

# CREUS Engineering

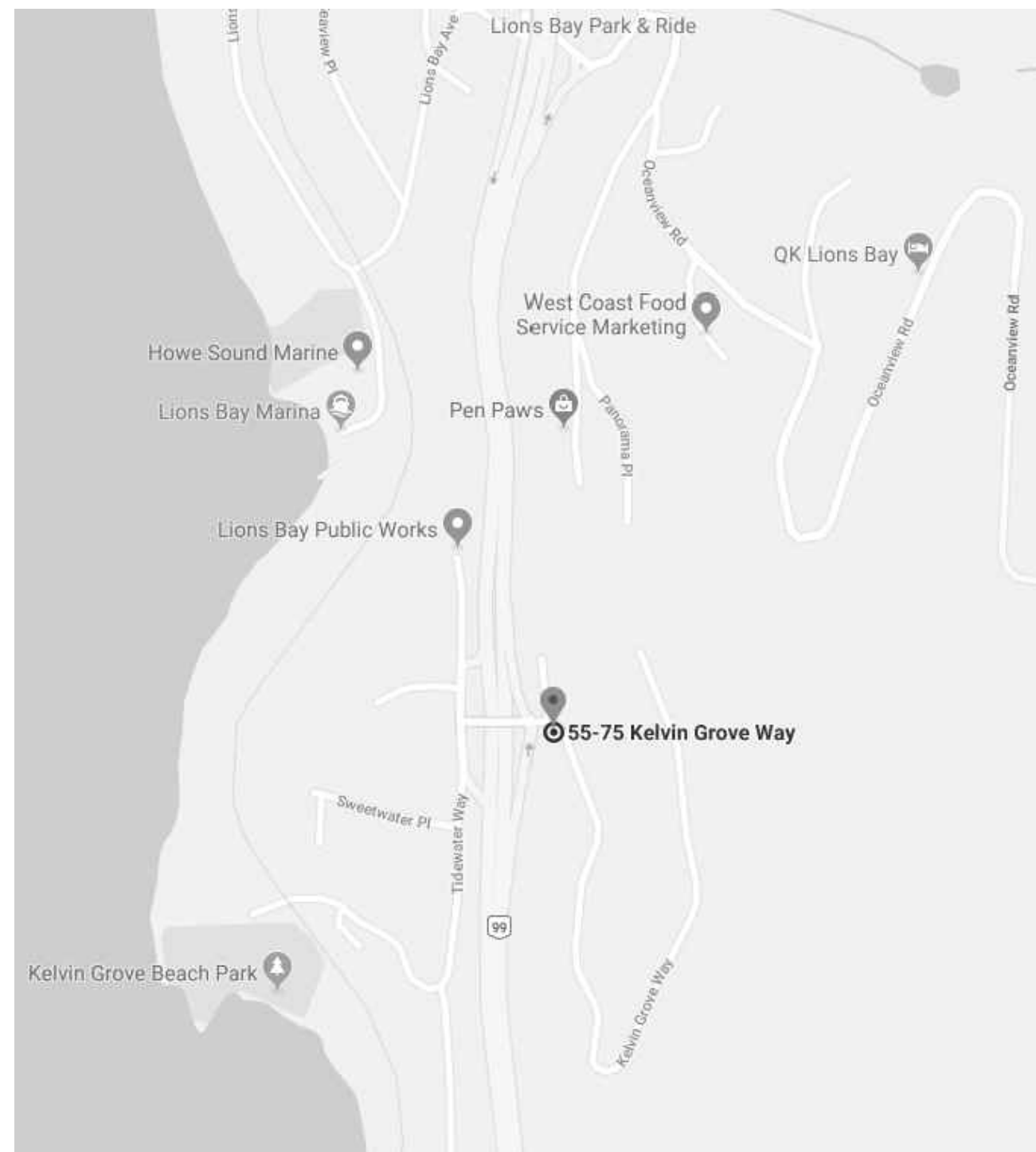
Civil Engineers & Project Managers  
#610 EAST TOWER - 221 ESPLANADE WEST, NORTH VANCOUVER BC, V7M3J3  
PH: 604-987-9070 WEBSITE: www.creus.ca

PROJECT:

## KELVIN GROVE LOT SERVICING LIONS BAY, BC

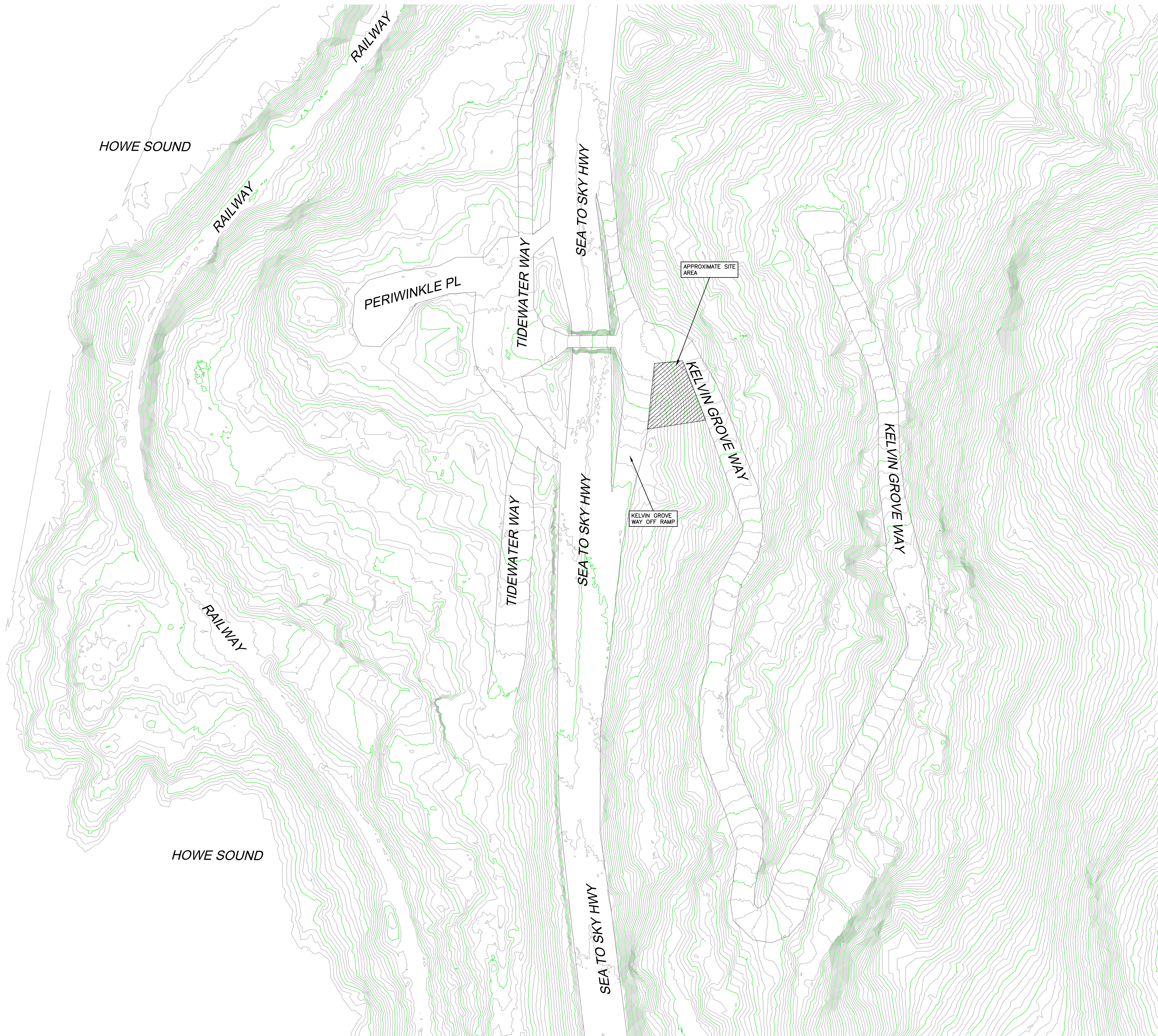
CLIENT:

## VILLAGE OF LIONS BAY

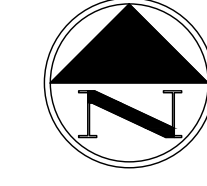


DRAWING LIST		
DWG NO		
CONTEXT-1	CONTEXT PLAN	
KEY-1	KEY PLAN	
ESC-1	EROSION SEDIMENT CONTROL	
TMP-1	TRAFFIC MANAGEMENT PLAN	
R-1	ROADWORKS PLAN	DITCHING
XS-1	CROSS SECTIONS	DITCH
DET-1	DETAILS	
DET-2	DETAILS	

**2018-07-17  
ISSUED FOR TENDER**



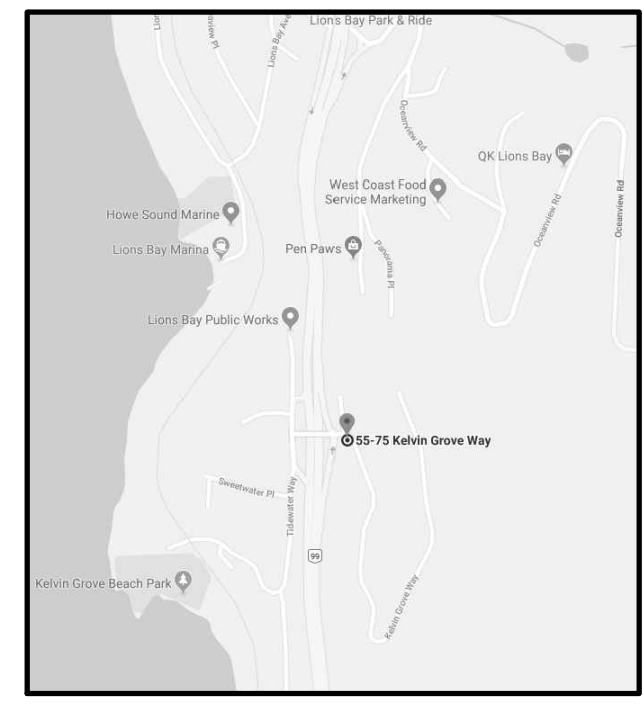
CONTRACTOR TO VERIFY & LOCATE EXISTING MAINS & SERVICE CONNECTIONS & NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO BEGINNING CONSTRUCTION



SEE DRAWING KEY-1 FOR GENERAL NOTES  
 SEE DRAWING R-1 FOR ROADWORKS NOTES  
 SEE DRAWING ESC-1 FOR SILTATION CONTROL NOTES

# CREUS Engineering

Civil Engineers & Project Managers  
 #510 EAST TOWER - 221 ESPLANADE WEST, NORTH VANCOUVER BC, V7M3J3  
 PH: 604-987-9070 WEBSITE: www.creus.ca



SITE MAP

### DRAWING LEGEND

	EXISTING	PROP.	TO BE REMOVED
LEGAL LINE	---	---	---
EASEMENT	---	---	---
WATERMAIN	---	---	---
SANITARY	---	---	---
STORM	---	---	---
HYDRO	---	---	---
TEL	---	---	---
STREETLIGHT	---	---	---
GAS	---	---	---

	EXISTING	PROP.	TO BE REMOVED
FIRE HYDRANT	⊗	⊗	⊗
GATE VALVE	⊙	⊙	⊙
AIR VALVE	⊙	⊙	⊙
REDUCER	⊙	⊙	⊙
INSPECTION CHAMBER	⊙	⊙	⊙
CATCHBASIN (STD/SI)	⊙	⊙	⊙
CAP	⊙	⊙	⊙
MANHOLE	⊙	⊙	⊙
POWER POLE	⊙	⊙	⊙
STREETLIGHT	⊙	⊙	⊙

approved

client

VILLAGE OF LIONS BAY

project

KELVIN GROVE LOT SERVICING LIONS BAY, BC

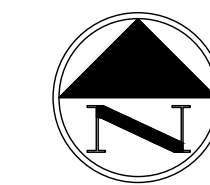
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CONTEXT PLAN

no.	(y/m/d)	revision	chn/d
2	18-07-17	ISSUED FOR TENDER	AJB
1	18-05-30	ISSUED FOR MOTI REVIEW	AJB

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engineer of record	KBH	scales	hor:1:1000 vert: -
designed by	KBH	file no.	<b>18190</b>
drawn by	AJB	drawing no.	CONTEXT-1
date	2018-04-19		

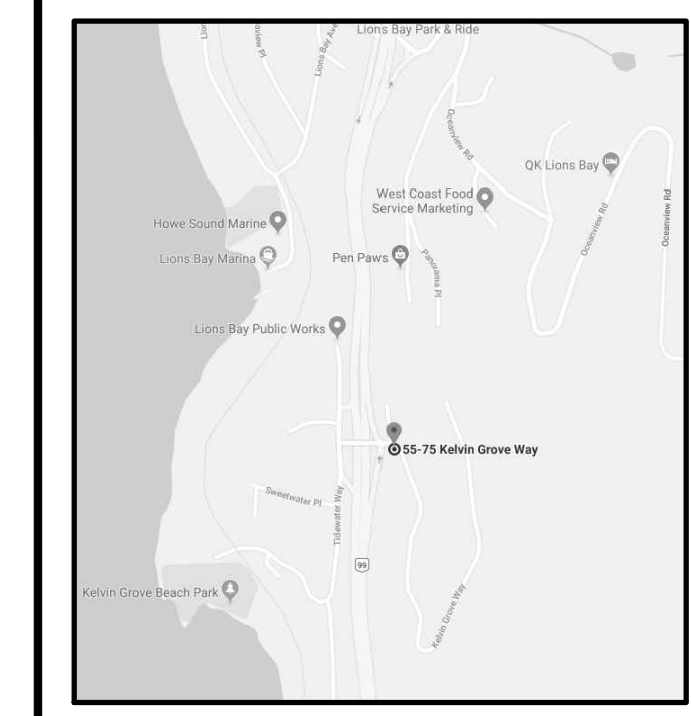
SEE DRAWING KEY-1 FOR GENERAL NOTES  
 SEE DRAWING R-1 FOR ROADWORKS NOTES  
 SEE DRAWING ESC-1 FOR SILTATION CONTROL NOTES



CONTRACTOR TO VERIFY & LOCATE  
 EXISTING MAINS & SERVICE  
 CONNECTIONS & NOTIFY THE  
 ENGINEER OF ANY DISCREPANCIES  
 PRIOR TO BEGINNING CONSTRUCTION

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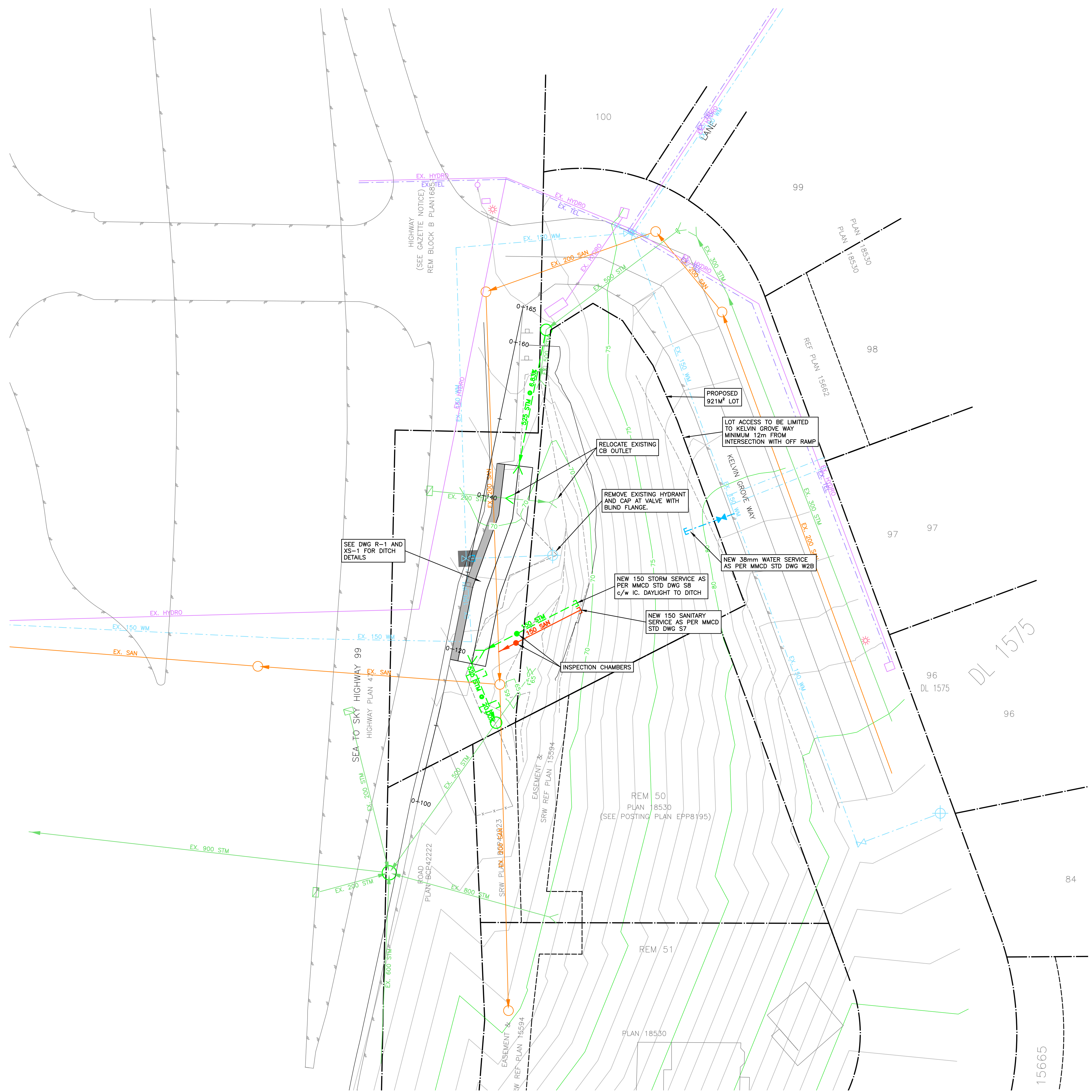
SITE MAP

## DRAWING LEGEND

	EXISTING	PROP.	TO BE REMOVED
LEGAL LINE	---	---	---
EASEMENT	---	---	---
WATERMAIN	---	---	---
SANITARY	---	---	---
STORM	---	---	---
HYDRO	---	---	---
TEL	---	---	---
STREETLIGHT	---	---	---
GAS	---	---	---
FIRE HYDRANT	---	---	---
GATE VALVE	---	---	---
AIR VALVE	---	---	---
REDUCER	---	---	---
INSPECTION CHAMBER	---	---	---
CATCHBASIN (STDS)	---	---	---
CAP	---	---	---
MANHOLE	---	---	---
POWER POLE	---	---	---
STREETLIGHT	---	---	---

## GENERAL NOTES

- ALL CONSTRUCTION MUST CONFORM TO THE MMCD SPECIFICATIONS AND MUST PASS THE ENGINEER'S INSPECTION UPON COMPLETION OF EACH STAGE OF CONSTRUCTION.
- ALL CONSTRUCTION WITHIN THE PROPERTY MUST CONFORM TO THE MASTER MUNICIPAL SPECIFICATIONS, CURRENT B.C. BUILDING CODE, & B.C. PLUMBING CODE.
- THE CONTRACTOR MUST NOTIFY ENGINEER THEN THE VILLAGE OF LIONS BAY, 48 HOURS PRIOR TO STARTING CONSTRUCTION TO ESTABLISH AN INSPECTION SCHEDULE.
- THE CONTRACTOR SHALL ENSURE THAT ALL APPROVALS REQUIRED FOR THE PROPOSED WORK HAVE BEEN OBTAINED PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION.
- A PRE-CONSTRUCTION MEETING BETWEEN ENGINEER, THE CONTRACTOR, AND THE VILLAGE OF LIONS BAY IS REQUIRED PRIOR TO COMMENCEMENT OF CONSTRUCTION.
- CONTRACTOR TO PROVIDE EMERGENCY CONTACT LIST, INSURANCE AND SURETY DOCUMENTATION AND PROPOSED SCHEDULE OF WORK PRIOR TO PROCEEDING WITH WORKS.
- A PORTION OF THE CONTRACT DOCUMENTS IS INCLUDED BY REFERENCE. COPIES OF THESE DOCUMENTS HAVE BEEN REFERENCED IN THE TENDER PACKAGE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT CURRENT RELEVANT COPIES OF ALL DRAWINGS AND CONTRACT DOCUMENTS ARE FORWARDED TO SURVEYORS, TESTING AGENCIES, SUBCONTRACTORS, SUPERINTENDENTS, ESTIMATORS, PROJECT MANAGERS, SITE STAFF AND ANY OTHER RELEVANT PARTIES. CONTRACTOR CONFIRMS THEY HAVE REVIEWED SAME PRIOR TO SUBMITTING TENDER.
- THE CONTRACTOR WILL CONSTRUCT ALL WORKS TO THE SATISFACTION OF THE INSPECTORS FROM THE ENGINEER AND THE REGULATORY AUTHORITY. IF APPLICABLE ADDITIONALLY, THE TELUS WORKS UNDER THE DIRECTION AND TO THE SATISFACTION OF THE TELUS INSPECTOR, HYDRO WORKS TO SATISFACTION OF THE BC HYDRO INSPECTOR, TERASEN WORKS TO SATISFACTION OF THE TERASEN INSPECTOR, SHAW WORKS TO SATISFACTION OF THE SHAW INSPECTOR. THE CONTRACTOR WILL FORWARD TO THE ENGINEER CERTIFICATION OF ACCEPTANCE OR APPROVAL FROM THE ABOVE NOTED INSPECTORS ON COMPLETION OF THE WORK. ELECTRICAL WORKS, IF APPLICABLE TO ALSO BE UNDER PERMIT WITH BC ELECTRICAL SAFETY BRANCH WITH A COPY OF PERMIT AND SIGN OFF TO BE FORWARDED TO THE ENGINEER. CONTRACTOR TO GIVE TIMELY NOTICE TO RELEVANT INSPECTOR TO ALLOW FOR INSPECTION ON WORKS AND UPDATE ENGINEER ON SAME.
- THE CONTRACTOR WILL PERFORM AT HIS OWN COST ALL TESTING REQUIRED BY THE REGULATORY AUTHORITY, MMCD AND THE ENGINEER. TESTING SHALL BE DONE BY AN INDEPENDENT SPECIALTY TESTING FIRM. CONTRACTOR TO GIVE ENGINEER NOTICE, ON ALL TESTING. COPIES OF TESTS TO BE FORWARDED DIRECTLY BY THE TESTING FIRM TO ENGINEER AND GEOTECHNICAL ENGINEER BY EMAIL.
- SUB-CONTRACTORS SHALL NOT COMMUNICATE WITH THE ENGINEERS OR OWNER DIRECTLY ON ANY CONTRACTUAL OR TECHNICAL ISSUE. THEY SHALL DIRECT THEIR ISSUES TO THE CONTRACTOR DIRECTLY WHOSE RESPONSIBILITY IT TO DEAL WITH THESE ISSUES ON THEIR BEHALF WITH THE ENGINEER. REVIEW AND APPROVAL OF ANY CONTRACTUAL MATTER INCLUDING PROGRESS PAYMENT, CHANGE ORDER, PAYMENT OF HOLDBACK, FINAL PAYMENT, INSURANCE AND WARRANTY, ETC. SHALL DIRECTED TO THE ENGINEER. CONTRACTOR MUST ONLY TAKE DIRECTION FROM THE ENGINEER IN REGARDS TO CHANGES TO DESIGN OR EXTRA WORKS.
- UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS OR NOTIFIED TO THE CONTRARY BY THE ENGINEER, THE CONTRACTOR IS THE "PRIME CONTRACTOR" FOR THE PURPOSE OF ALL APPLICABLE LAWS RELATIVE TO OCCUPATIONAL HEALTH AND SAFETY, INCLUDING THE DISCHARGE OF ALL DUTIES OF THE "PRIME CONTRACTOR" UNDER THE WORKERS COMPENSATION ACT (BRITISH COLUMBIA), NOTWITHSTANDING THAT THE ENGINEER, THE OWNER OR AN OTHER CONTRACTOR MAY PROVIDE FROM TIME TO TIME SOME OF THE SERVICES NORMALLY PROVIDED BY SUCH "PRIME CONTRACTOR". IN THIS SECTION "PRIME CONTRACTOR" MEANS THE CONTRACTOR SO DEFINED UNDER THE WORKERS COMPENSATION ACT (BRITISH COLUMBIA).
- LOCATIONS OF EXISTING UNDERGROUND SERVICES HAVE BEEN DETERMINED FROM UTILITY AS-CONSTRUCTED DRAWINGS. CONTRACTOR TO CONTACT BC ONE CALL AND PROVIDE COPIES TO ENGINEER AND VERIFY THE LOCATION OF ALL EXISTING SERVICES AND TO NOTIFY ENGINEER OF ANY DISCREPANCIES, CONFLICTS OR OMISSIONS PRIOR TO BEGINNING OF CONSTRUCTION.
- THE CONTRACTOR SHALL USE EXTREME CARE WHEN WORKING NEAR EXISTING SERVICES AND ANY SERVICES DISTURBED ARE TO BE REPLACED TO THE SATISFACTION OF M.O.T.I. & V.O.L.B., THE ENGINEER AND/OR APPROPRIATE UTILITY CORPORATION.
- THE CONTRACTOR'S SURVEYOR WILL RECORD AND CERTIFY ALL INFORMATION REQUIRED FOR THE ENGINEER TO PROVIDE A COMPLETE SET OF AS-CONSTRUCTED DRAWINGS INCLUDING CENTERLINE, FOG LINE, EDGE OF ASPHALT, SIGNS, AND ALL APPURTENANCES. SEE SUPPLEMENTAL SPECIFICATION FOR DETAILS.
- WHEN NO IMPROVEMENTS ARE PROPOSED UNDER THIS CONTRACT, THE EXISTING SECTION(S) OF ROADWAY SHALL BE KEPT CLEAN AND CLEAR FOR THE DURATION OF CONSTRUCTION AND LEFT IN SAME CONDITION AS PRIOR TO CONSTRUCTION.
- TRAFFIC CONTROL PER THE MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE "TRAFFIC MANUAL FOR WORK ON ROADWAYS" AND AS PER THE TRANSPORTATION ASSOCIATION OF CANADA "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES" CONTRACTOR TO SUBMIT PLAN FOR TRAFFIC MANAGEMENT FOR APPROVAL AND RECEIVE SAME PRIOR TO PROCEEDING WITH WORKS.
- VEHICULAR ACCESS TO EXISTING DWELLINGS TO BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF THE CONTRACT.
- PEDESTRIANS SHALL BE PROTECTED AT ALL TIMES. ANY CLOSURES OF THE SIDEWALK OR LANES TO BE COORDINATED WITH AND APPROVED BY THE ENGINEER AND A PERMIT FROM REGULATORY AUTHORITY OBTAINED AND FORWARDED TO ENGINEER. CONTRACTOR TO PROVIDE REQUIRED NOTICES.
- RESIDENTS DIRECTLY AFFECTED BY CONSTRUCTION OF THIS PROJECT SHALL BE GIVEN 48 HOURS WRITTEN NOTICE OF THE PROPOSED START OF CONSTRUCTION. IF CONSTRUCTION ENTERS ONTO PRIVATE PROPERTY, THE CONTRACTOR OR DEVELOPER'S AGENT WILL REQUIRED WRITTEN AUTHORIZATION FROM THE PRIVATE PROPERTY OWNER.
- RETAINING DESIGNATED TREES IS OF PRIME IMPORTANCE. WHEN WORKING IN PROXIMITY TO A DESIGNATED TREE OR WHEN ROOTS ARE ENCOUNTERED, THE CONTRACTOR SHALL CONSULT A CERTIFIED ARBORIST BEFORE PROCEEDING TO PREVENT DAMAGE TO TREES.
- THE CONTRACTOR SHALL TAKE ALL STEPS NECESSARY TO ENSURE THAT NO SILT IS DISCHARGED TO THE STORM DRAINAGE SYSTEM, ROADWAYS OR ADJACENT PROPERTIES DURING THE COURSE OF CONSTRUCTION IN ACCORDANCE WITH DFO/MOELP'S "LAND DEVELOPMENT GUIDELINES FOR THE PROTECTION OF AQUATIC HABITAT".
- FOR BC HYDRO, TELUS, AND TERASEN INSTALLATION, SEE APPROPRIATE UTILITY COMPANY DRAWINGS AND SPECIFICATIONS.
- UPON COMPLETION OF WORKS, OWNER MUST CONDUCT CCTV TEST TO ENSURE NO CROSS CONNECTIONS & CONDITION OF PIPES. A COPY OF THE REPORT IS TO BE FORWARDED TO THE VILLAGE OF LIONS BAY PUBLIC WORKS DEPARTMENT.



approved

client  
**VILLAGE OF LIONS BAY**

project  
**KELVIN GROVE LOT SERVICING  
 LIONS BAY, BC**

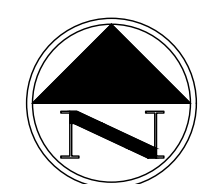
title  
**KEY PLAN**

no.	(y/m/d)	revision	chk'd
2	18-07-17	ISSUED FOR TENDER	AJB
1	18-05-30	ISSUED FOR MOTI REVIEW	AJB

engineer of record	KBH	scales	hor: 1:250	vert: -
designed by	KBH	file no.	18190	
drawn by	AJB	drawing no.	KEY-1	
date	2018-04-19			

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current rev. #  
**2**



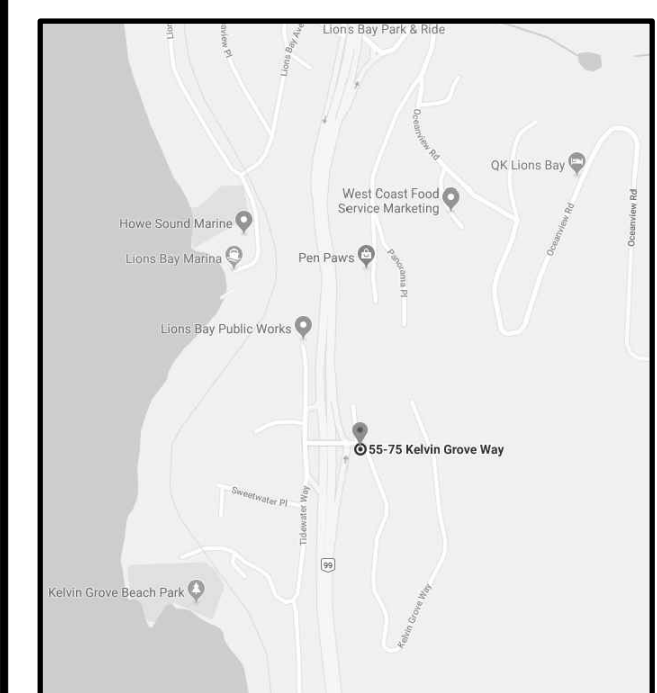
LINETYPE LEGEND	
EXTENT OF SITE WORKS	---
PROTECTIVE FENCE	---
SILT FENCE	---
ESC STORM ROUTING	---
EXISTING STORM MAIN	---
CATCHBASIN (INCL SILT SACK)	---

CONTRACTOR TO VERIFY & LOCATE EXISTING MAINS & SERVICE CONNECTIONS & NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO BEGINNING CONSTRUCTION

SEE DRAWING KEY-1 FOR GENERAL NOTES  
SEE DRAWING R-1 FOR ROADWORKS NOTES  
SEE DRAWING ESC-1 FOR SILTATION CONTROL NOTES

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SITE MAP

## DRAWING LEGEND

	EXISTING	PROP.	TO BE REMOVED
LEGAL LINE EASEMENT	---	---	---
WATERMAIN	---	---	---
SANITARY	---	---	---
STORM	---	---	---
HYDRO TEL	---	---	---
STREETLIGHT	---	---	---
GAS	---	---	---
FIRE HYDRANT	⊗	⊗	⊗
GATE VALVE	⊗	⊗	⊗
AIR VALVE	⊗	⊗	⊗
REDUCER	⊗	⊗	⊗
INSPECTION CHAMBER	⊗	⊗	⊗
CATCHBASIN (STD/SI)	⊗	⊗	⊗
CAP	⊗	⊗	⊗
MANHOLE	⊗	⊗	⊗
POWER POLE	⊗	⊗	⊗
STREETLIGHT	⊗	⊗	⊗

approved

client

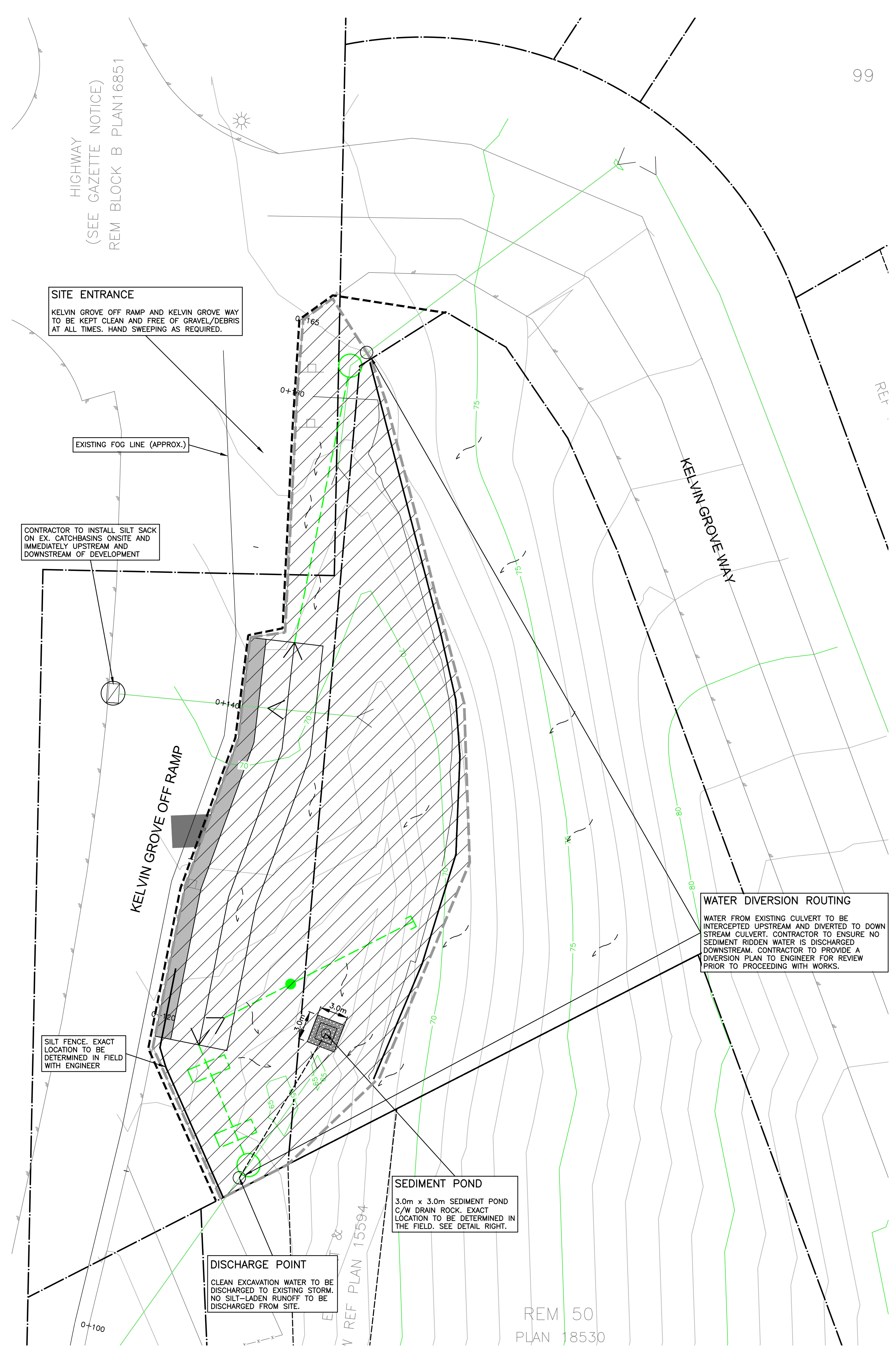
VILLAGE OF LIONS BAY

project

KELVIN GROVE LOT SERVICING  
LIONS BAY, BC

title

## EROSION SEDIMENT CONTROL



**SITE ENTRANCE**  
KELVIN GROVE OFF RAMP AND KELVIN GROVE WAY TO BE KEPT CLEAN AND FREE OF GRAVEL/DEBRIS AT ALL TIMES. HAND SWEEPING AS REQUIRED.

EXISTING FOG LINE (APPROX.)

CONTRACTOR TO INSTALL SILT SACK ON EX. CATCHBASINS ONSITE AND IMMEDIATELY UPSTREAM AND DOWNSTREAM OF DEVELOPMENT

KELVIN GROVE OFF RAMP

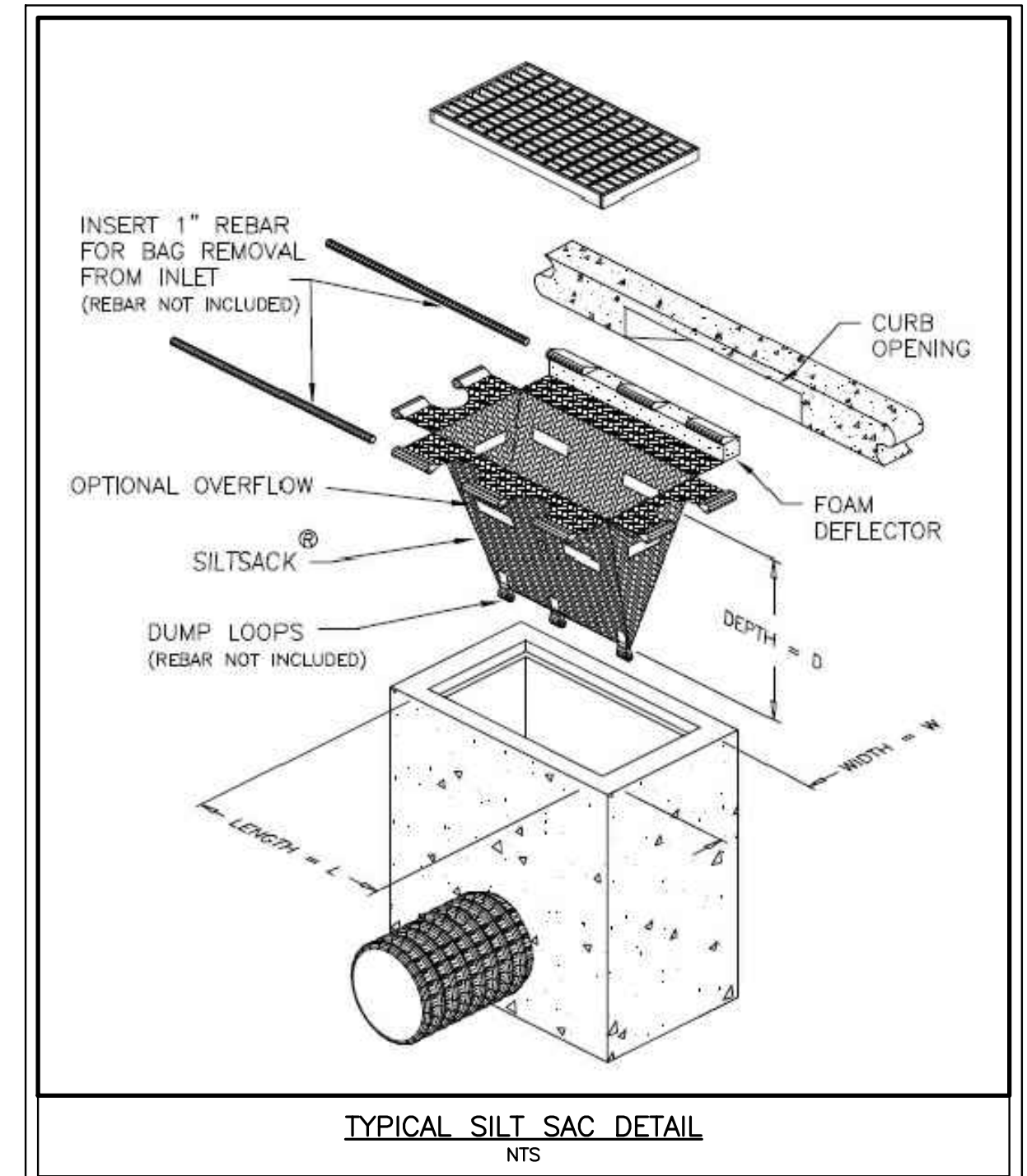
**WATER DIVERSION ROUTING**  
WATER FROM EXISTING CULVERT TO BE INTERCEPTED UPSTREAM AND DIVERTED TO DOWN STREAM CULVERT. CONTRACTOR TO ENSURE NO SEDIMENT RIDDEN WATER IS DISCHARGED DOWNSTREAM. CONTRACTOR TO PROVIDE A DIVERSION PLAN TO ENGINEER FOR REVIEW PRIOR TO PROCEEDING WITH WORKS.

SILT FENCE EXACT LOCATION TO BE DETERMINED IN FIELD WITH ENGINEER

**SEDIMENT POND**  
3.0m x 3.0m SEDIMENT POND C/W DRAIN ROCK. EXACT LOCATION TO BE DETERMINED IN THE FIELD. SEE DETAIL RIGHT.

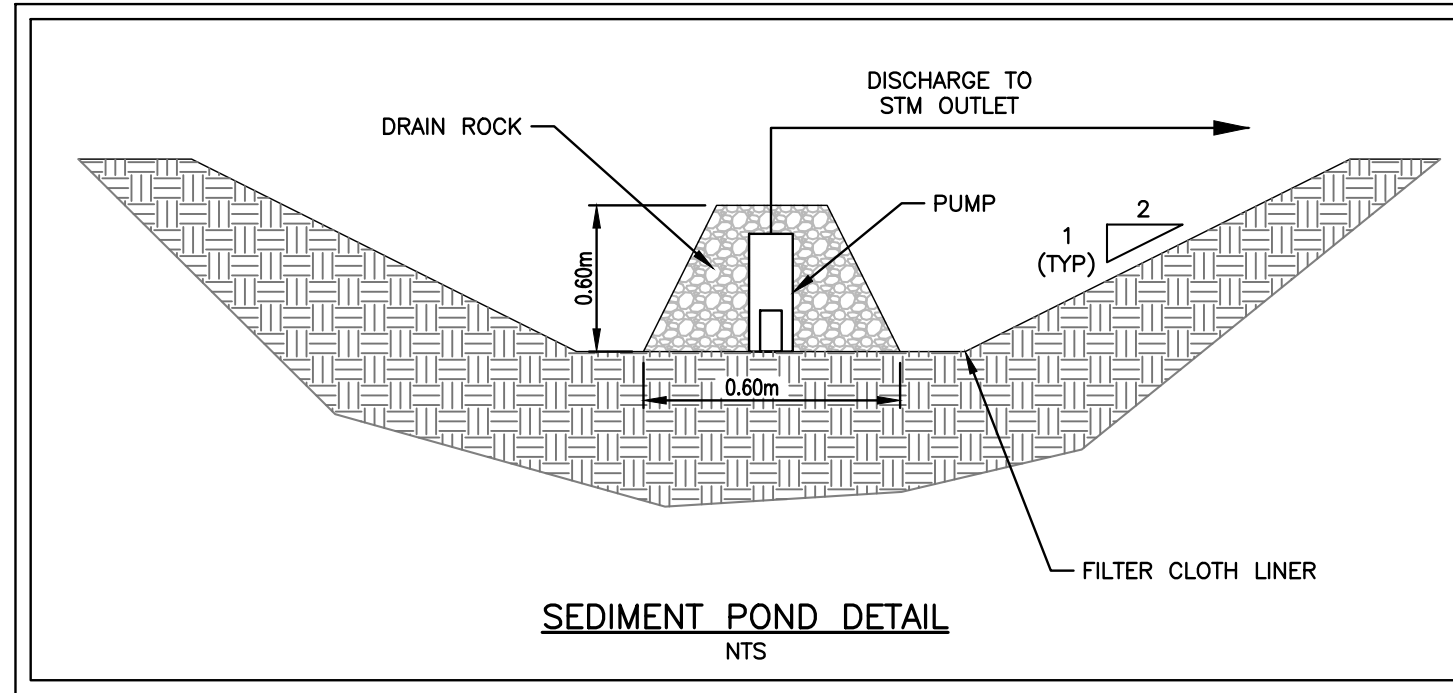
**DISCHARGE POINT**  
CLEAN EXCAVATION WATER TO BE DISCHARGED TO EXISTING STORM. NO SILT-LADEN RUNOFF TO BE DISCHARGED FROM SITE.

REM 50  
PLAN 18530



TYPICAL SILT SAC DETAIL  
N.T.S.

OPERATION & MAINTENANCE SCHEDULE		
SEDIMENT CONTROL BMP	MAINTENANCE ACTIVITY	FREQUENCY
CATCH BASIN SILT SACK	REPAIR & REPLACE DEGRADED FABRIC. REMOVE ACCUMULATED SEDIMENT & DEBRIS	ONCE A WEEK, BEFORE & AFTER ANY SIGNIFICANT RAINFALL EVENT OR AS REQUIRED
ACCESS ROADS	SWEEP	DAILY OR AS REQUIRED
CONSTRUCTION ACCESS	CLEAN DEBRIS	AS REQUIRED
SEDIMENT POND	REMOVE ACCUMULATED SEDIMENT	ONCE A MONTH, BEFORE & AFTER ANY SIGNIFICANT RAINFALL EVENT OR AS REQUIRED



SEDIMENT POND DETAIL  
N.T.S.

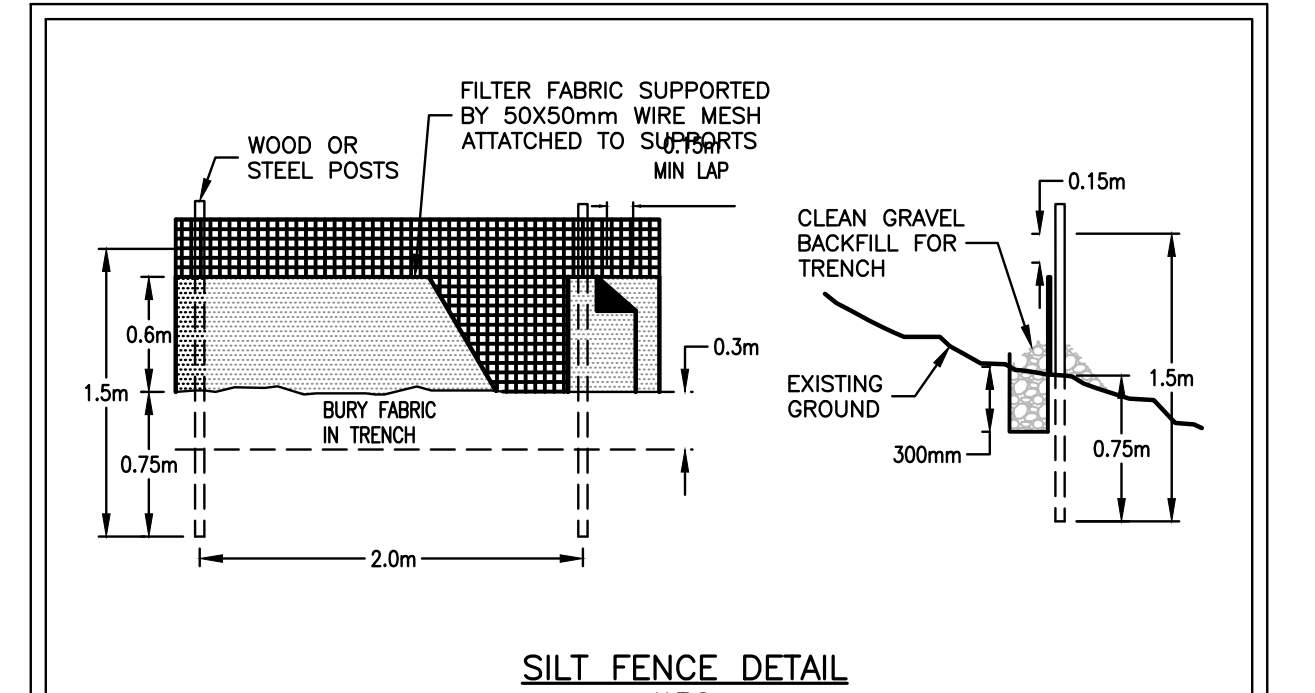
## SILTATION CONTROL NOTES

1. THE VILLAGE OF LIONS BAY REQUIRES THE ENGINEER TO BE INFORMED OF THE CONSTRUCTION SCHEDULE; PRIOR TO BUILDING PERMIT APPROVAL, THE FIRST EROSION AND SEDIMENT CONTROL INSPECTION REPORT MUST BE SUBMITTED TO VILLAGE OF LIONS BAY.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING AND MAINTAINING A SILTATION AND EROSION CONTROL SYSTEM AS SHOWN ON THESE DRAWINGS AS WELL AS ANY ADDITIONAL TEMPORARY WORKS NECESSARY TO PREVENT SILT DISCHARGES TO THE STORM DRAINAGE SYSTEM.
3. THE CONTRACTOR SHALL CONSTRUCT ALL NECESSARY SILTATION AND EROSION CONTROL WORKS BEFORE COMMENCING ANY OTHER ON-SITE CONSTRUCTION OTHER THAN FALLING TREES.
4. THE CONTRACTOR SHALL TAKE ALL STEPS NECESSARY TO ENSURE THAT NO SILT IS DISCHARGED TO THE STORM DRAINAGE SYSTEM, MARINE ENVIRONMENT, WATERCOURSES, ROADWAYS OR ADJACENT PROPERTIES DURING THE COURSE OF CONSTRUCTION.
5. THE CONTRACTOR SHALL INSPECT THE SILTATION AND EROSION CONTROL WORKS, PRIOR TO, DURING AND IMMEDIATELY FOLLOWING RAINFALL EVENTS AND UNDERTAKE ANY REMEDIAL WORK REQUIRED FOR FUNCTIONAL OPERATION.
6. SILT SACS MUST BE INSTALLED, MONITORED AND REPLACED AT ALL CATCHBASINS WHICH MAY BE AFFECTED BY CONSTRUCTION. CONTRACTOR TO CLEAN AND MAINTAIN AS REQUIRED.
7. WHEN SPECIFIED, ALL ON SITE SURFACE RUN-OFF IS TO BE DIRECTED TO WATER FILTRATION SYSTEM AND THEN DISCHARGED TO THE STORM SYSTEM, AS SHOWN IN THE DRAWING. NO SURFACE RUN-OFF IS TO EXIT THE SITE UNLESS ROUTED THROUGH THE WATER FILTRATION SYSTEM.
8. ALL EXPOSED CUTS/SLOPES/STOCKPILES ARE TO BE COVERED WITH SHOTCRETE OR POLYETHYLENE LINING. ALL STOCKPILED MATERIALS LEFT ONSITE FOR GREATER THAN 24 HOURS TO BE COVERED WITH SECURE POLYETHYLENE SHEETING AND SURROUNDED WITH A SILT FENCE. SHEETING MUST BE INSPECTED ON A REGULAR BASIS AND ANY SEPARATION OR TEARS REPAIRED IMMEDIATELY. STORE EXCAVATED SOILS AWAY FROM STORM DRAINS OR OTHER POTENTIAL OFFSITE TRANSPORT PATHWAYS AND MINIMUM 15m FROM TOP OF BANK, WHERE APPLICABLE.
9. NO MUD SHALL BE TRACKED ONTO CIVIC LANDS OR STREETS. EMPLOY STREET SWEEPERS AS REQUIRED. NO FLUSHING ON ROADS IS PERMITTED. IN DRY PERIODS OR AS DIRECTED BY THE ENGINEER, APPROPRIATE DUST SUPPRESSION MEASURES MUST BE UNDERTAKEN.
10. THE CONTRACTOR WILL NOT PERMIT THE DIRECT OR INDIRECT DISCHARGE, FROM ANY PROPERTY, OF WATER THAT DOES NOT AT ALL TIMES MEET OR EXCEED THE REQUIREMENTS OF THE VILLAGE OF LIONS BAY.
11. THE CONTRACTOR SHALL PLACE, STORE, TRANSPORT, OR DISPOSE OF ANY "PROHIBITED SUBSTANCE" IN SUCH A MANNER SO AS TO PREVENT THE LIKELY ESCAPE OF THE MATERIALS INTO THE "DRAINAGE SYSTEM."
12. CONSTRUCTION AND MAINTENANCE OF THE SILTATION AND EROSION CONTROL SYSTEM SHALL BE IN ACCORDANCE WITH THE DISTRICT OF WEST VANCOUVER'S BYLAWS, THE LATEST EDITION OF THE DEPARTMENT OF FISHERIES AND OCEANS/MINISTRY OF ENVIRONMENT, LANDS AND PARKS "LAND DEVELOPMENT GUIDELINES FOR THE PROTECTION OF AQUATIC HABITAT" AND SECTION 01561 OF THE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (MMCD).
13. THE DISCHARGE CRITERIA FROM THE WATER FILTRATION SYSTEM INCLUDES A PH OF BETWEEN 6.5-8.0 AND A TOTAL SUSPENDED SOLIDS (TSS) CONTENT OF LESS THAN OR EQUAL TO 75mg/l (OCTOBER TO APRIL) ABOVE "BACKGROUND" OR LESS THAN OR EQUAL TO 25mg/l (MAY TO SEPTEMBER) ABOVE "BACKGROUND" CONTENT - CREUS ENGINEERING LTD. SHOULD BE RETAINED TO INSPECT THE SEDIMENT CONTROLS IN PLACE, MONITOR THE DISCHARGE ON A WEEKLY BASIS AND DURING OR AFTER EACH SIGNIFICANT RAINFALL. NO DISCHARGE OF PETROLEUM HYDROCARBONS, SOLVENTS, HEAVY METAL PARTICULATE, CEMENT, ETC. OR ANY MATERIAL THAT COULD BE DEEMED "DELETERIOUS UNDER THE FISHERIES ACT OR THE VILLAGE OF LIONS BAY BYLAWS. IT IS THE SITE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT NO DELETERIOUS SUBSTANCES ARE DISCHARGED. DISCHARGE FROM SITE IS NOT TO EXCEED THOSE PARAMETERS LISTED IN "APPROVED AND WORKING CRITERIA FOR WATER QUALITY" AS PUBLISHED BY MINISTRY OF ENVIRONMENT, WATER MANAGEMENT BRANCH MARCH 1989, AND "URBAN RUNOFF QUALITY CONTROL GUIDELINES FOR BRITISH COLUMBIA" AS PUBLISHED BY WASTER MANAGEMENT GROUPS, BRITISH COLUMBIA RESEARCH CORPORATIONS, JUNE 1992.
14. INSPECTION, MONITORING AND TESTING OF THE "CONSTRUCTION WORK" BY CREUS ENGINEERING. IN CASE OF A SILTATION CONTROL EMERGENCY CALL FRED CIAMBRELLI @ 604-987-9070.
15. ALL CONCRETE SUPPLY TRUCKS SHALL BE EQUIPPED WITH WASH BUCKET SYSTEM FOR FLUSHING OF FLUME. UNDER NO CIRCUMSTANCES SHALL EXCESS CONCRETE FROM FLUME AND/OR TRUCK BE FLUSHED ONTO ROADS OR INTO STORM SEWER SYSTEMS.
16. CONTRACTOR TO PROVIDE NECESSARY DUST CONTROL.
17. AS CONSTRUCTION PROGRESSES AND INTERCEPTED FLOWS ARE REDUCED, THE SEDIMENT AND EROSION CONTROL PLAN BE ADJUSTED ACCORDINGLY AT THE DISCRETION OF THE ENGINEER. ADDITIONAL SEDIMENT CONTROL MEASURES MAY BE REQUIRED UNDER THE DISCRETION OF THE VILLAGE OF LIONS BAY.
18. DECOMMISSION ALL SEDIMENT CONTROL SYSTEMS ONLY AFTER HARD SURFACES ARE IN PLACE AND SURFACE WATER SUITABLY DIRECTED TO THE STORM WATER SYSTEM. ALL SEDIMENT TO BE REMOVED OFF SITE AND DISPOSED APPROPRIATELY. ANY REQUIRED VILLAGE OF LIONS BAY PERMITS TO BE ACQUIRED BY THE CONTRACTOR PRIOR TO DECOMMISSIONING.
19. MONITORING REPORTS ARE TO BE PROVIDED AS REQUIRED OR TO THE VILLAGE OF LIONS BAY.
20. DEFINITIONS:

"EXCESSIVE SUSPENDED SOLIDS DISCHARGE" MEANS THE DISCHARGE OF A FLUID CONTAINING "TOTAL SUSPENDED SOLIDS" OF 25 MILLIGRAMS PER LITRE ABOVE BACKGROUND "TOTAL SUSPENDED SOLIDS" OF THE RECEIVING ENVIRONMENT DURING THE MONTHS OF MAY TO SEPTEMBER, OR 75 MILLIGRAMS PER LITRE ABOVE BACKGROUND "TOTAL SUSPENDED SOLIDS" OF THE RECEIVING ENVIRONMENT DURING THE MONTHS OF OCTOBER TO APRIL.

"PROHIBITED SUBSTANCE" MEANS: PESTICIDES, HERBICIDES, FERTILIZERS, SOAPS, DETERGENTS, HOUSEHOLD AND COMMERCIAL GRADE CLEANING COMPOUNDS, PAINTS, SOLVENTS, CHEMICALS, CHLORINATED WATER, WASTE OIL OR ANY MATERIAL OR SUBSTANCE WHICH IS A "HAZARDOUS PRODUCT", "CONTAMINANT", "TOXIC SUBSTANCE", "DELETERIOUS SUBSTANCE", "SPECIAL WASTE", "DANGEROUS GOOD" OR "REPORTABLE SUBSTANCE" THAT IS IDENTIFIED OR DESCRIBED IN OR DEFINED BY ANY APPLICABLE STATUTE, REGULATION OR LAW, INCLUDING ANY SUBSTANCE THAT VIOLATES THE FISHERIES ACT R.S.C. 1985 OR THE WASTE MANAGEMENT ACT R.S.B.C. 1996, C.482 WHICH, IF INTRODUCED TO THE "DRAINAGE WORKS", WOULD FOUL IT; OR

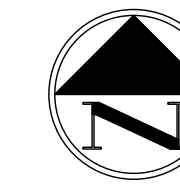
ANY SEDIMENT, ROCK, GRAVEL, SAND, CLAY, SILT, SEDIMENT, EARTH, CONSTRUCTION OR EXCAVATION WASTES, CEMENT, CONCRETE, EXPOSED AGGREGATE WASH WATER OR OTHER SUBSTANCES WHICH, WHEN INTRODUCED INTO A DRAINAGE SYSTEM, WILL AT THE POINT OF DEPOSITION, RESULT IN AN "EXCESSIVE SUSPENDED SOLIDS DISCHARGE" OR A PH VALUE OUTSIDE OF THE RANGE 6.5 - 8.0, OR TEMPERATURE INCREASE OF 2 DEGREES CELSIUS OR MORE.



SILT FENCE DETAIL  
N.T.S.

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engineer of record	KBH	scales
designed by	AJB	hor: 1:150 vert: -
drawn by	AJB	file no.
date	2018-04-19	18190
		drawing no.
		ESC-1

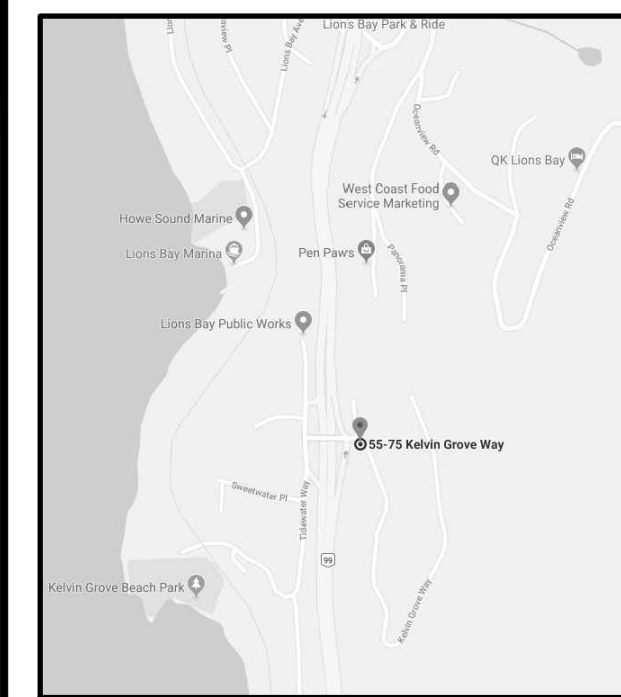
SEE DRAWING KEY-1 FOR GENERAL NOTES  
 SEE DRAWING R-1 FOR ROADWORKS NOTES  
 SEE DRAWING ESC-1 FOR SILTATION CONTROL NOTES



CONTRACTOR TO VERIFY & LOCATE  
 EXISTING MAINS & SERVICE  
 CONNECTIONS & NOTIFY THE  
 ENGINEER OF ANY DISCREPANCIES  
 PRIOR TO BEGINNING CONSTRUCTION

# CREUS Engineering

Civil Engineers & Project Managers  
 #10 EAST TOWER - 221 ESPLANADE WEST, NORTH VANCOUVER BC, V7M3J3  
 PH: 604-987-9070 WEBSITE: www.creus.ca



SITE MAP

### DRAWING LEGEND

	EXISTING	PROP.	TO BE REMOVED
LEGAL LINE	---	---	---
EASEMENT	---	---	---
WATERMAIN	---	---	---
SANITARY	---	---	---
STORM	---	---	---
HYDRO	---	---	---
TEL	---	---	---
STREETLIGHT	---	---	---
GAS	---	---	---
	EXISTING	PROP.	TO BE REMOVED
FIRE HYDRANT	⊗	⊗	⊗
GATE VALVE	⊗	⊗	⊗
AIR VALVE	⊗	⊗	⊗
REDUCER	⊗	⊗	⊗
INSPECTION CHAMBER	⊗	⊗	⊗
CATCHBASIN (STD/SI)	⊗	⊗	⊗
CAP	⊗	⊗	⊗
MANHOLE	⊗	⊗	⊗
POWER POLE	⊗	⊗	⊗
STREETLIGHT	⊗	⊗	⊗

approved

client

VILLAGE OF LIONS BAY

project

KELVIN GROVE LOT SERVICING  
LIONS BAY, BC

title

TRAFFIC MANAGEMENT PLAN

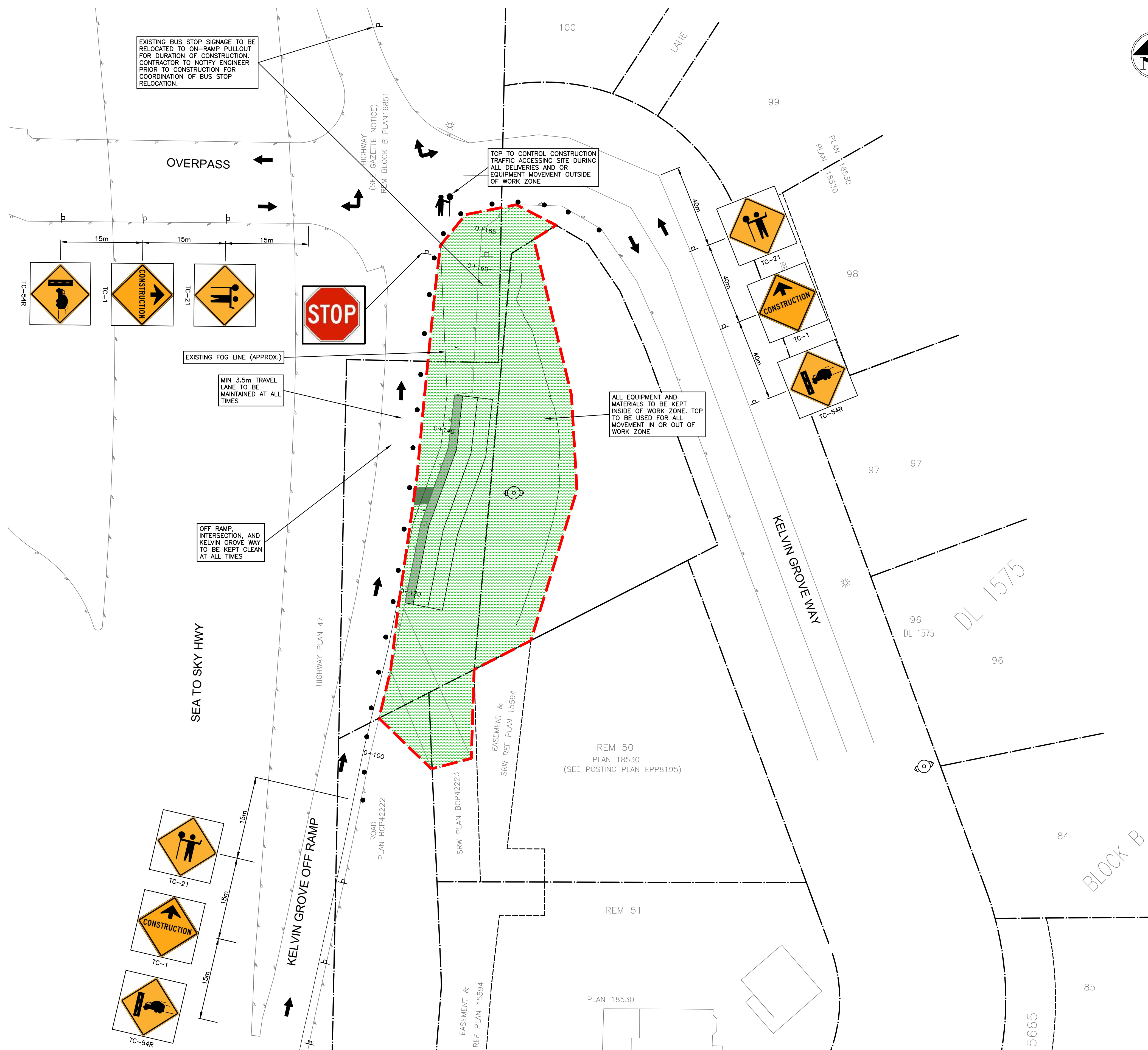
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 designed by AJB file no. 18190

drawn by AJB drawing no. TMP-1  
 date 2018-04-19



EXISTING BUS STOP SIGNAGE TO BE RELOCATED TO ON-RAMP PULLOUT FOR DURATION OF CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER PRIOR TO CONSTRUCTION FOR COORDINATION OF BUS STOP RELOCATION.

TCP TO CONTROL CONSTRUCTION TRAFFIC ACCESSING SITE DURING ALL DELIVERIES AND OR EQUIPMENT MOVEMENT OUTSIDE OF WORK ZONE

ALL EQUIPMENT AND MATERIALS TO BE KEPT INSIDE OF WORK ZONE. TCP TO BE USED FOR ALL MOVEMENT IN OR OUT OF WORK ZONE

EXISTING FOG LINE (APPROX.)

MIN 3.5m TRAVEL LANE TO BE MAINTAINED AT ALL TIMES

OFF RAMP, INTERSECTION, AND KELVIN GROVE WAY TO BE KEPT CLEAN AT ALL TIMES

### LEGEND

- CONSTRUCTION SITE ENTRANCE
- SITE TRAILER
- CONSTRUCTION PARKING STALLS
- CONSTRUCTION AREA
- ESC SYSTEM
- LOADING ZONE
- TRAFFIC CAMERA
- TRAFFIC ACCESS FLOW
- FIRST AID
- FIRE HYDRANT
- MARSHALLING AREA
- TEMP. ELECTRICAL SHACK
- PROPOSED CRANE LOCATION

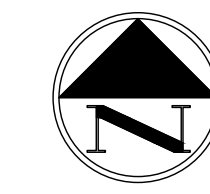
### CONSTRUCTION CONTACT INFO

CONTRACTOR:	TBD
PROJECT ENGINEER:	604-987-9070
VILLAGE OF LIONS BAY:	604-921-9333
AMBULANCE:	911
FIRE:	911
POLICE:	911
BC HYDRO:	1-888-769-3766
FORTIS BC:	1-800-663-9911

### SYMBOL LEGEND

TRAFFIC CONTROL SIGN	⊠	WORKS ZONE
TRAFFIC CONTROL SIGN (SHORT DURATION)	⊠	WORKS ZONE (SHORT DURATION)
DELINEATOR	•	WORKS ZONE (NIGHT WORK 7pm-6am DNV PERMIT REQUIRED)
DELINEATOR (SHORT DURATION)	○	
TRAFFIC CONTROL PERSON		

SEE DRAWING KEY-1 FOR GENERAL NOTES  
 SEE DRAWING R-1 FOR ROADWORKS NOTES  
 SEE DRAWING ESC-1 FOR SILTATION CONTROL NOTES



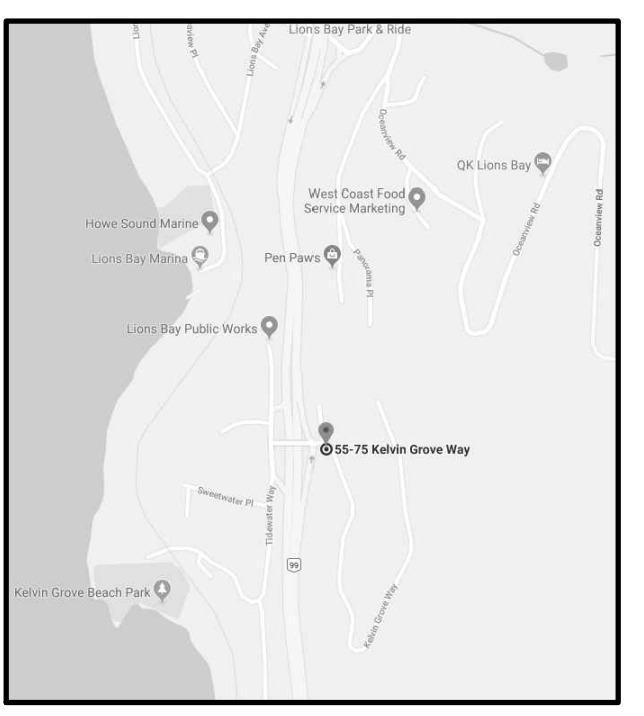
CONTRACTOR TO VERIFY & LOCATE EXISTING MAINS & SERVICE CONNECTIONS & NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO BEGINNING CONSTRUCTION

**ROADWORKS NOTES**

- ALL ROADWORKS CONSTRUCTION AND METHODS MUST BE IN ACCORDANCE WITH MOTI SPECIFICATIONS.
- PAVING CAN ONLY PROCEED IN THE PRESENCE OF THE ENGINEER OR DESIGNATED INSPECTORS.
- CONTRACTOR TO SUBMIT SEIVE TEST AND SOURCE DATA FOR AGGREGATES AND MIX DESIGN FOR ASPHALT AT BEGINNING OF CONTRACT FOR REVIEW AND APPROVAL.
- ALL LOOSE AND ORGANIC MATERIAL TO BE EXCAVATED FROM ROADWAY, ALL SUBGRADES TO BE COMPACTED TO 95% MODIFIED PROCTOR DENSITY. SUBGRADE TO BE INSPECTED BY ENGINEER PRIOR TO PLACEMENT OF GRAVEL SUBBASE. ANY WATER SOFTENED SUBGRADE SOIL SHALL BE OVEREXCAVATED AND THE GRADE RESTORED WITH GRANULAR SOILS COMPACTED TO 95% MODIFIED PROCTOR DENSITY.
- THE BASE AND SUBBASE MATERIALS SHALL BE PROPERLY PLACED AND COMPACTED TO A MINIMUM OF 100% OF STANDARD PROCTOR DENSITY (ASTM D 698).
- THE CONTRACTOR WILL GIVE ENGINEER 48 HOURS NOTICE PRIOR TO SUBGRADE PROOF ROLL, BASE COMPACTION AND PAVING.
- THE CONTRACTOR MUST NOTIFY ENGINEER 48 HOURS PRIOR TO STARTING CONSTRUCTION TO ESTABLISH AN INSPECTION SCHEDULE.
- A PORTION OF THE CONTRACT DOCUMENTS IS INCLUDED BY REFERENCE. COPIES OF THESE DOCUMENTS HAVE BEEN REFERENCED IN THE TENDER PACKAGE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT CURRENT RELEVANT COPIES OF ALL DRAWINGS AND CONTRACT DOCUMENTS ARE FORWARDED TO SURVEYORS, TESTING AGENCIES, SUBCONTRACTORS, SUPERINTENDENTS, ESTIMATORS, PROJECT MANAGERS, SITE STAFF AND ANY OTHER RELEVANT PARTIES. CONTRACTOR CONFIRMS THEY HAVE REVIEWED SAME PRIOR TO SUBMITTING TENDER.
- ALL CUTS IN EXISTING ASPHALT REQUIRED FOR CONSTRUCTION SHALL BE VERTICAL, FULL DEPTH, WITH A DIAMOND SAW AND REPLACED TO FULL / DESIGN DEPTH WITH MINIMUM 80mm ASPHALT CONCRETE FOR MAIN ROADS AND 65mm ASPHALT CONCRETE FOR LANES, AFTER BACKFILL AND COMPACTION. ALL PAVEMENTS, BOULEVARDS, DRIVEWAYS, FENCES, ETC. ARE TO BE RESTORED TO THE SATISFACTION AND APPROVAL OF THE CITY WHEN NO IMPROVEMENT IS PROPOSED UNDER THIS CONTRACT.
- TOP LIFT OF ASPHALT TO BE MINIMUM 40 mm OR AS NOTED.
- ALL PAVEMENTS, BOULEVARDS, DRIVEWAYS, FENCES, ETC. ARE TO BE RESTORED TO ORIGINAL CONDITION WHEN NO IMPROVEMENT IS PROPOSED UNDER THIS CONTRACT. CONTRACTOR TO ROUGHGRADE THE BOULEVARDS AT THE SAME TIME AS ROAD GRADING.
- CHANGES IN GRADE TO BE FORMED WITH SMOOTH CURVES.
- COVERS FOR INSPECTION CHAMBERS AND VALVE RISERS IN DRIVEWAYS SHALL BE SUITABLE FOR TRAVELED AREAS
- ALL MANHOLE LIDS, VALVE COVERS, CATCHBASIN RIMS AND LIDS OF OTHER STRUCTURES TO BE SET AT FIRST LIFT ROAD ELEVATIONS AND RAISED WHEN FINAL LIFT INSTALLED.
- ENSURE ALL NEW PAVEMENT WORKS ARE KEYED INTO EXISTING ASPHALT AS PER MMCD STANDARD.
- CULVERTS TO BE INSTALLED IN ACCORDANCE WITH MOTI SPECIFICATIONS SECTION 303 (CULVERTS).

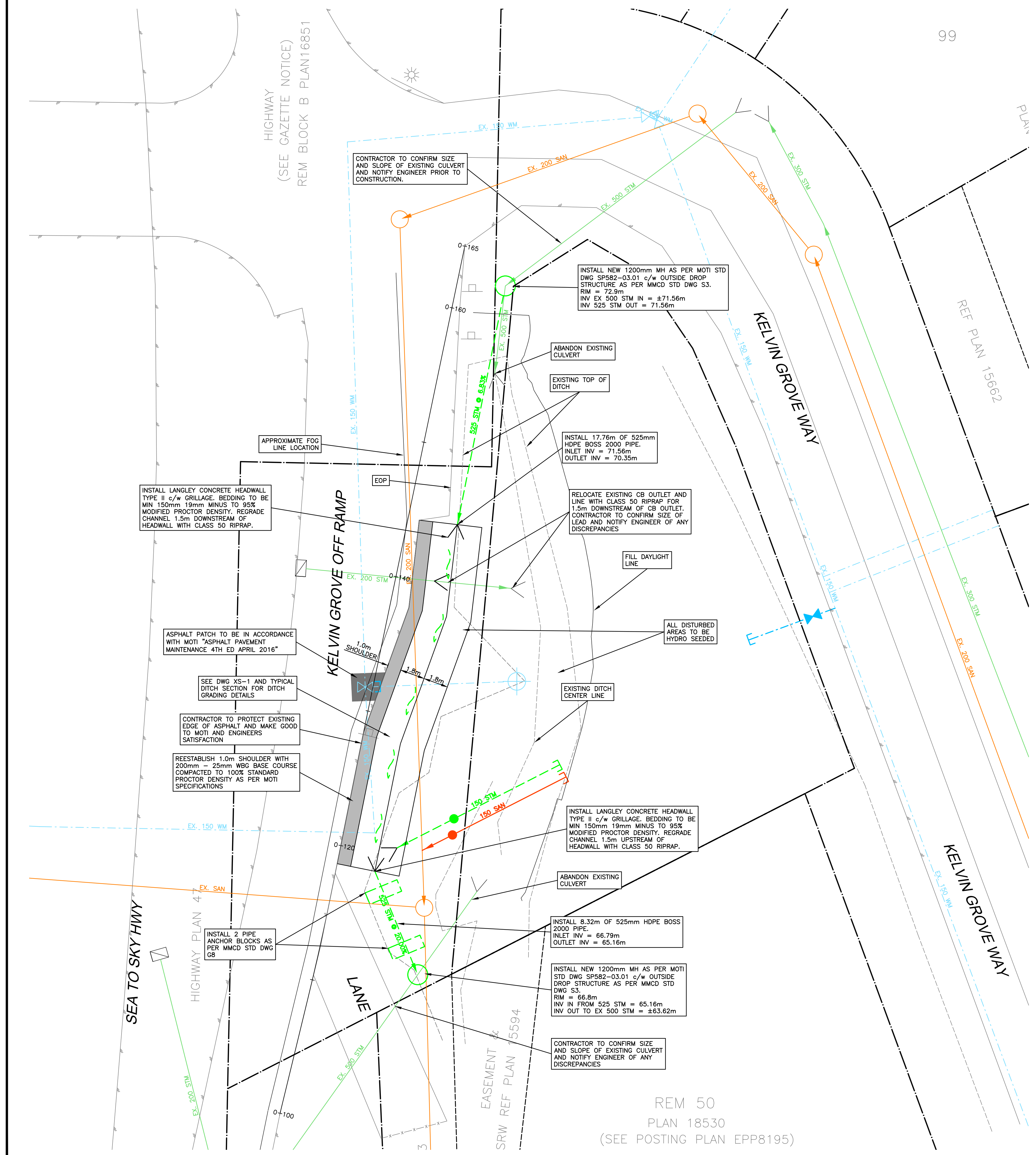
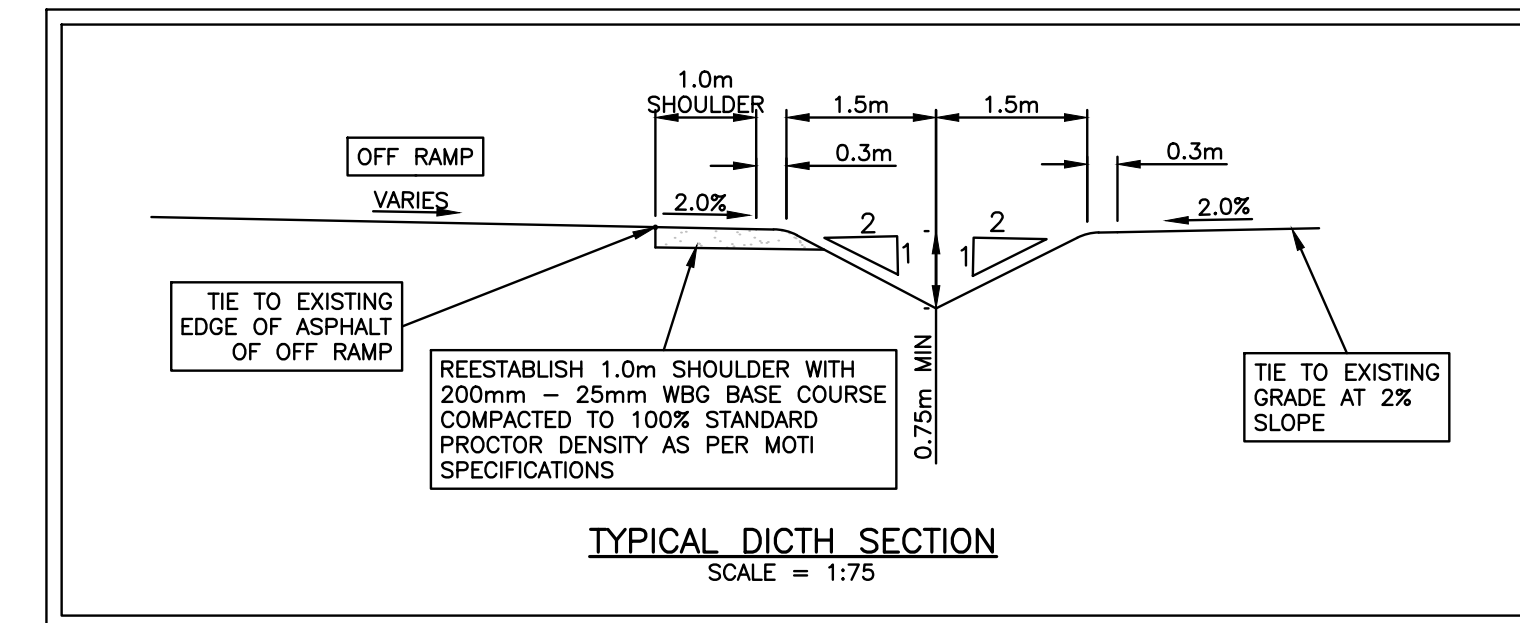
# CREUS Engineering

Civil Engineers & Project Managers  
 #10 EAST TOWER - 221 ESPLANADE WEST, NORTH VANCOUVER BC, V7M3J3  
 PH: 604-987-0070 WEBSITE: www.creus.ca



**DRAWING LEGEND**

	EXISTING	PROP.	TO BE REMOVED
LEGAL LINE	---	---	---
EASEMENT	---	---	---
WATERMAIN	---	---	---
SANITARY	---	---	---
STORM	---	---	---
HYDRO	---	---	---
TEL	---	---	---
STREETLIGHT	---	---	---
GAS	---	---	---
	EXISTING	PROP.	TO BE REMOVED
FIRE HYDRANT	⊗	⊗	⊗
GATE VALVE	⊙	⊙	⊙
AIR VALVE	⊕	⊕	⊕
REDUCER	⊖	⊖	⊖
INSPECTION CHAMBER	⊠	⊠	⊠
CATCHBASIN (STD/SI)	⊡	⊡	⊡
CAP	⊢	⊢	⊢
MANHOLE	⊣	⊣	⊣
POWER POLE	⊤	⊤	⊤
STREETLIGHT	⊥	⊥	⊥



approved

client  
 VILLAGE OF LIONS BAY

project  
 KELVIN GROVE LOT SERVICING LIONS BAY, BC

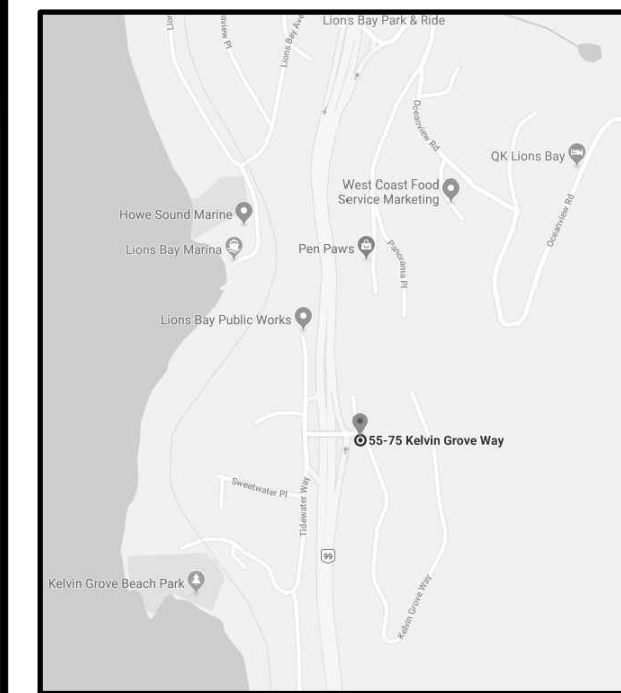
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 ROADWORKS PLAN DITCHING

no.	(y/m/d)	revision	chn/d
2	18-07-17	ISSUED FOR TENDER	AJB
1	18-05-30	ISSUED FOR MOTI REVIEW	AJB

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engineer of record	KBH	scales	hor: 1:150	vert: -
designed by	KBH	file no.	<b>18190</b>	
drawn by	AJB	drawing no.	<b>R-1</b>	
date	2018-04-19			

SEE DRAWING KEY-1 FOR GENERAL NOTES  
 SEE DRAWING R-1 FOR ROADWORKS NOTES  
 SEE DRAWING ESC-1 FOR SILTATION CONTROL NOTES

Civil Engineers & Project Managers  
 #10 EAST TOWER - 221 ESPLANADE WEST, NORTH VANCOUVER BC, V7M3J3  
 PH: 604-987-9070 WEBSITE: www.creus.ca



SITE MAP

DRAWING LEGEND

	EXISTING	PROP.	TO BE REMOVED
LEGAL LINE	---	---	---
EASEMENT	---	---	---
WATERMAIN	---	---	---
SANITARY	---	---	---
STORM	---	---	---
HYDRO	---	---	---
TEL	---	---	---
STREETLIGHT	---	---	---
GAS	---	---	---
	EXISTING	PROP.	TO BE REMOVED
FIRE HYDRANT	⊗	⊗	⊗
GATE VALVE	⊗	⊗	⊗
AIR VALVE	⊗	⊗	⊗
REDUCER	⊗	⊗	⊗
INSPECTION CHAMBER	⊗	⊗	⊗
CATCHBASIN (STD/SI)	⊗	⊗	⊗
CAP	⊗	⊗	⊗
MANHOLE	⊗	⊗	⊗
POWER POLE	⊗	⊗	⊗
STREETLIGHT	⊗	⊗	⊗

approved

client

VILLAGE OF LIONS BAY

project

KELVIN GROVE LOT SERVICING  
LIONS BAY, BC

title

CROSS SECTIONS  
DITCH  
(STA 0+115 - STA 0+ 155.95)

2 18-07-17 ISSUED FOR TENDER A,JB

1 18-05-30 ISSUED FOR MOTI REVIEW A,JB

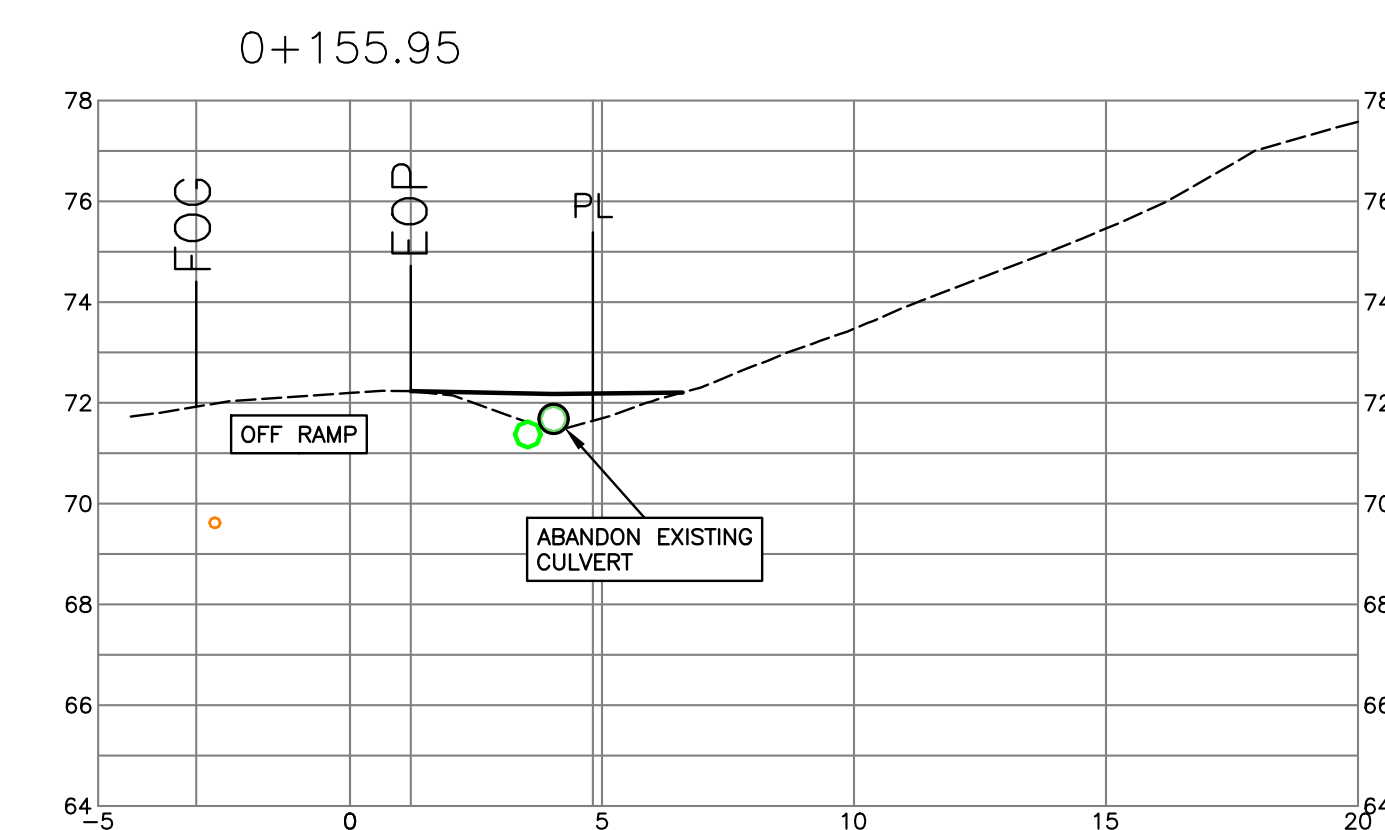
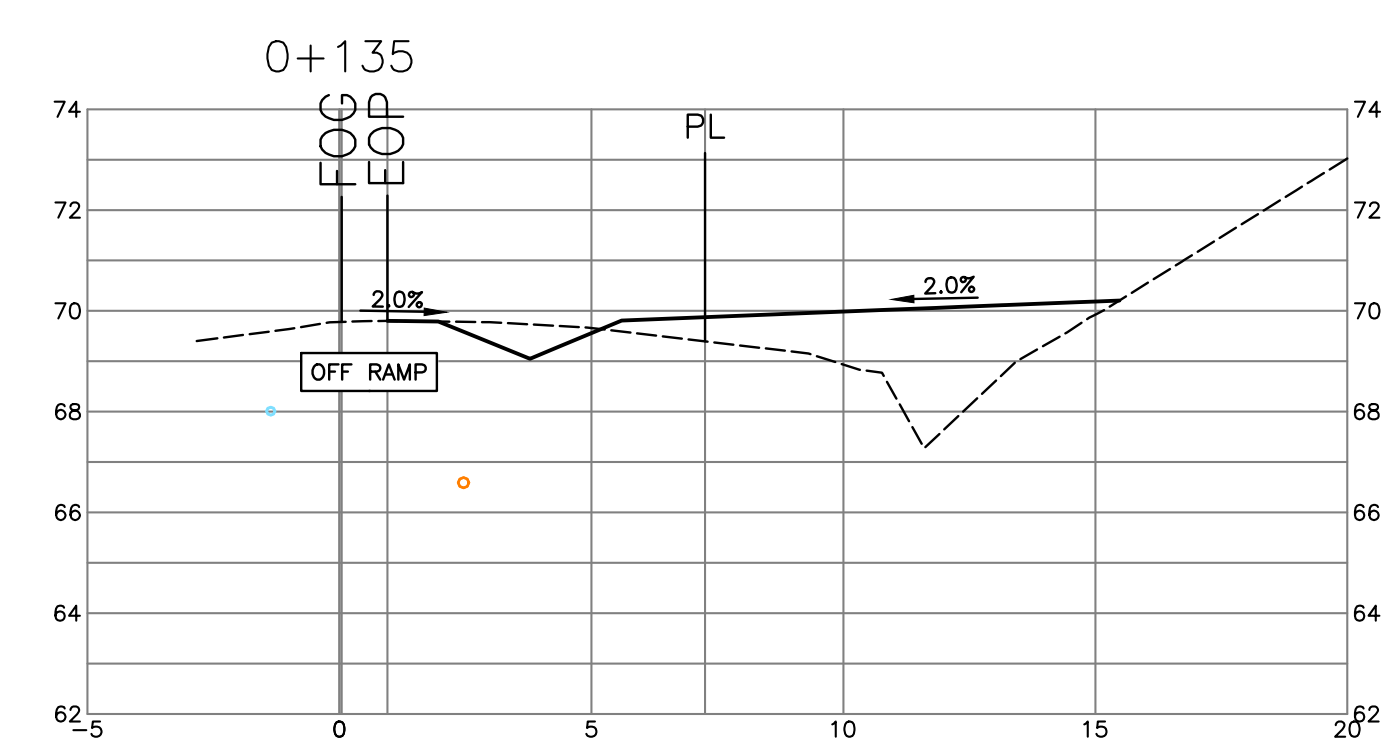
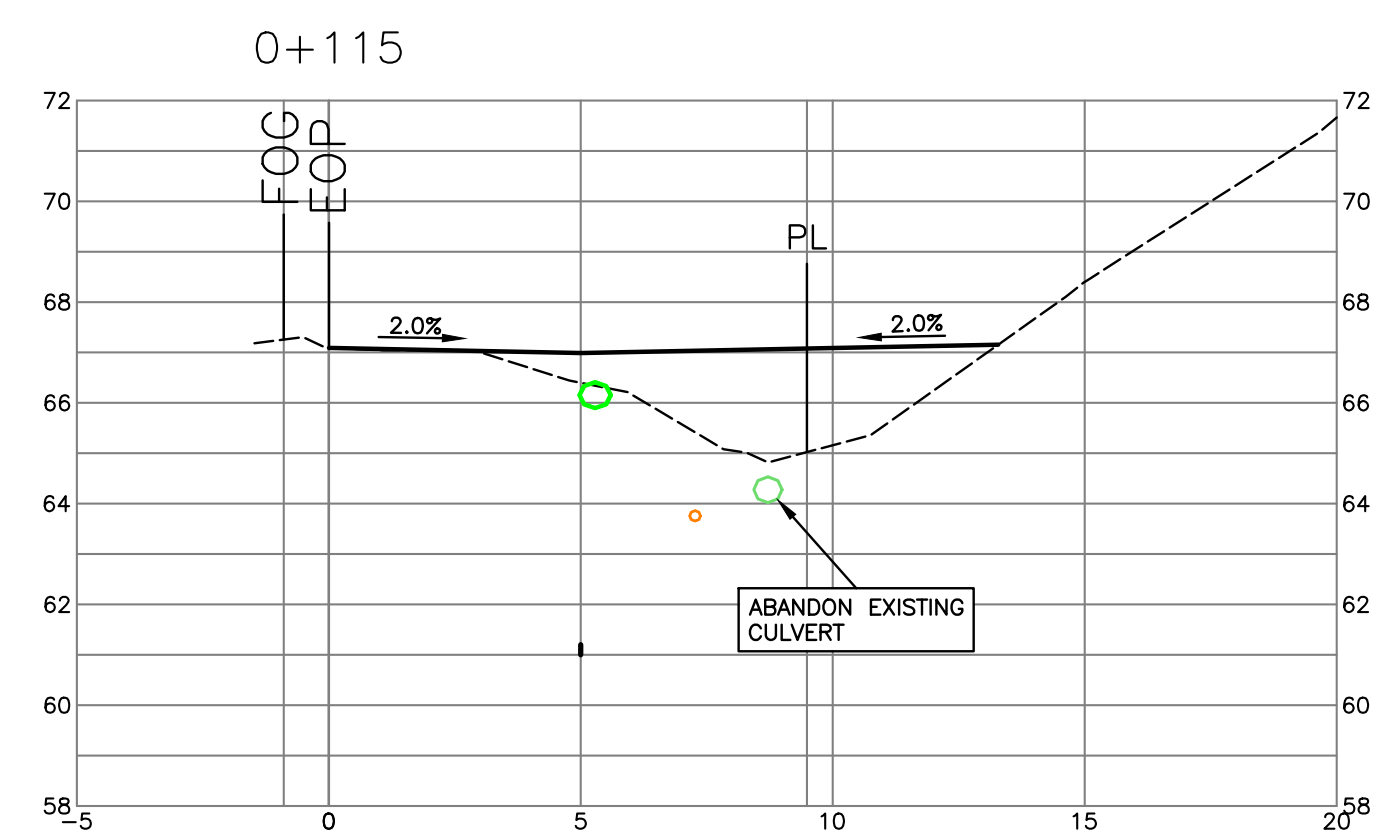
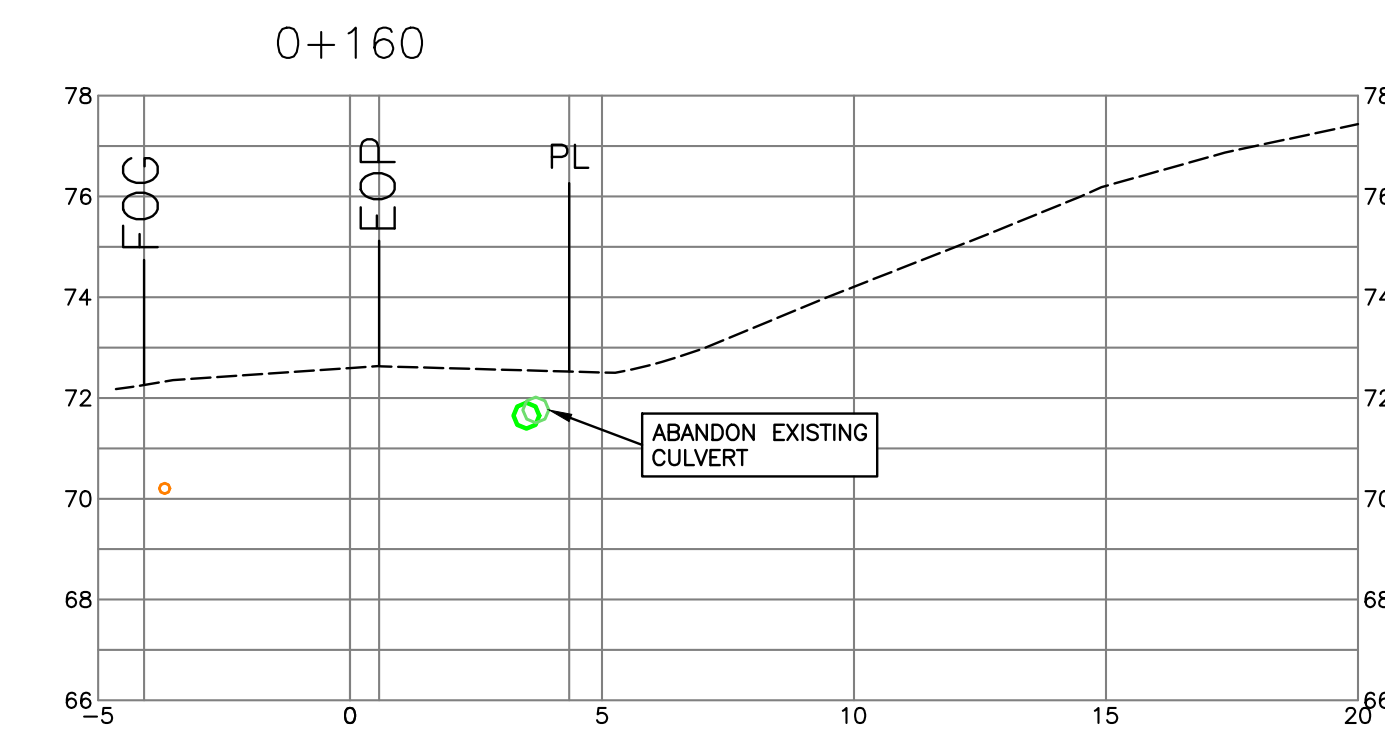
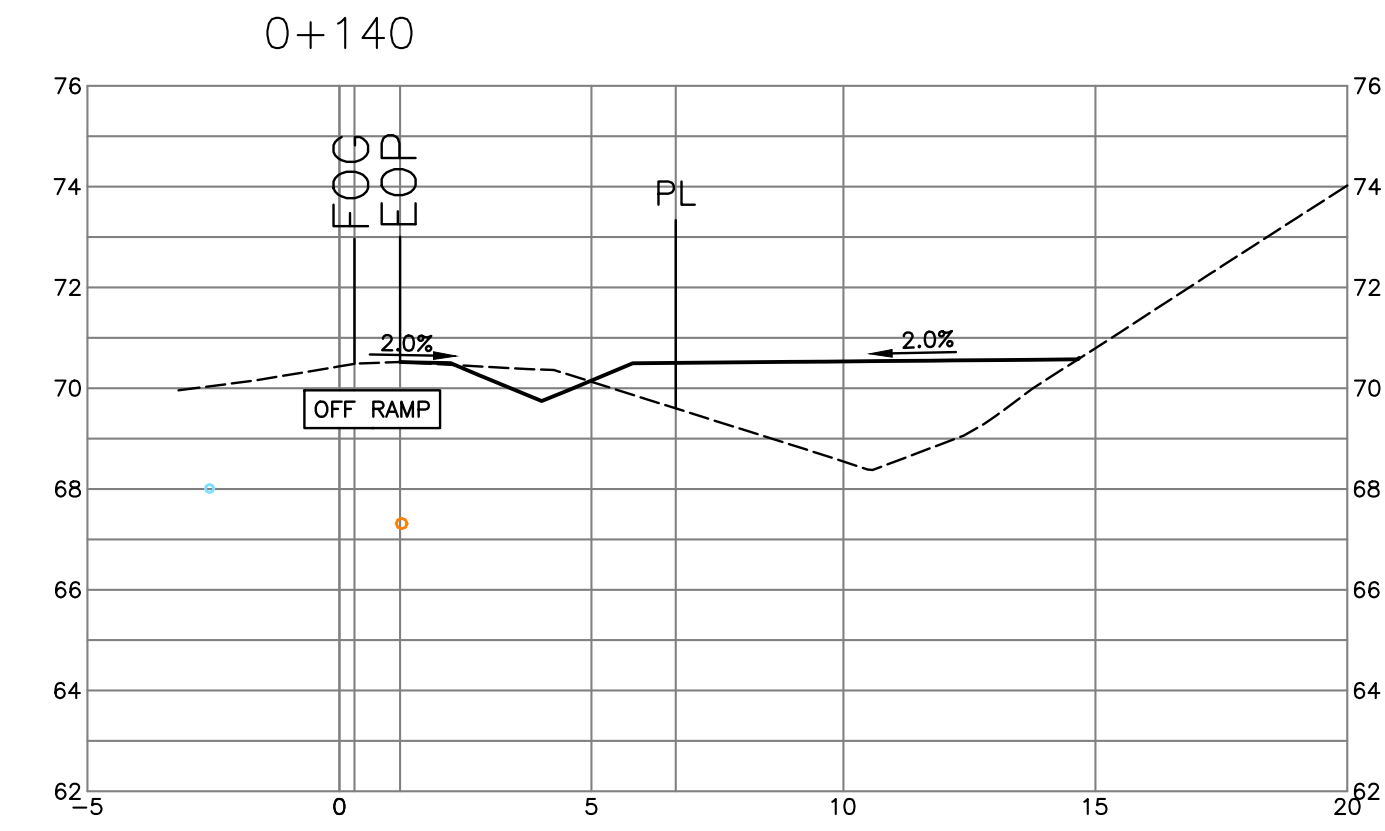
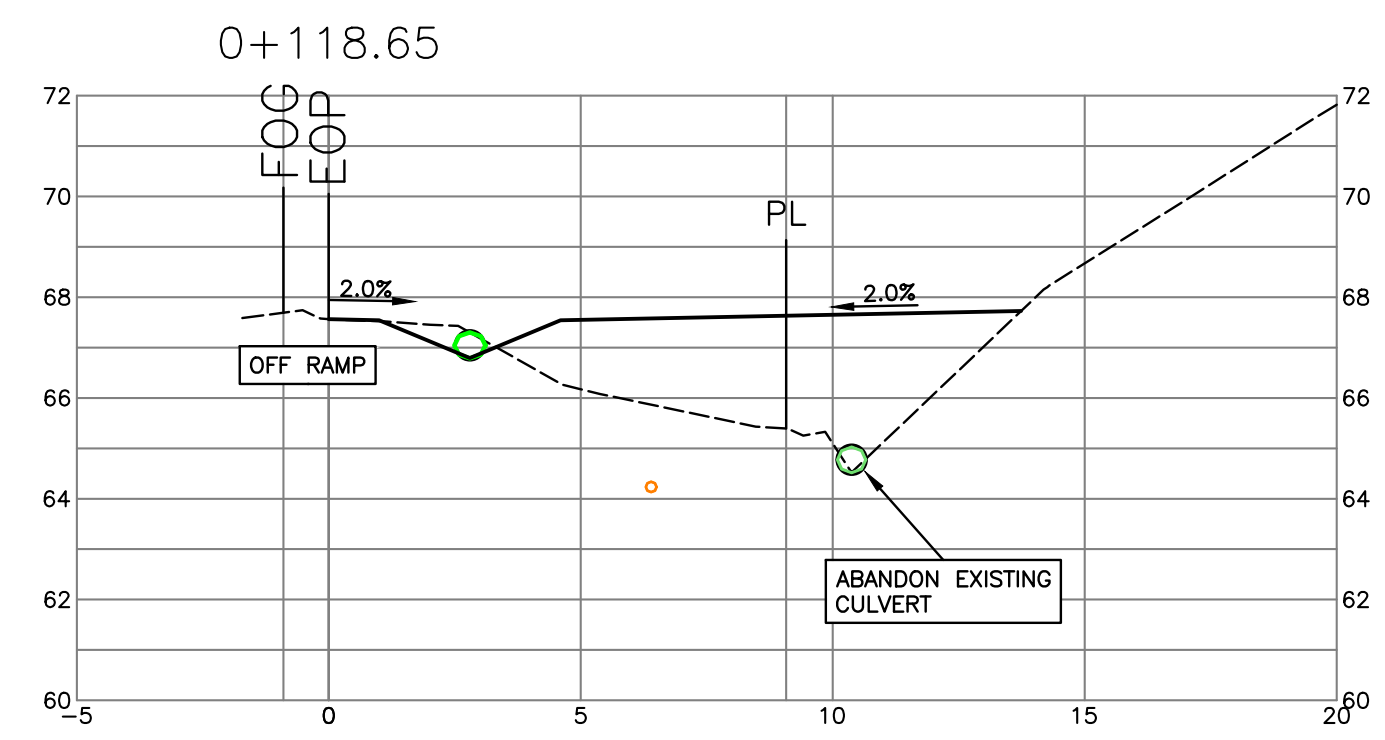
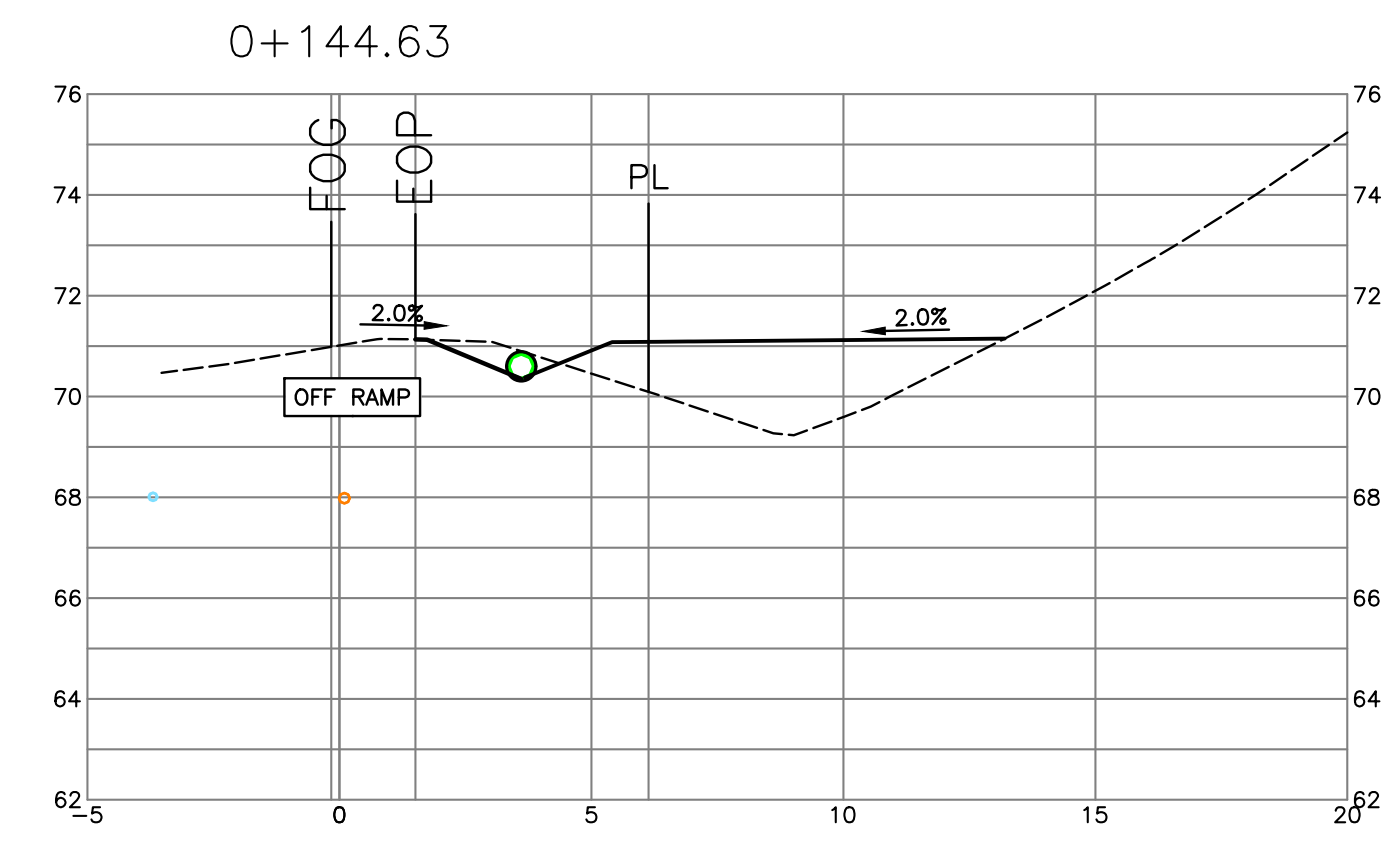
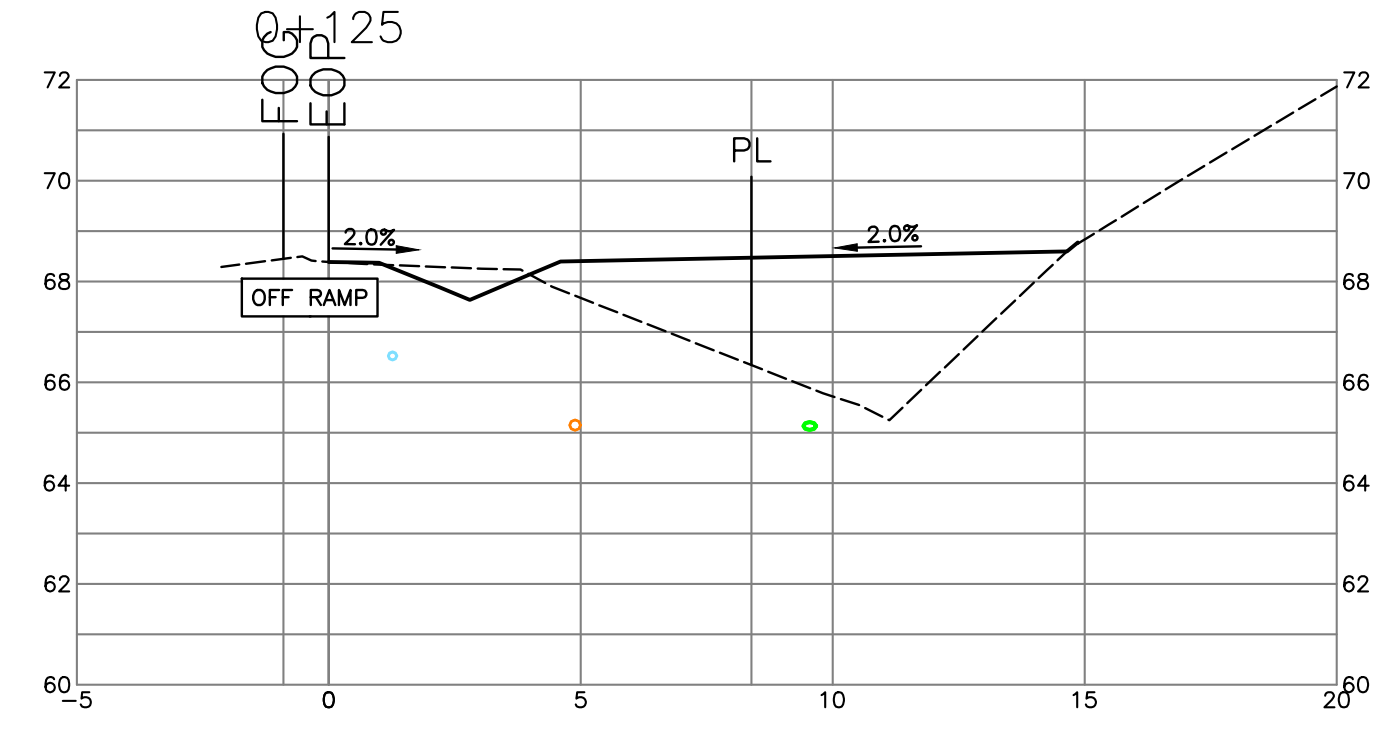
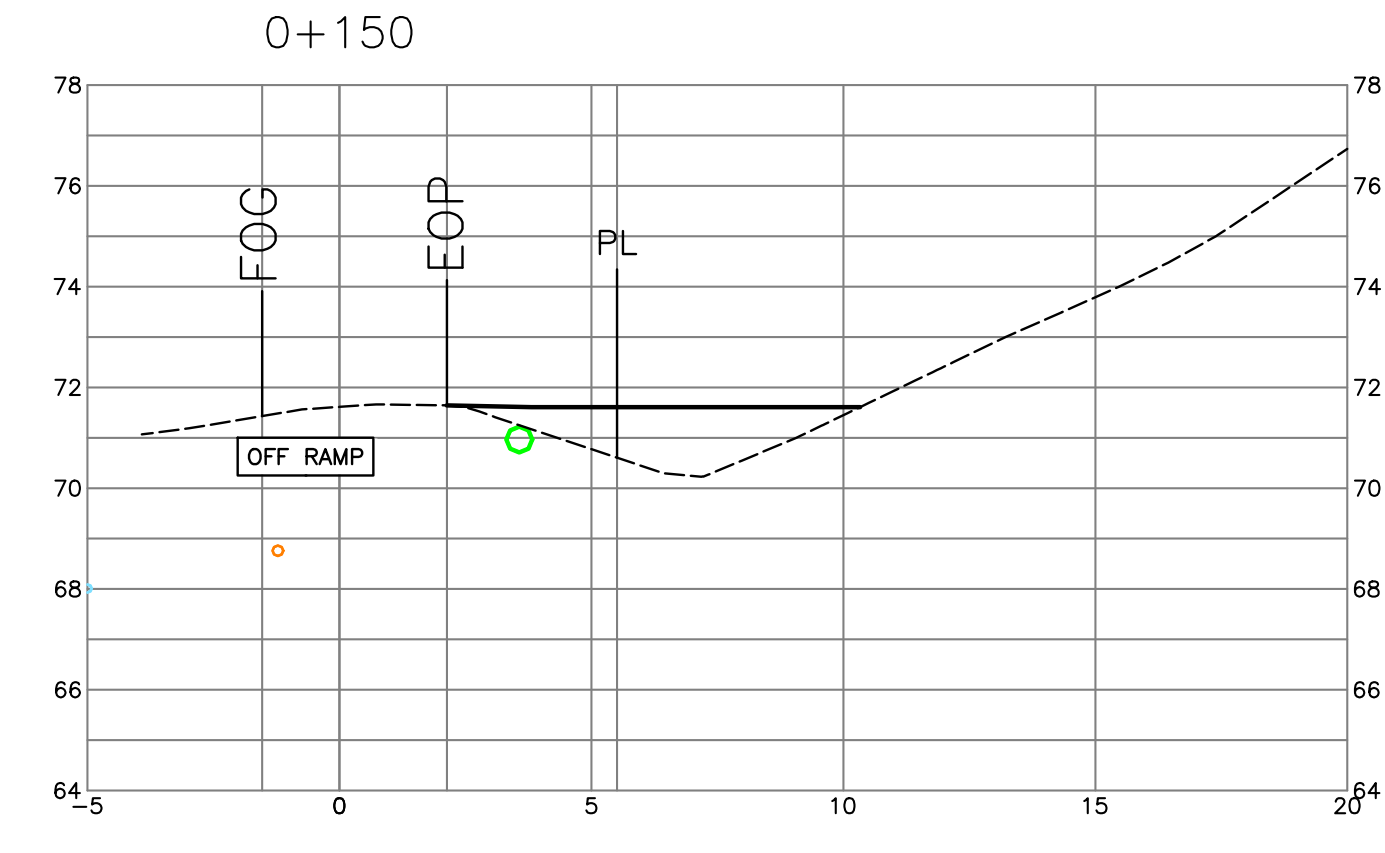
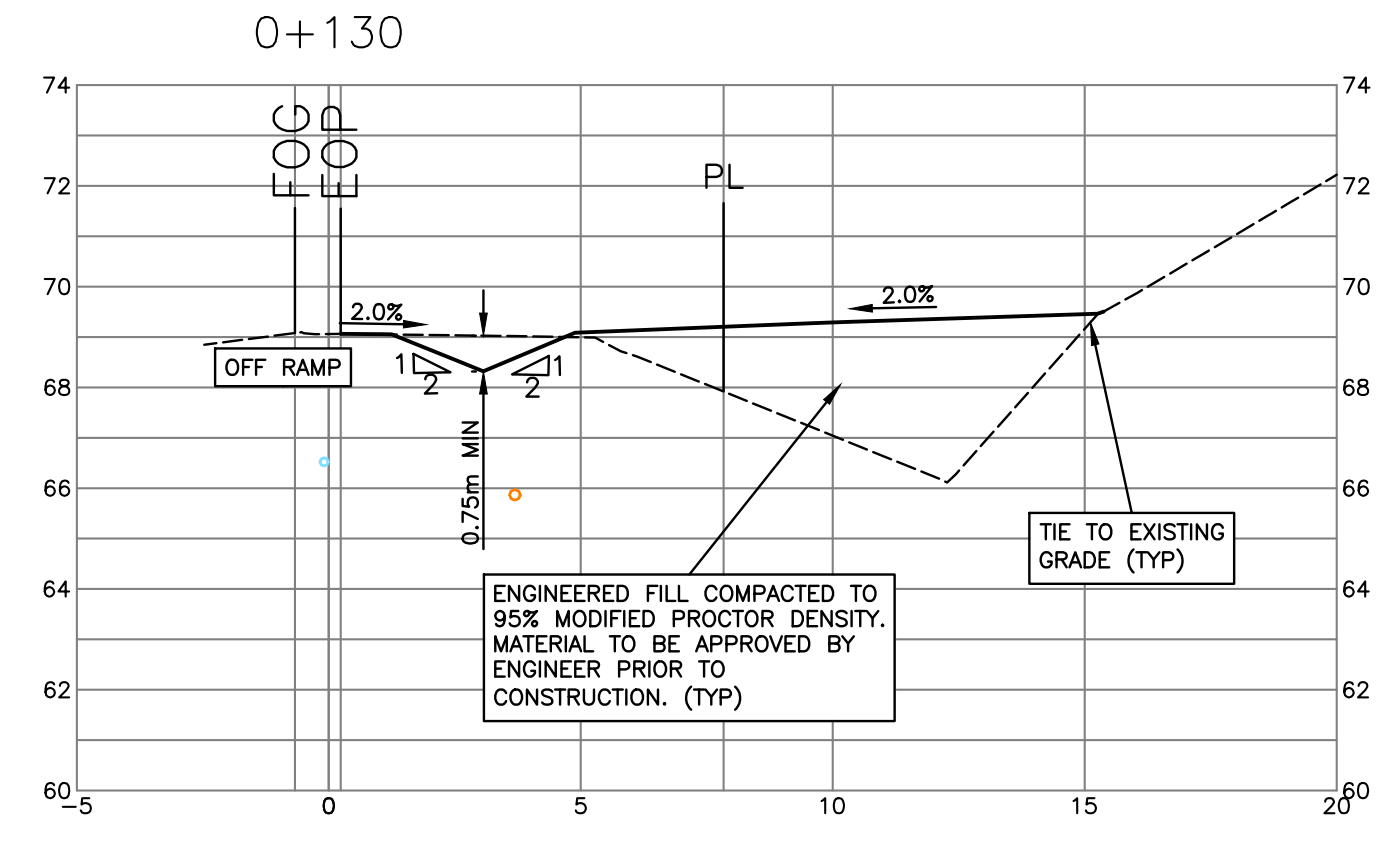
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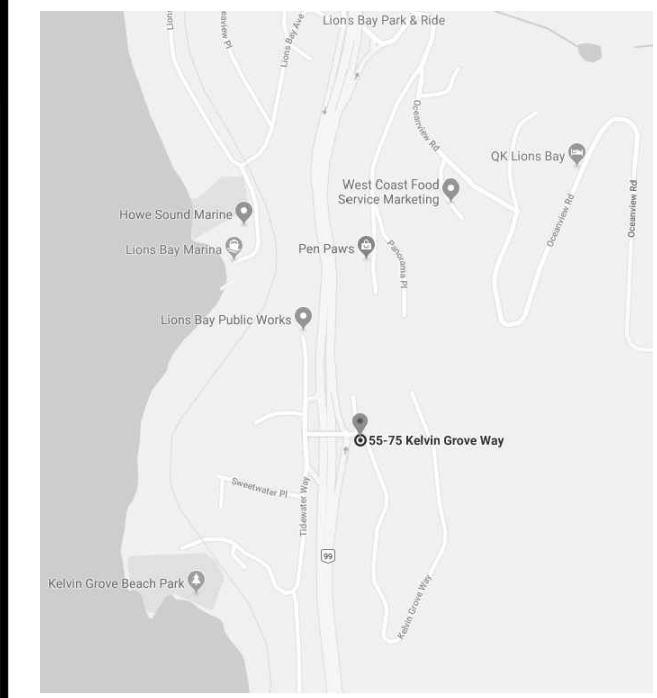
designed by KBH file no. 18190

drawn by A,JB drawing no. XS-1

date 2018-04-19







SITE MAP

DRAWING LEGEND

	EXISTING	PROP.	TO BE REMOVED
LEGAL LINE	---	---	---
EASEMENT	---	---	---
WATERMAIN	---	---	---
SANITARY	---	---	---
STORM	---	---	---
HYDRO	---	---	---
TEL	---	---	---
STREETLIGHT	---	---	---
GAS	---	---	---
	EXISTING	PROP.	TO BE REMOVED
FIRE HYDRANT	⊗	⊗	⊗
GATE VALVE	⊕	⊕	⊕
AIR VALVE	⊙	⊙	⊙
REDUCER	⊘	⊘	⊘
INSPECTION CHAMBER	⊚	⊚	⊚
CATCHBASIN (STD/SI)	⊚/⊚	⊚/⊚	⊚/⊚
CAP	⊚	⊚	⊚
MANHOLE	⊚	⊚	⊚
POWER POLE	⊚	⊚	⊚
STREETLIGHT	⊚	⊚	⊚

approved

client

VILLAGE OF LIONS BAY

project

KELVIN GROVE LOT SERVICING  
LIONS BAY, BC

title

DETAILS

1	18-07-17	ISSUED FOR TENDER	AJB
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no.	(y/m/d)	revision	chk'd
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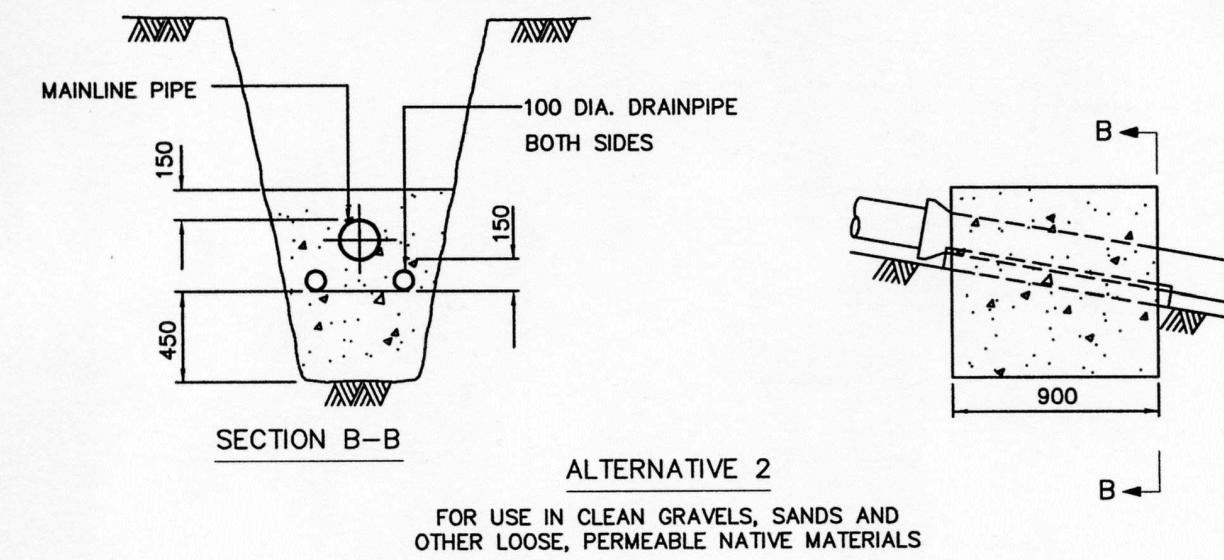
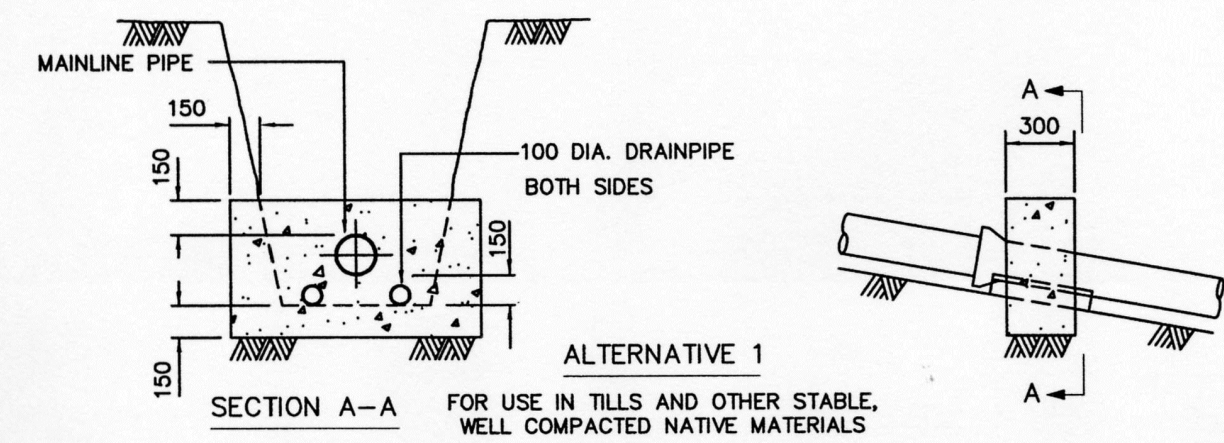
engineer of record	KBH	scales	hor: - vert: -
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designed by	AJB	file no.	18190
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drawn by	AJB	drawing no.	DET-2
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date	2018-04-19		
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MMCD STANDARD DETAIL DRAWINGS



MAXIMUM SPACING OF ANCHOR BLOCKS (SEE NOTE 4)			
SANITARY AND STORM GRAVITY SEWERS		WATERMAINS AND FORCEMAINS	
SLOPE	MAX. SPACING	SLOPE	MAX. SPACING
15% - 20%	25m	10% OR GREATER	10m
20% - 35%	20m		
35% - 50%	15m		
50% - OVER	10m		

- NOTE: 1. APPLICABLE TO ALL PIPE MATERIALS.  
 2. USE ALTERNATIVES 1 OR 2 AS SPECIFIED ON CONTRACT DRAWINGS.  
 3. USE 20 MPa CONCRETE UNLESS SPECIFIED OTHERWISE ON CONTRACT DRAWINGS.  
 4. REFER TO CONTRACT DRAWINGS FOR SPECIFIED SPACING IF OTHER THAN MAXIMUM SHOWN IN TABLE.

PIPE ANCHOR BLOCKS

DRAWING NUMBER:  
**G8**

2001