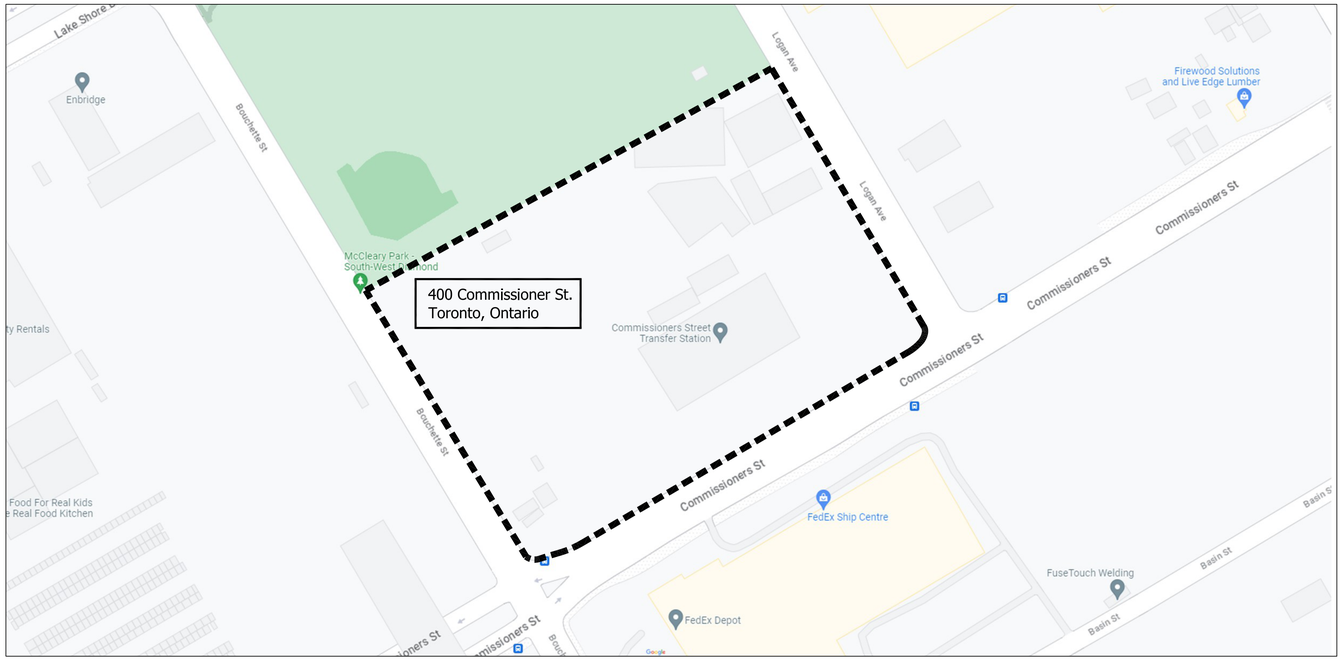
SOLID WASTE MANAGEMENT SERVICES

COMMISSIONER TRANSFER STATION
MRF BUILDING UPGRADES
CONTRACT NO. 23SWM-IRM-026CDU
ISSUED FOR TENDER



400 COMMISSIONER ST., TORONTO LOCATION PLAN

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ITEM	CITY DWG No.	DISCIPLINE	DRAWING DESCRIPTION
1	1601-2023-3-1	G1	COVER SHEET
2	1601-2023-3-2	A1	SITE PLAN
3	1601-2023-3-3	A2	KEY FLOOR PLAN
4	1601-2023-3-4	A3	LOADING DOCK FLOOR PLAN, AND ELEVATION
5	1601-2023-3-5	A4	ELEVATION, CROSS SECTION AND SECTION DETAILS
6	1601-2023-3-6	S1	GENERAL NOTES
7	1601-2023-3-7	S2	GENERAL NOTES
8	1601-2023-3-8	S3	SCHEDULES
9	1601-2023-3-9	S4	TYPICAL DETAILS
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13	1601-2023-3-13	S8	FOUNDATION SECTIONS
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15	1601-2023-3-15	S10	DETAILS
16	1601-2023-3-16	S11	CONCEPTUAL STAGING PLAN
17	1601-2023-3-17	E1	GENERAL NOTES AND ABBREVIATIONS
18	1601-2023-3-18	E2	GROUND FLOOR PLAN - ELECTRICAL DEMO AND NEW PLAN
19	1601-2023-3-19	E3	ELECTRICAL SINGLE LINE DIAGRAM, LUMINARIES, MECHANICAL AND PANEL SCHEDULES
20	1601-2023-3-20	E4	ELECTRICAL SPECIFICATIONS
21	1601-2023-3-21	M1	PART GROUND FLOOR PLANS - PLUMBING, VENTILATION AND SPRINKLERS
22	1601-2023-3-22	M2	PART GROUND FLOOR PLANS - HEATING AND VENTILATION, MECHANICAL SCHEDULES
23	1601-2023-3-23	M3	MECHANICAL SPECIFICATIONS
24	1601-2023-3-24	ESC1	EROSION AND SEDIMENT CONTROL PLAN

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TORONTO — SOLID WASTE MANAGEMENT SERVICES

MATT KELIHER	MATTHEW CASCHERA
GENERAL MANAGER	DIRECTOR
SOLID WASTE MANAGEMENT SERVICES	INFRASTRUCTURE AND RESOURCE MANAGEMENT

COMMISSIONERS TRANSFER STATION
MRF BUILDING UPGRADES
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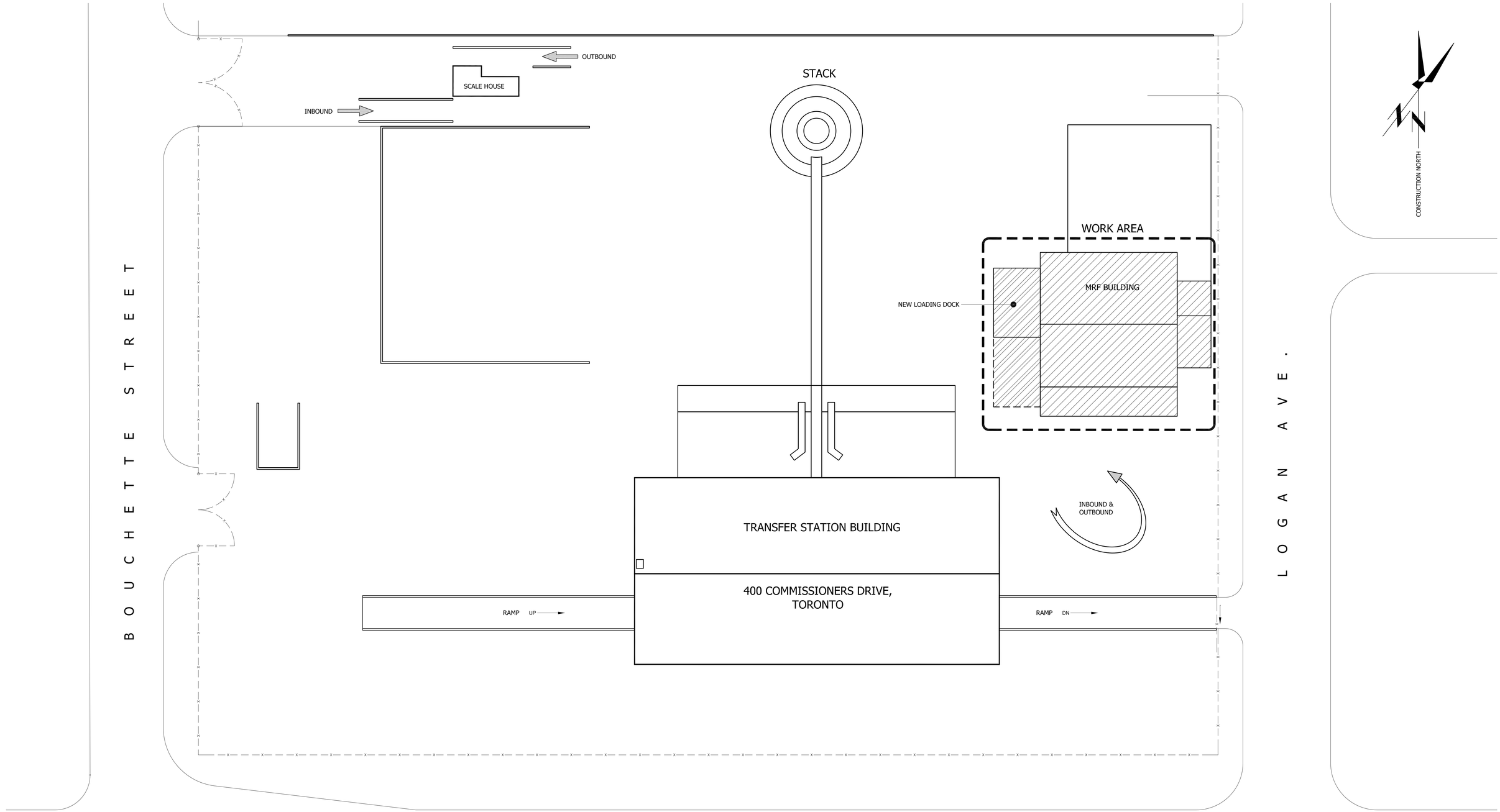
COVER SHEET

DESIGN:		DRAFTING:	A.M.S.	CHECK:	P.J.P.	CONTRACT No.	23SWM-IRM-026CDU
SCALE:	AS NOTED			DRAWING NUMBER:	1601-2023-3-1		G1
DATE:	JULY 18, 2023						



SITE PLAN

Scale: 1:300

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TORONTO

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M.H. HALADUICK
April 17, 2024
PROVINCE OF ONTARIO

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SITE PLAN

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SCALE:	AS NOTED			DRAWING NUMBER:	1601-2023-3-2	A1
DATE:	JULY 18, 2023					

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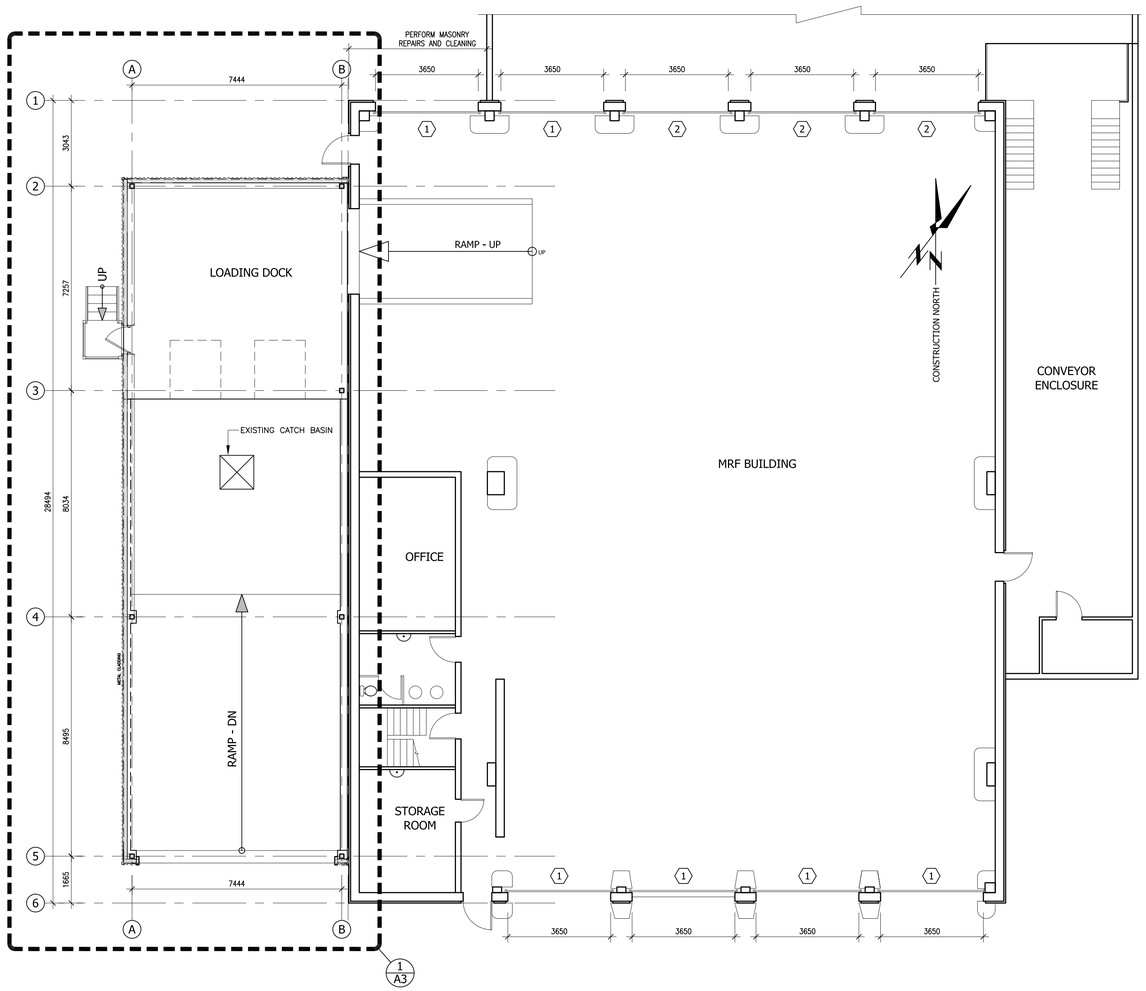
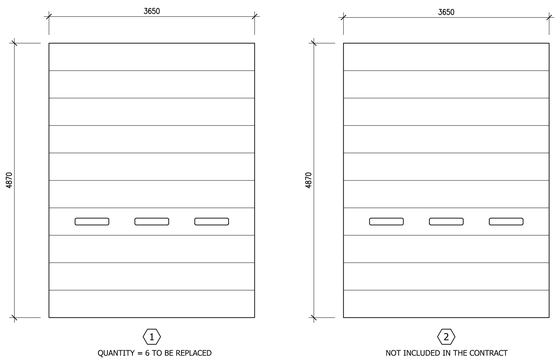


KEY FLOOR PLAN

Scale: 1:100



OVERHEAD DOOR SCHEDULE

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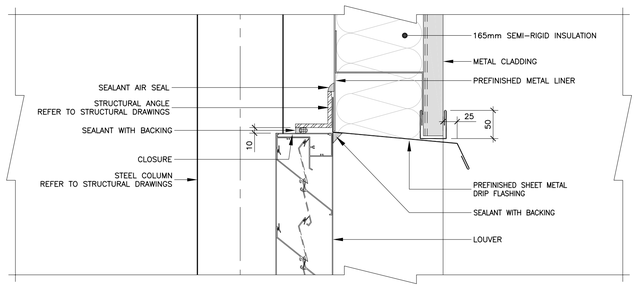
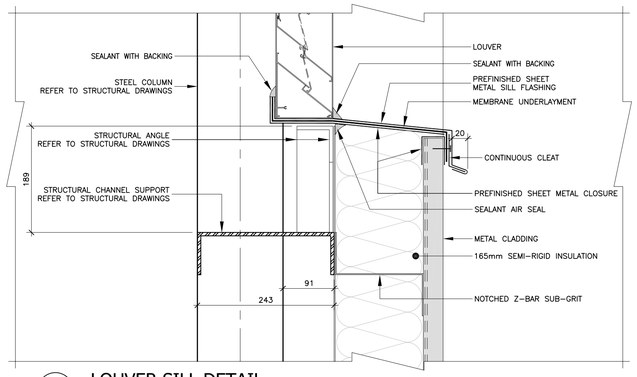


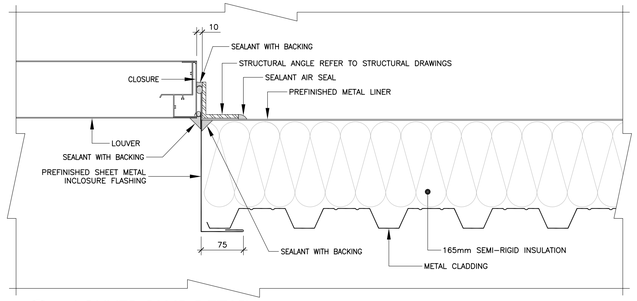
1 LOUVER HEAD DETAIL

Scale: 1:5



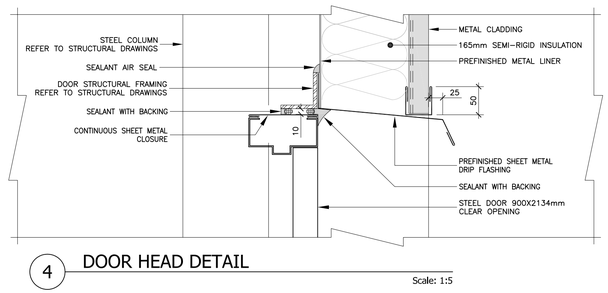
2 LOUVER SILL DETAIL

Scale: 1:5



3 LOUVER JAMB DETAIL

Scale: 1:5



4 DOOR HEAD DETAIL

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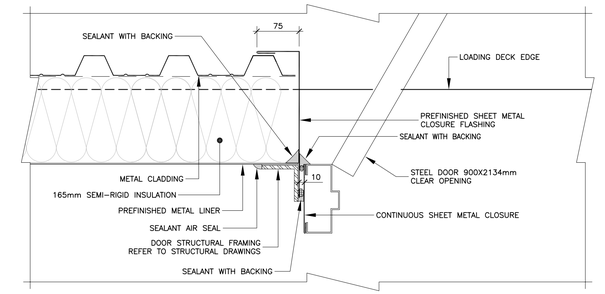

5 DOOR JAMB DETAIL

Scale: 1:5

\\EXP\DATA\BRM\BRM-2202609-A0\60 EXECUTION\65 DRAWINGS\CLADDING CAD DRAWINGS\BRM-2202609-A0.DWG (A2)

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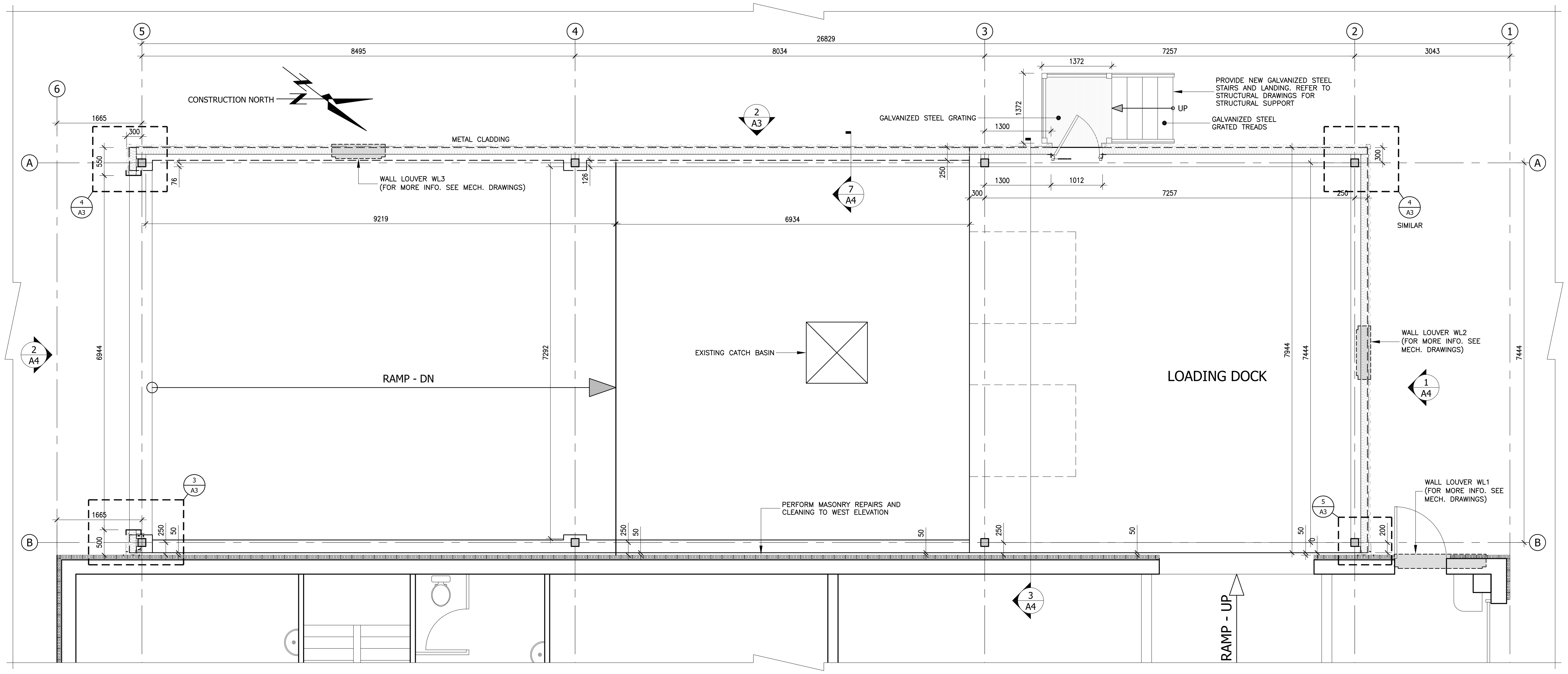
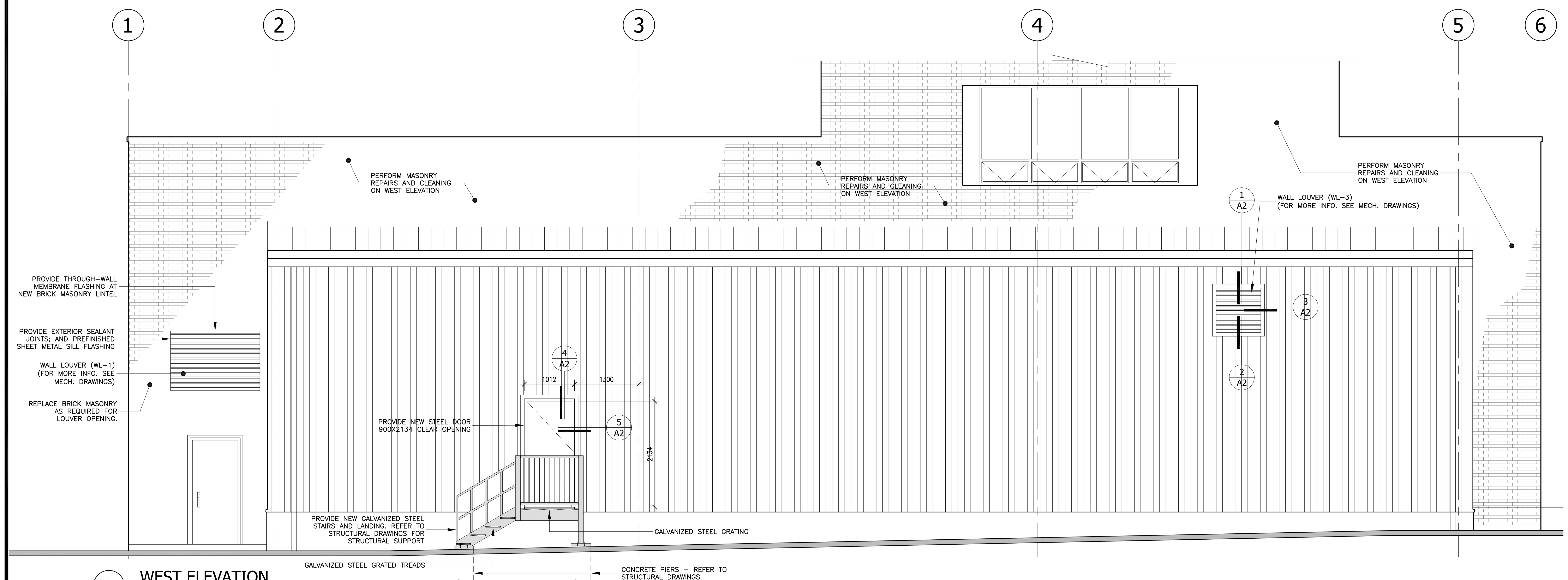
KEY FLOOR PLAN

DESIGN:		DRAFTING:	A.M.S.	CHECK:	P.J.P.	CONTRACT No.	23SWM-IRM-026CDU
SCALE:	AS NOTED			DRAWING NUMBER:	1601-2023-3-3		A2
DATE:	JULY 18, 2023						



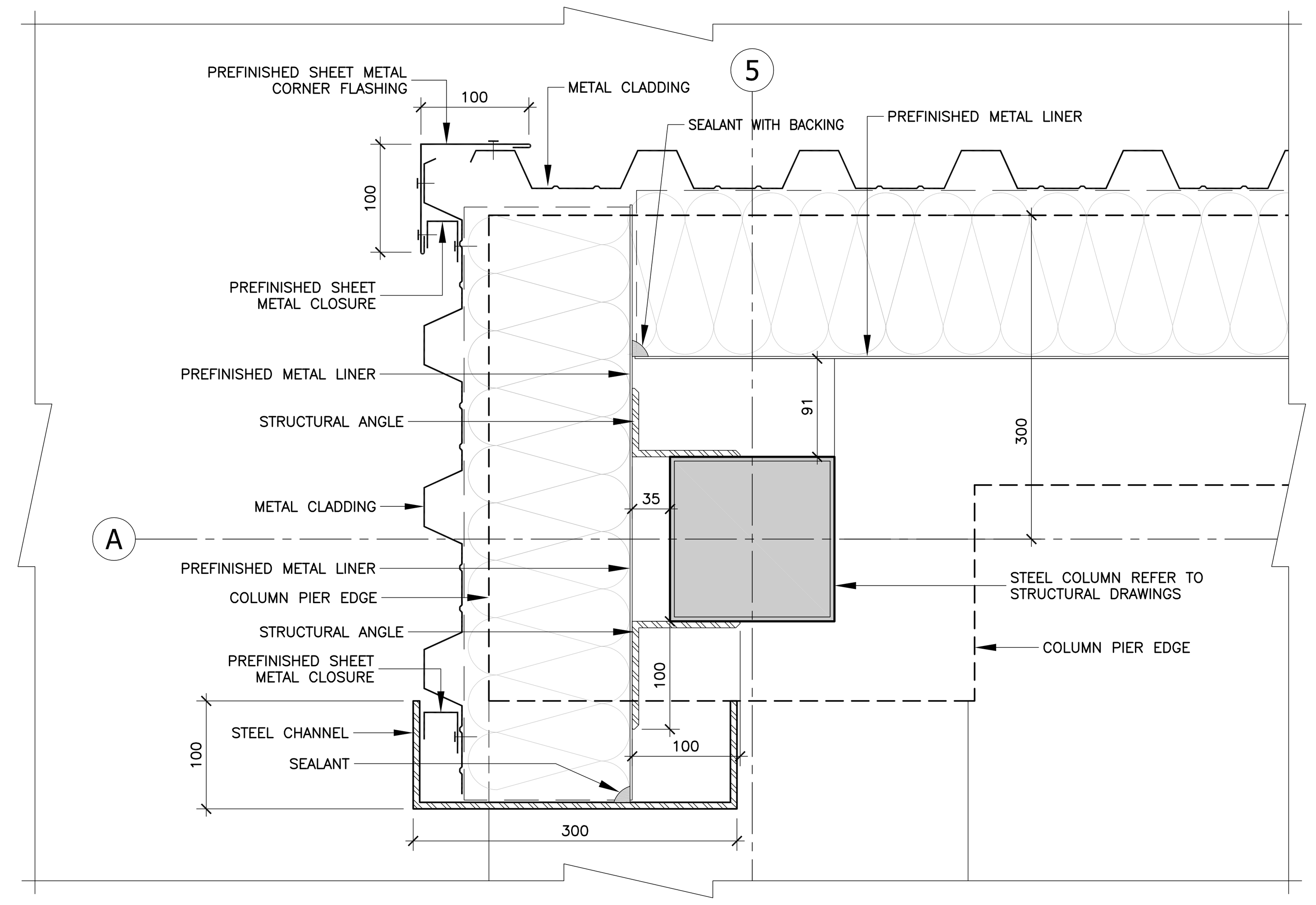
1 LOADING DOCK FLOOR PLAN

Scale: 1:50



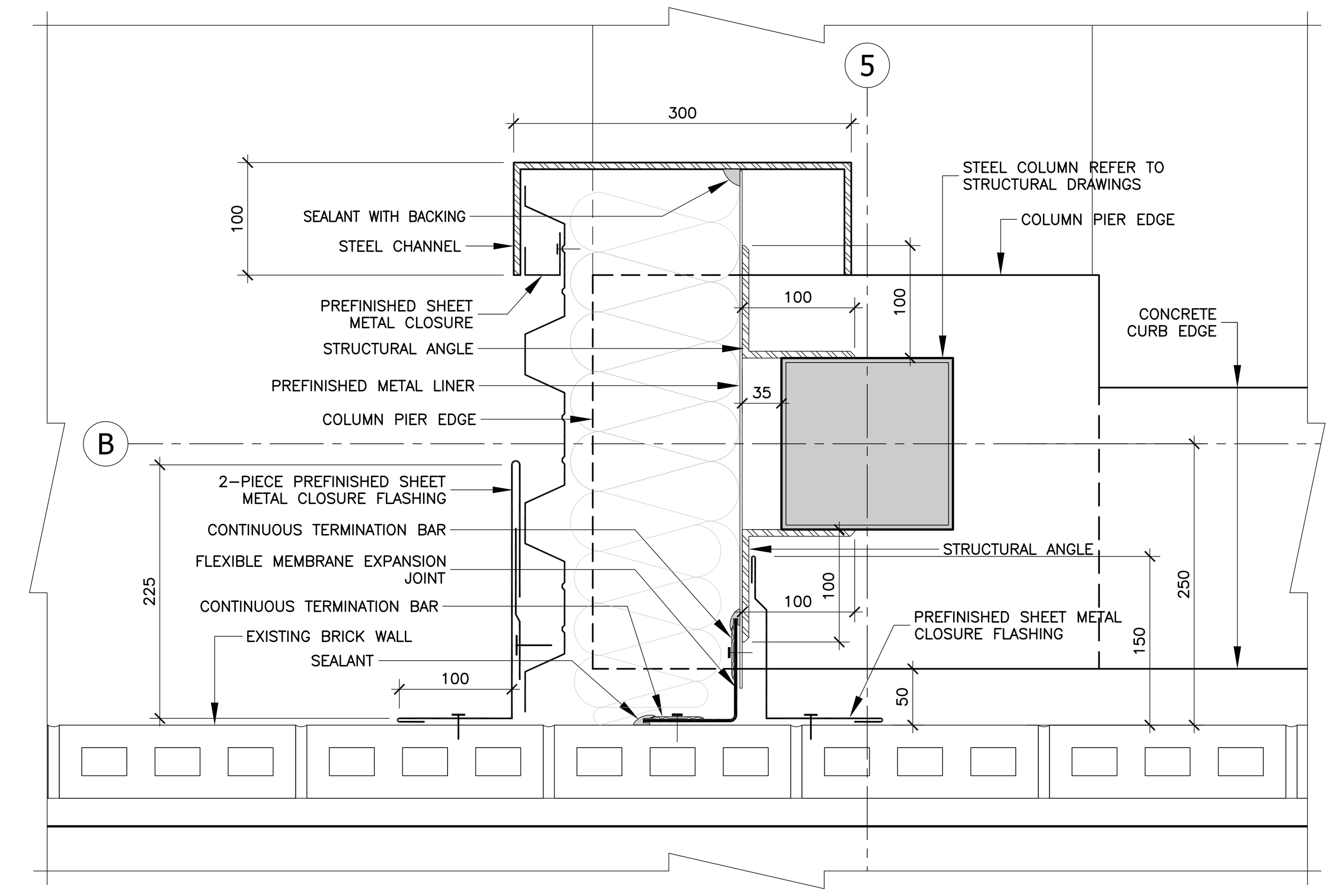
2 WEST ELEVATION

Scale: 1:50



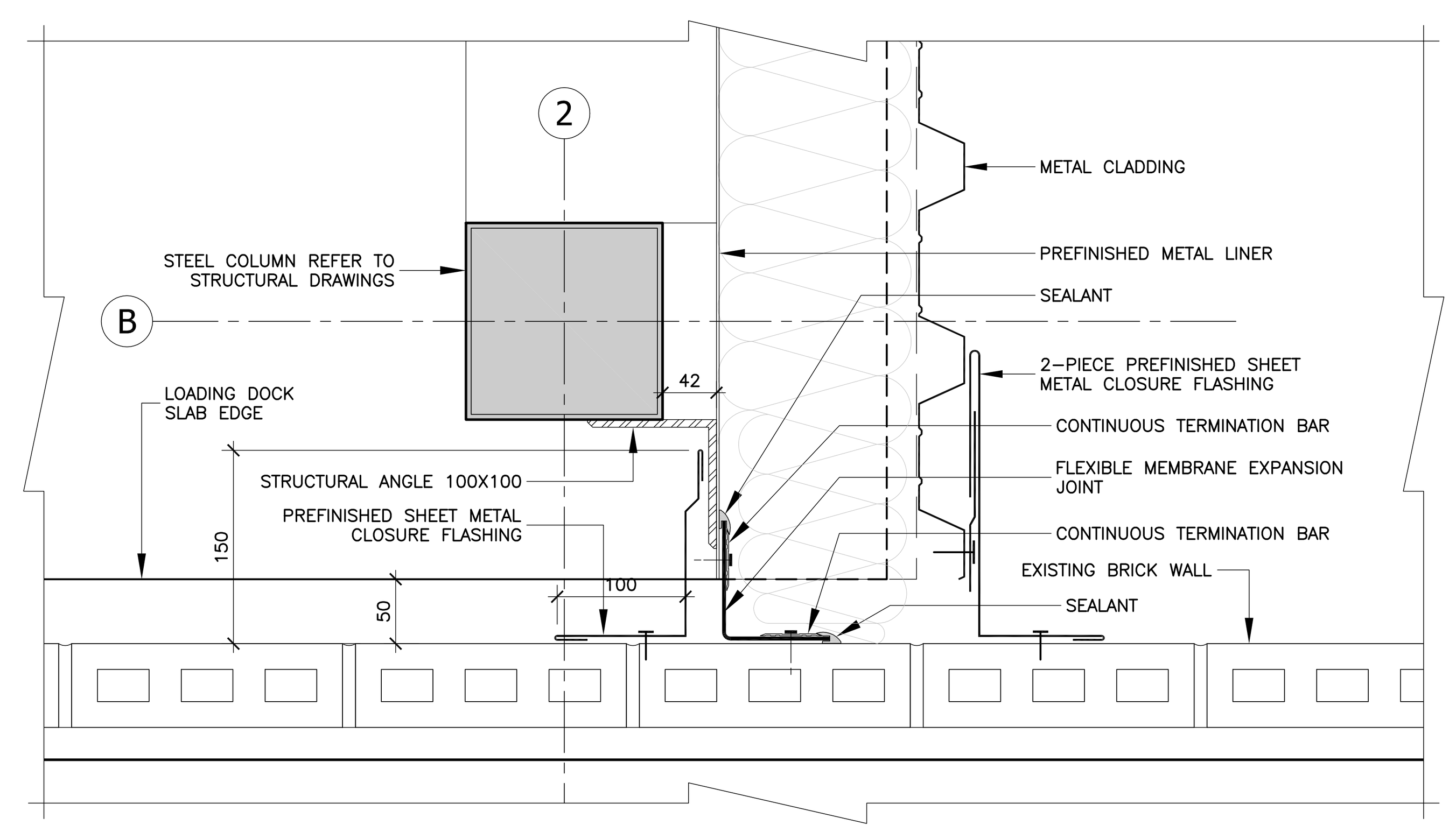
3 PLAN DETAIL - CORNER DETAIL

Scale: 1:5



4 PLAN DETAIL - EXPANSION JOINT

Scale: 1:5



5 PLAN DETAIL - EXPANSION JOINT

Scale: 1:5

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LOADING DOCK FLOOR PLAN AND ELEVATION

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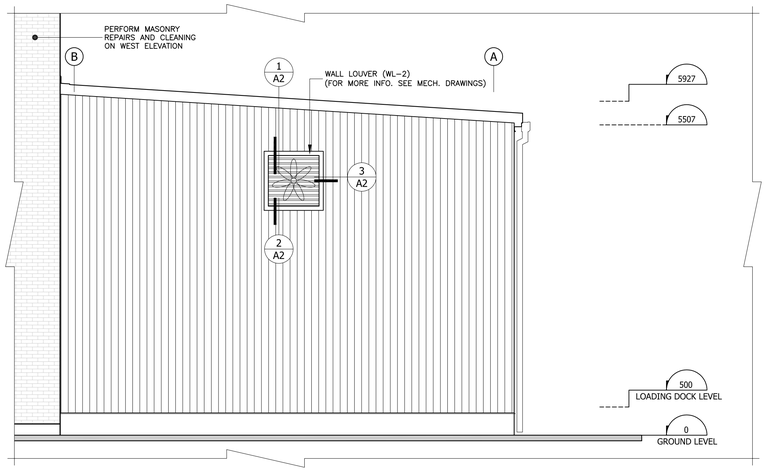
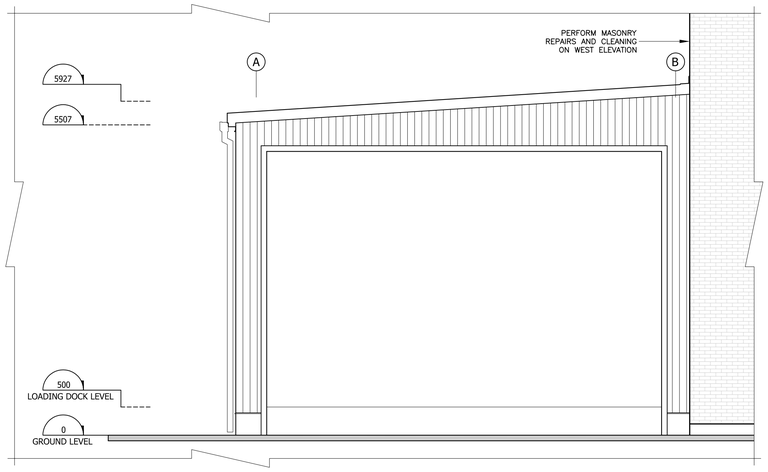
SCALE:	AS NOTED			DRAWING NUMBER:	1601-2023-3-4		A3
DATE:	JULY 18, 2023						



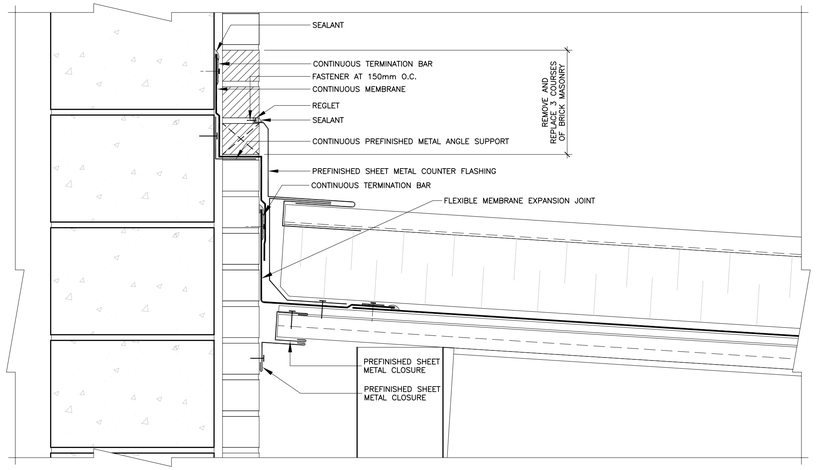
1 NORTH ELEVATION

Scale: 1:50



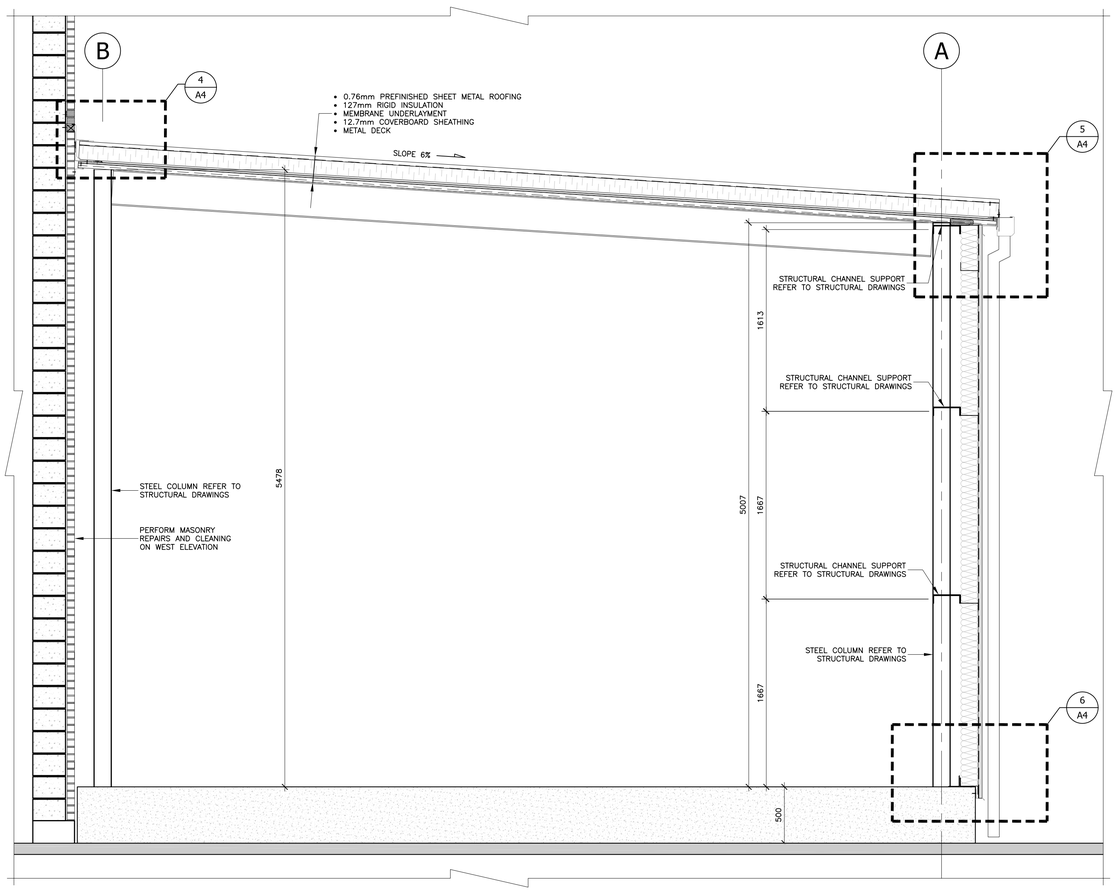
2 SOUTH ELEVATION

Scale: 1:50



4 SECTION DETAIL

Scale: 1:5



3 CROSS SECTION

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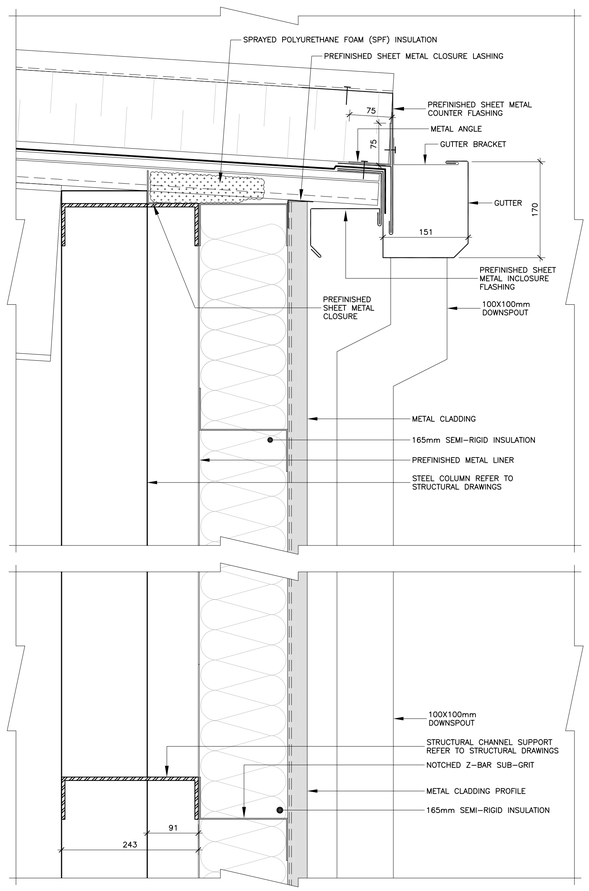

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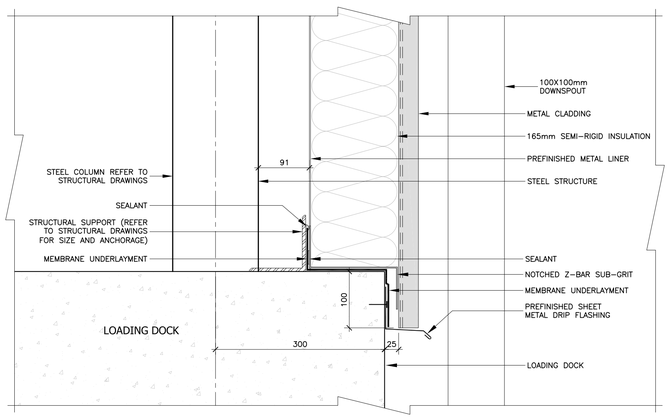

6 SECTION DETAIL

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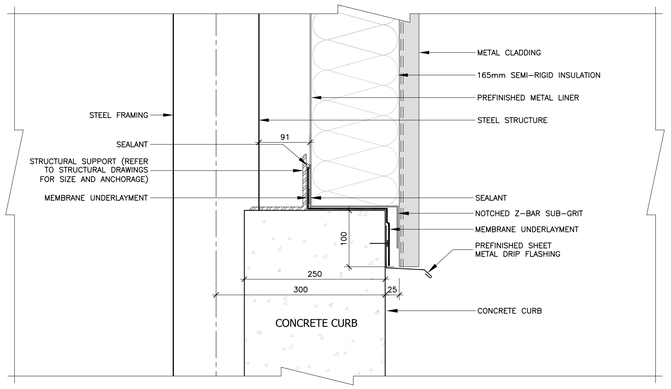

7 SECTION DETAIL

Scale: 1:5

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ELEVATION, CROSS SECTION AND SECTION DETAILS

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DATE:	JULY 18, 2023					

\\EXPDATA\IRM\IRM-22028009-A0\60 EXECUTION\65 DRAWINGS\CL-ADDING CAD DRAWINGS\IRM-22028009-A0.DWG (A4)

FOUNDATION NOTES — GN-005CS

THE FOLLOWING NOTES ARE IN ADDITION TO THE GENERAL NOTES, THE SPECIFICATION AND PLAN NOTES.

1. SEE FOUNDATION PLAN NOTES FOR ASSUMED BEARING CONDITIONS. IF ACTUAL SITE OR SOIL CONDITIONS VARY FROM THOSE ASSUMED, OBTAIN WRITTEN INSTRUCTIONS FROM THE CONTRACT ADMINISTRATOR BEFORE PROCEEDING WITH THE WORK.
2. CARRY EXTERIOR FOOTINGS DOWN MINIMUM 1200 mm (4') BELOW FINISHED GRADE. PROTECT FOOTINGS EXPOSED TO FROST DURING CONSTRUCTION WITH 1200 mm (4') OF EARTH OR ITS EQUIVALENT TO PREVENT FREEZING OF SOIL UNDER FOOTINGS. DO NOT PLACE FOOTINGS ON FROZEN SOIL.
3. KEEP EXCAVATIONS CONTINUOUSLY DRY BEFORE CONCRETE IS PLACED. IF SOIL IS SOFTENED BY WATER, EXTEND EXCAVATION BELOW SOFTENED MATERIAL AND LOWER FOOTINGS TO SUIT.
4. DO NOT EXCEED A RISE OF 7 IN RUN OF 10 IN THE LINE OF SLOPE BETWEEN ADJACENT EXCAVATIONS. MAXIMUM STEP 600 mm (24") APPROXIMATELY.
5. FOUND NEW FOOTINGS WHICH ARE LOCATED IMMEDIATELY ADJACENT TO EXISTING FOOTINGS AT THE SAME ELEVATION AS THE EXISTING FOOTING UNLESS NOTED OTHERWISE. AT LOCATIONS WHERE MECHANICAL SERVICES INTERFERE WITH FOOTINGS ESTABLISH TOP OF FOOTING A MINIMUM 200 mm (8") BELOW INVERT ELEVATION. REFER TO MECHANICAL DRAWINGS FOR LOCATION OF SERVICES.
6. CAP DEPTHS GIVEN ARE FOR ASSUMED SUBSOIL CONDITIONS. RAISE OR LOWER FOOTING BASES AND ADJUST CAP DEPTHS IF ACTUAL CONDITIONS VARY, IN ACCORDANCE WITH THE FOLLOWING:
   a. MINIMUM CAP DEPTH IS 300 mm (12"), BUT NOT LESS THAN:
      .1 UNDER STEEL COLUMN: TWICE THE HORIZONTAL PROJECTION OF THE CAP BEYOND THE COLUMN BASE PLATE.
      .2 UNDER CONCRETE COLUMN, THE GREATER OF
         a) TWICE THE GREATER HORIZONTAL PROJECTION OF THE CAP BEYOND THE COLUMN;
         b) COMPRESSION DEVELOPMENT LENGTH OF COLUMN DOWEL PLUS 75 mm MINUS DEPTH OF FOOTING BASE.
7. WHERE FOUNDATION CONDITIONS REQUIRE LOWERING FOOTING BASES TO THE EXTENT THAT THE CAP DEPTH EXCEEDS 3 TIMES ITS LEAST DIMENSION, OBTAIN CAP REINFORCEMENT FROM THE CONSULTANT.
8. PLACE BASEMENT AND GROUND (FIRST) FLOOR SLABS AND WAIT UNTIL CONCRETE HAS REACHED 100% OF DESIGN STRENGTH BEFORE BACKFILLING AGAINST WALLS. PROVIDE SUPPORT AT TOP AND BOTTOM OF WALLS WHERE SLABS CANNOT BE POURED UNTIL BACKFILL HAS BEEN PLACED. WHERE BACKFILL IS PLACED ON EACH SIDE OF FOUNDATION WALLS, DO NOT EXCEED A GRADE DIFFERENCE OF 600 mm (24").

EXCAVATION AND BACKFILL — GN-004CS

1 GENERAL

1.1 THE FOLLOWING REFERENCE STANDARDS SHALL GOVERN THE WORK OF THIS SECTION:
- 1.1.1 OPSS 1010, MATERIAL SPECIFICATION FOR AGGREGATES – BASE, SUBBASE, SELECT SUBGRADE AND BACKFILL MATERIALS

2 PRODUCTS:

2.1 MATERIAL
- 2.1.1 BACKFILL AROUND FOOTINGS, FOUNDATION WALLS, RETAINING WALLS
  - .1 TO OPSS GRANULAR B TYPE II
- 2.1.2 GRANULAR UNDERBED FOR SLABS-ON-GRADE *(Select .1 or .2)*
  - .1 20 mm CLEAR LIMESTONE.
  - .2 20 mm CRUSHER RUN LIMESTONE TO OPSS 1010 GRANULAR A, BUT WITH 100% PASSING 19 mm SIEVE.

3 EXECUTION

3.1 EXCAVATE TO FOOTING ELEVATIONS INDICATED ON DRAWINGS AND OBTAIN VERIFICATION FROM INSPECTION AND TESTING COMPANY THAT BEARING MATERIAL IS AS ANTICIPATED. REMOVE UNSUITABLE MATERIAL AS INSTRUCTED.

3.2 BACKFILL
- 3.2.1 PLACE GRANULAR MATERIAL SPECIFIED IN 2.1.1.1
- 3.2.2 PLACE BACKFILL IN 150 mm (6") LAYERS AND COMPACT TO 95% SPMDD.

3.3 GRANULAR UNDERBED FOR SLAB-ON-GRADE
- 3.3.1 OBTAIN GEOTECHNICAL CONSULTANT'S WRITTEN CONFIRMATION THAT PREPARED SUBGRADE IS ACCEPTABLE FOR PLACEMENT OF GRANULAR UNDERBED.
- 3.3.2 PLACE GRANULAR MATERIAL SPECIFIED IN PER 2.1.2.1
- 3.3.3 PLACE 150 mm (6") THICK UNDERBED AND COMPACT TO 100% SPMDD.

4 FIELD QUALITY CONTROL

4.1 INSPECTION AND TESTING COMPANY SHALL PERFORM:
- 4.1.1 VERIFICATION OF FOUNDATION BEARING MATERIAL;
- 4.1.2 TESTING OF GRANULAR MATERIALS TO CONFIRM THEY MEET GRADING AND COMPACTION REQUIREMENTS.

DESIGN LOAD — GN-002CS

1. UNIT FLOOR AND ROOF LOADINGS, SOIL BEARING PRESSURES AND FOUNDATION LOADS GIVEN ON PLANS ARE UNFACTORED. MEMBER FORCES GIVEN ON DRAWINGS ARE FACTORED.

2. GRAVITY LOADS: SUPERIMPOSED DEAD LOADS AND LIVE LOADS ARE GIVEN ON PLANS.

3. SNOW LOAD PARAMETERS, OBC – TORONTO, ONTARIO
   Ss = 0.9
   Sr = 0.4
   Is ULS = 1
   Is SLS = 0.9

4. RAIN LOAD PARAMETER, OBC – TORONTO, ONTARIO
   ONE DAY RAINFALL = 97mm

5. WIND LOAD PARAMETERS, OBC – TORONTO, ONTARIO
   q (1/10) = 0.34 kPa
   q (1/50) = 0.44 kPa
   Iw ULS = 1
   Iw SLS = 0.75
   WIND LOAD APPLIED AS PER OBC AND NBCC COMMENTARY FIGURE 4.1.7.6.A
   FACTORED HORIZONTAL FORCE AT BASE IN NORTH-SOUTH DIRECTION, V_F = 50 kN
   FACTORED HORIZONTAL FORCE AT BASE IN EAST-WEST DIRECTION, V_F = 150 kN

6. SEISMIC LOAD PARAMETERS, OBC – TORONTO, ONTARIO

Sa (0.2) = 0.249	Sa (5.0) = 0.0071
Sa (0.5) = 0.126	Sa (10.0) = 0.0028
Sa (1.0) = 0.063	PGA = 0.160
Sa (2.0) = 0.0290	PGV = 0.099

   SITE CLASSIFICATION = E
   Ie = 1
   Fa=1.53
   Fv=2.61
   IeFaSa(0.2)=0.38

GENERAL NOTES — GN-001CS

1 **GENERAL**

1.1 CHECK DIMENSIONS ON STRUCTURAL DRAWINGS AGAINST ARCHITECTURAL DRAWINGS AND EXISTING SITE CONDITIONS. REPORT INCONSISTENCIES TO CONSULTANT BEFORE PROCEEDING WITH THE WORK.
1.2 READ DRAWINGS IN CONJUNCTION WITH SPECIFICATIONS.
1.3 DO NOT EXCEED DURING CONSTRUCTION DESIGN LOADS SHOWN ON PLANS REDUCED AS NECESSARY UNTIL MATERIALS REACH DESIGN STRENGTH.
1.4 DO NOT SCALE DRAWINGS.
1.5 DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.ELEVATIONS ARE IN METRES UNLESS NOTED OTHERWISE.

2 **DESIGN**

2.1 ALL REFERENCED STANDARDS LISTED SHALL BE THE CURRENT PUBLISHED EDITION OR THE EDITION REFERENCED BY THE APPLICABLE BUILDING CODE IN FORCE AT THE DATE NOTED ON THE STRUCTURAL DRAWINGS FOR THE BUILDING PERMIT APPLICATION.
2.2 DESIGN IS IN ACCORDANCE WITH THE ONTARIO BUILDING CODE.
2.3 DESIGN STANDARDS
2.3.1 CONCRETE MEMBERS ARE DESIGNED IN ACCORDANCE WITH CSA STANDARD A23.3.
2.3.2 STRUCTURAL STEEL IS DESIGNED IN ACCORDANCE WITH CSA STANDARD S16.
2.3.3 MASONRY IS DESIGNED IN ACCORDANCE WITH CSA STANDARD S304.
2.3.4 TIMBER IS DESIGNED IN ACCORDANCE WITH CSA STANDARD CAN/CSA O86.

3 **MATERIALS**

3.1 CONCRETE: SEE SCHEDULE OF CONCRETE PROPERTIES AND SPECIFICATION.
3.2 STRUCTURAL STEEL: UNLESS NOTED OTHERWISE TO CSA G40.20/G40.21 OR ASTM STANDARD A992/A992M OR ASTM A572.
W AND S SHAPES: ASTM A992 OR ASTM A572 GRADE 50, FY=345 MPa
PLATES: CSA G40.21 GRADE 350 W
CHANNELS AND ANGLES: CSA G40.21 GRADE 300W
HOLLOW STRUCTURAL SECTIONS: CSA G40.21 GRADE 350W CLASS C OR ASTM STANDARD A1085
ANCHOR RODS: ASTM F1554 GRADE 36
3.3 REINFORCING STEEL: TO CONFORM TO CSA G30.18 GRADE 400W UNLESS NOTED OTHERWISE
3.3.1 REINFORCING BAR AREAS ARE 100, 200, 300, 500, 700, 1000, 1500 AND 2500 SQ. MM FOR BAR DESIGNATIONS 10M, 15M, 20M, 25M, 30M, 35M, 45M AND 55M RESPECTIVELY.
3.3.2 STRENGTH:
DEFORMED REINFORCING BARS: 400 MPa.
WELDED WIRE FABRIC: 440 MPa

STRUCTURAL STEEL NOTES — GN-006CS

1 GENERAL

1.1 THE FOLLOWING REFERENCE STANDARDS SHALL GOVERN THE WORK OF THIS SECTION:
- 1.1.1 ASTM A108, SPECIFICATION FOR STEEL BAR, CARBON AND ALLOY, COLD FINISHED
- 1.1.2 CSA S16, DESIGN OF STEEL STRUCTURES
- 1.1.3 CSA S136, NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS
- 1.1.4 CSA W47.1, CERTIFICATION OF COMPANIES FOR FUSION WELDING OF STEEL
- 1.1.5 CSA W59, WELDED STEEL CONSTRUCTION
- 1.1.6 CSA W178.1, CERTIFICATION OF WELDING INSPECTION ORGANIZATIONS
- 1.1.7 CSA W178.2, CERTIFICATION OF WELDING INSPECTORS

1.2 DESIGN OF CONNECTIONS SHALL BE BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO.
1.3 DESIGN CRITERIA
- 1.3.1 AXIAL LOADED MEMBERS THAT MEET AT A JOINT SHALL HAVE THEIR CENTROIDAL AXES INTERSECT AT A COMMON POINT UNLESS SHOWN OTHERWISE.
- 1.3.2 DESIGN AND DETAIL ALL CONNECTIONS AS FLEXIBLE EXCEPT WHERE NOTED OTHERWISE ON THE DRAWINGS. CONNECTIONS MAY BE WELDED OR BOLTED.
- 1.3.3 PROVIDE CONNECTIONS ADEQUATE TO RESIST REACTION OF BEAM, WHEN IT IS LOADED TO MAXIMUM FLEXURAL CAPACITY UNDER UNIFORMLY DISTRIBUTED LOAD. UNLESS REACTION OR CONNECTION DETAIL IS SHOWN ON DRAWINGS. FOR COMPOSITE BEAM CONSTRUCTION, USE FLEXURAL CAPACITY OF COMPOSITE SECTION BASED ON 100 PERCENT SHEAR CONNECTION OF BEAM TO SLAB.
- 1.3.4 WHERE MOMENT CONNECTIONS ARE CALLED FOR BUT DESIGN FORCES ARE NOT INDICATED, DESIGN MOMENT CONNECTION FOR THE FULL MOMENT CAPACITY OF THE WEAKER MEMBER JOINED.
- 1.3.5 FOR BOLTED CONNECTIONS USE SNUG TIGHT HIGH STRENGTH BOLTS, ASTM F3125/F3125M (A325 OR A490) EXCEPT USE PRETENSIONED HIGH STRENGTH BOLTS IN LOCATIONS SPECIFIED IN CSA-S16 CLAUSE 22.2.2
  - .1 SLIP-CRITICAL CONNECTIONS WHERE SLIPPAGE CANNOT BE TOLERATED;
  - .2 SHEAR CONNECTIONS PROPORTIONED IN ACCORDANCE WITH SEISMIC REQUIREMENTS;
  - .3 ALL ELEMENTS RESISTING CRANE LOADS;
  - .4 CONNECTIONS SUBJECT TO IMPACT OR CYCLIC LOADING;
  - .5 CONNECTIONS WHERE THE BOLTS ARE SUBJECT TO TENSILE LOADING;
  - .6 CONNECTIONS USING OVERSIZE OR LONG SLOTTED HOLES (UNLESS SPECIFICALLY DESIGNED TO ACCOMMODATE MOVEMENT).
- 1.3.6 PROVIDE CONNECTIONS FOR MEMBERS THAT ARE PART OF THE LATERAL LOAD RESISTING SYSTEM ADEQUATE TO RESIST FORCES SHOWN ON DRAWINGS. WHERE SEISMIC DESIGN GOVERNS, THE FORCES HAVE BEEN ADJUST TO MEET THE REQUIREMENTS OF CLAUSE 27.

1.4 SUBMITTALS
- 1.4.1 SUBMIT STRUCTURAL SHOP DRAWINGS.
  - .1 EACH SHOP DRAWING SUBMITTED SHALL BEAR THE SIGNATURE AND SEAL OF THE PROFESSIONAL ENGINEER RESPONSIBLE FOR CONNECTION DESIGN.

2 PRODUCTS

2.1 MATERIAL
- 2.1.1 PROVIDE NEW MATERIALS IN ACCORDANCE WITH REFERENCE STANDARDS, OF STRENGTH AND QUALITY NOTED IN GENERAL NOTES.
- 2.1.2 STUDS: ASTM A108
- 2.1.3 GALVANIZING: ASTM A123/A123M, STANDARD SPECIFICATION FOR ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS.
- 2.1.4 GALVANIZING: HOT-DIP TO ASTM A153 / A153M-16 STANDARD SPECIFICATION FOR ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE.
- 2.1.5 PAINT:
  - .1 INTERIOR: SHOP COAT FOR STEEL THAT WILL NOT RECEIVE A FINISH COAT: TO CISC/CPMA STANDARD 1-73A, A QUICK-DRYING ONE-COAT PAINT FOR USE ON STRUCTURAL STEEL.
  - .2 INTERIOR: PRIME PAINT: TO MEET THE REQUIREMENTS OF CISC/CPMA STANDARD 2-75, A QUICK DRYING PRIMER FOR USE ON STRUCTURAL STEEL
  - .3 EXTERIOR: ZINC-RICH PAINT READY MIX TO SPCC-PAINT 20 STANDARD

3 EXECUTION

3.1 PROVIDE WELDED STIFFENER PLATES MINIMUM 10 mm THICK ON BOTH SIDES OF WEB OF BEAMS AT POINTS OF CONCENTRATED LOADS INCLUDING BEAMS SUPPORTING COLUMNS OR BEAMS SUPPORTED ON TOP OF COLUMNS.
3.2 ALL EXPOSED WELDS SHALL BE CONTINUOUS AND GROUND SMOOTH.
3.3 PROVIDE STRUCTURAL STEEL FOR LATERAL SUPPORT OF MASONRY WALLS.
3.4 CLEAN STEEL, IN ACCORDANCE WITH PAINT SYSTEM SPECIFIED. ZINC-RICH PAINT REQUIRES CLEANING TO SSPC-SP6, COMMERCIAL BLAST CLEANING.
3.5 PAINTING:
- 3.5.1 PAINT INTERIOR STEEL SURFACES WITH INTERIOR PAINT SPECIFIED
- 3.5.2 PAINT EXTERIOR STEEL SURFACES WITH EXTERIOR PAINT SPECIFIED.
- 3.5.3 DO NOT PAINT:
  - .1 SURFACES AND EDGES WITHIN 50 mm OF FIELD WELDS
  - .2 SURFACES ENCASED IN OR IN CONTACT WITH CONCRETE
  - .3 SURFACES TO BE SPRAY FIREPROOFED.
- 3.5.4 AFTER ERECTION IS COMPLETE GIVE ONE COAT TOUCH-UP PAINT TO FIELD BOLTS, FIELD CONNECTIONS, BURNT AREAS AND DAMAGED AREAS. USE SAME PAINT AS SHOP PAINT.

3.6 GALVANIZE LINTELS, BRICK SUPPORT ANGLES, ARCHITECTURAL BLOCK SUPPORT ANGLES AND OTHER MEMBERS INDICATED AS GALVANIZED ON DRAWINGS AFTER SHOP WELDING IS COMPLETE.
3.7 COMPLY WITH THE REQUIREMENTS OF REFERENCE STANDARDS AND REQUIREMENTS OF REGULATORY AUTHORITIES IN ERECTION OF STRUCTURAL STEEL.
3.8 PROVIDE MINIMUM BEARING FOR ALL STEEL BEAMS:
- 3.8.1 200 mm (8") ON CONCRETE AND MASONRY
- 3.8.2 100 mm (4") ON STEEL

4 FIELD QUALITY CONTROL

4.1 INSPECTION AND TESTING COMPANY RETAINED BY THE CONTRACTOR, SHALL PERFORM:
- 4.1.1 INSPECTION OF ERECTION AND FIT-UP INCLUDING PLACING, PLUMBING AND LEVELLING;
- 4.1.2 INSPECTION OF BOLTED CONNECTIONS INCLUDING VERIFICATION OF BOLT GRADE AND IF SNUG TIGHT AND PRETENSIONED BOLTS HAVE BEEN USED APPROPRIATELY;
- 4.1.3 INSPECTION OF WELDED JOINTS;
- 4.1.4 GENERAL INSPECTION OF FIELD CUTTING AND ALTERATIONS;
- 4.1.5 GENERAL INSPECTION OF COATING TOUCH-UP.

CONCRETE & REINFORCING STEEL & FORMWORK — GN-003CS

1 GENERAL

1.1 THE FOLLOWING REFERENCE STANDARDS SHALL GOVERN THE WORK OF THIS SECTION:
- 1.1.1 CSA A23.1, CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION
- 1.1.2 CSA A23.2, METHODS OF TEST FOR CONCRETE
- 1.1.3 CSA A3000, CEMENTITIOUS MATERIALS COMPENDIUM
- 1.1.4 ASTM A1064/A1064M STANDARD SPECIFICATION FOR CARBON-STEEL WIRE AND WELDED WIRE REINFORCEMENT, PLAIN AND DEFORMED, FOR CONCRETE.
- 1.1.5 CSA G30.18, CARBON STEEL BARS FOR CONCRETE REINFORCEMENT
- 1.1.6 CSA W186, WELDING OF REINFORCING BARS IN REINFORCED CONCRETE CONSTRUCTION
- 1.1.7 ASTM D3963/D3963M, STANDARD SPECIFICATION FOR FABRICATION AND JOBSITE HANDLING OF EPOXY-COATED STEEL REINFORCEMENT BARS
- 1.1.8 ACI 315, MANUAL OF ENGINEERING AND PLACING DRAWINGS FOR REINFORCED CONCRETE STRUCTURES
- 1.1.9 RSIC REINFORCING STEEL MANUAL OF STANDARD PRACTICE, 2006.
- 1.1.10 ACI 117, STANDARD SPECIFICATIONS FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS AND COMMENTARY
- 1.1.11 CSA S269.1, FALSEWORK AND FORMWORK

1.2 SUBMITTALS
- 1.2.1 SUBMIT CONCRETE MIX DESIGNS
- 1.2.2 SUBMIT REINFORCING STEEL SHOP DRAWINGS
  - .1 PREPARE PLACING DRAWINGS AND BAR LISTS INDICATING REINFORCING, DOWELS, CONCRETE COVER, CONSTRUCTION JOINTS

2 PRODUCTS

2.1 PLYWOOD: DOUGLAS FIR, MINIMUM THICKNESS17 mm TO CSA O121, FINISHED ONE SIDE, FABRICATED SPECIALLY FOR USE AS CONCRETE FORM PANELS WITH SEALED EDGES.
2.2 ROUND COLUMN FIBRE FORMS: TO PRODUCE SMOOTH SURFACE WITHOUT FINS
2.3 VOIDFORM: HONEYCOMB CELLULAR CORE STRUCTURE MANUFACTURED FROM KRAFT FIBRE.
2.4 REINFORCING BARS: TO CAN/CSA-G30.18, GRADE 400W
2.5 WELDED WIRE FABRIC: TO ASTM A1064/A1064M AND IN FLAT SHEETS NOT ROLLS
2.6 EPOXY COATED REINFORCEMENT: FROM MINISTRY OF TRANSPORTATION APPROVED SOURCES TO ASTM D3963/D3963M
2.7 CEMENTING MATERIALS
- 2.7.1 PORTLAND CEMENT: TO CSA A3000 TYPE GU OR GUL
- 2.7.2 CEMENTITIOUS HYDRAULIC SLAG AND FLY ASH: TO CSA A3000

2.8 AGGREGATE
- 2.8.1 FINE AGGREGATE FOR SLABS ON GRADE: FINENESS MODULUS BETWEEN 2.6 AND 3.1
- 2.8.2 COARSE AGGREGATE: 20 mm TO 5 mm UNLESS OTHERWISE SPECIFIED

2.9 CORROSION INHIBITOR: CALCIUM NITRITE MEETING THE REQUIREMENTS OF CSA S413, APPENDIX C
2.10 VAPOUR BARRIER FOR SLABS ON GRADE: POLYETHYLENE MEMBRANE, 0.25 MM THICK TO ASTM E1745
2.11 CONTROL JOINT FILLER: SEMI-RIGID JOINT FILLER
: QWIKJOINT UVR, BY EUCLID CANADA INC., TORONTO, ON.
: LOADFLEX, BY SIKA CANADA INC., MISSISSAUGA, ON.
: PLANIBOND JF, BY MAPEI INC., BRAMPTON, ON.
2.12 PREMIXED GROUT: DRYPACK NON-SHRINK NON-METALLIC

3 EXECUTION

3.1 ALL REINFORCEMENT SHALL BE SECURELY HELD IN PROPER POSITION WHILE PLACING CONCRETE. PROVIDE CHAIRS, TIES, SPACERS, ADDITIONAL SUPPORT BARS AND STIRRUPS AS MAY BE REQUIRED.
3.2 PROVIDE OPENINGS IN SLABS AND WALLS AS SHOWN ON STRUCTURAL DRAWINGS OR OTHERWISE REQUIRED BY VARIOUS TRADES. OBTAIN CONTRACT ADMINISTRATOR'S APPROVAL FOR LOCATIONS AND SIZES OF OPENINGS NOT SHOWN ON STRUCTURAL DRAWINGS. FORM ALL OPENINGS BEFORE CONCRETE IS PLACED; DO NOT CUT OR CORE ANY OPENINGS AFTER CONCRETING UNLESS APPROVED BY THE CONTRACT ADMINISTRATOR.
3.3 PROVIDE SLEEVES IN SLABS AND WALLS FOR MECHANICAL PIPING WHEREVER POSSIBLE; AVOID CREATING OPENINGS NOT SHOWN ON STRUCTURAL DRAWINGS. OBTAIN CONTRACT ADMINISTRATOR'S APPROVAL FOR ALL SLEEVES. SUBMIT SLEEVING DRAWINGS FOR APPROVAL A MINIMUM TWO WEEKS PRIOR TO PLACING CONCRETE.
3.4 ELECTRICAL CONDUIT IN SLABS, BEAMS, WALLS AND COLUMNS SHALL BE APPROVED BY THE CONTRACT ADMINISTRATOR BEFORE PROCEEDING WITH THE WORK. REFER TO TYPICAL DETAILS FOR GUIDELINES.
3.5 CONSTRUCTION JOINTS FOR SLABS, BEAMS AND WALLS NOT SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE APPROVED BY THE CONTRACT ADMINISTRATOR BEFORE CONSTRUCTION. REFER TO TYPICAL DETAILS.
3.6 COORDINATE AND INSTALL ALL REQUIRED EMBEDDED ITEMS, SLEEVES, INSERTS, FASTENING DEVICES ETC, BEFORE PLACING CONCRETE. INSTALL THESE ITEMS IN A MANNER THAT DOES NOT IMPAIR THE STRUCTURAL STRENGTH OF THE SYSTEM. DO NOT CUT OR BEND OR DISPLACE REINFORCEMENT OTHER THAN SHOWN ON THE STRUCTURAL DRAWINGS.
3.7 CONCRETE WALLS
3.7.1 REINFORCEMENT OF CONCRETE WALLS NOT SHOWN BY SECTION, PLAN OR SCHEDULE SHALL BE AS FOLLOWS:

EXTERIOR WALLS OUTSIDE THE BUILDING ENVELOPE AND BASEMENT WALLS

WALL THICKNESS	HORIZONTAL	VERTICAL	LOCATION
100 TO 150 (4" TO 6")	15M@300 (12")	10M@000 (12")	CENTRE.
200 (8")	15M@225 (9")	10M@450 (18")	EACH FACE
250 (10")	15M@350 (14")	10M@450 (18")	EACH FACE
300 (12")	15M@325 (13")	10M@400 (16")	EACH FACE
>300 (12")	15M@300 (12")	15M@400 (16")	EACH FACE

ADD 2-15M HORIZONTAL TOP AND BOTTOM CONTINUOUS FOR 200 (8") WALLS
ADD 2-20M HORIZONTAL TOP AND BOTTOM CONTINUOUS FOR 250 (10") WALLS OR THICKER

3.7.2 UNLESS SHOWN OTHERWISE BY SECTION, PLAN OR SCHEDULE, ADD 2-15M HORIZONTAL BARS ABOVE AND BELOW OPENINGS IN HEAD AND SILL. EXTEND BARS 600 mm (24") PAST OPENING. ADD "U" BARS SAME SIZE AND SPACING AS VERTICAL BARS.
3.7.3 UNLESS SHOWN OTHERWISE BY SECTION, PLAN OR SCHEDULE, ADD 2 -15M VERTICAL BARS IN JAMBS OF OPENING AND EDGE TIES SAME SIZE AND SPACING OF HORIZONTAL BARS.
3.7.4 WALL DOWELS INTO SLAB NOT SHOWN BY SECTION, PLAN OR SCHEDULE SHALL BE SAME SIZE AND SPACING AS VERTICAL BARS.
3.7.5 DO NOT LOCATE HORIZONTAL JOINTS BETWEEN FLOORS UNLESS SHOWN ON DRAWINGS.
3.7.6 SAVE CHASES IN WALLS FOR SLABS, BEAMS AND CONCRETE STAIRS.
3.8 MINIMUM REINFORCING FOR ANY SUSPENDED SLAB SHALL BE TEMPERATURE BARS BOTTOM EACH WAY AS SHOWN IN TYPICAL DETAIL C-006 TWO-WAY-SLABS.
3.9 SLAB-ON-GRADE
3.9.1 SEE FOUNDATION PLAN NOTES FOR BEARING CONDITIONS.
3.9.2 WHERE FLOOR DEPRESSIONS OCCUR MAINTAIN SLAB THICKNESS SPECIFIED ON THE FOUNDATION PLANS. SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS AND AREAS.
3.9.3 EACH POUR SHALL BE CONTAINED BY A VERTICAL BULKHEAD OR ABUTTING CONSTRUCTION JOINT. REFER TO TYPICAL DETAILS FOR CONSTRUCTION JOINTS AND CONTROL JOINTS.
3.9.4 DO NOT PLACE CONCRETE ON FROZEN SUBGRADE OR ON SUBGRADE CONTAINING FROZEN MATERIAL. ASCERTAIN THAT FORMS, REINFORCING STEEL AND ADJACENT CONCRETE SURFACES ARE ENTIRELY FREE OF FROST, SNOW AND ICE BEFORE PLACING CONCRETE.
3.9.5 BEFORE PLACING SLAB-ON-GRADE VERIFY THAT:
- .1 SUBGRADE HAS BEEN COMPACTED TO THE REQUIREMENTS OF THE GEOTECHNICAL REPORT;
- .2 TRENCHES, HOLES ETC. THAT WERE DUG AFTER THE PREPARATION OF THE SUBGRADE HAVE BEEN FILLED WITH NEW GRANULAR MATERIAL AND COMPACTED TO THE REQUIREMENTS OF THE GEOTECHNICAL REPORT;
- .3 REINFORCING STEEL IS PROPERLY CHAIRED AND HELD SECURELY IN PLACE;
- .4 ALL EQUIPMENT FOR THE FINISHING OF CONCRETE AND THE SAW CUTTING OF CONTROL JOINTS IS ON SITE AND WORKING PROPERLY;
- .5 USE EARLY ENTRY SAW (SOFF-CUT, BY HUSQVARNA). COMMENCE SAWCUTTING AS SOON AS CONCRETE CAN SUPPORT WEIGHT OF SAW AND OPERATOR WITHOUT MARRING CONCRETE SURFACE AND WITHIN 2 HOURS OF COMPLETION OF FINAL FINISHING;

3.10 FLOOR FINISH: HARD, SMOOTH, DENSE TROWELED SURFACE FREE FROM BLEMISHES.

4 FIELD QUALITY CONTROL

4.1 INSPECTION AND TESTING COMPANY RETAINED BY THE CONTRACTOR, SHALL PERFORM:
4.1.1 SAMPLING, INSPECTION AND TESTING IN ACCORDANCE WITH CSA A23.2 AND TO INCLUDE:
- .1 MAKING STANDARD SLUMP TESTS;
- .2 OBTAINING OF THREE STANDARD SPECIMENS FOR STRENGTH TESTS FROM EACH 100 CUBIC METRES OF CONCRETE, OR FRACTION THEREOF, OF EACH MIX DESIGN OF CONCRETE PLACED IN ANY ONE DAY;
- .3 MAKING COMPRESSION TESTS OF EACH SET OF THREE SPECIMENS, ONE AT 7 DAYS AND TWO AT 28 DAYS;
- .4 VERIFICATION OF AIR CONTENT OF AIR-ENTRAINED CONCRETE;
- .5 VERIFICATION THAT CONCRETE CONTAINS CORROSION INHIBITOR WHERE SPECIFIED.
- .6 DETERMINE CHLORIDE ION CONTENT IN ACCORDANCE WITH CSA STANDARDA23.2 TEST METHOD 4B.
- .7 INSPECTION OF TOLERANCES.

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No.	DATE	REVISIONS	INITIAL	SIGNED
3	2024.01.12	ISSUED FOR TENDER		
2	2023.10.27	ISSUED FOR 100% REVIEW		
1	2023.10.20	REISSUED FOR 70% CD		

TORONTO

SOLID WASTE MANAGEMENT SERVICES

LICENSED PROFESSIONAL ENGINEER — C. M. BROWN — 100257532 — 2024-03-19 — PROVINCE OF ONTARIO

MATT KELIHER
GENERAL MANAGER
SOLID WASTE MANAGEMENT SERVICES

MATTHEW CASCHERA
DIRECTOR
INFRASTRUCTURE AND RESOURCE MANAGEMENT

COMMISSIONERS TRANSFER STATION

MRF BUILDING UPGRADES
400 COMMISSIONERS STREET, TORONTO, ONTARIO M4M 3K2

GENERAL NOTES

DESIGN:		DRAFTING:		CHECK:		CONTRACT No.	23SWM-IRM-026CDU	
SCALE:				DRAWING NUMBER:	1601-2023-3-6			S1
DATE:								

RENOVATION AND EXISTING CONDITIONS — GN-013

THE FOLLOWING NOTES ARE IN ADDITION TO THE GENERAL NOTES, THE SPECIFICATION, AND PLAN NOTES.

1. EXISTING CONDITIONS AS SHOWN ON THE STRUCTURAL DRAWINGS ARE BASED UPON THE INFORMATION AVAILABLE AT THE TIME THAT DRAWINGS WERE PREPARED.
2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BE FULLY KNOWLEDGEABLE OF THE SITE CONDITIONS INCLUDING: THE STRUCTURE, LOCATION OF INTERFERENCES, CONDUITS, PIPES, EQUIPMENT ETC.
3. FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS NECESSARY FOR THE PROPER CONSTRUCTION AND ALIGNMENT OF THE NEW PORTIONS OF THE WORK TO THE EXISTING WORK. REPORT INCONSISTENCIES TO THE CONSULTANT BEFORE PROCEEDING WITH THE WORK.
4. PRIOR TO FABRICATION OF ANY STRUCTURAL MEMBERS, THE CONTRACTOR SHALL COMPLETE THEIR SITE REVIEW OF CRITICAL "TIE-IN" DIMENSIONS AND CONFIRM ALL DIMENSIONS TO ENSURE PROPER FIT OF NEW WORK TO EXISTING WORK.
5. PROVIDE ALL NECESSARY BRACING, SHORING AND OTHER SAFEGUARDS TO MAINTAIN ALL PARTS OF THE EXISTING WORK IN A SAFE CONDITION DURING THE PROCESS OF DEMOLITION AND CONSTRUCTION AND TO PROTECT FROM DAMAGE THOSE PORTIONS OF THE EXISTING WORK WHICH ARE TO REMAIN.
6. TEMPORARY SHORING AND SUPPORT OF EXISTING STRUCTURE.
   - 6.1 BE AWARE THAT THE EXTENT OF TEMPORARY SHORING AND SUPPORT OF STRUCTURE SHOWN ON THE STRUCTURAL DRAWINGS IS CONCEPTUAL ONLY AND THE MINIMUM EXPECTED NECESSARY TO PROVIDE SHORING AND SUPPORT DURING THE REPAIR OF EXISTING STRUCTURE, OR THE DEMOLITION OF EXISTING STRUCTURE AND CONSTRUCTION OF NEW STRUCTURE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE MEANS AND EXTENT OF REQUIRED TEMPORARY SHORING AND SUPPORT OF EXISTING STRUCTURE NECESSARY TO COMPLETE THE WORK SHOWN ON THE STRUCTURAL DRAWINGS.
   - 6.2 DESIGN, DETAILING AND SPECIFICATION OF INSTALLATION PROCEDURE FOR ALL REQUIRED TEMPORARY SHORING OF EXISTING STRUCTURE TO PERMIT CONSTRUCTION OF STRUCTURAL REPAIRS, OR THE DEMOLITION OF EXISTING STRUCTURE AND CONSTRUCTION OF NEW STRUCTURE AS SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE UNDERTAKEN BY A PROFESSIONAL ENGINEER EXPERIENCED IN THE DESIGN OF TEMPORARY SHORING AND SUPPORT OF EXISTING STRUCTURE AND LICENSED IN THE PROVINCE OF ONTARIO. ENGINEER MUST BE INSURED AGAINST PROFESSIONAL LIABILITY IN ACCORDANCE WITH SECTION 74 SUB-SECTION (1) OF REGULATION 941 OF THE ONTARIO PROFESSIONAL ENGINEERS ACT. SUBMIT PROOF OF TEMPORARY SHORING DESIGN ENGINEER'S PROFESSIONAL LIABILITY INSURANCE.
   - 6.3 BE AWARE THAT THE TEMPORARY SHORING DESIGN ENGINEER IS TIE ENGINEER OF RECORD FOR THE TEMPORARY SHORING AND SUPPORT WORK WITH THE RESPONSIBILITY FOR THE DESIGN, PREPARATION AND REVIEW OF SHOP DRAWINGS AND FIELD REVIEW OF TEMPORARY SHORING AND SUPPORT WORK.
   - 6.4 TEMPORARY SHORING AND SUPPORT DESIGN ENGINEER SHALL SEAL ALL SHOP DRAWINGS FOR TEMPORARY SHORING AND SUPPORT SYSTEM(S). SUBMIT TO CONSULTANT FOR REVIEW SHOP DRAWINGS FOR TEMPORARY SHORING AND SUPPORT SYSTEM(S). DO NOT BEGIN INSTALLATION OF TEMPORARY SHORING AND SUPPORT SYSTEM(S) UNTIL ALL CONSULTANT COMMENTS ON SUBMITTED SHOP DRAWINGS HAVE BEEN ADDRESSED.
   - 6.5 TEMPORARY SHORING AND SUPPORT DESIGN ENGINEER SHALL CONDUCT FIELD REVIEW OF SHORING SYSTEM AS REQUIRED TO ENSURE PROPER INSTALLATION OF TEMPORARY SHORING AND SUPPORT SYSTEM(S), AND NOT LESS THAN AT WEEKLY INTERVALS UNTIL TEMPORARY SHORING AND SUPPORT SYSTEM IS REMOVED. PROVIDE A SEALED FIELD REVIEW LETTER OR REPORT DOCUMENTING EACH FIELD REVIEW VISIT.
   - 6.6 BE AWARE THAT REVIEW OF SHOP DRAWINGS AND ANY PERIODIC REVIEW OF TEMPORARY SHORING SYSTEM BY CONSULTANT IS FOR GENERAL CONFORMITY TO DESIGN CONCEPT AND GENERAL ARRANGEMENT ONLY AND THAT TEMPORARY SHORING AND SUPPORT DESIGN ENGINEER RETAINS RESPONSIBILITY AS ENGINEER OF RECORD AND THAT CONTRACTOR RETAINS RESPONSIBILITY FOR QUALITY CONTROL, ERRORS OR OMISSIONS, AND CONFORMANCE WITH THE REQUIREMENTS OF CONTRACT DOCUMENTS AND REGULATORY AUTHORITIES.
7. CONNECTIONS OF NEW STRUCTURAL STEEL FRAMING TO EXISTING STRUCTURAL STEEL SHALL BE ACHIEVED THROUGH WELDED CONNECTIONS UNLESS OTHERWISE NOTED.
   - 7.1 OBTAIN A REPORT FROM MATERIAL TESTING COMPANY COMMENTING ON CHEMICAL COMPOSITION AND WELDABILITY OF EXISTING STEEL. MODIFY WELDING PROCEDURES TO SUIT CHEMICAL COMPOSITION OF EXISTING STEEL.
   - 7.2 PAINT ON EXISTING STRUCTURAL STEEL MAY CONTAIN LEAD. REFER TO DESIGNATED SUBSTANCE SURVEY OR IF NO REPORT EXISTS OBTAIN A REPORT FROM MATERIAL TESTING COMPANY COMMENTING ON HAZARDOUS MATERIAL. MAKE ALL NECESSARY SAFETY PRECAUTIONS.
   - 7.3 WELDING TO AND WITHIN AN EXISTING FACILITY PRESENTS POTENTIAL HAZARDS
     - 7.3.1 PROTECT AGAINST FIRE:
       : PROTECT EXISTING COMBUSTIBLES PRIOR TO WELDING. KEEP A SEPARATE WATCHMAN AND SEVERAL FIRE EXTINGUISHERS ON HAND;
       : DO NOT LEAVE THE SITE UNTIL SATISFIED THAT NO FIRE HAZARD EXISTS.
     - 7.3.2 PROTECT AGAINST STRUCTURAL LIQUEFACTION DUE TO WELDING ACROSS THE FULL SECTION OF STRUCTURAL STEEL MEMBERS.
       : WELD IN SHORT INCREMENTS. ALLOW WELDS TO COOL BEFORE CONTINUING TO THE NEXT INCREMENT.
8. CONNECTIONS OF NEW STRUCTURAL STEEL TO EXISTING CONCRETE SHALL BE ACHIEVED BY CONCRETE ANCHORS. REFER TO DRAWINGS AND SPECIFICATION.
   - 8.1 DRILL AND SITE MEASURE HOLES FOR ANCHORS IN EXISTING STRUCTURE PRIOR TO FABRICATING STEEL CONNECTION PLATES. HOLE LOCATIONS MAY HAVE TO BE MOVED TO AVOID CUTTING EXISTING REINFORCING OR TO AVOID OTHER SITE CONDITIONS. OBTAIN CONSULTANT'S APPROVAL BEFORE MODIFYING CONNECTION PLATES.

NON-STRUCTURAL ELEMENTS — GN-011CS

1. "NON-STRUCTURAL" OR "SECONDARY STRUCTURAL" ELEMENTS ARE NOT PART OF THE STRUCTURAL DESIGN SHOWN ON THESE DRAWINGS. SUCH ELEMENTS ARE DESIGNED, DETAILED AND REVIEWED IN THE FIELD BY OTHERS. THEY APPEAR ON DRAWINGS OTHER THAN THESE STRUCTURAL DRAWINGS BY exp. WHERE STRUCTURAL ENGINEERING RESPONSIBILITY IS REQUIRED FOR THESE ELEMENTS, THIS SHALL BE PROVIDED BY SPECIALTY STRUCTURAL ENGINEERS, WHO SHALL ALSO PROVIDE ANY DOCUMENTATION REQUIRED BY BUILDING PERMIT AUTHORITIES.

2. EXAMPLES OF NON-STRUCTURAL ELEMENTS INCLUDE. BUT ARE NOT LIMITED TO:
   - a. ARCHITECTURAL COMPONENTS SUCH AS GUARDRAILS, HANDRAILS, MISCELLANEOUS STEEL STAIRS, FLAG POLES, CANOPIES, CEILINGS, MILLWORK, ETC.
   - b. LANDSCAPE ELEMENTS SUCH AS BENCHES, LIGHT POSTS, PLANTERS, ETC.
   - c. CLADDING, GLAZING, WINDOW MULLIONS, INTERIOR STUD WALLS AND EXTERIOR STUD WALLS.
   - d. ARCHITECTURAL PRECAST, PRECAST CLADDING.
   - e. SKYLIGHTS.
   - f. MECHANICAL AND ELECTRICAL EQUIPMENT, COMPONENTS, AND THEIR ATTACHMENT DETAILS. CONNECTIONS DESIGNED SEISMIC RESTRAINT ACCORDING TO OBC 2012 CLAUSE 4.1.8.18
   - g. WINDOW WASHING EQUIPMENT, FALL ARREST ANCHORS AND THEIR ATTACHMENTS.
   - h. ESCALATORS, ELEVATORS, AND CONVEYING SYSTEMS.
   - i. GLASS BLOCK AND ITS ATTACHMENTS.
   - j. BRICK OR BLOCK VENEERS AND THEIR ATTACHMENTS.
   - k. NON-LOAD BEARING MASONRY.
   - l. NON-STRUCTURAL CONCRETE TOPPINGS.

3. SUBMIT SHOP DRAWINGS FOR NON-STRUCTURAL ELEMENTS WHICH MAY AFFECT THE PRIMARY STRUCTURAL SYSTEM TO exp. THESE DRAWINGS WILL BE REVIEWED ONLY FOR THE LOAD EFFECT OF THE ELEMENT ON THE PRIMARY STRUCTURAL SYSTEM.

ABBREVIATIONS — GN-010CS

AB	ANCHOR BOLT	F'c	COMPRESSIVE STRENGTH	Pf,Cf,Tf,Mf,Vf,Rf	FACTORED LOADS
ADD	ADDITIONAL		OF CONCRETE	P,T,C,V,M,R	UNFACTORED LOADS
AESS	ARCHITECTURALLY EXPOSED STRUCTURAL STEEL	FF	FAR FACE	PC	PRECAST
		GALV	GALVANIZED	PL	PLATE
AIFB	ASPHALT IMPREGNATED FIBREBOARD	HB	HIGH BEAM	PSL	PARALLEL STRAND LUMBER
ALT	ALTERNATIVE	HD	HANGER DOWN	PVC	POLYVINYL CHLORIDE
AR	ANCHOR ROD	HEF	HORIZONTAL EACH FACE	REINF	REINFORCEMENT
ARCH	ARCHITECTURAL	HH	HOOK-HOOK (HOOK EACH END)	RE	RIGHT END
B, BOTT	BOTTOM	HIF	HORIZONTAL INSIDE FACE	RTU	ROOF TOP UNIT
BC	BOTTOM ELEVATION OF CAISSON	HL	HIGH LINE	S	STANDARD BEAM
BEW	BOTTOM EACH WAY	HOF	HORIZONTAL OUTSIDE FACE	SECT	SECTION
BLL	BOTTOM LOWER LAYER	HOR	HORIZONTAL	SF	SPRAY FIRE PROOFED
BM	BEAM	HP	HIGH POINT	SFD	STEP FOOTING DOWN
BMB	BENDING MOMENT BAR	HSC	HORIZONTALLY SLOTTED CONNECTION	SFU	STEP FOOTING UP
BPL	BEARING/BASE PLATE	HSS	HOLLOW STRUCTURAL SECTION	SIM	SIMILAR
BRG	BEARING	HU	HANGER UP	SJ	STEEL JOIST
BSMT	BASEMENT			SL	SLAB
BUL	BOTTOM UPPER LAYER	ID	INSIDE DIAMETER	SOG	SLAB ON GRADE
C	STANDARD CHANNEL	IF	INSIDE FACE	SP	SPANDREL, SPRUCE
C/C	CENTRE TO CENTRE			SPF	SPRUCE PINE FIR
C/W	COMPLETE WITH	KB	KNEE BRACE	ST	STRAIGHT
CA	COLUMN ABOVE	kN	KILOWNEWTON	STIRR	STIRRUP
CB	COLUMN BELOW	kPa	KILOPASCAL	STRUCT	STRUCTURAL
CANT/CANTIL	CANTILEVER			T	THICKNESS
CF	CONCRETE FIREPROOFED	L	SINGLE ANGLE	TC	TOP ELEVATION OF CAISSON
CJ	CONTROL JOINT	2L	DOUBLE ANGLES	TCAP	TOP ELEVATION OF CAP
CL	CLEAR	LB	LOWER BEAM	TEW	TOP EACH WAY
C.L.	CENTRE LINE	LE	LEFT END	T&J	TONGUE AND GROOVE
COMP	COMPOSITE	LG	LONG/LENGTH	TJ	TIE JOIST
COL	COLUMN	LL	LIVE LOAD	TLE	TOP LEFT END
CONC	CONCRETE	LL	LOW LINE	TLL	TOP LOWER LAYER
CONN	CONNECTION	LLV	LONG LEG VERTICAL	TOC	TOP OF CONCRETE
CONST JT	CONSTRUCTION JOINT	LLH	LONG LEG HORIZONTAL	TOS	TOP OF STEEL
CONT	CONTINUOUS	LP	LOW POINT	TRE	TOP RIGHT END
		LSSJ	LONG SPAN STEEL JOIST	TUL	TOP UPPER LAYER
DET	DETAIL	LVL	LAMINATED VENEER LUMBER	TYP	TYPICAL
D FIR	DOUGLAS FIR			UB	UPPER BEAM
DIA	DIAMETER	MAX	MAXIMUM	U/S	UNDERSIDE
DIM	DIMENSION	MC	MOMENT CONNECTION	USD	UNDERSIDE OF DECK
DL	DEAD LOAD	MC	MISCELLANEOUS CHANNEL	UL	UPPER LAYER
DP	DEEP	MIN	MINIMUM	U/N	UNLESS NOTED
DWG	DRAWING	m	METRE	UNO	UNLESS NOTED
DWL	DOWEL	m2	SQUARE METRE		OTHERWISE
DB	BAR DIAMETER	mm	MILLIMETRE	UPT	UPTURNED
EA	EACH	mm2	SQUARE MILLIMETRE		
ECR	EPOXY COATED REINFORCEMENT	MECH	MECHANICAL	VERT	VERTICAL
EE	EACH END	MPa	MEGAPASCAL	VBF	VERTICAL BRACED FRAME
EF	EACH FACE			VEF	VERTICAL EACH FACE
EJ, EXP. JT	EXPANSION JOINT	NBCC	NATIONAL BUILDING CODE OF CANADA	VIF	VERTICAL INSIDE FACE
EL, ELEV	ELEVATION	NCB	NO COLUMN BELOW	VOF	VERTICAL OUTSIDE FACE
ELECT	ELECTRICAL	NF	NEAR FACE	VSC	VERTICAL SLOTTED CONNECTION
EMBED	EMBEDMENT	NIC	NOT IN CONTRACT		
EQ	EQUAL	No	NUMBER	W	WIDE FLANGE BEAM
EW	EACH WAY	NTS	NOT TO SCALE	WP	WALL PLATE
EX, EXIST	EXISTING			WT	STRUCTURAL TEE
FIN	FINISHED	OBC	ONTARIO BUILDING CODE	WWF	WELDED WIRE FABRIC
FL	FLOOR	OC	ON CENTRE	WWF	WELDED WIDE FLANGE
FTG	FOOTING	OD	OUTSIDE DIAMETER		
FMC	FULL MOMENT CONNECTION	OF	OUTSIDE FACE		
		OPNG	OPENING		
Fy	YIELD STRENGTH	OWSJ	OPEN WEB STEEL JOIST		

STEEL DECK NOTES — GN-008CS

1 GENERAL

1.1 THE FOLLOWING REFERENCE STANDARDS SHALL GOVERN THE WORK OF THIS SECTION:
- 1.1.1 CSA S136 PACKAGE, COLD-FORMED STEEL STRUCTURAL MEMBERS
- 1.1.2 CSSBI 10M, STANDARD FOR STEEL ROOF DECK
- 1.1.3 CSSBI 12M, STANDARD FOR COMPOSITE STEEL DECK
- 1.1.4 ASTM A108, SPECIFICATION FOR STEEL BAR, CARBON AND ALLOY, COLD FINISHED
- 1.1.5 ASTM A653/A653M, STEEL SHEET, ZINC-COATED (GALVANIZED) OR ZINC-IRON COATED (GALVANNEALED) BY HOT-DIP PROCESS
- 1.1.6 CSA W47.1, CERTIFICATION OF COMPANIES FOR FUSION WELDING OF STEEL
- 1.1.7 CSA W59, WELDED STEEL CONSTRUCTION
- 1.1.8 CSA W178.1, CERTIFICATION OF WELDING INSPECTION ORGANIZATIONS
- 1.1.9 CSA W178.2, CERTIFICATION OF WELDING INSPECTORS

1.2 DESIGN OF STEEL DECK SHALL BE BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO EXPERIENCED IN THE DESIGN OF METAL DECK.

1.3 DESIGN CRITERIA:
- 1.3.1 WHEREVER STRUCTURAL FRAMING PERMITS, DESIGN AND FABRICATE DECK TO SPAN OVER AT LEAST 4 SUPPORTS (3 SPANS).
- 1.3.2 ROOF DECK
  - .1 DESIGN ROOF DECK IN ACCORDANCE WITH CSSBI 10M FOR GRAVITY LOADS NOTED ON PLANS, CONCENTRATED LOADS NOTED IN OBC AND WIND UPLIFT. MINIMUM FACTORED UNIFORM GRAVITY LOAD FOR STRENGTH IS 3.5 kPa (75 psf).
  - .2 MAXIMUM DEFLECTION SHALL NOT EXCEED OF 1/240 OF SPAN UNDER UNIFORM LIVE OR SNOW LOAD BUT NOT LESS THAN 1.9 kPa (40 psf).
  - .3 DESIGN DECK AND FASTENING TO RESIST DIAPHRAGM SHEARS NOTED ON DRAWINGS.
- 1.3.3 FLOOR DECK
  - .1 DESIGN FLOOR DECK IN ACCORDANCE WITH CSSBI 12M FOR LOADING INDICATED ON DRAWINGS INCLUDING CONCENTRATED LOADS NOTED IN OBC.
  - .2 MAXIMUM DEFLECTION OF COMPOSITE FLOOR SHALL NOT EXCEED 1/360 OF SPAN UNDER LIVE LOAD.
- 1.3.4 DO NOT SUSPEND CEILINGS, LIGHTS, DUCTS, PIPES OR ANY OTHER ITEMS FROM STEEL DECK.

1.4 SUBMITTALS
- 1.4.1 SUBMIT STEEL DECK SHOP DRAWINGS.
  - .1 EACH SHOP DRAWING SUBMITTED SHALL BEAR THE SIGNATURE AND SEAL OF THE PROFESSIONAL ENGINEER RESPONSIBLE FOR DECK DESIGN.
  - .2 INDICATE DESIGN LOADING, DECK PROFILE, THICKNESS, STEEL GRADE, ZINC COATING, LAYOUT OF UNITS, SIZE AND SPACING OF FASTENING TO MEET UPLIFT AND DIAPHRAGM REQUIREMENTS.

2 PRODUCTS

2.1 MATERIAL: ASTM A653/A653M, GRADE 230 MIN, MINIMUM ZINC COATING Z275, MINIMUM THICKNESS 0.76 mm.

2.2 SHEET STEEL ANGLES, COVER PLATES, CLOSURES, FLASHINGS, AND REINFORCING SHALL BE OF SIMILAR MATERIAL AND ZINC COATING AS DECK.

2.3 PRIME PAINT FOR TOUCH-UP: ZINC-RICH PAINT READY MIX TO SPCC-PAINT 20 STANDARD

2.4 STUDS: ASTM108.

2.5 REINFORCEMENT FOR OPENINGS:
- 2.5.1 REINFORCE OPENINGS 150 mm TO 300 mm (6" TO 12") (IF FLOOR) 450 mm (18") (IF ROOF) ACROSS FLUTES, WITH 51 X 51 X 6.4 (2 X 2 X ¼) STRUCTURAL STEEL ANGLES IN DIRECTION PERPENDICULAR TO FLUTES EXTENDING 450 mm (18") PAST OPENING. WELD TO DECK WITH 25 mm (1") LONG WELDS AT 150 mm (6") CENTRES.

3 EXECUTION

3.1 PLACEMENT:
- 3.1.1 MINIMUM BEARING ON STRUCTURAL STEEL SUPPORTS: 45 mm (1 ¾").
- 3.1.2 LAP ENDS OF PANELS NOT LESS THAN 45 mm (1 ¾").

3.2 FASTENING:
- 3.2.1 WELD FLUTES TO STEEL SUPPORTS WITH 20 mm (3/4") DIAMETER WELD AT MAXIMUM 300 mm (12") CENTRES.
- 3.2.2 PROVIDE WELD AT END LAPS AT 400 mm (16") CENTRES MAXIMUM.
- 3.2.3 SECURE PANELS TO EACH OTHER BY BUTTON PUNCHING AT 600 mm (24") CENTRES MAXIMUM.
- 3.2.4 WELD STUD SHEAR CONNECTORS THROUGH DECK WHERE INDICATED ON DRAWINGS.
- 3.2.5 INSTALL SHEET STEEL COVER PLATES AS MAY BE REQUIRED TO SUPPORT CANTS, INSULATION AND OTHER ROOFING COMPONENTS. SECURE WITH WELDS OR CORROSION RESISTANT SHEET METAL SCREWS.
- 3.2.6 CLEAN AND WIRE BRUSH WELDS, SCRATCHES AND OTHER DAMAGED AREAS AND APPLY TWO COATS OF PRIME PAINT.

3.3 WHERE MECHANICAL EQUIPMENT IS SUPPORTED ON TIMBER SLEEPERS OR CURBS DIRECTLY ON ROOF DECK, PROVIDE WEDGES IN FLUTES OF DECK UNDER SLEEPER AT STRUCTURAL SUPPORT (BEAMS, JOISTS, WALLS).

4 FIELD QUALITY CONTROL

4.1 INSPECTION AND TESTING COMPANY RETAINED BY THE CONTRACTOR, SHALL PERFORM:
- 4.1.1 VERIFICATION OF MATERIAL THICKNESS, DEPTH, PROFILE AND ZINC COATING;
- 4.1.2 VERIFICATION OF ERECTION AND FASTENING;
- 4.1.3 GENERAL INSPECTION OF COATING TOUCH-UP.

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No.	DATE	REVISIONS	INITIAL	SIGNED
3	2024.01.12	ISSUED FOR TENDER		
2	2023.10.27	ISSUED FOR 100% REVIEW		
1	2023.10.20	REISSUED FOR 70% CD		

TORONTO

SOLID WASTE MANAGEMENT SERVICES

LICENSED PROFESSIONAL ENGINEER — C. M. BROWN — 100225722 — 2024-03-19 — PROVINCE OF ONTARIO

MATT KELIHER
GENERAL MANAGER
SOLID WASTE MANAGEMENT SERVICES

MATTHEW CASCHERA
DIRECTOR
INFRASTRUCTURE AND RESOURCE MANAGEMENT

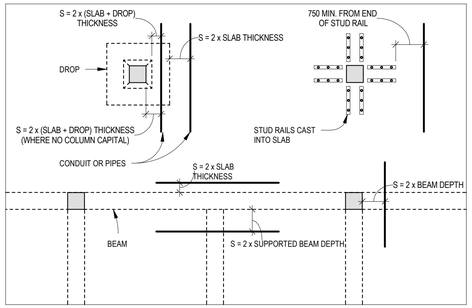
COMMISSIONERS TRANSFER STATION

MRF BUILDING UPGRADES
400 COMMISSIONERS STREET, TORONTO, ONTARIO M4M 3K2

GENERAL NOTES

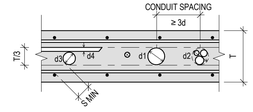
DESIGN:		DRAFTING:		CHECK:		CONTRACT No.	23SWM-IRM-026CDU
SCALE:				DRAWING NUMBER:	1601-2023-3-7		S2
DATE:							

EMBEDDED CONDUITS AND PIPES IN CONCRETE SLAB (NON-PARKING STRUCTURES) — C-026



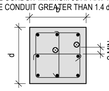
PLAN

NOTES:
1. PLACE CONDUITS AND PIPES IN CONCRETE SLABS AND WALLS IN ACCORDANCE WITH CSA STANDARD A23.1 CLAUSE 6.7.5.
2. DO NOT RUN CONDUITS LONGITUDINALLY IN A BEAM WITHOUT STRUCTURAL CONSULTANT'S APPROVAL.
3. PASS CONDUITS THROUGH A BEAM AT RIGHT ANGLES TO THE SPAN OF THE BEAM.
4. DO NOT PLACE CONDUITS CLOSER THAN SPACING 'S', AS DEFINED ABOVE, FROM COLUMNS, DROPS, AND BEAMS.



SLAB

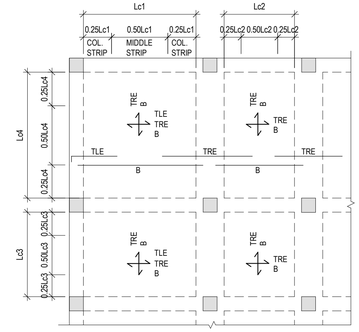
NOTES:
1. OUTSIDE DIAMETER OF ONE CONDUIT (d1) OR BUNDLE OF CONDUITS (d2) OR CROSSING CONDUITS (d3+d4) SHALL NOT EXCEED T/3.
2. PLACE CONDUITS IN MIDDLE THIRD OF SLAB THICKNESS. PROVIDE ADDITIONAL CHAIRS FOR CONDUITS AS REQUIRED.
3. DO NOT ALLOW CONDUIT TO LAY DIRECTLY ON REINFORCING STEEL. SECURE CONDUITS IN PLACE TO PREVENT DISPLACEMENT DURING PLACEMENT OF CONCRETE.
4. PLACE CONDUIT MINIMUM 3d APART WHERE d EQUALS LARGER OF ADJACENT PARALLEL CONDUIT DIAMETERS.
5. PLACE CONDUIT GREATER THAN 1.4 db AND 30 (1 1/4"), S MIN, FROM ADJACENT PARALLEL REINFORCING BARS.



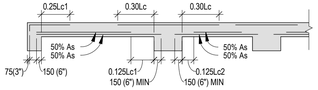
CONCRETE COLUMN

NOTES:
1. TOTAL AREA OF CONDUITS SHALL NOT EXCEED 1% OF THE GROSS AREA OF COLUMN (b x d).
2. SECURE CONDUITS TO COLUMN TIES TO PREVENT DISPLACEMENT DURING PLACEMENT OF CONCRETE. PLACE CONDUIT GREATER THAN 1.4 db AND 30 (1 1/4"), S MIN, FROM ADJACENT PARALLEL REINFORCING BARS.

TWO-WAY SLAB SYSTEM (CONFORMING TO CSA A23.3 ANNEX B) — C-006



NOTES:
1. PROVIDE MINIMUM 2-15M SPACER BARS SUPPORTED BY CHAIRS AT 1800 (6'-0") MAXIMUM FOR TOP BARS. PROVIDE CHAIRS IN ACCORDANCE WITH REINFORCED STEEL MANUAL OF STANDARD PRACTICE.
2. AREAS OF STEEL GIVEN ON PLAN ARE REINFORCEMENT WITHIN MIDDLE STRIPS. SEE PLAN FOR ORDER OF PLACING REINFORCING STEEL.
3. EXCEPT FOR TOP BARS, AREA OF REINFORCEMENT IN COLUMN STRIPS MAY BE REDUCED TO 75% OF MIDDLE STRIP REINFORCEMENT BUT NOT LESS THAN THAT REQUIRED FOR TEMPERATURE REINFORCEMENT NOR SPACED AT MORE THAN 3 TIMES SLAB THICKNESS OR 450 (18").
4. AT OUTER EDGE, EXTEND TOP BARS TO 75 (3") OF OUTER EDGE OF CONSTRUCTION AND TERMINATE IN STANDARD 90 DEGREE HOOK. WHERE BEAM DEPTH DOES NOT ACCOMMODATE 90 DEGREE HOOK, USE 180 DEGREE HOOK.
5. EXTEND TOP STEEL 900 (36") INTO ADJACENT BUT DISCONTINUOUS SLAB UNLESS NOTED OTHERWISE ON PLAN.
6. AT DISCONTINUOUS EDGE, EXTEND BOTTOM BARS MINIMUM 150 (6") INTO SUPPORT. WHERE STRAIGHT EMBEDMENT IS NOT POSSIBLE, PROVIDE STANDARD 90 DEGREE HOOK LAID FLAT, AT SPANDREL BEAMS WIDER THAN SUPPORT COLUMN, EXTEND ALTERNATE BOTTOM BARS TO 75 (3") OF OUTER EDGE.
7. PROVIDE ADDITIONAL TOP AND BOTTOM REINFORCEMENT AS REQUIRED AT EXTERIOR CORNERS AND EDGES WHERE SUPPORT WALLS OR STIFF BEAMS INTERSECT, SEE TYPICAL DETAIL C-009.
8. DIMENSIONS ARE MILLIMETRES, EXCEPT DIMENSIONS IN BRACKETS ARE INCHES.



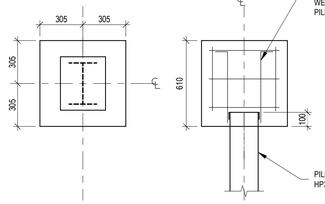
1. Lc IS GREATER OF TWO ADJACENT SPANS
2. ALTERNATE LONG AND SHORT BOTTOM BARS

MINIMUM CONCRETE COVER TO LONGITUDINAL REINFORCEMENT — C-002

ELEMENT	BAR SIZE	EXPOSURE CLASS								
		N, N-CF			F-1, F-2, S-1, S-2			C-XL, C-1, C-3, A-1, A-2, A-3		
		FIRE RATING (HRS)								
		≤2	3	4	≤2	3	4	≤2	3	4
SLABS (TOP) NON-PARKING STRUCTURE	≤25M	30			40			60		
	30M	30			45			60		
	35M	35			55			70		
SLABS (BOTTOM) NON-PARKING STRUCTURE AND WALLS EXPOSED TO FIRE ON ONE SIDE ONLY	≤25M	25	35	40	40			60		
	30M	30	35	40	45			60		
	35M	35	35	40	55			70		
BEAMS	≤30M	50			50			60		
	35M	50			55			70		
	45M	50			70			90		
COLUMNS, AND WALLS POTENTIALLY EXPOSED TO FIRE SIMULTANEOUSLY ON BOTH FACES	≤30M	50	50	65	50	50	65	60	60	65
	35M	50	50	65	55	55	65	70	70	70
	45M	50	50	65	75	70	70	90	90	90
	55M	55	55	65	85	85	85	110	110	110
MEMBERS CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	≤35M	75			75			75		

DRIVEN PILE CAP SCHEDULE

PILE CAP "PC1"



REINF.: 4-10M VERT.
3-10M TIES
PILE CAP DEAD LOAD=13.6kN

SCHEDULE OF CONCRETE PROPERTIES — C-001

STRUCTURAL ELEMENTS		ENVIRONMENT	LOCATION	CLASS OF EXPOSURE	F'c (MPa)	REMARKS
FOUNDATION	BASEMENT WALLS	CORROSIVE	ADJACENT TO PARKING RAMPS, LOADING DOCKS, SIDEWALKS	C1	35	
		NON-CORROSIVE		F2	25	
	FOUNDATION WALLS	CORROSIVE	ADJACENT TO SIDEWALKS, PARKING, ROADWAYS	C1	35	
		NON-CORROSIVE		F2	25	
	CAISSONS, PILES	CORROSIVE		C1	35	
		NON-CORROSIVE	AREAS NOT SUBJECTED TO DEPOSIT OF CHLORINE LADEN WATER FROM VEHICLES	N	25	
	FOOTINGS, FOOTING CAPS, CAISSON AND PILE CAPS	CORROSIVE	PARKING GARAGE, ADJACENT TO RAMPS, LOADING DOCK, SALLY PORT	C1	35	
		NON-CORROSIVE	AREAS NOT SUBJECTED TO DEPOSIT OF CHLORINE LADEN WATER FROM VEHICLES	N	25	
	RAFT SLAB	CORROSIVE	PARKING GARAGE	C1	35	CORROSION INHIBITOR 20 L/M3
		NON-CORROSIVE	AREAS NOT SUBJECTED TO DEPOSIT OF CHLORINE LADEN WATER FROM VEHICLES	N	25	
	TIE BEAMS	CORROSIVE	PARKING GARAGE	C1	35	
		NON-CORROSIVE	AREAS NOT SUBJECTED TO DEPOSIT OF CHLORINE LADEN WATER FROM VEHICLES	N	25	
	SLAB-ON-GRADE	CORROSIVE	REINFORCED	C1	35	CORROSION INHIBITOR 20 L/M3
			UNREINFORCED	C2	32	
		NON-CORROSIVE	OUTSIDE HEATED BUILDING ENVELOPE, REINFORCED	F2	25	
			OUTSIDE HEATED BUILDING ENVELOPE, UNREINFORCED	C2	32	
			COMPLETELY WITHIN HEATED BUILDING ENVELOPE	N-CF	25	
	PITS AND TRENCHES BELOW ROADS			C1	35	
	SKIM (MUD) SLABS			N	15	
	UNSHRINKABLE FILLS			N	0.7	
SUPERSTRUCTURE	COLUMNS	CORROSIVE	PARKING GARAGE, ADJACENT TO ROADS, SIDEWAKS	C1	35	
		NON-CORROSIVE	OUTSIDE HEATED BUILDING ENVELOPE	F2	25	
			COMPLETELY WITHIN HEATED BUILDING ENVELOPE	N	25	
	STAIRS AND STAIR LANDINGS	CORROSIVE	PARKING GARAGE	C1	35	
		NON-CORROSIVE	OUTSIDE HEATED BUILDING ENVELOPE	F2	25	
			COMPLETELY WITHIN HEATED BUILDING ENVELOPE	N	25	

NOTES:
1. THIS SCHEDULE IS A PERFORMANCE-BASED SPECIFICATION IN ACCORDANCE WITH CSA A23.1, TABLE 5 ALTERNATIVE (1). NOTHING ON THE DRAWINGS OR SCHEDULES SHALL BE CONSTRUED OR INTERPRETED AS RENDERING THE SPECIFICATION TO BE ALTERNATIVE.
2. READ THIS SCHEDULE IN CONJUNCTION WITH THE SPECIFICATIONS. FOR EXPOSURE CLASSIFICATION OF BUILDING ELEMENTS NOT SHOWN IN SCHEDULE AND FOR OTHER CONCRETE PROPERTIES AND REQUIREMENTS INCLUDING BUT NOT LIMITED TO SUPPLEMENTARY CEMENTITIOUS MATERIALS AND AGGREGATE SIZE, REFER TO THE SPECIFICATIONS.
3. CONCRETE STRENGTHS SHOWN ARE MINIMUMS. PROVIDE THE GREATER OF THE STRENGTH SHOWN ABOVE AND THE STRENGTHS SHOWN ON PLANS AND OTHER SCHEDULES ON DRAWINGS.
4. WHERE ELEMENTS OF DIFFERENT EXPOSURE CLASSIFICATIONS, STRENGTHS, CORROSION INHIBITOR DOSAGES, AND SHRINKAGE LIMITS ARE PLACED MONOLITHICALLY, USE THE MOST SEVERE EXPOSURE CLASSIFICATION, AND RESPECTIVE STRENGTH AND CORROSION INHIBITOR DOSAGE.

TENSION DEVELOPMENT LENGTH AND TENSION LAP SPLICES (Fy=400 MPa AND 500 MPa) — C-017

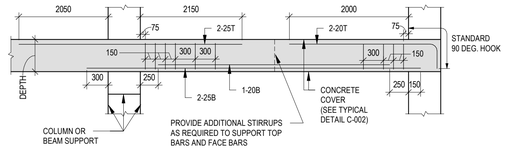
CONCRETE	25 MPa		30 MPa		35 MPa		40 MPa		45 MPa		50 MPa		CONCRETE
SPLICE	CLASS A OR Ld	CLASS B = 1.3*Ld	CLASS A OR Ld	CLASS B = 1.3*Ld	CLASS A OR Ld	CLASS B = 1.3*Ld	CLASS A OR Ld	CLASS B = 1.3*Ld	CLASS A OR Ld	CLASS B = 1.3*Ld	CLASS A OR Ld	CLASS B = 1.3*Ld	SPLICE
UNCOATED, OTHER THAN TOP BARS													
10M	300 (12)	380 (15)	300 (12)	350 (14)	300 (12)	320 (13)	300 (12)	300 (12)	300 (12)	300 (12)	300 (12)	300 (12)	10M
15M	440 (18)	570 (23)	400 (16)	520 (21)	370 (15)	480 (19)	350 (14)	450 (18)	330 (13)	420 (17)	310 (12)	400 (16)	15M
20M	580 (23)	750 (30)	530 (21)	690 (28)	490 (20)	640 (26)	460 (19)	600 (24)	430 (17)	560 (23)	410 (16)	530 (21)	20M
25M	900 (36)	1170 (47)	830 (33)	1070 (43)	760 (30)	990 (39)	720 (29)	930 (37)	670 (27)	880 (35)	640 (26)	830 (33)	25M
30M	1080 (43)	1410 (56)	990 (39)	1290 (51)	920 (37)	1190 (47)	860 (34)	1110 (44)	810 (32)	1050 (42)	770 (31)	1000 (40)	30M
35M	1260 (50)	1640 (65)	1150 (46)	1500 (60)	1070 (43)	1390 (55)	1000 (40)	1300 (52)	940 (38)	1220 (49)	890 (36)	1160 (46)	35M
UNCOATED, TOP BARS													
10M	380 (15)	490 (20)	350 (14)	450 (18)	320 (13)	420 (17)	300 (12)	390 (16)	300 (12)	370 (15)	300 (12)	350 (14)	10M
15M	570 (23)	730 (29)	520 (21)	670 (27)	480 (19)	620 (25)	450 (18)	580 (23)	420 (17)	550 (22)	400 (16)	520 (21)	15M
20M	750 (30)	980 (39)	690 (28)	890 (36)	640 (26)	830 (33)	600 (24)	770 (31)	560 (23)	730 (29)	530 (21)	690 (28)	20M
25M	1170 (47)	1530 (61)	1070 (43)	1390 (55)	990 (39)	1290 (51)	930 (37)	1210 (48)	880 (35)	1140 (45)	830 (33)	1080 (43)	25M
30M	1410 (56)	1830 (73)	1290 (51)	1670 (66)	1190 (47)	1550 (62)	1110 (44)	1450 (58)	1050 (42)	1360 (54)	1000 (40)	1290 (51)	30M
35M	1640 (65)	2130 (84)	1500 (60)	1950 (77)	1390 (55)	1800 (71)	1300 (52)	1690 (67)	1220 (49)	1590 (63)	1160 (46)	1510 (60)	35M

1. USE TABULATED TENSION LAP SPLICE LENGTHS UNLESS NOTED OTHERWISE ON DRAWINGS.
2. TENSION DEVELOPMENT LENGTHS, Ld DENOTED AS TENSION LAP SPLICE CLASS A.
3. TOP BARS ARE BARS WITH MORE THAN 300 (12") OF CONCRETE BELOW.
4. CLEAR COVER NOT LESS THAN db, CLEAR SPACING NOT LESS THAN 1.4 db.
5. FOR REINFORCEMENT WITH Fy = 500 MPa, INCREASE TABULATED LENGTHS BY 25%.
6. FOR STRUCTURAL LOW-DENSITY CONCRETE, INCREASE TABULATED LENGTHS BY 30%.
7. FOR STRUCTURAL SEMI-LOW DENSITY CONCRETE, INCREASE TABULATED LENGTHS BY 20%.
8. DIMENSIONS ARE MILLIMETRES, EXCEPT DIMENSIONS IN BRACKETS ARE INCHES.

CONCRETE BEAM — C-010

BEAM SCHEDULE

BEAM MARK	BEAM SIZE	REINFORCEMENT TOP/BOT REINF.	NO.	SIZE	LAYER	SUPPORT mm	SUPPORT mm	SUPPORT mm	SUPPORT mm	SUPPORT mm	SUPPORT mm	REMARKS
BM 101 SE	350x600	TOP	2	25	TUL	2050		2150				
		TOP	2	20	TUL				2000			
		BOT	1	20	BUL	300		250		250		
		BOT	2	25	BLL						150	
		STIRR	LE	10	SC	1@75, 3@150, 2@300						
		STIRR	RE	10	SC	1@75, 2@150, 1@300						
		HANGER		15	SC	9 PLACED IN SUPPORTING BEAM (SEE TYP. DETAIL C-011 CONC. BEAM HANGER STIRR)						



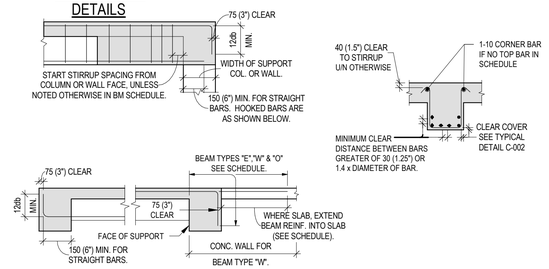
SAMPLE BEAM 101 - 350 x 600 (WIDTH x DEPTH)

BEAM SUPPORT TYPES
W=WALL
E=EXTERIOR
S=SLAB BEYOND
C=CONTINUOUS
O=NO SUPPORT

DETAIL OF BEAM SCHEDULE

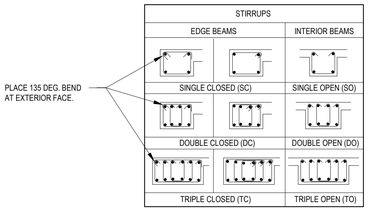
1. DIMENSIONS ARE GIVEN LOOKING AT PLAN FROM BOTTOM OR RIGHT HAND BORDER. SEE "BEAM SUPPORT TYPES" FOR CONDITIONS AT SUPPORT. STIRRUP SPACING GIVEN STARTING FROM FACE OF SUPPORT.
2. FIRST LETTER IN SCHEDULE INDICATES CONDITION AT LEFT SUPPORT, SECOND LETTER RIGHT SUPPORT.
3. EXAMPLE IS IN METRIC UNITS. SIMILAR DETAILS APPLY TO IMPERIALLY SCHEDULED BEAMS.
4. WHERE " ==== TSB" SHOWN IN SCHEDULE, PROVIDE TENSION LAP SPLICE AT MID SPAN FOR TOP BARS AND AT FACE OF SUPPORT FOR BOTTOM BARS, UNLESS NOTED OTHERWISE.
5. WHERE "(L)" SHOWN IN SCHEDULE, LOWER INDICATED TOP BARS BELOW THE TOP BARS SPECIFIED IN CROSS BEAM.

BAR PLACING DETAILS



DETAIL OF BARS AT SUPPORT (DISCONTINUOUS EDGE)

1. AT DISCONTINUOUS EDGE EXTEND TOP BARS TO 75 (3") OF OUTER EDGE OF SUPPORT AND TERMINATE IN STANDARD 90 DEGREE HOOK.
2. WHERE BEAM DEPTH WILL NOT ACCOMMODATE 90 DEGREE HOOK USE STANDARD 180 DEGREE HOOK.
3. BEAM SUPPORT TYPE "W" - TOP BARS EXTEND INTO CONCRETE WALL.
4. DIMENSIONS ARE MILLIMETRES, EXCEPT DIMENSIONS IN BRACKETS ARE INCHES.



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No.	DATE	REVISIONS	INITIAL	SIGNED
3	2024.01.12	ISSUED FOR TENDER		
2	2023.10.27	ISSUED FOR 100% REVIEW		
1	2023.10.20	REISSUED FOR 70% CD		

TORONTO

SOLID WASTE MANAGEMENT SERVICES

LICENSED PROFESSIONAL ENGINEER C.M. BROWN 100225732 2024-03-19 PROVINCE OF ONTARIO

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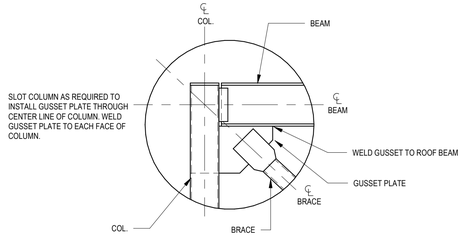
COMMISSIONERS TRANSFER STATION

MRF BUILDING UPGRADES
400 COMMISSIONERS STREET, TORONTO, ONTARIO M4M 3K2

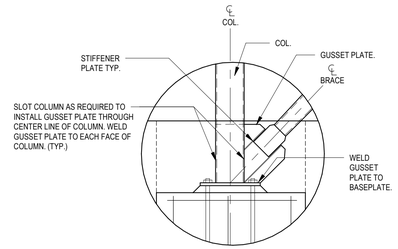
SCHEDULES

DESIGN:		DRAFTING:		CHECK:		CONTRACT No.	23SWM-IRM-026CDU
SCALE:				DRAWING NUMBER:	1601-2023-3-8		S3
DATE:							

VERTICAL BRACE DETAILS — S-010

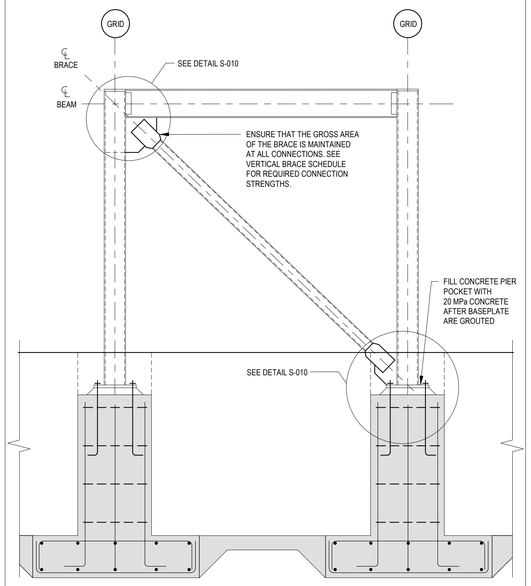


TYPICAL BRACE CONNECTION
TO COLUMN & ROOF BEAM



TYPICAL BRACE CONNECTION
TO COLUMN BASEPLATE

VERTICAL BRACE ELEVATION DETAIL — S-009



LINTEL SCHEDULE AND NOTES — M-002

NON-LOAD BEARING PARTITIONS

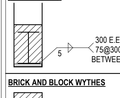
BLOCK LINTELS

MAX CLEAR SPAN	140 BLOCK				190 BLOCK				240 BLOCK				290 BLOCK			
	b	d	REBAR	STIRRUPS	b	d	REBAR	STIRRUPS	b	d	REBAR	STIRRUPS	b	d	REBAR	STIRRUPS
UP TO 1200	140	190	1-10 T&B	⁄	190	190	1-10 T&B	⁄	240	190	1-10 T&B	⁄	290	190	1-10 T&B	⁄
1201 TO 1800	140	390	1-10 T&B	⁄	190	390	1-15 T&B	⁄	240	390	1-15 T&B	⁄	290	390	1-15 T&B	⁄
1801 TO 2300	140	390	1-15 T&B	⁄	190	390	1-20 T&B	10@200	240	390	1-20 T&B	10@200	290	390	1-25 T&B	10@200
> 2300 USE STEEL LINTEL																

NOTES:

1. CONCRETE FILL: 20 MPa MIN. STRENGTH WITH 150 SLUMP
2. BEARING LENGTH: 200 MIN. AT EACH END.

STEEL LINTELS



MAX CLEAR SPAN	140 BLOCK		190 BLOCK		240 BLOCK		290 BLOCK	
	BEAM	PLATE	BEAM	PLATE	BEAM	PLATE	BEAM	PLATE
2300 TO 2600	S200x27	130x10	S200x27	180x10	S200x27	230x10	S200x27	280x10

NOTES:

1. BEARING LENGTH: 150 MIN. EACH END. BEAR PLATE ON BUTTER COAT OF CEMENT MORTAR EACH END.

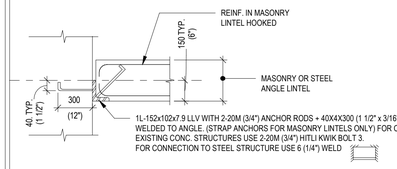
BRICK AND BLOCK WYTHES

MAX CLEAR SPAN	1-100 THICK WYTH	2-100 THICK WYTH	3-100 THICK WYTH	4-100 THICK WYTH	5-100 THICK WYTH
UP TO 1500	L 89x89x7.9	L 89x89x7.9	L 89x89x7.9	L 89x89x7.9	L 89x89x7.9
1501 TO 2300	L L127x89x7.9	L L127x89x7.9	L L127x89x7.9	L L127x89x7.9	L L127x89x7.9
2301 TO 2600	L L152x89x7.9	L L152x89x7.9	L L152x89x7.9	L L152x89x7.9	L L152x89x7.9

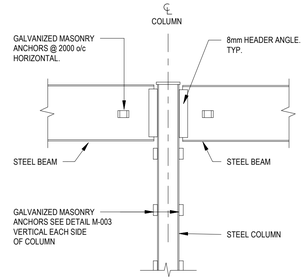
NOTES:

1. LONG LEGS VERTICAL
2. BEARING LENGTH 150 MIN. EACH END. SET STEEL ANGLE LINTELS WITH ENDS WRAPPED WITH 6mm POLYETHYLENE SHEET ON 10GA. GALV. STEEL PLATES ON MASONRY EA. END.
3. CONNECT ANGLES BACK TO BACK AT 600 o/c BY WELDING OR BOLTING ANGLES GREATER THAN 1800 LONG. USE 16 DIA. BOLTS.
4. FOR LOCATIONS & SIZES OF OPENINGS, SEE ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS.

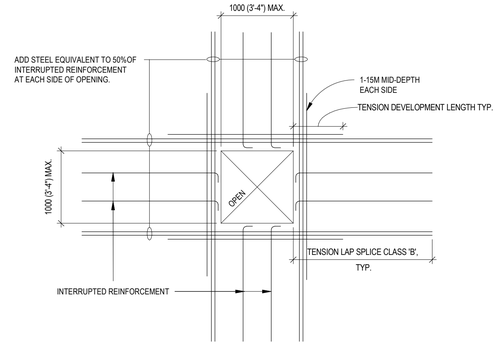
LINTEL CONNECTION TO CONCRETE OR STEEL STRUCTURE



TYPICAL BEAM TO COLUMN CONNECTION DETAIL — S-005



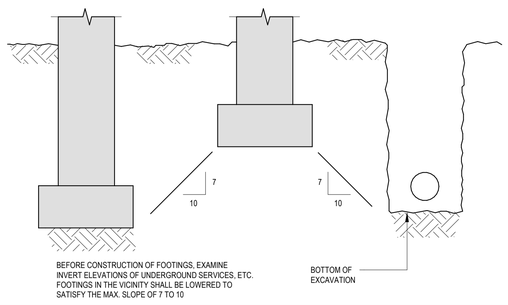
OPENINGS IN SLABS — C-027



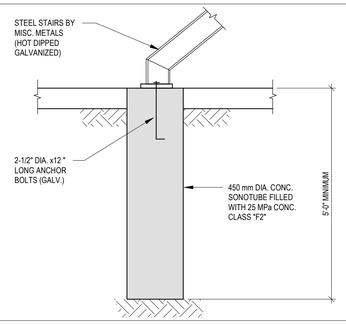
NOTES:

1. THIS DETAIL DOES NOT APPLY TO OPENINGS WITH ANY DIMENSION GREATER THAN 1000 (3'-4") OR OPENINGS WITHIN COLUMN STRIPS. OBTAIN SPECIAL INSTRUCTIONS FROM DESIGN CONSULTANT WHEN SUCH OPENINGS ARE REQUIRED.
2. DIMENSIONS ARE MILLIMETRES, EXCEPT DIMENSIONS IN BRACKETS ARE FEET AND INCHES.

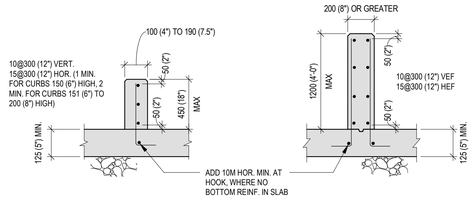
TYPICAL WALL FOOTING ADJACENT TO EXCAVATIONS — F-011



TYPICAL STEEL STAIR CONNECTION AT BASE — F-019A

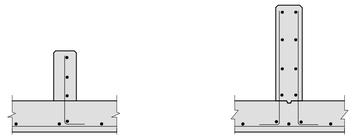


CONCRETE CURBS ON SLABS — C-029



100 (4") TO 190 (7.5") MAX — 200 (8") OR GREATER

CURBS (NON-VEHICULAR GUARD) ON UNREINFORCED SLAB



100 (4") TO 190 (7.5") MAX — 200 (8") OR GREATER

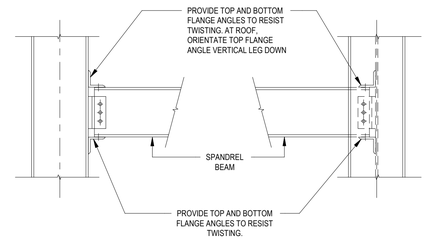
CURBS ON REINFORCED SLAB

SIMILAR TO CURBS ON UNREINFORCED SLAB EXCEPT AS NOTED

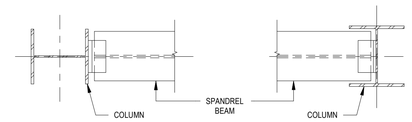
NOTES:

1. SEE ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR LOCATIONS AND DIMENSIONS OF CURBS NOT SHOWN ON STRUCTURAL DRAWINGS.
2. AT TOP OF CURB, PROVIDE 20 (3/4") CHAMFERS OR ROUNDED CORNERS EACH SIDE, TYPICAL WHERE NO MASONRY ABOVE - SEE ARCHITECTURAL DRAWINGS.
3. PLACED HOOKED VERTICAL REINFORCEMENT BEFORE PLACING CONCRETE SLAB.
4. COVER IN ACCORDANCE WITH TYPICAL DETAIL C-002:
5. FOR BARS IN CURB: AS FOR TYPICAL WALLS.
   FOR HOOK IN SLAB: AS FOR SLABS.
6. DIMENSIONS ARE MILLIMETRES, EXCEPT DIMENSIONS IN BRACKETS ARE FEET AND INCHES.

SPANDREL BEAM CONNECTION — S-016



ELEVATION

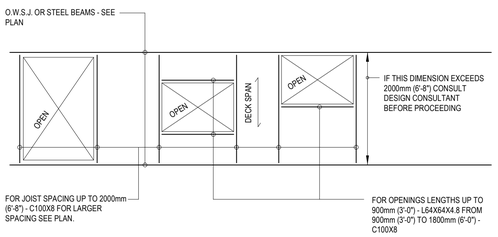


PLAN

NOTES:

1. SPANDREL BEAM IS DEFINED AS AN EXTERIOR PERIMETER BEAM.
2. SUPPORT SHOWN IS A "W" COLUMN. PROVIDE SIMILAR CONNECTION AT OTHER TYPES OF SUPPORT, SUCH AS "HSS" COLUMN, OR GIRDER SUPPORT.
3. WHEN BEAM IS TOO WIDE TO ENTER BETWEEN COLUMN FLANGES, CONNECT TOP AND BOTTOM ANGLES TO COLUMN FLANGES.

TRIMMING AT OPENING IN DECK — S-008



NOTES:

1. TOP OF ALL TRIMMING AT UNDERSIDE OF STEEL DECK UNLESS OTHERWISE NOTED
2. LOCATION OF MECHANICAL UNITS AND OPENINGS THROUGH ROOF IS BASED ON INFORMATION SHOWN ON MECHANICAL DRAWINGS. THE STRUCTURAL STEEL SUB-CONTRACTOR MUST CONFIRM ALL THESE DIMENSIONS AND SIZES WITH THE MECHANICAL CONTRACTOR
3. O.W.S.J. MUST BE DESIGNED FOR ADDITIONAL LOADS FOR MECHANICAL UNITS.
4. IF ACTUAL LOCATIONS OR DETAILS VARY FROM THOSE SHOWN, THE DESIGN CONSULTANT MUST BE INFORMED AND INSTRUCTIONS RECEIVED BEFORE PROCEEDING WITH THE WORK.
5. THE STRUCTURAL STEEL SUB-CONTRACTOR IS TO SUBMIT ERECTION DRAWINGS TO THE ENGINEER AND/OR CONTRACTOR FOR APPROVAL OF SIZE AND LOCATION OF OPENINGS FOR MECHANICAL UNITS.

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3	2024.01.12	ISSUED FOR TENDER		
2	2023.10.27	ISSUED FOR 100% REVIEW		
1	2023.10.20	REISSUED FOR 70% CD		

TORONTO

SOLID WASTE MANAGEMENT SERVICES

LICENSED PROFESSIONAL ENGINEER — C. M. BROWN — 100255732 — 2024-03-19 — PROVINCE OF ONTARIO

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GENERAL MANAGER
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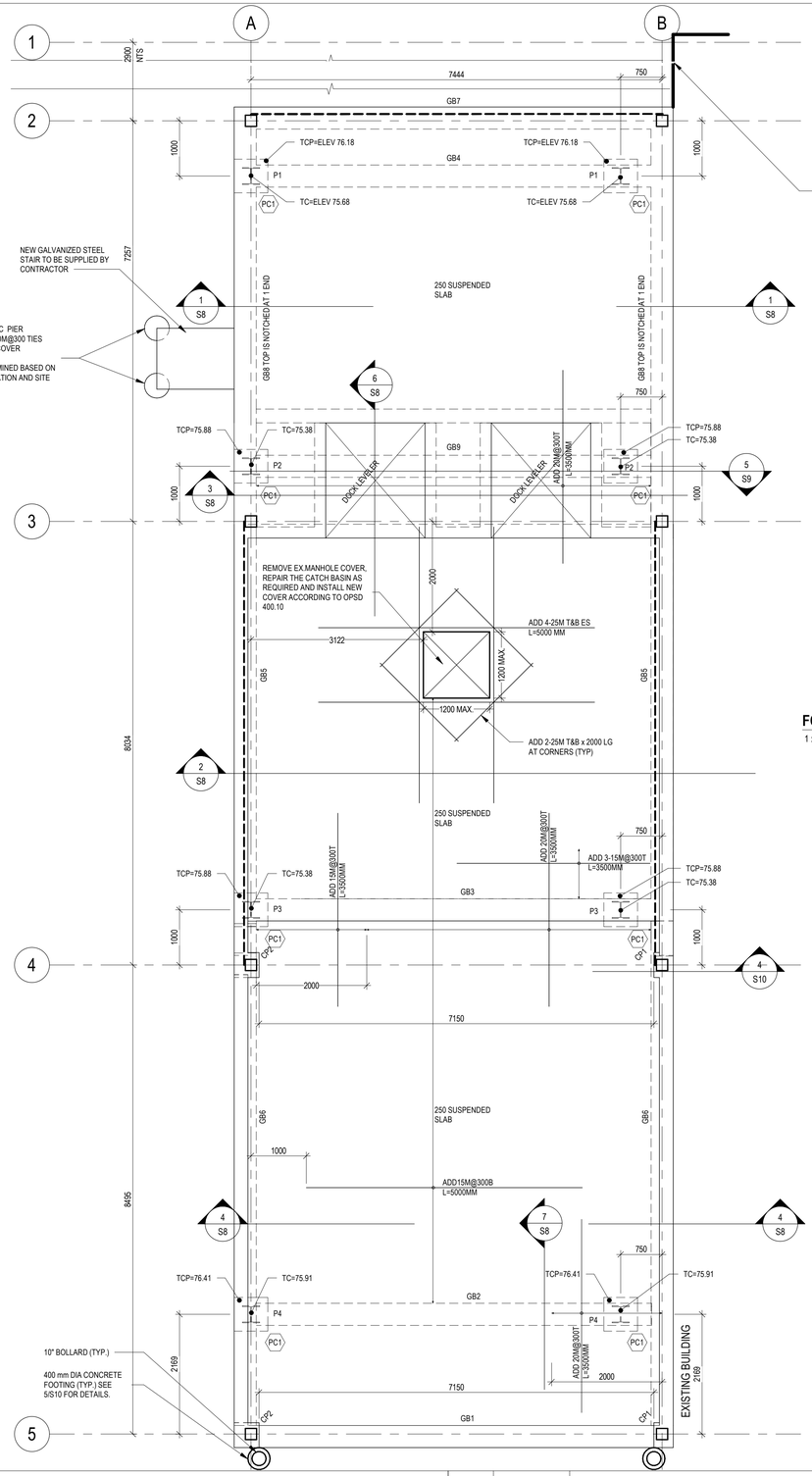
MATTHEW CASCHERA
DIRECTOR
INFRASTRUCTURE AND RESOURCE MANAGEMENT

COMMISSIONERS TRANSFER STATION

MRF BUILDING UPGRADES
400 COMMISSIONERS STREET, TORONTO, ONTARIO M4M 3K2

TYPICAL DETAILS

DESIGN:		DRAFTING:		CHECK:		CONTRACT No.	23SWM-IRM-026CDU
SCALE:				DRAWING NUMBER:	1601-2023-3-9		S4
DATE:							



FOUNDATION FRAMING PLAN

1 : 50

FOUNDATION NOTES (DRIVEN PILES)

1. FINISHED DRIVEN PILES AT ELEVATION 75.52 m EXCEPT AS CROSSED AND NOTED.
2. BOTTOM OF DRIVEN PILES AT ELEVATION 61-62m UNLESS NOTED OTHERWISE ON PLAN AS 'BC='
3. TOP OF DRIVEN PILES AT ELEVATION NOTED ON PLAN AS 'TC='
4. TOP OF DRIVEN PILE CAPS AT ELEVATION NOTED ON PLAN AS 'TCP='.
5. CARRY DRIVEN PILES DOWN TO NATURAL UNDISTURBED SOIL OF BEARING CAPACITY: ULTIMATE LIMIT STATES (ULS): 1600 kN
6. DRIVEN PILE ELEVATION AND BEARING VALUE OF SOIL UNDER DRIVEN PILE AND SLAB ON GRADE ARE BASED ON INFORMATION AVAILABLE AT THE TIME DRAWINGS ARE ISSUED. REFER TO GEOTECHNICAL INVESTIGATION PREPARED BY EXP Services Inc. REPORT ADJUSTMENTS NECESSARY DUE TO ACTUAL CONDITIONS TO THE CONSULTANT BEFORE PROCEEDING WITH THE WORK.
7. BEFORE PLACING SLAB ON GRADE VERIFY THAT BEARING CAPACITY OF SUBGRADE AND COMPACTION OF SUB-BASE ARE ADEQUATE TO SUPPORT 25 kPa UNIFORMLY DISTRIBUTED LOAD ON SLAB ON GRADE WITHOUT SIGNIFICANT DIFFERENTIAL SETTLEMENT BETWEEN SLAB AND BUILDING FOUNDATIONS.
8. CENTRE DRIVEN PILES UNDER COLUMNS UNLESS OTHERWISE NOTED ON PLANS.
9. CONCRETE PROPERTIES: SEE SCHEDULE OF CONCRETE PROPERTIES ON DRAWING S-03.
10. PROVIDE THE FOLLOWING DOWELS FROM DRIVEN PILES INTO GRADE BEAMS AND PIERS ABOVE UNLESS NOTED OTHERWISE:
    6-15M BARS 900 LONG TO GRADE BEAMS
    6-15M BARS 900 LONG TO PIERS
11. SEE ARCHITECTURAL AND MECHANICAL DRAWINGS FOR DEPRESSIONS IN SLAB ON GRADE. MAINTAIN SLAB THICKNESS SPECIFIED ON PLAN.
12. SEE GENERAL NOTES AND TYPICAL DETAILS ON DRAWING S-01 - S-04.
13. ALL FORCES NOTED ARE IN kN. FORCES ARE FACTORED ULS
14. FORCES NOTED AS C ARE COMPRESSION, T ARE TENSION.
15. ALL FORCES SHOWN ON DRAWING ARE APPLIED AT TOP OF PILE.
16. PILE CAPS ARE 610mm DEEP TYPICAL
17. PILE STEEL GRADE 240 MPa MIN.
18. NON-CORROSIVE SOIL CONDITION ASSUMED. NOTIFY CONSULTANT IF CORROSIVE SOIL CONDITION IDENTIFIED.
19. ALL INCLINED PILES ARE TO BE 4V:1H
20. ALL PILE SPLICES TO BE FULL CAPACITY SPLICES CAPABLE OF DEVELOPING THE FULL AXIAL TENSION, AXIAL COMPRESSION AND FLEXURAL COMPACITY OF THE SECTION.
21. THESE PILES SHOULD REACH PRACTICAL REFUSAL AT ABOUT 1 TO 2 m BELOW ROCK SURFACE, OR ABOUT ELEV 61 TO 62 m.
22. WHERE THE SURFACE OF THE ROCK IS HIGHLY WEATHERED, THE PILES MAY PENETRATE DEEPER INTO THE ROCK.
23. THE PILES SHOULD BE INSTALLED AS DISCUSSED IN SECTION 5.2.4 OF THE EXP'S GEOTECHNICAL REPORT. THE PILE TYPES NOTED INTHE GEOTECHNICAL REPORT WERE FOR REFERENCE ONLY. PILES TO BE INSTALLED SHOULD BE AS SHOWN IN THE DRAWINGS.
24. IN ADDITION, ALL PILES SHOULD BE RE-TAPPED ONE DAY AFTER INITIAL INSTALLATION, TO SEE IF RELAXATION HAS OCCURED.
25. PILES THAT SHOW RELAXATION SHOULD BE RE-DRIVEN TO THE REQUIRED SET CRITERION.
26. THERE ARE SEVERAL UNDERGROUND ULITITIES IN AREA OF THE LOAD DOCK/BAY. CONTRACTOR IS RESPONSIBLE TO DO A LOCATE UNDERGROUND UTILITY SURVEY PRIOR TO ANY DEMOLITION AND PLING WORK. CONTRACTOR TO PROTECT LOCATED UTILITIES IN PLACE AS REQUIRED DURING THE WORKS.

CONCRETE GRADE BEAM SCHEDULE

BEAM MARK	CONCRETE SIZE (WIDTH X DEPTH)	CONCRETE SHAPE (SHADED)	REINFORCEMENT: LONGITUDINAL BARS No.	SIZE	LOCATION	STIRRUPS SIZE	TYPE	SPACING	LOCATION	REMARKS
										COMPRESSIVE STRENGTH OF CONCRETE: 35 MPa CLASS C1 AT 28 DAYS
										YIELD STRENGTH FOR LONGITUDINAL BARS: 400 MPa
										FOR STIRRUPS: 400 MPa TO CSA SPEC. G30.12-M1977
GB1	400 x 750		3	20	T	10		@150	TH	FOR CONTINUOUS BEAM,
			8	15	M					CONTINUE TOP REINFORCEMENT
			3	30	B					OVER SUPPORT TYPICAL FOR
										ALL GRADE BEAMS
GB2	400 x 750 cantil. one end		3	35	T	15		@150	REM	
			8	15	M	15		@100	R	LENGTH=2500MM FROM GRID B
			3	35	B					
GB3	400 x 750 cantil. one end		3	30	T					
			8	15	M	15		@100	R	LENGTH=2500MM FROM GRID B
			3	35	B	15		@350	REM	
GB4	400 x 1700 cantil. one end		4	20	T	15		@300	TH	
			28	15	M					
			4	25	B					
GB5	400 x 750		3	25	T	15		@100	R	LENGTH=1500MM FROM GRID 3
			8	15	M					
			3	25	B	15		@200	REM	
GB6	400 x 750		3	20	T					
			8	15	M	10		@200	TH	
			3	20	B					
GB7	400 x 1700		3	20	T	10		@550	TH	
			28	15	M					
			3	20	B					
GB8	400 x 1700		3	25	T	10		@200	TH	
			28	15	M					
			3	20	B					
GB9	400 x 1500 cantil. one end		3	25	T	15		@150	R	LENGTH=2500MM FROM GRID B
			26	15	M	15		@350	REM	
			3	25	B					

PILE SCHEDULE

Pile #	Verticality	Pile Lgth. (m)	Factored ULS Compression Load kN	Factored ULS Tension Load kN	Pile Section
P1	Vert.	14.68	1600	0	HP 310x110
P2	Vert.	14.38	1600	0	HP 310x110
P3	Vert.	14.38	1600	0	HP 310x110
P4	Vert.	14.91	1600	0	HP 310x110

SLAB NOTES

SLAB THICKNESS	REINFORCEMENT: PRIMARY TOP BARS	PRIMARY BOTTOM BARS	INTEGRITY BARS	ADDITIONAL REINFORCEMENT	REMARKS
250 SUSPENDED SLAB	20M@300 EACH WAY, CONTINOUS MAT	20M@300 EACH WAY, CONTINOUS MAT		SEE PLAN	REINFORCEMENT SHOWN ON PLAN IS ADDITIONAL TO PRIMARY REINFORCEMENT

TUL = TOP UPPER LAYER
TLL = TOP LOWER LAYER
BUL = BOTTOM UPPER LAYER
BLL = BOTTOM LOWER LAYER

PIER SCHEDULE

MARK	SIZE	VERT. REINF.	TIES
CP1	450 x 350 x VARIES	4-20M	10M@100
CP2	450 x 450 x VARIES	4-20M	10M@100

NOTE:
EXISTING CONDITIONS AS SHOWN ON THE STRUCTURAL DRAWINGS ARE BASED UPON THE INFORMATION AVAILABLE AT THE TIME THAT DRAWINGS WERE PREPARED. THE CONTRACTOR IS TO VERIFY EXISTING CONDITIONS AND REPORT ANY VARIATIONS TO THE CONTRACT ADMINISTRATOR. THE CONTRACTOR IS TO WAIT FOR FURTHER INSTRUCTION PRIOR TO PROCEEDING WITH THE WORK.

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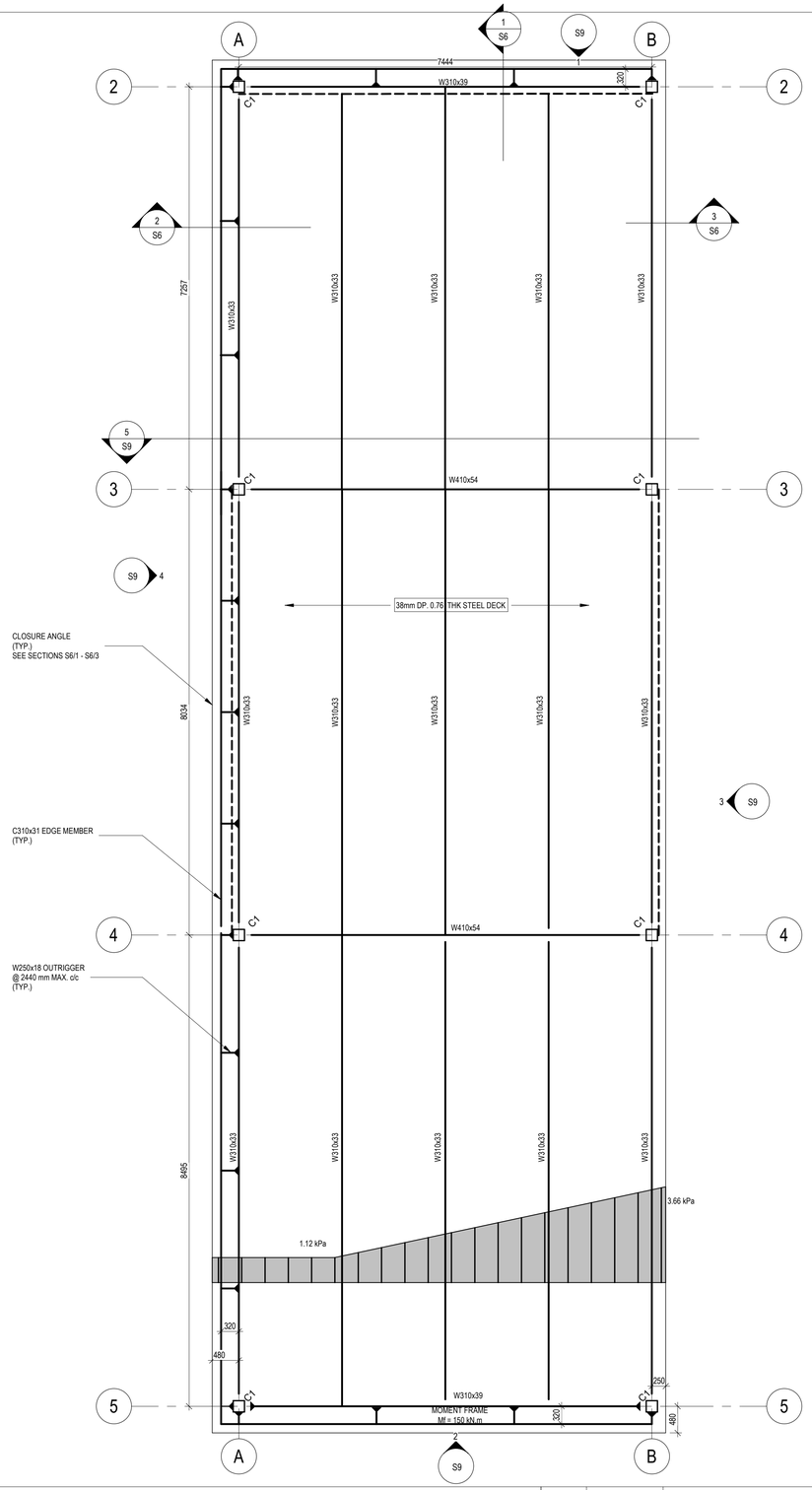
MRF BUILDING UPGRADES
400 COMMISSIONERS STREET, TORONTO, ONTARIO M4M 3K2

FOUNDATION FRAMING PLAN

DESIGN:		DRAFTING:		CHECK:		CONTRACT No.	23SWM-IRM-026CDU
SCALE:				DRAWING NUMBER:	1601-2023-3-10		S5
DATE:							



ROOF FRAMING PLAN

1 : 50

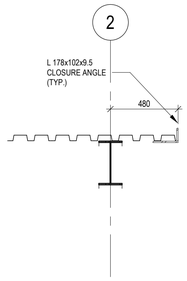
STEEL COLUMN SCHEDULE	
MARK	TYPE
C1	HSS 203x203x6.4

ROOF FRAMING PLAN NOTES

1. LOADING:
   SUPERIMPOSED DEAD LOAD
   ROOFTOP EQUIPMENT = SEE PLAN
   ROOFING + CEILING + MECH/ELECT ALLOWANCE = 1 kPa

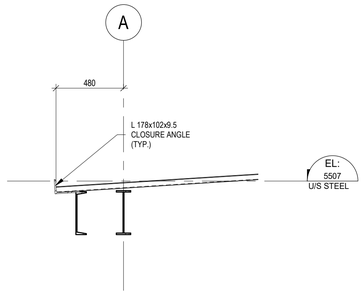
   LIVE LOAD = 1.0 kPa
   SNOW LOAD = 1.12 kPa PLUS ACCUMULATED SNOW LOAD NOTED ON PLAN
   RAIN LOAD = 0.4 kPa

   LIVE LOAD, SNOW LOADS AND RAIN LOAD NEED NOT BE CONSIDERED SIMULTANEOUSLY
2. "Wd" FOR ROOF DECK DENOTES SUPERIMPOSED DEAD LOAD IN kPa. DESIGN DECK FOR Wd, LIVE LOAD, SNOW LOADS, RAIN LOAD, CONCENTRATED LOAD REQUIRED BY OBC AND WIND UPLIFT GIVEN IN SPECIFICATIONS. DEAD LOAD FOR UPLIFT CALCULATION IS SHOWN IN PARENTHESES.
3. PIPES, DUCTWORK, ELECTRICAL CABLES, CEILING ETC. SHALL NOT BE HUNG FROM FLOOR ROOF DECK. ALL HANGERS SHALL BE HUNG FROM THE TOP CHORD OF JOISTS OR BEAMS.
4. STEEL DECK IS DESIGNED TO ACT AS A DIAPHRAGM. REFER TO ROOF DIAPHRAGM DETAILS ON DRAWING S-11.
5. ► " DENOTES FULL MOMENT CONNECTION.
6. SEE GENERAL NOTES AND TYPICAL DETAILS ON DRAWING S-01 TO S-05.



SECTION 1

1 : 20



SECTION 2

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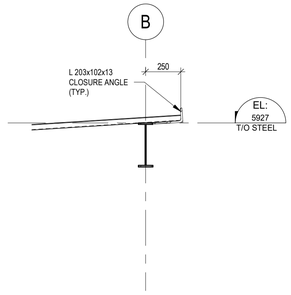
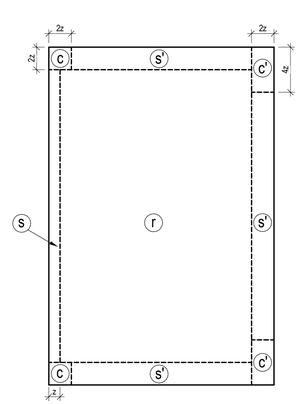


SECTION 3

1 : 20



ROOF AREA	WIND LOAD
END ZONE WIDTH, z	1 M
CORNER (C')	-3.6 kPa
CORNER (C)	-2.8 kPa
EDGE (S)	-2.3 kPa
EDGE (S')	-2.5 kPa
FIELD (r)	-1.9 kPa

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ROOF FRAMING PLAN

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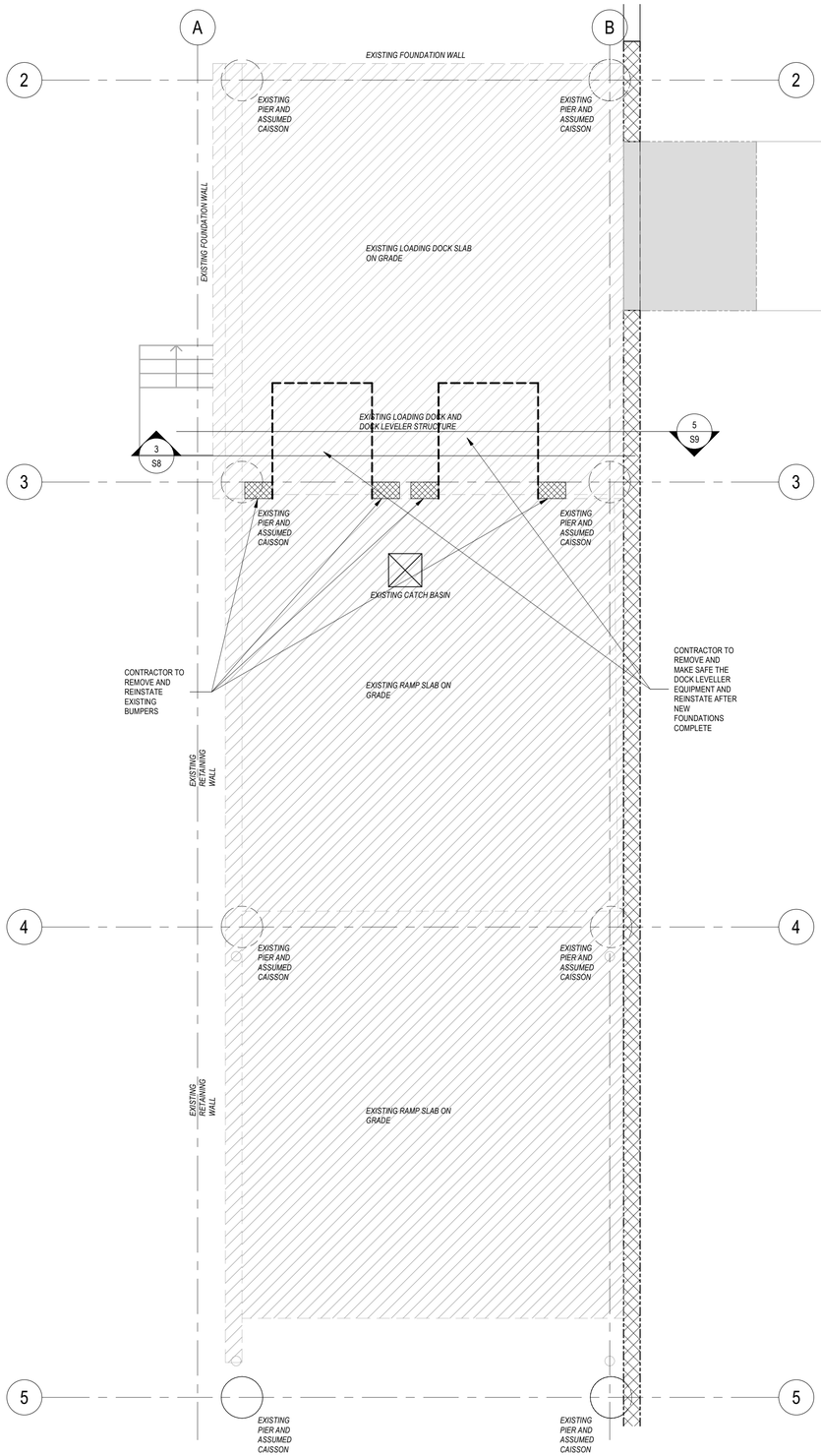
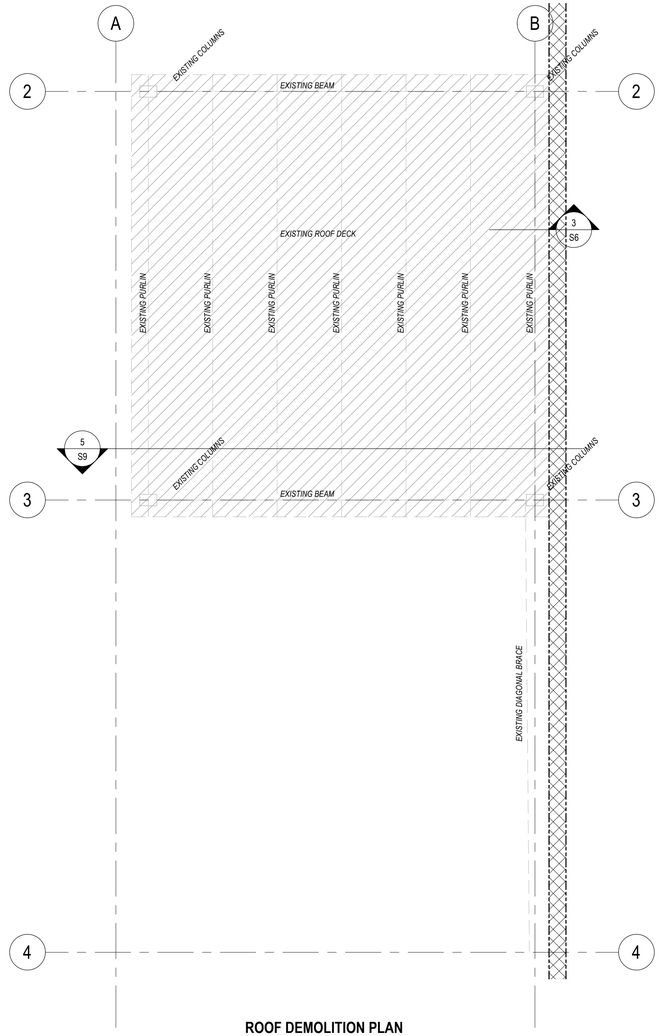
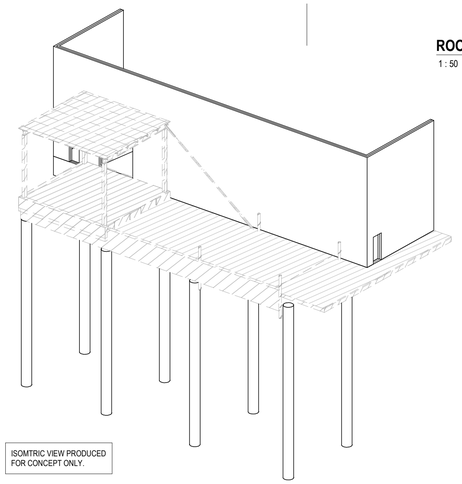
DATE:							



FOUNDATION DEMOLITION PLAN
1 : 50



ROOF DEMOLITION PLAN
1 : 50



ISOMTRIC VIEW PRODUCED FOR CONCEPT ONLY.

DEMOLITION GENERAL NOTES

1. ADEQUATE CARE IS TO BE USED DURING DEMOLITION TO PREVENT DAMAGE TO MATERIALS AND SERVICES. MAKE GOOD ANY DAMAGE TO EXISTING REMAINING STRUCTURE AT NO ADDITIONAL COST TO OWNER.
2. PROVIDE ADEQUATE SHORING AND REINFORCING OF EXISTING STRUCTURE AT ALL LEVELS TO EXISTING STRUCTURE BEFORE COMMENCING ANY DEMOLITION WORK.
3. VERIFY ALL EXISTING STRUCTURAL MEMBERS ON SITE BEFORE DEMOLITION. REPORT ANY DISCREPANCIES TO CONTRACT ADMINISTRATOR IMMEDIATELY FOR ADVICE.
4. CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY SHORING BEFORE AND DURING STRUCTURAL DEMOLITION.
5. PROVIDE DEMOLITION REPORT FROM DEMOLITION CONTRACTOR PRIOR TO STARTING DEMOLITION WORK.
6. DEMOLITION CONTRACTOR TO REVIEW EXISTING STRUCTURAL DRAWING: 1601-2023-3-12-S7 FOR MORE INFORMATION.
7. ALL EXISTING METAL WALLS, BEAMS, COLUMNS, ROOFING, STAIRS, ETC., TO BE DEMOLISHED / REMOVED AND DISPOSED OF BY THE CONTRACTOR.

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DEMOLITION PLAN

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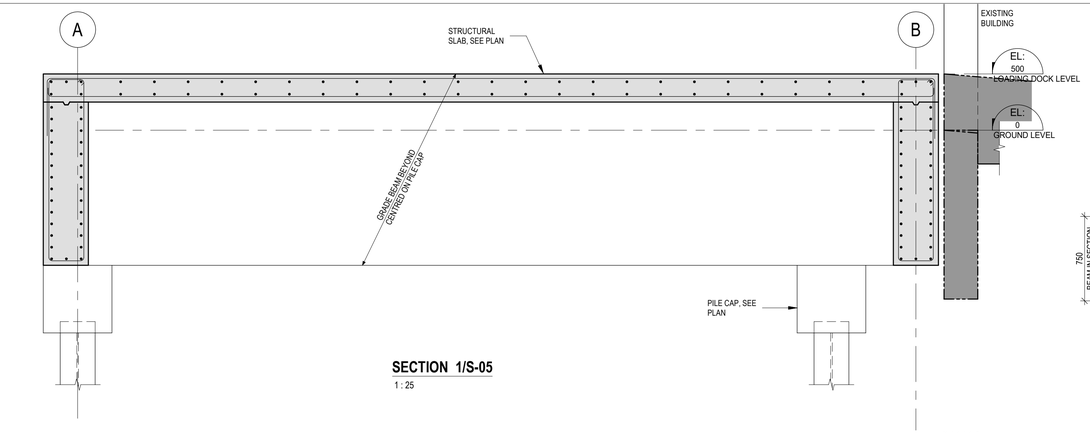
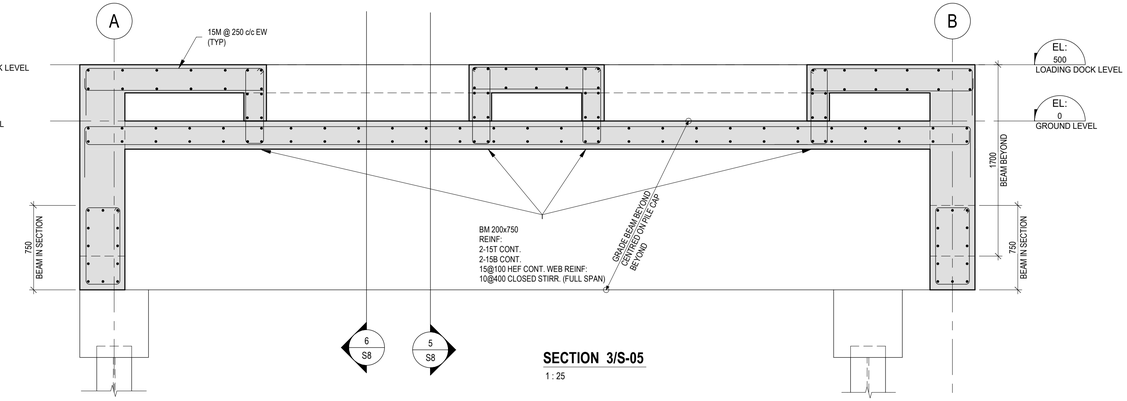
DATE:							



SECTION 1/S-05
1 : 25



SECTION 3/S-05
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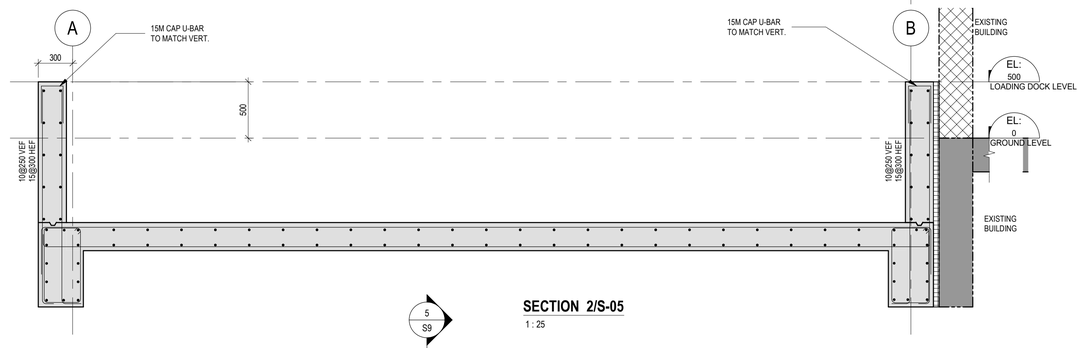

SECTION 2/S-05
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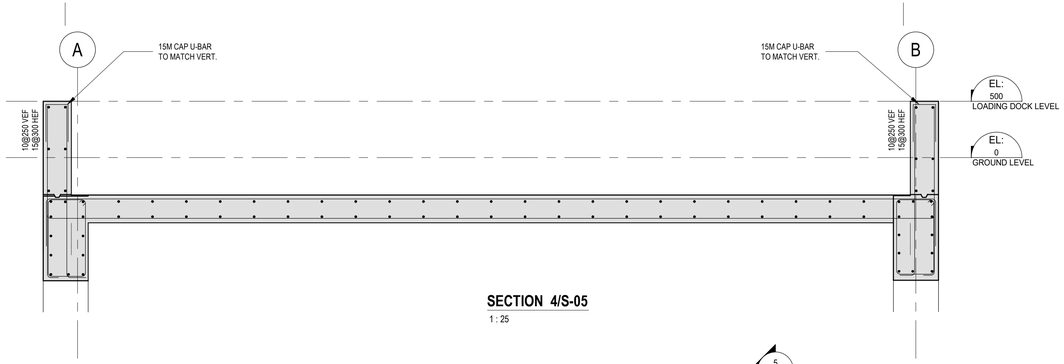

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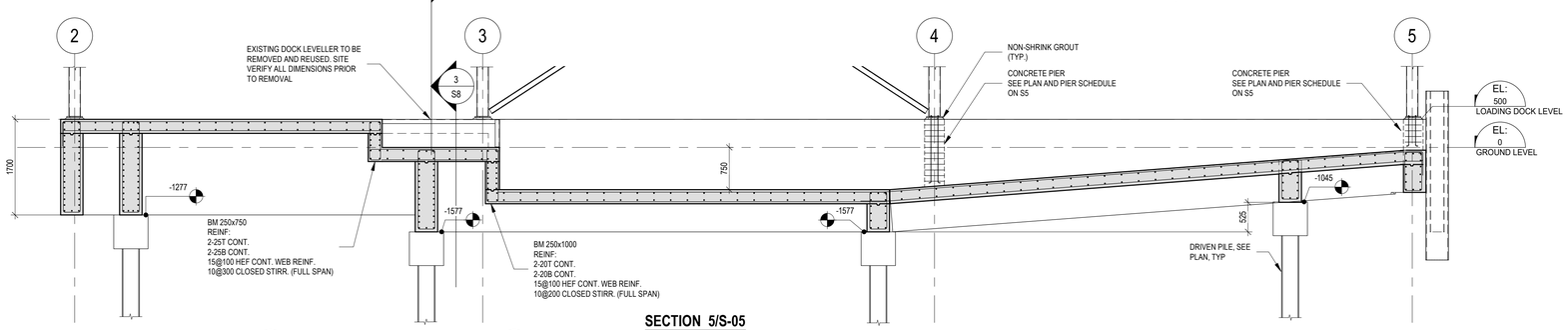

SECTION 5/S-05
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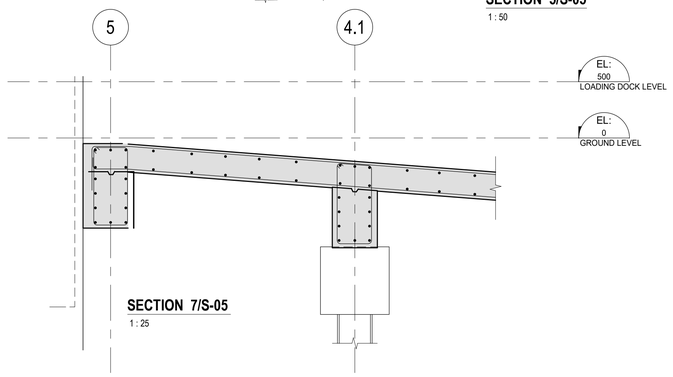

SECTION 7/S-05
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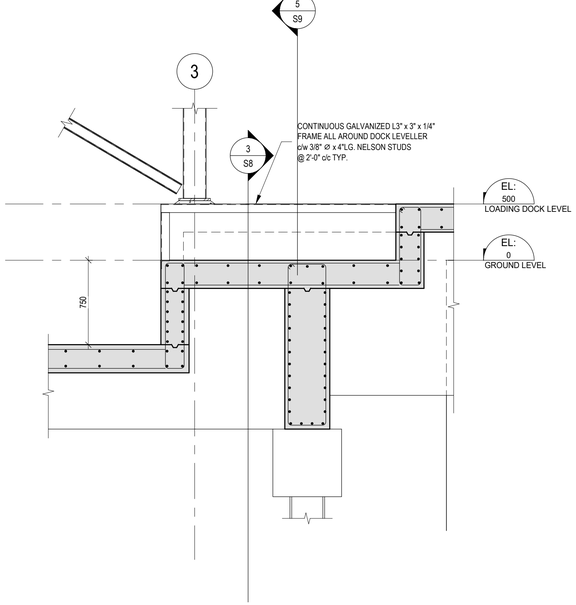

SECTION 6/S-05
1 : 25

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FOUNDATION SECTIONS

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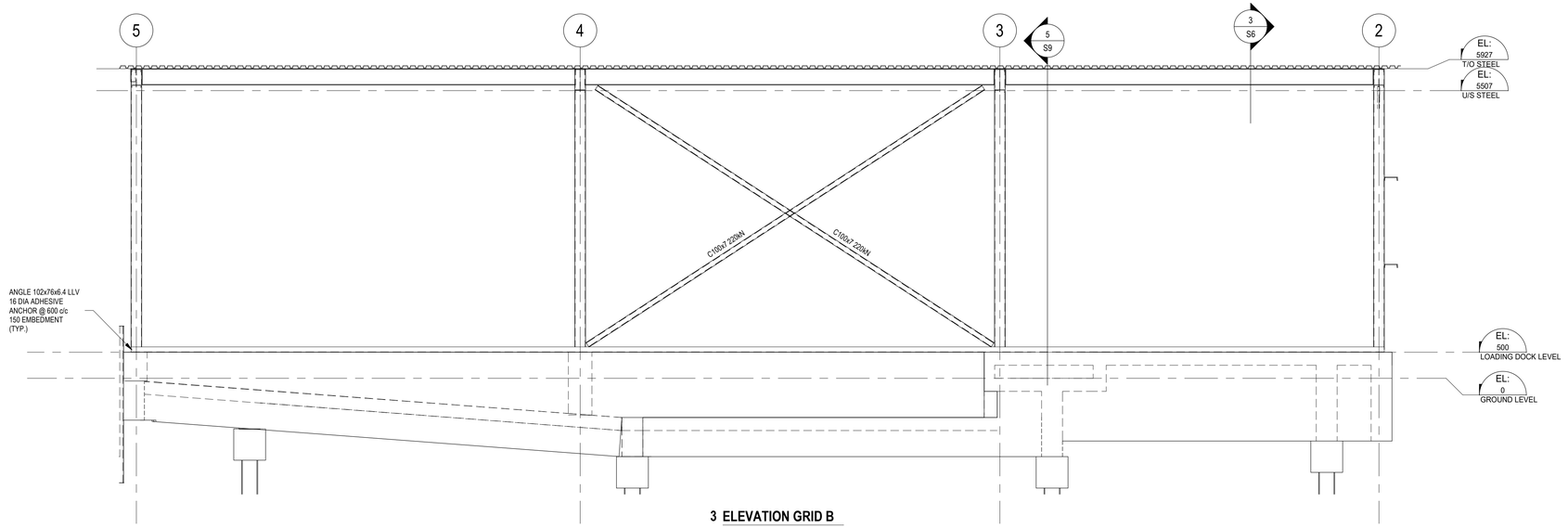
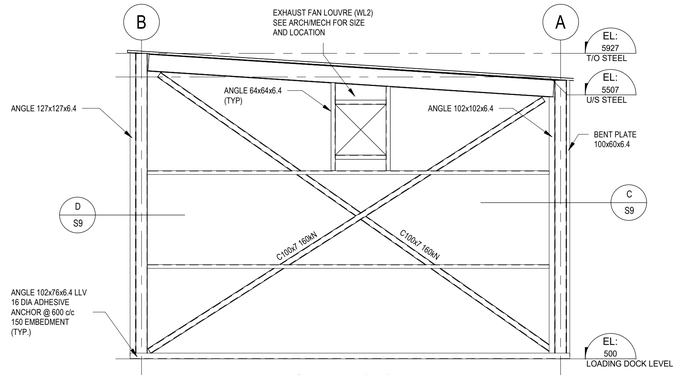
DATE:							



3 ELEVATION GRID B

1 : 50



1 ELEVATION GRID 2

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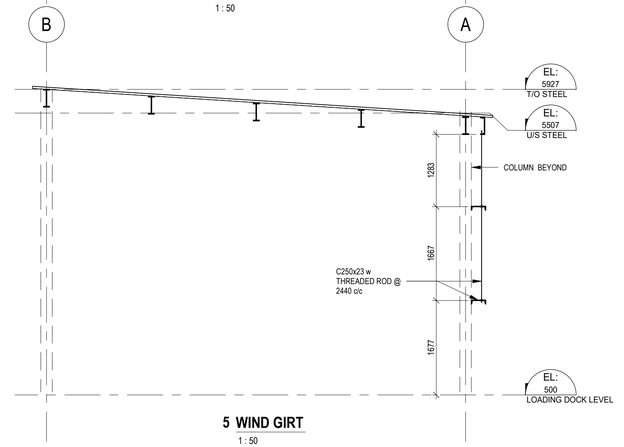
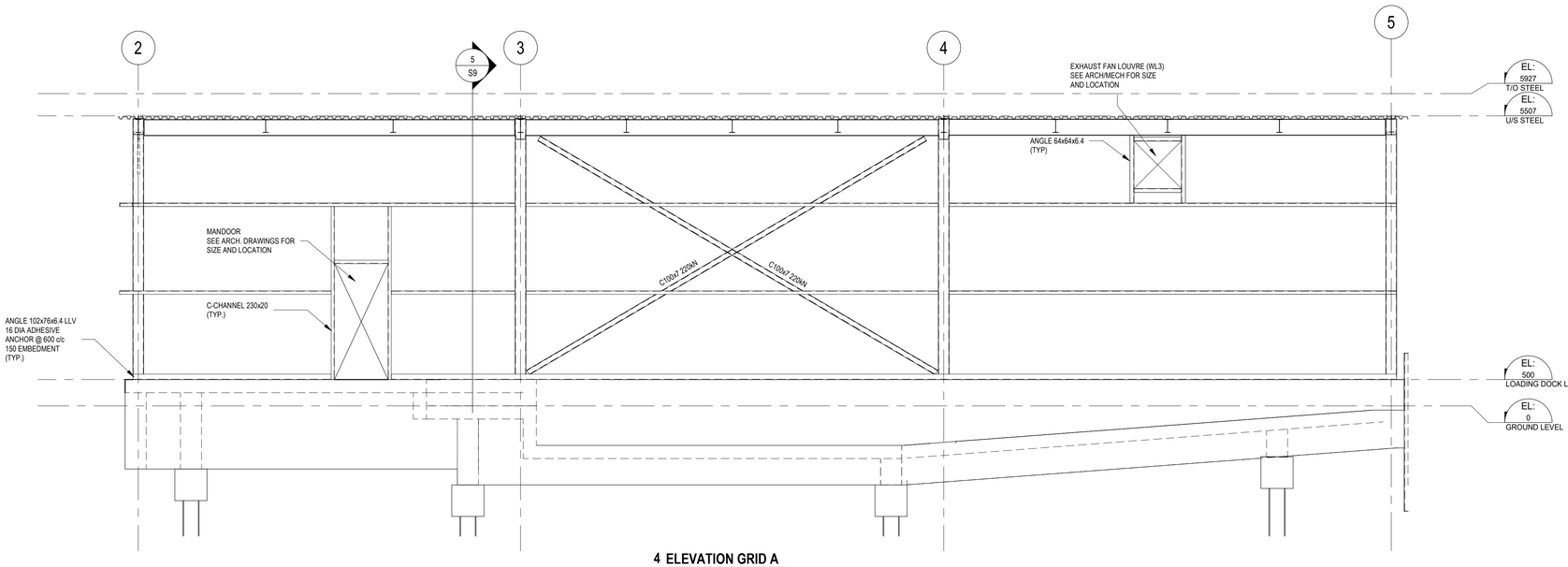


5 WIND GIRT

1 : 50



4 ELEVATION GRID A

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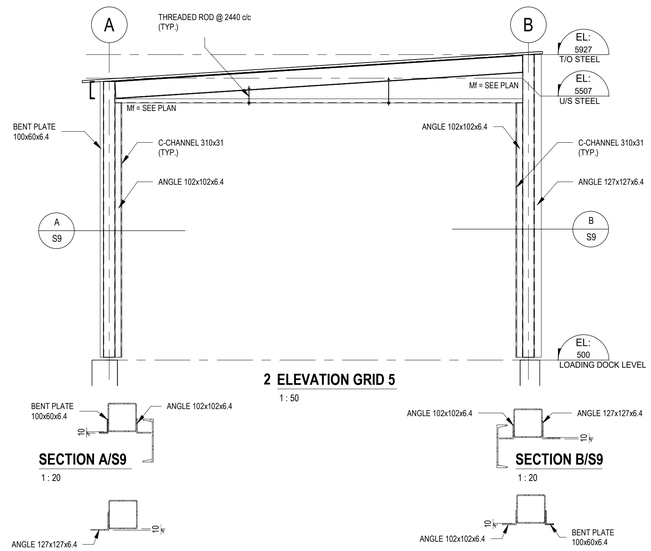

2 ELEVATION GRID 5

1 : 50

SECTION A/S9

1 : 20

SECTION B/S9

1 : 20

SECTION D/S9

1 : 20

SECTION C/S9

1 : 20

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ELEVATIONS

DESIGN:		DRAFTING:		CHECK:		CONTRACT No. 23SWM-IRM-026CDU
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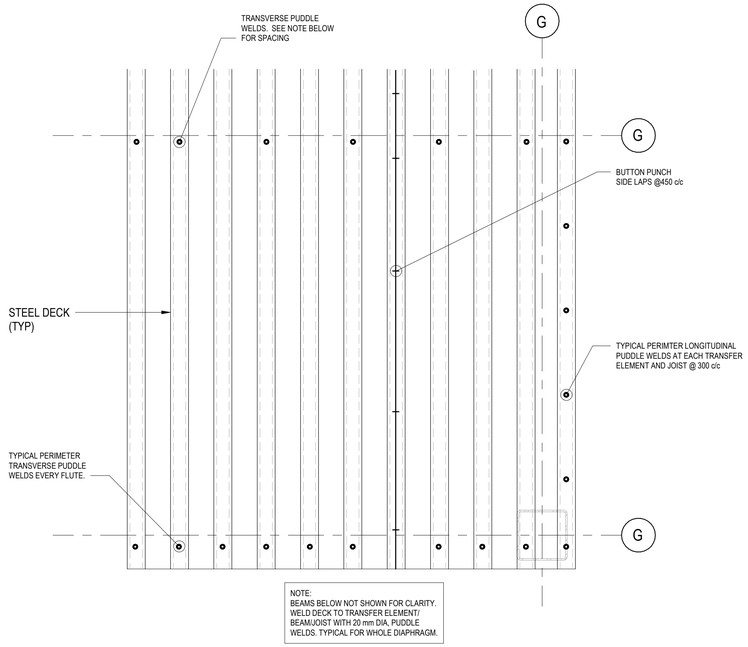
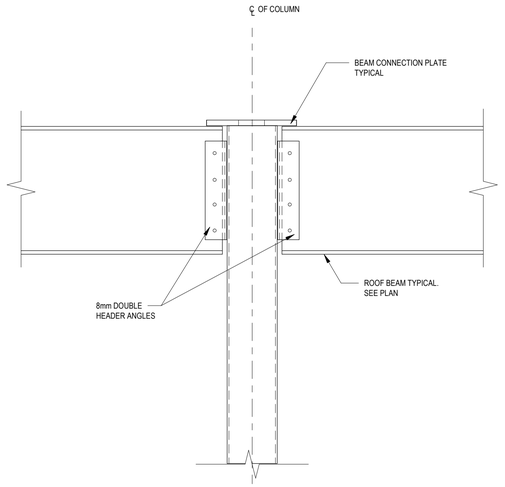
DATE:						



1 DIAPHRAGM PLAN DETAIL

NTS



2 COLUMN CONNECTION DETAIL

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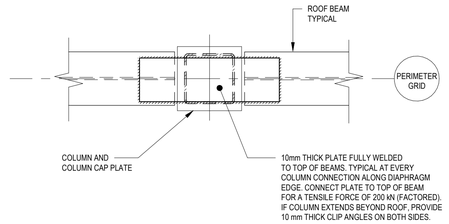
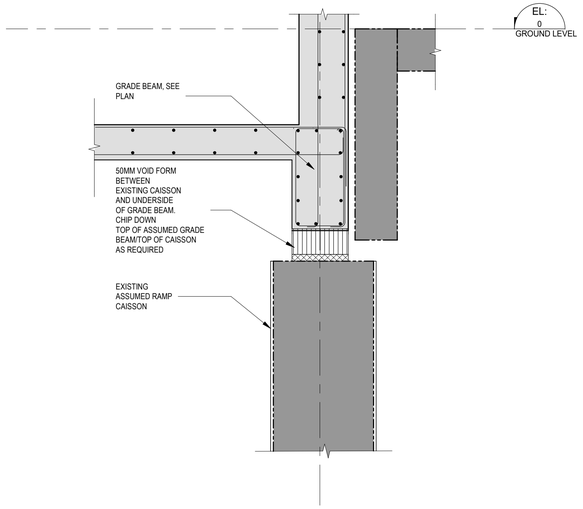


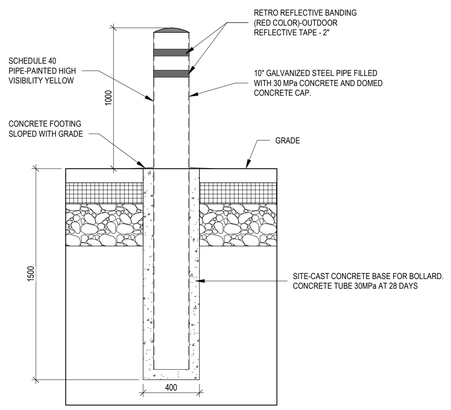
3 PERIMETER PLATE CONNECTION DETAIL

NTS



4 GRADE BEAM OVER ASSUMED EXISTING CAISSON DETAIL 4/S-05

NTS



5 10" BOLLARD DETAIL

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COMMISSIONERS TRANSFER STATION

MRF BUILDING UPGRADES
400 COMMISSIONERS STREET, TORONTO, ONTARIO M4M 3K2

DETAILS

DESIGN:		DRAFTING:		CHECK:		CONTRACT No.	23SWM-IRM-026CDU
SCALE:				DRAWING NUMBER:	1601-2023-3-15		S10
DATE:							

CONCEPTUAL STAGING DIAGRAM

NTS

NOTE: THE CONSTRUCTION STAGING PLAN IS CONCEPTUAL ONLY. THE CONTRACTOR TO SUBMIT THEIR STAGING PLAN TO THE APPROVAL OF CONTRACT ADMINISTRATOR AND OWNER AFTER COORDINATION WITH THE TRANSFER STATION OPERATIONS TEAM.

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No.	DATE	REVISIONS	INITIAL	SIGNED
3	2024.01.12	ISSUED FOR TENDER		
2	2023.10.27	ISSUED FOR 100% REVIEW		
1	2023.10.20	REISSUED FOR 70% CD		

TORONTO

SOLID WASTE MANAGEMENT SERVICES

MATT KELIHER
GENERAL MANAGER
SOLID WASTE MANAGEMENT SERVICES

MATTHEW CASCHERA
DIRECTOR
INFRASTRUCTURE AND RESOURCE MANAGEMENT

COMMISSIONERS TRANSFER STATION

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CONCEPTUAL STAGING PLAN

DESIGN:		DRAFTING:		CHECK:		CONTRACT No.	23SWM-IRM-026CDU
SCALE:				DRAWING NUMBER:	1601-2023-3-16		S11
DATE:							

POWER SINGLE LINE DIAGRAM SYMBOLS

Symbol	Description
###/#	CKT BREAKER, "###" INDICATES TRIP SETTING, "#" INDICATES NUMBER OF POLES
	TRANSFORMER
PANEL NAME	PANELBOARD

POWER DISTRIBUTION AND SMALL POWER

Symbol	Description	Symbol	Description
	DUPLEX RECEPTACLE, WALL MOUNTED		DOUBLE DUPLEX RECEPTACLE, WALL MOUNTED

Symbol	Description
	DISCONNECT SWITCH, REFER TO EQUIPMENT CONNECTION SCHEDULE FOR DISCONNECT TYPE, UON
X	DIRECT CONNECTION, CEILING MOUNTED. SUBSCRIPT "X" INDICATES UNIQUE IDENTIFIER, REFER TO EQUIPMENT CONNECTION SCHEDULE.
X	MOTOR, SUBSCRIPT "X" DENOTES MOTOR DESIGNATION, REFER TO EQUIPMENT CONNECTION SCHEDULE
	PANELBOARD
	TRANSFORMER

X — RECEPTACLE TYPE
12 — NUMBER INDICATES BRANCH CIRCUIT NUMBER

LIGHTING, LIGHITNG SWITCHING & CONTROLS

AF10 — UPPER CASE LETTERS INDICATE LIGHTING FIXTURE TYPE
7ab — NUMBER INDICATES CIRCUIT NUMBER, LOWER CASE LETTER INDICATES SWITCHLEG

Symbol	Description	Symbol	Description
	STRIP LIGHTING FIXTURE ON NORMAL BRANCH POWER		STRIP LIGHTING FIXTURE WITH EMERGENCY BATTERY
	DUAL HEAD EMERGENCY LIGHT WITH INTEGRAL BATTERY PACK – WALL MOUNTED		

FIRE ALARM SYSTEM

Symbol	Description	Symbol	Description
FACP	FIRE ALARM CONTROL PANEL		SMOKE ALARM
	FIRE ALARM PULL STATION	CO	COMBINATION SMOKE ALARM AND CARBON MONOXIDE DETECTOR
	FIRE ALARM HORN/STROBE, WALL MOUNTED		

DEMOLITION

Symbol	Description
< R >	EXISTING TO BE REMOVED
< RL >	EXISTING TO BE RELOCATED
< RR >	EXISTING TO BE REMOVED AND REINSTALLED AT HIGHER ELEVATION
< EX >	EXISTING TO REMAIN
< NL >	EXISTING – NEW LOCATION
	DEMOLITION CONDUIT
	DEMOLITION EQUIPMENT
	EXISTING TO REMAIN CONDUIT
	EXISTING TO REMAIN EQUIPMENT
	NEW CONDUIT
	NEW EQUIPMENT

CIRCUITING

BLDG-E1MDPHA-1
- CIRCUIT NUMBER
- PANEL DESIGNATION

3#12,#12G,21mmC
- CONDUIT SIZE
- GROUND CONDUCTOR QUANTITY AND SIZE
- CIRCUIT CONDUCTOR QUANTITY AND SIZE

GENERAL NOTES

1. ALL DRAWINGS ARE DIAGRAMMATIC ONLY. REFER TO ARCHITECTURAL & STRUCTURAL DRAWINGS FOR DIMENSIONS, EXACT LOCATIONS AND MOUNTING HEIGHTS OF DEVICES AND EQUIPMENT.
2. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH OTHER DRAWINGS, INCLUDING ARCHITECTUAL, STRUCTURAL, MECHANICAL AND EQUIPMENT DRAWINGS .
3. ALL EXISTING ELECTRICAL SYSTEMS, INCLUDING BUT NOT LIMITED TO EQUIPMENT DEVICES AND CONNECTIONS, SHALL REMAIN UNLESS SPECIFICALLY NOTED TO BE REMOVED.
4. DURING CONSTRUCTION IF REQUIRED/IMPACTED BY OTHER WORKS, CONTRACTOR TO TEMPORARILY REMOVE/RELOCATE ELECTRICAL SYSTEMS AND/OR PROVIDE TEMPORARY CONNECTIONS ON SITE TO ALLOW OTHERS' WORKS.
5. EXISTING ELECTRICAL SYSTEM NOT WITHIN SCOPE OF WORK ARE TO REMAIN FUNCTIONAL DURING THE CONSTRUCTION.
6. MAINTAIN EXISTING FIRE ALARM, EXIT SIGNS AND EMERGENCY LIGHTS IN FULL OPERATION DURING THE ENTIRE CONSTRUCTION STAGE. WHERE DISRUPTION TO LIFE SAFETY SYSTEM ARE REQUIRED, REPORT TO CONTRACT ADMINISTRATOR, PROVIDE CONTINUOUS MONITORING DURING SHUT DOWN PERIOD AND ENSURE THAT ALL SYSTEMS ARE REACTIVATED PRIOR TO LEAVING THE SITE AT THE END OF EACH WORKING DAY.
7. ALL OPENINGS, IF APPLICABLE, SHALL BE SEALED WITH APPROVED FIRE STOP MATERIAL. ANY FIREPROOFING MATERIAL REMOVED WILL BE REPLACED WITH A SUITABLE AND APPROVED FIREPROOFING MATERIAL, AND SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS TO APPLICABLE BUILDING AND FIRE CODES.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL REFINISHING OF DAMAGED BUILDING AREAS AND FINISHES AFFECTED BY THE WORK AS OUTLINED UNDER SCOPE OF WORK OF THIS PROJECT. SHOULD ANY EXISTING SYSTEM BE DAMAGED, MAKE FULL REPAIR/REPLACES WITHOUT EXTRA COST, AND TO THE SATISFACTION OF THE OWNER. ASSET TAGGING WILL ALSO BE REQUIRED AS PER SWMS STANDARDS.
9. CONTRACTOR TO PROVIDE WRITTEN NOTICE TO OWNER FOR ANY SHUTDOWN REQUIRED. MINIMUM FIVE(5) WORKING DAYS NOTICE SHALL BE PROVIDED.
10. CONTRACTOR IS RESPONSIBLE FOR STORAGE AND PROTECTION OF ALL EXISTING ITEMS WHICH WILL BE RELOCATED/REUSED IN THIS PROJECT.
11. THE CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION AND DISTRIBUTION OF TEMPORARY POWER AND LIGHTING WITHIN THE PREMISES DURING THE CONSTRUCTION PERIOD. EXPOSED ELECTRICAL CORDS OUTSIDE THE LEASED PREMISES SHALL NOT BE PERMITTED.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF ALL THE WORK WITH ALL OTHER TRADES, CONSULTANTS, AND THE OWNER. ALL WORK SHALL BE SCHEDULED AND CARRIED OUT BY THE CONTRACTOR IN A MANNER TO ENSURE CONTINUED AND NON-INTERRUPTED OPERATION OF EXISTING FACILITY.
13. CONTRACTOR SHALL IDENTIFY AND LABEL CLEARLY ALL CIRCUITS, WIRING, SERVICES, JUNCTION BOXES, PULLBOXES, DEVICES AND EQUIPMENT INSTALLED AND CONNECTED UNDER THE SCOPE OF WORK OF THIS PROJECT. IDENTIFICATION SHALL BE AS PER OWNER'S REQUIREMENTS AND ALL MARKINGS SHALL BE OF NON-ERASEABLE LAMACOID TYPE. COORDINATE ALL LABELING WITH THE OWNER AND CONSULTANT.
14. CONTRACTOR TO INCLUDE FOR PAYMENT OF REQUIRED PERMITS, FEES, LICENSES, CERTIFICATES OF INSPECTION ETC, IF REQUIRED.
15. CONTRACTOR TO REPORT BACK TO THE CONTRACT ADMINISTRATOR AND OWNER ON ANY ELECTRICAL AND COMMUNICATION SYSTEM FAILURES THAT OCCUR DURING THE CONSTRUCTION PHASE.
16. PHASING AND SCHEDULING OF THE WORK IS REQUIRED IN ORDER TO MAINTAIN EXISTING BUILDING OPERATIONS. INCLUDE COSTS FOR "OFF-HOURS" WORK. REFER TO PHASING SEQUENCE AND COORDINATE ALL WORK.
17. EXISTING LUMINAIRES TO REMAIN UNLESS OTHERWISE NOTED. REMOVE AND REINSTALL LIGHTING AT SAME LOCATIONS IF IMPACTED BY THE DEMOLITION WORK. PROVIDE NEW SUPPORT CHAIN FOR ALL AFFECTED LUMINAIRES. SUPPORT ALL LUMINAIRES DIRECTLY TO CEILING SLAB STRUCTURE, NOT TO CEILING HANGERS, DUCTWORK, PIPING, CABLE TRAYS, ROOF DECK, ETC.
18. FOR ALL LUMINAIRES THAT EXCEED 150V SHOWN, SUPPLY AND INSTALL NEW LUMINAIRES DISCONNECT THAT COMPLY WITH RECOMMENDATION SPECIFIED IN THE ONTARIO ELECTRICAL SAFETY CODE, RULE 30-308(4). ALL NEW RELOCATED FIXTURES (THAT EXCEED 150V) SHALL BE MARKED IN A CONSPICUOUS LEGIBLE AND PERMANENT MANNER ADJACENT TO THE CONNECTING MEANS, IDENTIFYING THE SPECIFIC PURPOSES.

TAGS AND CALL OUT SYMBOLS

Symbol	Description
1 / E3.1	SECTION CALLOUT SECTION DESIGNATION SHEET NUMBER
A / E3.1	DETAIL CALLOUT DETAIL DESIGNATION SHEET NUMBER
#	REVISION CALLOUT
1	KEYNOTE CALLOUT

ABBREVIATIONS

A	ANALOG	MCB	MAIN CIRCUIT BREAKER
AFCI	ARC FAULT CIRCUIT INTERRUPTOR	MCC	MOTOR CONTROL CENTER
AFF	ABOVE FINISHED FLOOR	MD	MOTORIZED DAMPER
ATS	AUTOMATIC TRANSFER SWITCH	MH	MOUNTING HEIGHT
CK	CLOCK HANGER	NC	NORMALLY CLOSED
CL	CEILING MOUNTED	NO	NORMALLY OPEN
EMT	ELECTRICAL METALLIC TUBING	OC	OVER THE COUNTER
EP	EXPLOSION PROOF	PTZ	PAN, TILT, ZOOM
F	FURNITURE OR MILLWORK MOUNTED	ST	SHUNT TRIP
FL	FLOOR MOUNTED	TP	TAMPER PROOF
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	WP	WEATHER PROOF
GFI	GROUND FAULT INTERRUPTER	UH	UNIT HEATER
EF	EXHAUST FAN	WL	WEATHER LOUVRE

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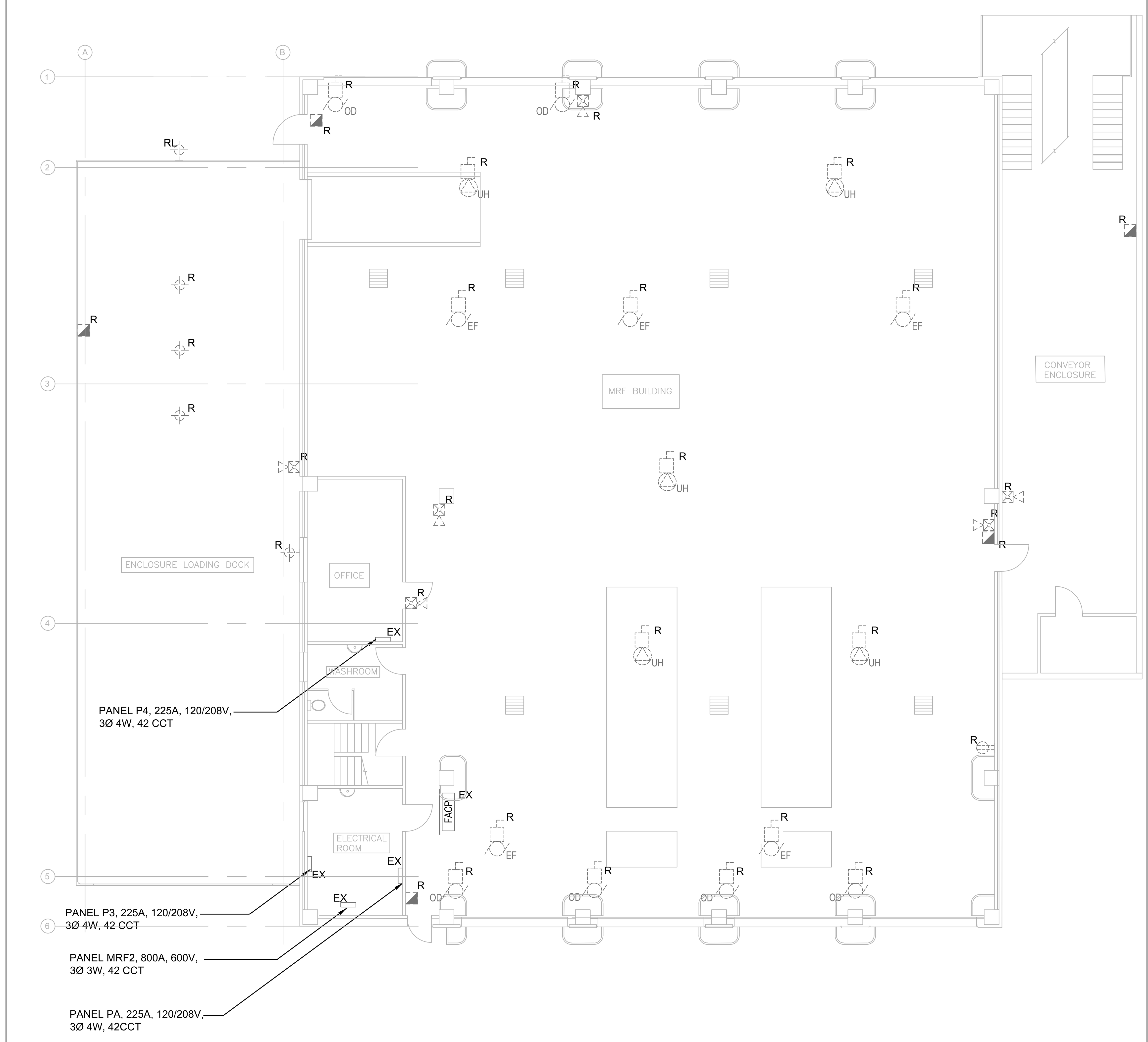
GENERAL NOTES AND ABBREVIATIONS

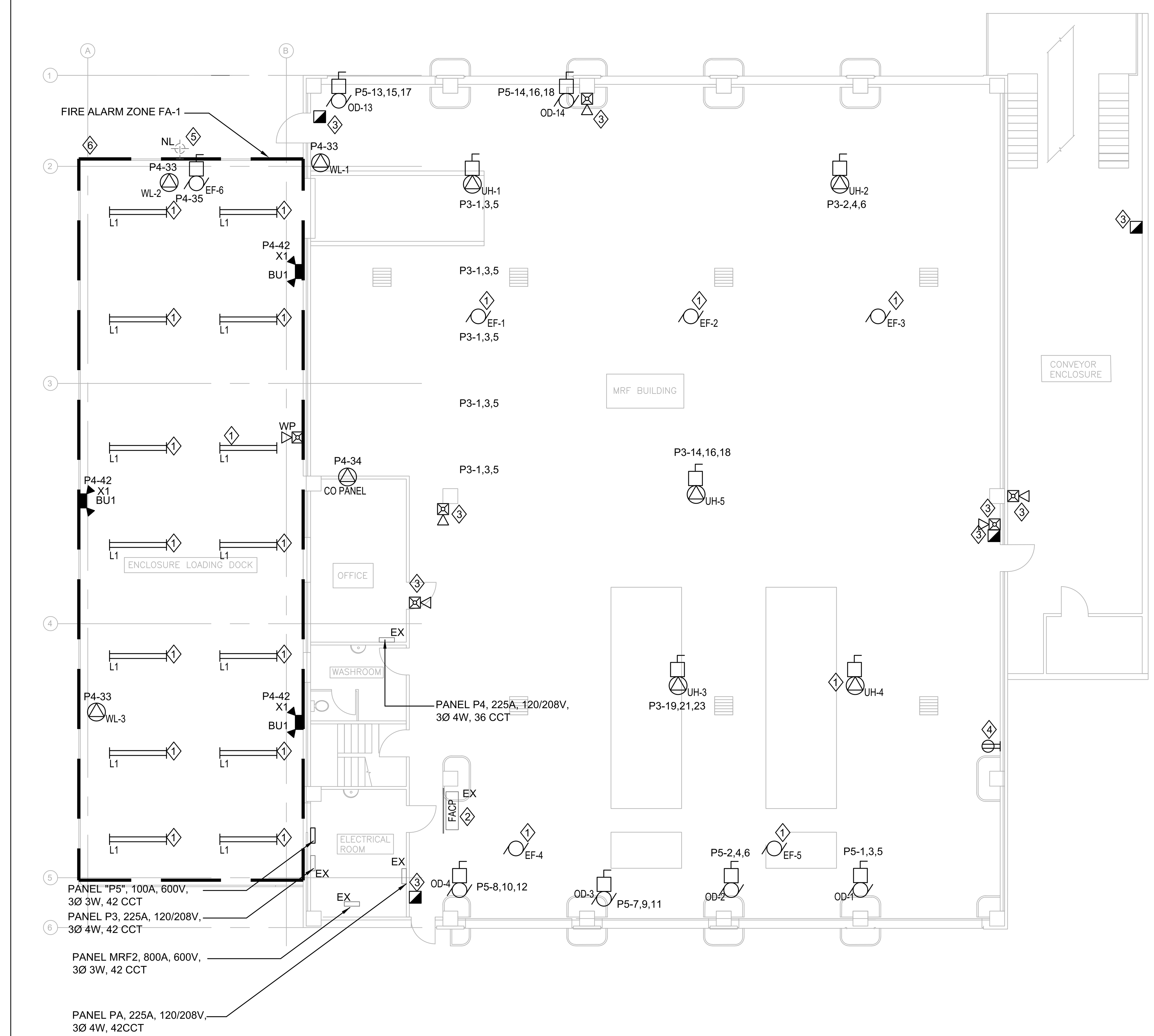
DESIGN:	CC	DRAFTING:	CC	CHECK:	DL	CONTRACT No. 23SWM-IRM-026CDU
SCALE:	AS NOTED			DRAWING NUMBER:	1601-2023-3-17	E1
DATE:	JULY 18, 2023					



GENERAL NOTES

1. UNLESS SPECIFIED, ALL ELECTRICAL EQUIPMENT & DEVICES ARE EXISTING TO REMAIN
2. FOR ELECTRICAL DEVICES SHOWN TO BE REMOVED. UNLESS SPECIFIED, REMOVE ALL ASSOCIATED WIRING, CONDUITS, CONTROLLERS AND SUPPORTS BACK TO SOURCE.

1 / E-02 — GROUND FLOOR PLAN
ELECTRICAL DEMOLITION PLAN
1:100



KEY NOTES

1. CONNECT TO EXISTING CIRCUIT.
2. EXISTING FIRE ALARM PANEL. MODEL : NOTIFIER NFS–320C. PROVIDE BOOSTER POWER SUPPLY TO EXISTING FIRE ALARM AS REQUIRED FOR ADDITIONAL ZONING. PROVIDE A NEW FIRE ALARM ZONE FOR FA–1. PROVIDE NEW FIRE ALARM SINGAL FOR NEW SPRINKLER ZONE FOR LOADING DOCK.
3. CONNECT TO EXISTING FIRE ALARM CABLE.
4. PROVIDE NEW CABLE WIRING FROM PANEL TO THE NEW DUPLEX RECEPTACLE.
5. EXISTING LIGHTING TO REMOVED AND RE–INSTALLED. RE–WORK EXISTING WIRING AND CONDUITS TO SUIT
6. ALL FIRE ALARM DEVICES WITHIN THE LOADING DOCK SHALL CONNECT TO NEW FIRE ALARM ZONE FA–1.

2 / E-02 — GROUND FLOOR PLAN
ELECTRICAL NEW PLAN
1:100

\\EXP\DATA\BRM\BRM-22028009-A0\60 EXECUTION\65 DRAWINGS_ELEC\E-02.DWG (E-02)

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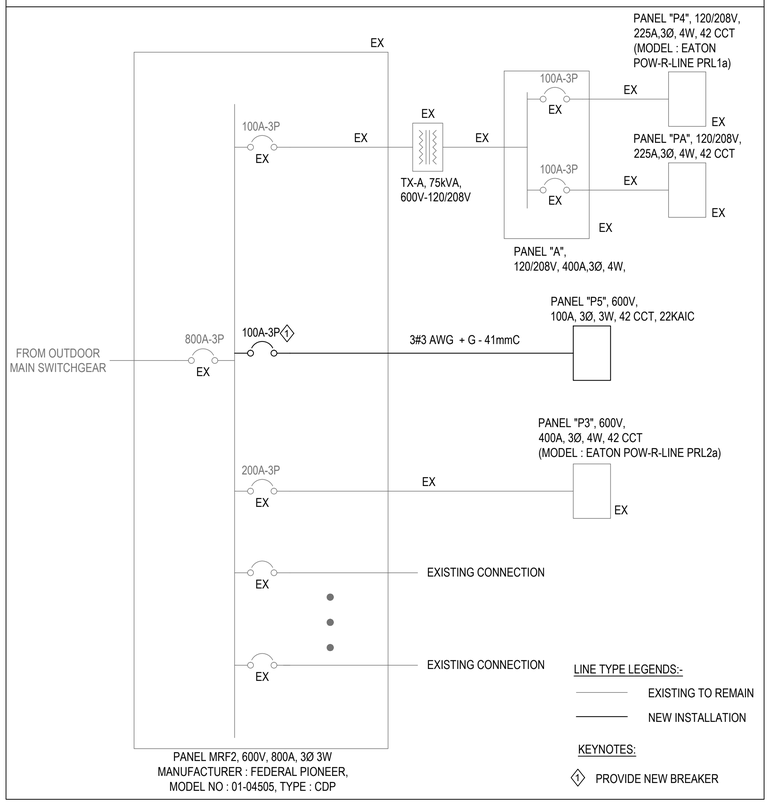
GROUND FLOOR PLAN - ELECTRICAL DEMO & NEW PLAN

DESIGN:	CC	DRAFTING:	CC	CHECK:	DL	CONTRACT No. 23SWM-IRM-026CDU
SCALE:	AS NOTED			DRAWING NUMBER:	1601-2023-3-18	E2
DATE:	JULY 18, 2023					

ELECTRICAL SINGLE LINE DIAGRAM



LUMINARIES SCHEDULE

TYPE	BASE MANUFACTURER (AS SPECIFIED)	CATALOGUE NUMBER	CEILING MOUNTED			WALL MOUNTED				WATTAGE	COLOUR TEMP.	VOLTAGE		REMARKS
			SURFACE	RECESSED	SUSPENDED	SURFACE	RECESSED	BRACKET	UNDER-CABINET			120V	347V	
L1	PEERLUX	AP4-4-50-40K-P5	•							37W 5000 LUMENS	3500K	•		
X1	READY-LITE	RHP-1275-2-L10				•				20W		•		REMOTE HEAD WITH BUILT-IN 30 MINUTES BATTERY UNIT BU1, 120V AC INPUT, 12V OUTPUT, 75W WATTAGE

MECHANICAL SCHEDULE(FOR REFERENCE ONLY)

JOB NAME: **COMMISSIONERS TS MRF BUILDING UPGRADE** JOB No. **BRM–22028009–A0**

MECHANICAL SCHEDULE – ELECTRIC UNIT HEATER SCHEDULE

DWG. DESIG–NATION	MODEL	DUCT SIZE	CFM	KW	VOLT/ø	STAGES	REMARKS
UH–1	CHROMALOX HVH	–	1500	20	575/3	–	VERTICAL THROW. HUNG FROM STRUCTURE.
UH–2	CHROMALOX HVH	–	1500	20	575/3	–	VERTICAL THROW. HUNG FROM STRUCTURE.
UH–3	CHROMALOX HVH	–	1500	20	575/3	–	VERTICAL THROW. HUNG FROM STRUCTURE.
UH–4	CHROMALOX HVH	–	850	7.5	575/3	–	VERTICAL THROW. HUNG FROM STRUCTURE.
UH–5	CHROMALOX HVH	–	850	7.5	575/3	–	VERTICAL THROW. HUNG FROM STRUCTURE.

JOB NAME: **COMMISSIONERS TS MRF BUILDING UPGRADE** JOB No. **BRM–22028009–A0**

MECHANICAL SCHEDULE – FANS

FAN No.	SYSTEM AND FAN LABEL	SPEC TYPE	MODEL	SIZE	CFM ESP "W.G.	RPM ARR	HP VAC/ø	REMARKS
EF–1	RESIDUE PROCESS BUILDING EXHAUST	ADF	COOK ACRUB	150 RH3B	950 0.50	1300	1/4 120/1	INTERCONNECT TO WL–1
EF–2	RESIDUE PROCESS BUILDING EXHAUST	ADF	COOK ACRUB	150 RH3B	950 0.50	1300	1/4 120/1	INTERCONNECT TO WL–1
EF–3	RESIDUE PROCESS BUILDING EXHAUST	ADF	COOK ACRUB	150 RH3B	950 0.50	1300	1/4 120/1	INTERCONNECT TO WL–1
EF–4	RESIDUE PROCESS BUILDING EXHAUST	ADF	COOK ACRUB	150 R4B	1900 0.50	1200	1/3 120/1	INTERCONNECT TO WL–1
EF–5	RESIDUE PROCESS BUILDING EXHAUST	ADF	COOK ACRUB	150 R4B	1900 0.50	1200	1/3 120/1	INTERCONNECT TO WL–1
EF–6	ENCLOSURE LOADING DOCK	PF	COOK AWD	20 A17D	1700 0.50	1700	1/4 120/1	INTERCONNECT TO WL–2

NOTE 1. **USE HIGH EFFICIENCY MOTORS.**

REMARK: THIS SCHEDULE IS FOR REFERENCE ONLY. PLEASE REFER TO MECHANICAL DRAWINGS FOR EXACT INFORMATION.

PANEL SCHEDULES

Existing Panel P3

LOCATION: Electrical room | VOLTS: 600V | A.I.C. RATING:
SUPPLY FROM: Panel MRF2 | PHASES: 3ϕ | MAIN TYPE:
MOUNTING: SURFACE | WIRES: 4W | MAINS RATING: 400 A
ENCLOSURE: | MCB RATING: N/A

DESCRIPTION	BKR	CCT		CCT	BKR	DESCRIPTION
20kW Heater(UH-1)*	30 A	1	A	2	20 A	Existing Circuit
		3	B	4		
		5	C	6		
20kW Heater(UH-2)*	30 A	7	A	8	15 A	Existing Circuit
		9	B	10		
		11	C	12		
Existing Circuit	15 A	13	A	14	15 A	7.5kW Heater(UH-5)**
		15	B	16		
		17	C	18		
20kW Heater(UH-3)*	30 A	19	A	20	15 A	7.5kW Heater(UH-4)**
		21	B	22		
		23	C	24		
Space		25	A	26		Space
Space		27	B	28		Space
Space		29	C	30		Space
Space		31	A	32		Space
Space		33	B	34		Space
Space		35	C	36		Space
Space		37	A	38		Space
Space		39	B	40		Space
Space		41	C	42		Space

NOTES:
* : Remove existing breaker and provide new breaker.
** : Existing breaker to be kept and re-use.

Existing Panel P4

LOCATION: Office | VOLTS: 120/208V | A.I.C. RATING:
SUPPLY FROM: Panel A | PHASES: 3ϕ | MAIN TYPE:
MOUNTING: SURFACE | WIRES: 4W | MAINS RATING: 225 A
ENCLOSURE: | MCB RATING: N/A

DESCRIPTION	BKR	CCT		CCT	BKR	DESCRIPTION
Existing Circuit		1	A	2		Existing Circuit
Existing Circuit		3	B	4		Existing Circuit
Existing Circuit		5	C	6		Existing Circuit
Existing Circuit		7	A	8		Existing Circuit
Existing Circuit		9	B	10		Existing Circuit
Existing Circuit		11	C	12		Existing Circuit
Notrth west roof exhaust fan**	15 A	13	A	14		Existing Circuit
Notrth middle roof exhaust fan**	15 A	15	B	16		Existing Circuit
Notrth east roof exhaust fan**	15 A	17	C	18	15 A	Screen floor roof exhaust fan**
Existing Circuit		19	A	20	15 A	South roof exhaust fan**
Existing Circuit		21	B	22		Existing Circuit
Existing Circuit		23	C	24		Existing Circuit
Existing Circuit		25	A	26		Existing Circuit
Existing Circuit		27	B	28		Existing Circuit
Existing Circuit		29	C	30		Existing Circuit
Existing Circuit		31	A	32		Existing Circuit
Existing Circuit		33	B	34		Existing Circuit
Existing Circuit		35	C	36		Existing Circuit
Existing Circuit		37	A	38		Existing Circuit
Motorized Dampers*	15 A	39	B	40	15 A	CO2 Panel*
EF-6*	15 A	41	C	42	15 A	REMOTE HEAD*

NOTES:
* : Remove existing breaker and provide a new breaker.
**: Existing breakers for exhaust fans to be re-used, contractor shall verify on-site.

New Panel P5

LOCATION: Electrical room | VOLTS: 600V | A.I.C. RATING:
SUPPLY FROM: Panel MRF2 | PHASES: 3ϕ | MAIN TYPE:
MOUNTING: SURFACE | WIRES: 4W | MAINS RATING: 100 A
ENCLOSURE: | MCB RATING: N/A

DESCRIPTION	BKR	CCT		CCT	BKR	DESCRIPTION
Overhead door(OD-1)	15 A	1	A	2	15 A	Overhead door(OD-2)
		3	B	4		
		5	C	6		
Overhead door(OD-3)	15 A	7	A	8	15 A	Overhead door(OD-4)
		9	B	10		
		11	C	12		
Overhead door(OD-13)	15 A	13	A	14	15 A	Overhead door(OD-14)
		15	B	16		
		17	C	18		
SPACE		19	A	20		SPACE
SPACE		21	B	22		SPACE
SPACE		23	C	24		SPACE
SPACE		25	A	26		SPACE
SPACE		27	B	28		SPACE
SPACE		29	C	30		SPACE
SPACE		31	A	32		SPACE
SPACE		33	B	34		SPACE
SPACE		35	C	36		SPACE
SPACE		37	A	38		SPACE
SPACE		39	B	40		SPACE
SPACE		41	C	42		SPACE

NOTES:

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ELECTRICAL SINGLE LINE DIAGRAM, LUMINARIES, MECHANICAL AND PANEL SCHEDULES

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\\EXP.DATA\BRMBRM-2202800$-A0\99 EXECUTION\05 DRAWINGS_ELE\DE-03.DWG [E-03]

ELECTRICAL SPECIFICATIONS

1. SCOPE OF WORK

1.1. SUPPLY LABOUR, TOOLS, SERVICES AND EQUIPMENT, AND PROVIDE MATERIALS REQUIRED TO COMPLETE WORK IN ACCORDANCE WITH THIS SPECIFICATION AND DRAWINGS. COMPLY WITH LAWS, REGULATIONS AND CODES OF AUTHORITIES HAVING JURISDICTION. CONFORM TO REQUIREMENTS OF TENDER DOCUMENTS AND DIVISION 1. PERFORM WORK IN ACCORDANCE WITH LOCAL APPLICABLE GOVERNING CODES AND AUTHORITIES INCLUDING THE ONTARIO BUILDING CODE AND ONTARIO ELECTRICAL SAFETY CODE (OESC).

2. EXAMINATION OF SITE AND DOCUMENTS

2.1. PRIOR TO SUBMITTING BID, CAREFULLY EXAMINE CONDITIONS AT SITE WHICH WILL OR MAY AFFECT WORK, DRAWINGS, AND SPECIFICATIONS, AND BECOME FAMILIAR WITH BUILDING CONSTRUCTION, FINISHES AND OTHER WORK ASSOCIATED WITH WORK IN ORDER THAT BID INCLUDES FOR EVERYTHING NECESSARY FOR COMPLETION OF WORK.

3. PERMITS, CERTIFICATES AND FEES

3.1. PAY FOR AND OBTAIN PERMITS TO COMPLETE WORK. WHEN WORK IS COMPLETE, SUPPLY AND TURN OVER INSPECTION CERTIFICATES FROM GOVERNING AUTHORITIES TO CONTRACT ADMINISTRATOR . PAY FEES AND CHARGES LEVIED BY MUNICIPALITY AND OTHER GOVERNING AUTHORITIES FOR PERMITS, INSPECTIONS AND CERTIFICATES. KEEP COPY OF SUCH PERMITS AND CERTIFICATES, ETC., ON JOB SITE.

4. CO-ORDINATION AND CO-OPERATION

4.1. COORDINATE ALL WORK WITH OTHER TRADES TO ENSURE A PROPER AND COMPLETE INSTALLATION. NOTIFY ALL TRADES CONCERNED OF REQUIREMENT FOR OPENINGS, SLEEVES, INSERTS AND OTHER HARDWARE NECESSARY IN THEIR WORK FOR INSTALLATION OF YOUR WORK, AND, WHERE YOUR WORK IS TO BE INTEGRATED WITH WORK OF OTHER TRADES OR IS TO BE INSTALLED IN CLOSE PROXIMITY WITH WORK OF OTHER TRADES, CAREFULLY COORDINATE WORK PRIOR TO AND DURING INSTALLATION.

4.2. EXACT LOCATIONS AND ROUTING OF SERVICES MUST BE PROPERLY PLANNED, COORDINATED AND ESTABLISHED WITH ALL AFFECTED TRADES PRIOR TO INSTALLATION SUCH THAT THEY WILL CLEAR EACH OTHER AS WELL AS ANY OBSTRUCTIONS. GENERALLY, PIPING REQUIRING UNIFORM PITCH SHALL BE GIVEN RIGHT OF WAY, WITH OTHER SERVICES LOCATED AND ARRANGED TO SUIT.

5. NOISE CONTROL

5.1. WORK WHICH MAY CAUSE NOISE DISTURBANCES MUST BE SCHEDULED AT TIMES APPROVED BY CONTRACT ADMINISTRATOR . COORDINATE WORK WITH TRADES TO MINIMIZE NOISE DISTURBANCES.

6. CLEANING UP

6.1. DURING CONSTRUCTION, KEEP SITE REASONABLY CLEAR OF RUBBISH AND WASTE MATERIAL RESULTING FROM WORK ON DAILY BASIS. AFTER COMPLETION OF WORK, REMOVE RUBBISH AND DEBRIS, ARRANGE AND PAY FOR REPAIR OF DAMAGES CAUSED AND LEAVE PREMISES AND WORK IN GOOD ORDER.

7. PROTECTION OF EQUIPMENT AND MATERIAL

7.1. PROPERLY PROTECT AND STORE ALL EQUIPMENT AND MATERIALS ON SITE FROM DAMAGE. CONTRACTOR SHALL BE RESPONSIBLE FOR SAFE STORAGE OF ALL EQUIPMENT AND GOODS TO BE RELOCATED AND SHALL REPAIR OR REPLACE DAMAGED EQUIPMENT AND GOODS AT DISCRETION OF OWNER.

8. INSPECTION OF WORK

8.1. CONTRACT ADMINISTRATOR SHALL AT ALL TIMES HAVE ACCESS TO WORK AND SHALL BE NOTIFIED AT AGREED UPON TIMES OF STAGES OF WORK.

8.2. WHERE STANDARDS OF WORK ARE SPECIFIED OR IMPLIED AND WORK DOES NOT COMPLY WITH PERFORMANCE SPECIFIED OR IMPLIED, SUCH DEFICIENCY SHALL BE CORRECTED AS DIRECTED BY CONTRACT ADMINISTRATOR . ANY SUBSEQUENT TESTING TO VERIFY PERFORMANCE SHALL BE DONE AT CONTRACTOR'S EXPENSE. ANY CHARGES FOR OWNER'S STAFF, CONTRACT ADMINISTRATOR OR OTHER PERSONNEL RELATED TO SUCH RETESTING SHALL ALSO BE AT EXPENSE OF CONTRACTOR.

9. PRODUCTS

9.1. PRODUCTS LISTED AND/OR SPECIFIED ON CONTRACT DOCUMENTS ARE SELECTED TO ESTABLISH DESIGN STANDARDS. IN MOST CASES, ACCEPTABLE MANUFACTURERS ARE LISTED. BASE YOUR BID PRICE ON BASE SPECIFIED PRODUCTS OR PRODUCTS SUPPLIED FROM ACCEPTABLE MANUFACTURERS. ENSURE PRODUCTS SUPPLIED FROM MANUFACTURERS OTHER THAN BASE SPECIFIED MANUFACTURERS ARE EQUIVALENT TO SPECIFIED PRODUCTS. CHANGES TO MANUFACTURERS OF PRODUCTS MAY BE PROPOSED TO CONTRACT ADMINISTRATOR FOR ACCEPTANCE PRIOR TO CLOSING OF BIDS, LISTING IN EACH CASE CORRESPONDING CREDIT. CONTRACT ADMINISTRATOR HAS SOLE DISCRETION IN ACCEPTING ANY PROPOSED SUBSTITUTION. INCLUDE IN BID PRICE ANY ADDITIONAL COSTS FOR CHANGES TO ASSOCIATED OR ADJACENT WORK RESULTING FROM PROVISION OF PRODUCTS SUPPLIED BY MANUFACTURER OTHER THAN BASE SPECIFIED MANUFACTURER. ANY PROPOSED CHANGES INITIATED BY CONTRACTOR AFTER AWARD OF CONTRACT MAY BE CONSIDERED BY THE CONTRACT ADMINISTRATOR AT CONTRACT ADMINISTRATOR 'S DISCRETION, WITH COSTS FOR SUCH CHANGES IF APPROVED BY CONTRACT ADMINISTRATOR , AND COSTS OF SUCH REVIEW BY THE CONTRACT ADMINISTRATOR TO BE PAID FOR BY THE CONTRACTOR.

10. WARRANTY

10.1. WARRANT WORK TO BE IN STRICT ACCORDANCE WITH CONTRACT DOCUMENTS AND FREE FROM DEFECTS FOR 2 YEAR PERIOD FROM DATE OF WRITTEN ACCEPTANCE BY CONTRACT ADMINISTRATOR . REPAIR AND/OR REPLACE ANY SUCH DEFECTS WHICH APPEAR IN WORK WITHIN WARRANTY PERIOD, ORDINARY WEAR AND TEAR AND WILFUL DAMAGE BY, OR CARELESSNESS OF OWNER'S STAFF OR AGENTS EXCEPTED, WITHOUT ADDITIONAL EXPENSE TO OWNER. WHERE SUCH DEFECTS OCCUR, BE RESPONSIBLE FOR COSTS INCURRED IN MAKING DEFECTIVE WORK GOOD, INCLUDES REPAIR OR REPLACEMENT OF BUILDING FINISHES, OTHER MATERIALS, OR DAMAGE TO OTHER EQUIPMENT CAUSED BY SUCH DEFECTS, OR BY SUBSEQUENT REPLACEMENT OR REPAIRS.

11. RECORD DRAWINGS (AS-BUILTS)

11.1. DRAWINGS FOR THIS PROJECT HAVE BEEN PREPARED ON A CAD SYSTEM. THE SOFTWARE USED IS AUTOCAD RELEASE 2010. COPIES OF DRAWINGS ON DISKS FOR USE IN PREPARING AS-BUILTS, MAY BE REQUESTED FROM CONTRACT ADMINISTRATOR.

11.2. WHEN WORK BEGINS AT SITE, CLEARLY AND ACCURATELY MARK ON A BOUND SET OF WHITE PRINTS OF DRAWINGS, ON A DAILY BASIS, ALL CHANGES AND DEVIATIONS FROM ROUTING OF AND LOCATIONS OF EQUIPMENT SHOWN ON DRAWINGS, CHANGES AND DEVIATIONS INCLUDING THOSE MADE BY ADDENDA, CHANGE ORDERS, AND SITE INSTRUCTIONS, AND CHANGES AND DEVIATIONS INDICATED ON SUPPLEMENTAL DRAWINGS ISSUED WITH ADDENDA, CHANGE ORDERS, AND SITE INSTRUCTIONS. MAINTAIN "AS-BUILT" WHITE PRINTS AT SITE FOR PERIODIC INSPECTION BY CONTRACT ADMINISTRATOR THROUGHOUT DURATION OF WORK. PAY PARTICULAR ATTENTION TO ACCURATELY DIMENSIONING LOCATION OF ALL CONCEALED SERVICES TERMINATED FOR FUTURE EXTENSION, ALL BURIED WORK AND SERVICES, AND WORK CONCEALED WITHIN BUILDING IN INACCESSIBLE LOCATIONS.

11.3. WHEN WORK ENDS AT SITE, UPDATE A COMPUTER FILE COPY OF DRAWING SET SO THAT IT REFLECTS ALL DEVIATIONS FROM ORIGINAL DRAWINGS, THUS FORMING A TRUE "AS-BUILT" DRAWING DISK SET. PROVIDE A SET OF REPRODUCIBLE MYLAR PRINTS OF DRAWINGS PRODUCED FROM TRUE "AS-BUILT" DRAWING SET. SUBMIT "AS-BUILT" DRAWING COMPACT DISKS WITH WHITE PRINTS AND CAD PRODUCED "AS-BUILT" MYLAR PRINTS TO CONTRACT ADMINISTRATOR . ALL SUBMITTED DRAWINGS SHALL BE OF THE SAME QUALITY AS ORIGINAL DRAWINGS.

11.4. UPDATE OWNER'S DISTRIBUTION RISER DIAGRAMS POSTED IN ELECTRICAL ROOMS.

12. SHOP DRAWINGS AND OPERATING/MAINTENANCE INSTRUCTION MANUALS

12.1. SUBMIT SHOP DRAWINGS AND OPERATING/MAINTENANCE INSTRUCTION MANUALS FOR FOLLOWING:
- 12.1.1. SPECIAL RECEPTACLES AND SWITCHES;
- 12.1.2. DISTRIBUTION EQUIPMENT;
- 12.1.3. LUMINAIRES;
- 12.1.4. EXIT SIGN;

12.2. PROPERLY IDENTIFY SHOP DRAWINGS FOR REVIEW AND SHOW IN DETAIL EQUIPMENT AND MATERIALS. ENDORSE EACH DRAWING, INCLUDE COMPANY NAME AND SUBMITTAL DATE. PROVIDE MANUALS AS INDEXED, IDENTIFIED HARD COVER 3-RING BINDERS COMPLETE WITH:
- 12.2.1. TITLE SHEET AND LIST OF CONTENTS;
- 12.2.2. A COPY OF EACH "REVIEWED" SHOP DRAWING;
- 12.2.3. EXPLANATIONS OF OPERATING PRINCIPLES AND SEQUENCES;
- 12.2.4. PART LISTS WITH NUMBERS;
- 12.2.5. RECOMMEND MAINTENANCE PRACTICES AND PRECAUTIONS;
- 12.2.6. COPIES OF INSPECTION CERTIFICATES ISSUED BY GOVERNING AUTHORITIES;
- 12.2.7. WIRING AND CONNECTION DIAGRAMS;
- 12.2.8. COPIES OF ADDITIONAL AND REVISED PANELBOARD DIRECTORIES.
- 12.2.9. PROVIDE 2 SETS OF MANUALS.

13. GENERAL CONDUIT AND CONDUCTOR INSTALLATION REQUIREMENTS

13.1. INSTALL CONDUIT AND CONDUCTORS CONCEALED TO DEGREE MADE POSSIBLE BY FINISHES AND PROVIDE INSTALLATIONS IN ACCORDANCE WITH CEC AND LOCAL GOVERNING AUTHORITIES. PLAN AND COORDINATE LOCATIONS AND ROUTING OF SERVICES, WITH TRADES PRIOR TO INSTALLATION. IN AREAS WHERE A MULTIPLICITY OF SERVICES OCCURS, PREPARE DETAIL DRAWINGS AND SUBMIT TO CONTRACT ADMINISTRATOR FOR REVIEW PRIOR TO START OF AFFECTED WORK.

13.2. WHERE CONDUIT AND/OR CONDUCTORS ARE EXPOSED, ARRANGE SAME TO AVOID INTERFERENCE WITH OTHER WORK AND PARALLEL TO BUILDING LINES.WHERE HORIZONTAL CONDUITS AND/OR CONDUCTORS ARE EXPOSED, INSTALL AS HIGH AS POSSIBLE. DO NOT INSTALL CONDUIT AND/OR CONDUCTORS WITHIN 6" (150 mm) OF "HOT" PIPES OR EQUIPMENT UNLESS CONDUIT AND/OR CONDUCTORS ARE ASSOCIATED WITH EQUIPMENT. INDEPENDENTLY RUN CONDUIT AND CONDUCTORS MUST BE SUPPORTED FROM THE CEILING/WALL STRUCTURE, NOT FROM CEILING HANGERS, DUCTWORK, PIPING, CABLE TRAYS, ETC.

13.3. IDENTIFY CONDUIT RUNS. (I.E.: TAG BOTH ENDS OF CONDUIT RUNS).

13.4. AT NO EXTRA COST, ALLOW FOR FINAL RELOCATIONS OF DEVICES UP TO 10' (3M) TO SUIT FINAL COORDINATED DEVICE LOCATIONS, PRIOR TO INSTALLATION OF WALL COVERINGS.

13.5. GENERALLY, CONDUCTORS AND CONDUIT ARE SIZED ON DRAWINGS, BUT IN ABSENCE OF DIRECTION IN TYPE AND SIZING, TYPE AND SIZE REQUIRED QUANTITY IN ACCORDANCE WITH THE INTENDED APPLICATION, TO APPLICABLE OESC REQUIREMENTS. SIZES WHERE SHOWN, ARE MINIMUM SIZES AND SHALL NOT BE REDUCED UNLESS APPROVED BY CONTRACT ADMINISTRATOR .

13.6. CONDUCTORS IN PLENUM SPACES AND IN RAISED FLOOR AREAS SHALL COMPLY WITH OBC AND OESC REQUIREMENTS WITH REGARDS TO FLAME AND SMOKE TEST.

14. CONDUIT

14.1. PROVIDE CONDUIT FOR CONDUCTORS. INTERIOR CONDUIT TO BE EMT (THINWALL) GALVANIZED, ELECTRICAL METALLIC TUBING TO CSA C22.2 NO. 83, COMPLETE WITH FACTORY MADE BENDS WHERE SITE BENDING IS NOT POSSIBLE, AND JOINTS AND TERMINATIONS MADE WITH SET SCREW TYPE CONNECTORS WITH INSULATED THROATS, AND CONCRETE TIGHT WHERE REQUIRED.

14.2. FOR SHORT BRANCH CIRCUIT CONNECTORS TO MOTORIZED EQUIPMENT AND TRANSFORMERS (MINIMUM LENGTH 18" [450 mm], MAXIMUM LENGTH 24" [600 mm] WITH 180 DEGREE LOOP WHERE POSSIBLE), PROVIDE GALVANIZED STEEL FLEXIBLE LIQUID-TIGHT METALLIC CONDUIT TO CSA C22.2 NO. 56, COMPLETE WITH IDEAL "STEEL TOUGH" LIQUID TIGHT FLEXIBLE CONDUIT CONNECTORS AT TERMINATIONS.

14.3. FOR EXTERIOR LOCATIONS, PROVIDE CSA APPROVED AND LABELLED, FT-4 RATED, RIGID PLASTIC (PVC) CONDUIT COMPLETE WITH SITE MADE HEAT GUN BENDS ON CONDUIT TO 50 MM (2") DIAMETER, FACTORY MADE ELBOWS IN CONDUIT LARGER THAN 50 MM (2") DIAMETER, SOLVENT WELD JOINTS, FACTORY MADE EXPANSION JOINTS WHERE REQUIRED, AND TERMINATIONS MADE WITH PROPER AND SUITABLE CONNECTORS AND ADAPTORS.

14.4. SUPPORT AND SECURE CONDUIT AT SPACING IN ACCORDANCE WITH CODE REQUIREMENTS BY MEANS OF GALVANIZED PIPE STRAPS, CONDUIT CLIPS, RING BOLT TYPE HANGERS, OR BY OTHER PROPER MANUFACTURED DEVICES. PROVIDE CONDUIT FITTINGS CONSTRUCTED OF SAME MATERIALS AS CONDUIT AND SUITABLE FOR APPLICATION. SQUARE AND PROPERLY REAM ENDS OF SITE CUT CONDUIT. GENERALLY, CONDUIT IS SIZED ON DRAWINGS. SIZE CONDUIT NOT SIZED ON DRAWINGS IN ACCORDANCE WITH CODE. BEND CONDUIT AT FULL CONDUIT DIAMETER WITH NO KINKING AND NO FLAKING OR CRACKING OF FINISHES.

14.5. PROVIDE COOPER B-LINE "DURA-BLOK" SERIES ROOFTOP SUPPORT SYSTEMS FOR CONDUIT RUNS ON ROOF. INSTALL ROOFTOP SUPPORT SYSTEM IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS TO SUIT TYPE OF RACEWAY AND ROOFING MATERIALS. USE PROPERLY SIZED CLAMPS TO SUITE CONDUIT SIZES. ENSURE THAT INSTALLATION AND USE OF SYSTEM DOES NOT INVALIDATE ROOF WARRANTY.

15. CONDUCTORS

15.1. PROVIDE CONDUCTORS. WIRE SHALL BE INSTALLED IN CONDUIT. REFER TO DRAWINGS FOR SIZING OF CONDUCTORS. GENERALLY, BRANCH CIRCUIT CONDUCTOR SIZES ARE INDICATED ON DRAWINGS. SUCH SIZES ARE MINIMUM REQUIREMENTS AND MUST BE INCREASED, TO SUIT LENGTH OF RUN AND VOLTAGE DROP IN ACCORDANCE WITH SCHEDULE OBTAINED FROM CONTRACT ADMINISTRATOR . CONDUCTORS NOT SIZED ON DRAWINGS SHALL BE SIZED IN ACCORDANCE WITH CODE. PROVIDE CABLE SUPPORT SYSTEM ACCESSORIES WHICH ARE NOT SPECIFIED HEREIN OR SHOWN ON DRAWINGS BUT ARE REQUIRED FOR PROPER INSTALLATION.

15.2. INTERIOR CONDUCTORS TO BE "RW90" SINGLE CONDUCTOR TO CSA C22.2 NO. 38, 600/1000 VOLTS, MAXIMUM 90°C (194°F) CONDUCTOR TEMPERATURE, -40°C (-40°F) MINIMUM INSTALLATION TEMPERATURE, X-LINK POLYETHYLENE (XLPE) INSULATION, COLOUR CODED.

15.3. EXTERIOR CONDUCTORS SHALL BE "RWU90" CSA CERTIFIED, SINGLE COPPER CONDUCTOR TO CSA C22.2 NO 38, MAXIMUM 90°C (194°F) CONDUCTOR TEMPERATURE, -40°C (-40°F) MINIMUM INSTALLATION TEMPERATURE, EXTRA THICKNESS X-LINK POLYETHYLENE (XLPE) INSULATION SUITABLE FOR WET AND BURIED INSTALLATIONS, COLOUR CODED.

15.4. DO NOT USE "BX" TYPE CABLING, ALL CIRCUITS SHALL BE CONDUCTORS IN CONDUIT.

15.5. CONDUCTORS UP TO AND INCLUDING NO. 10 AWG SHALL BE SOLID. CONDUCTORS IN SIZES LARGER THAN NO. 10 AWG SHALL BE STRANDED. PROVIDE CONDUCTORS CONSTRUCTED OF 98% CONDUCTIVE COPPER AND APPROVED FOR 600V. PROVIDE IDI ELECTRIC "IDEAL" NO. 451, NO. 452 AND NO. 453 "WING-NUT" CSA CERTIFIED 600V RATED PRESSURE TYPE CONNECTORS.

15.6. WHEN PULLING WIRES INTO CONDUIT, USE IDI ELECTRIC "IDEAL YELLOW 77" LUBRICANT. ENSURE WIRES ARE KEPT STRAIGHT AND ARE NOT TWISTED OR ABRAISED.

15.7. DO NOT USE CONDUCTORS SMALLER THAN NO. 12 AWG IN SYSTEMS OVER 30 VOLTS, UNLESS OTHERWISE NOTED.

15.8. COLOUR CODE CONDUCTORS THROUGHOUT TO IDENTIFY PHASES, NEUTRALS AND GROUND BY MEANS OF SELF-LAMINATING COLOURED TAPE, COLOURED CONDUCTOR INSULATION, OR PROPERLY SECURED COLOURED PLASTIC DISCS. COLOURS, UNLESS OTHERWISE NOTED, TO BE AS FOLLOWS:
- 15.8.1. PHASE A - RED;
- 15.8.2. PHASE B - BLACK;
- 15.8.3. PHASE C - BLUE;
- 15.8.4. GROUND - GREEN;
- 15.8.5. NEUTRAL - WHITE;
- 15.8.6. CONTROL - ORANGE.

15.9. USE 300V RATING FOR FIRE ALARM, SECURITY AND OTHER LOW VOLTAGE CIRCUITS, 600V RATING FOR 120/208V CIRCUITS, 1000V RATING FOR 347/600V CIRCUITS.

15.10. CONDUCTORS SHALL BE OVERSIZED TO ENSURE VOLTAGE DROP IS 2% MAXIMUM AT PANEL LOCATION OR 5% AT LOAD.

16. OUTLET BOXES, PULLBOXES AND JUNCTION BOXES

16.1. OUTLET BOXES: PROVIDE CSA APPROVED STAMPED GALVANIZED STEEL OUTLET BOX FOR EACH LUMINAIRE, FIRE ALARM DEVICE, ETC. REFER TO DRAWINGS FOR LOCATIONS OF OUTLETS. CONFIRM EXACT LOCATIONS PRIOR TO ROUGHING-IN. BOXES FOR RIGID STEEL CONDUITS SHALL BE CAST FS/FD TYPES.

16.2. PULLBOXES AND JUNCTION BOXES: PROVIDE GALVANIZED OR PRIME COATPLATED STEEL, SUITABLE IN RESPECTS FOR APPLICATION AND COMPLETE WITH SCREW ON OR HINGED COVERS AS REQUIRED, AND CONNECTORS SUITABLE FOR CONNECTED CONDUIT.

16.3. PROVIDE PULLBOXES AND JUNCTION BOXES WHEREVER NECESSARY TO FACILITATE CONDUCTOR/CONDUIT INSTALLATIONS. GENERALLY, PROVIDE CONDUIT RUNS EXCEEDING 100' (30 m) IN LENGTH, OR WITH MORE THAN 3 - 90 DEGREE BENDS WITH PULLBOX INSTALLED AT CONVENIENT AND SUITABLE INTERMEDIATE ACCESSIBLE LOCATION. PROVIDE JUNCTION BOXES AND PULLBOXES SIZED IN ACCORDANCE WITH CODE TO SUIT NUMBER AND SIZE OF CONDUITS AND CONDUCTORS. BOXES MUST BE ACCESSIBLE AFTER WORK IS COMPLETE.

16.4. SIZE, ARRANGEMENT AND TYPE OF BOXES MUST BE SUITABLE FOR APPLICATION. CLEARLY IDENTIFY MAIN PULL AND/OR JUNCTION BOXES BY SPRAY PAINTING COVERS AGREED UPON WITH OWNER AND SHALL BE CONFIRMED ON SITE.

16.5. WHERE REQUIRED, SUPPLY ACCESS DOORS OF MINIMUM NO. 12 GAUGE. PRIME COATED STEEL COMPLETE WITH HINGES AND FRAMES TO GIVE ACCESS TO BOXES AND CONDUCTOR JOINTS AND OTHER SIMILAR ELECTRICAL WORK WHICH MAY NEED MAINTENANCE OR REPAIR, BUT WHICH IS CONCEALED IN INACCESSIBLE CONSTRUCTION. CONFIRM FINISHES WITH OWNER.

17. RECEPTACLES, SWITCHES AND FACEPLATES

17.1. PROVIDE CSA APPROVED, HEAVY DUTY, SPECIFICATION GRADE, 347V, WHITE ROCKER STYLE LOW VOLTAGE SWITCHES THAT SHALL BE COMPATIBLE WITH THE EXISTING BASE BUILDING LIGHTING CONTROL SYSTEM.

17.2. PROVIDE CSA APPROVED HEAVY DUTY, PREMIUM QUALITY DUPLEX CONSTRUCTION U-GROUND, 15A-125V, 3W AND EQUAL TO HUBBELL SPECIFICATION GRADE RECEPTACLES. DEVICES SHALL BE BACK AND SIDE WIRED. PROVIDE IMPACT RESISTANT THERMOPLASTIC FACEPLATES WITH MATCHING SCREWS. CONFIRM TYPE AND FINISH OF DEVICES WITH CONTRACT ADMINISTRATOR OR/AND OWNER PRIOR TO ORDERING. THESE TYPE AND FINISH SHOULD BE SPECIFIED AND OF STANDARD MATERIALS/COLOURS.

17.3. COVER PLATES SHALL BE METAL WITH WHITE COLOUR, BLACK FOR ALL FLOOR BOX LOCATIONS.

17.4. IDENTIFY CIRCUIT NUMBERS ON RECEPTACLE DESIGNATED LABELLING SPACES. PROVIDE PERMANENTLY LABELLED, SELF ADHESIVE, IDENTIFICATION TAPE ON OUTSIDE OF EACH DEVICE OUTLET, IDENTIFYING LOCATION FROM WHERE EACH DEVICE IS FED.

18. FASTENING AND SECURING HARDWARE

18.1. PROVIDE PROPER FASTENERS AND SIMILAR HARDWARE REQUIRED FOR CONDUIT, CONDUCTORS, AND FOR EQUIPMENT HANGER AND/OR SUPPORT MATERIAL UNLESS OTHERWISE NOTED. EXPLOSIVE POWDER ACTUATED FASTENERS WILL NOT BE PERMITTED UNLESS SPECIFIC WRITTEN APPROVAL FOR THEIR USE AND TYPE HAS BEEN OBTAINED FROM CONTRACT ADMINISTRATOR . UNDER NO CIRCUMSTANCES USE CEILING SUSPENSION HANGERS OR GRIDS FOR SUSPENSION OF CONDUIT AND CONDUCTORS.

19. IDENTIFICATION NAMEPLATES

19.1. FOR EACH PIECE OF ELECTRICAL DISTRIBUTION EQUIPMENT FROM ELECTRICAL SOURCE OF SUPPLY UP TO AND INCLUDING PANELBOARDS, PROVIDE ENGRAVED LAMACOID IDENTIFICATION NAMEPLATES SECURED TO APPARATUS WITH STAINLESS STEEL SCREWS, WORDING TO INDICATE SOURCE OF ELECTRICAL SUPPLY AND SIZED TO SUIT EQUIPMENT FOR WHICH IT IS PROVIDED. REFER TO CITY'S ASSET TAGGING STANDARD IN THE TENDER PACKAGE

20. BRANCH CIRCUIT PANELBOARDS

20.1. EATON (CUTLER-HAMMER), "POW-R-LINE" SERIES, FACTORY ASSEMBLED DEAD FRONT PANELBOARDS AS PER SCHEDULES, MANUFACTURED TO CSA STANDARD C22.2 NO. 29 AND LOCAL GOVERNING ELECTRICAL CODE, AND DESIGNED FOR SEQUENCE PHASE CONNECTION OF BRANCH CIRCUIT BREAKERS.

20.2. PANELBOARDS TO BE EQUIPPED WITH ONE (1) CONTINUOUS BUS BAR PER PHASE. EACH BUS BAR TO HAVE SEQUENTIALLY PHASED BRANCH CIRCUIT CONNECTORS LIMITED TO BOLT-ON BRANCH CIRCUIT BREAKERS. BUSSING TO BE FULLY RATED AND OF PLATED COPPER CONSTRUCTION.

20.3. PANELBOARDS ARE TO BE COMPLETE WITH:
- 20.3.1. NEMA 2, BOX CONSTRUCTED OF CODE GAUGE GALVANIZED STEEL WITH REMOVABLE BOX ENDS, WIRING GUTTER SPACE ON SIDES; CONDUIT ENTRIES SEALED WATER-TIGHT;
- 20.3.2. DEAD-FRONT CONSTRUCTION TO SHIELD USER FROM ENERGIZED PARTS;
- 20.3.3. ENCLOSURE CONSTRUCTED OF CODE GAUGE, HOT ZINC DIPPED GALVANIZED STEEL CONSTRUCTED IN ACCORDANCE WITH UL 50 REQUIREMENTS; TRIM FOR FLUSH OR SURFACE WALL MOUNTING AS SHOWN; FRONT PANEL TO NOT BE REMOVABLE WITH THE DOOR LOCKED;
- 20.3.4. HINGED DOOR WITH CONCEALED FASTENERS, CONCEALED HINGE, CHROME PLATED DOOR LATCH AND KEYED ALIKE LOCK WITH KEY;
- 20.3.5. A STEEL FRAME HOLDER AND CIRCUIT DIRECTORY CARD PROTECTED BY CLEAR ACETATE AND SECURED TO BACK OF DOOR, AND MYLAR CIRCUIT BREAKER IDENTIFICATION STRIPS;
- 20.3.6. DRIP SHIELD FOR SURFACE MOUNTED PANELBOARDS;
- 20.3.7. COPPER NEUTRAL BARS;
- 20.3.8. 200% SIZED NEUTRALS FOR PANELS EQUIPPED WITH SPD UNITS AND FOR PANELS AS SCHEDULED;
- 20.3.9. SOLIDLY BONDED EQUIPMENT COPPER GROUND BAR;
- 20.3.10. HIGH STRENGTH, SET SCREW TYPE, ANTI-TURNING WIRE CONNECTORS;
- 20.3.11. CURRENT-CARRYING PARTS BE INSULATED FROM GROUND AND PHASE-TO-PHASE BY HIGH DIELECTRIC STRENGTH THERMOPLASTIC;
- 20.3.12. FILLER PLATES COVERING UNUSED MOUNTING SPACE;
- 20.3.13. NON-AUTOMATIC AND AUTOMATIC MAIN BREAKER TO FUNCTION AS AN ISOLATING SWITCH, WHERE SHOWN AND AS REQUIRED;

20.4. PANELS, DOORS AND TRIM ARE TO BE FACTORY PAINTED WITH ANSI GREY ENAMEL FINISH. RECESSED BACKBOXES (TUBS) NEED NOT BE FINISHED PAINTED.

20.5. PROVIDE FACTORY ASSEMBLED BRANCH CIRCUIT PANELBOARDS AND INSTALL INTO LOCATIONS AND CONNECT COMPLETE. ENSURE ADEQUATE CLEARANCE IS PROVIDED AS PER CODE REQUIREMENTS AND AS REQUIRED FOR ACCESS FOR OPERATION AND MAINTENANCE. LOAD PANELS WITH BREAKERS AS SCHEDULED.

20.6. SUPPORT CABINETS AND ENCLOSURES INDEPENDENT OF CONNECTING CONDUIT, AND ACCURATELY INSTALL WITH REFERENCE TO WALL FINISHES.

20.7. EQUIP PANELBOARDS WITH SUITABLE LUGS OR PROVISIONS TO ACCOMMODATE MAIN AND BRANCH CONDUCTORS SCHEDULED.

20.8. GROUND AND BOND EQUIPMENT AS PER LOCAL GOVERNING ELECTRICAL CODE AND INSPECTION AUTHORITY REQUIREMENTS. REFER ALSO REQUIREMENTS OF SECTION ENTITLED - GROUNDING AND BONDING.

20.9. IDENTIFY PANELBOARD BREAKERS IN A PERMANENT MANNER, AND COMPLETE TYPED PANELBOARD CIRCUIT DIRECTORIES IDENTIFYING CIRCUIT NUMBER AND TYPE AND LOCATION OF LOADS SUPPLIED FROM EACH BREAKER TO CONTRACT ADMINISTRATOR 'S APPROVAL.

20.10. INCLUDE FOR SPACES FOR FUTURE BREAKERS, SPARE BREAKERS AND ADDITIONAL BREAKERS FOR MISCELLANEOUS MECHANICAL LOADS ARE INCLUDED AS PER SCHEDULES AND AS SPECIFIED.

21. DISCONNECTS

21.1. THE DISCONNECT SWITCHES SHALL HAVE THE OPERATING HANDLE INTERLOCKED WITH THE SWITCH COVER SO THAT IT CAN ONLY BE OPENED WHEN THE SWITCH IS IN THE "OFF" POSITION, AND THE HANDLE CANNOT BE PUT IN THE "ON" POSITION UNLESS THE COVER IS CLOSED.

21.2. THE FUSED SWITCHES SHALL HAVE STEEL REINFORCED CLIPS AND FUSES SHALL BE EASILY REMOVABLE WHEN THE SWITCH IS IN THE "OFF" POSITION.

21.3. SWITCHES SHALL HAVE AMPLE GUTTER SPACE FOR TOP OR BOTTOM WIRING AND SHALL HAVE FULLY VISIBLE BLADES WHEN IN THE "OFF" POSITION, QUICK-MAKE, QUICK-BREAK, MECHANISM AND BE HORSE-POWER RATED.

21.4. SWITCHES USED OUTDOORS SHALL BE IN A WEATHERPROOF ENCLOSURE. SWITCHES USED INDOORS SHALL BE SPRINKLER PROOF, NEMA 3R.

21.5. SWITCHES SHALL HAVE PROVISION FOR PADLOCKING IN THE "OFF" POSITION AND INTERLOCK DEFEAT.

21.6. ALL MOTORS SHALL BE PROVIDED WITH A DISCONNECT SWITCH UNLESS OTHERWISE NOTED.

22. GROUNDING AND BONDING

22.1. PROVIDE REQUIRED GROUNDING AND BONDING WORK IN ACCORDANCE WITH DRAWINGS, LOCAL GOVERNING ELECTRICAL AUTHORITY, GOVERNING AUTHORITIES HAVING JURISDICTION AND LOCAL GOVERNING ELECTRICAL INSPECTION AUTHORITY. PROVIDE LOCAL GOVERNING ELECTRICAL UTILITY'S GROUNDING REQUIREMENTS FOR STATIONS, VAULTS AND ELECTRICAL ROOMS, AS APPLICABLE. CONFIRM REQUIREMENTS WITH LOCAL GOVERNING ELECTRICAL UTILITY.

22.2. GROUND AND BOND OTHER EQUIPMENT SUCH AS TRANSFORMERS, SWITCHBOARDS, PANELBOARDS, AND SIMILAR METAL WORK TO PERIMETER GROUND BUS. PROVIDE MINIMUM NO. 3/0 INSULATED GROUND WIRE FROM GROUND BUS IN ELECTRICAL ROOMS TO SWITCHBOARDS, TRANSFORMERS, STRUCTURE, FLOOR, ETC.

23. GENERAL ELECTRICAL WORK TESTING

23.1. GENERAL

23.1.1. IN ADDITION TO TESTS REQUIRED BY GOVERNING AUTHORITIES AND REGULATIONS, TEST WORK TO ENSURE THERE ARE NO GROUNDS OR CROSSES. ENSURE DEVICES ARE COMMISSIONED AND OPERABLE. CONNECT CIRCUITS TO PANELBOARDS SO AS TO BALANCE ACTUAL LOADS (WATTAGE) WITHIN 5%. IF REQUIRED, TRANSPOSE CIRCUITS WHEN WORK IS COMPLETE TO MEET THIS REQUIREMENT.

23.2. COORDINATION STUDY AND SHORT CIRCUIT CALCULATION

23.2.1. SUBMIT ELECTRICAL DISTRIBUTION SYSTEM COORDINATION STUDY AND SHORT CIRCUIT CALCULATIONS REPORTS PRIOR TO OR WITH PROPOSED SHOP DRAWINGS OF MAJOR ELECTRICAL DISTRIBUTION EQUIPMENT. ALLOW IN SHOP DRAWING PROCESS, SUFFICIENT TIME FOR CONTRACT ADMINISTRATOR TO REVIEW AND MAKE COMMENTS AND FOR CONTRACTOR AND EQUIPMENT VENDORS TO INCORPORATE CONTRACT ADMINISTRATOR COMMENTS, NECESSARY REVISIONS AND RESULTS OF REPORTS INTO EQUIPMENT SHOP DRAWINGS. DO NOT ORDER EQUIPMENT UNTIL SHOP DRAWINGS ARE ACCEPTABLE TO CONTRACT ADMINISTRATOR . TIME FOR THIS SHOP DRAWING REVIEW PROCESS WILL BE AT CONTRACT ADMINISTRATOR 'S DISCRETION, BUT TYPICALLY ALLOW FOR 15 WORKING DAYS FOR INITIAL REVIEW SUBMISSION WITH ADDITIONAL 10 WORKING DAYS ADDED TO ACCOMMODATE EACH RESUBMISSION.

23.2.2. PREPARE COORDINATION STUDY AND SHORT CIRCUIT CALCULATIONS (AVAILABLE FAULT CURRENTS) OF SYSTEM. PERFORM WORK TO STANDARDS OF APPLICABLE LOCAL GOVERNING AUTHORITIES, LOCAL ELECTRICAL INSPECTION AUTHORITY AND CSA STANDARDS.

23.2.3. REVIEW AND SURVEY EXISTING SYSTEMS AND/OR OBTAIN WHERE AVAILABLE, COORDINATION STUDY OF EXISTING SYSTEMS TO USE IN DETERMINING BEST COORDINATION FOR ADDITIONAL AND REVISED EQUIPMENT WITH EXISTING SYSTEMS. WHERE EXISTING STUDIES ARE NOT AVAILABLE, SURVEY EXISTING SYSTEMS AND PREPARE ADDITIONAL COORDINATION STUDIES AS REQUIRED TO PROVIDE A FULL AND PROPER COORDINATION OF ENTIRE EXISTING, REVISED AND ADDITIONAL SYSTEMS.

23.2.4. SUBMIT COORDINATION STUDY AND SHORT CIRCUIT CALCULATIONS REPORTS AS PART OF SHOP DRAWING SUBMISSION AS REQUIRED. ENSURE THAT RESULTS AND CONTRACT ADMINISTRATOR 'S REVIEWED COMMENTS FROM THESE REPORTS ARE INCORPORATED INTO ELECTRICAL DISTRIBUTION EQUIPMENT SHOP DRAWINGS.

23.2.5. PROTECTIVE SYSTEM DEVICES HAVE BEEN SELECTED SUCH THAT PROTECTION IS ADEQUATE AND GOOD COORDINATION IS POSSIBLE, HOWEVER, SINCE DIFFERENCES DO EXIST BETWEEN MANUFACTURERS, SOME CHANGES IN TRIP RATINGS OR RELAY SETTINGS MAY BE NECESSARY AND ARE TO BE CARRIED OUT. OBTAIN LOCAL ELECTRICAL UTILITY INFORMATION ON THEIR PROTECTIVE DEVICES AND INCLUDE REQUIREMENTS AS NECESSARY.

23.2.6. PROVIDE AND CARRY OUT FOLLOWING:
- 23.2.6.1. PREPARE A SET OF COORDINATION CURVES ON K.E. NO. 336E TIME CURRENT CHARACTERISTIC GRAPH PAPER;
- 23.2.6.2. THIS IS TO BE ACCOMPANIED BY SUPPORTING SYMMETRICAL AS WELL AS ASYMMETRICAL FAULT CURRENT CALCULATION DATA WITH TABULATIONS TO VERIFY PROTECTION OF VARIOUS ELEMENTS OF SYSTEMS UNDER MAXIMUM AND MINIMUM FAULT CONDITIONS AT VARIOUS POINTS IN SYSTEMS.
- 23.2.6.3. PLOT TIME-CURRENT CHARACTERISTIC CURVES FOR FOLLOWING:
  - 23.2.6.3.1. MAIN AND FEEDER PROTECTIVE DEVICES AT VOLTAGE LEVELS USED IN DISTRIBUTION SYSTEM;
  - 23.2.6.3.2. PROTECTIVE DEVICES ASSOCIATED WITH LARGEST MOTOR IN EACH MCC, REFRIGERATION MACHINE COMPRESSORS AND LARGEST DEVICE IN EACH DISTRIBUTION PANEL;
  - 23.2.6.3.3. MOTOR GENERATOR PROTECTIVE DEVICES, DAMAGE CURVES AND CURRENT DECREMENT CURVES.
- 23.2.6.4. COOPERATE WITH AND OBTAIN FROM OTHER MANUFACTURERS A LIST OF EQUIPMENT REQUIRING PROTECTIVE DEVICES TO BE USED IN DISTRIBUTION SYSTEM AND PREPARE COORDINATION CURVES AS SOON AS POSSIBLE. BE RESPONSIBLE, ALONG WITH OTHER MANUFACTURERS' EQUIPMENT CONNECTED TO DISTRIBUTION SYSTEM, TO ENSURE THAT PROPER CONTROL AND PROTECTIVE DEVICES ARE SELECTED SUCH THAT THEY COORDINATE WITH PROTECTIVE DEVICES.
- 23.2.6.5. IT IS RESPONSIBILITY OF EQUIPMENT MANUFACTURERS TO EXAMINE PLANS AND SPECIFICATIONS TO ENSURE THAT RELAYS AND PROTECTIVE DEVICES BEING INSTALLED IN DISTRIBUTION SYSTEM PROVIDE SATISFACTORY COORDINATION.
- 23.2.6.6. DOCUMENT TESTING, COORDINATION STUDY AND ARC FLASH ANALYSIS IN A REPORT SIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE PLACE OF WORK AND AUTHORIZED BY TESTING COMPANY. INCLUDE FOR MINIMUM 3 HARD COPIES AND ELECTRONIC COPY OF REPORT TO BE SUBMITTED TO CONTRACT ADMINISTRATOR FOR REVIEW. REPORT TO INCLUDE TEST RESULTS WITH PROPERLY PLOTTED CURVES, IDENTIFIED TROUBLE AREAS OF COORDINATION, EXTENSIVE COMMENTS REGARDING TEST RESULTS AND RECOMMENDATIONS ON BEST COURSE OF REMEDIAL ACTION.

23.3. SHOCK AND ARC FLASH PROTECTION

23.3.1. PROVIDE FOR ELECTRIC SHOCK AND ARC FLASH PROTECTION AS REQUIRED BY LOCAL GOVERNING ELECTRICAL CODE AND LOCAL GOVERNING AUTHORITIES. SCOPE OF WORK TO BE FOR ADDITIONAL AND REVISED EQUIPMENT AND FIRST LEVEL OF UPSTREAM DEVICES.

23.3.2. DETERMINE SEVERITY OF POTENTIAL EXPOSURE, PLANNING SAFE WORK PRACTICES AND SELECTING PERSONAL PROTECTIVE EQUIPMENT UNDER GENERAL GUIDELINES OF GOVERNING EDITION OF CSA Z462.

23.3.3. DESIGN SAFETY SIGNS AND LABELS FOR APPLICATIONS TO EQUIPMENT UNDER GENERAL GUIDELINES OF ANSI Z535.4.

23.3.4. DETERMINE ARC FLASH HAZARD DISTANCE AND INCIDENT ENERGY THAT WORKERS MAY BE EXPOSED TO FROM ELECTRICAL EQUIPMENT UNDER GENERAL GUIDELINES OF IEEE 1584.

23.3.5. INCORPORATE DOCUMENTATION WITH DISTRIBUTION SYSTEM AND COORDINATION STUDY REPORT.

23.3.6. PROVIDE LABELS AS REQUIRED ON EQUIPMENT, MEETING APPLICABLE STANDARDS AND CODES TO SATISFACTION OF CONTRACT ADMINISTRATOR .

24. LIGHTING

24.1. PROVIDE LUMINAIRES AS NOTED ON LUMINAIRE SCHEDULE, COMPLETE WITH ELECTRONIC BALLASTS. CONFIRM FINISHES WITH CONTRACT ADMINISTRATOR AND OWNER PRIOR TO ORDERING.

24.2. LED LAMPS SHALL BE CSA APPROVED AND ULC LISTED AND LABELLED.

24.3. LEDS HAVE THE MOST ADVANCED AND TECHNICALLY PROVEN AND SUCCESSFULLY TESTED LED TECHNOLOGY AT THE TIME OF INSTALLATION.

24.4. LED FEATURES TO INCLUDE:
- 24.4.1. LEDS TO BE SELECTED FROM SAME COLOUR BIN SIZE FOR CONSISTENCY AND CHROMATICITY AND MEET ANSI C78 377A AS A MINIMUM.
- 24.4.2. GENERALLY, COLOUR TEMPERATURE RANGE TO BE FROM 2700K TO 6500K; SPECIFIC TEMPERATURE REQUIREMENTS TO BE IDENTIFIED ON LUMINAIRE SCHEDULE

24.5. DRIVER (BALLAST) FEATURES TO INCLUDE:
- 24.5.1. PERATE FROM 60 HZ INPUT SOURCE OF 120 OR 347 VAC WITH SUSTAINED VARIATIONS OF ± 10% (VOLTAGE AND FREQUENCY) WITH NO DAMAGE TO DRIVER;
- 24.5.2. OUTPUT REGULATED TO ±5% ACROSS LOAD RANGE;
- 24.5.3. POWER FACTOR GREATER THAN 0.90;
- 24.5.4. TOTAL HARMONIC DISTORTION LESS THAN 20%;
- 24.5.5. CLASS A SOUND RATING;
- 24.5.6. COMPLY WITH ANSI C62.41 CATEGORY A FOR TRANSIENT PROTECTION.
- 24.5.7. LAMP CURRENT CREST FACTOR NOT GREATER THAN 1.7;
- 24.5.8. FREQUENCY OF OPERATION BETWEEN 20 KHZ MINIMUM TO 60 KHZ MAXIMUM, BUT NOT BETWEEN 30 KHZ AND 42 KHZ; LAMPS SHALL OPERATE WITHOUT VISIBLE FLICKER;

24.6. ALL LUMINAIRES SHALL HAVE A 5-YEAR FULL REPLACEMENT PARTS AND LABOUR INCLUDED WARRANTY.

24.7. THOROUGHLY REVIEW CEILING TYPES, FINISHES AND CONSTRUCTION DETAILS BEFORE PLACING LUMINAIRE ORDERS AND ENSURE REQUIRED MOUNTING ASSEMBLIES, RINGS AND SIMILAR FEATURES ARE INCLUDED. INCLUDE FOR ASSEMBLY, MOUNTING AND ADJUSTING OF LUMINAIRES, COMPLETE WITH WIRING, CONNECTIONS, HANGERS, ALIGNERS, BOX COVERS AND ACCESSORIES FOR COMPLETE, SAFE, FULLY OPERATIONAL ASSEMBLY. CAREFULLY COORDINATE LUMINAIRE INSTALLATION WITH WORK OF OTHER TRADES TO ENSURE NECESSARY RECESSING DEPTHS AND MOUNTING SPACES ARE PROVIDED. INSTALL LUMINAIRES IN ACCORDANCE WITH APPLICABLE ARCHITECTURAL REFLECTED CEILING PLANS AND/OR WALL ELEVATIONS. CONFIRM LUMINAIRE LOCATIONS PRIOR TO ROUGHING-IN.

24.8. SUPPORT LUMINAIRES DIRECTLY BY CEILING SLAB STRUCTURE AND NOT TO FORMED STEEL DECKING, CEILING HANGERS, DUCTWORK, PIPING, CABLE TRAYS, ETC.

24.9. CONNECT LUMINAIRES TO CIRCUITS AND LIGHTING CONTROL EQUIPMENT AS SHOWN.

25. EXISTING FIRE ALARM SYSTEM WORK

25.1. WHERE SHOWN ON DRAWINGS, DISCONNECT, RELOCATE AND RECONNECT REQUIRED DEVICES. NEW WORK TO BE AN EXTENSION OF EXISTING SYSTEM. PROVIDE ADDITIONAL DEVICES WHERE SHOWN, CONDUCTORS IN CONDUIT AND END OF LINE RESISTORS. PROVIDE ULC LISTED DEVICES TO MATCH EXISTING DEVICES AND BE COMPLETELY COMPATIBLE WITH EXISTING SYSTEM. PERFORM WORK IN ACCORDANCE WITH LATEST EDITION OF CAN/ULC S524. SEQUENCE OF OPERATION OF NEW WORK TO FUNCTION AS PER EXISTING SYSTEM. UNLESS OTHERWISE NOTED, CONNECT ADDITIONAL DEVICES TO EXISTING ZONES SERVING AREA, AS PER SYSTEM MANUFACTURER INSTRUCTIONS, TO EXISTING STANDARDS AND AS APPROVED BY LOCAL FIRE AUTHORITY. PROVIDE WIRING OF MINIMUM NO. 16 AWG IN CONDUIT AND AS PER OESC REQUIREMENTS. ALARM INITIATING CIRCUITS SHALL BE RUN IN SEPARATE CONDUITS FROM ALARM SIGNALLING CIRCUITS.

25.2. ADDITIONAL DEVICES SHALL MATCH BASE BUILDING STANDARDS. INCLUDE REQUIRED ACCESSORIES FOR PROPER OPERATION AND INSTALLATION. RE-PROGRAM SYSTEM TO ACCOMMODATE ADDITIONS AND MODIFICATIONS. RE-BURN SOFTWARE AS REQUIRED BY LOCAL FIRE AUTHORITY. MODIFY ANNUNCIATORS AS REQUIRED TO INCORPORATE ALL REVISIONS AND ADDITIONS. AUDIBLE DEVICES SHALL BE PROVIDED AND ADJUSTED TO SOUND AT LEVELS AS PER LOCAL FIRE AUTHORITY REQUIREMENTS. PROVIDE ADDITIONAL DEVICES AS REQUIRED TO ACHIEVE SOUND LEVEL STANDARDS.

25.3. DURING WORK TO THE EXISTING FIRE ALARM SYSTEM THE TIME AND DURATION OF INTERRUPTION SHALL BE APPROVED BY THE OWNER AND ONLY 1 ZONE SHALL BE INTERRUPTED AT ANY 1 TIME. IN ALL AREAS WHERE THE RENOVATION WORK REQUIRES SHUTDOWN OF ANY PART OF THE FIRE ALARM PROTECTION SYSTEM, PROVIDE MANUAL FIRE ALARM PROTECTION (FIRE WARDEN) BY MEANS OF SUPERVISING THE AREA AS APPROVED BY GOVERNING AUTHORITIES. AT NO TIME SHALL THE FIRE ALARM SYSTEM OR ANY 1 ZONE BE LEFT INOPERATIVE OVERNIGHT. PROVIDE ALL REQUIRED BYPASS WIRING AND TEMPORARY WIRING AS MAY BE REQUIRED TO MAINTAIN ALL PARTS OF THE FIRE ALARM SYSTEM OPERATIVE DURING CONSTRUCTION AND ALTERATIONS.

25.4. COVER EXISTING DETECTORS TO PROTECT FROM DEMOLITION/CONSTRUCTION DUST. REMOVE COVERS WHEN ALTERNATIVE FIRE ALARM PROTECTION IN AREA IS NOT AVAILABLE OVERNIGHT.

25.5. WHEN FIRE ALARM SYSTEM WORK IS COMPLETE AND READY FOR ACCEPTANCE, PROVIDE AND ARRANGE FOR INDEPENDENT TESTING COMPANY TO INSPECT, TEST, VERIFY AND CERTIFY THE WORK AND EQUIPMENT, INCLUDING INITIATING DEVICES, SIGNALLING DEVICES, CONTROL DEVICES AND WIRING. IN ADDITION, WHERE OWNERS EXISTING FIRE ALARM MAINTENANCE CONTRACTOR OR EXISTING SYSTEM MANUFACTURER HAS NOT PERFORMED THE INSTALLATION WORK OF THIS CONTRACT, SUCH COMPANIES MAY ALSO BE UTILIZED FOR TESTING AND CERTIFICATION WORK, SUBJECT TO CONDITIONS HEREIN THIS SPECIFICATION AND APPROVAL OF CONTRACT ADMINISTRATOR .

25.6. TEST AND VERIFY THAT AUDIBLE SIGNALS ARE AT LEVELS ACCEPTABLE TO LOCAL FIRE AUTHORITY AND THAT BATTERIES OF SUFFICIENT CAPACITY AS PER OBC. PROVIDE CERTIFICATE OF LIABILITY INSURANCE REGISTERED FOR THIS PROJECT TO SHOW SATISFACTORY PROOF OF MANUFACTURER'S AND TESTING COMPANY'S LIABILITY COVERAGE FOR BOTH HIS PRODUCT AND PERSONNEL. CONDUCT WORK IN ACCORDANCE WITH LATEST EDITIONS OF CAN/ULC S524, S534, 536, S537, S1001-11 AND OBC 2012. TESTS TO BE CONDUCTED IN PRESENCE OF OWNER AND/OR CONTRACT ADMINISTRATOR.

25.7. PROVIDE TO CONTRACT ADMINISTRATOR MINIMUM 3 COPIES OF TEST REPORT WITH DETAILED SCHEDULES OF TESTED DEVICES. REPORTS SHALL BE SIGNED BY AUTHORIZED CERTIFIED TESTING TECHNICIAN. A DIGITAL COPY OF THE REPORT SHALL ALSO BE PROVIDED IN COMPATIBLE FORMAT CONFIRMED WITH CONTRACT ADMINISTRATOR.

25.8. OBTAIN FROM LOCAL FIRE AUTHORITY, APPROVAL CERTIFICATE AND SUBMIT TO CONTRACT ADMINISTRATOR WITH REPORTS.

25.9. THE TESTING COMPANIES MUST EMPLOY TECHNICIANS CERTIFIED BY CANADIAN FIRE ALARM ASSOCIATION AND/OR ONTARIO FIRE MARSHALL, AS APPLICABLE.

26. CLOSEOUT DOCUMENTS

26.1. FOLLOWING DOCUMENTS ARE TO BE PROVIDED:
- 26.1.1. AS-BUILT DRAWINGS COMPLETE WITH CAD FILE DRAWINGS; ENSURE MAIN BRANCH CONDUITS, JUNCTION BOXES, AND ASSOCIATED ARE SHOWN ON AS BUILT DRAWINGS.
- 26.1.2. APPROVED AND STAMPED SHOP DRAWINGS;
- 26.1.3. ESA INSPECTION CERTIFICATE;
- 26.1.4. MAINTENANCE MANUALS CONTAINING DATA SHEETS, BROCHURE, OPERATING AND MAINTENANCE INFORMATION, LAMPING SPECIFICATIONS, RECOMMENDED SPARE PARTS LIST FOR ALL INSTALLED ELECTRICAL EQUIPMENT;
- 26.1.5. COPY OF TYPED PANEL BOARD SCHEDULES FOR NEW AND EXISTING PANELS WITHIN SCOPE OF WORK;
- 26.1.6. FIRE ALARM VERIFICATION REPORT;
- 26.1.7. EMERGENCY LIGHTING CONFIRMATION LETTER

26.2. PROVIDE 3 SETS OF CLOSEOUT DOCUMENTS BINDED IN HARD COVERS WITH "OPERATING AND MAINTENANCE MANUAL" TITLE ON COVER, AFTER SUBSTANTIAL COMPLETION OF THE PROJECT.

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No.	DATE	REVISIONS	INITIAL	SIGNED
4	JAN 12/24	DRAWINGS ISSUED FOR TENDER	CC	
3	NOV 20/23	100% DESIGN SUBMISSION	CC	
2	OCT 28/23	REISSUED 70% DESIGN SUBMISSION	CC	
1	JULY 18/23	70% DESIGN SUBMISSION	CC	

TORONTO

LICENSED PROFESSIONAL ENGINEER
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100200703
2024/04/05
PROVINCE OF ONTARIO

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MATT KELIHER
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MATTHEW CASCHERA
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ELECTRICAL SPECIFICATIONS

DESIGN:	CC	DRAFTING:	CC	CHECK:	DL	CONTRACT No.	23SWM-IRM-026CDU
SCALE:	AS NOTED			DRAWING NUMBER:	1601-2023-3-20		E4
DATE:	JULY 18, 2023						

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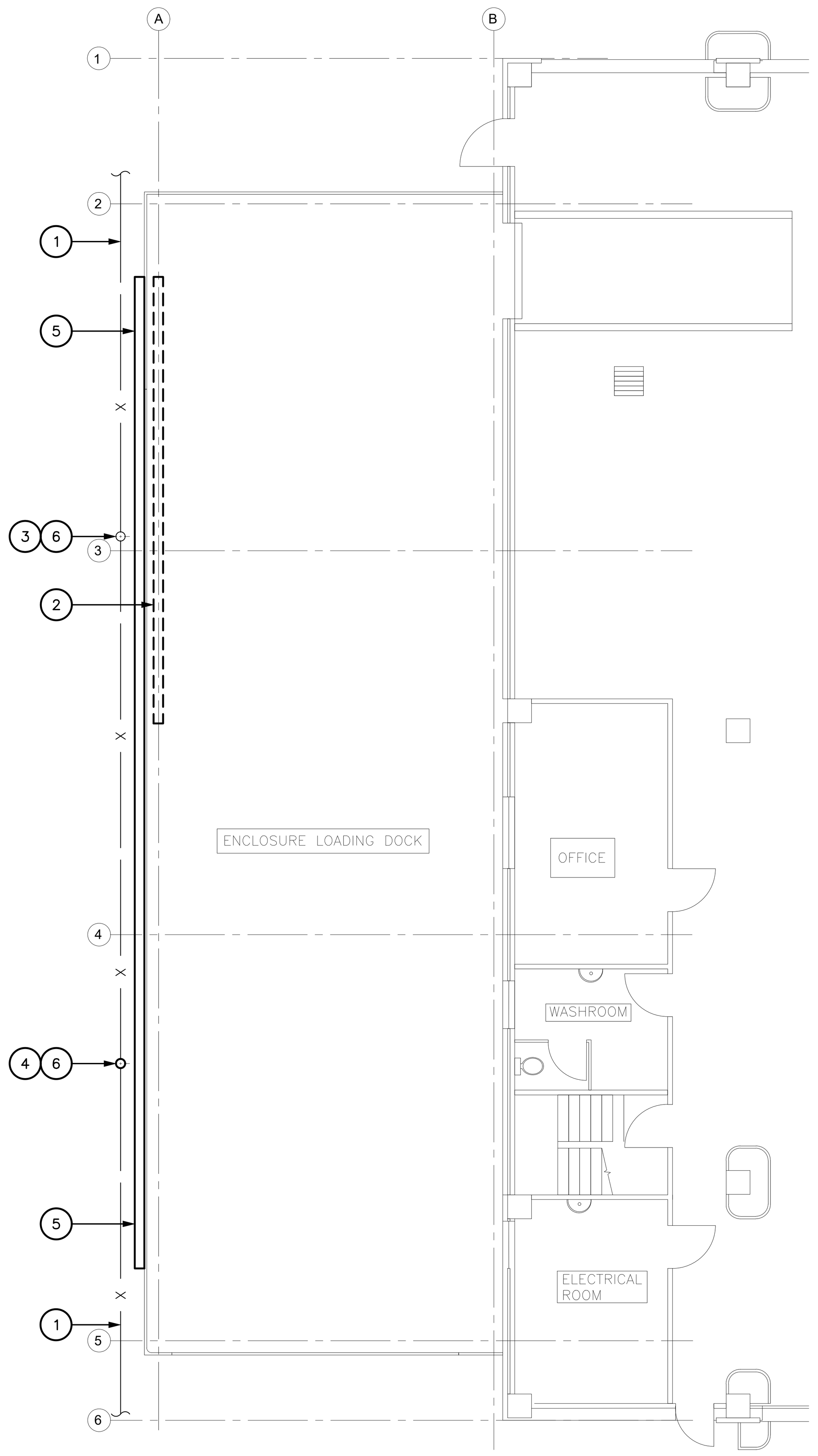


NORTH

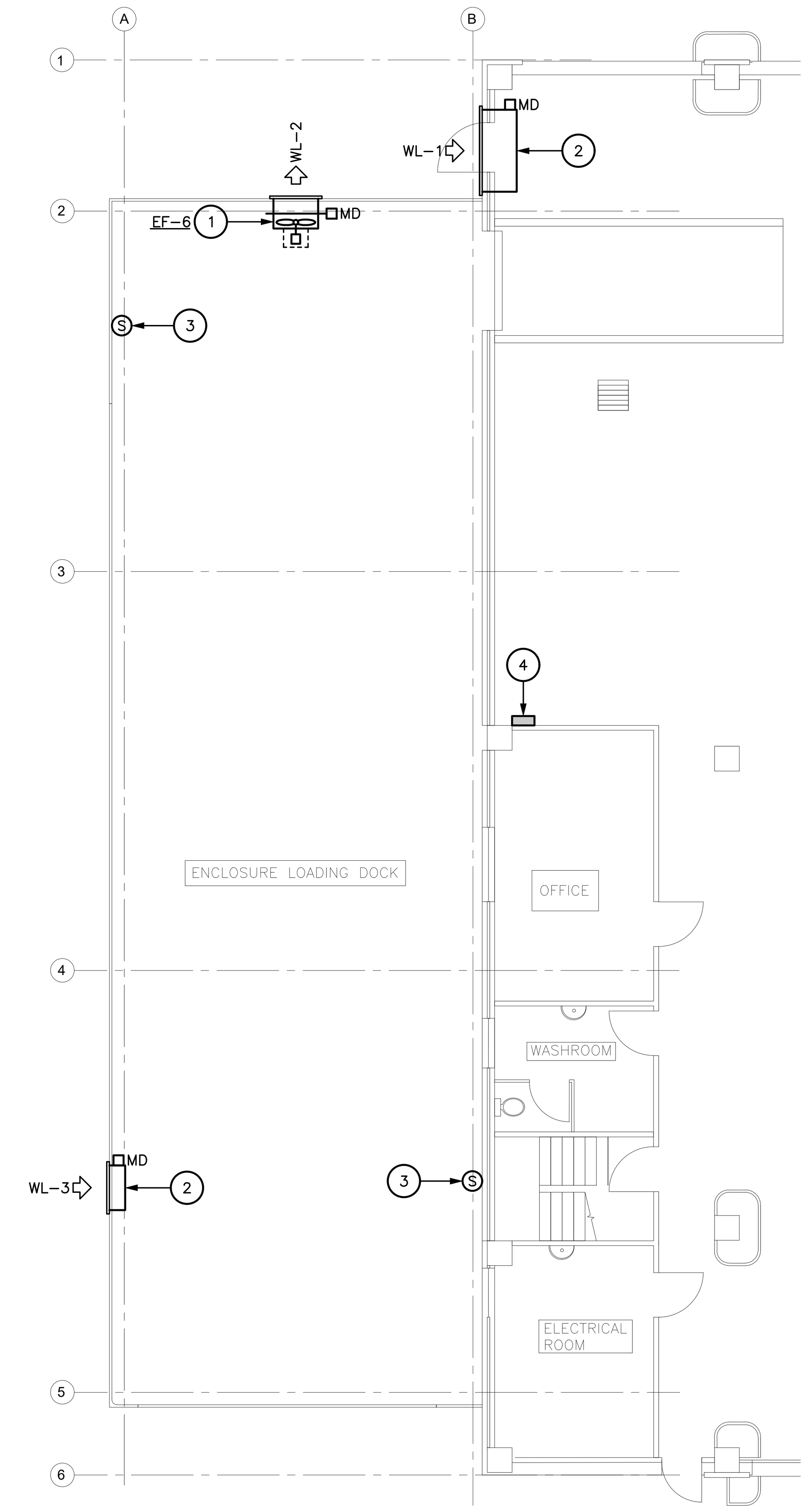
PART GROUND FLOOR PLAN – PLUMBING

SCALE – 1:100

0 1 2 3 4 5 6 7 8 9 10
BAR SCALE – 1:100

DRAWING NOTES

1. EXISTING BURIED STORM SEWER TO REMAIN.
2. EXISTING ROOF GUTTER AND ASSOCIATED RAINWATER LEADERS TO BE REMOVED FROM SITE.
3. EXISTING STORM WATER PIPE RISER TO REMAIN AND BE USED IN THE NEW ROOF GUTTER SYSTEM.
4. SUPPLY AND INSTALL NEW STORM WATER PIPE RISER TO CONNECT TO NEW ROOF GUTTER SYSTEM AND EXISTING BURIED STORM SEWER.
5. SUPPLY AND INSTALL NEW 200mm WIDE ALUMINUM ROOF GUTTER, SECURED TO ROOF FACIA. COLOUR TO MATCH WALL CLADDING.
6. SUPPLY AND INSTALL NEW 100mm x 100mm ALUMINUM RAINWATER LEADER BY GENERAL CONTRACTOR. REFER TO ARCHITECTURAL DRAWING A4



NORTH

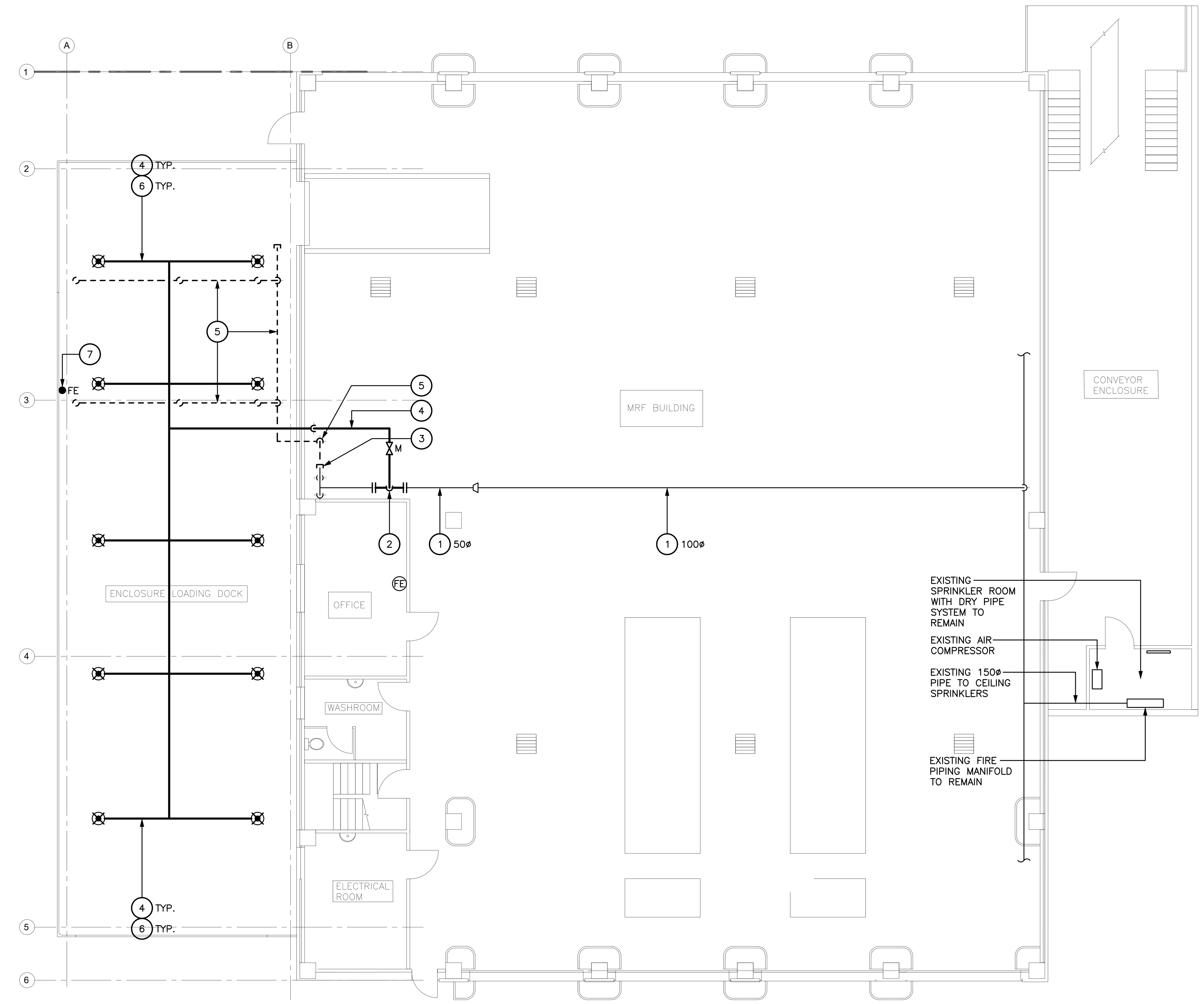
PART GROUND FLOOR PLAN – VENTILATION

SCALE – 1:100

0 1 2 3 4 5 6 7 8 9 10
BAR SCALE – 1:100

DRAWING NOTES

1. SUPPLY AND INSTALL NEW EXHAUST AIR LOUVRE AT HIGH LEVEL. LOUVRE TO BE COMPLETE WITH 900mm x 900mm x 600mm DEEP SHEET METAL EXHAUST PLENUM COMPLETE WITH MOTORIZED DAMPER AND 600mm x 300mm ACCESS DOOR. FLOOR OF PLENUM TO SLOPE DOWN TO LOUVRE. PLENUM TO BE COMPLETE WITH ACOUSTIC DUCT LINING. UNDERSIDE OF PLENUM TO BE 4300mm ABOVE FINISHED LOADING DOCK FLOOR.
2. SUPPLY AND INSTALL NEW INTAKE SUPPLY AIR MOTORIZED LOUVRE AT HIGH LEVEL. UNDERSIDE OF LOUVRE TO BE 4800mm ABOVE FINISHED GRADE.
3. CO/NO_2 SENSOR TO BE MOUNTED EXPOSED ON WALL.
4. CO/NO_2 GAS DETECTOR PANEL TO BE MOUNTED ON WALL. UNDERSIDE OF PANEL TO BE APPROXIMATELY 1500mm ABOVE FINISHED FLOOR.



NORTH

PART GROUND FLOOR PLAN – SPRINKLERS

SCALE – 1:100

0 1 2 3 4 5 6 7 8 9 10
BAR SCALE – 1:100

DRAWING NOTES

1. EXISTING SPRINKLER PIPE TO REMAIN.
2. CONNECT NEW SPRINKLER PIPE TO EXISTING SPRINKLER PIPE SYSTEM.
3. SUPPLY AND INSTALL NEW CAPPED END CONNECTION.
4. NEW SPRINKLER PIPE TO RUN EXPOSED AT HIGH LEVEL HUNG FROM EXISTING ROOF STRUCTURE.
5. PORTION OF EXISTING SPRINKLER PIPE TO BE REMOVED FROM SITE.
6. NEW SPRINKLER PIPE TO BE GALVANIZED SCHEDULE 40 STEEL PIPE.
7. NEW FIRE EXTINGUISHER TO BE MOUNTED EXPOSED ON WALL COMPLETE WITH WALL BRACKET.

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No.	DATE	REVISIONS	INITIAL	SIGNED
5	JAN 12/24	ISSUED FOR TENDER	MWW	
4	JAN 10/24	ISSUED FOR FINAL APPROVAL	MWW	
3	NOV 20/23	100% DESIGN SUBMISSION	MWW	
2	OCT 26/23	REISSUED 70% DESIGN SUBMISSION	MWW	
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TORONTO

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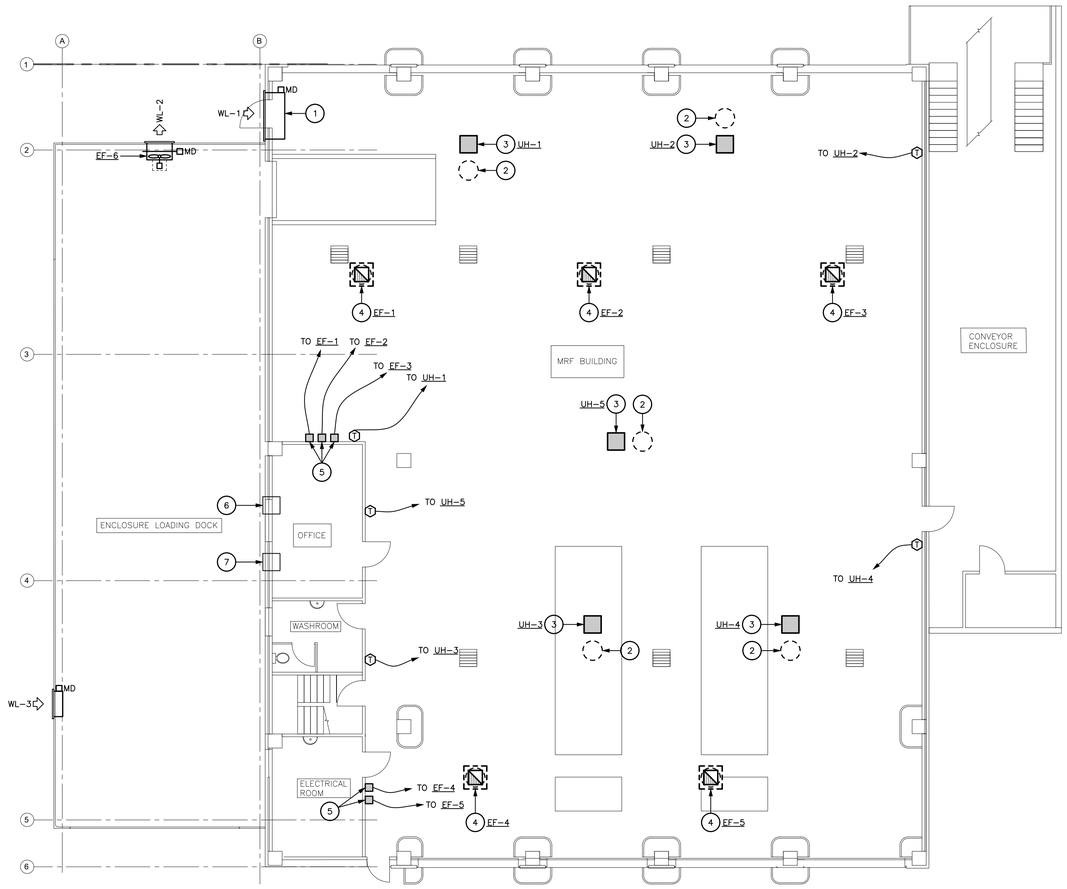
PART GROUND FLOOR PLANS - PLUMBING, VENTILATION AND SPRINKLRES

DESIGN:	EK	DRAFTING:	DGC	CHECK:	MWW	CONTRACT No.	23SWM-IRM-026CDU
SCALE:	AS NOTED			DRAWING NUMBER:	1601-2023-3-21		M1
DATE:	JULY 18, 2023						



NORTH

PART GROUND FLOOR PLAN – HEATING AND VENTILATION

SCALE – 1:100

0 1 2 3 4 5 6 7 8 9 10
BAR SCALE – 1:100

DRAWING NOTES

1. SUPPLY AND INSTALL NEW RELIEF AIR MOTORIZED LOUVRE IN EXISTING WALL ABOVE EXISTING DOOR. TOP OF LOUVRE TO MATCH LOUVRE WL–2 SERVING LOADING DOCK.
2. EXISTING ELECTRIC UNIT HEATER COMPLETE WITH ACCESSORIES TO BE REMOVED FROM SITE.
3. SUPPLY AND INSTALL NEW ELECTRIC UNIT HEATER AT HIGH LEVEL HUNG FROM EXISTING ROOF STRUCTURE. NEW HEATER TO BE IN SAME LOCATION AS THE EXISTING HEATER BEING REMOVED FROM THE SITE. SUPPLY AND INSTALL ADDITIONAL STEEL MEMBERS AS REQUIRED FOR NEW INSTALLATION.
4. REMOVE EXISTING OUTDOOR ROOF MOUNTED EXHAUST FAN AND ALL ACCESSORIES AND REPLACE WITH NEW FAN TO MATCH EXISTING CAPACITY AND DIMENSIONS. FIELD VERIFY NEW OUTDOOR ROOF EXHAUST FAN WILL FIT ONTO EXISTING CURB AND ROOF OPENING.
5. EXISTING EXHAUST FAN STARTER TO BE REPLACED WITH NEW MANUAL STARTER. SEE ELECTRICAL DRAWINGS.
6. EXISTING WINDOW AIR CONDITIONING UNIT AT LOW LEVEL TO REMAIN.
7. EXISTING WALL AIR CONDITIONING UNIT AT HIGH LEVEL TO REMAIN.

JOB NAME: COMMISSIONERS TS MRF BUILDING UPGRADE — JOB No. BRM–22028009–A0

MECHANICAL SCHEDULE – FANS

FAN No.	SYSTEM AND FAN LABEL	SPEC TYPE	MODEL	SIZE	CFM ESP "W.G.	RPM ARR	HP VAC/ø	REMARKS
EF–1	RESIDUE PROCESS BUILDING EXHAUST	ADF	COOK ACRUB	150 RH3B	950 0.50	1300	1/4 120/1	INTERCONNECT TO WL–1
EF–2	RESIDUE PROCESS BUILDING EXHAUST	ADF	COOK ACRUB	150 RH3B	950 0.50	1300	1/4 120/1	INTERCONNECT TO WL–1
EF–3	RESIDUE PROCESS BUILDING EXHAUST	ADF	COOK ACRUB	150 RH3B	950 0.50	1300	1/4 120/1	INTERCONNECT TO WL–1
EF–4	RESIDUE PROCESS BUILDING EXHAUST	ADF	COOK ACRUB	150 R4B	1900 0.50	1200	1/3 120/1	INTERCONNECT TO WL–1
EF–5	RESIDUE PROCESS BUILDING EXHAUST	ADF	COOK ACRUB	150 R4B	1900 0.50	1200	1/3 120/1	INTERCONNECT TO WL–1
EF–6	ENCLOSURE LOADING DOCK	PF	COOK AWD	20 A17D	1700 0.50	1700	1/4 120/1	INTERCONNECT TO WL–2

NOTE 1. USE HIGH EFFICIENCY MOTORS. SEE SECTION 15010.

JOB NAME: COMMISSIONERS TS MRF BUILDING UPGRADE — JOB No. BRM–22028009–A0

MECHANICAL SCHEDULE – ELECTRIC UNIT HEATER SCHEDULE

DWG. DESIG–NATION	MODEL	DUCT SIZE	CFM	KW	VOLT/ø	STAGES	REMARKS
UH–1	CHROMALOX HVH	–	1500	20	575/3	–	VERTICAL THROW. HUNG FROM STRUCTURE.
UH–2	CHROMALOX HVH	–	1500	20	575/3	–	VERTICAL THROW. HUNG FROM STRUCTURE.
UH–3	CHROMALOX HVH	–	1500	20	575/3	–	VERTICAL THROW. HUNG FROM STRUCTURE.
UH–4	CHROMALOX HVH	–	850	7.5	575/3	–	VERTICAL THROW. HUNG FROM STRUCTURE.
UH–5	CHROMALOX HVH	–	850	7.5	575/3	–	VERTICAL THROW. HUNG FROM STRUCTURE.

JOB NAME: COMMISSIONERS TS MRF BUILDING UPGRADE — JOB No. BRM–22028009–A0

MECHANICAL SCHEDULE – LOUVRES

DWG. DESIG–NATION	MODEL NO.	SIZE WIDTH(MM) X HEIGHT(MM)	REMARKS
WL–1	CS 4830	1800 x 1200	COLOUR TO MATCH WALL CLADDING
WL–2	CS A4097	900 x 900	COLOUR TO MATCH WALL CLADDING
WL–3	CS 4830	900 x 900	COLOUR TO MATCH WALL CLADDING

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No.	DATE	REVISIONS	INITIAL	SIGNED
5	JAN 12/24	ISSUED FOR TENDER	MWW	
4	JAN 10/24	ISSUED FOR FINAL APPROVAL	MWW	
3	NOV 20/23	100% DESIGN SUBMISSION	MWW	
2	OCT 26/23	REISSUED 70% DESIGN SUBMISSION	MWW	
1	JULY 18/23	70% DESIGN SUBMISSION	MWW	

TORONTO — SOLID WASTE MANAGEMENT SERVICES

LICENSED PROFESSIONAL ENGINEER — M. W. WICKHAM — Apr 19/24 — PROVINCE OF ONTARIO

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PART GROUND FLOOR PLAN - HEATING AND VENTILATION, MECHANICAL SCHEDULES

DESIGN:	EK	DRAFTING:	DGC	CHECK:	MWW	CONTRACT No.	23SWM-IRM-026CDU
SCALE:	AS NOTED			DRAWING NUMBER:	1601-2023-3-22		M2
DATE:	JULY 18, 2023						

E:\BRM\BRM-22028009-A0\60 EXECUTION\05 DRAWINGS\05_MECH\BRM-22028009-A0_M-2 PART GROUND FLOOR PLAN - HEATING AND VENTILATION, MECHANICAL SCHEDULES.DWG (M-02)

MECHANICAL SPECIFICATIONS

1. GENERAL CONDITIONS

.1 THE WORK SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE ONTARIO BUILDING CODE, THE ONTARIO WATER RESOURCES ACT, THE MINISTRY OF LABOUR, THE CITY OF TORONTO, THE ONTARIO GAS CODE, AND ALL CODES HAVING JURISDICTION, WHICH ARE TO BE CONSIDERED AN INTEGRAL PART OF THESE SPECIFICATIONS.

.2 SCOPE OF WORK: ALL LABOUR, MATERIALS, EQUIPMENT, FEES, PERMITS AND CHARGES TO PERFORM THE OPERATIONS FOR THE COMPLETE INSTALLATION OF THE PLUMBING, GAS HEATING, VENTILATING AND SHEETMETAL WORK AND SPRINKLERS (DRY SYSTEM), AS INDICATED ON THE DRAWINGS.

.3 SLEEVES, CUTTING & PATCHING:

- .1 INSTALL SLEEVES AND FRAMES FOR PIPING, DUCTS, FANS, AND SIMILAR EQUIPMENT TO BE BUILT INTO THE BUILDING AS THE CONSTRUCTION PROGRESSES. IF THESE ARE NOT INSTALLED AT THE TIME OF CONSTRUCTION, THE COST OF CUTTING AND PATCHING AT A LATER DATE, WILL BE AT THE EXPENSE OF THIS CONTRACTOR.
- .2 THE CONTRACTOR IS RESPONSIBLE FOR THE CUTTING AND PATCHING OF ALL HOLES AND OPENINGS UP TO AND INCLUDING 6" (150 mm) DIAMETER.
- .3 THE CONTRACTOR IS TO LOCATE THE EXACT POSITIONS AND DIMENSIONS OF LARGER OPENINGS FOR CUTTING.

.4 EXTENT OF THE WORK:

- .1 THE CONTRACT INCLUDES ALL DRAINAGE LINES, PRESSURE PIPING, NATURAL GAS SYSTEMS, AND SPRINKLERS AS SHOWN AND AS NOTED IN DRAWINGS.
- .2 THE SHEET METAL WORK INCLUDES ALL SHEETMETAL SYSTEMS, FANS, CONTROLS, LOUVRES, DAMPERS AND ASSOCIATED VENTS AND FLASHINGS.

.5 BALANCING, IDENTIFICATION & START-UP

- .1 IDENTIFICATION IS TO BE CARRIED OUT BY THE RESPECTIVE TRADE WITH NAME TAGS IDENTIFYING THE USE OR SERVICE OF ALL MAIN VALVES.
- .2 CLEAN ALL EQUIPMENT AND OTHER INSTALLATIONS.
- .3 PROVIDE MAINTENANCE INSTRUCTIONS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- .4 PROVIDE TWO (2) BOUND COPIES OF THE AIR BALANCING REPORT TO THE CONTRACT ADMINISTRATOR.
- .5 AIR BALANCING SHALL BE DONE BY A PROFESSIONAL TESTING AND BALANCING FIRM. THE AIR BALANCING REPORT SHALL SHOW THE QUANTITIES, VELOCITIES AND AREA OF EACH OUTLET, TYPE AND MODEL NUMBER OF FANS AND MOTORS INSTALLED, ACTUAL AIR DELIVERED BY THE FAN WITH TOTAL STATIC PRESSURE AND VOLTAGE DRAWN BY THE MOTORS. ADJUST AND RETEST TO THE SYSTEMS TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR.
- .6 SUBMIT TWO (2) COPIES OF MANUFACTURER MAINTENANCE MANUALS TO THE OWNER FOR ALL NEW EQUIPMENT.

.6 VISIT JOB SITE: THE CONTRACTOR SHALL VISIT THE JOB SITE AND EXAMINE ALL EXISTING CONDITIONS WHICH AFFECT THE WORK.

.7 CO-ORDINATION: CO-ORDINATE WITH OTHER TRADES REGARDING THE LOCATION OF EQUIPMENT, CONTROL DEVICES, PIPING, AND DUCTWORK. THIS INCLUDES SUPPLYING WIRING DIAGRAMS TO THE ELECTRICAL TRADE FOR CONNECTIONS.

.8 GUARANTEE:

- .1 GUARANTEE IN WRITING FOR THE MATERIAL AND WORKMANSHIP INCLUDING THE MANUFACTURER'S GUARANTEE FOR THE PERIOD OF TWO (2) YEAR FROM THE DATE OF ACCEPTANCE.
- .2 CERTIFY IN WRITING FOR ALL WORK COMPLETED IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS. SUBMIT AS-BUILT DRAWINGS SHOWING REVISIONS MADE.

.9 CO-OPERATION OF TRADES: THE PRIME MECHANICAL CONTRACTOR IS TO CO-OPERATE WITH ALL OTHER TRADES ON THE JOB SO THAT ALL EQUIPMENT CAN BE SATISFACTORILY INSTALLED, AND SO THAT NO DELAY IS CAUSED TO ANY OTHER TRADE. ANY REWORKING OF INSTALLED EQUIPMENT, PIPING, OR DUCTING TO ACCOMMODATE THE INSTALLATION OF OTHER TRADES WORK SHALL BE PERFORMED AT NO EXTRA COST.

.10 WARRANTY:

- .1 THE CONTRACTOR TO WARRANT PRODUCTS AND EXECUTION OF WORK UNDER THIS DIVISION AGAINST DEFECTS OF MATERIAL AND WORKMANSHIP FOR TWO (2) FULL YEARS AFTER DATE OF SUBSTANTIAL PERFORMANCE.
- .2 REPAIR DEFECTS THAT ARE DISCOVERED OR DEVELOP DURING THIS PERIOD AND MAKE GOOD ANY RESULTING DAMAGE TO EQUIPMENT OR BUILDING. REPAIRS TO BE CARRIED OUT AT NO COST TO OWNER.
- .3 PROVIDE EXTENDED WARRANTIES WHERE INDICATED IN OTHER SECTIONS OF THIS DIVISION. EXTENDED WARRANTIES TO COMMENCE ON TERMINATION OF THE STANDARD TWO YEAR WARRANTY AND TO BE AN EXTENSION OF THESE SAME PROVISIONS.

.11 EXISTING SERVICES

- .1 WHERE WORK INVOLVES BREAKING INTO OR CONNECTING EXISTING SERVICES, CARRY OUT WORK AT TIMES DIRECTED BY GOVERNING AUTHORITIES, WITH MINIMUM OF DISTURBANCE TO THE PREMISES AND ITS OPERATION.
- .2 BEFORE COMMENCING WORK, ESTABLISH LOCATION AND EXTENT OF SERVICE LINES IN AREA OF WORK AND NOTIFY CONSULTANT OF FINDING.
- .3 WHERE UNKNOWN SERVICES ARE ENCOUNTERED, IMMEDIATELY ADVISE CONSULTANT AND CONFIRM FINDINGS IN WRITING.
- .4 REMOVE ABANDONED SERVICE LINES. CAP OR OTHERWISE SEAL LINES AT CUT-OFF POINTS, IN MANNER APPROVED BY AUTHORITIES HAVING JURISDICTION OVER SERVICE.
- .5 RECORD LOCATIONS OF MAINTAINED, RE-ROUTED AND ABANDONED SERVICE LINES. THE CONTRACTOR SHALL PROVIDE WITH ALL NECESSARY DIMENSIONS REQUIRED TO ACCURATELY LOCATE THOSE SERVICES.
- .6 WHERE THE LOCATION OF ANY OF THESE UTILITIES HAS BEEN SHOWN ON THE PLANS, SUCH INFORMATION IS NOT GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY LOCATIONS AND ELEVATIONS, IMMEDIATELY AFTER THEY MOVE ON THE SITE. IF FOR ANY REASON THE INFORMATION OBTAINED NECESSITATES CHANGES IN PROCEDURES OR DESIGN, THEY MUST ADVISE THE CONSULTANT AT ONCE. IF THIS VERIFICATION OF EXISTING CONDITIONS IS NOT DONE AT THE OUTSET AND ANY PROBLEMS ARISE, THE RESPONSIBILITY FOR SAME IS ENTIRELY THIS CONTRACTOR'S.
- .7 WHERE IT IS NECESSARY TO TEMPORARILY SHUT DOWN EQUIPMENT OR SERVICES SERVING ESSENTIAL AREAS, THIS CONTRACTOR SHALL INCLUDE PREMIUM COSTS TO ENSURE THE WORK FORCE IS SCHEDULED FOR "ROUND THE CLOCK" OPERATION IN ORDER TO MINIMIZE DISRUPTION AND EQUIPMENT DOWNTIME. NO ADDITIONAL COST SHALL BE PAID FOR THIS

.12 PLACING IN OPERATION

- .1 PRIOR TO ACCEPTANCE AND ON COMPLETION OF WORK MAKE A COMPLETE OPERATIONAL TEST OF SYSTEMS AND WORK CARRIED OUT BY THIS CONTRACTOR.
- .2 BALANCING WILL BE CARRIED OUT AND SYSTEMS SET TO DESIGNED VALUES, AND A REPORT OF FINAL ACTUAL PERFORMANCE OF ALL EQUIPMENT AND BALANCING FOR FINAL SPACE CONDITIONS ON COOLING AND HEATING TO BE CARRIED OUT WHEN RELATIVE CLIMATIC CONDITIONS EXIST.
- .3 DURING THE TWO (2) YEAR GUARANTEE PERIOD, MAINTAIN ALL EQUIPMENT INSTALLED AS PART OF THIS DIVISION. THIS AGREEMENT SHALL BE PART OF THE WRITTEN GUARANTEE. THIS WORK SHALL BE CARRIED OUT IN THE PRESENCE OF THE BUILDING CUSTODIAN, AND A LETTER SHALL BE SENT TO THE CONSULTANT STATING THAT THIS WORK WAS CARRIED OUT. FOUR (4) MAINTENANCE INSPECTIONS MUST BE CARRIED OUT BY THE CONTRACTOR DURING THIS TWO (2) YEAR PERIOD (SIX MONTHS, TWELVE MONTH, EIGHTEEN MONTHS, AND TWENTY FOUR MONTHS AFTER SUBSTANTIAL COMPLETION LETTER ISSUED). SUBMIT WRITTEN REPORT TO OWNER AND CONSULTANT AFTER EACH INSPECTION.

.13 CLEAN-UP: AVOID ACCUMULATION OF SCRAP AND DEBRIS RESULTING FROM THE WORKS AND AT ALL TIMES HELP MAINTAIN THE WORKING SITE IN A NEAT AND CLEAN CONDITION. ON COMPLETION OF THE CONTRACT, REMOVE ALL SCRAP AND DEBRIS RESULTING FROM THE WORKS AND CLEAN ALL EQUIPMENT INSTALLED.

.14 START-UP SERVICE:

- .1 PROVIDE SERVICES OF A QUALIFIED TECHNICIAN RESPONSIBLE FOR ASSISTING THE OWNER'S STAFF IN BECOMING FAMILIAR WITH OPERATING OF SYSTEMS, CO-ORDINATING WORK OF CONTROL MANUFACTURER, ACTING ON ANY COMPLAINTS FROM THE OWNERS, OR CONSULTANT REGARDING OPERATION OF ANY OF THE SYSTEMS, INSTALLED UNDER THIS DIVISION.
- .2 PROVIDE START-UP OF MAJOR PIECES OF MECHANICAL EQUIPMENT OR SYSTEMS, BY REPRESENTATIVE OF EQUIPMENT MANUFACTURER OR PERSON QUALIFIED AND RECOGNIZED BY THE EQUIPMENT MANUFACTURER.
- .3 SUBMIT START-UP REPORTS ON ALL MECHANICAL EQUIPMENT AND SYSTEMS VERIFYING CORRECT INSTALLATION AND OPERATING PARAMETERS IN ALL MODES OF OPERATION. INCLUDE SERVICE REPORTS IN OPERATING AND MAINTENANCE MANUALS.
- .4 NOTIFY CONSULTANT PRIOR TO START-UP ON ANY PIECE OF MECHANICAL EQUIPMENT OR SYSTEM. DEMONSTRATE OPERATION OF ALL OR ANY MECHANICAL SYSTEM OR EQUIPMENT AS DIRECTED BY THE CONSULTANT IN HIS PRESENCE.

.15 TSSA INSPECTION: THE CONTRACTOR SHALL PAY ALL FEES AND SITE VISITS IN CONNECTION WITH TSSA INSPECTION FOR ALL SERVICES.

.16 FIRE STOPPING:

- .1 THE CONTRACTOR IS RESPONSIBLE FOR ALL FIRE STOPPING RELATED TO THE MECHANICAL WORK INCLUDING, BUT NOT LIMITED TO, THE NEW DUCTWORK, NEW PIPING AND CONTROL WIRING.
- .2 PROVIDE MATERIALS AND SYSTEMS CAPABLE OF MAINTAINING EFFECTIVE BARRIER AGAINST FLAME, SMOKE AND GASES.
- .3 COMPLY WITH THE REQUIREMENTS OF CAN4-S115-M35, AND DO NOT EXCEED OPENING SIZED FOR WHICH THEY HAVE BEEN TESTED.
- .4 SYSTEMS TO HAVE AN FIRE-RESISTANCE RATING NOT LESS THAN THE FIRE PROTECTION RATING REQUIRED FOR CLOSURES IN A FIRE SEPARATION.
- .5 THE FIRE STOPPING MATERIALS ARE NOT TO SHRINK, SLUMP OR SAG AND TO BE FREE OF ASBESTOS, HALOGENS AND VOLATILE SOLVENTS.
- .6 FIRESTOPPING MATERIALS ARE TO CONSIST OF A COMPONENT SEALANT APPLIED WITH A CONVENTIONAL CAULKING GUN AND TROWEL.
- .7 FIRE STOP MATERIALS ARE TO BE CAPABLE OF RECEIVING FINISH MATERIALS IN THOSE AREAS WHICH ARE EXPOSED AND SCHEDULED TO RECEIVE FINISHES.
- .8 ACCEPTABLE PRODUCTS:
  - .1 FYRESLEEVE INDUSTRIES INC.
  - .2 GENERAL ELECTRIC PENSIL FIRESTOP SYSTEMS
  - .3 INTERNATIONAL PROTECTIVE COATINGS CORP.
  - .4 RECTORSEAL CORPORATION (METACAULK)
  - .5 3M FIRE PROTECTION SYSTEMS

.17 SHOP DRAWINGS:

- .1 SUBMIT ELECTRONIC COPIES OF SHOP DRAWINGS FOR REVIEW FOR THE FOLLOWING:
  - .1 GAS DETECTOR
  - .2 ELECTRICAL UNIT HEATERS
  - .3 FANS
  - .4 SPRINKLER HEADS

2. SITE SERVICES

.1 EXCAVATION, TRENCHING, BACKFILLING & BEDDING:

- .1 EXCAVATION SHALL BE PROTECTED WITH FENCING, TIMBER SHEETING, BRACING OR SHORING AS REQUIRED BY ONTARIO HEALTH AND SAFETY ACT AND REGULATIONS LATEST ADDITION. PROVIDE ADEQUATE TEMPORARY CROSS-OVERS FOR PEDESTRIAN AND VEHICULAR TRAFFIC, INCLUDING GUARD RAILS, LAMPS AND FLAGS AS DIRECTED.
- .2 ALL PIPING AND EQUIPMENT SHALL HAVE ADEQUATE BEDDING. TRENCHES SHALL BE EXCAVATED 6" (150mm) BELOW THE INTENDED GRADE OF THE PIPING. THE PIPING SHALL BE BEDDED IN A GRANULAR 'A' MATERIAL, BACKFILLED BY HAND FROM THE CENTRE LINE OF THE PIPE TO 6" (150 mm) LAYERS BY TAMPING. THE SUBGRADE BENEATH THE PIPE SHALL BE WITHIN 1/4" (6 mm) OF A STRAIGHT LINE BETWEEN JOINTS. BELL HOLES SHALL BE MADE AT EACH JOINT TO PERMIT THE JOINT TO BE PROPERLY MADE. DEBRIS IS TO BE KEPT OUT OF THE PIPING. NO BACKFILL IS PERMITTED UNTIL THE TEST IS WITNESSED. BEDDING SHALL BE COMPACTED TO 95% MODIFIED PROCTOR TEST (AS PER ITEM BELOW).
- .3 OUTSIDE THE BUILDING, BACKFILLING IN UNPAVED AREAS SHALL BE DONE WITH LOOSE EARTH, FREE FROM ROCKS, DEBRIS, CINDERS, OR OTHER NON-CORROSIVE MATERIALS IN LAYERS NOT EXCEEDING 12" (300 mm) IN THICKNESS, COMPACTED TO 95% STANDARD PROCTOR DENSITY.

.2 MATERIALS:

- .1 PIPE MATERIALS:
  - .1 STORM SEWERS: CONCRETE PIPE WITH CEMENT OR RUBBER COUPLERS TO CSA A257.

3. PLUMBING & DRAINAGE

.1 PIPE MATERIALS:

- .1 ALL BURIED DRAINAGE PIPING:
  - .1 CLASS 4000 CAST IRON SHALL BE CERTIFIED TO CAN/CSA B70-M91 – MECHANICAL JOINT.
  - .2 DWV PLASTIC PIPE ABA AND SOLVENT WELD, 4" (100 mm) AND SMALLER.
  - .3 PVC SDR, 6" (150 mm) AND LARGER.

.2 FIRE EXTINGUISHERS:

- .1 SUPPLY AND INSTALL FULLY CHARGED NATIONAL FIRE EQUIPMENT LIMITED ABC-050 MULTI-PURPOSE DRY CHEMICAL FIRE EXTINGUISHERS WITH A 2A-10BC RATING COMPLETE WITH WALL BRACKET – DESIGNATED FE.

4. SPRINKLERS

.1 INSTALLATION SHALL COMPLY WITH THE BUILDING DEPARTMENT, FIRE DEPARTMENT, CUUA, OR NFPA PAMPHLET #13 AND NATIONAL BUILDING CODE, SECTION BUILDING SERVICES, FIRE PROTECTION.

.2 PIPING FOR EXTENDED SPRINKLER SYSTEM SHALL BE HYDRAULICALLY CALCULATED, DESIGNED AND SUBMITTED TO APPROVING AGENCIES BY THE TRADE RESPONSIBLE FOR THE INSTALLATION.

.3 SPRINKLER HEADS:

- .1 SPRINKLER HEADS TO BE PENDANT VIKING VK329 MICROMATIC CHROME TYPE, WITH STANDARD BULB RATED AT 155 DEG F (68 DEG C) UNLESS NOTED OTHERWISE. USE HIGH TEMPERATURE HEADS AT HEATERS TO NFPA STANDARDS.
- .2 SPRINKLER HEADS IN AREAS WITH AN 8'-0" (2400 mm) OR LESS CEILING HEIGHT, SHALL HAVE VIKING VK436-HP HEADS COMPLETE WITH ROUND FLAT CEILING PLATE COVER INSTALLED FLUSH TO FINISHED CEILING. COLOUR OF CEILING PLATE TO MATCH CEILING.
- .3 NOTE: PROVIDE SPRINKLER CABINET CONTAINING TEN (10) ADDITIONAL HEADS AND SPRINKLER WRENCH.

.4 PIPE & FITTINGS:

- .1 PIPING TO BE ASTM-A-53 LIGHTWALL STEEL PIPE SCHEDULE 40 BLACK STEEL PIPE, GROOVED TO STANDARD ROLL GROOVING SPECIFICATION, COMPLETE WITH APPROVED AND LISTED MECHANICAL COUPLINGS AND FITTINGS.
- .2 ALL VALVES SHALL BE UNDERWRITERS' LABORATORIES OF CANADA (ULC) APPROVED, COMPLETE WITH MONITORING SWITCHES.
- .3 VALVES SHALL BE ALL BRASS UP TO AND INCLUDING 2" (50 mm) SIZE. LARGER SIZES SHALL BE IRON BODY. VALVES OVER 2-1/2" (65 mm) DIAMETER ARE TO HAVE GEAR OPERATORS.

.5 TESTS & GUARANTEE:

- .1 TEST, ADJUST AND CERTIFY SPRINKLER SYSTEM AFTER COMPLETION OF WORK.
- .2 FURNISH TO THE OWNER, A WRITTEN GUARANTEE COVERING MATERIALS AND WORKMANSHIP, AS PER THE GENERAL CONDITIONS.

5. AIR DISTRIBUTION

.1 ALL DUCTWORK TO 2" (500 PA) MAXIMUM STATIC PRESSURE SHALL BE FABRICATED TO SMACNA DUCT CONSTRUCTION STANDARDS, SECTION NO. 1, AND AS FOLLOWS:

.2 MATERIAL & THICKNESS:

- .1 DUCTWORK SHALL BE FABRICATED FROM BEST QUALITY LOCK-FORMING GALVANIZED STEEL SHEETS, OF THE FOLLOWING THICKNESS.

SIZE OF DUCT IN WIDTH OR DEPTH	GAUGE OF SHEET STEEL
12" (300 mm) OR LESS	NO. 26 U.S.
13" TO 30" (325 mm TO 750 mm)	NO. 24 U.S.
31" TO 48" (775 mm TO 1200 mm)	NO. 22 U.S.
49" TO 84" (1225 mm TO 2130 mm)	NO. 20 U.S.

.3 CONSTRUCTION:

- .1 LONGITUDINAL SEAMS SHALL BE MADE WITH PITTSBURGH LOCK OR BUTTON PUNCH SEAMS IN ALL SIZES. ALL DUCTWORK SHALL BE CROSS-BROKEN OR BEADED 12" (300 mm) O.C. FOR RIGIDITY.

.4 EXHAUST FANS:

- .1 SUPPLY AND INSTALL THE FOLLOWING EXHAUST AND RECIRCULATING FANS OF THE SIZE, TYPE, MODEL AND DESIGNATION CONTAINED IN THE FAN SCHEDULE. ACCESSORIES LISTED IN THE SPECIFICATIONS APPLY TO ALL FANS OF THE SAME DESIGNATION. SPECIAL ACCESSORIES FOR INDIVIDUAL FANS ARE DESIGNATED ON THE FAN SCHEDULE.
- .2 SOUND LEVEL PERFORMANCE AND FAN CURVES SHALL BE INCLUDED WITH SUBMITTAL SHOP DRAWINGS.
- .3 SUSPEND FANS FROM STRUCTURE THROUGH VIBRATION ISOLATORS AND CONNECT TO DUCTWORK THROUGH FLEXIBLE DUCT CONNECTIONS. MOUNT FAN IN PLACE WITH BACKDRAFT DAMPERS AND GASKET SEALS. PROVIDE SEISMIC BRACING AS REQUIRED.
- .4 POWER WIRING FOR FANS IS BY ELECTRICAL CONTRACTOR
- .5 CONTROL WIRING IS BY MECHANICAL CONTRACTOR
- .6 PANEL-TYPE PROPELLER FANS – TYPE PF
  - .1 PANEL SHALL BE MANUFACTURED OF HEAVY GAUGE STEEL WITH SPUN VENTURI INLET AND WELDED CORNERS.
  - .2 PROPELLER BLADES SHALL BE STATICALLY AND DYNAMICALLY BALANCED.
  - .3 BELT DRIVE MOTOR SHALL BE MOUNTED ON A BRACKET ATTACHED TO THE PANEL WITH BELT DRIVE AND SHEAVES.
  - .4 ACCESSORIES SHALL INCLUDE BACKDRAFT DAMPER, AND WALL MOUNT BOX MOTOR SIDE GUARD, FAN SIDE GUARD.
  - .5 DESIGN IS BASED ON COOK
  - .6 ACCEPTABLE PRODUCTS:
    - .1 GREENHECK
    - .2 PENN VENTILATOR
    - .3 COOK
- .7 ALUMINUM DOME FANS – TYPE ADF
  - .1 SUPPLY AND INSTALL ALUMINUM DOME FAN OF SIZE LISTED IN THE SCHEDULE.
  - .2 FANS SHALL BE MANUFACTURED OF ALUMINUM COMPLETE WITH STANDARD FEATURES:
    - .1 CENTRIFUGAL WHEEL
    - .2 'V' BELT DRIVE WITH 1750 RPM MOTORS OR DIRECT-DRIVE MOTOR
    - .3 REMOVABLE TOP FOR ACCESS TO FAN AND MOTOR
    - .4 CURB CAP AND VIBRATION ISOLATION
  - .3 ACCESSORIES SHALL INCLUDE:
    - .1 BACKDRAFT DAMPER
    - .2 BIRDGUARD
    - .3 18" (450 MM) HIGH PRE-FABRICATED ROOF CURB (SOUND CURB)
  - .4 DESIGN IS BASED ON COOK
  - .5 ACCEPTABLE PRODUCTS:
    - .1 PENN VENTILATOR
    - .2 COOK
    - .3 GREENHECK

.5 MOTORIZED WEATHER LOUVRE – DESIGNATED MWL

- .1 ALL BLADES SHALL BE STORM TYPE, CENTRE PIVOTED WITH REINFORCING BOSSES AND HAVE A 1/2" (15 MM) DIAMETER PINION OPERATING IN A SELF-LUBRICATING NYLON BEARING. LOUVRE BLADES SHALL HAVE VINYL GASKET TO EFFECT POSITIVE CLOSURE. MOTORIZED LOUVRE SHALL BE FACTORY CONSTRUCTED OF SIZE LISTED IN THE LOUVRE SCHEDULE.
- .2 LOUVRE BLADES SHALL OPERATE BY A CONCEALED DRIVE ARM AT EACH JAMB AND BE COMPLETE WITH 110 VOLT ELECTRIC MOTOR.
- .3 ALL LOUVRES FURNISHED WITH 1/2" (15 MM) MESH, .063" (1.6 MM) DIAMETER WIRE SECURED TO THE EXTRUDED ALUMINUM FRAME AND SILL EXTENSION.
- .4 FINISH TO BE KYNAR 500 OF A COLOUR SELECTED BY THE CONSULTANT AND/OWNER.
- .5 ACCEPTABLE PRODUCTS:
  - .1 E. H. PRICE
  - .2 CONSTRUCTION SPECIALTIES
  - .3 RUSKIN

.6 GAS DETECTION SYSTEM

- .1 SUPPLY GAS DETECTION SYSTEMS AS DESCRIBED HEREIN. SPECIFICATION IS BASED ON CRITICAL ENVIRONMENT TECHNOLOGIES.
- .2 ACCEPTABLE PRODUCTS:
  - .1 CRITICAL ENVIRONMENT TECHNOLOGIES, AS SUPPLIED BY O'DELL ASSOCIATES, 905-681-3901
  - .2 VULCAIN
  - .3 MSA CANADA
- .3 LOADING DOCK MULTI-ZONE SYSTEM – DESIGNATED GDS-1
  - .1 PROGRAMMABLE DIGITAL CONTROLLER: SUPPLY A PROGRAMMABLE, DIGITAL, FOUR (4) CHANNEL, CONTROLLER EQUAL TO CRITICAL ENVIRONMENT TECHNOLOGIES, MODEL FCS-4-M-L, CONTAINING THE FOLLOWING:
    - .1 120 VAC/60 HZ POWER REQUIREMENT
    - .2 PROVIDES 24 VDC POWER TO TRANSMITTERS
    - .3 FOUR (4) 4-20 MA INPUTS FROM ANALOG TRANSMITTERS
    - .4 EIGHT (8) INPUTS FROM DIGITAL TRANSMITTERS
    - .5 EIGHT (8) PROGRAMMABLE RELAY OUTPUTS RATED 5A @ 240 VAC
    - .6 EXTENSIVE ZONING CAPABILITIES
    - .7 PROGRAMMABLE ALARM TIME DELAYS AND MINIMUM FAN RUN TIMES
    - .8 LCD DISPLAY OF GAS, CONCENTRATION AND ALARM STATUS
    - .9 LED ALARM INDICATION (FAULT, LOW, MED, HIGH)
    - .10 AUDIBLE ALARM RATED 90 DB @ 10 FEET
    - .11 ACKNOWLEDGE/SILENCE BUTTON
    - .12 COMPLETELY FIELD PROGRAMMABLE
    - .13 AUTOMATED CALIBRATION MAINTENANCE. ONE PUSHBUTTON ACHIEVES "AUTO ZERO" AND "AUTO SPAN"
    - .14 DIGITAL PUSHBUTTON SELECTION OF CALIBRATION GAS CONCENTRATION
    - .15 CSA/UL AND CE CERTIFICATIONS
    - .16 STROBE ALARM LIGHT
  - .2 TWO (2) CET MODEL CGS-D-CO-NO2 GAS SENSOR/TRANSMITTER:
    - .1 4-20 MA ANALOGUE OR 0 – 10 VDC OUTPUT SIGNALS
    - .2 COMPLETE WITH OPTIONAL PROTECTIVE GUARD
    - .3 FACTORY CALIBRATED TO A RANGE OF 0 – 200 PPM.
    - .4 COMMUNICATES DIGITALLY WITH PDC PANEL ON 4-WIRE DAISY CHAIN NETWORK
- .3 INSTALLATION OF ALL CONTROL WIRING OF ALL SENSORS IS BY MECHANICAL CONTRACTOR
- .4 POWER WIRING TO CONTROLLER BY ELECTRICAL CONTRACTOR
- .5 SENSOR DETECTION SUPPLIER SHALL CALIBRATE, PROGRAM AND TEST ALL EIGHT (8) SENSORS AND BOTH CONTROLLERS. PROVIDE COMPLETE START-UP REPORT TO CONSULTANT. ASSIST ELECTRICAL CONTRACTOR IN WIRING OF SENSORS.
- .6 INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND ALL APPLICABLE CODES AND REGULATIONS.
- .7 CHECK FINAL LOCATION WITH CONSULTANT, IF DIFFERENT FROM INDICATED LOCATION, PRIOR TO INSTALLATION. SHOULD DEVIATIONS BEYOND ALLOWABLE TOLERANCES ARISE FOLLOW CONSULTANT'S DIRECTIVE.
- .8 PROVIDE FOR TESTING AND COMMISSIONING TO DEMONSTRATE OPERATION TO SATISFACTION OF CONTRACT ADMINISTRATOR.
- .9 START-UP COMMISSIONING AND CALIBRATION MUST BE CONDUCTED BY PERSONNEL AUTHORIZED BY CRITICAL ENVIRONMENT TECHNOLOGIES. REPORT SHALL BE PROVIDED.
- .10 PROVIDE START-UP REPORT TO CONTRACT ADMINISTRATOR

.7 ELECTRIC UNIT HEATERS

- .1 UNIT TO BE VERTICAL FLOW (DOWN DISCHARGE), HUNG FROM EXISTING ROOF STRUCTURE.
- .2 CABINET TO BE 18 GAUGE STEEL COMPLETE WITH PHOSPHATE UNDERCOAT FOR CORROSION RESISTANCE. FINISH IS A TWO-TONE GRAY POLYESTER POWDER COAT.
- .3 LOUVRES SHALL BE INDIVIDUALLY ADJUSTABLE.
- .4 HEATING ELEMENTS SHALL BE CORROSION-RESISTANT STEEL FINS, FURNACE BRAZED TO A TUBULAR HEATING ELEMENT ASSEMBLY ASSURING LONG LIFE AND SUPERIOR HEAT TRANSFER.
- .5 FAN MOTOR SHALL BE TOTALLY ENCLOSED AND RATED FOR CONTINUOUS DUTY WITH BUILT-IN THERMOSTAT CUT-OUT AND SHALL OPERATE ON THE SAME VOLTAGE AS THE HEATING CIRCUIT.
- .6 FAN SHALL BE PULL-THROUGH ACROSS HEATING ELEMENT.
- .7 UNIT SHALL BE COMPLETE WITH:
  - .1 INTEGRAL 24V CONTROL TRANSFORMER
  - .2 HEAVY DUTY MAGNETIC CONTACTORS
  - .3 LINEAR THERMAL CUT-OUTS
  - .4 THERMOSTAT KIT
  - .5 DISCONNECT SWITCH KIT.
- .8 DESIGN IS BASED ON CHROMALOX
- .9 ACCEPTABLE PRODUCTS
  - .1 CHROMALOX
  - .2 TRAN
  - .3 P.M. WRIGHT
  - .4 OUELLET

6. TEMPERATURE CONTROLS

.1 GENERAL:

- .1 THE SUB-CONTRACTOR UNDER THIS HEADING SHALL FURNISH ALL MATERIALS, EQUIPMENT AND SUPERVISION FOR THE PROPER INSTALLATION OF A SYSTEM OF AUTOMATIC TEMPERATURE CONTROLS. THIS INCLUDES ALL THERMOSTATS, RELAYS, AND VALVES.
- .2 APPROVED CONTRACTORS:
  - .1 LANDIS & STAEFA
  - .2 HONEYWELL
  - .3 JOHNSON
- .3 SERVICE AND GUARANTEE:
  - .1 THE CONTROL SYSTEM SPECIFIED HEREIN SHALL BE FREE FROM DEFECTS IN WORKMANSHIP AND MATERIALS UNDER NORMAL USE AND SERVICE. IF WITHIN TWENTY FOUR (24) MONTHS FROM THE DATE OF ACCEPTANCE BY THE OWNER, ANY OF THE EQUIPMENT HEREIN SPECIFIED IS PROVED TO BE DEFECTIVE IN WORKMANSHIP OR MATERIAL, IT WILL BE REPLACED AT NO COST TO THE OWNER.
  - .2 AFTER COMPLETION OF THE ORIGINAL TEST OF THE INSTALLATION AND ACCEPTANCE BY THE CONTRACT ADMINISTRATOR AND OWNER, PROVIDE ANY SERVICE INCIDENTAL TO THE PROPER PERFORMANCE OF THE TEMPERATURE CONTROL SYSTEM UNDER GUARANTEE OUTLINE ABOVE FOR THE PERIOD OF TWO (2) YEAR.
  - .3 AFTER COMPLETION OF THE INSTALLATION, REGULATE AND ADJUST ALL THERMOSTATS, CONTROL VALVES, MOTORS AND OTHER EQUIPMENT, AND PLACE THEM IN COMPLETE OPERATING CONDITION, SUBJECT TO THE APPROVAL OF THE CONSULTANT.

.2 THERMOSTATS:

- .1 THERMOSTATS: INSTALL WALL MOUNTED THERMOSTAT AT 5'-6" (1675 MM) ABOVE FLOOR WHERE INDICATED ON THE DRAWING. THERMOSTAT SHALL BE COMPLETE WITH AN INSULATED SUB-BASE REQUIRED WHERE THERMOSTATS ARE LOCATED ON EXTERIOR WALLS.

.3 MECHANICAL SEQUENCE OF OPERATIONS

- .1 EXHAUST FAN EF-1,2,3,4,5 / WALL LOUVER WL-1:
  - .1 MECHANICAL CONTRACTOR TO INTERLOCK EACH OF EF-1,2,3,4 & 5 TO WALL LOUVER WL-1 SO THAT WL-1 OPENS WHEN ANY OF THE EXHAUST FANS ARE OPERATING.
  - .2 WL-1 IS CLOSED IF NO EXHAUST FANS ARE OPERATING
- .2 EXHAUST FAN EF-6:
  - .1 MECHANICAL CONTRACTOR TO INSTALL AND WIRE GAS SENSORS TO GAS DETECTOR.
  - .2 MECHANICAL CONTRACTOR SHALL INTERLOCK EF-6, WL-2 AND WL-3 TO GAS DETECTOR. WHEN THE GAS DETECTOR DETECTS ANY UNSAFE CONDITION ABOVE 50PPM CO, EF-6 STARTS AND WL-2 & WL-3 OPENS. WHEN THE GAS DETECTOR SENSOR CO LEVELS BELOW 50 PPM, EF-6 STOPS AND WL-2 & WL-3 CLOSE.

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No.	DATE	REVISIONS	INITIAL	SIGNED
5	JAN 12/24	ISSUED FOR TENDER	MWW	
4	JAN 10/24	ISSUED FOR FINAL APPROVAL	MWW	
3	NOV 20/23	100% DESIGN SUBMISSION	MWW	
2	OCT 26/23	REISSUED 70% DESIGN SUBMISSION	MWW	
1	JULY 18/23	70% DESIGN SUBMISSION	MWW	

TORONTO

LICENSED PROFESSIONAL ENGINEER
M. W. WICKHAM
Apr 19/24
PROVINCE OF ONTARIO

SOLID WASTE MANAGEMENT SERVICES

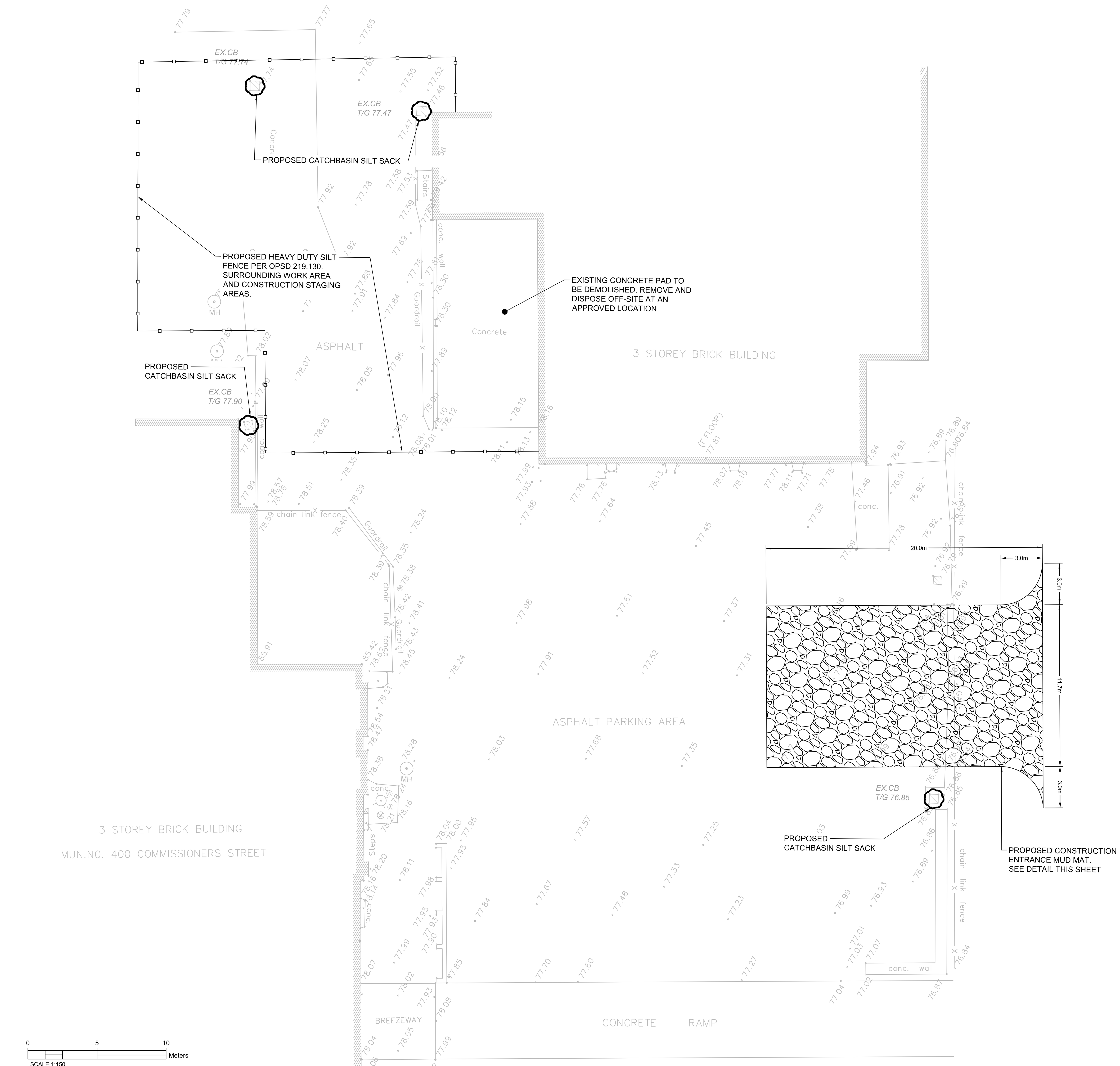
MATT KELIHER
GENERAL MANAGER
SOLID WASTE MANAGEMENT SERVICES

MATTHEW CASCHERA
DIRECTOR
INFRASTRUCTURE AND RESOURCE MANAGEMENT

COMMISSIONERS TRANSFER STATION
MRF BUILDING UPGRADES
400 COMMISSIONER STREET, TORONTO, ONTARIO M4M 3K2

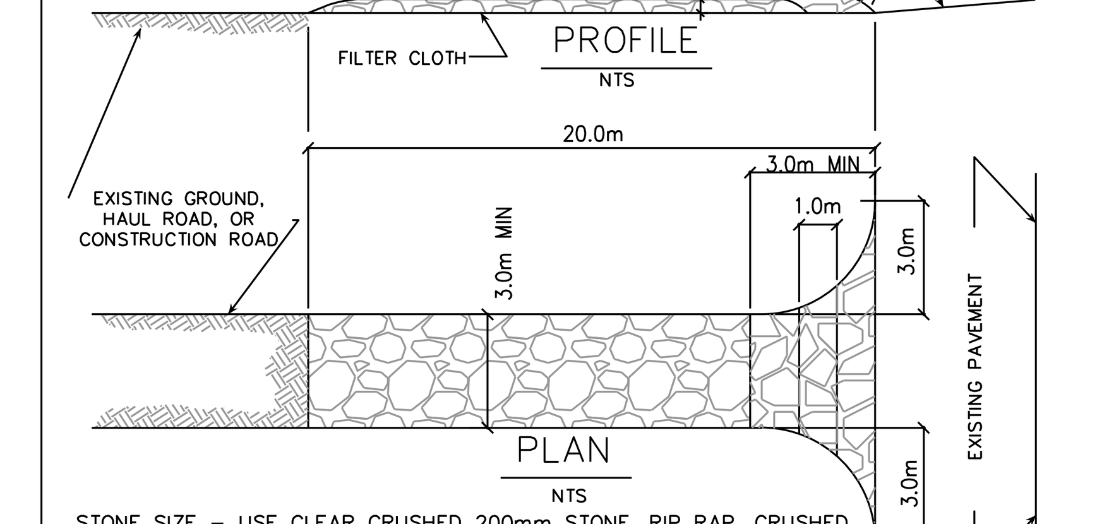
MECHANICAL SPECIFICATIONS

DESIGN:	EK	DRAFTING:	DGC	CHECK:	MWW	CONTRACT No.	23SWM-IRM-026CDU
SCALE:	AS NOTED	DRAWING NUMBER:	1601-2023-3-23	M3			
DATE:	JULY 18, 2023						



LEGEND:

- SILT SACK
- MUD MAT
- SILT FENCE



STONE SIZE – USE CLEAR CRUSHED 200mm STONE, RIP RAP, CRUSHED CONCRETE OR STEEL GRATING AS APPROVED BY THE MUNICIPALITY

LENGTH – AS REQUIRED, BUT NOT LESS THAN 15m

THICKNESS – NOT LESS THAN 300mm.

WIDTH – 3m MINIMUM, BUT NOT LESS THAN THE WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURES.

FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE.

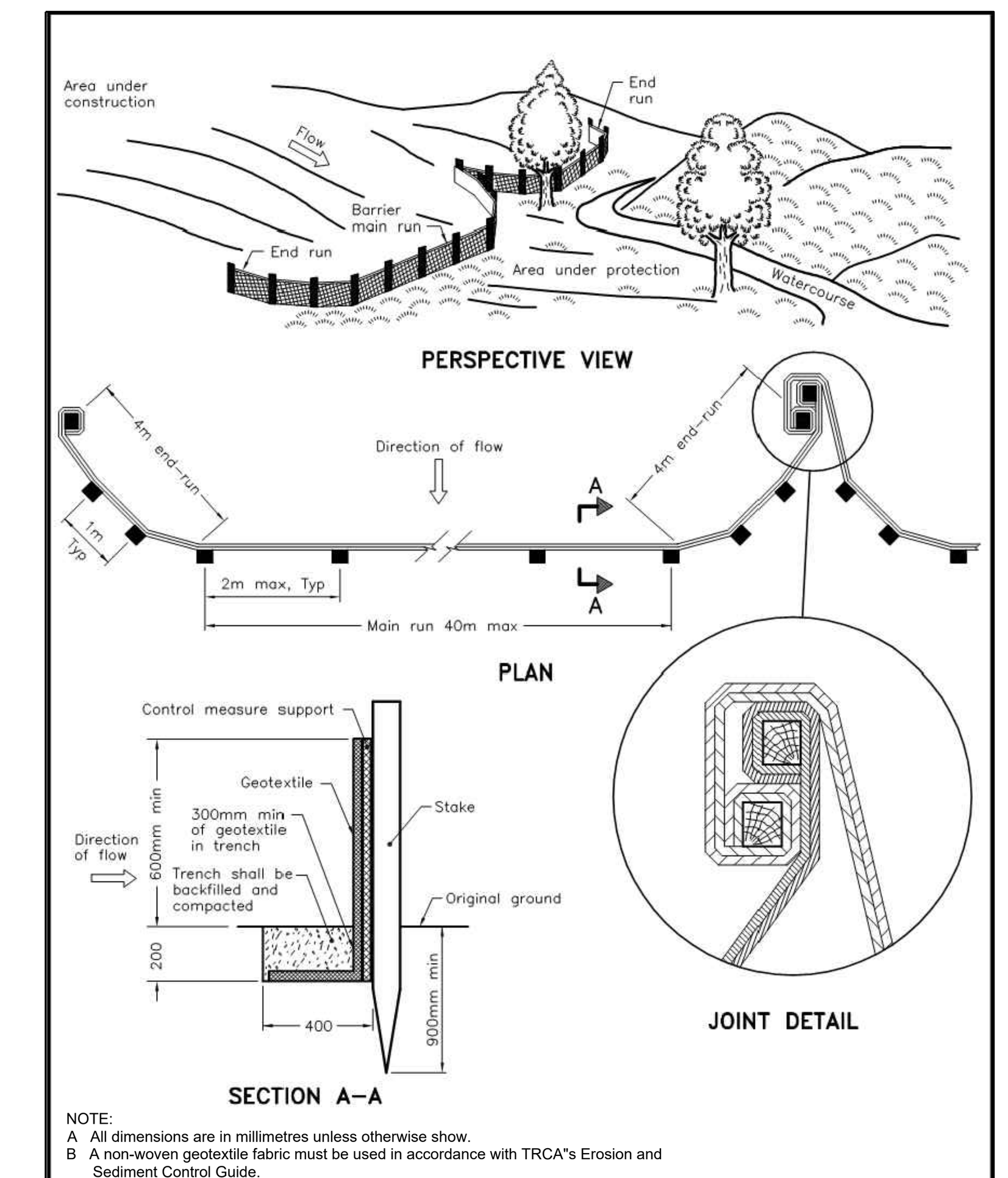
MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PRIVATELY OWNED LANDS AND PUBLIC RIGHT–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PRIVATELY OWNED LANDS AND PUBLIC RIGHT–OF WAY WAY MUST BE REMOVED IMMEDIATELY.

WASHING – WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT–OF–WAY AND PRIVATELY OWNED LANDS. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

STONE MUD MAT DETAIL (TYP)

N.T.S.



NOTE:
A All dimensions are in millimetres unless otherwise show.
B A non-woven geotextile fabric must be used in accordance with TRCA"s Erosion and Sediment Control Guide.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2
HEAVY–DUTY SILT FENCE BARRIER	OPSD 219.130	

TRCA STANDARD NOTES:

1. EROSION AND SEDIMENT CONTROL (ESC) MEASURES WILL BE IMPLEMENTED PRIOR TO, AND MAINTAINED DURING THE CONSTRUCTION PHASES, TO PREVENT ENTRY OF SEDIMENT INTO THE WATER. ALL DAMAGED EROSION AND SEDIMENT CONTROL MEASURES SHOULD BE REPAIRED AND/OR REPLACED WITHIN 48 HOURS OF THE INSPECTION.
2. DISTURBED AREAS WILL BE MINIMIZED TO THE EXTENT POSSIBLE, AND TEMPORARILY OR PERMANENTLY STABILIZED OR RESTORED AS THE WORK PROGRESSES.
3. THE EROSION AND SEDIMENT CONTROL STRATEGIES OUTLINED ON THE PLANS ARE NOT STATIC AND MAY NEED TO BE UPGRADED/AMENDED AS SITE CONDITIONS CHANGE TO MINIMIZE SEDIMENT LADEN RUNOFF FROM LEAVING THE WORK AREAS. IF THE PRESCRIBED MEASURES ON THE PLANS ARE NOT EFFECTIVE IN PREVENTING THE RELEASE OF A DELETERIOUS SUBSTANCE, INCLUDING SEDIMENT, THEN ALTERNATIVE MEASURES MUST BE IMPLEMENTED IMMEDIATELY TO MINIMIZE POTENTIAL ECOLOGICAL IMPACTS. TRCA ENFORCEMENT OFFICER SHOULD BE IMMEDIATELY CONTACTED. ADDITIONAL ESC MEASURES TO BE KEPT ON SITE AND USED, AS NECESSARY.
4. AN ENVIRONMENTAL MONITOR WILL ATTEND THE SITE TO INSPECT ALL NEW CONTROLS IMMEDIATELY AFTER INSTALLATION. INSPECTION OF ESC MEASURES TO BE WILL OCCUR, AT MINIMUM:
   - ON A WEEKLY BASIS;
   - PRIOR TO SIGNIFICANT RAINFALL EVENTS (MINIMUM PREDICTED 25MM OVER 24 HOURS);
   - AFTER EVERY RAINFALL/SNOWMELT EVENT; AND
   - DAILY DURING EXTENDED RAINFALL PERIODS.

   INSPECTIONS WILL FOCUS ON MEASURES RELATED TO EROSION AND SEDIMENT CONTROLS, DEWATERING OR UNWATERING, RESTORATION AND IN- OR NEAR-WATER WORKS. SHOULD CONCERNS ARISE ON SITE THE ENVIRONMENTAL MONITOR WILL CONTACT THE TRCA ENFORCEMENT OFFICER AS WELL AS THE PROPONENT.
5. ALL ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, WILL BE CONTROLLED TO PREVENT THE ENTRY OF PETROLEUM PRODUCTS, DEBRIS, RUBBLE, CONCRETE OR OTHER DELETERIOUS SUBSTANCES INTO THE WATER. VEHICULAR REFUELING AND MAINTENANCE WILL BE CONDUCTED A MINIMUM OF 30 METRES FROM THE WATER.
6. ALL GRADES WITHIN THE REGULATORY FLOOD PLAIN WILL BE MAINTAINED OR MATCHED.
7. THE PROPONENT/CONTRACTOR SHALL MONITOR THE WEATHER SEVERAL DAYS IN ADVANCE OF THE ONSET OF THE PROJECT TO ENSURE THAT THE WORKS WILL BE CONDUCTED DURING FAVOURABLE WEATHER CONDITIONS. SHOULD AN UNEXPECTED STORM ARISE, THE CONTRACTOR WILL REMOVE ALL UNFIXED ITEMS FROM THE REGIONAL STORM FLOOD PLAIN THAT WOULD HAVE THE POTENTIAL TO CAUSE A SPILL OR AN OBSTRUCTION TO FLOW, E.G., FUEL TANKS, PORTA POTTIES, MACHINERY, EQUIPMENT, CONSTRUCTION MATERIALS, ETC.
8. PLEASE NOTIFY THE FOLLOWING CONTACTS 48 HOURS PRIOR TO COMMENCING CONSTRUCTION: TRCA ENFORCEMENT (T: 437-880-2124; E: INSPECTIONS@TRCA.CA) AND TRCA INFRASTRUCTURE PLANNING AND PERMITS AT (T: 416-667-6280; E: INFRASTRUCTUREPLANNINGPERMITS@TRCA.CA). PLEASE ENSURE YOU QUOTE THE CFN OR PERMIT NUMBER IN YOUR NOTIFICATION.
9. AN ENVIRONMENTAL MONITOR WILL BE ON SITE, AND PROVIDE ADVICE, TO ENSURE THAT ACTIVITIES THAT COULD HAVE A NEGATIVE IMPACT TO THE NATURAL ENVIRONMENT ARE EFFECTIVELY MITIGATED AS CONSTRUCTION PROCEEDS. THE ENVIRONMENTAL MONITOR SHALL NOTIFY THE TRCA ENFORCEMENT OFFICER AND PROJECT MANAGER IF ISSUES ARISE.

EROSION AND SEDIMENT CONTROL NOTES:

1. CONTRACTOR TO INSTALL EROSION CONTROL MEASURES AS SHOWN AND MAINTAIN IN GOOD CONDITION UNTIL CONSTRUCTION IS COMPLETED.
2. ALL SILT FENCING TO BE INSTALLED PRIOR TO ANY AREA GRADING, EXCAVATING OR DEMOLITION COMMENCING.
3. EROSION PROTECTION TO BE PROVIDED AROUND ALL STORM CATCH BASINS AND CATCH BASIN MANHOLES.
4. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED AS THE PROJECT PROGRESSES. CONTRACTOR TO PROVIDE ALL ADDITIONAL EROSION CONTROL STRICTURES.
5. EROSION CONTROL STRUCTURES TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN RE-STABILIZED.
6. NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THE CONTRACT ADMINISTRATOR.
7. CONTRACTOR TO CLEAN ROADWAY AND SIDEWALKS OF SEDIMENTS RESULTING FROM CONSTRUCTION TRAFFIC FROM THE SITE EACH DAY.
8. CONTRACTOR MUST REMOVE EROSION AND SEDIMENTATION FENCING PRIOR TO COMPLETION OF PROJECT.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL AND HAVE APPROPRIATE EQUIPMENT ON THE SITE TO IMPLEMENT DUST CONTROL MEASURES AT THE DISCRETION OF THE CONTRACT ADMINISTRATOR.

E:\BRM\BRM-22026009-A0\60 EXECUTION\65 DRAWINGS\BRM-22026009-A0-ESC01.DWG [ESC1]

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No.	DATE	REVISIONS	INITIAL	SIGNED
3	MAR. 18/2024	RE-ISSUED FOR TENDER	JS	
2	FEB. 12/2024	ISSUED FOR TENDER	JS	
1	NOV. 29/2024	ISSUED FOR REVIEW	JS	

TORONTO

SOLID WASTE MANAGEMENT SERVICES

LICENSED PROFESSIONAL ENGINEER
J. D. STERN
100232894
Mar. 20/2024
PROVINCE OF ONTARIO

MATT KELIHER
GENERAL MANAGER
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MATTHEW CASCHERA
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400 COMMISSIONER STREET, TORONTO, ONTARIO M4M 3K2

EROSION AND SEDIMENT CONTROL PLAN

DESIGN:	JK	DRAFTING:	JK	CHECK:	JS	CONTRACT No.	23SWM-IRM-026CDU
SCALE:	1:150			DRAWING NUMBER:	1601-2023-3-24		ESC1
DATE:	FEBRUARY 12 , 2024						