Good morning Alice,

Please find below the comment summary on SLP15062-1 Brock Commons Landscape and Civil Works Respond to each item and return for our record. A resubmission of the Landscape set will be required once all comments have been satisfied.

Landscape

- Refer to the attached DG Landscape markup. A meeting was to be held with HAPA to resolve many of the outstanding Landscape issues. Check with your consultant on the status of these changes. Landscape resubmission required.
- Other general Landscape notes:
    - Cornus nuttalii is susceptible to anthracnose which causes dieback and makes leaves unsightly . Should be substituted for resistant species: suggest either Cornus kousa or kousa hybrid – Cornus nuttalii is deleted. Acer circinatum is added to replace.
    - Apart from sword fern, the other ferns specified are not as drought tolerant, and are not robust growers. I suggest these fern species should be significantly reduced in numbers and the relationship reversed: i.e. ferns should be "…informally located between Arctostaphylos" rather than Arctostaphylos informally located between ferns as indicated on plant list.
    - Further to above note, Arctostaphylos generally has not performed well on campus whether due to fungal dieback, compaction from foot traffic or soil issues. I suggest sub with willow-leaf cotoneaster. -Please confirm if we can use cotoneaster demmeri 'lowfast' instead of willow-leaf cotoneaster. Willow-leaf cotoneaster is a shrub, grows up to 10'-15' high and is not great from CEPTED point of view, especially South of the building between North parking.
      We have shown cotoneaster demmeri 'lowfast' combined with other drought tolerant shrubs mixed with small quantity of sword fern.
    - Street Tree planting detail on L6.01indicates structural soil "…as required". Seems too vague given current arboricultural science which confirms that small soil volumes=small or even stunted tree development. Structural cells are preferred over structural soil, but as minimum, consultant should do a calculation, verify and specify acceptable depth/width of structural soil under pavement.
      The street tree specified along Walter Gage rd. is Quercus palustris 'Pringreen', which will only have 2m+/- canopy in 10 years, which is not referenced in town of Oakville guidelines or the soil volume chart we received. In this project, we referred to Canadian Landscape Standard which specified 6m2/soil per tree. (Please refer to attached copy). Please find L3.03 Tree & Structural soil layout plan showing structural soil extent. Calculation of the area is based on structural soil contains 20% soil, and the depth is 750mm.

    - As per Tech Guidelines, please ensure there are no plantings under the overhang.
      No planting under the overhang

Utilities

- Submit DES design details including pipe profile and stress analysis info for review.
  Refer to attached Brock Commons DES Design, by Kerr Wood Leidal

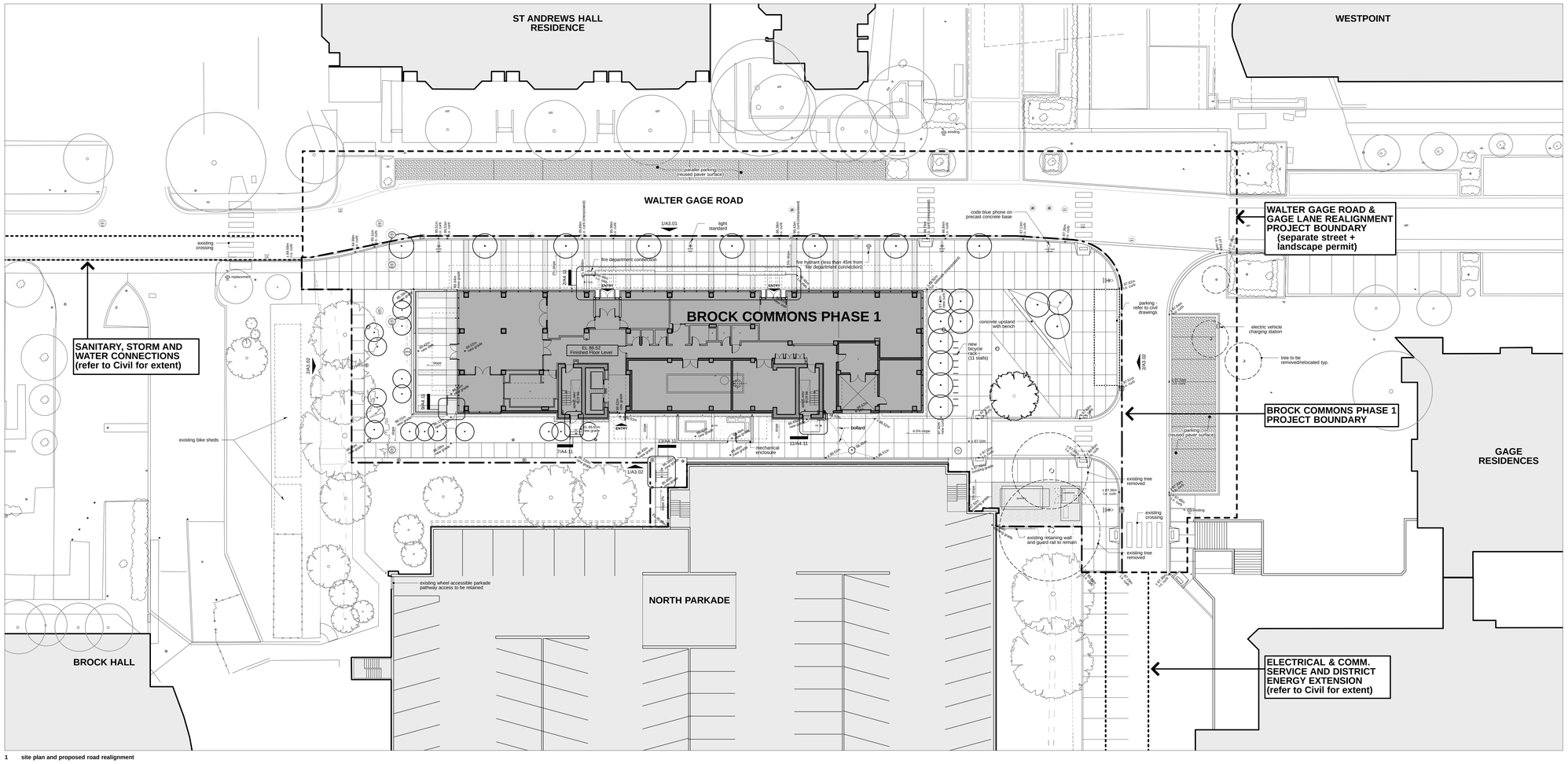
- *Additional Scope: A quote was requested by Energy Water Services for additional work including WM replacement, existing 250 mm DI main tie-in on south end, and existing AC main abandonment. See the mark –up on the attached water map. Contact Kamps Engineering for more information on the current status of this request. If this will be added to the project, we can process this separately as an amendment.*
  Brock Commons Watermain Replacement Estimate, by Kamps Engineering (an associated email was sent directly to Jenny Liu on 17 Oct. 2016 - a subsequent recommendation email was received from Jenny Liu on 19 October 2016)

Building Ops

- fix N arrow in title block to point north-North arrow is fixed.
- align eastern-most curb ramp to point in the direction of the crossing –Eastern-most curb ramp is aligned as discussed in the meeting with Dean Gregory, on September 14th, 2016
- relocate lamp standard at Gage and lane to be closer to curb (allowing greater clear space for pedestrians)
- relocate proposed new trees at south face of building to balance maximized health with minimized damage and intrusion into adjacent sidewalk-Numbers of trees South of the building are reduced to three.
- L6.01: redesign metal edge at planter so that it doesn't present a trip hazard; as ground is the same grade on both sides of proposed edge, flush treatment is preferred and landscaping should be graded so that planting material migration is minimized as much as possible- metal edge is deleted.
- Provide clarification on the temporary parking spaces at the east end of the project. –Parking is defined with bollards as discussed in the meeting with Dean Gregory, on September 14th, 2016

Issues

31 Mar 2015	Issued for DP signage
02 Apr 2015	Issued for DP Application
24 Apr 2015	Issued for Pricing
14 May 2015	Issued for BSSB & Review Panel
31 Jul 2015	Issued for DP Resubmission
18 Aug 2015	Issued for Tender
08 Oct 2015	Issued for Foundation and Structural to Grade BP
22 Oct 2015	Issued for Full BP
20 Jan 2016	Issued for DP Minor Amendment
20 Jan 2016	Issued for Full BP Resubmission
29 Jan 2016	Issued for Construction 2
26 Oct 2016	Issued for SLP 2 Resubmission



1 site plan and proposed road realignment

General Notes

1. Architectural floor elevation at Grade Level 0.00 = geodetic elevation 86.52m.

2. Survey information is derived from Murray & Associates survey drawing dated 06 February 2015.

Tree legend

(refer to landscape drawings for tree types)

existing tree

new tree

tree to be removed/relocated

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Brock Commons Phase 1

6088 Walter Gage Road
University of British Columbia

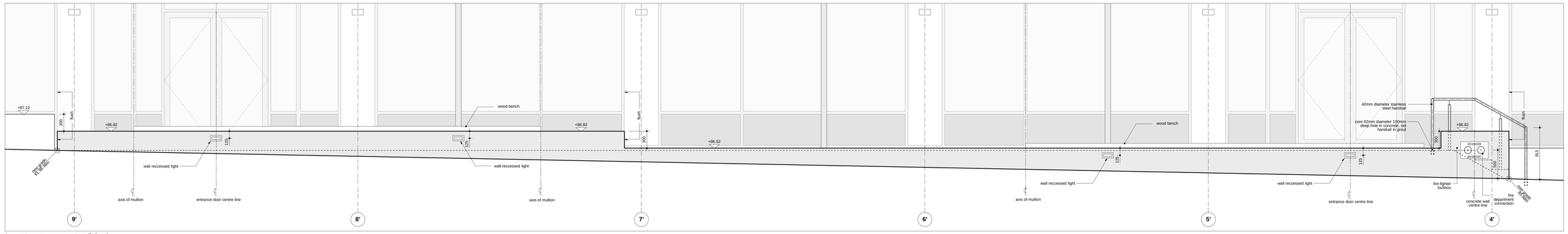
scale 1:200	**date** 26 Oct 2016
project code TWR	**status** Contract Documents
drawn RSA	**checked** MW/RA

Site Plan

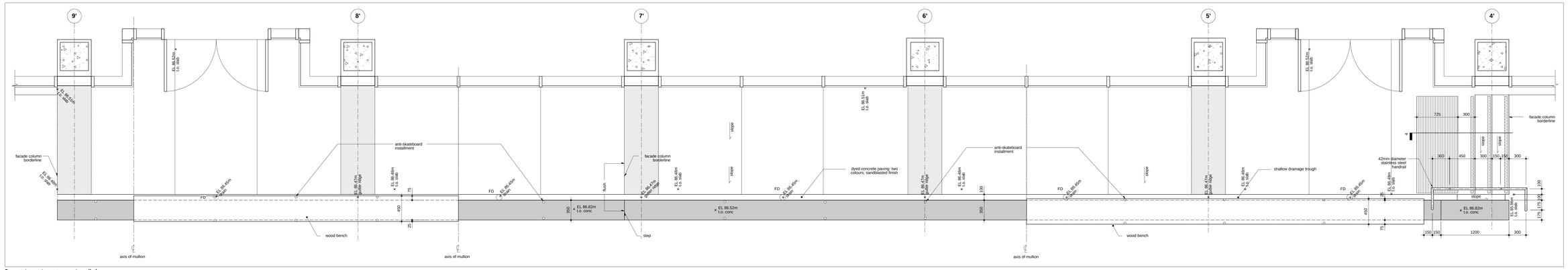
drawing number
A0.03

Issues

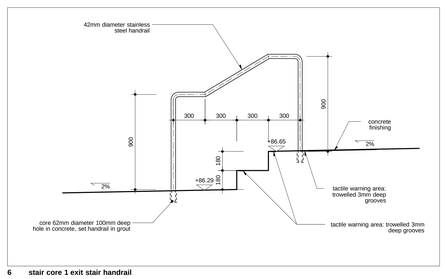
26 Oct 2016	Issued for SLP 2 Resubmission



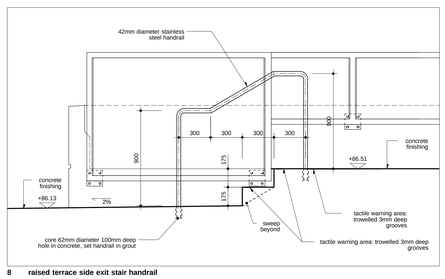
1 entrance terrace concrete wall elevation
1:25



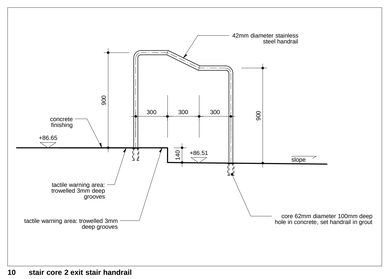
2 entrance terrace concrete wall plan
1 : 25



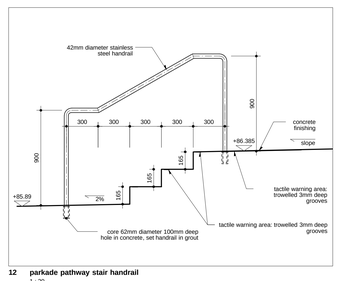
6 stair core 1 exit stair handrail
1 : 20



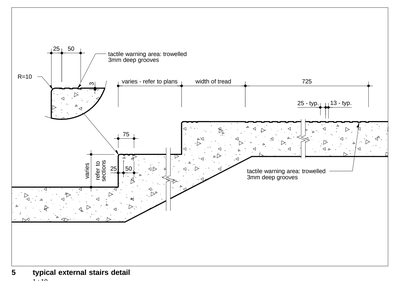
8 raised terrace side exit stair handrail
1 : 20



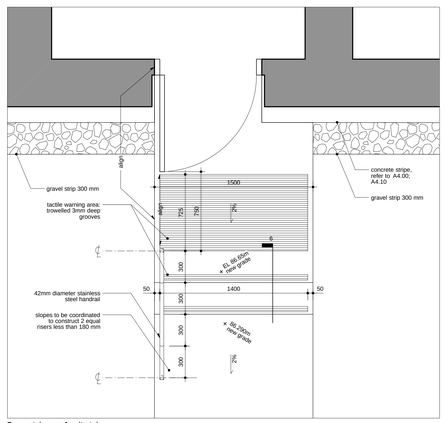
10 stair core 2 exit stair handrail
1 : 20



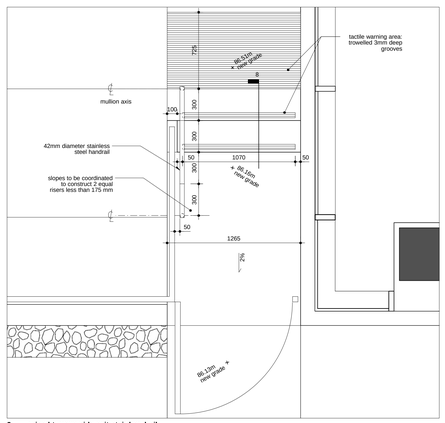
12 parkade pathway stair handrail
1 : 20



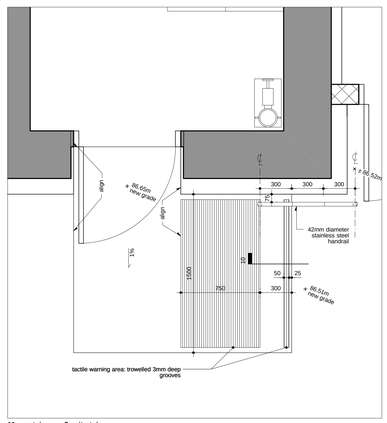
5 typical external stairs detail
1 : 10



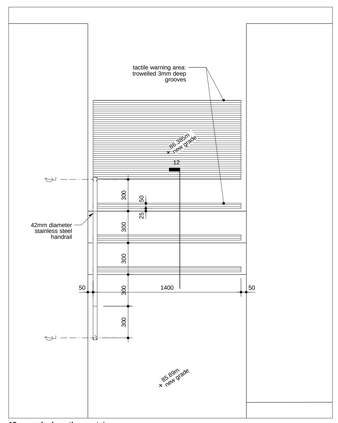
7 stair core 1 exit stair
1 : 20



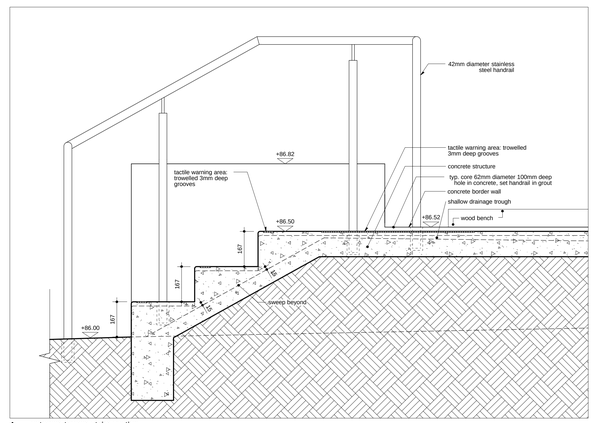
9 raised terrace side exit stair handrail
1 : 20



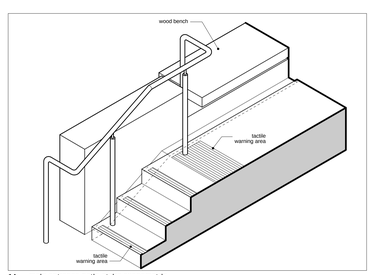
11 stair core 2 exit stair
1 : 20



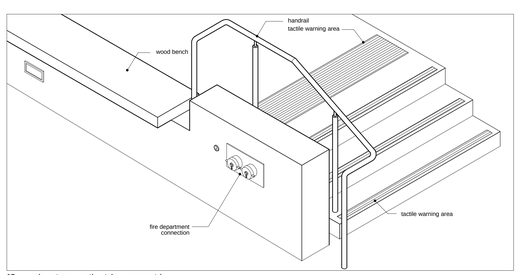
13 parkade pathway stair
1 : 20



4 entrance terrace stairs section
1 : 10



14 main entrance patio stairs axonometric
1 : 20



15 main entrance patio stairs axonometric
1 : 20

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Brock Commons Phase 1

6088 Walter Gage Road
University of British Columbia

scale	**date**
as noted	26 Oct 2016
project code	**status**
TWR	Contract Documents
drawn	**checked**
GH	MW/RA

Landscape Stair Details

drawing number
A4.11

LEGEND

PA PLANTING AREA
SIM SIMILAR
TYP TYPICAL

DETAIL NUMBER
DETAIL SHEET ON WHICH DETAIL IS SHOWN

PAVING TYPE A, VEHICULAR LOAD

NOTES:

EQ WITH 'NUMBER' NOTATION INDICATES NUMBER OF EQUAL SEGMENTS BETWEEN POINTS.
E.G. EQ'6' MEANS 6 SEGMENTS BETWEEN POINTS.

ALL DIMENSIONS ARE NOMINAL; DIMENSIONS ARE BASED ON ARCHITECTURAL GRID.

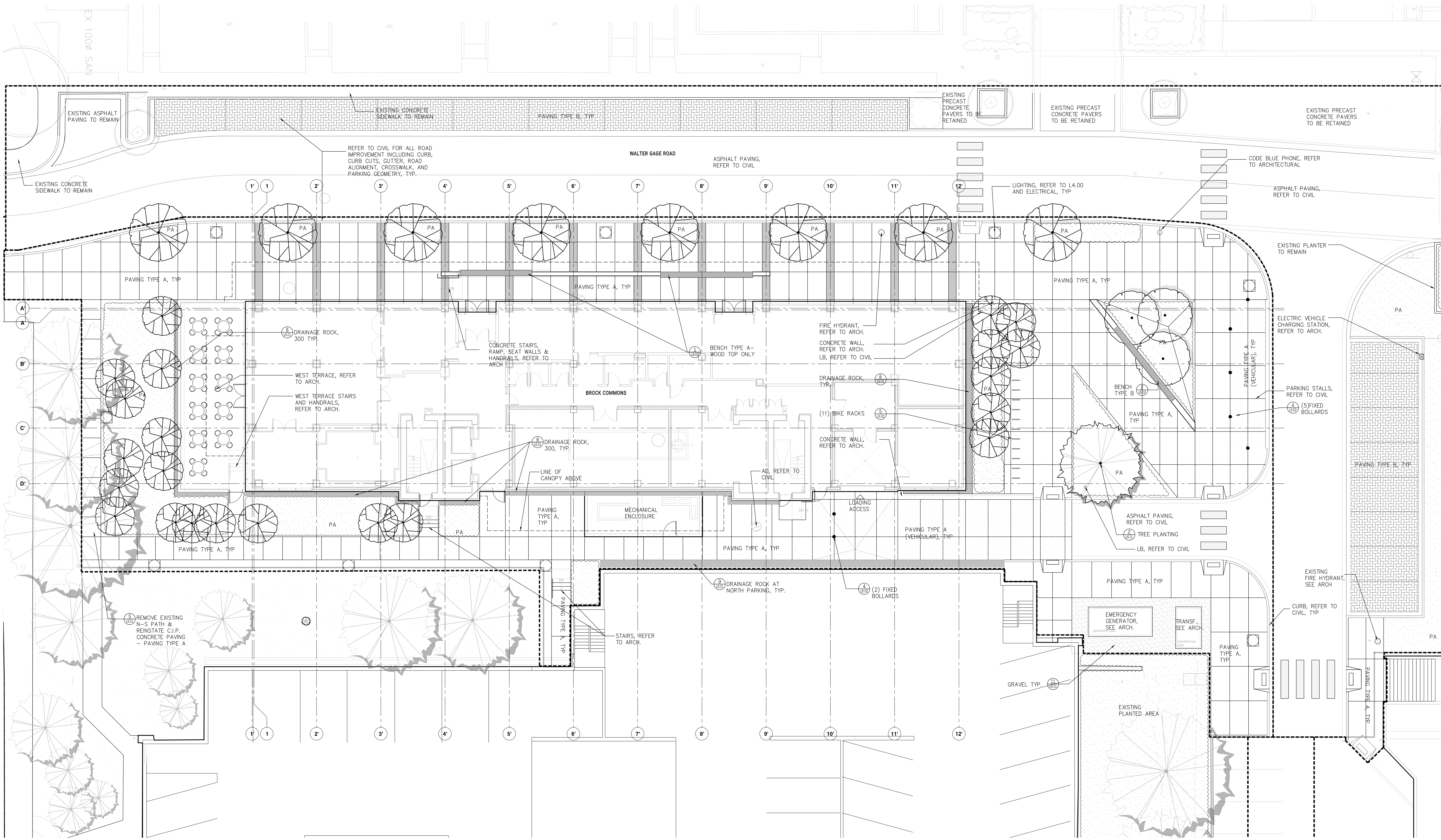
REFER TO ARCH. FOR ALL CONCRETE WALLS EXCEPT SEAT WALL AT EAST PLAZA.

REFER TO ARCH. FOR ALL STAIRS AND HANDRAILS.

REFER TO DETAILS FOR ALL LANDSCAPE IMPROVEMENTS.

REFER TO CIVIL FOR LAYOUT OF ROAD AND CURB ALIGNMENT

MAKE GOOD ANY DAMAGE TO THE EXISTING PAVING/PLANTING AREA RESULTING FROM CONSTRUCTION ACTIVITY



issues

50% Progress Set	Aug. 05, 2015
Draft BP/ Tender Set	Aug. 10, 2015
Issued for Tender	Aug. 18, 2015
Issued for BP	Oct. 22, 2015
Issued for Construction	Nov. 09, 2015
BP Resubmission	Jan. 20, 2016
DP Minor Amendment	Jan. 28, 2016
SLP Application	April 28, 2016
SLP2 Application	June 30, 2016
SLP2 Re-Issue	Oct. 03, 2016
SLP2 Resubmission	Oct. 21, 2016
Issued for Construction	Oct. 21, 2016

revisions

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Brock Commons Phase 1

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6088 Walter Gage Road
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scale 1:100	date 5 August 2015
project code TWR	status SLP2 REISSUE/IFC
drawn VH	checked HA

Materials Plan

drawing number
L1.01

Issues

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LEGEND

EQ EQUIDISTANT
PA PLANTING AREA
SIM SIMILAR
TYP TYPICAL
OC ON CENTRE

NOTES:

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ALL DIMENSIONS ARE NOMINAL; DIMENSIONS ARE BASED ON ARCHITECTURAL GRID.

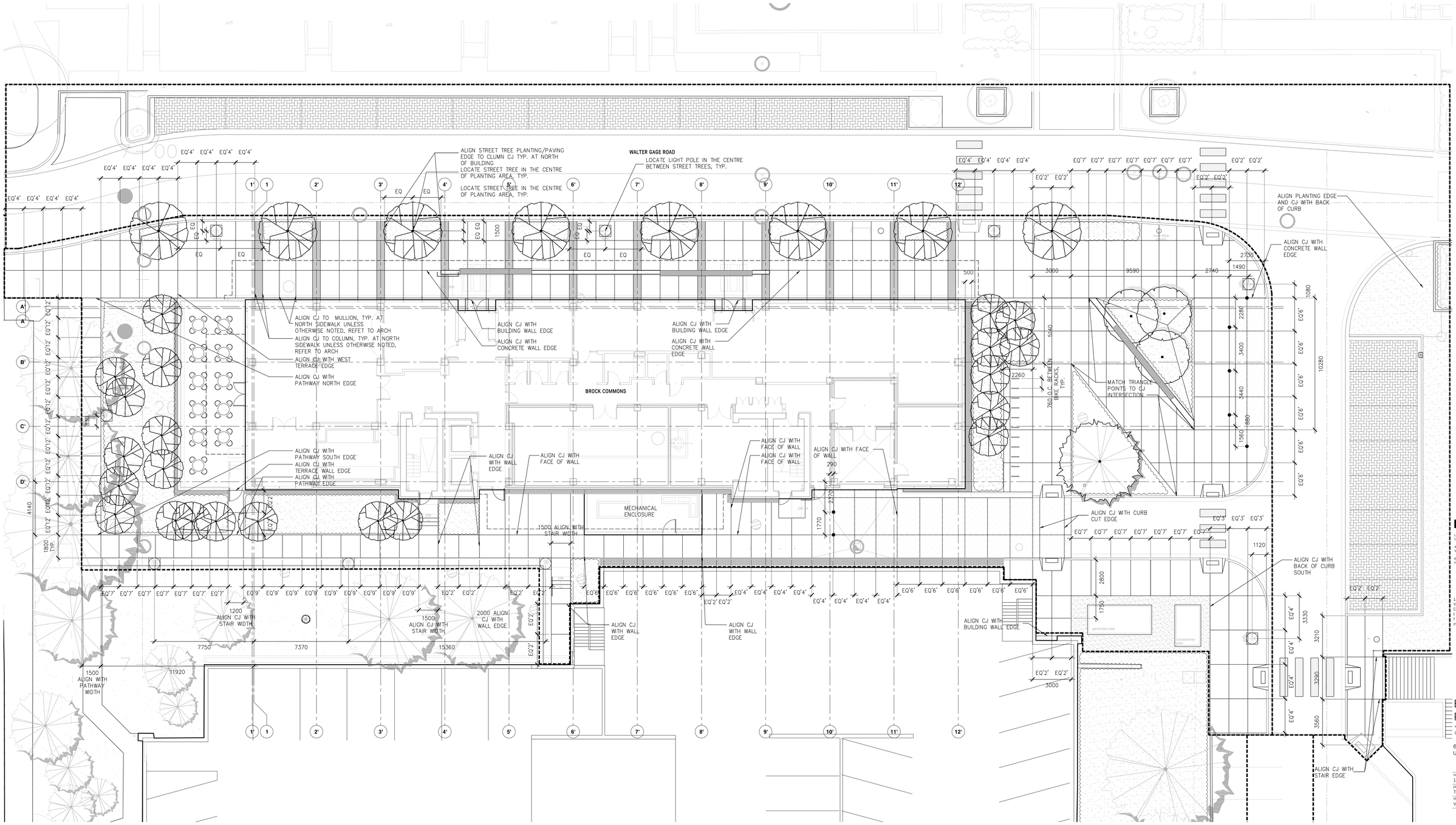
REFER TO ARCH. FOR LAYOUT OF ALL CONCRETE WALLS EXCEPT SEAT WALL AT EAST PLAZA; REFER TO GRADING PLAN FOR HORIZONTAL CONTROL OF PAVING/LANDSCAPE AREAS.

REFER TO DETAILS FOR ALL LANDSCAPE IMPROVEMENTS.

REFER TO CIVIL FOR LAYOUT OF ROAD AND CURB ALIGNMENT

ALL TREE LOCATIONS ARE SHOWN ON L3.03 TREE & STRUCTURAL SOIL LAYOUT PLAN

ALL LIGHTING LOCATIONS ARE SHOW ON L4.01 LIGHTING PLAN



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Brock Commons Phase 1

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scale	date
1:100	5 August 2015
project code	status
TWR	SLP2 REISSUE/IFC
drawn	checked
VH	HA

Layout Plan

drawing number

L1.02

GRADING LEGEND

EX	EXISTING GRADE
FFE	FINISH FLOOR ELEVATION
TS	TOP OF STAIRS
BS	BOTTOM OF STAIRS
BW	BOTTOM OF WALL
BC	BOTTOM OF CURB
TC	TOP OF CURB
BB	BOTTOM OF BENCH
TB	TOP OF BENCH

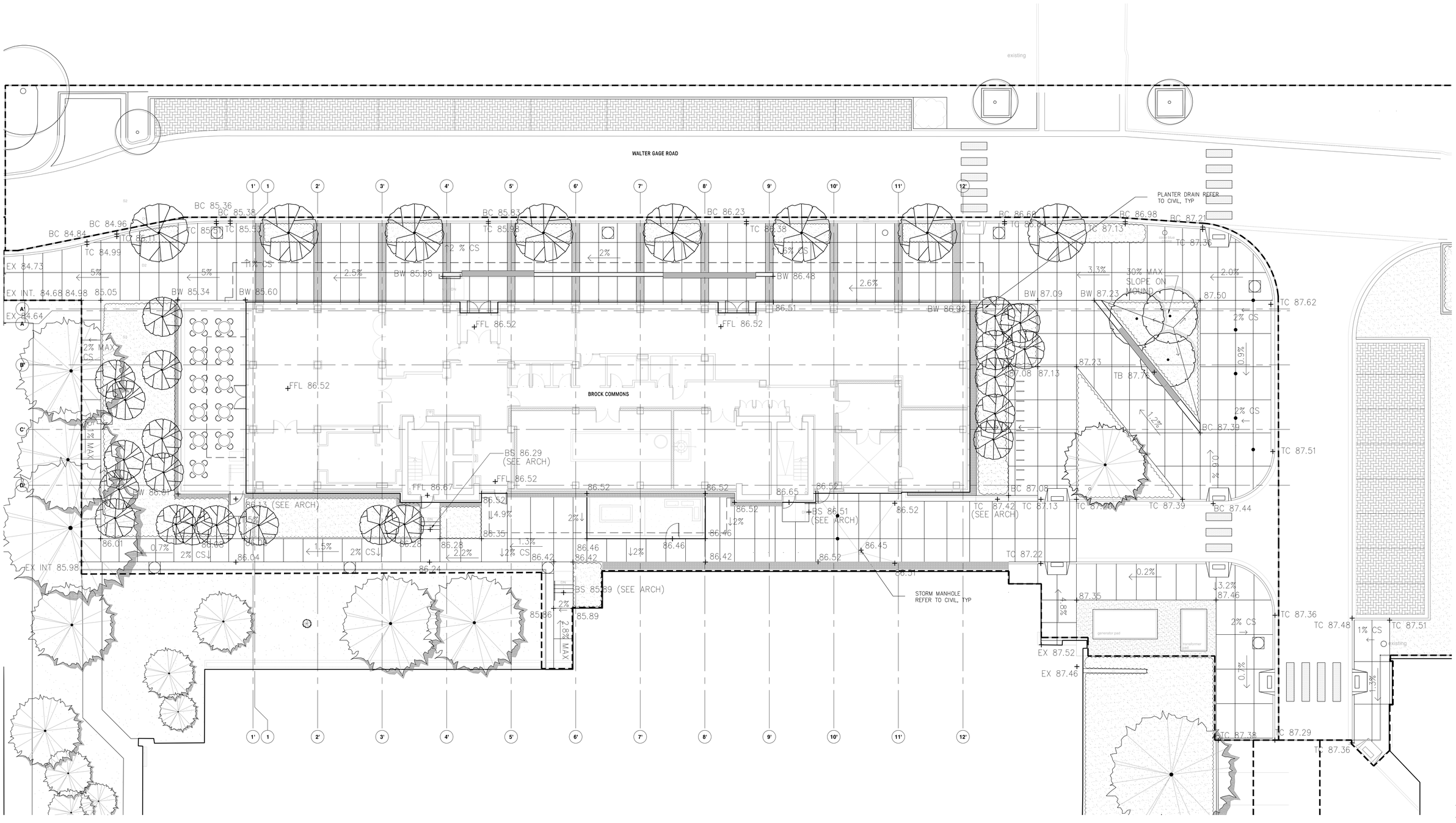
NOTES

ALL UTILITY COVERS ARE RAISED TO FINAL GRADE AND NO NEW TREES ARE TO BE PLANTED WITHIN 1.0M VICINITY

ALL ELEVATIONS ARE NOMINAL AND ARE BASED ON ARCHITECTURAL GRID AND ELEVATIONS PROVIDED BY ARCHITECT. CONTRACTOR TO VERIFY ALL MEASUREMENTS.

ALL PROPOSED ELEVATIONS ARE TO TOP OF FINISHED GRADE UNLESS NOTED OTHERWISE.

REFER TO CIVIL. FOR LAWN BASIN AND AREA DRAIN LOCATION



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drawn	checked
VH	HA

Grading Plan

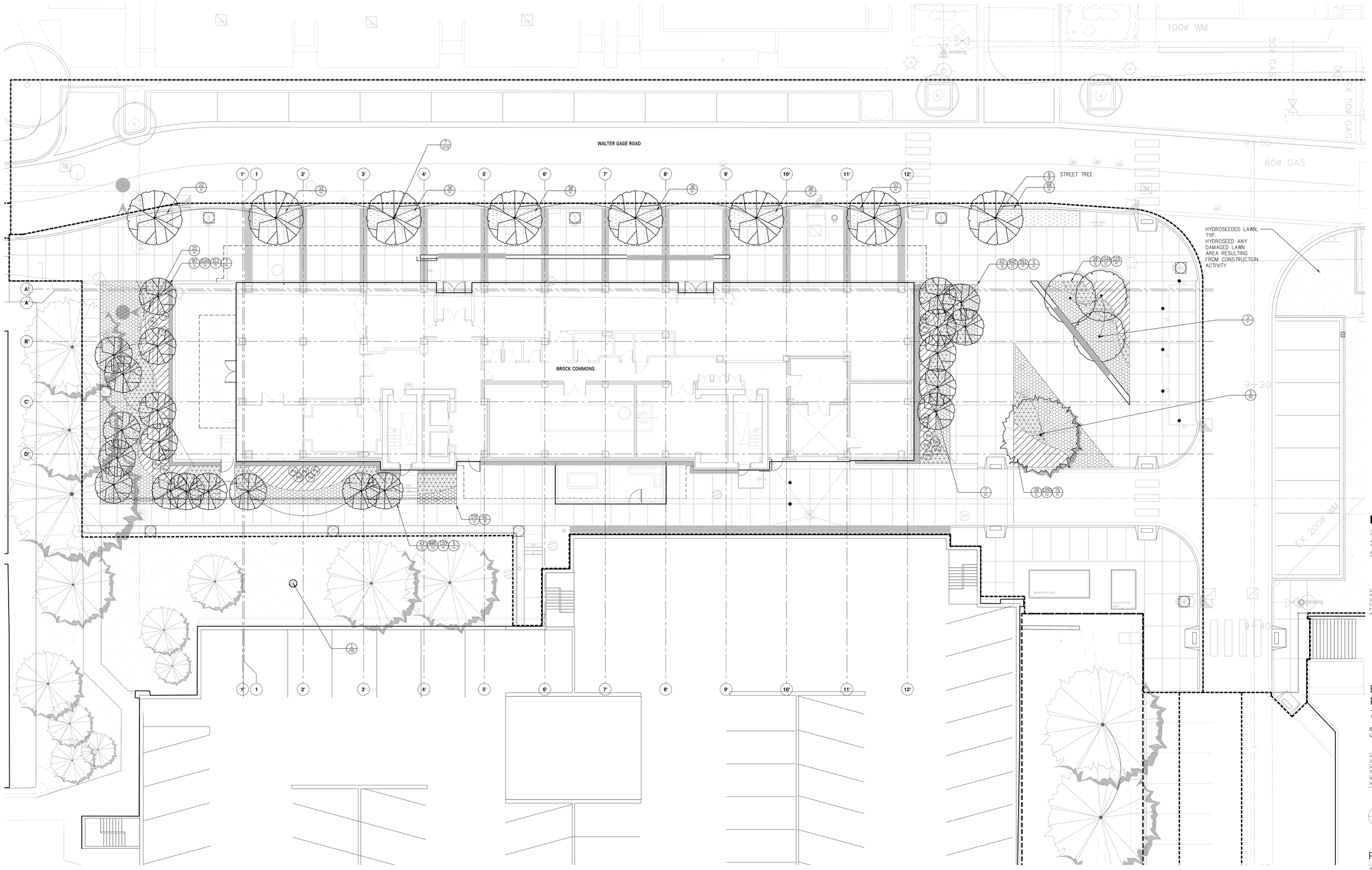
drawing number
L2.01

Preliminary Plant Schedule

SYM	QTY	BOTANICAL NAME	COMMON NAME	PLANTED SIZE	COMMENTS
TREES					
PM	1	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	8.0cm CAL., B&B	SPECIMAN QUALITY
PM2	1	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	–	DONATION TREE
AC	22	ACER CIRONATUM	VINE MAPLE	2.5–3m HEIGHT, FIELD GROWN	UNIFORM SIZE AND QUALITY
QP	8	QUERCUS PALUSTRIS 'PRINGREEN'	GREEN PILLAR PIN OAK	5.0cm CAL., B&B	UNIFORM SIZE AND QUALITY
P	3	PYRUS CALLERYANA CHANTICLEER'	FLOWERING PEAR	5.0cm CAL., B&B	UNIFORM SIZE AND QUALITY, TO MACTH EXISTING PEAR TREES
SHRUBS AND GROUNDCOVERS					
Hr	262	HEBE RAKAIENSIS	RAKAI HEBE	#1 POT, 450mm O.C.	FULL
Cd	7756	COTONEASTER DAMMER 'LOWFAST'	BEARBERRY COTONEASTER	#1 POT, 150mm O.C.	FULL
Pt	1064	PACHYSANDRA TERMINALIS	JAPANESE SPURGE	#1 POT, 300mm O.C.	FULL
SJ	232	SKIMMIA JAPONICA 'LUMIAN'	JAPANESE SKIMMA	#2 POT, 600mm O.C.	FULL
Po	21	POLYSTICHUM MUNITUM	SWORD FERN	#2 POT, 750mm O.C.	FULL

NOTES:

1. ALL STREETSCAPE DESIGN IS TO BE COORDINATED WITH UBC DESIGN GUIDELINES.
2. THIS PLAN SHOWS STREET TREES PROPOSED AS PART OF UBC VANCOUVER CAMPUS PLAN, MAP 3–9 STREET TREES .
3. ALL PLANT MATERIAL TO BCNTA AND BCSLA STANDARDS LATEST EDITION.
4. AREA OF SEARCH FOR PLANT MATERIAL: PACIFIC NORTHWEST, INCLUDING BRITISH COLUMBIA, WASHINGTON AND OREGON.



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1:100	5 August 2015
project code	status
TWR	SLP2 REISSUE/IFC
drawn	checked
VH	HA

Planting Plan

drawing number

L3.01

Issues

50% Progress Set	Aug. 05, 2015
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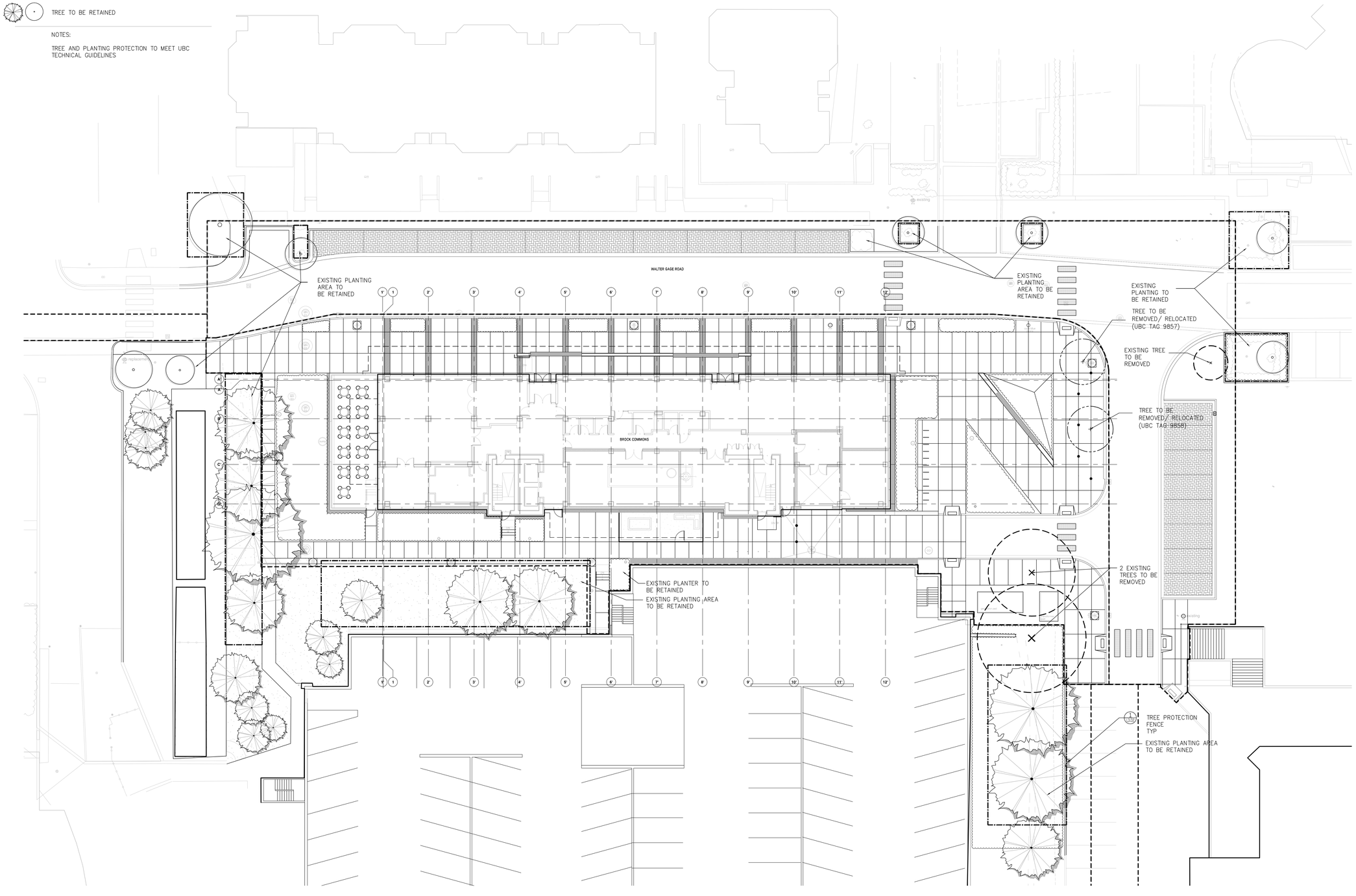
revisions

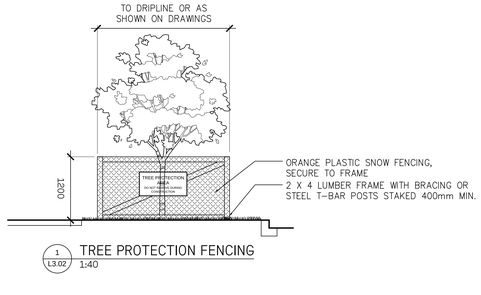
LEGEND

- TREE PROTECTION FENCE
- TREE TO BE REMOVED/ RELOCATED
- TREE TO BE REMOVED
- TREE TO BE RETAINED

NOTES:

TREE AND PLANTING PROTECTION TO MEET UBC TECHNICAL GUIDELINES





1 L3.02 TREE PROTECTION FENCING
1:40

HAPA
Landscape Architecture
Urban Design

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Brock Commons Phase 1

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scale	date
1:150	5 August 2015
project code	status
TWR	SLP2 REISSUE/IFC
drawn	checked
VH	HA

Tree Removal & Protection Plan

drawing number

L3.02

Issues

50% Progress Set	Aug. 05, 2015
Draft BP/ Tender Set	Aug. 10, 2015
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revisions

LEGEND

EXTENT OF STRUCTURAL SOIL

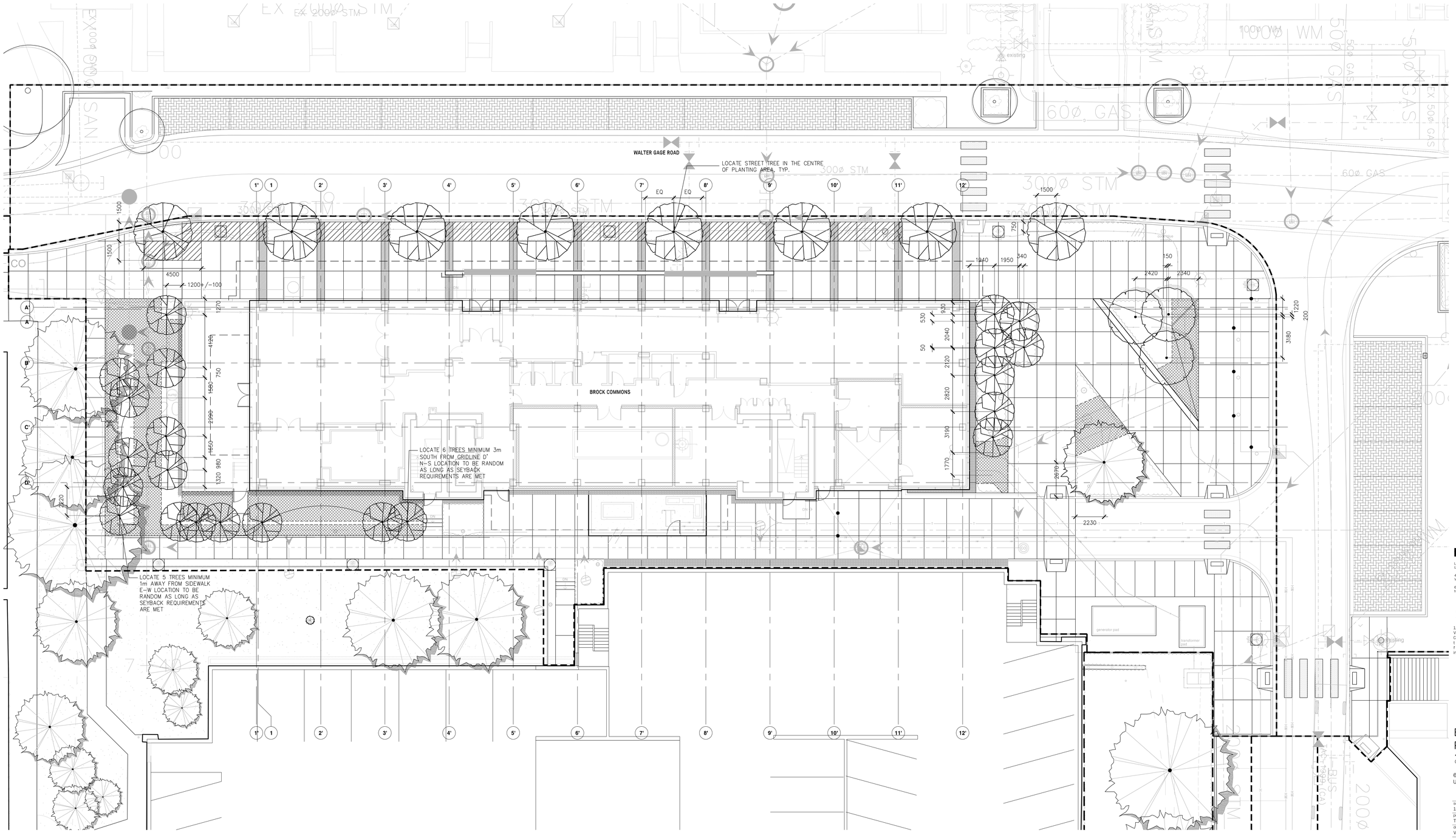
UTILITY/SIDEWALK SETBACK ZONE

NOTES:

ALL AREAS OF STRUCTURAL SOIL HAVE A DEPTH OF 750MM TO MATCH TREE SOIL DEPTH

PROVIDE 6 CUBIC METERS OF SOIL PER TREE (24 CUBIC METERS FOR STRUCTURAL SOIL OR COMBINATION OF BOTH TO PROVIDE 6 CUBIC METERS EQUIVALENT)

TREE LOCATION TO BE MINIMUM 1m SETBACK FROM ALL UNDERGROUND UTILITY LINES AND MINIMUM 750mm AWAY FROM BUILDING WALLS



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Brock Commons Phase 1

* Formerly Student Residence at Brock Commons

6088 Walter Gage Road
University of British Columbia

scale	date
1:100	5 August 2015
project code	status
TWR	SLP2 REISSUE/IFC
drawn	checked
VH	HA

Tree & Structural Soil Layout Plan

drawing number

L3.03

Issues

50% Progress Set	Aug. 05, 2015
Draft BP/ Tender Set	Aug. 10, 2015
Issued for Tender	Aug. 18, 2015
Issued for BP	Oct. 22, 2015
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revisions

Key	Qty	Description
SS	5	STREET LIGHT
UL	3	TREE UPLIGHT (SMALL)
OD	1	TREE UPLIGHT (LARGE)
SX	4	POLE LIGHT

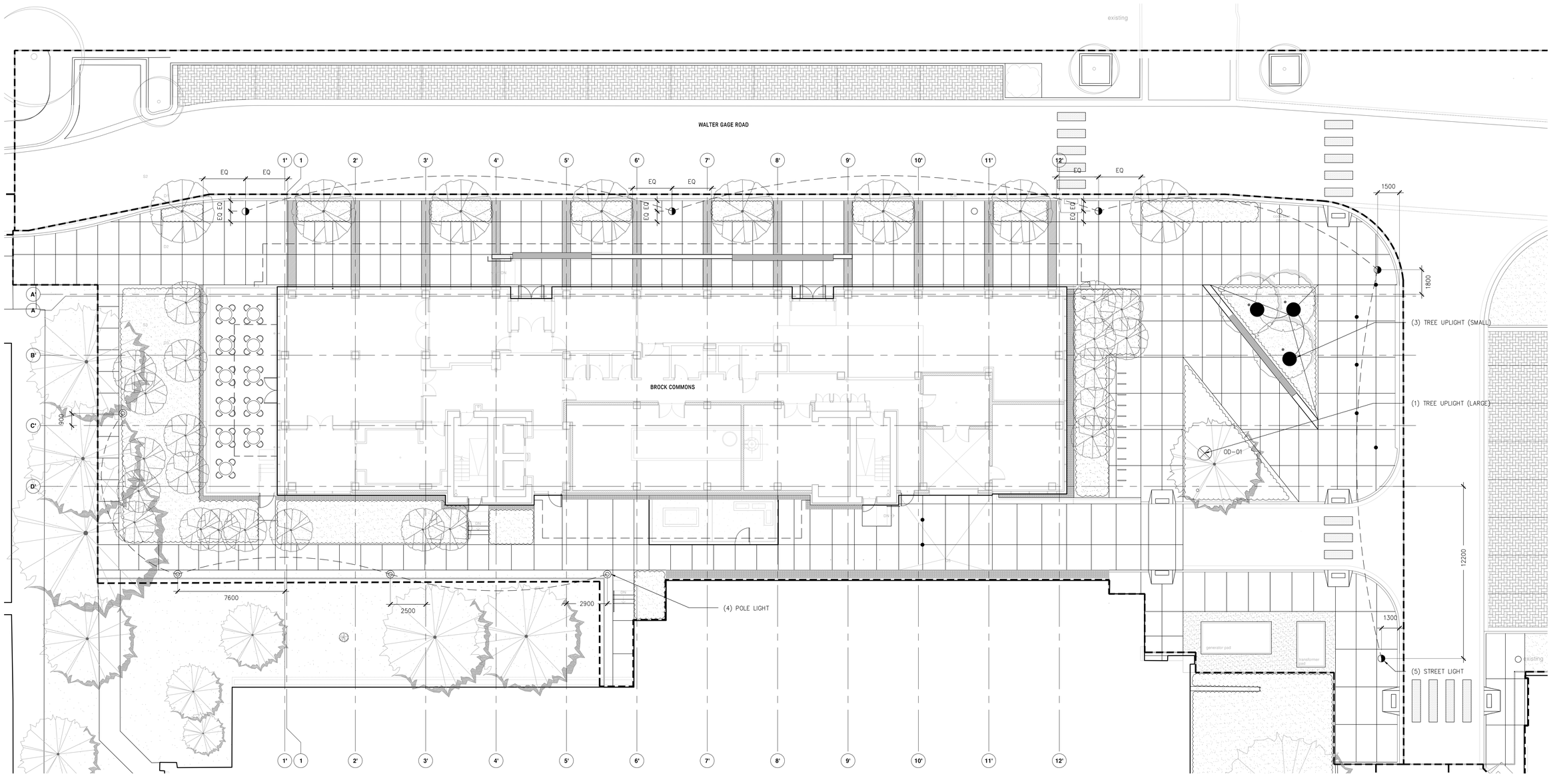
NOTE:

LIGHTING LAYOUT IS SCHEMATIC ONLY.

FINAL LIGHTING LAYOUT AND FIXTURE SELECTION TO BE COMPLETED BY REGISTERED PROFIESSIONAL LIGHTING DESIGNER IN ACCORDANCE WITH UBC DESIGN GUIDELINES.

FINAL FIXTURE SELECTION TO BE VERIFIED BY UBC ENGINEERING SERVICES, AND C&CP.

TREE UP-LIGHTS ARE DIAGRAMMATIC. CONFIRM LOCATION ON SITE TO SUIT EACH TREE LOCATION. REFER TO ELECTRICAL SPEC.



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Lighting Plan

drawing number

L4.01

Issues

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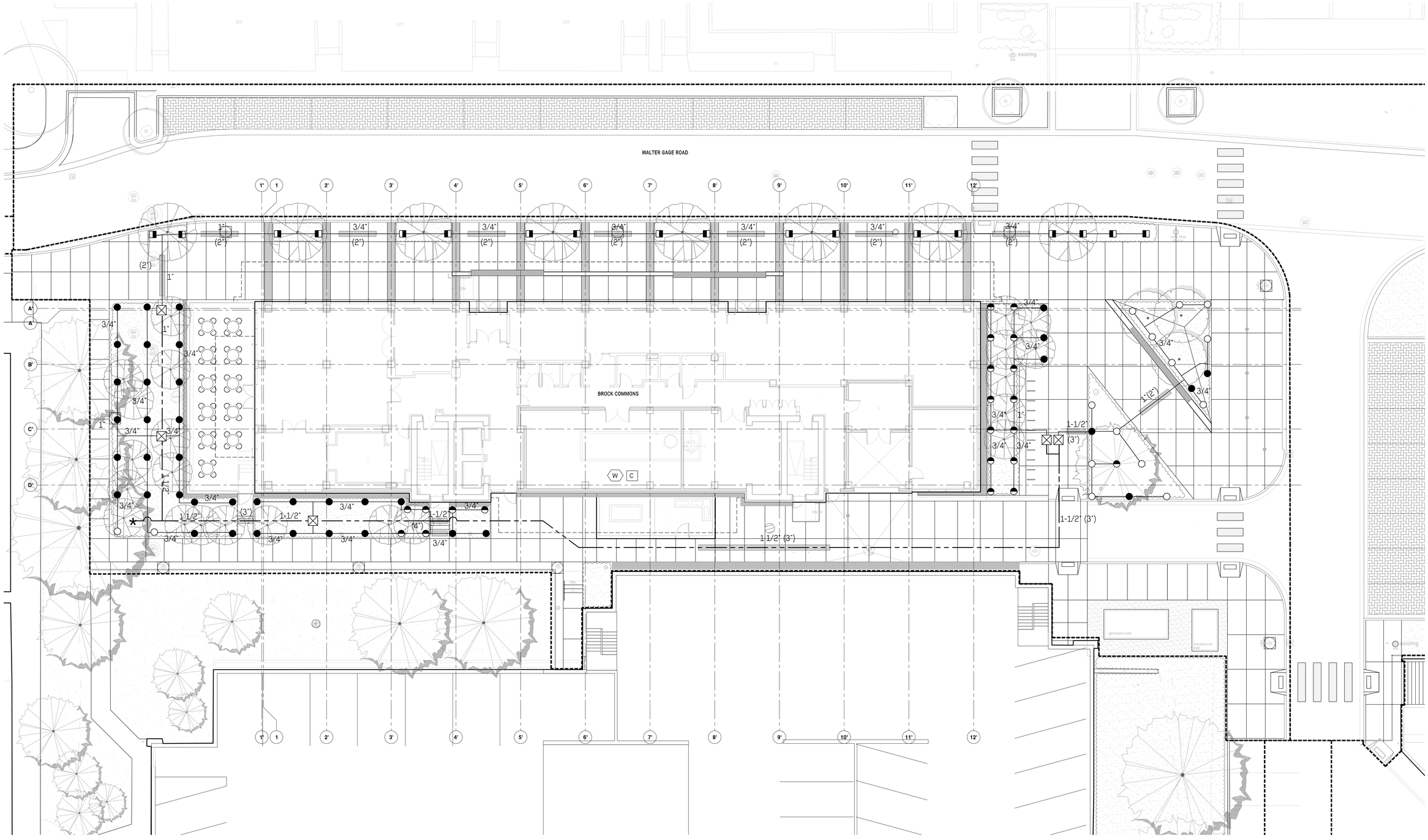
IRRIGATION LEGEND

- Auto Valve — Rainbird 100 PEB Valve
- Rainbird 1812-PRS Sprinkler c/w U15' Nozzle
- Rainbird 1812-PRS Sprinkler c.w U12' Nozzle
- Rainbird 1812-PRS Sprinkler c/w U10' Nozzle
- Rainbird 1806-PRS Sprinkler c/w U8' Nozzle
- Rainbird 1806-PRS Sprinkler c/w5' Nozzle
- Rainbird 1812-PRS Sprinkler c/w 15SST Nozzle
- Rainbird 1812-PS Sprinkler c/w 15RCS or LCS Nozzle
- Rainbird 1812-PRS Sprinkler c/w 15SST Nozzle + 0.6PCS
- (3") Sleeve Size
- Stubout Location — 11/2" ball valve & #30C in 1419 Box
- Sleeve
- W — 30.0 USGPM 60 PSI, 11/ 2",
  Double check Valve Assembly & Rainbird #3 Quick Coupler
  Rainbird WR2 Series Wireless Rain Sensors , Location tbd on site
- C — Controller Rainbird ESPLXME

NOTES

1. Use rain-bird 1804-PRS sprinklers in lawn or low groundcover areas
2. Use risers in shrub areas away from hard surface or lawn edges
3. Use HE-VAN nozzles for spray patterns less than 90 degrees
4. Flow through all piping not to exceed 5ft./ sec
5. Mainlines, laterals, stub-outs and valve locations shown for clarity. Locate Lines in planting beds wherever possible to minimize sleeving.



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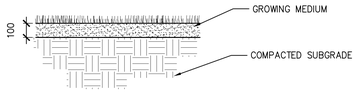
VH	HA

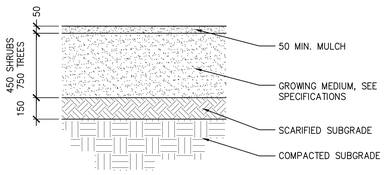
Irrigation Plan

drawing number

L5.01

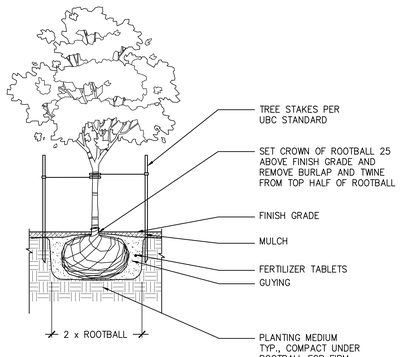


HYDROSEEDED LAWN TYP

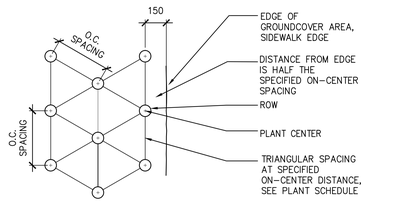


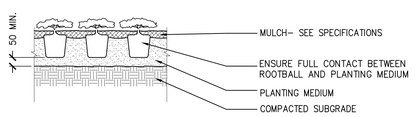
SHRUB/TREE PLANTING ON GRADE

1 L6.01 **SOIL PROFILE**
NTS



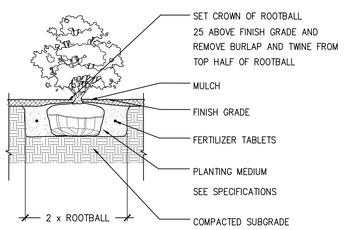
2 L6.01 **TREE PLANTING ON GRADE**
NTS



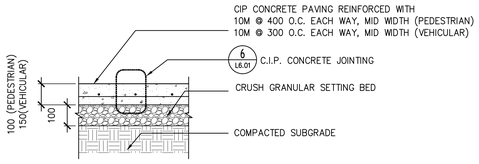


GROUNDCOVER PLANTING, TYP.

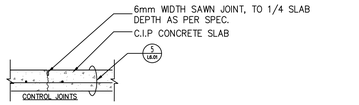
3 L6.01 **GROUND COVER PLANTING, TYP.**
NTS

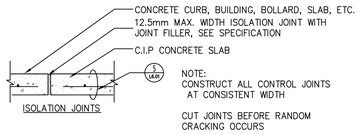


4 L6.01 **SHRUB PLANTING ON GRADE**
NTS

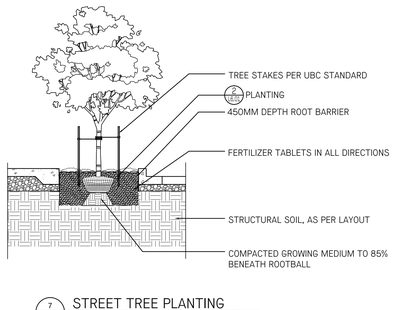


5 L6.01 **PAVING TYPE A - C.I.P CONCRETE PAVING**
1:10

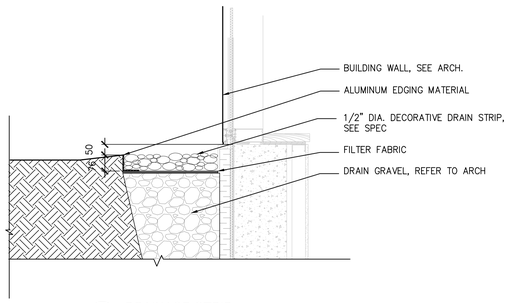




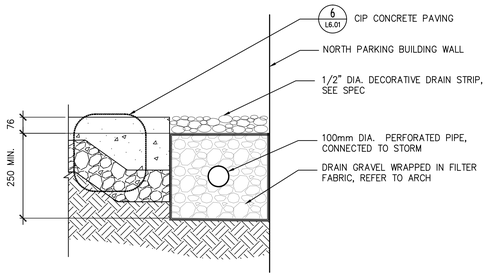
6 L6.01 **PAVING TYPE A - C.I.P. CONCRETE PAVING JOINTS**
1:10



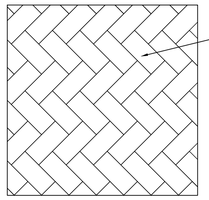
7 L6.01 **STREET TREE PLANTING**
1:40



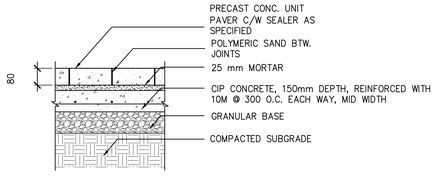
8 L6.01 **DRAINAGE STRIP**
NTS



9 L6.01 **DRAINAGE STRIP AT NORTH PARKING**
NTS

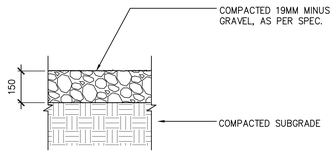


PLAN



SECTION

10 L6.01 **PAVING TYPE B - RECYCLED PRECAST CONCRETE PAVING**
1:10



11 L6.01 **GRAVEL PAVING**
1:10

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revisions

-
-
-
-
-

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Details

drawing number

L6.01

NOTES:

REFER TO ARCHITECTURAL FOR WALL DETAILS AND GRADES

issues

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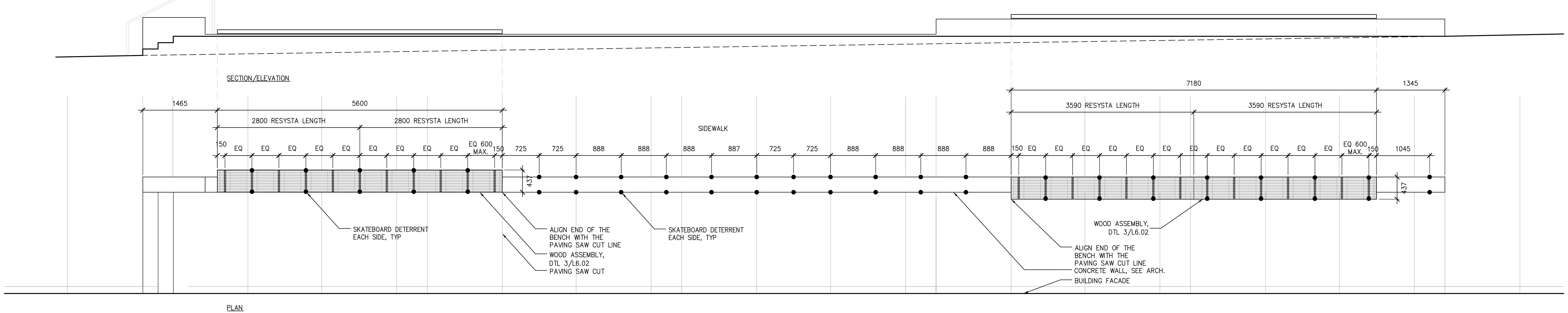
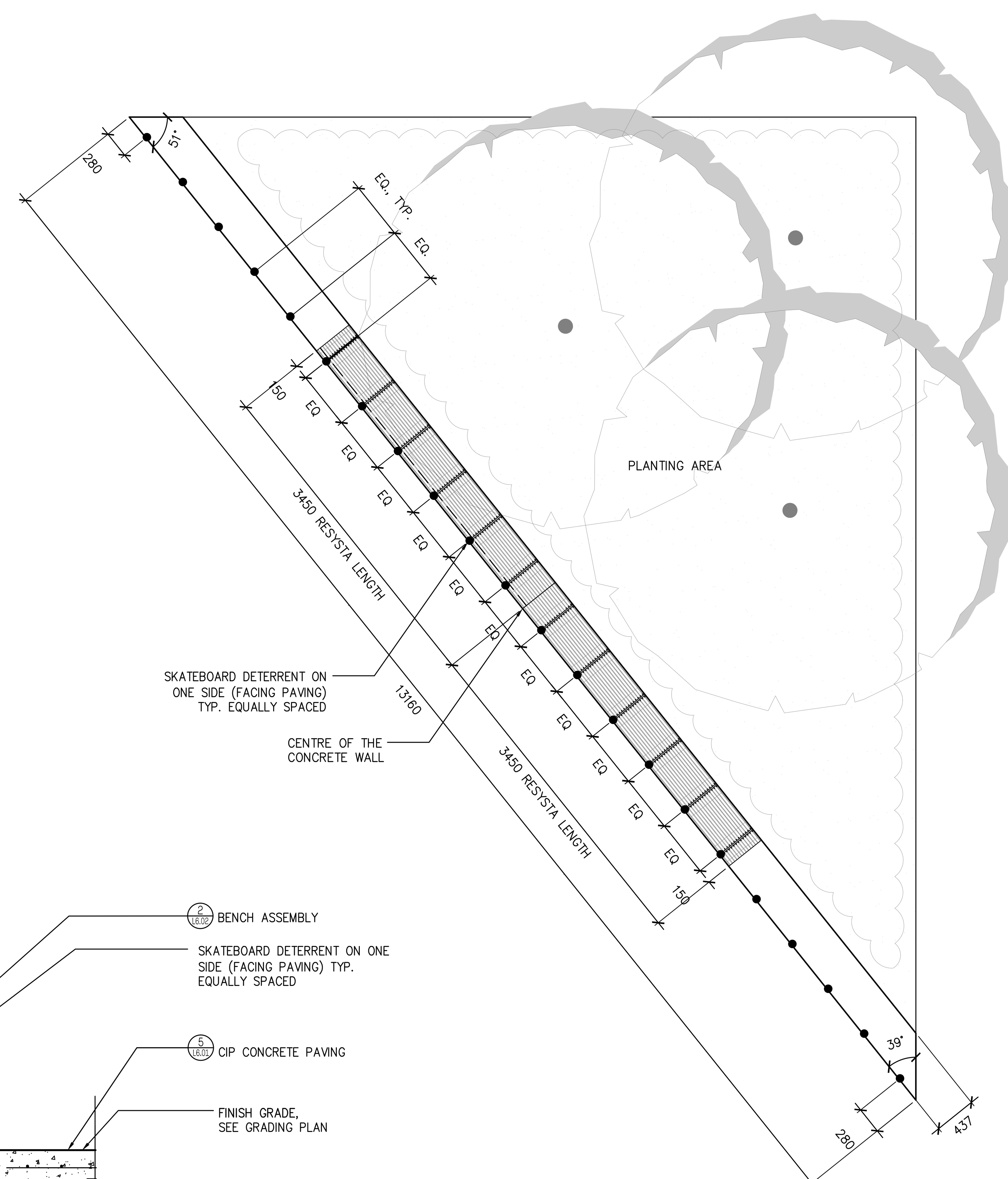
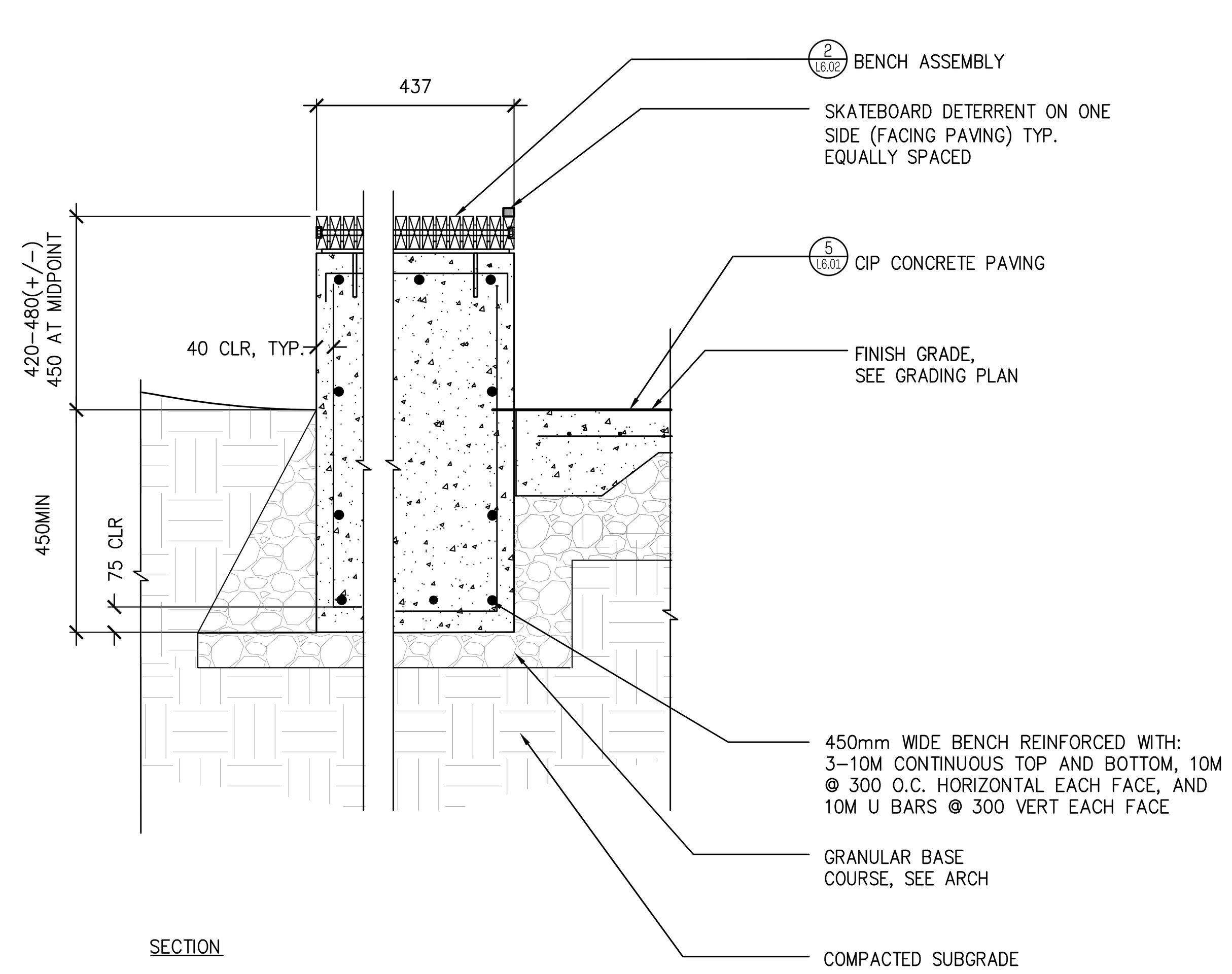
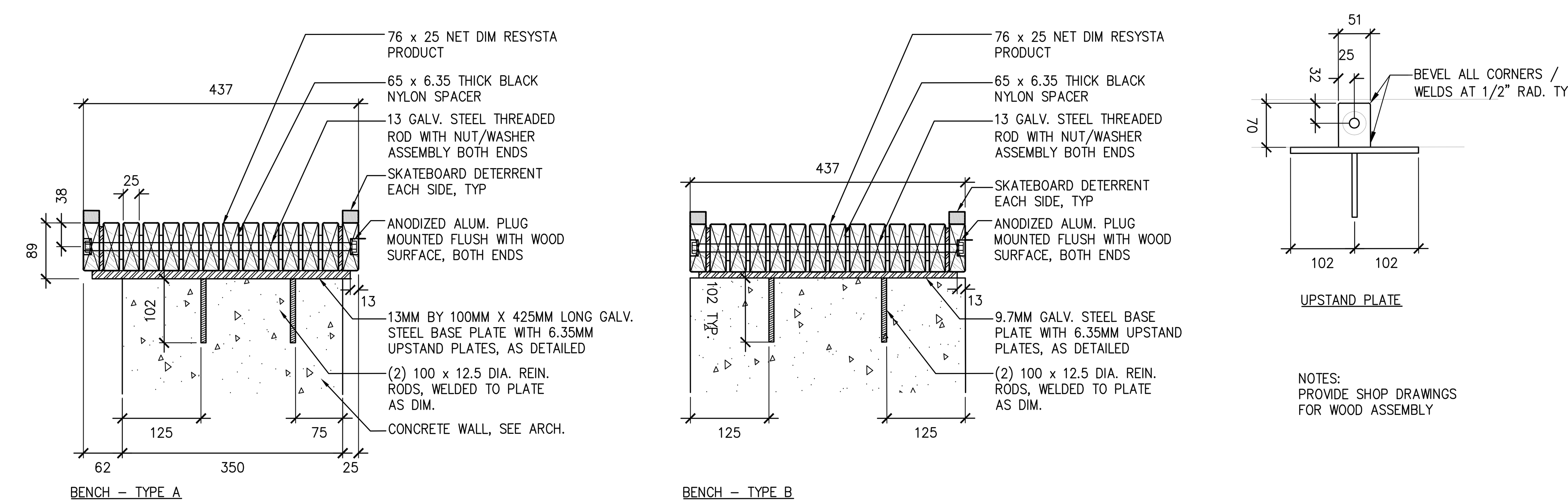


1 L6.02 BENCH TYPE A- WOOD TOP ONLY
1:30





2 L6.02 BENCH TYPE B- WOOD BENCH
1:30 (PLAN) 1:10 (SECTION)



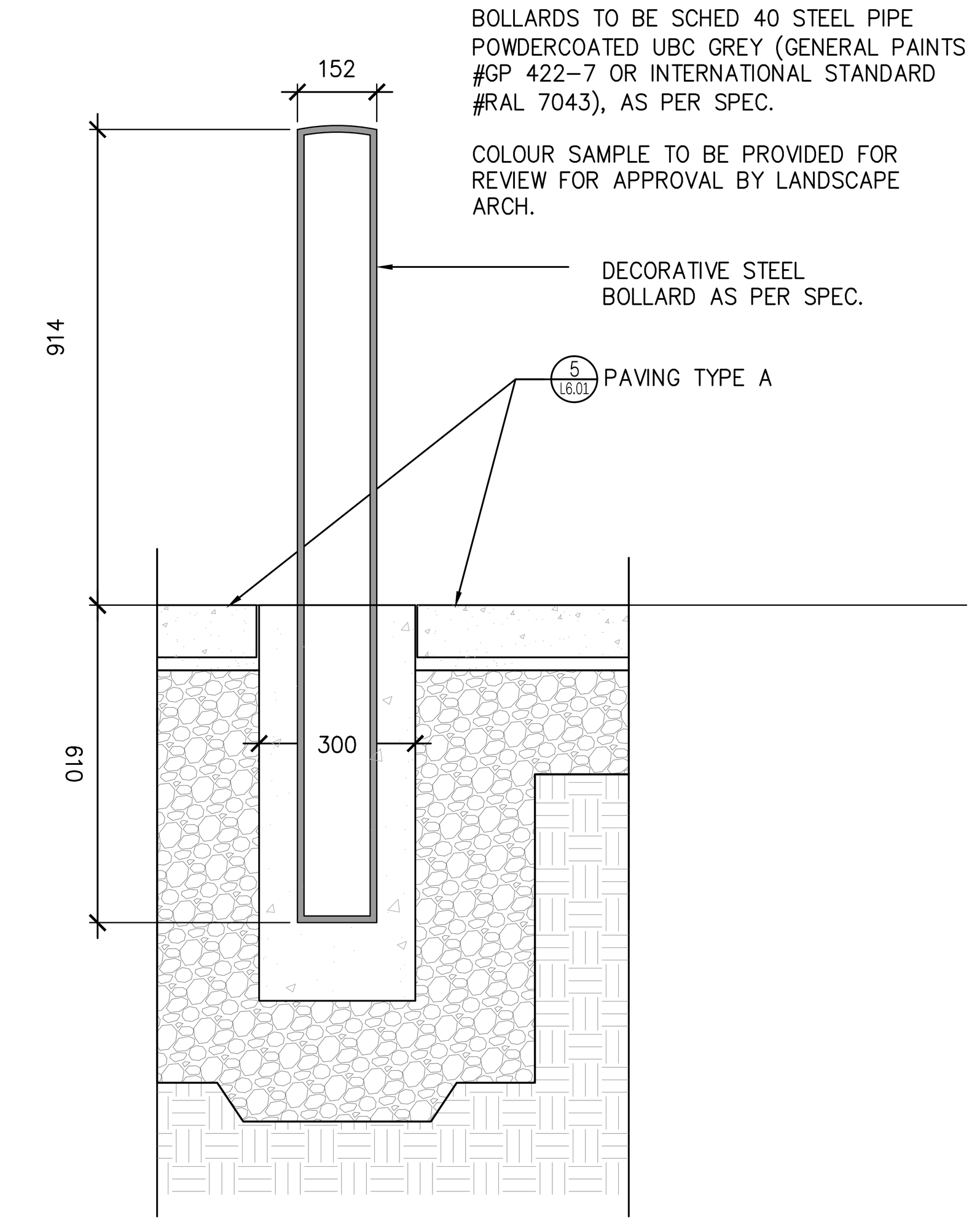
NOTES:
PROVIDE SHOP DRAWINGS FOR WOOD ASSEMBLY

3 L6.02 BENCH ASSEMBLY
1:5

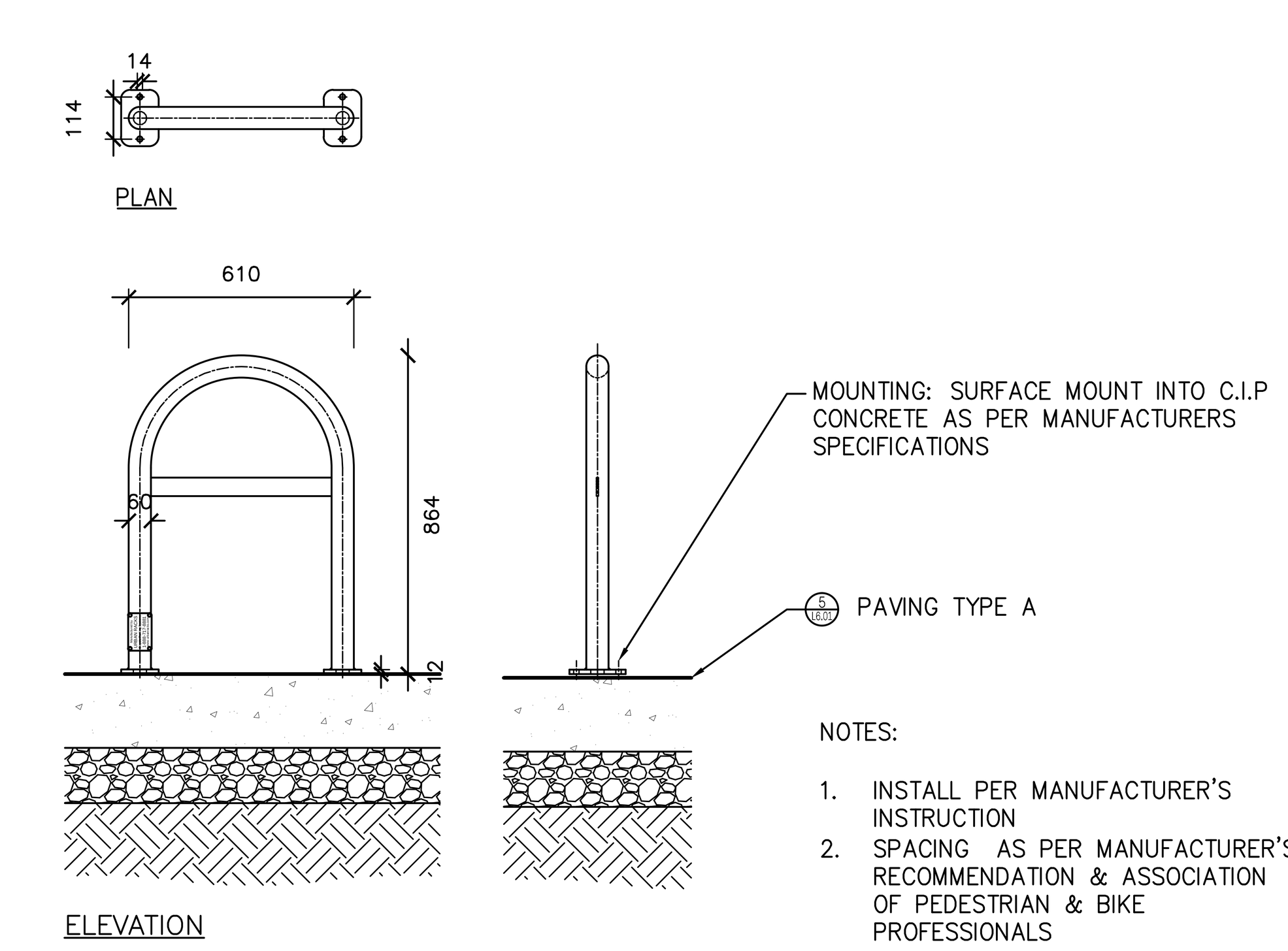
NOTE:

BOLLARDS TO BE SCHED 40 STEEL PIPE POWDERCOATED UBC GREY (GENERAL PAINTS #GP 422-7 OR INTERNATIONAL STANDARD #RAL 7043), AS PER SPEC.

COLOUR SAMPLE TO BE PROVIDED FOR REVIEW FOR APPROVAL BY LANDSCAPE ARCH.



4 L6.02 FIXED BOLLARD
SCALE 1:10



NOTES:

1. INSTALL PER MANUFACTURER'S INSTRUCTION
2. SPACING AS PER MANUFACTURER'S RECOMMENDATION & ASSOCIATION OF PEDESTRIAN & BIKE PROFESSIONALS

5 L6.02 BIKE RACK
SCALE 1:15

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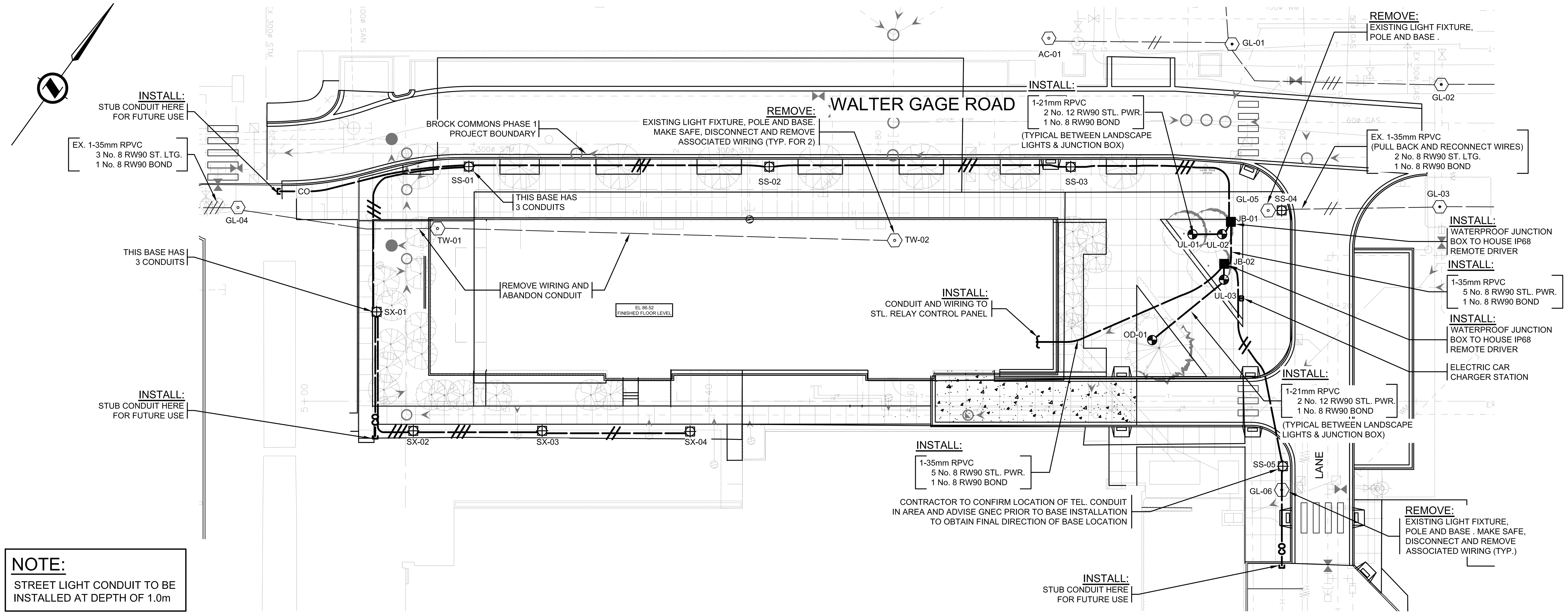
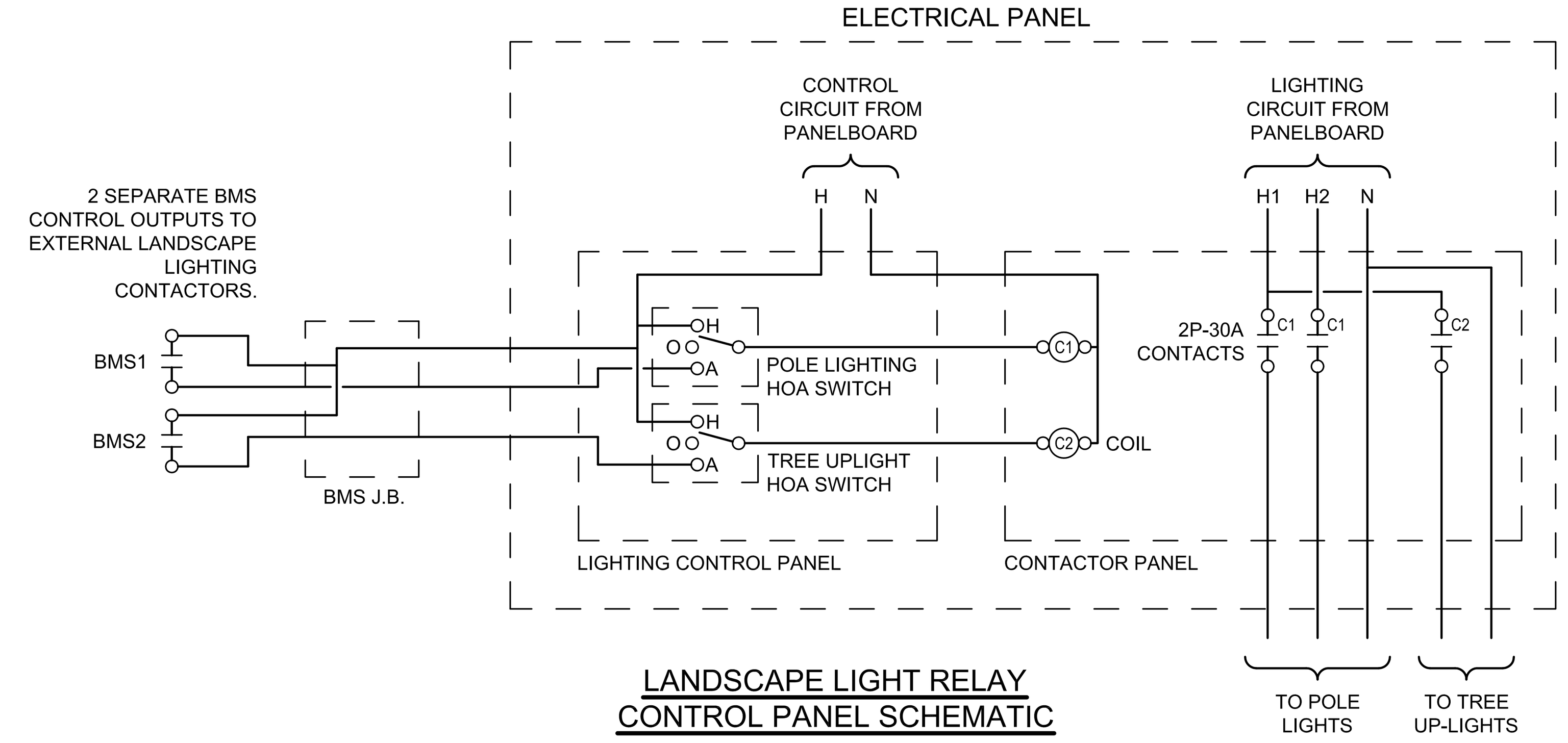
L6.02



NOTE:

STREET LIGHT CONDUIT TO BE INSTALLED AT DEPTH OF 1.0m

SITE PLAN
0 1:250 10



LANDSCAPE LIGHT RELAY CONTROL PANEL SCHEMATIC

TENDER TO IFC CHANGES:

1. SDL PURE FIXTURE SS-05 LOCATION CHANGED. NEW LIGHT FIXTURE POLE AND BASE TO BE INSTALLED COMPLETE WITH 2 No. 6 RW90 ST. LTG. & 1 No. 8 RW90 BOND IN 35mm RPVC TO TIE INTO FIXTURE SS-04
2. EXISTING NEW WESTMINSTER GLOBE LIGHT FIXTURE GL-06, POLE, BASE AND ASSOCIATED WIRING TO BE MADE SAFE, DISCONNECTED AND REMOVED.

TABLE-01

SCHEDULE OF LIGHTING INSTALLATIONS/REMOVALS

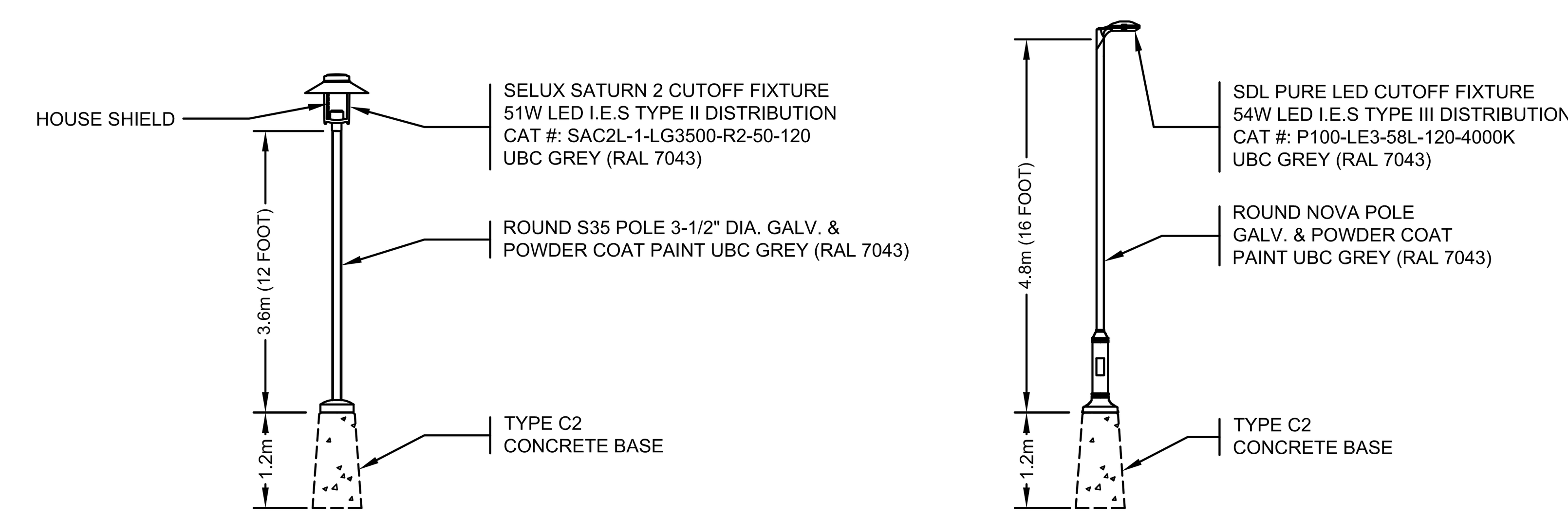
POLE TAG	DESCRIPTION
AC-01	EXISTING DECORATIVE ACORN STYLE FIXTURE, POLE AND BASE TO REMAIN.
GL-01 GL-02 GL-03 GL-04	EXISTING DECORATIVE LUMEC NEW WESTMINSTER GLOBE POLE (BASE, FIXTURE AND POLE) TO REMAIN.
GL-05	REMOVE DECORATIVE LUMEC NEW WESTMINSTER GLOBE FIXTURE AND POLE. RE-USE BASE.
GL-06	REMOVE DECORATIVE LUMEC NEW WESTMINSTER GLOBE FIXTURE, POLE & BASE. MAKE SAFE, DISCONNECT & REMOVE ASSOCIATED WIRING (TYP.)
SS-01 SS-02 SS-03 SS-04	PROPOSED SDL PURE LED STREET LIGHT POLE (TYPE III DISTRIBUTION) ADD NEW CONDUIT & WIRING.
SS-05	PROPOSED SDL PURE LED STREET LIGHT (TYPE II DISTRIBUTION). ADD NEW CONDUIT AND WIRING.
JB-01 JB-02	PROPOSED TYPE B937 JUNCTION BOX (TO HOUSE IP68 DRIVERS FOR UP LIGHTS)
UL-01 UL-02 UL-03	PROPOSED TREE UPLIGHT. ADD NEW CONDUIT AND WIRING.
OD-01	PROPOSED LIGMAN ODESSA 2 ACCENT FLOOD LIGHT 36.6W LED IP66 IK08 OD-5001-VW-W30-1LED-36.6-3200-3000K Mat SILVER RAL 9006. ADD NEW CONDUIT AND WIRING.
SX-01 SX-02 SX-03 SX-04	PROPOSED SELUX SATURN 2, 50W LED (TYPE II DISTRIBUTION) POST TOP POLE & BASE C/W HOUSE SHIELD. ADD NEW CONDUIT AND WIRING.
TW-01 TW-02	EXISTING TWIST PAK POST TOP, POLE AND BASE TO BE REMOVED, CONTRACTOR TO MAKE SAFE, DISCONNECT AND REMOVE ASSOCIATED WIRING.

LEGEND

EXISTING	PROPOSED	
AC-xx		ACORN STYLE DECORATIVE POST TOP
GL-xx		DECORATIVE LUMEC NEW WESTMINSTER GLOBE POLE.
TW-xx		EXISTING POST TOP FIXTURE, POLE AND BASE TO BE REMOVED.
	SX-xx	SELUX SATURN 2, 50W LED (TYPE II DISTRIBUTION) POST TOP POLE & BASE c/w HOUSE SHIELD
	SS-xx	SDL PURE LED STREET LIGHT, POLE & BASE (TYPE III DISTRIBUTION) P100-LE3-58L-120-4000K
	UL-xx	LIGMAN UTAH 2 MINI ACCENT FLOOD LIGHT 3W LED IP65 IK02 UT-50561-W40-3000K 14" BEAM 120V RAL 7043, IP65 REMOTE BOX A80291-4" CCG
	OD-xx	LIGMAN ODESSA 2 ACCENT FLOOD LIGHT 36.6W LED IP66 IK08 WITH INTEGRAL DRIVER OD-5001-VW-W30-1LED-36.6-3200-3000K 120V RAL 7043 GROUND SPIKE A50441. NOTE 120V CONTROL GEAR TO BE SUPPLIED.
	JB-xx	WATERPROOF JUNCTION BOX (~450x300x450) (TO HOUSE DRIVERS FOR LED LIGHTS)
		STUB OUT AND RUN 35mm RPVC FOR FUTURE EXTENSION (CAP CONDUIT LEAVE PULL STRING INSIDE CONDUIT)
		3 No. 8 RW90 ST. LTG. & 1 No. 8 RW90 BOND IN 35mm RPVC
		2 No. 8 RW90 ST. LTG. & 1 No. 8 RW90 BOND IN 35mm RPVC
		REMOVE WIRING AND ABANDON CONDUIT

CONDUCTOR COLOR CODE

ITEM	CONDUCTOR COLOUR
LUMINAIRE CCT. R LUMINAIRE CCT. B	RED BLACK
NEUTRAL	WHITE
GROUND/BOND	GREEN



PROPOSED SELUX SOUTHERN PATHWAY POLE
TYPE SX-XX

WALTER GAGE ROAD PROPOSED NOVA POLE ROUND POLE C/W SDL PURE LED FIXTURE
TYPE SS-XX

ELEVATION
0 1:75 5

CONFIRM LAYOUT WITH ENGINEER PRIOR TO BASE INSTALL

PLEASE CONTACT GREAT NORTHERN ENGINEERING AT 1-855-463-2266 EXT. 102
3 WORKING DAYS PRIOR TO PLANNED BASE INSTALLATION TO ARRANGE FOR A CHECK OF THE LAYOUT AGAINST KNOWN UTILITIES FOR THE ENGINEER TO RESOLVE ANY CONFLICTS

CHECK BEFORE YOU DIG

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH OCCUR DUE TO THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

LIGHTING DESIGN CRITERIA
PER: (ANSI/IES RP-8-00 & UBC PART 3 DESIGN GUIDELINES)

ROADWAY (NAME)	WALTER GAGE ROAD		
ROAD CLASSIFICATION	CAMPUS ROAD WITH SIDEWALKS		
PEDESTRIAN CONFLICT	MEDIUM		
ILLUMINANCE RECOMMENDED/DELIVERED	15 LUX / 15 LUX		
UNIFORMITY RECOMMENDED/DELIVERED	6.0:1 / 3.0:1		
LIGHT LOSS FACTOR	.88		
SPACING (SINGLE SIDED)	35m (MAX)		
EQUIPMENT:			
FIXTURE TYPE: LED	WATTAGE: 58w	MTG. HEIGHT: 4.8m	DIST TYPE: III
IES FILE: P100-LE3-58L-120-4000K.IES			

LIGHTING DESIGN CRITERIA
PER: (ANSI/IES RP-8-00 & UBC PART 3 DESIGN GUIDELINES)

ROADWAY (NAME)	PATHWAY (SOUTH SIDE)		
ROAD CLASSIFICATION	SECONDARY PEDESTRIAN ROUTE		
PEDESTRIAN CONFLICT	MEDIUM		
ILLUMINANCE RECOMMENDED/DELIVERED	15 LUX / 15 LUX		
UNIFORMITY RECOMMENDED/DELIVERED	4.0:1 / 4.0:1		
LIGHT LOSS FACTOR	.88		
SPACING (SINGLE SIDED)	20m (MAX)		
EQUIPMENT:			
FIXTURE TYPE: LED	WATTAGE: 51W	MTG. HEIGHT: 3.6m	
IES FILE: SAC2L-1-LG3500-R2-50.IES	DIST TYPE: II		

GENERAL NOTES:

1. FINAL CONDUIT/WIRING CONNECTIONS TO INTERNAL BUILDING PANELS TO BE CO-ORDINATED WITH BUILDING ELECTRICAL CONTRACTOR AND ARCHITECTS.
2. EXTERNAL LANDSCAPE LIGHTING TO BE WIRED BACK TO NEW 15A BREAKER INSTALLED IN ELECTRICAL PANEL C/W CONTACTOR, PHOTOCELL, H.O.A. AND LINK TO BMS.
3. ELECTRICAL PANEL AND BMS SYSTEM SUPPLIED AND INSTALLED BY OTHERS.

STREET LIGHTING NOTES:

1. UBC ORNAMENTAL STREET LIGHT STANDARDS AND SPECIFICATIONS TO APPLY.
2. CONTRACTOR TO ARRANGE FOR EXACT SERVICE LOCATIONS WITH UBC UTILITIES PRIOR TO COMMENCING CONSTRUCTION.
3. ALL LUMINAIRES TO HAVE SHATTERPROOF POLYCARBONATE REFRACTORS.
4. CONTRACTOR TO NUMBER POLES AS PER UBC INSTRUCTIONS.
5. ALL LAMPS ARE TO BE CLEAR.
6. ALL POLES ARE TO BE PAINTED WITH AN APPLICATION OF A THERMOSETTING POLYESTER POWDER COAT PAINT, APPLIED BY MEANS OF AN ELECTROSTATIC PROCESS,
7. CONTRACTOR SHALL OBTAIN ALL PERMITS & LICENSES PRIOR TO CONSTRUCTION.
8. ALL STREET LIGHTS ARE TO BE 1.0m CLEAR OF ALL DRIVEWAYS.
9. INSTALL A COMPLETE STREET LIGHTING SYSTEM AS SHOWN ON THIS DRAWING, AND IN ACCORDANCE WITH MASTER MUNICIPAL CONSTRUCTION DOCUMENTS & STANDARD DETAIL DRAWINGS AND ALSO IN ACCORDANCE WITH THE REQUIREMENTS OF THE CANADIAN ELECTRICAL CODE PART ONE, C 22.1 LATEST REVISION AS ADOPTED BY THE PROVINCE OF BRITISH COLUMBIA.
10. CONTRACTOR SHALL SUBMIT DRAWINGS TO INSPECTION AUTHORITIES, OBTAIN ELECTRIC PERMITS AND INSPECTIONS, MAKE ALL NECESSARY ARRANGEMENTS WITH UBC UTILITIES FOR SERVICE CONNECTIONS AND PAY ASSOCIATED FEES.
11. CONTRACTOR SHALL OBTAIN BASE TEMPLATES FROM THE POLE MANUFACTURER FOR ANCHOR BOLT INSTALLATION.
12. PROVE LOCATIONS OF ALL UTILITIES AND SERVICES BEFORE STARTING CONSTRUCTION.
13. CONDUIT TO BE INSTALLED 1m (min) BELOW GRADE TO AVOID ROOT BALLS.

PROFESSIONAL ENGINEER — C. COMMANDEUR # 23925 — PROVINCE OF BRITISH COLUMBIA — 2016-10-21

issues

150810	BUILDING PERMIT	0
151021	Issued for BP	1
151109	Issued for construction	2
160105	Issued for SLP	3
160108	Update per civil design	4
160224	BP Resubmission Drawing	5
160330	LEED Point Revisions	6
160421	Base Updated	7
160627	Base Updated	8
160727	Base Updated	9
161021	SLP2 Resubmission / IFC	10

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www.gnec.ca
15BC-0051.1

UBC
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Brock Commons Phase 1

* formerly student residence at brock commons

6088 Walter Gage Road
University of British Columbia

scale AS SHOWN	date 21 OCTOBER 2016
project code TWR	status SLP2 / IFC
drawn GNEC	checked CC

STREET LIGHTING

drawing number
STL-01

FILE NAME: W:\a-2015 GNEC-VAN\15BC-0051 UBC Student Union Blvd\15BC-0051.1 Gage Tower - TallWood Project\15BC-0051.1 Brock Commons STL.dwg

PLOT DATE: 10/21/2016 LAST SAVED BY: DARCY.METZ

NORTH-EAST CURB RETURN (AREA SHOWN SHADED):
- SAW CUT EX CURB & GUTTER & SIDEWALK AT BOTH ENDS, TO FORM CLEAN VERTICAL JOINT
- REMOVE EX. CONCRETE CURB & GUTTER AND SIDEWALK.
- SAWCUT EX ASPHALT EDGE TO FORM CLEAN VERTICAL JOINT.
- STRIP OUT AND REMOVE ALL GRASS, ORGANICS, FILL, LOOSE/SOFT AND WET WEATHERED MATERIAL TO EXPOSE NATURAL UNDISTURBED SUB-GRADE.

SUPPLY & PLACE:
- BARRIER CURB & GUTTER, WIDE BASE AS PER MMCD STD DWG C5 12mR SEE DETAIL THIS SHEET FOR GRADING.
- 2.5m WIDE CONCRETE SIDEWALK c/w WHEELCHAIR LETDOWN AS PER MMCD STD DWG C9 WITH 2.4m LONG x 0.60w WIDE WHITE TACTILE MAT AT CROSSING.
- SUPPLY & PLACE ASPHALT ROAD STRUCTURE TO MATCH EXISTING OR BETTER, MINIMUM STRUCTURE:
  - 85mm COURSE ASPHALT, IN 2 LIFTS OF
    - 35mm-12.5mm MINUS #1 SURFACE COURSE ASPHALT
    - 50mm-12.5mm MINUS #1 LOWER COURSE ASPHALT,

    ALL AS PER SEC 02512 OF MMCD
  - 150mm-19mm MINUS MMCD CRUSHED GRANULAR BASE GRAVEL
  - 200mm (MIN)-75mm MINUS MMCD CRUSHED GRANULAR SUB-BASE GRAVEL COMPACTED TO MIN. OF 95% MPMDD (MODIFIED PROCTOR MAX DRY DENSITY) ASTM D1557 WITHIN 2% OF OPTIMAL MOISTURE CONTENT

REMOVE & RELOCATE:
- EXISTING STREET LIGHT POLE & WIRING TO BACK OF NEW SIDEWALK.
- EXISTING STOP SIGN TO BACK OF NEW CURB
- EX CATCH BASIN TO NEW GUTTER LOCATION. SEE GRADES ON DETAIL THIS SHEET. RECONNECT EXISTING LEADS TO CATCH BASIN.
- ADJUST EXISTING ELECTRICAL JUNCTION BOX TO SUIT NEW SIDEWALK GRADE, AND REPLACE LID WITH STEEL LID SUITABLE FOR TRAFFIC LOADING.

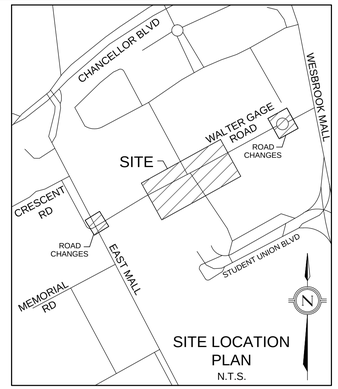
MH D6
- LOCATE EX. 750ø STM AND EX. 300ø STM CONNECTION AND CONFIRM INVERTS.
- SUPPLY AND INSTALL 1350ø MH OVER EX. 750ø PIPE AT 300ø TIE-IN.
- BREAK INTO EX. 750ø PIPE & EX. 300ø PIPE
- BENCH NEW MANHOLE TO SUIT EX INVERTS

EX. 750ø STM INV. 79.46±
EX. 300ø STM INV. 79.91±

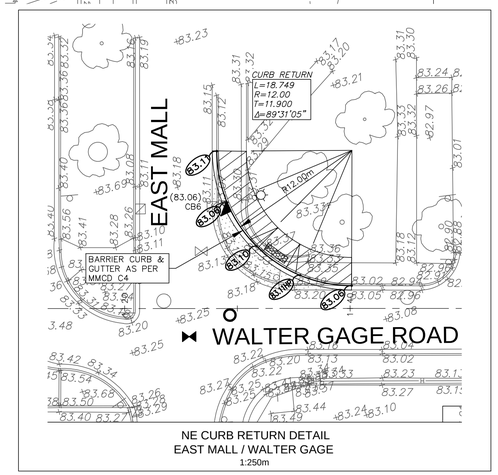
IN THE CENTRE LANDCAPE PORTION OF THE EXISTING ROUNDABOUT AREA RETAIN AND PROTECT EXISTING TREE AND HEDGE.
- STRIP OUT AND REMOVE ALL GRASS, TOPSOIL, FILL, LOOSE/SOFT AND WET WEATHERED MATERIAL TO EXPOSE NATURAL UNDISTURBED SUBGRADE.
- RETAIN EX IRRIGATION (IF FOUND) AND RELOCATE IF NEEDED.
- CONSTRUCT NEW CONCRETE BARRIER MEDIAN CURB AS PER MMCD STD DWG C6 TO FORM A 2.35m RADIUS CIRCLE (APPROX 1.5m SMALLER RADIUS THAN EX BARRIER CURB - TO BE CONFIRMED IN FIELD)
- SUPPLY & PLACE ASPHALT PAVEMENT WITH MIN STRUCTURE:
  - 85mm-12.5mm MINUS #1 BASE COURSE ASPHALT, AS PER SEC 02512 OF MMCD, IN 2 LIFTS.
  - 150mm-19mm MINUS MMCD CRUSHED GRANULAR BASE GRAVEL COMPACTED TO 95% MPMDD (MODIFIED PROCTOR MAX DRY DENSITY)ASTM D1557 WITHIN 2% OF OPTIMAL MOISTURE CONTENT.
  - 200mm (MIN)-75mm MINUS MMCD CRUSHED GRANULAR SUB-BASE GRAVEL COMPACTED TO MIN. OF 95% MPMDD (MODIFIED PROCTOR MAX DRY DENSITY) ASTM D1557 WITHIN 2% OF OPTIMAL MOISTURE CONTENT.

IN PAVER STONE CIRCLE:
- REMOVE AND PLACE ON PALLETS ALL EXISTING PAVER STONES.
- MOVE & STORE PALLETS AS DIRECTED BY UBCPT.
- REMOVE EX CONC ROLL OVER CURB & GUTTER AND BARRIER C&G.
- SAWCUT EX ASPHALT EDGE TO FORM CLEAN VERTICAL JOINT.
- GRADE AND COMPACT BASE GRAVELS TO 95% MPMDD.
- SUPPLY & PLACE ASPHALT PAVEMENT :
  - 85mm(MIN)-12.5mm MINUS #1 BASE COURSE ASPHALT, AS PER SEC 02512 OF MMCD IN 2 LIFTS
- NEW ASPHALT TO BLEND SMOOTHLY INTO EXISTING.

NOTE: FINAL DESIGN OF EX ROUNDABOUT TO BE REVIEWED AND DETERMINED BY UBC PRIOR TO COMPLETION OF THE BROCK COMMONS PHASE 1 PROJECT.



SITE LOCATION PLAN
N.T.S.



NE CURB RETURN DETAIL
EAST MALL / WALTER GAGE
1:250m

LEGEND

	EXISTING	PROPOSED
STORM SEWER		
SANITARY SEWER		
WATERMAIN		
STEAM		
STORM MANHOLE		
SANITARY MANHOLE		
CATCH BASIN		
VALVE		
TRIUMF LINE (RADIOACTIVE)		
GAS LOW PRESSURE (0.6psi)		
GAS HIGH PRESSURE (10psi)		
TELECOM		
HYDRO LINE		
UTILITY POLE		
UTILITY/HYDRO MANHOLE		
TRIUMF MANHOLE		
LIGHT STANDARD		
SIGN		

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DRAWING INDEX

DRAWING No.	DESCRIPTION	REV
200	KEY PLAN / SITE SERVICING PLAN	9
201	ROADWORKS - LAYOUT & GRADING	5
202	WATER MAIN - PLAN - PROFILE : WALTER GAGE ROAD: STA 1+20 to STA 3+40	6
203	STORM SEWER - PLAN - PROFILE : WEST SIDE: STA 7+00 to STA 7+40 & SOUTH LANE: STA 5+00 to STA 6+00	5
204	STORM WATER MANAGEMENT PLAN	3
205	SANITARY SEWER - PLAN - PROFILE : WALTER GAGE ROAD: STA 1+90 to STA 2+40 & WEST SIDE : STA 7+00 to STA 7+20	4
206	POWER / TELECOMMUNICATIONS - PLAN - PROFILE - EAST LANE: STA 9+20 to STA 10+60	3
207	DETAILED SPECIFICATIONS: GENERAL / WATER DISTRIBUTION	3
208	DETAILED SPECIFICATIONS: SANITARY, STORM, DUCT BANKS, POWER & COMMUNICATION	3
209	REMOVALS PLAN - SITE	3
210	ROADWORKS - REMOVALS & LINE PAINTING & SIGNAGE	3
211	WATER MAIN - PLAN - PROFILE : EAST LANE: STA 9+00 to STA 10+60	3

ALL ELEVATIONS ARE GEODETIC AND REFER TO UBC MONUMENT "W-W" ELEVATION = 93.631 m
LOCATION: EAST MALL IN FRONT OF CEME BUILDING BETWEEN AGRONOMY ROAD & UNIVERSITY BOULEVARD

REVISIONS

No.	DESCRIPTION	MO/DAY/YR
9	REVISED AS PER UBC REIVEW COMMENTS	09/28/2016
8	SLP 2 SUBMISSION - SERVICING & ROADWORKS	05/18/2016
7	SLP SUBMISSION	12/11/2015
6	AS PER UBC REVIEW COMMENTS IN SUPPORT OF EXCAVATION PERMIT	11/03/2015
5	ROAD CHANGES ADDED IN SUPPORT OF PERMIT & TMP	10/29/2015
4	REVISIONS AS PER UBC REVIEW FOR EXCAVATION & SHORING PERMIT	10/13/2015
3	ISSUE FOR TENDER / FOUNDATION BP	08/18/2015
2	REVISED SERVICING & ROADWORKS	07/27/2015
1	REVISED SERVICING AS PER UBC & CLIENT REQUEST	07/07/2015

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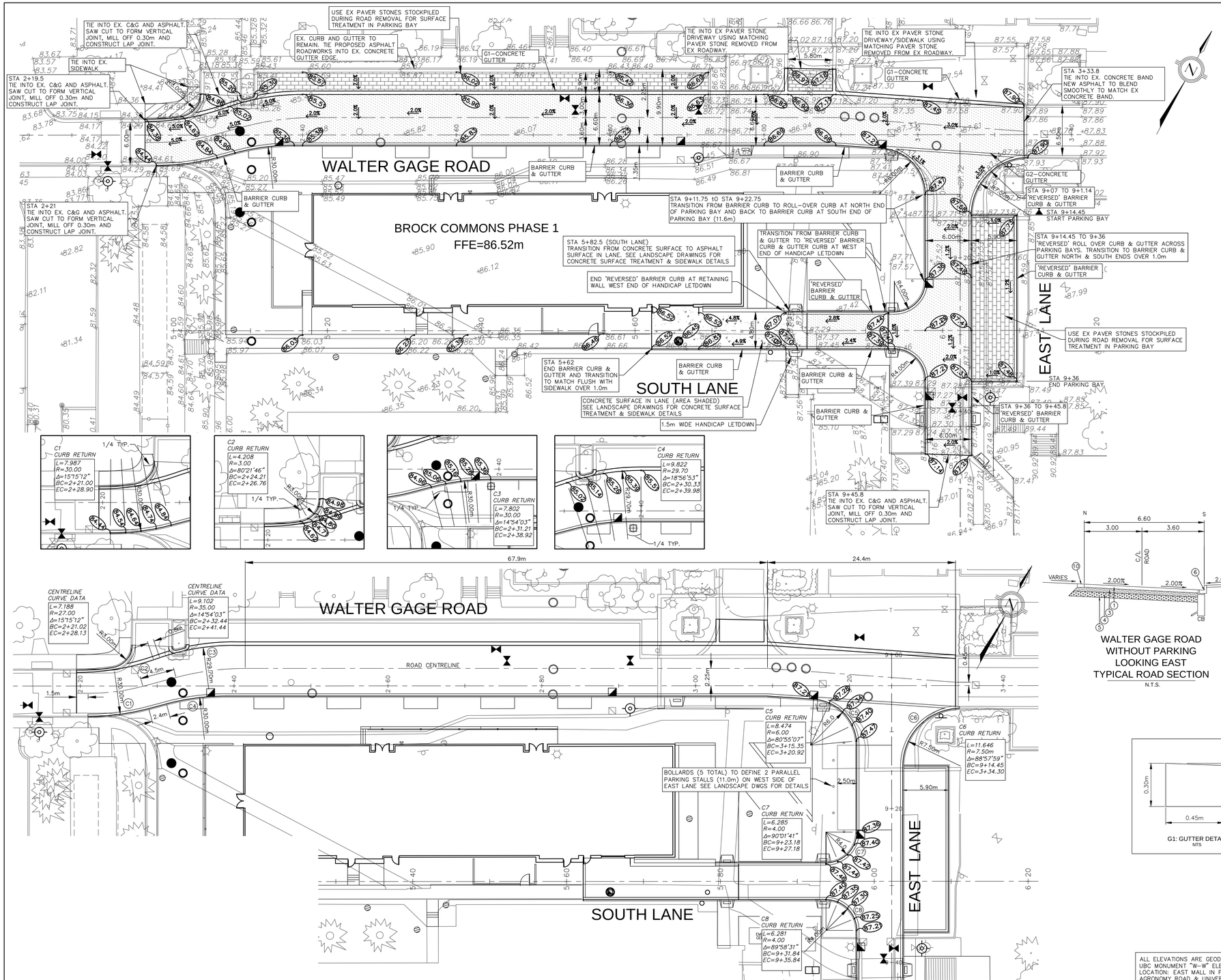
UBC PROPERTIES TRUST

CLIENT: UBC PROPERTIES TRUST
BUILDING/FACILITY:
DRAWING TITLE: KEY PLAN / SITE SERVICING PLAN
SEAL:

PROJECT TITLE: BROCK COMMONS - PHASE 1

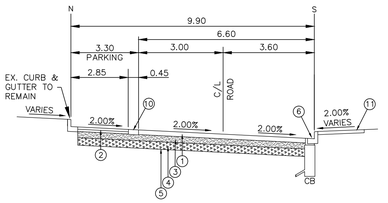
DRAWN	SCALE	PROJECT No.
J.N.	HORZ: 1:500m	8122
DESIGN	DATE	DRAWING No. / REV.
M.K.	APRIL 2015	200 / 9
CHECKED		



ROAD STRUCTURE RECOMMENDATIONS:

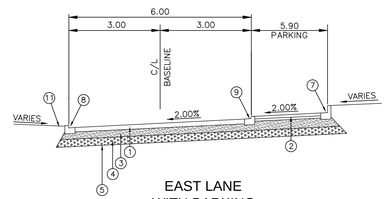
1. IN WALTER GAGE ROAD & EAST LANE & SOUTH LANE : 85mm ASPHALT IN TWO LIFTS
   −35mm −12.5mm MINUS #1 UPPER COURSE ASPHALT
   −50mm −12.5mm MINUS #1 LOWER COURSE ASPHALT
   ALL AS PER SEC. 02512 OF MMCD.
   or
2. IN PARKING STALL AREAS
   −75mm − PRE−CAST CONCRETE PAVERS (USE EXISTING PAVERS)
   −25mm −COMPACTED SETTING SAND.
   or
18. IN WEST END OF SOUTH LANE
   −200mm − 30MPa CONCRETE PAVEMENT − BROOMED FINISH
   SEE LANDSCAPE DRAWINGS FOR REINFORCEMENT AND EXPANSION JOINT DETAILS
3. 150mm − 19mm MINUS MMCD CRUSHED GRANULAR BASE GRAVEL COMPACTED TO MIN. OF 95% MPMDD (MODIFIED PROCTOR MAX. DRY DENSITY) TO ASTM D1557 WITHIN 2% OF OPTIMAL MOISTURE CONTENT.
4. 200mm (MIN) − 75mm MINUS MMCD CRUSHED GRANULAR SUB−BASE GRAVEL COMPACTED TO MIN. OF 95% MPMDD (MODIFIED PROCTOR MAX. DRY DENSITY) ASTM D1557 WITHIN 2% OF OPTIMAL MOISTURE CONTENT. IN 300mm LOOSE LIFTS.
   −DEPTH OF SUB−BASE GRAVEL WILL VARY BASED ON STRIPPING DEPTHS AND FINAL ROAD GRADE. REFER TO SOILS REPORT FOR SUB−GRADE FILL RECOMMENDATIONS & DESIGN DRAWINGS FOR DETAILS.
5. STRIP & REMOVE ALL TOPSOIL, FILL, LOOSE/SOFT AND WET WEATHERED MATERIAL AND VEGETATION, TO EXPOSE NATURAL UNDISTURBED SAND AND GRAVEL OR TILL SUBGRADE STRIPPING TO EXTEND BENEATH AND BEYOND ALL AREAS UNDER THE ROADWAY, CURBS, SIDEWALKS AND CONCRETE APRONS.
   − CONTRACTOR SHALL ENSURE SUB−GRADE IS INSPECTED & APPROVED BE EXTENDED BEYOND THE ROAD BY A DISTANCE EQUAL TO THE THE SUB−BASE GRAVELS.
   − WHERE SUBGRADE IS TO BE RAISED, THE AREA OF STRIPPING SHOULD BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF SUBGRADE OR SUBBASE FILL MATERIAL.
   − CONTRACTOR SHALL ENSURE COMPACTION OF SUB−GRADE FILL IS INSPECTED BY & APPROVED BY GEOTECHNICAL ENGINEER.
   − ALL BASE & SUBBASE (FILL) GRAVELS SHALL BE IN ACCORDANCE WITH THE MASTER MUNICIPAL SPECIFICATIONS & STANDARD DRAWINGS AND GEOTECHNICAL REPORT RECOMMENDATIONS.
6. CONCRETE BARRIER CURB WITH GUTTER−NARROW BASE TO MMCD C4
7. CONCRETE 'REVERSED' BARRIER CURB WITH GUTTER−NARROW BASE TO MMCD C4
8. CONCRETE ROLLOVER CURB WITH GUTTER−NARROW BASE TO MMCD C4
9. CONCRETE 'REVERSED' ROLLOVER CURB WITH GUTTER−NARROW BASE TO MMCD C4
10. G1: CONCRETE GUTTER− 0.45m WIDE X 0.30m −"REVERSED" SEE DETAIL THIS SHEET.
11. CONCRETE SIDEWALK − SEE LANDSCAPE DRAWINGS FOR DETAILS

WALTER GAGE ROAD
WITHOUT PARKING
LOOKING EAST
TYPICAL ROAD SECTION
N.T.S.



WALTER GAGE ROAD
WITH PARKING
LOOKING EAST
TYPICAL ROAD SECTION
N.T.S.

G1: GUTTER DETAIL
NTS



EAST LANE
WITH PARKING
LOOKING NORTH
TYPICAL ROAD SECTION
N.T.S.

ALL ELEVATIONS ARE GEODETIC AND REFER TO UBC MONUMENT "W−W" ELEVATION = 93.631 m
LOCATION: EAST MALL IN FRONT OF CEME BUILDING BETWEEN AGRONOMY ROAD & UNIVERSITY BOULEVARD

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REVISIONS

No.	DESCRIPTION	MO/DAY/YR
6		
5	REVISED AS PER UBC REVIEW COMMENTS	09/28/2016
4	SLP 2 SUBMISSION − ROADWORKS & SERVICING	05/18/2016
3	REVISED GRADING AND LANE CURB RETURNS	04/08/2016
2	SLP SUBMISSION	12/11/2015
1	AS PER UBC REVIEW COMMENTS	11/24/2015

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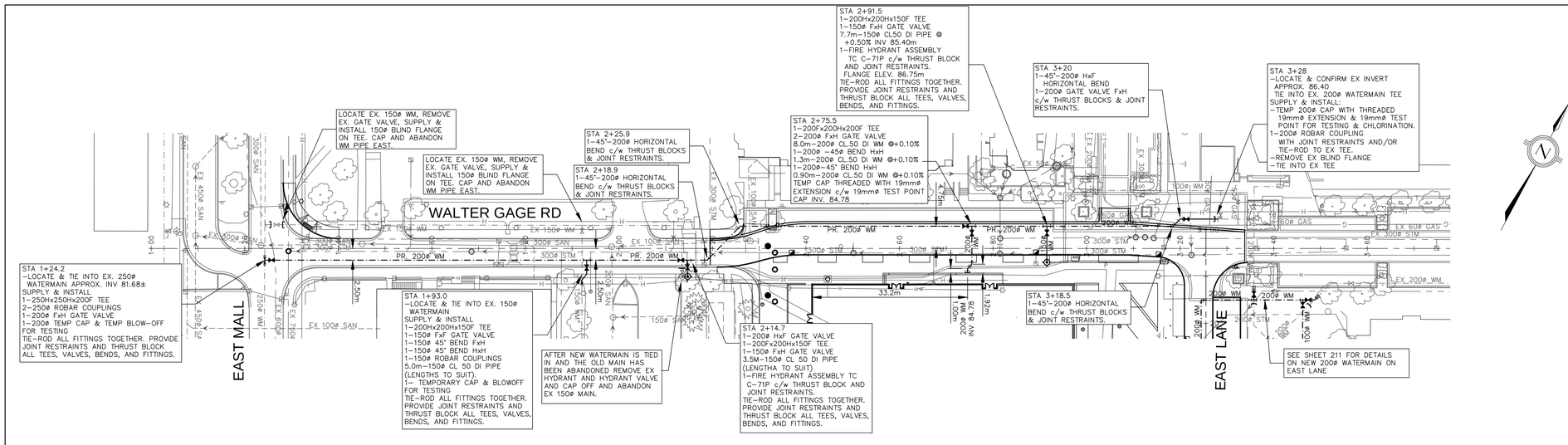
UBC PROPERTIES TRUST

CLIENT: UBC PROPERTIES TRUST
BUILDING/FACILITY:
DRAWING TITLE: ROADWORKS - LAYOUT & GRADING
SEAL:

PROJECT TITLE: BROCK COMMONS - PHASE 1

DRAWN: J.N.	SCALE: HORZ: 1:250m	PROJECT No.: 8122	
DESIGN: M.K.	DATE: OCT. 2015	DRAWING No.: 201	REV.: 5
CHECKED:			



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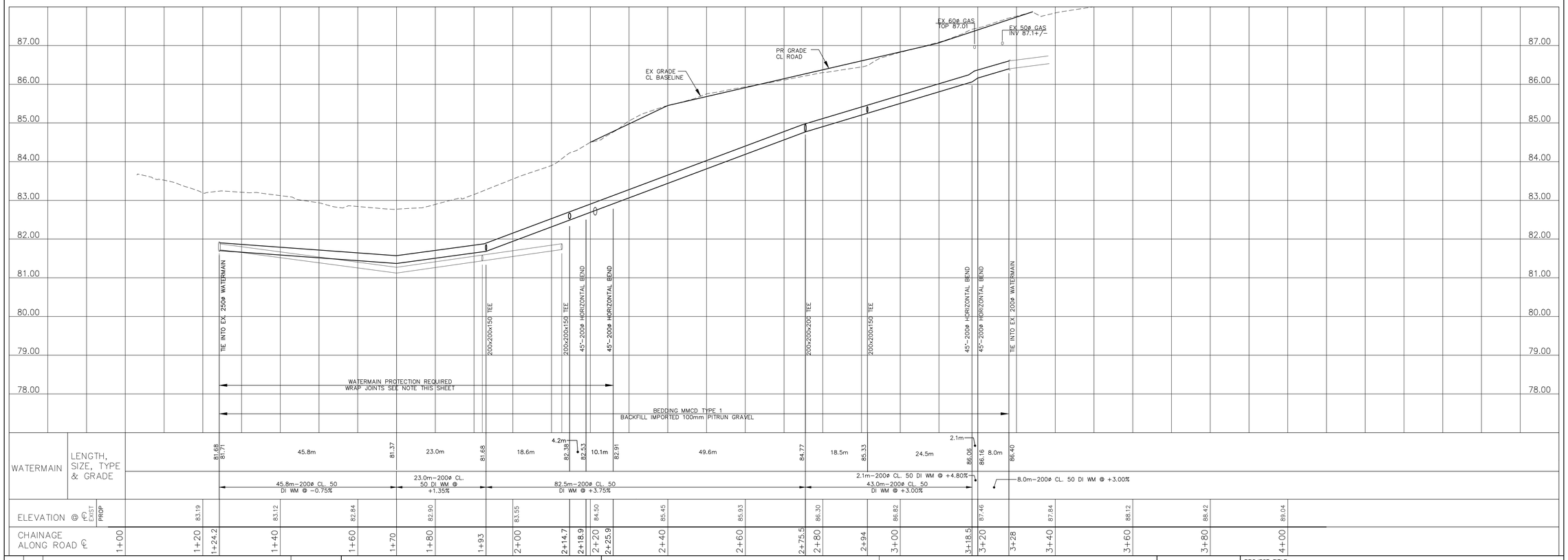
WATERMAIN JOINT PROTECTION:

WHERE WATERMAINS ARE INSTALLED WITH LESS THAN 3.0m CLEARANCE (HORIZONTAL) AND 0.5m (VERTICAL) FROM STORM OR SANITARY SEWERS, AND/OR WHERE NOTED ON THE DRAWINGS, ALL JOINTS SHALL BE WRAPPED AND PROTECTED USING DENSO PROFILING MASTIC AND DENSO LT TAPE OR APPROVED EQUIVALENT.



REVISIONS			
	6	REVISED VALVE LOCATION STA 2+14.7 AS PER UBC REVIEW	09/28/2016
	5	SLP 2 SUBMISSION & WATERMAIN PROTECTION STA 1+24 TO STA 2+25.9	05/18/2016
	4	REVISED WATER TO RESOLVE LOCATE CONFLICTS – STA 3+15 to STA 3+30	05/17/2016
	3	REVISED AS PER UBC REVIEW COMMENTS	05/10/2016
	2	SLP SUBMISSION	12/11/2015
	1	ISSUE FOR TENDER / FOUNDATION BP	08/18/2015
	No.	DESCRIPTION	MO/DAY/YR

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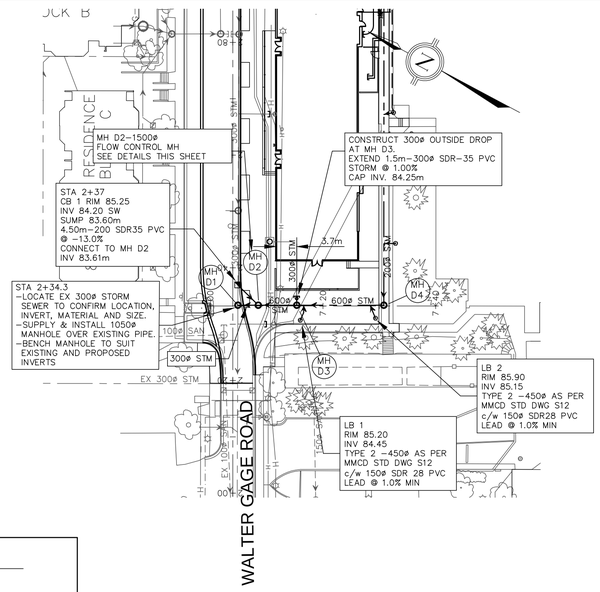
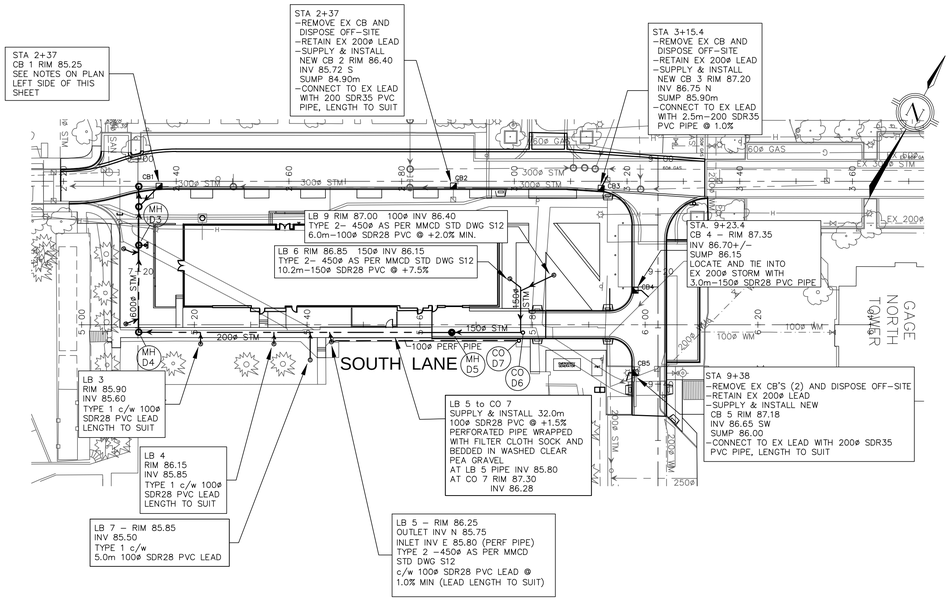
604-682-2020 kamps@rogers.com
UBC PROPERTIES TRUST

CLIENT: UBC PROPERTIES TRUST
BUILDING/FACILITY:
DRAWING TITLE: WATERMAIN PLAN AND PROFILE WALTER GAGE ROAD - STA 1+20 to STA 3+40
SEAL

PROJECT TITLE: BROCK COMMONS - PHASE 1
DRAWN: J.N.
SCALE: HORZ: 1:500 m VERT: 1:50 m
PROJECT No.: 8122
DESIGN: M.K.
DATE: AUG. 2015
CHECKED:
DRAWING No.: 202
REV.: 6





NOTES:
1. TYPE 1 LAWN BASINS SHALL BE 300ø LAWN DRAINS AS PER MMCD STD DWG S12 c/w 100ø SDR28 PVC LEADS.
2. TYPE 2 LAWN BASINS (LB) SHALL BE 450mmø LAWN DRAINS AS PER MMCD STD DWG S12, WITH "TR26C" FRAME & GRATE SUITABLE FOR H20 LOADING, 150mm DIA SDR28 PVC OUTLET PIPE (TYP) AND 300mm DEEP SUMP, UNLESS OTHERWISE NOTED. SUPPLY & INSTALL MIN. 2–25mm STEEL RISER RINGS UNDER FRAME TO ALLOW FOR FUTURE ADJUSTMENT. SEE DRAWINGS FOR RIM ELEVATION, SUMP, INLET & OUTLET INVERTS.
3. ON ALL MANHOLES SUPPLY & INSTALL A 0.3m HIGH TOP RISER SECTION, AND PROVIDE MIN. 2–25mm RISER RINGS UNDER FRAME TO ALLOW FOR FUTURE ADJUSTMENT.

ALL ELEVATIONS ARE GEODETIC AND REFER TO
UBC MONUMENT "W–W" ELEVATION = 93.631 m
LOCATION: EAST MALL IN FRONT OF CEME BUILDING BETWEEN
AGRONOMY ROAD & UNIVERSITY BOULEVARD

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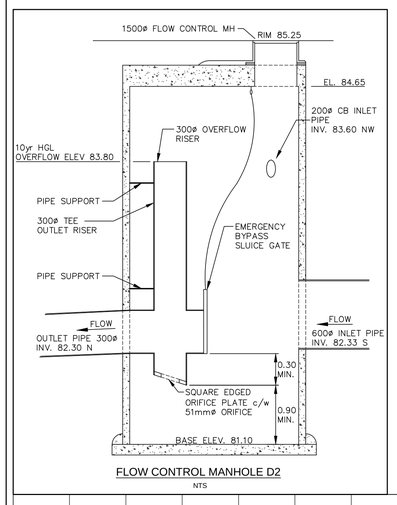
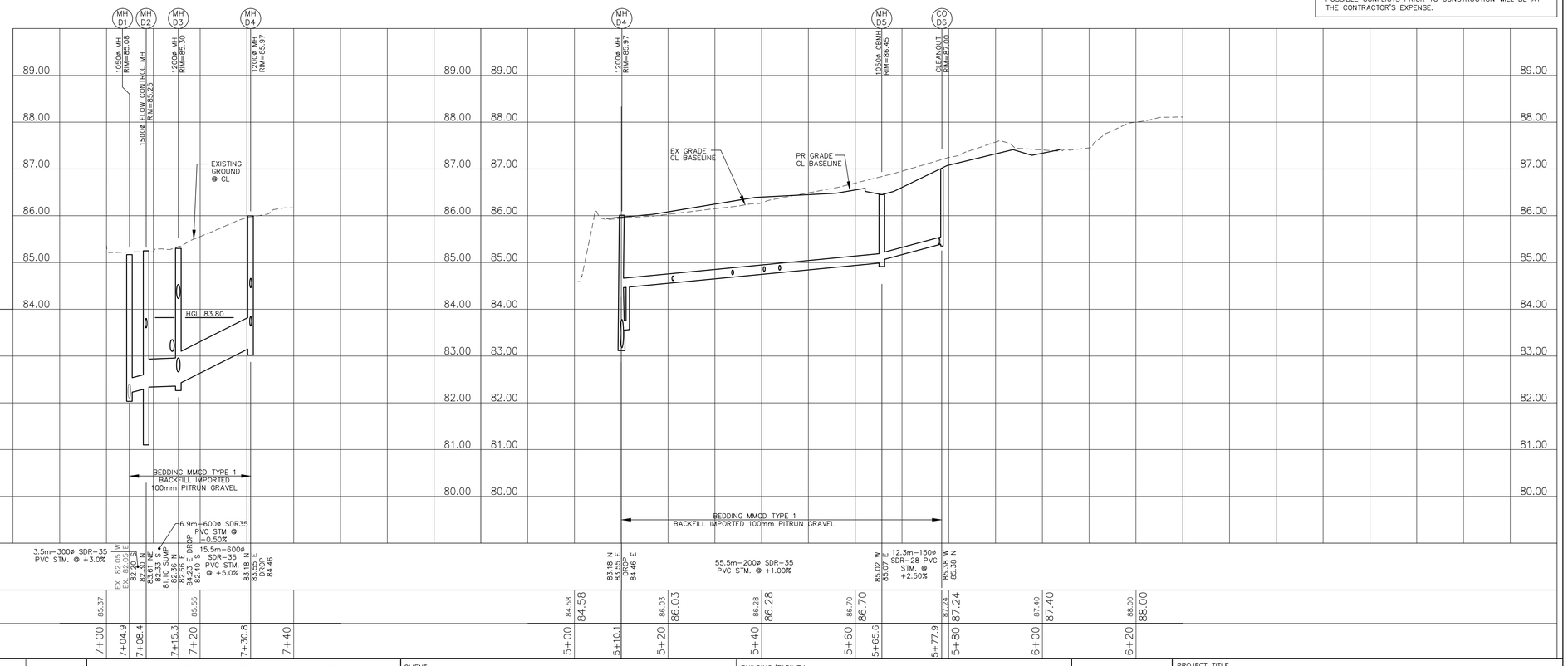


FLOW CONTROL MANHOLE D2
NTS



REVISIONS			
6			
5	REVISED AS PER UBC REVIEW COMMENTS	09/28/2016	
4	SLP 2 SUBMISSION	05/18/2016	
3	IFC (AS PART OF BP)	04/15/2016	
2	SLP SUBMISSION	12/11/2015	
1	ISSUE FOR TENDER / FOUNDATION BP	08/18/2015	
No.	DESCRIPTION	MO/DAY/YR	

KAMPS ENGINEERING LIMITED
604-682-2020 kamps@rogers.com

UBC PROPERTIES TRUST

CLIENT: UBC PROPERTIES TRUST
BUILDING/FACILITY:
DRAWING TITLE: STORM SEWER - PLAN AND PROFILE
WEST SIDE : STA 7+00 to STA 7+40
SOUTH LANE: STA 5+00 to STA 6+20
SEAL

PROJECT TITLE: BROCK COMMONS - PHASE 1

DRAWN	SCALE	PROJECT No.
J.N.	HORZ: 1:500 m VERT: 1:50 m	8122
DESIGN: M.K.	DATE: AUG. 2015	
CHECKED		DRAWING No. 203 / REV. 5

Storage Requirements (Modified Rational Method)

Project Name: Brock Commons Phase 1
Project Number: 8122
Area: Catchment Areas 1 to 5 = 0.290 ha

2 year pre-development release rate with 10 year post-development rainfall event

Rainfall Data			
Location:	UBC	a	129.5
Event:	10 year event	b	0
		c	0.52

Area Data						
Area	0.290	ha		A	C	AC
Runoff Coefficient	0.83		Area 1	0.074	0.80	0.059
AC	0.24		Area 2	0.108	0.90	0.097
Tc	10		Area 3	0.040	0.75	0.030
Time Increment	5		Area 4	0.027	0.85	0.023
Target Release Rate	9.40	l/s	Area 5	0.041	0.75	0.031
Storage Required	**10.6**	**m^3**	Total	0.290		0.240
				Avg 'C'		0.83

Time (min)	Rainfall Intensity (mm/hr)	Storm Runoff (m^3/s)	Runoff Volume (m^3)	Released Volume (m^3)	Storage Volume (m^3)	
5	56	0.04	11	3	8.4	
10	39	0.03	16	6	10.0	
15	32	0.02	19	8	10.6	*******
20	27	0.02	22	11	10.6	
25	24	0.02	24	14	10.2	
30	22	0.01	27	17	9.6	
35	20	0.01	29	20	8.8	
40	19	0.01	30	23	7.9	
45	18	0.01	32	25	6.9	
50	17	0.01	34	28	5.7	
55	16	0.01	36	31	4.5	
60	15	0.01	37	34	3.2	
65	15	0.01	38	37	1.8	
70	14	0.01	40	39	0.4	
75	14	0.01	41	42	-1.1	
80	13	0.01	42	45	-2.6	
85	13	0.01	44	48	-4.2	

Storage Volume Calculations

Project Name: Brock Commons Phase 1
Project Number: 8122
Area: Catchment Areas 1 to 5 = 0.290 ha

Storage Required: 10.6 m3

Storage Provided : Underground In Pipe & in MH's
10 yr HGL = 83.80 m

A. Manhole D2 :
1500m dia. = 1.767 m3/m
outlet inv = 82.30 m
head = 1.50 m
Volume 2.7 m3

B. Manhole D3 :
1200m dia. = 1.131 m3/m
outlet inv = 82.36 m
head = 1.44 m
Volume 1.6 m3

C. Manhole D4 :
1200m dia. = 1.131 m3/m
outlet inv = 83.18 m
head = 0.62 m
Volume 0.7 m3

F. 600mm dia Piping
600mm dia= 0.283 m3/m
Length Pipe 22.40 m
* Less MH width 2.55 m
Net Pipe = 19.85 m
Volume 5.6 m3

Total Storage Provided 10.6 m3

* MH width = 1/2 D2 + D3 + 1/2 D4

Orifice Sizing Calculations :

Project Name: Brock Commons Phase 1
Project Number: 8122

Orifice Location - MH D2 Flow Control MH
Orifice Equation: Q = CdA(2gh)1/2
2 yr Pre-Development Release Rate= 9.40 l/s

10 year event with 2 yr pre-development release rate:

Target Q (cms) up to 10 yr event = 0.0094 cms
Diameter of Orifice (mm) = 51 mm
Q (cms) = 0.0093 cms
C = 0.84
g = 9.81 m/s2
h = 1.50 m

10 year HGL (m) Overflow Elev = 83.80 m
Invert of Orifice Plate (m) Outlet Inv = 82.30 m

Pre-Development Flow Calculation

External Drainage Area Rational Method :

Project No: 8122
Project Name: Brock Commons Phase 1

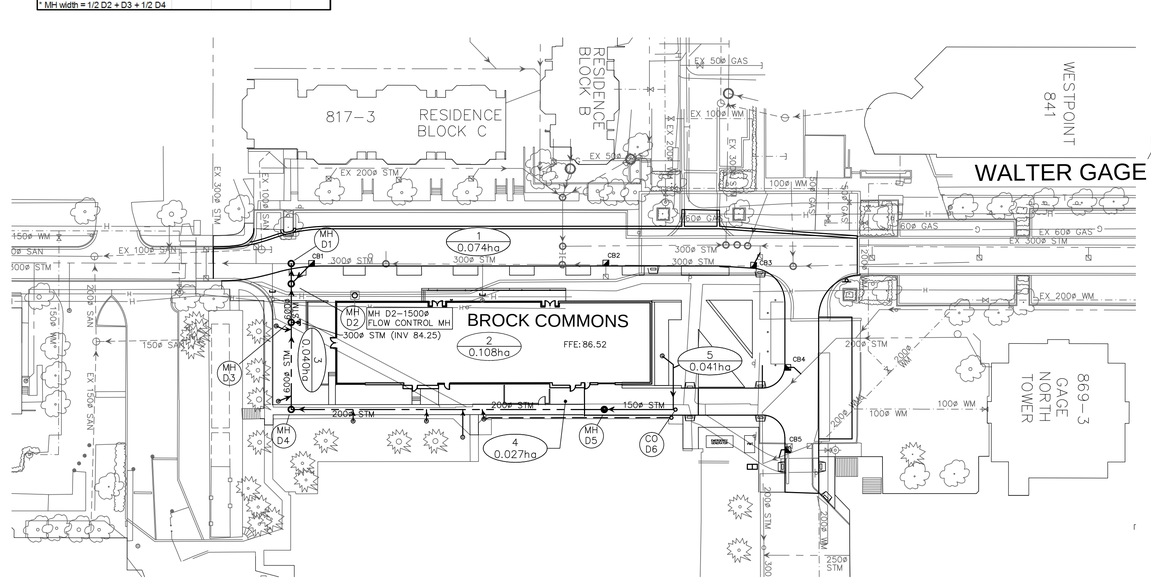
2 yr Pre-Development Flow

Event:	2	year				
	a	72		(using Brambsy Williams)		
ABC's:	b	0		T(over) = 0.0231 x L		
	c	0.48		(S^0.2) x (A^0.1)		
Time of Conc Initial	Ti	10	min	L = catchment length (m)	120	m
Time of Conc Overland	T(over)	2.73	min	S = slope (%) =	2.00	
				A = area (ha) =	0.290	
Time of Conc Total	Tc	12.73	min			
				Pre-Development Areas	**A**	**C**
Runoff Coefficient:	C	0.55		Area 1 - Road / Sidewalk	0.074	0.90
				Area 2 - Grass	0.108	0.40
Site Area	A	0.290	ha	Area 3 - Grass / Sidewalk	0.040	0.40
				Area 4 - Sidewalk / Grass	0.027	0.50
Intensity [i=a/(t+b)^n]	i	21.23	mm/hr	Area 5 - Grass / Sidewalk	0.041	0.50
				Total Area (ha)	0.290	0.55
Flow [Q=CiA/360]	Q	0.0094	m^3/s			
2 yr Pre-Development Flow		**9.4**	l/s			

STORM SEWER CALCULATION SHEET (Rational Method)

Project: Brock Commons Phase 1 | Location: UBC, BC | Rainfall Data: a, b, c Values | Kamps Engineering Limited
Project No: UBCPT | Prepared: MK | 10 year | File : 8122
Client: | a 129.50 | b 0 | c 0.52
Tc intial 10 minutes
Manning's Roughness Coeff = 0.013 | Design Return Frequency (years)= 2 years

1	2	3	4	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Location	From Node	Area	To Node	Diam. nominal (mm)	Length Pipe (m)	Slope Pipe (%)	Area (ha)	C	A x C (ha)	Accum AxC (ha)	Rainfall Intensity mm/hr	Time of Conc. (Tc) (min)	Area Flow Q (l/s)	Other Flows (l/s)	Total Flow (l/s)	Diameter Actual (m)	Pipe Area (sq.m)	Hydraulic Radius (m)	Pipe Mat.	Pipe Capacity (l/s)	Velocity (m/s)	Time of Flow (min)	Ratio Q/Q full	Cap. Check
East Lane	LB 6		CO D6	150	10.2	5.00%	0.041	0.75	0.031	0.031	39.1	10.00	3.3	0.0	3.3	0.150	0.02	0.038	PVC	34.1	1.93	0.09	0.10	OK
		5					0.000		0.000															
South Lane	CO D6		D5	150	12.3	2.50%				0.031	39.1	10.00	3.3	0.0	3.3	0.150	0.02	0.038	PVC	24.1	1.36	0.15	0.14	OK
		4					0.027	0.85	0.023															
South Lane	D5		D4	200	55.5	1.00%				0.054	38.8	10.15	5.8	0.0	5.8	0.200	0.03	0.050	PVC	32.8	1.04	0.89	0.18	OK
		3					0.040	0.75	0.030															
West Walkway	D4		D3	600	15.5	5.00%				0.084	37.2	11.04	8.6	0.0	8.6	0.610	0.29	0.152	PVC	1432.3	4.91	0.05	0.01	OK
		2					0.108	0.90	0.097															
West Walkway	D3		D2	600	6.9	0.50%				0.181	37.1	11.09	18.6	0.0	18.6	0.610	0.29	0.152	PVC	452.9	1.55	0.07	0.04	OK
		1					0.074	0.80	0.059															
Walter Gage	D2		D1	300	3.5	3.00%				0.240	36.9	11.16	24.6	0.0	24.6	0.298	0.07	0.075	PVC	164.5	2.36	0.02	0.15	OK
						Total Area	0.290	ha																



REVISIONS			
6			
5			
4			
3	SLP 2 SUBMISSION – SERVICING		05/18/2016
2	SLP SUBMISSION		12/11/2015
1	ISSUE FOR TENDER / FOUNDATION BP		08/18/2015
No.	DESCRIPTION		MO/DAY/YR

KAMPS ENGINEERING LIMITED
604-682-2020 kamps@rogers.com

UBC PROPERTIES TRUST

CLIENT: UBC PROPERTIES TRUST
BUILDING/FACILITY:
DRAWING TITLE: STORM WATER MANAGEMENT PLAN
SEAL:

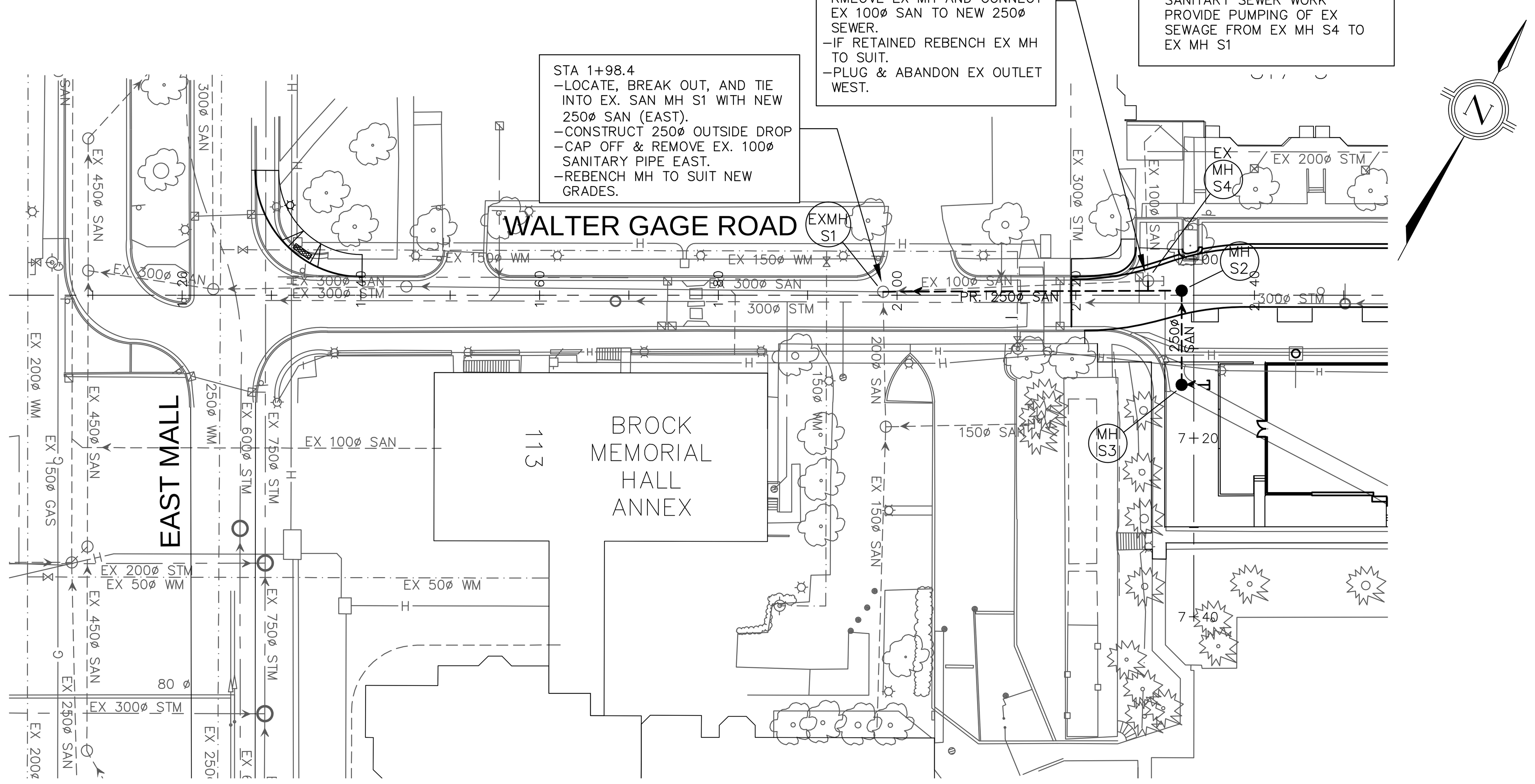
PROJECT TITLE: BROCK COMMONS - PHASE 1

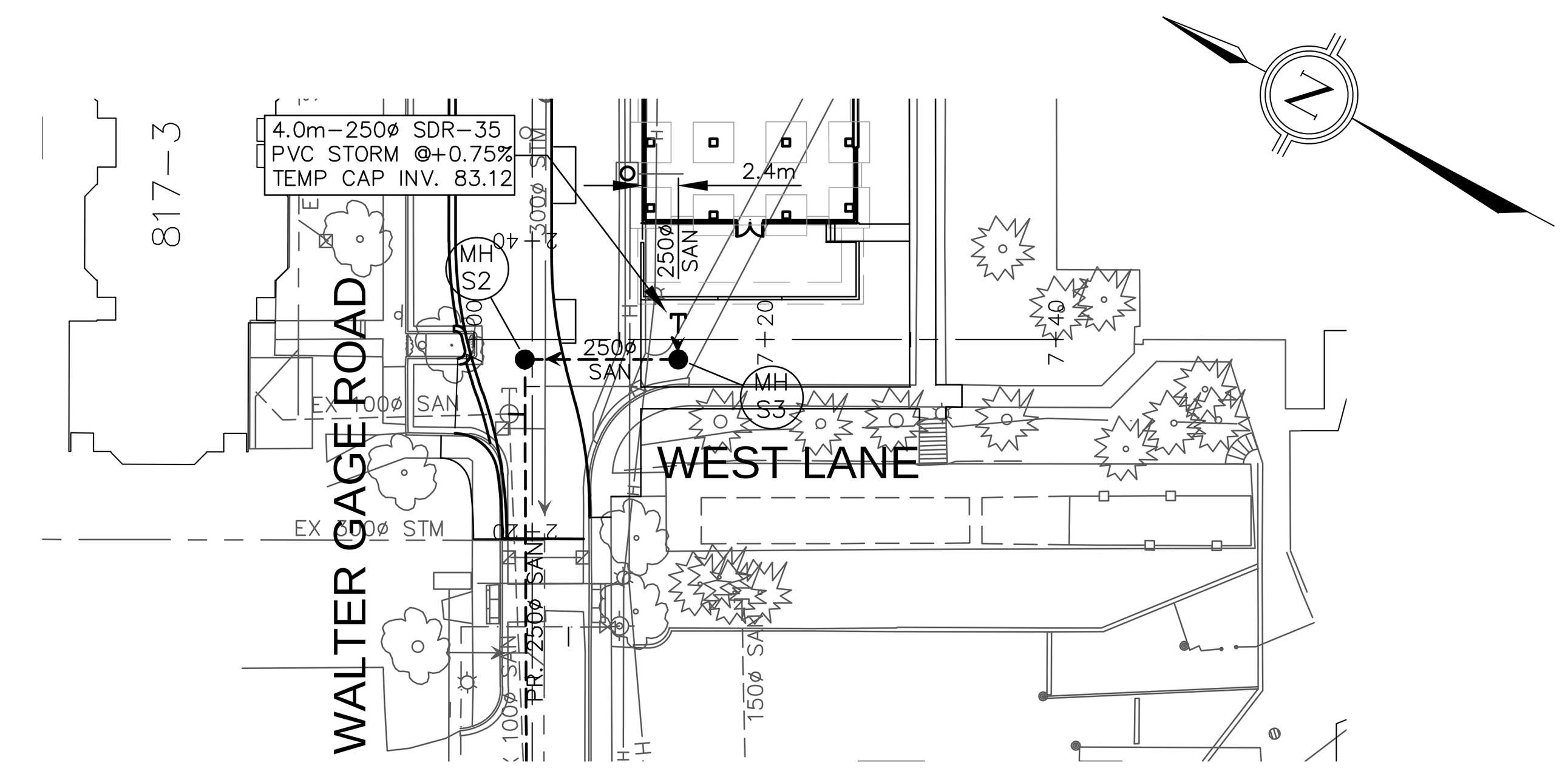
DRAWN: J.N.	SCALE: HORZ: 1:500m	PROJECT No.: 8122	
DESIGN: M.K.	DATE: AUG. 2015	DRAWING No.: 204	REV.: 3
CHECKED:			

EX SAN MH S4
- LOCATE EX MH (BURIED BELOW ASPHALT) & CONFIRM 100ø SAN SEWER INVERT AND SIZE.
- BREAK INTO EX MH OR RMEOVE EX MH AND CONNECT EX 100ø SAN TO NEW 250ø SEWER.
- IF RETAINED REBENCH EX MH TO SUIT.
- PLUG & ABANDON EX OUTLET WEST.

STA 1+98.4
- LOCATE, BREAK OUT, AND TIE INTO EX. SAN MH S1 WITH NEW 250ø SAN (EAST).
- CONSTRUCT 250ø OUTSIDE DROP
- CAP OFF & REMOVE EX. 100ø SANITARY PIPE EAST.
- REBENCH MH TO SUIT NEW GRADES.

NOTE:
DURING CONSTRUCTION OF THE SANITARY SEWER WORK PROVIDE PUMPING OF EX SEWAGE FROM EX MH S4 TO EX MH S1





ALL ELEVATIONS ARE GEODETIC AND REFER TO UBC MONUMENT "W−W" ELEVATION = 93.631 m
LOCATION: EAST MALL IN FRONT OF CEME BUILDING BETWEEN AGRONOMY ROAD & UNIVERSITY BOULEVARD

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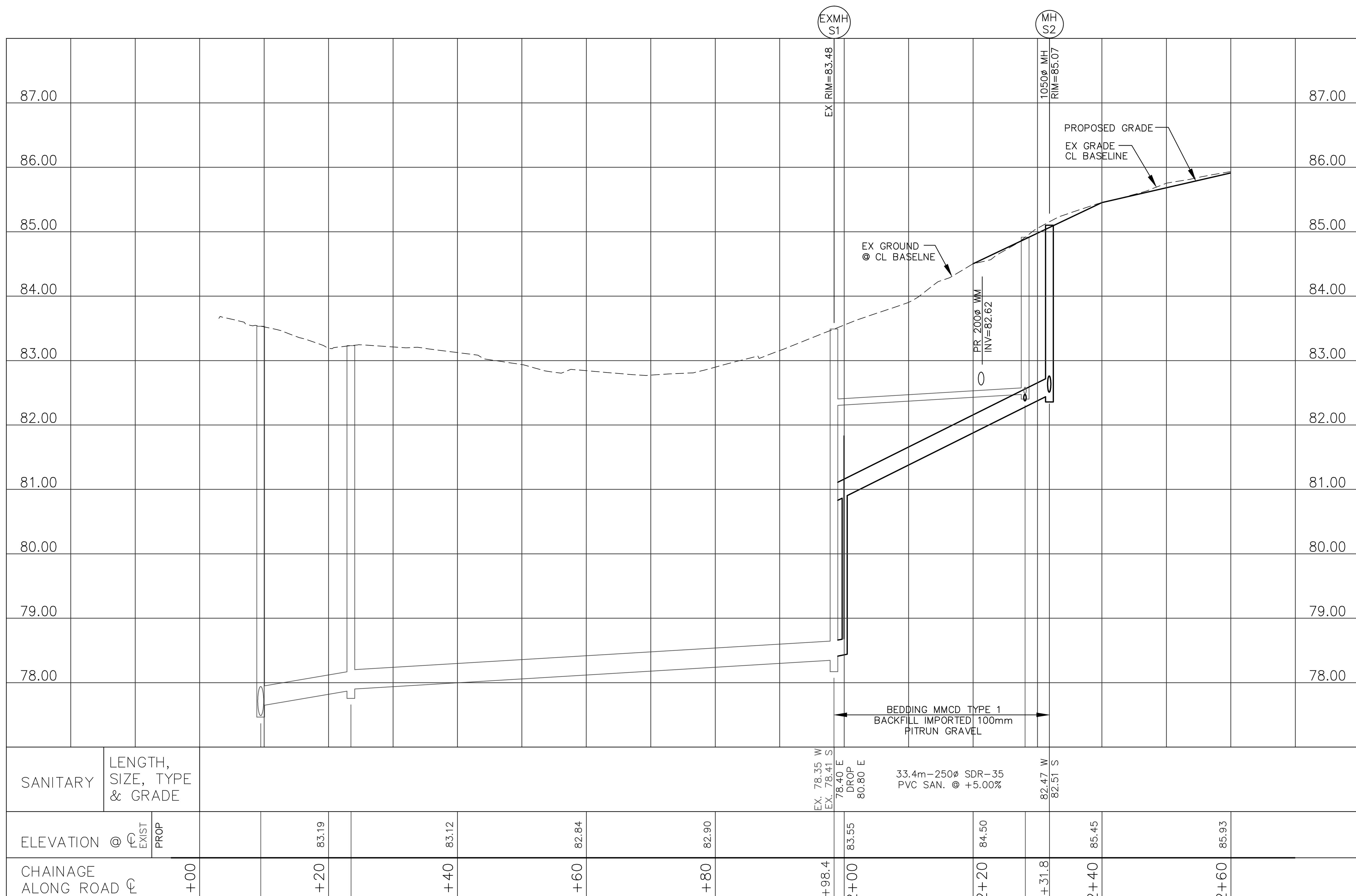
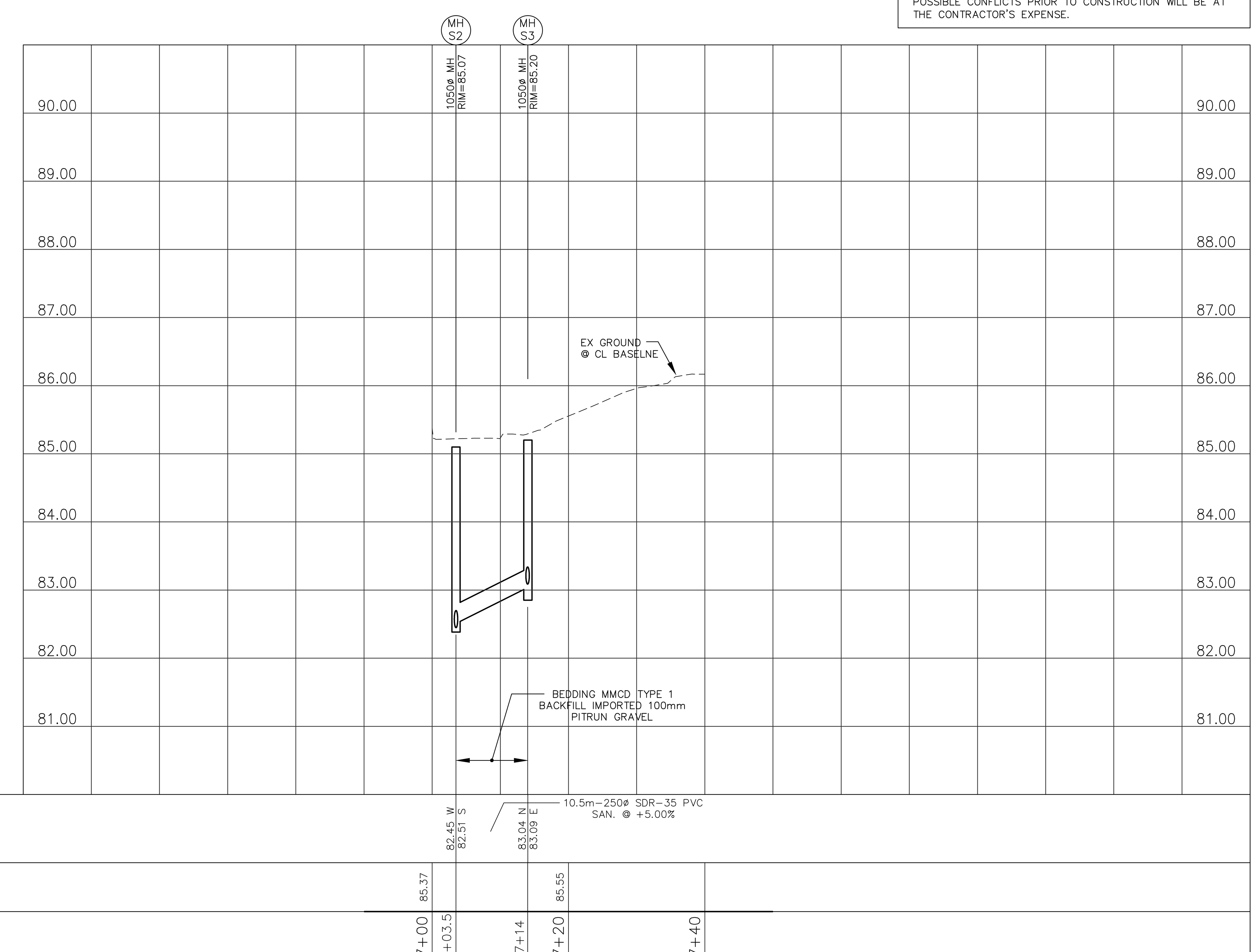




REVISIONS

No.	DESCRIPTION	MO/DAY/YR
6		
5		
4	SLP 2 SUBMISSION	05/18/2016
3	IFC (AS PART OF BP)	04/15/2016
2	SLP SUBMISSION	12/11/2015
1	ISSUE FOR TENDER / FOUNDATION BP	08/18/2015

KAMPS ENGINEERING LIMITED
604-682-2020 kamps@rogers.com

UBC PROPERTIES TRUST

CLIENT: UBC PROPERTIES TRUST

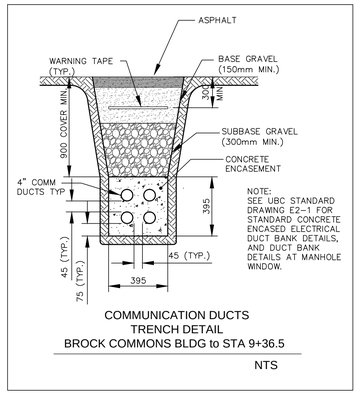
BUILDING/FACILITY

DRAWING TITLE
SANITARY SEWER - PLAN AND PROFILE
WALTER GAGE ROAD: STA 1+90 to STA 2+40
WEST SIDE: STA 7+00 to 7+20

SEAL

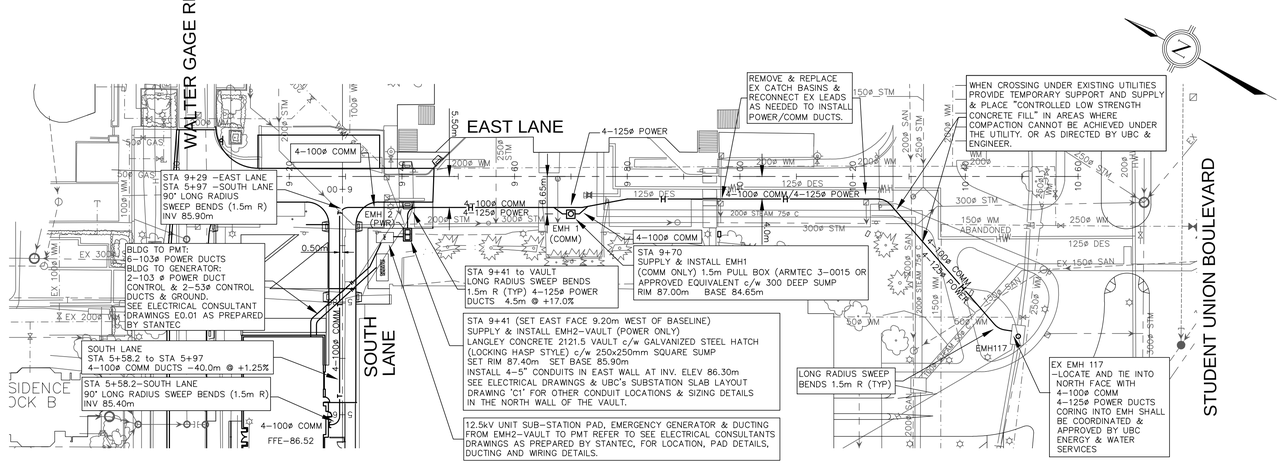
PROJECT TITLE
BROCK COMMONS - PHASE 1

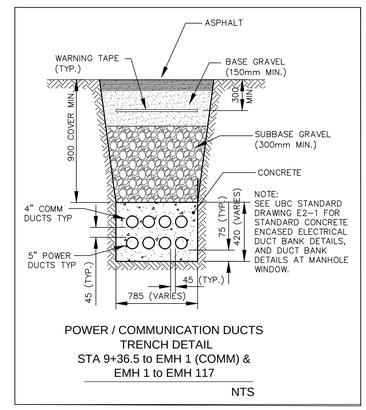
DRAWN J.N.	SCALE HORZ: 1:500 m VERT: 1:50 m	PROJECT No. 8122
DESIGN M.K.	DATE AUG. 2015	DRAWING No. 205 / REV. 4
CHECKED		



COMMUNICATION DUCTS
TRENCH DETAIL
BROCK COMMONS BLDG to STA 9+36.5

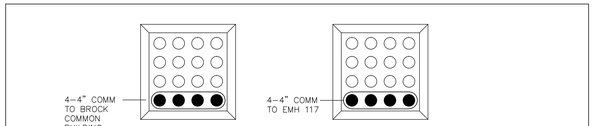
NTS



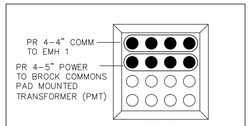


POWER / COMMUNICATION DUCTS
TRENCH DETAIL
STA 9+36.5 to EMH 1 (COMM) &
EMH 1 to EMH 117

NTS



PROPOSED EMH 1 (PULL BOX)
COMMUNICATIONS BOX



EX EMH 117

ALL ELEVATIONS ARE GEODETIC AND REFER TO UBC MONUMENT "W–W" ELEVATION = 93.631 m
LOCATION: EAST MALL IN FRONT OF CEME BUILDING BETWEEN AGRONOMY ROAD & UNIVERSITY BOULEVARD

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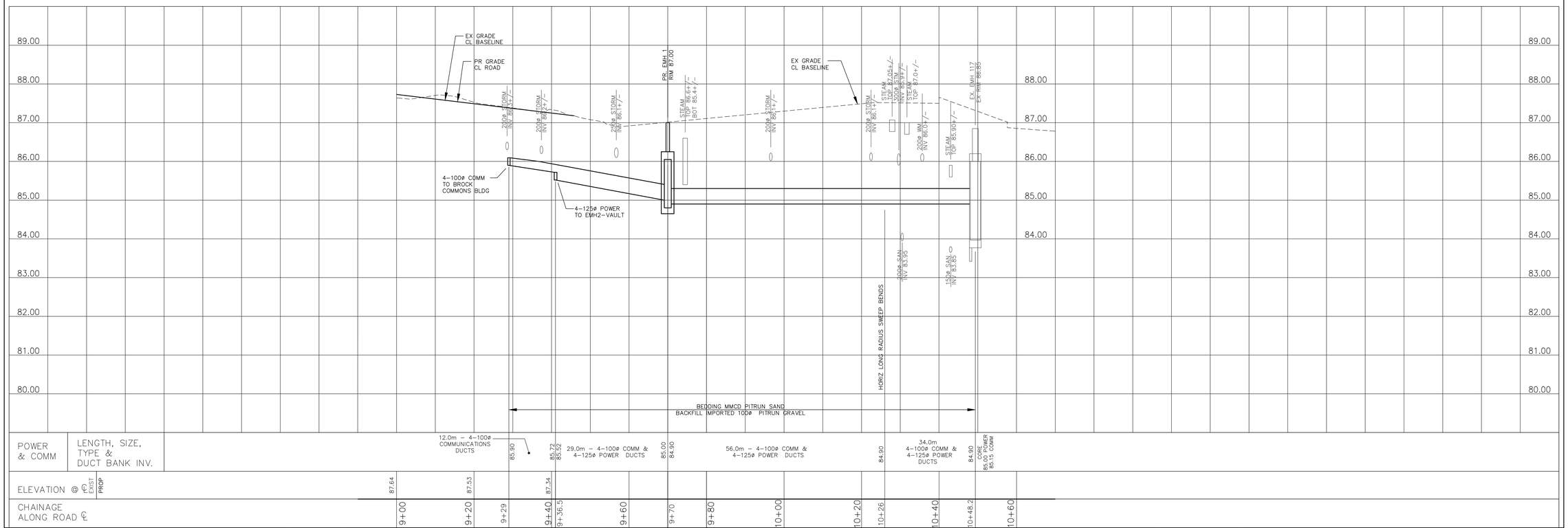


REVISIONS			
6			
5			
4			
3	SLP 2 SUBMISSION / ADDED EMH2 VAULT AS PER UBC REVIEW	05/18/2016	
2	SLP SUBMISSION	12/11/2015	
1	ISSUE FOR TENDER / FOUNDATION BP	08/18/2015	
No.	DESCRIPTION	MO/DAY/YR	

KAMPS ENGINEERING LIMITED
604-682-2020 kamps@rogers.com

UBC PROPERTIES TRUST

CLIENT: UBC PROPERTIES TRUST

BUILDING/FACILITY:

DRAWING TITLE:
POWER / TELECOMMUNICATIONS
PLAN AND PROFILE
EAST LANE: STA 9+20 to STA 10+60

SEAL

PROJECT TITLE: BROCK COMMONS - PHASE 1

DRAWN	SCALE	PROJECT No.
J.N.	HORZ: 1:500 m VERT: 1:50 m	8122
DESIGN: M.K.	DATE: AUG. 2015	
CHECKED		DRAWING No. 206 / REV. 3

DETAILED SPECIFICATIONS

1.0 EXTENT OF WORK

THIS CONTRACT IS FOR SERVICING AND ROADWORKS FOR THE BROCK COMMONS PHASE 1 PROJECT WHICH INCLUDES SUPPLY AND INSTALLATION OF SANITARY SEWER, STORM SEWER, WATERMAIN, AND POWER & COMMUNICATION DUCTS.

THE CONTRACTOR SHALL MAKE ALLOWANCES FOR PROVIDING THE NECESSARY CAPS FOR THE STORM AND SANITARY SEWER. THE CAPS ARE NOT SHOWN IN THE DRAWINGS.

THE CONTRACTOR SHALL HAVE A FULL TIME ON–SITE SUPERINTENDENT.

THE DRAWINGS HAVE BEEN PREPARED USING INFORMATION FOR OTHERS, BUT THE EXACT LOCATION OF EXISTING UNDERGROUND UTILITIES WILL ONLY BE DETERMINED BY FIELD LOCATES. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE AND CONFIRM THE FINAL LOCATION OF PROPOSED WORKS. THE CONTRACTOR IS TO NOTIFY, IN WRITING, THE PROJECT ENGINEER OF ANY CHANGES.

THE CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATION WITH ALL UBC AGENCIES FOR EXISTING UTILITIES RELOCATION AND CONNECTION TO EXISTING UTILITIES.

THE CONTRACTOR SHALL APPLY FOR ALL PERMITS.

2.0 SPECIFICATIONS

ALL WORK MUST BE DONE IN ACCORDANCE WITH UBC TECHNICAL GUIDELINES AND MASTER MUNICIPAL CONTRACT DOCUMENTS (VOLUME II 2000). IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN FOR HIMSELF A CURRENT COPY OF THE ABOVE NOTED SPECIFICATIONS. THE CONTRACTOR SHALL OBTAIN A COPY OF THE UBC UTILITIES MAPS WITHIN THE PROJECT. THE UTILITY MAPS CAN BE OBTAINED FROM UBC CAMPUS PLANNING AT AN APPROXIMATE COST OF $5.00 PLUS "HST" EACH.

3.0 HOURS OF WORK

WORK IS ONLY PERMITTED WITHIN THE HOURS OF 7:30a.m. TO 6:00p.m. MONDAY TO FRIDAY, AND 10:00a.m. TO 6:00p.m. ON SATURDAY. NO WORK NOISE IS PERMITTED OUTSIDE OF THESE WORK HOURS, THIS INCLUDES BUT IS NOT LIMITED TO, DELIVERIES, IDLING MACHINES, BACKING UP OF MACHINES, SERVICING, ETC...THE HOURS OF WORK AND LIMITED NOISE HOURS WILL BE STRICTLY ENFORCED.

NO WORK IS PERMITTED ON SUNDAY. THE CONTRACTOR MAY BE SUBJECT TO A FINE FOR WORKING OUTSIDE THESE HOURS.

4.0 SCHEDULE

THE CONTRACTOR WILL BE REQUIRED TO SUBMIT A WEEKLY SCHEDULE OF ACTIVITIES TO THE OWNER AND THE CONSULTANT TWO (2) DAYS PRIOR TO THE WEEKLY SITE MEETING.

5.0 EXPOSE EXISTING UTILITIES

THE CONTRACT DRAWINGS HAVE BEEN ASSEMBLED FOR INFORMATION PROVIDED BY UBC UTILITIES AND FIELD SURVEY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE OWNER'S REPRESENTATIVE.

THE CONTRACTOR SHALL EXPOSE ALL EXISTING UTILITIES, AS SHOWN ON THE CONTRACT DOCUMENTS, AND ON THE UBC PLANT MAPS. THE CONTRACTOR WILL PROVIDE THE LOCATION AND INVERT ELEVATION OF EXPOSED UTILITIES TO THE PROJECT ENGINEER. THE PROJECT ENGINEER WILL REVIEW THE DATA FOR CONFLICTS, AND IF REQUIRED, SUPPLY TO THE CONTRACTOR ADJUSTED GRADES OR DESIGN. THE CONTRACTOR SHALL SCHEDULE THE UTILITY LOCATES, SUCH THAT, THE PROJECT ENGINEER WILL HAVE FIVE (5) WORKING DAYS TO REVIEW THE DATA AND PREPARE ADJUSTMENTS AS REQUIRED. FAILURE TO EXPOSE THE EXISTING UTILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. IF A CONFLICT IS ENCOUNTERED, DUE TO THE FAILURE TO EXPOSE THE UTILITIES, THE COST TO ADJUST THE DESIGN WILL NOT BE THE RESPONSIBILITY OF THE OWNER NOR THE PROJECT ENGINEER, AND ANY COST TO ADJUST THE DESIGN AND TO RELOCATE OR RELOCATE INSTALLED MANHOLES OR SERVICES WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. IF AN UTILITY IS DISCOVERED THAT IS NOT SHOWN ON THE PROJECT DRAWINGS AND THE UBC PLANT MAP THEN THE OWNER WILL BE RESPONSIBLE FOR THE COST TO ADJUST THE DESIGN, SERVICES OR MANHOLES.

6.0 SITE TRAILER

CONTRACTOR WILL NOT BE REQUIRED TO SUPPLY A SITE TRAILER FOR THIS PROJECT.

7.0 MATERIAL STORAGE AND DELIVERY

THE CONTRACTOR SHALL STORE MATERIALS TO BE USED EACH DAY IN AN AREA THAT DOES NOT OBSTRUCT TRAFFIC OR SIGHTLINES. ALL ADDITIONAL MATERIALS SHALL BE STORED IN AN AGREED STAGING AREA. THE CONTRACTOR SHALL PROVIDE SUITABLE FENCING TO DEMARCATE THE STAGING AREA. THE STAGING AREAS WILL BE COORDINATED WITH THE OWNER, THE CONTRACTOR, AND UBC.

8.0 TIE–INS AND CONNECTION TO EXISTING SERVICES

THE CONTRACTOR SHALL MAKE ALL SANITARY, STORM, WATER, AND NATURAL GAS TIE–INS AND THE COSTS OF THESE TIE–INS SHALL BE INCLUDED IN THE SCHEDULE OF CONTRACT PRICES.

9.0 JOINT RESTRAINTS

ALL WATERMAINS ARE TO BE CLASS 50 DUCTILE IRON. UNI–FLANGE SERIES 1300 JOINT RESTRAINTS OR APPROVED EQUALS, ARE REQUIRED AT ALL FITTINGS AND PIPE JOINTS.

10.0 TESTING OF SEWERS AND WATER WORKS

TESTING AND CHLORINATION OF WATERMAINS SHALL BE COMPLETED BY THE CONTRACTOR. THE COST OF CHLORINATION AND ALL TESTING SHALL BE INCLUDED IN THE SCHEDULE OF CONTRACT PRICES. ALL TESTS ARE TO BE WITNESSED BY UBC UTILITIES AND KAMPS ENGINEERING LIMITED.

IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY BY VIDEO INSPECTION, THAT ALL SANITARY AND STORM CONNECTIONS TO THE EXISTING MAIN TO BE ABANDONED HAVE BEEN CONNECTED TO THE PROPOSED SEWER. THE COST FOR THIS IS TO BE INCLUDED IN THE SCHEDULE OF CONTRACT PRICES.

VIDEO INSPECTION OF THE SANITARY AND STORM SEWERS, IN ACCORDANCE WITH THE UBC TECHNICAL GUIDELINES AND MMCD, IS TO BE PERFORMED AT THE COMPLETION OF THE WORKS. THE COST FOR VIDEO INSPECTION IS TO BE INCLUDED IN THE SCHEDULE OF CONTRACT PRICES. DEFICIENCIES IDENTIFIED ARE TO BE REMEDIED AT NO COST TO THE OWNER.

11.0 STREET AND SIDEWALK SWEEPING

CONTRACTOR WILL BE RESPONSIBLE TO SWEEP ALL CONSTRUCTION DEBRIS FROM SIDEWALKS AND ROADWAYS. CONSTRUCTION DEBRIS SHALL BE SWEPT FROM SIDEWALKS AT THE END OF EACH DAY AND ROADWAYS ARE TO BE SWEPT EVERY TWO (2) DAYS. ALL SIDEWALKS AND ROADWAYS ARE TO BE FREE OF CONSTRUCTION DEBRIS AT ALL TIMES.

12.0 MILLING

ROADWAY MILLING IS TO BE UNDERTAKEN AT THE END OF THE PROJECT. GRANULAR BY–PRODUCT OF MILLING IS TO BE DISPOSED OF OFF–SITE.

13.0 PERMIT

THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS, SHUTDOWN NOTICES AND TIE–INS. CONTACT: UBC PLANT OPERATIONS, DOUG NAPIER 604–822–4116.

THE CONTRACTOR SHALL APPLY FOR MANHOLE ENTRY PERMITS BEFORE ENTERING AN ELECTRICAL OR TELECOMMUNICATION MANHOLE. CONTACT: UBC UTILITIES, RICHARD HUGLI 604–827–5056.

THE CONTRACTOR SHALL ALLOW TEN (10) WORKING DAYS FOR PERMIT APPLICATIONS.

THE CONTRACTOR SHALL ALLOW SUFFICIENT TIME FOR THE OWNER TO PAY PERMIT FEES, IF REQUIRED, BEFORE APPLICATION OF SHUTDOWN NOTICE.

UBC UTILITIES OVERHEAD ELECTRICAL

THE CONTRACTOR SHALL PROVIDE A SAFETY WATCHER WHILE WORKING IN THE VICINITY OF THE 69kv OVERHEAD ELECTRICAL LINES. 69kv OVERHEAD IS ON WESBROOK MALL AND THUNDERBIRD. A SAFETY PLAN FOR WORKING NEAR 69kv OVERHEAD LINE IS TO BE SUBMITTED TO THE PROJECT ENGINEER PRIOR TO THE START OF CONSTRUCTION. FOR INFORMATION CONTACT: RICHARD HUGLI 604–827–5056.

14.0 TRENCH BACKFILL

TRENCH PAVEMENT RESTORATION SHALL BE COMPLETED AS PER MMCD (2000) STANDARD DETAIL DRAWING NUMBER G5. ALL TRENCHES SHALL BE REPAIRED WITH HOT MIX ASPHALT, MATCH TO EXISTING ASPHALT THICKNESS AND GRADE, TEMPORARY PAVEMENT TO BE PLACED TO "TOP OF TRENCH AS SHOWN IN MMCD DETAIL G5".

THE CONTRACTOR SHALL PROVIDE THE FOLLOWING TRENCH COMPACTION TEST RESULTS:
1–TEST FOR EVERY 50m OF TRENCH PER METRE OF BACKFILL; AND
1–TEST FOR EVERY ROAD LANE CROSSING PER METRE DEPTH OF BACKFILL.

15.0 ROADWORKS AGGREGATE

ALL ROAD WORKS AGGREGATE SHALL BE IN ACCORDANCE WITH MMCD SECTION 02226.2.8 SELECT GRANULAR SUB–BASE AND SECTION 02226.2.10 GRANULAR BASE.

16.0 NATURAL GAS

INSTALLATION OF NATURAL GAS PIPING SHALL BE PERFORMED BY UBC UTILITIES APPROVED CONTRACTOR:

TERASEN GAS INC. 3700–2 AVENUE BURNABY, BC V5C 6S4 ATTENTION: KEN JARVIS tel: 604–575–3404	OR	UNIVERSAL HEATING LTD. 3868 COMMERCIAL ST. VANCOUVER, BC V5N 4G2 ATTENTION: DOUG tel: 604–873–3551

NIC

17.0 STEAM

INSTALLATION OF STEAM PIPING SHALL BE PERFORMED BY UBC UTILITIES APPROVED CONTRACTORS:

IDEAL WELDERS 660 CALDEW ST. ANNACIS ISLAND DELTA, BC V3M 5S2 ATTENTION: JIM LONGO tel: 604–525–5558	OR	LOCKERBIE & HOLE 401 SALTER ST. NEW WESTMINSTER, BC V3M 5Y1 ATTENTION: LANCE COLLINS & DAVE ANDREWS tel: 604–521–3322

18.0 SILTATION CONTROL

THE CONTRACTOR SHALL COMPLY WITH ALL REGULATORY AUTHORITIES, FISH AND WILDLIFE AND WATER MANAGEMENT BRANCHES OF THE PROVINCIAL MINISTRY OF ENVIRONMENT, AND FISHERS AND OCEANS CANADA IN THE PROTECTION OF FISH AND WILDLIFE DURING THE CONSTRUCTION OF THE WORKS AND SHALL BE RESPONSIBLE FOR ALL COSTS IN COMPLYING WITH THESE REQUIREMENTS.

PRIOR TO AND DURING CONSTRUCTION, THE CONTRACTOR SHALL TAKE ADEQUATE STEPS, INCLUDING BUT NOT LIMITED TO, INSTALLATION OF SILT FENCES, DITCHING OR ANY OTHER MEASURES AS MAY BE NECESSARY TO PREVENT SILT AND OTHER DELETERIOUS MATERIALS FROM THE WORKS ENTERING THE SYSTEM.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE, INCLUDING REMOVAL OF SILTS FROM EXISTING SILTATION CONTROL STRUCTURES AND REPAIRS AS REQUIRED TO ENSURE PROPER OPERATION OF THE TEMPORARY SILTATION CONTROL SYSTEM DURING THE CONSTRUCTION OF THE WORKS.

THE COST OF SUCH WORKS SHALL BE INCLUDED IN THE VARIOUS ITEMS OF WORK IN THE SCHEDULE OF CONTRACT PRICES.

19.0 OVER EXCAVATION

UNDER THE LUMP SUM ITEM FOR ROAD WORKS, THE CONTRACTOR IS FULLY RESPONSIBLE FOR MAKING HIS OWN ALLOWANCE FOR ANY OVER EXCAVATION DUE TO SOIL CONDITIONS AND NO EXTRA PAYMENT FOR SUCH WORK WILL BE MADE. UNDER THE LUMP SUM ITEM FOR WATERMAIN, SANITARY SEWERS, STORM SEWERS, NATURAL GAS, AND ELECTRICAL AND TELECOMMUNICATIONS DUCTS, THE CONTRACTOR IS RESPONSIBLE FOR UNSUITABLE MATERIAL, LARGE BOULDERS AND BACKFILLING AND NO EXTRA PAYMENT FOR SUCH WORK WILL BE MADE.

20.0 SITE VISIT PRIOR TO BIDDING

IT IS RECOMMENDED THAT ALL CONTRACTORS BIDDING THIS PROJECT WALK THE SITE TO ENSURE A CLEAR UNDERSTANDING OF THE SCOPE OF LIMITATION TO THIS CONTRACT.

21.0 CONSTRUCTION LAYOUT

THE CONTRACTOR WILL BE RESPONSIBLE TO SUPPLY HIS OWN CONSTRUCTION LAYOUT. THE COST INVOLVED SHALL BE INCLUDED IN THE PRICES BID FOR THE VARIOUS ITEMS OF WORK IN THE SCHEDULE OF CONTRACT PRICES.

22.0 AS–BUILT DRAWINGS

THE CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ON THE SITE ONE COMPLETE SET OF DRAWINGS FOR THE PURPOSE OF RECORDING ALL VARIATIONS FROM THE DRAWINGS. ALTERATIONS SHALL BE CLEARLY SHOWN IN RED. THE CONTRACTOR SHALL EMPLOY A SURVEYOR OF HIS CHOICE FOR RECORDING VARIATIONS AND ALTERATIONS TO THE PROJECT. THIS SET WILL BE RETURNED TO THE CONSULTANTS WITHIN ONE (1) WEEK AFTER SUBSTANTIAL COMPLETION OF THE CONTRACT TO ENABLE THE CONSULTANTS TO PREPARE A PERMANENT SET OF "AS–BUILT" DRAWINGS. THE CONTRACTOR SHALL PROVIDE THE CONSULTANT DOCUMENTATION OF CHANGES, WHICH SHALL PROVIDE ALL DETAILS APPLICABLE TO THE CHANGES.

THE CONTRACTOR SHALL HAVE DATED PHOTOS OF THE WORK IN PROGRESS. THE PHOTOS SHALL BE PLACED INTO A BINDER FOR THE PROJECT RECORDS. ON COMPLETION OF THE CONTRACT, THE PHOTOS WILL BE SUPPLIED TO THE PROJECT ENGINEER.

23.0 RESTORATIONS

THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORATIONS OF ANY AND ALL OFF–SITE PAVEMENTS, DRIVEWAYS, FENCING, LANDSCAPING, AND LAWNS DISTURBED DURING THE COURSE OF CONSTRUCTION. TRENCH PAVEMENT RESTORATION SHALL BE COMPLETED AS DETAIL IN MMCD (2000) STANDARD DETAIL DRAWING NUMBER G5, TEMPORARY PAVEMENT TO BE PLACED TO "TOP OF TRENCH AS SHOWN IN MMCD DETAIL G5".

THE COST OF THE ABOVE WORKS SHALL BE INCLUDED IN THE CONTRACT PRICE.

24.0 TREE PRESERVATION

ALL WORKS WITHIN THE DRIP LINE OF A TREE WILL BE DONE UNDER THE DIRECTION OF THE UBC ARBORIST, COLIN VAMER 604–341–6020.

ALL TREES ARE TO BE PRESERVED AND THE CONTRACTOR SHALL NOT DAMAGE ANY TREES DURING CONSTRUCTION. IF THERE IS A CONFLICT WITH A TREE, THE CONTRACTOR SHALL SUBMIT A DRAWING TO THE PROJECT ENGINEER AND UBC LANDSCAPE ARCHITECT SHOWING TREES THAT MAY BE DAMAGED BY CONSTRUCTION. NO TREES ARE TO BE REMOVED OR TRIMMED WITHOUT WRITTEN APPROVAL FROM THE PROJECT ENGINEER. IF TREE ROOTS ARE ENCOUNTERED DURING CONSTRUCTION, THEY ARE TO BE HAND CUT.

25.0 SITE PARKING

CONTRACTOR WILL BE RESPONSIBLE TO PROVIDE SEVEN (7) DAYS NOTICE TO UBC PARKING AND ACCESS CONTROL WHEN EXISTING PARKING IS TO BE REMOVED OR ACCESS TO PARKING IS TO BE LIMITED. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ALL NECESSARY BARRICADES TO DEMARCATE THE No. PARKING AREAS. THE CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATION WITH UBC PARKING AND ACCESS CONTROL SERVICES.

CONTRACTOR MUST USE PUBLIC PARKING OR FIND ALTERNATIVES WITHIN SITE.

26.0 TRAFFIC MANAGEMENT PLAN

THE CONTRACTOR SHALL PREPARE AND SUBMIT A TRAFFIC MANAGEMENT PLAN FOR REVIEW AND ACCEPTANCE BY THE OWNERS & OWNERS REPRESENTATIVES. THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE ALL CONDITIONS IN THE APPROVED TRAFFIC MANAGEMENT ARE PROVIDED FOR DURING CONSTRUCTION OF THE WORKS.

27.0 FIRE ACCESS AND SAFETY PLAN

CONTRACTOR WILL BE RESPONSIBLE TO MAINTAIN EMERGENCY VEHICLE ACCESS AT ALL TIMES. A FIRE ACCESS AND SAFETY PLAN SHALL BE SUBMITTED TO THE CONSULTANT FIVE (5) DAYS AFTER ACCEPTANCE OF CONTRACT.

28.0 STREET LIGHTS AND TRAFFIC SIGNALS

THE CONTRACTOR IS REQUIRED TO RETAIN A QUALIFIED STREET LIGHTING CONTRACTOR. ALL WORKS SHALL BE COMPLETED IN ACCORDANCE WITH UBC TECHNICAL GUIDELINES, MMCD AND THE SPECIFICATIONS ON THE STREETLIGHT DRAWING. THE COST FOR STREET LIGHTING SHALL BE INCLUDED IN THE PRICING OF THE WORK.

29.0 PLACEMENT OF EXCAVATED MATERIALS

THE CONTRACTOR IS RESPONSIBLE FOR OFF–SITE DISPOSAL OF ALL SURPLUS AND/OR UNSUITABLE EXCAVATED NATIVE MATERIALS. THE COST FOR ALL DISPOSAL IS TO BE INCLUDED IN THE PRICING OF THE WORKS.

30.0 TRIUMF – RAPID TRANSFER LINE

THE CONTRACTOR IS HEREBY ADVISED OF THE PRESENCE OF A HIGH–SPEED TRANSFER CONDUIT UTILIZED BY TRIUMF FOR TRANSMISSION OF RADIOACTIVE MATERIALS. THE CONTRACTOR IS TO PROVIDE ADVANCE NOTICE TO ANNE TRUDEL, 604–622–7370 OF ALL SCHEDULED WORKS IN THE AREA OF THE TRANSFER LINE.

TRIUMF STAFF WILL BE IN ATTENDANCE AT THE PRE–CONSTRUCTION MEETING AND WILL PROVIDE INFORMATION AND ANSWER ANY QUESTIONS RELATED TO THE TRANSFER LINE.

31.0 ROCK REMOVAL

THE CONTRACTOR IS ADVISED THAT THE REMOVAL OF ANY ROCKS ENCOUNTERED DURING EXCAVATION FOR ANY WORKS THAT ARE PART OF THIS CONTACT IS CONSIDERED INCIDENTAL AND IS INCLUDED IN SCHEDULE OF CONTRACT PRICES. THERE WILL BE NO EXTRAS FOR ROCK REMOVAL.

32.0 CONSTRUCTION ADMINISTRATION

PRIOR TO COMMENCEMENT OF ANY WORKS, THE SUCCESSFUL BIDDER IS REQUIRED TO ATTEND A MANDATORY PRE–CONSTRUCTION MEETING. THE MEETING WILL BE ARRANGED BY THE OWNER AND WILL INCLUDE ALL REQUIRED PARTICIPANTS.

THE CONTRACTOR IS REQUIRED TO HAVE A FULL–TIME SUPERINTENDENT ON–SITE AT ALL TIMES DURING CONSTRUCTION.

THE CONTRACTOR IS TO PROVIDE BI–WEEKLY PROGRESS REPORTS TO THE ENGINEER COMPLETE WITH A FORECAST OF THE NEXT TWO WEEKS OF ANTICIPATED WORKS.

33.0 GEOTECHNICAL REPORT

THE CONTRACTOR WILL COMPLY WITH GEOTECHNICAL REPORT RECOMMENDATIONS (WHERE APPLICABLE). IF AVAILABLE A COPY OF THE GEOTECHNICAL REPORT CAN BE OBTAINED THROUGH THE CONSULTANT. WHERE SOILS CONDITIONS ARE NOT COVERED IN THE GEOTECHNICAL REPORT, THE CONTRACTOR WILL PROVIDE IS OWN GEOTECHNICAL CONSULTANT AT THE CONTRACTOR'S COST.

34.0 PAYMENT

IN ACCORDANCE WITH BILL 38, BC BUILDER'S LIEN ACT, THE OWNER WILL BE ACTING AS THE PAYMENT CERTIFIER.

35.0 THRUST BLOCK DETAILS

THE CONTRACTOR IS TO APPLY THRUST BLOCKS TO ALL WATERMAIN TEE, ELBOWS, AND CAPS AS PER THE FOLLOWING:

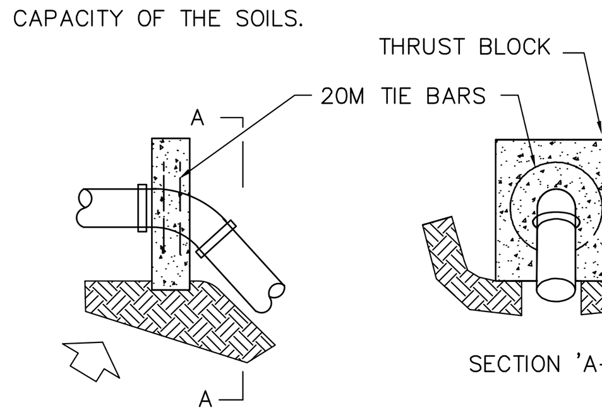
36.0 UBC TECHNICAL GUIDELINES SECTION 02660, CLAUSE 7.3.d. SHALL BE CHANGED TO

A FLANGE x HUB ISOLATION VALVE SHALL BE INSTALLED DIRECTLY AT THE WATERMAIN. IF THE LOCATION OF THE FIRE HYDRANT IS MORE THAN 6m FROM THE WATERMAIN, THEN A HUB x FLANGE ADDITIONAL ISOLATION VALVE SHALL BE INSTALLED NOT MORE THAN 1m IN FRONT OF THE FIRE HYDRANT.

NOTE:
1. THRUST BLOCKS OF 20MPa CONCRETE TO BE PLACED AGAINST UNDISTURBED GROUND.
2. CONCRETE SHALL NOT COVER FITTINGS, BELLS, OR FLANGES.
3. THE THRUST BLOCK TABLE IS BASED ON SOIL BEARING STRENGTH OF 70kPa AT 1380kPa WORKING PRESSURE.
4. THE CONTRACTOR WILL VERIFY THE BEARING CAPACITY OF THE SOILS.

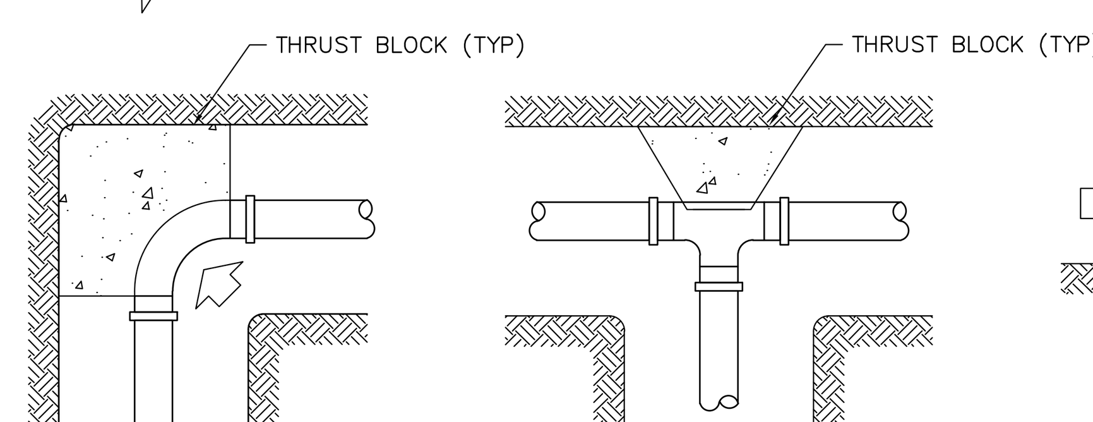
THRUST BLOCK BEARING AREA IN m2.

PIPE SIZE	TEES DEAD ENDS	90ø BENDS	45ø BENDS	22–1/2ø BENDS
100	0.2	0.3	0.15	0.1
150	0.4	0.5	0.3	0.2
200	0.6	0.9	0.5	0.3
250	1.0	1.4	0.7	0.4
300	1.4	2.0	1.1	0.5
350	1.9	2.7	1.5	0.7
400	2.5	3.5	1.9	1.0

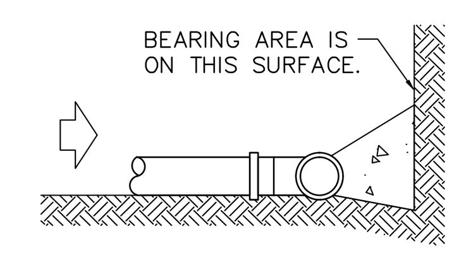


VERTICAL BENDS
(TYP. SCHEMATIC)

= THRUST DIRECTION



PLAN VIEWS
(TYP. SCHEMATIC)



SIDE VIEW
(TYP. SCHEMATIC)

WATER DISTRIBUTION SECTION 02660

1.0 GENERAL

1.1 SYSTEM DESCRIPTION

.1 THE UNIVERSITY OF BRITISH COLUMBIA OWNS AND OPERATES ITS OWN WATER DISTRIBUTION SYSTEM. THE UNIVERSITY ENDOWMENT LANDS (UEL) ADMINISTRATION SUPPLIES WATER TO THE CAMPUS, WHILE THE UEL PURCHASES WATER FROM METRO VANCOUVER (GVRD). UEL AND UBC ARE FED FROM GVRD'S SASAMAT RESERVOIR LOCATED SOUTH OF 16TH AVENUE IN PACIFIC SPIRIT PARK. ULTIMATELY TWO PIPES FEED UBC:

.1 24" (600mm) WATER MAIN ON UNIVERSITY BOULEVARD, WHICH IS THE SUCTION LINE SUPPLYING THREE CENTRAL BOOSTER PUMPS LOCATED IN THE POWERHOUSE. THE DISCHARGE PRESSURE FROM THE POWERHOUSE BOOSTER PUMPS IS SET AT 100 PSIG (689 kPa). THIS SUPPLIES UBC'S "HIGH–PRESSURE ZONE."

.2 12" (300mm) WATER MAIN ON 16TH AVENUE, WHICH SUPPLIES UBC'S "LOW–PRESSURE ZONE" THE LOW–PRESSURE ZONE IS SEPARATED FROM THE HIGH–PRESSURE ZONE BY EIGHT PRESSURE REDUCING VALVE (PRV) STATIONS.

2.0 MATERIALS AND DESIGN REQUIREMENTS

2.1 RESPONSIBILITIES

.1 UBC ENERGY & WATER SERVICES IS PRIMARILY RESPONSIBLE FOR OPERATION, MAINTENANCE, AND OVERALL STEWARDSHIP OF THE WATER DISTRIBUTION SYSTEM.
.2 KEY POSITIONS IN UBC ENERGY & WATER SERVICES ARE DESCRIBED IN DIVISION 2, SECTION 02610 OF UBC TECHNICAL GUIDELINES.
.3 UNLESS OTHERWISE AGREED IN WRITING, THE PROJECT DESIGNER IS RESPONSIBLE FOR ALL DESIGN, PERMIT, AND INSPECTION REQUIREMENTS OF THE B.C. PLUMBING CODE.
.5 THE PROJECT DESIGNER MUST INCORPORATE ALL SPECIFIC REQUIREMENTS FOR METERING, DESIGN AND MATERIALS, AND EXECUTION OF THIS SECTION INTO THE CONTRACT DRAWINGS IN THE FORM OF JOB–SPECIFIC NOTES. ONLY MAKING REFERENCE TO UBC TECHNICAL GUIDELINES IN THE DRAWINGS IS NOT SUFFICIENT.

2.2 WATER DISTRIBUTION STANDARDS & POLICIES

.1 THE LATEST REVISIONS OF THE FOLLOWING STANDARDS SHALL APPLY TO WATER DISTRIBUTION AT UBC.

.1 UBC SUSTAINABILITY DEVELOPMENT POLICY #5 (HTTP://UNIVERSITYCOUNSEL.UBC.CA/POLICIES/INDEX)
.2 B.C. MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (MMCD)
.3 B.C. WATER & WASTE ASSOCIATION (BCWWA)
.4 AMERICAN WATER WORKS ASSOCIATION
.5 CSA STANDARDS (AS APPLICABLE);

.2 WHERE THERE IS A DIFFERENCE BETWEEN THESE, DIVISION 2, SECTION 02660 AND THE REFERENCED STANDARDS, UBC TECHNICAL GUIDELINES SHALL APPLY.

2.6 SERVICE CONNECTIONS AND WATER MAINS

.6 PIPE SHALL BE CLASS 50 DUCTILE IRON PIPE MANUFACTURED TO AWWA C151, CEMENT MORTAR LINED TO AWWA C104 AND COATED 1 MIL THICK ASPHALT.
.7 COPPER, UP TO 75 mm DIAMETER, TYPE K, JOINTS BRAZED ONLY.
.8 JOINTS SHALL BE SINGLE RUBBER GASKET FOR PUSH–ON BELL AND SPIGOT TYPE JOINTS TO AWWA C111, TYTON OR APPROVED EQUAL.
.9 FLANGED JOINTS SHALL BE AWWA C110, FLAT FACED CONFORMING TO ANSI B16.1, CLASS 125
.10 FITTINGS SHALL BE DUCTILE TO AWWA C110 SUITABLE FOR PRESSURE RATING OF 2415 kPa CEMENT MORTAR LINED TO AWWA C104. MINIMUM DESIGN PRESSURE FOR PIPING 1,210 kPa
.11 BOLTS SHALL BE MEDIUM CARBON STEEL OR MARTENSITIC STEEL, ASTM A325 HEAVY HEX FINISHED, HOT–DIP GALVANIZED TO ASTM A153. COARSE THREADS SHALL HAVE CLASS 2A TOLERANCE BEFORE GALVANIZING. BOLT SIZES TO AWWA110.
.12 NUTS SHALL BE HEAVY STEEL HEX CARBON STEEL TO ASTM A563 GRADE C HOT–DIP GALVANIZED TO ASTM A153.
.13 TIE RODS SHALL BE CONTINUOUSLY THREADED, QUENCHED AND TEMPERED ALLOYED STEEL TO ASTM A354, GRADE BC, HOT–DIP GALVANIZED TO ASTM A153.
.14 JOINT RESTRAINT DEVICES:
.1 EACH JOINT SHALL BE RESTRAINED WITH THE SOCKET PIPE CLAMP OR EQUAL, WITH PRIOR APPROVAL.

2.7 VALVES AND VALVE BOXES

.1 GATE VALVES SHALL BE MANUFACTURED TO AWWA C509, DUCTILE IRON BODY, RESILIENT SEATED, NON–RISING STEAM, HUB OR FLANGED ENDS.
.2 STEM SEAL SHALL BE O–RING TYPE. VALVES TO BE COMPLETED WITH 50mm SQUARE NUT FOR UNDERGROUND OPERATION. MANUFACTURER SHALL BE CLOW, OR EQUAL APPROVED BY BUILDING OPERATIONS
.3 CIRCULAR VALVE BOXES SHALL BE NELSON–TYPE AS MANUFACTURED BY TERMINAL CITY OR DOBNEY FOUNDRY. VALVE BOX RISER PIPE TO BE 150mm DIAMETER PVC DR35.
.4 MAXIMUM DISTANCE BETWEEN ISOLATING DISTRIBUTION VALVES TO BE 100m.
.5 MAXIMUM DEPTH OF VALVE KNUCKLES TO BE 600mm.

2.8 HYDRANTS

.1 FIRE HYDRANTS TO BE 150mm DIAMETER TERMINAL CITY TYPE C–71–P HYDRANTS SUBJECTED TO HYDROSTATIC PRESSURE TEST OF 2070 kPa IN COMPLIANCE WITH AWWA C502.
.2 MAXIMUM DISTANCE 100m.
.3 MINIMUM SIZE OF PIPE CONNECTION 150mm.
.4 FIRE HYDRANT SHALL HAVE ISOLATION VALVE NOT MORE THAN 6.0m IN FRONT OF IT.
.5 FOR HYDRANT INSTALLATION REQUIREMENTS SEE STANDARD DWG. 1140–UT–02FIREHYDRANTDETAIL.DWG

2.9 HEAVY EQUIPMENT LOADS ON BURIED PIPE

.1 LOADS ON SHALLOW BURIED PIPE SHALL BE EVALUATED IN THE DESIGN AND CONSTRUCTION PLANNING PHASES. AWWA M41, SECTION 4.3 CAN BE USED AS A GUIDE FOR THIS EVALUATION.

3.0 EXECUTION REQUIREMENTS

3.1 PREPARATION .1 AS PER MMCD SECTION 02666

3.2 TRENCHING .1 AS PER MMCD SECTION 02666
.2 TRENCH ALIGNMENT AND DEPTH AS SHOWN ON CONTRACT DRAWINGS OR AS APPROVED OTHERWISE BY MECHANICAL DISTRIBUTION ENGINEER (tel: 604–822–3274, fax:604–822–8833).

3.3 GRANULAR BEDDING

.1 AS PER MMCD SECTION 02666
.2 MINIMUM SOIL COVER TO BE 1.0m.
.3 FOR PIPE BEDDING USE CLEAN GRANULAR PIPE BEDDING, GRADED GRAVEL, 19mm (–), MMS TYPE 1. BOTTOM THICKNESS SHALL BE A QUARTER OF PIPE DIAMETER, OR MINIMUM 100mm THICK. TOP SHALL BE MINIMUM 300mm THICK. SIDES SHALL BE MINIMUM 225mm TO MAXIMUM 300mm THICK.
.4 PLACE GRANULAR BEDDING (SAND) MATERIAL ACROSS FULL WIDTH OF TRENCH BOTTOM IN UNIFORM LAYERS TO 100mm DEPTH.
.5 USE IMPORTED BEDDING WHEN PROPOSED WORK IS INSTALLED UNDER THROUGH PAVED AREAS, WHEN UTILITIES MECHANICAL ENGINEER DEEMS NATIVE MATERIAL UNSUITABLE FOR BACKFILL, OR WHEN TRENCH HAS BEEN EXCAVATED IN ROCK. OTHERWISE FOR TRENCH BACKFILL, NATIVE BACKFILL MAY BE USED IF FREE OF ROCK GREATER THAN 25mm AND LOCATED IN BOULEVARDS OR EASEMENTS. APPROVAL BY UBC ENERGY & WATER SERVICES IS REQUIRED.

3.4 PIPE INSTALLATION

.1 AS PER MMCD SECTION 02666
.2 UTILITY SEPERATION: A MINIMUM 3m HORIZONTAL CLEARANCE IS REQUIRED FROM EITHER SANITARY SEWER OR STORM SEWER PIPING, WHEN THEY RUN PARALLEL TO WATER MAIN. IF THIS CLEARANCE CANNOT BE MET, WATER PIPING CAN BE INSTALLED CLOSER WITH PRIOR APPROVAL FROM UBC ENERGY & WATER SERVICES. REFER TO MMCD DESIGN GUIDELINE MANUAL SECTION 1.4, AND VANCOUVER COASTAL HEALTH'S WATER SUPPLY SYSTEM CONSTRUCTION PERMIT GUIDELINES ANS APPLICATION FORM (SEE 2.1.4 THIS SECTION). INSTALLATION MAY BE APPROVED PROVIDED WATER PIPE IS INSTALLED ABOVE SANITARY OR STORM SEWER PIPING WITH MINIMUM VERTICAL CLEARANCE 0.5m AND WATER MAIN JOINTS ARE WRAPPED. WHEN CROSSING SANITARY SEWERS AT 90° ANGLE, THE WATER PIPESHALL BE ENCASED WITH 20 MPa CONCRETE MINIMUM THICKNESS OF 150mm. IF CONCRETEIS NOT DESIRABLE, JOINTS OF THE WATER MAIN CAN BE WRAPPED WITH HEAT SHRINK PLASTICOR PACKED WITH COMPOUND AND WRAPPED WITH PETROLEUM TAPE IN ACCORDANCE WITH THELATEST VERSION OF THE AWWA STANDARDS C217, AND C214 OR C209.
.3 MINIMUM 750mm CLEARANCE IS REQUIRED FROM ALL OTHER SERVICES.
.4 WHEN CROSSING ELECTRIC DUCT BANK (CROSSING SHALL BE DONE AT 90°), RUN PIPE WITH MINIMUM VERTICAL CLEARANCE 150mm FROM THE BOTTOM OF ELECTRIC DUCT BANK. IF CROSSING OF ELECTRICAL DUCTBANK CANNOT BE DONE IN THIS MANNER, THEN ENCASE WATER PIPE IN ONE LARGER PLASTIC PIPE PROJECTION MINIMUM 500mm FROM EITHER SIDE OF ELECTRIC DUCTBANK.
.5 TEST AND/OR BLEED POINTS CONSISTING OF CORPORATION COCKS, SIZED TO ACHIEVE MINIMUM FLUSHING VELOCITY OF 0.8m/s IN ACCORDANCE WITH AWW C651, TO BE PROVIDED WHERE SHOWN ON CONTRACT DRAWINGS OR AS REQUIRED BY UTILITIES MECHANICAL ENGINEER FOR PRESSURE TESTING AND FLUSHING.
.6 REQUIREMENTS FOR PIPING INTO BUILDING'S MECHANICAL ROOM AS PER DRAWING 1140–UT–01WATERSTATIONSCHEMATIC.
.7 REQUIREMENTS FOR REPLACING CAST IRON OR ASBESTOS CEMENT WATERMAINS AT UTILITY EXCAVATIONS ARE TO BE AS SHOWN IN DRAWING 1140–UT–09 WATER MAINS AT EXCAVATIONS. WHERE WATER PIPES CROSS UNDER WALL FOUNDATIONS, THEY MUST BE BUILT OF DUCTILE IRON FOR A DISTANCE OF AT LEAST 3.0m ON EITHER SIDE OF THE WALL, TO AVOID SETTLEMENT CRACKING.
.8 WHEN EXCAVATING OVER EXISTING A/C OR CAST IRON WATERMAINS, ONLY CONTROLLED DENSITY BACKFILL SHALL BE USED. NO COMPACTION IS PERMITTED.

3.5 VALVE INSTALLATION

.1 AS PER MMCD SECTION 02666
.2 AT EVERY VALVE AND FITTING INSTALL UP TO 3.0m LENGTH OF TIE RODS ON EACH SIDE OF VALVE/FITTING AND EACH BRANCH, WHEN PIPE COUPLINGS ARE USED.

3.6 HYDRANTS

.1 AS PER MMCD SECTION 02666
.2 FOR HYDRANTS NOT IN SERVICE, PLACE AN ORANGE PAINTED SIGN, 30cm x 30cm, LETTERED "NOT IN SERVICE" ON THE MAIN PORT. REMOVE WHEN WATER MAIN IS ACCEPTED BY THE MECHANICAL DISTRIBUTION ENGINEER.

3.7 THRUST BLOCKS

.1 AS PER MMCD SECTION 02666
.2 PLACE CONCRETE THRUST BLOCKS BETWEEN VALVES, TEES, WYES, PLUGS, CAPS, BENDS AND UNDISTURBED GROUND AS SHOWN ON THE CONTRACT DRAWINGS OR AS DIRECTED BY MECHANICAL DISTRIBUTION ENGINEER.
.3 THRUST BLOCKS TO UNDISTURBED SOIL SHALL BE PROVIDED, COMPLETE WITH BEARING AREA AND BLOCK VOLUME.

3.8 PIPE SURROUND AND BACKFILL

.1 AS PER MMCD SECTION 02666
.2 UPON COMPLETION OF PIPE LAYING AND BEFORE BACKFILLING, CONTRACTOR SHALL NOTIFY FOR INSPECTION MECHANICAL DISTRIBUTION ENGINEER (fax: 604–822–8833) AND UBC ENERGY & WATER SERVICES HEAD PLUMBER (fax: 604–822–4416). NOTIFICATION FOR INSPECTION SHALL BE PROVIDED 24 HOURS IN ADVANCE.
.3 AFTER INSPECTION OF WORK IN PLACE, SURROUND AND COVER PIPES.
.4 FOR TRENCH BACKFILL NATIVE BACKFILL MATERIAL MAY BE USED IN BOULEVARD AND EASEMENT AREAS IF FREE OF ROCK GREATER THAN 25mm. APPROVAL FROM UBC ENERGY & WATER SERVICES IS REQUIRED.

3.9 CLEANING AND PRELIMINARY FLUSHING

.1 AS PER MMCD SECTION 02666
.2 WATER MAY BE SUPPLIED FROM UBC FIRE HYDRANTS UPON APPLICATION FOR A HYDRANT PERMIT

3.10 TESTING AND FLUSHING PROCEDURES

.1 AS PER MMCD SECTION 02666
.2 CONTRACTOR SHALL NOTIFY MECHANICAL DISTRIBUTION ENGINEER (fax: 604–822–8833) AND UBC ENERGY & WATER SERVICES HEAD PLUMBER 24 HOURS IN ADVANCE OF TESTING (fax: 604–822–4416). USE THE UTILITY SERVICE ACTIVATION REQUEST FORM.
.3 PERFORM ALL TESTS IN PRESENCE OF MECHANICAL DISTRIBUTION ENGINEER.
.4 TESTING PROCEDURE & REPORT AS PER MMCD SECTION 02666
.5 A CONCISE, WRITTEN AND SIGNED REPORT SHALL BE PROVIDED VIA FACSIMILE TO BOTH THE MECHANICAL DISTRIBUTION ENGINEER AND THE MANAGER, MECHANICAL DISTRIBUTION SERVICES (fax: 604–822–8833)

3.11 DISINFECTION AND FLUSHING

.1 AS PER MMCD SECTION 02666
.2 PERFORM DISINFECTION PROCEDURE AND RESIDUAL CHLORINE TEST IN PRESENCE OF MECHANICAL DISTRIBUTION ENGINEER.
.3 MAINTAIN WATER CHLORINATING LEVEL (FREE CHLORINE CONCENTRATION mm. 25mg/L) IN NEW PIPING FOR MINIMUM 24 HOURS.
.4 BEFORE CONNECTION TO UBC WATER SYSTEM, FLUSH PIPING CLEAN UNTIL MAXIMUM FREE CHLORINE CONCENTRATION IS LESS THAN 0.3mg/L. ANY FLUSHED WATER ON OR SOUTH OF AGRONOMY ROAD MUST BE DE–CHLORINATED IN A MANNER THAT IT DOES NOT POSE THREAT TO AQUATIC LIFE IN BOOMING GROUND CREEK.

3.12 TESTING NEW MAINS

.1 AFTER DISINFECTION AND FLUSHING, THE NEW MAIN IS FILLED WITH POTABLE WATER AND SAMPLED FOR TOTAL COLIFORM AND E. COLI BACTERIA (BUG TEST) EVERY 350m.
.2 IF A SAMPLE FAILS THE TEST, THE MAIN SHALL BE FLUSHED AND THE SAMPLING REPEATED. IF FLUSHING DOES NOT RESULT IN AN ACCEPTABLE TEST, THE MAIN SHOULD BE DISINFECTED AGAIN.

3.13 SHUTDOWNS & CONNECTIONS

.1 SHUTDOWNS MUST BE REQUESTED IN WRITING ADHERING TO UBC'S CAMPUS–WIDE STANDARD SHUTDOWN PROCEDURES. OBTAIN A SERVICE SHUTDOWN REQUEST FORM AND UTILITY SERVICE ACTIVATION REQUEST FORM FROM: HTTP://WWW.BUILDINGOPERATIONS.UBC.CA/RESOURCES/POLICIES–PROCEDURES–FORMS/
.2 OPERATING VALVES ON THE WATER DISTRIBUTION SYSTEM SHALL ONLY BE PERFORMED BY UBC ENERGY & WATER SERVICES.
.3 CONNECTIONS TO EXISTING WATERWORKS SYSTEM MAY BE MADE BY CONTRACTOR WITH APPROVED DESIGN AND PROPER NOTIFICATION.
.4 NOTIFY MECHANICAL DISTRIBUTION ENGINEER (fax: 604–822–8833) AND UBC ENERGY & WATER SERVICES HEAD PLUMBER (fax: 604–822–4416) WITH A MINIMUM 24 HOURS IN ADVANCE OF SCHEDULED CONNECTION.
.5 MAKE CONNECTIONS IN PRESENCE OF MECHANICAL DISTRIBUTION ENGINEER OR UBC ENERGY & WATER SERVICES HEAD PLUMBER. TO PREVENT DAMAGE TO EXISTING UTILITIES, EXCAVATE LAST 300mm OVER UTILITY BY HAND
.6 HOT TAPPING IS GENERALLY NOT ACCEPTED. IF THERE ARE EXCEPTIONAL CIRCUMSTANCES, HOT TAPPING MAY BE REQUESTED IN WRITING, AND DONE ONLY WITH PRIOR WRITTEN PERMISSION FROM THE MANAGER, MECHANICAL DISTRIBUTION SERVICES, UBC ENERGY & WATER SERVICES.

END OF SECTION 02660

REVISIONS

No.	DESCRIPTION	MO/DAY/YR
6		
5		
4		
3	SLP 2 SUBMISSION – SERVICING	05/18/2016
2	SLP SUBMISSION	12/11/2015
1	ISSUE FOR TENDER / FOUNDATION BP	08/18/2015

KAMPS ENGINEERING LIMITED
604-682-2020 kamps@rogers.com

UBC PROPERTIES TRUST

CLIENT: UBC PROPERTIES TRUST

BUILDING/FACILITY:

DRAWING TITLE: DETAILED SPECIFICATIONS - GENERAL / WATER DISTRIBUTION

SEAL

PROJECT TITLE: BROCK COMMONS PHASE 1

DRAWN: J.N.	SCALE: NTS	PROJECT No.: 8122	
DESIGN: M.K.	DATE: AUG. 2015	DRAWING No.: 207	REV.: 3
CHECKED:			

SANITARY SEWERS SECTION 02730

1.0 GENERAL

1.1 RELATED UBC GUIDELINES

.1 02735s CCTV PIPELINE INSPECTION
(SEE HTTP://WWW.BUILDINGOPERATIONS.UBC.CA/RESOURCES/POLICIES-PROCEDURES-FORMS/ UNDER WORK PROCEDURES)

.2 02736 CLEANING OF SEWERS (LINK AS ABOVE)

1.2 SYSTEM DESCRIPTION

.1 THE CAMPUS HAS A DEDICATED SANITARY SEWER SYSTEM WHICH DISCHARGES TO THE GVS & DD TRUNK SYSTEM; BOTH TO THE NORTH AND TO THE SOUTH. THERE ARE CURRENTLY 5 COMMUNAL PUMP STATIONS AND 30 INDIVIDUAL BUILDING PUMP STATIONS WITHIN THE CAMPUS WIDE SYSTEM. EACH DISCHARGE TO THE GVRD SYSTEM IS EQUIPPED WITH A FLOW METER.

2.0 MATERIALS AND DESIGN REQUIREMENTS

2.1 RESPONSIBILITIES

.1 UBC ENERGY & WATER SERVICES IS PRIMARILY RESPONSIBLE FOR OPERATION, MAINTENANCE, AND OVERALL STEWARDSHIP OF THE SANITARY SEWERS IN COOPERATION WITH THE FOLLOWING DEPARTMENTS/ORGANIZATIONS:
- .1 UBC HEALTH, SAFETY, & ENVIRONMENT.
- .2 UBC SUSTAINABILITY.
- .3 UBC PROPERTIES TRUST.
- .4 UBC CAMPUS PLANNING & DEVELOPMENT.
- .5 UBC BUILDING OPERATIONS.

.2 THE DEMARCATION OF UBC ENERGY & WATER SERVICES POINT OF SERVICE IS DEFINED IN THE STANDARD DRAWING FOUND UNDER DIVISION 2 SECTION LISTINGS HERE: (HTTP://WWW.TECHNICALGUIDELINES.UBC.CA/TECHNICAL/DIVISIONAL_SPECS.HTML)

.3 THE PROJECT DESIGNER MUST INCORPORATE ALL SPECIFIC REQUIREMENTS FOR DESIGN AND MATERIALS AND EXECUTION OF THIS SECTION INTO THE CONTRACT DRAWINGS IN THE FORM OF JOB-SPECIFIC NOTES. ONLY MAKING REFERENCE TO UBC TECHNICAL GUIDELINES IN THE DRAWINGS IS NOT SUFFICIENT.

2.2 SANITARY SEWER STANDARDS

.1 THE LATEST REVISIONS OF THE FOLLOWING STANDARDS SHALL APPLY TO SANITARY SEWERS AT UBC:
- .1 B.C. MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (MMCD)
- .2 GVRD SEWER USE BYLAW No. 164 – INCLUDING SCHEDULES A, B, C, AND D
- .3 UBC ENVIRONMENTAL PROTECTION POLICY # 6 (HTTP://UNIVERSITYCOUNSEL.UBC.CA/POLICIES/INDEX/)
- .4 UBC SUSTAINABILITY DEVELOPMENT POLICY # 5 (HTTP://UNIVERSITYCOUNSEL.UBC.CA/POLICIES/INDEX/)
- .5 B.C. PROVINCIAL HEALTH ACT

2.6 MATERIALS

.1 UNLESS OTHERWISE APPROVED IN WRITING BY THE MANAGER OF MECHANICAL DISTRIBUTION SERVICES, UBC ENERGY & WATER SERVICES, ONLY THE FOLLOWING PIPE MATERIAL SHALL BE USED FOR THE GRAVITY SANITARY SEWER SYSTEM:
- .1 PVC, CLASS SDR 28 (150mm ø AND SMALLER) AND SDR 35.
- .2 CONCRETE (REINFORCED C76 REQUIRED FOR ALL PIPES 600mm IN DIAMETER AND LARGER).
- .3 PVC PIPING IS PREFERRED FOR ALL PIPING 450mm IN DIAMETER OF SMALLER.

.2 UNLESS OTHERWISE APPROVED IN WRITING BY THE MANAGER, MECHANICAL DISTRIBUTION SERVICES, UBC ENERGY & WATER SERVICES, ONLY THE FOLLOWING PIPE MATERIAL SHALL BE USED FOR SANITARY SEWER FORCEMAINS:
- .1 PVC, CLASS C900 (300mm ø AND SMALLER) AND C905.
- .2 DUCTILE IRON (DI), CLASS C151.
- .3 PVC PIPING IS PREFERRED, THEREFORE, DI PIPE SHALL ONLY BE APPROVED UNDER UNIQUE CIRCUMSTANCES.

3.0 EXECUTION REQUIREMENTS

.1 SANITARY SEWER WORKS AND APPURTENANCES SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT MMCD STANDARDS AND SPECIFICATION, UNLESS OTHERWISE NOTED.

.2 IF TEMPORARY BYPASS PUMPING IS REQUIRED, THE FOLLOWING ITEMS ARE REQUIRED:
- .1 CONTRACTOR TO PROVIDE NOTICE OF WORK TO RESIDENTS MINIMUM 1 WEEK PRIOR TO COMMENCING (DATE ON LETTER).
- .2 CONTRACTOR SHALL INSTALL TEMPORARY BYPASS PUMPING SYSTEM AROUND THE DESIGNATED SEWER SECTIONS IN ACCORDANCE WITH PRE-SUBMITTED ARRANGEMENT.
- .3 PUMPS AND BYPASS LINES SHALL BE OF ADEQUATE CAPACITY TO ACCOMMODATE PRE-DETERMINED FLOWS AS SPECIFIED IN THE CONTRACT DOCUMENTS. A "DUPLEX" PUMP SYSTEM IS TO BE USED TO PROVIDE 100% REDUNDANCY.
- .4 CONTRACTOR TO TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SPILLS TO THE ENVIRONMENT OR BACKUP OF SEWERAGE ONTO PRIVATE PROPERTY. IN THE EVENT OF A SPILL CONTRACTOR SHALL BE RESPONSIBLE FOR IMMEDIATE CLEAN-UP OPERATION AND REMEDIATION OF DAMAGED PROPERTY.
- .5 CONTRACTOR SHALL REPORT ANY SPILLS AND BACK-UPS TO UBC ENERGY & WATER SERVICES MECHANICAL DISTRIBUTION ENGINEER IMMEDIATELY.

.3 MINIMUM COVER ON ALL SANITARY SEWERS SHALL BE 1.0m IN ACCORDANCE WITH THE MMCD STANDARDS. WHERE NO FUTURE MAIN LINE EXTENSION OR CONNECTION OF SERVICES IS REQUIRED, AND WHERE NO TRAFFIC ROAD EXISTS OR IN FUTURE WILL EXIST, MINIMUM COVER MAY BE REDUCED TO 600mm WITH SPECIAL APPROVAL.

.4 ALL PIPE SURROUND MATERIAL SHALL CONSIST OF CLEAN GRANULAR MMCD TYPE 1 BEDDING.

.5 NATIVE BACKFILL MAY BE USED IN NON-TRAVELED AREA IF FREE OF ROCK GREATER THAN 25mm IN BOULEVARDS AND EASEMENT AREAS ONLY. APPROVAL BY UBC ENERGY & WATER SERVICES IS REQUIRED.

.6 FOR PURPOSES OF CLEANING AND FLUSHING, WATER MAY BE SUPPLIED FROM UBC FIRE HYDRANTS UPON APPLICATION FOR A HYDRANT USE PERMIT. REFER TO: HTTP://WWW.BUILDINGOPERATIONS.UBC.CA/RESOURCES/POLICIES-PROCEDURES-FORMS/ UNDER FORMS.

.7 ALL GRAVITY SANITARY SEWER SYSTEMS SHALL BE LOW PRESSURE AIR TESTED IN ACCORDANCE WITH THE MMCD SECTION 02731, CLAUSE 3.14.

.8 AS PER UTILITIES SUPPLEMENTALS 02735s AND 02736s (SEE ITEM 1.1), A CONCISE, WRITTEN AND SIGNED REPORT AND VIDEO TAPE OR DVD DISK SHALL BE PROVIDED TO MECHANICAL DISTRIBUTION ENGINEER & MANAGER, MECHANICAL DISTRIBUTION SERVICES (FAX: 604-822-8833)

.9 PRIOR TO COVERING THE PIPE, ALL INSTALLED AND BEDDED PIPE SHALL BE INSPECTED BY UBC ENERGY & WATER SERVICES. THE CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO BOTH THE MECHANICAL DISTRIBUTION ENGINEER (tel: 604-822-3274, fax. 604-822-8833) AND THE HEAD PLUMBER (fax. 604-822-4416) WITH A MINIMUM OF 24 HOURS NOTICE.

.10 RECORDS OF PIPE SIZES AND INVERTS SHALL BE PROVIDED TO INFASTRUCTURE DEVELOPMENT, RECORDS; AND TO THE MANAGER, MECHANICAL UTILITIES, UBC ENERGY & WATER SERVICES; IN ACCORDANCE WITH THE SECTION 01781 AND 02610 OF THESE GUIDELINES.

.11 WHERE NOTIFICATION REQUIREMENTS ARE NOT MET, SERVICES MAY NEED TO BE RE-EXCAVATED FOR INSPECTION AND/OR TESTING UPON REQUEST OF UBC ENERGY & WATER SERVICES.

END OF SECTION 02730

STORM SEWERS SECTION 02720

1.0 GENERAL

1.1 RELATED UBC GUIDELINES

.1 02735s CCTV PIPELINE INSPECTION
(SEE HTTP://WWW.BUILDINGOPERATIONS.UBC.CA/RESOURCES/POLICIES-PROCEDURES-FORMS/ UNDER WORK PROCEDURES)

.2 02736 CLEANING OF SEWERS (LINK AS ABOVE)

1.2 SYSTEM DESCRIPTION

.1 THE CAMPUS HAS A DEDICATED STORM DRAINAGE SYSTEM WHICH DISCHARGES TO THE OCEAN ON THE NORTH. THE SOUTH DISCHARGES TO BOOMING GROUND CREEK AND TO THE FRASER RIVER.

2.0 MATERIALS AND DESIGN REQUIREMENTS

2.1 RESPONSIBILITIES

.1 UBC ENERGY & WATER SERVICES IS PRIMARILY RESPONSIBLE FOR OPERATION, MAINTENANCE, AND OVERALL STEWARDSHIPOF THE STORM SEWERS IN COOPERATION WITH THE FOLLOWING DEPARTMENTS/ORGANIZATIONS:
- .1 UBC HEALTH, SAFETY, & ENVIRONMENT.
- .2 UBC SUSTAINABILITY.
- .3 UBC PROPERTIES TRUST.
- .4 UBC CAMPUS AND COMMUNITY PLANNING
- .5 UBC BUILDING OPERATIONS.

.2 THE DEMARCATION OF UBC ENERGY & WATER SERVICES POINT OF SERVICE IS DEFINED IN THE STANDARD DRAWING 1120-UT-01-STORMDEMARC.DWG FOUND UNDER DIVISION 2 SECTION LISTINGS HERE: (HTTP://WWW.TECHNICALGUIDELINES.UBC.CA/TECHNICAL/DIVISIONAL_SPECS.HTML)

.3 THE PROJECT DESIGNER MUST INCORPORATE ALL SPECIFIC REQUIREMENTS FOR DESIGN AND MATERIALS AND EXECUTION OF THIS SECTION INTO THE CONTRACT DRAWINGS IN THE FORM OF JOB-SPECIFIC NOTES. ONLY MAKING REFERENCE TO UBC TECHNICAL GUIDELINES IN THE DRAWINGS IS NOT SUFFICIENT.

2.2 STORMWATER OBJECTIVES AND STANDARDS

.1 THE LATEST REVISIONS OF THE FOLLOWING STANDARDS SHALL APPLY TO STORM SEWERS AT UBC:
- .1 B.C. MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (MMCD)
- .2 GVRD SEWER USE BYLAW No. 164
- .3 UBC ENVIRONMENTAL PROTECTION POLICY # 6 (HTTP://UNIVERSITYCOUNSEL.UBC.CA/POLICIES/INDEX/)
- .4 UBC SUSTAINABILITY DEVELOPMENT POLICY # 5 (HTTP://UNIVERSITYCOUNSEL.UBC.CA/POLICIES/INDEX/)
- .5 FISHERIES ACT
- .6 AN INTEGRATED STORM-WATER MANAGEMENT PLAN (ISMP) IS CURRENTLY BEING PREPARED FOR THE UBCO POINT GREY CAMPUS (JULY 2008). THE OBJECTIVE OF THE ISMP ARE TO GUIDE THE OVERARCHING DESIGN PHILOSOPHY FOR ANY STORM-WATER PLANNING, CONSTRUCTION AND MAINTENANCE AT THE WATERSHED AND SUBDIVISION LEVELS.

.2 THE FOLLOWING GUIDELINES SHOULD BE CONSIDERED IN DESIGN AND CONSTRUCTION OF STORMWATER SYSTEMS:
- .1 BEST MANAGEMENT PRACTICES (BMP) GUIDE FOR STORMWATER, GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT LIQUID WASTE MANAGEMENT PLAN. SEARCH THE HTTP://WWW.METROVANCOUVER.ORG WEBSITE

2.6 MATERIALS

.1 UNLESS OTHERWISE APPROVED BY THE MANAGER, MECHANICAL DISTRIBUTION SERVICES, UBC ENERGY & WATER SERVICES, THE FOLLOWING PIPE MATERIAL SHALL BE USED FOR THE GRAVITY STORM SEWER SYSTEM:
- .1 PVC, CLASS SDR 28 (150mm ø AND SMALLER) AND SDR 35.
- .2 CONCRETE (REINFORCED C76 REQUIRED FOR ALL PIPES 600mm IN DIAMETER OR LARGER).
- .3 CORRUGATED HDPE HAVING A MINIMUM PIPE STIFFNESS OF 320 kPA MAY BE PERMITTED UNDER UNIQUE CIRCUMSTANCES.
- .4 PVC PIPING IS PREFERRED FOR ALL PIPING 300mm IN DIAMETER OR SMALLER.

3.0 EXECUTION REQUIREMENTS

.1 STORM SEWER WORKS AND APPURTENANCES SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT MMCD STANDARDS AND SPECIFICATION, UNLESS OTHERWISE NOTED.

.2 MINIMUM COVER ON ALL STORM SEWERS SHALL BE 1.0m IN ACCORDANCE WITH THE MMCD STANDARDS. WHERE NO FUTURE MAIN LINE EXTENSION OR CONNECTION OF SERVICES, LAWNBASINS, OR CATCH BASINS IS REQUIRED, AND WHERE NO TRAFFIC ROAD EXISTS OR IN FUTURE WILL EXIST, MINIMUM COVER MAY BE REDUCED TO 600mm WITH SPECIAL APPROVAL.

.3 SITE GRADING AND SURFACE INLETS SHALL BE LOCATED TO ENSURE THAT STORMWATER IS CONTAINED AND CONTROLLED WITHIN THE BOUNDARIES OF THE SITE.

.4 WASHOUT FROM CONCRETE TRUCKS AND SPRAY WASHING OF EXPOSED AGGREGATE PAVEMENT SHALL CONFORM TO METRO VANCOUVER'S BEST MANAGEMENT PRACTICES FOR STORMWATER GUIDE (APPENDIX H CONSTRUCTION SITE EROSION AND SEDIMENT CONTROL EMP CP10.

.5 ALL PIPE SURROUND MATERIAL SHALL CONSIST OF CLEAN GRANULAR MMCD TYPE 1 BEDDING.

.6 NATIVE BACKFILL MAY BE USED IN NON-TRAVELED AREA IF FREE OF ROCK GREATER THAN 25mm IN BOULEVARDS AND EASEMENT AREAS ONLY. APPROVAL BY UBC UTILITIES IS REQUIRED.

.7 FOR PURPOSES OF CLEANING AND FLUSHING, WATER MAY BE SUPPLIED FROM UBC FIRE HYDRANTS UPON APPLICATION FOR A HYDRANT USE PERMIT. REFER TO STANDARD DOCUMENTS – HYDRANTAPP.DOC

.8 AS PER ENERGY & WATER SERVICES' SUPPLEMENTALS (SEE ITEM 1.1), UBC TECHNICAL GUIDELINES SECTIONS 02735 AND 02736. A CONCISE, WRITTEN AND SIGNED REPORT AND VIDEO TAPE OR DVD DISK SHALL BE PROVIDED TO MECHANICAL DISTRIBUTION ENGINEER & MANAGER, MECHANICAL DISTRIBUTION SERVICES (FAX: 604-822-8833)

.9 PRIOR TO COVERING THE PIPE, ALL INSTALLED AND BEDDED PIPE SHALL BE INSPECTED BY UBC ENERGY & WATER SERVICES. THE CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO BOTH THE MECHANICAL DISTRIBUTION ENGINEER (tel. 604-822-3274, fax. 604-822-8833) AND THE HEAD PLUMBER (fax. 604-822-4416) WITH A MINIMUM OF 24 HOURS NOTICE.

.10 RECORDS OF PIPE SIZES AND INVERTS SHALL BE PROVIDED TO THE RECORD MANAGER, INFASTRUCTURE DEVELOPMENT (tel: 604-822-7217); AND ALSO TO THE MECHANICAL DISTRIBUTION ENGINEER, (tel: 604-822-3274) IN ACCORDANCE WITH THE SECTION 01781 AND 02610 OF THESE GUIDELINES.

.11 WHERE NOTIFICATION REQUIREMENTS ARE NOT MET, SERVICES MAY NEED TO BE RE-EXCAVATED FOR INSPECTION AND/OR TESTING UPON REQUEST OF UBC ENERGY & WATER SERVICES.
- .1 CONCRETE GUTTER/CURB INTERFACE SHOULD NOT BE GROOVED OUT BUT SMOOTHED OUT AT BOTTOM TO ALLOW SMOOTH PASSAGE OF WHEELCHAIRS AND BIKES. DRAIN GRATES SHOULD HAVE NARROW OPENINGS WHICH ARE ALIGNED AT RIGHT ANGLES TO THE DIRECTION OF TRAFFIC FLOW

END OF SECTION 02720

DUCT BANK & MANHOLES SECTION 16050

1.0 GENERAL

1.1 RELATED UBC GUIDELINES

.1 SECTION 02800

1.2 COORDINATION REQUIREMENTS

.1 UBC ENERGY & WATER SERVICES
.2 UBC BUILDING OPERATIONS

1.3 DESCRIPTION

.1 UBC REQUIREMENTS FOR DUCT BANKS AND MANHOLES

2.0 MATERIALS AND DESIGN REQUIREMENTS

2.1 DESIGN STANDARDS

.1 WORK SHALL COMPLY WITH REQUIREMENTS OF:
- .1 WORKSAFE BC
- .2 BC SAFETY AUTHORITY

.2 ALL CIVIL WORK INCLUDING DUCT BANKS, MANHOLES AND CAST-IN-PLACE AND PRECAST CONCRETE SHALL COMPLY WITH UBC TECHNICAL GUIDELINES, BC HYDRO STANDARDS, OR MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (MMCD) AS APPLICABLE.

2.2 TRENCHING

.1 PRIOR TO ANY TRENCHING THE DUCT RUNS SHALL BE SURVEYED AND STAKED OUT. APPROVAL OF THE STAKED RUNS SHALL BE OBTAINED FROM THE CONSULTANT.

.2 ALL TRENCHING, EXCAVATING, AND BACKFILL SHALL BE DONE TO MMCD SPECIFICATIONS. BACKFILL AND BEDDING MATERIALS SHALL BE SUPPLIED BY THE CONTRACTOR. TRENCH BOTTOM SHALL BE CONTINUOUS, FIRM AND SHALL PROVIDE UNIFORM SUPPORT TO THE DUCTS.

.3 BACKFILL MATERIALS SHALL BE FREE OF ROCKS LARGER THAT 75mm DIAMETER, WOOD, CINDERS, ASH, AND FROZEN MATERIALS. TOP SURFACE SHALL BE LANDSCAPED TO MATCH THE EXISTING GROUND AND ANY ROAD SURFACES SHALL BE MADE GOOD TO MATCH EXISTING CONDITIONS.

2.3 OTHER SERVICES

.1 THERE ARE EXISTING SERVICES AND MAY BE ADDITIONAL RUNS OF OTHER SERVICES SUCH AS ELECTRICAL, TELEPHONE, WATER, SEWERS, GAS, OIL DRAINAGE, ETC. EXERCISE THE MAXIMUM CARE TO AVOID INTERFERENCE OR DAMAGES TO THESE. REFER TO UNDERGROUND UTILITY SERVICES.

2.4 REQUIREMENTS FOR DUCTS

.1 DUCTS SHALL BE RIGID PVC, ENCASED BURIAL TYPE DUCT CONFORMING TO THE SPECIFIC OF CSA STANDARD C22.2 NO. 211.1 "RIGID TYPES EB1 AND DB2 / ES2 PVC CONDUIT". DUCTS SHALL BE 125mm (5") FOR ALL DUCTS BETWEEN MANHOLES.

.2 DUCTS SHALL BE:
- .1 POWER SERVICES: MINIMUM: 6 – 125mm (5") BETWEEN MANHOLES AND 4 – 100mm (4") INTO BUILDINGS. LARGER SIZE MAY BE REQUIRED BY CSA OR UBC ENERGY & WATER SERVICES.
- .2 COMMUNICATION SERVICES: MINIMUM 4 –125mm (5") BETWEEN MANHOLES AND 4 –100mm (4") INTO BUILDINGS

.3 DUCTS SHALL BE SIZED ON THE DRAWINGS.

.4 DUCTS SHALL BE BURIED AT A MINIMUM DEPTH OF 900mm. DUCT RUNS SHALL BE EVENLY SLOPED TOWARD DUCT TERMINATIONS FOR DRAINAGE.

.5 DUCTS SHALL TERMINATE WITH BELL MOUTH ENDS. A 10mm (¼") PULLING LINE SHALL BE INSTALLED IN ALL DUCTS.

.6 ALL DUCT BENDS SHALL BE LONG SWEEP "UTILITY" BENDS MANUFACTURED TO UTILITY PULLING SPECIFICATIONS.

.7 AT BUILDING ENTRY SEAL DUCT OPENINGS WITH AN APPROVED NON-HARDENING PUTTY MATERIAL FOR ALL CONDUITS OR DUCTS ENTERING BUILDING TO PREVENT MIGRATION OF GASES INTO THE BUILDING.

2.5 REQUIREMENTS FOR MANHOLES

.1 MANHOLES SHALL BE 1830mm X 3300mm X 2000mm HIGH INSIDE DIMENSIONS.

.2 MANHOLE SHALL BE COMPLETE WITH CAST MANHOLE COVER, FRAME AND BRICK ASSEMBLY BETWEEN MANHOLE AND MANHOLE LID.

.3 MATERIALS SHALL INCLUDE:
- .1 PRE-CAST MANHOLE ASSEMBLY.
- .2 MANHOLE FRAME.
- .3 MANHOLE COVER.
- .4 SPACER RINGS.
- .5 PULLING IRONS.
- .6 GROUND RODS.
- .7 SUMP COVER.

.4 MANHOLES SHALL BE CONSTRUCTED TO THE FOLLOWING UBC UTILITY STANDARDS:
- .1 E 3-1 STANDARD ELECTRICAL PRECAST MANHOLE.
- .2 E 3-2 STANDARD ELECTRICAL MANHOLE POUR IN PLACE.
- .3 E 3-3 ADDITIONAL REINFORCING FOR POUR IN PLACE ELECTRICAL MANHOLE.
- .4 E 3-4 STANDARD ELECTRICAL MANHOLE COVER & RISER DETAILS.
- .5 E 3-5 STANDARD ELECTRICAL MANHOLE SUMP DETAIL.
- .6 E 3-6 TYPICAL MANHOLE GROUNDING & DETAILS.
- .7 E 3-7 TYPICAL MANHOLE SEPARATION.

.5 PRE-CAST MANHOLE USING BC HYDRO 4212 CHAMBER MAY BE SUBSTITUTED AS AN ALTERNATE.

.6 CONCRETE SHALL NOT BE PLACED IN FOUNDATIONS UNTIL THE SOIL BREAKING HAS BEEN REVIEWED BY THE ENGINEER.

.7 ALL MANHOLES SHALL HAVE A SUMP WITH POSITIVE DRAINAGE. MANHOLE DRAINS SHALL BE CONNECTED TO THE STORM WATER SYSTEM.

.8 TESTING COSTS FOR COMPACTION AND CONCRETE TESTS SHALL BE PAID FOR BY THE PROJECT.

2.6 REQUIREMENTS FOR CONCRETE ENCASED DUCT BANK

.1 ALL SERVICE DUCTS SHALL BE CONCRETE ENCASED.

.2 ALL CIVIL WORK ASSOCIATED WITH DUCT BANK SHALL BE TO MMCD SPECIFICATIONS.

.3 DUCT BANKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH UBC STANDARDS DRAWINGS:
- .1 E2-1 STANDARD CONCRETE ENCASED ELECTRICAL DUCT.
- .2 E2-3 STANDARD ELECTRICAL DUCT BANK.
- .3 E2-4 ELECTRICAL DUCTBANK CLEARANCES TO STEAM DISTRIBUTION LINES.

.4 FORMS MUST BE USED ON THE WALLS OF THE DUCT BANK.

.5 DUCT CONNECTORS SHALL BE STAGGERED SO THEY ARE NEVER ADJACENT TO ANOTHER COUPLING. MANUFACTURED INTERMEDIATE SPACERS SHALL BE USED THROUGHOUT THE LENGTH OF THE DUCT RUN EVERY 2 METERS.

.6 CONCRETE SHALL HAVE MAXIMUM 200mm (3/4") AGGREGATE, MINIMUM 20 MPA STRENGTH AT 28 DAYS, AND SHALL CONTAIN "ANTI-HYDRO" MIXED AS RECOMMENDED BY THE ADDITIVE MANUFACTURER.

.7 IMMEDIATELY AFTER INSTALLATION, DUCTS SHALL BE TESTED FOR BLOCKAGES AND CLEANED AS NECESSARY. PRIOR TO COMPLETION THE DUCTS SHALL BE SWABBED AND MANDREL LED.

2.7 REQUIREMENTS FOR WARNING TAPE DURING CONSTRUCTION

.1 DURING CONSTRUCTION A WARNING TAPE (YELLOW) IMPRINTED "CAUTION BURIED ELECTRICAL LINE" SHALL BE INSTALLED AT ALL DUCT BANKS AND BURIED CONDUIT.

.2 WARNING TAPE SHALL BE LAID IN THE TRENCH MIDWAY BETWEEN DUCT BANK AND FINISHED GRADE.

END OF SECTION 16050

POWER & COMMUNICATION UTILITIES SECTION 02800

1.0 GENERAL

1.1 RELATED UBC GUIDELINES

.1 DIVISION 16 AND DIVISION 17

1.2 COORDINATION REQUIREMENTS

.1 UBC ENERGY & WATER SERVICES
.2 UBC BUILDING OPERATIONS – TECHNICAL SERVICES

1.3 POWER

.1 THE UNIVERSITY OWNS AND OPERATES THE POWER SYSTEM CONSISTING OF 60 KV UNDERGROUND AND OVERHEAD DISTRIBUTIONS, AND 12 KV UNDERGROUND DISTRIBUTIONS.

.2 THE UNIVERSITY PURCHASES POWER IN BULK FORM FROM BC HYDRO. THE TWO 60 KV LINES FEED TWO SUBSTATIONS, ONE LOCATED ON THE SOUTH CAMPUS AND ONE ON THE MAIN CAMPUS.

.3 THE MAIN SUBSTATION SUPPLIES IN TURN A 12 KV INDOOR SWITCHING STATION.

.4 THE 12 KV SYSTEMS IS DISTRIBUTED UNDERGROUND IN A COMBINED DUCT AND MANHOLE SYSTEM WHICH SERVICES THROUGHOUT THE MAJOR PORTION OF THE NORTH CAMPUS AND A PORTION OF THE SOUTH CAMPUS.

.5 THE 12 KV SYSTEM IS NOMINALLY RATED AT 12,480 VOLTS, 3 PHASE, 3 WIRES, WYE SYSTEM LOW RESISTANCE GROUNDED.

.6 THE DESIGN LIMITS SHALL BE BASIC IMPULSE LEVEL 95 KV AND DESIGN FAULT 300 MVA SYMMETRICAL.

.7 THE POWER DISTRIBUTION IS A DUAL RADIAL SYSTEM WITH 500 MCM LOW RESISTIVE GROUNDED SINGLE CONDUCTOR CROSSLINK POLYETHYLENE FOR 12 KV SYSTEM.

.8 FOR A GENERAL DISTRIBUTION DIAGRAM OF THE 12 KV FEEDERS, REFER TO DIVISION 16, STANDARD DRAWING E1-1 (HTTP://WWW.TECHNICALGUIDELINES.UBC.CA/TECHNICAL/DIVISIONAL_SPECS.HTML#16 ALSO, REFER TO 5.4.3.1 DESIGN DEVELOPMENT BRIEF.

1.4 COMMUNICATIONS

.1 THE CAMPUS COMMUNICATION SYSTEMS IN MOST AREAS OF THE CAMPUS IS OWNED AND OPERATED BY THE UNIVERSITY. PROJECT REQUIREMENTS SHALL BE COORDINATED BETWEEN THE USER, THE CONSULTANT AND THE CABLE FACILITIES SERVICES BY THE PROJECT MANAGER.

1.5 CENTRAL FIRE ALARM

.1 THE UNIVERSITY IS CONNECTED TO AN MSC 500 CENTRAL FIRE ALARM SYSTEM WHICH IS LOCATED IN THE PUBLIC SERVICE CENTRE BUILDING AT 3030 WESBROOK MALL. THE SYSTEM WAS BUILT AND SUPPLIED THROUGH THE B.C. BUILDINGS CORPORATION.

.2 THE SYSTEM REQUIRES A MSC 300/500 TRANSPONDER WHICH SHALL BE SUPPLIED BY UBC AT A COST ESTABLISHED BY THE ENGINEERING AND OPERATIONS DIVISION, BUILDING OPERATIONS, UBC.

1.6 CENTRAL BUILDING ALARM – A DIVISION, BUILDING OPERATIONS, UBC

.1 THE UNIVERSITY OPERATES A BUILDING MANAGEMENT SYSTEM (BMS) TO PROVIDE CONTROL AND ALARM MONITORING FOR ALL PRIMARY MECHANICAL AND ELECTRICAL SYSTEMS.

.2 THE PANELS ARE USUALLY LOCATED IN THE BUILDING MECHANICAL ROOMS TO CAPTURE THE NECESSARY ALARM EVENT. THIS EVENT IS TRANSMITTED ACROSS THE BMS NETWORK TO THE APPROPRIATE DISPLAY TERMINALS.

1.7 CENTRAL CLOCK AND PROGRAM BELLS

.1 THE UNIVERSITY OPERATES TWO INDEPENDENT TIME SYSTEMS. ONE IS USED FOR PROGRAM BELLS AND IS TRANSMITTED AT 24 V DC. THIS SYSTEM IS TRANSMITTED VIA LEASED TELEPHONE PAIR.

.2 THE OTHER IS A SIMPLEX CENTRAL CLOCK SYSTEM WHICH IS TRANSMITTED VIA A LEASED TELEPHONE PAIR TO NEW BUILDINGS.

.3 INSIDE EACH BUILDING THE SYSTEMS ARE DISTRIBUTED FROM A LOCAL RELAY CABINET OPERATING SYNCHRONOUS CLOCKS.

1.8 UBC STANDARD FORMS

.1 THE FOLLOWING STANDARD FORMS APPLY TO ALL UTILITIES FOR THIS PROJECT, AS APPLICABLE:
- .1 UBC APPLICATION FOR SERVICE SHUTDOWN.
- .2 UBC APPLICATION FOR SERVICE CONNECTION.
- .3 I-B-07 – CLEARANCE PERMITS.
- .4 I-B-33 – TEST AND WORK PERMITS.
- .5 UBC UTILITIES MANHOLE ENTRY PERMIT 1.

END OF SECTION 02800

REVISIONS			
	6		
	5		
	4		
	3	SLP 2 SUBMISSION – SERVICING	05/18/2016
	2	SLP SUBMISSION	12/11/2015
	1	ISSUE FOR TENDER / FOUNDATION BP	08/18/2015
	No.	DESCRIPTION	MO/DAY/YR

KAMPS ENGINEERING LIMITED
604-682-2020 kamps@rogers.com
UBC PROPERTIES TRUST

CLIENT: UBC PROPERTIES TRUST

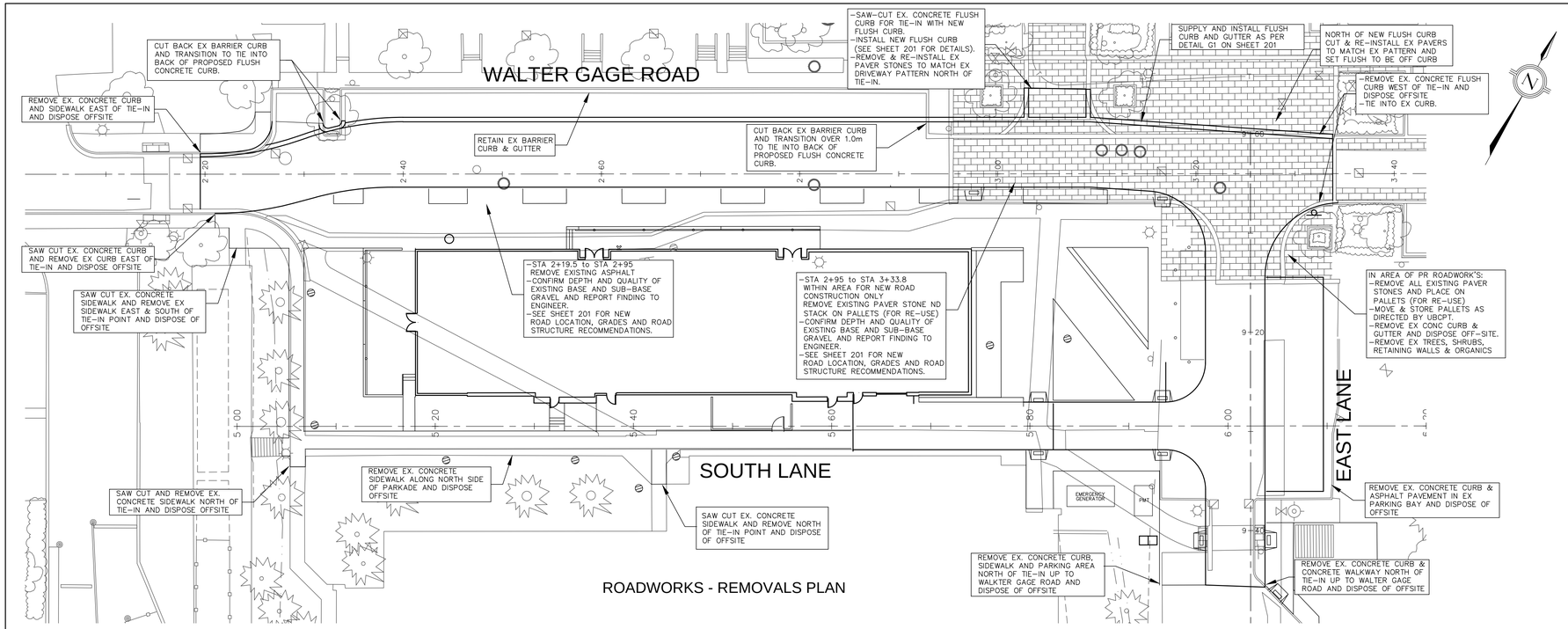
BUILDING/FACILITY:

DRAWING TITLE: DETAILED SPECIFICATIONS - STORM SEWER, SANITARY SEWER, DUCT BANK & MANHOLES, POWER & COMMUNICATION

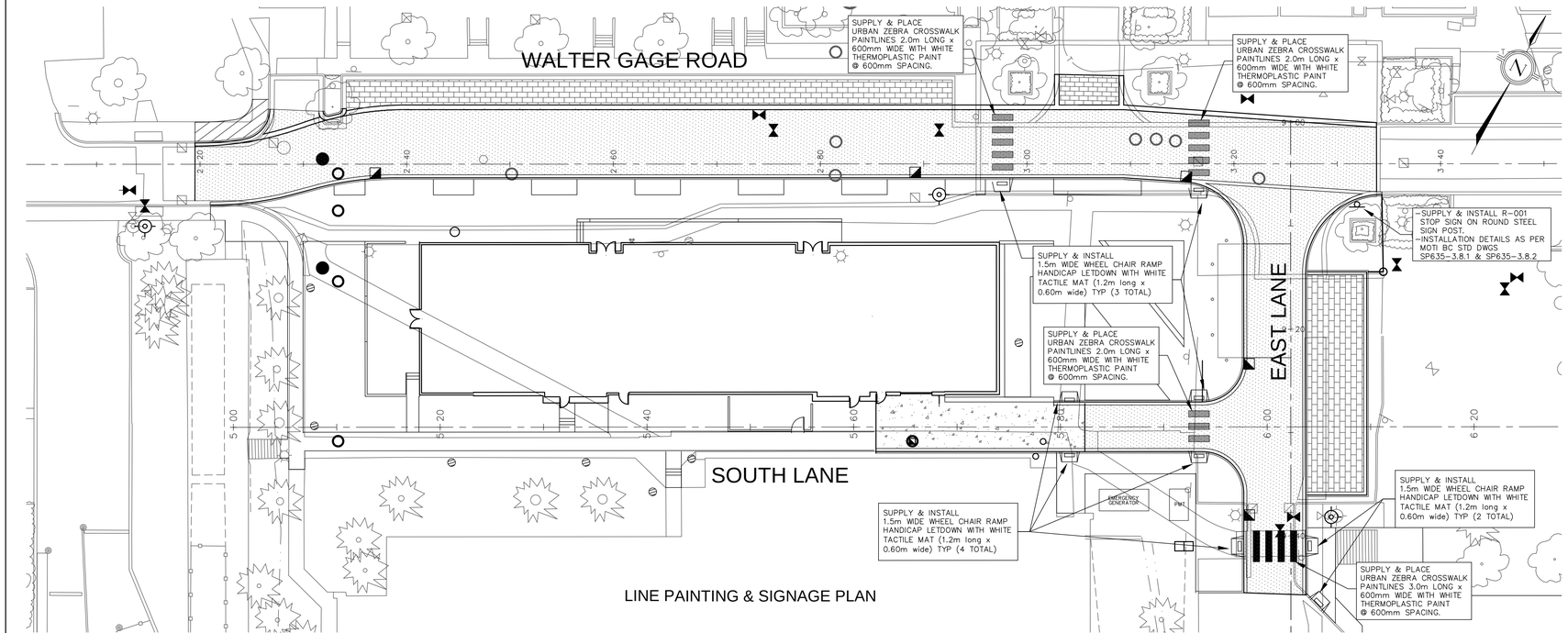
SEAL

PROJECT TITLE: BROCK COMMONS PHASE 1

DRAWN: J.N.	SCALE: NTS	PROJECT No.: 8122	
DESIGN: M.K.	DATE: AUG. 2015	DRAWING No.: 208	REV.: 3
CHECKED:			



ROADWORKS - REMOVALS PLAN



LINE PAINTING & SIGNAGE PLAN

ALL ELEVATIONS ARE GEODETIC AND REFER TO UBC MONUMENT "W-W" ELEVATION = 93.631 m
LOCATION: EAST MALL IN FRONT OF CEME BUILDING BETWEEN AGRONOMY ROAD & UNIVERSITY BOULEVARD

- THE INFORMATION SHOWN FOR EXISTING UTILITIES WAS PROVIDED BY OTHERS. THE INFORMATION IS SHOWN FOR GENERAL INFORMATION ONLY AND HAS NOT BEEN CONFIRMED OR VERIFIED BY KAMPS ENGINEERING LIMITED.
- THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL UTILITIES DURING CONSTRUCTION.
- ALL EXISTING UTILITIES, TIE-IN POINTS AND CROSSINGS MUST BE LOCATED AND VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF WORK. ANY VARIANCE OR DISCREPANCY FROM DESIGN IS TO BE IMMEDIATELY REPORTED TO THE ENGINEER FOR REVIEW AND ASSESSMENT. LOST TIME DUE TO FAILURE OF THE CONTRACTOR TO CONFIRM UTILITY LOCATIONS AND NOTIFY THE ENGINEER OF POSSIBLE CONFLICTS PRIOR TO CONSTRUCTION WILL BE AT THE CONTRACTOR'S EXPENSE.

REVISIONS

No.	DESCRIPTION	MO/DAY/YR
6		
5		
4		
3	REVISED AS PER UBC REVIEW COMMENTS	09/28/2016
2	SLP 2 SUBMISSION – ROADWORKS & SERVICING	05/18/2016
1	SLP SUBMISSION	12/11/2015

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UBC PROPERTIES TRUST

CLIENT: UBC PROPERTIES TRUST

BUILDING/FACILITY:

DRAWING TITLE: ROADWORKS - REMOVALS PLAN
LINE PAINTING & SIGNAGE PLAN

SEAL

PROJECT TITLE: BROCK COMMONS - PHASE 1

DRAWN: J.N.	SCALE: HORZ: 1:250m	PROJECT No.: 8122
DESIGN: M.K.	DATE: OCT. 2015	DRAWING No.: 210 / REV.: 3
CHECKED:		

STA 3+48.7 (WALTER GAGE BASELINE)
–LOCATE EX WATERMAIN AT TIE–IN POINT TO CONFIRM INVERT & LOCATION
–TIE INTO EX. 200ø WATERMAIN
SUPPLY & INSTALL
–TEMP 200ø CAP WITH THREADED 19mmø EXTENSION & 19mmø TEST POINT FOR TESTING & CHLORINATION
1–200ø 45° BEND (INV. 86.30m)
1–200ø ROBAR COUPLING
CAP OFF & ABANDON EX 200ø WM SOUTH–WEST

FROM STA 3+46.2 to STA 3+48.7
2.5m–200ø CL50 DI WM @ +2.00%

STA 3+46.2 (WALTER GAGE BASELINE)
SUPPLY & INSTALL
1–200Hx200Fx100F TEE (INV. 86.30m)
1–200ø FxH GATE VALVE
1–100ø FxH GATE VALVE

TIE–ROD ALL FITTINGS TOGETHER & PROVIDE JOINT RESTRAINTS & THRUST BLOCKS ON ALL TEES, VALVES, BENDS & FITTINGS.

STA 3+35.8 (WALTER GAGE BASELINE)
–LOCATE EX WATERMAIN AT TIE–IN POINT TO CONFIRM INVERT & LOCATION
–TIE INTO EX. 200ø WATERMAIN
SUPPLY & INSTALL
1–200Hx200Hx200F TEE (INV. 86.09m)
1–200ø HxF GATE VALVE
1–200ø ROBAR COUPLING
CAP OFF & ABANDON EX 200ø WM SOUTH
REMOVE EX GATE VALVE & CAP OFF WM

FROM STA 3+35.8 to STA 3+46.2
10.4m–200ø CL50 DI WM @ +2.00%

TIE–ROD ALL FITTINGS TOGETHER & PROVIDE JOINT RESTRAINTS & THRUST BLOCKS.

SEE SHEET 202 FOR DETAILS ON NEW 200ø WATERMAIN ON WALTER GAGE ROAD

STA 3+24.5 (WALTER GAGE BASELINE)
STA 9+15 (EAST LANE)
SUPPLY & INSTALL
1–200ø HxH 90° BEND (INV. 85.86m)

FROM STA 3+24.5 to STA 3+35.8
11.3m–200ø CL50 DI WM @ +2.00%

PROVIDE JOINT RESTRAINTS AND THRUST BLOCK ALL BENDS & FITTINGS.

WATERMAIN JOINT PROTECTION:

WHERE WATERMAINS ARE INSTALLED WITH LESS THAN 3.0m CLEARANCE (HORIZONTAL) AND 0.5m (VERTICAL) FROM STORM OR SANITARY SEWERS, AND/OR WHERE NOTED ON THE DRAWINGS, ALL JOINTS SHALL BE WRAPPED AND PROTECTED USING DENSO PROFILING MASTIC AND DENSO LT TAPE OR APPROVED EQUIVALENT.

NOTE:
–WATERMAIN BEDDING SHALL BE MMCD TYPE 1
–WATERMAIN BACKFILL SHALL BE IMPORTED 100mm PITRUN GRAVEL

GAGE TOWERS WATER SERVICE:

–LOCATE EX 100ø WATERMAIN AT TIE–IN POINT TO CONFIRM INVERT & LOCATION
–TIE INTO EX. 100ø WATERMAIN
SUPPLY & INSTALL
–TEMP 100ø CAP WITH THREADED 19mmø EXTENSION & 19mmø TEST POINT FOR TESTING & CHLORINATION
1–100ø 90° BEND (INV. 86.22m)
1–100ø ROBAR COUPLING

FROM TEE AT STA 3+46.2 to SERVICE
15.8m–100ø CL50 DI WM @ –0.50%

CAP OFF & ABANDON EX 100ø WM WEST

TIE–ROD ALL FITTINGS TOGETHER & PROVIDE JOINT RESTRAINTS & THRUST BLOCKS ON ALL TEES, VALVES, BENDS & FITTINGS.

STA 9+38.2
1–200Hx200Fx150F TEE
1–200ø FxH GATE VALVE
1–150ø FxH GATE VALVE
–AFTER NEW WATERMAIN IS TIED IN AND THE OLD MAIN HAS BEEN ABANDONED REMOVE EX HYDRANT & HYDRANT VALVE AND CAP OFF & ABANDON EX 200ø MAIN.
–4.5m–150ø CL 50 DI PIPE
1–FIRE HYDRANT ASSEMBLY TC C–71P c/w THRUST BLOCK AND JOINT RESTRAINTS.
–TIE–ROD ALL FITTINGS TOGETHER. PROVIDE JOINT RESTRAINTS AND THRUST BLOCK ALL TEES, VALVES, BENDS, AND FITTINGS.

STA 9+70
1–200ø 45° BEND HxH HORIZ
STA 9+71
1–200ø 45° BEND HxF HORIZ
1–200ø 45° BEND FxH VERT
TIE–ROD ALL FITTINGS TOGETHER. PROVIDE JOINT RESTRAINTS AND THRUST BLOCKS

STA 10+16
1–200Hx200Fx150F TEE
1–200ø FxH GATE VALVE
1–150ø FxH GATE VALVE
–AFTER NEW WATERMAIN IS TIED IN AND THE OLD MAIN HAS BEEN ABANDONED REMOVE EX HYDRANT AND HYDRANT VALVE AND CAP OFF AND ABANDON EX 200ø MAIN.
–4.0m–150ø CL 50 DI PIPE
1–FIRE HYDRANT ASSEMBLY TC C–71P c/w THRUST BLOCK AND JOINT RESTRAINTS.

STA 10+37.7
1–250Fx250Hx200F TEE
1–200ø FxH GATE VALVE
–LOCATE EX 200ø WATERMAIN AT TIE–IN POINT TO CONFIRM INVERT & LOCATION
–TIE INTO EX. 200ø WATERMAIN
SUPPLY & INSTALL
3.0m–200ø CL50 DI PIPE (LENGTH TO SUIT)
1–200ø ROBAR COUPLING WITH JOINT RESTAINTS
CAP OFF & ABANDON EX 200ø WM EAST & WEST.
TIE–ROD ALL FITTINGS TOGETHER & PROVIDE JOINT RESTRAINTS & THRUST BLOCKS.

STA 10+45
1–200ø 45° BEND HxH HORIZ

STA 10+48
1–200ø 45° BEND HxH HORIZ

STA 10+54.5
1–250ø 90° BEND HxH HORIZ
–LOCATE EX 250ø WATERMAIN AT TIE–IN POINT TO CONFIRM INVERT & LOCATION. BREAK OUT & REMOVE EX TEE.
–REMOVE EX 200ø WATERMAIN WHERE IN CONFLICT WITH PR 250ø MAIN AND CAP OFF AND ABANDON.
SUPPLY & INSTALL
4.0m–250ø CL50 DI PIPE (LENGTHS TO SUIT)
1–250ø ROBAR COUPLING
TIE–ROD ALL FITTINGS TOGETHER & PROVIDE JOINT RESTRAINTS & THRUST BLOCKS.
–TEMP 250ø CAP WITH THREADED 19mmø EXTENSION & 19mmø TEST POINT FOR TESTING & CHLORINATION

CROSS CONNECT EX 250ø DI WATERMAINS:
–LOCATE AND EXPOSE EX 250ø WATERMAIN AT TIE–IN POINTS TO CONFIRM INVERTS & LOCATION & MATERIAL
SUPPLY & INSTALL:
1–250Hx250Hx250F TEE
1–250FxH 90° BEND HORIZ
1–250HxH 90ø BEND HORIZ
2–250HxH 90° BENDS VERT (IF REQUIRED)
2–250ø ROBAR COUPLINGS WITH JOINT RESTAINTS.
3.0m–250ø CL50 DI PIPE (LENGTHS TO SUIT)
–ON EX TEE CAP OFF & ABANDON 200ø WATERMANI EAST
–REMOVE EX 200ø GATE VALVE AND CAP OFF & ABANDON EX 200ø WATERMAIN EAST.
TIE–ROD ALL FITTINGS TOGETHER & PROVIDE JOINT RESTRAINTS & THRUST BLOCKS.

ALL ELEVATIONS ARE GEODETIC AND REFER TO
UBC MONUMENT "W–W" ELEVATION = 93.631 m
LOCATION: EAST MALL IN FRONT OF CEME BUILDING BETWEEN AGRONOMY ROAD & UNIVERSITY BOULEVARD

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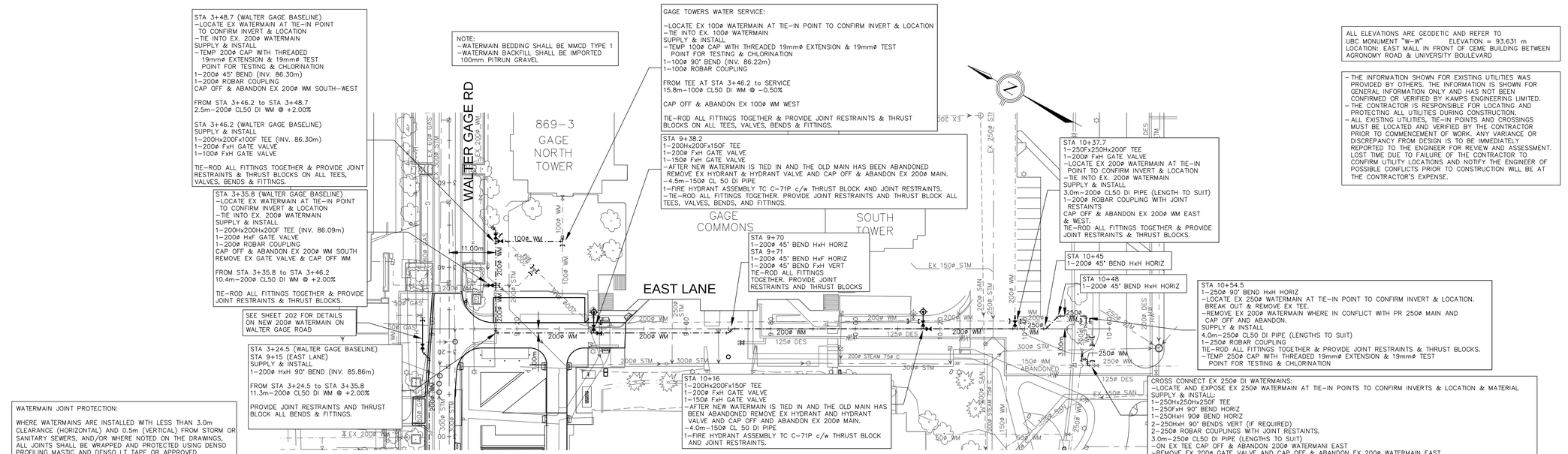

No.	DESCRIPTION	MO/DAY/YR
6		
5		
4		
3	ADD WATERMAIN ON EAST LANE AS PER UBC REVIEW COMMENTS	09/28/2016
2	SLP 2 SUBMISSION & AS PER UBC REVIEW COMMENTS	05/18/2016
1	REPLACE EX AC WM ON EAST LANE – AS PER UBC REVIEW REQUEST	05/10/2016

REVISIONS

KAMPS ENGINEERING LIMITED
604-682-2020 kamps@rogers.com

UBC PROPERTIES TRUST

CLIENT: UBC PROPERTIES TRUST

BUILDING/FACILITY:

DRAWING TITLE:
WATERMAIN
PLAN AND PROFILE
EAST LANE - STA 9+00 to STA 10+60

SEAL

PROJECT TITLE: BROCK COMMONS - PHASE 1

DRAWN: J.N.	SCALE: HORZ: 1:500 m VERT: 1:50 m	PROJECT No.: 8122
DESIGN: M.K.	DATE: AUG. 2015	DRAWING No.: 211
CHECKED		REV.: 3