1 GENERAL

1.01 REFERENCE STANDARDS

.1 ASTM International
  .1 ASTM D 5456-14b, Standard Specification for Evaluation of Structural Composite Lumber Products.

.2 Canadian Standards Association (CSA)
  .1 CSA O86-14 Engineered Design in Wood
  .2 CSA O112.9-10, Evaluation of Adhesives for Structural Wood Products (Exterior Exposure).
  .3 CSA O121-08(R2013), Douglas Fir Plywood.
  .4 CSA O325-07(R2012), Construction Sheathing.
  .5 CAN/CSA-S406-92(R2008), Construction of Preserved Wood Foundations.
  .6 CSA O80 Series-2015, Wood Preservation.
  .7 CSA O322-15, Procedure for Certification of Pressure-Treated Wood Materials for Use in Preserved Wood Foundations.

.3 National Lumber Grades Authority (NLGA)
  .1 Standard Grading Rules for Canadian Lumber 2017.

.4 National Research Council Canada (NRC)
  .1 National Building Code of Canada 2015 (NBC).

.5 American Wood-Preservers' Association (AWPA)
  .1 AWPA M2-15, Standard for Inspection of Treated Wood Products.
  .2 AWPA M4-15, Standard for the Care of Preservative-Treated Wood Products.

1.02 SUBMITTALS

.1 Submit timber grade certificates from an approved independent laboratory at least 20 days prior to finish cutting rough lumber indicating that the materials supplied meet specifications. Include manufacturer’s name, contact information, and timber quantities.

.2 Submit Vertical Timber Binder shop drawings at least 10 days prior to timber fabrication; include at least the following information:
  .1 Finished dimensions and weights of all timber elements.
  .2 Size of grains.
  .3 Location and dimensions of bolt holes.
  .4 Coating and wood preservative treatment.

.3 Submit Mitre Sill and Facing Board shop drawings at least 10 days prior to timber fabrication; include at least the following information:
  .1 Finished dimensions and weights of all timber elements.
  .2 Size of grains.
  .3 Location and dimensions of bolt holes.
  .4 Coating and wood preservative treatment.

1.03 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store, handle and transport materials in accordance with manufacturer's written instructions.

.2 Deliver materials to site in original factory packaging, labelled with product category, manufacturer's name and address.

.3 Store materials off ground with moisture barrier at both ground level and as a cover forming a well-ventilated enclosure, with drainage to prevent standing water.

.4 Stack, lift, brace, cut and notch engineered lumber products in strict accordance with manufacturer's instructions and recommendations.

2 PRODUCTS

2.01 STRUCTURAL TIMBER

.1 Wood Species:
- .1 Douglas Fir (old growth).
- .2 White Oak.

.2 Grade Definition: Select Structural No. 1
- .1 Grade to be dense "Select Structural" in accordance with the Standard Grading Rules for Canadian Lumber (NLGA 2017).

.3 Other Requirements:
- .1 All lumber supplied will have tight grain with no less than 12 growth rings per inch of thickness.
- .2 Lumber will be mainly clear grain with up to 15% knots permitted, however, knots will occur no more than one knot per meter of length. Very tight knots shall be no more than 19 mm (3/4") in diameter.
- .3 All lumber under 254 mm (10") inches in thickness is to:
  - .1 be "Boxed heart" cut "off the heart center" with no sapwood allowed.
- .4 Provide 100% of timber material to grade specified.
- .5 Provide lumber oversized to allow for cutting, trimming and finish planing of material during gate fabrication.
- .6 Butt ends of all lumber pieces to be waxed or painted to prevent rapid moisture loss while drying.
- .7 Lumber pieces to be assembled in Lots, stickered and covered in protective wrap for shipment to Site. Identify and label Lots corresponding to material requirements.
- .8 All lumber will be square edged, free form wane and without based edges.
- .9 All timbers to be single solid pieces, built up members or splices not permitted.

.4 All material is subject to inspection and acceptance by Departmental Representative prior to delivery to Site.

.5 Have timber order ready for inspection by Departmental Representative within 30 days of the date that the order is placed, or as otherwise authorized by the Departmental Representative.

2.02 SHOP FABRICATION

.1 Employ a fabricator with experience in the fabrication, construction and assembly of heavy Timberframes structures.

.2 Accurately fabricate all tie and bolt locations, notches, key slots and other connecting component and structural requirements.

.3 Treat all timber components with wood preservatives as per Section 2.04.

2.03 EXECUTION

.1 Vertical Timber Binders
- .1 Plane true and chamfer as indicated in Drawings.
- .2 Bolt heads to be counter sunk.

.2 Mitre Sill
- .1 White oak facing board thickness made to suit space between bottom gate timber and sill.

2.04 WOOD TREATMENT

.1 Pine Tar Stain Mix
- .1 Combine equal parts of:
  - .1 A natural Pine Tar Stain product that is enhanced with iron oxide/carbon pigments for durability to withstand strong UV exposure (natural VOC Limit ≤ 700 g/L), and
  - .2 Purified Raw Linseed Oil.
- .2 Heat to minimum 25°C and thoroughly mix.
- .3 Apply product at a temperature of 22°C, or warmer.
- .4 Thoroughly coat all horizontal edges of dry and final cut timber used in the construction of the lock gates.
- .5 Apply a minimum of 4 coats. Allow sufficient drying time between applications to allow for Pine Tar Stain Mix to soak into the wood, minimum 2 days between applications or as per manufacturer recommendations and as authorized by the Departmental Representative.
- .6 Apply a minimum of 2 coats to the wood pieces in a temperature controlled environment. Apply thin layers of the preservative until dark stain is achieved evenly throughout the surface.
- .7 Dry after final application is absorbed into the wood surface, after which the surface feels dry to the touch.
- .8 Comply with AWPA M4 and revisions specified in CSA O80 Series, Supplementary Requirements to AWPA M2.

.2 Copper Naphthenate Wood Preservative
- .1 17% Copper Naphthenate.
- .2 Dark green liquid with a pungent diesel fuel odor.
- .3 Insoluble in Water.
- .4 Relative density: 0.8 – 0.9.
- .5 Meeting AWPA M-4 end cut and field cut requirements for above and below ground use with all wood preservatives.
- .6 Use on all timber end cuts, slots, holes and notches.
- .7 Apply as per manufacturer's written specifications. Minimum 4 coats while allowing sufficient drying time in-between applications; or as approved by the Departmental Representative.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

.1 ASTM International
- .1 ASTM D395-16e1, Standard Test Methods for Rubber Property – Compression Set.
- .2 ASTM D412-16, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension.
- .3 ASTM D471-16a, Standard Test Method for Rubber Property – Effect of Liquids.
- .4 ASTM D2137-05, Standard Test Methods for Rubber Property-Brittleness Point of Flexible Polymers and Coated Fabrics.
- .5 ASTM D2240-15e1, Standard Test Method for Rubber Property – Durometer Hardness.

1.02 SUBMITTALS

.1 Submit manufacturer's product data at least 10 days prior to delivery to Site. Provide product literature, data sheets and drawings. Indicate product characteristics, performance criteria, dimensions and limitations. Include manufacturer's pre-engineered written recommended installation requirements. Provide details of bottom to side seal connection to Departmental Representative prior to fabrication.

2 PRODUCTS

2.01 RUBBER SEALS

.1 Provide and install rubber seals of compounded natural rubber, a copolymer of butadiene and styrene, or a blend of both, and containing reinforcing carbon black, zinc oxide, accelerators, antioxidants, vulcanizing agents and plasticizers. Provide a seal with adequate impact, abrasion, scuff, weather, water, temperature and age resistant properties which will provide, in the moulded form, suitable sealing properties.

.2 Test seal properties:
- .1 Shore durometer hardness Type A, 65 ±5, ASTM D2240.
- .2 Tensile strength, 20,000 kPa minimum, ASTM D412.
- .3 Elongation, 400% minimum, ASTM D412.
- .4 Water absorption, 5% by weight maximum, ASTM D471.
- .5 Compression set, 30% maximum, ASTM D395.
- .6 Low Temperature Brittleness, -40°C or lower, ASTM D2137.

.3 Pre-mould all corners to a suitable radius on the inside edge. Locate all joints, both shop and field, a reasonable distance from the corners. Vulcanize all shop joints.

END OF SECTION