

SECTION 01 7800 — CLOSEOUT SUBMITTALS

- 1.01 SUBMITTALS
A. Project Record Documents: Submit documents to Owner when submitting final application for payment.
B. Operation and Maintenance Data: Submit two sets of final documents in final form.
C. Warranties and Bonds: Submit prior to final Application for Payment.
D. Certificate of Occupancy: Submit to owner when requesting Substantial Completion inspection.
3.01 PROJECT RECORD DOCUMENTS
A. Maintain on site one set of the following record documents; record actual revisions to the Work: including but not limited to, Drawings, Specifications, Addenda, Change Orders, and reviewed submittals.
B. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction.
3.02 OPERATION AND MAINTENANCE DATA
A. For Each Product or System: List names, addresses and telephone numbers of z Subcontractors and suppliers.
B. Product Data: Mark each sheet to clearly identify specific products and component parts, and date applicable to installation. Delete inapplicable information.
C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
D. For Each Product, Applied Material, and Finish:
1. Product data, with catalog number, size, composition, and color and texture designations.
2. Information for re-ordering custom mixed or manufactured products.
3. Manufacturer's instructions for Care and Maintenance.
E. Moisture protection and weather-exposed products; Provide manufacturer recommendations for inspections, maintenance, and repair.
F. For Each Item of Equipment and Each System, provide the manufacturer's installation, operation and maintenance manuals. Include test and balancing reports.
3.03 WARRANTIES AND BONDS
A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.

SECTION 02 4100 — DEMOLITION

- 1.01 SUBMITTALS
A. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.
1.02 QUALITY ASSURANCE
A. Demolition Firm Qualifications: Company specializing in the type of work required.
B. Comply with governing EPA notification regulations.
3.01 SCOPE
A. Remove portions the building, as indicated on drawings.
B. Remove paving and curbs as required to accomplish new work.
C. Within area of new construction, remove foundation walls and footings to a minimum of 2 feet below finished grade, or to a minimum of 12" below foundation bearing elevation for any construction within 4' of new foundations.
D. Outside area of new construction, remove foundation walls and footings to a minimum of 2 feet below finished grade.
E. Remove underground tanks.
F. Remove other items indicated, for salvage, relocation, and recycling.
G. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact as specified.
3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS
A. Perform an engineering survey of building to determine whether demolition operations might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures.
B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
1. Obtain required permits.
2. Comply with applicable requirements of OSHA, NFPA 241, ANSI A10.6 and the Building Code.
3. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
4. Provide, erect, and maintain temporary barriers and security devices.
5. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
6. Do not close or obstruct roadways or sidewalks without permit.
7. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
8. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
C. Do not begin removal until built elements to be salvaged or relocated have been removed.
D. Do not begin removal until vegetation to be relocated has been removed and specified measures have been taken to protect vegetation to remain.
E. Protect existing structures and other elements that are not to be removed.
Provide bracing and shoring, prevent movement or settlement of adjacent structures and stop work immediately if adjacent structures appear to be in danger.
G. Minimize production of dust due to demolition operations.
H. If hazardous materials are discovered during removal operations, stop work and notify Owner.
I. Perform demolition in a manner that maximizes salvage and recycling of materials.
J. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.
K. Grade demolition areas to level condition, sloped to drain, with smooth transitions to adjacent surfaces.
3.03 EXISTING UTILITIES
A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
B. Protect existing utilities to remain from damage.
C. Do not disrupt public utilities without permit from authority having jurisdiction.
D. Do not close, shut off, or disrupt existing life safety systems that are in use.
E. Do not close, shut off, or disrupt existing utilities that are in use.
F. Locate and mark utilities to remain with identification of utility type.
G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
H. Prepare building demolition areas by disconnecting and capping services outside the demolition zone; identify and mark utilities to be subsequently connected, in same manner as other utilities to remain.
I. Refer to mechanical and electrical specifications for special installation requirements for plumbing, mechanical and electrical items.
3.04 DEBRIS AND WASTE REMOVAL
A. Remove debris, junk, and trash from site.
B. Leave site in clean condition, ready for subsequent work.
C. Clean up spillage and wind-blown debris from public areas and lands.

SECTION 02 4100 — DEMOLITION

- 1.01 SUBMITTALS
A. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.
1.02 QUALITY ASSURANCE
A. Demolition Firm Qualifications: Company specializing in the type of work required.
B. Comply with governing EPA notification regulations.
3.01 SCOPE
A. Remove portions the building, as indicated on drawings.
B. Remove paving and curbs as required to accomplish new work.
C. Within area of new construction, remove foundation walls and footings to a minimum of 2 feet below finished grade, or to a minimum of 12" below foundation bearing elevation for any construction within 4' of new foundations.
D. Outside area of new construction, remove foundation walls and footings to a minimum of 2 feet below finished grade.
E. Remove underground tanks.
F. Remove other items indicated, for salvage, relocation, and recycling.
G. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact as specified.
3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS
A. Perform an engineering survey of building to determine whether demolition operations might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures.
B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
1. Obtain required permits.
2. Comply with applicable requirements of OSHA, NFPA 241, ANSI A10.6 and the Building Code.
3. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
4. Provide, erect, and maintain temporary barriers and security devices.
5. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
6. Do not close or obstruct roadways or sidewalks without permit.
7. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
8. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
C. Do not begin removal until built elements to be salvaged or relocated have been removed.
D. Do not begin removal until vegetation to be relocated has been removed and specified measures have been taken to protect vegetation to remain.
E. Protect existing structures and other elements that are not to be removed.
Provide bracing and shoring, prevent movement or settlement of adjacent structures and stop work immediately if adjacent structures appear to be in danger.
G. Minimize production of dust due to demolition operations.
H. If hazardous materials are discovered during removal operations, stop work and notify Owner.
I. Perform demolition in a manner that maximizes salvage and recycling of materials.
J. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.
K. Grade demolition areas to level condition, sloped to drain, with smooth transitions to adjacent surfaces.
3.03 EXISTING UTILITIES
A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
B. Protect existing utilities to remain from damage.
C. Do not disrupt public utilities without permit from authority having jurisdiction.
D. Do not close, shut off, or disrupt existing life safety systems that are in use.
E. Do not close, shut off, or disrupt existing utilities that are in use.
F. Locate and mark utilities to remain with identification of utility type.
G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
H. Prepare building demolition areas by disconnecting and capping services outside the demolition zone; identify and mark utilities to be subsequently connected, in same manner as other utilities to remain.
I. Refer to mechanical and electrical specifications for special installation requirements for plumbing, mechanical and electrical items.
3.04 DEBRIS AND WASTE REMOVAL
A. Remove debris, junk, and trash from site.
B. Leave site in clean condition, ready for subsequent work.
C. Clean up spillage and wind-blown debris from public areas and lands.

SECTION 05 5500 — METAL FABRICATION

- 1.01 SUBMITTALS
A. Shop Drawings: Indicate profiles, sub-connection attachments, reinforcing, anchorage, size and type, fasteners and accessories. Include erection drawings, elevations, and details where applicable. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
1 MATERIALS — STEEL
A. Steel Sections: ASTM A 36/A 36M.
B. Bolts, Nuts, and Washers: ASTM A500/A500M, Grade B cold-formed structural tubing.
C. Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.
D. Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, galvanized to ASTM A 153/A 153M where connecting galvanized components.
E. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
F. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
G. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I — Inorganic, complying with VOC limitations of authorities having jurisdiction.
2.02 FABRICATION
A. Fit and shop assemble items in largest practical sections, for delivery to site.
B. Fabricate items with joints tightly fitted and secured.
C. Continuously seal joined members by continuous welds.
D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
2.03 FABRICATED ITEMS
A. Bumper Posts and Guard Rails: As detailed; galvanized finish.
B. Ballards: Steel pipe, concrete filled, crowned cap, as detailed; galvanized finish.
C. Lintels: As detailed; galvanized finish.
2.04 FINISHES — STEEL
A. Prepare surfaces to be primed in accordance with SSPC-SP2.
B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
C. Prime Painting: One coat.
D. Galvanizing of Steel Members: Galvanize after fabrication to ASTM A 123/A 123M requirements.
2.05 FABRICATION TOLERANCES
A. Squareness: 1/8 inch maximum difference in diagonal measurements.
B. Maximum Offset Between Faces: 1/16 inch.
C. Maximum Misalignment of Adjacent Members: 1/16 inch.
D. Maximum Bow: 1/8 inch in 48 inches.
E. Maximum Deviation From Plane: 1/16 inch in 48 inches.
3.01 EXAMINATION
A. Verify that field conditions are acceptable and are ready to receive work.
3.02 PREPARATION
A. Clean and strip primed steel items to bare metal where site welding is required.
B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.
3.03 INSTALLATION
A. Install items plumb and level, accurately fitted, free from distortion or defects.
B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
C. Perform field welding in accordance with AWS D1.1/D1.1M.
D. Obtain approval prior to site cutting or making adjustments not scheduled.
E. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.
3.04 TOLERANCES
A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
B. Maximum Offset From True Alignment: 1/4 inch.
C. Maximum Out-of-Position: 1/4 inch.

- having jurisdiction.
G. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I — Inorganic, complying with VOC limitations of authorities having jurisdiction.
2.02 FABRICATION
A. Fit and shop assemble items in largest practical sections, for delivery to site.
B. Fabricate items with joints tightly fitted and secured.
C. Continuously seal joined members by continuous welds.
D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
2.03 FABRICATED ITEMS
A. Bumper Posts and Guard Rails: As detailed; galvanized finish.
B. Ballards: Steel pipe, concrete filled, crowned cap, as detailed; galvanized finish.
C. Lintels: As detailed; galvanized finish.
2.04 FINISHES — STEEL
A. Prepare surfaces to be primed in accordance with SSPC-SP2.
B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
C. Prime Painting: One coat.
D. Galvanizing of Steel Members: Galvanize after fabrication to ASTM A 123/A 123M requirements.
2.05 FABRICATION TOLERANCES
A. Squareness: 1/8 inch maximum difference in diagonal measurements.
B. Maximum Offset Between Faces: 1/16 inch.
C. Maximum Misalignment of Adjacent Members: 1/16 inch.
D. Maximum Bow: 1/8 inch in 48 inches.
E. Maximum Deviation From Plane: 1/16 inch in 48 inches.
3.01 EXAMINATION
A. Verify that field conditions are acceptable and are ready to receive work.
3.02 PREPARATION
A. Clean and strip primed steel items to bare metal where site welding is required.
B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.
3.03 INSTALLATION
A. Install items plumb and level, accurately fitted, free from distortion or defects.
B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
C. Perform field welding in accordance with AWS D1.1/D1.1M.
D. Obtain approval prior to site cutting or making adjustments not scheduled.
E. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.
3.04 TOLERANCES
A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
B. Maximum Offset From True Alignment: 1/4 inch.
C. Maximum Out-of-Position: 1/4 inch.

SECTION 06 1000 — ROUGH CARPENTRY

- 1.01 SUBMITTALS
A. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.
1.02 DELIVERY, STORAGE, AND HANDLING
A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.
2.01 GENERAL REQUIREMENTS
A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
B. Lumber fabricated from old growth timber is not permitted.
2.02 DIMENSION LUMBER
A. Sizes: Nominal sizes as indicated on drawings, S4S.
B. Moisture Content: S-dry or MC19.
C. Miscellaneous Blocking, Nailers, and Furring: Lumber: S4S, No. 2 or Standard Grade; Boards: Standard or No. 3.
2.03 CONSTRUCTION PANELS
A. Roof Sheathing: Any PS 2 type, rated Structural I Sheathing. Bond Classification: Exterior. Span Rating: 60. Performance Category: 3/4 PERF CAT.
B. Wall Sheathing: Any PS 2 type. Bond Classification: Exterior. Grade: Structural I Sheathing. Span Rating: 24. Performance Category: 5/8 PERF CAT.
C. Wall Sheathing: Glass mat faced gypsum, ASTM C1177/C1177M, square-edge, 5/8 inch. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly.
D. Insulated Wall Sheathing: Extruded polystyrene, ASTM C 578, Type IV; tongue and groove long edges; 3/4 inch, unless noted otherwise.
E. Communications and Electrical Room Mounting Boards: PS A-D plywood; 3/4 inch thick; flame spread index of 450 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
2.04 ACCESSORIES
A. Fasteners and Anchors: Metal and Washers: Hot-dipped galvanized steel per ASTM A 153/A 153M for exterior, roof, and preservative-treated wood locations, unfinished steel elsewhere.
B. FACTORY WOOD TREATMENT
Treated lumber and plywood: Comply with requirements of AWWA U1 — Use Category System for wood treatments determined by use categories, expected service conditions, and special applications.
1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWWA standards.
B. Fire Retardant Treatment:
1. Exterior Type: AWWA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread rating of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
b. Do not use treated wood in direct contact with the ground.
2. Interior Type A: AWWA U1, Use Category UCFB, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread rating of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
a. Kiln dry wood after treatment to maximum moisture content of 19 percent for lumber and 15 percent for plywood.
b. Treat rough carpentry items as indicated.
c. Do not use treated wood in applications exposed to weather or where the wood may become wet.
C. Preservative Treatment:
1. Preservative Pressure Treatment of Lumber Above Grade: AWWA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft retention.
a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
b. Treat lumber in contact with roofing, flashing, or waterproofing.
c. Treat lumber in contact with masonry or concrete.
d. Treat lumber less than 18 inches above grade.

- 1) Treat lumber in other locations as indicated.
2. Preservative Pressure Treatment of Plywood Above Grade: AWWA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative to 0.25 lb/cu ft retention.
a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
b. Treat plywood in contact with roofing, flashing, or waterproofing.
c. Treat plywood in contact with masonry or concrete.
d. Treat plywood less than 18 inches above grade.
e. Treat plywood in other locations as indicated.
3.01 INSTALLATION — GENERAL
A. Select material sizes to minimize waste.
B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.
3.02 BLOCKING, NAILERS, AND SUPPORTS
A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.
C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
E. Specifically, provide the following non-structural framing and blocking:
1. Handrails.
2. Grab bars.
3. Toilet room accessories.
3.04 INSTALLATION OF CONSTRUCTION PANELS
A. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
1. At long edges use sheathing clips where joints occur between roof framing members.
2. Screw panels to framing; staples are not permitted.
B. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.
C. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24-inches on center on all edges and into studs in field of board.
1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
3. Install adjacent boards without gaps.
3.05 SITE APPLIED WOOD TREATMENT
A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.
B. Allow preservative to dry prior to erecting members.
3.06 TOLERANCES
A. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

SECTION 07 2100 — BOARD AND BATT INSULATION

- 1.01 SECTION INCLUDES
A. Insulation at perimeter foundation wall, underside of slabs, and indicated on drawings.
B. Batt insulation in exterior wall, ceiling, and roof construction.
1.02 SUBMITTALS
A. Provide data on product characteristics, performance, usage, and product limitations.
1.03 FIELD CONDITIONS
A. Do not install insulation adhesive when temperature or weather conditions are detrimental to successful installation.
2.01 FOAM BOARD INSULATION MATERIALS
A. Extruded Polystyrene Board Insulation: ASTM C578, Type IV; Extruded polystyrene board with either natural or cut cell surfaces; with the following characteristics:
1. Flame Spread Index: 450 or less, when tested in accordance with ASTM E84.
2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
2.02 BATT INSULATION MATERIALS
A. Glass Fiber Batt Insulation: Flexible, formed batt or blanket, complying with ASTM C665; friction fit.
1. Flame Spread Index: 450 or less, when tested in accordance with ASTM E84.
2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
3. Combustibility: Non-combustible, when tested in accordance with ASTM E136.
4. Formaldehyde Content: Zero.
5. Facing: Unfaced.
a. In Climate Zones 4c and above; where a separate vapor retarder is being used.
b. In Climate Zones 1, 2, 3, 4a & 4b; where no vapor retarder is required.
6. Facing: Asphalt treated Kraft paper, one side.
a. In Climate Zones 4c and above; where a vapor retarder is required.
b. Facing can not be exposed.
2.03 ACCESSORIES
A. Sheet Vapor Retarder: Polyamide film with variable vapor permeability based on ambient humidity. Permeance of 1 perm or less by the dry cup method, increasing to 10 perms by the wet cup method. Flame spread rating of 25 or less, when tested in accordance with ASTM E84.
B. Tape: As recommended by manufacturer.
C. Insulation Fasteners: Impaling clip of unfinished steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate; capable of security and rigidly fastening insulation in place.
D. Adhesive: Type recommended by insulation manufacturer for application.

- 3.01 EXAMINATION
A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.
3.05 BATT INSTALLATION
A. Install insulation and vapor retarder in accordance with manufacturer's instructions.
B. Install in exterior wall, roof, and ceiling spaces without gaps or voids. Do not compress insulation.
C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
E. Install with factory applied vapor retarder membrane facing warm side of wall assembly. Lap ends and side flanges of membrane over framing members.
F. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.
G. Place Sheet Vapor Retarder on warm side of insulation; lap and seal sheet retarder joints over member face.
H. Tape seal tears or cuts in vapor retarder.
I. Extend vapor retarder membrane tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane. Tape seal in place.

SECTION 05 5500 — METAL FABRICATION

- 1.01 SUBMITTALS
A. Shop Drawings: Indicate profiles, sub-connection attachments, reinforcing, anchorage, size and type, fasteners and accessories. Include erection drawings, elevations, and details where applicable. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
1 MATERIALS — STEEL
A. Steel Sections: ASTM A 36/A 36M.
B. Bolts, Nuts, and Washers: ASTM A500/A500M, Grade B cold-formed structural tubing.
C. Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.
D. Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, galvanized to ASTM A 153/A 153M where connecting galvanized components.
E. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
F. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
G. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I — Inorganic, complying with VOC limitations of authorities having jurisdiction.
2.02 FABRICATION
A. Fit and shop assemble items in largest practical sections, for delivery to site.
B. Fabricate items with joints tightly fitted and secured.
C. Continuously seal joined members by continuous welds.
D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
2.03 FABRICATED ITEMS
A. Bumper Posts and Guard Rails: As detailed; galvanized finish.
B. Ballards: Steel pipe, concrete filled, crowned cap, as detailed; galvanized finish.
C. Lintels: As detailed; galvanized finish.
2.04 FINISHES — STEEL
A. Prepare surfaces to be primed in accordance with SSPC-SP2.
B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
C. Prime Painting: One coat.
D. Galvanizing of Steel Members: Galvanize after fabrication to ASTM A 123/A 123M requirements.
2.05 FABRICATION TOLERANCES
A. Squareness: 1/8 inch maximum difference in diagonal measurements.
B. Maximum Offset Between Faces: 1/16 inch.
C. Maximum Misalignment of Adjacent Members: 1/16 inch.
D. Maximum Bow: 1/8 inch in 48 inches.
E. Maximum Deviation From Plane: 1/16 inch in 48 inches.
3.01 EXAMINATION
A. Verify that field conditions are acceptable and are ready to receive work.
3.02 PREPARATION
A. Clean and strip primed steel items to bare metal where site welding is required.
B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.
3.03 INSTALLATION
A. Install items plumb and level, accurately fitted, free from distortion or defects.
B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
C. Perform field welding in accordance with AWS D1.1/D1.1M.
D. Obtain approval prior to site cutting or making adjustments not scheduled.
E. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.
3.04 TOLERANCES
A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
B. Maximum Offset From True Alignment: 1/4 inch.
C. Maximum Out-of-Position: 1/4 inch.

APP: 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842,