

Project No.:
R.075212.001

October 27, 2016

Part 1 General

1.1 ADDENDUM FORM

- .1 This Addendum forms part of the Contract Documents and modifies the Bidding Documents dated 12 September 2016, Addenda previously issued, with amendments and additions noted below.
- .2 This addendum consists of six (6) pages plus attachments.

1.2 DRAWINGS

- .1 DRAWINGS A1.0 THROUGH A9.0 (ARCHITECTURAL)
 - .1 **DELETE** note: "Preliminary - Not for Construction." Drawings to be considered final & issued for construction.
- .2 DRAWING A2.0 – BIG HOUSE MAIN FLOOR PLAN
 - .1 **REVISE** Wall Type 1 - Exterior Wall Assembly, both vertical and horizontal strapping **REMOVE** "25mm" and **ADD** "19mm."
- .3 DRAWING A2.3 – MEN'S HOUSE FLOOR PLANS
 - .1 **DELETE** Note 4 of Men's House Keynotes: "Provide decorative bulkheads to coordinate with sprinkler heads. Bulkheads finished in 12mm wood planks."
- .4 DRAWING A5.3 BIG HOUSE NEW SHED CROSS SECTION
 - .1 **ADD** 2" exterior grade extruded polystyrene between vapour barrier and void form below basement floor.
- .5 DRAWING A6.1 – BIG HOUSE WALL SECTIONS & DETAILS
 - .1 **REFER** to Drawing 1 – Veranda Stair & Guardrail. **ADD** "Slot posts as necessary to fit-in the bottom of the stringer and the end of the handrail. Exact details to be proposed by the contractor for review/approval architecturally" to "140mm x 140mm Wood Post."
- .6 DRAWING A9.0 – ROOM FINISH SCHEDULE, WINDOW & DOOR TYPES, & DOOR SCHEDULE.
 - .1 **REFER** to Note 1 in Window and Door Type General Notes – **DELETE** "Dual glazed insulated units complete with thermally broken and insulated wood frames." and **REPLACE** with "The windows will be custom made with solid wood muntins and double glazed sealed units in between."
- .7 DRAWING S1 – BASEMENT / FOUNDATION GENERAL NOTES AND SCHEDULES
 - .1 **DELETE** Note 1 of General Notes / Foundations.
 - .2 **REFER** to Note 2 of General Notes / Foundations and **REMOVE** the following portion "Notwithstanding the information provided in the geotechnical report"

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- .8 DRAWING S2 – BASEMENT/FOUNDATION FRAMING PLAN & NOTES
 - .1 REVISE as indicated on attached Revision drawings: RS-1, RS-2, RS-3, RS-4.
- .9 DRAWING S3 – MAIN FLOOR & ROOF FRAMING PLANS & NOTES
 - .1 **REFER** to Main Floor Plan Key Notes - Note 4 -- **ADD** “Door rough opening width only.”
- .10 DRAWING S4 – SECTIONS
 - .1 **REFER** to reference at the opening in existing wall “Stone Cladding See Arch. See C/S4 for bottom connection” **REVISE** reference to B/S6.
 - .2 **ADD** “At every rafter to wall connection” to “Simpson H2 Connections Typical.”
- .11 DRAWING M1 – MECHANICAL SITE PLAN, DRAWING LIST & SYMBOL LEGEND
 - .1 **ADD** Scale 1:600.
- .12 DRAWING M7 – MEN’S HOUSE – FIRE PROTECTION LAYOUT
 - .1 **REVISE** sprinkler head layout in Men’s House as per attached detail sheet M7R1.1 and M7R1.2.

1.3 SPECIFICATIONS

- .1 **ADD** the following sections to the Project Manual, as attached to this addendum.
 - .1 Section 03 10 00 – Concrete Forming and Accessories.
 - .2 Section 03 20 00 – Concrete Reinforcing.
 - .3 Section 03 30 00 – Cast-in-Place Concrete.
 - .4 Section 31 63 23 – Bored Piles
- .2 SECTION 01 52 00 – CONSTRUCTION FACILITIES
 - .1 Refer to Item 1.10.1 – **REVISE** item to read: “Existing buildings are equipped with security systems, and require no additional security measures. Contractors and trades are to be responsible for securing equipment, materials, and other items required for performance of the Work.”
 - .2 **ADD** item 1.10.2 – “Departmental Representative will provide keys and access codes to buildings for contractors and trades. Ensure buildings are secured when site is vacated for each work day.”
- .3 SECTION 02 81 01 – HAZARDOUS MATERIALS
 - .1 **ADD** No report is available detailing the presence of lead-containing materials. No evidence of significant lead-containing materials has been established on site. If material is encountered during construction that is suspected of containing lead, Contractor is to bring that to the attention of the Departmental Representative
- .4 SECTION 06 20 00 – FINISH CARPENTRY

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.1 Refer to item 2.1.1.4 – **ADD** “For exterior stair construction, use painted Fir.”

.5 SECTION 08 71 00 – DOOR HARDWARE

.1 **Replace** section with attached version.

.6 SECTION 22 05 00 – COMMON WORK RESULTS FOR PLUMBING

.1 **DELETE** entire paragraph 2.5 – Fire Separation Repair.

.2 **Clarification:** There is no existing fire separation in the building that would require repair by plumbing trades.

1.4 **CLARIFICATIONS: STRUCTURAL**

.1 **Q:** Note 3 on S3 states “40 deep formed keyway in wall & beam for lower level conc slab” – please provide detail.

A: This is a typical construction detail for a structural concrete slab framing into a foundation wall/grade beam. There is no specific section detail at this location on the drawings, however refer to section 1/S4, right hand side, at basement floor level for a similar detail.

.2 **Q:** Could we receive a statement on what materials we will require to back-fill with, as it's not noted in the specifications. I imagine that the location below the concrete slabs between gridline 3 & 4 beside the lift will need to be back-filled with compatible sand (or something of that nature) to no allow settling.

A: We have no special structural backfill requirements since the floor slabs are all ‘structural’, i.e. grade beam and foundation wall supported and not slabs on compacted granular fill. Normally the contractor would use bulk fill material as required related to weeping tile/waterproofing/final grading needs, and they would put a shallow layer of sand down directly under the cardboard void form under the structural slabs because it's very easy to level in preparation for the slab pour. Also see Section 31 23 33 - Excavating, Trenching, and Backfilling.

.3 **Q:** In regards to the two C200x27 channels that support the HRV - are these channels to be cut and welded to allow access into the attic space? Alternatively, are we permitted to cut the roof for bringing the beams in whole?

A: “Openings in the roof to bring in the steel channels are not permitted. The channels can be manufactured and brought in in sections and connected in place. The splices are to be full moment splices, the detailed design and engineering of the splice connections is to be by the steel supplier as for other structural steel connections.”

1.5 **CLARIFICATIONS: MECHANICAL**

.1 **Q:** Can PVC DWV pipe and fittings be used above and below grade for this project?

A: We have no issue with PVC above and below grade.

.2 **Q:** As per section 23 82 23, is the intent that the mechanical contractor to remove the existing electric radiant panels and reinstall / provide additional panels for revised layout. Electrical would disconnect existing panels and connect the electrical to the new revised layout.

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A: Yes, this is correct.

- .3 **Q:** Please clarify the type of floor drain in the mechanical room B7 that is in front of the new backflow preventer.

A: Standard floor drain, Watts FD-100.

- .4 **Q:** Will the domestic water meter be provided by the utility or is this to be provided by the mechanical contractor.

A: By Mechanical contractor.

.5 **REQUESTS FOR EQUALS - Mechanical**

SECTION / REFERENCE	TAG	SPECIFIED PRODUCT/EQUIPMENT	PROPOSED PRODUCT	EQUAL (Y/N)	REMARKS
Dwg M10	LAV-1	American Standard 0954.004EC	Contrac Clayton 4640CHZ	Y	
		American Standard 0059.020EC	Contrac Clayton 4644CHZ	Y	
	WC-1,2	American Standard 2467.016.020	Contrac Cleo 722BOY/5712BOY	Y	
Dwg M3	P-1	Bell & Gossett 2DES	Liberty Pumps FL51M-2 and included system	Y	Requires 2" discharge
Dwg M4.2 & M10	HRV-1	Based on RenewAire	Fantech	-	Need model from supplier to review accordingly.
Dwg M4.1 & M10	S-1, R-1	AAG	Tuttle and Bailey	-	Shall be plaster-in grille. Architecture to review visual appeal of the proposed product.
Dwg M4.1 & M10	SF-1	Greenheck	Soler and Palau	Y	
Dwg M4.1 & M10	E-1	EH Price	Ventex	Y	

1.6 CLARIFICATIONS: ELECTRICAL

- .1 **Q:** New NWB-6MD-1 fed from new CSTE note 4 drawing E-2 calls for 2x4C #500 Cu. Teck. Single line drawing E17 NWB-6MD-1 is fed with 8x1C#600MCM RWU90 Cu. Please clarify.

A: Main feeder from CSTE to NWB-6MD-1 to be 2x4#600MCM Teck90 Cu.

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- .2 **Q:** Single Line Drawing E17 Panel BH-P6A 400A 120/209/30/4W Should read 347x1600 30 4W
 A: Correct. Revise 120/208V/3P/4W to 347/600V/3P/4W
- .3 **Q:** The phrase allowance for ... kW portable electric heating at 3 locations. What is this in reference to?
 A: These allowances are indicated for load calculation purposes only.
- .4 **Q:** Will there be a problem drilling through basement walls to new electrical room for new feeders for distribution?
 A: All new penetrations through stone walls to be coordinated on site with Departmental Representative and Parks Canada prior to commencement of any work.
- .5 **Q:** Drawing E1 is NTS (not to scale) yet it has substantial excavation via soft-dig on it. Also, I need to be close when measuring feeder lengths and I can't use this Drawing. I doubt the site will allow me to run around jumping bastion walls and measuring across highways etc. to get measurements to the existing CSTE across the road. Can we get a scaled drawing for this scope (electrical excavation & feeders)?
 A: Site plan drawings are for reference purposes and are presented as not to scale. All dimensions to be confirmed on site by contractor.
- .6 **Q:** During the site walk-through, we were unable to see the existing Distribution but it appears it is concealed behind the circular walls of the North West Bastion. Is it possible to get another site visit or at least pics of the existing distribution?
 A: See Addendum 1
- .7 **Q:** The top note on Detail #1 (Drawing E2) indicates existing feeders from the existing CSTE to be removed. Is this correct that the new feeders need to be 'soft dig' excavated (across the road), installed into the new CSTE & the new 800 amp Main Service Entrance unit and energized. Then we need to demo the old CSTE and the old 800 amp Service Entrance as well as soft dig across the road again to remove the existing demo'd feeders? Can the old feeders just not be cut off and abandoned? This is a substantial amount of additional soft digging to remove the existing demo'd feeders from the demo'd CSTE to the North West bastion.
 A: Existing underground feeders can be disconnected and abandoned. All above ground portions of the feeders to be removed.
- .8 The following has been accepted as an equal:
 Type H – Manufacturer: Lumascape, Cat. No. LS553LED-1H6-SS-2-32-13-DIM.
 As for the remainder:
 Type A – Aluminum channel width exceeds max dimension of 19mm at 30mm.
 Type B - Aluminum channel width exceeds max dimension of 19mm at 30mm.
 Type C - Aluminum channel width exceeds max dimension of 19mm at 30mm.
 Type F - Upon cursory review, this seems to meet the specification.

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Type G – Aluminum channel width exceeds max dimension of 26mm at 30.5mm.

Type J – Aluminum channel exceeds max dimension of 19mm at 30.5mm.

1.7

CLARIFICATIONS: GENERAL

.1 **Q:** Building Permit

A: All permits provided by contractor.

.2 **Q:** What is the estimated cost for stoves - for the purpose of insuring?

A: \$8000 per stove that would be sufficient to allow for the US-CDN exchange rate and inflation. There are 15 stoves in the Big House, of those 15 one of them in the parlour is very very fancy so of course would be more. There are also 2 in the men's House and a minimum of 4 in the fur loft building. (However some are more ornate than others.) If required, Parks can send out for an official quote. Final assessments of risk remain the responsibility of the Contractor.

END OF ADDENDUM NUMBER NO. 2

GENERAL NOTES

FOUNDATIONS

1. ALL END BEARING CAST-IN-PLACE FRICTION PILES DESIGNED ON THE BASIS OF AN ALLOWABLE END BEARING CAPACITY ON TILL OF 240 kPa.
2. PROVIDE 10 MIL POLYETHYLENE WRAPPED SONOTUBE PLASTIC TUBE, GREASED COMPLETELY ON INSIDE FOR TOP 1800 mm OF PILES INDICATED ON PLAN.

PILE SCHEDULE

MARK	DESCRIPTION	REINFORCING
P1	600# CAST-IN-PLACE CONC FRICTION PILE	6-15M VERTICAL 10M RINGS @ 1200 O/C
P2	650# CAST-IN-PLACE CONC FRICTION PILE	6-15M VERTICAL 10M RINGS @ 1200 O/C
P3	700# CAST-IN-PLACE CONC FRICTION PILE	7-15M VERTICAL 10M RINGS @ 1200 O/C
P4	750# CAST-IN-PLACE CONC FRICTION PILE	7-15M VERTICAL 10M RINGS @ 1200 O/C
P5	900# CAST-IN-PLACE CONC FRICTION PILE	8-15M VERTICAL 10M RINGS @ 1200 O/C

NOTE: ALL PILES TO BE CAST-IN-PLACE PILES END BEARING ON GLACIAL TILL.

UTILIZE PILE MARKED '*' AS TEST PILE. CONTRACTOR TO RETAIN QUALIFIED GEOTECHNICAL ENGINEER TO ASSESS FOUNDATION CONDITION AT TIME OF TEST PILE CONSTRUCTION TO VERIFY ASSUMED ALLOWABLE END BEARING CAPACITY OF 240 kPa AND TO PERFORM FULL-TIME PILE INSPECTIONS DURING PILE CONSTRUCTION.

CONTRACTOR TO ALLOW FOR AND EXPECT SLEEING FOR PILE CONSTRUCTION & FOR BOULDER REMOVAL.

READ THIS DRAWING IN CONJUNCTION WITH S1

300-275 Carlton Street
Winnipeg, Manitoba R3C 5R6
T 204. 943. 7501
F 204. 943. 7507



Crosier Kilgour
& Partners Ltd.

CONSULTING STRUCTURAL ENGINEERS

Project

LOWER FORT GARRY

HERITAGE BUILDING RECAPITALIZATION

WPG., MB.

Sheet Title

GENERAL NOTES & PILE SCHEDULE REVISED

Sheet No.

Design

BF

Drawn

CL

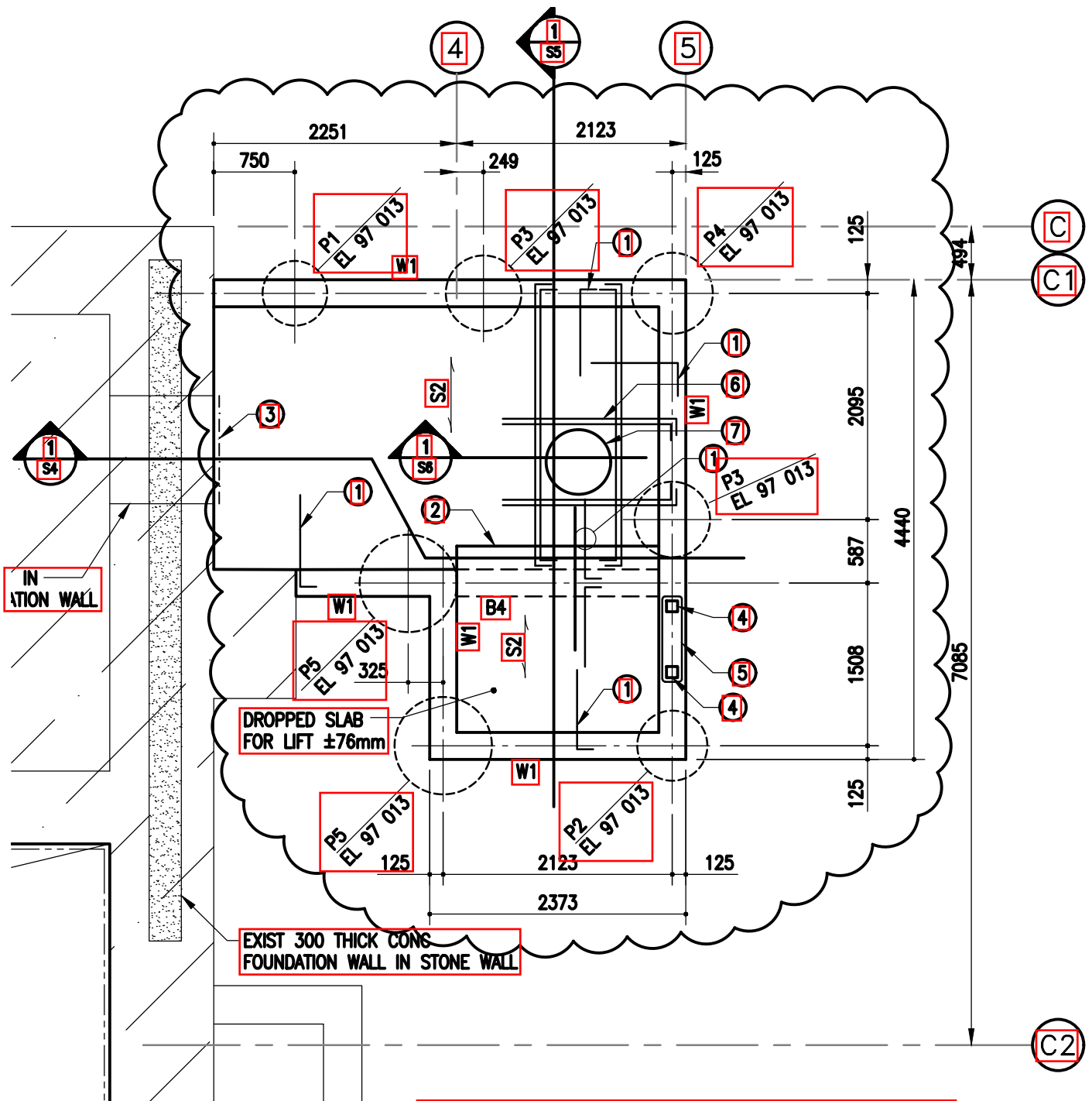
Date

2016-10-27

File

2015-1191

RS-1



BASEMENT FLOOR FRAMING AND FOUNDATION PLAN

1 : 50

READ THIS DRAWING IN CONJUNCTION WITH S2

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CONSULTING STRUCTURAL ENGINEERS

Project

LOWER FORT GARRY

HERITAGE BUILDING RECAPITALIZATION

WPG., MB.

Sheet Title

BASEMENT FLOOR FRAMING

Sheet No.

AND FOUNDATION PLAN PILES REVISED

Design

BF

Drawn

CL

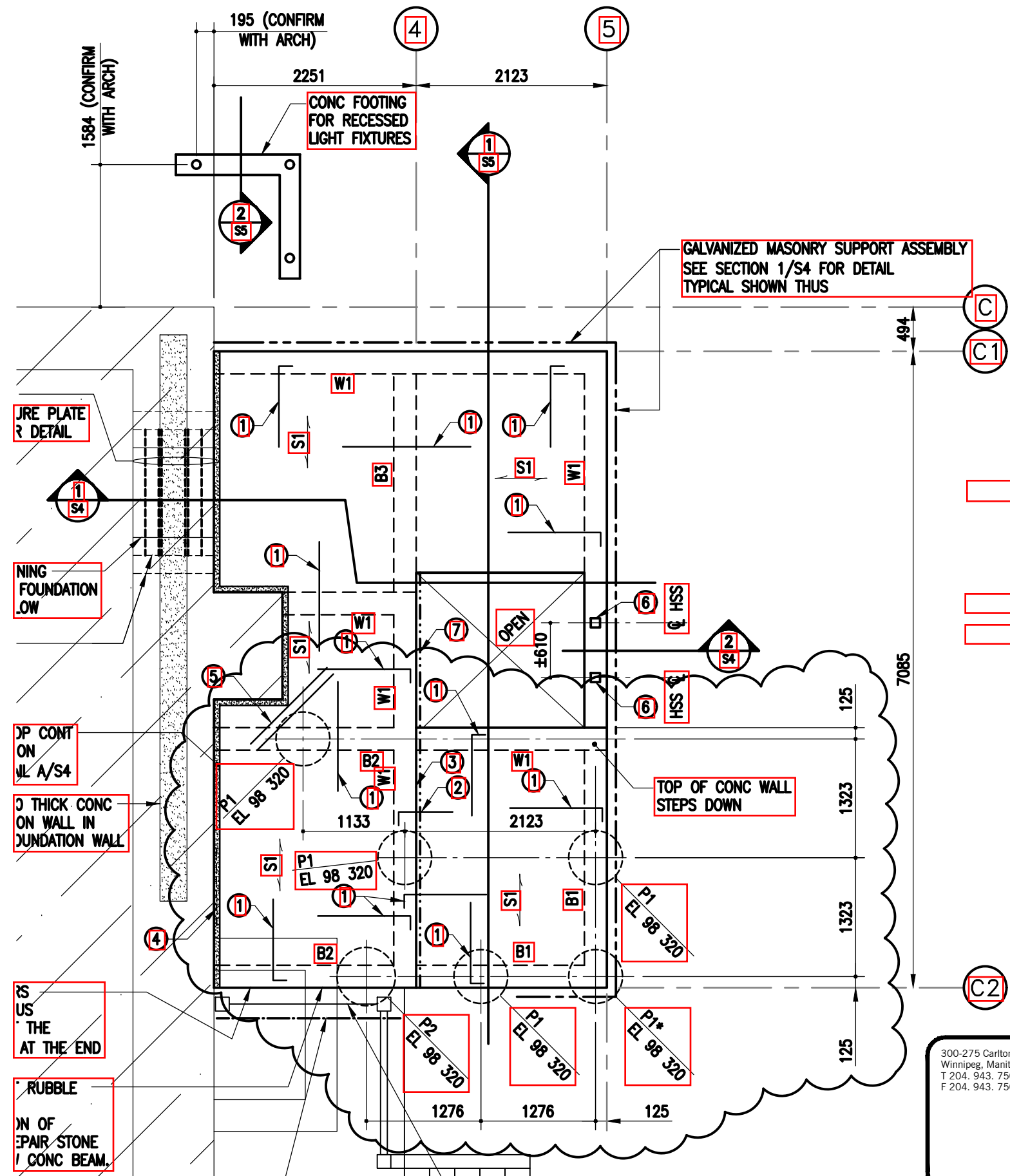
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2016-10-27

File

2015-1191

RS-2

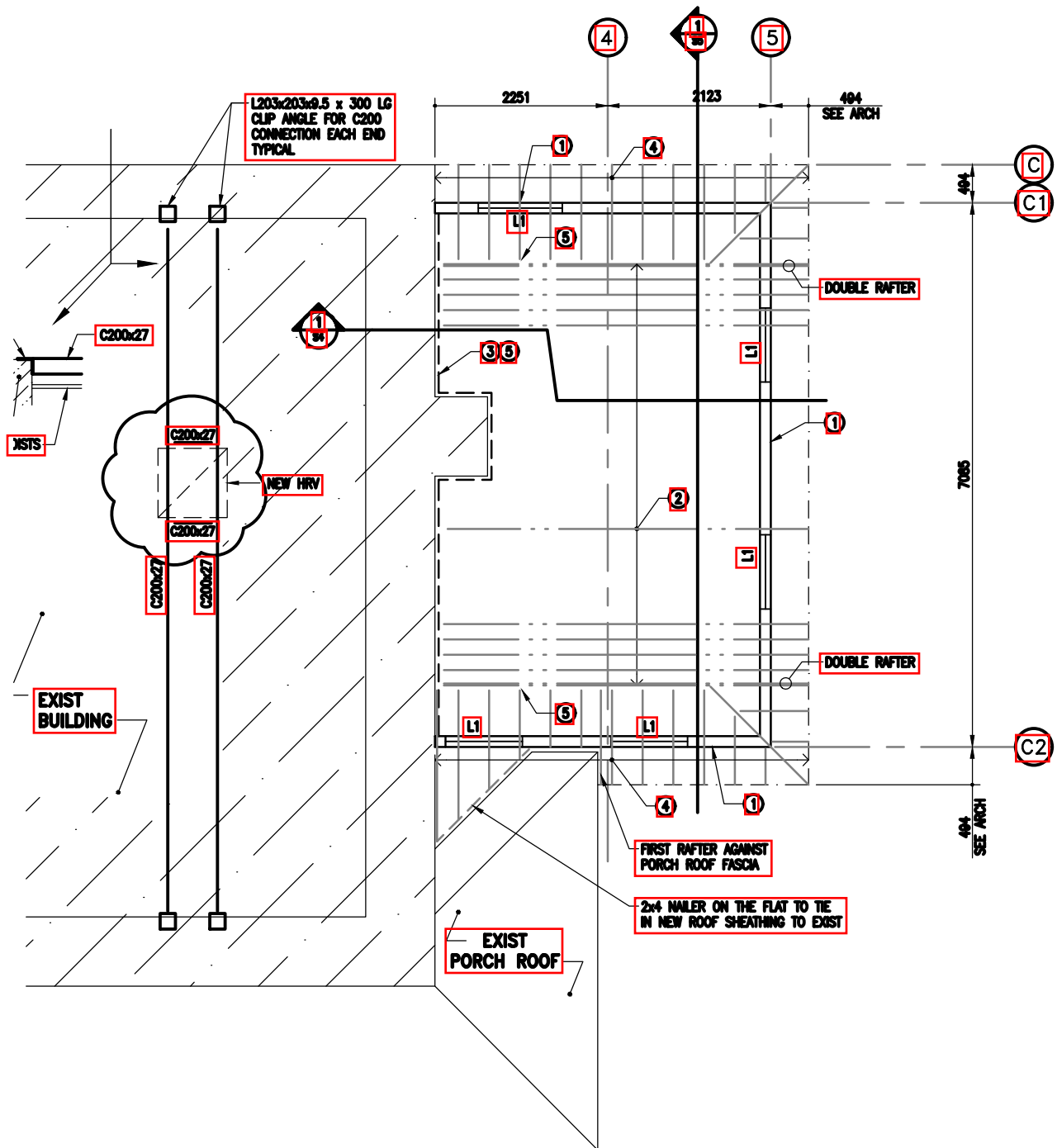


MAIN FLOOR FRAMING PLAN

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READ THIS DRAWING IN CONJUNCTION WITH S3

300-275 Carlton Street Winnipeg, Manitoba R3C 5R6 T 204. 943. 7501 F 204. 943. 7507	Project LOWER FORT GARRY HERITAGE BUILDING RECAPITALIZATION WPG., MB.
Crosier Kilgour & Partners Ltd. CONSULTING STRUCTURAL ENGINEERS	Sheet Title MAIN FLOOR FRAMING PLAN PILES REVISED Design BF Drawn CL Date 2016-10-27 File 2015-1191 Sheet No. RS-3



ROOF FRAMING PLAN

1 : 75

READ THIS DRAWING IN CONJUNCTION WITH S3

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F 204. 943. 7507



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& Partners Ltd.**

CONSULTING STRUCTURAL ENGINEERS

Project

**LOWER FORT GARRY
HERITAGE BUILDING RECAPITALIZATION**

WPG., MB.

Sheet Title

ROOF FRAMING HRV SUPPORT REVISED

Sheet No.

RS-4

Design

BF

Drawn

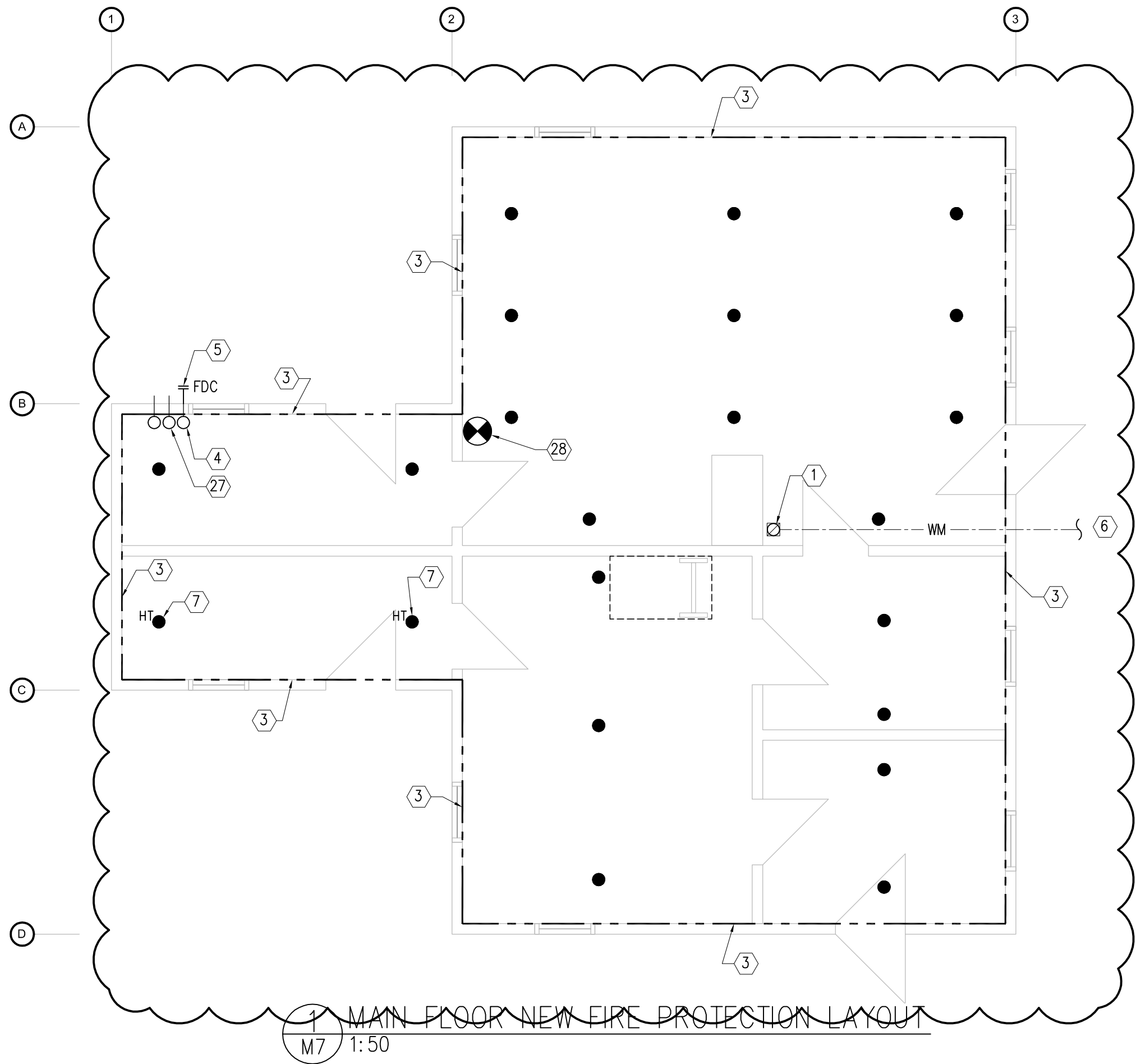
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Date

2016-10-27

File

2015-1191



REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
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Mechanical | Electrical | Communications | Security Engineering

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0	Issued with Addendum #4	2016-10-26
Revision	Description	Date

Client

Public Works
and Government Services
Canada

Project title

HERITAGE BUILDING
RECAPITALIZATION
LFG, MANITOBA

Drawn by

IS

Designed by

RR

Approved by

DD

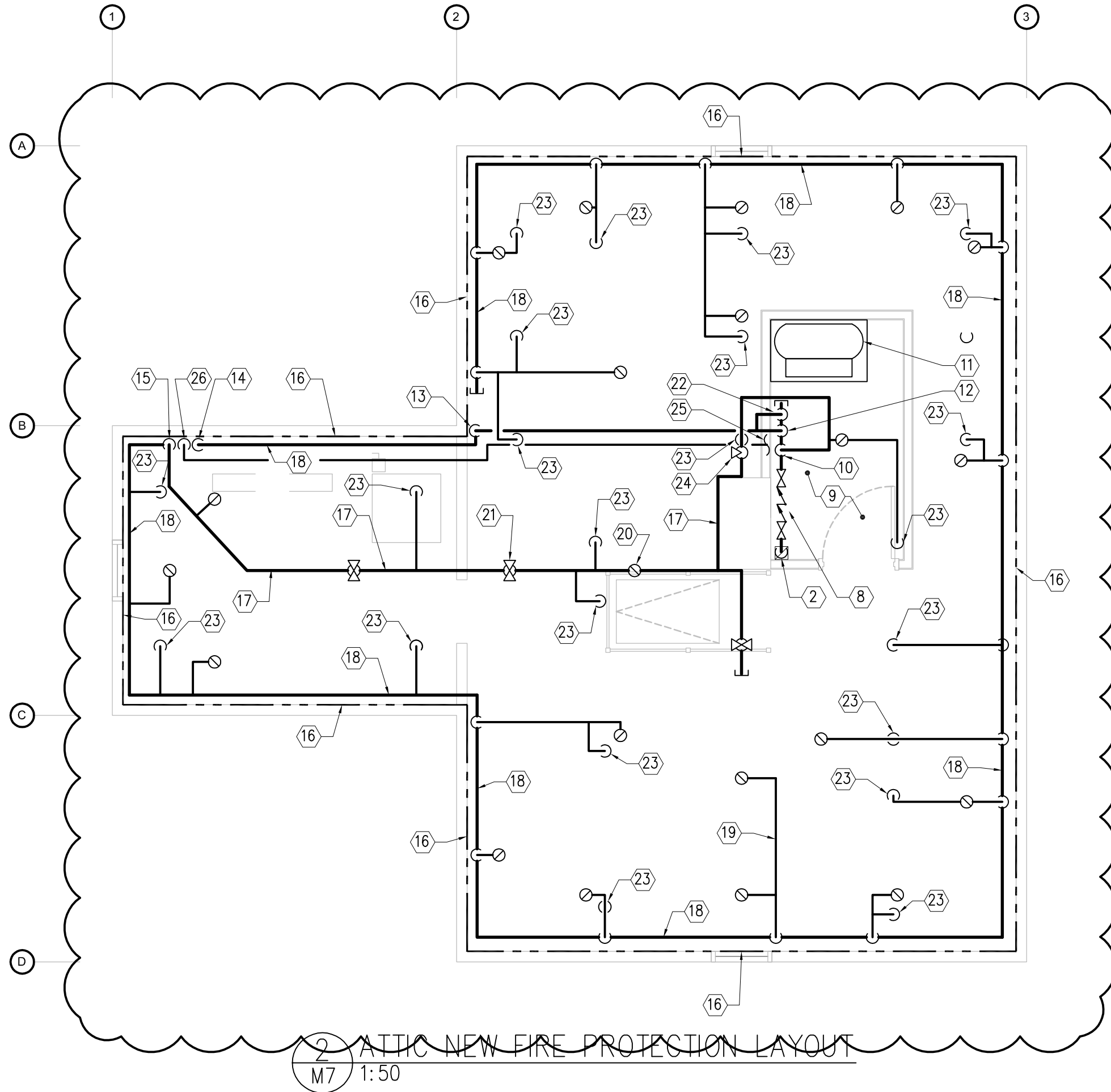
PWGSC Project Manager

CK

Drawing title

MAIN FLOOR NEW
FIRE PROTECTION
LAYOUT

Project no.	Sheet	Revision
R.075212.001	M7-R1.1	0



2 ATTIC NEW FIRE PROTECTION LAYOUT
M7 1:50

REAL PROPERTY SERVICES
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0	Issued with Addendum #4	2016-10-26
Revision	Description	Date

Client

**Public Works
and Government Services
Canada**

Project title

**HERITAGE BUILDING
RECAPITALIZATION
LFG, MANITOBA**

Drawn by

IS

Designed by

RR

Approved by

DD

PWGSC Project Manager

CK

Drawing title

**ATTIC NEW
FIRE PROTECTION
LAYOUT**

Project no.	Sheet	Revision
R.075212.001	M7-R1.2	0

Part 1 General

1.1 REFERENCES

- .1 Canadian Standards Association (CSA)
 - .1 CSA A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA O86S1-09, Supplement No. 1 to CAN/CSA-O86-01, Engineering Design in Wood.
 - .3 CSA O121-08, Douglas Fir Plywood.
 - .4 CSA O151-09, Canadian Softwood Plywood.
 - .5 CSA O153-M1980 (R2008), Poplar Plywood.
 - .6 CAN/CSA O325-07, Construction Sheathing.
 - .7 CSA O437 Series-93, Standards for OSB and Waferboard.
 - .8 CSA S269.1-1975 (R2003), Falsework for Construction Purposes.
 - .9 CAN/CSA S269.3-M92, Concrete Formwork.
- .2 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.2 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit shop drawings for formwork and falsework.
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba.
- .3 Submit WHMIS MSDS - Material Safety Data Sheets for products used.
- .4 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. Comply with CAN/CSA-S269.3 for formwork drawings.
- .5 Indicate formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms.
- .6 Indicate sequence of erection and removal of formwork/falsework as directed by Departmental Representative.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Waste Management and Disposal:
 - .1 Remove waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .2 Place materials defined as hazardous or toxic in designated containers.

Part 2 Products

2.1 MATERIALS

- .1 Formwork materials:
 - .1 For concrete without special architectural features, use wood and wood product formwork materials to CSA-O121.
 - .2 For concrete with special architectural features, use formwork materials to CSA-A23.1/A23.2.
- .2 Tubular column forms: round, spirally wound laminated fibre forms, internally treated with release material.
- .3 Form ties:
 - .1 For concrete not designated 'Architectural', use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.
 - .2 For Architectural concrete, use snap ties complete with plastic cones and light grey concrete plugs.
- .4 Void form: Honeycomb-type biodegradable plastic wrapped cardboard, 150 mm thick, treated to provide sufficient structural support for poured concrete until concrete cures.
- .5 Form liner:
 - .1 Plywood: Douglas Fir to CSA O121.
- .6 Form release agent: non-toxic, biodegradable, low VOC.
- .7 Falsework materials: to CSA-S269.1.
- .8 Sealant: to Section 07 92 00 - Joint Sealants.

Part 3 Execution

3.1 FABRICATION AND ERECTION

- .1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.
- .2 Earth forms are not permitted.
- .3 Fabricate and erect falsework in accordance with CSA S269.1.
- .4 Refer to architectural drawings for concrete members requiring architectural exposed finishes.
- .5 Do not place shores and mud sills on frozen ground.
- .6 Provide site drainage to prevent washout of soil supporting mud sills and shores.

- .7 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.
- .8 Align form joints and make watertight.
 - .1 Keep form joints to minimum.
- .9 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .10 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.
 - .1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.
- .11 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

3.2 REMOVAL AND RESHORING

- .1 Leave formwork in place for following minimum periods of time after placing concrete.
 - .1 3 days for walls and sides of beams.
- .2 Remove formwork when concrete has reached 75 % of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate re-shoring.
- .3 Provide necessary re-shoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.
- .4 Space reshoring in each principal direction at not more than 3000 mm apart.
- .5 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian Standards Association (CSA)
 - .1 CSA A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA A23.3-04(R2010), Design of Concrete Structures.
 - .3 CAN/CSA G30.18-M92, Carbon Steel Bars for Concrete Reinforcement.
- .2 Reinforcing Steel Institute of Canada (RSIC)
 - .1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

1.2 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice.
- .3 Shop Drawings:
 - .1 Submit detailed fabrication drawings .
 - .1 Indicate placing of reinforcement and:
 - .1 Bar bending details.
 - .2 Lists.
 - .3 Quantities of reinforcement.
 - .4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings.
 - .2 Detail lap lengths and bar development lengths to CAN/CSA A23.3.

1.3 QUALITY ASSURANCE

- .1 Submit in accordance with Section 01 45 00 - Quality Control and as described in PART 2 - SOURCE QUALITY CONTROL.
 - .1 Mill Test Report: upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, minimum 4 weeks prior to beginning reinforcing work.
 - .2 Upon request, submit in writing to Departmental Representative proposed source of reinforcement material to be supplied.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store, and handle materials in accordance with Section 01 61 00 - Common Product Requirement and with manufacturer's written instructions.

- .2 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground in dry location, and in accordance with manufacturer's recommendations, in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Substitute different size bars only if permitted in writing by Departmental Representative.
- .2 Reinforcing steel: Billet steel, grade 350, deformed bars to CSA-G30.18, unless indicated otherwise.
- .3 Reinforcing steel: Weldable low alloy steel deformed bars to CSA-G30.18.
- .4 Chairs, bolsters, bar supports, spacers: To CSA-A23.1/A23.2.
- .5 Mechanical splices: subject to approval of Departmental Representative.

2.2 FABRICATION

- .1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
- .2 Obtain Departmental Representative's written approval for locations of reinforcement splices other than those shown on placing drawings.
- .3 Upon approval of Departmental Representative, weld reinforcement in accordance with CSA W186.
- .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 SOURCE QUALITY CONTROL

- .1 Upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 4 weeks prior to beginning reinforcing work.
- .2 Upon request inform Departmental Representative of proposed source of material to be supplied.

Part 3 Execution

3.1 FIELD BENDING

- .1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.

- .2 When field bending is authorized, bend without heat, applying slow and steady pressure.
- .3 Replace bars, which develop cracks or splits.

3.2 PLACING REINFORCEMENT

- .1 Place reinforcing steel as indicated on placing drawings in accordance with CSA-A23.1/A23.2.
- .2 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.
- .3 Ensure cover to reinforcement is maintained during concrete pour.

3.3 CLEANING

- .1 Progress Cleaning: Clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: Upon completion, remove surplus materials, rubbish, tools, and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: Remove waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ASTM International
 - .1 ASTM C260/C250M-10a, Standard Specification for Air-Entraining Admixtures for Concrete.
 - .2 ASTM C309-11, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - .3 ASTM C494/C494M-13, Standard Specification for Chemical Admixtures for Concrete.
 - .4 ASTM D412-06a(2013), Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
 - .5 ASTM D624-00(2012), Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer.
 - .6 ASTM D1752-04a(2013), Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA A283-06(R2011), Qualification Code for Concrete Testing Laboratories.
 - .3 CAN/CSA-A3000-13, Cementitious Materials.

1.2 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.
- .2 Provide Departmental Representative, minimum 4 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.
 - .1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.
- .3 Minimum 4 weeks prior to starting concrete work, provide proposed quality control procedures for review by Departmental Representative on following items:
 - .1 Falsework erection.
 - .2 Hot weather concrete.

- .3 Cold weather concrete.
- .4 Curing.
- .5 Finishes.
- .6 Formwork removal.
- .7 Joints.
- .4 Quality Control Plan: provide written report to Departmental Representative verifying compliance that concrete in place meets performance requirements of concrete as established in PART 2 - PRODUCTS.
- .5 Arrange for and pay costs of CSA certified testing agency to perform concrete testing in accordance with CSA A23.1/A23.2. No less than one batch of tests (slump, air content, and a minimum of 3 compressive strength cylinders) shall be performed for every 100 cubic metres of each type of concrete placed and no less than one batch of tests shall be performed for each concrete type placed per day, whichever yields the greater number of tests.

1.3 SUBMITTALS

- .1 Certificates:
 - .1 Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CSA-A23.1. Certification letter to be sealed by an engineer registered in the Province of Manitoba.
 - .2 Provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CSA-A23.1. Certification letter to be sealed by an engineer registered in the Province of Manitoba.
- .2 Concrete hauling time: provide, for review by Departmental Representative, deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements:
 - .1 Concrete hauling time: Deliver to site of Work and discharge within 120minutes maximum after batching.
 - .1 Do not modify maximum time limit without receipt of prior written agreement from Departmental Representative and concrete producer as described in CSA A23.1/A23.2.
 - .2 Deviations to be submitted for review by Departmental Representative.
 - .2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

Part 2 Products

2.1 DESIGN CRITERIA

- .1 Alternative 1 - Performance: to CSA A23.1/A23.2, and as described in concrete mixes of PART 2 - PRODUCTS.

2.2 PERFORMANCE CRITERIA

- .1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established by Departmental Representative and provide verification of compliance as described in PART 1 - QUALITY ASSURANCE.

2.3 MATERIALS

- .1 Portland Cement: to CSA A3001.
- .2 Blended hydraulic cement: to CSA A3001.
- .3 Supplementary cementing materials: submit for approval, by mass of total cementitious materials to CSA A3001.
- .4 Water: to CSA A23.1.
- .5 Aggregates: to CSA A23.1/A23.2.
- .6 Admixtures:
 - .1 Air entraining admixture: to ASTM C260.

2.4 MIXES

- .1 Refer to General Notes on Drawings.

2.5 ACCESSORIES

- .1 Curing compound: to CSA A23.1/A23.2.
- .2 Mechanical waterstops: ribbed extruded PVC of sizes indicated with shop welded corner and intersecting pieces with legs not less than 150 mm long:
- .3 Premoulded joint fillers:
 - .1 Bituminous impregnated fiber board: to ASTM D1751.
- .4 Dampproofing:
 - .1 Emulsified asphalt, mineral colloid type, unfilled: to CAN/CGSB-37.2.
- .5 Polyethylene film: 0.25 mm thickness to CAN/CGSB-51.34.

Part 3 Execution

3.1 PREPARATION

- .1 Obtain Departmental Representative's written approval before placing concrete.
 - .1 Provide minimum 48 hours' notice prior to placing concrete.

- .2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.
- .3 During concreting operations:
 - .1 Development of cold joints not allowed.
 - .2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.
- .4 Pumping of concrete is permitted only after approval of equipment and mix.
- .5 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .6 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing.
- .7 Protect previous Work from staining.
- .8 Clean and remove stains prior to application for concrete finishes.
- .9 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .10 In locations where new concrete is dowelled to existing work, drill holes in existing concrete.
 - .1 Place deformed steel reinforcing bars and pack solidly with epoxy grout to anchor and hold dowels in positions as indicated.
- .11 Do not place load upon new concrete until authorized by Departmental Representative.

3.2 INSTALLATION/APPLICATION

- .1 Do cast-in-place concrete work to CSA A23.1/A23.2.
- .2 Sleeves and inserts:
 - .1 Do not permit penetrations, sleeves, ducts, pipes or other openings to pass through joists, beams, column capitals or columns, except where indicated or approved by Departmental Representative.
 - .2 Where approved by Departmental Representative, set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere.
 - .3 Sleeves and openings greater than 100 x 100 mm not indicated, must be reviewed by Departmental Representative.
 - .4 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain written approval of modifications from Departmental Representative before placing of concrete.
 - .5 Confirm locations and sizes of sleeves and openings shown on drawings.
 - .6 Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.
- .3 Anchor bolts:

- .1 Set anchor bolts to templates in co-ordination with appropriate trade prior to placing concrete.
- .2 Protect anchor bolt holes from water accumulations, snow and ice build-ups.
- .3 Set bolts and fill holes with epoxy grout.
- .4 Grout under base plates and machinery using procedures in accordance with manufacturer's recommendations which result in 100 % contact over grouted area.

3.3 FINISHING AND CURING

- .1 Finishing and curing: to CSA A23.1/A23.2.
- .2 Schedule of finishes:
 - .1 Concrete flatwork, unless otherwise indicated:
 - .1 Steel trowel finish.
 - .2 Concrete tolerance in accordance with CSA-A23.1/A23.2
 - .1 FF = 30
 - .2 FL = Not Applicable.
 - .3 Liquid Densifier and Dust proofer: magnesium fluorosilicate concrete hardener and dust proofer.
 - .3 Waterstops:
 - .1 Install waterstops to provide continuous water seal.
 - .2 Do not distort or pierce waterstop in way as to hamper performance.
 - .3 Do not displace reinforcement when installing waterstops.
 - .4 Use equipment to manufacturer's requirements to field splice waterstops.
 - .5 Tie waterstops rigidly in place.
 - .6 Use only straight heat-sealed butt joints in field.
 - .7 Use factory welded corners and intersections unless otherwise approved by Departmental Representative.
 - .4 Joint fillers:
 - .1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Departmental Representative.
 - .2 When more than one piece is required for joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.
 - .3 Locate and form isolation joints as indicated.
 - .4 Install joint filler.
 - .5 Use 12 mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to within 12 mm of finished slab surface unless indicated otherwise.

3.4 JOINTS

- .1 Locate control joints and construction joints as shown on the Drawings.

- .2 All joints to be sawcut via specialized dry-process cutting (ie. “Soff Cut”).
 - .1 Sawcut to a minimum of 25 mm or one-quarter of the depth of the slab, whichever is greater.
 - .2 Timing of the saw cutting will vary with weather conditions however are typically completed within 1 to 4 hours after final finishing. Timing of the saw cutting will be the responsibility of the Contractor.
 - .3 Sawcutting 24 hours following placement is not permitted.

3.5 FIELD QUALITY CONTROL

- .1 Site tests: conduct tests as follows and in accordance with Section 01 45 00 - Quality Control and submit report as described in PART 1 - SUBMITTALS.
 - .1 Concrete pours.
 - .2 Slump.
 - .3 Air content.
 - .4 Compressive strength at 7 and 28 days.
 - .5 Air and concrete temperature.
- .2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Departmental Representative for review to CSA A23.1/A23.2.
 - .1 Ensure testing laboratory is certified to CSA A283.
- .3 Ensure test results are distributed for discussion at pre-pouring concrete meeting between testing laboratory and Departmental Representative.
- .4 Take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete that they represent.
- .5 Inspection or testing by Departmental Representative will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

3.6 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

Part 1 General

1.1 MEASUREMENT PROCEDURES

- .1 Caissons:
 - .1 The contractor shall provide a fixed lump sum price for the caissons. The price shall include but not be limited to the following: shaft enlargement where bellling is not possible, tremied concrete where required, steel sleeves where required, variable till depth, boulder removal where required and any additional means necessary to install the caissons to support the required design capacity.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM A36/A36M-05, Standard Specification for Carbon Structural Steel.
 - .2 ASTM A53/A53M-05, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- .2 American Welding Society (AWS)
 - .1 AWS D1.4/D1.4M-05, Structural Welding Code - Reinforcing Steel.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2-04(July 2005), Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CAN/CSA-G30.18-M92(2002), Billet Steel Bars for Concrete Reinforcement.
 - .3 CSA-G40.20/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .4 CAN/CSA-S16-01(R2007), Limit States Design of Steel Structures.
 - .5 CSA W48-01(R2006), Filler Metals and Allied Materials for Metal Arc Welding.

1.3 EXISTING CONDITIONS

- .1 A test pile installation is to be conducted at the location indicated on the drawings in order to confirm the site soil conditions and assumed bearing capacities. The contractor shall arrange for and include in the tender price retention of a qualified Geotechnical Engineer registered in Manitoba to attend the site during the testing pile construction. A Geotechnical Report is to be provided by the Geotechnical Engineer. In accordance with Manitoba Building Code requirements, the Geotechnical Engineer is to be retained for full-time site inspections of the pile foundations work.
- .2 Notify Consultant in writing if subsurface conditions at site differ from those indicated and await further instructions from Geotechnical Engineer.

1.4 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
 - .1 Indicate: size of pile, reinforcing steel and ties.
- .3 Caissons Installation:
 - .1 Provide caisson installation sequence for review of the Consultant at least two weeks in advance of caisson installation.

Part 2 Products

2.1 MATERIALS

- .1 Concrete mixes and materials: in accordance with Section 03 30 00 - Cast-in-Place Concrete and with general notes on the drawings.
- .2 Reinforcing steel: to CAN/CSA-G30.18 and in accordance with Section 03 20 00 - Concrete Reinforcing.
- .3 Steel casing: As required and designed by installer.
- .4 Grout: in accordance with Section 03 30 00 - Cast-in-Place Concrete.

2.2 SOURCE QUALITY CONTROL

- .1 Mill report to CAN/CSA-S16.
- .2 Concrete tests: to CSA-A23.1/A23.2.

Part 3 Execution

3.1 INSTALLATION

- .1 Caissons:
 - .1 Bore holes to diameters as indicated until required bearing stratum as determined by Geotechnical Engineer is reached.
 - .2 Construct bell, unless a straight shaft caisson is required.
 - .3 Bottom of hole shall be mechanically cleaned.
 - .4 Geotechnical Engineer to inspect bottom of bore holes prior to placing of concrete. Remove loose material, foreign matter and water as directed by geotechnical engineer.
 - .5 The Caisson must be completed on the day that it is started and the concrete shall be placed as soon as possible after the excavation is completed and the base inspected to minimize the risk of base heave.
 - .6 Schedule caisson work in consultation with the geotechnical engineer. Adjacent caissons shall not be excavated simultaneously to minimize the risk of base heave.
- .2 Protective steel casing:

- .1 Install casing as required. Cost of casing shall be included in lump sum for foundation work.
- .3 Remove stones up to 300mm in dimension, boulders over 300mm and rock in whole or in part before boring tool is deflected. If required, lower boring tool and clean hole to ensure that machine auger has reached the required depth.
- .4 Dispose of excavated materials off site.
- .5 Install steel reinforcement in accordance with Section 03 20 00 - Concrete Reinforcing and as indicated.
- .6 Fill pile excavations with concrete to elevations as indicated.
 - .1 Place concrete in one continuous pour in accordance with Section 03 30 00 - Cast-in-Place Concrete.
- .7 Steel protective casing may be removed at option of Contractor.
- .8 Where steel protective casing is to be removed, provide concrete with minimum slump of 125 mm and with retarder to prevent arching or setting of concrete.
 - .1 Withdraw casing in conjunction with concrete placing, keeping bottom of casing below level of concrete.
- .9 Where steel protective casing is left in place, fill void space between casing and shaft excavation with concrete.
- .10 Use tremie pipe or concrete pumping as required. Costs of tremied concrete shall be included in the lump sum for the foundation work.

3.2 PROTECTION

- .1 If superimposed work is to be placed later, protect top of each unit with at least 150mm of damp sand.

3.3 DEFECTIVE PILES

- .1 Cased concrete shaft piles rejected where:
 - .1 Soil has entered casing.
 - .2 Water has entered casing.
 - .3 Casing is damaged, out of tolerance or alignment.
- .2 Defective Caissons:
 - .1 Perform remedial work as directed by Consultant and Geotechnical Engineer.

3.4 SAFETY

- .1 Conform to the latest regulations of the Provincial Building Protection Act and Provincial Building Code and provide all necessary safety equipment required.

3.5 FIELD QUALITY CONTROL

- .1 Review of caisson operations shall be done by an independent inspection and testing agency under a cash allowance and retained by the owner.

- .2 Maintain accurate records for each caisson and pile installation, including:
 - .1 Pile size and length, location of pile.
 - .2 Location.
 - .3 Top of Caisson Elevation.
 - .4 Bearing Condition.
 - .5 Bearing Capacity.
 - .6 Presence of Water.
 - .7 Other pertinent information.
- .3 Provide Consultant with three copies of records.

3.6 CLEANING

- .1 Proceed in accordance with Section 01 74 00 – Project Clean-Up.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)
 - .1 ANSI A117.1-2009, Standard for Accessible and Usable Buildings.
 - .2 ANSI/BHMA A156.1-2000, American National Standard for Butts and Hinges.
 - .3 ANSI/BHMA A156.2-2003, Bored and Preamsembled Locks and Latches.
 - .4 ANSI/BHMA A156.4-2000, Door Controls - Closers.
 - .5 ANSI/BHMA A156.5-2001, Auxiliary Locks and Associated Products.
 - .6 ANSI/BHMA A156.6-2010, Architectural Door Trim.
 - .7 ANSI/BHMA A156.13-2002, Mortise Locks and Latches Series 1000.
 - .8 ANSI/BHMA A156.16-2002, Auxiliary Hardware.
 - .9 ANSI/BHMA A156.19-2002, Power Assist and Low Energy Power - Operated Doors.
 - .10 ANSI/BHMA A156.21-2009, Thresholds.
 - .11 ANSI/BHMA A156.31-2013, Electric Strikes and Frame Mounted Actuators.
 - .12 ANSI/BHMA A156.115W-2006 – Hardware Preparations in Wood Doors.
- .2 Canadian Standards Association (CSA)
 - .1 CSA B651-12 – Accessible Design for the Built Environment.
- .3 Canadian Steel Door and Frame Manufacturers' Association (CSDMA)
 - .1 CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames - 2009.
- .4 National Fire Protection Association (NFPA)
 - .1 NFPA (Fire) 80 - Standard for Fire Doors and Other Opening Protectives, 2007 edition.
 - .2 NFPA (Fire) 252 - Fire Tests of Door Assemblies, 2012 edition.

1.2 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for door hardware; include product characteristics, performance criteria, physical size, finish, and limitations.
- .3 Samples:
 - .1 Submit for review and acceptance of each unit.

- .2 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.
- .3 After approval, samples will be returned for incorporation in Work.
- .4 Hardware List:
 - .1 Submit contract hardware list.
 - .2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.
- .5 Manufacturer's Instructions: Submit manufacturer's installation instructions.
- .6 Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
- .7 Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.3 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: Submit operation and maintenance data for door hardware for incorporation into manual.

1.4 QUALITY ASSURANCE

- .1 Regulatory Requirements:
 - .1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store, and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Package items of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.
- .4 Storage and Handling Requirements:
 - .1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, well-ventilated area.
 - .2 Store and protect door hardware from nicks, scratches, and blemishes.
 - .3 Protect prefinished surfaces with wrapping or strippable coating.
 - .4 Replace defective or damaged materials with new.

Part 2 Products

2.1 DOOR HARDWARE

- .1 Provide hardware with dark oxidized satin bronze finish.
- .2 Locks and latches:
 - .1 Mortise locks and latches: To BHMA A156.13, series 1000 mortise lock, Grade 1.
 - .1 Case: Wrought steel, zinc dichromate plated, 3 mm thick.
 - .2 Lever: Solid forged or cast, design as selected by Departmental Representative from manufacturer's full range.
 - .3 Latchbolt: Minimum 19 mm throw.
 - .4 Cylinders: To ANSI/BHMA A156.5, brass, 6-pin.
 - .5 Normal strikes: Box type, lip projection not beyond jamb.
 - .6 Function:
 - .1 Classroom: ANSI F05.
 - .2 Cylindrical lock: To ANSI/BHMA A156.2, Series 4000, Grade 2 and ANSI A117.1; through-bolt style.
 - .1 Latchbolt: Minimum 13 mm throw.
 - .2 Levers: Solid cast.
 - .3 Roses: Heavy wrought.
 - .4 Strikes: Curved lip, 124 mm height, complete with wrought boxes.
 - .5 Cylinders: To ANSI/BHMA A156.5, brass, 6-pin.
 - .6 Function: As scheduled.
 - .1 Storeroom: ANSI F86.
 - .2 Privacy: F76.
- .3 Hinges: To BHMA A156.1, five-knuckle, standard weight, 0.134 gauge steel.
- .4 Exit devices: To ANSI/BHMA A156.3, Grade 1; listed by UL, and to NFPA 80 and NFPA 101.
 - .1 Chassis: Heavy-duty, cast.
 - .2 Covers: Non-ferrous, removable.
 - .3 Mounting rails: Solid stainless steel, brass, or bronze; minimum 1.8 mm thick.
 - .4 Push rails: Same as mounting rails, minimum 1.57 mm thick.
 - .5 Projection: Maximum 75 mm from door face when in non-dogged position.
 - .6 Trim: Through-bolted pull.
- .5 In-floor door operator: To ANSI/BHMA A156.10 and ANSI/BHMA A156.19, barrier-free.
 - .1 Actuators: Wireless.
 - .2 Motor: 24 V, ¼ hp.

- .3 Closing time: Field-adjustable to close from 90° to 10° in 3 seconds or longer.
- .6 Mounting post for door operator actuator plate: Extruded aluminum, square 152 x 152 mm profile, dark bronze anodized finish, steel mounting base; designed to contain wireless transmitter.
- .7 Surface-mounted overhead operators: To ANSI/BHMA A156.10, ANSI/BHMA A156.19, and ANSI A117.1, low-energy design contained within aluminum housing.
- .8 Door closers: To ANSI/BHMA A156.4, Grade 1, rack and pinion operation, cast aluminum body, adjustable closer spring, adjustable backcheck intensity; complete with top jamb mounting plates for low ceiling applications.
 - .1 Mounting: As indicated in Schedule.
 - .2 Arms: Forged steel, for deep reveal top jamb; permits 140° door opening, ANSI Type C02011.
- .9 Electric strikes: To ANSI/BHMA A156.31, Grade 1; heavy duty stainless steel.
 - .1 Conforms to CAN4-S104.
 - .2 Static strength: 1320 kg (3000 lbs).
 - .3 Dynamic strength: 475 N-m (350 ft-lbs).
- .10 Thresholds: To ANSI/BHMA A156.21, fluted saddle type, extruded aluminum, 6063-T6 alloy, mill finish; 6 mm height, 150 mm width.
- .11 Door bottom sweep: To ANSI/BHMA A156.22, aluminum retainer with encased brush insert, screw attachment.
 - .1 Retainer: Extruded tempered aluminum, clear anodized finish.
 - .2 Brush: Densely compressed nylon filaments.
- .12 Wall stops: Brass, bronze, and stainless steel with rubber bumper, 63 mm diameter, 19 mm projection, concealed mounting.
 - .1 Bumper: Convex or concave as indicated in schedule.
- .13 Overhead stop: Concealed mounting, low profile, with slider cam and shock absorber spring, 110° maximum opening; ANSI C01541.
- .14 Perimeter gasketing: To ANSI/BHMA A156.22, heavy duty, extruded tempered aluminum, 6063-T6 alloy, with neoprene insert.

2.2 FASTENINGS

- .1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.
- .2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .3 Exposed fastening devices to match finish of hardware.
- .4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.

- .5 Use fasteners compatible with material through which they pass.

2.3 KEYING

- .1 Contact Departmental Representative for Keying Strategy.
- .2 Stamp keying code numbers on keys and cylinders.

Part 3 Execution

3.1 INSTALLATION

- .1 Manufacturer's Instructions: Comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Supply door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.
- .3 Supply manufacturers' instructions for proper installation of each hardware component.
- .4 Install hardware to standard hardware location dimensions in accordance with CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction) and CSA B651.
- .5 Where doorstop contacts door pulls, mount stop to strike bottom of pull.
- .6 Use only manufacturer's supplied fasteners.
 - .1 Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.
- .7 Remove temporary cores when directed by Departmental Representative.
 - .1 Install permanent cores and ensure locks operate correctly.

3.2 ADJUSTING

- .1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.
- .2 Lubricate hardware, operating equipment and other moving parts.
- .3 Adjust door hardware to ensure tight fit at contact points with frames.

3.3 CLEANING

- .1 Progress Cleaning: in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.
 - .3 Remove protective material from hardware items where present.
 - .4 Final Cleaning: Upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

- .2 Waste Management: Remove waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
 .2 Repair damage to adjacent materials caused by door hardware installation.

3.5 SCHEDULE

Set: 1.0

1 In Ground Operator	SW200ig - wireless actuators	Dark Bronze
Balance of Hardware Existing		

Notes: Historic Door. Re-Use all existing hardware if possible. Add electric strike to suit latch if required. Auto operator to come complete with centre bottom pivot arm and complete top centre pivot.

Set: 2.0

3 Hinge	TA2314 NRP 4-1/2" x 4"	US10BE
1 Exit Device	8804 862	US10BE
1 Surface Operator	SW200i - wireless actuators	Dark Bronze
1 Threshold	272A	
1 Gasketing	316DS	
1 Sweep	315DN	

Notes: Operator to be manually turned on by use of on/off switch on header. Door to be dogged open by use of hex key in exit device bar. Pull design to be confirmed prior to ordering.

Set: 3.0

3 Hinge	TA2714 4-1/2" x 4"	US10BE
1 Privacy Set	7U65 LL	US10BE
1 Wall Stop	409	US10BE

Notes: Lever design to be confirmed prior to ordering.

Set: 4.0

3 Hinge	TA2714 NRP 4-1/2" x 4"	US10BE
1 Storeroom Lock	7G04 LL	US10BE
1 Closer	1431 UO	EB
1 Wall Stop	406	US10BE

Notes: Lever design to be confirmed prior to ordering.

Set: 5.0

3 Hinge	TA2714 4-1/2" x 4"	US10BE
1 Storeroom Lock	7G04 LL	US10BE
1 Closer	1431 UO	EB
1 Wall Stop	406	US10BE

Notes: Lever design to be confirmed prior to ordering.

Set: 6.0

3 Hinge	TA2314 NRP 4-1/2" x 4"	US10BE
1 Mortise Classroom Lock	8237 LNL	US10BE
1 Electric Strike	1006	BLK
1 Electric Strike Faceplate	LB	BLK
1 Surface Operator	SW200i - wireless actuators	Dark Bronze
1 Threshold	272A	
1 Gasketing	316DS	
1 Sweep	315DN	

Notes: Operator to be manually turned on by use of on/off switch on header. When turned on, pressing actuator on either side of door will release the electric strike and power open the door. Lever design to be confirmed prior to ordering.

Set: 7.0

3 Hinge	TA2714 NRP 4-1/2" x 4"	US10BE
1 Mortise Classroom Lock	8237 LNL	US10BE
1 Concealed Overhead Stop	6-X36	613E

Notes: Lever design to be confirmed prior to ordering.

END OF SECTION