similar applications subject to contact with water.

F. Other Interior Applications: Acrylic latex caulk.
   1. Small voids between walls or partitions and adjacent lockers, door frames, built-in or surface-mounted equipment and fixtures, and similar items.
   2. Perimeter of frames at doors, windows, and access panels which adjoin exposed interior concrete and masonry surfaces.
   3. Joints of interior walls and partitions which adjoin columns, pilasters, concrete and masonry surfaces, and exterior walls.
   4. Interior locations not otherwise indicated or specified, where small voids exist between materials specified to be painted.

5. Tile joints between nonplanar tile surfaces, between tile and dissimilar materials, and joints occurring where substrates change.
6. Other exposed and concealed locations within partitions to seal against passage of air.

G. Glazing:
1. Sealer: Silicone sealant, glazing type.
2. Tape: Glazing tape.
3. Applications: As scheduled in Section 08 8000.

END OF SECTION

SECTION 08 1100 – METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Steel doors and frames.
      a. Non-rated.
      b. Thermally insulated.
   2. Interior glazed light frames.

B. Products Furnished But Not Installed Under This Section:
   1. Section 04 2000 – Unit Masonry: Placement of anchors into masonry wall construction.

C. Related Sections:
   1. Section 04 0500 – Common Work Results for Masonry: Masonry grout fill of metal frames.
   2. Section 07 9200 – Joint Sealants.
   3. Section 08 1400 – Wood Doors.
   4. Section 08 7100 – Door Hardware.
   5. Section 08 8000 – Glazing.
   6. Section 09 9000 – Painting and Coating: Field painting of doors and frames.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate door and frame elevations, internal reinforcement, closure method, anchor types and spacings, finishes, and cut-outs for hardware and glazing.

1.03 QUALITY ASSURANCE:

A. Conform to requirements of ANSI A250.8 and ADA.

B. Manufacturer: Company specializing in manufacturing the Products specified in this Section with minimum three years documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING:

A. Deliver, store, protect, and handle products to site under provisions of Section 01 6000 and HMMA 840.

B. Accept Products on site in manufacturer's packaging. Inspect for damage.

C. Break seal on site to permit ventilation.

D. Provide ¼ inch spaces between stored materials to promote air circulation.

1.05 PROJECT CONDITIONS: In accordance with Section 01 3100.

A. Coordinate frame installation with size, location, and installation of service utilities.

B. Coordinate the work with door opening construction and hardware installation.

C. Sequence installation to ensure wiring connections for electric hardware components are achieved in an orderly and expeditious manner.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Ceco Door Products.

B. Curries Company.

C. Core Industries, Inc.; Pioneer Industries Division.

D. Republic Doors and Frames.

E. Steelcraft Manufacturing Company.

2.02 FRAMES:

A. Exterior Frames: 14 gauge thick galvanized steel; thermally broken type.

B. Interior Frames: 16 gauge thick cold rolled steel.

2.03 DOORS:

A. Exterior Doors: ANSI A250.8, Level 3 Extra Heavy Duty, Model 2 Seamless; ANSI A250.4, physical performance level A; 16 gauge galvanized sheet steel.

B. Interior Doors: ANSI A250.8, Level 3 Extra Heavy Duty, Model 2 Seamless; ANSI A250.4, physical performance level A; 16 gauge cold rolled sheet steel.

C. End Closure: Continuous channel, flush.

1. Hinge Edge: Minimum 11 gauge.

2. Lock Edge, Top, and Bottom: Minimum 14 gauge.

D. Core:

1. Non-rated Doors: Cardboard honeycomb.

2. Thermal Insulated Doors: Polystyrene or polyurethane foam; U value certified to meet one or more of the following:
   a. ASTM C518; maximum 0.16.
   b. ASTM C1363; maximum 0.50.

2.04 ACCESSORIES:

A. Glass: In accordance with Section 08 8000.

B. Anchorages: Galvanized steel, minimum 18 gauge.

C. Anchorages at In-Place Masonry: Galvanized steel machine screws and shield.

D. Fasteners: Concealed type where possible. Where exposed screws and bolts are required, provide only countersunk, flat Phillips head fasteners.

E. Removable Stops: Rolled steel, channel shape, mitered corners; prepared for countersunk style screws. Locate removable stops on secure side of frame.

F. Bituminous Coating: Fibered asphalt emulsion.

G. Primer: Rust inhibitive, suitable to receive finish coatings specified.

H. Silencers: Resilient rubber or vinyl, fitted into drilled hole.

I. Weatherstripping: Specified in Section 08 7100.

2.05 FABRICATION:

A. Fabricate frames as welded unit, mitered and ground smooth.

B. Fabricate doors and frames for hardware installation in accordance with approved hardware shop drawings and ANSI A115. Provide hardware reinforcement plates welded in place. Provide mortar guard boxes and dust covers. When not otherwise scheduled, provide reinforcement for the following hardware:

1. Hinges: 4½ x 4½ inch, full mortise, template type.
   a. Doors Without Closers: Regular weight.
   b. Doors With Closers: Extra heavy weight.
   c. Doors up to 88 Inches High: 1½ pair.
2. Lockset: Mortise type, 2¾ inch backset.

C. Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.

D. Prepare frames for silencers. Provide three silencers for single doors and mullions of double doors on strike side. Provide two single silencers on frame head at double doors without mullions. Silencers may be omitted at openings scheduled to receive weatherstripping.

E. Fabricate frames located in masonry walls with head member size to suit coursing.

F. Transom Bars for Glazed Lights: Fixed type, of same profiles as jamb and head.

G. Sill Bars for Glazed Lights: Fixed type, flush with both faces of adjacent jambs; profile coordinated with jamb.

2.06 FINISH:

A. Cold Rolled Steel Sheet: ASTM A1008, matte finish exposed, oiled.

B. Galvanized Steel Sheet: ASTM A653, A60 zinc-iron or G60 zinc.

C. Primer: Clean by degreasing process; phosphatize; apply one coat primer, baked on, capable of passing a 70 hour salt spray test in accordance with ASTM B117. Prime all surfaces, including under and inside removable stops.

D. Exterior Frames: Coat inside of frame profile with bituminous coating to a thickness of 1/16 inch.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify exposed steel lintels are painted prior to frame installation.

3.02 INSTALLATION:

A. Install doors and frames in accordance with ANSI A250.8, HMMA 840, and DHI.

B. Coordinate with wall construction for anchor placement. Install frames in masonry walls with 6 anchors.

C. Brace frames placed prior to constructing walls; maintain plumb and planar. Remove braces after anchorages are permanently installed.

D. Prior to installation, paint bottom edge of doors scheduled to be field painted.

E. Coordinate installation of glass and glazing.

F. Coordinate installation of door hardware.

G. Touch-up abrasions with primer. Touch-up minor rust areas; sand smooth; apply primer.

3.03 ERECTION TOLERANCES:

A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.04 ADJUSTING: In accordance with Section 01 7000.

A. Adjust doors for smooth and balanced door movement.

END OF SECTION

SECTION 08 1400 – WOOD DOORS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Wood doors; flush design.

B. Related Sections:
   1. Section 08 1100 – Metal Doors and Frames: Hollow metal door frames.
   2. Section 08 7100 – Door Hardware.
   3. Section 08 8000 – Glazing.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, factory machining and finishing, and cut-outs and trim for hardware and glazing.

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

C. Samples: Submit two samples of door veneer, illustrating wood grain, stain color, and sheen.

1.03 QUALITY ASSURANCE:

A. Perform work in accordance with WDMA IS-1A, Custom grade; Extra Heavy Duty performance duty level.

B. Finish doors in accordance with AWI 1500 and WDMA.

C. Manufacturer: Company specializing in manufacturing the Products specified in this Section with minimum three years documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Accept Products on site in manufacturer's packaging. Inspect for damage.

B. Do not store in damp or wet areas, areas with uncured cement or plaster, or in areas exposed to direct sunlight. Seal top and bottom edges if stored more than one week. Break packaging seal on site to permit ventilation.

C. Store flat on a level surface, minimum 3½ inches off the floor. Provide ¼ inch spaces between stacked doors to promote air circulation.

D. Maintain relative humidity in storage area, and in building following installation, between 30% and 50%. Maintain temperature between 50 degrees F and 90 degrees F.

E. Handle with clean hands or gloves; do not drag doors across one another or across other surfaces.

1.05 PROJECT CONDITIONS: In accordance with Section 01 3100.

A. Coordinate the work with door opening construction, door frame and hardware installation.

PART 2 PRODUCTS

2.01 FLUSH WOOD INTERIOR DOORS:

A. Manufacturers: In accordance with Section 01 6000.

1. Eggers Industries.
2. Masonite Architectural; Marshfield-Algoma.
3. VT Industries, Inc.

B. Construction: 1¾ inches thick; 5-ply hot pressed; WDMA SLC-5 or SCLC-5; stave lumber core or structural composite lumber core.

C. Veneer Facing for Transparent Finish: AWI Custom quality wood, grade A face veneer, natural birch species, rotary cut, with book matched grain and running matched veneer assembly.

2.02 ACCESSORIES:

A. Glass: In accordance with Section 08 8000.

B. Glazing Stops: Wood, of same species as door facing; recessed or flush molding, beveled profile with mitered corners; prepared for countersunk style screws.

2.03 FABRICATION:

A. Fabricate doors in accordance with AWI Architectural Woodwork Standards and WDMA requirements.

B. Vertical Exposed Door Edge: Hardwood for type of finish to match door. Bond edge banding to cores.

C. Center match face veneer for pairs, and doors within 8 feet of another door in the same plane.

D. Factory machine doors for finish hardware in accordance with approved hardware shop drawings and ANSI A115. Provide blocking for lockset, closer, and other finish hardware items scheduled. Do not machine for surface hardware. When not otherwise scheduled, provide for the following hardware:

1. Hinges: 4½ x 4½ inch, full mortise, template type.
   a. Doors Without Closers: Regular weight.

b. Doors With Closers: Extra heavy weight.
c. Doors up to 88 Inches High: 1½ pair.

2. Lockset: Mortise type, 2¾ inch backset.

E. Factory fit doors for frame opening dimensions identified on shop drawings.

F. Provide edge clearances in accordance with AWI 1600.

G. Factory finish doors in accordance with WDMA Finish System TR-6 catalyzed polyurethane or TR-8 UV-cured polyurethane, to match approved sample.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION:

A. Install doors in accordance with AWI Architectural Woodwork Standards and WDMA requirements.

B. Trim door width by cutting equally on both jamb edges.

C. Trim door height by cutting bottom edge only a maximum of ¾ inch. Allow for installation of finish flooring materials as scheduled.

D. Coordinate installation of doors with installation of frames and hardware.

E. Coordinate installation of glass and glazing. Site finish glazing stops to match door facing.

F. Touch-up factory finished doors; remove protective wraps.

3.03 INSTALLATION TOLERANCES:

A. Maximum Diagonal Distortion (Warp): 1/8 inch measured with straight edge or taut string, corner to corner, over an imaginary 36 x 84 inch surface area.

B. Maximum Vertical Distortion (Bow): 1/8 inch measured with straight edge or taut string, top to bottom, over an imaginary 36 x 84 inch surface area.

C. Maximum Width Distortion (Cup): 1/8 inch measured with straight edge or taut string, edge to edge, over an imaginary 36 x 84 inch surface area.

3.04 ADJUSTING: In accordance with Section 01 7000.

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

END OF SECTION

SECTION 08 3303 – COILING DOORS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Coiling overhead doors, non-rated.

B. Related Sections:
   1. Section 08 7100 – Door Hardware: Cylinder locks.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate door and frame elevations, frame and track details, wall opening material and thickness, closure method, and finishes.

1.03 QUALITY ASSURANCE:

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

B. Installer: Company specializing in manufacturing the Products specified in this Section with minimum three years documented experience; approved by Manufacturer.

PART 2 PRODUCTS

2.01 COILING OVERHEAD DOORS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Overhead Door Corp.
   2. CornellCookson, LLC.
   3. Kinnear.
   4. Raynor Garage Doors.

B. Components:
   1. Curtain: Stainless steel; minimum 22 gauge flat face slats, 2¼ inch pitch, 5/8 inch deep.
   2. Bottom Bar: Tubular extruded aluminum with double vinyl astragal.
   3. Guides: Roll-formed steel channels and angles or structural steel angles to form a slot of sufficient depth to guide curtain travel, fastened to jambs with expansion bolts.
   4. Brackets: Die cast aluminum, minimum 3/16 inch thick.

5. Counterbalance: Helical torsion springs housed in steel pipe barrel, supporting the curtain with a deflection limited to 0.03 inch per foot of width; adjustable by means of an external adjusting tension wheel.
   a. Anchor springs to tension shaft and pipe with cast iron barrel plugs.
6. Hood: Stainless steel, minimum 24 gauge, formed to fit brackets.

C. Mounting: Face of wall.

D. Operation: Manual push-up operation, maximum 30 pounds of effort.

E. Locking Mechanism: Concealed sliding bolt deadlock in bottom bar to engage both jambs, operated by cylinder locks as specified in Section 08 7100.
   1. Provide one cylinder lock in each jamb, operated from opposite sides of door.

2.02 FINISHES:

A. Stainless Steel: ASTM A167, Type 304; No. 4 finish.

B. Aluminum: Clear anodized.

C. Exposed Ferrous Surfaces: Manufacturer's standard factory applied rust-inhibitive primer and finish coat to match curtain and hood.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

3.02 INSTALLATION:

A. Install doors and frames in accordance with manufacturer's instructions.

B. Touch-up abrasions and minor rust areas; sand smooth; apply primer.

C. Touch-up factory finished doors; remove protective wraps.

3.03 ADJUSTING: In accordance with Section 01 7000.

A. Adjust doors for smooth and balanced door movement.

END OF SECTION

SECTION 08 4113 – ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Aluminum storefront framing.

B. Related Sections:
   1. Section 07 2100 – Thermal Insulation.
   2. Section 07 9200 – Joint Sealants.
   3. Section 08 8000 – Glazing.

1.02 DESIGN REQUIREMENTS:

A. Aluminum storefront system includes tubular aluminum sections with supplementary internal support framing, shop fabricated, factory finished, with related flashings, accessories, anchorage and attachment devices.

B. System Design: Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall, calculated in accordance with applicable building code.

C. System Assembly: Accommodate without damage to components or deterioration of seals, movement within system, movement between system and peripheral construction, dynamic loading and release of loads, deflection of structural support framing.

D. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.

E. Thermal Movement: Provide for expansion and contraction within system components caused by a cycling temperature range of 170 degrees F without causing detrimental effect to system components, sealants, and anchorage.

F. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.

1.03 PERFORMANCE REQUIREMENTS:

A. Air Infiltration: ASTM E283; maximum 0.06 cfm/ft, at 6.24 psf static air pressure differential.

B. Water Leakage: ASTM E331; none, at 8.0 psf static air pressure differential.

C. Deflection: In accordance with AAMA TIR-A11.

D. Thermal Transmittance: AAMA 1503; maximum assembly U-value 0.45 Btu/sq. ft. with specified glazing.

E. Condensation Resistance: AAMA 1503; minimum CRF 45.

1.04 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate dimensions, framed opening requirements and tolerances, project-specific interface details with adjacent construction including flashing materials, anchorage, insulation, and expansion and contraction joint locations and details.

B. Product Data: Provide component dimensions, installation instructions, description of components within assembly, anchorage and fasteners, internal drainage details, and accessories.

C. Design Data: Provide framing member structural and physical characteristics, calculations, and dimensional limitations.

1.05 QUALITY ASSURANCE:

A. Perform Work in accordance with AAMA MCWM-1 and AAMA SFM-1.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this Section with minimum three years documented experience.

C. Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in the design of this Work and licensed at the place where the Project is located.

1.06 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Handle Products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping or strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.07 ENVIRONMENTAL REQUIREMENTS:

A. Do not install sealants when ambient temperature is less than 40 degrees F during and 48 hours after installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Capitol Aluminum and Glass Corp.

B. Efco Corporation.

C. Kawneer Company, Inc.

D. Tubelite, Inc.

E. Oldcastle BuildingEnvelope.

2.02 MATERIALS:

A. Extruded Aluminum: ASTM B221, alloy G.S. 10A-T5.

B. Sheet Aluminum: ASTM B209.

C. Sheet Steel: ASTM A653, galvanized in accordance with ASTM A123.

D. Steel Sections: ASTM A36; shaped to suit mullion sections.

E. Fasteners: Aluminum or stainless steel.

2.03 COMPONENTS:

A. Exterior Thermal Break Framing Members: 2 x 4½ inch nominal dimension; thermally broken with interior tubular section insulated from exterior; center plane glazing; flush glazing stops; drainage holes; internal weep drainage system. (Kawneer Trifab VG 451T; Capitol 245T; Oldcastle 3000 Thermal; Tubelite T14000)

B. Reinforced Framing Members: Nominal dimension to match adjacent framing; profile of extruded aluminum with internal reinforcement of shaped steel structural section.

C. Framing Accessories: Fillers, receptors; to coordinate with framing members; as indicated.

D. Flashings: 0.050 inch thick aluminum.

2.04 GLASS, GLAZING, AND SEALANT MATERIALS:

A. Glass and Glazing Materials: 1 inch thick Low E insulating glass units, as specified in Section 08 8000.

B. Sealant and Backing Materials: As specified in Section 07 9200.

2.05 FABRICATION:

A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

C. Prepare components to receive anchor devices. Fabricate anchors.

D. Arrange fasteners and attachments to conceal from view.

E. Reinforce framing members for imposed loads and to receive threaded fasteners.

F. Provide for isolation of incompatible metals to prevent galvanic deterioration.

2.06 FINISH:

A. Exposed Aluminum Surfaces: Contractor's option from the following:
   1. Clear anodized; AAMA 611, Class I; AA M12C22A41.
   2. AAMA 2605; 70 percent PVDF fluoropolymer; 2.0 mil thickness; metallic color to match anodized finish; 25 year warranty.

B. Concealed Steel Items: Galvanized in accordance with ASTM A123 to 2.0 oz/sq ft.

C. Apply one coat of bituminous paint to concealed surfaces in contact with cementitious or dissimilar materials.

D. Touch-Up Primer for Galvanized Steel Surfaces: SSPC 20, zinc rich.

E. Extent of Finish:
   1. Apply factory coating to all surfaces exposed at completed assemblies.
   2. Apply finish to surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
   3. Apply touch-up materials recommended by coating manufacturer for field application to cut ends and minor damage to factory applied finish.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify dimensions, tolerances, and method of attachment with other work.

C. Verify that wall openings and adjoining materials are ready to receive work of this Section.

D. Verify exposed steel lintels are painted prior to framing installation.

3.02 INSTALLATION:

A. Install wall system in accordance with manufacturer's instructions and AAMA MCWM-1.

B. Install assembly plumb and level, free of warp or twist. Maintain dimensional tolerances, aligning with adjacent work.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Apply insulating foam sealant to perimeter voids in accordance with Section 07 2100 to maintain continuity of thermal barrier.

G. Install flashings where scheduled. Turn up ends and edges; seal to adjacent work to form water tight dam.

H. Set sill members in bed of mastic and secure.

I. Install hardware using templates provided.

J. Install perimeter sealant; type, backing materials, and installation criteria in accordance with Section 07 9200.

K. Install glass in accordance with Section 08 8000.

3.03 ERECTION TOLERANCES:

A. Maximum Variation from Plumb: 0.06 inch every 3 ft non-cumulative or 1/16 inch per 10 ft, whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 CLEANING: In accordance with Section 01 7700.

A. Remove protective material from pre-finished aluminum surfaces.

B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

C. Remove excess sealant by method acceptable to sealant manufacturer.

D. Protect finished Work from damage.

END OF SECTION

SECTION 08 7100 – DOOR HARDWARE

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Hardware for wood and hollow metal doors.
   2. Thresholds.
   3. Weatherstripping, seals, and door gaskets.
   4. Keying.
   5. Low voltage control wiring.

B. Related Sections:
   1. Section 08 1100 – Metal Doors and Frames.
   2. Section 08 1400 – Wood Doors.
   3. Section 08 3303 – Coiling Doors.
   4. Section 10 1402 – Interior Signage.
   5. Division 26 – Electrical: Power supply to electric hardware devices; installation of low voltage wiring.
   6. Section 28 1000 – Access Control Systems.
   7. Section 32 3113 – Chain Link Fences and Gates: Gate hardware.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate locations and mounting dimensions of each type of hardware, schedules, and catalog cuts.
   1. Keying: Include minutes of keying meeting, keying schedule with Owner review comments incorporated, and number of keys.
   2. Wiring Diagrams: Provide for each opening containing electrically operated hardware. Indicate electrical characteristics and connection requirements; wire and conduit type, size, and location; point-to-point wiring requirements; power supplies and accessories. Identify interfaces to the work of other trades, and requirements affecting their work.

1.03 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Project Record Documents: Record actual locations of installed cylinders and their key code.

B. Maintenance Data: Include data on operating hardware, adjustment procedures, lubrication requirements, and inspection procedures related to preventative maintenance.

C. Maintenance Products: Provide special wrenches and tools applicable to each different or special hardware component. Provide maintenance tools and accessories supplied by hardware component manufacturer.

D. Keys: Deliver to Owner by security shipment direct from hardware supplier. Tag keys with door number and location in building. Include schematic drawing of keying and explanation of lock operating features, including method of rendering construction master keys inoperative.

1.04 QUALITY ASSURANCE:

A. Perform Work in accordance with applicable requirements of ADA, AWI, BHMA, DHI, NFPA, and UL.

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

C. Hardware Supplier Qualifications: Company specializing in supplying commercial and institutional door hardware with minimum three years documented experience; approved by manufacturers.

D. Hardware Supplier Personnel: Employ a Door + Hardware Consultant (DHC) and Access Control System Consultant (ACSC) or personnel with similar qualifications to assist in the work of this section.

1.05 DELIVERY, STORAGE AND PROTECTION: In accordance with Section 01 6000.

A. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

1.06 PROJECT CONDITIONS: In accordance with Section 01 3100.

A. Furnish hardware of proper design and function for the door and frame conditions, dimensions, profile, swing, and performance requirements indicated.

B. Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.

C. Sequence installation of surface applied hardware items with painting and finishing of the substrates involved.

D. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

E. Coordinate Owner's keying requirements during the course of the Work.

PART 2 PRODUCTS

2.01 SUPPLIERS: In accordance with Section 01 6000.

A. Central Indiana Hardware Co., Inc.

B. General Building Products, Inc.

C. Moss Building Products.

D. Stafford Building Products, Inc.

2.02 COMPONENTS:

A. Butt Hinges: ANSI A156.1; 5 knuckle full mortise type; 4½ x 4½ inch.

1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; Ives.
   b. Assa Abloy Architectural Door Accessories; McKinney.
   c. Bommer Industries, Inc.
   d. Hager Hinge Co.
   e. Stanley Security Solutions.

2. Heavy Duty Interior Type: ANSI A8111; steel. (McKinney T4A3786, Bommer BB5004, Hager BB1168, Ives 5BB1 HW, Stanley FBB168)

3. Heavy Duty Exterior Type: ANSI A5111; stainless steel with non-removable pin. (McKinney T4A3386 NRP, Bommer BB5005-N, Hager BB1199 NRP, Ives 5BB1 HW, Stanley FBB199 NRP)

B. Exit Devices: UL 305; ANSI A156.3, Grade 1; rim type; lever trim to match existing.

1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; Von Duprin.

2. Exit Only: ANSI 01 function; no exterior trim. (Von Duprin LD99EO)

3. Passage Exit: ANSI 14 passage function with lever and interchangeable core dogging cylinder. (Von Duprin CD99L-BE)

4. Classroom Security Exit: ANSI 10 function with lever and interchangeable core exterior and interior cylinders. (Von Duprin 99L-2SI)

5. Electric Lock: Lever electrically unlocked, fail secure; with interchangeable core cylinder and interchangeable core dogging cylinder. (Von Duprin CD-E99L-FSE)
   a. Power Supply: Voltage and amperage as required for application. (Von Duprin PS900 series)
   b. Power Transfer: Raceway and wiring for concealed power from frame to door. (Von Duprin EPT-10, or concealed circuit hinge by hinge supplier)

6. Removable Mullions: Keyed type with interchangeable core cylinder; non-rated; steel. (Von Duprin KR4954)

C. Mortise Locks: ANSI A156.13, Series 1000, Grade 1.

1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; Schlage.

2. General Requirements:
   a. Lever Trim: Match existing.
   b. Provide interchangeable core cylinder with removable plastic insert, except where temporary construction cores are scheduled.

3. Office Type: ANSI F04 function. (Schlage L9050)
4. Classroom Type: ANSI F05 function. (Schlage L9070)
5. Classroom Security Type: ANSI F33 function. (Schlage L9071)
6. Cylinders for Coiling Doors: Interchangeable core type; with compression ring, blocking ring, and cam as required for coordination with door; refer to Section 08 3303.

D. Closers: ANSI A156.4, Grade 1; rated for 10 million cycles.
1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; LCN Closers.
2. Standard Type: Pull side mounting. (LCN 4011)
3. Parallel Type: Push side mounting. (LCN 4111)
4. Parallel Stop Type: Push side mounting. (LCN 4111-3077CNS)

E. Overhead Stops and Holder/Stops: Extruded track, slide, arm, and frame bracket.
1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; Glynn-Johnson.
   b. Dorma USA, Inc.
   c. Rixson Specialty Door Controls.
   d. Sargent Manufacturing Co.
2. Concealed Stop: Sargent 698S; Glynn-Johnson 104S; Rixson 1-336; Dorma 912S.
3. Concealed Holder/Stop: Sargent 698H; Glynn-Johnson 104H; Rixson 1-326; Dorma 912H.

F. Plates and Trim:
1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; Ives.
   b. Assa Abloy Architectural Door Accessories; Rockwood.
   c. Baldwin Hardware Manufacturing Corp.
   d. Hiawatha, Inc.
   e. Sargent Manufacturing Co.
2. Kickplates: Stainless steel, 0.050 inch thick, 8 inch height; 2 inches less than single door width and pairs with mullions; 1 inch less than leaf width for pairs without mullions. (Rockwood K1050, Ives 8400)
3. Interior Wall Stops: Metal body with resilient bumper; 2½ inch diameter plate with concealed mounting; concave bumper; ¾ inch projection. (Rockwood 409, Ives WS406CCV)
4. Manual Flush Bolts: 12 inch rod length. (Rockwood 557; Ives FB458)

G. Seals and Gaskets: Provide thresholds, weatherstripping, and sweeps at all exterior doors, whether or not specifically scheduled.

1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; Zero.
   b. Assa Abloy Architectural Door Accessories; Pemko.
   c. Durable Products, Inc.
   d. Hager Companies.
   e. National Guard Products, Inc.
   f. Reese Enterprises, Inc.

2. Accessible Exit Thresholds: Single piece for full width of wall opening, with vinyl insert. (National Guard 896V, Durable HLT-205HV, Hager 520SV, Pemko 2005AV, Zero 65)

3. Weatherstrip: Surface applied, with vinyl insert. (National Guard 160V, Durable AV305, Hager 891SV, Pemko 303AV, Zero 8303)
   a. Surface applied weatherstrip may be omitted from thermally broken hollow metal frames with integral weather seal.

4. Sweeps: Surface applied, with neoprene sweep. (National Guard 200N, Durable HDS-21, Pemko 315CN, Zero 39)

H. Contact Switches: Low voltage SPDT switch.

1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; Schlage.
   b. Assa Abloy Electronic Security Hardware.
   c. Folger Adam Security, Inc.
   d. GE Interlogix; Sentrol.
   e. Sargent Manufacturing Co.

2. Swing Doors: Concealed mounting. (Sargent 3287, Sentrol 1076, Schlage 679-05 series)

3. Conduit: In accordance with Division 26.

I. Control Wiring: Furnish low voltage wiring for electrically operated components; in accordance with manufacturer's recommendations.

2.03 KEYING:

A. Door Locks: Master keyed to existing Schlage system; field verify prior to submitting bid.

B. Include construction master keying.

C. Include control keying with removable core cylinders.
   1. Provide temporary construction cores, keyed alike, for all doors which must be locked during construction. Provide temporary plastic covers for locks not equipped with construction cores.

D. Keying Meeting: Convene after award of contract and before preparation of hardware submittals. Require attendance of Owner, Architect, Contractor, and Hardware Supplier. Review preliminary keying schedule and number of each key to be supplied; revise as necessary to meet Owner's requirements.

E. Supply keys in the following quantities:
   1. Construction master keys as required by Contractor, plus 4 keys for Owner and Architect.
   2. 4 keys for each master key and change key, except as otherwise noted.
      a. Provide minimum 2 keys per keyed cylinder.

F. Key dogging cylinders and removable mullion cylinders alike to other cylinders at each door, unless noted otherwise.

2.04 FINISHES:

A. Butt Hinges, Exit Devices, Mortise Locks, and Bolts: US 26D; BHMA 626.

B. Cylinder Cores: US 15; BHMA 619; or match cylinder housing.

C. Removable Mullions: Prime painted; field paint to match frame.

D. Closers: Aluminum powder coat; BHMA 689.

E. Plates and Stops: US 32D; BHMA 630.

F. Thresholds, Weatherstrips, and Sweeps: Clear anodized aluminum.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify that doors and frames are ready to receive work and dimensions are as indicated on shop drawings and as instructed by manufacturer.

C. Verify that electric power is available to power operated devices and is of the correct characteristics.

3.02 INSTALLATION:

A. Install hardware in accordance with manufacturer's instructions.

B. Use templates provided by hardware item manufacturer.

C. Hardware Mounting Heights: In accordance with DHI.

D. Closers: Coordinate configuration of closers and arms to allow interior doors to swing 180 degrees or to nearest adjacent wall.

E. Kickplates: Mount on push side of door, flush with bottom of door, unless specifically indicated. Center between frame stops, or between frame stop and edge of door at pairs of doors without mullions.

F. Stops: Coordinate location and installation with levers, pulls, and other hardware for proper clearance and function. Provide shims, blocking, or other components as necessary; coordinate finishes with Architect where exposed.
   1. Provide wall stop, overhead stop, or closer with stop for all doors. At locations where type of stop scheduled does not suit field conditions, contact Architect for resolution. Upon request by Architect, change type of stop for up to 10 percent of openings without additional charge.

G. Contact Switches: Coordinate location and installation with security system installer. Maintain gap distance between switch and magnet as recommended by manufacturer for proper operation.

H. Low Voltage Control Wiring: Install in accordance with manufacturer's recommendations.

I. Coordinate with Section 28 1000 for access control system interconnection to electrified hardware. Wiring, final connections, programming, and accessories shall be by access control system installer.

3.03 ADJUSTING:

A. Adjust hardware for smooth operation.

B. Adjust hardware to provide operating and door opening forces in accordance with ADA and NFPA, maximum 5 lbf for non-rated interior doors.

3.04 PROTECTION OF FINISHED WORK:

A. Do not permit adjacent work to damage hardware or finish.

3.05 SCHEDULE:

A. Set No. 1: Doors E138, E139, E142A, E145.
   1. Butts (3): Heavy duty exterior type.
   2. Exit Device: Electric lock type.
   3. Closer: Parallel stop type.
   4. Weatherstrip.
   5. Threshold.
   6. Sweep.
   7. Kickplate.
   8. Contact switch.
   9. Sequence of Operation: Proximity reader shall shunt door contact and unlock lever.

B. Set No. 2: Doors E142, E144, E148.
   1. Butts (3): Heavy duty interior type.

2. Exit Device: Classroom security type.
3. Closer: Parallel type.
4. Wall stop.
5. Kickplate.

C. Set No. 3: Door E144A.
1. Butts (3): Heavy duty interior type.
2. Exit Device: Classroom security type.
3. Closer: Parallel stop type.
4. Kickplate.

D. Set No. 4: Door E133A.
1. Butts (3): Heavy duty interior type.
2. Exit Device: Passage type.
3. Closer: Parallel type.
4. Wall stop.
5. Kickplate.

E. Set No. 5: Door E136.
1. Butts (6): Heavy duty interior type.
2. Exit Device (RHR Leaf): Classroom security type.
3. Exit Device (LHR Leaf): Exit only type.
4. Removable mullion.
5. Closers (2): Parallel type.
6. Wall stops (2).
7. Kickplates (2).

F. Set No. 6: Doors E146, E149.
1. Butts (3): Heavy duty interior type.
2. Mortise classroom security lock.
3. Closer: Parallel type.
4. Wall stop.
5. Kickplate.

G. Set No. 7: Door E136A.
1. Butts (3): Heavy duty interior type.
2. Mortise classroom lock.
3. Overhead stop.
4. Kickplate.

H. Set No. 8: Door E143.
1. Butts (6): Heavy duty interior type.
2. Mortise classroom lock (LHR leaf).
3. Manual flush bolt.
4. Overhead holder/stops (2).
5. Kickplates (2).

I. Set No. 9: Doors E140, E141, E147.
   1. Butts (3): Heavy duty interior type.
   2. Mortise office lock.
   3. Closer: Standard type.
   4. Overhead stop.
   5. Kickplate.

J. Set No. 10: Door E114.
   1. Cylinder lock.
   2. Balance of hardware by coiling door supplier.

K. Gates at Chain Link Fences:
   1. Padlock: One per single gate or double gate.
   2. Remainder of hardware by chain link fence supplier.

END OF SECTION

SECTION 08 8000 – GLAZING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Annealed glass.
   2. Insulating glass units.
   3. Safety glazing.
   4. Glazing accessories.

B. Related Sections:
   1. Section 07 9200 – Joint Sealants.
   2. Section 08 1100 – Metal Doors and Frames.
   3. Section 08 1400 – Wood Doors.
   4. Section 08 4113 – Aluminum Entrances and Storefronts.

1.02 DESIGN REQUIREMENTS:

A. Size glazing in accordance with ASTM E1300 to withstand dead loads and positive and negative live loads acting normal to the plane of glazing in accordance with applicable building code.

B. Limit glazing deflection to ¾ inch or flexure limit of glazing with full recovery, whichever is less.

1.03 QUALITY ASSURANCE:

A. Each glass lite shall bear the manufacturer's label designating the type and thickness of glass.
   1. Permanently identify each lite of tempered glass with identification etched or ceramic-fired on the glass and visible when the unit is installed.

B. Provide safety glazing in accordance with ANSI Z97.1.

1.04 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Deliver glazing with manufacturer's labels intact. Do not remove label until glazing has been installed.

1.05 WARRANTY: In accordance with Section 01 7700.

A. Each lite of glass and each sealed glass unit shall have a 10 year manufacturer warranty against defects, including but not limited to seal failure, interpane dusting or misting.

PART 2 PRODUCTS

2.01 GLASS:

A. Manufacturers and Fabricators: In accordance with Section 01 6000.
   1. Vitro Architectural Glass.
   2. AGC Flat Glass North America, Inc.
   3. Guardian Industries Corp.
   4. Oldcastle BuildingEnvelope.
   5. Pilkington North America, Inc.
   6. Viracon, Inc.

B. Annealed Glass: ASTM C1036, Type I, Class 1, Quality q3; clear.

C. Low-Emissivity Coated Glass: ASTM C1036, Type I, Class 1, Quality q3; clear annealed float glass with pyrolitic coating. (Vitro Solarban 60; Guardian SN68; AGC Comfort Ti-AC40)

2.02 GLAZING ACCESSORIES:

A. Setting Blocks: ASTM C864, neoprene, 80 to 90 Shore A durometer hardness; compatible with sealant materials; length 4 inches, width of glazing rabbet space less 1/16 inch, height required for glazing method, pane weight, and pane area.

B. Spacer Shims: ASTM C864, neoprene, 50 to 60 Shore A durometer hardness; compatible with sealant materials; length 3 inches, one half height of glazing stop, thickness required for application, one face self-adhesive.

C. Glazing Tape: Butyl compound tape with integral resilient tube spacer, 10 to 15 Shore A durometer hardness, black color, coiled on release paper; widths required for specified installation.

D. Glazing Splines and Glazing Gaskets: ASTM C864 and ASTM D2287, resilient polyvinyl chloride, extruded shape to fit glazing channel retaining slot; black color.

E. Glazing Clips: Manufacturer's standard type.

F. Sealants: As specified in Section 07 9200.

2.03 FABRICATION:

A. Tempered Glass:
   1. Cut float glass materials to indicated sizes and provide cut-outs and holes, if indicated, before heat strengthening.
   2. Grind and polish exposed edges, where indicated, prior to tempering.
   3. Fully temper float glass materials in accordance with ASTM C1048, Kind FT.

B. Sealed Insulating Glass Units: Provide unit edge seals meeting requirements of ASTM E773, with aluminum spacers having mitered corners, and silicone sealant for glass-to-spacer seals. Where tempered glass is indicated, both outer and inner panes

shall be tempered. Where low-emissivity coated glass is indicated, coating shall be on interior surface of outer pane unless specifically noted.

1. Outer Pane: ¼ inch thick; low-emissivity coated glass.
2. Air Space: ½ inch thick; dehydrated, hermetically sealed.
3. Inner Pane: ¼ inch thick; clear annealed glass.
4. Solar Heat Gain Coefficient (SHGC): NFRC 200; maximum 0.39.
5. Visible Light Transmittance: NFRC 200; minimum 68%.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Inspect all openings prior to commencing work to verify that conditions do not interfere with proper glazing installation.

B. Verify glazing sizes in comparison with opening size to confirm that adequate clearances in accordance with Flat Glass Marketing Association (FGMA) standards are maintained on all four edges at perimeter, and that stops are of proper size.

C. Verify that glazing channels and recesses are clean and free of obstructions, that weeps are clear, and that channels and recesses are ready for glazing.

3.02 PREPARATION:

A. Clean contact surfaces to receive sealant with solvent; wipe dry.

B. Seal porous glazing channels and recesses with primer or sealer compatible with substrate.

C. Prime surfaces to receive sealant in accordance with sealant manufacturer's instructions.

3.03 INSTALLATION:

A. Perform glazing work in accordance with FGMA standards and glazing manufacturer's recommendations.

B. Exercise care in cutting and handling of glass to have clean cut edges, free of any defects or damage which would interfere with the installation.

C. Replace all glass broken or damaged in the process of the work. Replace glass which is cracked or broken by others at the expense of the party causing damage.

D. Installation Methods: As scheduled at the end of this Section, and in accordance with recommendations of manufacturers of doors, windows and framing systems.

1. Exterior Dry Method (Tape and Gasket Spline):
   a. Apply glazing tape or spline to glass; butt-joint tape edges; seal joints with sealant.
   b. Locate setting blocks in accordance with Insulating Glass Manufacturers Alliance (IGMA) TM-3000.

c. Set glass unit on setting blocks; apply pressure against fixed stop for full contact.
d. Install removable stops without displacing glazing tape or spline; apply pressure for full continuous contact.
e. Trim sight-exposed tape flush with stop.

2. Exterior Wet/Dry Method (Tape and Sealant):
   a. Apply glazing tape to glass; butt-joint tape edges; seal joints with sealant.
   b. Apply glazing tape to permanent stops, ¼ inch below sight line; butt-joint tape edges; seal joints with sealant.
   c. Apply heel bead of sealant along intersection of permanent stop with frame; ensure full perimeter seal between glass and frame for continuity of air and vapor seal.
   d. Locate setting blocks in accordance with IGMA TM-3000.
   e. Set glass unit on setting blocks; apply pressure against fixed stop for full contact.
   f. Install removable stops without displacing glazing tape; insert spacer strips between glazing and applied stops; terminate spacer strips ¼ inch below sight line; apply pressure for full continuous contact.
   g. Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing and to 3/8 inch below sight line.
   h. Apply cap bead of sealant along void between stop and glazing to uniform line flush with sight line; tool sealant surface smooth.

3. Interior Dry Method (Tape and Tape):
   a. Apply glazing tape to permanent stops, allowing tape edge to project 1/16 inch above stop; butt-joint tape edges; seal joints with sealant.
   b. Place setting blocks with edge blocks maximum 6 inches from glass edges and intermediate blocks at ¼ points of glass panel length.
   c. Set glass unit on setting blocks; apply pressure against fixed stop for full contact.
   d. Apply glazing tape on free perimeter of glazing as described above.
   e. Install removable stops without displacing glazing tape; apply pressure for full continuous contact.
   f. Trim sight-exposed tape flush with stop.

4. Interior Wet/Dry Method (Tape and Sealant):
   a. Apply glazing tape to glass; butt-joint tape edges; seal joints with sealant.
   b. Place setting blocks with edge blocks maximum 6 inches from glass edges and intermediate blocks at ¼ points of glass panel length.
   c. Set glass unit on setting blocks; apply pressure against fixed stop for full contact.
   d. Install removable stops without displacing glazing tape; insert spacer strips between glazing and applied stops; terminate spacer strips ¼ inch below sight line; apply pressure for full continuous contact.

e. Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing and to uniform line flush with sight line; tool sealant surface smooth.
f. Trim sight-exposed tape flush with stop.

5. Interior Wet Method (Compound and Compound):
   a. Place setting blocks at ¼ points; install glazing unit.
   b. Install applied stops; center glass unit in space by inserting spacer shims both sides at intervals of 24 inches; set spacer shims ¼ inch below sight line.
   c. Locate and secure glazing pane using glazer's clips.
   d. Fill gaps between glazing and stops with glazing compound flush with sight line; tool surface to straight line.

3.04 CLEANING: In accordance with Section 01 7700.

A. Remove excess glazing materials and sealants immediately after glazing operation is completed.

B. Remove labels from glass immediately after Substantial Completion.

3.05 SCHEDULE:

A. Safety Glazing: Provide tempered glass at the following locations, at locations required by applicable building code, and where indicated:
   1. In ingress and egress doors.
   2. In fixed panels having a glazed area in excess of 9 square feet with the lowest edge less than 18 inches above the finish floor level or walking surface within 36 inches of such glazing.
      a. Safety glazing is not required when glazed panels have a horizontal mullion located between 24 and 36 inches above the walking surfaces.
   3. In fixed or operable panels adjacent to a door and within the same plane as the door whose nearest vertical edge is within 24 inches of the door in a closed position and whose bottom edge is less than 60 inches above the floor or walking surface.

B. Installation Methods:
   1. Hollow Metal Doors: Wet/Dry method.
   2. Hollow Metal Borrowed Lites: Dry method.
   3. Wood Doors: Wet method.
   4. Aluminum Storefronts: Dry method.

END OF SECTION

SECTION 09 2210 – METAL SUPPORT SYSTEMS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Non-load bearing metal framing.
   2. Suspension systems for gypsum board and cement board ceilings.

B. Related Sections:
   1. Section 09 2900 – Gypsum Board.
   2. Section 09 8100 – Acoustic Insulation.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Materials: ASTM C645; fabricated from ASTM A653 sheet steel with minimum G40 galvanized coating, roll formed.

B. Interior Components: Minimum 20 gauge; 0.0312 inch minimum base metal thickness, or embossed pattern with equivalent structural properties documented by third party testing acceptable to authorities having jurisdiction.

2.02 NON-LOAD BEARING METAL FRAMING:

A. Manufacturers: In accordance with Section 01 6000.
   1. ClarkDietrich Building Systems.
   2. J. N. Linrose Manufacturing.
   3. MRI Steel Framing, LLC.
   4. State Building Products.
   5. Steel Structural Products LLC.
   6. Ware Industries, Inc.; Marino Ware.

B. Studs and Framing Components: Channel shape, punched web; sizes as indicated on the Drawings.

C. Runners: Unhemmed channel shape, unpunched web; sizes as indicated on the Drawings, and as required to accommodate framing members.

D. Headers and Jambs: Factory fabricated from unpunched components, with stiffened flanges.

E. Lateral Bridging:
   1. Unhemmed channel shape, ¾ inch with ½ inch flanges; 16 gauge; 0.054 inch minimum base metal thickness.
   2. Angle shape with prenotched slots to engage cutouts in framing member webs, 7/8 inch x 7/8 inch; 20 gauge; 0.0312 inch minimum base metal thickness

F. Backing: Flat stock, minimum 6 inch width, minimum 20 gauge thickness.
   1. Where point loads may exceed 250 lbs., including grab bars and shower curtain rods, provide minimum 5 inch wide backing bar with 1¼ inch flanges.

2.03 SUSPENDED CEILING FRAMING:

A. Grid System: ASTM C635, heavy duty; G40 hot dipped galvanized coating; 1½ inch flange width; commercial quality cold rolled steel; components die cut and interlocking; unpainted.
   1. Manufacturers: In accordance with Section 01 6000.
      a. Armstrong World Industries, Inc.; Drywall Grid System.
      b. CertainTeed Corporation.
      c. Chicago Metallic Corporation; 670-C Drywall Furring System.
      d. USG Corp.; Drywall Suspension System.
   2. Hanger Wire: Steel, minimum 12 gauge.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Install metal support system products in accordance with standard construction practices and manufacturer's recommended methods. Install members plumb, straight, true, and level to the lines indicated on the drawings. Connect members using welds, screws, or bolts.

3.02 FRAMING:

A. Install metal framing in accordance with ASTM C754.

B. Handle and lift prefabricated panels in a manner to prevent distortion.

C. Securely anchor runners to supporting structure at maximum 24 inches o.c. and 2 inches from each end.

D. At butt joints of runners, securely anchor abutting pieces of runner to a common structural element, or butt-weld or splice components together.

E. Securely attach studs to the flanges or webs of both upper and lower runners, plumb and aligned, with open side of studs facing in same direction. Space framing 16 inches o.c., except where indicated otherwise.
   1. Install one stud at each side of expansion and control joints.
   2. Install jack studs or cripples below openings to furnish support. Securely attach to supporting members.
   3. Position closed side of studs to be in direct contact with abutting partitions, partition corners and masonry construction elements.

F. Where partition extends to underside of structure above, accommodate structural deflection by one of the following methods as approved by framing manufacturer:
   1. Double deep leg head runner with studs secured to lower runner only.
   2. Single deep leg head runner with studs secured to horizontal bridging within 12 inches of track.
   3. Head runner with pre-attached UL classified galvanized steel clips and slotted holes for stud attachment with mechanical fasteners.

G. Where partition or bulkhead does not extend to underside of structure above, provide bracing at approximate 45 degree angle from top of partition to structure, using studs of same size as partition at maximum 32 inches o.c. on alternating sides of partition.

H. At bottom of bulkheads, provide bracing at approximate 45 degree angle from bottom of bulkhead to structure, using framing of same size as bulkhead framing at maximum 32 inches o.c. on alternating sides of bulkhead, or on one side of bulkhead where required by configuration of ceiling and structure.

I. Install bridging, blocking, and anchoring as required to secure the frame rigidly in place and to support the edges of all boards and panels.

J. Install backing required to support and anchor items installed by other trades. Coordinate locations and requirements.

K. Install all lateral bridging required, including the following locations. Bridging may be omitted where spans do not exceed manufacturer's table of limiting heights.
   1. Walls up to 10 ft high: One row at mid-span.
   2. Walls from 10 to 14 ft high: Two rows equally spaced.
   3. At mid-span locations of bulkheads.

3.03 SUSPENDED CEILING FRAMING:

A. Install suspension system in accordance with ASTM C636 and manufacturer's instructions.

B. Locate system on room axis to a balanced grid design to minimize gypsum board joints. Coordinate layout with HVAC, lighting, and other ceiling mounted components indicated.

C. Install after major above ceiling work is complete. Coordinate the location of hangers with other work.

D. Install main runners at 48 inches o.c. at right angles to structural framing, with cross tees at 24 inches o.c. spanning between main runners.

E. Hang suspension system from building structure independent of metal deck, walls, columns, ducts, pipes, and conduit. Install hangers at maximum 48 inches o.c. Provide supplemental steel framing in accordance with Section 05 5000, sized to carry imposed loads, where required to maintain specified hanger spacing.

F. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently.

END OF SECTION

SECTION 09 2600 – VENEER PLASTERING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Veneer plaster over cement board surfaces.

B. Related Sections:
   1. Section 09 2900 – Gypsum Board: Cement board substrate.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Provide data on veneer plaster products.

B. Samples: Submit two sample panels, 18 x 18 inch in size illustrating veneer finish and texture.

1.03 QUALITY ASSURANCE:

A. Perform Work in accordance with GA 150.

1.04 ENVIRONMENTAL REQUIREMENTS:

A. Do not apply veneer plaster when substrate or ambient air temperature is less than 55 degrees F or more than 80 degrees F; for 24 hours prior to, during operations and after, until building heating system can maintain the above minimum temperature.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. USG Corp.; Diamond Veneer Basecoat, Imperial Finish Plaster.

B. National Gypsum Company, Gold Bond Building Products; Kal-Kote.

C. Georgia-Pacific; Dens-Cote.

2.02 MATERIALS:

A. Gypsum Veneer Plaster: ASTM C587.

B. Bond Coat: ASTM C631, vinyl polymer type.

2.03 MIX DESIGN:

A. Mix plaster in accordance with ASTM C587 and manufacturer's instructions.

PART 3 EXECUTION

3.01 PREPARATION:

A. Clean surfaces of dust or loose matter.

B. Remove projections greater than 1/8 inch and fill depressions greater than 1/4 inch with latex filler.

C. Cement Board Substrate:
   1. Apply bond coat to joints in accordance with manufacturer's instructions.
   2. Finish joints in accordance with Section 09 2900 for Level 2 finish.
   3. Apply bond coat to entire surface in accordance with manufacturer's instructions.

3.02 APPLICATION OF VENEER PLASTER:

A. Apply gypsum veneer plaster in accordance with ASTM C843 and manufacturer's instructions.

B. Two Coat Application:
   1. Apply base coat to a thickness of 1/16 inch.
   2. Apply final coat over slightly green, almost dry base coat, to a thickness of 1/16 inch.
   3. Total Thickness: 1/8 inch.

C. Finish surface to flat, smooth, hard trowel finish.

D. Point around fixtures and other items abutting or extending into plaster.

E. Inspect finished surfaces and repair defects, cracks, blisters, pits, checks, discolorations, and damaged spots.

3.03 TOLERANCES:

A. Maximum Variation From Specified Thickness: Plus or minus 1/64 inch.

3.04 PROTECTION OF FINISHED WORK: In accordance with Section 01 7000.

A. Do not permit traffic near unprotected finished surfaces.

B. Clean adjacent aluminum surfaces at the end of each day's work.

END OF SECTION

SECTION 09 2900 – GYPSUM BOARD

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Interior gypsum wall and ceiling board.
   2. Backing boards.
   3. Gypsum board finishing.

B. Related Sections:
   1. Section 09 2210 – Metal Support Systems: Non-load bearing metal framing.
   2. Section 09 2600 – Veneer Plastering.
   3. Section 09 8100 – Acoustic Insulation.
   4. Section 09 9000 – Painting and Coating.

1.02 QUALITY ASSURANCE:

A. Perform Work in accordance with ANSI A97.1.

1.03 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Store materials in enclosed areas, protected from damage, moisture, and exposure to the elements. Protect ready-mixed joint compounds from freezing.

B. Store panels in a flat, horizontal position. Prevent damage to edges, ends and surfaces of panels. Do not allow panel storage area to exceed 70 percent relative humidity.

C. Do not install panels damaged by moisture or mold, including those with surface contamination, discoloration, swelling, or warping.

D. Exercise caution to prevent damage to windows, doors, floors and other finished work.

1.04 ENVIRONMENTAL REQUIREMENTS:

A. Provide temporary heat, ventilation, and dehumidification in accordance with Section 01 5000 and GA 236 upon beginning gypsum board installation and continuously until finishing is complete and joint compound is fully cured. Maintain ambient temperature between 60 degrees F and 80 degrees F. Maintain relative humidity below 50 percent at 60 degrees F and 70 percent at 80 degrees F.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. CertainTeed Corp.

B. Continental Building Products.

C. Georgia-Pacific Corp.

D. National Gypsum Company, Gold Bond Building Products.

E. USG Corp.

2.02 GYPSUM BOARD:

A. Interior Gypsum Panels: ASTM C1396; tapered edge; 48 inch width, 5/8 inch typical thickness, lengths as long as practical to minimize number of joints.

2.03 BACKING BOARDS:

A. Cement Backer Board: ANSI A118.9; Portland cement with polymer-coated, glass fiber mesh; formed edge; 48 inch width, lengths as long as practical to minimize number of joints; ½ inch typical thickness.

2.04 FASTENERS:

A. Fasteners: ASTM C954 or C1002; Type S bugle head screws; minimum length in accordance with GA 216.

B. Fasteners for Backer Board: Manufacturer's standard type for application.

2.05 FINISHING MATERIALS:

A. Sealer for Cement Backer Board: ANSI A136.1, Type I organic adhesive, or as recommended by board manufacturer.

B. Joint Tape: Cross-fibered paper or self-adhesive fiberglass mesh.
   1. Joint Tape for Backer Board: Alkali-resistant fiberglass mesh.

C. Joint Compound: ASTM C475; mix in accordance with manufacturer's recommendations.
   1. Use only setting-type joint compounds for Level 1 and Level 2 finish applications, for backer board, and for adhesive application of panels.

D. Corner Bead and Trim: ASTM C1047; galvanized steel.

E. Control Joint: Roll-formed zinc or extruded PVC.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that framing members are plumb and aligned to permit panel installation in a true surface plane.

B. Verify that all work of other trades which will be concealed or covered by this work has been completed and approved. Such work may include, but not be limited to,

blocking, insulation, mechanical piping and ductwork, and electrical and communications boxes, conduit, raceway and cable.

3.02 PANEL APPLICATION:

A. Apply panels in accordance with ASTM C840, GA 216, and manufacturer's recommendations.

B. Position panel ends and edges over framing members, except when joints are at right angles to framing members or when end joints are back-blocked.

C. Apply ceiling panels before wall panels. Extend ceiling board into corners and make firm contact with top plate.

D. Apply wall panels perpendicular to studs with end joints positioned over studs. Use maximum practical lengths to minimize end joints.

E. At assemblies indicated with acoustic insulation, apply acoustical sealant to perimeter and penetrations in accordance with Section 09 8100.

F. Fit ends and edges closely, but not forced together. Stagger end joints in successive courses, with joints on opposite sides of a partition placed on different studs.

G. Attach panels to framing members with power-driven screws; draw panels tight to framing. Space fasteners not less than 3/8 inch from edges and ends of panels, and 12 inches o.c. along each framing member in field of panels. Drive fasteners in field of panels first, working toward ends and edges. Drive fastener heads slightly below surface of panels in a uniform dimple without breaking face paper.

   1. Maximum Fastener Spacing at Backer Board: 8 inches o.c.

   2. Maximum Fastener Spacing at Backer Board for Ceiling Application: 6 inches o.c.

H. Adhesive Application: Adhere panels to substrate with 4 beads of joint compound, 3/8 inch wide by ½ inch high and spaced 1½ to 2 inches o.c., at center and near each panel edge. Position panels vertically over wall surface, press into place and provide temporary support until adhesive is hardened.

I. Cut ends, edges, scribe or make cutouts within field of panels with knife and straight edge; square and true to required dimension.

   1. Cement Backer Board: Cut panels with carbide-tipped knife and straight edge, or with power saw equipped with dust collection device.

J. Install trim at internal and external angles formed by the intersection of panels with adjacent panels or other surfaces. Apply corner bead to external corners in accordance with manufacturer's directions.

K. Control Joints: Provide separate framing members on each side of joint.

1. Locations: Position to intersect openings where possible. Coordinate with items indicated to be applied to wall surface.
   a. Aligned with control joints and expansion joints in masonry substrate or building structure.
   b. Where dissimilar substrates meet without change in surface plane.
   c. Where board surface forms L, U or T shape.
   d. Gypsum Board: Maximum 30 feet o.c. in all directions.
   e. Backer Board: Maximum 16 feet o.c. in all directions.

2. Where control joints occur in acoustically insulated assemblies, follow GA 234 and manufacturer's instructions to maintain required fire and sound separation.

3.03 FINISHING:

A. Provide surfaces with finishes as scheduled, in accordance with the GA 214 definitions of finishes.

B. Level 0: No finishing required.

C. Level 1: One coat fire-tape application.
   1. Cement Backer Board: Apply one coat of sealer to areas to receive joint compound.
   2. Board Joints and Interior Angles: Pre-fill abutting tapered panel V-grooves flush with joint compound; wipe off excess. Apply compound in thin uniform layer. Apply joint tape centered over joint and embedded in compound, with sufficient compound remaining under tape to provide proper bond. Fold and embed tape in interior angles to provide true angle.
   3. Fasteners: Cover fastener heads with one coat of joint compound; wipe off excess.

D. Level 2: One coat application.
   1. Board Joints and Interior Angles: Finish as specified for Level 1. Follow immediately with thin skim coat to embed tape.
   2. Fasteners: Finish as specified for Level 1.
   3. Bead and Trim: Apply one coat of joint compound over flanges; wipe off excess and apply a thin coat of joint compound over flanges.

E. Level 3: Two coat application.
   1. Finish as specified for Level 2. When first coat is thoroughly dry, apply second coat of compound, extending slightly beyond first coat into face of board. Do not allow finish coat to protrude beyond plane of surface.
   2. Board Joints and Interior Angles: Fill panel taper flush with surface; cover tape and feather out at least two inches beyond first coat. On joints with no taper, cover the tape and feather out at least four inches on each side of tape.

F. Level 4: Three coat application.
   1. Apply final coat of joint compound feathered out over the dry second coat.

G. Final Finishing (Not Required for Levels 0, 1 and 2):
   1. Sand between coats where necessary and following final coat, to provide flat, smooth surface ready for priming and decoration; free of ridges, tool marks and sanding grooves. Do not abrade adjacent face-paper surfaces.
   2. Inspect finished surfaces and repair all defects, ridges, cracks, blisters, pits, checks, discolorations, and damaged spots.
   3. Ridges: Sand ridges to reinforcing tape without cutting through tape. Fill concave areas on both sides of ridge with topping compound. After fill is dry, blend in topping compound over repaired area.
   4. Cracks: Fill cracks with compound and finish smooth and flush.

3.04 CLEANING:

A. At completion of the work of this section, remove all debris and excess materials. Remove all joint compound from floor and leave all areas broom clean.

3.05 SCHEDULE OF FINISHES:

A. Surfaces Indicated as Unfinished: Level 0.

B. Surfaces Above Suspended Ceilings: Level 1.

C. Gypsum Board Indicated to Receive Paint: Level 4.

D. Cement Backer Board Indicated to Receive Veneer Plaster: In accordance with Section 09 2600.

E. Surfaces Not Otherwise Scheduled: Level 3.

END OF SECTION

SECTION 09 3013 – CERAMIC TILING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Ceramic wall tile.

B. Related Sections:
   1. Section 04 2000 – Unit Masonry: Masonry substrate.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Indicate physical and performance characteristics, and installation instructions.

B. Samples: Submit 12 x 12 inch sample panel of each color, pattern and type of tile scheduled. Provide grout color samples for selection.

1.03 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Operation and Maintenance Data: Indicate recommendations of tile and grout manufacturers for cleaning products and methods.

1.04 EXTRA MATERIALS: In accordance with Section 01 7700.

A. Provide 2 percent of extra materials to Owner, for each type of tile; in new, unopened, packaging with protective covering for storage, identified with appropriate labels.

1.05 ENVIRONMENTAL REQUIREMENTS:

A. Maintain temperature at minimum 50 degrees F during tile work and for 7 days after completion.

B. Where portable heaters are used for temporary heat, vent to outside to avoid carbon dioxide damage to tile work.

PART 2 PRODUCTS

2.01 TILE MATERIALS:

A. Manufacturers: In accordance with Section 01 6000.
   1. American Olean.
   2. Crossville Ceramics Co.
   3. Daltile.
   4. Florida Tile, Inc.
   5. Summitville Tiles, Inc.

B. Wall Tile Materials: ANSI A137.1; standard grade porcelain tile.
   1. Size: Match existing.

2. Color and Finish: Match existing.

C. Trim Shapes: Size, color, and finish to match field tile; match existing.

2.02 SETTING AND GROUTING MATERIALS:

A. Manufacturers: In accordance with Section 01 6000.
1. Bostik Findley; Durabond, Hydroment.
2. Custom Building Products.
3. H. B. Fuller Construction Products, Inc.; TEC.
4. Laticrete International, Inc.
5. Mapei.
6. W. R. Bonsal Co.

B. Setting Materials: ANSI A136.1, Type I organic adhesive.

C. Grouting Materials: ANSI A118.6, latex portland cement grout.
1. Color: Match existing.

D. Sheet Membrane Waterproofing: ANSI A118.10.

E. Sealer: Clear, water based, penetrating type; water, oil and stain repellent. (Custom Aqua Mix Sealer's Choice Gold)

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify substrate surfaces are smooth and sound, free of curing membranes, oil, grease, wax, dust and other foreign substances, and within 1/8 inch in 8 ft.

3.02 PREPARATION:

A. Install waterproof membrane at scheduled locations in accordance with ANSI A108.13.

3.03 INSTALLATION:

A. Layout:
1. Jointing Pattern: Lay tile in grid pattern. Lay out tile work and center tile fields in both directions in each area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise shown.
2. Extend tile work into recesses and under or behind equipment and fixtures, to form a complete covering without interruptions, except as otherwise shown. Terminate work neatly at obstructions, edges and corners without disrupting pattern or joint alignment.
3. Determine locations of movement joints before starting tile work.
4. Lay out tile work to minimize cuts less than one-half tile in size. Locate tile cuts to be least conspicuous.
5. Align wall joints to give straight uniform grout lines, plumb and level.

B. Installation Methods:
   1. Wall Tile on Masonry: ANSI A108.4, TCNA Method W223.
   2. Wall Tile on Masonry (Shower Rooms): ANSI A108.1B, TCNA Method W211 with sheet membrane waterproofing.

C. Patterns: Refer to Drawings for ceramic tile locations and patterns.

D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures and other penetrations so that plates, escutcheons, or covers overlap tile.

E. Smooth all exposed cut tile edges.

F. Expansion and Control Joints: Provide openings for joints where shown and to comply with details, or, if not shown and detailed, to comply with recommendations in TCNA Handbook. Align joints with joints in substrate, where present.

G. Apply one coat of sealer at manufacturer's recommended rate, prior to grouting.

H. Grouting: ANSI A108.10.
   1. Follow grout manufacturer's recommendations as to grouting procedures and precautions.
   2. Remove grout film, observing both tile and grout manufacturers' recommendations as to use of acid and chemical cleaners.
   3. Rinse tile work thoroughly with clean water before and after chemical cleaners.
   4. Polish surface of tile work with soft cloth.

I. Install trim with anchoring leg adhered to substrate. Grout joint between trim and adjacent tile.

3.04 CLEANING:

A. Upon completion of installation and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

B. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturers' printed instructions, but not sooner than 14 days after installation.

C. Protect metal surfaces, cast iron and vitreous plumbing fixtures from effects of acid cleaning.

D. Flush surface with clean water before and after cleaning.

3.05 PROTECTION:

A. Prohibit all traffic from newly tiled floors for minimum 3 days, preferably 7 days.

B. When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile surfaces.

C. Protect installed tile work with plywood or similar durable covering during construction period to prevent damage and wear.

D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

E. Apply final coat of sealer after Owner occupancy. Coordinate scheduling to minimize disruption to Owner activities.

F. Leave finished installation clean and free of cracked, chipped, broken, unbonded, or otherwise defective tile work.

END OF SECTION

SECTION 09 5100 – ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Suspended metal grid ceiling system and perimeter trim.
   2. Acoustic panels.

B. Related Sections:
   1. Section 21 1300 – Fire Suppression Sprinkler Systems: Sprinkler heads in ceiling system.
   2. Division 23 – HVAC: Air outlets and inlets in ceiling system..
   3. Division 26 – Electrical: Power outlets and light fixtures in ceiling system.
   4. Division 27 – Communications: Communications outlets and speakers in ceiling system.

1.02 SYSTEM DESCRIPTION:

A. Design Requirements for Suspension System: Rigidly secure acoustic ceiling system including integral mechanical and electrical components with maximum deflection of 1/240 of span.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other work or ceiling finishes, and interrelation of mechanical and electrical items related to system.

B. Product Data: Provide data on metal grid system components, acoustic units, and accessories.

1.04 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Indicate recommendations for cleaning and refinishing acoustic units, including precautions against materials and methods which may be detrimental to finishes and acoustical performance.

1.05 EXTRA MATERIALS: In accordance with Section 01 7700.

A. Provide 1 percent of total area of extra panels to Owner, for each type of acoustic unit and ceiling panel; in new, unopened, packaging with protective covering for storage, identified with appropriate labels.

1.06 QUALITY ASSURANCE:

A. Conform to CISCA Acoustical Ceilings: Use and Practice.

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

C. Installer Qualifications: Company specializing in installing the Products specified in this section with minimum three years documented experience.

D. Regulatory Requirements: Conform to applicable building code for combustibility requirements for materials.

1.07 PROJECT CONDITIONS:

A. Sequence work to ensure acoustic ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, interior wet work is dry, and overhead work is completed, tested, and approved.

B. Maintain uniform temperature of minimum 55 degrees F and maximum 70 degrees F, and maximum humidity of 75 percent, for minimum 25 hours prior to, during, and 25 hours after acoustic unit installation.

1.08 WARRANTY: In accordance with Section 01 7700.

A. Provide manufacturer's warranty that humidity resistant ceiling panels will be free from sagging or warping for a period of 10 years from Substantial Completion.

PART 2 PRODUCTS

2.01 SUSPENSION SYSTEM MATERIALS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Armstrong World Industries, Inc.
   2. CertainTeed Corporation.
   3. Rockfon; Chicago Metallic.
   4. USG Interiors, Inc.

B. Exposed Grid: ASTM C635, intermediate duty or heavy duty; exposed T; commercial quality cold rolled steel with G60 hot dipped galvanized coating; components die cut and interlocking. (Armstrong Prelude Plus XL Fire Guard; Chicago Metallic Fire Front 1830 System; USG Donn ZXLA)
   1. Exposed Grid Surface Width: 15/16 inch.
   2. Grid Finish: White aluminum cap.

C. Accessories: Stabilizer bars, clips, splices, perimeter moldings, and other accessories required for suspended grid system.

D. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.

2.02 ACOUSTIC UNIT MATERIALS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Armstrong World Industries, Inc.
   2. CertainTeed Corporation.
   3. USG Interiors, Inc.

B. Abuse Resistant Panels: ASTM E1264, Type IV, Form 2; impact resistant, scratch resistant; 24 x 48 inches, ¾ inch thick. (Armstrong Ultima 1913; CertainTeed Symphony *m* 1220-OVT-1; USG Mars 88185)
   1. Panel Composition: Mineral fiber, wet felted.
   2. Fire Hazard Classification: ASTM E84, Class A.
      a. Flame Spread Rating: Maximum 25.
      b. Smoke Developed Rating: Maximum 10.
   3. Noise Reduction Coefficient (NRC): ASTM E1264; minimum 0.70.
   4. Humidity Resistance: Designed to withstand temperature of 104 degrees F and 90% relative humidity without visible sag.
   5. Surface Color: White.
   6. Edge Profile: Square lay-in.

2.03 ACCESSORIES:

A. Touch-up Paint: Type and color to match acoustic and grid units.

B. Concealed Hold-Down Clips: Armstrong Universal Hold Down Clip or equal by suspension system manufacturer.

C. Hanger Wire: Steel, minimum 12 gauge.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION OF LAY-IN GRID SUSPENSION SYSTEM:

A. Install suspension system in accordance with ASTM C636 and manufacturer's instructions.

B. Locate system on room axis according to reflected ceiling plan. Where reflected ceiling plans are not provided, lay out system to a balanced grid design with edge units no less than 50 percent of acoustic unit size.

C. Install after major above ceiling work is complete. Coordinate the location of hangers with other work.

D. Install main runners at 48 inches o.c. at right angles to structural framing, with cross tees at 24 inches o.c. spanning between main runners.

E. Hang suspension system from building structure independent of metal deck, walls, columns, ducts, pipes, and conduit. Install hangers at maximum 48 inches o.c. Provide supplemental steel framing, sized to carry imposed loads, where required to maintain specified hanger spacing.

F. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

G. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently.

I. Do not eccentrically load system, or produce rotation of runners.

J. Perimeter Molding:
   1. Install edge molding at intersection of ceiling and vertical surfaces.
   2. Secure edge molding to substrate with screw anchors through holes provided in vertical leg, at maximum 3 inches from each end and maximum 16 inches o.c.
   3. Use longest practical lengths.
   4. Miter corners to provide hairline joints. Cope exposed flanges of intersecting members, so that faces will be flush.
   5. Provide at junctions with other interruptions.

3.03 INSTALLATION OF ACOUSTIC UNITS AND CEILING PANELS:

A. Install units in accordance with manufacturer's instructions.

B. Fit units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Lay directional patterned units one way with pattern parallel to shortest room axis. Fit border trim neatly against abutting surfaces.

D. Install units after work above ceiling is complete.

E. Install units level, in uniform plane, and free from twist, warp, and dents.

F. Cut units to fit irregular grid and perimeter edge trim. Cut edges to match factory edge treatment. Field paint exposed edges to match factory edges.

G. Where round or radiused obstructions occur, provide preformed closures to match perimeter molding.

H. Install concealed hold-down clips to retain panels tight to grid system at the following locations:
   1. Within 48 inches of HVAC supply diffusers.
   2. Within 8 feet of vestibule and exterior doors.
   3. Toilet rooms.

3.04 ERECTION TOLERANCES:

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

SECTION 09 6500 – RESILIENT FLOORING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Luxury vinyl flooring.
   2. Rubber sheet flooring.
   3. Resilient base.

B. Related Sections:
   1. Section 01 5000 – Temporary Facilities and Controls: Temporary dehumidification.
   2. Section 03 3000 – Cast-in-place Concrete.
   3. Section 09 6723 – Resinous Flooring.
   4. Section 09 6800 – Carpeting.

1.02 PREINSTALLATION MEETING: In accordance with Section 01 3100.

A. Attendance: Flooring Installer, Contractor, Owner, and Architect.

B. Review methods and procedures related to flooring work, including approved submittals, samples, substrate conditions, perimeter transitions, and manufacturer's written instructions.

C. Review schedule and planned sequence of installation; availability of materials and labor; equipment, facilities, and temporary protection.

1.03 SEQUENCING AND SCHEDULING:

A. Install resilient flooring and accessories after other finishing operations (including painting) have been completed.

B. After installation, close areas to traffic and to other work for minimum 72 hours and until flooring is firmly set.

1.04 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Indicate physical and performance characteristics, and installation instructions.

B. Samples: Submit samples for each product scheduled, showing full range of standard colors and patterns.

1.05 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Maintenance Instructions: Include manufacturer's recommendations for each type of flooring.

B. Extra Tile and Plank Materials: Provide one box of each type, color, pattern, and size of flooring installed, from same lot as installed materials; in new, unopened, packaging with protective covering for storage, identified with appropriate labels.

C. Extra Sheet Flooring Materials: Provide 1 percent of each type, color, and pattern of sheet flooring installed, from same lot as installed materials; in undamaged rolls with protective covering for storage, identified with appropriate labels.

1.06 QUALITY ASSURANCE:

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

B. Installer Qualifications: Company specializing in installing the Products specified in this section with minimum three years documented experience; approved by manufacturer.

C. Fire Performance Characteristics: Provide materials whose properties have been determined in accordance with the test methods indicated below, by testing organizations acceptable to regulatory agencies having jurisdiction.
   1. Radiant Panel Test: ASTM E648; Class I.
   2. Smoke Density: ASTM E662; maximum 450 specific optical density.

1.07 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Store materials in original containers, at temperatures between 65 degrees F and 100 degrees F.

B. Protect roll materials from damage by storing on end.

1.08 ENVIRONMENTAL REQUIREMENTS:

A. Maintain the temperature of the space and the materials to be installed at a minimum 65 degrees F and maximum 100 degrees F for minimum 48 hours prior to, during, and 48 hours after installation.

B. Provide temporary ventilation in accordance with Section 01 5000 where required. Where solvent-based adhesives are used, provide safety sparkproof fans; prohibit smoking.

C. After installation, maintain minimum temperature of 55 degrees F in areas where work is complete.

1.09 WARRANTY: In accordance with Section 01 7700.

A. Luxury Vinyl Flooring: Provide manufacturer warranty against wear; minimum 10 years.

B. Sheet Rubber: Provide manufacturer warranty against wear; minimum 5 years.

PART 2 PRODUCTS

2.01 LUXURY VINYL FLOORING:

A. Manufacturers: In accordance with Section 01 6000.
   1. Tarkett North America.

B. Luxury Vinyl Flooring: ASTM F1700, Class III, Type B; textured surface; factory applied polyurethane finish.
   1. Floor Plank: 6 x 48 inch; 3 mm thick; 20 mil polymerized vinyl wear layer. (Tarkett iD Latitude Wood)
   2. Color and Pattern: As selected.

2.02 RUBBER FLOORING:

A. Manufacturers: In accordance with Section 01 6000.
   1. Ultimate RB.

B. Sheet Rubber: 8mm thick; 48 inch roll width; urethane binder.
   1. Color: As selected.

2.03 RESILIENT BASE:

A. Manufacturers: In accordance with Section 01 6000.
   1. American Biltrite.
   2. Armstrong Flooring, Inc.
   3. R. C. Musson Rubber Co.
   4. Nora Systems, Inc.
   5. Roppe Corp.
   6. Tarkett North America; Johnsonite.
   7. VPI Corp.

B. Rubber Wall Base: ASTM F1861, Type TS, Group I or II; cove profile; 1/8 inch thick; lengths as long as practicable to minimize joints. (Johnsonite BaseWorks; Roppe Pinnacle series; American Biltrite Pro-Tech series)
   1. Height: 4 inch.
   2. Color: As selected.
   3. Where new base is installed adjacent to existing base, match existing in color and height.

2.04 ACCESSORIES:

A. Manufacturers: In accordance with Section 01 6000.
   1. Flooring or base manufacturer.
   2. Dural USA, Inc.
   3. Roppe Corp.
   4. Schlüter Systems, Inc.
   5. Tarkett North America; Johnsonite.

B. Floor Transitions and Edge Protection: As recommended by resilient flooring manufacturer.
   1. At Exposed Concrete or Resinous Flooring: Rubber for glue down installation; butting gauge as required for flooring material.
   2. At Carpet: Rubber for glue down installation; butting gauge as required to accept approved carpet.

C. Adhesive: Waterproof mastic, as recommended by resilient flooring manufacturer for application and substrate conditions; spray-on adhesives are not permitted.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Test concrete substrate for moisture emission in accordance with ASTM F1869; maximum 3.0 pounds of water per 1000 square feet of slab in a 24 hour period, unless manufacturer recommends more stringent criteria.

B. Verify that substrates are dry, clean, smooth and flat and meet the requirements of ASTM F710. Correct unsatisfactory conditions prior to beginning installation. Proceeding with installation indicates acceptance of substrate conditions.

3.02 PREPARATION:

A. It shall be the full responsibility of this contractor to assure a level floor prior to installation of finish flooring. Install patching compound to fill cracks, holes and depressions and to correct uneven areas in the floor or grind off high spots prior to installation of flooring.
   1. Where thickness greater than 1/8 inch is required, apply patching compound in two or more applications.

B. Remove paints, oils, release agents, waxes, and sealers. Remove curing and hardening compounds not compatible with the adhesives employed.

C. Remove mastics and adhesives from previous flooring in accordance with RFCI Recommended Work Practices.

D. Broom or vacuum clean subfloor prior to installing flooring material.

E. Remove debris, sand, and other materials which would result in lack of adhesion or promote cracking. If these or any other defects occur within 1 year after Substantial Completion, the entire flooring at these areas shall be removed and replaced at no additional cost to the Owner.

3.03 INSTALLATION:

A. Install products in accordance with manufacturer's recommendations.

B. Adhesive Application: Apply adhesives following manufacturer's instructions, observing the recommended trowel notching, spread rates and open times. Do not permit the use of reground trowels.

C. Tightly adhere resilient flooring to substrate without open cracks, voids, raising and puckering at joints, telegraphing of adhesive, spreader marks, or other surface imperfections. Hand roll resilient flooring with minimum 100 pound floor roller at perimeter of each covered area to assure adhesion.
   1. Sheet Rubber Flooring: Roll entire sheet area in both directions within one hour after installation. Hold seams in place with suitable weights for minimum 12 hours.

D. Scribe, cut, and fit resilient flooring to permanent fixtures, pipes, outlets, columns, walls and partitions.
   1. Scribe, cut, and fit resilient flooring to perimeter of electrical and plumbing items which penetrate through the finish floor, including but not limited to electrical floor outlets, conduit, communications outlets, floor drains, plumbing and gas lines and related items.

E. Extend resilient flooring into toe spaces, door reveals, and into closets and similar openings.

F. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other non-permanent marking device.

G. Floor Tile and Plank Layout:
   1. Lay tile from center marks established with principal walls, discounting minor offsets, so that tile at opposite edges of room area are of equal width. Adjust as necessary to avoid use of cut widths less than ½ tile at room perimeters. Lay tile square to room axis, unless otherwise indicated.
   2. Match tiles for color and pattern by using tile from cartons in same sequence as manufactured and packaged, if so numbered. Cut tile neatly around fixtures. Broken, cracked, chipped, or deformed tiles are not acceptable. Lay tile with grain running parallel in adjacent tiles unless otherwise indicated.
   3. Unless specifically indicated on flooring plans, joints need not align at doorways.

H. Sheet Rubber Flooring Layout: Lay out flooring to minimize seams. Where seams are required, use methods in accordance with flooring manufacturer's recommendations. Prepare and finish seams to produce flush surfaces.

I. Resilient Base: Apply base to walls, columns, pilasters, and permanent fixtures in rooms or areas where base is scheduled or required. Install base in lengths as long as practicable, with mitered or coped inside corners. Tightly bond base to substrate throughout length of each piece, with continuous contact at horizontal and vertical surfaces. On masonry surfaces, or other similar irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material. Locate joints minimum 3 feet from corners.

J. Place carpet edge strips tightly butted to flooring and secure with adhesive. Install edge strips at all areas where carpet abuts dissimilar flooring material.

K. Place reducer strips tightly butted to flooring and secure with adhesive. Install reducer strips where resilient flooring material or resinous flooring abut each other or exposed concrete.

3.04 CLEANING: In accordance with Section 01 7700.

A. Sweep or vacuum floor thoroughly immediately upon completion.

B. Remove excess adhesives from flooring and adjacent surfaces using appropriate cleaner recommended by manufacturer.

C. Do not wash floor until time period recommended by manufacturer has elapsed, to allow resilient flooring to become well sealed in adhesive.

D. Damp mop floor, being careful to remove black marks and excessive soil.

3.05 PROTECTION:

A. Protect flooring against damage during construction period in accordance with manufacturer's instructions.

END OF SECTION

SECTION 09 6723 – RESINOUS FLOORING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Seamless epoxy resin flooring system.

B. Related Sections:
   1. Section 03 3000 – Cast-in-Place Concrete.

1.02 PREINSTALLATION MEETING: In accordance with Section 01 3100.

A. Attendance: Flooring Installer, Contractor, Owner, and Architect.

B. Review methods and procedures related to flooring work, including approved submittals, samples, substrate conditions, perimeter transitions, and manufacturer's written instructions.

C. Review schedule and planned sequence of installation; availability of materials and labor; equipment, facilities, and temporary protection.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Indicate products, material properties, environmental requirements, and installation instructions.

B. Samples: Six inch square samples of resinous system applied to rigid backing; indicating coating layers and thickness of each layer; indicating finish color and texture.

1.04 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Maintenance Instructions: Indicate cleaning materials and methods.

1.05 QUALITY ASSURANCE:

A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience; approved by manufacturer.

1.06 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Comply with manufacturer's recommendations for storage temperature and location, and product shelf life.

1.07 PROJECT CONDITIONS:

A. Environmental Requirements: Comply with manufacturer's recommendations for substrate and ambient temperatures, ventilation, and other conditions required to execute and protect work, and to minimize air quality problems for others on site.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Sherwin-Williams Co.; Ceramic Carpet #400.

2.02 PERFORMANCE REQUIREMENTS:

A. Compressive Strength: ASTM C579; minimum 12,000 psi.

B. Tensile Strength: ASTM C307; minimum 1600 psi.

2.03 MATERIALS:

A. Flooring System: Epoxy resin with decorative broadcast aggregate; chemical resistant.
   1. Primer, Base Coat, Grout Coat, and Top Coat: Manufacturer's standard; self leveling.
   2. Aggregate: Quartz; color as selected.
   3. Finish Texture: Slip resistant.
   4. Thickness: Minimum 1/8 inch.

2.04 MIXES:

A. Mix materials in accordance with manufacturer's instructions including product data and product technical bulletins. Do not exceed recommended pot life.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify substrate conditions are acceptable in accordance with manufacturer's instructions; dry; free of oil, grease, dirt, bituminous materials, and other contaminants.

B. Test concrete substrate for moisture emission in accordance with ASTM F1869; maximum 3.0 pounds of water per 1000 square feet of slab in a 24 hour period, unless manufacturer recommends more stringent criteria. Perform minimum 2 tests, plus 1 test per 1000 sq ft.

C. Installation of flooring indicates acceptance of substrate conditions including responsibility for defects after installation.

3.02 PREPARATION:

A. Protect adjacent work areas and finish surfaces from damage.

B. Remove weak or deteriorated concrete to sound concrete; patch in accordance with manufacturer's recommendations.

C. Remove oil, grease, wax, and surface contaminants by detergent scrubbing, low pressure water cleaning, steam cleaning, or chemical cleaning. Test pH of concrete and repeat cleaning until pH is between 11 and 13.

D. Mechanically blast clean concrete substrate with mobile steelshot, dust recycling equipment or other methods approved by manufacturer. Completely remove paints, sealers, toppings, hardened concrete layers, laitance, power trowel finishes and other surface characteristics harmful to coating bond. Prepared surface shall be bare concrete with upper fascia of aggregate exposed, with profile similar to 40 grit sandpaper, or as recommended by manufacturer.

E. Patch and level rough surfaces to prevent visibility of joints and surface defects.

F. Apply sealant to fill joints and cracks.

G. Bond Test: Perform manufacturer's recommended bond test, minimum one test per 250 square feet; verify that bond of primer to substrate is greater than tensile strength of substrate. Repeat as required until satisfactory results are obtained.

3.03 INSTALLATION:

A. Install flooring system in accordance with manufacturer's installation instructions to achieve uninterrupted uniform color, texture, and appearance.
   1. Primer: Apply with rollers at recommended coverage rate. Reprime areas where primer soaks into substrate. Flood primer into hairline cracks. Fill larger cracks with resin slurry and filler sand.
   2. Base Coats: Apply with rollers at recommended coverage rate to achieve scheduled thickness.
   3. Aggregate: Broadcast at recommended coverage rate to each base coat while wet. After material has cured, sweep off excess material.
   4. Grout Coat and Top Coat: Apply with rollers at recommended coverage rate in two coats, to achieve desired texture. Add curing compound thoroughly dispersed in final coat at rate determined by material and substrate temperature.

B. Cove Base: Form seamless integral cove to match floor system; minimum 4 inch height with ¾ inch cove radius.

C. Edge Termination: Maintain sharp, uniform edges without excessive thickness or ragged appearance at walls, embedded items, transitions to uncoated surfaces, and other discontinuities.

D. Curing: Cure coating at recommended temperature and duration after application of final coat.

END OF SECTION

SECTION 09 6800 – CARPETING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Sheet carpet direct-glued to substrate.
   2. Accessories.

B. Related Sections:
   1. Section 01 5000 – Temporary Facilities and Controls: Temporary dehumidification.
   2. Section 09 6500 – Resilient Flooring: Rubber base and transition strips.

1.02 PERFORMANCE REQUIREMENTS:

A. Tuft Bind: ASTM D1335; minimum 10 lbs.

B. Colorfastness to Crocking: American Association of Textile Chemists and Colorists (AATCC) 165; minimum Class 4 color transfer, wet and dry.

C. Colorfastness to Light: AATCC 16E; minimum Grade 4 color change after exposure of 40 AFU.

D. Electrostatic Propensity: AATCC 134 Step Method; maximum 3.0 Kv.

E. Flammability:
   1. Methenamine Pill Test: ASTM D2859; pass.
   2. Radiant Panel Test: ASTM E648; Class I.
   3. Smoke Density: ASTM E662; maximum 450 corrected optical density (flaming mode).

F. Indoor Air Quality: Carpet and Rug Institute (CRI) Green Label Plus.

G. Static Coefficient of Friction: Minimum 0.60.

1.03 PREINSTALLATION MEETING: In accordance with Section 01 3100.

A. Attendance: Flooring Installer, Contractor, Owner, and Architect.

B. Review methods and procedures related to flooring work, including approved submittals, samples, substrate conditions, perimeter transitions, and manufacturer's written instructions.

C. Review schedule and planned sequence of installation; availability of materials and labor; equipment, facilities, and temporary protection.

1.04 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: CRI 104 Section 6; indicate layout, seaming plan, method of joining seams, direction of pile and pattern, and location of edge moldings.

B. Product Data: Indicate physical and performance characteristics, sizes, and method of installation.

C. Samples: Submit complete sets of color swatches for the proposed style and pattern.

D. Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.

1.05 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Maintenance Instructions: Include manufacturer's cleaning and spot removal recommendations for each type of carpet.

B. Extra Materials: Provide minimum 1 percent of total yardage of each style and color, with protective covering for storage, identified with appropriate labels.

1.06 QUALITY ASSURANCE:

A. Installer Qualifications: Company specializing in installing the Products specified in this section with minimum three years documented experience; manufacturer's authorized dealer or distributor.

1.07 ENVIRONMENTAL REQUIREMENTS:

A. In areas to receive flooring, maintain room temperatures at minimum 70 degrees F for 48 hours prior to, during and 48 hours following application. Materials shall be conditioned at application temperature and humidity at least 24 hours prior to, during and 48 hours following application.

B. Ventilate installation area during installation and for 3 days after installation.

1.08 WARRANTY: In accordance with Section 01 7700.

A. Provide manufacturer's standard lifetime commercial wear warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Tarkett Industries, Inc.

2.02 SHEET CARPET:

A. Style C1: Tarkett "Applause III."

1. Type: Broadloom carpet with attached polymeric cushion backing. (Tarkett Powerbond)

2. Construction: Level loop pile.
3. Roll Width: 6 ft.
4. Yarn: 100% nylon.
   a. Soil Retardant Treatment: AATCC 189; minimum 350 ppm fluorine on pile fiber of 3 separate tests.
5. Pile Thickness: ASTM D418; 0.085 inch.
6. Yarn Weight: ASTM D5848; 18 oz/sq yd.
7. Gauge: 1/13.
8. Stitches per Inch: 8.2.
9. Color: As selected.

2.03 ACCESSORIES:

A. Installation Adhesives and Seam Sealers: As recommended by carpet manufacturer for substrate type; CRI Green Label Plus.

B. Reducer Strips: Refer to Section 09 6500.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Field verify room dimensions at building site before ordering or cutting material.

B. Verify that floor surfaces are smooth and flat, within specified surface tolerances, free from grease or foreign matter, free from concrete dust or powder, and ready to receive work.

C. Verify that concrete floors are aged minimum 60 days and are ready for flooring installation by testing for alkalinity and moisture emission rate in accordance with ASTM F1869. Obtain instructions if test results are not within specified limits.
   1. Moisture Emission Rate: Maximum 3.0 pounds of water per 1000 square feet of slab in a 24 hour period, unless manufacturer recommends more stringent criteria.
   2. Alkalinity: pH range of 5 to 9.

D. Installation of flooring indicates acceptance of substrate conditions including responsibility for defects after installation.

3.02 PREPARATION:

A. Remove subfloor ridges, bumps and high spots. Fill minor or local low spots, cracks, joints, holes and other defects with latex filler.

B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.

C. Remove wax or silicone-type curing compounds prior to application of adhesive.

D. Vacuum clean substrate.

3.03 SHEET CARPET INSTALLATION:

A. Install carpet by experienced carpet layers in an approved manner in accordance with carpet manufacturer's written instructions.

B. Verify carpet match before cutting to ensure minimal variation between dye lots.

C. Lay out carpet and locate seams in accordance with CRI 104 Section 6.2 and approved shop drawings.

1. Avoid seams at conspicuous locations, high traffic areas and pivot points, including perpendicular seams at doorways and entries.

2. Where parallel seams at doorways and entries are required, center seams directly under the door.

3. Where seams are required at change of corridor direction, seam shall follow the wall line parallel to the carpet direction.

4. Align run of pile in same direction as anticipated traffic and in same direction on adjacent pieces.

5. Provide monolithic color, pattern, and texture match within any one area.

D. Install carpet tight and flat on subfloor, well fastened at edges, with uniform appearance.

E. Double cut carpet seams with accurate pattern match. Make cuts straight, true, and unfrayed. Apply seam adhesive to cut edges of woven carpet immediately.

F. Direct Glue-Down Installation: CRI 104 Section 9.

1. Apply adhesive uniformly at rate recommended by manufacturer. After sufficient open time, press carpet into adhesive.

2. Apply seam adhesive. Lay adjoining piece with seam straight, not overlapped or peaked, and free of gaps.

3. Roll with appropriate roller for complete contact of adhesive to carpet backing.

G. Install carpet wall-to-wall, using continuous lengths and as broad widths as possible to minimize the placement of seams in traffic lanes. Cut edges straight and true, and seal with adhesive or cement to form permanently invisible and non-raveling joints and seams.

H. Trim carpet neatly at walls and around interruptions.

I. Install reducer strips at door openings, where floor covering material changes, where carpet edges do not abut a vertical surface, and where indicated on the Drawings.

J. Installer is responsible for the accuracy of measurement and fit.

3.04 CLEANING:

A. Package and label remnants and usable scrap in appropriate wrappings; leave at job site where directed. Remove all scraps smaller than 10 square feet and dispose of in a legal manner.

B. Remove excess adhesive without damage from floor, base and wall surfaces.

C. Perform final cleaning in accordance with Section 01 7700. Vacuum flooring thoroughly and leave in clean and acceptable condition, free from spots, dirt or soil, and without tears, frayed or pulled tufts.

3.05 PROTECTION:

A. Protect installed flooring in accordance with Section 01 7000 and CRI 104 Section 16.

B. Do not permit traffic over unprotected floor surface.

C. Apply appropriate protective non-staining building paper covering over finished flooring areas during construction. Immediately prior to Substantial Completion, remove protective coverings and all debris from the site and dispose of in a legal manner.

END OF SECTION

SECTION 09 8100 – ACOUSTIC INSULATION

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Sound control insulation.
   2. Acoustical sealants.

B. Related Sections:
   1. Section 07 2100 – Thermal Insulation.
   2. Section 09 2210 – Metal Support Systems.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Submit product data for each type of insulation product specified, indicating compliance with specified performance characteristics and physical properties.

1.03 QUALITY ASSURANCE:

A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

B. Regulatory Requirements:

   1. Fire Performance Characteristics: Provide insulation materials whose fire performance characteristics have been determined in accordance with the test methods indicated below, by testing organizations acceptable to regulatory agencies having jurisdiction.
      a. Surface Burning Characteristics: ASTM E84.
      b. Fire Resistance Ratings: ASTM E119.
      c. Combustion Characteristics: ASTM E136.

1.04 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Deliver materials in manufacturer's original, unopened, undamaged packaging with identification labels intact. Store materials protected from exposure to harmful conditions.

PART 2 PRODUCTS

2.01 INSULATION MATERIALS:

A. Sprayed Fiber Insulation: ASTM C764, Type I, Category 1, glass fiber, or ASTM C1149, cellulose fiber.

1. Manufacturers: In accordance with Section 01 6000.
   a. CertainTeed Corporation; Insul-Safe SP.
   b. Ark-Seal International, Inc.; Blow-In-Blanket System.
   c. International Cellulose Corp.; Celbar.
2. Binder and Adhesive: Manufacturer's standard.

B. Batt Insulation: ASTM C665, Type I, glass fiber batts; unfaced.

1. Manufacturers: In accordance with Section 01 6000.
   a. CertainTeed Corporation; NoiseReducer Sound Attenuation Batts.
   b. Johns Manville Building Insulation; Formaldehyde-Free Fiberglass Insulation.
   c. Knauf Insulation GmbH.
   d. Owens-Corning Fiberglas Corporation; Sound Attenuation Batts.
   e. Thermafiber, Inc.; Sound Attenuation Fire Blankets.
2. Size: 3 to 3½ inch thickness; width as required by framing member spacing; manufacturer's standard lengths.
3. Provide batt insulation where sprayed fiber insulation cannot be installed.

C. Wall Head Insulation at Metal Deck: Precut mineral wool plugs and strips to fill deck flutes.

2.02 ACOUSTICAL SEALANT:

A. Manufacturers: In accordance with Section 01 6000.
   1. Franklin International; Titebond Professional Acoustical Smoke & Sound Sealant.
   2. Hilti, Inc.; CP 506 Smoke and Acoustic Sealant.
   3. Pecora Corp.; AC-20 FTR Acoustical and Insulation Sealant.
   4. USG Corp.; Sheetrock Acoustical Sealant.

B. Acoustical Sealant for Exposed and Concealed Joints: ASTM C834; nonsag, paintable, nonstaining latex sealant intended for sealing interior joints to reduce airborne sound transmission.

PART 3 EXECUTION

3.01 INSTALLATION:

A. General:
   1. Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions, and product carton instructions.

2. Install insulation to comply with thermal and acoustical requirements. Fit insulation to areas and conditions required, without voids.
3. Fit insulation to form a complete insulation barrier around indicated areas. Fit snugly around penetrations.
4. Coordinate insulation installation within three inches of lighting fixtures, fans, or other heat-generating electrical devices with manufacturer's recommendations and regulations of authorities having jurisdiction.

B. Sprayed Fiber Insulation:
1. Perform installation with pneumatic equipment in accordance with manufacturer's recommendations. Distribute insulation material evenly.
2. Spray-force material into cracks, holes, and seams; seal around electrical boxes, ducts, and plumbing.
3. Provide natural or mechanical ventilation continuously until materials are properly cured.

C. Batt Insulation:
1. Friction fit batts between framing members, installed neatly around and behind all electrical boxes, vent piping, duct work, and other obstructions. Butt insulation tight, covering the entire area without voids.
2. Pack loose insulation in narrow spaces where fasteners cannot be installed, to ensure complete insulation coverage.

D. Wall Heads: Friction fit batts or precut strips to fill space between top of wall framing and deck flutes, flush with face of wall. Cover with acoustical sealant.

E. Acoustical Sealant: Install acoustical sealant in accordance with ASTM C919; continuous around perimeter of acoustical assembly, between gypsum wall board and floor and ceiling substrate and adjacent wall construction, and between gypsum wall and ceiling boards.

3.02 PROTECTION:

A. Protect installed insulation from harmful weather exposure and physical abuse, where possible by non-delayed installation of concealing work or, where that is not possible, by temporary covering or enclosure. Installer shall advise Contractor of exposure hazards, including possible sources of deterioration and fire hazard.

END OF SECTION

SECTION 09 9000 – PAINTING AND COATING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Exterior painting.
   2. Interior painting.

B. Related Sections:
   1. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under other sections.
   2. Section 04 2000 – Unit Masonry.
   3. Section 05 1200 – Structural Steel Framing.
   4. Section 05 2100 – Steel Joist Framing.
   5. Section 05 3123 – Steel Roof Decking.
   6. Section 05 5000 – Metal Fabrications.
   7. Section 06 1050 – Miscellaneous Rough Carpentry.
   8. Section 07 9200 – Joint Sealants.
   9. Section 08 1100 – Metal Doors and Frames.
   10. Section 09 2600 – Veneer Plastering.
   11. Section 09 2900 – Gypsum Board.
   12. Divisions 21 to 28: Facility services piping and equipment.
   13. Examine the above sections and all other sections of this specification and become familiar with their provisions regarding painting. All surfaces left unfinished by the requirements of other sections shall be painted or finished as part of this work, except as specifically indicated.

1.02 SYSTEM DESCRIPTION:

A. Paint all primed surfaces, and all surfaces not prefinished. The following categories of work are not included as part of field-applied finish work unless specifically indicated:
   1. Prefinished and factory finished items, or where installer finishing is specified.
   2. Concealed surfaces in generally inaccessible areas.
   3. Materials or areas scheduled or indicated as unfinished.
   4. Finished metal surfaces, including anodized and fluoropolymer finishes, and non-ferrous metals unless otherwise indicated.
   5. Operating parts.
   6. Glass.
   7. Acoustic ceiling panels.
   8. Concrete flatwork.
   9. Chain link fencing.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Do not begin work or deliver products to project site prior to approval of submittals.

B. Product Data: Indicate product characteristics, surface preparation, compatible primers and topcoats, recommended wet and dry film thickness, storage and handling requirements and recommendations, application methods, and cautions.

C. Color Selections: Obtain color schedule from Architect. If proposed manufacturer is different from that identified on color schedule, prepare and submit two samples 6 inches square of each color and sheen required on properly prepared and identified paint-out cards or hardboard.
   1. Concrete Masonry: Submit two samples 4 inches square of masonry with each type of finish and color, defining filler, prime and finish coat.

1.04 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Project Record Documents: Include schedule of each product, sheen, color, and location.

1.05 QUALITY ASSURANCE:

A. Single Source Responsibility: Provide primers and other undercoat paint produced by same manufacturer as finish coats.

B. Material Quality: Provide best quality grade of specified types of coatings as regularly produced by approved manufacturers. Claims relating to unsuitability of specified products, or inability to produce first-class work with specified products, must be submitted to Architect in writing.

C. Mock-Up: Prepare job site mock-up of each substrate and each paint system specified, using approved products and manufacturer recommended application methods.
   1. Obtain Owner's and Architect's acceptance of finish color, texture and pattern and workmanship standard prior to proceeding with remainder of work.
   2. Maintain mock-up during construction for workmanship comparison. Mock-up may be incorporated into final construction upon Owner's approval.

1.06 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Deliver products to the project site in original, unopened containers with all labels intact and legible at time of use.

B. Store materials at minimum ambient temperature of 45 degrees F in well ventilated area. Follow manufacturer's requirements for maximum temperatures.

1.07 ENVIRONMENTAL REQUIREMENTS:

A. VOC Content: ASTM D3960; comply with the most restrictive of the following requirements:
   1. Ozone Transport Commission (OTC) Model Rule.
   2. Applicable federal, state and local regulations.

B. Protect materials from freezing before, during, and after application.

C. Apply water-based paints only when temperatures of surfaces to be painted and ambient temperatures are between 50 degrees F and 90 degrees F.

D. Apply solvent-thinned paints only when temperature of surfaces to be painted and ambient temperatures are between 45 degrees F and 95 degrees F.

E. Do not apply paint in snow, rain, fog or mist, or when relative humidity exceeds 80%, or to damp or wet surfaces.

F. Apply interior finish painting only when ambient temperature is above 60 degrees F; after painting, maintain ambient temperature above 60 degrees F to prevent condensation.

G. Provide adequate continuous ventilation to maintain humidity below dew point of coldest surface.

PART 2 PRODUCTS

2.01 PAINT AND STAIN MATERIALS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Sherwin-Williams Co.
   2. ICI Paints.
   3. Benjamin Moore & Co.
   4. PPG Architectural Finishes, Inc.
   5. Pratt & Lambert.
   6. Tnemec Co., Inc.

B. Materials scheduled below are products of Sherwin-Williams Co. (abbreviated S-W) unless noted otherwise. Proprietary names used to designate materials are not intended to imply that products of named manufacturers are required to the exclusion of others. Equivalent products of other manufacturers listed above are also acceptable.

C. Provide primers and compatible finish coats by the same manufacturer.

D. Color Pigments: Pure, non-fading, applicable types to suit substrates and applications indicated.

E. Primers:

1. Block Filler: S-W Loxon Block Surfacer (A24W200).
2. Industrial Primer: S-W DTM Acrylic Primer/Finish (B66W1).
3. Metal Primer:
   a. Aluminum and Galvanized:
      (1) Gloss Finishes: S-W DTM Wash Primer (B71Y1).
      (2) Other Finishes: S-W Pro-Cryl Universal Primer (B66-310).
   b. Non-Galvanized Ferrous Metals: S-W Pro-Cryl Universal Primer (B66-310).
4. Stain Blocking Wood Primer: S-W A-100 Exterior Oil Stain Blocking Primer (Y24W20).
5. Wall Primer: S-W ProMar 200 Interior Latex Primer (B28W8200) or ProMar 200 Zero VOC Interior Latex Primer (B28W02600).

F. Finish Coats:

1. Acrylic Coatings:
   a. Acrylic Flat Dry Fall Coating: S-W Waterborne Acrylic Dry Fall (B42).
   b. Acrylic Latex Semi-Gloss Coating: S-W Pro Industrial Acrylic Semi-Gloss (B66-650).
   c. Acrylic Gloss Coating: S-W DTM Acrylic Gloss Coating (B66-100).
2. Alkyd Gloss Enamel: S-W Waterbased Industrial Enamel (B53-300).
3. Semi-Gloss Epoxy: S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy (K46W150).
4. Latex Coatings:
   a. Latex Flat: S-W ProMar 200 Interior Latex Flat (B30W200) or ProMar 200 Zero VOC Interior Latex Flat (B30-2600).
   b. Latex Semi-Gloss: S-W ProMar 200 Interior Latex Semi-Gloss (B31W2200) or ProMar 200 Zero VOC Interior Latex Semi-Gloss (B31-2600).
   c. Latex Gloss: S-W ProClassic Waterborne Acrylic Gloss Enamel (B21).

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that the work of all other trades is correct and complete so that paint application may properly commence.

B. Verify substrate conditions are acceptable for product application in accordance with manufacturer's instructions.

C. Painting of surface indicates Contractor's acceptance of surface and responsibility for paint failure.

3.02 PREPARATION:

A. Protection:

1. Remove electrical plates, hardware, light fixture trim, fittings, and similar items not scheduled to receive paint, prior to surface preparation or finishing. Mask in place items that cannot be removed.

2. Spot prime exposed metals such as bolts, nails, and welds which are to receive paint. Clean all metal work, smooth and prime if necessary where rusting or scaling occurs.

3. Remove dirt, dust, grease, mildew and other contaminants from all surfaces scheduled to be painted or finished.

B. Surface Preparation: In addition to the following general requirements, follow specific recommendations of the manufacturer for each finish system and substrate application.

1. Exterior Wood: Prime and paint as soon as possible. Countersink nail heads. Caulk nail heads and joints or cracks with latex caulk. Seal knots and sap streaks. Sand rough areas and wipe clean.

2. Concrete and Masonry: Allow cast-in-place concrete to cure minimum 60 days. Remove laitance by acid etching; apply acid liberally, then rinse thoroughly by scrubbing with fresh water and allow to dry. Sandblast where required to remove form release oil or bond breaker. Remove stains, dirt, loose mortar, scale, salt or alkali powder and other contaminants. Repair cracks, voids, and large voids by repointing, caulking or other approved methods.

3. Steel: Remove mill scale, rust, grease, dirt and dust, by hand scraping, wire brushing, power tool scraping, or sandblasting.

4. Shop Primed Steel: Sand and scrape to remove loose primer and rust. Sand and feather edges to smooth surface. Clean areas with solvent; spot prime bare metal areas.

5. Galvanized Surfaces: Acid etch or clean thoroughly with a grease cutting solvent such as mineral spirits.

6. Aluminum: Remove surface contamination by steam, high pressure detergent wash or solvent washing. Apply acid primer or acid etch. Apply paint immediately following cleaning and etching.

7. Plaster: Allow to cure for 30 days before painting. Repair cracks and holes, flush to the adjoining surface. Remove sanding dust and dirt.

8. Gypsum Board: Verify that surfaces are free of sanding dust, and that joint compound is thoroughly dry. Prime metal corner beads with metal primer before applying latex coatings. Fill minor defects with finishing compound; spot prime.

9. Previously Painted Surfaces: Remove all blistered, peeling and scaling paint to a sound substrate. Remove heavy chalk by scrubbing with soap and water. Sand glossy areas and dust clean. Clean and spot prime failed areas. Use soap and water on protected areas such as eaves and ceilings to remove invisible residues. Rinse clean and let dry. Remove and kill existing surface mildew before applying paint.
    a. Test sample area for compatibility, adhesion and film integrity; report in writing conditions that may affect proper application, appearance or performance.

3.03 PAINT APPLICATION:

A. Apply paint using spray, roller or brush unless otherwise specified or restricted. Method selected must be in accordance with manufacturer's recommendations, suitable for intended surface and finish.
    1. Apply block filler using airless spray method followed by roller. Ensure complete coverage with pores filled and no pinholes.

B. Do not open containers until required for use. Stir materials thoroughly and keep at uniform consistency during application.
    1. Mix multiple-component products in accordance with manufacturer's instructions.

C. Apply minimum two finish coats, unless otherwise indicated, in addition to field or shop applied prime coat.
    1. Allow sufficient drying time between coats in accordance with manufacturer's recommendations.
    2. Thinning: In accordance with the manufacturer's recommendations; adhere strictly to manufacturer's recommended spreading rate and dry or wet mil thickness per coat.
    3. Apply each coat to uniform finish without runs, sags, brush or roller marks, skips, ropiness or other defects.
    4. Tint primer and undercoats of paint approximately ½ to ¾ depth of final color.
    5. Sand and dust lightly between coats to achieve smooth finish.
    6. Clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.
    7. Touch-up suction spots between coats.
    8. Refinish surfaces affected by refitting work.
    9. Apply additional coat wherever there are voids, imperfections or lap marks.

D. Paint exposed steel lintels prior to installation of door, window, storefront, or louver.

E. Wood and Hollow Metal Doors:
    1. Seal, prime and finish coat top, bottom and edges of doors prior to door installation, same as door face.
    2. Finish glazing stops to match door face.

F. Exposed Mechanical and Electrical Equipment: Paint same color as used on walls or ceilings of room. Do not paint equipment or materials in unfinished areas.
   1. Remove and paint separately from adjacent surfaces all unfinished grilles, louvers, access panels, and covers.
   2. Prime and paint exposed pipes, ducts, covers, conduit, boxes, hangers, brackets and collars, including insulated items, except where items are plated or prefinished.
   3. Paint front, back and edges of plywood backboards for electrical and telephone equipment before installing equipment.
   4. Paint dampers and baffles behind grilles or in convectors to match face panels. Paint visible surfaces of ducts behind air outlets and inlets flat black.
   5. Do not paint over name plates or joints in moving parts of equipment.

3.04 TOUCH-UP:

A. Do all touch-up work that may be required throughout the project.

B. Apply materials in accordance with manufacturer's recommendations for adequate coverage, waterproofing, and weather resistance. If the specified number of coats do not achieve adequate coverage, waterproofing, and weather resistance, apply additional coats at no additional cost until acceptable performance and finish are obtained.

3.05 CLEANING:

A. Perform progress cleaning in accordance with Section 01 7000. Remove discarded paint materials, rubbish, cans, and soiled or used rags from the project site at the end of each work day. Use every precaution to avoid the danger of fire.

B. At completion of painting work, remove surplus paint materials and debris from the project site, and leave work areas in a clean and finished condition.

C. Perform final cleaning in accordance with Section 01 7700. Clean window glass and other paint-spattered surfaces. Remove spattered paint by approved methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

3.06 PROTECTION:

A. Protect surfaces and objects inside and outside the building, including lawns, shrubbery, and adjacent properties against damage; repair damage to adjacent surfaces.

B. Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct damage by cleaning, repairing, or replacing as required to match existing.

C. Exercise care and provide protection for adjacent prefinished or unfinished items, moving parts or assemblies, sprinkler heads, valves, motors, machinery, and related items. Provide all required covering, masking tape, and other protective materials.

D. Provide "wet paint" signs as required to protect newly painted finishes.

E. Following completion of painting in each area, promptly reinstall all items removed for protection.

F. After completion of painting operations, remove temporary protective materials, including those provided by others for protection of their work.

3.07 SCHEDULE:

A. Items scheduled herein to be painted are not intended to be all inclusive and are listed only as a guide to material type and exposure. Additional items indicated on the Drawings or in the Specifications shall receive applicable finishes, unless otherwise noted.

B. Exterior Metals: Exposed structural and miscellaneous galvanized and non-galvanized ferrous metal and aluminum items; lintels, guard posts, hollow metal doors and frames, mechanical and electrical piping including all exposed gas piping, mechanical vents, flues, stacks, conduit, electrical boxes, and related items.

1. Factory Primed Surfaces: Clean, sand, and touch-up with compatible primer wherever necessary before applying finish coats.

2. Unprimed Non-Galvanized Ferrous Metal Surfaces: Apply one coat industrial primer (6.0 mils wet, 3.0 mils dry).

3. Apply two finish coats acrylic gloss coating (8.0 mils wet, 3.0 mils dry per coat).

C. Exterior Wood:

1. Apply one coat stain blocking wood primer (4.0 mils wet, 2.3 mils dry).

2. Apply two finish coats alkyd gloss enamel, within 14 days after primer application (4.5 mils wet, 1.6 mils dry per coat).

D. Interior Concrete Masonry Units (CMU):

1. Apply one coat block filler (50-100 sq. ft. per gallon).

2. Apply two finish coats as scheduled. Where not specifically indicated, provide semi-gloss finish.
   a. Latex semi-gloss enamel (4.0 mils wet, 1.5 mils dry per coat).
   b. Latex gloss enamel (4.0 mils wet, 1.5 mils dry per coat).

E. Interior Metals: Clean, sand, and touch-up factory primed surfaces with compatible primer wherever necessary before applying finish coats.

1. Structural Components: Metal deck, structural framing, joists, and related items.
   a. Apply one coat industrial primer (5.0 mils wet, 2.5 mils dry).

b. Apply two finish coats latex flat wall paint (4.0 mils wet, 1.4 mils dry per coat) or acrylic flat dry fall coating (7.0 mils wet, 3.0 mils dry per coat).

2. General Building Components: Lintels, railings, columns, hollow metal doors and frames including removable mullions, and related items.
   a. Apply one coat metal primer (5.0 mils wet, 2.0 mils dry).
   b. Apply two finish coats acrylic latex semi-gloss coating (6.0 mils wet, 2.1 mils dry per coat).

3. Mechanical and Electrical Components: Sheet metal duct work, exposed piping, electrical panel covers, and related items.
   a. Apply one coat metal primer (7.5 mils wet, 3.0 mils dry).
   b. Apply two finish coats alkyd gloss enamel (4.5 mils wet, 1.6 mils dry per coat).

F. Interior Veneer Plaster:

1. Apply one coat wall primer (7.0 mils wet, 3.0 mils dry).

2. Apply two finish coats semi-gloss epoxy enamel (4.0 mils wet, 1.4 mils dry per coat).

END OF SECTION

SECTION 10 1100 – VISUAL DISPLAY UNITS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Fixed markerboards.

B. Related Sections:
   1. Section 04 2000 – Unit Masonry: Masonry wall substrate.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate wall elevations, dimensions, accessories and mounting details.

1.03 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Maintenance Data: Include recommendations for regular cleaning and stain removal.

1.04 WARRANTY: In accordance with Section 01 7700.

A. Include 5 year coverage of markerboard surfaces from discoloration, staining, crazing or cracking.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Sheet Steel: ASTM 424, Type I, commercial quality.

B. Particle Board: ANSI A208.1, wood materials set with waterproof resin binder, sanded faces.

C. Fiber Board: ASTM C208, cellulosic, dry type.

D. Aluminum Extrusions: ASTM B221.

E. Temporary Protective Cover: Sheet polyethylene, 8 mil thick.

F. Grounds, Clips, Brackets, Fasteners, and Anchors: As required.

2.02 FIXED DISPLAY BOARDS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Claridge Products & Equipment, Inc.
   2. K-Pro Specialty Products.
   3. Marsh Industries, Inc.
   4. Platinum Visual Systems.

B. Markerboards: Factory built, ready to install. (Marsh 1631 series; Claridge Series 1; Platinum BTS series)

1. Nominal Thickness: ½ inch.
2. Face: 24 gauge porcelain enamel steel; high gloss white finish.
3. Substrate: 3/8 inch particle board or medium density fiberboard, with minimum 0.005 inch thick aluminum backing.
4. Accessories:
   a. Map Rail: Extruded aluminum, satin anodized finish; full length of markerboard units, with finished ends; 1 inch high; with cork display insert.
      (1) Display Hooks: Metal sliding spring clip type; one for each 48 inches of board length.
   b. Chalk Tray: Extruded aluminum, satin anodized finish; box type with end caps, full length of board units; 2¾ inch nominal tray depth.

C. Frame and Trim: Extruded aluminum, satin anodized finish; 1¼ to 1½ inch face width.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Take field measurements prior to preparation of shop drawings and fabrication to assure proper fitting of the work. Allow for trimming and fitting wherever taking of field measurements before fabrication might delay work.

3.02 INSTALLATION:

A. Deliver factory built units completely assembled in one piece without joints.

B. Install units in locations and mounting heights indicated, in accordance with manufacturer's instructions. Keep perimeter lines plumb, straight, and level.
   1. Verify mounting heights with Owner.

C. Anchor components firmly to substrate materials and mounting surfaces using mechanical methods. Adhesive installation is not permitted unless specifically approved. Use concealed mounting methods where possible. Where exposed fasteners are required, use tamperproof type.

3.03 CLEANING:

A. Clean surfaces in accordance with manufacturer's instructions. Remove paint, glue, dirt and other foreign substances.

B. Cover surfaces with temporary protective cover, taped to frame; remove cover at Substantial Completion.

END OF SECTION

SECTION 10 1402 – INTERIOR SIGNAGE

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Interior signs and sign frames.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Illustrate graphics and copy of each style of signage; indicate mounting provisions, installation details and accessories.
   1. Verify final room names and numbers with Owner prior to submitting shop drawings.

B. Samples: Submit full range of colors for selection.

1.03 REGULATORY REQUIREMENTS:

A. Comply with provisions of ADA.

PART 2 PRODUCTS

2.01 INTERIOR SIGNS AND LETTERS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Best Sign Systems, Inc.
   2. Digimatics, Inc; Architectural Arts.
   3. Diskey Architectural Signage.
   4. EAS Environmental Signage.
   5. Ellet Sign Co.
   6. Interior Graphic Systems.
   7. Roban, Inc.
   8. Seton Name Plate Co.
   9. Signs Unlimited.

B. Wall Mounted Signs: Two color injection molded plastic, with 1/32” raised graphics and copy; grade 2 Braille.
   1. Graphics: International universal style symbols.
   2. Copy: Match existing typestyle and size, minimum 5/8 inch high.
   3. Colors: Match existing.
   4. Frame: Extruded aluminum with removable top cap.
   5. Mounting: Secure frame to wall using double faced vinyl foam tape. Secure sign to mounting frame with double faced vinyl foam tape.

C. Fire Evacuation Sign Frames: Two color injection molded plastic, with raised graphics and copy; radiused corners; clear plastic window with slot for letter size landscape insert.
   1. Copy: "EVACUATION MAP."
   2. Colors: White copy on red background.
   3. Mounting: Double faced vinyl foam tape.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Install signs after mounting surfaces are finished.

B. Install products in approved locations in accordance with manufacturer's instructions, level and plumb, and rigidly attached to anchoring surfaces.

C. Mounting Locations and Heights: In accordance with ADA. Adjacent to latch side of door or edge of opening, 9 inches from edge of door to center of sign; 60 inches above finish floor to top of sign. Do not mount signs on doors unless specifically approved.
   1. For pairs of doors with one active leaf, mount sign on inactive leaf, 10 inches from latch edge of active leaf to center of sign.
   2. For pairs of doors with two active leaves, mount sign 10 inches from hinge edge of right hand door to center of sign.

3.02 SCHEDULE:

A. Refer to schedule on Drawings for locations and copy for the following signs:
   1. Room Identification: Wall mounted sign, 6 x 6 inch; room name, or name and number, as indicated.

B. Provide signage as scheduled at each of the following locations, whether or not specifically indicated on the Drawings.
   1. Toilet Rooms, Accessible: Wall mounted sign, 8 x 8 inch; text as scheduled; with international symbol of accessibility and international male and/or female symbol as indicated.
   2. Wall Mounted Portable Fire Extinguishers: Wall mounted sign, 8 x 8 inch; "Fire Extinguisher"; with fire extinguisher symbol; white symbol and text on red background.
   3. Exits: Wall mounted sign, 8 x 3 inch; "Exit"; provide sign at each door to an exit passageway and exit discharge.
   4. Fire Evacuation Sign Frames: Provide for each room with posted capacity noted on Life Safety Plan.

C. Provide additional signs as scheduled and detailed.

END OF SECTION

SECTION 10 2117 – PHENOLIC-CORE COMPARTMENTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Toilet partitions.
   2. Urinal screens.
   3. Shower partitions.

B. Related Sections:
   1. Section 10 2800 – Toilet and Bath Accessories: Grab bars; partition mounted toilet paper holders, napkin disposals and shower seats; shower curtains and rods.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate partition plan, elevation views, door swings, field dimensions, installation details, supports, special procedures, and perimeter conditions requiring special attention. Provide data on panel construction, hardware, and accessories.

B. Samples: Submit full range of colors for selection.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. American Sanitary Partition Corp.

B. General Partitions Mfg. Corp.

C. Global Steel Products Corp.

D. Partition Systems Incorporated of South Carolina; Columbia Partitions.

2.02 MATERIALS:

A. Solid Phenolic Core: Water resistant; multiple layers of phenolic resin impregnated kraft paper, laminated under heat and pressure to form solid plastic material.

B. Stainless Steel: ASTM A167, Type 304; No. 4 satin brushed finish.

2.03 COMPONENTS:

A. Panels, Doors and Pilasters: High pressure melamine faces laminated to solid phenolic core; black or dark brown panel edges, burnished and eased.
   1. Panels and Doors: ¾ inch total thickness; 58 inch height.
   2. Pilasters: ¾ inch total thickness; with stirrups and leveling bolts for floor attachment, concealed with one piece theftproof stainless steel plinth.

B. Attachment Brackets: Stainless steel angle brackets, minimum 14 gauge.

C. Hardware: Stainless steel.

D. Fasteners: Vandal resistant type.

E. Color: As selected; single color for each room.

2.04 TOILET COMPARTMENTS:

A. Type: Floor mounted, overhead braced.

B. Doors:
   1. Standard Door Width: 24 inches.
   2. Accessible Door Width: 34 to 36 inches.
   3. Hardware: Controlled gravity hinges, two per door, or continuous hinge; nylon bearings; latch with stainless steel bolt and exterior access provisions; stop and keeper mounted on pilaster in alignment with door latch; coat hook and bumper; exterior and interior door pulls on outswinging doors.

C. Overhead Bracing: 1 x 1½ inch anodized aluminum tube, anti-grip shape, with cast socket wall brackets.

2.05 URINAL SCREENS:

A. Type: Wall hung, bracket supported.

B. Size: 18 x 48 inch.

C. Mounting Hardware: Continuous stainless steel wall flange, full height of urinal screen.

2.06 SHOWER COMPARTMENTS:

A. Type: Floor mounted, overhead braced.

B. Overhead Bracing and Curtain Track: 1 x 2½ inch anodized aluminum tube with integral curtain track, with cast socket wall brackets.
   1. Curtain Hooks: Nylon glide sized to coordinate with track, with aluminum wire hook.
   2. Shower Curtains: As specified in Section 10 2800; provide one curtain per compartment.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify that field measurements are as indicated in shop drawings.

C. Verify correct spacing of and between plumbing fixtures.

D. Verify correct location of built-in framing, anchorage and bracing.

3.02 INSTALLATION:

A. Install components secure, rigid, plumb and level in accordance with manufacturer's instructions.

B. Attach partitions to wall with full height brackets, or minimum 3 stirrup brackets each with 4 wall screws and 2 partition through-bolts. Attach panels and pilasters to brackets.

C. Maintain maximum ½ inch space between wall and panels, and between wall and end pilasters, except where continuous hinges and full height mounting flanges are used.

D. Secure overhead bracing to pilasters and walls, aligned with panels and door openings. Locate joints at pilaster center lines.
   1. Exposed bracing across compartments is not permitted, but diagonal bracing of maximum 2 ft length may be used where necessary for stability.

E. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

F. Conceal all evidence of drilling, cutting, and fitting to room finish.

G. Mounting Height: 12 inches above finish floor to bottom of partitions and doors; 82 inches above finish floor to top of headrail.
   1. Coat Hooks: 48 inches above finish floor.

H. Coordinate installation of partition mounted accessories and shower curtains.

3.03 ERECTION TOLERANCES:

A. Maximum Variation From True Position: 1/4 inch.

B. Maximum Variation From Plumb: 1/8 inch.

3.04 ADJUSTING:

A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.

B. Adjust hinges to position doors in slightly open position when unlatched. Return outswinging doors to closed position.

C. Adjust adjacent components for consistency of line or plane.

3.05 CLEANING:

A. Protect all finished parts of the building from damage.

B. Keep the site clean of all empty containers; promptly remove all equipment and unused materials upon completion.

END OF SECTION

SECTION 10 2800 – TOILET AND BATH ACCESSORIES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Toilet room accessories.

B. Related Sections:
   1. Section 01 1000 – Summary of Work: Owner supplied Products.
   2. Section 10 2117 – Phenolic-Core Compartments.
   3. Section 22 4000 – Plumbing Fixtures.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Manufacturer's data sheets, accessories schedule, and installation instructions.

1.03 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Submit service and parts manuals; keys; warranty documents; and name of local field service representative.

1.04 QUALITY ASSURANCE:

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years experience.

B. Regulatory Requirements: Operating features of accessories shall comply with ADA.

1.05 WARRANTY: In accordance with Section 01 7700.

A. Mirrors: Provide 15 year warranty against silver spoilage.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Bobrick Washroom Equipment, Inc.

B. American Accessories, Inc.

C. American Specialties, Inc.

D. Bradley Corporation.

2.02 MATERIALS:

A. General: Shop assembled, free of dents or scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
   1. Grind welded joints smooth.
   2. Fabricate units made of metal sheet using seamless sheets, with flat surfaces.

B. Stainless Steel: ASTM A167, Type 304; No. 4 satin brushed finish; 22 gauge minimum thickness.

C. Mirror Glass: ASTM C1503.

D. Fasteners, Screws and Bolts: ASTM A153, hot dip galvanized.

E. Chrome Plating: ASTM B456.

F. Keys: Accessories with locks shall be keyed alike, with the exception of coin boxes in vending equipment. Provide six keys to Owner.

G. Locks: Tumbler locks shall be fastened to accessories with lock nuts; spring clips are not acceptable.

2.03 TOILET ROOM ACCESSORIES:

A. Mirrors: ¼ inch plate glass, sizes as scheduled; with one piece roll formed stainless steel angle frame. Furnish with galvanized steel wall hanger for concealed mounting. (Bobrick B-290 series; Bradley 780 series; ASI 0600-A series)

B. Napkin Disposals: Surface mounted; stainless steel; door with full length piano hinge and international graphic symbol; 1.3 gallon capacity. (Bobrick B-254; Bradley 4722-15; ASI 0473-A)

C. Napkin and Tampon Vending Units: Semi-recessed stainless steel cabinet with adjustable face flange; door with full length piano hinge and tumbler lock; fully welded cabinet body. Single coin operation with barrier free pushbutton or handle; coin collection boxes keyed differently from cabinet door. Capacity for minimum 17 napkins and 26 tampons, identified without brand name advertising. (Bobrick B-3706; Bradley 4017; ASI 94684)

D. Grab Bars (General Areas): 18 gauge stainless steel, 1½ inch diameter; 1½ inch clearance between wall surface and inside face of bar; concealed stainless steel mounting flanges with snap-on covers; lengths as indicated. (Bobrick B-6806 series; Bradley 812 series; ASI 3800 series)

E. Grab Bars (Shower Areas): 18 gauge stainless steel, 1½ inch diameter; non-slip finish; 1½ inch clearance between wall surface and inside face of bar; concealed stainless steel mounting flanges with snap-on covers; lengths as indicated. (Bobrick B-6806.99 series; Bradley 812-2 series; ASI 3800 series)

F. Folding L-Shaped Shower Seats: Wall mounted surface type; welded tubular seat frame, structural support members, hinges and mechanical fasteners of stainless steel; L-shaped seat, ½ inch thick solid phenolic laminate, secured to supporting frame members with stainless steel screws. (Bobrick B-5171 or B-5181; Bradley 9569; ASI 8206)

G. Shower Curtains: Opaque vinyl or nylon reinforced vinyl fabric, 0.008 inch thick, with antibacterial treatment; flameproof and stain-resistant. (Bobrick 204 series; Bradley 9537 series; ASI 1200 series)
   1. Curtain Track and Hooks at Shower Compartments: As specified in Section 10 2117.
   2. Shower Curtain Rods: 18 gauge stainless steel tube, 1¼ inch outside diameter, satin finish; stainless steel mounting flanges; with curtain hooks. (Bobrick B-6047; Bradley 9531; ASI 1204)

H. Towel Hooks: Heavy duty stainless steel, 1 inch wide bent bar; square bracket and backplate for concealed mounting, with locking set screw. (Bobrick B-6827; Bradley 9940 series; ASI NY-682SF)

I. Towel Hook Strips: Heavy duty stainless steel, 1 inch wide bent bar; stainless steel backplate for exposed mounting; length and number of hooks as indicated. (Bobrick B-232; Bradley 9940 series; ASI HI series)

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify wall construction for proper dimensions and conditions affecting installation. For surface mounted accessories, check condition of wall and confirm installation of backing materials within wall.

B. Verify spacing and clearances of toilet compartments, plumbing fixtures and adjacent construction affecting installation of accessories.

3.02 INSTALLATION:

A. Install accessories in accordance with manufacturer's installation instructions, plumb and level, securely and rigidly attached to substrate.

B. Install accessories at locations and heights indicated, and as required to comply with ADA and applicable building codes.

C. Install items using non-corrosive anchoring devices.

D. Conceal evidence of drilling, cutting, and fitting to room finish.

E. Fit flanges of accessories snugly to wall surfaces.

3.03 ADJUSTING:

A. Adjust accessories for proper operation. Test mechanisms, hinges, locks and latches and where necessary adjust and lubricate.

3.04 CLEANING: In accordance with Section 01 7700.

A. Remove protective coatings and paper covers.

B. Clean and polish exposed surfaces.

END OF SECTION

SECTION 10 4400 – FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Fire extinguisher cabinets.
   2. Fire extinguishers.

B. Related Sections:
   1. Section 10 1402 – Interior Signage: Identification for wall bracket mounted extinguishers.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Indicate dimensions, certifications, and mounting details.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000. Provide fire extinguishers, cabinets and accessories by a single manufacturer.

A. Amerex.

B. J.L. Industries.

C. Larsen's Manufacturing Company.

D. Smith Industries, Inc.; Potter-Roemer.

2.02 FIRE EXTINGUISHERS:

A. Extinguishers: NFPA 10, UL rated, FM approved; 10 lb., 4A-60BC type, pressurized multi-purpose dry chemical extinguisher; with pressure gauge and hose.

B. Provide mounting brackets and fasteners for wall mounted extinguishers.

2.03 FIRE EXTINGUISHER CABINETS:

A. Semi-Recessed Cabinets: Sheet steel interior, minimum 18 gauge; white baked enamel finish; 2½ to 3 inch projection from face of wall, with rolled edge trim. (JL Academy 1027; Larsen's 2409-6R)

B. Door and Frame: Aluminum with satin anodized finish; pull handle with friction catch; full glazed door with clear acrylic window, ¼ inch thick. (JL F10 series)

PART 3 EXECUTION

3.01 INSTALLATION:

A. Install Products in accordance with manufacturer's instructions and requirements of governing authorities.

B. Prepare wall recesses as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions.

C. Securely fasten mounting brackets and cabinets to structure, square and plumb.

D. Mounting Height:
   1. Wall Mounted Extinguishers: 54 inches above finish floor to top of extinguisher.
   2. Fire Extinguisher Cabinets: Maximum 56 inches above finish floor to top of cabinet.

E. Check extinguishers for proper charge operation. Remove and replace damaged, defective or undercharged units prior to substantial completion.

F. Tag all extinguishers; indicate expiration date of charge.

END OF SECTION

SECTION 10 5113 – METAL LOCKERS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Metal lockers.
   2. Locker benches.

B. Related Sections:
   1. Section 04 2000 – Unit Masonry: Masonry substrates.
   2. Section 06 1050 – Miscellaneous Rough Carpentry.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Include plans, elevations, sections, and attachment details. Show fillers, trim, base, tops, and accessories. Show identification system and numbering sequence.
   1. Owner reserves the right to modify shelf locations prior to approval of submittals, without additional cost.

B. Product Data: Indicate fabrication details, installation instructions, and accessories.

C. Samples: Submit samples for color selection.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Lyon Metal Products, Inc.

B. List Industries, Inc.

C. Penco Products, Inc.

2.02 METAL ATHLETIC LOCKERS:

A. Style: Single tier, double tier, and open front; as indicated.

B. Size: As scheduled.

C. Finish: Baked enamel; color as selected.

D. Body: All welded construction; 18 gauge solid steel back; 16 gauge solid top and bottom; minimum 13 gauge expanded metal or 16 gauge diamond perforated metal sides.

E. Single Tier and Double Tier Lockers:

   1. Door Frame: 16 gauge formed steel channels, with vertical flange to form continuous door strike; corners lapped and welded to form rigid assembly; top and

bottom cross members for support of top and bottom panels; bottom cross members interlocked with upright frame members.

2. Doors: 12 gauge angle frame and lock plate; minimum 13 gauge expanded metal or 14 gauge diamond perforated metal face.
   a. Hinges: 5-knuckle steel hinges welded to frame and securely attached to door; with non-removable pins. Provide minimum 2 hinges per door; 3 hinges per door for doors more than 48 inches tall.
   b. Latching Mechanism: Three point latching device designed for quiet operation; two point latching for multiple tier doors.
   c. Handles: Chrome plated lever handles or recessed type handles with finger lift, with provision for padlock attachment.
   d. Locks for Accessible Lockers: Keyed type that requires insertion of key and lifting of handle, without turning key.
3. Interior Shelves: 16 gauge cold rolled steel, flanged on four sides; located 12 inches from top of single tier lockers.
   a. Accessible Lockers:
      (1) Single Tier Lockers: Provide additional shelf located 48 inches above finish floor.
      (2) Floor Mounted Lockers: Provide additional shelf located 15 inches above finish floor.
4. Coat Hooks: Single prong wall hooks; one for each side wall and minimum one back wall hook

F. Open Front Lockers:
1. Shelves: 16 gauge cold rolled steel, flanged on four sides; located 12 inches from top.
   a. Accessible Lockers: Provide additional shelf located 48 inches above finish floor. Locate coat rod below shelf.
2. Coat Hooks and Rods:
   a. 5/8 inch diameter heavy duty galvanized steel coat rod full width.
   b. Single prong wall hooks; two on back wall.
3. Security Boxes: 14 gauge steel door with provisions for padlock; pull; continuous hinge; 16 gauge side panel.
4. Foot Lockers: Bench seat, minimum 14 gauge steel with reinforced underside, with continuous hinge at rear; minimum 16 gauge steel front panel with ½ inch x ¼ inch mini louvers; recessed lock area with padlock hasp.

G. Accessories:
1. Continuous Z-type base with recessed toe space, 4 inch height; where scheduled.
2. Sloping top panels, continuous type, with end closures; where scheduled.
3. Aluminum number plates, with minimum 3/8 inch etched numbers. Verify numbering prior to fabrication.

4. Filler Materials: Top closure and corner fillers, top and end closure strips, and adjustable front fillers; as required to fill space between adjacent lockers, and between lockers and adjacent construction.
5. Accessible Lockers: Decal with international symbol of accessibility.

H. Built-in Benches: High density polyethylene or polypropylene with homogeneous color throughout; waterproof, corrosion proof, impact resistant, nonabsorbent, self-lubricating surface resistant to markings. Fabricate to dimensions and configuration as detailed, with uniform finish and smooth edges..
1. Manufacturers: In accordance with Section 01 6000.
   a. Scranton Products; Tufftec.
   b. General Partitions Mfg. Corp.
   c. Bradley Corporation.
2. Joint Adhesive: Type as recommended by manufacturer; color to match material; to create inconspicuous, non-porous joints, with a chemical bond.

I. Freestanding Benches: Hardwood top with transparent factory finish; dimensions as scheduled.
1. Pedestals: Heavy duty steel base with steel tubing uprights, minimum two per bench, spaced at maximum 5 ft o.c.; finish to match lockers; height as scheduled.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Install and anchor lockers, benches, and accessories in accordance with manufacturer's instructions, level and plumb with flush surfaces and rigidly attached to each other and to anchoring surfaces.

B. Provide accessible locker quantities and locations as indicated and in accordance with ADA and applicable building code; minimum one locker per room and minimum 5 percent of total quantity.
1. Install decals at locations indicated by Owner. Provide remaining decals to Owner for future installation.

END OF SECTION

SECTION 10 5623 – WIRE STORAGE SHELVING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Wire storage shelving.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Submit catalog cut sheets for each product scheduled. Indicate fabrication details, installation instructions, and accessories.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Eagle Foodservice Equipment.

B. Advance Tabco.

C. InterMetro Industries, Inc.

2.02 WIRE STORAGE SHELVING:

A. Wire Shelving: Steel posts with adjustable feet; steel wire shelves, 4 per unit, adjustable in 1 inch vertical increments; chrome finish. (Eagle C series shelves and P63-C posts)

PART 3 EXECUTION

3.01 INSTALLATION:

A. Assemble and install units in accordance with manufacturer's instructions, level and plumb, with required bracing.

B. Install shelves with equal spacing unless indicated otherwise.

END OF SECTION

SECTION 12 6613 – TELESCOPING BLEACHERS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Telescoping bleacher seating.

B. Related Sections:
   1. Section 01 2300 – Alternates.
   2. Division 26 – Electrical: Power wiring and final connections for electrically operated bleachers.

1.02 SYSTEM DESCRIPTION:

A. Telescoping seating system shall be multiple tiered seating rows comprised of seat and deck components, risers, and supporting understructure; stacking vertically in minimum floor area when not in use.

B. Design Criteria:
   1. Design system to support dead loads including accessories, and a uniformly distributed live load of minimum 100 psf of gross horizontal projection.
      a. Design wheels to distribute weight, including dead loads and live loads, not to exceed 180 psi applied to the finish floor surface.
   2. Design seat boards, platform decks and footrests for a live load of minimum 120 lb/ft.
   3. Design seats to withstand a sway force of 24 lb/ft parallel to the seats and 10 lb/ft perpendicular to the seats, not simultaneously applied.
   4. Design railings, posts and sockets to withstand the following forces applied separately:
      a. Design handrails to resist a concentrated load of 200 lbs applied in any direction at any point, and a uniform load of 50 lb/ft applied in any direction, without damage or permanent set.
      b. Design guards to resist a concentrated load of 200 lbs applied in any direction at any point along the top railing member, and a uniform load of 50 lb/ft applied horizontally at the required guardrail height with simultaneous uniform load of 100 lb/ft applied vertically downward at the top of the guardrail, without damage or permanent set.
   5. Design metal member sizes and connections in accordance with AISC, AISI and Aluminum Association (AA) design criteria.
   6. Design wood members in accordance with AFPA NDS.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate dimensions, anchorages, seating layouts, aisles, accessibility provisions, railings, and accessories. Submit copies for plan approval in addition to the number required by Section 01 3300.
   1. Indicate magnitude and locations of concentrated loads and total loads applied to supporting structure, in open and closed positions. Coordinate substrate blocking locations with wood floor installer.

1.04 QUALITY ASSURANCE:

A. Manufacturer Qualifications: Company specializing in folding seating with minimum 10 years experience in manufacturing gym seats.

B. Design system under direct supervision of a Professional Engineer experienced in design of this work and licensed at the place where the Project is located.

C. Installer Qualifications: Approved by manufacturer.

D. Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

1.05 REGULATORY REQUIREMENTS:

A. Comply with ADA for accessible wheelchair locations.

B. Comply with applicable building code for aisle and row dimensions, egress widths, treads and risers, handrails and guards, footboards and related requirements.

C. Comply with requirements of ICC 300 and NFPA 102, and specifically with provisions governing folding and telescopic seating.

D. Lumber Grading Rules: SPIB.

1.06 WARRANTY: In accordance with Section 01 7700.

A. Provide 10 year warranty for all components.

1.07 MAINTENANCE SERVICE:

A. For the first year after Substantial Completion, provide inspection and maintenance service by factory service personnel at recommended intervals, but not less than one inspection at the end of the period.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Hussey Seating Company.

B. Interkal, Inc.

C. Irwin Seating Company.

D. Kodiak Industries, Ltd.

2.02 BLEACHER SYSTEMS:

A. Seating Area: One group 29 feet 6 inches long, 4 rows high; wall and floor attached; manually operated.

1. Row Spacing: 32 inches.

2. Rise per Row: 11½ to 12 inches.

B. Accessories:

1. Aisles: Footrest level, with non-slip treads on the top front edge.
   a. Lay out aisle width and spacing in accordance with applicable building code and NFPA 102.
   b. Intermediate Aisle Steps: Permanently attached closed design; front step hinged for storage on first row deck without removal; walking surface to match deck panels.
   c. Aisle Hand Rails: Individual rail design, non-removable type, permanently attached to mounting pocket to allow railings to manually pivot and fold within the deck; located on every other row starting at row 2; 1½ inch diameter steel tubing, minimum 11 gauge, forming closed loops; textured powder coated epoxy finish; rail pockets concealed behind face of bleacher in closed position. Aisle rails spanning several rows, rails with open loops, or rails made from square tubing will not be acceptable.

2. End Rails: Self-storing type at open ends of group in accordance with applicable building code; textured epoxy powder-coated black enamel finish.

3. End Panels and Supports: Plywood; enclose open ends of group in the closed position, including space between wall and back of self-storing end rails. Finish to match deck panels.

4. End Curtains: Vinyl, configured to conceal space under open ends; with hanging hardware and grommets; chain weighted bottom hem.
   a. Color: As selected.

5. Rear Filler Panels: Close openings at seat level between top row and wall.

6. Accessible Seating Areas: In accordance with applicable handicapped accessibility codes; with front rails and closure panels behind these areas.
   a. Accessible seating shall be of recoverable design, such that accessible seating is provided with first row retracted, and first row can be manually extended to provide additional seating when accessible spaces are not in use.

C. Fabrication:

1. Understructure System:
   a. Steel Supports and Rolling Frames: Formed steel, size and shape as necessary to rigidly support design loads.

b. Wheels: Minimum 4 inch diameter, 1 inch wide; non-marring soft rubber face to protect floor surfaces; minimum 8 wheels per operating row.
c. Wheel Channels: Fully skirted, permanently lubricated, continuously in contact with adjacent channels by nylon guides, to eliminate metal to metal contact; non-binding interlocks to provide alignment when opening and closing.
d. Cantilever Arms: Securely welded to post assembly; permanently lubricated; non-binding interlocks with each lower row post assembly.
e. Vertical Columns: Structural steel tubing, sized to meet design criteria.
f. Deck Stiffeners: Double bolted to both the rear beam and the decking.

2. Deck System:
   a. Lower Rear Riser: Continuous formed steel member recessed to provide full heel room; G60 galvanized finish.
   b. Front Nose Beam: Continuous structural member to support design loads.
   c. Decking Panels: Structural western fir plywood, 5/8 inch thick. Support decking along front and back edges for maximum rigidity; provide H-type aluminum splice beam between decks.
   d. Through bolt decking fore and aft to steel supports with locking hardware.

3. Chair Seating: Fold-down chairs with impact resistant polyethylene seats and backs, double walled with textured surface and concealed steel support members; non-upholstered with provisions for future installation of seat and back pads; seats, backs, and armrests mounted to horizontal steel beam anchored to platform.
   a. Semi-Automatic Operation: Spring-assisted raising and lowering of all chairs per section by a single operator, independent of platform operation; foot release. All chairs except the first row shall be lowered automatically during closing of the platform.
   b. Armrests: Injection molded plastic, rotatable for storage; adjustable for row alignment.
   c. Seat and Row Numbers: Number and letter plates; seat numbers recessed in seat back; row letters attached to ends of chair support beam.

4. Locking Provisions: The first moving row shall be secured with key locks. All other rows shall be mechanically locked, operable only upon unlocking and cycling of first row.

5. Finishes:
   a. Metal Components: Textured epoxy powder coated finish; semi-gloss black color.
   b. Wood Components: Machine and hand sanded; finished with moisture repellent sealer coat on all surfaces, 2 coats of clear polyurethane finish on wearing surfaces.
   c. Plastic Components: Color as selected.

D. Manual Operation: Individual sections containing a series of tiered rows shall be independently opened and closed. Each tiered row shall have mechanical locks to

keep rows fully extended when in the open position. Row locks shall automatically release upon operation of key lock on first row and pulling release handle under skirt board.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Field verify dimensions and installation conditions prior to system fabrication.

3.02 INSTALLATION:

A. Install systems in accordance with manufacturer's instructions.

3.03 FIELD QUALITY CONTROL:

A. Manufacturer's representative shall visit site to inspect installation and instruct Owner's personnel in operating and maintenance requirements.

END OF SECTION

SECTION 21 0500 – COMMON WORK RESULTS FOR FIRE SUPPRESSION

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Materials and installation methods applicable to all Sections of Division 21.
   2. Identification.
   3. Testing and inspection.

B. Related Sections:
   1. Section 09 9000 – Painting and Coating.

PART 2 PRODUCTS

2.01 IDENTIFICATION MATERIALS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Allen Systems, Inc.
   2. W.H. Brady Company.
   3. Seton Name Plate Co.

B. Service Identification: Contractor's option from the following:
   1. Stenciled characters, 1 inch high. Provide one coat of clear lacquer or varnish over the stencils.
   2. Pipe Markers: Snap-around type; preprinted vinyl, color coded per ANSI A13.1, with name of piping system; arrows to indicate flow direction; with nylon ties for pipe sizes 6 inch and larger.

C. Valve Tags: Polished brass, 2 inch diameter, with stamped numbers and letters to identify serial number and service designation; with chain and corrosion resistant S-hook.

D. Engraved Plastic Nameplates: 1 x 3 x 1/16 inch thick minimum size; white engraved letters on black background; minimum ¼ inch high lettering.

PART 3 EXECUTION

3.01 PAINTING:

A. Finish painting of piping shall be done in accordance with Section 09 9000. Damage to finish painting shall be repaired at the expense of the party causing the damage.

B. Refinish factory primed or finished components damaged during shipping or installation. Remove rust, prime, and paint per manufacturer's recommendations for finish equal to original.

3.02 IDENTIFICATION:

A. Identify piping, valves, equipment and controls in accordance with ANSI A13.1. Verify numbering system with Owner; coordinate with existing identification system, where present.

B. Piping: Identify each pipe in exposed or accessible space (except architecturally finished spaces) at each major change of direction, at 20 foot intervals in straight runs, each branch connection, each riser, equipment connections, and both sides of walls.

C. Valve Tags: Securely fasten tags to all valves and cocks, chained to hand wheel, on main lines and branches, and at switches, equipment, and controls. Indicate piping system and purpose of valve; indicate whether valve is normally closed (N.C.) or normally open (N.O.) in service; indicate direction of flow.

3.03 TESTING AND INSPECTION:

A. Refer to individual Sections for specific tests required for each system.

B. Pay for all required tests and inspections. Furnish labor, materials, and instruments; bear other costs in connection with all tests.

C. Notice of Tests: Give written notice in ample time to all concerned of date when tests will be conducted.

D. Prior Tests: Concealed or insulated work shall remain uncovered until required tests have been completed, but if construction schedule requires it, arrange for prior tests on parts of system as approved by the Architect.

E. All piping systems shall be tested before piping is concealed, covered, or insulated. Before testing pipe systems, remove or otherwise protect from damage the components which are not designed to withstand the pressures used in testing piping.

F. Adjustments, Repairs, and Retests:
   1. Make adjustments, repairs, and alterations as required to meet specified test results.
   2. Correct defects disclosed by tests or inspection, and replace defective parts when directed.
   3. In replacing defective parts, use only new materials; in the case of pipe, replace with same length as defective piece.
   4. Caulking of screwed joints or peening of welds is not permitted.
   5. Repeat tests after defects have been corrected and parts replaced, as directed and until pronounced satisfactory.

G. Responsibility for Damage: Bear the cost of repairs and restoration of the work of other Contractors damaged by the tests or cutting required in connection with the tests.

END OF SECTION

SECTION 21 1100 – FIRE SUPPRESSION PIPING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Piping materials and installation methods applicable to all fire suppression work.

B. Related Sections:
   1. Section 07 8400 – Firestopping.
   2. Section 07 9200 – Joint Sealants.
   3. Section 09 8100 – Acoustic Insulation.
   4. Section 21 0500 – Common Work Results for Fire Suppression.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Provide for piping materials, dielectric fittings, mechanical sleeve seals, piping specialties. Indicate materials, sizes, dimensions and types.

1.03 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Valve Directories: Include in Operation and Maintenance binders. For each piping system, indicate identification (correlated with record documents), location and purpose of each valve.

1.04 QUALITY ASSURANCE:

A. Pipe: Identify with marking including size, material classification, and ASTM specification. Include water pressure rating and potable water certification where applicable.

B. Valves: Manufacturer's name and pressure rating marked on valve body.

C. Welding Procedures: Conform to ASME SEC IX, AWS D1.1, NCPWB Procedure Specifications for Pipe Welding, and applicable state labor regulations.

D. Welders Certification: In accordance with ASME SEC IX and NCPWB.

1.05 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Store piping and specialties elevated above grade, protected from moisture and dirt.

B. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

C. Provide temporary protective coating on cast iron and steel valves.

D. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

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

PART 2 PRODUCTS

2.01 PIPE AND PIPE FITTINGS:

A. Refer to individual specification Sections for piping materials, fittings and related requirements for specific piping systems.

B. Pipe Threads: ANSI B1.20.1.

C. Pipe Flanges:
   1. Full Face Type: Class 125, cast iron and cast bronze.
   2. Narrow Face Type: Class 250, cast iron and cast steel.
   3. Gasket Materials: ANSI B16.21, nonmetallic, flat, non-asbestos.
   4. Bolts and Nuts: ANSI B18.2.1.

D. Welding Materials: AWS B2.1.

2.02 PIPING SPECIALTIES:

A. Pipe Hangers and Supports: NFPA 13.

B. Unions For Steel Pipe:
   1. Sizes to 2 Inch: Class 150 malleable iron unions with ground joint brass to iron seat, galvanized or black.
   2. Sizes 2½ Inch and Over (Welded): Class 150 malleable iron forged steel slip-on flanges, preformed neoprene gaskets, and carbon steel bolts.
   3. Sizes 2½ Inch and Over (Screwed): Class 150 malleable iron threaded steel flanges, galvanized or black, preformed neoprene gaskets, and carbon steel bolts.

C. Dielectric Unions: Zinc plated with thermoplastic liner, rated for 250 degrees F.

D. Floor, Wall, and Ceiling Plates (Escutcheons):
   1. Finished Areas: Chrome plated brass.
   2. Unfinished and Concealed Areas: Stamped brass, split hinged type.

E. Pipe Sleeves:
   1. Existing Construction: 22 gauge galvanized steel.
   2. Interior Stud Walls, and Floors (Concealed): 22 gauge galvanized steel.
   3. Exterior Walls, Interior Masonry Walls, and Floors (Exposed): Galvanized steel pipe, ASTM A53, Type E, Grade A, Schedule 40.

F. Mechanical Sleeve Seals: Interlocking rubber link type, shaped to continuously fill annular space between pipe and sleeve; with connecting bolts and pressure plates.

PART 3 EXECUTION

3.01 PIPING INSTALLATION:

A. Verify piping and tubing is round and straight prior to installation. Prevent deformation during cutting and threading. Do not permit tool marks on exposed piping in finished areas.

B. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

C. Remove scale and foreign material from inside and outside before assembly.

D. Prepare piping connections to equipment with flanges or unions, arranged for quick disconnect for maintenance.
   1. Pipe Size 2 Inch and Smaller: Install unions adjacent to each valve on the downstream side, and at connection to each piece of equipment.
   2. Pipe Size 2½ Inch and Larger: Install unions adjacent to flanged valves on the downstream side, and at connection to each piece of equipment supplied with flanged pipe connections.
   3. Use the same material and finish as the piping system.
   4. Use non-conducting dielectric connections wherever joining dissimilar metals.
   5. Do not use unions or flanged unions in straight runs of pipe or in concealed locations except for flanged valve applications.

E. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.

F. Install piping to conserve building space, to not interfere with use of space and other work, and to maintain required headroom and clearances for equipment, door swings, ceiling panel removal, and related conditions.

G. Place piping in concealed spaces above finished ceilings. In areas without finish ceilings, route piping through spaces in open web joists.

H. Conceal vertical piping in stud wall cavities, pipe chases, and masonry cores where possible. Except in unfinished spaces, obtain approval prior to installing exposed piping.

I. Group piping whenever practical at common elevations. When installing piping in parallel, leave sufficient space between pipe lines to facilitate future work on any line.

J. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Utilize offsets, changes in direction and expansion loops, constructed to allow maximum anticipated variation in piping length.

K. Hang and support piping in accordance with NFPA 13. Provide clearance in hangers and from structure and other equipment for access to valves and fittings.

L. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level. Pipe drains to mop sink, floor drain, or similar approved location.

M. Prime coat and prepare for finish painting exposed pipe, fittings, supports, and accessories scheduled for field painting. Refer to Section 09 9000. Components located in pipe shafts and suspended ceiling spaces are not considered exposed. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to weld.

N. Do not penetrate building structural members unless indicated.

O. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

P. Die cut threaded joints with full cut standard taper pipe threads with non-toxic joint compound applied to male threads only.

Q. Install valves with stems upright or horizontal, not inverted. Remove protective coatings after installation.

R. Install unions downstream of valves and at equipment or apparatus connections.

S. Clean and flush piping systems prior to testing system or connecting equipment.

3.02 JOINING PIPE AND FITTINGS:

A. Threaded Joints: Right hand tapered national pipe threads; pipe joint compound on male threads only.

B. Welded Joints: In accordance with ASME SEC IX and NCPWB.

3.03 PIPE SLEEVES:

A. Provide sleeves and escutcheons when penetrating walls and partitions. Cut escutcheons as necessary to fit in close quarters.

B. Size sleeves to provide minimum ¾ inch clearance around all sides of piping.

C. Maintain sleeves plumb, level, and in proper position throughout construction.

D. Seal pipe and sleeve penetrations to achieve fire resistance equivalent to fire separation required, in accordance with Section 07 8400. Seal penetrations through non-rated acoustical assemblies with acoustical sealant in accordance with Section 09 8100. Where fire and acoustical separation are not required, apply waterproof sealant in accordance with Section 07 9200.

E. Exterior Wall Sleeves: Install sleeves reamed with welded flanged ends flush with wall.

F. Interior Masonry Wall Sleeves: Install sleeves reamed and finished flush with wall.

G. Stud Wall Sleeves: Terminate ends flush with wall.

END OF SECTION

SECTION 21 1300 – FIRE SUPPRESSION SPRINKLER SYSTEMS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Wet-pipe sprinkler system.
   2. System design, installation, and certification.

B. Related Sections:
   1. Section 09 9000 – Painting and Coating: Painting of exposed piping.
   2. Section 21 0500 – Common Work Results for Fire Suppression.
   3. Section 21 1100 – Fire Suppression Piping.

1.02 SYSTEM DESCRIPTION:

A. System to provide coverage for building addition areas. Extend existing sprinkler system.

B. Determine volume and pressure of incoming water supply from water flow test data. If test data is not available, contact local fire and water departments to verify that design minimum water supply and pressure is readily available at the base of the riser.

C. Provide the number and size of risers required by the system protection area limitations of NFPA 13.

D. Provide system components rated for 175 psi working pressure.

E. System Design Criteria:
   1. General Areas:
      a. Occupancy Classification: NFPA 13 light hazard.
      b. Density: 0.10 gpm per sq ft over the most remote 1500 sq ft.
      c. Hose Stream Allowance: 100 gpm.
      d. Sprinkler Temperature Ratings: In accordance with NFPA 13.
      e. Protection Area Per Sprinkler:
         (1) Areas With Ceilings: Maximum 225 sq ft.
         (2) Areas Without Ceilings: Maximum 168 sq ft.
   2. Indicated Areas:
      a. Occupancy Classification: NFPA 13 ordinary hazard, Group 1.
      b. Density: 0.15 gpm per sq ft over the most remote 1500 sq ft.
      c. Hose Stream Allowance: 250 gpm.
      d. Sprinklers:
         (1) Areas With Ceilings: Intermediate temperature rating, 165 degrees F.
         (2) Areas Without Ceilings: High temperature rating, 286 degrees F.

e. Protection Area Per Sprinkler: Maximum 130 sq ft.

3. Lay out sprinklers symmetrically in an equal grid pattern to achieve overall consistency and rhythm of spacings (for example, 10 x 12 ft) which will not be interrupted by columns, lighting fixtures, or ceiling grid. Sprinkler head spacing may be shortened or lengthened only at perimeter walls, at bulkheads, or at changes in ceiling heights.
   a. In corridors, center sprinkler heads between corridor walls.
   b. In finished spaces with suspended ceilings, locate sprinkler heads within 6 inches of ceiling grid.
4. Maximum protection area per sprinkler may be increased in accordance with NFPA 13 where extended coverage sprinkler heads are used.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Provide data on sprinklers, valves, and specialties, including manufacturer's catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.

B. Water Flow Test Data: Provide identification of person conducting test; date and time; location of hydrants where flow was taken, and where static and residual pressure readings were recorded; size of main supplying these hydrants; and results of test, giving size and number of hydrant butts flowed.

C. Shop Drawings: Submit the number of sets required for plan approval, approved by local fire department and Owner's insurance underwriter; drawn to an indicated scale, on sheets of uniform size, with plan of each floor; showing the following data:
   1. Name of Owner and occupant; location, including street address; point of compass; name and address of contractor.
   2. Ceiling construction; layout of finished ceiling areas indicating sprinkler locations coordinated with ceiling installation and HVAC and electrical installations.
   3. Full height cross section.
   4. Location of fire walls; location of partitions.
   5. Occupancy of each area or room; location and size of concealed spaces, closets, and toilet rooms; questionable small enclosures in which no sprinklers are to be installed.
   6. Size of main, pressure and whether dead-end or circulating, and if dead-end, direction and distance to nearest circulating main, main test results.
   7. Make, type, and nominal orifice size of sprinkler; temperature rating and location of high-temperature sprinklers.
   8. Total area protected by each system; number of sprinklers on riser.
   9. Pipe type and schedule of wall thickness.
   10. Nominal pipe size and cutting lengths of pipe (or center to center dimensions).
   11. Location and size of riser nipples.
   12. Type of fittings and joints and location of all welds and bends.

13. Type and locations of hangers, sleeves, braces, and methods of securing sprinklers when applicable.
14. All control valves, check valves, backflow prevention devices, drain pipes, and test connections.
15. Provisions for flushing.
16. For hydraulically designed systems, the material to be included on the hydraulic data nameplate.
17. Hydraulic calculations.

D. Coordinate with Architect for submittal of shop drawings and hydraulic calculations to plan approval agency in accordance with Section 01 4000. Submit shop drawings and hydraulic calculations to all other authorities having jurisdiction for approval. Submit proof of approval to Architect.
   1. Local fire department.
   2. Local building department.
   3. Owner's insurance underwriter.

1.04 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Project Record Documents: Record actual locations of sprinklers and deviations of piping from drawings. Indicate drain and test locations. Provide Contractor's Material and Test Certificate.

B. Operation and Maintenance Data: Include components of system, servicing requirements, record drawings, inspection data, replacement part numbers and availability, and location and numbers of service provider.

C. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

D. Extra Materials:
   1. Provide extra sprinklers under provisions of NFPA 13.
   2. Provide suitable wrenches for each sprinkler type.
   3. Provide metal storage cabinet located adjacent to alarm valve.

1.05 QUALITY ASSURANCE:

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

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience; licensed as a sprinkler system installer at the place where the project is located.

C. Designer Qualifications: Design system under direct supervision of a person experienced in design of this work and licensed as a sprinkler system designer at the place where the project is located.

1.06 REGULATORY REQUIREMENTS:

A. Conform to UL Fire Resistance Directory and FM Approval Guide, state and local codes, local fire department and water department requirements, and requirements of Owner's insurance underwriter.

B. Perform Work in accordance with NFPA 13.

C. Perform Work in accordance with NFPA 231 where applicable.

D. Equipment and Components: Bear UL and FM label or marking.

E. Welding Materials and Procedures: Conform to AWS B2.1.

1.07 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Store products in shipping containers and maintain in place until installation. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

B. Provide temporary protective coating on cast iron and steel valves.

PART 2 PRODUCTS

2.01 SPRINKLERS:

A. Sprinkler Heads: All brass body; nominal ½ inch orifice; temperature rated for specific area hazard. Extended coverage sprinkler heads are acceptable.

1. Finished Spaces With Ceilings:
   a. General Areas: Semi-recessed pendant type; white enamel finish; with matching escutcheon plate.
   b. Corridors, Toilet Rooms, Locker Rooms and Shower Rooms: Concealed pendant type; cover plate with white enamel finish.
   c. Storage Rooms: Standard pendant type; white enamel finish; with matching escutcheon plate.

2. Exposed Finished Locations: Standard upright type; chrome finish.
   a. Locker Rooms and Weight Rooms: Provide wire guards.

3. Exposed Unfinished Locations: Standard upright type; brass finish.

B. Accessories:

1. Wire Guards: Finish to match sprinkler finish; provide where scheduled and at all areas subject to potential damage.

2.02 PIPING:

A. Above Grade Piping: Steel pipe.

1. ASTM A135, Light Wall, Schedule 10.
   a. Pipe Sizes to 5 Inch: UL listed.
   b. Pipe Size 6 Inch: 0.134 inch wall thickness.

c. Pipe Size 8 Inch: 0.188 inch wall thickness.
d. Welded Steel Fittings: ASME B16.9, wrought steel, buttwelded.
e. Mechanical Grooved Couplings: Malleable iron housing clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers.

2. ASTM A53 or ASTM A135, Schedule 40, black.
   a. Cast Iron Fittings:
      (1) Pipe Sizes to 6 Inch: ASME B16.4, threaded fittings.
      (2) Pipe Sizes 8 Inch and Over: ASME B16.1, flanges and flanged fittings.
   b. Welded Steel Fittings, Mechanical Grooved Couplings, or Mechanical Formed Fittings: Submit substitution request in accordance with Section 01 6000, including evidence that governing authorities and codes permit the use of the requested method of coupling.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Prior to beginning shop fabrication of piping, field verify dimensions and conditions and coordinate work with Contractor and other trades. Minor adjustments to scheduled dimensions, such as ceiling heights, may be made prior to fabrication without an adjustment to the Contract Sum.

3.02 PIPING INSTALLATION:

A. Install piping in accordance with NFPA 13 and Section 21 1100.

B. Provide drain valves at main shut-off valves, low points of piping and apparatus.

C. Provide inspector's test valve in remote part of system; pipe discharge to floor drain or building exterior.

D. Provide minimum 24 x 24 inch precast concrete splash block at each drain and test valve discharge at the building exterior.

3.03 SYSTEM INSTALLATION:

A. Install system components in accordance with NFPA 13.

B. Install sprinklers under ductwork over 48 inches or more in width.

C. Where ceilings are scheduled to be field painted, apply masking tape or paper cover to ensure concealed sprinklers, cover plates, and sprinkler escutcheons do not receive field paint finish. Remove after painting.

D. Flush entire piping system of foreign matter, using approved procedures to inhibit microbially influenced corrosion.

E. Install wire guards on sprinklers where scheduled.

F. Install identification signs on riser and all valves in accordance with NFPA standards.

G. Hydraulic Design Information Sign: Provide metal or rigid plastic sign, permanently marked, secured to the alarm valve with corrosion-resistant wire or chain, indicating the following design criteria:
   1. The design area and density requirements of each system.
   2. The system or systems controlled by the riser.
   3. Required flow and pressure demand at the base of the riser.
   4. Occupancy classification.
   5. Hose stream demand.

3.04 TESTING:

A. Flush and hydrostatically test all systems, using domestic water. Provide additional tests and inspections required for approval.

B. Require testing be witnessed by all authorities having jurisdiction.

END OF SECTION

SECTION 22 0500 – COMMON WORK RESULTS FOR PLUMBING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Materials and installation methods applicable to all Sections of Division 22.
   2. Identification.
   3. Testing and inspection.

B. Related Sections:
   1. Section 09 9000 – Painting and Coating.

1.02 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Record Drawings: Indicate equipment locations, identified in accordance with identification system.

PART 2 PRODUCTS

2.01 IDENTIFICATION MATERIALS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Allen Systems, Inc.
   2. W.H. Brady Company.
   3. Seton Name Plate Co.

B. Service Identification: Contractor's option from the following:
   1. Stenciled characters, 1 inch high. Provide one coat of clear lacquer or varnish over the stencils.
   2. Pipe Markers: Snap-around type; preprinted vinyl, color coded per ANSI A13.1, with name of piping system and "Supply" or "Return" where applicable; arrows to indicate flow direction; with nylon ties for pipe sizes 6 inch and larger.

C. Valve Tags: Polished brass, 2 inch diameter, with stamped numbers and letters to identify serial number and service designation; with chain and corrosion resistant S-hook.

D. Engraved Plastic Nameplates: 1 x 3 x 1/16 inch thick minimum size; white engraved letters on black background; minimum ¼ inch high lettering.

PART 3 EXECUTION

3.01 EQUIPMENT INSTALLATION:

A. Locate and install equipment to facilitate service, maintenance, repair, and replacement of components. Maintain manufacturer's recommended clearances.

B. Maintain factory packaging, lubrication and gaskets during construction; remove immediately prior to Substantial Completion, except when temporary construction use is approved.

3.02 PAINTING:

A. Finish painting of piping shall be done in accordance with Section 09 9000. Damage to finish painting shall be repaired at the expense of the party causing the damage.

B. Refinish factory primed or finished components damaged during shipping or installation. Remove rust, prime, and paint per manufacturer's recommendations for finish equal to original.

3.03 IDENTIFICATION:

A. Identify piping and valves in accordance with ANSI A13.1. Verify numbering system with Owner; coordinate with existing identification system, where present.

B. Piping: Identify each pipe in exposed or accessible space (except architecturally finished spaces) at each major change of direction, at 20 foot intervals in straight runs, each branch connection, each riser, equipment connections, and both sides of walls.

C. Valve Tags: Securely fasten tags to all valves and cocks, chained to hand wheel, on main lines and branches, and at switches, equipment, and controls. Indicate piping system and purpose of valve; indicate whether valve is normally closed (N.C.) or normally open (N.O.) in service; supply (S) or return (R); indicate direction of flow. Tags may be omitted for local stop or shutoff valves to an item of equipment.

3.04 TESTING AND INSPECTION:

A. Refer to individual Sections for specific tests required for each system.

B. Pay for all required tests and inspections. Furnish labor, materials, and instruments; bear other costs in connection with all tests.

C. Coordinate testing and inspection with utility companies and authorities having jurisdiction.

D. Notice of Tests: Give written notice in ample time to all concerned of date when tests will be conducted.

E. Prior Tests: Concealed or insulated work shall remain uncovered until required tests have been completed, but if construction schedule requires it, arrange for prior tests on parts of system as approved by the Architect.

F. Test piping systems before piping is concealed, covered, or insulated. Before testing pipe systems, remove or otherwise protect from damage components not designed to withstand the pressures used in testing piping.

G. Adjustments, Repairs, and Retests:
   1. Make adjustments, repairs, and alterations as required to meet specified test results.
   2. Correct defects disclosed by tests or inspection, and replace defective parts when directed.
   3. In replacing defective parts, use only new materials; in the case of pipe, replace with same length as defective piece.
   4. Caulking of screwed joints or peening of welds is not permitted.
   5. Repeat tests after defects have been corrected and parts replaced, as directed and until pronounced satisfactory.

H. Responsibility for Damage: Bear the cost of repairs and restoration of the work of other Contractors damaged by the tests or cutting required in connection with the tests.

END OF SECTION

SECTION 22 0529 – PLUMBING HANGERS AND SUPPORTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Piping hangers and supports.

B. Related Sections:
   1. Section 22 0500 – Common Work Results for Plumbing.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Anvil International, Inc.

B. Eaton; B-Line.

C. Elcen Metal Products Co.

D. Fee and Mason Manufacturing Company.

E. Miro Industries, Inc.

2.02 COMPONENTS:

A. Provide all required components to rigidly support systems and equipment, using methods suitable for weight of components being supported. Include provisions for vertical and lateral adjustment, and accommodate expansion. Comply with ANSI B31.1, ASTM F708 and MSS SP58.

B. Pipe Hangers and Supports:

   1. Provide continuous threaded solid steel hanger rods for each pipe hanger. Equip each hanger rod with 3 semi-finished hex nuts not including the insert nut.

   2. Support Attachments to Structural Steel:
      a. Pipe Sizes to 2 Inch: Malleable iron C-clamps with lock nuts and cup formed set screws. (Elcen 29A)
      b. Pipe Sizes 2½ Inch and Over: Malleable iron or forged steel beam clamp with tie rod and nut, pocket threaded for rod connection. (Elcen 33 or 34)

   3. Hanger Attachments to Piping: Materials and coatings compatible with piping materials. For insulated piping, provide oversized hangers to fit on the outside of the pipe saddles and shields.
      a. Uninsulated Copper Tubing: Copper plated plastic-coated adjustable tubing rings. (Anvil CT-99C)
      b. Uninsulated Ferrous Piping: Adjustable clevis type. (Anvil 260)
      c. Uninsulated Plastic Piping: Protective type hangers. (Elcen 91)

d. Insulated Piping to 4 Inch: Adjustable clevis type with insulation shield of 18 gauge galvanized steel in 180 degree segments, minimum 12 inches long. (Anvil 260)
e. Insulated Piping 4 Inch and Over: Adjustable steel yoke with pipe roller and pipe covering protection saddle. (Anvil 181 with 160 saddle)

4. Multiple Pipe Supports: Trapeze hangers, preformed channel, enamel finish, with clamps to secure individual piping. (Fee and Mason 500 or 521 with 8500 pipe clamps or 8600 tubing clamps)
5. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
6. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp.
7. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Install in accordance with ANSI B31.9 and ASTM F708.

B. Piping shall be independently supported from the building structure and shall not be supported from other pipes. Where interferences do occur, provide trapeze type hangers or supports.

C. Attach hangers to structural members with clamps; at steel joists, support at panel points only. Do not suspend hangers from metal deck.

D. Pipe Hangers and Supports:

1. Install hangers to provide minimum ½ inch space between finished covering and adjacent work.
2. Place hangers within 12 inches of each horizontal elbow.
3. Use hangers with 1½ inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
4. Support vertical piping at every floor. Support riser piping independently of connected horizontal piping.
5. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
6. Provide sheet metal packing between hanger or support and piping. Insulate dissimilar metals against direct contact.
7. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.

8. Minimum Hanger and Rod Size:
   a. Pipe Sizes to 2 Inch: 3/8 inch diameter.
   b. 2½ Inch to 3½ Inch: 1/2 inch diameter.
   c. 4 Inch to 5 Inch: 5/8 inch diameter.
   d. 6 Inch: 3/4 inch diameter.
   e. 8 Inch to 10 Inch: 7/8 inch diameter.
9. Provide maximum hanger spacings for horizontal piping runs as follows, with minimum one hanger per section of pipe.
   a. Steel Pipe and No-Hub Cast Iron Soil Pipe:
      (1) Sizes to ¾ Inch: 6 ft o.c.
      (2) 1 Inch to 1¼ Inch: 7 ft o.c.
      (3) 1½ Inch: 9 ft o.c.
      (4) 2 Inch: 10 ft o.c.
      (5) 2½ Inch: 11 ft o.c.
      (6) 3 Inch: 12 ft o.c.
      (7) 4 Inch: 14 ft o.c.
      (8) 6 Inch: 17 ft o.c.
   b. Cast Iron Soil Pipe (Hub and Spigot): Locate hangers at each joint, maximum 5 ft o.c.
   c. Copper Pipe:
      (1) Sizes to ¾ Inch: 5 ft o.c.
      (2) 1 Inch: 6 ft o.c.
      (3) 1¼ Inch: 7 ft o.c.
      (4) 1½ Inch to 2 Inch: 8 ft o.c.
   d. Plastic Pipe Sizes to 6 Inch: 4 ft o.c.

END OF SECTION

SECTION 22 0700 – PLUMBING INSULATION

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Thermal insulation for plumbing piping.
   1. Domestic hot and cold water.
   2. Roof drainage.
   3. Condensate drains.
   4. Electric water coolers.
   5. Accessible sinks and lavatories.

B. Related Sections:
   1. Section 07 8400 – Firestopping.
   2. Section 22 0500 – Common Work Results for Plumbing.
   3. Section 22 1000 – Plumbing Piping.
   4. Section 22 1116 – Domestic Water Piping.
   5. Section 22 1316 – Sanitary Waste and Vent Piping.
   6. Section 22 1400 – Drainage Piping.
   7. Section 22 4000 – Plumbing Fixtures.

1.02 DEFINITIONS:

A. Concealed: Below grade or hidden from sight in normally inaccessible areas such as trenches, furred-in spaces, crawl spaces, attic spaces, areas above suspended ceilings, and similar locations.

B. Exposed: Not concealed. Exception: Pipe chases 24 inches and wider shall be considered exposed.

C. Below Grade: Buried in earth below floor inside building or below grade at exterior of building.

D. For the purposes of this Section, condensate waste piping includes all piping above grade receiving condensate discharge, including drainage piping downstream of indirect connections.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Provide list of materials and fastenings to be used for each system. Include general description, fire ratings, and installation instructions.

1.04 QUALITY ASSURANCE:

A. Fire and Smoke Hazard Ratings: ASTM E84.
   1. Flame Spread: Maximum 25.
   2. Smoke Developed: Maximum 50.

B. Thermal Conductivity: ASTM C335; maximum K value for each product listed with product description.

C. Accessories such as cements, fitting covers, and pressure sensitive tape shall have the same component ratings as listed above.

D. Paper laminate jackets shall be permanently fire and smoke resistant. Chemicals used for treating paper in jacket laminates shall not be water soluble and shall be unaffected by water and humidity.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Armacell LLC.

B. CertainTeed Corporation.

C. Johns Manville.

D. Owens-Corning Fiberglas Corporation.

2.02 MATERIALS:

A. Fiberglass Pipe Insulation: ASTM C547, Class I; rigid one piece construction with vapor barrier; minimum 36 inch sections; rated for applications to 850 degrees F; maximum K value 0.23 at 75 degrees F. (Johns Manville Micro-Lok)

1. All Purpose Jacket: ASTM C1136, Type I; reinforced foil-kraft laminate, with pressure sensitive tape sealing system at butt joints and longitudinal seams; white finish. (Johns Manville AP-T Plus)

2. PVC Jacket: ASTM D1784; preformed to shape of pipe or fitting; gloss white finish. (Johns Manville Zeston 2000)

3. Metal Jacket: Aluminum sheet, minimum 0.016 inch thick, with laminated moisture retarder.

4. Jacket Application Schedule:
   a. Piping Not Otherwise Scheduled: All purpose jacket; PVC fitting covers with precut fiberglass insulation insert; minimum two layers of insulation inserts where pipe operating temperature is below 45 degrees F or above 250 degrees F.
   b. Exposed Piping in Finished Areas: PVC jacket; PVC fitting covers with precut fiberglass insulation insert; minimum two layers of insulation inserts where pipe operating temperature is below 45 degrees F or above 250 degrees F.
   c. Outdoor Piping: Metal jacket with preformed aluminum fitting covers.
   d. Below Grade Piping: Metal jacket with preformed aluminum fitting covers.

B. Closed Cell Pipe Insulation: ASTM C534, Type II; flexible elastomeric tubing, black color; maximum K value 0.28 at 75 degrees F. (Johns Manville Aerotube AP; AP Armaflex)

1. Adhesive: Air drying contact type, for joining seams and butt joints. (Johns Manville 57; Armaflex 520 BLV)

2. Finish Paint: Water based latex enamel, semi-gloss; white color. (Johns Manville Aerotube Finish)

C. Heavy Duty Pipe Insulation: ASTM C533, Type I; rigid block molded from hydrous calcium silicate; specially formulated for high temperature, high strength, abuse resistant and fire protection applications; maximum K value 0.40 at 300 degrees F. (Johns Manville Thermo-12 Gold)

D. Mastic: Vapor retardant type, compatible with adjoining materials.

2.03 ACCESSORIES:

A. Manufacturers: In accordance with Section 01 6000.
1. Plumberex Specialty Products.
2. ProFlo.
3. TrueBro, Inc.

B. Pipe Covers: ASTM C1822, Type I; molded vinyl, 1/8 inch wall thickness, with internal ribs; locking covers for valves and cleanouts; white color or clear. (TrueBro Lav Guard)

PART 3 EXECUTION

3.01 PREPARATION:

A. Perform leak testing of piping systems, where specified, before installing insulation.

3.02 INSTALLATION:

A. Apply insulation over clean, dry pipe with all joints butted firmly together. Secure longitudinal jacket laps and butt strips according to manufacturer's recommendations.

B. Extend insulation continuous through wall and ceiling openings and sleeves. Where piping penetrates fire rated assemblies, provide heavy duty pipe insulation to completely fill space between pipe and sleeve, in accordance with Section 07 8400.

C. Assure continuous, unbroken vapor seal at seams, butt joints, and fittings where vapor barrier jackets are used, and on cold service piping below 60 degrees F. Provide adequate insulation and vapor seal to prevent condensation at hangers and support anchors secured directly to cold surfaces.

D. Extend surface finishes to protect all surfaces, ends and raw edges of insulation.

E. Install galvanized metal shields between hangers or supports and pipe insulation. Form shields to fit insulation and extend up to the center line of the pipe, with minimum length as follows:
   1. Pipe Sizes to 2½ Inches: 10 inches.
   2. Pipe Sizes 3 Inches to 6 Inches: 12 inches.

F. Install inserts between pipe and hangers, consisting of heavy duty pipe insulation of thickness equal to adjoining insulation, with vapor barrier where required. Insulation inserts shall have the same length as specified for shields.
   1. For ½ inch insulation thickness only, inserts may be preservative treated wood blocking.

G. Closed Cell Insulation: Push unslit sections over open ends of pipe where practical; otherwise slit tubular sections and wrap around pipe. Adhere and seal seams and butt joints with adhesive.
   1. Cold Piping: Adhere insulation to pipe at high end of run with one inch strip of adhesive on both insulation and pipe. Coat exposed end cuts with adhesive.
   2. Outdoor Exposed Piping: Locate seams on lower half of pipe. Apply two coats of finish paint.

H. Metal Jacket: Install with minimum 2 inch laps, configured to shed water; secure system with ½ inch aluminum bands at 12 inches o.c.

3.03 PROTECTION:

A. Protect installed insulation materials from inclement weather using approved waterproof sheeting. Remove and replace water-damaged insulation.

3.04 SCHEDULE:

A. Insulate all piping, fittings, valves, flanges and unions unless factory insulated or otherwise excluded. Maintain visibility and accessibility of testing laboratory labels, equipment nameplates, and access panels. Do not insulate the following unless specifically scheduled:
   1. Automatic air vent and discharge piping.
   2. Drain and discharge piping downstream of system drain valves and relief valves.
   3. Unions, on hot lines (65 to 250 degrees F) except for personnel protection from floor to seven feet above floor.
   4. Chrome plated pipe fittings and valves at fixtures (except at accessible fixtures).
   5. Bonnet on screwed valve bodies.
   6. Removable plates on check valves, strainers, etc.

B. Exposed Piping:
   1. Domestic Cold Water (up to 6 Inch): 1 inch fiberglass.
   2. Domestic Hot Water (up to 2 Inch): 1 inch fiberglass.
   3. Electric Water Cooler Trap and Drain: ½ inch closed cell.
   4. Hot Water Supply and Drain at Accessible Lavatories: ½ inch closed cell, or pipe covers; may be omitted if plastic pipe is used.

5. Roof Drainage: 1 inch fiberglass.
6. Condensate Drains (up to 1 Inch): 1 inch fiberglass.

C. Concealed Piping:
1. Domestic Cold Water (up to 6 Inch): ½ inch closed cell.
2. Domestic Hot Water (up to 4 Inch): ½ inch closed cell.
3. Roof Drainage (up to 6 Inch): ½ inch closed cell.
4. Condensate Drains (up to 2 Inch): ½ inch closed cell.

D. For pipe sizes larger than scheduled, provide insulation thickness ½ inch greater than scheduled thickness.

E. Where piping is exposed to outdoor ambient temperatures, provide insulation thickness ½ inch greater than scheduled thickness.

END OF SECTION

SECTION 22 1000 – PLUMBING PIPING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Piping materials and installation methods applicable to all plumbing piping work.

B. Related Sections:
   1. Section 07 8400 – Firestopping.
   2. Section 07 9200 – Joint Sealants.
   3. Section 09 8100 – Acoustic Insulation.
   4. Section 22 0500 – Common Work Results for Plumbing.
   5. Section 22 0529 – Plumbing Hangers and Supports.
   6. Section 31 2000 – Earth Moving: Excavation and backfilling.

1.02 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Valve Directories: Include in Operation and Maintenance binders. For each piping system, indicate identification (correlated with record documents), location and purpose of each valve.

1.03 QUALITY ASSURANCE:

A. Pipe: Identify with marking including size, material classification, and ASTM specification. Include water pressure rating and potable water certification where applicable.

B. Valves: Manufacturer's name and pressure rating marked on valve body.

C. Welding Procedures: Conform to ASME SEC IX, AWS D1.1, NCPWB Procedure Specifications for Pipe Welding, and applicable state labor regulations.

D. Brazing Procedures: Conform to ASME Boiler and Pressure Vessel Code requirements.

E. Soldering Procedures: Conform to ANSI B16.18.

F. Welders Certification: In accordance with ASME SEC IX and NCPWB.

1.04 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Store piping and specialties elevated above grade, protected from moisture and dirt.

B. Store plastic piping protected from direct sunlight, with supports to prevent sagging and bending.

C. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

D. Provide temporary protective coating on cast iron and steel valves.

E. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

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

PART 2 PRODUCTS

2.01 PIPE AND PIPE FITTINGS:

A. Refer to individual specification Sections for piping materials, fittings and related requirements for specific piping systems.

B. Pipe Threads: ANSI B1.20.1.

C. Pipe Flanges:
   1. Full Face Type: Class 125, cast iron and cast bronze.
   2. Narrow Face Type: Class 250, cast iron and cast steel.
   3. Gasket Materials: ANSI B16.21, nonmetallic, flat, non-asbestos.
   4. Bolts and Nuts: ANSI B18.2.1.

D. Welding Materials: AWS D10.12.

E. Brazing Materials: AWS A5.8.

F. Solder Materials: ASTM B32, Alloy Sn95 and Sn94.

G. Solvents for PVC Piping: ASTM D2564, with ASTM F656 primer.

2.02 PIPING SPECIALTIES:

A. Unions for Steel Pipe:
   1. Sizes to 2 Inch: Class 150 malleable iron unions with ground joint brass to iron seat, galvanized or black.
   2. Sizes 2½ Inch and Over (Welded): Class 150 malleable iron forged steel slip-on flanges, preformed neoprene gaskets, and carbon steel bolts.
   3. Sizes 2½ Inch and Over (Screwed): Class 150 malleable iron threaded steel flanges, galvanized or black, preformed neoprene gaskets, and carbon steel bolts.

B. Unions for Copper Pipe:
   1. Sizes to 3 Inch: Class 150 bronze unions with soldered joints.
   2. Sizes 3½ Inch and Over: Class 150 slip-on bronze flanges; preformed neoprene gaskets.

C. Dielectric Unions:
   1. Sizes to 2 Inch: Steel body and nut with insulating gasket (250 lb at 210 degrees F) and copper connector. (EPCO Models FX, EA, and FB)
   2. Sizes 2½ Inch and Over: Cast iron body flanges with insulating gasket (250 lb at 210 degrees F) and copper connector. (EPCO Model GX and GA)

D. Floor, Wall, and Ceiling Plates (Escutcheons):
   1. Finished Areas: Chrome plated brass.
   2. Unfinished and Concealed Areas: Stamped brass, split hinged type.

E. Pipe Sleeves:
   1. Existing Construction: 22 gauge galvanized steel.
   2. Roofs, Interior Stud Walls, and Floors (Concealed): 22 gauge galvanized steel.
   3. Exterior Walls, Interior Masonry Walls, and Floors (Exposed): Galvanized steel pipe, ASTM A53, Type E, Grade A, Schedule 40.
   4. Isolate sleeves from copper piping materials.

PART 3 EXECUTION

3.01 EXCAVATION AND BACKFILL:

A. Perform excavation and backfill in accordance with Section 31 2000.

B. Excavate as necessary to install below grade piping at indicated or required elevations. Maintain excavations free of water. Excavate trenches to uniform widths to allow minimum 12 inch working clearance on each side of pipe. Trim floor of excavation true, with uniform grade, to permit installation of piping on undisturbed earth.

C. Beyond building perimeter, excavate to allow installation of top of pipe below frost line.

D. Perform testing and obtain required approvals after pipe embedment and before backfilling.

E. Backfill by hand and manually compact initial backfill, using approved fill material free of particles larger than 1 inch, until 12 inches of cover is provided over top of pipe.

F. Place final backfill of approved fill material in maximum 8 inch layers to final subgrade. Compact each layer to ASTM D1557, 95 percent maximum dry density.

G. Exercise caution during backfilling and compaction to prevent damage or displacement of buried components.

3.02 PIPING INSTALLATION:

A. Verify piping and tubing is round and straight prior to installation. Prevent deformation during cutting and threading. Do not permit tool marks on exposed piping in finished areas.

B. Verify that excavations are to required grade, dry, and not over-excavated. Do not install underground piping when bedding is wet or frozen.

C. Establish elevations of buried piping outside the building to ensure not less than 3 ft of cover unless shallower cover is specifically approved.

D. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

E. Remove scale and foreign material from inside and outside before assembly.

F. Prepare piping connections to equipment with flanges or unions, arranged for quick disconnect for maintenance.
   1. Pipe Size 2 Inch and Smaller: Install unions adjacent to each valve on the downstream side, and at connection to each piece of equipment.
   2. Pipe Size 2½ Inch and Larger: Install unions adjacent to flanged valves on the downstream side, and at connection to each piece of equipment supplied with flanged pipe connections.
   3. Use the same material and finish as the piping system.
   4. Use non-conducting dielectric connections wherever joining dissimilar metals.
   5. Do not use unions or flanged unions in straight runs of pipe or in concealed locations except for flanged valve applications.

G. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.

H. Install piping to conserve building space, to not interfere with use of space and other work, and to maintain required headroom and clearances for equipment, door and window swings, ceiling panel removal, and related conditions.

I. Place piping in concealed spaces above finished ceilings. In areas without finish ceilings, route piping through spaces in open web joists, trusses, or girders.

J. Conceal vertical piping in stud wall cavities, furred wall spaces, pipe chases, and masonry cores where possible. Except in unfinished spaces, obtain approval prior to installing exposed piping.

K. Group piping whenever practical at common elevations. When installing piping in parallel, leave sufficient space between pipe lines to facilitate future work on any line.

L. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Utilize offsets, changes in direction and expansion loops, constructed to allow maximum anticipated variation in piping length.

M. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.

N. Install valves at service connections to equipment and at branch connections to main lines. Locate valves to facilitate maintenance access. In vertical piping in mechanical rooms and unfinished locations, locate valves within 8 feet of floor.

O. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.

P. Prime coat and prepare for finish painting exposed pipe, fittings, supports, and accessories scheduled for field painting. Refer to Section 09 9000. Components located in pipe shafts and suspended ceiling spaces are not considered exposed.

Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to weld.

Q. Do not penetrate building structural members unless indicated.

R. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

S. Install bell and spigot pipe with bell end upstream.

T. Die cut threaded joints with full cut standard taper pipe threads with non-toxic joint compound applied to male threads only.

U. Install valves with stems upright or horizontal, not inverted. Remove protective coatings after installation.

V. Provide valves for shut-off and to isolate service equipment, parts of systems, or vertical risers.

W. Install valves for throttling, bypass, or manual flow control services.

X. Install unions downstream of valves and at equipment or apparatus connections.

Y. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.

Z. Clean and flush piping systems prior to testing system or connecting equipment.

3.03 JOINING PIPE AND FITTINGS:

A. Steel Pipe and Fittings:

1. Threaded Joints: Right hand tapered national pipe threads; pipe joint compound on male threads only.

2. Welded Joints: In accordance with ASME SEC IX and NCPWB.

B. Cast Iron Soil Pipe and Fittings:

1. Join hub and spigot cast iron pipe and fittings with lead and oakum, or with neoprene compression gaskets.

2. Join no-hub cast iron pipe and fittings in accordance with CISPI 310.

3. Join cast iron fittings to threaded steel pipe with threaded fittings, using pipe joint compound on male threads only.

C. Copper Pipe and Fittings:

1. Type L Solder Fittings: 95-5 tin-antimony solder and soldering flux paste.
   a. Thoroughly clean the tube end and fitting portions of the joint prior to assembly.
   b. When applying flux, prevent excess paste from entering joint.

c. Remove excess flux from outside of assembly before applying heat.

2. Press Fittings: Install in accordance with manufacturer's instructions, using tools approved by manufacturer.

3. Grooved Joints: Assemble joints with coupling housing, gasket, lubricant, and bolts in accordance with manufacturer's instructions and to manufacturer's required tolerances.

D. Plastic Pipe and Fittings: Thoroughly clean all joint surfaces before starting the joining process. Make all connections to other piping systems using adapters. Do not thread Schedule 40 pipe. Schedule 80 pipe may be threaded.

1. PVC: Solvent weld in accordance with ASTM D2855.

3.04 PIPE SLEEVES:

A. Provide sleeves and escutcheons when penetrating foundations, floors, walls and partitions. Cut escutcheons as necessary to fit in close quarters.

B. Size sleeves to provide minimum ¾ inch clearance around all sides of piping and insulation.

C. Maintain sleeves plumb, level, and in proper position throughout construction. Inspect sleeves in cast-in-place concrete during and after concrete pour and correct any deviation from proper position.

D. Seal pipe and sleeve penetrations to achieve fire resistance equivalent to fire separation required, in accordance with Section 07 8400. Seal penetrations through non-rated acoustical assemblies with acoustical sealant in accordance with Section 09 8100. Where fire and acoustical separation are not required, apply waterproof sealant in accordance with Section 07 9200.

E. Exterior Wall Sleeves: Install sleeves reamed with welded flanged ends flush with wall.

F. Floor Sleeves: Install sleeves reamed with the top of the sleeve 4 inches above floor in equipment rooms and wet areas, and ¼ inch above floor in other locations.

G. Interior Masonry Wall Sleeves: Install sleeves reamed and finished flush with wall.

H. Stud Wall Sleeves: Terminate ends flush with wall.

END OF SECTION

SECTION 22 1116 – DOMESTIC WATER PIPING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Domestic hot and cold water supply piping and valves.
   2. Backflow preventers.
   3. Specialties: Water hammer arresters, thermostatic valves, trap primers, recessed valve boxes.

B. Related Sections:
   1. Section 21 1300 – Fire Suppression Sprinkler Systems.
   2. Section 22 0500 – Common Work Results for Plumbing.
   3. Section 22 0700 – Plumbing Insulation.
   4. Section 22 1000 – Plumbing Piping.
   5. Section 22 4000 – Plumbing Fixtures.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Provide for piping materials, valves and specialties. Indicate materials, sizes, dimensions and types.

1.03 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Project Record Documents: Record actual locations of components, water hammer arresters, and other equipment.

B. Maintenance Data: Periodic inspection requirements for backflow preventers.

1.04 PROJECT CONDITIONS:

A. Verify and coordinate all required connections to fixtures, equipment, and accessories with manufacturer's instructions.

1.05 WARRANTY: In accordance with Section 01 7700.

A. PEX Tubing: Provide 25 year manufacturer warranty.
   1. Manifolds and Fittings: Provide minimum 5 year manufacturer warranty.

PART 2 PRODUCTS

2.01 PIPE AND FITTINGS:

A. Copper Tubing: ASTM B88; Type L hard drawn copper tubing.
   1. Wrought Copper Solder Joint Fittings: ANSI B16.22.
   2. Copper Press Fittings: ANSI B16.18; ANSI B16.22; IAPMO PS 117; EPDM seals.

B. PEX Tubing: ASTM F876 and ASTM F877; rated for 80 psi at 200 degrees F.
   1. Fittings: ASTM F1960; barbed adapter and PEX ring with O-ring seal.
   2. Manifolds: Type L copper; with combination isolation and balancing valve on each outlet; manual air vents; with mounting brackets.

2.02 VALVES:

A. Manufacturers: In accordance with Section 01 6000.
   1. Nibco, Inc.
   2. Conbraco Industries, Inc.
   3. Crane Valves.
   4. Hammond Valve.
   5. Milwaukee Valve Co.
   6. The Wm. Powell Co.
   7. Stockham Valves & Fittings.
   8. Tyco Valves & Controls.

B. Gate Valves: Class 125, 200 psi WWP; MSS SP80, bronze body and trim, solid wedge disc, threaded or solder ends, inside screw, rising stem, handwheel. (Nibco T124 or S134)

C. Ball Valves: Class 150, 600 psi WOG; MSS SP110, standard port type, bronze two-piece body, chrome plated brass or stainless steel ball, Teflon seats and stuffing box ring, blow-out proof stem, lever handle, threaded or solder ends. (Nibco T580-70 or S580-70)
   1. Insulated Piping: Provide stem extensions, non-thermal conductive type with protective sleeve and memory stops.

D. Globe Valves: Class 125, 200 psi WOG; MSS SP80, bronze body and trim, bronze disc, threaded or solder ends, inside screw, handwheel. (Nibco T211-Y or S211-Y)

E. Check Valves: Class 125, 200 psi WOG; MSS SP80, bronze body and cap, bronze swing disc with rubber seat, threaded or solder ends. (Nibco T413 or S413)

F. Drain Valves: Bronze body, threaded or solder inlet end with hose thread outlet, Class 125. (Nibco 72, 73, or 74)

2.03 VALVE BOXES:

A. Manufacturers: In accordance with Section 01 6000.
   1. Acudor Products, Inc.
   2. IPS Corp.; Guy Gray.
   3. Mifab, Inc.
   4. Oatey.

B. Ice Maker: Metal rough-in box; brass ball valve with ¼ turn handle, screw on faceplate frame.

2.04 BACKFLOW PREVENTERS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Ames Co.
   2. CMB Industries, Inc.; Febco Backflow Prevention.
   3. Watts Water Technologies.
   4. Zurn Industries, Inc.; Wilkins Operation.

B. General Requirements: ANSI A112.1.2; approved by USC Foundation for Cross-Connection Control and Hydraulic Research and applicable plumbing code.

C. Atmospheric Type Vacuum Breakers: ASSE 1001; rated for 175 psi operation; brass body with stainless steel working parts; integral strainer; rubber discs. (Watts 288A series)

D. Hose Connection Vacuum Breakers: ASSE 1011; ¾ inch female hose inlet and ¾ inch male outlet connection; non-removable; plain brass finish. (Watts 8A series)

E. Pressure Type Vacuum Breakers: ASSE 1020; brass construction, atmospheric vent; rated for 175 psi continuous in-line operation. (Watts 800M series)

2.05 SPECIALTIES:

A. Manufacturers: In accordance with Section 01 6000.
   1. Armstrong-Lynwood, Inc.; Rada.
   2. Lawler Manufacturing Co.
   3. Leonard Valve Co.
   4. Mifab, Inc.
   5. Powers Process Controls.
   6. Precision Plumbing Products.
   7. Sioux Chief Mfg. Co.
   8. Jay R. Smith Manufacturing Co.
   9. Watts Water Technologies.
   10. Zurn Industries, Inc.

B. Water Hammer Arresters: ASSE 1010; ANSI A112.26.1; bellows type sized in accordance with PDI WH-201, precharged suitable for operation in temperature range 33 to 180 degrees F and maximum 125 psi working pressure. (Zurn Shoktrol Z-1700 series; Mifab WHB series; Smith 5000 series; Watts LF15M2 series)

C. Thermostatic Tempering Valves: ASSE 1062 and ASSE 1070; solid brass body, stainless steel internal components, integral temperature adjustment, sized for intended application, with integral check valves.
   1. Single Fixtures: ASSE 1016; 4 gpm capacity at 45 psi pressure drop. (Powers Hydroguard e480 series)
   2. Two Fixtures: ASSE 1016; 12 gpm capacity at 45 psi pressure drop. (Powers Hydroguard LM495 series)
   3. Three to Five Fixtures: ASSE 1017; 23 gpm capacity at 45 psi pressure drop. (Powers Hydroguard LM490 series)

D. Trap Primers: ASSE 1018; corrosion resistant brass; activated by pressure drop in water supply system; designed to maintain constant water seal in floor drain trap. (Precision Oregon 1 series)

PART 3 EXECUTION

3.01 INSTALLATION:

A. Connect piping system to existing primary water supply piping. Fill, drain, and flush new piping before connecting into existing system.

B. Install piping and fittings in accordance with Section 22 1000 and ANSI B31.9. Insulate piping in accordance with Section 22 0700.

C. Slope piping minimum 0.25 percent and arrange systems to drain through fixtures or drain valves at low points of piping.

D. Where branch lines serve only fixtures located above the piping, connect branch lines to top of main supply piping.

E. Avoid unnecessary traps in circulating lines.

F. Install unions and shut-off valves at all plumbing fixtures, equipment, appliances, meters, branch lines off main lines and before penetrating below grade.

G. Install expansion offsets in lines where required. Anchor piping at each end.

H. Install approved potable water protection devices on plumbing lines where contamination of domestic water may occur, including the following:
   1. Hose and hydrant connections.
   2. Flush valves.
   3. Other locations as required by applicable codes.

I. Pipe relief from backflow preventers to nearest drain.

J. Install water hammer arresters complete with accessible isolation valve on hot and cold water branch lines serving lavatories, and on branch lines with quick closing valves and solenoid valves.

K. Install air chambers on hot and cold water supply piping to each fixture or group of fixtures. Fabricate same size as supply pipe or ¾ inch minimum, and minimum 18 inches long.

L. Thermostatic Tempering Valves: Mount below counter or in accessible chase, located to prevent accidental user contact.

M. Trap Primers: Mount in accessible location above lay-in ceiling, or in mechanical room. Pipe outlet to floor drain connection.
   1. Trap primers may be omitted where all floor drains are provided with barrier type trap seals.

3.02 TESTING AND INSPECTION:

A. Test piping systems in accordance with Section 22 0500.

B. Water Supply Piping Test: Before connecting fixtures and equipment, test water supply piping at a hydrostatic pressure of 1.5 times normal operating pressure or 150 psig, whichever is larger, for 2 hours.

C. Final Operating Test: After connecting fixtures and equipment, operate all fixtures and verify proper performance of supply systems without leaks. Fully open and close all valves and verify proper operation without leaks.

3.03 CLEANING AND DISINFECTING:

A. Prior to starting work, verify system is complete.

B. Flush system with domestic water, using the maximum amount of water available.

C. Ensure Ph of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or hydrochloric acid.

D. Inject disinfectant, free chlorine in liquid, powder, tablet or gas form, throughout system to obtain 50 to 80 mg/L residual.

E. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.

F. Maintain disinfectant in system for 24 hours.

G. If final disinfectant residual tests less than 25 mg/L, repeat treatment.

H. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.

I. 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.

J. Repeat disinfecting until piping meets state and local bacteriological tests and is approved.

END OF SECTION

SECTION 22 1316 – SANITARY WASTE AND VENT PIPING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Sanitary sewer drain, waste and vent piping.
   2. Floor drains and cleanouts.

B. Related Sections:
   1. Section 22 0500 – Common Work Results for Plumbing.
   2. Section 22 0700 – Plumbing Insulation.
   3. Section 22 1000 – Plumbing Piping.
   4. Section 22 1400 – Drainage Piping.
   5. Section 22 4000 – Plumbing Fixtures.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Provide for piping materials and specialties. Indicate materials, sizes, dimensions and types.

1.03 PROJECT CONDITIONS:

A. Verify locations of all floor slab penetrations prior to installation, including rough-in dimensions and floor drains.

B. Verify and coordinate all required connections (including indirect waste connections) to fixtures, equipment, and accessories with manufacturer's instructions.

PART 2 PRODUCTS

2.01 SANITARY PIPING:

A. Above Grade and Below Grade:

   1. Cast Iron Soil Pipe: ASTM A74; service weight, with hub and spigot.
      a. Fittings: Cast iron.
      b. Neoprene Compression Gaskets: ASTM C564.

   2. Polyvinyl Chloride (PVC): ASTM D2665, Schedule 40 and Schedule 80, with PVC fittings.
      a. Do not use PVC piping in plenums or for kitchen equipment waste and vent.

B. Above Grade Only:

   1. Galvanized Steel Pipe: ASTM A53, Schedule 40; seamless or welded.
      a. Sizes to 2 Inch: Threaded and coupled ends.
      b. Sizes 2½ Inch and Larger: Beveled ends for welding.

c. Fittings (Sizes to 2 Inch): ANSI B16.3; Class 150 malleable iron, threaded type.
d. Fittings (Sizes 2½ Inch and Larger): ANSI B16.9, butt welding type.

2. No-Hub Cast Iron Pipe: ASTM A888; CISPI 301.
   a. Fittings: Cast iron.
   b. Mechanical Joint Couplings: CISPI 310; metallic shielded type with elastomeric sealing sleeve and clamps; 24 gauge type 304 stainless steel with ASTM C564 neoprene compression gaskets.

2.02 DRAINS AND CLEANOUTS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Zurn Industries, Inc.
   2. Amtrol, Inc.
   3. Josam Co.
   4. Mifab, Inc.
   5. Jay R. Smith Manufacturing Co.
   6. Wade.
   7. Watts Drainage.

B. Floor Drains: ASME A112.21.1; lacquered cast iron body with bottom outlet, combination invertible membrane clamp and adjustable collar; minimum 3 inch diameter outlet pipe size; trap primer connection or ASSE 1072 barrier type trap seal; polished nickel bronze grid strainer. (Zurn ZN-415-6B; Watts FD-100A series; Mifab F1100-C series; Smith 2005-A06NB series)

C. Floor Cleanouts: ASME A112.36.2; lacquered cast iron body; line size, maximum 4 inch. (Zurn ZN-1400 series; Watts CO-200 series; Mifab C1220 series)
   1. Exterior and Interior Exposed Concrete: Heavy duty threaded top assembly, round polished nickel bronze scored cover adjustable to finished concrete surface.
   2. Finished Floor Areas with Resinous or Resilient Flooring: Threaded top assembly, square polished nickel bronze cover recessed to accept floor finish, adjustable to finished floor.
   3. Finished Floor Areas with Carpet: Threaded top assembly, round polished nickel bronze scored cover adjustable to finished floor, with carpet marker.

D. Wall Cleanouts: ASME A112.36.2; lacquered cast iron body; line size, maximum 4 inch; threaded plug with smooth round stainless steel access cover. (Zurn ZN-1441)

PART 3 EXECUTION

3.01 EXAMINATION:

A. Before commencing work, check invert elevations required for sanitary sewer connections, confirm inverts and ensure that these can be properly connected with slope for drainage and cover to avoid freezing.

3.02 INSTALLATION:

A. Connect to existing sanitary drainage system as indicated.

B. Install piping and fittings in accordance with Section 22 1000. Insulate piping in accordance with Section 22 0700.

C. Slope piping and support to prevent sags and traps.
   1. Pipe Sizes to 3 Inch: ¼ inch per foot minimum, ½ inch per foot maximum.
   2. Pipe Sizes 4 Inch and Above: 1/8 inch per foot minimum, ½ inch per foot maximum.

D. Extend waste and vent stacks through roof minimum 12 inches, using cast iron soil pipe from a point below the roof deck to top of piping; pipe size full size of stack, 4 inch minimum. Maintain minimum 20 feet from fresh air intakes, operable windows, and ventilation louvers, and minimum 4 feet from exterior building walls and fire walls. Encase piping above roof in approved roof jacket, with flashing flange of 16 oz copper, compatible with roofing materials. Maintain integrity of roof assembly.

E. Conceal cast iron hubs located in partition walls where above grade piping joins below grade piping. Where thickness of stud or masonry is less than outside diameter of hub, locate top of hub below finished floor.

F. Provide cleanouts at locations required by applicable codes; where indicated on Drawings; at flow direction changes greater than 45 degrees; at base of each riser or stack; in all P-traps installed above grade; and at maximum 50 foot intervals in horizontal lines.
   1. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.
   2. Encase exterior cleanouts in minimum 18 x 18 inch concrete slab, thickened around cleanout, flush with grade.
   3. Install floor cleanouts at elevation to accommodate finished floor.

3.03 TESTING AND INSPECTION:

A. Test piping systems in accordance with Section 22 0500.

B. Drainage Systems Test: Test piping at a pressure of 5 psig for 15 minutes, using methods approved by state and local regulatory agencies.
   1. Perform test in presence of authorized plumbing inspector. Submit approval certificate in accordance with Section 01 7700.

C. Final Operating Test: After connecting fixtures and equipment, operate all fixtures and verify proper performance of waste systems without leaks.

END OF SECTION

SECTION 22 1400 – DRAINAGE PIPING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Roof drainage piping.
   2. Roof drains.

B. Related Sections:
   1. Section 22 0500 – Common Work Results for Plumbing.
   2. Section 22 0700 – Plumbing Insulation.
   3. Section 22 1000 – Plumbing Piping.
   4. Section 22 1316 – Sanitary Waste and Vent Piping: Floor drains; cleanouts.
   5. Section 33 4200 – Stormwater Drainage: Site storm sewer lines.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Provide for piping materials and specialties. Indicate materials, sizes, dimensions and types.

1.03 PROJECT CONDITIONS:

A. Verify locations of all floor slab penetrations prior to installation, including rough-in dimensions and floor drains.

B. Verify and coordinate all required connections (including indirect waste connections) to fixtures, equipment, and accessories with manufacturer's instructions.

PART 2 PRODUCTS

2.01 ROOF DRAINAGE PIPING:

A. Above Grade and Below Grade:

   1. Cast Iron Soil Pipe: ASTM A74; service weight, with hub and spigot.
      a. Fittings: Cast iron.
      b. Neoprene Compression Gaskets: ASTM C564.

   2. Polyvinyl Chloride (PVC): ASTM D2665, Schedule 40 and Schedule 80, with PVC fittings. Do not use PVC piping in plenums.

B. Above Grade Only:

   1. Galvanized Steel Pipe: ASTM A53, Schedule 40; seamless or welded.
      a. Sizes to 2 Inch: Threaded and coupled ends.
      b. Sizes 2½ Inch and Larger: Beveled ends for welding.

c. Fittings (Sizes to 2 Inch): ANSI B16.3; Class 150 malleable iron, threaded type.
d. Fittings (Sizes 2½ Inch and Larger): ANSI B16.9, butt welding type.

2. No-Hub Cast Iron Pipe: ASTM A888; CISPI 301.
   a. Fittings: Cast iron.
   b. Couplings: Shielded type with clamps; 24 gauge type 304 stainless steel with ASTM C564 neoprene compression gaskets.

2.02 ROOF DRAINS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Zurn Industries, Inc.
   2. Amtrol, Inc.
   3. Josam Co.
   4. Mifab, Inc.
   5. Jay R. Smith Manufacturing Co.
   6. Wade.
   7. Watts Drainage.

B. Roof Drain and Overflow Drain Assemblies: ASME A112.6.4; lacquered cast iron bodies with deck plate and removable polyethylene dome strainers; overflow drain with 2 inch high internal water dam. (Zurn Z-163-EA; Mifab R1270)
   1. Accessories: Coordinate with roofing type.
      a. Adjustable extension sleeve for roof insulation.

C. Downspout Nozzles: Nickel bronze body; threaded inlet; decorative face of wall flange and outlet nozzle with drip edge. (Zurn ZANB-199; Watts RD-940; Mifab R1940)

2.03 CONDENSATE DRAIN PIPING:

A. Galvanized Steel Pipe (Sizes to 2 Inch): ASTM A53, Schedule 40; seamless or welded; threaded and coupled ends.
   1. Fittings: ANSI B16.3; Class 150 malleable iron, threaded type.

B. Copper Drainage Tubing: ASTM B306, Type DWV.
   1. Wrought Copper Solder Joint Fittings: ANSI B16.29.

C. Polyvinyl Chloride (PVC) Pipe: ASTM D2665, Schedule 80, with PVC fittings. Do not use PVC piping in plenums.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Before commencing work, check invert elevations required for connections; confirm inverts and ensure that these can be properly connected with slope for drainage and cover to avoid freezing.

3.02 INSTALLATION:

A. Roof Drainage Piping: Connect to storm sewer outside the building as indicated. Connect to roof drains as indicated. Mount piping inside building as close to roof as possible.
   1. Verify securement of roof drain to structural deck and roof membranes and flashings to ensure a watertight, airtight, and durable installation.

B. Condensate Drain Piping: Minimum pipe size shall be ¾ inch. Discharge condensate waste into sanitary drainage system using approved indirect connection.

C. Install piping and fittings in accordance with Section 22 1000. Insulate piping in accordance with Section 22 0700.

D. Slope piping and support to prevent sags and traps.
   1. Pipe Sizes to 3 Inch: ¼ inch per foot minimum, ½ inch per foot maximum.
   2. Pipe Sizes 4 Inch and Above: 1/8 inch per foot minimum, ½ inch per foot maximum.

E. Extend waste and vent stacks through roof minimum 12 inches, using cast iron soil pipe from a point below the roof deck to top of piping; pipe size full size of stack, 4 inch minimum. Maintain minimum 20 feet from fresh air intakes, windows, and ventilation louvers, and minimum 4 feet from exterior building walls and fire walls. Encase piping above roof in approved roof jacket, with flashing flange of minimum 16 oz copper, compatible with roofing materials. Maintain integrity of roof assembly.

F. Conceal cast iron hubs located in partition walls where above grade piping joins below grade piping. Where thickness of stud or masonry is less than outside diameter of hub, locate top of hub below finished floor.

G. Provide cleanouts at locations required by applicable codes; where indicated on Drawings; at flow direction changes greater than 45 degrees; at base of each riser or stack; in all P-traps installed above grade; and at maximum 50 foot intervals in horizontal lines.
   1. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.
   2. Encase exterior cleanouts in minimum 14 x 14 inch concrete slab, 12 inch thick, flush with grade.
   3. Install floor cleanouts at elevation to accommodate finished floor.

3.03 TESTING AND INSPECTION:

A. Test piping systems in accordance with Section 22 0500.

B. Drainage Systems Test: Test piping at a pressure of 5 psig for 15 minutes, using methods approved by state and local regulatory agencies.
   1. Perform test in presence of authorized plumbing inspector. Submit approval certificate in accordance with Section 01 7700.

END OF SECTION

SECTION 22 2123 – NATURAL GAS PIPING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Natural gas piping system for operating pressures up to 160 psig.
   2. Accessories.

B. Related Sections:
   1. Section 07 5000 – Membrane Roofing: Walkways.
   2. Section 09 9000 – Painting and Coating: Field painting of exposed piping.
   3. Section 22 0500 – Common Work Results for Plumbing.
   4. Section 22 0700 – Plumbing Insulation.
   5. Section 22 1000 – Plumbing Piping.

1.02 DESIGN REQUIREMENTS:

A. Design natural gas piping system to all gas fired equipment indicated, in accordance with applicable codes and utility company requirements.
   1. Obtain load and pressure requirements from equipment supplier for each piece of gas fired equipment. Adjust pipe sizes and provide additional regulators as required to ensure that the correct pressure is provided to each piece of equipment.
   2. Field verify load and pressure requirements for existing gas fired equipment to remain.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Provide for piping materials, valves and specialties. Indicate materials, sizes, dimensions and types.

1.04 QUALITY ASSURANCE:

A. Ensure products and installation are in conformance with applicable recommendations and requirements of AGA, ANSI B31.2, NFPA 54, and local utility company.

PART 2 PRODUCTS

2.01 PIPE AND FITTINGS:

A. Above Grade: Black steel pipe; ASTM A53, Schedule 40; seamless or welded; beveled ends for welding.
   1. Threaded and coupled ends may be used at exposed locations, for pipe sizes 2 inch and smaller.

B. Fittings for Welded Joints: ASTM A234; wrought steel welding type.
   1. Make tee connections with welding tees; mitered tees will not be permitted in welded lines. The use of weldolets is permitted in lieu of welding tees in welded lines provided they are installed in prefabricated assemblies and the pipe interior is cleaned of slag. Field installation of weldolets is permitted in lines of 5 inches and larger, if the installation is cleaned inside after welding.
   2. Use welding elbows for all bends; mitered elbows in welded lines will not be permitted.
   3. Make reductions in line sizes with welding reducers; mitered reducers will not be permitted in welded lines.
   4. Carefully prepare pipe ends in all tees, laterals and reducers to provide for proper weld penetration.
   5. End to end joints of the same size pipe, sizes ¾ inch through 1 inch, may be butt welded provided that an internal welding ring is used.

C. Fittings for Threaded Joints: ANSI B16.3, Class 150.

2.02 GAS VALVES:

A. Manual Gas Valves:
   1. Sizes to 2 Inch: ANSI Z21.15; full port type; all brass construction with check; lever operator.
   2. Sizes 2½ Inch and Larger: MSS SP78; 125 psi, cast iron body and bonnet, cast iron lubricated plug; square head wrench operated.

2.03 ACCESSORIES:

A. Manufacturers: In accordance with Section 01 6000.
   1. Dormont.
   2. Eaton B-Line.
   3. Elcen Metal Products Co.
   4. Erico International Corp.
   5. Maxitrol Co.

B. Gas Pressure Regulators: Cast iron body; cast aluminum alloy diaphragm with nylon fabric insert, external vent connection, interchangeable brass orifices; adjustment range 4 inches to 12 inches w.c., or as required by equipment; with automatic safety vent limiting device.

C. Pipe Supports: Foam base with metal cover. (Erico Caddy Pyramid 50)

PART 3 EXECUTION

3.01 PIPING INSTALLATION:

A. Connect piping system to existing gas piping system.

B. Install piping and fittings in accordance with Section 22 1000. Weld joints in accordance with ANSI B31.2.

C. Install plugged drip pockets at low points of piping.

D. Make branch connections with premanufactured fittings only. Do not torch cut holes for branch connections.

E. Clean welding slag and carbon from welded connections. Paint welded area with primer.

F. Route indoor piping as close to roof as possible. Piping exposed to view in public areas is not permitted.

G. Support piping across roofs at maximum 8 ft o.c. Install roof walkway at each support location. Install pipe support and adjust height for level pipe run.

H. Prepare exposed outdoor piping for priming and painting in accordance with Section 09 9000.

I. Where piping is concealed in walls and at floor penetrations, wrap pipe with ½ inch closed cell insulation in accordance with Section 22 0700.

J. On inlet piping to equipment, install valve, union and dirt leg, including safety shut-off valves where required or indicated. Do not install valves or unions in accessible spaces above ceilings, or in air plenums.

K. Cap all outlets scheduled for future use or not connected to equipment.

L. Install gas pressure regulator at each equipment connection, sized in accordance with equipment.

M. Pipe vents from pressure reducing valves to outdoors and terminate with turndown elbow and insect screen. Maintain required distances from air intakes.

3.02 TESTING AND INSPECTION:

A. Test piping in accordance with Section 22 0500 and NFPA 54.

B. Before connecting fixtures and equipment, test gas piping with compressed air at a pressure of 60 psig for two hours without pressure loss.

C. Purge gas lines in accordance with NFPA 54.

D. After connecting equipment, operate all equipment and valves and verify proper performance of system without leaks. Use leak detector to check for leaks at all fittings and connections, and at meter.

END OF SECTION

SECTION 22 4000 – PLUMBING FIXTURES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Water closets and urinals.
   2. Lavatories.
   3. Shower controls.
   4. Hydrants.
   5. Drinking fountains and water coolers.

B. Related Sections:
   1. Section 07 9200 – Joint Sealants: Seal fixtures to walls, floors, and adjoining materials.
   2. Section 22 0500 – Common Work Results for Plumbing.
   3. Section 22 0700 – Plumbing Insulation.
   4. Section 22 1116 – Domestic Water Piping.
   5. Section 22 1316 – Sanitary Waste and Vent Piping.
   6. Division 26 – Electrical: Electrical characteristics and wiring connections.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Provide component sizes, rough-in requirements, and service sizes. Provide catalog illustrations of fixtures, trim, and finishes. Provide electrical characteristics and connection requirements.
   1. Indicate dimensions, weights, and placement of openings and holes.
   2. Manufacturer's Instructions: Indicate assembly and support requirements, installation methods and procedures.

1.03 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Project Record Documents: Record actual locations of components, cleanouts, and other equipment.

B. Maintenance Data: Include spare parts lists and exploded assembly views.

C. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE:

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

B. Ensure products and installation are in conformance with applicable recommendations and requirements of ASME, NEMA, NSF, and UL.

1.05 REGULATORY REQUIREMENTS:

A. Accessible Products: Ensure products and installation are in conformance with applicable requirements of ADA and ICC A117.1.

B. Provide products complying with the low flow standards mandated by Energy Policy Act (EPACT).

1.06 DELIVERY, STORAGE, AND PROTECTION: In accordance with Section 01 6000.

A. Accept Products on site in original factory packaging. Inspect for damage.

B. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

C. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Fixture Carriers; Hydrants:
   1. Manufacturer of fixture.
   2. Zurn Industries, Inc.
   3. Josam Co.
   4. Mifab, Inc.
   5. Sloan Valve Company.
   6. Jay R. Smith Manufacturing Co.
   7. Speakman Co.
   8. Wade.
   9. Watts Drainage.

B. Faucets; Trim:
   1. Manufacturer of lavatory, sink, or fixture.
   2. Chicago Faucets.
   3. Moen Incorporated.
   4. Sloan Valve Company.
   5. Speakman Co.
   6. T & S Brass and Bronze Works, Inc.
   7. Zurn Industries, Inc.

C. Supply Fittings; Traps:
   1. Brass-Craft Manufacturing Co.
   2. Dearborn Brass.
   3. Engineered Brass Company.
   4. Kohler Co.
   5. McGuire Manufacturing Co., Inc.
   6. Moen Incorporated.
   7. Zurn Industries, Inc.

2.02 WATER CLOSETS AND URINALS:

A. Manufacturers: In accordance with Section 01 6000.

1. Fixtures and Flush Valves:
   a. American Standard, Inc.
   b. Eljer, Inc.
   c. Kohler Co.
   d. Mansfield Plumbing Products, LLC.
   e. Sloan Valve Company.
   f. Zurn Industries, Inc.

2. Seats:
   a. Manufacturer of water closet.
   b. Bemis Manufacturing Co.
   c. Beneke Corp.
   d. Centoco.
   e. Church Seat Company.
   f. Olsonite Corp.
   g. Sperzel Co.

B. Flush Valve Water Closets, Wall Hung: ASME A112.19.2; wall hung, siphon jet, vitreous china closet bowl, with elongated rim, top spud, china bolt caps. (Zurn Z5615.258; American Standard 3351.001; Kohler K-4325; Sloan ST-2050-1.28)

1. Mounting Height (Accessible Type): 16-1/8 inches to top of bowl rim.

2. Mounting Height (Standard Type): 15 inches to top of bowl rim.

3. Color: White.

4. Automatic Flush Valves: ASME A112.19.5; exposed chrome plated, diaphragm type with battery powered automatic sensor and solenoid valve and chrome plated metal cover, escutcheon, seat bumper, integral screwdriver stop and vacuum breaker; maximum 1.28 gallon flush volume. (Zurn ZER-6000PL-HET-CPM-YO)

5. Seats: Solid white plastic, open front, extended back, brass bolts, less cover. (Church 9500C)

6. Carriers: ASME A112.6.1; adjustable cast iron frame, integral drain hub and vent, adjustable spud, lugs for floor and wall attachment, threaded fixture studs with nuts and washers. (Zurn Z-1200 series; Watts ISCA-100 series; Mifab MC-10 series)
   a. For installation at chases less than 24 inches, provide finishing frame.

C. Wall Hung Urinals: ASME 112.19.2; vitreous china, wall hung washout type, integral trap, removable stainless steel strainer, ¾ inch top spud, steel supporting hanger. (American Standard 6590.001; Sloan SU-1005-0.5; Kohler K-4991-ET)

1. Mounting Height (Accessible Type): 17 inches to top of rim.

2. Mounting Height (Standard Type): 22 inches to top of rim.

3. Color: White.
4. Automatic Flush Valves: ASME A112.19.5; exposed chrome plated, diaphragm type with battery powered automatic sensor and solenoid valve and chrome plated metal cover, escutcheon, integral screwdriver stop and vacuum breaker; maximum 0.5 gallon flush volume. (Zurn ZER-6003AV-EWS-CPM; Kohler K-10958; Sloan 8186-0.5)
5. Carriers: ASME 112.6.1; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, threaded fixture studs for fixture hanger, bearing plate. (Zurn Z-1222; Watts CA-311; Mifab MC-32)

2.03 LAVATORIES:

A. Manufacturers: In accordance with Section 01 6000.
   1. American Standard, Inc.
   2. Eljer, Inc.
   3. Mansfield Plumbing Products, LLC.
   4. Kohler Co.
   5. Zurn Industries, Inc.

B. Wall Hung Lavatories: ASME A112.19.2; vitreous china wall hung lavatory, 20 x 18 inch, with maximum 2½ inch high back, faucet holes on 4 inch centers, D-shaped basin with self draining deck, front overflow. (American Standard 0124.131 Comrade; Kohler K-1729 Chesapeake; Zurn Z5344)
   1. Mounting Height: 34 inches to top of rim.
   2. Carriers: ASME 112.6.1; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, concealed arm supports, mounting fasteners. (Zurn Z-1231; Watts TCA-411; Mifab MC-41; Smith 0710 series)
   3. Color: White.

C. Automatic Faucets: ASME A112.18.1; chrome plated lavatory faucet with battery powered automatic sensor and solenoid valve, mixing valve with checks and strainer, water economy aerator with flow regulator set to 0.5 gpm. (American Standard 6055.205 Innsbrook Selectronic; Zurn Z6913; Sloan SF-2350)
   1. Drain Fittings: Chrome plated open grid strainer with 1¼ inch tailpiece. (American Standard 2411.015; Zurn Z8743)

D. Supply Fittings: Angle supply with loose key stop and escutcheon. (Zurn Z8800-LRLK series)

E. Traps: Chrome plated 17 gauge brass P-trap with cleanout plug and arm with escutcheon; with offset tailpiece where required for accessible clearance. (Zurn Z8700 series)

2.04 SHOWER CONTROLS:

A. Manufacturers: In accordance with Section 01 6000.

1. Bradley Corporation.
2. Leonard Valve Co.
3. Powers Process Controls.
4. Speakman Co.
5. Symmons Industries, Inc.

B. Shower Controls: ASME A112.18.1; ASSE 1016; chrome plated brass concealed shower supply with pressure balanced mixing valve, integral service stops, adjustable temperature limit stop, with maximum 1.5 gpm flow; stainless steel panel with integral soap dish and removable cover for access to components.

1. Standard Type: Adjustable spray ball joint shower head. (Powers Hydropanel II 450-0418; Speakman S-1590-AF; Bradley WS-1X-HD-B-SD)
   a. Mounting Height:
      (1) Male: 77 inches above finish floor to shower head.
      (2) Female: 70 inches above finish floor to shower head.
2. Accessible Type: Hand shower with reinforced vinyl hose and slide bar; mounting height 43 inches above finish floor to center of controls. (Leonard SS-PAM-501P; Powers Hydropanel II 450-0420; Bradley WS-1X-HN-HD-B-SD)
3. Group Type: Trapezoidal housing with three adjustable spray ball joint shower heads; mounting height 72 inches above finish floor to shower head. (Bradley WS-3W-HD-B-SD)
4. Group Accessible Type: Trapezoidal housing with three adjustable spray ball joint shower heads; accessible position with hand shower, stainless steel hose, slide bar, diverter valve, and controls mounted 43 inches above finish floor; mounting height 72 inches above finish floor to shower head. (Bradley WS-3W-HN-HD-B-SD)
5. Modular Shrouding: Stainless steel panels with vandal resistant fasteners; horizontal adapters, corner adapters, overlay shrouding and extensions, and end caps.

2.05 HYDRANTS:

A. Exterior Wall Hydrants: ASSE 1019; non-freeze, self-draining type, with stainless steel box and hinged cover with operating key lock, integral backflow preventer, straight inlet connection. (Zurn Z-1320; Watts HY-725-3; Mifab MHY-26-3; Jay R. Smith 5519)

2.06 DRINKING FOUNTAINS AND WATER COOLERS:

A. Manufacturers: In accordance with Section 01 6000.

1. Elkay Manufacturing Company.
2. Halsey Taylor.
3. Haws Corporation.
4. Oasis International.

B. Electric Water Coolers: AHRI 1010; UL 399; wall mounted with stainless steel top, vinyl on steel body, elevated anti-squirt bubbler with stream guard, automatic stream regulator, pressbar operator, mounting bracket, refrigerated with integral air cooled condenser. (Elkay EZS8; Oasis PG8AC)

1. Bottle Filler: Wall mounted above cooler, where scheduled; with stainless steel housing and thermoplastic back panel; automatic sensor with shutoff timer; 1.1 gpm fill rate; water filter with maintenance monitor.
2. Splash Guard: 8 x 18 x 0.050 inch stainless steel, satin finish; at locations without bottle filler.
3. Carrier: ASME 112.6.1; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, threaded fixture studs for fixture hanger, bearing plate. (Zurn Z-1225; Watts CA-421)
4. Mounting Height:
   a. Standard Type: 40 inches to top of cabinet.
   b. Accessible Type: 36 inches to top of spout.
5. Capacity: 8 gph of 50 degree F water with inlet at 80 degrees F and room temperature of 90 degrees F.
6. Electrical: Maximum 1/5 hp compressor; cord and plug for grounded connection to electric wiring system.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify that walls and floors are prepared and ready for installation of fixtures.

C. Verify that electric power is available and of the correct characteristics.

3.02 PREPARATION:

A. Rough-in fixture piping connections in accordance with manufacturer's recommendations and in accordance with minimum sizes indicated in fixture rough-in schedule on Drawings.

3.03 INSTALLATION:

A. Install Products in accordance with manufacturer's instructions, with all required trim, accessories, and mounting devices.

B. Coordinate with plumbing piping and related electrical work to achieve operating system.

C. Install each fixture with trap, easily removable for servicing and cleaning.

D. Provide chrome plated rigid or flexible supplies to fixtures with stops, reducers, and escutcheons.

E. Install components level and plumb.

F. Install and secure fixtures in place with supports, carriers, and bolts.

G. Seal fixtures to walls, floors, and adjoining surfaces with sealant as specified in Section 07 9200, color to match fixture.

H. Automatic Faucets: Install mixing valve in accessible location above ceiling. Install solenoid valve below lavatory or counter, as high as installation clearances allow, positioned for future installation of standard prefabricated enclosure panel. Location of all components is subject to Architect's approval.

I. Water Coolers: Secure splash guards to wall surface, except where bottle fillers are scheduled; seal perimeter.

3.04 ADJUSTING: In accordance with Section 01 7000.

A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

3.05 CLEANING:

A. Perform daily progress cleaning and final cleaning in accordance with Section 01 7000 and Section 01 7700.

3.06 PROTECTION OF FINISHED WORK: In accordance with Section 01 7000.

A. Do not permit use of fixtures prior to substantial completion.

END OF SECTION

SECTION 31 2000 – EARTH MOVING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:

1. Excavation and fill.
   a. Excavating and backfilling for footings and foundations.
   b. Excavating and backfilling for utilities.
   c. Trenching and trench backfilling.
2. Compaction.
3. Rough grading and finish grading.

B. Related Sections:

1. Section 01 4520 – Testing and Inspecting Services.
2. Section 01 5710 – Temporary Erosion and Sedimentation Control.
3. Section 01 7000 – Execution Requirements: Field engineering.
4. Section 03 3000 – Cast-In-Place Concrete: Concrete fill for overexcavated areas.
5. Division 22 – Plumbing: Earthwork for sanitary, storm, and domestic water piping within building.
6. Division 26 – Electrical: Earthwork for underground electrical work within building.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Fill material shall be approved by the Architect and testing firm's Soils Engineer prior to delivery.

1.03 QUALITY ASSURANCE:

A. Excavator Qualifications: Trained in underground utility protection.

1.04 PROJECT CONDITIONS:

A. Safety: For the security or safety of persons in and adjacent to trenches or construction operations, the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America and the safety regulations of the Division of Industrial Compliance of the State of Ohio shall be followed when specifically applicable, or by similarity of operation or as necessary for adequate protection.

B. Maintain in place adequate structures, barricades, guards, warning lights, and other protection required by OSHA and other public authorities at cutting and filling and

excavation and hazards created by this work, including shoring, bracing, planking, fences and forming as required.

C. Exercise due care and diligence in all cutting, digging, and backfilling operations. Protect from damage overhead and underground site features that are to remain, including utility piping, trees, buildings, fences and property. Bear responsibility for, and replacement costs of, all damage arising from all operations connected with this work.

D. Carefully maintain benchmarks and other reference points; if disturbed or destroyed, replace as directed.

1.05 WARRANTY:

A. The Contractor shall be responsible for the condition of all trenches for a period of one year from the date of Substantial Completion.

PART 2 PRODUCTS

2.01 FILL MATERIAL:

A. Granular Fill Under Slabs and Walks: ODOT 304; crushed stone or gravel.

B. Granular Backfill for Foundations (Except Under Slabs and Walks): ODOT 703.01, No. 57.

C. Granular Backfill for Utilities: ODOT 304; crushed stone or gravel.

D. Granular Material for Pipe Bedding: Natural gravel or stone; ODOT 703.01; No. 57, No. 67, or No. 8 as detailed.

E. Soil Materials: ASTM D2487, soil classification groups CL, GW, GP, GM, SW, SP, and SM.

1. Material shall be free of trash, refuse, waste, mulch, brush, leaves, grass and weeds, cinders, ashes, vegetable or organic matter, shale, large stones or masonry, frozen material, earth with an exceptionally high void content, deleterious matter, lumber or other debris. Fill material shall have a laboratory dry density of minimum 100 lbs/cu ft and shall contain no material larger than 6 inches in any dimension, and no rock or gravel larger than 2 inches in any dimension.
2. On-Site Soil Materials: Fill and backfill material for areas not otherwise indicated shall be material excavated in connection with the work, insofar as sufficient quantities of material of satisfactory character are available. Where excavated material is insufficient, provide off-site soil material.

F. Topsoil: ODOT 653 and ASTM D5268; fertile, friable, surface soil containing natural loam; organic content ranging between 5% and 20%; free of stones larger than ½ inch in any dimension; free of extraneous or toxic matter harmful to plant growth; obtained from well-drained sites where soil occurs in depth of 4 inches or more.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Prior to the work of this Section, inspect the site and become familiar with all portions of the work within this section.

B. Where existing ground elevations or existing utility locations are indicated, these are believed to be reasonably correct, but do not purport to be absolutely so, and are presented only as an approximation.

C. Site Conditions: If suitable bearing for foundation is not encountered at the depth indicated on the Drawings, immediately notify the Architect and do not proceed further until instructions are given.

3.02 PREPARATION:

A. Notification: Notify Owner and applicable utilities and utilities protection services at least two full working days prior to commencing work. Mark site to indicate proposed excavation area.

B. Protection of Utilities: Preserve in operating condition all active utilities traversing the site unless specifically indicated to be removed.

C. Provide construction layout staking in accordance with Section 01 7000 and ODOT 623.

D. Place stakes or other approved markers for visual indication of construction limits and site disturbance boundaries.

E. Where removal or abandonment of utilities is indicated or required, disconnect, remove, cap and plug utility services. Notify affected utility companies in advance and obtain approval before starting this work.

F. Place markers to indicated location of disconnected services. Identify service lines and capping locations on Project Record Documents.

3.03 EXCAVATING:

A. Excavate as required for the dimensions and elevations indicated. Excavation shall extend a sufficient distance to allow for placing and removal of forms, inspections, installation of services and related construction activities. Excavations carried below indicated depths will not be permitted except when authorized by the Architect.

B. Stockpile excavated material in approved locations that will not endanger the work or obstruct traffic or drainage flow.

C. Unless indicated otherwise, remove existing foundation walls, footings, and concrete floor slabs within building areas and paved areas to minimum 12 inches below subgrade. Remove existing foundations to minimum 12 inches below finish grade in other areas. Remove all other obstructions as required within the developed areas.

D. Remove vegetation and topsoil, including surface fill with high organic and debris content, from the proposed developed areas.

E. Excavating for Footings:

1. Cut footing excavations to a flat bottom comprised of firm soil undisturbed by the method of excavating. Sides of the excavation may be used to form footing concrete; perform final trimming and cleaning of bottoms and sides of excavations immediately prior to placing concrete.

2. Unauthorized excavation below bottom of footing elevations given shall be filled with lean concrete in accordance with Section 03 3000.

3. Do not permit a new footing to bear directly on an old existing footing or other rigid body when the new footing is otherwise soil supported.

4. Do not permit soil from footing excavations to be wasted and loosely spread in areas of floor slab or pavement support.

5. Footings shall be founded in the undisturbed virgin soils or engineered fill unless otherwise approved.

F. Trench Excavation: Cut trenches near to exact grade, minimum width to permit installation; scooped out for pipe hubs, with backfill bed laid to ensure complete support of underground piping.

1. Where trenching is required within tree drip lines, tunnel under or around roots by drilling, auger boring, pipe jacking, or digging by hand.

2. Length of Open Trench:
   a. Minimize amount of trench opened in advance of completed work; further limitations may be directed by Architect where deemed necessary.
   b. In general, begin backfilling and restoration of surfaces as soon as the constructed work is in approved condition to receive it; complete as rapidly as possible.
   c. Do not perform new trenching when earlier trenches need backfilling or labor is needed to restore surfaces of streets or other areas to safe and proper conditions.

3. Test Pits: Dig exploratory test pits where necessary, in advance of trench excavation, to determine exact locations of subsurface pipe lines, conduits and structures which are likely to be encountered; protect, support and maintain in operation all active utilities.

4. Trench Drainage:
   a. If water is encountered, furnish and operate suitable pumping equipment of capacity adequate to dewater the trench, dispose of such water, and to maintain satisfactory drainage conditions. Conduct pump discharge to natural drainage channels, drains or storm sewers. Removal and handling of water

required to maintain dry trenches or other excavations for construction of pipe lines or other structures, shall be at Contractor's expense.

b. Where trenches are dug through areas of lateral ground water seepage or in areas below ground water table, construct bulkheads within trench, consisting of compacted native clay soil or other fines, at intervals as required to resist movement of ground water along trench and prevent displacement of bedding and backfill materials. Extend bulkheads approximately three feet in a direction parallel to the pipe, and from bottom of trench to one-half foot above top of pipe.

G. Rock Excavation:

1. Definition: Rock excavation includes boulders and solid masonry, exceeding 12 cubic feet in volume, which requires removal by drilling and blasting, wedging, sledging or barring, or breaking up with a power operated hand tool. Rock excavation does not include soft or disintegrated rock which can be removed with a hand pick or power operated excavator or shovel, or back hoe of ¾ cubic yard capacity; loose, shaken or previously blasted rock or broken stone; or rock beyond the minimum limits of measurement, which may fall into the excavation.

2. Where trench excavation is made in rock or boulders, excavate trenches minimum 6 inches below the pipe barrel for pipes 24 inches in diameter or less, and 9 inches for pipes larger than 24 inches in diameter. Bed pipe in compacted granular material placed on the trench bottom in accordance with the piping installation requirements.

3. Perform drilling and blasting, where necessary, in accordance with ODOT 208. Contractor shall satisfy all claims for damages resulting from blasting and shall fully indemnify Owner and Architect from such claims.

3.04 FILLING, BACKFILLING AND COMPACTING:

A. Subgrade Preparation and Compaction: Prior to placing fill or backfill, proof compact subgrade under slabs and paved areas with pneumatic or sheeps-foot compactor in accordance with ODOT 204. Where soft areas are encountered, excavate unsuitable material to the depth directed by the testing firm's Soils Engineer and replace with granular fill. Provide moisture control in accordance with ODOT 203; where necessary, reduce excess moisture using the following method:

1. Scarify subgrade to a depth of 12 inches; aerate and dry to within 2% of optimum moisture content; recompact to minimum 95% of maximum laboratory dry density in accordance with ASTM D1557.

B. General Filling and Backfilling:

1. Carefully place and compact fill material to ensure firm support and to prevent future displacement.

2. Do not place frozen fill material, or place fill material on frozen or snow-covered surfaces.
3. Fill excess cuts under slabs or paved areas with approved compacted fill material.
4. Where fill meets the natural grade of a slope, cut a bench in existing slope to serve as a key to connect existing grade with each lift of newly placed fill.
5. Place structural fills in layers of maximum 8 inches for the full width of the cross section. Thoroughly compact each layer with sheeps-foot roller with 200 psi rating.
6. Bring grades to underside of their respective surfacing. Grades not otherwise indicated shall be uniform levels or slopes between points where elevations are given or between such points and existing finished grades. Abrupt changes in slopes shall be rounded. Slope grades slightly away from buildings.
7. Fill planting areas to the top of adjacent curb or pavement with minimum 18 inches clean topsoil.

C. Site Filling and Rough Grading:

1. After completion of site preparation, prepare surface of areas to be filled by scarifying with a disc or harrow to a depth of 4 to 6 inches. Spread an initial 3 inch layer of fill material and compact entire area.
2. Recompact subgrade under paved areas to minimum 95% of maximum laboratory dry density in accordance with ASTM D698.

D. Backfilling for Foundations: Backfill around walls with stone to within two feet of finish grade; fill remainder of excavation with top soil. Where concrete work or pavement occurs next to the foundation wall, backfill with stone in compacted layers to the underside of the slab or paving.

E. Backfilling for Utility Piping:

1. Exercise special care in backfilling trenches in which piping is laid to guard against disturbing the joints.
2. Place backfill evenly in 6 inch layers, carefully tamped, under and around the pipe. Place and tamp remaining backfill in 12 inch layers to finish grade. Backfill excavations under walks, slabs and pavements with concrete fill in accordance with Section 03 3000.
3. Backfill trenches and excavations immediately after pipe is laid therein, unless other protections of the pipe line are directed. Do not permit water to rise in unbackfilled trenches after pipe has been placed.
4. Deposit backfill material in horizontal layers; thoroughly compact each layer by mechanical methods before placing succeeding layers.

5. Do not allow material to fall from a bucket directly on a structure or pipe; lower bucket to prevent damage caused by falling material.

F. Compacting:

1. Fill material placed in layers shall be within 2% of the optimum moisture content before compacting. Material which displays a pronounced deformation under construction equipment shall not exceed the optimum moisture content.
   a. Expedite drying of wet soil by use of plows, discs, harrows or other approved methods.
   b. Add water to dry soil, uniformly distributed by sprinkling wagons, pressure distributors, or other approved equipment. Manipulate material to secure a uniform moisture content throughout the layer.

2. Compact each layer of fill material to the following minimum percentage of maximum laboratory dry density as determined in accordance with the test method indicated.
   a. Native Soil Fill under Slabs: ASTM D1557; 96%.
   b. Granular Fill and Backfill under Slabs: ASTM D1557; 96%.
   c. Granular Fill and Backfill under Paved Areas: ASTM D698; 95%.
   d. Granular Backfill for Foundations: ASTM D698; 98%.
   e. Site Grading and Utility Backfilling: In accordance with ODOT 203.

3. Compact areas with approved equipment of design, weight, and quantity to obtain required density. Consolidate and compact areas inaccessible to a roller by mechanical tampers. Operate equipment in such manner that hardpan cemented gravel, clay, or other chunky soil material will be broken in the layer.

3.05 SITE GRADING AND DRAINAGE:

A. Control grading so that ground is pitched to prevent water from running into excavated areas. Maintain pits, trenches, and excavations free of water at all times.

B. Take all control measures necessary to prevent damage from flooding, erosion, and sedimentation to on-site and off-site areas throughout the entire period of the Contract, in accordance with ODOT SS 832 and applicable requirements of authorities having jurisdiction.

C. Rough Grading:

1. Fill and compact areas as specified.

2. Rough grade all areas to required subgrade, smooth and free from irregular surface changes. At lawn areas, rough grade to 4 inches below finish grade.

3. Tolerances:
   a. Building Areas: ½ inch in 10 feet.
   b. Paved Areas: ½ inch.
   c. Walks, Lawns, and Unpaved Areas: 0.10 foot.

4. Roll all cut areas; check for soft, yielding material. Where such areas are encountered and cannot be satisfactorily stabilized by moisture control and compaction, excavate unstable material to extent directed by the testing firm's Soils Engineer; fill and compact as required.

D. Final Grading:

1. Repair and reestablish rough grades to specified tolerances where eroded, rutted, settled, or decompacted due to construction operations or weather conditions; reshape and recompact to required density.
2. Where surface elevations are not indicated, grade to drain with a minimum surface slope of 1 percent.
3. As soon as the concrete work is completed, spread minimum 6 inches of stockpiled topsoil over planting and lawn areas to a level finish grade.
4. Compact exposed subgrade to 95% ASTM D698, Method D maximum dry density near optimum moisture content.
5. Remove stones, gravel, slag aggregate, and other objects 1 inch diameter and larger; remove roots, brush, wire, and other objects which may hinder fine grading operations.
6. Refill and compact excavations showing evidence of shrinkage, settlement, or wash.

E. Remove from the site and dispose of all debris and excess earth, and all excavated material not required or not suitable for fill.

3.06 FIELD QUALITY CONTROL:

A. Testing firm will perform testing of excavating and backfilling in accordance with Section 01 4520.

B. The footing excavations are to be inspected by the testing firm's Soils Engineer during construction and immediately prior to placement of concrete, to establish that the soil bearing conditions over the entire bearing area are in accordance with the minimum soil bearing pressure stated on the Drawings.

END OF SECTION

SECTION 32 1200 – ASPHALT PAVING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Asphaltic concrete paving.

B. Related Sections:
   1. Section 01 4520 – Testing and Inspecting Services.
   2. Section 31 2000 – Earth Moving.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Design asphalt concrete mixes in accordance with ODOT 441.
   1. Submit proposed mix design of each class of paving to testing firm for review prior to commencement of Work.

1.03 QUALITY ASSURANCE:

A. Perform Work in accordance with ODOT 401 and other applicable ODOT requirements.
   1. Asphalt binder price adjustment in accordance with ODOT 401.20 is not allowed.

B. Obtain materials from same source throughout.

1.04 FIELD CONDITIONS:

A. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Asphalt Cement: ODOT SS 908 and ASTM D946.

B. Aggregate: ODOT 703.

2.02 BASE COURSE:

A. Subgrade: ODOT 204, compacted in accordance with Section 31 2000.

B. Aggregate Base: ODOT 304, crushed stone; thickness as indicated.

2.03 ASPHALTIC CONCRETE:

A. Intermediate Course: ODOT 441, Type 2; thickness as indicated.

B. Surface Course: ODOT 441, Type 1; thickness as indicated.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Subgrade Preparation: Verify that stripping and stockpiling of topsoil is complete, and that subgrade is at correct grade elevations and properly compacted, dry and ready to support paving and imposed loads.

3.02 BASE COURSE INSTALLATION:

A. Place fill material in successive horizontal layers in a loose depth of maximum 8 inches and compacted thickness of maximum 5 inches for the full width of the cross section. Compact each layer of fill in accordance with ASTM D698 by rolling or tamping.

B. Compaction shall be accomplished by power rollers, machine tampers or other mechanical equipment approved by the Architect. If necessary, fill shall be moistened or allowed to dry to the correct moisture content before compaction. Do not deposit any fill on a subgrade that is muddy, frozen or that contains frost.

3.03 ASPHALTIC CONCRETE INSTALLATION:

A. Install asphaltic concrete in accordance with ODOT 401, to the grades and thicknesses indicated.

B. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact with hot hand tampers or vibrating place compactors in areas inaccessible to rolling equipment.

C. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

D. Adjust frames and castings to correct position and elevation.

E. In paved areas exposed to temporary use, delay installation of the final course of permanent paving until immediately before substantial completion. Thoroughly clean surface of temporary paving and repair loose areas, ruts, and other defects prior to applying surface course.

3.04 TOLERANCES:

A. Flatness: Maximum variation of ¼ inch measured with 10 foot straight edge.

B. Scheduled Compacted Thickness: Within ¼ inch.

C. Variation from True Elevation: Within ½ inch.

3.05 FIELD QUALITY CONTROL:

A. Testing firm will perform testing of paving in accordance with Section 01 4520 and ODOT 403.
   1. Provide free access to Work and cooperate with testing firm.

2. Tests of materials may be performed to ensure conformance with specified requirements.

3.06 PROTECTION:

A. Immediately after placement, protect pavement from mechanical injury for 24 hours and until surface temperature is less than 140 degrees F.

END OF SECTION

SECTION 32 3113 – CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Fence framework, fabric, and accessories.
   2. Excavation for post bases.
   3. Manual gates and related hardware.

B. Related Sections:
   1. Section 03 3000 – Cast-In-Place Concrete: Concrete anchorage for posts.
   2. Section 08 7100 – Door Hardware: Gate locking device.

1.02 SYSTEM DESCRIPTION:

A. Fence Height: Match existing.

B. Fence Post and Rail Strength: Conform to ASTM F1043 Light Industrial Fence quality.

1.03 QUALITY ASSURANCE:

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

PART 2 PRODUCTS

2.01 MATERIALS:

A. Steel Framing: Galvanized steel pipe; ASTM F1083, Schedule 40, minimum 25 ksi yield strength; or ASTM F1043, Group 1C, minimum 50 ksi yield strength.

B. Steel Fabric Wire: ASTM A491; Chain Link Fence Manufacturers Institute CLF 2445; aluminum coated wire fabric.

C. Concrete: Type specified in Section 03 3000.

2.02 COMPONENTS:

A. Line Posts: 1.875 inch diameter.

B. Corner and Terminal Posts: 2.375 inch diameter.

C. Gate Posts: 3.5 inch diameter.

D. Gate Frames: 1.66 inch diameter for welded fabrication.

E. Fabric: Diamond mesh interwoven wire, commercial service, 2 inch, 9 gauge. Top and bottom selvage knuckle end closed.

F. Tension Wire: 6 gauge thick steel, single strand.

G. Tie Wire: Aluminum alloy steel wire.

2.03 ACCESSORIES:

A. Caps: Cast steel galvanized; sized to post diameter, set screw retainer.

B. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners, and fittings; steel.

C. Privacy Slats: Vinyl or high density polyethylene strips, sized to fit fabric weave, color to match existing.

D. Hinged Gate Hardware: Double gate with center gate stop and drop rod; two 180 degree gate hinges per leaf; hardware for padlock.

2.04 FINISHES:

A. Steel Framing: ASTM F1043; minimum 1.8 oz/sq ft.

B. Fabric Wire: Aluminum coating to ASTM A428; 0.40 oz/sq ft.

C. Aluminum Components: Mill finish.

D. Hardware: Galvanized to ASTM A153, 2.0 oz/sq ft coating.

E. Accessories: Same finish as framing.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Install framework, fabric, accessories, and gates in accordance with manufacturer's instructions and ASTM F567.

B. Set posts plumb in concrete footings, with top of footing 2 inches above finish grade. Slope top of concrete for water runoff.
   1. Post Footing Depth Below Finish Grade: ASTM F567.
   2. Post Footing Diameter: Minimum 4 times the outside diameter of the post.

C. Install gate fabric and privacy slats. Install hinges, latch, catches, and other hardware.

D. Provide concrete center drop to footing depth and drop rod retainers at center of double gate openings.

3.02 ERECTION TOLERANCES:

A. Maximum Variation from Plumb: ¼ inch.

B. Maximum Offset from True Position: 1 inch.

END OF SECTION

SECTION 32 9200 – LAWNS AND GRASS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Preparation, fertilizing, and seeding indicated areas including the following:
   1. Building perimeter.
   2. Material storage areas.
   3. Site areas disturbed as a result of construction.

B. Related Sections:
   1. Section 01 5710 – Temporary Erosion and Sedimentation Control: Temporary seeding and mulching.
   2. Section 31 2000 – Earth Moving: Rough and final grading; removal of stones during grading operations.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Fertilizer: ODOT 659.04; dry or liquid type; 10-20-10 analysis or as recommended by topsoil analysis.

B. Lime: ODOT 659.03; agricultural ground limestone.

C. Seed for Lawn Areas: ODOT 659.09, Class 1. Verify grass seed mixture with Owner prior to purchasing materials.
   1. Kentucky Bluegrass: 30% by weight.
   2. Creeping Red Fescue: 30% by weight.
   3. Annual Ryegrass: 20% by weight.
   4. Perennial Ryegrass: 20% by weight.

D. Mulch: ODOT 659.14; wheat or oat straw, free of seeds and foreign matter.

PART 3 EXECUTION

3.01 PREPARATION:

A. Machine cultivate soil evenly to provide a firm seed bed four inches deep, free of hard clumps. No heavy objects except necessary lawn making equipment shall be moved over the lawn areas after the soil is prepared, unless it is again loosened and graded.

B. Remove stones, roots, brush, wire, and other foreign materials and objects larger than one inch in thickness or diameter.

C. Repair eroded areas to indicated grade elevations, with smooth transitions to adjacent areas. Hand rake adjacent to building where necessary.

3.02 FERTILIZER APPLICATION:

A. Apply fertilizer at a uniform rate of 20 pounds per 1000 square feet. Apply lime at a uniform rate of 92 pounds per 1000 square feet. Incorporate fertilizer and lime into subgrade to a minimum depth of two inches by discing, harrowing, or other approved methods.

B. At Contractor's option, fertilizer may be applied together with seed by mechanical machine spreading.

3.03 SEEDING:

A. Apply seed at a total rate of 10 pounds per 1000 square feet of area, in two equal applications at right angles to each other.

B. Mulch seeded areas at a rate of 100 pounds per 1000 square feet of area within 48 hours after seeding is completed. After application, cut straw into the seedbed using a disc roller; wet down to prevent displacement.

C. Perform seeding between April 1 and June 1, or between August 15 and November 1, unless otherwise approved.

D. Do not sow seed or spread mulch when wind speed exceeds 5 mph.

E. Rolling: Immediately after seeding, firm entire area with a roller not exceeding 90 lbs per foot of roller width. Rolling is not required for areas seeded with cultipacker-type seeder.

3.04 LAWN ESTABLISHMENT AND MAINTENANCE:

A. Provide continued proper care of lawn areas for minimum 60 days and as long as necessary to establish a uniformly close stand of grasses, free of weeds and undesirable grasses, with bare spots no larger than 6 inch diameter totaling a maximum of 2 percent of the entire lawn area.

B. Mowing: When average grass height reaches 3½ inches, mow lawn areas with approved mowing equipment to a height of 2 inches; continue mowing at maximum 7 day intervals during growing seasons until Substantial Completion.

C. Weeding: Uproot and remove weeds and other undesirable vegetation.

D. Refertilization: Where areas are designated for refertilization, apply fertilizer between August 15 and October 15 during a period when the grass is dry.

E. Reseeding: Where areas are designated for reseeding, apply seed at a rate of 4 pounds per 1000 square feet of area, in a manner which will cause minimum disturbance to existing grass, and at a minimum 15 degree angle from the direction of prior seeding.

3.05 PROTECTION:

A. Protect all other finished areas during the work of this section.

B. Keep paved areas clean. Remove dirt, debris, waste materials, equipment and unused materials. Leave the grounds in a clean and orderly condition at the completion of the work.

C. Protect finished lawn areas against damage, including erosion and washouts. Promptly repair damaged areas.

END OF SECTION

SECTION 33 4200 – STORMWATER DRAINAGE

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Storm sewer piping.

B. Related Sections:
   1. Section 22 1400 – Drainage Piping: Storm drainage within building.
   2. Section 31 2000 – Earth Moving: Trenching and backfilling.

1.02 PERFORMANCE REQUIREMENTS:

A. Water Tight Joints: Tested at minimum 10 psi for 10 minutes in accordance with ASTM D3212.

1.03 REGULATORY REQUIREMENTS:

A. Comply with regulations and requirements of environmental agencies and local utilities.

1.04 DELIVERY, STORAGE, AND HANDLING:

A. Load and unload pipe, fittings, and accessories by lifting with hoists or skidding; avoid shock or damage; do not drop materials; do not skid or roll pipe against pipe already on the ground.

B. Handle pipe to prevent damage to coating and lining. If any part of the coating or lining is damaged, replace damaged material with new material of like kind.

PART 2 PRODUCTS

2.01 STORM SEWER PIPE AND FITTINGS:

A. Reinforced Concrete Pipe: ODOT 706.02.
   1. Joints: ASTM C443; O-ring type.

B. PVC Pipe: ASTM D3034, SDR 35; or ASTM F794; or ASTM F949.
   1. Joints: ASTM D3212; gasketed bell and spigot type, water tight.

C. Corrugated Polyethylene (PE) Pipe: ODOT 707.33; smooth interior; annular corrugated exterior; nonperforated.
   1. Joints: ASTM D3212; gasketed bell and spigot type, water tight.

D. Aluminized Steel Pipe: ODOT 707.12.
   1. Joints: Gasketed bell and spigot type, water tight.

E. Where connections to existing systems are required, verify materials and provide appropriate adapters.

F. Testing:

1. Test pipe and joints for quality of materials, crushing strength and absorption in accordance with ASTM test requirements. Crushing strength test may be made by three-edge-bearing method.
2. Furnish test specimens sufficient to perform minimum two tests for each period of manufacture for each size, type and class of pipe. In case of unsatisfactory test results, perform additional tests up to the maximum number stated in the referenced ASTM Specifications.
3. All tests shall be made by an approved testing laboratory at the Contractor's expense. Submit 3 copies of each test report to the Architect.

G. Inspection and Rejection: Pipe shall be considered ready for acceptance when they conform to the requirements indicated above. All materials, processes of manufacture and finished pipe shall be subject to rejection on account of failure to conform to any of the specified requirements. Individual sections of pipe may be rejected at any time because of variations in dimensions, fractures, or cracks, chips and blisters exceeding the permissible tolerances.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Prior to the work of this Section, inspect the site and verify that all work can be installed in accordance with the original design. In the case of any discrepancy, immediately contact the Architect.

3.02 INSTALLATION:

A. Perform trenching and backfilling in accordance with Section 31 2000.

B. Pipe Bedding: Place granular bedding in 4 inch thick layers, thoroughly compacted, shaped to fit the outside pipe diameter, from at least 6 inches below bottom of pipe, around pipe, to an elevation of at least 6 inches above top of pipe.

C. Pipe Laying: Install pipe in accordance with ODOT 611.

1. Lay pipe after the trench bottom is properly prepared and pipe bedding materials are placed and compacted. Begin laying pipe at the lowest point, with the bell end or groove end laid upgrade. Lay pipe with ends abutting and true to line and grade, carefully centered to form sewer with uniform invert.
2. Before making pipe joints, verify that all surfaces and materials are clean and dry. Make joints using lubricants, primers, adhesives and related materials as recommended by the pipe or joint manufacturer. Place, fit, joint and adjust jointing materials or factory fabricated joints to obtain a watertight joint.
3. Maintain trenches water-free and as dry as possible during bedding, laying and jointing. As soon as possible after the joint is made, place sufficient backfill

material along each side of the pipe to prevent movement of the pipe from any cause.

4. Lay pipe to lines and grades by means of laser beams, unless otherwise approved. Maintain minimum slope as directed by code or by accepted engineering standards for the size of pipe used.
5. Pipe Deflection: ASTM D3034; horizontal and vertical deflection shall not exceed 5% of the nominal inside pipe diameter due to the imposed loads.

3.03 TESTING:

A. Furnish all labor, materials, and equipment required for making tests by approved methods.

B. Construct all sewers with tight joints. Repair joints that are leaking excessively, or where water is jetting through. Where directed, uncover small diameter sewers and repair defective joints from the outside.

END OF SECTION