CONSTRUCTION SUMMARY REPORT:
Roberts Bay Discharge System

Type “A” Water Licence 2AM-DOH1335
Hope Bay Project
TMAC Resources Inc.
November 04, 2020

Prepared For:
Nunavut Water Board
Gjoa Haven, NU

Prepared By:
TMAC Resources Inc.
Toronto, Ontario

Table of Contents

List of Appendices

1 INTRODUCTION

The Roberts Bay Discharge System ("**RBDS**") at the Hope Bay Project in Nunavut, Canada is designed to discharge water from the Doris Tailings Impoundment Area (**"TIA"**) and underground mine areas, to the marine environment in Roberts Bay. The RBDS was initially authorized under the amended Doris Project Certificate No: 003 and Doris Type A Water Licence 2AM-DOH1323 (since superseded by Type A Water Licence 2AM-DOH1335). TMAC Resources Inc. ("**TMAC**") completed the construction of the RBDS in 2020 and discharges, complaint with the Metal and Diamond Mining Effluent Regulations ("**MDMER**"), commenced on February 1st 2020.

This Construction Summary Report ("**CSR**") is being provided to the Nunavut Water Board ("**NWB**"), as required under Part D Item 11 of Water Licence 2AM-DOH1335. The CSR documents field decisions, supporting data and mitigation measures employed as a result of the installation the discharge system, as required under Schedule D, Item 2 of the NWB Water Licence 2AM-DOH1335.

2 RBDS SYSTEM COMPONENTS

The primary system components of the RBDS are described below. For more information, please see the RBDS Process Flow Diagram in Appendix B.

1) TIA Water Pump House (Area 710), located on the reclaim jetty at the TIA, pumps the water from the TIA reclaim pond into the outfall pump box of the 720 building.

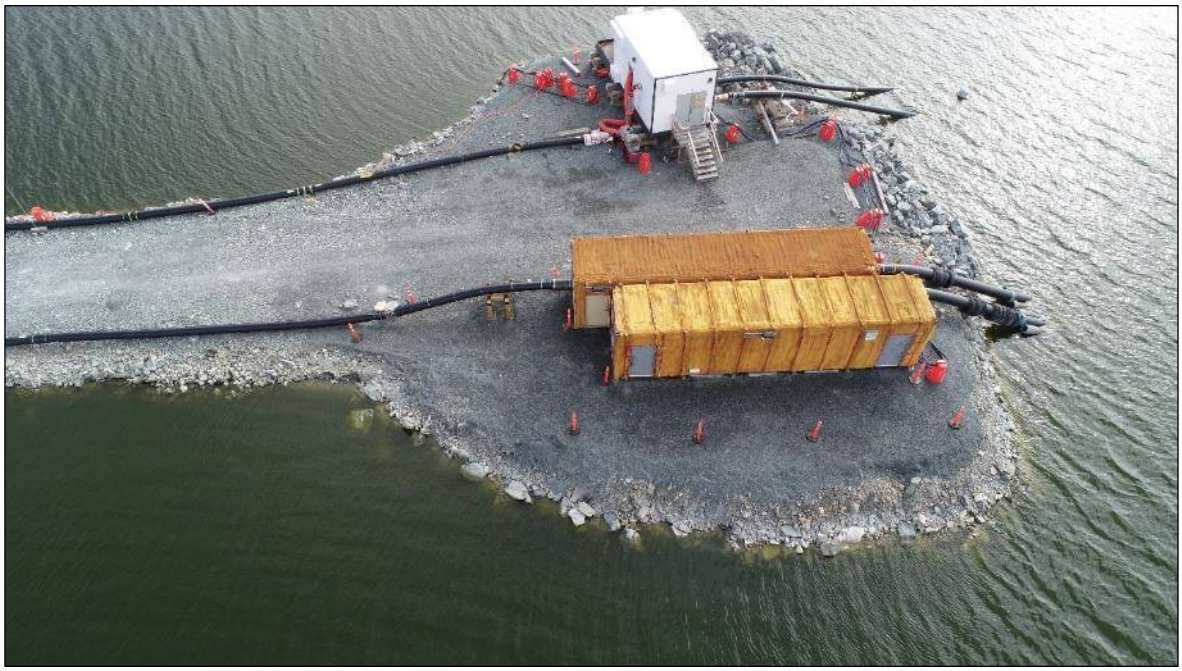


Photo 1: Showing the Reclaim Jetty where the new pump house and electrical room is location (orange insulation).

2) The Outfall Pump Station Building (Area 720), located between the mobile shop and the sedimentation control pond, pumps the water from the outfall pump box to the 730 building on the marine outfall berm on the shore of Roberts Bay.

Photo 2: Outfall pumping system (720) and TSS filtration plant (740) next to the sediment pond. 720 in beige on the right and 740 in orange/white on the left.

3) Water Treatment Plant (Area 740), filters water from underground using a lamella clarifier and a set of four (4) multimedia filters. Located right next to 720 building, on the north side.

Photo 3: 720 and 740 buildings after completion of construction

4) Marine Outfall Discharge System (Area 730), contains the outfall pipe, flushing system that prevents freezing during a shutdown, as well as instrumentation and valves. Located on Marine Outfall Berm, west of existing Jetty, in Roberts Bay.

Photo 4: 730 building on the outfall jetty after construction is completed

5) Underground pumping station(s) (Area 1000): Pumps the water collected underground to the Water Treatment Plant (Area 740). Water undergoes primary treatment (settling in underground sumps) before reaching Area 720 to reduce total suspended solids (TSS) in the water treatment plant.

Photo 5: Underground pump station (Area 1000)

6) Surface pipelines and various areas of the system are linked with over 11km of surface HDPE pipeline that is insulated and heat traced to prevent freezing.

3 WATER LICENCE CONDITIONS

The following sections are aligned with the CSR requirements as per Schedule D, Item 2 of Water Licence 2AM-DOH1335.

3.1 SCHEDULE D PART 2A – FINAL DESIGN AND CONSTRUCTION DRAWINGS

Issued for Construction ("**IFC**") drawings are provided in Appendix A.

3.2 SCHEDULE D PART 2e – GEOCHEMICAL ANALYSIS OF WASTE ROCKS AND FILLS

Crushed material sourced from Quarry 2 was used as construction material for the Robert's Bay Marine Outfall Berm and access road. Run of Quarry ("ROQ") was used to construct the access road, crushed material was used for surfacing, and larger boulders were used for armouring the Marine Outfall Berm. Quarry material was determined to be geochemically stable (non-acid generating or metal leaching) as per the Hope Bay Project Quarry Management and Monitoring Plan (December 2017).

3.3 SCHEDULE D PART 2F – PHOTOGRAPHIC RECORDS

Photographic records are provided below. A brief narrative for each photograph is included describing the activity being performed.

3.3.1 TIA Water Pump House (Area 710)

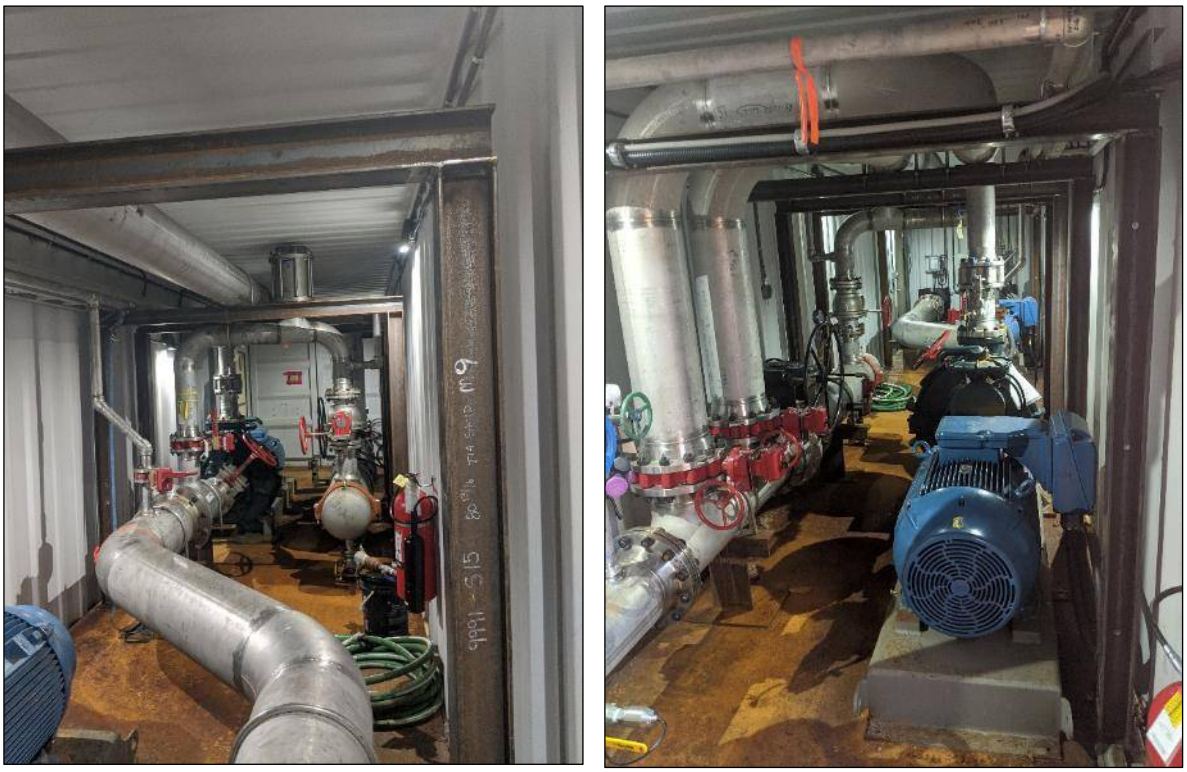


Photo 6: Inside of 710 TIA Water Pump House after completion

Photo 7: Electrician finalising the installation of heat trace on the 710 pump station. Pumping station in beige, electrical room in red.

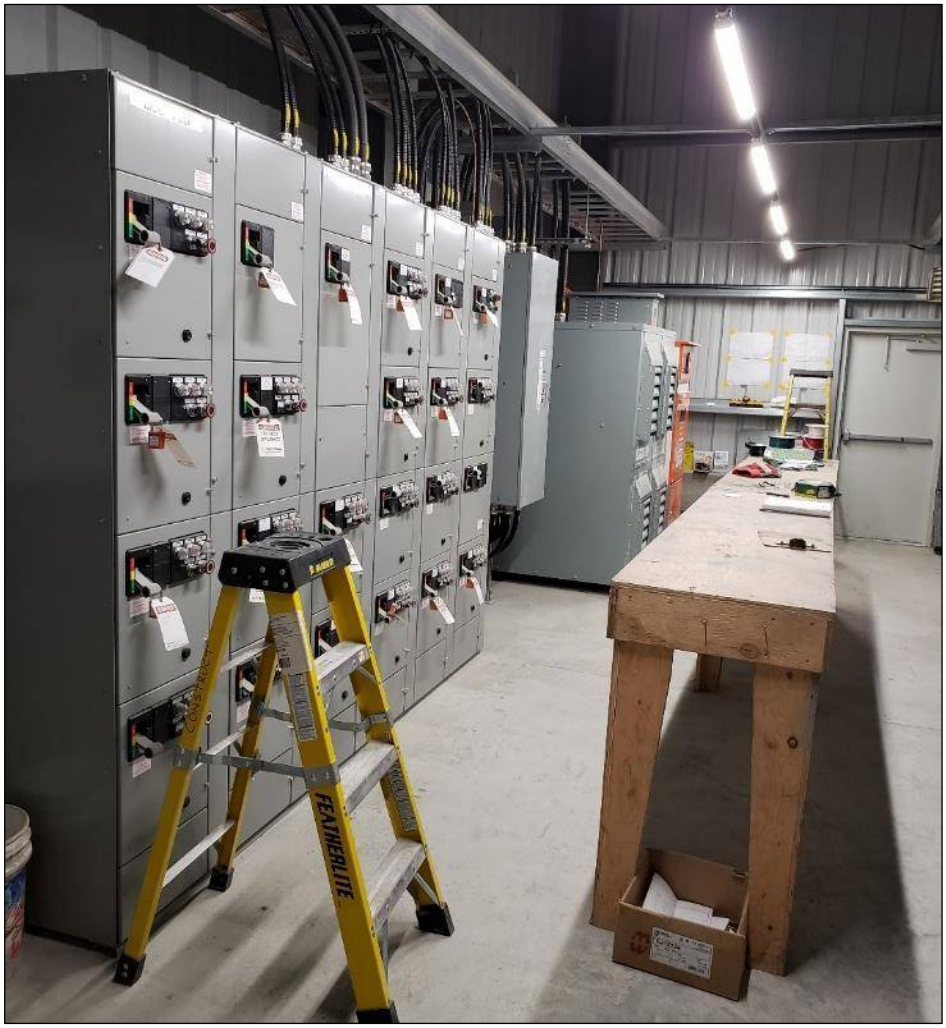
Photo 8: Showing the 710 buildings after insulation. Main power cables coming into the electrical room and the two stainless steel connections for reclaim pipelines.

Photo 9: Crew deploying one of the 14" suction for the TIA pumps in the 710 Area.

3.3.2 Outfall Pump Station Building (Area 720)

Photo 10: Large outfall transfer pump 720-PU-001 during construction.

Photo 11: Compressor system for pigging the line installed and ready for commissioning.



Picture 12: Electrical room in the outfall pumping building (720) during construction, with equipment locked out.

3.3.3 Outfall Discharge System (Area 730)

Picture 13: Construction of Marine Outfall Berm and access road. Silt curtains were installed to contain sediments.

Picture 14: Showing 730 pump house assembled.

Picture 15: 730 mechanical pump house after connection with intake and discharge pipeline.

Picture 16: Showing fully assembled diffuser and 200' sections of weighted pipe ready to be deployed and staged on the Marine Outfall Berm and access road.

Picture 17: Tugboat keeping tension and controlling the discharge pipeline and diffuser floating on the water surface during deployment.

Picture 18: Crew working from Marine Outfall Berm, and a smaller boat for the deployment of the underwater pipeline and diffuser.

Photo 19: With the help of a crane, deploying the 8" assembly of the recirculation line at the Marine Outfall Berm. Concrete weights are used to submerge the pipeline.

3.3.4 Underground Pumping Station (Area 1000)

Photo 20: Pumps and piping shown on the left side. Electrical, instrumentation and controls shown on the right side.

3.3.5 Water Treatment Plant (Area 740)

Photo 21: Installation of Area 740 plant supplied by BQE Water, on its pad.

Photo 22: Offloading Area 740 clarifier from truck prior to installation.

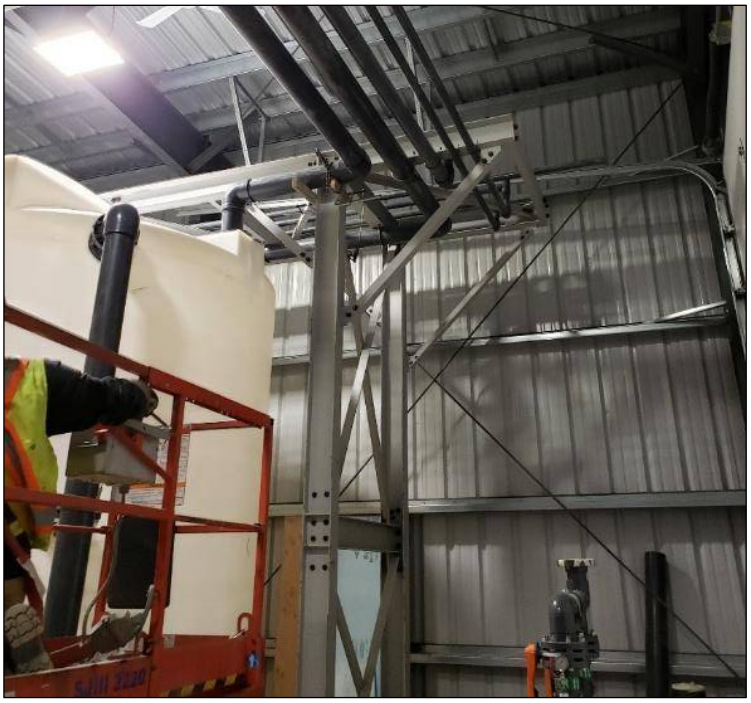


Photo 23: Installation of PVC piping using a scissor lift to connect the Area 740 plant to the 720 building. Outfall discharge pump box showing on the left side (opaque white tank).

Photo 24: Left side: Showing the inside of the TSS treatment plant (Area 740). Right side: showing the inside of the outfall pumping building (Area 720)

3.4 SCHEDULE D PART 2G – AS-BUILT DRAWINGS

As-built drawings are provided in Appendix B.

3.5 SCHEDULE D PART 2H – FIELD DECISIONS AND DESIGN CHANGES

In general, the RBDS was built to the design requirements. Deviations from the design were completed to adapt the design to encountered field and operational conditions. These changes include:

- The installation of intake at the tailings pond (710) was completed using hollow cylindrical weight from the outfall discharge and decommissioned rubber tires. The engineer of record, Great Pacific, confirmed modification from a concrete weight was acceptable as load criteria was maintained.

- 730 pump house is equipped with an air release valve which previously wasn't considered to ensure air doesn't reach the underwater pipeline when pigging the line, causing it to float.

Photo 25: Showing new air release valve installed in the 710 Building.

- TMAC installed a pipeline from the existing TIA reclaim pond reclaim pipeline to water treatment plant to ensure sufficient water pressure would be available for start-up. Previously not considered.

- Two sections of pipelines that were initially designed to be double walled (at water crossings) were installed using single walled pipeline. The decision was made based on the increased ability to maintain and visually inspect the pipeline. The pipeline alignment at water crossings was installed in a straight section (no bends) to facilitate low wear rates. The pipeline will be inspected at regular intervals and a leak detection system based on flow balances was implemented.

- Initial flocculent dosing system proposed by BQE water was determined to be labour intensive and a safety risk due slippery nature of flocculant. John Brooks Company was engaged to design and supply an automated system.

Photo 26: Flocculent dosing skid supplied by John Brooks

- A concrete floor and sump with overflow to adjacent sedimentation pond was added during commissioning to manage any potential major overflows or spills in building; instead of initially planned gravel floor and sump which required active pumping.

Photo 27: Showing the new overflow pipe coming from the concrete foundation of the 720 building into the sedimentation pond.

- As-built surface pipeline alignment did not follow design as the alignment was routed on the east side of the airstrip. It was determined that the west side of the airstrip provided easier access, while minimizing interference with snow removal in area.

Photo 28: Showing pipeline alignment on the east side of the road and crossing on the west side before the airstrip.

- To mitigate the risk of a negative pressure collapse in the pipeline at higher elevation points, four (4) vacuum breakers that were not previously considered were installed, with heated shelters, along the alignment.

Photo 29: A vacuum breaker with insulated and heated shelter.

- Original clarifier pumps, P-116A/B, did not provide sufficient flowrate when pumping slurries with high solid content, so new hose pumps with enough capacity to 'shock' the clarifier were installed. Shocking uses a high flowrate of water to discharge debris and clean the lamella clarifiers.

Picture 30: New hose pump installed on new concrete floor in the 740 building, at the underflow of clarifier.

- Initial design contemplated a remote underwater camera at the diffuser in Roberts Bay to visually monitor that location. After assessment, it was determined the visual data provided would offer very little useful information and a remote underwater camera in the Arctic Ocean would be difficult, and potentially dangerous, to maintain. The operation of the system will be monitored from instrumentation in the outfall discharge building (Area 730), including pressure and flow monitoring. If underwater work is needed, professional, certified, and experienced Arctic divers will be engaged to inspect or maintain the pipeline.

- Heat trace at the outfall was changed from immersion heaters to electric heat trace cable. The design change was initiated due to the impracticality of installing immersion heaters as per the original design. In addition, the redesign is expected to be more reliable during operations.

3.6 SCHEDULE D PART 2I – MITIGATION MEASURES

TMAC has a functioning environmental management system composed of numerous management plans that were developed and approved under its NIRB Project Certificate No. 003 and No.009 and, Type A Water Licence 2AM-DOH1335 that apply to all development at Hope Bay.

The following project-specific mitigation measures of note were implemented:

- For construction of Marine Outfall Berm, mitigations listed in Letter of Advice from Department of Fisheries and Oceans Canada, RE: Implementation of mitigation measures to avoid and mitigate serious harm to fish – Marine Outfall Berm – Project Certificate No. 003 Amendment (Doris North Gold Mine Project), issued to TMAC on August 30, 2016. This included minimizing the distance of the turbidity curtain to 25 m from the outfall berm and stopping work if a marine mammal is observed approaching the barrier or has gain entry past the barrier.

- Equipment used in the project stayed in existing or in construction road at all time to prevent damage to the tundra.

- Piping was built adjacent to the road to be accessible in the future while minimizing disturbance to tundra with equipment.

- Silt curtains were used during the construction of the Marine Outfall Berm to prevent impacts to the marine environment.

No additional erosion or sedimentation controls were required for the duration of the construction due to the mitigation measures listed above.

The effectiveness of the mitigation measures is discussed in Section 3.7.

3.7 SCHEDULE D PART 2J – MONITORING ACTIVITIES

Visual monitoring of the construction area was conducted prior to, during, and upon completion of the construction activity. The mitigations in place were effective and no tundra damage or marine mammals were observed. Monitoring will continue to be undertaken in compliance with Part D of the Water Licence.

3.8 SCHEDULE D PART 2K – BLAST VIBRATION MONITORING

For RBDS construction, no quarrying activities were performed in proximity to fish bearing waters, and therefore no blast vibration monitoring was done for the project.

3.9 SCHEDULE D PART 2L - MONITORING EROSION PROTECTION MEASURES

Erosion protection is discussed in Section 3.6.

3.10 SCHEDULE D PART 2M – MONITORING OF WATER USE FROM DUST SUPPRESION

Dust suppression was not specifically required as part of RBDS construction.

3.11 SCHEDULE D PART 2N – MONITORING OF CONTRACTOR'S GROUND IMPACTS

Since all construction activities were performed from the road, no impacts to tundra were observed. The construction area was visually monitored to confirm.

3.12 SCHEDULE D PART 2P – SUMMARY OF QUARRY ROCK SEEPAGE

The area surrounding the access road and Marine Outfall Berm was included in the 2020 seepage survey. If seepage is observed the results will be included in the 2020 Waste Rock, Quarry and Tailings Monitoring Report, Doris and Madrid North Mines (expected to be issued Q1 2021).

4 REFERENCES

TMAC Resources Inc., 2017. Hope Bay Project Quarry Management and Monitoring Plan. December 2017.

2019 Waste Rock, Quarry and Tailings Monitoring Report, Doris and Madrid North Mines, Hope Bay Project. SRK Consulting. March 2020

This Report: “Roberts Bay Discharge System – Construction Summary Report” was prepared under the direction of Brendan Barron, P.Eng. Information provided for the compilation of this report was provided from various sources and resources. While every effort has be made to ensure the accuracy of the information contained in the report, errors and omissions contained in source information used to prepare this report will, when discovered, will be brought to the attention of the Nunavut Water Board.

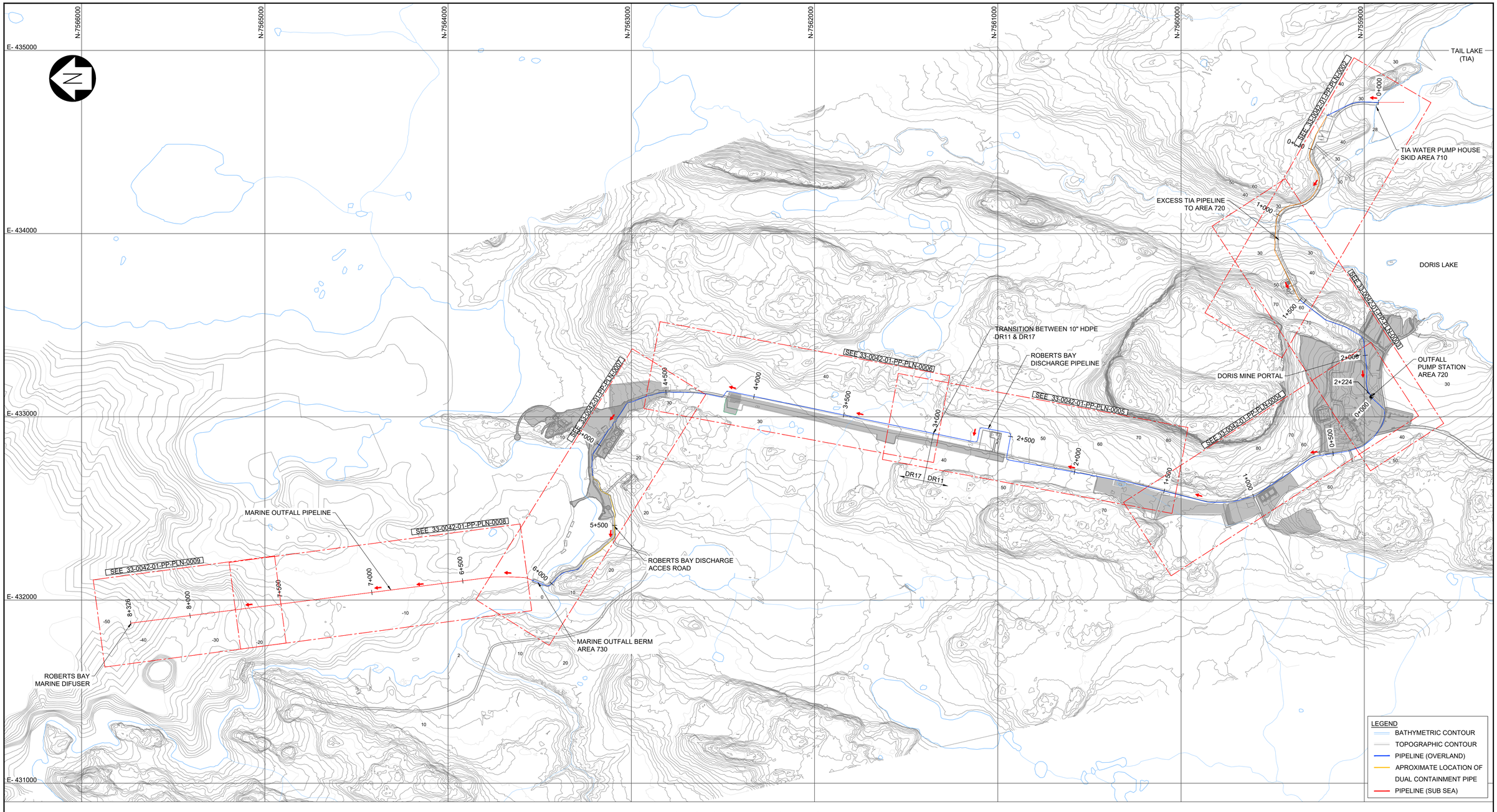
Brendan Barron, P.Eng.
Project Director
TMAC Resources Inc.

APPENDIX A

ISSUED FOR CONSTRUCTION DRAWINGS

Pipeline Alignment (Paterson & Cook)

730 Outfall Jetty (SRK Consulting)



ROBERTS BAY DISCHARGE SYSTEM - MASTER SITE PLAN

SCALE 1:10000

SCALE 0 200 400 600 800 1,000 m

NOTES
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
2. TOPOGRAPHY NAD83 UTM ZONE 13.
3. THE REQUIREMENT OF THE DUAL CONTAINMENT PIPE END SEALS SHALL BE DETERMINED BY OTHERS. P&C SHALL NOT BE RESPONSIBLE FOR ANY OMISSION OR DEVIATION FROM ANY ENVIRONMENTAL REQUIREMENTS.
4. PIPELINE SHALL BE JOINED USING FUSION WELDING IN ACCORDANCE WITH ASME B31.3 AND ASME SEC. IX WELDING QUALIFICATION. ALL WELDS SHALL BE 100% VISUALLY INSPECTED AND 100% VOLUMETRIC NON-DESTRUCTIVE TESTED USING UT/PAUT OR OTFD.

Drawing No.	Description
1CT022.032 - GA	HOPE BAY PROJECT - GENERAL ARRANGEMENT
-	BASE TOPO - ROB BAY TO TAIL LAKE

Reference Drawings

Rev.	Date	Description	Originator	Drawn	Checked
0	27-08-2018	ISSUED FOR DESIGN	MJ	AZ	NB

Revisions

Engineer's Stamp

CLIENT

MAC RESOURCES

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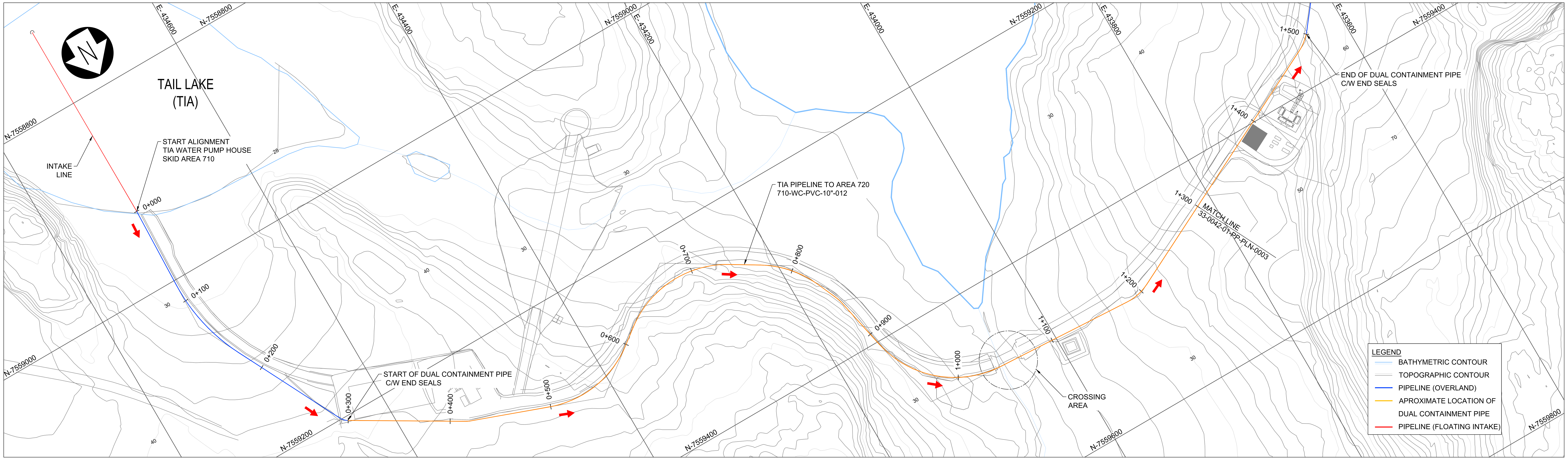
TEL : 604-687-7704
WWW.PATERSONCOOKE.COM

HOPE BAY
WATER DISCHARGE

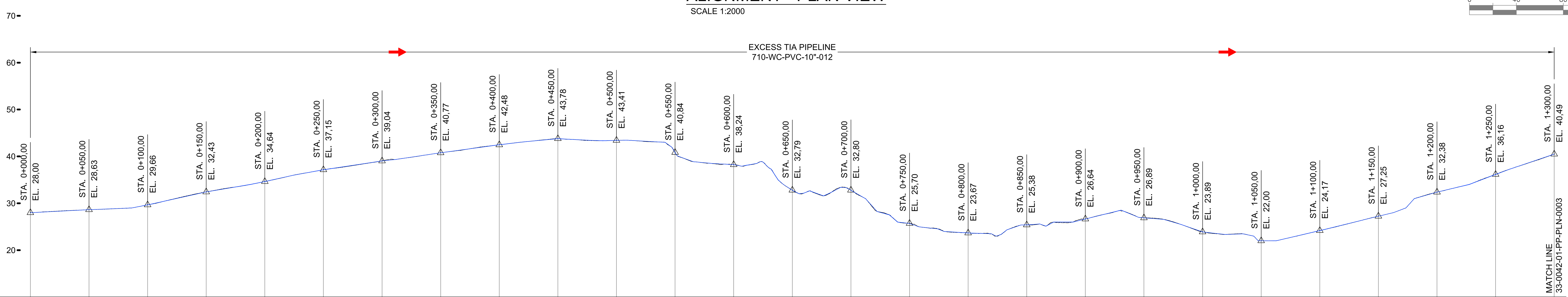
OUTFALL DISCHARGE SYSTEM
EXCESS TIA WATER AND OUTFALL PIPELINE
MASTER SITE PLAN

Scale	Document No							
	Off. Code	Proj. Code	Area Code	Disc. Code	Doc. Type	Unique. No	Sheet No	Rev.
ANSI D	33	0042	00	PP	PLN	0001	1 OF 1	0



ALIGNMENT - PLAN VIEW

SCALE 1:2000



GROUND ELEVATION	28,00	28,63	29,66	32,43	34,64	37,15	39,04	40,77	42,48	43,78	43,41	40,84	38,24	32,79	32,80	25,70	23,67	25,38	26,64	26,89	23,89	22,00	24,17	27,25	32,38	36,16	40,49
B.O.P.	28,00	28,63	29,66	32,43	34,64	37,15	39,04	40,77	42,48	43,78	43,41	40,84	38,24	32,79	32,80	25,70	23,67	25,38	26,64	26,89	23,89	22,00	24,17	27,25	32,38	36,16	40,49
CHAINAGE	0+000	0+050	0+100	0+150	0+200	0+250	0+300	0+350	0+400	0+450	0+500	0+550	0+600	0+650	0+700	0+750	0+800	0+850	0+900	0+950	1+000	1+050	1+100	1+150	1+200	1+250	1+300

LENGTH (m) SLOPE (%): L=50,00 i=1,26%; L=36,49 i=1,01%; L=13,53 i=4,88%; L=50,08 i=5,54%; L=37,40 i=4,21%; L=12,65 i=5,03%; L=24,54 i=5,57%; L=25,52 i=4,50%; L=50,04 i=3,78%; L=10,91 i=2,60%; L=39,12 i=3,70%; L=50,03 i=3,42%; L=21,24 i=2,94%; L=28,78 i=2,35%; L=26,1 i=-1,31%; L=12,10 i=-0,82%; [illegible]; L=32,59 i=-1,42%; [illegible]; L=13,49 i=-9,11%; L=14,82 i=-1,46%; [illegible]; L=10,07 i=-27,85%; [illegible]; L=16,39 i=-2,85%; [illegible]; L=4,01 i=-13,04%; [illegible]; L=5,33 i=-8,83%; [illegible]; L=10,43; L=30,64 i=6,19%; L=14,61 i=-10,35%; [illegible]; L=15,36 i=-7,36%; L=17,88 i=-8,69%; L=19,3 i=-2,79%; L=15,23 i=0,84%; L=2,55 i=0,00%; [illegible]; L=37,30 i=5,82%; L=50,09 i=6,16%; [illegible]; L=10,75 i=9,34%; [illegible]; L=27,34 i=5,95%; L=22,81 i=9,51%; L=12,52 i=9,29%; L=37,66 i=8,44%; L=5,45 i=9,47%

ALIGNMENT - PROFILE

SCALE H 1:2000
V 1:500

NOTES
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Reference Drawings

Drawing No.	Description
33-0042-00-PP-PLN-0001	EXCESS TIA WATER AND OUTFALL PIPELINE - MASTER SITE PLAN

Revisions

Rev.	Date	Description	Originator	Drawn	Checked
0	27-08-2018	ISSUED FOR DESIGN	MJ	AZ	NB

Engineer's Stamp

CLIENT

MAC RESOURCES

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HOPE BAY
WATER DISCHARGE

OUTFALL DISCHARGE SYSTEM
EXCESS TIA PIPELINE
PLAN VIEW AND PROFILE (STA 0+000 TO STA 1+300)

Scale	Off. Code	Proj. Code	Area Code	Disc. Code	Doc. Type	Unique. No	Sheet No	Rev.
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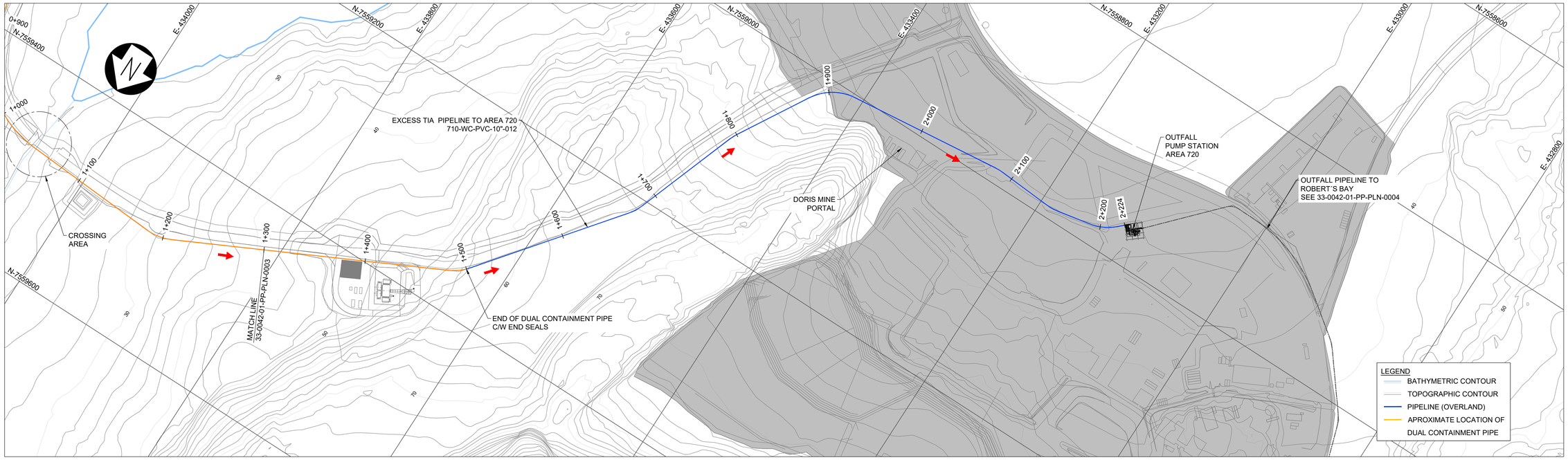
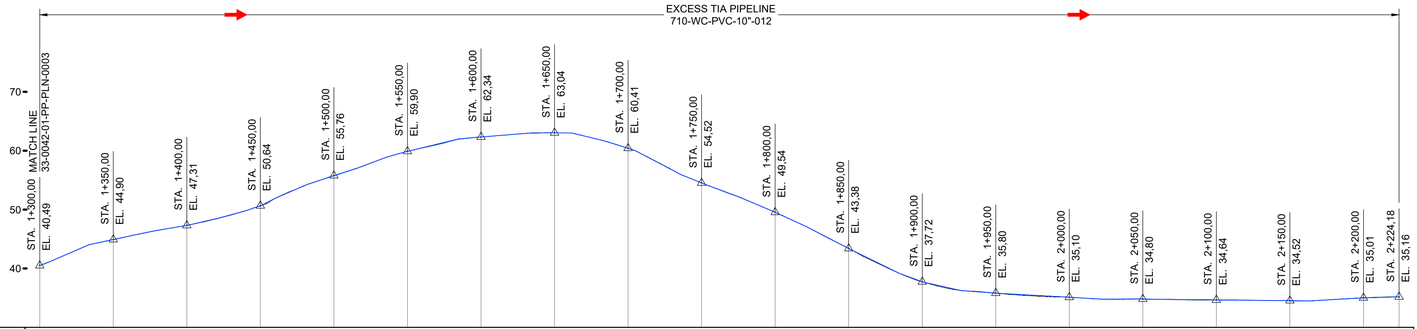


ALIGNMENT - PLAN VIEW

SCALE 1:2000



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B.O.P.	40,49	44,90	47,31	50,64	55,76	59,90	62,34	63,04	60,41	54,52	49,54	43,38	37,72	35,80	35,10	34,80	34,64	34,52	35,01		
CHAINAGE	1+300	1+350	1+400	1+450	1+500	1+550	1+600	1+650	1+700	1+750	1+800	1+850	1+900	1+950	2+000	2+050	2+100	2+150	2+200	2+224	
LENGTH (m) SLOPE (%)	L=37,66 i=8,44%	L=28,57 i=10,72%	L=16,19 i=5,29%	L=16,1 i=5,46	L=14,52 i=4,93%	L=19,47 i=4,20%	L=19,76 i=5,67%	L=18,97 i=6,70%	L=11,38 i=8,34%	1,(i=10,73%	L=20,87 i=8,14%	=17,72 i=8,00%	=15,5(i=9,34%	L=21,52 i=6,82%	=13,16 i=6,01%	L=35,11 i=2,27%	L=14,96 i=1,97%	L=33,57 i=0,27%	L=16,44 i=-6,12%	12,(i= -7	L=22,0 i= -8,2(	L= 5,(i= -13,14%	L= 30,70 -10,16	_= 14,6(i= -9,41%	L= 26,91 i= -10,62%	L= 23,34 i= -11,53%	L= 22,18 i= -12,95%	L= 28,20	L= 34,10 i= -12,30%	L= 16,23 i= -9,26%	_= 26,06 i= -5,67%	L= 23,98 i= -1,87%	L= 50,00 i= -1,39%	L= 20,88 i= -1,47%	L=29,12 i=0,01%	L= 50,00 i= -0,31%	L= 50,00 i= -0,25%	L= 13,82 i= -0,30%	L=36,19 i=1,45%	L=24,18 i=0,65%

ALIGNMENT - PROFILE

SCALE H 1:2000
V 1:500

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Drawing No.	Description	Rev.	Date	Description	Originator	Drawn	Checked
33-0042-00-PP-PLN-0001	EXCESS TIA WATER AND OUTFALL PIPELINE - MASTER SITE PLAN	0	27-08-2018	ISSUED FOR DESIGN	MJ	AZ	NB

Reference Drawings | Revisions

Engineer's Stamp

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HOPE BAY
WATER DISCHARGE

OUTFALL DISCHARGE SYSTEM
EXCESS TIA PIPELINE
PLAN VIEW AND PROFILE (STA 1+300 TO STA 2+224,18)

Scale	Document No							
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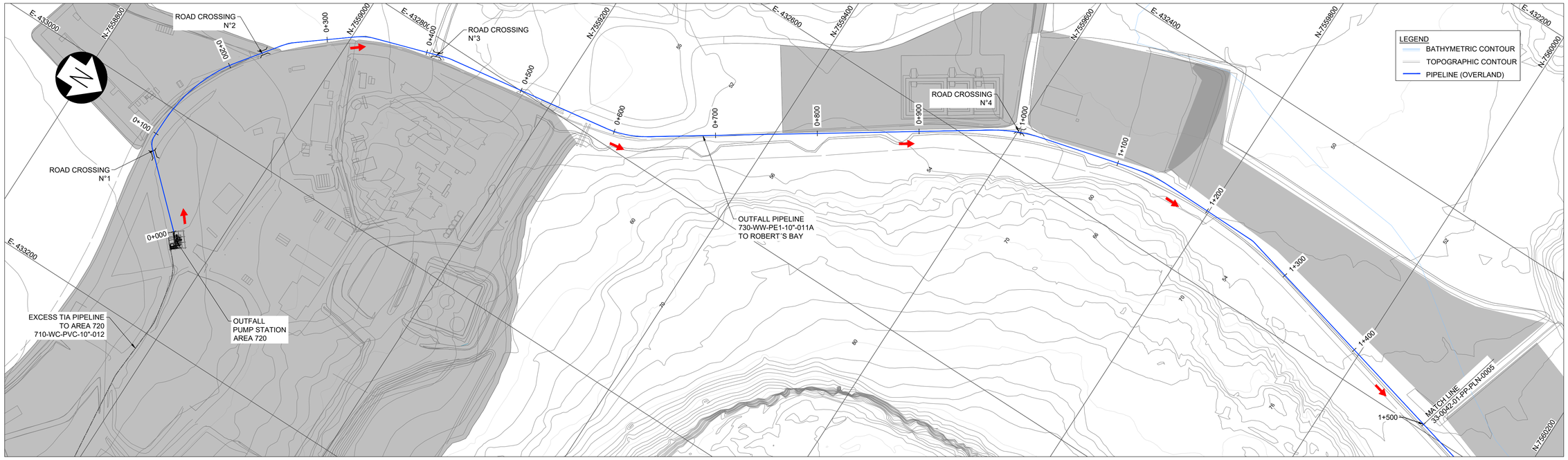

ALIGNMENT - PLAN VIEW

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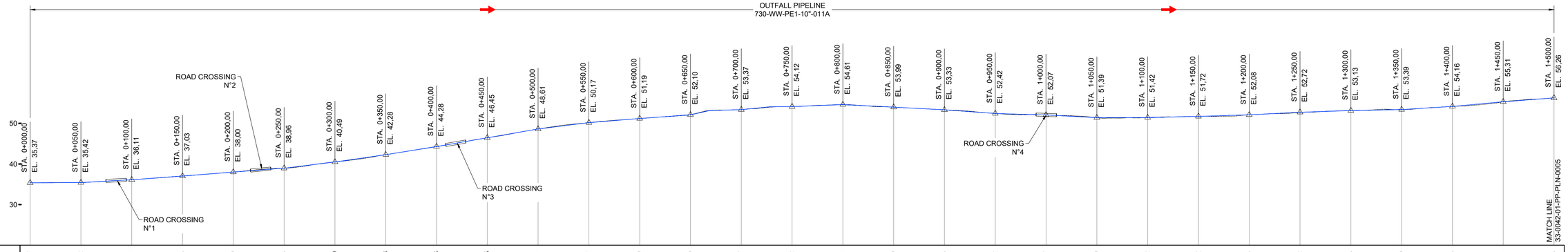

CHAINAGE	GROUND ELEVATION	B.O.P.	LENGTH (m) SLOPE (%)
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0+050	35,42	35,42	L=50,00 i=1,38%
0+100	36,11	36,11	L=50,01 i=1,82%
0+150	37,03	37,03	L=50,01 i=1,95%
0+200	38,00	38,00	L=50,01 i=1,92%
0+250	38,96	38,96	L=50,02 i=3,05%
0+300	40,49	40,49	L=50,03 i=3,59%
0+350	42,28	42,28	L=50,04 i=4,00%
0+400	44,28	44,28	L=50,05 i=4,34%
0+450	46,45	46,45	L=50,05 i=4,32%
0+500	48,61	48,61	L=50,02 i=3,13%
0+550	50,17	50,17	L=50,01 i=2,03%
0+600	51,19	51,19	L=50,01 i=1,82%
0+650	52,10	52,10	L=19,22 i=5,52% L=30,81 i=0,66%
0+700	53,37	53,37	L=28,26 i=2,48% L=21,75 i=0,25%
0+750	54,12	54,12	L=50,00 i=0,98%
0+800	54,61	54,61	L= 50,00 i= -1,24%
0+850	53,99	53,99	L= 50,00 i= -1,33%
0+900	53,33	53,33	L= 50,01 i= -1,82%
0+950	52,42	52,42	L= 49,96 i= -0,70%
1+000	52,07	52,07	L= 50,05 i= -1,35%
1+050	51,39	51,39	L=50,00 i=0,05%
1+100	51,42	51,42	L=50,00 i=0,60%
1+150	51,72	51,72	L=50,00 i=0,73%
1+200	52,08	52,08	L=50,00 i=1,28%
1+250	52,72	52,72	L=50,00 i=0,82%
1+300	53,13	53,13	L=50,00 i=0,52%
1+350	53,39	53,39	L=50,01 i=1,54%
1+400	54,16	54,16	L=50,01 i=2,30%
1+450	55,31	55,31	L=50,01 i=1,90%
1+500	56,26	56,26	L=50,00 i=0,93%

ALIGNMENT - PROFILE

SCALE H 1:2000
V 1:500

NOTES
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Reference Drawings

Drawing No.	Description
33-0042-00-PP-PLN-0001	EXCESS TIA WATER AND OUTFALL PIPELINE - MASTER SITE PLAN

Revisions

Rev.	Date	Description	Originator	Drawn	Checked
0	27-08-2018	ISSUED FOR DESIGN	MJ	AZ	NB

Engineer's Stamp

CLIENT

MAC RESOURCES

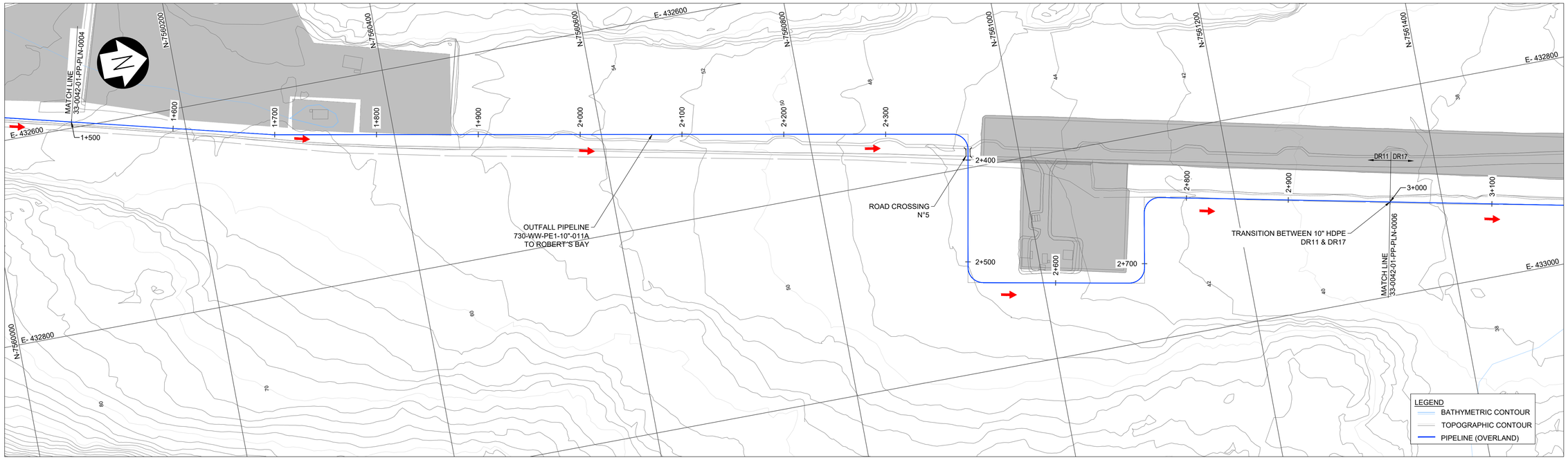
PATERSON & COOKE

PATERSON & COOKE CANADA INC.
306-595 HOWE STREET
VANCOUVER, BRITISH COLUMBIA, CANADA
TEL : 604-687-7704
WWW.PATERSONCOOKE.COM

HOPE BAY
WATER DISCHARGE

OUTFALL DISCHARGE SYSTEM
OUTFALL PIPELINE
PLAN VIEW AND PROFILE (STA 0+000 TO STA 1+500)

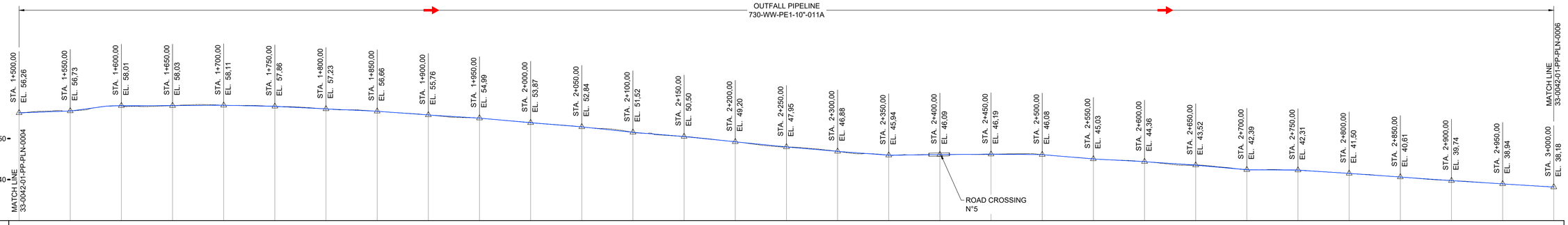
Scale	Off. Code	Proj. Code	Area Code	Disc. Code	Doc. Type	Unique. No	Sheet No	Rev.
ANSI D	33	0042	00	PP	PLN	0004	1 OF 6	0



SCALE
0 40 80 120 160 200 m

ALIGNMENT - PLAN VIEW

SCALE 1:2000



GROUND ELEVATION	56,26	56,73	58,01	58,03	58,11	57,86	57,23	56,66	55,76	54,99	53,87	52,84	51,52	50,50	49,20
B.O.P.	56,26	56,73	58,01	58,03	58,11	57,86	57,23	56,66	55,76	54,99	53,87	52,84	51,52	50,50	49,20
CHAINAGE	1+500	1+550	1+600	1+650	1+700	1+750	1+800	1+850	1+900	1+950	2+000	2+050	2+100	2+150	2+200

GROUND ELEVATION	47,95	46,88	45,94	46,09	46,19	46,08	45,03	44,36	43,52	42,39	42,31	41,50	40,61	39,74	38,94	38,18
B.O.P.	47,95	46,88	45,94	46,09	46,19	46,08	45,03	44,36	43,52	42,39	42,31	41,50	40,61	39,74	38,94	38,18
CHAINAGE	2+250	2+300	2+350	2+400	2+450	2+500	2+550	2+600	2+650	2+700	2+750	2+800	2+850	2+900	2+950	3+000

LENGTH (m) SLOPE (%)											
	L=50,01 i=1,90%	L=50,00 i=0,93%	L=35,90 i=3,32%	L=14,12 i=0,67%	L=50,00 i=0,03%	L=50,00 i=0,16%	L= 50,00 i= -0,50%	L= 50,00 i= -1,26%	L= 50,00 i= -1,15%	L= 50,01 i= -1,79%	L= 50,01 i= -1,54%
	L= 50,01 i= -2,24%	L= 50,01 i= -2,06%	L= 50,02 i= -2,64%	L= 50,01 i= -2,05%	L= 50,02 i= -2,58%	L= 50,02 i= -2,50%	L= 50,01 i= -2,15%	L= 50,01 i= -1,88%	L=50,00 i=0,30%	L=50,00 i=0,19%	L= 50,00 i= -0,20%
	L= 50,01 i= -2,11%	L= 50,00 i= -1,33%	L= 50,01 i= -1,68%	L= 50,01 i= -2,25%	L= 50,00 i= -0,17%	L= 50,01 i= -1,61%	L= 50,01 i= -1,78%	L= 50,01 i= -1,74%	L= 50,01 i= -1,60%	L= 50,01 i= -1,53%	L= 50,00 i= -0,85%

NOTES
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ALIGNMENT - PROFILE

SCALE H 1:2000
V 1:500

Reference Drawings

Drawing No.	Description
33-0042-00-PP-PLN-0001	EXCESS TIA WATER AND OUTFALL PIPELINE - MASTER SITE PLAN

Revisions

Rev.	Date	Description	Originator	Drawn	Checked
0	27-08-2018	ISSUED FOR DESIGN	MJ	AZ	NB

Engineer's Stamp

CLIENT

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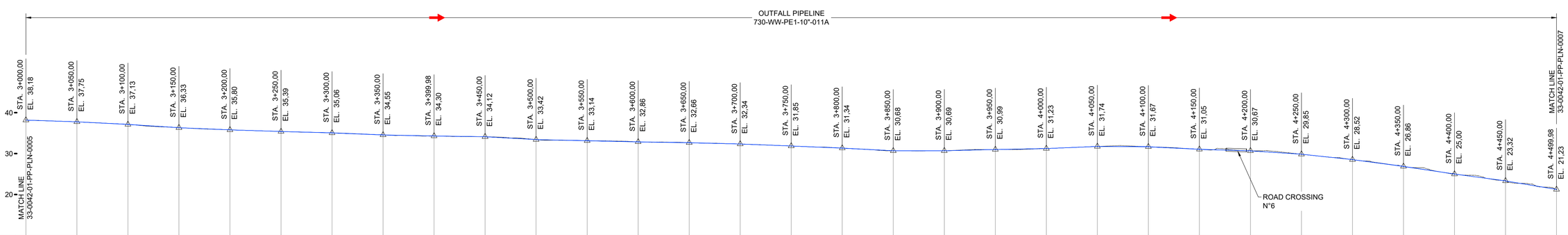
HOPE BAY
WATER DISCHARGE

OUTFALL DISCHARGE SYSTEM
OUTFALL PIPELINE
PLAN VIEW AND PROFILE (STA 1+500 TO STA 3+000)

Scale	Off. Code	Proj. Code	Area Code	Disc. Code	Doc. Type	Unique. No	Sheet No	Rev.
ANSI D	33	0042	00	PP	PLN	0005	2 OF 6	0



ALIGNMENT - PLAN VIEW

SCALE 1:2000

GROUND ELEVATION	38,18	37,75	37,13	36,33	35,80	35,39	35,06	34,55	34,30	34,12	33,42	33,14	32,86	32,66	32,34	31,85
B.O.P.	38,18	37,75	37,13	36,33	35,80	35,39	35,06	34,55	34,30	34,12	33,42	33,14	32,86	32,66	32,34	31,85
CHAINAGE	3+000	3+050	3+100	3+150	3+200	3+250	3+300	3+350	3+400	3+450	3+500	3+550	3+600	3+650	3+700	3+750
LENGTH (m) SLOPE (%)	L= 50,01 i= -1,53% L= 50,00 i= -0,85%	L= 50,00 i= -1,25%	L= 50,01 i= -1,60%	L= 50,00 i= -1,05%	L= 50,00 i= -0,82%	L= 50,00 i= -0,67%	L= 50,00 i= -1,01%	L= 49,98 i= -0,51%	L= 50,02 i= -0,36%	L= 50,00 i= -1,39%	L= 50,00 i= -0,56%	L= 50,00 i= -0,57%	L= 50,00 i= -0,40%	L= 50,00 i= -0,63%	L= 50,01 i= -0,99%	L= 50,00 i= -1,02%

GROUND ELEVATION	31,34	30,68	30,69	30,99	31,23	31,74	31,67	31,05	30,67	29,85	28,52	26,86	25,00	23,32	21,23
B.O.P.	31,34	30,68	30,69	30,99	31,23	31,74	31,67	31,05	30,67	29,85	28,52	26,86	25,00	23,32	21,23
CHAINAGE	3+800	3+850	3+900	3+950	4+000	4+050	4+100	4+150	4+200	4+250	4+300	4+350	4+400	4+450	4+500
LENGTH (m) SLOPE (%)	L= 50,00 i= -1,32%	L=50,00 i=0,03%	L=50,00 i=0,60%	L=50,00 i=0,47%	L=50,00 i=1,01%	L= 50,00 i= -0,14%	L= 50,00 i= -1,23%	L= 50,00 i= -0,77%	L= 50,01 i= -1,63%	L= 50,02 i= -2,66%	L= 50,03 i= -3,32%	L= 50,03 i= -3,73%	L= 50,03 i= -3,35%	L= 50,02 i= -4,18% L= 50,08 i= -4,93%	

ALIGNMENT - PROFILE

SCALE H 1:2000
V 1:500

NOTES
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Drawing No.	Description
33-0042-00-PP-PLN-0001	EXCESS TIA WATER AND OUTFALL PIPELINE - MASTER SITE PLAN

Reference Drawings

Rev.	Date	Description	Originator	Drawn	Checked
0	27-08-2018	ISSUED FOR DESIGN	MJ	AZ	NB

Revisions

Engineer's Stamp

CLIENT

MAC RESOURCES

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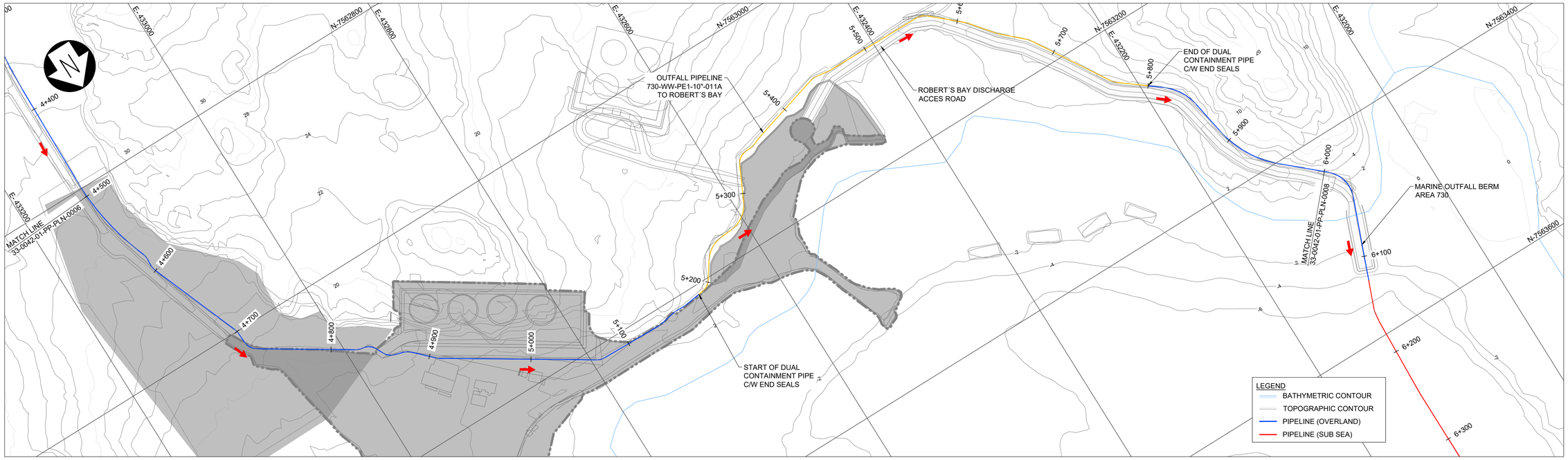
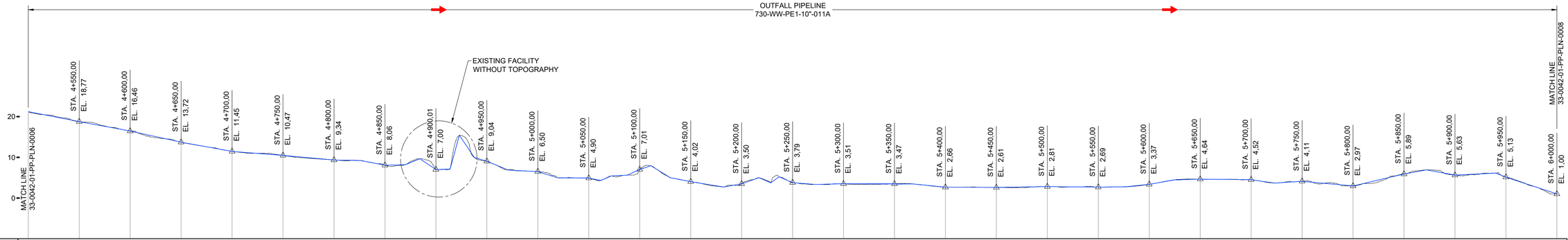
HOPE BAY
WATER DISCHARGE

OUTFALL DISCHARGE SYSTEM
OUTFALL PIPELINE
PLAN VIEW AND PROFILE (STA 3+000 TO STA 4+500)

Scale	Off. Code	Proj. Code	Area Code	Disc. Code	Doc. Type	Unique. No	Sheet No	Rev.
ANSI D	33	0042	00	PP	PLN	0006	3 OF 6	0





ALIGNMENT - PLAN VIEW

SCALE 1:2000

GROUND ELEVATION	21,23	18,77	16,46	13,72	11,45	10,47	9,34	8,06	7,00	9,04	6,50	4,90	7,01	4,02	3,50
B.O.P.	21,23	18,77	16,46	13,72	11,45	10,47	9,34	8,06	7,00	9,04	6,50	4,90	7,01	4,02	3,50
CHAINAGE	4+500	4+550	4+600	4+650	4+700	4+750	4+800	4+850	4+900	4+950	5+000	5+050	5+100	5+150	5+200

GROUND ELEVATION	3,79	3,51	3,47	2,66	2,61	2,81	2,69	3,37	4,64	4,52	4,11	2,97	5,89	5,63	5,13	1,00
B.O.P.	3,79	3,51	3,47	2,66	2,61	2,81	2,69	3,37	4,64	4,52	4,11	2,97	5,89	5,63	5,13	1,00
CHAINAGE	5+250	5+300	5+350	5+400	5+450	5+500	5+550	5+600	5+650	5+700	5+750	5+800	5+850	5+900	5+950	6+000

LENGTH (m)
SLOPE (%)

L= 50,08 i= -4,93%
L= 50,05 i= -4,62%
L= 50,07 i= -5,47%
L= 50,05 i= -4,54%
L= 50,01 i= -1,96%
L= 50,01 i= -2,27%
L= 26,40 i= -0,50%
L= 23,62 i= -4,88%
L=19,8 i=0,62
L=14 i=10,2
L= 15, i= -16,9
L=1 i=0,
L=1 i=90
L= 15 i= -37,
L= 12 i= -7,7
L= 21,19 i= -10,29%
L= 28,92 i= -1,29%
L= 19,17 i= -7,84%
L= 30,89 i= -0,33%
L= 1 i= -4
L=10 i=10,6
L=15,38 i=1,20%
12 1,
L=11 i=8,4
L= 19,2 i= -15,50
L= 20,02 i= -4,88%
L= 32,48 i= -4,05%
L=17,5 i=4,49
L=17 i=8,7
L= i= -1
L= i=1
L= 13,3 i= -10,8
L= 22,01 i= -2,00%
L=27,99 i=0,58%
L= 50,00 i= -0,08%
L= 19,01 i= -0,09%
L= 31,00 i= -2,56%
L= 50,00 i= -0,10%
L=50,00 i=0,40%
L= 50,00 i= -0,25%
L=26,51 i=0,29%
L=23,49 i=2,57%
L=24,77 i=4,40%
L=25,25 i=0,72%
L= 50,00 i= -0,23%
L= 22,65 i= -3,71%
L=27,37 i=1,57%
L= 50,01 i= -2,28%
L=50,09 i=5,85%
L=22,25 i=4,60%
L= 27,80 i= -4,64%
L=40,08 i=1,26%
L= 9,97 i= -10,14%
L= 50,17 i= -8,25%
L= 11,14 i= -0,00%

ALIGNMENT - PROFILE

SCALE H 1:2000
V 1:500

NOTES
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Drawing No.	Description
33-0042-00-PP-PLN-0001	EXCESS TIA WATER AND OUTFALL PIPELINE - MASTER SITE PLAN

Reference Drawings

Rev.	Date	Description	Originator	Drawn	Checked
0	27-08-2018	ISSUED FOR DESIGN	MJ	AZ	NB

Revisions

Engineer's Stamp

CLIENT

MAC RESOURCES

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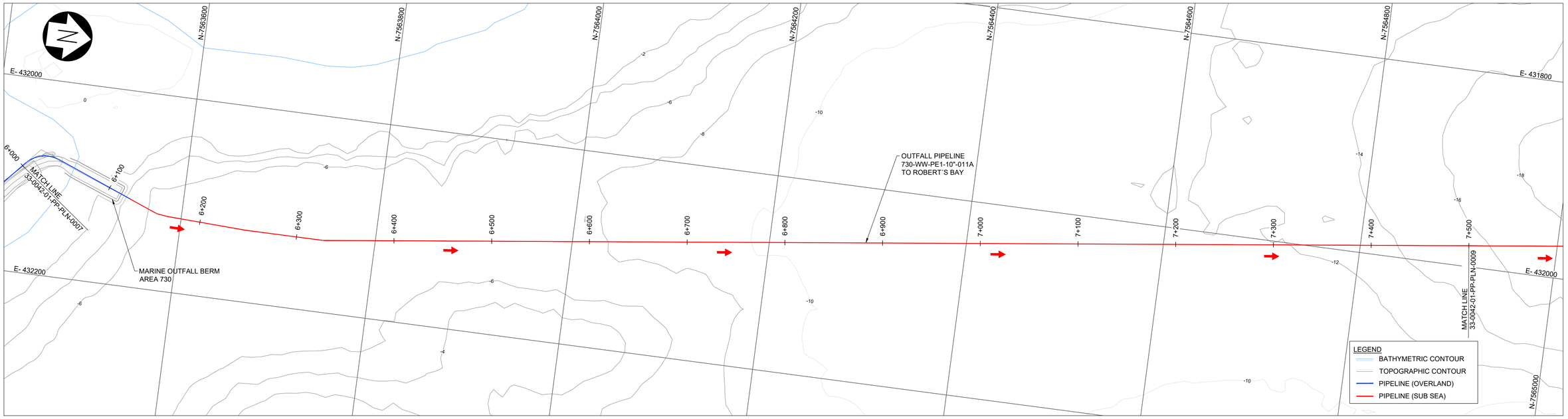
HOPE BAY
WATER DISCHARGE

OUTFALL DISCHARGE SYSTEM
OUTFALL PIPELINE
PLAN VIEW AND PROFILE (STA 4+500 TO STA 6+000)

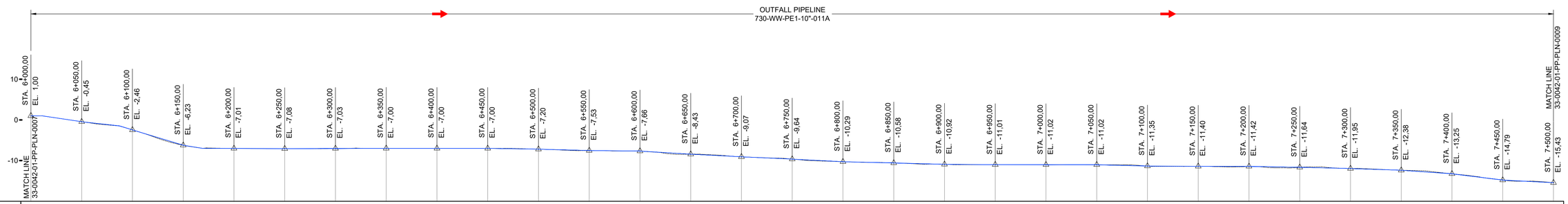
Scale	Off. Code	Proj. Code	Area Code	Disc. Code	Doc. Type	Unique. No	Sheet No	Rev.
ANSI D	33	0042	00	PP	PLN	0007	4 OF 6	0



ALIGNMENT - PLAN VIEW

SCALE 1:2000

SCALE
0 40 80 120 160 200 m



CHAINAGE	GROUND ELEVATION	B.O.P.
6+000	1,00	1,00
6+050	-0,45	-0,45
6+100	-2,46	-2,46
6+150	-6,23	-6,23
6+200	-7,01	-7,01
6+250	-7,08	-7,08
6+300	-7,03	-7,03
6+350	-7,00	-7,00
6+400	-7,00	-7,00
6+450	-7,00	-7,00
6+500	-7,20	-7,20
6+550	-7,53	-7,53
6+600	-7,66	-7,66
6+650	-8,43	-8,43
6+700	-9,07	-9,07
6+750	-9,64	-9,64
6+800	-10,29	-10,29
6+850	-10,58	-10,58
6+900	-10,92	-10,92
6+950	-11,01	-11,01
7+000	-11,02	-11,02
7+050	-11,02	-11,02
7+100	-11,35	-11,35
7+150	-11,40	-11,40
7+200	-11,42	-11,42
7+250	-11,64	-11,64
7+300	-11,95	-11,95
7+350	-12,38	-12,38
7+400	-13,25	-13,25
7+450	-14,79	-14,79
7+500	-15,43	-15,43

LENGTH (m)	SLOPE (%)
L:	i=
L= 11,14	i= -0,00%
L= 38,89	i= -3,74%
L= 37,59	i= -2,78%
L= 12,46	i= -7,74%
L= 50,14	i= -7,54%
L= 19,02	i= -4,03%
L= 30,99	i= -0,03%
L= 50,00	i= -0,14%
L=50,00	i=0,09%
L=50,00	i=0,06%
L= 50,00	i= -0,00%
L= 50,00	i= -0,00%
L= 50,00	i= -0,39%
L= 50,00	i= -0,67%
L= 50,00	i= -0,25%
L= 50,01	i= -1,55%
L= 50,00	i= -1,27%
L= 50,00	i= -1,14%
L= 50,00	i= -1,30%
L= 50,00	i= -0,58%
L= 50,00	i= -0,69%
L= 50,00	i= -0,17%
L= 50,00	i= -0,02%
L= 50,00	i= -0,01%
L= 50,00	i= -0,66%
L= 50,00	i= -0,10%
L= 50,00	i= -0,03%
L= 50,00	i= -0,46%
L= 50,00	i= -0,61%
L= 50,00	i= -0,86%
L= 50,01	i= -1,74%
L= 50,02	i= -3,08%
L= 50,00	i= -1,29%
L= 50,01	i= -2,04%

ALIGNMENT - PROFILE

SCALE H 1:2000
V 1:500

NOTES
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Reference Drawings

Drawing No.	Description
33-0042-00-PP-PLN-0001	EXCESS TIA WATER AND OUTFALL PIPELINE - MASTER SITE PLAN

Revisions

Rev.	Date	Description	Originator	Drawn	Checked
0	27-08-2018	ISSUED FOR DESIGN	MJ	AZ	NB

Engineer's Stamp

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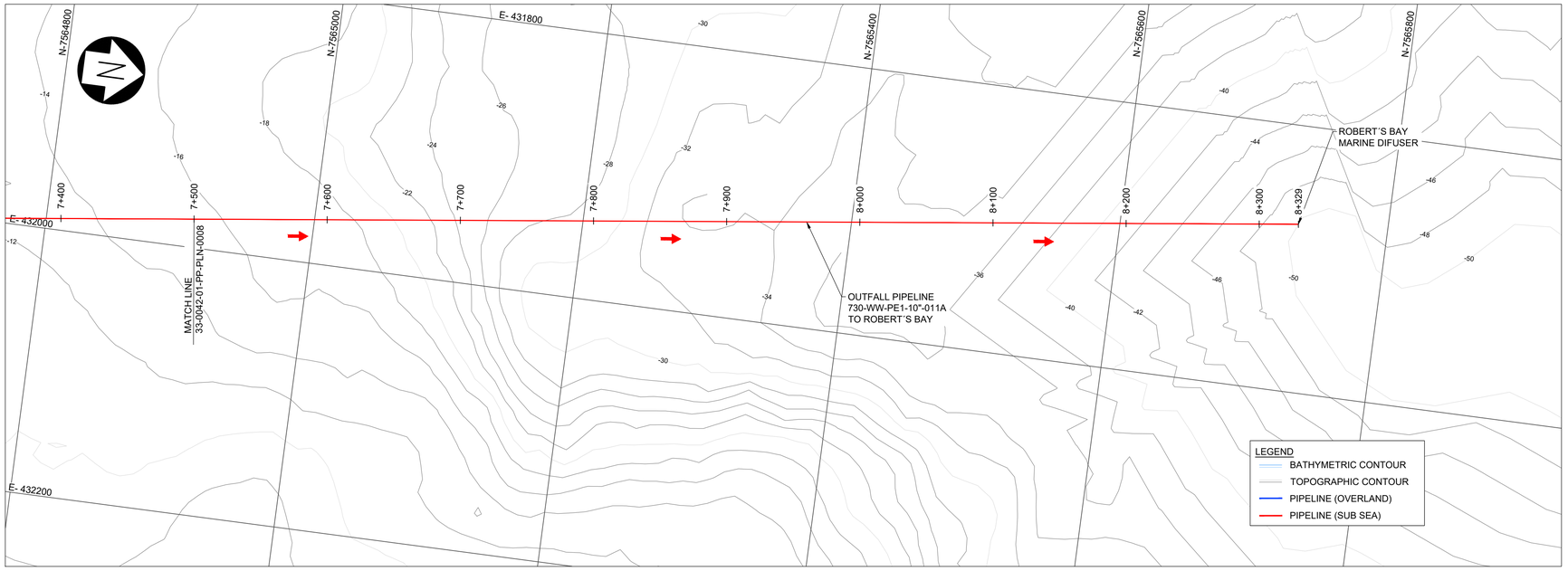
HOPE BAY
WATER DISCHARGE

OUTFALL DISCHARGE SYSTEM
OUTFALL PIPELINE
PLAN VIEW AND PROFILE (STA 6+000 TO STA 7+500)

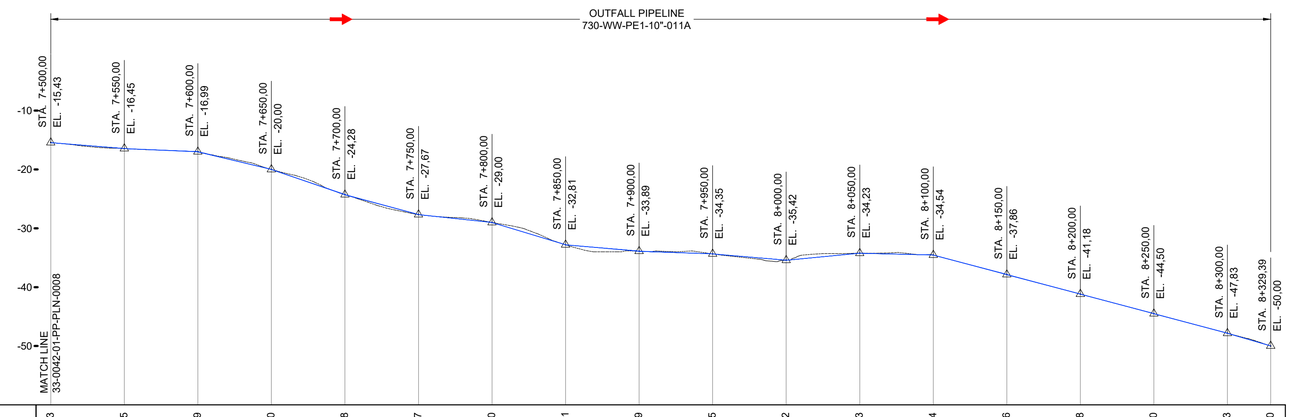
Scale	Off. Code	Proj. Code	Area Code	Disc. Code	Doc. Type	Unique. No	Sheet No	Rev.
ANSI D	33	0042	00	PP	PLN	0008	5 OF 6	0



ALIGNMENT - PLAN VIEW

SCALE 1:2000

SCALE 0 40 80 120 160 200 m



GROUND ELEVATION	-15,43	-16,45	-16,99	-20,00	-24,28	-27,67	-29,00	-32,81	-33,89	-34,35	-35,42	-34,23	-34,54	-37,86	-41,18	-44,50	-47,83	-50,00
B.O.P.	-15,43	-16,45	-16,99	-20,00	-24,28	-27,67	-29,00	-32,81	-33,89	-34,35	-35,42	-34,23	-34,54	-37,86	-41,18	-44,50	-47,83	-50,00
CHAINAGE	7+500	7+550	7+600	7+650	7+700	7+750	7+800	7+850	7+900	7+950	8+000	8+050	8+100	8+150	8+200	8+250	8+300	8+329
LENGTH (m) SLOPE (%)	L= 50,00 i= -1,29%	L= 50,01 i= -2,04%	L= 50,00 i= -1,08%	L= 50,09 i= -6,01%	L= 50,18 i= -8,57%	L= 50,11 i= -6,77%	L= 50,02 i= -2,67%	L= 50,14 i= -7,61%	L= 50,01 i= -2,16%	L= 50,00 i= -0,91%	L= 50,01 i= -2,15%	L=50,01 i=2,39%	L= 50,00 i= -0,62%	L= 50,11 i= -6,64%	L= 50,11 i= -6,64%	L= 50,11 i= -6,64%	L= 50,11 i= -6,64%	L= 29,47 i= -7,38%

ALIGNMENT - PROFILE

SCALE H 1:2000
V 1:500

NOTES
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
2. TOPOGRAPHY NAD83 UTM ZONE 13.
3. THE REQUIREMENT OF THE DUAL CONTAINMENT PIPE END SEALS SHALL BE DETERMINED BY OTHERS. P&C SHALL NOT BE RESPONSIBLE FOR ANY OMISSION OR DEVIATION FROM ANY ENVIRONMENTAL REQUIREMENTS.
4. PIPELINE SHALL BE JOINED USING FUSION WELDING IN ACCORDANCE WITH ASME B31.3 AND ASME SEC. IX WELDING QUALIFICATION. ALL WELDS SHALL BE 100% VISUALLY INSPECTED AND 100% VOLUMETRIC NON-DESTRUCTIVE TESTED USING UT/PAUT OR OTFD.

Reference Drawings		Revisions					
Drawing No.	Description	Rev.	Date	Description	Originator	Drawn	Checked
33-0042-00-PP-PLN-0001	EXCESS TIA WATER AND OUTFALL PIPELINE - MASTER SITE PLAN	0	27-08-2018	ISSUED FOR DESIGN	MJ	AZ	NB

Engineer's Stamp

CLIENT

PATERSON & COOKE
PATERSON & COOKE CANADA INC.
306-595 HOWE STREET
VANCOUVER, BRITISH COLUMBIA, CANADA
TEL : 604-687-7704
WWW.PATERSONCOOKE.COM

HOPE BAY
WATER DISCHARGE

OUTFALL DISCHARGE SYSTEM
OUTFALL PIPELINE
PLAN VIEW AND PROFILE (STA 7+500 TO STA 8+329,39)

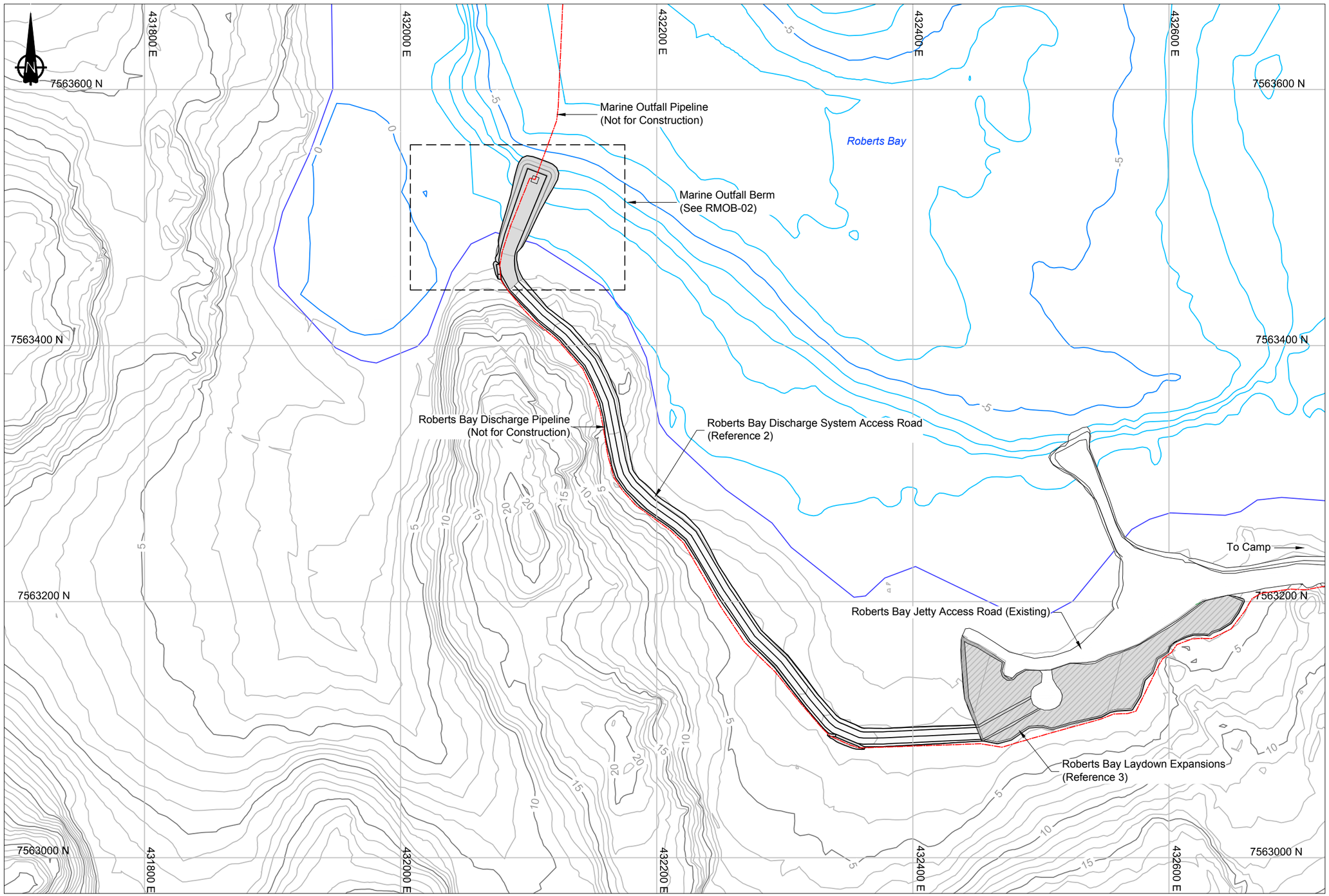
Scale	Document No							
	Off. Code	Proj. Code	Area Code	Disc. Code	Doc. Type	Unique. No	Sheet No	Rev
ANSI D	33	0042	00	PP	PLN	0009	6 OF 6	0

Doris North Project
Engineering Drawings for
Roberts Bay Marine Outfall Berm

Drawing Number	Drawing Title	Issue	Date	Revision	Old / Replaced Revisions
RMOB-01	General Arrangements	Issued for Construction	May 10, 2018	0	
RMOB-02	Plan and Profile	Issued for Construction	May 16, 2018	0	
RMOB-03	Pipe Ramp	Issued for Construction	May 10, 2018	0	
RMOB-04	Geogrid Layout Pattern	Issued for Construction	May 10, 2018	0	
RMOB-05	Schedule of Quantities	Issues for Construction	May 10, 2018	0	

SRK Job No. 1CT022.030

P:\01_SITES\Hope Bay\IACAD\Roberts Bay Discharge System\1CT0022.017 - RMOB - Cover.dwg



LEGEND

- Bathymetric Contour
- Topographic Contour
- Discharge Pipeline

NOTES

1. All dimensions are in meters unless otherwise stated.
2. Contours shown at 1.0m intervals.

REFERENCES

1. NAD83 UTM Zone 13.
2. SRK Consulting (Canada) Inc., 2018 Engineering Drawings for the Roberts Bay Discharge System Access Road. Doris North Project, Nunavut, Canada. Issued for Construction. Drawings prepared for Hope Bay Mining Limited. Project number 1CT022.030. January 30, 2018.
3. SRK Consulting (Canada) Inc., 2011. Engineering Drawings for the Roberts Bay Laydown Expansions, Doris North Project, Nunavut, Canada. Water License Amendment. Revision A. Issued for Discussion. Drawings prepared for Hope Bay Mining Limited. Project Number 1CH008.049. June 13, 2011.

0m 30 60 90 120

DRAWING NO.	DRAWING TITLE
--	--

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
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0	Issued for Construction	CH	--	18/05/10

REVISIONS

Original Drawings Stamped and Signed by Engineer

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PROFESSIONAL ENGINEERS STAMP

srk consulting

DESIGN:	DRAWN:	REVIEWED:
CH	TAH	
CHECKED:	APPROVED:	DATE:
		2018/05/10

FILE NAME: 1CT022.002_MOB-GA.dwg

MAC RESOURCES

HOPE BAY PROJECT

SRK JOB NO.: 1CT022.002

Roberts Bay Marine Outfall Berm

DRAWING TITLE: General Arrangement

DRAWING NO.	SHEET	REVISION NO.
RMOB-01	1 OF 5	0

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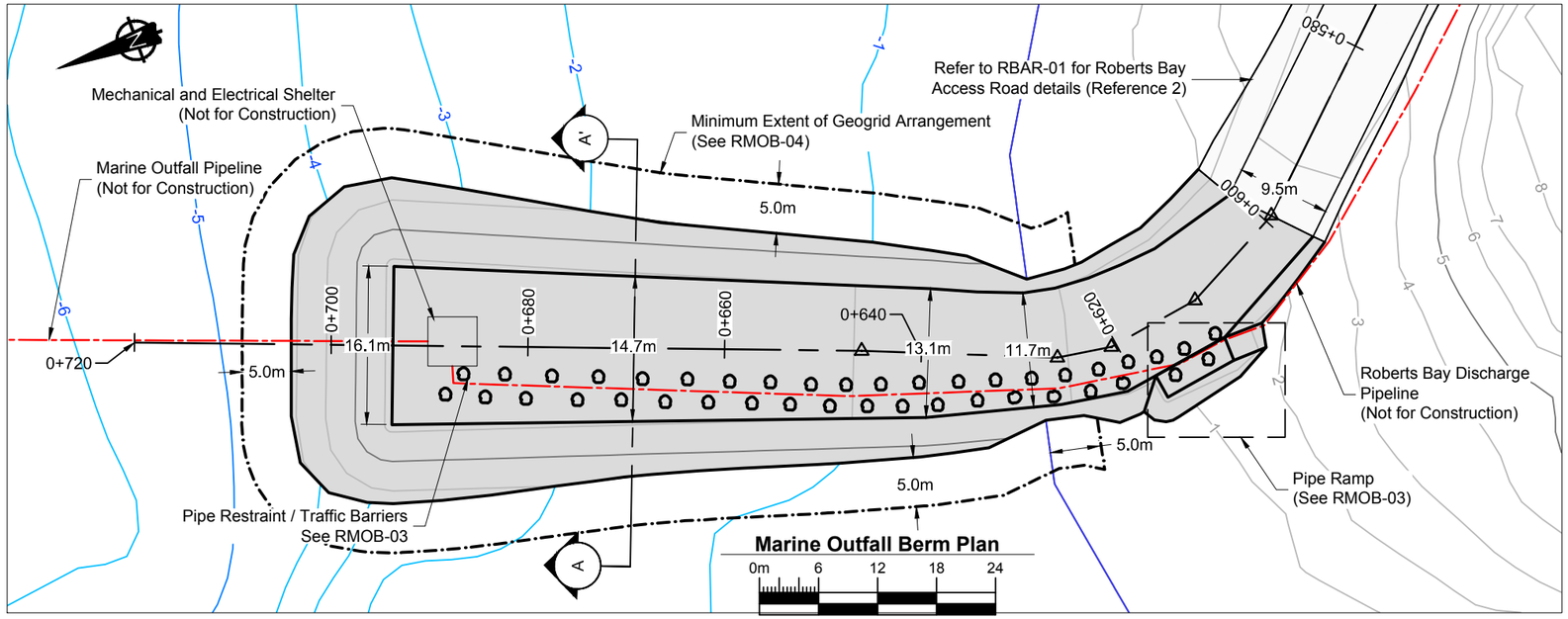
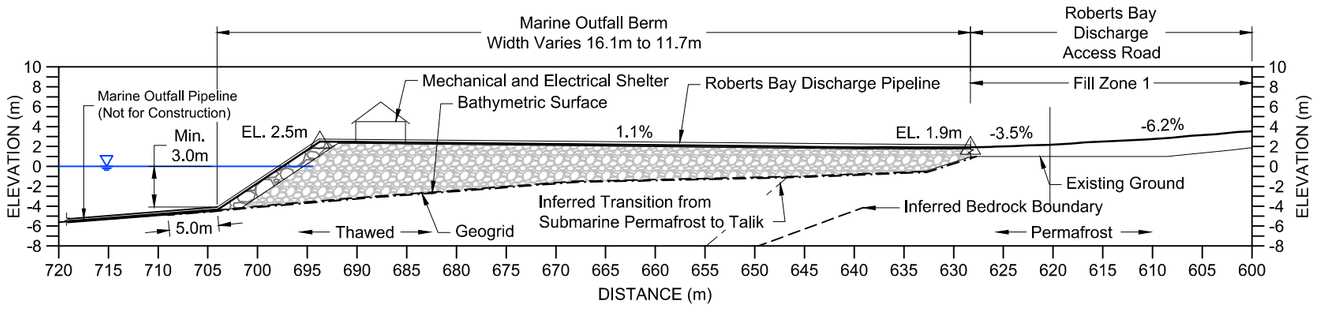
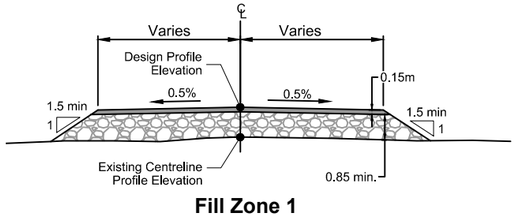




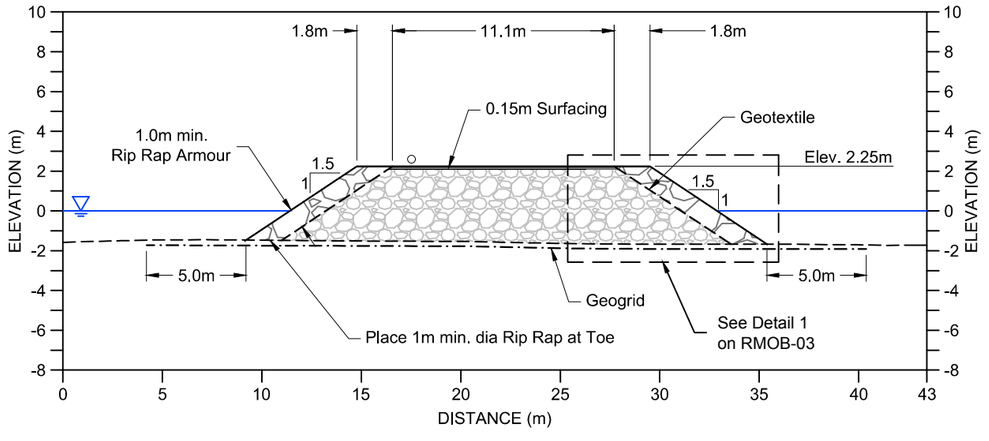
Marine Outfall Berm Profile

0m 6 12 18 24



Fill Zone 1

0m 2 4 6 8



Cross Section A-A'

0m 3 6 9 12

LEGEND

- Geotextile
- Geogrid
- Bathymetric Contour
- Topographic Contour
- Discharge Pipeline
- Rip Rap Armour
- ROQ Material
- Surfacing Material
- Traffic Barrier

NOTES

1. All dimensions are in meters unless noted otherwise.
2. Contours shown at 1m interval, and are based on aerial photography.
3. For details on Roberts Bay Discharge System Access road from 0+000 to 0+600, refer to drawings RBAR-01 to 04.
4. It is the Contractor's responsibility to ensure that the geogrid is installed in advance of the construction fill being placed. The Contractor must submit a construction procedure to the Engineer for approval before commencing this work.
5. Significant settlement of placed ROQ into the sea bed is expected during placement, even with geogrid installation.
6. The Contractor is responsible for silt and sediment control during construction. The construction methods by the Contractor must comply with TMAC environmental policies and permits and in line with requirements specified in References 1, 3, and 4.
7. The design provided considers the likely settlement of the marine outfall berm, and is deliberately raised and graded to account for this settlement. The final design is to have a horizontal crest at 1.5m elevation with 9.5m width (excluding armoring). Future 'repair' work designs should reflect this final design and not this initial construction design.

REFERENCES

1. TMAC Resources Inc. Amendment Application No. 1 of Project Certificate No. 003 and Water License 2AM-DOH1323 (TMAC 2015).
2. SRK Consulting (Canada) Inc., 2018. Engineering Drawings for the Roberts Bay Discharge System Access Road. Doris North Project, Nunavut, Canada. Issued for Construction. Drawings prepared for Hope Bay Mining Limited. Project number 1CT022.030. January 30, 2018
3. Fisheries and Oceans Canada. Letter to TMAC Resources, Inc., ATTN: Mr. Roberts. Subject: Implementation of mitigation measures to avoid and mitigate serious harm to fish - Marine Outfall Berm - Project Certification No. 003 Amendment (Doris North Gold Mine Project). File 02-HCAA-CA7-0017. August 30, 2016.
4. Fisheries and Oceans Canada, Request for Review form, TMAC Resources Inc. Doris North Project - Marine Outfall Berm, Project Certificate No. 003 Amendment. Document name: 2AM-DOH1323 (TMAC 2015)

DRAWING NO.	DRAWING TITLE	NO.	DESCRIPTION	CHK'D	APP'D	DATE
- -	- -	0	Issued for Construction	CH	- -	18/05/16

REFERENCE DRAWINGS | REVISIONS

Original Drawings Stamped and Signed by Engineer

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PROFESSIONAL ENGINEERS STAMP

srk consulting

DESIGN: CH | DRAWN: TAH | REVIEWED:
CHECKED: | APPROVED: | DATE: 2018/05/16
FILE NAME: 1CT022.002_MOB.dwg

TMAC RESOURCES

HOPE BAY PROJECT

SRK JOB NO.: 1CT022.002

Roberts Bay Marine Outfall Berm

DRAWING TITLE: Plan and Profile

DRAWING NO. RMOB-02 | SHEET 2 OF 5 | REVISION NO. 0

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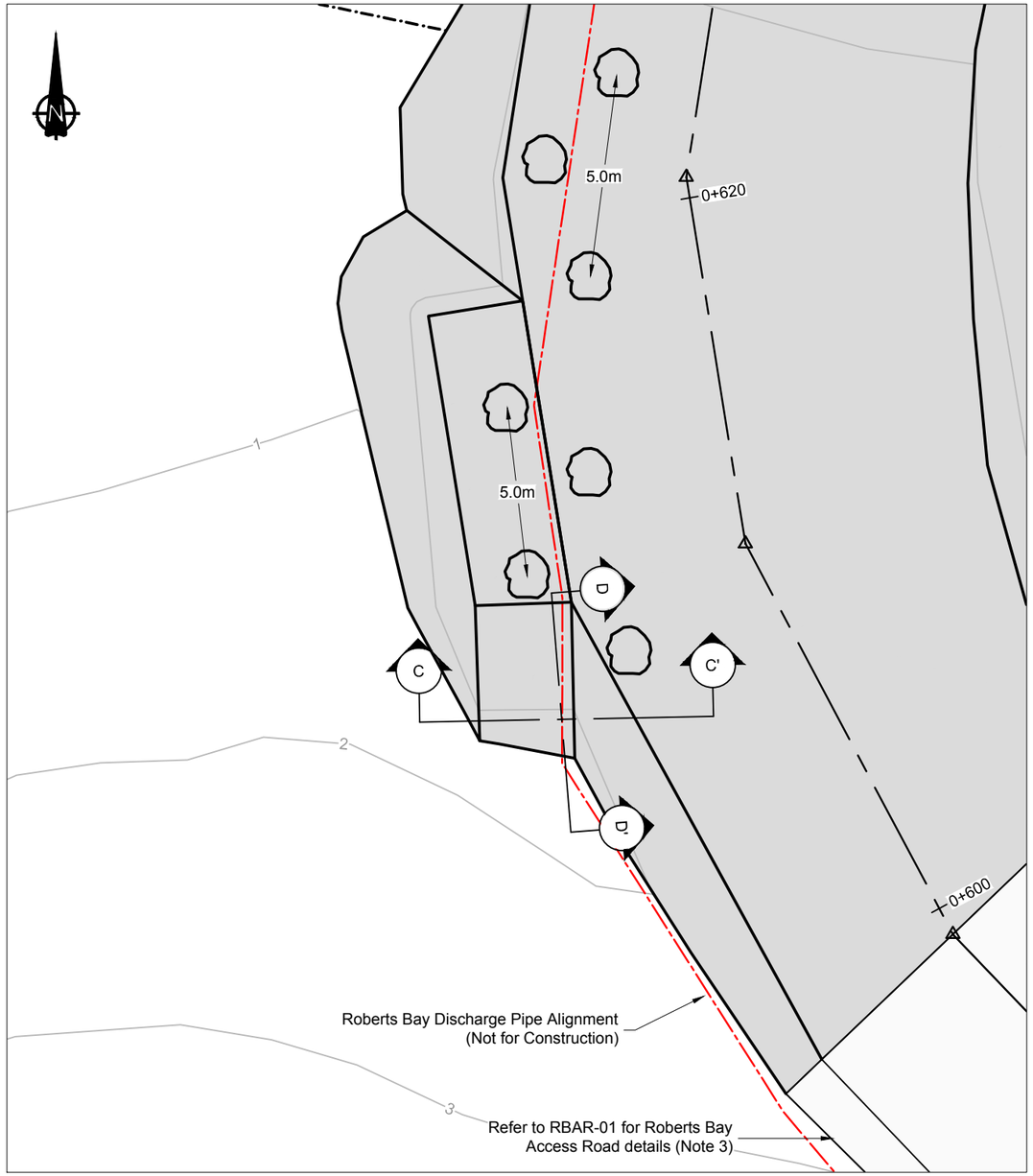
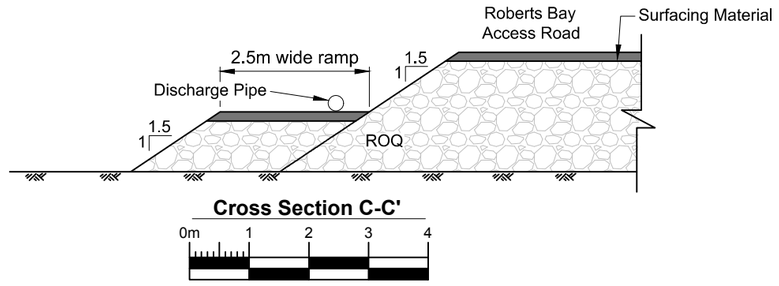


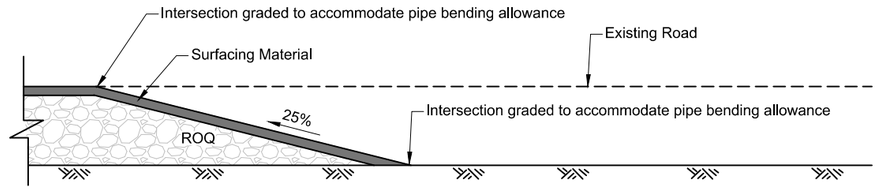
Marine Outfall Berm Pipe Ramp Location

0m 1 2 3 4 5 6



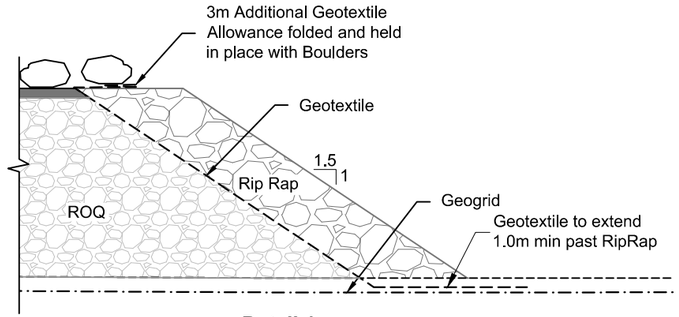
Cross Section C-C'

0m 1 2 3 4



Cross Section D-D'

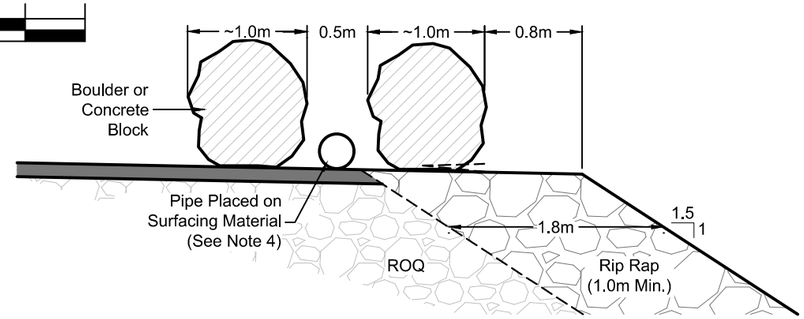
0m 1 2 3 4



Detail 1

on Dwg. RMOB-02

0m 1 2 3 4



Pipe Restraint / Traffic Barriers

Not To Scale

LEGEND

- Discharge Pipeline
- Geotextile
- Geogrid.
- Road Centerline
- Topographic Contour
- Jetty Rip Rap Armour
- ROQ Material
- Surfacing Material
- Traffic Barrier

NOTES

1. All dimensions are in meters unless noted otherwise.
2. Contours shown at 1m interval, and are based on aerial photography.
3. For details on Roberts Bay Discharge System Access road from 0+000 to 0+600, refer to drawings RBAR-01 to 04.
4. Pipe restraints / traffic barriers to be located based on final pipe alignment.

DRAWING NO.	DRAWING TITLE
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REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
0	Issued for Construction	CH	--	18/05/02

REVISIONS

Original Drawings Stamped and Signed by Engineer

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CH	TAH	
CHECKED:	APPROVED:	DATE:
		2018/05/10

FILE NAME: 1CT022.002_MOB.dwg

MAC RESOURCES

HOPE BAY PROJECT

SRK JOB NO.: 1CT022.002

Roberts Bay Marine Outfall Berm

DRAWING TITLE: Pipe Ramp

DRAWING NO.	SHEET	REVISION NO.
RMOB-03	3 OF 5	0

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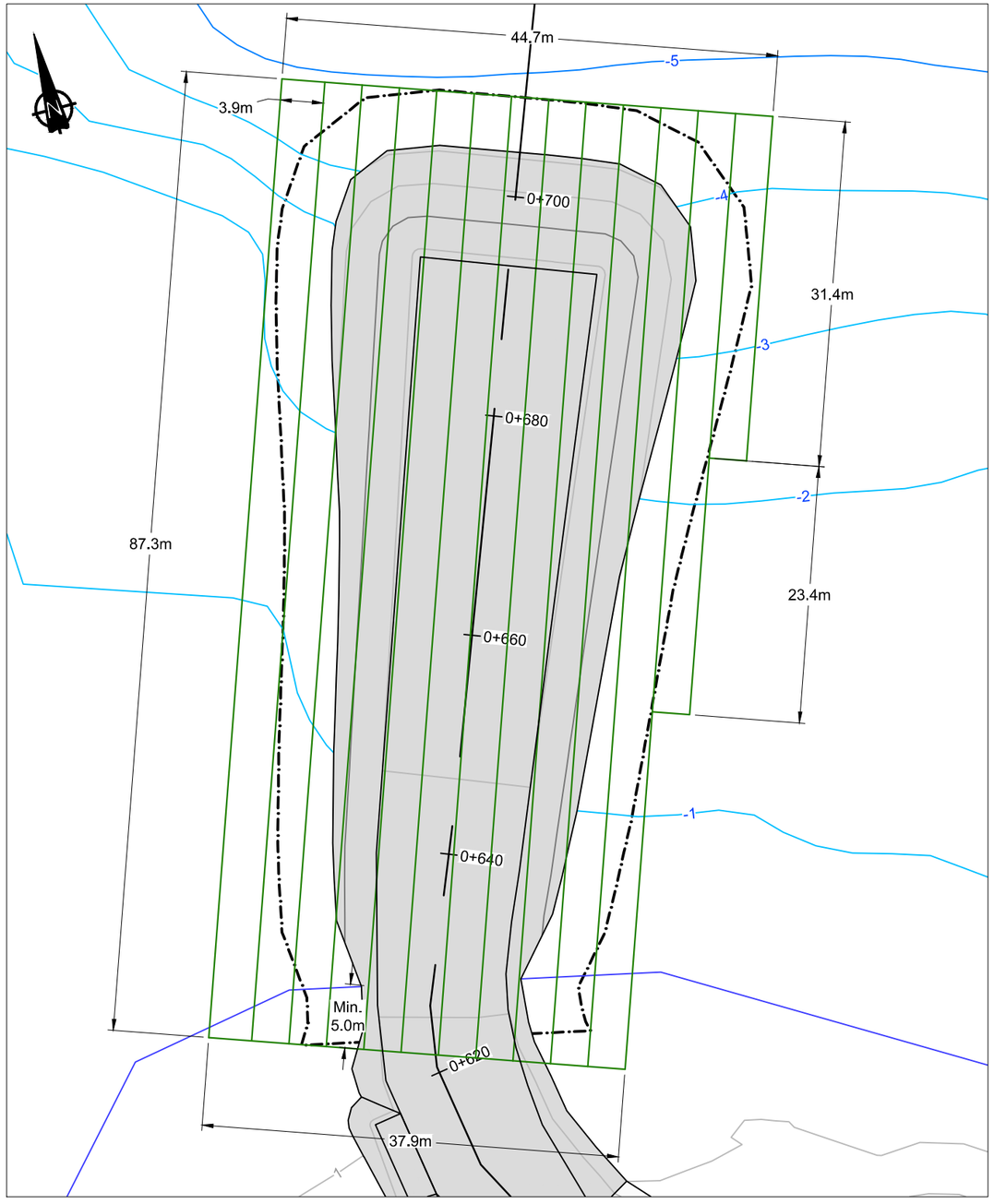
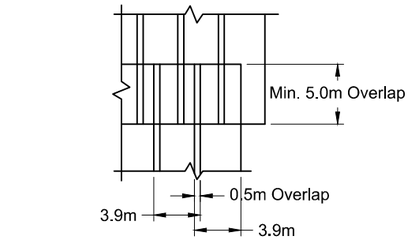


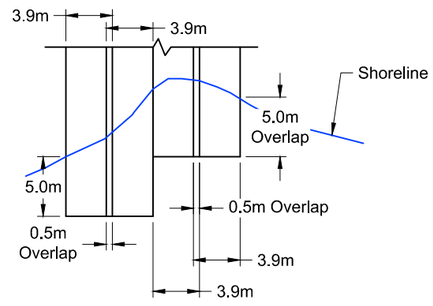
Geogrid Plan Layout

0m 5 10 15 20



Typical Panel Tie-in

0m 5 10 15 20



Typical Panel End - Shoreline

0m 5 10 15 20

LEGEND

- Minimum Extent of Geogrid
- Geogrid Panel
- Bathymetric Contour
- Topographic Contour

NOTES

1. All dimensions are in meters unless noted otherwise.
2. Contours shown at 1m interval, and are based on aerial photography.
3. Geogrid panel placement will be Contractor's responsibility and must meet the Standards shown on this drawing. This drawing shows the panel layout proposed by SRK Consulting. Changes and layout deviation from this drawing must be approved by the Engineer prior to construction.
4. This layout assumes geogrid roll dimensions of 3.9m by 100.0m. Typical Panel Tie-in will be required if shorter geogrid rolls are ordered.
5. The setting out coordinates for the panel placements will be Contractor's responsibility and they must be approved by the Engineer prior to deployment.
6. The minimum longtitudinal overlap must be 0.5m and minimum transverse overlap must be 5m. More overlap may be required over the transverse joints toward deeper water to reinforce for strength as directed by the Engineer.
7. All joints will be permanently secured using heavy duty zip ties at a minimum spacing 1.0m. Heavy duty zip ties will have a minimum tensile strength of 175lbs, 641mm long, 8.6mm wide and 2.3mm thick.
8. Two layers of geogrids will be placed at all locations. The second layer of geogrid will be permanently secured to the first using heavy duty zip ties at a minimum 3.0m spacing in all directions.
9. The Contractor will provide methods for the Engineer to inspect and perform QA/QC on the work done in all parts of the Jetty.
10. The Contractor is responsible for silt and sediment control during the construction. The construction methods by the Contractor must comply with TMAC environmental policies and permits (refer to RMOB-2).

REFERENCE DRAWINGS		REVISIONS									
DRAWING NO.	DRAWING TITLE	NO.	DESCRIPTION	CHK'D	APP'D	DATE	NO.	DESCRIPTION	CHK'D	APP'D	DATE
--	--						0	Issued for Construction	CH	--	18/05/10

Original Drawings Stamped and Signed by Engineer

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DESIGN:	DRAWN:	REVIEWED:
CH	TAH	
CHECKED:	APPROVED:	DATE:
		2018/05/10

FILE NAME: 1CT022.002_MOB-Geogrid.dwg

TMAC RESOURCES

HOPE BAY PROJECT

SRK JOB NO.: 1CT022.002

Roberts Bay Marine Outfall Berm

DRAWING TITLE: Geogrid Layout Pattern

DRAWING NO.	SHEET	REVISION NO.
RMOB-04	4 OF 5	0

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Materials List and Quantity Estimates

Item	Quantity / Area / Volume		Description
1. Run of Quarry Material		ROQ (cu.m.)	Approximate In-Place Neat-line Volume (3D volume based on Civil 3D surfaces - no allowance has been made for losses and embedment) Access Road volume for 0+600 to 0+630 only.
	Roberts Bay Discharge Pipeline Access Road	470	
	Marine Outfall Berm	4,800	
	Pipe Ramp	35	
	Total	5,305	
2. Surface Grade Material		Surfacing Material (cu.m.)	Approximate In-Place Neat-line Volume Access Road volume for 0+600 to 0+630 only
	Roberts Bay Discharge Access Road	22	
	Marine Outfall Berm	150	
	Pipe Ramp	4	
	Total	176	
3. Rip Rap	Total	2,200 cu.m.	Based on Marine Outfall Berm Outer Surface 3D Area - no allowance has been made for losses and embedment.
4. Geogrid	Base of ROQ area	2,380sq.m.	Based on Marine Outfall Berm Footprint
	5m extension beyond ROQ toe	980 sq.m.	
	Total	3,360 sq.m.	
5. Geotextile	Total	1,215 sq.m.	Based on Marine Outfall Berm Outer Surface 3D Area

NOTES

1. All quantities are based on neat line Civil 3D surfaces and do not account for losses due to embedment and settlement. It is expected that there will significant settlement of the rockfill into the seabed and as such the required quantities will be significantly higher than those presented.

DRAWING NO.	DRAWING TITLE
- -	- -

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
0	Issued for Construction	CH	- -	18/05/10

REVISIONS

Original Drawings Stamped and Signed by Engineer

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CHECKED:	APPROVED:	DATE:
		2018/05/10

FILE NAME: 1CT022.002_MOB.dwg

MAC RESOURCES

HOPE BAY PROJECT

SRK JOB NO.: 1CT022.002

Roberts Bay Marine Outfall Berm

DRAWING TITLE:

Schedule of Quantities

DRAWING NO.	SHEET	REVISION NO.
RMOB-05	5 OF 5	0

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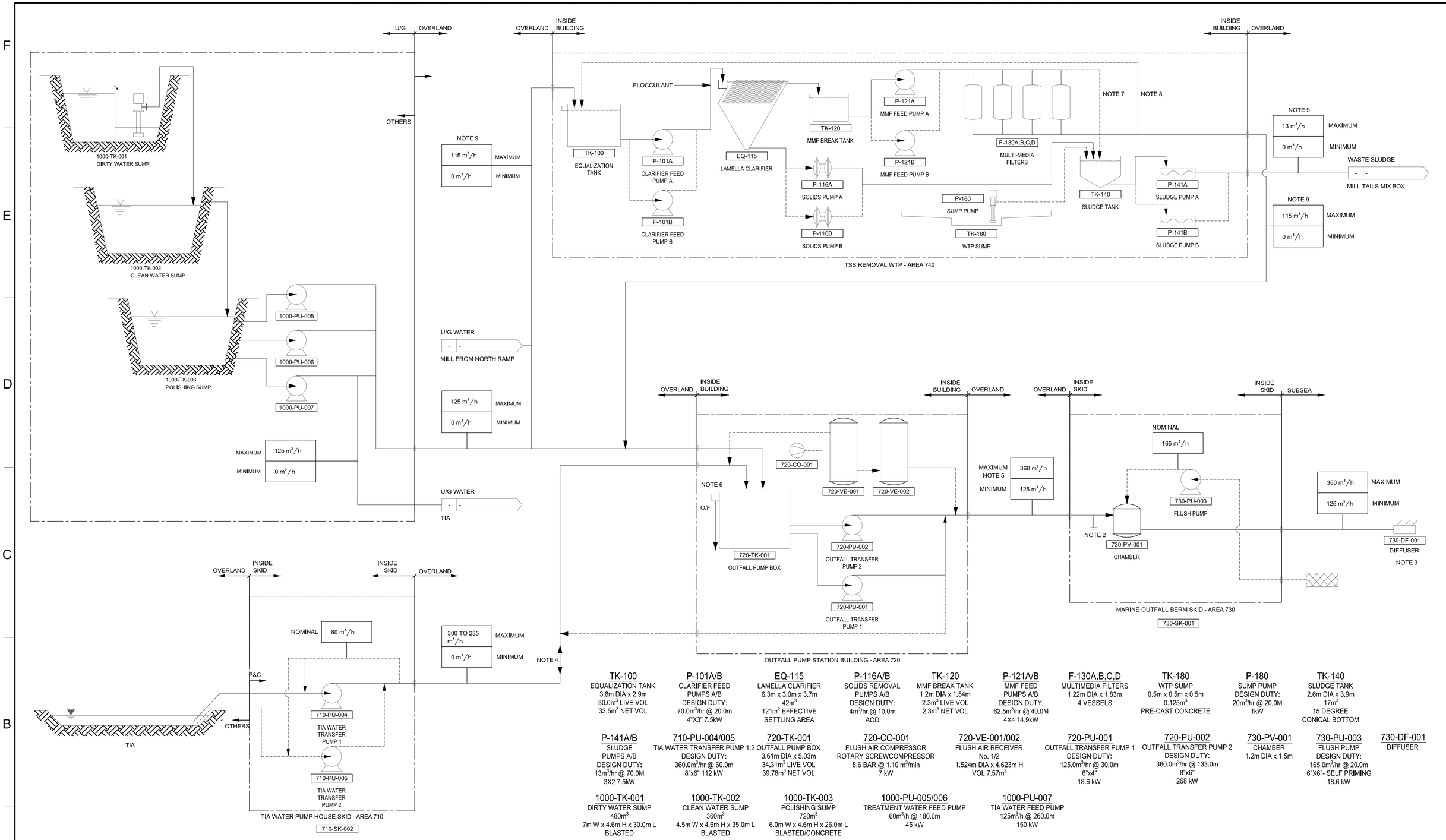


TK-100 EQUALIZATION TANK
3.8m DIA x 2.9m
30.0m³ LIVE VOL
33.5m³ NET VOL

P-101A/B CLARIFIER FEED PUMPS A/B
DESIGN DUTY:
70.0m³/hr @ 20.0m
4"X3" 7.5kW

EQ-115 LAMELLA CLARIFIER
6.3m x 3.0m x 3.7m
42m³
121m² EFFECTIVE SETTLING AREA

P-116A/B SOLIDS REMOVAL PUMPS A/B
DESIGN DUTY:
4m³/hr @ 10.0m
AOD

TK-120 MMF BREAK TANK
1.2m DIA x 1.54m
2.3m³ LIVE VOL
2.3m³ NET VOL

P-121A/B MMF FEED PUMPS A/B
DESIGN DUTY:
62.5m³/hr @ 40.0M
4X4 14.9kW

F-130A,B,C,D MULTIMEDIA FILTERS
1.22m DIA x 1.83m
4 VESSELS

TK-180 WTP SUMP
0.5m x 0.5m x 0.5m
0.125m³
PRE-CAST CONCRETE

P-180 SUMP PUMP
DESIGN DUTY:
20m³/hr @ 20.0M
1kW

TK-140 SLUDGE TANK
2.6m DIA x 3.9m
17m³
15 DEGREE CONICAL BOTTOM

P-141A/B SLUDGE PUMPS A/B
DESIGN DUTY:
13m³/hr @ 70.0M
3X2 7.5kW

710-PU-004/005 TIA WATER TRANSFER PUMP 1,2
DESIGN DUTY:
360.0m³/hr @ 60.0m
8"x6" 112 kW

720-TK-001 OUTFALL PUMP BOX
3.61m DIA x 5.03m
34.31m³ LIVE VOL
39.78m³ NET VOL

720-CO-001 FLUSH AIR COMPRESSOR
ROTARY SCREWCOMPRESSOR
8.6 BAR @ 1.10 m³/min
7 kW

720-VE-001/002 FLUSH AIR RECEIVER
No. 1/2
1.524m DIA x 4.623m H
VOL 7.57m³

720-PU-001 OUTFALL TRANSFER PUMP 1
DESIGN DUTY:
125.0m³/hr @ 30.0m
6"x4"
18.6 kW

720-PU-002 OUTFALL TRANSFER PUMP 2
DESIGN DUTY:
360.0m³/hr @ 133.0m
8"x6"
268 kW

730-PV-001 CHAMBER
1.2m DIA x 1.5m

730-PU-003 FLUSH PUMP
DESIGN DUTY:
165.0m³/hr @ 20.0m
6"X6"- SELF PRIMING
18.6 kW

730-DF-001 DIFFUSER

1000-TK-001 DIRTY WATER SUMP
480m³
7m W x 4.6m H x 30.0m L
BLASTED

1000-TK-002 CLEAN WATER SUMP
360m³
4.5m W x 4.6m H x 35.0m L
BLASTED

1000-TK-003 POLISHING SUMP
720m³
6.0m W x 4.6m H x 26.0m L
BLASTED/CONCRETE

1000-PU-005/006 TREATMENT WATER FEED PUMP
60m³/h @ 180.0m
45 kW

1000-PU-007 TIA WATER FEED PUMP
125m³/h @ 260.0m
150 kW

REV	Y/M/D	REVISION	DRN	CHK	APP
1	20/09/16	ADDED SUMP SYSTEM	DM	JPH	
0	18/08/02	ISSUED FOR CONSTRUCTION	ML	NB	MJ

NUMBER	TITLE
33-0042-01-PR-PID-0006	TIA WATER PUMP HOUSE - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PID-0005	MARINE DIFFUSER - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PID-0004	MARINE OUTFALL BERM SKID - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PID-0003	OUTFALL OVERLAND PIPELINE - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PID-0002	COMPRESSED AIR FLUSH SYSTEM - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PID-0001	OUTFALL PUMP STATION BUILDING - PIPING & INSTRUMENTATION DIAGRAM
33-0042-00-PR-PID-0001	OUTFALL DISCHARGE SYSTEM -LEGEND - PIPING & INSTRUMENTATION DIAGRAM

REFERENCES

STAMP/SEAL

PROJECT PHASE

PACKAGE CODE

AREA

PROJECT NO. 30002-208

SCALE NTS

	BY	YY/MM/DD
APP.		
CHKD.		
DRN.	D.M.	20/09/16

SUBJECT
TMAC RESOURCES
OUTFALL DISCHARGE SYSTEM
PUMP STATIONS AND PIPELINES
PROCESS FLOW DIAGRAM

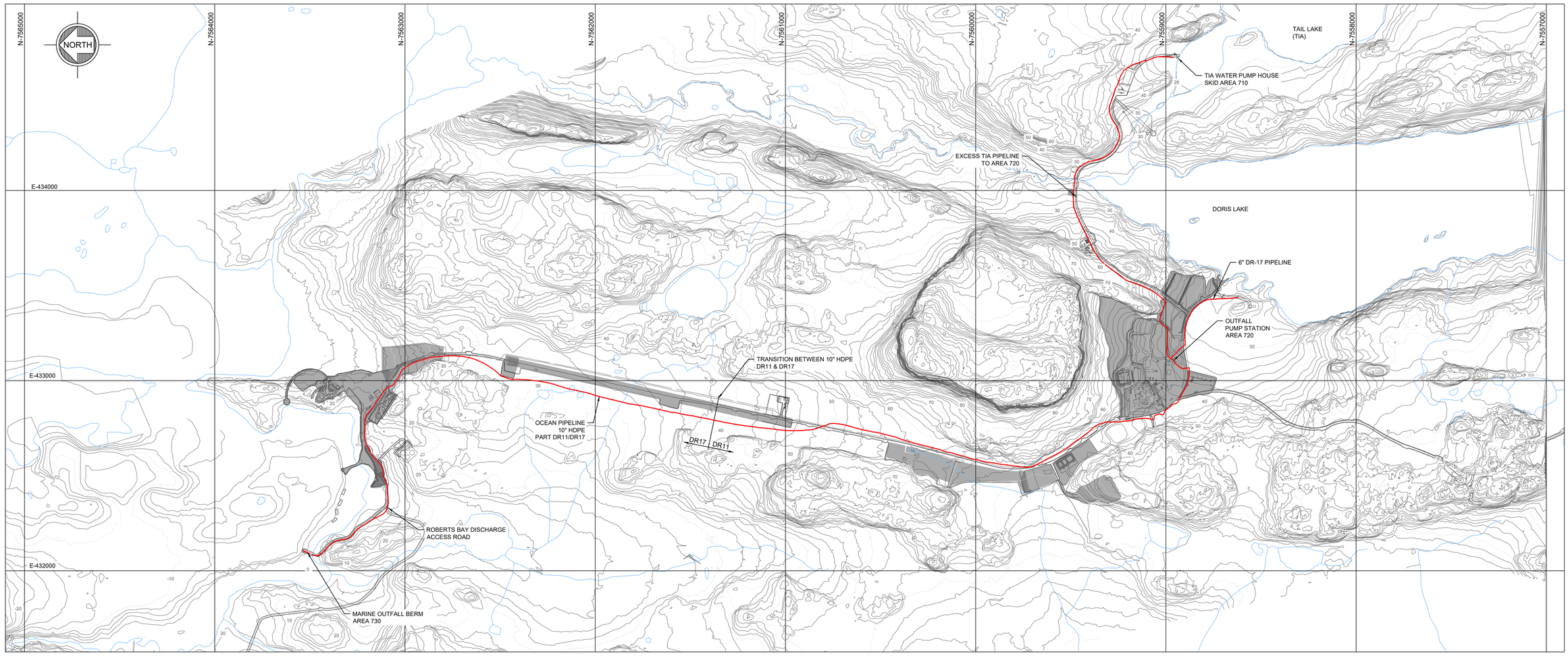
TMAC RESOURCES

CLIENT DWG. NO.

DRAWING NO. 30002-208-2001

REV. 1

D SIZE (610x914) METRIC



ROBERTS BAY DISCHARGE SYSTEM - OVERLAND PIPE AS-BUILT

SCALE 1:10000

LEGEND

- BATHYMETRIC CONTOUR
- TOPOGRAPHIC CONTOUR
- PIPELINE (OVERLAND) (ASBUILT)

SCALE 0 200 400 600 800 1,000 m

NOTES
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
2. TOPOGRAPHY NAD83 UTM ZONE 13.
3. THE REQUIREMENT OF THE DUAL CONTAINMENT PIPE END SEALS SHALL BE DETERMINED BY OTHERS. P&C SHALL NOT BE RESPONSIBLE FOR ANY OMISSION OR DEVIATION FROM ANY ENVIRONMENTAL REQUIREMENTS.
4. PIPELINE SHALL BE JOINED USING FUSION WELDING IN ACCORDANCE WITH ASME B31.3 AND ASME SEC. IX WELDING QUALIFICATION. ALL WELDS SHALL BE 100% VISUALLY INSPECTED AND 100% VOLUMETRIC NON-DESTRUCTIVE TESTED USING UT/PAUT OR OTFD.

REV	Y/M/D	REVISION	DRN	CHK	APP
1	20/09/16	ADDED SURFACE PIPELINES	DM		
0	18/08/27	ISSUED FOR DESIGN	AZ	NB	MJ

NUMBER	TITLE
REFERENCES	

PROJECT PHASE | PACKAGE CODE

PROJECT NO. 30002-208

SCALE NTS

	BY	YY/MM/DD
APP.		
CHKD.		
DRN.	DM	20/09/16

AREA

SUBJECT
OUTFALL DISCHARGE SYSTEM
EXCESS TIA WATER AND
OUTFALL PIPELINE
MASTER SITE PLAN

CLIENT DWG. NO.

DRAWING NO. 30002-208-2002

REV. 1

D SIZE (610x914) METRIC

TMAC RESOURCES INC.
HOPE BAY, NUNAVUT CANADA
ROBERTS BAY DISCHARGE SYSTEM
MARINE OUTFALL AND INTAKE

RECORD DRAWINGS

PROJECT NUMBER: 1065-001/002
DATE: 2019-11-25
REVISION: 0

GREATPACIFIC
ENGINEERING & ENVIRONMENT

TMAC RESOURCES

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Signature _____
Date 2019/11/27
PERMIT NUMBER: P 1290
NT/NU Association of Professional Engineers and Geoscientists

RECORD DRAWINGS

NOVEMBER 25,2019

DATE	DESCRIPTION	DRAWN	DESIGNED	APPROVED
19-11-25	REV 0	ECL	AH	AH
19-11-22	AS RECORDED FOR CLIENT REVIEW	ECL	AH	JC
19-09-16	AS RECORDED FOR CLIENT REVIEW	TRB	AH	JC

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778–433–2672
www.greatpacific.ca

PERMIT/STAMP:

NOTES:

1. GREATPACIFIC RECORDED DEPLOYED INTAKE ALIGNMENT ON 2019/08/19 AND DEPLOYED OUTFALL ALIGNMENT ON 2019/08/15 USING A SINGLE BEAM LOWRANCE HDS9 GEN 2 CHART PLOTTER/ECHO SOUNDER WITH A POINT-1 GPS ANTENNA/DIGITAL COMPASS.
2. WATER LEVELS ADJUSTED TO GEODETIC DATA. (RESCAN, 2011)

CLIENT: TMAC RESOURCES

PROJECT NUMBER: 1065-001

OUTFALL RECORDED ALIGNMENT PLAN AND PROFILE

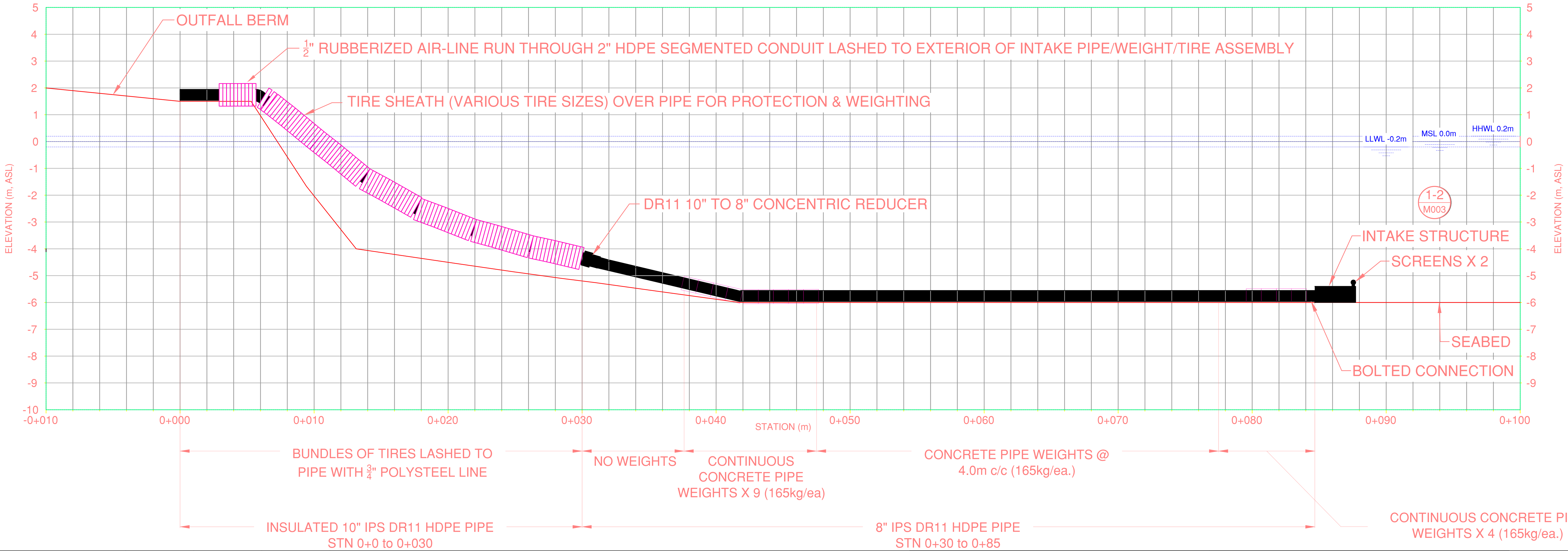
DRAWING NUMBER: M001

SCALE: 1:3000

REV: REV 0

FILE: W:\1065-001 - TMAC - OCEAN DISCHARGE AND INTAKE\DRAWINGS\RECORD DRAWINGS\FINAL\1065-001 TMAC - OCEAN OUTFALL - REV0 - 191125 - ECL.DWG
DATE/TIME: 2019-11-18 11:24 AM

TMAC OCEAN INTAKE



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Signature
Date 2019/11/27
PERMIT NUMBER: P 1290
NT/NU Association of Professional Engineers and Geoscientists

DATE	DESCRIPTION	DRAWN	DESIGNED	APPROVED
19-11-25	REV 0	ECL	AH	AH
19-11-22	RECORD DRAWING	ECL	AH	AH
19-10-07	RECORD DRAWING	TRB	AH	AH

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VICTORIA, BC V9B 3S6
778–433–2672
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PERMIT/STAMP:

NOTES:

1. GREATPACIFIC RECORDED DEPLOYED INTAKE ALIGNMENT ON 2019/08/19 USING A SINGLE BEAM LOWRANCE HDS9 GEN 2 CHART PLOTTER/ECHO SOUNDER WITH A POINT-1 GPS ANTENNA/DIGITAL COMPASS.
2. WATER LEVELS ADJUSTED TO GEODETIC DATA. (RESCAN, 2011)

CLIENT: TMAC RESOURCES

PROJECT NUMBER: 1065-001

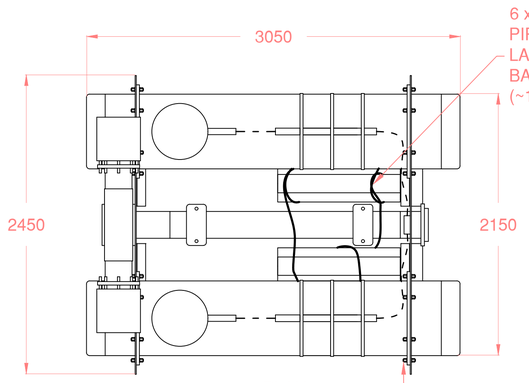
HOPE BAY
NUNAVUT, CANADA
OCEAN INTAKE

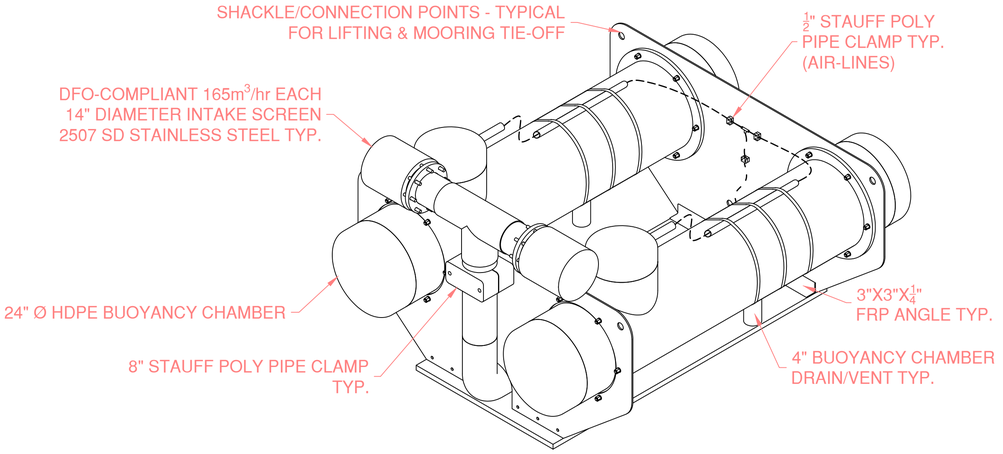
DRAWING NUMBER: M002

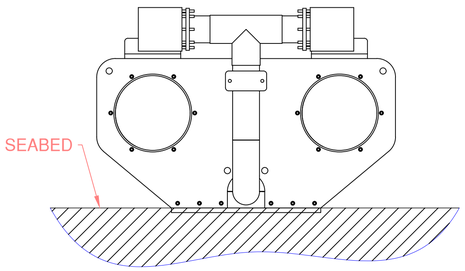
SCALE: 1:250

REV: REV 0

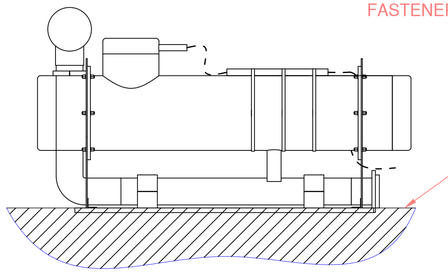
FILE: W:\1065-001 –TMAC –OCEAN DISCHARGE AND INTAKE\DRAWINGS\RECORD DRAWINGS\FINAL\1065-001 TMAC – OCEAN INTAKE – REV0 – 191125 – ECL.DWG



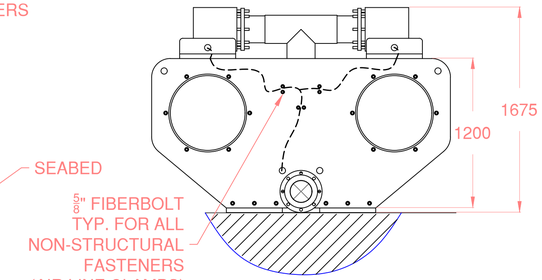




OFFSHORE END

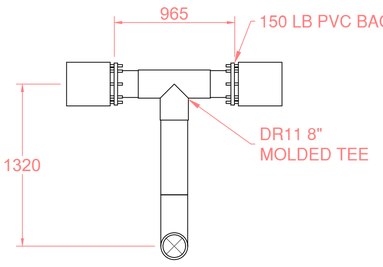


SIDE ELEVATION

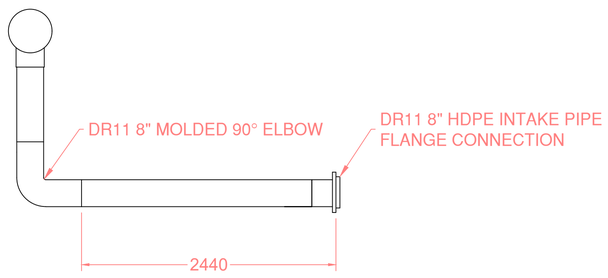


INSHORE END

1
M002



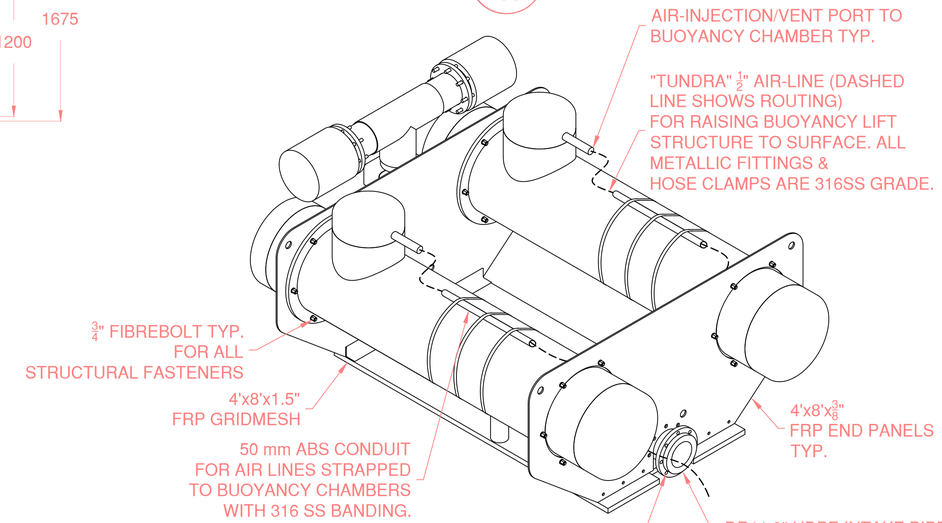
HDPE VERTICAL TEE-RISER



HDPE HORIZONTAL RISER FEED

3
M003

2
M002



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DATE	DESCRIPTION	DRAWN	DESIGNED	APPROVED
19-11-25	REV 0	ECL	AH	AH
19-11-22	RECORD DRAWING	ECL	AH	AH
19-10-08	RECORD DRAWING	TRB	AH	AH

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www.greatpacific.ca

PERMIT/STAMP:

NOTES:
1. ALL DISTANCES ARE IN MILIMETERS AND DECIMALS THEREOF UNLESS OTHERWISE STATED.
2. DO NOT SCALE FROM DRAWINGS.
3. BUOYANCY STRUCTURE CAN BE BROUGHT TO THE SURFACE DURING ICE-FREE PERIODS OF CALM WEATHER (<5 knot WINDS, <0.25m WAVES) TO INSPECT & CLEAN INTAKE SCREENS OF BIOFOULING/DEBRIS.
4. MOORINGS (x3) COMPRISED OF DANFORTH ANCHOR (75lB-NORTH, 40lb-EAST&WEST), $\frac{3}{8}$" GALVANIZED CHAIN AND $\frac{3}{4}$" POLYSTEEL SYNTHETIC LINE. MOORING SCOPE IS ~3:1.

CLIENT: TMAC RESOURCES

PROJECT NUMBER: 1065–001

SEAWATER INTAKE & MARINE EFFLUENT OUTFALL DETAILS

DRAWING NUMBER: M003

SCALE: AS SHOWN

REV: REV 0

FILE: W:\1065-001 -TMAC -OCEAN DISCHARGE AND INTAKE\DRAWINGS\RECORD DRAWINGS\FINAL\1065-001 TMAC - OCEAN INTAKE - REV0 - 191125 - ECL.DWG

START OF OUTFALL
N: 7563532.000
E: 432101.000
STA: 0+000.00

SEABED TENURE

SEAWATER INTAKE

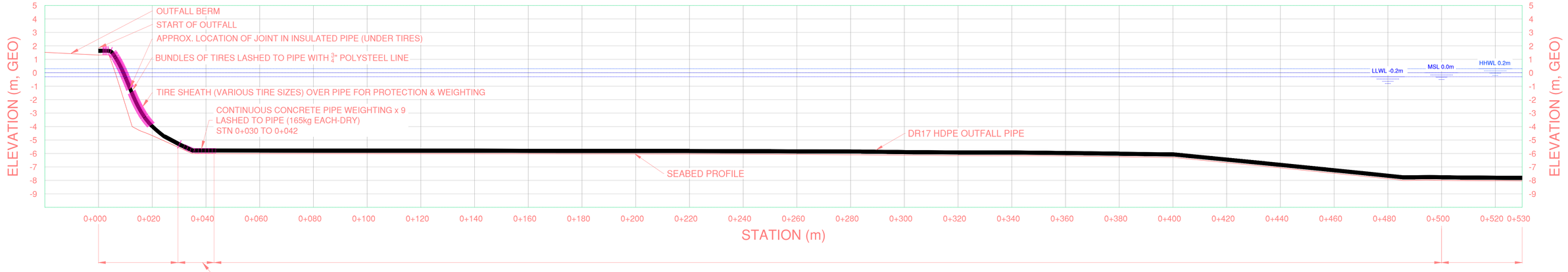
SEAWATER INTAKE
BUOYANCY STRUCTURE

RECORDED ALIGNMENT

SEABED TENURE

0 25 50 Meters

TMAC MARINE OUTFALL
RECORDED ALIGNMENT



INSULATED 10" IPS DR17 HDPE PIPE
STN 0+000 TO 0+030

280mm DR17 HDPE PIPE
WEIGHTING CONTINUOUS
STN 0+030 TO 0+042

280mm DR17 HDPE PIPE
WEIGHTING 4.0m c/c
STN 0+042 TO 0+500
(2 / M008)

10" IPS DR17 HDPE PIPE
WEIGHTING 4.5m c/c
0+500 TO 1+700
(2 / M008)

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Date 2019/11/27
PERMIT NUMBER: P 1290
NT/NU Association of Prosfessional Engineers and Geoscientists

DATE	DESCRIPTION	DRAWN	DESIGNED	APPROVED
19-11-25	REV 0	ECL	AH	AH
19-11-22	AS RECORDED FOR CLIENT REVIEW	ECL	AH	JC
19-09-16	AS RECORDED FOR CLIENT REVIEW	TRB	AH	JC

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PERMIT/STAMP:

NOTES:
1. GREATPACIFIC RECORDED DEPLOYED OUTFALL ALIGNMENT ON 2019/08/15 USING A SINGLE BEAM LOWRANCE HDS9 GEN 2 CHART PLOTTER/ECHO SOUNDER WITH A POINT-1 GPS ANTENNA/DIGITAL COMPASS.
2. WATER LEVELS ADJUSTED TO GEODETIC DATA. (RESCAN, 2011)

CLIENT: TMAC RESOURCES

PROJECT NUMBER: 1065-001

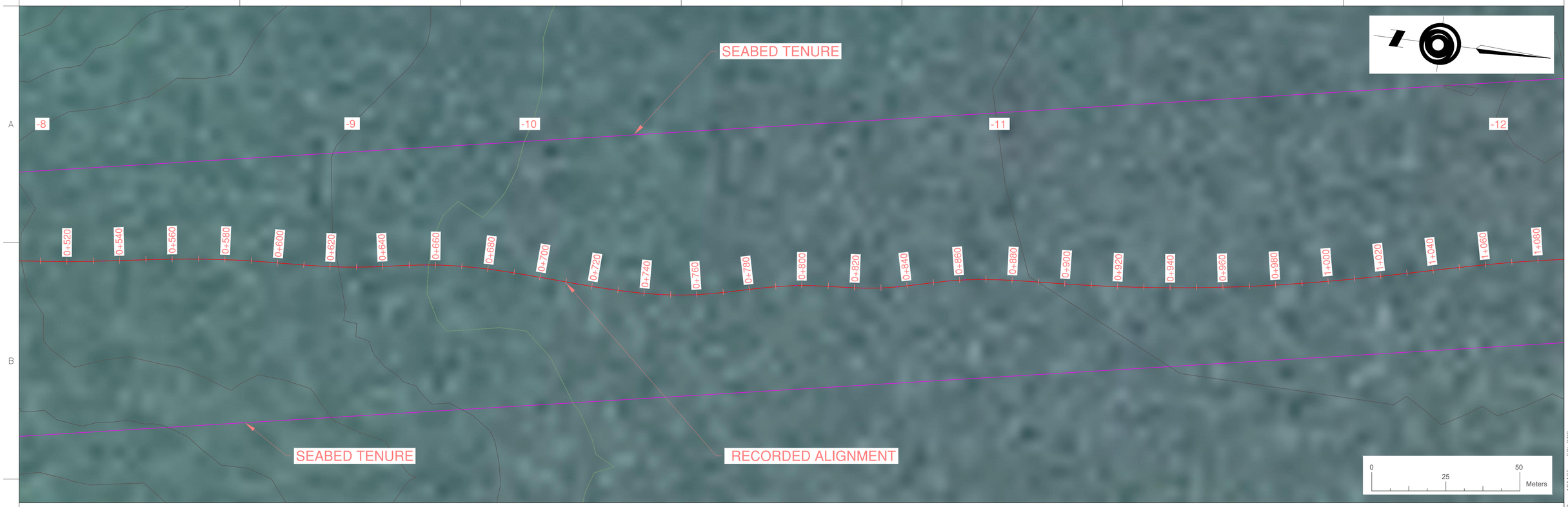
OUTFALL
RECORDED ALIGNMENT
PLAN AND PROFILE

DRAWING NUMBER: M004

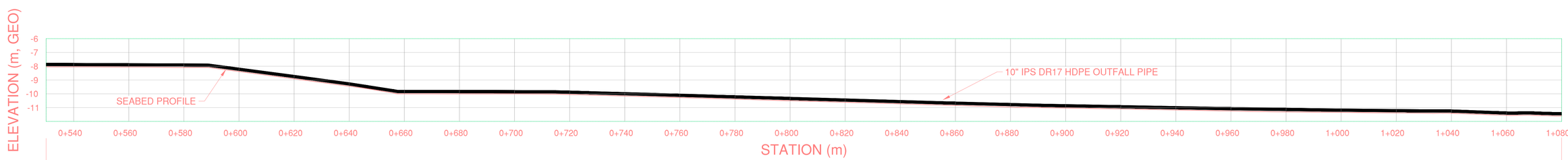
SCALE: 1:750

REV: REV 0

FILE: W:\1065-001 - TMAC - OCEAN DISCHARGE AND INTAKE\DRAWINGS\RECORD DRAWINGS\FINAL\1065-001 TMAC - OCEAN OUTFALL - REVO - 191125 - ECL.DWG
DATE/TIME: 2019-11-18 11:24 AM



TMAC MARINE OUTFALL
RECORDED ALIGNMENT



10" IPS DR17 HDPE PIPE
WEIGHTING 4.5m c/c
STN: 0+500 TO 1+700

2
M008

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Signature
Date 2019/11/27
PERMIT NUMBER: P 1290
NT/NU Association of Prosfessional Engineers and Geoscientists

" The seal and signature of the undersigned on this drawing certifies that the design information contained in these drawings accurately reflects the original design and the material design changes made during construction that were brought to the undersigned's attention. These drawings are intended to incorporate addenda, change orders, and other material design changes, but not necessarily, all site instructions. The undersigned does not warrant or guarantee, nor accept any responsibility for the accuracy or completeness of the as-constructed information supplied by others contained in these drawings, but does, by sealing and signing, certify that the as-constructed information, if accurate and complete, provides an as-constructed system which substantially complies in all material respects with the original design intent."

DATE	DESCRIPTION	DRAWN	DESIGNED	APPROVED
19-11-25	REV 0	ECL	AH	AH
19-11-22	AS RECORDED FOR CLIENT REVIEW	ECL	AH	JC
19-09-16	AS RECORDED FOR CLIENT REVIEW	TRB	AH	JC

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NOTES:
1. GREATPACIFIC RECORDED DEPLOYED OUTFALL ALIGNMENT ON 2019/08/15 USING A SINGLE BEAM LOWRANCE HDS9 GEN 2 CHART PLOTTER/ECHO SOUNDER WITH A POINT-1 GPS ANTENNA/DIGITAL COMPASS.
2. WATER LEVELS ADJUSTED TO GEODETIC DATA. (RESCAN, 2011)

CLIENT: TMAC RESOURCES

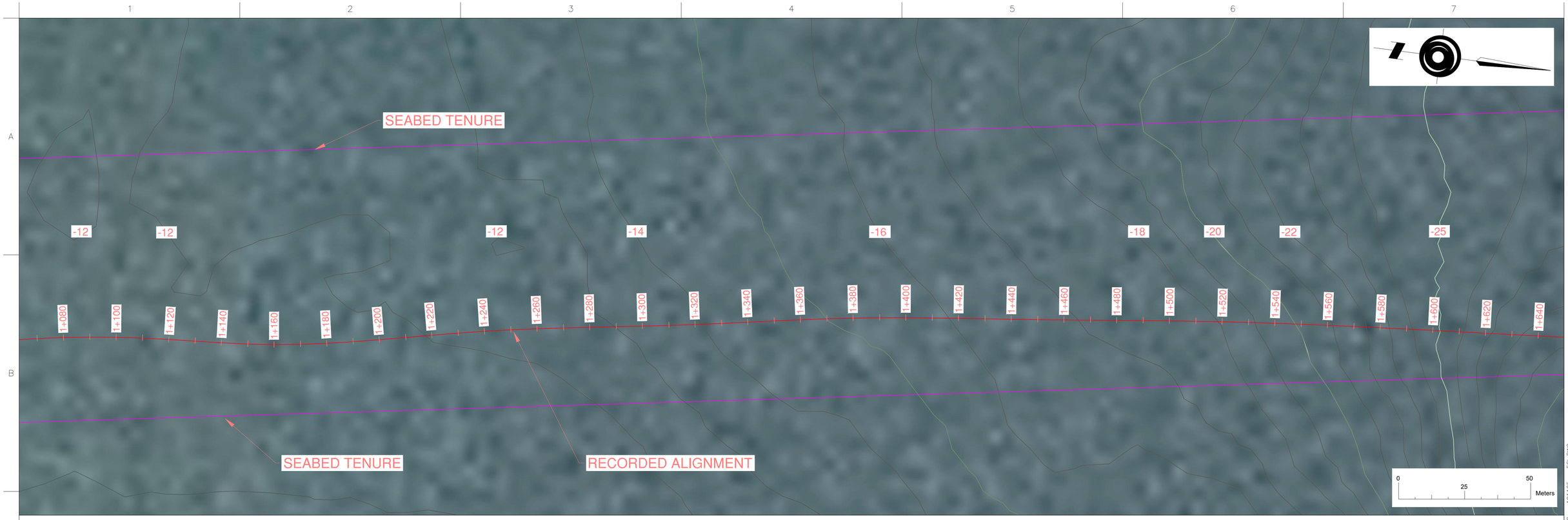
MARINE OUTFALL
RECORDED ALIGNMENT
PLAN AND PROFILE

DRAWING NUMBER: M005

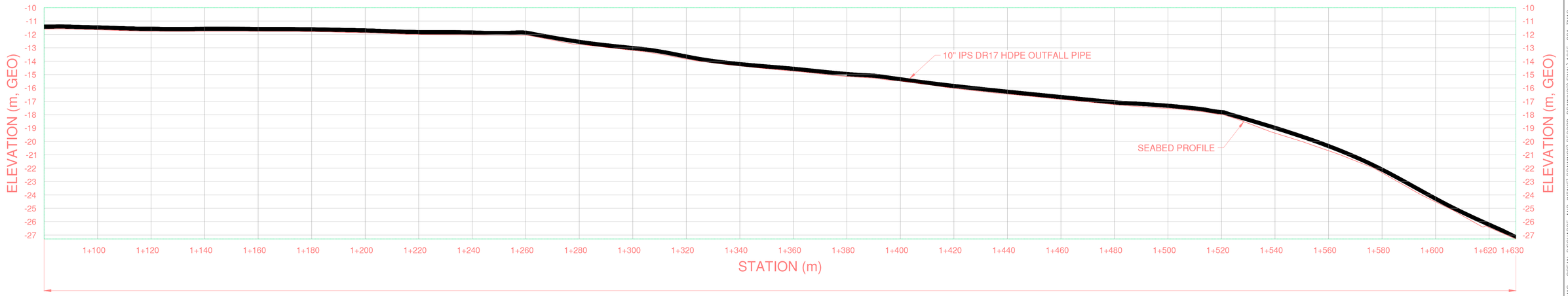
PROJECT NUMBER: 1065-001

SCALE: 1:750

REV: REV 0



TMAC MARINE OUTFALL
RECORDED ALIGNMENT



10" IPS DR17 HDPE PIPE
WEIGHTING 4.5m c/c
STN: 0+500 TO 1+700

2
M008

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Date 2019/11/27
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DATE	DESCRIPTION	DRAWN	DESIGNED	APPROVED
19-11-25	REV 0	ECL	AH	AH
19-11-22	AS RECORDED FOR CLIENT REVIEW	ECL	AH	JC
19-09-16	AS RECORDED FOR CLIENT REVIEW	TRB	AH	JC

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NOTES:
1. GREATPACIFIC RECORDED DEPLOYED OUTFALL ALIGNMENT ON 2019/08/15 USING A SINGLE BEAM LOWRANCE HDS9 GEN 2 CHART PLOTTER/ECHO SOUNDER WITH A POINT-1 GPS ANTENNA/DIGITAL COMPASS.
2. WATER LEVELS ADJUSTED TO GEODETIC DATA. (RESCAN, 2011)

CLIENT: TMAC RESOURCES

PROJECT NUMBER: 1065-001

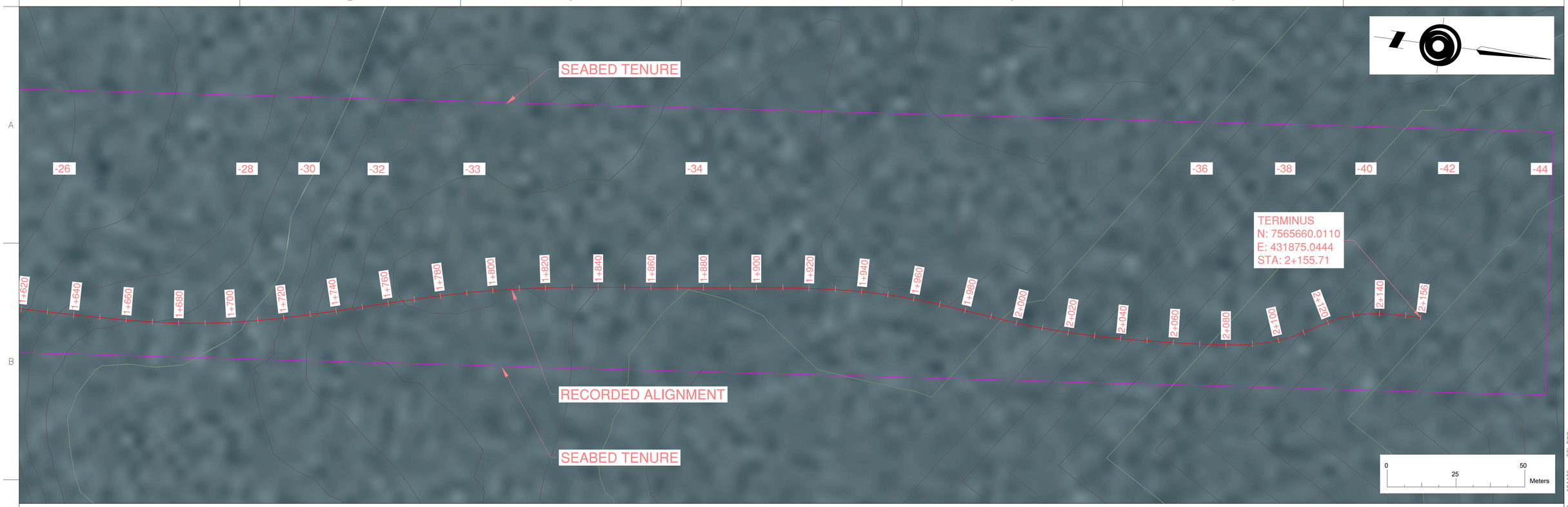
MARINE OUTFALL
RECORDED ALIGNMENT
PLAN AND PROFILE

DRAWING NUMBER: M006

SCALE: 1:750

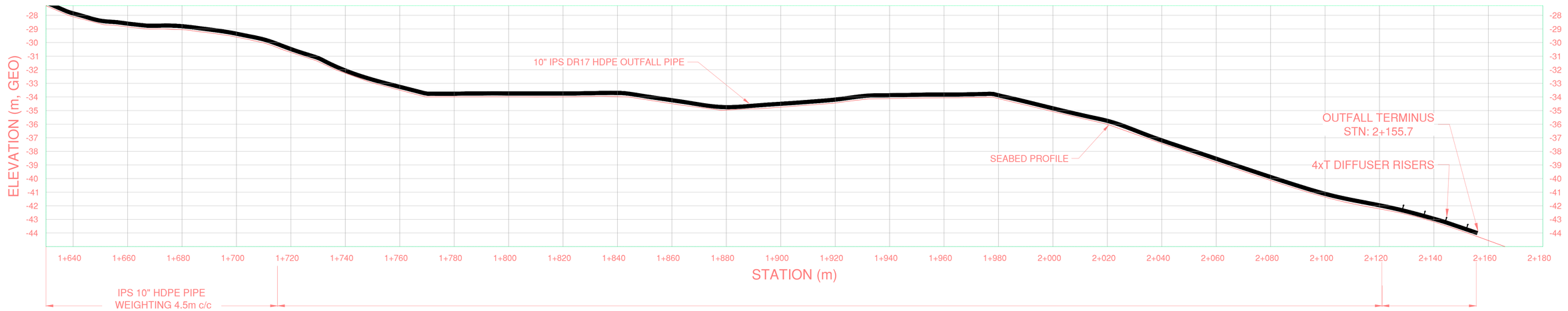
REV: REV 0

FILE: W:\1065-001 -TMAC -OCEAN DISCHARGE AND INTAKE\DRAWINGS\RECORD DRAWINGS\FINAL\1065-001 TMAC - OCEAN OUTFALL - REVO - 191125 - ECL.DWG
DATE/TIME: 2019-11-18 11:24 AM



TMAC MARINE OUTFALL
RECORDED ALIGNMENT

PERMIT TO PRACTICE
GREATPACIFIC CONSULTING LTD.
Signature
Date 2019/11/27
PERMIT NUMBER: P 1290
NT/NU Association of Prosfessional Engineers and Geoscientists



DATE	DESCRIPTION	DRAWN	DESIGNED	APPROVED
19-11-25	REV 0	ECL	AH	AH
19-11-22	AS RECORDED FOR CLIENT REVIEW	ECL	AH	JC
19-09-16	AS RECORDED FOR CLIENT REVIEW	TRB	AH	JC

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www.greatpacific.ca

PERMIT/STAMP:

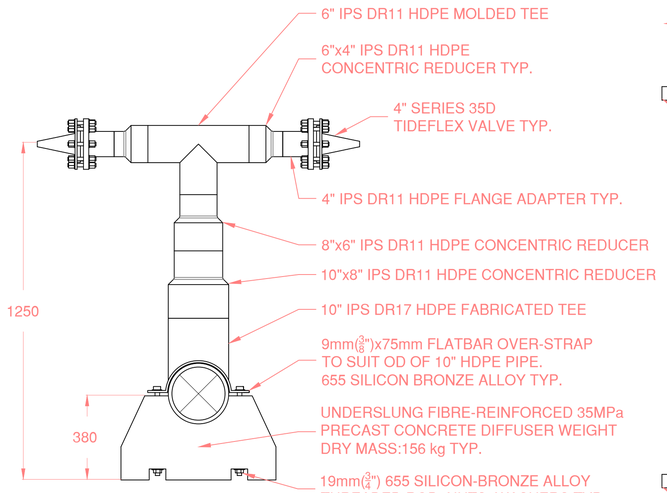
NOTES:
1. GREATPACIFIC RECORDED DEPLOYED OUTFALL ALIGNMENT ON 2019/08/15 USING A SINGLE BEAM LOWRANCE HDS9 GEN 2 CHART PLOTTER/ECHO SOUNDER WITH A POINT-1 GPS ANTENNA/DIGITAL COMPASS.
2. WATER LEVELS ADJUSTED TO GEODETIC DATA. (RESCAN, 2011)

CLIENT: TMAC RESOURCES

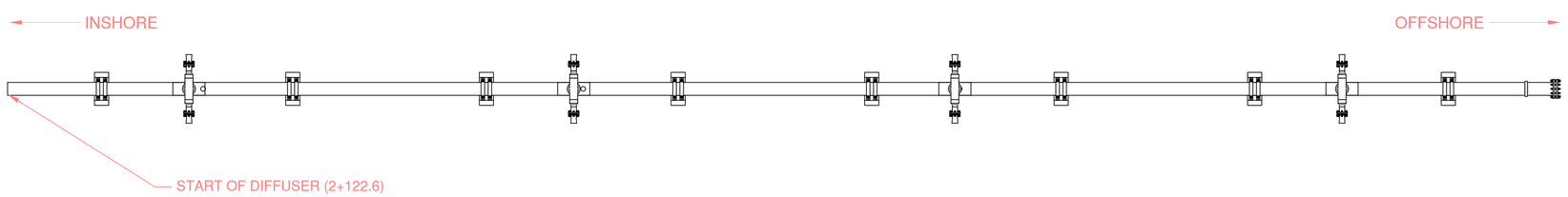
MARINE OUTFALL
RECORDED ALIGNMENT
PLAN AND PROFILE

PROJECT NUMBER: 1065-001
DRAWING NUMBER: M007
SCALE: 1:750
REV: REV 0

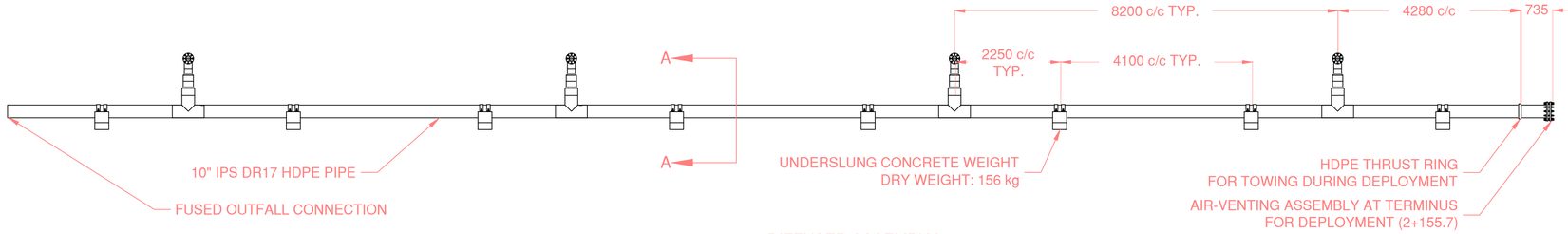
FILE: W:\1065-001 -TMAC -OCEAN DISCHARGE AND INTAKE\DRAWINGS\RECORD DRAWINGS\FINAL\1065-001 TMAC - OCEAN OUTFALL - REV0 - 191125 - ECL.DWG
DATE/TIME: 2019-11-18 11:24 AM



DETAIL A-A
DIFFUSER ASSEMBLY
SCALE 1:15

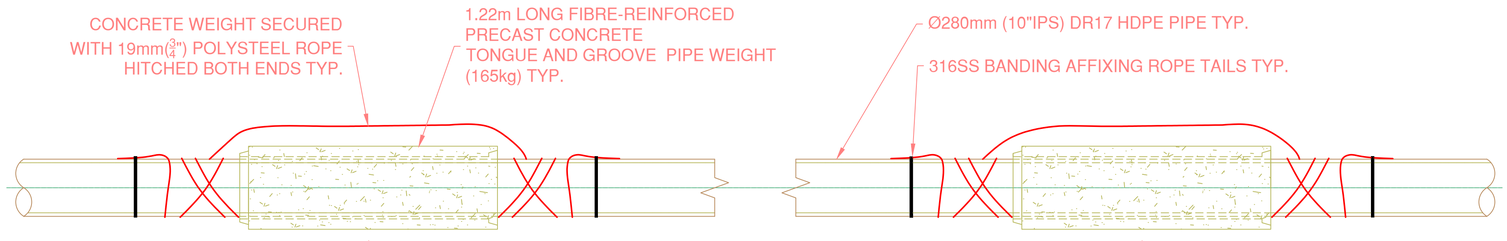


DIFFUSER ASSEMBLY
PLAN VIEW
SCALE 1:75



DIFFUSER ASSEMBLY
ELEVATION VIEW
SCALE 1:75

1
M007



PIPE WEIGHT SPACING
4.0m c/c FROM STA: 0+042m to 0+500m
4.5m c/c FROM STA: 0+500m to 1+700m
5.0m c/c FROM STA: 1+700m to DIFFUSER

2
M004-M005-M006-M007

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Signature
Date 2019/11/27
PERMIT NUMBER: P 1290
NT/NU Association of Professional Engineers and Geoscientists

DATE	DESCRIPTION	DRAWN	DESIGNED	APPROVED
19-11-25	REV 0	ECL	AH	AH
19-11-22	AS RECORDED FOR CLIENT REVIEW	ECL	AH	AH
19-10-08	AS RECORDED FOR CLIENT REVIEW	BC	AH	AH

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PERMIT/STAMP:

NOTES:
1. ALL DISTANCES ARE IN MILIMETERS AND DECIMALS THEREOF UNLESS OTHERWISE STATED.
2. DO NOT SCALE FROM DRAWINGS.

CLIENT: TMAC RESOURCES

PROJECT NUMBER: 1065-001

SEAWATER INTAKE & MARINE EFFLUENT OUTFALL

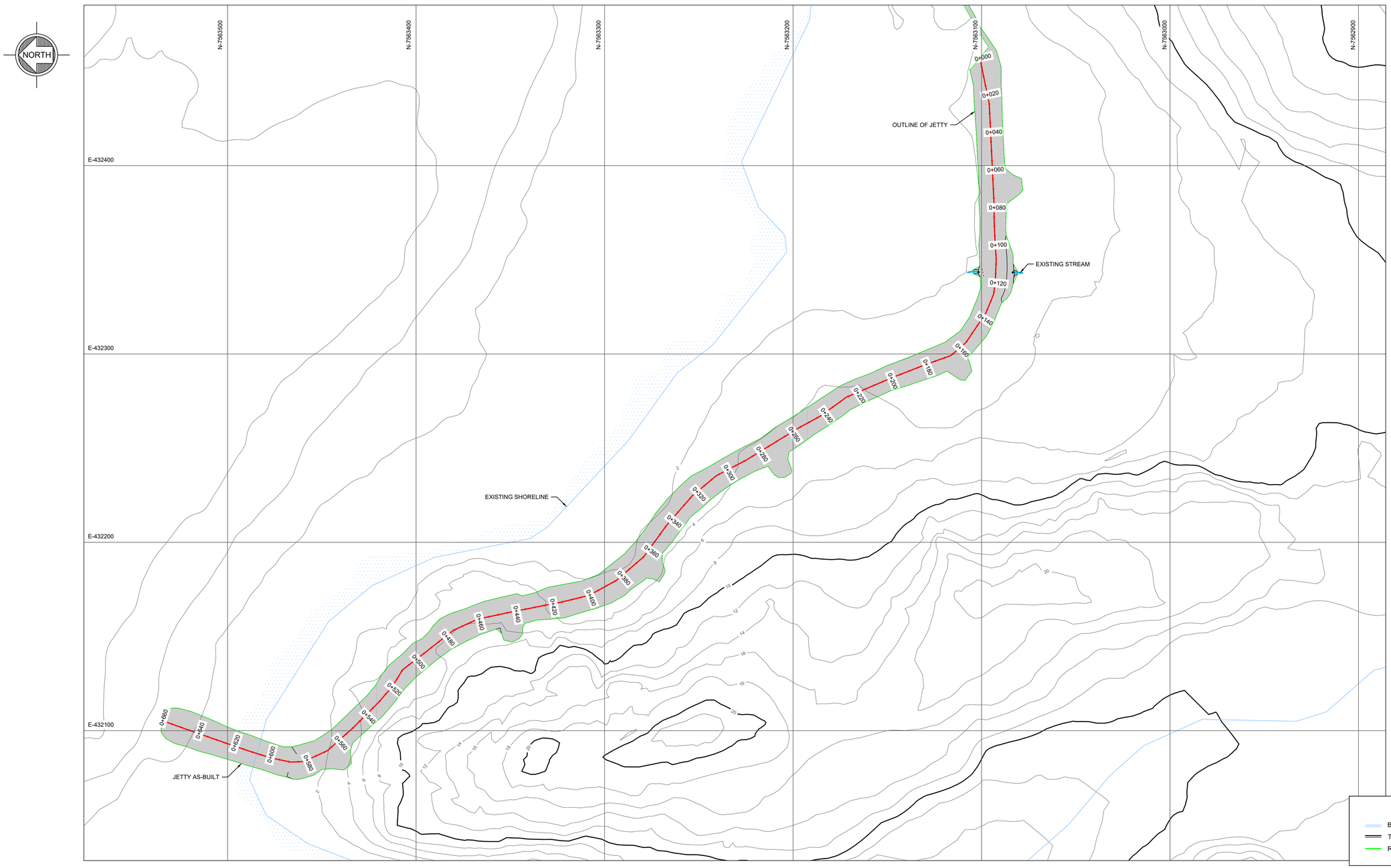
DETAILS

DRAWING NUMBER: M008

SCALE: AS SHOWN

REV: REV 0

FILE: W:\1065-001 -TMAC -OCEAN DISCHARGE AND INTAKE\DRAWINGS\RECORD DRAWINGS\FINAL\1065-001 TMAC - OCEAN OUTFALL - REV0 - 191125 - ECL.DWG



ROBERTS BAY DISCHARGE SYSTEM - JETTY AS-BUILT PLAN

SCALE 1:1000

SCALE
0 20 40 60 80 100m

NOTES
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
2. TOPOGRAPHY NAD83 UTM ZONE 13.
3. REFER TO DRAWING 30002-208-2004, 2005, AND 2006 FOR CROSS SECTIONS.

REV	Y/M/D	REVISION	DRN	CHK	APP
0	20/09/21	AS-BUILT	AZ	NB	MJ

NUMBER	TITLE

REFERENCES

PROJECT PHASE | PACKAGE CODE | AREA

PROJECT NO. 30002-208

SCALE: NTS

	BY	YY/MM/DD
APP.		
CHKD.		
DRN.	DM	20/09/21

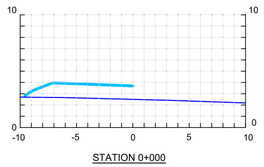
SUBJECT: OUTFALL DISCHARGE SYSTEM EXCESS TIA WATER AND OUTFALL PIPELINE JETTY MASTER SITE PLAN

CLIENT DWG. NO.

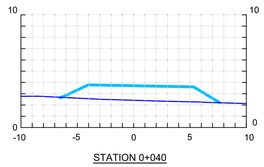
DRAWING NO. 30002-208-2003

REV. 0

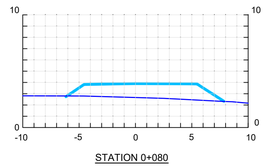
D SIZE (610x914) METRIC



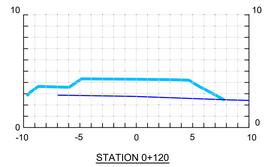
STATION 0+000



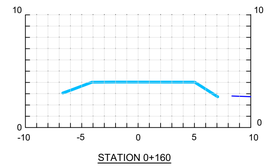
STATION 0+040



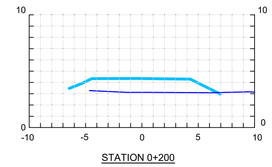
STATION 0+080



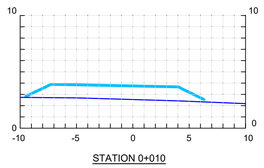
STATION 0+120



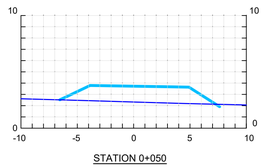
STATION 0+160



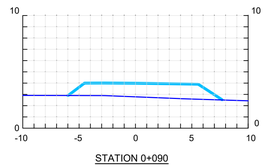
STATION 0+200



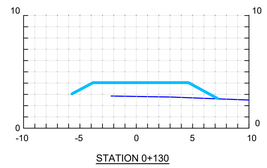
STATION 0+010



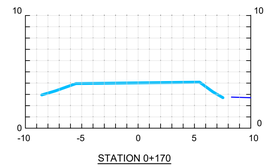
STATION 0+050



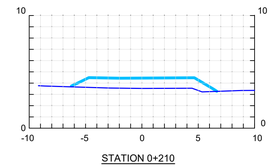
STATION 0+090



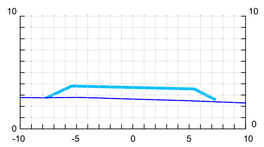
STATION 0+130



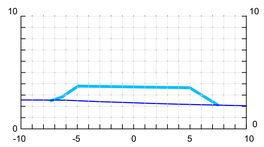
STATION 0+170



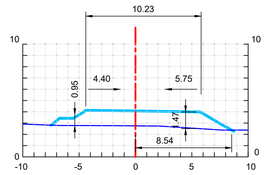
STATION 0+210



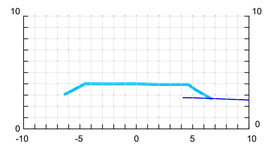
STATION 0+020



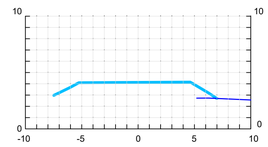
STATION 0+060



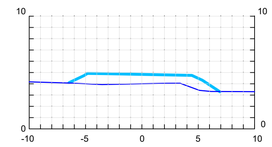
STATION 0+100



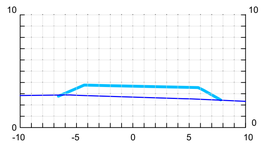
STATION 0+140



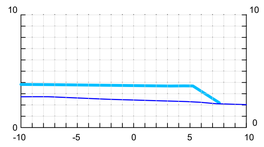
STATION 0+180



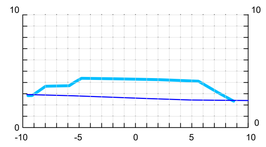
STATION 0+220



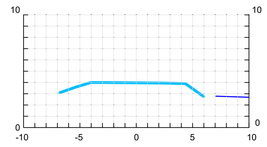
STATION 0+030



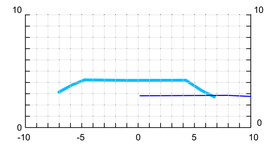
STATION 0+070



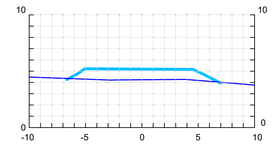
STATION 0+110



STATION 0+150



STATION 0+190



STATION 0+230

ROBERTS BAY DISCHARGE SYSTEM - JETTY AS-BUILT CROSS-SECTIONS STA.0+000 TO STA. 0+230

SCALE 1:250 HORIZONTAL
1:250 VERTICAL

LEGEND
- AGGREGATE SUBBASE
- GRADE

SCALE
0 5 10 15 20 25m

NOTES
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
2. TOPOGRAPHY NAD83 UTM ZONE 13.
3. REFER TO DRAWING 30002-208-2003 FOR JETTY AS-BUILT PLAN
4. REFER TO DRAWING 30002-208-2005, AND 2006 FOR CROSS SECTIONS.

REV	Y/M/D	REVISION	DRN	CHK	APP
0	20/09/21	AS-BUILT	AZ	NB	MJ

NUMBER	REFERENCES

STAMP/SEAL

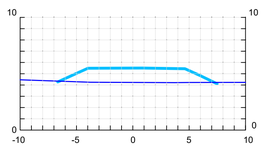
PROJECT PHASE | PACKAGE CODE
PROJECT NO. 30002-208
SCALE NTS

	BY	YY/MM/DD
APP.		
CHKD.		
DRN.	DM	20/09/16

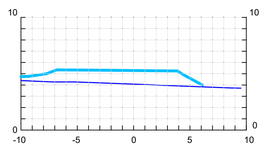
AREA
SUBJECT: OUTFALL DISCHARGE SYSTEM EXCESS TIA WATER AND OUTFALL PIPELINE JETTY CROSS SECTIONS

CLIENT DWG. NO.
DRAWING NO. 30002-208-2004
REV. 0

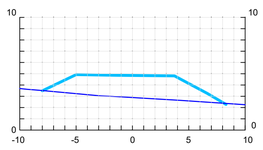
D SIZE (610x914) METRIC



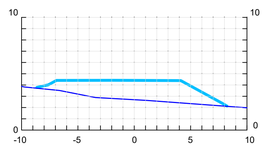
STATION 0+240



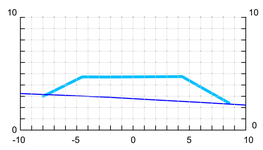
STATION 0+280



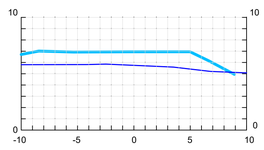
STATION 0+320



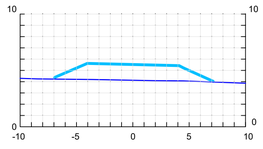
STATION 0+360



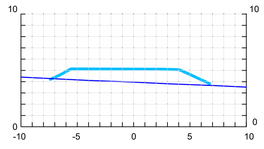
STATION 0+400



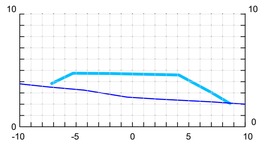
STATION 0+440



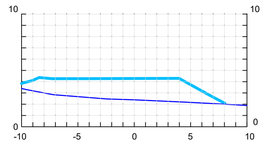
STATION 0+250



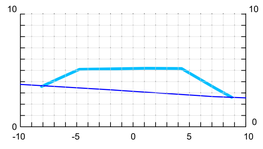
STATION 0+290



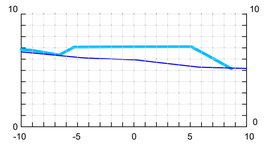
STATION 0+330



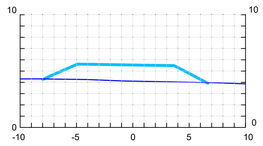
STATION 0+370



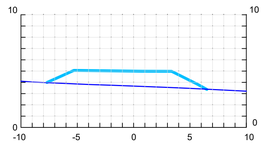
STATION 0+410



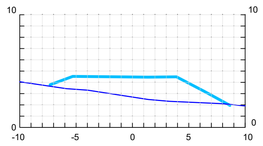
STATION 0+450



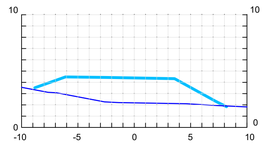
STATION 0+260



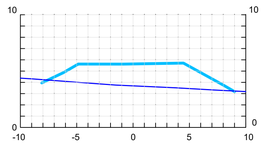
STATION 0+300



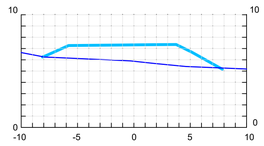
STATION 0+340



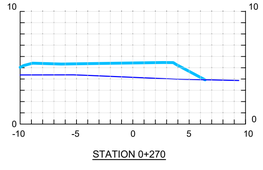
STATION 0+380



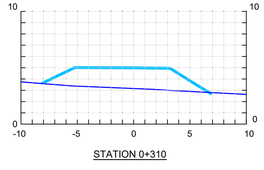
STATION 0+420



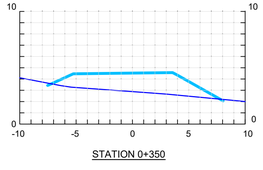
STATION 0+460



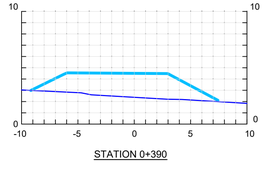
STATION 0+270



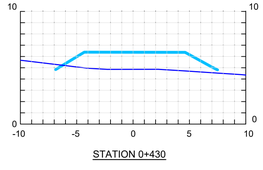
STATION 0+310



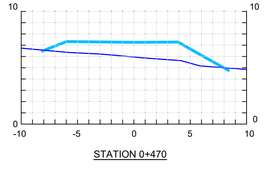
STATION 0+350



STATION 0+390



STATION 0+430



STATION 0+470

ROBERTS BAY DISCHARGE SYSTEM - JETTY AS-BUILT CROSS-SECTIONS STA.0+240 TO STA. 0+470

SCALE 1:250 HORIZONTAL
1:250 VERTICAL

LEGEND
- AGGREGATE SUBBASE
- GRADE

SCALE
0 5 10 15 20 25m

NOTES
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
2. TOPOGRAPHY NAD83 UTM ZONE 13.
3. REFER TO DRAWING 30002-208-2003 FOR JETTY AS-BUILT PLAN
4. REFER TO DRAWING 30002-208-2004, AND 2006 FOR CROSS SECTIONS.

REV	Y/M/D	REVISION	DRN	CHK	APP
0	20/09/21	AS-BUILT	AZ	NB	MJ

NUMBER	TITLE
	REFERENCES

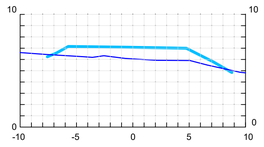
PROJECT PHASE
PACKAGE CODE
AREA
PROJECT NO. 30002-208
SCALE NTS

	BY	YY/MM/DD
APP.		
CHKD.		
DRN.	DM	20/09/16

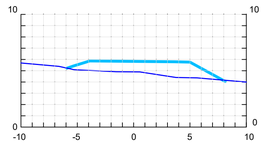
SUBJECT
OUTFALL DISCHARGE SYSTEM
EXCESS TIA WATER AND
OUTFALL PIPELINE JETTY
CROSS SECTIONS

CLIENT DWG. NO.
DRAWING NO. 30002-208-2005
REV. 0

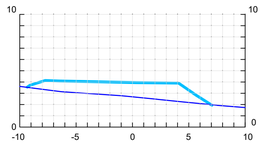
D SIZE (610x914) METRIC



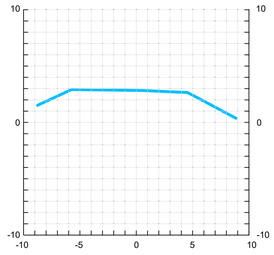
STATION 0+480



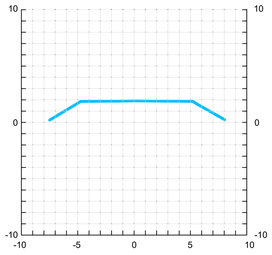
STATION 0+520



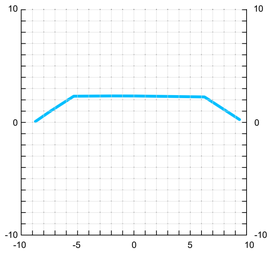
STATION 0+560



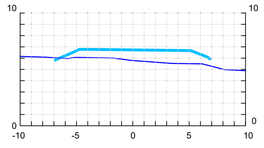
STATION 0+580



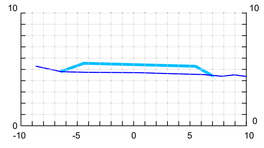
STATION 0+610



STATION 0+640



STATION 0+490



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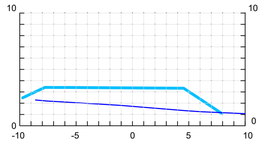

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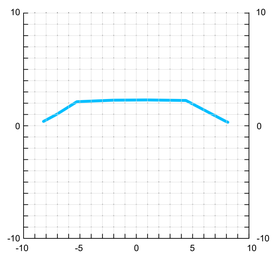

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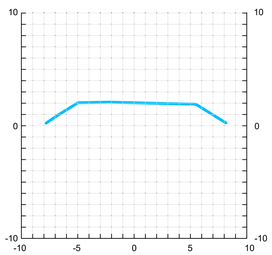

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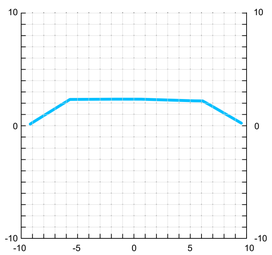

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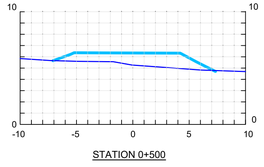

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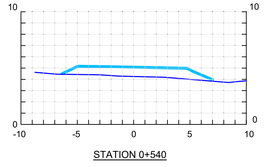

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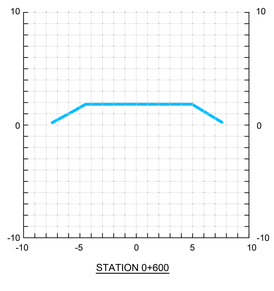

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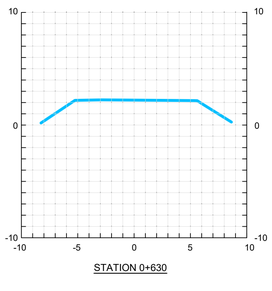
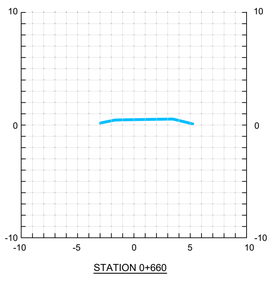
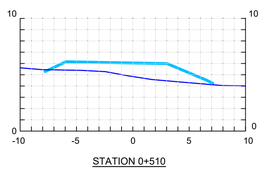


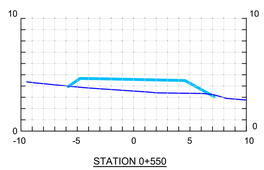
STATION 0+630



STATION 0+660



STATION 0+510



STATION 0+550

ROBERTS BAY DISCHARGE SYSTEM - JETTY AS-BUILT CROSS-SECTIONS STA.0+480 TO STA. 0+660

SCALE 1:250 HORIZONTAL
1:250 VERTICAL

LEGEND
- AGGREGATE SUBBASE
- GRADE

SCALE 0 5 10 15 20 25m

NOTES
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
2. TOPOGRAPHY NAD83 UTM ZONE 13.
3. REFER TO DRAWING 30002-208-2003 FOR JETTY AS-BUILT PLAN
4. REFER TO DRAWING 30002-208-2004, AND 2005 FOR CROSS SECTIONS.

REV	Y/M/D	REVISION	DRN	CHK	APP
0	20/09/21	AS-BUILT	AZ	NB	MJ

NUMBER	TITLE
	REFERENCES

STAMP/SEAL

PROJECT PHASE | PACKAGE CODE | AREA

PROJECT NO. 30002-208

SCALE NTS

	BY	YY/MM/DD
APP.		
CHKD.		
DRN.	DM	20/09/16

SUBJECT: OUTFALL DISCHARGE SYSTEM EXCESS TIA WATER AND OUTFALL PIPELINE JETTY CROSS SECTIONS

CLIENT DWG. NO.

DRAWING NO. 30002-208-2006

REV. 0

D SIZE (610x914) METRIC

APPENDIX B

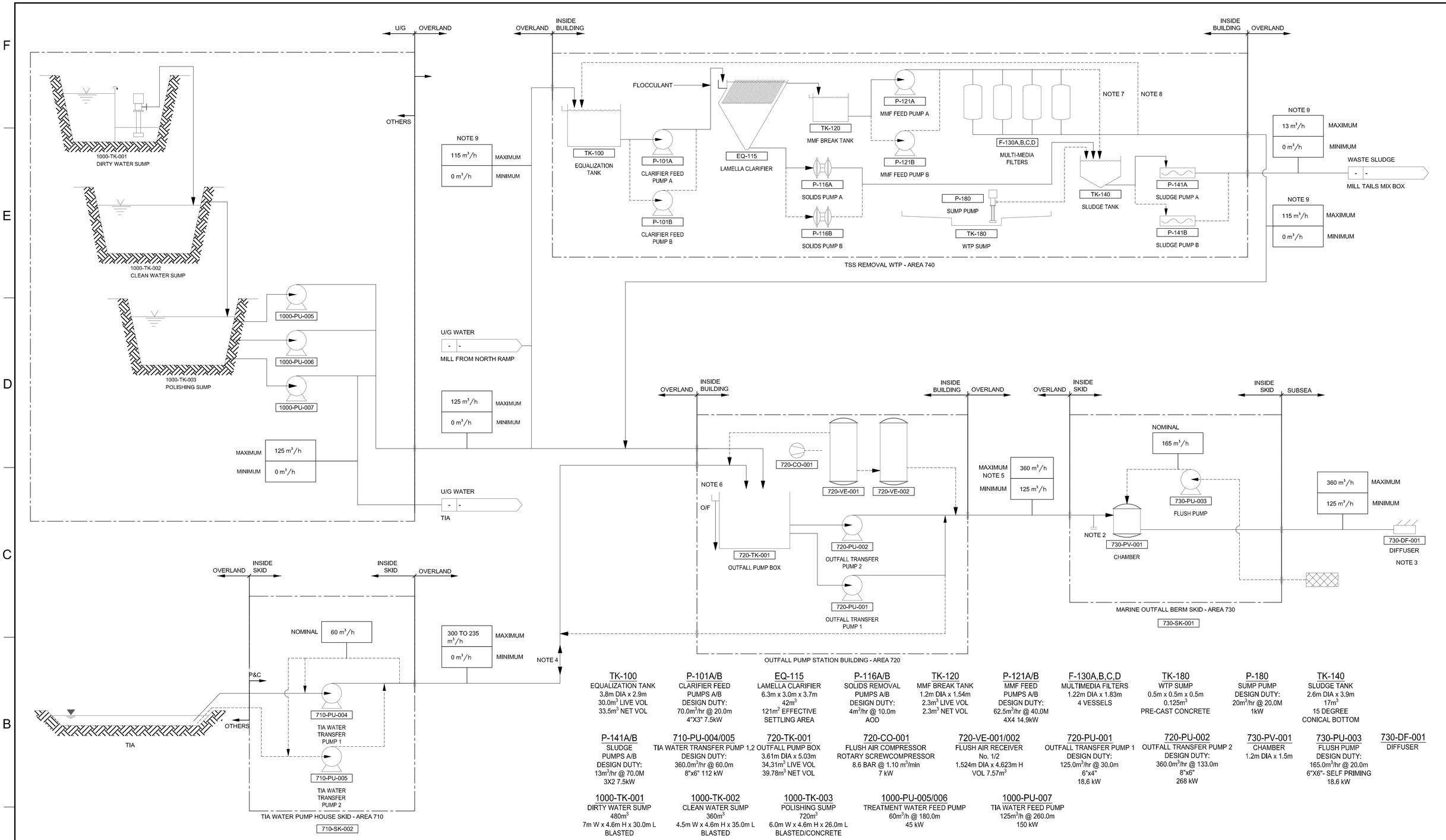
AS-BUILT DRAWINGS

Roberts Bay Discharge System Process Flow Diagram (TMAC)

Overland Pipeline Alignment (TMAC)

Marine Outfall and Intake, Record Drawings (Great Pacific Engineering and Environment)

Marine Outfall Berm and Access Road (TMAC)



TK-100 EQUALIZATION TANK
3.8m DIA x 2.9m
30.0m³ LIVE VOL
33.5m³ NET VOL

P-101A/B CLARIFIER FEED PUMPS A/B
DESIGN DUTY:
70.0m³/hr @ 20.0m
4"X3" 7.5kW

EQ-115 LAMELLA CLARIFIER
6.3m x 3.0m x 3.7m
42m³
121m² EFFECTIVE SETTLING AREA

P-116A/B SOLIDS REMOVAL PUMPS A/B
DESIGN DUTY:
4m³/hr @ 10.0m
AOD

TK-120 MMF BREAK TANK
1.2m DIA x 1.54m
2.3m³ LIVE VOL
2.3m³ NET VOL

P-121A/B MMF FEED PUMPS A/B
DESIGN DUTY:
62.5m³/hr @ 40.0M
4X4 14.9kW

F-130A,B,C,D MULTIMEDIA FILTERS
1.22m DIA x 1.83m
4 VESSELS

TK-180 WTP SUMP
0.5m x 0.5m x 0.5m
0.125m³
PRE-CAST CONCRETE

P-180 SUMP PUMP
DESIGN DUTY:
20m³/hr @ 20.0M
1kW

TK-140 SLUDGE TANK
2.6m DIA x 3.9m
17m³
15 DEGREE CONICAL BOTTOM

P-141A/B SLUDGE PUMPS A/B
DESIGN DUTY:
13m³/hr @ 70.0M
3X2 7.5kW

710-PU-004/005 TIA WATER TRANSFER PUMP 1,2
DESIGN DUTY:
360.0m³/hr @ 60.0m
8"x6" 112 kW

720-TK-001 OUTFALL PUMP BOX
3.61m DIA x 5.03m
34.31m³ LIVE VOL
39.78m³ NET VOL

720-CO-001 FLUSH AIR COMPRESSOR
ROTARY SCREWCOMPRESSOR
8.6 BAR @ 1.10 m³/min
7 kW

720-VE-001/002 FLUSH AIR RECEIVER
No. 1/2
1.524m DIA x 4.623m H
VOL 7.57m³

720-PU-001 OUTFALL TRANSFER PUMP 1
DESIGN DUTY:
125.0m³/hr @ 30.0m
6"x4"
18.6 kW

720-PU-002 OUTFALL TRANSFER PUMP 2
DESIGN DUTY:
360.0m³/hr @ 133.0m
8"x6"
268 kW

730-PV-001 CHAMBER
1.2m DIA x 1.5m

730-PU-003 FLUSH PUMP
DESIGN DUTY:
165.0m³/hr @ 20.0m
6"X6"- SELF PRIMING
18.6 kW

730-DF-001 DIFFUSER

1000-TK-001 DIRTY WATER SUMP
480m³
7m W x 4.6m H x 30.0m L
BLASTED

1000-TK-002 CLEAN WATER SUMP
360m³
4.5m W x 4.6m H x 35.0m L
BLASTED

1000-TK-003 POLISHING SUMP
720m³
6.0m W x 4.6m H x 26.0m L
BLASTED/CONCRETE

1000-PU-005/006 TREATMENT WATER FEED PUMP
60m³/h @ 180.0m
45 kW

1000-PU-007 TIA WATER FEED PUMP
125m³/h @ 260.0m
150 kW

REV	Y/M/D	REVISION	DRN	CHK	APP
1	20/09/16	ADDED SUMP SYSTEM	DM	JPH	
0	18/08/02	ISSUED FOR CONSTRUCTION	ML	NB	MJ

NUMBER	TITLE
33-0042-01-PR-PID-0006	TIA WATER PUMP HOUSE - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PID-0005	MARINE DIFFUSER - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PID-0004	MARINE OUTFALL BERM SKID - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PID-0003	OUTFALL OVERLAND PIPELINE - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PID-0002	COMPRESSED AIR FLUSH SYSTEM - PIPING & INSTRUMENTATION DIAGRAM
33-0042-01-PR-PID-0001	OUTFALL PUMP STATION BUILDING - PIPING & INSTRUMENTATION DIAGRAM
33-0042-00-PR-PID-0001	OUTFALL DISCHARGE SYSTEM -LEGEND - PIPING & INSTRUMENTATION DIAGRAM

REFERENCES

STAMP/SEAL

PROJECT PHASE

PACKAGE CODE

AREA

PROJECT NO. 30002-208

SCALE NTS

	BY	YY/MM/DD
APP.		
CHKD.		
DRN.	D.M.	20/09/16

SUBJECT
TMAC RESOURCES
OUTFALL DISCHARGE SYSTEM
PUMP STATIONS AND PIPELINES
PROCESS FLOW DIAGRAM

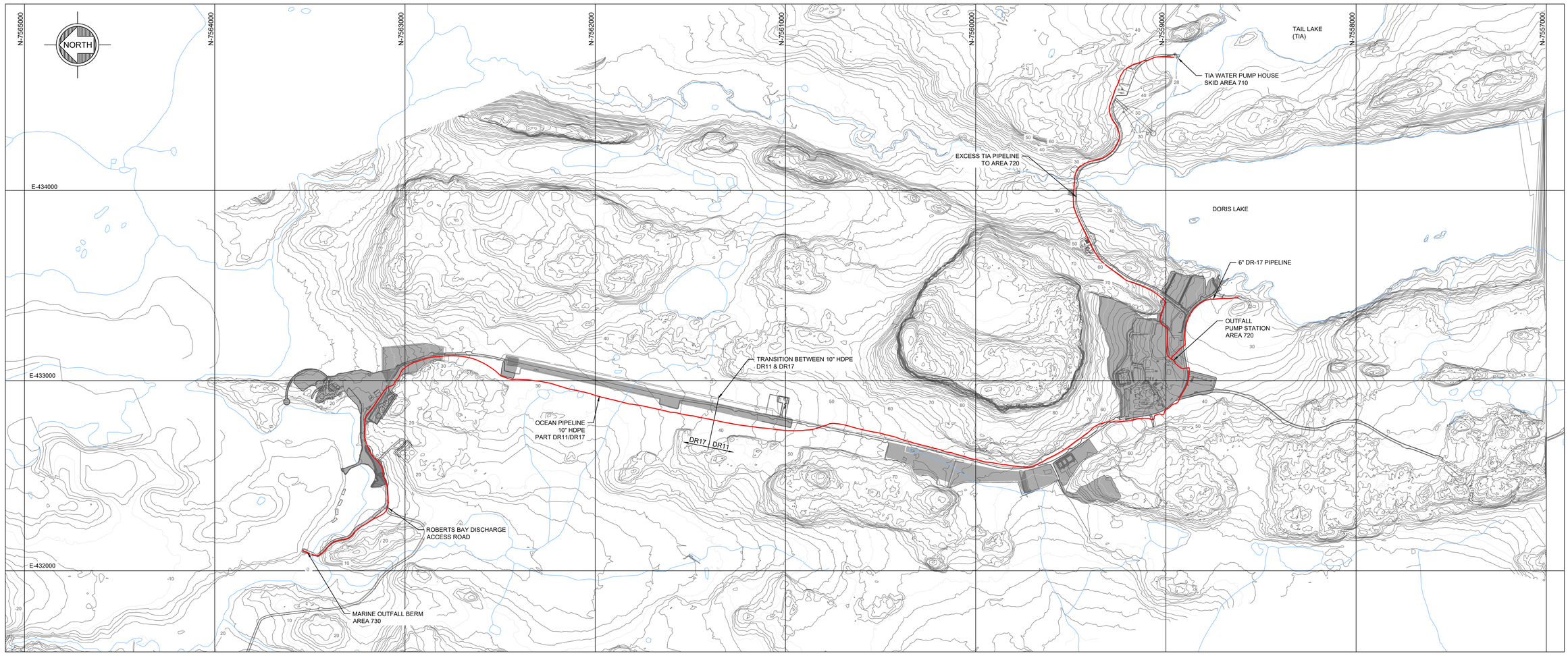
TMAC RESOURCES

CLIENT DWG. NO.

DRAWING NO. 30002-208-2001

REV. 1

D SIZE (610x914) METRIC



ROBERTS BAY DISCHARGE SYSTEM - OVERLAND PIPE AS-BUILT

SCALE 1:10000

LEGEND

- BATHYMETRIC CONTOUR
- TOPOGRAPHIC CONTOUR
- PIPELINE (OVERLAND) (ASBUILT)

SCALE 0 200 400 600 800 1,000 m

NOTES
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
2. TOPOGRAPHY NAD83 UTM ZONE 13.
3. THE REQUIREMENT OF THE DUAL CONTAINMENT PIPE END SEALS SHALL BE DETERMINED BY OTHERS. P&C SHALL NOT BE RESPONSIBLE FOR ANY OMISSION OR DEVIATION FROM ANY ENVIRONMENTAL REQUIREMENTS.
4. PIPELINE SHALL BE JOINED USING FUSION WELDING IN ACCORDANCE WITH ASME B31.3 AND ASME SEC. IX WELDING QUALIFICATION. ALL WELDS SHALL BE 100% VISUALLY INSPECTED AND 100% VOLUMETRIC NON-DESTRUCTIVE TESTED USING UT/PAUT OR OTFD.

REV	Y/M/D	REVISION	DRN	CHK	APP
1	20/09/16	ADDED SURFACE PIPELINES	DM		
0	18/08/27	ISSUED FOR DESIGN	AZ	NB	MJ

NUMBER	TITLE
REFERENCES	

PROJECT PHASE | PACKAGE CODE

PROJECT NO. 30002-208

SCALE NTS

	BY	YY/MM/DD
APP.		
CHKD.		
DRN.	DM	20/09/16

AREA

SUBJECT
OUTFALL DISCHARGE SYSTEM
EXCESS TIA WATER AND
OUTFALL PIPELINE
MASTER SITE PLAN

CLIENT DWG. NO.

DRAWING NO. 30002-208-2002

REV. 1

D SIZE (610x914) METRIC

TMAC RESOURCES INC.
HOPE BAY, NUNAVUT CANADA
ROBERTS BAY DISCHARGE SYSTEM
MARINE OUTFALL AND INTAKE

RECORD DRAWINGS

PROJECT NUMBER: 1065-001/002
DATE: 2019-11-25
REVISION: 0

GREATPACIFIC
ENGINEERING & ENVIRONMENT

TMAC RESOURCES

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GREATPACIFIC CONSULTING LTD.
Signature _____
Date 2019/11/27
PERMIT NUMBER: P 1290
NT/NU Association of Professional Engineers and Geoscientists

RECORD DRAWINGS

NOVEMBER 25,2019

DATE	DESCRIPTION	DRAWN	DESIGNED	APPROVED
19-11-25	REV 0	ECL	AH	AH
19-11-22	AS RECORDED FOR CLIENT REVIEW	ECL	AH	JC
19-09-16	AS RECORDED FOR CLIENT REVIEW	TRB	AH	JC

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www.greatpacific.ca

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NOTES:

1. GREATPACIFIC RECORDED DEPLOYED INTAKE ALIGNMENT ON 2019/08/19 AND DEPLOYED OUTFALL ALIGNMENT ON 2019/08/15 USING A SINGLE BEAM LOWRANCE HDS9 GEN 2 CHART PLOTTER/ECHO SOUNDER WITH A POINT-1 GPS ANTENNA/DIGITAL COMPASS.
2. WATER LEVELS ADJUSTED TO GEODETIC DATA. (RESCAN, 2011)

CLIENT: TMAC RESOURCES

PROJECT NUMBER: 1065-001

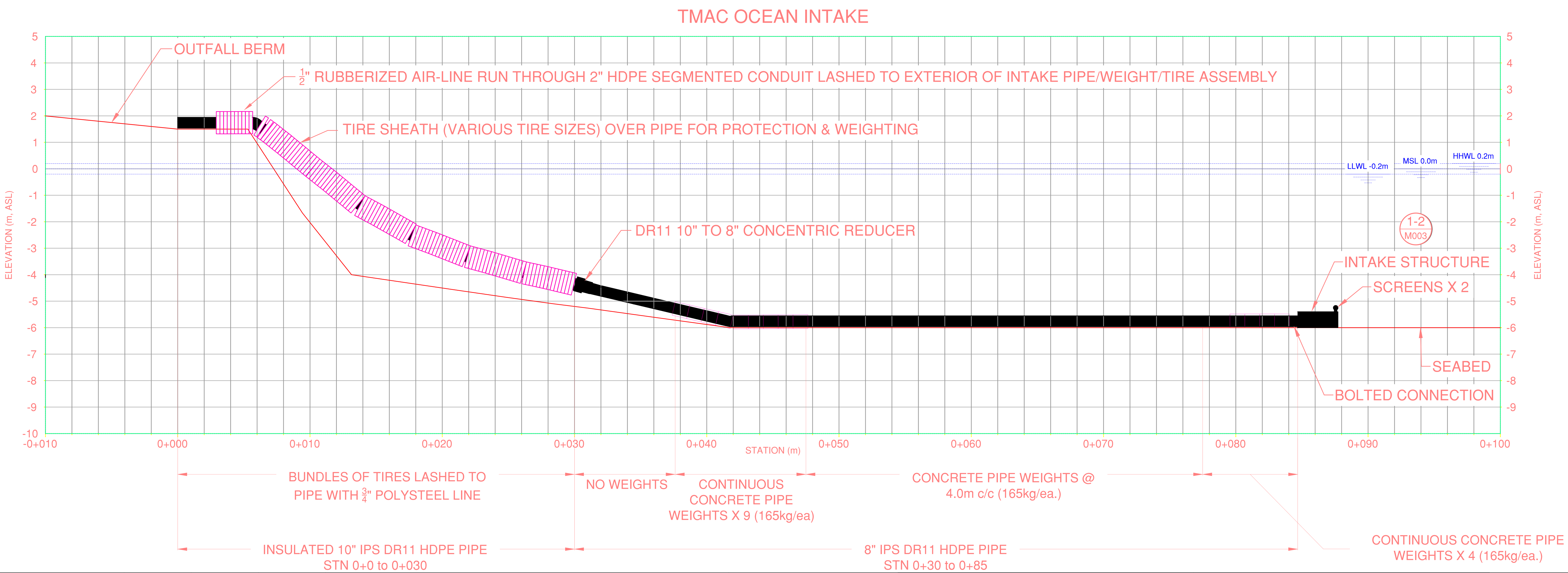
OUTFALL RECORDED ALIGNMENT PLAN AND PROFILE

DRAWING NUMBER: M001

SCALE: 1:3000

REV: REV 0

FILE: W:\1065-001 - TMAC - OCEAN DISCHARGE AND INTAKE\DRAWINGS\RECORD DRAWINGS\FINAL\1065-001 TMAC - OCEAN OUTFALL - REV0 - 191125 - ECL.DWG
DATE/TIME: 2019-11-18 11:24 AM



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GREATPACIFIC CONSULTING LTD.
Signature
Date 2019/11/27
PERMIT NUMBER: P 1290
NT/NU Association of Professional Engineers and Geoscientists

DATE	DESCRIPTION	DRAWN	DESIGNED	APPROVED
19-11-25	REV 0	ECL	AH	AH
19-11-22	RECORD DRAWING	ECL	AH	AH
19-10-07	RECORD DRAWING	TRB	AH	AH

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NOTES:
1. GREATPACIFIC RECORDED DEPLOYED INTAKE ALIGNMENT ON 2019/08/19 USING A SINGLE BEAM LOWRANCE HDS9 GEN 2 CHART PLOTTER/ECHO SOUNDER WITH A POINT-1 GPS ANTENNA/DIGITAL COMPASS.
2. WATER LEVELS ADJUSTED TO GEODETIC DATA. (RESCAN, 2011)

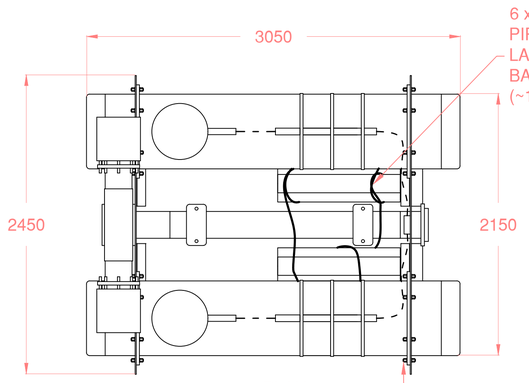
CLIENT: TMAC RESOURCES

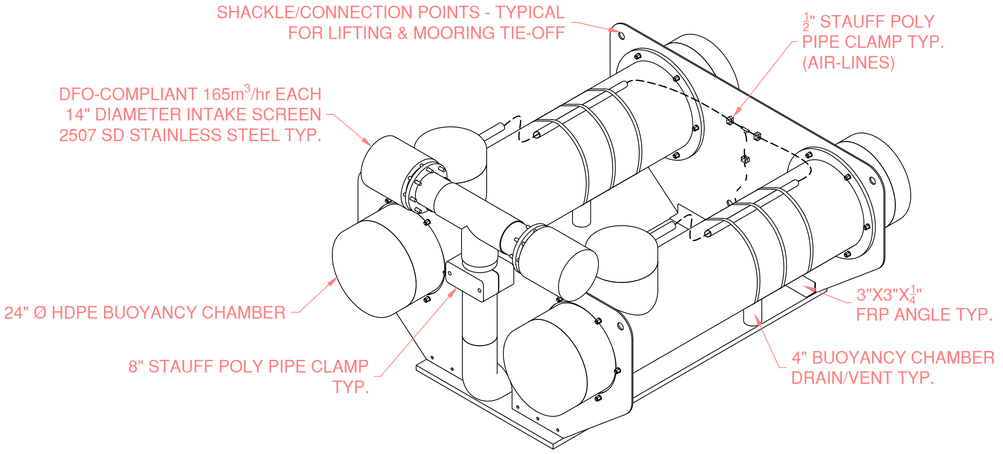
PROJECT NUMBER: 1065-001

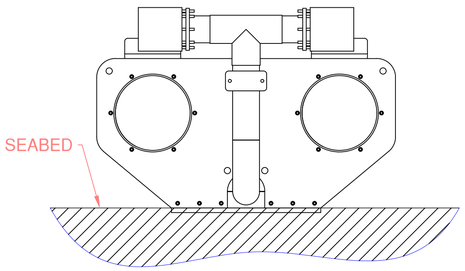
HOPE BAY
NUNAVUT, CANADA
OCEAN INTAKE

DRAWING NUMBER: M002
SCALE: 1:250
REV: REV 0

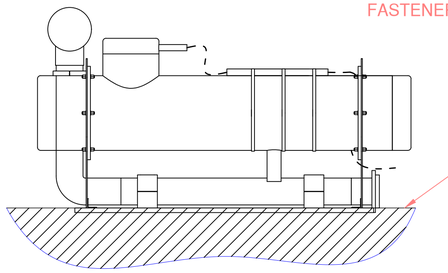
FILE: W:\1065-001 -TMAC -OCEAN DISCHARGE AND INTAKE\DRAWINGS\RECORD DRAWINGS\FINAL\1065-001 TMAC - OCEAN INTAKE - REVO - 191125 - ECL.DWG



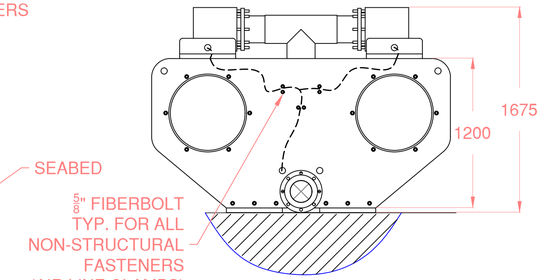




OFFSHORE END

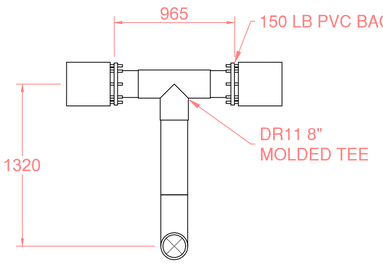


SIDE ELEVATION

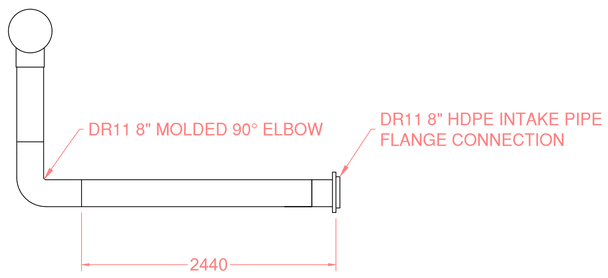


INSHORE END

1
M002



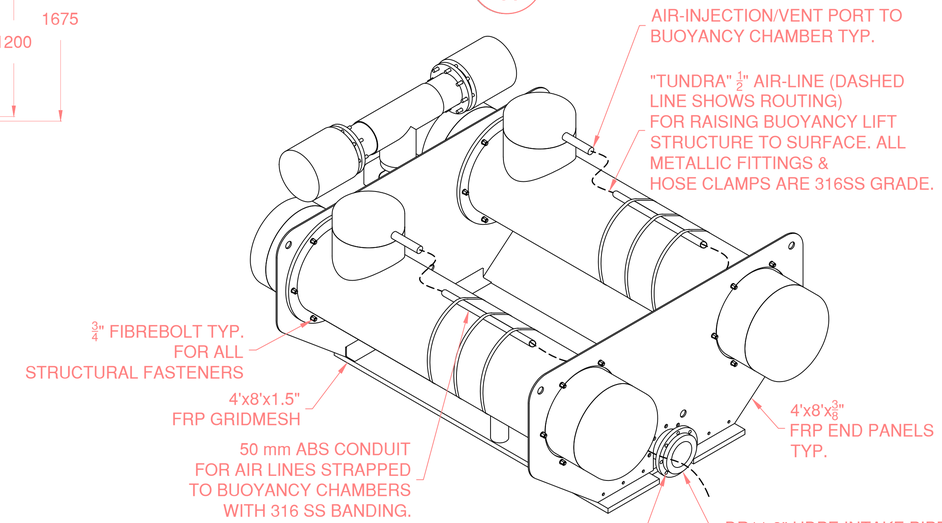
HDPE VERTICAL TEE-RISER



HDPE HORIZONTAL RISER FEED

3
M003

2
M002



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Signature
Date 2019/11/27
PERMIT NUMBER: P 1290
NT/NU Association of Prosfessional Engineers and Geoscientists

DATE	DESCRIPTION	DRAWN	DESIGNED	APPROVED
19-11-25	REV 0	ECL	AH	AH
19-11-22	RECORD DRAWING	ECL	AH	AH
19-10-08	RECORD DRAWING	TRB	AH	AH

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www.greatpacific.ca

PERMIT/STAMP:

NOTES:
1. ALL DISTANCES ARE IN MILIMETERS AND DECIMALS THEREOF UNLESS OTHERWISE STATED.
2. DO NOT SCALE FROM DRAWINGS.
3. BUOYANCY STRUCTURE CAN BE BROUGHT TO THE SURFACE DURING ICE-FREE PERIODS OF CALM WEATHER (<5 knot WINDS, <0.25m WAVES) TO INSPECT & CLEAN INTAKE SCREENS OF BIOFOULING/DEBRIS.
4. MOORINGS (x3) COMPRISED OF DANFORTH ANCHOR (75lB-NORTH, 40lb-EAST&WEST), $\frac{3}{8}$" GALVANIZED CHAIN AND $\frac{3}{4}$" POLYSTEEL SYNTHETIC LINE. MOORING SCOPE IS ~3:1.

CLIENT: TMAC RESOURCES

PROJECT NUMBER: 1065–001

SEAWATER INTAKE & MARINE EFFLUENT OUTFALL DETAILS

DRAWING NUMBER: M003

SCALE: AS SHOWN

REV: REV 0

FILE: W:\1065-001 -TMAC -OCEAN DISCHARGE AND INTAKE\DRAWINGS\RECORD DRAWINGS\FINAL\1065-001 TMAC - OCEAN INTAKE - REV0 - 191125 - ECL.DWG

START OF OUTFALL
N: 7563532.000
E: 432101.000
STA: 0+000.00

SEABED TENURE

SEAWATER INTAKE

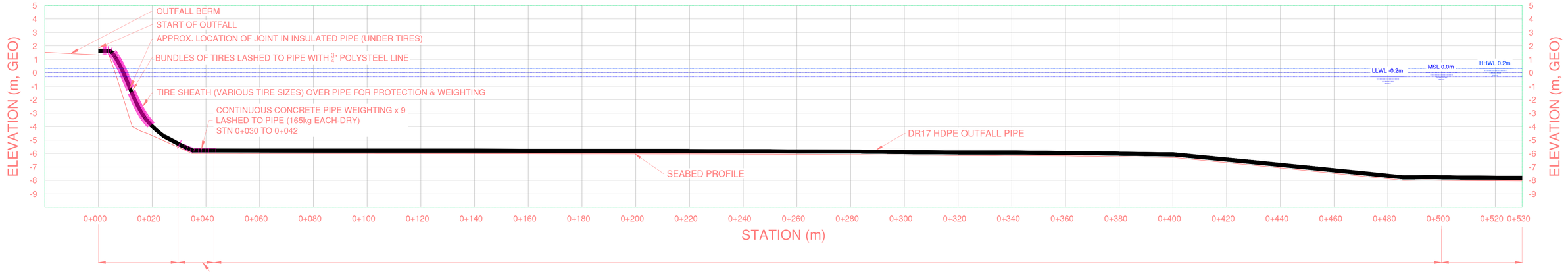
SEAWATER INTAKE
BUOYANCY STRUCTURE

RECORDED ALIGNMENT

SEABED TENURE

0 25 50 Meters

TMAC MARINE OUTFALL
RECORDED ALIGNMENT



INSULATED 10" IPS DR17 HDPE PIPE
STN 0+000 TO 0+030

280mm DR17 HDPE PIPE
WEIGHTING CONTINUOUS
STN 0+030 TO 0+042

280mm DR17 HDPE PIPE
WEIGHTING 4.0m c/c
STN 0+042 TO 0+500
(2 / M008)

10" IPS DR17 HDPE PIPE
WEIGHTING 4.5m c/c
0+500 TO 1+700
(2 / M008)

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Signature
Date 2019/11/27
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NT/NU Association of Prosfessional Engineers and Geoscientists

DATE	DESCRIPTION	DRAWN	DESIGNED	APPROVED
19-11-25	REV 0	ECL	AH	AH
19-11-22	AS RECORDED FOR CLIENT REVIEW	ECL	AH	JC
19-09-16	AS RECORDED FOR CLIENT REVIEW	TRB	AH	JC

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PERMIT/STAMP:

NOTES:
1. GREATPACIFIC RECORDED DEPLOYED OUTFALL ALIGNMENT ON 2019/08/15 USING A SINGLE BEAM LOWRANCE HDS9 GEN 2 CHART PLOTTER/ECHO SOUNDER WITH A POINT-1 GPS ANTENNA/DIGITAL COMPASS.
2. WATER LEVELS ADJUSTED TO GEODETIC DATA. (RESCAN, 2011)

CLIENT: TMAC RESOURCES

PROJECT NUMBER: 1065-001

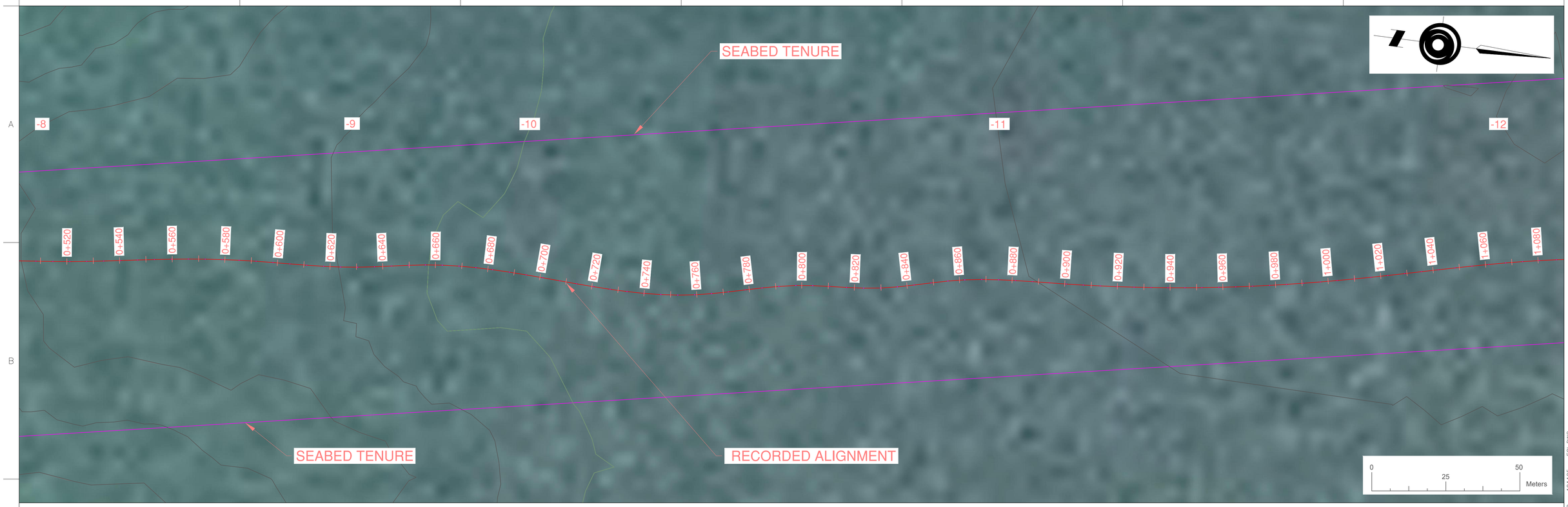
OUTFALL
RECORDED ALIGNMENT
PLAN AND PROFILE

DRAWING NUMBER: M004

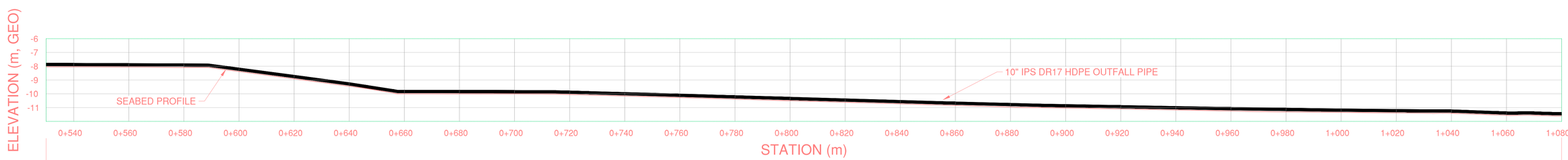
SCALE: 1:750

REV: REV 0

FILE: W:\1065-001 - TMAC - OCEAN DISCHARGE AND INTAKE\DRAWINGS\RECORD DRAWINGS\FINAL\1065-001 TMAC - OCEAN OUTFALL - REVO - 191125 - ECL.DWG
DATE/TIME: 2019-11-18 11:24 AM



TMAC MARINE OUTFALL
RECORDED ALIGNMENT



10" IPS DR17 HDPE PIPE
WEIGHTING 4.5m c/c
STN: 0+500 TO 1+700

2
M008

PERMIT TO PRACTICE
GREATPACIFIC CONSULTING LTD.
Signature
Date 2019/11/27
PERMIT NUMBER: P 1290
NT/NU Association of Prosfessional Engineers and Geoscientists

" The seal and signature of the undersigned on this drawing certifies that the design information contained in these drawings accurately reflects the original design and the material design changes made during construction that were brought to the undersigned's attention. These drawings are intended to incorporate addenda, change orders, and other material design changes, but not necessarily, all site instructions. The undersigned does not warrant or guarantee, nor accept any responsibility for the accuracy or completeness of the as-constructed information supplied by others contained in these drawings, but does, by sealing and signing, certify that the as-constructed information, if accurate and complete, provides an as-constructed system which substantially complies in all material respects with the original design intent."

DATE	DESCRIPTION	DRAWN	DESIGNED	APPROVED
19-11-25	REV 0	ECL	AH	AH
19-11-22	AS RECORDED FOR CLIENT REVIEW	ECL	AH	JC
19-09-16	AS RECORDED FOR CLIENT REVIEW	TRB	AH	JC

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202–2780 VETERANS MEMORIAL PARKWAY
VICTORIA, BC V9B 3S6
778–433–2672
www.greatpacific.ca

PERMIT/STAMP:

NOTES:
1. GREATPACIFIC RECORDED DEPLOYED OUTFALL ALIGNMENT ON 2019/08/15 USING A SINGLE BEAM LOWRANCE HDS9 GEN 2 CHART PLOTTER/ECHO SOUNDER WITH A POINT-1 GPS ANTENNA/DIGITAL COMPASS.
2. WATER LEVELS ADJUSTED TO GEODETIC DATA. (RESCAN, 2011)

CLIENT: TMAC RESOURCES

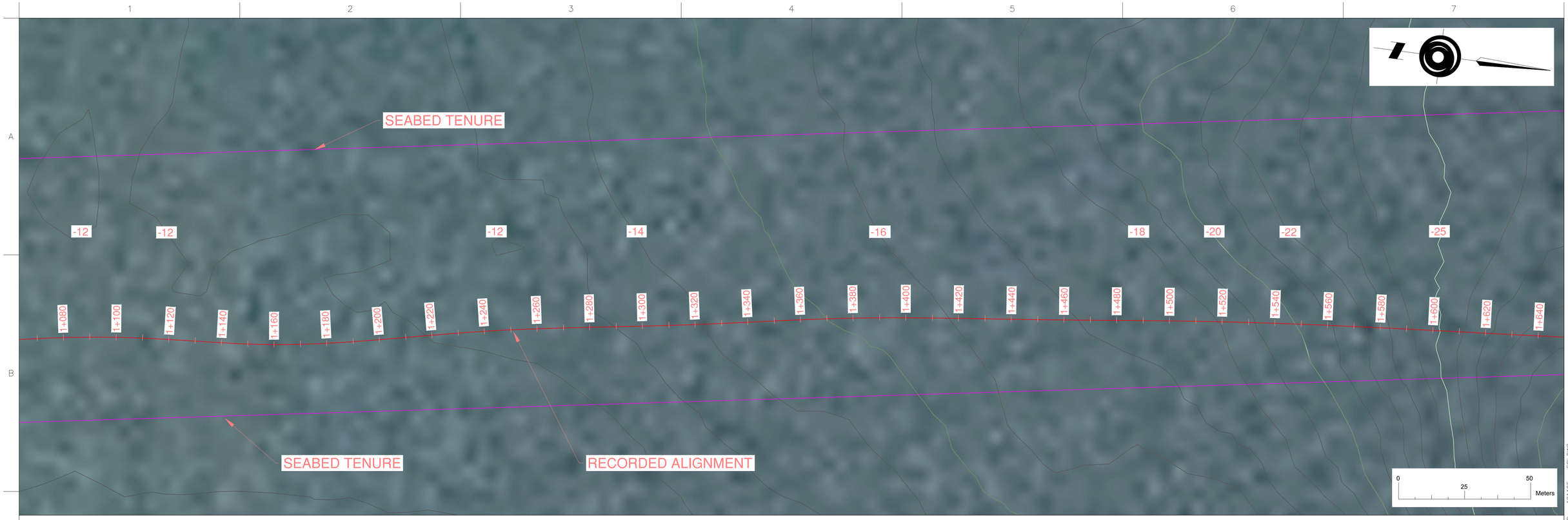
MARINE OUTFALL
RECORDED ALIGNMENT
PLAN AND PROFILE

DRAWING NUMBER: M005

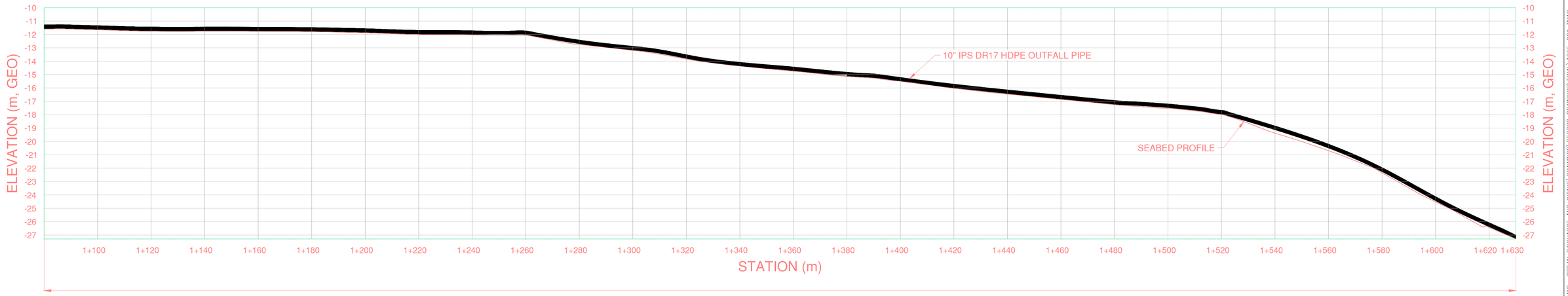
PROJECT NUMBER: 1065-001

SCALE: 1:750

REV: REV 0



TMAC MARINE OUTFALL
RECORDED ALIGNMENT



10" IPS DR17 HDPE PIPE
WEIGHTING 4.5m c/c
STN: 0+500 TO 1+700

2
M008

PERMIT TO PRACTICE
GREATPACIFIC CONSULTING LTD.
Signature
Date 2019/11/27
PERMIT NUMBER: P 1290
NT/NU Association of Prosfessional Engineers and Geoscientists

DATE	DESCRIPTION	DRAWN	DESIGNED	APPROVED
19-11-25	REV 0	ECL	AH	AH
19-11-22	AS RECORDED FOR CLIENT REVIEW	ECL	AH	JC
19-09-16	AS RECORDED FOR CLIENT REVIEW	TRB	AH	JC

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PERMIT/STAMP:

NOTES:
1. GREATPACIFIC RECORDED DEPLOYED OUTFALL ALIGNMENT ON 2019/08/15 USING A SINGLE BEAM LOWRANCE HDS9 GEN 2 CHART PLOTTER/ECHO SOUNDER WITH A POINT-1 GPS ANTENNA/DIGITAL COMPASS.
2. WATER LEVELS ADJUSTED TO GEODETIC DATA. (RESCAN, 2011)

CLIENT: TMAC RESOURCES

PROJECT NUMBER: 1065-001

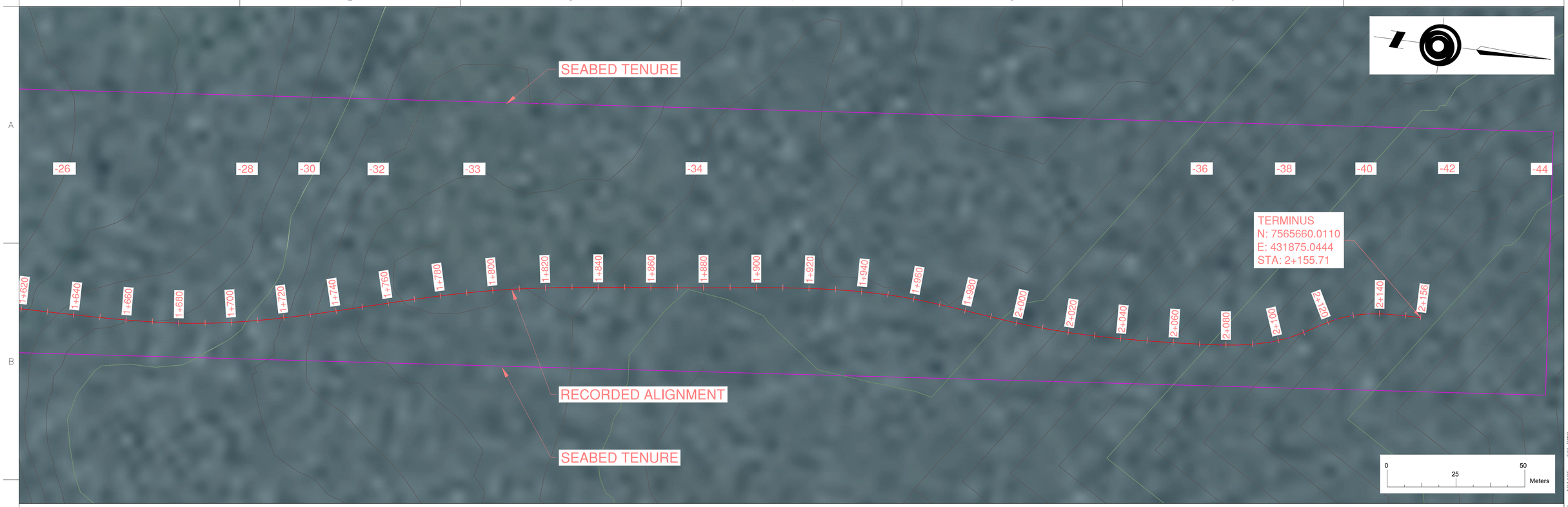
MARINE OUTFALL
RECORDED ALIGNMENT
PLAN AND PROFILE

DRAWING NUMBER: M006

SCALE: 1:750

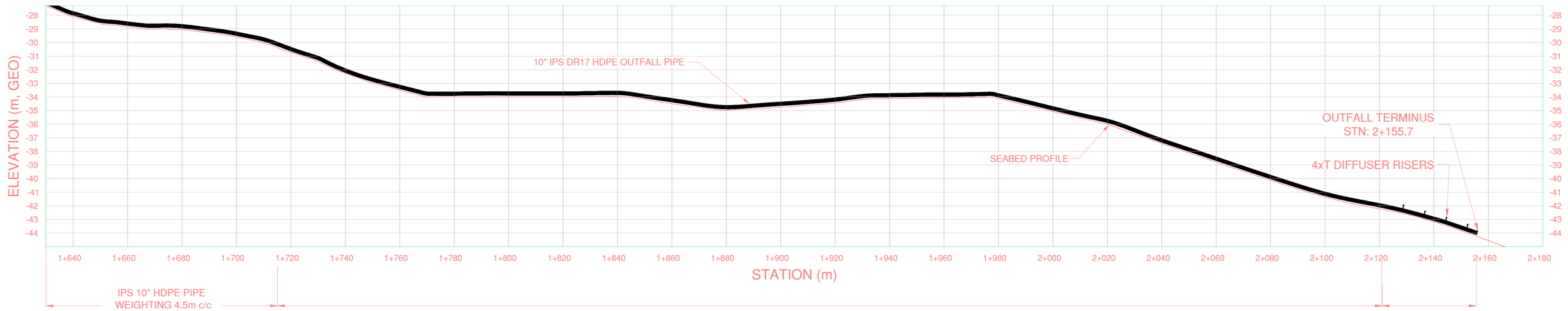
REV: REV 0

FILE: W:\1065-001 -TMAC -OCEAN DISCHARGE AND INTAKE\DRAWINGS\RECORD DRAWINGS\FINAL\1065-001 TMAC - OCEAN OUTFALL - REVO - 191125 - ECL.DWG
DATE/TIME: 2019-11-18 11:24 AM



TMAC MARINE OUTFALL
RECORDED ALIGNMENT

PERMIT TO PRACTICE
GREATPACIFIC CONSULTING LTD.
Signature
Date 2019/11/27
PERMIT NUMBER: P 1290
NT/NU Association of Prosfessional Engineers and Geoscientists



DATE	DESCRIPTION	DRAWN	DESIGNED	APPROVED
19-11-25	REV 0	ECL	AH	AH
19-11-22	AS RECORDED FOR CLIENT REVIEW	ECL	AH	JC
19-09-16	AS RECORDED FOR CLIENT REVIEW	TRB	AH	JC

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PERMIT/STAMP:

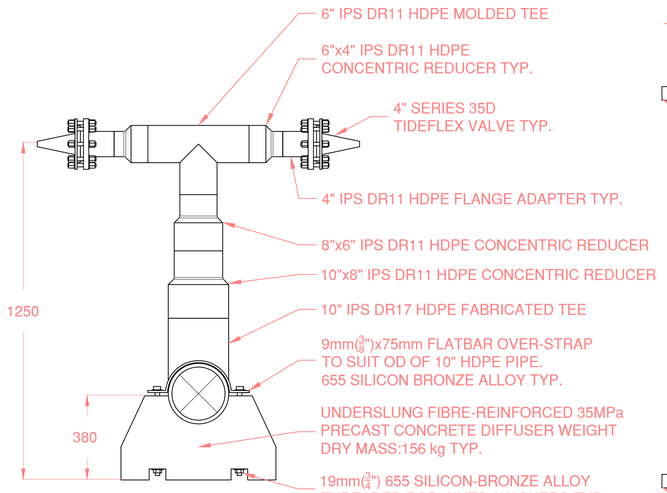
NOTES:
1. GREATPACIFIC RECORDED DEPLOYED OUTFALL ALIGNMENT ON 2019/08/15 USING A SINGLE BEAM LOWRANCE HDS9 GEN 2 CHART PLOTTER/ECHO SOUNDER WITH A POINT-1 GPS ANTENNA/DIGITAL COMPASS.
2. WATER LEVELS ADJUSTED TO GEODETIC DATA. (RESCAN, 2011)

CLIENT: TMAC RESOURCES

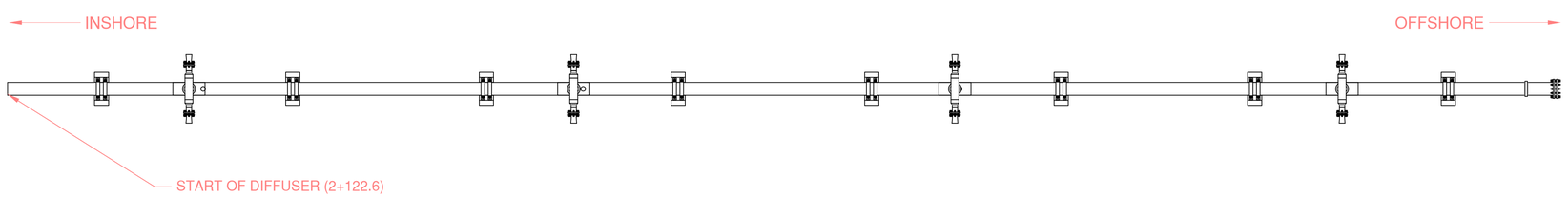
MARINE OUTFALL
RECORDED ALIGNMENT
PLAN AND PROFILE

PROJECT NUMBER: 1065-001
DRAWING NUMBER: M007
SCALE: 1:750
REV: REV 0

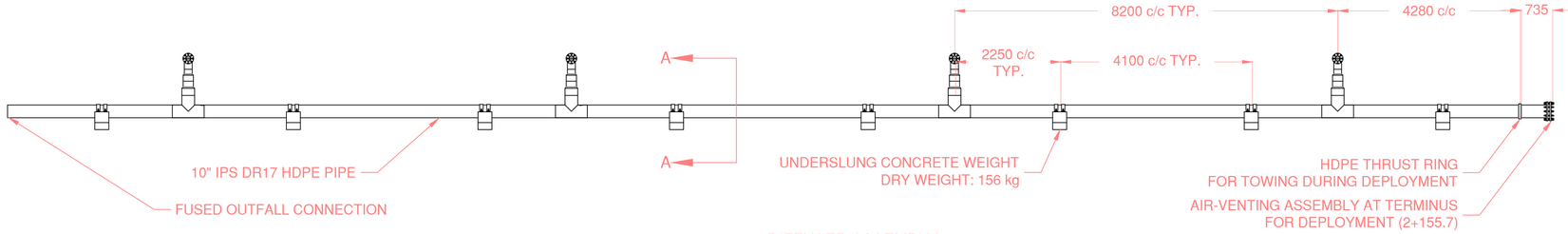
FILE: W:\1065-001 -TMAC -OCEAN DISCHARGE AND INTAKE\DRAWINGS\RECORD DRAWINGS\FINAL\1065-001 TMAC - OCEAN OUTFALL - REV0 - 191125 - ECL.DWG
DATE/TIME: 2019-11-18 11:24 AM



DETAIL A-A
DIFFUSER ASSEMBLY
SCALE 1:15

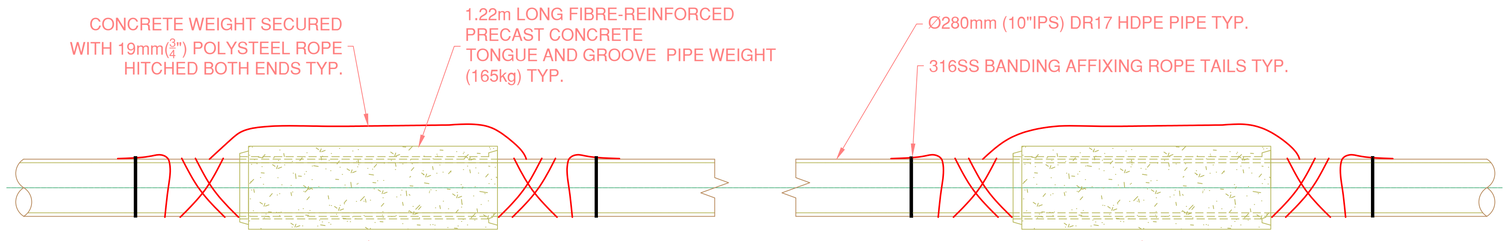


DIFFUSER ASSEMBLY
PLAN VIEW
SCALE 1:75



DIFFUSER ASSEMBLY
ELEVATION VIEW
SCALE 1:75

1
M007



PIPE WEIGHT SPACING
4.0m c/c FROM STA: 0+042m to 0+500m
4.5m c/c FROM STA: 0+500m to 1+700m
5.0m c/c FROM STA: 1+700m to DIFFUSER

2
M004-M005-M006-M007

PERMIT TO PRACTICE
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Signature
Date 2019/11/27
PERMIT NUMBER: P 1290
NT/NU Association of Professional Engineers and Geoscientists

DATE	DESCRIPTION	DRAWN	DESIGNED	APPROVED
19-11-25	REV 0	ECL	AH	AH
19-11-22	AS RECORDED FOR CLIENT REVIEW	ECL	AH	AH
19-10-08	AS RECORDED FOR CLIENT REVIEW	BC	AH	AH

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PERMIT/STAMP:

NOTES:
1. ALL DISTANCES ARE IN MILIMETERS AND DECIMALS THEREOF UNLESS OTHERWISE STATED.
2. DO NOT SCALE FROM DRAWINGS.

CLIENT: TMAC RESOURCES

PROJECT NUMBER: 1065-001

SEAWATER INTAKE & MARINE EFFLUENT OUTFALL

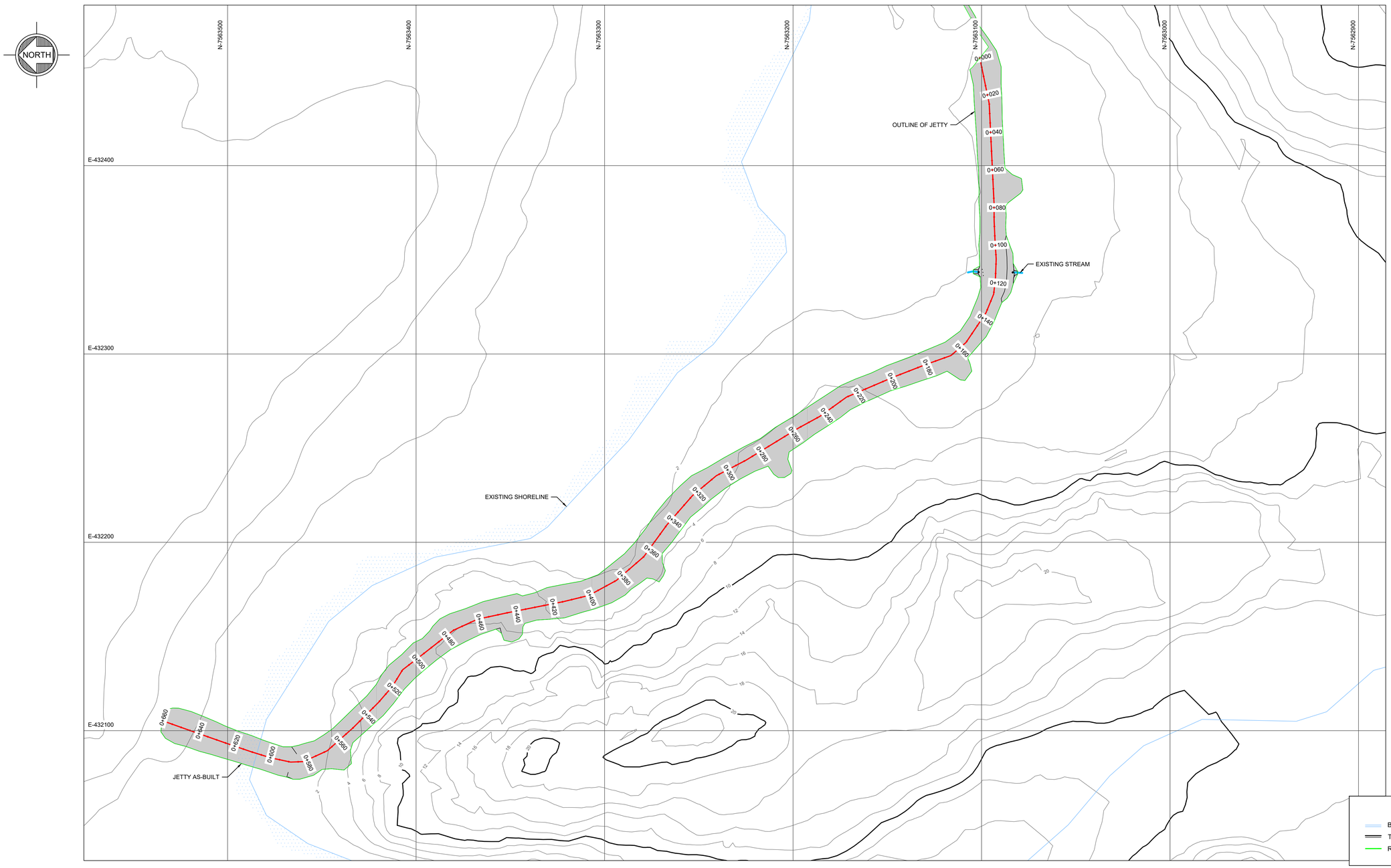
DETAILS

DRAWING NUMBER: M008

SCALE: AS SHOWN

REV: REV 0

FILE: W:\1065-001 -TMAC -OCEAN DISCHARGE AND INTAKE\DRAWINGS\RECORD DRAWINGS\FINAL\1065-001 TMAC - OCEAN OUTFALL - REV0 - 191125 - ECL.DWG



ROBERTS BAY DISCHARGE SYSTEM - JETTY AS-BUILT PLAN

SCALE 1:1000

SCALE
0 20 40 60 80 100m

NOTES
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
2. TOPOGRAPHY NAD83 UTM ZONE 13.
3. REFER TO DRAWING 30002-208-2004, 2005, AND 2006 FOR CROSS SECTIONS.

REV	Y/M/D	REVISION	DRN	CHK	APP
0	20/09/21	AS-BUILT	AZ	NB	MJ

NUMBER	TITLE

REFERENCES

PROJECT PHASE | PACKAGE CODE | AREA

PROJECT NO. 30002-208

SCALE: NTS

	BY	YY/MM/DD
APP.		
CHKD.		
DRN.	DM	20/09/21

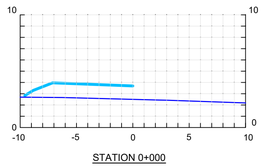
SUBJECT: OUTFALL DISCHARGE SYSTEM EXCESS TIA WATER AND OUTFALL PIPELINE JETTY MASTER SITE PLAN

CLIENT DWG. NO.

DRAWING NO. 30002-208-2003

REV. 0

D SIZE (610x914) METRIC



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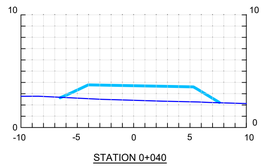

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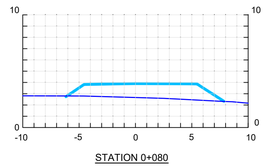

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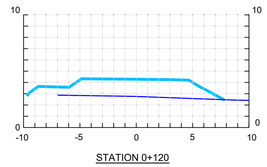

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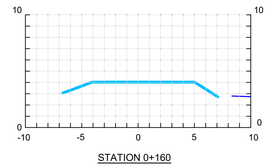

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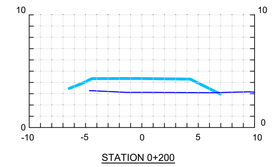

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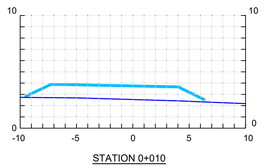

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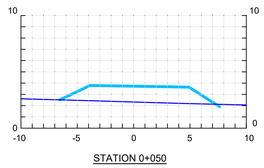

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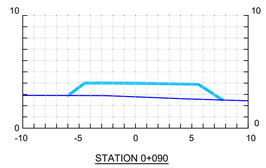

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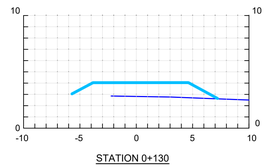
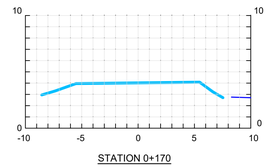


STATION 0+130



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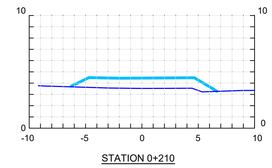
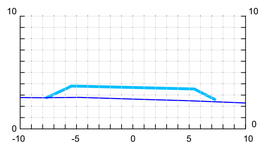


STATION 0+210



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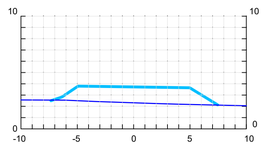

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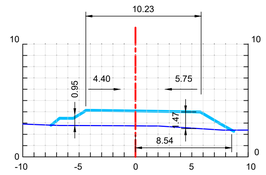

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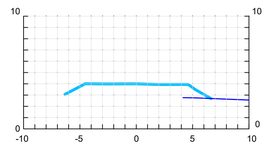

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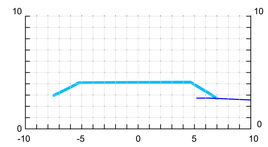

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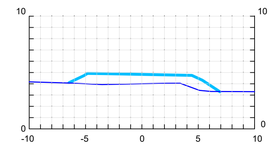

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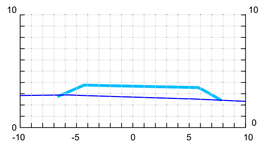

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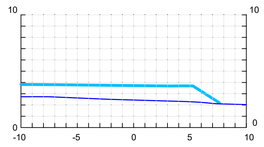
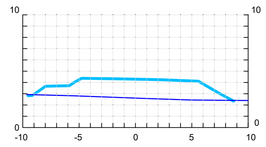


STATION 0+070



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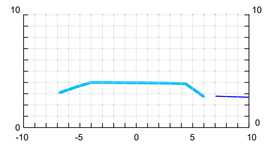

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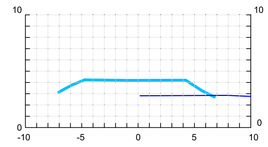

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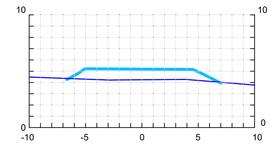


STATION 0+230

ROBERTS BAY DISCHARGE SYSTEM - JETTY AS-BUILT CROSS-SECTIONS STA.0+000 TO STA. 0+230

SCALE 1:250 HORIZONTAL
1:250 VERTICAL

LEGEND
- AGGREGATE SUBBASE
- GRADE

SCALE
0 5 10 15 20 25m

NOTES
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
2. TOPOGRAPHY NAD83 UTM ZONE 13.
3. REFER TO DRAWING 30002-208-2003 FOR JETTY AS-BUILT PLAN
4. REFER TO DRAWING 30002-208-2005, AND 2006 FOR CROSS SECTIONS.

REV	Y/M/D	REVISION	DRN	CHK	APP
0	20/09/21	AS-BUILT	AZ	NB	MJ

NUMBER	REFERENCES

STAMP/SEAL

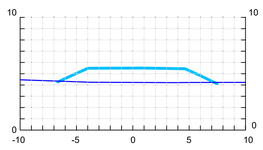
PROJECT PHASE | PACKAGE CODE
PROJECT NO. 30002-208
SCALE NTS

	BY	YY/MM/DD
APP.		
CHKD.		
DRN.	DM	20/09/16

AREA
SUBJECT: OUTFALL DISCHARGE SYSTEM EXCESS TIA WATER AND OUTFALL PIPELINE JETTY CROSS SECTIONS

CLIENT DWG. NO.
DRAWING NO. 30002-208-2004
REV. 0

D SIZE (610x914) METRIC



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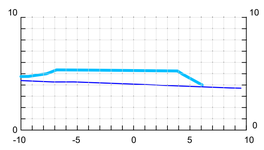

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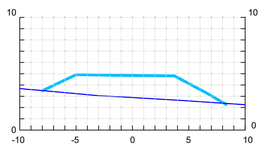

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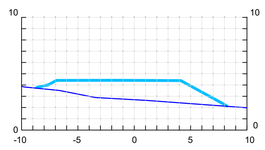
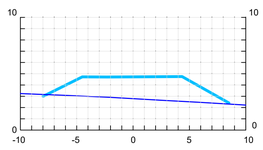
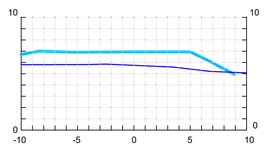


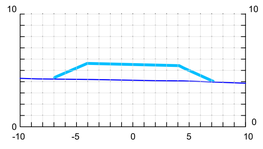
STATION 0+360



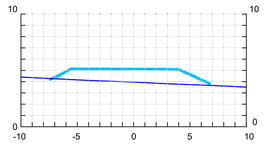
STATION 0+400



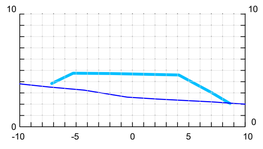
STATION 0+440



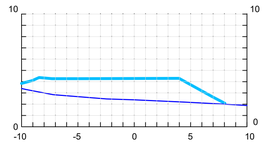
STATION 0+250



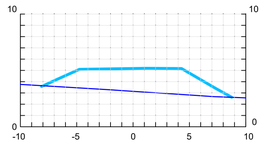
STATION 0+290



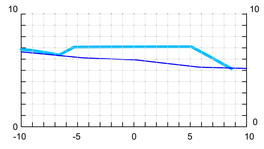
STATION 0+330



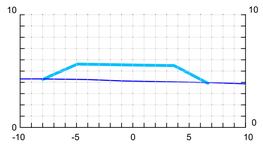
STATION 0+370



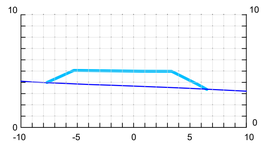
STATION 0+410



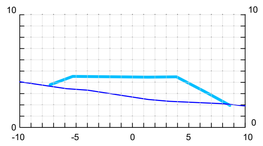
STATION 0+450



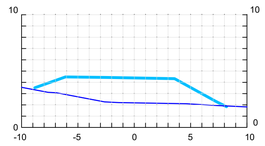
STATION 0+260



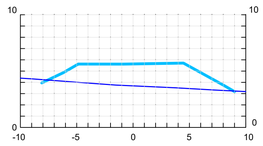
STATION 0+300



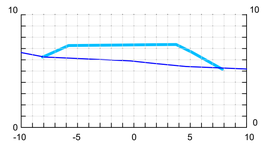
STATION 0+340



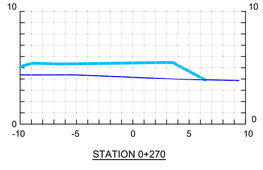
STATION 0+380



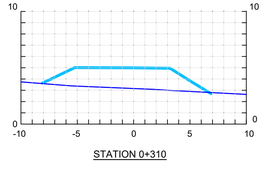
STATION 0+420



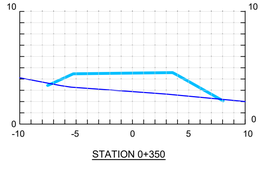
STATION 0+460



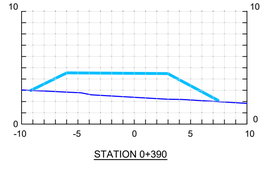
STATION 0+270



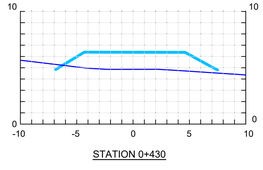
STATION 0+310



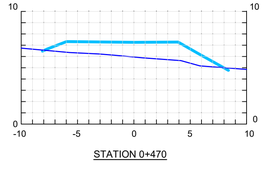
STATION 0+350



STATION 0+390



STATION 0+430



STATION 0+470

ROBERTS BAY DISCHARGE SYSTEM - JETTY AS-BUILT CROSS-SECTIONS STA.0+240 TO STA. 0+470

SCALE 1:250 HORIZONTAL
1:250 VERTICAL

LEGEND
- AGGREGATE SUBBASE
- GRADE

SCALE
0 5 10 15 20 25m

NOTES
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
2. TOPOGRAPHY NAD83 UTM ZONE 13.
3. REFER TO DRAWING 30002-208-2003 FOR JETTY AS-BUILT PLAN
4. REFER TO DRAWING 30002-208-2004, AND 2006 FOR CROSS SECTIONS.

REV	Y/M/D	REVISION	DRN	CHK	APP
0	20/09/21	AS-BUILT	AZ	NB	MJ

NUMBER	TITLE
	REFERENCES

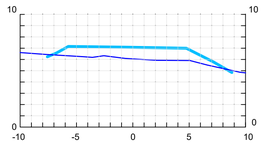
PROJECT PHASE
PACKAGE CODE
AREA
PROJECT NO. 30002-208
SCALE NTS

	BY	YY/MM/DD
APP.		
CHKD.		
DRN.	DM	20/09/16

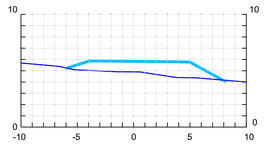
SUBJECT
OUTFALL DISCHARGE SYSTEM
EXCESS TIA WATER AND
OUTFALL PIPELINE JETTY
CROSS SECTIONS

CLIENT DWG. NO.
DRAWING NO. 30002-208-2005
REV. 0

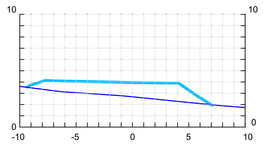
D SIZE (610x914) METRIC



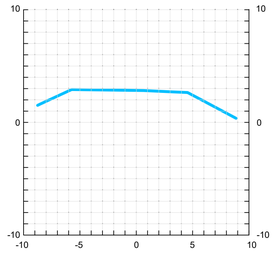
STATION 0+480



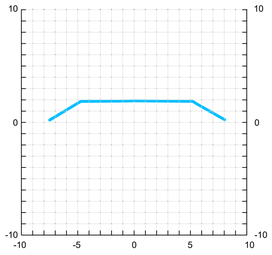
STATION 0+520



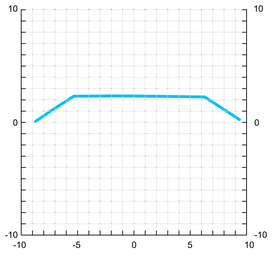
STATION 0+560



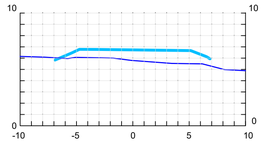
STATION 0+580



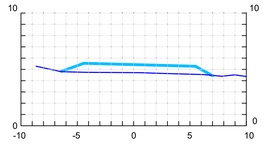
STATION 0+610



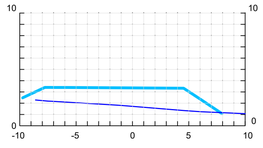
STATION 0+640



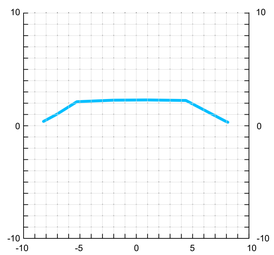
STATION 0+490



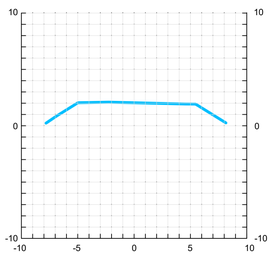
STATION 0+530



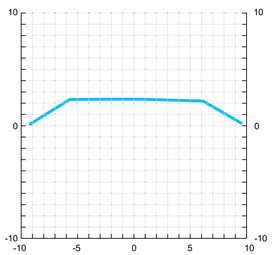
STATION 0+570



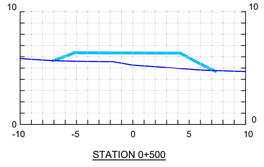
STATION 0+590



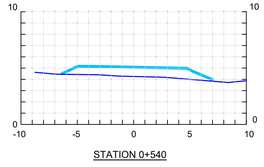
STATION 0+620



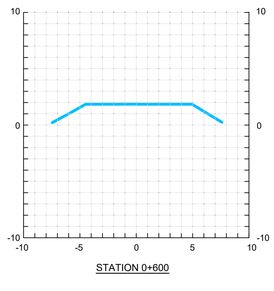
STATION 0+650



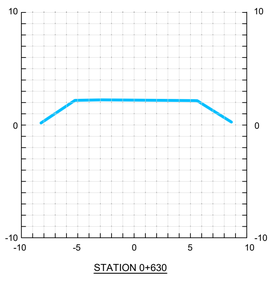
STATION 0+500



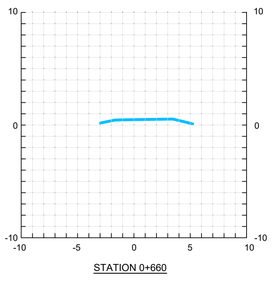
STATION 0+540



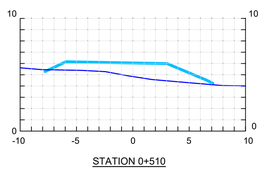
STATION 0+600



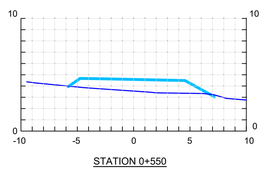
STATION 0+630



STATION 0+660



STATION 0+510



STATION 0+550

ROBERTS BAY DISCHARGE SYSTEM - JETTY AS-BUILT CROSS-SECTIONS STA.0+480 TO STA. 0+660

SCALE 1:250 HORIZONTAL
1:250 VERTICAL

LEGEND
- AGGREGATE SUBBASE
- GRADE

SCALE 0 5 10 15 20 25m

NOTES
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE STATED.
2. TOPOGRAPHY NAD83 UTM ZONE 13.
3. REFER TO DRAWING 30002-208-2003 FOR JETTY AS-BUILT PLAN
4. REFER TO DRAWING 30002-208-2004, AND 2005 FOR CROSS SECTIONS.

REV	Y/M/D	REVISION	DRN	CHK	APP
0	20/09/21	AS-BUILT	AZ	NB	MJ

NUMBER	TITLE
	REFERENCES

STAMP/SEAL

PROJECT PHASE | PACKAGE CODE | AREA

PROJECT NO. 30002-208

SCALE NTS

	BY	YY/MM/DD
APP.		
CHKD.		
DRN.	DM	20/09/16

SUBJECT: OUTFALL DISCHARGE SYSTEM EXCESS TIA WATER AND OUTFALL PIPELINE JETTY CROSS SECTIONS

CLIENT DWG. NO.

DRAWING NO. 30002-208-2006

REV. 0

D SIZE (610x914) METRIC