



Technical Specifications and Performance Standards

Challenge Grant/Milwaukee Home Program
Residential Rehabilitation

3/18/2016

TABLE OF CONTENTS

DIVISION 1 – GENERAL REQUIREMENTS

- 01010 – Summary of Work
- 01045 – Cutting and Patching
- 01153 – Change Order and Substitution Procedures
- 01800 – Cleaning and Maintenance
- 01810 – Lead Dust Hazards

DIVISION 2 – SITEWORK

- 02050 – Demolition
- 02080 – Asbestos Removal
- 02200 – Excavation, Grading and Backfill
- 02510 – Concrete
- 02900 – Landscaping

DIVISION 4 – MASONRY

- 04200 – Masonry

DIVISION 6 – WOOD AND PLASTIC

- 06010 – Lumber and Rough Carpentry
- 06200 – Finish Carpentry and Millwork

DIVISION 7 – THERMAL AND MOISTURE PROTECTIOJN

- 07200 – Building Insulation
- 07311 – Asphalt Shingles
- 07530 – Single-Ply Membrane Roofing
- 07560 – Wood Siding
- 07580 – Vinyl Siding and Cladding
- 07600 – Flashing and Sheet Metal
- 07631 – Gutters and Downspouts

DIVISION 8 – DOORS AND WINDOWS

- 08200 – Doors
- 08600 – Windows
- 08610 – Standard Wood Double Hung Window Treatment
- 08710 – Hardware

DIVISION 9 – FINISHES

09250 – Gypsum Wallboard

09300 – Ceramic Tile

09550 – Wood Flooring

09660 – Asphalt, Vinyl and Resilient Tile Flooring

09665 – Resilient Sheet Flooring

09680 – Carpet

09900 – Painting

DIVISION 11 – EQUIPMENT

11020 – Security Items

DIVISION 15 – MECHANICAL

15300 – Smoke Alarms

15400 – Plumbing

15500 – Heating and Ventilation

DIVISION 16 – ELECTRICAL

16400 – Electrical

16500 – Lighting

DIVISION 1 – GENERAL REQUIREMENTS

01010 SUMMARY OF WORK

PART 1 – GENERAL

1.1 CHALLENGE GRANT/MILWAUKEE HOME PROGRAM RESIDENTIAL REHABILITATION PROJECT

A. The Challenge Grant Fund Program

- The Challenge Grant Fund is a City of Milwaukee initiative to solicit interest in the rehabilitation of property tax foreclosed homes with the goal of redeveloping parcels into affordable rental and home ownership opportunities through a partnership with the Housing Authority of the City of Milwaukee.
- The Housing Authority for the City of Milwaukee will act as the Agency and Owner (see 1.2 DEFINITIONS).

B. PRESUMPTION OF LEAD: For the purposes of these Specifications, and unless the building was constructed in 1978 or later, or the building has undergone a Lead-Based Paint Risk Assessment by a properly licensed Lead-based Paint Inspector or Risk Assessor and is certified as being “Lead Free”, the City of Milwaukee assumes that all painted surfaces contain lead-based paint. This presumption is made in lieu of a risk assessment. As a result of this presumption each rehabilitation project shall be conducted in a lead-safe manner as outlined herein.

C. All Sections in these Specifications are applicable to all the work listed in the Scope. All Contractors must abide by the requirements set forth herein. The Conditions of the Contract, the Scope of work, plans and drawings (if any), and these Specifications shall apply with equal force and effect to all Contractors engaged in this work.

1.2 DEFINITIONS

A. The following terms are used throughout these specifications:

- Agency – Agency is the non-profit and/or for profit organization funded as a sub-recipient to perform residential housing repair or rehabilitation under the Challenge Fund Grant provided by the City of Milwaukee.
- Change Order - A Change Order is used to add additional work (labor and/or materials) to the Scope.
- Substitution - A Substitution is used to exchange or modify materials and/or work listed on the Scope for other materials or work.
- Contractor – Contractor is the business entity under contract with the Agency and charged with the responsibility to complete all or part of the work outlined in the Scope.
- Owner – The Owner is the titleholder of the subject property that is to be repaired or rehabilitated.
- Scope – The Scope is a complete list of work to be performed on the subject property. The Scope along with the Specifications and construction plans (if necessary) constitute a complete set of construction documents. These documents are used to request proposals from contractors and sub-contractors.
- Specifications – The Specifications entitled “Technical Specifications and Performance Standards,” included in the bid documents, are HACM’s rehabilitation construction standards.
- Sub-contractor – Sub-contractor is a business entity under contract with the Contractor to perform work listed on the Scope. A Sub-contractor may also be an entity under contract with the Agency to perform work listed on the Scope when the Agency is acting as the Contractor.
- R/R shall mean Remove old and Replace with new.
- F/I shall mean Furnish new and Install per specifications.
- A/A shall mean Assorted Areas.
- U/T shall mean Up To
- SF shall mean Square Foot.
- Cu. Ft. shall mean Cubic Foot.
- SQ.YD. shall mean Square Yard.
- EA shall mean Each.
- LF shall Mean Lineal Foot.
- HT shall mean Height.
- T & G shall mean Tongue and Groove.

- Pb-N shall mean Lead Notification Required. Contractor shall use lead safe work methods per Section 01810 Lead Dust Hazards.
 - Pb-A shall mean Lead Abatement. Contractor shall obtain a lead abatement permit from Milwaukee Health Department (MHD) Lead Section two (2) days prior to starting work on this item. Contractor shall use lead safe work methods per Section 01810 Lead Dust Hazards.
- B. THE CONTRACTOR IS RESPONSIBLE FOR, AND SHALL VERIFY ALL FIELD DIMENSIONS, SIZES, QUANTITIES, SQUARE FOOTAGES, LINEAL FOOTAGES, ETC. BEFORE ORDERING MATERIALS, PRODUCTS OR SUPPLIES. QUANTITIES, SQUARE FOOTAGES, LINEAR FOOTAGES, ETC. LISTED ON THE SCOPE ARE FOR THE CONVENIENCE OF THE CONTRACTOR. HACM NEITHER MAKES NOR IMPLIES ANY GUARANTEE FOR THE ACCURACY OF THESE NUMBERS.
- The Contractor shall obtain complete data at the site and inspect surfaces that are to receive his work before proceeding with fabricating, assembling, fitting or erecting his work. Contractor shall be solely responsible for the accuracy of measurements and laying out his work and shall make good any errors, defects due to faulty measurements taken, information obtained, layout, or failure to report discrepancies.
 - Starting of work by the Contractor implies his acceptance of the work of others. Removal and replacement of work applied to defective surfaces, in order to correct defects, shall be done at the expense of the Contractor who applied work to defective surfaces.
- C. Change orders – Substitutions:
- All Changes orders and/or substitutions shall be approved by the Owner in writing.
 - Upgrade from the Standard Window Treatment as outlined in Section 08610 Standard Window Treatment to a vinyl or aluminum replacement window per Section 08600 Windows is allowed with Owner approval. Any additional cost due to this upgrade is solely the Contractor's expense unless authorized by the Owner in writing.
- D. The Scope is final. In no case shall the Contractor agree to, or initiate work on anything that is not listed in the Scope without the written approval of the Owner. In emergency situations, or when time is of the essence, the Owner may give verbal approval to deviate from the Scope. All verbal approvals will be put in writing by the Owner when time allows.

1.3 PROJECT REQUIREMENTS

- A. Notice to proceed:
- Contractor shall not begin work on a project without a written notice to proceed from the Agency.
- B. Owner's Selections:
- Contractor shall obtain a signed, approved submittals for all selections.
 - Owner's selections shall be, whenever possible, standard colors, styles, and readily available materials as outlined on the Scope and as specified herein.
- C. Pre-construction conference:
- Contractor shall schedule a pre-construction meeting at the job site with the Agency and all Sub contractors.
 - All subcontractors are required to attend the scheduled Pre-construction conference.
 - The pre-construction conference is the Contractor's opportunity to ask questions about the Scope, Specifications, Owner selections, permits required, inspections, etc.
- D. Contractor's use of facilities:
- Owner shall provide Contractor with access to the site during normal business hours, 8:00 AM–4:30 PM Monday through Friday. Contractor shall not work on weekends or holidays without the approval of the Owner.
 - Owner shall provide the Contractor, at no charge, access to existing services, electrical, water, gas and bathroom facilities.
- E. Rebuilding/replacing of porches, decks, exterior stairs, and jump porches unless otherwise stated in the Scope, shall be constructed to the same size (footprint) as the original.

1.4 CONTRACTING REQUIREMENTS

- A. General Contractors and Sub-contractors shall possess all required licenses prior to accepting and/or entering into any contracts to perform work on City of Milwaukee funded rehabilitation projects.
 - General Contractors and Sub-contractors shall have a current City of Milwaukee Home Improvement Contractors License.
 - General Contractors and Sub-contractors shall have a current State of Wisconsin Dwelling Contractor Financial Responsibility Certification.
 - General Contractors and Sub-contractors performing lead abatement work or work that will disturb painted or otherwise coated surfaces in excess of two (2) square feet shall hold a valid State of Wisconsin Lead (Pb) Company Certification.
- B. Trade Contractors, i.e. electrical, HVAC, plumbing, etc. shall have the following licenses and/or certifications:
 - Electrical contractors shall have a valid State of Wisconsin Master Electrician's license in addition to a City of Milwaukee Electrical Contractor's License. Electrical contractors possessing only a valid City of Milwaukee Master Electrician's license shall be considered in compliance with this requirement.
 - Heating, ventilating, and air conditioning (HVAC) contractors shall hold a valid State of Wisconsin HVAC Contractor license.
 - Plumbing contractors shall have a valid State of Wisconsin Master Plumber License.
- C. Contractor shall provide all required proof of insurance prior to accepting or entering into any contracts to perform work on City of Milwaukee funded rehabilitation projects.
 - The Contractor shall provide additional proof of insurance and/or proof of insurance renewal when any changes to Contractor's insurance coverage occur while the Contractor is under contract with the City of Milwaukee or one of its funded Agencies.
- D. Contractor shall provide the Agency with a completed IRS W-9 form at time of contract execution.
- E. At the time payments are made to the Contractor, the Contractor shall provide Agency with a signed lien waiver or (when contracted work is not fully completed) signed partial lien waiver.

1.5 TIMELINESS

- A. Work shall be completed in a manner that is least disruptive to the Owner and Neighborhood.
 - Work shall be completed within the time frames specified in the contract.
 - When performing work involving disturbance of painted or otherwise coated surfaces, Contractor shall safely expedite the work in strict accordance with Section 01810 Lead Dust Hazards.
- B. Sequence of operations shall be as determined by the Contractor.
 - Contractor shall perform his work in proper sequence in relation to that of other Contractors or trades. Any cost caused by defective or ill-timed work shall be borne by the Contractor responsible.

1.6 PERMITS

- A. Obtain all applicable permits prior to starting the work covered under the permit.
- B. Provide a copy of each permit to the Agency.
- C. The work shall comply with State of Wisconsin Uniform Dwelling Code, HVAC, Electrical, and Plumbing Codes and the City of Milwaukee Code of Ordinances, Volumes 1 and 2.

1.7 QUALITY STANDARDS

- A. Provide experienced, well-trained workers competent to complete the work as specified.
- B. Provide a certified lead abatement supervisor and certified lead abatement workers for any work involving suspected or known lead-based painted or otherwise coated surfaces, including but not limited to the following: installation of containment measures, demolition, removal, encapsulation, enclosure, debris removal or clean-up per the Scope, Section 01810 Lead Dust Hazards and as specified herein.
- C. All work shall comply with the governing lead-based paint regulations and OSHA Worker Safety Regulations.

PART 2 – PRODUCTS AND MATERIALS

2.1 PRODUCT INFORMATION:

- A. All products and materials shall be new in unopened containers and/or packaging.
- B. Supply Owner with all product owner manuals, operating instructions, maintenance instructions, and product warranties.
- C. Supply Owner, product specifications to prove compliance with the Owner's selections and these specifications.
- D. Products containing lead or asbestos may not be used in this work without prior written permission of the Owner.

2.2 OWNER SELECTIONS

- A. Contractor shall obtain from the Owner a completed, signed, and dated Owners Selection Sheet prior to starting work under the contract.
 - Owner shall select colors, finishes, products, styles, etc. from standard and readily available materials and products.
- B. All materials and products installed by the Contractor and any Sub Contractors shall be approved for its intended use by a recognized testing laboratory.

PART 3 – INSTALLATION

3.1 INSPECTIONS

- A. Progress inspections:
 - Progress inspections and final inspections of maintenance work are done by the Agency.
 - Progress inspections and final inspections of mechanical work under permit are done by the Department of Neighborhood Services district trade inspectors, i.e. construction, HVAC, electrical, plumbing.
- B. Completions:
 - A completed project includes a sign off of the Scope by the Owner, a Certificate of Code Compliance from the Department of Neighborhood Services, a final passing lead clearance test by the Milwaukee Health Department (MHD) Lead Section and all required permits including mechanical permits (if any) signed off by the appropriate district trade inspector.

3.2 PERFORMANCE STANDARDS

- A. Performance standards shall be as specified by the product manufacturers and as stated herein:
 - Contractor shall warrant his/her labor and materials for a period of one year after date of completion. The date of completion is the date in which the Owner signs off on the Scope of work. When work scopes require a permit, the Contractor shall be responsible for obtaining all permit sign-offs from the appropriate DNS district trade inspector.
 - Contractor's quality of materials and workmanship shall meet a 5 year performance standard as outlined in the Milwaukee Metropolitan Builders Association of Greater Milwaukee, Inc. "Construction Industry Quality Standards".

END OF SECTION – 01010 SUMMARY OF WORK

DIVISION 1 – GENERAL REQUIREMENTS

01045 CUTTING AND PATCHING

PART 1 – GENERAL

1.1 SUMMARY

- A. Cut and patch as required to repair damage as listed in the Scope and as specified herein:
 - Interior plaster or drywall
 - Stucco
 - Electrical, plumbing and HVAC openings
- B. Cut and patch with care to avoid damage to work, safety hazards, violation of warranty requirements, building code violations, or maintenance problems.
- C. When cutting and patching areas large enough to meet or exceed regulated thresholds, work shall be done in accordance with:
 - Painted or otherwise coated surfaces shall be done in accordance with Section 01810 Lead Dust Hazards.
 - Asbestos or asbestos containing material shall be done in accordance with Section 02080 Asbestos Removal.

PART 2 – MATERIALS AND PRODUCTS

2.1 MATERIALS

- A. Match existing materials with new materials so that patching work is consistent with surrounding surfaces.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Inspect field conditions to identify all work required.
- B. Perform work with workers skilled in the trades involved. Protect adjacent work from damage and dirt.
- C. If work will disturb painted or otherwise coated surfaces, install containment measures as outlined in Section 01810 Lead Dust Hazards.
- D. If work will disturb asbestos or asbestos containing materials, install containment measures as outlined in Section 02080 Asbestos Removal.
- E. For cutting work, use proper cutting tools, not chopping tools. Make neat holes. Check for concealed utilities and structure before cutting.
- F. Make patches, seams, and joints durable and consistent with adjacent surfaces.
- G. Clean work areas and areas affected by cutting and patching operations as outlined in Section 01810 Lead Dust Hazards, Section 02080 Asbestos Removal and Section 01800 Cleaning and Maintenance.

END OF SECTION – 01045 CUTTING AND PATCHING

DIVISION 1 – GENERAL REQUIREMENTS

01153 CHANGE ORDER AND SUBSTITUTION PROCEDURES

PART 1 – GENERAL

1.1 SUMMARY

- A. Changes from the Scope may, from time to time, be required. Any changes from the Scope must be authorized by the Agency in writing.
 - A Change Order is used to add additional work (labor and/or materials) to the Scope.
 - A Substitution is used to exchange or modify materials and/or work listed on the Scope for other materials or work.
- B. Change orders and Substitutions will include equivalent changes in the project cost and allow for extensions to the projected time of completion.
 - The Contractor shall submit to the Agency a breakdown of the cost for each Change Order or Addendum.
 - The Contractor shall submit to the Agency a revised date of completion taking into account the Change Order or Addendum.
- C. Change Orders and Substitutions shall be numbered in sequence, dated and signed.
- D. Emergency authorization for Change Orders and Addendums:
 - May be verbally authorized by the Agency to address immediate health or safety concerns.
 - May be verbally authorized by the Agency to expedite repairs of unforeseen conditions during the course of construction.
 - Verbal authorization of emergency Change Orders and Substitutions shall be followed up in writing as soon as possible, usually by the next business day.
- E. A request for estimates for possible changes is not a Change Order or Substitution. These requests are not an authorization to proceed with the proposed changes or addendums. Except for an emergency authorization, a signed Change Order or Addendum must be executed prior to any deviation from the Scope.

END OF SECTION – 01153 CHANGE ORDER AND SUBSTITUTION PROCEDURE

DIVISION 1 – GENERAL REQUIREMENTS

01800 CLEANING AND MAINTENANCE

PART 1 – GENERAL

1.1 SUMMARY

- A. Keep the buildings and site well organized and clean throughout the construction period.
- B. When work under this section involves cleaning and disposal of construction debris presumed, or known to contain lead-based paint, the work shall be in accordance with Section 01810 Lead Dust Hazards.
- C. When work under this section involves cleaning and disposal of construction debris containing asbestos or asbestos containing material, the work shall be in accordance with Section 02080 Asbestos Removal.
- D. Provide all related materials, equipment, and labor required to maintain the job site in a neat and orderly condition in accordance with the Scope and as specified herein.
- E. Provide general clean up daily and removal of all scrap and debris from the site. Exception: Reusable scrap shall be stored in a neatly maintained, designated storage area.
- F. Daily pick up shall include a thorough broom-clean sweep or HEPA vacuum per Section 01810 Lead Dust Hazards of all paved areas on site and public paved areas adjacent to the site. Completely remove swept dirt and debris.
- G. Daily cleaning shall not replace the required clean up after the work of specific trades as specified herein.
- H. At completion of work, remove from the job site all tools, equipment, surplus materials, scrap and debris.
- I. Inspect both interior and exterior surfaces and remove all waste materials, paint droppings, or other debris remaining from the work performed under the Scope and as specified herein.
- J. Glass: Clean inside and outside so there are no spots or dirt, and no smudges or streaks remaining, from the cleaning process.
- K. Schedule final cleaning and clearance testing as outlined in Section 01810 Lead Dust Hazards.

END OF SECTION – 01800 CLEANING AND MAINTENANCE

DIVISION 1 – GENERAL REQUIREMENTS

01810 LEAD DUST HAZARDS

PART 1 – GENERAL

1.1 WORK

- A. PRESUMPTION OF LEAD: For the purposes of these Specifications, and unless the building was constructed in 1978 or later, or the building has undergone a Lead-Based Paint Risk Assessment by a properly licensed Lead-based Paint Inspector or Risk Assessor and is certified as being “Lead Free”, the City of Milwaukee assumes that all painted surfaces contain lead-based paint. This presumption is made in lieu of a risk assessment. As a result of this presumption each rehabilitation project shall be conducted in a lead-safe manner as outlined herein.
- B. Work under this section does not apply to painted or coated surfaces when the lead content of that surface coating is determined to be below 0.7 mg/cm² as measured by an x-ray fluorescence (XRF) analyzer, or less than .06% lead by weight as determined by a certified laboratory paint chip analysis.
- C. Work under this section is limited to painted or coated surfaces that are presumed or known to contain lead-based paint per the City of Milwaukee Presumption of Lead notice.
- D. Provide all related materials, equipment, and labor required to complete the work in a lead safe manner in accordance with the Scope and as specified herein.
- E. After the work under this section is complete, provide all materials, equipment and labor necessary to clean and prepare the property for lead (Pb) clearance testing. It is the Contractor’s responsibility to achieve lead clearance per the Department of Housing and Urban Development Lead-Based Paint Regulation [24 CFR Part 35] standards.
- F. Contractor shall be responsible for compliance with Department of Housing and Urban Development Lead-Based Paint Regulation [24 CFR Part 35], State of Wisconsin, Department of Health and Family Services Lead-Based Paint Regulations [Chapter HFS 163], and the City of Milwaukee Code of Ordinances, Lead-based Paint Hazard Control Regulations, [Chapter 66-47].
- G. Contractor shall obtain a Lead Abatement Permit from the Milwaukee Health Department at least two (2) business days prior to starting any lead abatement work.

1.2 QUALITY STANDARDS

- A. Provide experienced, well-trained workers competent to complete the work as specified.
- B. Provide a certified lead abatement supervisor and certified lead abatement workers for any containment installation, demolition, removal, encapsulation, enclosure, debris removal or clean-up of suspected lead containing materials per the Scope and as specified herein.
- C. All work shall comply with the governing lead-based paint regulations and OSHA Worker Safety Regulations.
- D. Lead abatement and lead reduction work is time sensitive. Contractor shall complete the abatement work in accordance with the Occupant Protection Plan and as quickly and safely as possible to minimize potential exposure to lead hazards and to minimize the disruption to Owner and tenants.

1.3 SUBMITTALS

- A. Contractor shall notify the Milwaukee Health Department (MHD) – Lead Section (414-286-5033) at least 24 hours prior to starting any work that involves disturbance of painted or otherwise coated surfaces. MHD will assign a Lead Risk Assessor to monitor the work to document lead safe rehabilitation procedures were followed.
- B. Contractor shall obtain a Lead Abatement Permit from the Milwaukee Health Department at least two (2) business days prior to starting any lead abatement work.
- C. Contractor shall complete an Occupant Protection Plan form and submit it to the Milwaukee Health Department along with their Lead Abatement Permit application.
- D. Contractor shall provide Owner and (if applicable) tenant a minimum of two (2) days advance notice prior to starting any lead abatement work.

- E. Prior to starting work under this section, Contractor shall present to the Agency for the purpose of making a copy, a current State of Wisconsin Lead (Pb) Company license and all Lead Supervisor(s) or Lead Worker(s) licenses of individuals employed by the Contractor or the Contractor's Sub-contractors.
- F. At the completion of the job and prior to final payment to the Contractor, the Contractor shall provide copies of all lead clearance testing results to both the Owner and the Agency.

1.4 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
 - Contractor shall meet with the Owner and (if applicable) tenant to explain the Occupant Protection Plan.
 - Contractor and Owner shall arrange for all occupants and other non-lead certified workers to remain out of the lead containment areas during construction and clean-up.
 - Children under seven (7) years of age shall not occupy the living unit or work area during lead abatement work, lead reduction work or clean-up of work.
 - Post in an obvious location, Lead Hazard Warning Signs, Occupant Protection Plan, and a copy of the Lead Abatement Permit at the entrances to containment areas. Note: Lead Hazard Warning Signs are available from MHD.
 - All containment measures shall be in place prior to starting any work which will disturb painted or otherwise coated surfaces.

PART 2 – MATERIALS AND EQUIPMENT

2.1 CONTAINMENT MATERIALS

- A. All materials used for containment shall be new and unused.
 - Plastic shall be new, free of rips, tears and holes.
 - Tape shall be a minimum of 2" wide and of sufficient quality to serve its intended purpose.

2.2 CONTAINMENT MEASURES

- A. Provide all materials and equipment required to safely contain lead dust hazards on the exterior of the building.
 - Cover the ground in work areas with 6 mil plastic secured continuously along the foundation and extended out from the building a minimum of 6 feet and in all cases adequate to contain any falling debris. If adjacent structures are less than 6 feet away, contractor shall allow 6 mil plastic to extend up the side of the adjacent structure.
 - Cover all shrubbery, plantings, etc. with a minimum of 1-2 mil plastic.
 - All storm windows, windows and doors shall be closed to prevent the movement of lead dust and debris into or out of the building.
 - All storm windows, windows and doors in adjacent buildings closer than 6 feet to the work area shall be closed to prevent the movement of lead dust and debris into the building.
 - Maintain a HEPA vacuum in the containment area to periodically clean up dust and debris generated during the course of work.

- B. Provide all materials and equipment required to safely contain lead dust hazards in the interior of the building.
- Cover floors up to the top of the baseboard in work areas with 6 mil plastic secured continuously along the edges with duct tape.
 - Remove furniture, clothes, toys, etc. from the work area. If it is impractical or impossible to remove these items, the Contractor shall completely cover items with 1-2 mil plastic secured in place with duct tape.
 - All built in cabinets, countertops, bookshelves, plumbing, electrical, HVAC fixtures, etc. shall be covered with 1-2 mil plastic secured in place with duct tape.
 - Entrances to containment areas used by workers shall have two (2) layers of 6 mil plastic attached to the top edges of the doorway and at opposite sides of the doorway to form a z-door.
 - Provide continuous 6 mil plastic floor runners into and out of work areas, secured in place with duct tape.
 - Provide and use 6 mil plastic bages to transport sash from the containment area to other areas in and around the premises.
 - All storm windows, windows and doors shall be closed to prevent the movement of lead dust and debris into or out of the building or work area.
 - All HVAC registers and vents shall be closed and covered with 6 mil plastic secured with duct tape.
 - Provide tacky mats where necessary to control tracking of debris and dust hazards.
 - Maintain a HEPA vacuum in the containment area to periodically clean up dust and debris generated during the course of work.

2.3 MATERIALS AND EQUIPMENT – LIMITATIONS ON USE

- A. Equipment and procedures not allowed.
- Do not use grinders, sandblasters, open flames, torches, power sanders, power washers or other abrasive type paint removal methods to remove paint or other coatings.
 - Do not use heat guns that provide temperatures above 1,100 degrees Fahrenheit.
 - Do not use solvents or chemical strippers that contain methylene chloride.
 - Do not dry sweep dust or debris in areas not properly contained and sealed.
 - Do not use standard house vacuums or shop vacuums that are not HEPA equipped.
 - Do not use any method that allows leaded dust to become airborne.
- B. Permissible methods and equipment.
- Wet scraping with a sharp scraping tool using a spray bottle with water to first wet the surface.
 - Wet sanding (by hand) using a spray bottle with water to first wet the surface.
 - The use of a power planer with a HEPA vacuum attachment to collect the dust and debris.
 - Using a heat gun with temperatures less than 1,100 degrees Fahrenheit.
 - Chemical methods which do not contain methylene chloride.

2.4 WORKING CONDITIONS

- A. Maintain a lead safe working environment.
- Do not allow excessive accumulation of dust and debris in work area.
 - Maintain containment area free of airborne construction dust.
 - Do not allow children, uncertified workers, building occupants or other unauthorized individuals to enter containment areas.
 - Do not allow tracking of dust and debris out of the containment areas. Tacky mats are required at any active unit entryways and outside of any contained work area.
 - Do not perform exterior lead-based paint removal when weather conditions are unacceptable. Exterior work is not permitted in adverse weather conditions such as strong winds, or in any condition that would allow lead dust and debris to cause a hazard or escape the containment area.

PART 3 – DISPOSAL AND CLEAN-UP

3.1 DISPOSAL

A. Disposal of painted components:

- Place construction debris in 6 mil plastic bags. Seal bags with duct tape.
- Debris too large for bags shall be wrapped in 6 mil plastic and secured with duct tape.
- Properly wrapped debris can be placed within the green garbage containers for City of Milwaukee pick-up.
- Items too large to fit in the green garbage carts should be neatly stored on the Owner's property in an area accessible for City of Milwaukee pick-up. If necessary Contractor shall call the City of Milwaukee, Department of Public Works Sanitation Division (414) 286-8282 for a special pick-up.
- For large quantities of debris, Contractor shall remove debris from property and dispose of debris at Contractor's expense.
- At the end of each work day, Contractor shall not leave more than six (6) unabated window sash at the property. Contractor is responsible for removing and properly disposing of these additional sashes at the Contractor's expense.

3.2 CLEAN-UP

A. Clean-up and removal of containment measures:

- All construction debris shall be wrapped and removed from the containment area.
- Clean and remove all unused materials, tools and power cords from containment area.
- Clean with a HEPA vacuum containment area to remove excessive paint chips and dust prior to removing containment measures.
- Remove containment from furniture, walls, etc. and carefully roll-up plastic and seal with duct tape.
- Remove containment from floors by carefully rolling up plastic to prevent lead dust and debris from becoming airborne. Seal plastic with duct tape.
- HEPA vacuum all surfaces including floors and windows after containment measures have been removed.

B. Contractor shall supply all materials, equipment and labor necessary to safely clean and prepare properties for lead (Pb) clearance testing.

- Use cleaning solutions mixed from water and standard household cleaning products.
- Use clean buckets and mops with disposable mop heads.
- Use disposable towels, rags, mop heads or sponges for cleaning and rinsing surfaces.

C. Washing and cleaning surfaces:

- All horizontal surfaces including floors and windows shall be washed and rinsed using a mixture of water, soap or other household cleaning solutions.
- Use a separate bucket for cleaning and a bucket for rinsing surfaces.
- Frequently change the cleaning and rinse solutions. Do not allow wash solution or rinse water to become saturated with dust and dirt.
- Frequently dispose dirty or saturated towels, rags, mop heads or sponges.
- Repeat wash and rinse process multiple times to assure that all residue and dust has been removed and surface will pass a clearance test.
- Carpeted floors shall be thoroughly HEPA vacuumed in one direction overlapping each row and repeated in a perpendicular direction.
- Walls and other vertical surfaces shall be washed as specified herein.
- Window glass shall be free of dust, dirt, streaks, spots, paint and excess glazing material.
- Used cleaning materials shall be disposed of in a plastic bag sealed with duct tape.

3.3 INSPECTION TOUCH-UP AND REPAIRS

- A. The Contractor is responsible for contacting the Milwaukee Health Department to schedule final inspections and clearance testing.
- All work involving the disturbance of painted or otherwise coated surfaces shall be completed prior to the final clearance test.
 - Clearance testing shall be scheduled with the Milwaukee Health Department – Lead Section (414) 286-5033 a minimum of 24 hours in advance.
 - The Contractor shall be responsible for contacting the Owner and (if applicable) tenant to schedule access to the building for clearance testing.
 - All cleaning and preparation work shall be completed a minimum of one hour prior to the scheduled clearance appointment.
 - The Contractor's abatement supervisor or other licensed representative shall be present during the final clearance test.

3.4 CLEARANCE

- A. The property must first pass a visual inspection by the Risk Assessor prior to clearance sampling.
- B. Clearance wipes samples will only be taken if the property passes the visual inspection.
- C. The Risk Assessor will determine the number, location and type (i.e. floor, sill, well, other) of clearance wipes taken.
- D. Clearance test results shall be provided to the Contractor by the Milwaukee Health Department Laboratory.
- Upon completion of the job and before final payment to the Contractor, the Contractor shall provide copies of all clearance results to both the owner and agency.
 - Contractor shall maintain copies of all clearance results.

3.5 CLEARANCE FAILURES

- A. Failure of visual inspection:
- Contractor, at Contractor's expense, shall make all necessary repairs as directed by the Risk Assessor upon failure of the visual inspection.
 - After completion of defects found during the visual inspection, Contractor shall reschedule final clearance testing as outlined herein.
- B. Failure of clearance test:
- Upon notification from Milwaukee Health Department – Lead Section of clearance failure(s), the Contractor shall re-clean the failed surface(s) and schedule another clearance test within 72 hours.
 - Contractor shall make all necessary arrangements for entry with the Owner and (if applicable) tenant for re-cleaning and clearance testing.
 - Contractor shall re-clean failed surface(s) at contractors expense.
 - Continued clearance failure(s) by the Contractor may result in citations, notification being sent to the State of Wisconsin Health and Family Services Lead Section and/or the levying of clearance testing and laboratory fees to the Contractor.

END OF SECTION – 01810 LEAD DUST HAZARD

DIVISION 2 – SITEWORK

02050 DEMOLITION

PART 1 – GENERAL

1.1 WORK

- A. Provide all related materials, equipment, and labor required to complete the work specified.
- B. Work involving the removal of painted or otherwise coated building components shall be in accordance with Section 01810 Lead Dust Hazards and as specified herein.
- C. Work involving the removal of asbestos or asbestos containing material shall be in accordance with Section 02080 Asbestos Removal and as specified herein.
- D. Demolition of garages shall be in accordance with the City of Milwaukee Code of Ordinances [Chapter 218] and as specified herein.

1.2 QUALITY OF WORK

- A. Provide experienced, well-trained workers competent to complete the work as specified.
- B. All work shall comply with governing building and safety codes and OSHA Worker Safety Regulations.

1.3 SUBMITTALS

- A. Contractor shall notify the Milwaukee Health Department (MHD) – Lead Section (414-286-5033) at least 24 hours prior to starting any demolition work that involves disturbance of painted or otherwise coated surfaces. MHD will assign a Lead Risk Assessor to monitor the work to document lead safe demolition procedures were followed.
- B. Contractor shall obtain a Raze Permit from the City of Milwaukee Department of City Development Permit Center (809 N. Broadway, 1st floor) prior to starting building demolition. This applies to dwelling units and garages.

PART 2 – MATERIALS

2.1 PROTECTIVE BARRIERS AND COVERS

- A. Provide demolition materials, barriers, protective covers, etc. to complete the work assigned.
- B. Install lead-based paint containment measures per Section 01810 Lead Dust Hazards and as specified herein when demolition will disturb painted or otherwise coated surfaces.
- C. Any asbestos or asbestos containing materials shall be removed from the structure, building components, etc. prior to the start of demolition in accordance with Section 02080 Asbestos Removal.

PART 3 – CONSTRUCTION

3.1 SITEWORK PREPARATION

- A. Protection of property:
 - Close all windows and doors adjacent to demolition work area.
 - Don't allow debris or dust to contaminate interior areas of building or adjacent property.
 - Locate any hidden utilities, electric, water, sewer, heat, etc. and disconnect or cap off utilities prior to start of demolition.
 - Provide sturdy barriers and covers as necessary for safety and to protect remaining work.
 - Provide braces or shores wherever structural elements will be removed in partial demolition.
 - Do not allow any dislodged materials to fall outside demolition area.
 - Protect all public areas and adjacent property with secure protective barriers.
 - Provide tree and shrub protectors.

- B. Demolish and remove all work indicated on Scope.
- Start demolition at top most level, and proceed downward.
 - Provide water supply and hoses for spray, to control dust.
- C. Cleanup:
- Completely control and remove all demolition debris, scraps, and dust.
 - Disposal of painted or otherwise coated debris and dust shall be per Section 01810 Lead Dust Hazards.
 - Properly wrapped debris can be placed in the green garbage containers for City of Milwaukee pick-up.
 - Items too large to fit in the green garbage carts should be neatly stored on the Owner's property in an area accessible for City of Milwaukee pick-up. If necessary Contractor shall call the City of Milwaukee, Department of Public Works Sanitation Division (414) 286-8282 for a special pick-up.
 - For large quantities of debris, Contractor shall remove debris from property and dispose of debris at Contractor's expense.

END OF SECTION – 02050 DEMOLITION

DIVISION 2 – SITEWORK

02080 ASBESTOS REMOVAL

PART 1 – GENERAL

1.1 WORK

- A. Work includes the removal of asbestos and asbestos containing materials in excess of 160 square feet or 260 lineal feet.
- B. Provide all related materials, equipment, and labor required to complete the work specified.

1.2 QUALITY OF WORK

- A. Provide experienced, well-trained and certified asbestos abatement supervisor and certified asbestos workers to complete the work.
- B. All work shall comply with the City of Milwaukee Code of Ordinances, Chapter 66, "Asbestos Hazard Control" regulations.
- C. Work shall also comply with State of Wisconsin Department of Natural Resources (DNR), Chapter NR 447 Asbestos Removal Regulations, Federal Environmental Protection Agency (EPA) Clean Air Act, and Occupational Safety and Health Administration (OSHA) worker safety codes and regulations.

1.3 SUBMITTALS

- A. When the asbestos removal is to occur in a building of three (3) or more dwelling units, the Contractor shall obtain an Asbestos Abatement Permit from the City of Milwaukee Department of City Development Permit Center (809 N. Broadway, 1st floor) prior to starting asbestos removal. This permit is not required for one and two family dwellings.
- B. When asbestos removal is subject to the provisions of this Section, notification shall be made to the State of Wisconsin DNR in accordance with Chapter NR 447.
- C. Contractor shall supply a detailed abatement plan along with their permit application to the City of Milwaukee Department of City Development Permit Center.
- D. Supply Agency with a copy of the Asbestos Abatement Permit.
- E. Contractor shall clearly post in plain view asbestos abatement warning signs outside of the entrance to containment areas.
- F. Contractor shall provide Owner and (if applicable) tenant a minimum of two (2) days advance notice prior to starting any asbestos removal.
- G. Contractor shall provide the Owner and the Agency with copies of:
 - All final clearance testing.
 - The waste disposal tickets and the Hazardous Waste Manifest from the Wisconsin DNR.

PART 2 – MATERIALS

2.1 PROTECTIVE BARRIERS AND COVERS

- A. Provide demolition materials, barriers, protective covers, etc. to complete the work assigned.
- B. Provide all necessary containment measures necessary to protect occupants, workers, and property.
- C. Install asbestos containment measures as required by State and Local regulations. See Section 01810 Lead Dust Hazards for additional containment information.

2.1 STANDARD TREATMENTS

- A. Remove asbestos containing materials as listed in the Scope.
 - Removal of pipe and duct wrap.
 - Removal of slate siding or roofing materials.
 - Building components containing pipe or duct wrap.
 - Flooring tile and/or flooring adhesives
 - Plaster, stucco and mastics.
- B. Stabilization of asbestos or asbestos containing materials as listed in the Scope.
 - Use an approved "Lockdown" product.
 - Use an approved enclosure or containment method.
- C. Prohibited practices:
 - Use of non-HEPA approved vacuum.
 - Dry removal methods such as scraping, sanding, or sweeping. Use only wet methods when disturbing asbestos and asbestos containing materials.
 - Asbestos debris shall not be stored on site unless it is properly protected in approved containment devices.
 - Creating asbestos hazards.
 - Disposal of asbestos and/or asbestos containing materials in City of Milwaukee trash containers.

PART 3 – CONSTRUCTION

3.1 SITEWORK PREPARATION AND CONTAINMENT

- A. Protection of property:
 - Close all windows and doors adjacent to asbestos removal work area.
 - Don't allow debris or dust to contaminate interior areas of building or adjacent property.
 - Locate any hidden utilities, electric, water, sewer, heat, etc. and disconnect, cover, or cap off utilities prior to start of asbestos removal.
 - Provide sturdy barriers and covers as necessary for safety and to protect remaining work.
 - Provide braces or shores wherever structural elements will be removed in partial demolition.
 - Do not allow any dislodged materials to fall outside the containment area.
- B. Provide all materials and equipment required to safely contain asbestos hazards.
 - Containment areas shall be constructed using 6 mil polyethylene and duct tape in such a fashion as to prevent the dispersion of asbestos dust and particles.
 - Cover ground or floor areas with two layers of 6 mil polyethylene.
 - Shut down forced air heating systems and seal all hot and cold air returns with 6 mil polyethylene and duct tape.
 - Cover and seal all surfaces not to be worked on in the containment area.
 - Entrances to containment areas used by workers shall have two (2) layers of 6 mil polyethylene attached to the top edges of the doorway and at opposite sides of the doorway to form a z-door.
 - Provide all necessary worker decontamination equipment.
- C. All containment measures shall be in place prior to the commencement of asbestos removal.

3.2 REMOVAL AND DISPOSAL

- A. Asbestos removal as indicated on Scope.
 - Start removal at top most level, and proceed downward.
 - Provide water supply and hoses for spray, to control dust.
 - Use wet methods for removal.
 - Do not allow excessive amounts of asbestos and asbestos containing materials to collect inside the containment area.
 - Properly wrap asbestos and asbestos containing materials in approved containers for disposal.

- B. Asbestos and asbestos containing materials shall be:
- Disposed of in properly labeled double 6 mil polyethylene bags sealed with duct tape.
 - Dumpsters shall be lined with 6 mil polyethylene to prevent asbestos dispersion during transportation.
 - Disposal shall be in compliance with State of Wisconsin DNR regulations.
 - No debris shall be stored outside the building while awaiting disposal.
 - Dumpsters shall be promptly removed from the site so as to prevent asbestos contamination.

3.3 CLEARANCE

- A. Daily cleanup:
- Use HEPA vacuuming and wet cleaning methods.
 - The work area shall be cleaned daily throughout the entire asbestos removal project.
 - The Contractor is responsible for preventing other areas in and around the containment area from becoming contaminated.
 - Exterior containment measures shall be removed and disposed in an approved manner of on a daily basis unless adequate measures have been taken to prevent unauthorized entrance to the contained areas and the containment measures are adequately protected from vandalism, weather conditions, etc.
- B. Final cleaning:
- Completely control and remove all asbestos, asbestos debris, etc.
 - Disposal of asbestos and asbestos containing materials shall be done in compliance with all Local and State regulations.
 - Final cleaning requires thorough HEPA vacuuming and wet washing followed by the use of lockdown to seal any fibers that may remain.
- C. A final clearance shall be conducted at the completion of the asbestos removal work.
- In the event of a final clearance failure, the Contractor shall at Contractor's expense shall provide all additional cleaning and preparation work necessary for re-testing.
 - The Contractor shall be responsible for the cost of additional final clearance testing including laboratory fees.
 - Contractor shall be responsible for all clean up of other areas contaminated as a result of Contractor's work.

END OF SECTION – 02080 ASBESTOS REMOVAL

DIVISION 2 – SITEWORK

02200 EXCAVATION, GRADING, AND BACKFILL

PART 1 – GENERAL

1.1 WORK

- A. Provide all related materials, equipment, and labor required to complete the work specified.
- B. All excavation, trenching, compaction, backfill, and landscaping shall be as listed in the Scope and as specified herein.

1.2 QUALITY OF WORK

- A. Provide experienced, well-trained workers competent to complete the work as specified.
- B. All work shall comply with governing building and safety codes.

1.3 SUBMITTALS

- A. Depending on the Scope, an erosion control permit maybe required. Contractor is required to obtain all required permits from the City of Milwaukee DCD Development Center (809 N. Broadway, 1st Floor) prior to starting any work.
- B. Contractor shall contact Diggers Hotline at 414-259-1181, or visit the Diggers Hotline website at www.diggershotline.com to request that the site be marked for underground utilities a minimum of three business days prior to starting any excavation work.
- C. When work involves excavation of public property, i.e. water or sewer connections, underground electrical lines, etc., the Contractor shall obtain all required permits and approvals from the City of Milwaukee Department of Public Works, Milwaukee Water Works, and/or WE energies prior to starting any work.

1.4 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
- B. Confirm there is no conflict between this work and work of other trades.
- C. Confirm that the work of other trades that must precede this work has been completed.

PART 2 – MATERIALS

2.1 FILL

- A. Fill materials shall be:
 - Uniform.
 - From an approved source.
 - Clean, free of debris or organic matter.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Protection:
 - Contact Diggers Hotline at least three business days prior to starting excavation work.
 - Protect overhead lines from damage by trucks and cranes.
 - If utility lines are damaged, they shall be repaired or replaced at the Contractor's expense.
 - Existing utilities that will interfere with construction shall be relocated.
 - Provide all necessary shoring and bracing as required by site conditions.
 - Provide temporary drains and/or pumps to remove ground and rain water.

- B. Contractor shall put in place all necessary erosion control measures as required by State and local building codes.

3.2 GRADING AND EXCAVATION

- A. Grade and excavate to lines, grades, and elevations as listed in the Scope and as specified herein.
B. Grading for slabs shall be level and not crowned toward center portion of slab.
C. Topsoil shall be placed at a depth of no less than 6 inches.
- Topsoil shall be clean, free of rock and debris.
 - Topsoil removed from building perimeter shall be removed from the site and properly disposed of by the Contractor. Do not reuse this topsoil.

3.3 EXCAVATION

- A. Excavate areas required to complete the work as listed in the Scope, and as specified herein.
- Footings shall be excavated to a depth of 4 feet below finished ground elevation.
 - Footing size shall be as required by building code.
- B. Excavation control:
- Contact the Department of Neighborhood Services construction inspector at 286-2513 for all necessary inspections prior to pouring footing concrete.
 - Keep footing and foundation trenches uniform in width and direction.
 - Clean excavations of debris and loose dirt, and keep clean before pouring concrete.
 - Immediately remove dirt, rock, or other debris that spills onto paving or planting areas.
 - Take frequent measurements to prevent over-excavation.
 - Provide temporary drainage as necessary to prevent ponding, erosion, or spillover.

3.4 SITE MAINTENANCE DURING EXCAVATION AND GRADING

- A. Control excavation dust:
- With water spray.
 - Through controlled demolition.
 - Using and installing approved barriers.
 - No dust shall be allowed to blow onto the neighboring property.
- B. Cleaning:
- Do frequent and thorough cleanups.
 - Identify potentially harmful substances that might be uncovered during excavation.
 - Handle potentially harmful substances strictly according to governing regulations.
 - Contact the Milwaukee Health Department Lead Section at 286-5033 when suspected lead soil hazards will be disturbed.
 - Excavation and grading work shall be in compliance with Section 01810 Lead Dust Hazards and as directed by Milwaukee Health Department.
 - Suspected hazardous substances shall be removed from the site as per the governing regulations.

3.5 BACKFILL AND COMPACTION

- A. Before backfilling:
- All inspections must be completed and approved.
 - Drains, drain tile, etc. shall be installed, inspected, and approved.
 - All exterior waterproofing has been completed, inspected, and approved.
 - Exterior foundation insulation has been installed (if required).
 - All formwork shall be removed.
 - All trash and debris shall be removed.
- B. Perform backfill and compaction in a systematic pattern, to assure complete and consistent work.
- If any over excavation accidentally occurs, correct it with well-compacted backfill.
 - Fill and thoroughly compact holes from root and stump removal pits.
 - Do not allow any debris to be mixed with the fill.

- C. Protect foundation and retaining walls during backfilling.
 - Brace foundation or retaining walls to prevent damage from backfilling.
 - Do not allow damage to waterproofing or wall insulation board from backfilling.

3.6 SUBGRADE PREPARATION FOR PAVING

- A. Provide graded slopes as required for:
 - Positive pavement slopes as required for driveways, patios, garages, walks, etc.
 - Backfill in layers, and thoroughly compact trenches or pits beneath paving.
 - Install base course firmly, and wet it down prior to concrete application.

3.7 SURFACE DRAINAGE

- A. Provide drainage catchers for roof water as well as surface runoff.
- B. Provide surface storm drainage free of impediments to smooth drain flow.
 - Continuous
 - No narrow restrictions
 - No barriers
 - No sharp changes in direction
 - No sharp drops in grade
 - No level areas or depressions
- C. Provide erosion control measures as required by State and local building codes.

3.8 REPAIR AND CLEANUP

- A. Repair or replace work not in compliance with the Scope or these Specifications.
 - Repairs shall be made at the direction of the Inspector.
 - Repairs shall be made at the Contractor's expense.
- B. Contractor is responsible for removal of all debris and excess material from site.
- C. Landscape disturbed areas as indicated in the Scope and as specified in Section 02900 Landscaping.

END OF SECTION – 02200 EXCAVATION, GRADING, AND BACKFILL

DIVISION 2 – SITEWORK

02510 CONCRETE

PART 1 – GENERAL

1.1 WORK

- A. Provide all related materials, equipment, and labor required to complete the work specified.
- B. Demolition and removal of existing concrete shall be in accordance with Section 02050 Demolition and as specified herein.
- C. All excavation, trenching, compaction, backfill, and landscaping shall be as listed in the Scope and as specified herein.

1.2 QUALITY OF WORK

- A. Provide experienced, well-trained workers competent to complete the work as specified.
- B. Concrete shall be from manufacturers and suppliers who specialize in concrete products.

1.3 SUBMITTALS

- A. Depending on the Scope, a building permit maybe required. Contractor is required to obtain all required permits from the City of Milwaukee DCD Development Center (809 N. Broadway, 1st Floor) prior to starting any work.
- B. When concrete work involves paving in publicly owned areas (i.e. driveway aprons, curb cuts, carriage walks, etc.) the Contractor shall obtain all required permits and approvals from the City of Milwaukee Department of Public Works prior to starting any work.
- C. Contractor shall contact the City of Milwaukee Department of Neighborhood Services at 286-2513 for all necessary inspections prior to pouring concrete.
- D. Supply Agency with a copy of the concrete delivery ticket from concrete supplier showing the concrete mix delivered to the job site.
- E. Contractor shall, upon request of the Inspector, submit manufacturer's specifications to prove compliance with these Specifications.

1.4 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
- B. Confirm there is no conflict between this work and work of other trades.
- C. Confirm that the work of other trades that must precede this work has been completed.
- D. At all stairways to porches, service walk steps, stoops, door entrances, etc. confirm finished riser height will be uniform throughout stairway and within code allowed maximum (8 inches).

PART 2 – MATERIALS

2.1 CONCRETE FLAT WORK

A. Concrete:

- Contractor shall supply ready-mixed concrete in compliance with ASTM C 94.
- On-site mixed concrete will conform to ASTM C 685.
- Concrete shall have a 28 day compressive strength as follows:
 - Walks, steps, garbage can and storage area slabs: 3500 psi
 - Parking slabs and driveways: 4000 psi
 - Retaining walls: 4000 psi
 - Foundations and footings: 3500 psi
 - Interior slabs: 3000 psi
- No admixtures or curing materials will be allowed unless specifically approved for use by the concrete manufacturer.
- Ready-mixed concrete shall be delivered to the site of the work and be completely discharged from the transporting vehicle within 1-½ hours.

B. Forms:

- Provide metal or wood formwork for borders and curbs with profiles to match required concrete thickness.
- Earth forms are not permitted for paving.
- Formwork shall be installed to replicate layout of the concrete that was removed, in accordance with the Scope, and as specified herein.

C. Concrete reinforcing:

- Use number 10 welded wire mesh, plain type in coiled rolls, unfinished.
- Use rebar where required, number 3 or larger as required by code.

D. Aggregate:

- Maximum size is ¾", compacted to 95%.
- Sub-base aggregate to depth as listed:
 - Walks, steps, garbage can and storage area slabs: 3 inches
 - Parking slabs and driveways: 4 inches
 - Interior slabs: 4 inches

PART 3 – CONSTRUCTION

3.1 SITEWORK PREPARATION

- A. Remove and dispose of existing concrete as indicated in the Scope.
- B. Provide demolition materials, barriers, protective covers, etc. to complete the work assigned.
- C. All demolition work shall be in accordance with Section 02050 Demolition.
- D. Install lead-based paint containment measures per Section 01810 Lead Dust Hazards and as specified herein when demolition will disturb painted or otherwise coated surfaces.
- E. Contractor shall take all necessary precautions to minimize damage to surrounding yard and landscaping.
- F. Examine site conditions and correct any conditions detrimental to the work.
 - Do not do work when new paving might be harmed by rain, snow or low temperatures.
 - Concrete shall be protected from frost or rapid drying.
 - Concrete shall not be placed on frozen ground or when temperature is below 32 degrees Fahrenheit or will be below 32 degrees within 72 hours.
 - Verify that all necessary sub-grade preparation is completed.
 - Keep area free of scraps, trash, and organic matter.

- G. Install related work before concrete pour, and protect from damage.
- Formwork
 - Anchors
 - Baseplates
 - Inserts
 - Bolts
 - Expansion joints
 - Sleeves for bollards and fence posts
 - Utility boxes
 - Drains
 - Electrical conduit or boxes
 - Pipe and plumbing
 - Separation joints
 - Headers/screeds
- H. Contractor shall make all repairs necessary to restore owner's property and any adjacent properties damaged as a result of the contractor's work.

3.2 EXCAVATION

- A. Excavate areas as listed in the Scope, Section 02200 Excavation, Grading and Backfill and as specified herein.
- B. Contractor is responsible for contacting the building construction inspector for all applicable inspections and approvals prior to pouring concrete.

3.3 AGGREGATE

- A. Install aggregate to specified depth.
- Granular shall be clean mineral aggregate.
- B. Compact aggregate as specified in Section 02200 Excavation, Grading and Backfill and as specified herein.

3.4 FORMS

- A. Construct forms to the exact sizes, shapes, lines and dimensions as listed in the Scope or specified herein.
- Construct and brace forms to maintain work in correct line, proper grade height, and pitch.
 - Install screed boards at correct height for paving thickness.
 - Construct forms for all exposed concrete surfaces with smooth faced materials to provide continuous, straight, smooth surfaces.
 - Furnish forms in the largest practicable sizes to minimize the number of joints.
 - Secure forms against dislocation during concrete pour.
 - Forms shall be of sufficient thickness and strength to withstand pressure of newly placed concrete without excessive and objectionable bow or deflection.
 - Design and build forms to adequately and safely support vertical and lateral loads that might be applied.
 - Provide form-coating compounds that will not bond with, stain, or adversely affect concrete surfaces or impede the wetting of surfaces to be cured with water.
 - Provide form work sufficiently tight to prevent leakage of cement during concrete placement.
 - Provide for all openings, offsets, sinkages, keyway recesses, moldings, reglets, chamfers, blocking, bulkheads, anchorages, inserts, and other features.
 - Avoid small or angular concrete paving sections, or install extra reinforcing to prevent cracking.
- B. Formwork shall be installed to duplicate as closely as possible the size and configuration of original concrete footprint as listed in the Scope, and as specified herein.

- C. Fabricate forms for easy removal without hammering or prying against concrete surfaces.
 - Form work not supporting concrete may be removed after cumulatively curing at not less than 50 degrees Fahrenheit for at least 24 hours after placing concrete, providing that concrete is sufficiently hard to not be damaged by form removal operation.
 - Other formwork may not be removed in less than 14 days or until concrete has attained design minimum 28-day compressive strength.
 - After removal of forms restore finish grade as outlined in Section 02200 Excavation, Grading and Backfill.
 - Finish grading shall be flush with top of the slab, providing for proper drainage and eliminating any trip hazards.
- D. Side forms of footings may be omitted and concrete placed directly against excavation provided an additional one (1) inch of concrete is added to each side of the minimum required footing size.

3.5 CONCRETE PLACEMENT

- A. Provide protection (i.e. plastic, plywood sheets, etc.) to ensure nearby walls, buildings, porches, doors, windows, etc. are not sprayed or splashed with concrete during pour or subsequent concrete finishing work.
- B. Verify concrete supplier mix is certified for proportions.
 - Don't allow trucks to wait beyond the time limits before pour.
 - Don't allow unauthorized watering; do not over-water.
 - Don't permit segregation.
 - Verify that visual slump is correct.
 - Do compaction, consolidation, and vibration as required.
 - Deposit concrete continuously or as to avoid placing concrete on or adjacent to concrete which has hardened sufficiently to cause formation of seams or planes of weakness within the section.
- C. Provide movement and relief joints in locations, depths, and widths as detailed;
 - At contact of pavement with other work.
 - For thermal expansion/contraction.
 - To control movement and settlement cracks.
 - At breaks in the construction sequence.
 - Make joint lines straight and uniform.
 - Coordinate and align sawn joint work with other work.
- D. Concrete shall be placed in accordance with the Scope as specified herein.
 - Walks: 4 inch thick with control joints 5'-0" on center. Width of walks shall be as indicated in Scope. Concrete may be poured on undisturbed soil. If soil is disturbed provide 3" thick compacted sand or gravel aggregate.
 - Parking slabs/driveways: 4 inch thick with control joints every 400 square feet. Wire mesh reinforcement required.
 - Interior slabs on grade: 4 inch thick with control joints every 400 square feet. Wire mesh reinforcement and vapor barrier required.
 - Steps and stoops: Minimum of 4 inch thick with control joints at building and at walks and slabs surrounding the steps or stoop. Step treads shall be uniform in rise and run with rounded nosings. Maximum riser height is 8 inches and minimum tread size is 9 inches. In addition all treads and risers shall conform to the following formula, 2 risers heights + 1 tread length = 24 to 25 inches. Treads to receive fine broom finish.
 - Footings shall be placed on undisturbed soil, free of organic material at a depth of 4 feet below grade, sized and reinforced as required by building code.
 - Retaining walls shall be designed to sustain required loads. Concrete shall be vibrated during placement. Retaining walls in excess of 3' in height or longer than 24' in length shall include plastic drain tile inside the perimeter of the wall with 6" of gravel above the drain tile. Bleeders shall be provided for drain tile installations.
- E. Finished concrete flat work shall be free of depressions or low spots to prevent the pooling of water. Concrete shall be pitched 1/8" per foot to shed water.

3.6 CURING

A. Curing

- Start curing procedures promptly after pour, to protect concrete from premature drying.
- Control curing methods, covers, and wetting, with special attention to weather conditions.
- Use proper wet spray or moist curing methods as required and as appropriate to weather.
- Where formwork is exposed to sun, maintain moisture on formwork until removal.

3.7 FINISHING

A. Match up finish work to adjacent or nearby surfaces at:

- Joints.
- Edges.
- Corners.

B. Joints:

- Coordinate sawn joints, to keep all joints straight and continuous.
- Keep joint lines uniform and free of damage.
- Do not make any cuts in finished concrete that might affect structural integrity or strength.

C. Floating, troweling, and special finishes shall be as indicated on the Scope or as specified herein.

- A medium broom finish across traffic path is required for exterior concrete work such as sidewalks, patios, driveways, driveway aprons, etc.
- Troweled finish is required for interior concrete floors in basements, enclosures, or living areas.
- A non-slip finish for steps, landings, platforms, and ramps.
- Do not begin floating until bleed water is gone.
- Do not over-trowel.
- Do not dust cement to expedite troweling start time.
- Remove any marks left by finishing tools.

3.8 PROTECTION AND COMPLETION

A. Curing, protection, and sealing:

- Protect concrete from heat or cold, to maintain temperature between 50 and 70 degrees Fahrenheit.
- Protect concrete from inclement weather or running water.
- Protect concrete from damage caused by construction equipment.
- Protect concrete from shock.
- Protect concrete from movement or vibration.
- Protect concrete from load stress.
- Protect fresh slab work from foot or traffic damage.
- Seal concrete surfaces as recommended by concrete supplier.

3.9 REPAIR AND CLEANUP

A. Repair or replace work not in compliance with the Scope or these Specifications.

- Repairs shall be made at the direction of the Inspector.
- Repairs shall be made at the Contractor's expense.

B. Clean work surfaces, and completely remove debris and excess material from site.

- Contractor is responsible for cleaning, removing, and repairing any surfaces sprayed or splashed with concrete, or otherwise damaged as a result of the Contractor's work.

C. Backfill as indicated on the Scope and as specified in Section 02200 Excavation, Grading, and Backfill.

D. Landscape disturbed areas as indicated in the Scope and as specified in Section 02900 Landscaping.

END OF SECTION – 02510 CONCRETE

DIVISION 2 – SITEWORK

02900 LANDSCAPING

PART 1 – GENERAL

1.1 WORK

- A. Provide and install trees, plants, and ground cover as listed on the Scope and as specified herein.
- B. Provide all related materials, equipment, and labor required to complete the work as specified.

1.2 QUALITY OF WORK

- A. Provide experienced, well-trained workers competent to complete the work as specified.
- B. Use products from a supplier who specializes in landscaping materials.
- C. All work shall comply with governing building and safety codes.

1.3 SUBMITTALS

- A. Submit a list of materials to be provided for this work.
- B. Submit supplier's planting and care instructions to Owner.

1.4 MATERIALS HANDLING

- A. Provide all materials required to complete the work as listed on the Scope and as specified herein.
 - Deliver, store, and transport materials to avoid damage to the product or to any other work.
 - Return any materials delivered in an unsatisfactory condition.
 - Materials delivered will be certified by the supplier to be as specified.
- B. Store materials in a safe, secure location, protected from weather.

1.5 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
- B. Confirm there is no conflict between this work and work of other trades.
- C. Confirm that the work of other trades that must precede this work has been completed.

PART 2 – MATERIALS

2.1 PLANTS, SOD, AND RELATED MATERIALS

- A. Provide plants, and related materials from a fully qualified plant supply nursery.
- B. Provide approved grade cultivated grass sod with a strong fibrous root system; machine cut with a ½ to 1 inch topsoil base.
- C. Provide and install fertilizer per supplier's instructions.

PART 3 – LANDSCAPE INSTALLATION

3.1 COORDINATION AND PREPARATION

- A. Coordinate planting with other site improvements installed or not yet installed.
 - Contact Diggers Hotline at least three days prior to starting any excavation work required for trees, shrubbery, or other plantings.
 - Provide topsoil as per instructions of plant supplier and as specified in Section 02200 Excavation, Grading, and Backfill.
 - Till and loosen subsoil, to bond with topsoil.

3.2 PLANTING PROCEDURES

- A. Prepare soil, provide water, and install plants according to the instructions of the plant supplier.
- B. Protect plantings from damage according to suppliers instructions and from:
 - Foot or machine traffic.
 - Other construction activities.

3.3 WARRANTY AND REPLACEMENT

- A. Contractor shall warrant and if necessary replace any trees or shrubbery that die as a result of improper handling or installation.
- B. Contractor is responsible for removal of all debris and excess material from site.
- C. Contractor shall not be responsible for plantings including grass seed or sod that fails to germinate or grow as a result of Owner neglect.
- D. Owner is responsible for following supplier's instructions for watering and caring for new plantings.
 - New grass seed shall be watered per supplier's instructions.
 - Newly installed sod shall be watered as necessary and according to supplier's instructions.
 - New plantings including grass seed and sod shall be protected from foot and other traffic.

END OF SECTION – 02900 LANDSCAPING

DIVISION 4 – MASONRY

04000 MASONRY

PART 1 – GENERAL

1.1 WORK

- A. Provide all related materials, equipment, and labor required to complete the work specified.
- B. Demolition and removal of existing masonry shall be in accordance with Section 02050 Demolition and as specified herein.
- C. All excavation, trenching, compaction, backfill, and landscaping shall be as listed in the Scope and as specified in Section 02200 Excavation, Grading, and Backfill, and as specified herein.

1.2 QUALITY OF WORK

- A. Provide experienced, well-trained workers competent to complete the work as specified.
- B. All masonry materials shall be new from manufacturers and suppliers who specialize in masonry products.

1.3 SUBMITTALS

- A. Depending on the work listed in Scope, a building permit may be required. Contractor is responsible for obtaining all required permits from the City of Milwaukee DCD Development Center (809 N. Broadway, 1st Floor) prior to starting any work.
- B. Contractor shall, upon request of the Inspector, submit manufacturer's specifications to prove compliance with these Specifications.

1.4 MATERIALS HANDLING

- A. Deliver, store, and transport materials to avoid damage to the product or to any other work.
 - Return any product or materials delivered in a damaged or unsatisfactory condition.
- B. Store masonry materials:
 - Supported off the ground.
 - Protected from weather or moisture.
 - Protected from occupant and construction traffic.
 - Stored neatly with level support to prevent toppling.
 - Store metal connectors and fasteners in a dry location safe from physical damage.

1.5 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
- B. Confirm there is no conflict between this work and work of other trades.

PART 2 – MATERIALS

2.1 MORTAR

- A. Mortar as per manufacturer's instructions and as specified herein:
 - Type S.
 - Type M mortar for below grade applications
 - One part Portland cement.
 - One-half part lime.
 - Not more than four and one half parts sand, measured damp and loose.
 - Compressive strength of 1800 psi at 28 days.
- B. Masonry used below grade or subject to high lateral or compressive loads or severe frost should use Type M mortar, high strength mortar with 2500 psi compressive strength.

- C. No admixtures or curing materials will be allowed unless specifically approved for use by the mortar manufacturer.
- D. Mortar materials:
 - Portland cement: Type I or II.
 - Aggregate: Clean, sharp sand.
 - Lime: Hydrated Type S.
 - Water: Clean and potable.

2.2 ACCESSORIES AND OTHER RELATED MATERIALS

- A. Install reinforcing and anchoring as required by code and as specified herein:
 - Reinforcing bars: Grade 40, or as approved by the building code.
 - Deformed bars for No. 3 and larger.
 - Single wythe joint reinforcement: Truss type.
 - Multiple wythe joint reinforcement: Truss type with moisture drip.
 - Joint reinforcement: Unprotected cold-drawn steel.
 - Strap anchors: Bent steel, ¼" thick, galvanized.
 - Sheet metal wall ties: Corrugated galvanized steel.
 - Steel wire wall ties: Galvanized steel-formed wire.
 - Dovetail anchors: Bent strap, ¼" thick galvanized steel.
- B. All flashing shall be non-corrosive sheet metal.

2.3 BRICK MASONRY

- A. Provide brick masonry as listed in the Scope and as specified herein.
- B. New brick type, grade, and size shall match as closely as possible to original brick.
- C. Major brick foundation wall, facade, and column replacement shall require new brick as specified herein.
- D. Brick masonry may be reused provided:
 - Reused brick shall only be used for repairing or patching small areas of foundations, facade, guardrails, retaining walls, etc.
 - Reused brick is whole, intact and free of cracks or other defects.
 - Reused brick is cleaned prior to installation by completely removing old mortar and debris.

2.4 CONCRETE UNIT MASONRY (BLOCK)

- A. Provide new concrete unit masonry as listed in the Scope and as specified herein.
- B. Concrete unit masonry used for load bearing shall comply with the following:
 - Grade and type shall be: Hollow, load-bearing units Grade N, Type I, Medium Weight.
 - Pattern and size to match as closely as possible to original.

PART 3 – CONSTRUCTION AND INSTALLATION

3.1 WORK PREPARATION AND CONDITIONS

- A. All demolition work shall be in accordance with Section 02050 Demolition and as specified herein.
 - Remove and dispose of existing masonry as indicated in the Scope.
 - Provide demolition materials, barriers, protective covers, etc. to complete the work assigned.
 - Install lead-based paint containment measures per Section 01810 Lead Dust Hazards and as specified herein when demolition will disturb painted or otherwise coated surfaces.
 - Contractor shall take all necessary precautions to minimize damage to building, other work and surrounding areas of the building, yard, etc.
- B. Examine site conditions and correct any conditions detrimental to the work.
 - Do not do work when masonry might be harmed by rain, snow or low temperatures.
 - Verify that all necessary sub-grade preparation is completed.
 - Protect concrete masonry units from moisture, and keep them dry during installation.

C. Cold weather:

- Masonry work shall be protected from frost or rapid drying.
- No masonry or concrete footings shall be placed on or with frozen materials. Before placing masonry on older work, apply heat in such a manner that frost, ice, snow will be completely removed and temperature of the surface is brought to a minimum temperature of 50 degrees F. Spreading of salts or chemicals on older work to remove ice and snow is not permitted.
- After the first frost and until the mean daily temperature falls below 40 degrees Fahrenheit for more than one day, freshly laid masonry shall be protected from freezing for not less than 72 hours after it is laid. Similarly protect in the spring.
- No masonry shall be laid when the temperature outside is below 40 degrees Fahrenheit, unless suitable means are provided and used to heat the newly completed work against damage or defacement from frost or freezing.
- When outside temperature drops below 40 degrees Fahrenheit, all masonry units and mortar intended for use shall be heated to a minimum temperature of 50 degrees F. and used when at a temperature of between 40 to 60 degrees F. The temperature of the separate mixing materials shall not exceed 150 degrees F.
- Masonry sand shall be heated to at least the minimum mortar temperature required above. The sand shall be heated slowly and evenly to prevent scorching. Scorched sand shall not be used in mortar.
- No anti-freeze or other ingredients shall be used to lower the freezing temperature of mortars. Admixtures except for those specified by the manufacturer are not allowed.
- All newly placed masonry shall be kept from freezing for a period of at least 72 hours (3 days) after it is laid.
- The Contractor shall supply temporary enclosures, artificial heat and such other protective methods as needed to protect masonry from cold temperatures.
- The Contractor is responsible for danger to workers and carbonization of masonry and concrete resulting from the use of salamanders or other heating devices, which directly exhaust CO gases.

3.2 WORK LAYOUT AND PREPARATION

A. Examine and layout work to establish and assure correct:

- Coursing and patterns.
- Elevation of base course.
- Opening sizes and locations.
- Sill and header heights and sizes.
- Location and sizing of beam pockets, or other openings.

B. Check and if necessary correct building structural members that support masonry to assure they are:

- Correctly located.
- Plumb.
- Aligned.
- Braced.
- Clean.

C. Install attachments that support masonry as required by building code or as specified herein.

D. Put in place, anchor, plumb and level metal work that will be embedded in masonry:

- Angles.
- Lintels.
- Bucks and frames.

E. Put appurtenances in place, anchoring them and protecting them from damage.

- Flashing and counter flashing.
- Expansion felt.
- Piping and conduit.
- Ductwork.
- Sleeves.

3.3 UNIT MASONRY INSTALLATION AND MORTAR APPLICATION

- A. Lay masonry plumb, level, square, and true to line, matching existing workmanship, joints and bond.
 - Rebuild walls, etc. to match the original design.
 - Lay out work so minimum cutting is required, using only whole brick or block where possible.
 - Where cutting is necessary, cut brick or block to neat, true line without chips on exposed faces.
 - Conceal cut faces where possible.
 - Do not lay brick or block less than ¼" in length in exposed work.
 - If any brick or block must be removed or shifted after it has been laid, remove setting mortar, clean brick or block thoroughly, apply fresh mortar and re-lay.
 - Solidly fill with mortar intersections between bricks or blocks and other materials.
 - Solidly fill joints and line pin holes.
- B. When brick or block laying has been delayed for more than one hour, clean masonry of exposed mortar, then wet by water spray when necessary.
- C. Amount of wetting depends on rate of absorption of brick or block at time of laying.
 - When being laid, brick or block shall have a suction sufficient to hold mortar and absorb excess moisture, yet leave mortar sufficiently damp so it remains plastic enough to permit brick to be leveled and plumbed after being laid without breaking mortar bond.
- D. Mortar joints:
 - Do mortar applications promptly.
 - Construct mortar joint sizes to match original joint style.
 - Provide full head and bed joints.
 - Properly butter masonry unit edges.
 - Completely fill joints: bed, cross, end, and head.
 - Do not tool joints prematurely before initial mortar set.
 - Tool joints without damaging mortar.
 - Promptly point holes, such as for line nails, as work proceeds.
 - Fully bed copings, blocks, and caps, and completely point joints.
 - Remove wedges as work progresses.
 - Repair defective units as work progresses.
 - Completely fill and level bed joints on lintels.
 - Lay brick or block courses in reference to a level line.
 - Align and plumb vertical joint lines in alternate courses.
 - Keep wall face plumb and aligned story by story.
- E. Install caulking, control joints, lintels, and flashing as listed in the Scope, required in building code, and as specified herein.
 - Keep caulking spaces at window and doorframes uniform and of acceptable size.
 - Keep spaces for expansion/contraction control joints uniform and of acceptable size.
 - Recess window and door lintels from face of wall.
 - Tightly mortar chimney, parapet wall or other flashings into masonry work.
 - Repoint counterflashing after roofers have turned it back over base flashing.

3.4 TUCKPOINTING BRICK AND BLOCK

- A. Rake clean all mortar joints that are cracked and/or deteriorated as listed in the Scope.
 - Rake clean to a point where solid, but to a minimum of ½ inch deep.
 - Tuckpoint cleaned joints with new mortar.
 - Strike all mortar joints to match existing joint style.
- B. Mortar (Type S or M) should be as listed herein.
 - Mortar color shall match as closely as possible to existing.

3.5 MASONRY ACCESSORIES AND REINFORCING

- A. Provide and install metal ties for bonding as required by building code and as specified herein.
 - Assure compliance in types, sizes, spacing, depth of anchoring, and corrosion resistance.

3.6 FOUNDATION PARING AND WATERPROOFING

- A. Parge and waterproof foundation walls as listed in the Scope, required by the building code, or specified herein.
 - Parging shall be smooth, consistent, and provide full coverage.
 - Parge or otherwise treat walls as required to receive backfill.
 - Do not backfill prior to proper curing of parging.
 - Use waterproofing manufacturer's recommended curing procedures.
- B. Backfill as indicated on the Scope and as specified in Section 02200 Excavation, Grading, and Backfill.

3.7 WORK PROTECTION AND CLEANING

- A. Clean all surfaces during work and immediately upon completion:
 - Don't allow mortar to enter expansion joints.
 - Don't allow any mortar droppings on sills, copings, and projecting courses.
 - Scrape mortar extrusions off inside wall.
 - Clean mortar droppings from brick, anchors and straps, to avoid water bridges.
 - Clean or replace any finished brick or block damaged by spilled concrete or mortar.
- B. Clean work site, and completely remove debris and excess material from site.

3.8 REPAIR

- A. After installation, inspect all work for improper installation or damage.
- B. Repair or replace work not in compliance with the Scope or these Specifications.
 - Repairs shall be made at the direction of the Inspector.
 - Repairs shall be made at the Contractor's expense.
 - Repair work should be undetectable.
- C. Contractor shall make all repairs necessary to restore Owner's property and any adjacent properties damaged as a result of the Contractor's work.

END OF SECTION – 04000 MASONRY

DIVISION 6 – WOOD AND PLASTIC

06010 LUMBER AND ROUGH CARPENTRY

PART 1 – GENERAL

1.1 WORK

- A. Provide and install all wood framing and finish carpentry necessary to complete the work listed on the Scope and specified herein.
- B. Where additional instruction is required, work shall be as directed by the Inspector.
- C. When rough carpentry work involves removal or disturbance of painted or otherwise coated surfaces, the Contractor shall comply with Section 02050 Demolition and Section 01810 Lead Dust Hazards.
- D. Work includes all lumber, connectors, and related hardware and materials.

1.2 QUALITY STANDARDS

- A. Provide skilled, trained, experienced and competent workers to complete the work as specified.
 - Capable of handling any special heavy-duty or high-lift operations.
 - Sufficient in number for the work and time schedule.
- B. All work shall be as per State and local building codes and:
 - Manual for Wood Frame Construction, American Forest and Paper Association (NFPA), © 2001.
 - Plywood Specifications and Grade Guide of the American Plywood Association.
- C. Tolerances:
 - Vertical framing shall be plumb within ¼" per 10 linear feet.
 - Horizontal framing shall be level within ¼" per 10 linear feet.
- D. Moisture contents:
 - Moisture content of framing lumber shall be 19% or less by weight.
 - Kiln-dried or other lumber requiring lower moisture content shall be as specified.
- E. Grading:
 - Follow applicable lumber grading agency standards in accepting or rejecting delivered lumber.
 - American Forest and Paper Association (NFPA), © 2001, Appendix B.
 - Plywood Specifications and Grade Guide of the American Plywood Association.
 - Reject special lumber that is required when it is not marked and certified as kiln-dried or Preservative-treated.

1.3 SUBMITTALS

- A. Submit copies of all permits to both Owner and Agency.
 - Submit manufacturer's data required to prove compliance with these Specifications.
 - Submit copies to both Owner and Agency of all engineering data for any engineered building components, i.e. beams, columns, trusses, etc.

1.4 MATERIALS HANDLING AND STORAGE

- A. Delivery and inspection:
 - Reject any framing lumber that is not grade-stamped by a bona fide grading agency.
 - Do not accept or use lumber that has excessive: Moisture content, loose knots, decay streaks, rot, insect damage, splits, pitch pockets, waness, crooks, warps, twists, or bends.
 - Do not accept or use wood panels that deviate from grade standards or have excessive: Marred surfaces, cracks, defective patches, loose knots, split edges, or delaminations.
 - Materials and products delivered will be certified by the manufacturer to be as specified.
- B. Handling:
 - Handle lumber to avoid damage during transport, unloading, and moving on the job site.
 - Handle chemically treated lumber and panels strictly according to manufacturers' instructions.

- C. Store framing lumber and wood panels to prevent damage.
 - Well supported off the ground.
 - Protected from weather or moisture.
 - Neatly stacked to prevent warping.
 - Stacked with cross pieces for ventilation.
 - Protected from occupant and construction traffic.
 - Stored with level support to prevent toppling.
 - Store metal connectors and fasteners in a dry location safe from physical damage.
 - Store chemically treated lumber and wood panels outdoors until installation.

PART 2 – MATERIALS

2.1 FASTENERS, CONNECTORS, AND SUPPORTS

- A. Use hot-dipped galvanized steel or stainless steel nails for exterior, high humidity, and treated wood locations.
- B. Nails:
 - Use common wire or spike nails.
 - Follow all nail size requirements and nail spacings required by the building code.
 - Use hot-dipped galvanized steel nails for exterior work, areas of high humidity or at treated wood.
 - Electro-galvanized nails shall not be used on exterior surfaces.
 - Electro-galvanized nails shall not be used where corrosive staining might mar wood surfaces.
 - Nails into redwood or cedar shall be of stainless steel.
- C. Power-driven nailing shall comply with the following:
 - Power driven nailing shall comply with State and Local building code standards.
 - International Staple, Nail and Tool Association (<http://isanta.org/>) standards as outlined in the ICC Evaluation Services, Inc. (www.icc-es.org) Legacy Report (NER-272), © January 1, 2004.
- D. Bolts
 - Drill holes 1/16" larger than bolt diameters.
 - Drill straight through from one side.
 - Use washers under all nuts.
 - Do not bear bolt heads on wood; use washers.
- E. Hangers, connectors, and crossbridging.
 - Brand name Teco, Simpson, or equal.
 - Joist hangers
 - Metal framing connectors.
 - Metal crossbridging.
 - Galvanized steel, sized to suit framing.
- F. Anchors to adjacent construction:
 - Hollow masonry: Use toggle bolt.
 - Solid masonry or concrete: Use expansion shield and lag bolt.
 - Steel: Use bolt or ballistic fastener.

2.2 LUMBER

- A. Select lumber species and grade according to the design needs. Framing lumber shall be grade marked designed for Construction, Standard, or Stud use.
- B. Pressure treated lumber shall be labeled to show conformance with AWPA C22-03 "Lumber and Plywood for Permanent Wood Foundations – Preservative Treatment by Pressure Processes" and labeled by an inspection accredited by the American Lumber Standards Committee.

2.3 SHEATHING AND UNDERLAYMENT

- A. Sheathing and underlayment:
- Subflooring: APA rated plywood sheathing, exterior grade or Oriented Strand Board (OSB).
 - Roof sheathing: APA rated plywood sheathing, exterior grade, Oriented Strand Board (OSB), or Waferboard with waterproof resin binder.
 - Underlayment: APA rated underlayment, approved for use under asphalt, vinyl, and resilient tile or sheet flooring.
- B. Related construction and materials:
- Subfloor glue: APA solvent based, waterproof construction grade adhesive.
 - Building paper: No. 15 asphalt felt, or spun-bonded polyethylene.
 - Vapor barrier: 6 mil polyethylene.

PART 3 – INSTALLATION

3.1 WOOD FRAMING – PREPARATION AND PRECONSTRUCTION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
- B. Coordination:
- Maintain a copy of the Scope at the job site.
 - Maintain and use up-to-date trade standards.
 - Identify actual dimensions of all rough openings in framing: Doors, windows, other framed openings.
 - Cross-coordinate rough framing members with existing and new mechanical (electrical, plumbing, HVAC) installation requirements.
- C. Operations:
- Provide framing, bracing and shoring as necessary to safely complete the work.
 - Provide lifts, cranes, ladders or scaffolding to assist high-level framing work.
 - Verify that materials are stored so as to not overload or interfere with construction in terms of: Quantities and weights, locations, or traffic.

3.2 ROUGH CARPENTRY, WOOD FRAMING – GENERAL

- A. Installation of framing members shall be:
- Straight with a side variation tolerance of $\frac{1}{4}$ " per 10 linear feet.
 - Plumb within $\frac{1}{4}$ " per 10 linear feet.
 - Level within $\frac{1}{4}$ " per 10 linear feet.
 - Square.
 - Top-of-plate elevations correct and consistent with existing elevations.
 - Aligned vertically and horizontally with existing framing.

3.3 ROUGH CARPENTRY, WOOD FRAMING – AT GRADE AND FOUNDATIONS

- A. Use foundation grade or preservative-treated lumber as outlined in the building code and as specified herein:
- Do not use untreated wood wedges or shims in any location subject to moisture or decay.
 - Provide ventilation space for girders that will be set in foundation wall pockets or directly above earth.
- B. Installation of foundation framing members:
- Foundation fasteners shall not be located underneath any studs.
 - Shims for mudsills shall be of preservative treated lumber.

3.4 ROUGH CARPENTRY, FRAMING MEMBERS – FLOOR JOISTS

- A. Install floor framing members as required by the building code and as specified herein:
- Set with crowns upwards.
 - Set with full bearing on plates.

- B. Install joist hangers as per the building code, manufacturer's instructions and as specified herein:
- Set straight.
 - Aligned.
 - Substantially braced.
 - Secured with correct size and type fastenings.

3.5 ROUGH CARPENTRY, WOOD FRAMING – EXTERIOR AND INTERIOR WALLS

- A. Install stud framing as required in the building code and as specified herein:
- Substantially braced.
 - Secure with correct sizes and types of fastenings.
 - Install fire stops so as to provide complete, snug blocking between studs.
- B. Install special framing as required for:
- Position studs at corners to provide ample nailing backing for exterior interior panels.
 - Provide blocking and double top plate headers for wall openings.
 - Lap top plates and set butt joints so they don't occur over openings.
 - Install top plates to provide for uninterrupted, ample nailing backing for exterior and interior panels.
- C. Install headers and lintels as per the building code and as specified herein:
- Ample bearing.
 - Secure connection to supports.
 - Provide complete and temporary bracing.
 - Nailing and stop plates at floors and slabs.
 - Double-sided prop bracing at walls.
 - Diagonal horizontal cross bracing at plates of intersecting walls.
 - Braced walls won't move, waver, or shake when force is applied to them.
- D. Framing for related work:
- Prepare stud framing for waterproof finishes as outlined in the Scope.
 - Construct stud framing and blocking to support wall-mounted fixtures, cabinets, railings, and equipment.

3.6 ROUGH CARPENTRY, WOOD FRAMING – CEILING AND ROOF

- A. Install ceiling and roof framing members as required in the building code and as specified herein:
- Install ample bracing.
 - Set with crowns upward.
 - Set with ample bearing on plates.
 - Securely anchored to plates.
 - Install rafters with proper slope for roof drainage.
 - Make angled rafter cuts that are tightly fitted and securely anchored.
- B. Framing for related work:
- Provide adequate framing for fascia and soffit materials.
 - Provide blocking for the installation of roofing materials, flashing, vents, etc.

3.7 SUBFLOOR SHEATHING

- A. Install plywood subflooring as required in the building code and as specified herein:
- Stagger subflooring butt joints.
 - Nailing pattern.
 - Blocking with 100% support at all butt edges and support as required at intermediate spans.
- B. Install fasteners as required in the building code and as specified herein:
- Subfloor-to-joist connections must be sufficient to prevent any squeaking of flooring
 - Glue and secure subflooring to floor joists with screws or screw-type nails.
- C. Completed subflooring shall be:
- Level within 1/4" per 10 linear feet.
 - Free of depressions or humps.
 - Patched to repair holes, splits, or construction damage.

3.8 SHEATHING, SIDING, AND FINISH-UP WORK

- A. Install sheathing as required in the building code and as specified herein:
 - Stagger wall sheathing butt joints.
 - Install wall-sheathing panels so that edges have full bearing on framing.
 - Include 1/8" expansion joints between sheathing panels.
- B. Install siding as required in the building code, per manufacturer's instructions and as specified herein:
 - All joints are square.
 - Joints are staggered or per manufacturer's instructions.
- C. Prepare plywood surfaces for paint or stain according to manufacturer's instructions.

3.9 WOOD FRAMING – COORDINATION

- A. Coordination with other work – mechanicals, fixtures, equipment, finishes:
 - Coordinate location of electrical fixtures with rough framing.
 - Coordinate location of plumbing work with rough framing.
 - Coordinate location of HVAC work with rough framing.
 - Do not allow HVAC ducts or plumbing components in wall framing to protrude beyond the face of framing.
 - Supply and install rough framing members for in wall fixture and equipment supports such as blocking, anchors, brackets, and frames.
 - Provide and install in wall blocking, anchors, brackets, and frames for plumbing fixtures, electrical fixtures, HVAC equipment, bathroom accessories, handrails, guardrails, shelves, closet poles, etc.
- B. Movement joints and clearances:
 - Provide joints and connectors for non-wood construction to allow for movement such as lumber shrinkage and normal thermal expansion and contraction of building components.
 - Provide clearance between framing and other construction subject to fire hazard such as chimneys and appliance vent piping.
- C. Waterproofing, water barriers, and vapor barriers.
 - Prepare framing for waterproof finishes where waterproofing is required.
 - Install water barriers, vapor barriers, and flashing as per manufacturer's instructions and as specified in Section 07600 Flashing and Sheet Metal.
- D. Coordination and quality control:
 - Provide all necessary blocking for fire stopping including under enclosed stairs.
 - Do not allow trades to impair framing strength by cutting or drilling through members.

3.10 WOOD FRAMING – BETWEEN PHASES AND AT CONCLUSION OF FRAMING

- A. Inspection and cleanup:
 - Remove all unusable wood scraps from site daily and between each phrase of framing.
 - Clean up sawdust, dirt, etc. daily.
 - When rough carpentry work involves removal or disturbance of existing painted or otherwise coated surfaces cleanup shall be as outlined in Section 02050 Demolition and Section 01810 Lead Dust Hazards.
 - Do not bury any scraps or other trash on site.
 - Schedule all required interim inspections prior to closing up concealed work.

3.11 FASTENERS, CONNECTORS, AND SUPPORTS – INSTALLATION

A. Nailing and connectors:

- Confirm that quantities, spacing, and patterning of fasteners meet building code requirements and are as specified herein.
- Provide correct sizes and types of nails for use in pneumatic nailing equipment per manufacturer's instructions, building code requirements and as outlined in International Staple, Nail and Tool Association (<http://isanta.org/>) standards as outlined in the ICC Evaluation Services, Inc. (www.icc-es.org) Legacy Report (NER-272), © January 1, 2004.
- Nail at sufficient edge distance to avoid splitting wood.
- Predrill as required.
 - Remove and replace split framing members.
 - Check nailing at each stage of framing before installing subsequent framing.
 - Nail heads flush or recessed as required.
 - Bent or used nails shall not be reused.
 - Use pneumatic nailing equipment according to manufacturer's instructions.
 - Recheck and tighten all bolt connections before final construction is completed.

B. Install joist hangers as per building code requirements and manufacturer's instructions.

- Set straight.
- Aligned.
- Completely secured at all connection points.
- Secured with correct size and type of fasteners.

C. Install bridging as per the building code and manufacturer's instructions.

- Placed so as to provide full bearing.
- Set at joist midpoints or otherwise correctly spaced.
- Bottoms are not nailed until the roof sheathing is laid.
- Secured with the correct size and type fasteners.

END OF SECTION – 06010 LUMBER AND ROUGH CARPENTRY

DIVISION 6 – WOOD AND PLASTIC

06200 FINISH CARPENTRY AND MILLWORK

PART 1 – GENERAL

1.1 WORK

- A. Provide and install all necessary interior and exterior finish carpentry as listed on the Scope and specified herein.
- B. Where additional instruction is required, work shall be as directed by the Inspector.
- C. When finish carpentry work involves removal or disturbance of painted or otherwise coated surfaces work shall comply with Section 02050 Demolition and Section 01810 Lead Dust Hazards.
- D. Work includes all lumber, connectors, and related hardware and materials.

1.2 QUALITY STANDARDS

- A. Provide skilled, trained, experienced and competent workers sufficient in number to complete the work in a timely manner as specified herein.
- B. All work shall comply with state and local building codes.

1.3 SUBMITTALS

- A. For complete siding replacement, obtain a siding permit prior to installing or removing siding materials.
 - Submit a copy of the siding permit to the Agency.
 - Submit to the Agency a completed and signed Owner's Selection Sheet with siding and color selections.

1.4 MATERIALS HANDLING AND STORAGE

- A. Delivery and inspection:
 - Do not accept or use lumber that has excessive: Moisture content, loose knots, decay streaks, rot, insect damage, splits, pitch pockets, waness, crooks, warps, twists, or bends.
 - Do not accept or use wood panels that deviate from grade standards or have excessive: Marred surfaces, cracks, defective patches, loose knots, split edges, or delaminations.
 - Materials and products delivered will be certified by the manufacturer to be as specified.
- B. Handle lumber carefully to avoid damage during transport, unloading, and moving on the job site.
- C. Storage:
 - Store finish lumber and wood panels to prevent damage and moisture.
 - Well supported off the ground.
 - Protected from weather or moisture.
 - Neatly stacked to prevent warping.
 - Stacked with cross pieces for ventilation.
 - Protected from occupant and construction traffic.
 - Stored with level support to prevent toppling.

PART 2 – MATERIALS AND PRODUCTS

2.1 WOOD AND ACCESSORIES

- A. Provide materials as per Scope and as specified herein.
 - Provide wood free of significant defects or deviations from grade standards.
 - Plywood and finish wood panels.
 - Fastenings and hardware.
 - Finish nails and putty.

PART 3 – CONSTRUCTION AND INSTALLATION

3.1 PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
- B. Interior or exterior finish carpentry which disturbs painted or otherwise coated surfaces shall be in accordance Section 01810 Lead Dust Hazards.
- C. Do not install finish lumber or panels with defects or deviations from grade standards:
 - Marred surfaces.
 - Cracks.
 - Defective patches.
 - Loose knots.
 - Split edges.
 - Delaminations.
- D. Handle wood with care to avoid damage during:
 - Transport.
 - Unloading.
 - Moving.
 - Stacking.

3.2 FINISH CARPENTRY – EXTERIOR WORK

- A. Protect newly cut wood with prime coat or preservative treatment.
- B. Install wood trim at cornices, eaves, columns, doors, windows, porches, etc. so that:
 - Cuts are clean, straight, and square.
 - Joints in parallel wood trim members shall be staggered.
- C. Wood siding:
 - Cuts are clean, straight, and square.
 - Joints in wood siding shall be staggered.
 - Joints in wood siding shall in line with wall studs.
 - Allow for expansion space at edges as required by manufacturer.
- D. Fasteners:
 - Fasten all pieces straight, true, and secure.
 - Coordinate backing and blocking.
 - Set nails before finishing.
 - Follow all nail type, size, and spacing requirements required by the building code.
 - Use hot-dipped galvanized steel or stainless steel nails for exterior, high humidity, and treated wood locations.
 - Power driven nailing shall comply with State and Local building code standards and the International Staple, Nail and Tool Association (<http://isanta.org/>) standards as outlined in the ICC Evaluation Services, Inc. (www.icc-es.org) Legacy Report (NER-272), © January 1, 2004.
- E. Cleanup and remove all wood scraps and sawdust from site.

3.3 FINISH CARPENTRY – INTERIOR FINISH WORK

- A. Coordination:
 - Coordinate with finish carpentry, furnishings, fixtures, and equipment to be installed by others.
 - Coordinate backing materials and blocking.
 - Protect finish work from damage by other trades.
 - Prepare sub-surfaces to receive finish materials.
- B. Keep working environment clean, free of airborne construction dust.

- C. Jointing:
 - Make joints to conceal shrinkage by mitering exterior joints, mitering or scarfing end-to-end joints, and coping interior joints.
 - Make saw cuts straight and clean.
 - Make tight fits without gaps.
 - Make splices tight and staggered (never side by side).
 - Align and exactly match miter joints at edges and corners.
 - Install running trim in maximum lengths; do not use short pieces or splicing of scraps.
 - Keep number of joints to a minimum by consistently using maximum size material.
 - Thoroughly sand smooth all new materials including cut edges.
- D. Fasteners: See section 3.2 Finish Carpentry – Exterior Work, (D. Fasteners).
- E. Miscellaneous
 - Securely attach wood handrails that meet building code required loads.
 - Support shelves and closet poles so that they will not sag when loaded.
- F. Finishing:
 - Where sanding of new materials is required, sand with grain to totally smooth, unblemished surface.
 - Set finish nails before painting or staining
- G. Cleaning:
 - Vacuum clean all work surfaces where sawdust is present.
 - Remove scraps frequently.

3.4 FINISH CARPENTRY – INSPECTION

- A. Work will be rejected by the Inspector as nonconforming due to:
 - Substandard material.
 - Hammer or other tool marks.
 - Dents.
 - Nailing splits.
 - Unmatched grains or patterns.
 - Uneven or over sanding.
- B. Correct nonconforming work by:
 - Replacing damaged or defective materials with new materials at the Contractor's expense.
 - Re-sand any unfinished or unsmoothed surfaces.
 - Make repairs so they are undetectable.

END OF SECTION – 06200 FINISH CARPENTRY AND MILLWORK

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

07200 BUILDING INSULATION

PART 1 – GENERAL

1.1 WORK

- A. Work includes all labor and materials required for completely insulating the building as listed on the Scope and specified herein.
- B. Where additional instruction is required, work shall be as directed by the Inspector.

1.2 QUALITY STANDARDS

- A. Provide skilled, trained, experienced and competent workers to complete the work as specified.
- B. All work shall be completed in accordance with state and local building codes, manufacturer's instructions, and as specified herein.

1.3 MATERIALS HANDLING AND STORAGE

- A. Provide all materials required to complete the work.
 - Materials and products delivered will be certified by the manufacturer to be as specified.
 - Do not install any used, damaged, defective or unsatisfactory materials.
- B. Handling:
 - Deliver and transport materials to avoid damage to the product or to any other work.
 - Keep all materials to be installed dry.
- C. Store materials off the ground, protected from dirt, ground moisture, contaminants, and weather.

1.4 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
 - Insulation shall not be installed until after roofing, siding, windows, doors, flashings, etc. have been installed to protect the insulation and prevent exposure to moisture.

PART 2 – MATERIALS

2.1 INSULATION

- A. Provide building insulation from a recognized manufacturer. Type of insulation as listed in the Scope or as specified herein:
 - Glass fiber insulation
 - Rigid insulation
 - Semi-rigid insulation
 - Batt insulation
 - Preformed glass fiber batt insulation.
 - Polystyrene insulation
 - Glass fiber loose fill
 - Fiberglass
 - Cellulose
- B. Insulation R-value should be as listed in the Scope or as specified herein.
 - When not listed by the Scope, or elsewhere insulation R-value shall be sized (to fit wall, floor, ceiling space completely filling the cavity without overstuffing).
- C. Provide tapes, fastenings, and other related materials as instructed by insulation manufacturer.

PART 3 – CONSTRUCTION AND INSTALLATION

3.1 APPLICATION

A. Preparation:

- Keep areas to be insulated clean and dry.
- Do not install insulation where it might be exposed to water.

B. Install as per manufacturer's instructions and building code requirements:

- Install batts with tight contact of insulation with framing.
- Use fastenings and fastening spacing as required by manufacturer.
- Allow air spaces as required by manufacturer.
- Keep rips and surface damage minimal; repair damage wherever it occurs.
- Properly position reflective surface.
- Cleanly cut and tightly fit batts around electrical and plumbing components.
- Keep ventilation space unobstructed.

C. Loose insulation:

- Do not allow air blower to over-fluff insulation.
- Completely and evenly fill joist spaces to correct depth.
- Thoroughly fill and pack all wall spaces.

3.2 INSPECTION AND CLEANUP

A. Cleaning, inspection, and repairs:

- Clean the work area and remove all scrap and excess materials from the site.
- Allow convenient access for inspection of work.
- Repair or replace defective work as directed by the Inspector.

END OF SECTION – 07200 BUILDING INSULATION

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

07311 ASPHALT SHINGLES

PART 1 – GENERAL

1.1 WORK

- A. Provide everything required to complete the work as listed on the Scope and specified herein.
- B. Where additional instruction is required, work shall be as directed by the Inspector.
- C. Work includes all shingles, asphalt roofing felt, flashing, drip edge, vents, connectors, and related materials.

1.2 QUALITY STANDARDS

- A. Provide skilled, trained, experienced and competent workers to complete the work as specified.
 - Capable of handling any special heavy-duty or high-lift operations.
 - Sufficient in number for the work and time schedule.
- B. All work shall be completed in accordance with state and local building codes and manufacturer's instructions.
- C. Low pitched roofs:
 - Asphalt shingles shall not be installed on roofs less than 2" rise in 12" of run.
 - Install waterproof roofing membrane per manufacturer's instructions on roofs pitched between 3" through 4" rise in 12' of run.

1.3 SUBMITTALS

- A. Submit manufacturer's data required to prove compliance with these specifications.
 - Do not start work until Owner has approved and signed the Owner's Selection Sheet indicating approved shingle color and type (See Appendix A).
 - Provide Owner's written approval of shingle color and type to the Agency.
 - Submit manufacturer's installation instructions (usually found on shingle packaging).
 - Submit to the Owner, a copy of the manufacturer's roofing warranty.

1.4 MATERIALS HANDLING AND STORAGE

- A. Provide all materials required to complete the work.
 - Materials and products delivered will be certified by the manufacturer to be as specified.
 - Do not install any used, damaged, defective or unsatisfactory materials.
- B. Handling:
 - Deliver and transport materials to avoid damage to the product or to any other work.
 - Keep all materials to be installed dry.
- C. Storage:
 - Store materials off the ground, protected from dirt, ground moisture, contaminants, and weather.
 - Neatly stacked to prevent damage.
 - Protected from occupant and construction traffic.
 - Stored with level support to prevent toppling.

1.5 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
 - Check that weather conditions will be acceptable for work.
 - Provide framing, bracing and shoring as necessary to safely complete the work.
 - Provide lifts, cranes, ladders or scaffolding to assist high-level roofing work.
 - Verify that materials are stored so as to not overload or interfere with construction in terms of quantities and weights, locations, or traffic.
 - Have on hand and ready for installation in coordination with roofing, all flashing, roof vents, drip edging, sheet metal, roof cement, underlayment, water shield, and fasteners.

- B. Protection of exposed roof:
- Have on hand adequately sized waterproof tarps or covers to protect exposed roof in the event of inclement weather.
 - Securely attach tarps or covers to prevent wind, rain, snow or other weather related condition from dislodging coverings.
 - Contractor shall be responsible for repairing at Contractor's expense, any damage caused by Contractor's failure to install, secure and adequately maintain roof protection during construction period.

PART 2 – MATERIALS

2.1 ASPHALT SHINGLES, ACCESSORIES, AND RELATED MATERIALS

- A. Asphalt shingles shall be as manufactured by a recognized roofing product manufacturer.
- Shingles must have an Underwriters Laboratory (UL) "Class A" rating.
 - Shingles must meet the UL 997 Wind Resistance of Prepared Roof Covering Materials standard.
 - Shingles must meet the ASTM D3462 Asphalt Shingles Made From Glass Felt and Surfaced with Mineral Granules standard.
 - Shingles must meet the ASTM D3018 "Class A" Asphalt Shingles Surfaced with Mineral Granules standard.
- B. Product details:
- Minimum weight: 240-245 lbs./square.
 - Minimum three tabs per shingle.
 - Minimum 25-year manufacturer warranty.
- C. Underlayment:
- Use 15# asphalt-saturated roofing felt.
 - Eave protection membrane underlayment shall be self-adhesive rubberized asphalt sheet from the same manufacturer as the shingles.
 - Wood underlayment shall be an exterior grade plywood, waferboard, or OSB with a minimum thickness of 3/8 inch.
- D. Nails:
- Use hot-dipped, zinc-coated steel roofing nails.
 - Use nails of sufficient length to penetrate roof sheathing.
 - Follow all nail size requirements and nail spacings required by the building code.
- E. Power-driven nailing and staples shall comply with the following:
- Power driven nailing shall comply with State and Local building code standards.
 - International Staple, Nail and Tool Association (<http://isanta.org/>) standards as outlined in the ICC Evaluation Services, Inc. (www.icc-es.org) Legacy Report (NER-272), © January 1, 2004.
- F. Plastic cement shall be asphalt-type cement with mineral fiber components.
- G. Flashing shall be non-corrosive sheet metal or aluminum.
- 24 gauge hot-dip galvanized steel sheet.
 - 0.032 inch aluminum sheet.
 - Plumbing vent stacks shall be flashed with code approved methods.
- H. Drip edge or gutter flashing shall be non-corrosive sheet metal or aluminum installed at eaves and gables.
- I. Roof vents:
- Square roof vents shall be of non-corrosive sheet metal or aluminum, brown, black or aluminum in color.
 - Continuous ridge vent shall be non-corrosive sheet metal or aluminum, brown or black in color.

PART 3 – INSTALLATION

3.1 TEAR-OFF OF EXISTING ROOFING MATERIALS

- A. Examine and verify that job and weather conditions are satisfactory for speedy and acceptable work.

- B. Tear-off preparation:
- Install safety barricades, fencing, or other warning devices to prevent the building occupants or unauthorized individuals from entering the work area.
 - Install plastic or tarps around exterior of building to collect falling debris from roof.
 - Install plastic or tarps in attic or other interior areas to completely collect falling debris from roof.
 - The Contractor shall take all necessary precautions to protect the building, its components, i.e. windows, doors, gutters, siding, etc. and any neighboring buildings, structures, vehicles, etc. from falling debris.
 - All plantings and shrubbery shall be protected from damage by falling debris.
 - Contractor will be responsible for any damage caused as a result of Contractor's work.
 - Contractor is responsible for completely removing from the property all debris generated from removal of roofing materials at contractor's expense.
 - All debris including roofing materials, nails, scrap lumber, flashing, etc. shall be removed from site or neatly stored at the end of each workday.
 - All sidewalks, driveways, patios, etc. shall be broom swept daily.
- C. Tear-off:
- Remove all of the existing roofing materials down to the roof deck.
 - Verify that deck is dry, sound, clean, and smooth, free of protruding nails, staples, or other projections.
 - Repair all holes over 1 inch in diameter, all cracks over ½ inch in width, loose knots, depressions, rotten wood or defective roof boards.
 - Replace defective decking as necessary to provide a structurally sound deck surface.

3.2 UNDERLAYMENT INSTALLATION

- A. Install underlayments in accordance with building code and manufacturer's instructions.
- B. If listed in the Scope, wood roof deck underlayment shall be:
- Installed directly over entire existing wood deck material.
 - Secured in place with fasteners of sufficient size and length per the building code and as specified herein.
 - Underlayment shall be placed to allow a 1/8 inch gap around all edges for expansion.
 - Edge joints in successive rows shall be staggered.
 - Edges of sheets shall break on rafters.
 - Install deck or sheathing with firm complete supports.
- C. Install eave protection membrane as listed in the Scope, and always on roofs pitched between 3" through 4" rise in 12' of run.
- Install eave protection membrane up the slope from eave edge to 36 inches from the edge or at least 24 inches beyond the interior face of the warm exterior wall, whichever is greater.
 - Lap ends 6 inches and bond.
 - At vent pipes, install a 24-inch square patch of eave protection membrane lapping over the roofing felt, seal tightly to pipe.
 - At vertical walls, install eave protection membrane extending at least 6 inches up the wall and 12 inches on to the roof surface lapping over roofing felt.
 - At chimneys, install eave protection membrane around entire chimney extending at least 6 inches up the wall and 12 inches on to the roof surface lapping over the roofing felt.
- D. Use 15# asphalt-saturated roofing felt.
- Install one layer of roofing felt over entire roof deck area not protected by eave or valley membrane.
 - Run sheets horizontally lapped so water sheds.
 - Nail in place per manufacturer's instructions and as specified herein.
 - On roofs sloped greater than 4 in 12, lap horizontal edges at least 2 inches and at least 2 inches over eave protection membrane.
 - On roofs sloped between 3 in 12 and 4 in 12, lap horizontal edges at least 19 inches and at least 19 inches over eave protection membrane.
 - Lap ends at least 4 inches; stagger end laps of each layer at least 36 inches.
 - Lap underlayment over valley protection at least 6 inches.
 - At vent pipes, seal asphalt roofing felt tightly to pipe.
 - At vertical walls, install asphalt roofing felt extending at least 6 inches up the wall.
 - At chimneys, install asphalt roofing felt around entire chimney extending at least 6 inches up the wall.
 - At skylights and roof hatches, install asphalt roofing felt from under the built-in counterflashing and on to the roof surface.

3.3 FLASHING

- A. Prior to shingling install metal hip, valley, and cricket flashing per manufacturer's instructions and as specified herein.
- Provide compatible flashing materials.
 - Complete flashings as required during and at the conclusion of shingling.
 - Use asphalt roofing felt or if listed in the Scope, waterproof membrane, under metal valley flashing, run continuously from ridge to eave.
 - Do not nail through metal valley flashing; secure by nailing at 18 inches on center just beyond edge of flashing so that nail heads hold down edge.
 - Step flashing shall be used at side walls, dormers, and chimneys.
 - Install counterflashing around chimney skylights, roof hatchways, etc.
- B. Install metal drip edge:
- At rake edges and at eaves without gutters.
 - Tightly to rake or fascia boards.
 - Sealed with roofing cement over top of asphalt roofing felt or eave protection membrane.
 - Lapping joints at least 2 inches.
 - Use full-length pieces; do not piece together scraps.
 - Secure with approved fasteners as specified herein.
- C. Install gutter flashing at eaves:
- Below the roofing felt.
 - Seal asphalt roofing felt to top of gutter flashing with roofing cement.
 - Flashing shall be tight against the fascia board and roof deck.
 - Use full-length pieces; do not piece together scraps.
 - Secure with approved fasteners as specified herein.
 - Install roof deck mounted gutters, flashing and straps directly to roof deck prior to applying roofing underlayment, asphalt felt paper and shingles.

3.4 SHINGLE INSTALLATION

- A. Install shingles in accordance with manufacturer's instructions, the building code, and as specified herein.
- Avoid breakage of shingles by avoiding dropping bundles on edge, by separating shingles carefully, and by taking extra precautions in temperatures below 40 degrees Fahrenheit.
 - Handle shingles carefully in hot weather to avoid damaging shingles.
 - Secure each shingle with proper number and type of fastener per manufacturer's instructions and as specified herein.
 - Space each joint a minimum of 1 ½ inches from adjacent course.
 - Double shingles at first course to form a 1-inch drip edge.
 - Install shingles so there is no visible deviation from alignment.
 - Do not allow nails to penetrate decking or sheathing so as to be visible from below.
 - Make hips or ridges using shingles required by manufacturer.
- B. If listed in the Scope, install ridge vent along entire length of ridges.
- Cut continuous vent slot through wood roof sheathing or decking, stopping 12 inches from each end of the ridge.
 - On roofs without ridge board, make a slot 2 inches wide, centered on ridge.
 - On roofs with a ridge board, make two slots 1 ¾ inches wide, one on each side.
 - Install ridge vent material full length of ridge slot(s) extending the vent material 6 inches beyond the end of slot(s).
 - Join ends of vent material per manufacturer's instructions.
- C. Individual roof vents:
- Replace individual roof vents with new vents of non-corrosive sheet metal or aluminum similar in size, color, and configuration to vent it is intended to replace.
 - Install vent per manufacturer's instructions.

- D. Open valley technique:
 - Snap diverging chalk lines on metal flashing, starting at 3 inches each side of top of valley, spreading at 1/8 inch per foot to eave.
 - Run shingles to chalk line.
 - Trim last shingle in each course to match chalk line; do not trim shingles to less than 12 inches width.
 - Apply 2-inch wide strip of plastic cement under ends of shingles, sealing them to metal flashing.
- E. Closed valley technique:
 - Run the first, and only the first, course of shingles from the higher roof slope across the valley at least 12 inches.
 - Run all courses from lower roof slope across the valley at least 12 inches and nail not closer than 6 inches to center of valley.
 - Run shingles from the upper roof slope into valley and trim 2 inches from center of valley.
- F. Woven valley technique:
 - Do not make woven valley with laminated type shingles or when not allowed by manufacturer's instructions.
 - Run shingles from both roof slopes at least 12 inches across center of valley, lapping alternate sides in a woven pattern.
 - Nail not closer than 6 inches to center of valley.

3.5 INSPECTION AND CLEAN-UP

- A. Contractor is responsible for thoroughly cleaning up the work area.
 - At completion of work, Contractor is responsible for completely removing from the property, at Contractor's expense, all debris generated from removal and installation of roofing materials.
 - At the end of each workday, all debris including roofing materials, nails, scrap lumber, flashing, etc. shall either be removed from site or neatly stored.
 - Leave drains, gutters, and downspouts clear and clean of debris.
 - All sidewalks, driveways, patios, etc. shall be broom swept daily.
 - Repair or replace defective work as directed by the Inspector.

END OF SECTION – 07311 ASPHALT SHINGLES

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

07530 SINGLE-PLY MEMBRANE ROOFING

PART 1 – GENERAL

1.1 WORK

- A. Provide everything required to complete the work as listed on the Scope and specified herein.
- B. Where additional instruction is required, work shall be as directed by the Inspector.
- C. Work includes installation of membrane roofing, insulation board, sub flooring, flashing, scuppers, vents, connectors, and related materials.

1.2 QUALITY STANDARDS

- A. Provide skilled, trained, experienced and competent workers to complete the work as specified.
 - Sufficient in number for the work and time schedule.
- B. All work shall be completed in accordance with state and local building codes and manufacturer's instructions.
- C. Install waterproof roofing membrane per manufacturer's instructions on low pitched roof less than 4" rise in 12' of run.

1.3 SUBMITTALS

- A. Submit manufacturer's data required proving compliance with these Specifications.
 - Submit manufacturer's installation instructions.
 - Submit to the owner, a copy of the manufacturer's roofing warranty.

1.4 MATERIALS HANDLING AND STORAGE

- A. Provide all materials required to complete the work.
 - Materials and products delivered will be certified by the manufacturer to be as specified.
 - Do not install any used, damaged, defective or unsatisfactory materials.
- B. Handling:
 - Deliver and transport materials to avoid damage to the product or to any other work.
 - Keep all materials to be installed dry.
- C. Storage:
 - Store materials off the ground, protected from dirt, ground moisture, contaminants, and weather.
 - Neatly stacked to prevent damage.
 - Protected from occupant and construction traffic.

1.5 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
 - Check that weather conditions will be acceptable for work.
 - Provide framing, bracing and shoring as necessary to safely complete the work.
 - Provide lifts, cranes, ladders or scaffolding to assist high-level roofing work.
 - Verify that materials are stored so as to not overload or interfere with construction in terms of quantities and weights, locations, or traffic.
 - Have on hand and ready for installation in coordination with roofing, all flashing, roof vents, drip edging, sheet metal, roof cement, underlayment and fasteners.
- B. Protection of exposed roof:
 - Have on hand adequately sized waterproof tarps or covers to protect exposed roof in the event of inclement weather.
 - Securely attach tarps or covers to prevent wind, rain, snow or other weather related condition from dislodging coverings.
 - Contractor shall be responsible for repairing at Contractor's expense, any damage caused by Contractor's failure to install, secure and adequately maintain roof protection during construction period.

PART 2 – MATERIALS

2.1 MEMBRANE ROOFING, ACCESSORIES, AND RELATED MATERIALS

- A. Membrane roofing shall be sixty (60) mil, black, Ethylene Propylene Diene Terpolymer (EPDM), fully adhered to the approved substrate.
- B. Underlayment:
 - Furnish and install underlayment as listed on the Scope and as specified by the membrane manufacturer.
 - Wood underlayment shall be an exterior grade plywood, waferboard, or OSB with a minimum thickness of 3/4 inch.
 - Type and installation of insulation boards shall be as recommended by roofing membrane manufacturer.
- C. Fasteners shall be as recommended by membrane manufacturer.
 - Follow all nail size requirements and nail spacings required by the building code.
- D. Seams shall be adequately overlapped and sealed per manufacturer instructions.
- E. Flashing membrane shall be black EPDM flashing, nominal thickness 60 mils.
 - Plumbing vent and stacks shall be flashed with code approved methods consistent with manufacturer's instructions.
- F. Scuppers shall be installed as listed in the Scope, per manufacturer's recommendations, and as specified herein.
 - Scuppers shall be properly flashed to prevent water infiltration.
 - Roof shall be pitched toward scupper(s) to allow for proper drainage.
 - Scuppers shall be installed in sufficient quantity and sized to adequately drain water from roof.

PART 3 – INSTALLATION

3.1 TEAR-OFF OF EXISTING ROOFING MATERIALS

- A. Examine and verify that job and weather conditions are satisfactory for speedy and acceptable work.
- B. Tear-off preparation:
 - Install safety barricades, fencing, or other warning devices to prevent the building occupants or unauthorized individuals from entering the work area.
 - Install plastic or tarps around exterior of building to collect falling debris from roof.
 - Install plastic or tarps in attic or other interior areas to completely collect falling debris from roof.
 - The contractor shall take all necessary precautions to protect the building, its components, i.e. windows, doors, gutters, siding, etc. and any neighboring buildings, structures, vehicles, etc. from falling debris.
 - All plantings and shrubbery shall be protected from damage by falling debris.
 - Contractor will be responsible for any damage caused as a result of contractor's work.
 - Contractor is responsible for completely removing from the property all debris generated from removal of roofing materials at Contractor's expense.
 - All sidewalks, driveways, patios, etc. shall be broom swept daily.
- C. Tear-off:
 - Remove all of the existing roofing materials down to the roof deck.
 - Verify that deck is dry, sound, clean, and smooth, free of protruding nails, staples, or other projections.
 - Repair all holes over 1 inch in diameter, all cracks over 1/2 inch in width, loose knots, depressions, rotten wood or defective roof boards.
 - Replace defective decking as necessary to provide a structurally sound deck surface.

3.2 UNDERLAYMENT INSTALLATION

- A. Install underlayments in accordance with manufacturer's instructions, building code, and Section 06010 Lumber and Rough Carpentry.

- B. If listed in the Scope, wood roof deck underlayment shall be:
- Installed directly over entire existing deck material.
 - Construct deck slopes so there will be no level areas or pockets that allow ponding.
 - Secured in place with fasteners of sufficient size and length per the building code and as specified herein.
 - Underlayment shall be placed to allow a 1/8 inch gap around all edges for expansion.
 - Edge joints in successive rows shall be staggered.
 - Edges of sheets shall break on rafters.
 - Install deck or sheathing with firm complete supports.
 - Keep deck surface smooth and free of irregularities.
 - Broom clean deck surface.
 - Install rigid insulation boards per manufacturer's instructions.
 - Stagger rigid insulation joints.
 - Secure rigid insulation boards to prevent uplift from air infiltration or high winds.

3.3 FLASHING

- A. Install flashing as listed in the Scope and per manufacturer's instructions and as specified herein.
- Provide compatible flashing materials.
 - Complete flashings as necessary to prevent water infiltration.
 - Do not nail through metal or membrane flashing; secure by nailing at 18 inches on center just beyond edge of flashing so that nail heads hold down edge.
 - Install counterflashing around chimney, skylights, roof hatchways, etc.
- B. Install scuppers, gutters and gutter flashing as listed on the Scope.
- Sealed per membrane manufacturer's instructions.
 - Flashing and gutters shall be tight against the fascia board and roof deck.
 - Use full-length pieces; do not piece together scraps.
 - Secure with approved fasteners as specified herein.

3.4 MEMBRANE INSTALLATION

- A. Install roofing membrane in accordance with manufacturer's instructions, the building code, and as specified herein.
- Secure membrane with manufacturer's approved adhesive.
 - Installation should start at the high point of the roof, and proceed to the lowest point if possible.
- B. Use all necessary precautions to prevent damaging membrane during or after installation.
- Avoid damage from dropping or placing tools, materials, etc. on membrane.
 - Do not allow nails to penetrate membrane.
 - Assure proper pitch for drainage of water.
 - Do not place ladders, saw horses, etc. on top of membrane.
- C. Seams shall be sealed per membrane manufacturer's instructions.
- Never allow laps to be less than manufacturer's recommended width.
 - Use adhesives and sealant per manufacturer's recommendations.

3.5 INSPECTION AND CLEAN-UP

- A. Contractor is responsible for thoroughly cleaning up the work area.
- At completion of work, Contractor is responsible for completely removing from the property, at Contractor's expense, all debris generated from removal and installation of roofing materials.
 - At the end of each workday, all debris including roofing materials, nails, scrap lumber, flashing, etc. shall either be removed from site or neatly stored.
 - Leave drains, gutters, and downspouts clear and clean of debris.
 - All sidewalks, driveways, patios, etc. shall be broom swept daily.
 - Repair or replace defective work as directed by the Inspector.

END OF SECTION – 07530 SINGLY-PLY MEMBRANE ROOFING

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

07560 WOOD SIDING

PART 1 – GENERAL

1.1 WORK

- A. Work includes all labor and materials required to complete the work as listed on the Scope and specified herein.
- B. Where additional instruction is required, work shall be as directed by the Inspector.
- C. When siding work involves removal or disturbance of painted or otherwise coated surfaces work shall comply with Section 01810 Lead Dust Hazards.

1.2 QUALITY STANDARDS

- A. Provide skilled, trained, experienced and competent workers to complete the work as specified.
- B. Provide a certified lead abatement supervisor and certified lead abatement workers to perform siding demolition, including clean up and debris removal per Section 01810 Lead Dust Hazards.
- C. All work shall be completed in accordance with state and local building codes, manufacturer's instructions, and as specified herein.

1.3 SUBMITTALS

- A. Contractor shall obtain a Siding Permit from the City of Milwaukee Department of City Development Permit Center (809 N. Broadway, 1st floor) prior to starting work when the Scope calls for a complete siding replacement. Minor siding repairs do not require a permit.
- B. Submit a copy of the siding permit to the Agency.
- C. Contractor shall notify the Milwaukee Health Department (MHD) – Lead Section (414-286-5033) at least 24 hours prior to starting any work that involves disturbance of painted or otherwise coated surfaces. MHD will assign a Lead Risk Assessor to monitor the work to document lead safe rehabilitation procedures were followed.

1.4 MATERIALS HANDLING AND STORAGE

- A. Provide all materials required to complete the work.
 - Materials and products delivered will be certified by the manufacturer to be as specified.
 - Do not install any used, damaged, defective or unsatisfactory materials.
- B. Handling:
 - Deliver and transport materials to avoid damage to the product or to any other work.
 - Keep all materials to be installed dry.
- C. Storage:
 - Store materials off the ground, protected from dirt, ground moisture, contaminants, and weather.
 - Neatly stacked to prevent damage.
 - Protected from occupant and construction traffic.
 - Stored with level support to prevent twisting, cupping, or warping.

1.5 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
 - Check that weather conditions will be acceptable for work.
 - Provide proper containment measures as outlined in Section 01810 Lead Dust Hazards.
 - Provide lifts, cranes, ladders or scaffolding to assist high-level siding work.
 - Have on hand and ready for installation in coordination with siding, all flashing, vents, and fasteners.

PART 2 – MATERIALS

2.1 SIDING

- A. Provide wood lap, wood sheet, or cedar shake siding as listed on the Scope or as specified herein.
- B. Provide wood lap, wood sheet, and cedar shake siding:
 - Material, species and grade shall match existing siding.
 - Sized to match existing siding.
- C. Use 15# asphalt-saturated felt underlayment.
- D. Fasteners shall be as required in the local building code, Western Red Cedar Lumber Association, "Installing Cedar Siding" © 1993, revised January 2001, and as specified herein.
- E. Flashing shall be non-corrosive sheet metal or aluminum.
 - 24 gauge hot-dip galvanized steel sheet.
 - 0.032 inch aluminum.

PART 3 – INSTALLATION

3.1 UNDERLAYMENT

- A. Install underlayments in accordance with building code and manufacturer's instructions.
- B. Use 15# asphalt-saturated roofing felt.
 - Install one layer of roofing felt over entire wall area.
 - Run sheets horizontally lapped so water sheds.
 - Nail in place per manufacturer's instructions and as specified herein.

3.2 FLASHING

- A. Before installing siding, make sure that flashings are installed to prevent moisture from entering the wall and roof spaces.
 - Provide compatible flashing materials.
 - Complete flashings as required during and at the conclusion of siding.
 - Install drip edges, z-flashing, and other flashing as recommended by the siding manufacturer.

3.3 SIDING INSTALLATION

- A. Install siding as recommended in the Western Red Cedar Lumber Association, "Installing Cedar Siding" © 1993, revised January 2001.
 - All joints between lap siding pieces and sheet siding shall be over studs.
 - Nails shall be set and puttied.
 - Siding exposure shall match existing.
 - Siding overlap shall be a minimum of 1-inch.
 - Replace defective wall sheathing as necessary to provide a structurally sound wall surface.

3.4 INSPECTION AND CLEAN-UP

- A. Cleaning and repairs:
 - Clean up shall be in accordance with Section 01810 Lead Dust Hazards.
 - At completion of work, clean the work area and remove all scrap and excessive materials.
 - Repair or replace defective work as directed by the Inspector.

END OF SECTION – 07560 WOOD SIDING

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

07580 VINYL SIDING AND CLADDING

PART 1 – GENERAL

1.1 WORK

- A. Work includes all labor and materials required to complete the work as listed on the Scope and specified herein.
- B. Where additional instruction is required, work shall be as directed by the Inspector.
- C. When siding work involves removal or disturbance of painted or otherwise coated surfaces work shall comply with Section 01810 Lead Dust Hazards.

1.2 QUALITY STANDARDS

- A. Provide skilled, trained, experienced and competent workers to complete the work as specified.
- B. Provide a certified lead abatement supervisor and certified lead abatement workers to perform siding demolition, including clean up and debris removal per Section 01810 Lead Dust Hazards.
- C. All work shall be completed in accordance with the “Vinyl Siding Installation Manual” published by the National Housing Center, updated October 2004 (www.vinylsiding.org), manufacturer’s specifications, and as specified herein.
- D. Siding installation shall comply with all state and local building codes.

1.3 SUBMITTALS

- A. Contractor shall obtain a Siding Permit from the City of Milwaukee Department of City Development Permit Center (809 N. Broadway, 1st floor) prior to starting work when the Scope calls for a complete siding installation or replacement. Minor siding repairs do not require a permit.
- B. Submit a copy of the siding permit to the Agency.
- C. Contractor shall notify the Milwaukee Health Department (MHD) – Lead Section (414-286-5033) at least 24 hours prior to starting any work that involves disturbance of painted or otherwise coated surfaces. MHD will assign a Lead Risk Assessor to monitor the work to document lead safe rehabilitation procedures were followed.

1.4 MATERIALS HANDLING AND STORAGE

- A. Provide all materials required to complete the work.
 - Materials and products delivered will be certified by the manufacturer to be as specified.
 - Do not install any used, damaged, defective or unsatisfactory materials.
- B. Handling:
 - Deliver and transport materials to avoid damage to the product or to any other work.
 - Keep all materials to be installed dry.
- C. Storage:
 - Store materials off the ground, protected from dirt, ground moisture, contaminants, and weather.
 - Neatly stacked to prevent damage.
 - Protected from occupant and construction traffic.
 - Stored with level support to prevent twisting, cupping, or warping.

1.5 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
 - Check that weather conditions will be acceptable for work.
 - Provide proper containment measures as outlined in Section 01810 Lead Dust Hazards.
 - Provide lifts, cranes, ladders or scaffolding to assist high-level siding work.
 - Have on hand and ready for installation in coordination with siding, all flashing, vents, building energy wrap, insulation board, and fasteners.

PART 2 – MATERIALS

2.1 SIDING

- A. Provide rigid vinyl, extruded polyvinyl chloride minimum .044 inch thick, wood grain or embossed finish horizontal bevel profile and color selected by Owner.
- B. Provide accessories of extruded plastic or polyvinyl chloride same material and color as siding:
 - Internal corners
 - External corners
 - Cap strip
 - Drip cap
 - Undersill trim
 - Starter strip
 - Window and door trim (J-Channel)
- C. When required by manufacturers or specified in the Scope use exterior wall sheathing paper:
 - 15# asphalt-saturated felt.
 - Non-woven, spun-bonded olefin sheet air barrier system, i.e Tyvek, Typar, or similar.
 - Solid insulation board or fan fold insulation (1/4" minimum or sized per siding manufacturer's specification).
- D. Metal aluminum trim (sheet goods), minimum of .032 inch thick, standard color selected by Owner.
- E. Use corrosion resistant fasteners as specified by siding manufacturer and local building code.
- F. Flashing shall be non-corrosive sheet metal or aluminum.
 - 24 gauge hot-dip galvanized steel sheet.
 - 0.032 inch aluminum.

PART 3 – INSTALLATION

3.1 PREPARATION OF WALL

- A. Prepare exterior walls for siding application:
 - Nail down loose boards of existing siding, and replace any rotten boards. Do not install vinyl siding over rotting wood.
 - Remove drip caps, corner boards or other architectural components to provide a flat surface for siding installation.
 - Remove loose caulk and re-caulk around windows, doors, and other areas to protect from moisture penetration.
 - Remove all protrusions such as gutters, downspouts, wires, light fixtures, etc.
 - Check all walls for evenness and install furring strips where necessary. When installing furring strips, please take appropriate measures to establish a smooth and continuous surface.
NOTE: In cases where the lower portion of a horizontal siding panel must be trimmed so that it may be installed over steps, porches, etc., the panel should be built out ("furred") for proper angle and rigidity. Utility trim can be used to seal the cut edge of the panel and then secured to the wall.
- B. Prepare fascia, and other trim for installation of cladding.
 - Nail loose fascia, soffit, rake, crown, and other trim.
 - Replace any rotten boards. Do not install cladding over rotting wood.
 - Remove all protrusions such as gutters, downspouts, wires, light fixtures, etc. as necessary to install cladding.

3.2 UNDERLAYMENT

- A. When the use of an underlayment material is required per the siding manufacturer's instructions and a specific product is not listed by the siding manufacturer, or listed on the Scope, the Contractor may choose to install either of the following options (B or C).
- B. Install 15# asphalt-saturated roofing felt.
 - Install one layer of roofing felt over entire wall area.
 - Run sheets horizontally lapped so water sheds.
 - Nail in place per manufacturer's instructions and as specified herein.

- C. Install building wrap horizontally by nailing and lapping edges a minimum of 6 inches in accordance with manufacturer's instructions.
- D. Install solid installation board fastened securely to wall with tight joints.

3.3 FLASHING

- A. Before installing siding, make sure that flashings are installed to prevent moisture from entering the wall and roof spaces Refer to Section 07600 Flashing and Sheet Metal.
 - Provide compatible flashing materials.
 - Complete flashings as required during and at the conclusion of siding.
 - Install drip edges, z-flashing, and other flashing as recommended by the siding manufacturer.

3.4 SIDING INSTALLATION

- A. Install vinyl siding in accordance with manufacturer's printed installation instructions:
 - Replace defective wall sheathing as necessary to provide a structurally sound wall surface.
 - Be sure that installed panels can move freely from side to side, allowing for expansion and contraction of the panel.
 - When installing a panel, push up from the bottom until the lock is fully engaged with the piece below it. Without stretching the panel, reach up and nail it in place.
 - Install siding in such a way as to minimize the number of joints, seams, and edges. Use full length panels wherever possible.
 - Overlap adjacent panels per manufacturer's instructions. Place visible ends away from the front of the property.
 - Place nails or other fasteners in the center of the nailing slot.
 - Fasteners shall be of sufficient length to adequately penetrate the wall.
 - Do not force the panels up or down when fastening in position. Allow each panel to hang without strain.
 - Do not drive the head of the nail tightly against the siding nail hem. Allow 1/32" (about the thickness of a dime) clearance between the fastener head and the siding panel. Drive nails straight and level to prevent distortion and buckling of the panel.
 - Leave a minimum of 1/4" clearance at all openings and stops to allow for normal expansion and contraction. When installing in temperatures below 40 degrees Fahrenheit, increase minimum clearance to 3/8".
 - Do not caulk the panels where they meet the receiver of inside corners, outside corners, or J-channel trim. Do not caulk the overlap joints.
 - Do not face-nail or staple through the face of the siding.
 - Remove gutters, downspouts, electrical conduit, wires, etc. to allow for the installation of the siding. Reattach all items after siding installation is complete.
 - All caulking shall match material color and be applied so as to present a neat appearance.
- B. Install trim in accordance with manufacturer's instructions:
 - Make all corners, bends, and creases crisp and straight. Use a siding brake or similar equipment.
 - Joints at corners, ends, etc. shall be folded to present a finished surface not a raw edge.
 - Trim shall be installed continuous over each horizontal or vertical member to minimize the number of joints.
 - Trim fasteners shall be placed (whenever possible) in hidden locations.
 - Trim fasteners shall be of non-corrosive material and of sufficient length to adequately secure trim materials.
 - Do not install trim over rotten or defective wood. Rotten and defective wood shall be replaced prior to installation of trim.
 - Trim applied to window openings must be continuous and cover the exterior blind stop.
 - Windowsill covering shall be continuous to interior sill edge and cover the exterior sill completely with drip edge below sill.
 - Fascia and soffit trim shall be installed per manufacturer's instructions using manufactured soffit material.
 - Fascia and soffit trim shall provide complete coverage of all exposed trim. If necessary contractor shall install drip edge trim at roofline.
 - Soffit trim shall be vented as necessary to allow for sufficient airflow in attics.
 - All caulking shall match material color and be applied so as to present a neat appearance.

3.5 INSPECTION AND CLEAN-UP

A. Cleaning and repairs:

- Clean up shall be in accordance with Section 01810 Lead Dust Hazards.
- At completion of work, clean the work area and remove all scrap and excessive materials.
- Repair or replace defective work as directed by the Inspector.

END OF SECTION – 07580 VINYL SIDING AND CLADDING

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

07600 FLASHING AND SHEET METAL

PART 1 – GENERAL

1.1 WORK

- A. Work includes all labor and materials required to complete the work as listed on the Scope and specified herein.
- B. Where additional instruction is required, work shall be as directed by the Inspector.
- C. When flashing and sheet metal work involves removal or disturbance of painted or otherwise coated surfaces work shall comply with Section 01810 Lead Dust Hazards.

1.2 QUALITY STANDARDS

- A. Provide skilled, trained, experienced and competent workers to complete the work as specified.
- B. Provide a certified lead abatement supervisor and certified lead abatement workers to perform any removal or demolition work, including clean up and debris removal per Section 01810 Lead Dust Hazards for any work under this section.
- C. All work shall be completed in accordance with state and local building codes, manufacturer's instructions, and as specified herein.

1.3 SUBMITTALS

- A. Contractor shall notify the Milwaukee Health Department (MHD) – Lead Section (414-286-5033) at least 24 hours prior to starting any work that involves disturbance of painted or otherwise coated surfaces. MHD will assign a Lead Risk Assessor to monitor the work to document lead safe rehabilitation procedures were followed.

1.4 MATERIALS HANDLING AND STORAGE

- A. Provide all materials required to complete the work.
 - Materials and products delivered will be certified by the manufacturer to be as specified.
 - Do not install any damaged, defective or unsatisfactory materials.
- B. Store materials off the ground, protected from dirt, ground moisture, contaminants, and weather.

1.5 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
 - Check that weather conditions will be acceptable for work.
 - Provide proper containment measures as outlined in Section 01810 Lead Dust Hazards.
 - Provide lifts, cranes, ladders or scaffolding to assist high-level flashing work.
 - Have on hand and ready for installation in coordination with siding, roofing, or other work.

PART 2 – MATERIALS

2.1 FLASHING

- A. Provide and install all flashing of types, sizes and gauges as listed on the Scope and as specified herein.
- B. Provide flashing material as follows:
 - Steel: 20 gauge galvanized steel
 - Aluminum: 20 gauge aluminum
 - PVC: 30 mil. Sheet
 - Copper: 16oz./sq.ft. cold rolled copper
- C. Flashing fasteners shall be made of compatible non-corrosive materials consistent with the type of flashing being installed.

PART 3 – INSTALLATION

3.1 FLASHINGS

- A. Install flashing in accordance with building code and manufacturer's instructions.
- B. Provide flashing installations as outlined in the Scope and as follows:
 - Keep dissimilar metals well separated to avoid corrosion.
 - Lap and lock seams; solder seam joints where necessary to guarantee a watertight seal.
 - Lap edge metal at least 4 inches.
 - Install flashing high enough at walls to ensure a watertight seal.

3.2 ROOF FLASHING

- A. Provide and install roof flashing as needed to guarantee a finished and watertight roof system.
 - Integrate and embed flashing within roofing materials per manufacturer's instructions.
 - Flashing shall be in adequate widths with enough lap to prevent water infiltration.
 - Caulk hip, ridge, and other flashing.
 - Cover all edges of metal flashing with roofing cement or adhesive.
 - Fill all joints between flashing and edges of shingles with roof cement or adhesive.
 - Caulk all reglets.
 - Provide all flashing, roof cement, and caulking for roof hatches, skylights, vents, curbs, roof drains, scuppers, equipment supports, newel posts, parapet walls, etc.

3.3 INSPECTION AND CLEAN-UP

- A. Cleaning and repairs:
 - Clean up shall be in accordance with Section 01810 Lead Dust Hazards.
 - At completion of work, clean the work area and remove all scrap and excessive materials.
 - Repair or replace defective work as directed by the Inspector.

END OF SECTION – 07600 FLASHING AND SHEET METAL

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

07631 GUTTERS AND DOWNSPOUTS

PART 1 – GENERAL

1.1 WORK

- A. Provide everything required to complete the work as listed on the Scope and specified herein.
- B. When removing or disturbing painted gutters and downspouts, work shall comply with Section 02050 Demolition and Section 1810 Lead Dust Hazards.
- C. Where additional instruction is required, work shall be as directed by the Inspector.

1.2 QUALITY STANDARDS

- A. Provide skilled, trained, experienced and competent workers to complete the work as specified.
- B. When necessary, provide a certified lead abatement supervisor and certified lead abatement workers to perform gutter and downspout demolition, including clean up and debris removal per Section 01810 Lead Dust Hazards.
- C. All work shall be completed in accordance with state and local building codes and manufacturer's instructions.

1.3 SUBMITTALS

- A. Contractor shall notify the Milwaukee Health Department (MHD) – Lead Section (414-286-5033) at least 24 hours prior to starting any work that involves disturbance of painted or otherwise coated surfaces. MHD will assign a Lead Risk Assessor to monitor the work to document lead safe rehabilitation procedures were followed.

1.4 MATERIALS HANDLING AND STORAGE

- A. Provide all materials required to complete the work as listed on the Scope and as specified herein.
 - Return any damaged or unsatisfactory materials and products.
 - Replace any materials damaged during installation.

1.5 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
 - Confirm that there are no conflicts between this work and work by others.
 - If gutters or gutter flashing mounts directly to the roof deck, coordinate the installation with roofer and carpenter.

PART 2 – MATERIALS

2.1 GUTTERS AND DOWNSPOUTS

- A. Gutter size and type shall be as listed on the Scope and as specified herein:
 - Aluminum gutters: "K-Type" (also called Ogee), 5 or 6 inch, shall be seamless, a minimum of .032 gauge aluminum, color as selected by Owner. See Owner's Selection Sheet (Appendix A).
 - Galvanized gutters: "K-Type" (also called Ogee), 5 or 6 inch, shall be seamless, minimum of 26 gauge galvanized metal.
 - Galvanized gutters: "Half Round", 5 or 6 inch, shall be seamless, minimum of 26 gauge galvanized metal.

- B. Downspout size and type shall be as listed on the Scope and as specified herein:
 - Aluminum downspouts: 3 or 4 inch round corrugated, minimum of .024 gauge aluminum, color as selected by Owner. See Owner's Selection Sheet (Appendix A).
 - Aluminum downspouts: 3 or 4 inch square corrugated, minimum of .024 gauge aluminum, color as selected by Owner. See Owner's Selection Sheet (Appendix A).
 - Galvanized downspouts: 3 or 4 inch round corrugated, minimum of 26 gauge galvanized steel.
 - Galvanized downspouts: 3 or 4 inch square corrugated, minimum of 26 gauge galvanized steel.
- C. Vinyl, plastic, or PVC materials shall not be used in place of metal gutter or downspout materials.
- D. Fasteners:
 - Gutters and downspouts shall be mounted with manufacturer's approved fasteners.
 - Nails, screws, etc shall be corrosion resistant per manufacturer's instructions and as specified herein.
- E. Only use sealant that is specifically recommended for gutter and downspout use. Sealant shall be UV resistant and installed per manufacturer's instructions.
- F. Gutter flashing shall be non-corrosive sheet metal or aluminum.
 - Minimum of 24 gauge hot-dip galvanized steel sheet.
 - Minimum of .032 inch aluminum sheet.
- G. Connectors:
 - Provide gags or other code approved adapters at all downspout connections to the storm water leader or storm water conductor.
 - Do not make downspout connections by installing concrete at the storm water leader or storm water conductor.
- H. Install precast concrete or plastic splash blocks when listed in the Scope or specified herein.

PART 3 – INSTALLATION

3.1 GUTTERS AND DOWNSPOUTS

- A. Follow manufacturer's installation instructions:
 - Provide manufacturer's standard matching accessories as required for a complete installation.
 - Take adequate precaution to protect gutters and downspouts from damage during installation process.
- B. Install to provide ample support and proper drainage as follows:
 - Use hangers and straps adequate in size and spacing to support loads.
 - Seal all gutter joints, screws, rivets, etc. with approved sealant.
 - Support every separate section.
 - Do not mount gutter straps over top of shingles.
 - Construct gutters with positive slopes, to prevent accumulation of standing water.
 - Set gutter height to prevent possible overshoot of water.
 - Install downspouts that are visually plumb and that match specified tolerances.
 - Lap joints to match drainage flow.
 - Provide movement slip joints on downspouts.
 - Provide downspout extensions as necessary to adequately divert water away from building.
 - Protect building surfaces from damage from hanger and strap connections.
 - Keep downspouts and gutters separated from wall surfaces to avoid staining and corrosion.
 - Splash blocks shall be pitched to direct water runoff away from the building.
 - Splash blocks shall be placed to adequately catch the discharge from the downspout.

3.2 INSPECTION AND CLEAN-UP

- A. After system is complete, fully test system with flowing water to assure proper runoff. Adjust and retest as required.
- B. At completion of work, Contractor is responsible for completely removing from the property, at Contractor's expense, all debris generated from removal and installation of gutter materials.
 - When clean up of work involves painted gutters and downspouts, clean up shall comply with Section 01810 Lead Dust Hazards.
 - Leave gutters and downspouts clear and clean of debris.
- C. Repair or replace defective work as directed by the Inspector.

END OF SECTION – 07631 GUTTERS AND DOWNSPOUTS

DIVISION 8 – DOORS AND WINDOWS

08200 DOORS

Part 1 – General

1.1 WORK

- A. Provide replacement doors, complete with hardware as indicated on the Scope and as specified herein.
- B. When work involves removal or disturbance of painted or otherwise coated surfaces work shall comply with Section 01810 Lead Dust Hazards.
- C. Replacement doors shall be sized to fit existing openings.
- D. Door types shall be as listed in the Scope as specified herein.
- E. Provide and install all door hardware necessary for a completely operational door, as indicated on the Scope, and as specified herein. See Section 08710 Hardware for further details.

1.2 QUALITY STANDARDS

- A. Provide experienced, well trained workers competent to complete the work as specified.
- B. Provide a certified lead abatement supervisor and certified lead abatement workers to perform door demolition and removal, including clean-up and debris removal per Section 01810 Lead Dust Hazards.
- C. Unless approved by the Inspector, provide all related products and accessories from one manufacturer.
- D. Comply with standards of the Architectural Woodwork Institute for grades specified.
 - Architectural Woodwork Institute
 - www.awinet.org/Publications
 - AWI Quality Standards Illustrated, 8th Edition

1.3 SUBMITTALS

- A. Provide manufacturer's data required to prove compliance with these specifications.
 - Do not start work until Owner has approved and signed the Owner's Selection Sheet (Appendix A).
 - Do not start work until Owner has approved color/finish selections in writing (Appendix A).
 - Provide a copy of the Owner's written color/finish selections to Agency.
 - Submit manufacturer's installation instructions and warranty.

1.4 MATERIALS HANDLING

- A. Provide all materials required to complete the work.
 - Deliver and transport materials to avoid damage to the product or to any other work.
 - Return any products or materials delivered in a damaged or unsatisfactory condition.
 - Materials and products delivered will be certified by the manufacturer to be as specified.
- B. Delivery:
 - Packaging must be sealed with clear manufacturer and identification markings.
 - Lift and carry doors when moving them, do not drag into position.
- C. Storage:
 - Store consistently vertical or flat.
 - Supported off floor with 2x boards spaced at 12" centers.
 - Protected from weather or moisture.
 - Protected from construction damage.
 - Protected from occupant traffic.

PART 2 – MATERIALS AND PRODUCTS

2.1 08200 WOOD DOORS

- A. Provide wood or metal doors as per the Scope.
 - Solid or hollow-core as indicated in the Scope.
 - UL label is required on fire rated doors.
 - Pre-hung door assemblies, wood or metal, as per the Scope.
- B. Provide doors that are straight, free of defects and blemishes, and that have:
 - Smooth edges
 - Clean joints
 - Consistent, blemish free finishes
 - Correct finish material thickness
- C. Verify that factory preparation and pre-fitting follow required hardware templates:
 - Cuts
 - Drilling
 - Routing
 - Accessories
 - Hollow-core doors must have core construction as required to receive finish hardware.
- D. Provide door glazing with:
 - Stops as required.
 - Labeled safety glass.
- E. Provide fire rated doors that comply with all building code and fire code requirements.
 - Openings/glass are as required.
 - Hinges are as required.
 - Undercut does not exceed the allowable code maximum.
 - Correct identification labels and/or certification.
 - Correct factory-supplied hardware.
 - Automatic closure hardware.
- F. Door finish shall be in accordance with the Scope, Section 09900 Painting and as specified herein.
 - Color as selected by Owner.

PART 3 – INSTALLATION

3.1 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
- B. Do not allow door swings to conflict with:
 - Electrical switches or outlets.
 - Wall guards or rails.
- C. Removal of existing door:
 - Prior to removal, containment measures shall be in place as described in Section 01810 Lead Dust Hazards.
 - All debris created shall be properly disposed of by the Contractor in accordance with Section 01810 Lead Dust Hazards.
 - Contractor shall take all necessary precautions to minimize damage to surrounding surfaces during removal.
 - The Contractor at the Contractor's expense shall repair any surfaces damaged during removal.
 - The Contractor shall make any necessary repairs to the rough door opening including replacing defective framing members, leveling or squaring, installing insulation, or installing blocking and shims.

3.2 INSTALLATION

- A. Mount frames and doors plumb, straight, and securely braced.
- B. Mounting tolerances:
 - Bottom clearance $\frac{1}{2}$ " maximum.
 - Top clearance, $\frac{1}{8}$ " maximum.
 - Lock and hinge edge, bevel at $\frac{1}{8}$ " in 2" maximum.

C. Installing doors:

- Schedule exterior door installation when weather conditions are dry and temperatures are moderate. Exterior doors not separated by a closeable entry hall door or enter directly into the habitable space shall not be replaced on a day when temperatures are below 32°.
- Schedule door installations to avoid construction damage.
- Hang doors – straight, plumb, smooth in opening, smooth and secure in closing.
- Install fiberglass insulation in openings and cavities around exterior door frame.
- Install all necessary door jambs, stops, casings or other trim material as necessary for a finished installation.
- Apply high quality sealant under door threshold prior to installing pre-hung exterior door.
- Provide clearances below doors as necessary to allow for: thresholds, weatherstripping, gasketing, carpet, and other types of flooring.
- Install fastenings and hardware as per manufacturer's instructions and in accordance with the Scope and Section 08710 Hardware.

D. Cutting and sealing doors:

- Do not cut fire-rated doors so as to negate fire rating.
- Seal or reseal doors whenever they are cut.
- Seal doors at tops and bottoms after installation.
- Apply first coats of paint or sealer to both sides of doors during the same painting operation.
- Seal, stain, or paint exterior doors per Scope, Section 09900 Painting, and as specified herein.
- Exterior doors shall be treated/sealed before or immediately after installation.

3.3 INSPECTION, REPAIR, AND TOUCH-UP

A. After installation, inspect all doors and frames to find and repair damaged surfaces.

- Repair or replace any damaged materials as directed by Inspector.
- Repair or replace any other materials damaged during installation.
- Make undetectable repairs before applying final finish.
- Repair or replace any related damaged or non-complying materials.
- Repair or replace doors that do not operate freely and smoothly.
- Contractor shall replace any doors that Contractor installed as part of the Scope which are not in compliance with these specifications.
- Any costs for replacing doors for non-compliance will be paid by the Contractor.

B. Final door mounts:

- Square
- Smooth operating.
- Plumb when doors are closed, partially open, and fully open.
- After installation clean doors thoroughly per Section 01810 Lead Dust Hazards.

END OF SECTION – 08200 DOORS

DIVISION 8 – DOORS AND WINDOWS

08600 WINDOWS

Part 1 – General

1.1 WORK

- A. Provide windows where indicated on the Scope and as specified herein.
- B. When work involves removal or disturbance of painted or otherwise coated surfaces work shall comply with Section 01810 Lead Dust Hazards.
- C. Window types shall be per the Scope.
- D. Replacement windows shall be sized to fit existing openings.
- E. New windows shall be sized per the Scope and as specified herein.

1.2 QUALITY STANDARDS

- A. Provide experienced, well trained workers competent to complete the work as specified.
- B. Provide a certified lead abatement supervisor and certified lead abatement workers to perform window demolition and removal including clean-up and debris removal per Section 01800 Lead Dust Hazards.
- C. Unless approved by the Inspector, provide all related products and accessories from one manufacturer.

1.3 SUBMITTALS

- A. Contractor shall obtain a Lead Abatement Permit from the Milwaukee Health Department at least two (2) business days prior to starting any lead abatement work.
- B. Contractor shall provide Owner and (if applicable) tenant a minimum of two (2) days advance notice prior to starting any lead abatement work.
- C. Contractor shall post the permit, hazard warning sign, occupant protection plan, and MHD checklist in a visible location at or near the job site entrance door.
- D. Contractor shall submit a list of materials to be provided for this work.
 - Submit manufacturer's installation instructions.
 - If necessary, submit manufacturer's data required to prove compliance with these specifications.
- E. Submit to Agency an approved and signed Owner's Selection Sheet (Appendix A).

1.4 MATERIALS HANDLING

- A. Provide all materials required to complete the work.
 - Deliver and transport materials to avoid damage to the product or to any other work.
 - Return any products or materials delivered in a damaged or unsatisfactory condition.
 - Materials and products delivered will be certified by the manufacturer to be as specified.
- B. Delivery:
 - Packaging must be sealed with clear manufacturer and identification markings.
 - Lift and carry windows when moving them, do not drag into position.
- C. Storage:
 - Store consistently vertical or flat.
 - Support off floor with 2x boards spaced at 12" centers
 - Protect from weather or moisture.
 - Protect from construction damage.
 - Protect from occupant traffic.

PART 2 – MATERIALS AND PRODUCTS

2.1 WINDOWS

- A. Provide windows complete with glazing as per the Scope and as specified herein.

B. Approved windows:

<u>Manufacturer</u>	<u>Model</u>
• Alside Supply Center	Excalibur Window
• Amcraft	Grand Horizons EP
• Norandex/Reynolds	American Classic-3000 Series
• Richards Building Supply	Architect's Select/Survivor
• Silverline	9500 Series
• Unlimited Inc.	2100 Series
• Other *	

* If the Contractor's bid includes the installation of windows other than listed above, it is the Contractor's responsibility to submit to the Agency all window manufacturer data necessary to prove that the alternate window meets or exceeds the specifications and quality of the above listed windows. The Agency and the Inspector shall reserve the right to make the final determination as to whether the alternate window is approved for use.

PART 3 – CONSTRUCTION AND INSTALLATION

3.1 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
- Verify that weather conditions are acceptable for window replacement.
 - Properly measure window openings per window manufacturer's recommendations.
 - Verify that delivered windows are of correct size and type prior to removing existing windows.
- B. Removal of existing window:
- Prior to removal, containment measure shall be in place as described in Section 01800 Lead Dust Hazards.
 - All debris created shall be properly disposed of by the Contractor in accordance with Section 01810 Lead Dust Hazards and as stated herein.
 - Contractor shall take all necessary precautions to minimize damage to surrounding surfaces during removal.
 - Carefully remove interior stops and if in good condition Contractor may reuse stops. If the interior stops are missing, damaged, broken, etc. Contractor shall install new interior stops.
 - Remove lower sash, parting stop and upper sash from window unit and properly discard.
 - Remove to bare wood all paint from windowsill taking all necessary precautions to minimize damage to sill and surrounding surfaces. This includes the inside edge of the windowsill where the windowsill meets the lower sash.
 - Remove to bare wood all paint from the exterior (blind) window stops and exposed exterior sill or trough. An alternative option is to remove loose paint from blind stop and wrap blind stop with aluminum or vinyl.
 - After the paint removal work is complete remove the storm window and properly dispose. Owner is allowed to keep removed storm windows. However, if the removed storm window is painted it must be sealed by the Contractor in a 6 mil plastic bag.
 - The Contractor at the Contractor's expense shall repair any surfaces damaged during removal.
 - The Contractor shall make any necessary repairs to the window opening including replacing defective framing members, leveling or squaring, installing insulation, or installing blocking and shims.

3.2 INSTALLATION

A. Installing windows:

- Install and tightly secure frame braces and anchors.
- Install sash free of bends, warps, and dents.
- Protect window frames and other parts from damage during installation process.
- Install fiberglass insulation in openings and cavities around window.
- Install all necessary window jambs, stops, casings or other trim material as necessary for a finished installation.
- Place windows into opening without forcing.
- Repaint or refinish windowsill, exterior blind stop, and any other bare wood surfaces. If the exterior window trim is wrapped with aluminum or vinyl, the exterior blind stops shall be also be wrapped in matching or similar material.
- Prepare weep holes adequate in size and spacing.
- Keep weep holes clean.
- Install windows that are weathertight and that allow no air infiltration.
- Install ventilator hardware to operate easily and without sticking.
- Use closures that are uniform and tight when units are closed and locked.
- Install operable windows that open and close smoothly, without rattling or sticking.
- After window is properly installed, caulk around window perimeter (per manufacturer's instructions) using a good quality silicone sealant.

3.3 INSPECTION, REPAIR, AND TOUCH-UP

A. After installation, inspect all windows and frames to find and repair damaged surfaces.

- Repair or replace any damaged materials as directed by Inspector.
- Repair or replace any other materials damaged during installation.
- Make undetectable repairs before applying final finish.
- Repair or replace any related damaged or non-complying materials.
- Repair or replace windows that do not open freely and smoothly.
- Any costs for replacing windows for non-compliance will be paid by the Contractor.

B. Final window mounts:

- Square
- Smooth operating.

C. Protection and repair:

- Make undetectable repairs to damaged materials or finishes.
- Touch up damaged shop coats before final painting.
- Keep hardware clean.
- After installation clean windows thoroughly per Section 01800 Lead Dust Hazards.
- Do not use petroleum based cleaning materials on window glass or vinyl window components.

END OF SECTION – 08600 WINDOWS

DIVISION 8 – DOORS AND WINDOWS

08610 STANDARD WOOD DOUBLE HUNG WINDOW TREATMENT

PART 1 – GENERAL

1.1 WORK

- A. Provide MHD Window Treatments on all wood double hung windows in all habitable rooms and where indicated on the Scope and as specified herein.
- B. Contractor shall be responsible for compliance with Department of Housing and Urban Development Lead-Based Paint Regulation [24 CFR Part 35], State of Wisconsin, Department of Health and Family Services Lead-Based Paint Regulations [Chapter HFS 163], and the City of Milwaukee Code of Ordinances, Lead-based Paint Hazard Control Regulations, Chapter 66-47.
- C. Obtain Lead Abatement Permit from City of Milwaukee Health Department at least two (2) business days prior to starting any window abatement work.

1.2 QUALITY STANDARDS

- A. Provide experienced, well-trained workers competent to complete the work as specified.
- B. Provide a certified lead abatement supervisor and certified lead abatement workers to install MHD Window Treatments including clean up and debris removal per Section 01810 Lead Dust Hazards.
- C. Window and other lead abatement work is time sensitive. Contractor is required to expedite the window abatement work to minimize the potential for lead dust exposure to occupants of the dwelling.

1.3 SUBMITTALS

- A. Contractor shall post a copy of the MHD Lead Abatement Permit in a visible location at or near the job site entrance door.
- B. Contractor shall obtain a Lead Abatement Permit from the Milwaukee Health Department at least two (2) business days prior to starting any lead abatement work.
- C. Contractor shall complete an Occupant Protection Plan form and submit it to the Milwaukee Health Department along with their Lead Abatement Permit application.
- D. Contractor shall provide Owner and (if applicable) tenant a minimum of two (2) days advance notice prior to starting any lead abatement work.

1.4 MATERIALS HANDLING

- A. Provide all materials required to complete the work as listed in the Scope and specified herein:
 - Deliver and transport materials to avoid damage to the product or to any other work.
 - Return any products or materials delivered in a damaged or unsatisfactory condition.
 - Materials and products delivered will be certified by the manufacturer to be as specified.
 - Protected from weather or moisture.
 - Protected from construction damage.
 - Protected from occupant traffic.

PART 2 – MATERIALS AND PRODUCTS

2.1 STANDARD WINDOW TREATMENT

- A. Provide Vinyl Jamb-liners (3-1/4 in. x 80 in.), manufactured by Pro*Seal Products, PO Box 147, Beloit, WI 53512-0147, or equal.
- B. Provide aluminum or vinyl coil stock, color as selected by Owner, for window trough covering.
- C. Provide aluminum or vinyl, color as selected by Owner, for covering blind stop.
- D. Provide, if necessary, interior wood window stops. Color shall match as closely as possible existing interior window trim.
- E. Replace window glass if broken or cracked with glass of same size and thickness.

- F. Replace broken, rotten or otherwise unusable sash.
- G. Repairs to window troughs, sill, stools, jambs, stops or casing shall be made using materials of similar quality, and grade. Replacement materials shall have architectural characteristics that match as closely as possible to the existing building architecture.

PART 3 – INSTALLATION

3.1 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
- B. Contractor shall confirm that all windows have working storm windows.
 - Broken or missing storm windows shall be repaired or replaced prior to starting window treatments as outlined in the Scope and specified herein.
 - In the absence of a working storm window, the Contractor may with the approval of Milwaukee Health Department Risk Assessor, use 6 mil plastic as a containment barrier if it is installed and adequately secured with tape from the outside.
- C. Post Lead Abatement Hazard warning signs at the entrances of containment areas.
 - Post a copy of the lead abatement permit.
 - Post a copy of the Occupant Protection Plan.
 - Maintain a copy of the Scope at the job site.

3.2 REMOVAL OF EXISTING COMPONENTS

- A. Prior to removal, containment measures shall be in place as described in Section 01810 Lead Dust Hazards.
 - Prior to removal, exterior storm window must be secure in place and closed to prevent escape of lead dust to the exterior of the building.
 - All debris created by the Contractor shall be properly disposed of in accordance with Section 01810 Lead Dust Hazards and Section 01800 Cleaning and Maintenance.
 - Contractor shall take all necessary precautions to minimize generation of dust during the course of work, per Section 01810 Lead Dust Hazards.
 - Contractor shall take all necessary precautions to minimize damage to surrounding surfaces during removal.
 - Remove interior window stops taking all necessary precautions to minimize damage to stops.
 - Remove interior sash, window parting bead and exterior sash taking all necessary precautions to minimize damage to window sash and glazing.
 - Disconnect or cut window cords connecting window weights. Remove cords and allow weights to remain in wall cavity. Unscrew pulley fasteners and remove pulleys. Do not pound or damage window jambs.
 - Wet sand or scrape exterior (blind) window stops.
 - Clean out and/or install weep holes sized to allow water drainage from window trough.
 - Remove window hardware, HEPA plane front, back and all four edges of window sash to bare wood.
 - Wet sand or scrape the sash returns adjacent to the glass.
 - Remove all loose glazing material.
 - Wet sand or scrape the parting bead at the top (header) of the window opening.
 - Remove to bare wood all paint from windowsills taking all necessary precautions to minimize damage to sill and surrounding surfaces.
 - Remove to bare wood all paint from inside edge of windowsills where the windowsill meets the lower sash.
 - If window sashes and/or windowsills are stained and in reasonably good condition as determined by the Inspector, stained surfaces need not be planed to bare wood unless it is specifically listed in the Scope.
 - Stained surfaces such as sashes and sills must be sealed.
 - The Contractor at the Contractor's expense shall repair any damage to window components during removal.

- B. The Contractor shall make all necessary repairs to defective window components as listed on the Scope or specified herein.
- Sashes that are broken, warped, cracked, split, rotten, or otherwise unusable shall be replaced by the Contractor this includes sash that contain more than one L-bracket.
 - Broken or cracked glass shall be replaced with glass of matching type and thickness. Bathrooms require opaque glass. Note: Consult Inspector prior to removal of sash containing stained glass or beveled glass. If necessary, this type of glass shall be replaced with standard conventional window glass, size and thickness to fit opening.
 - Broken, loose or missing glazing shall be replaced with window glazing material.
 - Broken, cracked, split, rotten or missing interior window stops shall be replaced with similar grade and species material. Contractor shall match as closely as possible existing stop material.
 - Broken, cracked, split, rotten, or missing windowsills shall be replaced with similar grade and species material. Contractor shall match as closely as possible existing architectural finish materials.
 - Broken, cracked, split, rotten, improperly pitched or missing window troughs shall be replaced with similar grade and species material. Contractor shall match as closely as possible existing architectural materials.
 - Window opening shall be reasonably straight level and square. Contractor shall make all necessary adjustments to window components to assure smooth and weathertight operation of window sash.

3.3 INSTALLATION

- A. Prior to installation of window treatment components, thoroughly clean out window opening with HEPA vacuum, wet scrape all loose, cracked or chipping paint from window blind stop, jambs, and trough.
- B. Mount window jamb-liners in window opening plumb, straight and secure.
- Install aluminum or vinyl wrap in window trough. Caulk underside of covering to create a watertight seal. Fasten securely using like colored 1 ¼ inch aluminum trim nails.
 - Caulk behind bottom of window jamb-liners to create a watertight seal.
 - Cover exterior (blind) window stops with aluminum or vinyl.
 - Mount jamb-liners with a minimum of 2 –1” wood or drywall screws located within 3” of each top and bottom edges of jamb-liner.
 - Jamb-liners shall be sized and cut to fit tightly within the opening, bottom cut angle shall match the pitch of the window trough.
 - Sash mid-rails shall align properly when sashes are in closed position. Contractor shall make all necessary adjustments to sash prior to window assembly to assure adequate finished alignment.
 - Prior to assembly of window components, window sashes, windowsills, interior window stops and all other bare surfaces or scraped surfaces of the window shall be shall be primed and painted, or stained and sealed (for natural finished wood) as per Section 09900 Painting.
 - Interior window stops shall be reused if in good condition. Damaged or broken stops shall be replaced with stops sized to fit opening without gaps, or joints. Contractor shall match window stops as closely as possible to existing window architectural trim materials.
 - Recess nail heads below surface of material. Nail holes shall be filled with carpenter’s wood filler.
 - Reinstall window hardware. Contractor shall replace missing, damaged, broken or otherwise unusable window hardware including but not limited to window locks, window pulls, window locking pins, etc. If hardware replacement is necessary, Contractor shall match as closely as possible the existing architectural hardware.
 - Hardware shall be clean, free of paint and mounted securely in place with adequate fasteners. Shimmiing of fasteners to correct misalignment of sashes is unacceptable and will be rejected.
 - Clean all surfaces of window including sash, jambs, sill, trough, hardware and adjacent floor as per outlined in Section 01810 Lead Dust Hazards.
 - Scrape excess paint and glazing material off window glass and clean both sides of glass.

3.4 INSPECTION, REPAIR, AND TOUCH-UP

- A. After installation, inspect all windows and frames to find and repair damaged surfaces.
- Repair any damaged materials or parts as directed by Inspector.
 - Repair or replace any non-complying materials.
 - Repair or replace any windows that do not operate freely and smoothly.
 - Repair or replace any window sashes that do not remain in a stationary position, open or closed.
 - Any costs for replacing windows for non-compliance will be paid by the Contractor.

B. Final window mounts:

- Smooth operating.
- Sash shall remain stationary in open or closed position.
- Window shall be reasonably weathertight, having no visible gaps or openings when in the closed and locked position including at the mid-rail between the upper and lower sash.
- Upper and lower sash shall be tight against the top and bottom of window opening when window is in the closed and locked position.

END OF SECTION – 08610 STANDARD WOOD DOUBLEHUNG WINDOW TREATMENT

DIVISION 8 – DOORS AND WINDOWS

08710 HARDWARE

Part 1 – General

1.1 WORK

- A. Provide and install all hardware as indicated on the Scope and as specified herein.
- B. See Section 11020 Security Items for information on window pins and basement window bars.

1.2 QUALITY STANDARDS

- A. Provide experienced, well trained workers competent to complete the work as specified.
- B. Unless approved by the Inspector, provide all related products and accessories from one manufacturer.

1.3 SUBMITTALS

- A. Provide manufacturer's data required to prove compliance with these specifications.
 - Do not start work until Owner has approved and signed color/finish selections in writing on the Owner's Selection Sheet (Appendix A).
 - Provide a copy of the Owner's written color/finish selections to Agency.
- B. Provide Owner with at least two (2) keys for each lockset or deadbolt installed.
 - Submit manufacturer's installation instructions and warranty.

1.4 MATERIALS HANDLING

- A. Provide all materials required to complete the work listed on the Scope and specified herein.
 - Deliver and transport materials to avoid damage to the product or to any other work.
 - Return any products or materials delivered in a damaged or unsatisfactory condition.
 - Materials and products must be delivered in new unopened containers with manufacturer's identification markings.
- B. Store materials safely to avoid damage, protected from moisture.

PART 2 – MATERIALS AND PRODUCTS

2.1 HARDWARE

- A. Provide hardware as listed in the Scope.
 - Provide hardware with unblemished finishes.
 - Match up hardware pieces (as closely as possible) in type, finish and color when they are used together or in close proximity.
 - Provide all fastenings and auxiliary devices necessary to complete the work.
- B. Door hardware shall be "builders grade", standard readily available varieties manufactured by recognized manufacturers.
 - Entry door locksets and deadbolts serving an individual unit shall be keyed alike.
 - Deadbolts shall be openable (unlockable) without a key from the inside of the dwelling unit.
 - Common entry doors serving more than one unit shall have only one locking/latch device that is openable with one movement. Do not install door chains, deadbolts, etc. on common entry doors.
 - Interior common swinging doors shall have a standard passage set.
 - Doors to bathrooms shall have a passage set with privacy lock.
 - Door hinges shall be of sufficient size and quantity to support the door and allow for proper door operation.
 - A doorstop shall be installed where necessary to protect the door and surrounding surfaces and projections from damage.

- C. Provide miscellaneous hardware as listed on the Scope and as specified herein:
- Provide handrail mounting brackets in sufficient size and quantity to adequately support the handrail and the loads imposed on it.
 - Provide window locking devices capable of securely locking both window sashes in a closed position. Window locking devices shall also comply with Section 11020 Security Items and Section 08610 Standard Window Treatment.
 - Doorstops, bumpers, etc. shall be manufactured for that use and installed according to manufacturer's instructions.
 - Provide all other required hardware for proper installation of pocket doors, bi-fold doors, slide-by doors, accordion doors, etc.

PART 3 – INSTALLATION

3.1 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
B. Temporarily remove or cover exposed hardware when painting or cleaning adjacent materials.

3.2 INSTALLATION GENERAL

- A. Attach all hardware:
- Securely.
 - With fasteners made specifically for that hardware.
 - With fasteners suited to door or door frame materials and construction.
 - Without damage to hardware or fasteners.
- B. Match hardware:
- Match in type, size, and finish, all sets of fastenings, such as screws on hinge butts.
 - Match all required screws to all screw-attached hardware, such as hinges.
 - Install screws flush, straight, and complete in number.
 - Install screws tight without damaging screw slots.

3.3 INSTALLATION – BUTTS AND HINGES

- A. Install door hinges so that:
- Mortise-type hinges are flush.
 - Mortise edge distances on door are correct.
 - Top and bottom hinge heights are correct.
 - Space intermediate hinges equidistant from others.
 - Completely set pins in butts.
 - Where butt hinges will swing 180 degrees, use hinges with adequate throw to clear the door trim.
- B. Install all door hardware such that doors will operate:
- Easily, without binding.
 - Quietly.
 - With secure fit at latches.
 - With tight fit at frames.

3.4 INSTALLATION – LOCKSETS, DEADBOLTS, AND LATCHES

- A. Install locksets, deadbolts, and latches per manufacturer's instructions:
- Jig, bore or pre-drill as required.
 - Mortise for strike allows latchbolt to project fully.
 - Install deadbolt security strike plate below finished strike plate.
 - Install finished latchbolt hole cover for finished appearance.
 - Install cylinder cores with tumblers set upward.
 - Verify that all locksets and latches operate smoothly without effort.

3.5 INSTALLATION – DOOR CLOSERS

- A. Install closers per manufacturer's instructions:
 - For wood doors, metal doors, and storm doors.
 - Install closer fasteners straight, true, and undamaged.
- B. After adjustment, verify that door closers operate:
 - Smoothly at correct speed.
 - Without noise.
 - Firmly to close and latch doors.
 - Verify that door arms of closers are straight out when doors are closed.

3.6 INSTALLATION – PLATES, DOOR STOPS, AND HOLDERS

- A. Install door stops as per manufacturer's instructions:
 - Secure firmly to solid blocking or backing.
 - Allow proper door opening clearance.
 - Install doorstops of correct type and in correct position to fully protect adjacent surfaces, trim, hardware, and furnishings.
- B. Install push, pull, and kickplates according to door manufacturer's instructions:
 - At correct heights from finished floor.
 - Within correct edge distances.
 - On correct sides of doors.
 - Firmly attached with fasteners suited to door construction.

3.7 INSTALLATION – MISCELLANEOUS HARDWARE AND ACCESSORIES

- A. Install hanging, folding, bifold, slide-by and accordion door hardware per manufacturer's instructions:
 - Install level.
 - Matched to weight of door panels.
 - Tightly secured into supportive framing.
 - Clear of obstructions.
 - Smooth and level glide.
 - Easy opening.
 - Secure closure of doors into latches.
- B. Install weatherstripping as per manufacturer's instructions:
 - Install weatherstripping after setting, adjusting, checking, and finishing doors.
 - Fasten securely.
 - Set to not scrape finished flooring.
 - Set to not interfere with door operation.

3.8 INSPECTION, REPAIR, AND TOUCH-UP

- A. After installation clean and inspect all hardware for proper operation.
 - Repair or replace any damaged or defective hardware.
 - Make all repairs undetectable.
 - Protect hardware from paint or other finishes.

END OF SECTION – 08710 HARDWARE

DIVISION 9 – FINISHES

09250 GYPSUM WALLBOARD

Part 1 – General

1.1 WORK

- A. Provide everything that is required to complete the work in the Scope and as specified herein.
- B. Where additional instruction is required, work shall be as directed by the Inspector.
- C. When work involves removal or disturbance of painted or otherwise coated surfaces, the Contractor shall comply with Section 02050 Demolition and Section 01810 Lead Dust Hazards.

1.2 QUALITY STANDARDS

- A. Provide experienced, well-trained workers competent to complete the work as specified.
- B. Provide a certified lead abatement supervisor and certified lead abatement workers to perform any surface preparation work, including but not limited to wet scraping, wet sanding, HEPA planning, heat gunning, clean up and debris removal per Section 01810 Lead Dust Hazards.
- C. All work shall comply with manufacturer's instructions and governing building and safety codes.
- D. All work shall comply with the Gypsum Association, "Application and Finishing of Gypsum Board", GA-216-2000, February 2000.

1.3 SUBMITTALS

- A. Contractor shall notify the Milwaukee Health Department (MHD) – Lead Section (414-286-5033) at least 24 hours prior to starting any work that involves disturbance of painted or otherwise coated surfaces. MHD will assign a Lead Risk Assessor to monitor the work to document lead safe rehabilitation procedures were followed.

1.4 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
- B. Confirm that there is no conflict between this work and the governing lead-safe rehabilitation rules or Section 01810 Lead Dust Hazards.
- C. Notify the Milwaukee Health Department – Lead Section (414-286-5033) at least one day in advance of starting any work under this section.
- D. Confirm that work of other trades that must precede this work has been completed.

PART 2 – MATERIALS

2.1 GYPSUM WALLBOARD

- A. Gypsum wallboard shall be manufactured by:
 - National Gypsum Company
 - American Gypsum
 - Georgia Pacific Gypsum
 - Lafarge North America
 - United States Gypsum Company
- B. Provide boards in 8 foot or other lengths for a minimum of joints.
- C. Use types and thicknesses as listed on the Scope and as specified herein.

2.2 METAL TRIM AND ACCESSORIES

- A. Metal trim shall be zinc-coated steel 26 gauge.

- B. Corner beads:
 - Angle shapes with wings not less than 7/8 inch wide.
 - Perforated for nailing and joint treatment.
 - Or use paper/metal combination bead suitable for joint treatment.

2.3 JOINTING

- A. Jointing system with reinforcing tape and compound as recommended by the gypsum wallboard manufacturer.

2.4 FASTENINGS

- A. For gypsum wallboard attached to wood framing:
 - Use 1-1/4 inch type W bugle-head screws.
 - Alternate: Annular ring nails (drywall nail).
 - Nail sizes as required by the building code.

2.5 ACCESS DOORS AND PANELS

- A. Access doors and panels in plastered walls and ceilings:
 - Install as listed on the Scope or as specified herein.
 - Install where necessary to provide access to plumbing, or other mechanical systems.
- B. Types of access doors and panels:
 - Metal or plastic access doors sized adequately, shall be installed per manufactures instructions.
 - Job built access panels must be adequately sized, made of gypsum or plywood, neatly trimmed and cased with finish lumber, and painted.

2.6 MATERIALS DELIVERY AND STORAGE

- A. Delivery:
 - All gypsum wallboard and accessories shall be delivered new and undamaged.
 - Material sizes shall be as specified on the Scope or as specified herein
- B. Storage:
 - Have materials delivered in a timely sequence as required to expedite the workflow.
 - Store all materials in a secure, clean, dry location with ample ventilation.
 - Well supported off the ground.
 - Protected from weather or moisture.
 - Neatly stacked to prevent warping.
 - Protected from occupant and construction traffic.
 - Stored with level support to prevent toppling.
 - Do not overload floor construction with stored wallboard.

2.7 WORKING CONDITIONS

- A. Maintain a proper work environment:
 - Clean, dry, well ventilated work area.
 - Free of airborne construction dust.
 - Well lighted
 - Within temperature range required by paint manufacturer.
 - Keep humidity low enough to prevent moisture condensation on work surfaces.
 - Do not apply paint in snow, rain, fog, or when relative humidity exceeds 85%.
 - Never apply paint to damp or wet surfaces.

PART 3 – APPLICATION

3.1 PREPARATION

- A. Preparation and coordination:
- Install blocking and backups to support all edges of wallboard.
 - Verify that wood framing to receive wallboard is dry and not subject to shrinkage.
 - Verify that all-mechanical equipment i.e. wiring, piping, ductwork, etc. is properly protected from nail and screw penetration.
- B. Work area shall be within the manufacturer's recommended temperature range.

3.2 INSTALLATION

- A. Install as per manufacturer's instructions, local building codes, per the Gypsum Association, "Application and Finishing of Gypsum Board", GA-216-2000, February 2000, and as specified herein.
- B. If there is a conflict between instructions, standards, code, etc. install as instructed by Inspector.
- C. For walls and ceilings:
- Hold wallboard $\frac{3}{8}$ inch to $\frac{1}{2}$ inch up from floor.
 - Install wall panels horizontally unless otherwise required.
 - Stagger panel joints vertically.
 - Stagger panel joints back-to-back if using double-layered panels.
 - Keep long joints of ceiling straight and aligned.
 - Stagger short joints of ceiling panels at half the long dimensions of panels.
 - Keep joints to a minimum.
 - Keep joints tightly fitted.
 - Align doorjamb and vertical joints.
 - Keep piecing and use of odd sizes to an absolute minimum.
 - Use moisture-resistant wallboard (green board) in damp environments.
 - Seal edges and cuts of wallboard in damp environments.
 - Install metal corners and other protective strips where finish wallboard edges might be damaged.
 - Never force wallboards into place.
 - Install gypsum wallboard at right angles to furring or studs.
 - All end joints over framing or furring members.
 - Install wallboard to ceilings with long dimension of board at right angles to joists.
- D. Nailing and screw attachment:
- Attach screws with clutch-controlled power screwdrivers.
 - Attach screws at 12" o.c. at ceilings and 16" o.c. at walls.
 - Where wall-framing members are 24 inches apart, space screws 12" o.c.
 - Start nailing from centers of panels, and proceed outward to edges.
 - Avoid paper damage in nailing.
 - Where paper damage occurs, add another nail within about 2 inches.
 - Do not proceed with nailing into wood framing that has over 19% of moisture content.
- E. Sealing:
- Thoroughly seal penetrations in fire-rated walls.
 - Cut cutouts for electrical outlets, switch boxes, pipe, etc., tightly to size.
- F. Taping and spackling:
- Follow applicable trade standards and manufacturer's instructions throughout.
 - Keep temperature above specified minimum (usually 55 degrees Fahrenheit).
 - Do not allow any bumps, bubbles, or dimples in taping and spackling.
 - Allow 24 hours between spackling coats.
 - Sand and spackle wallboard as required, as base for final specified texture or finish.
 - Do not track gypsum and spackle dust to clean areas.
 - Final spackle coat shall be sanded smoothly.
 - Final spackle coat shall be feathered outward from 12 inches to 16 inches, each side of joint.

G. Joint treatment:

- Gypsum wallboard must fit completely snugly against supporting framework.
- Joint work shall be at a minimum of 55 degrees Fahrenheit for 24 hours prior to work.
- Joint and finishing compounds must dry 24 hours before starting finishing.
- Apply joint treatment and finishing compound by machine or hand tool.
- Allow minimum drying time of 24 hours.
- Allow additional drying time in humid or poorly ventilated areas.
- Embedding compounds shall be applied at wallboard joints and fastener heads in thin uniform layer.
- Spread embedding compound not less than 3 inches wide at joints.
- Finishing compounds shall be applied to joints and fastener heads when compound is dry and has been sanded.
- Sandpaper between coats, and do final sandpaper work to eliminate all ridges and high points.
- Feather finishing compound to not less than 12 inches wide.
- When thoroughly dry, sandpaper to a uniform smooth surface without damaging wallboard.

3.3 ACCESS DOORS

- A. Install access doors in coordination with other work and as listed in the Scope.
- Anchor access doors firmly into position.
 - Install access doors to be completely straight, flush, and aligned with finished surface.
 - Install access doors so they can be easily opened without damaging the surrounding surfaces.

3.4 METAL TRIM

- A. Provide all metal trim as required to complete the work.
- B. Securely nail corner beads.
- With required type and size nail.
 - Starting 2 inches from each end.
 - Space and stagger as required by wallboard system manufacturer.

3.5 CLEANING AND REPAIR

- A. When work involves removal or disturbance of painted or otherwise coated surfaces, cleanup shall comply with Section 01810 Lead Dust Hazards, and as specified herein.
- B. Cleaning:
- Don't allow tracking of gypsum and finishing compounds onto floor surfaces.
 - Don't allow gypsum and compound dust to accumulate on horizontal surfaces.
 - At completion of each segment of work in a room, clean thoroughly and remove all debris.
 - Frequently remove all debris from site.
 - Do not allow gypsum dust to blow around and contaminate other areas of the work site.
 - Immediately clean any spilled, splattered, or smeared joint compound.

3.6 INSPECTION AND REPAIRS

- A. Recheck work for necessary repairs that may be required before painting or other added work.
- B. Make repairs as directed by the Inspector.

END OF SECTION – 09250 GYPSUM WALLBOARD

DIVISION 9 – FINISHES

09300 CERAMIC TILE

Part 1 – General

1.1 WORK

- A. Provide all labor and materials required to complete the tile work as listed on the Scope, and as specified herein.
- B. When work involves repair and removal of plaster, drywall, or other painted components in excess of 2 square feet total, work shall comply with Section 01810 Lead Dust Hazards.

1.2 QUALITY STANDARDS

- A. Provide experienced, well-trained workers competent to complete the work as specified.
- B. All work shall comply with manufacturer's instructions and governing building codes.
- C. Provide a certified lead abatement supervisor and certified lead abatement workers per Section 01810 Lead Dust Hazards, if work will involve the removal or disturbance of painted components in excess of 2 square feet.

1.3 SUBMITTALS

- A. Do not start work until Owner has approved and signed the Owner's Selection Sheet (Appendix A).
 - Supply Owner with samples of standard tile color, pattern, and style selections.
 - Provide a copy of the Owner's written color selection to Agency.
 - Submit to Owner manufacturer's flooring care and cleaning instructions, and warranty.

1.4 MATERIALS HANDLING

- A. Provide all materials required to complete the work.
 - Deliver and transport materials to avoid damage to the product or to any other work.
 - Return any products or materials delivered in a damaged or unsatisfactory condition.
 - Materials and products shall be new and delivered materials will be certified by the manufacturer to be as specified.
 - Packaging must be sealed with clear manufacturer and identification markings.
- B. Store ceramic tile and related materials in work area:
 - Protected from weather or moisture.
 - Protected from construction damage.
 - Protected from occupant traffic.

PART 2 – MATERIALS

2.1 TILE AND ACCESSORIES

- A. Tile:
 - Shall comply with Tile Council of America Specification 137.1.
 - Colors, textures, and patterns will be as selected by the Owner from standard and readily available local suppliers.
 - Tile shall be selected for use per manufacturer's instructions.
 - Delivered tile shall match samples selected by Owner.
 - Floor tile shall have coefficient of friction not less than 0.50 as per ASTM F489, ASTM F609.
- B. Provide all accessory shapes to complete the work as listed of the Scope and as specified herein.

2.2 SETTING MATERIALS

- A. Comply with Tile Council of America "Handbook for Ceramic Tile Installation".
- B. Latex-portland cement mortar as per ANSI A118.4.
- C. Organic Adhesive as per ANSI A136.1.
 - Type I where subject to extended water exposure.
 - Type II at all other locations.

2.3 GROUT

- A. Comply with Tile Council of America "Handbook for Ceramic Tile Installation".
- B. Colors will be selected by Owner from standard colors available from approved manufacturers.
- C. Portland cement grout:
 - Use mixture of portland cement and other materials manufactured for this purpose.
 - Grout must comply with tile manufacturer's instructions.

2.4 OTHER MATERIALS

- A. Provide all other materials, required for a complete, proper installation.
- B. Adhesive, sealant, and grout as per applicable trade standards and tile manufacturer's instructions.
 - Delivered in new unopened containers.
 - With correct color additives.
- C. Provide non-corrosive lath:
 - Zinc-coated
 - Lapped
 - Tied with zinc-coated fasteners.
- D. Tile backer board – cement boards:
 - Installed as an underlayment for wall tile.
 - Minimum thickness ½ inch.
 - Installed per manufacturer's instructions.
- E. Install all necessary waterproofing per manufacturer's instructions including all:
 - Primer.
 - Felt.
 - Waterproof membrane.
 - Sealant.
 - Waterproof sheet metal work.
 - Underlayment.

PART 3 – INSTALLATION

3.1 PREPARATION

- A. Keep work surfaces and working environment:
 - Clean.
 - Dry.
 - Well lighted.
 - Well ventilated.
 - Free of airborne construction dust.
 - At comfortable working temperature per manufacturer's instructions.
- B. For accessories and other work:
 - Provide supports for fixtures and related construction including wall blocking, backing, inserts, and anchors.
 - Pre-mark and double-check locations for accessories to be installed.
 - Set accessories in place before beginning tile work.
 - Put in place and properly position, work of related trades such as electrical boxes, switches, stub ups, drains, and other plumbing.
- C. Install all support framing, furring, and backing plumb, square, aligned, and secured so that surfaces will not move or deflect.
- D. Prepare floors for tiling so the finish floor will be either perfectly level or slope properly to drains.

- E. Work preparation:
- Install backer board (cement board) securely, in line with surrounding wall plane.
 - Install waterproofing and backing that will absolutely block water leakage
 - Install control joints and edge strips.
 - Securely fasten all components.
 - Sized and shaped exactly to fit finished tile work.
 - Set layout start points to achieve tile patterning that is symmetrical, complete, planned for minimal and balanced tile cutting.
 - Include trim, edge, and base shapes with materials that match other tiles and are free of irregularities.

3.2 INSTALLATION

- A. Work standards and conditions:
- Comply with Tile Council of America “Handbook for Ceramic Tile Installation”.
 - Comply with manufacturer’s instructions.
 - Work temperature must be as per instructions of materials manufacturers.
- B. Limits of tile application:
- Extend tile into recesses and under and behind future equipment or fixtures.
 - Tile must be installed as a complete, uninterrupted covering.
 - Edges and corners must be terminated neatly without disruption of pattern or joint alignment.
 - Terminate tile neatly at obstructions or penetrations of other work.
- C. Joint pattern:
- Lay tile in standard grid unless otherwise specified in Scope.
 - Align joints of adjoining same size tiles on floor, base, walls, and trim.
 - In tile layout, center field tile in both directions on floors or walls.
 - Adjust layout and pattern to minimize tile cutting.
 - Joint widths must be consistent and uniform.
- D. Patching existing tile:
- Match existing size, pattern, shape, and layout as closely as possible.
 - Tile shall match as closely as possible the size, thickness, shape, finish, and color of surrounding tile.
 - Grout shall match as closely as possible to existing grout, in color and type.
- E. Provide expansion and joint controls:
- As instructed by the Tile Council of America “Handbook for Ceramic Tile Installation”.
- F. Standards of work quality:
- Fit special border tiles squarely without cuts.
 - Perfectly match tiles pieces with other tile work, trim, bases, tile accessories.
 - Prepare tile according to manufacturer’s instructions, presoak, dry surfaces, clean, etc.
 - Plan and install correct patterning that’s symmetrical, complete, square to floor or wall.
 - Apply tile surface smoothly and free of irregularities, humps, and dips.
 - Install tile joints straight, level horizontally, aligned and exact vertically and uniform in size.
 - Use extra care at difficult areas such as corners, fixture locations, around wall openings and recesses, at penetrations such as floor drains, door and window trim.
 - Make tile cuts minimal, uniform, not smaller than half a tile.
 - Complete grouted or thin-set adhesion so no tiles can be pulled loose.
 - Do not allow tile at door thresholds to interfere with closure.
 - Do not use broken or cracked tiles.

3.3. PROTECTION, CLEANING, AND REPAIR

- A. Completely protect finished tile, and allow no damage to the work.
- B. Cleaning:
- Wash tile surfaces with clean water before and after cleaning.
 - Use cleaning solutions and materials as per manufacturer’s instructions.
 - Do not use acidic cleaners near finish metal or other vulnerable surfaces.
 - Remove excess corrosive cleaning solutions from site, do not empty into building drains.

- C. Repair and replace defective work. Reject tiles and replace if:
- Chipped.
 - Scratched.
 - Cracked.
 - Popped up.
 - Loose.
 - Stained.
 - Miss-aligned.
- D. Repair or replace all defective and non-conforming work as directed by Inspector. All repairs shall be undetectable.

END OF SECTION – 09300 CERAMIC TILE

DIVISION 9 – FINISHES

09550 WOOD FLOORING

Part 1 – General

1.1 WORK

- A. Provide all labor and materials required to complete the wood flooring work as listed on the Scope, and as specified herein.
- B. When work involves repair and removal of wood flooring in excess of 2 square feet total, work shall comply with Section 01810 Lead Dust Hazards.
- C. When work includes the refinishing of existing wood flooring, work shall comply with Section 01810 Lead Dust Hazards.

1.2 QUALITY STANDARDS

- A. Provide experienced, well-trained workers competent to complete the work as specified.
- B. All work shall comply with manufacturer's instructions and governing building codes.
- C. Provide a certified lead abatement supervisor and certified lead abatement workers per Section 01810 Lead Dust Hazards, if work will involve refinishing of wood floors or the removal and disturbance of more than 2 square feet of wood flooring.

1.3 SUBMITTALS

- A. Do not start work until Owner has approved and signed the Owner's Selection Sheet (Appendix A).
 - Supply Owner with samples of standard color selections.
 - Provide a copy of the Owner's written color selection to Agency.
 - Submit to Owner manufacturer's flooring care and cleaning instructions, and warranty.

1.4 MATERIALS HANDLING

- A. Provide all materials required to complete the work.
 - Deliver and transport materials to avoid damage to the product or to any other work.
 - Return any products or materials delivered in a damaged or unsatisfactory condition.
 - Materials and products delivered will be certified by the manufacturer to be as specified.
 - Packaging must be sealed with clear manufacturer and identification markings.
- B. Store wood flooring materials in work area for at least 72 hours prior to installation.
 - Protected from weather or moisture.
 - Protected from construction damage.
 - Protected from occupant traffic.

PART 2 – MATERIALS

2.1 FLOORING AND ACCESSORIES

- A. Wood flooring repairs:
 - Provide wood flooring in sizes, species, grades and configurations as similar as possible to the original flooring.
- B. New wood flooring:
 - Select grade plain-sawn Red Oak or White Oak, 25/32" thick, 3-1/4" face width.
 - Tongue and groove, end matched.
 - Install wood nosings at landings and stair treads.
 - Install underlayments per manufacturer's recommendations.

- C. Nails, screws, other fasteners as per flooring manufacturer's specifications.
 - Ring-shank flooring nails must be long enough to securely attach the flooring to substrate.
 - Where possible, nails shall be hidden from view.
 - When nails cannot be hidden, countersink nails and fill holes with manufacturer's recommended filler.
 - Nails must not split the flooring.
- D. Install wood baseboard as listed in the Scope and as specified herein.
 - Unless otherwise listed in the Scope, wood baseboard shall match as closely as possible the architectural characteristics of the original (existing) baseboard.
 - Newly installed wood baseboard and trim shall be painted or stained to match surrounding woodwork.
- E. Install shoe molding to conceal edges at vertical projections, walls, cabinets, etc.
 - Newly installed wood shoe shall be painted or stained to match flooring finish.
- F. Metal transition strips (thresholds):
 - Edge strips shall be no less than 3/4" width, 1/8" thick, butt type, rounded or beveled on the exposed edge with lengths sufficient to minimize joints.
 - Standard color (i.e. silver or gold) per Owner's selection.
 - Do not reuse transition strips.

PART 3 – INSTALLATION

3.1 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
- B. Prior to installation of new wood flooring:
 - Clear area or room of furniture, appliances, and other obstructions.
 - Contractor shall take all necessary precautions to minimize damage to surrounding surfaces during removal and installation of flooring materials.
 - The Contractor at the Contractor's expense shall repair any surfaces damaged during removal and installation of flooring materials.
 - Remove existing shoe molding, nosings, transition strips (thresholds), etc. to allow for the complete and proper installation of the flooring.
 - Remove base molding only if necessary for a complete and proper installation of new flooring, or if listed in Scope.
 - When removal of baseboard or shoe disturbs painted surfaces in excess of two square feet, work shall be done in accordance with Section 01810 Lead Dust Hazards.
 - All debris created shall be properly disposed of by the Contractor in accordance with Section 01810 Lead Dust Hazards.
 - Inspect sub-floor for structural deficiencies, soundness, and make any necessary repairs.

3.2 FLOORING INSTALLATION

- A. Flooring shall be installed per manufacturer's instructions and as specified herein.
 - Store wood flooring in work area for 72 hours prior to installation.
 - Reject warped or bent flooring material.
- B. Wood floor layout:
 - Confirm direction of wood flooring strips, patterns, and borders.
 - Confirm the schedule for stripping, sanding and finishing.
 - Extend flooring into closets, recesses, toe spaces, doorways, etc.
 - Flooring shall be smooth without humps or depressions.
 - Butt flooring tightly against vertical surfaces, door jambs, casings, etc.
 - Scribe as necessary to fit around objects and at changes in floor finish materials.
 - Scribed joints must be cut neatly and square.
- C. Nailing:
 - Drive diagonally.
 - Space as required.
 - Nail at ends of each strip.
 - Pre-drill as necessary to prevent splits.
 - Nail type as specified by manufacturer.

- D. Joints:
 - Construct joints within tolerances required by manufacturer.
 - Cut joints: tight, straight, matched, aligned.
 - Stagger joints.
 - Do not allow end joints to occur side by side; separate by at least two strips.
 - Do not damage tongue and grooves before or during installation.
 - Use small or varied strips sparingly and never near one another.
 - Provide a minimum of ½" expansion joint space at all walls.
- E. Install shoe molding and baseboard per Section 06200 Finish Carpentry and Millwork and as specified herein:
 - Install wood shoe molding and baseboards tight to wall and floor.
 - Fasten baseboards and/or shoe molding to walls only, not floors, to cover expansion space.
 - Miter joints in shoe moldings and baseboard at outside corners, joints, and at ends.
 - Cope joints at inside corners of shoe molding and baseboard.
 - Install shoe molding and baseboards in adequate lengths to minimize joints.
 - Set and fill all nail holes in shoe molding and baseboard.
 - Finish (stain or paint) shoe molding and baseboard to match surrounding wood work.
 - Existing shoe molding and baseboards maybe reused if material is in good condition, free from damage, and unbroken. Contractor shall take care to prevent damage during removal and reinstallation.
- F. Door clearance:
 - If necessary, Contractor shall undercut doors to allow for proper clearance over new flooring. Door shall not drag or scrape on new flooring. Contractor shall take extreme care to not scratch, mar, splinter, or otherwise damage the door or door finish when undercutting.
 - Provide clearances below doors as necessary to allow for; thresholds, weatherstripping, nosings, etc.
- G. Install wood or metal transition strips only where new flooring meets a dissimilar flooring material.
 - Transition strips shall be securely installed with screws or nails per manufacturer's instructions.
 - Transition strips shall be in sufficient lengths to minimize joints.

3.3 FINISHING AND REFINISHING

- A. Finishing of new wood floors:
 - Sand new wood flooring consistently smooth, without lumps, depressions, and burns.
 - Before applying finish, thoroughly cleanup and vacuum all sanding dust.
 - Fill all nail holes with manufacturer's recommended wood filler compound.
 - Apply final finish as soon as possible after final sanding is complete.
 - Apply final finish as per manufacturer's instructions.
 - Allow at least 24 hours, or longer per manufacturer's instructions, drying time between finish coats.
- B. Refinishing of existing wood flooring:
 - Prior to refinishing of wood flooring, notify the Milwaukee Health Department – Lead Section (414-286-5033) at least one day in advance of starting work.
 - Install lead based paint containment measures as outlined in Section 01810 Lead Dust Hazards prior to starting work.
 - Remove existing wood flooring finish materials using approved lead safe methods as outlined in Section 01810 Lead Dust Hazards.
 - Remove and dispose of debris as outlined in Section 01810 Lead Dust Hazards.
 - After cleanup is complete, containment measures may be removed and properly disposed.
 - Fill all nail holes with manufacturer's recommended wood filler compound.
 - Apply final finish as soon as possible after finish removal is complete.
 - Apply final finish as per manufacturer's instructions.
 - Allow at least twenty-four (24) hours, or longer per manufacturer's instructions, drying time between finish coats.

3.4 FINAL CLEANING

- A. Follow cleaning instructions in Section 01800 Cleaning and Maintenance and Section 01810 Lead Dust Hazards.

3.5 INSPECTION, REPAIR, AND TOUCH-UP

- A. Securely protect flooring from damage by construction traffic or further construction work.
- B. Repair or replace any damaged or defective work:
 - Chipped
 - Scratched
 - Marred
 - Stained
 - Joints that are not tight
 - Gaps at walls, jambs, or trim
- C. The Contractor shall pay all costs for repairing or replacing defective flooring or flooring which has been damaged as a result of Contractor failing to adequately protect flooring.

END OF SECTION – 09550 WOOD FLOORING

DIVISION 9 – FINISHES

09660 ASPHALT, VINYL, AND RESILIENT TILE FLOORING

Part 1 – General

1.1 WORK

- A. Provide all labor and materials required to complete the flooring work indicated on the **Scope** and as specified herein.
- B. Installation of asphalt, vinyl and resilient tile flooring shall include underlayment as listed on the **Scope** and as specified by the manufacturer.
- C. When work involves removal or disturbance of painted or otherwise coated surfaces work shall comply with Section 01810 Lead Dust Hazards.

1.2 QUALITY STANDARDS

- A. Provide experienced, well-trained workers competent to complete the work as specified.
- B. All work shall comply with manufacturer's instructions and governing building codes.
- C. Provide a certified lead abatement supervisor and certified lead abatement workers per Section 01810 Lead Dust Hazards, if work will involve the removal or disturbance of painted or otherwise coated surfaces.

1.3 SUBMITTALS

- A. Do not start work until **Owner** has approved and signed the Owner's Selection Sheet (Appendix A).
 - Supply **Owner** with samples of flooring manufacturer's standard color and pattern selections.
 - Provide a copy of the **Owner's** written color/pattern selections to **Agency**.
 - Submit to **Owner** manufacturer's installation instructions, flooring care and cleaning instructions, and warranty.

1.4 MATERIALS HANDLING

- A. Provide all materials required to complete the work.
 - Deliver and transport materials to avoid damage to the product or to any other work.
 - Return any products or materials delivered in a damaged or unsatisfactory condition.
 - Materials and products delivered will be certified by the manufacturer to be as specified.
 - Packaging must be sealed with clear manufacturer and identification markings.
- B. Storage:
 - Protected from weather or moisture.
 - Protected from construction damage
 - Protected from occupant traffic

PART 2 – MATERIALS

2.1 FLOORING

- A. Provide Asphalt, vinyl, and resilient tile flooring only from manufacturers who specialize in flooring materials.
 - Floor tiles shall be a minimum of 12" x 12" x 1/8" in size.
 - **Owner** shall select in writing, colors and patterns from manufacturer's standard selections.
 - Flooring shall be specified by the manufacturer for use in the location in which it is to be installed (i.e. kitchen, bathroom, etc.).
 - Asbestos-containing materials shall not be used.
 - **Owner** shall be given an additional 5% of the total number of new tiles for future repairs.
- B. Adhesives
 - All flooring and base adhesives shall be waterproof, non-toxic, low odor and recommended by the flooring manufacturer for the purpose and structural condition of the floor and base.
 - Adhesives shall be free of asbestos-containing materials.

- C. Install a minimum of 1/4" wood underlayment as listed on the **Scope** and as specified herein.
 - Underlayment material shall be specified for use as underlayment.
 - Underlayment shall always be installed when manufacturer's installation specifications require it.
- D. Install baseboard, wood, rubber or vinyl as listed in the **Scope** and as specified herein.
 - Unless otherwise listed in the **Scope**, wood baseboard shall match as closely as possible the architectural characteristics of the original (existing) baseboard.
 - Rubber and vinyl baseboard shall be as specified by the flooring manufacturer.
 - Newly installed wood baseboard and trim shall be painted or stained to match surrounding woodwork.
- E. Install shoe molding to conceal edges at all vertical projections, walls, cabinets, etc.
 - Newly installed wood shoe shall be painted or stained to match surrounding woodwork.
- F. Transition strips (thresholds) and nosings.
 - Edge strips shall be no less than 3/4" width, 1/8" thick, butt type, rounded or beveled on the exposed edge with lengths sufficient to minimize joints.
 - Standard color (i.e. silver or gold) per **Owner's** selection.
 - Do not reuse transition strips or nosings.
- G. Rubber step tread covers shall be shall be a single piece minimum of 3' wide, solid black rubber, 1/8" thick with either square or round nosing.

PART 3 – INSTALLATION

3.1 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
- B. Prior to installation of new underlayment and flooring:
 - Clear area or room of furniture, appliances, and other obstructions.
 - **Contractor** shall take all necessary precautions to minimize damage to surrounding surfaces during removal and installation of flooring materials.
 - The **Contractor** at the **Contractor's** expense shall repair any surfaces damaged during removal and installation of flooring materials.
 - Remove existing shoe molding, nosings, transition strips (thresholds), etc. to allow for the complete and proper installation of the new underlayment and flooring.
 - If necessary for a complete and proper installation of new flooring, or listed in **Scope**, remove base molding.
 - When removal of baseboard or shoe disturbs painted or surfaces, demolition work shall be done in accordance with Section 01810 Lead Dust Hazards.
 - All debris created shall be properly disposed of by the **Contractor** in accordance with Section 01810 Lead Dust Hazards.
 - Inspect floor for structural deficiencies, soundness, and make any necessary repairs.
- C. Installation of underlayment material:
 - Install underlayment in sizes and shapes to minimize joints.
 - Securely attach underlayment to existing flooring using 1" or longer (as needed) ring shank flooring nails spaced 6" on center at edges and 8" on center in the field. Countersink all nail heads as necessary for a smooth finish.
 - All joints, nail heads, and other imperfections shall be filled with a material recommended by the flooring manufacturer. Ridges, trowel marks, and other projections shall be sanded smooth.
 - Broom clean or vacuum entire area prior to installation of flooring materials and adhesives.

3.2 FLOORING INSTALLATION

- A. Floor layout:
 - Lay out floor tiles from centerlines oriented to principle walls.
 - Lay tiles square to principal walls.
 - Lay tile pattern with grain as directed by **Owner**.
 - Tiles at opposite ends of each room will be equally wide.
 - Avoid cut widths less than 3" at edges of rooms.
 - Maintain continuous pattern throughout floor.

- B. Bathroom fixtures:
- Where bathroom flooring is replaced, the watercloset shall be removed and the flooring including underlayment shall be fitted to the closet flange. If necessary the plumber shall install a lift ring (spacer) prior to resetting the watercloset to ensure a watertight seal. The **Contractor** is responsible for coordinating the removal and replacement of the watercloset with the plumber. The cost of this work is the responsibility of the **Contractor**.
 - Where a free standing (claw foot) bathtub exists, new underlayment and flooring shall extend under the bathtub. **Contractor** shall check the **Scope** and with the **Inspector** to verify requirement of bathtub removal and replacement.
- C. Apply adhesives as outlined in manufacturer's instructions.
- Assure that room temperature is per manufacturer's requirements.
 - Use appropriate trowels and scrapers to assure adequate amounts of adhesive is applied.
 - Apply adhesive for full coverage for each tile; do not allow voids in adhesive coverage.
 - Once adhesive is in place, install tile within manufacturer's recommended timeframe to assure a tight seal.
 - Wipe off excessive adhesive from finished surface of tile with clean rag or cloth.
- D. Placement of tiles:
- Place tiles neatly, tightly aligned, even, in straight parallel lines.
 - Tiles shall be placed flat without overlapping. Each tile shall lay even with adjacent tiles.
 - Extend flooring into closets, recesses, toe spaces, doorways, etc.
 - Butt tiles tightly against vertical surfaces, nosings, etc.
 - Scribe as necessary to fit around objects and at changes in floor finish materials.
 - Scribed joints must be cut neatly and square.
- E. Install shoe molding and baseboard per Section 06200 Finish Carpentry and Millwork and as specified herein:
- Install wood shoe molding and baseboards tight to wall and floor using finish nails.
 - Miter joints in shoe moldings and baseboard at outside corners, joints, and at ends.
 - Cope joints at inside corners of shoe molding and baseboard.
 - Install shoe molding and baseboards in adequate lengths to minimize joints.
 - Set and fill all nail holes in shoe molding and baseboard.
 - Finish (stain or paint) shoe molding and baseboard to match surrounding wood work.
 - Existing shoe molding and baseboards maybe reused if material is in good condition, free from damage, and unbroken. **Contractor** shall take care to prevent damage during removal and reinstallation.
 - Rubber and vinyl baseboard shall be installed using adhesives recommended by manufacturer.
 - Preformed rubber or vinyl baseboard corners shall be used at all inside and outside corners. Do not bend rubber or vinyl base around corners.
- F. Door clearance:
- If necessary, **Contractor** shall undercut doors to allow for proper clearance over new flooring. Door shall not drag or scrape on new flooring. **Contractor** shall take extreme care to not scratch, mar, splinter, or otherwise damage the door or door finish when undercutting.
 - Provide clearances below doors as necessary to allow for; thresholds, weatherstripping, nosings, etc.
- G. Install metal transition strips only where new flooring meets a dissimilar flooring material.
- Transition strips shall be securely installed with screws or nails per manufacturer's instructions.
 - Transition strips shall be in sufficient lengths to minimize joints.
- H. Install nosings at exposed edges of flooring, i.e. landings, stair treads, etc.
- Nosing shall be securely installed with screws or nails per manufacturer's instructions.
 - Nosing shall be in sufficient lengths to minimize joints.

3.3 CLEANING

- A. Only use cleaner recommended by the flooring manufacturer.
- Remove excess adhesive and other marks or stains from finish flooring.
- B. Follow cleaning instructions in Section 01800 Cleaning and Maintenance and Section 01810 Lead Dust Hazards.

3.4 INSPECTION, REPAIR, AND TOUCH-UP

- A. Repair or replace any damaged or defective work:
- Chipped
 - Scratched
 - Marred
 - Wrinkled
 - Cracked
 - Stained
 - Blistered
 - Air pockets
 - Raised edges or corners
 - Joints that are not tight
 - Gaps at walls, jambs, or trim
 - Mismatched tiles
 - Tiles that do not match the approved color and pattern selected by **Owner**.
- B. Securely protect flooring from damage by construction traffic or further construction work.
- C. The **Contractor** shall pay any costs for repairing or replacing flooring damaged as a result of **Contractor's** work.
- D. Supply **Owner** with an additional 5% of the total number of each new tile used for future repair or replacement.

END OF SECTION – 09660 ASPHALT, VINYL, AND RESILIENT TILE FLOORING

DIVISION 9 – FINISHES

09665 RESILIENT SHEET FLOORING

Part 1 – General

1.1 WORK

- A. Provide all labor and materials required to complete the flooring work indicated on the Scope and as specified herein.
- B. Installation of resilient sheet flooring shall include underlayment as listed on the Scope and as specified by the manufacturer.
- C. When work involves removal or disturbance of painted or otherwise coated surfaces work shall comply with Section 01810 Lead Dust Hazards.

1.2 QUALITY STANDARDS

- A. Provide experienced, well-trained workers competent to complete the work as specified.
- B. All work shall comply with manufacturer's instructions and governing building codes.
- C. Provide a certified lead abatement supervisor and certified lead abatement workers per Section 01810 Lead Dust Hazards, if work will involve the removal or disturbance of painted or otherwise coated surfaces.

1.3 SUBMITTALS

- A. Do not start work until Owner has approved and signed the Owner's Selection Sheet (Appendix A).
 - Supply Owner with samples of flooring manufacturer's standard color and pattern selections.
 - Provide a copy of the Owner's written color/pattern selections to Agency.
 - Submit to Owner manufacturer's installation instructions, flooring care and cleaning instructions, and warranty.

1.4 MATERIALS HANDLING

- A. Provide all materials required to complete the work.
 - Deliver and transport materials to avoid damage to the product or to any other work.
 - Return any products or materials delivered in a damaged or unsatisfactory condition.
 - Materials and products delivered will be certified by the manufacturer to be as specified.
 - Packaging must be sealed with clear manufacturer and identification markings.
- B. Storage:
 - Protected from weather or moisture.
 - Protected from construction damage
 - Protected from occupant traffic

PART 2 – MATERIALS

2.1 FLOORING

- A. Provide resilient sheet flooring only from manufacturers who specialize in flooring materials.
 - Floor sheets shall be a minimum of 6' wide.
 - Owner shall select in writing, colors and patterns from manufacturer's standard selections.
 - Flooring shall be specified by the manufacturer for use in the location in which it is to be installed (i.e. kitchen, bathroom, etc.).
 - Asbestos-containing materials shall not be used.
- B. Adhesives
 - All flooring and base adhesives shall be waterproof, non-toxic, low odor and recommended by the flooring manufacturer for the purpose and structural condition of the floor and base.
 - Adhesives shall be free of asbestos-containing materials.

- C. Install a minimum of 1/4" wood underlayment as listed on the Scope and as specified herein.
 - Underlayment material shall be specified for use as underlayment.
 - Underlayment shall always be installed when manufacturer's installation specifications require it.
- D. Install baseboard, wood, rubber or vinyl as listed in the Scope and as specified herein.
 - Unless otherwise listed in the Scope, wood baseboard shall match as closely as possible the architectural characteristics of the original (existing) baseboard.
 - Rubber and vinyl baseboard shall be as specified by the flooring manufacturer.
 - Newly installed wood baseboard and trim shall be painted or stained to match surrounding woodwork.
- E. Install shoe molding to conceal edges at vertical projections, walls, cabinets, etc.
 - Newly installed wood shoe shall be painted or stained to match surrounding woodwork.
- F. Transition strips (thresholds) and nosings.
 - Edge strips shall be no less than 3/4" width, 1/8" thick, butt type, rounded or beveled on the exposed edge with lengths sufficient to minimize joints.
 - Standard color (i.e. silver or gold) per Owner's selection.
 - Do not reuse transition strips or nosings.

PART 3 – INSTALLATION

3.1 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
- B. Prior to installation of new underlayment and flooring:
 - Clear area or room of furniture, appliances, and other obstructions.
 - Contractor shall take all necessary precautions to minimize damage to surrounding surfaces during removal and installation of flooring materials.
 - The Contractor at the Contractor's expense shall repair any surfaces damaged during removal and installation of flooring materials.
 - Remove existing shoe molding, nosings, transition strips (thresholds), etc. to allow for the complete and proper installation of the new underlayment and flooring.
 - If necessary for a complete and proper installation of new flooring, or listed in Scope, remove base molding.
 - When removal of baseboard or shoe disturbs painted or surfaces, demolition work shall be done in accordance with Section 01810 Lead Dust Hazards.
 - All debris created shall be properly disposed of by the Contractor in accordance with Section 01810 Lead Dust Hazards.
 - Inspect floor for structural deficiencies, soundness, and make any necessary repairs.
- C. Installation of underlayment material:
 - Install underlayment in sizes and shapes to minimize joints.
 - Securely attach underlayment to existing flooring using 1" or longer (as needed) ring shank flooring nails spaced 6" on center at edges and 8" on center in the field. Countersink all nail heads as necessary for a smooth finish.
 - All joints, nail heads, and other imperfections shall be filled with a material recommended by the flooring manufacturer. Ridges, trowel marks, and other projections shall be sanded smooth.
 - Broom clean or vacuum entire area prior to installation of flooring materials and adhesives.

3.2 FLOORING INSTALLATION

- A. Flooring shall be installed per manufacturer's instructions and as specified herein.
 - Unroll material 24 hours prior to installation, if required by manufacturer's instructions.
 - Start compression rolling over sheet flooring in middle, move outward to press out all bubbles.

- B. Resilient floor layout:
- All portions are laid in one uniform direction.
 - Color and pattern match throughout installation.
 - Seams are minimal.
 - Flooring shall be installed to the full size of the room, tight to all vertical projections.
 - Extend flooring into closets, recesses, toe spaces, doorways, etc.
 - Cut joints: straight, matched, aligned.
 - Flooring shall be smooth without humps or depressions.
 - Butt flooring tightly against vertical surfaces, door jambs, casings, etc.
 - Scribe as necessary to fit around objects and at changes in floor finish materials.
 - Scribed joints must be cut neatly and square.
- C. Bathroom fixtures:
- Where bathroom flooring is replaced, the watercloset shall be removed and the flooring including underlayment shall be fitted to the closet flange. If necessary the plumber shall install a lift ring (spacer) prior to resetting the watercloset to ensure a watertight seal. The Contractor is responsible for coordinating the removal and replacement of the watercloset with the plumber. The cost of this work is the responsibility of the Contractor.
 - Where a free standing (claw foot) bathtub exists, new underlayment and flooring shall extend under the bathtub. Contractor shall check the Scope and with the Inspector to verify requirement of bathtub removal and replacement.
- D. Apply adhesives as outlined in manufacturer's instructions.
- Assure that room temperature is per manufacturer's requirements.
 - Use appropriate trowels and scrapers to assure adequate amounts of adhesive is applied.
 - Apply adhesive for full coverage with flooring; do not allow voids in adhesive coverage.
 - Once adhesive is in place, install flooring within manufacturer's recommended timeframe to assure a tight seal.
 - Wipe off excessive adhesive from finished surface of flooring with clean rag or cloth.
- E. Seams:
- Lay flooring to minimize seams.
 - Use seam sealer at seams.
- F. Installing resilient flooring on landings and stair treads:
- Sheet flooring shall be installed to completely cover the entire landing or step tread.
 - A single continuous nosing shall be installed for the full length of the landing or tread.
 - Nosing shall be securely installed with screws or nails per manufacturer's instructions.
 - Resilient flooring on landings or step treads shall be laid flat free of air bubbles, secure at edges and corners.
- G. Install shoe molding and baseboard per Section 06200 Finish Carpentry and Millwork and as specified herein:
- Install wood shoe molding and baseboards tight to wall and floor using finish nails.
 - Miter joints in shoe moldings and baseboard at outside corners, joints, and at ends.
 - Cope joints at inside corners of shoe molding and baseboard.
 - Install shoe molding and baseboards in adequate lengths to minimize joints.
 - Set and fill all nail holes in shoe molding and baseboard.
 - Finish (stain or paint) shoe molding and baseboard to match surrounding woodwork.
 - Existing shoe molding and baseboards maybe reused if material is in good condition, free from damage, and unbroken. Contractor shall take care to prevent damage during removal and reinstallation.
 - Rubber and vinyl baseboard shall be installed using adhesives recommended by manufacturer.
 - Preformed rubber or vinyl baseboard corners shall be used at all inside and outside corners. Do not bend rubber or vinyl base around corners.
- H. Door clearance:
- If necessary, Contractor shall undercut doors to allow for proper clearance over new flooring. Door shall not drag or scrape on new flooring. Contractor shall take extreme care to not scratch, mar, splinter, or otherwise damage the door or its finish when undercutting.
 - Provide clearances below doors as necessary to allow for; thresholds, weatherstripping, nosings, etc.
- I. Install metal transition strips only where new flooring meets a dissimilar flooring material.
- Transition strips shall be securely installed with screws or nails per manufacturer's instructions.
 - Transition strips shall be in sufficient lengths to minimize joints.

3.3 CLEANING

- A. Only use cleaner recommended by the flooring manufacturer.
 - Remove excess adhesive and other marks or stains from finished flooring.
- B. Follow cleaning instructions in Section 01800 Cleaning and Maintenance and Section 01810 Lead Dust Hazards.

3.4 INSPECTION, REPAIR, AND TOUCH-UP

- A. Repair or replace any damaged or defective work:
 - Chipped
 - Scratched
 - Marred
 - Wrinkled
 - Cracked
 - Stained
 - Blistered
 - Air pockets
 - Raised edges or corners
 - Joints that are not tight
 - Gaps at walls, jambs, or trim
- B. Securely protect flooring from damage by construction traffic or further construction work.
- C. The Contractor shall pay any costs for repairing or replacing flooring damaged as a result of Contractor's work.

END OF SECTION – 09665 RESILIENT SHEET FLOORING

DIVISION 9 – FINISHES

09680 CARPET

Part 1 – General

1.1 WORK

- A. Provide all labor and materials required to complete the carpet installation work as listed on the Scope, and as specified herein.

1.2 QUALITY STANDARDS

- A. Provide experienced, well-trained workers competent to complete the work as specified.
B. All work shall comply with manufacturer's instructions and governing building codes.

1.3 SUBMITTALS

- A. Do not start work until Owner has approved and signed the Owner's Selection Sheet (Appendix A).
- Supply Owner with samples of standard grade, style and color selections.
 - Provide a copy of the Owner's written selections to Agency.
 - Submit to Owner manufacturer's care and cleaning instructions, and warranty.

1.4 MATERIALS HANDLING

- A. Provide all materials required to complete the work.
- Deliver and transport materials to avoid damage to the product or to any other work.
 - Return any products or materials delivered in a damaged or unsatisfactory condition.
 - Materials and products delivered will be certified by the manufacturer to be as specified.
 - Packaging must be sealed with clear manufacturer and identification markings.
- B. Store carpeting and related materials in work area protected from occupant traffic.
- Protected from weather or moisture.
 - Protected from construction damage.

PART 2 – MATERIALS

2.1 CARPETING AND ACCESSORIES

- A. Provide and install carpet, padding, and accessories as specified in the Scope and as specified herein.
B. Provide all related materials and accessories required for a professional installation.
C. Adhesives:
 - Provide adhesives as recommended by the carpet manufacturer.
 - Provide seam adhesive as recommended for use by the carpet manufacturer.
D. At intersections of carpet and other flooring provide carpet strips as selected by Owner.

PART 3 – INSTALLATION

3.1 PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
B. Prior to installation of new carpeting and pad:
 - Clear area or room of furniture, appliances, and other obstructions.
 - Contractor shall take all necessary precautions to minimize damage to surrounding surfaces during removal and installation of flooring materials.
 - The Contractor at the Contractor's expense shall repair any surfaces damaged during removal and installation of flooring materials.
 - Remove existing carpet strips, nosings, transition strips (thresholds), etc. to allow for the complete and proper installation of the carpeting.

- C. Make sub-floor ready for carpet installation.
 - Eliminate irregularities and high spots, fill low spots up to a flush even surface.
 - Remove grease, paint, varnish, and any other material that might interfere with the adhesive.
 - Nail sub-floor well, and secure against moving and squeaking.
 - Patch, repair, and sand smooth.
 - Tighten and seal at joints.
 - Clean substructure or underlayment.
- D. Make concrete slab ready for carpet installation:
 - Level, Without humps or dips.
 - Dry.
 - Trowel smooth.
 - Patch and repair as required for smooth surface.
 - Seal smoothly at joints.
 - Clean.
- E. Prepare joints and coordinate with carpet installation:
 - Thresholds.
 - Carpet strips.
 - Borders with other flooring materials.
 - Trench duct cover plates and floor access panels.
 - Cuts at openings and edges such as balcony or stairs.
 - Cuts at stub ups, steps, platforms, curbs, etc.
- F. Coordinate carpet installation with other trades:
 - Baseboard installation.
 - Floor-mounted fixtures.
 - Floor-mounted cabinets and furnishings.

3.2 CARPET INSTALLATION

- A. Install carpet so that:
 - All portions are laid in the same direction.
 - There are no fill strips less than 6 inches wide.
- B. Place seams as follows:
 - Seams are minimal.
 - There are no seams in heavy traffic areas.
 - There are no cross seams.
 - Cuts for seams are made only on the weave line.
 - Fabricate seams with compression method.
 - Use butt joints, thoroughly bedded and sealed.
 - Cuts are not visible at lines of walls, door jambs, floor-mounted cabinets, etc.
 - Seam joints are straight, matched, and aligned.
 - Seam joints are level, without humps or depressions.
- C. Apply carpet pad per manufacturer's instructions:
 - Adhere thoroughly.
 - Adhere with materials required by manufacturer.
- D. Door clearance:
 - If necessary, Contractor shall undercut doors to allow for proper clearance over new carpet. Door shall not drag or scrape on new carpet. Contractor shall take extreme care to not scratch, mar, splinter, or otherwise damage the door or door finish when undercutting.
 - Provide clearances below doors as necessary to allow for; carpet strips, thresholds, weatherstripping, nosings, etc.
- E. Install wood or metal transition strips only where new flooring meets a dissimilar flooring material.
 - Transition strips shall be securely installed with screws or nails per manufacturer's instructions.
 - Transition strips shall be in sufficient lengths to minimize joints.

3.3 CLEANING AND PROTECTION

- A. Cleaning:
 - Clean scraps, threads, and dust as work proceeds.
 - Thoroughly clean carpet and adjacent surfaces upon completion of installation.
- B. Protection:
 - Provide heavy duty non-staining paper, 6 mil plastic, or board walkways as necessary to protect carpeting during remainder of rehabilitation project.
 - Allow no damage to the carpet from traffic, spills, or other work.
 - Damaged work will be replaced by the Contractor at no cost to the Owner.
 - Replaced or repaired carpet shall be undetectable.

3.4 INSPECTION, REPAIR, AND SURPLUS MATERIAL

- A. Surplus:
 - Save large scraps for Owner's Maintenance.
 - Wrap selected scraps in plastic and deliver to Owner.
- B. Repair
 - Repair or replace all defective and non-conforming work.
 - Make repairs so they are undetectable.

END OF SECTION – 09680 CARPET

DIVISION 9 – FINISHES

09900 PAINTING

Part 1 – General

1.1 WORK

- A. Provide everything that is required to complete the work in the Scope and as specified herein.
- B. Other related work:
 - Contractor shall be responsible for compliance with Department of Housing and Urban Development Lead-Based Paint Regulation [24 CFR Part 35], State of Wisconsin, Department of Health and Family Services Lead-Based Paint Regulations [Chapter HFS 163], and the City of Milwaukee Code of Ordinances, Lead-based Paint Hazard Control Regulations, Chapter 66-47.
 - The Contractor shall comply with the lead safe rehab standards as outlined in Section 01810 Lead Dust Hazards and as listed herein.

1.2 QUALITY STANDARDS

- A. Provide experienced, well-trained workers competent to complete the work as specified.
- B. Provide a certified lead abatement supervisor and certified lead abatement workers to perform any surface preparation work, including but not limited to wet scraping, wet sanding, HEPA planning, heat gunning, clean up and debris removal per Section 01810 Lead Dust Hazards.
- C. Unless approved by the Inspector, provide all related products and accessories from one manufacturer.
- D. All work shall comply with manufacturer's instructions and governing building and safety codes.
- E. All painting, staining and varnishing shall be to industry standards as outlined in the Painting and Decorating Contractors of America Industry Standards (www.pdca.com/Standards.htm).

1.3 SUBMITTALS

- A. Provide manufacturer's specifications and other data to prove compliance with these Specifications.
- B. Paint color samples and stain/varnish samples:
 - Provide color/finish samples to Owner for approval.
 - Do not start work until Owner has approved color/finish selections in writing (See Appendix A).
 - Provide Owner's written color/finish selections to Agency.

1.4 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
 - Maintain an up-to-date copy of the Scope on site.
 - Confirm that there is no conflict between this work and the governing lead-safe rehabilitation rules or Section 01810 Lead Dust Hazards.
 - Notify the Milwaukee Health Department – Lead Section (414-286-5033) at least one day in advance of starting any work under this section.
 - Confirm there is no conflict between this work and work of other trades.
 - Confirm that work of other trades that must precede this work has been completed.

PART 2 – MATERIALS

2.1 PAINT AND RELATED MATERIALS

- A. Provide all materials and tools required for the work.
- B. Paint, stain or varnish shall be from a recognized manufacturer or any of the following manufacturers: Benjamin Moore, Cabot's, Deft, Duron, Dutchboy, Glidden, Hallman-Lindsay, Mautz, Minwax, Sherwin Williams, or Thompsons Waterseal.
- C. Product selection and use shall be per manufacturer's recommendations.

2.2 MATERIALS – LIMITATIONS ON USE

- A. Undercoats and thinners:
- Undercoat must be from the same manufacturer as finish coat.
 - Thinners must be recommended by the paint manufacturer and used only as recommended.
 - The undercoat, finish coat and thinner are integrated parts of a total paint finish.
- B. Primers:
- Apply primers that are from the same manufacturer as finish coats and per manufacturer's recommendations.
 - Do not use alkyd primer on gypsum board.
 - Apply primer or sealer to knots and pitch pockets on wood that is to be painted.

2.3 MATERIALS DELIVERY AND STORAGE

- A. Delivery:
- All paint materials shall be delivered new, in labeled and unopened containers.
 - Material quality shall be as specified on the Scope or as specified herein.
- B. Storage:
- Have materials delivered in a timely sequence as required to expedite the workflow.
 - Store all paint materials in a secure, clean, dry location with ample ventilation.
 - Storage areas shall be clean and clear of spilled material, empty containers, rags and scrap.
 - Cleaning solutions, solvents or other hazardous solutions shall be securely sealed and stored in a well-ventilated location.

2.4 APPLICATION EQUIPMENT

- A. Use painting tools and equipment only as recommended by the paint manufacturer.

2.5 WORKING CONDITIONS

- A. Maintain a proper work environment:
- Clean, dry, well ventilated work area.
 - Free of airborne construction dust.
 - Well lighted
 - Within temperature range required by paint manufacturer.
 - Keep humidity low enough to prevent moisture condensation on work surfaces.
 - Do not apply paint in snow, rain, fog, or when relative humidity exceeds 85%.
 - Never apply paint to damp or wet surfaces.

2.6 MATERIALS PREPARATION

- A. Handle and mix paint materials strictly according to manufacturers' instructions.
- Maintain paint storage and mix containers clean and free from dirt or paint residue.
 - Stir materials as required to produce a completely uniform mix.
 - Remove and strain away any paint film.
 - Never stir paint film into the mix.

2.7 SURFACE PREPARATION

- A. PRESUMPTION OF LEAD: For the purposes of these Specifications, and unless the building was constructed in 1978 or later, or the building has undergone a Lead-Based Paint Risk Assessment by a properly licensed Lead-based Paint Inspector or Risk Assessor and is certified as being "Lead Free", the City of Milwaukee assumes that all painted surfaces contain lead-based paint. This presumption is made in lieu of a risk assessment. As a result of this presumption each rehabilitation project shall be conducted in a lead-safe manner as outlined in Section 01810 Lead Dust Hazards.

- B. Work Preparation:
- Test areas with paint, and match dry paint to approved color sample.
 - Remove or protect items attached to work surfaces that are not to be painted.
 - After painting in each area, reinstall removed items using workers competent in the related trades.
 - Remove oil and grease with clean cloths.
 - Cleaning must not contaminate adjacent surfaces.
 - Cleaning solvents must meet safety standards of governing building, environmental and safety codes.
 - Cleaned surfaces must be thoroughly dry before painting.
 - Thoroughly clean surfaces of construction droppings or stains.
- C. Preparation of wood surfaces:
- Prepare surfaces according to manufacturer's recommendations.
 - Clean wood of dirt, oil, and any other material that might interfere with painting.
 - Sand bare wood to smooth uniform surface.
 - Fill all nail holes with wood filler material.
 - Do not paint wood having a moisture content of 12% or higher.
 - Measure moisture content of wood with an approved moisture meter.
- D. Preparation of metal surfaces:
- Prepare surfaces according to manufacturer's recommendations.
 - Clean metal of dirt, oil, and any other material that might interfere with painting.
 - Use solvent to start cleaning galvanized surfaces.
 - Treat galvanized surface with phosphoric acid etch.
 - Remove etching solution completely before proceeding.

PART 3 – APPLICATION

3.1 PREPARATION AND COORDINATION

- A. Preparation:
- Remove or fully protect adjacent or related work that might be marred by painting.
 - Coordinate painting with adjacent or related work such as hardware installation, electrical switches, outlets and light fixtures, plumbing fixtures and trim moldings.
- B. Coordination with pre-primed or other materials:
- Touch up any damaged or bare areas prior to application of finish coats.
 - Finish coat materials must be compatible with prime coats.
 - Do not allow paint gaps or overlaps at edges of hardware, fixtures, or trim.

3.2 PAINT APPLICATION

- A. Mix and apply coats as per manufacturer's instructions:
- Apply coats in the proper thickness.
 - Allow the appropriate curing time between coats.
 - Apply the correct number of coats.
 - Apply paint to thoroughly cover undercoat.
 - Do not allow runs, lumps, droplets, lap marks, brush marks or streaks.
- B. Drying, brushing, and spraying:
- Allow drying time between coats as instructed by manufacturer.
 - Work and smooth out brush strokes onto surface in an even film.
 - Where spraying, apply each coat to provide the hiding equivalent of brush coats.
 - Do not double back with spray equipment to build up film thickness of two coats in one pass.
- C. Doors, windows, cabinets, other moveable items:
- Do not paint over joints or seams that would prevent the free movement of window sashes, storm windows, doors, cabinet doors or drawers, scuttle panels, etc.
 - Contractor shall test each painted item for free movement after finish is completely dry.

3.3 PAINTING AND CLEANING SPECIAL SURFACES

- A. Exposed mechanical items:
 - Paint registers, panels, access doors, ducts, etc. to match adjacent surfaces.
 - Paint backsides of access panels to match exposed sides.
 - Radiators, apply two coats of heat-resistant paint.
- B. Cleaning and prime coats on metal:
 - Wash metal with approved solvent.
 - Add prime coat followed by two coats of alkyd enamel.
- C. Hardware
 - Paint prime-coat hardware to match adjacent surfaces.
 - Allow no paint to come in contact with hardware that is not to be painted.
- D. Damp spaces:
 - In shower or toilet rooms and other damp rooms add approved fungicide to paints.

3.4 CLEANING AND EXTRA STOCK

- A. Protection and cleaning:
 - Maintain thorough dust and dirt control throughout the painting process.
 - Thoroughly protect all surfaces that won't be painted with clean drop cloths, masking tape, etc.
 - Immediately clean any spilled, splattered, or smeared materials.
 - Do not allow spilled materials to be tracked in a work area or to other areas.
 - Do not allow paint to dry in cans that are being used or on applicators.
- B. Upon completion of painting work, deliver to the Owner:
 - Extra stock of 10% or more of each color, type, and gloss of paint used in the work.
 - Tightly seal and clearly label each container with notes on contents and location used.

3.5 INSPECTION, TOUCH UP AND REPAIRS

- A. After finishing coats are dry, inspect all surfaces and make all necessary repairs.
 - Unacceptable work includes runs, drips, spotting, incomplete coverage, globs, etc.
 - Remove and replace or repaint any finish or paint not in compliance with the Scope or the Specifications herein.
 - Remove and refinish, or repaint any finish colors that are other than what was approved by Owner in writing.
 - Contractor shall remove, refinish, or repaint work not in compliance with these Specifications at Contractor's expense.
 - Repair the finish or paint to any moveable items such as window sashes, storm windows, doors, cabinet doors and drawers, scuttles, etc. that do not operate freely.

END OF SECTION – 09900 PAINTING

DIVISION 11 – EQUIPMENT

11020 SECURITY ITEMS

PART 1 – GENERAL

1.1 WORK

- A. Provide and install security items as listed on the Scope, per the building code and as specified herein.
- B. Each accessible double hung window within 10' of grade or accessible from a porch, deck, stoop, etc. shall have window locking devices.
- C. See Section 08710 Hardware for deadbolt and lockset requirements.

1.2 SUBMITTALS

- A. Supply Owner with two keys for each newly installed deadbolt or entry lockset.
- B. Supply Owner with an adequate number of window locking pins – two per double hung window.

PART 2 – MATERIALS AND PRODUCTS

2.1 MATERIALS

- A. Window pins shall be as manufactured and listed for that purpose. A standard duplex framing nail is an acceptable alternative to a manufactured window pin.
- B. Manufactured window bars are acceptable, otherwise basement window bars may be site fabricated with telescoping conduit bars using 5/8" and larger conduit overlapped a minimum of 3/4 of the overall length of the bar.
- C. Board basement windows as listed in the Scope and as specified herein. NOTE: The Building Code requires a minimum of two (2) operable basement windows for light and ventilation in each basement.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Deadbolts and locksets shall be installed as listed in the Scope and as specified in Section 08710 Hardware.
- B. Window pins or window locking devices shall be installed as listed in the Scope, per manufacturer's specifications, and as specified herein.
 - Holes drilled to accept pins shall be sized to allow for easy installation and removal by others without being oversized.
 - Window pins shall be installed in the upper right and left corners of the lower sash (two pins per double hung window).
 - Two sets of holes are required in the upper sash (note these holes shall not extend through the exterior of the sash). One set of holes allows the window sash to be secured (locked) in a closed position. The second set of holes allows the window to be locked in an open position to provide a 6" maximum opening for ventilation purposes.
- C. Basement window bars shall be installed to prevent the passage of a 6" sphere through the window opening.
 - Conduit bars may be used in a telescoping fashion with a minimum overlap of ¾ of the length of the bar.
 - Holes drilled through sash and into adjacent framing members shall be of sufficient size and depth to accept conduit bars and provide adequate security.
 - Once installed in opening, telescoping conduit bars shall be riveted in such a way as to prevent their easy removal.
 - Bar spacing shall be no greater than 6" on center.

- D. Board basement windows as listed on the Scope:
- Use exterior grade plywood minimum of 5/8" thick.
 - Secure plywood in place with corrosion resistant screws of sufficient length to adequately secure plywood.
 - Paint exterior side of plywood as specified in Section 09900 Painting.

3.2 INSPECTION

- A. Security items shall be tested for proper operation.
- Window pins and locking devices should be easily removable and provide for proper ventilation.
 - Basement bars shall be secure.

END OF SECTION – 11020 SECURITY ITEMS

DIVISION 15 – MECHANICAL

15300 SMOKE ALARMS

PART 1 – GENERAL

1.1 WORK

- A. Provide and install smoke alarms as listed on the Scope, per the building code and as specified herein.
- B. Provide and install smoke alarms that are listed and labeled by an independent testing agency.

1.2 SUBMITTALS

- A. Supply Owner with smoke alarm manufacturer's operating instructions.

PART 2 – MATERIALS AND PRODUCTS

2.1 MATERIALS

- A. Smoke alarms shall be listed and labeled by an independent testing agency.
- B. Smoke alarms shall be equipped with a "hush button" if the alarm is located within 20 feet of the main cooking appliance within the dwelling unit.

PART 3 – EXECUTION

3.1 LOCATIONS

- A. Smoke detectors shall be installed in locations per the building code and as specified herein:
 - On floor levels that contain one or more sleeping areas, an alarm shall be installed outside the sleeping rooms, in the vicinity of each sleeping area.
 - An alarm equipped with a "hush button" is required if the smoke detector is installed within 20 feet of the main cooking appliance within the dwelling unit.
 - On floors that do not contain sleeping areas, an alarm shall be installed in a common area on each floor level.
 - An alarm shall be installed in the basement in the vicinity of the basement stairway.
 - An alarm shall be installed at the top of common stairways in a duplex.
 - Alarms need not be installed in attics or storage areas.

3.2 INSTALLATION

- A. Smoke alarms shall be installed as soon as possible after the start of work, preferably prior to the start of work at the property.
- B. Install smoke alarms per manufacturer's instructions and as specified herein:
 - Install smoke alarms on ceilings at least 6 inches away from walls.
 - Install smoke alarms on walls within 12 inches but not less than 6 inches away from ceiling.
 - On vaulted ceilings, install smoke alarm at highest point of ceiling.
 - Do not install smoke alarms in kitchens or bathrooms.

3.3 INSPECTION

- A. Smoke alarms may be tested for proper operation.
 - Defective smoke alarms shall be replaced.
 - Batteries shall be replaced in all existing operational smoke alarms throughout building.

END OF SECTION – 15300 SMOKE ALARMS

DIVISION 15 – PLUMBING

15400 PLUMBING

Part 1 – General

1.1 WORK

- A. Provide and install all plumbing required to complete the work in the Scope and as specified herein.
- B. Plumbing includes:
 - Hot and cold water distribution systems.
 - Waste drains and vents.
 - Gas piping.
 - Plumbing fixtures.
- C. Plumbing fixtures shall be as listed in the Scope and as specified herein. Fixture selections, i.e manufacturer, model, colors, etc. shall be approved by the Owner (see appendix A). Work includes trim and related construction as required.
- D. When work involves removal or disturbance of painted or otherwise coated surfaces in excess of 2 square feet, the Contractor shall comply with Section 02050 Demolition and Section 01810 Lead Dust Hazards.

1.2 QUALITY STANDARDS

- A. Provide licensed, experienced, well-trained workers competent to complete the work as specified.
- B. Unless approved by the Inspector, provide all related products and accessories from one manufacturer.
- C. All work shall comply with manufacturer's instructions and the Wisconsin Plumbing Code.

1.3 SUBMITTALS

- A. Submit a copy of the plumbing permit from the City of Milwaukee to the Agency prior to starting any plumbing work.
- B. Provide manufacturer's specifications and other data to prove compliance with these Specifications.
- C. Submit a list of materials to be provided for this work.
- D. At the completion of this work, provide copies of manufacturer's installation, maintenance, and any warranty information.
- E. Owner Selection Sheet:
 - Do not start work until Owner has approved product/style/color selections in writing (See Appendix A).
 - Provide Agency with a completed and signed Owner Selection Sheet.

1.4 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
 - Maintain an up-to-date copy of the Scope on site.
 - Confirm that there is no conflict between this work and the work of other trades.
 - Confirm that the work of other trades that must precede this work has been completed.

PART 2 – MATERIALS

2.1 SANITARY SEWER PIPES

- A. Sanitary sewer piping within the building shall be:
 - PVC pipe as per ASTM D2665, D1785, or F891, with solvent weld joints.
 - ABS pipe as per ASTM D1527, D2661, or F628, with solvent weld joints.
 - Cast iron pipe as per ASTM A74, A888, or CISPI 301, service weight, neoprene gaskets.
- B. Sanitary sewer piping below grade beyond the building line shall be:
 - Vitrified clay pipe as per ASTM C700, standard, bell and spigot, neoprene gaskets.
 - PVC pipe as per ASTM D1785, D2665, D3034 or F891. Elastomeric Gaskets as required.
 - Cast iron pipe, as per ASTM A74, A888, or CISPI 301, service weight, neoprene gaskets.

2.2 WATER SUPPLY

- A. Water supply piping within the building shall be:
- Copper piping type M, as per ASTM B42, or B88.
 - Galvanized Steel as per ASTM A53.
 - Other materials as approved by the State of Wisconsin Plumbing Code.

2.3 WATER SERVICE

- A. Water service piping shall be copper, as per ASTM B42 or B88.

2.4 GAS SUPPLY

- A. Gas supply piping shall be steel, Schedule 40 black, malleable iron or forged steel fittings, screwed or welded.
- B. Gas supply piping materials shall comply with the standards of the Nation Fuel Gas Code, 1999 Edition.
- C. Provide clearly marked, easily accessible, and tested shut off valves as required by the building code.

2.5 WATER HEATER

- A. Provide and install an automatic water heater as per the Scope.
- Gas or electric powered as per the Scope.
 - Standard or high-efficiency as per Scope.
 - Sized per the Scope.
 - Seal all chimney breaches with concrete mortar materials.
 - Provide and install metal flue liners where required or listed on the Scope.
- B. Manufacturer as approved by plumbing code.

2.6 PLUMBING FIXTURES

- A. Provide and install plumbing fixtures, trim, and related construction as per the Scope.
- B. All plumbing fixtures shall be as approved by the plumbing code.
- C. Plumbing fixtures shall be as listed on the Owner Selection Sheet.

2.7 CABINETS, LAVATORY VANITIES, AND COUNTERTOPS

- A. Kitchen or bathroom cabinets shall be delivered new in sealed packaging.
- Cabinets shall be manufactured by a recognized cabinet manufacturer. No "homemade" cabinets will be accepted.
 - Installed cabinets shall be specified for the use in which they are intended.
 - Cabinet style, color, and cabinet hardware shall be as selected by Owner from standard readily available products.
 - Cabinet sizes shall be as listed on the Scope, or equal in size and configuration to the cabinets that were removed.
 - When cabinet(s) are being installed where no cabinet originally existed, (i.e. cabinet replacing a wall hung sink) the new cabinet(s) should be at least as wide as the sink it is replacing.
- B. Countertops for kitchen and bathroom sinks shall be:
- New, fabricated and sized too completely cover the cabinets.
 - Countertops shall be one continuous piece without joints.
 - Top and all exposed edges of countertops covered with Formica or other approved countertop material.
 - Countertops abutting walls shall have a backsplash.
 - Molded marble or similar type countertops are acceptable when selected by Owner.

2.8 MATERIALS DELIVERY AND STORAGE

- A. Deliver and transport materials to avoid damage to the product or to any other work.
- All materials shall be delivered new, in labeled and unopened containers.
 - Material quality shall be as specified on the Scope or as specified herein.
 - Reject and return any products or materials delivered in a damaged or unsatisfactory condition.

- B. Store materials indoors, protected from damage, dirt, moisture, contaminants, and weather.

PART 3 – CONSTRUCTION AND INSTALLATION

3.1 INSTALLATION – GENERAL

- A. Install products as per the Scope, state plumbing code and these Specifications.
- B. Upon completion, secure all required pressure tests, inspections, and approvals of the completed system. Make all required adjustments and corrections at no added cost.
- C. Provide for maintenance of this work for one year following final permit approval by the Inspector.

3.2 REPAIR, REPLACE, OR INSTALL FIXTURES

- A. Repair, replacement, or installation of a specified fixture or system shall require all of the following:
 - All necessary supply lines.
 - All necessary waste and vent piping.
- B. Provide on all pipe passing through finished floors, walls, and ceilings, including piping at fixtures, chromed escutcheons of sufficient size to cover openings.
- C. Installation of new sinks, lavatories, tubs, etc. shall include new faucets, tail pieces, traps, shut-offs, etc. unless otherwise specified.
- D. All openings in the walls, floors, ceiling, cabinets or other finishes for piping shall be repaired at the Contractor's expense.
- E. Seal all openings at pipes and conduits in exterior walls with non-hardening, weather-resistant caulk. Openings in masonry walls shall be sealed with concrete mortar materials.
- F. No pipes shall run in wall cavities adjacent to any unheated area unless specifically designed to do so.

3.3 INSTALLATION OF CABINETS, COUNTERTOPS, ETC.

- A. Cabinets shall be installed:
 - Securely to wall with screws driven deep enough into wall studs or blocking to adequately support cabinet and its contents.
 - Securely to adjacent cabinets with screws or other manufacturer's approved hardware.
 - In locations identical to the cabinetry or sink it is replacing, or as listed on the Scope.
 - Level and plumb, shim cabinets as necessary.
 - Furnish and install all necessary trim for a complete installation (i.e. shoe molding, etc.).
- B. Countertops shall be installed:
 - Securely in place with screws and/or glue.
 - Care shall be taken to not drive screw ends through top or other finished surfaces of the countertop.
 - Countertop back splashes shall be tight to wall with no gaps larger than 1/8 inch.
 - Caulk backsplash to wall with high quality silicone caulk. Color to match.
 - When required carefully cut out properly sized sink opening using care so as to not damage finished countertop material or cabinet.
- C. Bathroom accessories (i.e. paper holders, towel racks, grab bars, soap dishes, etc. shall be installed as listed in the Scope as specified herein:
 - Level and at manufacturer's recommended heights.
 - In accessible locations based upon their purpose.
 - Securely to wall studs and/or solid wall blocking.

3.4 REPAIR AND CLEANUP

- A. After installation, inspect all work for improper installation or damage.
- B. Operating fixtures must perform smoothly. Repair or replace any defective work as directed by the Inspector at the Contractor's expense. Repair work shall be undetectable.
- C. When work involved removal or disturbance of painted or otherwise coated surfaces in excess of 2 square feet, cleanup shall comply with Section 01810 Lead Dust Hazards, and as specified herein.
- D. Clean the work area and remove all scrap and excess material from the site.

END OF SECTION – 15400 PLUMBING

DIVISION 15 – MECHANICAL

15500 HEATING AND VENTILATION

Part 1 – General

1.1 WORK

- A. Provide and install heating and ventilation systems as listed in the Scope and as specified herein.
- B. Mechanical systems include:
 - Forced warm air: Furnace, ductwork, and air outlets.
 - Hydronic: Boiler, water pumps, water distribution system and radiators.
- C. Mechanical equipment and fittings shall include all trim and related construction as required.
- D. Work involving the removal of asbestos or asbestos containing material shall be in accordance with Section 02080 Asbestos Removal.

1.2 QUALITY STANDARDS

- A. Provide licensed, experienced, well-trained workers competent to complete the work as specified.
- B. Unless approved by the Inspector, provide all related products and accessories from one manufacturer.
- C. All work shall comply with manufacturer's instructions and the Wisconsin Uniform Dwelling Code.

1.3 SUBMITTALS

- A. Submit a copy of the heating or boiler permit from the City of Milwaukee to the Agency prior to replacing any heating system.
- B. Provide manufacturer's specifications and other data to prove compliance with these Specifications.
- C. Submit a list of materials to be provided for this work.
- D. Contractor is responsible for informing owner about the safe operation and routine maintenance of the equipment at time of installation.
- E. At the completion of this work, provide copies of manufacturer's installation, maintenance, and any warranty information to the property owner.
- F. Contractor shall leave information on, or near the equipment which identifies the Contractor, Contractor's address, phone number, and date of installation.
- G. Owner Selection Sheet:
 - Do not start work until Owner has approved product/type/trim selections in writing (See Appendix A).
 - Provide Agency with a completed and signed Owner Selection Sheet.

1.4 MATERIALS HANDLING

- A. Provide all materials required to complete the work as listed on the Scope and specified herein.
 - Deliver, store, and transport materials to avoid damage to the product or to any other work.
 - Reject and return any products or materials in a damaged or unsatisfactory condition.
 - Materials and products delivered will be new and certified by the manufacturer to be as specified.
- B. Store materials indoors, protected from dirt, moisture, contaminants, and weather.

1.5 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
 - Maintain an up-to-date copy of the Scope on site.
 - Confirm that there is no conflict between this work and the work of other trades.
 - Confirm that there is no conflict between this work and the governing building code.
 - Confirm that the work of other trades that must precede this work has been completed.
 - Meet all requirements to secure warranty.
- B. When the work involves the disturbance of asbestos or asbestos containing material work shall be done in accordance with Section 02080 Asbestos Removal.

PART 2 – MATERIALS

2.1 GAS FIRED-FORCED AIR HEATING

- A. All gas fired-forced air furnaces shall be new and have a 90% minimum AFUE rating unless otherwise specified in the Scope.
- Sizing of the unit shall be the responsibility of the Contractor.
 - The installation shall comply with all applicable building codes.
 - Contractor is responsible for ensuring that the chimney flue is properly sized to ensure adequate draft of other existing appliances, i.e. water heaters, etc.
 - Provide a sheet metal outside mounted filter track with only one open end to install filter.
 - Provide and install compatible thermostat and all necessary wiring.
 - Provide a concrete pad or bricks to raise furnace above basement floor.
 - Provide three (3) properly sized replacement filters.
 - No return air grilles shall be mounted in basement, attic, or other storage areas.
- B. Ductwork.
- Sheet metal ducts shall be galvanized as per ASHRAE and SMACNA standards.
 - Branch ducts must have manually operated dampers.
 - Flexible ductwork shall have a seamless vapor barrier and a minimum of 1 inch fiberglass insulation.
 - Flexible ducts shall be installed as directed by the manufacturer, without sags or kinks.
- C. Forced air system outlets.
- Diffusers and registers shall be replaced as listed in the Scope.
 - New diffusers and registers shall match size and configuration of existing duct opening, but still allow for required air flow.
 - Color to be selected by Owner in writing see Owner's Selection Sheet (Appendix A).
 - Exterior exhaust and fresh air intake vents shall be as listed by manufacturer.

2.2 HYDRONIC HEAT SYSTEMS

- A. All boilers shall be new, designed and tested for a minimum of 82% (gas fired) and/or 84% (oil fired) combustion efficiency based on I=B=R testing procedure.
- The installation shall be in accordance with all manufacturer specifications.
 - The installation shall comply with all applicable building codes.
 - Contractor is responsible for ensuring that the chimney flue is properly sized to ensure adequate draft of the boiler and other existing appliances, i.e. water heaters, furnaces, etc.
 - Provide and install compatible thermostat and all necessary wiring.
 - Provide a concrete pad or bricks to raise boiler above basement floor.
- B. Hot water piping system shall be tested to assure proper operation in accordance with boiler manufacturer specifications.
- Replace any defective piping, valves, etc. to assure proper operation of system.
 - Piping systems shall be in compliance with applicable building codes.
 - Piping systems shall be installed per manufacturer's specifications.
 - Piping with exterior covering suspected of containing asbestos shall be left undisturbed. In the event repairs or replacement is necessary to piping covered with material suspected of containing asbestos, the Contractor shall notify the Agency immediately upon the discovery of the defect.
- C. All radiators shall be new, designed and tested for proper operation in accordance with manufacturer specifications.
- New radiators shall be sized according to manufacturer specifications.
 - Defects found by the Contractor in the existing radiators shall be immediately reported to the Agency.

2.3 GAS SUPPLY PIPING

- A. Gas supply piping shall be steel, Schedule 40 black, malleable iron or forged steel fittings, screwed or welded.
- B. Gas supply piping materials and installation shall comply with all applicable building codes and the standards of the National Fuel Gas Code.
- C. Provide clearly marked, easily accessible, and tested shut off valves as required by the building code.

2.4 MATERIALS DELIVERY AND STORAGE

- A. Deliver and transport materials to avoid damage to the product or to any other work.
 - All materials shall be delivered new, in labeled and unopened containers.
 - Material quality shall be as specified on the Scope or as specified herein.
 - Reject and return any products or materials delivered in a damaged or unsatisfactory condition.
- B. Store materials indoors, protected from damage, dirt, moisture, contaminants, and weather.

PART 3 – CONSTRUCTION AND INSTALLATION

3.1 INSTALLATION

- A. Install products as per the Scope, state building code and as stated herein.
- B. Vents and related support construction for mechanical equipment must be as required by the building code.
- C. Upon completion, secure all required tests, inspections, and approvals of the completed system. Make all required adjustments and corrections at the Contractor's expense.
- D. Provide for maintenance of this work for one year following final permit approval by the Inspector.

3.2 REPAIR AND CLEANUP

- A. After installation, inspect all work for improper installation or damage.
- B. Heating systems shall operate smoothly and provide sufficient heat to all habitable rooms within dwelling.
- C. Repair or replace any defective work as directed by the Inspector at the Contractor's expense. Repair work shall be undetectable.
- D. Clean the work area and remove all scrap and excess material from the site.

END OF SECTION – 15500 HEATING AND VENTILATION

DIVISION 16 – ELECTRICAL

16400 ELECTRICAL

Part 1 – General

1.1 WORK

- A. Provide and install complete electrical service, power and lighting as listed in the Scope and as specified herein.

1.2 QUALITY STANDARDS

- A. Provide licensed, experienced, well-trained workers competent to complete the work as specified.
- B. Unless approved by the Inspector, provide all related products and accessories from one manufacturer.
- C. All work shall comply with manufacturer's instructions and the Wisconsin Electrical Code, Comm 16.

1.3 SUBMITTALS

- A. Submit a copy of the electrical permit from the City of Milwaukee to the Agency prior to starting any electrical work.
- B. Provide manufacturer's specifications and other data to prove compliance with these Specifications.
- C. Submit a list of materials to be provided for this work.
- D. At the completion of this work, provide copies of manufacturer's installation, maintenance, and any warranty information to Owner.
- E. Owner Selection Sheet:
 - Do not start work until Owner has approved product/style/color selections in writing (See Appendix A).
 - Provide Agency with a completed and signed Owner Selection Sheet.

1.4 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
 - Maintain an up-to-date copy of the Scope on site.
 - Confirm that there is no conflict between this work and the work of other trades.
 - Confirm that the work of other trades that must precede this work has been completed.

PART 2 – MATERIALS

2.1 GENERAL

- A. All materials must be new and of the type and quality specified. Materials must be delivered in labeled, unopened containers.
 - All electrical products must bear the Underwriters Laboratory label.
 - Reject and return any products or materials delivered in a damaged or unsatisfactory condition.
- B. Store materials indoors, protected from damage, dirt, moisture, contaminants, and weather.

2.2 ELECTRICAL SERVICE

- A. Provide complete electrical service as listed in the Scope and as specified herein.
- B. Service entrance cable, copper conductor, 600 volt insulation, type SE.
- C. Main distribution panels: circuit breaker type, provide surface cabinet with screw cover and hinged door. Copper bus and ground bus, 110/220 volts.
- D. Underground feeder and branch circuit cable, size 14 through 4 AWG, copper conductor 600 volt insulation, type UF.
- E. Wiring, nonmetallic sheathed cable, size 14 through 4 AWG, copper conductor, 600 volt insulation, type NM.
- F. Circuits will be as listed in the Scope, or as required by electrical code.

2.3 SWITCHES, RECEPTACLES AND WALL PLATES

- A. Provide complete switches, receptacles, wall plates and related materials as listed in the Scope and as specified herein.
- B. Wall switches, quiet operating switch rated 20 amperes and 110-220 volts AC. Color and switch type as selected by Owner. Wall dimmers, linear slide type, color selected by Owner. Rated for 600 watts minimum, size as per circuit.
- C. Receptacles, type 5-20 R, plastic face, color as selected by Owner. Specific purpose receptacles as listed in the Scope.
- D. Exterior weatherproof cover plates shall be gasketed cast metal with hinged gasketed covers.

PART 3 – CONSTRUCTION AND INSTALLATION

3.1 INSTALLATION

- A. Install products as per the Scope, state electrical code and these Specifications.
 - Straps and other support construction for electrical equipment must be as required by building code.
- B. Upon completion, secure all required inspections and approvals of the completed system. Make all required adjustments and corrections at no added cost.
- C. Provide for warranty of this work for one year following final permit approval by the Inspector.

3.2 REPAIR AND CLEANUP

- A. After installation, inspect all work for improper installation or damage.
- B. Operating fixtures must perform smoothly. Repair or replace any defective work as directed by the Inspector at the Contractor's expense. Repair work shall be undetectable.
- C. Clean the work area and remove all scrap and excess material from the site.

END OF SECTION – 16400 ELECTRICAL

DIVISION 16 – ELECTRICAL

16500 LIGHTING

Part 1 – General

1.1 WORK

- A. Provide and install all interior and exterior lighting fixtures and lamps as listed in the Scope and as specified herein.

1.2 QUALITY STANDARDS

- A. Provide licensed, experienced, well-trained workers competent to complete the work as specified.
- B. Unless approved by the Inspector, provide all related products and accessories from one manufacturer.
- C. All work shall comply with manufacturer's instructions and the Wisconsin Electrical Code, Chapter Comm 16.

1.3 SUBMITTALS

- A. Submit a copy of the electrical permit from the City of Milwaukee to the Agency prior to starting any electrical work.
- B. Provide manufacturer's specifications and other data to prove compliance with these Specifications.
- C. Submit a list of materials to be provided for this work.
- D. At the completion of this work, provide copies of manufacturer's installation, maintenance, and any warranty information to Owner.
- E. Owner Selection Sheet:
 - Do not start work until Owner has approved product/style/color selections of lighting fixtures in writing (See Appendix A).
 - Provide Agency with a completed and signed Owner Selection Sheet.

1.4 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
 - Maintain an up-to-date copy of the Scope on site.
 - Confirm that there is no conflict between this work and the work of other trades.
 - Confirm that the work of other trades that must precede this work has been completed.

PART 2 – MATERIALS

2.1 GENERAL

- A. All materials must be new and of the type and quality specified. Materials must be delivered in labeled, unopened containers.
 - All electrical products must bear the Underwriters Laboratory label.
 - Reject and return any products or materials delivered in a damaged or unsatisfactory condition.
- B. Store materials indoors, protected from damage, dirt, moisture, contaminants, and weather.
- C. Provide and install all required accessories for mounting and operation of each fixture.
- D. Provide new light bulbs for all fixtures repaired or installed by the Contractor.

PART 3 – CONSTRUCTION AND INSTALLATION

3.1 INSTALLATION

- A. Install products as per the Scope, state electrical code and these Specifications.
 - Straps and other support construction for electrical equipment must be as required by building code.
- B. Upon completion, secure all required inspections and approvals of the completed system. Make all required adjustments and corrections at no added cost.

C. Provide for warranty of this work for one year following final permit approval by the Inspector.

3.2 REPAIR AND CLEANUP

- A. After installation, inspect all work for improper installation or damage.
- B. Operating fixtures must perform smoothly. Repair or replace any defective work as directed by the Inspector at the Contractor's expense. Repair work shall be undetectable.
- C. Clean the work area and remove all scrap and excess material from the site.

END OF SECTION – 16500 LIGHTING