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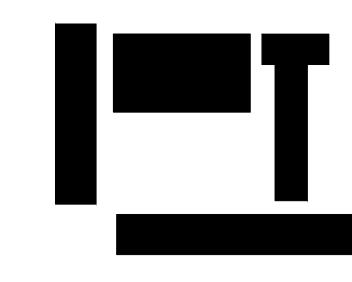
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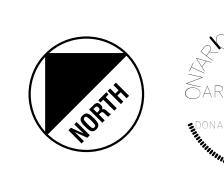
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CONTACT U.B.C. UTILITIES 72 HOURS PRIOR TO START OF CONSTRUCTION 604-822-9570. ALL CONSTRUCTION TO MMCD (2009) AND U.B.C. TECHNICAL GUIDELINES

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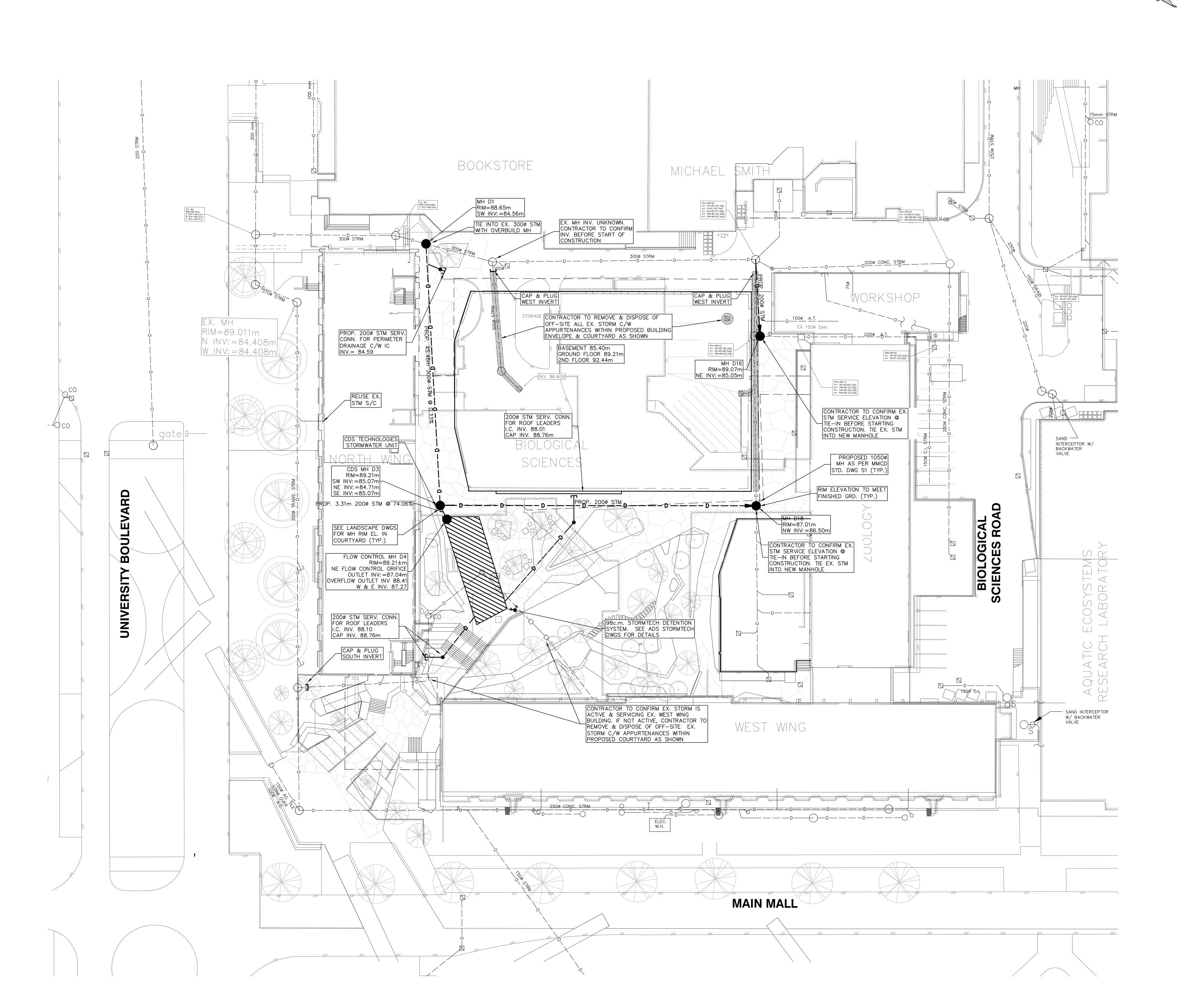


UBC Undergrad Life Sciences Teaching

6270 UNIVERSITY BOULEVARD, VANCOUVER, BC

KEY PLAN

Scale: 1:250 Project No: 14-838 Date: October 15, 2014



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LEGEND:

INVERTS FROM:

SEPT 17, 2009 SURVEY Inv. NE=87.19(.15ø)

INVERTS FROM: UBC AS-CONSTRUCTED INFO | S INV: =84.54m

PROP. STORM SEWER — D — — — PROP. STORM MANHOLE PROP. CATCH BASIN

PROP. LAWN BASIN

UTILITY INFORMATION COMPILED USING 2008 UBC BASE MAP WITH MURRAY AND ASSOC. SURVEY FOR ELEVATIONS, SOME DISCREPANCIES APPEAR TO EXIST BETWEEN DATA WHICH WERE UNABLE TO BE VERIFIED IN THE FIELD.

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UBC Undergrad Life Sciences Teaching

6270 UNIVERSITY BOULEVARD, VANCOUVER, BC

STORM SEWER

Scale: 1:250 Project No: 14-838 Date: October 15, 2014

RIM=89.07m /S INV: =84.25m N INV: = 83.75m SW INV: =84.19m MICHAEL SMITH REMOVE & DISPOSE OFFSITE EX. 2000 MAIN AS SHOWN & INSTALL ___ 250ø C.I. in 450¢ SLEEVE NEW 2000 MAIN C/W WITH NEW TIE INTO EX. MANHOLE TIÉ INTO EX. MANHOLE RIM=UNKNOWN RIM=89.75m N INV: =83.58m TIE INTO EX. MH. \sim W INV: =86.20m S INV: = 83.58mE INV: = 86.17mCAP & PLUG EX. WEST INVERT W INV: 86.20m EX. MH INV. UNKNOWN. CAP & PLUG EX. WEST INVERT CONTRACTOR TO CONFIRM INV. BEFORE START OF CONSTRUCTION SAN @ 0.50% MH S13 RIM=89.12m N INV: = 86.83m CONTRACTOR TO CONFIRM EX. SAN SERVICE SW INV: =86.88m ELEVATIONS @ TIE-IN BEFORE STARTING REUSE EX. SAN S/C+ CONSTRUCTION. TIE EX. SAN SERVICES INTO V|NEW MANHOLE CAP EX 200¢ SAN PROP. 200Ø SAN CONN. INV.=83.96m C/W I.C. EX. SAN S/C TO BE CAPPED BASEMENT 85.40m GROUND FLOOR 89.21m 2ND FLOOR 92.44m CONTRACTOR TO REMOVE &
DISPOSE OF OFF-SITE ALL EX.
SANITARY C/W APPURTENANCES
WITHIN PROPOSED BUILDING - -- -- --ENVELOPE AS SHOWN PROPOSED 1050Ø MH AS PER MMCD STD. DWG S1 (TYP) BIOLOGICAL ____ RIM=89.1m± NW INV: =85.05m SW INV: =85.10m —RROP. 42.98m 200ø_SAN_@ 0.95%—— — — — RIM=89.21 SE INV: =84.64m NE INV: =84.59m SEE LANDSCAPE DWGS FOR MH RIM EL. The state of the s 1500 DESIGN WEST WING **MAIN MALL**

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INVERTS FROM:
SEPT 17, 2009 SURVEY

Rim=88.92
Inv. NE=87.19(.15\$\$)

INVERTS FROM:

INVERTS FROM:
UBC AS-CONSTRUCTED INFO

PROP. SANITARY SEWER

PROP. SANITARY MANHOLE

UTILITY INFORMATION COMPILED USING 2008
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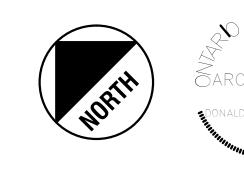
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UBC Undergrad Life Sciences Teaching Labs

6270 UNIVERSITY BOULEVARD, VANCOUVER, BC

SANITARY SEWER

Scale: 1:250
Project No: 14-838
Date: October 15, 2014

200ø W/M PLANTER ENTRANCE PLAZA BOOKSTORE MICHAEL SMIT TIE TO EX 1500 WAT 1-150ø HxH 90° BEND C/W THRUST BLOCK PROP. 150ø CAP PLANTER PLANTER PROP. 150¢ CAP WORKSHOP CONTRACTOR TO REMOVE &
DISPOSE OF OFF-SITE ALL EX.
WATER C/W APPURTENANCES BASEMENT 85.40m GROUND FLOOR 89.21m WITHIN PROPOSED BUILDING 2ND FLOOR 92.44m ENVELOPE AS SHOWN - -- -- --EXST. WAT S/C TO BE CAPPED -Waate 1-BIOLOGICAL CONTROL BOX SCIENCES EXST. IRRIGATION TO BE TIED INTO EXST. 3000 WM C/W PRESSURE REDUCING BÁCKFLOW VALVE SEA WATER 2 1/2" SW ₹ WEST WING ≥ 100mm GALV. SIAMESE LINE (DESIGN) APPROX. LOC'N 150ø CI W/M **MAIN MALL** 500ø W/M ...

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INVERTS FROM: SEPT 17, 2009 SURVEY

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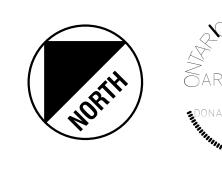
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UBC Undergrad Life Sciences Teaching

6270 UNIVERSITY BOULEVARD, VANCOUVER, BC

WATERMAIN

Scale: 1:250 Project No: 14-838 Date: October 15, 2014

— STEAM — --- STEAM---BOOKSTORE MICHAEL SMIT PLANTER PLANTER 150¢ AG. TILE
100¢ A.C. RELIEF AIR
OUTLET WORKSHOP BASEMENT 85.40m GROUND FLOOR 89.21m 150 AG. TILE STRM
OVER 1000 A.C.
STORM 100 AC.
TIE IN UNKNOWN 2ND FLOOR 92.44m CAP EX. STEAM MAINS. REMOVE & DISPOSE OF OFFSITE EX. STEAM MAINS C/W APPURTENANCES WITHIN PROPOSED BUILDING ENVELOPE AS SHOWN. 3" GAS G APPROX. LOC'N SERVICE TUNNEL ____ PROP. GAS SERV. CONN. FOR
NORTH & WEST BUILDING THRU
NORTH BUILDING TUNNEL. SEE
MECHANICAL DWGS FOR DETAILS BIOLOGICAL CAL SCIENCES BIOLOGIC SCIENCES I STEAM — STEAM ---42ø DESIGN -9<u>4" GAS</u>-9-----9 **MAIN MALL** -18 JEANG. TILE EXST. GAS SERV. CONN. C/W
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UBC Undergrad Life Sciences Teaching Labs

6270 UNIVERSITY BOULEVARD, VANCOUVER, BC

GAS AND STEAM

 Scale:
 1:250

 Project No:
 14-838

 Date:
 October 15, 2014

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— н—

FUTURE DISTRICT ENERGY LINES CURRENTLY BEING

CONSTRUCTED.

MICHAEL SMITH

PROP. 150ø WAT

NEW DISTRICT ENERGY LINES
TO BE TIED INTO FUTURE
DISTRICT ENERGY LINES

NEW ELEC. SERV. CONN. FROM WEST BLG TO SERVICE NORTH & EAST BLGS. NEW ELEC. ROOM TO BE LOCATED IN EAST BLG

- --- ---

WEST WING

MAIN MALL

The triang thing the triang the triangle tr

WORKSHOP

BIOLOGICAL SCIENCES ROAI

PLANTER

(EMERGENCY NPHONE)

PLANTER

BASEMENT 85.40m GROUND FLOOR 89.21m

2ND FLOOR 92.44m

BIOLOGICAL

SCIENCES

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Date: October 15, 2014

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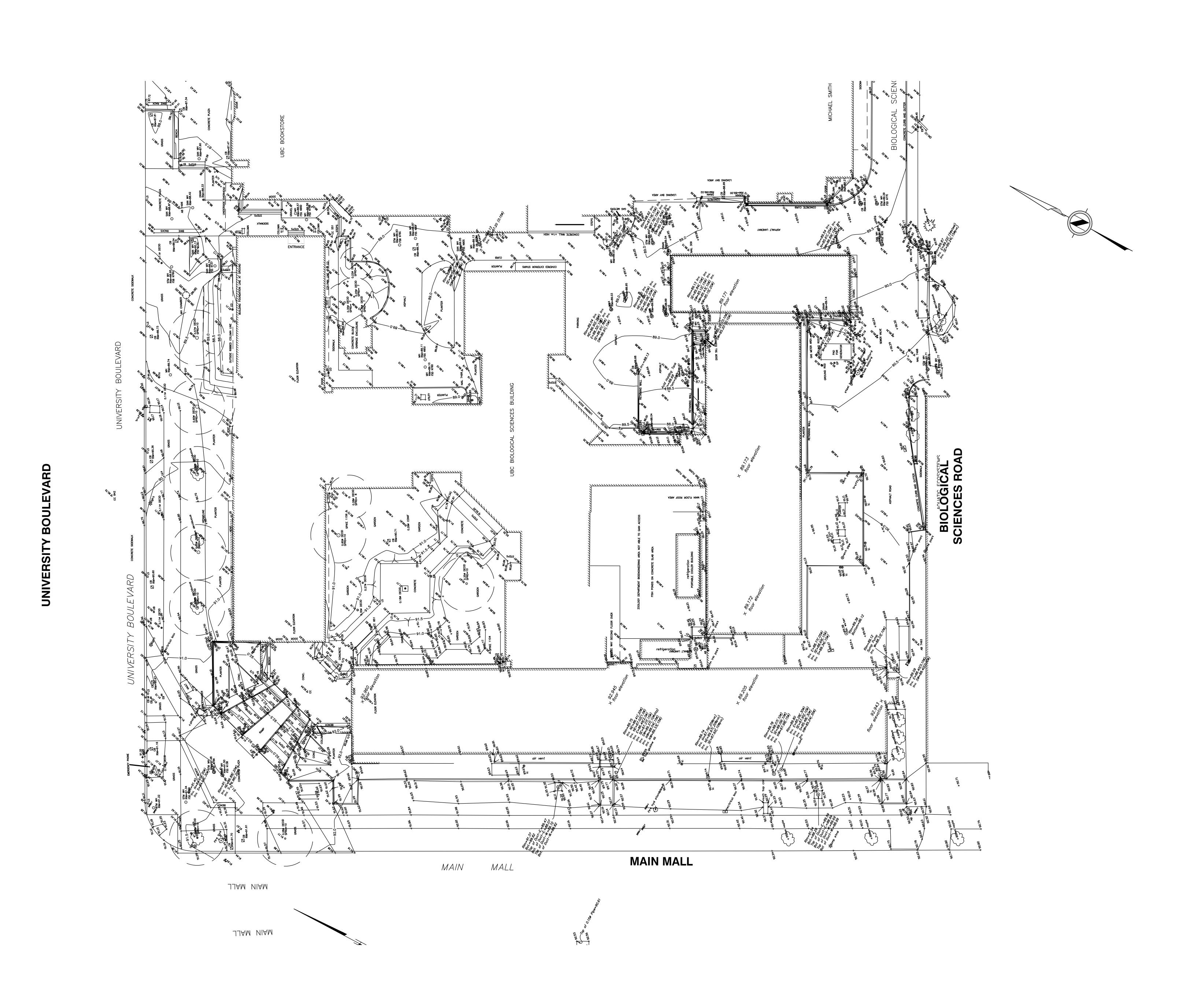
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C-006

Scale: 1:250

Project No: 14-838



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UBC Undergrad Life Sciences Teaching Labs

6270 UNIVERSITY BOULEVARD, VANCOUVER, BC

SURVEY

Scale: 1:250
Project No: 14-838
Date: October 15, 2014

Engineer of any changes.

The Contractor shall make allowances for providing the necessary caps and test points for the water mains, storm and sanitary sewer. The caps or test points are not shown in

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 the final location of all proposed

works. The Contractor is to notify, in writing, the Project

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. The Owner will pay

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 GST

3.0 Hours of Work Work is only permitted within the hours of 7:30 a.m. to 7 p.m. Monday to Friday, and 9 a.m. to 5 p.m. on Saturday. No noise outside these work hours. This includes but is not limited to, deliveries, idling machines, backing up of machines and servicing etc. The hours of work and limited noise hours will be strictly

No work is permitted on Sunday. The Contractor may be subject to a fine for working outside these hours.

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.

Contractor shall expose all existing utilities, as shown on the contract documents and 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 with the duct bank and supply, to the Contractor, the adjusted arades, if required. 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 soul 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 any installed ducts or manholes will be the responsibility of the Contractor. If a utility is discovered, that is not shown on the project drawings and the UBC Plant Map, the owner will be responsible for the cost to adjust the design or the installed ducts and manholes.

6.0 Site Trailer Contractor will be responsible to provide a site trailer, adequate size to hold weekly site meetings. A staging area in the vicinity of Thunderbird and Wesbrook Mall will be available for the site trailer and material storage.

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 water mains 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 water mains 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 Aplin & Martin and UBC Utilities.

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

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

- 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, James Bellavance 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 shut down

UBC UTILITIES OVERHEAD ELECTRICAL

The Contractor shall provide a safety watcher while working in the vicinity of the 69 kv overhead electrical lines. 69 kv overhead is on Wesbrook Mall and Thunderbird. A safety plan for working near 69 kv overhead line is to be submitted to the Project Engineer prior to start of construction. For information contact Richard Hugli at 604-827-5056.

14.0 Trench Backfill Trench pavement restoration shall be completed as detailed in 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 50 m of trench per metre of backfill; and 1 — test for every road lane crossing per metre depth of

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 Contractors: Terasen Gas Inc. Universal Heating Ltd.

3700 - 2 Avenue 3868 Commercial St. Burnaby, BC Vancouver, BC V5C 6S4 V5N 4G2 Attention: Ken Jarvis Attention: Doug Tel.: 604-575-3404 Tel.: 604-873-3551

Installation of steam piping shall be performed by UBC Utilities approved Contractors:

Lockerbie & Hole

New Westminster,

Attention: Lance Collins &

401 Salter St

BC V3M 5Y1

Dave Andrews

Tel.: 604-521-3322

Ideal Welders 660 Caldew St. Annacis Island Delta, BC V3M 5S2 Attention: Jim Longo Tel.: 604-525-5558

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

18.0 Siltation Control

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.

The Contractor shall comply with all regulatory authorities, Fish

19.0 Over Excavation 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. For water main, sanitary sewers, storm sewers, natural gas, and electrical and telecommunication ducts, the Contractor is responsible for making his own allowance for any over excavation of 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 restoration 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

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 Varner 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

they are to be hand cut. 25.0 Site Parking Contractor will be responsible to provide 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.

engineer. If tree roots are encountered during construction,

Contractor must use public parking or at an alternate site approved by UBC PT.

26.0 Traffic Management Plan Refer to the Supplemental Provisions for the Traffic Management Plan for details and requirements related to traffic management and reporting during construction.

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

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 Schedule of Contract Prices.

28.0 Street Lights and Traffic Signals

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 Schedule of Contract Price.

- 30.0 Triumf — Rapid Transfer Line The Contractor is hereby advised of the presence of a highspeed transfer conduit utilized by TRIUMF for transmission of radioactive materials. The Contractor is to provide advance notice to Anne Trudel, 604-222-7370 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 contract 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. A copy of the Geotechnical Report can be obtained through the Consultant. Where soil conditions are not covered in the Geotechnical Report, the Contractor will provide his 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 tees, elbows, and

caps as per the following: Hauling and Truck Routes 36.0 UBC Technical Guidelines Section 02660, Clause 7.3.d. shall be The Traffic Control Plan shall provide a detailed drawing of the changed to: designated truck access and egress points, the applicable routes A flange x hub isolation valve shall be installed directly at through UBC Campus, the City of Vancouver, and / or Ministry the water main. If the location of the fire hydrant is more of Transportation jurisdiction, and the staging areas both on and than 6m from the water main, than a hub x flange additional off UBC property. The Plan shall also include the type and isolation valve shall be installed not more than 1m in front estimated number of loads per day traveling through UBC of the fire hydrant. Campus, including, but not limited to, material delivery,

SUPPLEMENTAL PROVISIONS TO 26.0 TRAFFIC MANAGEMENT PLAN

1.0 Traffic Management Strategy 1.1 General Requirements All traffic control measures shall be in accordance with these special provisions, the Ministry of Transportation Traffic Control Manual for Work on Roadways and subsequent addenda,

Transportation Association of Canada Manual of Uniform Traffic Control Devices for Canada, Transportation Association of Canada Geometric Design Guide for Canadian Roads, Ministry of Transportation BC Supplement to TAC Geometric Design Guide, University of British Columbia Strategic Transportation Plan, University of British Columbia Development Handbook. The following traffic control requirements shall apply:

a) The Contractor shall be responsible for attaining all necessary approvals / acceptance and / or permits required by the additional jurisdictional bodies, i.e. Ministry of Transportation and / or City of Vancouver.

b) The Contractor shall be additionally responsible for carrying out

standards for Traffic Control held by UBC, UBC Properties Trust,

traffic control throughout the duration of the project to the

City of Vancouver, and Ministry of Transportation.

c) Notwithstanding the intention stated at the front of the Traffic Control Manual for Work on Roadways, Section 1.1 General, use of the standards and the devices described within shall be fully

d)Further to Clause 1.2.3 — RESPONSIBILITY in the Traffic Control Manual for Work on Roadways, the Contractor is assigned such responsibility and shall ensure that traffic flows through the work to a sufficiently high standard to guarantee the convenience and safety of public, vehicular and pedestrian traffic, the safety of the workers on the site and the protection of the works.

e)Further to Clause 1.4 — TRAFFIC CONTROL (WORK) ZONES in the Traffic Control Manual for Work on Roadways, any one or more of the following: advance warning area, transition area, buffer space, work area and termination area of the traffic control work zone may be outside the limits of construction, but this in no way shall diminish the Contractors responsibility to meet the requirements of the Traffic Control Manual for Work on

INSPECTION OF TRAFFIC CONTROL in the Traffic Control Manual for Work on Roadways, construction signs, specific to an operation, shall either be covered or removed so that their message is obscured whenever the operation is not in progress. g) The Contractor shall designate a qualified Traffic Control Supervisor (TCS) who has the Contractor's authority to respond to traffic control requirements and who shall personally perform all the duties of the TCS, as detailed in Part 18.3. "WCB Occupational Health & Safety Regulation"

f) Further to Clause 1.5 - INSTALLATION, MAINTENANCE AND

h) The Contractor shall provide UBC Properties Trust or designated Representative with proof of currently valid certification by a body acceptable to UBC Properties Trust of all Traffic Control Persons prior to them performing in that capacity.

1.2 Traffic Management Plan 1.2.1 General Requirements The Contractor shall cooperate with UBC Properties Trust to prepare a Traffic Management Plan for the scheduled works. The Traffic Management Plan consists of six (6) types of sub-plans:

" Traffic Control Plan " Public Information Plan " Incident Management Plan " Implementation Plan " Three Week Truck Traffic — Actual and Projected " Three Week Projected Construction Schedule

One of each sub-plan shall be prepared one (1) week prior to the commencement of any work affecting the roadway or pedestrian traffic. The initial Public Information Plan, Incident Management Plan, and Implementation Plan, shall each be prepared to address the general requirements of the entire

Construction shall be scheduled so that the duration and extent of the proposed work and traffic control measures minimizes the impact on the traveling public, and shall not prohibit any part of the traveling public prior to receiving the required authorization to do so.

The Contractor shall prepare "Weekly Truck and Construction Schedule Report" forms (contained in Appendix A) on a weekly

The "Weekly Truck" portion shall provide the actual truck counts from the previous week, the projected truck counts for the current week, and the projected truck counts for the upcoming week. The "Construction Schedule" portion shall provide brief descriptions of the construction activity (i.e. bulk excavation), associated traffic control requirements including location and direction (i.e. northbound curb lane closure on Wesbrook Mall between Thunderbird Boulevard and the Hospital), anticipated delays, and days and hours of work.

The Contractor shall be responsible for providing, installing and maintaining all traffic control and protective devices as outlined in the Ministry of Transportation's Traffic Control Manual for Work on Roadways or custom traffic control drawings.

The Contractor's construction scheduling shall be fully integrated in the developed Traffic Management Plan. The cost of the preparation of the Plan shall be borne by UBC Properties Trust. The implementation of the Plan including the provision of signage required and the preparation of all related reports on projected trucking activity shall be borne by the

1.2.2 Traffic Control Plan

Contractor.

A detailed Traffic Control Plan complete with traffic control layout drawings and fully integrated with the Contractor's construction schedule, shall be prepared outlining the provision for all forms of traffic control required throughout the duration of the project.

The Traffic Control Plan shall: a) Identify the hours of work b) Identify the work zone location and direction and distance to

nearest landmarks c) Identify the size of the work zone

d) Identify lanes affected by the works e) Identify lane configuration in the work zone

f) Indicate whether accesses or intersections will be affected by the work zone and / or by traffic control devices

Traffic Control Persons in accordance with the standards

" Follow symbol conventions for identifying traffic control

devices as per the Ministry of Transportation Traffic Control

" Include all dimensions and explanatory notes on the layout

" Identify accesses or intersections affected by the work zone

" Identify the traveled lanes affected and provide the resulting

k) Any local roads used for a detour route, including the design

current accepted Traffic Control Plan. UBC Properties Trust shall

not be liable to the Contractor for their decision not to abide

by a Traffic Control Plan and cannot under any circumstances

If the Contractor fails to provide for the safe passage and

control of vehicular, pedestrian, or cyclist traffic or fails to

correct forthwith an unsatisfactory condition upon being so

until UBC Properties Trust or designated Representative is

directed, UBC Properties Trust or designated Representative, shall

issue a Stop Work Order and any impediments to traffic shall be

removed immediately. The Resume Work Order shall not be issued

satisfied that the situation has been rectified and is safe for

excavation spoil, and concrete. In addition, the Contractor shall

Appendix B), and weekly hauling summaries to be kept on file at

complete a daily traffic control and hauling log (contained in

The Contractor shall provide proof of annual safety inspection

certificates for all trucks. These certificates are to be provided

for the duration of the project, and shall be forwarded to UBC

Trucking hours are restricted to the hours of 7:30 am and 7:00

5:00 pm on Saturday. Trucks are not permitted on site prior to

required, the Contractor shall make application to UBC Properties

Trust, who may, at their discretion, allow a maximum of two (2)

In the event trucks arrive on site prior to the established start

Wesbrook Mall just south of W. 16th Avenue. The Contractor is

to ensure that all trucks utilize and are aware of the approved

in non-compliance with the staging requirements, the trucking

The Contractor is also to ensure that all trucks are aware and

company will be fined as outlined in Section 1.10.1.

staging location in South Campus. In the event trucks are found

location at the South Campus Temporary Parking Lot situated on

time, all trucks are to be directed to the approved staging

pm Monday to Friday, and between the hours of 9:00 am and

the established hours of work. In the event longer hours are

Properties Trust or designated Representative upon renewal.

the site office and made available upon request.

additional hours during the evening.

The Contractor shall not work on any operation without a

lane configuration including widths and locations

i) The location of vehicle storage areas if delays are

contained in the Ministry of Transportation Traffic Control Manual

g) Identify traffic volume capacity during project

for Work on Roadway

Manual for Work on Roadway

either typed or hand printed

or by traffic control devices

speed and vehicle for each road

be the basis of a claim by the Contractor.

road users, pedestrians, and / or cyclists.

anticipated

c) Define a process to notify major user groups such as BC h) Identify proposed delays or closure times Transit, emergency response agencies, and transportation companies of scheduled single lane alternating traffic patterns, i) Include custom traffic control scale drawing(s), which shall: detours and / or road closures at least one (1) week prior to work starting. " Identify the placement of all traffic control devices and

d) For single lane alternating traffic patterns, the Public Information Plan shall define a process, which ensures that the traveling public is informed about alternate routes at least one (1) week prior to work beginning.

utilize the campus truck routing assigned to the project. In the

routing requirements, the trucking company will be fined as

UBC Properties Trust has developed a map of campus which

provides the location of the South Campus Temporary Parking

Lot and the campus truck routing assisted for the project. The

not have the map provided in Appendix C. In the event, the

sub-trades and / or delivery companies, the Contractor will be

routes. These routes are to be alternated each day (South West

The Contractor is to ensure that all trucks traveling to and from

including, but not limited to, designated truck routes, load limits,

tarping of loads and special permitting for oversize or overweight

detail excavation, and back-fill requirements. In cases where site

constraints do not allow the use of "Trucks with Pups" and / or

The Contractor is to ensure that all trucks staging outside the

Trust, City of Vancouver, and / or Ministry of Transportation

requirements and attain the necessary permits from the

The Contractor shall be responsible for ensuring that all

roadways utilized for haul routes are kept clean and free of

dust. The Contractor shall be responsible for road sweeping

activities in addition to ensuring an on—site truck wash facility is

in place. The Contractor shall be required to submit any required

a) Parking permits for the Contractor and Subcontractor and

Services. UBC Properties Trust or designated Representative shall

their employees shall be obtained from Parking and Security

introduce the Contractor's Superintendent to the Parking and

permits for the crewmembers and subcontractors. Vehicles

shall be towed at the expense of the vehicle's owner.

Security Supervisor. The Contractor shall then purchase parking

parking in assigned parking lots without the appropriate permits

b) Parking is not permitted outside of the Contractor's hoarding

unless the area has been designated on the contract drawings

c) Contractors working on renovations to existing UBC Buildings

shall not be provided with on—site parking and only time—limited

governed by UBC Traffic and Parking Regulations and are to be

UBC Properties Trust or designated Representative shall identify

the major user groups affected by the Project. Major user

groups may include, but is not limited to, the following:

Any organization identified by UBC Properties Trust or

The Contractor shall work with UBC Properties Trust to organize

groups informed of planned traffic pattern changes, including but

not limited to the following: hauling and truck routes, detours,

lane shifts, lane closures, sidewalk closures, access restrictions,

Procedures for disseminating information related to unplanned

Relevant information with regard to the planned traffic pattern

Properties Trust Communication Representative at least one (1)

have prior approval of UBC Properties Trust Communications

week prior to implementation. Arrangements for notification shall

a) Define a process to routinely notify UBC Properties Trust of

b) Define a process to notify the traveling public of scheduled

traffic delays and project duration at least one (1) week prior to

repairs, motor vehicle accidents) shall be addressed in the

changes shall be provided by the Contractor to the UBC

traffic pattern changes (e.g. due to incidents such as emergency

schedule changes, and other traffic control procedures.

and implement a Public Information Plan to keep major user

identified to the satisfaction of the UBC Director of Parking and

d) Vehicles, which are to be parked on the Campus, are

limits of construction are in compliance with the UBC Properties

vehicles. In addition, the Contractor shall utilize "Trucks with

Pups" and / or "Trucks with Transfers" for bulk excavation,

"Trucks with Transfers" the Contractor shall notify UBC

UBC are in compliance with the guidelines of the University of

Contractor neglected to forward a copy of the map to the

The Contractor is to ensure that established haul routes are

spread over a minimum of two west—side Vancouver truck

Marine Drive, W. 41st Avenue, W. 10th Avenue, and W. 4th

British Columbia Strategic Transportation Plan / City of

Vancouver and / or Ministry of Transportation regulations

map is attached as Appendix C, and shall be distributed to the

various sub-trades. As outlined above, the trucking company will

be found in non-compliance if the trucks are not aware or does

outlined in Section 1.10.1.

fined as outlined above.

Properties Trust.

associated jurisdictional authority.

Construction Parking Control

damage deposits as per UBC requirements.

as being reserved for the Contractor.

loading permits shall be issued.

Emergency response services

Security Services.

1.2.3 Public Information Plan

Transit authorities

- Transport companies

- UBC Plant Operations

designated Representative

Incident Management Plan.

The Public Information Plan shall:

Representative.

scheduled work plans.

the start of work.

- Ministry of Transportation

UMA Triumf BC Research Papracan

Motorists

Pedestrians

Municipalities

Property owners

Special events

Cyclists

event trucks are found in non-compliance with the campus truck

e) For detours and / or road closures, the Public Information Plan shall define a process, which ensures that the traveling public is informed about alternate routes at least one (1) week prior to work beginning. f) For hauling / truck routes, the Public Information Plan shall define a process, which ensures that the traveling public is

informed about the location and hours of operation at least one (1) week in advance.

The Contractor is to coordinate with UBC Properties Trust in all matters concerning any interference with the normal operation of UBC Campus facilities, including, but not limited to haul and trucks routes and traffic pattern changes within the Campus. Minimizing disruption of normal campus operation and vehicular, pedestrian, and / or cyclist movements on Campus is an essential requirement of the contract.

The Contractor shall coordinate traffic control procedures with other contractors and / or UBC staff who are working in the vicinity of the Project in order to eliminate concurrent delays. Public Information Line

UBC Properties Trust has developed a Public Information Line (604-925-4142), which is to be utilized for all public and media inquiries. All public and media inquiries are to be referred to the UBC Properties Trust Public Information Line.

1.2.4 Incident Management Plan The Contractor shall work with UBC Properties Trust to organize and implement an Incident Management Plan. The primary objectives of an Incident Management Plan are to facilitate incident response and move traffic safely and expeditiously around the incident. The Plan shall specify how the Contractor will provide access for emergency vehicles and assistance to emergency personnel. An incident includes, but is not limited to, motor vehicle accidents, emergency road repairs, disabled vehicles, and debris on the road. The immediate response to an emergency shall by necessity make use of available devices and

As stated in Section 1.6.2.3, the Incident Management Plan shall address the procedures for disseminating information related to unscheduled traffic pattern changes (e.g. due to incidents) to UBC Properties Trust, stakeholders, and any additional parties identified by UBC Properties Trust or designated Representative.

The Incident Management Plan shall identify the following: a) Types of traffic incidents that may occur in the work zone. b) Procedure(s) to respond to a traffic incident that occurs

within the work zone. c) Procedure(s) to inform and update UBC Properties Trust of: ' Incident occurrence Response measures taken Clearance measures required

" Estimated clearance time

" Incident clearance

d) Procedure(s) to inform the traveling public of estimated duration and, if applicable, alternate routes.

e) The duties and responsibilities of the Traffic Control Supervisor with respect to incident response operations.

f) Procedure(s) to detect and verify incidents that occur within the work zone.

g) Procedure(s) to restore traffic flow around an incident site as quickly as possible.

h) Procedure(s) to clear the incident and restore normal project

traffic operations as soon as possible. i) The defined process to review incidents as they occur and propose modifications to the project that will reduce and / or prevent the severity and frequency of future incidents.

j) List of emergency response agencies and / or key personnel

required for information dissemination.

1.2.5 Implementation Plan

k) Procedure(s) and responsibility assigned for the completion and dissemination of the Incident Management Report to UBC Properties Trust or designated Representative within 24-hours of an incident, a sample of which is contained in Appendix B-Sample Traffic Management Documents.

The Contractor shall work with UBC Properties Trust to develop an Implementation Plan that outlines the procedures, which ensure that the Traffic Control Plan, Public Information Plan, and Incident Management Plan are developed and implemented efficiently and appropriately.

a) The Contractor shall identify a Traffic Control Supervisor who shall be delegated the following duties:

1) Have authority over all of the traffic control personnel on

site in compliance with the requirements of Part 18 of the WCB

Occupational Health and Safety Regulation regarding supervision of traffic control persons at the work zone. 2) Monitor and confirm that emergency traffic control operations

are carried out in accordance with the Incident Response Plan.

3) Ensure that daily traffic control and hauling logs are maintained and made available to UBC Properties Trust or designated Representative upon request, a sample of which is contained in Appendix B — Sample Traffic Management Documents.

4) Ensure that weekly hauling summaries are completed and made available to UBC Properties Trust or designated Representative upon request.

5) Monitor the implementation of the Traffic Control Plan(s) and installation, maintenance, and inspection of all traffic control measures, in accordance with Clause 1.5 of the Traffic Control Manual for Work on Roadways.

6) Monitor traffic operations to determine the effectiveness of the Traffic Control Plan including queue lengths during active construction and implementing appropriate measures when such queues become excessive or as directed by UBC Properties Trust or designated Representative.

7) Follow the Public Information Plan and liaise with UBC Properties Trust Communications Representative as required. 8) Follow the Incident Management Plan and report immediately to UBC Properties Trust or their designated Representative on traffic / construction incidents involving damage, injuries or fatalities, or on complaints from residents. The Traffic Control Supervisor shall ensure that the Incident Management Report is accurately completed for traffic / construction incidents involving damage, injuries or fatalities. The form shall be submitted to UBC Properties Trust or designated Representative the next

working day. 9) Ensure that appropriate minor modifications are made to the Traffic Control Plan and accepted by UBC Properties Trust if the specified traffic control measures are not achieving the desired effect. The Traffic Control Supervisor shall mark—up the Traffic Control Plan to indicate all modifications as installed, to keep the Traffic Management Plan is up to date.

10) Attend meetings relating to traffic control with UBC Properties Trust or designated Representative on behalf of the Contractor.

11) Inspect the condition of all temporary signs ensuring that these are maintained in accordance with Clause 1.5.2 of the Traffic Control Manual for Work on Roadways.

12) Oversee all requirements of the Contract, which contribute to the convenience, safety, and orderly movement of vehicular, pedestrian and / or cyclist traffic.

13) The Traffic Control Supervisor shall be responsible for updating the following: UBC Properties Trust; UBC Properties Trust designated Representative; UBC Properties Trust Communications Representative; police, emergency services, transit operators, affected municipalities, and directly affected property owners and businesses; and commenting on the traffic management plan as part of a Project—related meeting.

1.2.6 "Weekly Truck and Construction Schedule Report"

The Contractor shall work with UBC Properties Trust's consultant and participate in the providing the necessary data to compile the Weekly Truck Summary reports and Construction Schedule publications. The data will be forwarded each Tuesday by noon and will be documented as per the form contained in Appendix A. The UBC construction week is defined as a Monday to Saturday period.

The truck data forwarded will be an account of the deliveries / trucks which the Contractor actually had to the site the previous Monday to Saturday period. The truck data forwarded will also include an account of the deliveries / trucks which the Contractor projects for the current and upcoming Monday to Saturday periods. The truck report is to provide the number of truck trips which occur in the defined weeks, with a truck being defined as "a vehicle or any combination of vehicles with three (3) or more axles and a G.V.W. greater than 5500kg" and a truck trip being defined as "a one-way trip" — each load to and / or from the site would be considered two (2) truck trips on the report. The truck report is also to indicate the type of trucks which occur in the defined weeks (i.e. dump truck and pup; concrete mixer; concrete pump; semi with flatbed; etc.).

The construction schedule data forwarded will be a listing of all the general construction activities (i.e. excavation, backfill, form and pour concrete suspended slab, etc.) scheduled for the upcoming Monday to Friday period. The construction schedule data will also include the associated traffic control requirements including the approximate location and direction (i.e. northbound curb lane closure on Wesbrook Mall between Thunderbird Boulevard and the Hospital), and anticipated delays.

1.3 Signing Requirements The Contractor shall be responsible for the supply, installation, maintenance, and removal of all temporary (construction) signing The locations and types of signing shall be indicated on the Traffic Control Drawings provided by UBC Properties Trust,

including Advance Warning Signs for major traffic pattern

changes, a sample of which is shown in Appendix D — Signage. The Contractor shall also be responsible for the supply, installation, and maintenance of all project information signs, a sample of which is shown in Appendix D — Signage.

1.4 Location of Storage of Materials and Equipment Unless protected by traffic control devices and / or barrier, materials and equipment shall not be stored within the Clear Zone of the traveled portion of any roadway.

1.5 Permissible Delays Permissible delays shall be approved by UBC Properties Trust and are categorized as follows: a) Minor Delays — Less than two (2) minutes in duration for

and are permitted at any time during the day. b) Continuous Minor Delays — Traffic is stopped and released on a continuous cycle with less than five (5) minutes total interruption. These delays are not permitted prior to 9:30 am

Monday to Friday.

occasional interruption due to construction activities. These

delays shall be coordinated with available breaks in traffic flow

c) Major Delays - Maximum of ten (10) minutes in duration for occasional interruption of traffic for construction activities permitted after 9:30 am Monday to Friday under the control of Traffic Control Personnel. Activities, which are anticipated to require Major Delays, shall be outlined in an accepted Traffic Control Plan and shall include the associated traffic control measures to be utilized during these activities. During Major Delays, the Traffic Control Personnel will take a proactive role in redirecting traffic to available alternate routes and assisting traffic / pedestrians as required.

The Traffic Control Supervisor shall monitor queue lengths and if traffic cannot be cleared prior to starting another delay, the Traffic Control Supervisor shall adjust the duration of the delay and/or the interval between delays. If UBC Properties Trust or designated Representative determines that the delays are excessive, the Contractor shall immediately cease construction activities and make all the traveled lanes available to traffic as quickly as possible. A stop work order shall not be the basis of a claim for the contractor against UBC Properties Trust. UBC Properties Trust or designated Representative shall permit resumption of roadway operations as traffic levels dictate.

1.6 Additional Jurisdictional Considerations The Contractor shall comply with all Municipal by—laws and Provincial regulations at the Contractor's expense. This includes but is not limited to attaining all necessary permits for oversize, overweight vehicles traveling along the Ministry of Transportation and / or City of Vancouver roads and / or truck routes. In addition, if the scheduled work affects the flow of traffic on or access to a municipal or provincial roadway, the Contractor shall

be responsible for attaining necessary approvals from the

applicable jurisdictional governing bodies.

1.7 Open Excavations

All areas of excavation, along with the proposed safety measures, shall be shown on the Traffic Control Plan. Where excavation works are completed along the shoulder line or within a traveled lane line, the excavation shall be backfilled prior to the end of each working day. Shoulder excavations adjacent to traveled lanes may be left open for a longer duration providing that the excavation is:

" A minimum one metre offset from the outside lane line; Delineated and signed; and Accepted by UBC Properties Trust or designated Representative:

1.8 Allowable Hours for Construction

Allowable hours of construction are in accordance with the recommendations of the University Neighbourhood Association which restricts noise related construction activities to be completed between the hours of 7:30 am and 8:00 pm on any weekday that is not a holiday, and between the hours of 9:00 am and 5:00 pm on any Saturday that is not a holiday. Special written permission for extended hours of operation for specific construction activities on specific dates may be issued at the sole discretion of UBC Properties Trust.

Special events, statutory holidays, and unforeseen circumstances can cause variations in traffic flow; the Contractor shall use good judgment when scheduling the hours of work and lane closure hours.

1.9 Construction Access

a) Construction access for the work force and delivery of materials to the work areas within an existing building shall be designated by the Contractor and submitted for approval by UBC Properties Trust or designated Representative. No other existing exits or entrances shall be used by the work force for access or delivery of materials.

b) The Contractor is to maintain clear access to existing fire hydrants and Siamese connections at all times or obtain written permission from the Fire Marshall for any variances

c) The Contractor is to ensure that entrances and exits to existing and / or adjacent building are clear at all times. d) The Contractor shall provide and maintain adequate access to the project site at all times.

The Contractor shall be responsible for maintaining for the duration of the project, and correcting any damages occurring to existing roadways utilized to access the project site.

The Contractor is solely responsible for ensuring compliance with the UBC Strategic Transportation Plan guidelines, UBC Development Handbook and City of Vancouver by—laws.

Except where otherwise specifically permitted either by an approved Traffic Management Plan or by prior written permission from UBC Properties Trust and/or its designated representatives, whenever, in the opinion of UBC Properties Trust and/or its designated representatives, the Contractor causes or permits either through action or inaction, a violation of the rules and regulations outlined herein, UBC Properties Trust will require the Contractor to pay a fine based on an assessment made by UBC Properties Trust and/or its designated representatives.

The Fine payable by the Contractor for each violation will be: 1) For the first violation \$2,000.00 2) For the second violation

3) For the third violation

\$4,000.00

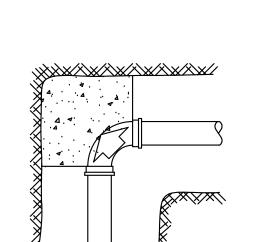
Upon issuance of the third fine, UBC Properties Trust, in its sole discretion, will issue a stop work order, and the Contractor will submit a plan to UBC Properties Trust and/or its designated representatives outlining the procedures to be followed by the Contractor to ensure that the violation does not recur. On acceptance of this plan by UBC Properties Trust, the Contractor will be issued a resume work order. Payments otherwise due to the Contractor will be reduced by the amount of the fine

NOTE: 1. Thrust blocks of 20 MPa concrete to be placed against undisturbed ground.

ON THIS SURFACE

2. Concrete shall not cover fittings, bells or flanges. 3. The Thrust Block Table is based on soil bearing strength of 70 kPa at 1380 kPa working

4. The Contractor will verify the bearing capacity of the soils.



THRUST BLOCK BEARING AREA IN m2. TEES 90° 45° 22 1/2° DEAD ENDS BENDS BENDS BENDS

NOTICE TO CONTRACTOR

IT IS THE RESPONSIBILITY OF THE CONTRACTOR'S SURVEYOR TO VERIFY THAT ALL

LEGAL SURVEY DIMENSIONS SHOWN ON THE ENGINEERS DRAWINGS AGREE WITH

THOSE ON THE REGISTERED LEGAL SURVEY PLAN. SHOULD THERE BE ANY

DISCREPANCIES, THEN IMMEDIATELY NOTIFY THE ENGINEER OF RECORD

ALL CONTRUCTION TO MMCD (2009) AND U.B.C. TECHNICAL GUIDELINES

BEARING AREA IS

THRUST DIRECTION

(TYPICAL SCHEMATIC)

UBC Undergrad Life Sciences Teaching

GENERAL NOTES

Date:

SPECIFICATIONS AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE PERMISSION OF THE ARCHITECT. THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNTIL SIGNED BY

ALL DRAWINGS. SPECIFICATIONS AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF

CONTRACTOR MUST CHECK & VERIFY ALL DIMENSIONS ON THE JOB.



NOT FOR CONSTRUCTION

2015-12-04 Issued for Development Permit

3 2016-04-29 Re-Issued for Development Permit

No. Date Description 2015-04-17 Issued for Design Development

INVERTS FROM:

LEGEND:

SEPT 17, 2009 SURVEY Inv. NE=87.19(.15ø)

UBC AS-CONSTRUCTED INFO S INV: =84.54m PROP. STORM SEWER -D----PROP. STORM MANHOLE

PROP. CATCH BASIN PROP. LAWN BASIN

SURVEY FOR ELEVATIONS. SOME

DISCREPANCIES APPEAR TO EXIST BETWEEN DATA WHICH WERE UNABLE TO BE VERIFIED IN THE FIELD. THE LOCATION 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

UTILITY INFORMATION COMPILED USING 2008

UBC BASE MAP WITH MURRAY AND ASSOC.

UTILITIES. CONTACT U.B.C. UTILITIES 72 HOURS PRIOR TO START OF CONSTRUCTION 604-822-9570. ALL CONSTRUCTION TO MMCD (2009) AND

U.B.C. TECHNICAL GUIDELINES

WHICH MIGHT BE OCCASIONED BY THE

CONTRACTOR'S FAILURE TO EXACTLY LOCATE

AND PRESERVE ANY AND ALL UNDERGROUND

Diamond Schmitt Architects 384 Adelaide Street West, Suite 300, Toronto, Canada, M5V1R7 Tel: 416 862 8800 Fax: 416 862 5508 info@dsai.ca www.dsai.ca In Collaboration With: HDR CEI Architecture Associates, Inc. 500 - 1500 West Gerogia Street, Vancouver, British Columbia, Canada V6G 2Z6

Tel: 604 687 1898 Fax: 604 682 5398 www.ceiarchitecture.com



6270 UNIVERSITY BOULEVARD, VANCOUVER, BO

Scale: Project No: 14-838

October 15, 2014

The demarcation point of service defining UBC Utilities' responsibility is included in the respective sections as listed above.

2. UBC Utilities Contact Information

* Section 02720 Storm Sewers

* Section 02730 Sanitary Sewers

* Section 02800 Power Utilities.

Administration Office: UBC Utilities 2040 West Mall Vancouver, BC V6T 1Z2

Telephone: (604) 822-9445 Facsimile: (604) 822-8833 Key positions in Utilities include:

* Director * Manager, Steam Plant (Chief Engineer) * Manager, Electrical Utilities (Senior Electrical Engineer) * Manager, Mechanical Utilities (Senior Mechanical Engineer) * Mechanical Utilities Engineer * Senior Accounting Clerk

* Lead Trades: Head Electrician, Head Plumber, Head Steamfitter, Head Utilities Maintenance Engineer.

3. Designer Responsibility UBC Technical Guidelines establishes the minimum acceptable standards for the supply and installation of the underground utility services to the buildings on the campus. This is not a design manual. The designer is responsible to ensure that the standards stipulated herein are consistent with the project requirements and are adequate for the project design criteria. The designer shall define the project requirements in the project specification as part of the project tender document.

Where comments in UBC Technical Guidelines is interpreted to conflict with the industry Standards, Acts and Codes, the compliance with the Standards, Acts and Codes shall prevail and the designer shall bring these conflicts in writing to the attention of the responsible manager at

The consultant and/or contractor shall provide drawings in accordance with the Section 01720 of these guidelines. Upon completion of installation of any new or modified underground utility services, As—built record drawings of underground utility services shall be provided to Campus Planning & Development Records Department. As—built drawings shall show inverts at points of tie-in, changes in direction, entrance and exit to the manholes, etc. Service profiles shall be provided in congested areas indicating location of all services.

4. UBC Utilities Development Support Services Table 'UBC Utilities Service Standard for Campus Development' outlines UBC Utilities' development support services and requirements for underground utility services. Support services and development requirements are defined in terms of UBC Board of Governors approval status.

.1 Underground Utility Record Drawings Record drawings for all underground utility services must be obtained from Campus Planning Records Department (telephone 604-822-9570).

.2 Utility Service Connection Applications A Service Connection Application is required to be submitted for any connection to a utility service as defined in the following Sections in Division 2: * Section 02660 Water Distribution * Section 02685 Natural Gas Distribution * Section 02695 Steam Distribution * Section 02720 Storm Sewers * Section 02730 Sanitary Sewers

* Section 02800 Power Utilities

This application is not a permit and there is no fee for this. Its primary purpose to provide the design loads on UBC's utility systems, and it shall be considered to be approved along with the Building Permit issued by Campus

The Service Connection Application form must be completed and submitted to UBC Utilities per the instructions on the form.

Permits from the provincial Electric Safety Branch, Gas Safety Branch, Boiler Safety Branch, Excavation Permits (UBC Campus Planning) and Plumbing permits (UBC Campus Planning) are the responsibility of the project

.3 Development Permit Approval by UBC Utilities The Director of UBC Utilities has sole authority to authorize underground utility service aspects of any development. Sign-off of development permits by UBC Utilities is coordinated by the Manager of Development in Campus Planning & Development.

.4 Field Inspections Once the applicable permits are approved and record drawings obtained, the Contractor (or in-house crew) performing construction is responsible to locate all underground services as per MMCD and WCB standards. As necessary, use of pipe locators and hand digging must be employed until all known services are located.

Once the project team has obtained permits, record drawings, and made all reasonable efforts to locate underground utility services, UBC Utilities will provide trades .3 Hydrants: staff support to perform field inspections to assist in verifying locations, condition, and features of existing underground utility services. Trades staff will be supported by UBC Utilities engineering and technical professionals.

Written requests (facsimile or Email) shall be submitted as

* For electrical service: Manager, Electrical Utilities * For gas, steam, water, sanitary, or storm: Manager, * Requests shall normally be submitted 3 working days in advance to enable scheduling of support crews.

UBC Utilities reserves the right to charge a \$300 fixed fee 8. Execution per utility service per site. .5 Shutdowns

UBC Utilities has sole authority and responsibility to perform shutdowns (or cross connections) of the systems within its jurisdiction. Shutdown of systems within UBC Utilities jurisdiction shall not be performed by Contractors. To initiate a shutdown, written request must be made

using the standard UBC protocol and form.

Costs for shutdowns may be remunerated by establishing a work order through UBC, or by arrangement with UBC Utilities can be done at a fixed fee. If the latter option is sought, the fixed fee is \$200 per shutdown if work can be performed Monday through Friday, between the hours of 7:30-15:30. If shutdowns must be performed after hours or weekends, the fixed fee is \$350 per shutdown.

END OF SECTION 02610

WATER DISTRIBUTION SECTION 02660

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 the Greater Vancouver Regional District (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: * 24" (600 mm) 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." * 12" (300 mm) 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. Responsibilities UBC Utilities is primarily responsible for operation, maintenance, and overall stewardship of the water distribution system . The demarcation of UBC Utilities point of service is as shown in standard dwg 1140-UT-04-WaterBldgDemarc.dwg for water supply to buildings, and standard dwg 1140-UT-05-WaterIrrigDemarc.dwg for water supply to irrigation systems.

Key positions in UBC Utilities are described in Division 2, Section 02610 of UBC Technical Guidelines. Unless otherwise agreed in writing, the project Designer is responsible for all design, permit, and inspection

requirements of the B.C. Plumbing Code. 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.

Water Distribution Standards & Policies The latest revisions of the following standards shall apply to water distribution at UBC. * UBC Sustainability Development Policy # 5 (www.policy.ubc.ca) * B.C. Master Municipal Construction Documents (MMCD) * B.C. Water & Waste Association (BCWWA) * American Water Works Association

Where there is a difference between these, Division 2,

Section 02660 and the referenced standards, UBC

* CSA Standards (as applicable);

Technical Guidelines shall apply.

consumption and fire flows.

Water Distribution Service Connections The first step to install any new or substantially modified connections to the water distribution system at UBC is to apply for a Service Connection Application as per Division 2, Section 02610 Underground Utility Services. Note that a Plumbing Permit is also required by Campus Planning & Development (CP&D) Regulatory Services as the regulatory authority for plumbing requirements of the B.C. Building

UBC Utilities are shown in UBC Technical Guidelines Division .11 General procedure for Testing and Flushing as per MMCD Project design drawings shall provide building load for both peak domestic consumption in litres/second, and fire flow required in litres/second. UBC Utilities reserves the right to request the calculations used to estimate the peak

The process and development review services provided by

Any new connections to the water distribution system will be reviewed for consistency with UBC Technical Guideline standards. UBC Utilities will evaluate the added load using UBC's water distribution (Cybernet) model at no cost to the project. The residual pressure under fire flow conditions as per the system model will be provided in

The Designer shall obtain the Water service records by contacting the Records Clerk at Campus Planning & Development (CP&D telephone 604-822-9570) and develop proposed service connection location(s). Service connections may be possible to more than one water main fronting the site for large, complex buildings with the approval of UBC Utilities.

Water meters are required for all buildings as per the design requirements shown in Figure xxx (insert Water Meter Drawing standard). As indicated on the drawing standard, the meter and

strainer are to be purchased and supplied by UBC Utilities. The project will be invoiced for the purchase price of the hardware with no additional markup or procurement fees. Fire Hydrant Connections Connections to UBC's fire hydrants are allowed with an approved Hydrant Connection Permit issued by Campus

Planning & Development. Instructions for applying are included in the Fire Hydrant Permit Application. Insert Fire Hydrant Permit Design and Materials

Service Connections and Water Mains: Pipe shall be Class 50 ductile iron pipe manufactured to AWWA C151, cement mortar lined to AWWA C104 and coated 1 mil thick asphalt.

b. Copper, up to 75 mm diameter, type K, joints brazed c. Joints shall be single rubber gasket for push—on bell and spigot type joints to AWWA C111, Tyton or approved

d. Flanged joints shall be AWWA C110, flat faced conforming to ANSI B16.1, Class 125. e. 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

f. Bolts shall be medium carbon steel or martensitic steel. ASTM A325 heavy hex finished, hot-dip aglyanized to ASTM A153. Coarse threads shall have Class 2A tolerance before galvanizing. Bolt sizes to AWWA110.

g. Nuts shall be heavy steel hex carbon steel to ASTM A563 Grade C hot—dip galvanized to ASTM A153. h. Tie rods shall be continuously threaded, guenched and tempered alloyed steel to ASTM A354, Grade BC, hot—dip

i. Joint Restraint Devices: Each joint shall be restrained with the socket pipe clamp (Grinnell figure 606) or equal with prior approval. .2 Valves and valve boxes: a. Gate Valves shall be manufactured to AWWA C509,

galvanized to ASTM A153.

or flanged ends. b. Stem seal shall be 0-ring type. Valves to be complete with 50 mm square nut for underground operation. Manufacturer shall be Clow.

ductile iron body, resilient seated, non-rising steam, hub

c. Circular valve boxes shall be Nelson-type as manufactured by Terminal City or Dobney Foundry. Valve box riser pipe to be 150 mm diameter PVC DR35. d. Maximum distance between isolating distribution valves to be 100 m.

Fire Hydrants to be 150 mm diameter Terminal City type C-71-P hydrants subjected to hydrostatic pressure test of 2070 kPa in compliance with AWWA C502.

b. Maximum distance 100 m. Minimum size of pipe connection 150 mm. d. Fire hydrant shall have isolating valve not more than 1 m in front of it.

4 Heavy Equipment Loads on Buried Pipe: a. 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.

Preparation: As per MMCD Section 02666.

.2 Trenching: As per MMCD Section 02666. Trench alignment and depth as shown on Contract Drawings or as approved otherwise by Utilities Mechanical Engineer (telephone 604-822-3274, fax 604-822-8833).

.3 Granular Bedding as per MMCD Section 02666. a. Minimum soil cover 700 mm. b. For pipe bedding use clean granular pipe bedding, graded gravel, 19 mm (-), MMS type 1. Bottom thickness shall be a quarter of pipe diameter, or minimum 100 mm thick. Top shall be minimum 300 mm thick. Sides shall be minimum 225 mm to maximum 300 mm thick. c. Place granular bedding (sand) material across full with of trench bottom in uniform layers to 100 mm depth. d. 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

.4 Pipe Installation as per MMCD Section 02666. a. A minimum 3 m horizontal clearance is required from sanitary piping, when they run parallel. If this clearance cannot be met, water piping can be installed closer with prior approval from UBC Utilities, providing water pipe is installed above sanitary piping with minimum vertical clearance 150 mm. When crossing sanitary sewers at 90° angle, the water pipe shall be encased with 20 MPa concrete minimum thickness of 150 mm. b. Minimum 750 mm clearance is required from all other

greater than 25 mm.

c. When crossing electric duct bank (crossing shall be done at 90°), run pipe with minimum vertical clearance 150 mm 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 projecting minimum 500 mm from either side of electric d. Test and/or bleed points consisting of Corporation cocks, sized to achieve minimum flushing velocity of 0.8 m/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.

.5 Valve installation: As per MMCD Section 02666. .6 At every valve and fitting install up to 3 m length of tie rods on each side of valve/fitting and each branch, when pipe couplings are used.

7 Hydrants as per MMCD Section 02666. a. For Hydrants not in service, place an orange painted sign, 30 cm x 30 cm, lettered "Not in Service" on the main port. Remove when water main is accepted by the Utilities Mechanical Engineer and UBC Plumbing Inspector.

90 Lpcd .8 Thrust Blocks as per MMCD Section 02666. Mixed Building Use a. Place concrete thrust blocks between valves, tees, wyes, plugs, caps, bends and undisturbed ground as shown on the Contract Drawings or as directed by Utilities M-RCO Mechanical Engineer. 90 Lpcd b. Thrust blocks to undisturbed soil shall be provided,

complete with bearing area and block volume .9 Pipe Surround and Backfill as per MMCD Section 02666. a. Upon completion of pipe laying and before backfilling, Contractor shall notify for inspection both (a) Utilities Mechanical Engineer (tel 822—3274 and fax 822—8833), and (b) UBC's Plumbing Inspector (A. Naidu, tel 822—0481 and fax 822-2632). Notification for inspection shall be provided 24 hours in advance. b. After inspection of work in place, surround and cover

.10 Cleaning and Preliminary Flushing as per MMCD Section a. Water may be supplied from UBC fire hydrants upon application for a Hydrant Use Permit as per Part 6 of Division 2. Section 02660. b. Before connection to UBC water system, flush piping clean until maximum free chlorine concentration is less than 0.3 mg/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

c. For trench backfill native backfill material may be used

in boulevard areas if free of rock greater than 100 mm.

LIBRY

Animal Sciences

Assembly

cultural shows.

Food Services

food services.

FOOD

Hospital

Hospital

Formula.

determine the PWWF.

pumped sewage be considered.

minimum velocity of 0.9 m/s.

be used for service connections.

be straight between manholes.

is permitted.

with a manhole.

maximum 75 m.

with clean—outs.

.5 Ductile Iron (DI), class C151;

MMCD Type 1 bedding.

Clause 3.14.

604-822-2632).

of 24 hours notice.

Mechanical Utilities Engineer.

STORM SEWERS SECTION 02720

END OF SECTION 02730

of rock greater than 25 mm.

approved under unique circumstances.

specification, unless otherwise noted.

Materials

the Sanitary Sewer Master Servicing Plan.

Other Uses

Specifically determined for use.

Dominant floor area designed for preparing and serving

Further description of the building uses and design flows

The ADF values listed above shall be considered minimum

values. The varied building uses and activities at UBC

responsible to ensure that flow rates are computed in

accordance with the specific size and activities of the

The PDWF shall be computed using the Harmon Peaking

An infiltration rate of 500 Litres per Pipe Diameter (m)

Sanitary sewage shall be collected and conveyed by a

Gravity sewers shall be sized using the Manning's Formula

New gravity sewers shall be sized such that the PWWF

with a resulting minimum flow velocity of 0.6 m/s.

Forcemains shall be sized using the Hazen-Williams

depth will not exceed 50% of the full depth of the pipe,

formula using a "C" value of 100. Forcemains shall have

a minimum pipe size of 100 mm and designed for a

When extending the existing trunk lines, sufficient size,

depth and slope of the sewer shall be maintained to

service mains in residential areas and 250 mm in research

/ industrial areas. A minimum pipe size of 150 mm shall

10 Regardless of pipe slope and capacity, the downstream

1 Manholes at maximum 100 m spacing shall be installed

.12 All service connections shall connect to the service main

.13 The length of service between the building face to the

first sanitary sewer connecting manhole shall be a

.14 A minimum 750 mm horizontal clearance is required

where the sanitary sewer is installed within a common

sewer varies significantly from the storm sewer, the

a water line shall be in accordance with the

angle shall be between 45° and 90°.

deflection angles exceeding 45 degrees.

Vancouver/Richmond Health Board requirements.

16 When crossing electric duct bank, run pipe below

electrical duct bank with minimum 150 mm vertical

trench with the storm sewer. If the invert of the sanitary

Designer shall give special consideration to the horizontal

15 Horizontal and vertical spacing of the sanitary sewer from

clearance from the bottom of electric duct bank. Crossing

17 Where drop manholes are required, drops shall be outside,

.18 All manholes shall be benched and have a minimum drop

of 30 mm. The drop shall be increased to 50 mm for

Unless otherwise approved in writing by the Manager,

material shall be used for the gravity sanitary sewer

.1 PVC, class SDR 28 (150 mm diam. and smaller) and SDR

6 PVC piping is preferred, therefore DI pipe will only be

in accordance with the current MMCD standards and

.2 Minimum cover on all sanitary sewers shall be 1.0 meters

in accordance with the MMCD standards. Where no future

main line extension or connection of services are required,

minimum cover may be reduced to 600 mm with special

.3 All pipe surround material shall consist of clean granular

4 Native backfill may be used in non—traveled area if free

For purposes of cleaning and flushing, water may be

Hydrant Use Permit available by download at

supplied from UBC fire hydrants upon application for a

All gravity sanitary sewer systems shall be low pressure

air tested in accordance with the MMCD Section 02731,

UBC's Plumbing Inspector shall be provided written notice

24 hours in advance to witness all testing and flushing of

.8 Supplemental to MMCD Section 02721, Clause 3.12 — Video

Inspection, a concise, written and signed report shall be

604-822-3274, fax. 604-822-8833) and UBC Plumbing

shall be inspected by UBC's Engineer and Inspector. The

Contractor shall provide written notification to both the

(tel. 604-822-0481, fax. 604-822-2632) with a minimum

10 Records of pipe sizes and inverts shall be provided to the

accordance with the Section 01720 of these guidelines.

need to be re-excavated for inspection and/or testing

upon request of UBC Plumbing Inspector or Utilities

Record Section, Campus Planning & Development, and to

.11 Where notification requirements are not met, services may

The campus has a dedicated storm drainage system which

discharges to the ocean on the north. The south

provided to both the Utilities Mechanical Engineer (tel.

Inspector (tel. 604-822-0481, fax. 604-822-2632).

.9 Prior to covering the pipe, all installed and bedded pipe

fax. 604-822-8833) and the UBC Plumbing Inspector

Utilities Mechanical Engineer (tel. 604-822-3274,

the Manager, Mechanical Utilities, UBC Utilities, in

the sanitary service system. (tel. 604-822-0481, fax.

Sanitary sewer works and appurtenances shall be installed

Concrete (reinforced C76 required for all pipes 600 mm in

Mechanical Utilities, UBC Utilities, only the following pipe

at each branch connection and each change of direction.

Top of manholes shall be 150 mm above the ground in all

landscaped areas, otherwise flush with surface. Pipe shall

pipe shall be of equal or larger diameter. No downsizing

using an "n" value of 0.011 for PVC or 0.013 for concrete.

gravity system. Only under unique circumstances will

per Length (m) per Day shall be added to the PDWF to

proposed facility. All pertinent information shall be

provided on the design drawings as described above.

may produce unique sewage flow rates. The Developer is

can be obtained in the Sanitary Sewer Master Servicing

a. Contractor shall notify both (a) Utilities Mechanical Engineer (tel 822-3274 and fax 822-8833), and (b) UBC's Plumbing Inspector (A. Naidu, tel 822-0481 and fax 822-2632). b. Notification shall be provided 24 hours in advance of testing. Perform all tests to in presence of Utilities Mechanical Engineer. Testing Procedure & Report as per MMCD Section 02666 Clause 3.19.1, 3.19.2, 3.19.3, 3.19.6. d. A concise, written and signed report shall be provided via facsimile to both the Utilities Mechanical Engineer (822-8833) and UBC Plumbing Inspector (822-2632).

.12 Disinfection and Flushing as per MMCD Section 02666. a. Perform desinfection procedure and residual chlorine test 24 hours later in presence of Utilities Mechanical b. Maintain water chlorinating level (free chlorine concentration mm. 25 mg/L) in new piping for minimum 24 hours.

Section 02610. Operating valves on the water distribution system shall only be performed by UBC. 14 Connections to existing waterworks system may be made by Contractor with approved design and proper notification. a. Notify both (a) Utilities Mechanical Engineer (tel 822-3274 and fax 822-8833), and (b) UBC's Plumbing Inspector (A. Naidu, tel 822-0481 and fax 822-2632) a minimum 24 hours in advance of scheduled connection.

13 Shutdowns must be requested in writing adhering to UBC's

campus—wide standard shutdown procedures as per Division

b. Make connections in presence of Utilities Mechanical Engineer and, upon request, UBC's Plumbing Inspector. To prevent damage to existing utilities, excavate at last 300 mm over utility by hand. c. 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 Utilities, UBC Utilities. END OF SECTION 02660

<u>SANITARY SEWERS SECTION 02730</u>

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. UBC Utilities maintains a Sanitary Sewer Master Servicing Plan and an engineering sanitary sewer model in SANSYS.

. Responsibilities UBC Utilities is primarily responsible for operation, maintenance, and overall stewardship of the sanitary sewers in cooperation with the following departments/organizations: * UBC Health, Safety, & Environment

* UBC Sustainability * UBC Properties Trust * UBC Campus Planning & Development * UBC Plant Operations

The demarcation of UBC Utilities point of service is defined in Figure ?? (insert AutoCad drawing as a figure).

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.

Sanitary Sewer Standards The latest revisions of the following standards shall apply to sanitary sewers at UBC. * B.C. Master Municipal Construction Documents (MMCD) * GVRD Sewer Use Bylaw No. 164 — including Schedules A, B, C, and D * UBC Environmental Protection Policy # 6 (www.policy.ubc.ca) * UBC Sustainability Development Policy # 5 (www.policy.ubc.ca)

* B.C. Provincial Health Act Sanitary Sewer Connections The first step to install any new or substantially modified connections to the sanitary sewer system at UBC is to apply for a Service Connection Permit as per Division 2, Section 02610 of UBC Technical Guidelines. There is no fee for the Service Connection Permit.

Campus Planning and Development's Regulatory Services also requires a Plumbing Permit to meet provisions of the B.C. Building Code Plumbing Provisions.

diameter and larger); The process and development review services provided by PVC piping is preferred for all piping 450 mm in diameter UBC Utilities are also shown in UBC Technical Guidelines or smaller. Division 2, Section 02610. Unless otherwise approved in writing by the Manager, Mechanical Utilities, UBC Utilities, only the following pipe Any new connections to the sanitary sewer system will be material shall be used for sanitary sewer forcemains: reviewed for consistency with the Sanitary Sewer Master

model will be updated and run by UBC Utilities at no cost .4 PVC, class C900 (300 mm diam. and smaller) and C905; to the project.

Servicing Plan, and if necessary the sanitary engineering

The Designer shall obtain the sanitary service records by contacting the Records Clerk at Campus Planning & Development and develop proposed service connection location(s). Service connections may be possible to more than one sanitary sewer main fronting the site.

Sanitary Sewer Discharge Characterization As part of the development design submission, the Designer shall provide the following: * Estimates on the number and types of plumbing figures proposed in the buildings (ie. low flow vs. conventional). The waste stream must be fully characterized by type and quantity. The design flows must be identified for all pipe reaches. Any chemical or biological materials must be fully disclosed and addressed in the design. * All waste being discharged shall be in compliance with the GVRD Sewer Use Bylaw No.164. A materials handling and disposal management strategy report must also be submitted for all waste which is not in compliance. * The sanitary discharge characterization may be included

in the drawing notes of the mechanical or civil design drawings for the development. 6. Sanitary Sewer Design 1 Sanitary sewer systems shall be designed using the Peak Wet Weather Flow (PWWF). The PWWF flow shall be the sum of the Peak Dry Weather Flow (PDWF), infiltration flow,

and pumped flow. .2 The PDWF shall be the product of the Average Daily Flow

(ADF) and the peaking factor. The following minimum ADF rates shall be used: Summary of Minimum Average Daily Flows (ADF)

Flow Category Description Category Code Average Daily Flow Family Residential Housing for families, post graduate couples, professional,

faculty and staff. 325 Lpcd Student Residential Housing for students — apartments, dormitories, shared RES-S

230 Lpcd Administrative and academic offices.

Classrooms, lectures, teaching labs, student and community activities. Research Facilities Research and processing.

Mixed use of classrooms, lecture halls, labs, research, administration and academic.

Library discharges to Booming Ground Creek and to the Fraser Libraries. River. The present system is monitored for stormwater flow and quality at all discharges from the campus. UBC 90 Lpcd Utilities maintains a Storm Drainage Master Servicing Plan and an engineering stormwater model in XP-SWMM. Medical/Clinical Clinics, medical sciences research and teaching Responsibilities 4 L/square meter

UBC Utilities is primarily responsible for operation, maintenance, and overall stewardship of the storm sewers in cooperation with the following Livestock holding for research purposes. departments/organizations: * UBC Health, Safety, & Environment 7.5 L/square meter * UBC Sustainability * UBC Properties Trust Visitor oriented buildings for conferences, events, and * UBC Campus Planning & Development * UBC Plant Operations 16 L/square meter

The demarcation of UBC Utilities point of service is defined in Figure ?? (insert AutoCad drawing as a figure). The project Designer must incorporate all specific requirements for Design and Materials and Execution of

100 L/m2 dining area 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. 3. Stormwater Objectives and Standards 7 L / square meter The latest revisions of the following standards shall apply to storm sewers at UBC No distinct comon use or other than described above.

* B.C. Master Municipal Construction Documents (MMCD) * GVRD Sewer Use Bylaw No. 164 * UBC Environmental Protection Policy # 6 (www.policy.ubc.ca) * UBC Sustainability Development Policy # 5 (www.policy.ubc.ca) * Fisheries Act The following guidelines should be considered in design and

* Best Management Practices (BMP) Guide for Stormwater, Greater Vancouver Sewerage and Drainage District Liquid Waste Management Plan www.gvrd.bc.ca/services/sewers/drain/BestMgmtGuide.html 4. Storm Sewer Connections

construction of stormwater systems

B.C. Building Code Plumbing Provisions.

The first step to install any new or substantially modified connections to the storm sewer system at UBC is to apply for a Service Connection Applications as per the requirements in Division 2, Section 02610 of UBC Technical Campus Planning and Development's Regulatory Services

The process and development review services provided by UBC Utilities are also shown in UBC Technical Guidelines Division 2, Section 02610. Any new connections to the storm sewer system will be reviewed for consistency with the Storm Drainage Master Servicing Plan, and if necessary the stormwater engineering

model will be updated and run by UBC Utilities at no cost

also requires a Plumbing Permit to meet provisions of the

to the project The Designer shall obtain the Storm service records by contacting the Records Clerk at Campus Planning & Development and develop proposed service connection facilitate the future extension of service in accordance with location(s). Service connections may be possible to more than one storm sewer main fronting the site.

.9 A minimum pipe size of 200 mm shall be used for gravity 5. Stormwater Control Plan As part of the site design submission, a Stormwater Control Plan is required if one of the following conditions a) The development site is 0.5 hectares (5,000 m2) or b) The development involves one or more new buildings, c) Net increase in stormwater runoff is 50 1/s or more based on 10 year return period and 10 minute duration storm (see IDF curve). d) There are features of the development which could lead to stormwater quality problems such as parking facilities, agricultural uses, or research functions that could lead to contaminated runoff.

> If a Stormwater Control Plan is required, the Designer shall provide a written document which clearly summarizes: * The storm flow design computations to include, but not necessarily be limited to, a figure indicating the catchment area and land use condition, along with a list of all design parameters and resulting design flows for the storm system. The design flows and hydraulic grade line must be indicated for all pipe reaches. * Description of potential stormwater contaminants and how stormwater quality will be controlled. * The Stormwater Control Plan need not be a large document, and the effort should be in proportion to the size and complexity of the development. For example, a single building development may adequately summarize stormwater design in one or two pages. * A copy of the shall be provided to the following: Manager, Mechanical Utilities — UBC Utilities (fax 604-822-8833) Director, Sustainability — UBC Land & Building Services

(fax 604-822-6119) Manager, Environmental Programs — UBC Health, Safetv. & Environment (fax 604-822-1637) Associate Director of Planning, Campus Planning & Development (fax 604-822-6119) Urban Designer/Landscape Architect, Campus Planning & Development (fax 604-822-6119) Associate Director of Municipal Services, Plant Operations (fax 604-822-6969) Landscape Supervisor, Plant Operations (fax 604-822-6969)

Approval of the Stormwater Control Plan is confirmed with authorization of the Storm Sewer Service Connection Permit

Storm Sewer Design Control of stormwater quality shall be addressed in the Stormwater Control Plan. Best Management Practices (BMP's) that shall be implemented to protect stormwater runoff quality. A reference document for applicable BMP's is GVRD's Best Management Practices Guide for Stormwater. This document should also be consulted for associated design information.

The Designer is encouraged to incorporate methods of biofiltration into the site design to assist with water quality treatment. This includes such features as grassed swales, vegetated buffer strips, french drains, engineered wetlands, etc. Engineered BMP's described above may be reduced or eliminated if adequate biofiltration measures are incorporated into the site design. If biofiltration is proposed for a development, it shall be included in the Stormwater Control Plan.

The Rational Method shall be applied for the design of all drainage systems servicing an area of 10 hectares or less. The hydrograph method shall be used for catchment areas exceeding 10 hectares. Hydrograph modeling shall also be applied where stormwater detention facilities are incorporated into the storm system. All hydrograph modeling shall be completed using either Visual OTTHYMO or a SWMM based program compatible with XP—SWMM2000. .4 The storm service system shall be designed within the

project site and to the receiving trunk sewer to convey the peak 1:10 year return period storm flows. In most cases, the sewer system shall be sized to ensure that the maximum hydraulic grade line elevation remains within the pipe. Under unique circumstances, surcharging below ground surface may be permitted provided it can be demonstrated that no risk to buildings or property result

.5 Rainfall intensity—duration—frequency curves and associated rainfall data for all storm flow calculations are provided in Figure ?? (insert IDF Curve) The Designer shall select a time of concentration (Tc) and

run—off coefficient (R) which are appropriate for the proposed development. The "Tc" shall be the sum of the inlet time and travel time. In most cases, the inlet time shall be 10 minutes when the impervious surface flow path length to the storm inlets is 100 meters or less .7 Stormwater shall preferably be collected and conveyed by a gravity system.

When extending the existing trunk lines, sufficient size, depth and slope of the sewer shall be maintained to facilitate the future extension of service in accordance with the Storm Drainage Master Servicing Plan. All storm sewer piping shall be designed with a mean velocity of 0.6 m/s when flowing full, based on the Manning's formula. Special provisions must be provided

m/s to ensure structural stability and durability concerns are addressed. .10 The minimum slope shall be 1.0 % for CB leads, 0.2 % for storm mains smaller than 600 mm in diameter, and 0.1 % for storm mains 600 mm in diameter and larger. 11 All catchbasins, lawn drains and inlet shall provide a sump

and trash hood in accordance with MMCD standard

for supercritical flow or where the velocity exceeds 3.0

.12 A Coalescing Plate Separator (CPS) shall be used for maintenance and repair yards, industrial facilities, fuelling stations, automotive repair facilities, and other locations where runoff has elevated levels (relative to typical urban runoff) of oil and grease contamination. .13 An API Oil Water Separator or equivalent product such as

Lafarge's Stormceptor chamber shall be incorporated at

the most downstream point of the on—site storm drainage

system for all parking facilities providing 20 or more parking stalls. The system shall be appropriately sized and include a bypass to reduce flushing of contaminants during

.14 Manholes at maximum 100 m spacing shall be installed at each branch connection and each change of direction. op of manholes shall be 150 mm above the ground in all landscaped areas, otherwise flush with surface. Pipe shall be straight between manholes.

.15 Where drop manholes are required, drops shall be outside, with clean—outs. .16 Catchbasins shall be spaced to service a maximum area

of 500 m2 on grades up to 3%. For grades exceeding 3% the spacing shall be reduced to an area of 350 m2. Special consideration shall be given at low spots to ensure that adequate capacity is provided. .17 The length of service between the building face to the

first storm sewer connecting manhole shall be a maximum 18 A minimum 750 mm horizontal clearance is required where the storm sewer is installed within a common trench with

the sanitary sewer. If the invert of the sanitary sewer varies significantly from the storm sewer, the Designer shall give special consideration to the horizontal spacing. 9 Horizontal and vertical spacing of the storm sewer from a water line shall be in accordance with the

Vancouver/Richmond Health Board requirements. .20 When crossing electric duct bank, run pipe below electrical duct bank with minimum 150 mm vertical clearance from the bottom of electric duct bank. Crossing angle shall be between 45° and 90°.

Unless otherwise approved by the Manager, Mechanical Utilities, UBC Utilities, only the following pipe material shall be used for the gravity storm sewer system: .1 PVC, class SDR 28 (150 mm diam. and smaller) and SDR

. MATERIALS

Concrete (reinforced C76 required for all pipes 600 mm in diameter and larger); .3 Corrugated HDPE having a minimum pipe stiffness of 320 kPa may be permitted under unique circumstances.

or smaller. Storm sewer works and appurtenances shall be installed in accordance with the current MMCD standards and specification, unless otherwise noted.

.4 PVC piping is preferred for all piping 300 mm in diameter

Minimum cover on all storm sewers shall be 1.0 meters in

accordance with the MMCD standards. Where no future

main line extension or connection of services, lawndrains, or catchbasins are required, minimum cover may be reduced to 600 mm with special approval. 3 Site grading and surface inlets shall be located to ensure

boundaries of the site. .4 Washout from concrete trucks and spray washing of exposed aggregate pavement shall conform to GVRD Best Management Practices for Stormwater Guide (Appendix H Construction Site Erosion and Sediment Control Guide) BMP

that stormwater is contained and controlled within the

.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 25 mm.

supplied from UBC fire hydrants upon application for a Hydrant Use Permit available by download at UBC's Plumbing Inspector shall be provided written notice 24 hours in advance to witness all testing and flushing of the storm service system. (tel. 604-822-0481, fax.

604-822-2632).

For purposes of cleaning and flushing, water may be

Supplemental to MMCD Section 02721, Clause 3.12 — Video Inspection, a concise, written and signed report shall be provided to both the Utilities Mechanical Engineer (tel. 604-822-3274, fax 604-822-8833) and UBC Plumbing Inspector (tel. 604-822-0481, fax 604-822-2632). 10 Prior to covering the pipe, all installed and bedded pipe shall be inspected by UBC's Engineer and Inspector. The

Contractor shall provide written notification to both the Utilities Mechanical Engineer (tel. 604—822—3274, fax. 604—822—8833) and the UBC Plumbing Inspector (tel. 604-822-0481, fax. 604-822-2632) with a minimum of 24 hours notice. 1 Records of pipe sizes and inverts shall be provided to the Record Section, Campus Planning & Development, and to the Manager, Mechanical Utilities, UBC Utilities, in

accordance with the Section 01720 of these guidelines. 2 Where notification requirements are not met, services may need to be re-excavated for inspection and/or testing upon request of UBC Plumbing Inspector or Utilities Mechanical Utilities Engineer.

END OF SECTION 02720 NATURAL GAS DISTRIBUTUION SECTION 02685

The University of British Columbia owns and operates its own natural gas distribution system. All parts of the system are non—interruptible (firm gas) service, except the supply to the steam plant. There three pressure zones within North Campus part of

the system (north of 16th Avenue): * 1.8 kPa (7" water) low pressure, * 34 kPa (5 psig) medium pressure, * 69 kPa (10 psig) high pressure.

The south campus (south of 16th Avenue) operates at 69 kPa (10 psig). Steel gas piping system throughout UBC Campus has a complete cathodic protection system.

Responsibilities

UBC Utilities is primarily responsible for operation, maintenance, and overall stewardship of the natural gas distribution system . The demarcation of UBC Utilities point of service is as shown on Gas Meter Standard Figure xx (insert gas meter standard drawing). distribution" is used, it applies to both steam supply and Where there is no gas meter for a given building, UBC condensate return piping and appurtenances unless

Utilities demarcation point is the last valve outside the otherwise specified. building wall. UBC Utilities is not responsible for any part of the gas

piping or equipment inside buildings. 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.

Natural Gas Distribution Standards The latest revisions of the following standards shall apply to natural gas distribution at UBC * UBC Sustainability Development Policy # 5 (www.policy.ubc.ca) * B.C. Gas Safety Act * Canadian National Gas Code * NACE xxxxx * CGA Standard (as applicable);

* CSA Standard (as applicable);

4. Natural Gas Service Connections The first step to install any new or substantially modified connections to the natural gas distribution system at UBC is to apply for a Natural Gas Service Connection Application as per Division 2, Section 02610 Underground Utility

The process and development review services provided by UBC Utilities are shown in UBC Technical Guidelines Division 2. Section 02610. Any new connections to the gas distribution system will be reviewed for consistency with UBC Utilities standards, and

if necessary the natural gas distribution (Stoner) model will

be updated and run by UBC Utilities at no cost to the

Project design drawings shall provide building load (list of appliances with nameplate capacities in m3/hour) and required pressure.

The Designer shall obtain the Gas service records by contacting the Records Clerk at Campus Planning & Development and develop proposed service connection location(s). Service connections may be possible to more than one gas main fronting the site.

meters shall be temperature compensated. Gas meter design requirements are as shown in Figure xxx (insert Gas Meter Drawing standard). Revenue gas meters shall have reading in m3, shall be provided with PFM regulator, ISO 9001 (smaller meters) or with electronically compensated pressure and temperature (larger meters). As indicated on the drawing standard, the meter assembly is to be purchased and supplied by UBC Utilities. The project will be invoiced for the purchase price of the

Natural gas meters are required for all buildings. All

The mean atmospheric pressure for PFM (Pressure Factor Measurement) is 100.71 kPa for all revenue natural gas meters on UBC Campus. Seismic Protection The decision whether to install seismic shutoff valves is the responsibility of the project consultants. Buildings which meet the following criteria may not benefit significantly by installing a seismic shutoff valve: (a) building is structurally designed for current seismic codes,

hardware with no additional markup or procurement fees.

.2 Buildings which use natural gas for emergency power or other emergency needs are recommended not to install seismic valves.

flexible connections to all gas equipment.

heaters, air heating units) and piping, and (c) install

Where installed, the following valves are required: California SeismicTM (formerly KosoTM) valves for horizontal orientation; Safe—T—QuakeTM valves for vertical orientation. Seismic gas valve shall be supported with two (2) brackets secured to a building wall or equivalent. Regardless UBC Utilities recommends that seismic restraints be used on all gas equipment (e.g. water heaters) and main gas piping in the building. 5 UBC Utilities recommends that flexible gas connections be

used on all gas equipment in the building. 7. Design and Materials .1 Design piping pressure: 415 kPa (60 psig).

.2 Connections shall be to the highest available pressure. .3 New underground piping shall be SDR11 Series 125 Polyethylene, manufactured to CAN 3-B137.4M86. New underground valves shall be PSV polyethylene shut off valves with butt fusion outlet ends, to accommodate SDR 11 pipe, confirming to ASTM D-2513. Pipe fittings shall be butt heat fusion polyethylene manufactured to ASTM D-3261-85.

40, ASTM A53 steel piping. Up to, but not including the gas meter assembly, all piping shall be painted yellow. All piping up to 2" size shall be socket welded, manufactured to ASTM A182. New piping over 2" may be butt welded. All aboveground valves shall be bronze plug—type shutoff valves with threaded outlet ends to accommodate A53 steel pipe, and conforming to ASTM B62. by B.C. Gas Safety Inspector of pressure testing and

New aboveground piping up to shall be minimum Schedule

.5 Permits by B.C. Gas Safety Branch and inspections/witness purging are the sole responsibility of the project. .6 The Mechanical Utilities Engineer (telephone 604-822-3274, fax 604-822-8833) and Utilities Head Plumber (telephone 604-822-3274, fax 604-822-4416) shall be notified in writing 24 hours in advance of any planned pressure testing of a new gas service pipe. Failure to provide notice may result in installed services to be re-excavated for inspection.

8. Execution Minimum soil cover shall be 600 mm.

undertaken.

END OF SECTION 02685

.3 Minimum 750 mm horizontal clearance is required from all .11 All underground steam and condensate piping shall be other services .4 When crossing electric ductbank, run pipe above electrical ductbank with minimum vertical clearance 150 mm from the top of electric ductbank. Crossing angle shall be 90°. If crossing of electric ductbank cannot be done in this manner, then encase natural gas pipe in one larger plastic

.2 Warning tape at 300 mm below grade level shall be

electric ductbank. .5 A top tracer wire attached to the underground polyethylene pipe shall be provided. .6 Continuity of the existing cathodic protection system shall

be maintained when any additions or replacements are

pipe projecting minimum 500 mm from either side of the

.7 Hot tapping may be done only with a written permission from the Manager, Mechanical Utilities, UBC Utilities. If hot tapping is permitted, Pacific Flow Control or equivalent .8 Purge pipe with nitrogen after new service pipe is installed. .9 For pipe bedding use clean granular pipe bedding, graded

gravel, 10 mm (minus), MMCD type 1. Bottom bedding shall be a guarter of pipe diameter or 100 mm thick. whichever is larger. Top bedding shall be minimum 300 mm thick. Side bedding shall be a minimum 225 mm to maximum 300 mm thicku .10 For trench backfill, native backfill may be used if free of rock greater than 100 mm. .11 No trees shall be planted within 1,200 mm of underground

campus—wide standard shutdown procedures as per Division 2, Section 02610. Operating valves on the gas distribution system shall only be performed by UBC. .13 Connections to existing gas distribution system may be made by Contractor with approved design and shutdown

.12 Shutdowns must be requested in writing adhering to UBC's

<u>STEAM</u> STEAM CONDENSATION

The majority of the buildings in the Main Campus area (north of 16th Avenue) are serviced by steam from the Powerhouse. 99 % dry steam is generated at 1,137 kPa (165 psig) and reduced to approximately 482 kPa (70 psig) in the Powerhouse for distribution to the following major systems: North, South, and West. There is also a Low Pressure system in the vicinity of Powerhouse with steam pressure in the range of 34 - 69 kPa (5-10 psig). There is a condensate return as part of UBC's steam distribution system. Wherever the term "steam

> Responsibilities UBC Utilities is primarily responsible for operation, maintenance, and overall stewardship of the steam distribution system. The demarcation of UBC Utilities point of service is as shown in Figure xx (insert Steam Demarcation Drawing).

> Key positions in UBC Utilities are described in Divsion 2,

Technical Guidelines in the drawings is not sufficient.

Section 02610 of UBC Technical Guidelines. Unless otherwise agreed in writing, the project Designer is responsible for all design, permit, and inspection requirements of the B.C. Boiler Safety Branch. 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

Steam Distribution Standards and Policies The latest revisions of the following standards and policies LEGEND: shall apply to steam distribution at UBC. * B.C. Boiler and Pressure Vessel Act (ASME B31.1 Power Piping Code; B.C. Boiler Safety Branch) * UBC Sustainability Development Policy # 5 (www.policy.ubc.ca) * CSA standards as applicable

Steam Distribution Service Connections The first step to install any new or substantially modified connections to the steam distribution system at UBC is to submit a Service Connection Application as per Division 2, Section 02610. The process and development review services provided by

UBC Utilities are also provided in UBC Technical Guidelines Division 2, Section 02610. Any new connections to the steam distribution system will be reviewed for consistency with UBC Utilities standards as defined in the UBC Technical Guidelines. If necessary the steam distribution engineering/flow model will be updated and run by UBC Utilities at no cost to the project. The Designer shall obtain the Steam service records by contacting the Records Clerk at Campus Planning &

Development and develop proposed service connection

location(s). Steam Distribution Design and Materials Steam pipina: * Design pressure shall be 1,030 kPa (150 psig), A106 Grade B seamless. * Schedule 40 is required for pipe sizes over 2", and Schedule 80 is required for pipe sizes 2" and smaller. * Fittings shall be A234 WPB, Schedule 40 for pipe sizes over 2", and #3000 forged—steel, socket welded for pipes 2" and smaller. * Flanges shall be #150 raised—face, weld neck (bore to suit pipe), A105, Grade 1 * Pressure bolting shall be A194, Grade B7. * Support lugs shall be carbon steel. * No cast iron fittings or valves are acceptable. * All valves upstream of PRV's, including PRV bypass valve, shall be at least #150 rated and socket welded for pipe sizes 2" and smaller. Greater than 2" shall be flanged or

* Attachment to condensate main piping shall be a tee.

Optionally a SockoletTM shall be used for pipes 2" or

(b) restraints installed on all gas equipment (e.g. water Condensate piping: * Design pressure shall be 1,030 kPa (150 psig), A106 Grade B seamless. [Design temperature must be a minimum 200 C (400 F). * Schedule 80 is required for all pipe sizes in consideration of corrosion. * Fittings shall be A234, WPB and #3000 F/S socket welded for pipes 2" and smaller. * Flanges shall be #150 raised—face, weld neck, extra heavy (XH) A105, Grade 1. * Pressure bolting shall be A194, Grade B7 * Support lugs shall be carbon steel. * No cast iron fittings or valves are acceptable. * Beginning with the last condensate return valve leaving a building, all valves shall be at least #150 rated and socket welded for pipe sizes 2" and smaller. Greater than 2" shall

be flanged or butt welded.

smaller, or WeldoletTM if greater than 2".

butt welded.

Optionally a SockoletTM shall be used for pipes 2" or smaller, or WeldoletTM if greater than 2". .3 Isolating valves are required in all mains and branches (incoming and outgoing) for steam and condensate.

4 Double block and bleed is mandatory inside steam

* Attachment to condensate main piping shall be a tee.

manholes on all main steam, main condensate, and small bore piping (including steam traps). Steam meters are required for all newly construction or substantially modified buildings at UBC. Steam meter design standards are shown in Figure xx (insert Steam Meter Standard Drawing). Steam meters shall be installed inside buildings, and located upstream of the pressure reducing valves (PRV). As indicated on the drawing standard, the meter, computer, and transmitter are to be purchased and supplied by UBC Utilities. The project will

be invoiced for the purchase price of the hardware with no additional markup or procurement fees .6 Condensate return shall be a pumped, open system. .7 A copy of design approval by B.C. Boiler Safety Branch shall be provided to UBC Utilities Mechanical Utilities Manager (Senior Mechanical Engineer) and Steam Plant

Manager (Chief Engineer). .8 A copy of hydrostatic tests required by B.C. Boiler Safety Branch shall be provided to UBC Utilities Mechanical

Utilities Manager and Steam Plant Manager (Chief Engineer). .9 Manholes shall be constructed with one or two side openable tops.

.10 Insulation of piping inside steam distribution manholes shall

be per Figure xx (insert Steam Manhole Insulation Drawing).

equipment, and pipe supports. There shall be no splatter,

installed in inverted concrete channel with removable lid, all joints sealed with tar. Perforated SDR35 PVC drainpipe, connected to the storm sewer shall be installed under all steam distribution trenches. .12 Welding: procedures and welder certification as per ASME B31.1 applies to all steam and condensate piping,

.13 Zinc coated components shall not be in contact (welded, bolted, or loose) with any part of the piping. 14 Substances containing chlorine or which will decompose to hydrogen chloride (e.g. coating to prevent adhesion of weld

splatter) shall not be applied to any part of the piping.

Cross electrical duct—bank above and leave vertical space

future expansion is not required, leave minimum 200 mm

for any future expansion. Crossing angle shall be 90°. If

arc strikes, or center punch marks on piping.

6. Execution Minimum soil cover 700 mm..2 Minimum 750 mm horizontal clearance required from all other services, except for condensate.

vertical clearance from the top of electrical duct—bank and place minimum 50 mm extruded polystyrene insulation overlapping minimum 250 mm on each side. .4 Native backfill may be used if free of rock greater than

Shutdowns must be requested in writing adhering to UBC's campus—wide standard shutdown procedures as per Division 2, Section 02610. Operating valves on the steam—condensate distribution system shall only be performed by UBC.ler END OF SECTION 02695

SITEWORK DIVISION 2

NOTICE TO CONTRACTOR

THOSE ON THE REGISTERED LEGAL SURVEY PLAN. SHOULD THERE BE ANY

DISCREPANCIES, THEN IMMEDIATELY NOTIFY THE ENGINEER OF RECORD

ALL CONTRUCTION TO MMCD (2009) AND U.B.C. TECHNICAL GUIDELINES

STEAM AND CONDENSATE DISTRIBUTION SECTION 02695 IT IS THE RESPONSIBILITY OF THE CONTRACTOR'S SURVEYOR TO VERIFY THAT ALL Scale: LEGAL SURVEY DIMENSIONS SHOWN ON THE ENGINEERS DRAWINGS AGREE WITH

NOT FOR CONSTRUCTION

CONTRACTOR MUST CHECK & VERIFY ALL DIMENSIONS ON THE JOB.

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNTIL SIGNED BY

PERMISSION OF THE ARCHITECT

ALL DRAWINGS, SPECIFICATIONS AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF

SPECIFICATIONS AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE

ISSUED No. Date 2015-04-17 Issued for Design Development

2015-12-04 Issued for Development Permit 2016-04-29 Re-Issued for Development Permit

INVERTS FROM: SEPT 17, 2009 SURVEY Inv. NE=87.19(.15ø)

UBC AS-CONSTRUCTED INFO S INV: =84.54m PROP. STORM SEWER -D----PROP. STORM MANHOLE

PROP. CATCH BASIN

PROP. LAWN BASIN

UTILITY INFORMATION COMPILED USING 2008 UBC BASE MAP WITH MURRAY AND ASSOC. SURVEY FOR ELEVATIONS. SOME DISCREPANCIES APPEAR TO EXIST BETWEEN DATA WHICH WERE UNABLE TO BE VERIFIED IN THE FIELD.

THE LOCATION 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 MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

ALL CONSTRUCTION TO MMCD (2009) AND U.B.C. TECHNICAL GUIDELINES

CONTACT U.B.C. UTILITIES 72 HOURS PRIOR

TO START OF CONSTRUCTION

604-822-9570.

Diamond Schmitt Architects 384 Adelaide Street West, Suite 300, Toronto, Canada, M5V1R7 Tel: 416 862 8800 Fax: 416 862 5508 info@dsai.ca www.dsai.ca In Collaboration With: HDR CEI Architecture Associates, Inc.



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Tel: 604 687 1898 Fax: 604 682 5398 www.ceiarchitecture.com

UBC Undergrad Life Sciences Teaching

GENERAL NOTES

6270 UNIVERSITY BOULEVARD, VANCOUVER, BC

Project No: 14-838 October 15, 2014 Date:

— STEAM—— BOOKSTORE MICHAEL SMITH ___ 250ø C.I. in 450¢ SLEEVE PLANTER PLANTER EXST. STM & SAN S/C TO BE CAPPED 150¢ AG. TILE
100¢ A.C. RELIEF AIR EXST. STEAM
TO BE CAPPED 150 AG. TILE STRM OVER 1000 A.C. STORM 100 AC. TIE IN UNKNOWN _EXST. SAN S/C APPROX. LOC'N TO BE CAPPÉD TO BE CAPPÉD SERVICE TUNNEL EXST. STM S/C TO BE REUSED CONTRACTOR TO REMOVE & DISPOSE OF OFF-SITE ALL EX. STORM, SANITARY, WATER AND STEAM C/W APPURTENANCES WITHIN PROPOSED BUILDING ENVELOPE & COURTYARD AS SHOWN EXST. IRRIGATION TO BE TIED INTO EXST. 300¢ WM C/W PRESSURE REDUCING BACKWATER VALVE NORTH WING SCIENCES EXST. STEAM TO BE CAPPED BACKFLOW VALVE PROP. BLDG (TYP.) 2 1/2" SW EXST. STM S/C TO BE CAPPED 2 1/2" WW SAND INTERCEPTOR W/ BACKWATER WEST WING CONTRACTOR TO CONFIRM EX. STORM IS ACTIVE & SERVICING EX. WEST WING BUILDING. IF NOT ACTIVE, CONTRACTOR TO REMOVE & DISPOSE OF OFF-SITE EX. STORM C/W APPURTENANCES WITHIN PROPOSED COURTYARD AS SHOWN 42Ø DESIGN ≥ 100mm GALV. SIAMESE LINE (DESIGN) APPROX. LOC'N 150ø CI W/M **MAIN MALL**

NOTICE TO CONTRACTOR

IT IS THE RESPONSIBILITY OF THE CONTRACTOR'S SURVEYOR TO VERIFY THAT ALL LEGAL SURVEY DIMENSIONS SHOWN ON THE ENGINEERS DRAWINGS AGREE WITH THOSE ON THE REGISTERED LEGAL SURVEY PLAN. SHOULD THERE BE ANY DISCREPANCIES, THEN IMMEDIATELY NOTIFY THE ENGINEER OF RECORD

ALL CONTRUCTION TO MMCD (2009) AND U.B.C. TECHNICAL GUIDELINES

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THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNTIL SIGNED BY THE ARCHITECT.



CONTRACTOR MUST CHECK & VERIFY ALL DIMENSIONS ON THE JOB.

DO NOT SCALE DRAWINGS.

NOT FOR CONSTRUCTION

No. Date Description
1 2015-04-17 Issued for Design Development
2 2015-12-04 Issued for Development Permit
3 2016-04-29 Re-Issued for Development Permit

UTILITY INFORMATION COMPILED USING 2008
UBC BASE MAP WITH MURRAY AND ASSOC.
SURVEY FOR ELEVATIONS. SOME
DISCREPANCIES APPEAR TO EXIST BETWEEN
DATA WHICH WERE UNABLE TO BE VERIFIED
IN THE FIELD.

THE LOCATION 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 MIGHT BE OCCASIONED BY THE
CONTRACTOR'S FAILURE TO EXACTLY LOCATE
AND PRESERVE ANY AND ALL UNDERGROUND
UTILITIES.

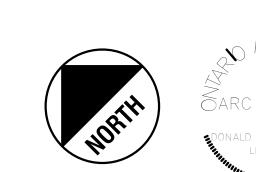
CONTACT U.B.C. UTILITIES 72 HOURS PRIOR
TO START OF CONSTRUCTION
604-822-9570.

ALL CONSTRUCTION TO MMCD (2009) AND U.B.C. TECHNICAL GUIDELINES

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In Collaboration With:

UBC Undergrad Life Sciences Teaching

6270 UNIVERSITY BOULEVARD, VANCOUVER, BC

DEMOLITION PLAN

Scale: 1:250
Project No: 14-838
Date: October 15, 2014

