

**Town of Comox**

Lazo Road Shoreline Protection and Restoration  
Reference No. V15-0196/A

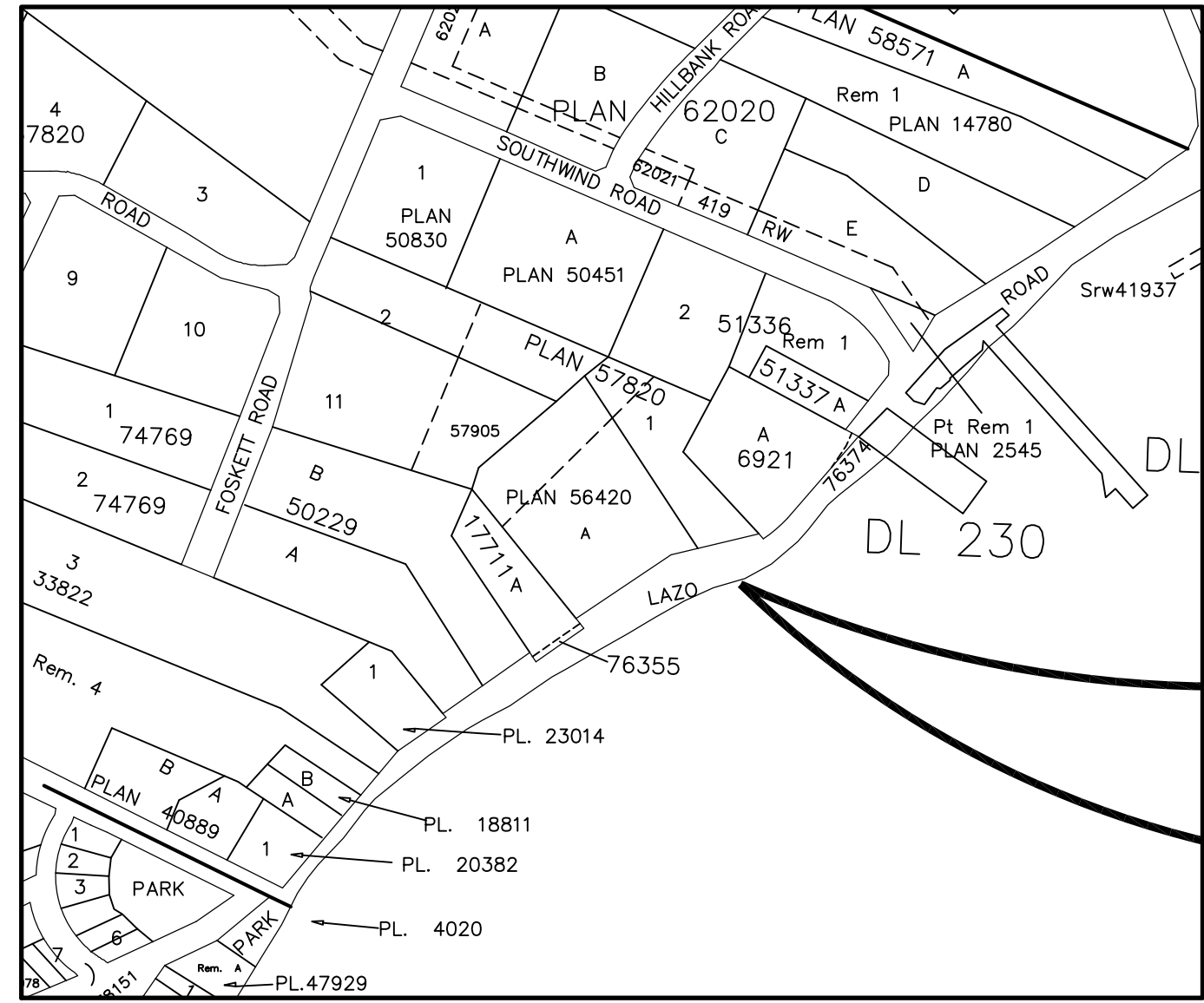
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## Appendix A

Contract Drawings





**LOCATION PLAN**  
SCALE 1:5000

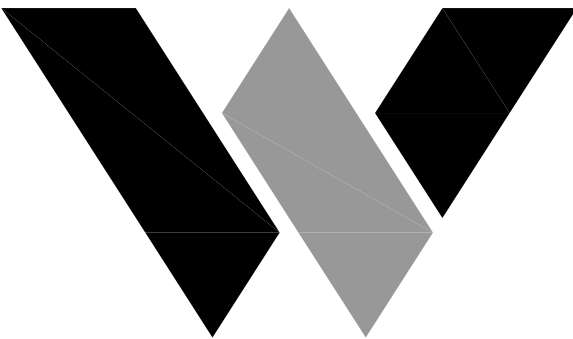
**Client:**

Town of Comox  
1809 Beaufort Ave, Comox, BC.  
Tel. 250 339 2202

**Project:**

Lazo Road Shoreline Protection and Restoration  
Lazo Road  
Comox, BC

**Engineering Services Provided by:**



**WEDLER**  
ENGINEERING

- THE WEDLER GROUP
- Chilliwack  
1.604.792.0651
  - Courtenay  
1.250.334.3263
  - Surrey  
1.604.588.1919

# Drawing Index:

Drawing Number	Title of Drawing
V15-0196/A-00	COVER SHEET / LOCATION PLAN
V15-0196/A-01	KEY PLAN
V15-0196/A-02	1+000 TO 1+170
V15-0196/A-03	1+170 TO 1+360
V15-0196/A-04	1+360 TO 1+560
V15-0196/A-05	1+560 TO 1+720
V15-0196/A-06	SECTIONS 1+020 TO 1+100
V15-0196/A-07	SECTIONS 1+120 TO 1+160
V15-0196/A-08	SECTIONS 1+180 TO 1+251.61
V15-0196/A-09	SECTIONS 1+260 TO 1+340
V15-0196/A-10	SECTIONS 1+350.79 TO 1+400
V15-0196/A-11	SECTIONS 1+410.28 TO 1+480
V15-0196/A-12	SECTIONS 1+500 TO 1+580
V15-0196/A-13	SECTIONS 1+600 TO 1+700
V15-0196/A-14	NOTES & DETAILS

SYMBOL		DESCRIPTION
EXISTING	PROPOSED	
		MANHOLE
		CLEANOUT
		CAP
		INSPECTION CHAMBER
		CATCH BASIN (CIRCULAR GRATE)
		CATCH BASIN (GUTTER LINE)
		LAWN BASIN
		HYDRANT
		GATE VALVE
		BLOWOFF
		WATER METER
		DRAINAGE
		SANITARY
		WATER
		TELEPHONE
		GAS
		HYDRO
		HYDRO POLE & ANCHOR
		TELEPHONE POLE
		LAMP STANDARD
		CURB, GUTTER & SIDEWALK
		FENCE LINE
		LOT LINE
		EASEMENT & RIGHT-OF-WAY
		BUILDING ENVELOPE
		GROUND ELEVATION

Project No: V15-0196/A

REVISION J

Date: JUNE 2015

Issue: TENDER / PERMITTING





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BENCHMARK:  
ELEVATIONS ARE GEODETIC AND DERIVED FROM GPS DUAL  
FREQUENCY STATIC OBSERVATIONS POST PROCESSED USING GEODETIC  
SURVEY OF CANADA'S PRECISE POINT POSITIONING SERVICE

K	ISSUED FOR TENDER	2016/04/15	SBH
G-J	ISSUED FOR PERMITTING / MUNICIPAL APPROVAL	2015/01-06	SBH/TJD
F	REVISED PER NHC COMMENTS	2015/01/08	SBH
E	REVISED PER COMMENTS	2014/12/19	SBH
D	ISSUED FOR REVIEW	2014/11/28	TJD
A-C	PRELIMINARY DESIGN	2011/08-11	ARG
NO.	ISSUE / REVISION	YYYY/MM/DD	BY

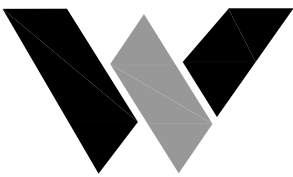
PROJ. MGR. ARG

DESIGN/DRAWN SBH

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HORIZ. SCALE 1:1,250

VERT. SCALE NA



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TOWN OF COMOX

LAZO ROAD SHORELINE PROTECTION AND RESTORATION

LAZO ROAD, COMOX

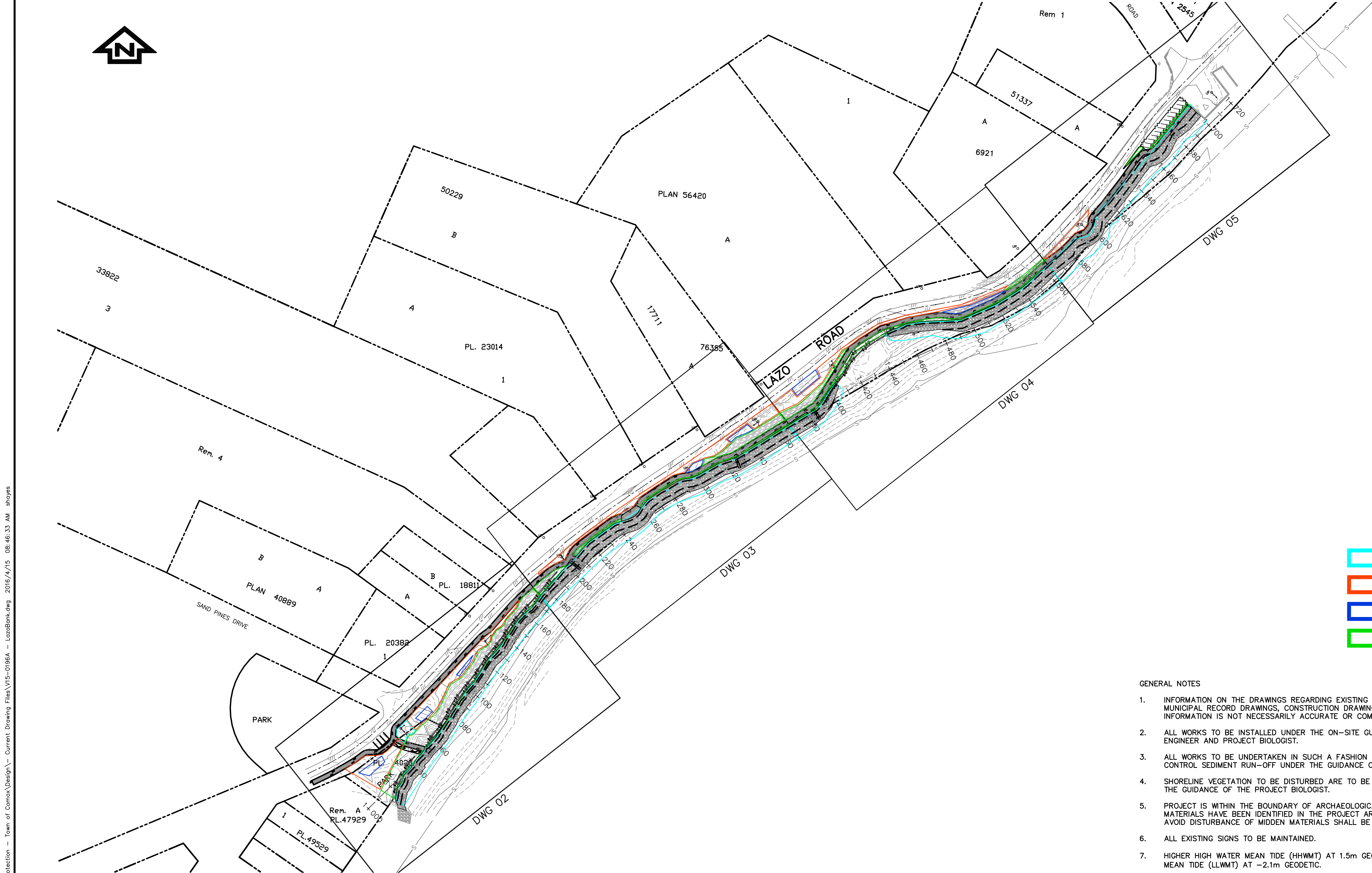
KEY PLAN

DRAWING NO.  
**V15-0196/A-01**

SUB. NO.

OF 14

ISSUE/REV.  
K

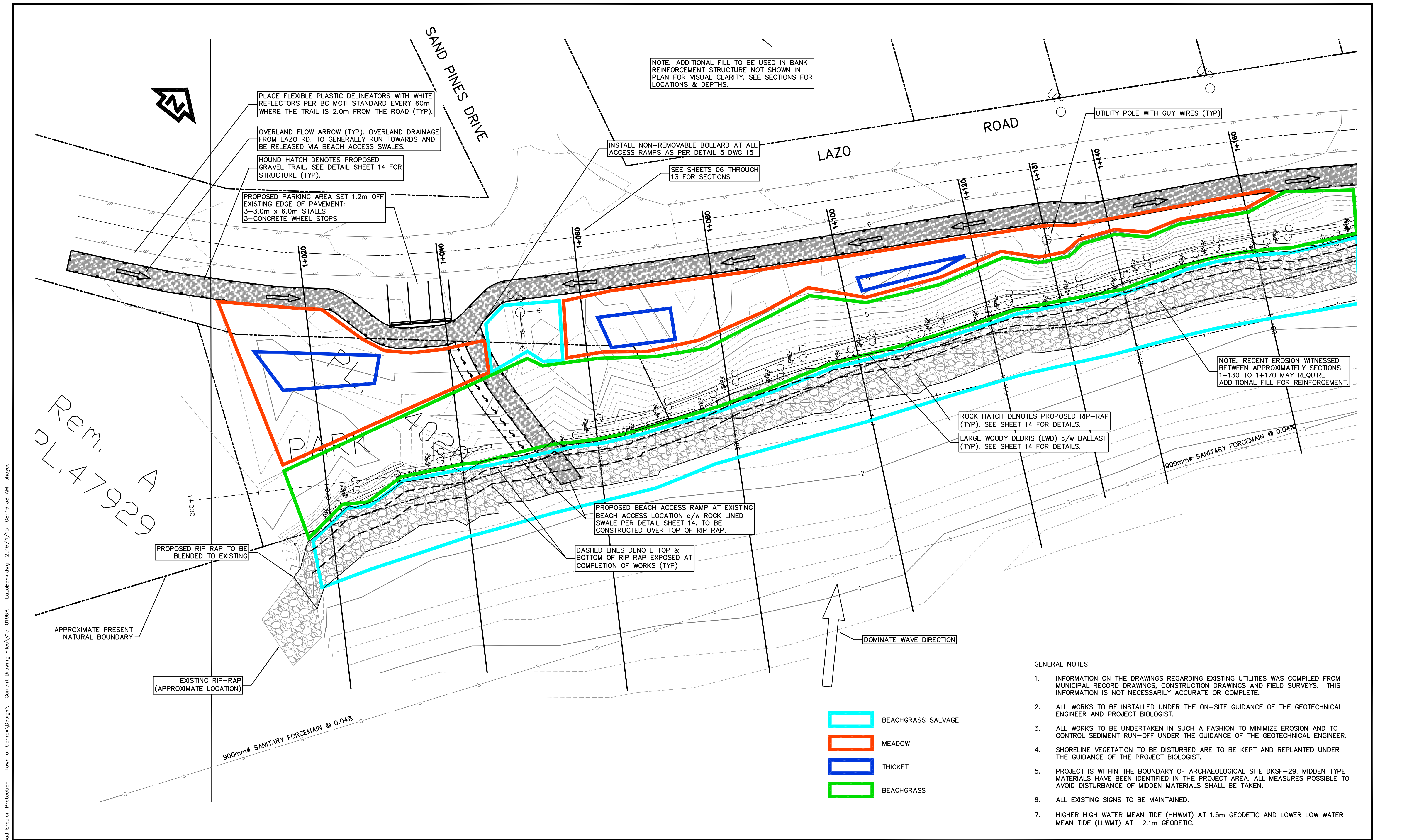


- BEACHGRASS SALVAGE
- MEADOW
- THICKET
- BEACHGRASS


- GENERAL NOTES
- INFORMATION ON THE DRAWINGS REGARDING EXISTING UTILITIES WAS COMPILED FROM MUNICIPAL RECORD DRAWINGS, CONSTRUCTION DRAWINGS AND FIELD SURVEYS. THIS INFORMATION IS NOT NECESSARILY ACCURATE OR COMPLETE.
  - ALL WORKS TO BE INSTALLED UNDER THE ON-SITE GUIDANCE OF THE GEOTECHNICAL ENGINEER AND PROJECT BIOLOGIST.
  - ALL WORKS TO BE UNDERTAKEN IN SUCH A FASHION TO MINIMIZE EROSION AND TO CONTROL SEDIMENT RUN-OFF UNDER THE GUIDANCE OF THE GEOTECHNICAL ENGINEER.
  - SHORELINE VEGETATION TO BE DISTURBED ARE TO BE KEPT AND REPLANTED UNDER THE GUIDANCE OF THE PROJECT BIOLOGIST.
  - PROJECT IS WITHIN THE BOUNDARY OF ARCHAEOLOGICAL SITE DKSF-29. MIDDEN TYPE MATERIALS HAVE BEEN IDENTIFIED IN THE PROJECT AREA. ALL MEASURES POSSIBLE TO AVOID DISTURBANCE OF MIDDEN MATERIALS SHALL BE TAKEN.
  - ALL EXISTING SIGNS TO BE MAINTAINED.
  - HIGHER HIGH WATER MEAN TIDE (HHWMT) AT 1.5m GEODETIC AND LOWER LOW WATER MEAN TIDE (LLWMT) AT -2.1m GEODETIC.



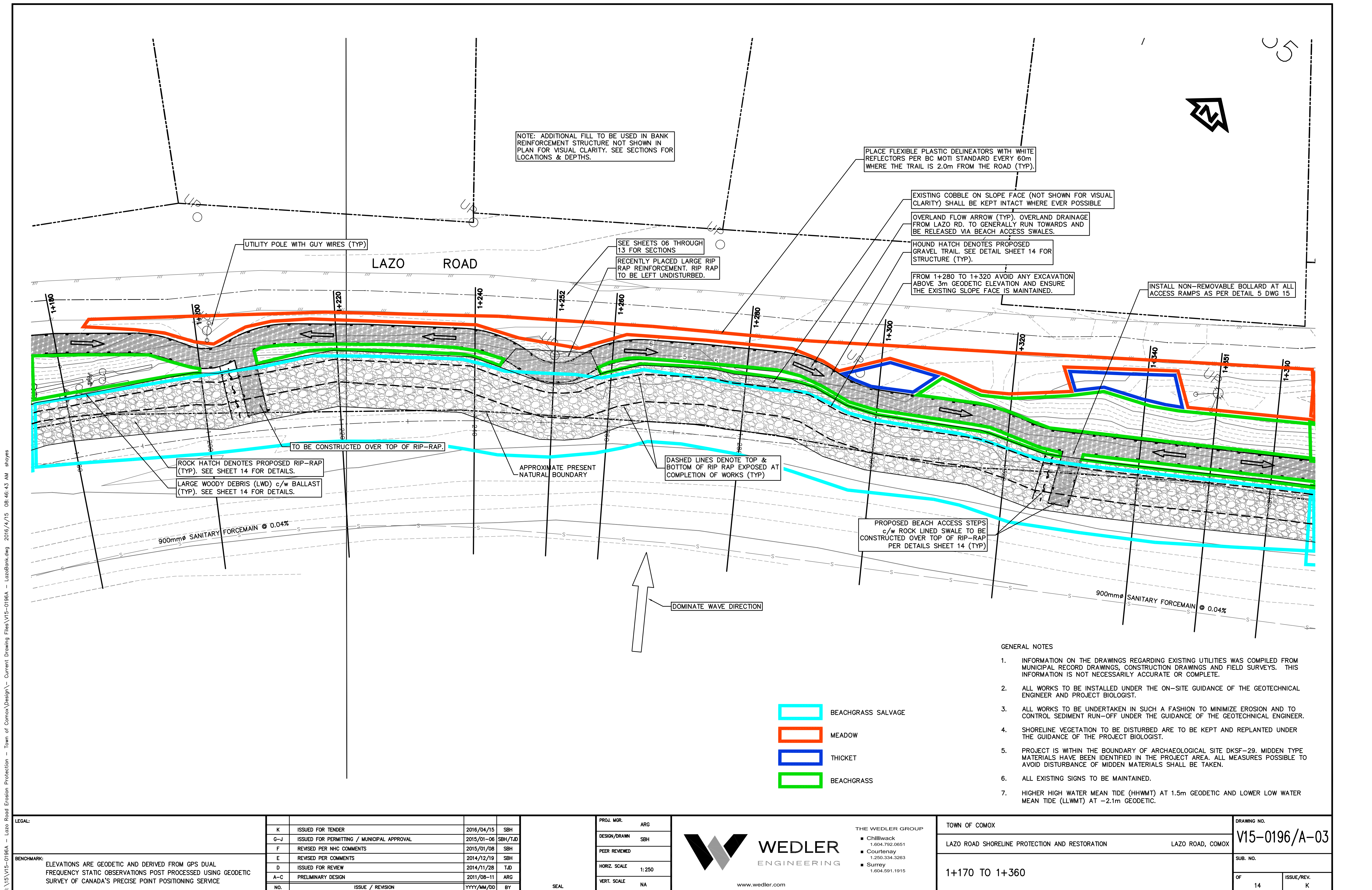
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LEGAL:								PROJ. MGR. ARG		<div><div>WEDLER ENGINEERING</div><div>www.wedler.com</div></div>		THE WEDLER GROUP <ul style="list-style-type: none"><li>■ Chilliwack 1.604.792.0651</li><li>■ Courtenay 1.250.334.3263</li><li>■ Surrey 1.604.591.1915</li></ul>		TOWN OF COMOX		DRAWING NO. <b>V15-0196/A-02</b>	
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		E REVISED PER COMMENTS		2014/12/19		SBH		HORIZ. SCALE 1:250									
BENCHMARK: ELEVATIONS ARE GEODETIC AND DERIVED FROM GPS DUAL FREQUENCY STATIC OBSERVATIONS POST PROCESSED USING GEODETIC SURVEY OF CANADA'S PRECISE POINT POSITIONING SERVICE		D ISSUED FOR REVIEW		2014/11/28		TJD		VERT. SCALE NA				1+000 TO 1+170		SUB. NO.			
		A-C PRELIMINARY DESIGN		2011/08-11		ARG											
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														ISSUE/REV. K			





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ELEVATIONS ARE GEODETIC AND DERIVED FROM GPS DUAL FREQUENCY STATIC OBSERVATIONS POST PROCESSED USING GEODETIC SURVEY OF CANADA'S PRECISE POINT POSITIONING SERVICE

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F	REVISED PER NHC COMMENTS	2015/01/08	SBH
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D	ISSUED FOR REVIEW	2014/11/28	TJD
A-C	PRELIMINARY DESIGN	2011/08-11	ARG
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PROJ. MGR. ARG

DESIGN/DRAWN SBH

PEER REVIEWED

HORIZ. SCALE 1:250

VERT. SCALE NA

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LAZO ROAD SHORELINE PROTECTION AND RESTORATION LAZO ROAD, COMOX

1+170 TO 1+360

DRAWING NO. V15-0196/A-03

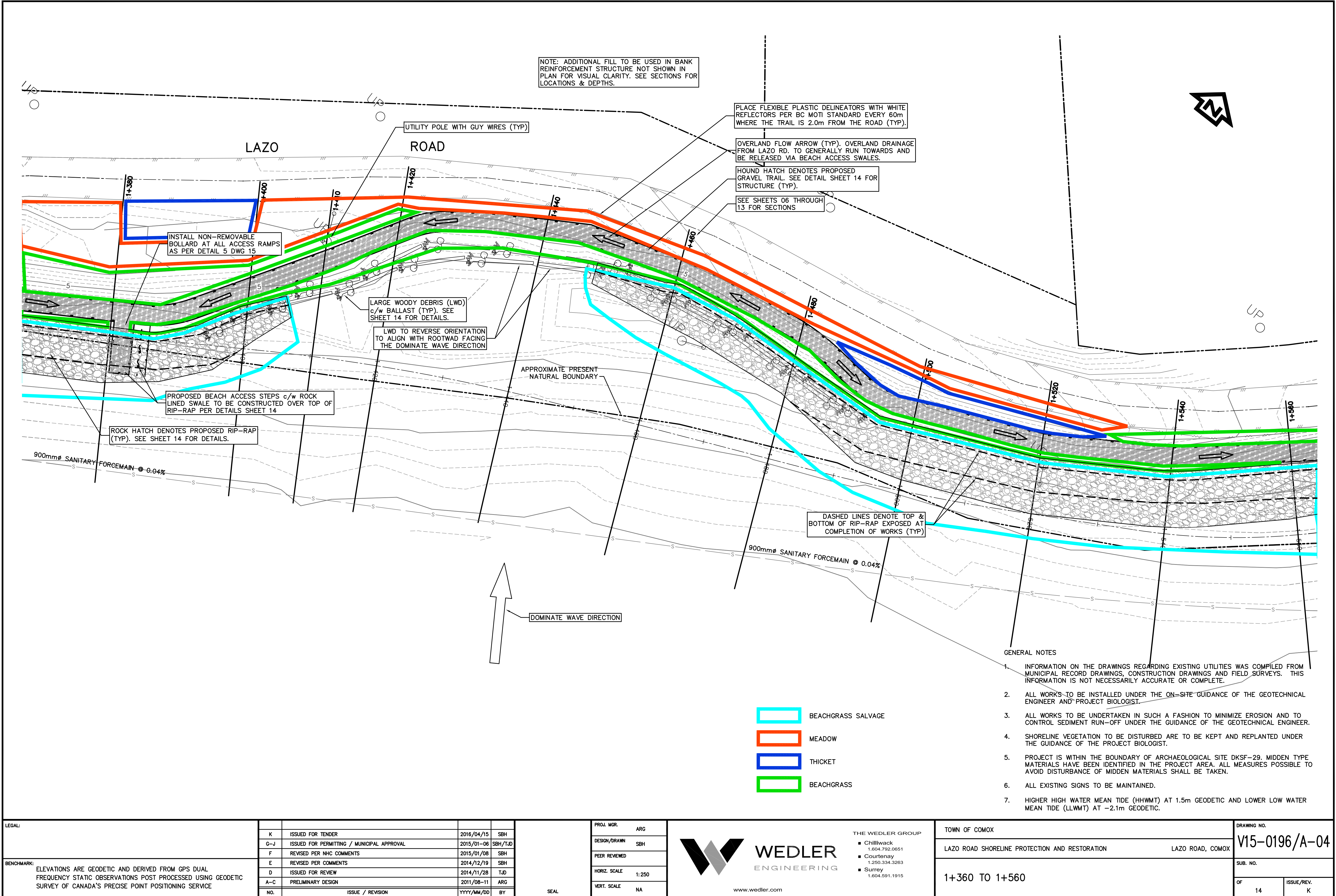
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OF 14

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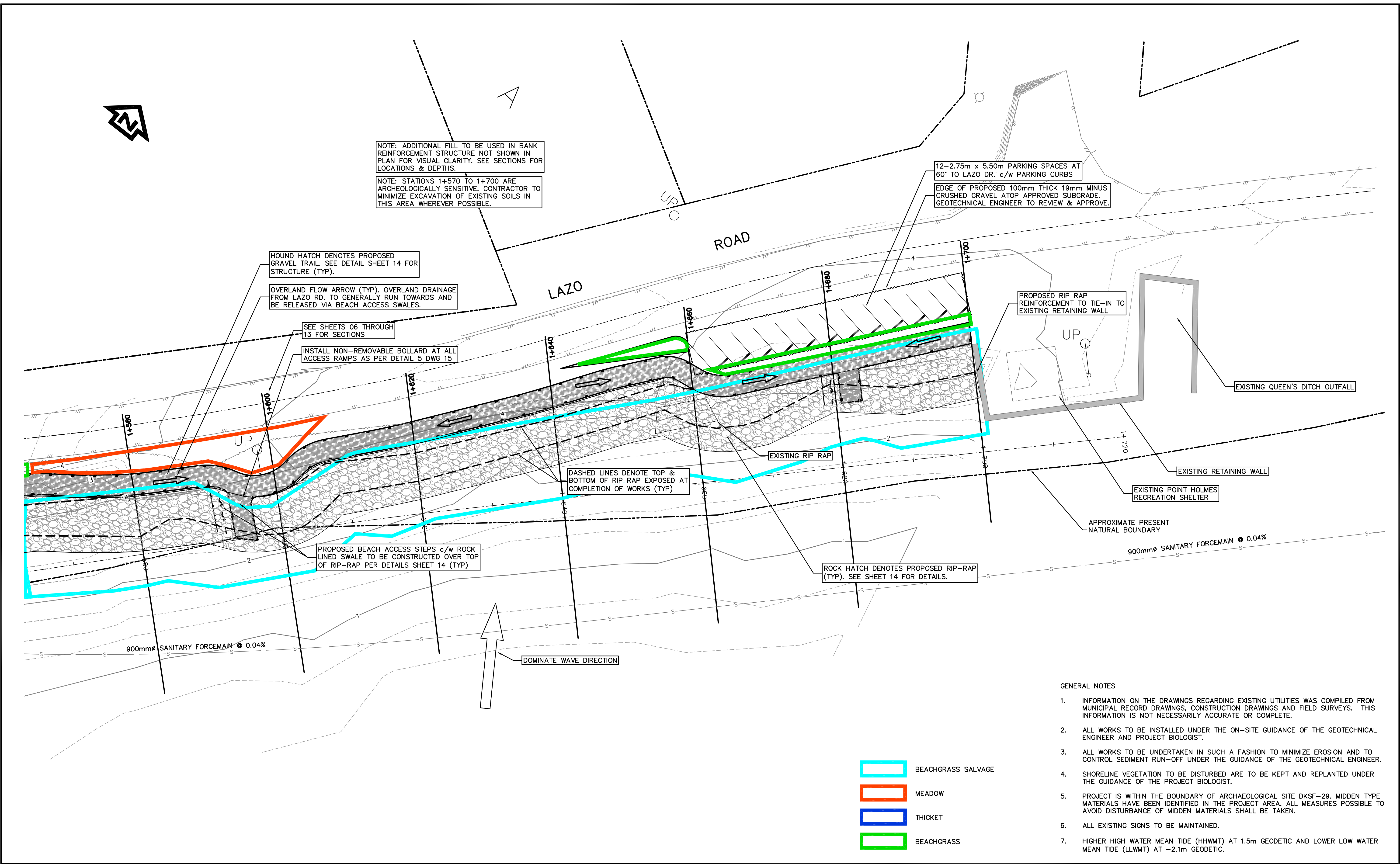


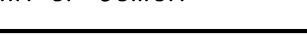
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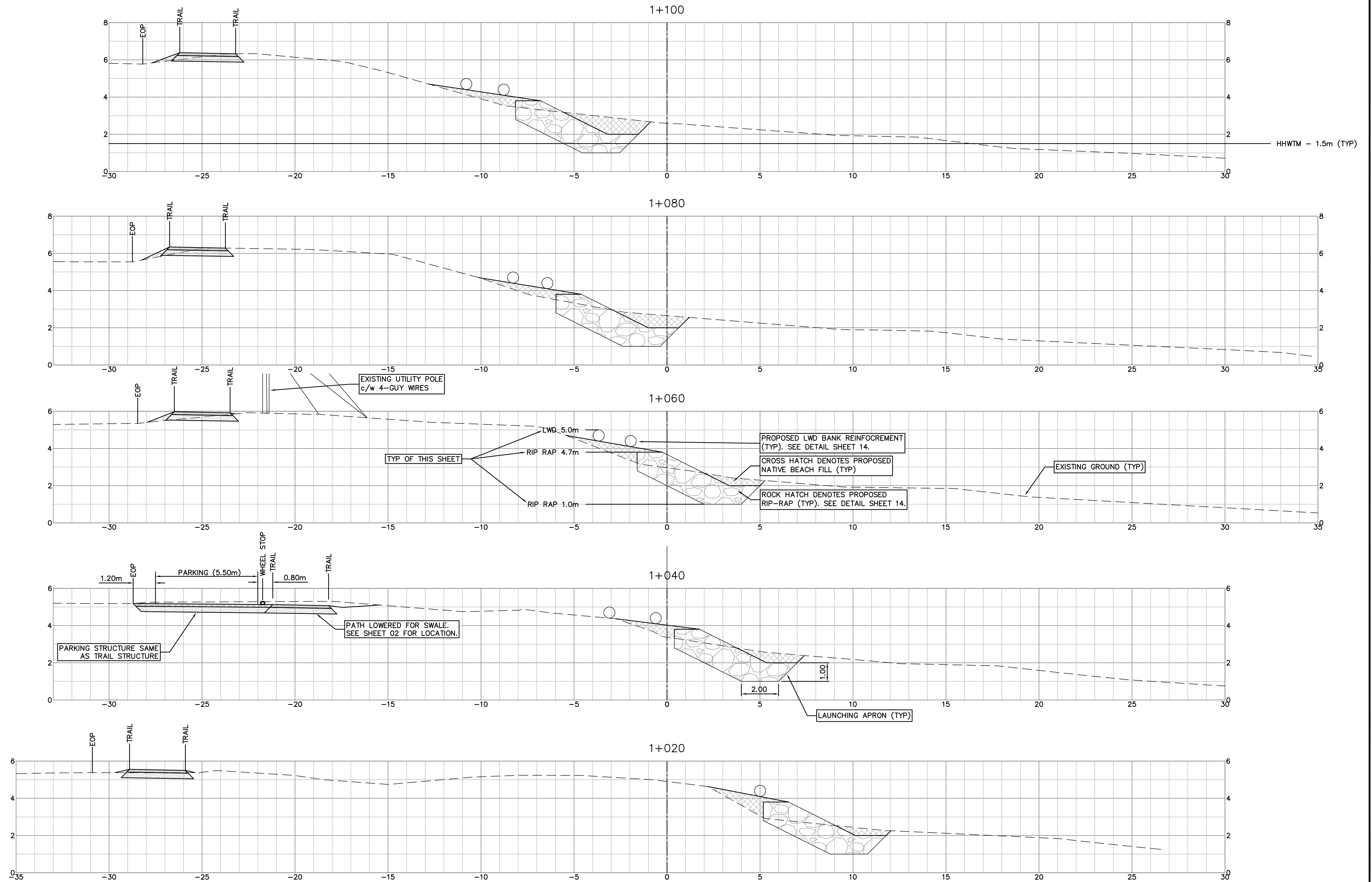
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	E REVISED PER COMMENTS		2014/12/19	SBH											
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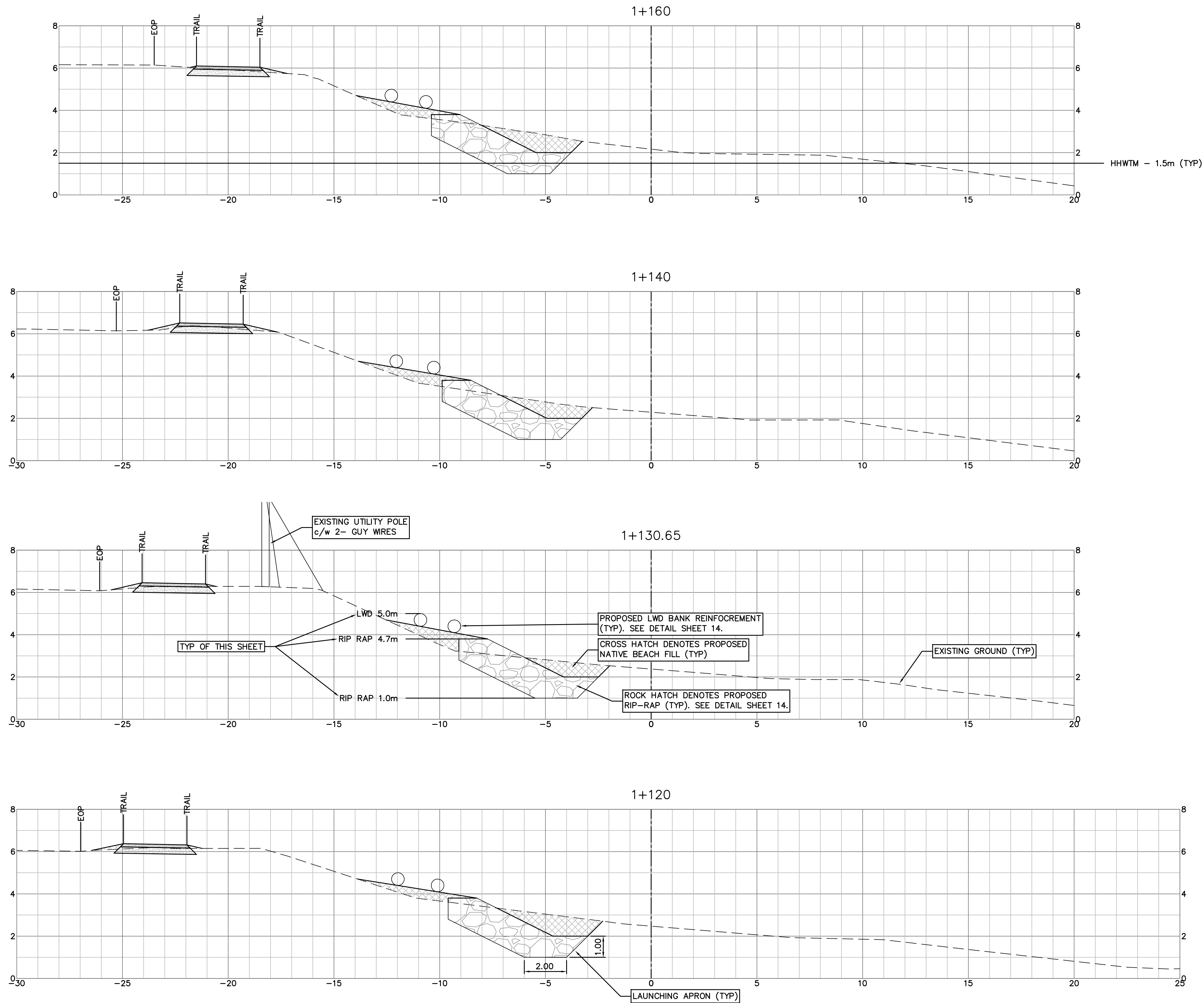
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	E	REVISED PER COMMENTS	2014/12/19	SBH											
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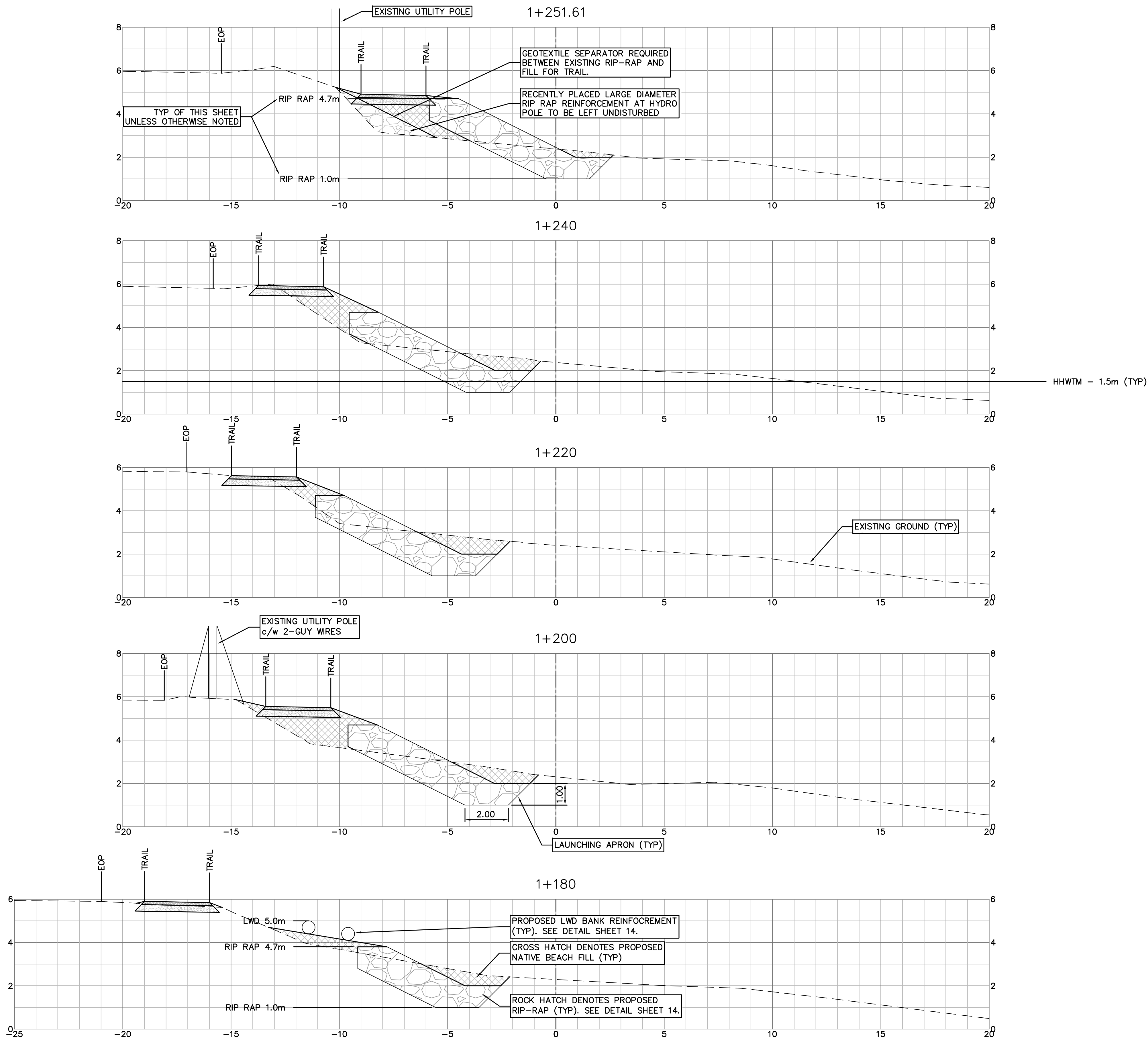



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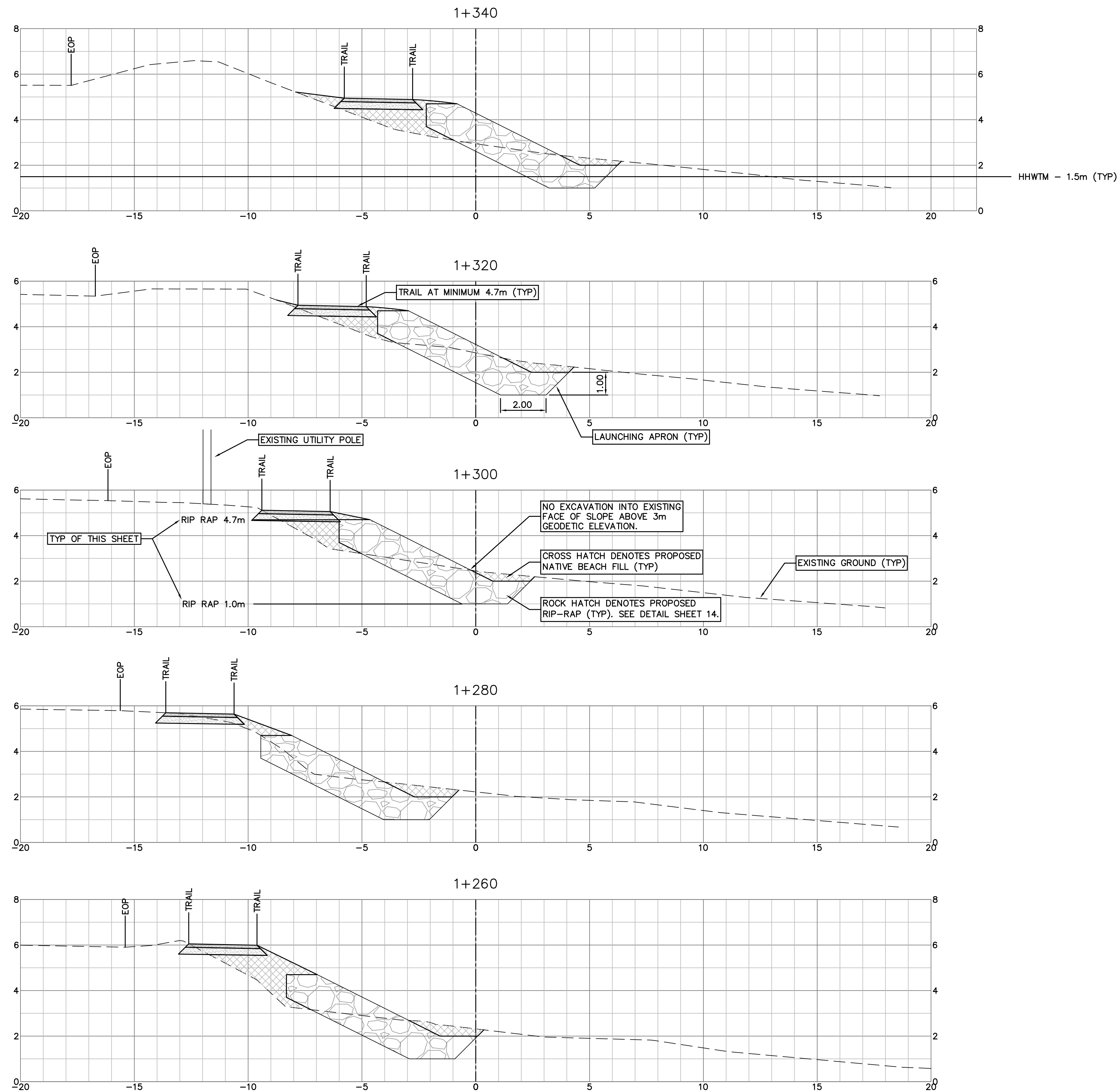





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F REVISED PER NHC COMMENTS			2015/01/08	SBH	PEER REVIEWED							
E REVISED PER COMMENTS			2014/12/19	SBH	HORIZ. SCALE 1:100							
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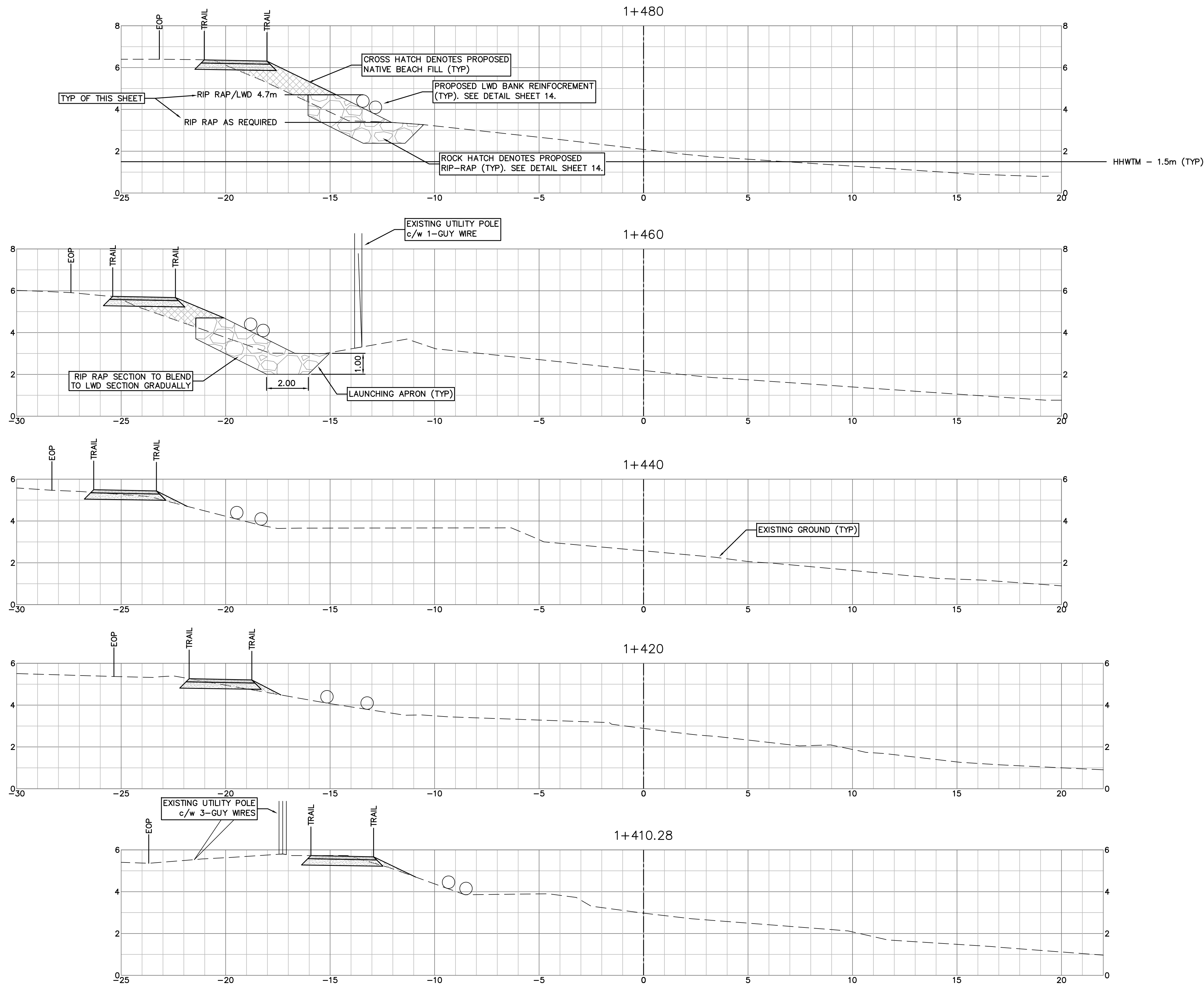
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SEAL

PROJ. MGR.

ARG

DESIGN/DRAWN

SBH

PEER REVIEWED

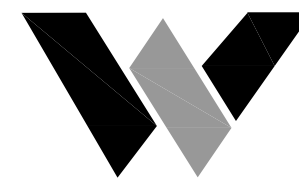
SBH

HORIZ. SCALE

1:100

VERT. SCALE

1:100



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1.250.334.3263
- Surrey  
1.604.591.1915

TOWN OF COMOX

LAZO ROAD SHORELINE PROTECTION AND RESTORATION

LAZO ROAD, COMOX

SECTIONS 1+410.28 TO 1+480

DRAWING NO.

**V15-0196/A-11**

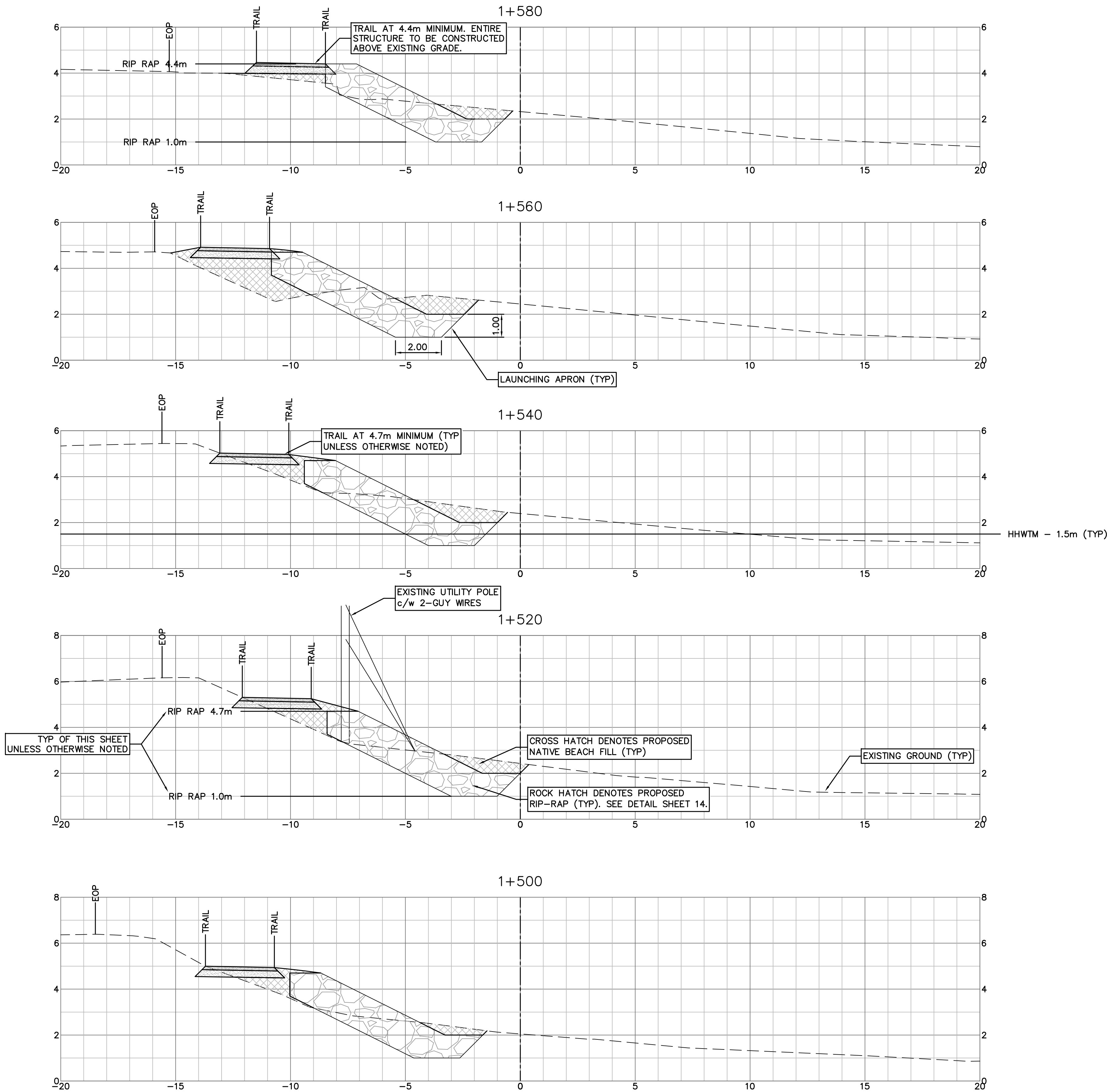
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ISSUE/REV.  
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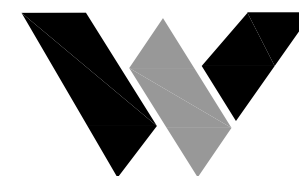
BENCHMARK:

ELEVATIONS ARE GEODETIC AND DERIVED FROM GPS DUAL FREQUENCY STATIC OBSERVATIONS POST PROCESSED USING GEODETIC SURVEY OF CANADA'S PRECISE POINT POSITIONING SERVICE

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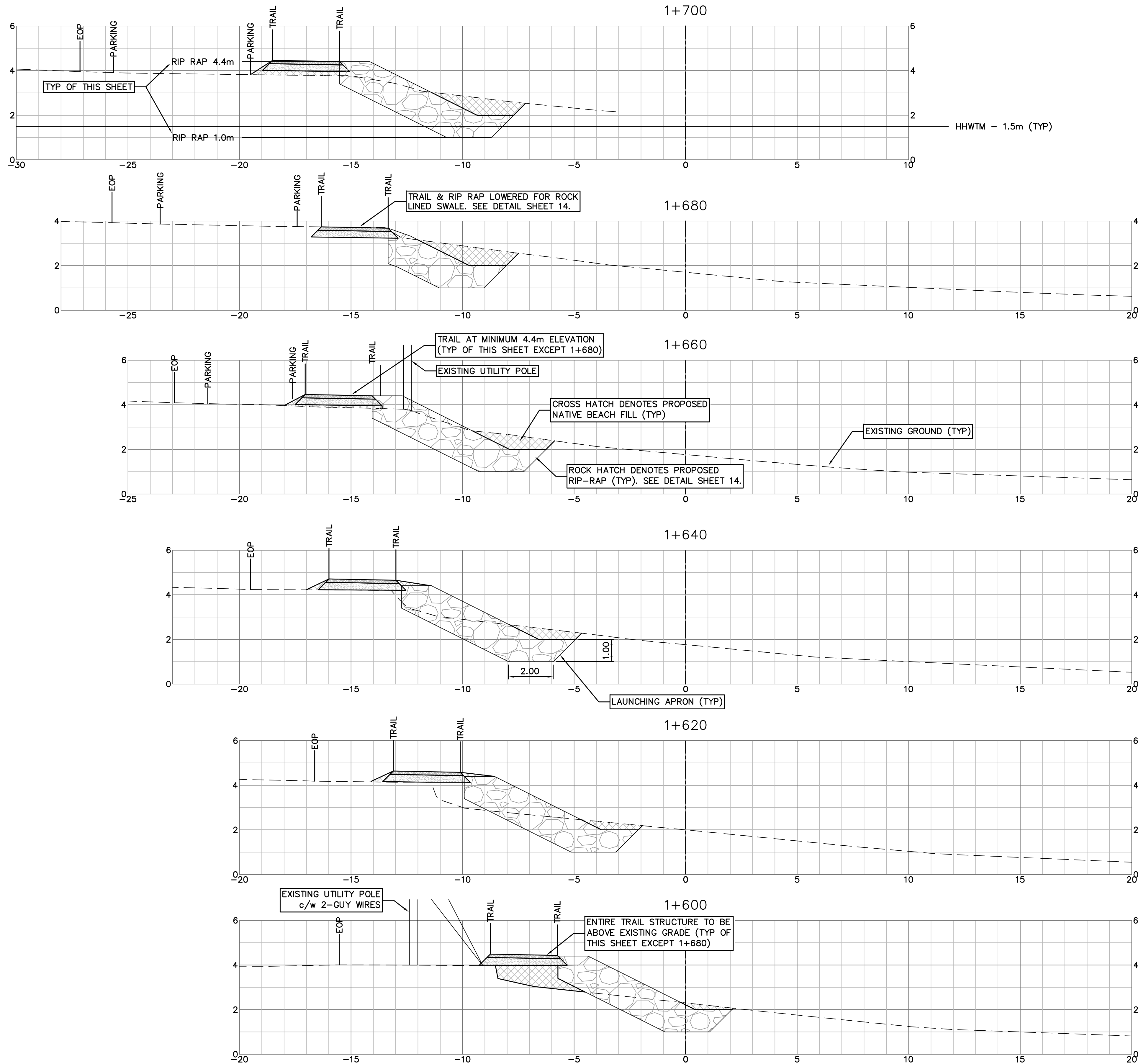
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TOWN OF COMOX	DRAWING NO.
LAZO ROAD SHORELINE PROTECTION AND RESTORATION	LAZO ROAD, COMOX
SECTIONS 1+500 TO 1+580	SUB. NO.
OF 14	ISSUE/REV. K

V15-0196/A-12



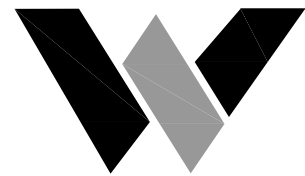
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#### GENERAL

1. THE GOVERNING JURISDICTION FOR THIS PROJECT IS THE TOWN OF COMOX.
2. **ALL WORKS, MATERIALS AND TESTING SHALL BE IN ACCORDANCE WITH THE CURRENT BYLAWS OF THE GOVERNING JURISDICTION, THE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (PRINTED 2000 "GOLD" EDITION) (MMCD).**
3. FOR SITE DIMENSIONS, REFER TO LEGAL SURVEY PLANS. ALL ELEVATIONS ARE SHOWN IN METERS RELATED TO GEODETIC SURVEY OF CANADA. UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE SHOWN IN METERS AND ALL PIPE DIAMETERS ARE SHOWN IN MILLIMETERS.
4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE TO WEDLER ENGINEERING A DIGITAL VIDEO AND PHOTOGRAPHIC RECORD IDENTIFYING ANY AND ALL EXISTING FEATURES TO BE DISTURBED. THE CONTRACTOR SHALL RESTORE ALL DISTURBED PAVEMENT, CURBS, SIDEWALKS, BOULEVARDS, LANDSCAPING, FENCES OR ANY OTHER FEATURES AFFECTED BY THE WORK IN COMPLIANCE WITH THE SPECIFICATIONS OF THE GOVERNING JURISDICTION, MMCD AND ANY RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER AND TO THE SATISFACTION OF THE GOVERNING JURISDICTION AND WEDLER ENGINEERING.
5. THE CONTRACTOR MUST CONTACT THE GOVERNING JURISDICTION AND WEDLER ENGINEERING PRIOR TO CONSTRUCTION TO SCHEDULE A PRE-CONSTRUCTION MEETING.
6. THE CONTRACTOR SHALL NOTIFY WEDLER ENGINEERING A MINIMUM OF 2 WORKING DAYS PRIOR TO REQUIRED INSPECTIONS INCLUDING, BUT NOT LIMITED TO THE FOLLOWING:
  - A) MOBILIZATION
  - B) DURING PIPE LAYING
  - C) DURING CONSTRUCTION OF DETENTION FACILITIES
  - D) DURING PREPARATION OF PAVEMENT STRUCTURE
  - E) TESTING OF ALL UTILITIES
  - F) AFTER COMPLETION OF ALL WORK
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION LAYOUT. CONFIRM BENCH MARK OR TEMPORARY BENCH MARK PRIOR TO CONSTRUCTION. ADVISE WEDLER ENGINEERING OF ANY DISCREPANCIES.
6. ANY VARIATIONS FROM THE PROPOSED WORK MUST BE APPROVED IN WRITING BY WEDLER ENGINEERING. FAILURE TO NOTIFY WEDLER ENGINEERING IN ADVANCE MAY RESULT IN REJECTION OF THE WORK. SUBSTITUTION OF ANY SPECIFIED MATERIALS, PRODUCTS OR EQUIPMENT WITH AN APPROVED EQUAL OR APPROVED EQUIVALENT WILL BE PERMITTED ONLY WITH THE EXPRESS WRITTEN APPROVAL OF WEDLER ENGINEERING, AT ITS DISCRETION.
7. CONTRACTOR SHALL REFER TO GEOTECHNICAL REPORT PREPARED BY LEVETON CONSULTANTS LTD. AND TO HYDRAULIC REPORT PREPARED BY NORTHWEST HYDRAULICS CONSULTANTS.
8. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION SAFETY AT THE PLACE OF WORK AS AND TO THE EXTENT REQUIRED BY APPLICABLE CONSTRUCTION SAFETY LEGISLATION, REGULATIONS AND CODES, AND BY GOOD CONSTRUCTION PRACTICE. THE CONTRACTOR SHALL PERFORM ITS WORKS IN STRICT COMPLIANCE WITH THE REQUIREMENTS, RULES, REGULATIONS, AND BY-LAWS OF ANY FEDERAL, PROVINCIAL OR MUNICIPAL AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL APPLY FOR AND OBTAIN ALL REQUIRED PERMITS.
9. THE CONTRACTOR SHALL MAINTAIN AND REPAIR ALL PUBLIC AND PRIVATE ROADS AFFECTED BY THE WORK AND ARRANGE FOR ADEQUATE STREET CLEANING DURING WORKING DAYS.
10. THE CONTRACTOR SHALL PREPARE A TRAFFIC MANAGEMENT PLAN FOR APPROVAL BEFORE START OF CONSTRUCTION. TRAFFIC MANAGEMENT PLAN TO BE IN ACCORDANCE WITH THE GOVERNING JURISDICTION'S REGULATIONS. AS A MINIMUM, ONE LANE TRAFFIC MUST BE MAINTAINED AND KEPT OPEN AT ALL TIMES.
11. THE CONTRACTOR SHALL CARRY OUT THE WORK SO AS TO MINIMIZE THE INCONVENIENCE TO THE PUBLIC. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SERVICES AND ACCESS TO RESIDENCES AND BUSINESSES AT ALL TIMES FOR VEHICLES AND PEDESTRIANS. ANY DISRUPTIONS THAT ARE UNAVOIDABLE WILL REQUIRE A MINIMUM NOTICE OF 2 WORKING DAYS BE GIVEN TO PROPERTY OWNERS, THE GOVERNING JURISDICTION AND WEDLER ENGINEERING.
12. THE CONTRACTOR SHALL RECORD ON A CURRENT SET OF PLANS IN A NEAT MANNER, ALL CHANGES, ADDITIONS AND DELETIONS TO REFLECT THE "AS CONSTRUCTED" INSTALLATION. THIS SET OF PLANS SHALL BE RETURNED TO WEDLER ENGINEERING AT THE COMPLETION OF THE WORKS AND PRIOR TO THE ISSUANCE OF SUBSTANTIAL PERFORMANCE. ANY ADDITIONAL SURVEY REQUIRED TO COMPLETE THE RECORD DRAWINGS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

#### EXISTING STRUCTURES, UTILITIES AND PROPERTIES

1. **INFORMATION ON THE DRAWINGS REGARDING EXISTING UTILITIES WAS COMPILED FROM RECORD DRAWINGS, CONSTRUCTION DRAWINGS AND FIELD SURVEYS. THIS INFORMATION IS NOT NECESSARILY ACCURATE OR COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DATA BY EXPOSURE BEFORE ANY CONSTRUCTION AND TO IMMEDIATELY REPORT ANY DISCREPANCIES TO WEDLER ENGINEERING. BEFORE CONSTRUCTION, ALL TIE-IN INVERTS SHALL BE CONFIRMED, AND EXPOSURES PERFORMED WHERE THERE IS POTENTIAL FOR CONFLICTS BETWEEN EXISTING AND PROPOSED SERVICES. ANY COSTS RESULTING FROM THE CONTRACTOR'S FAILURE TO DO SO SHALL BE AT THE CONTRACTOR'S EXPENSE.**
2. **BEFORE CONSTRUCTION THE CONTRACTOR SHALL ASCERTAIN FOR HIMSELF THE EXACT LOCATION OF BOUNDARIES OF PROPERTIES, RIGHTS-OF-WAY OR EASEMENTS. ANY COST RESULTING FROM SPECIAL CONSTRUCTION METHODS, EQUIPMENT OR MATERIALS REQUIRED TO PERFORM THE WORK WITHOUT ENCRoACHING ON OR CAUSING DAMAGE TO OTHER PROPERTY, SHALL BE INCLUDED IN THE CONTRACT PRICE, AND NO ADDITIONAL PAYMENT WILL BE MADE FOR SUCH COSTS.**

#### COORDINATION WITH OTHER WORK

1. CONTRACTOR TO IMMEDIATELY REPORT (TO WEDLER ENGINEERING AND OTHERS AS REQUIRED) ANY CONFLICTS, DISCREPANCIES, ETC. BETWEEN WORKS SHOWN ON WEDLER ENGINEERING PLANS AND WORKS SHOWN ON ANY OTHER PLANS.

#### QUALITY CONTROL

1. ALL TESTING SHALL BE PERFORMED BY INDEPENDENT AND CERTIFIED TESTING AGENCIES AT THE CONTRACTOR'S COST.
2. ALL REQUIRED TESTING OF THE SUBGRADE, EMBANKMENT, BACKFILL, GRANULAR MATERIALS, COMPACTION, CONCRETE, ASPHALT, GROWING MEDIUM, ETC. IS THE RESPONSIBILITY OF THE CONTRACTOR AND AT THE CONTRACTOR'S COST.
3. MATERIAL TESTS SHALL BE PERFORMED AT THE MINIMUM FREQUENCIES / INTERVALS AS PER THE GOVERNING JURISDICTION'S REGULATIONS, OR AS PER "WEDLER MINIMUM MATERIAL TEST FREQUENCIES", WHICHEVER IS GREATER.
4. IN ADDITION TO THE REQUIREMENTS OF THE GENERAL CONDITIONS, THE CERTIFICATE OF SUBSTANTIAL PERFORMANCE WILL NOT BE ISSUED PRIOR TO RECEIPT BY WEDLER ENGINEERING OF COPIES OF ALL REQUIRED CERTIFICATES, INSPECTION AND TESTING REPORTS.

#### EROSION PROTECTION STRUCTURES AND GEOSYNTHETICS

1. DESIGN AND CONSTRUCTION OF ALL SLOPES AND RETAINING WALLS TO BE CERTIFIED BY THE GEOTECHNICAL ENGINEER.
2. SHORELINE EROSION PROTECTION WORK SHALL BE CARRIED OUT IN STAGES TO MINIMIZE THE EFFECT OF EROSION FROM TIDAL VARIATIONS, WAVES & CURRENTS. IN GENERAL, WORK BELOW TIDE LEVEL SHOULD BE COMPLETED IN ONE LOW TIDE SEQUENCE.
3. EXISTING VEGETATION IS TO BE SALVAGED AND REPLANTED IN ACCORDANCE WITH THE PROJECT BIOLOGIST. CRITICAL SPECIES TO BE IDENTIFIED DURING A SITE WALK AT PROJECT START-UP.
4. RIP RAP IS TO BE DELIVERED TO THE CONSTRUCTION AREA FROM UP LAND AREAS. SPECIAL PERMITS AND PERMISSION NOT CURRENTLY ALLOWED FOR WOULD BE REQUIRED TO DELIVER RIP RAP FROM BEACH LEVEL.
5. A SEDIMENT AND EROSION CONTROL PLAN IS THE BE SUBMITTED AND APPROVED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF RIP RAP INSTALLATION.

#### SUBGRADE PREPARATION

6. BEACH DEBRIS, VEGETATION & NEAR SURFACE ORGANIC RICH SOIL SHOULD BE REMOVED TO PROVIDE A STABLE BASE TO SUPPORT THE RIP RAP. MIDDEN DEPOSITS ARE NOT TO BE DISTURBED UNLESS APPROVED OR UNDER GUIDANCE OF THE PROJECT ARCHEOLOGIST.
7. IRREGULAR UNDERCUT AREAS OF BANK SHOULD BE SHAPED TO PROVIDE A RELATIVELY EVEN SURFACE FREE FROM SHARP POINTS OR STICKS THAT COULD PUNCTURE THE GEOTEXTILE. SUBJECT TO GEOTECHNICAL REVIEW, EXCAVATED SAND AND GRAVEL FROM THE RIP RAP TOE AREA MAY BE UTILIZED TO REGRADE THE EXISTING BANK TO A FLATTER SLOPE.
8. THE PREPARED SLOPE AND TOE SUBGRADE SURFACES SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF GEOTEXTILE, FILL AND/OR RIP RAP. APPROVED SUBGRADE TO BE COVERED AS SOON AS POSSIBLE.

#### ROCK MATERIALS

9. ALL ROCK MATERIALS WILL BE ROUGH, ANGULAR QUARRIED STONE OF A DENSE, HARD, DURABLE CHARACTER, FREE FROM ORGANIC MATERIAL, IN-FILLED JOINTS, SEAMS OR OTHER DEFECTS, RESISTANT TO BREAKDOWN BY HANDLING, FROST ACTION OR WEATHERING AND NOT SUBJECT TO DETERIORATION IN SEA WATER. THE LEAST DIMENSION OF AN INDIVIDUAL ROCK FRAGMENT SHALL NOT BE LESS THAN ONE-THIRD THE GREATEST DIMENSIONS OF THE ROCK FRAGMENT.
10. AS A MINIMUM, ROCKS WILL MEET THE FOLLOWING TEST REQUIREMENTS PER TABLE 1 THIS SHEET.
11. RIP RAP SHALL BE GRADED BASED ON BC-MOT - SECTION 205 AND SUMMARIZED IN TABLE 2 & 3 THIS SHEET, WHEREIN BELOW ELEVATION 2.1m TO MEET 1000KG CLASS AND ABOVE ELEVATION 2.1m TO MEET 500KG CLASS. IN GENERAL, COARSER PARTICLES ARE TO BE PLACED LOWER IN THE SLOPE.
12. ROCK SIZE, GRADATION & REQUIRED TEST REPORT MUST BE APPROVED BY THE CONSULTANT BEFORE CONSTRUCTION COMMENCES.
13. CONTROL OF THE GRADATION OF RIP RAP TO BE DONE BY VISUAL INSPECTION. THE CONTRACTOR MAY BE REQUIRED TO ARRANGE A SAMPLE FOR INSPECTION WITH INDIVIDUAL PIECES WEIGHTED AND MARKED WITH THE WEIGHT.
14. THE CONTRACTOR SHALL PROVIDE THE CONSULTANT WITH EVIDENCE OF THE ACCEPTABILITY OF THE RIP RAP MATERIAL. RELIABLE PERFORMANCE RECORDS OF PROPOSED MATERIAL WILL BE CONSIDERED AS A COMPONENT OF ACCEPTABILITY.
15. THE ACCEPTANCE OF ROCK SAMPLES FROM A PARTICULAR SOURCE OR QUARRY SITE SHALL NOT NECESSARILY BE CONSTRUED AS CONSTITUTING ACCEPTANCE OF ALL MATERIAL FROM THAT LOCATION.

#### GEOTEXTILE

16. A HEAVY WEIGHT, NON-WOVEN GEOTEXTILE (ARMTEC 250 OR APPROVED ALTERNATE) SHALL BE PLACED OVER THE PREPARED SUBGRADE PERPENDICULAR TO THE SLOPE AND OVERLAPPED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

#### RIP RAP PLACEMENT

17. RIP RAP IS TO BE PLACED IN A MANNER THAT AVOIDS DAMAGE TO THE UNDERLYING GEOTEXTILE FILTER SEPARATOR.
18. THE RIP RAP SHOULD BE PLACED TO A NOMINAL THICKNESS OF 1.5m AS MEASURED AT RIGHT ANGLES TO THE SLOPE.
19. RIP RAP IS TO BE PLACED WITH GOOD INTERLOCK BETWEEN ROCK FRAGMENTS TO ACHIEVE A 2H:1V SLOPE FACE (OR GENTLER) AS SHOWN ON SECTIONS. THE FINISHED SURFACE TO BE REASONABLY UNIFORM WITHOUT LARGE CAVITIES, AND WITHOUT INDIVIDUAL STONES PROTRUDING ABOVE THE SURFACE.
20. THE CONTRACTOR IS TO PROVIDE ALL ASSISTANCE NECESSARY TO CONFIRM THAT THE ROCK BEING PLACED CONFORMS TO THE SPECIFICATIONS.

#### LWD PLACEMENT

21. ONLY LARGE MEMBERS CONFORMING TO THE FULL DIMENSIONS PER DETAIL 1 THIS SHEET SHALL BE USED.
22. LWD MEMBERS TO BE INSTALLED WITH THE ROOTWAD FACING THE DOMINATE WAVE DIRECTION, WHICH IS SOUTHEAST PER NHC.
23. LWD MEMBERS TO BE EMBEDDED TO APPROXIMATELY 50% HEIGHT TO PREVENT SCOUR BENEATH MEMBERS.
24. WHEN LWD MEMBERS ARE PLACED IN TWO OR MORE ROWS, ROWS ARE TO BE STAGGERED WITH MEMBERS OVERLAPPING A MINIMUM 2.5m.
25. CABLES TO DEADMEN AND BALLAST BOULDERS TO BE INSTALLED WITHOUT SLACK. DEADMAN BOULDERS CAN BE INCORPORATED INTO RIP-RAP.

#### MEASUREMENT & PAYMENT

26. MEASUREMENT SHALL BE MADE BY MULTIPLYING THE FACIAL AREA BY THE AVERAGE THICKNESS DIMENSIONS AS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE CONTRACT ADMINISTRATOR. NO ALLOWANCES WILL BE MADE FOR THE QUANTITY OF ROCK PLACED IN EXCESS OF THESE DIMENSIONS.
27. PAYMENT SHALL BE ON THE BASIS OF THE UNIT PRICE BID PER CUBIC METER FOR THE TYPE AND CLASS OF RIP RAP SPECIFIED OR REQUIRED. THE UNIT PRICE BID SHALL INCLUDE ALL COSTS TO DEVELOP THE SOURCE AND PRODUCE THE RIP RAP.

#### PATHWAY

1. SITE PREPARATION FOR THE PATHWAY IS TO INCLUDE STRIPPING AND REMOVING VARIABLE FILL MATERIAL AND ORGANIC SILT FROM THE SUPPORT AREA (DEFINED AS 0.3 M LATERSLIP PLUS 1H:1V FROM THE EDGE OF THE PATHWAY) TO EXPOSE THE UNDERLYING INORGANIC NATURAL SOILS. NATURAL SOILS ARE EXPECTED TO GENERALLY CONSIST OF LOOSE, FINE TO MEDIUM GRAINED SAND (DUNE SAND) BUT MAY ALSO INCLUDE SOME LOCALIZED AREAS WITH SAND AND / OR GRAVEL BEACH DEPOSITS.
2. ALL SUBGRADE AREAS SHOULD BE COMPACTED WITH A ROLLER OR HEAVY PLATE COMPACTOR IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER TO IDENTIFY THE PRESENCE OF VISIBLY POOR SOILS. LOCAL AREAS THAT PERFORM POORLY DURING THE COMPACTION SHOULD BE EXCAVATED AND REPLACED WITH ENGINEERED FILL AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
3. A GEOTEXTILE SEPARATOR (I.E., MEDIUM WEIGHT, NON-WOVEN GEOTEXTILE SUCH AS ARMTEC 200, OR APPROVED EQUIVALENT) MAY BE REQUIRED TO SEPARATE THE SAND AND GRAVEL FROM UNDERLYING COARSE MATERIALS. DIRECTION TO BE PROVIDED ON SITE BY THE GEOTECHNICAL ENGINEER BASED ON SUBGRADE CONDITIONS.
4. AN EXCEPTION IS AT THE EAST END OF THE PROJECT AREA (1+570 TO 1+700), WHERE A LAYER OF BLACK SILT WITH NUMEROUS SHELLS - IDENTIFIED AS ARCHEOLOGICALLY SENSITIVE BY OTHERS - IS PRESENT NEAR GROUND SURFACE AND IS TO NOT BE DISTURBED. IN THIS AREA THE CONTRACTOR MAY COMPACT SUBGRADE ONLY WITH APPROVAL OF PROJECT ARCHEOLOGIST AND IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER. A BIALXIAL GEOGRID (BX1100, OR APPROVED EQUIVALENT) IS TO BE PLACED ON GEOTECHNICALLY APPROVED SUBGRADE AT THE BASE OF THE PATH STRUCTURE. A GEOTEXTILE SEPARATOR MAY ALSO BE NEEDED.
5. SUBGRADE IS TO BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF ENGINEERED FILL AND / OR GEOTEXTILE.
6. ADD A SPECIFICATION REFERENCE FOR MATERIALS: SUBBASE, BASE (PER MMCD OR MOTI).
7. ADD A GENERAL REFERENCE TO MATERIAL REUSE: ON SITE MATERIAL TO BE USED AS ENGINEERED FILL ONLY WITH APPROVAL OF GEOTECHNICAL ENGINEER.
8. ENGINEERED FILL SHOULD BE PLACED IN UNIFORM HORIZONTAL LIFTS NOT EXCEEDING 300 MM (LOOSE) AND COMPACTED TO A MINIMUM OF 95% OF MODIFIED PROCTOR MAXIMUM DRY DENSITY (MPMD). COMPACTION EQUIPMENT SHOULD BE COMMENSURATE WITH THE LIFT THICKNESS.

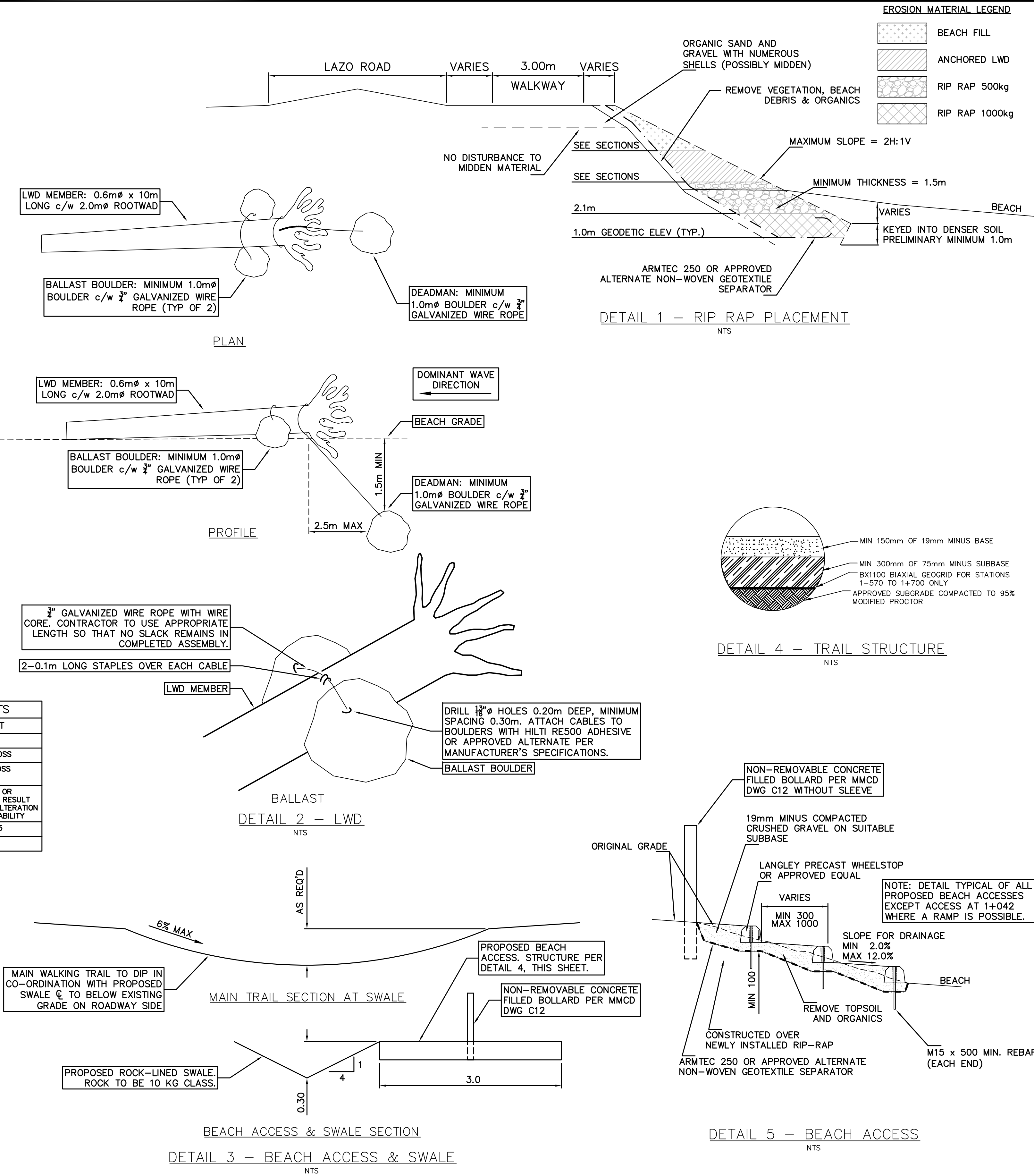
TABLE 1: RIP RAP TESTING REQUIREMENTS	
TEST	REQUIREMENT
ABSORPTION (ASTM C127)	NOT MORE THAN 2%
ABRASION, 500 REVOLUTIONS (ASTM C535)	NOT MORE THAN 20% LOSS
MAGNESIUM SULPHATE SOUNDNESS, 5 CYCLES (ASTM C88)	NOT MORE THAN 10% LOSS
PETROGRAPHIC EXAMINATION	ABSENCE OF WEAKNESS OR MATERIALS THAT COULD RESULT IN SIGNIFICANT STONE ALTERATION AND REDUCTION IN DURABILITY
DEGRADATION (ASTM D3744)	NO INDEX LESS THAN 35
BULK SPECIFIC GRAVITY (SSD, ASTM C127)	NOT LESS THAN 2.65


TABLE 2: GRADATION OF ROCK SIZES			
ROCK CLASS	PERCENTAGE OF ROCK LARGER THAN GIVEN ROCK MASS		
	85%	50%	15%
500	50kg	500kg	1500kg
1000	100kg	1000kg	3000kg

NOTE 1: SAND AND ROCK DUST SHALL BE LESS THAN 5% BY MASS OF THE TOTAL MATERIAL.

THE PERCENTAGE OF THIS SIZE MATERIAL SHALL NOT EXCEED AN AMOUNT THAT WILL FILL THE VOIDS BETWEEN LARGER ROCKS. IN GENERAL, ROCK ON THE FACE OF THE RIP RAP SHALL NOT BE LESS THAN 0.5m $\phi$ .

TABLE 3: APPROXIMATE AVERAGE DIMENSION OF AN ANGULAR ROCK FOR A GIVEN MASS					
kg	3000	2000	1000	500	50
mm	1350	1200	1000	800	350



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