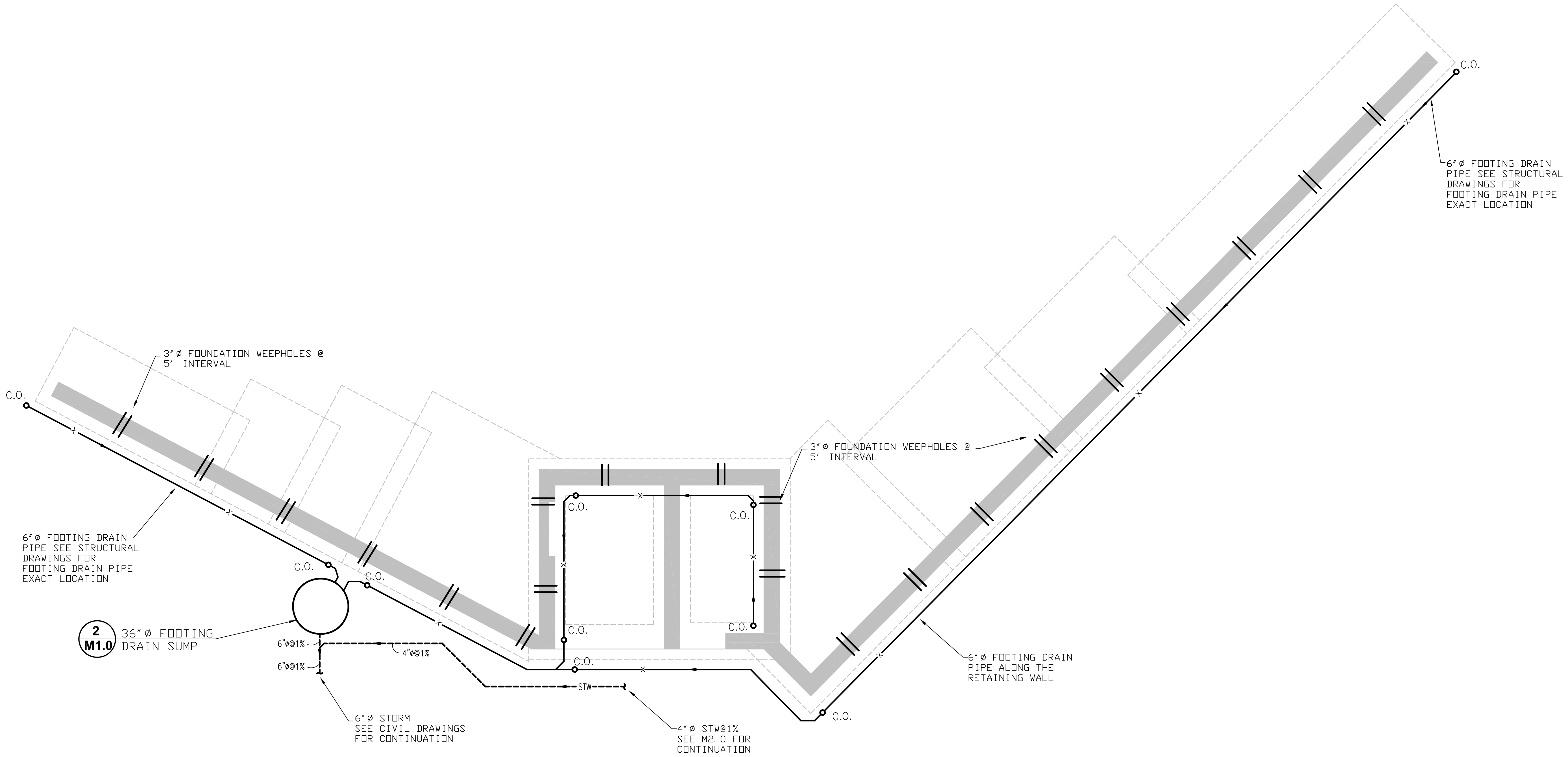


FOUNDATIONS DRIANGE PLAN

SCALE: N. T. S. **KEY PLAN**

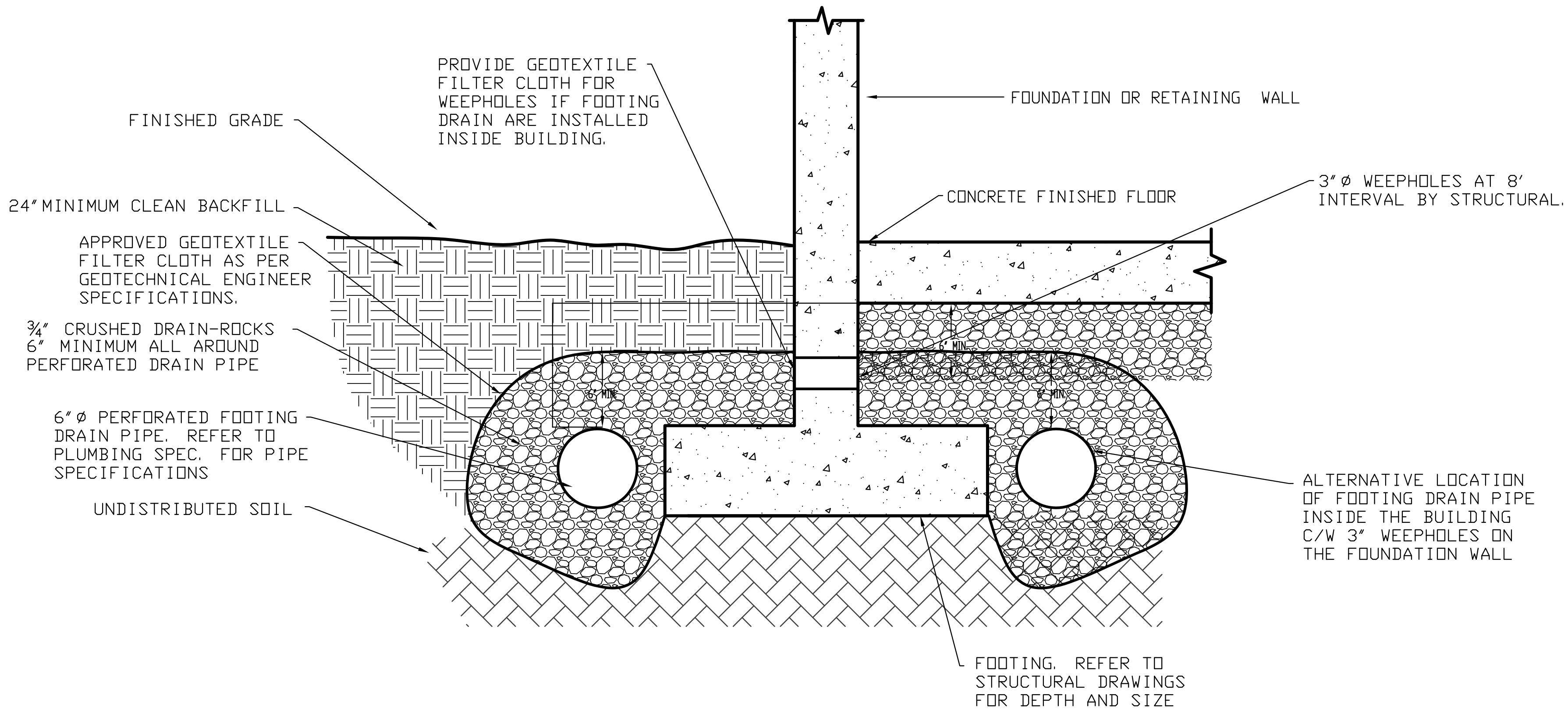
N.T.S.

MECHANICAL DRAWINGS LIST

M1.0	SITE PLAN - FOOTING DRAIN - PLUMBING
M2.0	MAIN FLOOR - PLUMBING & HVAC
M3.0	SPECIFICATIONS

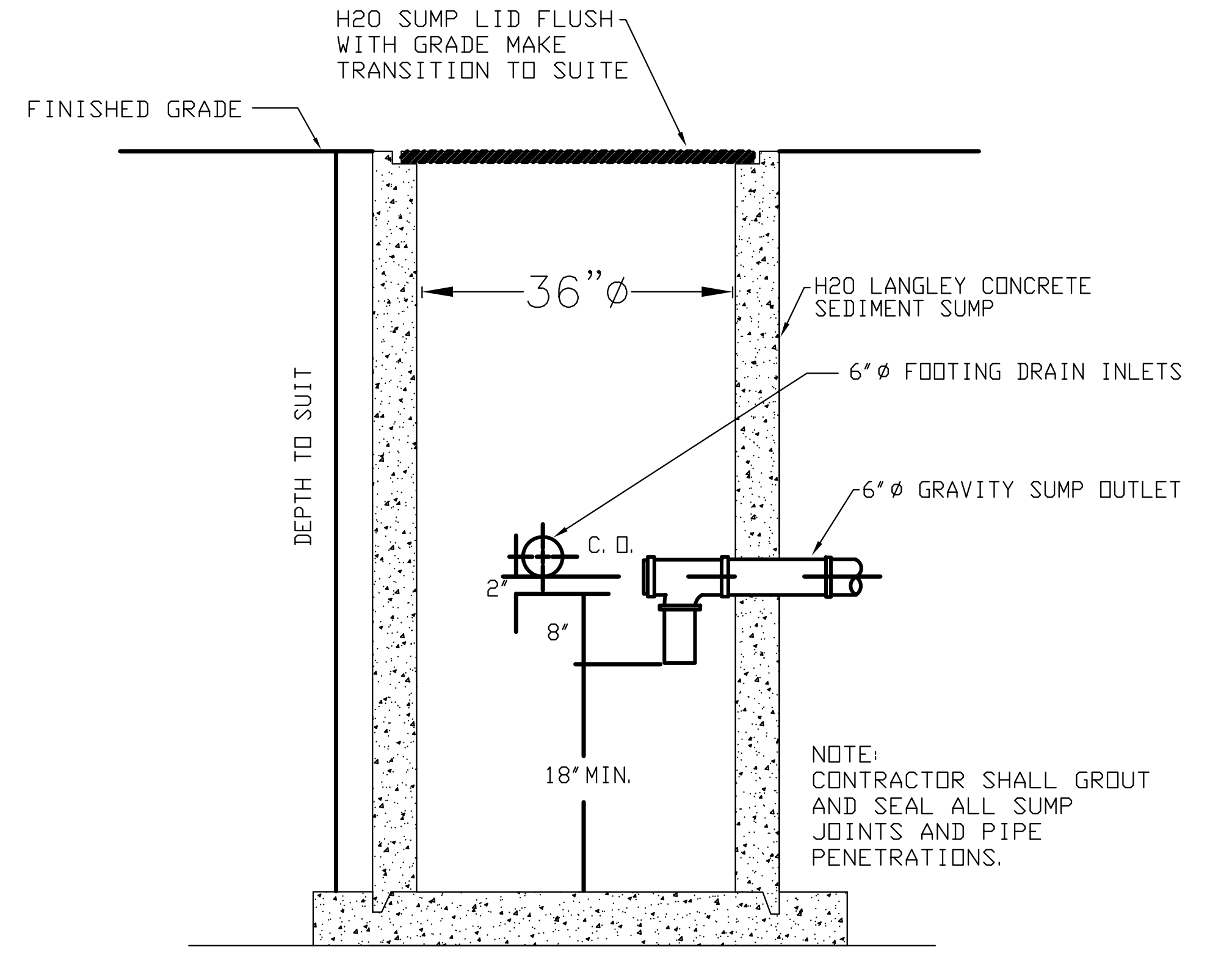
DRAWINGS LEGEND

— — — SAN — — —	SANITARY BELOW GRADE
— — — ST — — —	STORM BELOW GRADE
——— SAN ———	STORM ABOVE GRADE
— — — V — — —	SAN. VENT PIPE
——— X ———	FOOTING DRAIN
——— CD ———	CONDENSATE DRAIN
——— G ———	NATURAL GAS
——— F ———	FIRE LINE
——— FDC ———	FIRE DEP. CONNECTION
——— — ———	DOMESTIC COLD WATER
——— — — ———	DOMESTIC HOT WATER
——— — — — ———	DOMESTIC RECIRC LINE
——▭——	PIPE C/W EXPANSION JOINT
	P.R.V.
	GAS COCK
	SHUT-OFF VALVE
	CHECK VALVE
	BALANCING VALVE
	STRAINER
	AUTOMATIC 2-WAY VALVE
	AUTOMATIC 3-WAY VALVE
	GAS SOLENOID VALVE OR MECH. VALVE
	TEMPERATURE/PRESSURE RELIEVE VALVE
	UNION
W.H.A.	WATER HAMMER ARRESTORS
HB	HOSE BIB
C.O.	CLEAN OUT
RD ◎	ROOF DRAIN
FD ▨	FLOOR DRAIN
C.B. ▨	CATCH BASIN
M.H. ○	MANHOLE
A.P.	ACCESS PANEL
F/A	FROM ABOVE
T/B	TO BELOW
S.A.	SUPPLY AIR
R.A.	RETURN AIR
O.A.	OUTDOOR FRESH AIR
E.A.	EXHAUST AIR
RWL	RAIN WATER LEADER
FiD	FIRE DAMPER
	PUMP
WHA	WATER HAMMER ARRESTER
	DUCT TURNING VANES
☒	SUPPLY DUCT
☒	SUPPLY DUCT SECTION
	RETURN DUCT
	RETURN DUCT SECTION
▨	ACOUSTICALLY LINED DUCT
	THERMOMETER
Ⓟ	PRESSURE GAUGE
Ⓣ	THERMOSTAT
50 50	DESIGN NOTE #
EF-15	EQUIPMENT TAG #
SG-1 24X24 CFM	AIR OUTLET TYPE REC. OR NECK SIZE (IN INCHES) AIR FLOW (CFM)
BB-1.0KW	1.0 KW BASEBOARD ELECTRIC HEATER BY DIV. 16
FF-1.0KW	1.0 KW FORCED FLOW ELECTRIC HEATER BY DIV. 16



1
M1.0
FOOTING DRAIN - DETAILS

N. T. S.



CONTRACTOR TO VERIFY ALL INVERTS ELEVATIONS OF PIPING INLETS AND OUTLETS BEFORE INSTALLING SUMP

2
M2.0
SEDIMENT SUMP DETAIL

N. T. S.

NOTES:

MECHANICAL AND PLUMBING DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE LATEST ARCHITECTURAL, CIVIL, STRUCTURAL, LANDSCAPE, AND ELECTRICAL DRAWINGS.

BEFORE PRICING AND CONSTRICTION REFER TO ARCHITECTURAL DRAWINGS FOR FLOOR PLAN LAYOUT, FIXTURES, ELEVATIONS, AND DIMENSIONS

NOTES:

1. PLUMBING DRAWINGS ARE SCHEMATIC AND SHALL NOT BE SCALED.
2. LOCATION AND SIZE OF UNDERGROUND OR CONCEALED PIPING SHOWN ON DRAWINGS ARE BASED ON THE AVAILABLE INFORMATION. NO GUARANTEE IS GIVEN BY THE ENGINEER FOR THESE INFORMATION. PRIOR TO COMMENCING ANY PLUMBING WORKS, CONTRACTOR SHALL EXCAVATE AND CONFIRM THE SUITABILITY OF BURIED CIVIL PLUMBING PIPING SERVICES. IF THE BURIED OR CONCEALED SERVICES FOUND TO BE UNSUITABLE IN TERM OF PIPE SIZE, LOCATION, INVERT, AND CONDITIONS, THE CONTRACTOR SHALL INFORM THE ENGINEER IN WRITING AND REQUEST FOR A DECISION.
3. CONSULT WITH CIVIL DRAWINGS FOR BUILDING SERVICE CONNECTION DEPTH, LOCATION AND SIZES.
4. MINIMUM 36" COVER SHALL BE PROVIDED FOR ALL PIPING SUBJECTED TO TRAFFIC. FOR PIPE COVER LESS THAN 36" DEPTH USE HEAVY DUTY D.W.V. PIPING MATERIALS.
5. GEOTECHNICAL ENGINEER SHALL BE RETAINED BY OWNER OR CONTRACTOR TO APPROVE ALL BEDDING, TRENCHING, AND BACKFILLING FOR ALL UNDERGROUND PIPING.
6. ALL OUTDOOR UNDERGROUND PIPING SHALL BE BURIED BELOW THE FROST LEVEL.
7. GENERAL CONTRACTOR SHALL PROVIDE PIPE GUARD TO PROTECT ALL PIPING SUBJECTED TO TRAFFIC DAMAGE.

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ISSUES

DESCRIPTION	DATE
Issued for 50% review	Jan. 26, 2021
Issued for 75% review	Feb. 23, 2021
Issued For Building Permit	Mar. 10, 2021
Issued For 90% Review	Mar. 17, 2021
Issued For RFP	Apr. 21, 2021

THESE DRAWINGS ARE FOR THE PURPOSES SPECIFICALLY IDENTIFIED IN THE REVISION AND ISSUE COLUMNS.

DRAWINGS ARE SCHEMATIC AND SHALL NOT BE SCALED. CONTRACTOR SHALL VISIT SITE AND VERIFY ALL DIMENSIONS BEFORE SUBMITTING BID.

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Seal

Project:
SHEFFIELD PARK WASHROOM

Coquitlam

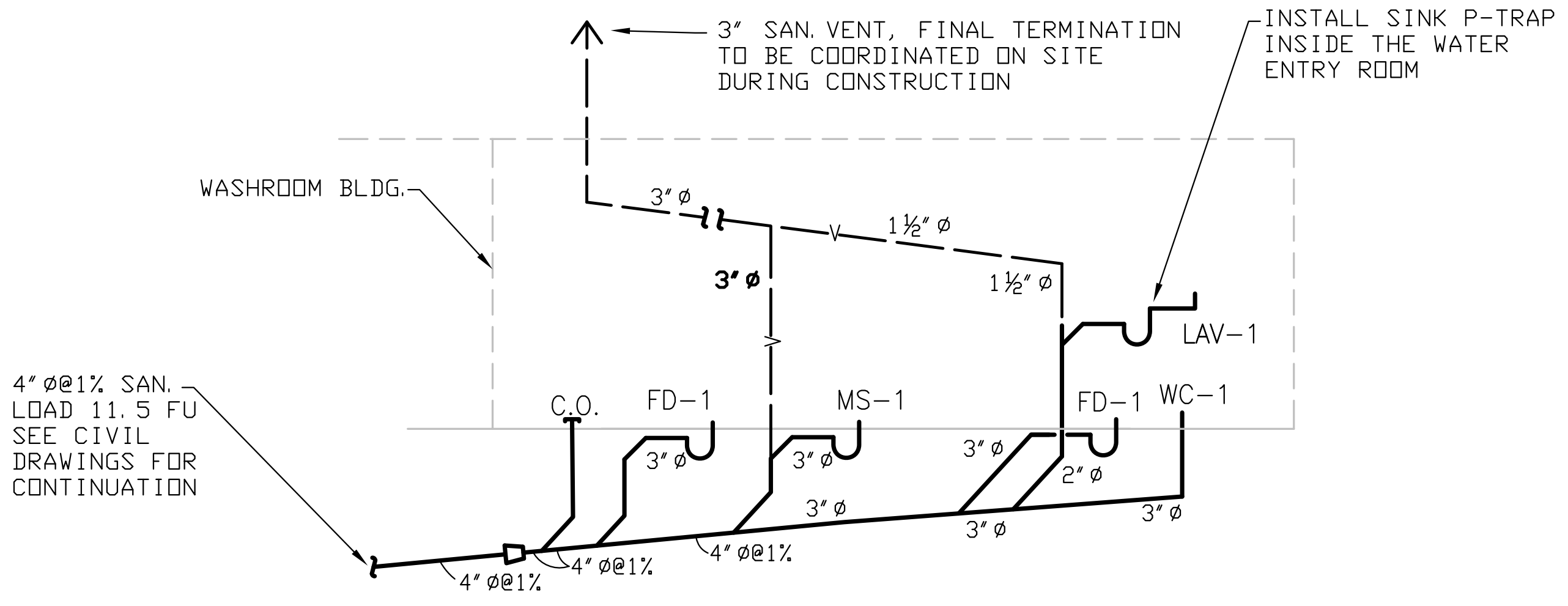
3510 Sheffield Avenue,
Coquitlam, BC

Sheet Title:

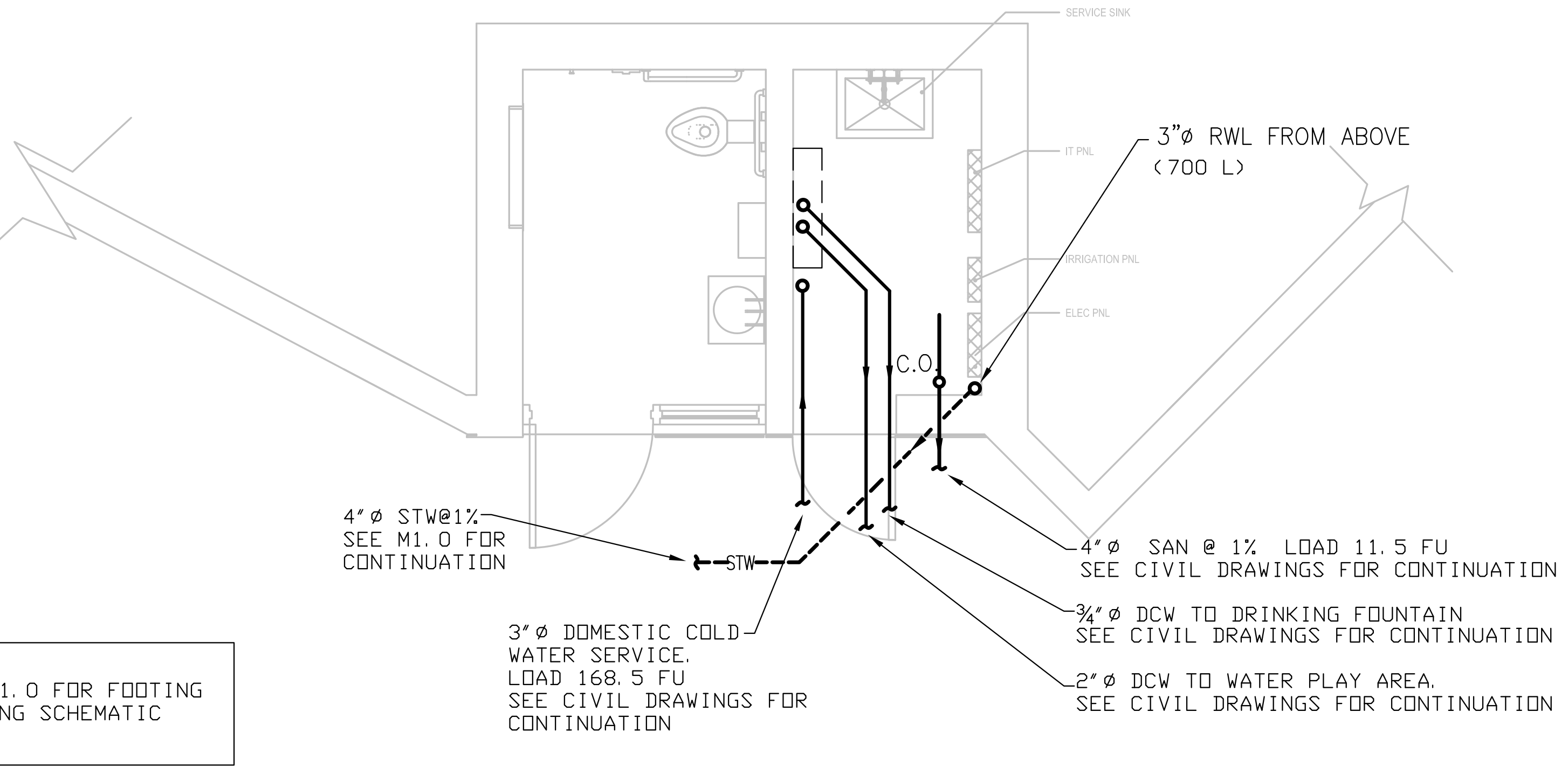
SITE/KEY PLAN
(PLUMBING)

Start Date: January, 2021
Scale: As Noted
Project No. : 1297

Drawing No.
M1.0 of 3.0



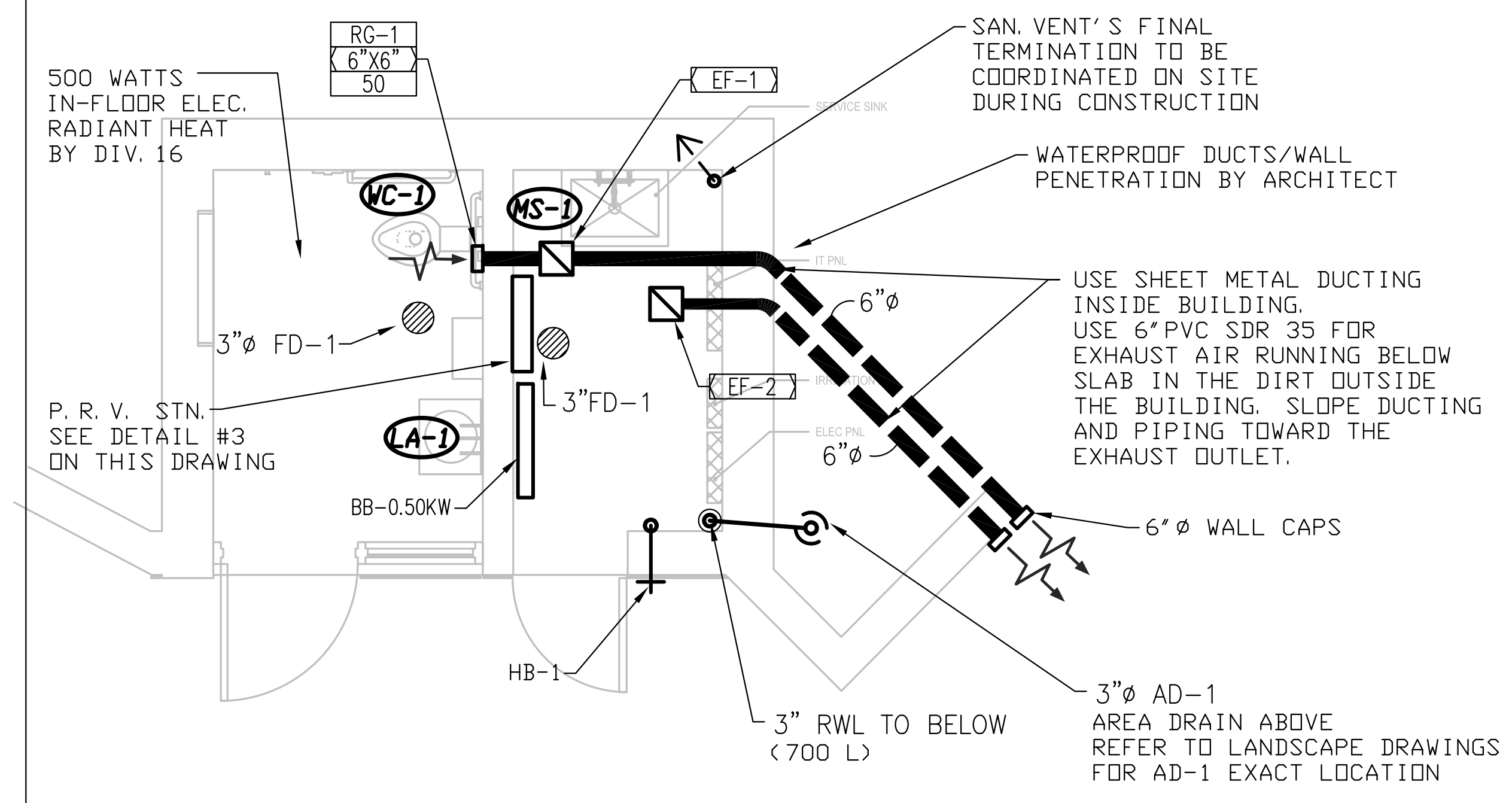
WASHROOM SAN. SCHEMATIC



NOTE
REFER TO M1.0 FOR FOOTING DRAIN PIPING SCHEMATIC

FOUNDATIONS PLAN

SCALE: N. T. S.



MAIN FLOOR PLAN

SCALE: N. T. S.

DOMESTIC WATER PIPING SIZING METHODOLOGY :

AVERAGE PRESSURE LOSS METHOD

1. ESTIMATED MIN. PRESSURE AVAILABLE 140 PSI
2. LOSSES:
   a. SERVICE PRESSURE LOSS = (20 PSI)
   b. PRV STATION PRESSURE LOSSES = (10 PSI)
   c. ELEVATION (HEIGHT) PRESSURE = (2.6 PSI @ 6' HEIGHT).
   d. MIN. PRESSURE REQUIRED FOR FIXTURES OPERATION = (30 PSI)
3. TOTAL PRESSURE AVAILABLE FOR FRICTION LOSS FROM WATER SERVICE ENTRY TO FURTHEST FIXTURE:

140 - (20+10+2.6+30)= 62.6 PSI (431 KPA)

4. MAX. DEVELOPED LENGTH X1.5 FOR FITTING = 150' X1.5=225' OR 68.6M
5. 62.6 PSI/ 225' = 0.28 PSI/FT OR (6.28 KPa/M.)

   AVERAGE PRESSURE LOSS IS > 2.6 KPa/meter.

PIPE SIZES IS BASED ON BC PLUMBING CODE TABLE A-2.6.3.1(2)F

MAXIMUM WATER VELOCITY RECOMMENDED BY THE MANUFACTURER FOR COPPER OR PVC PIPING IS 5 FPS.

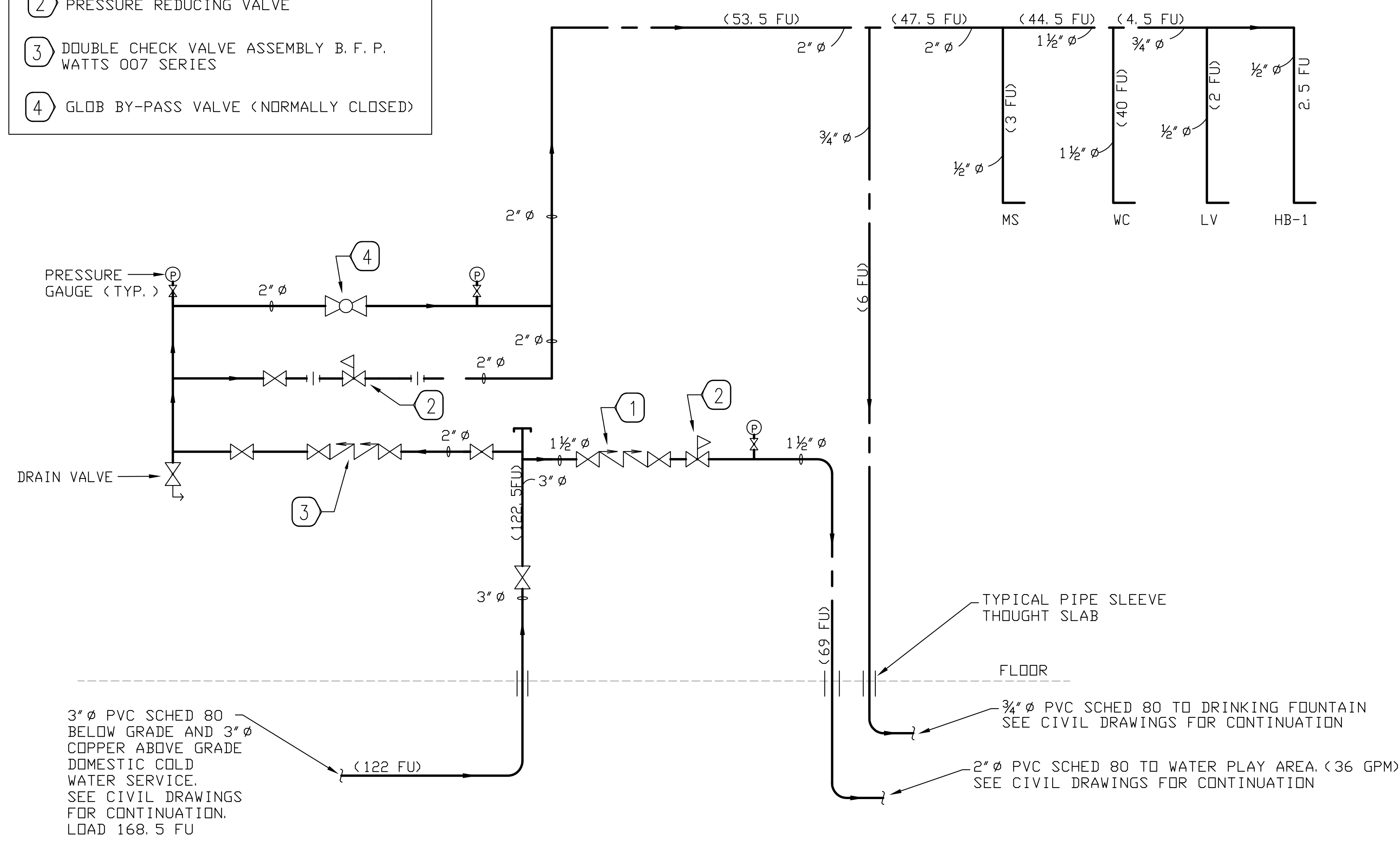
COPPER TYPE L OR PVC SCHED 80 PIPING PIPE SIZE V.S. FUs

½"ø 3.5FU MAX., ¾"ø 9FU MAX, 1"ø 18FU MAX,
1¼"ø 29 FU MAX., 1½"ø 46 FU MAX., 2"ø 120 FU MAX.

USE COPPER TYPE L ALL FOR ALL DOMESTIC COLD WATER LINES ABOVE GRADE
USE IPEX Xirtec PVC SCHED 80 FOR BELOW GRADE PIPING.
USE PEX PIPING FOR ¾"ø FEEDING THE DRINKING FOUNTAIN.

PLUMBING DESIGN NOTES

① REDUCED PRESSURE (RP) B.F.P. ASSEMBLY WATTS 009 SERIES
② PRESSURE REDUCING VALVE
③ DOUBLE CHECK VALVE ASSEMBLY B.F.P. WATTS 007 SERIES
④ GLOB BY-PASS VALVE (NORMALLY CLOSED)



3 / M2.0 **P.R.V. STATION - DETAIL / DOMESITC WATER SCHEMATIC**

N. T. S.

1. PLUMBING FIXTURES:

WC-1 TOILET:

REFER TO ARCHITECTURAL DRAWINGS FOR SPECIFICATIONS.

LA-1 LAVATORY:

REFER TO ARCHITECTURAL DRAWINGS FOR SPECIFICATIONS.

MS-1 MOP SINK:

FLOOR MOUNTED SERVICE MOP SINK - TWO HANDLES FAUCET

- FRANKE COMMERCIAL #FSS222210/316-1, SERVICE / MOP SINK.
- AMERICAN STANDARD #8344212.004, 'YOKE', TWO HANDLES FAUCET.
- PROVIDE P-TRAP.

2. PLUMBING EQUIPMENTS:

HB-1	HOSE BIB WITH NB BOX ZURN -Z1320 ECOLOTROL CERAMIC DISC WALL HYDRAINT C/W INTEGRAL VACUUM BREAKER,
AD-1	4"ø AREA DECK DRAIN WATTS MODEL# FD-100 SERIES.
FD-1	3"ø FLOOR DRAIN WATTS FD-100 SERIES C/W P-TRAP AND TRAP PRIMER CONNECTION.
TRAP PRIMER	PRECISION PLUMBING PRODUCT (PPP) MODEL # P1 OR P-2.
W.H.A.	WATER HAMMER ARRESTOR FOR WATER CLOSET FEED LINE PRECISION PLUMBING PRODUCT (PPP) SELECTED BY MANUFACTURER RECOMMENDATIONS.

AIR OUTLETS SPECIFICATIONS

RG-1: E.H.PRICE 530/F/L/A/B12

EXHAUST FANS SCHEDULE

TAG	SERVED ROOM	MANUFACTURER	MODEL#	CFM	ESP.	RPM	[HP] OR [W]	FAN TYPE	POWER SUPPLY			WEIGHT (LBS.)	SONES	ACCESSORIES
									VOLT	ø	HZ			
EF-1	WASHROOM	GREENHECK	CSP-A90	75	0.25"	650	49 W	CEILING	115	1	60	12	0.9	1,2,3,4
EF-2	WATER ENTRY ROOM	GREENHECK	SP-A90	50	0.25"	900	49 W	CEILING	115	1	60	12	0.7	1,2,3,4

1. CSA APPROVED.
2. SEISMIC RESTRAIN.
3. BACK DRAFT DAMPER.
4. 24/7 PROGRAMMABLE TIME CLOCK CONTROLLER MOUNTED ON WALL.

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Seal

Project:
SHEFFIELD PARK WASHROOM

Coquitlam

3510 Sheffield Avenue,
Coquitlam, BC

Sheet Title:

MAIN FLOOR PLAN
(PLUMBING & HVAC)
EQUIPMENT SCHEDULES

Start Date: January, 2021
Scale: As Noted
Project No. : 1297

Drawing No.
M2.0 of 3.0

MECHANICAL SPECIFICATIONS- DIVISION 15

1. GENERAL

1. THIS SPECIFICATION FORM PART OF THE CONTRACT DOCUMENTS AND THEY SHALL BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS AND SPECIFICATIONS RELATED TO THIS PROJECT.

2. BIDDERS SHALL EXAMINE ALL DRAWINGS AND SPECIFICATIONS ISSUED AND SHALL VISIT THE SITE OF WORK TO BE FAMILIAR WITH SITE CONDITIONS PRIOR TO SUBMITTING BIDS. CLAIM FOR EXTRAS DUE TO NOT VISITING SITE TO CONFIRM THE SITE CONDITIONS WILL NOT BE ACCEPTED.

3. MECHANICAL PLANS ARE INTENDED TO BE DIAGRAMMATIC AND THEY ARE NOT INTENDED TO SHOW EVERY ITEM IN ITS EXACT LOCATION AND IN ITS EXACT DIMENSIONS. CONTRACTOR SHALL PROVIDE ANY NECESSARILY DUCT AND PIPE OFFSETS AND ADJUSTMENT, TRANSITIONS AT NO COST TO SUIT THE SITE CONDITIONS.

4. SHOULD ANY DISCREPANCY APPEARS BETWEEN DRAWINGS AND SPECIFICATIONS WHICH LEAVES THE CONTRACTOR IN DOUBT TO THE TRUE INTENT AND MEANING OF THE PLANS AND SPECIFICATIONS, CONTRACTOR SHALL OBTAIN A WRITTEN CLARIFICATION FROM THE CONSULTANT BEFORE SUBMITTING THE TENDER. IF THIS IS NOT DONE, THE INTENT OF THE MEANING WILL ONLY BE JUDGED BY BSA ENGINEERING CONSULTANTS INC.

5. THIS CONTRACTOR SHALL CHECK DRAWINGS OF ALL TRADES AND COORDINATE WITH GENERAL CONTRACTOR AND OTHER TRADES TO INSURE THE INSTALLATION OF THE MECHANICAL SYSTEM WILL REMAIN WITHIN THE LIMITATION OF THE AVAILABLE SPACE.

5. PRIOR TO ORDER ANY MECHANICAL EQUIPMENT, CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS OF THE MECHANICAL EQUIPMENT AND SPACE LIMITATION TO INSURE THE EQUIPMENT WILL FIT IN THE AVAILABLE SPACE.

6. INSTALLATION SHALL BE WITHIN THE LIMITATION IMPOSED BY THE ARCHITECTURAL, STRUCTURAL, ELECTRICAL EQUIPMENT, WITH ADEQUATE SPACE FOR EQUIPMENT MAINTENANCE.

7. ALL MECHANICAL INSTALLATION SHALL BE PERFORMED AS PER THE MECHANICAL PLANS, SPECIFICATION AND ACCORDING TO THE GOVERNING LOCAL CODES AND BEST PRACTICE AND STANDARDS ESTABLISHED BY THE TRADES.

8. PROVIDE COMPLETE AND OPERATIONAL HEATING, VENTILATION, AIR CONDITIONING, AND PLUMBING SYSTEMS IN EVERY DETAIL INCLUDING THE CONTROL SYSTEM AND MAKE IT READY FOR OWNER'S USE FOR THE PROPOSED BUILDING.

9. ALL MATERIALS AND EQUIPMENT INSTALLED IN THE PROJECT SHALL BE ULC LISTED, AND NEW WITH FIRST LINE OF PRODUCT QUALITY. EACH MAJOR EQUIPMENT SHALL IDENTIFIED BY THE MANUFACTURER'S NAME, MODEL NUMBER AND SERIAL NUMBER.

10. THE TERM "PROVIDE" WHERE USED SHALL BE UNDERSTOOD TO SUPPLY MATERIALS, LABORS, TOOLS, AND INCIDENTALS NECESSARY TO DELIVER OPERATIONAL AND READY TO USE.

11. THE MECHANICAL DRAWINGS SHALL NOT BE SCALED AND THE ACTUAL DIMENSIONS SHALL BE TAKEN BY SITE MEASUREMENTS AND FROM THE LATEST ARCHITECTURAL AND STRUCTURAL DRAWINGS.

12. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND PAYING FOR REQUIRED TRADE PERMITS.

13. ALL INSTALLATION SHALL COMPLY WITH ALL REQUIREMENT FOR THE LATEST APPLICABLE PROVINCIAL CODES, NATIONAL CODES, APPLICABLE ASHRAE STANDARD, APPLICABLE NFPA STANDARDS, AND BYLAWS OF THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ).

14. PRIOR TO COMMENCING ANY PLUMBING WORKS, CONTRACTOR SHALL EXCAVATE AND CONFIRM THE SUITABILITY OF THE BURIED AND CONCEALED PLUMBING PIPING. IF THE EXISTING SERVICES FOUND TO BE UNSUITABLE IN TERM OF THE PIPE SIZE, LOCATION, INVERT, AND CONDITIONS, THE CONTRACTOR SHALL INFORM THE ENGINEER IN WRITING.

15. ALL CUTTING AND PATCHING SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR. THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR AT EARLY STAGE OF THE PROJECT FOR ALL CUTTING AND PATCHING REQUIREMENT TO INSTALL THE MECHANICAL SYSTEM. GENERAL AND MECHANICAL CONTRACTORS SHALL OBTAIN A PRIOR APPROVAL FROM THE STRUCTURAL ENGINEER FOR ANY CUTTING OR PENETRATIONS OF STRUCTURAL MEMBERS. ROOF/ WALL FLASHING SHALL BE SUPPLIED AND INSTALLED BY AN EXPERIENCED ROOFING CONTRACTOR.

16. DO NOT USE THE PERMANENT HVAC SYSTEM FOR TEMPORARY HEATING. CONTRACTOR SHALL BE RESPONSIBLE TO STORING AND PROTECTING ALL EQUIPMENT DURING THE CONSTRUCTIONS.

17. PROVIDE SEISMIC RESTRAINS FOR ALL EQUIPMENT, PIPING DUCTING AS REQUIRED CANADA NATIONAL BUILDING CODE AND AS PER SMACNA GUIDELINES. CONTRACTOR SHALL HIRE A SEISMIC ENGINEER REGISTERED IN THE PROVINCE OF BC TO DESIGN, REVIEW AND ACCEPT THE INSTALLATION OF THE EQUIPMENT'S SEISMIC RESTRAINS AND TO PROVIDE LETTER OF ASSURANCES; SCHEDULE S-B AND S-C. THIS SEISMIC ENGINEER SHALL CARRY A PROFESSIONAL LIABILITY INSURANCE NOT LESS THAN $1000,000.

18. PROVIDE FIRE STOPPING FOR ALL PIPING AND DUCTS PENETRATION THE RATED ASSEMBLIES. THE INSTALLATION OF FIRE STOP SHALL BE DONE BY A SPECIALIST CONTRACTOR. ALL FIRE STOP USED SHALL BE CSA APPROVED, ULC LISTED AND INSTALLED AS PER THE FIRE STOP MANUFACTURER'S RECOMMENDATIONS. FIRE STOP RATING SHALL MATCH AND SUITABLE TO BUILDING'S ASSEMBLIES FIRE RATING. USE 2HR FT RATING FIRE STOPPING MATERIAL FOR DUCTING AND PIPING PENETRATING PARKING CEILING SLAB. PRIOR TO THE FIRE STOP INSTALLATION, CONTRACTOR SHALL SUBMIT TO THE CONSULTANT SHOP DRAWINGS OF THE FIRE STOP DETAILS AND MATERIALS FOR ALL TYPES OF PENETRATIONS TO THE RATED ASSEMBLIES. AFTER COMPLETING FIRE STOP INSTALLATION, CONTRACTOR SHALL PROVIDE A CERTIFICATE CONFIRMING THAT ALL DUCTS AND PIPING PENETRATING THE RATED ASSEMBLIES HAVE BEEN FIRE STOPPED AS PER FIRE STOP MANUFACTURER'S RECOMMENDATIONS.

19. MECHANICAL CONTRACTOR (DIVISION 15) SHALL COORDINATE WITH ELECTRICAL CONTRACTOR (DIVISION 16) BEFORE ORDERING ANY MECHANICAL EQUIPMENT TO CONFIRM THE COMPATIBILITY OF THE AVAILABLE POWER SUPPLY AND ELECTRICAL CONNECTIONS.

20. ALL MECHANICAL DRAWINGS ARE FOR THE PROPOSES SPECIFICALLY IDENTIFIED IN THE REVISION COLUMN IN EACH DRAWINGS. THE DRAWINGS ARE NOT FOR PRICING OR CONSTRUCTION UNLESS IDENTIFIED AS SUCH.

21. CONTRACTOR SHALL FOLLOW MANUFACTURER'S RECOMMENDATIONS, DETAILS AND PROCEDURES IN INSTALLING SPECIFIED EQUIPMENTS IN THE CONTRACT.

22. ALL HEAT TRACING REQUIRED FOR THIS PROJECT SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR. MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR.

23. OWNER SHALL PAY UTILITIES CHARGES DURING THE CONSTRICTION. CONTRACTORS SHALL BE RESPONSIBLE FOR COORDINATING UTILITY CONNECTIONS AND WORKS WITH UTILITY PROVIDERS.

24. THIS CONTRACTOR SHALL CARRY A COMPREHENSIVE GENERAL LIABILITY INSURANCE TO THE AMOUNT OF $2000,000 MINIMUM TO PROTECT HIMSELF AND THE OWNER FROM ANY CLAIM MAY ARISE DUE TO THE LOSE OR DAMAGE CAUSED BY WORKS IN THE BUILDING. THIS CONTRACTOR SHALL CARRY EMPLOYEES LIABILITY INSURANCE FOR ALL HIS WORKERS ON SITE AS PER WORKERS' COMPENSATION ACT.

2. SUBMITTALS:

1. PRIOR TO STARTING ANY INSTALLATION SUBMIT NOT LESS THAN 3 SETS OF COMPLETE SHOP DRAWINGS FOR THE SPECIFIED MECHANICAL ITEMS FOR BSA ENGINEERING CONSULTANTS INC. REVIEW. ALLOW MINIMUM 10 WORKING DAYS FOR SHOP DRAWINGS REVIEWS.

2. SHOP DRAWINGS SHALL BE CLEARLY MARKED TO SHOW THE INTENDED ITEMS WITH IDENTIFICATIONS SIMILAR TO THE DESIGN DRAWINGS.

3. CONTRACTOR AGREES THAT IF DEVIATIONS OR DISCREPANCIES OR CONFLICT BETWEEN THE SUBMITTALS AND CONTRACT DOCUMENTS ARE DISCOVERED EITHER PRIOR TO OR AFTER THE SUBMITTALS ARE PROCESSED AND APPROVED BY THE ENGINEER, THE CONTRACT DOCUMENTS SHALL CONTROL AND SHALL BE FOLLOWED.

4. IF A WRITTEN PREAPPROVAL OBTAINED FROM BSA ENGINEERING CONSULTANTS CO. TO USE ALTERNATIVE MANUFACTURER OR MATERIAL, REGARDLESS OF THE ENGINEER'S PREAPPROVAL THE CONTRACTOR SHALL BE RESPONSIBLE TO CONFIRM THAT THE ALTERNATIVE PROPOSED MATERIAL OR EQUIPMENT MEETS THE SPECIFICATION, PHYSICAL PROPERTIES, AND THE PERFORMANCE OF THE ORIGINALLY SPECIFIED EQUIPMENT OR MATERIAL.

3. GUARANTEES

1. CONTRACTOR SHALL PROVIDE MINIMUM ONE (1) YEAR WRITTEN WARRANTY FOR THE WHOLE MECHANICAL SYSTEM BEGINNING WITH THE DATE OF THE ENGINEER ACCEPTANCE OF THE PROJECT IN WRITING.

2. THIS ONE YEAR WARRANTY SHALL NOT OVERRIDE ANY LONGER EQUIPMENT OR MATERIAL WARRANTIES PROVIDED BY THE MANUFACTURER OR REQUESTED BY THE CONTRACT.

3. DURING CONSTRUCTION AND WARRANTY PERIODS, THIS CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPAIRS REQUIRED IN DIVISION 15 OR OTHER DIVISIONS IN THE BUILDING DUE TO THE FAULTY INSTALLATION OR DEFECTIVE MATERIALS OR EQUIPMENT OF THE MECHANICAL SYSTEM.

4. AT THE END OF THE COMPLETION OF THE JOB THE CONTRACTOR SHALL PROVIDE THE OWNER WITH ALL WARRANTEE CERTIFICATES.

4. OPERATION AND MAINTENANCE MANUALS

1. AT THE CLOSE OF THE JOB, SUBMIT TO THE ENGINEER 3 SETS OF DRAFT OF MAINTENANCE AND OPERATION (M&O) MANUAL FOR REVIEW.

2. THE MANUAL SHALL INCLUDE BUT LIMITED TO DESCRIPTION OF THE SYSTEM, EQUIPMENT WARRANTIES, CONTRACTOR'S WARRANTY, PART LISTS, EQUIPMENT MANUALS, BALANCING REPORTS, COMMISSIONING REPORTS, OPERATION INSTRUCTIONS, WRITTEN INSTRUCTION ON MAINTENANCE AND CARE OF THE SYSTEM, EQUIPMENT SHOP DRAWINGS, COPY OF ALL PERMITS AND INSPECTION REPORTS, CERTIFICATIONS, CONTACT INFORMATION OF THE EQUIPMENT SUPPLIERS AND CONTRACTORS AND A COPY OF THE AS-BUILT DRAWINGS.

3. CONTRACTOR SHALL PROVIDE THE OWNER'S PERSONALS WITH A COMPLETE TRAINING FOR USING THE MECHANICAL SYSTEM.

5. ACCESSIBILITY

1. ALL EQUIPMENT SHALL BE INSTALLED IN SUCH A WAY THAT ALL COMPONENTS REQUIRING ACCESS (SUCH AS MOTORS, FILTERS, DAMPERS, VALVES, ETC.) ARE SO LOCATED AND INSTALLED THAT THEY WILL BE SERVICED, RESET, REPLACED OR CALIBRATED ETC., BY SERVICE PEOPLE WITH NORMAL SERVICE TOOLS AND EQUIPMENT.

2. IF ANY OF THE EQUIPMENT OR COMPONENTS ARE SHOWN IN SUCH POSITION THAT THIS CONTRACTOR CANNOT COMPLY WITH THE ABOVE, THE CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR AND ATTEMPT TO RESOLVE THE PROBLEM, OF ACCESS. IF THIS CONSULTATION IS NOT SUCCESSFUL, THE ENGINEER AND ARCHITECT SHALL BE NOTIFIED IN WRITING AND A DECISION REQUESTED.

3. THE SIZE OF THE ACCESS PANELS SHALL BE 8"X8" FOR HAND ACCESS AND 24"X24" FOR SHOULDER ACCESS.

4. ALL ACCESS DOORS SHALL BE "MILCOR" OR EQUAL AND SHALL BE PRE-APPROVED BY THE ARCHITECT AND THEY SHALL HAVE FIRE RATING MATCH THE RATING OF THE CEILINGS OR WALLS.

6. IDENTIFICATION AND PAINTING

1. CONTRACTOR SHALL PAINT ALL DUCTS OR PIPES WHICH ARE SUBJECTED TO THE EXTERIOR WEATHER AND CORROSIONS.

2. ALL NATURAL GAS LINES SHALL BE IDENTIFIED AND PAINTED AS PER GAS CODE CAN/CSA-B149.1

3. IDENTIFY DOMESTIC WATER LINES, HEATING LINES, REFRIGERANT LINES WITH LETTERING IDENTIFICATION SYSTEM (FOR EXAMPLE DCW, DHW, ETC.) INCLUDING FLOW DIRECTION ARROWS.

4. IDENTIFY ALL EQUIPMENT (SUCH AS EXHAUST FANS, FAN-COILS, VALVES ...ETC.) WITH SECURELY BLACK LAMICOID NAMEPLATES WITH WHITE LETTERS.

5. THE CONTRACTOR SHALL TAG ALL VALVES (EXCEPT SHUT OFF HAND VALVES SERVING INDIVIDUAL PLUMBING FIXTURES OR INDIVIDUAL HEATING RADIATORS). PREPARE A LIST DETAILING VALVES, LOCATION, NORMAL POSITIONS, PURPOSE SERVED. THIS LIST SHALL BE INCLUDED IN THE OPERATION AND MAINTENANCE MANUAL.

7. AS-BUILT DRAWINGS

1. CONTRACTOR SHALL MAINTAIN ONE FULL SIZE SET OF MECHANICAL DRAWINGS ON SITE TO MARK UP ALL CHANGES AND DEVIATION FROM THE DESIGN DRAWINGS. THIS SET SHALL BE AVAILABLE AT ALL TIMES TO THE ENGINEER DURING CONSTRUCTION.

2. AT THE END OF THE CONSTRUCTION CONTRACTOR SHALL SIGN EACH SHEET OF THE MARKED AS-BUILT DRAWINGS AND PROVIDE A LETTER CONFIRMING THAT THESE DRAWINGS ARE ACCURATELY REFLECT THE ACTUAL INSTALLATION.

3. SUBMIT ONE COPY OF THE CONTRACTOR MARKED AND SIGNED AS-BUILT DRAWINGS TO BSA ENGINEERING CONSULTANTS INC. TO UPDATE THE CAD FILE.

4. CONTRACTOR SHALL BE RESPONSIBLE TO ALLOW CASH ALLOWANCE TO BSA ENGINEERING CONSULTANTS INC. TO COVER THE COST OF UPDATING THE CAD FILE AND TO PROVIDE A FINAL SET OF THE DRAWINGS TO THE OWNER. THIS CASH ALLOWANCE SHALL BE $100 PER EACH DRAWING SHEET.

8. FIELD REVIEW

1. ALL WORKS AND MATERIAL WILL BE SUBJECTED TO INSPECTION FROM TIME TO TIME BY THE ENGINEER.

2. GENERAL AND MECHANICAL CONTRACTORS MUST NOTIFY THE ENGINEER (2 BUSINESS DAYS FOR PROJECT IN THE LOWER MAINLAND AND 4 BUSINESS DAYS FOR PROJECT OUTSIDE THE LOWER MAINLAND) AT THE FOLLOWING CRITICAL STAGES OF CONSTRUCTION SO THAT THE ENGINEER VISIT THE SITE FOR GENERAL FIELD REVIEW AND CONSULTATION:

a. WHEN UNDERGROUND PLUMBING OR HVAC PIPING ARE INSTALLED AND UNDER TEST BUT BEFORE ANY BACKFILLING.

b. WHEN PLUMBING OR HVAC PIPING ARE ROUGHED AND UNDER TEST BUT BEFORE INSULATING THE PIPES OR ANY DRYWALL COVER UPS.

c. WHEN THE DUCTWORKS AND HVAC EQUIPMENT ARE ROUGHED IN BUT BEFORE ANY DRYWALL OR T-BARS COVER UPS.

d. DURING PRE-OCCUPANCY REVIEW.

e. AFTER THE SUBSTANTIAL COMPLETION OF THE WORKS AND WHEN ALL EQUIPMENT ARE OPERATIONAL AND PROJECT IS READY FOR FINAL OCCUPANCY.

3. CONTRACTOR SHALL NOT COVER ANY PORTION OF THE HVAC AND PLUMBING SYSTEMS AT ANY TIME DURING THE CONSTRUCTION WITHOUT THE ENGINEER'S APPROVAL.

5. IN ADDITION TO THE ENGINEER'S REVIEWS ALL WORKS SHALL BE APPROVED BY OTHER A.H.J. WHERE REQUIRED.

6. IF THE CONTRACTOR COVERS AND CONCEALS PERMANENTLY ANY PORTION OF THE MECHANICAL SYSTEMS WITHOUT THE ENGINEER'S APPROVAL, IT SHALL BE IN HIS/HER RESPONSIBILITY TO MAKE THE CONCEALED WORKS ACCESSIBLE AND EXPOSED FOR INSPECTION TO DEMONSTRATE THE ACCEPTABILITY OF ANY PART OF THE SYSTEM BY BSA ENGINEERING CONSULTANTS CO. ANY EXTRA COST CAUSED BY THE REMOVAL OF WORK BY OTHER TRADES SHALL BE BORN BY THE MECHANICAL CONTRACTOR.

9. DUCTWORKS SPECIFICATIONS

1. ALL DUCT FABRICATION, INSTALLATION AND SUPPORTS SHALL BE AS PER SMACNA AND ASHRAE STANDARDS.

2. ALL DUCTWORKS SHALL BE MADE FROM GALVANIZED STEEL CLASS "C" PRESSURE RATING AND AS PER SMACNA.

3. DUCT DIMENSIONS NOTED ON THE DRAWINGS ARE FOR CLEARED INSIDE DIMENSIONS. FOR LINED DUCT, INCREASE DUCT SIZE TO MAINTAIN THE SPECIFIED CLEAR DUCT SIZE.

4. PROVIDE TURNING VANES FOR ALL SQUARE ELBOWS.

5. USE THERMALLY INSULATED FLEXIBLE TYPE DUCTING WHERE INDICATED ON THE DRAWINGS FOR A 5' MAXIMUM LENGTH. EXTEND AND SUPPORT FLEXIBLE DUCTS TO PREVENT ANY DUCT SAGGING. DO NOT USE FLEXIBLE DUCTS IN THE EXHAUST DUCTING SYSTEM.

6. ALL ROUND ELBOWS RADIUS SHALL BE 1.5 OF DUCT WIDTH.

7. SEAL ALL DUCTWORK JOINTS WITH 3M DUCT SEALER OR APPROVED ALUMINUM FOIL PRESSURE TAPE.

8. PROVIDE FLEXIBLE JOINT CONNECTIONS FOR ALL DUCTS ATTACHED TO AIR HANDLING UNITS, FANS, MAKE UP AIR UNITS, AND FAN-COIL UNITS.

9. PROVIDE AND INSTALL ACCESS DOORS FOR ALL CONCEALED SERVICEABLE COMPONENTS OF THE HVAC SYSTEM.

10. MAKE TRANSITIONS AS REQUIRED IN THE DUCTWORK TO SUIT THE SITE CONDITIONS WITHOUT ANY EXTRA COST.

11. PROVIDE BALANCE DAMPER FOR EACH DIFFUSER OR GRILLE.

12. PROVIDE FIRE DAMPERS FOR ALL DUCTS PENETRATING RATED ASSEMBLIES. ALL FIRE DAMPER SHALL BE DYNAMIC TYPE, ULC LISTED, AND CSA APPROVED. ALL FIRE DAMPERS SHALL HAVE MINIMUM 2 HOURS FIRE RATING. FIRE DAMPERS' FUSIBLE LINK SHALL HAVE 72°C (60°F) MELTING POINT. INSTALL AND TEST ALL FIRE DAMPERS AS PER MANUFACTURERS' RECOMMENDATIONS.

13. PROVIDE RUSTPROOF BIRD SCREENS C/W WEATHER CAPS FOR ALL OUTDOOR EXHAUSTS AND INTAKES. DO NOT USE A SCREEN FOR DRYER EXHAUST OUTLETS.

14. DRYER VENTS SHALL BE ALUMINUM SLOPED TO THE OUTDOOR. DO NOT USE SCREWS OR RIVETS FOR FASTENING THE DRYER'S VENTS. DRYER VENT SHALL BE SEALED AND TAPED.

15. INSTALL VIBRATION ISOLATORS, FLEXIBLE CONNECTION, EXPANSION JOINS AND OTHER SAFETY MEASURES TO PREVENT NOISE AND VIBRATIONS FROM BEING TRANSMITTED TO THE OCCUPIED SPACES. MAKE PROPER ADJUSTMENTS TO ELIMINATE EXCESSIVE VIBRATION AND NOISE.

16. PROVIDE HANGERS, BRACKETS, ANCHORS, VIBRATION ISOLATORS, AND ALL MISCELLANEOUS SUPPORTS AS REQUIRED FOR THE INSTALLATION OF DUCTWORK, PIPING AND ALL MECHANICAL EQUIPMENT.

10. TESTING

1. ALL PLUMBING SYSTEM SHALL BE TESTED AS PER 2018 B.C. PLUMBING CODE, AND PIPING MANUFACTURER'S RECOMMENDATIONS.

2. DRAIN WAIST VENT (DWV) PIPING SHALL BE TESTED WITH HYDROSTATIC 3M (10') STANDING WATER COLUMN.

3. DOMESTIC WATER PIPING, SHALL BE PRESSURE TESTED WITH A MINIMUM 1.5 TIMES OF MAXIMUM WATER PRESSURE BUT NOT LESS THAN 200 PSI. THE MEDIUM OF THE TEST SHALL BE AS PER BY THE PIPE MANUFACTURER'S RECOMMENDATIONS (I.E. WATER OR AIR .ETC.).

4. DUCTWORKS SHALL BE TESTED AS PER SMACNA RECOMMENDATIONS.

5. CONTRACTOR SHALL BE RESPONSIBLE TO PROTECT PIPING FROM FREEZING DURING THE TEST.

6. TEST ALL FIRE DAMPERS WITH DROP TEST AND REST THE DAMPERS AFTER TESTING.

7. ALL TESTS SHALL BE DOCUMENTED AND WITNESSED AND BY THE AHJ, CONSULTANTS OR BY THE GENERAL CONTRACTOR.

11. BALANCING AND COMMISSIONING

1. PROVIDE TOTAL MECHANICAL SYSTEMS TESTING, ADJUSTING, COMMISSIONING AND BALANCING. THE REQUIREMENTS INCLUDE THE BALANCE OF AIR AND WATER DISTRIBUTION SYSTEMS, ADJUSTMENT OF NEW AND EXISTING SYSTEMS AND EQUIPMENT TO PROVIDE DESIGN REQUIREMENTS INDICATED ON THE DRAWINGS.

2. THE CONTRACTOR SHALL HIRE IN HIS/HER COST AN INDEPENDENT TESTING AND BALANCING AGENCY TO PERFORM ALL COMMISSIONING, TESTING, ADJUSTING, AND BALANCING OF HVAC AND DOMESTIC HOT WATER RECIRC SYSTEMS WHERE APPLICABLE FOR THIS PROJECT. ANY SITE VISITS REQUIRED BY THE TESTING AGENCY DURING THE CONSTRUCTION AND DURING THE ONE YEAR WARRANTY PERIOD AFTER THE CONSTRUCTION TO PERFORM THE BALANCING AND ADJUSTMENTS SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.

3. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN VALUES OF THE HVAC SYSTEM AND DOMESTIC HOT WATER RECIRC SYSTEM SHOWN IN THE DRAWINGS WITHIN 10 % OF QUANTITIES NOTED IN THE DESIGN DRAWINGS. PROVIDE FAN AND MOTOR DRIVE SHEAVE ADJUSTMENTS, BELTS OR REPLACEMENT AS NECESSARY TO OBTAIN DESIGN PERFORMANCE. PROVIDE ALL NECESSARILY VOLUME DAMPERS, BALANCING VALVES ..ETC TO COMPLETE THE BALANCING.

4. TEST, ADJUST AND BALANCE ALL AIR AND HYDRONIC SYSTEMS SO THAT EACH ROOM, PIECE OF EQUIPMENT OR TERMINAL DEVICE MEETS THE DESIGN REQUIREMENTS INDICATED ON THE DRAWINGS AND IN THE SPECIFICATIONS.

5. AT THE END OF THE COMMISSIONING AND BALANCING, BALANCING CONTRACTOR SHALL PROVIDE THE FINAL BALANCING AND COMMISSIONING REPORTS FOR ALL SYSTEMS TO THE CONSULTANT FOR REVIEW. CONSULTANT'S REVIEW AND ACCEPTANCE OF THE BALANCING REPORTS SHALL NOT RELIEVE THE CONTRACTOR FROM CORRECTING ANY DEFICIENCY IN THE BALANCING AND COMMISSIONING MAY EXIST OR MAY APPEAR DURING THE WARRANTY PERIOD.

6. COPY OF ALL BALANCING AND COMMISSIONING REPORTS SHALL BE INCLUDED IN O&M MANUAL.

12. PLUMBING MATERIAL AND INSTALLATION

1. ALL PLUMBING INSTALLATION AND MATERIALS SHALL COMPLY WITH 2018 B.C. BUILDING AND PLUMBING CODES.
2. PROVIDE WATER HAMMER ARRESTOR FOR ALL HOT AND COLD WATER LINES SERVING GROUP OF PLUMBING FIXTURES, CLOTH WASHERS, DISHWASHERS, KITCHEN SINKS.
3. PROVIDE CHROMES PLATED ESCUTCHEON FOR ALL PIPING PENETRATING FINISHED WALLS, FLOORS AND CEILING.
4. DOMESTIC AND SANITARY PIPING INSTALLED IN THE EXTERIOR WALLS SHALL BE INSTALLED ON THE WARM SIDE OF EXTERIOR WALL INSULATION.
5. PROVIDE LAUNDRY BOX FOR CLOTH WASHER'S HOT AND COLD WATER VALVES.
6. ALL BELOW GRADE PLUMBING PIPES SHALL BE BURIED BELOW THE FROST LEVEL.
7. ALL BELOW GRADE PIPING SUBJECTED TO TRAFFIC SHALL BE BURIED AT 36" MINIMUM DEPTH.
8. PRIOR TO COMMENCING UNDERGROUND PLUMBING WORKS VISIT THE SITE TO CONFIRM THE SUITABILITY OF THE EXISTING PIPE CONDITIONS, INVERTS, SIZES AND LOCATIONS. INFORM THE ENGINEER IF THERE IS ANY CHANGE TO BE MADE TO SUIT THE EXISTING CONDITIONS.
9. PROVIDE SHUT OFF VALVES IN HOT AND COLD DOMESTIC WATER LINES SERVING EACH PLUMBING FIXTURE, EACH GROUP OF PLUMBING FIXTURES, EACH WATER RISER, AND EACH SUITE.
10. PROVIDE EXPANSION JOINTS FOR ALL PLUMBING PIPING SYSTEM TO ALLOW EXPANSION AND CONTRACTION DUE TO THE TEMPERATURE EFFECTS AND BUILDING SETTLEMENT AND SHRINKAGES. ALL EXPANSION JOINTS SHALL BE INSTALLED AS PER THE PIPE MANUFACTURER RECOMMENDATIONS. PROVIDE ANCHORS BETWEEN THE EXPANSION ELEMENTS.
11. PROVIDE CLEANOUTS ON ALL INTERIOR AND EXTERIOR SANITARY AND STORM PIPING SYSTEMS AS REQUIRED BY 2018 BC PLUMBING CODE. CLEANOUTS SHALL BE FULL SIZE OF THE PIPE DIAMETER FOR PIPING SIZE LESS THAN 4" AND 4" FOR PIPING SIZE DIAMETER MORE THAN 4".
12. ALL FLOOR DRAINS SHALL HAVE DEEP SEAL TRAPS AND TRAP PRIMER CONNECTION.
13. ALL HOSE BIBS SHALL HAVE VACUUM BREAKERS.
14. ALL COPPER DOMESTIC PIPING SYSTEM SHALL HAVE LEAD FREE SOLDER JOINTS.
15. PROVIDE EXPANSION JOINTS FOR ALL ROOF DRAINS CONNECTED TO THE RAIN WATER LEADERS (RWL) OR OFFSET THE ROOF DRAIN 5' MINIMUM FROM RWL.
16. CONTRACTOR SHALL NOT INSTALL ANY PLUMBING PIPING IN THE ELEVATOR MACHINE ROOMS, ELECTRICAL ROOMS, TRANSFORMER ROOMS, AND ELECTRICAL CLOSETS.
17. PROVIDE HANGERS, BRACKETS, ANCHORS, VIBRATION ISOLATORS, AND ALL MISCELLANEOUS SUPPORTS AS REQUIRED FOR THE INSTALLATION OF PLUMBING PIPING AND EQUIPMENT.
18. PROVIDE THRUST BLOCKS AND THE REQUIRED PIPING RESTRAINS FOR ALL UNDERGROUND DOMESTIC WATER PIPING AT EVERY CHANGE OF DIRECTION, EVERY TEE, AND AT THE END OF WATER MAIN OR BRANCH.
19. ALL PLUMBING FIXTURES SELECTION AND INSTALLATION SHALL COMPLY WITH 2018 BC BUILDING AND PLUMBING CODES.
20. PROVIDE AND INSTALL ALL PLUMBING FIXTURES SUPPLIED BY THIS CONTRACTOR.
21. WHERE PLUMBING FIXTURES ARE SUPPLIED BY OTHERS, THIS CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING HANGERS, BOLTS, ANCHORS, AND ANY ACCESSORIES NECESSARY TO FASTEN AND TO SECURE THE INSTALLATION OF THE PLUMBING FIXTURES. PRIOR ORDERING ANY PLUMBING FIXTURES, PROVIDE COMPLETE SHOP DRAWINGS FOR ENGINEER'S APPROVAL.
22. DOMESTIC WATER PIPING SYSTEM SHALL BE ENTIRELY FLUSHED, CLEANED, CHLORINATED AND RE-FLUSHED AND READY FOR OWNER USE AS PER THE INDUSTRY STANDARDS AND AS PER LOCAL BYLAWS REQUIREMENT. CONTRACTOR SHALL SUBMIT TO THE CONSULTANT THE CERTIFICATION OF COMPLETING SUCCESSFULLY THE PROCESS OF POTABLE WATER CHLORINATION AND FLUSHING.

23. THE FOLLOWING PIPING MATERIAL AND PIPE FITTING SHALL BE USED UNLESS OTHERWISE SPECIFIED ON THE DRAWINGS OR APPROVED BY BSA ENGINEERING CONSULTANTS INC:

SERVICE	PIPE MATERIAL	FITTINGS
DOMESTIC COLD/HOT WATER INSIDE BUILDING ABOVE GRADE	COPPER TYPE L, ASTM B88	LEAD FREE SOLDER JOINTS
DOMESTIC WATER BELOW GRADE OUTSIDE/INSIDE	IPEX Xirtec 140 PVC SCHED 80 CSA B137.3	SOLVENT JOINTS
SANITARY & STORM ABOVE/BELOW GRADE INSIDE BUILDING	IPEX PVC SYSTEM 15	SOLVENT JOINTS
SANITARY & STORM SEWERS BELOW GRADE OUTSIDE BUILDING	PVC SEWER CSA-B182.2 SDR-35	SOLVENT JOINTS
FOOTING DRAIN PIPING	PERFORATED PVC SEWER SDR 35	SOLVENT JOINTS

TABLE NOTES

1. ALL PIPES AND FITTING SHALL BE LISTED AND CERTIFIED AS PER 2016 BC PLUMBING CODE REQUIREMENT.
2. ALTERATION OR CHANGES TO MATERIALS SPECIFIED IS NOT ACCEPTABLE WITHOUT PRIOR WRITTEN APPROVAL FROM BOTH BSA ENGINEERING CONSULTANTS AND AHJ.
3. ALL PIPES AND FITTINGS SHALL BE TESTED AFTER INSTALLATION AS PER 2016 B.C. PLUMBING CODE REQUIREMENT.
4. DO NOT USE AIR TEST FOR ANY PIPING MATERIAL UNLESS ITS APPROVED BY THE MANUFACTURER.

13. INSULATION SPECIFICATION

1. ALL INSTALLATION SHALL CONFIRM TO BRITISH COLOMBIA INSULATION CONTRACTORS ASSOCIATIONS' (B.C.I.C.A) QUALITY STANDARD FOR MECHANICAL INSULATION MANUAL.
4. ALL INSULATION MATERIALS SHALL HAVE FLAME SPREAD RATINGS AND SMOKE DEVELOPED CLASSIFICATIONS AS REQUIRED BY BC BUILDING CODE AND NFPA 90A. TYPICALLY, THE FLAME SPREAD RATING OF THE INSULATION SHALL NOT EXCEED 25 AND THE SMOKE DEVELOPED CLASSIFICATION SHALL NOT EXCEED 50.
5. ALL INSULATION THICKNESS, DENSITY, AND R-VALUES SHALL MEET THE MINIMUM REQUIREMENTS LISTED IN ASHRAE 90.1, 2016 STANDARD.
6. ALL INSULATION MATERIAL SHALL BE FIBERGLASS WITH VAPOR BARRIER MANUFACTURED
7. ACCEPTABLE INSULATION MATERIAL SHALL BE BY MANSON OR KNAUF INDUSTRIES.
8. HVAC HYDRONIC HEATING AND COOLING HVAC PIPING SHALL BE INSULATED AS PER ASHRAE STANDARD 90.1, 2016.
9. PROVIDE THERMAL INSULATION FOR PLUMBING PIPING AS REQUIRED BY BC BUILDING CODE AND AS PER ASHRAE 90.1, 2016 STANDARD.
10. PROVIDE PVC JACKET FINISH WHERE THE INSULATED PIPING ARE SUBJECTED TO VIEW; SUCH AS PIPING LOCATED IN MECHANICAL ROOMS.
11. ALL HATCH DUCTING SHALL BE INTERNALLY INSULATED WITH 1" MINIMUM DUCT LINING. DUCT LINING SHALL HAVE 0.7 NRC SOUND ABSORPTION AND R-3.5 MINIMUM.

12. PROVIDE WEATHERPROOF PVC OR ALUMINUM JACKETS FOR ALL DUCTWORKS SUBJECTED TO OUTDOOR WEATHER.

13. INSULATE THE FOLLOWINGS PLUMBING PIPING:

a. ALL ROOF STORM DRAIN PIPING INCLUDING THE ROOF DRAIN BODY IN HEATED SPACES.
b. ALL DOMESTIC HOT WATER AND HOT WATER RECIRC LINES.
c. ALL DOMESTIC COLD WATER LINES.
d. ALL SANITARY P-TRAPS SUBJECTED TO FREEZING.
e. ALL HEAT TRACED PLUMBING LINES.
f. ALL CONDENSATE DRAINS IN HEATED SPACES.

PIPE SERVICE	INSULATION a		
	Thickness	K-Value	
DOMESTIC COLD WATER PIPING UP TO 1"	$\frac{1}{2}$"	0.22-0.28	
DOMESTIC COLD WATER PIPING > 1"	1"	0.22-0.28	
HEATING, DOMESTIC HOT AND RECIRC PIPING < 1 $\frac{1}{2}$"	1"	0.22-0.28	b
HEATING, DOMESTIC HOT AND RECIRC PIPING 1 $\frac{1}{2}$" AND ABOVE	1 $\frac{1}{2}$"	0.22-0.28	b
STORM PIPING IN HEATED SPACES	1"	0.22-0.28	
CONDENSATE DRAIN PIPING	$\frac{1}{2}$"	0.22-0.28	

TABLE NOTES

a. K: MAXIMUM THERMAL CONDUCTIVITY MEASURED IN Btu.in/(h.ft2.F°) AT 75°F.
b. K VALUES AND INSULATION THICKNESS ARE FOR WATER TEMPERATURE UP TO 140°F. FOR WATER TEMPERATURE MORE THAN 140°F CONSULT WITH ASHRAE STANDARD 90.1, 2016.

14. INSULATE THE FOLLOWING HVAC DUCTING WHERE APPLICABLE:

a. ALL EXPOSED TO WEATHER SUPPLY AND RETURN AIR DUCTING WITH RIGID INSULATION.
b. ALL SUPPLY AND RETURN AIR DUCTING IN UNHEATED SPACES.
c. ALL HATCHED SUPPLY AND RETURN AIR DUCTING SHOWN IN THE DRAWINGS -INTERNAL ACOUSTIC INSULATION.
d. ALL FRESH AIR DUCTING RUN IN HEATED SPACES.
e. ALL SUPPLY AIR DUCTING IN RETURN AIR PLENUMS.
f. ALL EXHAUST AIR DUCTING INSIDE THE BUILDING IN HEATED SPACES FOR 10' (3M) MINIMUM FROM OUTDOOR TERMINATION.

DUCT SERVICE	INSULATION a		
	Thickness	R-Value	
EXTERIOR SUPPLY & RETURN DUCTS	1 $\frac{1}{2}$"	R-6	b,c
INTERIOR SUPPLY & RETURN DUCTS IN UNCONDITIONED SPACES	1 $\frac{1}{2}$"	R-6	b,d
BURIED SUPPLY & RETURN DUCTS	1 $\frac{1}{2}$"	R-6	b,d
SUPPLY DUCTS IN RETURN AIR PLENUM	1"	R-3.5	d
OUTDOOR AIR DUCTS IN HEATED SPACES	1"	R-3.5	d
EXHAUST DUCTS IN HEATED SPACES	1"	R-3.5	d,e

TABLE NOTES

a. R VALUES SHALL BE THE MINIMUM MEASURED IN (h.ft2.F°)/Btu.
b. R VALUES LISTED IN THIS TABLE ARE FOR PROJECTS LOCATED IN THE LOWER MAINLAND OF B.C. (CLIMATE ZONE#5). FOR PROJECTS LOCATED OUTSIDE LOWER MAINLAND OF BC CONSULT WITH ASHRAE STANDARD 90.1, 2016 FOR MINIMUM R-VALUES.
c. RIGID FIBERGLASS INSULATION.
d. FLEXIBLE FOIL FACE FIBERGLASS INSULATION.
e. EXHAUST DUCTING SHALL BE INSULATED 10' MINIMUM INSIDE HEATED SPACES FROM THE EXTERNAL WALL OR ROOF TERMINATION.

14. CONTROLS SPECIFICATIONS

1. PROVIDE COMPLETE MATERIAL AND LABOR NECESSARY TO DELIVER FULLY OPERATIONAL OF HVAC, PLUMBING AND FIRE SUPPRESSION SYSTEMS.
2. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE AND INSTALL ALL LOW VOLTAGE WIRING, SENSORS, THERMOSTATS, CONDUITS, AND 24 VOLTS TRANSFORMERS AS REQUIRED.
3. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE INSTALL ALL HIGH VOLTAGE WIRING, SWITCH GEARS, ELECTRIC MOTORS PROTECTIONS, AND MAGNETIC STARTERS.
4. COORDINATE ALL CONTROL WORKS WITH THE ELECTRICAL AND FIRE SUPPRESSION CONTRACTORS TO DELIVER GOOD AND FUNCTIONAL SYSTEMS.

ARCHITECT

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ISSUES

DESCRIPTION	DATE
Issued for 50% review	Jan. 26, 2021
Issued for 75% review	Feb. 23, 2021
Issued For Building Permit	Mar. 10, 2021
Issued For 90% Review	Mar. 17, 2021
Issued For RFP	Apr. 21, 2021

THESE DRAWINGS ARE FOR THE PURPOSES SPECIFICALLY IDENTIFIED IN THE REVISION AND ISSUE COLUMNS.

DRAWINGS ARE SCHEMATIC AND SHALL NOT BE SCALED. CONTRACTOR SHALL VISIT SITE AND VERIFY ALL DIMENSIONS BEFORE SUBMITTING BID.

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Seal

Project:
SHEFFIELD PARK WASHROOM

Coquitlam

3510 Sheffield Avenue,
Coquitlam, BC

Sheet Title:

SPECIFICATIONS
(PLUMBING & HVAC)

Start Date: January, 2021
Scale: As Noted
Project No. : 1297

Drawing No.
M3.0 of 3.0