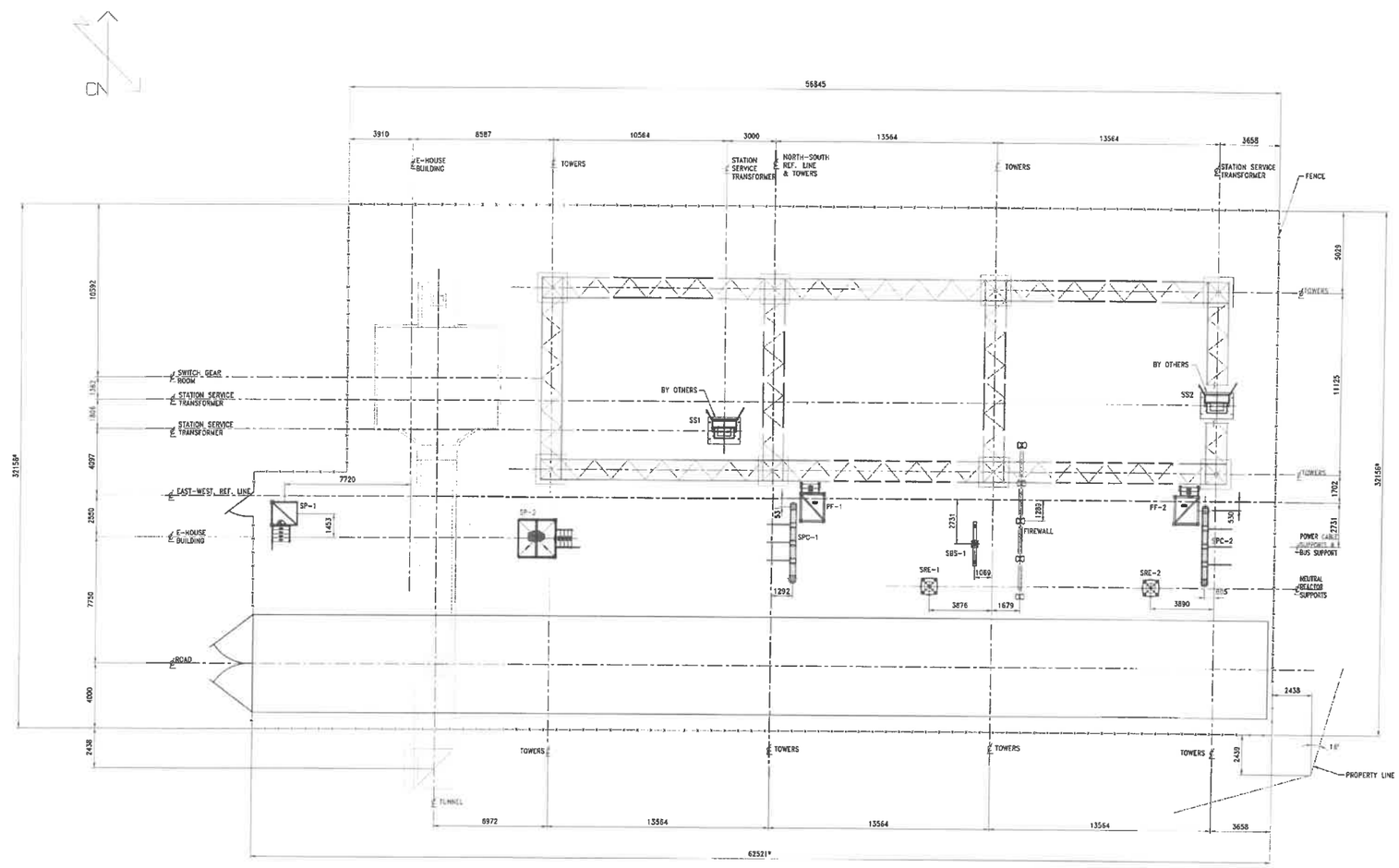


FTG MARK	TOTAL QTY	DESCRIPTION	DETAIL DWG. No.	REMARKS	MASS PER UNIT-Kg
SPC-1&2	2	115/13.8kV STATION POWER CABLE & PT/CT SUPP. IN THE PITS STEEL DETAILS STRUCTURE	F1731664-200-S002		2779
SBS-1	1	115/13.8kV STATION INSUL. & BUS SUPP. STEEL DETAILS STRUCTURE	F1731664-200-S003		513
PF-1&2	2	115kV AREA SERVICE PLATF. FOR TRANSF. STEEL DESIGN STRUCTURE	F1731664-200-S005		444
FIREWALL	1	115/13.8kV STATION FIREWALL BETWEEN "11&12" PLAN, ELEVATION & SPECIFICATION	F1731664-200-S004	BY OTHERS	-
SRE-1&2	2	115/13.8kV STATION NEUTRAL REACTOR BUS SUPP. STR STEEL DETAILS STRUCTURE	F1731664-200-S006		345
SP-1	1	115/13.8kV STATION STEEL STAIRS & PLATF. AT PERSONAL DR. FOR DCT BLDG (1.0M ABOVE GRADE) STEEL DETAILS STRUCTURE	F1731664-200-S007, S008 & S009		534
SP-2	1	115/13.8kV STATION STEEL STAIRS & PLATF. AT FRONT DR. FOR DCT BLDG (1.0M ABOVE GRADE) STEEL DETAILS STRUCTURE	F1731664-200-S010, S011 & S012		873

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 ----------1796-D-E4
3. 115/13.8 kV STATION FOUNDATION KEY PLAN & LIST FOUNDATION ---F1731664-100-FD01
4. 115/13.8kV STATION BASIC LAYOUT ELECTRICAL ARRANGEMENT ---F1731664-330-EA001
5. 115/13.8kV STATION FENCE & FENCE & FOOTINGS CONC. & REINF. DETAILS FOUNDATION ---F1731664-100-FD07

LEGEND

EXISTING STEEL
NEW STEEL
REF. LINE
CENTER LINE
FENCE

KEY PLAN

NO.	DATE	REVISION	BY CHK
00	2015/09/14	RELEASED FOR CONSTRUCTION	STW

SM THE S.M. GROUP INTERNATIONAL INC.

STAMP

S.Y. WANG 100136747 2015/09/14 PROVINCE OF ONTARIO

REVISION

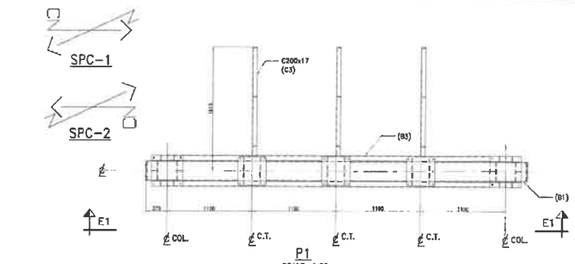
PROJECT:
MCMASTER UNIVERSITY-NF91

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

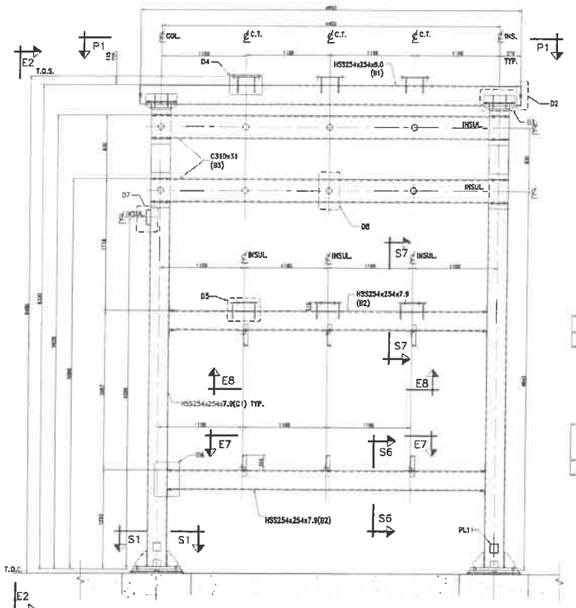
PREPARED BY	DATE
S.Y. WANG	2015-09-14
DRAWN BY	SCALE
C. TUDELA	1:500
VERIFIED BY	DISCIPLINE
Z. WANG	STRUCTURAL
APPROVED BY	FACILITY NAME
S.Y. WANG	FIXTURE AND BOTTLING

PROJECT NO. F1731664 | SITE 200 | DWG # S001 | REV 00 | FINAL

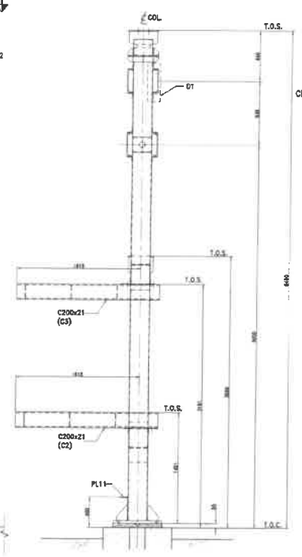
A0



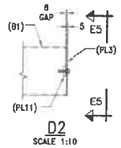
P1
SCALE: 1:25



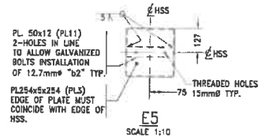
E1
SPC-1&2
SCALE: 1:25



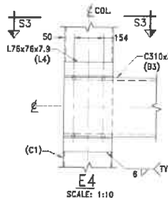
E2
SCALE: 1:25



D2
SCALE 1:10

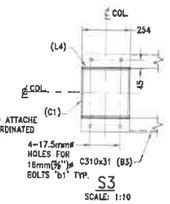


E5
SCALE 1:10

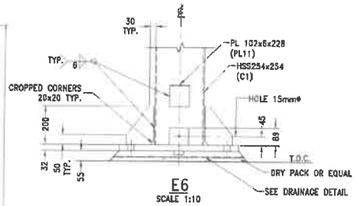


E4
SCALE: 1:10

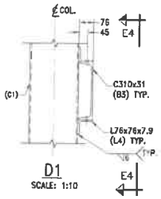
NOTE:
HOLES ON C200 TO ATTACHE CABLES TO BE COORDINATED & DRILLED ON SITE



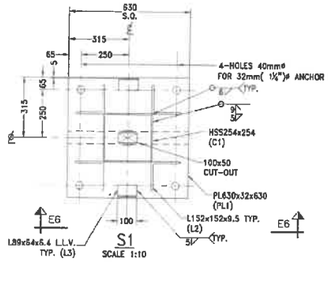
S3
SCALE: 1:10

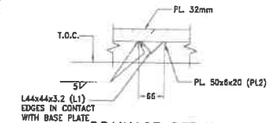


E6
SCALE 1:10



D1
SCALE: 1:10





DRAINAGE DETAIL
SCALE: 1:5

BILL OF MATERIAL FOR ONE STEEL INSULATOR & POWER CABLE SUPPORT

MARK	QUANT.	DESCRIPTION	MATERIAL	LENGTH (mm)	WEIGHT (kg)	REMARK
B1	1	HSS254x254x7.9	G40.20-350W	4950	297.5	HOT DIP GALV.
B2	2	HSS254x254x7.9	G40.20-350W	4145	498.2	HOT DIP GALV.
B3	4	C310x31	G40.21-300W	4145	527.5	HOT DIP GALV.
C1	2	HSS254x254x7.9	G40.20-350W	4950	595.0	HOT DIP GALV.
C2	3	C200x21	G40.21-300W	1869	117.7	HOT DIP GALV.
C3	3	C200x21	G40.21-300W	1869	117.7	HOT DIP GALV.
C4	1	C200x21	G40.21-300W	254	5.5	HOT DIP GALV.
L1	2	L44x44x3.2	G40.21-300W	630	2.7	HOT DIP GALV.
L2	8	L152x152x9.5	G40.21-300W	200	35.5	HOT DIP GALV.
L3	4	L89x64x6.4	G40.21-300W	100	2.9	HOT DIP GALV.
L4	24	L76x76x7.9	G40.21-300W	254	54.9	HOT DIP GALV.
L5	4	L102x76x7.9	G40.21-300W	406	17.2	HOT DIP GALV.
L6	4	L76x76x7.9	G40.21-300W	254	9.2	HOT DIP GALV.
L7	4	L76x76x7.9	G40.21-300W	406	14.6	HOT DIP GALV.
L8	6	L76x76x7.9	G40.21-300W	220	11.9	HOT DIP GALV.
L9	8	L127x76x7.9	G40.21-300W	60	4.4	HOT DIP GALV.
L10	6	L76x76x7.9	G40.21-300W	80	3.3	HOT DIP GALV.
PL1	2	PL630x32	G40.21-300W	630	199.4	HOT DIP GALV.
PL2	4	PL50x6	G40.21-300W	20	0.2	HOT DIP GALV.
PL3	2	PL254x5	G40.21-300W	254	5.1	HOT DIP GALV.
PL4	8	PL68x8	G40.21-300W	94	3.2	HOT DIP GALV.
PL5	12	PL68x8	G40.21-300W	88	3.5	HOT DIP GALV.
PL6	3	PL370x15	G40.21-300W	370	48.4	HOT DIP GALV.
PL7	6	PL200x10	G40.21-300W	344	25.9	HOT DIP GALV.
PL8	3	PL350x15	G40.21-300W	350	43.3	HOT DIP GALV.
PL9	6	PL180x10	G40.21-300W	324	24.4	HOT DIP GALV.
PL10	24	PL50x6	G40.21-300W	183	10.3	HOT DIP GALV.
PL11	4	PL102x6	G40.21-300W	228	4.4	HOT DIP GALV.
TOTAL WEIGHT (INCLUDING 3.5 % FOR GALVANIZATION)					2778.3	

BILL OF MATERIAL FOR BOLTS

MARK	QUANT.	DESCRIPTION	MATERIAL	LENGTH (mm)	WEIGHT (kg)	REMARK
b1	62	16mmø (⅝") BOLTS, WASHERS AND NUTS	A325	58mm	–	GALV.
b2	4	12.7mmø (½") BOLTS , WASHERS	A325	48mm	–	GALV.
b3	16	16mmø (⅝") THRU BOLTS	A325	305mm (12")	–	GALV.
b4	16	16mmø (⅝") BOLTS, WASHERS AND NUTS	A325	48mm	–	GALV.

2 POWER CABLE & PT/CT SUPP. ON THE PITS 'T1&T2' REQUIRED. (SPC-1&2) BOM FOR REFERENCE ONLY

GENERAL NOTES:

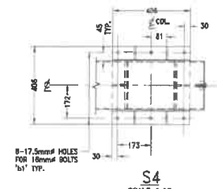
REFER TO DWG. F1731664-200-S005

REFERENCE DRAWINGS:

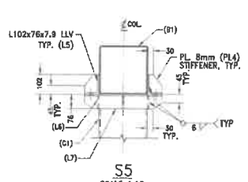
1. 115/13.8kV STATION
   STEEL KEY PLAN & LIST
   STRUCTURE F1731664-200-S001
2. 115kV AREA
   CONTAINM. PITS FOR TRANSF. 'T1'
   CONC. & REINF. DETAILS
   FOUNDATION F1731664-100-F003
3. 115kV AREA
   CONTAINMENT PIT FOR TRANSF. 'T2'
   CONC. & REINF. DETAILS
   FOUNDATION F1731664-100-F004
4. 115/13.8kV STATION
   BASIC LAYOUT
   ELECTRICAL ARRANGEMENT F1731664-300-EA001
5. 115/13.8kV STATION
   ELEVATIONS
   ELECTRICAL ARRANGEMENT F1731664-300-EA009
6. 115/13.8kV STATION
   MAIN GROUNDING GRID
   PLAN & DETAILS
   ELECTRICAL ARRANGEMENT F1731664-300-EA014

LEGEND:

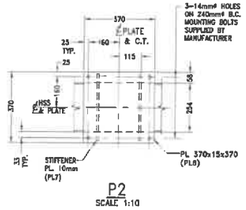
T.O.C.: TOP OF CONCRETE
T.O.S.: TOP OF STEEL
L.L.V.: LONG LEG VERTICAL
INSUL.: INSULATOR
B.C.: BOLT CIRCLE
S.Q.: SQUARE



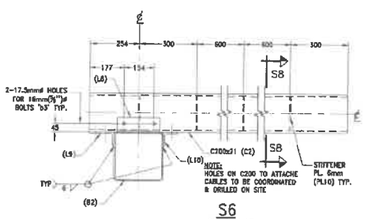
S4
SCALE 1:10



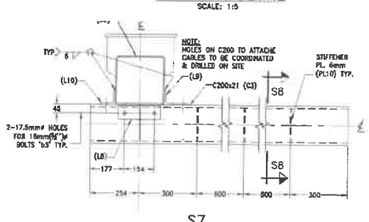
S5
SCALE 1:10



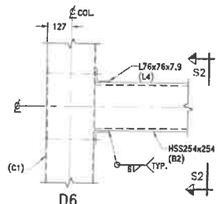
P2
SCALE 1:10



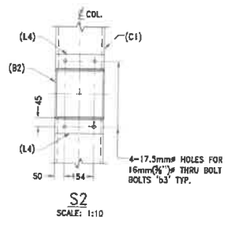
S6
SCALE: 1:10



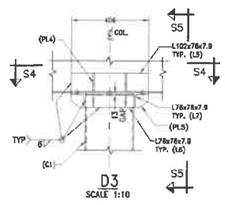
S7
SCALE: 1:10



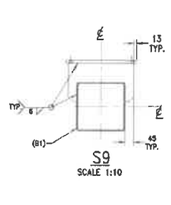
D6
SCALE: 1:10



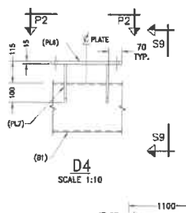
S2
SCALE 1:10



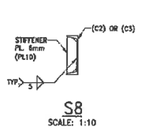
D3
SCALE 1:10



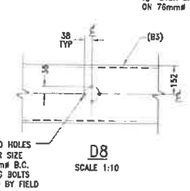
S9
SCALE 1:10



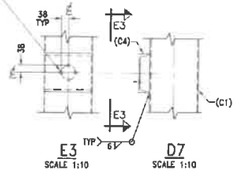
D4
SCALE 1:10

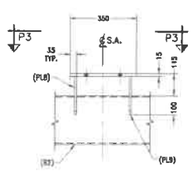


S8
SCALE: 1:10

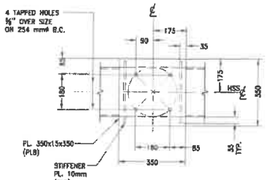


D8
SCALE 1:10

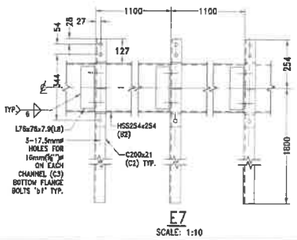




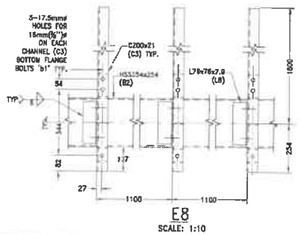
D5
SCALE 1:10



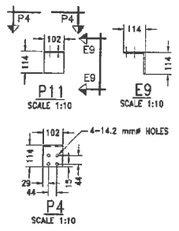
P3
SCALE 1:10



E7
SCALE: 1:10



E8
SCALE: 1:10



P4
SCALE 1:10

SMi THE S.M. GROUP INTERNATIONAL INC.
10000 Jasper Ave, Suite 906, Edmonton Centre Law 403
Tel.: 780.497.8500 Fax: 780.973.6044
www.smigroup.com

LICENSED PROFESSIONAL ENGINEER
S.T. WANG
100136367
PROVINCE OF ONTARIO

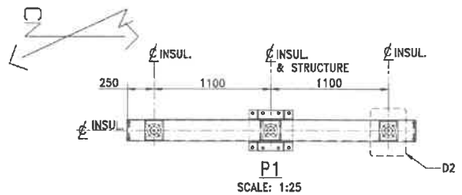
CLIENT:
MCMASTER UNIVERSITY-NF91

TITLE:
115/13.8kV STATION
POWER CABLE & PT/CT SUPPORTS
"SPC-1 & 2" IN THE PITS
STEEL DETAILS, STRUCTURE

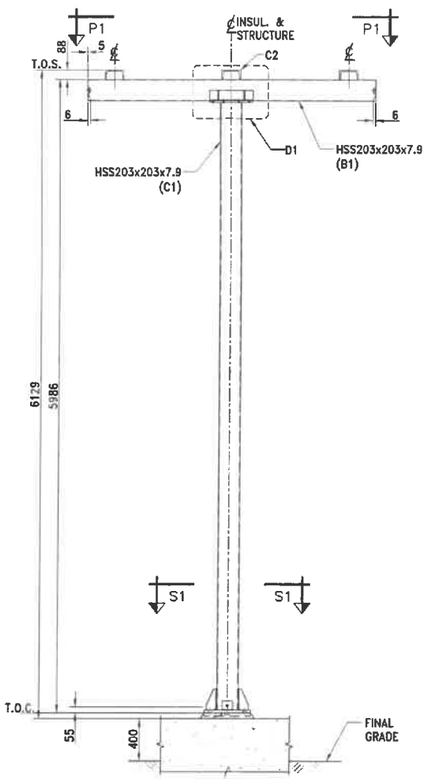
PREPARED BY: Z. WANG	DATE: 2019-09-27
DESIGNED BY: D. LECOMTE CHEVALIER	SCALE: AS SHOWN
VERIFIED BY: S.T. WANG	DISCIPLINE: STRUCTURE
APPROVED BY: S.T. WANG	CAD FILE NAME: F1731664-200-S002.dwg

PROJECT NO. F1731664 | LOC. 200 | DWG.# S002 | REV. 00 | PAGE:

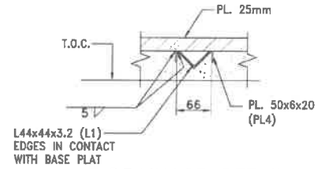
00 2019/09/27 RELEASED FOR CONSTRUCTION STW
NO. DATE TRANSMISSION BY



P1
SCALE: 1:25



ELEVATION
SBS-1
SCALE: 1:25



DRAINAGE DETAIL
SCALE: 1:5

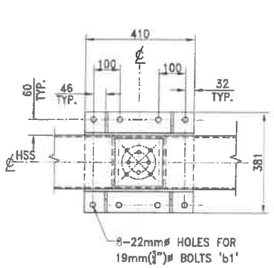
BILL OF MATERIAL FOR ONE STEEL INSULATOR & BUS SUPPORT

MARK	QUANT.	DESCRIPTION	MATERIAL	LENGTH (mm)	WEIGHT (kg)	REMARK
B1	1	HSS 203x203x7.9	G40.20-350W	2700	128.0	HOT DIP GALV.
C1	1	HSS 203x203x7.9	G40.20-350W	5746	272.4	HOT DIP GALV.
C2	3	MC180x28.4	G40.21-300W	180	15.3	HOT DIP GALV.
L1	1	L 44x44x3.2	G40.21-300W	440	0.9	HOT DIP GALV.
L2	4	L 89x89x7.9	G40.21-300W	150	6.4	HOT DIP GALV.
L3	2	L 89x64x6.4	G40.21-300W	100	1.5	HOT DIP GALV.
L4	2	L 102x89x9.5	G40.21-300W	410	11.2	HOT DIP GALV.
PL1	1	PL 440x25	G40.21-300W	440	38.0	HOT DIP GALV.
PL2	4	PL 68x8	G40.21-300W	94	1.6	HOT DIP GALV.
PL3	1	PL 381x12	G40.21-300W	410	14.7	HOT DIP GALV.
PL4	2	PL 50x6	G40.21-300W	20	0.1	HOT DIP GALV.
PL5	2	PL 203x5	G40.21-300W	203	3.3	HOT DIP GALV.
PL6	2	PL 50x12	G40.21-300W	187	1.8	HOT DIP GALV.
TOTAL WEIGHT (INCLUDING 3.5 % FOR GALVANIZATION)					512.5	

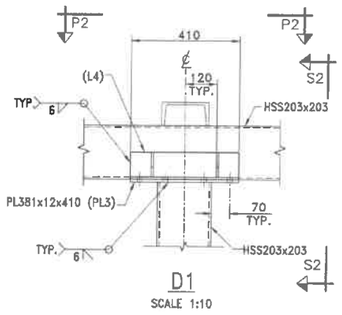
BILL OF MATERIAL FOR BOLTS

MARK	QUANT.	DESCRIPTION	MATERIAL	LENGTH (mm)	WEIGHT (kg)	REMARK
b1	8	19mmø (3/4") BOLTS, WASHERS AND NUTS	A325	64mm	-	GALV.
b2	4	12.7mmø (1/2") BOLTS, WASHERS	A325	48mm	-	GALV.

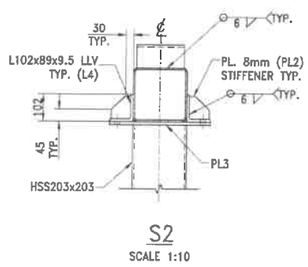
1 INSUL. & BUS SUPPORT REQUIRED. (SBS-1)
BOM FOR REFERENCE ONLY



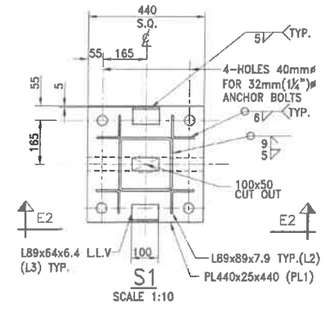
P2
SCALE 1:10



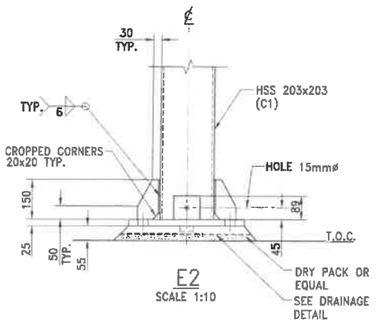
D1
SCALE 1:10



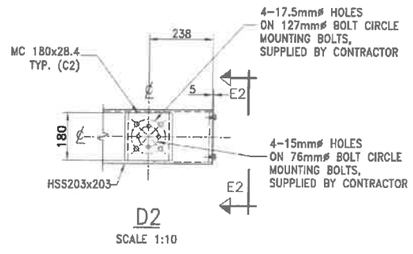
S2
SCALE 1:10



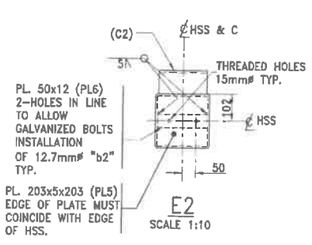
S1
SCALE 1:10



E2
SCALE 1:10



D2
SCALE 1:10



E2
SCALE 1:10

GENERAL NOTES:

REFER TO DWG. F1731664-200-S005.

REFERENCE DRAWINGS:

1. 115/13.8kV STATION
   STEEL KEY PLAN & LIST
   STRUCTURE F1731664-200-S001
2. 115kV AREA
   CONTAINM. PIT FOR "T1"
   CONC. & REINF. DETAILS
   FONDATION F1731664-100-F003
3. 115/13.8kV STATION
   BASIC LAYOUT
   ELECTRICAL ARRANG. F1731664-300-EA001
4. 115/13.8kV STATION
   ELEVATIONS
   ELECTRICAL ARRANG. F1731664-300-EA009

LEGEND:

T.O.C.: TOP OF CONCRETE
T.O.S.: TOP OF STEEL
L.L.V.: LONG LEG VERTICAL
INSUL.: INSULATOR

PROFESSIONALS:

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

THE S.M. GROUP INTERNATIONAL INC.
6205B Airport rd, Suite 200, Mississauga (Ontario) L4V 1E3
Tel.: 905 677.2009 / Fax.: 905 677.2014
www.groupsmi.com

STAMP:

LICENSED PROFESSIONAL ENGINEER
S.Y. WANG
100139367
PROVINCE OF ONTARIO
2018-9-27

CLIENT:

PROJECT:

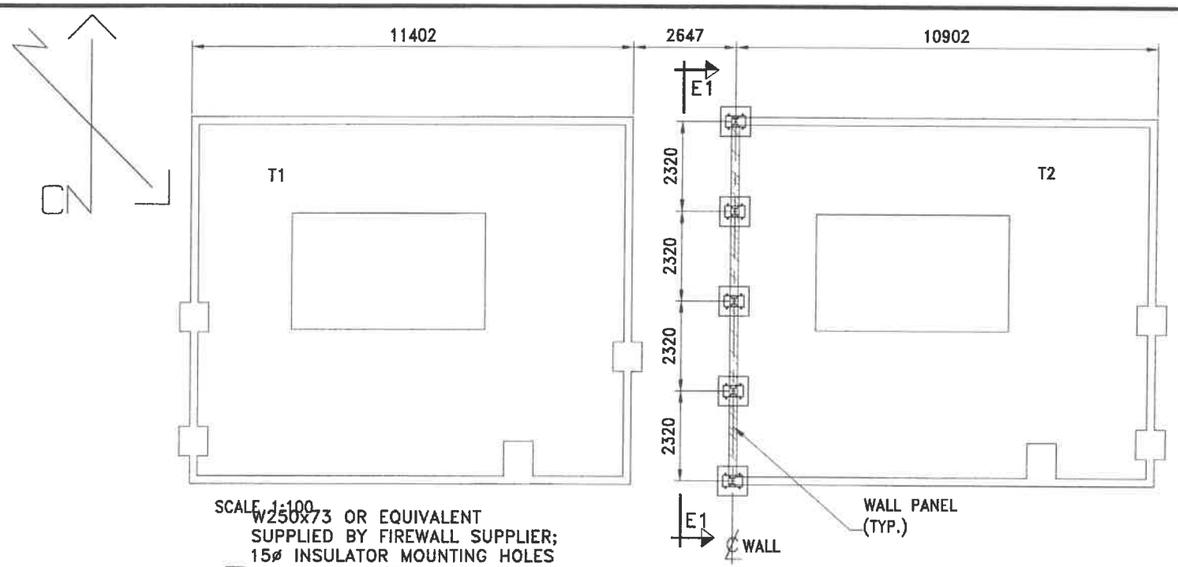
MCMASTER UNIVERSITY-NF91

TITLE:
115/13.8kV STATION
INSUL. & BUS SUPP. 'SBS-1'
STEEL DETAILS
STRUCTURE

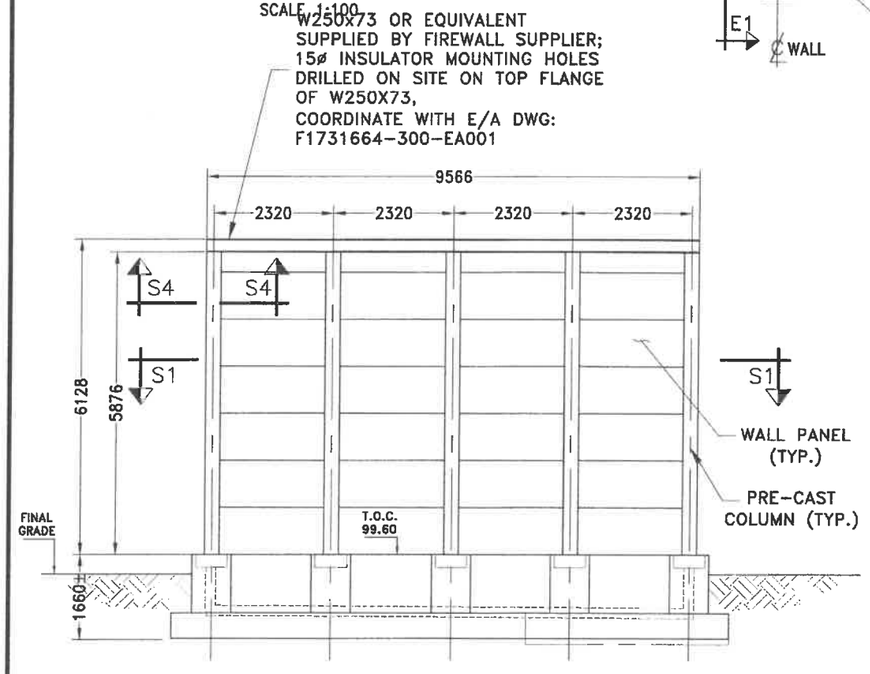
PREPARED BY: S.Y. WANG	DATE: 2018/09/27
DRAWN BY: G. TUDELA	SCALE: AS SHOWN
VERIFIED BY: Z.WANG	DISCIPLINE: STRUCTURE
APPROVED BY: S.Y.WANG	CAD FILE NAME: F1731664-200-S003.dwg

PROJECT No:	LOT:	DWG. #	REV:	PAGE:
F1731664	200	S003	00	

A1

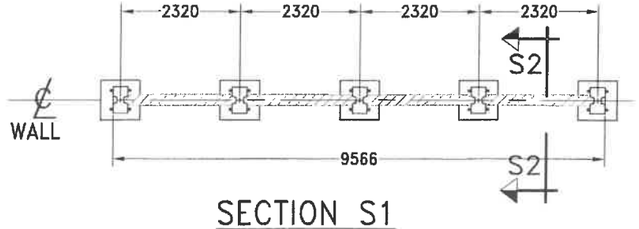


SCALE 1:100



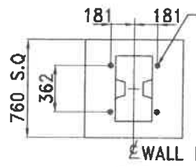
FIREWALL BETWEEN T1/T2 ELEVATION E1

SCALE 1:75



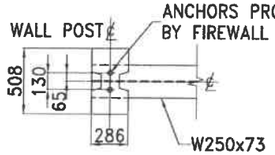
SECTION S1

SCALE 1:75



S3

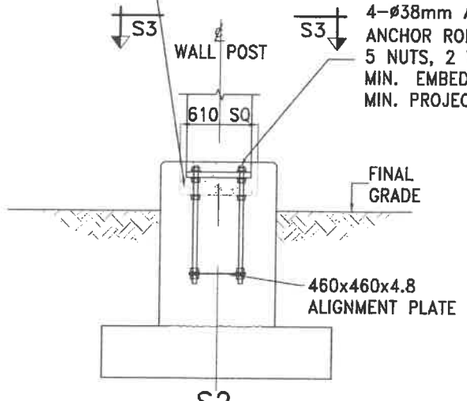
SCALE: 1:30



S4

SCALE: 1:30

FORMED RECESS FILLED WITH 35MPa NON-SHRINK GROUT. ENSURE FULL CONTACT WITH UNDERSIDE OF PLATE. GROUT TO BE PLACE PRIOR TO PLACEMENT OF PANELS.



S2

SCALE: 1:30

(FOR REFERENCE ONLY, FOUNDATION DETAILS REFER TO F1731664-100-F004)

FIREWALL SPECIFICATION

1. SCOPE OF WORK

1.1 A NEW FIREWALL WILL PROVIDE ADEQUATE FIRE PROTECTION BETWEEN TRANSFORMERS "T1 & T2".

2. DESIGN CRITERIA

2.1 PROVIDED FIRE BARRIER SYSTEM SHALL BE DESIGNED TO HAVE A MINIMUM 25 YEARS DESIGN LIFE.

2.2 FIREWALL FIRE-RATING RESISTANCE IS 2HRS.

2.3 WALL AND SUPPORT SHALL BE DESIGNED TO WITHSTAND WIND LOAD OF 0.46KPa FOR HAMILTON AS PER OBC 2012.

2.4 WALL AND SUPPORT SHALL BE DESIGNED TO WITHSTAND OTHER LOADS(SEISMIC...) IN ACCORDANCE WITH LOCAL AND ONTARIO BUILDING CODE REQUIREMENTS.

2.5 WALL SHALL BE SUPPORTED BY FOUNDATION DESIGNED IN ACCORDANCE WITH SOUND ENGINEERING PRINCIPLES AND GOVERNING CODES AND REGULATIONS.

2.6 THE CONTRACTOR SHALL VERIFY ALL DIMENSION ON SITE AND CORRELATE WITH CONSTRUCTION DRAWING.
THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANNES PRIOR TO COMMENCING CONSTRUCTION.

2.7 STRUCTURAL STEEL SHALL CONFORM TO CSA G40.21 300W AND 350W (FOR "W" SHAPE).
STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED.

2.8 ALL THE EXPOSED SURFACE OF THE STEEL SHALL BE OVER SPRAYED WITH PROTECTION COATING.

2.9 FOUNDATION CONCRETE: SPECIFIED COMPRESSIVE STRENGTH: 35MPa.

2.10 THIS DRAWING IS FOR REFERENCE ONLY.

NOTES :

REFERENCE DRAWING:

REFER TO DWG. F1731664-200-S001

GENERAL NOTES:

1. 115/13.8kV STATION
FOUNDATION KEY PLAN & LIST
FOUNDATION F1731664-100-F001

2. 115/13.8kV STATION
BASIC LAYOUT
ELECTRICAL ARRANGEMENT F1731664-300-EA001

3. 115/13.8kV STATION
ELEVATIONS
ELECTRICAL ARRANGEMENT F1731664-300-EA009

N°	DATE	TRANSMISSION	BY ENG
00	2018/09/27	RELEASED FOR CONSTRUCTION	S.Y.W

THE S.M. GROUP INTERNATIONAL INC.
6205B Airport rd, Mississauga (Ontario) L4V 1E3
Tel. : 905 677.9009/ Fax. : 905 677.9014
www.groupesm.com

STAMP :

LICENSED PROFESSIONAL ENGINEER
S.Y. WANG
100139367
2018/09/27
PROVINCE OF ONTARIO

CLIENT :

PROJECT :

MCMASTER UNIVERSITY-NF91

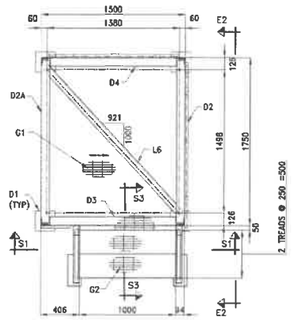
TITLE :

115/13.8kV STATION
FIREWALL BETWEEN "T1 / T2"
PLAN, ELEVATION & SPECIFICATION

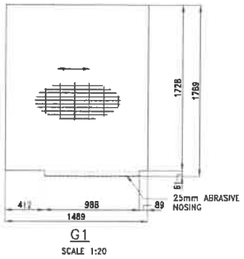
PREPARED BY : S.Y.WANG	DATE : 2018-08-27
DRAWN BY : A.DUBE	SCALE : AS SHOWN
VERIFIED BY : Z.WANG	DISCIPLINE : STRUCTURE
APPROVED BY : S.Y.WANG	CAD FILE NAME F1731664-200-S004.dwg

PROJECT No:	LOT:	DWG. #	REV:	PAGE :
F1731664	200	S004	00	

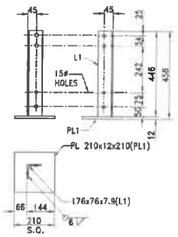
A2



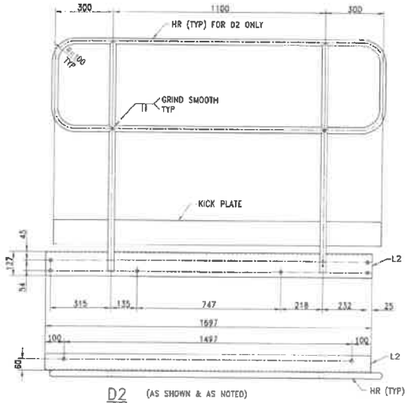
P1
SCALE 1:20



G1
SCALE 1:20



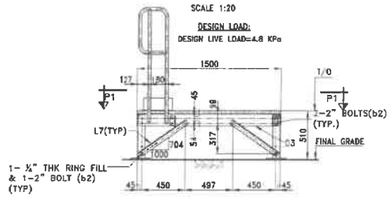
D1
SCALE 1:10



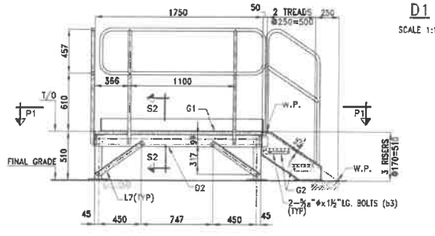
D2 (AS SHOWN & AS NOTED)

D2A (OPP. HAND & WITHOUT HANDRAIL)

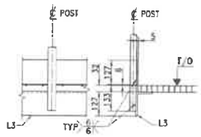
SCALE 1:10



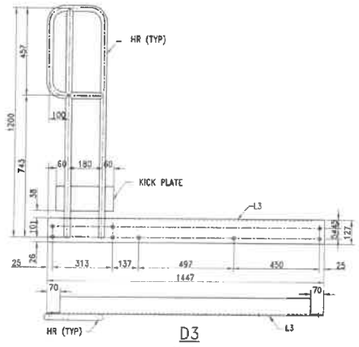
S1
SCALE 1:20



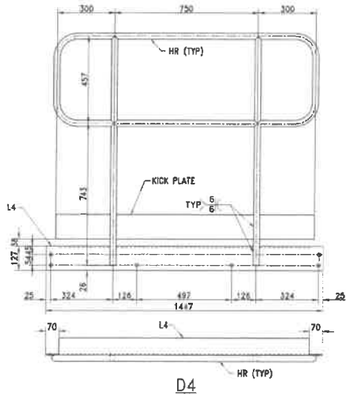
E2
SCALE 1:20



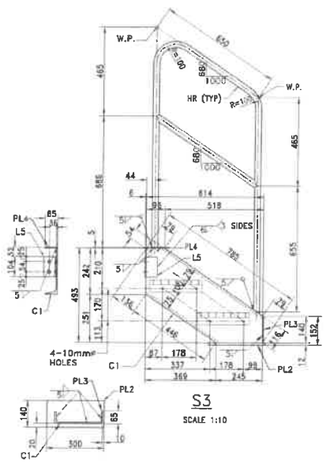
S2
SCALE 1:10



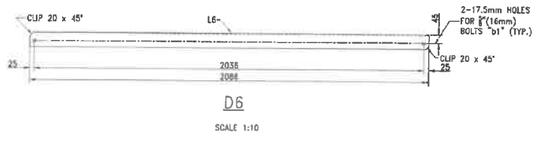
D3
SCALE 1:10



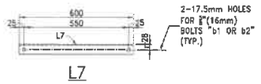
D4
SCALE 1:10



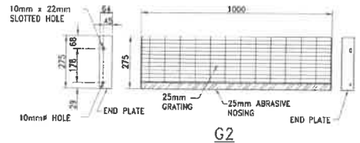
S3
SCALE 1:10



D6
SCALE 1:10



L7
SCALE 1:10



G2
SCALE 1:10

GENERAL NOTES:

1.0 GENERAL REQUIREMENTS:

1.1 CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, EQUIPMENT MOUNTING PATTERN AND CONDITIONS ON SITE AND ADVISE THE ENGINEER OF ANY ERROR OR OMISSION BEFORE WORK GETS UNDER WAY.
1.2 CONTRACTOR AND SUBCONTRACTOR SHALL TAKE INTO ACCOUNT THAT ALL WORK IS EFFECTED BY THE SITE'S STATE. ALL WORK SHALL BE COMPLETED FOLLOWING THE RULE OF ART OF THEIR SPECIFICATIONS AND MEET THE ENGINEER AND OTHER STANDARD.
1.3 THE WORKS MUST BE CONFORM TO ALL THE CODES AND REGULATIONS APPLICABLE TO THIS TYPE OF WORK AND IN EFFECT AT THE TIME THE WORK IS PERFORMED. AS A MINIMUM AND UNLESS OTHERWISE SPECIFIED, THE WORKS MUST BE PERFORMED IN ACCORDANCE WITH ONTARIO BUILDING CODE OF CANADA, THE 2012 EDITION.
1.4 ALL DIMENSIONS ARE IN MILLIMETERS U.N.O.
1.5 ALL DIMENSIONS MARKED ± BASED ON THE SURVEY SHALL BE VERIFIED BY THE GENERAL CONTRACTOR BEFORE STEEL FABRICATION & INSTALLATION.

2.0 STRUCTURAL STEEL:

2.1 UNLESS OTHERWISE INDICATED ON THE JOB SPECIFICATIONS OR ON THE DRAWINGS, ALL STEEL FRAMEWORKS SHALL COMPLY WITH CSA STANDARDS CAN/CSA-S16-0-, W59, W48 AND W47.1 LATEST EDITION.

2.2 MATERIAL

1. STEEL FRAMEWORKS SHALL COMPLY WITH CSA STANDARDS CAN/CSA-G40.21, CAN/CSA-G40.20 GRADE 350W FOR PROFILE HSS.
2. STEEL FRAMEWORKS SHALL COMPLY WITH CSA STANDARDS CAN/CSA-G40.21 GRADE 300W FOR PLATES, ANGLES, CHANNELS AND OTHERS.
3. STRUCTURAL BOLTS: ASTM A325; NUTS: ASTM A563 AND WASHERS: ASTM F436
4. NON-SHRINK GROUT UNDER BASE PLATES: 50MPa AT 28 DAYS, IF REQUIRED

2.3 CONNECTIONS

1. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, ALL SHOP CONNECTIONS MUST BE WELDED.
2. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, ALL FIELD CONNECTIONS MUST BE BOLTED.
3. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FIELD CONNECTIONS CAN ONLY BE WELDED ON ENGINEER'S APPROVAL.
4. ALL BOLTED CONNECTIONS MUST BE BEARING TYPE.
5. HIGH STRENGTH BOLTS IN DIAMETER ACCORDING TO THE ASTM STANDARD A325.
6. SHEAR CONNECTIONS OF BEAMS MUST BE CALCULATED FOR THE REACTION CORRESPONDING TO THE FULL BENDING CAPACITY OF THE BEAM.

2.4 WELDING

1. ALL WELDING SHALL COMPLY WITH CSA STANDARD W59. THE FABRICATOR AND ERECTOR SHALL BE CERTIFIED BY THE CANADIAN WELDING BUREAU IN THE DIVISION 1 OR 2.1, IN ACCORDANCE WITH CSA STANDARD W47.1.
2. ALL BUTT WELDS MUST BE FULL PENETRATION.
3. NO WELDING IS ALLOWED ON SITE UNLESS OTHERWISE SPECIFIED IN THE DRAWING OF RECORD.

2.5 SHOP DRAWINGS

1. SHOP AND ERECTION DRAWINGS, SHOWING ALL THE ERECTION AND FABRICATION DETAILS OF THE STEEL WORK, SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE THE FABRICATION IN A MINIMUM OF 5 COPIES.
2. THE SHOP DRAWINGS MUST BEAR THE STAMP AND SIGNATURE OF AN ENGINEER RECOGNIZED IN THE PROVINCE OF ONTARIO. THE DRAWINGS MUST ALSO INDICATE THE NAME AND THE GENERAL INFORMATION OF THE FABRICATOR.

2.6 GALVANIZATION

1. ALL NEW STEEL SHALL BE HOT-DIP GALVANIZED IN CONFORMITY TO CAN/CSA G164 STANDARD AND HYDRO-ONE SPEC A-9.
2. ALL DAMAGED DRILLED OR WELDED STEEL SHALL BE TOUCHED-UP USING "GALVICON" APPLIED WITH A BRUSH.

BILL OF MATERIAL FOR ONE STEEL PLATFORM FOR TRANSFORMER

MARK	QUANT	DESCRIPTION	MATERIAL	LENGTH (mm)	WEIGHT (kg)	REMARK
G1	1	FISHOLOW ALUMINIUM GRATING (SERRATED TOP) WIDTH:1489mm±	ALUMINIUM GRATING TYPE 30x102M, 32x4.8 BEARING BAR	1789±	115.3	FISHER & LUDLOW
G2	2	FISHOLOW ALUMINIUM GRATING STAIR TREADS SERRATED TOP ABRASIVE NOSING TYPE B WIDTH:275mm	ALUMINIUM GRATING TYPE 30x102M, 38x4.8 BEARING BAR	1000	18.4	FISHER & LUDLOW
L1	4	L 76x76x7.9	G40.21-300W	446	16.1	HOP DIP GALV.
L2	2	L 127x89x6.4	G40.21-300W	1697	35.3	HOP DIP GALV.
L3	1	L 127x89x6.4	G40.21-300W	1447	15.1	HOP DIP GALV.
L4	1	L 127x89x6.4	G40.21-300W	1447	15.1	HOP DIP GALV.
L5	2	L 64x64x6.4	G40.21-300W	99	1.2	HOP DIP GALV.
L6	1	L 76x76x6.4	G40.21-300W	2086	15.1	HOP DIP GALV.
L7	8	L 51x51x4.8	G40.21-300W	600	22.8	HOP DIP GALV.
PL1	4	PL 210x12	G40.21-300W	210	16.6	HOP DIP GALV.
PL2	2	PL 140x12	G40.21-300W	300	7.9	HOP DIP GALV.
PL3	2	PL 65x5	G40.21-300W	140	0.7	HOP DIP GALV.
PL4	2	PL 65x5	G40.21-300W	96	0.5	HOP DIP GALV.
C1	2	C250X23	G40.21-300W	785	38.1	HOP DIP GALV.
HR	–	ØX32 STD SCHEDULE 40 PIPE	ASTM A53	28500	96.6	HOP DIP GALV.
KICK PLATE	–	PL 6x125	G40.21-300W	3350	19.7	HOP DIP GALV.
TOTAL WEIGHT (INCLUDING 3.5% FOR GALVANIZATION)					444.0	

BILL OF MATERIAL FOR BOLT

MARK	QUANT	DESCRIPTION	MATERIAL	LENGTH (mm)	WEIGHT (kg)	REMARK
b1	26	16mm(5/8") BOLTS WASHER AND NUTS	A325	45	–	GALV.
b2	10	16mm(5/8") BOLTS WASHER AND NUTS	A325	51	–	GALV.
b3	8	8mm(5/16") BOLTS WASHER AND NUTS	A325	38	–	GALV.

2 SERVICE PLATFORMS FOR TRANSFORMERS REQUIRED. (PF-1 & 2)
BOM FOR REFERENCE ONLY

REFERENCE DRAWINGS:

1. 115/13.8kV STATION
STEEL KEY PLAN & LIST
STRUCTURE F1731664-200-S001

2. 115kV AREA
CONTAINMENT PIT FOR "T1"
CONC. & REINF. DETAILS
FOUNDATION F1731664-100-F003

3. 115kV AREA
CONTAIN. PIT FOR "T2"& FIREWALL FOOTINGS
CONC. & REINF. DETAILS
FOUNDATION F1731664-100-F004

4. 115/13.8kV STATION
BASIC LAYOUT
ELECTRICAL ARRANGEMENT F1731664-300-EA001

5. 115/13.8kV STATION
ELEVATIONS
ELETRICAL ARRANGEMENT F1731664-300-EA009

LEGEND:

W.P.: WORK POINT
HR: HAND RAIL
PL: PLATE
T/O: TOP OF GRATING

00 2018/09/27 RELEASED FOR CONSTRUCTION STM
DATE TRANSMISSION BY ENG

SMi THE S.M. GROUP INTERNATIONAL INC.
6200B Ambler Rd, Bath ON, Mississauga (Ontario) L4Y 4E5
Tel.: 905 917 8600 / Fax. : 905 897 3804
www.smgroup.ca

S. WANG
100139367
2018/09/27
PROVINCE OF ONTARIO

CLIENT

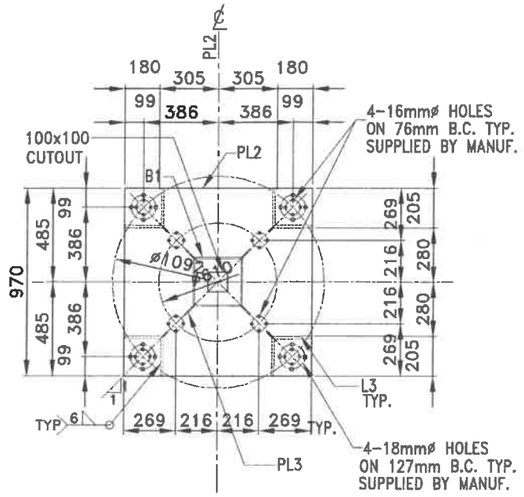
PROJECT
MCMASTER UNIVERSITY-NF91

TITLE
115kV AREA
SERVICE. PLATF. FOR TRANSF. "PF-1&2"
STEEL DESIGN
STRUCTURE

PREPARED BY: Z. WANG	DATE: 2018-09-27
DRAWN BY: S. TUZELA	SCALE: 1:100
VERIFIED BY: Z. WANG	DISCIPLINE: STRUCTURE
APPROVED BY: S.Y. WANG	CAD FILE NAME: F1731664-300-S005.dwg

PROJECT No. F1731664 | LOT 200 | DWG # S005 | REV. 00 | PAGE

A0



P1

SCALE: 1:20

BILL OF MATERIAL FOR ONE STEEL NEUTRAL REACTOR SUPPORT						
MARK	QUANT.	DESCRIPTION	MATERIAL	LENGTH (mm)	WEIGHT (kg)	REMARK
B1	1	HSS254x254x6.4	G40.20-350W	2654	129.0	HOT DIP GALV.
PL1	1	PL470x25	G40.21-300W	470	43.3	HOT DIP GALV.
PL2	1	PL970x16	G40.21-300W	970	118.3	HOT DIP GALV.
PL3	4	PL152x8	G40.21-300W	220	8.4	HOT DIP GALV.
L1	4	L102x102x7.9	G40.21-300W	150	7.3	HOT DIP GALV.
L2	4	L89x64x6.4	G40.21-300W	100	2.9	HOT DIP GALV.
L3	4	L203x203x13	G40.21-300W	152	23.9	HOT DIP GALV.
TOTAL WEIGHT (INCLUDING 3.5 % FOR GALVANIZATION)					344.7	

2 STEEL REACTOR SUPPORTS REQUIRED (SRE-1&2)
BOM FOR REFERENCE ONLY

LEGEND:

T.O.C.: TOP OF CONCRETE
T.O.S.: TOP OF STEEL
L.L.V.: LONG LEG VERTICAL
INSUL.: INSULATOR

GENERAL NOTES:

REFER TO DWG. F1731664-200-S005.

REFERENCE DRAWINGS:

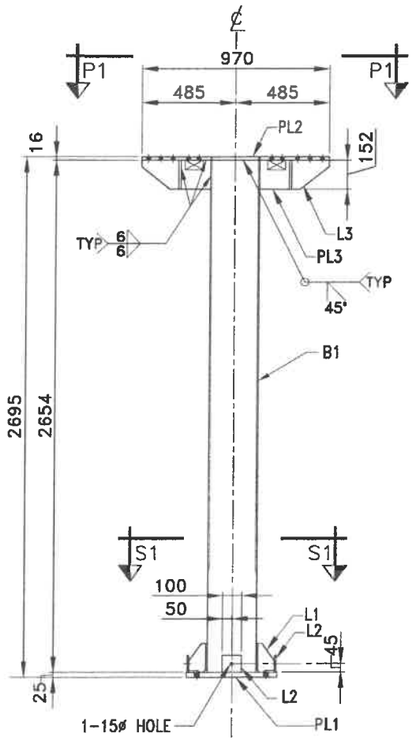
1. 115/13.8kV STATION
STEEL KEY PLAN & LIST
STRUCTURE F1731664-200-S001

2. 115kV AREA
CONTAINM. PIT FOR TRANSF."T1"
CONC. & REINF. DETAILS
FOUNDATION F1731664-100-F003

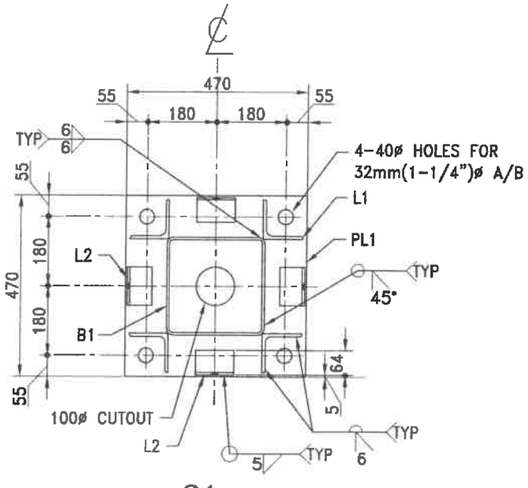
3. 115kV AREA
CONTAINM. PIT FOR TRANSF. "T2"
CONC. & REINF. DETAILS
FOUNDATION F1731664-100-F004

4. 115/13.8kV STATION
BASIC LAYOUT
ELECTRICAL ARRANG. F1731664-300-EA001

5. 115/13.8kV STATION
ELEVATION
ELECTRICAL ARRANG. F1731664-300-EA009

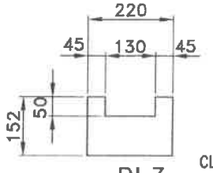


WELDED ASS'Y
SCALE: 1:20



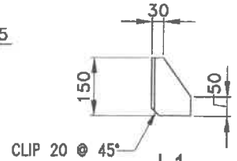
S1

SCALE: 1:10



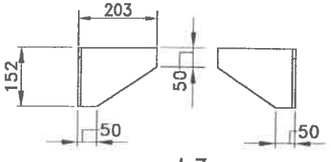
PL3

SCALE: 1:10



L1

SCALE: 1:10



L3

SCALE: 1:10

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

SMi THE S.M. GROUP INTERNATIONAL INC.
6205 Airport rd, Mississauga (Ontario) L4V 1E1
Tel. : 905 677.9009 Fax. : 905 677.9014
www.groupesm.com

STAMP :

LICENSED PROFESSIONAL ENGINEER
S.Y. WANG
100139367
2018/09/27
PROVINCE OF ONTARIO

PROJECT :

MCMASTER UNIVERSITY-NF91

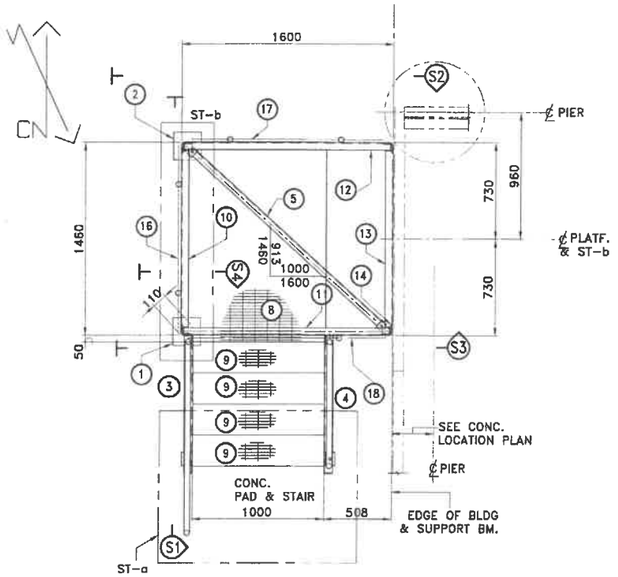
TITLE :

115/13.8kV STATION
NEUTRAL REACTOR BUS SUPP. STR
STEEL DETAILS
STRUCTURE

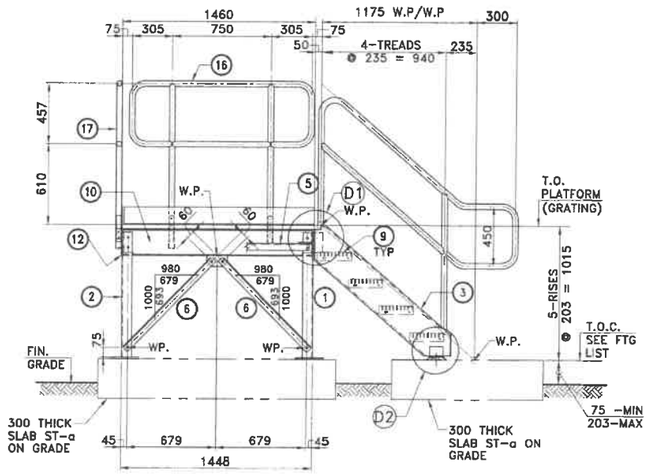
PREPARED BY : S.Y.WANG	DATE : 2018-09-27
DRAWN BY : D.LECONTE-CHEVALIER	SCALE : AS SHOWN
VERIFIED BY : Z.WANG	DISCIPLINE : STRUCTURE
APPROVED BY : S.Y.WANG	CAD FILE NAME F1731664-200-S006.dwg

PROJECT No:	LOT:	DWG. #	REV:	PAGE :
F1731664	200	S006	00	

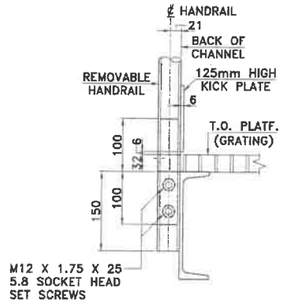
A2



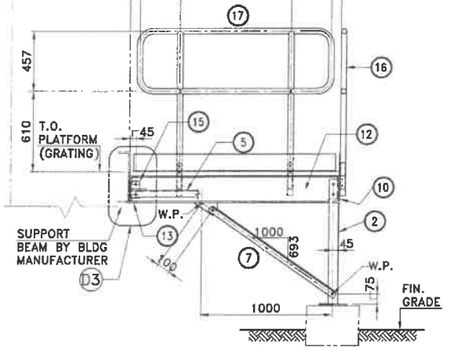
SP-1
SCALE: 1:20



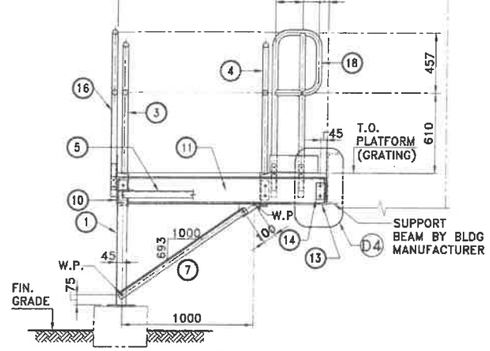
S1
SCALE: 1:20



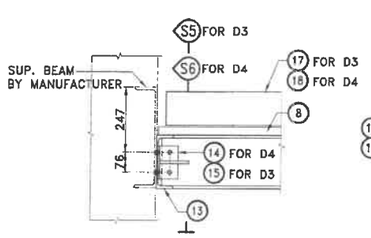
S4
SCALE: 1:5



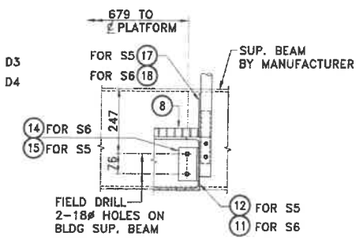
S2
SCALE: 1:20



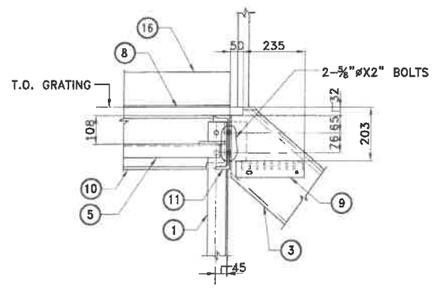
S3
SCALE: 1:20



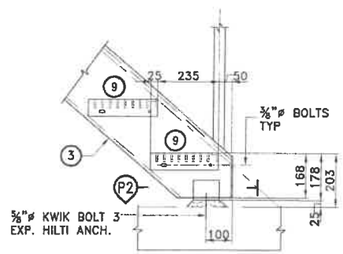
D3 AS SHOWN & NOTED
D4 OPP' HAND & NOTED
SCALE: 1:10



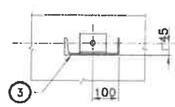
S5 AS SHOWN & NOTED
S6 OPP' HAND & NOTED
SCALE: 1:10



D1
SCALE: 1:10



D2
SCALE: 1:10



P2
SCALE: 1:10

GENERAL NOTES:

REFER TO DWG. F1731664-200-S005

REFERENCE DRAWINGS:

1. 115/13.8kV STATION
   STEEL KEY PLAN & LIST
   ELECTRICAL ARRANGEMENT F1731664-300-EA009

2. 115/13.8kV STATION
   ELEVATIONS
   ELECTRICAL ARRANGEMENT F1731664-300-EA009

3. 115/13.8kV STATION
   MAIN GROUNDING GRID
   PLAN & DETAILS
   ELECTRICAL ARRANGEMENT F1731664-300-EA014

THIS DRAWING MUST BE READ IN CONJUNCTION WITH:
- F1731664-200-S008
- F1731664-200-S009

LEGEND:

T.O.C.: TOP OF CONCRETE
T.O.S.: TOP OF STEEL
L.L.V.: LONG LEG VERTICAL
INSUL.: INSULATOR

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

SMi THE S.M. GROUP INTERNATIONAL INC.
6020 Airport rd, Suite 205, Mississauga (Ontario) L4V 1E3
Tel.: 905 677 0008 / Fax.: 905 677 8044
www.gmicomm.com

STAMP:

LICENSED PROFESSIONAL ENGINEER
S.Y. WANG
100139367
2018/09/27
PROVINCE OF ONTARIO

CLIENT:

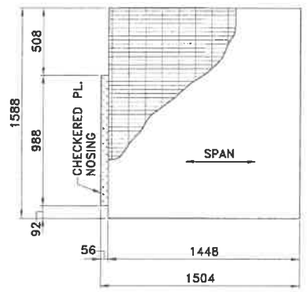
PROJECT:
MCMASTER UNIVERSITY-NF91

TITLE:
115/13.8kV AREA
STEEL STAIRS & PLATF. AT PERSONAL DR FOR E-HOUSE BLDG (1.0m ABOVE GRADE)
STEEL DETAILS, STRUCTURE

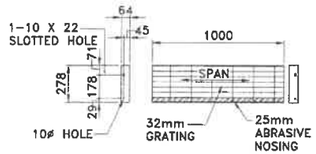
PREPARED BY: S.Y. WANG	DATE: 2018/09/27
DRAWN BY: D. LECONTE-CHEVALIER	SCALE: AS SHOWN
VERIFIED BY: Z.WANG	DISCIPLINE: STRUCTURE
APPROVED BY: S.Y.WANG	CAD FILE NAME: F1731664-200-S007.dwg

PROJECT No:	LOT:	DWG #:	REV:	PAGE:
F1731664	200	S007	00	

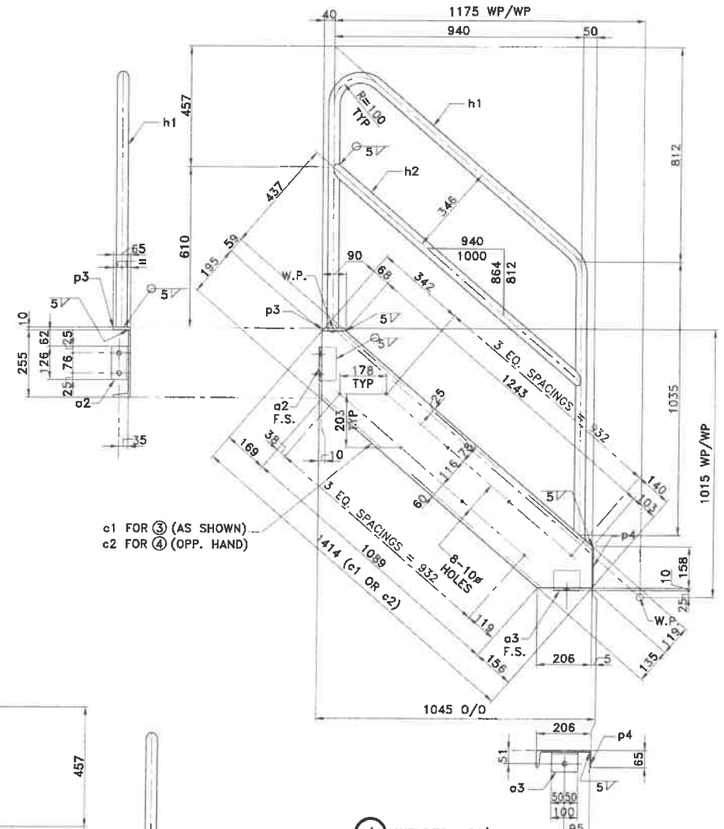
A1



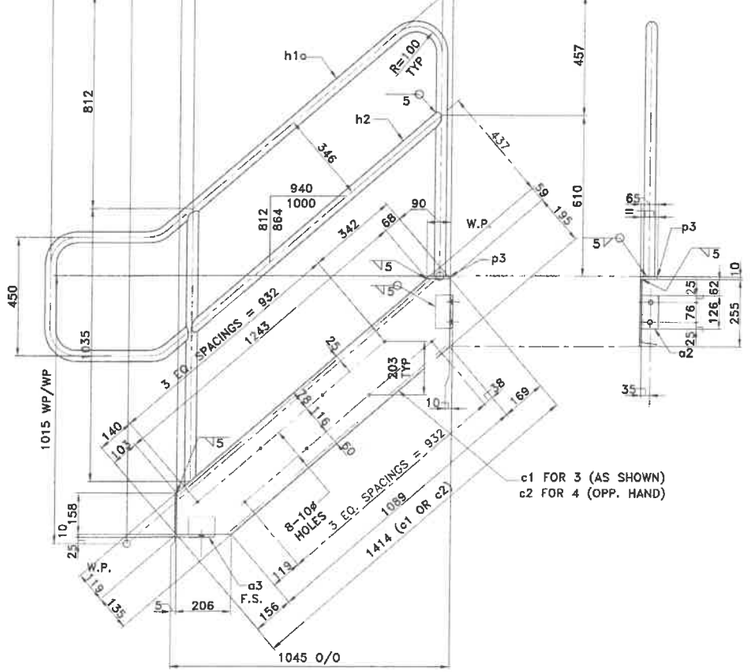
8
SCALE: 1:20



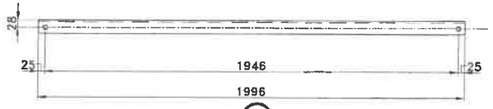
9
SCALE: 1:20



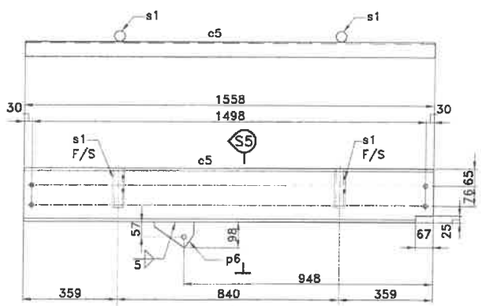
4 WELDED ASS'Y
SCALE: 1:10



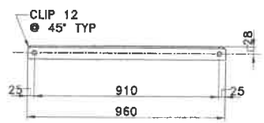
3 WELDED ASS'Y
SCALE: 1:10



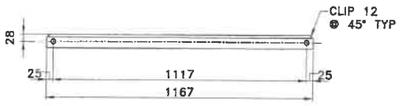
5
SCALE: 1:10



12
SCALE: 1:10



6
SCALE: 1:10



7
SCALE: 1:10

BILL OF MATERIAL

MARK	No. REQ'D	DESCRIPTION	REMARKS	WT. kgs
①	1	1-a1-L76 X 76 X 7.9 X 946 LG. 1-p1-PL 12 X 210 X 210 LG. 1-p2-PL 10 X 68 X 104 LG.	WELDED ASS'Y	13.2
②	1	1-a1-L76 X 76 X 7.9 X 946 LG. 1-p1-PL 12 X 210 X 210 LG.	WELDED ASS'Y	12.7
③	1	1-c1-C250 X 23 X 1414 LG. 1-a2-L64 X 64 X 6.4 X 126 LG. 1-a3-L76 X 76 X 6.4 X 100 LG. 1-p3-PL 10 X 65 X 94 LG. 1-p4-PL 5 X 65 X 161 LG. 1-ha1-NPS 1½" SCH. 40 STD PIPE X 4560 LG. 1-h2-NPS 1¼" SCH. 40 STD PIPE X 1242 LG.	WELDED ASS'Y	71.3
④	1	1-c2-C250 X 23 X 1414 LG. (OPP. HAND TO c1) 1-a2-L64 X 64 X 6.4 X 126 LG. 1-a3-L76 X 76 X 6.4 X 100 LG. 1-p3-PL 10 X 65 X 94 LG. 1-p4-PL 5 X 65 X 158 LG. 1-h1-NPS 1½" SCH. 40 STD PIPE X 3200 LG. 1-h2-NPS 1¼" SCH. 40 STD PIPE X 1242 LG.	WELDED ASS'Y OPP' HAND TO ③	50.0
⑤	1	L51 X 51 X 6.4 X 1996 LG.		9.5
⑥	2	L51 X 51 X 6.4 X 960 LG.		9.1
⑦	2	L51 X 51 X 6.4 X 1167 LG.		11.1
⑧	1	1504X1588 SERRATED GALV GRATING TYPE 30-102, 32X4.8mm BEARING BAR C/W ABRASIVE STD NOSING, END PLATES AND EXTRA GRIP ON BEARING BAR	BY FISHER & LUDLOW	103.4
⑨	4	278X1000 SERRATED GALV GRATING TYPE 30-102, 32X4.8mm BEARING BAR C/W ABRASIVE STD NOSING, AND EXTRA GRIP ON BEARING BAR	BY FISHER & LUDLOW	48.1
⑩	1	1-c3-C200 X 17 X 1418 LG. 2-s1-NPS 1½" SCH. 40 STD PIPE X 150 LG. 1-p5-PL 8 X 80 X 230 LG.	WELDED ASS'Y	26.3
⑪	1	1-c4-C200 X 17 X 1558 LG. 2-s1-NPS 1½" SCH. 40 STD PIPE X 150 LG. 1-p6-PL 8 X 98 X 150 LG.	WELDED ASS'Y	28.7
⑫	1	1-c5-C200 X 17 X 1558 LG. 2-s1-NPS 1½" SCH. 40 STD PIPE X 150 LG. 1-p6-PL 8 X 98 X 150 LG.	WELDED ASS'Y	28.7
		EST. WT. OF STEEL INCL. 3.5 % GALV.		= 429 kg

GENERAL NOTES:

REFER TO DWG. F1731664-200-S005

REFERENCE DRAWINGS:

1. 115/13.8kV STATION
   STEEL KEY PLAN & LIST STRUCTURE F1731664-200-S001
2. 115/13.8kV STATION
   ELEVATIONS
   ELECTRICAL ARRANGEMENT F1731664-300-EA009
3. 115/13.8kV STATION
   MAIN GROUNDING GRID
   PLAN & DETAILS
   ELECTRICAL ARRANGEMENT F1731664-300-EA014

THIS DRAWING MUST BE READ IN CONJUNCTION WITH:
- F1731664-200-S007
- F1731664-200-S009

LEGEND:

T.O.C.: TOP OF CONCRETE
T.O.S.: TOP OF STEEL
L.L.V.: LONG LEG VERTICAL
INSUL.: INSULATOR

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

SMi THE S.M. GROUP INTERNATIONAL INC.
6205B Airport rd, Suite 205, Mississauga (Ontario) L4V 1E3
Tel.: 905 677 9009 / Fax.: 905 677 8014
www.smgroupintl.com

STAMP:

LICENSED PROFESSIONAL ENGINEER S.Y. WANG 100139357 PROVINCE OF ONTARIO

CLIENT:

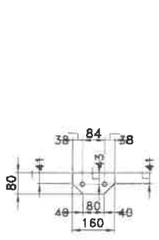
PROJECT:
MCMASTER UNIVERSITY-NF91

TITLE:
115/13.8kV AREA
STEEL STAIRS & PLATF. AT PERSONAL DR. FOR E-HOUSE BLDG (1.0m ABOVE GRADE)
STEEL DETAILS, STRUCTURE

PREPARED BY: S.Y. WANG	DATE: 2018/09/27
DRAWN BY: D. LECOMTE-CHEVALIER	SCALE: AS SHOWN
VERIFIED BY: Z.WANG	DISCIPLINE: STRUCTURE
APPROVED BY: S.Y.WANG	CAD FILE NAME: F1731664-200-S008.dwg

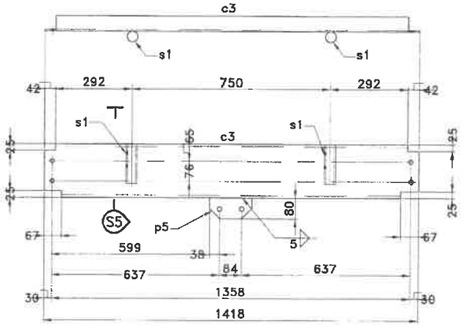
PROJECT No:	LOT:	DWG. #	REV:	PAGE:
F1731664	200	S008	00	

A1



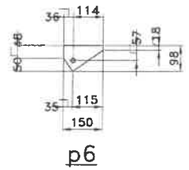
p5

SCALE: 1:10



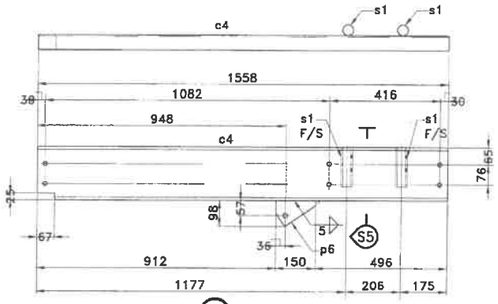
10

SCALE: 1:10



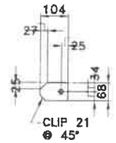
p6

SCALE: 1:10



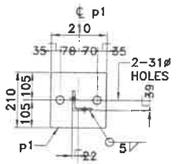
11

SCALE: 1:10



p2

1 AS SHOWN & AS NOTED
2 OPP' HAND & AS NOTED
} WELDED ASS'Y



P4

SCALE: 1:10

BILL OF MATERIAL

MARK	No. REQ'D	DESCRIPTION	REMARKS	WT. kgs
13	1	C200 X 17 X 1418 LG.		24.1
14	1	L76 X 76 X 7.9 X 126 LG.		1.1
15	1	1-a4-L76 X 76 X 7.9 X 126 LG.	WELDED ASS'Y	1.7
		1-p2-PL 10 X 68 X 104 LG.		
16	1	1-h4-NPS 1¼" SCH. 40 STD PIPE X 2850 LG.	WELDED ASS'Y	29.2
		2-h3-NPS 1¼" SCH. 40 STD PIPE X 1099 LG.		
		1-h5-NPS 1¼" SCH. 40 STD PIPE X 750 LG.		
		2-h6-NPS 1" SCH. 80 XS PIPE X 200 LG.		
		1-p7-PL 6 X 125 X 1402 LG.		
17	1	1-h7-NPS 1¼" SCH. 40 STD PIPE X 2940 LG.	WELDED ASS'Y	30.3
		2-h3-NPS 1¼" SCH. 40 STD PIPE X 1099 LG.		
		1-h8-NPS 1¼" SCH. 40 STD PIPE X 840 LG.		
		2-h6-NPS 1" SCH. 80 XS PIPE X 200 LG.		
		1-p8-PL 6 X 125 X 1492 LG.		
18	1	1-h9-NPS 1¼" SCH. 40 STD PIPE X 2090 LG.	WELDED ASS'Y	15.0
		1-h10-NPS 1¼" SCH. 40 STD PIPE X 206 LG.		
		1-h3-NPS 1¼" SCH. 40 STD PIPE X 1099 LG.		
		1-h6-NPS 1" SCH. 80 XS PIPE X 200 LG.		
		1-p9-PL 6 X 125 X 392 LG.		
	4	HILTI ANCHOR HSL M20/30 W/MIN. EMBEDMENT 130mm		
	2	⅝"ø BOLTS X 2" LG. C/W HEX. NUTS		
	26	⅝"ø BOLTS X 1¾" LG. C/W HEX. NUTS		
	28	LOCK WASHERS FOR ⅝"ø BOLTS		
	12	M12x1.75 BOLTS X 25LG. C/W HEX NUTS		
	2	⅜"ø KWIK BOLT 3 EXP. HILTI ANCH. SET W/MIN. EMB. 102mm		
	12	⅜"ø BOLTS X 1½" LG. C/W HEX. NUTS		
	12	LOCK WASHERS FOR ⅜"ø BOLTS		
		EST. WT. OF STEEL INCL. 3.5 % GALV.		= 105 kg

ALL BOLTS SHALL BE SUPPLIED BY STEEL MANUFACTURER

GENERAL NOTES:

REFER TO DWG. F1731664-200-S005

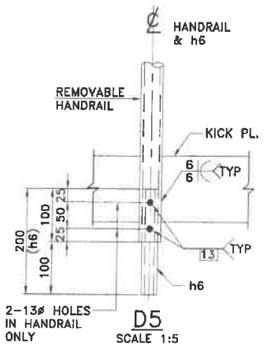
REFERENCE DRAWINGS:

1. 115/13.8kV STATION
   STEEL KEY PLAN
   STRUCTURE F1731664-200-S001
2. 115/13.8kV STATION
   ELEVATIONS
   ELECTRICAL ARRANGEMENT F1731664-300-EA009
3. 115/13.8kV STATION
   MAIN GROUNDING GRID
   PLAN & DETAILS
   ELECTRICAL ARRANGEMENT F1731664-300-EA014

THIS DRAWING MUST BE READ IN CONJUNCTION WITH:
- F1731664-200-S007
- F1731664-200-S008

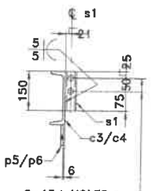
LEGEND:

T.O.C.: TOP OF CONCRETE
T.O.S.: TOP OF STEEL
L.L.V.: LONG LEG VERTICAL
INSUL.: INSULATOR



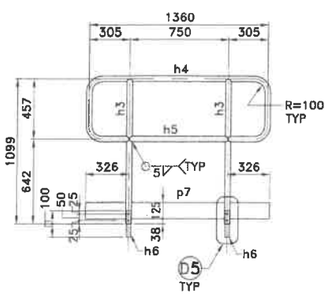
D5

SCALE 1:5



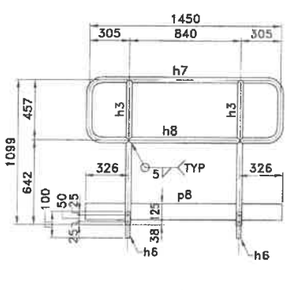
S5

SCALE: 1:10



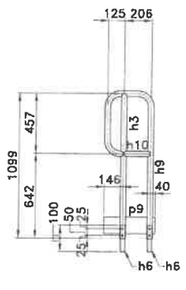
16

SCALE 1:20



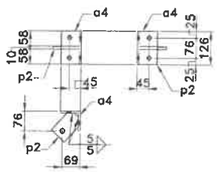
17

SCALE 1:20



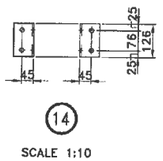
18

SCALE 1:20



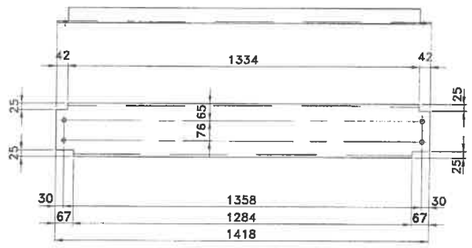
15

SCALE 1:10



14

SCALE 1:10



13

SCALE 1:10

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

SMi THE S.M. GROUP INTERNATIONAL INC.
82068 Airport rd. Suite 206, Mississauga (Ontario) L4V 1R3
Tel.: 905 677.8000 / Fax.: 905 677.8014
www.groupsmi.com

STAMP:

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

CLIENT:

PROJECT:

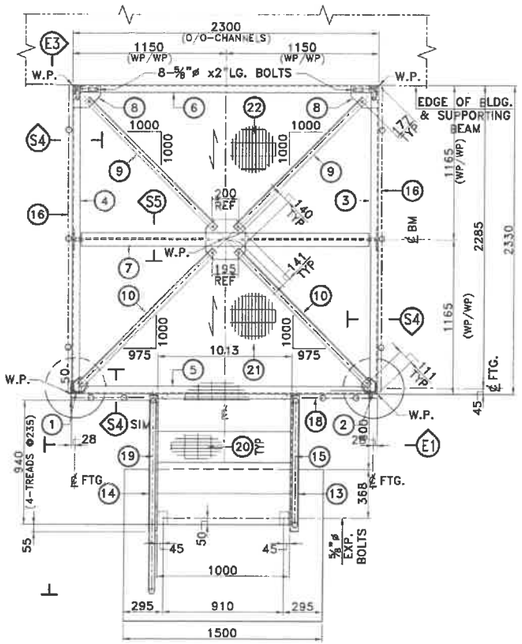
MCMASTER UNIVERSITY-NF91

TITLE:
115/13.8kV AREA
STEEL STAIRS & PLATF. AT PERSONAL DR.
FOR E-HOUSE BLDG (1.0m ABOVE GRADE)
STEEL DETAILS, STRUCTURE

PREPARED BY: S.Y. WANG	DATE: 2018/09/27
DRAWN BY: D. LECONTE-CHEVALIER	SCALE: AS SHOWN
VERIFIED BY: Z.WANG	DISCIPLINE: STRUCTURE
APPROVED BY: S.Y.WANG	CAD FILE NAME: F1731664-200-S009.dwg

PROJECT No:	LOT:	DWG.#	REV:	PAGE:
F1731664	200	S009	00	

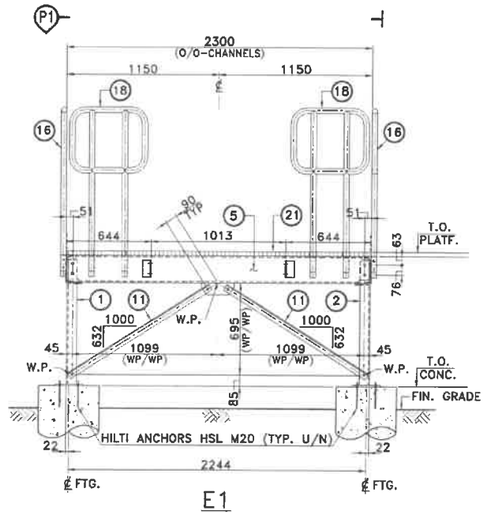
A1



P1

SP-2

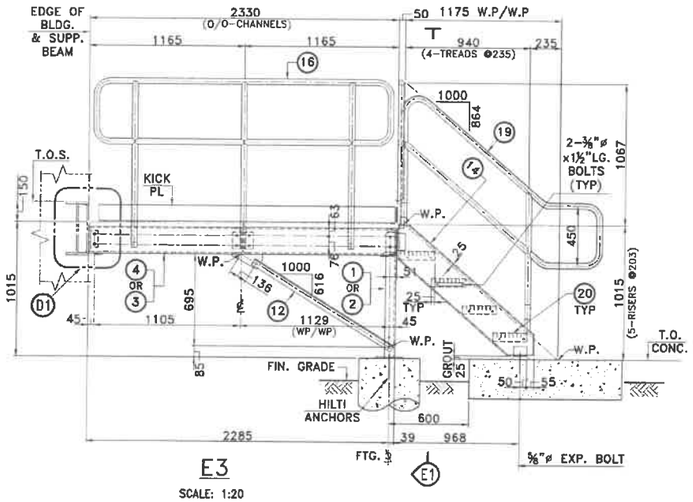
SCALE: 1:20



E1

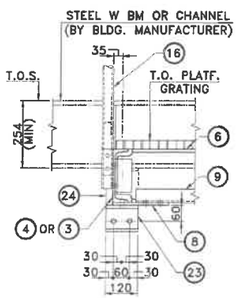
SCALE: 1:20

NOTE: STAIRS NON SHOWN FOR CLARITY



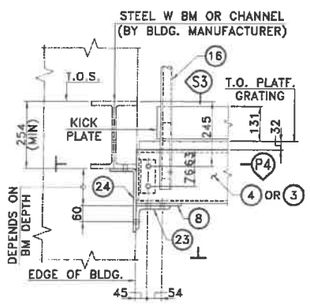
E3

SCALE: 1:20



S3

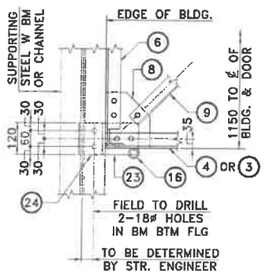
SCALE 1:10



D1 - AS SHOWN

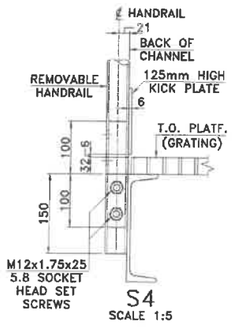
(DETAILS FOR SUPP. BM (DEPTH = 254 OR MORE)

SCALE 1:10



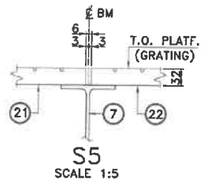
P4

SCALE 1:10



S4

SCALE 1:5



S5

SCALE 1:5

GENERAL NOTES:

REFER TO DWG. F1731664-200-S005

REFERENCE DRAWINGS:

1. 115/ 13.8kV STATION
   STEEL KEY PLAN & LIST
   STRUCTURE F1731664-200-S001
2. 115/13.8kV STATION
   ELEVATIONS
   ELECTRICAL ARRANGEMENT F1731664-300-EA009
3. 115/13.8kV STATION
   MAIN GROUNDING GRID
   PLAN & DETAILS
   ELECTRICAL ARRANGEMENT F1731664-300-EA014

THIS DRAWING MUST BE READ IN CONJUNCTION WITH:
- F1731664-200-S011
- F1731664-200-S012

LEGEND:

T.O.C.: TOP OF CONCRETE
T.O.S.: TOP OF STEEL
L.L.V.: LONG LEG VERTICAL
INSUL.: INSULATOR

PROFESSIONALS:

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

SMi THE S.M. GROUP INTERNATIONAL INC.
6200B Airport rd. Suite 200, Mississauga (Ontario) L4V 1E3
Tel.: 905 672.8000 / Fax.: 905 672.2014
www.groupsmi.com

STAMP:

LICENSED PROFESSIONAL ENGINEER
S.Y. WANG
100139367
2018/09/27
PROVINCE OF ONTARIO

CLIENT:

PROJECT:

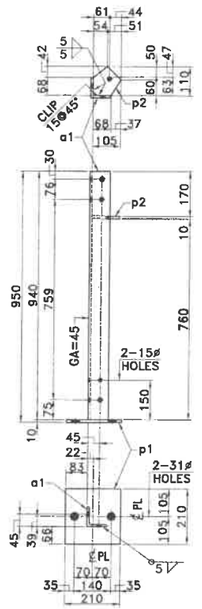
MCMASTER UNIVERSITY-NF91

TITLE:
115/13.8kV STATION
STEEL STAIRS & PLATF. AT FRONT DR. FOR E-HOUSE BLDG (1m ABOVE GRADE)
STEEL DETAILS, STRUCTURE

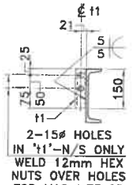
PREPARED BY: S.Y. WANG	DATE: 2018/09/27
DRAWN BY: G. TUELLA	SCALE: AS SHOWN
VERIFIED BY: Z.WANG	DISCIPLINE: STRUCTURE
APPROVED BY: S.Y.WANG	CAD FILE NAME: F1731664-200-S010.dwg

PROJECT No:	LOT:	DWG. #	REV:	PAGE:
F1731664	200	S010	00	

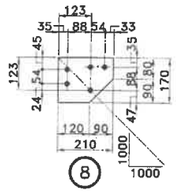
A1



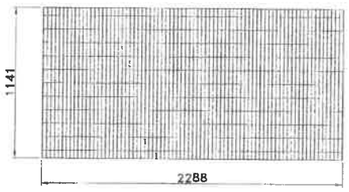
1 AS SHOWN
2 OPP. HAND
WELDED ASS'Y
SCALE 1:10



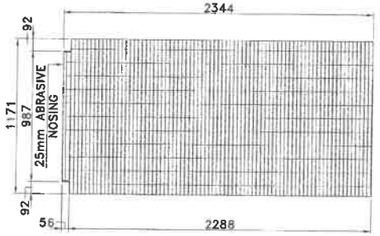
SCALE 1:10



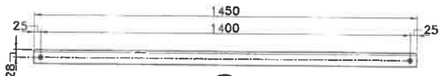
8
SCALE 1:10



22
SCALE 1:20



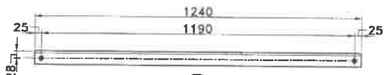
21
SCALE 1:20



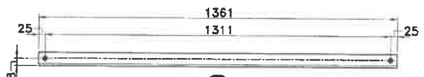
10
SCALE 1:10



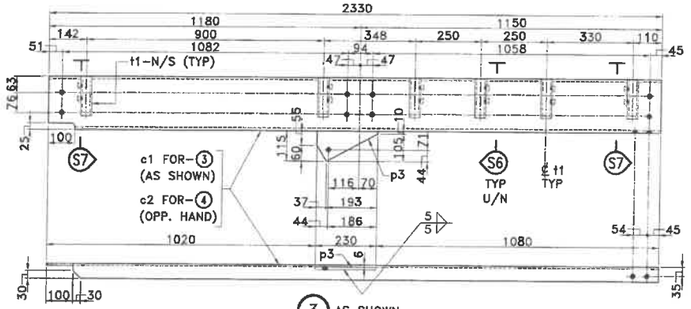
11
SCALE 1:10



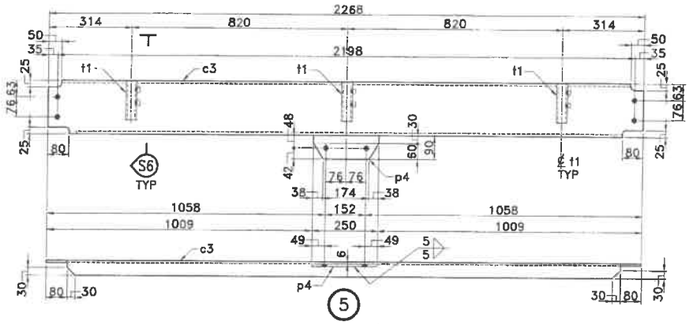
12
SCALE 1:10



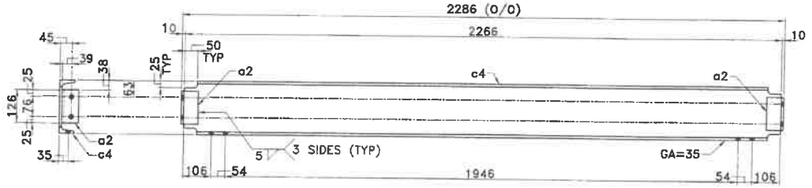
9
SCALE 1:10



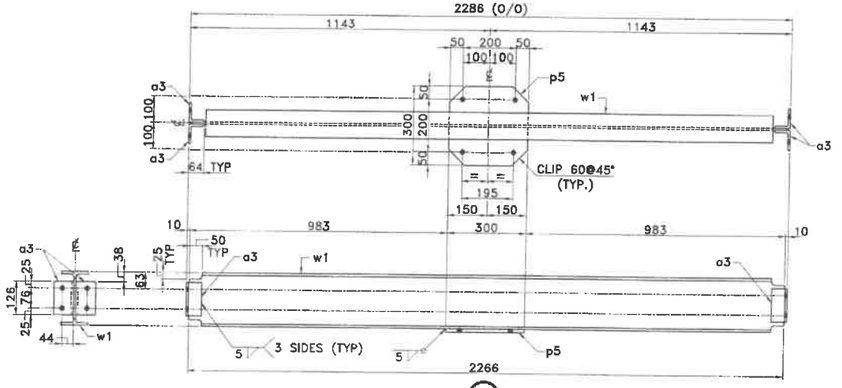
3 AS SHOWN
4 OPP. HAND
WELDED ASS'Y
SCALE 1:10



5
WELDED ASS'Y
SCALE 1:10



6
WELDED ASS'Y
SCALE 1:10



7
WELDED ASS'Y
SCALE 1:10

BILL OF MATERIAL

MARK	No. REQ'D	DESCRIPTION	REMARKS	WT. kgs
①	1	1-a1-L76 X 76 X 7.9 X 940 LG. 1-p1-PL 10 X 210 X 210 LG. 1-p2-PL 10 X 105 X 110 LG.	WELDED ASS'Y	12.8
②	1	OPP. HAND TO ①	WELDED ASS'Y	12.8
③	1	1-c1-C200 X 17 X 2330 LG. 1-p3-PL 10 X 115 X 230 LG. 6-11-NPS 1¼ SCH. 40 STD PIPE X 150 LG. C/W 12-HEX. NUTS FOR M12 X 1.75 SCREWS	WELDED ASS'Y	44.7
④	1	1-c2-C200 X 17 X 2330 LG. (OPP. HAND TO 'c1') 1-p3-PL 10 X 115 X 230 LG. 6-11-NPS 1¼ SCH. 40 STD PIPE X 150 LG. C/W 12-HEX. NUTS FOR M12 X 1.75 SCREWS	WELDED ASS'Y (OPP. HAND TO ③)	44.7
⑤	1	1-c3-C200 X 17 X 2268 LG. 1-p4-PL 10 X 90 X 250 LG. 3-11-NPS 1¼ SCH. 40 STD PIPE X 150 LG. C/W 6-HEX. NUTS FOR M12 X 1.75 SCREWS	WELDED ASS'Y	41.9
⑥	1	1-c3-C200 X 17 X 2266 LG. 2-a2-L64 X 64 X 6.4 X 126 LG.	WELDED ASS'Y	40.0
⑦	1	1-w1-W200 X 19 X 2266 LG. 4-a3-L76 X 64 X 6.4 X 126 LG. 1-p5-PL 10 X 300 X 300 LG.	WELDED ASS'Y	53.5
⑧	2	PL 10 X 170 X 210 LG.		5.6
⑨	2	L51 X 51 X 6.4 X 1361 LG.		12.9
⑩	2	L51 X 51 X 6.4 X 1450 LG.		13.8
⑪	2	L51 X 51 X 6.4 X 1260 LG.		12.0
⑫	2	L51 X 51 X 6.4 X 1240 LG.		11.8
	4	HILTI ANCHOR HSL M20 W/MIN. EMBEDMENT 130mm		
	12	⅜"ø BOLTS X 2" LG. C/W HEX. NUTS		
	32	⅜"ø BOLTS X 1¾" LG. C/W HEX. NUTS		
	36	LOCK WASHERS FOR ⅜"ø BOLTS		
	8	BEV. WASHERS FOR ⅜"ø BOLTS		
	26	M12x1.75 BOLTS X 25LG. (NO NUTS)		
		EST. WT. OF STEEL INCL. 3.5 % GALV.		= 317 kg

ALL BOLTS SHALL BE SUPPLIED BY STEEL MANUFACTURER BOM FOR REFERENCE ONLY

GENERAL NOTES:

REFER TO DWG. F1731664-200-S005

REFERENCE DRAWINGS:

1. 115/ 13.8kV STATION
   STEEL KEY PLAN & LIST
   STRUCTURE F1731664-200-S001
2. 115/13.8kV STATION
   ELEVATIONS
   ELECTRICAL ARRANGEMENT F1731664-300-EA009
3. 115/13.8kV STATION
   MAIN GROUNDING GRID
   PLAN & DETAILS
   ELECTRICAL ARRANGEMENT F1731664-300-EA014

THIS DRAWING MUST BE READ IN CONJUNCTION WITH:
- F1731664-200-S010
- F1731664-200-S012

LEGEND:

T.O.C.: TOP OF CONCRETE
T.O.S.: TOP OF STEEL
L.L.V.: LONG LEG VERTICAL
INSUL.: INSULATOR

PROFESSIONALS:

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

SMi THE S.M. GROUP INTERNATIONAL INC.
6050B Airport rd, Suite 205, Mississauga (Ontario) L4V 1E3
Tel.: 905 677 8000 / Fax.: 905 677 2014
www.gmsgsam.com

STAMP:



CLIENT:

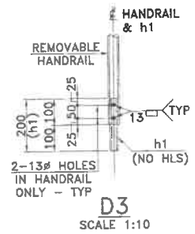
PROJECT:
MCMASTER UNIVERSITY-NF91

TITLE:
115/13.8kV AREA
STEEL STAIRS & PLATF. AT FRONT DR FOR E-HOUSE BLDG (1.0m ABOVE GRADE)
STEEL DETAILS, STRUCTURE

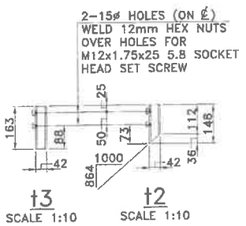
PREPARED BY: S.Y. WANG	DATE: 2018/09/27
DRAWN BY: D. LECOMTE-CHEVALIER	SCALE: AS SHOWN
VERIFIED BY: Z.WANG	DISCIPLINE: STRUCTURE
APPROVED BY: S.Y.WANG	CAD FILE NAME: F1731664-200-S011.dwg

PROJECT No:	LOT:	DWG.#	REV:	PAGE:
F1731664	200	S011	00	

A1

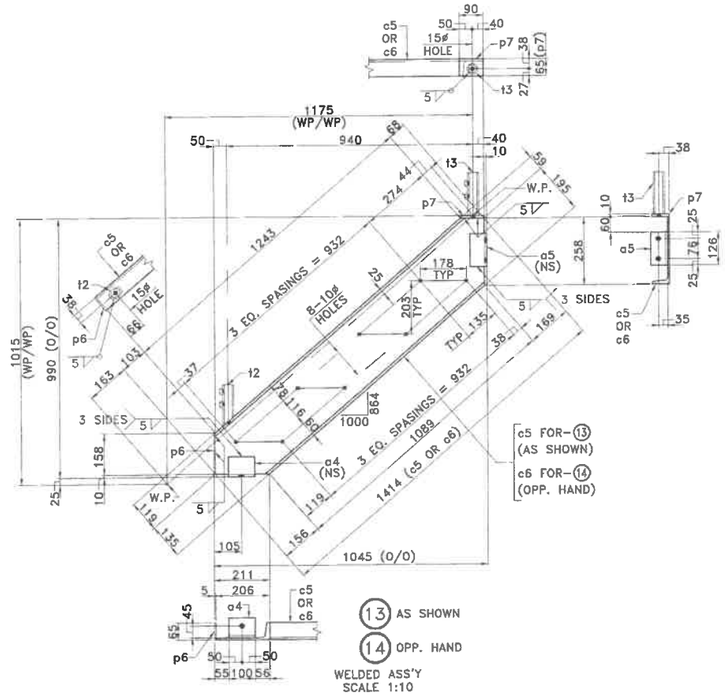


D3
SCALE 1:10

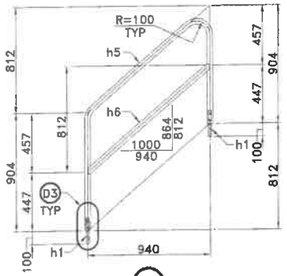


t3
SCALE 1:10

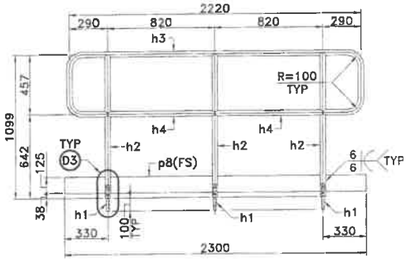
t2
SCALE 1:10



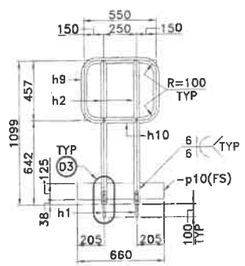
13 AS SHOWN
14 OPP. HAND
WELDED ASS'Y
SCALE 1:10



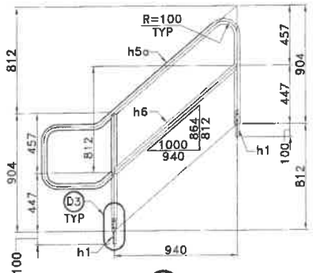
15
WELDED ASS'Y



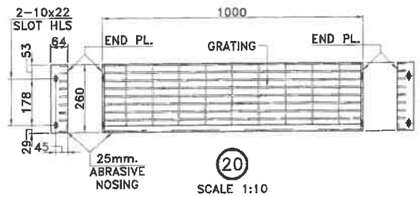
16
WELDED ASS'Y



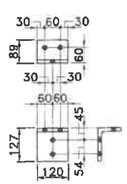
18
WELDED ASS'Y



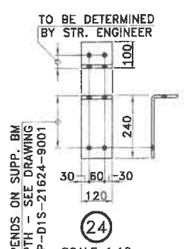
19
WELDED ASS'Y



20
SCALE 1:10



23
SCALE 1:10



24
SCALE 1:10

BILL OF MATERIAL

MARK	No. REQ'D	DESCRIPTION	REMARKS	WT. kgs
13	1	1-c5-C250 X 23 X 1414 LG. 1-a4-L76 X 76 X 6.4 X 100 LG. 1-a5-L64 X 64 X 6.4 X 126 LG. 1-p8-PL 5 X 65 X 158 LG. 1-p7-PL 10 X 65 X 90 LG. 1-t2-NPS 1¼ SCH. 40 STD. PIPE X 148 LG. C/W 2-HEX. NUTS FOR M12 X 1.75 SCREWS 1-t3-NPS 1¼ SCH. 40 STD. PIPE X 163 LG. C/W 2-HEX. NUTS FOR M12 X 1.75 SCREWS	WELDED ASS'Y	35.9
14	1	OPP. HAND TO 13	WELDED ASS'Y	35.9
15	2	2-h1-NPS 1 SCH. 80 XS PIPE X 200 LG. 1-h5-NPS 1¼ SCH. 40 STD PIPE X 2902 LG. 1-h6-NPS 1¼ SCH. 40 STD PIPE X 1242 LG.	WELDED ASS'Y	30.7
16	1	3-h1-NPS 1 SCH. 80 XS PIPE X 200 LG. 3-h2-NPS 1¼ SCH. 40 STD PIPE X 1099 LG. 1-h3-NPS 1¼ SCH. 40 STD PIPE X 3714 LG. 2-h4-NPS 1¼ SCH. 40 STD PIPE X 820 LG. 1-p8-PL 6 X 125 X 2300 LG.	WELDED ASS'Y	44.8
18	2	2-h1-NPS 1 SCH. 80 XS PIPE X 200 LG. 2-h2-NPS 1¼ SCH. 40 STD PIPE X 1099 LG. 1-h9-NPS 1¼ SCH. 40 STD PIPE X 1724 LG. 1-h10-NPS 1¼ SCH. 40 STD PIPE X 250 LG. 1-p10-PL 6 X 125 X 660 LG.	WELDED ASS'Y	56.8
19	2	2-h1-NPS 1 SCH. 80 XS PIPE X 200 LG. 1-h5a-NPS 1¼ SCH. 40 STD PIPE X 4262 LG. 1-h6-NPS 1¼ SCH. 40 STD PIPE X 1242 LG.	WELDED ASS'Y	45.1
20	4	260 X 1000 LG. SERRATED GALV. GRATING TYPE 30-102, 32x4.8mm BEARING BAR C/W ABRASIVE STD NOSING, END PLATES AND EXTRA GRIP ON BEARING BAR	BY FISHER & LUDLOW	45.0
21	1	1171 X 2344 LG. SERRATED GALV. GRATING TYPE 30-102 , 32x4.8mm BEARING BAR C/W ABRASIVE STD NOSING AND EXTRA GRIP ON BEARING BAR	BY FISHER & LUDLOW	118.9
22	1	1141 X 2288 LG. SERRATED GALV. GRATING TYPE 30-102 , 32x4.8mm BEARING BAR C/W EXTRA GRIP ON BEARING BAR	BY FISHER & LUDLOW	113.0
23	2	L 127 X 89 X 13 X 120 LG.		4.9
24	2	PL 10 X 120 X 340 LG.	BENT	6.4
	2	⅝"ø KWIK BOLT 3 EXP. HILTI ANCH. SET W/MIN. EMB. 102mm		
	16	⅜"ø BOLTS X 1½" LG. C/W HEX. NUTS		
	16	LOCK WASHERS FOR ⅜"ø BOLTS		
	8	M12x1.75 BOLTS X 25LG. (NO NUTS)		
		EST. WT. OF STEEL INCL. 3.5 % GALV.		= 556 kg

ALL BOLTS SHALL BE SUPPLIED BY STEEL MANUFACTURER
BOM FOR REFERENCE ONLY

GENERAL NOTES:

REFER TO DWG. F1731664-200-S005

REFERENCE DRAWINGS:

1. 115/ 13.8kV STATION
   STEEL KEY PLAN & LIST
   STRUCTURE F1731664-200-S001
2. 115/13.8kV STATION
   ELEVATIONS
   ELECTRICAL ARRANGEMENT F1731664-300-EA009
3. 115/13.8kV STATION
   MAIN GROUNDING GRID
   PLAN & DETAILS
   ELECTRICAL ARRANGEMENT F1731664-300-EA014

THIS DRAWING MUST BE READ IN CONJUNCTION WITH:
- F1731664-200-S010
- F1731664-200-S011

LEGEND:

T.O.C.: TOP OF CONCRETE
T.O.S.: TOP OF STEEL
L.L.V.: LONG LEG VERTICAL
INSUL.: INSULATOR

PROFESSIONAL(S):

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

SMi THE S.M. GROUP INTERNATIONAL INC.
6205B Airport rd, Suite 200, Mississauga (Ontario) L4V 1E3
Tel.: 905 677.6000 / Fax.: 905 677.6014
www.smgroup.com

STAMP:

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

CLIENT:

PROJECT:

MCMASTER UNIVERSITY-NF91

TITLE:
115/13.8kV AREA
STEEL STAIRS & PLATF. AT FRONT DR FOR E-HOUSE BLDG (1.0m ABOVE GRADE)
STEEL DETAILS, STRUCTURE

PREPARED BY: S.Y. WANG	DATE: 2018/09/27
DRAWN BY: D. LECOMTE-CHEVALIER	SCALE: AS SHOWN
VERIFIED BY: Z.WANG	DISCIPLINE: STRUCTURE
APPROVED BY: S.Y. WANG	CAD FILE NAME: F1731664-200-S012.dwg

PROJECT No: F1731664 | LOT: 200 | DWG. #: S012 | REV: 00 | PAGE:

A1