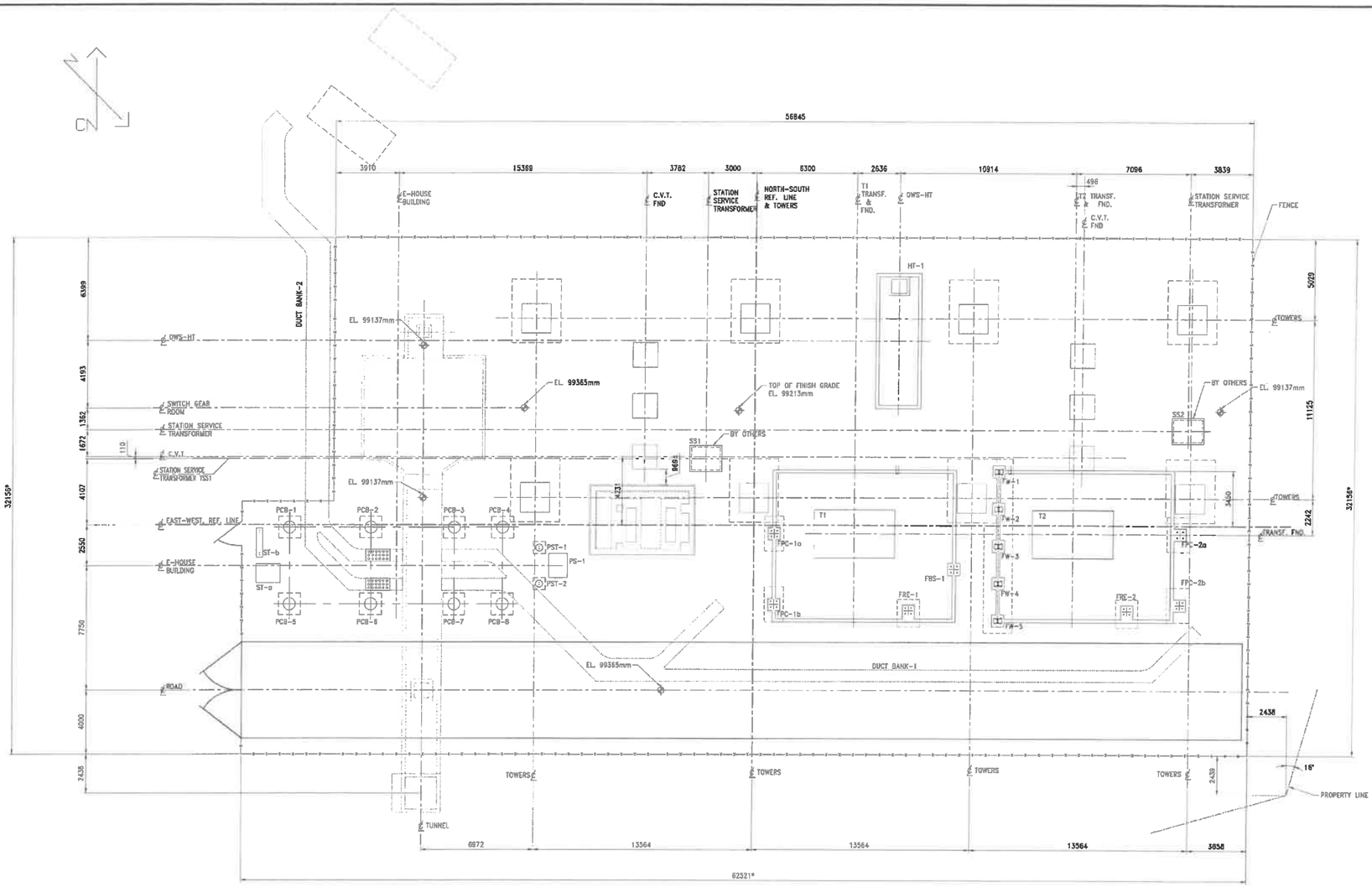


FTG MARK	DESCRIPTION	DETAIL DWG. No.	FTG TYPE	ANCHOR BOLTS QTY	ANCHOR BOLTS TYPE	ANCHOR BOLTS SIZE	REMARKS
PITS FOR "T1&T2"	115kV AREA CONC. & REINF. DETAILS FOUNDATION	F1731664-100-F003 & F004	FORMED	–	–	–	–
FW-1 TO 5	115kV AREA FIREWALL FOUNDATION IN THE PIT FOR "T2" CONC. & REINF. DETAILS FOUNDATION	F1731664-100-F004	FORMED	20	–	1 1/2"ø (38mm) A/B	4-A/B PER FND.
FPC-1a,1b & 2a, 2b	115/13.8kV STATION FOUNDATION FOR POWER CABLE SUPPORTS IN THE PITS CONC. & REINF. DETAILS FOUNDATION	F1731664-100-F003 & F004	FORMED	16	–	1 1/4"ø (32mm) A/B	4-A/B PER FND. 2 FTGS PER FND.
FBS-1	115/13.8kV STATION FOUNDATION FOR BUS SUPPORT IN THE PIT "T1" CONC. & REINF. DETAILS FOUNDATION	F1731664-100-F003	FORMED	4	–	1 1/4"ø (32mm) A/B	4-A/B PER FND
FRE-1&2	115/13.8kV STATION FND FOR NEUTRAL REACTOR BUS SUPP. CONCRETE FTG.	F1731664-100-F003 & F004	FORMED	8	–	1 1/4"ø (32mm) A/B	4-A/B PER FND.
HT-1	115/13.8kV STATION CAST-IN-PLACE OIL WATER SEPARATOR CONC. & REINF. DETAILS FOUNDATION	F1731664-100-F008	FORMED	–	–	–	–

FTG MARK	DESCRIPTION	DETAIL DWG. No.	FTG TYPE	ANCHOR BOLTS QTY	ANCHOR BOLTS TYPE	ANCHOR BOLTS SIZE	REMARKS
DUCT BANK-1 & 2	115/13.8kV STATION DUCT BANKS PLAN, ELEV. & SECTIONS CONC. & REINF. DETAILS FOUNDATION	F1731664-100-F005 & F008	FORMED	–	–	–	–
SS1 & SS2	115/13.8kV STATION VAULTS FOR SUBSTATION SERVICE TRANSFORMER	–	PRE-CAST	–	–	–	BY OTHERS
PCB-1 TO 8	115/13.8kV STATION E-HOUSE BLDG FOOTINGS CONC. & REINF. DETAILS FOUNDATION	F1731664-100-F002	FORMED	8	–	3/4"ø (19mm)	HILTI KB3 3/4" X8 1 A/B PER FTG
PST-1&2	E-HOUSE BLDG FRONT & REAR ENTRANCE PLATFORMS FOOTINGS CONC. & REINF. DETAILS FOUNDATION	F1731664-100-F002	FORMED	4		3/4"ø (19mm)	HILTI HSL-M20/30 2 PER PST
PS-1				–	–	–	–
ST-1a				–	–	–	–
ST-1b				4		3/4"ø (19mm)	HILTI HSL-M20/30 4 PER ST-1b
LINE POST FOOTINGS	115/13.8kV STATION STATION FENCE & FOOTINGS CONC. & DETAILS FOUNDATION	F1731664-100-F007	FORMED	–	–	–	57 LINE POST FTGS REQ'D
CORNER/ GATE POST FOOTINGS				–	–	–	6 CORNER POST FTG REQ'D 2 GATE POST FTGS REQ'D
HOLD BACK FOOTING				–	–	–	1 HOLD BACK FTG REQ'D

NOTES

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
2. DIMENSIONS MARKED WITH "*" HAVE BEEN SOFT CONVERTED TO THE NEAREST MILLIMETER.

REFERENCE DRAWINGS:

1. GENERAL LAYOUT & DETAILS ----------1796-D-C1
2. LAYOUT AND ELEVATIONS ----------1798-D-E4
3. 115/13.8kV STATION STEEL KEY PLAN & LIST STRUCTURE ---F1731664-200-S001
4. 115/13.8kV STATION BASIC LAYOUT ELECTRICAL ARRANGEMENT ---F1731664-300-EA001
5. 115/13.8kV STATION FENCE & FENCE & FOOTINGS CONC. & REINF. DETAILS FOUNDATION ----F1731664-100-F007

LEGEND

EXISTING FND
NEW FND
REF. LINE
CENTER LINE
FENCE

KEY PLAN

N

PROFESSIONAL

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

SMi THE S.M. GROUP INTERNATIONAL INC.

STAMP

LICENSED PROFESSIONAL ENGINEER S. T. WANG 100116367 PROVINCE OF ONTARIO 2018/09/27

CLIENT:

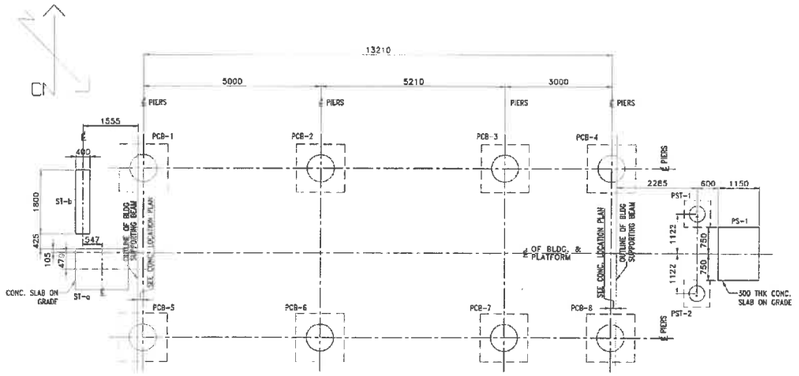
PROJECT:
MCMASTER UNIVERSITY-NF91

TITLE:
115/13.8kV STATION FOUNDATION KEY PLAN. & LIST. FOUNDATION

PREPARED BY: S.T. WANG	DATE: 2018-09-27
DRAWN BY: S. TADDLA	SCALE: 1:100
VERIFIED BY: S. YUAN	DISCIPLINE: FOUNDATION
APPROVED BY: S.T.WANG	CAD FILE NAME: F1731664-100-F001.dwg

PROJECT #	LOC.	DRAW. #	REV.	PAGE
F1731664	100	F001	00	

A0



KEY PLAN
SCALE 1:50

TOTAL VOL OF CONC (m³)	ITEM NAME	'H'	REINFORCING STEEL FOR FORMED TYPE(1 PIER) STANDARD BENDING DETAILS – R.S.I.O METRIC SUPPLEMENT (1992) ALL BARS SHALL BE IN ACCORDANCE WITH CSA SPEC G30-18M-1992 (DEFORMED) EXCEPT AS NOTED GRADE OF STEEL: 400 MPa					DIMENSIONS					
			MARK	QTY	SIZE	LGTH	TYPE	A	B	C	D	E	F	G
0.43	PST-1 & 2	1825	MV5	4	20M	1090	17		780	310				
			MV7	4	20M	1485	–							
			MH3	6	15M	610	–							
	(TOTAL=2)		MT1	6	10M	1500	13						470	327

2 FOUNDATIONS REQUIRED. (PST-1 & 2)

TOTAL VOL OF CONC (m³)	ITEM NAME	REINFORCING STEEL FOR SLAB ON GRADE STANDARD BENDING DETAILS – R.S.I.O METRIC SUPPLEMENT (1992) ALL BARS SHALL BE IN ACCORDANCE WITH CSA SPEC G30.18-M1992 (DEFORMED) EXCEPT AS NOTED GRADE OF STEEL: 400 MPa					DIMENSIONS						
		MARK	QTY	SIZE	LGTH	TYPE	A	B	C	D	E	G	O
0.64	PS-1 & ST-a	MH1	10	10M	1300	17		150	1000	150			
		MH2	8	10M	1650	17		150	1350	150			
	(TOTAL=2)												

2 FOUNDATIONS REQUIRED. (PS-1 & ST-a)

TOTAL VOL OF CONC (m³)	ITEM NAME	REINFORCING STEEL FOR FORMED TYPE(1 PIER) STANDARD BENDING DETAILS – R.S.I.O METRIC SUPPLEMENT (1992) ALL BARS SHALL BE IN ACCORDANCE WITH CSA SPEC G30-18M-1992 (DEFORMED) EXCEPT AS NOTED GRADE OF STEEL: 400 MPa					DIMENSIONS						
		'H'	MARK	QTY	SIZE	LGTH	TYPE	A	B	C	D	E	F	G
0.3	ST-b	408	H3	12	15M	766	17		258	250	258			
	(TOTAL=1)		H4	4	15M	2166	17		258	1550	258			

1 FOUNDATION REQUIRED. (ST-b)

BILL OF MATERIAL FOR BOLTS FOR ONE FOUNDATION

MARK	QUANT	DESCRIPTION	MATERIAL	LENGTH (mm)	WEIGHT (kg)	REMARK
b1	2	HEAVY DUTY EXP. HILTI ANCHOR HSL-3 M20/30 EMBEDMENT: 125mm	HAS-E RODS STD ISO 898 CLASS 5.8	183	–	GALV.

1 FOUNDATION REQUIRED. (ST-b)

REINF. STEEL FOR ONE PIER – FORMED TYPE (TOTAL 7 REQ'D)
STANDARD BENDING DETAILS – R.S.I.O. METRIC SUPPLEMENT (1992)
ALL BARS SHALL BE IN ACCORDANCE WITH CSA SPEC. G30-18-1992
(DEFORMED) EXCEPT AS NOTED GRADE OF STEEL : 400 MPa

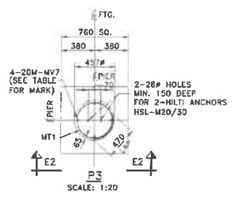
VOL OF CONC.(M³)	'H'	MARK	REQ'D	SIZE	LENGTH	TYPE	DIMENSIONS A	B	C	D	G	O
1.56	2300	V1	6	25M	1810	–						
		DW	6	25M	1385	2	300	1085				
		T1	7	10M	2395	13					470	612
		H1	20	20M	1770	17		280	1210	280		

7 FOUNDATIONS REQUIRED. (PCB-1 TO 7)

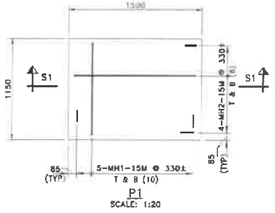
REINF. STEEL FOR ONE PIER – FORMED TYPE (TOTAL 1 REQ'D)
STANDARD BENDING DETAILS – R.S.I.O. METRIC SUPPLEMENT (1992)
ALL BARS SHALL BE IN ACCORDANCE WITH CSA SPEC. G30-18-1992
(DEFORMED) EXCEPT AS NOTED GRADE OF STEEL : 400 MPa

VOL OF CONC.(M³)	'H'	MARK	REQ'D	SIZE	LENGTH	TYPE	DIMENSIONS A	B	C	D	G	O
2.02	3050	V1	6	25M	2560	–						
		DW	6	25M	1385	2	300	1085				
		T1	10	10M	2395	13					470	612
		H1	20	20M	1770	17		280	1210	280		

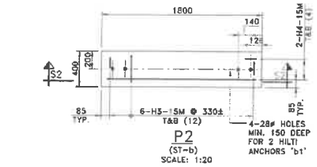
1 FOUNDATION REQUIRED. (PCB-8)
ALL BOM FOR REFERENCE ONLY



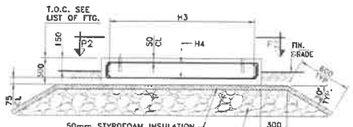
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P1
SCALE: 1:20

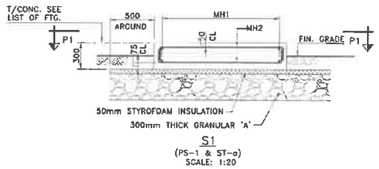


P2
(ST-b)
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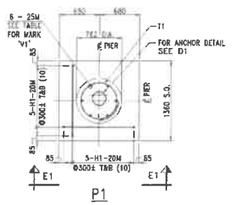


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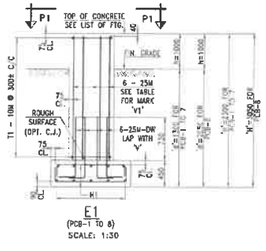
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(FORMED TYPE)
(PST-1 & 2)
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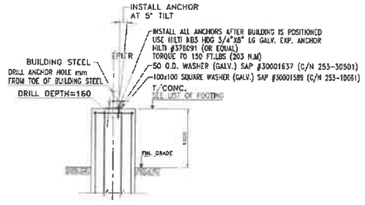
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(PS-1 & ST-a)
SCALE: 1:20



P1
SCALE: 1:30



E1
(PCB-1 TO 8)
SCALE: 1:30



D1
SCALE: 1:30

GENERAL NOTES:

REFER TO DWG. F1731664-100-F003

REFERENCE DRAWINGS:

1. 115/13.8kV AREA CONCRETE FOOTINGS KEY PLAN & LIST FOUNDATION F1731664-100-FC01
2. 115/13.8kV AREA BASIC LAYOUT ELECTRICAL ARRANG. F1731684-300-EA001
3. 115/13.8kV AREA ELEVATIONS ELECTRICAL ARRANG. F1731664-300-EA009

LEGEND:

1. T.O.C: TOP OF CONCRETE

PROFESSIONAL ENGINEERS

NO	DATE	ISSUE/REVISION	BY
0	2016/08/17	RELEASE FOR CONSTRUCTION	SMI
NO	DATE	TRANSMISSION	BY

SMi THE S.M. GROUP INTERNATIONAL INC.

STAMP

LICENCE PROFESSIONAL ENGINEER S.T. WANG 100161697 PROVINCE OF ONTARIO

PROJECT

MCMASTER UNIVERSITY-NF91

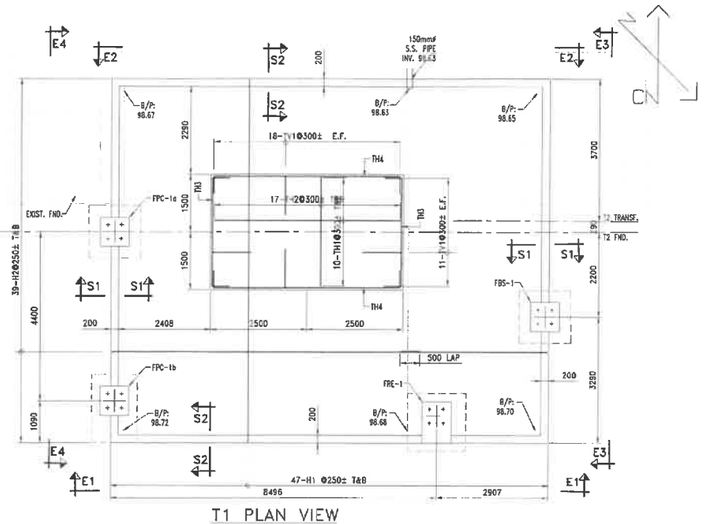
TITLE

115/13.8kV STATION
E-HOUSE BLDG. FOOTINGS
CONC. & REINF. DETAILS
FOUNDATION

PREPARED BY: Z. WANG	DATE: 2016-08-14
DRAWN BY: E. TUBILLA	SCALE: AS SHOWN
VERIFIED BY: Z. WANG	DISCIPLINE: FOUNDATION
APPROVED BY: S.T. WANG	CAD FILE NAME: F1731664-100-FF002.dwg

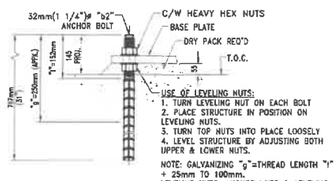
PROJECT NO. F1731664 | SIZE 100 | DWG # F002 | REV 00

A0



T1 PLAN VIEW

SCALE: 1:50

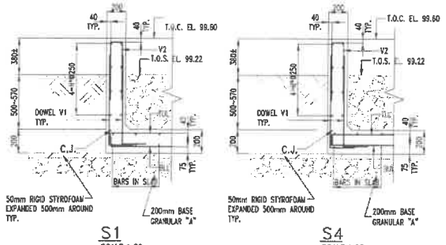


DETAIL D1
ANCHOR BASE & BOLT INSTALLATION SECTION

N.T.S.

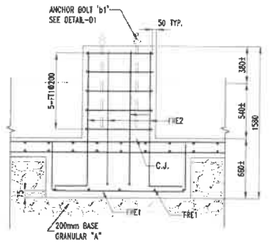
USE OF LEVELING NUTS:
1. TURN LEVELING NUT ON EACH BOLT
2. PLACE STRUCTURE IN POSITION ON LEVELING NUTS.
3. TURN TOP NUTS INTO PLACE LOOSELY
4. LEVEL STRUCTURE BY ADJUSTING BOTH UPPER & LOWER NUTS.

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

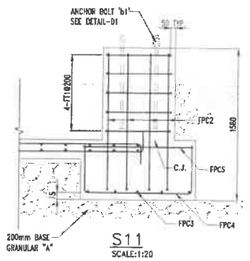


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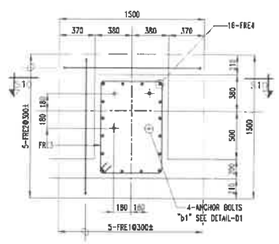
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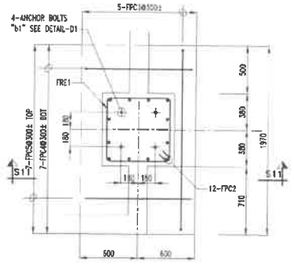
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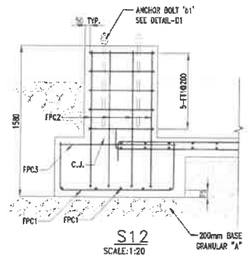
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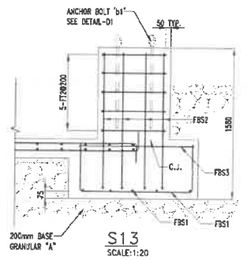
FRE-1
SCALE:1:20



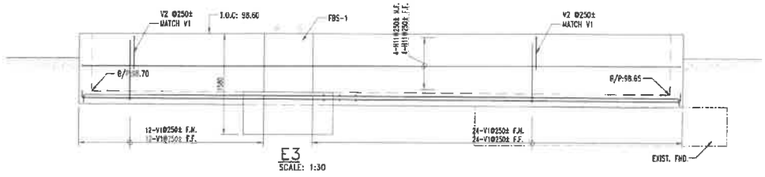
FPC-1b
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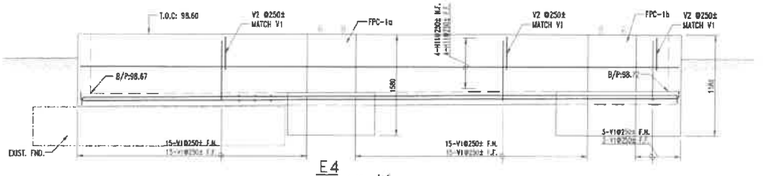
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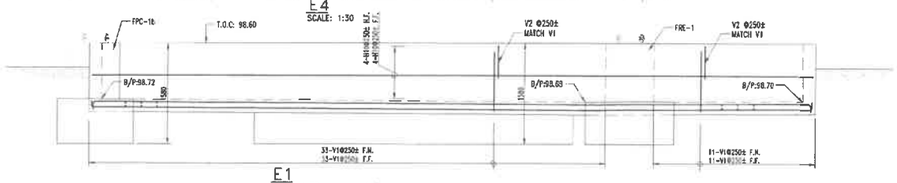
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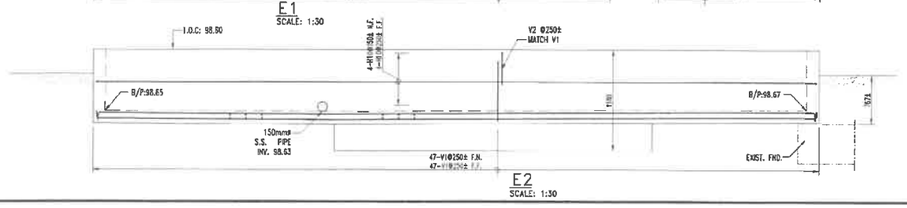
E3
SCALE: 1:30



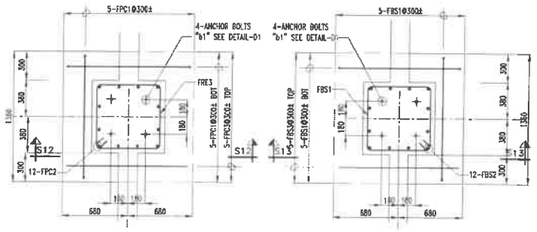
E4
SCALE: 1:30



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 RESERVES 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-S269.2-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	H (mm)	REINFORCING STEEL FOR ONE FOOTING 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	9360	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	9800	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	2650	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	H (mm)	REINFORCING STEEL FOR ONE FOOTING (FRE-1) MARK	REQ'D	SIZE	LENGTH (mm)	TYPE	DIMENSIONS A	B	C	D	E	G	O
	FRE-1	1580	FRE1	12	25M	2800	17			810	1380	810		
			FRE2	16	25M	1880	17			340	1540			
	TOTAL 1		FT1	5	10M	3460	T1	100	660	980	660	980	100	

BILL OF MATERIAL OF CONCRETE AND STEEL REINFORCING

TOTAL VOL. OF CONC (m³)	ITEM'NAME	H (mm)	REINFORCING STEEL FOR ONE FOOTING MARK	REQ'D	SIZE	LENGTH (mm)	TYPE	DIMENSIONS A	B	C	D	E	G	O
	FBS-1	1580	FBS1	10	25M	2280	17			520	1240	520		
			FBS2	12	25M	1780	17			340	1440			
			FBS3	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	H (mm)	REINFORCING STEEL FOR ONE FOOTING 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	H (mm)	REINFORCING STEEL FOR ONE FOOTING (FPC-2b) 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	18	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---- 1786-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.O.: SONARC
14. FTG.: FOOTING

EXST. FND.

KEY PLAN

N
E

PROFESSIONALS

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

SMi THE S.M. GROUP INTERNATIONAL INC.

SEAL:

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

CLIENT:

PROJECT:

MCMASTER UNIVERSITY-NF91

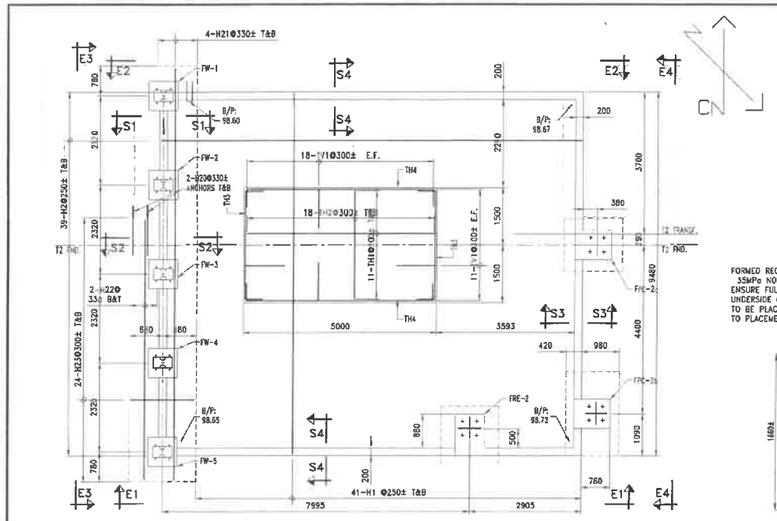
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115/13.8kV STATION
SPILL CONTAINMENT PIT FOR 'T1'
PLAN ELEVATIONS & DETAILS
CONC. & REINF. DETAILS ; FOUNDATION

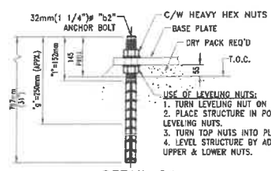
PREPARED BY: Z.WANG	DATE: 2018-08-14
DRAWN BY: Z.WANG	SCALE: 1:100
VERIFIED BY: S.Y. WANG	DGN FILE: FOUNDATION
APPROVED BY: S.Y. WANG	CAD FILE NAME: F1731664-100-F003.DWG

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

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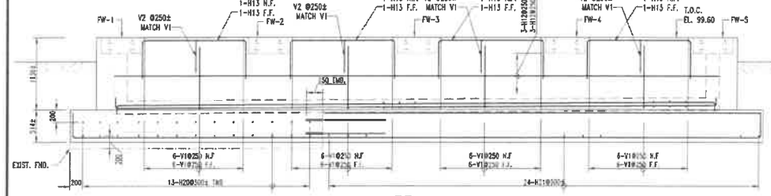


T2 PLAN VIEW
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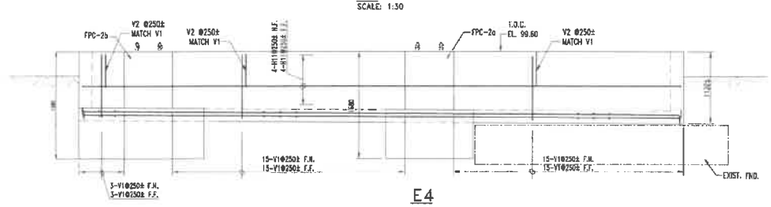


DETAIL D1
ANCHOR BASE & BOLT INSTALLATION SECTION
N.T.S.

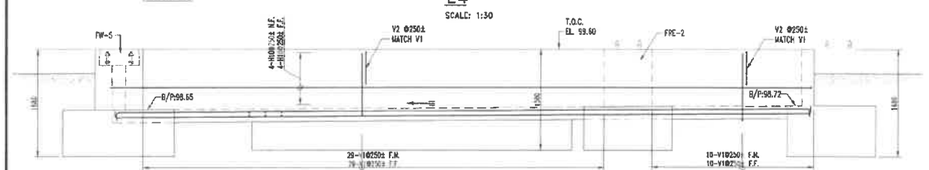
NOTE: GALVANIZING "g"=THREAD LENGTH "l" + 25mm TO 100mm.
LEVELING NUTS, ANCHOR NUTS & LEVELING SHIMS SHALL BE GALVANIZED PER CSA-G164. ANCHOR NUTS & LEVELING NUTS SHALL CONFORM TO CSA 833.1 & INSI B18.22.1, TYPE B.
LEVELING SHIMS SHALL HAVE A MIN. 10,000LB. BREAKING STRENGTH. ANCHOR BOLTS SHALL BE "I" SHAPED



E3
SCALE: 1:50

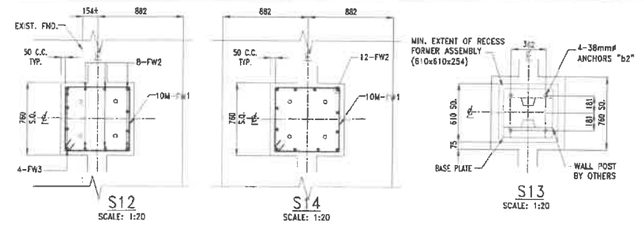


E4
SCALE: 1:50



E1
SCALE: 1:30

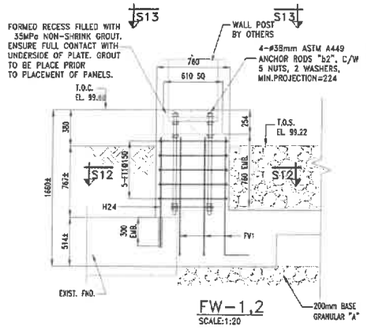
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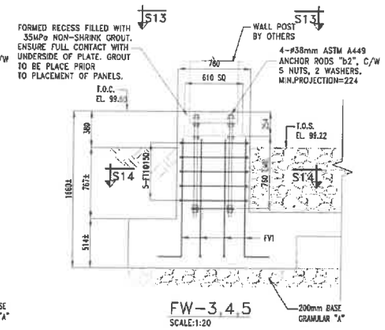
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S14
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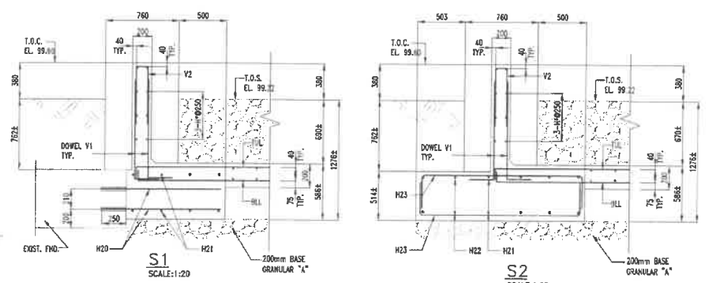
S13
SCALE: 1:20



FW-1,2
SCALE:1:20

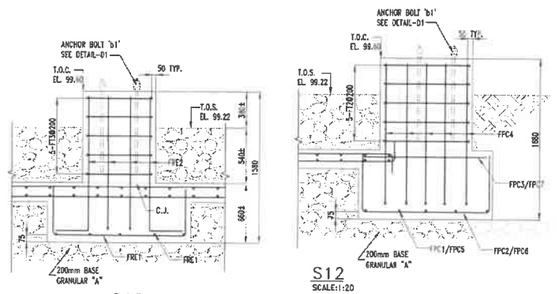


FW-3,4,5
SCALE:1:20



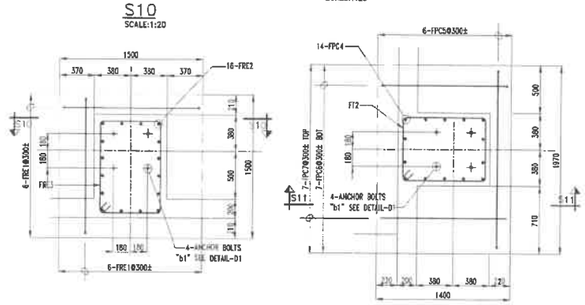
S1
SCALE:1:20

S2
SCALE:1:20



S10
SCALE:1:20

S12
SCALE:1:20



FRE-2
SCALE:1:20

FPC-2b
SCALE:1:20

FPC-2a
SCALE:1:20

BILL OF MATERIAL OF CONCRETE AND STEEL REINFORCING

REINFORCING STEEL FOR ONE FOUNDATION

TOTAL VOL. OF CONC (m³)	ITEM NAME	H (mm)	MARK	REQ'D	SIZE	LENGTH (mm)	TYPE	DIMENSIONS A	B	C	D	E	G	H
64	CONTAINMENT PIT FOR T2	VAR. 1080± TO 1980±	H1	82	10M	9320	17		120	9380	120			
			H2	78	10M	11140	17		120	10990	120			
			V1	280	10M	1050	17		250	970				
			V2	140	10M	1320	17		600	120	600			
			H10	16	10M	11200	17		200	11000				
			H11	8	10M	9800	17		120	9560	120			
			H12	6	10M	11000	–			11000				
			H13	8	10M	2820	17		600	1620	600			
			H20	30	25M	1200	–			1200	ANCHOR REBARS EMB.=25±			
			H21	8	25M	11380	17		340	10700	340			
			H22	4	25M	7110	17		340	6772				
			H23	48	25M	2300	17		340	1623	340			
			TV1	58	25M	3410	17		1080	1413	1080			
			TH1	22	25M	2900	–			2903				
			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

REINFORCING STEEL FOR ONE FOOTING (FW-1,2,3,4,5)

TOTAL VOL. OF CONC (m³)	ITEM NAME	H (mm)	MARK	REQ'D	SIZE	LENGTH (mm)	TYPE	DIMENSIONS A	B	C	D	E	G	O
	FW1,2,3,4,5	1660±	H24	4	25M	1160	–			1160	ANCHOR REBARS EMB.=300			
			FV1	8	25M	1800	17		340	1280				
	TOTAL 5		FT1	5	10M	2840	T1	100	660	880	880	660	100	

BILL OF MATERIAL FOR BOLTS FOR ONE FOUNDATION

MARK	QUANT	DESCRIPTION	MATERIAL	LENGTH(mm)	WEIGHT(kg)	REMARK
b2	4	ANCHOR BOLTS, WASHER AND NUTS, 38mm ø(1 1/2")	ASTM A449	SEE SECTION	–	GALV.

5 FOOTINGS REQUIRED

BILL OF MATERIAL OF CONCRETE AND STEEL REINFORCING

REINFORCING STEEL FOR ONE FOOTING (FRE-2)

TOTAL VOL. OF CONC (m³)	ITEM NAME	H (mm)	MARK	REQ'D	SIZE	LENGTH (mm)	TYPE	DIMENSIONS A	B	C	D	E	G	O
	FRE-2	1580	FRE1	12	25M	2600	17		610	1380	610			
			FRE2	16	25M	1880	17		340	1540				
	TOTAL 1		FT3	5	10M	3480	T1	100	660	980	660	880	100	

BILL OF MATERIAL OF CONCRETE AND STEEL REINFORCING

REINFORCING STEEL FOR ONE FOOTING (FPC-2a)

TOTAL VOL. OF CONC (m³)	ITEM NAME	H (mm)	MARK	REQ'D	SIZE	LENGTH (mm)	TYPE	DIMENSIONS A	B	C	D	E	G	O
	FPC-2a	1680	FPC1	12	25M	2560	17		670	1220	670			
			FPC2	6	25M	2760	17		670	1420	670			
			FPC3	6	25M	1500	–			1500				
			FPC4	14	25M	1880	17		340	1540				
	TOTAL 1		FT2	5	10M	3240	T1	100	660	860	880	880	100	

BILL OF MATERIAL OF CONCRETE AND STEEL REINFORCING

REINFORCING STEEL FOR ONE FOOTING (FPC-2b)

TOTAL VOL. OF CONC (m³)	ITEM NAME	H (mm)	MARK	REQ'D	SIZE	LENGTH (mm)	TYPE	DIMENSIONS A	B	C	D	E	G	O
	FPC-2b	1680	FPC5	12	25M	3170	17		670	1830	670			
			FPC6	7	25M	2800	17		670	1280	670			
			FPC7	7	25M	1500	–			1400				
			FPC4	14	25M	1880	17		340	1540				
	TOTAL 1		FT2	5	10M	3240	T1	100	660	860	880	880	100	

BILL OF MATERIAL FOR BOLTS FOR FPC & FRE

MARK	QUANT	DESCRIPTION	MATERIAL	LENGTH(mm)	WEIGHT(kg)	REMARK
b1	12	ANCHOR BOLTS, WASHER AND NUTS, 32mm ø(1")	G30.12-M GRADE 300	787 (31")	–	GALV.

BOM FOR REFERENCE ONLY

NOTES:

1. GENERAL NOTES SEE DWG. F1731664-100-F003.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

REFERENCE DRAWINGS:

1. 115/13.8kV STATION FOUNDATION KEY PLAN & LIST FOUNDATION ----------F1731664-100-F001
2. GENERAL LAYOUT & DETAIL----1795-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
EXIST. FND.

KEYPLAN

PROFESSIONALS

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

SMi THE S.M. GROUP INTERNATIONAL INC.
69258 Alcona rd, Suite 305, Wawanesa (Elgin) MB R0G 2E0
Tel.: 905.972.2500 / Fax.: 866.691.6844
www.smgroup.com

STAMP:

LICENSED PROFESSIONAL ENGINEER
S.Y. WANG
100136383
PROVINCE OF ONTARIO

CLIENT:

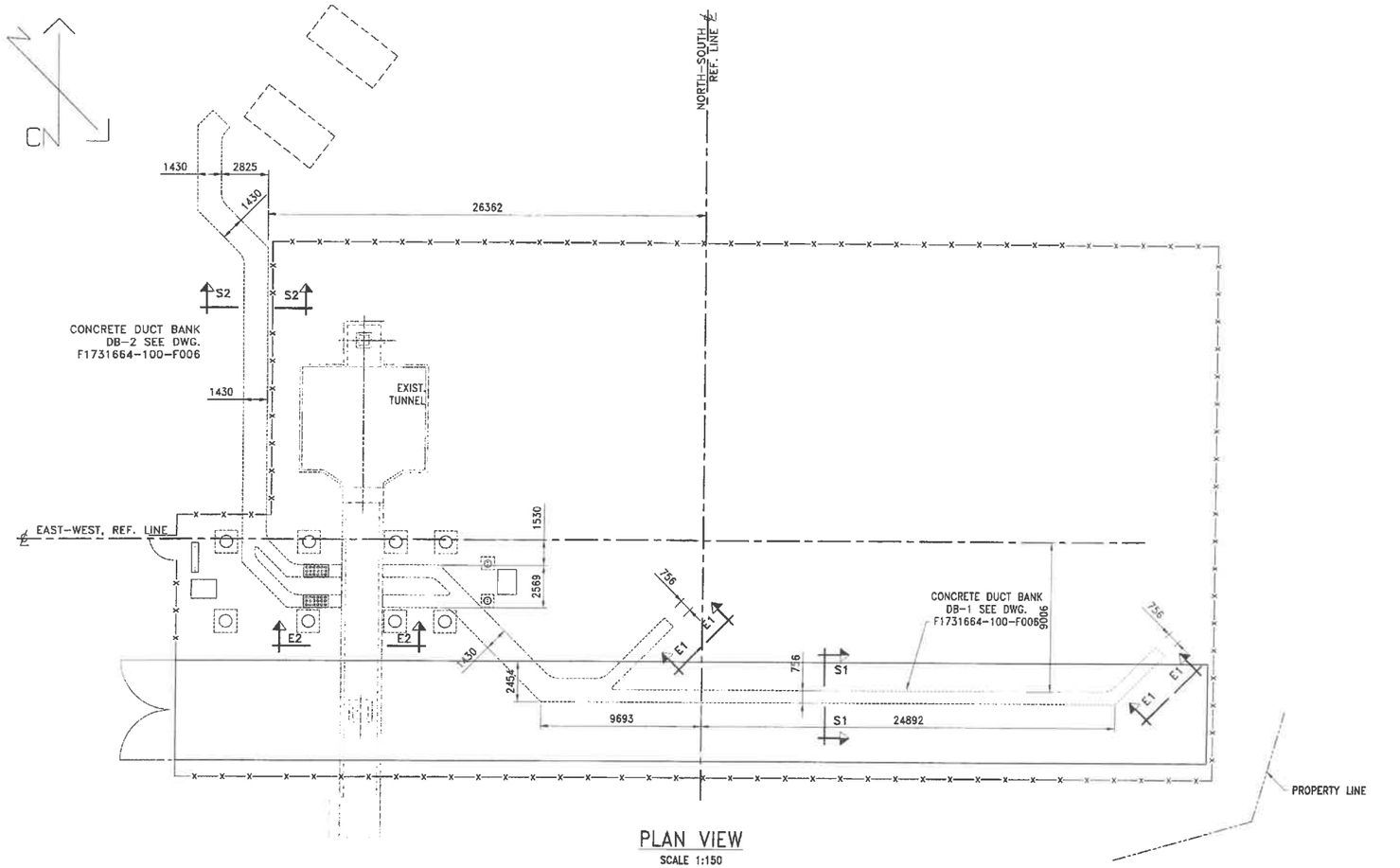
PROJECT:
MCMASTER UNIVERSITY-NF91

TITLE:
115/13.8kV STATION
SPILL CONTAINMENT PIT FOR 'T2'
PLAN ELEVATIONS & DETAILS
CONC. REINF.; FOUNDATION

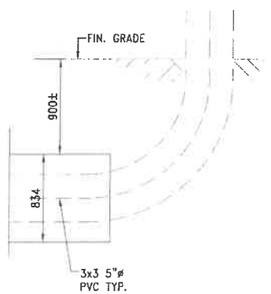
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DRAWN BY: Z.WANG	SCALE: 1:100
VERIFIED BY: S.Y. WANG	DISCIPLINE: FOUNDATIONS
APPROVED BY: S.Y. WANG	CAD FILE NAME: F1731664-100-F004.dwg

PROJECT NO: F1731664 | LOC: 100 | DWG #: F004 | REV: 00 | PAGE:

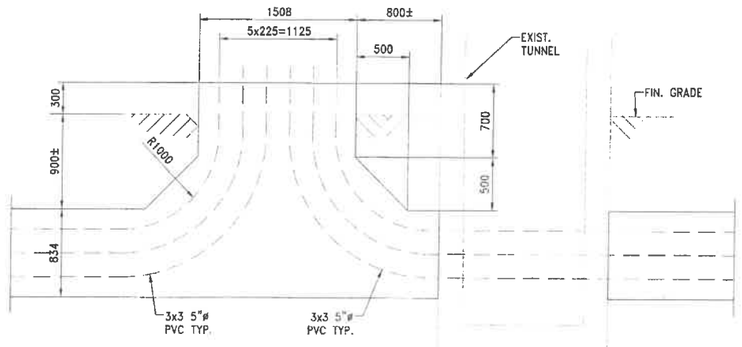
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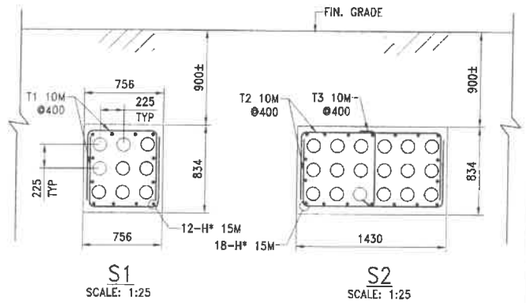
PLAN VIEW
SCALE 1:150



E1
SCALE: 1:25



E2
SCALE: 1:25
NOTE: TO BE VALIDATED BY MANUFACTURER



S1
SCALE: 1:25

S2
SCALE: 1:25

GENERAL NOTES:

REFER TO DWG. F1731664-100-F004

NOTES:

- DUCT BANKS CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS f'c=25Mpa
- ALL REBARS TO BE 15M U.N.O.
- ALL REINFORCING REBARS IN CONC. DUCT BANK SHALL BE EPOXY COATED OR EQUIVALENT. ALL THE LOOPS MUST BE OPEN ELECTRICALLY.
- REBARS MAY BE CUT AT FIELD TO SUIT IF REQ'D.
- ALL DUCTS TO BE APPROVED AFTER INSTALLATION.
- EARTH UNDER DUCT TO BE THOROUGHLY COMPACTED PRIOR TO DUCT BANK INSTALLATION IF REQUIRED.
- THIS DRAWING MUST BE READ IN CONJUNCTION WITH DWG F1731664-100-F006

REFERENCE DRAWINGS:

1. 115/13.8kV STATION
   CONC. DUCT BANK 'DB-1 & DB-2'
   CONC. & REINF. DETAILS
   FOUNDATION F1731664-100-F006
2. 115/13.8kV STATION
   FOUNDATION
   KEY PLAN & LIST
   FOUNDATION F1731664-100-F001
3. 115/13.8kV STATION
   BASIC LAYOUT
   ELECTRICAL
   ARRANGEMENT F1731664-300-EA001

LEGEND:

1. T.O.C: TOP OF CONCRETE

N°	DATE	TRANSMISSION	BY ENG
00	2018/09/27	RELEASED FOR CONSTRUCTION	SYW

SMi THE S.M. GROUP INTERNATIONAL INC.
6205A Airport rd, Suite 502 Mississauga (Ontario) L4V 1E3
Tel.: 905 677.3030 Fax.: 905 677.3014
www.groupesm.com

STAMP :

LICENCED PROFESSIONAL ENGINEER
S.Y. WANG
100139367
2018/09/28
PROVINCE OF ONTARIO

CLIENT :

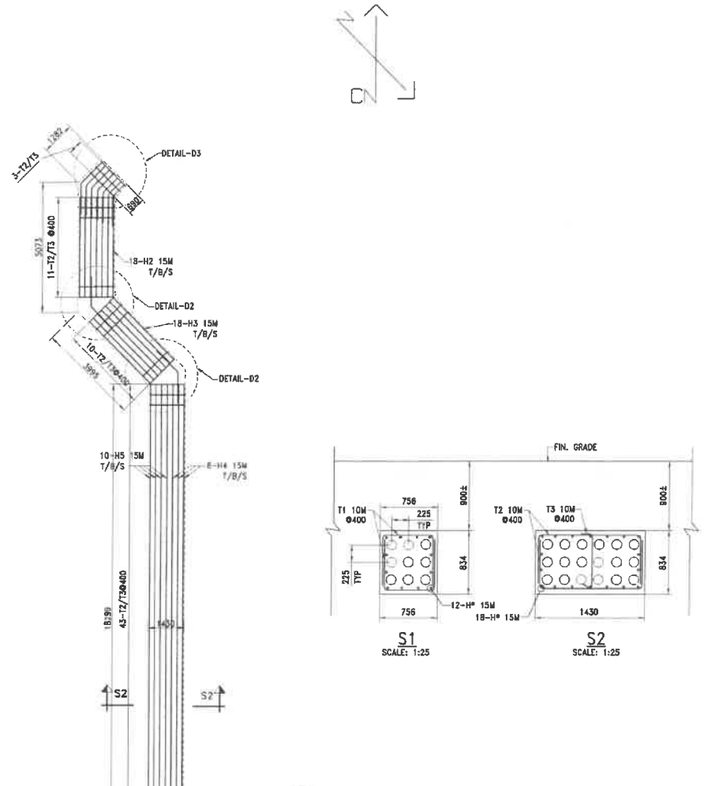
PROJECT :
MCMASTER UNIVERSITY-NF91

TITLE :
115/13.8kV STATION
CONC. DUCT BANK "DB-1 & DB-2"
PLAN VIEW & SECTIONS
FOUNDATION

PREPARED BY : S.Y. WANG	DATE : 2018-09-27
DRAWN BY : G. TUDELA	SCALE : AS SHOWN
VERIFIED BY : Z. WANG	DISCIPLINE : 100
APPROVED BY : S.Y. WANG	CAD FILE NAME : F1731664-100-F005.dwg

PROJECT No:	LOT:	DWG. #	REV:	PAGE :
F1731664	100	F005	00	

A1

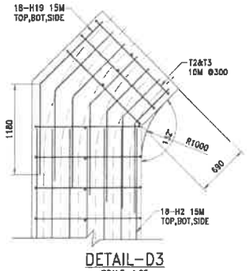


DUCT BANK (DB-2)
SCALE 1:75

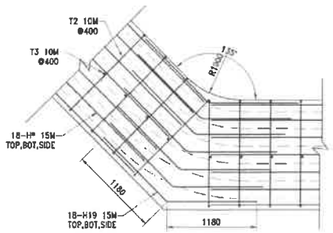
DUCT BANK (DB-1)
SCALE 1:75

S1
SCALE: 1:25

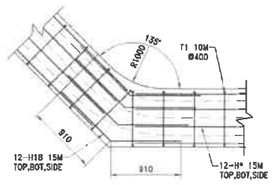
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SCALE: 1:25



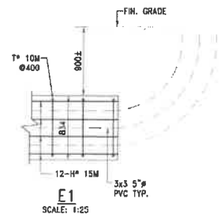
DETAIL-D3
SCALE: 1:25



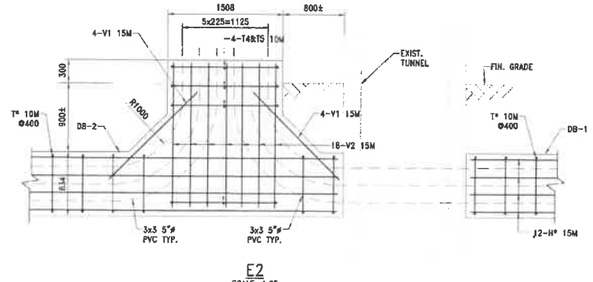
DETAIL-D2
SCALE: 1:25



DETAIL-D1
SCALE: 1:25



E1
SCALE: 1:25



E2
SCALE: 1:25

TOTAL VOL. OF CONC (m³)	BILL OF MATERIAL OF CONCRETE AND STEEL REINFORCING													
	ITEM'NAME	REINFORCING STEEL FOR ONE FOUNDATION (DB1)												
		H (mm)	MARK	REQ'D	SIZE	LENGTH (mm)	TYPE	DIMENSIONS						
								A	B	C	D	E	G	O
46.53	DB1	VARIABLE	H10	12	15M	3910	–							
			H11	12	15M	3055	–							
			H12	12	15M	9290	–							
			H13	8	15M	7410	–							
			H14	8	15M	3120	–							
			H15	12	15M	5120	–							
			H16	12	15M	33700	–							
			H17	12	15M	3835	–							
			H18	48	15M	1820	23		910	910				
			H19	18	15M	2360	23		1180	1180				
			T1	2x122	10M	1970	17		657	656	657			
			T2	2x29	10M	2595	17		632	1331	632			
	(TOTAL=1)		T3	29	10M	974	T9	120	714				140	

BOM. FOR REFERENCE ONLY.

TOTAL VOL. OF CONC (m³)	BILL OF MATERIAL OF CONCRETE AND STEEL REINFORCING													
	ITEM'NAME	REINFORCING STEEL FOR ONE FOUNDATION (Db2)												
		H (mm)	MARK	REQ'D	SIZE	LENGTH (mm)	TYPE	DIMENSIONS						
								A	B	C	D	E	G	O
42.2	DB2	VARIABLE	H2	18	15M	3685	–							
			H3	18	15M	3400	–							
			H4	8	15M	16820	–							
			H5	10	15M	18000	–							
			H6	12	15M	3200	–							
			H7	12	15M	2250	–							
			H8	24	15M	2975	–							
			H18	48	15M	2360	23		910	910				
			H19	36	15M	2360	23		1180	1180				
			T1	2x34	10M	1970	17		657	656	657			
			T2	2x67	10M	2595	17		632	1331	632			
			T3	67	10M	974	T9	120	714				140	
			V1	8	15M	1660	–							
			V2	18	15M	1875	–							
			T4	2x4	10M	2595	17		632	1400	632			
	(TOTAL=1)		T5	4	10M	974	T9	120	650				140	

BOM. FOR REFERENCE ONLY.

GENERAL NOTES:

REFER TO DWG. F1731664-100-F003

REFERENCE DRAWINGS:

1. 115/13.8kV STATION CONC. DUCT BANK 'DB-1 & DB-2' PLAN VIEW & SECTIONS FOUNDATION F1731664-100-F005
2. 115/13.8kV STATION FOUNDATION KEY PLAN & LIST FOUNDATION F1731664-100-F001
3. 115/13.8kV STATION BASIC LAYOUT ELECTRICAL ARRANGEMENT F1731664-100-EA001

LEGEND:

1. T.O.C: TOP OF CONCRETE
2. T/B/S: TOP, BOTTOM, SIDE

NO	DATE	TRANSMISSION	BY/CHK
0	2018.08.27	'RELEASE FOR CONSTRUCTION'	SY/RD

PROFESSIONALS

THE S.M. GROUP INTERNATIONAL INC.

SEAL

LICENSED PROFESSIONAL ENGINEER
S.Y. WAHID
100120307
2018-09-27
PROVINCE OF ONTARIO

CLIENT:

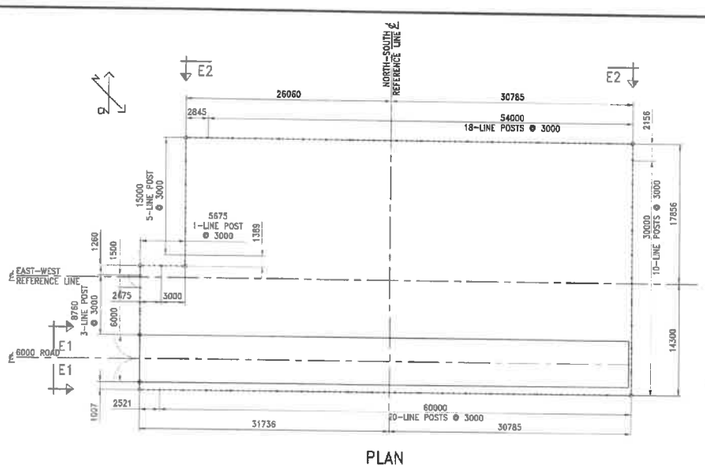
PROJECT:
MCMASTER UNIVERSITY-NF91

TITLE:
115/13.8kV STATION
CONC. DUCT BANK "DB-1" & "DB-2"
CONC. & REINF. DETAILS
FOUNDATION

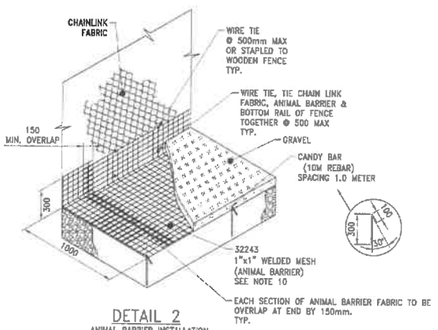
PREPARED BY: E. WANG	DATE: 2018-08-27
DRAWN BY: D. TUDELA	SCALE: 1:25
VERIFIED BY: Z. WANG	DISCIPLINE: FOUNDATION
APPROVED BY: S.Y. WAHID	CAD FILE NAME: F1731664-100-F006.dwg

PROJECT NO	LOC	DWG #	REV	PAGE
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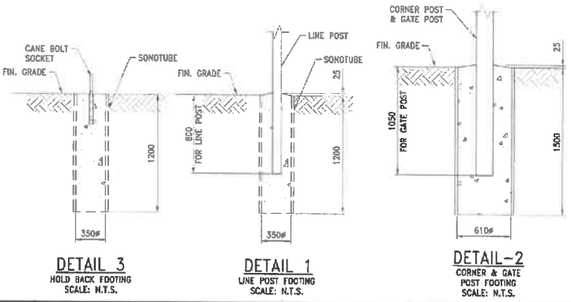
A0



PLAN



DETAIL 2
ANIMAL BARRIER INSTALLATION
SCALE: N.T.S.



DETAIL 3
HOLD BACK FOOTING
SCALE: N.T.S.

DETAIL 1
LINE POST FOOTING
SCALE: N.T.S.

DETAIL-2
CORNER & GATE POST FOOTING
SCALE: N.T.S.

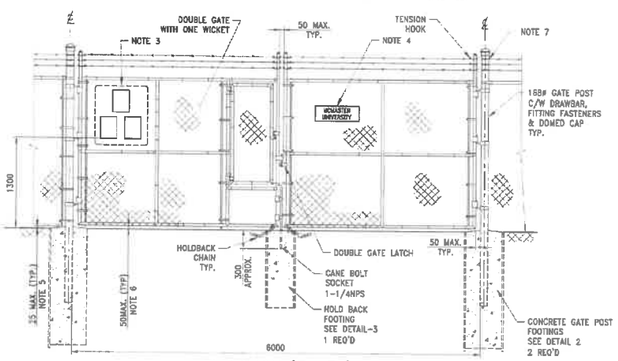
TABLE 1	
POST HEIGHTS ON LEVEL GROUND	
POST TYPE	HEIGHT ABOVE GRADE (mm ± 12)
END/GATE	2785
CORNER	2540
LINE	2400

REFERENCE DRAWINGS:

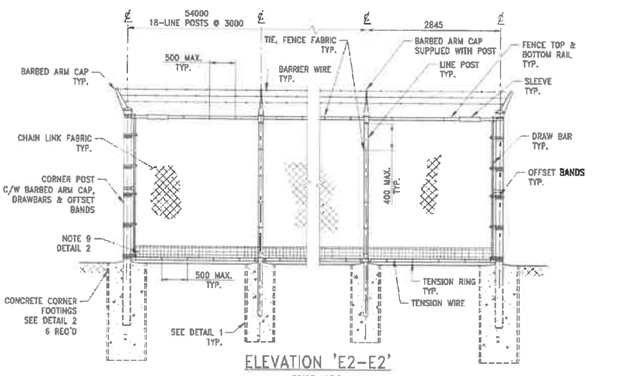
1. 115/13.8KV STATION, BASIC LAYOUT, ELECTRICAL ARRANGEMENT ---------F1731684-300-EA001

LEGEND:

1. · LINE POST
2. ○ CORNER POST
3. ■ GATE POST



ELEVATION 'E1-E1'
SCALE: N.T.S.



ELEVATION 'E2-E2'
SCALE: N.T.S.

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
2. STATION FENCE SHOULD BE 2.4m HIGH. ALL FENCE MATERIALS SHALL BE GALVANIZED STEEL.
3. WARNING SIGNS AND PICTORIALS TO BE INSTALLED ON EVERY 10 METERS.
4. IDENTIFICATION STATION SIGN TO BE PROVIDE BY CONSTRUCTION.
5. THE BOTTOM OF FENCE FABRIC SHALL NOT EXCEED 25mm ABOVE FINISHED GRADE.
6. THE BOTTOM OF THE GATE SHALL NOT EXCEED 50mm ABOVE FINISHED GRADE.
7. END OF WIRE TO BE WRAPPED TWICE AROUND POST AND SERVED BACK ON ITSELF 4 TURNS.
8. REMOVE GALVANIZE COATING PRIOR WELDING. APPLY GALVICON PAINTING AFTER WELDING.
9. ANIMAL BARRIER TO BE BURIED UNDER SUBSTATION SURFACE GRAVEL, TYPICALLY AT 100MM.

PROVISIONALS

NO	DATE	ISSUED FOR	BY
00	2018/09/11	RELEASED FOR CONSTRUCTION	TYW

SMi THE S.M. GROUP INTERNATIONAL INC.
[illegible]

S.Y. WANG
100128367
LICENCED PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO

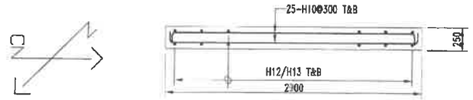
CLIENT :

MCMASTER UNIVERSITY-NF91

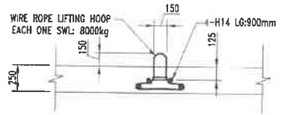
TITLE :
115/13.8kV STATION
FENCE & FENCE FOOTINGS
CONC. & REINF. DETAILS
FOUNDATION

PREPARED BY : S.Y. WANG	DATE: 2018-09-27
DRAWN BY : C. RANDAZZO/S.Y.WANG	SCALE: AS SHOWN
VERIFIED BY : Z. WANG	D SCHUB. TECHNOLOGY
APPROVED BY : S.Y. WANG	CAD FILE NAME: F1731684-100-F007.dwg

PROJECT No	LOT:	DWG #	REV:	PAGE :
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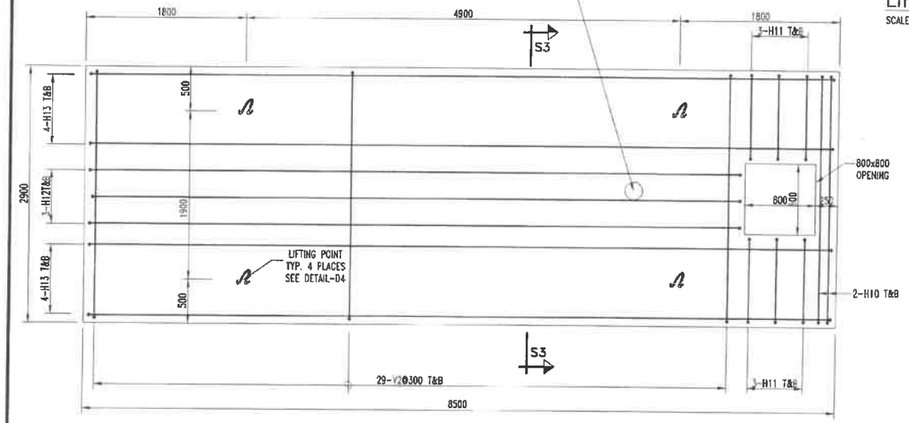


S3
SCALE: 1:30



DETAIL-D4
LIFTING POINT (4 PLACES)
SCALE: 1:30

NOTES:
1. TOP SLAB WEIGHT IS ABOUT 16000kg.
2. USING A LIFTING BEAM AND TWO PAIRS OF ANCHORS SET OUT SYMMETRICALLY.



TOP SLAB PLAN
SCALE: 1:30

TOTAL VOL OF CONC (m³)	BILL OF MATERIAL OF CONCRETE AND STEEL REINFORCING													
	REINFORCING STEEL FOR ONE FOUNDATION													
	ITEM'NAME	H (mm)	MARK	REQ'D	SIZE	LENGTH (mm)	TYPE	DIMENSIONS A	B	C	D	E	G	O
19.7	HT-1	2300	V1	74	15M	1080	17		210	870				
			V2	148	15M	1660	–			1660				
			H1	29	15M	3060	17		130	2800	130			
			H2	29	15M	4540	17		870	2800	870			
			H3	10	15M	8660	17		130	8400	130			
			H4	10	15M	10140	17		870	8400	870			
			H5	12	15M	8400	–			8400				
			H6	12	15M	8820	17		210	8400	210			
			H7	12	15M	3980	17		600	2780	600			
			H8	12	15M	3200	17		210	2780	210			
			H10	54	15M	3200	17		130	2780	130			
			H11	12	15M	1210	17		130	950	130			
			H12	6	15M	7590	17		130	7350	130			
			H13	16	15M	8660	17		130	8400	130			
			H14	16	15M	900	–			900				

1 OIL WATER SEPARATOR (HT-1) REQUIRED.
NOTE: FOR REBAR LONGER THAN 6m, IF IT IS NECESSARY REBAR COULD BE SPLIT INTO 2 PARTS WITH 600mm LAP FOR 15M.
BOM FOR REFERENCE ONLY

GENERAL NOTES:

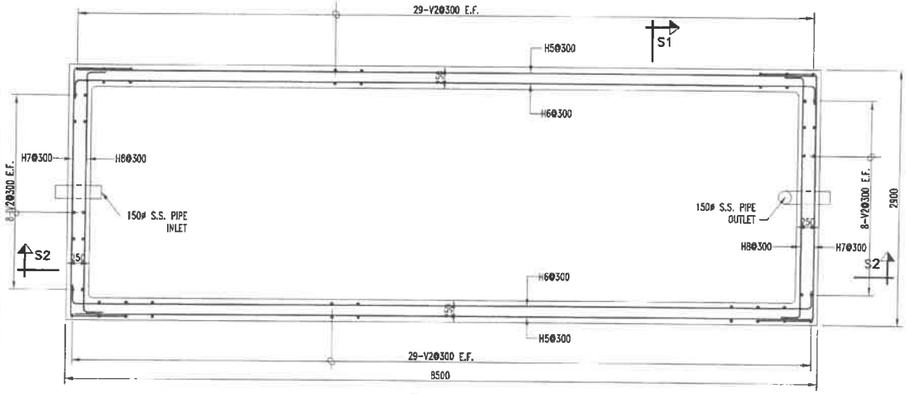
REFER TO DWG. F1731664-100-F003

REFERENCE DRAWINGS:

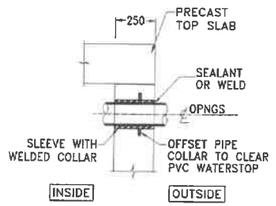
1. 115/13.8kV AREA DRAINAGE & SPILL CONTAINM. SYSTEM PLAN & DETAILS CIVIL F1731664-075-CV001
2. 115/13.8kV STATION FOUNDATION KEY PLAN & LIST FOUNDATION F1731664-100-F001
3. 115/13.8kV STATION BASIC LAYOUT ELECTRICAL ARRANGEMENT F1731664-300-EA001

LEGEND:

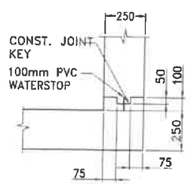
1. T.O.C: TOP OF CONCRETE
2. C.C.: CONCRETE CLEAR COVER
3. T.&B.: TOP & BOTTOM
4. E.F.: EACH FACE
5. L.G.: LENGTH



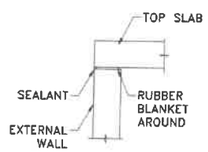
BASE PLAN
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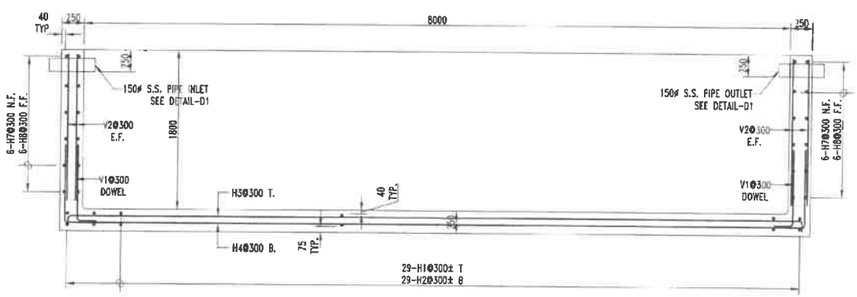
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SCALE: 1:20



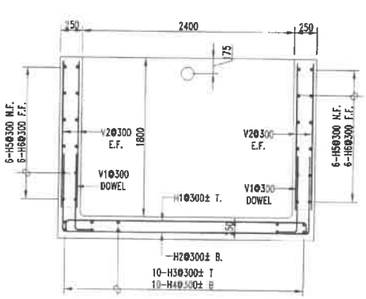
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SCALE: 1:20



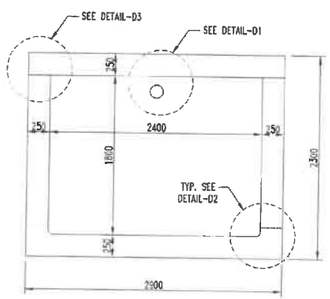
D3
SCALE: 1:20



S2
SCALE: 1:30



S1
SCALE: 1:30



E1
SCALE: 1:30

N°	DATE	TRANSMISSION	BY
00	2018/09/27	RELEASED FOR CONSTRUCTION	SYW

SMi THE S.M. GROUP INTERNATIONAL INC.
5205 Airport rd. Mississauga (Ontario) L4V 1T2
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www.groupsmi.com

STAMP :

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

CLIENT :

PROJECT :
MCMASTER UNIVERSITY-NF91

TITLE :
115/13.8kV STATION
CAST-IN-PLACE OIL WATER SEPARATOR "HT-1"
CONC. & REINF. DETAILS
FOUNDATION

PREPARED BY : S.Y. WANG	DATE : 2018-09-27
DRAWN BY : Z. ZANG	SCALE : AS SHOWN
VERIFIED BY : Z. WANG	DISCIPLINE : 100
APPROVED BY : S.Y. WANG	CAD FILE NAME : F1731664-100-F008.dwg

PROJECT No: F1731664 | LOT: 100 | DWG. # F008 | REV: 00 | PAGE :

A1