

SPECIFICATIONS

ROSEBURG URBAN SANITRY AUTHORITY

Bisulfite Building

3845 W. Goedek Avenue.

Roseburg, OR

June 13, 2022

PROJECT: BISULFITE BUILDING
3845 W. GOEDEK AVENUE
ROSEBURG, OR 97471

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SPECIFICATIONS FOR CONSTRUCTION RUSA BISULFITE BUILDING.

PART 1 GENERAL

1.01 SCOPE OF WORK:

The project consists of site work, utilities, and construction of a masonry equipment building.

1.02 EXPLANATION OF CONTRACT DOCUMENTS:

The Conditions of the Contract and the General Requirements (Division 1) of these Specifications apply to the Work described under each Section hereof. The Contractor shall instruct each subcontractor to become fully familiar with them.

1.03 DIVISION AND PARAGRAPH NUMBERING:

Numbering and lettering of Divisions and Paragraphs in these Specifications are merely for identification and may not be consecutive. Divisions included are listed in the "Table of Contents." Contractor shall check his copies of the Project Manual with the Table of Contents to be sure they are complete.

1.04 ADDITIONAL DEFINITIONS

The term "Owner" means the "Roseburg Urban Sanitary Authority" (RUSA).

The term "Project Manager" means the individual representing RUSA for this Project, and noted as Project Manager on the title sheet of these specifications.

Unless specifically noted otherwise, all notices and other correspondence with the Owner shall be directed to the attention of the Project Manager.

The term "approved" means "approved by the Project Manager and/or Engineer".

The term "for approval" means "for the Project Manager's and/or Engineer's approval".

The term "as directed" means "as directed by the Project Manager and/or Engineer".

The term "product" includes materials, systems, and equipment.

The term "furnish" means "supply and deliver to the project site".

The term "install" describes operations at the project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

The term "provide" means "furnish and install, complete, in place and ready for operation and use".

The term "Installer" means the Contractor or entity engaged by the Contractor, either as an employee, subcontractor, or sub-subcontractor for performance of a particular construction activity, including, installation, erection, application, and similar operations.

The term "selected" means "selected by the Project Manager and/or Engineer".

Where the words "or approved" are used, the Project Manager is the sole judge of quality and suitability of proposed substitution.

1.05 SUB-CONTRACTS:

Divisions of Specifications into trade Sections conforms roughly to customary practice. They are used for convenience only. The Project Manager and the Engineer are not bound to define limits of any subcontract and will not enter into disputes between the Contractor and his employees, including subcontractors.

1.06 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

Where references are made to other Sections regarding Related Requirements Specified Elsewhere, it is for the convenience of the Contractor only and shall not limit the Contractor's responsibility under other Sections not so referenced. As previously noted, each Section of the Specifications is bound by all applicable requirements of all Sections in Division 1.

1.07 WORDING OF SPECIFICATIONS:

These are abbreviated or "streamline" type specifications and frequently include incomplete sentences. The omission of words or phrases such as "The Contractor shall", "according to the drawings", "in conformity with", "shall", "shall be", "as noted", "a", "an", "and", are all intentional. Omitted words or phrases shall be supplied by inference, in the same manner as they are in the notes on the Drawings. Titles and headings

are frequently a part of the Specifications, and the same as the text of the article or paragraph. Where question arises as to wording in the Drawings and Specifications, consult the Engineer.

1.08 WORK COVERED BY CONTRACT DOCUMENTS:

Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, permits, fees, transportation, incidentals, and other facilities and services necessary for the proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

1.09 CONTRACTS:

All Work shall be performed under a single contract. The General Contractor shall perform at least 51 percent of the Work.

1.10 WORK BY OTHERS:

Items specifically noted in the Contract Documents as:

1. "By Others"
2. "N.I.C." (Not in Contract)
3. "By Owner"

1.11 OWNER FURNISHED ITEMS:

- A. Items specifically noted: "Furnished by Owner"
- B. Owner furnished items shall be installed by the Contractor unless noted otherwise.

1.12 EXISTING CONDITIONS

The Contractor acknowledges that he has satisfied himself as to the nature and location of the Work, the general and local conditions, particularly those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, river stages, or similar physical conditions at the site, the conformation and conditions of the ground, the character, quality and quantity of surface and sub-surface materials to be encountered, the character of equipment and facilities needed preliminary to and during the prosecution of the Work or the cost thereof under this Contract. Any failure by the Contractor to acquaint himself with all of the available information concerning these conditions will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the Work. The Engineer assumes no responsibility for any understanding or representations made during or prior to the bidding or execution of this Contract, unless (1) such understanding or representations are expressly stated in the Contract, and (2) the Contract expressly provides that responsibility therefore is assumed by the Engineer. Representations made, but not so expressly stated, and for which liability is not expressly assumed by the Engineer in the Contract shall be deemed only for the information of the Contractor and the Engineer shall not be liable or responsible therefore.

The Site information on the Drawings represents the best information available to the Engineer during preparation of the Contract Documents, but cannot be guaranteed to be complete to the bid date.

1.13 UNACCEPTABLE EXISTING CONDITIONS:

- A. Exposed to view, or noted in the Contract Documents, or otherwise accessible to verify prior to bid opening date:
 1. Repair or replace as part of this Work.
 2. No additional payments by Owner will be made.
- B. Concealed, and not accessible to verify prior to bidding:
 1. Repair or replace where necessary;
 2. Upon notification from Contractor, Owner will issue Change Order authorizing Contractor to perform this Work and Contract Sum will be adjusted accordingly.

1.14 CONTRACTOR USE OF PREMISES:

- A. The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents, and shall not unreasonably encumber the site with any materials or equipment.
- B. Confine operations to Project Areas directed by the Project Manager.
- C. Obtain Project Manager's permission for use of any existing facilities, utilities, areas, materials, etc., not specifically provided for the Contractor's use in the Contract Documents. Use of utilities is optional and not guaranteed available at all times by the Owner.

END OF SECTION

PART 1 GENERAL

1.01 SCOPE:

- A. Contractor is responsible for Project coordination.
- B. Cooperation between the various crafts and subcontractors shall be required for proper execution of the Work.
- C. Prior to the installation of materials or equipment with the Work of other Sections, by Owner, or by other contracts, verify the requirements of the other crafts, Owner, or other contract materials or equipment.
- D. Bring deviations to the attention of the Project Manager immediately.
- E. Maintain at the site, copies of all communications and directives from Authorities having jurisdiction. Notify Project Manager of all such communications and provide Project Manager with copies when requested.
- F. Neither the Project Manager nor the Engineer will interfere with the Contractor's right and responsibility to coordinate or divide the Work among the Subcontractors or to establish the extent of the Work to be performed by any Subcontractor. The Project Manager and the Engineer will not enter into disputes between the Contractor and his employees, including subcontractors.

1.03 SCHEDULES

A. Contractor's Construction Schedule:

Prior to proceeding with the Work, Contractor shall submit a proposed progress schedule. The progress schedule shall include dates of submission and dates reviewed submittals will be required for each product, as well as the dates for starting and completion of the various stages of construction.

Include critical dates for procurement of products. Indicate, at suitable scale, percentage of Work scheduled for completion at any time.

Enter actual progress on Chart prior to each progress payment for direct comparison with Schedule. If Contractor fails to deliver Schedule on time or properly update Schedule, with each payment request, Project Manager may withhold Progress Payment approval until such time as Contractor complies with these requirements.

Do not proceed with work at the site until Project Manager has approved construction schedule.

If in Project Manager's opinion, Work progress falls behind approved Schedule, Contractor shall take necessary action to regain lost time. Contractor shall increase Work amount, or number of shifts, or establish overtime operations, or all of them, and submit for review Schedule revisions in which progress rate will be regained, all without additional cost to the Owner.

Contractor's failure to comply with any of these requirements shall be grounds for determination that the Contractor is not prosecuting the Work with such diligence as will insure Project completion within specified time. Upon such determination Owner may terminate Contractor's right to proceed with the Work, or any separable part thereof, in accordance with Contract Conditions.

B. Testing Schedule

Prior to proceeding with the Work, the General Contractor shall submit, for approval by the Project Manager, a schedule of required testing and Inspections, including the names addresses and phone numbers of the proposed testing agencies.

C. Schedule of Values

Before the first Application for Payment, the Contractor shall submit to the Project Manager a schedule of values allocated to various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Project Manager may require. This schedule, unless objected to by the Project Manager, shall be used as a basis for reviewing the Contractor's Applications for Payment.

1.04 SUPERINTENDENT

- A. General Contractor shall identify a Superintendent (as defined in the General Conditions) which shall be on site and available as necessary to coordinate and direct construction.
- B. Superintendent shall not be changed or replaced prior to Final Completion of the project without the Project Manager's written consent.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

3.01 COORDINATION:

- A. Do all necessary work to receive or join work of all trades.
- B. Coordinate the Work to provide adequate clearances for proper installation and maintenance of materials and equipment.

END OF SECTION

PART 1 GENERAL

1.01 DESCRIPTION:

A. Related Work Specified Elsewhere

1. Substitutions and Product Options: Section 01 62 00
2. Closeout Submittals: Section 01 77 00

1.02 GENERAL REQUIREMENTS:

A. Submittals:

1. Submittals are defined as documents required by the Contract to be submitted to the Project Manager for review, and may include shop drawings, product data, samples, or a schedule of construction events.
2. Shop drawings, Product Data, Samples and other Submittals are not part of the Contract. Their purpose is to demonstrate, for those portions of the Work for which Submittals are required, the way the Contractor proposes to conform to the requirements of the Contract and the design concept expressed in the Contract.
3. The Contractor shall review, approve and submit to the Project Manager all Shop Drawings, Product Data, Samples and other Submittals required by the Contract regardless of whether the document originated with the Contractor or with some other subcontractor or supplier. They shall be submitted at the time required by the Contract, or, if no time is specified, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. Submittals made by the Contractor that are not required by the Contract may be returned without action or may not be returned at all.
4. Informational Submittals upon which the Project Manager is not expected to take responsive action may be so identified in the Contract.
5. The Project Manager's review of any Submittal does not relieve the Contractor from its responsibility to follow the requirements of the Contract. The Project Manager is not responsible for ensuring that Submittals are correct. Failure of the Project Manager to discover that a submittal varies from the requirements of the Contract Documents shall not relieve the Contractor of its responsibilities to conform to the Contract nor provide a basis for a change order. Nevertheless, the Project Manager shall review any Submittals provided in order to make a general determination about whether they appear to meet Contract requirements or the intended design of the project. The Contractor remains responsible for following the contract, including, but not limited to:
 - a. Confirming and correlating all dimensions;
 - b. Fabricating and construction techniques;
 - c. Coordinating the work with that of all other trades and subcontractors;
 - d. Satisfactorily performing the Work in strict accordance with the contract documents;
 - e. The means and methods of construction;
 - f. Conforming to all the requirements of the Contract.

B. Submittals Shall Include:

1. Date and revision dates.
2. Project title and number.
3. Name of Contractor, Supplier and Manufacturer.
4. Identification of product material.
5. Relation to adjacent structure or material.
6. Field dimensions, clearly identified as such; other dimensions critical to product installation, or relevant to installation of other adjacent products.
7. Specification Section number.
8. Applicable standards such as ASTM, Federal Specification, etc.
9. Identification of deviations from Contract Documents.
10. Contractor's note or stamp, initialed or signed, certifying to review of submittal, verification of field measurements and compliance with Contract Documents.
11. Transmittal letter with all submittals containing: the number of drawings, data or samples submitted; notification of deviation from the Contract Documents; other pertinent data.

PART 2 - PRODUCTS

2.01 SHOP DRAWINGS:

- A. Defined as: Original drawings prepared by the Contractor, Subcontractor, Supplier or Distributor which illustrate some portion of the Work; showing fabrication, layout, setting or erection details.
- B. Prepared by qualified detailer.
- C. Identify details by reference to contract sheet and detail number.
- D. Minimum size sheet 8"x11", maximum 24"x36".

2.02 PRODUCT DATA:

- A. Defined as: Illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.
- B. Manufacturer's standard schematic drawings;
 - 1. Modify to delete extraneous information.
 - 2. Supplement standard information as applicable to project.
- C. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data;
 - 1. Clearly mark each copy to identify pertinent materials, products or models.
 - 2. Show dimensions, weights, and clearances required.
 - 3. Show performance data.

2.03 SAMPLES:

- A. Defined as: Physical examples to illustrate materials, colors, equipment or workmanship, and to establish standards by which completed work is judged.
- B. Office Samples: Sufficient size and quantity to illustrate:
 - 1. Functional characteristics of product or material, with integrally related parts and attachment devices.
 - 2. Full range of color samples.
- C. Field samples and mock-ups:
 - 1. Erect at Project site in location acceptable to the Project Manager.
 - 2. Include work of all trades required in finished work.
 - 3. After review, approved field samples may be used in construction of Project.

PART 3 - EXECUTION

3.01 CONTRACTOR'S RESPONSIBILITY:

- A. Review submittals prior to submission to Project Manager. When tendering a Submittal for review, the Contractor represents that it has determined and verified materials, field measurements and field construction criteria related thereto, or shall do so, and has checked and coordinated the information contained with such Submittals with the requirements of the Work and of the Contract. The Contractor shall expressly note where any submittal differs from or varies from the requirements of the Contract, notwithstanding any belief on the part of the Contractor that the variance is obvious.
- B. Verify: field measurements, field construction criteria, catalog numbers and similar data.
- C. Coordinate with requirements of Work and Contract Documents.

- D. Contractor's responsibility for errors and omissions in submittals is not relieved by Project Manager's or Engineer's review of submittals.
- E. Contractor's responsibility for deviations from the Contract Documents is not relieved by review of submittals unless Project Manager gives written acceptance of specific revisions expressly requested by the contractor.
- F. Begin no work which requires submittals until return of submittals with appropriate stamp and initials or signature indicating approval.

3.02 SUBMISSION REQUIREMENTS:

- A. Submit at least 14 days before the date each reviewed submittal is needed.
- B. Submittals may be transmitted electronically, except for when physical samples of products are necessary.
- C. Unless a greater quantity is specified in the various Specifications Sections, submit the number of Samples Contractor requires for distribution plus 2 of all Samples which the Project Manager will retain.

3.03 ENGINEER'S REVIEW: The Engineer shall have seven (7) days to review any Submittals. The Engineer shall review the Submittals and return them to the Contractor stamped with one of the following notations:

- A. "APPROVED": This means that the Contractor immediately can begin the work encompassed by the Submittal.
- B. "APPROVED AS CORRECTED": This means the Contractor is required to make any revisions suggested by the Engineer and, upon correction, may immediately begin the work indicated by the Submittal or may incorporate the material or equipment covered by the Submittal into the Work.
- C. "REVISE AND RESUBMIT": This means the Contractor is required to revise the Submittal and resubmit it to the Engineer. No work shown on the Submittal, or which is dependent upon approval of the Submittal or material or equipment covered by the Submittal, may be incorporated into the Work until the Contractor has made the necessary revisions, resubmitted the Submittal and received the Submittal back marked either "APPROVED" OR "APPROVED AS CORRECTED"
- D. "NOT APPROVED": This means that the Engineer has found the Submittal, material or product data to be unacceptable and not in conformance with the Contract. Generally speaking, rejection of a Submittal simply indicates the Engineer's belief that the defects in the Submittal are so great that it cannot be revised in order to make it conform to the Contract. The Contractor may not begin work indicated by the Submittal, nor incorporate material or equipment, nor proceed with Work dependent upon approval of the Submittal, into the Work based on any Submittal, product data or material that has been marked "NOT APPROVED."
- E. "SUBMIT SPECIFIED ITEM": This means that additional information is required to permit a full review. Work may begin on incorporating the material or equipment covered by the Submittal into the Work, only if it is not affected by the item to be submitted. However, if any material or equipment is affected by the item to be submitted, then no work may begin until the Submittal is resubmitted and returned marked either "APPROVED" or "APPROVED AS NOTED."

3.04 RESUBMISSION REQUIREMENTS:

- A. Revise initial drawings as required and resubmit as specified for initial submittal.
- B. Indicate changes which have been made other than those requested by the Engineer.

END OF SECTION

PART 1 GENERAL

1.01 GENERAL

All Products and Execution of the Work shall comply with Reference Standards as specified and defined herein and as supplemented in the respective Sections of the Specifications.

1.02 REFERENCE STANDARDS

- A. The term Reference Standards as used throughout these specifications shall include Standard Specifications, Manufacturer's Directions or recommendations, and all applicable Codes, Policies, Regulations, and Ordinances, issued by authorities having jurisdiction.
- B. Reference Standards listed in the respective Sections of the Specifications shall be in addition to Reference Standards specified in this Section.

1.03 STANDARD SPECIFICATIONS

Reference herein to specifications issued by organizations or governmental bodies shall mean edition current on date of Invitation to Bid, unless otherwise noted. Wherever reference standard specifications contain provisions which conflict with these Contract Documents the Contract Documents shall govern.

Reference to ES reports, shall include current evaluation reports recognized by ICC, whether originated by ICBO, ICC, BOCA or other recognized code agency.

Comply with applicable Federal, State and Local Standards for VOC limitations, hazardous materials, etc.

1.04 MANUFACTURER'S DIRECTIONS

- A. All manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned, protected, and conditioned as directed by the manufacturer's printed instructions, unless specifically instructed to the contrary in writing by the Project Manager.
- B. The Contractor shall provide all accessories, incidentals, processes and labor required to complete the installation as provided in the manufacturer's recommendations.
- C. Should any provision in these Contract Documents be in conflict with manufacturer's recommendations, or in any other way reduce or nullify the manufacturer's warranty or responsibility, notify the Project Manager in writing prior to ordering the respective manufacturer's product.

1.05 CODE REQUIREMENTS

- A. The requirements of the Oregon State Structural Specialties Code and Fire and Life Safety Code, current edition; Oregon State Plumbing Code, current edition; Oregon State Mechanical Code, current edition, the Oregon State Electrical Code current edition, the Oregon Fire Code and the Oregon Energy Efficiency Code shall govern all construction.
- B. Comply with all applicable local, State, and Federal environmental regulations.
- C. Comply with all applicable safety codes, including but not limited to the "Oregon Occupational Safety and Health Code", and Workmen's Compensation Board OAR 437-83-2754 and 2755.

END OF SECTION

PART 1 GENERAL

1.01 ABBREVIATIONS:

- A Reference to technical society, institutional, association or governmental authority is made in accordance with the following:

AA	Aluminum Association
AAMA	American Architectural Metals Assoc.
ACI	American Concrete Institute
ADA	Americans with Disabilities Act
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AITC	American Institute of Timber Construction
ANSI	American National Standards Institute
APA	American Plywood Association
ARI	Air-Conditioning and Refrigeration Institute
ARMA	Asphalt Roofing Manufacturer's Assoc.
ASHRAE	American Society of Heating, Refrigeration & Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASPE	American Society of Plumbing Engineers
ASTM	American Society for Testing and Materials
AWI	Architectural Woodwork Society
AWPA	American Wood Preservers' Assoc.
AWS	American Welding Society
AASHO	American Association of State Highway Officials
CPSC	Consumer Product Safety Commission
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standard of the U.S. Dept. of Commerce
CSI	Construction Specifications Institute
CTI	Ceramic Tile Institute of America
DOC	Department of Commerce
EPA	Environmental Protection Agency
FCC	Federal Communications Commission
FDA	Food and Drug Administration
FHA	Federal Housing Administration (of HUD)
FS	Federal Specifications (from GSA)
GA	Gypsum Association
GSA	General Services Administration
HUD	U.S Dept. of Housing and Urban Development
IBC	International Building Code (as modified by OSSC)
ICBO	International Conference of Building Officials
ICC	International Code Council
KCMA	Kitchen Cabinet Manufacturers Assoc.
NAAMM	National Association of Architectural Metal Manufacturers
NCMA	National Concrete Masonry Association
NEC	National Electrical Code
NECA	National Electrical Contractors Assoc.
NEMA	National Electrical Manufacturers Assoc.
NFPA	National Fire Protective Association, Inc.
NRCA	National Roofing Contractors Association
OSHA	Occupational Safety and Health Administration
OSHC	Oregon State Highway Commission
ORSC	Oregon Residential Specialty Code (2014 ed)
OSSC	Oregon Structural Specialty Code (2014 ed.)
PS	Product Standard, U.S. Dept. of Commerce
SIGMA	Sealed Insulating Glass Manufacturers Assoc.
SDI or S.D.I.	Steel Door Institute or Steel deck Institute (depending on context)
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association, Inc.
TCA	Tile Council of America
UL	Underwriter's Laboratories, Inc.
UBC	Uniform Building Code (as modified by OSSC)
USDA	U. S. Department of Agriculture
WCLIB	West Coast Lumbermen's Inspection Bureau
WWPA	Western Wood Products Association

- B. Other abbreviations used in these documents are in accord with ANSI Y1.1 "Abbreviation for Use on Drawings and in Text", or are indicated in the Drawings or respective sections of the Specifications.

1.02 SYMBOLS AND MISCELLANEOUS ABBREVIATIONS

ACM	Aluminum Composite matl.	GYP	Gypsum	SL	Structural line (Metal Bldg)
BD	Board	GB, GBD or GYP.BD	= Gypsum Board	SG	Semi-Gloss
BOT	Bottom of	HPL	high pressure plastic lam	SQ	Square
B.U.	Built-Up			SS or S.STL.	Stainless Steel
C/C	Center to center	ILO	In lieu of	STL	Steel
CJ	Ceiling Joist(s)	IN	Inches	SW	Sidewalk
CONC.	Concrete	ISF	Inside Face	TO	Top of, eg. T0.PL
CMU	Conc. masonry units	LB or #	Pounds	TC	Top of Curb
CMP	Corrugated metal panel	LSL	Laminated strand lumber	T&B	Top and Bottom
EA.	Each	LVL	Laminated veneer lumber	UNO	Unless Noted Otherwise
E/W	Each Way	Matl.	Material	WD	Wood
E.N.	Edge nailing (sheathing)	MAX.	Maximum	WP	Water Proof
ENAM	Enamel	MIN.	Minimum	W/	With
ES	ICC Evaluation Service report	MTL	Metal	W/O	Without
FNDN	Foundation	NTS	Not to Scale	WR	Water Resistant eg. WR.GB
FO	Face of; eg FO.CMU	OC	On Center	"	Inches or second
FOM	Face of Masonry	OSB	Oriented Strand Board	'	Feet or Minute
FOC	Face of Concrete or Curb	OSF	Outside Face	+	Plus
FOS	Face of Studs	PG	Paving Grade or Page	-	Minus
FSH	Face of sheathing	PL or	Property Line or Plate	/	Per; eg lb/sf
FT	Feet	P.LAM or HPL	Plastic laminate.	#	Number or Pounds
FTG	Footing	PSF	Pounds/sq.ft.	X	By ; eg. 2 x 4
GVP	Gypsum Veneer Plaster	PSI	Pounds/ sq.in.	%	Percent
G.I	Galvanized Steel / Iron	PSL	Parallel strand lumber	@	At

END OF SECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. This Section includes administrative and procedural requirements for quality-control services.
- B. Quality control services include inspections, tests, and related actions, including reports performed by Contractor, by independent agencies, and by governing authorities. They do not include contract enforcement activities performed by Engineer and Project Manager.
- C. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with Contract Document requirements.
- D. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.
1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 2. Specified inspections, tests, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with Contract Document requirements.
 3. Requirements for Contractor to provide quality-control services required by Engineer, Project Manager, or authorities having jurisdiction are not limited by provisions of this Section.
- E. Repair and restore construction disturbed by inspection and testing activities.
- F. Related Sections: The following Sections contain requirements that relate to this Section:
1. Section 01 73 29 Cutting and Patching
 2. Section 01 31 13 Coordination.
 3. Section 03 20 00 Concrete Reinforcement.
 4. Section 03 30 00 Cast-In-Place Concrete

1.03 RESPONSIBILITIES

- A. Contractor Responsibilities: Unless otherwise indicated as the responsibility of another identified entity, Contractor shall provide inspections, tests, and other quality-control services specified elsewhere in the Contract Documents and required by authorities having jurisdiction. Costs for these services are included in the Contract Sum.
1. Inspections and testing required by the OSSC and in particular OSSC Chapter 17 relating to Structural Tests and Special inspections are applicable to this project. Inspections and Tests required by OSSC shall be the Contractor's responsibility unless specifically indicated elsewhere in the contract documents to be the Owner's responsibility. Costs for these services will be paid by the Owner.
 2. Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the Contractor's responsibility, the Contractor shall employ and pay a qualified independent testing agency to perform quality-control services. Costs for these services are included in the Contract Sum.
 3. Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the Owner's responsibility, the Owner will employ and pay a qualified independent testing agency to perform those services. The Contractor shall coordinate and cooperate with the Owner's testing

agency.

- B. Retesting: The Contractor is responsible for retesting where results of inspections, tests, or other quality-control services prove unsatisfactory and indicate noncompliance with Contract Document requirements, regardless of whether the original test was Contractor's responsibility.
1. The cost of retesting construction, revised or replaced by the Contractor, is the Contractor's responsibility where required tests performed on original construction indicated noncompliance with Contract Document requirements.
- C. Associated Services: Cooperate with agencies performing required inspections, tests, and similar services, and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include, but are not limited to, the following:
1. Provide access to the Work.
 2. Furnish incidental labor and facilities necessary to facilitate inspections and tests.
 3. Take adequate quantities of representative samples of materials that require testing or assist the agency in taking samples.
 4. Provide facilities for storage and curing of test samples.
 5. Deliver samples to testing laboratories.
 6. Provide the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
 7. Provide security and protection of samples and test equipment at the Project Site.
- D. Duties of the Testing Agency: The independent agency engaged to perform inspections, sampling, and testing of materials and construction specified in individual Sections shall cooperate with the Engineer, Project Manager, and the Contractor in performance of the agency's duties. The testing agency shall provide qualified personnel to perform required inspections and tests.
1. The agency shall notify the Engineer, the Project Manager, and the Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. The agency is not authorized to release, revoke, alter, or enlarge requirements of the Contract Documents or approve or accept any portion of the Work.
 3. The agency shall not perform any duties of the Contractor.
- E. Coordination: Coordinate the sequence of activities to accommodate required services with a minimum of delay. Coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
1. The Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities, and shall include these events in the Contractor's Construction Schedule. Times for proposed inspections, tests, and sampling shall be incorporated into the Contractor's Construction Schedule."

1.04 SUBMITTALS

A. Testing Schedule

Prior to proceeding with the Work, the General Contractor shall submit, for approval by the Project Manager, a schedule of required testing and Inspections, including the names addresses and phone numbers of the proposed testing agencies.

- B. Unless the Contractor is responsible for this service, the independent testing agency shall submit a certified written report, in duplicate, of each inspection, test, or similar service to the Engineer and Project Manager. If the Contractor is responsible for the service, submit a certified written report, in duplicate, of each inspection, test, or similar service through the Contractor.

1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.

2. Submit a final report with closeout submittals, documenting all required special inspections and correction of any discrepancies noted in the inspections. This may be a copy of report required by OSSC 1704.1.2.
3. Report Data: Written reports of each inspection, test, or similar service include, but are not limited to, the following:
 - a. Date of issue.
 - b. Project title and number.
 - c. Name, address, and telephone number of testing agency.
 - d. Dates and locations of samples and tests or inspections.
 - e. Names of individuals making the inspection or test.
 - f. Designation of the Work and test method.
 - g. Identification of product and Specification Section.
 - h. Complete inspection or test data.
 - l Test results and an interpretation of test results.
 - j. Ambient conditions at the time of sample taking and testing.
 - k. Comments or professional opinion on whether inspected or tested Work complies with Contract Document requirements.
 - l Name and signature of laboratory inspector.
 - m. Recommendations on retesting.

1.05 QUALITY ASSURANCE

A. Qualifications for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, which are prequalified as complying with the American Council of Independent Laboratories' Recommended Requirements for Independent Laboratory Qualification and that specialize in the types of inspections and tests to be performed.

1. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the state where the Project is located.

PART 2- PRODUCTS (Not Applicable)

PART 3- EXECUTION

3.01 REPAIR AND PROTECTION

- A. General: Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes. Comply with Contract Document requirements for Division 1 Section "Cutting and Patching."
- B. Protect construction exposed by or for quality-control service activities, and protect repaired construction.
- C. Repair and protection is Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing, or similar services.

END OF SECTION

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE:

A. Removal of temporary facilities: 01 74 00 CLEANING & WASTE MANAGEMENT

1.02 REQUIREMENTS OF REGULATORY AGENCIES:

A. Comply with all applicable codes, ordinances and laws. Pay all permits and fees required for temporary facilities and controls.

1.03 UTILITIES:

A. Temporary Heat:

1. Furnish as required to protect the work, and to provide proper conditions for installation and curing of work of the respective trades.
2. The General Contractor shall provide all fuel for temporary heat generated by independent heating devices and shall be responsible for all damage to the building, its contents and persons..

B. Temporary Lights and Power:

1. Furnish adequate lights and power for safe working conditions, as required by O.S.H.A. or other applicable regulatory agencies.
2. Temporary power and light service equipment, installation, and fees paid for by the General Contractor.
3. Each Contractor shall provide extension cords and lamps as necessary for the work under his contract, and shall provide his own connections to and extensions from the power panel.
4. When available and approved by the Project Manager, the Contractor may use Owner provided power available at the construction site. Power provided by the Owner is not guaranteed at all times due to unforeseen outages. Cost of electrical power provided by the Owner will be paid for by the Owner. Two 120v outlets are available at the site, additional power necessary to be provided by the contractor.

C. Temporary Toilets:

1. Contractor responsible to meet all State and Local requirements for sanitary facilities.
2. Restrooms are available in buildings on site, or provide temporary facilities for all those connected with the project.
3. Maintain in sanitary condition.
4. Remove when directed and disinfect the premises.

D. Water:

1. Provide from a proven safe drinking source for all those connected with the work; serve in single service containers or drinking fountain.
2. Non-potable (W3) water is available at the site. Providing potable water is part of the project scope. The Contractor may use Owner provided water for construction. Cost of Owner provided water will be paid for by the Owner.

1.04 CONSTRUCTION AIDS:

A. Provide all necessary construction aids, including, but not limited to ladders, ramps, hoists, runways, etc.

B Contractor shall be responsible for all such apparatus, equipment and construction meeting the requirements of labor and State and local laws.

1.05 BARRIERS:

- A. Construct barricades, fences, railings, and similar safety precautions in accordance with, but not necessarily limited to applicable safety codes, including but not limited to the "Oregon Occupational Safety and Health Code", and WCD Administrative Rules 437-83-2754 thru 437-83-2755.
- B. Project Limits Barricade: At Contractor's option.

1.06 PROJECT ACCESS LOCATIONS:

- A. Limit to locations approved by the Project Manager or noted on the drawings.
- B. Upon completion of the Project restore to original condition, unless noted otherwise.

1.07 SPECIAL CONTROLS:

- A. Noise Control: The Contractor shall prevent all unnecessary noise from his operations and those from his employees and subcontractors.
- B. Dust Control: During the entire period of construction, the Contractor shall exercise all reasonable and necessary means to abate dust. Necessary sprinkling and wetting shall be performed so that the site will not become excessively dusty at any time and the amount of dust carried in the air will be kept to a minimum.
- C. Water Control: Perform pumping, trenching, damming, and underdraining necessary to keep site free from water during construction. Dispose of water in a manner acceptable to local regulation, taking care that no existing water disposal facilities are impeded, clogged, damaged, or interfered with in any way.
- D. Rubbish and Debris: Allow no excess accumulation of non-reusable material at the job site. Dispose of accumulations of rubbish and debris in a satisfactory manner, in accordance with the rules and regulations of the pollution control agencies having jurisdiction.
- E. Protection of Existing Improvements:
 - 1. The Contractor is hereby cautioned and notified that he is responsible for the protection of existing improvements which are to remain in place, throughout the execution of this contract. Temporary enclosures, walls, covers, or other protection shall be provided and maintained.
 - 2. Excavation and grading operations shall be conducted in such a manner that the streets, curbs, sewers, storm drains, utilities and other public and private facilities and improvements which are to remain in place permanently, or which are to remain in place temporarily during the performance of the contract work, will not be subject to damage, vertical settlement or horizontal movement. The Contractor shall furnish and install sheet piling, cribbing, bulkheads, shores, and other protective means as necessary. When no longer required, they shall be removed and disposed of by the Contractor.
 - 3. At points where the Contractor's operations are adjacent to or cross properties of railways, telegraph, telephone, power, gas, oil and water companies, or are adjacent to other property, (damage to which might result in significant expense, loss or inconvenience) no work shall be started until all arrangements necessary for the protection thereof have been made.
 - 4. The Contractor shall be solely and directly responsible to the Owners and Operators of such properties for any damage, injury, expense, loss, inconvenience, delay, suits, actions, or claims of any character brought because of any injuries or damages which result from carrying out the work to be done under the contract.

1.08 RESTORATION OF EXISTING IMPROVEMENTS:

- A. Restoration of Damage: Except as shown on the plans or as provided elsewhere in these specifications, the Contractor shall at his expense repair or replace curbs, sidewalks, driveways, utilities, street surfaces, plant materials, and any and all structures, substructures, and finishes damaged by his operations. This requirement extends to all such work now in place or completed prior to the time damage is incurred. These repairs and replacements shall be similar and equal in every respect to the original work, and acceptable to the Project Manager.

- B. Restoration of Services: In the event of interruption to domestic water, or to other utility services as a result of the Contractor's operations, the Contractor shall promptly notify the proper authority. He shall cooperate with said authority in restoration of service as promptly as possible, and shall bear all costs of repair. In no case shall interruption of any water or utility service be allowed to exist outside working hours unless prior approval is received.

1.09 FIELD OFFICE BUILDING:

- A. The General Contractor shall provide a weather tight office building on the premises, where directed, for joint use of the Contractor, the Engineer, and Project Manager.

- B. Provide layout table for drawings; adequate light; storage for protection of Project Record Drawings.

- C. Remove from premises upon completion of the Project, or sooner if requested.

END OF SECTION

PART 1 GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE:

- 01 41 13 Codes and Standards
- 01 33 23 Shop Drawings, Product Data, and Samples
- 01 62 00 Substitutions and Product Options

1.02 PRODUCT DELIVERY STORAGE AND PROTECTION

A. Transportation and Handling:

1. Timing: Arrange Product deliveries in accord with Construction Progress Schedule; coordinate to avoid conflict with Work and site conditions.
2. Delivery and inspection: Deliver Products undamaged, in Manufacturer's original containers or packaging, and with legible identifying labels intact. Immediately upon delivery, inspect shipments to assure that Products are properly protected and undamaged.

B. Storage and Protection:

1. General: Follow Manufacturer's instructions. Maintain product identity labels legible and intact. Store Products subject to weather damage in weather tight enclosures. Maintain storage at room temperature and humidity within ranges required by Manufacturer's recommendations.
2. Exterior Storage: Store fabricated Products above ground, on blocking or skids; prevent Product damage and discoloration. Cover Products subject to deterioration with impervious sheet coverings; provide adequate ventilation to prevent condensation.
3. Inspection of Stored Products: Arrange storage to permit easy access for inspection. Make periodic inspections of stored Products to assure that Products are maintained as specified and are free from damage, discoloration, and deterioration.
4. Protection after Installation: Provide substantial coverings as necessary to protect installed Products against damage. Remove covering when no longer needed.

1.03 INAPPROPRIATE PRODUCTS AND METHODS:

- A. Should any materials be found to be contrary to the Contract, the material no matter in what stage of completion, may be rejected by the Project Manager and if rejected shall be removed from the site at once.
- B. If the Contractor believes that any specified product, method, or system is inappropriate for use, or any specified result cannot be achieved, he shall so notify the Project Manager at least 7 days prior to Bid opening, or prior to execution of the Agreement if the project is not bid. Failure to deliver such notice of objection within the specified time limit, shall for the purposes of this Contract, establish that the Contractor agrees that the specified products, methods, or systems are appropriate, and achievable, and the Contractor's responsibility to provide and warrant such product, method, or system shall not later be voided or reduced. If after the agreement is signed, the Contractor notifies the Project Manager that a specified result, product, or system cannot be provided, then it shall be the Contractor's responsibility to provide a substitute which is acceptable to the Project Manager.

PART 2 PRODUCTS

2.01 NUMBER OF ITEMS SPECIFIED:

Wherever in these specifications an article, device, or equipment is referred to in the singular number, such reference shall apply to as many such articles as are shown on the Drawings or are required to complete the installations.

2.02 CONFORMANCE WITH SPECIFIED PRODUCT DESCRIPTIONS

- A. Conform to applicable Specifications and Reference Standards.
- B. Furnish all materials of a kind by one manufacturer, except component parts of an assembly need not be the product of a single manufacturer unless otherwise indicated.
- C. Furnish all items new and free from defects, of size, type, and quality specified.
- D. Refer to Section 01 62 00 for requirements concerning proprietary specifications and product options.
- E. Items shown on the drawings, but not otherwise described or noted, shall be provided in conformance with applicable code requirements.

PART 3 EXECUTION

3.01 PREPARATION AND INSPECTION

- A. No Product shall be applied or installed until conditions and surfaces are acceptable to Applicator or Installer. Prior to ordering products, field verify existing conditions and dimensions critical to product installation.
- B. Notify Project Manager of unacceptable condition or surfaces.
- C. Failure to notify Project Manager of unsatisfactory condition or subsurface before Work is started shall place full responsibility for final results upon the installer or applicator. This shall not relieve the General Contractor from any responsibilities under this Contract.
- D. Prior to covering, concealing or otherwise affecting the Work of other trades, verify with General Contractor that the Work of the other trade is complete and may be so concealed, covered, or affected. A Subcontractor who fails to make such verification shall assume complete responsibility for any necessary corrective measures. This requirement shall not relieve the General Contractor from any responsibilities under this Contract.

3.02 MANUFACTURER'S INSTRUCTIONS:

Perform Work in accord with manufacturer's instructions. Do not omit preparatory or installation procedures required by Manufacturer, unless specifically modified or exempted by Contract Documents. When Contract Documents require Work to comply with Manufacturer's instructions, obtain and distribute such instructions to parties performing Work, and if requested, include copy to the Manager. Maintain one copy of

Manufacturer's instructions at job site during installation and until acceptance. Handle, install, connect, clean, condition, and adjust Products in strict accordance with Manufacturer's instructions and in

conformance with specified requirements. Should job conditions or specified requirements conflict with Manufacturer's instructions, consult Project Manager for further instructions. Do not proceed with Work without clear instructions.

3.03 RESTORATION OF DAMAGE:

Except as shown on the plans or as provided elsewhere in these specifications, the Contractor shall at his expense repair or replace curbs, sidewalks, driveways, utilities, street surfaces, plant materials, and any and all structures, substructures, finishes and other work damaged by his operations. This requirement extends to all such work now in place or completed prior to the time damage is incurred. These repairs and replacements shall be similar and equal in every respect to the original work, and acceptable to the Engineer and Project Manager.

END OF SECTION

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE:

01 33 23 Shop Drawings Product Data and
Samples 01 60 00 Product Requirements

1.02 PRODUCTS LIST

Before Contractor's first request for payment, submit to Project Manager complete list of major Products proposed for use; include proprietary names, Manufacturer's name, and installing subcontractor's name.

1.03 CONTRACTOR'S OPTIONS

A. Definition of Descriptive Specification: For the purposes of this Contract Descriptive Specification shall mean one or more listed requirements describing a Product, or reference to Standard Specifications or Standards issued by a named Agency, Manufacturer or similar Organization.

B. For Products specified only by Descriptive Specifications select any product meeting specified requirements.

C. For Products specified by listing proprietary names of Products:

1. If no Descriptive Specification is included, select any named Product.
2. If descriptive specification is included it shall take precedence. Contractor shall verify with supplier that the named Product may be provided to meet the requirements of the descriptive specification including requirements in addition to named manufacturer's regular standards. If Product cannot be provided to meet the specifications, notify Project Manager at least seven days prior to Bid Opening, or prior to execution of the Agreement if the Project is negotiated. Failure to deliver such notice within the specified time limit shall for the purposes of this Contract establish that the Contractor has made the required verifications, and he shall be responsible either to provide the Product as specified, or to provide an approved substitute Product at no additional cost to the Owner.

D. Items shown on the drawings, but not otherwise described or noted, shall be provided in conformance with applicable code requirements.

1.04 SUBSTITUTIONS:

A. Submit requests for substitution approvals are to be submitted by the Contractor. Submit two copies and include complete data substantiating compliance of proposed substitution with Contract Documents as follows:

1. Identity of product for which substitution is requested, including specification page and paragraph.
2. Identity of proposed substitution, including drawings, photographs, performance and test data, and any other information necessary for evaluation.
3. Quality comparison of proposed substitution with specified product.
4. Changes required in other Work because of substitution.
5. Effect on Construction progress schedule.
6. Cost comparison of proposed substitution with specified product.
7. Any required license fees or royalties.
8. Availability of maintenance service.
9. Source of replacement materials.

B. In making request for substitution, Contractor represents:

1. He has personally investigated proposed Product, and determined that it is equal to or superior in all respects to that specified.
2. He will provide the same guarantee for substitutions as for product specified.

3. He will coordinate installation of proposed substitution into Work, making such changes as may be required for the Work to be complete in all respects.
4. He waives all claims for additional costs related to substitution which consequently become apparent.
5. Data submitted with substitution request is complete and accurate.

C. During Bidding Period:

1. No request for approval will be considered unless submitted in accordance with C2 of the invitation to bid.
2. Project Manager will issue addenda prior to Bid Opening listing all approved substitutions.

D. After Contract Award approval will be granted only when:

1. Specified product cannot be delivered without project delay, or
2. Specified product has been discontinued, or
3. Specified product has been replaced by a superior product, or
4. Specified product cannot be guaranteed as specified, or
5. Specified product will not perform properly, or
6. Specified product will not fit within the designated space, or
7. Specified product does not comply with governing codes or regulations, or
8. Substitution will be clearly in Owners interest.

E. Substitutions will not be considered if:

1. They are indicated or implied on shop drawings or project data submittals without formal request for substitution as described herein above.
2. Acceptance will require substantial revision of the Contract Documents.
3. Project Manager does not agree that the proposed substitution meets the requirements listed herein above.

SUBSTITUTION REQUEST FORM

TO: Jim Baird, Manager
 1297 NE Grandview Drive
 Roseburg, OR 97470

PROJECT: Bisulfite Building

We hereby submit for your consideration the following product instead of the specified item for the above project:

Section	Paragraph	Specified Item
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Proposed Substitution:

Attached data includes product description, specifications, drawings, photographs, performance and test data, adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes description of changes to Contract Documents which proposed substitution will require for its proper installation.

The Undersigned also states that the following paragraphs, unless modified on the attachments, are correct.

1. The proposed substitution does not affect dimensions shown on the Drawings.
2. The Undersigned will pay for changes to the building design, including engineering, design, detailing, and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.

Submitted by:

Signature

For Use by Design Consultant

Accepted

Accepted as Noted

Not Accepted

Received Too Late

Firm

 Address

By

Date

 Telephone

Remarks

Attachments:

END OF SECTION

PART 1 GENERAL**1.01 DESCRIPTION:****A. Related requirements specified elsewhere:**

1. Section 01 11 00: Summary of Work
2. Section 01 31 13: Coordination
3. Section 01 50 00: Temporary Facilities and Controls

B. Execute cutting, patching and fitting required to:

1. Make all Work fit properly.
2. Uncover Work to provide for installation of ill-timed Work.
3. Remove and replace defective Work, or Work not conforming to the Contract Documents.
4. Repair and restore construction disturbed by inspection and testing activities.

1.02 PAYMENT FOR COSTS:

Costs caused by defective or ill-timed Work or Work not conforming to the Contract Documents, including costs of additional professional services shall be borne by the Contractor.

PART 2 PRODUCTS

2.01 Materials for the replacement of Work removed shall comply with the Contract Documents for type of Work to be done.

PART 3 EXECUTION**3.01 PREPARATION AND PROTECTION:**

- A. Obtain written permission from Engineer or his representative prior to removing, bending, boring, or making cuts or cores in any structural element other than as specifically indicated in the Drawings and Specifications.
- B. Provide shoring, bracing and support as required to maintain structural integrity of the Project.
- C. Provide protection for other portions of the Project, including protection from the weather or other sources of damage.

3.02 PERFORMANCE:

- A. Execute fitting and adjustment of products to provide finished installation to comply with specified tolerances and finishes.
- B. Execute cutting and demolition work by methods which will prevent damage to other Work, and will provide proper surfaces to receive installation of repairs and new Work.
- C. Restore Work which has been cut or removed; install new products to Provide completed Work which is in compliance with the Contract Documents.
- D. Refinish entire surfaces as necessary to provide an even finish, to nearest intersections. Unless noted or detailed otherwise repairs and replacements shall match existing adjacent surfaces,

END OF SECTION

PART 1 GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE:

Rubbish Control and removal: Section 01 50 00 Temporary Facilities
Project Closeout: Section 01 77 00

PART 2 PRODUCTS

2.01 CLEANING MATERIALS

Use only those which will not create hazards to health or property, and which will not damage surfaces.
Use only those recommended by Manufacturer of surface to be cleaned.
Use only on surfaces recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.01 GENERAL

Follow cleaning Material and Surface Manufacturer's instructions.

3.02 DURING CONSTRUCTION

- A. Remove rubbish and debris on regular basis.
- B. Clean surfaces prior to painting and continue cleaning as needed until painting is complete.
- C. Schedule cleaning so that resultant dust and contaminants will not fall on wet or newly coated surfaces.

3.03 FINAL CLEANING

- A. Perform final cleaning prior to Owner Occupancy or Final Completion, whichever of the two is earlier.
- B. Employ skilled workmen for final cleaning.
- C. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign matter from all exposed interior and exterior surfaces.
- D. Hose clean exterior paved surfaces; rake clean other surfaces of grounds, after removal of temporary facilities. Remove nails and other ferrous metal debris from grounds with magnetic pick-up.
- E. Ventilating System: Clean permanent filters and replace disposable filters if units were operated during construction. Clean ducts, blowers, and coils if units were operated without effective filters during construction.
- F. Remove rubbish dirt and extraneous materials from the interiors of conduits, catch basins, manholes, and other construction work.

END OF SECTION

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Comply with Contract Conditions and specified administrative requirements in closing out Work. In particular note the following requirements:
1. Liquidated damages: General Conditions
 2. Warranties and Bonds: General Conditions; Section 01 78 36
 3. Partial Owner Occupancy: General Conditions
 4. Cleaning and Trash Removal: 01 74 00 Cleaning
 5. Record Documents: 01 78 39 Project Record Documents
 6. Operation and Maintenance Data: 01 78 23

1.02 SUBSTANTIAL COMPLETION

- A. When Contractor considers Work Substantially Complete, as defined in the General Conditions he shall submit to Engineer and Project Manager:
1. Written notice that Work, or designated portion thereof is Substantially Complete.
 2. List of items to be completed or corrected.
- B. Engineer and Project Manager will, as soon as possible after receipt of notice, inspect to verify completion status.
- C. Should Engineer and Project Manager consider that Work is not Substantially Complete:
1. Project Manager will notify Contractor in writing, giving reasons therefore.
 2. Contractor shall remedy Work deficiencies, and send second notice of Substantial Completion to Project Manager.
 3. Project Manager and Engineer will reinspect Work.
- D. When Project Manager concurs that Work is Substantially Complete, he will:
1. Prepare Certificate of Substantial Completion, accompanied with Contractor's list of items to be completed or corrected, as verified by Project Manager.
 2. Submit Certificate to Project Manager and Engineer for their written acceptance of the responsibilities assigned to them in the Certificate.

1.03 FINAL COMPLETION

- A. When Contractor considers Work complete, he shall submit written certification that:
1. Contract Documents have been reviewed.
 2. Contractor has inspected Work for compliance with Contract Documents.
 3. Work has been completed in accordance with the Contract Documents.
 4. Equipment and Systems have been tested in presence of Project Manager and are operational.
 5. Work is complete and ready for final inspection
- B. Project Manager and Engineer will, as soon as possible after receipt of Contractor's Certification, inspect to verify completion status.
- C. Should Project Manager and Engineer consider Work incomplete or defective:
1. Project manager will notify Contractor in writing, listing incomplete or defective Work.
 2. Contractor shall immediately remedy deficiencies, and send second written certification to Project manager and Engineer that Work is complete.
 3. Project Manager and Engineer will reinspect Work.
- D. When Project Manager and Engineer find Work acceptable under Contract Documents, final closeout submittals will be requested.

1.04 REINSPECTION FEES

- A. Should Engineer be required to make more than two final inspections due to Contractor's failure to correct specified deficiencies, Owner will compensate Engineer for additional services, and deduct Engineer's compensation amount from Contractor's final payment as follows:
1. Engineer's time at \$100.00 per hour.
 2. Engineer's employees at 2.5 times the direct personnel expense.
 3. Others at 1.20 times the direct cost incurred.
 4. Charges will be made for necessary travel time, commercial air fare, auto expense computed at 50 cents per mile, room and board, and all other expenses incurred in making inspections.

1.05 CONTRACTOR'S CLOSEOUT SUBMITTALS TO PROJECT MANAGER

- A. All closeout submittals shall be made at one time to Project Manager, except that extra materials shall be delivered at one time to the Project site, with letter of transmittal verifying signature of receipt by Project Manager.
- B. Contractor shall submit evidence of payments and release of liens as follows:
1. Contractor's Affidavit of Payment of Debts and Claims, AIA Document G706.
 2. Contractor's Affidavit of Release of Liens, AIA Document G706A including:
 3. Consent of Contractor's Surety to Final Payment, AIA Document G707.
 4. Contractor's release or Waiver of Liens.
 5. Duly sign and execute all submittals before delivery to Project Manager.
- C. Submit the following documents and extra materials as required by code or specified elsewhere:
1. Building Official's Certificate of Mechanical and Electrical Inspections.
 2. Building Official's Certificate of Occupancy.
 3. Certificate of Insurance for Products and Completed Operations.
 4. Owners Operating and Maintenance Manuals; see Section 01 78 23.
 5. Project Record Documents; see Section 01 78 39.
 6. Warranties and Bonds; see Section 01 78 36, and the following:
Roofing, Flashing, Damproofing: see Division 7, all Sections.
- D. Submit final statement of accounting to Project Manager, including the following:
1. Original Contract Sum.
 2. Additions and deductions resulting from:
Deductions for uncompleted Work.
Penalties and Bonuses.
Previous change orders.
Deductions for Liquidated Damages.
Deductions for Reinspection Payments.
Other adjustments.
 3. Total Contract Sum, as adjusted.
 4. Previous payments.
 5. Sum remaining due.

1.06 FINAL ADJUSTMENTS AND FINAL PAYMENT

- A. Project Manager will prepare and issue final Change Order, reflecting approved adjustments to Contract Sum not previously made by Change Orders.
- B. Contractor shall follow procedures specified in Supplementary Conditions in making final application for payment.

END OF SECTION

1.01 GENERAL

Compile full details for care and maintenance of materials, equipment, and systems, where specified herein or in other Specification Sections.

Instruct Owner's personnel in maintenance of Products and in operation of equipment and systems.

1.02 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

01 33 23 Shop Drawings, Product Data, and Samples.

01 77 00 Closeout Procedures

01 78 39 Project Record Documents.

Demonstrating Mechanical and Electrical Equipment; Divisions 23 and 26 respectively.

1.03 PREPARATION AND FORM OF SUBMITTALS

A. Data preparation shall be done by personnel:

1. Completely familiar with the requirements of this Section.
2. Trained and experienced in maintenance and operation of described products.
3. Sufficiently skilled as technical writer to communicate essential data.
4. Sufficiently skilled as draftsman to prepare required drawings.

B. Prepare data in form of instruction manual as follows:

1. Bind with 8-1/2 x 11 inch, commercial quality three ring binders with durable covers, tabs and index.
2. Bind in drawings with edges reinforced against tear-out, and folded to match size of text pages.
3. Provide fly-leaf with labeled tabs for each separate product.
4. Label Binder Cover "Operation and Maintenance Instructions" and list:
Project Title, Identity of Separate Structures if applicable, and Identity of Subject matter in manual.

1.04. GENERAL CONTENT OF ALL MANUALS:

A. Table of contents, neatly typed and systematically ordered, listing:

1. Contractor, name of responsible principal, address, and telephone number.
2. Each Product including name, address, and telephone number of Subcontractor or installer
Recommended Maintenance Contractor
Local source for replacement parts

B. Product Data:

Include only those sheets which are pertinent to specified Product. Annotate each sheet to clearly identify specific product or part installed and data applicable to installation. Delete references to inapplicable data.

C. Drawings:

1. Supplement product data where necessary to clearly illustrate relationship of component parts, and control or flow diagrams.
2. Do not use Project Record Documents as Maintenance Drawings.

D. Written Text:

1. Provide where necessary to supplement Product Data and Drawings.
2. Provide logical sequence of instructions for each procedure.
3. Organize text with separate headings for different procedures.

E. Warranties, Bonds, and Maintenance Contracts:

1. Provide copy of each.
2. Include proper procedures in event of failure.
3. Include instances which might affect validity of Warranties, bonds, or Contracts.

1.05 MANUAL FOR MATERIALS AND FINISHES

- A. Include Manufacturer's Data as follows:
 Catalog number, size, composition, color and texture designations.
 Required reordering information.
 Recommended cleaning materials, methods, and maintenance schedules.
 Cautions against detrimental cleaning materials and methods.
- B. Submit specified information for the following:
 Finish Hardware: Section 08 70 00
 Painting: Section 09 90 00
 Miscellaneous Specialties: Section 10 20 00

1.06 MANUAL FOR WEATHER PROTECTION MATERIALS

- A. Include Manufacturer's data as follows:
 Applicable manufacturing standards.
 Instructions for inspection, maintenance and repair.

1.07 MANUALS FOR MECHANICAL AND ELECTRICAL EQUIPMENT AND SYSTEMS

- A. Include the following Data:
1. Equipment Directory:
 List equipment, by nameplate designation, location and area served. Describe function, operating characteristics, and limiting conditions.
 List complete nomenclature and commercial number of replaceable parts.
 Performance curves, engineering data and tests.
 2. Operating procedures including:
 Start-up, break-in, routine and normal operating instructions. Special operating instructions (including summer-winter variations) Sequences required, regulation, shutdown, and emergency
 3. Maintenance Procedures, including:
 List of equipment requiring routine maintenance or servicing. Recommended schedule and routine operations for maintenance. Disassembly, repair and reassembly.
 Adjusting and Checking.
 Manufacturer's printed operating and maintenance instructions.
 Parts list, and recommended parts to remain in storage.
 4. As installed control system diagrams, and description of sequences of operation.
 5. Color-code Legend, if any.
 6. Electrical panelboard circuit directories indicating:
 Electrical Service
 Controls
 Communications, if any.

- B. Submit specified information for the following:
 Electrical and Mechanical Equipment specified in Divisions 21 through 28

1.08 ADDITIONAL DATA

Prepare and include additional data:
 When need becomes apparent during instruction of Project Manager. As specified in other Sections of Specifications.

1.09 SUBMITTAL SCHEDULE

A. Preliminary Draft:

1. Submit two copies of proposed format.
2. Project Manager will review, and return one copy with comments.

B. Final Submittal:

- Submit in final form, one complete copy, 15 days prior to Final inspection.
- Copy will be returned with comments
- Submit 2 copies, in approved final form, with closeout submittals.

1.10 INSTRUCTION OF OWNER'S PERSONNEL

- A. Prior to final acceptance, instruct Owner's Personnel in necessary operation, adjustment and maintenance of Products, Equipment and Systems.
- B. Operating and Maintenance Manual shall constitute basis of instruction.
- C. Review manual with Owners personnel in detail to explain all aspects of operations and maintenance.

END OF SECTION

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Bonds and Insurance required prior to Construction, and General and Extended Warranties by General Contractor, are specified in the General Conditions.
- B. Submittal of Bonds and Warranties specified herein:

1.02 CERTIFICATES OF WARRANTY

- A. Provide for all Products incorporated into the Work when required by the respective Sections of the Specifications.
- B. Certificates of Warranty or Guarantee required by this Section or in the respective Sections of the Specifications, are in addition to warranties or guarantees required from the General Contractor and Specified in the Supplementary Conditions, and will in no manner reduce or nullify the General Contractor's warranty or guarantee responsibilities.
- C. All Certificates of warranties and guarantees shall:
 1. Be type written or professionally printed and be duly signed by the installing Subcontractor, or representative of the Product Manufacturer, authorized to legally bind the Subcontractor or Product Manufacturer.
 2. Warrant that the Product will be replaced or properly repaired, without delay and without cost to Owner, should the Product fail to properly function or provide proper service within the specified warranty period.
 3. Warranty period shall begin upon Substantial Completion, or if a Certificate of Substantial Completion is not issued, or if Work which is to be covered by warranty is not then complete, Warranty period shall begin upon the date of Final Acceptance.
 4. Additional warranty conditions shall be as specified in the respective Sections of the Specifications.
- D. Warranty Submittals Shall include:
 - Project name and address
 - Description of Product, and reference to Specification Section
 - Length of Warranty as specified.
 - Date of beginning for Warranty Period.
 - Conditions of warranty as specified above.
 - Additional conditions of warranty as required for Product by Specifications.
 - Statement that the signator agrees to provide said warranty.
 - Typed Name of individual signing warranty, signature, and date.
- E. Submit with Project Closeout Submittals as specified in Section 01 77 00.
- F. Where extended Warranties or specific conditions of Warranty are called for in the respective Sections of the Specifications or in the Supplementary Conditions, but where no Certificate of Warranty is required to be submitted, the General Contractor may, at his option, and to protect his own interests, require the respective Subcontractors or Suppliers to provide him with Certificates of Warranty covering his Warranty obligations to the Owner.

1.03 UNCOVERING AND CORRECTION OF WORK - WARRANTIES

- A. Warranty Period:
 1. The warranty period relating to faulty Products and workmanship will begin on the date appearing on the Certificate of Substantial Completion, or if a Certificate of Substantial Completion is not issued, on the date appearing on the final Certificate for Payment to the Contractor, whichever is earlier. The Owner's occupancy or use of the Project will not alter the Warranty Period herein defined.

2. The Contractor shall and hereby does warrant against ordinary wear and usage the following Work as noted, and for the following periods of time after the start of the Warranty Period as defined above:
- a. Warranties for Work and for periods of service as called for in the respective Sections of the Specifications, regardless of limitations or conditions written into any certificates of warranty or guarantee which might be submitted.
 - b. 10 years: Weather tightness of Sealants, Roofing, Moisture barrier, Damproofing, Flashing, Roof Accessories, and other Work which is a component part of Roofing or other weather protective or moisture protective elements of the Work.
 - c. 3 years: Applied finishes against delaminating from surface to which applied.
 - d. 2 years: Effectiveness of soil sterilizers; Mechanical and electrical work and equipment specified in Divisions 22, 23 and 26.

The above warranties are an extension to run concurrently with the one-year statutory warranty, and are in addition to any Guarantee, Bond or warranties called for elsewhere in the Contract Documents.

Should any Work covered by Warranty fail to properly function or to provide proper service within the Warranty period, the Contractor shall correct the defect immediately, at no cost to the Owner, following receipt of written notice from the Owner. Should any other damage be incurred, either as a direct result of the subject defect, or as a result of the Contractor's failure to promptly correct the defect, then the Contractor shall also correct the resulting damage to the Owner's satisfaction, at no additional cost, whether or not said damage is to Work provided under this contract. If delay in correction of a defect covered by warranty can reasonably be expected to create a risk of significant future damage, contingent expenses, or danger to persons or property, and if the Contractor does not act with promptness commensurate to such risk, or if the Owner cannot contact the Contractor after making a reasonable effort, then the Project Manager may at his option, have the defect corrected and the Contractor shall pay all related costs billed to the Owner.

Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty except that the remaining warranty period shall be a minimum of one year following acceptance of the subject correction Work.

END OF SECTION

1.01 MAINTENANCE OF DOCUMENTS

- A. Maintain at Project Site for Owner one record copy each of:
1. Contract Drawings and Project Manual.
 2. Addenda, Field Orders, Change Orders and other Contract Modifications.
 3. Other written instructions.
 4. Approved Shop Drawings, Product Data, and Samples.
 5. Field Test Reports.
- B. Store Project Record Documents in field office apart from documents to be used for construction, and maintain in clean dry, legible condition; available at all times for inspection by Project Manager.
- C. Keep Record Drawings Current; do not Conceal any Work until required information has been recorded. Lack of current Record Documents shall be grounds for withholding progress payments.

1.02 RECORDING

- A. Documents shall be maintained by a competent draftsman. If Project Manager considers submitted drafting to be unacceptable, redraft until acceptable at no additional cost to Owner. Marking shall be by waterproof, felt tip pens.
- B. Label each Document "PROJECT RECORD" in 1" high printed letters.
- C. Required Drawings:
1. Maintain one print of Contract Drawings as "work set"; using Marking devices specified to record all Contract changes.
 2. Prior to submittal, transfer recorded information to one additional print. Contractor may retain "work set" for his records.
- D. Mark Drawings to record:
1. Depths of foundation elements in relation to floor elevation.
 2. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 3. Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.
 4. Field changes of dimensions and details.
 5. Changes made by Change Order or other Contract Modifications.
 6. Details not on original Contract Drawings.
- E. Specifications and Addenda: Legibly mark to record the following:
1. Manufacturer, trade name, catalog number, and Supplier of each Product actually installed.
 2. Changes made by Change Order or other Contract Modification.

1.03 SUBMITTALS

- A. Submit Record Documents as specified in Section 01 77 00 Closeout Procedures, accompanied by transmittal letter, in duplicate, containing:
1. Project Title.
 2. Date.
 3. Contractor's name and address.
 4. Title and number of each Record Document.
 5. Signature of Contractor, or his authorized representative.

END OF SECTION

PART 1 GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

General and Supplementary Conditions, Division 1, and accompanying Drawings.
03 20 00 Concrete Reinforcing
03 30 00 Cast-In-Place Concrete

1.02 QUALITY ASSURANCE

- A. Reference Standards: Conform to recommendations of ACI 318 and ACI 347.
- B. Design and Engineering Formwork Design and Engineering are Contractors responsibility.

PART 2 PRODUCTS

2.01 FORM MATERIALS

- A. Plywood: APA Exterior "Plyform", or approved, class I, or class II, thickness as required to support concrete without visible deflection, at rate poured.
- B. Lumber Forms: 2 inch solid Douglas fir, No. 2 grade.
- C. Round Column Forms: Seamless coated tube forms; Sleek, Sonotube, or Burke approved.
- D. Metal Forms: Conform to Standards of CRSI.
- E. Form Release Agent: Non staining, non grain-raising, free of mineral oils, and leaving no bond inhibiting residues.

2.02 ACCESSORY ITEMS

- A. Ties and Spreaders: Metal type acting as spreaders leaving no metal within 1" of concrete face, and no fractures, spalls, depressions or other surface disfiguration greater than 3/4 inch in size. Strap and wire ties acceptable on footing forms.
- B. Expansion Joint Filler: W.R.Meadows (Sealtight) Asphalt joint filler meeting ASTM D 994 or Fiber Joint filler meeting ASTM D1751. Non extruding, 1/2" thick unless noted otherwise.
- C. Expansion Joint sealer: W.R. Meadows #164, HI-SPEC®, Cold-Applied SOF-SEAL®, Sonolastic ® NP1, or approved.

PART 3 EXECUTION

3.01 COORDINATION

- A. Coordinate with others for installation of all cast in place items, allowing sufficient time between the erection of forms and placing of concrete to allow the various trades to properly install their work.
- B. Do not core or sleeve columns, beams or joists without Engineer's specific approval.

3.02 INSTALLATION

- A. Construct formwork to meet tolerances specified in ACI 347, section 203.1. Provide for openings, offsets, keyways, reglets, chamfers, blocking and other features required on the Work. Conform to shapes, lines, and surfaces shown in the Drawings and Specified.
- B. Build formwork to prevent washing out of mortar, leakage, spreading, shifting, settling, and visible deflection.
- C. Form all concrete surfaces. Earth sidewalls permitted only with Engineer's specific written approval.

3.03 TREATMENT OF FORMS

- A. **General:** Apply form release agents in strict accordance with Manufacturer's instructions, with special attention to rate and method of application.
- B. **Board Forms:** Keep wet prior to pouring; wet thoroughly just before placing concrete.

3.04 ACCESSORY ITEMS

- A. **Ties and Spreaders:**
Set in straight rows, evenly spaced, pattern as approved or as shown in the drawings. No form ties in columns.
- B. **Construction Joints:**
Provide where shown or as approved. Form to profiles detailed. Coat one side of metal key joints with bond breaking agent. Install as recommended by manufacturer. Refer to 03 20 00 for reinforcing at construction joint locations.
- C. **Slab Expansion Joints:**
 1. Provide where shown in Drawings and unless noted otherwise: Wherever slabs abut vertical surfaces,
Wherever slabs extend through door openings at ends of foundation walls. Not over 20 feet spacing in any direction in slabs.
Not over 15 feet spacing in exterior curbs and walks.
 2. Bring joint material to within 1/2" of surface, and fill remainder with joint sealing compound.
 3. Unless noted otherwise on the Drawings, provide smooth dowels (3/8" diameter x 30" long at 12" oc unless noted otherwise) centered on expansion joint; one end heavily coated with bond breaking agent and capped with plastic dowel cap similar to Heckman no.87, opposite end clean for good bond.
- D. **Anchor Slots:**
Set in true vertical position, anchored securely in place. Provide for masonry abutting concrete, and for masonry veneer and furring; one slot for each abutment not more than 24" oc. for veneer.
- E. **Chamfers, Reglets, and Nailing strips:**
 1. Chamfer exposed external corners with 3/4" triangular strip in forms, except where corner is to form flush joint with other materials.
 2. Provide nailing strips flush to concrete surface; shapes and locations as shown.
 3. Provide reglets in maximum standard lengths for watertight installation.

3.05 FORM REMOVAL

Leave forms in place until concrete has attained sufficient strength to safely support its own weight plus any loads imposed upon it. Formwork not supporting weight of concrete may be removed in 48 hours, provided concrete has hardened sufficiently not to be damaged by form removal, and curing and protection operations are maintained.

3.06 REUSE OF FORMS

Engineer will approve reuse of forms provided they are in good condition and have been cleaned, repaired and resealed as required to achieve concrete finish equal to new forms.

END OF SECTION

PART 1 GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

General and Supplementary Conditions, Division 1, and accompanying Drawings.
01 45 00 Quality Controls (Sampling and Testing)
03 11 00 Concrete Formwork
03 30 00 Cast In Place Concrete

1.02 QUALITY ASSURANCE

Reference Standards:
CRSI Manual of Standard Practice, and current ASTM Standards.
OSSC Chapters 17 Testing and 19 Concrete.
ASTM C 94 - Standard Specification for Ready-Mixed Concrete.
.ASTM C 1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete.

Synthetic Fiber Reinforcement Manufacturer's Qualifications:

1. Synthetic fiber reinforcement manufactured in ISO 9001:2000 certified facility.
2. Satisfactory performance history of specified synthetic fiber reinforcement.

1.03 SUBMITTALS

A. Steel Reinforcing:

Shop Drawings: Bending and placing drawings prepared in conformance with "Manual of Standard Practice for Detailing Reinforced Concrete Structures, ACI 315".

B. Synthetic Fiber Reinforcing

1. Submit manufacturer's product data, including application rate and mixing instructions.
2. Submit manufacturer's sample of synthetic fiber reinforcement.
3. Manufacturer's Certification:
 - a. Submit manufacturer's certification that synthetic fiber reinforcement complies with specified requirements.
 - b. Submit evidence of manufacturer's ISO 9001:2000 certification.
 - c. Submit evidence of satisfactory performance history of synthetic fiber reinforcement.

1.04 DELIVERY STORAGE AND PROTECTION

A. Metal bar and wire mesh reinforcing:

Identification: Each piece of reinforcing steel grade marked or each shipment accompanied by a certificate of compliance. Deliver all reinforcement to site, bundled, tagged and marked. Use tags indicating bar size, lengths and other information corresponding to markings shown on placement drawings.

Store on site to protect from ice, mud, oil, and rust or other damage.

Coordinate for special inspections and testing where required by OSSSC chapter 17, or ACI 318.

B. Synthetic Fiber Reinforcing

1. Delivery: Deliver synthetic fiber reinforcement in manufacturer's original, unopened, undamaged containers and packaging, with labels clearly identifying product name, unique identification number, code approvals, directions for use, manufacturer, and weight of fibers.
2. Store synthetic fiber reinforcement in clean, dry area indoors in accordance with manufacturer's instructions.
3. Keep packaging sealed until ready for use.
4. Protect synthetic fiber reinforcement during handling to prevent contamination

PART 2 PRODUCTS

2.01 MATERIALS

- A. Bars: ASTM A615, Grade 60, unless noted otherwise. ASTM A706, Grade 60, for all bars to be welded, unless noted otherwise.
- B. Accessories: Conform to requirements of Reference Standards. Provide all items necessary for proper placing, spacing, supporting, and fastening of reinforcement in place. Provide galvanized or stainless steel metal accessories where portions will be exposed in finished surfaces.
- C. Synthetic Fiber Reinforcement: Novomesh 950.
 - 1. Material: Blend of polypropylene/polyethylene macro-monofilament fibers with sinusoidal deformations and 100 percent virgin polypropylene micro-synthetic fibers, containing no reprocessed olefin materials.
 - 2. Conformance: ASTM C 1116, Type III.
 - 3. Polypropylene Component:
 - a. Fiber Length: Multi-design gradation.
 - b. Alkali Resistance: Alkali proof.
 - c. Absorption: Nil.
 - d. Specific Gravity: 0.91.
 - e. Melt Point: 324 degrees F (162 degrees C).
 - 4. Coarse Macro-Monofilament Polypropylene Component:
 - a. Fiber Length: 2.0 inches (50 mm).
 - b. Nominal Filament Diameter: 0.033 inches (0.83 mm).
 - c. Alkali Resistance: Alkali proof.
 - d. Absorption: Nil.
 - e. Specific Gravity: 0.91.
 - f. Melt Point: 328 degrees F (164 degrees C).

PART 3 EXECUTION

3.01 GENERAL

Conform to requirements of reference standards.

3.02 FABRICATION

- A. Conform to approved shop drawings except as such requirements may be exceeded by Drawings or Specifications. Welding, where required, by AWS certified welders only.
- B. Shop fabricate and cold bend in a manner that will not injure the material.

3.03 INSTALLATION OF METAL BAR

- A. Positioning:
 - 1. Accurately position, support and secure against displacement. Do not cut, bend or displace reinforcing for convenience of other trades. Insure that reinforcing is protected by required thickness of concrete.
 - 2. Mesh reinforcing for slabs poured on grade shall be set on sand/gravel aggregate masonry dobies. Do not attempt to hook mesh up into slab during pour without dobies.
- B. Splicing:

Tightly wire and tie with bars in tight contact.
Minimum lap of bar splices: 36 diameters unless detailed otherwise.
Provide standard splices at corners, and as required, except do not splice in self-supporting slabs, beams, joists or headers unless specifically detailed and shown on approved placement drawings.
- C. Tying:

Wire tie and support at intersections and at intervals not over 3'-0" horizontally and 6'-0" vertically. Suspend reinforcement by wires from forms in footings, or set on wide base wire chairs. Bars balanced on blocks, rocks or bricks not acceptable.
Wire tie footing dowels in place before pouring.

Stabbing dowels into wet concrete not acceptable.

D. Minimum Concrete Cover

1. Concrete cover cast against earth (below footing reinforcing): 3" Minimum.
2. Form Cast and exposed to earth or weather: No. 5 and smaller: 1-1/2"
No. 6 and Larger: 2"
3. Not exposed to weather or earth: 3/4" unless noted otherwise.
4. Wall reinforcing.
Single layer reinforcing: centered; 1/2" tolerance ea. way.
5. Welded Wire Mesh in earth supported slabs: 1" top cover, minimum bottom cover = 2/3 slab thickness.

3.04 MINIMUM REINFORCEMENT

- A. Unless exceeded by reinforcing requirements shown in the Drawings and shown on approved placement drawings, provide minimum reinforcing specified hereinafter.
- B. Walls and self-supporting slabs: 1/4 of 1% steel each way per cross sectional area of concrete; maximum spacing = 1-1/2xthickness.
- C. Top, bottom and discontinuous ends of all walls: 2 no. 4 bars continuous.
- D. Corners and Intersections: 2' x 2' bars; size and number to match horizontal reinforcing.

3.05 CLEANING AND DEFECTIVE MATERIALS

Remove all oil, grease, dirt, scale, loose rust and other bond reducing coatings not specified herein, and replace severely rust-pitted reinforcing.

3.06 MIXING synthetic fiber reinforcement

- A. Add synthetic fiber reinforcement to concrete mixture in accordance with manufacturer's instructions.
- B. Add degradable bags of synthetic fiber reinforcement into concrete mixer after batching other concrete materials or during addition of aggregates and water.
- C. Application Rate: Add synthetic fiber reinforcement at minimum application rate of one 5-pound degradable bag per cubic yard (3.0 kg/m³) of concrete.
- D. Mix synthetic fiber reinforcement in concrete mixer for a minimum of 5 minutes at maximum mixing speed in accordance with ASTM C 94.

END OF SECTION

PART 1 GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

General and Supplementary Conditions, Division 1, and accompanying Drawings.
01 45 00 Quality Controls (Sampling and Testing)
03 11 00 Concrete Formwork
03 20 00 Concrete Reinforcing

1.02 QUALITY ASSURANCE

- A. Reference Standards: ACI 318 and OSSC Chapter 19 (2010 edition), as supplemented herein.
- B. Manufacturer's Qualifications: Manufacturer shall be regularly engaged in the manufacture and delivery of ready mixed concrete.
- C. Delivery Tickets: Delivery tickets as required by OSSC and ASTM C-94 Standard specification for Ready Mix Concrete shall be filled out completely for each concrete delivery, and tickets shall be sent to the Project Manager.

1.03 TESTING

- A. Sampling and Testing will be done in accordance with ASTM C31, and C39, by an independent testing laboratory approved by the Project Manager. Test results sent directly to the Project Manager. Contractor shall coordinate with approved testing laboratory and arrange for testing.
- B. Samples for strength tests of each class of concrete placed each day shall be taken from each load of concrete, unless otherwise directed by the project manager or engineer. Not less than three cylinders shall be taken for each sample.

If the total volume of concrete is such that the frequency of testing required by the paragraph above would result in less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used. Test 1 cylinder from each sample at 7 days and 1 cylinders at 28 days. Retain 1 cylinder for testing if the 28 day break does not meet specifications.

Note that reference standards require slump and air content tests to be made each time samples are taken for concrete strength tests.

- C. Core samples and tests may be required at Contractor's expense if required cylinder tests are not taken as specified, or if 28 day test on any one cylinder falls more than 20% below specified strength, or if average of any three cylinders is less than specified strength.
- D. If core tests fall below specified design strength, replace structural portion in question at Contractor's expense.

PART 2 PRODUCTS

2.01 GENERAL

Concrete shall be ready Mixed, complying with ASTM C94, and Reference Standards.

2.02 COMPOSITION AND STRENGTH

- A. Design Mix: Manufacturer fully responsible for mix design and performance. Fly ash content shall be as high as practical based on manufacturer's design mix requirements, weather, and specific product application. Indicate proposed content on design mix submittal prior to delivery.
- B. 28 Day Minimum Compressive Strength:
Interior: 3000 psi.

Exterior: 4000 psi

C. Maximum Slump: 5"; water added only by written permission of Project Manager. Concrete ticket to bear signature and amount of water added.

D. Maximum Aggregate Size: 3/4" unless otherwise noted or approved for special finishes.

E. Air Entrainment:

Interior: Maximum 3%

Exterior: Minimum 5%; Maximum 7%.

F. Synthetic Fiber Reinforcement: Refer to Section 03 20 00 Concrete Reinforcing

2.03 OTHER MATERIALS

A. Floor Sealer: Sealtight "CS-309", AC Horn "Clear Seal 150", or approved.

B. Bonding Agent: Larson Products "Weld-Crete", or approved.

C. Construction Joints, Expansion Joints: Section 03 11 00.

D. Membrane Under Interior Slabs on Grade: Section 31 20 00.

E. Non-Shrink Grout: Factory premixed high strength grout similar to Embeco, Por-Rok, or Speed Crete.

3.01 GENERAL

Conform to reference standards, as supplemented herein.

3.02 PREPARATION

A. General:

1. Arrange for specified testing; contact Project Manager and Engineer at least 48 hours before intended pour. Notify Project Manager and Engineer immediately if pour is called off.
2. Check forms for accuracy, rigidity, completion of embedded items and reinforcing; clean out forms and coat as specified prior to pour.

B. Bonding:

Except where bond is obtained by use of concrete bonding agent, roughen adjacent concrete to expose bonded aggregate uniformly. Clean all contact surfaces and remove laitance, coatings, loose particles and foreign matter prior to placing adjacent pour.

3.03 ENVIRONMENTAL CONDITIONS

A. Cold Weather:

Conform to recommendations of ACI-306. Protect all Concrete Work from reduced strength caused by frost, freezing, or low temperatures. Provide adequate means of maintaining temperatures of not less than 50 degrees F. when air temperature has fallen to or is expected to fall below 40 degrees F. Remove or replace frozen or frost damaged concrete at Contractor's expense.

B. Hot Weather:

Conform to recommendations of ACI-305, "Recommended Practice for Hot Weather Concrete", as supplemented herein. Cover reinforcing steel with water soaked burlap, or shade as required to maintain steel temperatures at that or below that of ambient air temperatures. Wet forms thoroughly before placing concrete.

C. Discontinue placement when, climatic conditions of sun, wind, and heat prevent proper placement and finishing, or when directed by the Project Manager.

3.04 PLACING CONCRETE

- A. Employ high frequency mechanical vibrators supplemented by hand spading as necessary to avoid honeycombing and achieve proper consolidation. Extend tip of vibrator into previous layer placed.
- B. Place Concrete in horizontal layers of uniform depth not more than 18" deep. Place as near final location as possible. Movement by vibrator not permitted. Stop pours only at joints where shown or approved. Concrete may be placed by pumping, but the use of aluminum pipe is prohibited.
- C. Avoid segregation of material due to excessive vibration, or drops in excess of 6 feet. Avoid damage to forms.
- D. Support mesh for slabs on chairs or lift completely above slab and work down approximately 1" with grid tamp.

3.05 CONSTRUCTION JOINTS

Verify locations and conformance with details; provide only where shown or approved by Engineer. Prepare as specified for proper bonding.

3.06 CONCRETE FINISHES

- A. Slab Finishes - General:
 - 1. Screed to true levels or slopes; remove surface water, laitance, and dirt; bring sufficient mortar to surface for proper finishing.
 - 2. Do not use chemical dryers or absorb wet spots with neat cement or sand and cement mixtures.
 - 3. Rough screed slabs to receive setting beds; finish other slabs monolithically without topping, unless noted otherwise.
 - 4. Wait until surfaces are sufficiently dry for finishing.
 - 5. Maximum variation in finished slab: 1/8" measured from 10 ft. straight edge, laid on slab in any direction.
- B. Interior – Trowel Finish:
 - 1. Trowel to produce smooth, hard, dense surface, free from trowel marks.
 - 2. Provide trowel finish for all interior slabs unless noted otherwise.
 - 3. Avoid surface crazing or cracking due to over floating or troweling.
- C. Exterior - Broom Finish:
 - 1. Light trowel finish, followed by light brooming at right angles to slab length.
 - 2. Mark slab with 1/2" deep score lines where score joints are indicated.
 - 3. Provide for all exterior slabs, walks and steps unless noted otherwise.

3.07 CURING

- A. General:
 - 1. Protect concrete from direct rays of sun, freezing, wash by rain, and drying for a minimum of 5 days, and until thoroughly hardened.
 - 2. Keep forms wet until removed; if removed during curing period, keep walls wet with wet burlap or water spray.
 - 3. Cover, apply heat, and/or use other approved means to prevent damage from freezing or premature drying.
- B. Slab Curing:
 - 1. Apply approved sealer in strict compliance with manufacturer's directions for application as a curing compound.
 - 2. When temperature exceeds 75 degrees F. within 5 day curing period follow one of the following procedures in addition to the above:
Maintain fine fog spray to cover entire surface being cured.
Completely cover area being cured with wet sand or burlap, and keep wet.
Dam or curb slab edges and flood with minimum 1" of water for curing period.

3.08 CLEANING AND PATCHING

- A. Immediately following removal of forms or curing membranes, inspect all concrete surfaces and patch all pour joints, voids, form tie holes, honeycombed areas and other imperfections before concrete is thoroughly dry. Patch shall match adjacent surfaces unless noted otherwise for special finishes.
- B. Remove bituminous materials, form release agents, bond breakers, or other materials employed in concreting which would otherwise prevent proper application of sealants, waterproofing, or other finishes or treatments.
- C. Remove ledges and bulges:
- D. Where Concrete is under strength, out of line, exceeds tolerances, or shows objectionable cracks, honeycombing, staining, discoloration, rock pockets, or is otherwise defective, remove and replace or repair as directed by the Project Manager at Contractor's expense.

END OF SECTION

PART 1 GENERAL

1.01 DESCRIPTION

- A. Work in this Section includes cement masonry units, reinforcing, grout, mortar, and sealer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

General and Supplementary Conditions, Division 1, and accompanying Drawings.

01 33 00 Submittals

01 45 00 Quality Controls (Sampling and Testing)

03 20 00 Concrete Reinforcing

1.03 QUALITY ASSURANCE

- A. Mason contractor is responsible for moisture content of block after delivery to job site until fully cured in completed.
- B. The Contractor shall coordinate the following required tests per the requirements of Section 01 45 00:
 1. Provide testing and inspection per OSSC. Chapter 17, Section 2105.2.2.2

1.04 STANDARDS

- A. Concrete Masonry Association TEK information series recommendations.
- B. OSSC Chapter 21

1.05 SUBMITTALS

- A. Comply with the provisions of Section 01 33 23
- B. Submit mix design to engineer for review.

PART 2 PRODUCTS

2.01 MATERIAL

- A. Cement Masonry Units
 1. Complying with ASTM C90, latest revision, Grade N, Type 1, medium weight 50/50 with a blend of aggregates that conform to ASTM C331 and ASTM C33. Dry to intermediate humidity condition per table No. 1, fm = 1,500 psi.
 2. Linear shrinkage not greater than 0.065%, not to exceed amount recommended in ASTM C426.
 3. Moisture content not to exceed 30% of total absorption.
 4. Unit types -See Drawings to verify locations and colors:

a .	Sizes	8x8x16
b .	Texture:	Smooth
c .	Colors:	Natural Gray
d .	Other:	n/a
 5. Unit configurations:
 - a. Provide all specialty unit configurations including returns, bond beams, open end, half, lintel, single sash, corner, etc., blocks as required by structural and finished exposure.
 - b. Provide textured block ends where required to match face texture.
 6. Integral water repellent admixture:
 - a. Polymeric type, Krete DriGard, Dry-Block or equal, per manufacturer's recommendations.
- B. Reinforcing steel to have minimum yield stress of 60,000 PSI.
- C. Mortar:
 1. Mortar to be type M or S per ASTM C 270, with proportion by volume per manufacturer's recommendations to reach required compressive strength of 1,800 psi @ 28 days.

2. Integral water repellent admixture:
 - a. Polymeric type, Krete DriGard, Dry-Block or equal, per manufacturer's recommendations.
- D. Grout to be per ASTM C476, with proportion by volume per manufacturer's recommendations to reach required compressive strength of 2,000 psi @ 28 days.
- E. Masonry Anchors:
 1. Epoxy Anchors: Simpson SET-XP, Hilti HY-70, DeWalt AC100+Gold (Simpson AT-XP for cold weather).
 - a. Unless noted, install threaded ASTM A193 B7 rods into clean, dry holes to embed depth as shown on drawings. Comply with manufacturer's ICBO report for hole diameter. If embed depths are not shown, use manufacturer's minimum depths. Fill hole with enough epoxy to fill all void spaces and insert rod with clockwise twisting motion.
 - b. Do not place when epoxy or concrete is less than 50 degrees F, unless cold weather products are utilized.
 2. Screw Anchors: Simpson Titen HD, DeWalt Screw-Bolt+.
- F. Flashing: Perm-A-Barrier, wall flashing by W.R. Grace.
- G. Masonry Cleaner: Prosoco, Sure Klean, Custom Masonry Cleaner.

PART 3 EXECUTION

3.01 MIXING MORTAR

- A. Use a mechanical mixer of one sack minimum capacity. Mix mortar for at least three minutes after all materials have been added. Mix only as much mortar as can be used in one hour after water has been first mixed into the batch. Do not re-temper mortar.

3.02 INSTALLATION

- A. Per IBC Chapter 2104 to 2104.7. Fully grout walls per Structural Drawings.
- B. General: Lay up all walls in running bond, plumb, level and true to the lines and dimensions shown on the Drawings. Do not use chipped or broken units.
- C. Dampening:
 1. Store all masonry units on the job site so that they are kept off the ground and protected from the rain.
 2. Wetting the units will not be permitted, except when hot and dry weather cause the units to be warm to the touch, and then only the surface may be wetted with a light fog spray.
- D. Laying Up:
 1. Place all units in mortar with full shoved bed and head joints: 1/2" - 5/8".
 2. Align all vertical cells to maintain a clear, unobstructed system of flues.
 3. Hold racking to an absolute minimum.
 4. No block shall be laid when temperatures are below 40°F. Do not build on work having a film of water or frost on its surfaces. Take precautions to protect green masonry from freezing or inclement weather.
 5. Provide sloped mortar tops on all walls exposed to weather.
 6. While laying, keep exposed faces of block free from mortar. Clean block after wall is complete.
- E. Flashing: Clean surfaces of masonry smooth and free from projections which might puncture flashing materials. Place through-wall and cavity flashing on a bed of mortar then cover with mortar.
- F. Sealant Recess: Leave joints around outside perimeter of exterior doors, window frames and other openings. Depth: Uniform 3/4" Width 1/4" to 3/8".
- G. Reinforcement: Install all reinforcement as indicated on the Drawings. Fully embed reinforcement in grout, not in mortar or mortar joints. Provide all required metal accessories to ensure accurate alignment of steel during grout filling operations. Maintain 1/4-inch clear between reinforcing bars and masonry units.
- H. Tooling: Tool all joints to a dense, smooth surface, with a **concave** profile.

3.03 GROUTING

- A. General: Perform all grouting in strict accordance with the provisions as described in Chapter 21 of the IBC.
- B. Timing: Do not grout until masonry has cured at least 24 hours.
- C. Consolidation: Consolidate all grout at time of pouring by puddling with a mechanical vibrator, filling all cells of the masonry, and then reconsolidating later by puddling before plasticity is lost.
- D. Grout walls per structural drawings.

3.04 CLEANING AND SEALING

- A. Promptly clean work as it progresses so as to minimize final cleaning. Do not leave mortar scum to dry on faces of material.
- B. Cut out any defective joints and holes in exposed masonry and repoint with mortar.
- C. Prior to sealing/finishing unglazed masonry, clean with masonry cleaner per manufacturer's printed instructions to remove all job dirt, stains and excess mortar. Remove any efflorescence in accordance with brick manufacturer's recommendations.
- D. When not scheduled to receive other finishes, provide spray-applied damp-proofing per manufacturer's printed instructions.

END OF SECTION

PART 1 GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

General and Supplementary Conditions, Division 1, and accompanying Drawings.
03 11 00 Concrete Forming
06 20 00 Finish Carpentry
07 27 00 Water Resistive Barrier.

1.02 QUALITY ASSURANCE

Evidence of Grade:

1. Framing Lumber: Each piece stamped with grade mark and trademark of Western Wood Products Association (WWPA), except that exposed lumber shall be stamped in a concealed location or supplied with a certificate of inspection with each delivery.
2. Plywood: Identify as to grade, species, panel index, and glue type by stamp of American Plywood Association (APA); stamp on back side of exposed panels.
3. Other materials: Provide certificate of compliance or other proof of compliance with these specifications if requested by Project Manager.

1.03 DELIVERY STORAGE AND PROTECTION

- A. Protect from moisture, damage and discoloration. Do not store ferrous metal or wood products in damp areas or in contact with ground.
- B. Identify wood products as to grades and store respective grades separated.

PART 2 PRODUCTS

2.01 GENERAL

- A. Lumber:
 1. Dimensions: Specified lumber dimensions are nominal unless specifically noted as "net".
 2. Surfacing: Provide all lumber surfaced four sides (s4s) to standard net dimensions unless otherwise scheduled or noted on the drawings.
 3. Moisture Content: Kiln Dried, or 19% maximum at time of closing in of structure, for 2" or less nominal thickness. Other lumber cured dry as market affords.
 4. Species: Douglas Fir, Larch unless scheduled or noted otherwise.
 5. Grade: as scheduled or noted in the Drawings for specific application.
- B. Plywood and OSB (Oriented Strand Board):
 1. All panels shall be APA grade stamped and shall meet the requirements of the latest edition of U.S. Product Standard PS-1 and/or APA PRP-108 performance standards, as applicable.
 2. Dimensions, surfacing, grade and span rating as scheduled or noted in the drawings for specific application. Where span rating is not scheduled or noted, provide panels with span rating as required by code for framing spaced 6" wider than actual conditions of installation.
 3. All panels which have any edge or surface exposed to the weather shall have APA "Exterior" exposure classification. Unless otherwise scheduled or noted all other panels shall have "Exposure 1" exposure classification.
 4. Plywood: All panels shall be Douglas Fir (APA Group 1), and shall be minimum 5 ply, regardless of the number of layers; as defined by APA.
 5. Oriented Strand Board (OSB): All panels shall have HUD/FHA materials release for the intended material use.
- C. Preservative Treatment
 1. All wood products faced with metal or in contact with earth, concrete, or masonry shall be preservative pressure treated. Wood preservative shall be ACQ or approved preservative that does not contain arsenic, chromium or other EPA classified hazardous preservatives. Treatment shall comply with AWWPA specifications and preservative retentions applicable to the intended use of the treated material.
- D. Fasteners and other Rough Hardware:
 1. Type and sizes specified, noted on Drawings, or required by code.

2. Manufactured Framing Connectors and hangers shall be ICC approved, and shall be attached only with the fastener type recommended by the manufacturer.
3. All Fasteners and other rough hardware exposed to moisture shall be type 316 stainless steel, or approved type nonferrous metal.
4. Fasteners shall meet the following standards:
 - Bolts: Fed Spec. FF-B-575. - ASTM A307
 - Nuts: Fed Spec. FF-N-836. - ASTM A307
 - Expansion Shields: Fed Spec. FF-S-325.
 - Lag Screws and Lag Bolts: Fed. Spec. FF-B-561.
 - Toggle Bolts: Fed. Spec. FF-B-588.
 - Wood Screws: Fed. Spec. FF-S-111.
 - Nails and Staples: Fed. Spec. FF-N-105B
5. Provide washers under all Nuts and under heads of bolts and lags; bevel type where on sloped bearing.

E. Other Materials:

1. Provide, all materials required to properly complete carpentry Work which are not specifically required to be provided by Others, or by trades under other Sections of these Specifications.
2. All materials shall be: new, in conformance with reference standards, suitable for the intended use, and subject to the approval of the Project Manager.

2.02 MATERIALS SCHEDULE

- A. Concealed Horizontal Wood Framing: 2"to 4" thick, 2"to 4" wide: No. 2 and better. 2"to 4" thick, 6"and wider: No. 2 and better.
- B. Exposed Structural Wood Framing: Select Structural
- C. Other Structural Wood Framing: No. 1 and better
- D. Plywood Roof Sheathing:
APA CD-INT, with exterior glue, except APA AC-EXT at exposed soffits. Panels 5/8" thickness with 40/20 span rating unless noted otherwise.
Option: With the exception of exposed eave areas roof sheathing may be 19/32" or 5/8" thick OSB type APA Rated Sheathing grade with 40/20 span rating, Exposure 1 durability classification.
- E. Framing Connectors and Hangers:
Simpson, Silvers, K/C Metals, or approved; type recommended by manufacturer for condition of use. Type referenced in ES reports, and recognized by OSSC, whether originated by ICBO, ICC, BOCA or other recognized code agency. Obtain Engineer's approval prior to substitution for items specifically described by Manufacturer and Model No. in the Drawings.

PART 3 EXECUTION

3.01 GENERAL

- A. Preparation:
Verify suitability of construction and surfaces to receive Work of this Section. Verify field measurements prior to fabrication. Notify General Contractor of unsuitable conditions, and variations from Drawing dimensions. Notify Engineer of significant variations from Drawing dimensions. Do not proceed with Work until all conditions are satisfactory.
- B. Workmanship:
 1. Accurately locate, lay out, cut, fit, and install rough carpentry items and framing items furnished under other sections.
 2. Provide for installation and support of Work furnished by other trades, including backing, blocking, clearances etc.
 3. Install Work to true lines, plumb and level unless shown otherwise.
 4. Set Horizontal or sloping members with crown up.

- C. Selection of Lumber Pieces:
1. Carefully select individual pieces so that knots and obvious defects will not interfere with placing bolts, proper nailing or making proper connections.
 2. Cut out and discard all defects which will render a piece unsuitable for its intended function. Lumber may be rejected by the Project Manager, whether or not installed, for excessive warp, twist, bow, crook, mildew, fungus, stain, or mold as well as for improper cutting and fitting.
- D. Shimming:
Do not shim sills, studs, joists, headers, beams, or other framing components, without specific approval of the Engineer
- E. Notching and Boring:
1. Do not notch, bore, or cut members except as noted in the Drawings or approved in advance by the Engineer.
 2. Studs: Maximum notch = 20% of stud width; Maximum bored hole = 33% of stud width with minimum 3/4" between edge of hole and stud edge.
 3. Joists: Do not notch joists without specific approval of Engineer. Maximum bored hole = 15% of joist depth in center 1/3 of span and with hole bored at centerline of joist depth.
- F. Bearings:
1. Make all bearings full unless shown otherwise.
 2. Finish all bearing surfaces on which structural members are to rest to ensure even support. Where Lumber members slope, cut or notch ends as required to give uniform bearing.
- G. Alignment:
1. On all framing members to receive a finish material, align the finish subsurface to vary not more than 1/8" from plane of surfaces of adjacent framing members or $l/180 \times$ distance between the members, whichever is less.
 2. Alignment along length of any framing member shall remain within 1/8" of true line or 1/240 of any portion, whichever is less.

3.02 PRESERVATIVE TREATED LUMBER

- A. Pressure treated Lumber:
Use only preservative pressure treated lumber for all applications in contact with earth, masonry, or concrete, whether or not separated by moisture barrier.

Wood preservative shall be ACQ or approved preservative that does not contain arsenic, chromium or other EPA classified hazardous preservatives. Treatment shall comply with AWPA specifications and preservative retentions applicable to the intended use of the treated material.

- B. Brush coat or dip with ACQ or approved preservative that does not contain EPA classified hazardous preservatives.
1. Cut surfaces of pressure treated materials.
 2. All faces of wood faced with metal.
 3. Ends of members bearing on plates required to be pressure treated; minimum 6" from bearing end.

3.03 SILL SEALER (Capillary break)

Apply fiberglass sill sealer under sill plates of all exterior walls in contact with concrete or masonry. Apply continuous bead of specified construction mastic, or approved caulking under all plates, rim joists and perimeter blocking of all exterior walls and all party walls which are not in contact with masonry or concrete. Refer to sections and details in the drawings for sealant locations.

3.04 FASTENING

- A. General:
1. Provide necessary nails, spikes, screws, and bolts for proper installation of carpentry work; sizes and quantities required by building code and approved by the Engineer.
 2. Use only hot dipped galvanized or approved non-ferrous type hardware in locations exposed to exterior or extremes of humidity.
 3. Do all fastening without splitting wood, preboring as required; replace all split members.
 4. Use washers under all nuts and under heads of bolts, and lag screws which bear on wood; beveled type for even bearing on sloped surfaces.

- B Bolting:
 - 1. Drill holes 1/16" larger than nominal bolt diameter.
 - 2. Bolt threads shall not bear on wood.
- C Lag Screws and Wood Screws:
 - 1. Prebore holes same diameter as root of thread; enlarge holes to shank diameter for length of shank.
 - 2. Screw, do not drive to install.
- D Framing Connectors:
 - 1. Secure with nails, screws or bolts recommended by manufacturer.
 - 2. Nail and/or bolt all spaces provided in the specified connector or hanger.
- E Nailing:
 - 1. Drive nails perpendicular in lieu of toe nailing where feasible.
 - 2. Spot galvanized nail heads with zinc rich paint if finish abraded.
 - 3. Conform to OSSSC for nailing requirements not specified herein or noted on the Drawings. Nailing requirements scheduled in the Drawings shall take precedence in the event they exceed those specified herein.

3.05 WALL FRAMING

- A. Plates and Sills
 - 1. Nominal 2 x width shown unless noted otherwise.
 - 2. Single plates at floors and bottoms of openings, top plates doubled.
 - 3. Unless detailed otherwise, provide double 2 x header on edge of minimum nominal depth in inches equal to 1-1/2 times opening width in feet.
 - 4. Stagger ends of double plates 4'-0"; splice plates abutting at corners.
 - 5. Anchor to masonry or concrete with 1/2" x 10"- "J"bolts at 48"oc unless noted otherwise.
 - 6. Anchor bolts within 12" of each end of each piece; minimum 2 bolts per piece.
- B. Studs and Furring:
 - 1. Nominal 2x4 spaced 16" oc unless noted otherwise.
 - 2. Double studs at openings, triple studs at corners and intersections.
 - 3. Double trimmer studs at openings 6 feet and wider.
 - 4. Provide backing for anchoring all edges of finish materials.
 - 5. Anchor to abutting masonry with 3/8" anchor bolts top, bottom and 36"oc.
- C. Blocking:
 - 1. Install 2" nominal blocking as detailed and as required for installation of finishes, cabinets, equipment, mirrors, specialties and other items.
 - 2. Provide firestopping as required by OSSC Chapter 7.
 - 3. Solid block joists and rafters at each bearing, and not over 48"oc in doubled joists that are spaced under walls to clear piping.
 - 4. 2x12 flat block for traverse rods at all windows and doors.
 - 5. 2X6 or wider flat block at wall mounted door stops, towel bars, grab bars, etc.
- D. Sheathing Paper:
 - See Section 07 27 00 Water Resistive Barrier.

3.06 PLYWOOD SHEATHING

- A. Sheathing
 - 1. Lay with face grain perpendicular to supports, unless noted otherwise.
 - 2. Joints centered over supports; staggered; spaced 1/16".

END OF SECTION

PART 1 GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

General and Supplementary Conditions, Division 1, and accompanying Drawings.
 06 10 00 Rough Carpentry – blocking and support
 09 90 00 Painting

1.02 QUALITY ASSURANCE

Reference Standards:

Conform to the requirements of Architectural Woodwork Standards (AWS) Publication "Architectural Woodwork Standards" 1st edition, 2009, published jointly by the Architectural Woodwork Institute, AWMAC, and Woodwork Institute, as the Engineer judges it applicable and as supplemented herein.

1.03 SUBMITTALS

- A. Shop Drawings: Submit in accordance with Section 01 33 23, for all Work except standard dimension standing and running trim, and lumber. Identify each item as to location, grade, specie, and finish type.
- B. Samples: Submit approved manufacturer's full line of colors, patterns and textures for color selection and approval of all factory prefinished Products used in finish carpentry.

1.04 DELIVERY STORAGE AND PROTECTION

Protect from moisture, damage and discoloration. Do not deliver to job site until notified by General Contractor that project is conditioned and prepared to handle and store Products without damage. Maintain 50 degree F. minimum in interior spaces where Finish Carpentry Materials are located.

PART 2 PRODUCTS

2.01 GENERAL

- A. Conform to AWS "Custom" grade requirements unless noted otherwise.
- B. Provide all necessary rough and finish hardware items, including screws, anchors, brackets, etc. required for completion of the Work, but not specifically required to be furnished under other Sections.

2.02 TRIM

- A. Definition: Frames, casings, surrounds, fascia, and other millwork not specified elsewhere.
- B. Maximum moisture content at time of surfacing: 15% exterior, 10% interior.
- C. Minimum lengths:
 - Opening trim - 1 piece, single length
 - Standing trim - Joints no less than full story height apart.
 - Running Trim - Joints no closer than 12 feet apart.
- C. Interior:
 - Species: Douglas Fir
 - Grain: Vertical
 - Surface Texture: Smooth
- D. Exterior:
 - 1. Building trim
 - James Hardie Building Products "HardiTrim" HZ10 or approved 5/4" cement board trim. Surface Texture: James Hardie "Cedarmill" or approved woodgrain texture.

PART 3 EXECUTION

3.01 GENERAL

- A. Preparation:
 - 1. Inspection: Verify that surfaces to receive Finish Carpentry are straight, plumb, true, solid, rigid, properly prepared, and completed to the point that Work of this Section may properly commence and be completed in accordance with the original design.
 - 2. Field Measurements: Prior to fabrication, verify field dimensions as required for accurate fit. Notify Engineer of significant variations from plan dimensions.
 - 3. Discrepancies: Do not proceed until all discrepancies have been resolved, and all conditions are satisfactory.
- B. Workmanship: Conform to AWI "Custom" grade requirements unless noted otherwise.
- C. Finishing:
 - 1. Sand all finished wood surfaces as required to produce uniformly smooth surface, except do not sand wood scheduled to be rough or textured.
 - 2. Use proper size nails or screws to hold members without splitting wood; set for puttying unless noted otherwise; galvanized for exterior applications.
 - 3. Coarse or cross grain sandpaper marks, hammer marks, scratches, stains or other imperfections will not be accepted.
- D. Installation Of Items Furnished Under Other Sections:
 - 1. Install in accurate locations shown on the Drawings, in accordance with approved shop drawings.
 - 2. Install plumb and level; moving parts without rattle, drag, or binding.

3.02 TRIM INSTALLATION

Accurately miter exterior corners, cope interior corners, miter or scarf end to end joints and scribe to abutting surfaces; Joints located only over solid support. Kerf backs of flat grained members over 5" wide or 1" thickness.

3.03 DOOR INSTALLATION

- A. Door clearances
 - 1. The clearance between the door and frame head and jambs shall be 1/8" (3.2 mm) in the case of both single swing and pairs of doors.
 - 2. The clearance between the face of the door and door stop shall be 1/16" (1.6 mm) to 1/8" (3.2 mm).
 - 3. All clearances shall be, unless otherwise specified, subject to a tolerance of $\pm 1/32$ " (0.8 mm).

3.04 FINISH HARDWARE AND SPECIALTIES INSTALLATION

- A. Install in accordance with manufacturer's recommendations.
- B. Remove hardware, with the exception of prime coated items, tag, box, and reinstall after finish painting work is completed.

END OF SECTION

PART 1 GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

General and Supplementary Conditions, Division 1, and accompanying Drawings.

1.02 QUALITY ASSURANCE

- A Warranty: Refer to Supplementary Conditions

1.03 SUBMITTALS

- A. Shop Drawings & Product Data:

1. Submit in accordance with Section 01 33 23, showing manufacturer, R-values, vapor barriers, colors, installation recommendations, and other pertinent data, for each type or insulation specified.
2. After installation submit record indicating number of bags and/or total weight of blown insulation actually installed in each separate attic space. Provide documentation indicating that weights and depths equal or exceed minimums listed by manufacturer for specified R-values.

1.04 DELIVERY STORAGE AND PROTECTION

Deliver and store materials protected from moisture or damage, in original containers bearing identification of manufacturer, R-Values, UL ratings, and type of material. Maintain seals intact until time of use.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Spray foam Insulation:

1. Type: Low pressure, low VOC, closed cell polyurethane spray foam insulation.
2. Manufacturer: Certanteed Corp., or approved.

PART 3 EXECUTION

3.01 GENERAL

- A. Conform to Reference Standards, including Manufacturer's recommendations.
- B. Rafter spaces to be contained in a complete and continuous envelope of insulation.

END OF SECTION

PART 1 GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

General and Supplementary Conditions, Division 1, and accompanying Drawings.

07 20 00 Insulation other than rigid type specified in this section.

07 41 13 Metal Roof Panels

07 90 00 Joint Protection - Caulking and Sealants

1.02 QUALITY ASSURANCE

- A. Reference Standards:
Conform to recommendations of "Architectural Sheet Metal Manual" of the Sheet Metal and Air Conditioning Contractors National Association, Inc., (SMACNA) as modified herein and on the Drawings.
- B. Installer's Qualifications: Minimum of 4 years experience installing the subject Products.
- C. Warranty: Contractor's Warranty: Refer to Supplementary Conditions.

1.03 DELIVERY STORAGE AND PROTECTION

Deliver and store materials protected from damage and discoloration.

Nonferrous and Stainless Steel sheet metal Products which are not scheduled to be painted and which are to be visible upon completion of the Work, shall be delivered with a continuous adhesive applied protective plastic or paper film, which shall be left in place until ready for final cleaning and finishing. Regardless of sequence or methods of fabrication, it shall be the responsibility of the installing subcontractor to coordinate and maintain protection of sheet metal surfaces until Final Completion, maintaining them free from damage, stain or discoloration.

PART 2 PRODUCTS

2.01 SHEET METAL

- A. Gages: Sheet metal gages specified are minimums; provide heavier gages where required to maintain shape and alignment without waves and buckles.
- B. Galvanized Steel:
 - 1. Zinc-Coated Steel: Commercial quality with 0.20 percent copper, ASTM A526, except ASTM A527 for lock-forming, G90 hot-dip galvanized.
 - 2. Gage: 26 gage minimum, unless noted otherwise.
 - 3. Primer: Alkyd type Zinc Chromate Primer; Rodda, Sherwin Williams, or approved.
 - 4. Locations: All sheet metal work unless noted otherwise.
- C. Baked Enamel Prefinished Galvanized Steel:
 - 1. Prefinished Zinc-Coated Steel: Hot-dip galvanized steel, commercial quality A1 S1 G90 extra smooth, primed on both sides and finished on 1 side with 70 percent KYNAR 500 ® based fluorocarbon coating of minimum 0.70 mils (1.8 mm) total dry film thickness. Minimum 10 year warranty against visible fade, blister, or rust.
 - 2. Strippable coating: Shop-applied liquid to front side of pre-finished metal to protect finish during fabrication, shipment, and field handling.
 - 3. Locations: As required for exposed flashing in connection with prefinished metal roofing.

2.02 OTHER MATERIALS

- A. Nails, Rivets and fasteners:
 - 1. Connecting Ferrous Metals: Use only stainless steel screws and washers.
 - 2. Connecting Copper and High Copper Alloy Metals: Use only copper or copper clad stainless steel fasteners, nails, rivets, screws and washers, except that unclad stainless steel fasteners may be used if not visible upon completion.
 - 3. Connecting Aluminum and Aluminum Alloys: Use only aluminum or stainless steel fasteners, nails rivets, screws, and washers.

B Sealant: Silicone Type; Dow, GE, or approved.

PART 3 EXECUTION

3.01 PREPARATION

A. Inspection:

1. Prior to starting Work of this Section, carefully inspect the installed Work of other trades and verify that they are complete and acceptable for proper installation of approved roofing products.
2. Field verify shapes and dimensions of surfaces to be covered prior to fabrication.
3. Coordinate with roofing and others trades affecting sheet metal Work.
4. Discrepancies:
5. Do not proceed until all unsatisfactory conditions have been corrected.
6. Proceeding with installation implies acceptance by the installing Subcontractor of all subsurfaces and other conditions affecting this Work.

3.02 INSTALLATION

A General

1. Provide all sheet metal Work shown and as required for weather tight job.
2. Form materials accurately to shapes indicated, with lines and angles in true alignment, without waves, buckles, or tool marks using the best standards of modern sheet metal practice, and in conformance with Reference Standards.
3. Make work weather tight.
4. Conceal fastenings, do not drive nails tight enough to warp metal.
5. Make proper allowance for expansion and contraction.
6. Reinforce corners as required for stiffness.
7. Unless noted otherwise, Hem exposed edges, and angle bottom edges of exposed vertical surfaces to form drip.
8. Protect contacting dissimilar metals from corrosion with approved asphaltic coating compound applied to each face, or hold separation with approved type glazing tape continuous between faces.

B Painting:

1. Shop prime all sheet metal except copper, stainless steel, and factory finished materials, with specified primer.
2. Touch-up damage to prime coat after installation.

C Copings, and Caps:

1. Hem bottom edges; corners shop formed and soldered, except materials not scheduled to be painted which are located where discoloration would be visible, shall be hem or flat seamed in accordance with SMACNA Manual, and made water tight with sealant bead concealed under seam tabs.
2. Fabricate for tight fit; exterior (visible) edges locked over continuous cleat.
3. Unless detailed otherwise use cover plate type seams; space abutting sheets 1/4", set in sealant over 12" wide back-up plate and cover with 4" wide cover plate, set in sealant.

D Drip Edge Flashing: 28 gage; nominal 1-1/2" x 3" with 1/4" hemmed drip edge, unless detailed otherwise. Provide along all bottom edges (eaves), over roofing felts, per recommendations of NRCA Steep Roofing Manual.

E Rake Edge Flashing: 28 gage; Provide along all rake edges, over roofing felts, per recommendations of NRCA Steep Roofing Manual.

F Rain Leaders:(down spouts)

1. Telescope joints 1-1/2" in direction of flow and make watertight.
2. Install clear of wall on hangers compatible with rain leader but 2 gauges heavier, spaced at top, bottom, and not over 6 ft. oc. in between.
3. Provide mitered down spout elbows where required.

G Gutters:

1. Form to profiles indicated, with slope to outlets.
2. Secure to adjacent construction with appropriate fastener type as indicated in SMACNA manual

END OF SECTION

PART 1 GENERAL

1.01 DESCRIPTION

A. Work in this section includes furnishing and installation, preformed Steel standing seam roofing on all sloped portions of buildings and metal accessories and trim necessary for a water-tight building.

1.02 RELATEDWORK

A. Installation of Flashing and Sheet Metal - Section 07 60 00

1.03 AUTHORIZATION OF INSTALLER

A. The installer of the system shall be factory trained and authorized by the manufacturer to install the products specified herein. Evidence of manufacturer's certification for this project will be required.

1.04 SUBMITTALS

A. Description Data: Submit manufacturer's descriptive data on materials to be provided. Data shall be sufficient to indicate conformance to all specified requirements including finish.

B. Installation Instructions and Diagrams: Submit manufacturer's instructions and diagrams required to install complete system.

C. Shop drawings as necessary to supplement the instructions and diagrams. Drawings shall be thorough and show all typical and special conditions including flashings, materials and thickness, all dimensions, all anchoring methods, sealant locations, fastener, layout sizes, and spacing, and provisions for thermal movement. Shop drawings shall be reviewed by the manufacturer's technical engineering department before submittal to the Owner.

D. Calculations by a Professional Structural Engineer registered in the State of Oregon verifying that system supplied meets the design loads indicated. Coordinate calculations with manufacturer's test results.

E. Manufacturer's Certificates of Conformance or Compliance: Submit certificates for all materials to be provided under this section.

F. Laboratory Test Reports: Test reports on previously tested material is of the same type, quality, manufacturer and make as that proposed for this project.

G. Samples: One sample of each of the following:

1. 2 foot long section of typical panel in color specified.
2. Any Special Flashing designed specifically for this project.

1.05 WARRANTY

A. The Contractor shall warrant for two years from substantial completion that the standing seam roofing is free from defective materials and workmanship. While roofing is under warranty, repairs shall be performed by the Contractor within 7 days after notification, unless additional time is approved by the Project Manager. Failure to perform repairs within the specified period of time will constitute grounds for having the repairs performed by others and the cost billed to the Contractor.

B. Manufacturer's standard warranty for 30 years, following delivery date, that under normal usage, panels will not rupture, fail structurally or perforate due to corrosion.

C. Manufacturer's standard paint warranty for 30 years (non-prorated) that:

1. Paint will not peel, check, chip, crack (except for such crazing or slight cracking as may occur on tightly roll formed edges or brake bends at the time of forming pre-painted sheet and which is accepted as standards).

2. Chalk in excess of a numerical rating of eight (8) when measured in accordance with the standard procedures specified in ASTM D659-80; or
3. Fade or change in color in excess of five (5) E units (NBS), calculated in accordance with ASTM D2244-85, paragraph 6.3. Color change shall be measured on an exposed painted surface that has been cleaned of surface soils and chalk, and the corresponding values measured on the original or unexposed painted surface. It is understood that fading of color changes may not be uniform if the surfaces are not equally exposed to the sun and elements.

1.06 DELIVERY HANDLING AND STORAGE

- A. Deliver, store and handle preformed panels and other manufactured items so that they will not be damaged or deformed.
- B. Delivery: provide adequate packaging for materials which will protect them during shipment. Crated materials shall not be uncrated until ready to use, except for inspection. Immediately upon arrival of the materials at the job site, the Contractor shall inspect materials for damage, dampness, and staining. Damaged or permanently stained materials that cannot be restored to like-new condition shall be replaced with satisfactory material. If materials are wet, remove the moisture and restack and protect the panels until used.
- C. Handling: Handle material carefully to avoid damage to surface, edges and ends.
- D. Storage: Stack materials stored on the site on platforms or pallets and cover with tarpaulins or other suitable weather tight covering which prevents water trapping or condensation. Store panels so that water which might have accumulated during transit or storage will drain off. Do not store the panels in contact with materials that might cause staining, such as mud, lime, cement, fresh concrete or chemicals. Protect stored panels from wind damage.

1.07 SYSTEM REQUIREMENTS

- A. Panels shall be continuous lengths with no joints or seams, except where indicated. Individual panels shall be removable for replacement of damaged material.
- B. There shall be no exposed or penetrating fasteners except where needed for trim flashings.
- C. Roof panel standing seams shall have continuous bead of flexible sealant applied between seams when roof pitch is 2/12 or less.

1.08 PERFORMANCE REQUIREMENTS

- A. Wind uplift - resistance to wind uplift from winds 97 mph, exposure B.
- B. Panels shall have a minimum snow load of 25 psf.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURER

- A. Bruce and Dana, Inc.; 2204 Simpson Street SE; Salem, OR 97301;
(503) 364-5274; (800) 653-5144 FAX (503) 371-7688; E-MAIL snaploc1@aol.com
or Bruce & Dana, Inc. 1799 Sage Rd; Medford, OR 97501;
(541) 776-5206; FAX (541) 776-2738 E-MAIL sanp1oc2@aol.com or approved equal.

2.02 GENERAL

- A. Single Source: Roof and flashings and other accessories shall be the product of a single manufacturer.

1. Pre-coated Galvanized Steel: ASTM A653- (A446)C, 40,000 pounds per square inch minimum yield strength. 24 gauge(ASG). G90 Galvanized coated.

2. Finish:

- a. Exterior: (1) Poly-vinylidene Fluoride (PVF2) 70% Kynar 500, Hylar 5000 Resin coating 0.2 mil corrosion resistant primer. 0.8 mil PVF2 = 1.0 Dry film thickness.

3. Panel Lengths: Panels are to be full length, from peak to eave on roof.

B. Non - insulated Roof Panels

1. Panels: Roll formed, 1 inch vertical standing seam "Snap - Lock", vertical ribs at 12" o.c. complete with performed corners, fasteners and accessories. Inside rib must be min. 7/8 inch.

2.03 OTHER ACCESSORIES

- A. Accessories: Sheet metal flashings, trim, closure strips, caps and other similar sheet metal accessories used in conjunction with preformed metal panels shall be of the same material and finish as used for the panels.
- B. Concealed Fasteners: Ultra Z low profile pancake head. Electro Zinc -Carbon Steel fasteners. #12 14 x 1 self-drilling for metal applications. #12 11 x 1 bugle screw for wood applications. Atlas Bolt and Screw Co. or approved equal.
- C. Exposed Fasteners: Electro Zinc - Carbon Steel. Painted Hex head with neoprene washer. #12 x 2 self driller for metal applications. #12 x 2 woodfast for wood applications. Atlas Bolt and Screw Co. or approved equal.
- D. Sealant: Kraton G block copolymer based elastomeric sealant, conforming to ASTM G-53-77. Adhesion Minimum 40 PLI on steel. Tensile and elongation conforming to ASTM D-2370. Flexoseal or approved equal.
- E. Underlayment: 30 lb ASTM Felt or Triply.

PART 3- EXECUTION

3.01 INSPECTION

- A. Inspect surface to receive standing seam metal roofing and flashing. Substrate shall be plumb and true, clean, even, smooth and as dry as possible and free from defects and projections which might affect the installation. Report unsuitable conditions to Contracting Officer.

3.02 INSTALLATION

A. Underlayment:

1. Install 30 lb Felt horizontal to eave with 2" overlap.
2. Install Rosin Slip Sheet vertically with 3" side lap.
3. Alternative: Install Triply vertically with a 4" side lap.

B. Roof Panels:

1. Apply panel with the standing seam parallel to the slope of the roof. Provide panels in full lengths, with no transverse joints except at the junction or ventilators, curbs, and similar openings. Install flashing to assure positive water drainage away from penetrations. Flash and seal at the ridge, at eaves and rakes.
2. Minimum 1" fastener 2 at Eave, 14" on center after that.

- C. Flashing: All flashing and related accessories in connection with the preformed metal panels shall be provided as indicated and as necessary to provide a weather tight installation. Details of installations which are not indicated shall be in accordance with NRCA Construction Details, SMACNA Architectural Sheet Metal Manual 5th ed., AA Specifications for Sheet Metal Work, panel manufacturer's printed instructions and details of the approved shop drawings. Installation shall allow for expansion and contraction of flashing.

- D. Flashing Fasteners: Fastener spacing shall be in accordance with the panel manufacturer's recommendations and as necessary to withstand the design loads indicated. Install fasteners in roof valleys as recommended by the manufacturer of the panels. Drive exposed penetrating type washers properly and drive so as not to damage factory applied coating. Exercise extreme care in drilling pilot holes for fastenings to keep drills perpendicular and centered. After drilling, remove metal filings and burrs from holes prior to installing fasteners. Fasteners shall not exceed that recommended by the manufacturer. Remove panels deformed or otherwise damaged by over-torqued fastenings, and provide new panels.

END OF SECTION

PART 1 GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

General and Supplementary Conditions, Division 1, and accompanying Drawings.
 06 10 00 Rough Carpentry - Construction Mastic
 06 20 00 Finish Carpentry - Sealants for plastic laminate counter tops.
 07 60 00 Flashing and Sheet Metal

1.02 QUALITY ASSURANCE

Warranty: Refer to Supplementary Conditions.

1.03 DELIVERY STORAGE AND PROTECTION

Deliver and store materials protected from damage, in original tightly sealed containers bearing identification of manufacturer, and type of material. Maintain seals intact until time of use.

PART 2 PRODUCTS

2.01 SEALANTS

- A. General:
 1. Unless noted otherwise all sealants shall be approximate color of adjacent surfaces.
 2. Sealant materials shall be type recommended by manufacturer for use in application for which sealant is proposed.
- B. Acrylic Latex Sealant:
 DAP[®] ALEX PLUS[®], 3M "Weatherban" acrylic sealant 606-NF, or approved paintable acrylic latex based sealant.
- C. Polyurethane Sealants:
 Sikaflex-1a, or approved, one part, gun grade sealant meeting Federal Specification TT-S-00230C type II class A, Conforming to ASTM C920 type S Grade NS class 25.
- D. Silicone, Polysulfide Sealants:
 Dow Corning[®] 790 SILICONE or approved, one part, gun grade sealant complying with ASTM C920 Elastomeric Joint Sealants.

2.02 ACCESSORY PRODUCTS

- A. Primer and Surface Conditioner: Products recommended by Manufacturer of sealant to be applied.
- B. Backer Rod: Closed cell, polyethylene gasketing rod, by same manufacturer as sealant with which to be used; and with diameter 1/4 greater than width of joint in which to be installed.
- C. Rope Yarn: Raveled strands of non-staining fiber or cotton wicking.

PART 3 EXECUTION

3.01 PREPARATION

- A. Inspection:
 Examine all surfaces upon which this Work is to be applied and notify General Contractor of all conditions detrimental to proper installation. Do not proceed until all unsatisfactory conditions have been corrected. Proceeding with installation implies acceptance by the installing Subcontractor of all subsurfaces and other conditions affecting this Work.

- B. Surface Preparation:

1. Allow concrete to dry at least 4 weeks before caulking or sealing.
2. Remove all dust and dirt and make sure that joints are dry and free of any bond reducing matter before proceeding.
3. Prime unpainted surfaces as recommended by Manufacturer of sealant.

3.02 BACKING INSTALLATION:

- A. Joints to receive acrylic latex sealant:
If joint is deeper than 3/4" and no suitable backstop is provided, pack with rope yarn to within 1/2" of surface before applying sealant.
- B. Joints to receive other sealant types:
Install Backer Rod behind sealant in accordance with Manufacturer's directions.
Stretch taut and force into joint to uniform depth, approximately 1/2 joint width, but not to exceed 1/2".
Replace any punctured backer rod with undamaged material.

3.03 SEALANT SELECTION

- A. Read Manufacturer's recommendations, and verify that sealant is intended for use with materials and conditions of application to be encountered.
- B. Sealants:
 1. Use specified Polyurethane Sealant, or Silicone Sealant for general sealing applications, unless specifically noted otherwise.
 2. Acrylic Latex Sealant may be used for joints in wood frame construction, and in all interior applications to be painted, unless noted otherwise.
 3. Joint sealing in interior areas subject to high moisture or humidity, such as bathrooms, showers, etc. shall be done with silicone sealant.
 4. Sealant types called for in the Drawings shall take precedence.

3.04 APPLICATION OF SEALANT

- A. Install in strict accordance with Manufacturer's current recommendations, taking care to produce beads of proper width and depth. Seal joints using gun type dispenser, before applying final coat of paint. Install flush with adjacent surfaces, tool smooth and remove all surplus sealant immediately.
- B. In addition to sealant locations specified elsewhere or noted in the Drawings:
 1. Caulked or glue soleplate to subfloor, and caulk rim joist between stories.
 2. Set window and door nailing flanges and thresholds in sealant bead, and seal perimeters after siding installation.
 3. Seal all holes in building envelope (i.e. exterior ceilings, walls, and floors), including all electrical, plumbing, and HVAC penetrations.
 4. Seal outlets, switch boxes, and recessed fixtures on exterior walls with approved sealant or have foam face gaskets installed.
 5. Seal recessed fixtures to the ceiling sheetrock.

END OF SECTION

PART 1 GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

General and Supplementary Conditions, Division 1, and accompanying Drawings.

06 10 00 Rough Carpentry – Blocking for stops.

06 20 00 Finish Carpentry - Installation

1.02 SCOPE OF WORK

A General: This Section Includes standard steel doors and door frames.

1.03 QUALITY ASSURANCE

A. Reference Standards:

Conform to ANSI A250.8 - 2003 **SDI-100** "Recommended Specifications for Standard Steel Doors and Frames published by Steel Door Institute, as the Project Manager judges it applicable and as modified herein.

B. Regulatory Requirements: Fire rated steel frames shall be of the types tested and approved by a testing agency that is acceptable to regulatory agency having jurisdiction. Fire rated steel frames shall bear labels of testing agency.

Provide Underwriters (UL) label on doors and frames for class indicated on door schedule.

1.04 SUBMITTALS

Shop Drawings: Submit in accordance with Section 01 33 23 showing manufacturer's standard details of stock items and detailed shop drawings of variations from standards. Show anchors, rough openings, cut-outs, joints, welds, profiles, reinforcing, core, label compliance, etc., for every door and frame required.

Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress schedule to avoid construction delays.

1.05 DELIVERY STORAGE AND PROTECTION

Protect from moisture, damage and discoloration; store upright in dry area off of the ground, with bottom ends of frames braced against displacement.

PART 2 PRODUCTS

2.01 GENERAL

All products shall Conform to Reference Standards and Regulatory Requirements.

2.02 DOORS

A. HM on schedule

1. Exterior Doors: SDI Level 2 _ Performance level B - Heavy Duty, Model 2 - seamless composite, 18 ga. min., 1-3/4" thick; flush sealed end closure treatment required at top of doors.

2.03 FRAMES

A. **HM on schedule:**

1. Type: Welded unit type; 16 ga. exterior; 16 ga. interior. Profiles as detailed in the drawings. No seams or penetrations visible at joints.
2. Anchors: Special types where indicated, standard elsewhere; minimum 4 per jamb including floor clip. for doors up to 7'-6" high; add 1 anchor per 24" or fraction thereof over 7'-6" high. Stud anchors weld to frame type; friction fit or twist in type not approved.
3. Casings: Refer to drawings. Casings not applicable

2.04 PREPARATION

- A. Hardware:
 - 1. Provide cut-outs and reinforcing for all hardware indicated.
 - 2. Do all drilling and tapping for hardware at factory.
 - 3. Reinforce all doors for closers.
- B. Shop Finish:
 - 1. Dress surface irregularities to smooth surface.
 - 2. Electrolytically zinc coated, chemically treat and cleaned and bonderized by steam chemical process.
 - 3. Prime with rust inhibitive primer.
 - 4. Where scheduled: Frames and doors electrolytically zinc coated to smooth finish prior to dressing and cleaning.

2.05 FINISH

- A. All doors, frames and frame components shall be cleaned, phosphatized and finished as standard with one coat of baked-on rust inhibiting prime paint in accordance with the ANSI A224.1 "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames".

2.05 OPENINGS:

- A. General: Make provisions for openings where indicated, as detailed, and in accordance with Reference Standards.
- B. Glazing Beads shall be rectangular in profile and be held in place with oval head countersunk screws.

PART 3 EXECUTION

3.01 Reference Standards

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions for installation.
- B. Conform to Reference Standards, Regulatory Requirements, and to door installation requirements specified in Section 06200.
- C. Doors and frames shall be installed in accordance with "Door and Hardware Institute" publication, "Installation Guide for Doors and Hardware" and manufacturer's recommendations.

3.02 Examination

- A. Field verify dimensions prior to fabrication.
- B. Verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.
 - 1. Verify rough openings sizes and wall thickness are acceptable.
 - 2. Verify finish hardware requirements for each opening; verify frame reinforcement, preparation and anchorage. Verify requirements and coordinate with door and hardware supplier.

3.03 Installation

- A. Steel Door Frames:
 - 1. Install frames plumb and square, per shop drawings and manufacturers printed instructions. Verify opening and dimensions with the shop drawings. Use door as a template to insure proper alignment and clearances.
 - 2. Install frames as indicated on drawings.
 - a. Comply with manufacturer's recommendations for fasteners every 11" (279 mm) minimum.
 - 3. Secure frame to wall with appropriate type fasteners. Install casings on slip-on type frames.
 - a. Anchor slip-on type frames with one drywall-type screw adjacent to each casing clip.
 - b. Use pre-fit template door or actual door in opening to ensure proper alignment and clearances.
 - 4. Align parts with proper clearances to ensure proper fit, tight miters and performance

requirements.

5. Adjust strike plate to hold door tight to stops when closed.

B Final Inspection:

1. Inspect each opening for operation, hardware, appearance and installation. Make required adjustments.

3.04 Cleaning

A Cleaning: Remove temporary coverings and protection of adjacent work areas.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Overhead coiling service doors.

1.2 RELATED SECTIONS

- A. Section 09 09 00 - Painting: Field applied finish.

1.3 REFERENCES

- A. ANSI/DASMA 108 - American National Standards Institute Standard Method For Testing Sectional Garage Doors And Rolling Doors: Determination Of Structural Performance Under Uniform Static Air Pressure Difference.
- B. NFRC 102 - Test Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems.
- C. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Element.
- D. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- E. ASTM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- F. ASTM A 666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- G. ASTM A 924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- H. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Overhead coiling service doors:
 - 1. Wind Loads: Design door assembly to withstand wind/suction load of 20 psf without damage to door or assembly components in conformance with ASTM E 330.
 - 2. Operation: Design door assembly, including operator, to operate for not less than 20,000 cycles.
- B. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.
- C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. acceptable to authority having jurisdiction as suitable for purpose specified.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 23
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Details of construction and fabrication.
 - 4. Installation instructions.

- C. Shop Drawings: Include detailed plans, elevations, details of framing members, anchoring methods, required clearances, hardware, and accessories. Include relationship with adjacent construction.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) long, representing actual product, color, and patterns.
- F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- G. Operation and Maintenance Data: Submit lubrication requirements and frequency, and periodic adjustments required.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years experience in the fabrication and installation of security closures.
- B. Installer Qualifications: Installer Qualifications: Company specializing in performing Work of this section with minimum three years and approved by manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.
- C. Store materials in a dry, warm, ventilated weathertight location.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 COORDINATION

- A. Coordinate Work with other operations and installation of adjacent materials to avoid damage to installed materials.

1.10 WARRANTY

- A. Warranty: Manufacturer's limited door and operator system, except the counterbalance spring and finish, to be free from defects in materials and workmanship for 3 years or 20,000 cycles, whichever occurs first.
- B. Warranty: Manufacturer's limited door system warranty for 2 years for all parts and components.
- C. PowderGuard Finish
 - 1. PowderGuard Max: Applied to curtain, guides, bottom bar, headplates: Manufacturer's limited Max Finish warranty for 5 years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Overhead Door Corp., 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. ASD. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100. Fax: (972) 906-1499. Web Site: www.overheaddoor.com. E-mail: info@overheaddoor.com.

- B. Requests for substitutions will be considered in accordance with provisions of Section 01 62 00.

2.2 OVERHEAD COILING SERVICE DOORS

A. Industrial Doors: Overhead Door Corporation, Model 610 Service Doors.

1. Curtain: Interlocking roll-formed slats as specified following. Endlocks shall be attached to each end of alternate slats to prevent lateral movement.
 - a. Curved profile type C-187 for doors up to 15 feet 4 inches (4.67 m) wide, fabricated of 24 gauge galvanized steel.
2. Slats and Hood Finish:
 - a. Galvanized Steel: Slats and hood galvanized in accordance with ASTM A 653 and receive rust-inhibitive, roll coating process, including 0.2 mils thick baked-on prime paint, and 0.6 mils thick baked-on polyester top coat.
 - 1) Polyester Top Coat:
Gray polyester.
 - 2) Powder Coat:
PowderGuard Max powder coat, color as selected by Project Manager.
 - 3) Non-galvanized exposed ferrous surfaces shall receive one coat of rust-inhibitive primer.
3. Weatherseals:
 - a. Vinyl bottom seal.
 - b. Guide weatherseal.
4. Bottom Bars: (4.67 m) wide..
5. Guides: Three structural steel angles.
6. Brackets:
Galvanized steel to support counterbalance, curtain and hood.
7. Finish; Bottom Bar, Guides, Headplate and Brackets:
PowderGuard Max powder color as selected by the Project Manager.
8. Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel, supporting the curtain with deflection limited to 0.03 inch per foot of span. Counterbalance is adjustable by means of an adjusting tension wheel.
9. Hood:
24 gauge galvanized steel with intermediate supports as required.
10. Manual Operation:
Chain hoist, Bracket Mount, Cast gear hoist
11. Windload Design:
Standard windload shall be 20 PSF.
12. Locking:
Two interior bottom bar slide bolts for manually operated doors.
13. Wall Mounting Condition:
Face-of-wall mounting.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify opening sizes, tolerances and conditions are acceptable.
- B. Examine conditions of substrates, supports, and other conditions under which this work is to be performed.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.

- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- E. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07 90 00.
- F. Install perimeter trim and closures.
- G. Instruct Owner's personnel in proper operating procedures and maintenance schedule.

3.4 ADJUSTING

- A. Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- B. Adjust hardware and operating assemblies for smooth and noiseless operation.

3.5 CLEANING

- A. Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.
- B. Remove labels and visible markings.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

3.6 PROTECTION

- A. Protect installed products until completion of project.

END OF SECTION

PART 1 GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

Contract Conditions, Division 1, and accompanying Drawings.
08 11 13 Hollow Metal Doors and Frames
09 90 00 Painting

1.02 SCOPE OF WORK

- A. Provide hardware for all doors scheduled in the drawings.
- B. Hardware supplier shall prepare a complete vertical schedule in compliance with the specifications and drawings.

1.02 QUALITY ASSURANCE

- A. Regulatory Requirements:
Conform to requirements for Underwriters (UL) label for class indicated on door schedule.

1.03 SUBMITTALS

Materials List:

- A. Hardware Schedule (see 2.02 below)
Submit 2 copies of draft hardware schedule for Project Manager's approval.
Resubmit as required with modifications requested by Project Manager.
Submit 2 copies of final schedule in accordance with Section 01 33 23.
Include with each copy a complete description showing appearance and function of each item of hardware.
Show for each opening, all hardware, indicating Manufacturer's name and numbers, finish, keying, fastening, dimensions, clearances, and calling attention to any deviations proposed from specified hardware and reason for proposed deviation.

Manufacturer's Recommendations:

Prior to installation, deliver to all installing personnel, complete manufacturer's recommendations for installation.

Template Hardware:

Send direct to door and frame Manufacturer prints or physical templates together with approved hardware materials list, for all metal doors.

1.04 DELIVERY STORAGE AND PROTECTION

Coordinate with General Contractor and ship hardware for prehung doors direct to manufacturer, together with approved hardware materials list.

Package each item separately, and each package marked with item number shown on Contractors hardware list. Include all necessary screws, fasteners, templates.

Store protected from moisture and damage.

PART 2 PRODUCTS

2.01 KEYING

- A. Furnish Construction cylinders with keying method independent of final keying system.
- B. Final Keying: By Owner

2.02 HARDWARE SCHEDULE

- A. Hardware supplier shall prepare a complete vertical schedule in compliance with the specifications and drawings including the following:

For each opening list opening number, door size, door hand, and frame material, door label, and each hardware item indicating Manufacturer's name and numbers, finish, keying, fastening, dimensions, clearances.

Detailing and selection of hardware to provide clearances, swings, etc. specified, or shown on the Drawings shall be the responsibility of the Contractor.

All doors shall be accessible for use by the handicapped, and shall comply with requirements of ANSI A117.1 and the American With Disabilities Act. Make hardware selections and adjustments accordingly.

All Butts shall be ball bearing type. 3 per door. Butt size per hardware manufacturer recommendation for door size and conditions of installation.

All exterior butts shall be stainless steel or nonferrous base metal.

Provide closers for all exterior doors.

All hardware shall be - dull chrome finish.

Schedule shall be prepared by a member of the American Society of Architectural Hardware Consultants or a person who is responsible and the equivalent thereof. This individual shall be available for consultation at all times and make one final inspection to verify that all hardware items have been properly installed in accordance with applicable codes and the manufacturer's recommendations.

Hardware finish and function shall be subject to the Owner's final approval prior to ordering any hardware item.

All exterior hardware shall be ANSI grade 1

All interior hardware shall be ANSI grade 1 or grade 2.

- B Approved Manufacturers:

Locksets and Latches	Schlage L9453P 06N 626
Butts	McKinney
Kick Plates, Push, Pull, Flush Bolts	Cipco
Stops, Silencers	Glynn Johnson
Thresholds, Weather-stripping.....	Pemko
Closers	LCN

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in strict accordance with Manufacturer's instructions and in accordance with requirements of Section 0
- B. Adjust as required to operate smoothly and silently, without rattle, bind or drag.

3.02 LOCATIONS

- A. Hinges: Top hinge 6" from hinge top to edge of door rabbet; Bottom hinge 10" between hinge bottom and finish floor; intermediate hinge centered between top and bottom hinges.
- B. Lock and Latches: Center at 36" above finish floor; dead locks 50" above finish floor.
- C. Thresholds set in heavy sealant bead entire length both sides of threshold.

END OF SECTION

PART 1 GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

General and Supplementary Conditions, Division 1, and accompanying Drawings.

06 10 00 Rough Carpentry - Wood to receive Gypsum Drywall.

07 90 00 Joint Protection - Sealants And Caulking: Acoustical Sealants.

09 90 00 Painting

1.02 QUALITY ASSURANCE

- A. Reference Standards: Conform with OSSC Chapter 25, and applicable requirements of ASTM C840.
- B. Allowable Tolerances: Maximum deflection or deviation from true plane 1/360 of span or 3/8" whichever is less.

1.03 DELIVERY STORAGE AND PROTECTION

Deliver and store protected from moisture or other damaging elements. Compounds and finish products in original unopened containers, Manufacturer's original labels thereon and intact until time of use.

1.04 COORDINATION

Coordinate with painting subcontractor. If required to maintain uniform texture and/or paint sheen, painting subcontractor and gypsum drywall subcontractor shall coordinate for application of primer sealer by painting subcontractor prior to application of sprayed texture. Irregularities in drywall finish texture, color or paint sheen will not be accepted.

PART 2 PRODUCTS

2.01 MANUFACTURER

All gypsum panels to be of one manufacturer; Celotex, US Gypsum, Gold Bond, or approved.

2.02 MATERIALS

- A. Standard Panels: Mold resistant (Green Board) panels 5/8" thickness unless scheduled otherwise, conforming to ASTM C-36.
- B. Joint System: ASTM C745, as recommended by panel Manufacturer.

2.04 OTHER MATERIALS

Other Materials: Provide all other materials, not specifically described, but required for a complete and proper installation, as recommended by gypsum panel Manufacturer.

PART 3 EXECUTION

3.01 GENERAL

- A. Preparation and Inspection:
 - 1. Verify that surfaces to receive Work specified herein are straight, true, plumb, square, secure, rigid, dry and otherwise properly prepared. Notify General Contractor of defects requiring correction
 - 2. Obtain verification from General Contractor that blocking has been installed and properly located for door stops, grab bars, towel bars, cabinet mounting, and similar items.
 - 3. Do not proceed until all conditions are satisfactory.
- B. Surfaces to be finished:

Refer to finish schedule. Unless noted otherwise finish closets and alcoves same as scheduled for spaces to which they are adjacent.

3.02 INSTALLATION

- A. General:
1. Install wallboard in accordance with Reference Standards, including Manufacturer's directions, and applicable Codes.
 2. Install all panels parallel, using maximum lengths, staggering end joints away from center of surface.
 3. Abut all edges without forcing; all ends on framing.
 4. Install ceiling panels with long dimensions perpendicular to framing. End and edge joints of face layer offset 24" from joints in base layer in double layer construction.
 5. Provide metal trim at all exterior corners and at exposed edges; apply joint compound in three coats as indicated below.
- B. Fastening: Comply with OSSC requirements. Refer to OSSC table 2508.1 and GA-216 for minimum fastener size and spacing, as modified by OSSC Chapter 23 for gypsum board used as sheathing, and OSSC Chapter 7 for fire resistive requirements. Nail or screw all panels using single nailing method as described in reference standards, except screw attach panels at ceilings and where applied over metal framing or furring. Double nailing system not allowed for fire rated assemblies.
- C. Nail and Joint Treatment: Conform to ASTM C745; 3 coat application.
- D. Finishes:
1. Coordinate with painting contractor to provide sealer coat over taped and filled joint areas prior to applying texture finishes.
 2. Interior: Spray Splatter Finish: USG "Spray Texture" or approved, on all gypsum board surfaces scheduled to be painted unless "smooth" or other texture noted. Knock down splatter finish with trowel prior to setting. Sample texture is subject to Project Manager's approval.
 3. All exposed gypsum board to receive Gypsum Association "level 4" finish.

3.03 CLEANING AND REPAIR

After trim has been applied, and prior to painting, correct surface damage and defects. Leave Work clean, uniform, and without defects which will be apparent after finish is applied.

END OF SECTION

PART 1 GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

General and Supplementary Conditions, Division 1, and accompanying Drawings.
Division 5 Metals - shop prime coatings
07 60 00 Flashing and Sheet Metal - shop primed and prefinished metals.
08 11 13 Hollow Metal Doors and Frames - shop priming
Divisions 22 through 26: shop priming of equipment, exposed duct interiors etc.

1.02 DESCRIPTION

The term "Paint" as used herein includes enamels, paints, sealers, fillers, emulsions, stains, and other coatings, whether or not pigmented and whether used as a prime, intermediate or top coat.

1.03 QUALITY ASSURANCE

- A. Labels: Each Product container shall bear Manufacturer's label indicating: Manufacturer's name, Type of Material, Manufacturer's stock or product number, and if applicable color and instructions for reducing.
- B. Warranty: Refer to Supplementary Conditions. Work of this Section is subject to specified warranty against delamination of applied finishes, and where design is dependent upon integrity of coating for moisture protection of structure it is subject to specified warranty for moisture resistive elements of the Work. Also refer to Section 01 60 00 Product Requirements regarding responsibility for inappropriate methods or materials.
- C. Interior paints shall be low VOC meeting Green Seal Standard (GS-11) with Certified VOC less than 25g/L. Submit certification for interior paints.

1.04 SUBMITTALS

- A. Color Samples:
 - 1. Submit Manufacturer's full line of colors for material type specified, for selection by Project Manager. Provide stained wood samples on type and quality of wood specified for Work. Specifically note any limitations on availability.
 - 2. If requested by Project Manager, submit duplicate samples approximately 8"x10" for each color and texture selected, and if so directed, furnish actual brush-outs on walls and panels in designated areas.
- B. Test Samples: If requested by Project Manager, obtain test samples from material proposed for use, or used on Project. Submit 1 quart samples from each 50 gallons or part thereof, selected at random from sealed containers. Stir thoroughly before taking sample. If test results indicate nonconformance with specifications, replace with conforming product and pay test costs.
- C. Extra Stock: Provide one extra unopened 1 gallon container of each top coat material and/or color used.
- D. Maintenance Instructions: Submit with Closeout Submittals Manufacturer's printed instructions for proper maintenance of any finishes requiring special attention or special maintenance procedures.

1.05 DELIVERY STORAGE AND PROTECTION

- A. Deliver materials in original sealed containers; Manufacturer's labels intact and legible at time of use.
 - B. Store only approved materials at job site, and store only in a suitable area as designated by General Contractor. Protect from contamination or damage by the elements.
 - C. Use all means necessary to insure safe storage and use of materials. Remove waste ,debris, rags, and empty cans daily.
 - D. Do not deliver or store any painting material in building until Project Manager and painting contractor agree that the area in question is thoroughly dry and proper temperatures will be maintained.
 - E. Protect Painting Work and Work of other trades with suitable coverings.
- RUSA Bisulfite Building

1.06 COORDINATION

Coordinate with drywall subcontractor. If required to maintain uniform texture and/or paint sheen, painting subcontractor and gypsum drywall subcontractor shall coordinate for application of primer sealer by painting subcontractor prior to application of sprayed texture. Irregularities in drywall finish texture, color or paint sheen will not be accepted.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. Materials selected for coating systems for each type surface shall be the product of a single Manufacturer.
- B. Paint products the "best grade" and "highest quality" Products manufactured by Rodda, Glidden, Fuller-O'Brian, Pittsburgh, Pratt and Lambert, Sherwin-Williams, or approved.
- C. Use only products which are recommended by approved Manufacturer for use with the materials, and under conditions of service to be encountered by the Work. Refer to Section 01 60 00 for further requirements.

2.02 MIXING AND TINTING

- A. Interior: White Exterior: Clear sealer.
- B. Use tinting colors recommended by Manufacturer for each type of finish.
- C. Fungicidal agent shall be incorporated into the paint by the Manufacturer, otherwise add fungicide to coating mix, in accordance with Manufacturer's recommendations prior to application.

PART 3 EXECUTION

3.01 GENERAL

- A. Inspection and Coordination:
 - 1. Inspect surfaces to receive Finishes. Notify General Contractor of unsatisfactory conditions requiring correction. Do not proceed until all conditions are satisfactory.
 - 2. Coordinate with General Contractor and verify that Work of other Trades is sufficiently completed, cured, approved, and ready to receive finishes. Do not proceed until directed by General Contractor.
 - 3. Test surfaces to be painted with standard moisture meter and do not apply initial coating until moisture content is within required limits.
 - 4. Do not paint putty, caulking or sealants, concrete, plaster, or other similar products (which are required to cure), until thoroughly cured.
 - 5. Obtain Project Manager's color schedule before priming.
- B. Job Conditions:
 - Apply paint only under dry and dust free conditions; maintain conditions until paint is cured.
 - Provide 40 foot candles minimum lighting for preparation and painting.
- C. Surfaces to be finished:
 - 1. Unless otherwise noted on the Drawings, all surfaces shall be painted except the following: glass, flat concrete, galvanized fences, rubber, plastic laminate, ceramic tile, resilient flooring, acoustic tile, fire rating and instruction labels, anodized aluminum, items specified as "prefinished", and items specifically noted or scheduled not to receive finish.
 - 2. Frames and Trim and wood siding: Back prime with scheduled primer, prior to installation, touch-up with same material prior to finish coats.
 - 3. Doors: Remove to paint bottom edges; Prime top, bottom, side edges and cut outs with two coats of specified primer.
 - 4. Hardware: Remove hardware from doors and other items to receive finish coatings; replace upon completion.

3.02 SURFACE PREPARATION

- A. General: Strictly comply with Product Manufacturer's recommendations.

- B Galvanized Metal and Zinc Alloy: Thoroughly clean with surface conditioner, and dry with clean cloth.
- C. Non-galvanized Steel: Remove all oil, rust, scale and dirt; touch up damaged Shop Coat areas. Where shop coat is asphalt Base Paint, apply one coat Polyvinyl Acetate Asphalt sealer before applying Finish Coats hereinafter specified.
- D Aluminum: Clean with mineral spirits.
- E Copper: Buff or polish to bright color; Clean with mild phosphoric acid cleaner in accordance with approved Manufacturer's recommendations; Apply finish while surface is clean and bright.
- F Wood Preparation:
 1. Clean soiled surfaces with alcohol.
 2. Except where rough sawn or bandsawn textures are specified, sand wood to smooth and even surface, then dust or vacuum clean.
 3. Apply sealer to all knots, pitch and resinous sap wood before priming.
 4. Fill holes, cracks, open joints, and other defects with plastic wood.
 5. Test for moisture, and do not paint if moisture content is over 14%.
 6. Apply clear primer sealer to smooth surfaced softwoods before applying penetrating stain.
- G. Plaster and Gypsum wallboard Preparation:
 1. Fill narrow, shallow cracks and small holes with spackling compound, notify General Contractor to repair cracks wider than 1/16" and holes over 1/8", and other larger defects, and surface irregularities.
 2. Sand untextured surfaces smooth without raising nap of paper on wallboard.
 3. Remove surface salts from plaster by dry brushing; fill holes and cracks.
 4. Test surface for moisture content and proceed as follows:
 - Moisture content over 12%: Do not paint.
 - Moisture content 8 to 12%: Treat with Alkali-Proof Sealer before painting.
 - Moisture content less than 8%: Paint as scheduled.
- H Concrete Masonry and Cement Stucco Preparation:
 1. Fill cracks and irregularities with portland cement grout to provide uniform surface texture.
 2. Etch with 5% solution (by weight) of muratic acid.

3.03 APPLICATION

- A. General:
 1. Do not apply initial coating until moisture content of surface is within limitations recommended by paint Manufacturer. Test with Moisture meter.
 2. Apply coating with suitable brushes, rollers or spraying equipment. Rate of application shall not exceed that as recommended by paint Manufacturer for the surface involved. Keep brushes, rollers, and spraying equipment clean, dry, free from contamination, and suitable for the finish required. Apply stain by brush unless noted otherwise.
 3. Comply with Product Manufacturer's recommendations for drying time between succeeding coats.
 4. Vary slightly the color of succeeding coats.
 5. Sand and dust between each coat to remove defects visible at 5 ft. distance.
 6. Finish coats shall be smooth, free of brush marks, streaks, laps, pile-up, and skipped or missed areas.
 7. Leave all parts of moldings and ornaments clean and true to details without excessive coating build-up in corners or depressions.
 8. Cut paint edges clean and sharp against other materials or colors, without overlap.
- B. All Painted Wood: Backprime all Frames, Trim and Siding immediately upon delivery to Site. Face runs not permitted. Notify Project Manager if exterior frames have not been treated with "Wood Life" or approved clear preservative by millwork supplier.
- C. Coverage: Provide additional coats as required to meet the following requirements:
 1. With the exception of semi-transparent stains and clear finishes, all paint films shall be completely and uniformly opaque, regardless of the Dry Mil Thickness (DMT) or number of coats specified.
 2. Dry Mil Thickness (DMT) shall be no less than recommended by Manufacturer or scheduled herein, whichever is greater.
 3. Both the number of coats and Dry Mil Thickness (where scheduled) are minimums and independent of

each other.

3.04 CLEANING AND REPAIR

- A. Immediately remove spills, and splatters. Repair or replace when directed all Work, including Work by Others, damaged or stained by this Trade and leave in top condition at time of final acceptance.

3.05 PAINTING SCHEDULE

- A. General:
 - 1. Work scheduled herein is in addition to shop coats specified.
 - 2. Prime coats may be omitted from existing finished surfaces, provided existing coating is sound.
 - 3. DMT (Dry Mil Thickness) is minimum total including primers where scheduled.
 - 4. The terms "gloss", "semi-gloss", "egg shell", etc. are subjective and vary between coating manufacturers. The degree of sheen or gloss shall be modified as directed by the Project Manager and demonstrated on approved samples, regardless of such terms used in the plans or specifications to describe the degree of sheen or gloss.
- B. Exterior Coatings: (As applicable)
 - 1. Galvanized Metal:
 - Prime: 1 coat galvanized iron primer
 - Finish: 2 coats semigloss alkyd enamel
 - DMT: 5.4 mils
 - 2. Non-galvanized ferrous metal
 - Prime: 1 coat rust inhibiting primer
 - Finish: 2 coats semigloss alkyd enamel
 - DMT: 4.0 mils
 - 3. Aluminum
 - Prime: 1 coat zinc chromate primer
 - Finish: 2 coats semigloss alkyd enamel
 - 4. Siding, fascias and trim
 - Test Cementous siding and trim for pH, if the pH is higher than 8, prime with Sherwin Williams Loxon Concrete & Masonry Primer.
 - Prime: Face and back and edges prior to installation.
 - 1 coat Sherwin Williams "Duration" Exterior Acrylic Latex Flat coating.
 - (Cut edges and touch-up only for factory primed siding)**
 - Finish: 1 coat Sherwin Williams "Duration" Exterior Acrylic Latex Flat coating after installation.
 - 5. Masonry
 - Clear sealer
- C. Interior Coatings:
 - 1. Metals: same as for exterior
 - 2. Gypsum Wallboard:
 - Prime: 1 coat primer sealer.
 - Finish: Epoxy paint, mil thickness per manufacture.
 - 3. Masonry:
 - Sealer and epoxy paint.

END OF SECTION

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUBMITTALS

- A. Provide Shop Drawings for the following:
 - 1. Valves
 - 2. Piping Specialties
 - 3. Pipe Supports

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Refer to Division 1, Summary of Work for description of work.

1.04 WORK INCLUDED

- A. Provide all materials, labor, equipment together with all incidental items not shown or specified, which are required by code and good practice to provide complete systems. Refer to Division 1, Summary of Work.

1.05 COORDINATION

- A. Coordinate all work in Division 22 with work specified in other Divisions to provide a complete installation. Expense of changes required because of lack of supervision or coordination shall be borne by the Contractor. Such changes shall be to the satisfaction of and directly supervised by the Project Manager.

1.06 CONTRACT DRAWINGS

- A. Location of piping and equipment on Drawings is approximate. Plan exact location with respect to measurements on the job and work of other trades prior to work. If measurements differ slightly, modify work. If measurements differ substantially, notify Engineer prior to fabrication.

1.07 SITE VISIT

- A. Examine site of proposed work and become familiar with job conditions affecting work. No additional allowance will be granted due to lack of information of existing conditions.

1.08 SUBSTITUTIONS

- A. Manufacturer's and catalog numbers indicate quality of equipment or materials. Manufacturers not listed require prior approval. Substitution requests must be made in writing to the Project Manager prior to bid in accordance with Division 1, Product Requirements. Provide sufficient information indicating compliance with these Specifications.

1.09 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

- A. Provide shop drawings in accordance with Division 1, Submittal Procedures. Submittals shall include all information necessary as required for complete check including any changes or modifications to the drawings necessary.

1.10 RECORD DRAWINGS

- A. Provide record "as-built" drawings in accordance with Division 1, Project Record Drawings. Show all deviations from Contract Drawings, including addenda and change order items. Show depth of all stub outs and underground lines. Dimension all concealed piping from column grids or building lines. Transfer all information to reproducible drawings as required at the completion of the project.

1.11 PERMITS, CODES, AND INSPECTIONS

- A. Permits: Obtain all permits and pay fees required by governing agencies having jurisdiction over this work.
- B. Codes, Standards: Applicable codes and standards contained therein shall determine minimum requirements for materials, methods, and labor practices not otherwise stated herein.
- C. Inspections: Arrange and pay for inspections and tests required by codes or ordinances.

1.12 CUTTING AND PATCHING

- A. In accordance with Division 1, Cutting and Patching.

1.13 TEMPORARY SERVICES

- A. Provide in accordance with Section Division 1, Temporary Facilities and Controls as required for completion of Work.

1.14 OPERATING AND MAINTENANCE DATA

- A. Submit in accordance with Division 1, Operation and Maintenance Data. Include information only on the exact equipment installed. Include the following information where applicable:
 - 1. Manufacturer's printed operating, maintenance, and service information.
 - 2. Approved shop drawings.
 - 3. Manufacturer's parts list.
 - 4. Service and dealer directory listing.
 - 5. Written certification of disinfection of the domestic water system.
 - 6. Valve directory listing with valve number, type, size, location, function, and normal position.

1.15 STARTUP

- A. The Mechanical Contractor shall be responsible for proper operation of all systems and shall coordinate startup procedures, calibration and system checkup with subcontractors present. System operational problems shall be diagnosed and corrected as required for system operation.

1.16 COMPLETION

- A. General: When installation is complete, cleaned and adjustments specified herein made, operate system to demonstrate to Project Manager that system is complete and operating in conformance with these Specifications.
- B. Final Inspection: Work hereunder will not be inspected for Substantial Completion until operating and maintenance data, record drawings and directories specified herein have been approved.
- C. Final Completion: Entire installation turned over to the Owner in finished and satisfactory working condition.

1.17 WARRANTY

- A. Provide a written warranty covering Work of the Division for a period of one year in accordance with Division 1. Include manufacturer's written warranties for material and equipment.

PART 2 – PRODUCTS

2.01 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle materials and equipment in a manner to prevent damage and deterioration. Store in original container. Indoor units, if stored outside, must be covered.

2.02 MATERIALS

- A. All materials employed in permanent construction shall be new, full weight, in first class condition and suitable for space provided. All similar materials shall be of one manufacturer.

2.03 VARIATIONS IN EQUIPMENT

- A. If approved mechanical equipment of other manufacturer requires modification or additions to any Work as shown on the drawings, Mechanical Contractor shall arrange for and pay costs of such changes as part of this Work.

2.04 PIPES AND PIPE FITTINGS

- A. Steel Pipe: Schedule 40 pipe, black or galvanized, conforming to ASTM A120. Size 2" and smaller fittings shall be threaded.
- B. Copper Tube: Hard drawn copper conforming to ANSI H23.1 and ASTM B88. Type L above grade, type K below grade. Fittings shall be wrought copper 95-5 solder joint fittings, type K, conforming to ANSI B16.22.
- C. Plastic Sewer Pipe: PVC gravity sewer pipe and fittings conforming to ASTM D2665 with solvent weld DWV fittings and tracer wire where below grade.
- D. Plastic Pressure Pipe: PVC or ABS pressure pipe conforming to ASTM D2665 with solvent weld DWV fittings and tracer wire where below grade.

2.05 VALVES

- A. All valves of a given type shall be of one manufacturer. Manufacturer's name and number listed are intended to indicate quality. Valves manufactured by Crane, Appollo, Nibco, Powell, Jenkins, Watts, Stockham, Hammond, as listed below, or approved.
- B. Ball Valves: Size 2" and Smaller: Bronze two piece body, 150 WSP, full port, lever handle with stops. Threaded or soldered ends to match pipe. Brass stem and chrome plated ball. Teflon or ethylene propylene seats. Provide stem extender for insulated valves. Must meet Federal Specification MSS SP-110 and WW-V-35, Type II. Hammond 8501, 8511.
- C. Gate Valves: Size 2-1/2" and Smaller: Bronze body, Class 125. Malleable iron wheel handle, ends to match pipe, bronze stem, non-rising. Must meet Federal Specifications MSS-SP-80 and WW-V-54, Type 1, Class A. Hammond IB645, IB647.
- D. Check Valves: 3" and Smaller: Bronze body, Class 150, ends to match pipe. T-pattern, replaceable teflon disc. Must meet Federal Specification MSS-SP-80. Hammond IB945, IB946.
- E. Drain Valves: Bronze, compression stop with nipple and cap or hose thread.

2.06 PIPE SUPPORTS AND ACCESSORIES

- A. Use adjustable pipe hangers on suspended pipe. Chain or perforated strap hangers are not permitted. Provide supports between piping and building structure where necessary to prevent swaying.
- B. Pipe Hangers:
 1. Size 3" and smaller cast iron, Schedule 40 steel: Adjustable, malleable iron, solid or split ring, black. UL and FM approved. PHD 505, Grinnell, or equal.
 2. Size 3-1/2" and larger cast iron, Schedule 40 steel: Carbon steel, black finish. UL and FM approved. PHD 450, Grinnell, or equal.
 3. Copper tubing hangers: Steel hanger; PHD 151, Grinnell, or equal. On uninsulated piping provide calcium silicate inserts of same diameter as pipe insulation.

- C. Insulation Protection: Shields for insulated 4" and smaller cold water or storm drain shall be 18 ga. x 12" length. Galvanized steel shield to encompass 1/2 circumference. PHD 170, Grinnell, or equal.
- D. Supports for exposed piping routed along finished walls shall be metal framing channels with pipe clamps. Superstrut Series 1000 Channel with 702 Pipe Clamp.

2.07 PIPING SPECIALTIES

- A. Escutcheons: Cast brass, nickel or chrome, split ring type, plated, size sufficient to cover pipe sleeve or opening.
- B. Unions: Iron body with brass seat for steel pipe, bronze or brass for copper pipe, 125 lb. MWP.
- C. Insulating Unions: 250 lb. MWP, ends to match piping. Flow of electric current must be below 1% of the galvanic current. Gasket material as recommended by manufacturer for service intended. Epco or equal.
- D. Pipe Sleeves: Minimum 20 gauge galvanized steel with diameter 1/2" larger than outside diameter of pipe including insulation. Must fully encircle pipe. Extend sleeve 1 inch above finished floor.

2.08 EXCAVATION AND BACKFILL

- A. General: Refer to Division 2.
- B. Bedding and Backfill Material: Unclassified or native material shall be excavated materials, free of roots, large rocks, debris, clay or other foreign material.
- C. Crushed Rock: 3/4" minus, conforming to the latest Oregon State Highway Specification for base rock.
- D. Gravel: 1/2" by No. 4 washed pea gravel.
- E. Sand: Washed concrete sand or washed fill sand.

PART 3 – EXECUTION

3.01 CLEANING SYSTEMS

- A. After all fixtures and piping systems are installed, system shall be thoroughly cleaned per Division 1. Remove all stickers and tags from fixtures. Clean fixtures. Clean all piping systems prior to installation of insulation or painting. Repair or replace any discoloration or damage to system, building finish, or furnishing resulting from failure to properly clean systems.

3.02 ACCESS TO EQUIPMENT AND ACCESSORIES

- A. Install equipment with adequate access for service. Provide access doors where shown or required for proper access to valves, P-traps, trap primers, cleanouts, shock absorbers, vacuum breakers, and all other mechanical equipment requiring maintenance where area is not accessible by other means.
- B. Access doors shall be minimum size of 12 X 12 inches. Access doors shall have handles and shall be lockable where required. Access doors shall have same fire rating as the surface they are installed in. Type, size, and exact location of access doors shall be coordinated with Engineer prior to Work.

3.03 SEISMIC REQUIREMENTS

- A. All piping, equipment, and fixtures shall be provided with hangers, transverse bracing, longitudinal bracing, bolts, and connection types per OSSC. Seismic calculations shall be provided by the Contractor. Coordinate with Structural Engineer

3.04 PIPES

- A. Route piping in general locations indicated. Coordinate with other piping, ducts, conduits and equipment making necessary offsets. Install to conserve headroom and interfere as little as possible with use of available space. Group piping at common elevations wherever possible.
- B. Slope piping and arrange for drainage at low point.
- C. Provide clearance for proper installation of insulation and for access to other pipes, valves, and equipment as required. Install horizontal lines parallel with walls and partitions, vertical risers plumb and straight. Conceal piping above ceiling and within furring and walls unless otherwise indicated. Piping shall not be installed on the floor without prior approval.
- D. Install piping on warm side of building insulation.

3.05 VALVES

- A. Valves shall be the full size of pipes in which they are installed unless otherwise noted on Drawings. Install valves in groups where possible. All valves shall be accessible. All valves to be installed with stem above horizontal.
- B. Valve Application:
 - 1. Install valve types as specified herein and as designated by symbols on the Drawings. Unless otherwise noted provide ball valves in domestic water systems.
 - 2. Install valves for shut off and to isolate equipment, parts of systems, and vertical risers.

3.06 PIPE SUPPORTS AND ACCESSORIES

- A. Supports for hot water pipes shall rest directly on the pipe insert with insulation tight to insert. Supports for cold water pipes shall rest on the insulation with specified protection. Supports for all piping not more than two feet from each change of direction.
- B. Vertical Pipe Supports:
 - 1. Vertical pipes adjacent to walls: Support by means of bracket formed of steel straps bolted to wall, with clamps around pipe. Super Strut with series 700 clamps or equal.
 - 2. Vertical pipes not adjacent to walls: Riser clamp at each floor, steel on steel pipe and copper-plated on copper pipe.
- C. Horizontal Pipe Supports:
 - 1. Support cast iron piping at each joint and at each branch fitting with same size rod diameter as specified below.
 - 2. Spacing for horizontal steel and copper piping supports as follows unless otherwise indicated on Drawings:

Pipe size	Rod Diameter	Max. Spacing
		Steel & Copper
Up to 1"	3/8"	6'-0"
1-1/4" thru 2"	3/8"	10'-0"
2-1/2" thru 3-1/2"	1/2"	10'-0"
4"	5/8"	14'-0"
6"	3/4"	17'-0"

3.07 PIPING SPECIALTIES

- A. Escutcheons: Install on exposed pipes passing through walls, floors, or ceilings where pipes are exposed in finished areas and within cabinets. Escutcheons not required in Mechanical Rooms.
- B. Unions: Place in line at all equipment and where shown or required to facilitate maintenance or removal.
- C. Insulating Unions: Place in line in accessible locations wherever ferrous and non-ferrous metals come in contact in plumbing systems. Place in line at water heaters.
- D. Pipe Sleeves: Install where pressure or hot pipes pass through concrete or masonry construction. Install flush with finished surfaces, secure sleeve against displacement by caulking with grout or equal to make watertight. Extend sleeve 1 inch above finished floor.

3.08 COMPONENT IDENTIFICATION

- A. Piping: Identify all piping size 1" and larger with the name and direction of flow on the pipe at 20' intervals, at each take-off, and at penetrations through structure. Lettering shall be 1" high block. Marking Services MS-900 or equal.
- B. Equipment: Identify all equipment with nameplate attached to the equipment or adjacent to it. Use equipment designation per schedule on drawings, where possible. Nameplate shall be black bakelit or phenolic resin with 1/2" high white letters.
- C. Valves: Identify all valves with a tag attached to the equipment. Tags shall be a 1-1/2" numbered brass or plastic disc and shall indicate system served. Include valve number on disc and provide list of location, function, normal position, and lines controlled. Insert list into Operating and Maintenance Manuals and mount on wall in mechanical rooms.

3.09 PAINTING

- A. All pipe hangers, ferrous piping, supports, and equipment without factory finish installed in mechanical room or outside the building shall be painted flat black.
- B. Prepare all mechanical equipment and piping for painting if painting is required in Division 1, Painting.

3.10 PIPE PENETRATION

- A. Where pipes pass through walls, ceilings, or floors, seal off void between opening and duct, or pipe and sleeve. Provide escutcheon in exposed locations.
- B. Where pipes or other material pass through or penetrate any fire-resistant wall, ceiling, or floor use approved fire resistant materials and completely seal voids the full thickness of material being penetrated. USG Firestop Firecode System, Pro Set, or equal.

3.11 FLASHING

- A. All exterior building penetrations shall be flashed for weather tightness. Coordinate with General Contractor.

3.12 EXCAVATION AND BACKFILL

- A. Refer to Division 31. Determine location and elevation of underground utilities and uncover by hand digging. If damaged by Contractor, replace immediately at no expense to the Owner and as approved by Project Manager.
- B. Completely de-water trenches and excavations before pipe is laid or concrete is placed. When necessary to prevent caving, excavation shall be adequately shored and braced. Shoring shall remain in place for 12" above pipe until testing and inspection are complete. Remove from site excavated materials not suitable for backfill. Delay backfill of trenches until all tests are performed and until after inspection and approval by governing authority. Repair any damage to existing streets, sidewalks, concrete piping, etc., at Contractor's expense.
- C. Excavation: Unless otherwise shown, piping outside the building shall have the following minimum cover over pipes:
 - 1. Building Sewer = 24"

2. Domestic Water = 36"
3. Piping inside building shall have depth as required.

- D Width of trench shall be adequate to provide working space, but in no case less than 12" plus the inside diameter of the pipe to be placed therein. Provide 6" minimum between adjacent pipes.
- E Grade Bottom of Trenches: Construct to lines and grades as shown or as required with proper allowances for pipe thickness and gravel base. Over excavation shall be corrected with approved materials, thoroughly compacted.
- F Pipe Bedding: Provide the following minimum bedding materials:
1. Sanitary Piping = 4" crushed rock.
 2. Domestic Water Piping = 4" sand.
- G. Backfilling:
1. Under building slabs, concrete slabs, paved areas, streets or sidewalks, all backfill shall be pea gravel or crushed rock. Fill material shall extend from the bedding material to the bottom of surfacing material. Fill all voids around pipe. Fill in 8" lifts and compact to 95% density of AASHTO-T-180.
 2. Should backfilled ditch show settlement at any time through one year guarantee period, Contractor shall bring ditch back to grade with compacted fill and repair any damage to concrete or paved areas caused by settlement.

3.13 EXPANSION COMPENSATION

- A. Provide structural work and equipment required to permit free expansion and contraction of piping without causing undue stress. Provide pipe loops and offsets, swing joints, and flexible connectors where required or as shown.
- B. Securely anchor pipe and provide pipe guides as necessary for proper installation of expansion loops. Provide thrust blocks on underground hot water elbows and tees as required to control and direct expansion.

3.04 PIPE TEST

- A. Test all piping per code requirements. Make all tests before pipes are concealed. Provide valves and temporary plugs or caps as needed to isolate sections of piping for testing.
- B. Building Drainage, Waste and Vent Piping: Test hydrostatically by filling piping system with water to the highest point. The water shall be kept in the system for at least 15 minutes before inspection starts. System shall be tight at all points.

3.05 CLOSING IN UNINSPECTED WORK

- A. Do not cover up or enclose Work until it has been properly and completely inspected and approved.
- B. Should any of the Work be covered up or enclosed prior to all required inspections and approvals, uncover the Work as required, make all repairs and replacement with such materials as are necessary to the approval of the Project Manager and at no additional cost to the Owner.

3.06 CLEANING UP

- A. Prior to acceptance of Work building, thoroughly clean all exposed portions of the installation, removing all labels and all traces of foreign substances, using only a cleaning solution approved by the manufacturer of the plumbing item and being careful to avoid all damage to finished surfaces.

END OF SECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SHOP DRAWINGS

- A. Provide Shop Drawings for the following equipment:
 - 1. Piping
 - 2. Plumbing Specialties

PART 2 – PRODUCTS

2.01 PIPING

- A. Domestic water pipe above grade: Type L copper, or PEX tubing.
- B. Domestic water pipe below grade: Type K copper. Silver brazed joints.

2.02 PLUMBING SPECIALTIES

- A. Vacuum Breaker: Pressure vacuum breaker. Febco or equal.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

- A. Prior to all Work of this section, carefully inspect the installed Work of all other trades affected by Work of this section and verify that all such Work is completed to the point where installation may properly commence. Verify that plumbing may be installed in strict accordance with all pertinent codes and regulations and approved Shop Drawings.
- B. In the event of discrepancy, immediately notify the Project Manager. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 CUTTING STRUCTURAL FRAMING

- A. Exposed Members: Not permitted unless shown on Drawings or otherwise approved.

3.03 PIPE AND FITTINGS

- A. Route piping in general locations indicated. Coordinate with other piping, ducts, conduits and equipment making necessary offsets. Install to conserve headroom and interfere as little as possible with use of available space. Group piping at common elevations wherever possible.
- B. Slope piping and arrange for drainage at low point.
- C. Provide clearance for proper installation of insulation and for access to other pipes, valves, and equipment as required.
- D. Install horizontal lines parallel with walls and partitions, vertical risers plumb and straight. Conceal piping above ceiling and within furring and walls unless otherwise indicated. Piping shall not be installed on the floor without prior approval.
- E. Copper Tube: All joints shall be silver brazed, or 95-5 tin antimony solder. All joints below grade permitted only where necessary and only with silver brazed joints.

3.04 PIPE TEST

- A. Test and disinfect all piping per code requirements. Make all tests before pipes are concealed. Provide valves and temporary plugs or caps as needed to isolate sections of piping for testing.
- B. Domestic Water Piping:
 - 1. Test hydrostatically at 125 psi. Remain under pressure for minimum of two hours with no leakage.
 - 2. Follow Oregon State Board of Health requirements for disinfection. Employ firm specializing in disinfection. Provide written certification at completion of Work to the Project Manager.

3.07 CLOSING IN UNINSPECTED WORK

- A. Do not cover up or enclose Work until it has been properly and completely inspected and approved.
- B. Should any of the Work be covered up or enclosed prior to all required inspections and approvals, uncover the Work as required, make all repairs and replacement with such materials as are necessary to the approval of the Project Manager and at no additional cost to the Owner.

3.08 CLEANING UP

- A. Prior to acceptance of Work building, thoroughly clean all exposed portions of the installation, removing all labels and all traces of foreign substances, using only a cleaning solution approved by the manufacturer of the plumbing item and being careful to avoid all damage to finished surfaces.

END OF SECTION

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

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

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Refer to Division 26 related electrical work.
- B. Refer to Division 1, Summary of Work.

1.03 WORK INCLUDED

- A. Provide all materials, labor, equipment together with all incidental items not shown or specified, which are required by code and good practice to provide complete systems.

1.04 COORDINATION

- A. Coordinate all work in Division 23 with work specified in other Divisions to provide a complete installation. Expense of changes required because of lack of supervision or coordination shall be borne by the Contractor. Such changes shall be to the satisfaction of and directly supervised by the Project Manager.

1.05 CONTRACT DRAWINGS

- A. Location of piping, and equipment on Drawings is approximate. Plan exact location with respect to measurements on the job and work of other trades prior to work. If measurements differ slightly, modify work. If measurements differ substantially, notify Contractor prior to fabrication.

1.06 SITE VISIT

- A. Examine site of proposed work and become familiar with job conditions affecting work. No additional allowance will be granted due to lack of information of existing conditions.

1.07 SUBSTITUTIONS

- A. Manufacturer's and catalog numbers indicate quality of equipment or materials. Manufacturers not listed require prior approval. Substitution requests must be made in writing to the Project Manager prior to bid in accordance with Section 01 60 00, Product Requirements. Provide sufficient information indicating compliance with these Specifications.

1.08 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

- A. Provide shop drawings in accordance with Section 01 76 39, Product Requirements. Submittals shall include all information necessary as required for complete check including any changes or modifications to the drawings necessary. Include fan curves.

1.09 RECORD DRAWINGS

- A. Provide record "as-built" drawings in accordance with Section 01 78 00, Closeout Submittals. Show all deviations from Contract Drawings, including addenda and change order items. Dimension all concealed piping from column grids or building lines. Transfer all information to reproducible drawings as required at the completion of the project.

1.10 PERMITS, CODES, AND INSPECTIONS

- A. Permits: Obtain all permits and pay fees required by governing agencies having jurisdiction over this work.
- B. Codes, Standards: Applicable codes and standards contained therein shall determine minimum requirements for materials, methods, and labor practices not otherwise stated herein.
- C. Inspections: Arrange and pay for inspections and tests required by codes or ordinances.

1.11 CUTTING AND PATCHING

- A. In accordance with Division 1, Cutting and Patching.

1.12 TEMPORARY SERVICES

- A. Provide in accordance with Section 01 50 00, Temporary Facilities and Controls as required for completion of Work. Permanent heating system shall not be used for heating during construction without prior approval by the Project Manager. Provide separate portable heaters as required.

1.13 OPERATING AND MAINTENANCE DATA

- A. Submit in accordance with Section 01 78 00, Closeout Submittals. Include information only on the exact equipment installed. Include the following information where applicable:
 - 1. Manufacturer's printed operating, maintenance, and service information.
 - 2. Approved shop drawings.
 - 3. Manufacturer's parts list.
 - 4. Service and dealer directory listing.
 - 5. Balance report.
 - 6. Nameplate directory of equipment with location and area served.

1.14 INSTRUCTION

- A. After all equipment and systems are operating, instruct Owner's operating personnel in the operation and maintenance of all systems. Training shall be by individuals who are familiar and have minimum three years experience with the systems. Provide the following minimum instruction: HVAC systems - 2 hours

1.15 STARTUP

- A. The Mechanical Contractor shall be responsible for proper operation of all systems and shall coordinate startup procedures, calibration and system checkup with subcontractors present. System operational problems shall be diagnosed and corrected as required for system operation.

1.16 COMPLETION

- A. General: When installation is complete, cleaned and adjustments specified herein made, operate system to demonstrate to Project Manager that system is complete and operating in conformance with these Specifications.
- B. Final Inspection: Work hereunder will not be inspected for Substantial Completion until operating and maintenance data, record drawings and directories specified herein have been approved.
- C. Final Completion: Entire installation turned over to the Owner in finished and satisfactory working condition.

1.17 WARRANTY

- A. Provide a written warranty covering Work of the Division for a period of one year in accordance with Division 1. Include manufacturer's written warranties for material and equipment.

PART 2 – PRODUCTS

2.01 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle materials and equipment in a manner to prevent damage and deterioration. Store in original container. Indoor units, if stored outside, must be covered.

2.02 MATERIALS

- A. All materials employed in permanent construction shall be new, full weight, in first class condition and suitable for space provided. All similar materials shall be of one manufacturer.

2.03 ELECTRICAL EQUIPMENT

- A. All electrical equipment UL and NEMA labeled or acceptable to electrical inspection authorities having jurisdiction. All equipment which requires electrical service of 50 amps or more shall have lugs suitable for either copper or aluminum supply conductors.
- B. Provide any interlocking devices as required for automatic control. All wiring (and electrical Work pertaining to mechanical system) by Mechanical Contractor unless specified in Division 26.
- C. Motors: Motors 1/2 HP or over voltage and phase as shown on Drawings. Motors rated less than 1/2 HP wound for 120 volt 60 cycle, single phase, 1750 rpm, unless otherwise specified. Provide manual switch with overload protection when required. All motors protected by thermal overload protection. Motor starters and fused disconnects shall be provided by the Mechanical Contractor unless specified in Division 26.

2.04 VARIATIONS IN EQUIPMENT

- A. If approved mechanical equipment of other manufacturer requires modification or additions to any Work as shown on the drawings, Mechanical Contractor shall arrange for and pay costs of such changes as part of this Work.

ART 3 – EXECUTION 3.01

CLEANING SYSTEMS

- A. After all equipment and systems are installed, system shall be thoroughly cleaned per Division 1. Remove all stickers and tags from equipment and fixtures. Clean all piping systems prior to installation of insulation or painting. Repair or replace any discoloration or damage to system, building finish, or furnishing resulting from failure to properly clean systems.

3.02 ACCESS TO EQUIPMENT AND ACCESSORIES

- A. Install equipment with adequate access for service.

3.03 SEISMIC REQUIREMENTS

- A. All equipment shall be provided with hangers, transverse bracing, longitudinal bracing, bolts, and connection types per OSSC and SMACNA Seismic Restraint Manual Guidelines for Mechanical Systems. Seismic calculations shall be provided by the Contractor. Coordinate with Structural Engineer.

3.04 PAINTING

- A. Prepare all mechanical equipment, piping, and ductwork for painting if painting is required in Division 1, Painting.
- B. All outside equipment without factory finish shall be painted. Provide necessary protection of work installed by other trades. Prepare surfaces to receive paint using a cleaning solution as recommended by paint manufacturer. Paint with one coat of primer followed by two coats Rustoleum enamel, and one coat enamel as selected by Project Manager.

3.05 PIPE AND DUCTWORK PENETRATION

- A. Where pipes pass through walls, ceilings, or floors, seal off void between opening and pipe and sleeve. Provide escutcheon in exposed locations.

END OF SECTION

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SHOP DRAWINGS

- A Provide Shop Drawings for the following equipment:
 - 1. Fans

PART 2 - PRODUCTS

2.01 GENERAL

- A All fans shall be AMCA certified for sound and air performance and shall be UL listed.

2.02 EXHAUST FANS

- A Fans shall be centrifugal fans with insulated housing, aluminum grille, backdraft damper, and vibration isolator kit for suspended installation. Motor mounted on vibration isolators. UL listed, AMCA certified. Maximum sound rating and rpm as shown on schedule. Manufactured by Greenheck, Carnes, Penn, Cook, Acme, Dayton, or equal.
- B Control by fan timer as specified. Termination to have built in bird screen and backdraft damper.

PART 3 - EXECUTION

3.01 INSTALLATION

- A Install all equipment and accessories with adequate access for service and per Manufacturer's recommended instructions. Systems shall be cleaned prior to startup. All moving and rotating parts shall be lubricated per Manufacturer's recommendations prior to equipment startup. Mechanical Contractor shall coordinate startup of all equipment and systems.
- B Provide backdraft/barometric dampers at all outside air intakes and exhaust outlets where damper is not an integral part of the fan and as shown on drawings.

3.02 CLOSING IN UNINSPECTED WORK

- A Do not cover up or enclose work until it has been properly and completely inspected and approved.
- B Should any of the work be covered up or enclosed prior to all required inspections and approvals; uncover the work as required and, after it has been completely inspected and approved, make all repairs and replacements with such materials as are necessary to the approval of the Project Manager and at no additional cost to the Owner.

3.03 CLEANING UP

- A Prior to acceptance of the Work, thoroughly clean all exposed portions of the installation. Remove all labels and all traces of foreign substance, using only a cleaning solution approved by the manufacturer of the equipment and being careful to avoid all damage to finished spaces. Remove all debris accumulated by this Work.

END OF SECTION

PART 1 – GENERAL

PART 1 GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

General Conditions, Division 1, and accompanying Drawings.
31 20 00 EARTHWORK

1.02 DEFINITIONS

- A. The term "clearing grubbing and demolition" includes removal of all existing objects (except those objects designated to remain) down to the existing ground level, plus other work as described in this Section.
- B. The term "debris" includes all non-reusable materials.

1.03 JOB CONDITIONS

- A. General: Protect construction, vegetation, bench marks and monuments in areas to remain undisturbed until Final Completion. Leave in as good condition as found. Protect all trees not designated to be removed.
- B. Special controls: Refer to Section 01 50 00

PART 2 PRODUCTS (As noted in the Drawings or Specified in Section 31 20 00 Earthwork)

PART 3 EXECUTION

3.01 PREPARATION AND SITE INSPECTION

- A. Notify Project Manager at least 2 full days prior to starting Work of this Section.
- B. Inspect entire site and all objects to be removed and to be preserved; determine all requirements for disconnection, capping or protection of existing utilities, as applicable.

3.02 Permits and Protections

- A. Remove materials using proper methods. Comply with Oregon DEQ. Obtain proper permits for removal, transportation, and disposal. Permits must be obtained by the contractor or their sub-contractor.
- B. Maintain a copy of disposal permits and dump records for all materials requiring disposal permits
- C. Specific care must be taken not to contaminate the interior of the existing building space with Asbestos, lead base paint or other hazardous materials.

3.03 DEMOLITION

Remove all existing construction designated to be removed or required to be removed for the completion of the Work.

3.04 CLEARING AND GRUBBING

Completely clear areas to be occupied by structures, fills or other improvements indicated on the Drawings, and scalp to remove all roots, grass, and other debris. Remove all stumps and roots to a depth of 18", and treat remaining ends of such stumps and roots over 3" in diameter with herbicide to prevent regrowth. Remove trees only where so noted on the Drawings.

3.04 DISPOSAL OF DEBRIS

Remove from site and legally dispose of all debris unless otherwise noted on the Drawings.

END OF SECTION

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE:

General and Supplementary Conditions, Division 1, and accompanying Drawings.

31 10 00 CLEARING AND GRUBBING

03 30 00 CAST IN PLACE CONCRETE

1.02 WORK INCLUDED BUT SUBJECT TO COST ADJUSTMENTS:

A Rock:

1. Definition: All material which by actual demonstration cannot in the Owner's representative's opinion, be reasonably excavated with a 3/4 yard manufacturer's rated backhoe equipped with a general duty ripper and rock points, or similar approved equipment and which is, in fact, systematically drilled and blasted.
2. Reimbursed Expense: Should rock, as defined herein, be encountered Owner will pay extra for removal and take credit for Earth Excavation omitted, in accordance with the General Conditions.
3. Volume: The volume of rock for which the Owner will pay extra will be defined as that which is within the required vertical depth of the excavation and 1'-0" on either side of the footing. No payment shall be made for any method of rock removal other than systematic drilling and blasting. If material which would be classified as rock as defined above is mechanically removed with excavating equipment of a larger size than specified above, it shall be understood that any added costs for the removal of material by this method shall be included in the unit price for common excavation.

B Quicksand and Plastic Soils:

1. Definition: Soft, loose, or wet ground that is incapable of supporting material, equipment, personnel, or structure.
2. Reimbursed Expense: Should quicksand or plastic soils, as defined herein be encountered, which are not indicated in the Contract Documents, Owner will pay extra for dewatering or removal in accordance with the General Conditions.

C Buried objects:

Should Wells, Cisterns, Tanks, Cesspools, etc., be encountered, which are not indicated in the Contract Documents, the Owner will pay extra for removal or filling as directed by the Project Manager, in accordance with the General Conditions.

D Contract Quantities:

Drawings indicate contract quantities; adjustments will be made for variations in accordance with the General Conditions.

1.03 TESTING

A. Soil Bearing:

1. Notify Engineer when excavations are complete.
2. Do not begin fills, formwork or concrete work until Engineer approves.
3. Engineer may order tests at Owner's expense.

B Compaction:

1. Definition: Ratio expressed as percentage of dry density of material compacted in field to maximum dry density of same material as described by ASTM D1557-70 or AASHTO T180.
2. Compaction tests taken when and where directed by Engineer.
3. Tests paid for by Owner if test results indicate specified compaction has been achieved, otherwise tests paid for by Contractor.

1.04. PROTECTION AND CONTROLS: Refer to Section 01 50 00.

PART 2 PRODUCTS

2.01 FILL MATERIAL

- A General: All fill material is subject to Engineer's approval.
- B Bar-Run Gravel:
1. Round water-worn, washed, sound, durable, uniform, evenly graded Rock free of soft, friable, thin, elongated, or laminated pieces, disintegrated material, organic matter, oil, alkali, clay, or other deleterious substances.
 2. Size: Minimum-Not more than 10% passing a No.8 sieve; Maximum-specified below.
- C Crushed Rock or Crushed Gravel:
1. Washed, sound, durable, uniform, evenly graded Rock free of soft, friable, thin, elongated, or laminated pieces, disintegrated material, organic matter, oil, alkali, clay, or other deleterious substances.
 2. Mechanically crushed with at least 80% of particles fractured on 2 faces, and maximum of 5% of particles unfractured.
 3. Size: Minimum-Not more than 5% passing a No.8 sieve; Maximum-specified below.
- D Gabion Rock and Rip-Rap: Not required
- E Drain Rock:
1. Round water-worn, washed, sound, durable, uniform, free of soft, friable, thin, elongated, or laminated pieces, disintegrated material, organic matter, oil, alkali, clay, or other deleterious substances.
 2. Size: 1.1/2" - 3/4" size.
- F Sand:
Fine granular material, naturally produced by rock disintegration and free from organic material, mica, loam clay, and other deleterious substances.
- G. Topsoil:
Fertile, friable, natural loam, free of subsoil, stones, clay chunks, seeds, roots, noxious weeds, and approved by Engineer. Soil amendments other than those specified herein are Contractor's responsibility prior to approval of topsoil. Submit representative sample.

2.02 OTHER MATERIALS

- A. Moisture barrier: Sisalkraft "Moistop" or approved reinforced waterproof craft paper.
- B. Soil Cloth (Referred to as "Filter Fabric", and "Geotextile Fabric" in the drawings)
- 1 Non-woven, heat fused, 100 percent polypropylene stable fiber, freely permeable to moisture transmittal.
Minimum nominal weight 5-oz per sq.yd; Dupont "Tyvar 3601" or approved.
- C. Mulch: Ground bark, aged, no chunks permitted, size to prevent wind erosion.

PART 3 EXECUTION

3.01 PREPARATION

Prior to starting work of this Section, verify that site clearing has been properly completed and existing grades agree with Drawings. Notify General Contractor of defects requiring correction, and do not start until conditions are satisfactory.

3.02 EXCAVATION

- A General:
1. Excavate as necessary for Work shown on Drawings or specified.
 2. Remove rocks, pavements and other obstructions as required.
 3. Allow ample space for formwork and Utility trenching.
 4. Leave bearing surfaces undisturbed, true and level.
 5. Shore, brace, sheet and slope excavations to prevent caving, erosion, danger to persons and structures or interference with construction operations as required to comply with safety laws.
 6. Repair slides and cave-ins should they occur.

7. Remove shoring before backfilling.
- B Topsoil:
1. Before excavating topsoil, remove any vegetation, sticks, clods, rocks larger than 1-1/2 inches, excessive gravel, and debris.
 2. Stockpile topsoil for reuse on site where directed.
- C Depth of Excavations:
1. Excavate to solid bearing at elevations no higher than shown on Drawings.
 2. Notify Engineer if adequate solid bearing is not reached.
- D Temporary Stockpiling:
- Locate in area indicated in Drawings or at location approved by Owner, at least 2 feet away from trench edges. If stockpiles are to remain during rainy periods, grade and cover as required to prevent compaction, erosion, and water infiltration.
- E Excess Excavation:
1. Should excavation, through error, be carried to elevations lower than those shown on the Drawings, fill at Contractor's expense.
 2. Fill under footings with concrete as required.
 3. Fill under slabs with compacted gravel, or crushed rock as required.
- F Water and Frost:
1. Keep earth under footings free from frost.
 2. Provide and operate pumping equipment, and provide temporary drainage structures as required to keep excavations free from standing water.
 3. Should bearing surfaces be softened by water or frost, re-excavate to solid bearing and fill as specified for excess excavation.
- G. Excess Material:
- Unless otherwise noted on the Drawings, remove excess excavated and fill materials from site and legally dispose.

3.03 FILLING AND COMPACTION

- A. Subgrade Preparation:
1. Do not place fill or backfill until forms, debris and decayable materials have been removed, waterproofing measures completed and areas approved by the Engineer.
 2. Scarify areas to receive fill or backfill to 6 inch depth and until surface is free from ruts or other uneven features. Disc or blade scarified surface until free from large clods.
 3. Bring scarified material to proper moisture content and compact to specified density.
 4. If the above specified conventional methods cannot achieve specified compaction for subgrade, consult the Engineer. The intent is to provide an even dense surface below the specified minimum fill depth. Cost adjustments for variations in excavation and fill, or in procedures required by the Engineer to obtain acceptable subgrade conditions, shall be made in accordance with the General Conditions.
- B Fill and Compaction Sequence:
1. After subgrade compaction has been approved by the Engineer, install specified geotextile fabric over subgrade, lapping all edges 36 inches.
 2. Over geotextile fabric spread approved fill material in layers not exceeding 8" in uncompacted depth.
 3. Water or aerate fill material as necessary, and thoroughly mix to obtain moisture content to permit proper compaction.
 4. Compact each layer to specified minimum degree and repeat compaction process until plan grade is attained.
- C Density Requirements:
1. Subgrade and Fills under slabs, paving, and foundations 95 percent.
 2. Subgrade and Backfill against walls for full depth and width 95 percent
 3. Other fills 90 percent.
 4. Compact topsoil and mulch only as required to minimize settlement.

- D. Fills Under Interior Slabs:
1. Base Layer on compacted subgrade: 6" minimum depth, crushed rock 1-1/2" minus size.
 2. Top Layer: 2" minimum depth, gravel 3/4" minus size.
 3. Moisture Barrier: Cover top layer with Moisture Barrier; lap 6" at joints.
- E. Fills Under Exterior Slabs:
Base Layer on compacted subgrade: 6" minimum depth, crushed rock 1-1/2" minus size. No Top Layer, Moisture Barrier, or Sand Bed required.
- F. Fills Against Walls:
1. Where walls are Damproofed: fill against wall and around drain tiles with approved 1-1/2"-3/4" size drain rock, to within 8" of final grade, and 24" minimum out from face of wall, remainder of fill same as for fill against other walls. Lay continuous blanket of approved filter fabric in trench prior to installing drain rock. Fold filter fabric over drain rock prior to final backfill to create continuous separation between drain rock and adjacent earth cut and backfill materials.
 2. Other Walls: Fill with approved material from excavations or with approved imported fill.
- H. Other Fills:
Unless otherwise noted on the Drawings, fill with approved materials from site or from approved local source, allowing for required finish grading materials.

3.04 GRADING

- A. General:
1. Contractor responsible for grading and staking shall verify all grades prior to starting grading and when finish grading is completed, to insure proper drainage.
 2. Should site conditions, elevations or slopes conflict with elevations shown on the Drawings, consult the Engineer prior to beginning grading operations.
 3. Grade entire area to smooth, level or evenly sloped uniform surfaces between elevations indicated on Drawings.
 4. Allow for specified finish grading materials and fills.
 5. Round abrupt changes in slope.
 6. Slope ground away from building walls and to insure water is conducted to area drains, gutters, etc.
 7. Refill to required levels, any areas which settle within warranty period.
- B. Finish Grading
1. Remove rocks or clods over 1" in largest dimension, and all sticks and twigs.
 2. Machine drag where possible, otherwise hand rake.
 3. Do no finish grading when moisture content is such that soil balls or clods.
 4. Hold finish grade approximately 3/4" below top of walks and curbs, unless noted otherwise on the Drawings.
- C. Topsoil and Mulch placement and Grading:
1. If subsoil has not been freshly graded, scarify at least 4 inches deep.
 2. Place Topsoil approximately 6" deep in lawn and planting areas.
 3. Place Mulch approximately 6" deep in planting areas over topsoil.
 4. Roll and tamp lightly to prevent wind erosion and future settlement.
 5. Remove stones and clods larger than 3/4" and all sticks and twigs.
 6. Leave surfaces ready for soil preparation by Landscaper.

END OF SECTION

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. The Contractor shall maintain and construct temporary erosion control structures as necessary to prevent erosion.

1.02 EROSION CONTROL REQUIREMENTS

- A. Prior to any construction activity, provisions shall be made for the interception of all potential silt-laden runoff that could result from construction activity. Interception shall preclude any silt-laden runoff from discharging from the proposed construction to downstream properties. Specific laws, ordinances and resolutions regarding pollution prevention and natural resource preservation that may affect this project include, but are not limited to, the following:
 - 1. Federal Clean Water Act
 - 2. ORS 468-740 and OAR 340-41-455 (3)
- B. Contractor shall obtain an Erosion Control Permit and shall comply with all permit provisions, when required by local jurisdiction having regulatory authority.

PART 2 PRODUCTS

2.01 BIOFILTER BAGS

- A. Provide minimum size 18" x 6" x 30" plastic mesh bags with ½" openings filled with approximately 45 pounds of clean, 100% recycled wood-product waste.

2.02 SAND BAGS

- A. Provide 24" x 12" x 6" durable, weather-resistant, tightly woven bags sufficient to prevent leakage of filler material. Fill bags with at least 75 pounds of firmly packed fine aggregate 3/8" minus or 3/8" to 3/16" pea gravel.

2.03 SEDIMENT FENCE

- A. Provide prepared fence with integral 2 x 2 wood stakes. Embed base of fence in soil to block sediment passage.

2.04 OTHERS

- A. Provide other products and materials as necessary for a successful ESCP.

PART 3 EXECUTION

3.01 GENERAL

- A. All erosion control products and materials shall be installed in accordance with the manufacturer's recommendations and shall conform to the requirements of applicable permits.
- B. Maintain all erosion control and sediment prevention elements to ensure that no sediments are allowed to leave the construction area. Make necessary adjustments to the erosion control plan throughout the project as required.
- C. Inspect erosion control elements at least once every 7 days, but within no more than 24 hours in the event of a significant rainfall event. Correct any deficiencies immediately upon discovery.

- D. All sediment barriers shall remain in place for the duration of work and shall be removed after surface restoration and cleanup has occurred.

END OF SECTION