City of Kenosha Minimum Housing Rehabilitation Standards

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Introduction

Purpose and intent

These guidelines for the rehabilitation of existing residential properties have been developed to provide minimum criteria for HOME-funded owner-occupied rehabilitation. These standards are intended to assure that assisted housing is livable, healthful, and safe and physically sound; is non-luxury, suitable amenities housing; and is good quality, reasonably priced housing. These standards were also designed to assist in achieving consistency throughout the state for single-family rehabilitation activities funded through the HOME Homebuyer and Rehabilitation (HHR) Program .

These guidelines are intended to provide an acceptable minimum level for rehabilitation with sufficient flexibility to meet varied local conditions and codes. It should be noted that if other funding sources are being used, additional criteria may be applicable.

Consideration should be given to having energy audits conducted on all properties to be rehabilitated prior to generating the project specifications (encouraged, not required). To the extent possible and practical, and where benefiting household's income are within the eligibility range, local weatherization program offerings should be accessed and used in combination with HHR rehabilitation assistance. Utility rebates offered by the utility company serving your programs should be accessed whenever available and the rebates should be used to further the cost of your single-family rehabilitation activities.

Whenever possible and practical, specify materials or products that are made from recycled materials or specify materials and products produced from rapidly renewable materials. To the extent possible and practical, avoid using products from non-renewable resources.

The standards assume that a knowledgeable inspector will thoroughly inspect each dwelling to verify the presence and condition of all components, systems, and equipment of the dwelling. All components, systems, and equipment of a dwelling referenced in this document shall be in good working order and condition and be capable of being used for the purpose for which they were intended and/or designed. Components, systems, and/or equipment that are not in good working order and condition shall be repaired or replaced. When it is necessary to replace items the replacement items must conform to these standards. These standards also assume that the inspector will take into account any extraordinary circumstances of the occupants of the dwelling and reflect a means to address such circumstances in their inspection and in the preparation of a work write-up/project specifications for that dwelling.

If an inspector determines that specific individual standards of this document cannot be achieved on any Single dwelling due to it being structurally impossible and/or cost prohibitive, the inspector shall document the specific item(s) as non-conforming with these standards. The inspector shall prepare a list of any and all non-conforming items or non-conforming uses along with his/her recommendation to waive, or not-to waive, the individual non-conforming items. The inspector's list of non-conforming items and subsequent recommended actions shall be explained to the property owner and the program administrator, as well as provide for

their signatures and dating of the inspector's list of non-conforming items and subsequent recommendations. If all parties (property owner, administrator, and inspector) agree, non-conforming items to these standards may be waived. (NOTE: Items that are necessary to meet HUD Section 8 HQS or the Minimum Property Standards may not be waived.)

Dwelling Contractor Certification

All contractors working on rehabilitation projects must carry a minimum of $250,000 (per occurrence) of general liability insurance. It is recommended that all contractors have the Dwelling Contractor Certification (formerly called the Dwelling Contractor Financial Responsibility Certification). Individuals may have the Dwelling Contractor Qualifier Certification. To obtain a one- or two-family permit, a contractor will need have both the Dwelling Contractor (business) Certification and Dwelling Contractor Qualifier (individual) certification.

For more information on the Certifications see:
http://www.commerce.state.wi.us/sb/sbcreddwelconexplan0707.html

Lead Dust Hazard

PART 1 - GENERAL WORK

WORK

A. PRESUMPTION OF LEAD FOR ALL PRE-1978 BUILDINGS: For the purposes of these Standards, 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", it is assumed 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 activity 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 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.

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] and the State of Wisconsin, Department of Health and Family Services Lead-Based Paint Regulations [Chapter HFS 163].

G. Any Company conducting work on a building presumed or known to have lead paint must be a **Wisconsin Certified Lead Company.** Individuals working on these projects must obtain certification as **Lead Abatement Workers** and **Lead Safe Renovators. Lead Abatement Workers** must be supervised on-site by certified **Lead Abatement Supervisors.** Certification and training are provided by the Wisconsin Department of Health Services.

QUALITY STANDARDS

A. Provide experienced, lead-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 I 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 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.

SUBMITTALS

A. **Contractor** shall complete an **Occupant Protection Plan** form (if applicable) and submit it to the Department of Health Services.

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. Prior to starting work under this section, **Contractor** shall present to the **Administrator** 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.**

D. At the completion of the job and prior to final payment to the **Contractor,** copies of all lead clearance testing results shall be provided to the **Owner** and on file with the **Administrator.**

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** and **Occupant Protection Plan.**
   - **Warning Notices:** At least two warning signs shall be conspicuously posted adjacent to the work area. The signs shall be posted at the beginning of the project and remain posted until the project has been completed. The signs shall measure at least eleven (11) inches by eight (8) inches and display the following working:

Caution - Paint Removal Work Area
Danger to children and Pregnant Women

- 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

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.

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 bags 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.
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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.

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

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.
- For large quantities of debris, **Contractor** shall remove debris from property and dispose of debris at **Contractor's** expense.

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.

INSPECTION TOUCH-UP AND REPAIRS

A. The **Contractor** is responsible for contacting the **Program** Administrator 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.
   - The **Contractor** shall be responsible for contacting the **Program Administrator** and 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.

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.

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, 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 contractor's 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.**

Asbestos Removal

PART 1 - GENERAL

DEFINITIONS

- Category I nonfriable Asbestos Containing Material (ACM) - packing, gaskets, resilient floor covering and asphalt roofing containing asbestos that cannot be crumbled to powder by hand pressure. The material is pliable and breaks by tearing. It does not easily release asbestos fibers upon breaking.
- Category II nonfriable ACM - any material containing asbestos that cannot be crumbled by hand pressure, but which is not pliable and breaks by fracturing. It does release asbestos fibers upon breaking. Exterior siding boards are included in this category.
- Friable ACM - any asbestos containing material that can be crumbled to a powder with hand pressure. Common materials include pipe insulation and sprayed on or tiled sound insulation material. Asbestos fibers are readily released upon breaking. Some nonfriable materials may become friable during activities such as grinding, cutting, and the like.

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.

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 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.

SUBMITTALS

A. When required by Wisconsin DNR in accordance with Chapter NR 447, **Contractor** shall supply a detailed abatement plan to the **Administrator.**

B. **Contractor** shall clearly post in plain view asbestos abatement warning signs outside of the entrance to containment areas.

C. **Contractor** shall provide **Owner** and (if applicable) tenant a minimum of two (2) days

advance notice prior to starting any asbestos removal.

D. **Contractor** shall provide the **Owner** and the **Administrator** with copies of all final clearance testing, the waste disposal tickets and the Hazardous Waste Manifest from the DNR.

PART 2 - MATERIALS

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.

D. See Lead Dust Hazards for additional containment information.

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.

PART 3 - CONSTRUCTION

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 including electric, water, sewer, heat 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.

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.

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, 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.

Site Maintenance

PART 1 – GENERAL

SITE PREPARATION
- Close windows and doors adjacent to demolition work area.
- Prevent dust and debris from contaminating interior areas of the building or adjacent property.
- Locate any hidden utilities, electric, water, sewer, heat, etc. and disconnect or cap off utilities prior to start of demolition.
- Arrange and verify shut off of appropriate utilities, and protect utilities indicated to remain in services from damage during 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.
- Provide tree and shrub protectors.

- Store and handle materials in a manner to prevent loss from weather or other damage, and according to manufacturer specifications.

SITE WORK
- Start demolition at top most level, and proceed downward.
- Provide water supply and hoses for spray to control dust.

SITE CLEAN-UP
- Keep the building(s) and site well organized and clean throughout the construction period.
- 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.
- Daily cleaning shall not replace the required clean up after the work of specific trades as specified herein.
- Clean transparent materials inside and outside and remove glazing compounds.
- Clean exposed hard-surfaced finishes to a dust-free condition free of stains, films, and other foreign substances. Sweep hard surface flooring and vacuum carpeting.
- Wipe surfaces of mechanical and electrical equipment. Clean light and plumbing fixtures.
- Remove labels that are not permanent.
- At completion of work, remove from the job site all tools, equipment, demolition debris, scraps and dust.
- Remove temporary protection and facilities.

Site Improvements

Concrete Walkways

PART 1 - MATERIALS AND PRODUCTS

A. Comply with American Concrete Institute 301 Specifications for Concrete (ACI 301).

B. Create exterior slabs with a minimum of a 6 bag mix or design strength of 4,000 pounds per square inch of Portland Cement to prevent freeze/thaw damage and maximize performance.

PART 2 - CONSTRUCTION AND INSTALLATION

A. Comply with ACI 304 for measuring, mixing, transporting and placing concrete.

B. Provide protection to ensure nearby walls, buildings, porches, doors, windows, etc. are not sprayed or splashed with concrete during pour or subsequent concrete finishing work.

C. If pouring concrete on disturbed soil, provide 3 inches of compacted sand or gravel aggregate.

D. 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.

E. All control joints shall be a minimum of % the thickness of the slab.

F. Make joint lines straight and uniform.

G. 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.

H. Use a light broom or wood trowel finish.

I. Exterior sidewalks shall be a minimum thickness of 4 inches

J. Steps shall be uniform in rise and run with rounded nosings. Maximum riser height is 8 inches and minimum tread size is 9 inches.

K. Comply with ACI 302 for screening, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

L. To start the curing process, cover the slab with plastic sheets or apply a liquid curing compound.

PART 3 – COMPLETION

A. Back fill and landscape disturbed areas.

B. Walkways shall be of safe level surface. Deteriorated essential paving shall be repaired.

PART 4 - ENERGY AND ENVIRONMENTAL CONSIDERATIONS

A. Opportunities may exist to use asphalt with recycled content.

B. The use of permeable materials is encouraged where possible.

Excavation, Grading and Backfill

PART 1 - MATERIALS AND PRODUCTS

A. Fill material shall be uniform and free from debris or organic matter.

B. Avoid silt heavy clay or expansive clay backfill, use granular soils instead.

C. Footings shall be excavated to a depth of 4 feet below finished ground elevation and shall be uniform in direction and width.

PART 2 - CONSTRUCTION AND INSTALLATION

A. Contact Diggers Hotline at least three business days prior to starting excavation work.

B. Protect overhead lines from damage by trucks and cranes.

C. Provide shoring and bracing as necessary, as well as temporary drains and/or pumps to remove ground and rain water.

D. Grading for slabs shall be level.

E. Backfilling shall not occur until exterior waterproofing has been completed, inspected, and approved; exterior foundation insulation has been installed, and formwork and any trash and debris are removed.

F. Protect foundation and retaining walls during backfilling by bracing.

PART 3 - COMPLETION

A. The ground around the dwelling shall be sloped away from foundation walls to divert water away from the structure. Sloping should be a minimum of 3 inches for every 5 feet for at least 10 feet outward from building foundation.

PART 4 - ENERGY AND ENVIRONMENTALCONSIDERATIONS

A. Identify potentially harmful substances that may be uncovered during excavation and handle them according to governing regulations.
B. Strip and stockpile topsoil that will be reused in the work for final grading and landscaping.

Roofing

Shingles

PART 1 - MATERIALS AND PRODUCTS

A. Shingles
- Fiberglass or asphalt shingles may be used. Fiberglass shingles are a type of asphalt shingle made out of fiberglass mats as an alternative to the felt mats that are usually used.
- Asphalt shingles shall not be installed on roofs with less than a 2 inch rise per foot of run.
- 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 American Society for Testing and Materials (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.
- Shingles that have a self-sealing adhesive strip shall include a sealant which has average bond strength of at least 1.5 pounds per 3.75 inches of shingle width, at 32° F.
- Shingles must meet minimum weight standard of 240-245 lbs/square.
- Shingles shall have at least 4 fasteners per strip shingle or 2 fasteners per interlocking shingle.
- Shingle head lap shall be at least 2 inches.
- Shingles must have a minimum 25-year manufacturer warranty.

B. Underlayment
- Install waterproof roofing membrane per manufacturer's instructions on roofs pitched between 3 inches through 4 inches of rise per foot of run.
- Use 15 pound 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.

C. Nails
- Use nails of sufficient length to penetrate roof sheathing.
- Use hot-dipped, zinc-coated steel roofing nails.
- Follow all nail size requirements and nail spacings required by building code and shingle manufacturer's installation instructions.

PART 2 - CONSTRUCTION AND INSTALLATION

A. Preconstruction and Preparation
- The placing of new covering over existing covering shall not take place if two or more layers exist.
- Store materials to avoid weather or other damage - comply with manufacturers recommendations for storage and protection.
- Install plastic tarps around exterior of building and in attic or other interior areas to collect falling debris from roof.
- 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.
- 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.

- Proceed with shingle installation only after all penetrations have been made, substrate is dry, and weather conditions are acceptable.
- In the case of tear-off, remove existing materials down to roof deck; ensure deck is dry, clean and smooth before proceeding; replace and/or repair defective decking as necessary to provide a structurally sound deck surface.

B. Installation
- Install all items according to manufacturer's recommendations.
- Provide lifts, cranes, ladders or scaffolding to assist high-level roofing work.

a. Underlayment
- 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.
- On roofs sloped greater than 4 inches per foot, lap horizontal edges at least 2 inches and at least 2 inches over eave protection membrane.
- On roofs sloped between 3 inches per foot and 4 inches per foot, 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 chimney face.
- At skylights and roof hatches, install asphalt roofing felt from under the built-in counterflashing and on to the roof surface.

b. Shingles
- Space each joint a minimum of 1 % inches from adjacent course.
- Double shingles at first course to form a 1-inch drip edge.
- Install sheet metal or equivalent ice dam protection if roof extends over a heated area of a dwelling, attached garage and has a slope of 4:12 or less. Ice dams shall extend at least 30 inches up the roof slope from the edge and ate least 12 inches beyond the inner face of the exterior wall.

c. Techniques: Choose one of the following
- 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.
- 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.
- 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.

PART 3 - COMPLETION

A. Remove shingle installation debris from site.

B. Provide manufacturer's warranty.

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.

Single-Ply Membrane Roofing

PART 1 – GENERAL

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.

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.

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.
   -

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.

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

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

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 'h inch in width, loose knots, depressions, rotten wood or defective roof boards.
   - Replace defective decking as necessary to provide a structurally sound deck surface.

UNDERLAYMENT INSTALLATION

A. Install under/ayments in accordance with manufacturer's instructions and building code.

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.

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.

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.

PART 4 -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.**

Gutters and Downspouts

PART 1 - MATERIALS AND PRODUCTS

A. Gutters
- Aluminum gutters shall be "K-Type" (also called Ogee), 5 or 6 inch, and shall be seamless with a minimum gauge of 0.27.
- Galvanized gutters shall be "K-Type" or "Half Round", 5 or 6 inch, and shall be seamless with a minimum gauge of 26.
- Gutter flashing shall be non-corrosive sheet metal with a minimum of 24 gauge hot-dipped galvanized steel sheet, or aluminum with a minimum 0.032 inch sheet.

B. Downspouts
- Aluminum downspouts shall be 3 or 4 inch round or square corrugated aluminum with a minimum gauge of 0.024.
- Galvanized downspouts shall be 3 or 4 inch round or square corrugated with a minimum of galvanized steel gauge of 26.

PART 2 - CONSTRUCTION AND INSTALLATION

A. Seal all gutter joints, screws, rivets, etc. with approved sealant.

B. Support every separate section with hangars and straps adequate in size to support loads.

C. Do not mount gutter straps over top of shingles.

D. Construct gutters with positive slopes to prevent accumulation of standing water.

E. Lap joints to match drainage flow.

F. Provide movement slip joints on downspouts.

G. Provide downspout extensions as necessary to adequately divert water away from building.

H. Keep downspouts and gutters separated from wall surfaces to avoid staining and corrosion.

PART 3 - COMPLETION

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. Leave gutters and downspouts clear and clean of debris.

C. Repair or replace defective work as directed by the **Program Inspector.**

PART 4 - ENERGY AND ENVIRONMENTAL CONSIDERATIONS

A. Lead Paint
- 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 as per Section 2 Lead Hazard Reduction.

Openings

Windows

PART 1 - MATERIALS AND PRODUCTS

A. Windows shall be weathertight and allow no air infiltration, storm windows shall be provided.

B. Windows must be capable of being maintained in a clean and sanitary condition.

C. Closures shall be uniform and secure when units are closed and locked.

D. Windows on the ground level must be equipped with locks.

E. Windows that are nailed shut are acceptable only if these windows are not needed for ventilation or as an alternate exit in case of fire.

PART 2 - CONSTRUCTION AND INSTALLATION

A. Preconstruction and Preparation
- Store materials to avoid weather or other damage - comply with manufacturers recommendations for storage and protection.
- Ensure containment measures are in place and debris (old windows and trim) is disposed in a lead safe manner.
- Check rough opening to ensure it is sized property and is square and level.

B. Installation
- Install all items according to manufacturer's recommendations.
- Install proper flashing under and around window opening.
- Anchor windows securely in place, level and plumb.
- Seal entire perimeter of each unit with a continuous bead of sealant.
- Install insulation in openings and cavities around window.
- Install all necessary window jambs, stops, casings or other trim materials as necessary for a finished installation.
- Adjust operating sash for proper operation and closure, and lubricate hardware.
- Install proper weatherstripping.

PART 3 - COMPLETION

A. Clean glass promptly after installation.

B. Repair or replace any materials, such as trim, damaged during installation.

C. Provide manufacturer's warranty.

D. Any raw wood (windows and trim) is to be stained, sealed, varnished, coated with polyurethane or painted.

PART 4 – ENERGY AND ENVIRONMENTAL CONSIDERATIONS

A. Lead Paint
- When work involves removal or disturbance of painted or otherwise coated surfaces, work shall comply with Lead Dust Hazard (see Section 2 Lead Hazard Reduction)

B. Energy
- Whenever possible Energy Star rated windows shall be used, or windows with a U-Factor $\leq$ 0.30 (National Fenestration Rating Council label).
- Skylights must have a U-Factor of $\leq$ 0.55.
- Aluminum is highly conductive and not energy efficient, if using aluminum windows specify thermally broken frames only.

- East and West facing glass should have an NFRC label solar heat gain coefficient of less than 0.40.
- If using insulating glass specify glazing with low-E films and argon or other inert gas between the panes.

Doorways

PART 1- MATERIALS AND PRODUCTS

A. Underwriting Laboratory (UL) label is required on fire rated doors.

B. Fire rated doors must comply with all building and fire code requirements.

C. Entry door locksets and dead bolts serving an individual unit shall be keyed alike.

D. Deadbolts shall be operable without a key from the inside of the dwelling unit.

E. Standard thickness for exterior doors is 1-3/4 inches.

F. Standard thickness for interior doors is 1-3/8 inches.

PART 2 - CONSTRUCTION AND INSTALLATION

A. Bottom clearance on mounted doors shall be %" maximum; clearance must allow for thresholds, weatherstripping, gasketing, carpet and other types of flooring.

B. Top clearance on mounted doors shall be 1/8" maximum.

C. Lock and hinge edge should be beveled at 1/8" in 2 inches maximum.

D. Install hinges so that mortise-type hinges are flush, distances on door are correct, heights are correct and intermediate hinges are equidistant from others.

E. Install fiberglass insulation in openings and cavities around exterior door frame.

F. Apply high quality sealant under door threshold prior to installing pre-hung exterior doors.

G. Seal doors at doors at tops and bottoms after installation.

H. Install proper weatherstripping.

PART 3 - COMPLETION

A. Install all finishing hardware such as door jambs, stops, and casings or other trim materials.

B. Seal, stain or paint exterior doors before or immediately after installation.

PART 4 - ENERGY AND ENVIRONMENTAL CONSIDERATIONS

A. Energy
- Whenever possible Energy Star qualifying doors shall be used. Energy Star qualifying U-Factors for doors depend on the amount of glass the door has.
  - Opaque glazing should have a U-Factor of ≤0.21.
  - ≤1/2-Lite glazing should have U-Factor of ≤0.27 and a Solar Heat Gain Coefficient (SHGC) of ≤0.30.
  - >1/2-Lite glazing should have a U-Factor of ≤0.32 and a SHGC of ≤0.30.

Siding

Wood Siding

PART 1 – GENERAL

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 Lead Dust Hazards.

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 Lead Dust Hazards.

C. All work shall be completed in accordance with state and local building codes, manufacturer's instructions, and as specified herein.

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.

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

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

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.

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.

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.

INSPECTION AND CLEAN-UP

A. Cleaning and repairs:
   - Clean up shall be in accordance with 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.**

Vinyl Siding and Cladding

PART 1 - GENERAL

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 Lead Dust Hazards.

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 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.

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.

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

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

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 (Ufurred") 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.

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 ljsted 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.

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.

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 %" 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 Jchannel 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.

INSPECTION AND CLEAN-UP

A. Cleaning and repairs: .
- Clean up shall be in accordance with 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.**

Foundation and Structure

Structure

PART 1 - MATERIALS AND PRODUCTS

A. Walls and Flooring
- Comply with Plywood Specification and Grade Guide of the American Plywood Association and the Manual for Wood Frame Construction, American Forest and Paper Association (NFPA), © 2001.
- Moisture content of framing lumber shall be 19% or less by weight.
- Reject any framing lumber that is not grade-stamped by a bona fide grading agency.
- Pressure treated lumber shall be labeled to show conformance with American Wood Preservers' Association (AWPA) C22-03 "Lumber and Plywood for Permanent Wood FoundationsPreservative Treatment by Pressure Processes" and labeled by an inspection accredited by the American Lumber Standards Committee.
- Subflooring shall be APA rated plywood sheathing, exterior grade, or Oriented Strand Board (OSB).
- Roof sheathing shall be APA rated plywood sheathing, exterior grade, OSB, or Waferboard with waterproof resin binder.
- Underlayment shall be APA rated underlayment, approved for use under asphalt, vinyl, and resilient tile or sheet flooring.

B. Fasteners
- Use hot-dipped galvanized steel or stainless steel nails for exterior, high humidity, and treated wood locations.
- Electro-galvanized nails shall not be used on exteriors, or where corrosive staining might mar wood surfaces.
- Nails used in redwood or cedar shall be of stainless steel.
- Subfloor glue shall be APA solvent based, waterproof construction grade adhesive.

PART 2 - CONSTRUCTION AND INSTALLATION

A. Walls
- Vertical framing shall be plumb within %" per 1 0 linear feet.
- Horizontal framing shall be level within %" per 1 0 linear feet.
- Nails shall be at least twice as long as the thickness of the wood, with spiral shanks to maximize hold.
- Construct stud framing and blocking to support wall-mounted fixtures, cabinets, railings, and equipment.
- Stud framing shall be substantially braced, secured with correct sizes and types of fasteners, and installed with fire stops to provide snug blocking between studs.
- 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 as not to occur over openings.
- Install top plates to provide uninterrupted, ample nailing backing for exterior and interior panels.
- Install headers and lintels with ample baring, secure connection to supports, complete bracing, nailing and stop plates at floors and slabs, double-sided prop bracing at walls, and diagonal horizontal cross bracing at plates of intersecting walls.
- 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.

B. Flooring
- Floor *framing* members shall be set *with* crowns upward and with full bearing plates.
- Joist hangers shall be set straight, aligned, substantially braced and secured with correct size and type fastenings.
- Stagger subflooring butt joints.
- Completed subflooring shall be level within %" per 1 0 linear feet, free of depressions or humps, and free from holes, splits or other construction damage.

C. Fasteners
- When using bolts, drill holes 1/16" larger than bolt diameter.
- Use washers under all nuts.
- Glue and secure subflooring to joists with screws or screw type nails. Subfloor to joist connections must be sufficient to prevent any squeaking of flooring.

Foundation

PART 1 - MATERIALS AND PRODUCTS

A. Unless otherwise noted, all concrete foundation walls and slabs on grade shall be 3,000

p.s.i.

B. All slabs under interior finished and heated living spaces shall be place don 6-mil polyethylene vapor barriers with a minimum of 6 inch lapped joints.

PART 2 - CONSTRUCTION AND INSTALLATION

A. Foundation walls shall prevent the entrance of water or moisture into a basement or crawl space area.

B. Crawl spaces shall have a minimum access opening of no less than 22" by 30" with a clear height of over 30", unless the space contains mechanical equipment, in which case the opening shall be of sufficient size to permit the removal and replacement of equipment.

C. Cracks in walls shall be effectively sealed and loose or defective mortar joints replaced.

D. Provide % inch expansion joint material between all concrete slabs and abutting concrete or masonry walls occurring in exterior or unheated spaces or areas.

E. Where necessary, interior or exterior face of walls shall be damp proofed by bituminous coating or cement parging.

F. Foundation fasteners shall not be located underneath any studs.

G. Shims for mudsills shall be of preservative treated lumber.

H. When foundation is to be insulated excavate 1 foot below grate, install 2" Styrofoam board to cover area between ground level and bottom siding, cover with aluminum or pressure treated plywood, pebble board or fiberglass board.

I. Provide ventilation space for girders that will be set in foundation wall pockets or directly above earth.

PART 3 - COMPLETION

A. Ground around the dwelling shall be sloped away from foundation walls to divert water away from the structure.

B. Provide termite protection as required and remove all wood construction materials from the excavation near the structure.

Heating, Insulation, and Ventilation

Heating

PART 1 - MATERIALS AND PRODUCTS

A. Heating facilities shall be provided for each living unit and other spaces assuring for interior comfort, safety and convenience in operations, and economical performance.

B. Furnaces and boilers shall be provided with ducted combustion air ducted directly from outdoors to the burner or to an airtight mechanical room. The combustion air requirements of the furnace are separate from the building to eliminate backdrafting.

C. New furnaces shall be a 95 AFUE "Carrier", "Luxair", "Comfortmaker", or equal with a Lifetime Warranty on the primary and secondary heat exchanger and 5 years Parts Warranty.

D. New boilers shall be designed and tested for a minimum of 82% (gas fired) and 84% (oil fired) combustion efficiency based on I=B=R testing procedures.

E. Each heating system or device shall have a recognized approval for safety and shall be capable of maintaining a temperature of at least 68 degrees Fahrenheit within the living units, corridors, public spaces, and utility spaces where the outside temperature is at zero degrees.

F. Ducts connected to furnaces shall be constructed of sheet metal for at least 6 feet from furnace, and shall be located 6 inches below combustible framing.

G. Sheet metal ducts shall be galvanized as per ASHRAE and SMACNA standards.

H. Flexible ductwork shall have a seamless vapor barrier and a minimum of 1 inch fiberglass insulation.

I. Gas supply piping shall be steel, Schedule 40 black, malleable iron or forged steel fittings, screwed or welded.

J. Provide "Honeywell" #T8112D, or approved equal, thermostat.

PART 2 - CONSTRUCTION AND INSTALLATION

A. Ensure that chimney flue is properly sized to ensure adequate draft of other existing appliance such as water heaters.

B. Do not mount return air grilles in basements, attics, or other storage areas.

C. Provide sheetmetal outside mounted filter track with only one open end to install filter.
D. Provide a concrete pad or bricks to raise installed boilers above basement floors.

E. All supply and return ducts to be completely sealed with either approved mastic sealed or taped. Tape must be UL 181A or UL 181B approved. No unlisted "DUCT TAPE" is allowed.

PART 3 - COMPLETION

A. Upon completion secure all required inspections and approvals of the completed systems.
PART 4 - ENERGY AND ENVIRONMENTAL CONSIDERATIONS

A. All new furnaces and boilers shall be Energy Star labeled with an Annual Fuel Utilization Efficiency (AFUE) of 90% or greater.

B. Programmable set-back thermostats shall be used in all new installations.

C. To maximize efficiency, locate furnace to minimize total length of duct runs.

D. Minimize positioning of new ductwork in unconditioned spaces or exterior walls. If doing so, insulate with R-30 minimum insulation.

Insulation

PART 1- MATERIALS AND PRODUCTS

A. Use minimum R-11 batt insulation in all exterior walls, minimum R-30 insulation in all attics and cathedral ceilings, and minimum R-19 batt insulation in all floors adjacent to the exterior or to unheated spaces.

PART 2 - CONSTRUCTION AND INSTALLATION

A. Insulation shall be installed where possible in any new walls, attics, crawl spaces when other work is performed.

B. When using unfaced insulation, install minimum 6 mil polyethylene vapor barriers against warm side of all insulation.

C. Weather stripping and/or weather-proof thresholds shall be installed around all doors.

D. Caulk and seal at all windows, exterior doors, vents, pipe penetrations, bottom plates and around all electrical boxes mounted in exterior walls.

E. Install sill sealer between foundation wall and wood sill plates.

F. Install batts with tight contact of insulation with framing.

G. Cleanly cut and tightly fit batts around electrical and plumbing components.

H. Keep ventilation space unobstructed.

PART 4 - ENERGY AND ENVIRONMENTAL CONSIDERATIONS

A. In addition to basic sealing practices, advanced sealing practices can be used (sealing at top and bottom plates, at corners and between cavities at penetrations).

B. Insulate new attics to R-50 for maximum energy efficiency.

C. Insulate and tack knee walls, rim joints, existing crawl spaces and floors over basements for added efficiency.

D. Use recycled content insulation when possible.

E. For energy conservation, recommended are values are R-19 for crawl spaces and band joists, R-38 for ceilings and R-11 for walls.

Ventilation and Cooling

Ventilation requirements are described in AHRAE 62-1999, "Ventilation for Acceptable Indoor Air Quality."

PART 1 - MATERIALS AND PRODUCTS

A. Attics will be ventilated with a minimum of 1 square foot of free vent for each 300 square feet of roof area if a ceiling vapor barrier is present, 1 square foot for each 150 square feet of roof area is no ceiling vapor barrier is present.

B. Natural ventilation of spaces such as attics and enclosed crawl spaces shall be provided by opening of sufficient size to overcome dampness and minimizing the effect of conditions conducive to decay and deterioration of the structure, and to prevent excessive heat in attics.

C. Roof vents and/or gable vents shall be used in conjunction with soffit vents to provide adequate removal of summer heat as well as winter moisture.

D. Exterior ventilation openings shall be effectively screened where needed.

E. Bathrooms shall have an operable window or be provided with a mechanical means of ventilation capable of completely changing the air every 7 minutes.

- Provide a "Panasonic WhisperValue VS1" vent fan, or equivalent, 80 CFM (Max airflow), low sone (1.5 or less) in **central/main** baths. Provide a "Honeywell Model H46E1013" dehumidifier control for fan, to be installed in hallway outside bathroom to provide whole house ventilation.
- Provide a "Panasonic WhisperValue VS1" vent fan, or equivalent, 70 CFM (or as determined by HVAC designer), low sone (1.5 or less, in master or ½ baths.

F. Range hoods and exhaust fans shall be exterior ducted with rigid ductwork, with straight and the most direct runs to the exterior as possible.

G. Air conditioning system, where provided, shall be a 13 SEER "Carrier", "Luxair" or equal.

PART 2 - COMPLETION

Complete a blower door test in accordance with American Society for Testing and Materials (ASTM) Standard E779-87 (Recommended, not required). Energy Star® qualifications, Natural Air Changes per Hour (ACH_{nat}) shall be less than or equal to 0.50 Air Changes Per Hour as determined by an Energy Star consultant.

Interior Standards

Flooring

PART 1 - MATERIALS AND PRODUCTS

A. Ceramic Tile
- Comply with Tile Council of America Specifications 137.1.
- Floor tile shall have a coefficient of friction not less than 0.50 as per American Society for Testing and Materials (ASTM) F489, ASTM F609.
- Use Latex-portland cement mortar that conforms to American National Standards Institute (ANSI) A118.4.
- Use organic adhesive as per ANSI A 136.1; Type I where subject to extended water exposure and Type II in all other locations.
- Provide non-corrosive lath: lapped, zinc-coated and tied with zinc-coated fasteners.

B. Wood Flooring
- Metal transition strips (thresholds) shall be not less than %" width, 1/8" thick, butt type, rounded or beveled on the exposed edge with lengths sufficient to minimize joints.

C. Asphalt, Vinyl, Resilient Sheeting and Resilient Tile Flooring
- All flooring and base adhesives shall be waterproof, non-toxic, and low-odor.
- Metal transition strips (thresholds) shall be not less than %" width, 1/8" thick, butt type, rounded or beveled on the exposed edge with lengths sufficient to minimize joints.
- Resilient floor sheeting shall be a minimum of 6' wide.
- Vinyl flooring to be "Congoleum Pacesetter" or "Congoleum Fast Track" sheet flooring, or equivalent.
  1. Installation to include "Multi-ply" or "Pre-Floor" brand ¼ inch underlayment, installed to manufacturer's specifications.
  2. 10 year warranty minimum.
  3. Maximum installed price not to exceed $5.35 per square foot.

D. Carpet
- Carpeting to be 26 oz. Per yard, Berber by "Philadelphia", "Mohawk", "Shaw", or "Beaulieu", not to exceed maximum installed price of $2 per square foot.
- Carpet pad to 6 lb., ½ REBOND padding or equal, installed to manufacturer's

specifications.
- Warranties to provide a minimum of 10-year quality assurance, 5-year stain/soil, and 5-year texture retention.

PART 2 - CONSTRUCTION AND INSTALLATION

A. Ceramic Tile
- Comply with Tile Council of America "Handbook for Ceramic Tile Installation".
- Prepare floors for tiling so that the finished floor will be either perfectly level or slope properly to drains.
- Install waterproofing and backing that will absolutely block water leakage.

B. Wood Flooring
- Remove existing shoe molding, nosings, transition strips, etc. to allow for complete and proper
- installation. Remove base molding only if necessary.
- Inspect sub-floor for structural deficiencies and make any necessary repairs.
- Ring-shank flooring nails must be long enough to securely attach the flooring to substrate.
- Do not allow end joints to occur side by side, separate by at least two strips.
- Provide a minimum of 1/2" expansion joint space at walls.
- Fasten baseboards and/or shoe molding to walls only, not floors, to cover expansion space.
- Miter joints in shoe moldings and baseboards at outside corners, joints and at ends.

C. Asphalt, Vinyl, and Resilient Sheeting and Resilient Tile Flooring
- Remove existing shoe molding, nosings, transition strips, etc. to allow for complete and proper installation. Remove base molding only if necessary. Remove base molding only if necessary.
- Securely attach underlayment to existing floor 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 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.
- Fasten baseboards and/or shoe molding to walls only, not floors, to cover expansion space.
- Miter joints in shoe moldings and baseboards at outside corners, joints and at ends.
- Preformed rubber or vinyl baseboard corner shall be used at all inside and outside corners, do not bend rubber of vinyl base around corners.
- Install nosings at exposed edges of flooring, e.g., landings, stair treads, etc.
- For resilient sheeting flooring, start compression rolling over sheet flooring in middle and move outward to press out all bubbles. Use seam sealer at seams.

- Transition strips between vinyl and carpet to be square nosed end cap transition strips used for laminate flooring installations in maple or birch wood tone.

D. Carpet

- Remove existing carpet strips, nosings, transition strips (thresholds), etc. to allow for the complete and proper installation of carpeting.
- Prepare sub-floor by eliminating irregularities; removing grease, paints, varnish and other materials that might interfere with the adhesive; ensuring the sub-floor is secured; and cleaning the substructure of underlayment.
- Prepare concrete slab for installation by ensuring a smooth, dry, clean surface.
- Install so that all portions are laid in the same direction and there are no fill strips less than 6 inches wide.
- Do not place seams in heavy traffic areas.
- Use thoroughly bedded and sealed butt joints.
- "Waterfall" or contour installation shall be used to carpet basement stairs. Carpeting to coordinate with first floor carpeting.
- Transition strips between vinyl and carpet to be square nosed end cap transition strips used for laminate flooring installations in maple or birch wood tone.

PART 3 – COMPLETION

A. Ceramic Tile

- Wash tile surfaces with clean water before and after cleaning.
- 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.
- Prevent foot traffic for at least 3 days, place flat boards in walkways for 7 days where use of newly tiled floors with cement type grout is unavoidable.

B. Wood Flooring

- If necessary undercut doors to allow for proper clearance over new flooring.
- Sand new wood flooring consistently smooth, without lumps, depressions, and burns.
- Before applying finish, thoroughly cleanup and vacuum all sanding dust.
- Apply final finish as soon as possible.
- Allow at least 24 hours drying time between finish coats.
- Protect floor during and after installation with heavy Kraft paper or other suitable material.

C. Asphalt, Vinyl, and Resilient Sheeting and Resilient Tile Flooring

- If necessary undercut doors to allow for proper clearance over new flooring.
- Remove excess adhesive and other marks from finished flooring.

D. Carpet

- If necessary undercut doors to allow for proper clearance over new flooring.

- Provide heavy duty non-staining paper, 6 mil plastic, or board walkways as necessary to protect carpeting during remainder of rehab project.
- Save large scraps for owner maintenance.

PART 4 - ENERGY AND ENVIRONMENTAL CONSIDERATIONS

A. Ceramic Tile
- If air quality is a concern use grouts, grout sealers, and mortars without latex additives or fungicides.

B. Wood Flooring
- Use solvent-free, low V.O.C. finish if possible.

C. Carpet
- Use recycled content carpeting when possible.

Wallboard

All work with gypsum wallboard shall comply with Gypsum Association, "Application and Finishing of Gypsum Board," GA-216-2000, February 2000.

PART 1 - MATERIALS AND PRODUCTS

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

B. When attaching gypsum to metal framing use 1-1/4 inch type W bugle-head screws or annular ring nails (drywall nails).

C. Use moisture resistant wallboard in damp environments and seal edges and cuts.

PART 1 - CONSTRUCTION AND INSTALLATION

A. Install blocking and backups to support all edges of wallboard.

B. Verify that wood framing to receive wallboard is dry and not subject to shrinkage.

C. Verify that all-mechanical equipment (e.g., wiring, piping, ductwork, etc.) is properly protected from nail and screw penetration.

D. Install wall panels horizontally 3/8 inch to 1/2 inch from floor.

E. Stagger panel joints vertically.

F. Stagger panel joints back-to-back if using double layered panels.

G. Stagger short joints of ceiling panels at half the long dimensions of panels.

H. Keep joints to a minimum.

I. Install metal corners and other protective strips where finish wallboard edges might be damaged.

J. Install gypsum wallboards at right angles to furring or studs.

K. Install wallboard to ceilings with long dimension of board at right angles to joists.

L. Attach screws at 12" o.c. at ceilings and 16" o.c. at walls unless wall framing members are 24 inches apart, then space screws 12" o.c.

M. Start nailing at center and proceed to outward edges.

N. Do not proceed with nailing into wood framing that has over 19% moisture content.

O. Thoroughly seal penetrations in fire-rated walls.

Painting

PART 1 - MATERIALS AND PRODUCTS

A. Do not use alkyd primer on gypsum board.

B. Add approved fungicide to paints in shower or toilet room and other damp rooms.

C. Wall and Ceilings to be painted "Navajo White" #73 by Benjamin Moore over a primer.

D. Exterior paint to be "Sherwin Williams Super Paint, A-100" or equivalent exterior latex primer and finish paint.

PART 2 - CONSTRUCTION AND INSTALLATION

A. Clean surface to be painted of dirt, oil, and any other materials that might interfere with painting.

B. Fill nail holes and other irregularities to create a uniform surface.

C. Do not apply paint when relative humidity exceeds 85% or on wet or damp surfaces, including wood with moisture content of 12% or higher.

D. Do not paint over joints or seams that would prevent free movement of window sashes, storm windows, doors, cabinet doors or drawers, scuttle panels, etc.

E. Use two coats of heat-resistant paint when covering radiators.

F. Exterior painting

- Paint steel entry doors and jambs with two coats of latex enamel paint (spray or roll only)
- Paint front porch with primer and finish paint, 2 coats of latex, flat exterior paint. Front porch to include prime and paint of wood porch posts, handrails, balusters, trim boards step risers, cedar door kick plate, and cedar lattice, where painted. Rear porch to include prime and paint of rim joist, stair risers, cedar door kick plate, and cedar lattice frame.
- Deck and stair treads are unfinished. Stair risers to be painted the exterior trim color.
- Paint garage door frame with two coats of latex flat paint.
- As a general rule; posts, balusters, and porch columns to be painted a **light color**. Exterior handrails, door, step risers, wood trim, lattice, and porch skirtboard to be painted a **dark color**.

G. Interior Painting

- Spray latex primer with sand texture.
- Spray finish coat on all walls and ceilings.
- Trim to be painted, where noted, with semi-gloss enamel finish, Sherwin Williams Extra White Base with 2/32 black tint.
- Interior doors to be latex prime painted and finish painted, where noted, with semi-gloss finish, Sherwin Williams Extra White Base with 2/32 black tint. Paint to be spray painted or rolled; **no brush painting of doors allowed.**
- Interior side of entry doors to be painted with semi-gloss enamel in same color as interior trim. Entry doors to be spray painted or rolled; **no brush painting of doors**.
- Garage and basement walls are unfinished, with the exception of walls on both sides of the basement stairs, which shall be primed and painted as noted above.
- Basement floor shall be sealed.

PART 3 - COMPLETION

A. Reinstall removed items using workers competent in the related trades.

B. Test each painted item for free movement after finish is completely dry.

C. Provide owners with extra stock of 10% or more of each color, type and gloss of paint used in the work.

D. Inspect dry coats and make all necessary repairs and corrections.

PART 4 – ENERGY AND ENVIRONMENTAL CONSIDERATIONS

A. Use low or no V.O.C. paints when possible.

B. Lead Paint

- Provide certified lead abatement supervisor and certified lead abatement workers to perform and surface preparation work, including but not limited to wet scraping, wet sanding, HEPA planning, heat gunning clean up and debris removal. See Section 2. Lead Hazard Reduction.

Electrical Equipment and Wiring

All electrical wiring installations, equipment and materials used in the construction of dwellings shall comply with the requirements of the Wisconsin Administrative Electrical Code, Vole 2, ch. Comm 16, and the National Electrical Code.

Lighting

PART 1 - MATERIALS AND PRODUCTS

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.

PART 2 - CONSTRUCTION AND INSTALLATION

A. Install products as per state electrical code requirements and manufacturers instructions.

PART 3 - COMPLETION

A. Each room shall have adequate natural or artificial lighting to permit normal indoor and to support the health and safety of occupants.

B. At least one wall switch controlled lighting outlet shall be installed in every habitable room, kitchen and bathroom.

C. A ceiling or wall-type light fixture shall be present and working in the bathroom and kitchen areas.

PART 4 - ENERGY AND ENVIRONMENTAL CONSIDERATIONS

A. Use Compact Florescent Bulbs (CFLs) when possible.

Electricity

PART 1 - MATERIALS AND PRODUCTS

A. Service entrance cable shall be of copper conductor with 600 volt insulation, type SE.

B. Underground feeder and branch circuit cable shall be size 14 through 4 AWG, copper conductor 600 volt insulation, type UF.

C. Circuit breakers shall be provided with surface cabinets with screw covers and hinged doors. Copper bus and ground bus 110/220 volts.

D. Wiring shall be nonmetallic sheathed cable, size 14 through 4 AWG, copper conductor 600 volt insulation, type UF.

E. Wall switches shall be quiet operating, rated 20 amperes and 110-220 volts AC.

F. Outlets installed in a kitchen, bathroom, garage, laundry room and in the general location of water shall be protected by ground fault interrupter.

G. Exterior weatherproof cover plates shall be gasketed cast metal with hinged gasketed covers.

H. Permanently installed stoves, refrigerators, freezers, dishwashers and disposals, washers and dryers shall have separate circuits sized to NEC. Two separate 20-amp counter circuits are required with each kitchen area.

PART 2 - CONSTRUCTION AND INSTALLATION

A. All aboveground cables and flexible cords shall be enclosed to protect against physical damage.

B. Provide 220 amp electrical outlet to range in kitchen and dryer in laundry room, in addition to gas piping with shut-off valve.

C. Provide separate circuit for laundry, microwave (above range), dishwasher and garbage disposal (with switch).

D. Provide television cable and phone jacks in living room and all bedrooms.

E. Provide door chimes for front and rear doors.

F. Garage to be provided with garage door opener, and circuit(s) for garage door opener, exterior and interior lights, switches and GFCI outlet. Provide 3 way switch at entry door in or near kitchen to control garage lights.

G. Provide a "Panasonic WhisperValue VS1" vent fan, or equivalent, 80 CFM (Max airflow), low sone (1.5 or less) in **central/main** baths. Provide a "Honeywell Model H46E1013" dehumidifier control for fan, to be installed in hallway outside bathroom to provide whole house ventilation.

H. Provide a "Panasonic WhisperValue VS1" vent fan, or equivalent, 70 CFM (or as determined by HVAC designer), low sone (1.5 or less, in master or ½ baths.

PART 3 – COMPLETION

A. Sufficient electrical sources shall be provided to permit the use of essential electrical appliances while assuring safety from fire.

B. At least two electric outlets (duplex wall-type outlets) shall be present and operable in the living area, kitchen, and each bedroom.

C. Single main disconnecting means shall exist for each metered service, except services rated 300 amperes or more shall be permitted to have 2 service disconnecting means.

Plumbing Systems

All work shall comply with Wisconsin Plumbing Code.

Water Supply

PART 1 - MATERIALS AND PRODUCTS

A. Sanitary sewer piping within the building shall be PVS pipe as per American Society for Testing and Materials (ASTM) D2665, or F891 with solvent weld joints; ABS pipe as per ASTM D1527, D2661 or F628 with solvent weld joints; or case iron pipe as per ASTM A74, A888, or CISPI 301 service weight with neoprene gaskets.

B. Sanitary sewer piping below grade and beyond the building line shall be vitrified clay pipe as per ASTM C700 standard with bell and spigot and neoprene gaskets; PVC pipe as per ASTM D1785, D2665, D3034, or F891 with elastometric gaskets; or cast iron piping as per ASTM A74, A888, or CISPI 301 service weight with neoprene gaskets.

C. Water supply piping within the building shall be copper piping type M as per ASTM B42 or B88, galvanized steel as per ASTM A53, CPVC, or other materials as approved by the State of Wisconsin Plumbing Code. Fixtures shall include shock arrestors.

D. Water Service piping shall be copper as per ASTM B42 or B88.

E. Any underground drain piping shall be a minimum of 2" in diameter, any portion that is 2" shall not exceed 20 feet. Drain piping shall be installed at the appropriate pitch for piping diameter.

PART 2 - CONSTRUCTION AND INSTALLATION

A. 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.

B. Provide gas piping with shut-off valve to range in kitchen, in addition to 220 amp electrical outlet.

C. Provide gas piping with shut-off valve to dryer in laundry room, in addition to 220 amp electrical outlet.

D. Provide gas piping to furnace and hot water heater, if provided.

E. Provide water service/waste line for dishwasher, if provided.

F. Provide two (2) outside hose bibs, ¾" Frostless type.

G. Provide sump crock, Zoeller Model M53, or equivalent submersible sump pump and piping through wall, where indicated. Crock to be 18" x 22" with "AK Industries" #AKP30000 18" plastic cover with bolt down gasket kit, or equal, that provides a gas-tight seal. (not typical in rehabilitation projects)

H. Provide basement floor drain within three (3) feet of of furnace and hot water heater.

PART 3 – COMPLETION

A. Secure all required pressure tests, inspections, and approvals for the completed systems.

Hot water Supply

PART 1 - MATERIALS AND PRODUCTS

A. No water heater shall be located in any room used or designed for sleeping purposes, in a bathroom, clothes closet, under a stairway or in a confined space with access only to the above locations.

B. All fuel burning water heaters shall be connected to a vent leading to the exterior.

C. All water heaters shall be equipped with a pressure/temperature relief valve possessing a full-sized (non-reduced) rigid copper or steel drop leg to within six inches of the floor.

D. Water heater, where provided, to be 50-gallon "A.O. Smith" high efficiency, power vented, Model #GPSH50

E. Provide laundry room supply and waste including wash tub or laundry room sink, per

architectural drawings/specifications.

PART 2 - CONSTRUCTION AND INSTALLATION

A. Seal all chimney breaches with concrete mortar materials.

B. Provide and install metal flue liners where required.

PART 3 - ENERGY AND ENVIRONMENTAL CONSIDERATIONS

A. Insulate all hot water lines to a minimum of R-4 where possible.

Kitchens and Bathrooms

PART 1 - MATERIALS AND PRODUCTS

A. Arrangement of fixtures shall provide for the comfortable use of each fixture.

B. A bathroom shall not be used as a passageway to a habitable room, or exit to the exterior.

C. Kitchen Plumbing Materials

- Kitchen Materials
  1. Double-bowl, stainless steel kitchen sink. "Elkay Celebrity" CR3322, 33 x 22 inch.
  2. Faucet to be chrome finish "Moen Chateau" #67430, single lever with spray.
  3. PVC traps, and stop/supply manufactured by BrassCraft, OCR19-C.
  4. Garbage disposal manufactured by Insinkerator, "Badger5", or equivalent.
- Bathroom Materials
  1. Fiberglass, full-surround tub and shower module, manufactured by Aker (CM-60), white.
  2. Faucet to be chrome finish "Moen Chateau" #L4635, single lever with pop-up assembly.
  3. Cultured marble vanity tops with side splash, manufactured by "Marlam", "Lippert", or equivalent.
  4. Chrome Posi-temp pressure-balanced shower faucet, manufactured by Moen "Chateau" #TL183EP + 2570.
  5. Gerber #41-818 brass tub waste drain/lever.
  6. 1.6 gallon or less per flush round front toilet; American Standard (Cadet3 FloWise), or Mansfield (Alto Model 130-60). White.
  1. Bemis white round front toilet seat; #200SLOWT, or #300SLOWT.
  2. PVC traps, and stop/supply manufactured by BrassCraft, OCR19-C.

PART 3 - ENERGY AND ENVIRONMENTAL CONSIDERATIONS

A. Select faucets with GPM less than code or install low flow aerators where possible.

Safety Equipment

PART 1 - MATERIALS AND PRODUCTS

A. Smoke Detectors: Must be UL approved, NFPA rated, and ceiling mounted. Location and number of the devices required shall meet the National Fire Protection Association's (NFPA) minimum requirements of one on every level used for living including the basement. Requirements for new construction may be more stringent.

B. Carbon Monoxide Detectors: Requirements are now allied with smoke detector requirements.

C. Where to place detectors and whether they should be battery powered or hard wired is outlined in the table below:

Smoke Alarms

Date of Building Permit or Construction	Battery Powered Permitted	Hard Wired Required	Hard Wired with Battery Backup	Alarms Connected	Alarm Outside Each Bedroom	Alarms in Each Bedroom
1 and 2 Family dwellings before 4/1/92	X					
Uniform Dwelling Code after 4/1/92		X		X		
Uniform Dwelling Code after 12/1/95		X		X	X	
Uniform Dwelling Code after 4/1/01			X	X	X	X
Carbon Monoxide Alarms						
Prior to 2/1/11	X (or plug in)					
After 2/1/11		X	X	X	X	

PART 2 - CONSTRUCTION AND INSTALLATION

A. Do not install smoke alarms in kitchens or bathrooms.

B. Alarms are not required in attics, garages or storage areas.

PART 3 – COMPLETION

A. Test smoke alarm to ensure proper operation.

Kitchen Appliances

PART 1 - MATERIALS AND PRODUCTS

A. Provide Amana Dishwasher (ADB1400PY) EnergyStar® approved, or equivalent. White.

B. Provide Amana Microwave Oven (AMV1150VAW), or equivalent. White.

Cabinets and Countertops

PART 1 - MATERIALS AND PRODUCTS

A. Provide Kitchen and Bath pre-finished cabinets with trim and accessories, including door knobs and pulls. Cabinets to be maple "HomeCrest Laurel", "Merrilat Spring Valley Square", "Timberlake Fairfield Maple" in honey or natural finish. Wall cabinets to be 30" or 42" tall.

B. Provide Crown molding on top of wall cabinets where wall cabinets are not attached to a soffit.

C. Provide laminate countertops (standard finish) for kitchen and any built-in desks per architectural plans. Bathroom shall be provided with a white cultured marble top with integrated sink, in lieu of a laminate countertop.

Bathroom Accessories

PART 1 - MATERIALS AND PRODUCTS

A. Provide a ¼ inch plate 36" tall glass mirror to be installed with clips over the vanity (ies). Width to be slightly smaller than width of vanity.

B. Provide towel bars and paper holders.