

1 PLAN VIEW  
SCALE: 1:500

SITE DEMOLITION LEGEND

[Hatched Box] SITE AREA TO BE DEMOLISHED

SITE DEMOLITION NOTES

1. PLAN BASED ON SURVEY CONDUCTED BY MURRAY & ASSOCIATES, SURREY, BC AND SUPPLIED BY UBC.
2. ALL EXISTING HARDSCAPE AND SOFTSCAPE WITHIN PROJECT BOUNDARY TO BE DEMOLISHED.
3. REMOVE AND STOCKPILE ANY EXISTING SITE FURNISHINGS WITHIN HATCHED AREAS. COORDINATE STORAGE WITH UBC PLANT OPERATIONS.
4. REMOVE AND RETAIN ANY MEMORIAL OR HISTORIC LANDSCAPE ITEMS, PLAQUES, BENCHES, TREES, ETC. AND RETURN TO OWNER.
5. LOCATION OF AT-GRADE SERVICES SHOWN ON DRAWINGS ARE INDICATIVE ONLY. CONTRACTOR TO VERIFY LOCATION AND PROTECT ALL SITE SERVICES WITHIN SCOPE OF WORK PRIOR TO COMMENCEMENT OF EXCAVATION. REFER TO CIVIL FOR SUB SURFACE UTILITY LOCATIONS.
6. REFER TO CIVIL FOR UTILITY DEMOLITION AND PROTECTION MEASURES.
7. REFER TO CIVIL FOR EROSION CONTROL MEASURES.
8. CONTRACTOR TO MAKE GOOD ANY DAMAGE DONE DURING THE CONSTRUCTION PERIOD TO EXISTING FEATURES TO BE RETAINED.
9. ANY BLUE PHONES IN CONFLICT WITH PROPOSED DESIGN TO BE EVALUATED FOR REMOVAL AND RELOCATION BY CLIENT IN COORDINATION WITH TELECOM PROVIDER.

TREE PROTECTION LEGEND

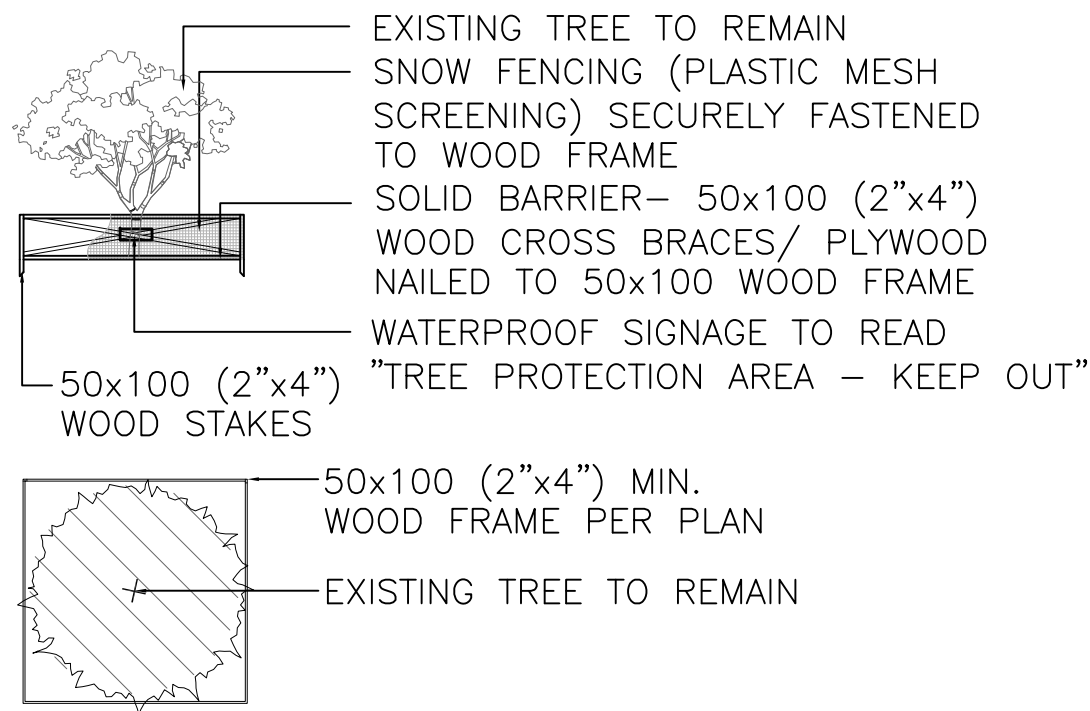
- [Circle with X] TREE TO BE REMOVED
- [Circle with X and dot] TREE TO BE REMOVED (OUTSIDE SCOPE – SEE NOTE #9)
- [Square with X] TREE TO BE RELOCATED
- [Line with circle] TREE PROTECTION FENCE
- [Circle with dot] EXISTING TREE TO REMAIN

TREE REMOVAL SCHEDULE

1. 460mm, PINE	26. 430mm, MAPLE	52. 250mm, MAPLE*
2. 460mm, PINE	27. 310mm, MAPLE	53. 210mm, MAPLE*
3. 840mm, COTTONWOOD	28. 330mm, MAPLE	54. 230mm, MAPLE
4. 810mm, COTTONWOOD	29. 460mm, MAPLE	55. 260mm, MAPLE
5. 310mm, MAPLE	30. 390mm, MAPLE	56. 280mm, MAPLE
5A. 390mm, MAPLE	31. 310mm, PINE	57. 240mm, MAPLE
6. 280mm, MAPLE	32. 190mm, DECIDUOUS	58. 300mm, MAPLE
7. 330mm, MAPLE	33. 220mm, PINE	59. 330mm, MAPLE
8. 270mm, MAPLE	34. 170mm, DECIDUOUS	60. 200mm, MAPLE
9. 260mm, MAPLE	35. 180mm, PINE	61. 260mm, MAPLE
10. 200mm, MAPLE	36. 210mm, PINE	62. 320mm, MAPLE
11. 220mm, MAPLE	37. 210mm, MAPLE	63. 300mm, MAPLE
12. 230mm, MAPLE	38. 210mm, PINE	64. 110mm, BIRCH
13. 210mm, MAPLE	39. 460mm, PLATINUS	65. 130mm, BIRCH
14. 240mm, MAPLE	40. 320mm, BEECH	66. 170mm, BIRCH
15. 200mm, MAPLE	41. 230mm, OAK	67. 400mm, ALDER
16. 240mm, MAPLE	42. 240mm, BEECH	68. 590mm, ALDER
17. 180mm, MAPLE	43. 420mm, OAK	69. 200mm, DECIDUOUS
18. 190mm, MAPLE	44. 280mm, BEECH	70. 2/100–140mm, DECIDUOUS
19. 180mm, DECIDUOUS	45. 270mm/110mm, BEECH	71. 3/70–100mm, DECIDUOUS
20. 180mm, DECIDUOUS	46. 290mm, BEECH	72. 4/90–120mm, DECIDUOUS
21. 180mm, DECIDUOUS	47. 330mm, BEECH	
22. 430mm, MAPLE	48. 280mm, MAPLE*	
23. 420mm, MAPLE	49. 240mm, MAPLE*	
24. 430mm, MAPLE	50. 220mm, MAPLE*	
25. 420mm, MAPLE	51. 260mm, MAPLE*	

TREE PROTECTION NOTES (TREES TO BE PROTECTED OR RELOCATED TBD IN COORDINATION WITH CLIENT)

1. ARBORIST REPORT PROVIDED BY DIAMOND HEAD CONSULTING LTD, FEBRUARY 3, 2016, 342 WEST 8TH AVENUE, VANCOUVER, BC V5Y 3X2 – 604-733-4886
2. NO STORAGE OF BUILDING /CONSTRUCTION MATERIALS WITHIN PROTECTED AREAS OR AGAINST PROTECTION BARRIER.
3. ANY PRUNING OF BRANCHES OR ROOTS MUST BE DONE BY THE PROJECT ARBORIST.
4. CONTRACTOR TO UNDERTAKE TREE PROTECTION MEASURES TO UNIVERSITY OF BRITISH COLUMBIA STANDARDS.
5. HAND EXCAVATE ONLY WITHIN DRIPLINE OF TREES TO BE RETAINED. SEVER ROOTS CLEANLY. CONTACT PROJECT ARBORIST FOR APPROVAL PRIOR TO SEVERING ROOTS IN EXCESS OF 100mm DIA.
6. TREE PROTECTION FENCE IS NOT TO BE LIFTED OR REMOVED AT ANY TIME FOR VEHICULAR ACCESS. VEHICLES AND HEAVY EQUIPMENT CAN CAUSE SOIL COMPACTION IN THE ROOT ZONE DEPLETING THE AIR SPACE THAT IS ESSENTIAL TO THE TREE'S HEALTH.
7. LOCATION OF TREE PROTECTION FENCING AND LIMIT OF ACCESS FENCING TO BE VERIFIED WITH CONSULTANT AND PROJECT ARBORIST PRIOR TO INSTALLATION.
8. BASED ON CONTRACTOR'S STAGING AND ACCESS REQUIREMENTS, ADDITIONAL TREE PROTECTION FENCING MAY BE REQUIRED.
9. TREES IDENTIFIED TO BE RELOCATED (\*) REQUIRE ASSESSMENT AND COORDINATION WITH THE PROJECT ARBORIST AND CAMPUS LANDSCAPE ARCHITECT. RELOCATION TO BE DETERMINED BY CAMPUS LANDSCAPE ARCHITECT.



2 TREE PROTECTION FENCE AS APPLICABLE  
SCALE: N.T.S.

DIALOG®

PFS STUDIO  
PLANNING • URBAN DESIGN • LANDSCAPE ARCHITECTURE

ISSUED FOR:  
1 2016-02-05 ISSUE FOR BID-INTERIM  
2 2016-02-12 ISSUE FOR BID ADDENDUM R1  
3 2016-04-20 ISSUE FOR CONSTRUCTION

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SEAL

UBC GAGE SOUTH

TREE MAINTENANCE  
AND SURFACE  
DEMOLITION PLAN

DRAWN: NST CHECKED: RD

L001

PLOT DATE: 11/02/2015 11:57:12 AM



# Memo

## **SLP REV. 1 to SLP REV. 2**

**Date:** April 25, 2016

**Re:** UBC Gage South

### **Drawing Changes :**

#### **C4A – Utilities, Overall Site Servicing**

- 1) Water Connection and Hydrant Location Adjusted
- 2) Oil/TSS Removal Manhole Revised
- 3) Hydrant Removed

#### **C4B – Utilities, Site Servicing**

- 1) Water Connection and Hydrant Location Adjusted
- 2) Revised Hydro Conduit Adjusted per UBC and AES Comments

#### **C4C – Utilities, Site Servicing**

- 1) Future Services and Notation Greyed Out
- 2) Revised Hydro Conduit Adjusted per UBC and AES Comments
- 3) Oil/TSS Removal Manhole Revised
- 4) Hydrant Removed

#### **C4E – Utilities, Notes and Details**

- 1) Revised OIL/TSS Removal Manhole Detail added

#### **C27B – Utilities, Plan/Profile Phase 1 Storm Sewer**

- 1) Oil/TSS Removal Manhole Revised (Plan/Profile)

#### **C27E – Utilities, Plan/Profile Phase 1 Water**

- 1) Water Connection and Hydrant Location Adjusted
- 2) Water Service Building Entry Detail Added

#### **H1 – Electrical Site Servicing Plan**

- 1) Hydro Conduit, kiosks, and Chambers Updated to UBC and AES Comments

Regards,

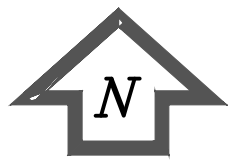
Brian Carnahan



# GAGE SOUTH EXCHANGE

## PHASE 1 - UNDERGROUND WORKS

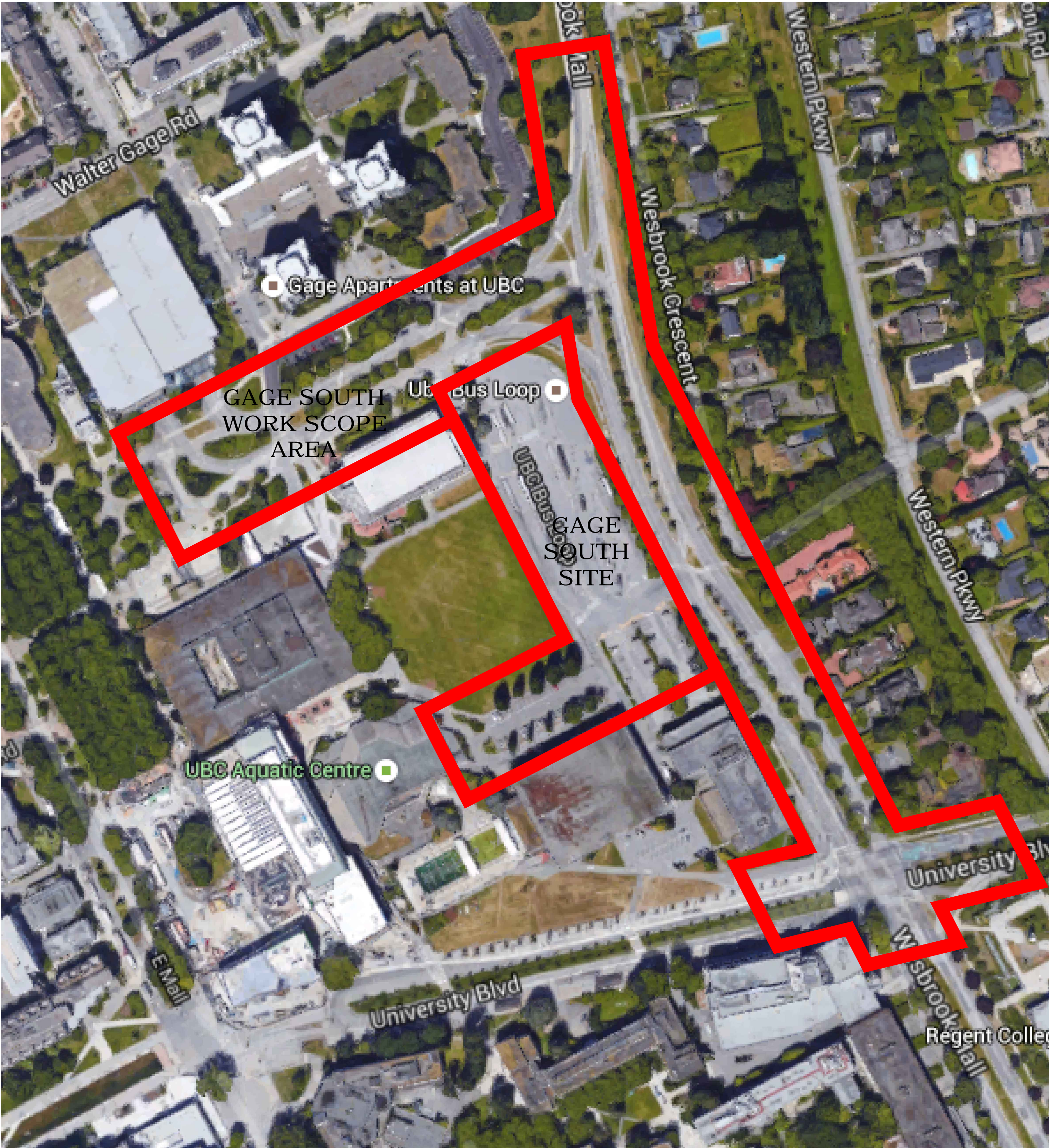
VANCOUVER, BC



ISSUED FOR  
1 / 2016-03-30 / SLP SUBMISSION  
2 / 2016-04-26 / SLP - PHASE 1 UNDERGROUND

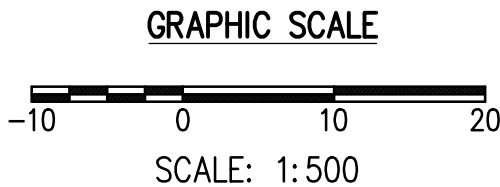
DRAWING LIST

- C0 - COVER SHEET
- C1 - UTILITIES : EXISTING CONDITIONS
- C2 - ABANDON AND DEMOLITION PLAN
- C3 - NOTES AND DETAILS
- C4A - UTILITIES : OVERALL SITE SERVICING PLAN
- C4B - UTILITIES : SITE SERVICING PLAN
- C4C - UTILITIES : SITE SERVICING PLAN
- C4D - UTILITIES : SITE SERVICING PLAN
- C4E - UTILITIES : NOTES AND DETAILS
- C5 - PAVING GEOMETRY : STUDENT UNION BLVD.
- C6 - PAVING GRADING : STUDENT UNION BLVD.
- C7 - CROSS SECTIONS : STUDENT UNION BLVD.
- C8 - CROSS SECTIONS : STUDENT UNION BLVD.
- C9 - PAVING GEOMETRY : WESBROOK MALL
- C10 - PAVING GEOMETRY : WESBROOK MALL
- C11 - PAVING GRADING : WESBROOK MALL
- C12 - PAVING GRADING : WESBROOK MALL
- C13 - CROSS SECTIONS : WESBROOK MALL
- C14 - CROSS SECTIONS : WESBROOK MALL
- C15 - CROSS SECTIONS : WESBROOK MALL
- C16 - PAVING GEOMETRY : INTERIM BUS LOOP - STAGE 1
- C17 - PAVING GEOMETRY : INTERIM BUS LOOP - STAGE 2
- C18 - PAVING GRADING : INTERIM BUS LOOP - STAGE 1
- C19 - PAVING GRADING : INTERIM BUS LOOP - STAGE 2
- C20 - CROSS SECTIONS : INTERIM BUS LOOP
- C21 - CROSS SECTIONS : INTERIM BUS LOOP
- C22 - PAVING GEOMETRY & GRADING : UNIVERSITY BLVD.
- C23 - STRIPING & SIGNAGE : STUDENT UNION BLVD.
- C24 - STRIPING & SIGNAGE : WESBROOK MALL
- C25 - STRIPING & SIGNAGE : WESBROOK MALL
- C26 - STRIPING & SIGNAGE : INTERIM BUS LOOP & UNIVERSITY BLVD.
- C27A - UTILITIES : PLAN/PROFILE - STORM SEWER
- C27B - UTILITIES : PLAN/PROFILE - STORM SEWER
- C27C - UTILITIES : PLAN/PROFILE - STORM SEWER
- C27D - UTILITIES : PLAN/PROFILE - SANITARY SEWER
- C27E - UTILITIES : PLAN/PROFILE - WATER WORKS
- H1 - ELECTRICAL SITE SERVICING PLAN



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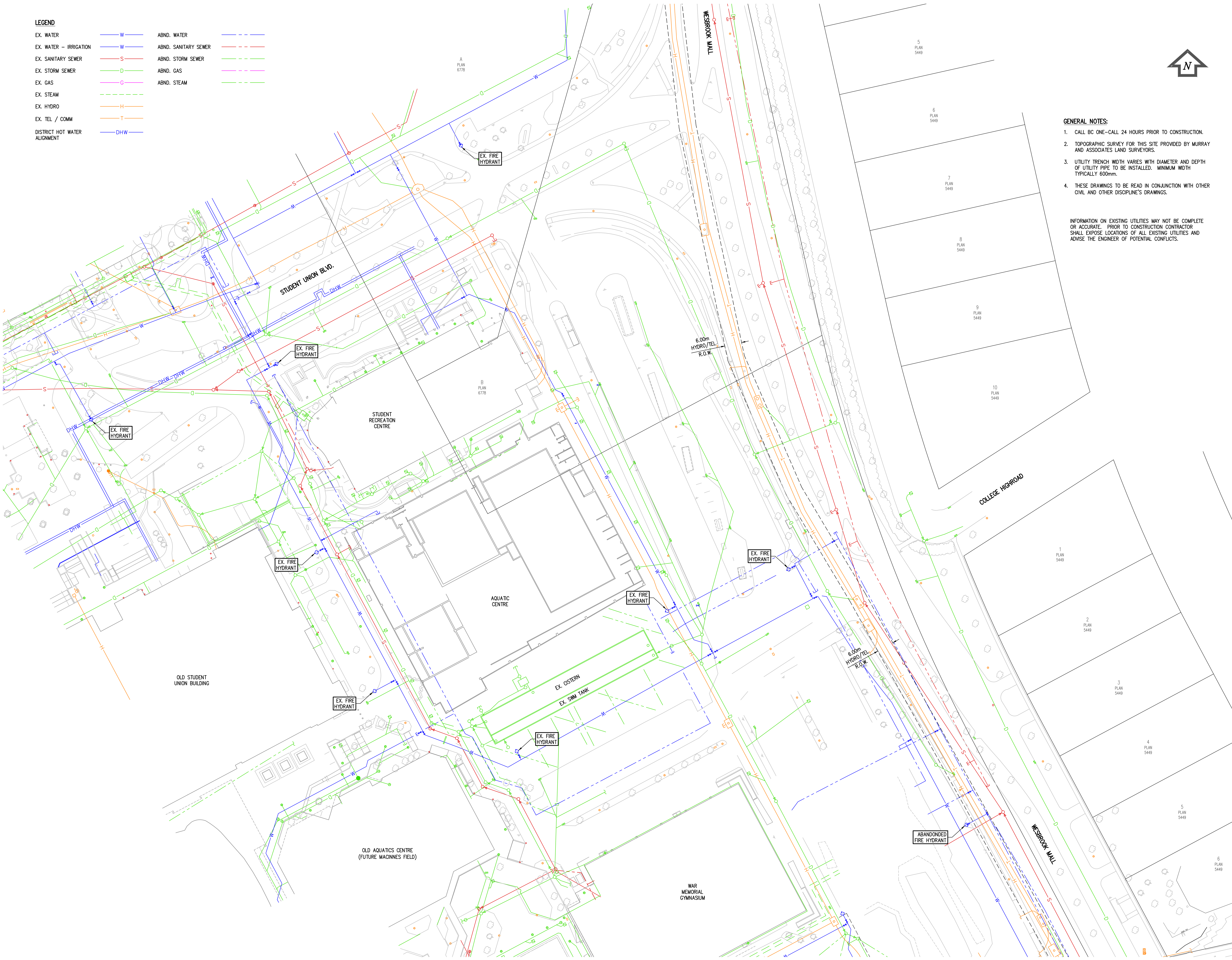
UBC Gage South  
PHASE 1  
UNDERGROUND WORKS

Civil Design  
GAGE SOUTH  
COVER SHEET

DRAWN: BC CHECKED: CN

C 0





LEGEND			
EX. WATER	W	ABND. WATER	
EX. WATER - IRRIGATION	W	ABND. SANITARY SEWER	
EX. SANITARY SEWER	S	ABND. STORM SEWER	
EX. STORM SEWER	D	ABND. GAS	
EX. GAS	G	ABND. STEAM	
EX. STEAM			
EX. HYDRO	H		
EX. TEL / COMM	T		
DISTRICT HOT WATER ALIGNMENT	DHW		



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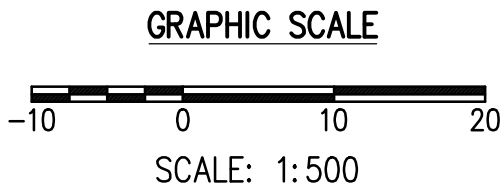
- GENERAL NOTES:
1. CALL BC ONE-CALL 24 HOURS PRIOR TO CONSTRUCTION.
  2. TOPOGRAPHIC SURVEY FOR THIS SITE PROVIDED BY MURRAY AND ASSOCIATES LAND SURVEYORS.
  3. UTILITY TRENCH WIDTH VARIES WITH DIAMETER AND DEPTH OF UTILITY PIPE TO BE INSTALLED. MINIMUM WIDTH TYPICALLY 800mm.
  4. THESE DRAWINGS TO BE READ IN CONJUNCTION WITH OTHER CIVIL AND OTHER DISCIPLINE'S DRAWINGS.

INFORMATION ON EXISTING UTILITIES MAY NOT BE COMPLETE OR ACCURATE. PRIOR TO CONSTRUCTION CONTRACTOR SHALL EXPOSE LOCATIONS OF ALL EXISTING UTILITIES AND ADVISE THE ENGINEER OF POTENTIAL CONFLICTS.

**CoreGroup**  
CONSULTANTS  
LAND DEVELOPMENT SERVICES  
320-8888 PRASERTON COURT  
BURNABY, BC V5J 5H8  
tel: (604)299 0605 fax: (604)299 0629

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2 / 2016-04-26 / SLP - PHASE 1 UNDERGROUND

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SEAL

UBC Gage South  
PHASE 1  
UNDERGROUND WORKS

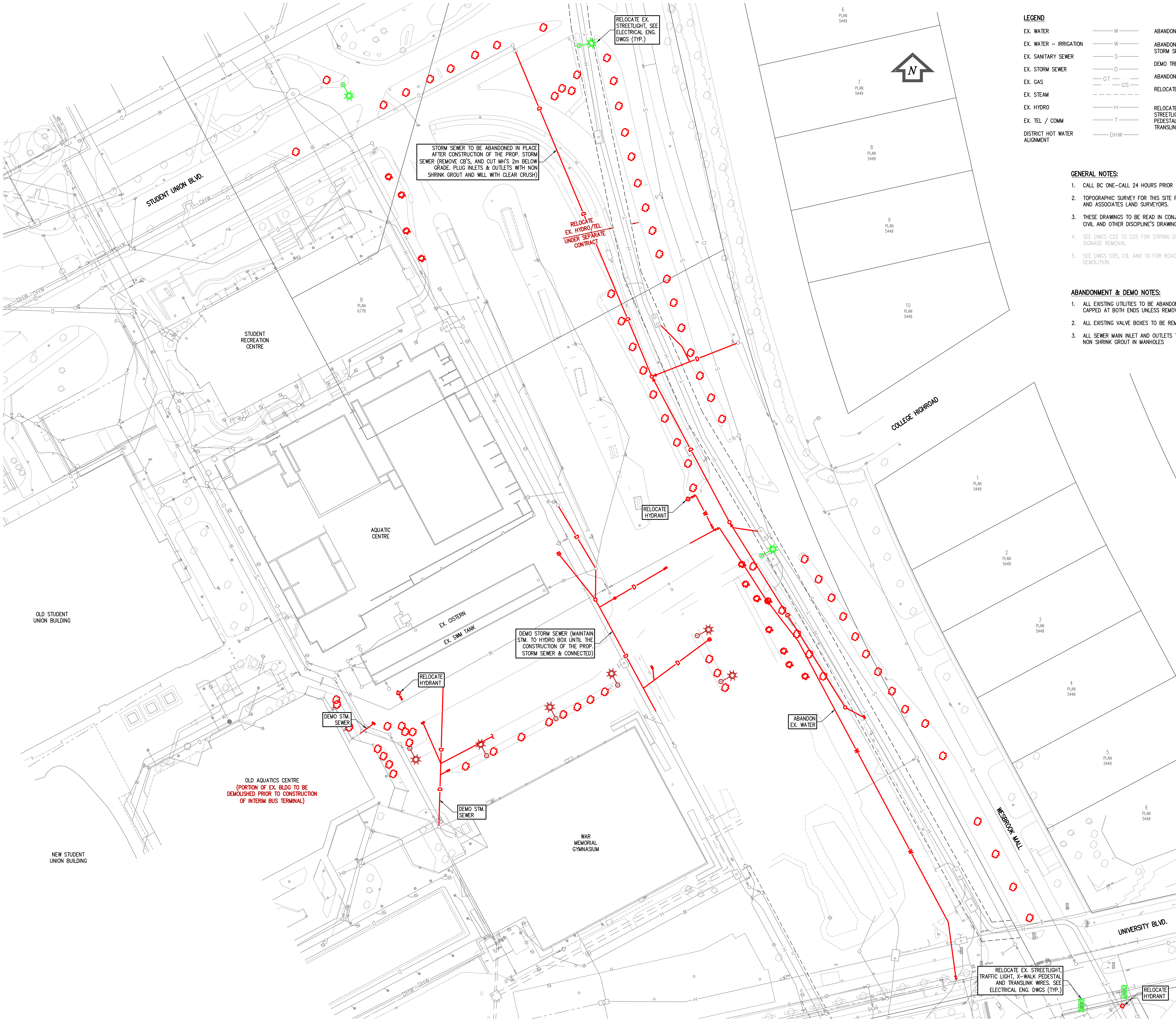
Civil Design  
UTILITIES  
EXISTING CONDITIONS








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C 1

CORE-1773





LEGEND			
EX. WATER	—— W ——	ABANDON WATER	
EX. WATER — IRRIGATION	—— W ——	ABANDON / DEMO STORM SEWER	
EX. SANITARY SEWER	—— S ——	DEMO TREES	
EX. STORM SEWER	—— D ——	ABANDON STREETLIGHT	
EX. GAS	—— GT —— GS ——	RELOCATED STREETLIGHT	
EX. STEAM	—— ——— ———		
EX. HYDRO	—— H ——	RELOCATE EX. STREETLIGHT, X-WALK PEDESTAL, AND TRANSLINK BUS WIRES	
EX. TEL / COMM	—— T ——		
DISTRICT HOT WATER ALIGNMENT	—— DHW ——		

- GENERAL NOTES:
1. CALL BC ONE-CALL 24 HOURS PRIOR TO CONSTRUCTION.
  2. TOPOGRAPHIC SURVEY FOR THIS SITE PROVIDED BY MURRAY AND ASSOCIATES LAND SURVEYORS.
  3. THESE DRAWINGS TO BE READ IN CONJUNCTION WITH OTHER CIVIL AND OTHER DISCIPLINE'S DRAWINGS.
  4. SEE DWGS C22 TO C25 FOR STIPING DEMARCATION AND SIGNAGE REMOVAL.
  5. SEE DWGS C05, C9, AND 10 FOR ROAD WORKS AND ISLAND DEMOLITION.

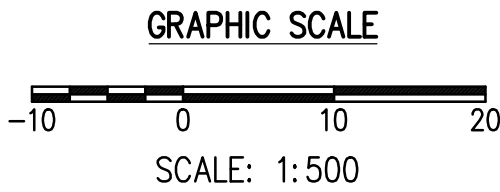
- ABANDONMENT & DEMO NOTES:
1. ALL EXISTING UTILITIES TO BE ABANDONED ARE TO BE CAPPED AT BOTH ENDS UNLESS REMOVED ENTIRELY.
  2. ALL EXISTING VALVE BOXES TO BE REMOVED OFF SITE.
  3. ALL SEWER MAIN INLET AND OUTLETS TO BE PLUGGED WITH NON SHRINK GROUT IN MANHOLES.

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SEAL

UBC Gage South  
PHASE 1  
UNDERGROUND WORKS

Civil Design  
ABANDON AND  
DEMOLITION PLAN

DRAWN: BC CHECKED: CN

C 2

CORE-1773

INFORMATION ON EXISTING UTILITIES MAY NOT BE COMPLETE OR ACCURATE. PRIOR TO CONSTRUCTION CONTRACTOR SHALL EXPOSE LOCATIONS OF ALL EXISTING UTILITIES AND ADVISE THE ENGINEER OF POTENTIAL CONFLICTS.



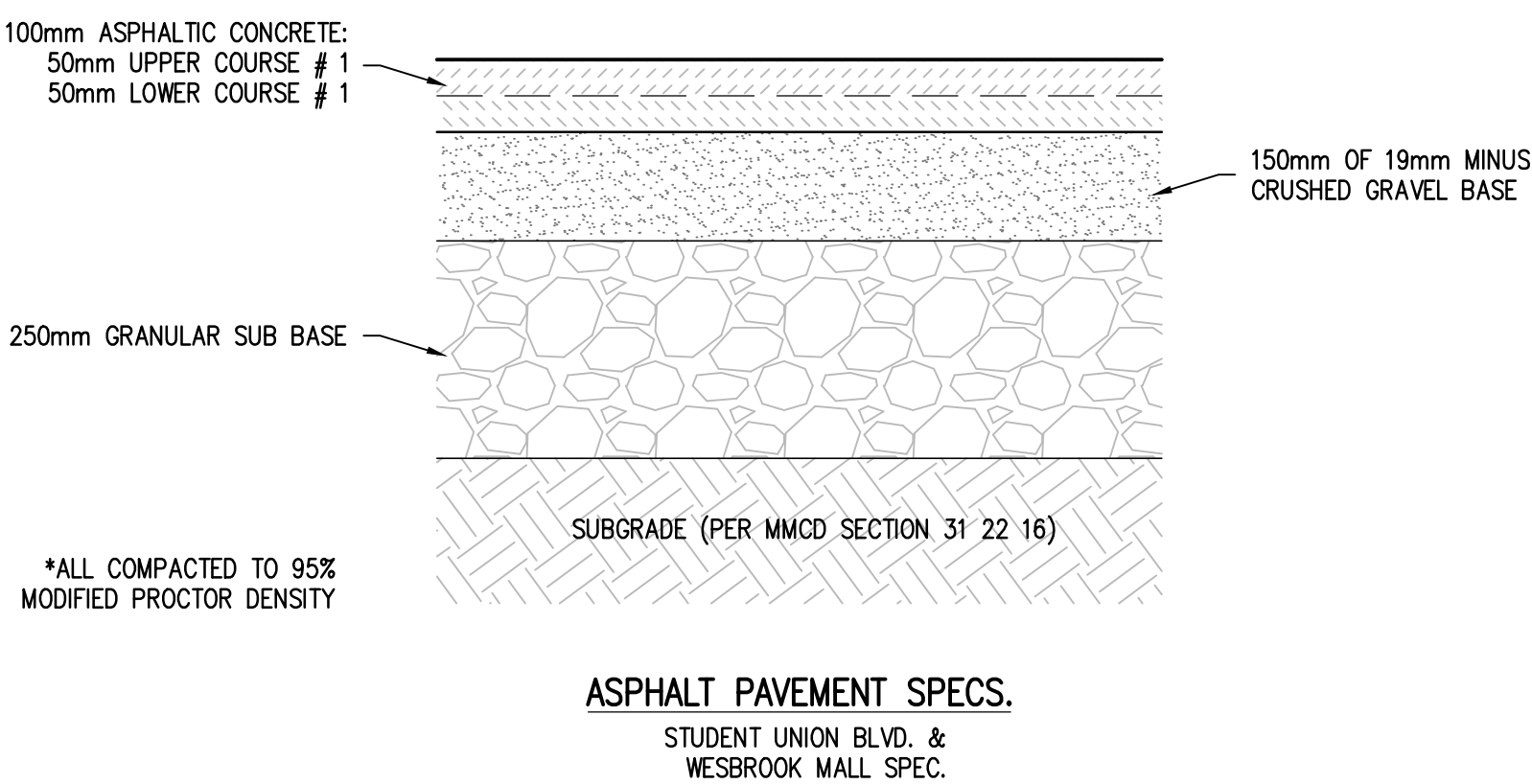
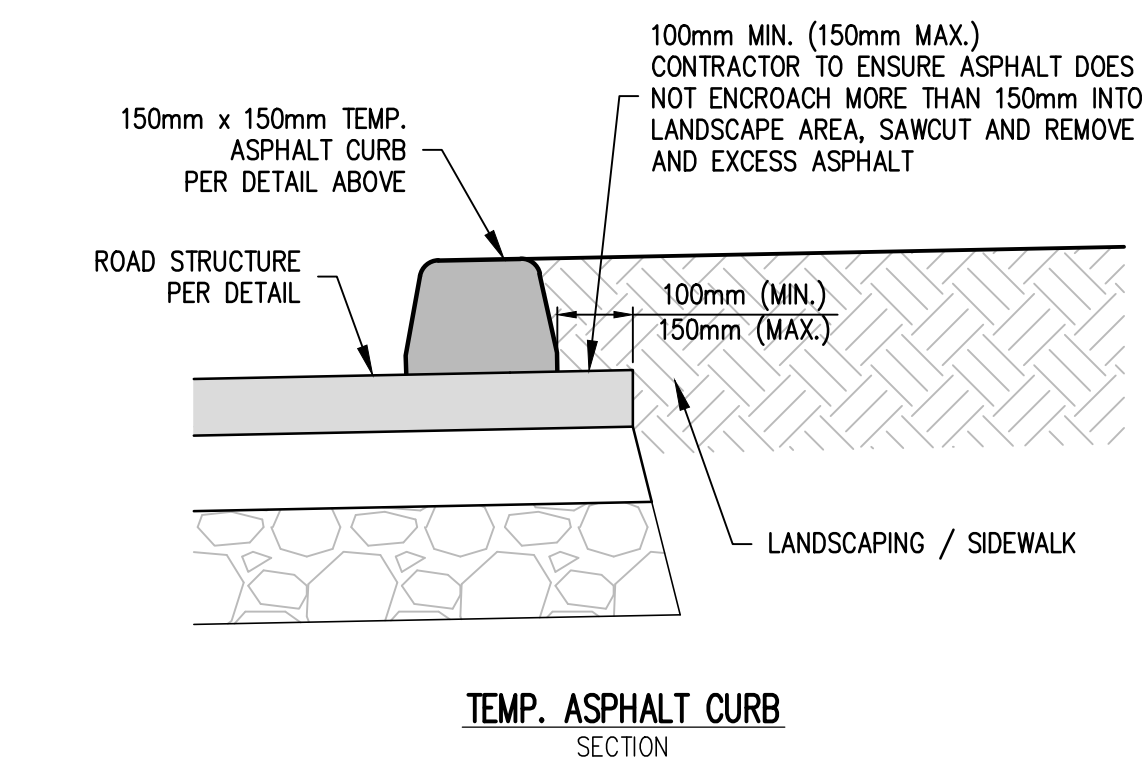
1. ALL TESTING TO BE PERFORMED BY A CSA OR COIL (CANADIAN CERTIFIED TESTING LABORATORIES) CERTIFIED LABORATORY.
2. FREQUENCY OF DENSITY TESTS FOR EXCAVATING, TRENCHING AND BACKFILLING SHALL BE ONE TEST PER 50 LINEAL METRES OR TRENCH PER METRE OF DEPTH. MATERIAL TO BE COMPACTED IN 300mm LIFTS.
3. FREQUENCY OF DENSITY TESTS FOR ROADWAY EXCAVATION, EMBANKMENT (SUB-GRADE FILL) AND COMPACTION SHALL BE ONE TEST PER 250m<sup>2</sup> PER 300mm LIFT.
4. FREQUENCY OF DENSITY TESTS FOR GRANULAR BASE AND SUB-BASE SHALL BE ONE TEST PER 30 LINEAL METRES OF LANE WIDTH STAGGERED EACH SIDE OF CENTRELINE PER 150mm LIFT OR OF SPECIFIED THICKNESS.
5. FREQUENCY OF DENSITY TESTS FOR SIDEWALK BASE SHALL BE ONE TEST PER 30 LINEAL METRES WITHIN SIDEWALK AND DRIVEWAY AREA.
6. FREQUENCY OF DENSITY TESTS FOR CURB BASE SHALL BE ONE TEST PER 100 LINEAL METRES.
7. FREQUENCY OF MARSHALL TESTS FOR HOT-MIX ASPHALT CONCRETE PAVING SHALL BE ONE TEST PER 500 TONNES OF MIX PLACED OR ONE TEST FOR EACH TYPE OF ASPHALT MIX, MINIMUM ONE PER DAY.
8. FOR PAVING, CORE LOCATIONS WILL BE SELECTED FOR EACH PASS OF THE PAVING MACHINE AS FOLLOWS:
  - 8.1. ACROSS THE WIDTH, CORE LOCATIONS WILL BE SELECTED RANDOMLY FROM ONE-SIXTH INCREMENTS.
  - 8.2. ALONG THE LENGTH, CORE LOCATIONS WILL HAVE A RANDOMLY SELECTED START WITH CORES AT A SPACING OF APPROXIMATELY, BUT NOT TO EXCEED 30 METRES.
  - 8.3. FOR OTHER PAVING OPERATIONS, A MINIMUM OF ONE CORE FOR EVERY 250 SQUARE METRES OF ASPHALT MIX PLACED.
9. FREQUENCY OF PLASTIC CONCRETE TESTS FOR SIDEWALK SHALL BE ONE TEST PER 150 LINEAL METRES OR A MINIMUM OF ONE PER DAY.
10. FREQUENCY OF PLASTIC CONCRETE TESTS FOR CURB AND GUTTER SHALL BE ONE TEST PER 300 LINEAL METRES OF A MINIMUM OF ONE PER DAY.
11. PRESSURE AND BACTERIOLOGICAL TESTING TO BE DONE BY CONTRACTOR PRIOR TO TIE-IN AND ACCEPTANCE BY UBC UTILITIES. ASSUMED TEST PRESSURE OF 1380 kPa (200 psi). THE CONTRACTOR SHALL TEST ALL WATERMANS: PRESSURE TEST TO B.C. BUILDING CODE (2012) AND SHALL CHLORINATE AND FLUSH TO MINISTRY OF HEALTH AND AWWA STANDARDS. ALL TESTING IS TO BE WITNESSED BY THE ENGINEER AND THE UBC INSPECTOR. TESTING TO BE APPROVED BY UBC PRIOR TO TIE-IN TO MUNICIPAL WATER SYSTEM. ALL STORM AND SANITARY SYSTEMS TO BE TESTED PER SECTION 3.6 OF THE B.C. PLUMBING CODE. THE ENGINEER IS TO BE NOTIFIED 48 HOURS PRIOR TO TESTING.
12. STORM SEWERS SHALL BE VIDEO INSPECTED PER MMCD SPECIFICATIONS SECTION 02731.
13. SANITARY SEWERS SHALL BE PRESSURE TESTED AND VIDEO INSPECTED PER MMCD SPECIFICATIONS.
14. EXISTING SANITARY AND STORM SERVICE STUBS ARE TO BE CCTV INSPECTED AFTER SHORING. SUBMIT THE CCTV INSPECTION REPORTS AND VIDEOS TO UTILITIES TO ENSURE NO CONSTRUCTION DAMAGE ON EXISTING SERVICE STUBS.
15. ALL TESTING TO BE DONE AND APPROVED BEFORE BACKFILLING PIPE.

1. CALL BC ONE-CALL 24 HOURS PRIOR TO CONSTRUCTION.
2. TOPOGRAPHIC SURVEY FOR THIS SITE PROVIDED BY MURRAY AND ASSOCIATES LAND SURVEYORS.
3. UTILITY TRENCH WIDTH VARIES WITH DIAMETER AND DEPTH OF UTILITY PIPE TO BE INSTALLED. MINIMUM WIDTH TYPICALLY 600mm OR AS PER MMCD STD. DET. G4.
4. THESE DRAWINGS TO BE READ IN CONJUNCTION WITH OTHER CIVIL AND OTHER DISCIPLINE'S DRAWINGS.
5. ALL EX. VALVES AND MANHOLES TO BE ADJUSTED TO SUIT NEW GRADES. ADJUSTED EX. WATER VALVES TO BE REPLACED WITH SQUARE ROBAR VALVE BOXES SUPPLIED BY DOBNEY OR APPROVED EQUIVALENT. VALVE # TO BE MARKED WITH GREASE PEN.
6. COORDINATE ALL EXCAVATIONS CLOSE TO BUILDING WITH SHORING PLANS BY GEOTECH.
7. ALL EXISTING UTILITIES TO BE ABANDONED ARE TO BE CAPPED AT BOTH ENDS UNLESS REMOVED ENTIRELY.

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT UBC AND MMCD SPECIFICATIONS.
2. PIPE BEDDING SHALL BE GRANULAR PIPE BEDDING AND SURROUND MATERIAL CONFORMING TO MMCD CLAUSE 2.7, SECTION 02226.
3. PIPE BACKFILL SHALL BE 100mm PIT RUN GRAVEL MATERIAL CONFORMING TO MMCD CLAUSE 2.3, SECTION 02226.
4. ALL PIPES UP TO AND INCLUDING 525mmØ PVC PIPE TO UBC SPECIFICATIONS AS FOLLOWS (UNLESS OTHERWISE NOTED) :
  - 150mmØ & SMALLER SDR28
  - 200mmØ TO 525mmØ SDR35 TO ASTM 03034 SPECS.
5. ALL PIPES SHALL HAVE CLOSED JOINTS
6. PIPE TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS FOR PIPE DEPTH AND SLOPE PER SOIL CONDITIONS.
7. ALL SANITARY AND STORM SEWER MANHOLES TO BE 1050mmØ WITH MARKINGS PER UBC REQUIREMENTS UNLESS OTHERWISE NOTED.
8. ALL CATCH BASIN LEADS SHALL HAVE A MINIMUM OF 1.0% GRADE.
9. ALL STORM MANHOLES TO BE BENCHED UNLESS NOTED OTHERWISE.
10. CONTRACTOR TO CONFIRM ANY FOUNDATION STABILIZATION REQUIREMENTS OF EXISTING STRUCTURES IN TRENCHING AREA WITH GEOTECHNICAL ENGINEER.
11. EXISTING SANITARY AND STORM SERVICE STUBS ARE TO BE CCTV INSPECTED AFTER SHORING, SUBMIT THE CCTV INSPECTION REPORTS AND VIDEOS TO UTILITIES TO ENSURE NO CONSTRUCTION DAMAGE ON EXISTING SERVICE STUBS.

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH MMCD AND UBC SPECIFICATIONS.
2. GEOTECHNICAL ENGINEER TO APPROVE ALL SUBGRADES AND LAYER PLACING BASE MATERIALS.
3. ALL SUBGRADES AND BASE MATERIALS SHALL BE COMPACTED TO 95% MPD. ALL MATERIALS IN ACCORDANCE WITH MMCD STANDARDS.
4. COMPACTION TESTING, ASPHALT TESTING AND CONCRETE TESTING BY CONTRACTOR.
5. ALL PAVEMENT MARKINGS TO BE INCLUDED IN CONTRACT.
6. ALL CONCRETE PAVEMENT AND CONCRETE REINFORCEMENT TO BE IN ACCORDANCE WITH MMCD SECTION 03 20 01, 03 30 20, 32 13 13, AND 03 30 53.
7. CONCRETE MIX TO BE TO SECTION 03 30 53 :  
 PORTLAND CEMENT : TYPE 10  
 EXPOSURE CLASS : C-2  
 SLUMP : 80mm  
 AIR ENTRAINMENT : 5% - 8%  
 MAX. AGGREGATE SIZE : 20mm  
 MIN. 28 DAY COMPRESSIVE STRENGTH : 32 MPa  
 MAX. WATER/CEMENT RATIO : 0.45

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH MMCD AND UBC SPECIFICATIONS.
2. WATERMAIN TO HAVE MIN. 1.0m COVER.
3. PIPE BEDDING SHALL BE GRANULAR PIPE BEDDING AND SURROUND MATERIAL CONFORMING TO MMCD CLAUSE 2.7, SECTION 02226.
4. PIPE BACKFILL SHALL BE 100mm PIT RUN GRAVEL MATERIAL CONFORMING TO MMCD CLAUSE 2.3, SECTION 02226.
5. ALL PIPE TO BE CLASS 50 DUCTILE IRON MANUFACTURED TO AWWA C151; CEMENT MORTAR LINED TO AWWA C104 AND COATED 1 MIL. THICK ASPHALT.
6. PRESSURE AND BACTERIOLOGICAL TESTING TO BE DONE BY CONTRACTOR PRIOR TO TIE-IN AND ACCEPTANCE BY UBC UTILITIES. ASSUMED TEST PRESSURE OF 1380 kPa (200 psi).
7. WATER MAIN OR SERVICE PIPE WALLS TO HAVE WRAPPED JOINTS PER LOCAL & MUNICIPAL HEALTH STANDARDS IF CLOSER THAN 0.5m VERTICAL OR 3.0m HORIZONTAL TO SANITARY OR STORM MAIN PIPE WALLS.
8. VALVE, VALVE BOXES, COMPONENTS & HYDRANTS TO BE PER UBC TECHNICAL GUIDELINES SECTION 02660, CLAUSE 2.7 AND 2.8. CIRCULAR VALVE BOXES SHALL BE NELSON TYPE.
9. ALL WATER VALVE KNUCKLES TO BE RAISED TO 0.6m BELOW FINAL GRADE.
10. ALL WATER MAIN JOINTS TO BE RESTRAINED.
11. ALL WATER MAIN FITTINGS TO BE INSTALLED WITH THRUST BLOCKS PER MMCD.
12. ALL TESTING TO BE DONE AND APPROVED BEFORE BACKFILLING PIPE.
13. WHERE CONTROLLED DENSITY FILL (CDF) OR CONCRETE IS USED, 6 MIL POLY BARRIER TO BE PLACED BETWEEN CDF/CONCRETE AND WATER MAIN/FITTINGS.



	CAPS PLUGS & TEES	90° ELBOWS	45° ELBOWS	22 1/2° ELBOWS	11 1/4° ELBOWS	VERTICAL BENDS & ANCHOR BLOCK					
<div> <div>Min. (dia) 10.137"</div> <div>CORR. FACTOR IN TO kg</div> <div>P- PRESSURE= 2088Psi</div> <div>W- WEIGHT OF PIPE BLOCK AGAINST RADIAL STRESS</div> <div>T- THRUST (kN)</div> <div>A- PIPE CROSS SECTIONAL AREA (cm²)</div> </div>											
FORMULAS	T=A.P	T=SPAC(SIN90°/2)	T=SPAC(SIN45°/2)	T=SPAC(SIN22.5°/2)	T=SPAC(SIN11.25°/2)	NOTES T=WC.(L-COSθ) CONC. VOL.=πD³(H+1)/97.2 2402kg/m³					
SUC. LIFECAP FITTING RIGID LOADS FSD (mm)	FITTING SIZE mm	THRUST (T) kN	MINIMUM BLOCK BASE AREA cm²	THRUST (T) kN	MINIMUM BLOCK BASE AREA cm²	THRUST (T) kN	MINIMUM BLOCK BASE AREA cm²				
97,650 HARDPAN OR SHALE	100	16.3	170	23.1	250	12.5	140	6.4	70	3.2	40
	150	36.6	390	51.8	550	28.0	300	14.3	150	7.2	80
	200	65.0	680	91.9	960	49.7	520	25.3	270	12.7	140
58,600 HARD CLAY	100	146.2	1530	206.8	2160	111.9	1170	57.1	600	28.7	300
	150	16.3	290	23.1	410	12.5	220	6.4	120	3.2	60
	200	36.6	640	51.8	910	28.0	490	14.3	250	7.2	130
22,300 SAND COARSE, LOOSE OR COMPACT	100	65.0	1140	91.9	1600	49.7	870	25.3	440	12.7	230
	150	146.2	2550	206.8	3600	111.9	1950	57.1	1000	28.7	500
	200	16.3	750	23.1	1060	12.5	580	6.4	300	3.2	150
9,800 SOFT CLAY	150	36.6	1880	51.8	2370	28.0	1280	14.3	660	7.2	330
	200	65.0	2970	91.9	4200	49.7	2280	25.3	1160	12.7	580
	300	146.2	6690	206.8	9460	111.9	5120	57.1	2620	28.7	1320
	100	16.3	1700	23.1	2410	12.5	1300	6.4	870	3.2	340
	150	36.6	3810	51.8	5390	28.0	2920	14.3	1490	7.2	750
	200	65.0	6780	91.9	9560	49.7	5180	25.3	2640	12.7	1330
	100	146.2	15220	206.8	21520	111.9	11650	57.1	9950	28.7	2990

TYPICAL SIZING OF CONC. THRUST BLOCKS

SCALE: 1:500

SEAL

UBC Gage South  
PHASE 1  
UNDERGROUND WORKS

# Civil Design

## NOTES & DETAILS

DRAWN: BC

CHECKED: CM

C 3

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## METRIC

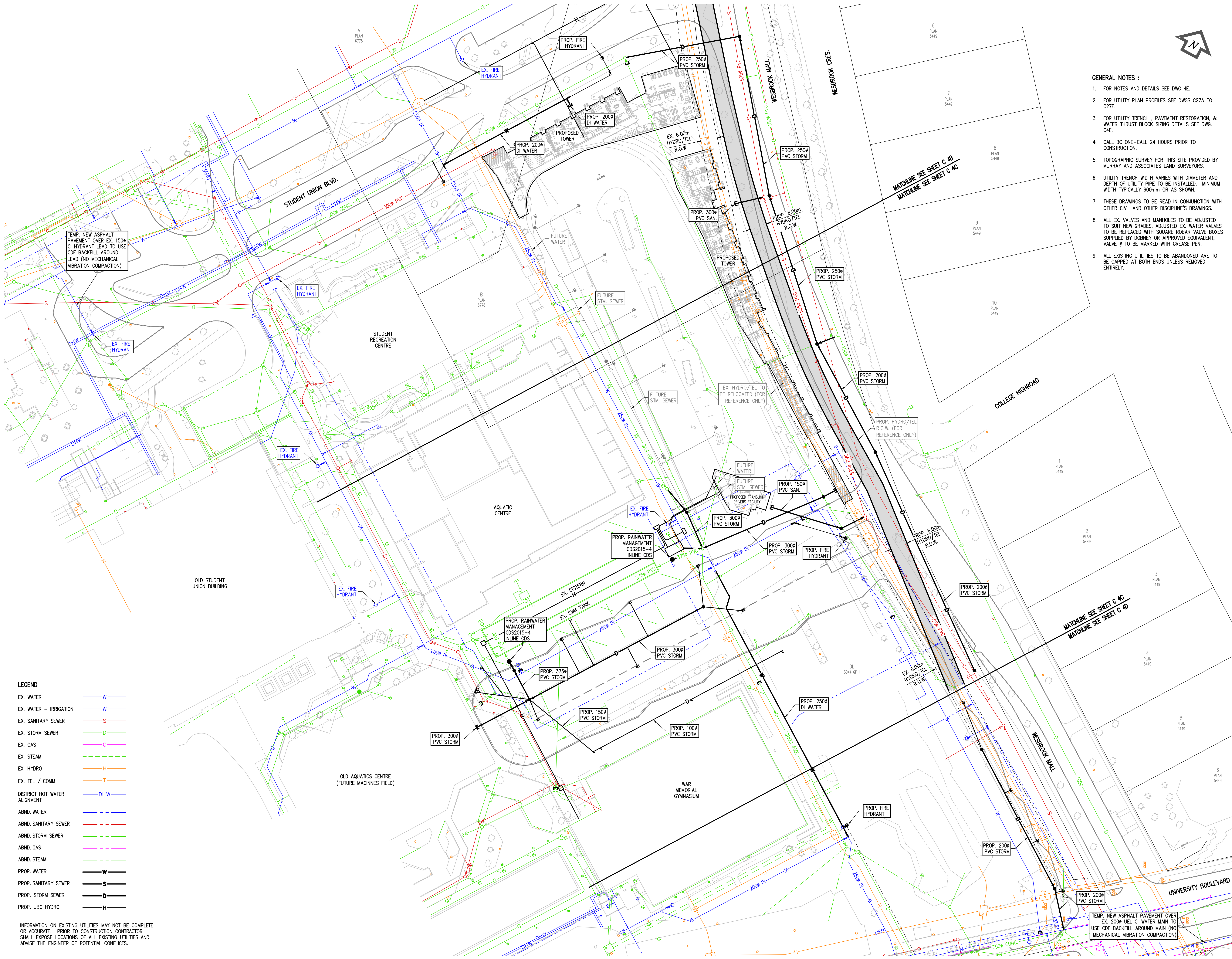
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FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.





LEGEND

EX. WATER	W
EX. WATER - IRRIGATION	W
EX. SANITARY SEWER	S
EX. STORM SEWER	D
EX. GAS	G
EX. STEAM	—
EX. HYDRO	H
EX. TEL / COMM	T
DISTRICT HOT WATER ALIGNMENT	DHW
ABND. WATER	---
ABND. SANITARY SEWER	---
ABND. STORM SEWER	---
ABND. GAS	---
ABND. STEAM	---
PROP. WATER	W
PROP. SANITARY SEWER	S
PROP. STORM SEWER	D
PROP. UBC HYDRO	H

INFORMATION ON EXISTING UTILITIES MAY NOT BE COMPLETE OR ACCURATE. PRIOR TO CONSTRUCTION CONTRACTOR SHALL EXPOSE LOCATIONS OF ALL EXISTING UTILITIES AND ADVISE THE ENGINEER OF POTENTIAL CONFLICTS.

GENERAL NOTES :

- FOR NOTES AND DETAILS SEE DWG 4E.
- FOR UTILITY PLAN PROFILES SEE DWGS C27A TO C27E.
- FOR UTILITY TRENCH , PAVEMENT RESTORATION, & WATER THRUST BLOCK SIZING DETAILS SEE DWG. C4E.
- CALL BC ONE-CALL 24 HOURS PRIOR TO CONSTRUCTION.
- TOPOGRAPHIC SURVEY FOR THIS SITE PROVIDED BY MURRAY AND ASSOCIATES LAND SURVEYORS.
- UTILITY TRENCH WIDTH VARIES WITH DIAMETER AND DEPTH OF UTILITY PIPE TO BE INSTALLED. MINIMUM WIDTH TYPICALLY 600mm OR AS SHOWN.
- THESE DRAWINGS TO BE READ IN CONJUNCTION WITH OTHER CIVIL AND OTHER DISCIPLINE'S DRAWINGS.
- ALL EX. VALVES AND MANHOLES TO BE ADJUSTED TO SUIT NEW GRADES. ADJUSTED EX. WATER VALVES TO BE REPLACED WITH SQUARE ROBAR VALVE BOXES SUPPLIED BY DOBNEY OR APPROVED EQUIVALENT, VALVE # TO BE MARKED WITH GREASE PEN.
- ALL EXISTING UTILITIES TO BE ABANDONED ARE TO BE CAPPED AT BOTH ENDS UNLESS REMOVED ENTIRELY.

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**CoreGroup**  
CONSULTANTS  
LAND DEVELOPMENT SERVICES  
320-8888 FRASERTON COURT  
BURNABY, BC V5J 5H8  
tel. (604)299 0605 fax. (604)299 0629

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METRIC

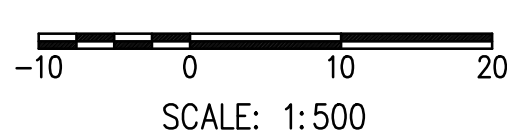
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GRAPHIC SCALE



SEAL

UBC Gage South

PHASE 1  
UNDERGROUND WORKS

Civil Design  
UTILITIES - OVERALL  
SITE SERVING

DRAWN: BC

CHECKED: CN

C 4A

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SCALE: 1:250

SEAL

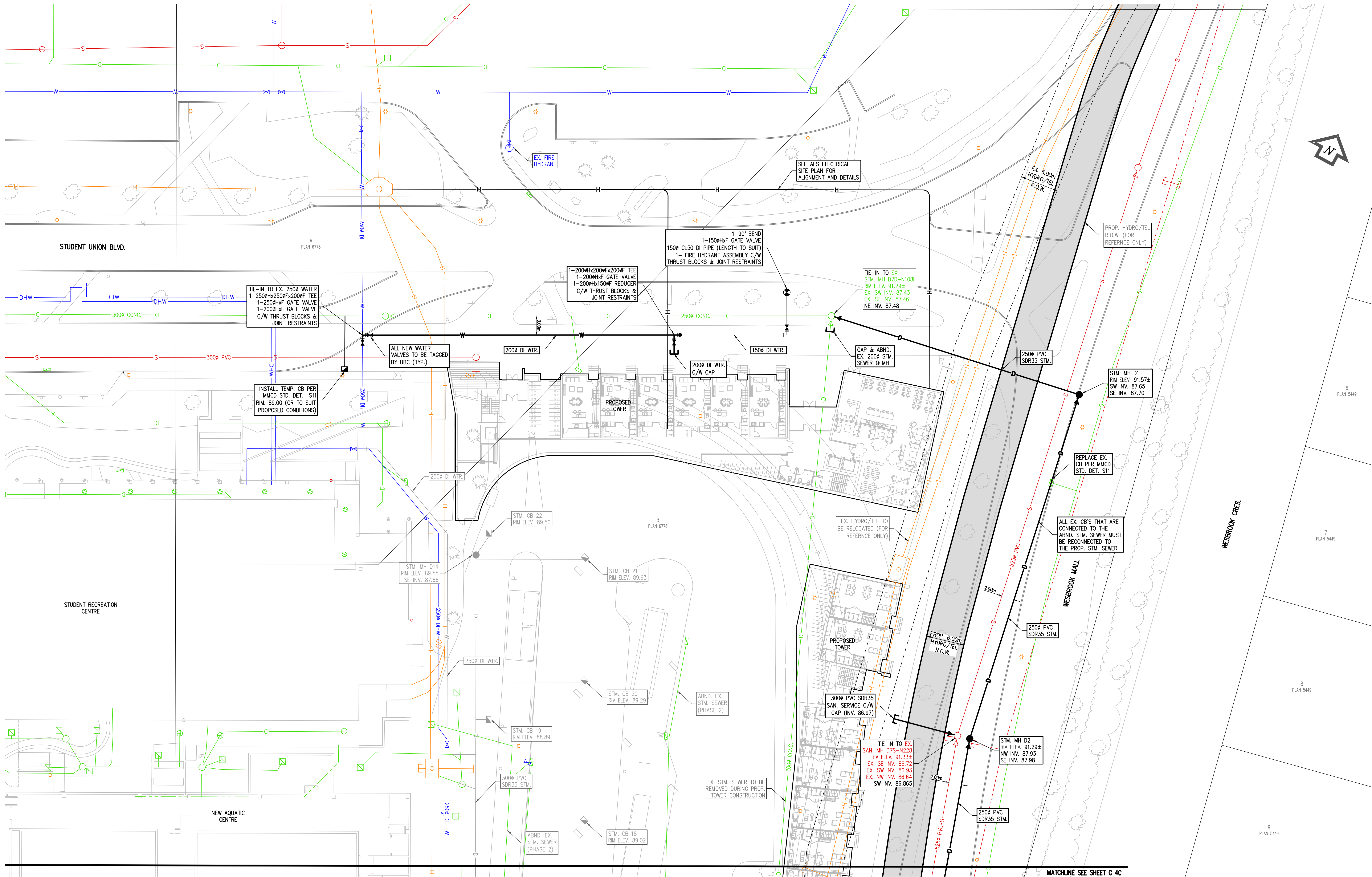
UBC Gage South  
PHASE 1  
UNDERGROUND WORKS

Civil Design  
UTILITIES  
SITE SERVICING

DRAWN: BC CHECKED: CN

C 4B

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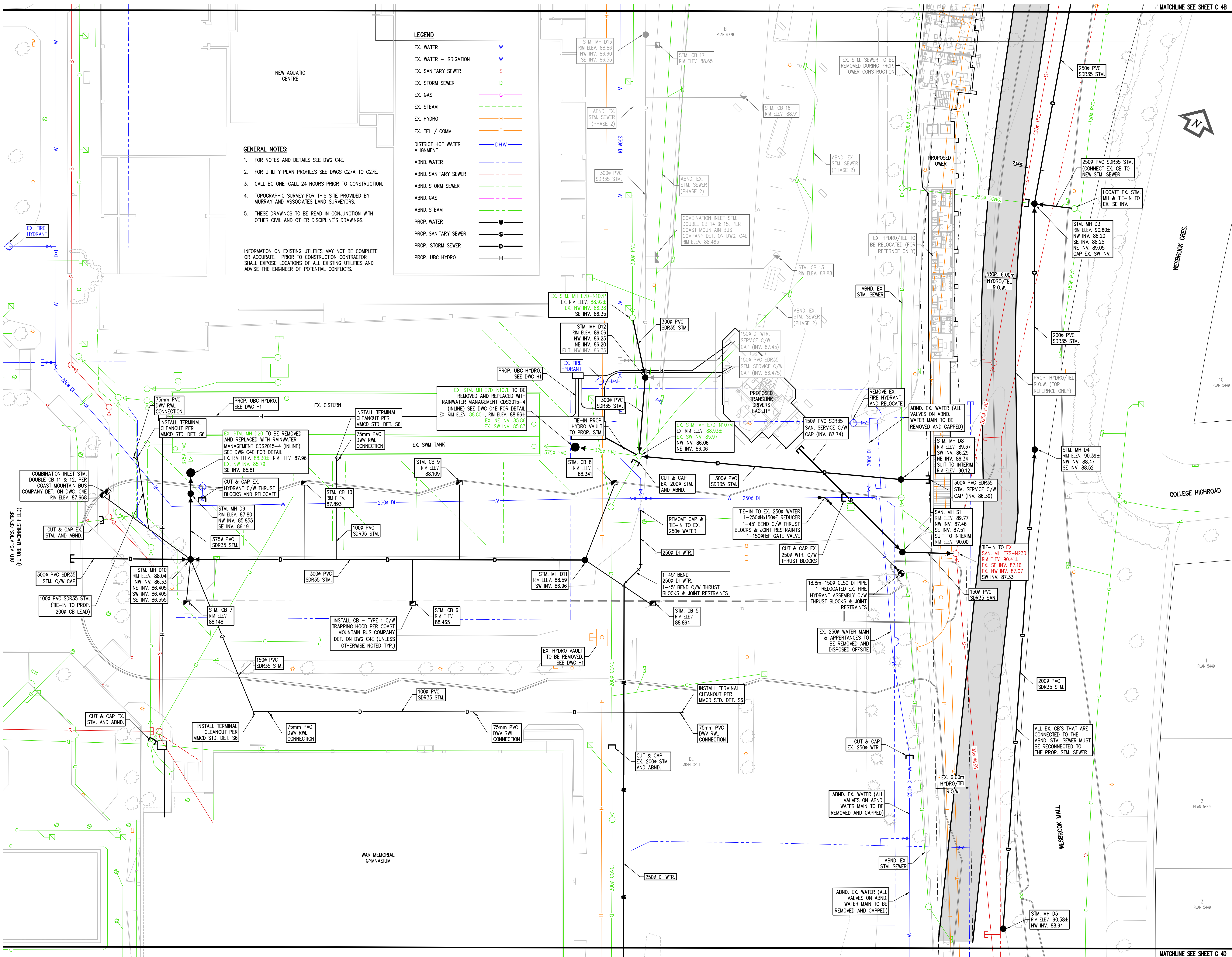


LEGEND			
EX. WATER	W	ABND. WATER	---
EX. WATER - IRRIGATION	W	ABND. SANITARY SEWER	---
EX. SANITARY SEWER	S	ABND. STORM SEWER	---
EX. STORM SEWER	D	ABND. GAS	---
EX. GAS	G	ABND. STEAM	---
EX. STEAM	---	PROP. WATER	W
EX. HYDRO	H	PROP. SANITARY SEWER	S
EX. TEL / COMM	T	PROP. STORM SEWER	D
DISTRICT HOT WATER ALIGNMENT	DHW	PROP. UBC HYDRO	H

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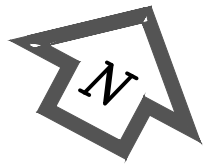
UBC Gage South  
PHASE 1  
UNDERGROUND WORKS

Civil Design  
UTILITIES  
SITE SERVICING  
DRAWN: BC CHECKED: CN

C 4C

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GRAPHIC SCALE  
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SCALE: 1:250

SEAL

UBC Gage South  
PHASE 1  
UNDERGROUND WORKS

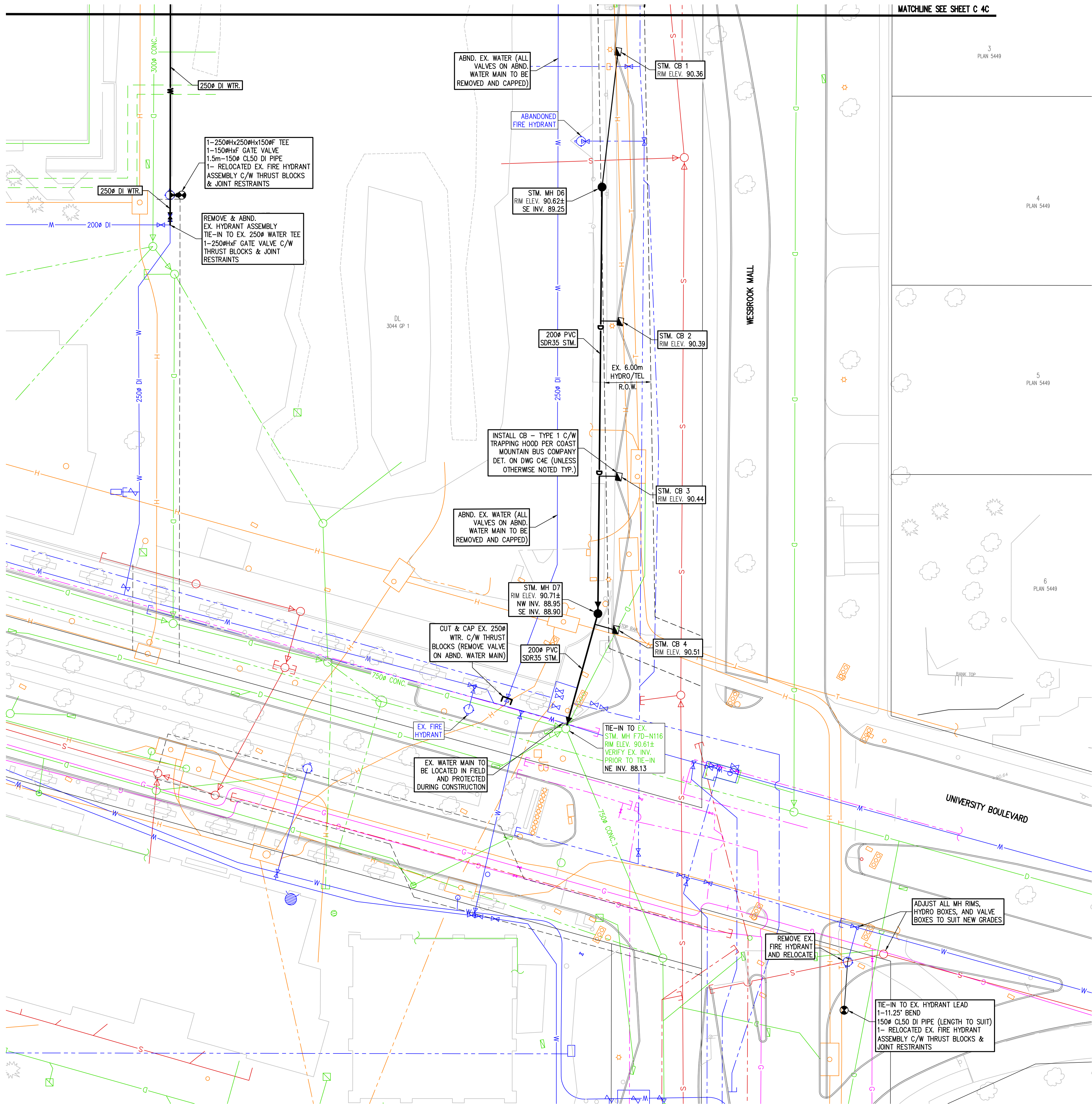
Civil Design  
UTILITIES  
SITE SERVICING

DRAWN: BC CHECKED: CN

C 4D

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**LEGEND**

EX. WATER	— W —
EX. WATER - IRRIGATION	— W —
EX. SANITARY SEWER	— S —
EX. STORM SEWER	— D —
EX. GAS	— G —
EX. STEAM	— H —
EX. HYDRO	— T —
EX. TEL / COMM	— T —
DISTRICT HOT WATER ALIGNMENT	— DHW —
ABND. WATER	— W —
ABND. SANITARY SEWER	— S —
ABND. STORM SEWER	— D —
ABND. GAS	— G —
ABND. STEAM	— H —
PROP. WATER	— W —
PROP. SANITARY SEWER	— S —
PROP. STORM SEWER	— D —



TESTING :

- ALL TESTING TO BE PERFORMED BY A CSA OR COIL (CANADIAN CERTIFIED TESTING LABORATORIES) CERTIFIED LABORATORY.
- FREQUENCY OF DENSITY TESTS FOR EXCAVATING, TRENCHING AND BACKFILLING SHALL BE ONE TEST PER 50 LINEAL METRES OR TRENCH PER METRE OF DEPTH. MATERIAL TO BE COMPACTED IN 300mm LIFTS.
- FREQUENCY OF DENSITY TESTS FOR ROADWAY EXCAVATION, EMBANKMENT (SUB-GRADE FILL) AND COMPACTION SHALL BE ONE TEST PER 250m<sup>2</sup> PER 300mm LIFT.
- FREQUENCY OF DENSITY TESTS FOR GRANULAR BASE AND SUB-BASE SHALL BE ONE TEST PER 30 LINEAL METRES OF LANE WIDTH STAGGERED EACH SIDE OF CENTRELINE PER 150mm LIFT OR OF SPECIFIED THICKNESS.
- FREQUENCY OF DENSITY TESTS FOR SIDEWALK BASE SHALL BE ONE TEST PER 30 LINEAL METRES WITHIN SIDEWALK AND DRIVEWAY AREA.
- FREQUENCY OF DENSITY TESTS FOR CURB BASE SHALL BE ONE TEST PER 100 LINEAL METRES.
- FREQUENCY OF MARSHALL TESTS FOR HOT-MIX ASPHALT CONCRETE PAVING SHALL BE ONE TEST PER 500 TONNES OF MIX PLACED OR ONE TEST FOR EACH TYPE OF ASPHALT MIX, MINIMUM ONE PER DAY.
- FOR PAVING, CORE LOCATIONS WILL BE SELECTED FOR EACH PASS OF THE PAVING MACHINE AS FOLLOWS:
  - ACROSS THE WIDTH, CORE LOCATIONS WILL BE SELECTED RANDOMLY FROM ONE-SIXTH INCREMENTS.
  - ALONG THE LENGTH, CORE LOCATIONS WILL HAVE A RANDOMLY SELECTED START WITH CORES AT A SPACING OF APPROXIMATELY, BUT NOT TO EXCEED 30 METRES.
  - FOR OTHER PAVING OPERATIONS, A MINIMUM OF ONE CORE FOR EVERY 250 SQUARE METRES OF ASPHALT MIX PLACED.
- FREQUENCY OF PLASTIC CONCRETE TESTS FOR SIDEWALK SHALL BE ONE TEST PER 150 LINEAL METRES OR A MINIMUM OF ONE PER DAY.
- FREQUENCY OF PLASTIC CONCRETE TESTS FOR CURB AND GUTTER SHALL BE ONE TEST PER 300 LINEAL METRES OF A MINIMUM OF ONE PER DAY.
- PRESSURE AND BACTERIOLOGICAL TESTING TO BE DONE BY CONTRACTOR PRIOR TO TIE-IN AND ACCEPTANCE BY UBC UTILITIES. ASSUMED TEST PRESSURE OF 1380 kPa (200 psi). THE CONTRACTOR SHALL TEST ALL WATERMAINS: PRESSURE TEST TO B.C. BUILDING CODE (2012) AND SHALL CHLORINATE AND FLUSH TO MINISTRY OF HEALTH AND AWWA STANDARDS. ALL TESTING IS TO BE WITNESSED BY THE ENGINEER AND THE UBC INSPECTOR. TESTING TO BE APPROVED BY UBC PRIOR TO TIE-IN TO MUNICIPAL WATER SYSTEM. ALL STORM AND SANITARY SYSTEMS TO BE TESTED PER SECTION 3.6 OF THE B.C. PLUMBING CODE. THE ENGINEER IS TO BE NOTIFIED 48 HOURS PRIOR TO TESTING.

- STORM SEWERS SHALL BE VIDEO INSPECTED PER MMCD SPECIFICATIONS SECTION 02731.

- SANITARY SEWERS SHALL BE PRESSURE TESTED AND VIDEO INSPECTED PER MMCD SPECIFICATIONS.

- EXISTING SANITARY AND STORM SERVICE STUBS ARE TO BE CCTV INSPECTED AFTER SHORING. SUBMIT THE CCTV INSPECTION REPORTS AND VIDEOS TO UTILITIES TO ENSURE NO CONSTRUCTION DAMAGE ON EXISTING SERVICE STUBS.

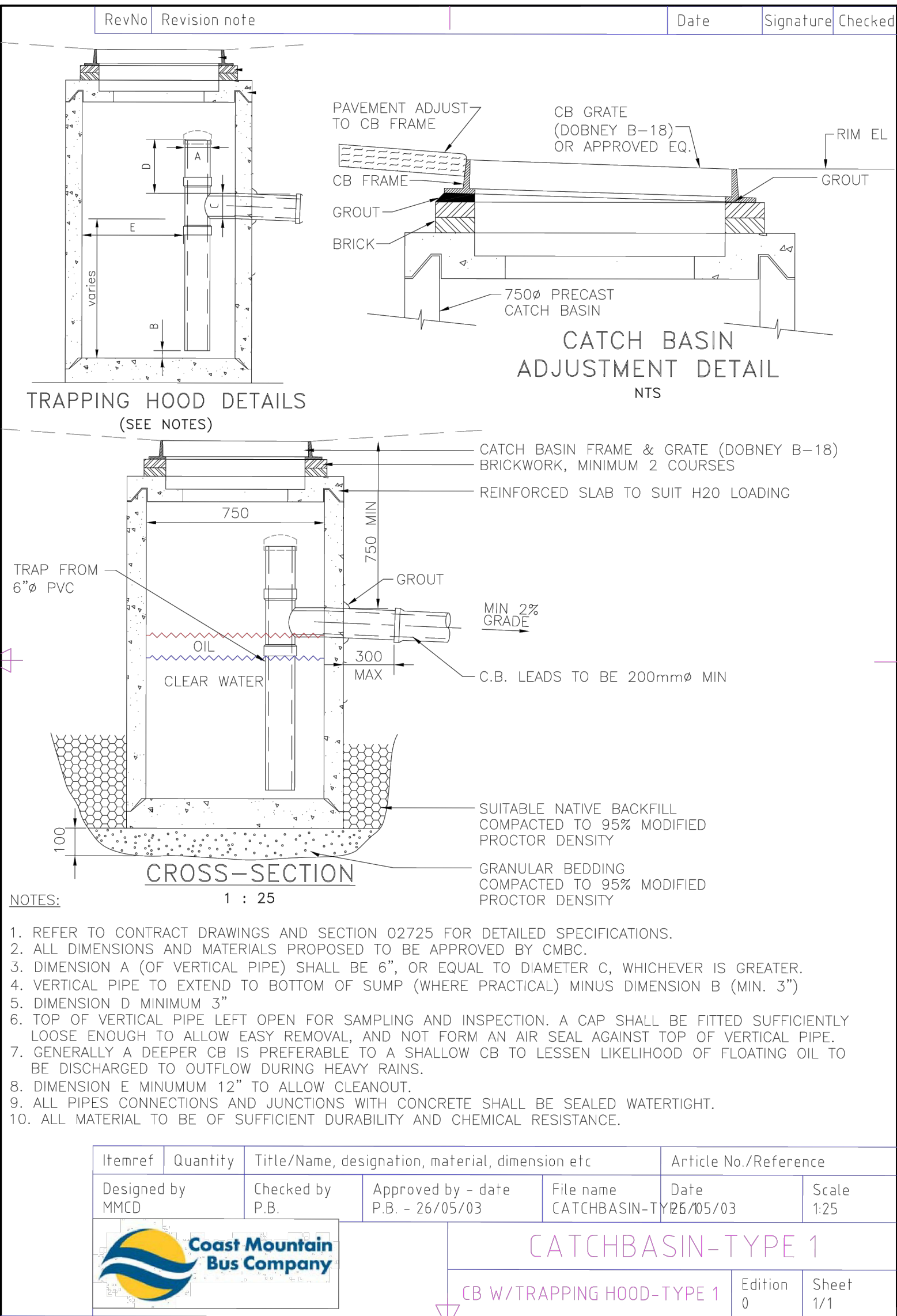
- ALL TESTING TO BE DONE AND APPROVED BEFORE BACKFILLING PIPE.

WATER NOTES :

- ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH MMCD AND UBC SPECIFICATIONS.
- WATERMAIN TO HAVE MIN. 1.0m COVER.
- PIPE BEDDING SHALL BE GRANULAR PIPE BEDDING AND SURROUND MATERIAL CONFORMING TO MMCD CLAUSE 2.7, SECTION 02226.
- PIPE BACKFILL SHALL BE 100mm PIT RUN GRAVEL MATERIAL CONFORMING TO MMCD CLAUSE 2.3, SECTION 02226.
- ALL PIPE TO BE CLASS 50 DUCTILE IRON MANUFACTURED TO AWWA C151; CEMENT MORTAR LINED TO AWWA C104 AND COATED 1 MIL. THICK ASPHALT.
- PRESSURE AND BACTERIOLOGICAL TESTING TO BE DONE BY CONTRACTOR PRIOR TO TIE-IN AND ACCEPTANCE BY UBC UTILITIES. ASSUMED TEST PRESSURE OF 1380 kPa (200 psi).
- WATER MAIN OR SERVICE PIPE WALLS TO HAVE WRAPPED JOINTS PER LOCAL & MUNICIPAL HEALTH STANDARDS IF CLOSER THAN 0.5m VERTICAL OR 3.0m HORIZONTAL TO SANITARY OR STORM MAIN PIPE WALLS.
- VALVE, VALVE BOXES, COMPONENTS & HYDRANTS TO BE PER UBC TECHNICAL GUIDELINES SECTION 02660, CLAUSE 2.7 AND 2.8. CIRCULAR VALVE BOXES SHALL BE NELSON TYPE.
- ALL WATER VALVE KNUCKLES TO BE RAISED TO 0.6m BELOW FINAL GRADE.
- ALL WATER MAIN JOINTS TO BE RESTRAINED.
- ALL WATER MAIN FITTINGS TO BE INSTALLED WITH THRUST BLOCKS PER MMCD.
- ALL TESTING TO BE DONE AND APPROVED BEFORE BACKFILLING PIPE.
- WHERE CONTROLLED DENSITY FILL (CDF) OR CONCRETE IS USED, 6 MIL. POLY BARRIER TO BE PLACED BETWEEN CDF/CONCRETE AND WATER MAIN/FITTINGS.

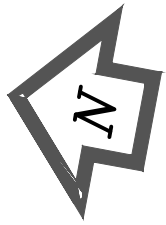
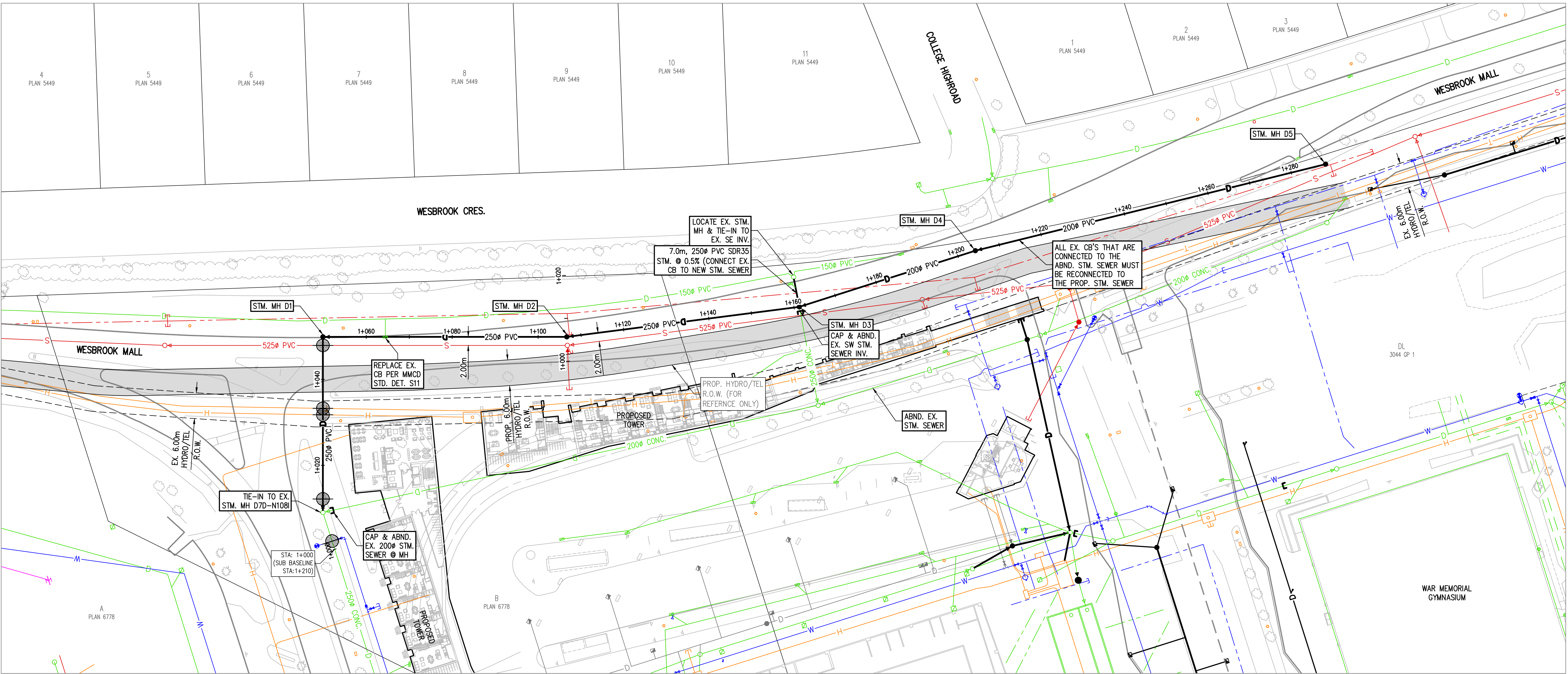
STORM & SANITARY SEWER NOTES :

- ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT UBC AND MMCD SPECIFICATIONS.
- PIPE BEDDING SHALL BE GRANULAR PIPE BEDDING AND SURROUND MATERIAL CONFORMING TO MMCD CLAUSE 2.7, SECTION 02226.
- PIPE BACKFILL SHALL BE 100mm PIT RUN GRAVEL MATERIAL CONFORMING TO MMCD CLAUSE 2.3, SECTION 02226.
- ALL PIPES UP TO AND INCLUDING 525mmØ PVC PIPE TO UBC SPECIFICATIONS AS FOLLOWS (UNLESS OTHERWISE NOTED) :
  - 150mmØ & SMALLER SDR28
  - 200mmØ TO 525mmØ SDR35 TO ASTM 03034 SPECS.
- ALL PIPES SHALL HAVE CLOSED JOINTS
- PIPE TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS FOR PIPE DEPTH AND SLOPE PER SOIL CONDITIONS.
- ALL SANITARY AND STORM SEWER MANHOLES TO BE 1050mmØ WITH MARKINGS PER UBC REQUIREMENTS UNLESS OTHERWISE NOTED.
- ALL CATCH BASIN LEADS SHALL HAVE A MINIMUM OF 1.0% GRADE.
- ALL STORM MANHOLES TO BE BENCHED UNLESS NOTED OTHERWISE.
- CONTRACTOR TO CONFIRM ANY FOUNDATION STABILIZATION REQUIREMENTS OF EXISTING STRUCTURES IN TRENCHING AREA WITH GEOTECHNICAL ENGINEER.
- EXISTING SANITARY AND STORM SERVICE STUBS ARE TO BE CCTV INSPECTED AFTER SHORING. SUBMIT THE CCTV INSPECTION REPORTS AND VIDEOS TO UTILITIES TO ENSURE NO CONSTRUCTION DAMAGE ON EXISTING SERVICE STUBS.



	CAPS, PLUGS & TEES	90° ELBOWS	45° ELBOWS	22 1/2° ELBOWS	11 1/4° ELBOWS	VERTICAL BENDS & ANCHOR BLOCK
Rev. (a) 10/97						
FORM. FACTOR 84 IN TO 16 IN						
PRESSURE - 2000 PSI						
NEW SURFACE AREA OF BLOCK AGAINST NADIVE PROUD						
THRUST (40)						
PIPE CROSS SECTIONAL AREA (sq)						
FORMULAS	T=PA	T=2PA(SIN90°/2)	T=2PA(SIN45°/2)	T=2PA(SIN22.5°/2)	T=2PA(SIN11.25°/2)	T=PA(1-COSθ) CONC. VOL.=PA(SINθ/2)S1.67
MAX. ALLOWABLE FOR BENDING (TYP.) LOADS (kN)						
97,650 HARD PAN OR SHALE						
58,600 HARD CLAY						
22,300 SAND COURSE, LOOSE OR FINE COMPACT						
9,800 SOFT CLAY						
	100	150	200	300	100	150
	16.3	36.6	65.0	146.2	16.3	36.6
	170	390	680	1530	290	640
	23.1	51.8	91.9	206.8	41.0	91.0
	250	550	960	2160	111.9	1600
	12.5	28.0	49.7	111.9	22.0	49.7
	140	300	520	1170	800	1950
	6.4	14.3	25.3	57.1	3.2	12.5
	40	80	140	270	300	500
	3.2	7.2	12.7	28.7	60	130
	230	440	730	1320	230	580
	150	270	420	660	120	330
	23.1	51.8	91.9	206.8	41.0	91.0
	250	550	960	2160	111.9	1600
	12.5	28.0	49.7	111.9	22.0	49.7
	140	300	520	1170	800	1950
	6.4	14.3	25.3	57.1	3.2	12.5
	40	80	140	270	300	500
	3.2	7.2	12.7	28.7	60	130
	230	440	730	1320	230	580
	150	270	420	660	120	330
	23.1	51.8	91.9	206.8	41.0	91.0
	250	550	960	2160	111.9	1600
	12.5	28.0	49.7	111.9	22.0	49.7
	140	300	520	1170	800	1950
	6.4	14.3	25.3	57.1	3.2	12.5
	40	80	140	270	300	500
	3.2	7.2	12.7	28.7	60	130
	230	440	730	1320	230	580
	150	270	420	660	120	330
	23.1	51.8	91.9	206.8	41.0	91.0
	250	550	960	2160	111.9	1600
	12.5	28.0	49.7	111.9	22.0	49.7
	140	300	520	1170	800	1950
	6.4	14.3	25.3	57.1	3.2	12.5
	40	80	140	270	300	500
	3.2	7.2	12.7	28.7	60	130
	230	440	730	1320	230	580
	150	270	420	660	120	330
	23.1	51.8	91.9	206.8	41.0	91.0
	250	550	960	2160	111.9	1600
	12.5	28.0	49.7	111.9	22.0	49.7
	140	300	520	1170	800	1950
	6.4	14.3	25.3	57.1	3.2	12.5
	40	80	140	270	300	500
	3.2	7.2	12.7	28.7	60	130
	230	440	730	1320	230	580
	150	270	420	660	120	330
	23.1	51.8	91.9	206.8	41.0	91.0
	250	550	960	2160	111.9	1600
	12.5	28.0	49.7	111.9	22.0	49.7
	140	300	520	1170	800	1950
	6.4	14.3	25.3	57.1	3.2	12.5
	40	80	140	270	300	500
	3.2	7.2	12.7	28.7	60	130
	230	440	730	1320	230	580
	150	270	420	660	120	330
	23.1	51.8	91.9	206.8	41.0	91.0
	250	550	960	2160	111.9	1600
	12.5	28.0	49.7	111.9	22.0	49.7
	140	300	520	1170	800	1950
	6.4	14.3	25.3	57.1	3.2	12.5
	40	80	140	270	300	500
	3.2	7.2	12.7	28.7	60	130
	230	440	730	1320	230	580
	150	270	420	660	120	330
	23.1	51.8	91.9	206.8	41.0	91.0
	250	550	960	2160	111.9	1600
	12.5	28.0	49.7	111.9	22.0	49.7
	140	300	520	1170	800	1950
	6.4	14.3	25.3	57.1	3.2	12.5
	40	80	140	270	300	500
	3.2	7.2	12.7	28.7	60	130
	230	440	730	1320	230	580
	150	270	420	660	120	330
	23.1	51.8	91.9	206.8	41.0	91.0
	250	550	960	2160	111.9	1600
	12.5	28.0	49.7	111.9	22.0	49.7
	140	300	520	1170	800	1950
	6.4	14.3	25.3	57.1	3.2	12.5
	40	80	140	270	300	500
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	230	440	730	1320	230	580
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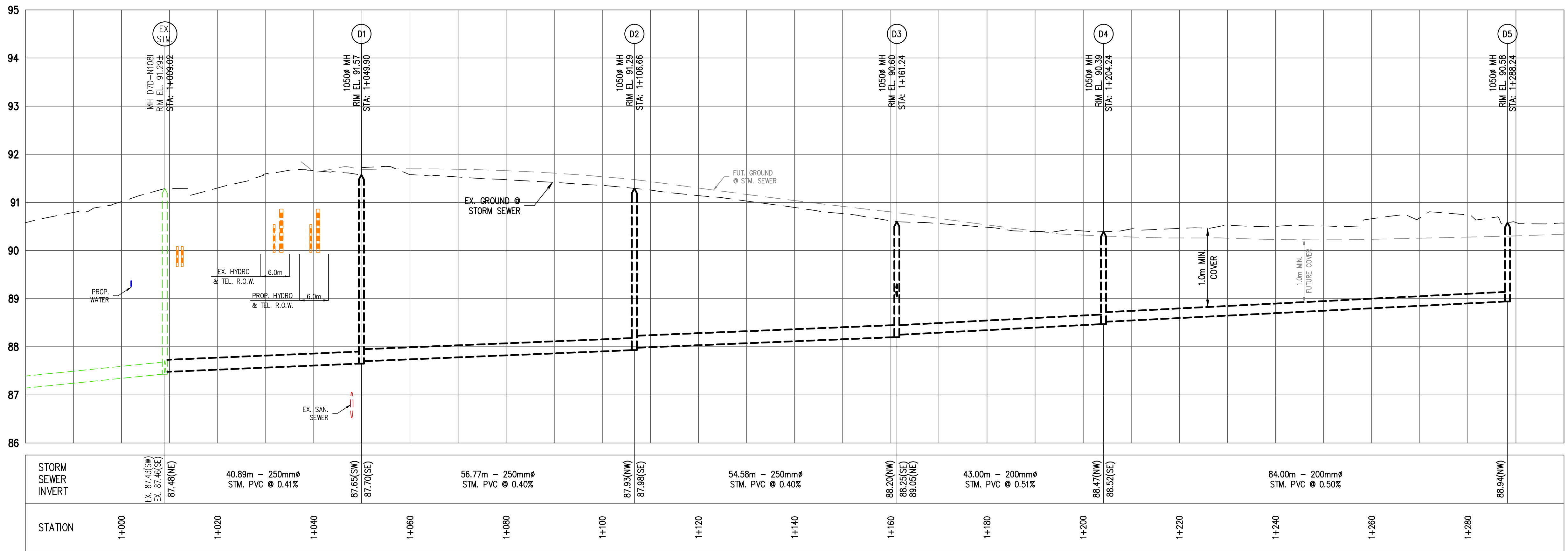


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320-8888 FRASERTON COURT  
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tel. (604)299 0605 fax. (604)299 0629

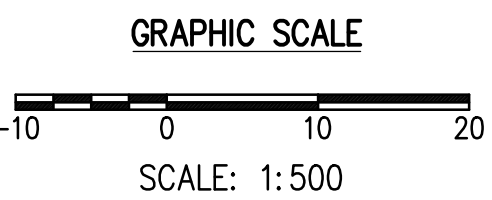
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- LEGEND**
- EX. WATER — W —
  - EX. WATER — IRRIGATION — W —
  - EX. SANITARY SEWER — S —
  - EX. STORM SEWER — D —
  - EX. GAS — G —
  - EX. STEAM — —
  - EX. HYDRO — H —
  - EX. TEL / COMM — T —
  - DISTRICT HOT WATER ALIGNMENT — DHW —
  - ABND. WATER — —
  - ABND. SANITARY SEWER — —
  - ABND. STORM SEWER — —
  - ABND. GAS — —
  - ABND. STEAM — —
  - PROP. WATER — W —
  - PROP. SANITARY SEWER — S —
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  - PROP. UBC HYDRO — H —

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SEAL

UBC Gage South  
PHASE 1  
UNDERGROUND WORKS

Civil Design  
UTILITIES - PLAN/PROFILE  
STORM SEWER

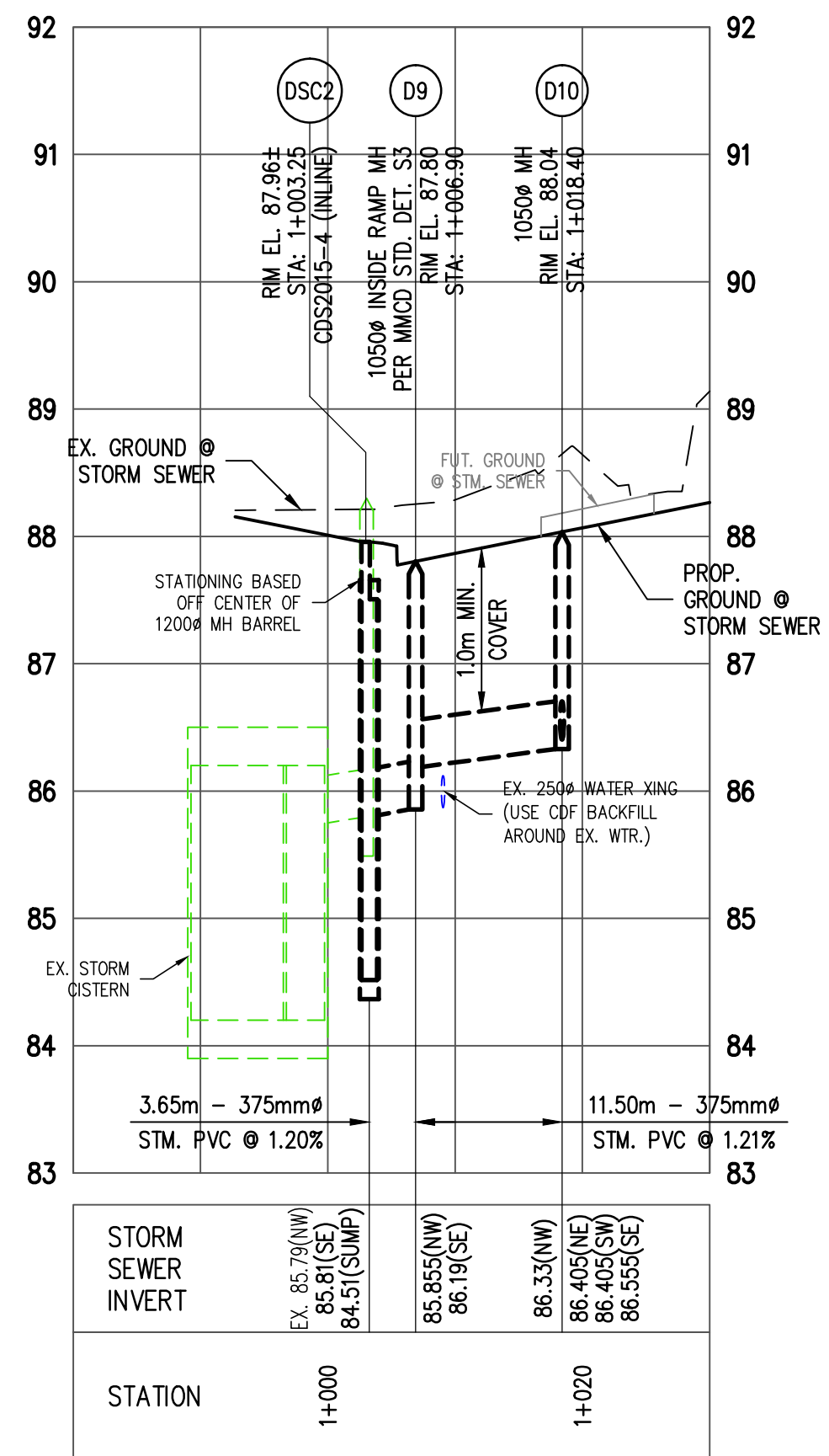
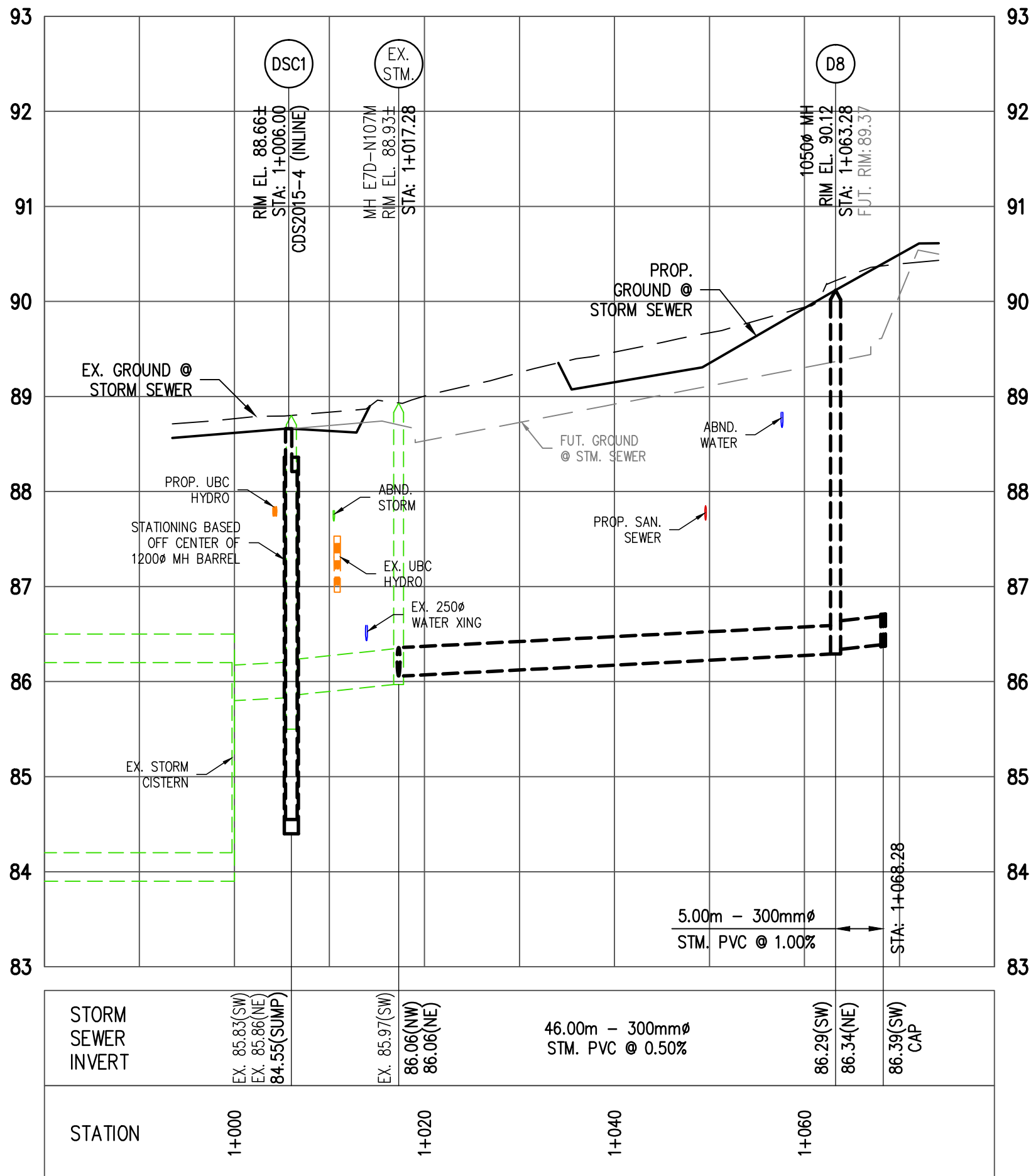
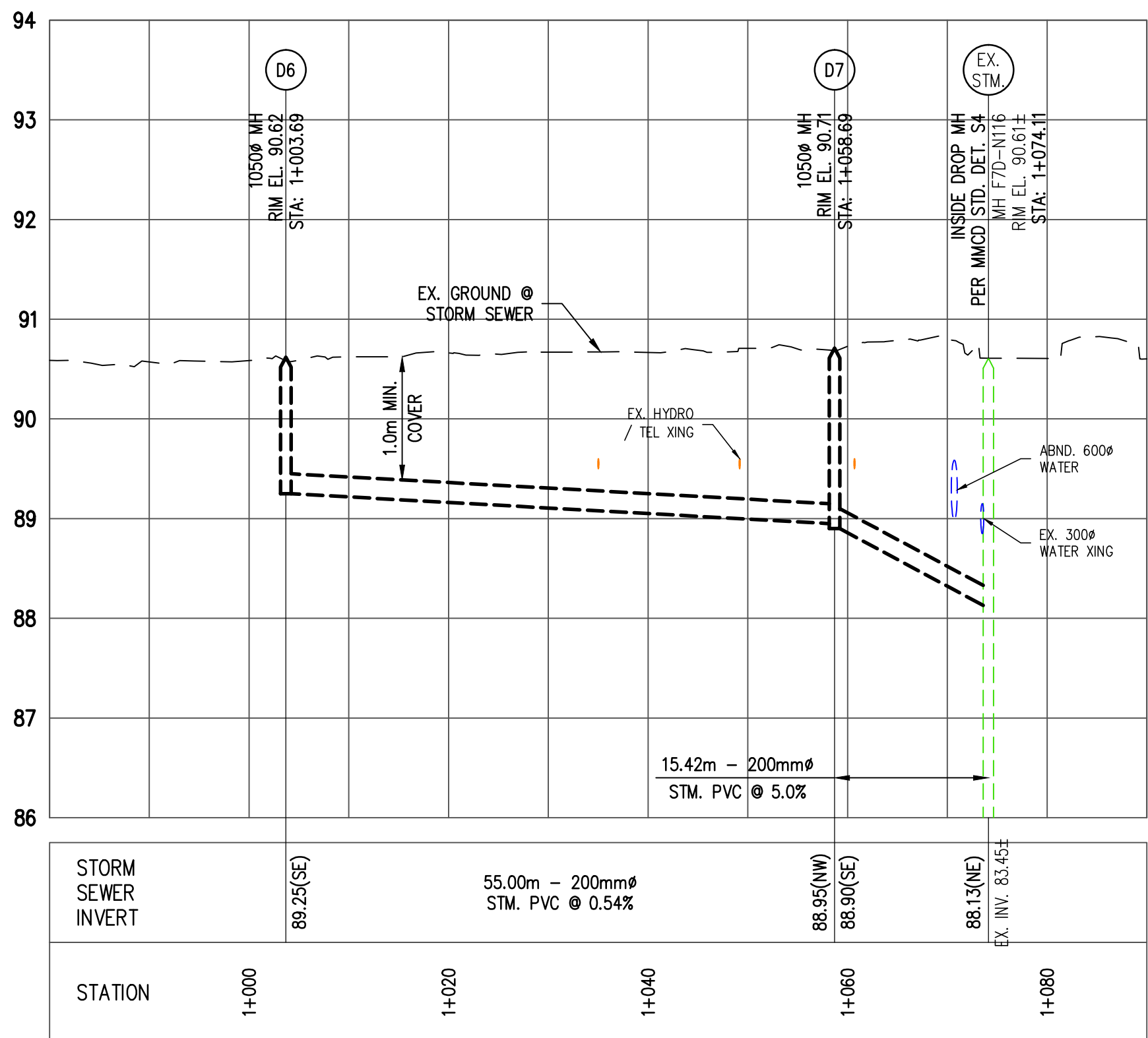
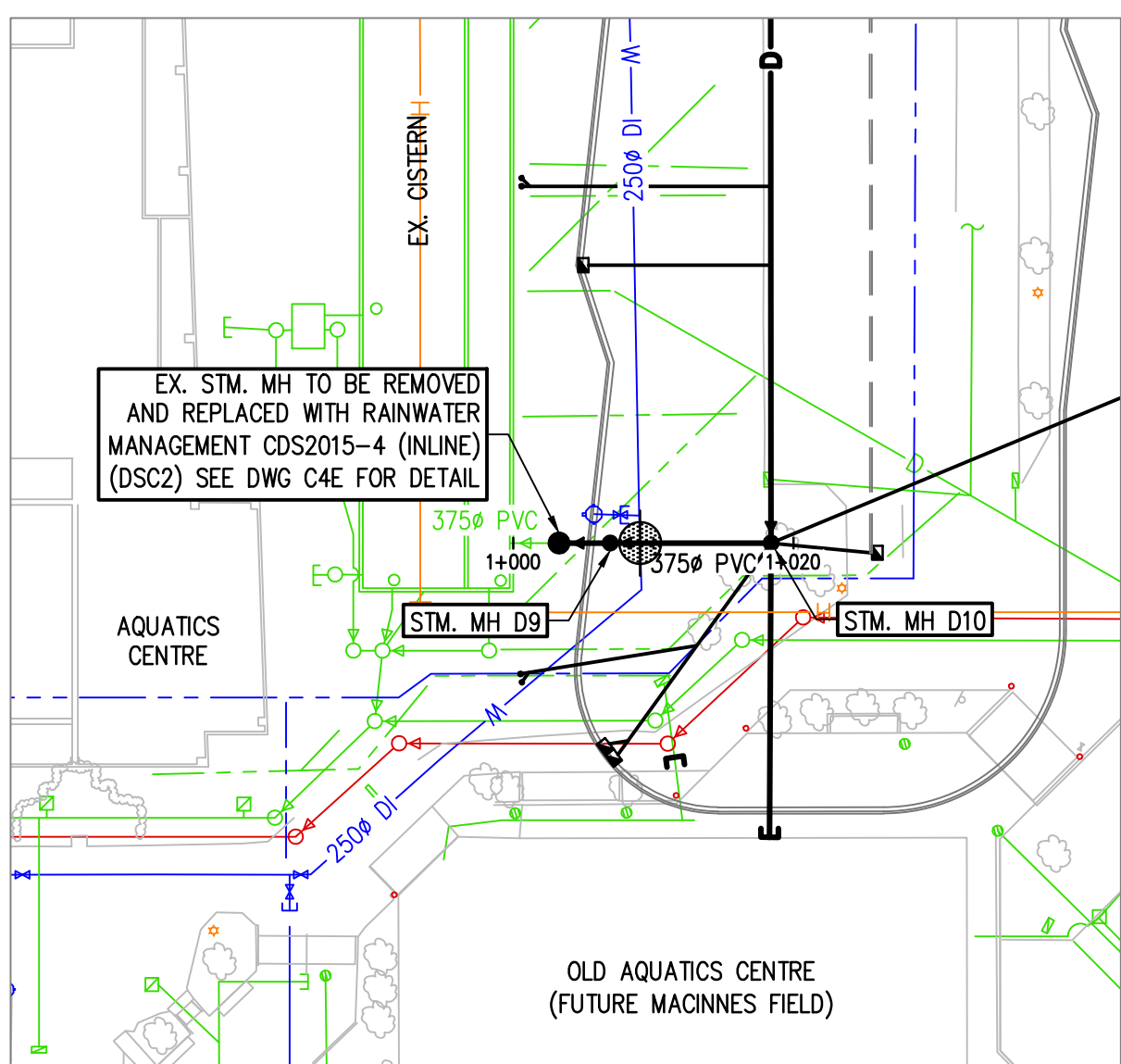
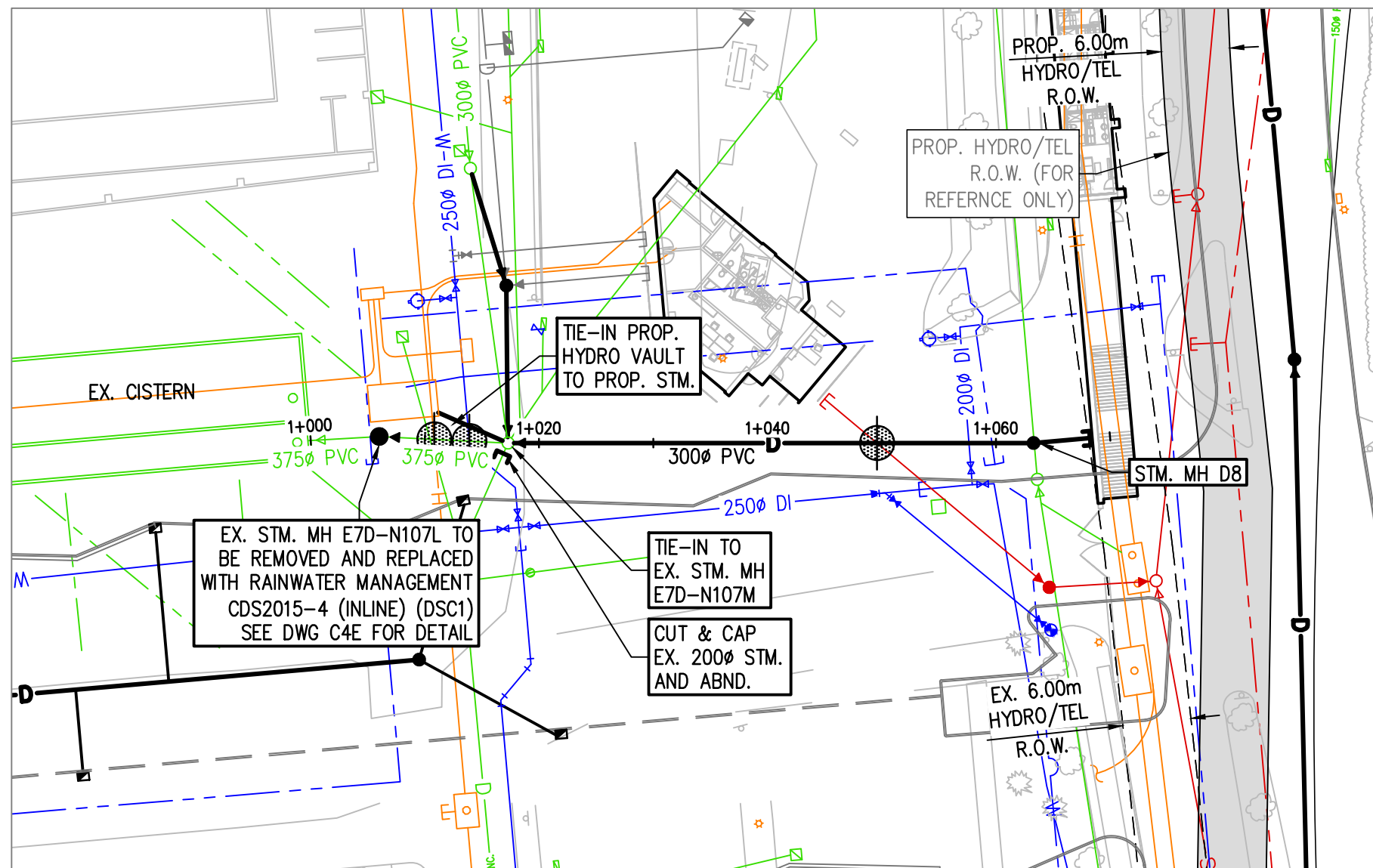
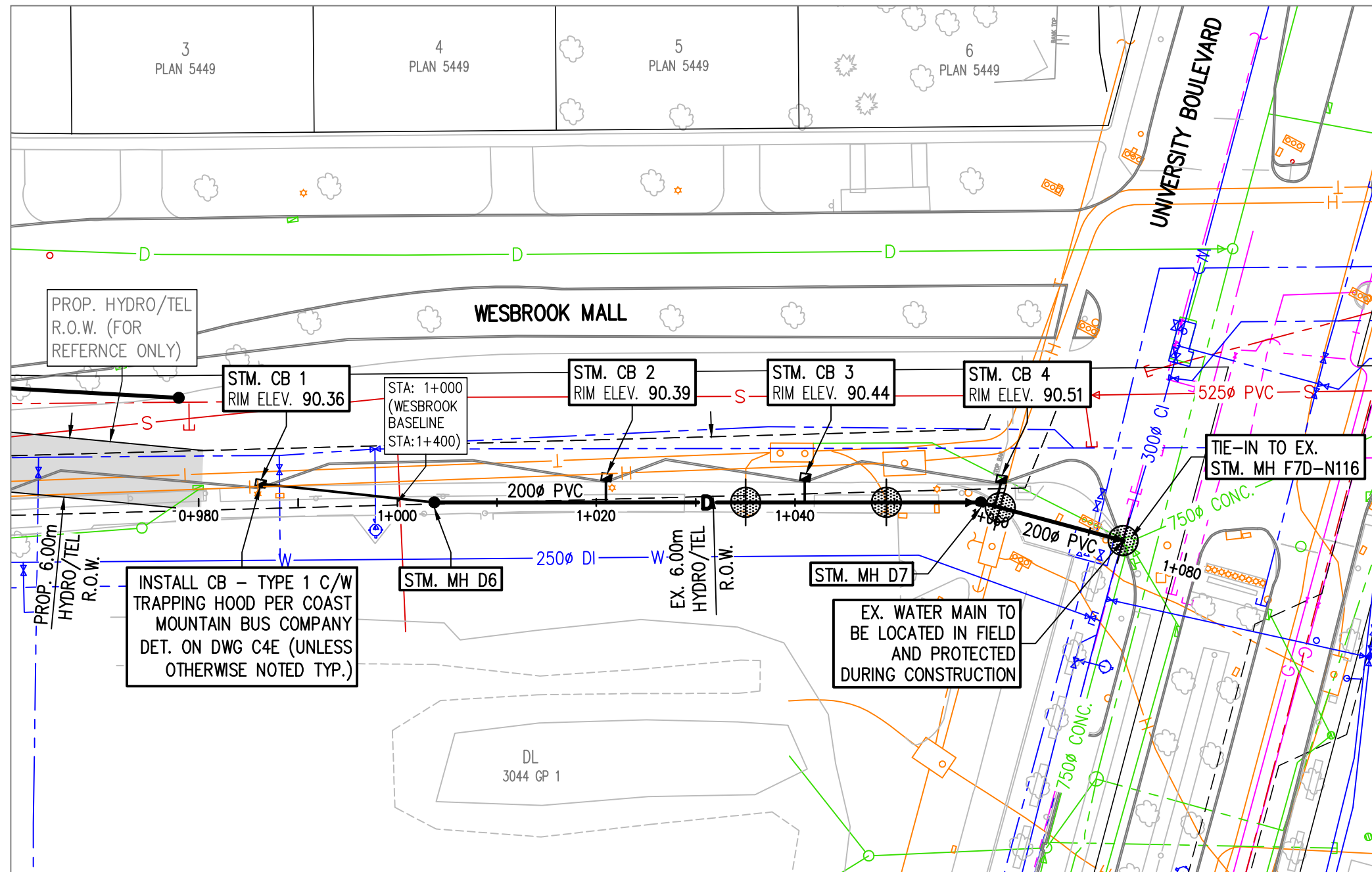
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C 27A

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CORE-1773





LEGEND

EX. WATER	W	ABND. WATER	---
EX. WATER - IRRIGATION	W	ABND. SANITARY SEWER	---
EX. SANITARY SEWER	S	ABND. STORM SEWER	---
EX. STORM SEWER	D	ABND. GAS	---
EX. GAS	G	ABND. STEAM	---
EX. STEAM	---	PROP. WATER	W
EX. HYDRO	H	PROP. SANITARY SEWER	S
EX. TEL / COMM	T	PROP. STORM SEWER	D
DISTRICT HOT WATER ALIGNMENT	DHW	PROP. UBC HYDRO	H

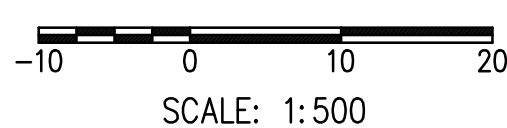
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GRAPHIC SCALE



SEAL

UBC Gage South  
PHASE 1  
UNDERGROUND WORKS

Civil Design  
UTILITIES - PLAN/PROFILE  
STORM SEWER

DRAWN: BC

CHECKED: CN

C 27B

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# METRIC

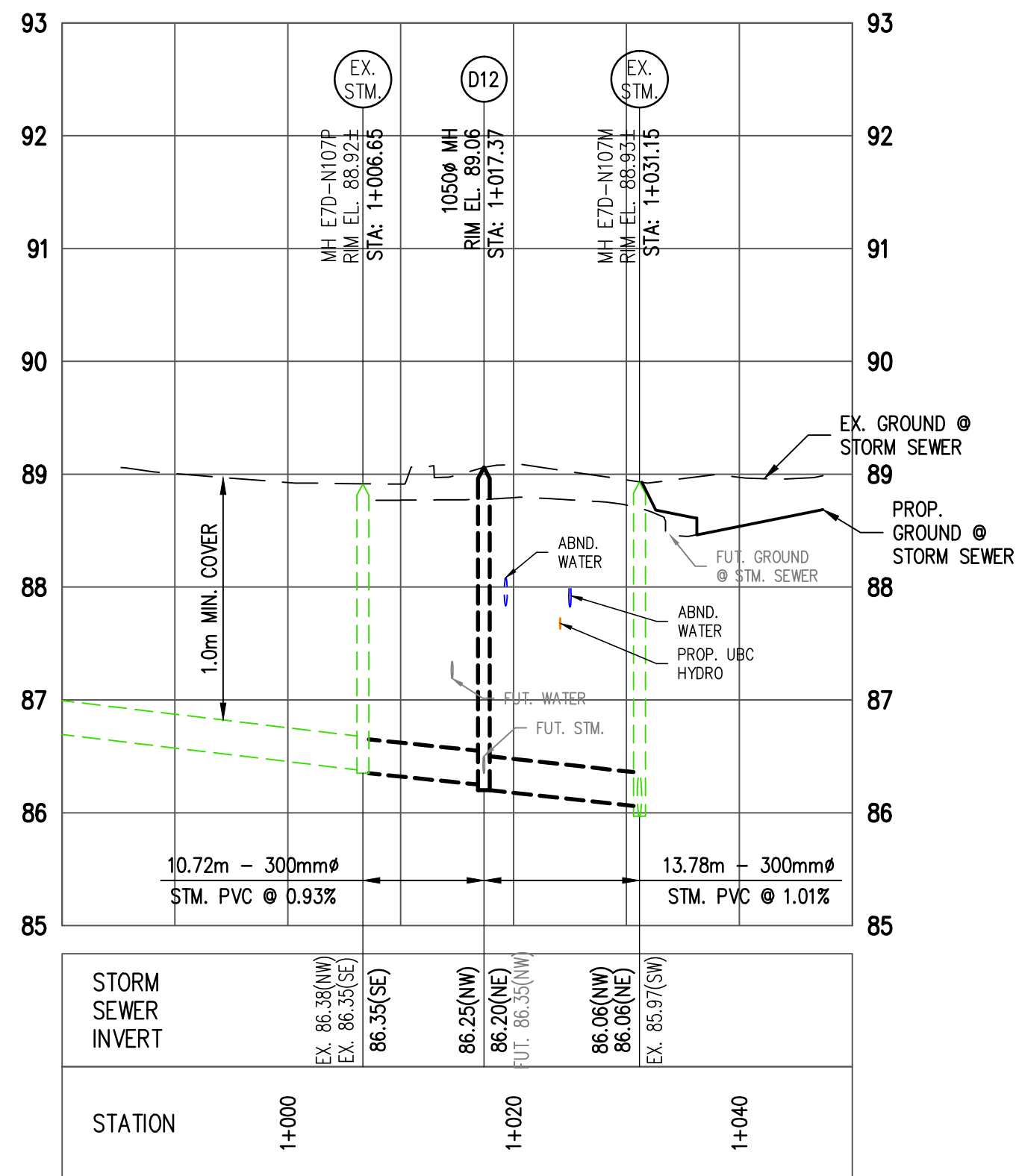
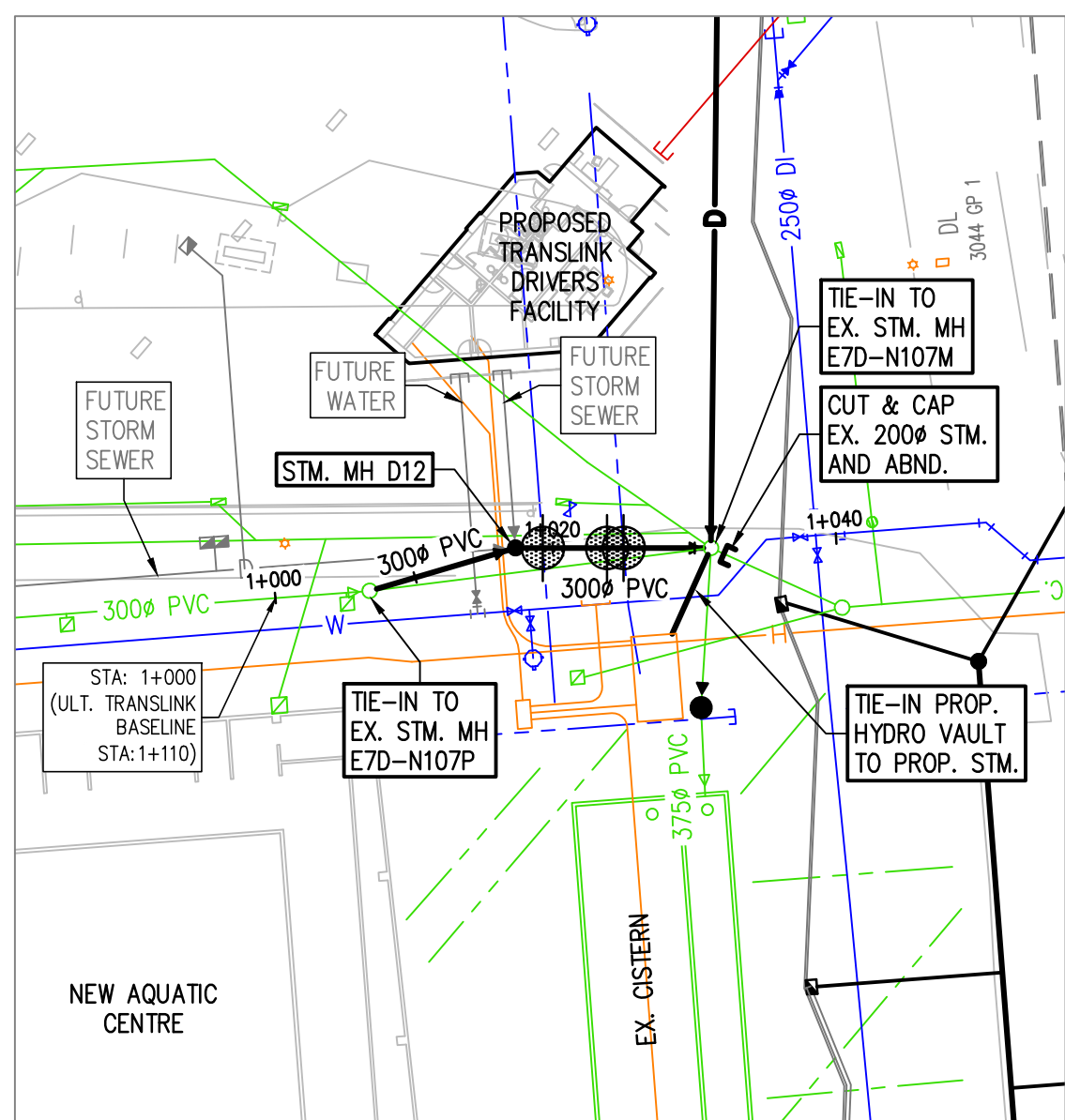
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Civil Design  
UTILITIES - PLAN/PROFILE  
STORM SEWER

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LEGEND			
EX. WATER		ABND. WATER	
EX. WATER - IRRIGATION		ABND. SANITARY SEWER	
EX. SANITARY SEWER		ABND. STORM SEWER	
EX. STORM SEWER		ABND. GAS	
EX. GAS		ABND. STEAM	
EX. STEAM		PROP. WATER	
EX. HYDRO		PROP. SANITARY SEWER	
EX. TEL / COMM		PROP. STORM SEWER	
DISTRICT HOT WATER		PROP. UBC HYDRO	



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LEGEND

EX. WATER	— W —
EX. WATER - IRRIGATION	— W —
EX. SANITARY SEWER	— S —
EX. STORM SEWER	— D —
EX. GAS	— G —
EX. STEAM	— — — —
EX. HYDRO	— H —
EX. TEL / COMM	— T —
DISTRICT HOT WATER ALIGNMENT	— DHW —
ABND. WATER	— - - -
ABND. SANITARY SEWER	— - - -
ABND. STORM SEWER	— - - -
ABND. GAS	— - - -
ABND. STEAM	— - - -
PROP. WATER	— W —
PROP. SANITARY SEWER	— S —
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PROP. UBC HYDRO	— H —

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GRAPHIC SCALE



SCALE: 1:500

SEAL

UBC Gage South

PHASE 1  
UNDERGROUND WORKS

Civil Design  
UTILITIES - PLAN/PROFILE  
SANITARY SEWER

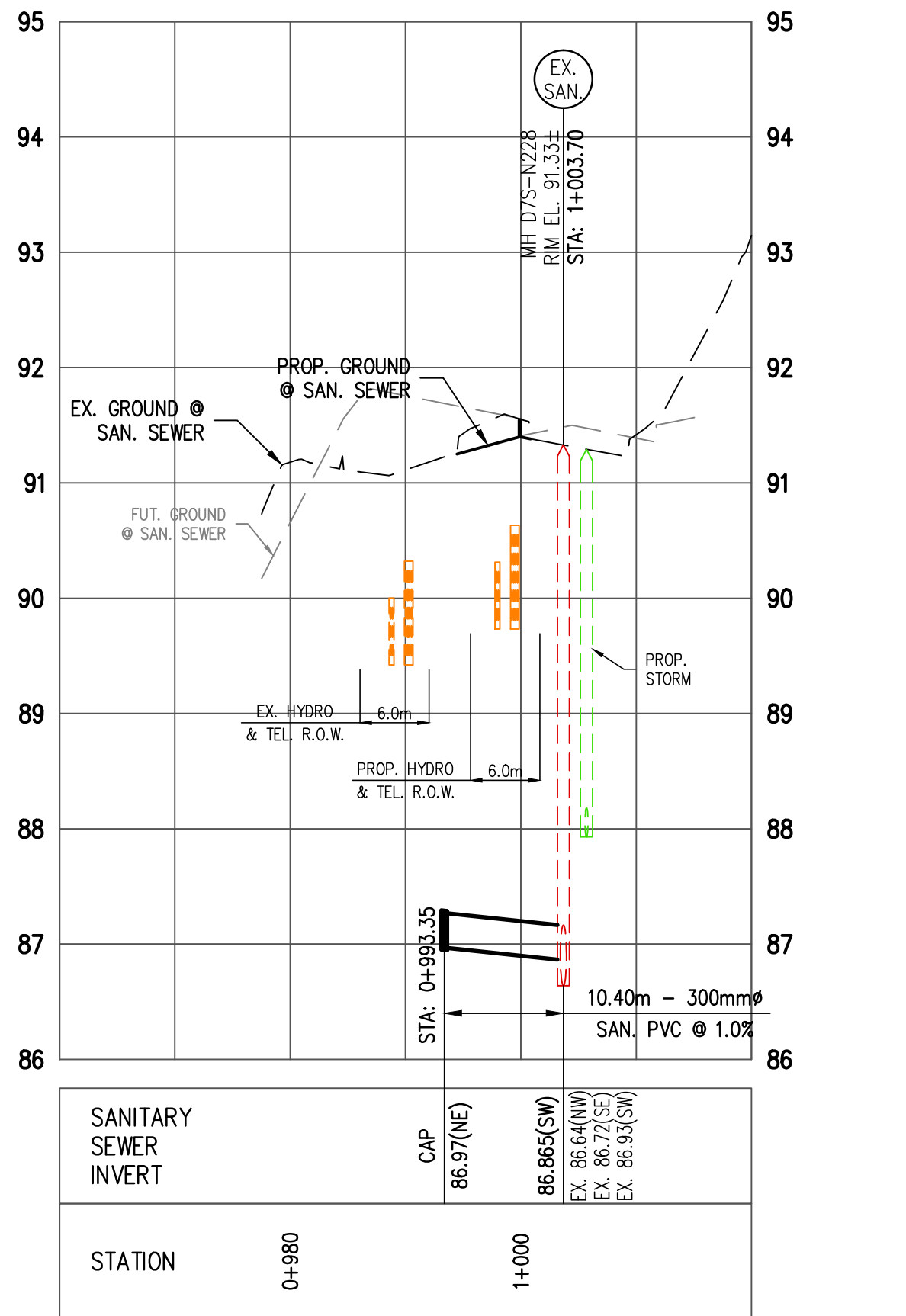
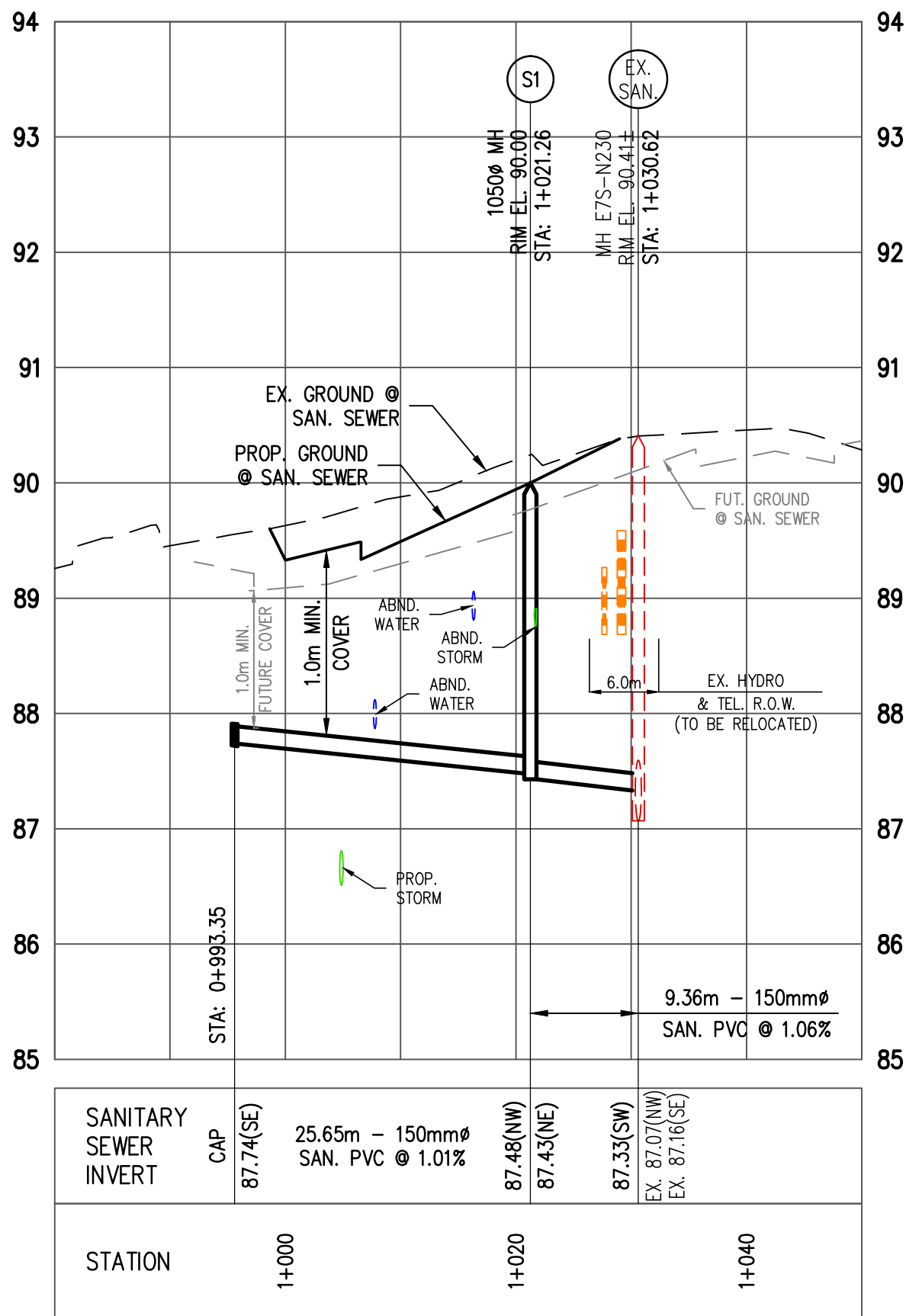
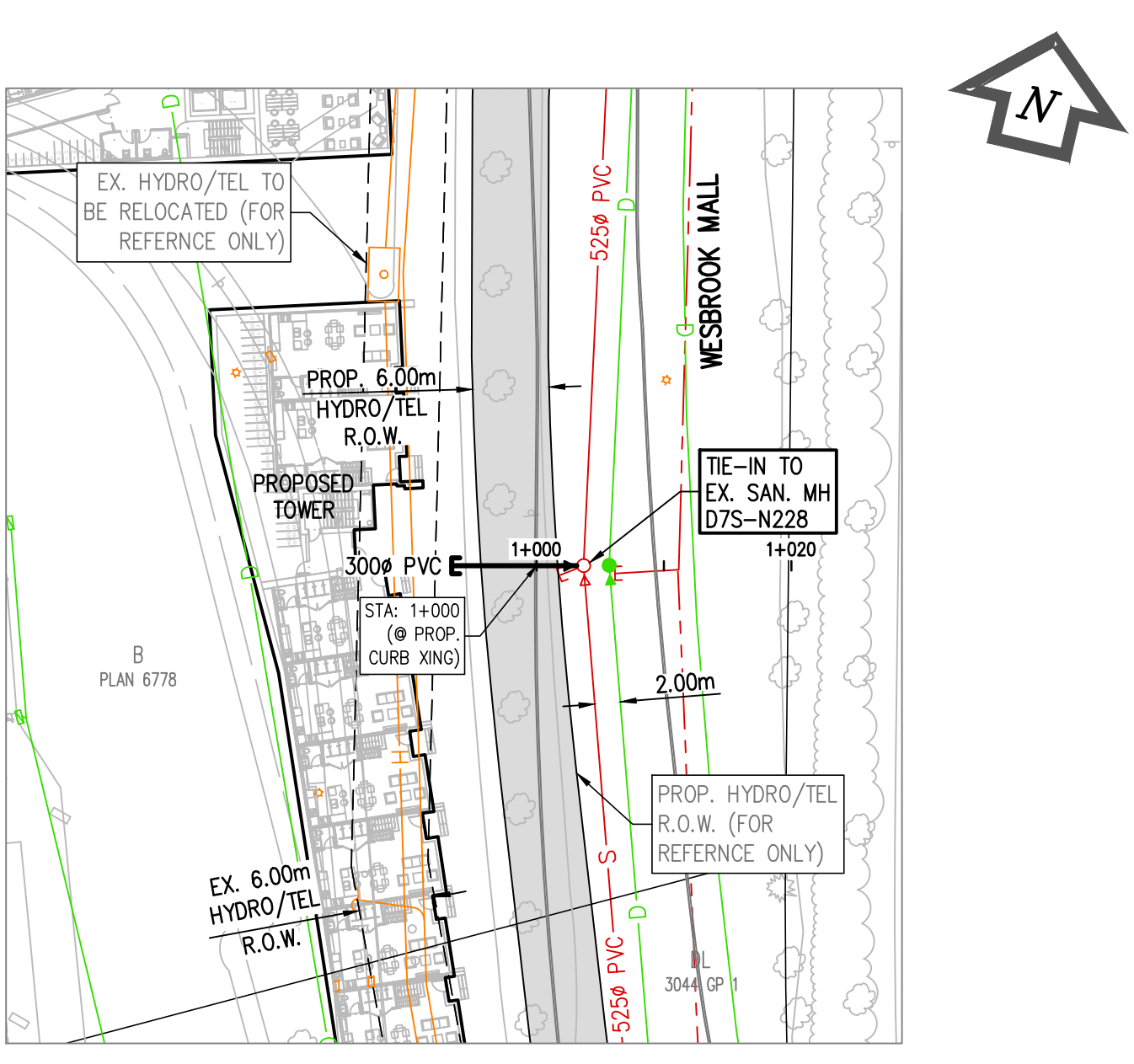
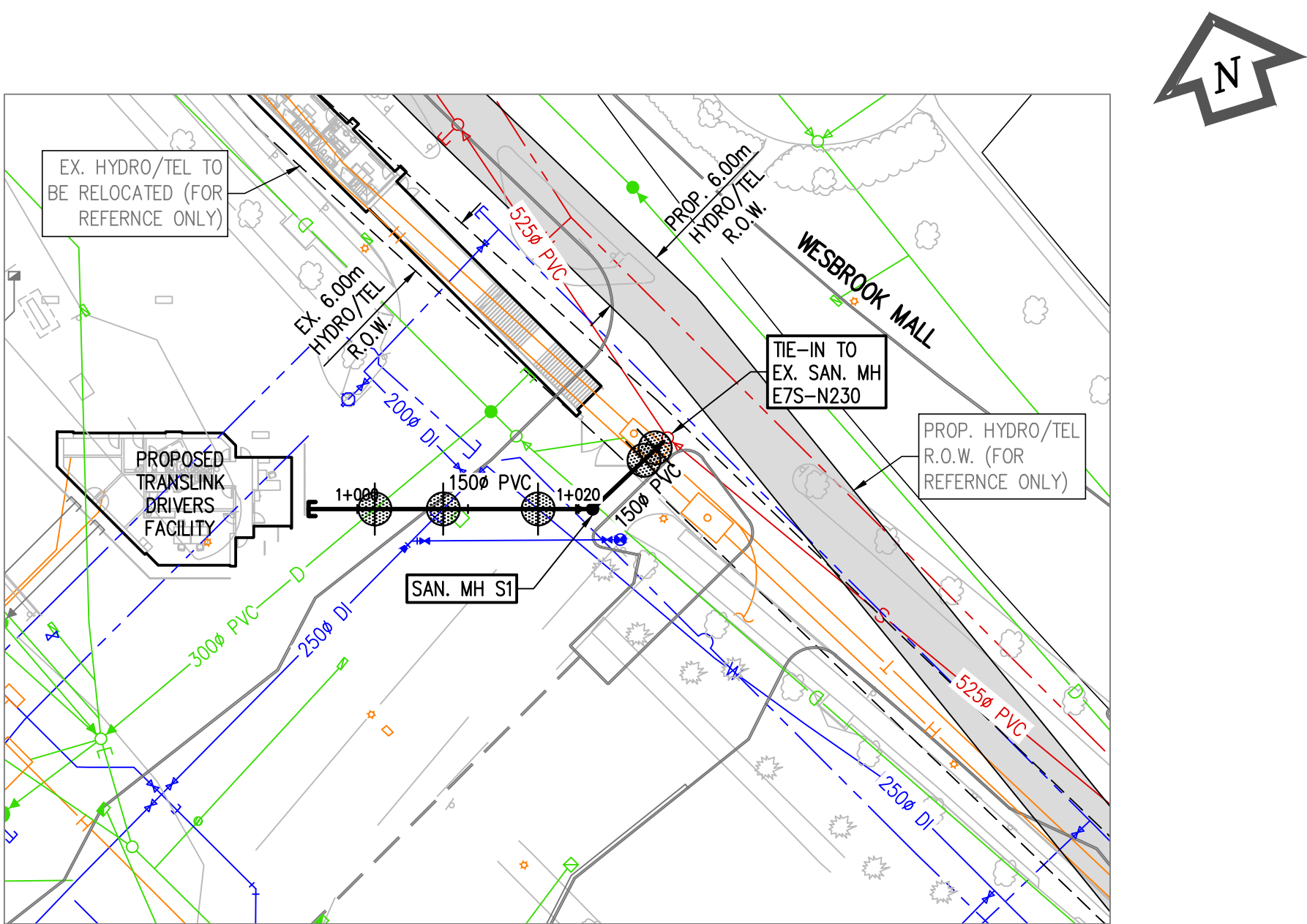
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C 27D

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GRAPHIC SCALE

SCALE: 1:500

SEAL

UBC Gage South  
PHASE 1  
UNDERGROUND WORKS

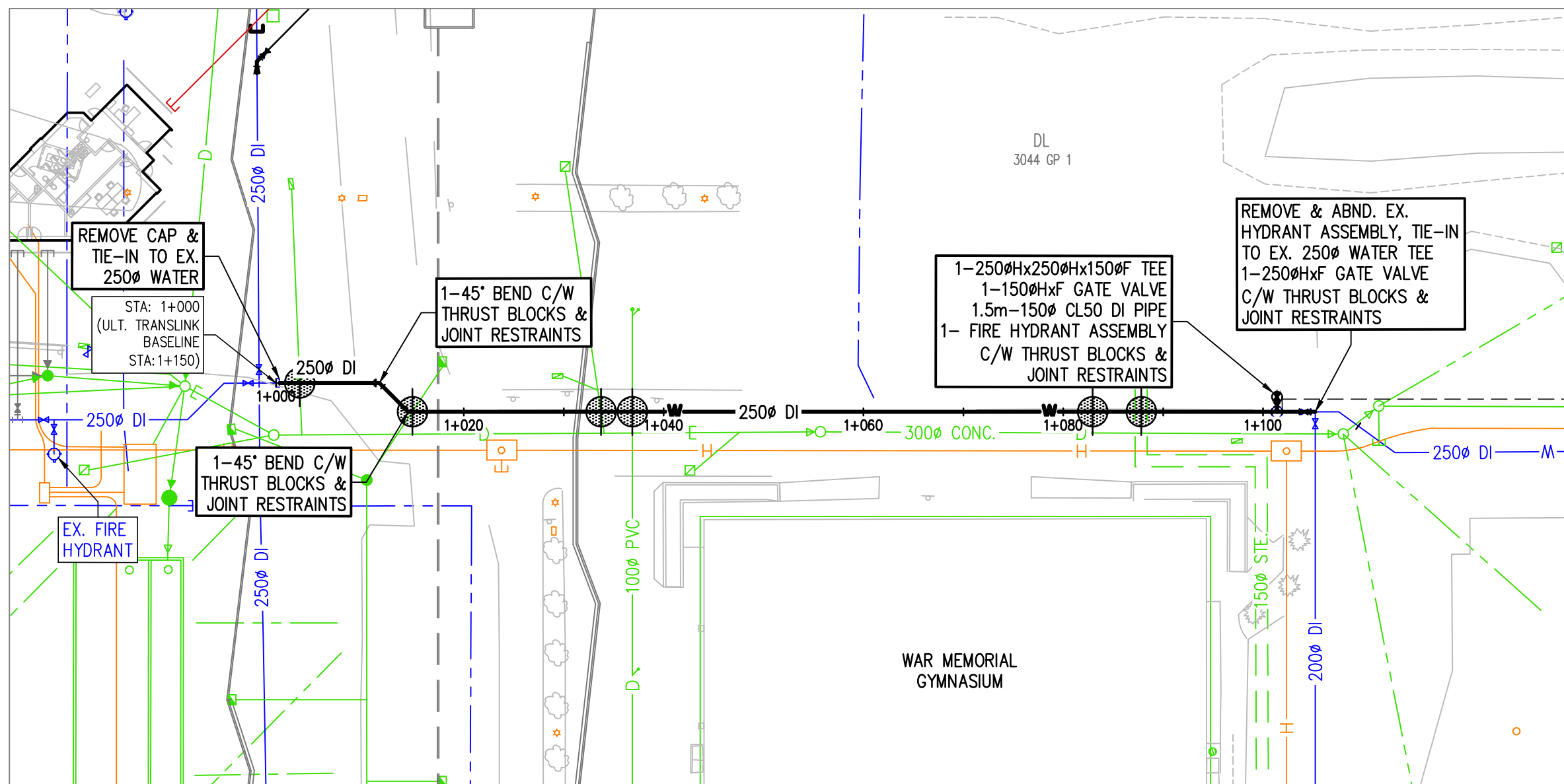
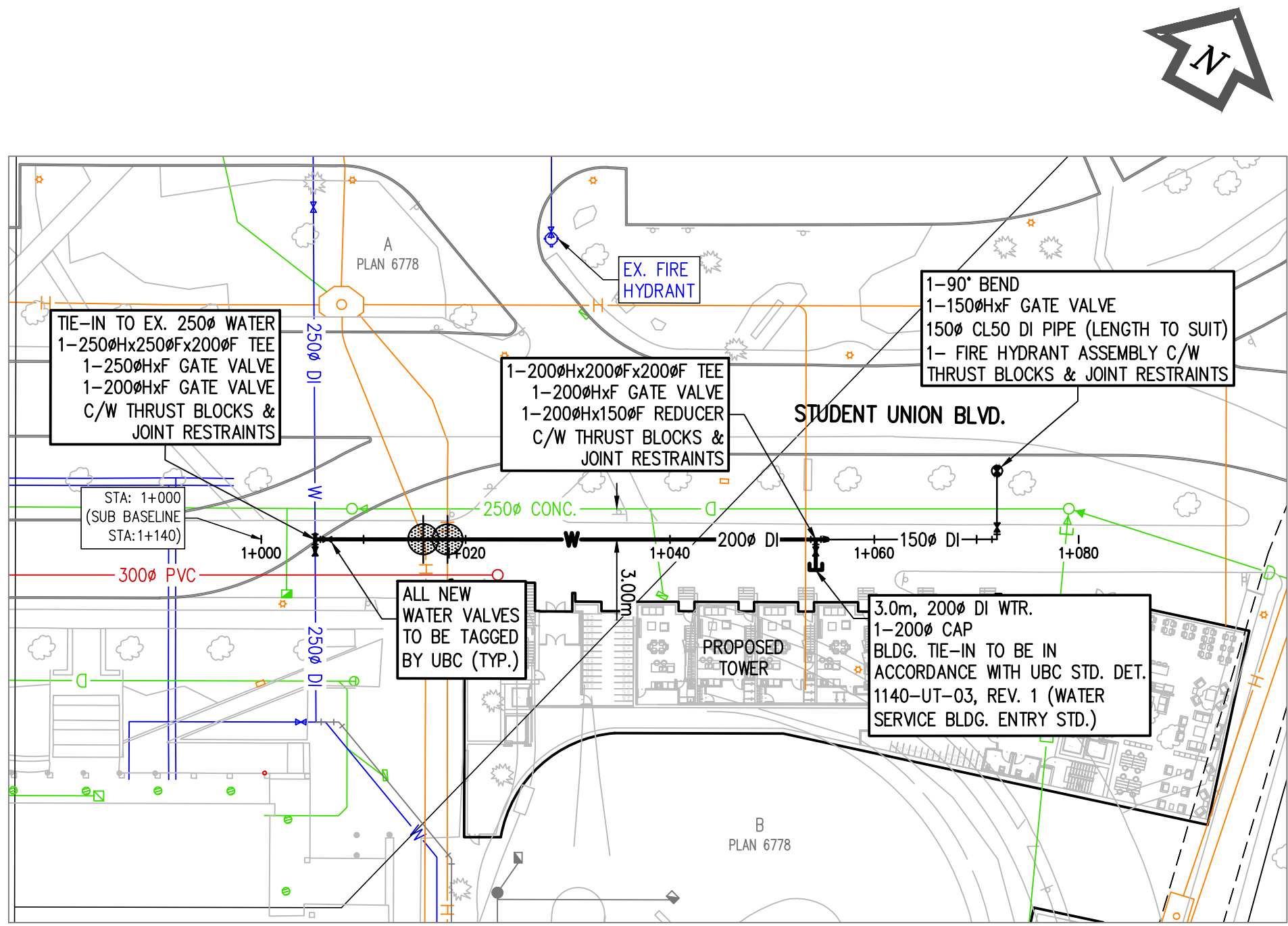
Civil Design  
UTILITIES - PLAN/PROFILE  
WATER WORKS

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CHECKED: CN

C 27E

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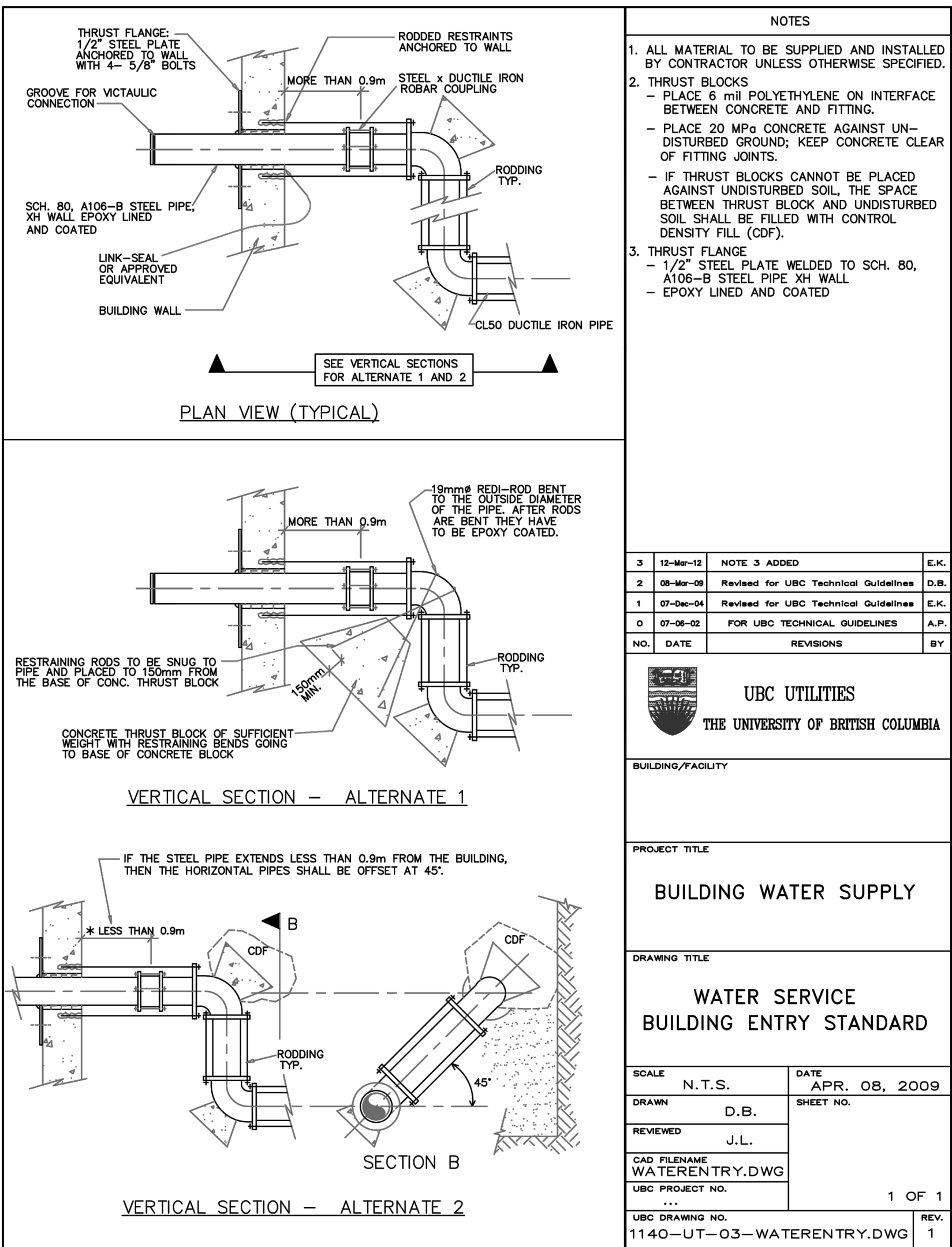
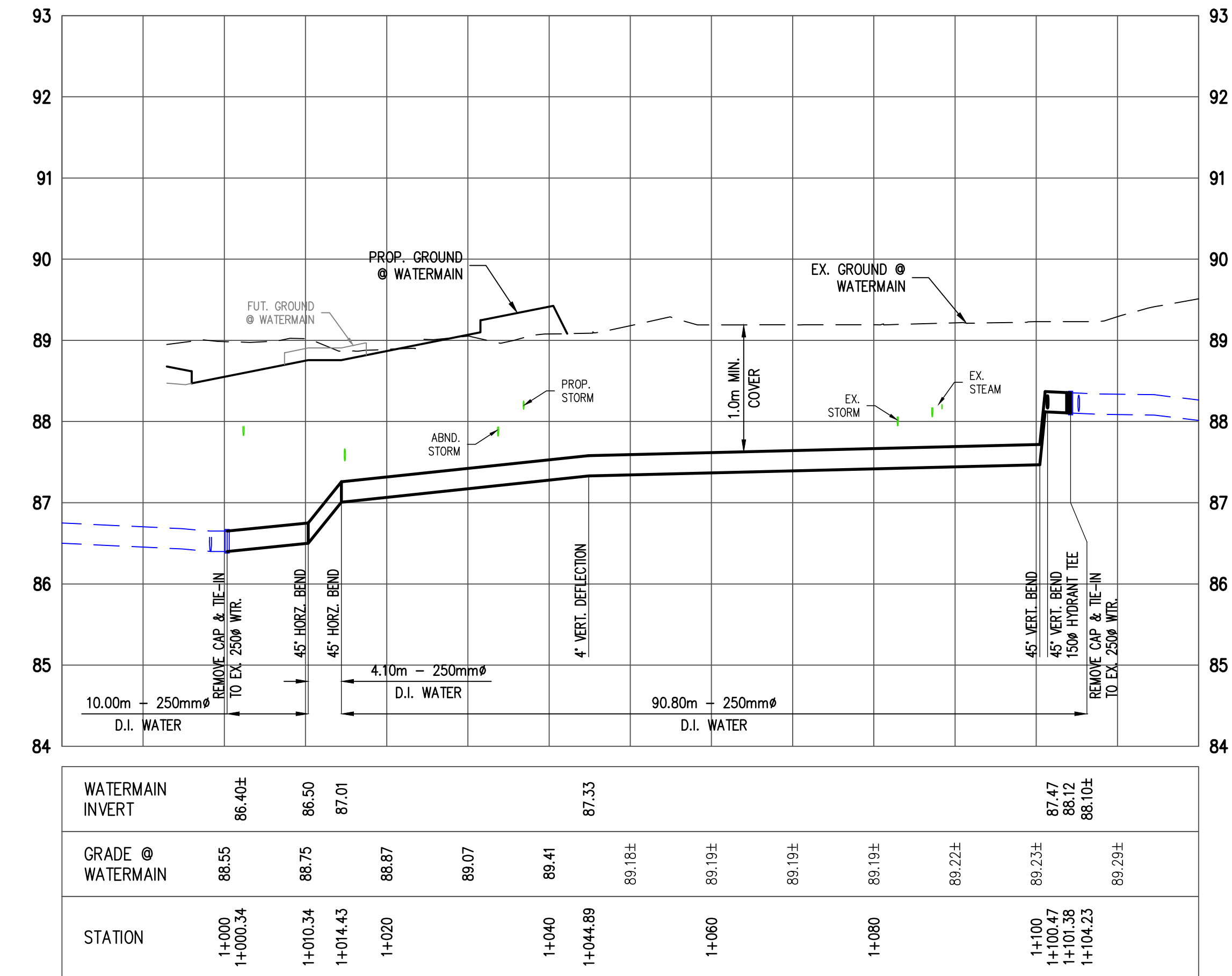
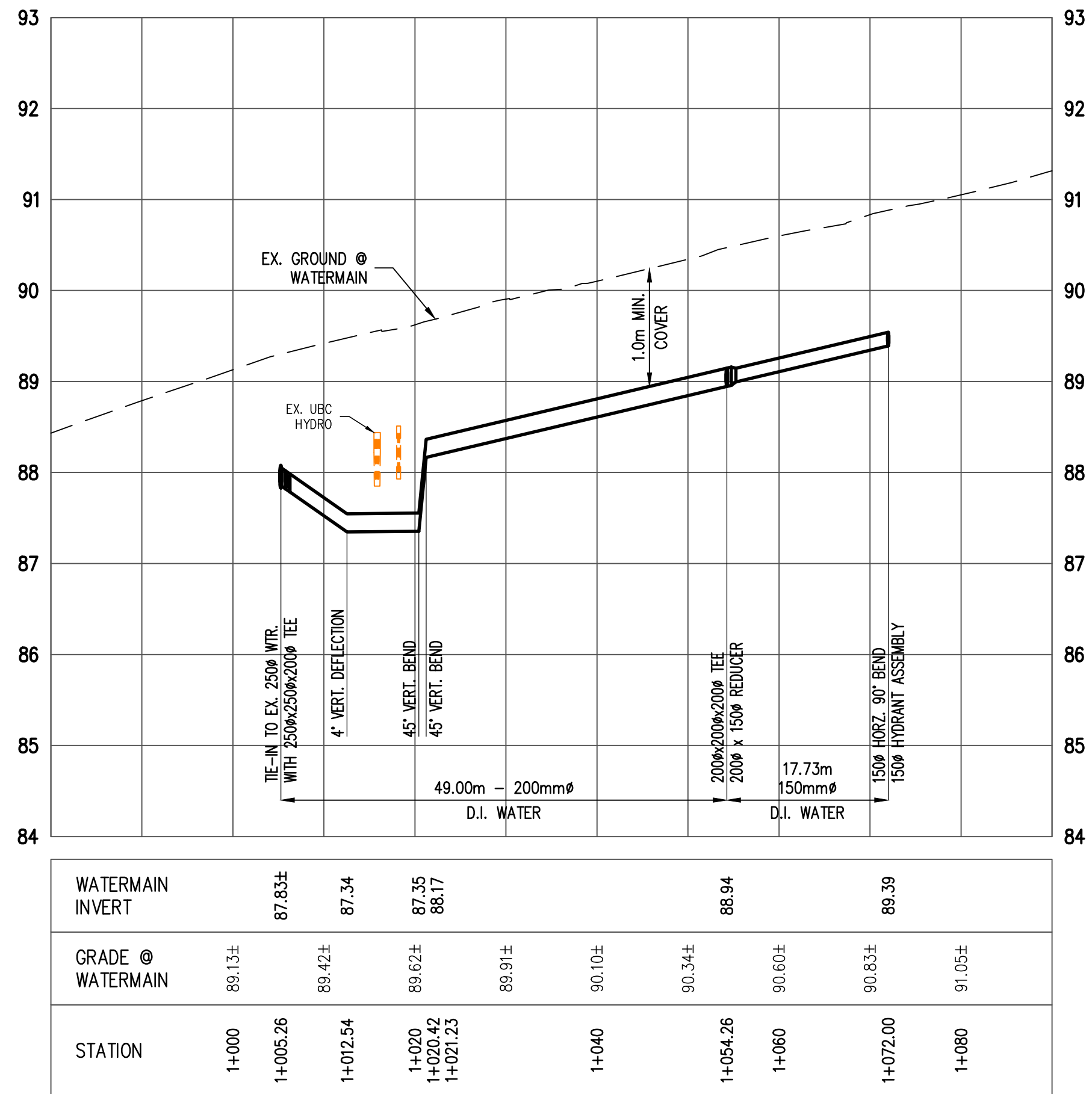


LEGEND

- EX. WATER - W
- EX. WATER - IRRIGATION - W
- EX. SANITARY SEWER - S
- EX. STORM SEWER - D
- EX. GAS - G
- EX. STEAM - H
- EX. HYDRO - T
- EX. TEL / COMM - DHW
- DISTRICT HOT WATER ALIGNMENT - DHW
- ABND. WATER - W
- ABND. SANITARY SEWER - S
- ABND. STORM SEWER - D
- ABND. GAS - G
- ABND. STEAM - H
- PROP. WATER - W
- PROP. SANITARY SEWER - S
- PROP. STORM SEWER - D
- PROP. UBC HYDRO - H

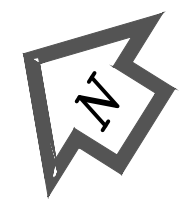
GENERAL NOTES:

- FOR NOTES AND DETAILS SEE DWG C4E.
- UTILITY TRENCH WIDTH VARIES WITH DIAMETER AND DEPTH OF UTILITY PIPE TO BE INSTALLED. MINIMUM WIDTH TYPICALLY 600mm OR AS PER MMCD STD. DET. C4.
- ALL EX. VALVES AND MANHOLES TO BE ADJUSTED TO SUIT NEW GRADES. ADJUSTED EX. WATER VALVES TO BE REPLACED WITH SQUARE ROBAR VALVE BOXES SUPPLIED BY DOBNEY OR APPROVED EQUIVALENT. VALVE # TO BE MARKED WITH GREASE PEN.
- COORDINATE ALL EXCAVATIONS CLOSE TO BUILDING WITH SHORING PLANS BY GEOTECH.
- CALL BC ONE-CALL 24 HOURS PRIOR TO CONSTRUCTION.
- TOPOGRAPHIC SURVEY FOR THIS SITE PROVIDED BY MURRAY AND ASSOCIATES LAND SURVEYORS.
- THESE DRAWINGS TO BE READ IN CONJUNCTION WITH OTHER CIVIL AND OTHER DISCIPLINE'S DRAWINGS.



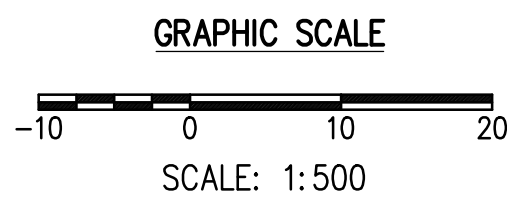
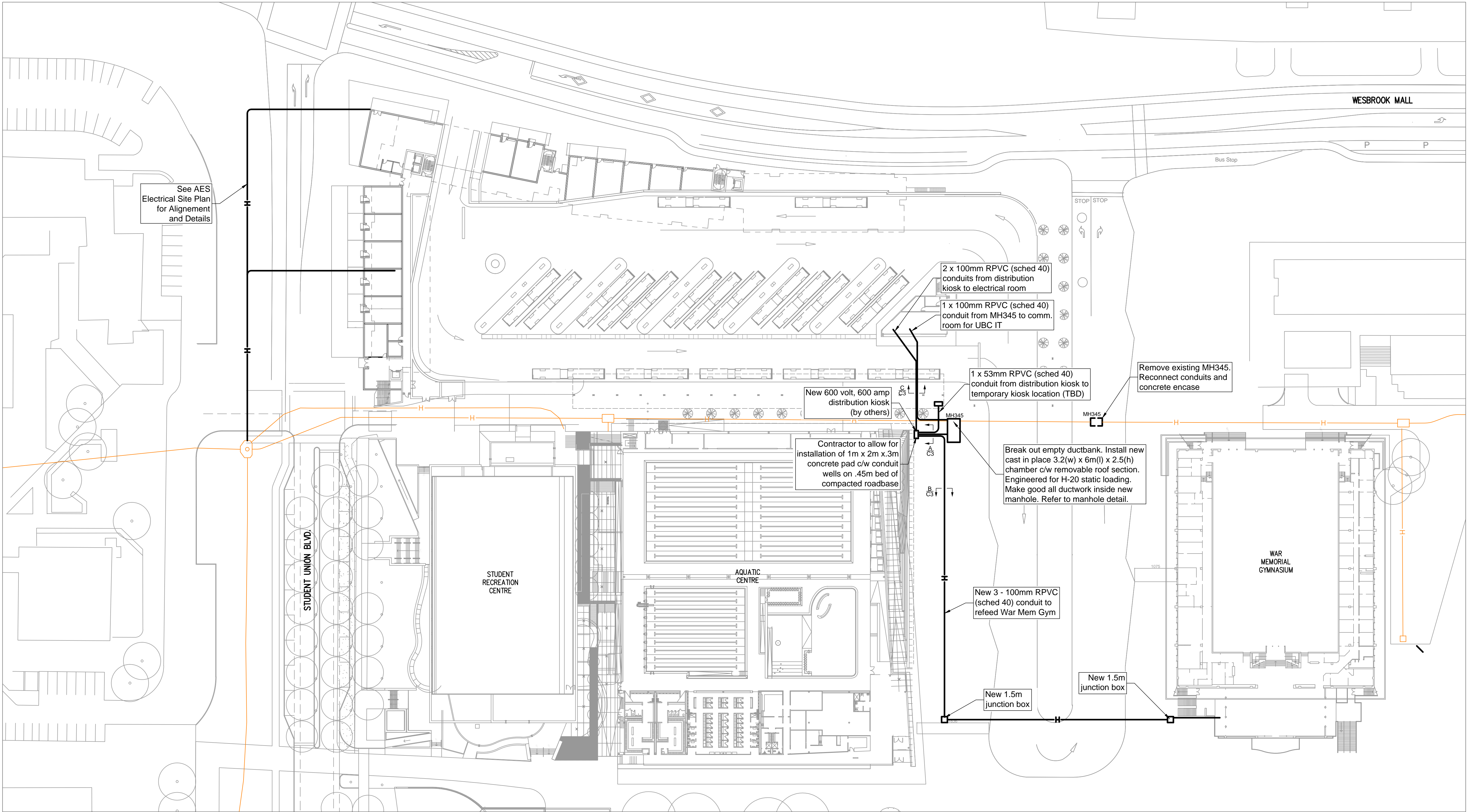
INFORMATION ON EXISTING UTILITIES MAY NOT BE COMPLETE OR ACCURATE. PRIOR TO CONSTRUCTION CONTRACTOR SHALL EXPOSE LOCATIONS OF ALL EXISTING UTILITIES AND ADVISE THE ENGINEER OF POTENTIAL CONFLICTS.



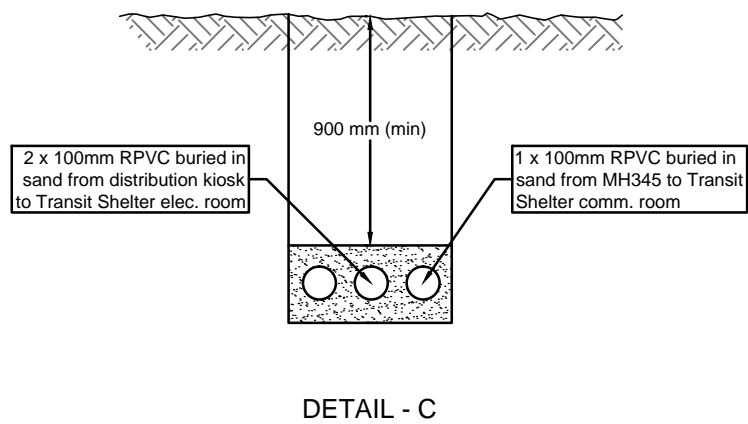
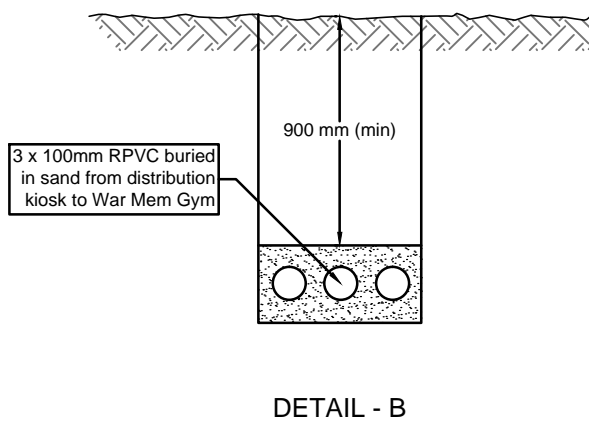
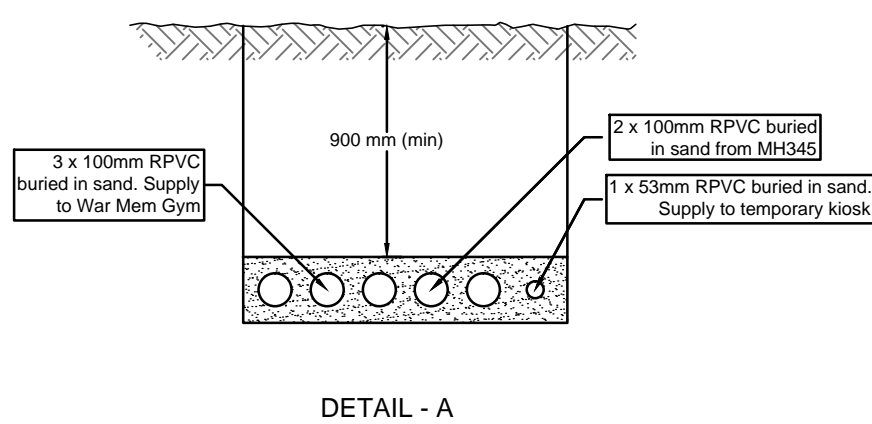


ISSUED FOR  
1 / 2016-03-30 / SLP SUBMISSION  
2 / 2016-04-26 / SLP - PHASE 1 UNDERGROUND

**METRIC**  
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SEAL



**LEGEND**  
EX. HYDRO  
PROP. UBC HYDRO

- GENERAL NOTES :**
- DRAWINGS ARE FOR REFERENCE PURPOSES ONLY. UBC CANNOT GUARANTEE ACCURACY OF SERVICE LOCATIONS. CONTRACTOR SHALL VERIFY BY SITE SURVEY, VACUUM EXCAVATION, HAND DIGGING OR OTHER NON-INVASIVE METHODS.
  - CALL BC ONE-CALL 24 HOURS PRIOR TO CONSTRUCTION.
  - THESE DRAWINGS TO BE READ IN CONJUNCTION WITH OTHER CIVIL AND OTHER DISCIPLINE'S DRAWINGS.

INFORMATION ON EXISTING UTILITIES MAY NOT BE COMPLETE OR ACCURATE. PRIOR TO CONSTRUCTION CONTRACTOR SHALL EXPOSE LOCATIONS OF ALL EXISTING UTILITIES AND ADVISE THE ENGINEER OF POTENTIAL CONFLICTS.

UBC Gage South  
PHASE 1  
UNDERGROUND WORKS

Civil Design  
ELECTRICAL SITE  
SERVICING PLAN

DRAWN: RNH CHECKED: CN

H 1