

SECTION 06075

WOOD PRESERVATIVE TREATMENT

PART 1 - GENERAL

1.01 DESCRIPTION:

- A. This section specifies preservative treatment of timber and lumber where shown.
- B. Unless otherwise shown, apply preservative treatments as follows:
 - 1. Creosote: Apply creosote treatment to wood which meets all of the following :
 - a. Is to be in contact with water or earth.
 - b. Is to be exposed to weather but not painted.
 - c. Is not subject to handling after installation.
 - 2. Pentachlorophenol and copper naphthenate: Apply pentachlorophenol and copper naphthenate treatment to wood which meets all of the following:
 - a. Is exposed to the weather.
 - b. May or may not be painted.
 - c. Is subject to handling after installation.
 - 3. Water-borne preservatives:
 - a. Use in approved locations.
- C. Definitions:
 - 1. PPT: Pressure-preservative treated.
 - 2. FRT: Fire-retardant treated.
 - 3. MSDS: Material safety data sheets.

1.02 SUBMITTALS:

Submit the following for approval in accordance with the General Requirements and with the additional requirements as specified for each:

- A. Product Data: Manufacturer's product data and MSDS, including instructions for handling, storing, installing and finishing treated material.
- B. Certification: Submit certification that furnished meet specified requirements with each shipment of treated timber and lumber.

1.03 QUALITY ASSURANCE:

- A. Codes, Regulations, Reference Standards and Specifications:
 - 1. Comply with codes and regulations of the jurisdictional authorities.
 - 2. AWPA Standards: C2, C3, C9, C20, C27, C35, M4, P1, P2, P5, P8, P17.
- B. Source Quality Control:
 - 1. Use only preservative treatment materials which have been tested and approved.
 - 2. After treatment have each piece of material stamped with the American Wood Preserver's Institute Quality Mark to indicate compliance with specified requirements.
 - 3. Inform the Engineer when treated wood is ready for inspection.
 - 4. Ship treated wood only after inspection and approval.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. Handling:
 - 1. Handle treated items with rope slings or other approved means. Do not drop, bruise, break outer fibers or penetrate surface with sharp tools.
 - 2. When stacking timber, avoid use of sharp tools for handling or turning in leads.
- B. Storage:
 - 1. Ensure that storage area has been cleared of debris and vegetation to at least four feet beyond limits of stored materials.
 - 2. Provide drainage away from stored materials.
 - 3. Store piles of timber and lumber so as to permit ready access and free air circulation.
 - 4. Store treated timber and lumber at least 12 inches above surface of ground.
 - 5. Stack ties no more than 20 layers high nor 10 feet wide.

PART 2 MATERIALS:

2.01 MATERIALS:

- A. Creosote: AWPA P1.
- B. Creosote and Coal-Tar Solution: Coal-tar distillate or solution of coal tar in coal-tar distillate conforming to AWPA P2.
- C. Pentachlorophenol: AWPA P8.
- D. Copper Naphthenate: AWPA P8..
- E. Waterborne Preservatives: AWPA P5.
- F. Fire Retardant Formulations: AWPA P17.

PART 3 - EXECUTION

3.01 TREATMENT:

- A. General:
 - 1. Prior to treating timber and lumber, perform fitting, cutting, drilling and mortising of joints.
 - 2. After treatment, kiln-dry lumber and plywood to a maximum moisture content of 19 and 15 respectively.
- B. Pressure treat timber and lumber in accordance with AWPA C2. For creosote, creosote solutions and oil-borne preservatives, use empty-cell treatment. If retention specified is greater than can be obtained by empty-cell process, inject water-borne preservative by full-cell process.
- C. Piles: Unless otherwise shown, apply creosote treatment to timber piles in accordance with AWPA C3.
- D. Poles: Unless otherwise shown, apply creosote treatment to timber poles in accordance with AWPA C35.

- E. Plywood (PPT): Pressure preservative treat plywood where indicated in accordance with AWPA C9.
- F. Plywood (FRT): Pressure fire retardant treat plywood where indicated in accordance with AWPA C27.
- G. Miscellaneous Wood Framing: Treat indicated items and the following in accordance with AWPA C2.
 - 1. Wood cants, nailers, curbs , equipment support bases, blocking stripping and similar members in connection with roofing, flashing, vapor barriers and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping and similar concealed membrane in contact with masonry or concrete.
 - 3. Wood framing members less than 18 inches above grade.
 - 4. Wood floor plates installed over concrete slabs directly in contact with earth.
- H. Fire-Retardant Treatment for Lumber (FRT): Fire-retardant wood treatment in accordance with AWPA C20.
- I. Incising:
 - 1. For lumber with least dimension between two inches and three inches, incise wide faces by means of suitable power-driven machine prior to treatment.
 - 2. For timber with least dimension in excess of three inches, incise all four faces.

3.02 TREATMENT OF FIELD CUTS:

- A. Treat bare surfaces resulting from drilling, cutting, tapping or damage of timber and lumber in accordance with AWPA M4.
- B. Apply same treatment to cutoff surfaces of timber piles not embedded in concrete.

END OF SECTION

SECTION 06100

ROUGH CARPENTRY

PART 1 - GENERAL

1.01 DESCRIPTION:

- A. This section specifies rough carpentry for wood blocking, roof sheathing, rooftop equipment bases and support curbs, miscellaneous lumber and accessories.
- B. Related Work Specified Elsewhere:
 - 1. Wood Preservative Treatment: Section 06075.
 - 2. Roof Accessories: Section 07730.
 - 3. Flashing and Sheet Metal: Section 07600.

1.02 SUBMITTALS:

- A. Submit the following for approval in accordance with the General Requirements and with the additional requirements as specified for each:
- B. Product Data for metal framing anchors and construction adhesives.

1.03 QUALITY ASSURANCE:

- A. Codes, Regulations, Reference Standards and Specifications:
- B. Comply with codes and regulations of the jurisdictional authorities.
 - 1. ALSC: NGR.
 - 2. DOC PS20.
 - 3. AWPA C2, C9, C20, C27, M4.
 - 4. UL.
 - 5. APA.
 - 6. FS FF-N-105.
 - 7. CAB NER-272.
 - 8. ASME A153, A307, A563, A653, B18.6.1, B18.2.1

1.04 DELIVERY, STORAGE, AND HANDLING:

- A. Keep materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings.
 - 1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

PART 2 - PRODUCTS

2.01 LUMBER, GENERAL:

- A. Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard," and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.

- B. Dressed sizes of green lumber are larger than dry lumber under DOC PS 20. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.

2.02 WOOD-PRESERVATIVE-TREATED MATERIALS:

- A. General: Where lumber or plywood is indicated as preservative treated or is specified to be treated, comply with applicable requirements of AWWA C2 (lumber) and AWWA C9 (plywood). Mark each treated item with the Quality Mark Requirements of an inspection agency approved by ALSC's Board of Review.
 - 1. Do not use chemicals containing chromium or arsenic.
- B. Pressure treat aboveground items with waterborne preservatives to a minimum retention of 0.25 lb/cu. ft.. After treatment, kiln-dry lumber and plywood to a maximum moisture content of 19 and 15 percent, respectively. Treat indicated items and the following:
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 - 3. Wood framing members less than 18 inches above grade.
 - 4. Complete fabrication of treated items before treatment, where possible. If cut after treatment, apply field treatment complying with AWWA M4 to cut surfaces. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

2.03 FIRE-RETARDANT-TREATED MATERIALS:

- A. General: Where fire-retardant-treated wood is indicated, comply with applicable requirements of AWWA C20 (lumber) and AWWA C27 (plywood). Identify fire-retardant-treated wood with appropriate classification marking of UL; U.S. Testing; Timber Products Inspection, Inc.; or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Research or Evaluation Reports: Provide fire-retardant-treated wood acceptable to authorities having jurisdiction and for which a current model code research or evaluation report exists that evidences compliance of fire-retardant-treated wood for application indicated.
- B. Interior Type A: For interior locations, use chemical formulation that produces treated lumber and plywood with the following properties under conditions present after installation:
 - 1. Bending strength, stiffness, and fastener-holding capacities are not reduced below values published by manufacturer of chemical formulation under elevated temperature and humidity conditions simulating installed conditions when tested by a qualified independent testing agency.
 - 2. No form of degradation occurs due to acid hydrolysis or other causes related to treatment.
 - 3. Contact with treated wood does not promote corrosion of metal fasteners.

2.04 DIMENSION LUMBER:

- A. General: Provide dimension lumber of grades indicated according to the ALSC National Grading Rule (NGR) provisions of the inspection agency indicated.

2.05 MISCELLANEOUS LUMBER:

- A. General: Provide lumber for support or attachment of other construction, including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members.
- B. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.
- C. Moisture Content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.

2.06 ROOF SHEATHING:

- A. General: Where structural-use panels are indicated for the following concealed types of applications, provide American Plywood Association (APA)-performance-rated panels complying with requirements designated under each application for grade, span rating, exposure durability classification, and edge detail (where applicable).
 - 1. Thickness: Provide panels meeting requirements specified but not less than thickness indicated.
 - 2. Span Ratings: Provide panels with span ratings required to meet "Code Plus" provisions of APA Form No. E30, "APA Design/Construction Guide: Residential & Commercial."

2.07 FASTENERS:

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
 - 1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with a hot-dip zinc coating per ASTM A 153 or of Type 304 stainless steel.
- B. Nails, Wire, Brads, and Staples: FS FF-N-105.
- C. Power-Driven Fasteners: CABO NER-272
- D. Wood Screws: ASME B18.6.1
- E. Lag Bolts: ASME B18.2.1.
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

2.08 METAL FRAMING ANCHORS:

- A. General: Provide galvanized steel framing anchors of structural capacity, type, and size indicated and as follows:
 - 1. Research or Evaluation Reports: Provide products for which model code research or evaluation reports exist that are acceptable to authorities having jurisdiction and that evidence compliance of metal framing anchors for application indicated with building code in effect for Project.
 - 2. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis, and demonstrated by comprehensive testing performed by a qualified independent testing agency.

- B. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653, G60 coating designation; structural, commercial, or lock-forming quality, as standard with manufacturer for type of anchor indicated.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL:

- A. Discard units of material with defects that impair quality of rough carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.
- B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted.
- C. Fit rough carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.
- D. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.
- E. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. Counsel of American Building Officials: CABO NER-272 for power-driven staples, P-nails, and allied fasteners.
 - 2. Published requirements of metal framing anchor manufacturer.
- F. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required.
- G. Use hot-dip galvanized or stainless-steel nails where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity.

3.02 WOOD GROUNDS, NAILERS, BLOCKING, AND SLEEPERS:

- A. Install wood nailers, blocking, and sleepers where shown and where required for screeding or attaching other work. Form to shapes shown and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.

END OF SECTION

SECTION 06130

TIMBER TIES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The section specifies furnishing timber cross ties, contact rail ties and switch ties as shown and specified.

1.02 RELATED SECTIONS

- A. Section 05651 - General Track Construction
- B. Section 05652 - Ballasted Track Construction
- C. Section 05654 - Special Trackwork Construction - Ballasted
- D. Section 05659 - Special Trackwork
- E. Section 05660 - Restraining Rail and Lubricators

1.03 REFERENCES

- A. American Railway Engineering and Maintenance-of-Way Association (AREMA), **latest edition:**
 - 1. AREMA Manual for Railway Engineering
 - 2. AREMA Portfolio of Trackwork Plans
 - 3. AREMA Specifications for Ties
 - 4. AREMA Specification for Preservatives
 - 5. AREMA Specification for Treatment
 - 6. AREMA Records of Treatment and Reports of Inspection.
- B. American Wood Preserver 's Association (AWPA)
 - 1. AWPA Standard C6
 - 2. AWPA Standard M3

1.04 SUBMITTALS

- A. Submittals shall be made on accordance with Section 01300, Submittals
- B. Documentation
 - 1. Proposed method of delivery. Submit not late than 60 days prior to delivery.
 - 2. Proposed anti-splitting devices and location in tie.
 - 3. Proposed manner of marking treated ties to indicate compliance with specifications.
 - 4. Certificate of Compliance with AWPA Standard M3 for tie treatment.

1.05 QUALITY ASSURANCE

- A. Inspection:
 - 1. The Engineer will inspect in accordance with pertinent sections of the AREMA Manual (**latest edition**), as modified herein.

2. Acceptance criteria: Failure to meet any pertinent part of AREMA requirements (latest edition) or these specifications constitutes cause for rejection. AREMA inspection requirements are to include, but not limited to, the physical requirement inspection criteria as outlined in Chapter 30, Section 3.1.1.4 (decay, holes, knots, shake, split, checks, slope of grain, bark seams and manufacturer defects).
3. Averaging of dimensions, with respect to measurement for size acceptance, is not permitted.
4. Provide suitable equipment, facilities and assistance required by the Engineer to effect inspections.
5. Inform the Engineer when treated wood is ready for inspection.
6. Do not deliver material until inspected and approved for shipment by the Engineer.
7. Final inspection and approval of ties will occur as a part of the final inspection of installed ballasted track.
8. WMATA, or its representatives, reserve the right to visit the producers facility during usual business hours unscheduled to: a) observe sampling and inspection procedures, b) obtain samples of the prepare material being produced and shipped, and c) review plant inspection methods, quality control procedures, equipment and examine inspection test results of current and previous tests.

1.06 DELIVERY, STORAGE AND HANDLING

- A. It shall be the Contractor's responsibility to make all arrangements for storage, shipment and handling of the ties.
- B. Tie stacks shall not exceed 20 layers each.
- C. Ties will be stacked with branding visible.
- D. Ties shall be handled in a manner that prevents damage.
- E. Ties shall not be dropped or dragged on the trackbed.

PART 2 - PRODUCTS

2.01 TIMBER

- A. Furnish ties in accordance with the requirements as specified in this section:

PART 3 - EXECUTION

3.01 REQUIREMENTS

- A. General Requirements:
 1. All ties shall be new.
 2. Physical requirements in accordance with the AREMA manual, as modified herein. (Reference the physical requirement criteria as outlined in Chapter 30, Section 3.1.1.4 - decay, holes, knots, shake, split, checks, slope of grain, bark seams and manufacturer defects).
 3. AREMA 7" Grade.
 4. All ties shall be Oak wood species.
 5. Sawed top, bottom and sides.
 6. Free of checks over two inches deep or extending more than eight inches from end of tie.

- B. Anti-splitting devices shall be nail plates in accordance with the AREMA Manual, as modified herein.
1. Minimum size 5 - ½ inches x 7 inches.
 2. Nail plates shall be installed by a method or machine that presses them into the end of the tie. Hammer installation of nail plates is not allowed and will be a cause for the rejection of the ties.
 3. Incise all sides prior to treatment to a depth of 3/4 inch. Thickness of incisor teeth shall not exceed 7/32 inch.
 4. Free of knots greater than ½ inch diameter for areas indicated in the AREMA Manual.
- C. Individual Requirements:
1. Cross ties:
 - a. Length: Eight feet six inches.
 - b. Straightness: A cross tie will be considered straight when a line along a side from the middle of one end to the middle of one end to the other end is everywhere more than 2-3/4 inches from the top and bottom of the tie.
 2. Contact rail ties:
 - a. Length: Ten feet.
 - b. Free of knots greater than ½ inch diameter in area of contact rail insulator, i.e., 100 through 110 inches from line end.
 - c. AREMA Size 5 requirements apply to contact rail insulator area.
 - d. Straightness: A contact rail tie will be considered straight when a line along the tip from the middle of one end to the middle of the other end is everywhere more than two inches from both sides.
 3. Switch ties:
 - a. Switch ties within Special Trackwork, as shown on the drawings.
 - b. Length: As shown in the contract documents.
 - c. Free of knots greater than ½ inch diameter for areas indicated in the AREMA Manual.
 - d. Straightness: A contact rail tie will be considered straight when a line along the top from the middle of one end to the middle of the other end is everywhere more than two inches from both sides.
- D. Preservative Treatment:
1. All timbers shall be bored for screw spikes. The holes shall be treated with copper naphthenate.
 2. Ties shall be treated in accordance with the requirements of AWPA Standard C6 for Cross Ties and Switch Ties. Conditioning prior to treatment shall be in accordance with Paragraph 3.2, Boulton Drying Process, of the above standard.
 3. Immediately following conditioning, the ties shall be pressure treated. Because of the environmental problems and other reasons, alternative preservative used shall be copper naphthenate. The minimum quality control requirements shall be in accordance with AWPA Standard M3. The treating company shall furnish a Certificate of Compliance with this standard, and shall certify the treatment according to the foregoing Specification.
 4. The Authority Engineer will determine when ties are ready for treatment.
 5. Use only tested and approved preservatives.
 6. Stamp each treated tie to indicate compliance with these specifications.
 7. Complete AREMA or AWPA forms for treatment of ties.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

- A. Measurement of work specified in this section will be made in the following manner:
 - 1. No separate measurement.

4.02 PAYMENT:

- A. Compensation for work specified in this section will be in the following manner:
 - 1. Included in the price of the work of which it is a part.

END OF SECTION

SECTION 06131

COMPOSITE (PLASTIC) TIES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. This section specifies furnishing composite (plastic) cross ties, contact rail ties and switch ties as shown and specified.

1.02 RELATED SECTIONS

- A. Section 05651 - General Track Construction
- B. Section 05652 - Ballasted Track Construction
- C. Section 05654 - Special Trackwork Construction - Ballasted
- D. Section 05659 - Special Trackwork
- E. Section 05660 - Restraining Rail and Lubricators

1.03 REFERENCES

- A. American Railway Engineering and Maintenance-of-Way Association (AREMA), **latest edition**:
 - 1. AREMA Manual for Railway Engineering
 - 2. AREMA Portfolio of Trackwork Plans
 - 3. AREMA Specifications for Ties
- B. ASTM D696
- C. ASTM D6108
- D. ASTM D6109
- E. ASTM D6111
- F. ASTM D6117

1.04 DESIGN REQUIREMENTS

- A. The tie shall be designed to resist rail seat positive, rail seat negative, tie center negative and tie center positive bending moments. Refer to the AREMA Manual (**latest edition**) for design considerations for the composite tie.
- B. Tie design shall be based on American railroad 100 ton capacity freight car and train operations. The Contractor must submit documentation indicating that the plastic or composite railroad tie which is to be provided to the Authority has been successfully tested in such railroad application. The railroad tie shall have safely functioned under railroad conditions without failure.

- C. Anticipated service life of the tie shall be 50 years. Tie shall support the weight and dynamic forces of the rail and trains without failure requiring the tie to be replaced during the anticipated service life.

1.05 SUBMITTALS

- A. Submittals shall be made on accordance with Section 01300, Submittals
- B. Documentation
 - 1. Proposed method of delivery. Submit to the Engineer at least 60 days prior to delivery.
 - 2. Proposed damage protection and treatment.
- C. The manufacturer shall submit sealed calculations of the design.
- D. The manufacturer shall submit MSDS data for the tie.
- E. The manufacturer shall provide certified test reports, **and any other documents to substantiate certification**, that the ties being provided meet or exceed the specified physical properties.

1.06 QUALITY ASSURANCE

- A. Inspection:
 - 1. In accordance with pertinent sections of the AREMA Manual as modified herein.
 - 2. Acceptance criteria: Failure to meet any pertinent part of AREMA requirements **(latest edition)** or these specifications constitutes cause for rejection.
 - 3. Averaging of dimensions, with respect to measurement for size acceptance, is not permitted.
 - 4. Provide suitable equipment, facilities and assistance required by the Engineer to effect inspections.
 - 5. Inform the Engineer when composite (plastic) ties are ready for inspection.
 - 6. Do not deliver material until inspected and approved for shipment by the Engineer.
 - 7. Final inspection and approval of composite (plastic) ties will occur as a part of the final inspection of installed ballasted track.
 - 8. **WMATA, or its representatives, reserve the right to visit the producers facility during usual business hours unscheduled to: a) observe sampling and inspection procedures, b) obtain samples of the prepare material being produced and shipped, and c) review plant inspection methods, quality control procedures, equipment and examine inspection test results of current and previous tests.**

1.07 DELIVERY, STORAGE AND HANDLING

- A. It shall be the Contractor's responsibility to make all arrangements for storage, shipment and handling of the ties.
- B. Ties shall be handled in a manner that prevents damage.
- C. Ties shall not be dropped or dragged on the trackbed.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Properties

1. Composition: plastic composite formulation of foamed, colored, recycled polyolefin plastic reinforced with materials such as fiber glass or styrene. No wood or rubber material over 3% is allowed.
2. Color shall be black.
3. Ties shall not require use of toxic preservatives.
4. Ties shall resist decay and insect attack. Water absorption shall not cause loss of strength requiring the tie to be replaced.
5. Ties shall be non-conductive electrically.
6. Ties shall be non-hazardous and non-leaching.

2.02 REQUIREMENTS

A. General Requirements:

1. All ties shall be new.
2. Physical requirements, design and manufacture: Pertinent sections of the AREMA manual (**latest edition**), as modified herein.
3. Ties shall interact with the ballast and distribute the weight of the train to the underlying roadbed. Tie surface shall provide resistance to lateral movement, equal to or better than a wood tie of the same dimensions.
4. Ties shall hold gauge of track on tangent and curves similar to the wood tie of the same dimensions.
5. Ties shall permit the application of standard rail, tie plate and hold-down fasteners, such as screw spikes or cut spikes, without requiring special procedures for installation other than ordinary predrilling of the tie. The hole diameter shall be of sufficient size to prevent splitting of the tie during installation of the track screw spike but shall not permit the track screw spike to back-out after installation due to vibration from passing trains.
6. Ties shall provide rail seat loading (compression) without failure. Ties shall be stiff enough to support the weight but flexible enough to absorb the vibration of passing trains.
7. All tie surfaces shall be non-skid.
8. Tie surfaces shall have slip resistance equal to or better than a wood tie.
9. Ties shall not be prone to failure due to extreme weather related heat or freezing temperatures.
10. Ties shall not warp or sag to the level of permanent deformation which would require replacement of the tie.
11. Ties shall not require end caps. Ties shall not split or crack requiring the tie to be replaced.
12. Tie surface degradation due to sunlight (UV radiation) exposure shall not exceed 0.003" per year.
13. Tie surface deterioration due to abrasion shall not exceed that of a wood tie.
14. Tie surface flatness in the area of the tie plate, 11" from each end and for a distance of 20", shall be within 0.125".
15. All ties shall have a thickness tolerance +1/8", -0". Width tolerance +/-1/4". Length tolerance +1/2", -0".
16. Ties for installation in ballasted track shall have three (3) sides (two - 7" sides and one - 9" side) knurled to resist lateral movement in the ballast.
17. Straightness: All ties will be considered straight when a line along a side from the middle of one end to the middle of one end to the other end is everywhere more than 2-3/4 inches from the top and bottom of the tie.
18. **Ties should not split or crack in anyway requiring the tie to be replaced.**

19. Material surface degradation due to solar ultraviolet (UV) radiation exposure shall not exceed 0.003 inch (0.076 mm) per year.

- B. Individual Requirements:
1. Cross ties:
 - a. Length: Eight feet six inches.
 2. Contact rail ties:
 - a. Length: Ten feet.
 - b. AREMA Size 5 requirements apply to contact rail insulator area.
 3. Switch ties:
 - a. Switch ties within Special Trackwork, as shown on the drawings.
 - b. Length: As shown.

2.03 TESTING AND TECHNICAL DATA

- A. Mechanical Properties and Test Method
1. Composite railroad tie samples shall be tested per the appropriate ASTM test standards for the mechanical properties listed in the table below by an independent testing agency.
 2. Actual test results shall be submitted on a form similar to Exhibit A.
 3. The typical values shown in the following table represent anticipated material parameters based on "as manufactured" plastic tie specimens measuring 7"x 9" or 4'x 6" in cross-section. Strength values shown are at failure. Design allowable values shall have a minimum factor of safety against failure of 2.5.

Mechanical Properties/Test Method	Typical Value	Size of Test Specimen
Specific Gravity ASTM D6111-97	0.90	7" x 9"
Density - ASTM D6111-97	45.0 lbs. per cu ft	7" x 9"
Coefficient of Thermal Expansion - ASTM D696-91	0.00007 in/in per degree F (Max.)	7" x 9"
Compressive Strength - ASTM D6108-97 (Compression Parallel to Grain)	3,000 psi minimum	4" x 6"
Compressive Strength - ASTM D6108-97 (Compression Perpendicular to Grain)	1,000 psi minimum	7" x 9"
Permanent Deformation Under Load ASTM D6108-97 (Compression Perpendicular to Grain)	0.0015 inch (Max.)	7" x 9"
Modulus of Elasticity (Compression) ASTM D6108-97	170,000 psi minimum	4" x 6"
Flexural Strength - ASTM D6109- 97	2,500 psi minimum	4" x 6"

Modulus of Elasticity (Flexure) ASTM D6109-97	200,000 psi minimum	4" x 6"
Shear Strength - ASTM D6109-97 (Calc.)	1,000 psi minimum	4" x 6"
Mechanical Fasteners - ASTM D6117-97 Screw Spike Pullout	2,500 lbs. minimum	7" x 9"

- B. Rail Seat Compression Test shall be as follows:
1. Test specimen(s) shall be from as manufactured plastic ties with 7" x 9" in cross-section and cut to thirty inches in length.
 2. The tie shall rest on a flat surface, on it's nine inch face, shall be loaded from the top through a one foot section of AREMA 115 RE rail secured to the tie with a Pandrol tie plate and "e" clip and two screw spikes. The Pandrol tie plate shall be 7 3/4" by 14 7/8" dimension (standard dimensional tolerances apply). The tie plate shall be centered on the plastic tie segment in a Universal Test Machine (200,000 pound hydraulic).
 3. The head of the rail shall be loaded in 10,000 pound increments beginning at 70,000 pounds.
 4. Loading shall increase until tie failure or deformation of 0.125 inches.
 5. The load at failure shall be recorded and the compressive (bearing) stress under the tie plate shall be calculated using the tie plate dimension.
 6. Deformation to the tie shall be measured and recorded. Tie deformation shall not exceed 0.125 inches.
- C. Permanent Deformation Under Load Test:
1. Test specimen(s) shall be from as manufactured plastic ties with a 7" x 9" cross-section and cut to thirty inch length.
 2. The tie shall rest on a flat surface, on it's nine inch face, shall be loaded from the top thru a one foot section of AREMA 115 RE rail secured to the tie with a Pandrol tie plate and "e" clip and two screw spikes. The Pandrol tie plate shall be 7 3/4" by 14 7/8" dimension (standard dimensional tolerances apply). The tie plate shall be centered on the plastic tie segment in a Universal Test Machine (200,000 pound hydraulic).
 3. The head of the rail shall be loaded for one hour at each 5,000 pound increment
 4. Unload the rail and record the amount of permanent deformation.
 5. The permanent deformation after the load is removed shall not exceed 0.0015 inches.
 6. Screw spike withdrawal resistance testing:
 7. Standard uncoated Style "U" track screw spike, 3/4" diameter, 5-1/2" length and 1/4" end taper.
 8. Predrilling of the crosstie shall be permitted. The hole diameter shall be of sufficient size to prevent splitting of the tie during installation of the track screw spike but shall not permit the track screw spike to back-out after installation due to vibration from passing trains.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The composite (plastic) ties shall be installed in compliance with the Ballasted Track Construction: Section 05652.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. Measurement of work specified in this section will be made in the following manner:
 - 1. No separate measurement.

4.02 PAYMENT

- A. Compensation for work specified in this section will be in the following manner:
 - 1. Included in the price of the work of which it is a part.

EXHIBIT A

SAMPLE OF MECHANICAL PROPERTIES TABLE

PROPOSAL INCLUDES MECHANICAL PROPERTIES TABLE TO BE FILLED WITH
TEST RESULT VALUES BY SUPPLIER

MECHANICAL PROPERTIES TABLE - VALUES TO BE WRITTEN BY SUPPLIER

Mechanical Properties/Test Method	Typical Value	Size of Test Specimen
Specific Gravity - ASTM D6111-97	VALUES TO BE WRITTEN BY SUPPLIER	7" x 9"
Density - ASTM D6111-97		7" x 9"
Coefficient of Thermal Expansion -ASTM D696-91		7" x 9"
Compressive Strength - ASTM D6108-97 (Compression Parallel to Grain)		4" x 6"
Compressive Strength - ASTM D6108-97 (Compression Perpendicular to Grain)		7" x 9"
Permanent Deformation Under Load ASTM D6108-97 (Compression Perpendicular to Grain)		7" x 9"
Modulus of Elasticity (Compression) ASTM D6108-97 (170,000 psi minimum)		4" x 6"
Flexural Strength - ASTM D6109-97		4" x 6"
Modulus of Elasticity (Flexure) ASTM D6109-97		4" x 6"
Shear Strength - ASTM D6109-97 (Calc.)		4" x 6"
Mechanical Fasteners - ASTM D6117-97 Screw Spike Pullout		7" x 9"

END OF SECTION

SECTION 06132

TIMBER GRADE CROSSINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The section specifies furnishing solid timber panel grade crossings as shown on the Contract Drawings. Solid timber panel grade crossings shall be in accordance with the current requirements of the AREMA "Guidelines for the Construction or Reconstruction of Highway - Railway Crossings" except as modified herein.

1.02 RELATED SECTIONS

- A. General Track Construction: Section 05651
- B. Ballasted Track Construction: Section 05652

1.03 REFERENCES

- A. American Railway Engineering and Maintenance-of-Way Association (AREMA), **latest edition**:
 - 1. AREMA Manual for Railway Engineering
 - 2. AREMA Portfolio of Trackwork Plans
 - 3. AREMA "Guidelines for the Construction or Reconstruction of Highway - Railway Crossings"
 - 4. AREMA Specification for Preservatives
 - 5. AREMA Specification for Treatment
 - 6. AREMA Records of Treatment and Reports of Inspection
- B. American Wood Preserver 's Association (AWPA)
 - 1. AWPA Standard C6
 - 2. AWPA Standard M3

1.04 SUBMITTALS

- A. Submittals shall be made on accordance with Section 01300, Submittals
- B. Documentation
 - 1. Proposed method of delivery. Submit prior to delivery.
 - 2. Proposed anti-splitting devices and location in timbers.
 - 3. Proposed manner of marking treated timbers to indicate compliance with specifications.
 - 4. Certificate of Compliance with AWPA Standard M3 for timber treatment.

1.05 QUALITY ASSURANCE

- A. Inspection:
 - 1. In accordance with pertinent sections of the AREMA Manual (**latest edition**), as modified herein.

2. Acceptance criteria: Failure to meet any pertinent part of AREMA requirements (latest edition) or these specifications constitutes cause for rejection. AREMA inspection requirements are to include, but not limited to, the physical requirement inspection criteria (decay, holes, knots, shake, split, checks, slope of grain, bark seams and manufacturer defects).
3. Averaging of dimensions, with respect to measurement for size acceptance, is not permitted.
4. Provide suitable equipment, facilities and assistance required by the Engineer to effect inspections.
5. Inform the Engineer when treated wood is ready for inspection.
6. Do not deliver material until inspected and approved for shipment by the Engineer.
7. Final inspection and approval of ties will occur as a part of the final inspection of installed ballasted track.
8. WMATA, or its representatives, reserve the right to visit the producers facility during usual business hours unscheduled to: a) observe sampling and inspection procedures, b) obtain samples of the prepare material being produced and shipped, and c) review plant inspection methods, quality control procedures, equipment and examine inspection test results of current and previous tests.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Furnish timbers in accordance with the requirements, as specified in this section:
- B. Crossing timbers shall be sawed, treated oak made into panels approximately 8 feet in length. Field side sections shall be 20 inches wide consisting of two 10 inch timbers and gauge side sections shall be 25-1/2 inches wide consisting of three 8-1/2 inch timbers.
- C. Each gauge section shall have a filler block of such size and shape as to provide a snug fit against the rail web and a flangeway 2-1/2 inches wide and 3 inches deep.
- D. Each section shall be made up using three 3/4 inch spiral dowel pins.
- E. Each section shall have 8 holes for use in anchoring the section to the ties with lag screws. These holes shall be 13/16 inches in diameter and shall have a 2-5/8 inches counter bore 1-1/4 inches deep in the top side.
- F. Each section shall be anchored in place with 10 inches long, 3/4 inch diameter lag screws. After the lag screw is in place, the counter bore shall be filled with a mastic material.
- G. Sections shall be full depth with the top surface in the plane of the top of rail and the bottom of the section resting directly on the cross tie.

PART 3 - EXECUTION

3.01 REQUIREMENTS

- A. The Contractor shall construct the crossings as shown on the Contract Drawings.
- B. Grade crossing track shall be ballasted track using standard AREMA Tie Plates, Plan No. 8, Punching A and Cut Spikes, with ties spaced at 19-1/4 inch centers.

- C. Prior to place timbers, grade crossing track shall be brought to final alignment and grade within the tolerances for ballasted yard and secondary track as specified in Section 05651, General Track Construction.
- D. Ballast shall be added to provide full cribs and level shoulders.
- E. Ties shall be swept clean of all loose ballast and debris prior to placing timbers. The timbers shall then be properly located, so that the heart wood will be on the bottom side.
- F. No shims shall be used between timbers and cross ties.
- G. The outside ends of end timbers shall be beveled. The bevel shall have dimensions of 4 inches measured horizontally and vertically.
- H. All bored holes and bevels shall be treated with pentachlorophenol or creosote immediately after boring and beveling.
- I. Two field sections and two gauge sections shall constitute one grade crossing panel.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

- A. Measurement of work specified in this section will be made in the following manner:
 - 1. No separate measurement.

4.02 PAYMENT:

- A. Compensation for work specified in this section will be in the following manner:
 - 1. Included in the price of the work of which it is a part.

END OF SECTION

SECTION 06402

INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.01 DESCRIPTION:

- A. This Section specifies providing wood cabinets, plastic-laminate cabinets, wood countertops, plastic-laminate countertops, solid-surfacing-material countertops.
 - 1. Related Work Specified Elsewhere:
 - a. Rough Carpentry: Section 06100.
 - b. Seals and Sealants: Section 07900.

1.02 SUBMITTALS:

- A. Submit the following for approval in accordance with the General Requirements and with the additional requirements as specified for each:
- B. Product Data: For each type of product indicated, including cabinet hardware and accessories, and finishing materials and processes.
- C. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
 - 1. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in Section 06100.
 - 2. Show locations and sizes of cutouts and holes for installed in architectural woodwork.
- D. Samples for Initial Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available for each type of material indicated.
 - 1. Plastic laminates.
 - 2. Solid-surfacing materials.
- E. Samples for Verification: For the following:
 - 1. Plastic-laminate-clad panel products, 8 by 10 inches, for each type, color, pattern, and surface finish.
 - 2. Solid-surfacing materials, 6 inches square.
 - 3. Exposed cabinet hardware and accessories, one unit for each type.
- F. Certification: Signed by manufacturers of woodwork certifying that products furnished comply with requirements.
- G. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.03 QUALITY ASSURANCE:

- A. Codes, Regulations, Reference Standards and Specifications:
 - 1. Comply with codes and regulations of the jurisdictional authorities.
 - 2. AWI: Section 400 & 700, AGS.

3. Builders Hardware Manufacturer's Association (BHMA): A156.9, A256.11, A156.18, B01361, B01521, B02011, B03141, B04071, B04081, B04013, B05091, E07121, E7041, 613, 630, 640
 4. ANSI A208.2, Z124.3
 5. NEMA LD 3.
- B. Installer Qualifications: An experienced installer who has completed architectural woodwork similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Fabricator Qualifications: A firm experienced in producing architectural woodwork similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards" for grades of interior architectural woodwork, construction, finishes, and other requirements.
1. Provide AWI Quality Certification Program certificate indicating that woodwork complies with requirements of grades specified.

1.04 DELIVERY, STORAGE, AND HANDLING:

- A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.05 PROJECT CONDITIONS:

- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed and indicate measurements on Shop Drawings.
 2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.06 COORDINATION:

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. General: Provide materials that comply with requirements of the AWI quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.
- B. Wood Products: Comply with the following:
 - 1. Medium-Density Fiberboard: ANSI A208.2, Grade MD-Exterior Glue.
- C. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated, or if not indicated, as required by woodwork quality standard.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering high-pressure decorative laminates that may be incorporated into the Work include, but are not limited to, the following:
 - a. Formica Corporation.
 - b. International Paper; Decorative Products Div.
 - c. Wilsonart International; Div. of Premark International, Inc.
- D. Adhesive for Bonding Plastic Laminate: Unpigmented contact cement.
- E. Solid-Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with material and performance requirements in ANSI Z124.3, for Type 5 or Type 6, without a precoated finish.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Corian; DuPont Polymers.
 - b. Surell; Formica Corporation.
 - c. Fountainhead; International Paper, Decorative Products Div.
 - d. Gibraltar; Wilsonart International, Div. of Premark International, Inc.

2.02 CABINET HARDWARE AND ACCESSORIES:

- A. Butt Hinges: 2-3/4-inch, 5-knuckle steel hinges made from 0.095-inch- thick metal, and as follows:
 - 1. Semiconcealed Hinges for Flush Doors: BHMA A156.9, B01361.
 - 2. Semiconcealed Hinges for Overlay Doors: BHMA A156.9, B01521.
- B. Back-Mounted Pulls: BHMA A156.9, B02011.
- C. Wire Pulls: Back mounted, 5 inches long, 2-1/2 inches deep, and 5/16 inches in diameter.
- D. Catches: Magnetic catches, BHMA A156.9, B03141.
- E. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081.
- F. Shelf Rests: BHMA A156.9, B04013.
- G. Drawer Slides: Side-mounted, full-extension, zinc-plated steel drawer slides with steel ball bearings, BHMA A156.9, B05091, and rated for the following loads:
 - 1. Box Drawer Slides: 100 lbf.
 - 2. File Drawer Slides: 200 lbf.
- H. Door Locks: BHMA A156.11, E07121.

- I. Drawer Locks: BHMA A156.11, E07041.
- J. Grommets for Cable Passage through Countertops: 2-inch OD, black, molded-plastic grommets and matching plastic caps with slot for wire passage.
- K. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated. Dark, Oxidized, Satin Bronze, Oil Rubbed: BHMA 613 for bronze base; BHMA 640 for steel base; match Architect's sample.
 - 1. Satin Stainless Steel: BHMA 630.
- L. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.03 INSTALLATION MATERIALS:

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

2.04 FABRICATION, GENERAL:

- A. Interior Woodwork Grade: Provide [**Premium**] [**Custom**] grade interior woodwork complying with the referenced quality standard.
- B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.
- C. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible, before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting. Retain subparagraph below if Architect will visit woodwork shop and examine work before it is shipped to Project site.
- D. Shop cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings.

2.05 PLASTIC-LAMINATE CABINETS AND COUNTERTOPS:

- A. Quality Standard: Comply with AWI Section 400 requirements for laminate cabinets.
- B. AWI Type of Cabinet Construction: Flush overlay.
- C. Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate complying with the following requirements:
 - 1. Horizontal Surfaces Other Than Tops: HGS.
 - 2. Vertical Surfaces: HGS.
 - 3. Edges: HGS.

- D. Materials for Semiexposed Surfaces: Provide surface materials indicated below:
 - 1. Surfaces Other Than Drawer Bodies: Thermoset decorative overlay.
- E. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 - 1. Provide selections from laminate manufacturer's full range of colors and finishes in the following categories:
 - a. Solid colors.
 - b. Patterns.

2.06 SOLID-SURFACING-MATERIAL COUNTERTOPS:

- A. Quality Standard: Comply with AWI Section 400 requirements for countertops.
- B. Solid-Surfacing-Material Thickness: 3/4 inch.
- C. Colors, Patterns, and Finishes: Provide materials and products that result in colors of solid-surfacing material complying with the following requirements:
 - 1. Provide selections from manufacturer's full range of colors and finishes.
- D. Fabricate tops in one piece with shop-applied backsplashes and edges, unless otherwise indicated. Comply with solid-surfacing-material manufacturer's written recommendations for adhesives, sealers, fabrication, and finishing.
- E. Drill holes in countertops for plumbing fittings in shop.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Condition woodwork to average prevailing humidity conditions in installation areas before installation.
- B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.02 INSTALLATION:

- A. Quality Standard: Install woodwork to comply with AWI Section 1700 for the same grade specified
- B. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches.
- C. Scribe and cut woodwork to fit adjoining work, and refinish cut surfaces and repair damaged finish at cuts.
- D. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 - 1. Install cabinets with no more than 1/8 inch in 96-inchsag, bow, or other variation from a straight line.

2. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c. with No. 10 wafer-head screws sized for 1-inch penetration into wood, blocking, or hanging strips.
- E. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
1. Align adjacent solid-surfacing-material countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
 2. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
 3. Secure backsplashes to walls with adhesive.
 4. Caulk space between backsplash and wall with sealant specified in Section 07900.

3.03 ADJUSTING AND CLEANING

- A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.

END OF SECTION