SECTION 06 10 01
ROUGH CARPENTRY

PART 1 - GENERAL

1.01 DESCRIPTION

A. Under this Section, the Contractor shall provide all labor, materials and equipment required to furnish and install Rough Carpentry, as shown on the Plans, as specified, and/or as directed.
   1. The following is for internal use:
      a. 2 x PT blocking at the roof penetrations.
      b. 2 x pt blocking at the Old roof meets wall detail at 7/a105
      c. 2 x pt lumber at store parapet for stone support wall. (14/A106)
      d. ½" plywood sheathing at parapet in addition
      e. Plywood sheathing at Janitors closet roof at addition
      f. ¾" Plywood subfloor on 1st and 2nd floor at addition

1.02 REFERENCES

A. The publications listed below and their latest revisions form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only.
   1. American Institute of Timber Construction (AITC) Publication:
      a. A190.1 - Structural Glued Laminated Timber (ANSI/AITC A190.1)
   2. American National Standards Institute, Inc. (ANSI) Publications:
      a. B18.2.1 - Square and Hex Bolts and Screws, Inch Series Including Hex Cap Screws and Lag Screws
      b. B18.2.4 - Square and Hex Nuts
      c. B18.5 - Round Head Bolts (Inch Series)
      d. B18.6.1 - Wood Screws (Inch Series)
   3. American Plywood Association (APA) Publications:
      a. E30-F - APA Design/Construction Guide, Residential and Commercial
      b. E445-J - Performance Standards and Policies for APA Structural-Use Panels (APA PRP-108)
   4. American Society for Testing and Materials (ASTM) Publications:
      a. A525 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, General Requirements for
      b. A687 - High-Strength Non-headed Steel Bolts and Studs
      c. C79 - Gypsum Sheathing Board
      d. C208 - Insulating Board (Cellulosic Fiber), Structural and Decorative
      e. D2277 - Fiberboard Nail-Base Sheathing
   5. American Wood-Preservers' Association (AWPA) Publications:
      a. C1 - All Timber Products - Preservative Treatment by Pressure Process
      b. C2 - Standard for the Preservative Treatment of Lumber, Timber, Bridge Ties, and Mine Ties by Pressure Treatment

6. C9 - Plywood - Preservative Treatment by Pressure Process
7. C28 - Structural Glued Laminated Members and Laminations Before Gluing, Pressure Treatment
8. M2 - Standard for Inspection of Treated Timber Products
9. M6 - Brands Used on Forest Products
10. American Wood Preservers Bureau (AWPB) Publication:
    a. LP22 - Standard for Softwood Lumber, Timber, and Plywood Pressure Treated with Waterborne Preservatives for Ground Contact Use
11. Northeastern Lumber Manufacturers Association (NELMA) Publication:
    a. SGRNL - Standard Grading Rules for Northeastern Lumber
12. National Forest Products Association (NFP) Publications:
    a. NDS - National Design Specification for Wood Construction, Design Values for Wood Construction
    b. WCD1 - Manual for House Framing
13. U.S. Department of Commerce Product Standards (PS):
    a. PS-1 - Construction and Industrial Plywood
    b. PS-2 - Performance Standard for Wood-based Structural-use Panels
    c. PS-20 - American Softwood Lumber Standard
    d. PS-56 - Structural Glued Laminated Timber
    e. PS-58 - Basic Hardboard

1.03 SUBMITTALS: Submit the following.

A. Drawings:
1. Modifications of existing structural members
2. LVL members Fabricated structural members

Indicate materials, details of construction, methods of fastening, and erection details. Include reference to design criteria used and stress computations. Submit drawings for all proposed modifications of structural members. Do not proceed with modifications until the submittal has been approved.

B. Statements:
1. Certificates of grade

Submit certificates attesting that products meet the grade requirements specified in lieu of grade arkings where appearance is important and grade marks will deface material.

C. Factory Test Report:
1. Treatment standard compliance

Submit report required in paragraph entitled "Preservative-Treated Lumber and Plywood".

1.04 DELIVERY AND STORAGE

A. Deliver materials to the site in an undamaged condition. Carefully store materials off the ground to provide proper ventilation, drainage, and protection against dampness. Remove defective and damaged materials and provide new materials.

1.05 GRADING AND MARKING

A. Lumber: Mark each piece of framing and board lumber or each bundle of small pieces of lumber with the grade mark of a recognized association or independent inspection agency. Such association or agency shall be certified by the Board of Review, American Lumber Standards Committee, to grade the species used.

B. Plywood: Mark each sheet with the mark of a recognized association or independent inspection agency that maintains continuing control over the quality of the plywood. The mark shall identify the plywood by species group or span rating, exposure durability classification, grade, and compliance with PS-1.

C. Structural-Use Panels: Mark each panel with the mark of a recognized association or independent inspection agency that maintains continuing control over the quality of the panel. The mark shall indicate end use, span rating, and exposure durability classification.

D. Preservative-Treated Lumber and Plywood: The Contractor shall be responsible for the quality of treated wood products. Each treated piece shall be inspected in accordance with AWPA M2 and permanently marked or branded, by the producer, in accordance with AWPA M6. The Contractor shall provide the Engineer with the inspection report of an independent inspection agency that offered products comply with applicable AWPA Standards. The AWPB LP22 Quality Mark "LP-22"on each piece will be accepted, in lieu of inspection reports, as evidence of compliance with applicable AWPA treatment standards.

E. Hardboard, Gypsum Board, and Fiberboard: Mark each sheet or bundle to identify the standard under which the material is produced and the producer.

1.06 SIZES AND SURFACING:

A. PS-20 for dressed sizes of yard and structural lumber. Lumber shall be surfaced four sides. Size references, unless otherwise specified, are nominal sizes, and actual sizes shall be within manufacturing tolerances allowed by the standard under which the product is produced.

1.07 MOISTURE CONTENT

A. Air-dry or kiln-dry lumber. Kiln-dry treated lumber after treatment. Maximum moisture content of wood products shall be as follows at the time of delivery to the job site:
   1. Framing lumber and boards - 19 percent maximum
   2. Timbers 5 inches and thicker - 25 percent maximum
   3. Materials other than lumber - Moisture content shall be in accordance with standard under which the product is produced

1.08 PRESERVATIVE TREATMENT

A. Lumber and timber shall be treated in accordance with AWPA C1 and AWPA C2, and plywood in accordance with AWPA C1 and AWPA C9. Structural glued laminated timber shall be treated in accordance with AWPA C1 and AWPA C28.

All wood shall be air or kiln dried after treatment. Specific treatments shall be verified by the report of an approved independent inspection agency, or the AWPB Quality Mark on each piece. Do not incise surfaces of lumber that will be exposed. Brush coat areas that are cut or drilled after treatment with either the same preservative used in the treatment or with a 2 percent copper naphthenate solution in accordance with CCA-4, retention assay of 0.40 pounds per cubic foot. The following items shall be preservative treated:

1. Wood-framing, woodwork, and plywood up to and including the subflooring at the first-floor level of structures having crawl spaces when the bottoms of such items are 24 inches or less from the earth underneath.
2. Exterior wood steps, platforms, and railings; and all wood framing of open, roofed structures.
3. Wood sills, soles, plates, furring, and sleepers that are less than 24 inches from the ground, furring and nailers that are set into or in contact with concrete or masonry.
4. Nailers, edge strips, crickets, curbs, and cants for roof decks.

PART 2 - PRODUCTS

2.01 LUMBER

A. Structural Lumber: As indicated on structural drawings. Use for joists, rafters, headers, trusses, beams (except collar beams), columns, posts, stair stringers, girders, and all other members indicated to be stress rated.

B. Framing Lumber: Framing lumber such as studs, plates, caps, collar beams, cant strips, bucks, sleepers, nailing strips, and nailers and board lumber such as subflooring and wall and roof sheathing shall be one of the species listed in the table below. Minimum grade of species shall be as listed.

Table of Grades for Framing and Board Lumber			
Grading Rules	**Species**	**Framing**	**Board Lumber**
NELMA SGRNL Standard Grading Rules	Balsam Fir, Eastern Hemlock - Tamarack, Eastern Spruce, Eastern White Pine, Northern Pine, Northern Pine Cedar	All Species: Standard Light Framing or No. 3 Structural Light Framing (Stud Grade For 2 x 4 Size, 10 Feet and Shorter)	All Species: No. 3 Common Except Standard for Eastern White and Northern Pine

2.02 PLYWOOD AND STRUCTURAL-USE PANELS

A. PS-1 and APA E445-J, respectively.

B. Subflooring:
1. Plywood: C-D Grade, Exposure 1 durability classification, Span rating of 24/16or greater.
2. Structural-Use Panel: Sheathing grade with durability equivalent to Exposure 1, Span Rating of 32/16or greater.

C. Combination Subfloor-Underlayment:
1. Plywood: Underlayment Grade, Exposure 1orExterior Type, C-C (Plugged) Grade. Minimum thickness shall be as listed below except where indicated to have greater thickness.

Underlayment

Support Spacing	Minimum Thickness
16 inches	1/2 inch for Group 1 species 19/32 inch for Group 2 and 3 species 23/32 inch for Group 4 species
24 inches	23/32 inch for Group 1 species 7/8 inch for Group 2 and 3 species one inch for Group 4 species

2. Structural-Use Panel: Combination subfloor-underlayment grade with durability equivalent to Exterior plywood, Span Rating of 24 48or greater.

D. Wall Sheathing:
1. Plywood: C-D Grade, Exposure 1, and a minimum thickness of 1/2] inch, except where indicated to have greater thickness.
2. Structural-Use Panel: Sheathing grade with durability equivalent to Exposure 1, Span Rating of 24/0or greater.

E. Roof Sheathing:

1. Plywood: C-D Grade, Exposure 1, with an Identification Index of not less than 24/0
2. Structural-Use Panel: Sheathing grade with durability equivalent to Exposure 1, Span Rating of 24/0or greater.

F. Underlayment: Plywood, Underlayment Grade, Exposure 1, or Exterior C-C (Plugged) Grade, minimum thickness 1/4inch.

G. Diaphragms:
1. Plywood: Structural I C-D, Exposure 1, and a minimum thickness of 7/16 inch.
2. Structural-Use Panel: Sheathing grade with durability equivalent to Exposure 1 and a minimum thickness of 7/16 inch.

H. Make a list where is plywood is used, joist spacing, grade, thickness of plywood

2.03 OTHER MATERIALS

A. Hardboard Underlayment: PS-58, service class, sanded on one side, 1/4-inch thick, 4-feet wide.

B. Gypsum Wall Sheathing: ASTM C79, 1/2-inch thick fire retardant (Type X) 5/8-inch thick; 4-feet wide with square edge for supports 16 inches o.c. with or without corner bracing of framing or for supports 24 inches o.c. with corner bracing of framing; 2-feet wide with V-tongue and groove (T&G) edge for supports 16or 24inches o.c. with corner bracing of framing.

C. Air Infiltration Barrier: Cross laminated polyethylene, UV resistant.

2.04 ROUGH HARDWARE

A. Unless otherwise indicated or specified, rough hardware shall be of the type and size necessary for the project requirements. Sizes, types, and spacing of fastenings of manufactured building materials shall be as recommended by the product manufacturer unless otherwise indicated or specified. Rough hardware exposed to the weather or embedded in or in contact with preservative treated wood, exterior masonry, or concrete walls or slabs shall be zinc-coated.

B. Bolts, Nuts, Studs, and Rivets: ANSI B18.2.1, ANSI B18.5, ANSI B18.2.2, and ASTM A687. Provide a flat washer under each bolt head and a flat and lock washers under each nut.

C. Lag Screws and Lag Bolts: ANSI B18.2.1.

D. Wood Screws: ANSI B18.6.1.

E. Door Buck Anchors: Metal anchors, 1/8-inch by 1-1/4-inch steel, 12 inches long, with ends bent 2 inches, except as indicated otherwise. Anchors shall be screwed to the backs of bucks and built into masonry or concrete. Locate 8 inches above sills and below heads and not more than 24 inches intermediately

between. Anchorage of bucks to steel framing shall be as indicated as necessary to suit the conditions.

F. Metal Bridging: Where not indicated or specified otherwise, No. 16 U.S. Standard gauge, cadmium-plated or zinc-coated.

G. Metal Framing Anchors: Construct anchors to the configuration shown using hot dip zinc-coated steel conforming to ASTM A525, coating designation G90. Except where otherwise shown, Steel shall be not lighter than 18 gauge. Special nails supplied by the manufacturer shall be used for all nailing.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Conform to NFP WCD1 unless otherwise indicated or specified. Fit framing lumber and other rough carpentry, set accurately to the required lines and levels, and secure in place in a rigid manner. Do not splice framing members between bearing points. Set joists, rafters, and purlins with their crown edge up. Faces of framing members which will receive gypsum wallboard shall not vary more than 1/8 inch from the plane of the faces of adjacent framing, bridging, or furring members. Frame members for the passage of pipes, conduits, and ducts. Do not cut or bore structural members for the passage of ducts or pipes without approval. Reinforce all members damaged by such cutting or boring by means of specially formed and approved sheet metal or bar steel shapes, or remove and provide new, as approved. Provide as necessary for the proper completion of the work all framing members not indicated or specified. Spikes, nails, and bolts shall be drawn up tight. Timber connections and fastenings shall conform to NFP NDS. Do not use shimming on wood or metal bearings.

B. Sills: Set sills level and square and wedge with steel or slate shims; point or grout with non-shrinking cement mortar to provide continuous and solid bearing. Anchor sills to the foundations as indicated. Where sizes and spacing of anchor bolts are not indicated, provide not less than 5/8-inch diameter bolts at all corners and splices and space at a maximum of 6 feet o.c. between corner bolts. Provide at least two bolts for each sill member. Lap and splice sills at corners and bolt through the laps or butt the ends and through-bolt not more than 6 inches from the ends. Provide bolts with plate washers and nuts. Bolts in exterior walls shall be zinc-coated.

1. Anchors in Masonry: Except where indicated otherwise, Embed anchor bolts not less than 15 inches in masonry unit walls and provide each with a nut and a 2-inch diameter washer at bottom end. Fully grout bolts with mortar.
2. Anchors in Concrete: Except where indicated otherwise, Embed anchor bolts not less than 8 inches in poured concrete walls and provide each with a nut and a 2-inch diameter washer at bottom end. A bent end may be substituted for the nut and washer; bend shall be not less than 90 degrees. Powder-actuated fasteners spaced 3 feet o.c. may be provided in lieu of bolts for single thickness plates on concrete.

C. Beams and Girders: Set beams and girders level and in alignment and anchor to supports per details and approved fasteners.

D. Subflooring:
   1. Plywood and Structural-Use Panels: Apply best side up with the grain of outer plies or the long dimension at right angles to joists. Stagger end joints and locate over the center line of joists. Support panel edges by nominal 2-by 4-inch members framed between joists so the edge joints of subfloor occur over the center line of blocking. Allow 1/8-inch spacing at panel ends and 1/4 inch at panel edges. Panels shall be continuous over two or more spans. Nail panels 6 inches o.c. at supported edges and 10 inches o.c. over intermediate bearing. Nails shall be 8-penny common or 6-penny threaded. Provide at least 1/2-inch clearance between subflooring and masonry or concrete walls.
   2. Combination Subfloor-Underlayment: Apply with the grain of the face plies or the long dimension at right angles to joists. Panels shall be continuous over two or more spans. Stagger end joints of adjacent panels. Panel edges shall be T&G or supported by 2-x 4-inch members framed between joists so the edge joints of subfloor-underlayment occur over the center line of blocking. Provide end joints of panels over the center line of joists. Allow 1/8-inch spacing between panel edge and end joints. Nail panels 6 inches o.c. at ends and edges and 10 inches o.c. along intermediate bearings unless they are glue-nailed in accordance with APA E30-F. Nails shall be 8-penny coated common or 6-penny threaded. Provide at least 1/2-inch clearance between subfloor-underlayment and masonry or concrete walls. Lightly sand all joints to receive flooring finish per finish schedule in drawings.

E. Underlayment: Install underlayment over subfloor just prior to laying of finish flooring and protect from water and physical damage. Underlayment shall be plywood. Stagger end joints of underlayment with respect to each other, and stagger all joints with respect to paralleling panel joints in subfloor. Space panels 1/16 inch apart at ends and 1/8 inch apart at edges and at least 1/2 inch from concrete or masonry walls. Nail panels 6 inches o.c. along edges and 6 inches o.c. each way throughout panel, but not closer than 3/8 inch to panel edges. Nails shall be 4-penny annular ring or screw type and shall be countersunk 1/16 inch.

F. Columns and Posts: Set columns and posts, plumb, in alignment, and with full and uniform bearing. Do not embed the bottom and bearing surfaces of posts in concrete or set in direct contact with concrete slabs on grade.

G. Wall Framing:
   1. Studs: Select studs for straightness and set plumb, true, and in alignment. In walls and partitions more than eight feet tall, provide horizontal bridging at not more than eight feet o.c. using nominal 2-inch material of the same width as the studs; install the bridging flat. Sizes and spacing of studs shall be as indicated. Double studs at jambs and heads of openings and triple at corners to form corner posts. Frame corner posts to receive sheathing lath, and interior finish. Truss over openings exceeding 4 feet in width or use a header of sufficient depth.

Toenail studs to sills or soleplates with four 8-penny nails or fasten with metal nailing clips or connectors. Anchor studs abutting concrete or masonry walls thereto near the top and bottom and at mid-height of each story using expansion bolts or powder-actuated drive studs.

2. Plates: Use plates for walls and partitions of the same width as the studs to form continuous horizontal ties. Splice single plates; stagger the ends of double plates. Double top plates in walls and bearing partitions, built up of two nominal 2-inch thick members. Top plates for nonbearing partitions shall be single or double plates of the same size as the studs. Nail lower members of double top plates and single top plates to each stud and corner post with two 16-penny nails. Nail the upper members of double plates to the lower members with 10-penny nails, two near each end, and stagger 16 inches o.c. intermediately between. Nail soleplates on wood construction through the subfloor to each joist and header; stagger nails. Anchor sole- plates on concrete with expansion bolts, one near each end and at not more than 6 feet o.c., or with powder-actuated fasteners, one near each end and at not more than 3 feet o.c. Provide plates cut for the passage of pipes or ducts with a steel angle as a tie for the plate and bearing for joist.
3. Fire Stops: Provide fire stops for wood-framed walls and partitions and for furred spaces of concrete or masonry walls at each floor level and at the ceiling line in the top story. Where fire stops are not automatically provided by the framing system used, they shall be formed of closely fitted wood blocks of nominal 2-inch thick material of the same width as the studs and joists.
4. Diagonal Bracing: Provide diagonal bracing at all external corners and internal angles and at maximum 40-foot centers in stud walls, except that bracing may be omitted where diagonally applied wood sheathing, plywood or structural-use panel sheathing, 4-by 8-foot fiberboard sheathing, or gypsum board sheathing is used. Bracing shall be of 1-by 6-inch material, let into the exterior face of studs. Extend bracing from top plates to sill at an angle of approximately 45 degrees and double nail at each stud. When openings occur near corners, provide diagonal knee braces extending from the corner post above headers to top plates and from below window sills to the main sill. Nail bracing at each bearing with two 8-penny nails.

H. Wall Sheathing:
1. Plywood and Structural-Use Panel Wall Sheathing: Apply horizontally or vertically. Extend sheathing over and nail to sill and top plate. Abut sheathing edges over center lines of supports. Allow 1/8-inch spacing at panel ends and 1/4 inch at panel edges. If sheathing is applied horizontally, stagger vertical end joints. Nail panels with 6-penny nails spaced 6 inches o.c. along edges of the panel and 12 inches o.c. over intermediate supports. Provide 2-by 4-inch blocking for horizontal edges not otherwise supported.
2. Gypsum Sheathing Board: Apply gypsum sheathing board either horizontally or vertically. Butt joints and locate over the center lines of supports. Horizontally applied sheathing shall be T&G, applied with tongued edge up. Stagger vertical joints and abut sheet closely to frames of openings. Nail sheathing with 11 gauge, 3/8-inch head, zinc-coated

nails 1-1/2 inches long for 1/2-inch sheathing and 1-3/4 inches long for 5/8-inch sheathing, spaced 3/8 inch minimum from edges. Provide 2-by 4-inch blocking for horizontal edges of 4-foot wide panels not otherwise supported.

a. Gypsum Sheathing Board Used with Diagonal-Braced Framing: Sheathing shall be either 2-feet or 4-feet wide. Apply sheathing 2-feet wide horizontally. Nail 4 inches maximum o.c. at edges and over intermediate bearings. Apply sheathing 4-feet wide either horizontally or vertically. Nail 4 inches maximum o.c. at edges and 8 inches maximum o.c. at intermediate bearings.

b. Gypsum Sheathing Board Used with Unbraced Frames: Sheathing shall be 4-feet wide and applied vertically. Extend sheathing over and nail to both sill and top plates. Nail 4 inches maximum o.c. at edges and 8 inches maximum o.c. at intermediate bearings.

c. Foil-Faced Insulative Sheathing: Apply sheathing vertically. Butt or overlap joints and locate over center line of supports. Attach sheathing to framing with 1-1/4-inch, large, flat-head, 11 gauge, galvanized roofing nails or 16 gauge, 7/16-inch minimum crown, galvanized staples with 1-1/4-inch legs. For nonstructural application (with corner bracing), space fasteners 6 inches o.c. on all panel edges and 12 inches o.c. on intermediate supports, regardless of sheathing thickness, for studs not more than 24 inches o.c. For structural application (without corner bracing), for studs not more than 16 inches o.c., space fasteners 3 inches o.c. on all edges and 6 inches o.c. on intermediate members using minimum 0.115-inch thickness; for studs up to 24 inches o.c., space fasteners 3 inches o.c. on all edges and 3 inches o.c. on intermediate supports using minimum 0.137-inch thickness.

I. Building Paper: Provide building paper where indicated on wood board sheathing for all types of exterior siding. Apply paper shingle fashion, horizontally, beginning at the bottom of the wall. Lap edges 4 inches, and nail with one-inch, zinc-coated roofing nails, spaced 12 inches o.c. and driven through tin discs.

J. Ceiling Joists: Size as indicated and set accurately and in alignment. Toenail joists to all plates with not less than three 10-penny nails. Frame openings in ceilings with headers and trimmers.

K. Plywood and Structural-Use Panel Roof Sheathing: Install with the grain of the outer plies or long dimension at right angles to supports. Stagger end joints and locate over the center lines of supports. Allow 1/8-inch spacing at panel ends and 1/4 inch at panel edges. Nail panels with 8-penny common nails or 6-penny annular rings or screw-type nails spaced 6 inches o.c. at supported edges and 12 inches o.c. at intermediate bearings.

L. Stair Framing: Cut carriages to exact shape required to receive treads and risers, with risers of uniform height and treads of uniform width. Provide trimmers, nailers, and blocking as required to support finish materials.

3.02 MISCELLANEOUS

A. Wood Roof Nailers, Edge Strips, Crickets, Curbs, and Cants: Provide sizes and configurations indicated or specified and anchored securely to continuous construction.

1. Roof Nailing Strips: Provide roof nailing strips for roof decks as indicated] and specified herein. Apply nailing strips in straight parallel rows in the direction and spacing. Strips shall be surface applied.
   a. Surface-Applied Nailers: Shall be 3 inches wide and of thickness to finish flush with the top of the insulation. Anchor strips securely to the roof deck with powder actuated fastening devices or expansion shields and bolts, spaced not more than 24 inches o.c.
2. Roof Edge Strips and Nailers: Provide at perimeter of roof, around openings through roof, and where roofs abut walls, curbs, and other vertical surfaces. Except where indicated otherwise, nailers shall be 6 inches wide and the same thickness as the insulation.
3. Crickets, Cants, and Curbs: Provide wood saddles or crickets, cant strips, as indicated, specified, or necessary and of lumber.

B. Rough Wood Bucks: Size as indicated. Set wood bucks true and plumb. Anchor bucks to concrete or masonry with steel straps extending into the wall 8 inches minimum. Place anchors near the top and bottom of the buck and space uniformly at 2-foot maximum intervals.

C. Wood Blocking: Provide proper sizes and shapes at proper locations for the installation and attachment of wood and other finish materials, fixtures, equipment, and items indicated or specified.

D. Wood Grounds: Provide for fastening wood trim, finish materials, and other items to plastered walls and ceilings. Install grounds in proper alignment and true with an 8-foot straightedge.

E. Wood Furring: Provide where shown and as necessary for facing materials specified. Except as shown otherwise, furring strips shall be one inch by 3 inches, continuous, and spaced 16 inches o.c. Erect furring vertically or horizontally as necessary. Nail furring strips to masonry. Do not use wood plugs. Provide furring strips around openings, behind bases, and at angles and corners. Furring shall be plumb, rigid, and level and shall be shimmed as necessary to provide a true, even plane with surfaces suitable to receive the finish required. Form furring for cornices, offsets and breaks in walls or ceilings on 1-inch by 4-inch wood strips spaced 16 inches o.c.

F. Wood Sleepers: Run wood sleepers in lengths as long as practicable and stagger end joints in adjacent rows.

END OF SECTION

SECTION 06 16 13
INSULATING SHEATHING

PART 1 GENERAL

1.01 SUMMARY

A. Section includes insulating wall sheathing with integral water-resistive barrier and air barrier.

1.02 REFERENCES

A. American Society of Mechanical Engineers (ASME): www.asme.org <http://www.asme.org>
   1. ASME B18.6.1 - Wood Screws (Inch Series)

B. ASTM International (ASTM): www.astm.org <http://www.astm.org>
   1. ASTM A153/A153M - Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
   2. ASTM C1289 - Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
   3. ASTM D779 - Test Method for Water Resistance of Paper, Paperboard, and Other Sheet Materials by the Dry Indicator Method
   4. ASTM D1621 - Test Method for Compressive Properties Of Rigid Cellular Plastics
   5. ASTM D2247 - Practice for Testing Water Resistance of Coatings in 100% Relative Humidity
   6. ASTM E96/E 96M - Test Methods for Water Vapor Transmission of Materials
   7. ASTM E331 - Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
   8. ASTM E2357 - Test Method for Determining Air Leakage of Air Barrier Assemblies
   9. ASTM F1667 - Specification for Driven Fasteners: Nails, Spikes, and Staples
   10. ASTM G154 - Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials

C. US Department of Commerce (DOC): <http://gsi.nist.gov/global/index.cfm/L1-5/l2-44/A-355>
   1. DOC PS 2 - Performance Standard for Wood-Based Structural Panels

D. International Code Council (ICC): www.iccsafe.org <http://www.iccsafe.org>
   1. ICC IBC - International Building Code
   2. ICC IRC - International Residential Code for One and Two-Family Dwellings

E. ICC Evaluation Service, Inc. (ICC-ES): www.icc-es.org <http://www.icc-es.org>
   1. ICC-ES AC12 - Acceptance Criteria For Foam Plastic Insulation
   2. ICC-ES AC38 - Acceptance Criteria for Water-Resistive Barriers
   3. ICC-ES AC116 - Acceptance Criteria for Nails and Spikes
   4. ICC-ES AC148 - Acceptance Criteria For Flexible Flashing Materials
   5. ICC-ES AC201 - Acceptance Criteria for Staples
   6. ICC-ES AC269 - Acceptance Criteria for Racking Shear Evaluation of Proprietary Sheathing Materials attached to Light-Frame Wall Construction or Code-Complying Sheathing Attached to Light-Framed Walls with Proprietary Fasteners
   7. ICC-ES AC310 - Acceptance Criteria for Water-Resistive Membranes Factory-bonded to Wood-based Structural Sheathing, Used as Water-Resistive Barriers
   8. ICC-ES ESR-1539 - Power Driven Staples and Nails for Use in Engineered and Non-Engineered Connections
   9. ICC-ES NER-272 - Power Driven Staples and Nails for Use in All Types of Building Construction

F. Sustainable Forestry Initiative (SFI): www.sfiprogram.org/ <http://www.sfiprogram.org/>
   1. SFI 2010 - 2014 Standard

1.03 ACTION SUBMITTALS

A. Product Data: For each type of sheathing product specified.

1.04 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: From ICC-ES, for wood sheathing and seam tape.

B. Product Certifications: From manufacturer, indicating that sheathing products comply with ICC-ES AC269 and ICC-ES AC310.

1.05 CLOSEOUT SUBMITTALS

A. Warranty: Executed copy of manufacturer special warranties.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Provide wood products from manufacturer certified by SFI, FSC, or comparable sustainable forestry program acceptable to Architect.

B. Provide wall sheathing products meeting requirements for water-resistive barrier in accordance with ICC-ES AC310.

C. Provide wall sheathing products meeting requirements of ICC-ES AC269.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturer's written instructions for protection of sheathing products from weather prior to installation.

1.08 WARRANTY

A. Special Manufacturer's Warranty: Manufacturer's standard form in which sheathing manufacturer agrees to repair or replace sheathing products that demonstrate deterioration or failure under normal use due to manufacturing defects within warranty period specified, when installed according to manufacturer's instructions.

1. Warranty Period for Sheathing Products: 30 years following date of Substantial Completion.
2. Warranty Conditions: Special warranties exclude deterioration or failure due to structural movement resulting in stresses on sheathing products exceeding manufacturer's written specifications, or due to air or moisture infiltration resulting from cladding failure or mechanical damage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Product: Provide sheathing products manufactured by Huber Engineered Woods LLC, Charlotte NC; Phone: (800) 933-9220; Website: www.zipsystem.com <http://www.zipsystem.com>.

B. Or approved equal

2.02 PERFORMANCE REQUIREMENTS

A. Air-Barrier Assembly Air Leakage: Less than 0.04 cfm/sq. ft. at 1.57 lbf/sq. ft. (0.2 L/s x sq. m at 75 Pa), per ASTM E2375.

B. Water-Vapor Permeance, Facer: Minimum 12 perms (689 ng/Pa x s x sq. m), ASTM E96/E96M.

C. Weather Exposure: Manufacturer warranty applies for maximum allowable exposure period of 180 days.

2.03 MATERIALS

A. Oriented Strand Board: DOC PS 2, made with binder containing no added urea formaldehyde.

B. Rigid Foam Plastic Insulating Board: Rigid polyisocyanurate foam core complying with ASTM C1289 Type II, Class 2, and ICC-ES AC12, with coated glass fiber facers on both sides, with the following characteristics:
   1. Nominal Density: 2.0 pcf (32 kg/cu. m).
   2. Compressive Strength, ASTM D1621: Not less than 20 psi (150 kPa).
   3. Vapor Permeance, ASTM E96/E96M: Less than 1.0 perm.
   4. Edge Configuration: Square finished.

2.04 COMPOSITE INSULATING WALL SHEATHING

A. (Structural panel with polyiso insulation): Composite Insulating Wall Sheathing: Oriented-strand-board Exposure 1 sheathing 7/16 inch (11.1 mm) thick, with factory-laminated water-resistive barrier exterior facer, and with rigid foam plastic insulating board laminated to interior face.
   1. Basis-of-Design Product: Huber Engineered Woods LLC; ZIP System R Sheathing.
   2. Span Rating and Performance Category of Sheathing Layer: Not less than 24/16; 7/16 Performance Category.
   3. Thickness: 1-1/2 inch (38 mm).
   4. Thermal Resistivity (R Value): 9.6 deg F x h x sq. ft./Btu x in. at 75 deg F ([25] [46] K x m/W at 24 deg C).
   5. Edge Profile: Square edge.
   6. Exterior Facer: Medium-density, phenolic-impregnated polymer-modified sheet material meeting requirements for ASTM D779 Grade D weather-resistive barrier (WRB) in accordance with ICC AC38 and AC310, with fastener spacing symbols on exterior facer for 16-inch (406 mm) and 24-inch (610 mm) on center spacing, with the following characteristics
      a. Water Resistance of Coatings, ASTM D2247: Pass 14 day exposure test.
      b. Moisture Vapor Transmission, ASTM E96: Not less than 12 perms.
      c. Water Penetration, ASTM E331: Pass at 2.86 lbf/sq. ft. (137 Pa).
      d. Wind Driven Rain, TAS-100: Pass.
      e. Accelerated Weathering, ASTM G154: Pass.

2.05 FASTENERS

A. Fasteners, General: Size and type complying with manufacturer's written instructions for Project conditions and requirements of authorities having jurisdiction.
   1. Corrosion Resistance: Hot-dip zinc coating, ASTM A153/A 153M.

B. Nails, Brads, and Staples: ICC AC116 and ICC AC201.

C. Power-Driven Fasteners: ICC-ES-1539 or NER-272.

D. Wood Screws: ASME B18.6.1.

2.06 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIAL

A. Self-Adhering Seam and Flashing Tape: Pressure-sensitive, self-adhering, cold-applied, seam tape consisting of polyolefin film with acrylic adhesive, meeting ICC AC148.
   1. Basis-of-Design Product: Huber Engineered Woods; ZIP System Tape.
   2. Thickness: 0.012 inch (0.3 mm).

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine framing spacing and alignment to determine if work is ready to receive sheathing. Proceed with sheathing work once conditions meet requirements.

3.02 SHEATHING INSTALLATION

A. Install sheathing panels in accordance with manufacturer's written instructions, requirements of applicable Evaluation Reports, and requirements of authorities having jurisdiction.

B. Air and Moisture Barrier: Coordinate sheathing installation with flashing and joint sealant installation and with adjacent building air and moisture barrier components to provide complete, continuous air- and moisture- barrier.

C. Do not bridge expansion joints; allow joint spacing equal to spacing of structural supports.

D. Install panels with laminated facer to exterior. Stagger end joints of adjacent panel runs.

E. Attach sheathing panels securely to substrate with manufacturer-approved fasteners in compliance with the following:
   1. ICC-ES ESR-1539 or ICC-NES NER-272 for power-driven fasteners.
   2. IBC: Table 2304.9.1 Fastening Schedule.

F. Apply seam tape at all panel seams, penetrations, and facer defects or cracks to form continuous weathertight surface. Apply tape according to manufacturer's written instructions and requirements of ICC-ES applicable to tape application.

END OF SECTION

SECTION 06 20 00
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finish carpentry items.

B. Wood door frames, glazed frames.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Interior Woodwork Items:

1. Moldings, Bases, Casings, and Miscellaneous Trim: Clear white pine; prepare for paint finish.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from timber recovered from riverbeds or otherwise abandoned is permitted, unless indicated otherwise, and provided it is clean and free of contamination, identify source; provide lumber re-graded by an inspection service accredited by the American Lumber Standard Committee, Inc. (ALSC).

2.03 FASTENINGS

A. Fasteners: Of size and type to suit application; In exposed areas, use paintable/stainable wood filler to cover holes, sand work smooth, and paint/stain to match the existing finish of adjacent material.

2.04 ACCESSORIES

A. Wood Filler: Solvent base, tinted to match surface finish color.

2.05 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.

B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install custom fabrications in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Set and secure materials and components in place, plumb and level.

C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

3.02 PREPARATION FOR SITE FINISHING

A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

B. Site Finishing: See Section 09 91 13 and 09 91 23.

END OF SECTION

SECTION 06 31 00

WOOD RESTORATION SYSTEMS

PART 1 – GENERAL

1.01 SECTION INCLUDES:

A. All labor, materials, equipment and services necessary to complete the work of wood restoration including consolidation, patching and repairs to architectural woodwork, wood doors and windows, as shown on drawings, specified herein, and as required by conditions and authorities having jurisdiction, including the following:

1. Consolidate deteriorated wood to restore wood member to sound condition.
2. Consolidate and patch elements where portions of wood are deteriorated and portions are missing to restore wood member to sound condition and original configuration, profile, and dimension.
3. Replace deteriorated wood members with new wood members to restore deteriorated wood elements to sound condition and original configuration, profile, and dimension.

B. Intent of Wood Restoration: It is the specific intent of this Section that elements of wood repair indicated on the drawings and specified elsewhere to be restored under this Contract shall be completely restored to sound condition and original planes and profiles, except as specifically indicated otherwise. Replacement components must replicate the size, shape, and profile of the original. Match historic joinery details such as mortise and tenon joints.

1.02 RELATED SECTIONS

A. Section 06 40 00 – Architectural Woodwork
B. Section 08 20 00 – Wood Door Restoration
C. Section 08 60 00 – Wood Window Restoration

1.03 DEFINITIONS

A. "Consolidate": Solidify friable and decayed wood that still retains its original dimensions and profile through application of a wood epoxy consolidant.

B. "Consolidate and Patch": Replacement of localized areas of rot or decay in a wooden member with a wood epoxy filler. Includes consolidation of adjacent areas of soft or friable wood through application of a wood epoxy consolidant.

C. "Dutchman Repair": Replacement of localized areas of rot or decay in a wooden member with a wood patch.

D. "Partial Replacement": Replacement of a section of a wooden member, encompassing the full width and thickness, with new wood.

1.04 QUALITITY ASSURANCE

A. The Contractor for the Work of this Section shall be regularly engaged in the restoration of historic woodwork, including materials and techniques for epoxy consolidation/repair, and fabricating/ installing wooden Dutchmen.

B. Restoration Specialist: Engage a carpenter for the Work of this Section who is specially trained in the restoration of historic structural and architectural woodwork and who has at least five (5) years experience in restoration, epoxy consolidation and patching and Dutchman repair of architectural woodwork.
   1. In acceptance of or rejection of work under this Section, no allowance will be made for workers' incompetence or lack of skill.

C. Reference Standards: Comply with the requirements of the following standards and with the requirements specified in this Section. In case of conflict, the most stringent and restrictive requirement shall govern.
   1. *Architectural Woodwork Quality Standards* by the Architectural Woodwork Institute (AWI), most recent edition.
   2. *American Softwood Lumber Standard* US Department of Commerce Product Standard 20 (DOC PS 20-99).

D. Mill & Producers Label: Lumber shall bear label indicating type, grade, mill and grading agency on unfinished surface or end.
   1. In lieu of mill & producers label, supply affidavit from material supplier certifying grade, species and cut of milled lumber and molding products.

1.05 SUBMITTALS

A. General: Submit each item in this article in compliance with the General Conditions of the Contract and Division 1 Specifications. Revise and resubmit each item as required to obtain the Architect's or Director's Representative's approval.

B. Qualification Data: Submit qualification data for personnel specified in Quality Assurance article that demonstrates that the personnel have the capabilities and experience complying with requirements specified herein.

C. Product Literature: Manufacturers' published technical data for each product to be used in work of this Section including recommendations for application and use, test reports and certificates verifying that product complies with specified requirements, and Material Safety Data Sheets (MSDS).
   1. Wood epoxy resins and fillers.
   2. Wood glue.
   3. Wood epoxy adhesives.
   4. Wood preservative (biocide/fungicide), if required.

D. Shop Drawings: Shop Drawings will be required at the discretion of the Director's Representative and/or Architect, where the extent of dismantling, repair or replacement of components requires extensive work to an element. See requirements in specific sections for architectural woodwork, wood door and window restoration.

E. Field Samples (Mock-Ups):
   1. Prepare field sample at a location designated by the Director's Representative. Do not proceed further with the Work of this Section until the field sample is approved.
      a. Engage the approved Restoration Specialist to prepare the field sample.
      b. Utilize only approved materials and methods and comply with product manufacturer's instructions and other requirements of this Section to prepare field sample.
   2. Approved field sample will be used as quality control standard for acceptance or rejection of the Work of this Section.
      a. Maintain and protect approved field sample from damage, deterioration, or alteration for the duration of the Contract.
   3. Field Samples Required (may be incorporated into Architectural Woodwork, Wood Door or Wood Window restoration work):
      a. One sample of consolidated and patched architectural woodwork element.
      b. One sample of wooden Dutchman repair to architectural woodwork element.
      c. One sample of partial replacement of an element or member of architectural woodwork.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original unopened containers, bundles, or packaging labeled with manufacturer's name, brand name, item name, expiration date and instructions for use as applicable.

B. Store materials in compliance with manufacturer's recommendations for temperature and other conditions. Keep materials dry and under cover. Protect against exposure to weather.

C. Discard and remove from project site any materials damaged in handling or storage, any materials that have been subjected to conditions contrary to manufacturer's recommendations, and any materials whose maximum shelf life has expired. Replace with fresh materials.

1.07 PROJECT CONDITIONS

A. Laws and Regulations: Perform all work of this Section in compliance with all Federal, state, and local laws and regulations.

B. Safety: Use all necessary means to protect all persons, whether engaged in the work of this Section or not, from harm resulting from the work of this Section.

C. Protection: Use all necessary means to protect areas of wood not being consolidated or patched and all other surfaces of building elements from damage, deterioration or staining caused by the work of this Section.

D. Retention of Existing Building Fabric: carefully remove, store, and reinstall all existing building fabric that must be removed to undertake architectural woodwork repair and restoration, except where Contract Documents indicate that element is to be modified or replaced.

E. Dimensions: Field measure dimensions of all existing and in-place elements to be altered or repaired before preparing shop drawings or beginning work. Contractor is responsible for all dimensions.

F. Environmental Conditions: Proceed with work of this Section only when existing and forecasted weather conditions permit work to be performed in accordance with manufacturer's or with requirements specified herein, whichever is more stringent.

a. Mix and use epoxy resins only when temperatures of air, wood to be patched, and epoxy resins are between 50 deg F and 85 deg F.
b. Use polyurethane glue only when temperatures of air, wood to be glued, and glue are between 40 deg F and 100 deg F.

G. Surface Conditions: Proceed with work of this Section only when wood moisture levels are within the limits recommended by manufacturers of materials being used.

a. Use Epoxy Resins only on wood that is completely dry.
b. Use polyurethane glue on wood that has a moisture level as recommended by glue manufacturer. Dampen substrates as recommended by manufacturer when moisture level is below acceptable level.

H. Removal of Existing Construction: Where removal of existing construction is required to perform the Work, take all necessary measures to carefully remove and salvage sound materials without damage and without marring finished surfaces.
1. Tag or otherwise label removed items to facilitate reinstallation at the same location, position and orientation.
2. Protect and store removed items. Reinstall items as soon as practical.

1.08 LEAD-CONTAINING PAINT

A. Assume that all existing painted surfaces are coated with lead-containing paints. Handle, transport and dispose of lead-containing paint and residue in accordance with all applicable federal, state, and local laws and regulations including, but not limited to, the regulations referenced herein.

1. OSHA Regulations, Title 29, CFR Section 1926.62: "Lead Exposure in Construction" and Title 29, CFR Section 1910.1200: "Hazard Communication Standard."
2. US EPA Regulations, Title 40, CFR Part 262: "Standards Applicable to Generators of Hazardous Waste" and Part 263: "Standards Applicable to Transporters of Hazardous Waste."
3. US DOT Regulations, Title 49 CFR Parts 172 thru 180 inclusive.
4. NYS DEC Regulations, Title 6, Part 364, and parts 370-374.

B. Prior to repairs and restoration of architectural woodwork, removal (chemical stripping, scraping and/or sanding) of woodwork may be required in accordance with Section 09 90 00 Painting.

PART 2 – PRODUCTS

2.01 WOOD

A. General: Wood shall comply with Quality Standards Illustrated (QSI) Grade I and applicable rules for lumber grading agencies certified by the American Lumber Standards Committee Board of Review.
1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Provide dry lumber with 12 percent maximum moisture content at time of use, unless specifically indicated otherwise.
3. Lumber shall be straight, without twist, bow or cup, or other deformation that adversely affects the lumber for use intended.

B. Solid Lumber: All wood elements shall be solid lumber of full length (without finger joints). Wood panels over 12 inches wide may be made up of solid boards edge glued or splined and edge glued as approved by the Architect or Director's Representative.

C. Wood for Standing and Running Trim: Match existing wood species and direction of grain unless otherwise indicated.

D. Wood for Severe Exposure Locations: Clear quarter sawn redwood, cedar, white oak, chestnut oak or any North American (non-tropical) species defined in (AWI) *Architectural Woodwork Quality Standards*, 100-G-9 as acceptable for exterior use. Use where required by Architect or Director's Representative.

D. Wood for exterior use, where not matching existing species must be of a species listed in Architectural Woodwork Institute (AWI) *Architectural Woodwork Quality Standards*, 100-G-9.

2.02 EPOXY CONSOLIDATION AND PATCHING MATERIALS

A. Manufacturer: Provide products from a manufacturer with a system of epoxy consolidants and patching materials formulated specifically for wood consolidation, patching and repair with a record of successful in-service performance and (if applicable) with special dispensing equipment to ensure accurate proportioning. Subject to compliance with requirements, provide one of the following, or approved equal:
   1. West Systems brand Epoxy Products manufactured by Gougeon Brothers, Inc., 100 Patterson Ave., P.O. Box 908, bay City, MI 48707 (989) 684-6881.
   2. Conserv Epoxy LLC. PO Box 454, Northford, CT 06472. PH: 203-484-4123; fax: 203-484-2398; www.conservepoxy.com.
   3. Advanced Repair Technology; Cherry Valley, NY; 607-264-9040 (www.advancedrepair.com).
   4. Abatron, 5501 95th Ave., Kenosha, WI 55144; 262-653-2000 (www.abatron.com) – *For use in wood structural & framing applications only, not for exposed architectural woodwork, wood windows and doors.*

B. Low Viscosity Epoxy Consolidant: Two-part epoxy consolidant of viscosity to thoroughly penetrate deteriorated wood.
   1. West System 105 Epoxy Resin mixed with 206 Slow Hardener or 205 Fast Hardener per manufacturer's recommendation.
   2. Conserv 100 epoxy resin system, parts A & B.
   3. Advanced Repair Technology Primatrate Flexible Cell-Bonding Primer.
   4. Abatron Liquid Wood epoxy resin and hardener, parts A & B.

C. Two, or Three-part Epoxy Fillers or Fillers for Patching Mix: As required to provide epoxy putty for correct viscosity, workability and density for each application (for Architectural Woodwork, Doors & Windows).
   1. West System 403 Microfibers, 404 High Density Filler, 405 Filleting Blend, 406 Colloidal Silica, 407 Low-Density Filler, and 410 Microlight) combined with epoxy resin and hardener as recommended by manufacturer and as appropriate for each location to be patched and filled.
   2. Conserv 200 Flexible Epoxy Patch system.
   3. Advanced Repair Technology - Flex-Tec HV Elastomeric Wood Repair Compound.

D. Two, or Three-part Epoxy Fillers or Fillers for Patching Mix: As required to provide epoxy putty for correct viscosity, workability and density for each application (for Wood Structural applications and Framing)
   1. West System 404 High Density Filler, 406 Colloidal Silica) combined with epoxy resin and hardener as recommended by manufacturer and as appropriate for each location to be patched and filled.
   2. Conserv 600 Structural Epoxy Repair system.

3. Abatron Wood Epox patching system, resin paste (part A) and hardener paste (part B).

E. Dispensers: Provide manufacturer's special pumps designed for use in dispensing and measuring resins and hardeners to ensure accurate proportions where applicable.

2.03 ANCHORS AND FASTENERS

A. Architectural Woodwork: All anchors and fasteners used in woodwork shall be Type 302/304 stainless steel.

B. Hardware Attachment: All visible replacement screws for attaching hardware shall match existing screws in material, form and size.

2.04 MISCELLANEOUS MATERIALS

A. Adhesive for assembly of Architectural Woodwork and Wood Door and Window components: One-component moisture activated polyurethane glue, fast curing, creating boil-resistant bonds in accordance with classification requirements in EN 204/205-D4:
1. Gorilla Glue, manufactured by Lutz File and Tool Co., 3929 Virginia Ave., Cincinnati, OH 45227; 800-966-3458.
2. Titebond Polyurethane by Franklin International.
3. Excel One by The Ambel Corporation.

B. Adhesive for Installing Dutchman: Two-part epoxy adhesive formulated and sold for use with wood. Provide same manufacturer(s) listed in Part 2.02 above.

C. Linseed Oil – Turpentine Solution: Solution of 50 percent boiled linseed oil and 50 percent turpentine.

D. Borate Preservative Treatment – Fungicide/Biocide to inhibit decay and insect infestation in wood framing with active ingredient Disodium Octaborate Tetrahydrate:
1. BoraSol-PC by Quality Borate Company, LLC
2. Bora-Care by Nisus.
3. Timbor by Borax, Inc.
4. or approved equal.

E. Primer: Refer to Section 09 91 13 Painting.

PART 3 – EXECUTION

3.00 GENERAL

A. Where the level of repair or replacement is not specifically indicated on the plans, every reasonable effort shall be made to repair existing historic building materials rather than replace them.

B. Do not use units of material with defects which impair the quality of the Work and units which are too small to fabricate the Work with minimum joints or optimum joint arrangement.

C. Install work accurately to required lines and levels with members plumb and true, accurately cut and fitted and securely fastened. Closely fit rough carpentry to other associated construction and to existing construction. Where existing construction is not level or plumb, match lines of existing construction.

3.01 TEMPORARY PROTECTION

A. General: Provide temporary protection of exposed building fabric and interior of building at all locations from which elements are removed for work of this Section. Install, maintain and remove temporary protection without altering or damaging historic building fabric.

B. Protection at Openings from which Window Sash Are Removed: provide plywood panels or framed plywood panels to replace sash that are removed for more than one day. Use wood wedges, security bars or other devices to avoid attachment to historic building fabric where possible.

C. Protection of Building Fabric Where Running or Standing Trim Elements Are Removed: Where moisture infiltration or safety or security risks exist, install temporary protection.

3.02 REMOVAL AND DISASSEMBLY

A. General: Carefully disassemble architectural woodwork and other elements as required to perform the work indicated and to allow removal of window sash, doors, standing and running wood trim and other elements to be restored or repaired. Use all reasonable care in removing elements without causing damage or deterioration to historic building fabric. Do not crush, split or gouge wood that will remain or be reinstalled. Pull heads of finish nails through from concealed surface to avoid splintering wood.

B. Identification and Labeling: Identify each element removed, label each element on surface to be concealed when element is reinstalled or on tag tied to element with wire.

C. Storage: Carefully handle and store elements to be reinstalled to protect from damage or loss.

3.03 INSPECTION OF WOOD MEMBERS AND WOOD ELEMENTS

A. General: Following preparation for removal or disassembly, inspect all wood elements in conjunction with the Director's Representative to determine method and extent of treatment.
   1. Elements having minor instances of rotten or spongy wood will require consolidation.
   2. Areas that do not match original profiles due to minor deterioration and damage will require consolidation and filling to original profiles.
   3. Areas of major damage or deterioration require Dutchman repairs or member replacement to restore the original profile depending on the amount of damage and structural integrity of the element.
   4. Some elements, such as windowsills and lower rails on windows that are not deteriorated, but severely weathered and checked may require application of linseed oil/turpentine solution. Apply as directed.
   5. The Director's Representative's decision regarding extent of required consolidation, consolidation and patching, Dutchman repairs, and member replacement shall be final.

3.04 WOODWORK REPAIR & RESTORATION

A. General: Restore architectural woodwork, doors and windows as shown on Drawings, and as specified herein. Comply with American Woodworks Institute's *Architectural Woodwork Quality Standards*, Sections 300 (Standing and Running Trim) and 700 (Ornamental/Historic Work), Custom Grade.

B. Disassembly: Where required, carefully disassemble woodwork as required to perform restoration and repair work. Identify and label all parts identifying original locations to ensure that the elements are reconstructed with all parts in their original location and orientation.

C. Restoration
   1. Carefully chemically strip or scrape and sand paint from surfaces of wood requiring consolidation and consolidation and patching. Use all care necessary to remove paint without damaging sound wood to remain.
   2. Consolidate and fill, provide Dutchman repairs, glue cracked elements and failed joints, and replace severely deteriorated members as indicated, following procedures specified below.
   3. Prepare and prime new and repaired wood.

3.05 EPOXY CONSOLIDATION AND PATCHING

A. Preparation
   1. Cut back and remove all loose, friable, and flaking deteriorated wood. Do not disturb soft spongy wood. For patching, use small power or hand tools to produce clean, straight cuts.
   2. Scrape and sand or chemically strip as required to properly roughen surfaces without removing sound wood or changing existing profiles and arrises to remain.
   3. Take steps necessary to ensure areas to be consolidated, or consolidated and patched are free of dirt, paint, oil, grease and other substances that might inhibit proper wood consolidation and filling.
   4. Ensure that wood is dry. No open flames will be permitted.

B. Epoxy Consolidation
   1. Preparation: Drill 1/8-inch diameter holes into deteriorated wood at a 90 degree angle to finished surface. Stagger holes to ensure complete penetration of epoxy consolidant throughout deteriorated portions of member and into adjacent sound wood.
   2. Application: Mix epoxy consolidant following manufacturer's directions. Flow consolidant onto wood continuously with a brush until wood is saturated. Ensure that consolidant completely fills areas where wood is deteriorated. Apply epoxy consolidant when surface and ambient air temperatures are optimal for complete penetration of consolidant.
   3. Curing: Cure following manufacturer's instructions. Fill holes that require patching as specified below.
   4. Protection: Protect consolidated wood from sunlight and other sources of ultraviolet light until the wood is painted.

C. Epoxy Patching
   1. General: patch holes and losses in wood with epoxy patching compound (filler) to match original planes and profiles.
   2. Patching Consolidated Wood: Apply epoxy fillers before consolidant has completely cured, unless otherwise recommended by the manufacturer, to ensure a chemical bond between the consolidated wood and the patching material.
   3. Patching Non-Consolidated Wood: When patching areas of wood that have not been consolidated, apply a liberal coat of consolidant to wood substrate brushing well to ensure penetration. Apply patching mixture before epoxy consolidant has completely cured.
   4. Application: Mix and apply epoxy paste filler according to the manufacturer's printed instructions. Fill holes and cracks completely. Build up losses and depressions, leaving filled surfaces slightly raised above the surface of the finished wood. Do not feather epoxy over wood surfaces.

a. Do not span joints in original woodwork with epoxy paste filler. If patch spans both sides of a joint, form and cure each area separately.
b. Prepare only enough material to repair one element at each mixing. Do not allow patching material to exceed pot life. Work material into areas of wood requiring repair.

5. After epoxy paste filler has completely cured, sand and tool filled areas flush with the adjoining surfaces. Match the dimensions and profile exactly. Blend repair flush with the surface of the wood before painting. Leave filled surfaces smooth and without gouges, depressions or other imperfections that will show through paint layers. When painted, the patching material should not be visible.
6. Protection: Protect patched wood surfaces from exposure to sunlight and other sources of ultraviolet light until the wood is painted.

3.06 DUTCHMAN REPAIRS

A. General: Provide Dutchmen in an invisible manner at all locations indicated and at all areas where existing wood is missing or deteriorated so extensively as to require replacement.

B. Preparation: Cut out rotted and decayed wood down to sound surfaces. Use small power or hand tools to produce clean, straight cuts. Remove paint and other surface coatings from adjacent surfaces. Cut out sound wood to provide mortise with edges parallel and perpendicular to edges of member with straight sides to receive Dutchman.
1. Form scarf joints at end cuts within exposed faces.
2. Provide a mechanical key for dutchmen repairs that are less than 1-inch thick.
3. Where Dutchman replaces the entire end of an element, form end of Dutchman to exactly match the joinery to the adjacent member to which the repaired member will be connected
4. Treat cut surfaces with epoxy consolidant

C. Install Dutchman meeting the following requirements:
1. Fabricate dutchmen out of solid wood to match the original dimensions and profiles and to fit tightly within repaired area.
2. Where dutchman replaces the end of a member, fabricate the end of the dutchman to match the joint of the mating member.
3. Use biscuits or dowels where wood thickness is sufficient.
4. Provide Dutchman with grain running in the same direction as that of the existing member.
5. Form Dutchman so that its surface is slightly proud of existing wood surface.
6. Attach dutchman to wooden member with polyurethane glue. Clamp or nail in place until set. Countersink nails and fill nail holes.

D. Finishing: finish Dutchman to match adjacent member.

1. Plane or shave Dutchman surface to match plane and profile of adjacent wood. Do not damage profiles or surfaces of adjacent wood.
2. Sand to produce a uniformly smooth surface without sandpaper marks or other imperfections.
3. Location of Dutchman shall not be visible at a distance of 2 feet after the member has been painted.

3.07 MEMBER REPLACEMENT

A. Preparation: Remove deteriorated member and clean adjacent wood surfaces to provide sound, clean surfaces for mating with new member.
   1. Remove and replace pins fixing mortise and tenon joints without damaging existing member to remain.
   2. Consolidate joints in adjacent wood surfaces where water stained or spongy. Patch or install wooden dutchman at mating surfaces where rotted or decayed.

B. Provide new member matching original member in plane, dimensions, profile and direction of grain. Fabricate end joints in running or standing trim with scarf joints.

C. Install new member using the same joinery methods as used to install the original member (e.g. mortise and tenon, pegs, dowels, adhesive, etc.) to provide sound wood element matching original condition.

D. Install and secure new member to wooden element in the same manner as originally used. Produce tight, neat, and full joints. Countersink nails and fill nail holes.

3.08 WOOD TREATMENT

A. Follow manufacturer's written instructions for mixing and application of borate wood preservative/biocide/fungicide.

B. Apply borate wood preservative to new and existing wood framing elements in basements or crawl spaces where wood is in contact with ground, concrete and masonry surfaces.

3.09 ADJUST AND CLEAN

A. Remove and replace any architectural woodwork repair and restoration work that does not match existing planes and profiles or meet other specified requirements to Director's Representative's or Architect's satisfaction at no additional cost to Owner.

B. Remove and replace any consolidant and filler that is loose and has not bonded or cured properly to the Director's Representative's satisfaction at no additional cost to Owner.

C. Clean all surfaces or materials damaged or stained by work of this Section.

D. Protect architectural woodwork restoration work and maintain conditions necessary to ensure that the work will be without damage or deterioration at time of acceptance.

END OF SECTION

SECTION 06 40 00 - ARCHITECTURAL WOODWORK

PART 1 – GENERAL

1.01 **SECTION INCLUDES**:

A. All labor, materials, equipment, and services necessary to complete the work improvements, repairs and restoration of interior and exterior architectural woodwork as shown on drawings, specified herein, and as required by conditions and authorities having jurisdiction, including the following:

1. Standing and Running trim
2. Wood Porches, including columns, pilasters, pedestals, entablatures, ceilings, siding, railings, and benches
3. Wood Dormers, including siding, trim cornices, tympanum.
4. Ornamental/Historic Woodwork.
   a. Roof and Pent Cornices, including running trim, fascias, soffits, modillions, dentils
   b. Roof balustrades, including posts, railings and balusters.
5. Door & Window Frames and Sills.
6. Wood shutters & Shutter Hardware

B. Intent of Architectural Woodwork: It is the specific intent of this Section that elements of architectural woodwork indicated on the drawings and specified elsewhere to be restored under this Contract shall be completely restored to sound condition and original planes and profiles, except as specifically indicated otherwise. Replacement components must replicate the size, shape, and profile of the original. Match historic joinery details such as mortise and tenon joints.

1.02 RELATED SECTIONS

A. Section 01 21 00 – Allowances
B. Section 01 23 00 – Alternates
C. Section 06 31 00 – Wood Restoration Systems
D. Section 08 20 00 – Wood Door Restoration
E. Section 08 60 00 – Wood Window Restoration
F. Section 08 70 00 – Hardware
G. Section 09 90 00 – Painting

1.03 DEFINITIONS

A. "Consolidate": Solidify friable and decayed wood that still retains its original dimensions and profile through application of a wood epoxy consolidant.

B. "Consolidate and Patch": Replacement of localized areas of rot or decay in a wooden member with a wood epoxy filler. Includes consolidation of adjacent areas of soft or friable wood through application of a wood epoxy consolidant.

C. "Dutchman Repair": Replacement of localized areas of rot or decay in a wooden member with a wood patch.

D. "Partial Replacement": Replacement of a section of a wooden member, encompassing the full width and thickness, with new wood.

1.04 QUALITITY ASSURANCE

A. The Contractor for the Work of this Section shall be regularly engaged in the restoration of historic architectural woodwork and windows, including materials and techniques for epoxy consolidation/repair and fabricating/ installing wooden Dutchmen.

B. Restoration Specialist: Engage a carpenter for the Work of this Section who is specially trained in the restoration of historic architectural woodwork and who has at least five (5) years experience in restoration, epoxy consolidation and patching and Dutchman repair of architectural woodwork.
   1. In acceptance of or rejection of work under this Section, no allowance will be made for workers' incompetence or lack of skill.

C. Reference Standards: Comply with the requirements of the following standards and with the requirements specified in this Section. In case of conflict, the most stringent and restrictive requirement shall govern..
   1. *Architectural Woodwork Quality Standards* by the Architectural Woodwork Institute (AWI), most recent edition.
   2. *American Softwood Lumber Standard* US Department of Commerce Product Standard 20 (DOC PS 20-99).

D. Mill & Producers Label: Lumber shall bear label indicating type, grade, mill and grading agency on unfinished surface or end.
   1. In lieu of mill & producers label, supply affidavit from material supplier certifying grade, species and cut of milled lumber and molding products.

1.05 SUBMITTALS

A. General: Submit each item in this article in compliance with the General Conditions of the Contract and Division 1 Specifications. Revise and resubmit each item as required to obtain the Architect's or Director's Representative's approval.

B. Qualification Data: Submit qualification data for personnel specified in Quality Assurance article that demonstrates that the personnel have the capabilities and experience complying with requirements specified herein.

C. Product Literature: Manufacturers' published technical data for each product to be used in work of this Section including recommendations for application and use, test reports and certificates verifying that product complies with specified requirements, and Material Safety Data Sheets (MSDS): *Refer to Section 06310*.

D. Shop Drawings: Shop Drawings will be required at the discretion of the Director's Representative and/or Architect, where the extent of dismantling, repair or replacement of components requires extensive work to an element. Detailed shop drawings are required as follows:

E. Samples: Provide samples representative of dimensions, profiles, and material of each element.
   1. Each molding to be replicated/replaced.

F. Field Samples (Mock-Ups):
   1. Prepare field sample at a location designated by the Director's Representative. Do not proceed further with the Work of this Section until the field sample is approved.
      a. Engage the approved Restoration Specialist to prepare the field sample.
      b. Utilize only approved materials and methods, and comply with product manufacturer's instructions and other requirements of this Section to prepare field sample.
   2. Approved field sample will be used as quality control standard for acceptance or rejection of the Work of this Section.
      a. Maintain and protect approved field sample from damage, deterioration, or alteration for the duration of the Contract.
   3. Field Samples Required:
      a. Roof Balustrade – 1 Section

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original unopened containers, bundles, or packaging labeled with manufacturer's name, brand name, item name, expiration date and instructions for use as applicable.

B. Store materials in compliance with manufacturer's recommendations for temperature and other conditions. Keep materials dry and under cover. Protect against exposure to weather.

C. Discard and remove from project site any materials damaged in handling or storage, any materials that have been subjected to conditions contrary to manufacturer's recommendations, and any materials whose maximum shelf life has expired. Replace with fresh materials.

1.07 PROJECT CONDITIONS

A. Laws and Regulations: Perform all work of this Section in compliance with all Federal, state and local laws and regulations.

B. Safety: Use all necessary means to protect all persons, whether engaged in the work of this Section or not, from harm resulting from the work of this Section.

C. Protection: Use all necessary means to protect areas of wood not being consolidated or patched and all other surfaces of building elements from damage, deterioration or staining caused by the work of this Section.

D. Retention of Existing Building Fabric: carefully remove, store, and reinstall all existing building fabric that must be removed to undertake architectural woodwork repair and restoration, except where Contract Documents indicate that element is to be modified or replaced.

E. Dimensions: Field measure dimensions of all existing and in-place elements to be altered or repaired before preparing shop drawings or beginning work. Contractor is responsible for all dimensions.

F. Environmental Conditions: Proceed with work of this Section only when existing and forecasted weather conditions permit work to be performed in accordance with manufacturer's or with requirements specified herein, whichever is more stringent.

1. Mix and use epoxy resins only when temperatures of air, wood to be patched, and epoxy resins are between 50 deg F and 85 deg F.
2. Use polyurethane glue only when temperatures of air, wood to be glued, and glue are between 40 deg F and 100 deg F.

G. Surface Conditions: Proceed with work of this Section only when wood moisture levels are within the limits recommended by manufacturers of materials being used.

1. Use Epoxy Resins only on wood that is completely dry.
2. Use polyurethane glue on wood that has a moisture level as recommended by glue manufacturer. Dampen substrates as recommended by manufacturer when moisture level is below acceptable level.

H. Removal of Existing Construction: Where removal of existing construction is required to perform the Work, take all necessary measures to carefully remove and salvage sound materials without damage and without marring finished surfaces.
1. Tag or otherwise label removed items to facilitate reinstallation at the same location, position and orientation.
2. Protect and store removed items. Reinstall items as soon as practical.

1.08 LEAD-CONTAINING PAINT

A. Assume that all existing painted surfaces are coated with lead-containing paints. Handle, transport and dispose of lead-containing paint and residue in accordance with all applicable federal, state, and local laws and regulations including, but not limited to, the regulations referenced herein.

1. OSHA Regulations, Title 29, CFR Section 1926.62: "Lead Exposure in Construction" and Title 29, CFR Section 1910.1200: "Hazard Communication Standard."
2. US EPA Regulations, Title 40, CFR Part 262: "Standards Applicable to Generators of Hazardous Waste" and Part 263: "Standards Applicable to Transporters of Hazardous Waste."
3. US DOT Regulations, Title 49 CFR Parts 172 thru 180 inclusive.
4. NYS DEC Regulations, Title 6, Part 364, and parts 370-374.

B See also Section 02 83 00

C. Prior to repairs and restoration of interior woodwork, removal (chemical stripping, scraping and/or sanding) of woodwork may be required in accordance with Section 09 90 00 Painting.

PART 2 – PRODUCTS

2.01 WOOD

A. General: Wood shall comply with Quality Standards Illustrated (QSI) Grade I and applicable rules for lumber grading agencies certified by the American Lumber Standards Committee Board of Review.
1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Provide dry lumber with 12 percent maximum moisture content at time of use, unless specifically indicated otherwise.
3. Lumber shall be straight, without twist, bow or cup, or other deformation that adversely affects the lumber for use intended.

B. Solid Lumber: All wood elements shall be solid lumber of full length (without finger joints). Wood panels over 12 inches wide may be made up of solid boards edge glued or splined and edge glued as approved by the Architect or Director's Representative.

C. Wood for Standing and Running Trim: Match existing wood species and direction of grain unless otherwise indicated.

D. Wood for Severe Exposure Locations: Clear quarter sawn redwood, cedar, and Genuine (Honduran) Mahogany. Use only where required by Architect or Director's Representative.

E. Wood for exterior use, where not matching existing species must be Eastern or Western Red Cedar, Cypress, White Oak, Chestnut Oak, Black Locust or any of a species listed in Architectural Woodwork Institute (AWI) *Architectural Woodwork Quality Standards*, 100-G-9.
1. Wood for exposed windowsills and door sills to be White Oak or Chestnut Oak.

F. Wood for Concealed Blocking: Pine, No. 1 or better.

2.02 EPOXY CONSOLIDATION AND PATCHING MATERIALS

A. Refer to Section 06310 Wood Restoration Systems.

2.03 ANCHORS AND FASTENERS

A. Architectural Woodwork: All anchors and fasteners used in woodwork shall be Type 302/304 stainless steel.

B. Hardware Attachment: All visible replacement screws for attaching hardware shall match existing screws in material, form and size.

2.04 MISCELLANEOUS MATERIALS

A. Adhesive for assembly of Architectural Woodwork components: One-component moisture activated polyurethane glue, fast curing, creating boil-resistant bonds in accordance with classification requirements in EN 204/205-D4:
   1. Gorilla Glue, manufactured by Lutz File and Tool Co., 3929 Virginia Ave., Cincinnati, OH 45227; 800-966-3458.
   2. Titebond Polyurethane by Franklin International.
   3. Excel One by The Ambel Corporation.

B. Adhesive for Installing Dutchman: Two-part epoxy adhesive formulated and sold for use with wood. Provide same manufacturer(s) listed in Part

C. Linseed Oil – Turpentine Solution: Solution of 50 percent boiled linseed oil and 50 percent turpentine.

D. Primer: 100% Acrylic Latex Primer for exterior and interior use (Refer to Section 09 90 13 Painting).

2.05 HARDWARE FOR WOOD SHUTTERS

A. New Hardware for wood shutters shall be forged steel (mild or low-carbon steel), matching existing historic or replica hardware, including patterns and dimensions.
   1. Use only flat head (slotted) screws for attachment of hardware to wood where not attached by driven pintels.

B. Repair existing shutter hardware, where practical

C. Engage a qualified blacksmith to custom forge, fabricate or repair historic or replica “wrought iron” or forged steel hardware.
   1. Qualified blacksmith shall have a minimum five (5) years of experience fabricating or repairing forged hardware on similar projects.

2. Fabricator: Canal Forge, High Falls, NY (www.hudsonvalleyblacksmith.com), or approved equal.

PART 3 – EXECUTION

3.00 GENERAL

A. Where the level of repair or replacement is not specifically indicated on the plans, every reasonable effort shall be made to repair existing historic building materials rather than replace them.

B. Do not use units of material with defects which impair the quality of the Work and units which are too small to fabricate the Work with minimum joints or optimum joint arrangement.

C. Install work accurately to required lines and levels with members plumb and true, accurately cut and fitted and securely fastened. Closely fit rough carpentry to other associated construction and to existing construction. Where existing construction is not level or plumb, match lines of existing construction.

3.01 TEMPORARY PROTECTION

A. General: Provide temporary protection of exposed building fabric and interior of building at all locations from which elements are removed for work of this Section. Install, maintain and remove temporary protection without altering or damaging historic building fabric.

B. Protection at Openings from which Window Sash Are Removed: provide plywood panels or framed plywood panels to replace sash that are removed for more than one day. Use wood wedges, security bars or other devices to avoid attachment to historic building fabric where possible.

C. Protection of Building Fabric Where Running or Standing Trim Elements Are Removed: Where moisture infiltration or safety or security risks exist, install temporary protection.

3.02 REMOVAL AND DISASSEMBLY

A. General: Carefully disassemble architectural woodwork and other elements as required to perform the work indicated and to allow removal of window sills, siding, standing and running wood trim and other elements to be restored or repaired. Use all reasonable care in removing elements without causing damage or deterioration to historic building fabric. Do not crush, split or gouge wood that will remain or be reinstalled. Pull heads of finish nails through from concealed surface to avoid splintering wood.

B. Identification and Labeling: Identify each element removed, label each element on surface to be concealed when element is reinstalled or on tag tied to element with wire.

C. Storage: Carefully handle and store elements to be reinstalled to protect from damage or loss.

3.03 INSPECTION OF WOOD MEMBERS AND WOOD ELEMENTS

A. General: Following preparation for removal or disassembly, inspect all wood elements in conjunction with the Director's Representative to determine method and extent of treatment.
   1. Elements having minor instances of rotten or spongy wood will require consolidation.
   2. Areas that do not match original profiles due to minor deterioration and damage will require consolidation and filling to original profiles.
   3. Areas of major damage or deterioration require Dutchman repairs or member replacement to restore the original profile depending on the amount of damage and structural integrity of the element.
   4. The Architect's or Director's Representative's decision regarding extent of required consolidation, consolidation and patching, Dutchman repairs, and member replacement shall be final.

3.04 ARCHITECTURAL WOODWORK REPAIR & RESTORATION

A. General: Restore architectural woodwork as shown on Drawings, and as specified herein. Comply with American Woodworks Institute's *Architectural Woodwork Quality Standards*, Sections 300 (Standing and Running Trim) and 700 (Ornamental/Historic Work), Custom Grade.

B. Disassembly: Where required, carefully disassemble woodwork as required to perform roofing, restoration and repair work. Identify and label all parts identifying original locations to ensure that the elements are reconstructed with all parts in their original location and orientation.

C. Restoration
   1. Carefully chemically strip or scrape and sand paint from surfaces of wood requiring consolidation and consolidation and patching. Use all care necessary to remove paint without damaging sound wood to remain.
   2. Consolidate and fill, provide Dutchman repairs, glue cracked elements and failed joints, and replace severely deteriorated members as indicated, following procedures specified below.
   3. Prepare and prime new and repaired wood.

3.05 EPOXY CONSOLIDATION AND PATCHING

A. Refer to Section 06 31 00 Wood Restoration Systems.

3.06 DUTCHMAN REPAIRS

A. Refer to Section 06 31 00 Wood Restoration Systems

3.07 MEMBER REPLACEMENT

A. Refer to Section 06 31 00 Wood Restoration Systems

3.08 ADJUST AND CLEAN

A. Remove and replace any architectural woodwork repair and restoration work that does not match existing planes and profiles or meet other specified requirements to Director's Representative's or Architect's satisfaction at no additional cost to Owner.

B. Remove and replace any consolidant and filler that is loose and has not bonded or cured properly to the Director's Representative's satisfaction at no additional cost to Owner.

C. Clean all surfaces or materials damaged or stained by work of this Section.

D. Protect architectural woodwork restoration work and maintain conditions necessary to ensure that the work will be without damage or deterioration at time of acceptance.

END OF SECTION

SECTION 06 41 00
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Specially fabricated cabinet units.

B. Hardware.

C. Factory finishing.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Support framing, grounds, and concealed blocking.

B. Section 06 65 10 - Solid Surface Fabrications: Countertops.

C. Section 09 91 23 - Interior Painting: Field finishing of cabinet exterior.

D. Section 09 93 00 - Staining and Transparent Finishing: Field finishing of cabinet exterior.

1.03 REFERENCE STANDARDS

A. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.1; 2016, with Errata (2017).

B. BHMA A156.9 - American National Standard for Cabinet Hardware; 2015.

C. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2016.

D. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

E. AWI (QCP) - Quality Certification Program, www.awiqcp.org; current edition at www.awiqcp.org.

F. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.

G. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2010 (ANSI/BHMA A156.9).

H. GSA CID A-A-1936 - Adhesive, Contact, Neoprene Rubber; Federal Specifications and Standards; Revision A, 1996.

I. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; Hardwood Plywood & Veneer Association; 2009 (ANSI/HPVA HP-1).

J. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.

K. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2010.

L. WI (CCP) - Certified Compliance Program (CCP); current edition at www.woodworkinstitute.com/certification.

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.

B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
   1. Provide the information required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).

C. Product Data: Provide data for hardware accessories.

D. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches square, illustrating proposed cabinet and countertop substrate and finish.

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect units from moisture damage.

1.07 FIELD CONDITIONS

A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. MasterCraft Cabinets, Univeral Access Cabinetry; https://www.mastercraftcabinets.com.

B. Kraftmaid, Universal Design Cabinetry - Passport Series; https://www.kraftmaid.com/.

C. Or approved equal.

2.02 CABINETS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Wood Veneer Faced Cabinet:
   1. Exposed Surfaces: HPVA HP-1 Grade A, Ash, plain sliced, random-matched.
   2. Concealed Surfaces: HPVA Grade C, Ash, plain sliced, random-matched.

C. Universal Access Cabinetry at Cottage Kitchen:
   1. Finish - Exposed Exterior Surfaces: 3/4" thick solid wood.
   2. Finish - Exposed Interior Surfaces: Matching finished interior, finished plywood shelving.
   3. Door and Drawer Front Edge Profiles: Square edge with thin applied band.
   4. Door and Drawer Front Retention Profiles: Fixed panel.
   5. Casework Construction Type: Type B - Face-frame.
   6. Interface Style for Cabinet and Door: Style 2 - Finish Inset; reveal overlay.
   7. Grained Face Layout for Cabinet and Door Fronts: Style and Rail, all Grades.
      a. Drawer fronts run grain either vertically or horizontally at the manufacturer's option.
      b. Doors: Vertical grain.
   8. Adjustable Shelf Loading: 50 lbs. per sq. ft.
   9. Cabinet Style: Flush overlay.
   10. Cabinet Doors and Drawer Fronts: Flush style.
   11. Drawer Side Construction: Multiple-dovetailed.
   12. Drawer Construction Technique: Dovetail joints.
   13. Countertop: Solid surfacing, Refer to specification 06 6510
   14. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with chrome finish.
      a. Coordinate lock cylinders and keying with Director's Representative.
   15. 9" high toe kick
   16. Reduced-height cabinets offer easy access to work surfaces
   17. Base cabinets with roll-out trays eliminate bending and reaching for stored items
   18. Crafted to coordinate with standard wall cabinets

2.03 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

B. Hardwood Edgebanding: Use solid hardwood edgebanding matching species, color, grain, and grade for exposed portions of cabinetry.

2.04 LAMINATE MATERIALS

A. Manufacturers:
   1. Formica Corporation; ____: www.formica.com/#sle.
   2. Panolam Industries International, Inc; Nevamar Standard HPL: www.panolam.com/#sle.
   3. Wilsonart LLC; ____: www.wilsonart.com/#sle.
   4. Substitutions: See Section 01 33 00 - Submittals.

B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.

2.05 ACCESSORIES

A. Adhesive: Type recommended by fabricator to suit application.

B. Plastic Edge Banding: Extruded PVC, convex shaped; smooth finish; self locking serrated tongue; of width to match component thickness.
   1. Color: As selected by Director's Representative from manufacturer's standard range.

C. Fasteners: Size and type to suit application.

D. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.

E. Concealed Joint Fasteners: Threaded steel.

2.06 HARDWARE

A. Hardware: BHMA A156.9, types as scheduled for quality grade specified.

B. Adjustable Shelf Supports: Standard back-mounted system using surface mounted metal shelf standards and coordinated cantilevered shelf brackets, satin chrome finish, for nominal 1 inch spacing adjustments.

C. Drawer and Door Pulls: "U" shaped wire pull, steel with satin finish, 4 inch centers.

D. Catches: Magnetic.

E. Drawer Slides:
   1. Type: Extension types as indicated.
   2. Static Load Capacity: Commercial grade.
   3. Mounting: Side mounted.
   4. Stops: Integral type.
   5. Features: Provide self closing/stay closed type.
   6. Manufacturers:
      a. Accuride International, Inc; Light-Duty Drawer Slides: www.accuride.com/#sle.
      b. Grass America Inc; ____: www.grassusa.com.
      c. Knape & Vogt Manufacturing Company; Light-Duty Drawer Slides: www.knapeandvogt.com/#sle.

F. Hinges: European style concealed self-closing type, steel with nickel-plated finish.
   1. Manufacturers:
      a. Grass America Inc; ____: www.grassusa.com/#sle.
      b. Hardware Resources; _____: www.hardwareresources.com/#sle.
      c. Julius Blum, Inc; _____: www.blum.com/#sle.

2.07 SITE FINISHING MATERIALS

A. Finishing: Field finished as specified in Section 09 93 00.

2.08 FABRICATION

A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.

E. Matching Wood Grain: Comply with requirements of quality standard for specified Grade and as follows:
   1. Provide center matched panels at each elevation.
   2. Provide sequence matching across each elevation.

F. Mechanically fasten back splash to countertops as recommended by laminate manufacturer at 16 inches on center.

G. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Seal cut edges.

2.09 SHOP FINISHING

A. Sand work smooth and set exposed nails and screws.

B. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
   1. Transparent:
      a. Stain: As selected by Director's Representative.
      b. Sheen: Flat.
   2. Opaque:
      a. Color: As selected by Director's Representative.
      b. Sheen: Flat.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.

B. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.

C. Secure cabinets to floor using appropriate angles and anchorages.

D. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.03 ADJUSTING

A. Adjust installed work.

B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

SECTION 06 65 10
SOLID SURFACE FABRICATIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. A. Drawings and general provisions of the contract, including general and supplementary conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following horizontal and trim solid surface product types:
   1. Countertops with undermount sinks
   2. Countertop
   3. Cove backsplashes

B. Related Sections include the following:
   1. Division 6 Section “Rough Carpentry” for Blocking.
   2. Division 15 Section “Plumbing Fixtures.”
   3. Division 16 Section “Wiring Devices.”

C. Alternates:
   1. Refer to Division 1 Section "Submittals" for description of work in this Section affected by alternates.

1.03 DEFINITION

A. Solid surface is defined as nonporous, homogeneous material maintaining the same composition throughout the part with a composition of acrylic polymer, aluminum trihydrate filler and pigment.

1.04 SUBMITTALS

A. Product data:
   1. For each type of product indicated.
   2. Product data for the following:

B. Shop drawings:
   1. Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices and other components.
      a. Show full-size details, edge details, thermoforming requirements, attachments, etc.
      b. Show locations and sizes of furring, blocking, including concealed blocking and reinforcement specified in other Sections.
      c. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, waste receptacle and other items installed in solid surface.

C. Samples:
   1. For each type of product indicated.
      a. Submit minimum 6-inch by 6-inch sample in specified gloss.
      b. Cut sample and seam together for representation of inconspicuous seam.
      c. Indicate full range of color and pattern variation.
   2. Approved samples will be retained as a standard for work.

D. Product data:
   1. Indicate product description, fabrication information and compliance with specified performance requirements.

E. Product certificates:
   1. For each type of product, signed by product manufacturer.

F. Fabricator/installer qualifications:

1. Provide copy of certification number.

G. Manufacturer certificates:
   1. Signed by manufacturers certifying that they comply with requirements.

H. NSF/ANSI standards:
   1. Refer to www.nsf.org for the latest compliance to NSF/ANSI Standard 51 for food zone - all food types.

I. Maintenance data:
   1. Submit manufacturer's care and maintenance data, including repair and cleaning instructions.
      a. Maintenance kit for finishes shall be submitted.
   2. Include in project closeout documents.

1.05 QUALITY ASSURANCE

A. Qualifications:
   1. Shop that employs skilled workers who custom fabricate products similar to those required for this project and whose products have a record of successful in-service performance.

B. Fabricator/installer qualifications:
   1. Work of this section shall be by a certified fabricator/installer, certified in writing by the manufacturer.

C. C. Applicable standards:
   1. Standards of the following, as referenced herein:
      a. American National Standards Institute (ANSI)
      b. American Society for Testing and Materials (ASTM)
      c. National Electrical Manufacturers Association (NEMA)
      d. NSF International
   2. Fire test response characteristics:
      a. Provide with the following Class A (Class I) surface burning characteristics as determined by testing identical products per UL 723 (ASTM E84) or another testing and inspecting agency acceptable to authorities having jurisdiction:
         1) Flame Spread Index: 25 or less.
         2) Smoke Developed Index: 450 or less.

D. Coordination drawings:
   1. Shall be prepared indicating:
      a. Plumbing work.
      b. Electrical work.
      c. Miscellaneous steel for the general work.
      d. Indicate location of all walls (rated and non-rated), blocking locations and recessed wall items, etc.
   2. Content:
      a. Project-specific information, drawn accurately to scale.
      b. Do not base coordination drawings on reproductions of the contract documents or standard printed data.
      c. Indicate dimensions shown on the contract drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements.
      d. Provide alternate sketches to designer for resolution of such conflicts.
         1) Minor dimension changes and difficult installations will not be considered changes to the contract.

E. Drawings shall:

1. Be produced in 1/2-inch scale for all fabricated items.

F. Drawings must be complete and submitted to the architect within 60 days after award of contract for record only.
   1. No review or approval will be forthcoming.
   2. Coordination drawings are required for the benefit of contractor's fabricators/installers as an aid to coordination of their work so as to eliminate or reduce conflicts that may arise during the installation of their work.

G. Job mock-up:
   1. Prior to fabrication of architectural millwork, erect sample unit to further verify selections made under sample submittals and to demonstrate the quality of materials and execution.
   2. Mock-up shall be of lavatory top with integral bowl.
   3. Build the mock-up to comply with the contract documents and install in a location as directed by the architect.
   4. Notify the architect two weeks in advance of the date of when the mock-up will be delivered.
   5. Should mock-up not be approved, re-fabricate and reinstall until approval is secured.
      a. Remove rejected units from project site.
   6. After approval, the mock-up may become a part of the project.
   7. This mock-up, once approved, shall serve as a standard for judging quality of all completed units of work.

H. Pre-installation conference:
   1. Conduct conference at project site to comply with requirements in Division 1.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver no components to project site until areas are ready for installation.

B. Store components indoors prior to installation.

C. Handle materials to prevent damage to finished surfaces.
   1. Provide protective coverings to prevent physical damage or staining following installation for duration of project.

1.07 WARRANTY

A. Provide manufacturer's warranty against defects in materials.
   1. Warranty shall provide material and labor to repair or replace defective materials.
   2. Damage caused by physical or chemical abuse or damage from excessive heat will not be warranted.

B. Optional Installed Warranty:
   1. To qualify for the optional Installed Warranty, fabrication and installation must be performed by a DuPont Certified Fabrication/Installation source who will provide a brand plate for the application.
   2. This warranty covers all fabrication and installation performed by the certified/approved source subject to the specific wording contained in the Installed Warranty Card.

C. Manufacturer's warranty period:
   1. Ten years from date of substantial completion.

1.08 MAINTENANCE

A. Provide maintenance requirements as specified by the manufacturer.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers:

1. Subject to compliance with requirements, provide products by one of the following:
   a. Corian® surfaces from the DuPont company (basis of design).
   b. Or approved equal.

2.02 MATERIALS

A. Solid polymer components
   1. Cast, nonporous, filled polymer, not coated, laminated or of composite construction with through body colors meeting ANSI Z124.3 or ANSI Z124.6, having minimum physical and performance properties specified.
   2. Superficial damage to a depth of 0.010 inch (.25 mm) shall be repairable by sanding and/or polishing.

B. Thickness:
   1. 1/2 inch

C. Edge treatment:
   1. Even Receding

D. Backsplash:
   1. Coved.
   2. Height: 4 inches, unless otherwise indicated.

E. Performance characteristics:

Property	**Typical Result**	**Test**
Tensile Strength	6,000 psi	ASTM D 638
Tensile Modulus	1.5 x 10-6 psi	ASTM D 638
Tensile Elongation	0.4% min	ASTM D 638
Flexural Strength	10,000 psi	ASTM D 790
Flexural Modulus	1.2 x 10-6 psi	ASTM D 790
Hardness	>85 56	Rockwell “M” Scale ASTM D 785 Barcol Impressor
Thermal Expansion	3.02 x 10-5 in./in./°C (1.80 x 10-5 in./in./°F)	ASTM D 696
Gloss (60° Gardner)	5–75 (matte—highly polished)	ANSI Z124
Light Resistance	(Xenon Arc) No effect	NEMA LD 3-2000 Method 3.3
Wear and Cleanability	Passes	ANSI Z124.3 & Z124.6
Stain Resistance: Sheets	Passes	ANSI Z124.3 & Z124.6
Fungus and Bacteria Resistance	Does not support microbial growth	ASTM G21&G22
Boiling Water Resistance	No visible change	NEMA LD 3-2000 Method 3.5
High Temperature Resistance	No change	NEMA LD 3-2000 Method 3.6
Izod Impact (Notched Specimen)	0.28 ft.-lbs./in. of notch	ASTM D 256 (Method A)
Ball Impact Resistance: Sheets	No fracture—1/2 lb. ball: 1/4" slab—36" drop 1/2" slab—144" drop	NEMA LD 3-2000 Method 3.8
Weatherability	?E*94<5 in 1,000 hrs	ASTM G 155
Specific Gravity †	1.7	ASTM D 570
Water Absorption	Long-term 0.4% (3/4") 0.8% (1/4")	

0

Property	Typical Result	Test
Toxicity	99 (solid colors) 66 (patterned colors)	Pittsburgh Protocol Test (“LC50”Test)
Flammability	All colors (Class I and Class A)	ASTM E 84, NFPA 255 &UL 723
Flame Spread Index	<25	
Smoke Developed Index	<25	

† Approximate weight per square foot: 1/4" (6 mm) 2.2 lbs., 1/2" (12.3 mm) 4.4 lbs
Shapes meet or exceed the ANSI Z124.3 and ANSI Z124.6 standards for plastic sinks and lavatories
NEMA results based on the NEMA LD 3-2000

2.03 ACCESSORIES

A. Joint adhesive:
   1. Manufacturer’s standard one- or two-part adhesive kit to create inconspicuous, nonporous joints.

B. Sealant:
   1. Manufacturer’s standard mildew-resistant, FDA-compliant, NSF 51-compliant (food zone - any type), UL-listed silicone sealant in colors matching components.

C. Sink/lavatory mounting hardware:
   1. Manufacturer’s standard bowl clips, panel inserts and fasteners for attachment of undermount sinks/lavatories.

D. Conductive tape:
   1. Manufacturer’s standard aluminum foil tape, with required thickness, for use with cutouts near heat sources.

E. Insulating felt tape:
   1. Manufacturer’s standard for use with conductive tape in insulating solid surface material from adjacent heat source.

2.04 FACTORY FABRICATION

A. Shop assembly
   1. Fabricate components to greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings and manufacturer’s printed instructions and technical bulletins.
   2. Form joints between components using manufacturer’s standard joint adhesive without conspicuous joints.
      a. Reinforce with strip of solid polymer material, 2" wide.
   3. Provide factory cutouts for plumbing fittings and bath accessories as indicated on the drawings.
   4. Rout and finish component edges with clean, sharp returns.
      a. Rout cutouts, radii and contours to template.
      b. Smooth edges.
      c. Repair or reject defective and inaccurate work.

B. Thermoforming:
   1. Comply with manufacturer’s data.
   2. Heat entire component.
      a. Material shall be uniform, between 275 and 325 degrees Fahrenheit during forming.

3. Form pieces to shape prior to seaming and joining.
4. Cut pieces to finished dimensions.
5. Sand edges and remove nicks and scratches.

2.05 FINISHES

A. Select from the manufacturer's standard color chart.
   1. Color:
      a. Architect to choose color from Dupont price range B & C or equal

B. Finish:
   1. Provide surfaces with a uniform finish.
      a. Matte; gloss range of 5-20.
         1) Color: Architect to choose color from Dupont price range B & C or equal

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions, with fabricator present for compliance with requirements for installation tolerances and other conditions affecting performance of work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.
   1. Provide product in the largest pieces available.
   2. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work.
      a. Exposed joints/seams shall not be allowed.
   3. Reinforce field joints with solid surface strips extending a minimum of 1 inch on either side of the seam with the strip being the same thickness as the top.
   4. Cut and finish component edges with clean, sharp returns.
   5. Rout radii and contours to template.
   6. Anchor securely to base cabinets or other supports.
   7. Align adjacent countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop.
   8. Carefully dress joints smooth, remove surface scratches and clean entire surface.
   9. Install countertops with no more than 1/8-inch (3 mm) sag, bow or other variation from a straight line.

B. Coved backsplashes and sidesplashes:
   1. Provide coved backsplashes and sidesplashes at all walls and adjacent millwork.
   2. Fabricate radius cove at intersection of counters with backsplashes to dimensions shown on the drawings.
   3. Adhere to countertops using manufacturer's standard color-matched Joint Adhesive.

C. Integral sinks/vanities:
   1. Provide solid surface materials bowls and/or lavatories sinks with overflows in locations shown on the drawings.
   2. Secure sinks and lavatory bowls to tops using manufacturer's recommended sealant, adhesive and mounting hardware to maintain warranty.

3.03 REPAIR

A. Repair or replace damaged work which cannot be repaired to Director's Reprsentative's satisfaction.

3.04 CLEANING AND PROTECTION

A. Keep components clean during installation.

B. Remove adhesives, sealants and other stains.

END OF SECTION