

Revise: E21.3.2 to read: Interlocking Paving Stones:

(a) Concrete interlocking paving stones (unit pavers) for bus stop indicator paver squares, are as shown on the Drawings and as follows:

(i) Blue Holland Pavers 200 x 200 x 60 mm **or approved equal Blue Holland Pavers 105 x 210 x 60 mm.**

(ii) Concrete interlocking paving stones (unit pavers) for indicator strips shall be precast concrete pavers conforming to CAN3-A231.2. Further to CAN3-231.2.6.1.1, where concrete pavers are shipped for installation before the pavers are twenty-eight (28) days old, the average compressive strength of these pavers at this time of delivery to work site shall be not less than 40 Mpa.

(iii) Supplied by:

Barkman Concrete
Phone: (204) 667-3310
www.barkmanconcrete.com

Clarification: E21.3.2 (b) (ii): Medium Ironspot pavers shall be Medium Ironspot #46. This note is found in the legend of all drawings in the Landscape series, LS-01 to LS-11.

Revise: E30 to read: ~~W-BEAM GUARDRAIL SYSTEM~~ **SUPPLY AND INSTALLATION OF THRIE BEAM, W-BEAM GUARDRAILS AND ACCESSORIES.**

Add: E30.1.1 (a)(iii): Thrie Beam guardrail including Asymmetrical transition section and Thrie beam Terminal connector.

Add: E30.1.1 (e) The Thrie beam guardrail shall be erected and connected on the southwest side of the bridge, roadway shoulder barriers, and the underpass wingwalls completed with the asymmetrical transition section, as per Drawings. Included in the work associated with this Specification, shall be the supply and installation of all thrie beam guardrail components and fasteners.

Add: E30.2.8 Thrie Beam Guardrail

Add: E30.2.8 (a) The Thrie Beam guardrail and all incidental components shall be galvanized.

Revise E30.3.4 (e) to read: After the post is installed, it shall be backfilled **with granular material**. Backfill shall be thoroughly compacted, using pneumatic tampers, in layers not exceeding 150 mm. Unsuitable material at the bottom of the holes excavated shall be replaced with granular material at the Contractor's expense, as directed by the Contract Administrator.

Add: E30.3.4 (h) The Contractor shall place and compact 50 mm asphalt on the top surface of the leave out section to match final roadway elevations. Supply and compacted asphalt shall be paid in accordance CW3410.

Revise E30.4.1 to read: Supply and installation of roadside hazard protection guardrail, **thrie beam terminal connectors, thrie beam, asymmetrical transition sections**, posts, and all related appurtenances will be measured on a length basis and paid for at the Contract Unit Price for the ~~"Steel Beam Guardrail"~~ **"Supply and Installation of Thrie Beam, W-Beam Guardrails and Accessories"**. The length to be paid for will be the total number of metres of ~~Steel Beam Guardrail~~ **Supply and Installation of Thrie Beam, W-Beam Guardrails and Accessories** in accordance with this Specification, accepted and measured by the Contract Administrator.

Revise: E45.4.3 (a) to read: Naturalized Area Seed Mix shall be sown at a rate of 4-θ **0.33 kilograms** per 100 square metres.

Add: E44.4.3 (b) Wet Blend Seed Mix shall be sown at a rate of 0.33 kilograms per 100 square metres.

Add: E44.4.4 Install seed in accordance with CW 3520-R7, using a mechanical seed drill or approved alternate.

Revise: E55.2.1 (c) to read: Supplying and placing structural concrete for ~~abutment~~ wingwalls and maskwalls;

Revise: E55.2.1 (f) to read: Supplying and placing structural concrete for bridge **and underpass** traffic barriers

Delete: E55.2.1 (i)

Revise: **Table E55-1: Requirements for Hardened Concrete:**

Type of Concrete	Location	Nominal Compressive Strength [MPa]	Class of Exposure	Air Content Category	Max Aggregate Size	Special Requirements	Post Residual Cracking Index
Type 3	Abutment Wingwalls and Maskwall, Underpass Structure, Diaphragms, Deck Slab, Sidewalk Slab, Approach Slabs, Bridge and Underpass Traffic Barriers, and Retaining Wall Coping, and Curbs and Roadway Traffic Barriers	35 @ 28 Days	C-1	1	20 mm	Synthetic Fibres	0.15

Delete: E55.4.26 (a)

Delete: E55.4.26 (c)

Delete: E55.4.26 (d)

Revise: E55.8.2 to read: Items of Work:

(a) Supply and Place Structural Concrete:

(i) Bridge Rehabilitation:

- Abutment Wingwall Repairs;
- Diaphragms;
- New Deck Concrete;
- Approach Slabs;
- Traffic Barriers.

(ii) Pedestrian-Cyclist Underpass;

- Underpass Structure;
- ~~Traffic Barrier Footing;~~
- ~~Traffic Barrier;~~
- **Underpass Wingwall including Traffic Barriers.**

(iii) Retaining Walls;

- Cladding;

- Coping;
- ~~Traffic Barrier Footing;~~
- ~~Traffic Barrier.~~

Revise: E56.3.1 (b) to read: ~~Retaining wall cladding;~~ **Pier concrete surface repairs;**

Revise: **Table E56-6: Concrete Mix Design Requirements:**

Type of Concrete	Location	Nominal Compressive Strength MPa	Class of Exposure	Air Content Category	Max Aggregate Size	Special Requirements	Slump-Flow
Type 2	Retaining Wall Cladding, Abutment Cap Resurfacing Refacing, Pier Surface Repairs	35 @ 28 Days	C-1	1	10 mm	Self-Compacting Concrete 28-Day Moist Cured Electrical Resistivity < 15,000 ohm-cm Low-Shrinkage Concrete according to the definition of CAN/CSA- A23.1, Clause 8.9.2	550-650 mm

Revise E56.16.1 to read: Supplying and placing ~~structural~~ **self-compacting** concrete will not be measured and this Work shall be paid for at the ~~Contract Lump Sum Price~~ **Unit Price per square metre** for the "Items of Work" listed here below, which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

Revise E56.16.2 to read: Items of Work:

(b) Supply and place Structural Self-Compacting Concrete:

(i) Bridge Rehabilitation:

- Abutment ~~Repairs~~ **Seat Resurfacing;**
- **Pier Surface Repairs.**

~~(ii) Retaining Wall:~~

- ~~Cladding.~~

Revise E56.16.3 to read: Supplying and installing all the listed materials, concrete design requirements, equipment, construction methods, and Quality Control and Quality Assurance measures associated with this Specification and Drawings shall be considered incidental to "Supply and Place ~~Structural~~ **Self-Compacting** Concrete", unless otherwise noted herein. No measurement or payment shall be made for this Work unless indicated otherwise.

Add E56.16.4: The Contract Administrator will identify and measure on site, the pier surface areas to be repaired in accordance with this specification

Add E74.5.1 (c): The Contractor is to refer to ALS Certificate of Analysis Report, Appendix "L"

Add E74.7 (c). The Contractor shall meet all Provincial, Federal, Workplace Health and Safety, and/or any other governing Regulation associated with working with lead containing paints including, but not limited to, removal of the lead paint system and disposal of the resulting hazardous waste. No additional payment will be made for this work as it shall be considered incidental to the Contract Lump Sum Price for "Environmental Containment Collection and Disposal for Metallizing".

Revise: E78.1.2(a) to read: Refer to Drawings CS-~~78~~ **81** and CS-~~79~~ **82**

Revise: E78.2.1(a) to read: Refer to Drawings CS-~~78~~ **81** and CS-~~79~~ **82**

Revise: E78.3.1(a) to read: Refer to Drawings CS-~~78~~ **81** and CS-~~79~~ **82**

Delete: E69

Add: **E98 CONCRETE TRAFFIC BARRIERS**

E98.1 Description

E98.1.1 General

- (a) This Specification shall cover the furnishing and placing of the concrete median barriers (610 mm, Slip Formed), Cast-in-place median roadway barriers panel 'B6M' , and 'B7M' (610 mm, Cast-in-place), north concrete traffic barriers, and roadway shoulder barriers and barrier footings on the accepted and prepared concrete footing and/or base course material.
- (b) This Specification supplements City of Winnipeg Standard Construction Specification CW 3310 – Portland Cement Concrete Works.

E98.2 Scope of work

E98.2.1 The work under this specification shall include:

- (a) Supply and placing Portland Cement concrete for the:
 - (i) Median roadway barrier (610 mm, slip-formed). (Approx. sta. 6+830 to sta. 6+990 7+059 to 7+159);
 - (ii) Median roadway barrier and footings for Panel 'B6M' (610 mm, cast-in-place) at two (2) locations;
 - (iii) Median roadway barrier and footings for Panel 'B7M' (610 mm, cast-in-place) at two (2) locations;
 - (iv) North concrete traffic barriers and footings (450 mm, cast-in-place);
 - (v) Roadway shoulder barriers and footings (450 mm, cast-in-place).

E98.3 Reference

E98.3.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision.

- (a) E57: Supply and Placing Reinforcing Steel;
- (b) CW 3310 – Portland Cement Concrete;
- (c) ASTM A1035 CM Grade 4100 Low-Carbon Chromium Steel.

E98.4 Materials

E98.4.1 General

- (a) The Contractor shall be responsible for the supply, safe storage, and handling of all materials as set forth in this Specification and in accordance with CW 3310. All materials shall be handled in a careful and workmanship like manner, to the satisfaction of the Contract Administrator.

E98.4.2 Bedding and Backfill

- (a) Bedding and backfill in accordance with CW 2030.

E98.4.3 Grout, Mortar and Fibre Joint Filler

- (a) Materials supplied shall be as per E55: Structural Concrete.

E98.4.4 Grout, Mortar and Fibre Joint Filler

- (a) Concrete materials susceptible to frost damage shall be protected from freezing.
- (b) Proportioning of fine aggregate, coarse aggregate, cement, water and air entraining agent shall be such as yield concrete having the required strength and workability as follows:
 - (i) Concrete Type 4;
 - (ii) Class of Exposure C-2;
 - (iii) Minimum Compressive Strength at 28 days = 35 MPa;
 - (iv) Minimum Cementitious Content = 340 kg/m^3 ;
 - (v) Maximum Water/Cementitious Ratio = 0.45 ;
 - (vi) Slump = $50 \pm 20 \text{ mm}$ (for slip-formed) ;
 $=70 \pm 20 \text{ mm}$ (for hand placement);
 - (vii) Aggregate Size = 20 mm Nominal;
 - (viii) Air Content = 5.0% to 8.0%.

E98.4.5 Reinforcing Steel

- (a) All reinforcing steel shall conform to the requirements of ASTM A1035 CM Grade 4100, Low-Carbon, Chromium Reinforcement.

E98.5 Equipment

E98.5.1 As per CW 3310, Clause 8.

E98.6 Construction Methods

E98.6.1 General

- (a) The work shall include foundation preparation, placement of concrete traffic barriers, expansion joints, contraction joints, curing of the concrete, surface finish.
- (b) Construction of permanent concrete traffic barrier shall be used of the following methods:
 - (i) Conventional wooden or steel form work (cast-in-place)
 - (ii) Slip-formed

E98.6.2 Foundation Preparation

- (a) Preparation of the granular foundation shall conform to CW3110 – Sub-Grade, Sub-Base and Base Course Construction. Immediately ahead of placing concrete, the Contractor shall wet down the subgrade by means of uniform spray of water sufficient to wet the subgrade thoroughly without leaving standing water.

E98.6.3 Concrete Median and Roadway Traffic Barriers (cast-in-place)

- (a) The surface of the concrete barrier placed with conventional forms shall conform to E55 Structural Concrete.

E98.6.4 Concrete Median Roadway Traffic Barrier (Slip-formed)

- (a) Concrete shall not be placed by slip-forming when the air temperature is below zero degrees Celsius (0°C).
- (b) Placing concrete by slip-forming shall not be carried out when the air temperature is below five degrees Celsius (5°C) unless the concrete at the time of placing is between fifteen degrees Celsius (15°C) and (30°C).
- (c) The slip-formed barrier surface shall not be brushed. Offsets and fins shall be removed immediately by light trowelling. Surface blemishes 10 mm or less in diameter shall be left untouched. If surface blemishes larger than 10 mm diameter occur, adjustments in the operation shall be halt until the condition is corrected either by adjustments to the operation or to the concrete mix.
- (d) The use of water on the completed barrier to correct imperfections shall not be permitted.
- (e) The Contractor shall immediately remove excess concrete during the operation by light trowelling. Concrete surfaces against which new bituminous asphalt is placed shall be left with a rough surface finish.

E98.6.6 Expansion Joints

- (a) As per E55.6.5;
- (b) The supply, placing, installation and all operations necessary as specified in this Specification, pertaining to the expansion joints 50 mm in width shall be installed, as shown on drawing and shall be considered incidental to the Work. No additional measurement or payment shall be made for this Work.

E98.6.6 Contraction Joints

- (a) The Contractor shall saw cut contraction joints as per Drawings.
- (b) The supply, placing, installation and all operations necessary as specified in this Specification, pertaining to the expansion joints 50 mm in width shall be installed, as shown on drawing and shall be considered incidental to the Work. No additional measurement or payment shall be made for this Work.

E98.6.7 Manhole, Catch Basin, Catch Pit Installation and Barrier Steel Inlet

- (a) As per E79.5.

E98.7 Measurement and Payment

- E98.7.1 Supply and placing concrete median roadway barriers and footing (slip-formed), and all related appurtenances will be measured on a length basis and paid for at the Concrete Unit Price for the "Median Roadway Traffic Barrier, (610 mm, Slip-formed)" listed here below, which price shall be payment in full for supply all materials and for performing all operations herein described. The length to be paid for, will be the total number of metres

of Concrete Median Roadway Barrier in accordance with this Specification, accepted and measured by the Contract Administrator.

E98.7.2 Supply and placing structural concrete, including expansion joints for the median roadway barriers (Panels B6M and B7M only) and roadway traffic shoulder barriers and footing will not be measured. This Work shall be paid for at the Concrete Lump Sum Price for the "Items of work" listed here below, which price shall be payment in full for supply all materials and for performing all operations herein described and all other items incidental to the Work included in this Specification and accepted by the Contract Administrator.

E98.7.3 Items of Work

(a) Concrete Roadway Traffic Barrier:

- (i) Median Roadway Barriers (Panels B6M and B7M);
- (ii) Roadway Traffic Shoulder and Barrier Footing.

Add: **E99 SUPPLY AND DRIVING STEEL H PILES**

E99.1 Description

E99.1.1 This Specification shall cover all operations related to the pre-boring for piles, supplying, handling, hauling, storing, supplying and installing pile tips, aligning and driving, splicing, and cutting off of piles at the required elevations for steel H piles.

E99.1.2 Steel piles, steel "H" piles, and "H" Piles shall be considered one and the same for the Drawings and this Specification.

E99.1.3 The Work to be done by the Contractor under this Specification shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, and all other things necessary for and incidental to the satisfactory performance and completion of all Work as hereinafter specified.

E99.2 References

E99.2.1 All related Specifications and reference Standards are in accordance with the most current issue or latest revision:

- (a) CAN/CSA G40.20M/G40.21M, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- (b) CSA W59, Welded Steel Construction (Metal Arc Welding).
- (c) AASHTO/AWS D1.5M/D1.5 Bridge Welding Code.
- (d) City of Winnipeg's Approved Products List.

E99.3 Submittals

E99.3.1 The Contractor shall submit the following to the Contract Administrator:

- (a) Copies of Mill Test Certificates showing chemical analysis and physical tests for piling material. Piling material without this certification will be rejected;
- (b) Details of the proposed pile driving system and manufacturer's specifications and catalogue for all mechanical hammers to be used to perform preconstruction wave equations analysis and determine adequacy of the driving system and hammer and the preliminary pile driving criteria;
- (c) Certificate of mass for gravity or drop hammers. If this certificate is not available, the gravity or drop hammers shall be weighed in the presence of the Contract Administrator. Hammers so weighed shall have the exact mass marked on them. Gravity hammers shall weigh at least 1.5 ton but in no case shall the mass of the hammer be less than the combined mass of the pile and pile cap;
- (d) Proof of certification for the welders conducting the Work (if applicable). All welders shall satisfy one of the following requirements:

- (i) welders qualified in accordance with the requirements of ASHTO/AWS D1.5M/1.5;
 - (ii) valid Canadian Welding Bureau (CWB) Welding ticket;
 - (iii) valid "Welder's Licence" as issued by the Mechanical and Engineering Division, Department of Labour and Manpower, Province of Manitoba, with a minimum of five (5) years of experience welding on steel structures.
- (e) Welding procedures specific to the Work.

E99.4 Materials

E99.4.1 General

- (a) The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification.

E99.4.2 Handling and Storage of Materials

- (a) Piling shall be handled, hauled and stored in a manner that avoids damage to the piling materials. Loading and unloading shall be by crane, loader or other appropriate hoisting equipment.
- (b) The method of handling and storing steel H piles shall be such so as to prevent any damage to the pile and to ensure that the design strength will not be affected by deterioration or deformation. The Contractor, in handling or lifting the piles, will not be permitted to drag them along the ground.
- (c) Any piles excessively damaged through negligence or improper handling operations shall be immediately removed from the Site and replaced with sound piles by the Contractor, at their own expense.

E99.4.3 Steel "H" Piles

- (a) Steel "H" Piles shall be structural HP 310 x 110 steel members manufactured in accordance with CAN/CSA-G40.20M/G40.21M, Grade 350W.

E99.4.4 Splice Plates

- (a) Splice plates shall conform to the requirements of CAN/CSA G40.21M, Grade 350W.

E99.4.5 Welding

- (a) The Contractor is responsible for supplying all welding materials. All welding materials shall conform to the requirements of Welded Steel Construction (Metal Arc Welding).
- (b) All welding shall conform to the latest CSA Standard W59, electric arc method.

E99.5 Construction Methods

E99.5.1 Location and Alignment of Piles

- (a) The piles shall be located at the positions shown on the Drawings or as directed by the Contract Administrator. Piles shall be driven vertically unless shown otherwise on the Drawings, and shall not deviate more than two percent (2%) out-of-plumb. Battered piles shall be driven to the battered specified on the Drawings, and shall not deviate more than two percent (2%) from the batter specified. Piles shall not be more than 75 mm off centre measured at cut-off elevation.
- (b) Piles shall not be jacked or pulled into their final positions.

E99.5.2 Driving of Piles

- (a) The piles shall be driven to the tip elevations as shown on the Drawings except when required by the Contract Administrator.

- (b) The method of driving shall be such as not to impair the strength of the pile and shall meet the approval of the Contract Administrator. The Contractor will be required to remove any surface and/or shallow depth obstruction(s) to obtain the required penetration of the pile.
- (c) Piles covering a large area or in groups, shall be driven working out from the centre of the area or group to ensure that the piles at the boundaries are in their correct final positions.
- (d) For pile installation monitoring purposes, the Contractor shall paint markings on each pile at 0.25 m intervals, with a label at each 1.0 m interval, starting from the toe of the pile.
- (e) Pile driver leads shall be used to support the piles while they are being driven and shall be braced to the supporting crane so as to hold the piles securely and accurately in the required position during driving. Leads shall be of sufficient length to be supported firmly on the ground. The use of hanging or swinging leads will not be allowed unless they can be held in a fixed position during the driving operations. Battered piles shall be driven with incline leads.
- (f) The heads of the steel piles shall be squared and protected by a cap of a design approved by the Contract Administrator. The cap shall be designed to hold the axis of the pile in line with the axis of the hammer. The top of the cap shall have a timber shock block.
- (g) If, during the piling operations, upheaval of pile occurs, the Contractor will be required to redrive the lifted piles down to their original elevations. The Contractor will also be required to excavate material that has boiled up during pile driving operations. The elevation of all piles previously driven or redriven shall be observed to detect uplift. If uplift of 5 mm or more occurs in any pile, that pile shall be redriven to its original elevation and thereafter to the required final driving resistance.
- (h) Driving of all piles shall be continuous without intermission until the pile has been driven to final elevation.
- (i) Where boulders or other obstructions make it difficult to drive certain piles in the location shown and to the proper bearing strata or depth, the Contractor shall install the piles as directed by the Contract Administrator. Abandoned pile will be paid in accordance with this Specification.
- (j) Preboring will not be allowed unless it is approved in writing by the Contract Administrator.
- (k) If, in the judgement of the Contract Administrator, the Contractor is unable to complete properly any pile or piles driven to replace the original pile in the Contract, they shall be abandoned. Piles abandoned, because of obstructions encountered before reaching the accepted bearing strata, shall be cut off at the cut-off elevation and paid for as outlined hereinafter.
- (l) The Contractor shall ensure the safety of all personnel during pile driving operations.
- (m) The Contractor is responsible for the means, methods, and necessary precautions to manage vibration generated during pile driving. This may include modifying the driving sequence or introducing additional requirements to maintain acceptable vibration levels. The Contractor is responsible for all nuisance, noise, damage, and legal claims resulting from noise/vibration generated through piling or other construction activities.

E99.5.3 Splicing of Piles

- (a) Full-length piles shall be used where practicable. In exceptional circumstances, splicing of piles may be permitted. The method of splicing shall be as shown on the Drawings, in accordance with the welding procedures, Shop Drawings and the following:
 - (i) The butting ends of the driven pile and its extension or the pile shall be cut square to give reasonable bearing between the matting surfaces;
 - (ii) All butting surfaces shall be one hundred percent (100%) butt welded;
 - (iii) The butting surface of the extension piece shall be bevel cut at 45° to facilitate a full-penetration butt weld. Temporary clamping plates may be used as required;

- (iv) Before welding over previously-deposited metal, the slag shall be cleaned off. This requirement shall apply to successive layers, to successive beads, and to the cratered area when welding is resumed after any interruption;
- (v) All butt welds shall have the root of the initial weld gouged, chipped, or otherwise removed to sound metal before welding is started from the second side;
- (vi) The piles shall not have more than one splice per pile unless otherwise approved by the Contract Administrator;
- (vii) Splices shall be located such that no more than fifty percent (50%) of the piles are spliced at the same elevation;
- (viii) Material to be welded shall be preheated in accordance with CSA W59;
- (ix) When the air temperature is below zero degrees Celsius (0 °C), all materials to be welded shall be preheated to one hundred degrees Celsius (100 °C) for a distance of 80 mm beyond the weld and shall be sheltered from the wind;
- (x) When the air temperature is below eighteen degrees Celsius (18°C), welding will not be permitted unless suitable hoarding approved by the Contract Administrator is in place.

E99.5.4 Defective Piles

- (a) The pile driving procedures shall not subject the piles to excessive and undue abuse producing deformation of the steel. Manipulation of piles to force them into proper position will not be permitted.
- (b) Piles damaged by improper driving, or driven out of proper location, or driven below the cut-off elevation, shall be corrected by one of the following methods accepted by the Contract Administrator:
 - (i) the piles shall be withdrawn and replaced by new, if necessary, longer piles;
 - (ii) replacement piles shall be driven adjacent to defective or low piles;
 - (iii) the piles shall be spliced or built up, as otherwise provided herein, or a sufficient portion of the footing extended to properly embed the piles. All piles, pushed up by the driving of adjacent piles or by any other cause, shall be driven down again.
- (c) In the case of required penetration and bearing capacity are not obtained, the Contractor shall provide a hammer of greater energy, as applicable, or when accepted by the Contract Administrator, resort to pre-drilling.

E99.5.5 Cut-Off of Piles

- (a) After piles have been driven to the required penetration (and, if required, redriven), the Contractor shall mark the required cut-off elevation on each pile as specified on the Drawings or as directed by the Contract Administrator. The top of all piles shall be neatly cut off (true and level) at the cut-off elevation.
- (b) Unless determined otherwise by the Contract Administrator, cut offs shall become the property of the Contractor and shall be removed from the Site.

E99.5.6 Steel Pile Extensions

- (a) Steel H pile extensions shall be avoided, but when necessary and as directed by the Contract Administrator, they shall be made in accordance with E99.5.3.

E99.6 Quality Control

E99.6.1 Inspection

- (a) All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator, including all operations, from the selection and production of materials, through to final acceptance of the specified Work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given.
- (b) The Contractor shall provide a detailed survey of all of the pile locations for a pile cap (foundation) and provide that to the Contract Administrator prior to cutting off any piles for that pile cap.
- (c) The Contractor shall replace any piles, or add additional pile(s), for piles that do not meet the specified refusal criteria or do not meet the following tolerances: +/- two percent (2%) out of alignment for battered piles, +/- two percent (2%) out of plumb for vertical piles, and 75 mm off centre of the specified locations. Any modifications required to the pile cap, due to piles out of tolerance or due to required additional piles to compensate for out of tolerance piles, shall be carried out as specified by the Contract Administrator at the Contractor's own costs.

E99.6.2 Access

- (a) The Contractor Administrator shall be allowed free access for the inspection and control testing of the piles at the Site of Work to determine whether the steel piles are being supplied in accordance with this Specification.

E99.6.3 Pile Driving Records

- (a) The Contract Administrator will keep a record of each and every pile driven. The records shall give the date, time, size, length, location, type, total depth of penetration, rate of penetration, number of blows per 300 mm, penetration for the last five blows, steam, air or diesel pressure, and any kind and size of hammer used in driving. Any unusual phenomena shall be noted and recorded, especially if they indicate possible damage to the pile.
- (b) Energy output of driving equipment at the time of final set shall be carefully recorded, along with the final penetration readings, and reported immediately to the Contract Administrator. The required set per blow will be subject to approval by the Contract Administrator, showing regard to the specific driving equipment and piles permitted.

E99.7 Measurement and Payment

E99.7.1 Steel H Piles

- (a) Supplying steel H piles will be measured in linear metres of piling. The number of linear metres to be paid for will be the total number of linear metres of piling unloaded and stockpiled at the Site as authorized by the Contract Administrator.
The supply of steel H piles will be paid for at the Contract Unit Price per linear metre for "Supplying Steel Piles", which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the Work included in this Specification.
- (b) Driving steel H piles will be measured in lineal metres of piling. The length to be paid for will be the total number of lineal metres driven, less fifty percent (50%) of the total number of lineal metres of piling cut off after driving. Cut offs will be measured by the Contract Administrator in the presence of the Contractor.
Driving steel H piles will be paid for at the Contract Unit Price per linear metre for "Driving Steel Piles", which price shall be payment in full for supplying all materials and for performing all operations herein described and all other items incidental to the Work included in this Specification.
- (c) Pre-Boring of piles will be considered incidental to the supplying and driving steel bearing piles and no separate measurement will be made of this work.

DRAWINGS

Replace: 772-2017 _Drawing_GE-002-R0 with 772-2017 _Addendum_5 Drawing_GE-002-R1
772-2017 _Drawing_GE-012-R0 with 772-2017 _Addendum_5 Drawing_GE-012-R1
772-2017 _Drawing_GE-013-R0 with 772-2017 _Addendum_5 Drawing_GE-013-R1
772-2017 _Drawing_GE-014-R0 with 772-2017 _Addendum_5 Drawing_GE-014-R1
772-2017 _Drawing_GE-019-R0 with 772-2017 _Addendum_5 Drawing_GE-019-R1
772-2017 _Drawing_GE-021-R0 with 772-2017 _Addendum_5 Drawing_GE-021-R1
772-2017 _Addendum_2-Drawing_CS-001-R1 with 772-2017 _Addendum_5 -Drawing_CS-001-R2
772-2017 _Drawing_CS-017-R0 with 772-2017 _Addendum_5 Drawing_CS-017-R1
772-2017 _Drawing_CS-027-R0 with 772-2017 _Addendum_5 Drawing_CS-027-R1
772-2017 _Addendum_2- Drawing_CS-032-R1 with 772-2017 _Addendum_5 Drawing_CS-032-R2
772-2017 _Drawing_CS-040-R0 with 772-2017 _Addendum_5 Drawing_CS-040-R1
772-2017 _Drawing_CS-047-R0 with 772-2017 _Addendum_5 Drawing_CS-047-R1
772-2017 _Addendum_2-Drawing_CS-049-R1 with 772-2017 _Addendum_5 Drawing_CS-049-R2
772-2017 _Addendum_2-Drawing_CS-050-R1 with 772-2017 _Addendum_5 Drawing_CS-050-R2
772-2017 _Drawing_CS-051-R0 with 772-2017 _Addendum_5 Drawing_CS-051-R1
772-2017 _Drawing_CS-052-R0 with 772-2017 _Addendum_5 Drawing_CS-052-R1
772-2017 _Drawing_CS-053-R0 with 772-2017 _Addendum_5 Drawing_CS-053-R1
772-2017 _Drawing_CS-055-R0 with 772-2017 _Addendum_5 Drawing_CS-055-R1
772-2017 _Drawing_CS-057-R0 with 772-2017 _Addendum_5 Drawing_CS-057-R1
772-2017 _Drawing_CS-058-R0 with 772-2017 _Addendum_5 Drawing_CS-058-R1
772-2017 _Drawing_CS-059-R0 with 772-2017 _Addendum_5 Drawing_CS-059-R1
772-2017 _Drawing_CS-060-R0 with 772-2017 _Addendum_5 Drawing_CS-060-R1
772-2017 _Drawing_CS-061-R0 with 772-2017 _Addendum_5 Drawing_CS-061-R1
772-2017 _Drawing_CS-062-R0 with 772-2017 _Addendum_5 Drawing_CS-062-R1
772-2017 _Drawing_CS-063-R0 with 772-2017 _Addendum_5 Drawing_CS-063-R1
772-2017 _Drawing_CS-064-R0 with 772-2017 _Addendum_5 Drawing_CS-064-R1
772-2017 _Drawing_CS-065-R0 with 772-2017 _Addendum_5 Drawing_CS-065-R1
772-2017 _Drawing_CS-066-R0 with 772-2017 _Addendum_5 Drawing_CS-066-R1
772-2017 _Drawing_CS-067-R0 with 772-2017 _Addendum_5 Drawing_CS-067-R1
772-2017 _Drawing_CS-068-R0 with 772-2017 _Addendum_5 Drawing_CS-068-R1

772-2017 _Drawing_CS-069-R0 with 772-2017 _Addendum_5 Drawing_CS-069-R1
772-2017 _Drawing_CS-070-R0 with 772-2017 _Addendum_5 Drawing_CS-070-R1
772-2017 _Drawing_CS-071-R0 with 772-2017 _Addendum_5 Drawing_CS-071-R1
772-2017 _Drawing_CS-072-R0 with 772-2017 _Addendum_5 Drawing_CS-072-R1
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772-2017 _Drawing_CS-078-R0 with 772-2017 _Addendum_5 Drawing_CS-078-R1
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772-2017 _Drawing_CS-085-R0 with 772-2017 _Addendum_5 Drawing_CS-085-R1
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772-2017 _Drawing_CS-087-R0 with 772-2017 _Addendum_5 Drawing_CS-087-R1
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772-2017 _Drawing_CT-063-R0 with 772-2017 _Addendum_5 Drawing_CT-063-R1
772-2017 _Drawing_CT-064-R0 with 772-2017 _Addendum_5 Drawing_CT-064-R1
772-2017 _Drawing_CU-002-R0 with 772-2017 _Addendum_5 Drawing_CU-002-R1
772-2017 _Drawing_CU-003-R0 with 772-2017 _Addendum_5 Drawing_CU-003-R1
772-2017 _Drawing_CU-004-R0 with 772-2017 _Addendum_5 Drawing_CU-004-R1
772-2017 _Drawing_CU-005-R0 with 772-2017 _Addendum_5 Drawing_CU-005-R1
772-2017 _Drawing_CU-006-R0 with 772-2017 _Addendum_5 Drawing_CU-006-R1

772-2017 _Drawing_CU-007-R0 with 772-2017 _Addendum_5 Drawing_CU-007-R1

772-2017 _Drawing_CU-008-R0 with 772-2017 _Addendum_5 Drawing_CU-008-R1

772-2017 _Drawing_CU-010-R0 with 772-2017 _Addendum_5 Drawing_CU-010-R1

772-2017 _Drawing_CU-011-R0 with 772-2017 _Addendum_5 Drawing_CU-011-R1

Add: 772-2017 _Addendum_5-Drawing _CT-065A-R0

772-2017 _Addendum_5-Drawing _CT-065B-R0

QUESTIONS AND ANSWERS

Q. 1.0: Does the existing paint on the structural steel girders contain lead? Has the existing paint been analyzed for lead and are the results of the analysis available?

A 1.0: Two paint samples from the existing steel girders were tested by ALS Canada Ltd. and their Certificate of Analysis is provided in, "Appendix L" Lead quantities of 48,900 and 45,100 mg/kg were detected in the samples provided to ALS for analysis. These values are well above typical published figures defining a lead containing paint. As a result, the Contractor shall meet all Provincial, Federal, Workplace Health and Safety, and/or any other governing Regulation associated with working with lead containing paints including, but not limited to, removal of the lead paint system and disposal of the resulting hazardous waste. No additional payment will be made for this work as it shall be considered incidental to the Contract Lump Sum Price for "Environmental Containment Collection and Disposal for Metallizing". Please refer to E.74.7 (c) and Appendix L of Addendum 5.

Q. 2.0: Is the abutment seat refacing measured in square metres or cubic metric?

A 2.0: Yes, the abutment seat refacing is measured in square metres. See E56.16.1 in Addendum 5 for clarification.

Q. 3.0: As per drawing CU-011, the catch pits are specified as 750 mm diameter; City of Winnipeg standards are 900 mm diameter. Is 750 mm acceptable?

A 3.0: No, the table on drawing CU-011 has been revised in Addendum 5 to reflect the standard 900 mm diameter.

Q 4.0: Please provide additional clarification regarding the sump elevations, as the catch-pit elevations are higher than the invert out.

A 4.0: The table on drawing CU-011 has been revised in Addendum 5. Bidders are advised to review CU-011 accordingly.

Q 5.0: The MH L12 on page CU-011 has two (2) elevations for the inverts in, and then on page CU-002, the plan view for MH L12 has three (3) pipes coming in and no out pipe. Can you provide additional information on MH L12?

A 5.0: MH L12 replaces an existing manhole. In addition to the two proposed pipes it also connects to two (2) existing pipes; a 300 mm LDS from the south (in) and a 375 mm LDS to the west (out). Plans have been revised to also show connecting to the existing pipes.

APPENDIX

Add: Appendix "L" – ALS Certificate of Analysis Report