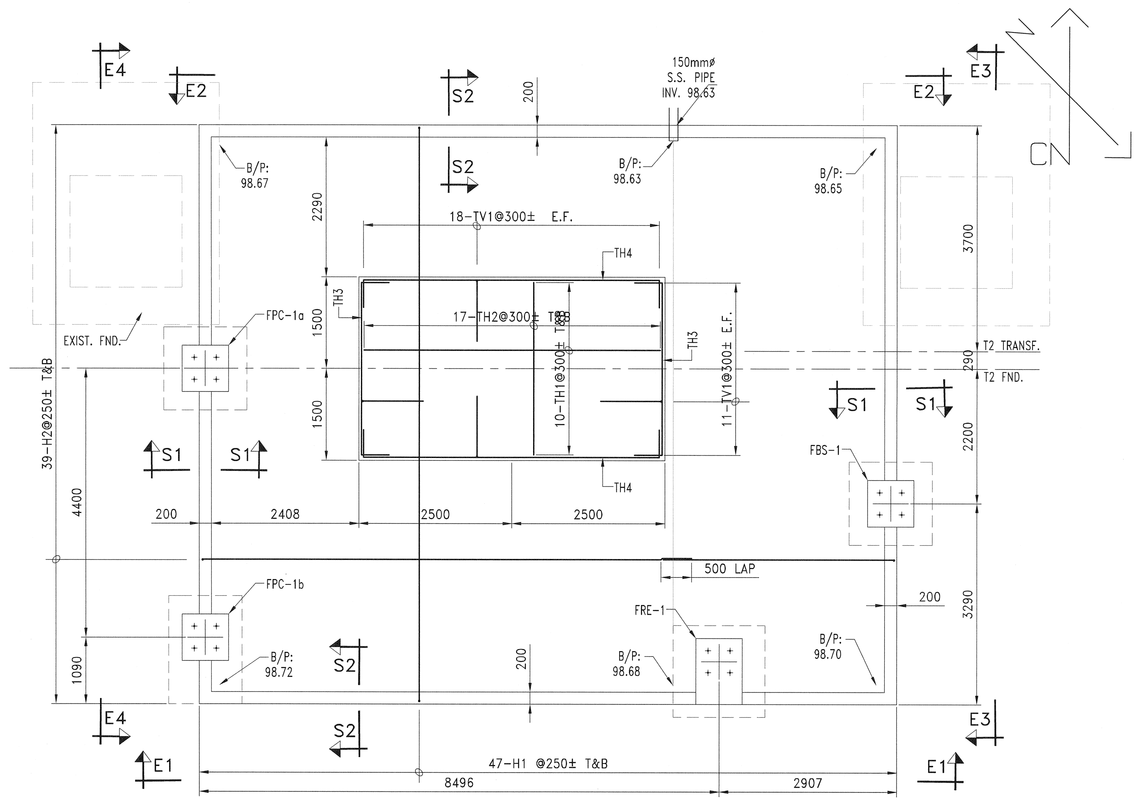
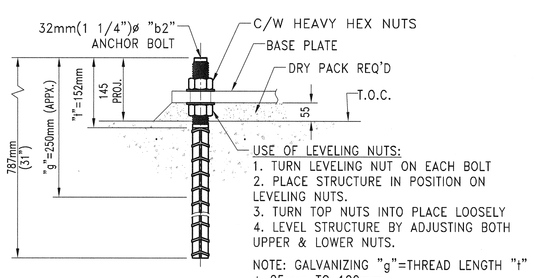


T1 PLAN VIEW

SCALE: 1:50

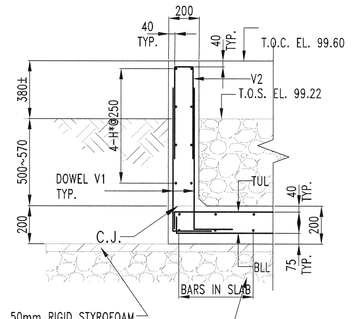


DETAIL D1
ANCHOR BASE & BOLT INSTALLATION SECTION

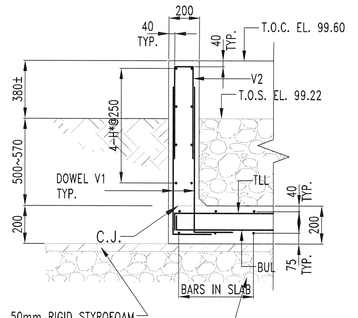
N.T.S.

USE OF LEVELING NUTS:
1. TURN LEVELING NUT ON EACH BOLT
2. PLACE STRUCTURE IN POSITION ON LEVELING NUTS.
3. TURN TOP NUTS INTO PLACE LOOSELY
4. LEVEL STRUCTURE BY ADJUSTING BOTH UPPER & LOWER NUTS.

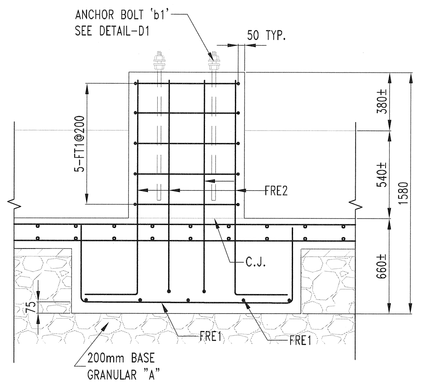
NOTE: GALVANIZING "g"=THREAD LENGTH "f" + 25mm TO 100mm.
LEVELING NUTS, ANCHOR NUTS & LEVELING SHIMS SHALL BE GALVANIZED PER CSA-G164. ANCHOR NUTS & LEVELING NUTS SHALL COMFORM TO CSA B33.1 & INSI B18.22.1, TYPE B.
LEVELING SHIMS SHALL HAVE A MIN. 10,000LB. BREAKING STRENGTH. ANCHOR BOLTS SHALL BE "I" SHAPED



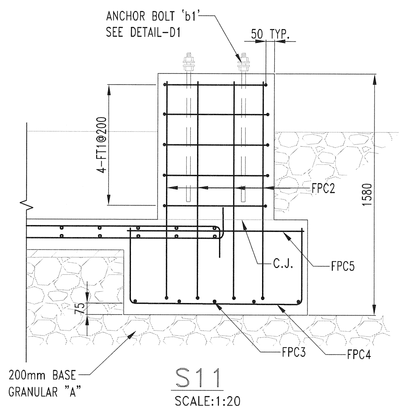
S1
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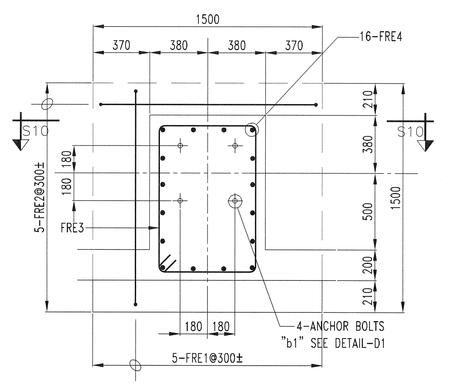
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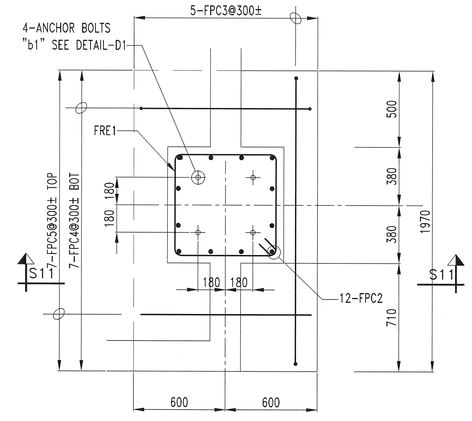
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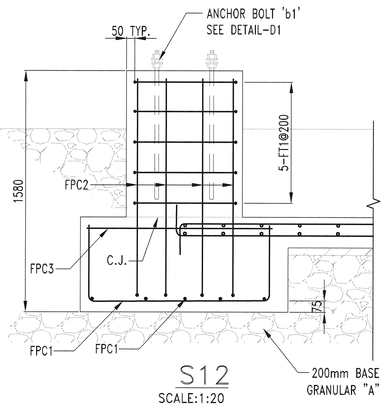
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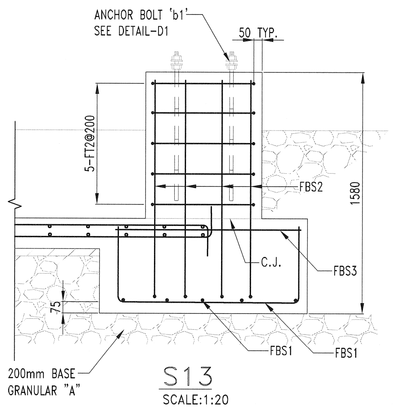
FRE-1
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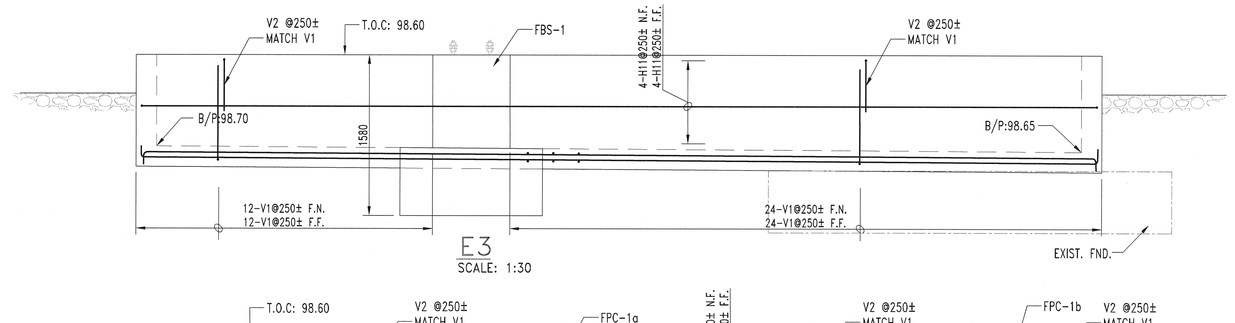
FPC-1b
SCALE:1:20



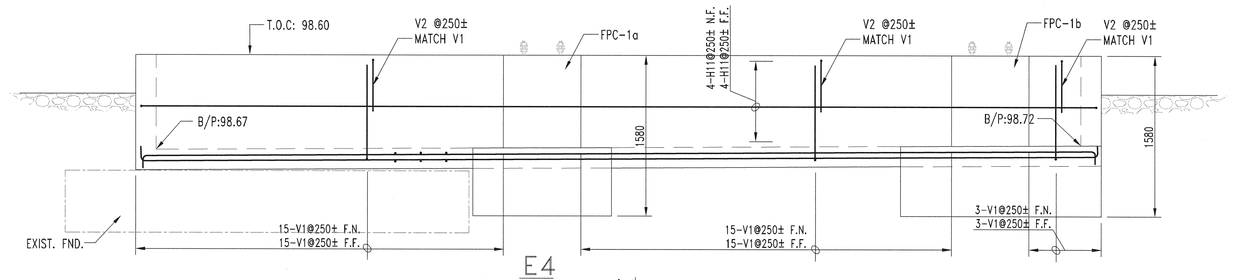
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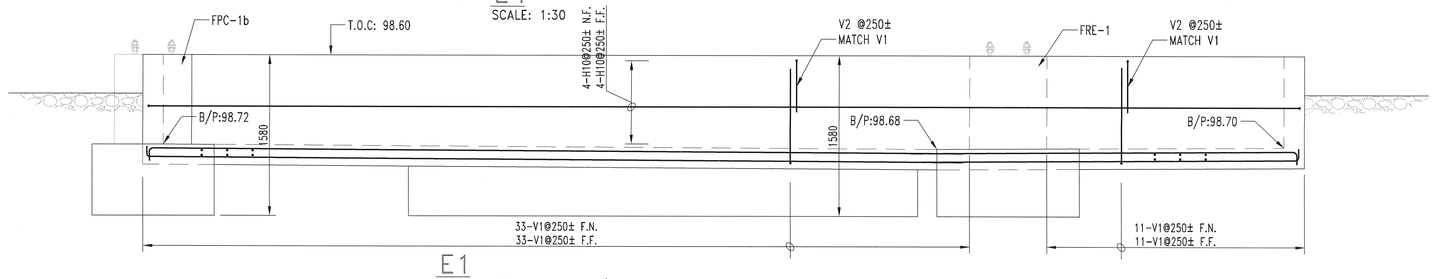
S13
SCALE:1:20



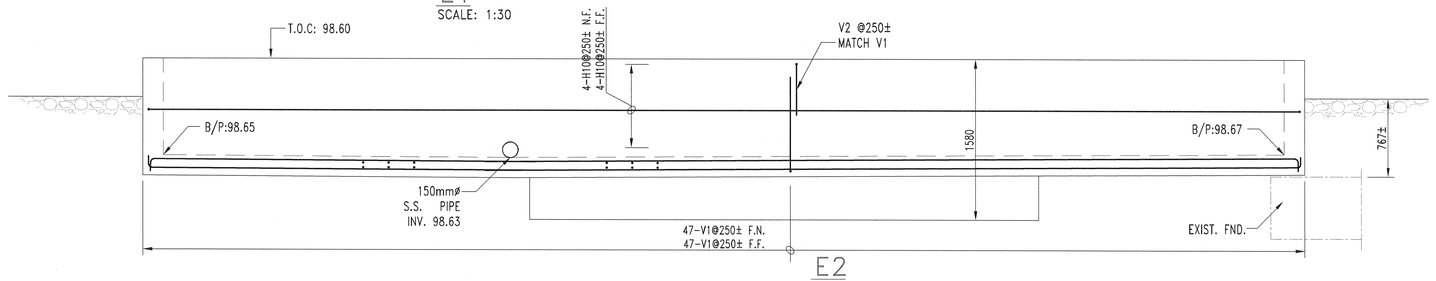
E3
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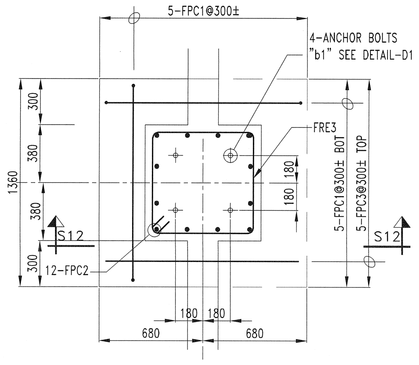
E4
SCALE: 1:30



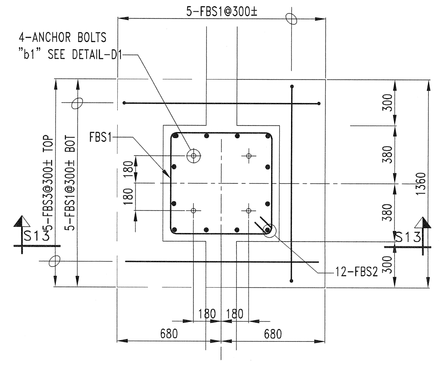
E1
SCALE: 1:30



E2
SCALE: 1:30



FPC-1a
SCALE:1:20



FBS-1
SCALE:1:20

GENERAL NOTES:

1.0 GENERAL REQUIREMENTS

1.1 CONTRACTOR MUST CHECK ALL DIMENSIONS, ELEVATIONS AND CONDITIONS ON SITE AND ADVISE THE ENGINEER OF ALL ERRORS AND DISCREPANCIES BEFORE PERFORMING ANY WORK.

1.2 PRESCRIPTIONS FROM THE ONTARIO BUILDING CODE 2012 APPLY.

1.3 REPRESENTATIVE FROM THE MANDATED SOIL LABORATORY TO CONFIRM THE MINIMUM BEARING CAPACITY AT 150kPa.

2.0 DEMOLITION

2.1 ANY DEMOLITION WORK IN CONTACT WITH AN APPARENT SURFACE OR ONE THAT NEEDS TO BE CONSERVED MUST BE PRECEDED BY DOING A SAW CUT OF 25mm (1 IN.) DEEP.

2.2 THE CONTRACTOR SHALL DEMOLISH ALL EXISTING ELEMENTS REQUIRED ON DRAWINGS IN ORDER TO EXECUTE THE WORK OF THE NEW CONTRACT. ALL NECESSARY MATERIAL, EQUIPMENT AND LABOR SHALL BE MADE AVAILABLE TO EXECUTE THE WORK.

2.3 THE CONTRACTOR SHALL CAREFULLY INSPECT THE SITE TO VIEW AND ASSESS FEATURES AND DIFFICULTIES THAT MIGHT AFFECT THE DEMOLITION WORK. NO EXTRA CHARGE DUE TO A BAD EVALUATION WILL BE ACCEPTED.

2.4 ALL DEMOLISH ELEMENTS SHALL BE TAKEN OUT OF THE SITE DAILY. THEY ARE THE CONTRACTOR'S PROPERTY UNLESS SPECIFIED OTHERWISE BY THE ENGINEER AND/OR OWNER.

2.5 FURNISH AND INSTALL ALL NECESSARY PARTS FOR THE REINFORCEMENT AND SHORING IF NECESSARY. REPAIR ALL DAMAGED WORK AND ASSUME RESPONSIBILITY FOR CORPORAL INJURIES RESULTING FROM THE DEMOLITION WORK.

2.6 EXECUTE ALL DEMOLITION WORK ACCORDING TO THE CSA S350-M1980 (R2003) "CODE OF PRACTICE FOR SAFETY IN DEMOLITION OF STRUCTURES" & LOCAL REGULATIONS.

2.7 THE CONTRACTOR SHALL INSURE THAT THE INTEGRITY OF THE STRUCTURAL ELEMENTS DURING DEMOLITION, IS NOT COMPROMISED.

3.0 EXCAVATION AND BACKFILL

3.1 EXCAVATION MUST BE LEVELED, MADE UP OF DRY UNDISTURBED SOIL AND FREE OF ORGANIC OR LOOSE MATERIAL. DISTURBED SOIL SHALL BE REMOVED FROM UNDER FOOTINGS BY USING HAND SHOVELS.

3.2 ALL EXCAVATIONS IN EXCESS SHALL BE BACKFILLED BY THE CONTRACTOR WITH IN COMPLIANCE WITH THE STANDARDS OF THE GRANULAR "A" BACKFILL ONTARIO. IT SHALL BE COMPACTED TO 98% OF THE TRANSPORTATION MINISTRY PROCTOR VALUE IN 150mm LAYERS. AT THE OPTION OF THE CONTRACTOR, LEAN CONCRETE CAN BE USED UNDER FOOTINGS.

3.3 ALL EXCAVATION SHALL BE APPROVED BY THE MANDATED SOIL LABORATORY REPRESENTATIVE.

3.4 THE BOTTOM OF THE EXCAVATIONS SHALL REMAIN DRY AT ALL TIMES.

3.5 ANY BACKFILLING SHALL BE PERFORMED SIMULTANEOUSLY ON BOTH SIDES OF WALLS OR OTHER STRUCTURAL ELEMENTS IN ORDER TO HAVE BALANCED ANY EARTH PRESSURES. WHERE REQUIRED, BACKFILL TYPE GRANULAR 'A' TO FILL ANY EMPTY SPACE BETWEEN FOUNDATION AND NATURAL SOIL. INSTALLATION OF ANY BACKFILL SHALL BE DONE FOLLOWING THE GEOTECHNICAL LABORATORY RECOMMENDATIONS.

3.6 THE CONTRACTOR HAS OVERALL RESPONSIBILITY DURING CONSTRUCTION OF THE STABILITY OF EXISTING FOUNDATIONS BESIDE THE NEW FOUNDATION.

4.0 REINFORCEMENT

4.1 REINFORCEMENT STEEL SHALL CONFORM TO CSA STANDARD G30.18 M1992 LATEST EDITION, GRADE fy= 400 MPa.

4.2 UNLESS OTHERWISE INDICATED ON THE DRAWINGS, LAP SPLICES SHALL CONFORM TO CSA STANDARD A23.3-04 DESIGN OF CONCRETE STRUCTURES.

4.3 MINIMUM SPECIFIED CLEAR CONCRETE COVER FOR REINFORCEMENT:

.1 CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH (EX. FOOTING): 75mm (3 IN.)

.2 CONCRETE EXPOSED TO EARTH AND WEATHER:
WHEN REBAR IS 20mm OR LESS : 40mm (1½ IN.)
WHEN REBAR IS >20mm : 50mm (2 IN.)

4.4 THE CONTRACTOR SHALL SUBMIT FIVE (5) COPIES OF SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL. SHOP DRAWINGS SHALL CLEARLY INDICATE BAR DIMENSIONS, BENDING DETAILS, SPACING, PLACEMENTS AND QUANTITIES OF REINFORCEMENT, SPACERS AND SUPPORTS.

5.0 CAST-IN-PLACE CONCRETE

5.1 ALL CONCRETE WORK, FORMWORK AND REINFORCEMENT WORK SHALL CONFORM TO CSA STANDARD CAN3-A23.1 LATEST EDITION.

5.2 THE CONCRETE SHALL MEET THE FOLLOWING REQUIREMENTS

.1 COMPRESSIVE STRENGTH AT 28 DAYS
– SPILL CONTAINMENT PIT (SLAB, CURB & FIREWALL FOOTINGS): 35MPa
– FOOTINGS COMBINED WITH CURB OR IN THE PITS : 35MPa
– OIL WATER SEPARATOR: 35MPa
– OTHER FOOTINGS : 25MPa

.2 SLUMP: 100mm MAX. (4 IN.)

.3 AIR ENTRAINMENT: 5% TO 8%.
(FOR EXPOSED CONCRETE ONLY)

.4 AGGREGATES: 19mm (3/4 IN.)

5.3 TOUCH UP THE FINISHED SURFACES USING A NON-SHRINK GROUT APPROVED BY THE ENGINEER.

5.4 PUT ALL INSERTS IN CONCRETE REQUIRED AND APPROVED BY THE ENGINEER, ACCORDING TO THE CONCEPTUAL DRAWINGS.

5.5 CHAMFER ALL EXPOSED CORNERS TO 150mm BELOW FINAL GRADE 25mmX45deg.

6.0 CONCRETE FORMWORK

6.1 REFERENCE STANDARDS

.1 UNLESS OTHERWISE INDICATED, CONSTRUCT THE FORMWORK IN CONFORMANCE WITH CSA STANDARD CAN3-A23.1-04 AND CAN/CSA-S269.3-M92 (R2008)

.2 UNLESS OTHERWISE INDICATED, CONSTRUCT THE FALSEWORK IN CONFORMANCE WITH CSA STANDARD S269.1(R2016) "FALSEWORK AND FORMWORK" AND ALL APPLICABLE CODES IN THE PROVINCE OF ONTARIO.

.3 UNLESS OTHERWISE INDICATED, CONSTRUCT THE SCAFFOLDING IN CONFORMANCE WITH CSA STANDARD CAN/CSA-269.2-M87(R2003).

6.2 MATERIAL

.1 FOR ALL EXPOSED SURFACES, USE NEW PLYWOOD AND LUMBER CONFORMING TO CSA STANDARD CAN3-A23.1-04 FORMWORK FOR NON EXPOSED SURFACES SHALL BE IN A CONDITION ACCEPTABLE BY THE ENGINEER. (EXAMPLE: PANELS WITH ROUNDED EDGES OR DAMAGED SURFACED, WILL BE REJECTED).

.2 FORM RELEASE AGENT: COLORLESS MINERAL OIL. FREE OF KEROSENE, WHOSE VISCOSITY RANGES FROM 15 TO 24 mm.sqr./s (70 TO 110 UNIVERSAL SAYBOLT SECONDS) AT A TEMPERATURE OF 40°C AND WHOSE FLASH POINT (OPEN CONTAINER) IS 150°C MINIMUM.

.3 WOOD FORM TIES: REMOVABLE OR SNAP-OFF METAL TIES OF FIXED LENGTH OR ADJUSTABLE. THE TIES ARE DESIGNED SPECIALLY TO BE CUT 25mm (1 IN.) FROM THE INTERIOR OF THE CONCRETE SURFACE.

7.0 CONCRETE FOOTINGS

.1 THE FOOTINGS SHALL BE WATERPROOFED WITH "HYDROZO 100" BY DEGUSSA OR EQUIVALENT. THE WATERPROOFING MATERIAL SHALL BE APPLIED TO ALL VISIBLE VERTICAL AND HORIZONTAL SURFACES. PREPARE THE SURFACES AND APPLY THE AGENT PER MANUFACTURER RECOMMENDATIONS.

BILL OF MATERIAL OF CONCRETE AND STEEL REINFORCING

TOTAL VOL. OF CONC (m³)	ITEM'NAME	REINFORCING STEEL FOR ONE FOUNDATION												
		H (mm)	MARK	REQ'D	SIZE	LENGTH (mm)	TYPE	DIMENSIONS A	B	C	D	E	G	H
54	CONTAINMENT PIT FOR T1	VAR. 1080± TO 1580±	H1	94	10M	9620	17		120	9380	120			
			H2	78	10M	11540	17		120	11300	120			
			V1	320	10M	1050	17		250	970				
			V2	160	10M	1320	17		600	120	600			
			H10	16	10M	11700	17		200	11300	200			
			H11	16	10M	9600	17		120	9360	120			
			TV1	58	25M	3410	17		1000	1410	1000			
			TH1	22	25M	2900	–			2900				
			TH2	36	25M	4900	–			4900				
			TH3	12	25M	3530	17		340	2850	340			
	TOTAL 1		TH4	12	25M	5530	17		340	4850	340			

NOTE: LAP FOR 10M IS 500mm, IF REQUIRED.

BILL OF MATERIAL OF CONCRETE AND STEEL REINFORCING

TOTAL VOL. OF CONC (m³)	ITEM'NAME	REINFORCING STEEL FOR ONE FOOTING (FRE-1)												
		H (mm)	MARK	REQ'D	SIZE	LENGTH (mm)	TYPE	DIMENSIONS A	B	C	D	E	G	O
	FRE-1	1580	FRE1	12	25M	2600	17		610	1380	610			
			FRE2	16	25M	1880	17		340	1540				
	TOTAL 1		FT1	5	10M	3480	T1	100	660	980	660	980	100	

BILL OF MATERIAL OF CONCRETE AND STEEL REINFORCING

TOTAL VOL. OF CONC (m³)	ITEM'NAME	REINFORCING STEEL FOR ONE FOOTING												
		H (mm)	MARK	REQ'D	SIZE	LENGTH (mm)	TYPE	DIMENSIONS A	B	C	D	E	G	O
	FPC-1a	1580	FPC1	10	25M	2280	17		520	1240	520			
			FPC2	12	25M	1780	17		340	1440				
			FPC3	5	25M	1300	–			1300				
	TOTAL 1		FT2	5	10M	2840	T1	100	660	660	660	660	100	

BILL OF MATERIAL OF CONCRETE AND STEEL REINFORCING

TOTAL VOL. OF CONC (m³)	ITEM'NAME	REINFORCING STEEL FOR ONE FOOTING (FPC-2b)												
		H (mm)	MARK	REQ'D	SIZE	LENGTH (mm)	TYPE	DIMENSIONS A	B	C	D	E	G	O
	FPC-1b	1580	FPC3	12	25M	3170	17		670	1830	670			
			FPC4	7	25M	2600	17		670	1260	670			
			FPC5	7	25M	1500	–			1400				
			FPC2	14	25M	1780	17		340	1440				
	TOTAL 1		FT2	5	10M	2840	T1	100	660	660	660	660	100	

BILL OF MATERIAL FOR BOLTS FOR FOUNDATION IN PIT T1

MARK	QUANT	DESCRIPTION	MATERIAL	LENGTH(mm)	WEIGHT(kg)	REMARK
b1	16	ANCHOR BOLTS, WASHER AND NUTS, 32mmø(1¼")	G30.12-M GRADE 300	787 (31")	–	GALV.

BOM FOR REFERENCE ONLY

REFERENCE DRAWINGS:

1. 115/13.8kV STATION
   FOUNDATION KEY PLAN & LIST
   FOUNDATION ---------- F1731664-100-F001
2. GENERAL LAYOUT & DETAIL---- 1796-D-C1
3. 115/13.8kV STATION
   DRAINAGE & SPILL CONTAINM. SYSTEM
   PLAN & DETAILS
   CIVIL ---------- F1731664-075-C001
4. 115/13.8kV STATION
   BASIC LAYOUT
   ELECTRICAL ARRANGEMENT----- F1731664-300-EA001

LEGEND:

1. T.O.C: TOP OF CONCRETE
2. FND: FOUNDATION
3. C.C.: CONCRETE CLEAR COVER
4. C.J.: CONSTRUCTION JOINT
5. B.&T.: BOTTOM & TOP
6. TUL.: TOP UPPER LAYER
7. BLL.: BOTTOM LOWER LAYER
8. TLL: TOP LOWER LAYER
9. BUL: BOTTOM UPPER LAYER
10. E.F.: EACH FACE
11. N.F.: NEAR FACE
12. F.F.: FAR FACE
13. S.Q.: SQUARE
14. FTG.: FOOTING

EXIT. FND.

KEY PLAN:

PROFESSIONALS:

NO	DATE	TRANSMISSION	BY
00	2018/09/27	RELEASED FOR CONSTRUCTION	SYW

THE S.M. GROUP INTERNATIONAL INC.
62068 Airport rd, Suite 205, Mississauga (Ontario) L4V 1E3
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www.groupesmi.com

STAMP:

LICENSED PROFESSIONAL ENGINEER
S.Y. WANG
100139367
PROVINCE OF ONTARIO

CLIENT:

PROJECT:
MCMASTER UNIVERSITY–NF91

TITLE:
115/13.8kV STATION
SPILL CONTAINMENT PIT FOR 'T1'
PLAN ELEVATIONS & DETAILS
CONC. & REINF. DETAILS ; FOUNDATION

PREPARED BY: Z.WANG	DATE: 2018-09-14
DRAWN BY: Z.WANG	SCALE: 1:100
VERIFIED BY: S.Y. WANG	DICIPLINE: FOUNDATION
APPROVED BY: S.Y. WANG	CAD FILE NAME: F1731664-100-F003.DWG

PROJECT No.: F1731664 | LOT: 100 | DWG. #: F003 | REV.: 00 | PAGE:

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