Project Manual for:

Renovation of Existing Townhomes

for

West Birch Estates

W Branch Street
Princeton, MN

Commission Number: 616-18

Original Issue
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Blumentals Architecture

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DIVISION 00

1. PROJECT IDENTIFICATION: West Birch Townhomes is a 24 unit complex.
   1.1. Project Address: W Birch Street Princeton, MN
   1.2. Four (4) two-story townhomes, including:
      a) (8) 2-bedroom / 1-bathroom
      b) (8) 2-bedroom / 2-bathroom
      c) (8) 3-bedroom / 2-bathroom
2. GENERAL CONDITIONS: The AIA A201, General Conditions of the Construction Contract, shall be included as reference for this project. All criteria, provisions, definitions and articles shall be adhered to. The Architect will provide a copy of the A201 to the Contractor upon written request.
   2.1. Reference Section 00 73 00 Supplementary Conditions for amendments. These Supplementary Conditions amend and supplement the General Conditions defined in the AIA A201, General Conditions and other provisions of the Contract Documents as indicated. Provisions that are not so amended or supplemented remain in full force and effect.
3. EXISTING CONDITIONS
   3.1. The Contractor is required to become familiar will all existing conditions of the site. The Contractor should verify all dimensions, existing conditions, and existing electrical, mechanical, plumbing, utility and all other site conditions and notify the Architect of any discrepancies before proceeding with the work or Contract. Any discrepancies found must be immediately brought to the attention of the Architect and Owner in writing.
   3.2. Prior to contracting for or beginning construction of each portion of the work the Contractor is required to carefully verify the Contract Documents and any supplemental information provided by the Owner against the existing conditions and notify the Owner and Architect in writing of an discrepancies. Any remediation of said work begun or completed shall be performed to the satisfaction of the Owner, and Architect by the Contractor at no additional cost to the Owner.
4. CONTRACTOR'S DUTIES
   4.1. Provide and pay for: labor, materials, and equipment; tools, construction equipment, and machinery; and water, heat and utilities required for construction.
   4.2. Pay legally required sales, consumers and use taxes.
   4.3. As applicable at the time of receipt of bids, secure and pay for permits, fees, and licenses necessary for execution and completion of the work.
   4.4. Give required notices.
   4.5. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities, which bear on performance of work.
   4.6. Enforce strict discipline and good order among employees. Do not employ unfit persons or persons not skilled in assigned task.
   4.7. Obtain all required government, utility companies and other agency approvals for layout, equipment, etc.
   4.8. Coordination of work with other trades and prompt notification of requirements affecting execution of work.
   4.9. Scheduling, material purchase, installation lead time, Sub-contractor or interdisciplinary coordination, determining working hours, and complete installation of any appliance or materials necessary for the proper operation of all items, including coordinating work with Owners vendors/Contractors who are under separate Contract, shall be the responsibility of the Contractor. Any uncoordinated issues shall be brought to the attention of the Architect prior to finalizing the Contract with the Owner.
   4.10. Provide storage containers for all construction materials. Contractor to ensure that all materials

are stored in a suitable place and in an orderly fashion for the project. Coordinate exact location with the Owner.

4.11. Construction signage and barricades for the work within the right-of-way shall conform to the latest revisions of the Manual of Uniform Traffic Control Devices. This work shall be at no additional cost to the Owner.

4.12. The Contractor shall provide all supervision, tools, material, labor, services, transportation, etc. necessary for completion of the work as it is intended, shown and/or described.

4.13. Contractor is not to proceed with any work that will alter the Contract Sum or Construction Schedule without the written consent of the Owner and Architect of the Change Order price or length of time proposed by the Contractor to complete such work. Work completed without prior written approval may be required to be remedied or removed at the discretion of the Owner and Architect without additional cost to the Owner.

4.14. No alcoholic beverages or substances, abusive or profane language, or other disruptive or illegal activities will be tolerated.

4.15. Prior to ordering and installing equipment the Contractor shall verify that clearances required for the proper, warrantied installation of new equipment is either existing or is included in the scope of new work to be performed. If required dimensional clearances are not met in existing locations or are illustrated in the scope of new work the Contractor shall inform the Architect immediately in writing.

5. Any appliances or materials obviously part or required by the manufacturer of any electrical, mechanical, plumbing, sprinkler and/or alarm work and necessary for its proper operation, although not specifically mentioned or shown on the drawings, shall be furnished and installed by the Contractor without additional cost to the Owner.

6. Items depicted as new and/or called out with the words "new", "provide", "complete", "paint", "finish" and/or "install" denote the Contractor is to purchase and fully install/complete the specified or said item/work, as well as the manufacturer recommended accessories and procedures for the proper installation and operation of said item/work for the project scope of work at no additional cost to the Owner. All items shown on the plans are to be new, provided and completely installed by the Contractor unless explicitly stated otherwise.

7. LOW VOLTAGE: All telephone, cable and data work is to be coordinated by the Contractor with the Owner.

8. FURNITURE: All new furniture is not in contract. Contractor to coordinate w/ Owner’s furniture supplier for all electrical, mechanical, logistical, storage, etc. requirements if requested by Owner.

9. PERMITS: The Contractor is responsible for the completion and filing of all required permits and related fees as part of the Contract. The Owner will reimburse for the cost of permit fees.

10. INSPECTIONS: All requests for clarification or for additional design requirements from the inspecting official shall be provided to the Architect in writing.

11. SPECIFICATION FORMATS AND CONVENTIONS: Specification Format: The Specifications are organized into Divisions and Sections using the 2004 CSI/CSC's "Master Format" numbering system.

12. CONTRACT DOCUMENTS: Consist of any or all of the items listed in AIA Document A201 General Conditions of the Contract for Construction, Article 1.1.1.

13. HIERARCHY OF DOCUMENTS: In the case of a conflict between the drawings, notes and specifications the most stringent requirement shall apply.

14. Blumentals / Architecture is the sole interpreter of the Contract Documents and performance in any dispute among Owner and Contractor as it pertains to life safety, code or aesthetic issues.

15. DIMENSIONS: Unless noted otherwise, interior dimensions are from face of finished wall to face of finish wall.

16. SCOPE OF WORK: These Drawings and Specifications indicate general scope of work and design intent only. The Contractor shall visit the site, review construction conditions and, prior to starting work,

shall verify all dimensions shown on the Drawings, site conditions, and requirements for the project.

16.1. The intention of the Drawings is to provide for work complete in every detail even though every item involved may not be shown or mentioned in particular.

16.2. Variations or ambiguities between these Drawings and actual site and construction conditions shall be brought to the attention of the Architect in writing and shall be resolved and documented by the Contractor in writing prior to starting construction. Otherwise the Contractor shall perform his work in accordance with the most stringent notation or requirement to properly and functionally execute the work as part of his contract.

16.3. It is assumed that the Contractor shall comply fully with all General Notes and Specifications. It is not the intent of the Owner or Architect to withhold information and any reasonably discoverable items should be brought to the attention of the Owner and Architect prior to contracting. The Contractor is responsible for any deficiencies in the work performed by any of the Contractor's employees including but not limited to proper oversight, installation, execution and field verification, etc. of the work and existing conditions.

17. QUANTITIES: Contractor to verify all quantities required for the Project's whole and complete Scope of Work. Any discrepancies shall be brought to the Architect's attention prior to submitting a bid.

18. SITE SUPERINTENDENT: The General Contractor shall provide a full-time site superintendent. The site superintendent shall be a representative of the General Contractor, shall be present on site during all construction activities, and shall not be provided through any Subcontractor. The site superintendent's role shall be supervisory in nature, and shall not include day-to-day performance of construction activities. A 24-hour contact phone number shall be provided by the Contractor to the Owner and Architect at the time of award of Contract.

19. CONSTRUCTION CLEANUP: All construction-related debris and tools shall be kept clear of required ingress/egress walkways, corridors, drive aisles that are used for access to the site and work areas. Cleanup shall occur in a timely fashion throughout the day, and in all cases, shall be completed at the end of each working day. Final cleanup shall occur before unit and/or building turnover, and a final project cleanup shall occur at the completion of the project.

20. ATTIC STOCK: Any remaining portions of finishes that were not used as part of the work shall be given to the Owner. Contractor to include an additional 5% of all other materials in each finish/texture/sheen/thickness.

21. WARRANTY: All Contractors work shall be guaranteed against defects for a period of (1) year from the date of substantial completion or if Substantial Completion date is not issued then at the date of issuance of Certificate of Occupancy. Any portion of the Contractor's work which develops defects during that time, shall be replaced or repaired in a manner satisfying to the Owner.

22. INSURANCE: All Contractors engaged in this project are to carry proper workman and construction liability insurance, and are to file proper insurance certification when requested by the Owner.

23. ACCESSIBILITY

23.1. One (4) Units shall comply with 2010 ADA ANSI 117.1.

23.2. One (1) Unit shall comply with 2010 ADA ANSI 117.1 Chapter 7 requirements for visual and hearing impaired.

24. ACCESSIBILITY COMPLIANCE: It is the intention for all work within the identified accessible/ADA/UFAS units and common areas to be in compliance with the governing accessibility regulations. Please reference the Building Code Data on sheet A001 and Financing Requirements below for applicable codes.

24.1. Items include, but are not limited to, electrical switches, outlets and control devices, thermostats and environmental controls, plumbing fixtures, counters and work surfaces, doors and windows including hardware, walls, stairs, ramps, lifts and elevators including controls, common amenities such as washers, dryers and mailboxes.

24.2. New items shall be installed in compliance with the governing accessibility code.

24.3. Reference the typical accessibility mounting heights and clearances within the contract documents for new fixture/device/control locations. If an item is not specifically detailed, contact the architect ahead of installation for the applicable location.

24.4. Reference Concrete Paving 32 13 13 specification for replacement of concrete sidewalks scope, site verification and slope design limits.

25. ENERGY REBATE AND TAX CREDIT: Contractor to provide assistance, submittals, cut sheets, applicable forms for all energy rebate and/or tax credit applications as requested by the Owner as part of the base bid.

25.1. All Local and State sales taxes are eligible for and exemption. The Contractor is to coordinate with the Owner in order to document all required information to remain eligible. If the Contractor fails to coordinate with the Owner and comply with the requirements of the tax exemption, the Contractor is responsible to pay all applicable taxes are no additional cost.

26. FINANCING REQUIREMENTS: The intention of this renovation is to comply with building codes and the physical building requirements of applicable fair housing laws. If the Contractor becomes aware that any of the following criteria may not be met by the Project's Scope of Work the Architect and Owner shall be immediately notified in writing.

26.1. The Section 8 Housing Quality Standards for Existing Housing contained in 24 CFR 982.401 (https://www.law.cornell.edu/cfr/text/24/982.401)

26.2. Lead-Based Paint Regulations issued by the U.S. Department of Housing and Urban Development pursuant to the Lead- Based Paint Poisoning Act. (https://www.law.cornell.edu/uscode/text/42/chapter-63)

26.3. The Americans with Disabilities Act (42 U.S.C. § 12101) (http://finduslaw.com/americans-disabilities-act-1990-ada-42-us-code-chapter-126)

26.4. Fair Housing Amendments Act of 1988 (42 U.S.C. 3604 (f)(3)(C)(iii)

a) All premises within such dwellings contain the following features of adaptive design: an accessible route into and through the dwelling; light switches, electrical outlets, thermostats, and other environmental controls in accessible locations; reinforcements in bathroom walls to allow later installation of grab bars; and usable kitchens and bathrooms such that an individual in a wheelchair can maneuver about the space.

26.5. Section 504 of the 1973 Rehabilitation Act and all regulations and promulgations there under. (https://www.dol.gov/oasam/regs/statutes/sec504.htm)

26.6. Clean Air Act, specifically 40 CFR Part 82, Subparts A and F

26.7. Air Conditioning Contractors of America (ACCA) Manuals, Part J and S, or ASHRAE handbooks for all HVAC design.

26.8. 2015 Enterprise Green Community Criteria

26.9. 2017 Minnesota Housing Multifamily Rental Housing Design/Construction Standards

26.10. 2017 Minnesota Housing Architect's Guide

27. OWNER SUPPLIED REPORTS: As part of this Project the following documents are included as part of the Owner's requirements of the Contractor:

27.1. PHASE 1 environmental site assessment, prepared by Braun Intertec, dated February 16, 2018

28. AIR QUALITY REQUIREMENTS: At a minimum VOC limitations shall be set for by the following criteria:

28.1. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.

28.2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

28.3. SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

28.4. SEALANTS: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.

29. SOUND TRANSMISSION REQUIREMENTS:

29.1. The contractor shall verify that the STC and IIC requirements listed below will be met as a minimum. Include an allowance in the base bid for acoustic testing.

29.2. All walls and floor-ceiling assemblies between dwelling units and all other interior spaces shall be constructed to have a sound transmission class (STC) of not less than 50 for air-borne noise when tested in accordance with ASTM E90.

29.3. In addition to the above STC requirement, all floor-ceiling assemblies between dwelling units and all other interior spaces shall be constructed to have an impact insulation class (IIC) of not less than 50 when tested in accordance with ASTM E492.

29.4. All wall and floor-ceilings assemblies separating dwelling units from any other interior space shall include acoustic sealant at the following locations before any tape, spackle, molding or trim is installed: below the sill plate; around the perimeter of walls, floors and ceiling; between the seams of drywall sheets; around electric boxes, around recessed lights; around windows and doors.

29.5. Penetrations or openings in any construction separating dwelling units and any other interior spaces for piping, electrical devices, recessed cabinets, bathtubs, soffits or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required STC and IIC ratings.

29.6. Reference the door schedule for additional STC requirements. All dwelling unit entry doors shall be tight fitting to the frame and sill/threshold.

30. PRE CONSTRUCTION MEETING:

30.1. Before major work is to begin, the Contractor is required to hold an on-site preconstruction meeting with representatives from the Owner, Architect, General Contractor and any Sub-Contractor pertaining to a major portion of the work, in particular those performing work on the exterior envelope.

30.2. Agenda to include:

a) List of key personnel from property management, contractor super intendent, owner’s rep, architect and other consultants.

b) Submittal quality, labeling, compliance form, information to be included, distribution and deviation from specified materials.

c) Request For Information (RFI) quality and procedure.

d) Electronic submittal service, access, distribution, responsible parties and deadlines.

e) Sustainable design features, codes and standards to follow, and submittal requirements.

f) Pay applications, change order procedure and draw schedule.

g) Construction meeting schedule, minutes by Contractor, 3-week look ahead.

h) Punch list procedure and responsible parties.

i) Certificate of Substantial Completion requirements and anticipated date for issuance.

j) Project close out procedure, required documents and de-mobilization schedule.

k) Site access, staging areas, hours of operation, and construction keys.

31. REQUIRED BONDS:

31.1. PERFORMANCE BOND REQUIREMENT:

a) To protect Minnesota Housing's and the owner's interest, the general contractor must submit:

b) On Minnesota Housing's Performance Bond form, a 100% Performance Bond (Dual Obligee) each in draft form, in amounts equal to the gross construction cost for review and approval prior

to closing.

c) A limited partner investor or member investor cannot be listed as an Obligee on the bond or bond rider.

d) Minnesota Housing requires one pen and ink fully executed original Performance Bond, dated the date of closing, delivered at closing.

e) If there is a HUD-insured first mortgage loan closing simultaneous with Minnesota Housing's loan(s) then Minnesota Housing will accept HUD's form of performance bond and Minnesota Housing must be listed as a lender-obligee on HUD's form of performance bond

31.2. PAYMENT BOND REQUIREMENT:

a) To protect Minnesota Housing's and the owner's interest, the general contractor must submit:

b) On Minnesota Housing's Payment Bond form, a 100% Payment Bond each in draft form, in amounts equal to the gross construction cost for review and approval prior to closing.

c) A limited partner investor or member investor cannot be listed as an Obligee on the bond or bond rider.

d) Minnesota Housing requires one pen and ink fully executed original Payment Bond, dated the date of closing, delivered at closing.

e) If there is a HUD-insured first mortgage loan closing simultaneous with Minnesota Housing's loan(s) then Minnesota Housing will accept HUD's form of payment bond and Minnesota Housing must be listed as a lender-obligee on HUD's form of payment bond.

31.3. NDC (INVESTOR) REQUIREMENT:

a) 100% Payment and Performance Bonds

b) Naming NDC CEF as dual obligee

32. BID FORM AND OTHER REQUIRED DOCUMENTS: Contractor is to provide a bid in the form as per Section 00 41 00, in conjunction with all terms and conditions defined in AIA A701-1997 and include the following:

32.1. Values and other information input on Section 00 41 00 Bid Form

32.2. Values input on Section 01 23 00 Schedule of Alternates

32.3. Values input on Section 01 21 00 Schedule of Allowances

32.4. Substitution requests being requested by the Bidder as allowed per this project manual

32.5. Schedule of Values (SOV) on form AIA G703-1992 Continuation Sheet or other similar SOV

32.6. MHFA Contractor Compliance Form

32.7. MHFA Performance Bond

33. FIRE EXTINGUISHERS: Are to be provided new or relocated by the Contractor and placed/mounted in accordance with all codes and the local fire code official's direction. Contractor to coordinate final locations with the AHJ.

34. SMOKE/HEAT ALARMS: Units in compliance with UL 217 are to be provided and installed as per NFPA 101 by the Contractor as part of the Contract price in the following locations as a minimum; 1) Smoke detectors shall be installed in all common areas and work spaces outside the living unit, such as exit stairs, egress corridors, lobbies, storage rooms, equipment rooms, and other tenantless spaces in environments that are suitable for proper smoke detector operation. 2) Heat detectors shall be located within each room of the living unit. Alarms shall be audible and interconnected in such a way that the actuation of one alarm will activate all alarms. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

35. CARBON MONOXIDE ALARMS: Units in compliance with UL 2034 are to be provided and installed by the Contractor as part of the Contract price outside each separate sleeping area in the immediate vicinity

of the bedrooms as a minimum as per the manufacturer's recommended height above finished floor.

36. FIREBLOCKING: As required by the AHJ, fire blocking shall be installed to cut off concealed draft openings, both vertical and horizontal, and shall form an effective barrier between floors, attic, roofs, etc. All fire stopping shall be installed as per the requirements set forth in the "fireblocking" section of the latest edition of the International Residential Code (R302.11).

    36.1. FIREBLOCKING MATERIALS: Shall consist of at least (2) layers of 5/8" type "X" gypsum sheathing with all overlapping sheet joints staggered or (1) layer of 2" (nominal) lumber or (1) layer of 3/4" particle board with joints backed by 3/4" particle board and all intersecting edges properly fire caulked with a joint not exceeding the manufacturer's recommended maximum or minimum.

    36.2. FIREBLOCKING LOCATION: shall be installed, at a minimum, in concealed wall spaces vertically at the ceiling and floor levels, horizontally at intervals not exceeding 10 feet, at the top and bottom of stair stringers, at interconnections between concealed spaces, at all openings in fire rated construction, around all vents, pipes, ducts, chimneys, or other penetrations, beneath architectural trim, and within concealed wood sleeper spaces. All fireblocking shall be included as part of the base Contract and shall be provided by the Contractor to the satisfaction of the Construction Code Official and the Architect at no additional cost to the Owner.

37. DRAFTSTOPPING: As required by the AHJ draftstopping shall be installed to restrict the movement of air within open spaces of concealed areas of building components such as, but not limited to, crawl spaces, floor and ceiling assemblies, roof and ceiling assemblies, attics, soffits, eaves, mansards, overhangs, etc. And shall be placed so that, at minimum, the space is divided equally.

    37.1. DRAFTSTOP MATERIALS: Shall consist of not less than 1/2" gypsum board, 3/4" structural wood panels, 1" nominal lumber, or other materials approved by the latest edition of the International Residential Code installed in a manner to maintain the integrity of such materials.

    37.2. DRAFTSTOPPING LOCATION: shall be installed within combustible construction where there is usable space both above and below the concealed space of a floor-ceiling assembly. Draftstopping shall be installed so that the area of the concealed space does not exceed (1,000) square feet.

38. FIRE RATED CONSTRUCTION CONTINUITY: Vertical assemblies shall extend from the edge of the foundation or rated assembly below to the underside of the roof sheathing or rated assembly above and shall be securely attached thereto and at a minimum shall be fire-calked around all perimeter edges and all full and semi-recessed penetrations. Horizontal assemblies shall extend from exterior sheathing or rated assembly to exterior sheathing or rated assembly and at a minimum shall be fire-calked around all perimeter edges and all full and semi-recessed penetrations.

39. RATED PENETRATIONS: All penetrations semi-into or fully through any existing or proposed rated assembly shall be done so in compliance with Underwriters Laboratories for the required rating. Contractor to submit applicable UL assembly designs for all penetrations.

40. LOADS FOR RAILS, GUARDS AND FILL PANELS: All handrails and guards shall be designed to resist a linear load of 50 pounds per linear foot in accordance with Section 4.5.1 of ASCE 7. In addition, all handrails and guards shall be designed to resist a concentrated load of 200 pounds in accordance with Section 4.5.1 of ASCE 7. Intermediate rails (all those except the handrail), ballusters and panel fillers shall be designed to resist a concentrated load of 50 pounds in accordance with Section 4.5.1 of ASCE 7.

41. LOADS FOR GRAB BARS AND TUB/SHOWER SEATS: All shall be designed to resist a single concentrated load of 250 pounds applied in any direction at any point on the grab bar or seat as to produce the maximum load effects.

42. SHOP FABRICATED ITEMS: All Shop fabricated steel and structural wood items shall be designed by an engineer licensed in the jurisdiction where the project is located. Final signed and sealed drawings and calculations shall be prepared by the fabricator and submitted to the architect and engineer of record. Fabricated items shall include but not be limited to: roof and floor trusses, prefabricated wall panels, railings, columns, beams, headers, lintels, precast structural pieces, all connections, and any

other items fabricated off site.

43. SPECIAL INSPECTIONS: Chapter 17 of the IBC has specific requirements for special inspections, testing and structural observations. These special inspections are in addition to the inspections required by the Authority Having Jurisdiction (AHJ) and does not waive the requirement for the “normal” inspections conducted by the AHJ. The contractor is responsible for scheduling all “normal” inspections with the AHJ in the proper sequence and prior to concealment or proceeding with the work as required.

    43.1. Special inspections are to be made by Special Inspections Agencies approved by the AHJ and can include but are not limited to special inspectors, testing labs, and/or fabrication shops. The approved agencies must be employed by the Owner and coordinated by the Contractor.

    43.2. Field Discrepancies: Material and design discrepancies which are not resolved in a timely manner or are about to be incorporated into the work must be brought to the attention of the Professional of Record (POR) and the AHJ. Uncorrected field deficiencies observed by the special inspections agency must also be brought to the attention of the POR and AHJ.

    43.3. Special Inspections Agencies shall inspect, observe or test all work for which they are responsible, the approved construction documents, listed standards and nationally recognized testing methods. A special inspector shall be on site at appropriate times to observe construction operations that require continuous or periodic inspections per tables 1705.2.2, 1705.3, 1705.6, 1705.7 and 1705.8 of the IBC.

    43.4. Special Inspections Agencies should complete written reports for each inspection, observation or test and provide the report in a timely manner. The agency shall furnish these reports directly to the POR, the Owner and the Contractor. Agencies shall bring all non-conforming items to the immediate attention of the Contractor. If any such item is not resolved in a timely manner or is about to be incorporated into the work, the POR and AHJ shall be notified immediately.

    43.5. Special Inspection Agencies shall verify that the fabricator maintains detailed fabrication and quality control procedures that provide a basis for inspection control of the workmanship and the fabricator’s ability to conform to approved construction documents and referenced standards. The special inspector shall review the procedures for completeness and adequacy relative to the code requirements for the fabricator’s scope of work.

    43.6. Special inspections are not required where the work is done on the premises of a fabricator registered and approved to perform such work without special inspection. Approval shall be based upon review of the fabricator’s written procedural and quality control manuals and periodic auditing of fabrication practices by an approved special inspection agency. At completion of fabrication, the approved fabricator shall submit a certificate of compliance to the AHJ stating that the work was performed in accordance with the approved construction documents.

    43.7. The Contractor is responsible for notifying the Special Inspections Agencies regarding special inspections required by the IBC. Adequate notice shall be provided so that the agency has time to become familiar with the project. The Contractor is responsible for requesting all required special inspections as well as all “normal” inspections conducted by the AHJ.

    43.8. The Contractor is responsible for providing the Special Inspections Agencies with access to approved plans, specifications and approved shop drawings. The construction or work for which special inspection is required shall remain accessible and exposed for special inspection purposes until completion of the required special inspections.

    43.9. The Contractor is responsible for retaining at the job site all special inspections reports submitted by Special Inspections Agencies and providing these reports for review by the AHJ.

BID FORM – 00 41 00

THE PROJECT AND THE PARTIES

1. TO:

   1.1. West Birch Estates of Princeton, LP
   c/o Central Minnesota Housing Partnership
   37 28th Avenue North
   Suite 102
   St. Cloud, MN 56303

   1.2. Blumentals/Architecture Inc.
   1600 Marshall Street NE
   Suite #1
   Minneapolis, MN 55413
   Email: ryand@blumentals.com

2. For: **WEST BIRCH ESTATES TOWNHOME RENOVATION**

3. DATE: _____ (Bidder to enter Date)

4. SUBMITTED BY: (Bidder to enter Name and Address)

   _____
   Company Name

   _____
   Contact Person

   _____
   Address

   _____
   City, State, Zip

5. OFFER

   5.1. Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Contract Documents prepared by Blumentals/Architecture, Inc. for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Sum of:

   _____dollars

   ($_____), in lawful money of the United States of America.

   5.2. We have included the required security deposit as required by the Instruction to Bidders.

   5.3. We have included the required performance assurance bonds in the Bid Amount as required by the Instructions to Bidders.

   5.4. The cost of the required performance assurance bonds is _ _____ _dollars ($_____), in lawful money of the United States of America.

   5.5. All applicable Federal, State, and Local taxes are included in the Bid Sum.

   5.6. The Payment and Performance Bond of ($_____) is included in the above Bid Sum.

5.7. The Builders Risk Insurance of ($_____) is included in the above Bid Sum.

5.8. The Building Permit of ($_____) is included in the above Bid Sum.

5.9. Contractor visited site on (_____) to review existing conditions.

6. ACCEPTANCE

6.1. This offer shall be open to acceptance and is irrevocable for sixty days from the bid closing date.

6.2. If this bid is accepted by Owner within the time period stated above, we will:

a) Execute the Agreement within seven days of receipt of Notice of Award.

b) Furnish the required bonds within seven days of receipt of Notice of Award.

c) Commence work within seven days after written Notice to Proceed of this bid.

7. CONTRACT TIME

7.1. If this Bid is accepted, we:

7.2. Propose to complete the work in _____ calendar days from Notice to Proceed.

8. UNIT PRICES

8.1. Provide unit prices for all items, material and labor as required in the contract documents, drawings, specifications, addenda and as per the Owner's instructions. The Contractor may provide these on a separate sheet behind this bid form.

9. ADDENDA

9.1. All Addenda as listed in the Schedule of Addenda listed in this project manual have been received. The modifications to the Bid Documents noted therein have been considered and all costs are included in the Bid Sum. Please initial and date here noting acceptance:

_____(initial), _____(date).

10. BID FORM SIGNATURE(S)

10.1. This proposal is submitted after careful study of the specifications, and from a personal knowledge of the conditions at the site and the existing buildings as they are currently.

10.2. The undersigned Bidder understands that the Owner reserves the right to reject any and all bids, to waive any and all informalities not involving the price, time or changes in the work and to negotiate contract terms with the successful Bidders, and the right to disregard all non-conforming, non-responsive, unbalanced or conditional bids. Also, Bidder understands that Owner reserves the right to reject the bid of any Bidders if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by Owner.

_____

(Signature)

_____

(Bidder - print the full name)

_____

(Bidder - Title)

_____

(Bidder - print the full name of your firm)

SUPPLEMENTARY CONDITIONS – 00 73 00

1. SCOPE AND INTENT: These Supplementary Conditions amend and supplement the General Conditions defined in the AIA A201, General Conditions and other provisions of the Contract Documents as indicated. Provisions that are not so amended or supplemented remain in full force and effect.

ARTICLE 1 - GENERAL PROVISIONS

1.2.1.1 Add: In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities:

.1 Modifications.

.2 The Agreement.

.3 Addenda, with those of later date having precedence over those of earlier date.

.4 The Supplementary Conditions.

.5 The General Conditions of the Contract for Construction.

.6 Division 1 of the Specifications.

.7 Drawings and Divisions 2-49 of the Specifications.

.8 Other documents specifically enumerated in the Agreement as part of the Contract Documents.

In the case of conflicts or discrepancies between Drawings and Divisions 2-49 of the Specifications, or within or among the Contract Documents and not clarified by Addendum, the Architect will determine which takes precedence in accordance with Sections 4.2.11, 4.2.12, and 4.2.13.

ARTICLE 2 – OWNER: No amendment is made

ARTICLE 3 - CONTRACTOR

Add Section 3.11.1 to Section 3.11:

3.11.1: Wherever manufacturer's printed specifications or instructions are by reference made a part of this specification, the Contractor upon demand shall furnish copies of such specifications or instructions to the Architect.

Add Section 3.12.11 to Section 3.12:

3.12.11: The Architect's review of Contractor's submittals will be limited to examination of an initial submittal and one (1) resubmittals. The Owner is entitled to obtain reimbursement from the Contractor for amounts paid to the Architect for evaluation of additional resubmittals.

ARTICLE 4 – ARCHITECT: Add Section 4.2.2.1 to Section 4.2.2:

4.2.2.1: The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for site visits made necessary by the fault of the Contractor or by defects and deficiencies in the work.

ARTICLE 5 – SUBCONTRACTORS: Add 5.5

5.5 SUBCONTRACTURAL AGREEMENTS WITH THE OWNER OR THE ARCHITECT

5.5.1 Nothing in any subcontractural agreement shall create any contractual relationship between the Owner or the Architect and any Subcontractor or Sub-subcontractor.

ARTICLE 6 - CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS: No amendment is made

ARTICLE 7 - CHANGES IN THE WORK: Add the following Section 7.1.4 to Section 7.1:

7.1.4: The combined overhead and profit included in the total cost to the Owner for a change in the Work shall be based on the following schedule:

.1 For the Contractor, for Work performed by the Contractor's own forces, 5 percent of the cost.

.2 For the Contractor, for Work performed by the Contractor's Subcontractors, 5 percent of the amount due the Subcontractors.

.3 For each Subcontractor involved, for Work performed by that Subcontractor's own forces, 10

percent of the cost.

.4 For each Subcontractor involved, for Work performed by the Subcontractor's Subsubcontractors, 10 percent of the amount due the Sub-subcontractor.

.5 Cost to which overhead and profit is to be applied shall be determined in accordance with Section 7.3.7.

.6 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and Subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are Subcontracts, they shall be itemized also. In no case will a change involving over $100 be approved without such itemization.

ARTICLE 8 – TIME: No amendment is made

ARTICLE 9 - PAYMENTS AND COMPLETION: Add the following Section 9.3.1.3 to Section 9.3.1

9.3.1.3 Until the Work is 100% complete, the Owner shall pay 95% of the amount due the Contractor on account of progress payments. It shall be clarified that 5% retainage will be strictly enforced for all subcontracts and suppliers regardless where particular construction activity occurs in the construction sequence.

ARTICLE 10 - PROTECTION OF PERSONS AND PROPERTY: No amendment is made

ARTICLE 11 - INSURANCE AND BONDS: Article 11 is deleted and substitute with the following:

11.1 CONTRACTORS INSURANCE

11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them by be liable:

11.1.1.1 WORKERS' COMPENSATION AND EMPLOYERS LIABILITY

.1 Coverage A: Per State Statute

.2 Coverage B: $100,000 Each Accident

$500,000 Disease - Policy Limit

$100,000 Disease - Each Employee

11.1.1.2 COMMERCIAL GENERAL LIABILITY

.1 $3,000,000 General Aggregate

.2 $1,000,000 Products - Completed Operations Aggregate

.3 $1,000,000 Each Occurrence

.4 $1,000,000 Personal Injury

THE COMMERCIAL GENERAL LIABILTY SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:

.5 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees.

.6 Claims for damages insured by usual personal injury liability coverage.

.7 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom.

.8 Claims for bodily injury or property damage arising out of completed operations (to be carried for a minimum of five years) and,

.9 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

.10 The Architect, Engineer and their consultants, and Owner shall be named as Additional Insureds.

.11 The General Aggregate shall apply on a Per Project basis.

11.1.1.3 COMPREHENSIVE AUTOMOBILE LIABILTY

.1 $1,000,000. Combined Single Limit Bodily Injury and Property Damage Each Accident

THE COMPREHENSIVE AUTOMOBILE LIABILITY SHALL PROVIDE COVERAGE FOR THE FOLLOWING AUTOMOBILES:

.2 All Owned Automobiles.

.3 All Non-Owned Automobiles.

.4 All Hired Automobiles.

11.1.1.4 UMBRELLA OR EXCESS LIABILITY

.1 $1,000,000 Each Occurrence

$3,000,000 Annual Aggregate

.2 THE UMBRELLA / EXCESS LIABILTY SHALL PROVIDE EXCESS LIMITS OVER AND ABOVE THE COMMERCIAL GENERAL LIABILITY, EMPLOYERS LIABILITY AND COMPREHENSIVE AUTOMOBILE LIABILITY LIMITS AS STATED IN THIS ARTICLE.

11.1.2 The insurance required by 11.1.1 shall be written for the limits specified or limits required by lay, whichever is greater. The coverage shall be maintained without interruption from date of commencement of the work until date of final payment and termination of any coverage required to be maintained after final payment and with respect to the Contractor's completed operations coverage, for a minimum of (5) years following final payment.

11.1.3 CERTIFICATES OF INSURANCE

Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates shall contain a provision that coverages afforded under the policies as required by this Section 11.1 will not be canceled, allowed to expire, or reduced in limits by endorsement until at least 30 days prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2.

11.1.4 The Contractor shall cause the Commercial General Liability coverage required by the Contract Documents to include the Owner, the Architect and the Architects Consultants as additional insureds for claims caused by the Contractor's negligent acts or omissions during the Contractor's operations or completed operations.

11.2 THE OWNERS LIABILTY INSURANCE

.1 In lieu of naming the Architect, Engineer and their consultants, and Owner as additional insureds, the Contractor at his own expense may purchase and maintain, during the life of the contract an Owners' Protective Liability policy with the Owner as insured.

.2 Such insurance shall be written with limits not less than:

$1,000,000 Each Occurrence

$3,000,000 Aggregate

.3 The Owners Protective Liability Insurance shall name as an additional insured the Architect, Engineer and their consultants.

PROPERTY INSURANCE

11.3.1 The Contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the project is located, property insurance written on builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries o such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-Subcontractors in the Project.

11.3.1.1 Property insurance shall be written on an "all risk" or equivalent form and shall include without limitation, insurance against the perils of fire (with extended coverage), and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, (where applicable), flood (where applicable), windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.

11.3.1.2 Any deductible amount which may occur as part of the Builders Risk policy shall be borne by the named insureds making claims in direct proportion as their individual losses bear to the total loss and the policy deductible will be no more then $25,000.

11.3.1.3 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

11.3.1.4 Such property insurance shall allow for partial occupancy by the owner prior to completion of the project.

11.3.1.5 Prior to any exposure to loss, the Contractor shall file with the Owner a certificate of insurance evidencing Builders Risk coverage. Such certificate shall require a 30 days advance written notice to the Owner should the policy be canceled or non-renewed.

11.3.2 BOILER AND MACHINERY

The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-Subcontractors in the Work, and the Owner and Contractor shall be named insureds.

11.3.3 LOSS OF USE INSURANCE

The Owner, at the Owner's option, may purchase and maintain such insurance as will insured the Owners against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractors for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

11.3.4 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site, the Owner shall waive all rights in accordance with the terms of Section 11.3.5 for damages caused by fire or other causes or loss covered by this property insurance. All such policies shall provide this waiver of subrogation by endorsement or otherwise.

11.3.5 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other and (2) the Architects, Architect's consultants, separate contractors described in Article 6, if any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Paragraph 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-

subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

11.3.6 The Contractor, as trustee, shall have power to adjust and settle any loss with the insurer unless one of the parties in interest shall object in writing within five days after the occurrence of loss to the Contractor's exercise of this power, and if such objection be made, arbitrators shall be chosen as provided elsewhere in the contract. The Contractor as trustee shall, in that case, make settlement with the insurer in accordance with the directions of the arbitrators. If distribution of the insurance proceeds by arbitration is required, the arbitrators will direct such distribution.

11.3.7 ADDITIONAL INSURANCE

The insurance set forth in these documents is the minimum insurance required. Any additional coverage that may be necessary to further protect the Contractor are the sole responsibility of the Contractor.

ARTICLE 12 - UNCOVERING AND CORRECTION OF WORK: No amendment is made

ARTICLE 13 - MISCELLANEOUS PROVISIONS: No amendment is made

ARTICLE 14 - TERMINATION OR SUSPENSION OF THE CONTRACT: No amendment is made

ARTICLE 15 - CLAIMS AND DISPUTES: No amendment is made

DIVISION 01

GREEN COMMUNITIES CRITERIA– 01 00 01

1. WORK COVERED BY THIS SECTION: Items have been included that meet criteria set by the Green Communities Criteria. These items are highlighted by placing a (GCC - item # - M) or (GCC - item # - O) before the item. The 'M' denotes mandatory items and the 'O' denotes optional items.
2. CONTRACTOR'S DUTIES: Coordination of work in this section with other trades. Provide all necessary documentation as required per all Mandatory and Optional Criteria Items. Certify the Green Communities Intended Methods Worksheet that all Criteria Items have been completed and incorporated into project at the end of construction
3. HIERARCHY OF DOCUMENTS: The complete set of documents in this set includes the Project Manual and the Drawing Set along with other miscellaneous documents referenced. When these items are in conflict with each other, discrepancies shall be brought to the attention of the Architect during the bid phase so clarifications can be made prior to bidding.
4. SCOPE OF WORK: This project is located in the State of Minnesota and shall follow the MN Overlay and Guide to the Enterprise Green Communities Criteria. This document modifies the "Mandatory" and "Optional" Criteria to better adapt them to conditions in our region and in conjunction with Minnesota Housing's Rental Housing Design/Construction Standards. This project has also been classified as New Construction per the MN Overlay and Guide to the Enterprise Green Communities Criteria.
5. AMENDMENTS TO OTHER PARTS OF THIS PROJECT MANUAL: Below are alterations and additions made to other sections of this Project manual. Items are titled under the specification section that is altered or amended. These modifications shall be in full effect for each of the specification sections listed below.

01 57 13 / TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. P1 GENERAL
  - 1. Summary
    - a. Related sections:
      - 1) Section 018113 Sustainable Building Requirements
  - 2. Submittals

a. Site Improvements
1) 3.2 Erosion and Sedimentation Control
(a) Submit photo documentation in accordance with 018113 under Criterion 3.2.

B. P3 EXECUTION
1. Execution Requirements
a. Site Improvements
1) 3.2 Erosion and Sedimentation Control
(a) Conform to execution requirements in accordance with 018113 under Criterion 3.2.

01 74 19 / CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

A. P1 GENERAL
1. Summary
a. Reduce construction and demolition waste on job site and minimize waste sent to landfills through implementation of Construction Waste Management Plan as required by Enterprise Green Communities criterion 6.12 and as outlined within this Section and in the Sections referenced herein.
b. Related sections:
1) Section 018113 Sustainable Building Requirements
c. All projects must commit to following a waste management plan that reduces non-hazardous construction and demolition waste through recycling, salvaging, or diversion strategies. Projects must meet the minimum requirements of at least one of the following Options, and may earn additional points for selecting additional pathways:
1) [Option 1]: Provide a waste plan that diverts at least 50%.
2. Submittals
a. Construction and Demolition Waste Management (CWM) Plan: Prior to any waste removal and within 30 days of Contract award, submit for approval a detailed CWM Plan in accordance with this Section:
1) Analysis of estimated job-site waste to be generated, including types and quantities of compostable, recyclable, and salvageable materials.
2) Description of means and methods to achieve the mandatory requirement documented under 1.1C.
3) Identification of recycling contractors and haulers proposed for use in the project and locations accepting construction waste materials or entities providing related services.
b. Waste Management Progress Reports: Submit monthly, concurrent with each Application for Payment.
1) Project title, name of party completing report, and dates of period covered by the report.
2) Amount (by weight or volume) of project waste material landfilled to date and identity of the landfill(s).
c. Final Waste Management Report: Submit at completion of construction and prior to contract close-out, in electronic format.
1) All information required in Waste Management Progress Reports.
2) Legible copies of on-site logs, manifests, weight tickets, and receipts.
3) Final calculations and/or summaries that demonstrate compliance with the mandatory and optional pathways chosen under Criterion 6.12 as detailed in Section 018113.

B. P3 EXECUTION
1. Waste Management Plan Implementation
a. Training and Coordination
1) Provide copies of approved CWM Plan to all on-site supervisors, each subcontractor, Owner, and Architect.
(a) Contractors, sub-contractors, and other entities responsible for implementing the CWM Plan must return a signed agreement stating that they will comply.
2) Instruction: Provide on-site instruction of appropriate separation, handling, recycling, salvage, reuse, and return methods to be used by all entities at the appropriate stages of the project.

3) Meetings: Include construction waste management on the agenda of all required regularly scheduled construction meetings.

b. Facilities: Provide designated facilities for co-mingling or separation and storage of materials for recycling, salvage, reuse, return, and waste disposal, per approved CWM Plan for use by all contractors and installers.
   1) Provide signage in English (Spanish, Vietnamese, etc.) and graphics to indicate recycling procedure.
   2) Provide materials for barriers and enclosures that are non-hazardous, recyclable, or reusable to the maximum extent possible; reuse project construction waste materials if possible.
   3) Provide adequate space, convenient to subcontractors, for pickup and delivery.
   4) Keep recycling and waste bin areas neat and clean to avoid contamination of materials.

c. Methods of waste disposal that are not acceptable for meeting this criterion include:
   1) Burning or incinerating on or off project site.
   2) Burying on project site, other than fill.
   3) Dumping or burying on other property, public or private, other than official landfill.
   4) Illegal dumping or burying.

d. Recycling Procedures:
   1) Co-mingle or separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.
   2) Coordinate work of recycling, composting, and salvaging waste haulers with other trades.
   3) Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.

01 77 00 / CLOSEOUT PROCEDURES

A. P1 GENERAL
   1. Summary
      a. Related sections:
         1) Section 018113 Sustainable Building Requirements
   2. Submittals
      a. Operations, Maintenance and Resident Engagement
         1) Refer to 018113 for submittals related to Enterprise Green Communities criterion 8.1 O&M Manual and Plan, 8.2 Emergency Management Manual.

01 78 23 / OPERATIONS AND MAINTENANCE DATA

A. P1 GENERAL
   1. Summary
      a. Related sections:
         1) Section 018113 Sustainable Building Requirements
   2. Submittals
      a. Operations, Maintenance and Resident Engagement
         1) 8.1 Building Maintenance Manual
            (a) Refer to 018113 for submittals related to Enterprise Green Communities Criterion 8.1 Building Maintenance Manual.
         2) 8.2 Emergency Manual
            (a) Refer to 018113 for submittals related to Enterprise Green Communities Criterion 8.2 Emergency Manual.

01 79 00 / DEMONSTRATION AND TRAINING

A. P1 GENERAL
   1. Summary
      a. Related sections:

1) Section 018113 Sustainable Building Requirements

B. P3 EXECUTION (NO EGC COMMENTS)
1. Execution Requirements
a. Operations, Maintenance and Resident Engagement
1) 8.4 Resident and Property Staff Orientation
(a) Refer to 018113 for submittals related to Enterprise Green Communities Criterion 8.4 Resident and Property Staff Orientation.

DIVISION 2: EXISTING CONDITIONS

02 24 00 / ENVIRONMENTAL ASSESSMENT

A. P1 GENERAL

B. Summary
1. Related Sections:
a. Section 018113 Sustainable Building Requirements
2. Submittals
a. 3.1 Environmental Remediation
1) Submit data in accordance with 018113 under Criterion 3.1.

C. P3 EXECUTION
1. 3.1 Environmental Remediation
a. Conform to all mitigation steps determined by environmental assessment and in accordance with 018113 under Criterion 3.1.

DIVISION 3: CONCRETE

03 30 00 / CONCRETE

A. P1 GENERAL
1. Summary
a. Related Sections:
1) Section 018113 Sustainable Building Requirements
2. Submittals
a. Operations & Maintenance and Resident Engagement
1) 8.1 Building Operations & Maintenance (O&M) Manual and Plan

DIVISION 4: MASONRY

DIVISION 5: METALS

DIVISION 6: WOOD, PLASTICS & COMPOSITES

06 10 00 / ROUGH CARPENTRY

A. P1 GENERAL
1. Summary
a. Related Sections:
1) Section 018113 Sustainable Building Requirements
2. Submittals
a. Materials
1) 6.2 Low / No VOC Adhesives and Sealants
(a) Submit VOC level in grams per liter for all interior adhesives and sealants in accordance with 018113 under Criterion 6.2.
2) 6.6 Composite Wood Products that Emit Low / No Formaldehyde
(a) Submit product information in accordance with 018113 under Criterion 6.6.
3) 6.10 Asthmagen-free Materials
(a) Submit product information in accordance with 018113 under Criterion 6.10.

B. P2 PRODUCTS
1. Product Requirements
a. Materials

1) 6.2 Low / No VOC Adhesives and Sealants
   (a) For all interior adhesives and sealants, use products that meet VOC level requirements in 018113 under Criterion 6.2.
2) 6.6 Composite Wood Products that Emit Low / No Formaldehyde
   (a) Submit product information in accordance with 018113 under Criterion 6.6.
3) 6.10 Asthmagen-free Materials
   (a) Submit product information in accordance with 018113 under Criterion 6.10.

C. P3 EXECUTION
1. Execution Requirements
   a. Materials
      1) 6.6 Composite Wood Products that Emit Low / No Formaldehyde
         (a) Follow execution details in accordance with 018113 under Criterion 6.6.

06 16 00 / SHEATHING

A. P1 GENERAL
1. Summary
   a. Related Sections:
      1) Section 018113 Sustainable Building Requirements
2. Submittals
   a. Materials
      1) 6.2 Low / No VOC Adhesives and Sealants
         (a) Submit VOC level in grams per liter for all interior adhesives and sealants in accordance with 018113 under Criterion 6.2.
      2) 6.6 Composite Wood Products that Emit Low / No Formaldehyde
         (a) Submit product information in accordance with 018113 under Criterion 6.6.
      3) 6.10 Asthmagen-free Materials
         (a) Submit product information in accordance with 018113 under Criterion 6.10.

B. P2 PRODUCTS
1. Product Requirements
   a. Materials
      1) 6.2 Low / No VOC Adhesives and Sealants
         (a) For all interior adhesives and sealants, use products that meet VOC level requirements in 018113 under Criterion 6.2.
      2) 6.6 Composite Wood Products that Emit Low / No Formaldehyde
         (a) Use products that meet requirements in 018113 under Criterion 6.6.
      3) 6.10 Asthmagen-free Materials
         (a) Submit product information in accordance with 018113 under Criterion 6.10.

06 20 00 / FINISH CARPENTRY

A. P1 GENERAL
1. Summary
   a. Related Sections:
      1) Section 018113 Sustainable Building Requirements
2. Submittals
   a. Materials
      1) 6.2 Low / No VOC Adhesives and Sealants
         (a) Submit VOC level in grams per liter for all interior adhesives and sealants in accordance with 018113 under Criterion 6.2.
      2) 6.6 Composite Wood Products that Emit Low / No Formaldehyde
         (a) Submit product information in accordance with 018113 under Criterion 6.6.
      3) 6.10 Asthmagen-free Materials
         (a) Submit product information in accordance with 018113 under Criterion 6.10.

B. P2 PRODUCTS
1. Product Requirements
a. Materials
1) 6.2 Low / No VOC Adhesives and Sealants
(a) For all interior adhesives and sealants, use products that meet VOC level requirements in 018113 under Criterion 6.2.
2) 6.6 Composite Wood Products that Emit Low / No Formaldehyde
(a) Use products that meet requirements in 018113 under Criterion 6.6.
3) 6.10 Asthmagen-free Materials
(a) Submit product information in accordance with 018113 under Criterion 6.10.

DIVISION 7: THERMAL & MOISTURE PROTECTION

07 21 00 / THERMAL INSULATION

A. P1 GENERAL
1. Summary
a. Related Sections:
1) Section 018113 Sustainable Building Requirements
2. Submittals
a. Energy Efficiency
1) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily
(a) Submit product information confirming the R-values comply with the designed energy efficiency measures.
2) 5.1d Building Performance Standard: (Substantial and Moderate Rehab: Mid-rise and High-rise Multifamily)
(a) Submit product information confirming the R-values comply with the designed energy efficiency measures.
3) 6.10 Asthmagen-free Materials
(a) Submit product information in accordance with 018113 under Criterion 6.10.

B. P2 PRODUCTS
1. Product Requirements
a. Energy Efficiency
1) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily
(a) Use products that provide the nominal R-values required in the construction documents when installed at each location in the envelope assembly as appropriate.
2) 5.1d Building Performance Standard: (Substantial and Moderate Rehab: Mid-rise and High-rise Multifamily)
(a) Use products that provide the nominal R-values required in the construction documents when installed at each location in the envelope assembly as appropriate.
3) 6.10 Asthmagen-free Materials
(a) Submit product information in accordance with 018113 under Criterion 6.10.

C. P3 EXECUTION
1. Execution Requirements
a. Energy Efficiency
1) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily
(a) Install products consistent with the manufacturer’s installation guidelines to achieve the nominal insulation value at all locations. Installation quality will be verified by a third party energy rater, per the requirements in Section 018113 Sustainable Building Requirements.

1) 5.1d Building Performance Standard: (Substantial and Moderate Rehab: Mid-rise and High-rise Multifamily)
   (a) Install products consistent with the manufacturer's installation guidelines to achieve the nominal insulation value at all locations. Installation quality will be verified by a third party energy rater, per the requirements in Section 018113 Sustainable Building Requirements.

DIVISION 8: OPENINGS

08 10 00 / DOORS AND FRAMES

A. P1 GENERAL
   1. Summary
      a. Related Sections:
         1) Section 018113 Sustainable Building Requirements
   2. Submittals
      a. Energy Efficiency
         1) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily
            (a) Submit product information that meet requirements in 018113 under Criterion 5.1c
         2) 5.1d Building Performance Standard: (Substantial and Moderate Rehab: Mid-rise and High-rise Multifamily)
            (a) Submit product information that meet requirements in 018113 under Criterion 5.1d
      b. Materials
         1) 6.2 Low / No VOC Adhesives and Sealants
            (a) Submit VOC level in grams per liter for all interior adhesives and sealants in accordance with 018113 under Criterion 6.2.

B. P2 PRODUCTS
   1. Product Requirements
      a. Energy Efficiency
         1) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily
            (a) Use products that meet requirements in 018113 under Criterion 5.1c
         2) 5.1d Building Performance Standard: (Substantial and Moderate Rehab: Mid-rise and High-rise Multifamily)
            (a) Use products that meet requirements in 018113 under Criterion 5.1d
      b. Materials
         1) 6.2 Low / No VOC Adhesives and Sealants
            (a) For all interior adhesives and sealants, use products that meet VOC level requirements in 018113 under Criterion 6.2.

C. P3 EXECUTION
   1. Execution Requirements
      a. Healthy Living Environment
         1) 7.9 Garage Isolation
            (a) Meet Installation requirements in accordance with 018113 under Criterion 7.9.

08 50 00 / WINDOWS

A. P1 GENERAL
   1. Summary
      a. Related Sections:
         1) Section 018113 Sustainable Building Requirements
   2. Submittals
      a. Energy Efficiency

1) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily
   (a) Submit documentation that meet requirements in 018113 under Criterion 5.1c
2) 5.1d Building Performance Standard: Substantial and Moderate Rehab: mid-rise and high-rise multifamily
   (a) Submit documentation that meet requirements in 018113 under Criterion 5.1d

b. Materials
   1) 6.2 Low / No VOC Adhesives and Sealants
      (a) Submit VOC level in grams per liter for all interior adhesives and sealants in accordance with 018113 under Criterion 6.2.

c. Operations, Maintenance and Resident Engagement
   1) 8.1 Building Maintenance Manual
      (a) Submit cleaning, operations & maintenance guidance in accordance with the requirements of 018113 under Criterion 8.1.

B. P2 PRODUCTS
   1. Product Requirements
      a. Materials
         1) 6.2 Low / No VOC Adhesives and Sealants
            (a) For all interior adhesives and sealants, use products that meet VOC level requirements in 018113 under Criterion 6.2.

08 90 00 / LOUVERS AND VENTS

A. P1 GENERAL
   1. Summary
      a. Related Sections:
         1) Section 018113 Sustainable Building Requirements
   2. Submittals
      a. Healthy Living Environment
         1) 7.10 Integrated Pest Management
            (a) Submit product data in accordance with 018113 under Criterion 7.10.

B. P2 PRODUCTS
   1. Product Requirements
      a. Healthy Living Environment
         1) 7.10 Integrated Pest Management
            (a) Use products that meet requirements in 018113 under Criterion 7.10.

C. P3 EXECUTION
   1. Execution Requirements
      a. Healthy Living Environment
         1) 7.10 Integrated Pest Management
            (a) Meet installation requirements in 018113 under Criterion 7.10.

DIVISION 9: FINISHES

09 22 16 / NON-STRUCTURAL METAL FRAMING

A. P1 GENERAL
   1. Summary
      a. Related Sections:
         1) Section 018113 Sustainable Building Requirements

B. P3 EXECUTION
   1. Execution Requirements
      a. Residential units will be infiltration tested as a requirement of Enterprise Green Communities, under Criterion 5.1 and 5.2. Refer to project details including unit air sealing details in the drawings for air sealing requirements for light-gauge steel framing of exterior walls, party walls, corridor walls and interior partitions.

b. See related requirements in 018113 under criterion 5.1.

09 29 00 / GYPSUM BOARD

A. P1 GENERAL
1. Summary
a. Related Sections:
1) Section 018113 Sustainable Building Requirements
2. Submittals
a. Materials
1) 6.2 Low / No VOC Adhesives and Sealants
(a) Submit VOC level in grams per liter for all interior adhesives and sealants in accordance with 018113 under Criterion 6.2.
2) 6.9 Mold Prevention: Tub and Shower Enclosures
(a) Submit product information in accordance with 018113 under Criterion 6.9.

B. P2 PRODUCTS
1. Product Requirements
a. Materials
1) 6.2 Low / No VOC Adhesives and Sealants
(a) For all interior adhesives and sealants, use products that meet VOC level requirements in 018113 under Criterion 6.2.
2) 6.9 Mold Prevention: Tub and Shower Enclosures
(a) Install compliant product behind tub and shower enclosures that meet requirements in 018113 under Criterion 6.9.

C. P3 EXECUTION
1. Execution Requirements
a. Residential units will be infiltration tested as a requirement of Enterprise Green Communities. Refer to project details including unit air sealing details in the drawings for air sealing requirements for framing of exterior walls, party walls, corridor walls and interior partitions.
b. See related requirements in 018113 under criterion 5.1.

09 60 00 / FLOORING

A. P1 GENERAL
1. Summary
a. Related Sections:
1) Section 018113 Sustainable Building Requirements
2. Submittals
a. Materials
1) 6.2 Low / No VOC Adhesives and Sealants
(a) Submit VOC level in grams per liter for all interior adhesives and sealants in accordance with 018113 under Criterion 6.2.
2) 6.7a Environmentally Preferable Flooring
(a) Submit product information in accordance with 018113 under Criterion 6.7a.
3) 6.10 Asthmagen-free Materials
(a) Submit product information in accordance with 018113 under Criterion 6.10.
b. Operations, Maintenance and Resident Engagement
1) 8.1 Building Maintenance Manual
(a) Submit cleaning and maintenance information in accordance with the requirements of 018113 under Criterion 8.1.

B. P2 PRODUCTS
1. Product Requirements
a. Materials
1) 6.2 Low / No VOC Adhesives and Sealants

(a) For all interior adhesives and sealants, use products that meet VOC level requirements in 018113 under Criterion 6.2.

2) 6.7a Environmentally Preferable Flooring
   (a) Use products that meet requirements in 018113 under Criterion 6.7a.
3) 6.10 Asthmagen-free Materials
   (a) Submit product information in accordance with 018113 under Criterion 6.10.

09 68 00 / CARPETING

A. P1 GENERAL
   1. Summary
      a. Related Sections:
         1) Section 018113 Sustainable Building Requirements
   2. Submittals
      a. Materials
         1) 6.2 Low / No VOC Adhesives and Sealants
            (a) Submit VOC level in grams per liter for all interior adhesives and sealants in accordance with 018113 under Criterion 6.2.
         2) 6.7a Environmentally Preferable Flooring
            (a) Submit product information in accordance with 018113 under Criterion 6.7a.
         3) 6.10 Asthmagen-free Materials
            (a) Submit product information in accordance with 018113 under Criterion 6.10.
         4) 6.12 Construction Waste Management
            (a) Submit a price quote to recycle carpet and carpet components.
      b. Operations, Maintenance and Resident Engagement
         1) 8.1 Building Maintenance Manual
            (a) Submit cleaning and maintenance information in accordance with the requirements of 018113 under Criterion 8.1.

B. P2 PRODUCTS
   1. Product Requirements
      a. Materials
         1) 6.2 Low / No VOC Adhesives and Sealants
            (a) For all interior adhesives and sealants, use products that meet VOC level requirements in 018113 under Criterion 6.2.
         2) 6.7a Environmentally Preferable Flooring
            (a) Use products that meet requirements in 018113 under Criterion 6.7a.
         3) 6.10 Asthmagen-free Materials
            (a) Submit product information in accordance with 018113 under Criterion 6.10.

09 90 00 / PAINTING AND COATING

A. P1 GENERAL
   1. Summary
      a. Related Sections:
         1) Section 018113 Sustainable Building Requirements
   2. Submittals
      a. Materials
         1) 6.1 Low / No VOC Paints, Coatings and Primers
            (a) Submit VOC level in grams per liter for all interior paints, coatings, and primers in accordance with 018113 under Criterion 6.1.
      b. Operations, Maintenance and Resident Engagement
         1) 8.1 Building Maintenance Manual
            (a) Submit paint product information and guidance on cleaning and maintaining painted surfaces in accordance with the requirements of 018113 under Criterion 8.1.

B. P2 PRODUCTS

1. Product Requirements
    a. Materials
        1) 6.1 Low / No VOC Paints, Coatings and Primers
            (a) For all interior paints, coatings, and primers, use products that meet VOC level requirements in 018113 under Criterion 6.1.

09 91 23 / INTERIOR PAINTING

A. P1 GENERAL
    1. Summary
        a. Related Sections:
            1) Section 018113 Sustainable Building Requirements
    2. Submittals
        a. Materials
            1) 6.1 Low / No VOC Paints, Coatings and Primers
                (a) Submit VOC level in grams per liter for all interior paints, coatings, and primers in accordance with 018113 under Criterion 6.1.
        b. Operations, Maintenance and Resident Engagement
            1) 8.1 Building Maintenance Manual
                (a) Submit paint product information and guidance on cleaning and maintaining painted surfaces in accordance with the requirements of 018113 under Criterion 8.1.
B. P2 PRODUCTS
    1. Product Requirements
        a. Materials
            1) 6.1 Low / No VOC Paints, Coatings and Primers
                (a) For all interior paints, coatings, and primers, use products that meet VOC level requirements in 018113 under Criterion 6.1.

DIVISION 10: SPECIALTIES

10 14 00 / SIGNAGE

A. P1 GENERAL
    1. Summary
        a. Related Sections:
            1) Section 018113 Sustainable Building Requirements
    2. Submittals
        a. Materials
            1) 6.2 Low / No VOC Adhesives and Sealants
                (a) Submit VOC level in grams per liter for all interior adhesives and sealants in accordance with 018113 under Criterion 6.2.
B. P2 PRODUCTS
    1. Product Requirements
        a. Materials
            1) 6.2 Low / No VOC Adhesives and Sealants
                (a) For all interior adhesives and sealants, use products that meet VOC level requirements in 018113 under Criterion 6.2.

DIVISION 11: EQUIPMENT

11 26 00 / UNIT KITCHENS

A. P1 GENERAL
    1. Summary
        a. Related Sections:
            1) Section 018113 Sustainable Building Requirements
    2. Submittals

a. Water Conservation
    1) 4.1 Water Conserving Fixtures
        (a) Submit product data in accordance with 018113 under Criterion 4.1.
b. Energy Efficiency
    1) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily
        (a) Submit product data in accordance with 018113 under Criterion 5.4
    2) 5.1d Building Performance Standard: Substantial and Moderate Rehab: mid-rise and high-rise multifamily
        (a) Submit product data in accordance with 018113 under Criterion 5.4
    3) 5.4 ENERGY STAR Appliances
        (a) Submit product data indicating ENERGY STAR certification as noted in 018113 under Criterion 5.4.
c. Materials
    1) 6.2 Low / No VOC Adhesives and Sealants
        (a) Submit VOC level in grams per liter for all interior adhesives and sealants in accordance with 018113 under Criterion 6.2.
    2) 6.6 Composite Wood Products that Emit Low / No Formaldehyde
        (a) Submit product information in accordance with 018113 under Criterion 6.6.
    3) 6.10 Asthmagen-free Materials
        (a) Submit product information in accordance with 018113 under Criterion 6.10.
d. Healthy Living Environment
    1) 7.1 Ventilation - Kitchen Range Hood
        (a) Submit product information demonstrating compliance with requirements of ASHRAE 62.2-2010 in accordance with 018113 under Criterion 7.1.
e. Operations, Maintenance and Resident Engagement
    1) 8.1 Building Maintenance Manual
        (a) Submit operations & maintenance guidance in accordance with the requirements of 018113 under Criterion 8.1.

B. P2 PRODUCTS
1. Product Requirements
    a. Water Conservation
        1) 4.1 Water Conserving Fixtures
            (a) Use products that meet requirements in 018113 under Criterion 4.1.
    b. Energy Efficiency
        1) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily
            (a) Use products that meet requirements in 018113 under Criterion 5.4
        2) 5.1d Building Performance Standard: Substantial and Moderate Rehab: mid-rise and high-rise multifamily
            (a) Use products that meet requirements in 018113 under Criterion 5.4
        3) 5.4 ENERGY STAR Appliances
            (a) Provide appliances that meet ENERGY STAR certification as noted in 018113 under Criterion 5.4.
    c. Materials
        1) 6.2 Low / No VOC Adhesives and Sealants
            (a) For all interior adhesives and sealants, use products that meet VOC level requirements in 018113 under Criterion 6.2.
        2) 6.6 Composite Wood Products that Emit Low / No Formaldehyde
            (a) Use products that meet requirements in 018113 under Criterion 6.6.
        3) 6.10 Asthmagen-free Materials
            (a) Submit product information in accordance with 018113 under Criterion 6.10.

C. P3 EXECUTION

1. Execution Requirements
    a. Materials
        1) 6.6 Composite Wood Products that Emit Low / No Formaldehyde
            (a) Follow execution details in accordance with 018113 under Criterion 6.6.

11 31 00 / RESIDENTIAL APPLIANCES

A. P1 GENERAL
    1. Summary
        a. Related Sections:
            1) Section 018113 Sustainable Building Requirements
    2. Submittals
        a. Energy Efficiency
            1) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily
                (a) Submit product data in accordance with 018113 under Criterion 5.4
            2) 5.1d Building Performance Standard: Substantial and Moderate Rehab: mid-rise and high-rise multifamily
                (a) Submit product data in accordance with 018113 under Criterion 5.4
            3) 5.4 ENERGY STAR Appliances
                (a) Submit product data indicating ENERGY STAR certification as noted in 018113 under Criterion 5.4.
        b. Operations, Maintenance and Resident Engagement
            1) 8.1 Building Maintenance Manual
                (a) Submit operations & maintenance guidance in accordance with the requirements of 018113 under Criterion 8.1.

B. P2 PRODUCTS
    1. Product Requirements
        a. Energy Efficiency
            1) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily
                (a) Use products that meet requirements in 018113 under Criterion 5.4
            2) 5.1d Building Performance Standard: Substantial and Moderate Rehab: mid-rise and high-rise multifamily
                (a) Use products that meet requirements in 018113 under Criterion 5.4
            3) 5.4 ENERGY STAR Appliances
                (a) Provide appliances that meet ENERGY STAR certification as noted in 018113 under Criterion 5.4.

C. P3 EXECUTION
    1. Execution Requirements
        a. Healthy Living Environment
            1) 7.2 Clothes Dryer Exhaust
                (a) Install rigid-type exhaust ductwork to connect all vented clothes dryers directly to outdoors as indicated in 018113 under Criterion 7.2.

DIVISION 12: FURNISHINGS

12 35 30 / RESIDENTIAL CASEWORK

A. P1 GENERAL
    1. Summary
        a. Related Sections:
            1) Section 018113 Sustainable Building Requirements
    2. Submittals
        a. Materials
            1) 6.2 Low / No VOC Adhesives and Sealants

(a) Submit VOC level in grams per liter for all interior adhesives and sealants in accordance with 018113 under Criterion 6.2.

2) 6.6 Composite Wood Products that Emit Low / No Formaldehyde
   (a) Submit product information in accordance with 018113 under Criterion 6.6.

3) 6.10 Asthmagen-free Materials
   (a) Submit product information in accordance with 018113 under Criterion 6.10.

B. P2 PRODUCTS
1. Product Requirements
a. Materials
1) 6.2 Low / No VOC Adhesives and Sealants
(a) For all interior adhesives and sealants, use products that meet VOC level requirements in 018113 under Criterion 6.2.

2) 6.6 Composite Wood Products that Emit Low / No Formaldehyde
   (a) Use products that meet requirements in 018113 under Criterion 6.6.

3) 6.10 Asthmagen-free Materials
   (a) Submit product information in accordance with 018113 under Criterion 6.10.

C. P3 EXECUTION
1. Execution Requirements
a. Materials
1) 6.6 Composite Wood Products that Emit Low / No Formaldehyde
(a) Follow execution details in accordance with 018113 under Criterion 6.6.

DIVISION 13: NOT USED

DIVISION 14: NOT USED

DIVISION 15: NOT USED

DIVISION 16: NOT USED

DIVISION 17: NOT USED

DIVISION 18: NOT USED

DIVISION 19: NOT USED

DIVISION 20: NOT USED

DIVISION 21: NOT USED

DIVISION 22: PLUMBING

22 08 00 / COMMISSIONING OF PLUMBING

A. P1 GENERAL
1. Summary
a. Related Sections:
1) Section 018113 Sustainable Building Requirements

B. P3 EXECUTION
1. Execution Requirements
a. Operations, Maintenance and Resident Engagement
1) 8.1 Building Operations and Maintenance (O&M) Manual and Plan
(a) Provide as-built documentation of systems for O&M Manual in accordance with the requirements of 018113 under Criterion 8.1

22 10 00 / PLUMBING / PIPING

A. P1 GENERAL
1. Summary
a. Related Sections:
1) Section 018113 Sustainable Building Requirements
b. Submittals

1) Materials
(a) 6.2 Low / No VOC Adhesives and Sealants
(1) Submit VOC level in grams per liter for all interior adhesives and sealants in accordance with 018113 under Criterion 6.2.

2. P2 PRODUCTS
a. Product Requirements
1) Materials
(a) 6.2 Low / No VOC Adhesives and Sealants
(1) For all interior adhesives and sealants, use products that meet VOC level requirements in 018113 under Criterion 6.2.

22 33 00 / DOMESTIC WATER HEATERS

A. P1 GENERAL
1. Summary
a. Related Sections:
1) Section 018113 Sustainable Building Requirements
2. Submittals
a. Energy Efficiency
1) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily
(a) Submit product data in accordance with 018113 under Criterion 5.1c
2) 5.1d Building Performance Standard: Substantial and Moderate Rehab: mid-rise and high-rise multifamily
(a) Submit product data in accordance with 018113 under Criterion 5.1d
b. Operations, Maintenance and Resident Engagement
1) 8.1 Building Maintenance Manual
(a) Submit operations & maintenance guidance in accordance with the requirements of 018113 under Criterion 8.1.

B. P2 PRODUCTS
1. Product Requirements
a. Energy Efficiency
1) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily
(a) Use products that meet requirements in 018113 under Criterion 5.4
2) 5.1d Building Performance Standard: Substantial and Moderate Rehab: mid-rise and high-rise multifamily
(a) Use products that meet requirements in 018113 under Criterion 5.4

C. P3 EXECUTION
1. Execution Requirements
a. Healthy Living Environment
1) 7.7 Mold Prevention: Water Heaters
(a) Meet installation requirements in accordance with 018113 under Criterion 7.7.

22 40 00 / PLUMBING FIXTURES

A. P1 GENERAL
1. Summary
a. Related Sections:
1) Section 018113 Sustainable Building Requirements
2. Submittals
a. Water Conservation
1) 4.1 Water-Conserving Fixtures
(a) Submit product data in accordance with 018113 under Criterion 4.1.
b. Materials
1) 6.2 Low / No VOC Adhesives and Sealants

(a) Submit VOC level in grams per liter for all interior adhesives and sealants in accordance with 018113 under Criterion 6.2.

c. Operations, Maintenance and Resident Engagement
1) 8.1 Building Maintenance Manual
(a) Submit operations & maintenance guidance in accordance with the requirements of 018113 under Criterion 8.1.

B. P2 PRODUCTS
1. Product Requirements
a. Water Conservation
1) 4.1 Water-Conserving Fixtures
(a) Use products that meet requirements in 018113 under Criterion 4.1.

DIVISION 23: HVAC

23 00 00 / HEATING, VENTILATING, & AIR CONDITIONING (HVAC)

A. P1 GENERAL
1. Summary
a. Related Sections:
1) Section 018113 Sustainable Building Requirements
2. Submittals
a. Energy Efficiency
1) 5.1a Building Performance Standard: New Construction: single family and low-rise multifamily
(a) Submit documentation showing energy efficiency ratings and heating/cooling/ventilation flow rate capacities for all equipment, consistent with the requirements of 018113 under Criterion 5.1a.
2) 5.3 Sizing of Heating and Cooling Equipment
(a) Submit calculations and product data in accordance with 018113 under Criterion 5.3.
b. Materials
1) 6.2 Low / No VOC Adhesives and Sealants
(a) Submit VOC level in grams per liter for all interior adhesives and sealants in accordance with 018113 under Criterion 6.2.

B. P2 PRODUCTS
1. Product Requirements
a. Energy Efficiency
1) 5.1a Building Performance Standard: New Construction: single family and low-rise multifamily
(a) Select heating/cooling/ventilation equipment consistent with the requirements of 018113 under Criterion 5.1a.
2) 5.3 Sizing of Heating and Cooling Equipment
(a) Install products in accordance with sizing calculations and requirements identified in 018113 under Criterion 5.3.
b. Materials
1) 6.2 Low / No VOC Adhesives and Sealants
(a) For all interior adhesives and sealants, use products that meet VOC level requirements in 018113 under Criterion 6.2.

C. P3 EXECUTION
1. Execution Requirements
a. Energy Efficiency
1) 5.3 Sizing of Heating and Cooling Equipment
(a) Follow execution details in accordance with 018113 under Criterion 5.3.
b. Operations, Maintenance and Resident Engagement
1) 8.1 Building Operations and Maintenance (O&M) Manual and Plan

(a) Provide as-built documentation of systems for O&M Manual in accordance with the requirements of 018113 under Criterion 8.1.

c. Healthy Living Environment
1) 7.9 Garage Isolation
(a) Meet Installation requirements in accordance with 018113 under Criterion 7.9.

23 30 00 / HVAC AIR DISTRIBUTION

A. P1 GENERAL
1. Summary
a. Related Sections:
1) Section 018113 Sustainable Building Requirements
b. Submittals
1) Energy Efficiency
(a) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily
(1) Submit product data showing energy efficiency ratings in accordance with 018113 under Criterion 5.1c.
(b) 5.1d Building Performance Standard: Substantial and Moderate Rehab: mid-rise and high-rise multifamily
(1) Submit product data showing energy efficiency ratings in accordance with 018113 under Criterion 5.1d.
(c) 5.2a Additional Reductions in Energy Use
(1) Submit documentation showing energy efficiency ratings and heating/cooling/ventilation flow rate capacities for all equipment, consistent with the requirements of 018113 under Criterion 5.2a.
(d) 5.3 Sizing of Heating and Cooling Equipment - distribution ductwork
(1) Submit duct design calculations in accordance with ACCA Manual J and D and 018113 under Criterion 5.3.
2) Materials
(a) 6.2 Low / No VOC Adhesives and Sealants
(1) Submit VOC level in grams per liter for all interior adhesives and sealants in accordance with 018113 under Criterion 6.2.
3) Healthy Living Environment
(a) 7.1 Ventilation
(1) Submit product data in accordance with 018113 under Criterion 7.1.
2. P2 PRODUCTS
a. Product Requirements
1) Energy Efficiency
(a) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily
(1) Select heating/cooling/ventilation equipment consistent with the requirements of 018113 under Criterion 5.1c.
(b) 5.1d Building Performance Standard: Substantial and Moderate Rehab: mid-rise and high-rise multifamily
(1) Select heating/cooling/ventilation equipment consistent with the requirements of 018113 under Criterion 5.1d.
(c) 5.2a Additional Reductions in Energy Use
(1) Install heating/cooling/ventilation equipment, consistent with the requirements of 018113 under Criterion 5.2a.
(d) 5.3 Sizing of Heating and Cooling Equipment - distribution ductwork
(1) Install heating/cooling/ventilation equipment, consistent with the requirements of 018113 under Criterion 5.3.
2) Materials
(a) 6.2 Low / No VOC Adhesives and Sealants

(1) For all interior adhesives and sealants, use products that meet VOC level requirements in 018113 under Criterion 6.2.

3) Healthy Living Environment
(a) 7.1 Ventilation
(1) Use products that meet requirements in 018113 under Criterion 7.1.

3. P3 EXECUTION
a. Execution Requirements
1) Energy Efficiency
(a) 5.1 Building Performance Standard - duct sealing
(1) All heating and cooling distribution ductwork shall be air-sealed to the standard required by the applicable ENERGY STAR program. Follow execution details in accordance with 018113 under Criterion 5.1 (a, b or c as applicable).
(2) Heating and cooling distribution ductwork leakage shall be tested by a qualified third party energy rater or Commissioning Authority, in accordance with 018113 under Criterion 5.1 and/or 5.2.
2) Healthy Living Environment
(a) 7.1 Ventilation
(1) Install all equipment in accordance with 018113 under Criterion 7.1.
(a) 7.9 Garage Isolation
(1) Meet Installation requirements in accordance with 018113 under Criterion 7.9.
3) Operations, Maintenance and Resident Engagement
(a) 8.1 Building Operations and Maintenance (O&M) Manual and Plan
(1) Provide as-built documentation of systems for O&M Manual in accordance with the requirements of 018113 under Criterion 8.1.

23 34 00 / HVAC FANS

A. P1 GENERAL
1. Summary
a. Related Sections:
1) Section 018113 Sustainable Building Requirements
2. Submittals
a. Energy Efficiency
1) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily
(1) Submit product data showing energy efficiency ratings in accordance with 018113 under Criterion 5.1c.
2) 5.1d Building Performance Standard: Substantial and Moderate Rehab: mid-rise and high-rise multifamily
(1) Submit product data showing energy efficiency ratings in accordance with 018113 under Criterion 5.1d.
b. Healthy Living Environment
1) 7.1 Ventilation
(a) Submit product data in accordance with 018113 under Criterion 7.1.
c. Operations, Maintenance and Resident Engagement
1) 8.1 Building Maintenance Manual
(a) Submit operations & maintenance guidance in accordance with the requirements of 018113 under Criterion 8.1.

B. P2 PRODUCTS
1. Product Requirements
a. Energy Efficiency
1) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily

(1) Select heating/cooling/ventilation equipment consistent with the requirements of 018113 under Criterion 5.1c.

2) 5.1d Building Performance Standard: Substantial and Moderate Rehab: mid-rise and high-rise multifamily

(1) Select heating/cooling/ventilation equipment consistent with the requirements of 018113 under Criterion 5.1d.

b. Healthy Living Environment

1) 7.1 Ventilation

C. P3 EXECUTION

1. Execution Requirements

a. Healthy Living Environment

1) 7.1 Ventilation

(a) Install all equipment in accordance with 018113 under Criterion 7.1.

23 52 00 / BOILERS

A. P1 GENERAL

1. Summary

a. Related Sections:

1) Section 018113 Sustainable Building Requirements

2. Submittals

a. Energy Efficiency

1) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily

(1) Submit product data showing energy efficiency ratings in accordance with 018113 under Criterion 5.1c.

2) 5.1d Building Performance Standard: Substantial and Moderate Rehab: mid-rise and high-rise multifamily

(1) Submit product data showing energy efficiency ratings in accordance with 018113 under Criterion 5.1d.

b. Operations, Maintenance and Resident Engagement

1) 8.1 Building Maintenance Manual

(a) Submit operations & maintenance guidance in accordance with the requirements of 018113 under Criterion 8.1.

B. P2 PRODUCTS

1. Product Requirements

a. Energy Efficiency

1) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily

(1) Select heating/cooling/ventilation equipment consistent with the requirements of 018113 under Criterion 5.1c.

2) 5.1d Building Performance Standard: Substantial and Moderate Rehab: mid-rise and high-rise multifamily

(1) Select heating/cooling/ventilation equipment consistent with the requirements of 018113 under Criterion 5.1d.

C. P3 EXECUTION

1. Execution Requirements

a. Healthy Living Environment

1) 7.3 Combustion Equipment

(a) Install power-vented or direct-vent equipment that meets requirements in 018113 under Criterion 7.3.

23 54 00 / FURNACES

A. P1 GENERAL

1. Summary

a. Related Sections:
1) Section 018113 Sustainable Building Requirements

2. Submittals
a. Energy Efficiency
1) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily
(1) Submit product data showing energy efficiency ratings in accordance with 018113 under Criterion 5.1c.
2) 5.1d Building Performance Standard: Substantial and Moderate Rehab: mid-rise and high-rise multifamily
(1) Submit product data showing energy efficiency ratings in accordance with 018113 under Criterion 5.1d.
b. Operations, Maintenance and Resident Engagement
1) 8.1 Building Maintenance Manual
(a) Submit operations & maintenance guidance in accordance with the requirements of 018113 under Criterion 8.1.

B. P2 PRODUCTS
1. Product Requirements
a. Energy Efficiency
1) 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily
(1) Select heating/cooling/ventilation equipment consistent with the requirements of 018113 under Criterion 5.1c.
2) 5.1d Building Performance Standard: Substantial and Moderate Rehab: mid-rise and high-rise multifamily
(1) Select heating/cooling/ventilation equipment consistent with the requirements of 018113 under Criterion 5.1d.

C. P3 EXECUTION
1. Execution Requirements
a. Healthy Living Environment
1) 7.3 Combustion Equipment
(a) Install hard-wired CO alarms with battery backup in accordance with NFPA 720 as identified in 018113 under Criterion 7.3.

DIVISION 24: NOT USED

DIVISION 25: NOT USED

DIVISION 26: ELECTRICAL

26 05 00 / BASIC ELECTRICAL MATERIALS & METHODS

A. P1 GENERAL
1. Submittals
a. Operations, Maintenance and Resident Engagement
1) 8.2 Emergency Management Manual
(a) Submit operations and maintenance information related to electrical equipment, emergency shutoffs and other systems associated with emergency response (such as islandable power systems) in accordance with 01 81 13 under Criterion 8.2.

26 51 00 / INTERIOR LIGHTING

A. P1 GENERAL
1. Summary
a. Related Sections:
1) Section 018113 Sustainable Building Requirements
2. Submittals
a. Energy Efficiency

1) 5.5 Lighting
(a) Submit product data in accordance with 018113 under Criterion 5.5.

b. Operations, Maintenance and Resident Engagement
1) 8.1 Building Maintenance Manual
(a) Submit maintenance & replacement guidance in accordance with the requirements of 018113 under Criterion 8.1.

B. P2 PRODUCTS
1. Product Requirements
a. Energy Efficiency
1) 5.5 Lighting
(a) Use products that meet requirements in 018113 under Criterion 5.5.

26 53 00 / EXIT SIGNS

A. P1 GENERAL
1. Summary
a. Related Sections:
1) Section 018113 Sustainable Building Requirements
2. Submittals
a. Energy Efficiency
1) 5.5 Lighting
(a) Submit product data in accordance with 018113 under Criterion 5.5.

B. P2 PRODUCTS
1. Product Requirements
a. Energy Efficiency
1) 5.5 Lighting
(a) Use products that meet requirements in 018113 under Criterion 5.5.

26 56 00 / EXTERIOR LIGHTING

A. P1 GENERAL
1. Summary
a. Related Sections:
1) Section 018113 Sustainable Building Requirements
2. Submittals
a. Energy Efficiency
1) 5.5 Lighting
(a) Submit product data in accordance with 018113 under Criterion 5.5.
b. Operations, Maintenance and Resident Engagement
1) 8.1 Building Maintenance Manual
(a) Submit maintenance & replacement guidance in accordance with the requirements of 018113 under Criterion 8.1.

B. P2 PRODUCTS
1. Product Requirements
a. Energy Efficiency
1) 5.5 Lighting
(a) Use products that meet requirements in 018113 under Criterion 5.5.

DIVISION 27: NOT USED

DIVISION 28: ELECTRONIC SAFETY & SECURITY

28 31 49 / CARBON MONOXIDE DETECTION SENSORS

A. P1 GENERAL
1. Summary
a. Related Sections:
1) Section 018113 Sustainable Building Requirements

2. Submittals
    a. Healthy Living Environment
        1) 7.3 Combustion Equipment
            (a) Submit product data in accordance with 018113 under Criterion 7.3.
        2) 7.9 Garage isolation
            (a) Submit product data in accordance with 018113 under Criterion 7.9.
    b. Operations, Maintenance and Resident Engagement
        1) 8.1 Building Maintenance Manual
            (a) Submit operations & maintenance guidance in accordance with the requirements of 018113 under Criterion 8.1.

B. P2 PRODUCTS
1. Product Requirements
    a. Healthy Living Environment
        1) 7.3 Combustion Equipment
            (a) Use products that meet requirements in 018113 under Criterion 7.3.
        2) 7.9 Garage Isolation
            (a) Use products that meet requirements in 018113 under Criterion 7.9.

DIVISION 29: NOT USED

DIVISION 30: NOT USED

DIVISION 31: EARTHWORK

31 10 00 / SITE CLEARING

A. P1 GENERAL
1. Summary
    a. Related Sections:
        1) Section 018113 Sustainable Building Requirements

DIVISION 32: EXTERIOR IMPROVEMENTS

32 13 00 / RIGID PAVING

A. P1 GENERAL
1. Summary
    a. Related Sections:
        1) Section 018113 Sustainable Building Requirements
2. Submittals
    a. Operations, Maintenance and Resident Engagement
        1) 8.1 Building Maintenance Manual
            (a) Submit operations & maintenance guidance in accordance with the requirements of 018113 under Criterion 8.1.

32 80 00 / IRRIGATION

A. P1 GENERAL
1. Summary
    a. Related Sections:
        1) Section 018113 Sustainable Building Requirements
2. Submittals
    a. Site Improvements
        1) 3.5b Efficient Irrigation and Water Reuse
            (a) Submit product data in accordance with 018113 under Criterion 3.5b.

B. P2 PRODUCTS
1. Product Requirements
    a. Site Improvements
        1) 3.5b Efficient Irrigation and Water Reuse

(a) Use products that meet requirements in 018113 under Criterion 3.5b.

C. P3 EXECUTION
   1. Execution Requirements
      a. Site Improvements
         1) 3.5b Efficient Irrigation and Water Reuse
            (a) Conform to execution requirements in accordance with 018113 under Criterion 3.5b.
      b. Operations, Maintenance and Resident Engagement
         1) 8.1 Building Operations and Maintenance (O&M) Manual and Plan
            (a) Provide as-built documentation of systems for O&M Manual in accordance with the requirements of 018113 under Criterion 8.1.

ALLOWANCES – 01 21 00

1. Allowances shall be listed on the Contractor's bid form as separate line items that are included in the base bid.
2. Allowances are described in the contract drawings and specifications and may include other items than those listed in the schedule below. The Contractor is to review the entire specification and drawing set to evaluate all allowances as required.
3. Allowances quoted on the bid forms will be utilized at the Owner's discretion in completing the whole and complete work.
4. Costs to be included in all allowances are to be: cost of product to contractor and/or subcontractor, less applicable trade discounts, less cost of delivery to site, less applicable taxes.
5. Reference the specification section or drawing listed in the schedule below for a description of each allowance. The allowance scope within specification sections identified as allowances may not include the full scope of that specification section.
6. SCHEDULE OF ALLOWANCES:

Division 00	Acoustic Testing	Value: $_____
09 65 00	Resilient Flooring	Value: $_____
09 68 00	Carpeting	Value: $_____
09 68 13	Tile Carpeting	Value: $_____
10 14 00	Signage	Value: $_____
11 68 13	Playground Equipment	Value: $_____
32 17 13	Parking Bumpers	Value: $_____
32 92 19	Seeding	Value: $_____
32 92 23	Sodding	Value: $_____
32 93 00	Plants	Value: $_____

ALTERNATES – 01 23 00

1. Alternates shall be listed on the Contractor's bid form as separate line items that include additions to or deductions from the base bid.
2. Alternates are described in the contract drawings and specifications and may include other items than those listed in the schedule below. The Contractor is to review the entire specification and drawing set to evaluate all alternates as required.
3. Alternates quoted on the bid forms will be reviewed and accepted or rejected at the Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.

4. Each alternate may include alteration or modification of the surrounding work. The scope and price for such coordination, alteration or modification to the surrounding work shall be fully included in the price listed for that alternate.
5. Reference the specification section or drawing listed in the schedule below for a description of each alternate each alternate. The alternate scope within specification sections identified as alternates may not include the full scope of that specification section.
6. SCHEDULE OF ALTERNATES:

07 18 00 Traffic Coating	Value: $_____
08 14 16 Flush Wood Doors	Value: $_____
09 68 00 Carpeting	Value: $_____
10 14 00 Signage	Value: $_____
10 55 23 Mailboxes	Value: $_____
11 31 00 Residential Appliances	Value: $_____
11 68 13 Playground Equipment	Value: $_____
23 00 00 HVAC Design Criteria	Value: $_____
32 30 00 Splash Blocks	Value: $_____

ADMINISTRATIVE REQUIREMENTS – 01 30 00

1. ELECTRONIC DOCUMENT SUBMITTAL SERVICE: All documents transmitted for purposes of administration of the contract are to be in electronic (PDF) format and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email. Besides submittals for review, information, and closeout, this procedure applies to requests for information (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
   1.1. Contractor and Architect are required to use this service.
   1.2. It is Contractor's responsibility to setup and maintain the service.
      a) Contractor to receive Owner's and Architect's approval prior to setup.
      b) Contractor to include any fees associated with the service as a part of their base bid.
   1.3. Paper document transmittals will not be reviewed; emailed PDF documents will not be reviewed except that electronic document requirements do not apply to samples or color selection charts.
2. PROGRESS MEETINGS: Schedule and administer Draw Meetings throughout progress of the Work at maximum monthly intervals. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings. Record minutes and distribute electronic copies within two days after meeting, with copies sent to Architect, Owner, participants, and those affected by decisions made.
3. SUBMITTALS FOR REVIEW: When the following are specified in individual sections, submit them for review: Product data, Shop drawings, Samples for selection, Samples for verification.
   3.1. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents. Samples will be reviewed only for aesthetic, color, or finish selection.
   3.2. Interior finish submission should be provided in a single package including all wall, ceiling, flooring, cabinetry, hardware, and all other interior finishes as included in the Finish Schedule.
   3.3. Exterior finish submission should be provided in a single package including all wall siding/paint/stucco, roof, soffit, handrail, fencing, concrete finish, decking, window frame and glass, storefront, stair tread and riser as well as any other items that may impact the overall

exterior aesthetic.

4. SUBMITTALS FOR INFORMATION: When the following are specified in individual sections, submit them for information: Design data, Certificates, Test reports, Inspection reports, Manufacturer's instructions, Manufacturer's field reports, Other types indicated.
   4.1. Submit for Architect's knowledge as contract administrator or for Owner. No action will be taken.
5. SUBMITTALS FOR PROJECT CLOSEOUT: Submit Correction Punch List for Substantial Completion, Submit Final Correction Punch List for Substantial Completion, When the following are specified in individual sections, submit them at project closeout: Project record documents, Operation and maintenance data, Warranties, Bonds, Other types as indicated. Submit for Owner's benefit during and after project completion.
6. SAMPLES: To be provided by the Contractor at no additional cost to the Owner.
7. PRODUCT DATA SUBMITTALS: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
   7.1. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
8. SUBMITTAL PROCEDURES
   8.1. Substitutions that are submitted with being specifically identified as a substitution will not be reviewed.
   8.2. Shop Drawing / Submittals Procedures:
      a) Contractor must complete and utilize the Submittal Compliance Form for each shop drawing and submittal issued. Items issued without a complete and accurate Compliance Form will be rejected without review.
      b) Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting the Contract Documents and coordinating related Work.
      c) Do not reproduce the Contract Documents to create shop drawings.
      d) Generic, non-project specific information submitted as shop drawings do not meet the requirements for shop drawings.
      e) Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
   8.3. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.
   8.4. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor for the Architect's initial comments. Due dates, or review by dates setup in the Electronic Document Submittal Service shall not be set for a shorter duration.
   8.5. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.
9. REQUESTS FOR INFORMATION (RFI): Questions requiring a written response must be submitted in the form of an RFI. All RFIs shall go through the same electronic document submittal service as Submittals.
   9.1. For each RFI, allow 15 days for the Architect's initial comments.
10. PUNCHLIST, PERIODIC DURING CONSTRUCTION: It is the sole responsibility of the General Contractor to have the work completed as shown in the Contract Documents. It is also the sole responsibility of the General Contractor to make sure the work that is completed meets the requirements of the documents and expectations of the Owner and Architect.
    10.1. Throughout this specification there are specific areas that require Mock-Ups of the work be

completed. In order to set the standard of care in which the Owner and Architect expect these mock-ups should be completed and reviewed by both the Owner and Architect.

10.2. The process of generating a punch list shall be the responsibility of the General Contractor unless the Owner hires a third-party to generate the punch list.

11. PUNCHLIST, SUBSTANTIAL COMPLETION: As per the A201 section 9.8 SUBSTANTIAL COMPLETION, the Contractor is responsible for the preparation of a thorough Punchlist (Inspection or Correction List) for the Owner's and Architect's review prior to Substantial Completion. The Punchlist should be compiled prior to any site visits are scheduled to review the project for Substantial Completion. Exclusion of deficient items from the Punchlist does not relieve the Contractor of compliance if required in particular or in general by the Contract Documents or Owner.

12. PUNCHLIST, PRCEDURE: The items on the punch list shall be corrected by the responsible contractor and then re-inspected by the General Contractor to ensure all work is complete and to the approved standards and quality. Once the Punch List has been verified and signed off by the General Contractor, the Architect will conduct a random inspection of the work. If the work is approved, then the Architect will sign off on the work as being complete. If the Architect finds incomplete work that was on the list, or other items that do not meet the set standards, then the work in question will not be signed-off until corrected. Exclusion of deficient items from the Punch list does not relieve the General Contractor of compliance if required in particular or in general by the Contract Documents or Owner.

13. ARCHITECTS RESPONSE TO RFIs AND SUBMITTALS: Any response to an RFI or Submittal does not give approval for any change in the construction cost or schedule. Any change to the construction cost or schedule as a result of the Architect's response shall be documented by the Contractor, issued as a Change Order and approved by the Owner and Architect prior to proceeding with the work or ordering materials.

QUALITY REQUIREMENTS – 01 40 00

1. CONTROL OF INSTALLATION: Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality. Comply with manufacturers' instructions, including each step in sequence. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship. Have Work performed by persons qualified to produce required and specified quality. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

2. MOCK-UPS: Tests shall be performed under provisions identified in this section and identified in the respective product specification sections. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes. Accepted mock-ups shall be a comparison standard for the remaining Work. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.

   2.1. Mock-ups shall be required at a minimum for all exterior finishes and all interior finishes.

   2.2. Mock-ups shall be approved by the Owner and Architect prior to continuing with the work.

3. DEFECT ASSESSMENT: Replace Work or portions of the Work not conforming to specified requirements.

4. UNIT INTERIOR MOCK-UP: Unless specifically directed otherwise by the Owner, it is required to complete one full apartment unit as a Mock-Up, have it reviewed by all parties, and approved by the Owner and Architect to set the standards for the project. The workmanship in this apartment unit will be used to judge all other work throughout the project.

TEMPORARY FACILITIES AND CONTROLS – 01 50 00

1. TEMPORARY UTILITIES: Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes. Existing facilities may not be used.
2. TELECOMMUNICATIONS SERVICES: Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
3. TEMPORARY SANITARY FACILITIES: Provide and maintain required facilities and enclosures. Provide at time of project mobilization. Maintain daily in clean and sanitary condition.
4. BARRIERS: Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for Owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition. Provide protection for plants designated to remain. Replace damaged plants.
5. FENCING: Construction fencing shall be placed as required and coordinated with the on-site management as well as the Owner.
6. EXTERIOR ENCLOSURES: Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.
7. SECURITY: Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.
8. VEHICULAR ACCESS AND PARKING: Coordinate access and haul routes with governing authorities and Owner. Provide and maintain access to fire hydrants, free of obstructions.
9. FIELD OFFICES: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack and drawing display table. Provide space for Project meetings, with table and chairs to accommodate 6 persons.

PRODUCT REQUIREMENTS – 01 60 00

1. EXISTING PRODUCTS: Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.
2. NEW PRODUCTS: Provide new products unless specifically required or permitted by the Contract Documents.
3. SUBSTITUTION PROCEDURES: Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. A request for substitution constitutes a representation that the submitter:
    - 3.1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
    - 3.2. Agrees to provide the same warranty for the substitution as for the specified product.
    - 3.3. Agrees to coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
    - 3.4. Waives claims for additional costs or time extension that may subsequently become apparent.
    - 3.5. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
    - 3.6. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
    - 3.7. No substitutions of materials, equipment, quality standards, etc. specified will be accepted or approved unless the deviation is brought the explicate attention of the Owner and Architect prior

to purchase or change and written approval is issued by the Owner and Architect.

EXECUTION AND CLOSEOUT REQUIREMENTS – 01 70 00

1. SUBMITTALS FOR CUTTING AND PATCHING: Submit written request in advance of cutting or alteration that affects: Structural integrity of any element of Project, Integrity of weather exposed or moisture resistant element, Efficiency, maintenance, or safety of any operational element.
2. PROJECT CONDITIONS: Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
    2.1. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
    2.2. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
    2.3. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.
3. PATCHING MATERIALS: New Materials shall be as specified in product sections; match existing products and work for patching and extending work. Existing Products shall be of a type and quality determined by inspecting and testing products where necessary, referring to existing work as a standard.
4. GENERAL INSTALLATION REQUIREMENTS: Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement. Make vertical elements plumb and horizontal elements level, unless otherwise indicated. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated. Make neat transitions between different surfaces, maintaining texture and appearance.
5. CUTTING AND PATCHING: Whenever possible, execute the work by methods that avoid cutting or patching. Perform whatever cutting and patching is necessary to: Complete the work, Fit products together to integrate with other work, Provide openings for penetration of mechanical, electrical, and other services, Match work that has been cut to adjacent work, Repair areas adjacent to cuts to required condition, Repair new work damaged by subsequent work, Remove samples of installed work for testing when requested, Remove and replace defective and non-conforming work.
    5.1. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
    5.2. Patching: Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
6. PROGRESS CLEANING: Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
7. PROTECTION OF INSTALLED WORK: Protect installed work from damage by construction operations. Provide special protection where specified in individual specification sections. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.
8. FINAL CLEANING: Use cleaning materials that are nonhazardous. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

9. CLOSEOUT PROCEDURES: Make submittals that are required by governing or other authorities. Notify Architect when work is considered ready for Architect's Substantial Completion inspection. Submit written certification containing Contractor's Correction Punch List,that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL – 01 74 19

1. REGULATORY REQUIREMENTS: Comply with applicable Federal, State, and Local requirements for the handling, removal, reuse, recycling and disposal of construction waste. Contractor is responsible for all debris removal from the site as required by local ordinance, and to the satisfaction of the Owner.
2. CONSTRUCTION WASTE AND RECYCLING MANAGER: A single entity responsible for managing and documenting the volume of construction waste and recycling for the project. The entity shall: Implement the waste management and recycling plan, Compile monthly waste disposal and recycling reports, Coordinate with the Owner in identifying materials to be salvaged, or reused.
3. WASTE MANAGEMENT: Implement waste management procedures in accordance with approved construction waste management and recycling plan. Maintain procedures throughout the life of this Contract.
    3.1. Site Storage: All non-hazardous construction waste may be co-mingled in a single dumpster; on site separation is not required. Remove all waste materials from the work area to dumpsters daily.
    3.2. Keep construction site clear and prevent contamination of materials. Provide empty dumpsters in exchange for loaded dumpsters as demand requires. Deliver loaded dumpsters to the approved off -site recycling facility.
    3.3. Delivery Records: Maintain a record of waste material leaving the site, including: Driver tickets for loaded dumpsters removed from the site, Scale tickets for dumpsters delivered from the site to the off-site recycling facility, Scale tickets for material delivered from the off-site recycling facility to receive entities for recyclable material and landfills.

CLOSEOUT SUBMITTALS – 01 78 00

1. PROJECT RECORD DOCUMENTS: Submit documents to Architect with claim for final Application for Payment. Coordinate with the Owner for any other additional requirements for Project Closeout or if any documents need to be submitted as a hard copy in addition to those listed below.
2. PROJECT RECORD DOCUMENTS: Maintain on site one set of the following record documents; record actual revisions to the Work: Drawings, Addenda, Change Orders and other modifications to the Contract.
3. OPERATION AND MAINTENANCE DATA
    3.1. Source Data: For each product or system, list names, addresses and telephone numbers of SubContractors and suppliers, including local source of supplies and replacement parts.
    3.2. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
    3.3. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
4. OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES: For Each Product, Applied Material, and Finish: Product data, with catalog number, size, composition, and color and texture designations, Information for re-ordering custom manufactured products, Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against

detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

5. OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS: For Each Item of Equipment and Each System: Description of unit or system, and component parts, Identify function, normal operating characteristics, and limiting conditions, Include performance curves, with engineering data and tests, Complete nomenclature and model number of replaceable parts.
   5.1. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
   5.2. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
6. ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS: Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections. Where systems involve more than one specification section, provide separate tabbed divider for each system. Prepare instructions and data by personnel experienced in maintenance and operation of described products. Prepare data in the form of an instructional manual.
   6.1. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
   6.2. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
7. WARRANTIES AND BONDS: Obtain warranties and bonds, executed in duplicate by responsible SubContractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

SUSTAINABLE BUILDING REQUIREMENTS – 01 81 13

1.01 SUMMARY

A. Section includes:
   1. Summary of sustainable building requirements for project as necessary for certification of this project through the 2015 Criteria.
      a. Related performance and administrative requirements.
   2. Related sections:
      a. Section 017419 Construction Waste Management and Disposal
      b. Divisions 02 through 12, 14, 22, 23, 26, 28, 31 through 33 where related submittal, product, or execution requirements relate to Criteria. Requirements are not repeated but 018113 is referenced within respective sections.

B. References
   1. 2015 Enterprise Green Communities Criteria

C. Coordination
   1. Contractor is responsible for all requirements of the 2015 Criteria that are contained throughout these Specifications, including successful compliance with and passage of visual inspections and performance tests by verifying party.
   2. ENERGY STAR verification: Contractor is responsible for coordinating with appropriate verification team members to ensure inspections and leakage tests can be performed at the appropriate times and without delaying construction progress;
      a. Coordinate framers, plumbers, HVAC, insulators, and drywall trades to minimize uncontrolled air leakage pathways between residential units by sealing all penetrations in walls, ceilings, and floors in the units and by sealing all vertical chases adjacent to the units.

D. Submittals
   1. Site Improvements
      a. 3.1 Environmental Remediation
         1) Submit [Phase I Environmental Site Assessment, Tier II Environmental Review Assessment, environmental site assessment approved by HUD through the Part 50 or Part 58 process, an environmental assessment approved by USDA through the 1940-G or 1794 process].
         2) If Environmental Site Assessment reveals hazardous materials submit abatement reports as necessary.
      b. 3.2 Erosion and Sedimentation Control
         1) Submit photo documentation of erosion control measures throughout construction.
      c. 3.5b Efficient Irrigation and Water Reuse
         1) Submit [Option 1: product data indicating WaterSense-labeled weather-based irrigation controller (WBIC) or Option 2: product data (cut sheets, control sequence and instructions, operations and maintenance data, and warranty information) for all system components related to water reuse for irrigation including storage tank(s), plumbing valves and controls, and other associated equipment.]
   2. Water Conservation
      a. 4.1 Water-Conserving Fixtures
         1) Submit product data for toilets and urinals documenting flush rate in gallons per flush (gpf); for showerheads, kitchen and lavatory faucets, documenting flow rate in gallons per minute (gpm).
         2) Submit product data for toilets, urinals, showerheads, and lavatory faucets documenting fixture is WaterSense-labeled.
   3. Energy Efficiency
      a. 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily
         1) Submit HERS Home Energy Rating Certificate for each dwelling unit in the development.
      b. 5.1d Building Performance Standard: Substantial and Moderate Rehab: mid-rise and high-rise multifamily
         1) Submit energy model output report demonstrating project energy performance consistent with ASHRAE 90.1-2010 using Appendix G.l
      c. 5.3 Sizing of Heating and Cooling Equipment
         1) Submit heating and cooling load calculations and equipment selection performed in accordance with the Air Conditioning Contractors of America (ACCA) Manuals J and S or ASHRAE handbooks.
      d. 5.4 ENERGY STAR Appliances
         1) If providing appliances, submit clothes washer, dishwasher and refrigerator product details generated directly from ENERGY STAR's list of certified products.
      e. 5.5 Lighting
         1) Submit product data for all lighting fixtures, lighting and lamps documenting efficacy in lumens per watt (lm/W).
         2) Submit product data for all lighting controls.
      f. 5.6 Electricity Meter
         1) Submit product data for individual dwelling unit electric meter/submeter.
   4. Materials
      a. 6.1 Low / No VOC Paints, Coatings and Primers
         1) Submit VOC level in grams per liter for all interior paints, coatings, and primers.
      b. 6.2 Low / No VOC Adhesives and Sealants
         1) Submit VOC level in grams per liter for all interior adhesives, sealants, and caulks.
      c. 6.6 Composite Wood Products that Emit Low / No Formaldehyde

1) Submit product documentation demonstrating that all composite wood products installed within the weather resistive barrier (WRB) are compliant with California 93120 Phase 2.
2) If non-compliant products are used, submit photo documentation and confirmation that all exposed edges and sides have been sealed with low-VOC sealants in accordance with Criterion 6.2.

d. 6.7a Environmentally Preferable Flooring
1) Submit product documentation to confirm that all hard surface flooring is: [ceramic tile], [solid unfinished hardwood], [meets the Scientific Certification System's FloorScore program criteria, including for pre-finished hardwood flooring].
2) Submit product documentation to confirm all carpet products meet the Carpet and Rug Institute's Green Label Plus certification and all carpet pads and adhesives meet Green Label certification.

e. 6.9 Mold Prevention: Tub & Shower Enclosures
1) Submit product documentation demonstrating all drywall behind tub and shower enclosures meets ASTM #D3273.

f. 6.10 Asthmagen-free Materials
1) [For insulation] Submit product documentation demonstrating no formaldehyde in fiberglass batts and no spray polyurethane foam is used.
2) [For flooring] Submit product documentation demonstrating non-flexible vinyl (PVC) roll or sheet flooring was used and that carpets are not backed with vinyl or phthalates.
3) [For wall coverings] Submit product documentation demonstrating flooring materials do not contain vinyl, phthalates, epoxy-based coatings or polyurethane-based coatings.
4) [For Composite Wood] Submit product documentation demonstrating ULEF or NAF compliance.

g. 6.12 Construction Waste Management
1) Refer to 017419 for general information and submittals related to Enterprise Green Communities criterion 6.12 Construction Waste Management.

5. Healthy Living Environment
a. 7.1 Ventilation
1) Submit product data for in-unit ventilation system(s) in compliance with ASHRAE 62.2-2010 requirements for
(a) local mechanical exhaust system in bathrooms;
(b) local mechanical exhaust system in kitchens; and
(c) whole-house mechanical ventilation.
2) Submit product data for any individual bathroom fans demonstrating ENERGY STAR label and humidistat sensor, timer or other control.
3) Submit product data for any central ventilation systems in compliance with ASHRAE 62.1-2010 requirements for any corridors, stair wells, common and amenity areas and retail/commercial/office spaces.
4) Submit product data for any central rooftop fans showing direct-drive and variable-speed capability.
5) Submit product data for any fan providing central ventilation with design CFM 300-2000 showing an electronically commutated motor (ECM).

b. 7.3 Combustion Safety
1) Submit product data for any combustion water heating or space heating equipment showing compliant venting.
2) Submit product data for hard-wired carbon monoxide alarms with battery backup.

c. 7.10 Integrated Pest Management
1) Submit product data for nontoxic sealing methods including window screens, door sweeps, escutcheon plates, and rodent- and corrosion-proof screens for openings greater than ¼ inch.

d. 7.12 Active Design: Promoting Physical Activity Within the Building

1) Option 2: photographs of strategies installed to increase frequency and duration of physical activity.

e. 7.13 Active Design: Staircases and Building Circulation
1) Submit product data or photographs demonstrating [10 square feet of glazing in or adjacent to stair doors] or [magnetic door holds on all doors leading to the stairs].

6. Operations, Maintenance and Resident Engagement
a. 8.1 Building Operations & Maintenance (O&M) Manual and Plan
1) Submit a manual with thorough building operations and maintenance guidance and a complementary plan, including all of the following components:
(a) Operations and maintenance guidance for all mechanical, electrical and plumbing equipment and appliances for building-level equipment and dwelling-unit equipment, including HVAC and plumbing as-built information and O&M schedules;
(b) O&M and replacement requirements for any other specialized systems within the project;
(c) Floor plans specifically highlighting the location of mechanical, electrical, gas, and water-system turnoffs;
(d) As-built lighting fixture and lamp schedules, specifications, and replacement guidance;
(e) As-built landscaping and hardscaping plant lists, specifications, maintenance requirements and schedules, and any specific instructions for community gardens or growing spaces;
(f) As-built irrigation plans, including zone delineation, control sequence, maintenance instructions, seasonal O&M schedule, and indication if irrigation is solely for establishment (indication # years) or is permanent;
(g) Green cleaning product specifications and cleaning schedules for any finish materials requiring special treatment;
(h) Pest Control Guidelines that reference the IPM strategies developed in 7.10 Integrated Pest Management;
(i) Clear O&M requirements for building accessibility systems for residents, including but not limited to security and safety systems, door locking devices such as card keys or other; and
(j) Maintenance requirements for equipment installed in active recreation and play spaces.

b. 8.2 Emergency Management Manual
1) Submit information critical to an Emergency Management Manual related to operations such as infrastructure and building shutdown procedures, potable water protection and supply.

2.01 PRODUCT REQUIREMENTS

A. Site Improvements
1. 3.5b Efficient Irrigation and Water Reuse
a. Install WaterSense labeled weather-based irrigation controller (WBIC)

B. Water Conservation
1. 4.1 Water-Conserving Fixtures
a. Toilets, WaterSense-labeled and = 1.28 gallons per flush (gpf)
b. Urinals, WaterSense-labeled and = 0.5 gpf
c. Showerheads, WaterSense-labeled and = 2.0 gallons per minute (gpm)
d. Kitchen faucets, = 2.0 gallons per minute (gpm)
e. Lavatory faucets, WaterSense-labeled and = 1.5 gallons per minute (gpm)

C. Energy Efficiency
1. 5.3 Sizing of Heating and Cooling Systems
a. Install equipment that meets the sizing calculations in accordance with the Air Conditioning Contractors of America (ACCA) Manuals J and S or ASHRAE handbooks. Equipment

capacity shall not exceed calculated sizing by more than 20% (unless smaller capacity equipment is unavailable).

2. 5.4 ENERGY STAR Appliances
    a. The following appliances shall be ENERGY STAR certified
        1) Clothes washers; and
        2) Dishwashers; and
        3) Refrigerators.
3. 5.5 Lighting
    a. Permanently installed lighting fixtures shall have efficacy = 40 lumens per watt.
        1) Recessed lights are ballasted compact fluorescent fixtures or use ENERGY STAR qualified LED lamps; and
        2) Fixtures are Insulation Contact Air-Tight rated.
        3) Common area lighting are ballasted compact fluorescent fixtures or use ENERGY STAR qualified LED lamps; and
        4) Are controlled by occupancy sensors or automatic bi-level controls
        5) Exterior lamps are fluorescent or LED; and
        6) ENERGY STAR certified when available in the product category; and
        7) Dark-Sky approved; and
        8) Have motion sensor controls, integrative photo cells, photo sensors or astronomic time-clock operation.
    b. Exit signs shall consume = 5 watts and have battery backup when located above stairwell doors and other forms of egress.
4. 5.6 Electricity Meter
    a. Electric meter or submeter shall be installed that is capable of individually metering each dwelling unit's electricity.

D. Materials
1. 6.1 Low / No VOC Paints, Coatings and Primers
    a. All interior paints and primers must have volatile organic compound (VOC) levels, in grams per liter, less than or equal to the thresholds established by South Coast Air Quality Management District (SCAQMD) Rule 1113. Projects must follow the most recent revision available at the time of product specification. For the latest rules: www.aqmd.gov/home/regulations/rules; as of July 1, 2013 SCAQMD Rule 1113 thresholds are listed as:
        1) Primers and sealers: 100g/L
        2) Coatings, flats and non-flats: 50 g/L
        3) Opaque floor coatings: 50 g/L
        4) Rust preventative coatings: 100 g/L
        5) Clear wood finishes: 275 g/L
2. 6.2 Low / No VOC Adhesives and Sealants
    a. All interior adhesives and sealants (including caulks) must have volatile organic compound (VOC) levels, in grams per liter, less than or equal to the thresholds established by South Coast Air Quality Management District (SCAQMD) Rule 1168. Projects must follow the most recent revision available at the time of product specification. For the latest rules: www.aqmd.gov/home/regulations/rules; as of January 7, 2005, SCAQMD Rule 1168 thresholds are listed as:
        1) Indoor carpet adhesives: 50 g/L
        2) Carpet pad adhesives: 50 g/L
        3) Outdoor carpet adhesives: 150 g/L
        4) Wood flooring adhesives: 100 g/L
        5) Rubber floor adhesives: 60 g/L
        6) Subfloor adhesive: 50 g/L
        7) Ceramic tile adhesives: 65 g/L

8) VCT and asphalt tile adhesives: 50 g/L
9) Drywall and panel adhesives: 50 g/L
10) Cove base adhesives: 50 g/L
11) Multipurpose construction adhesives: 100 g/L
12) Structural glazing adhesives: 100 g/L
13) Single-ply roof membrane adhesives: 250 g/L
14) Structural wood member adhesive: 140 g/L
15) Architectural sealants, including caulk: 250 g/L

3. 6.6 Composite Wood Products that Emit Low / No Formaldehyde
   a. [All composite wood products (plywood, OSB, MDF, cabinetry, etc.) installed within the weather-resistive barrier (WRB) must either be certified as compliant with California 93120 Phase 2], and/or;
   b. [For composite wood products installed within the WRB that do not comply with California 93120 Phase 2, all exposed edges and sides must be sealed with low-VOC sealants per Criterion 6.2.]
4. 6.7a Environmentally Preferable Flooring
   a. All hard surface flooring must be: [ceramic tile], [solid unfinished hardwood], and/or [a product that meets the Scientific Certification System's FloorScore program criteria, including for pre-finished hardwood flooring].
   b. All carpet products must meet the Carpet and Rug Institute's Green Label Plus certification and all carpet pads and adhesives must meet Green Label certification.
5. 6.9 Mold Prevention: Tub & Shower Enclosures
   a. Use moisture-resistant backing materials such as cement board, fiber cement board, or equivalent perASTM #D3273 behind tub/shower enclosures.
6. 6.10 Asthmagen-free Materials
   a. [For insulation] Do not use spray polyurethane foam (SPF) or formaldehyde-containing fiberglass batts.
   b. [For flooring] Do not use flexible vinyl (PVC) roll or sheet flooring or carpet backed with vinyl or phthalates. Do not use fluid applied finish floor.
   c. [For wall coverings]Do not use wallpaper made from vinyl (PVC) with phthalates or site-applied high-performance coatings that are epoxy-based or polyurethane-based.
   d. [For composite wood] Use only Ultra Low Emitting Formaldehyde (ULEF) or No Added Formaldehyde (NAF) products for cabinetry, subflooring, and other interior composite wood uses.

E. Healthy Living Environment
1. 7.1 Ventilation
   a. In-unit ventilation system(s) shall comply with ASHRAE 62.2-2010 requirements for local mechanical exhaust system in bathrooms and kitchens, and whole-house mechanical ventilation. Design/measured flow rates shall not exceed ASHRAE 62.2-2010 requirements by more than 50%.
   b. Individual bathroom fans shall be
      1) ENERGY STAR labeled; and either turn on with the light switch and off with associated automatic delay timer, or be activated by motion sensor, humidistat or other appropriate control.
   c. Central ventilation system (s) shall comply with ASHRAE 62.1-2010 requirements for any corridors, stair wells, common and amenity areas and retail/commercial/office spaces. Design/measured flow rates shall not exceed ASHRAE 62.1-2010 requirements by more than 50%.
   d. Any central rooftop fans shall be direct-drive and variable-speed.
   e. Any fan providing central ventilation with design CFM 300-2000 shall be equipped with an ECM motor.
2. 7.3 Combustion Safety
   a. Any combustion water heating or space heating equipment located within the conditioned envelope shall be power-vented or direct-vented.

b. Carbon monoxide alarms shall be hard-wired with battery backup.

3. 7.7 Mold Prevention: Water Heaters
   a. Drain pans under tank water heaters shall be sloped and corrosion-resistant (e.g., stainless steel or plastic).
4. 7.9 Garage Isolation
   a. Doors between conditioned space and garage space shall be equipped automatic closers or spring hinges AND weatherstripping or gaskets.
   b. Air sealing products shall be low-VOC.
   c. Do not install ductwork or air handling equipment in a garage.
5. 7.10 Integrated Pest Management
   a. Sealants shall be low-VOC.
   b. Openings greater than ¼" shall be equipped with rodent- and corrosion-proof screens.
   c. Operable windows shall have screens.
   d. All exterior doors and apartment entry doors shall be equipped with weatherstripping and door sweeps.

3.01 ENTERPRISE GREEN COMMUNITIES - GENERAL

A. Meet all Mandatory criterion and all Optional criterion as identified and specified by the design team, as required to achieve certification through Enterprise Green Communities.

3.02 EXECUTION REQUIREMENTS

A. Site Improvements
   1. 3.1 Environmental Remediation
      a. Execute mitigation steps as determined by environmental assessment.
   2. 3.2 Erosion and Sedimentation Control
      a. Follow all Best Management Practices (BMPs) within the Total Erosion and Sedimentation Control (TESC) Plan.
      b. Photograph all erosion control measures used throughout construction, including representative photos during rain events (as applicable) to document no visible off-site discharge.
   3. 3.5b Efficient Irrigation and Water Reuse
      a. [Option 1]: Coordinate with Electrical to provide power directly to the WaterSense-labeled Irrigation Controller.

B. Energy Efficiency
   1. 5.1c Building Performance Standard: Substantial and Moderate Rehab: single family and low-rise multifamily
      a. Co-ordinate with a qualified energy rater to verify that each dwelling unit achieves a Certified or Sampled HERS Index score of = 85.
   2. 5.1d Building Performance Standard: (Substantial and Moderate Rehab: Mid-rise and High-rise Multifamily)
      a. The as-built building's energy performance demonstrates compliance with ASHRAE 90.1-2010 Appendix G.
   3. 5.3 Sizing of Heating and Cooling Equipment
      a. Use HVAC load calculation software programs reviewed by ACCA to perform Manual J and S calculations; and
      b. Select and install HVAC equipment according to ACCA Manual J and S procedures to ensure right-sizing.

C. Materials
   1. 6.6 Composite Wood Products that Emit Low/No Formaldehyde
      a. For composite wood products installed within the WRB, that do not comply with California 93120 Phase 2, all exposed edges and sides must be sealed with low-VOC sealants per Criterion 6.2 prior to installation.

D. Healthy Living Environment
   1. 7.1 Ventilation

a. Install the following ventilation systems and ductwork in full accordance with ASHRAE 62.2-2010 and manufacturer's recommendations (This includes following guidelines for minimum straight duct length from fan boxes prior to first bend, type and size of duct, and number of bends to exterior wall termination):
    1) Local mechanical exhaust system in each bathroom and wire individual bathroom fans to turn on with light switch;
    2) Local mechanical exhaust system in each kitchen;
    3) Whole-house ventilation system.
b. In the common spaces and hallways of multifamily buildings 4 stories or taller, install mechanical ventilation systems in full accordance with ASHRAE 62.1-2010 and manufacturer's recommendations.

2. 7.2 Clothes Dryer Exhaust
    a. Install rigid-type exhaust ductwork to connect all vented clothes dryers directly to outdoors.
    b. Install a plumbed drain for all condensing or heat pump clothes dryers.
3. 7.3 Combustion Safety
    a. Install hard-wired carbon monoxide (CO) alarm with battery backup function for each sleeping zone and placed per National Fire Protection Association (NFPA) 720.
    b. For rehab projects with any atmospheric combustion space or water heating equipment within the conditioned envelope, conduct combustion safety testing for minimum 10% of dwelling units in accordance with RESNET or BPI Combustion Safety Test Procedures. Report any deficiencies immediately to the owner or owner's representative.
4. 7.7 Mold Prevention: Water Heaters
    a. Install non-water-sensitive floor coverings in rooms with water heaters.
    b. Install plumbed floor drains or plumbed drain pans under all tank water heaters, and ensure that floor slope or drain pan slope allows for adequate drainage.
    c. Direct all condensate lines into a plumbing system; do not deposit condensate under concrete slabs.
5. 7.9 Garage Isolation
    a. Install continuous air barrier between conditioned space and any garage space.
        1) Seal between all walls separating conditioned and garage spaces with foam [and/or caulk].
        2) Seal all pipe and conduit penetrations with material compatible with the adjacent materials and resilient to temperature fluctuations and providing fire-resistive characteristics if required by authorities having jurisdictions.
        3) Block and seal floor trusses and joists between conditioned space and garage with foam [and/or caulk].
    b. Visually inspect air sealing for continuity and completeness before any insulation is installed.
    c. Install automatic closers, spring hinges, and gaskets or weatherstripping on all doors between conditioned space and garage space.
    d. Install a carbon monoxide alarm with backup in each sleeping zone of the project, placed per National Fire Protection Association (NFPA) 720.
8. 7.10 Integrated Pest Management
    a. Seal all interior and exterior wall, floor, and joint penetrations with low-VOC caulking or other appropriate nontoxic sealing method (window screens, door sweeps, escutcheon plates, elastomeric sealant) to prevent pest entry.
    b. Install rodent- and corrosion-proof screens (copper or stainless steel mesh, or rigid metal cloth) for openings greater than ¼ inch.
    c. Thoroughly seal entry points under kitchen and bathroom sinks to prevent pest entry.

E. Operations and Maintenance
1. 8.4 Resident and Property Staff Orientation
    a. Use materials provided under Criterion 8.1 and 8.2 to deliver training to facility management and building maintenance staff on all relevant systems.

DIVISION 02

DEMOLITION – 02 41 00

1. SCOPE OF DEMOLITION: All work required for the site as illustrated in the Contract Documents.
   1.1. Site Demolition:
      a) Remove areas of parking lot, curb, drive, etc. as needed for new work.
      b) Remove all trees, shrubs, soil and other material from the site as required for the placement of new work and general construction activities.
      c) Reference site clearing specification section 31 10 00 for additional requirements.
      d) All excavation and earthwork as required for new work.
   1.2. If any hazardous materials are encountered on site notify the owner and architect immediately.
2. GENERAL PROCEDURES AND PROJECT CONDITIONS: Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public. Contractor is required to: Obtain required permits, Comply with applicable requirements of NFPA 241, Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures and Provide, erect, and maintain temporary barriers and security devices.
   2.1. Use of explosives is not permitted.
   2.2. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
   2.3. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.
   2.4. Perform demolition in a manner that maximizes salvage and recycling of materials.
3. EXISTING UTILITIES: Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits. Protect existing utilities to remain from damage.
4. DEBRIS AND WASTE REMOVAL: Remove debris, junk, and trash from site.
5. Walls, partitions, doors, frames, siding, windows, trim, shingles, sheathing, joists, studs, rafters and other items to be removed are shown dashed. Services within walls, ceilings, floors and other concealed spaces shall also be removed. Edges of walls shown to remain shall be saw cut or cleanly toothed to accept new construction. Repair and patch existing walls shown to remain where intersecting walls, doors, frames, etc. Are shown to be removed and where existing construction will be exposed in the new construction.
6. Provide all necessary shoring, bracing, and support to prevent movement, settlement, or collapse of structure or element to be demolished, and adjacent structure or element shown to remain (if applicable). Shoring and bracing shall be designed by a Professional Engineer licensed in the local jurisdiction. No demolition work shall be completed without a thorough inspection performed by the Contractor to verify the existing conditions and that the structural integrity of the structure to remain shall not be compromised. Notify the Architect of detriments in the existing structure within hidden conditions that are not remedied with reasonable methods.
7. Provide temporary weather protection and security barriers during interval between demolition and removal of existing construction on exterior surfaces and installation of new construction to ensure that no water leakage or damage occurs to structure or to interior areas of existing building.
8. Demolition plans show approximate layout of existing building and are not intended to represent "as-built" conditions. Contractor shall visit the site and become familiar with actual conditions when bidding the work as well as prior to the start of construction.
9. Existing construction shown to remain including but not limited to walls, partitions, doors, frames, etc. shall be protected during demolition. Damage to existing construction shown to remain shall be restored to match pre-damaged condition at no additional cost to the Owner.

10. Protect from damage all existing finish work to remain in place and which becomes exposed during demolition operation.
11. Where finishes are shown to be removed from existing construction, repair and patch remaining substrate and prepare for new finish. Carefully repair and patch all remaining substrates that were originally concealed by existing finishes, but will now be exposed in the new construction.
12. All infill or replacement work is to match existing conditions in materials, construction and finish, unless specifically noted elsewhere in the Contract Documents.
13. Items specifically noted for salvage on the contract documents shall be certified by the Contractor that they are in good working order prior to contracting or the items shall be replaced in kind at no additional cost to the Owner. Store all salvage in a location as directed by the Owner.
14. Remove all existing plumbing items, mechanical items, electrical items and finishes in their entirety where noted in the Contract Documents and where existing items will interfere with the installation of new construction even if not noted on the Contract Documents, or where existing items will be exposed in the new construction, unless specifically shown elsewhere in the Contract Documents to remain with materials matching existing construction.
15. Contractor is required to remove all existing finishes and associated supports, glue, furring, backing, etc. on surfaces that are to receive new finishes at no additional cost to the Owner.
16. All items, finishes, plumbing, electrical, mechanical, structural, and all other systems to remain shall be protected during demolition. Contractor is to investigate all concealed spaces prior to demolition and note existing conditions. If any system is discovered within a concealed space notify the Architect and Owner.
17. All walls shown for demolition shall be examined by the Contractor prior to demolition to determine if the existing wall is bearing. Notify the Architect in writing if any elements that are noted to be removed are bearing gravity or lateral loads and if not accommodations are made in the Contract Documents.

DIVISION 03

CONCRETE FORMING AND ACCESSORIES – 03 10 00

1. SCOPE OF WORK: Provide and install all required form work for on site concrete.
2. SECTION INCLUDES: Formwork for cast-in place concrete. Form stripping.
3. REFERENCE STANDARDS: ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; 2010. ACI 301 - Specifications for Structural Concrete; 2010 (Errata 2012). ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2011. ACI 347R - Guide to Formwork for Concrete; 2014.
4. FORMWORK – GENERAL: Provide concrete forms, accessories, shoring, and bracing to accomplish cast-in-place concrete work. Design and construct to provide resultant concrete that conforms to design with respect to shape, lines, and dimensions. Comply with applicable state and local codes with respect to design, fabrication, erection, and removal of formwork.
5. EXAMINATION: Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.
6. EARTH FORMS: Earth forms are not permitted.
7. ERECTION – FORMWORK: Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
8. APPLICATION - FORM RELEASE AGENT: Apply form release agent on formwork in accordance with manufacturer's recommendations.
9. FORM REMOVAL: Do not remove forms or bracing until concrete has gained sufficient strength to carry

its own weight and imposed loads.

CONCRETE REINFORCING – 03 20 00

1. SCOPE OF WORK: Provide all reinforcing as required for the work illustrated in the contract documents. This includes all exterior sidewalks and flatwork.
2. REINFORCING STEEL: ASTM A615/A615M, Grade 60 (60,000 psi). Plain billet-steel bars.
3. STEEL WELDED WIRE REINFORCEMENT (WWR): Galvanized, deformed type; ASTM A1064/A1064M. Style: 6x6: 1.4x1.4 W.W.M.
4. FABRICATION: Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.
5. PLACEMENT: Place, support and secure reinforcement against displacement. Do not deviate from required position. Do not displace or damage vapor barrier. Conform to applicable code for concrete cover over reinforcement.
6. Reinforcing shall be supplied as detailed on the drawings for all new concrete including sidewalks. If not specifically detailed in the documents reference Cast In Place Concrete 03 30 00 specification for minimum reinforcing required.

CAST-IN-PLACE CONCRETE – 03 30 00

1. SCOPE OF WORK: Provide new cast in place concrete at all slabs on grade, side walks, foundations, footings, piers etc. as described in the contract documents.
2. PROJECT RECORD DOCUMENTS: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.
3. QUALITY ASSURANCE: Perform work of this section in accordance with ACI 301 and ACI 318. Follow recommendations of ACI 305R when concreting during hot weather. Follow recommendations of ACI 306R when concreting during cold weather.
4. CONCRETE MATERIALS
   - 4.1. CEMENT: ASTM C150/C150M, Type I - Normal Portland type.
   - 4.2. FINE AND COARSE AGGREGATES: ASTM C 33.
   - 4.3. FLY ASH: ASTM C618, Class C or F.
   - 4.4. WATER: Clean and not detrimental to concrete.
5. ADMIXTURES: Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
6. BONDING AND JOINTING PRODUCTS: Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with minimum 1 inch diameter holes for conduit or rebars to pass through at 6 inches on center; ribbed steel stakes for setting.
7. CONCRETE MIX DESIGN:
   - 7.1. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
   - 7.2. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.
   - 7.3. Fiber Reinforcement: Add to mix at rate of 1.5 pounds per cubic yard, or as recommended by manufacturer for specific project conditions.
8. PREPARATION: Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
9. PLACING CONCRETE: Place concrete in accordance with ACI 304R. Place concrete for floor slabs in accordance with ACI 302.1R. Finish floors level and flat, unless otherwise indicated, within the

tolerances specified below.

10. FLOOR FLATNESS AND LEVELNESS TOLERANCES: Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.
11. CONCRETE FINISHING: Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows for Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, thin set quarry tile, and thin set ceramic tile.
12. CURING AND PROTECTION: Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
13. MINIMUM REQUIRED: Unless specifically called out elsewhere in the Contract Documents slabs shall be minimum 4” thick with 6x6-W4.0xW4.0 WWF throughout placed at the center of the slab vertically. Lap 12” min. and tie.

CURING AND SEALING CONCRETE FLOORS – 03 39 05

1. SCOPE OF WORK: Provide compliant curing and sealing of all concrete floors prior to the application of finish materials.
2. INSTALLER QUALIFICATIONS: Applicator experienced with installation of product and certified by manufacturer, or applicator experienced with similar products and providing manufacturer's field technician on site to advise on application procedures; and providing adequate number of skilled workers trained and familiar with application requirements.
3. DELIVERY, STORAGE, AND HANDLING: Deliver product in factory numbered and sealed drums, with numbers recorded for Owner's records. Store products in manufacturer's unopened drums until ready for installation.
4. PROJECT CONDITIONS: No satisfactory procedures are available to remove petroleum or rust stains from concrete. Prevention is therefore essential. Take precautions to prevent staining of concrete prior to application of cure-seal-hardener and for minimum of three months after application:
    4.1. Prohibit parking of vehicles on concrete slab.
    4.2. If vehicles must be temporarily parked on slab, place drop cloths under vehicles during entire time parked.
    4.3. If construction equipment must be used for application, diaper all components that might drip oil, hydraulic fluid, or other liquids.
    4.4. Prohibit pipe cutting using pipe cutting machinery on concrete slab.
    4.5. Prohibit temporary placement and storage of steel members on concrete slab.
5. Do not install products under environmental conditions outside manufacturer's absolute limits. Do not use frozen material; thaw and agitate prior to use.
6. WARRANTY: Provide manufacturer's warranty that a structurally sound concrete surface prepared and treated according to the manufacturer's directions will remain permanently dustproof, hardened and water repellent. If after the specified sealing period the treated surface does not remain dustproof, hardened and water repellent, provide, at manufacturer's expense, sufficient material to reseal defective areas.
7. MATERIALS: Cure-Seal water-based chemically-reactive penetrating sealer and hardener, Colorless, transparent, odorless, non-toxic, non-flammable; Allowing traffic on floors within 2 to 3 hours, with chemical process complete within 3 months. Water shall be clean and potable.
8. EXAMINATION: Do not begin installation until substrates have been properly prepared and are suitable for application of product. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
9. PREPARATION: Clean surfaces thoroughly prior to installation. Prepare surfaces using the methods

recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

10. INSTALLATION: Install in accordance with manufacturer's instructions. If this is the applicator's first project using this product, provide the manufacturer's technical representative on-site to familiarize installers with proper procedures. Prevent damage to and soiling of adjacent work. New Concrete: Apply cure-seal to new concrete as soon as the concrete is firm enough to work on after troweling, except on colored concrete wait minimum of 30 days.
    10.1. Spray on at rate of as recommended by manufacturer.
    10.2. Comply with manufacturers installation instructions or as follows
    10.3. Keep surfaces wet with cure-seal-hardener for minimum soak-in period of 30 minutes, without allowing drying out or becoming slippery. In hot weather slipperiness may appear before the 30 minute time period has elapsed. If that occurs, apply more cure-seal-hardener as required to keep entire surface in a non-slippery state for the first 15 minutes. For the remaining 15 minutes, mist the surface as needed with water to keep the material in a non-slippery state.
    10.4. After this period, when treated surface becomes slippery lightly mist with water until slipperiness disappears.
    10.5. Wait for surface to become slippery again and then flush entire surface with water removing all residue of cure-seal-hardener.
    10.6. Squeegee surface completely dry, flushing any remaining slippery areas until no residue remains.
    10.7. Wet vacuum or scrubbing machines may be used to remove residue, provided manufacturer's instructions are followed.
11. PROTECTION: Protect installed floors until chemical reaction process is complete; at least three months. Clean floor regularly in accordance with manufacturer's recommendations because water will accelerate the sealing and scrubbing will impart a shine. Clean up spills immediately and spot-treat stains with good degreaser or oil emulsifier. Precautions and cleaning are the responsibility of the Contractor until Substantial Completion.

DIVISION 04

1. Not included on this specification.

DIVISION 05

METAL FABRICATIONS – 05 50 00

1. SCOPE OF WORK: All new metal fabrication supporting all other new work.
2. SHOP DRAWINGS: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
3. CODE COMPILANCE: Fabricator shall provide steel framing that has been designed to resist code prescribed loads, with consideration of serviceability (deflections), and be able to submit calculations for review. This includes required PLF and point loading along railings.
4. STEEL SECTIONS: ASTM A36/A36M.
5. STEEL TUBING: ASTM A501/A501M hot-formed structural tubing.
6. PLATES: ASTM A283/A283M.
7. PIPE: ASTM A53/A53M, Grade B Schedule 40, hot-dip galvanized finish.
8. BOLTS, NUTS, AND WASHERS: ASTM A325 (ASTM A325M), Type 1 , plain.
9. WELDING MATERIALS: AWS D1.1/D1.1M; type required for materials being welded.
10. SHOP AND TOUCH-UP PRIMER: SSPC-Paint 15, complying with VOC limitations of authorities having

jurisdiction.

11. TOUCH-UP PRIMER FOR GALVANIZED SURFACES: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.
12. FINISHES – STEEL: Prime paint steel items.
13. INSTALLATION: Install items plumb and level, accurately fitted, free from distortion or defects.

DIVISION 06

CONNECTORS AND ANCHORS – 06 05 23

1. SCOPE OF WORK: Provide and install engineered hangers, straps, anchors, clips, angles, accessories, screws, bolts, plates, etc. as required for a whole and complete framing system. Reference structural drawings for specific items. Any connections in which an engineered connector is available, it shall be provided and fully installed as part of the contractor's base bid. All items shall be installed in strict accordance with both the engineered systems illustrated in the Contract Documents, the building code, industry best practice as well as the manufacturer's instructions.
    1.1. Reference Structural drawings for additional requirements. If there is a conflict between this specification section and the structural drawings, the engineered solution provided on the structural drawings shall govern.
2. SECTION INCLUDES:
    2.1. Anchors: Requirements pertaining to post-installed and cast-in-place anchors for materials and equipment. This section pertains to all other sections of these specifications that require post-installed or cast-in-place anchors, unless specified otherwise.
    2.2. Connectors: Pre-engineered metal or plastic connectors used to support a wood, plated truss or composite wood, from a concrete, masonry, steel, wood, or composite wood supporting member(s).
3. SUBSTITUTIONS: Only manufacturers with an ICC-ES or IAPMO-UES listing will be considered for substitution requests. The contractor shall submit, for Engineer-of-Record's review, calculations that are prepared & sealed by a registered Professional Engineer demonstrating that the substituted product is capable of achieving the pertinent equivalent performance values of the specified product using the appropriate design procedure and/or standard(s) as required by the Building Code. In addition, the calculations shall specify the diameter and embedment depth of the substituted product. Any increase in material costs for such submittal shall be the responsibility of the contractor.
4. QUALITY ASSURANCE: Installer Qualifications: The installer shall be experienced in installing anchors equal to type, and into the substrate material required for this project.
5. DELIVERY, STORAGE, AND HANDLING: Deliver products to job site in manufacturer's or distributor's packaging undamaged, complete with installation instructions. Protect and handle materials in accordance with manufacturer's recommendations to prevent damage or deterioration.
6. PROJECT CONDITIONS: Adhesive anchors shall be installed in concrete having a minimum age of 21 days at time of anchor installation. Anchoring adhesives must be stored at temperatures prescribed by the manufacturer and must not be used beyond the expiration date. The anchor or fastener coating, plating or steel type must provide suitable corrosion resistance for the environment in which the anchor or fastener is installed.
7. EXPANSION ANCHORS FOR CRACKED AND UNCRACKED CONCRETE: Simpson Strong-Tie Strong-Bolt 2 Wedge Anchor, ICC-ES ESR-3037 (carbon steel or type 316 or 304 stainless steel)
8. SCREW ANCHORS FOR CRACKED AND UNCRACKED CONCRETE: Simpson Strong-Tie Titen HD Screw Anchor, ICC-ES ESR-2713 or Simpson Strong-Tie Titen HD Rod Hanger, ICC-ES ESR-2713
9. SELF-UNDERCUTTING ANCHORS FOR CRACKED AND UNCRACKED CONCRETE: Simpson Strong-Tie Torq-Cut Self-Undercutting Anchor, ICC-ES ESR-2705
10. ADHESIVE ANCHORS FOR CRACKED AND UNCRACKED CONCRETE: Simpson Strong-Tie SET-XP

Epoxy Adhesive, ICC-ES ESR-2508

11. ADHESIVE ANCHORS FOR CRACKED AND UNCRACKED CONCRETE AND DECREASED INSTALLATION TEMPERATURE (14°F): Simpson Strong-Tie AT-XP Acrylic Adhesive, IAPMO-UES ER-263
12. SLEEVE ANCHORS FOR UNCRACKED CONCRETE: Simpson Strong-Tie Sleeve-All Anchor carrying the following approvals and listings: Factory Mutual 3017082, 3026805, 3029959, and 3043442, 3/8"–3/4" dia.; Underwriters Laboratories File Ex3605, 3/8"–3/4" dia.; Meets requirements of Federal Specifications A-A-1922A
13. DROP-IN ANCHORS FOR UNCRACKED CONCRETE: Simpson Strong-Tie Drop-In Anchor carrying the following approvals and listings: Factory Mutual 3017082; Underwriters Laboratories File Ex3605.; Meets requirements of Federal Specifications A-A-55614, Type 1
14. CAST-IN-PLACE INSERTS FOR CONCRETE: Simpson Strong-Tie Blue Banger Hanger Cast-In-Place Inserts carrying the following approvals and listings: Factory Mutual 3024378; Underwriters Laboratories File Ex3605; UL Standard 2043, 2nd Edition “Fire test for heat and visible smoke release for discrete products and their accessories installed in air-handling spaces” (multi-thread metal deck insert only)
15. EXPANSION ANCHORS FOR GROUT-FILLED CONCRETE MASONRY UNITS: Simpson Strong-Tie Strong-Bolt 2 Wedge Anchor, IAPMO-UES ER-240 (carbon steel) or Simpson Strong-Tie Wedge-All Anchor, ICC-ES ESR-1396 (carbon steel or mechanically galvanized)
16. SCREW ANCHORS FOR GROUT-FILLED CONCRETE MASONRY UNITS: Simpson Strong-Tie Titen HD Screw Anchor, ICC-ES ESR-1056
17. ADHESIVE ANCHORS FOR GROUT-FILLED CONCRETE MASONRY UNITS: Simpson Strong-Tie SET-XP Epoxy Adhesive, IAPMO-UES ER-265 or Simpson Strong-Tie AT-XP Acrylic Adhesive, IAPMO-UES ER-281 or Simpson Strong-Tie ET-HP Epoxy Adhesive, IAPMO-UES ER-241
18. SLEEVE ANCHORS FOR GROUT-FILLED CONCRETE MASONRY UNITS: Simpson Strong-Tie Sleeve-All Anchor carrying the following approvals and listings: Factory Mutual 3017082, 3026805, 3029959, and 3043442, 3/8"–3/4" dia; Underwriters Laboratories File Ex3605, 3/8"–3/4" dia.; Meets requirements of Federal Specifications A-A-1922A
19. SCREW ANCHORS FOR HOLLOW CONCRETE MASONRY UNITS: Simpson Strong-Tie Titen HD Screw Anchor
20. ADHESIVE ANCHORS FOR HOLLOW CONCRETE MASONRY UNITS: Simpson Strong-Tie SET Epoxy Adhesive (use carbon steel or plastic screen tube) or Simpson Strong-Tie AT Acrylic Adhesive (use stainless steel or plastic screen tube) or Simpson Strong-Tie ET-HP Epoxy Adhesive (use carbon steel or plastic screen tube)
21. ADHESIVE ANCHORS FOR UNREINFORCED MASONRY: Simpson Strong-Tie SET Epoxy Adhesive, ICC-ES ESR-1772 or Simpson Strong-Tie AT Acrylic Adhesive, ICC-ES ESR-1958 or Simpson Strong-Tie ET-HP Epoxy Adhesive, ICC-ES ER-4945
22. GAS-ACTUATED FASTENERS AND ASSEMBLIES: Shall be specified by the Engineer of Record if applicable for this project. Gas-Actuated Fasteners and Assemblies attached to normal-weight and sand-lightweight concrete, steel deck with sand-lightweight concrete fill, structural steel, and hollow and grout-filled concrete masonry units shall be: Simpson Strong-Tie Gas-Actuated Fasteners and Assemblies, ICC-ES ESR-2811
23. POWDER-ACTUATED FASTENERS, THREADED STUDS AND ASSEMBLIES: Shall be specified by the Engineer of Record if applicable for this project. Powder-actuated fasteners, threaded studs and assemblies attached to normal-weight and sand-lightweight concrete, steel deck with sand-lightweight concrete fill, structural steel, and hollow and grout-filled concrete masonry units shall be: Simpson Strong-Tie Powder-Actuated Fasteners, Threaded Studs and Assemblies, ICC-ES ESR-2138
24. MATERIAL (Connectors):
    24.1. Steel: Sheet: ASTM A36, ASTM A653, ASTM A1011; Fasteners: ASTM A307, ASTM F1554, ASTM F1667, SAE C1022 (SDS Screws)

24.2. Stainless Steel: Sheet: ASTM A240, ATTM A480; Fasteners: ASTM A493

24.3. Finishes: Gray paint; Hot-dipped galvanized or electro-plated galvanized: G90, G185 (ZMAX or HDG); Powder-coated paint; Electro-galvanized, Zinc dichromate and Double Barrier for SD and SDS screws

25. FABRICATION (Connectors): Shop assembly to occur per the manufacturer's approved production drawings. Fabrication tolerances per manufacturer. Fabrication requiring welding shall be performed in accordance with the current American Welding Society's standards. The manufacturer's identification shall be stamped into the metal or wood part and a label may be attached to the part with adhesive.

26. TESTING (Connectors): Allowable loads published in manufacturer's catalog to be determined using the minimum load from static and/or cyclic analysis and one or more of the following test methods: Static load tests in wood assemblies; Static load tests in steel jigs; Static load tests of products embedded in concrete or masonry. Testing to determine allowable loads shall be performed as per the applicable ICC-ES Acceptance Criteria or ASTM standard. Allowable loads for hangers are determined by a static load test resulting in not more than a 1/8" deflection of the joist relative to the header, or either the lowest of 3 or average of 6 ultimate load divided by 3, or the fastener allowable load as determined by the NDS, whichever is lowest. Manufacturer to provide code testing data on all products that have been code tested upon request.

27. EXAMINATION (Connectors): Unless otherwise noted in the manufacturer's catalog, allowable loads are for Douglas Fir-Larch under continuously dry conditions. Allowable loads for other species or conditions must be adjusted according to the code. See manufacturer's catalog for additional notes and requirements. Built up lumber (multiple members) must be fastened together to act as one unit to resist the applied load. Verify that the dimensions of the supporting member are sufficient to receive the specified fasteners.

28. INSTALLATION (Connectors):

28.1. Unless otherwise noted in the manufacturer's catalog, bolts, screws and/or nails shall not be combined.

28.2. All nails shall be common unless otherwise noted in the manufacturer's catalog or substituted by the engineer of record with a reduction taken.

28.3. Unless otherwise noted in the manufacturer's catalog, bending steel in the field may cause fractures at the bend line. Fractured steel will not carry the allowable load and must be replaced. When bending is allowed or required in the catalog, the connector shall be allowed one cycle bend, one time only.

28.4. Galvanized connectors should not be placed in contact with treated wood unless the treated wood is adequately verified to be suitable for such contact. Some wood treatments may accelerate metal deterioration. See the manufacturer's catalog for specific recommendations.

28.5. A fastener that splits the wood will not carry the allowable load. Evaluate splits to determine if the connection will perform as required. Dry wood will split more easily and should be evaluated as needed. If wood tends to split, consider pre-boring holes with a diameter not exceeding 0.75 of the nail diameter, for screws in wood with a specific gravity of 0.5 or greater use: 5/32" for SDS, 5/64" for SD9 or SD10, and 1/16" for SD8 (2005 NDS 11.1.4 and 11.1.5.3).

28.6. Wood shrinkage will be taken into consideration when designing and installing connections.

28.7. Built-up lumber (multiple members) must be fastened together to act as one unit to resist the applied load.

28.8. Top flange hangers may cause unevenness. Possible remedies should be evaluated by a professional and include using a face mount hanger, routering the beam, or cutting the subfloor to accommodate the top flange thickness.

28.9. Do not overload by exceeding the manufacturer's catalog allowable load values.

28.10. Unless otherwise noted in the manufacturer's catalog, fill all fastener holes with fastener types as specified in the manufacturer's catalog.

28.11. All specified fasteners must be installed according to the instructions in the manufacturer's catalog.

28.12. Bolt holes shall be a minimum of 1/32" and a maximum of 1/16" larger than the bolt diameter (2005 NDS 11.1.2.2).

28.13. Install all specified fasteners before loading the connection.

28.14. Use proper safety equipment.

28.15. Welding shall be in accordance with the Welding Society (AWS) standards.

28.16. Welding galvanized steel may produce harmful fumes. Follow proper welding procedures and safety precautions.

28.17. Nail tools with hole-location mechanisms may be used to install connectors, provided the correct quantity and type of nails are properly installed in the nail holes.

28.18. The joist shall bear completely on the connector seat the gap between the joist end and the header or back plate of the hanger shall not exceed 1/8".

28.19. The installer of ATS systems shall cut rods to length as required.

28.20. Anchor bolt nuts should be finger-tight plus 1/3 to ½ turn with a wrench. Do not use an impact wrench to tighten nuts on the anchor bolts.

28.21. Modifications to products or changes in installation procedures should only be made by a qualified designer. The performance of such modified products or altered installation procedure is the sole responsibility of the designer.

29. FIELD QUALITY CONTROL (Connectors): Determine that the proper part is being used in the correct application and has been fabricated by the approved manufacturer by observation of the stamp into the metal part and/or the adhesive label on the product denoting part and manufacturer name. Before substituting another brand, confirm load capacity based on published testing data and calculations per this section. The engineer/designer of record shall evaluate and give written approval for substitution prior to installation.

30. EXAMINATION (Anchors): Examine supporting base materials and environmental conditions. Do not begin installation until base materials have been properly prepared. Unless otherwise specified, do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength. Install only if environmental conditions are in compliance with manufacturer’s recommendations for installation conditions.

31. INSTALLATION (Anchors): Adhesive anchors shall be installed in concrete having a minimum age of 21 days at time of anchor installation. Installation shall conform to the manufacturer’s published installation instructions. Where holes are drilled in concrete or masonry, holes shall be accurately and squarely drilled, and the holes shall be cleaned in accordance with the manufacturer’s recommendations. Unless otherwise noted, anchors shall be installed in holes drilled into base materials using carbide-tipped drill bits conforming to ANSI B212.15-1994. Where manufacturer recommends use of special tools for installation of anchors, such tools shall be used, unless otherwise permitted specifically by the Engineer or Architect of Record. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Exercise care in drilling to avoid damaging existing reinforcing or embedded items. Notify the Engineer if reinforcing steel or other embedded items are encountered during drilling.

32. SPECIAL INSPECTION (Anchors): Special inspection is defined in ACI 318 as a function performed by qualified special inspectors in the employ of the owner or the owner’s agent. Inspection is particularly important for post-installed anchors to make certain that the Manufacturer’s Printed Installation Instructions (MPII) are followed. A distinction is made between continuous special inspection and periodic special inspection. Special Inspection, continuous or periodic, of post-installed anchors, shall be provided as required by ICC-ES or IAPMO-UES evaluation reports and/or as specified by the Engineer of Record. This service shall be performed by personnel independent of the manufacturer or contractor so as to prevent a conflict of interest.

32.1. For mechanical anchors qualified for use in cracked and uncracked concrete in accordance with ICC-ES AC193, periodic special inspection is required.

32.2. For adhesive anchors qualified for use in cracked and uncracked concrete in accordance with ICC-ES AC308, installations may be made under continuous special inspection with an onsite proof loading program or periodic special inspection, as determined by the registered design professional. Strength reduction factors, Φ, and additional factors published in the evaluation report, and used in design, must correspond to the type of inspection provided.

32.3. For adhesive anchors qualified for use in cracked and uncracked concrete in accordance with ICC-ES AC308, where required, a program for on-site proof loading, that is, proof loading program, to be conducted as part of the special inspection shall be established by the engineer or design professional of record and shall conform to the following minimum requirements: Frequency of proof loading based on anchor type, diameter, and embedment; Proof loads by anchor type, diameter, embedment, and location; Acceptable displacements at proof load; Remedial action in the event of failure to achieve proof load or excessive displacement

32.4. Unless otherwise directed by the engineer or design professional of record, proof loads shall be applied as confined tension tests. Proof load levels shall not exceed the lesser of 50 percent of the expected peak load based on adhesive bond strength or 80 percent of the anchor yield strength. Maintain the proof load at the required load level for a minimum of 10 seconds.

33. INSTALLER CERTIFICATION (Anchors): The installer shall be certified and install all products in accordance with adhesive anchors assessed by the acceptance testing under ACI 355.4.

ROUGH CARPENTRY – 06 10 00

1. SCOPE OF WORK: All dimensional lumber as needed for framing, blocking, etc. as needed to complete the design intent in the contract documents.

   1.1. Reference Structural drawings for additional requirements. If there is a conflict between this specification section and the structural drawings, the engineered solution provided on the structural drawings shall govern.

2. DIMENSION LUMBER: Comply with PS 20 and requirements of specified grading agencies.

   2.1. Species: Spruce-Pine-Fir (South), unless otherwise indicated. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

   2.2. Lumber fabricated from old growth timber is not permitted.

3. DIMENSION LUMBER FOR CONCEALED APPLICATIONS:

   3.1. Grading Agency: Western Wood Products Association; WWPA G-5. Nominal sizes as indicated on drawings, S4S, with Moisture Content: S-dry or MC19.

   3.2. Stud Framing (2 by 2 through 2 by 6): Spruce-Pine-Fir, Stud grade or better.

   3.3. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16): Hem Fir, Grade: No. 2.

   3.4. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring: S4S, No. 2 or Standard Grade. Blocking shall be minimum 2x6.

   3.5. Boards: Standard or No. 3.

4. STRUCTURAL COMPOSITE LUMBER: Structural Composite Lumber shall be Factory fabricated beams, headers, and columns, of sizes and types indicated on drawings; structural capacity as published by manufacturer. Specifically, Beams shall Use laminated veneer lumber, laminated strand lumber, or parallel strand lumber with manufacturer's published E (modulus of elasticity): 1,800,000 psi, minimum.

5. BLOCKING: Concealed blocking shall consist of nominal lumber not less than 2"x6" and be provided and installed at all wall mounted appliances and accessories as required as newly installed items only. This includes but is not limited to doors, casework, kitchen and bath accessories, etc.

6. EXPOSED BOARDS: Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping. Moisture Content: Kiln-dry (15 percent maximum). Surfacing:

S4S. Species: Douglas Fir, Grade No. 1, 1 Common, or Select.

7. CONSTRUCTION PANELS:
   7.1. Subflooring : APA PRP-108: Rated Sheathing. Thickness: 3/4 inch, nominal.
   7.2. Roof Sheathing : APA PRP-108, Rated Sheathing, Exterior Exposure Class, Thickness: 5/8 inch, nominal.
8. ACCESSORIES
   8.1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
   8.2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
   8.3. Joist Hangers: Hot dipped galvanized steel, sized to suit framing conditions. For contact with preservative treated wood in exposed locations, provide minimum G185 galvanizing complying with ASTM A653/A653M.
9. FACTORY WOOD TREATMENT: Treated Lumber and Plywood shall Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   9.1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
   9.2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.
10. INSTALLATION – GENERAL: Select material sizes to minimize waste. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.
11. FRAMING INSTALLATION: Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members. Install structural members full length without splices unless otherwise specifically detailed. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AFPA (WFCM) Wood Frame Construction Manual. Install horizontal spanning members with crown edge up and not less than 1-1/2 inches of bearing at each end.
12. INSTALLATION OF CONSTRUCTION PANELS
   12.1. Subflooring: Glue and nail to framing; staples are not permitted.
   12.2. Underlayment: Secure to subflooring with nails and glue.
   12.3. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
13. HEADERS: Wood headers over all interior openings of NONBEARING partitions shall be as scheduled below. Headers over all interior finished openings not greater than 3'-0" wide at BEARING partitions shall be a minimum of (2) 2x12, unless otherwise noted. Refer to the Drawings for headers over BEARING partitions. Furnish and install a minimum of two (2) studs at ends of all engineered headers and double joist headers. All framing shall bear a minimum of 1-1/2 inches.
14. MULTIPLE JOISTS: Furnish and install double joist under all partitions parallel to joists and under kitchen base cabinets, bathtubs and all other areas of heavy loading. At all floor and roof openings furnish and install double or triple header and trimmer joists.
15. PLYWOOD: All plywood shall be APA structural II, C-C, exterior or standard tongue and groove sheathing with exterior glue, thickness as indicated. All plywood shall be identified with the appropriate grade-trademark of the APA and shall meet requirements of the latest edition of DOC PS-1 "Construction and Industrial Plywood" and PS-2 "Performance Standard for Wood-based Structural Panels" or one of APA's performance proprietary specifications. All applications shall be in accordance

with the recommendations of the APA and the DOC. Provide marine-grade plywood at all locations of fiberglass seamless roofing, if applicable.

16. FRAMING ANCHORS: Provide a complete system of High Wind Resistant Framing Anchors to provide a continuous load path from the ridge to the foundation of the structure as using products as manufactured and as recommended by USP Structural Connectors, Simpson Strong Tie, or equal. Products shall be galvanized steel and shall include, but not be limited to: ridge rafter strapping; rafter-to-top plate anchors; rafter-to-joist/stud strapping; beam/joist hangers; column caps; joist-to-sill plate strapping or anchors.

FINISH CARPENTRY – 06 20 00

1. SCOPE OF WORK: Finish trim on interior of walls, windows, doors, and cabinets.
2. SAMPLES: Submit two samples of wood trim 6 inch long.
3. LUMBER MATERIALS: Hardwood Lumber shall be Maple species, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish. Grading In accordance with rules certified by ALSC; www.alsc.org.
4. ACCESSORIES: Wood Filler shall be Solvent base, tinted to match surface finish color.
5. FABRICATION: Shop assemble work for delivery to site, permitting passage through building openings.
6. SHOP FINISHING: Sand work smooth and set exposed nails and screws. Apply wood filler in exposed nail and screw indentations. Finish work in accordance with AWI/AWMAC/WI (AWS), Section 5 - Finishing for grade specified.
7. INSTALLATION: Set and secure materials and components in place, plumb and level. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.
   7.1. All nails to be counter sunk and filled with wood FILLER.
   7.2. If new trim does not cover old paint lines, include patching and painting in this area.

CAST MARBLE FABRICATIONS – 06 61 50

1. SCOPE OF WORK: All window sills. Reference finish schedule for exact product
2. SECTION INCLUDES: Synthetic marble window sills.
3. SUBMITTALS: Product Data: Manufacturer's printed product data indicating compliance with specified requirements. Manufacturer's cleaning and maintenance data.
   3.1. Selection Samples: For each product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
   3.2. Verification Samples: For each finish product specified, two samples, minimum size 6 inches square, representing actual product, color, and patterns.
4. QUALITY ASSURANCE: Manufacturer Qualifications: Member of International Cast Polymer Association (ICPA), with not less than five years of experience in manufacturing products similar to those required for this project.
   4.1. Installer Qualifications: Not less than five installations of comparable scope within the past three years.
5. DELIVERY, STORAGE, AND HANDLING: Packing and Shipping: Pack countertops, and other flat products in wooden crates to minimize shipping damage. Palletize other components. Check for shipping damage during unloading at site and notify manufacturer immediately of any obvious damage. Store products under cover, off the ground, and protected from moisture. Handle products to prevent physical damage. Protect surfaces from staining, scratching, and other damage during handling and installation.
6. PROJECT CONDITIONS: Field Measurements: Verify shop drawings with field measurements. Coordination: Coordinate construction activities of this section with construction activities specified in

related sections.

7. WARRANTY: Window Sills, Thresholds, and Other Flat Items: Manufacturer's standard warranty on defective materials.
8. MANUFACTURERS
   8.1. Central Marble Products; Rice, MN
   8.2. Princess Marble; Burnsville, MN
9. MATERIALS: Provide cast marble fabrications made of proprietary resin and gel coat finish with finished properties as described under specific product types. Polishing Cream: As recommended by manufacturer.
10. ADHESIVES AND SEALANTS: As specified in Section 07 90 05, and as follows:
    10.1. To adhere cast marble panels to gypsum wallboard, use LN-601 Liquid Nails, Nail-No-More, or other product recommended by manufacturer.
    10.2. For joints between cast marble panels, use a mildew resistant 100 percent silicone joint sealer; siliconized calking compound is not acceptable.
    10.3. For sealing cast marble panels at adjoining surfaces such as gypsum wallboard, use mildew resistant acrylic calk joint sealer, such as Phenoseal Acrylic Caulk by Gibson-Homans, or other product recommended by cast marble panel manufacturer.
11. CONFIGURATION, COLOR AND PATTERN: Minimum thickness of 3/4 inch; other dimensions as indicated in the Finish Schedule.
12. FABRICATION: Use molds, materials, methods, and procedures that will result in proper texture and finish. Fabricate to required profiles and dimensions. To the greatest extent possible, fabricate each unit as a continuous piece, without joints, and configured to minimize on-site cutting or other modifications. Ease all edges and sand smooth; provide uniform gloss finish on all exposed surfaces. Cure components prior to shipping, and remove traces of material that may be toxic or incompatible with other building materials.
13. EXAMINATION: Do not begin installation until substrates have been properly prepared. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
14. INSTALLATION: General: Install in accordance with manufacturer's instructions and approved shop drawings. Install components to be plumb, level, and rigid. Neatly scribe to adjoining surfaces, and field trim for snug fit. Replace any component that is cracked, chipped, broken, or otherwise defective. Window Sills: Attach to solid substrate with silicone joint sealer, as recommended by manufacturer.
15. PROTECTION: Protect installed products until completion of project. Touch-up, repair or replace damaged components before Substantial Completion.

DIVISION 07

TRAFFIC COATINGS – 07 18 00

1. SCOPE OF WORK: As an alternate to the base bid:
   1.1. Item #1: Include a cost to coat all walkways.
   1.2. Item #2: Include a cost to coat all maintenance, utility rooms, and storage areas.
2. SECTION INCLUDES: Coating for waterproofing and traffic surface
3. SUBMITTALS: Include product characteristics and limitations. Identify dissolving solvents, fuels, and potential destructive compounds. Manufacturer's Installation Instructions: Include special field conditions required to install traffic membrane and potential incompatibilities with adjacent materials.
4. MAINTENANCE DATA: Include procedures for stain removal, repairing surface, and cleaning.
5. WARRANTY: Submit manufacturer warranty and ensure that forms have been completed in Owner's

name and registered with manufacturer.

6. QUALITY ASSURANCE: Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than three years of documented experience.
7. APPLICATOR QUALIFICATIONS: Company specializing in performing installation of traffic membrane, with minimum 5 years documented experience and approved by manufacturer.
8. FIELD CONDITIONS: Do not install materials when temperature is below 50 degrees F or above 90 degrees F. Maintain this temperature range, 24 hours before, during and 72 hours after application. Restrict traffic from area where materials are being installed or are curing.
9. WARRANTY:Correct defective Work within a five year period after Date of Substantial Completion. Provide five year manufacturer warranty for 20 years. Include coverage for delamination of system from substrate.
10. PEDESTRIAN COATING: Fluid-applied polyurethane with slip-reducing aggregate surface. Finished Coating Thickness: 50 mils (0.050 inch), minimum.
11. MANUFACTURERS: AVM Industries, Inc; System 650SF, Gaco Western; GacoFlex U61
12. EXAMINATION: Verify that substrate is ready to receive work, surface is clean, dry and free of substances that could adversely affect bond.
13. PREPARATION: Clean substrate surface free of foreign matter. Patch wood substrate with latex filler to produce surface conducive to bond. Patch concrete substrate with filler to produce surface conducive to bond. Install cant strips securely at intersecting surfaces. Protect adjacent surfaces.
14. INSTALLATION: Apply system materials in accordance with manufacturer's instructions.
15. PROTECTION: Do not permit traffic over unprotected surfaces.

SHEET METAL FLASHING – 07 62 00

1. SCOPE OF WORK: Provide all sheet metal flashing as required for all exterior and interior applications required by product manufacturers, called out in the contract documents or as otherwise to provide a complete waterproofed system. Including but not limited to:
   1.1. Flashing to be installed above the head of all exterior horizontal trim, head of all windows and doors.
   1.2. All ends of flashing shall be cut, folded and turned back towards the building to wrap the unfinished edge of the material it is covering.
   1.3. Where flashing turns a corner, the material shall be overlapped, cut, folded and turned around the corner.
2. SECTION INCLUDES: Fabricated sheet metal items, including flashings and counterflashings. Sealants for joints within sheet metal fabrications. Reglets and accessories.
3. QUALITY ASSURANCE: Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.
4. DELIVERY, STORAGE, AND HANDLING: Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage. Prevent contact with materials that could cause discoloration or staining.
5. GALVANIZED STEEL: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage, (0.0239 inch) thick base metal.
6. PRE-FINISHED GALVANIZED STEEL: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 0.0276 inch (min 24 gauge) thick base metal, shop pre-coated with modified silicone coating.
7. MODIFIED SILICONE POLYESTER COATING: Pigmented Organic Coating System, AAMA 2603; baked enamel finish system.
8. PRE-FINISHED ALUMINUM: ASTM B209 (ASTM B209M); 20 gage, (0.032 inch) thick; plain finish shop pre-coated with modified silicone coating.

9. MODIFIED SILICONE POLYESTER COATING: Pigmented Organic Coating System, AAMA 2603; baked enamel finish system.
10. LEAD COATED COPPER: ASTM B101, 24 oz/sq ft weight of bare copper sheet, HOO (cold-rolled) temper.
11. ACCESSORIES: Fasteners: Galvanized steel, with soft neoprene washers. Primer: Zinc chromate type. Sealant to be Concealed in Completed Work: Non-curing butyl sealant. Sealant to be Exposed in Completed Work: 1; elastomeric sealant, 100 percent silicone with minimum movement capability of plus/minus 25 percent and recommended by manufacturer for substrates to be sealed; clear. Plastic Cement: 1, Type I.
12. FABRICATION: Form sections true to shape, accurate in size, square, and free from distortion or defects. Form pieces in longest possible lengths. Hem exposed edges on underside 1/2 inch; miter and seam corners. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip. Fabricate flashings to allow toe to extend 2 inches over roofing gravel. Return and brake edges.
13. EXAMINATION: Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located. Verify roofing termination and base flashings are in place, sealed, and secure.
14. INSTALLATION: Conform to drawing details. Insert flashings into reglets to form tight fit; secure in place with lead wedges; pack remaining spaces with lead wool; seal flashings into reglets with sealant. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted. Apply plastic cement compound between metal flashings and felt flashings. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles. Seal metal joints watertight.

FLASHING PANELS – 07 65 00

1. SCOPE OF WORK: Provide all new flashing panels at all exterior wall penetrations, including plumbing and electrical penetrations.
2. SUBMITTALS: Product Data: Submit manufacturer's product data, including installation instructions.
3. DELIVERY, STORAGE, AND HANDLING: Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer. Storage: Store materials in clean, dry area indoors in accordance with manufacturer's instructions. Handling: Protect materials during handling and installation to prevent damage.
4. WARRANTY PERIOD: 10 years.
5. MANUFACTURERS: Quickflash Weatherproofing Products, Inc
6. PLUMBING FLASHING PANELS:
   6.1. Materials:
   a) Panel: Combination of high-density polyethylene (HDPE) and low-density polyethylene (LDPE).
      - HDPE, Specific Gravity, ASTM D 1505: 0.953 g/cm3.
      - HDPE, Tensile Strength at Yield, ASTM D 638: 3,100 psi.
      - LDPE, Specific Gravity, ASTM D 792: 0.917 g/cm3.
      - LDPE, Tensile Strength at Yield, ASTM D 638: 1,300 psi.
   b) Weatherproof Seal: Thermoplastic elastomer.
      - Hardness, ASTM D 2240, Shore A, 10 Seconds: 46.
      - Specific Gravity, ASTM D 792: 1.05 g/cm3.

- Tensile Strength, ASTM D 412: 490 psi.

6.2. Model: P-50.
   a) Fits: 1/2-inch to 3/4-inch pipes; copper, rigid, PVC, and ABS.
   b) Size: 11-1/8 inches by 11-1/8 inches by 3/32 inch.

6.3. Model: P-100.
   a) Fits: 1-inch to 1-1/4-inch pipes; copper, rigid, PVC, and ABS.
   b) Size: 11-1/8 inches by 11-1/8 inches by 3/32 inch.

6.4. Model: P-150.
   a) Fits: 1-1/2-inch to 1-3/4-inch pipes; copper, rigid, PVC, and ABS.
   b) Size: 11-1/8 inches by 11-1/8 inches by 3/32 inch.

6.5. Model: P-200.
   a) Fits: 2-inch to 2-1/2-inch pipes; copper, rigid, PVC, and ABS.
   b) Size: 11-1/8 inches by 11-1/8 inches by 3/32 inch.

6.6. Model: P-300.
   a) Fits: 3-inch pipes, ABS.
   b) Size: 11-1/8 inches by 11-1/8 inches by 3/32 inch.

6.7. Model: P-400.
   a) Fits: 4-inch pipes, ABS.
   b) Size: 12-1/2 inches by 12-1/2 inches by 3/32 inch.

6.8. Model: P-600.
   a) Fits: 6-inch sheet metal duct.
   b) Size: 12-1/2 inches by 12-1/2 inches by 3/32 inch.

6.9. Model: P-2PS.
   a) Fits: Cut out center to fit 1/2-inch to 2-inch copper pipes with exterior tees sweated on.
   b) Size: 11-1/8 inches by 11-1/8 inches by 3/32 inch. 2-piece panel.

7. ELECTRICAL FLASHING PANELS:

7.1. Material: Thermoplastic elastomer.
   a) Hardness, ASTM D 2240, Shore A, 10 Seconds: 93.
   b) Specific Gravity, ASTM D 792: 1.05 g/cm3.
   c) Tensile Strength, ASTM D 412: 1,300 psi.

7.2. Model: E-SGB-A 1-3/8 inches, electrical single-gang box flashing panel.
   a) Use: 1-coat stucco and EIFS.
   b) Fits: Allied Moulded electrical single-gang boxes, part 9327-N.
   c) Size: 11-1/8 inches by 11-1/8 inches by 3/32 inch.

7.3. Model: E-3/0 B-A 1-3/8 inches, electrical 3/0 box flashing panel.
   a) Use: 1-coat stucco and EIFS.
   b) Fits: Allied Moulded electrical 3/0 boxes, parts 9335-HNK and 9335-HNGK.
   c) Size: 11-1/8 inches by 11-1/8 inches by 3/32 inch.

7.4. Model: E-SGB-A 7/8 inches, electrical single-gang box flashing panel.
   a) Use: 3-coat stucco.

b) Fits: Allied Moulded electrical single-gang boxes, part 9327-N.

c) Size: 11-1/8 inches by 11-1/8 inches by 3/32 inch.

7.5. Model: E-3/0 B-A 7/8 inches, electrical 3/0 box flashing panel.

a) Use: 3-coat stucco.

b) Fits: Allied Moulded electrical 3/0 boxes, parts 9335-HNK and 9335-HNGK.

c) Size: 11-1/8 inches by 11-1/8 inches by 3/32 inch.

7.6. Model: E-3/0 B, electrical 3/0 box flashing panel.

a) Use: 3-coat stucco and lap siding.

b) Fits: Specified electrical 3/0 plastic boxes.

c) Size: 11-1/8 inches by 11-1/8 inches by 3/32 inch.

7.7. Model: E-4/0 B, electrical 4/0 box flashing panel.

a) Use: 3-coat stucco and lap siding.

b) Fits: Specified electrical 4/0 plastic boxes.

c) Size: 11-1/8 inches by 11-1/8 inches by 3/32 inch.

7.8. Model: E-PC 3/0, electrical pancake 3/0 box flashing panel.

a) Use: 3-coat stucco and lap siding.

b) Fits: Specified electrical pancake 3/0 metal boxes.

c) Size: 11-1/8 inches by 11-1/8 inches by 3/32 inch.

7.9. Model: E-PC 4/0, electrical pancake 4/0 box flashing panel.

a) Use: 3-coat stucco and lap siding.

b) Fits: Specified electrical pancake 4/0 metal boxes.

c) Size: 11-1/8 inches by 11-1/8 inches by 3/32 inch.

7.10. Model: E-SGB, electrical single-gang box flashing panel.

a) Use: 3-coat stucco and lap siding.

b) Fits: Specified electrical single-gang plastic boxes.

c) Size: 11-1/8 inches by 11-1/8 inches by 3/32 inch.

7.11. Model: E-SGR, electrical single-gang 1/2-inch raised-plaster-ring cover flashing panel.

a) Use: 3-coat stucco and lap siding.

b) Fits: Specified electrical single-gang raised-plastic-ring cover.

c) Size: 11-1/8 inches by 11-1/8 inches by 3/32 inch.

8. EXAMINATION: Examine areas to receive flashing panels. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not begin installation until unacceptable conditions are corrected.

9. PREPARATION: Copper Pipes: Heat sweat copper pipes before installation of flashing panels.

10. INSTALLATION: Install flashing panels in accordance with manufacturer's instructions.

10.1. Plumbing Flashing Panels, 1 Piece: Select flashing panel required for specific pipe sizes. Push flashing panel over pipe with label facing to exterior to form weatherproof seal around pipe. Nail flashing panels to walls with corrosion-resistant nails at top of panels.

10.2. Plumbing Flashing Panels, 2 Piece: Cut flashing panel scores to size of pipe. Place bottom panel under pipe. Snap top panel to bottom panel over pipe. Caulk pipe to flashing panel with exterior polyurethane joint sealant for weatherproof seal.

10.3. Electrical Flashing Panels: Select flashing panel required for specific electrical boxes. Push

flashing panel over electrical box with label facing to exterior to form weatherproof seal around box. Ensure flashing panel collar edge is flush with electrical box opening edge. Nail flashing panels to walls with corrosion-resistant nails at top of panels.

10.4. Weather Barriers: Place weather barrier up behind bottom of flashing panel to bottom of pipe or electrical box. Place second layer of weather barrier over top of flashing panel to bottom front edge or further down.

11. PROTECTION: Protect installed flashing panels from damage during construction.

FIRESTOPPING – 07 84 00

1. SCOPE OF WORK: To be installed to maintain the ratings of assemblies at any penetrations, intersections or openings. To be installed as required for any noted UL assemblies in the contract documents. As required by AHJ inspectors for minor applications. See General Notes for additional requirements.
2. SYSTEM REQUIREMENTS: Provide systems that are listed by Underwriters Laboratories Inc. (UL), in "Fire Resistance Directory". All firestopping is to be Low or No VOC.
3. PERFORMANCE REQUIREMENTS
   - 3.1. Provide firestop products that are flexible enough to allow for pipe vibration in a through penetration application.
   - 3.2. Provide firestop sealants and sprays for construction joint applications that are flexible enough to satisfy the movement criteria per the test standards ASTM E 1399, ASTM E 1966 or ANSI/UL 2079.
   - 3.3. Provide products with flame spread index of less than 25 and smoke developed index of less than 450, when tested in accordance with ASTM E 84.
   - 3.4. Provide products that meet the intent of the L rating classification for the movement of smoke per ANSI/UL 1479 for through penetrations and ANSI/UL 2079 for construction joints.
   - 3.5. Provide products that bear classification marking of qualified independent testing agency.
   - 3.6. Where firestop systems not listed by any listing agency are required due to project conditions, submit a substitution proposal with evidence specified.
   - 3.7. Use only products specifically listed for use in listed systems.
   - 3.8. Provide products that are compatible with each other, with the substrates forming openings, and with the items, if any, penetrating the firestopping, under the conditions represented by this project, based on testing and field performance demonstrated by manufacturer.
   - 3.9. Firestopping materials must meet and be acceptable for use by all building codes and NFPA codes cited in this section.
4. SUBMITTALS: List each type of penetration. Provide data on product characteristics, performance ratings, and limitations.
5. QUALITY ASSURANCE: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
6. FIELD CONDITIONS: Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.
7. FIRESTOPPING SYSTEMS: Match rating of existing wall & ceiling assemblies
8. INSTALLATION: Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings. Do not cover installed firestopping until inspected by authorities having jurisdiction. Install labeling required by code.

JOINT SEALERS – 07 90 05

1. SCOPE OF WORK: Install in all locations required by the contract documents, by any material manufacturer's installation instructions. Where sealant is to come in contact with a surface, utilize only the sealant approved by that material manufacturer.
2. SEALANTS: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.
    2.1. General Purpose Exterior Sealant: Polyurethane; ASTM C920, Grade NS, Class 25 minimum; Uses M, G, and A; single component. Color: Match adjacent finished surfaces.
    2.2. Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, nondrying, nonskinning, noncuring.
    2.3. General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, Type OP, Grade NF single component, paintable. Color: Match adjacent finished surfaces.
    2.4. Bathtub/Tile Sealant: White silicone; ASTM C920, Uses I, M and A; single component, mildew resistant.
    2.5. Concrete Paving Joint Sealant: Polyurethane, self-leveling; ASTM C920, Class 25, Uses T, I, M and A; single component. Color: Color as selected.
3. SILICONE SEALANT: ASTM C920, Grade NS, Class 25 minimum; Uses NT, A, G , M , O; single component, neutral curing, non-sagging, non-staining, fungus resistant, non-bleeding. Color: Match adjacent finished surfaces. Movement Capability: Plus and minus 25 percent. Service Temperature Range: -65 to 180 degrees F.
4. ACCESSORIES: Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.
5. INSTALLATION: Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions. Perform installation in accordance with ASTM C1193. Tool joints concave.

DIVISION 08

HOLLOW METAL DOORS – 08 11 13

1. SCOPE OF WORK: Provide doors as outlined in the door schedule. Reference types below for locations.
2. SECTION INCLUDES: Non-fire-rated hollow metal doors. Fire-rated hollow metal doors. Thermally insulated hollow metal doors.
3. SUBMITTALS: Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.
4. SHOP DRAWINGS: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
5. QUALITY ASSURANCE: Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience. Provide hollow metal frames from SDI Certified manufacturer. Maintain at project site copies of reference standards relating to installation of products specified.
6. DELIVERY, STORAGE, AND HANDLING: Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.
7. MANUFACTURERS:
    7.1. Ceco Door, an Assa Abloy Group company; Curries, an Assa Abloy Group company; Republic Doors, an Allegion brand; Steelcraft, an Allegion brand.
    7.2. Manufacturer of hollow metal doors and frames shall be the same company.
8. DESIGN CRITERIA: Requirements for Hollow Metal Doors and Frames:

8.1. Steel used for fabrication of doors and frames shall comply with one or more of the following requirements; Galvannealed steel conforming to ASTM A653/A653M, cold-rolled steel conforming to ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel conforming to ASTM A1011/A1011M, Commercial Steel (CS) Type B for each.

8.2. Accessibility: Comply with ICC A117.1 and ADA Standards.

8.3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.

8.4. Door Edge Profile: Manufacturers standard for application indicated.

8.5. Typical Door Face Sheets: Flush.

8.6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturers standard.

8.7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

8.8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.

8.9. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

9. HOLLOW METAL DOORS

9.1. Door Type (D02), Exterior Doors: Two Panel Thermally insulated with half lite.

a) Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).

b) Level 1 - Standard-duty.

c) Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.

d) Model 1 - Full Flush.

e) Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.

f) Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.

g) Door Core Material: Polyisocyanurate, 2 lbs/cu ft minimum density.

h) Foam Plastic Insulation: Manufacturer's standard board insulation with maximum flame spread index (FSI) of 75, and maximum smoke developed index (SDI) of 450 in accordance with ASTM E84, and completely enclosed within interior of door.

i) Door Thermal Resistance: R-Value of 9.9, minimum, for installed thickness of polyisocyanurate.

j) Door Thickness: 1-3/4 inch, nominal.

k) Weatherstripping: Refer to Section 08 71 00.

l) Door Finish: Factory finished.

9.2. Door Type (XXX), Interior Doors, Non-Fire Rated with half lite (NOT USED)

a) Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).

b) Level 1 - Standard-duty.

c) Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.

d) Model 1 - Full Flush.

e) Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.

f) Door Thickness: 1-3/4 inch, nominal.

9.3. Door Type (XXX), Fire-Rated Doors: (NOT USED)

a) Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).

b) Level 1 - Standard-duty.

c) Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.

d) Model 1 - Full Flush.

e) Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.

f) Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").

g) Provide units listed and labeled by UL (DIR) or ITS (DIR).

h) Attach fire rating label to each fire rated unit.

i) Smoke and Draft Control Doors (Indicated with letter "S" on Drawings and/or Door Schedule): Self-closing or automatic closing doors in accordance with NFPA 80 and NFPA 105, with fire-resistance-rated wall construction rated the same or greater than the fire-rated doors, and the following;

j) Maximum Air Leakage: 3.0 cfm/sq ft of door opening at 0.10 inch w.g. pressure, when tested in accordance with UL 1784 at both ambient and elevated temperatures.

k) Gasketing: Provide gasketing or edge sealing as necessary to achieve leakage limit.

l) Label: Include the "S" label on fire-rating label of door.

m) Door Core Material: Manufacturers standard core material/construction in compliance with requirements.

n) Door Thickness: 1-3/4 inch, nominal.

9.4. Door Type (D03), Exterior Doors: Thermally insulated

a) Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).

b) Level 1 - Standard-duty.

c) Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.

d) Model 1 - Full Flush.

e) Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.

f) Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.

g) Door Core Material: Polyisocyanurate, 2 lbs/cu ft minimum density.

h) Foam Plastic Insulation: Manufacturer's standard board insulation with maximum flame spread index (FSI) of 75, and maximum smoke developed index (SDI) of 450 in accordance with ASTM E84, and completely enclosed within interior of door.

i) Door Thermal Resistance: R-Value of 9.9, minimum, for installed thickness of polyisocyanurate.

j) Door Thickness: 1-3/4 inch, nominal.

k) Weatherstripping: Refer to Section 08 71 00.

l) Door Finish: Factory finished.

10. EXAMINATION: Verify existing conditions before starting work. Verify that opening sizes and tolerances are acceptable. Verify that finished walls are in plane to ensure proper door alignment.

11. INSTALLATION: Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated. Install fire rated units in accordance with NFPA 80. Coordinate frame anchor placement with wall construction. Install door hardware as specified in Section 08 71 00. Touch up damaged factory finishes.

12. TOLERANCES: Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.

Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

13. ADJUSTING: Adjust for smooth and balanced door movement.
14. SCHEDULE: Refer to Door and Frame Schedule on the drawings.

HOLLOW METAL FRAMES – 08 12 13

1. SCOPE OF WORK: Provide frames for all doors as outlined in the door schedule. Reference types below for locations.
2. SECTION INCLUDES: Non-fire-rated hollow metal frames for non-hollow metal and hollow metal doors. Fire-rated hollow metal frames for non-hollow metal and hollow metal doors. Interior glazed borrowed lite frames.
3. SUBMITTALS: Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced grade standard.
4. SHOP DRAWINGS: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.
5. QUALITY ASSURANCE: Manufacturer Qualifications: Provide hollow metal frames from SDI Certified manufacturer: www.steeldoor.org/sdicertified.php.
6. DELIVERY, STORAGE, AND HANDLING: Store in accordance with applicable requirements and in compliance with standards and/or custom guidelines as indicated. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.
7. MANUFACTURERS: Hollow Metal Frames with Integral Casings:
    7.1. Ceco Door, an Assa Abloy Group company; Curries, an Assa Abloy Group company; Republic Doors, an Allegion brand; Steelcraft, an Allegion brand
    7.2. Manufacturer of hollow metal doors and frames shall be the same company.
8. DESIGN CRITERIA: Refer to Door and Frame Schedule on the drawings for frame sizes, fire ratings, sound ratings, finishing, door hardware to be installed, and other variations, if any.
    8.1. Steel used for fabrication of frames shall conform to one or more of the following requirements; galvannealed steel conforming to ASTM A653/A653M, cold-rolled steel conforming to ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel conforming to ASTM A1011/A1011M, Commercial Steel (CS) Type B for each.
    8.2. Accessibility: Conform to ICC A117.1 and ADA Standards.
    8.3. Combined Requirements: If a particular door and frame unit is indicated to conform to more than one type of requirement, conform to the specified requirements for each type; for instance, an exterior frame that is also indicated as being sound-rated must conform to the requirements specified for exterior frames and for sound-rated frames; where two requirements conflict, conform to the most stringent.
    8.4. Hardware Preparations, Selections and Locations: Comply with BHMA A156.115, NAAMM HMMA 830, NAAMM HMMA 831 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
    8.5. Frames for Interior Glazing or Borrowed Lites: Construction and face dimensions to match door frames, and as indicated on drawings.
9. HOLLOW METAL DOOR FRAMES WITH INTEGRAL CASINGS
    9.1. Frame Type (XXX), Exterior Door Frames, Knock-down type (NOT USED)
        a) Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
        b) Level 1 - Standard-duty.
        c) Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.

d) Frame Metal Thickness: 18 gage, 0.042 inch, minimum.

e) Weatherstripping: Refer to Section 08 71 00.

9.2. Frame Type (F01), Interior Door Frames, Non-Fire Rated, Knock-down type

a) Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).

b) Level 1 - Standard-duty.

c) Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.

d) Frame Metal Thickness: 18 gage, 0.042 inch, minimum.

9.3. Frame Type (XXX), Fire-Rated Door Frames, Knock-down type (NOT USED)

a) Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).

b) Level 1 - Standard-duty.

c) Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.

d) Frame Metal Thickness: 18 gage, 0.042 inch, minimum.

e) Fire Rating: As indicated on Door and Frame Schedule, tested in accordance with UL 10C or NFPA 252 ("positive pressure fire tests").

f) Provide units listed and labeled by ITS (DIR) or UL (DIR).

g) Attach fire rating label to each fire rated unit.

h) Smoke and Draft Control Doors (Indicated with letter "S" on Drawings and/or Door Schedule): Self-closing or automatic closing framed doors in accordance with NFPA 80 and NFPA 105, with fire-resistance-rated wall construction rated the same or greater than the fire-rated doors, and the following;

i) Maximum Air Leakage: 3.0 cfm/sq ft of framed door opening at 0.10 inch w.g. pressure, when tested in accordance with UL 1784 at both ambient and elevated temperatures.

j) Gasketing: Provide gasketing or edge sealing as necessary to achieve leakage limit.

k) Label: Include the "S" label on fire-rating label of door.

l) Frame Finish: Factory finished.

9.4. Frame Type (F02), Exterior wood with aluminum cladding. Reference Section XX XX XX.

9.5. Frame Type (F03), Interior Pre-hung wood frame. Reference Section 08 14 16.

10. FINISHES: Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

11. ACCESSORIES: Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.

12. EXAMINATION: Verify existing conditions before starting work. Verify that opening sizes and tolerances are acceptable. Verify that finished walls are in plane to ensure proper door alignment.

13. INSTALLATION: Install frames in accordance with manufacturer's instructions and related requirements of specified frame standards or custom guidelines indicated. Install fire rated units in accordance with NFPA 80.

14. Coordinate frame anchor placement with wall construction. Conform to glazing installation requirements of Section 08 80 00. Install door hardware as specified in Section 08 71 00. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861. Coordinate installation of electrical connections to electrical hardware items.

15. TOLERANCES: Clearances Between Door and Frame: Conform to related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861. Maximum Diagonal Distortion: 1/16 inch measured with straight edges, crossed corner to corner.

16. SCHEDULE: Refer to Door and Frame Schedule on the drawings.

FLUSH WOOD DOORS – 08 14 16

1. SCOPE OF WORK:
   1.1. Reference Door Schedule for locations of all doors.
   1.2. Door Types D04, D05, D06, D07: Dwelling Unit interior doors, pre-hung flat panel hollow core wood doors.
   1.3. Door Type D09: Solid core wood door
2. MANUFACTURERS: Lynden Door or approved equal
3. SUBMITTALS: Product Data to Indicate door core materials and construction; veneer species, type and characteristics. Samples: Submit two samples of door veneer, 6 x 6 inch in size illustrating wood grain, stain/paint color, and sheen.
4. QUALITY ASSURANCE: As Required, Fire Rated Door and Transom Panel Assembly to Conform to NFPA 80 for fire-rating as indicated.
5. WARRANTY: Interior Doors: Provide manufacturer's warranty for 2 years. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.
6. INTERIOR DOORS: 1-3/4 inches thick unless otherwise indicated; flush construction. Fire Rated Doors: Tested to 20 minutes, 60 minutes, 90 minutes, and ratings as indicated on drawings in accordance with UL 10C - Positive Pressure; Underwriters Laboratories Inc. (UL) without any visible seals when door is open.
7. ACCESSIBILITY COMPLIANCE: All doors within or as an entry to accessible apartments, amenity spaces, restrooms, common areas, corridors, stairwells or otherwise required to comply with accessibility codes shall contain the features listed below as a minimum. If there is a conflict with the hardware group or manufacture's or suppliers specified hardware and the following, provide compliant hardware and notify the architect immediately.
   7.1. 10” clear smooth space at bottom of door / 10” flush bottom rail for the full width of the door
   7.2. If cavities are created by the installation of kick, armor or other plates, they shall be blocked and capped
   7.3. 32” minimum clear width as measured from the most constraining points with the door installed and open to 90 degrees
   7.4. 80” clear height opening as measured to to the most constraining points with the door installed
   7.5. Handles, pulls, latches, locks and other operating devices on accessible doors must have a shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist to operate. Lever-operated mechanisms, push-type mechanisms, and U-shaped handles are acceptable designs. When sliding doors are fully open, the operating hardware must still be exposed and usable from both sides.
   7.6. Hardware must be mounted no higher than 48 inches above finished floor.
   7.7. Thresholds must not exceed 3⁄4 inch in height for exterior sliding doors or 1⁄2 inch for other types of doors. Changes in level up to 1⁄4 inch can be vertical and do not need an edge treatment. Changes in level between 1⁄4 inch and 1⁄2 inch must have a beveled slope equaling 1:2.
   7.8. If the changes in level are greater than 1⁄2 inch, the threshold must be equipped with a ramp. The floor or ground surface within the maneuvering clearances at the doorway must not have a slope steeper than 1:48.
   7.9. If a door is equipped with an automatic closing device, then the sweep range of the closer must be adjusted so that from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door
8. DOOR AND PANEL CORES
   8.1. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.

8.2. Fire Rated Doors: Mineral core, Type FD, plies and faces as indicated above; with core blocking to provide adequate anchorage of hardware without through-bolting.

8.3. Hollow Core Doors: Type - Standard (FSHC); plies and faces as indicated above.

9. DOOR CONSTRUCTION: Fabricate doors in accordance with door quality standard specified. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

10. INSTALLATION: Install doors in accordance with manufacturer's instructions and specified quality standard. Install fire-rated doors in accordance with NFPA 80 requirements. Coordinate installation of doors with installation of frames and hardware.

SLIDING GLASS DOORS – 08 32 00

1. SCOPE OF WORK: Provide and install new sliding glass doors at all openings illustrated on the exterior elevations. Door hardware to comply with accessible regulations for operation, shape and mounting location.

2. SECTION INCLUDES: Thermo-Tech® Classic Series Vinyl Doors

3. SUBMITTALS: Product Data: Submit the following documents for each type of door. Manufacturer's technical data, product descriptions and installation manuals.

4. SHOP DRAWINGS: Elevations for each style door specified indicating its size, color, glazing type, muntin type and design. Manufacturer's head, jamb and sill section details for each door type specified.

5. SELECTION SAMPLES: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

6. TEST REPORTS: Submit certified independent testing agency reports indicating door units meet or exceed specified performance requirements.

7. QUALITY ASSURANCE: Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of twenty (20) years of experience. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.

8. MOCK-UP: Provide a mock-up for evaluation of surface preparation techniques and application workmanship. Finish areas designated by Architect. Do not proceed with remaining work until workmanship and color are approved by Architect. Refinish mock-up area as required to produce acceptable work.

9. DELIVERY, STORAGE, AND HANDLING: Store products in manufacturer's unopened packaging until ready for installation. All doors are to be handled and stored sill down in an upright position and not on sides or head. No more than 8 patio doors are to be stored in a stack and keep out of direct sunlight. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.

10. WARRANTY: At project closeout, provide to Owner or Owner’s Representative an executed copy of the manufacturer's standard limited warranty against manufacturing defect, outlining its terms, conditions, and exclusions from coverage.

10.1. UPVC Vinyl Frame and Sash Parts: 10 Years from Date of Manufacture.

10.2. Door Hardware: 10 Years from Date of Manufacture.

10.3. Insulated Glass Seal Failure: 10 Years from Date of Manufacture.

10.4. Stress Cracks: 1 Year form Date of Manufacture.

10.5. Labor on Warranty Parts: 1 Year from Date of Manufacture.

11. MANUFACTURER: AAMA Accredited Manufacturer: Thermo-Tech Premium Windows and Doors

12. SUBSTITUTIONS: Not permitted.

13. DOOR TYPE (D08): SLIMLINE SLIDING PATIO DOOR CONSTRUCTION
    13.1. Frame: 4 9/16 inch (116mm) multi-chambered design, made with Polyvinyl Chloride (PVC) with fusion welded corners.
    13.2. Frame/Sash Color: White
    13.3. Hardware: C-Handle with Dual Point locking system Color: Interior Complementing Color
    13.4. Weather Stripping: Multi-layer weather stripping in compliance with AAMA 701.2
    13.5. Screens: Color complementing aluminum frame with BetterVue® charcoal fiberglass mesh
    13.6. Muntins / Grids: 5/8" Flat Grids between glass (GBG) dividers
    13.7. Exterior Trim: Integral Nailing Fin to be coordinated with applicable adjacent materials and siding
    13.8. Interior Trim: Jamb receptors to match interior door color (Field Applied): 11/16 inch
    13.9. Extension Jambs: Vinyl Wrapped to Complement Interior Door Color Selection
14. PERFORMANCE:
    14.1. Unit Size Tested: To be included with submittal documents for each door style.
    14.2. Energy and structural performance results to be included with submittal for each door style.
    14.3. Air Infiltration: Maximum .02 cfm/sq. ft. at 1.57 psf (25 mph) in accordance with ASTM E 283
    14.4. Water Resistance: No leakage when tested at 7.50 psf in accordance with ASTM E 547
    14.5. Performance Grade: R-30
    14.6. Forced Entry Resistance: Grade 10
15. GLAZING: 7/8 inch (19mm) dual pane insulated glass units utilizing warm edge spacer system and (2) panes of 1/8" double strength glass secured to sash frame using a silicone sealant and glazing bead.
    15.1. Type: Ultimate Premium High Performance 366 LoE^3 with Argon and i89
    15.2. U-Factor: 0.25
    15.3. Solar Heat Gain Coefficient (SHGC): 0.22 (No Grids), 0.19 (With Grids)
    15.4. Visible Light Transmittance: 0.51 (No Grids), 0.44 (With Grids)
    15.5. Condensation Resistance: 42
    15.6. Color / Tint: None
16. EXAMINATION: do not begin installation until substrates have been properly prepared. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
17. PREPARATION: Clean surfaces thoroughly prior to installation. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
18. INSTALLATION: Install in accordance with manufacturer's instructions.
19. PROTECTION: Protect installed products until completion of project. Touch-up, repair or replace damaged products before Substantial Completion.
20. ENERGY STAR PERFORMANCE REQUIREMENT: Windows must comply with at least one of the following:
    20.1. U-factor of 0.27 or less (any SHGC is allowed)
    20.2. U-factor of 0.28 AND an SHGC of 0.32 or more
    20.3. U-factor of 0.29 AND an SHGC of 0.37 or more
    20.4. U-factor of 0.30 AND an SHGC of 0.42 or more

1. SCOPE OF WORK: Provide and install all windows as illustrated in the contract documents.
    1.1. Verify insulated glazing meets HERS, Energy Star and other MHFA energy requirements and other criteria as listed in Section 08 80 00.
    1.2. Apartment Units: All windows are to be sliding units that comply with egress requirements unless otherwise noted.
    1.3. New Window at A/C Unit opening: To be awning type window to fit in existing opening.
    1.4. Common Area: All windows are to be slider units unless indicated as fixed pane/picture.
2. SECTION INCLUDES: Thermo-Tech Classic Series Vinyl Windows
3. SUBMITTALS: Product Data: Submit Manufacturer's technical data, product descriptions and installation manuals for each type of window
4. SHOP DRAWINGS: Elevations for each style window specified indicating its size, color, glazing type, muntin type and design. Manufacturer's head, jamb and sill section details for each window type specified.
5. SELECTION SAMPLES: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
6. TEST REPORTS: Submit certified independent testing agency reports indicating window units meet or exceed specified performance requirements. Window units must be tested to comply with AAMA/WDMA/CSA 101/I.S.2/A440-11
7. QUALITY ASSURANCE: Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of twenty (20) years of experience. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.
8. EGRESS: All windows must comply with the requirements of the code bodies having jurisdiction over the project. Install windows with the following properties:
    8.1. Sill height must not exceed 44 inches above the floor.
    8.2. Minimum net clear opening must be 5.7 square feet with the exception of grade level windows may have a minimum clear opening of 5 square feet.
    8.3. Minimum net clear opening height must be 24 inches.
    8.4. Minimum net clear opening width must be at least 20 inches.
9. MOCK-UP: Provide a mock-up for evaluation of surface preparation techniques and application workmanship. Finish area as selected by Architect. Do not proceed with remaining work until workmanship and color are approved by Architect. Refinish mock-up area as required to produce acceptable work.
10. DELIVERY, STORAGE, AND HANDLING: Store products in manufacturer's unopened packaging until ready for installation. All windows and doors are to be handled and stored sill down in an upright position and not on sides or head. No more than 8 patio doors and 12 windows are to be stored in a stack and keep out of direct sunlight. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.
11. WARRANTY: At project closeout, provide to Owner or Owner’s Representative an executed copy of the manufacturer's standard limited warranty against manufacturing defect, outlining its terms, conditions, and exclusions from coverage.
    11.1. UPVC Vinyl Frame and Sash Parts: 10 Years from Date of Manufacture.
    11.2. Window Hardware: 10 Years from Date of Manufacture.
    11.3. Insulated Glass Seal Failure: 10 Years from Date of Manufacture.
    11.4. Stress Cracks: 1 Year form Date of Manufacture.
    11.5. Labor on Warranty Parts: 1 Year from Date of Manufacture.

12. MANUFACTURER: AAMA Accredited Manufacturer: Thermo-Tech Premium Windows and Doors
13. SUBSTITUTIONS: Not permitted.
14. CLASSIC SERIES WINDOW CONSTRUCTION:
    - 14.1. Frame: 3 1/4 inch (83mm) multi-chambered design, made from Polyvinyl Chloride (PVC) with fusion welded corners.
    - 14.2. Frame/Sash Color: White
    - 14.3. Hardware: Metal lock and keeper system. Hardware Color: To match interior frame color.
    - 14.4. Sliding window track-lock system locks closed or in place at 3” (76mm) for secure ventilation
    - 14.5. Weather Stripping: Multi-layer weather stripping in compliance with AAMA 701.2
    - 14.6. Screens: Color complemented aluminum frame with BetterVue® charcoal fiberglass mesh on operable units
    - 14.7. Muntins/Grids: 5/8” Flat grids between glass (GBG) dividers
    - 14.8. Exterior Trim: Integral Nailing Fin to be coordinated with applicable adjacent materials and siding.
    - 14.9. Interior Trim: Jamb Receptors to Match Interior Window Color: 11/16 inch to coordinate with 5/8” drywall return. Extension Jambs: Complement Interior Window Color Selection
    - 14.10. Window sill to coordinate with 3/4" thick cast marble sill.
15. PERFORMANCE:
    - 15.1. Unit Size Tested: To be included with submittal documents for each window style.
    - 15.2. Energy and structural performance results to be included with submittal for each window style.
    - 15.3. Air Infiltration: Maximum 0.07 cfm/sq. ft. at 1.57 psf (25 mph) in accordance with ASTM E 283
    - 15.4. Water Resistance: No leakage when tested at 6.06 psf in accordance with ASTM E 547
    - 15.5. Performance Grade: Minimum of R-40
    - 15.6. Forced Entry Resistance: Grade 10
16. SLIDING WINDOWS – CLASSIC SERIES
    - 16.1. Glazing: 7/8 inch dual pane insulated glass units utilizing warm edge spacer system and (2) panes of 1/8 inch (minimum) double strength glass secured to sash frame using a silicone sealant and glazing bead.
    - 16.2. Type: Premium High Performance 366 LoE^3 with Argon and I89 on interior surface
    - 16.3. U-Factor: 0.25
    - 16.4. Solar Heat Gain Coefficient (SHGC): 0.22 (No Grids), 0.20 (With Grids)
    - 16.5. Visible Light Transmittance: 0.50 (No Grids), 0.44 (With Grids)
    - 16.6. Condensation Resistance: 46
    - 16.7. Color / Tint: None
17. AWNING WINDOWS – CLASSIC SERIES
    - 17.1. Glazing: 7/8 inch dual pane insulated glass units utilizing warm edge spacer system and (2) panes of 1/8 inch (minimum) double strength glass secured to frame using double sided glazing tape and glazing bead.
    - 17.2. Type: Ultimate High Performance 366 LoE^3 with Argon and I89 on interior surface
    - 17.3. U-Factor: 0.23
    - 17.4. Solar Heat Gain Coefficient (SHGC): 0.18 (No Grids), 0.17 (With Grids)
    - 17.5. Visible Light Transmittance: 0.42 (No Grids), 0.38 (With Grids)
    - 17.6. Condensation Resistance: 45

18. EXAMINATION: Do not begin installation until substrates have been properly prepared. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
19. PREPARATION: Clean surfaces thoroughly prior to installation. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
20. INSTALLATION: Install in accordance with manufacturer's instructions.
21. PROTECTION: Protect installed products until completion of project. Touch-up, repair or replace damaged products before Substantial Completion.

DOOR HARDWARE – 08 71 00

1. SCOPE OF WORK: Door hardware to be provided as outlined in this specification to meet the intended functionality. Contractor to utilize a hardware consultant.
2. ACCESSIBLE ACTUATOR SYSTEM: Provide and install complete accessible actuator system at main entrance vestibule. A total of (4) actuators are to be provided as a part of the system, (2) operating each door of the series from both ingress and egress directions. Include mounting post on exterior side of exterior door. Include pedestrian sensors and adjust for proper operation.
    2.1. Basis of Design Product: LCN 8310 Series actuator and accessories.
    2.2. Actuators are to be mounted within accessible reach range heights and be provided with a 30 inch by 48 inch clear floor space, centered on the actuator.
    2.3. Contractor to include all interconnect, power, controllers and other associated devices and wiring to provide a compliant entrance system. Coordinate locations of all devices with adjacent devices and construction types.
    2.4. Provide and install openers for doors to be operated as a part of the hardware group associated with each door. Select appropriate opener as required for the specific door type and mounting.
    2.5. Submit to the architect for review and approval a complete package submission.
3. DOOR HARDWARE – GENERAL: Provide hardware specified or required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated. Provide items of a single type of the same model by the same manufacturer. Doors to include hinges, silencers, frames, levers/knobs, and all other hardware as recommended by the supplier/manufacturer for proper operation to meet the design intent of the Contract Documents.
4. FIRE RATED DOORS: Provide products that comply with applicable provisions of federal, state, and local codes and in the case of Fire-Rated Doors, NFPA 80.
    4.1. Hardware on Fire-Rated Doors, Except Hinges: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.
    4.2. Hardware for Smoke and Draft Control Doors: Provide hardware that enables door assembly to comply with air leakage requirements of the applicable code.
5. SUBMITTALS: Within ten days after award of contract, submit detailed hardware schedule. Schedule format shall be consistent with recommendations for a vertical format as set forth in the Door & Hardware Institute's (DHI) publication "Sequence and Format for the Hardware Schedule". Hardware sets shall be consolidated to group multiple door openings which share similar hardware requirements. Schedule shall include the following information:
    5.1. Door number, location, size, handing, and rating.
    5.2. Door and frame material, handing.
    5.3. Degree of swing.
    5.4. Manufacturer
    5.5. Product name and catalog number

5.6. Function, type and style

5.7. Size and finish of each item

5.8. Mounting heights

5.9. Explanation of abbreviations, symbols, etc.

5.10. Numerical door index, indicating the hardware set/ group number for each door.

6. GENERAL REQUIREMENTS

6.1. HARDWARE CONSULTANT: The hardware schedule will be prepared under the direct supervision of a certified Architectural Hardware Consultant (AHC) employed by the hardware distributor. The hardware schedule shall be signed and embossed with the DHI certification seal of the supervising AHC. The supervising AHC shall attend any meetings related to the project when requested by the Architect.

6.2. Check the specified hardware for suitability and adaptability to the details and surrounding conditions.

6.3. Review drawings from related trades to verify compatibility with specified hardware. Indicate unsuitable or in compatible items, and proposed substitutions in the hardware schedule.

6.4. Provide documentation for all hardware to be furnished on labeled fire doors indicating compliance with positive pressure fire testing UL 10C.

6.5. Furnish manufacturers' catalog data for each item of hardware.

6.6. Submit a sample of each type of hardware requested by the Architect. Samples shall be of the same finish, style, and function as specified herein. Tag each sample with its permanent location so that it may be used in the final work.

6.7. Furnish with first submittal, a list of required lead times for all hardware items.

6.8. After final approved schedule is returned, transmit corrected copies for distribution and field use in quantities by Division 1 - General Conditions.

6.9. Furnish approved hardware schedules, template lists, and pertinent templates as requested by related trades.

6.10. Furnish necessary diagrams, schematics, voltage and amperage requirements for all electro-mechanical devices or systems by related trades.

6.11. After receipt of approved hardware schedule, Hardware supplier shall initiate a meeting including the Owner's representative to determine keying requirements. Upon completion of the initial key meeting, hardware supplier shall prepare a proposed key schedule with symbols and abbreviations as set forth in the door and hardware institute's publication "Keying Procedures, Systems, and Nomenclature". Submit copies of Owner approved key schedule for review and field use.

7. QUALITY ASSURANCE: Manufacturers and model numbers listed are to establish a standard of function and quality. Similar items by approved manufacturers that are equal in design, function, and quality, may be considered for prior approval of the Architect, provided the required data and physical samples are submitted for approval as set forth in Division One General Requirements.

7.1. Obtain each type of hardware (hinges, latch & locksets, exit devices, closers, etc.) from a single manufacturer, although several may be indicated as offering products complying with requirements.

7.2. Installation of hardware shall be installed or directly supervised and inspected by a skilled installer certified by the manufacturer of locksets, door closers, and exit devices used on the project, or with not less than 3 years experience in successful completion of projects similar in size and scope.

7.3. Provide hardware for all labeled fire doors, which complies with positive pressure fire testing UL 10C.

7.4. Comply with all applicable provisions of the standards referenced within section 1.4 of this

specification.

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

9. BUTT HINGES: Unless otherwise specified, furnish the following hinge quantities for each door leaf: 3 hinges for doors up to 90 inches. 1 additional hinge for every 30 inch on doors over 90 inches. 4 hinges for Dutch door applications.

	Ives	Stanley	Hager
Standard Weight, Plain Bearing	5PB1	F179	1279
Standard Weight, Ball Bearing	5BB1	BB179	BB1279
Standard Weight, Ball Bearing, Non-Ferrous	5BB1	FBB19	BB1191

9.1. Unless otherwise specified, furnish hinge weight and type as follows:

a) Standard weight: plain bearing hinge 5PB1 for interior openings through 36 inches wide without a door closer.

b) Standard weight: ball bearing hinge 5BB1 for interior opening over 36 through 40 inches wide without a door closer, and for interior openings through 40 inches wide with a door closer.

c) Heavyweight: 4 ball bearing hinge 5BB1HW for interior openings over 40 inches wide, and for all vestibule doors.

d) Heavyweight: 4 ball bearing hinge 5BB1HWss for exterior openings unless otherwise listed in groups.

9.2. Unless otherwise specified, furnish hinges for exterior doors, fabricated from brass, bronze, or stainless steel. Unless otherwise specified, hinges for interior doors may be fabricated from steel.

9.3. Unless otherwise specified, furnish hinges in the following sizes: 5" x 5" for 2-1/4" thick doors; 4-1/2" x 4-1/2" for1-3/4" thick doors; 3-1/2" x 3-1/2" for 1-3/8" thick doors.

9.4. Furnish hinges with sufficient width to accommodate trim and allow for 180-degree swing.

9.5. Unless otherwise specified, furnish hinges with flat button tips with non-rising pins at interior doors, non-removable loose pins (NRP) at exterior and out-swinging interior doors.

9.6. Unless otherwise specified, furnish all hinges to template standards.

9.7. Hinges: Provide hinges on every swinging door.

a) Provide five-knuckle full mortise butt hinges unless otherwise indicated.

b) Provide ball-bearing hinges at all doors having closers.

c) Provide hinges in the quantities indicated.

d) Provide non-removable pins on exterior outswinging doors.

e) Where electrified hardware is mounted in door leaf, provide power transfer hinges.

10. EXIT DEVICES

Von Duprin	Precision
98 / 99 Series	2000 Series
33 / 35 Series	20 Series
22 Series	50 Series
996 Series	3900 Series
990 Series	1700A Series

10.1. Obtain exit devices from a single manufacturer, although several may be indicated as offering products complying with requirements.

10.2. All exit devices shall be equipped with a sound-dampening feature to reduce touch pad return noise.

10.3. On full glass doors there shall be no exposed fasteners on the back of the mechanism visible through the glass.

10.4. All exit devices shall be provided with flush end caps to reduce potential damage from impact.

10.5. All exit devices shall be provided with dead-locking latchbolts to insure security.

10.6. All exit devices shall be U.L. listed for accident hazard. Exit device for use on fire doors shall also be U.L. listed for fire exit hardware.

10.7. Provide optional strikes, special length rods, and adapter plates to accommodate door and frame conditions. Provide narrow style series devices in lieu of wide stile series devices where optional strikes will not accommodate door and frame conditions.

10.8. Coordinate with related trades to insure adequate clearance and reinforcement is provided in doors and frames. Provide thru bolts.

10.9. Refer to hardware groups for exit device applications utilizing the option of: "less bottom rod and floor strike" (LBR)

10.10. All exit devices shall be provided with optional trim designs to match other lever and pull designs used on the project.

10.11. Provide interchangeable core cylinders when used in conjunction with exit devices. Cylinder keyway shall match locksets furnished on this project.

10.12. Provide cylinder keyed dogging (interchangeable core) for all non-fire rated exit devices.

10.13. Provide glass bead kits to accommodate door conditions. Screws shall not be visible through full glass doors.

10.14. Where specified, provide compatible keyed mullions with cylinder for pairs of doors.

10.15. Provide reinforced crossbars for all traditional style exit devices applied to doors over 36" wide.

10.16. Devices specified are designed for wide style doors. If door size will not allow for the wide style device, provide the appropriate device to fit the door specified.

11. LOCKS AND LATCHES

Schlage

Grade 2 Cylindrical	AL Series Saturn
Grade 2 Tubular	F Series ELAN
Grade 2 Deadbolt	BC100 Kwikset

11.1. No substitutions allowed.

11.2. Unless otherwise specified, all locks and latches to have: 2-3/4" Backset, 1/2" minimum throw latchbolt, 1" throw deadbolt, 6 pin cylinders, ANSI A115.2 strikes

11.3. Provide guarded latchbolts for all locksets, and latchbolts with sufficient throw to maintain fire rating of both single and paired door assemblies.

11.4. Length of strike lip shall be sufficient to clear surrounding trim.

11.5. Provide wrought boxes for strikes at inactive doors, wood frames, and metal frames without integral mortar covers.

11.6. Provide a lock for every door, unless specifically indicated as not requiring locking.

a) If no hardware set is indicated for a swinging door provide an office lockset.

11.7. Trim: Provide lever handle or pull trim on outside of all locks unless specifically stated to have no outside trim.

11.8. Lock Cylinders: Provide key access on outside of all locks unless specifically stated to have no locking or no outside trim.

11.9. Lock Cylinders: Manufacturer's standard tumbler type, six-pin standard core.

a) Provide cams and/or tailpieces as required for locking devices required.

11.10. Keying: Grand master keyed.

11.11. Latches: Provide a latch for every door that is not required to lock, unless specifically indicated "push/pull" or "not required to latch".

12. PULLS, PUSHBARS, PUSH/PULL PLATES

	Burns	Hager	Ives
Offset Door Pull (1" dia., 10" ctc)	26C	4J	8190-0
Pull / Push-Bar (1" dia., 10" ctc Pull)	422 x 26C	153	9103EZ-0

12.1. Adjust dimensions of protection plates to accommodate stile and rail dimensions, lite and louver cutouts, and adjacent hardware. Where required by adjacent hardware, protection plates shall be factory drilled for cylinders or other mortised hardware. All push plates shall be beveled 4 sides and counter sunk.

12.2. Where specified, provide surface mounted door edges. Edges shall butt to protective plates. Provide edges with cutouts adjacent hardware.

12.3. Where possible, provide back-to-back, and concealed mounting for pulls and push bars. Push bar length shall be 3" less door width, or center of stile to center of stile for stile & rail or full glass doors.

13. CLOSERS

LCN	Norton	Sargent
SC71 RW/PA	7500/pr7500	281 / 281P10

13.1. Obtain door closers from a single manufacturer, although several may be indicated as offering products complying with requirements.

13.2. Closers shall use high strength cast iron cylinders, forged main arms, and 1 piece forged steel pistons.

13.3. Closers shall utilize a stable fluid withstanding temperature range of +120deg F to -30deg F without seasonal adjustment of closer speed to properly close the door. Closers for fire-rated doors shall be provided with temperature stabilizing fluid that complies with standards UL10C.

13.4. Unless otherwise specified, all door closers shall have full covers and separate adjusting valves for sweeps, latch, and backcheck.

13.5. Provide closers for all labeled doors. Provide closers with adjustable spring power. Size closers to insure exterior and fire rated doors will consistently close and latch doors under existing conditions. Size all other door closers to allow for reduced opening force not to exceed 5 lbs.

13.6. Install closers on the room side of corridor doors, stair side of stairways and interior side of exterior doors.

13.7. Closers shall be furnished complete with all mounting brackets and cover plates by door and frame conditions, and by adjacent hardware.

14. KICK PLATES AND MOP PLATES

14.1. Furnish protective plates as specified in hardware groups.

14.2. Where specified, provide 10" kick plates, 36" armor plates, and 4" mop plates. Unless otherwise specified, metal protective plates shall be .050" thick; plastic plates shall be 1/8" thick.

14.3. Protective plates shall be 2" less door width, or 1" less door width at pairs. All protective plates shall be beveled 4 sides and counter sunk. Protection plates over 16" shall not be provided for labeled doors unless specifically approved by door manufacturers listing.

14.4. Where required by adjacent hardware, protection plates shall be factory drilled for cylinders or other mortised hardware.

15. OVERHEAD STOPS

Glynn-Johnson	Rixson	Sargent
GJ90 Series	9 Series	590
GJ100 Series	1 Series	690

15.1. Overhead stops (including slide block and end caps) shall be fabricated from metal.

15.2. Unless otherwise specified, furnish GJ450 series overhead stop for doors equipped with regular arm surface type closers that swing more than 140 degrees before striking a wall, for doors that open against equipment, casework, sidelights, or other objects that would make wall bumpers inappropriate, and as specified in hardware groups.

15.3. Furnish chicago screw or barrel nut attachments for wood and mineral core doors unless doors are supplied with proper reinforcing blocks.

15.4. Do not provide holder function for fire rater and/or labeled doors.

16. STOPS AND HOLDERS

	Ives	Hager	Burns
Convex Bumper	WS406CVX	232W	570
Concave Bumper	WS406CCV	236W	575
Spring Stop	069	*****	*****
Hinge pin stop	070	*****	*****

16.1. Furnish a stop or holder for all doors. Furnish floor stops only where specifically specified.

16.2. Where wall stops are not applicable, furnish overhead stops.

16.3. Do not provide holder function for fire rated and/or labeled doors.

17. WEATHERSTRIP, GASKETING

	Pemko	NGP	Reese
Weatherstrip	2891APK	700NA	755A
Gasket	S88D	2525	797B
Edge Seal	S77	5060	*****
Sweeps	18061CP	B606A	964A
Sweep drip	345	*****	*****
Drip Cap	346A	16A	R201A

17.1. Where specified in the hardware groups, furnish the above products unless otherwise detailed in groups.

17.2. Provide weatherstripping all exterior doors and where specified.

17.3. Provide intumescent and other required edge sealing systems by individual fire door listings to comply with positive pressure standards UL 10C.

17.4. Provide S88D smoke gaskets at all fire rated doors and smoke and draft control assemblies.

18. THRESHOLDS

Pemko	NGP	Reese
171	425	S205

18.1. Hardware supplier shall verify all finish floor conditions and coordinate proper threshold to insure a smooth transition between threshold and interior floor finish.

18.2. Threshold Types:

a) Unless otherwise specified, provide saddle threshold similar to Reese S205 for all exterior openings with a interior floor finish less than or equal to 1/4" in height.

b) Unless otherwise specified, provide half saddle threshold similar to Reese S239 for all exterior openings with a interior floor finish greater than 1/4" in height. Threshold height shall match thickness of interior floor finish.

19. DOOR POSITION SWITCHES

Locknetics	Sentrol	Sargent
679 Series	1076W	3287

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

HARDWARE ITEM	BHMA FINISH AND BASE MATERIAL
Butt Hinges: Exterior	630
Butt Hinges: Interior	652
Exit Devices	626
Locks and Latches	626
Closers	689
Protective Plates	630
Wall Stops and Holders	630
Thresholds	628 (AL)
Weather-strip, Sweeps Drips	AL
Miscellaneous	626

21. KEYING: Match Existing

21.1. Provide all locks and cylinders utilizing a patented keyway to prevent manufacturing and distribution of aftermarket key blanks by anyone other than factory authorized dealers.

21.2. Keying shall be by lock manufacturer where permanent records shall be kept.

21.3. Furnish a total of 2 keys per cylinder. Actual cut keys to be determined by Owner.

21.4. Master keys and control keys to be delivered by registered mail to the Owner. Change keys shall be delivered in a set up key cabinet. Construction keys shall be delivered to the Contractor.

21.5. Final keying requirements shall be coordinated by the Contractor with the Owner prior to material ordering.

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

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

23.1. Install all hardware in accordance with the approved hardware schedule and manufacturers instructions for installation and adjustment.

23.2. Set units level, plumb and true to the line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

23.3. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accord with industry standards.

23.4. Drill appropriate size pilot holes for all hardware attached to wood doors and frames.

23.5. Shim doors to maintain proper operating clearance between door and frame.

23.6. Unless otherwise specified, locate all hardware in accordance with the recommended locations for builders hardware for standard doors and frames as published by the Door and Hardware Institute.

23.7. Use only fasteners supplied by or approved by the manufacturer for each respective item of hardware.

23.8. Mortise and cut to close tolerance and conceal evidence of cutting in the finished work.

23.9. Conceal push and pull bar fasteners where possible. Do not install through bolts through push plates.

23.10. Install hardware on UL labeled openings in accordance with manufacturer's requirements to maintain the label.

23.11. Install hardware in accordance with supplemental "S" label instructions on all fire rated openings.

23.12. Install wall stops to contact lever handles or pulls. Do not mount wall stops on casework, or equipment.

23.13. Where necessary, adjust doors and hardware to eliminate binding between strike and latchbolt. Doors should not rattle.

23.14. Install door closers on corridor side of lobby doors, room side of corridor doors, and stair side of stairways.

23.15. Adjust spring power of door closers to insure exterior and fire rated doors will consistently close and latch doors under existing conditions. Adjust all other door closers to insure opening force does not to exceed 5 lbs.

23.16. Adjust "sweep", "latch", & "back check" valves on all door closers to properly control door through out the opening and closing cycle. Adjust total closing speed to comply with all applicable state and local building codes.

23.17. Unless otherwise specified or detailed, install thresholds with the bevel in vertical alignment with the outside door face. Notch and closely fit thresholds to frame profile. Set thresholds in full bed of sealant.

23.18. Compress sweep during installation as recommended by sweep manufacturer to facilitate a water resistant seal.

23.19. Deliver to the Owner 1 complete set of installation and adjustment instructions, and tools as furnished with the hardware.

23.20. Install hardware on fire-rated doors and frames in accordance with code and NFPA 80.

24. QUALITY ASSURANCE: After installation has been completed, the hardware supplier and manufacturers representative for locksets, door closers, exit devices, and overhead stops shall check the project and verify compliance with installation instructions, adjustment of all hardware items, and proper application according to the approved hardware schedule. Hardware supplier shall submit a list of all hardware that has not been installed correctly. After installation has been completed, the hardware supplier and manufacturers representative shall meet with the Owner to explain the functions, uses, adjustment, and maintenance of each item of hardware. Apply self-adhesive gasketing on frame stop at head & latch side and on rabbet of frame at hinge side.

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

Hardware Schedule – 08 71 01

(Spec): Reference component section above for information

Reference Door Schedule for required hardware rating

Group U01 – Unit Exterior, Swing: Entry Doors

Qty.	Type	Manufacturer	Number	Finish
2 Ea.	Spring Hinge	Ives	3SP1	(Spec)
1 Ea.	Hinge	Ives	5BB1 (Top)	(Spec)
1 Ea.	Passage Set	Schlage	F75	(Spec)
1 Ea.	Sgl. Cyl. Deadbolt	Schlage	B60RF6	(Spec)
1 Ea.	Door Stop (as req'd)	(Spec)	(Spec)	(Spec)
1 Ea.	Threshold	Profile as Req'd	(Spec)	(Spec)
1 Ea.	Rain Drip	Zero	142	Mfgr.
2 Ea.	Wide Angle Viewer	Ives	U698	626
	Additional Viewer at	Accessible Units		

WEATHERSEAL TO INCLUDE: Weatherstrip, Gasket, Edge Seal, Sweeps, Sweep Drip and Drip Cap by a single manufacturer as listed in WEATHERSTRIP, GASKETING above.

Group U02 – Unit Interior, Swing: Bedrooms & Bathrooms

Qty.	Type	Manufacturer	Number	Finish
3 Ea.	Hinge	w/ Pre-Hung Door	N/A	(Spec)
1 Ea.	Privacy Lockset	Schlage	F76	(Spec)
1 Ea.	Door Stop (as req'd)	(Spec)	(Spec)	(Spec)

Group U03 – Unit Interior, Swing, Double: Closet

Qty.	Type	Manufacturer	Number	Finish
6 Ea.	Hinge	w/ Pre-Hung Door	N/A	(Spec)
2 Ea.	Dummy Trim	Schlage	AL170	(Spec)
2 Ea.	Door Stop (as req'd)	(Spec)	(Spec)	(Spec)
2 Ea.	Top & Bot. Latch	Ives		(Spec)

Group U04 – Unit Interior, Swing: Closet

Qty.	Type	Manufacturer	Number	Finish
3 Ea.	Hinge	Ives	(Spec)	(Spec)
1 Ea.	Passage Set	Schlage	F75	(Spec)
1 Ea.	Door Stop (as req'd)	(Spec)	(Spec)	(Spec)

Group U05 – Unit Interior, Swing: Garage

WEATHERSEAL TO INCLUDE: Weatherstrip, Gasket, Edge Seal, and Sweeps, by a single manufacturer as listed in WEATHERSTRIP, GASKETING above.

Group U06 – Unit Interior, Double Bi-Fold: Closet

Qty.	Type	Manufacturer	Number	Finish
2 Ea.	Full Hardware Set	Stanley	BF30-00	(Spec)

Group U07 – Unit Interior, Bi-Fold: Closet

Qty.	Type	Manufacturer	Number	Finish
1 Ea.	Full Hardware Set	Stanley	BF30-00	(Spec)

Group C01 – Common Exterior, Swing: Laundry

Qty.	Type	Manufacturer	Number	Finish
3 Ea.	Hinge	Ives	(Spec)	(Spec)
1 Ea.	Storeroom Lockset	Schlage	F86	(Spec)
1 Ea.	Surface Closer	Falcon	SC71 HD	(Spec)
1 Ea.	Kick Plate	Ives	8400	(Spec)
1 Ea.	Wall Stop	Ives	WS406	(Spec)
1 Ea.	Threshold	Profile as Req'd	(Spec)	(Spec)

Weatherseal to include: Weatherstrip, Gasket, Edge Seal, Sweeps, Sweep Drip and Drip Cap by a single manufacturer as listed in WEATHERSTRIP, GASKETING above.

GLAZING – 08 80 00

1. SCOPE OF WORK: Provide all glass materials as required in the contract documents.
   - 1.1. All glazing units to be insulated glass and compliant with Energy Star, the IECC, the HERS Rater's analysis.
   - 1.2. Insulated units to include High-performance LoE 366/Argon heat reflecting glass. Reference Section 08 53 13 for additional information.
2. MANUFACTURERS: Thermo-Tech or approved equal
3. SUBMITTALS: Provide 12"x12" sample of each type of glazing utilized in the project to the Architect for approval.
4. PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES
   - 4.1. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
     a) Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
     b) Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
     c) Glass thicknesses listed are minimum.
   - 4.2. Vapor Retarder and Air Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier. In conjunction with vapor retarder and joint sealer materials described in other sections.
   - 4.3. Thermal and Optical Performance: Provide glass products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
     a) Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 5.2/6.3 computer program.
     b) Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 5.2/6.3 computer program.

c) Solar Optical Properties: Comply with NFRC 300 test method.

5. GLASS MATERIALS: Float Glass: Provide float glass based glazing unless noted otherwise.
   5.1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality-Q3.
   5.2. Heat-Strengthened and Fully Tempered Types: ASTM C1048, Kind HS and FT.
   5.3. Tinted Type: ASTM C1036, Class 2 - Tinted , Quality-Q3, color and performance characteristics as indicated.
   5.4. Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.
6. INSULATING GLASS UNITS: Certified by an independent testing agency to comply with ASTM E2190.
   6.1. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
   6.2. Spacer Color: Black.
   6.3. Edge Seal Color: Black. Purge interpane space with dry air, hermetically sealed.
7. SAFETY GLASS: Furnish and install safety glass at all hazardous locations in accordance with IBC requirements for "Hazardous Locations" as follows:
   7.1. Glazing in fixed and swinging exterior doors (means of egress).
   7.2. Glazing in fixed and sliding panels of sliding (patio) doors.
   7.3. Glazing in storm doors.
   7.4. Glazing in doors and enclosures for bathtubs and showers.
   7.5. Glazing in fixed or operable panels or windows with an exposed area of an individual pane of 9 SF, bottom edge less than 18 inches above the floor, top edge greater than 36 inches above the floor, one or more walking surfaces within 36 inches horizontally of the glazing.

MIRRORS – 08 83 00

1. SCOPE OF WORK: Provide new mirrors in all bathrooms.
2. MANUFACTURER: Bobrick, type B-165
3. SUBMITTALS: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
4. MATERIALS:
   4.1. Mirror Glass - General: Select materials and/or provide supports to limit mirrored glass deflection to 1/200 or flexure limit of glass with full recovery of glazing materials, whichever is less.
   4.2. Mirror Glass: Clear float type with copper and silver coating, organic overcoating, frameless, 1/4" thick.
   4.3. Width: Full width of vanity in units and width of sink in common bathrooms. Minimum size to be 24” wide.
5. INSTALLATION: Install mirrors in accordance with GANA (TIPS) and manufacturers recommendations. Set mirrors plumb and level, and free of optical distortion. Set mirrors with edge clearance free of surrounding construction including countertops or backsplashes.

LOUVERS – 08 91 00

1. SCOPE OF WORK: Provide and install all new louvers as required in the contract documents. Verify size and location with the requirements of specific equipment and as scheduled in the drawings.
   1.1. All louvers shall operate as specified in the contract documents. Provide power as needed.

1.2. Provide trim matching window trim around all exterior louvers.

2. SHOP DRAWINGS: Provide drawings and specifications for each louver to be provided. Provide location on exterior elevation drawings for coordination with architect.
3. LOUVERS: Factory fabricated and assembled, complete with frame, mullions, and accessories; AMCA Certified in accordance with AMCA 511.
4. SCREENS: Provide insect screens at intake louvers and bird screens at exhaust louvers. Frame of same material as louver, with reinforced corners; removable, screw attached; installed on inside face of louver frame.
5. STATIONARY LOUVERS: Horizontal blade, formed galvanized steel sheet construction, with intermediate mullions matching frame.
   5.1. Blades: Straight.
   5.2. Frame: 4 inches deep, channel profile; corner joints mitered and, with continuous recessed caulking channel each side.
   5.3. Steel Finish: Superior performing organic coatings, finished after fabrication.
6. OPERABLE LOUVERS: Operable horizontal blades, extruded aluminum construction.
   6.1. Movable Blades: Straight, pivoted at, with vinyl, rubber, or polyethylene blade edge and jamb seals; rattle-free linkage.
   6.2. Frame: 4 inches deep, channel profile; corner joints mitered and, with continuous recessed caulking channel each side.
   6.3. Aluminum Thickness: Frame 12 gage, 0.0808 inch minimum; blades 12 gage, 0.0808 inch minimum.
7. MATERIALS:
   7.1. Extruded Aluminum: ASTM B221 (ASTM B221M)
   7.2. Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
8. FINISHES: Class II Natural Anodized Finish: AAMA 611 AA-M12C22A31 Clear anodic coating not less than 0.4 mils thick.
9. SEALANT: Non-curing butyl type for Setting Sills and Sill Flashing.
10. INSTALLATION: Install louver assembly in accordance with manufacturer's instructions. Install louvers level and plumb. Align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior. Secure louver frames in openings with concealed fasteners.
11. ADJUSTING: Adjust operable louvers for freedom of movement of control mechanism. Lubricate operating joints.
12. CLEANING: Strip protective finish coverings. Clean surfaces and components.
13. SCHEDULES: Refer to contract documents for required size and location. Refer to equipment manufacturer's documentation for required size. If location is not provided in contract documents, Contractor is to coordinate with architect prior to providing rough opening.

DIVISION 09

GYPSUM BOARD ASSEMBLIES – 09 21 16

1. SCOPE OF WORK: Provide all new gypsum board on all walls as required by the contract documents.
   1.1. All gypsum board is to be a minimum of 5/8" thick
   1.2. All gypsum board included as part of a fire rated assembly shall be fire rated units.
   1.3. Jointing shall be reduced to a minimum; scrap pieces are not to be used to complete large sections but may be utilized in smaller areas.
   1.4. Fasten all gypsum to structure as required in the contract documents.

1.5. All gypsum within the garage or in anyway exposed to the outdoors or an unconditioned space shall be rated for an exterior exposure.

2. MANUFACTURERS: USG Corporation, National Gypsum or Georgia-Pacific products only.

3. GYPSUM BOARD ASSEMBLIES: Provide completed assemblies complying with ASTM C840 and GA-216. Fire Rated Assemblies: Provide completed assemblies complying with applicable code.

4. BOARD MATERIALS: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut. Thickness: Vertical Surfaces at 1/2 inch. Ceilings at 5/8 inch.

5. BACKING BOARD FOR WET AREAS: For all surfaces behind tile in wet areas including tub and shower surrounds and ceilings; sizes to minimum joints in place; ends square cut. Mold resistance score of 10 when tested in accordance with ASTM D3273.

6. BOARD INSTALLATION: Comply with ASTM C 840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

   6.1. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

   6.2. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

   6.3. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of non-rated double-layer assemblies, which may be installed by means of adhesive lamination.

   6.4. Installation on Wood Framing: For rated assemblies, comply with requirements of listing authority.

7. ACOUSTIC SEALANT: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.

8. JOINT MATERIALS: ASTM C475 and as recommended by gypsum board manufacturer for project conditions. Tape: 2 inch wide, creased paper tape for joints and corners , except as otherwise indicated. Ready-mixed vinyl-based joint compound.

9. FASTENING: Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant. Screws shall penetrate not less than 5/8 inch. Screw types shall be applied as per the schedule below:

   9.1. Type W GWB to wood studs

   9.2. Type S GWB to cold formed steel

   9.3. Type G GWB to GWB

10. NAILS: Attachment to Wood Members ONLY: ASTM C514.

11. JOINT TREATMENT: Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:

   11.1. All existing walls and ceilings required to be patched. Patchwork & repairs shall match existing finish and texture.

   11.2. Level 4 at all walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated. All joints and interior angles shall have tape embedded in joint compound and three separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. All joint compound shall be smooth and free of tool marks and ridges. Note: It is recommended that the prepared surface be coated with a primer/sealer prior to the application of final finishes. See painting/wallcovering specification in this regard.

   11.3. Level 1 at Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction. All joints and interior angles shall have tape embedded in joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable.

RESILIENT FLOORING AND WALL BASE – 09 65 00

1. SCOPE OF WORK: Provide resilient flooring and wall base as described in the finish schedule. Unless specifically noted otherwise, at a minimum the contractor shall include an allowance to provide and install:
   1.1. Vinyl Wall Base along the full length of all interior walls.
   1.2. Reference Scope of Work Matrix on sheet A901 for locations.
2. SUBMITTALS: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
3. SELECTION SAMPLES: Submit manufacturer's complete set of color samples for Architect's initial selection.
4. SHEET VINYL: Solid vinyl with color and pattern throughout thickness, Comply with ASTM F1913, of Class corresponding to type specified. Size & Pattern as selected by Owner. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions. Lay flooring with joints and seams parallel to building lines. Heat weld seams.
   4.1. MANUFACTURER: Mannington Commercial, Congoleum or approved equal.
5. VINYL PLANK TILE: Solid vinyl with color and pattern throughout thickness, Comply with ASTM F1700, of Class corresponding to type specified. Size & Pattern as selected by Owner. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.
   5.1. MANUFACTURER: Mannington Commercial or approved equal.
6. VINYL COMPOSITION TILE: Homogeneous, with color extending throughout thickness. Comply with ASTM F1066, of Class corresponding to type specified. Size: 12 by 12 inch. Thickness: 0.125 inch. Color: To be selected by Architect from manufacturer's full range.
   6.1. MANUFACTURER: Armstrong World Industries, Inc, Johnsonite or approved equal.
7. RESILIENT BASE: ASTM F 1861, Type TV, vinyl, thermoplastic; top set Style B, Cove, roll good, Finish & Color as selected by Owner. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
   7.1. MANUFACTURER: Johnsonite
   7.2. Material shall be supplied in rolls; 4-foot sections shall not be used.
   7.3. Butt joints shall occur at inside corners or in hidden conditions to reduce the number of visible joints.
8. SUBFLOOR FILLER: White premix latex; type recommended by adhesive material manufacturer.
9. PRIMERS, ADHESIVES, AND SEAM SEALER: Waterproof; types recommended by flooring manufacturer.
10. MOLDINGS, TRANSITION AND EDGE STRIPS: Same material as flooring.
11. FILLER FOR COVED BASE: Plastic.
12. INSTALLATION: Install in accordance with manufacturer's written instructions. Spread only enough adhesive to permit installation of materials before initial set. Fit joints and butt seams tightly. Set flooring in place, press with heavy roller to attain full adhesion.

CARPETING – 09 68 00

1. SCOPE OF WORK: Provide and install all carpeting as required by the finish schedule. Unless specifically noted otherwise, at a minimum the contractor shall include an allowance to provide and install:
   1.1. Carpeting in locations called out in Scope of Work Matrix on sheet A901.

2. SUBMITTALS: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation. Provide shop drawings illustrating locations of seams as well as tack-less strips, thresholds, and all other accessories locations and types
3. SAMPLES: Contractor to submit manufacturer's standard color and pattern to Owner for selection. Submit two samples 12 by 12 inch in size illustrating color and pattern for each carpet and cushion material selected by Owner.
4. FIELD CONDITIONS: Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation. Ventilate installation area during installation and for 72 hours after installation.
5. CUSHION: Provide cushion under all carpet installations. Cushion shall not be less than 1/2" thick with integral water repellent. If applicable, verify thickness of any immediately adjacent carpet cushion installations that are existing to remain abutting to new carpet and match thickness.
    5.1. Provide this as a separate line item with a unit cost if this scope is removed from the project
6. SUB-FLOOR FILLER: Type recommended by carpet manufacturer.
7. TACKLESS STRIP: Carpet gripper, of type recommended by carpet manufacturer to suit application, with attachment devices.
8. INSTALLATION – GENERAL: Lay out carpet and locate seams in accordance with shop drawings. Locate seams in area of least traffic, out of areas of pivoting traffic, and parallel to main traffic. Align run of pile in same direction as anticipated traffic and in same direction on adjacent pieces.
9. STRETCHED-IN CARPET: Install tack-less strips with pins facing the wall around entire perimeter, except across door openings. Use edge strip where carpet terminates at other floor coverings. Double cut carpet seams, with accurate pattern match. Make cuts straight, true, and un-frayed. Apply seam adhesive to all cut edges immediately. Join seams by hand sewing. Form seams straight, not overlapped or peaked, and free of gaps. Following seaming, hook carpet onto tack-less strip at one edge, power stretch, and hook firmly at other edges. Follow manufacturer's recommendations for method and amount of stretch.
    9.1. MANUFACTURER: As listed in the finish schedule.
10. DIRECT-GLUED CARPET: Double cut carpet seams , with accurate pattern match. Make cuts straight, true, and un-frayed. Apply seam adhesive to cut edges of woven carpet immediately. Apply contact adhesive to floor uniformly at rate recommended by manufacturer. After sufficient open time, press carpet into adhesive.
    10.1. MANUFACTURER: As listed in the finish schedule.

PAINTING AND COATING – 09 90 00

1. SCOPE OF WORK: Interior and Exterior: All unfinished surfaces to receive a full, warrantied, primer and paint system, unless specifically excluded in the contract documents.
    1.1. Reference Scope of Work Matrix on sheet A901.
2. LOCATION: Where areas are identified to be finished: Finish all interior and exterior surfaces exposed to view with minimum 1-coat of primer and 2-coats of finish paint, unless fully factory-finished and unless specifically otherwise indicated.
    2.1. Do Not Paint or Finish the Following Items:
        a) Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
        b) Items indicated to receive other finishes.
        c) Items indicated to remain unfinished.
        d) Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.

e) Floors, unless specifically so indicated.

f) Glass.

g) Concealed pipes, ducts, and conduits.

3. SUBMIT SAMPLES: Submit two paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified. Where sheen is specified, submit samples in only that sheen.

4. MANUFACTURERS: Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions: Sherwin Williams unless listed otherwise in the Finish Schedule.

5. MOCK-UP:

6. PAINTS AND COATINGS – GENERAL: Ready mixed, unless intended to be a field-catalyzed coating. Supply each coating material in quantity required to complete entire project's work from a single production run. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions. Provide coatings that comply with the most stringent requirements specified in the following:

   6.1. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.

   6.2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

7. PAINT SYSTEMS - EXTERIOR

   7.1. Paint WE-OP-3L - Wood, Opaque, Latex, 3 Coat:

   a) One coat of latex primer

   b) 2 Coat: B20WJ8651 - Solo Satin VOC 100% Acylic Int/Ext Block resistant enamel

   7.2. Paint ME-OP-3A - Ferrous Metals, Unprimed, Alkyd, 3 Coat:

   a) One coat of alkyd primer

   b) 2 Coat: B66W00651 - Pro Industrial 0 VOC Acrylic Semi-Gloss

8. PAINT SYSTEMS - INTERIOR

   8.1. Paint WI-OP-3L - Wood, Opaque, Latex, 3 Coat:

   a) One coat of latex primer sealer.

   b) Eggshell: Two coats of latex enamel .

   8.2. Paint WI-TR-VS - Wood, Transparent, Varnish, Stain:

   a) Filler coat (for open grained wood only).

   b) Two coats of stain .

   c) One coat sealer .

   8.3. Paint CI-OP-3L - Concrete/Masonry, Opaque, Latex, 3 Coat:

   a) One coat of block filler.

   b) Satin: Two coats of latex enamel .

   8.4. Paint MI-OP-2L - Ferrous Metals, Primed, Latex, 2 Coat:

   a) Touch-up with latex primer.

   b) Semi-gloss: Two coats of latex enamel .

   8.5. Paint GI-OP-3L - Gypsum Board/Plaster, Latex, 3 Coat:

   a) One coat of latex primer sealer.

   b) Eggshell: Two coats of latex enamel

8.6. Steel Handrail:

a) Prime Coat: B66W00310 - Pro Industrial Pro-Cryl Universal Primer Off White.

b) Top Coat: B66T00354 - Sher-Cryl HPA High Performance Acrylic Semi-Gloss Coating Ultradeep/Clear Tint Base.

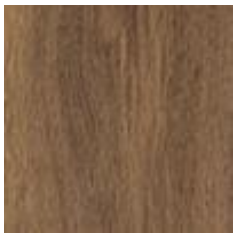
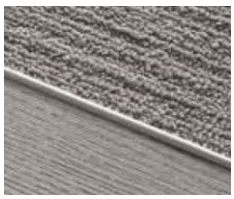
9. PREPARATION: Clean surfaces thoroughly and correct defects prior to coating application. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

9.1. Tape, spackle, sand smooth and clean all gypsum board joints.

10. APPLICATION: Apply products in accordance with manufacturer's instructions. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

11. FINAL UNIT FINISH SELECTION: Finishes listed below shall be approved by the Client prior to installation. Mock-up to be approved prior to full installation.

FINISH SCHEDULE – 09 90 05		
ID CODE	**DESCRIPTION**	**LOCATION**
	INTERIOR FINISHES	
P1	Product: Paint Mfg: Sherwin Williams Color: SW7043 Worldly Gray Finish: P1A: Eggshell (Walls)	Unit walls
P2	Product: Paint Mfg: Sherwin Williams Color: SW7030 Anew Gray Finish: Eggshell	Field Color - All common area walls unless otherwise specified.
P6	Product: Paint Mfg: Sherwin Williams Color: SW7570 Egret White Finish: Satin Enamel	Painted trim & casing
P7	Product: Paint Mfg: Sherwin Williams Color: SW7006 Extra White Finish: Flat (Ceilings) Eggshell (Walls)	All ceilings Maintenance Mechanical
WT 	Wall & Ceiling Texture: Knock Down Knock Down Procedure: Apply as spatter as described except use material at heavy latex-paint consistency. After spattering surface, wait about 10-15 min., then very lightly flatten only tops of spatters with flat blade or flat hand trowel. Size of spatters depends on pressures used. Application: Spray Equipment: Pole gun, hopper, or Binks 7D, Binks 7E2 gun or equivalent Sample: Provide a 2' x 2' sample for approval prior to starting any work.	
C1 	Product: Carpet Broadloom Mfg: Shaw Contract Collection: Quiet Canvas Style: Sentiment 60775 Color: Emotion 00753 Contact: Nora Lewandowski (612) 865-1818 nora.lewandowski@shawinc.com	Unit Bedrooms & bedroom closets.

LVT1 	Product: Luxury Vinyl Plank – Glue Down Mfg: Shaw Contract Collection: Terrain II Style: Terrain II 12 Mil 0453V Alternate: Terrain II 20 Mil 0454V Color: Pirch 00684 Plank Size: 6" x 48" x 2.5mm Wear Layer: 12 Mil. / Alt: 20mil Contact: Nora Lewandowski (612) 865-1818 nora.lewandowski@shawinc.com	Unit all rooms except bedrooms and bedroom closets
SV1 	Product: Sheet Vinyl Mfg: Mannington Commercial Collection: Paradigm CStyle: Streamline Color: Foundation PAR203	Laundry Room
VB1 	Product: Vinyl Wall Base Mfg: Johnsonite Style: 4" Traditional Cove Color: Zephyr #31	Unit wall base – exception bedrooms & bedroom closet Laundry Room
VB2 	Product: Vinyl Wall Base Mfg: Johnsonite Style: 4" Traditional Cove Color: Burnt Umber #63	Wall base for - aintenance - echanical
VT1 	Product: Vinyl Floor Transition Mfg: Tandus Collection: Tandus/Metal Edge Collection Color: TBD Item: Transition Strip Size: ME002	Floor transition between LVT & Carpet where that condition exists.
MT3 	Product: Metal Transition Mfg: Schluter Systems Item: Schiene Finish: Brushed Nickel Anodized Aluminum	Edge protection between carpet and tile in all areas where that condition exists.
SC1	Product: Sealed Concrete	Utility/Maintenance/ Mechanical Rooms

PL1 	Product: Plastic Laminate Mfg: Wilsonart Color: Sierra Cascade 5005 Finish: 38 Fine Velvet Texture (Standard)	Unit Kitchen countertops
CM1 	Product: Cultured Marble Mfg.: Central Marble Products, Inc. Color: Pure White (145) Edge Style: Eased Edge Integral Bowl: Same Color Finish: Gloss	Unit Bathroom vanity tops
CM2 	Product: Cultured Marble Mfg.: Central Marble Products, Inc. Style: Pure White (145) Edge Style: Eased Edge Finish: Matte	Window Sills
WB1	Product: Wood Base & Door Trim Mfg: TBD Profile: Square Color: Color to closely match Doors & LVT1 **Submit samples for architect/designer approval.**	Unit Bedroom wall base and door trim
CAB1 	Product: Cabinets Mfg.: Smart Cabinetry Style: Squire (Shaker, Standard Overlay) Wood: Maple Finish: Pecan (Or approved equal by Architect/Designer)	Unit kitchen cabinets and bathroom vanities
HW1  (or approved equal)	Product: Hardware – Cabinet 96mm Pull Manufacturer: Jamison Collection by Charles McMurray Model: J444-SN Finish: Satin Nickel CTC: 3.75” Length: 4.25”	Unit & Common areas cabinet doors & drawers

BL1	Product: Window Blinds Manufacturer: SWF contract Style: 2" Composite Color: TBD from color selection submittals	Door sidelites
BL2	Product: Window Blinds Manufacturer: Hunter Douglas Style: 3-1/2" Composite Color: White	All other areas where BL1 is not specified
DR1	Product: Prefinished Interior Doors Note: GC to submit physical color samples for color selection & approval. - Color/Finish to be close in color to CAB1	Common area & unit doors
MF1	Product: Prefinished Metal Door Frames Note: GC to submit physical color samples for color selection & approval. - Color to be close to P7.	Common area & unit entry door frames

DIVISION 10

SIGNAGE – 10 14 00

1. SCOPE OF WORK: Provide and install all new signage as required in the contract documents including at a minimum:
   1.1. Exterior signage: Directional traffic signage, min. 3 locations; at each Accessible Parking Stall and Accessible Access Aisle; at the trash enclosure; at each visitor parking stall, at community room door, at storage room door, at rear exit door.
   1.2. Interior signage: Not included.
   1.3. Building numbers: Metal letters located on front of building; location as indicated in contract drawings.
2. MANUFACTURERS: Teems, Inc., Sign Source, Designer Sign Systems or approved equal.
3. ACCESSIBILITY COMPLIANCE: Signs are required to comply with accessible standards indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
4. ROOM AND DOOR SIGNS: Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.
   4.1. Sign Type: Flat signs with engraved panel media as specified.
   4.2. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
   4.3. Locate on wall at latch side of door with centerline of sign at 60 inches above finished floor.
5. LUMINOUS EGRESS PATH MARKING AND OTHER "GLOW-IN-THE-DARK" SIGNS: Photoluminescent media.
   5.1. Provide luminous egress path marking as required by local authority having jurisdiction.
   5.2. Allow for total of 50 directional signs, approximately 14 inches square.
6. EMERGENCY EVACUATION MAPS: Allow for one map per elevator lobby and stair landing. Map

content to be provided by Owner. Use clear plastic panel silk-screened on reverse, in brushed aluminum frame, screw-mounted.

7. UNIT IDENTIFICATION SIGNS: Use individual metal letters. Mount on outside wall adjacent to unit entry door in ADA compliant location. Provide mounting blocks.
8. COMMON ROOM IDENTIFICATION SIGNS: Use individual metal letters. Mount on outside wall adjacent to room entry door in ADA compliant location. Provide mounting blocks.
9. ENGRAVED PANELS: Laminated colored plastic; engraved through face to expose core as background color: Total Thickness: 1/16 inch. Base bid for signage package on all unit and room identification interior signs.
10. SILK SCREENED PLASTIC PANELS: Letters and graphics silk screened onto reverse side of plastic surface: Sign Color: Clear. Total Thickness: 1/8 inch. Provide alternate pricing for all unit and room identification interior signage.
11. BUILDING IDENTIFICATION METAL LETTERS: Mounting: Concealed screws.
12. CONCEALED SCREWS: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.
13. EXPOSED SCREWS: Chrome plated.
14. TAPE ADHESIVE: Double sided tape, permanent adhesive. Do not use tape adhesive unless specifically approved by architect and owner.
15. EXAMINATION: Verify that substrate surfaces are ready to receive work.
16. INSTALLATION: Install in accordance with manufacturer's instructions. Install neatly, with horizontal edges level. Locate signs and mount at heights indicated in accordance with ADA Standards and ICC A117.1. Locate signs as required by Owner. Protect from damage and repair or replace damaged items.
17. MONUMENT SIGN: The contractor is to include an allowance as coordinated with the Owner to provide all required design of graphics, mounting details, etc. for a new monument sign. Contractor is to provide all permit applications and fully comply with local signage ordinances for design, size, height, mounting and requirements for installer's qualifications and licensure. Contractor to install sign in accordance with manufacturer's requirements. Contractor to coordinate required lighting as noted in the contract documents, required by the Owner and/or as required by the authority having jurisdiction.

TOILET, BATH AND LAUNDRY ACCESSORIES – 10 28 00

1. SCOPE OF WORK: Provide and install all new accessories as described in the contract documents. As a minimum the contractor should include one set of the items listed below for each room:
   - 1.1. Unit Bathroom: Toilet paper dispenser, two towel bars, hat and coat hook, mirror, medicine cabinet, horizontal and vertical grab bar, cabinet base protective tray and accessible tub surround. Provide roll-in shower in Unit #2.
   - 1.2. Unit Kitchen: Cabinet base protective tray.
2. TOILET ROOM ACCESSORIES (provided and installed by Contractor): Provide blocking behind all accessories as indicated by the manufacturer's instruction.
   - 2.1. Toilet Paper Dispenser: Single roll, surface mounted bracket type, stainless steel. Model B-76857 manufactured by Bobrick.
   - 2.2. Towel Bar: Satin-finish stainless steel, 18-gauge, 1" dia. bar with snap-flange mounting. With stands 900 lbs downward pull when properly installed. 24" length; verify location and appropriate length in field. Model B-530 manufactured by Bobrick.
   - 2.3. Hat and Coat Hook: (Option to be installed adjacent to entry door) Satin finish stainless steel. Flange is 2" x 2". Hook 1" W, 6 1⁄2" H; projects 3 1⁄16" from wall. Concealed wall plate. Model B6827 manufactured by Bobrick.
   - 2.4. Mirrors: Supplied and installed in size per Section 08 83 00.
   - 2.5. Toilet Seat Cover Dispenser: Surface mounted. Model B-221 manufactured by Bobrick

2.6. Combination Paper Towel Dispenser/Waste Receptacle: Convertible Recessed. Model B-3944 manufactured by Bobrick

2.7. Soap Dispenser: Surface mounted. Model B-2111 manufactured by Bobrick

2.8. Sanitary Napkin Disposal: Surface mounted. Model B270 manufactured by Bobrick

2.9. Medicine Cabinet: Recessed. Model B-397 manufactured by Bobrick.

2.10. Grab Bars: Stainless steel, 1-1/4 inches outside diameter, minimum 0.05 inch wall thickness, nonslip grasping surface finish, concealed flange mounting; 1-1/2 inches clearance between wall and inside of grab bar. Length and configuration shall be as indicated on drawings.

a) Horizontal: Model B-68137 (or equivalent two-bar system) manufactured by Bobrick.

b) Vertical: Model B-6806 manufactured by Bobrick.

2.11. Accessible Tub Surround: Modular design, Durable high gloss finish, Smooth walls with integrated shelves, In-tub removable seat mounts directly to the back of the bath, To include all ADA required 1-1/2" OD stainless steel grab bars, 17-1/4" bath depth, 60"x30"x74-1/4"complete unit finished dimensions. Model Accord #71240115 as manufactured by Sterling / Kohler.

2.12. Roll-In Shower: Full height tile on three sides and floor in the dimensions as illustrated on the contract documents and meet ADA clearance requirements. Slope floor to center drain with maximum 2% in all directions. Provide and install full width compressible threshold, heavy duty shower rod, adjustable shower head, ADA compliant controls within accessible reach zone and folding shower seat. Provide and install two-wall horizontal grab bar and vertical grab bar mounted as per ANSI A117.1, reference Grab bars above.

a) Threshold: Extruded mill finish aluminum with compressible neoprene gasket and end caps, roll over threshold for full width of shower; model number WASTxx by Gordon Glass Co.

b) Tile: Semi-gloss 4x4 Daltile, Color: Artic White 0190(1), include bullnose edge from floor to ceiling, include cove base on three sides.

c) Shower seat: Model B-5181 as manufactured by Bobrick; mount at accessible compliant height.

3. KITCHEN SINK & VANITY BASE ACCESSORIES: All kitchen sink and vanity base cabinets shall receive a protective tray by Slide N' Fit by Driptite. Installation shall include:

3.1. Slide in place

3.2. Remove seal on water proof tape at mid-point and seal 2 halves together

3.3. Set leading edge in silicone sealant

3.4. Seal 3 remaining sides with silicone sealant

4. SUBMITTALS: Submit data on accessories describing size, finish, details of function, and attachment methods.

5. MATERIALS Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation. Stainless Steel Sheet shall be ASTM A666 , Type 304.

6. FINISHES: Stainless Steel No. 4 Brushed finish , unless otherwise noted. Chrome/Nickel Plating: ASTM B456 , SC 2, satin finish , unless otherwise noted.

7. EXAMINATION: Verify existing conditions before starting work. Verify exact location of accessories for installation.

8. INSTALLATION: Install accessories in accordance with manufacturers' instructions in locations indicated on the drawings. Install plumb and level, securely and rigidly anchored to studs or blocking. Mounting Heights shall be as required by accessibility regulations, unless specifically otherwise indicated.

MANUFACTURED FIREPLACES – 10 31 00

1. SCOPE OF WORK: Provide and install manufactured steel box gas fireplace with sealed combustion chamber and all required Insulated chimney flue and associated roof flashings.
2. MANUFACTURERS: Heat & Glo, Model number: 6000C Gas Fireplace:
    2.1. Controls: IntelliFire Plus RC100. Wall mount switch. Locate as directed by owner.
    2.2. Fronts-Doors: Graphite Arcadia Front.
    2.3. Refractory: Stratford Brick.
    2.4. Mantel Shelf: 48 inches, Gifford Shelf, Unfinished Maple
    2.5. Size: Unit Front Width: 41 inches. Framing Front Width: 42 inches. Unit Back Width: 28-1/2 inches. Framing Back Width: 42 inches. Unit Height: 39-7/8 inches. Framing Height: 40-1/8 inches. Unit Depth: 21 inches. Framing Depth: 22 inches. Glass Size: 32 inches x 21-1/2 inches.
    2.6. BTU/Hour Input: 30,000 (8.8 kW).
    2.7. Efficiency: Steady State 78.5%, AFUE 61.1%, Canada EnerGuide 63%
    2.8. Termination Cap: High-Rise Termination through chimney to above roof line.
3. REFERENCE STANDARDS: UL (DIR) - Online Certifications Directory; current listings at database.ul.com. UL 127 - Standard for Factory-Built Fireplaces; Current Edition, Including All Revisions.
4. DESIGN REQUIREMENTS: Fuel: Natural gas as specified elsewhere is the contract documents.
5. SUBMITTALS: Product Data: Provide fire box cabinet dimensions, clearances required from adjacent dissimilar construction, applicable regulatory agency approvals, electrical characteristics of fan. Manufacturer's Instructions: Indicate installation procedures and component installation sequence, clearances and tolerances from adjacent construction.
6. Shop Drawings: Indicate fire box rough opening dimensions, rough opening sizes for chimney flue, and fan size.
7. REGULATORY REQUIREMENTS: Conform to applicable code for clearances from adjacent materials, chimney height above roof line requirements, and unit UL approval. Listed by Underwriters Laboratories Inc. (UL) as complying with UL 127. Products Requiring Electrical Connection: Listed and labeled by UL (DIR) or testing firm acceptable to authorities having jurisdiction, as suitable for the purpose specified and indicated.
8. COMPONENTS: Fire Box: Formed insulated steel cabinet, rectangular shaped interior, configured to include chimney outlet and cleanout, refractory brick lining. Combustion Air Source: Ducted air with screened grilles and ducts. Exposed Cladding: Prepainted steel.
9. VERIFICATION OF CONDITIONS: Verify that prepared openings are ready to receive work and opening dimensions are as indicated on drawings.
10. INSTALLATION: Install unit assembly in accordance with manufacturer's instructions.

FIRE PROTECTION SPECIALTIES– 10 44 00

1. SCOPE OF WORK: Provide and install new fire extinguishers fire extinguisher cabinets and accessories as illustrated in the contract documents and as directed by the local code official.
    1.1. Contractor to include allowance for one in each townhome extinguisher and extinguisher cabinets as part of the base bid.
    1.2. Provide unit pricing for extinguisher and extinguisher cabinet.
2. SECTION INCLUDES: Fire extinguishers. Fire extinguisher cabinets. Accessories.
3. SUBMITTALS: Provide extinguisher operational features.
4. SHOP DRAWINGS: Indicate locations of cabinets and cabinet physical dimensions.
5. MANUFACTURERS:

5.1. Fire Extinguishers: Ansul, a Tyco Business; Pyro-Chem or JL Industries, Inc

5.2. Fire Extinguisher Cabinets and Accessories: Produced by the same manufacturer as extigusher.

6. FIRE EXTINGUISHERS: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.

6.1. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gage.

6.2. Class: A:B:C type.

6.3. Finish: Baked polyester powder coat, red color.

7. FIRE EXTINGUISHER CABINETS:

7.1. Metal: Formed primed steel sheet; 0.036 inch thick base metal.

7.2. Cabinet Configuration: Recessed type.

7.3. Size to accommodate accessories.

7.4. Door: 0.036 inch metal thickness, reinforced for flatness and rigidity with nylon catch. Hinge doors for 180 degree opening with two butt hinge.

7.5. Door Glazing: Float glass, clear, 1/8 inch thick, and set in resilient channel glazing gasket.

7.6. Cabinet Mounting Hardware: Appropriate to cabinet, with pre-drilled holes for placement of anchors.

7.7. Finish of Cabinet Exterior Trim and Door: No. 4 - Brushed stainless steel.

7.8. Finish of Cabinet Interior: White colored enamel.

8. EXTINGUISHER BRACKETS: Formed steel, chrome-plated.

9. EXAMINATION: Verify existing conditions before starting work. Verify rough openings for cabinet are correctly sized and located.

10. INSTALLATION: Install in accordance with manufacturer's instructions. Install cabinets plumb and level in wall openings. Secure rigidly in place. Place extinguishers in cabinets. Provide testing & inspection tags to all extinguishers when placed for operation.

MAIL BOXES – 10 55 23

1. SCOPE OF WORK: Provide two mailbox units adjacent to new shed as illustrated in the contract documents

1.1. Coordinate all numbering with postal service and owner prior to ordering.

2. PRODUCTS: Model numbers based on Salsbury Industries products.

2.1. Rent Drop: Model 2255; provide alternate pricing to provide required installation, framing and finish work

2.2. Pedestal Box Units, Mailbox/Parcel - Model 3713D-13

2.3. Pedestal: Model 3485

3. ACCESSIBILITY: All new post office boxes shall be ADA compliant unless specifically noted otherwise in the Contract Documents. Locate all accessible mailboxes within accessible reach range between 15” and 48” above finish floor.

1. LOCAL POST MASTER: The Contractor shall coordinate new post office boxes with the local postmaster for location, access, keying, numbering, etc. prior to purchase of new post office boxes.

2. SUBMITTALS: Provide data for components, Manufacturer's Instructions: Include installation procedures, special considerations, and maintenance information. Manufacturer's Certificate: Certify that products meet or exceed specified requirements. Boxes to be provided for all Units along with General Delivery and any other specific Owner requirements.

3. SHOP DRAWINGS: Indicate locations, construction and anchorage details, dimensions, rough-in openings sizes, quantity and arrangement of box sizes. Contractor to supply fully detailed drawings for

approval by Owner and Architect prior to order and/ or fabrication.

4. U.S. POSTAL SERVICE: Comply with U.S. Postal Service "F" & "4C" Specifications for specific models listed above.
5. COMPONENTS: Front Loading Panel Frame with Aluminum with mill finish with Edges beveled, piano hinged jamb, prepared for Post Office lock cylinder. Box Door with Aluminum with mill finish.
6. BOX CONSTRUCTION: Sheet steel, zinc coated, 22 gauge thick, fabricated into modular stackable units, baked enamel flat black finish. Pre-punch bolt holes in box for stack bolting to each other and anchoring to adjacent construction; label plates for identifying each box.
7. POSTAL BOX LOCKS: USPS standard, two keys per box.
8. "OUT-GOING MAIL" LOCK BOX: Face plate to match front loading panel frame, box of galvanized steel construction , lockable with cylinder provided by Post Office , with bag hooks for rear unloading.
9. BOX INDENTIFICATION: Custom engraved door - color filled lettering to be selected by Owner.
10. INSTALLATION: Install in accordance with manufacturer's instructions and U.S. Postal Service regulations. Place anchor devices in correct position. Install and secure boxes in position, neatly, and accurately stacked. Install doors and adjust to operate smoothly. Label rear of box same as front door label identification.

WALL MOUNTED STANDARDS AND SHELVING – 10 56 17

1. SCOPE OF WORK: Provide and install all new shelving, brackets, rods and fasteners as illustrated in the contract documents. As a minimum the contractor should include the following in each type of room:
    1.1. Unit Linen Closet: Set of 5 shelves, brackets and standards. Shelves to be full depth and width of closet and equally spaced vertically along standards.
    1.2. Unit Bedroom Closet: Closet Rod: installed at 44” a.f.f. and 12” clear of back wall. Shelf: one 15” deep shelf installed at 48” a.f.f.
    1.3. Unit Storage Closet: Set of 5 shelves, brackets and standards. Shelves to be 15” deep by full width of closet and equally spaced vertically along standards.
2. SECTION INCLUDES: Shelf standards, brackets, and accessories. Closet rods for mounting on brackets.
3. SUBMITTALS: Product Data: Manufacturer's data sheets on each product to be used. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns. Maintenance Materials: Furnish the following for Owner's use in maintenance of project. Extra Brackets: Ten of each size of standard straight bracket.
4. DELIVERY, STORAGE, AND HANDLING: Store products under cover and elevated above grade. Store products in manufacturer's unopened packaging until ready for installation.
5. MANUFACTURERS: Knape & Vogt Manufacturing Company
6. STANDARD DUTY SHELF STANDARDS: Single-slotted channel standards for brackets adjustable in 1 inch increments along entire length of standard, drilled and countersunk for screws.
    6.1. Load Capacity: Recommended by manufacturer for loading of 120 to 320 pounds per pair of standards.
    6.2. Face Width: 5/8 inch.
    6.3. Material: 16 gage, 0.0598 inch sheet steel.
    6.4. Lengths: As indicated on drawings.
    6.5. Finish: Electroplated, chrome-look.
    6.6. Brackets: 14 gage, 0.0747 inch sheet steel, locking into slots; size to suit shelves; zinc coated finish.
    6.7. Bracket Quantity: Provide one bracket for each 12 inches of standard length.

7. CLOSET RODS: Steel tubing for wall mounting in flange fittings.
    7.1. Type: Round stainless steel, standard duty; 1-1/16 inch outside diameter, 0.087 inch wall thickness.
    7.2. Length: As required for application, up to 12 feet.
    7.3. Provide mounting fittings to suit application.
8. FASTENERS: Screws as recommended by manufacturer for intended application or as otherwise required by project conditions.
9. EXAMINATION: Do not begin installation until substrates have been properly prepared. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
10. PREPARATION: Clean surfaces thoroughly prior to installation. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
11. INSTALLATION: Install in accordance with manufacturer's instructions. Mount standards to solid backing capable of supporting intended loads. Install brackets, shelving, and accessories.
12. PROTECTION: Protect installed products until completion of project. Touch-up, repair or replace damaged products before Substantial Completion.

DIVISION 11

RESIDENTIAL APPLIANCES – 11 31 00

1. SCOPE OF WORK: Provide and install all new appliances as described in the contract documents. Reference the Scope of Work Matrix on sheet A901. Unless specifically noted otherwise in the matrix, as a minimum the contractor should include one set of the items listed below for each room:
    1.1. Unit Kitchen: Refrigerator, range, range exhaust, microwave, grease shield, and dishwasher.
2. SUBMITTALS: Manufacturer's data indicating dimensions, capacity, and operating features of each piece of residential equipment specified. Copies of Warranties: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
3. WARRANTY: Provide manufacturer's standard warranty for all specified equipment.
4. ENERGY STAR: Provide all equipment eligible for Energy Star rating where applicable.
5. KITCHEN APPLIANCES: All appliances shall be supplied by the same manufacturer for entire project. Provide all required power, sanitary and supply connections as well as mounting and installation best practices as recommended by the manufacturer. All appliances are to be coordinated with the residential cabinetry by the contractor for all clearances prior to ordering.
6. APPLIANCES: Provided and installed by the Contractor as part of the base bid:
    6.1. REFRIGERATOR: Frigidaire, Model: FFHT1814QB, Black
    6.2. RANGE: Frigidaire, Electric, Model: FFED3025PS, Stainless (BASE BID)
        a) RANGE: Frigidaire, Electric, Model: FFEF3009PB, Black, (ALTERNATE)
    6.3. RANGE EXHAUST: Air King, Model: ESZ366ADA , Black, Vented to Exterior
    6.4. DISHWASHER: Frigidaire, Model: FDB2410HIC, Stainless
    6.5. MICROWAVE: Frigidaire, Model: FFCE1439LB, Black
    6.6. GREASE SHIELD: Air King, Model: SP2436S, Stainless
        a) Installed flat to substrate with spray adhesive and screws. Verify in field if grease shield will fully protect wall behind top of range to bottom of cabinet/range-hood above. Install on both walls in corner range installation.

7. LAUNDRY EQUIPMENT: Coordinate with Owner's vendor for exact equipment and payment method prior to ordering specified equipment below. If card operation and payment method is to be provided other equipment shall be required.
    7.1. CLOTHES WASHER: Whirlpool, Model: CHW9050AW, White, Provide coin drop kit in lieu of coin-slide, power cord and ADA compliant pedestal as well as all accessories required for intended operation.
    7.2. CLOTHES DRYER: Whirlpool, Model: CEM2743BQ, White, Provide coin drop kit in lieu of coin-slide, power cord and ADA compliant pedestal as well as all accessories required for intended operation. Contractor to verify stable option prior to order.
8. EXAMINATION: Verify utility rough-ins are provided and correctly located. In existing structures contractor shall verify existing conditions & dimensions to determine that all equipment will meet manufacturer's clearance requirements. In existing structures contractor shall verify existing range receptacle location. Notify Architect if existing receptacle location does not meet manufacturer's installation guidelines.
9. INSTALLATION: Install in accordance with manufacturer's instructions. Anchor built-in equipment in place. Adjust equipment to provide efficient operation.
10. CLEANING: Remove packing materials from equipment and properly discard. Wash and clean equipment.

PLAYGROUND EQUIPMENT – 11 68 13

1. SCOPE OF WORK: Provide and install whole and complete playground as selected by owner. Include allowance and coordinate with subdrainage section. Include allowance to provide and install protective surfacing.
2. CURB: Include alternates for concrete curb system as detailed in the contract documents as well as a fully designed system consisting of rubber curbing produced by the same manufacturer as the playground equipment.
3. SECTION INCLUDES: Playground layout (staking). Concrete footings for playground equipment. Playground equipment.
4. SUBMITTALS: Product Data: For all manufactured equipment, provide manufacturer's product data showing materials of construction, compliance with specified standards, installation procedures, safety limitations, and the number of users permitted.
5. SHOP DRAWINGS: Detailed scale drawings showing play event layout, Use Zone perimeters, and fall height for each play event.
6. MAINTENANCE DATA: Provide manufacturer's recommended maintenance instructions and list of replaceable parts for each equipment item, with address and phone number of source of supply.
7. WARRANTY: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
8. QUALITY ASSURANCE: Maintain one copy of the latest edition of ASTM F1487 and CPSC Pub. No. 325 at project site. Manufacturer Qualifications: Company regularly engaged in manufacturing materials and products specified in this section, with not less than three years of experience.
9. DELIVERY, STORAGE, AND HANDLING: Deliver, handle, and store equipment to project site in accordance with manufacturer's recommendations.
10. Store materials in a dry, covered area, elevated above grade.
11. WARRANTY: To be the manufacturer’s lifetime warranty.
12. MANUFACTURERS: MN/WI Playground; GameTime, Inc; Landscape Structures, Inc; or Park Structures, Inc
13. DESIGN ASSUMPTIONS: Because the safety of the playground depends on strict conformance to the design criteria, this information is provided for Contractor's information.

14. There shall be two different areas
15. Playground has been designed for children ages 2 through 5.
16. Playground has been designed for children ages 5 through 12.
17. If deviations from specified dimensions, especially fall heights, is required, obtain approval prior to proceeding; follow approval request procedure as specified for substitutions.
18. FOOTINGS: Mount all equipment on concrete footings, unless otherwise indicated.
19. SUPPORT MOUNTS: Provide supports as required to mount equipment at proper height above finish and sub-grades to allow installation of sufficient depth of protective surfacing; portion of support below top of surfacing must comply with specified requirements for equipment.
20. SUPPORT FINISH: Paint the portion of the support that is intended to be installed below the top surface of the protective surfacing a different color, or mark in other permanent way, so that installers and maintainers of protective surfacing can easily determine whether sufficient depth has been installed.
21. EQUIPMENT LABELS: Label each equipment item with permanent labels stating age group that equipment was designed for, manufacturer identification, and warning labels in accordance with ASTM F1487.
22. PLAYGROUND EQUIPMENT: Comply with ASTM F1487 and CPSC Pub. No. 325; provide equipment complying with specific requirements for the relevant age group(s). Provide components having factory-drilled holes. Do not use components with extra holes that will not be filled by hardware or covered by other components.
23. STEEL PIPE AND TUBE: Conforming to ASTM A135/A135M, ASTM A500/A500M, or ASTM A513/A513M; hot-dipped galvanized and free of excess weld and spatter. Tensile Strength: 45,000 psi, minimum. Yield Point: 33,000 psi, minimum. Galvanizing: Hot-dip metal components in zinc after fabrication, in accordance with ASTM A123/A123M; remove tailings and sharp protrusions and burnish edges.
24. EXTRUDED ALUMINUM: ASTM B221 or ASTM B221M, Alloy 6061, 6062, or 6063. Tensile Strength: 39,000 psi, minimum. Yield Point: 36,500 psi, minimum.
25. HARDWARE: Provide design without hazardous protrusions, corners, or finishes, and requiring tools for removal after installation; countersunk fasteners are preferred. Use stainless steel for metal-to-metal connections; select type to minimize galvanic corrosion of materials connected by hardware. Use stainless steel for wood-to-wood and wood-to-metal connections. Use stainless steel with plastic components. Bearings: Self lubricating. Hooks, Including S-Hooks: Closed loop; maximum gap 0.04 inches, less than the thickness of a dime. Rails, Loops, and Hand Bars: Same metal as item is mounted on or aluminum; with powder coating. Anchors: In accordance with manufacturer's recommendations.
26. BOARDS AND TIMBERS: Free of holes, cracks, and loose knots; do not use wood or wood coatings that contain pesticides; do not utilize used lumber.
27. CONCRETE: As specified in Section 03 30 00. To meet ASTM C94/C94M ready mix concrete; 28 days strength of 3,000 psi.
28. VERIFICATION OF CONDITIONS: Verify that playground area has been graded to subgrade elevations required and that excess soil, rocks, and debris have been removed. Verify that playground equipment footings have been installed in proper locations and at proper elevations. Verify location of underground utilities and facilities in playground area; damage to underground utilities and facilities will be repaired at Contractor's expense.
29. PREPARATION: Stake location of playground elements, including Use Zone perimeters, perimeter of protective surfacing, access and egress points, hard surfaces, walls, fences, and structures, and planting locations. Stake layout of entire Use Zone perimeter before starting any work and before subbase under resilient surfacing is laid.
30. USE ZONE: Verify that Use Zone perimeters do not overlap hard surfaces, whether currently installed or not. Verify that Use Zones are free of obstructions that would extend into the resilient portion of the

protective surfacing. If conflicts or obstructions exist, notify Architect. Do not proceed until revised drawings have been provided, showing corrected layout, and obstructions have been removed.

31. INSTALLATION: Coordinate work with preparation for and installation of protective surfacing included as part of the Contractors base bid. The protective surfacing is to be installed after playground equipment installation. Install concrete footings with top surface a minimum of 1/2 inch below required subgrade elevation. Install in accordance with CPSC Pub. No. 325, ASTM F1487, manufacturer's instructions, and requirements of authorities having jurisdiction (AHJ). Anchor equipment securely below the bottom elevation of the resilient surfacing layer. Install without sharp points, edges, or protrusions; entanglement hazards; or pinch, crush, or shear points. Do not modify play events on site without written approval of manufacturer. Install required signage if not factory-installed.
32. CLEANING: Restore adjacent existing areas that have been damaged from the construction. Clean playground equipment of construction materials, dirt, stains, filings, and blemishes due to shipment or installation. Clean in accordance with manufacturer's instructions, using cleaning agents as recommended by manufacturer. Clean playground area of excess construction materials, debris, and waste. Remove excess and waste material and dispose of off-site in accordance with requirements of authorities having jurisdiction.
33. PROTECTION: Protect installed products until Date of Substantial Completion. Replace damaged products before Date of Substantial Completion.

DIVISION 12

VERTICAL LOUVER BLINDS – 12 21 16

1. SCOPE OF WORK: Provide and install complete blind system and accessories on all windows throughout apartment areas.
2. MANUFACTURERS: Hunter Douglas. Vertical Solutions. 3-1/2” wide flame retardant vanes. Wand Control. Color: White. In width and height to fully fill window openings. Stack should occur on the non-operational side of windows; Contractor to coordinate with window provider.
3. SUBMITTALS: Manufacturer's data sheets on each product to be used, including: Preparation instructions and recommendations, Storage and handling requirements and recommendations, and Installation methods.
4. SELECTION SAMPLES: Contractor to submit samples to Owner for review and approval for vanes, color chips or material samples representing manufacturer's full range of available colors and patterns.
5. VERTICAL LOUVER BLINDS: Color as selected by Owner from Contractor provided samples. Horizontal travel, vertical vane louver units complete with tracks, pivot and traversing mechanisms, and accessories as well as: Vanes: NFPA 701 compliant PVC vanes of size adequate and appropriate for opening size with Integrally colored, extruded smooth PVC; flat, 3-1/2 inches (80mm) wide, Operation Manual, and Wand operation.
6. BLIND RESTING POSITION: Over fixed pane of glass
7. MOUNTING: Inside (between jambs)
8. TRACKS: Channel tracks for type of operation, extruded aluminum with clear anodized finish, with end caps. Sized in a Manufacturer's standard dimension, selected for suitability for installation conditions, span, and weight of vanes.
9. PIVOT MECHANISM: Geared for synchronous 180 degrees rotation of vanes and type of operation indicated.
10. LOUVER CARRIERS: Injection molded PVC carriers with 8 prong rotation system carriers have self-lubricating wheels for reduced friction. Carriers allow for 180 degree simultaneous rotation.
11. BRACKETS AND MOUNTING HARDWARE: As recommended by manufacturer for the mounting configuration and span indicated; provide manufacturer’s standard L- bracket with clip for outside mounting and clip only for inside mounting.
12. FABRICATION: Field measure finished openings prior to ordering or fabrication.

13. INSTALLATION: Install in accordance with manufacturer's instructions using mounting style as indicated. Adjust blinds for smooth operation.
14. WARRANTY: Minimum 2-year manufacturer warranty.

RESIDENTIAL CASEWORK – 12 35 30

1. SCOPE OF WORK: Provide an install new cabinets in dwelling units as illustrated in the contract documents. Reference Unit key notes on unit plans for scope of work.
2. Including the following in all Accessible Unit Kitchens:
   - 2.1. New base & upper cabinets in kitchens.
   - 2.2. New vanity in bathrooms
   - 2.3. Meet all accessibility requirements, including 34” max. height to top of sink rim
   - 2.4. Removable base cabinets at sink & open work spaces allowed. Provide valance & concealment panel when cabinet faces removed.
   - 2.5. Toe kick shall not be continuous, so that easy removal of cabinet fronts is readily achievable.
   - 2.6. Flooring and wall finishes behind cabinets shall be complete.
   - 2.7. Upper cabinet heights shall be installed per drawing, which may vary from standard upper cabinet mounting heights.
   - 2.8. Install be pull hardware on all doors & drawers.
   - 2.9. Shelving that is provided but that is not immediately installed in the cabinets shall be stored in a location as directed by the Owner.
3. MANUFACTURERS: Smart Cabinets. Mortise and tenon door, veneer flat panel, solid drawer front, square edge profile, standard overlay.
4. GENERAL CABINET NOTES:
   - 4.1. Install Drip-Tite liners at all kitchen sink cabinets.
   - 4.2. Do not use cabinets that contain added urea-formaldehyde.
   - 4.3. Provide hardware at all cabinet doors and drawers.
   - 4.4. See finish schedule for product information
5. SUBMITTALS: Provide component dimensions and construction details.
6. SHOP DRAWINGS: Indicate casework locations, large scale plans, elevations, clearances required, rough-in and anchor placement dimensions and tolerances.
7. QUALITY ASSURANCE: Complying with ANSI/KCMA A161.1 and KCMA Certified.
8. CABINET CONSTRUCTION: Maple hardwood face framing and min. 1/2” plywood, tempered hardboard gables. Water resistant shelves with powder coating. Four sided 5/8” solid dovetail drawer with 1/4” captive matching laminate bottom.
9. COUNTERTOPS: As specified in Section 12 36 00.
10. DOOR AND DRAWER FRONTS: Solid wood.
11. BOLTS, NUTS, WASHERS AND SCREWS: Of size and type to suit application.
12. HARDWARE: BHMA A156.9, Types as recommended by fabricator. Drawer Slides shall be Extension arms, steel and ball bearing construction. Side mounted.
13. FABRICATION: Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings. Fabricate corners and joints without gaps or inaccessible spaces or areas where dirt or moisture could accumulate. Provide cutouts for plumbing fixtures. Prime paint contact surfaces of cut edges.
14. FINISHES: All surfaces exposed to view shall be Stain, seal, and varnish .

15. INSTALLATION: Install casework, components and accessories in accordance with manufacturer's instructions. Use anchoring devices to suit conditions and substrate materials encountered. Set casework items plumb and square, securely anchored to building structure.

COUNTERTOPS – 12 36 00

1. SCOPE OF WORK: Provide and install all new countertops as illustrated in the contract documents. Including the following:
   1.1. Unit Kitchens and Bathrooms: New plastic laminate countertops with eased front edge. Provide back & side splashes at walls, cabinets, and end panels as required for layout. Countertop height required to accommodate top of sink rim to be no higher than 34". Install low-profile blocking to meet this requirement. See finish schedule for product information.
2. SUBMITTALS: Manufacturer's data sheets on each product to be used, including: Preparation instructions and recommendations, Storage and handling requirements and recommendations, Specimen warranty.
3. SELECTION SAMPLES: Contractor to provide to Owner for review and selection for each finish product specified, color chips representing manufacturer's full range of available colors and patterns.
4. PLASTIC LAMINATE COUNTERTOPS: High-pressure decorative laminate (HPDL) sheet bonded to substrate. Laminate Sheet to be NEMA LD 3, Grade HGS, 0.048 inch nominal thickness. Finish to be Matte or suede, gloss rating of 5 to 20. Surface Color and Pattern to be As selected by Owner from the manufacturer's full line.
   4.1. MANUFACTURERS: As listed in the finish schedule.
   4.2. EXPOSED EDGE TREATMENT: Post formed laminate; front edge substrate built up to minimum 1-1/4 inch thick with a no drip raised radius edge, integral cove backsplash with radius top edge.
   4.3. BACK AND END SPLASHES: Same material, same construction.
   4.4. FABRICATION: As per AWI/AWMAC/WI (AWS), Section 11 - Countertops, Custom Grade. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
   4.5. PARTICLEBOARD FOR SUPPORTING SUBSTRATE: ANSI A208.1 Grade 2-M-2, 42-45 pcf minimum density; minimum 3/4 inch thick; join lengths using metal splines. Shall meet California 93120.
   4.6. ADHESIVES: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.
   4.7. INSTALLATION: Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch. Seal joint between back/end splashes and vertical surfaces.

DIVISION 13 - 20

1. Not included on this specification.

DIVISION 21

1. Not included on this specification.

DIVISION 22

PLUMBING DESIGN CRITERIA – 22 00 00

1. SCOPE OF WORK: Design, provide and install a complete plumbing system including all materials and labor as illustrated in the contract documents, including:
   1.1. Unit Bathrooms: Vanity sink with faucet, toilet, tub with spigot and shower head on adjustable mounting.
   1.2. Unit Kitchen: Kitchen sink and faucet, connection to dishwasher.
   1.3. Unit Mechanical: Hot water heater.
   1.4. Sanitary line, supply and return lines, drains, condensate, venting for all fixtures, equipment and appliances as required.
   1.5. Whole and complete gas piping, valves, hangers and metered system. Including natural gas connection to fireplace.
2. CODE: All plumbing work shall be design and installed by the Contractor in accordance with all governing authorities, ordinances and codes.
3. DESIGN BUILD: Plumbing design scope shall be fully engineered and documented as part of the Contractor's base bid. Submission to the authority having jurisdiction any and all information, drawings, cut-sheets, etc. that are required for permitting shall be the sole responsibility of the Contractor.
4. ACCESSIBILITY COMPLIANCE: All plumbing fixtures within accessible apartments, amenity spaces, restrooms, common areas, corridors, or otherwise required to comply with accessibility codes shall be, if new, located as required by the governing accessibility code or if existing, relocated to meet the governing accessibility code. If there is found to be a conflict in the field or manufacture's or suppliers specified fixture and the governing accessibility code, provide a compliant fixture installed as required by the governing code and notify the architect immediately. Reference the typical accessibility mounting heights and clearances within the contract documents for all new and existing fixture locations.
5. Shop drawings shall be required for the Owner’s review and approvals. Shop drawings shall include all required drawings, equipment and fixture submittals and calculations.
6. Each Contractor shall visit site to become fully informed as to existing conditions before submitting proposal. No additional compensation or allowances shall be granted to this Contractor for failure to fully understand existing conditions prior to design and construction.
7. Each Contractor shall coordinate closely with General Contractor and other Contractors to perform the work. Sufficient materials and labor shall be provided as required to maintain progress with all phases of construction.
8. Provide all submittals within the final O&M manuals.
9. Contractor to provide as built drawings of installed work.
10. INSTALLATION: Install in accordance with manufacturer's instructions.
11. COORDINATION: The plumbing Contractor shall coordinate with all other trades to prevent interference between beams, joists, structures, wiring, ductwork, etc.
12. Verify the location of all plumbing fixtures and devices with the Owner prior to roughing in any work. Actual and final locations of fixtures are subject to Owner's approval.
13. Placement of piping in exterior walls or other areas subject to freezing shall be avoided. However, where such placement is necessary, the piping shall be placed on the warm-in-winter side of insulation or other acceptable measures as proposed by the Contractor and approved by the Owner to ensure no pipe freezing may be accepted.
14. Pitch all laterals to drain at or greater than as required by the local governing plumbing code.
15. All floor drains are to have associated air break and trap.
16. Provide thermostatic mixing valve at all hand sinks and lavatories.
17. New plumbing shall be connected to existing waste & vent line where possible, verify in field.

18. Insulate all hot water piping and place all piping on the warm-in-winter side of wall, floor and/or ceiling insulation.
19. Provide new shut-off valves at all fixtures and units.
20. All new supply piping shall be minimum of 1/2" dia. Unless specifically noted otherwise.
21. FINAL INSPECTION, TESTING, CLEANING AND ADJUSTING: At completion of work, all parts of the installation and equipment shall be inspected, tested, adjusted, cleaned, and left in a safe, proper operating condition to the satisfaction of the Owner.
22. GUARANTEE: All materials and equipment furnished for this project shall be new and free of defects. All work shall be of good quality, free of faults and defects. All work, materials and equipment shall be guaranteed for one (1) full year from the date of certificate of occupancy. All manufacturer's warranties shall be in excess of Contractor's guarantee.
23. STARTING EQUIPMENT AND SYSTEMS: Provide manufacturer's approved field representative to prepare and start equipment. Adjust for proper operation within manufacturer's published tolerances. Demonstrate proper operation of equipment to Owner's designated representative. Video tape demonstration and turn over to Owner

DIVISION 23

HVAC DESIGN CRITERIA – 23 00 00

1. SCOPE OF WORK: Design, provide and install all new, complete HVAC system as described in the contract documents
   1.1. Interior and Exterior of Units: Furnace, fans, condensing units, line-sets, grilles, and ductwork.
   1.2. As an alternate to the base bid in the Laundry Room, provide and install a Mini-Split system and provide engineered design.
2. CODE: All mechanical work shall be designed and installed by the Contractor in accordance with all governing authorities, ordinances and codes.
3. DESIGN BUILD: Mechanical design scope shall be fully engineered and documented as part of the Contractor's base bid. Submission to the authority having jurisdiction any and all information, drawings, cut-sheets, etc. that are required for permitting shall be the sole responsibility of the Contractor.
4. Shop drawings shall be required for the Owner’s review and approvals. Shop drawings shall include all required drawings, equipment and fixture submittals and calculations.
5. Each Contractor shall visit site to become fully informed as to existing conditions before submitting proposal. No additional compensation or allowances shall be granted to this Contractor for failure to fully understand existing conditions prior to design and construction.
6. Each Contractor shall coordinate closely with General Contractor and other Contractors to perform the work. Sufficient materials and labor shall be provided as required to maintain progress with all phases of construction.
7. All work, materials and equipment provided under this division shall be guaranteed against defect by this Contractor for one year beyond date of acceptance.
8. Provide all submittals within the final O&M manuals
9. Contractor to provide as built drawings of installed work.
10. INSTALLATION: Install in accordance with manufacturer's instructions.
11. COORDINATION: The mechanical Contractor shall coordinate with all other trades to prevent interference between beams, joists, structures, piping, wiring, etc.
12. All penetrations through fire rated assemblies shall be installed in accordance with the required rating. At the request of the building official or Contractor the Architect will supply UL design numbers to accommodate specific existing conditions.
13. TEMPERATURE CONTROL: system shall be designed to maintain an indoor temperature of 68°f at a

point 3'-0" above the floor on the design heating day.

14. ENERGY CONSERVATION: Heating, ventilating and air conditioning systems of all structures shall be designed and installed for efficient utilization of energy in accordance with the Owner's provided energy report, international energy conservation code as well as the local AHJ.
15. Ducts, fans and distribution system shall be designed to minimize air noise and sensibility of air movement.
16. Exterior air conditioning units shall be located and installed on pads as per code in locations as approved by the Owner. Include hurricane tie-down clips at all units.
17. FINAL INSPECTION, TESTING, CLEANING AND ADJUSTING: At completion of work, all parts of the installation and equipment shall be inspected, tested, adjusted, cleaned, and left in a safe, proper operating condition to the satisfaction of the Owner.
18. GUARANTEE: All materials and equipment furnished for this project shall be new and free of defects. All work shall be of good quality, free of faults and defects. All work, materials and equipment shall be guaranteed for one (1) full year from the date of certificate of occupancy. All manufacturer's warranties shall be in excess of Contractor's guarantee.
19. STARTING EQUIPMENT AND SYSTEMS: Provide manufacturer's approved field representative to prepare and start equipment. Adjust for proper operation within manufacturer's published tolerances. Demonstrate proper operation of equipment to Owner's designated representative. Video tape demonstration and turn over to Owner.

DIVISION 24 – 25

1. Not included on this specification.

DIVISION 26

ELECTRICAL DESIGN CRITERIA – 26 00 00

1. SCOPE OF WORK: Design, provide and install complete interior, exterior and site lighting, power, low voltage emergency lighting, and alarm systems as illustrated in the contract documents.
    1.1. Including control panels, feeder, service connection, main and sub panels, connections to all mechanical equipment, pumps and fans, building grounding/bonding, switching devices, ground fault devices, duplex devices, quadplex devices, horns, strobes, smoke detectors, carbon monoxide detectors, occupancy sensors, specialty power for equipment and coordination with owner's security and tele/data consultant.
2. CODE: All electrical work shall be designed and installed by the Contractor in accordance with all governing authorities, ordinances and codes.
3. DESIGN BUILD: Electrical design scope shall be fully engineered and documented as part of the Contractor's base bid. Submission to the authority having jurisdiction any and all information, drawings, cut-sheets, etc. that are required for permitting shall be the sole responsibility of the Contractor.
4. Shop drawings shall be required for the Owner's review and approvals. Shop drawings shall include all required drawings, equipment and fixture submittals and calculations.
    4.1. Shop drawings should also include a foot candle plot of the specified lighting fixtures in all areas with new lighting; both interior and exterior.
5. Each Contractor shall visit site to become fully informed as to existing conditions before submitting proposal. No additional compensation or allowances shall be granted to this Contractor for failure to fully understand existing conditions prior to design and construction.
    5.1. Each Contractor shall coordinate closely with General Contractor and other Contractors to perform the work. Sufficient materials and labor shall be provided as required to maintain progress with all phases of construction.
6. Verify the location of all electrical devices with the Owner prior to roughing in any work. Actual and final

locations of devices are subject to Owner's approval.

7. NEW DEVICES: All new power devices shall be temper resistant. As required by code all new devices shall be arc fault. Contractor to verify exact scope and include as part of base bid.
8. BRANCH CIRCUIT WIRING: Complete with all final connections to equipment, devices, light fixtures, receptacles, motors, and all other equipment as required. Minimum wire size for lighting and power circuits shall be as per the local governing electrical code. Larger wire sizes shall be provided as required to carry the connected loads without excessive voltage drop.
9. JUNCTION AND OUTLET BOXES: Provide device boxes suitable for intended service and in compliance with the local governing electrical code. The electrical Contractor shall furnish and install all junction and pull boxes as required.
10. GROUNDING: All electrical equipment shall be connected to the ground network. Ground cable size, type, and connection shall be as required by the local governing electrical code.
11. All battery backed-up devices, including smoke detectors and carbon monoxide detectors shall be tested and replaced if found to not be in working order.
12. All recessed fixtures that are mounted in insulated cavities shall be IC rated. All other recessed fixtures shall be provided with a physical barrier keeping min. 3" clear of all insulation around all sides with no insulation resting on top of the fixture.
13. SMOKE AND CARBON MONOXIDE DETECTORS: All detectors shall be provided and installed by the Contractor as required by the local official and hard wired in accordance with state and local fire codes. Reference General Notes for required minimum locations as well as Electrical Sheets.
14. GUARANTEE: All materials and equipment furnished for this project shall be new and free of defects. All work shall be of good quality, free of faults and defects. All work, materials and equipment shall be guaranteed for one (1) full year from the date of certificate of occupancy. All manufacturer's warranties shall be in excess of Contractor's guarantee.
15. Provide all submittals within the final O&M manuals.
16. Contractor to provide as built drawings of installed work.
17. INSTALLATION: Install in accordance with manufacturer's instructions.
18. COORDINATION: The electrical Contractor shall coordinate with all other trades to prevent interference between beams, joists, structures, piping, ductwork, etc.
19. STARTING EQUIPMENT AND SYSTEMS: Provide manufacturer's approved field representative to prepare and start equipment. Adjust for proper operation within manufacturer's published tolerances. Demonstrate proper operation of equipment to Owner's designated representative.
20. Unless specifically noted on the drawings, no new raceways or conduits shall be exposed on the finished side of and interior or exterior surface. All concealed wiring, conduit, junction boxes, etc. shall be installed as per the requirements of the local electrical code. If any are concealed within a fire-rated assembly, proper encasement/penetrations shall be included as part of a complete installation.

HEARING AND VISUAL IMPAIRMENT DEVICES – 26 00 01

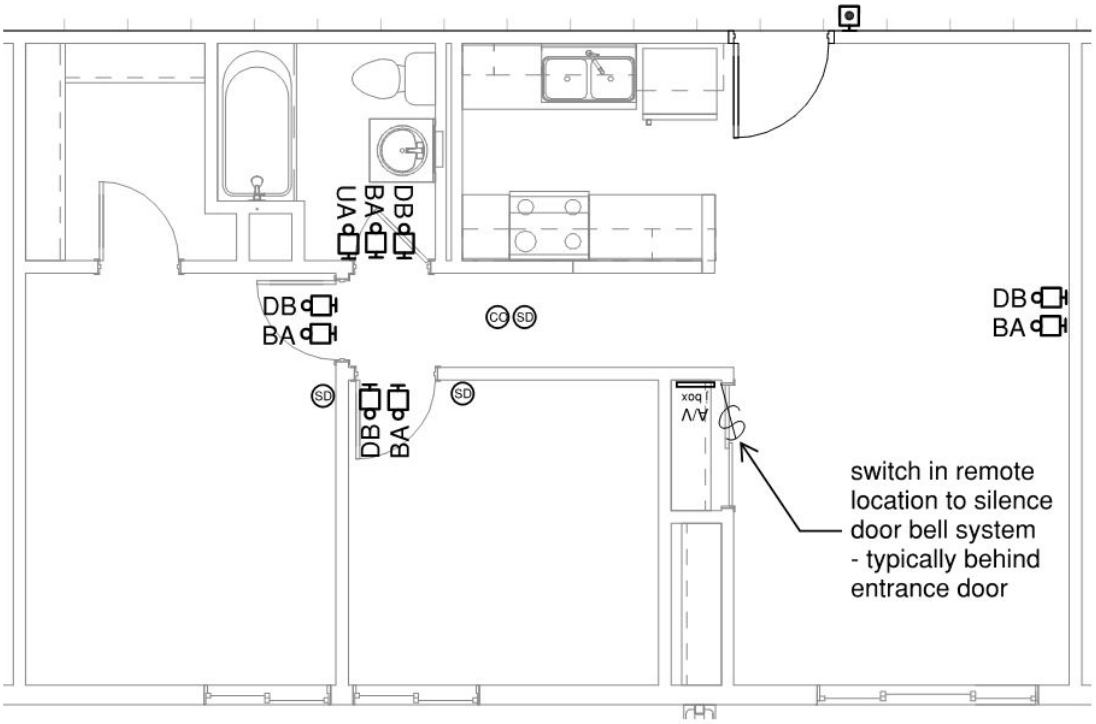
1. SCOPE OF WORK: Units as noted to be for the Hearing and Visually Impaired shall comply fully with ANSI A117.1 Chapter 7 and other relevant sections of this specification. Contractor to coordinate exact devices as illustrated in the contract documents. If not specified elsewhere, at a minimum the contractor shall provide and install the following:
2. UNIT SMOKE DETECTION – All smoke detectors in the unit shall be interconnected and include an audible and strobe notification device similar to the BRK 7010BSL. If a CO detector is needed, than a separate device needs to be installed interconnected with this device.
3. BUILDING FIRE ALARM SYSTEM – Where a building fire alarm system is provided, the system wiring shall be extended to a point within the unit in the vicinity of each bedroom detector and one location in the common area similar to all other units. The combination signaling device shall be activated by the

building fire alarm system in the portion of the building containing the unit. The lens on the devise shall be CLEAR similar to the Edwards Signaling Combination Devices, 869 Series.

4. UNIT FIRE ALARM SYSTEM – Where a building fire alarm system is provided, the system wiring shall be extended to a point within the unit in the vicinity of each bedroom detector and one location in the common area similar to all other units. The combination signaling device shall be activated by the building fire alarm system in the portion of the building containing the unit. The lens on the devise shall be CLEAR similar to the Edwards Signaling Combination Devices, 869 Series.
5. UNIT PRIMARY ENTRANCE – A hard-wired electric doorbell shall be provided. A button shall be provided on the public side of the unit primary entrance. Activation of the button shall initiate an audible tone along with a strobe within the unit. The combination signaling device shall have a BLUE lens similar to the Edwards Signaling Combination Devices, 869 Series. Doorbell button basis of design: Viking Electronics, DB40-WH.
6. BUILDING ENTRY SYSTEM – System shall support voice and TTY communication with the unit interface. The unit interface shall include a telephone jack capable of supporting voice and TTY communication with the public or common-use system interface.
7. CLOSED-CIRCUIT COMMUNICATION SYSTEMS – System shall be integrated into the building entry system and comply with the same requirements.
8. VISUAL IDENTIFICATION SYSTEM - A means for visually identifying a visitor without opening the residential dwelling unit entry door shall be provided and shall allow for a minimum 180 degree range of view. In doors, peepholes that include prisms clarify the image and should offer a wide-angle view of the hallway or exterior for both standing persons and wheelchair users. Such peepholes can be placed at a “standard height” of 60” AFF and permit a view from several feet from the door. A second viewer at 42” AFF shall be installed. Basis of design: Doorscope DS238 Metallic Ultra-Wide Angle.

9. BASIS OF DESIGN LAYOUT FOR DEVICES:

9.1. All devices shall be located in areas as illustrated in the contract documents as well as per the illustration below.



Unit Door Bell	DB	 amber lens	Edwards Signaling Combination Devices, 869 Series Xenon strobe light source with horn • Flash rate 60 fpm • 100dB at 1 meter/90dB at 10ft. (measured in anechoic chamber) Provide permanent label.
Building Alarm	BA	 clear lens	
Unit Alarm - strobe only	UA	 clear lens	
Unit Smoke Detector	SD		BRK 7010BSL - 177 candela strobe Xenon light
Unit CO2	CO		standard detector interconnected with smoke detectors
System On/Off switch			Provide ON/OFF switch in remote location for Audio/Visual system. Provide permanent label.
Signaling device			Provide Audio/Visual Signaling device with Horn/Strobe, lighted pushbutton with engraved plate & transformer. Edwards Signaling - 7005G5
J Box	A/V j box		Provide 6"x6" Hoffman box for 100VA transformer & hearing impaired wiring

DIVISION 27 – 30

1. Not included on this sheet

DIVISION 31

SITE CLEARING – 31 10 00

1. SCOPE OF WORK: Provide all site clearing as needed to accommodate new work and as illustrated in the contract documents.
2. SECTION INCLUDES: Clearing and protection of vegetation. Removal of existing debris.
3. REFERENCE STANDARDS:
   - 3.1. MnDOT Standard Specifications for Construction: Standard Specifications for Construction, Latest Edition, published by the Minnesota Department of Transportation.
   - 3.2. CEAM Standard Specifications: Standard Specifications, Latest Edition, published by the City Engineers Association of Minnesota.
   - 3.3. ASTM International:
     a) ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
     b) ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb:£'ft3 (600 kN-mlm3))
     c) ASTM D2419 - Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
     d) ASTM D2434 - Standard Test Method for Permeability of Granular Soils (Constant Head).
     e) ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
     f) ASTM D30 17 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
   - 3.4. Local utility standards when working within 24 inches of utility lines
4. SUBMITTALS: Site Plan Showing: Vegetation removal limits. Areas for temporary construction and field offices.
5. SITE CLEARING: Minimize production of dust due to clearing operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
6. EXISTING UTILITIES AND BUILT ELEMENTS: Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits. Protect existing utilities to remain from damage. Do not disrupt public utilities without permit from authority having jurisdiction. Protect existing structures and other elements that are not to be removed.
7. VEGETATION SCOPE: Remove trees, shrubs, brush, and stumps in areas to be covered by building structure, paving, playing fields, lawns, and planting beds.
   - 7.1. Do not remove or damage vegetation beyond the limits indicated on drawings. If not specifically illustrated the following shall be coordinated on site with the requirements of the project by the contractor:
     a) 40 feet outside the building perimeter.
     b) 10 feet each side of surface walkways, patios, surface parking, and utility lines less than 12 inches in diameter.
     c) 15 feet each side of roadway curbs and main utility trenches.
     d) 25 feet outside perimeter of pervious paving areas that must not be compacted by construction traffic.
     e) Exception: Specific trees and vegetation indicated on drawings to be removed.
     f) Exception: Selective thinning of undergrowth specified elsewhere.

7.2. Install substantial, highly visible fences at least 3 feet high to prevent inadvertent damage to vegetation to remain at vegetation removal limits.

7.3. In areas where vegetation must be removed but no construction will occur other than pervious paving, remove vegetation with minimum disturbance of the subsoil.

7.4. Vegetation Removed: Do not burn, bury, landfill, or leave on site, except as indicated. Chip, grind, crush, or shred vegetation for mulching, composting, or other purposes; preference should be given to on-site uses.

7.5. Trees: Sell if marketable; if not, treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches.

7.6. Existing Stumps: Treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches.

7.7. Sod: Re-use on site if possible; otherwise sell if marketable, and if not, treat as specified for other vegetation removed.

7.8. Fill holes left by removal of stumps and roots, using suitable fill material, with top surface neat in appearance and smooth enough not to constitute a hazard to pedestrians.

7.9. Dead Wood: Remove all dead trees (standing or down), limbs, and dry brush on entire site; treat as specified for vegetation removed.

7.10. Restoration: If vegetation outside removal limits or within specified protective fences is damaged or destroyed due to subsequent construction operations, replace at no cost to Owner.

8. DEBRIS: Remove debris, junk, and trash from site. Leave site in clean condition, ready for subsequent work. Clean up spillage and wind-blown debris from public and private lands.

GRADING – 31 22 00

1. SCOPE OF WORK: Provide all necessary rough and finish grading to accommodate elevations indicated on the contract documents. All grading shall in general slope away from the finished floor of buildings and direct the flow of water to drain into the storm water management system.
2. SITE CLEARING: Provide clearing, grubbing and removal of site debris as required to execute the work. Dispose of all debris and soil if applicable in environmentally sound and Code approved manner. During all operations maintain positive drainage and control of soil erosion and sediment in an approved manner. All trees and shrubs shall have stumps removed to a minimum of 12 inches below grade. Strip and store topsoil for use in Final Grading and Landscaping. All waste disposal shall comply with the requirements of the local authority.
3. ROUGH GRADING: Remove topsoil from areas to be further excavated, re-landscaped, or re-graded, without mixing with foreign materials. Remove subsoil from areas to be further excavated, re-landscaped, or re-graded. When excavating through roots, perform work by hand and cut roots with sharp axe.
4. SOIL REMOVAL: Stockpile topsoil & subsoil to be re-used on site; remove remainder from site. Stockpiles: Use areas designated on site; pile depth not to exceed 8 feet; protect from erosion.
5. FINISH GRADING: Where topsoil is to be placed, scarify surface to depth of 3 inches. Place topsoil where required to level finish grade. Remove roots, weeds, rocks, and foreign material while spreading. Fine grade topsoil to eliminate uneven areas and low spots. Maintain profiles and contour of subgrade. Lightly compact placed topsoil.
6. TOLERANCES: Top Surface of Subgrade: Plus or minus 0.10 foot (1-3/16 inches) from required elevation. Top Surface of Finish Grade: Plus or minus 0.04 foot (1/2 inch).

EXCAVATION – 31 23 16

1. SCOPE OF WORK: Excavate to accommodate new structures and construction operations. Store all excavated materials in a location to not interfere with any tenant or construction activities as approved by the owner.
2. GEOTEXTILE FABRIC: Non-biodegradable, non-woven.
3. SECTION INCLUDES: Excavating for footings and slabs-on-grade. Temporary excavation support and protection systems.
4. REFERENCE STANDARDS: 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.
5. SUBMITTALS: Temporary Support and Excavation Protection Plan. Project Record Documents: Record drawings at project closeout. Show locations of installed support materials left in place, including referenced locations and depths, on drawings. Shoring Installer's Qualification Statement. Field Quality Control Submittals: Document visual inspection of load-bearing excavated surfaces.
6. QUALITY ASSURANCE: Temporary Support and Excavation Protection Plan:
    6.1. Indicate sheeting, shoring, and bracing materials and installation required to protect excavations and adjacent structures and property.
    6.2. Include drawings and calculations for bracing and shoring.
    6.3. Bracing and shoring design to meet requirements of OSHA's Excavation Standard, 29 CFR 1926, Subpart P.
    6.4. Designer Qualifications: For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in City, STATE.
7. REFERENCE STANDARDS: MnDOT Standard Specifications for Construction, latest edition. CEAM Standard Specifications. Latest edition. Local utility standards.
8. EXAMINATION: Verify that survey bench mark and intended elevations for the work are as indicated.
9. EXCAVATING: Excavate to accommodate new structures and construction operations. Notify Architect of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored. Do not interfere with 45 degree bearing splay of foundations. Cut utility trenches wide enough to allow inspection of installed utilities. Hand trim excavations. Remove loose matter. Correct areas that are over-excavated and load-bearing surfaces that are disturbed; see Section 31 23 23. Provide temporary means and methods, as required, to remove all water from excavations until directed by Architect. Remove and replace soils deemed suitable by classification and which are excessively moist due to lack of dewatering or surface water control. Remove excavated material that is unsuitable for re-use from site. Remove excess excavated material from site.
10. GROUNDWATER: Determine the prevailing groundwater level prior to excavation. If the proposed excavation extends less than 1 foot into the prevailing groundwater, control groundwater intrusion with perimeter drains routed to sump pumps, or as directed by the Architect. If the proposed excavation extends more than 1 foot into the excavation, control groundwater intrusion with a comprehensive dewatering procedures, or as directed by the Geotechnical Engineer.
11. CLEANING: Stockpile excavated material to be re-used in area designated on site in accordance with Section 31 22 00. Remove excavated material that is unsuitable for re-use from site. Remove excess excavated material from site.
12. PROTECTION: Divert surface flow from rains or water discharges from the excavation. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability. Protect open excavations from rainfall, runoff, freezing groundwater, or excessive drying so as to maintain foundation subgrade in satisfactory, undisturbed condition. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing. Keep excavations free of standing water and completely free of water during concrete placement.

TRENCHING – 31 23 16.13

1. SCOPE OF WORK: Excavate to provide a total scope of trenching required as needed to install the Work including but not limited to:
   1.1. Utility trench excavations with Compacted bedding under fill,
   1.2. Over utilities to subgrade elevations with Backfilling and compaction.
   1.3. Compliance with the pertinent state trenching act and laws, trench safety engineering design and OSHA compliance.
   1.4. Trench safety design shall be in compliance with applicable city and state codes and in compliance with federal regulations part 126 of OSHA, sub-part p is incorporated by reference.
   1.5. Store all excavated materials in a location to not interfere with any tenant or construction activities as approved by the owner.
2. SECTION INCLUDES: Backfilling and compacting for utilities outside the building to utility main connections.
3. REFERENCE STANDARDS: MnDOT Standard Specifications for Construction, latest edition. CEAM Standard Specifications, latest edition. Local utility standards.
4. DELIVERY, STORAGE, AND HANDLING: When necessary, store materials on site in advance of need. When fill materials need to be stored on site, locate stockpiles where indicated. Separate differing materials with dividers or stockpile separately to prevent intermixing. Prevent contamination. Protect stockpiles from erosion and deterioration of materials.
5. FILL MATERIALS: See Section 31 23 23 - Fill
6. EXAMINATION: Verify that survey bench marks and intended elevations for the work are as indicated.
7. PREPARATION: Identify required lines, levels, contours, and datum locations. Grade top perimeter of trenching area to prevent surface water from draining into trench. Provide temporary means and methods, as required, to maintain surface water diversion until no longer needed, or as directed by the Architect.
8. TRENCHING: Notify Architect of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored. Do not interfere with 45 degree bearing splay of foundations. Cut trenches wide enough to allow inspection of installed utilities. Hand trim excavations. Remove loose matter. Remove large stones and other hard matter that could damage piping or impede consistent backfilling or compaction. Remove excavated material that is unsuitable for re-use from site. Remove excess excavated material from site.
9. GROUND WATER: Provide temporary means and methods, as required, to remove all water from trenching until directed by the Architect. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.
   9.1. Determine the prevailing groundwater level prior to trenching. If the proposed trench extends less than 1 foot into the prevailing groundwater, control groundwater intrusion with perimeter drains routed to sump pumps, or as directed by the Architect.
10. PREPARATION FOR UTILITY PLACEMENT: Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill. Compact subgrade to density equal to or greater than requirements for subsequent fill material. Until ready to backfill, maintain excavations and prevent loose soil from falling into excavation.
11. BACKFILLING: Backfill to contours and elevations indicated using unfrozen materials. Fill up to subgrade elevations unless otherwise indicated. Employ a placement method that does not disturb or damage other work. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces. Maintain optimum moisture content of fill materials to attain required compaction density. Slope grade away from building minimum 2 inches in 3 ft, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.
12. OVER-EXCAVATION: Correct areas that are over-excavated.

12.1. Thrust bearing surfaces: Fill with concrete.

12.2. Under utility: Use pipe bedding material

12.3. Other areas: Use general fill, flush to required elevation, compacted to minimum 97 percent of maximum dry density.

13. COMPACTION: Density Unless Otherwise Specified or Indicated: Under paving, slabs-on-grade, and similar construction: 97 percent of maximum dry density. Reshape and re-compact fills subjected to vehicular traffic.

14. CLEANING: Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

FILL – 31 23 23

1. SCOPE OF WORK: Provide all necessary fill to accommodate scope as defined in this specification and elsewhere in the contract documents.

1.1. Contractor to utilize appropriate fill where required

2. SECTION INCLUDES: Filling, backfilling, and compacting for footings, slabs-on-grade, paving, and site structures. Backfilling and compacting for utilities outside the building to utility main connections. Filling holes, pits, and excavations generated as a result of removal (demolition) operations.

3. REFERENCE STANDARDS: MnDOT Standard Specifications for Construction, latest edition. CEAM Standard Specifications, latest edition. Local utility standards. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); latest edition.

4. SUBMITTALS: Product Data for Manufactured Fill. Materials Sources: Submit name of imported materials source. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used, including manufactured fill. Compaction Density Test Reports. Designer's Qualification Statement. Testing Agency Qualification Statement. Specimen Warranty.

5. QUALITY ASSURANCE: Designer Qualifications: Perform design under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the local jurisdiction. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

6. DELIVERY, STORAGE, AND HANDLING: When necessary, store materials on site in advance of need. When fill materials need to be stored on site, locate stockpiles where indicated. Separate differing materials with dividers or stockpile separately to prevent intermixing. Prevent contamination. Protect stockpiles from erosion and deterioration of materials.

7. WARRANTY: Correct defective Work within a five year period after Date of Substantial Completion. Provide ten year manufacturer warranty for manufactured fill material.

8. GENERAL FILL: Subsoil excavated on-site or sandy fill material. Graded. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris. Conforming to ASTM D2487 Group Symbol CL.

9. STRUCTURAL FILL: Subsoil excavated on-site. Graded. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris. Conforming to ASTM D2487 Group Symbol CL.

10. CONCRETE FOR FILL: As specified in Section 03 30 00; compressive strength of 2500 psi.

11. GRANULAR FILL: Coarse aggregate, conforming to State of Minnesota Highway Department standard.

12. SAND: Conforming to State of Minnesota Highway Department standard.

13. TOPSOIL: Friable loam; imported borrow. Select. Free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds and foreign matter.

14. SITE PIPE BEDDING: free of silt, clay, loam, friable or soluble materials, and organic matter. Graded in accordance with ASTM C 136; within the following limits:

14.1. 1" sieve: 100 percent passing.

14.2. 3/4" sieve: 90 to 100 percent passing.

14.3. 3/8" sieve: 50 to 90 percent passing.

14.4. No. 4 sieve: 35 to 80 percent passing.

14.5. No. 10 sieve: 20 to 65 percent passing.

14.6. No. 40 sieve: 10 to 35 percent passing.

14.7. No. 200 sieve: 3 to 10 percent passing.

15. GEOTEXTILE FABRIC: Non-biodegradable, non-woven.

16. EXAMINATION: Verify that survey bench marks and intended elevations for the Work are as indicated. Identify required lines, levels, contours, and datum locations. See Section 31 22 00 for additional requirements. Verify subdrainage, dampproofing, or waterproofing installation has been inspected. Verify areas to be filled are not compromised with surface or ground water.

17. PREPARATION: Scarify and proof roll subgrade surface to a depth of 6 inches to identify soft spots. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill. Compact subgrade to density equal to or greater than requirements for subsequent fill material. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

18. FILLING: Fill to contours and elevations indicated using unfrozen materials. Fill up to subgrade elevations unless otherwise indicated. Employ a placement method that does not disturb or damage other work. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces. Maintain optimum moisture content of fill materials to attain required compaction density. Slope grade away from building minimum 2 inches in 10 feet, unless noted otherwise. Make gradual grade changes. Blend slope into level areas. Compaction Density Unless Otherwise Specified or Indicated: 97%. Reshape and re-compact fills subjected to vehicular traffic. Maintain temporary means and methods, as required, to remove all water while fill is being placed as required, or until directed by the Architect. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.

19. OVER EXCAVATION: Correct areas that are over-excavated.

19.1. Load-bearing foundation surfaces: Use structural fill, flush to required elevation, compacted to 100 percent of maximum dry density.

19.2. Other areas: Use general fill, flush to required elevation, compacted to minimum 97 percent of maximum dry density.

20. BURIED SITE UTILITIES IN TRENCHES: Contractor maintain utility trenches by pumping ground water seepage out of trenches during excavation and backfilling operations.

20.1. Bedding: Use Site Pipe Bedding as per the Plan details. Compact at midpoint of pipe with pneumatic (mechanical) tamper on each side of pipe.

20.2. Cover with general fill.

20.3. Compact trench, beginning at a point two feet above the pipe, with motorized compaction equipment in maximum 12 inch lifts to 95 percent of maximum dry density.

21. TOLERANCES:

21.1. Top Surface of General Filling: Plus or minus 1 inch from required elevations.

21.2. Top Surface of Filling Under Paved Areas: Plus or minus 1 inch from required elevations.

22. CLEANING: Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

23. FIELD QUALITY CONTROL: Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D698 ("standard Proctor"), ASTM D1557 ("modified Proctor"), or AASHTO T 180. If tests indicate work does not meet specified requirements, remove work, replace and retest.

EROSION AND SEDIMENT CONTROL – 31 25 00

PART 0 - ARCHITECTURAL

1. SCOPE OF WORK: Provide and install erosion prevention and control of sediment transport by wind or water. Provide structural measures shown and performance measures to prevent soil erosion. Provide structural measures shown to control sediment transport. Provide additional measures to prevent erosion and control sediment in accordance with the means, methods, techniques, and sequence of construction.
2. CONTINUOUS INSPECTION AND MAINTENANCE: Provide inspection, maintenance, and repair of prevention and control devices. Schedule monitoring, cleaning, replacing, and reporting required by Regulatory Authorities. Provide removal and coordination for surface restoration on completion.
3. WORK AREA CLEANING: Provide cleaning in surrounding areas to remove sediment.
4. REFERENCE STANDARDS: MnDOT Standard Specifications for Construction, latest edition. CEAM Standard Specifications, latest edition. Local utility standards.
5. DESIGN AND PERFORMANCE REQUIREMENTS: Erosion prevention and sediment control devices and practices shown indicate the minimum. Provide additional design and implementation of Best Management Practices, consistent with References and Regulatory Requirements; and in accordance with the means, methods, techniques, and sequence of construction.
6. SEQUENCING AND SCHEDULING: Determine schedules for clearing, grading, storage of soil materials, utility installation, building excavation, paving, final turf restoration, and other work that constitutes land disturbance. Include schedule for installation of erosion prevention and sediment control measures in the SWPPP.
7. MATERIALS AND UNIT PRICES: Provide materials listed below for a whole and complete sediment control system. Provide unit prices for each material to be used.
    - 7.1. Silt Fence Machine Sliced: Basis of Measurement: By Linear Foot. Basis of Payment: Includes furnishing, installing, maintaining, and removing erosion and sediment control device.
    - 7.2. Wood Fiber Blanket (Ditch): Basis of Measurement: By Square Yard. Basis of Payment: Includes furnishing, installing, and maintaining.
    - 7.3. Seed and Mulch: Basis of Measurement: By Acre. Basis of Payment: Includes furnishing and application of seed, mulch and fertilizer.
    - 7.4. Erosion Control Blanket (Outlet Stabilization): Basis of Measurement: By Square Foot. Basis of Payment: Includes application and maintenance.
8. QUALITY ASSURANCE:
    - 8.1. Qualifications: Designers, installers, and inspectors of erosion prevention and sediment control devices shall have thorough knowledge of the References and requirements of the NPDES/SDS Permit. Those responsible for performance or supervision of the Work shall be authorized to render decisions on behalf of the Contractor.
    - 8.2. Regulatory Requirements: Minnesota Pollution Control Agency - NPDES/SDS Permit. Comply with permit for trash and debris removal, handling hazardous materials and waste, spill protection including concrete washout, inspections, cleaning, and removal of prevention and control devices. With the Owner, complete and submit the Notice of Termination when responsibility is complete. Comply with any additional permit or regulatory requirements of the City, State and other authorities having jurisdiction.
    - 8.3. The Contractor is responsible for cleanup and restoration of any stormwater system, river, stream, lake, reservoir, ground, roadway, or other property upon which sediment may be deposited.
    - 8.4. Pre-installation Meetings: Installers, inspectors, and those responsible for supervision of the Work shall attend pre-installation meetings for Work of Related Sections to provide for coordination for the SWPPP and land disturbing activity that may require temporary removal, relocation, or additional installation of prevention or control devices.

9. EXAMINATION: Examine areas affected by Work prior to beginning. Determine condition of site and downstream water conveyance system. Notify Owner of conditions that may be construed as being damaged by failure to complete Work. Provide documentation of detrimental conditions and inform Regulatory Authorities.
10. INSTALLATION: Install erosion prevention and sediment control devised at perimeter locations prior to disturbing soil. Install additional prevention and control devises as Work progresses. Install devices as specified in the References. Coordinate sequence with Work of Related Sections such that disturbed soils, stockpiles, dewatering discharge, concrete washouts, and drainage systems will not be unprotected. Remove and replace devices as needed for progress of construction.
11. FIELD QUALITY CONTROL: Maintain References on site. Provide for inspections and maintain log in accordance with NPDES/SDS Permit requirements.
12. INSPECTION: Inspect all prevention and control devices once weekly, after each 0.5" rainfall event, and daily during prolonged rainfalls.
13. REPAIR: Repair structural measures on detection of damage and replace filters when 50% of capacity is clogged.
14. CLEANING: Remove sediment when 33% of available up slope storage of device is full. Provide street sweeping and other measures to clean up sediment transported beyond the project limits.
15. REMOVAL: Remove temporary devices after permanent ground cover has been established. Provide coordination for surface restoration at locations of removal.

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Provide prevention against erosion and control of transport of sediment by wind or water.
   1. Provide structural measures indicated on Drawings and performance measures during execution of the Work to prevent erosion of soils.
   2. Provide internal and perimeter structural measures indicated on Drawings to control transport of sediment.
   3. Provide additional performance and structural measures where needed to prevent erosion and control sediment as the Work progresses, coordinated with Work of Related Sections.

B. Provide inspection, maintenance, and removal of erosion prevention and sediment control devices.
   1. Schedule monitoring, cleaning, replacing, and reporting as required by Regulatory Authorities.
   2. Provide removal of devices and coordination for surface restoration.

C. Provide cleaning in surrounding areas to remove sediment transported off site.

1.02 RELATED SECTIONS

A. Provisions of the Contract including Contracting and General Requirements.
B. Section 31 2300 – Excavation and Fill
C. Section 31 2333 – Trenching and Backfilling
D. Section 33 4000 – Storm Drainage Utilities

1.03 REFERENCES

A. City of Princeton Engineering Standards.
B. Minnesota Pollution Control Agency (MPCA), *State of Minnesota Stormwater Manual*, 2005 edition with current updates.
C. Metropolitan Council, *Minnesota Urban Small Sites BMP Manual: Stormwater Best Management Practices for Cold Climates*, 2001 edition.
D. Minnesota Department of Transportation (Mn/DOT), Standard Specifications for Stormwater Management and Erosion Control, current edition with supplements.

1.04 DEFINITIONS

A. Definitions as described in Related Sections.

1.05 SYSTEM DESCRIPTION

A. General: The project is required to be permitted under a National Pollutant Discharge Elimination System (NPDES) General Stormwater Permit for Construction Activity for all phases of the project.

B. Design and performance requirements

1. Erosion prevention and sediment control devices and practices indicated on the Drawings are the minimum requirement.
2. Provide additional design and implementation of Best Management Practices (BMPs), consistent with references and regulatory requirements of this Section; and in accordance with the means, methods, techniques, procedures, and sequence of construction.
3. Remove and dispose of temporary devices when areas contributing run off are stabilized and provide coordination for surface restoration in areas occupied by devices.

1.06 SUBMITTALS

A. Permits: Evidence of permits applied for and received.

1. Submit at pre-construction meeting.
2. For information only.

1.07 QUALITY ASSURANCE

A. Qualifications

1. Designers, installers, and inspectors of erosion prevention and sediment control devices shall have thorough knowledge of the References and requirements of the NPDES Permit.
2. Those responsible for performance or supervision of the Work shall be authorized to render decisions on behalf of the Contractor.

B. Regulatory requirements

1. Minnesota Pollution Control Agency - NPDES Permit
   a. With the Owner, provide a Storm Water Pollution Prevention Plan (SWPPP) for this project, incorporating the project Drawings and Specifications relating to erosion prevention, sediment control, and final restoration of all disturbed surfaces.
   b. Complete and submit the permit application and pay necessary fees.
   c. Comply with permit requirements for trash and debris removal, handling and storing potentially hazardous materials and waste, spill protection including concrete washout, site inspections, cleaning and maintenance, and removal of erosion prevention and sediment control devices.
   d. With the Owner, complete and submit the Application for Permit Transfer/Modification or Notice of Termination when responsibility for Work of this project or phase is complete.
2. Other: Comply with any additional permit or regulatory requirements of the City, County, water management organization, or other Regulatory Authority.
3. Damages: The Contractor is solely responsible for required cleanup and restoration of any storm water conveyance system, river, stream, lake, reservoir, ground, roadway surface, or other property upon which sediment may be deposited as a result of failure to provide proper controls.

C. Pre-construction meetings: Installers, inspectors, and those responsible for performance or supervision of the Work shall attend pre-construction meetings for Work of Related Sections to provide for coordination of the SWPPP prior to beginning any demolition or land disturbing activity or subsequent construction that may require temporary removal, relocation, or additional installation of erosion prevention or sediment control measures or devices.

1.08 SEQUENCING AND SCHEDULING

A. Determine the sequence and schedules for site clearing and grading, temporary storage of soil materials, utility installation, building excavation, paving, final turf restoration, and all other work that constitutes land disturbing activity.

B. As Work progresses, include detailed schedule for installation of erosion prevention and sediment control measures in the SWPPP.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Materials shall be as specified in the SWPPP or noted on the Drawings.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine all areas affected by Work prior to start of land disturbing activities.
B. Determine extent and condition of on-site and downstream surface water conveyance system.
C. Notify Owner of conditions that may be construed as being damaged by failure to complete work.
D. Provide documentation of detrimental downstream conditions that may be construed as being caused by the Work and inform Regulatory Authorities of such condition prior to beginning.

3.02 INSTALLATION

A. Install erosion prevention and sediment control devices at perimeter locations indicated on Drawings prior to initiation of soil disturbing activities.
B. Install additional erosion prevention and sediment control devices as Work progresses in accordance with the means, methods, techniques, procedures, and sequence of construction.
C. Install devices as specified in the References or noted on the Drawings.
D. Interface with Other Work
   1. Coordinate installation sequence with schedules for Work of Related Sections, such that disturbed soil areas, temporary stockpiles, dewatering discharge locations, and drainage systems will not be unprotected.
   2. Remove and replace erosion prevention and sediment control devices as needed for progress of construction and coordination between Work of Related Sections.

3.03 FIELD QUALITY CONTROL

A. Maintain copies of References at the project site.
B. Provide for inspections and maintain log in accordance with NPDES Permit requirements.

3.04 MAINTENANCE

A. Inspect all erosion prevention and sediment control devices a minimum of once weekly while Work is active, after each run-off event, and daily during prolonged rainfalls.
B. Repair all structural measures immediately on detection of damage.
C. Replace filters when capacity is reduced to 50 percent by clogging.
D. Remove sediment deposits when 33 percent of available storage space within or up slope of control device is met or exceeded.
E. Off site cleaning: Provide street sweeping and any other measures required to immediately clean up sediment transported beyond the project limits.

3.05 REMOVAL

A. Remove temporary erosion prevention and sediment control devices after permanent ground cover on runoff contributing areas has been established and approved by the Owner.
B. Provide coordination for final surface restoration at locations of removal as designated for new construction in the surrounding area.

DIVISION 32

AGGREGATE BASE COURSES – 32 11 23

1. SCOPE OF WORK: Provide all necessary aggregate and fabric as required by the project's scope of work and the contract documents.

2. SECTION INCLUDES: Aggregate base course. Geotextile fabric for under bituminous paving. Aggregate surfacing.
3. GEOTEXTILE FABRIC: Shall be Woven Geotextile Fabric. Shall be polymeric filaments or yarns such as polypropylene, polyethylene, polyester, or polyamide formed inot a stable network such that the filaments/yarns retain their relative position to each other. Shall be delivered to the Project with an opaque plastic covering to prevent degradation due to ultraviolet rays of the sun or contamination with mud, dirt, dust or debris. Rolled geotextile shall be identified by manufacturer, product name, and roll number, both on the outside wrap and inside core as well as other requirements of ASTM D 4873. Shall have a minimum Grab Tensile Strength of 200 pounds as per ASTM D 4632. Shall have a maximum Apparent Opening Size of 30 U.S. Standard Sieve Size.
    3.1. Install geotextile in accordance with manufacturer's instructions.
    3.2. Place on finished subgrade to a point 1 foot beyond proposed back of curb.
    3.3. Minimum overlap is 2 feet. An alternate to the overlap method is a sewn J seam with two rows of stitching.
    3.4. Replace damaged geotextile with a minimum patch size of damaged area plus three feet.
4. COURSE AGGREGATE: Coarse virgin aggregate, conforming to the State Department of Transportation Standard Specifications.
5. FINE AGGREGATE: Sand. Conforming to the State Department of Transportation Standard Specifications.
6. AGGREGATE PLACEMENT: Place by end dumping adjacent to geotextile or over previously placed aggregate. Dumping on geotextile is not permitted. Traffic directly on geotextile is not permitted.
    6.1. Vibratory compaction shall not be used on initial lift over geotextile.
    6.2. Place aggregate to a total compacted thickness shown in the Plan details for each type of pavement section.
    6.3. Compact to 98 percent of maximum dry density.
    6.4. Place aggregate in maximum 4 inch layers and mechanically compact to specified density.
    6.5. Level and contour surfaces to elevations and gradients indicated.
    6.6. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.
    6.7. Use mechanical tamping equipment in areas inaccessible to compaction equipment.
7. SOURCE QUALITY CONTROL: If tests indicate materials do not meet specified requirements, change material and retest. Provide materials of each type from same source throughout the Work.
8. EXAMINATION: Verify substrate has been inspected, gradients and elevations are correct, and is dry.
9. PREPARATION: Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting. Do not place aggregate on soft, muddy, or frozen surfaces. Construction signage and barricades for the work within the highway right-of-way shall conform to the latest revisions of the Manual of Uniform Traffic Control Devices. This work shall be at no additional cost to the Owner.
10. TOLERANCES: Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge. Variation From Design Elevation: Plus 0 inch, minus 1/2 inch.
11. FIELD QUALITY CONTROL: Compaction density testing will be performed on compacted aggregate base course in accordance with ASTM D1556, ASTM D2167, or ASTM D6938.
12. CLEANING: Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

BITUMINOUS CONCRETE PAVING – 32 12 16

PART 0 - ARCHITECTURAL

1. SCOPE OF WORK: Provide and install all new paving as illustrated in the contract documents. It is the contractor's responsibility to ensure that finished parking lot and drives have not low spots that will hold water. 100% drainage is required.
   1.1. Slopes at accessible parking spaces and access aisles shall not exceed 1:48 or 2% in all directions
   1.2. A maximum of 1/4" threshold shall be provided where access aisles transition up to curb ramps.
2. SECTION INCLUDES: Aggregate base course. Double course bituminous concrete paving. Surface sealer.
3. REFERENCE STANDARDS: All materials and products used shall comply with State Department of Transportation Standard Specifications for Highway Construction.
4. QUALITY ASSURANCE: Perform Work in accordance with State Highway Standards. Mixing Plant: Conform to State Highway Standards. Obtain materials from same source throughout.
5. FIELD CONDITIONS: Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen.
6. MATERIALS
   6.1. Aggregate for Base Course, Binder Course, and Wearing Course: in accordance with State Highway Standards.
   6.2. Base Course: State Department of Transportation Highways standards.
   6.3. Seal Coat: AI MS-19, sand type.
7. ASPHALT PAVING MIXES AND MIX DESIGN
   7.1. Base Course, Binder Course, and Wearing Course: State Department of Transportation Highways standards.
   7.2. Submit proposed mix design of each class of mix for review prior to beginning of work.
8. EXAMINATION: Verify that compacted subgrade is dry and ready to support paving and imposed loads. Verify gradients and elevations of base are correct. Test Roll
9. BASE COURSE: Place and compact base course.
10. PREPARATION - TACK COAT: Apply tack coat in accordance with manufacturer's instructions. Apply tack coat on asphalt or concrete surfaces over subgrade surface at uniform rate of 1/3 gal/sq yd.
11. PLACING ASPHALT PAVEMENT - DOUBLE COURSE: Place asphalt binder course within 24 hours of applying primer or tack coat. Place wearing course within two hours of placing and compacting binder course. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.
12. SEAL COAT: Apply seal coat to surface course in accordance with State Department of Transportation Highways standards.
13. TOLERANCES: Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge. Variation from True Elevation: Within 1/2 inch.

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Asphalt roadways, fire lanes, driveways, parking surfaces, trails, and walkways.
B. Patching asphalt pavement.
C. Pavement marking.

1.02 RELATED SECTIONS

A. Provisions of the Contract including Contracting and General Requirements.
B. Section 31 2300 – Earthwork
C. Section 32 1313 – Concrete Paving

D. Section 33 4000 – Storm Drainage Utilities

1.03 REFERENCES

A. City of Princeton Engineering Standards.

B. Minnesota Department of Transportation (Mn/DOT) Standard Specifications for Construction, current edition with supplements.

C. American Association of State Highway Transportation Officials (AASHTO).
   1. M20/ASTM D946 – Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction.
   2. M140/ASTM D977 – Specification for Emulsified Asphalt.
   3. M208/ASTM D2397 – Specification for Cationic Emulsified Asphalt.
   4. M226/ASTM D3381 – Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.
   5. M248 – Specification for Ready-Mixed White, Blue, and Yellow Traffic Paints.
   6. M320/ASTM D6373 – Specification for Performance-Graded Asphalt Binder.

D. ASTM International (ASTM).
   1. C33 – Specification for Concrete Aggregates.
   2. C131 – Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
   3. D1074 – Test Method for Compressive Strength of Bituminous Mixtures.
   4. D2950 – Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.
   5. D5581 – Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.

E. Asphalt Institute: Mix Design Methods for Asphalt Concrete, Manual MS-4, Marshall Stability Method.

1.04 SYSTEM DESCRIPTION

A. Design Requirements
   1. Provide a mix design for each type of pavement from locally available materials.
   2. Meet the requirements of the References, the local Regulatory Authorities, as specified herein, or as recommended in the Geotechnical Report; whichever results in the higher quality.
   3. In Lieu of Mix Design: Provide certification from the asphalt supplier of mixes approved during the most recent production season by local or state authorities, with verification that mixes delivered are the same as approved.

B. Performance Requirements: Compacted asphalt in vehicular areas shall provide Marshall Stability of not less than 1125 and contain air voids of 3.0 to 3.5 percent.

1.05 SEQUENCING AND SCHEDULING

A. Do not begin paving until abutting concrete has received a minimum 7 days of cure time and curbs have been backfilled sufficient to provide support against displacement.

B. Coordinate the schedule to allow time for placing embedded items, final adjustment of utility castings, and removal and replacement of sediment control devices.

C. Notify the Testing Laboratory when items of work requiring observation or testing are scheduled and allow time for the same.

D. Allow pavement to cool to ambient temperature before applying pavement marking paint.

E. Obtain necessary permissions from the Owner or Regulatory Authorities for Work that must be performed outside of normal work hours; either as necessary to maintain the schedule, minimize interference with traffic, or for the convenience of the Contractor.

PART 2 PRODUCTS

2.01 MATERIALS

A. General
   1. Public Improvements: Comply with design standards of the public Regulatory Authority for materials and mixes used within public rights of way or easements.

2. Meet Performance Requirements listed in Part 1, System Description, and the following minimum criteria for all other.

B. Wear Course Aggregate
   1. Coarse Fraction
      a. Clean, sound, durable particles of crushed stone or gravel and sharp sand.
      b. Maximum dimension of coarse fraction shall not exceed 2/3 of pavement course lift thickness.
   2. Fine Fraction
      a. Upper limit: Clean sharp sand, screenings from aggregate crushing process.
      b. Lower limit: Rock flour, Portland cement

C. Base and Binder Course Aggregate: May contain recycled or reclaimed material content up to the limits allowed by local or State standards.

D. Asphalt Binder
   1. Wear Course: AASHTO M320, PG 58-28
   2. Base and Binder Courses: May contain up to 50 percent recycled asphalt pavement unless noted otherwise on Drawings.

2.02 ACCESSORIES

A. Tack Coat: Emulsified asphalt, SS-1, SS-1H, CSS-1, or CSS-1H, diluted with up to 50 percent of volume with water.

B. Pavement Marking Paint: Chlorinated rubber-alkyd type, AASHTO M248 (Federal Specification TT-P-115F), Type II, factory mixed, and non-bleeding.

C. Herbicide: Round Up, Monsanto Corp.

2.03 SOURCE QUALITY CONTROL

A. Obtain materials from the same source throughout construction.

B. Test aggregate for hydrophilic properties and determine if anti-stripping additive is required.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify aggregate base was placed as specified in Related Sections.

B. Verify utility castings are set in full bed of grout and have been adjusted to final elevations.

C. Verify cure time for abutting concrete.

D. Verify curbs have been backfilled to subgrade with compaction as specified.

3.02 PREPARATION

A. Protection of Persons
   1. Provide temporary barricades as needed to prohibit unauthorized access to active Work areas.
   2. Sequence and schedule the Work to maintain access to the site for personnel requiring access by Regulatory Authorities and emergency response vehicles.
   3. Provide traffic control, signing, and notification to affected agencies or institutions in accordance with requirements of Mn/DOT Sections 1404 and 1710 when work interferes with a traveled roadway.

B. Protection of Property
   1. Protect benchmarks and monuments established for the Work.
   2. Protect adjacent finished surfaces from overspray of tack coat material, staining with paving material, or by wheel tracking.
   3. Prevent displacement of abutting structures or embedded objects by wedging action of spreading or compacting equipment.

C. Surface Preparation
   1. Remove loose material from aggregate base or provide surface recompaction.
   2. Apply prime and tack coats to provide uniform coverage on abutting contact surfaces and subgrade surfaces and allow drying time.

3. Wash and sweep pavement surfaces before application of pavement markings and allow drying time.

3.03 PLACING MIX

A. Place mixture by paving machine in nominal 10 foot wide strips.
B. Place areas inaccessible to paving machine by hand and spread to uniform thickness with rakes or lutes.
C. Place each course of paving in as complete segments as practicable to minimize cold joints for subsequent Work.
D. Complete each course and allow time for observation and testing prior to placing subsequent courses.
E. Construct joints to ensure continuous bond between adjoining strips and to have the same texture, density, and smoothness of adjacent paving.
F. Adjust width of strips to provide overlapping of joints between courses to the greatest extent practicable.

3.04 COMPACTING

A. Begin initial rolling of strips at outside edges or edges abutting adjacent paving or structures.
B. Roll joints between strips immediately after pavement will bear roller weight without excessive displacement.
C. Continue rolling while mixture is hot until specified density is achieved and roller marks are eliminated.
D. Compact mixture in areas inaccessible to rollers with hot vibratory plate compactors or hand tampers.

3.05 FIELD QUALITY CONTROL

A. Submit bag samples in the quantity determined by the Testing Laboratory and approved by the Owner from each day's production for Marshall density, stability, and extraction tests.
B. Determine constructed density with a portable nuclear testing device by random sampling on a 25 to 50 foot grid for each constructed lift.
C. The Owner reserves the right to take corings of the paving to verify field test results.
D. Test surface smoothness with a minimum 10 foot straight edge in the presence of the Owner.
E. Observations for ponded water shall be conducted by the Owner following a rainfall event that produces a measurable amount of runoff.

3.06 TOLERANCES

A. Compacted Density: The mean of density tests shall be 96 percent of the Marshall density established in the laboratory with no test less than 92 percent.
B. Thickness
    1. Base Course: Minus 1/2 inch
    2. Binder and Wear Courses: Minus 1/4 inch
    3. Pavement Total Thickness: Minus 1/4 inch
C. Surface Smoothness: 3/16 inch in 10 feet
D. Depth of Ponded Water: 1/16 inch

3.07 PAVEMENT MARKING

A. Apply in 2 coats at Manufacturer's recommended rates.
B. Use equipment, masking, or templates to produce uniform sharp edges.

3.08 PROTECTION

A. Restrict traffic on new pavement until temperature is less than 140 degrees F.
B. Restrict traffic on pavement marking until dry.
C. Obtain prior approval for use of paving as temporary parking or construction staging surface.
    1. Provide additional protective covering when subjecting pavements to extreme construction traffic wheel loads or outriggers for lifting equipment.

2. Provide protection against leaking fluids from vehicles that may soften or otherwise weaken pavement.
3. Avoid static or slow speed turning movements by construction or delivery vehicles.

CONCRETE PAVING – 32 13 13

PART 0 - ARCHITECTURAL

1. SCOPE OF WORK: Provide and install new concrete paving as illustrated in the contract documents. Including:
   1.1. Sidewalks
   1.2. Trash enclosure slab
   1.3. All accessible parking stalls and access aisles
   1.4. Shed slab
   1.5. Concrete curbing and gutter system at all parking, drive aisle and roadway
2. FIELD MEASUREMENTS: Verify actual locations of exterior concrete work and other construction to which concrete work must fit, by accurate field measurements before installation. Show recorded measurements on final Shop Drawings. Coordinate installation schedule with construction progress to avoid delay of the Work.
3. LAND SURVEY OR REQUIRED: The Contractor is to employ the services of a registered land surveyor to perform the specified layout work.
4. WARRANTY: All materials and workmanship provided are guaranteed against defects after completion and final acceptance of the Work. Defects due to faulty materials or workmanship developed during the guarantee period shall be satisfactorily required or replaced by the Contractor at his/her expense.
5. PAVING ASSEMBLIES: Comply with applicable requirements of ACI 301.
   5.1. Unless specifically noted elsewhere in the contract documents, at a minimum, concrete on grade shall be 4” thick with 6x6:1.4x1.4 WWM.
6. CONCRETE SIDEWALKS AND MEDIAN BARRIER: 3,000 psi 28 day concrete, 4 inches thick, grey color Portland cement, broom finish. Verify exact requirements with the local AHJ; if more stringent of if required color is different then those requirements shall apply.
7. FORM MATERIALS: The forms shall be of metal, wood or other suitable material, and shall be capable of sustaining the concrete in its proper position until set. Do not use aluminum materials in contact with concrete. Concrete form materials must be used in a manner to provide the surface finish specified.
8. FORM COATING MATERIAL: Coat forms with a non-staining form release agent that will not discolor or deface the surface of the concrete. Side forms shall have a height at least equal to the edge thickness of concrete being formed. Flexible or curved forms shall be used on curves having a radius of 150 feet or less. Face forms for curbing shall conform to the shape and design of the curb.
9. CEMENT FOR NORMAL WEIGHT STRUCTURAL CONCRETE: ASTM C 150 Normal - Type I Portland type, grey color.
10. CEMENT FOR HIGH EARLY STRENGTH STRUCTURAL CONCRETE: ASTM C 150 Normal - Type III Portland type, grey color
11. Use only one type and brand of Portland Cement for all exposed concrete.
12. FINE AND COARSE MIX AGGREGATES: ASTM C33/C33M. Maximum nominal size of coarse aggregate shall be 3/4" for all concrete. Limits for deleterious substances and physical properties of coarse aggregate for concrete shall meet the requirements of ASTM C33, 3/4", Class 4S.
13. FLY ASH: ASTM C618, Class C or F.
14. All products shall be clean and free from deleterious amounts of acids, alkalies or organic materials.
15. AIR ENTRAINING: Admixture, conforming to ASTM C260, shall be used for all concrete.

16. MOISTURE-RETAINING COVER: ASTM C171, waterproof paper or polyethylene film.
17. LIQUID MEMBRANE CURING COMPOUND: ASTM C309, Type 2, Class B.
18. FORM RELEASE AGENT: Commercial product to facilitate stripping without staining or damaging concrete or impairing future concrete treatment.
19. EXPANSION JOINT AND ISOLATION JOINT FILLER: ASTM D1751, performed, resilient, non-extruding, asphalt impregnated joint filler, 1/2" thick unless otherwise indicated.
20. Provide granular cushion material under all other exterior concrete work.
21. EVAPORATION RETARDANTS: An evaporation-retarding agent may be used during the concrete finishing operation to control plastic cracking of the fresh concrete.
22. CONCRETE MIX DESIGN: as per ACI 301. Provide mixes meeting the following minimum requirements. Submit concrete mix design for each type of concrete. Mix designs must be reviewed prior to pouring concrete. Review is for conformance with specification requirements only. Contractor is responsible for performance. Unless specifically indicated elsewhere in the contract documents, all the following criteria shall be met:
    22.1. 28-day Compressive Strength: 4,000 psi.
    22.2. Maximum Aggregate Size: 3/4" Class 4S (1/2” for exposed aggregate concrete).
    22.3. Maximum Slump: 4".
    22.4. Air Content ASTM C231: 6-1/2% ? ±1-1/2%.
    22.5. Maximum Water/Cement Ratio: 0.40.
    22.6. Concrete shall conform to the requirements of ASTM C94.
    22.7. Provide concrete with workability such that it will fill the forms, without voids or honeycombs, when properly vibrated, without permitting materials to separate or excess water to collect on the surface.
23. EXAMINATION: Examine the areas and conditions under which the Work of this Section will be performed. Correct conditions detrimental to the timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected. Verify compacted subgrade is acceptable and ready to support paving and imposed loads. Verify gradients and elevations of base are correct.
24. BASE PLACEMENT: Spread granular cushion over prepared base to a total compacted thickness required for the Work. Place granular cushion base of Class 5 gravel or sand in maximum three (3") inch layers and roller compact. Level and contour surfaces to elevations and gradients indicated on the Drawings.
    24.1. Compact placed aggregate materials to achieve compaction to 100 percent of its maximum dry density in accordance with ASTM D698.
    24.2. If excess water is apparent, remove aggregate and aerate to reduce moisture content.
    24.3. Use mechanical vibrating tamping in areas inaccessible to compaction equipment.
25. PREPARATION: Moisten base to minimize absorption of water from fresh concrete. Coat surfaces of manhole frames with oil to prevent bond with concrete pavement. Notify Architect minimum 24 hours prior to commencement of concreting operations.
26. FORMING: Place and secure forms to correct location, dimension, profile, and gradient. Assemble formwork to permit easy stripping and dismantling without damaging concrete. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement. Install forms to allow continuous progress of Work and so that forms can remain in place at least twenty-four (24) hours after concrete placement. Slipform equipment may be used if the resulting curb and gutter conforms to the shape as specified on the drawings and the finish is satisfactory to the Architect/Engineer.
27. ACCESSIBILITY: Sidewalks, paths and walkways shall meet applicable accessibility standards.
    27.1. The accessible route is identified in the Contract Drawings. Survey, removal, regrading, new ADA compliant handrails or fall protection and replacement of concrete along the accessible

route shall be scoped in detail and provided by the design-build contractor.

27.2. Replacement of all existing walks is required if they do not meet the slopes listed below. All new concrete walks shall be formed and installed to meet accessibility slopes:

a) Running slope not to exceed 1:20 or 5%.

b) Cross slope not to exceed 1:48 or 2%.

c) Slope at landings and 90-degree change in direction shall not exceed 1:48 or 2%.

d) Slopes in all directions at accessible parking and access aisles shall not exceed 1:48 or 2%.

e) Slopes at ramps with compliant handrails and landings shall not exceed 1:12 or 8%

f) Running slopes at curb ramps shall not exceed 1:12 or 8%

g) Slopes at flared sides of curb ramp shall not exceed 1:10 or 10%

27.3. Contractor required to use a smart level to verify all slopes meet requirements for accessibility prior to pouring.

a) 4 foot long minimum level shall be used.

b) Photo documentation shall be provided to Architect showing slopes have been verified.

c) All slopes are subject to the approval of the AHJ and the Owner.

28. PLACING CONCRETE: Place concrete in accordance with ACI 301 and comply with the requirements for mixing and placing concrete as herein specified.

28.1. Ensure reinforcement, inserts, embedded parts, and formed joints are not disturbed during concrete placement.

28.2. Immediately before concrete placement, dampen base to reduce absorption. Standing water will not be permitted.

28.3. Do not place concrete on frozen ground.

28.4. Incorporate all concrete admixtures into the concrete at the ready-mix plant.

28.5. Reject concrete not placed within 90 minutes of initial mix.

28.6. Place concrete continuously between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

28.7. Place concrete to pattern indicated on the Drawings or as directed by the Architect/Engineer.

28.8. Place concrete by methods that prevent segregation of the mix. Consolidate concrete along the face of the forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement and side forms.

28.9. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

29. EXPANSION JOINTS: Joints shall be filled with one-half (1/2") inch thick pre-formed joint filler material and shall be installed in the following locations:

29.1. At the beginning and end of all curved sections.

29.2. Where all new concrete surrounds, adjoins or abuts any existing fixed objects, such as fire hydrants, valve boxes, manholes, light poles, flag poles, curbs, walks or other rigid structures.

29.3. At sixty (60') foot maximum spacing or as indicated on the drawings.

30. CONTRACTION JOINTS: Curbing shall be provided with contraction joints at ten (10') feet on center or as indicated on the Drawings.

31. JOINTS - GENERAL: All joints shall be vertical and straight. Transverse joints shall be placed at right angles to the longitudinal axis of the Work. Joints shall align with similar joints in adjoining work where practical.

31.1. The panels shall be square where practicable and generally have not more than 36 square feet of area.

31.2. The joints shall align with like joints in adjoining work unless the work is isolated by ½ inch isolation joints.

31.3. All joint work shall coordinate precisely with grids, modules and radials as prescribed on the Drawings.

31.4. All joints and edges of walk shall be rounded with a 1/8-inch radius tool.

31.5. Contraction joints shall extend to at least 1/3 the walk thickness and shall be approximately 1/8 inch wide.

31.6. Expansion and isolation joints shall be ½ inch wide and shall be equal in depth to the full thickness of the slab.

32. FINISHING

32.1. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with troweled and radius edge 1/4 inch radius.

32.2. Curbs and Gutters: Light broom, texture parallel to pavement direction.

32.3. Inclined Vehicular Ramps: Broom perpendicular to slope.

32.4. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

33. JOINT SEALING: Prepare joints and sealing compounds in accordance to the manufacturers installation instructions. Install sealing compounds where indicated on Drawings in accordance with manufacturer's instructions and ASTM D3406.

34. FIELD QUALITY CONTROL: An independent testing agency will perform field quality control tests. Provide free access to concrete operations at project site and cooperate with appointed firm.

35. COMPRESSIVE STRENGTH TESTS: Make one set of test cylinders (three per set) ASTM C31, for each day's pour in excess of one cubic yard for each type of concrete. If day's pour exceeds 25 cubic yards, make one set of test cylinders for each additional 50 cubic yards or fraction thereof. Cure cylinders in same proximity to and protected and cured in same manner as in-place concrete from which taken. Deliver one cylinder to independent testing lab at 7 days and 2 cylinders for testing at 28 days.

36. SLUMP TESTS: Furnish and maintain a slump cone and tamping rod. Test first batch of each type of concrete delivered for each day's pour, plus one test for each 25 cubic yards or fraction thereof, ASTM C143.

37. ENTRAINED AIR TESTS: Furnish and maintain a properly calibrated pressure-type air meter. Test first batch of air entrained concrete delivered for each day's pour plus one test for each 50 cubic yards or fraction thereof, ASTM C231.

38. PROTECTION: Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

PART 1 GENERAL

1.01 SECTION INCLUDES

1. Portland cement sidewalks and curbs.

1.02 RELATED SECTIONS

A. Provisions of the Contract including Contracting and General Requirements.
B. Section 31 2300 – Earthwork
C. Section 32 1216 – Asphalt Paving
D. Section 33 4000 – Storm Drainage Utilities

1.03 REFERENCES

A. City of Princeton Engineering Standards.
B. Minnesota Department of Transportation (Mn/DOT) Standard Specifications for Construction, current edition with supplements.
C. ASTM International (ASTM).

1. A185 – Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
2. C31 – Practice for Making and Curing Concrete Test Specimens in the Field.
3. C33 – Specification for Concrete Aggregates.
4. C39 – Test Method for Compressive Strength of Cylindrical Concrete Specimens.
5. C94 – Specification for Ready-Mixed Concrete.
6. C131 – Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
7. C150 – Specification for Portland Cement.
8. C172 – Practice for Sampling Freshly Mixed Concrete.
9. C260 – Specification for Air-Entraining Admixtures for Concrete.
10. C309 – Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
11. C494 – Specification for Chemical Admixtures for Concrete.
12. D1751 – Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
13. D1752 – Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

D. American Concrete Institute (ACI): SP-15 – Field Reference Manual: Standard Specifications for Structural Concrete with Selected ACI and ASTM References.

E. International Code Council/American National Standards Institute (ICC/ANSI): A117.1, 705 Detectable Warnings.

1.04 SYSTEM DESCRIPTION

A. Design Requirements
1. Provide a mix design for each type of concrete from locally available materials.
2. Meet the requirements of the References, of the local Regulatory Authorities, as specified herein, or as recommended in the Geotechnical Report; whichever results in the higher quality.
3. In Lieu of Mix Design: Provide certification from the concrete producer of mixes approved during the most recent production season by local or state authorities, with verification that mixes delivered are the same as approved.

B. Performance Requirements:
1. 28 day compressive strength: Not less than 4,000 psi
2. Entrained air content: 5 to 8 percent
3. Maximum Water/Cement Ratio: 0.49
4. Slump: 4 inches

1.05 SEQUENCING AND SCHEDULING

A. Install curbs, etc. in advance of abutting asphalt paving to provide minimum 7 day cure time.

B. Provide other sequencing and scheduling as indicated in Related Sections.

PART 2 PRODUCTS

2.01 MATERIALS

A. Portland Cement: Type 1A, or Type 1 with approved air-entraining admixture.

B. Coarse Aggregate: Non-reactive crushed quarry or mine trap rock of igneous or metamorphic types; including basalt, diabase, gabbro, gneiss, quartzite, or granite.

C. Fine Aggregate: Washed, sharp, natural or crushed sand consisting of particles of sound durable rock of igneous or metamorphic origin.

D. Exposed Aggregate: Washed river rock, 3/4 inch minus; verify color and texture.

E. Recycled content; including aggregates, fly ash, slag, or other constituent; shall be used only to the amounts and quality as allowed by local or state Regulatory Authorities' standards, on recommendation of the Testing Laboratory with approval of the Owner.

F. Admixtures for workability, water reducing, retarding, or accelerating shall be used only on recommendation of the Testing Laboratory and approval of the Owner.

2.02 ACCESSORIES

A. Form Materials
1. Plywood, metal, metal framed plywood, or other panel type materials providing full depth, continuous, straight, smooth exposed surfaces.
2. Use flexible or curved forms for 100 foot radius or less.
B. Form-Release Agent: Commercially formulated that will not bond with, stain, or affect surfaces nor impair subsequent treatments, attachments, or finishes.
C. Joint Filler: Conforming to References.
D. Curing Compound: White, water based, dissipating, membrane forming – Type 2, Class B
E. Fiber Reinforcement: Virgin polypropylene fibrillated fibers, type MD, 1.5 lb./CY mixed at plant.

2.03 SOURCE QUALITY CONTROL
A. All materials, admixtures, and accessories shall conform to References.
B. Obtain materials from the same source throughout construction.
C. Provide all prequalification testing and obtain approval for change in source.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify aggregate base was placed as specified in Related Sections.
B. Verify utility castings are set in full bed of grout and all embedded items have been installed.

3.02 PREPARATION
A. Protection of Persons
1. Provide temporary barricades as needed to prohibit unauthorized access to active Work areas.
2. Sequence and schedule the Work to maintain access to the site for personnel requiring access by Regulatory Authorities and emergency response vehicles.
3. Provide traffic control, signing, and notification to affected agencies or institutions in accordance with requirements of Mn/DOT Sections 1404 and 1710 when work interferes with a traveled roadway.
B. Protection of Property
1. Protect benchmarks and monuments established for the Work.
2. Protect adjacent finished surfaces from splashing or smearing with concrete material or curing compound.
C. Surface Preparation
1. Remove loose material from aggregate base or provide surface recompaction.
2. Moisture condition base in accordance with ACI Standards.
D. Forming
1. Provide qualified personnel for the establishment of line and grade from benchmarks and baselines established for the Work.
2. Place and adequately secure forms to prevent displacement.
3. Assemble and coat forms to permit stripping without damage to pavement.
4. Coordinate formwork with Work of Related Sections to facilitate placement of embedded items such as sidewalk grates, trench drains, and the like.
5. Machine placement by slip form may be used at the Contractor's option.
a. Provide appropriate mix design for slip form construction.
b. Provide full depth expansion joints and specified depth of contraction joints at the spacing indicated.
E. Joint Fillers
1. Place full width and depth at all expansion joints and as shown on the Drawings.
2. Place plumb and in alignment or coincident with contraction or decorative tooled joints.
3. Place with top flush to concrete surfaces or depressed 1/2 to 3/4 inch where joint sealer is indicated.
4. Secure to prevent displacement during concreting operations.
5. Protect top edges with temporary pre-manufactured cap.

3.03 CONCRETE PLACING

A. Place and consolidate concrete in accordance with References.
B. Place in one course of monolithic construction eliminating “cold” construction joints to the greatest extent practicable.
C. Remove and discard placed concrete back to the nearest planned joint when concreting is interrupted such that placed concrete has reached the flash set point or for more than one-half hour.
D. Install embedded detectable warning strips and drainage grate appurtenances in accordance with manufacturer’s recommendations.

3.04 JOINTS

A. General
   1. Align joints across abutting sidewalks, curbs, and pavements paying particular attention to spacing of expansion joints and special scoring patterns indicated on Drawings.
   2. Divide panels into nominally equal areas with tooled joints unless indicated otherwise.
   3. Sawn contraction joints are permitted only as indicated on the Drawings or to increase the depth of tooled joints for the Contractor’s convenience.
B. Expansion Joints
   1. Install transverse joints at the following maximum intervals.
      a. Sidewalks and Maintenance Strips: 40 feet and 5 to 10 feet each side of sidewalk grates spaced to match nominal scoring pattern.
      b. Curbs: 60 feet, 5 to 10 feet each side of curb drain inlets, and ends of curved sections
   2. Install lateral joints against abutting surfaces where concrete is confined between or penetrated by rigid structures or furnishings such as buildings, stoops, planters, pole supports or bases, posts, utilities and sleeves, thicker pavement sections, etc.
   3. Install additional joints where indicated on Drawings.
C. Contraction Joints
   1. Install joints to coincide with tooled joints at not greater than the following nominal intervals.
      a. Sidewalks: 8 to 10 feet
      b. Curbs and Aprons: 12 to 15 feet
   2. Install additional joints where indicated on Drawings.
   3. Tool or saw joints to 1/3 the nominal thickness of the pavement section or curb.

3.05 FINISHING AND CURING

A. Edging
   1. Tool joints and edges with 1/8 inch radius tool or as indicated on Details.
   2. Retool edges and joints following broom finishing leaving trowel finish tool marks when indicated on Drawings.
   3. Clean out expansion joints.
B. Surface Finishes
   1. Sidewalks: Light broom perpendicular to direction of travel.
   2. Curbs: Medium broom perpendicular to direction of travel.
C. Curing
   1. Apply curing compound on all exposed surfaces immediately after finishing.
   2. Apply uniformly in accordance with Manufacturer’s recommendations at a minimum rate of one gallon per 200 square feet.
   3. Apply compound on exposed surfaces if forms are removed before 7 days of cure time.

3.06 TOLERANCES

A. Comply with ACI 117 tolerances and the following.
   1. Lateral Alignment and Spacing of Bars and Dowels: 1 inch
   2. Vertical Alignment of Bars and Dowels: 1/4 inch
   3. Joint Spacing: 2 inches
   4. Joint Width: Plus 1/8 inch
   5. Thickness: Minus 1/4 inch in any dimension

6. Elevation: Plus or minus 1/8 inch
7. Plumb and Alignment: Plus or minus 1/4 inch in 10 feet
8. Surface Smoothness: 1/4 inch in 10 feet
9. Ponded Water Depth: 1/16 inch
10. Contraction Joint Depth: Minus 1/8 inch

B. Provide tolerance checking in the presence of the Owner, if requested.

3.08 FIELD QUALITY CONTROL

A. Tests and Observations
1. Conduct tests in accordance with References.
2. Obtain a minimum of two sets of test cylinders for compressive strength testing for each type of concrete placed daily.
3. Test for slump and air content.
4. Provide field curing of additional cylinders for testing results of cold weather placing and curing.
5. Obtain additional cylinders and perform higher frequency of daily testing if recommended by the Testing Laboratory and approved by the Owner.

B. The Owner reserves the right to take corings of the concrete or to order non-destructive testing to verify field test results.

C. Observations for ponded water will be conducted by the Owner with the Contractor present following a rainfall event that produces a measurable amount of runoff.

3.09 PROTECTION

A. Protect newly placed concrete from detrimental effects of the weather in accordance with References.

B. Do not allow traffic on roadways, drives, or aprons until minimum cure time of 14 days has passed or as recommended by the Testing Laboratory.

C. Do not allow vehicular traffic or storage of concentrated loads on unreinforced or minimally cured concrete.

D. Do not allow direct contact with concrete surfaces of any material that may cause staining or discoloration.

E. Delay placing of curbs across temporary haul roads or provide temporary ramps and covering of curbs that must be traveled over.

3.10 CLEANING

A. Sweep pavement and remove stains and discoloration prior to final inspection.

PARKING BUMPERS – 32 17 13

1. SCOPE OF WORK: Place wheel stops where indicated in the contract documents. At a minimum an allowance for new wheel stops shall be included at each accessible parking stall and any stall that is signed.
2. WHEEL STOPS: Precast, 3.5% minimum air entrained concrete; 4000 psi minimum compressive strength. Each stop shall be reinforced with two No. 4 deformed steel reinforcing bars, minimum. Provide chamfered corners and drainage slots on underside, and provide holes for dowel-anchoring to substrate. Unless indicated otherwise, provide stops of half octagonal configuration and 36-inch length.
   2.1. Precast wheel stops shall be manufactured for the intended purpose by a company or firm specializing in the manufacture of precast concrete parking appurtenances.
3. ADHESIVE FOR BONDING DOWEL TO WHEEL STOP: As proposed by Contractor and approved by the manufacturer, suitable for application.
4. STEEL BARS FOR INSTALLATION: Galvanized 5/8” diameter steel dowels or galvanized No. 5 steel reinforcing bars.
5. INSTALLATION: Securely attach wheel stops into at-grade concrete and at-grade asphalt pavement with

not less than two galvanized steel dowels embedded in holes cast into wheel stops. Firmly bond each dowel to wheel stop and to pavement. At concrete pavement, drill holes in pavement for dowels. At parking structure slabs, epoxy to slab.

PAINTED PAVEMENT MARKINGS – 32 17 23 13

1. SCOPE OF WORK: Provide all striping and painting as indicated in the contract documents. At a minimum the contractor should include all parking bays, crosswalks, arrows, handicapped symbols and curb markings required for a whole and complete parking/traffic control system as described in the contract documents.
   1.1. Striping color to be verified with the local code official. If required, accessible parking stalls may be a different color.
   1.2. Coordinate with local official for all fire zone or other required painting.
2. LAYOUT PLAN: Contractor to provide a striping layout plan to the Owner and Architect for approval prior to proceeding with the work. Include color of all striping as verified by the local official.
3. LINE AND ZONE MARKING PAINT: MPI No. 97 Latex Traffic Marking Paint.
4. DELIVERY, STORAGE, AND HANDLING: Deliver paint in containers of at least 5 gallons accompanied by batch certificate. Store products in manufacturer's unopened packaging until ready for installation. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
5. FIELD CONDITIONS: Do not install products under environmental conditions outside manufacturer's absolute limits.
6. EXAMINATION: Do not begin installation until substrates have been properly prepared. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
7. PREPARATION: Allow new pavement surfaces to cure for a period of not less than 14 days before application of marking materials. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions. Establish survey control points to determine locations and dimensions of markings; provide templates to control paint application by type and color at necessary intervals.
8. CLEANING: Clean surfaces thoroughly prior to installation. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods. Completely remove rubber deposits, existing paint markings, and other coatings adhering to the pavement, by scraping, wire brushing, sandblasting, mechanical abrasion, or approved chemicals.
   8.1. Where oil or grease are present, scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application; after cleaning, seal oil-soaked areas with cut shellac to prevent bleeding through the new paint.
9. INSTALLATION – GENERAL: Begin pavement marking as soon as practicable after surface has been cleaned and dried. Do not apply paint if temperature of surface to be painted or the atmosphere is less than 50 degrees F or more than 95 degrees F. Apply in accordance with manufacturer's instructions using an experienced technician that is thoroughly familiar with equipment, materials, and marking layouts. Comply with FHWA MUTCD manual (http://mutcd.fhwa.dot.gov) for details not shown. Apply markings in locations determined by measurement from survey control points; preserve control points until after markings have been accepted.
10. APPLICATION: Apply uniformly painted markings of color(s), lengths, and widths as indicated on the drawings true, sharp edges and ends. Apply paint in one coat only. Wet Film Thickness: 0.015 inch, minimum. Length Tolerance: Plus or minus 3 inches. Width Tolerance: Plus or minus 1/8 inch.
11. PARKING LOTS: Apply parking space lines, entrance and exit arrows, painted curbs, and other markings indicated on drawings.

12. SYMBOLS: Use a suitable template that will provide a pavement marking with true, sharp edges and ends, of the design and size indicated.
13. DRYING, PROTECTION, AND REPLACEMENT: Protect newly painted markings so that paint is not picked up by tires, smeared, or tracked. Provide barricades, warning signs, and flags as necessary to prevent traffic crossing newly painted markings. Allow paint to dry at least the minimum time specified by the applicable paint standard and not less than that recommended by the manufacturer. Remove and replace markings that are applied at less than minimum material rates; deviate from true alignment; exceed length and width tolerances; or show light spots, smears, or other deficiencies or irregularities. Remove markings in manner to avoid damage to the surface to which the marking was applied, using carefully controlled sand blasting, approved grinding equipment, or other approved method. Replace removed markings at no additional cost to Owner.

TACTILE WARNING SURFACING – 32 17 26

1. SCOPE OF WORK: Locate tactile warnings at a minimum:
   1.1. All curb ramps
   1.2. All parking access aisles, including from accessible stalls, building entrances, at side walk corners or any other access from the sidewalk to the parking area
   1.3. In compliance with ADA Standards
   1.4. As direct by the AHJ.
2. PRICING: Provide a price for each unit pricing. Include minimum six full width units.
3. SEALANT: Elastomeric sealant of color to match adjacent surfaces; approved by surfacing tile manufacturer.
4. INSTALLATION, GENERAL: Install in accordance with manufacturer's written instructions. Locate relative to curb line in compliance with PROWAG, Sections 304 and 305. Orient so dome pattern is aligned with the direction of ramp.

SPLASH BLOCKS – 32 30 00

1. SCOPE OF WORK: Provide a new splash block at each downspout termination. Slope away from building to drain into storm water management system.
   1.1. As an alternate to the base bid, provide total cost to provide and install all required splash blocks. Also include unit pricing.
2. PREFABRICATED CONCRETE SPLASH BLOCKS: Minimum 12" x 24" or, if located in a landscape buffer, provide drainage to the defined edge of the buffer. Tie splash blocks into under sidewalk drains.
3. EXAMINATION: Verify that all components are free of defects prior to installation.
4. INSTALLATION: Install in accordance with manufacturer's instructions. Install splash blocks to provide positive drainage away from the building and towards the natural downgrade of the site or to any designed swales. (2" drop in 24")

SEEDING – 32 92 19

1. SCOPE OF WORK: Provide an allowance as part of the base bid to completely install and restore all areas affected by construction activity, to comply with the contract documents and as per the Owner's direction.
2. SEED MIXTURE: Residential Turf Grass: Kentucky Blue Grass at 50 percent, Creeping Red Fescue Grass at 30 percent, Red Top at 10 percent and Norlea Perennial Rye at 10 percent.
3. SEEDING: Apply seed at a rate of 3-4 lbs per 1000 sq ft evenly in two intersecting directions. Rake in lightly. Do not seed areas in excess of that which can be mulched on same day. Immediately following seeding and compacting, apply mulch to a thickness of 1/8 inches. Maintain clear of shrubs and trees.

4. SOIL MATERIALS: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay or impurities, plants, weeds and roots; pH value of minimum 5.4 and maximum 7.0.
5. MULCHING MATERIAL: Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable.
6. FERTILIZER: Recommended for grass, with fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil.
7. FERTILIZING: Apply fertilizer in accordance with manufacturer's instructions. Apply after smooth raking of topsoil and prior to roller compaction. Do not apply fertilizer at same time or with same machine as will be used to apply seed.
8. WATER: Clean, fresh and free of substances or matter that could inhibit vigorous growth of grass. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

SODDING – 32 92 23

1. SCOPE OF WORK: Provide an allowance as part of the base bid to completely install and restore all areas affected by construction activity, to comply with the contract documents and as per the Owner's direction.
2. SOD: TPI, Certified Turfgrass Sod quality; cultivated grass sod; type indicated in plant schedule on Drawings; with strong fibrous root system, free of stones, burned or bare spots; containing no more than 5 weeds per 1000 sq ft. Minimum age of 18 months, with root development that will support its own weight without tearing, when suspended vertically by holding the upper two corners. Shall be 50 percent Kentucky Blue Grass.
3. LAYING SOD: Moisten prepared surface immediately prior to laying sod. Lay sod immediately after delivery to site to prevent deterioration. Lay sod smooth and tight with no open joints visible, and no overlapping; stagger end joints 12 inches minimum. Do not stretch or overlap sod pieces. Water sodded areas immediately after installation. Saturate sod to 4 inches of soil. After sod and soil have dried, roll sodded areas to ensure good bond between sod & soil & to remove minor depressions and irregularities. Roll sodded areas with roller not exceeding 200 lbs.
4. TOPSOIL: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay, or impurities, plants, weeds and roots; pH value of minimum 5.4 and maximum 7.0.
5. FERTILIZER: Recommended for grass, with fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil, as indicated by analysis.
6. FERTILIZING: Apply fertilizer in accordance with manufacturer's instructions.

PLANTS – 32 93 00

1. SCOPE OF WORK: Provide an allowance as part of the base bid to provide and install all new planting as illustrated in the contract documents.
2. DESIGN: If required by the AHJ the Contractor shall, as part of the base contract, engage the services of a licensed Landscape Architect to provide all required documents to the AHJ and the Contractor's Landscaper.
3. FIELD CONDITIONS: Do not install plant life when ambient temperatures may drop below 35 degrees F or rise above 90 degrees F.
4. WARRANTY: One year. Include coverage for one continuous growing season; replace dead or unhealthy plants.
5. REPLACEMENTS: Plants of same size and species as specified, planted in the next growing season, with a new warranty commencing on date of replacement.
6. PLANTS: Species and size identified by Contractor's Landscaper or Landscape Architect, grown in

climatic conditions similar to those in locality of the work.

7. PLANTING: Place plants for best appearance. Set plants vertical. Saturate soil with water when the pit or bed is half full of topsoil and again when full.
8. TOPSOIL: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay or impurities, plants, weeds and roots; minimum pH value of 5.4 and maximum 7.0.
9. TOP SOIL MIX: A uniform mixture of 1 part peat and 3 parts topsoil by volume.
10. PLACING TOPSOIL: Spread topsoil to a minimum depth of 4 inches over area to be planted. Rake smooth.
11. FERTILIZER: Containing fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil, as indicated in analysis.
12. FERTILIZING: Apply fertilizer in accordance with manufacturer's instructions.
13. WATER: Clean, fresh, and free of substances or matter that could inhibit vigorous growth of plants.
14. MULCHING MATERIAL: Wood shavings, free of growth or germination inhibiting ingredients.
15. WRAPPING MATERIALS: Burlap.
16. STAKES: Softwood lumber, pointed end.
17. CABLE, WIRE, EYE BOLTS AND TURNBUCKLES: Non-corrosive, of sufficient strength to withstand wind pressure and resulting movement of plant life.
18. MAINTENANCE: Provide maintenance at no extra cost to Owner; Owner will pay for water.

DIVISION 33

SUBDRAINAGE – 33 41 00

1. SCOPE OF WORK: Provide and install whole and complete subdrainage system as illustrated in the contract documents.
2. SECTION INCLUDESL Building Perimeter, Retaining Wall, and Under-Slab Drainage Systems. Playground drainage system. Filter aggregate and fabric and bedding.
3. REFERENCE STANDARDS: ASTM D2729 - Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; latest edition.
4. SUBMITTALS: Shop Drawings: Indicate dimensions, layout of piping, high and low points of pipe inverts, gradient of slope between corners and intersections. Manufacturer's Certificate: Certify that products meet or exceed specified requirements. Project Record Documents: Record location of pipe runs, connections, cleanouts and principal invert elevations.
5. REGULATORY REQUIREMENTS: Conform to applicable code for materials and installation of the work of this section.
6. PIPE MATERIALS: Polyvinyl Chloride Pipe: ASTM D2729; plain end, 4 inch inside diameter; with required fittings. Use perforated pipe at subdrainage system; unperforated through sleeved walls.
7. AGGREGATE AND BEDDING: Filter Aggregate and Bedding Material: Granular fill as specified in Section 31 23 23.
8. ACCESSORIES: Pipe Couplings: Solid plastic. Filter Fabric: Water pervious type, black polyolefin.
9. EXAMINATION: Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on layout Drawings.
10. PREPARATION: Hand trim excavations to required elevations. Correct over-excavation. Remove large stones or other hard matter that could damage drainage piping or impede consistent backfilling or compaction.

11. INSTALLATION: Install and join pipe and pipe fittings in accordance with pipe manufacturer's instructions. Place drainage pipe on compacted impervious fill. Place pipe with perforations facing down. Mechanically join pipe ends. Install pipe couplings. Install filter aggregate at sides, over joint covers and top of pipe. Provide top cover compacted thickness of 12 inches. Place filter fabric over levelled top surface of aggregate cover prior to subsequent backfilling operations. Refer to Section 31 23 23 for compaction requirements. Do not displace or damage pipe when compacting. Place impervious fill over drainage pipe aggregate cover and compact.
12. PROTECTION: Protect pipe and aggregate cover from damage or displacement until backfilling operation begins.