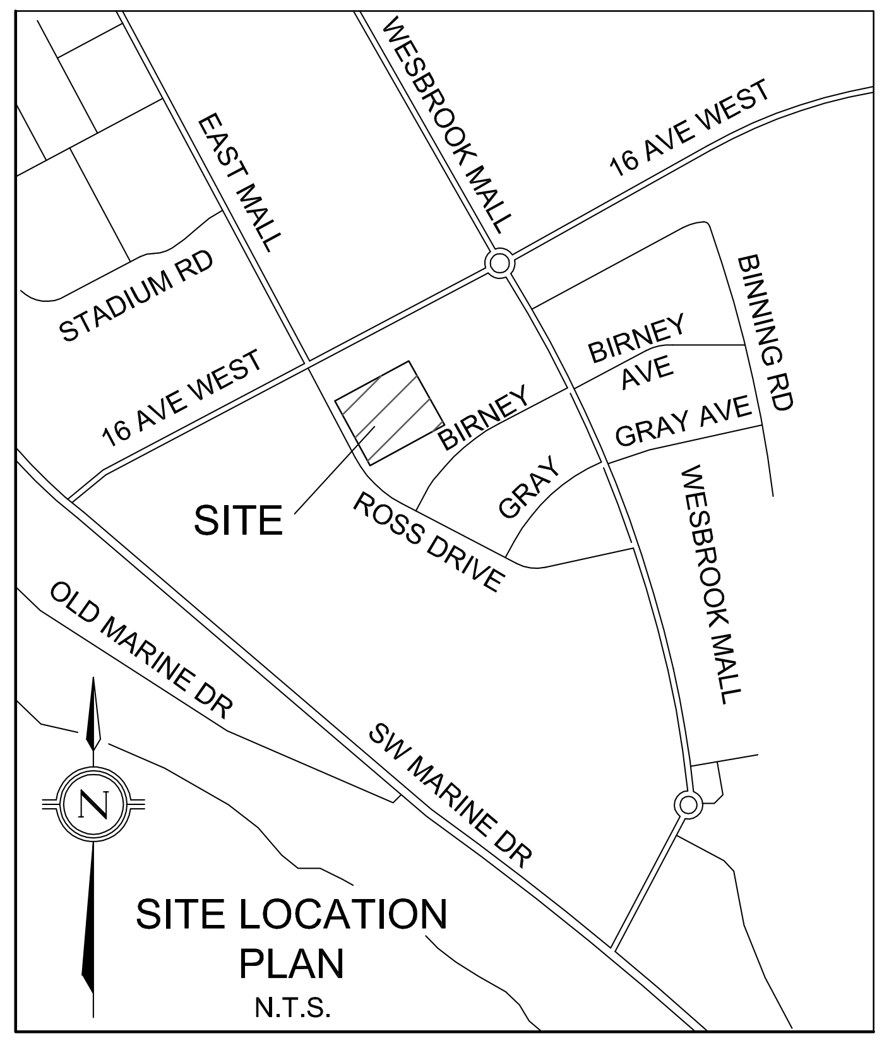
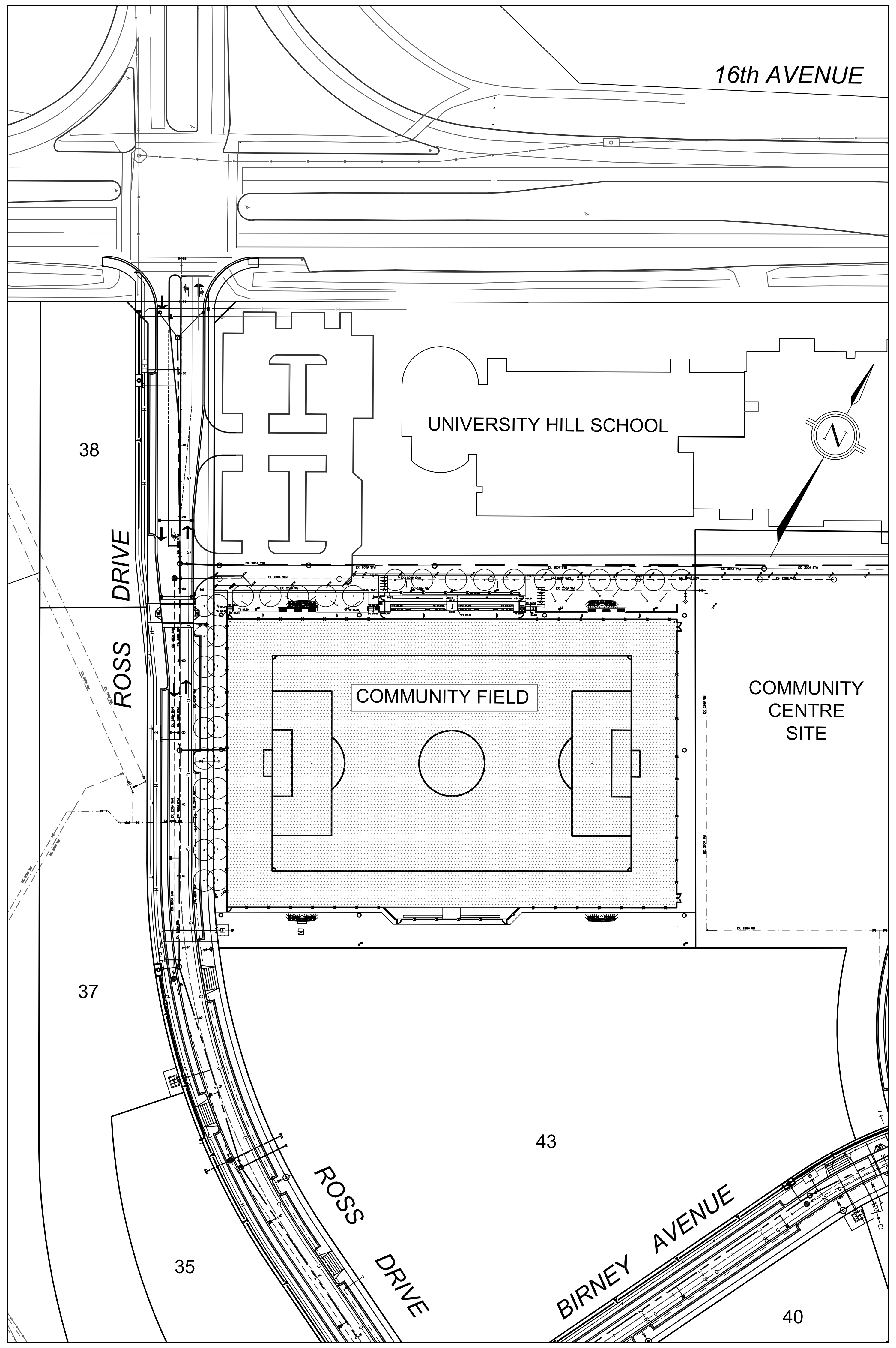


SITE LOCATION PLAN
N.T.S.

UBC PROPERTIES TRUST

UNIVERSITY OF BRITISH COLUMBIA

COMMUNITY FIELD
FIELD LAYOUT & STORM WORKS



KEY PLAN
SCALE 1:500m

DRAWING INDEX	
DRAWING No.	DESCRIPTION
100	KEY PLAN / DRAWING INDEX / LEGEND
200	COMMUNITY FIELD - SITE LAYOUT
300	COMMUNITY FIELD - STORM SEWER & GRADING PLAN
301	COMMUNITY FIELD - DETAILS
302	COMMUNITY FIELD - STORM SEWER : MH D45 to MH D40 to MH D47
303	COMMUNITY FIELD - STORM SEWER : MH D40 to MH D41
401	DETAILED SPECIFICATIONS - GENERAL / SANITARY / STORM
402	DETAILED SPECIFICATIONS - WATER, POWER & COMMUNICATIONS

LEGEND

	EXISTING	PROPOSED
STORM SEWER	——→——	——→——
SANITARY SEWER	— — → — —	— — → — —
WATERMAIN	—— · —— · ——	—— · —— · ——
STORM MANHOLE	○	○
SANITARY MANHOLE	●	●
CATCH BASIN	⧄	◪
VALVE	⋈	⧓
TRIUMF LINE (RADIOACTIVE)	——R——	——R——
GAS	——G——	——G——
TELECOM	——T——	——T——
HYDRO LINE	——H——	——H——
UTILITY POLE	⊙	⊙
UTILITY/HYDRO MANHOLE	Ⓤ	Ⓤ
TRIUMF MANHOLE	Ⓡ	Ⓡ
LIGHT STANDARD	☼	☼
SIGN	⍜	⍜

REVISIONS		
No.	DESCRIPTION	MO/DAY/YR
6		
5		
4		
3		
2		
1		

KAMPS ENGINEERING LIMITED
VANCOUVER, B.C.
604-682-2020 kamps@rogers.com

UBC PROPERTIES TRUST

CLIENT
UBC PROPERTIES TRUST

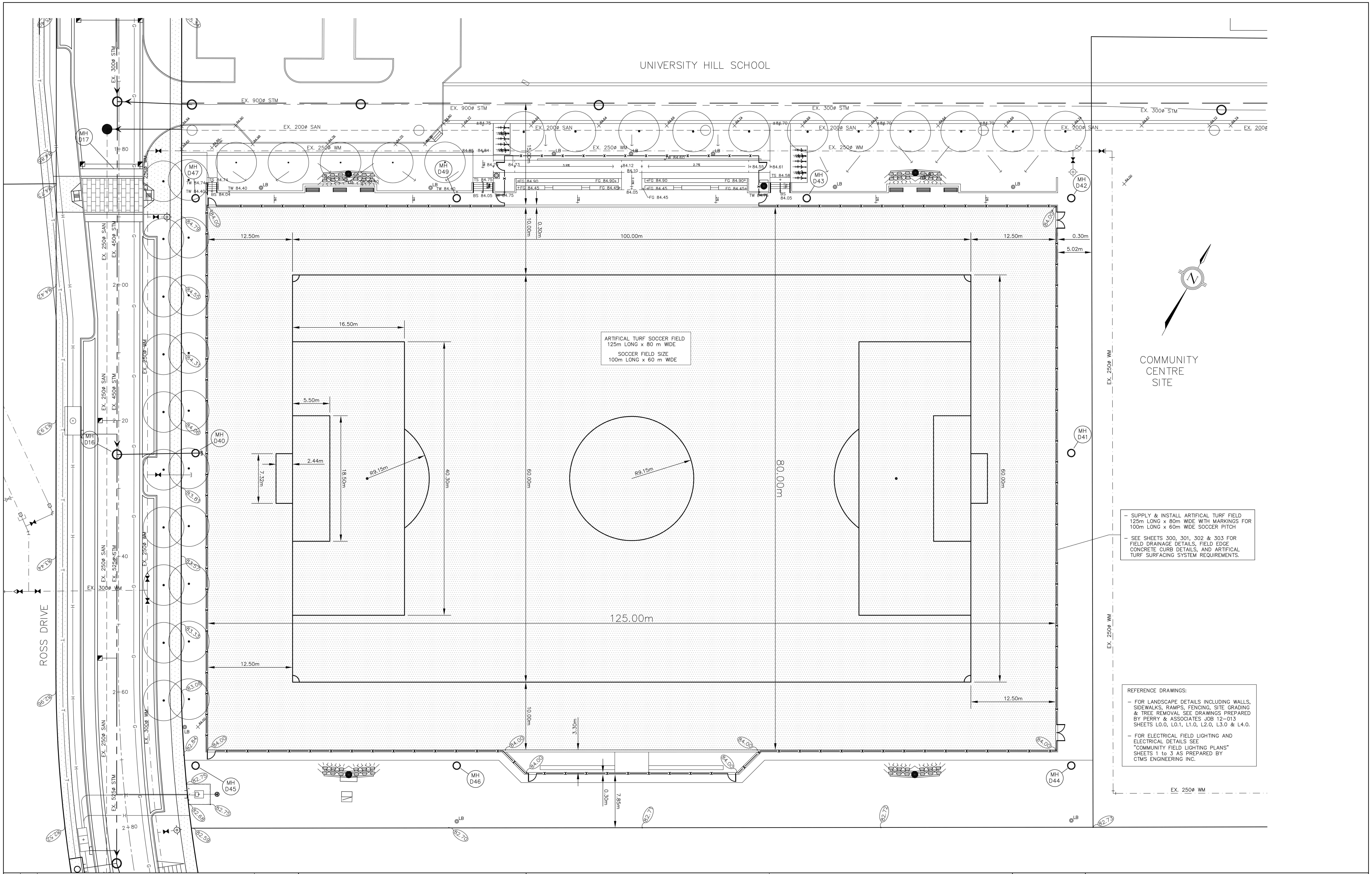
BUILDING/FACILITY

DRAWING TITLE
KEY PLAN / DRAWING INDEX / LEGEND

SEAL

PROJECT TITLE
COMMUNITY FIELD

DRAWN J.N.	SCALE AS SHOWN	PROJECT No. 8042
DESIGN M.K.	DATE JULY. 2012	DRAWING No. 100
CHECKED		REV.



- SUPPLY & INSTALL ARTIFICAL TURF FIELD 125m LONG x 80m WIDE WITH MARKINGS FOR 100m LONG x 60m WIDE SOCCER PITCH
- SEE SHEETS 300, 301, 302 & 303 FOR FIELD DRAINAGE DETAILS, FIELD EDGE CONCRETE CURB DETAILS, AND ARTIFICAL TURF SURFACING SYSTEM REQUIREMENTS.

REFERENCE DRAWINGS:

- FOR LANDSCAPE DETAILS INCLUDING WALLS, SIDEWALKS, RAMPS, FENCING, SITE GRADING & TREE REMOVAL SEE DRAWINGS PREPARED BY PERRY & ASSOCIATES JOB 12-013 SHEETS L0.0, L0.1, L1.0, L2.0, L3.0 & L4.0.
- FOR ELECTRICAL FIELD LIGHTING AND ELECTRICAL DETAILS SEE "COMMUNITY FIELD LIGHTING PLANS" SHEETS 1 to 3 AS PREPARED BY CTMS ENGINEERING INC.

REVISIONS

No.	DESCRIPTION	MO/DAY/YR
6		
5		
4		
3		
2		
1		

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

UBC PROPERTIES TRUST

CLIENT
UBC PROPERTIES TRUST

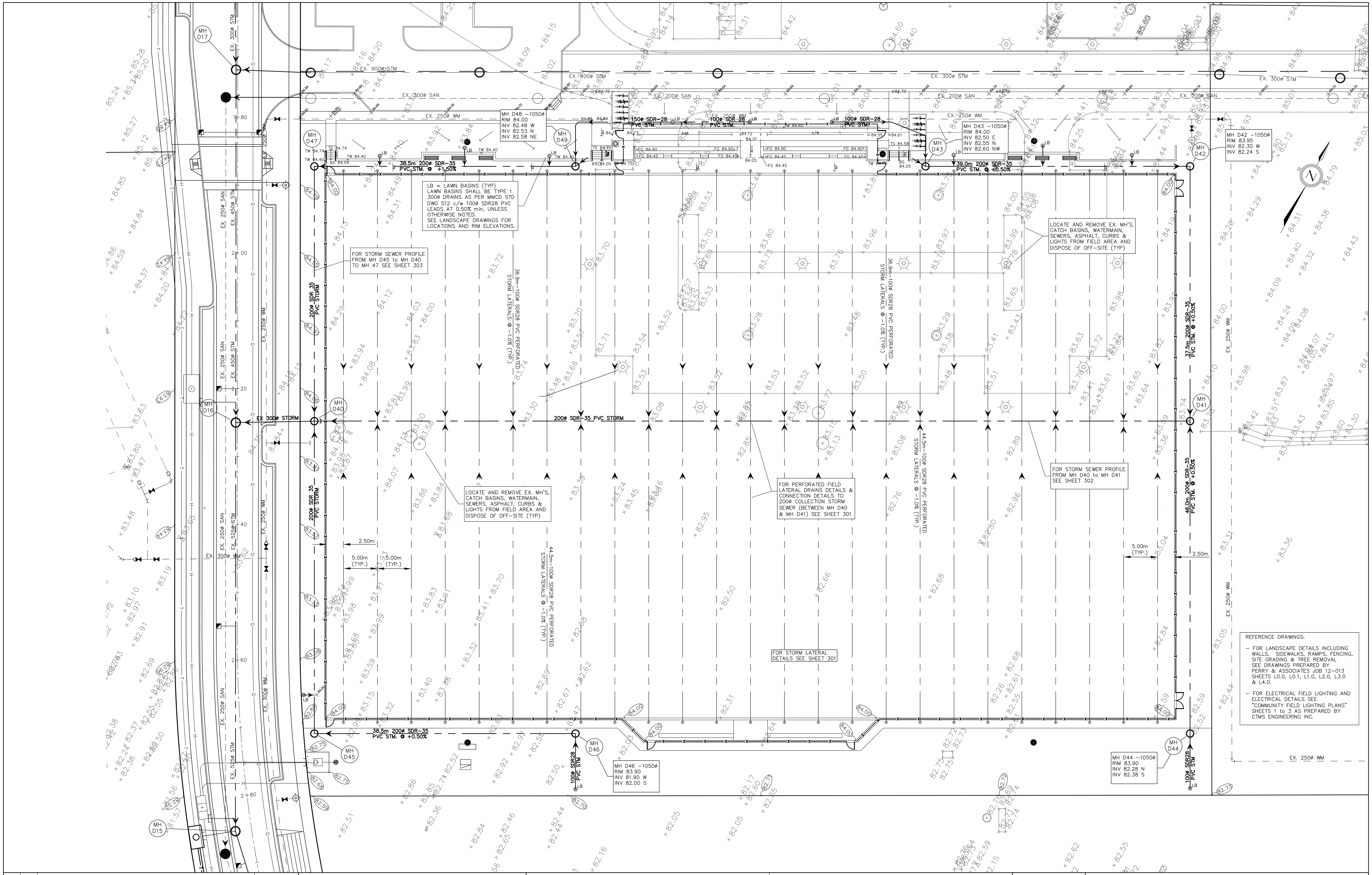
BUILDING/FACILITY

DRAWING TITLE
COMMUNITY FIELD
SITE LAYOUT

SEAL

PROJECT TITLE
COMMUNITY FIELD

DRAWN J.N.	SCALE 1:250m	PROJECT No. 8042
DESIGN M.K.	DATE JULY 2012	DRAWING No. 200
CHECKED		REV.



MH D48 -1050ø
RIM 84.00
INV 82.48 W
INV 82.53 N
INV 82.58 NE

MH D43 -1050ø
RIM 84.00
INV 82.50 E
INV 82.55 N
INV 82.60 NW

MH D42 -1050ø
RIM 83.95
INV 82.30 W
INV 82.24 S

MH D46 -1050ø
RIM 83.90
INV 81.90 W
INV 82.00 S

MH D44 -1050ø
RIM 83.90
INV 82.28 N
INV 82.38 S

LB = LAWN BASINS (TYP)
LAWN BASINS SHALL BE TYPE 1 300ø DRAINS AS PER MMCD STD DWG S12 c/w 100ø SDR28 PVC LEADS AT 0.50% min, UNLESS OTHERWISE NOTED.
SEE LANDSCAPE DRAWINGS FOR LOCATIONS AND RIM ELEVATIONS.

FOR STORM SEWER PROFILE FROM MH D45 to MH D40 TO MH 47 SEE SHEET 303

LOCATE AND REMOVE EX. MH'S, CATCH BASINS, WATERMAIN, SEWERS, ASPHALT, CURBS & LIGHTS FROM FIELD AREA AND DISPOSE OF OFF-SITE (TYP)

LOCATE AND REMOVE EX. MH'S, CATCH BASINS, WATERMAIN, SEWERS, ASPHALT, CURBS & LIGHTS FROM FIELD AREA AND DISPOSE OF OFF-SITE (TYP)

FOR PERFORATED FIELD LATERAL DRAINS DETAILS & CONNECTION DETAILS TO 200ø COLLECTION STORM SEWER (BETWEEN MH D40 & MH D41) SEE SHEET 301

FOR STORM SEWER PROFILE FROM MH D40 to MH D41 SEE SHEET 302

FOR STORM LATERAL DETAILS SEE SHEET 301

REFERENCE DRAWINGS:

- FOR LANDSCAPE DETAILS INCLUDING WALLS, SIDEWALKS, RAMPS, FENCING, SITE GRADING & TREE REMOVAL SEE DRAWINGS PREPARED BY PERRY & ASSOCIATES JOB 12-013 SHEETS L0.0, L0.1, L1.0, L2.0, L3.0 & L4.0.
- FOR ELECTRICAL FIELD LIGHTING AND ELECTRICAL DETAILS SEE "COMMUNITY FIELD LIGHTING PLANS" SHEETS 1 to 3 AS PREPARED BY CTMS ENGINEERING INC.

REVISIONS

No.	DESCRIPTION	MO/DAY/YR
6		
5		
4		
3		
2		
1		

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

UBC PROPERTIES TRUST

CLIENT
UBC PROPERTIES TRUST

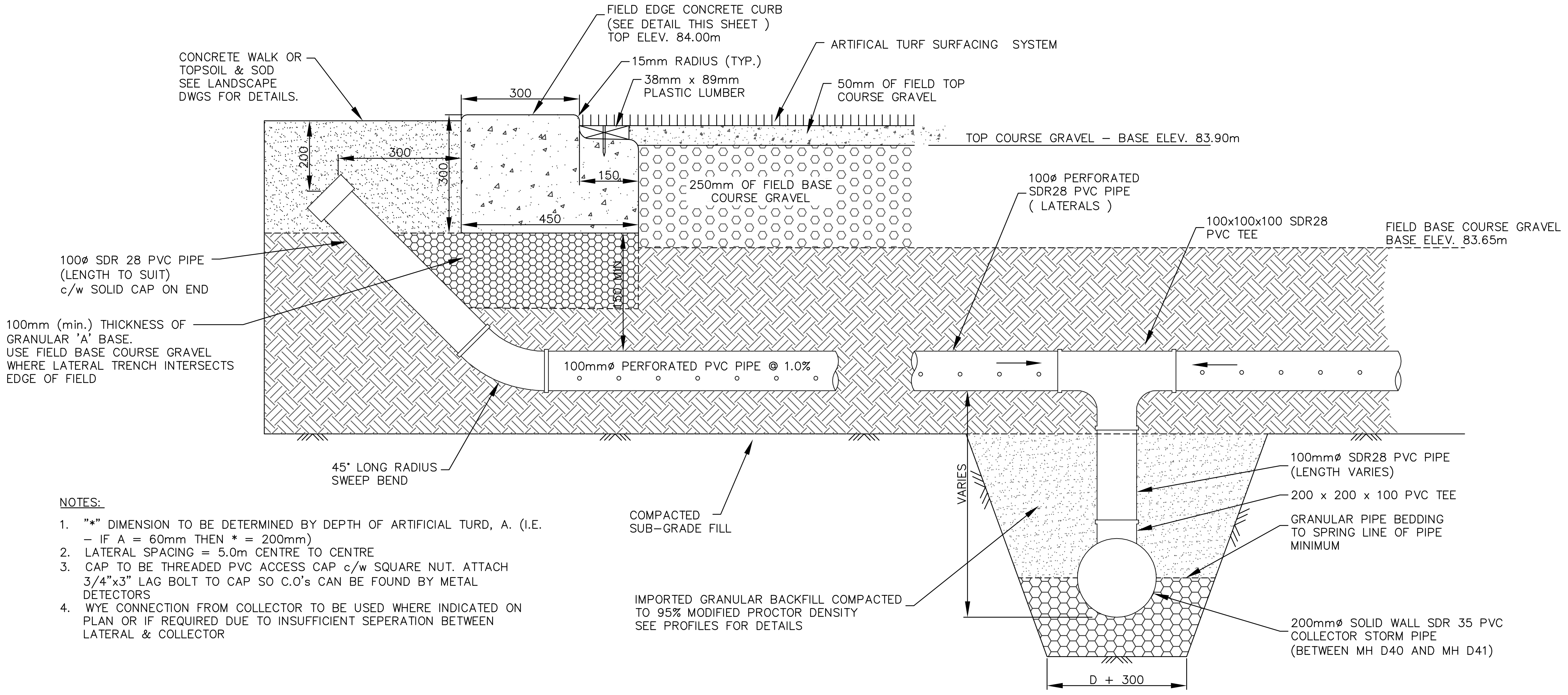
BUILDING/FACILITY

DRAWING TITLE
COMMUNITY FIELD
STORM SEWER & GRADING PLAN

SEAL

PROJECT TITLE
COMMUNITY FIELD

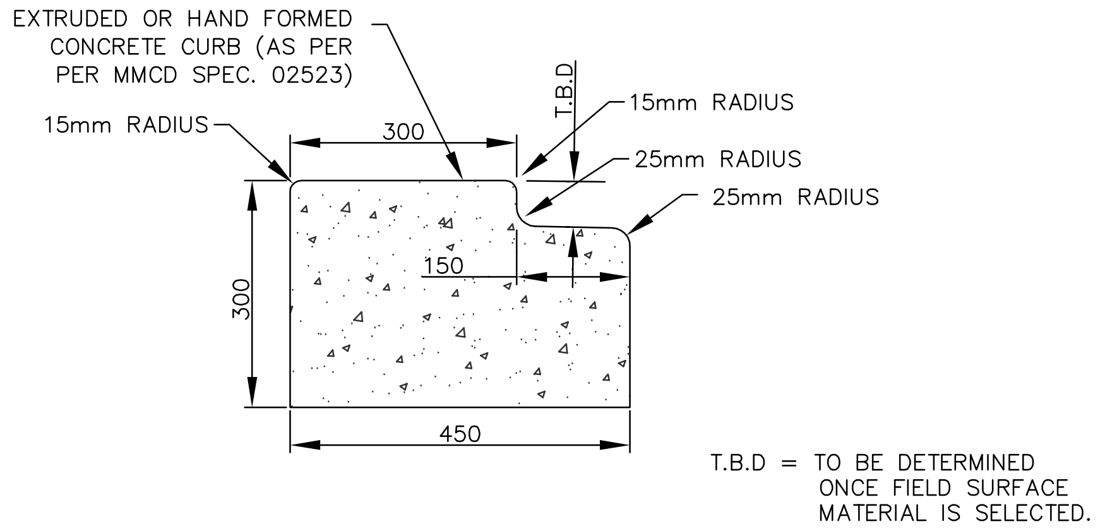
DRAWN J.N.
DESIGN M.K.
CHECKED
SCALE 1:250m
DATE JULY. 2012
PROJECT No. 8042
DRAWING No. 300
REV.



NOTES:

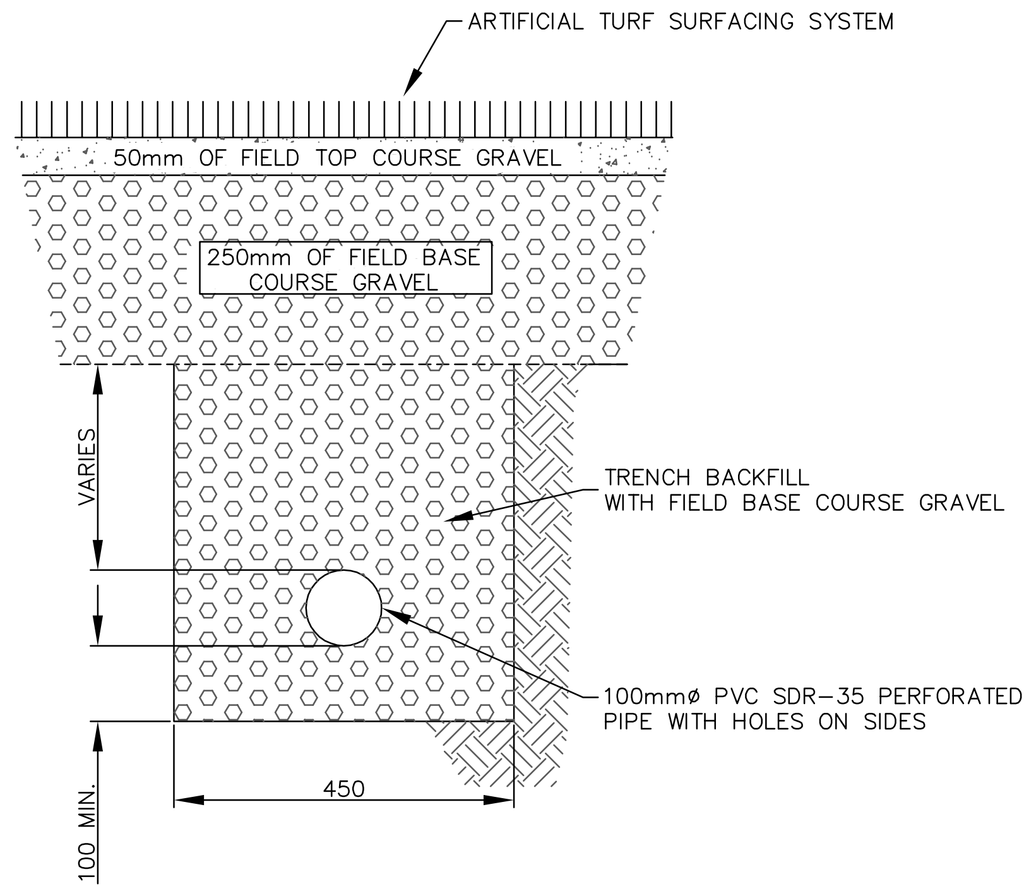
1. "*" DIMENSION TO BE DETERMINED BY DEPTH OF ARTIFICIAL TURD, A. (I.E. – IF A = 60mm THEN * = 200mm)
2. LATERAL SPACING = 5.0m CENTRE TO CENTRE
3. CAP TO BE THREADED PVC ACCESS CAP c/w SQUARE NUT. ATTACH 3/4"x3" LAG BOLT TO CAP SO C.O's CAN BE FOUND BY METAL DETECTORS
4. WYE CONNECTION FROM COLLECTOR TO BE USED WHERE INDICATED ON PLAN OR IF REQUIRED DUE TO INSUFFICIENT SEPERATION BETWEEN LATERAL & COLLECTOR

FIELD LATERAL DRAIN - PROFILE (typ)
NTS



T.B.D = TO BE DETERMINED ONCE FIELD SURFACE MATERIAL IS SELECTED.

FIELD EDGE CONCRETE CURB - DETAIL
NTS



FIELD LATERAL DRAIN - CROSS-SECTION (typ)
NTS

FIELD CONSTRUCTION NOTES:

AGGREGATES AND GRANULAR MATERIALS

1 AGGREGATES AND GRANULAR MATERIALS SHALL BE PER MMCD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THESE DRAWINGS.

2. THE ARTIFICIAL TURF FIELD SHALL BE CONSTRUCTED WITH A TWO LAYER GRADED GRAVEL FILTER USING MATERIAL GRADATIONS AS PER TABLE BELOW. VALUES SHOW % PASSING.

FIELD GRANULAR BASE MATERIAL GRADATION

SIEVE	FIELD BASE COURSE	FIELD TOP COURSE
38	100	
25		
19	60–100	100
15.88		98–100
12.7		90–100
9.53	40–78	60–100
6.35		25–95
4.75	25–60	20–85
2.36		8–65
1.18	8–33	0–40
0.59		0–20
0.29		0–8
0.30	4–13	
0.15		0–3
0.075	0–3	0–2

3. FIELD GRAVELS SHALL BE COMPOSED OF INERT, DURABLE, NON–LIMESTONE MATERIAL, FREE FROM SOFT OR DISINTEGRATED PARTICLES.

4. FOR ARTIFICIAL TURF FIELDS, THE FIELD BASE COURSE MATERIAL SHALL ALSO BE USED AS A PIPE SURROUND IN THE LATERAL DRAIN TRENCHES.

5. PRIOR TO BEGINNING PLACEMENT OF FIELD BASE AGGREGATES, THE CONTRACTOR SHALL SUBMIT A WRITTEN PLAN OF THE METHODS AND EQUIPMENT TO BE USED IN PLACING THE FIELD AGGREGATES. MATERIAL MUST BE PLACED ON SITE IN A MANNER THAT MINIMIZES THE DISTANCE THAT THE MATERIAL MUST BE PUSHED IN ORDER TO REDUCE THE POTENTIAL FOR SEGREGATION.

6. RIGOROUS TESTING AND APPROVALS ARE REQUIRED FOR COMPOSITION AND PLACEMENT OF FIELD AGGREGATES. IT IS THE CONTRACTORS RESPONSIBILITY TO REVIEW THE SUPPLEMENTAL SPECIFICATIONS AND ENSURE ALL TESTING AND APPROVAL PROCESSES ARE FOLLOWED.

7. CONTRACTOR TO CONFIRM SOURCE AND AVAILABILITY OF FIELD GRAVELS WITH ENGINEER, PRIOR TO ORDERING OR PLACING MATERIAL.

8. COMPACT BASE COURSE TO 95% S.P.D. USING OF A STEEL DRUM ROLLER IN STATIC (NON–VIBRATORY) MODE AFTER INITIAL SPREADING AND COMPACTION WITH TRACKED EQUIPMENT. THE OWNER'S CONSULTANT WILL PERFORM DENSITY TESTS.

9. ELEVATION OF CONCRETE CURB AND PLASTIC WOOD AT FIELD EDGE SHALL BE PLUS OF MINUS 6mm WHEN MEASURED USED A 3m STRAIGHT EDGE. DIMENSIONAL TOLERANCES AHLL BE PLUS OR MINUS 6mm.

10. PLANARITY REQUIREMENTS OR ARTIFICIAL TURF FIELD SHALL BE AS FOLLWS WHEN MEASURED IN ANY DIRECTION USING A 3m STRAIGHT EDGE:

FOR TOP COURSE:	PLUS OR MINUS 6mm
FOR BASE COURSE:	PLUS OR MINUS 10mm
FOR SUBGRADE:	PLUS OR MINUS 20mm

11. PERMEABILITY REQUIREMENTS FOR THE ARTIFICIAL TURF FIELD TO BE 250mm/hr.

RESHAPING EXISTING SUBGRADE:

12. OBTAIN APPROVAL FROM ARTIFICIAL TURF SUPPLIER FOR PLANARITY AND PERMEABILITY OF INSTALLED GRAVELS PRIOR TO PLACEMENT OF ARTIFICAL TURF.

13. RESHAPING OF THE EXISTING SUBGRADE SHALL BE PER MMCD SPECIFICATIONS OUNLESS OTHERWISE NOTED.

14. THE SUBGRADE OF THE FIELD IS TO BE A UNIFORM, TRUE SURFACE RELATIVE TO FINISH GRADE AND IS TO BE CONTROLLED USING LASER CONTROLLED EQUIPMENT. ALL SUBGRADE MUST BE AT DESIGN GRADE OR LOWER.

15. FILL TO SUBGRADE, WHERE REQUIRED, BY REUSING NATIVE MATERIALS ONLY IF FILLING SHALL BE DONE UNDER FAVORABLE WEATHER CONDITIONS AND IS TO THE REQUIREMENTS OF THE GEOTECHNICAL REPORT OR UNDER REVIEW OF GEOTECHNICAL CONSULTANT. ALL COMPACTION TO BE COMPLETED AT OPTIMUM MOISTURE CONTENT.

FIELD LATERAL DRAINS:

16. ALL FIELD LATERAL DRAIN PIPING SHALL BE PER MMCD SPECIFICATIONS OR AS SPECIFIED ON THESE DRAWINGS.

17. AFTER FIELD DRAIN IS INSTALLED RE–COMPACT AREA BETWEEN TRENCHES LEAVING NO LOOSE MATERIAL ON THE SUBGRADE.

18. ALLOW INSPECTION OF PERFORATED PIPE BY THE ENGINEER BEFORE COVERING PIPE WITH DRAIN ROCK. NO TRUCKS OR EQUIPMENT TO DRIVE OVER DRAIN TRENCHES UNTIL A MINIMUM OF 200mm OF COMPACTED BASE AGGREGATE IS COVERING THE PIPES. WHERE TRUCK TRAFFIC CROSSED COMPLETED TRENCHES THE BACKFILL SHALL BE REMOVED TO ALLOW RE–INSPECTION OF THE PIPE IF REQUIRED.

ARTIFICAL TURF SURFACING

19. THE CONTRACTOR SHALL SUPPLY & INSTALL AN ARTIFICAL TURF SURFACING SYSTEM THAT MEETS DESIGN AND PERFORMANCE STANDARDS SET OUT BY THE OWNER AND SUITABLE FOR THE USE OF THE COMMUNITY FIELD AS A SOCCER FIELD.

20. ALL PROPOSED SYSTEMS SHALL BE COMPOSED OF A TURFED POLYETHYLENE FIBRE MAT WITH INFILL OF SAND AND RUBBER, OR ONLY RUBBER, OVER A DRAINAGE LAYER OR AN POROUS ELASTIC LAYER.

21. THE TURF SHALL CONSISTS OF A UV RESISTANT POLYOLEFIN (POLYETHLENE) 'MONOFILAMENT' FIBRES TUFTED INTO A WOVEN RESLIENT, POROUS, REINFORCED POLYESTER PRIMARY BACKING MAT. THE FIRBE LENGTH SHALL BE AS PER MANUFACTURER'S SPECIFICATIONS AND DESIGN REQUIRMENTS.

22. THE ARTIFICAL TURF FIELD IS TO BE FILLED WITH A PROPRIETARY BLEND OF SAND AND/OR RUBBER GRANULES TO A DEPTH AND PROPORTIONS AS SPECIFIED BY THE MANUFACTURES SPECIFICATIONS.

23. THE ARTIFICAL TURF SURFACING SYSTEM SHALL BE TESTED AND EVALUATED AGAINST THE REQUIREMENTS OF THE INTERNATIONS SOCCER ASSOCIATION (FIFA), THE GERMAN INDUSTRIAL STANDARDS (DIN) AND THE AMERICAN SOCIETY OF TESTING OF MATEWRIALS (ASTM) AS APPLICABLE TO ARTIFICAL SURFACING SYSTEMS.

24. ON COMPLETION OF THE ARTIFICAL TURF SURFACING SYSTEM THE CONTRACTOR SHALL TEST THE INSTALLATION IN ACCORDANCE WITH ASTM F355–01 AND "STANDARD TEST METHOD FOR SHOCK–ABORBING PROPERTIES OF A PLAYING SURFACE AND MATERIALS (PROCEDURE A) AND SHALL MEET FIFA 1 STAR TEST STANDARDS.

FIELD MARKINGS

25. THE ARTIFICAL TURF SHALL BE MARKED OUT TO SHOW A 100m LONG X 60m WIDE SOCCER FIELD.

26. THE LINE MATERIAL SHALL BE TECHNICALLY AND DIMENSIONALLY THE SAME AS THAT IS USED FOR THE MAIN PLAYING FIELD MAT SYSTEM. ALL INLAID MATERIAL SHALL BE IDENTICAL TO THE REMINDER OF THE TURF MATERIAL EXCEPT FOR COLOUR OF FIBRE.

27. THE SOCCER FIELD LINE WIDTHS, EITHER FACTORY PRODUCED OR IN–LAID ON–SITE, SHALL BE TO FIFA STANDARDS (WHITE IN COLOUR) WITH LINES 5 inches IN WIDTH FOR ALL GOAL LINES, FIELD BORDER, CENTRELINES AND CIRCULAR LINES. CONTRACTOR SHALL SUBMIT A SHOP DRAWING SHOWING FIELD LAYOUT AND LINEAGE TO THE OWNERS FOR REVIEW AND APPORVAL. .

REVISIONS

No.	DESCRIPTION	MO/DAY/YR
6		
5		
4		
3		
2		
1		

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

UBC PROPERTIES TRUST

CLIENT
UBC PROPERTIES TRUST

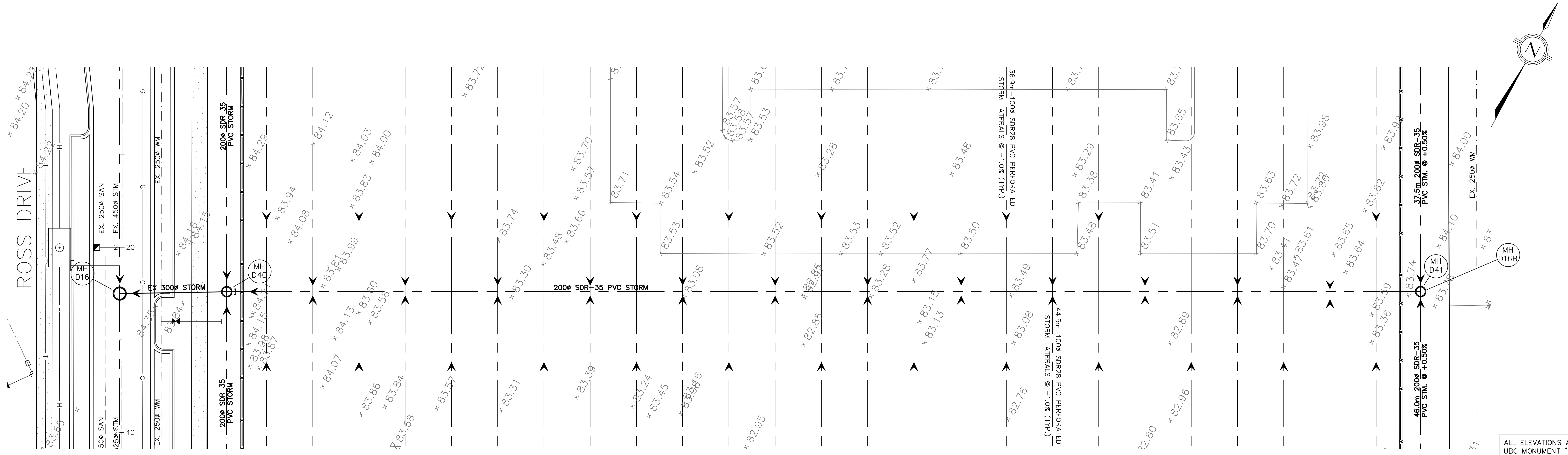
BUILDING/FACILITY

DRAWING TITLE
COMMUNITY FIELD
DETAILS

SEAL

PROJECT TITLE
COMMUNITY FIELD

DRAWN J.N.
SCALE NTS
PROJECT No. 8022
DESIGN M.K.
DATE JULY 2012
DRAWING No. 301
REV.
CHECKED

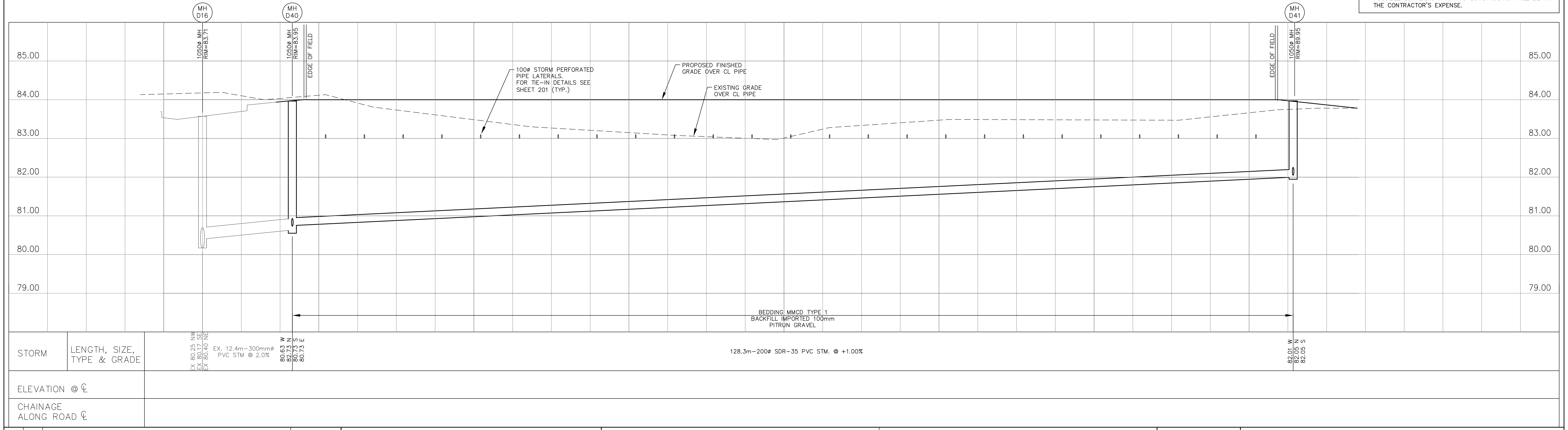


FOR STORM LATERAL DETAILS SEE SHEET 201

FOR STORM LATERAL DETAILS SEE SHEET 201

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

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



REVISIONS No.	DESCRIPTION	MO/DAY/YR
6		
5		
4		
3		
2		
1		

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

UBC PROPERTIES TRUST

CLIENT
UBC PROPERTIES TRUST

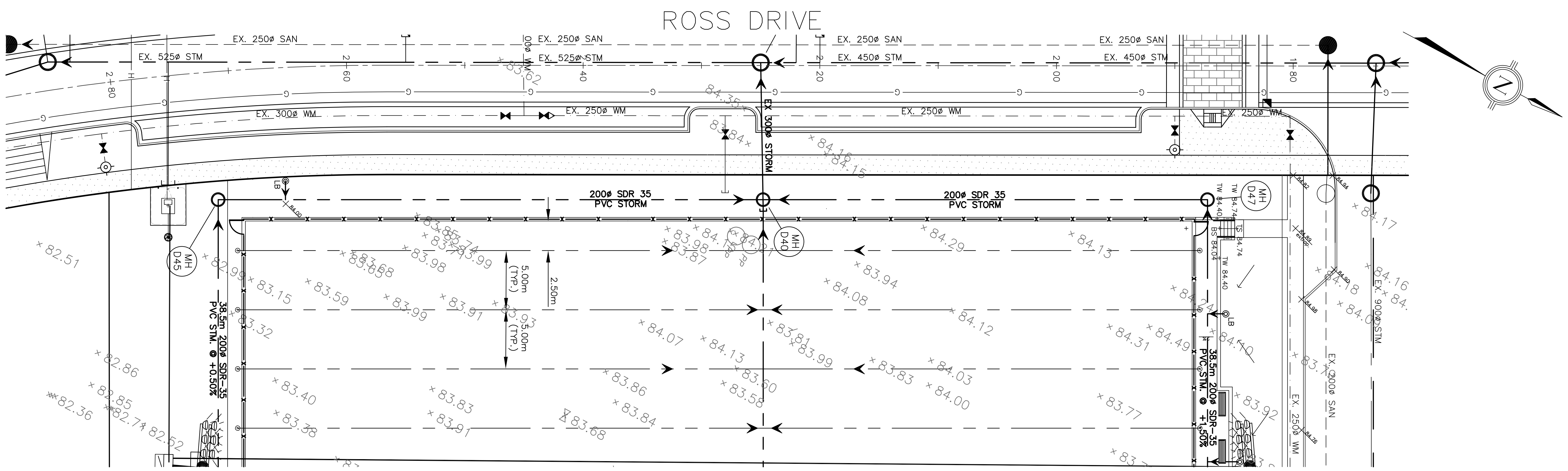
BUILDING/FACILITY

DRAWING TITLE
COMMUNITY FIELD
STORM SEWER - MH D40 to MH D41

SEAL

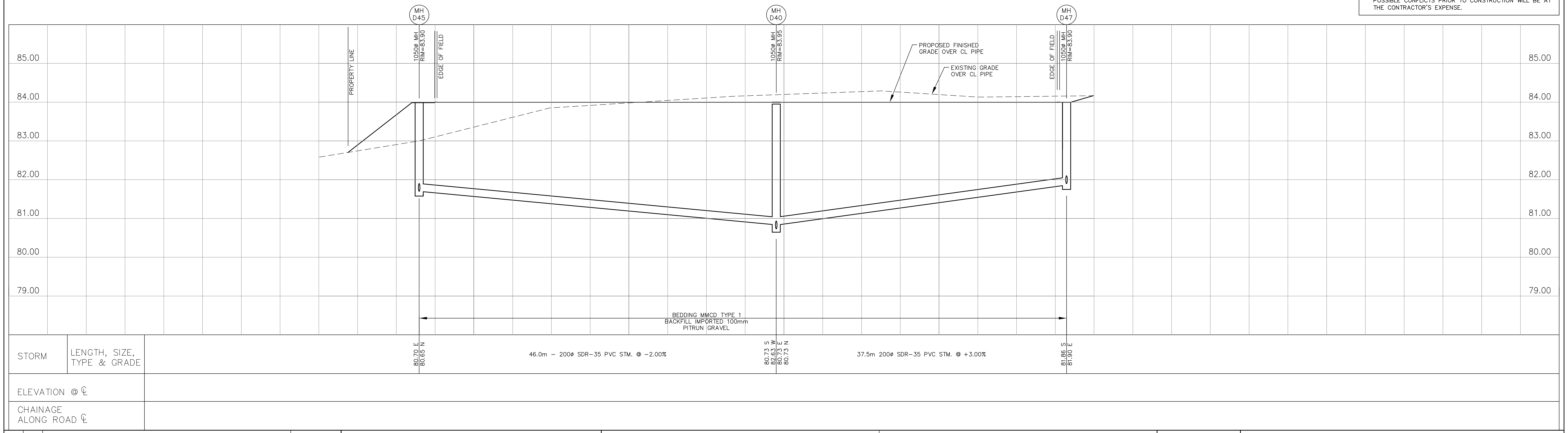
PROJECT TITLE
COMMUNITY FIELD

DRAWN J.N.	SCALE HORZ: 1:250m VERT: 1:50m	PROJECT No. 8042	
DESIGN M.K.	DATE JULY. 2012	DRAWING No. 302	REV.
CHECKED			



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

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



REVISIONS No.	DESCRIPTION	MO/DAY/YR
6		
5		
4		
3		
2		
1		

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

UBC PROPERTIES TRUST

CLIENT
UBC PROPERTIES TRUST

BUILDING/FACILITY

DRAWING TITLE
COMMUNITY FIELD
STORM SEWER : MH D45 to MH D40 to MH D47

SEAL

PROJECT TITLE
COMMUNITY FIELD

DRAWN J.N.	SCALE HORZ: 1:250m VERT: 1:50m	PROJECT No. 8042	
DESIGN M.K.	DATE JULY. 2012	DRAWING No. 303	REV.
CHECKED			

DETAILED SPECIFICATIONS

1.0 EXTENT OF WORK

THIS CONTRACT IS FOR THE SUPPLY AND INSTALLATION OF SANITARY SEWER AND STORM SEWER, WATERMAIN AND ROADWORK'S.

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

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

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

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

THE CONTRACTOR SHALL APPLY FOR ALL PERMITS.

2.0 SPECIFICATIONS

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

3.0 HOURS OF WORK

WORK IS ONLY PERMITTED WITHIN THE HOURS OF 7:30a.m. TO 7:00p.m. MONDAY TO FRIDAY, AND 8:00a.m. TO 5:00p.m. ON SATURDAY. NO WORK NOISE IS PERMITTED OUTSIDE OF THESE WORK HOURS, THIS INCLUDES BUT IS NOT LIMITED TO, DELIVERIES, IDLING MACHINES, BACKING UP OF MACHINES, SERVICING, ETC...THE HOURS OF WORK AND LIMITED NOISE HOURS WILL BE STRICTLY ENFORCED.

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

4.0 SCHEDULE

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

5.0 EXPOSE EXISTING UTILITIES

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

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

6.0 SITE TRAILER

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

7.0 MATERIAL STORAGE AND DELIVERY

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

8.0 TIE-INS AND CONNECTION TO EXISTING SERVICES

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

9.0 JOINT RESTRAINTS

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

10.0 TESTING OF SEWERS AND WATER WORKS

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

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

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

11.0 STREET AND SIDEWALK SWEEPING

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

12.0 MILLING

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

13.0 PERMIT

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

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

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

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

UBC UTILITIES OVERHEAD ELECTRICAL

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

14.0 TRENCH BACKFILL

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

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

15.0 ROADWORKS AGGREGATE

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

16.0 NATURAL GAS

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

TERASEN GAS INC.	OR	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

NIC

17.0 STEAM

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

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

18.0 SILTATION CONTROL

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

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

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

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

19.0 OVER EXCAVATION

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

20.0 SITE VISIT PRIOR TO BIDDING

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

21.0 CONSTRUCTION LAYOUT

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

22.0 AS-BUILT DRAWINGS

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

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

23.0 RESTORATIONS

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

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

24.0 TREE PRESERVATION

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

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

25.0 SITE PARKING

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

CONTRACTOR MUST USE PUBLIC PARKING OR FIND ALTERNATIVES WITHIN SITE.

26.0 TRAFFIC MANAGEMENT PLAN

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

27.0 FIRE ACCESS AND SAFETY PLAN

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

28.0 STREET LIGHTS AND TRAFFIC SIGNALS

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

29.0 PLACEMENT OF EXCAVATED MATERIALS

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

30.0 TRIUMF – RAPID TRANSFER LINE

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

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

31.0 ROCK REMOVAL

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

32.0 CONSTRUCTION ADMINISTRATION

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

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

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

33.0 GEOTECHNICAL REPORT

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

34.0 PAYMENT

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

SANITARY SEWERS SECTION 02730

1.0 GENERAL

1.1 RELATED UBC GUIDELINES
  .1 UBC TECHNICAL GUIDELINES

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

2.0 MATERIALS AND DESIGN REQUIREMENTS

2.1 RESPONSIBILITIES
  .1 UBC UTILITIES IS PRIMARILY RESPONSIBLE FOR OPERATION, MAINTENANCE, AND OVERALL STEWARDSHIP OF THE SANITARY SEWERS IN CORPORATION WITH THE FOLLOWING DEPARTMENTS/ORGANIZATIONS:
    .1 UBC HEALTH, SAFETY, & ENVIRONMENT.
    .2 UBC SUSTAINABILITY.
    .3 UBC PROPERTIES TRUST.
    .4 UBC CAMPUS PLANNING & DEVELOPMENT.
    .5 UBC BUILDING OPERATIONS.
  .2 THE DEMARCATION OF UBC UTILITIES POINT OF SERVICE IS DEFINED IN THE STANDARD DOCUMENT 1110-UT-01-SANITARYDEMARC.DWG (HTTP://WWW.TECHNICALGUIDELINES.UBC.CA/TECHNICAL/DIVISIONAL_SPECS.HTML)
  .3 THE PROJECT DESIGNER MUST INCORPORATE ALL SPECIFIC REQUIREMENTS FOR DESIGN AND MATERIALS AND EXECUTION OF THIS SECTION INTO THE CONTRACT DRAWINGS IN THE FORM OF JOB-SPECIFIC NOTES. ONLY MAKING REFERENCE TO UBC TECHNICAL GUIDELINES IN THE DRAWINGS IS NOT SUFFICIENT.

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

2.6 MATERIALS
  .1 UNLESS OTHERWISE APPROVED IN WRITING BY THE MANAGER OF MECHANICAL UTILITIES, UBC UTILITIES, ONLY THE FOLLOWING PIPE MATERIAL SHALL BE USED FOR THE GRAVITY SANITARY SEWER SYSTEM:
    .1 PVC, CLASS SDR 28 (150mm ø AND SMALLER) AND SDR 35.
    .2 CONCRETE (REINFORCED C76 REQUIRED FOR ALL PIPES 600mm IN DIAMETER OR LARGER).
    .3 PVC PIPING IS PREFERRED FOR ALL PIPING 450mm IN DIAMETER OF SMALLER.
  .2 UNLESS OTHERWISE APPROVED IN WRITING BY THE MANAGER OF MECHANICAL UTILITIES, UBC UTILITIES, ONLY THE FOLLOWING PIPE MATERIAL SHALL BE USED FOR SANITARY SEWER FORCEMAINS:
    .1 PVC, CLASS C900 (300mm ø AND SMALLER) AND C905.
    .2 DUCTILE IRON (DI), CLASS C151.
    .3 PVC PIPING IS PREFERRED, THEREFORE DI PIPE SHALL ONLY BE APPROVED UNDER UNIQUE CIRCUMSTANCES.

3.0 EXECUTION REQUIREMENTS

.1 SANITARY SEWER WORKS AND APPURTENANCES SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT MMCD STANDARDS AND SPECIFICATION, UNLESS OTHERWISE NOTED.
.2 MINIMUM COVER ON ALL SANITARY SEWERS SHALL BE 1.0m IN ACCORDANCE WITH THE MMCD STANDARDS. WHERE NO FUTURE MAIN LINE EXTENSION OR CONNECTION OF SERVICES IS REQUIRED, AND WHERE NO TRAFFIC ROAD EXISTS OR IN FUTURE WILL EXIST, MINIMUM COVER MAY BE REDUCED TO 600mm WITH SPECIAL APPROVAL.
.3 ALL PIPE SURROUND MATERIAL SHALL CONSIST OF CLEAN GRANULAR MMCD TYPE 1 BEDDING.
.4 NATIVE BACKFILL MAY BE USED IN NON-TRAVELED AREA IF FREE OF ROCK GREATER THAN 25mm.
.5 FOR PURPOSES OF CLEANING AND FLUSHING, WATER MAY BE SUPPLIED FROM UBC FIRE HYDRANTS UPON APPLICATION FOR A HYDRANT USE PERMIT. REFER TO STANDARD DOCUMENTS HYDRANTAPP.DOC
.6 ALL GRAVITY SANITARY SEWER SYSTEMS SHALL BE LOW PRESSURE AIR TESTED IN ACCORDANCE WITH THE MMCD SECTION 02731, CLAUSE 3.14.
.7 SUPPLEMENTAL TO MMCD SECTION 02721, CLAUSE 3.12 – VIDEO INSPECTION. A CONCISE, WRITTEN AND SIGNED REPORT AND VIDEO TAPE OR DVD DISK SHALL BE PROVIDED TO UTILITIES MECHANICAL ENGINEER & MECHANICAL UTILITIES MANAGER (fax: 604-822-8833).
.8 PRIOR TO COVERING THE PIPE, ALL INSTALLED AND BEDDED PIPE SHALL BE INSPECTED BY UBC UTILITIES. THE CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO BOTH THE UTILITIES MECHANICAL ENGINEER (tel. 604-822-3274, fax. 604-822-8833) AND THE UBC UTILITIES' HEAD PLUMBER (fax. 604-822-4416) WITH A MINIMUM OF 24 HOURS NOTICE.
.9 RECORDS OF PIPE SIZES AND INVERTS SHALL BE PROVIDED TO THE RECORD SECTION, CAMPUS & COMMUNITY PLANNING; AND TO THE MANAGER, MECHANICAL UTILITIES, UBC UTILITIES, IN ACCORDANCE WITH THE SECTION 01720 OF THESE GUIDELINES.
.10 WHERE NOTIFICATION REQUIREMENTS ARE NOT MET, SERVICES MAY NEED TO BE RE-EXCAVATED FOR INSPECTION AND/OR TESTING UPON REQUEST OF UBC UTILITIES

END OF SECTION 02730

STORM SEWERS SECTION 02720

1.0 GENERAL

1.1 RELATED UBC GUIDELINES
  .1 UBC TECHNICAL GUIDELINES

1.2 SYSTEM DESCRIPTION
  .1 THE CAMPUS HAS A DEDICATED STORM DRAINAGE SYSTEM WHICH DISCHARGES TO THE OCEAN ON THE NORTH. THE SOUTH DISCHARGES TO BOOMING GROUND CREEK AND TO THE FRASER RIVER. THE PRESENT SYSTEM IS MONITORED FOR STORMWATER FLOW AND QUALITY AT ALL DISCHARGES FROM THE CAMPUS.

2.0 MATERIALS AND DESIGN REQUIREMENTS

2.1 RESPONSIBILITIES
  .1 UBC UTILITIES IS PRIMARILY RESPONSIBLE FOR OPERATION, MAINTENANCE, AND OVERALL STEWARDSHIP OF THE STORM SEWERS IN CORPORATION WITH THE FOLLOWING DEPARTMENTS/ORGANIZATIONS:
    .1 UBC HEALTH, SAFETY, & ENVIRONMENT.
    .2 UBC SUSTAINABILITY.
    .3 UBC PROPERTIES TRUST.
    .4 UBC CAMPUS AND COMMUNITY PLANNING
    .5 UBC BUILDING OPERATIONS.
  .2 THE DEMARCATION OF UBC UTILITIES POINT OF SERVICE IS DEFINED IN THE STANDARD DOCUMENT 1120-UT-01-STORMDEMARC.DWG (HTTP://WWW.UTILITIES.UBC.CA/RESOURCES.HTML)
  .3 THE PROJECT DESIGNER MUST INCORPORATE ALL SPECIFIC REQUIREMENTS FOR DESIGN AND MATERIALS AND EXECUTION OF THIS SECTION INTO THE CONTRACT DRAWINGS IN THE FORM OF JOB-SPECIFIC NOTES. ONLY MAKING REFERENCE TO UBC TECHNICAL GUIDELINES IN THE DRAWINGS IS NOT SUFFICIENT.

2.2 STORMWATER OBJECTIVES AND STANDARDS
  .1 THE LATEST REVISIONS OF THE FOLLOWING STANDARDS SHALL APPLY TO STORM SEWERS AT UBC:
    .1 B.C. MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (MMCD)
    .2 GVRD SEWER USE BYLAW No. 164
    .3 UBC ENVIRONMENTAL PROTECTION POLICY # 6 (HTTP://UNIVERSITYCOUNSEL.UBC.CA/POLICIES/INDEX/)
    .4 UBC SUSTAINABILITY DEVELOPMENT POLICY # 5 (HTTP://UNIVERSITYCOUNSEL.UBC.CA/POLICIES/INDEX/)
    .5 B.C. PROVINCIAL HEALTH ACT
    .6 AN INTEGRATED STORM-WATER MANAGEMENT PLAN (ISMP) IS CURRENTLY BEING PREPARED FOR THE UBCD POINT GREY CAMPUS (JULY 2008). THE OBJECTIVE OF THE ISMP ARE TO GUIDE THE OVERARCHING DESIGN PHILOSOPHY FOR ANY STORM-WATER PLANNING, CONSTRUCTION AND MAINTENANCE AT THE WATERSHED AND SUBDIVISION LEVELS.
  .2 THE FOLLOWING GUIDELINES SHOULD BE CONSIDERED IN DESIGN AND CONSTRUCTION OF STORMWATER SYSTEMS:
    .1 BEST MANAGEMENT PRACTICES (BMP) GUIDE FOR STORMWATER, GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT LIQUID WASTE MANAGEMENT PLAN (HTTP://WWW.METROVANCOUVER.ORG/ABOUT/PUBLICATIONS/PUBLICATIONS/BMPVOL1A.PDF)

2.6 MATERIALS
  .1 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 (150mm ø AND SMALLER) AND SDR 35.
    .2 CONCRETE (REINFORCED C76 REQUIRED FOR ALL PIPES 600mm IN DIAMETER OR LARGER).
    .3 CORRUGATED HDPE HAVING A MINIMUM PIPE STIFFNESS OF 320 kPA MAY BE PERMITTED UNDER UNIQUE CIRCUMSTANCES.
    .4 PVC PIPING IS PREFERRED FOR ALL PIPING 300mm IN DIAMETER OR SMALLER.

3.0 EXECUTION REQUIREMENTS

.1 STORM SEWER WORKS AND APPURTENANCES SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT MMCD STANDARDS AND SPECIFICATION, UNLESS OTHERWISE NOTED.
.2 MINIMUM COVER ON ALL STORM SEWERS SHALL BE 1.0m IN ACCORDANCE WITH THE MMCD STANDARDS. WHERE NO FUTURE MAIN LINE EXTENSION OR CONNECTION OF SERVICES, LAWNBASINS, OR CATCH BASINS IS REQUIRED, AND WHERE NO TRAFFIC ROAD EXISTS OR IN FUTURE WILL EXIST, MINIMUM COVER MAY BE REDUCED TO 600mm WITH SPECIAL APPROVAL.
.3 SITE GRADING AND SURFACE INLETS SHALL BE LOCATED TO ENSURE THAT STORMWATER IS CONTAINED AND CONTROLLED WITHIN THE BOUNDARIES OF THE SITE.
.4 WASHOUT FROM CONCRETE TRUCKS AND SPRAY WASHING OF EXPOSED AGGREGATE PAVEMENT SHALL CONFORM TO GVRD BEST MANAGEMENT PRACTICES FOR STORMWATER GUIDE (APPENDIX H CONSTRUCTION SITE EROSION AND SEDIMENT CONTROL GUIDE) BMP CP10.
.5 ALL PIPE SURROUND MATERIAL SHALL CONSIST OF CLEAN GRANULAR MMCD TYPE 1 BEDDING.
.6 NATIVE BACKFILL MAY BE USED IN NON-TRAVELED AREA IF FREE OF ROCK GREATER THAN 25mm.
.7 FOR PURPOSES OF CLEANING AND FLUSHING, WATER MAY BE SUPPLIED FROM UBC FIRE HYDRANTS UPON APPLICATION FOR A HYDRANT USE PERMIT. REFER TO STANDARD DOCUMENTS – HYDRANTAPP.DOC
.8 SUPPLEMENTAL TO MMCD SECTION 02721, CLAUSE 3.12 – VIDEO INSPECTION. A CONCISE, WRITTEN AND SIGNED REPORT AND VIDEO TAPE OR DVD DISK SHALL BE PROVIDED TO UTILITIES MECHANICAL ENGINEER & MECHANICAL UTILITIES MANAGER (fax: 604-822-8833)
.9 PRIOR TO COVERING THE PIPE, ALL INSTALLED AND BEDDED PIPE SHALL BE INSPECTED BY UBC UTILITIES. THE CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO BOTH THE UTILITIES MECHANICAL ENGINEER (tel. 604-822-3274, fax. 604-822-8833) AND THE UBC UTILITIES' HEAD PLUMBER (fax. 604-822-4416) WITH A MINIMUM OF 24 HOURS NOTICE.
.10 RECORDS OF PIPE SIZES AND INVERTS SHALL BE PROVIDED TO THE RECORD MANAGER, CAMPUS & COMMUNITY PLANNING (tel: 604-822-7217); AND TO THE MECHANICAL UTILITIES ENGINEER, (tel: 604-822-3274) IN ACCORDANCE WITH THE SECTION 01720 OF THESE GUIDELINES.
.11 WHERE NOTIFICATION REQUIREMENTS ARE NOT MET, SERVICES MAY NEED TO BE RE-EXCAVATED FOR INSPECTION AND/OR TESTING UPON REQUEST OF UBC UTILITIES.
  .1 CONCRETE GUTTER/CURB INTERFACE SHOULD NOT BE GROOVED OUT BUT SMOOTHED OUT AT BOTTOM TO ALLOW SMOOTH PASSAGE OF WHEELCHAIRS AND BIKES. DRAIN GRATES SHOULD HAVE NARROW OPENINGS WHICH ARE ALIGNED AT RIGHT ANGLES TO THE DIRECTION OF TRAFFIC FLOW

END OF SECTION 02720

REVISIONS

No.	DESCRIPTION	MO/DAY/YR
6		
5		
4		
3		
2		
1		

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

UBC PROPERTIES TRUST

CLIENT
UBC PROPERTIES TRUST

BUILDING/FACILITY

DRAWING TITLE
DETAILED SPECIFICATIONS - GENERAL / SANITARY / STORM

SEAL

PROJECT TITLE
COMMUNITY FIELD

DRAWN J.N.
SCALE NTS
PROJECT No. 8042
DESIGN M.K.
DATE JULY. 2012
CHECKED
DRAWING No. 401
REV.

DETAILED SPECIFICATIONS

....CONTINUED FROM DRAWING 601

35.0 THRUST BLOCK DETAILS

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

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

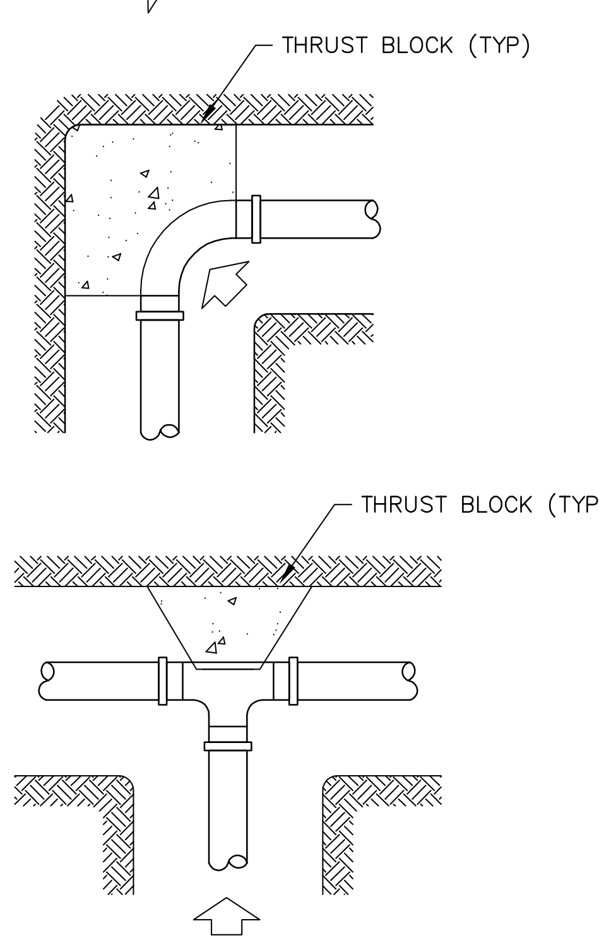
A FLANGE x HUB ISOLATION VALVE SHALL BE INSTALLED DIRECTLY AT THE WATERMAIN. IF THE LOCATION OF THE FIRE HYDRANT IS MORE THAN 6m FROM THE WATERMAIN, THEN A HUB x FLANGE ADDITIONAL ISOLATION VALVE SHALL BE INSTALLED NOT MORE THAN 1m IN FRONT OF THE FIRE HYDRANT.

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

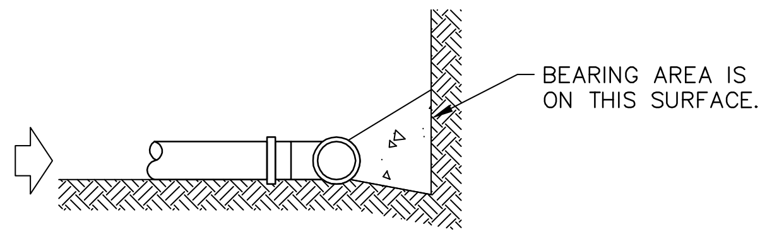
THRUST BLOCK BEARING AREA IN m2.

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

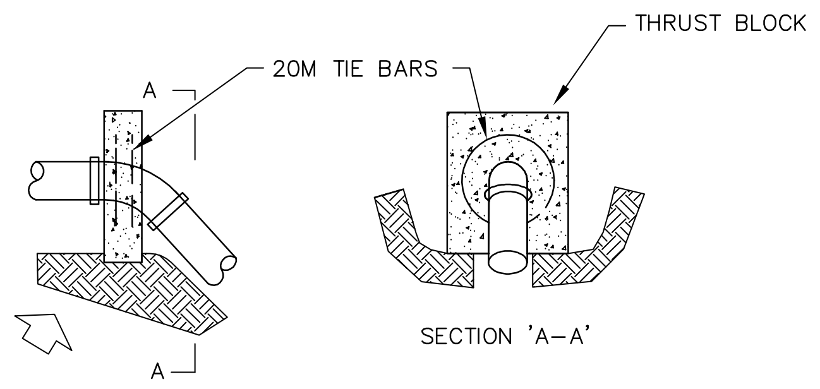
⇨ = THRUST DIRECTION



PLAN VIEWS
(TYP. SCHEMATIC)



SIDE VIEW
(TYP. SCHEMATIC)



VERTICAL BENDS
(TYP. SCHEMATIC)

WATER DISTRIBUTION SECTION 02660

1.0 GENERAL

1.1 RELATED UBC GUIDELINES
- .1 UBC TECHNICAL GUIDELINES

1.2 SYSTEM DESCRIPTION
- .1 THE UNIVERSITY OF BRITISH COLUMBIA OWNS AND OPERATES ITS OWN WATER DISTRIBUTION SYSTEM. THE UNIVERSITY ENDOWMENT LANDS (UEL) ADMINISTRATION SUPPLIES WATER TO THE CAMPUS, WHILE THE UEL PURCHASES WATER FROM 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:
  - .1 24" (600mm) WATER MAIN ON UNIVERSITY BOULEVARD, WHICH IS THE SUCTION LINE SUPPLYING THREE CENTRAL BOOSTER PUMPS LOCATED IN THE POWERHOUSE. THE DISCHARGE PRESSURE FROM THE POWERHOUSE BOOSTER PUMPS IS SET AT 100 PSIG (689 kPa). THIS SUPPLIES UBC'S "HIGH-PRESSURE ZONE."
  - .2 12" (300mm) WATER MAIN ON 16TH AVENUE, WHICH SUPPLIES UBC'S "LOW-PRESSURE ZONE" THE LOW-PRESSURE ZONE IS SEPARATED FROM THE HIGH-PRESSURE ZONE BY EIGHT PRESSURE REDUCING VALVE (PRV) STATIONS.

2.0 MATERIALS AND DESIGN REQUIREMENTS

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

2.2 WATER DISTRIBUTION STANDARDS & POLICIES
- .1 THE LATEST REVISIONS OF THE FOLLOWING STANDARDS SHALL APPLY TO WATER DISTRIBUTION AT UBC.
  - .1 UBC SUSTAINABILITY DEVELOPMENT POLICY #5 (HTTP://UNIVERSITYCOUNSEL.UBC.CA/POLICIES/INDEX)
  - .2 B.C. MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (MMCD)
  - .3 B.C. WATER & WASTE ASSOCIATION (BCWWA)
  - .4 AMERICAN WATER WORKS ASSOCIATION
  - .5 CSA STANDARDS (AS APPLICABLE);
- .2 WHERE THERE IS A DIFFERENCE BETWEEN THESE, DIVISION 2, SECTION 02660 AND THE REFERENCED STANDARDS, UBC TECHNICAL GUIDELINES SHALL APPLY.

2.6 SERVICE CONNECTIONS AND WATER MAINS
- .3 PIPE SHALL BE CLASS 50 DUCTILE IRON PIPE MANUFACTURED TO AWWA C151, CEMENT MORTAR LINED TO AWWA C104 AND COATED 1 MIL THICK ASPHALT.
- .4 COPPER, UP TO 75 mm DIAMETER, TYPE K, JOINTS BRAZED ONLY.
- .5 JOINTS SHALL BE SINGLE RUBBER GASKET FOR PUSH-ON BELL AND SPIGOT TYPE JOINTS TO AWWA C111, TYTON OR APPROVED EQUAL.
- .6 FLANGED JOINTS SHALL BE AWWA C110, FLAT FACED CONFORMING TO ANSI B16.1, CLASS 125
- .7 FITTINGS SHALL BE DUCTILE TO AWWA C110 SUITABLE FOR PRESSURE RATINGS OF 2415 kPa CEMENT MORTAR LINED TO AWWA C104. MINIMUM DESIGN PRESSURE FOR PIPING 1,210 kPa
- .8 BOLTS SHALL BE MEDIUM CARBON STEEL OR MARTENSITIC STEEL, ASTM A325 HEAVY HEX FINISHED, HOT-DIP GALVANIZED TO ASTM A153. COARSE THREADS SHALL HAVE CLASS 2A TOLERANCE BEFORE GALVANIZING. BOLT SIZES TO AWWA110.
- .9 NUTS SHALL BE HEAVY STEEL HEX CARBON STEEL TO ASTM A563 GRADE C HOT-DIP GALVANIZED TO ASTM A153.
- .10 TIE RODS SHALL BE CONTINUOUSLY THREADED, QUENCHED AND TEMPERED ALLOYED STEEL TO ASTM A354, GRADE BC, HOT-DIP GALVANIZED TO ASTM A153.
- .11 JOINT RESTRAINT DEVICES:
  - .1 EACH JOINT SHALL BE RESTRAINED WITH THE SOCKET PIPE CLAMP (GRINNELL FIGURE 606) OR EQUAL WITH PRIOR APPROVAL.

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

2.8 HYDRANTS
- .1 FIRE HYDRANTS TO BE 150mm DIAMETER TERMINAL CITY TYPE C-71-P HYDRANTS SUBJECTED TO HYDROSTATIC PRESSURE TEST OF 2070 kPa IN COMPLIANCE WITH AWWA C502.
- .2 MAXIMUM DISTANCE 100m.
- .3 MINIMUM SIZE OF PIPE CONNECTION 150mm.
- .4 FIRE HYDRANT SHALL HAVE ISOLATION VALVE NOT MORE THAN 6.0m IN FRONT OF IT.
- .5 FOR HYDRANT INSTALLATION REQUIREMENTS SEE STANDARD DWG. 1140-UT-02FIREHYDRANTDETAIL.DWG (HTTP://WWW.TECHNICALGUIDELINES.UBC.CA/TECHNICAL/DIVISIONAL_SPECS.HTML#1)

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

3.0 EXECUTION REQUIREMENTS

3.1 PREPARATION
- .1 AS PER MMCD SECTION 02666

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

3.3 GRANULAR BEDDING
- .1 AS PER MMCD SECTION 02666
- .2 MINIMUM SOIL COVER TO BE 1000mm.
- .3 FOR PIPE BEDDING USE CLEAN GRANULAR PIPE BEDDING, GRADED GRAVEL, 19mm (-), MMS TYPE 1. BOTTOM THICKNESS SHALL BE A QUARTER OF PIPE DIAMETER, OR MINIMUM 100mm THICK. TOP SHALL BE MINIMUM 300mm THICK. SIDES SHALL BE MINIMUM 225mm TO MAXIMUM 300mm THICK.
- .4 PLACE GRANULAR BEDDING (SAND) MATERIAL ACROSS FULL WIDTH OF TRENCH BOTTOM IN UNIFORM LAYERS TO 100mm DEPTH.
- .5 USE IMPORTED BEDDING WHEN PROPOSED WORK IS INSTALLED UNDER THROUGH PAVED AREAS, WHEN UTILITIES MECHANICAL ENGINEER DEEMS NATIVE MATERIAL UNSUITABLE FOR BACKFILL, OR WHEN TRENCH HAS BEEN EXCAVATED IN ROCK. OTHERWISE FOR TRENCH BACKFILL, NATIVE BACKFILL MAY BE USED IF FREE OF ROCK GREATER THAN 25mm.

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

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

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

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

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

3.9 CLEANING AND PRELIMINARY FLUSHING
- .1 AS PER MMCD SECTION 02666
- .2 WATER MAY BE SUPPLIED FROM UBC FIRE HYDRANTS UPON APPLICATION FOR A HYDRANT PERMIT
- .3 BEFORE CONNECTION TO UBC WATER SYSTEM, FLUSH PIPING CLEAN UNTIL MAXIMUM FREE CHLORINE CONCENTRATION IS LESS THAN 0.3mg/L. ANY FLUSHED WATER ON OR SOUTH OF AGRONOMY ROAD MUST BE DE-CHLORINATED IN A MANNER THAT IT DOES NOT POSE THREAT TO AQUATIC LIFE IN BOOMING GROUND CREEK.

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

3.11 DISINFECTION AND FLUSHING
- .1 AS PER MMCD SECTION 02666
- .2 PERFORM DISINFECTION PROCEDURE AND RESIDUAL CHLORINE TEST IN PRESENCE OF UTILITIES MECHANICAL ENGINEER.
- .3 MAINTAIN WATER CHLORINATING LEVEL (FREE CHLORINE CONCENTRATION mm. 25mg/L) IN NEW PIPING FOR MINIMUM 24 HOURS.

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

END OF SECTION 02660

POWER & COMMUNICATION UTILITIES SECTION 02800

1.0 GENERAL

1.1 RELATED UBC GUIDELINES
- .1 UBC TECHNICAL GUIDELINES
- .2 DIVISION 16 AND DIVISION 17

1.2 COORDINATION REQUIREMENTS
- .1 UBC UTILITIES
- .2 UBC BUILDING OPERATIONS – TECHNICAL SERVICES

1.3 POWER
- .1 THE UNIVERSITY OWNS AND OPERATES THE POWER SYSTEM CONSISTING OF 60 KV UNDERGROUND AND OVERHEAD DISTRIBUTIONS, AND 12 KV UNDERGROUND DISTRIBUTIONS.
- .2 THE UNIVERSITY PURCHASES POWER IN BULK FORM FROM BC HYDRO. THE TWO 60 KV LINES FEED TWO SUBSTATIONS, ONE LOCATED ON THE SOUTH CAMPUS AND ONE ON THE MAIN CAMPUS.
- .3 THE MAIN SUBSTATION SUPPLIES IN TURN A 12 KV INDOOR SWITCHING STATION.
- .4 THE 12 KV SYSTEMS IS DISTRIBUTED UNDERGROUND IN A COMBINED DUCT AND MANHOLE SYSTEM WHICH SERVICES THROUGHOUT THE MAJOR PORTION OF THE NORTH CAMPUS AND A PORTION OF THE SOUTH CAMPUS.
- .5 THE 12 KV SYSTEM IS NOMINALLY RATED AT 12,480 VOLTS, 3 PHASE, 3 WIRES, WYE SYSTEM LOW RESISTANCE GROUNDED.
- .6 THE DESIGN LIMITS SHALL BE BASIC IMPULSE LEVEL 95 KV AND DESIGN FAULT 300 MVA SYMMETRICAL.
- .7 THE POWER DISTRIBUTION IS A DUAL RADIAL SYSTEM WITH 500 MCM LOW RESISTIVE GROUNDED SINGLE CONDUCTOR CROSSLINK POLYETHYLENE FOR 12 KV SYSTEM.
- .8 FOR A GENERAL DISTRIBUTION DIAGRAM OF THE 12 KV FEEDERS, REFER TO DIVISION 16, STANDARD DRAWING E1-1 (HTTP://WWW.TECHNICALGUIDELINES.UBC.CA/TECHNICAL/DIVISIONAL_SPECS.HTML#16). ALSO, REFER TO 5.4.3.1 DESIGN DEVELOPMENT BRIEF.

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

1.5 CENTRAL FIRE ALARM
- .1 THE UNIVERSITY IS CONNECTED TO AN MSC 500 CENTRAL FIRE ALARM SYSTEM WHICH IS LOCATED IN THE PUBLIC SERVICE CENTRE BUILDING AT 3030 WESBROOK MALL. THE SYSTEM WAS BUILT AND SUPPLIED THROUGH THE B.C. BUILDINGS CORPORATION.
- .2 THE SYSTEM REQUIRES A MSC 300/500 TRANSPONDER WHICH SHALL BE SUPPLIED BY UBC AT A COST ESTABLISHED BY THE ENGINEERING AND OPERATIONS DIVISION, BUILDING OPERATIONS, UBC.

1.6 CENTRAL BUILDING ALARM – A DIVISION, BUILDING OPERATIONS, UBC
- .1 THE UNIVERSITY OPERATES A BUILDING MANAGEMENT SYSTEM (BMS) TO PROVIDE CONTROL AND ALARM MONITORING FOR ALL PRIMARY MECHANICAL AND ELECTRICAL SYSTEMS.
- .2 THE PANELS ARE USUALLY LOCATED IN THE BUILDING MECHANICAL ROOMS TO CAPTURE THE NECESSARY ALARM EVENT. THIS EVENT IS TRANSMITTED ACROSS THE BMS NETWORK TO THE APPROPRIATE DISPLAY TERMINALS.

1.7 CENTRAL CLOCK AND PROGRAM BELLS BUILDING/FACILITY
- .1 THE UNIVERSITY OPERATES TWO INDEPENDENT TIME SYSTEMS. ONE IS USED FOR PROGRAM BELLS AND IS TRANSMITTED AT 24 V DC. THIS SYSTEM IS TRANSMITTED VIA LEASED TELEPHONE PAIR.
- .2 THE OTHER IS A SIMPLEX CENTRAL CLOCK SYSTEM WHICH IS TRANSMITTED VIA A LEASED TELEPHONE PAIR TO NEW BUILDINGS.
- .3 INSIDE EACH BUILDING THE SYSTEMS ARE DISTRIBUTED FROM A LOCAL RELAY CABINET OPERATING SYNCHRONOUS CLOCKS.

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

END OF SECTION 02800

REVISIONS

No.	DESCRIPTION	MO/DAY/YR
6		
5		
4		
3		
2		
1		

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

UBC PROPERTIES TRUST

CLIENT
UBC PROPERTIES TRUST

DRAWING TITLE
DETAILED SPECIFICATIONS - WATER, POWER & COMMUNICATIONS

SEAL

PROJECT TITLE
COMMUNITY FIELD

DRAWN J.N.	SCALE NTS	PROJECT No. 8042
DESIGN M.K.	DATE JULY. 2012	DRAWING No. 402
CHECKED		REV.