



# **MAJORVILLE 03-29 WELLSITE**

## **LSD: 03-29-018-19 W4M**

CIVIL DRAWINGS  
ISSUED FOR CONSTRUCTION  
MAY 29<sup>TH</sup>, 2013.



PROJECT # 195-02-00



PART 1 GENERAL

1.1 SECTION INCLUDES

- .1 THIS SPECIFICATION COVERS THE MATERIALS, FABRICATION AND INSTALLATION OF DRIVEN STEEL PILES AS DETAILED WITHIN THE CONTRACT DOCUMENTS.
- .2 PROCEDURES FOR USING SCREW PILES AS AN ALTERNATIVE TO THE DRIVEN PILES SHOWN.

1.2 DEVIATION FROM SPECIFICATION

- .1 EQUINOX ENGINEERING LTD. MUST APPROVE ANY DEVIATION FROM THIS SPECIFICATION, IN WRITING. APPROVAL SHALL BE OBTAINED PRIOR TO THE WORK BEING STARTED. THIS INCLUDES MATERIAL SUBSTITUTION AND INSTALLATION REQUIREMENTS.

1.3 REFERENCES

- .1 THE MOST STRINGENT OF THE LATEST EDITIONS OF THE FOLLOWING CODES AND STANDARDS SHALL APPLY TO THE MATERIALS, FABRICATION AND INSTALLATION OF DRIVEN STEEL PILES.
 

ASTM A252	WELDED AND SEAMLESS STEEL PIPE PILES.
NBC	NATIONAL BUILDING CODE OF CANADA
PBC	PROVINCIAL BUILDING CODE.
CSA-16.1	LIMIT STATES DESIGN OF STEEL STRUCTURES.
CSA-C40.21	GENERAL REQUIREMENTS FOR ROLLED OR WELDED STRUCTURAL QUALITY STEEL.
CSA-W59	WELDED STEEL CONSTRUCTION.
ASTM-A36	CARBON STRUCTURAL STEEL.
ASTM-A53	PIPE, STEEL, BLACK AND HOT-DIPPED, ZINC-COATED, WELDED AND SEAMLESS.
ASTM-A252	WELDED AND SEAMLESS STEEL PIPE PILES.
- .2 ALL CONSTRUCTION WILL COMPLY WITH THE SAFETY REGULATIONS OF THE PROVINCIAL OCCUPATIONAL HEALTH AND SAFETY ACT, THE WORKER'S COMPENSATION ACT AND THE COMPANY'S SAFETY STANDARDS.
- .3 A COPY OF THE GEOTECHNICAL REPORT GP1514 BY PARKLAND GEO IS INCLUDED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL FOLLOW THE RECOMMENDATIONS CONTAINED WITHIN THE GEOTECHNICAL REPORT.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 STEEL FOR PIPE PILES SHALL BE IN ACCORDANCE WITH ASTM A252 GRADE 2 OR A53 GRADE A WITH THE MINIMUM WALL THICKNESS SHOWN IN THE PILE SCHEDULE. WHERE RECLAIMED MATERIAL IS USED, WRITTEN APPROVAL IS REQUIRED FROM EQUINOX ENGINEERING LTD.
- .2 PILES SHALL BE OPEN ENDED UNLESS STATED OTHERWISE ON THE DRAWINGS.
- .3 WHERE SPlicing OF THE PILE IS REQUIRED THE WORK SHALL BE DONE IN ACCORDANCE WITH CSA STANDARD W47.1. THE CONNECTION SHALL BE A FULL STRENGTH BEVELLED BUTT WELD. CONTRACTOR SHALL ENSURE COMPATIBILITY OF WELDING ELECTRODES WITH PILE AND CAP PLATE MATERIALS. THERE SHALL BE NO MORE THAN ONE SPLICE PER 6m OF PILE. SPLICES SHALL BE SO CONSTRUCTED AS TO PROVIDE AND MAINTAIN TRUE ALIGNMENT AND POSITION OF THE COMPONENT PARTS OF THE PILE DURING INSTALLATION.
- .4 STEEL FOR DRIVING SHOES, CAP PLATES AND TIP REINFORCEMENT SHALL BE IN ACCORDANCE WITH CSA STANDARD C40.21 GRADE 300W.

2.2 SCREW PILES

- .1 SCREW PILES CAN BE SUBSTITUTED FOR DRIVEN STEEL PILES ONLY WITH THE PRIOR WRITTEN APPROVAL OF EQUINOX ENGINEERING LTD. AND UNDER THE FOLLOWING CONDITIONS:
  - .1 THE CONTRACTOR IS SUITABLY QUALIFIED FOR THE INSTALLATION OF SCREW PILES.
  - .2 FOR LOCATIONS WHERE THE LOAD IS LESS THAN 50 kN.
  - .3 WHERE SOILS CONDITIONS ARE SUITABLE, AS CONFIRMED BY A GEOTECHNICAL ENGINEER.
- .2 FOR ALL INDIVIDUAL PILE LOADS OVER 50 kN THE CONTRACTOR SHALL PROVIDE A LETTER, AT NO ADDITIONAL COST TO THE CLIENT, FROM A PROFESSIONAL ENGINEER CONFIRMING THAT THE PILES ARE ADEQUATE FOR THE LOADS INDICATED ON THE DRAWINGS.
- .3 THE HELIX SHALL BE ATTACHED TO THE PIPE BY WELDING ON BOTH SIDES. THE HELIX SHALL BE FABRICATED FROM 100mm BY 9.5mm GRADE 300W STEEL PLATE AND SHALL BE A MINIMUM OF ONE CIRCUMFERENCE OF THE PILE.

PART 3 EXECUTION

3.1 DRILLING

- .1 DRILL ONLY THROUGH STRATA THAT OBSTRUCT DRIVING.
- .2 HOLE DIAMETER: THE PILES SHALL BE DRIVEN TO THE MINIMUM EMBEDMENT DEPTH AS SHOWN BELOW. PRE-DRILLING MAY BE REQUIRED USING A DRILL BIT DIAMETER WHICH IS 95% OF THE PILE SIZE. IN NO CASE SHALL THE PILE EMBEDMENT BE LESS THAN THE LENGTH INDICATED BELOW.

3.2 INSTALLATION

- .1 THE PILES ARE DESIGNED AS FRICTION PILES. ALL PILES SHALL BE DRIVEN TO THE DEPTHS SHOWN IN THE PILE SCHEDULE. IF A PILE REACHES PRACTICAL REFUSAL AFTER THE MINIMUM DEPTH HAS BEEN REACHED IT IS DEEMED ACCEPTABLE.
- .2 REFUSAL SHALL BE DEFINED AS PER THE GEOTECHNICAL REPORT. IF THERE IS NO REPORT THEN REFUSAL SHALL BE DEFINED AS BEING MET WHEN THE BLOW COUNT EXCEEDS 8 BLOWS PER 25mm OF PENETRATION IN THE LAST 300mm OF DRIVING, AT RECOMMENDED PILES DRIVING ENERGY LEVELS AS INDICATED BELOW.

PILE SIZE (O.D. x W.T.)	DRIVING ENERGY	MINIMUM EMBEDMENT	ALLOWABLE LOAD
168.3mm x 7.11mm	6" 20,000 J 15,000 ft-lbs	6m 20'	160 kN 36,000 lbs
219.1mm x 8.18mm	8" 30,000 J 22,000 ft-lbs	8.5m 28'	225 kN 50,000 lbs
323.9mm x 9.53mm	12" 50,005 J 37,500 ft-lbs	8.5m 28'	375 kN 84,000 lbs

NOTE: THE REQUIRED PILE EMBEDMENT MAY BE DEEPER THAN SHOWN IN THIS TABLE. REFER TO THE PILE SCHEDULE, FOR NON-TYPICAL PILE EMBEDMENTS.

- .3 IN THE EVENT THAT SITE CONDITIONS PREVENT THE INSTALLATION OF THE PILES IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS THEN THE CONTRACTOR SHALL NOTIFY EQUINOX ENGINEERING LTD. IMMEDIATELY.
- .4 PILES SHALL BE DRIVEN CONTINUOUSLY WITHOUT INTERRUPTION.
- .5 IF ROCK IS ENCOUNTERED BEFORE THE MINIMUM EMBEDMENT DEPTH IS REACHED THE CONTRACTOR SHALL USE THE FOLLOWING PROCEDURES:
  - .1 WHERE THE ROCK IS ENCOUNTERED OVER 2.0m ABOVE THE MINIMUM EMBEDMENT DEPTH - CALL EQUINOX ENGINEERING LTD. FOR INSTRUCTIONS.
  - .2 WHERE THE ROCK IS ENCOUNTERED OVER 0.5m ABOVE THE MINIMUM EMBEDMENT DEPTH - PRE-DRILL INTO THE ROCK 2.0m.
  - .3 WHERE THE ROCK IS AT THE MINIMUM EMBEDMENT DEPTH - PRE-DRILL A MINIMUM OF 1.5m INTO THE ROCK.

- .6 TO MINIMIZE HEAVING, PILE GROUPS SHALL BE DRIVEN FROM THE CENTER OF THE GROUP OUTWARD. AFTER ALL THE PILES HAVE BEEN DRIVEN, HEAVED PILES SHALL BE RE-DRIVEN TO THE REQUIRED RESISTANCE.
- .7 PROTECT PILE HEAD DURING DRIVING, USING CAP WITH FULL BEARING ON PILE FOR EVEN DISTRIBUTION OF HAMMER BLOW. DELIVER HAMMER BLOWS TO CENTRAL AXIS OF PILE.
- .8 RE-DRIVE PIPE SHELLS THAT HAVE LIFTED OR MOVED DUE TO DRIVING ADJACENT PILES, OR BY SOIL UPLIFT.
- .9 DO NOT DAMAGE PILES DURING DRIVING OPERATIONS.
- .10 SET TOPS OF PILES TO ELEVATIONS INDICATED.

3.3 TOLERANCES

- .1 MAXIMUM VARIATION FROM VERTICAL FOR PLUMB PILES: 1 IN 50.
- .2 MAXIMUM VARIATION FROM TOP OF PILE ELEVATION: 5mm.
- .3 MAXIMUM OUT-OF-POSITION: 75mm.

3.4 PROJECT RECORD DOCUMENTS

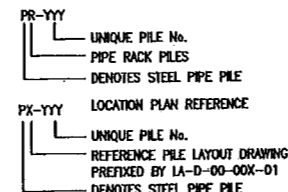
- .1 ACCURATELY RECORD THE FOLLOWING:
  - .1 SIZES, LENGTHS, AND LOCATIONS OF PILES.
- .2 SEQUENCE OF DRIVING, CONTRACTOR SHALL MAINTAIN DRIVEN RECORDS FOR EACH PILE SHOWING DATE, TIME, SIZE, LENGTH, HAMMER ENERGY, HAMMER TYPE, BLOW COUNT FOR EACH 300mm AFTER 3,000mm DEPTH AND REMARKS. THE REPORT SHALL SHOW THE HAMMER SIZE AND DROP HEIGHT
- .3 DRILLING: HOLE DIAMETERS.
- .4 FINAL BASE AND HEAD ELEVATIONS.
- .5 ONE SIGNED AND SEALED LETTER FROM A PROFESSIONAL ENGINEER CONFIRMING THE STRUCTURAL ADEQUACY OF ANY SCREW PILES USED FOR LOADS GREATER THAN 50 kN.
- .6 ONE COPY OF RECORD SHALL BE SENT TO THE EQUINOX ENGINEERING LTD. WITHIN ONE (1) WEEK OF DRIVING.

3.5 UNACCEPTABLE PILES

- .1 UNACCEPTABLE PILES: PILES THAT FAIL TESTS, ARE PLACED OUT OF POSITION, ARE BELOW CUT-OFF ELEVATIONS, OR ARE DAMAGED. CONTRACTOR SHALL PROVIDE A WRITTEN PROPOSAL FOR REMEDIAL WORK AND WILL COMMENCE AFTER RECEIVING WRITTEN APPROVAL FROM THE ENGINEER.


PILE IDENTIFICATION

- 1. PILES ARE IDENTIFIED IN THE FOLLOWING FORMATS:

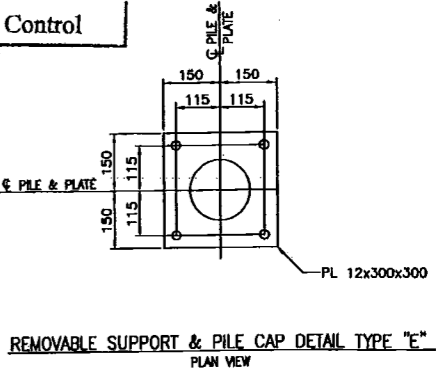
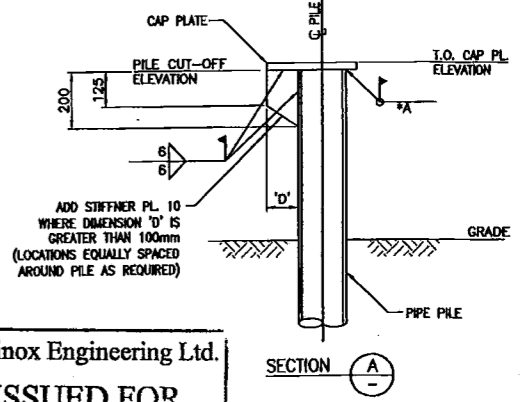
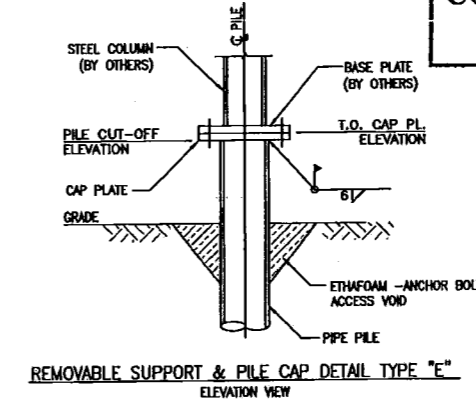
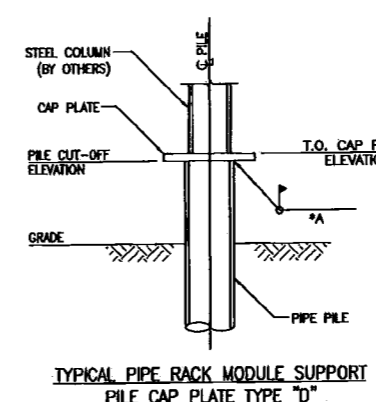
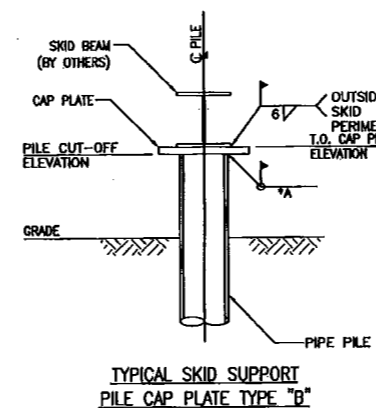
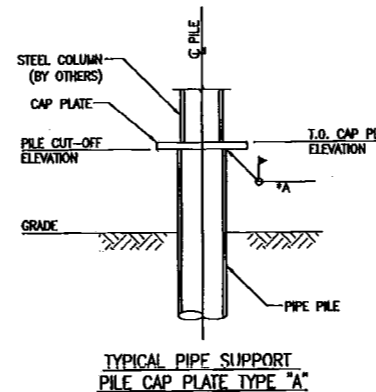
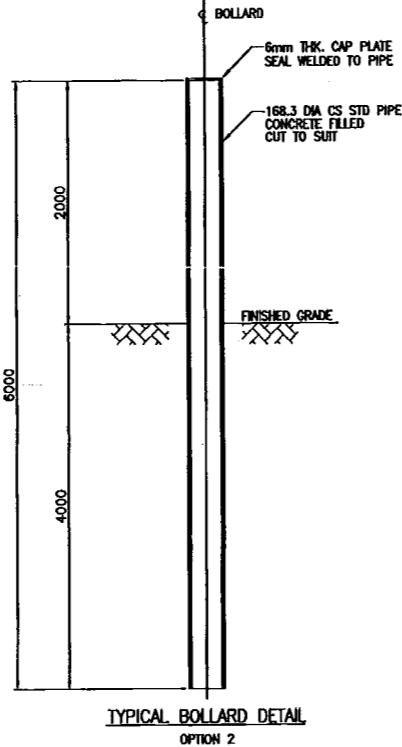
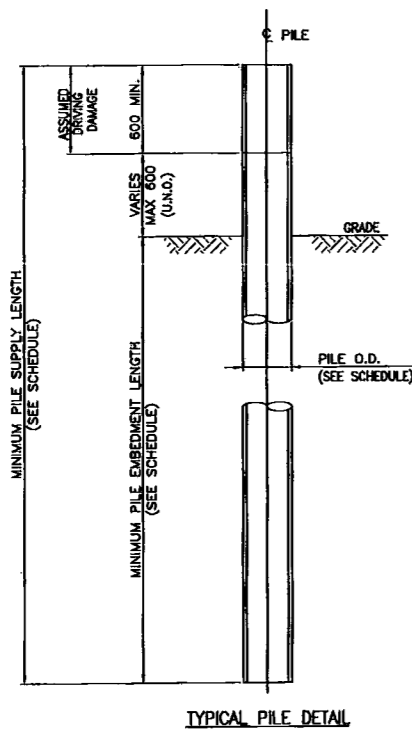
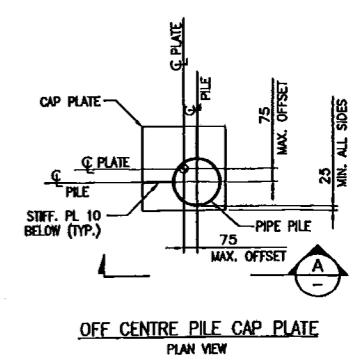
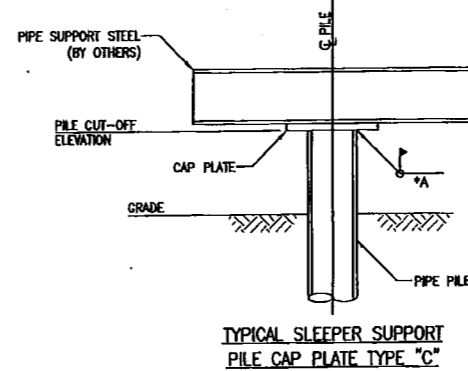
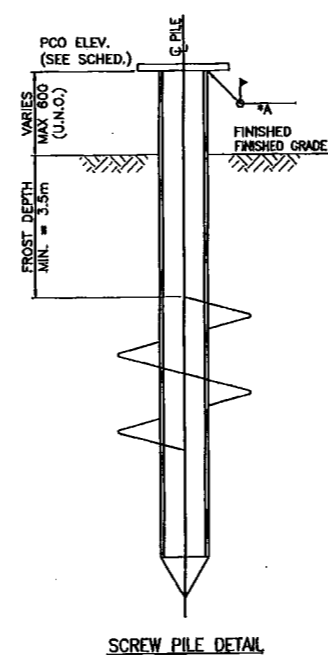
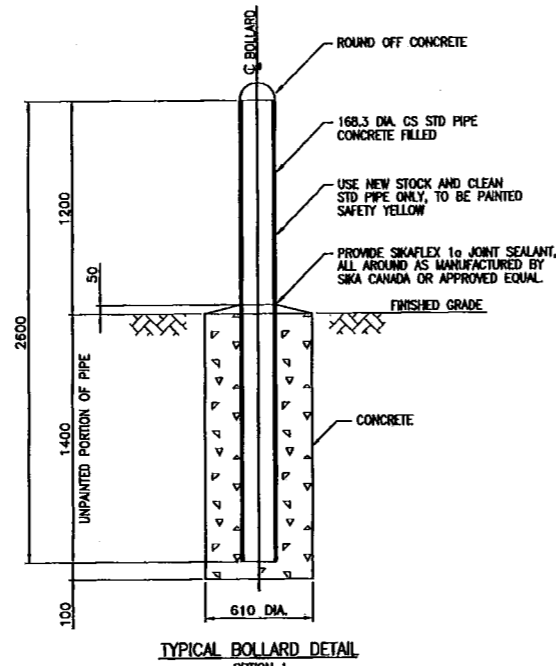


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REFERENCE DRAWINGS		REVISIONS						SEAL	PERMIT	EQUINOX Engineering Ltd.										
DRAWING NO.	DRAWING DESCRIPTION	REV	DATE	BY	CHK'D DATE	CHK'D BY	APP'D DATE	REVISION DESCRIPTION	 2013-05-28	PERMIT TO PRACTICE EQUINOX ENGINEERING LTD. PERMIT NUMBER: P 6608 The Association of Professional Engineers, Geologists and Geophysicists of Alberta	PROJECT	TITLE	SCALE	DRAWN BY	DATE	CLIENT	REGION	PROJECT	DRAWING NO.	REV
		0	2013/05/27	RT				ISSUED FOR CONSTRUCTION					MAJORVILLE 03-29 WELLSITE	LSD 03-29-018-19 W4M STEEL PILE GENERAL NOTES AND SPECIFICATIONS	NTS	R. TERADO	2013/05/27	195	02	00

SCHEDULE #A	
PILE #	WELD TYPE
168.3#	6V
219.1#	81/2
244.5#	10V
273.1#	81/2
*273.1# (EXTRA THK.)	10V
323.9#	8V
609.6#	8V

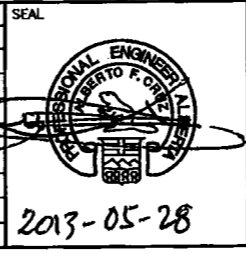


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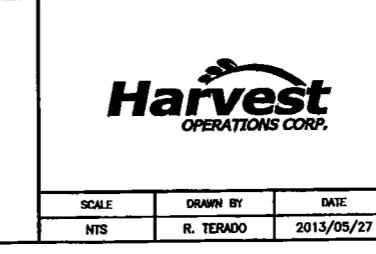
NOTES:  
1. TYPICAL MINIMUM PILE EMBEDMENT IS TO BE AS PER THE TABLE IN THE PILING SPECIFICATION.

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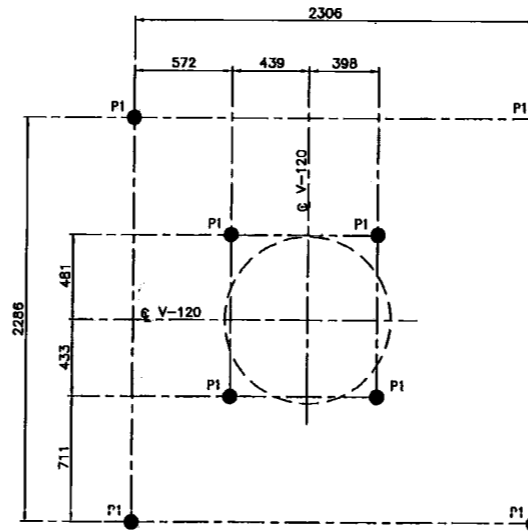
PERMIT TO PRACTICE  
EQUINOX ENGINEERING LTD.  
PERMIT NUMBER: P 6608  
The Association of Professional Engineers,  
Geologists and Geophysicists of Alberta



EQUINOX Engineering Ltd.		PROJECT: MAJORVILLE 03-29 WELLSITE	
TITLE: LSD 03-29-018-19 W4M STEEL PILE TYPICAL DETAILS		DRAWING NO.: TY-D-00-001-01	
SCALE: HTS	DRAWN BY: R. TERADO	DATE: 2013/05/27	REV: 0

PILE SCHEDULE										
PILE NUMBER	PILE INFORMATION						PILE CAP INFORMATION			REMARKS
	QTY.	PILE O.D. (mm)	MIN. WALL THICKNESS (mm)	MIN. EMBEDMENT LENGTH (m)	SUPPLY LENGTH (m)	CUT-OFF ELEVATION	TYPE	CAP PLATE	T.O. CAP PL. ELEVATION	
P1	8	168.3	7.11	SEE NOTE 2	SEE NOTE 2	XXX.XXX	B	WELDED	XXX.XXX	

CAP PLATE SCHEDULE		
PILE DIAMETER(mm)	WELDED CAP(mm)	REMOVABLE CAP(mm)
88.9	125x125x12	150x150x12
114.3	150x150x12	250x250x12
168.3	250x250x12	300x300x12
193.6	275x275x12	325x325x12
219.1	300x300x16	350x350x16
244.5	325x325x16	375x375x16
273.1	350x350x16	400x400x16
323.9	400x400x19	450x450x19



V-120 SWEETENING VESSEL

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NOTES:

- FOR PILE GENERAL NOTES REFER TO DWG. 1950200-NT-D-00-001-01
- GEOTECHNICAL REPORT NOT AVAILABLE, THEREFORE ALL PILES ARE TO BE DRIVEN TO REFUSAL BELOW MINIMUM EMBEDMENT.

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		0	2013/05/27	RT			ISSUED FOR CONSTRUCTION					MAJORVILLE 03-29 WELLSITE	LSD 03-29-018-19 W4M SWEETENING VESSEL (V-120) AREA PILE LAYOUT						
												SCALE	DRAWN BY	DATE	CLIENT	REGION	PROJECT	DRAWING NO.	REV
												NTS	R. TERADO	2013/05/27	195	02	00	LA-D-00-001-01	0

2013-05-28