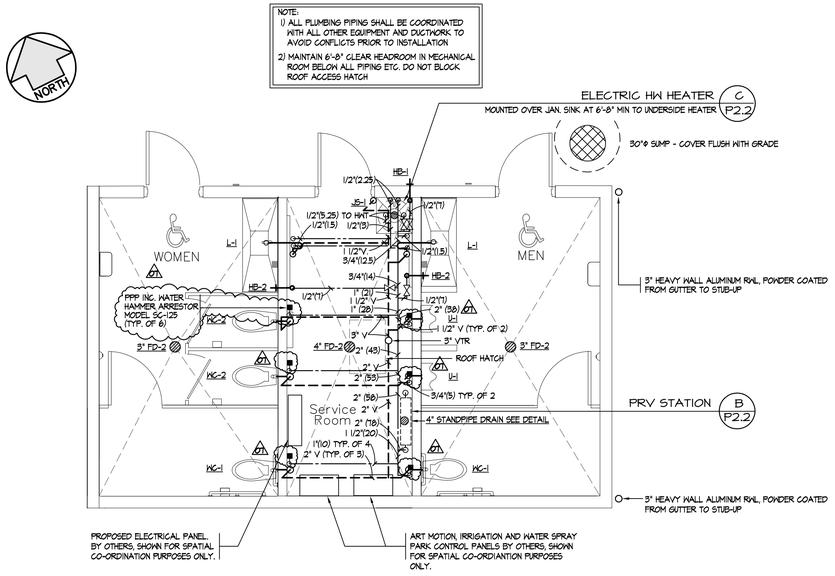


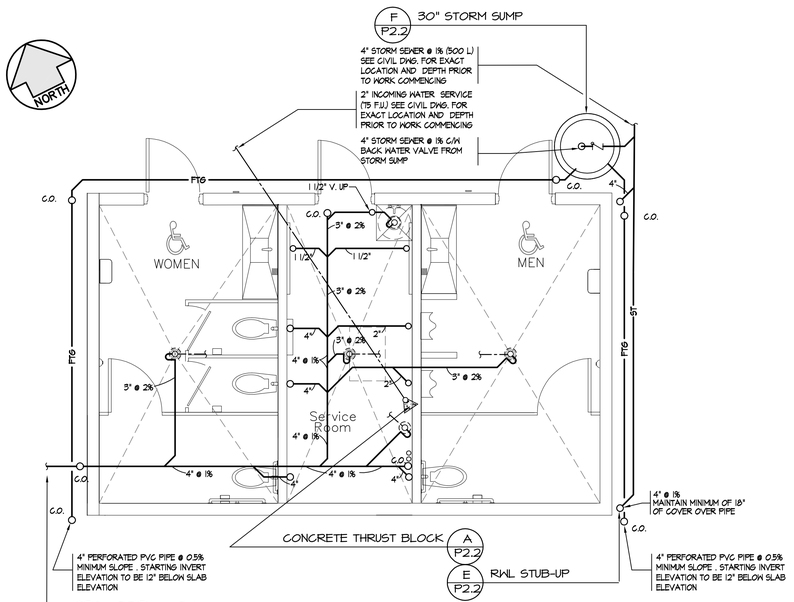

## Floor Plan (Plumbing)

SCALE: 1/4" = 1'-0"

| LEGEND | |
|---|---|
| TAG SIZE FLOW | GRILLE REGISTER AND DIFFUSER DESIGNATOR |
| UNIT TAG | EQUIPMENT UNIT TAG |
| | CEILING DIFFUSER |
| | CEILING RETURN GRILLE |
| | EXHAUST AIR UP |
| | RETURN AIR UP |
| | SUPPLY AIR UP |
| | EXHAUST AIR DOWN |
| | RETURN AIR DOWN |
| | SUPPLY AIR DOWN |
| BD | BALANCING DAMPER |
| Y FD | HORIZONTAL FIRE DAMPER |
| BDD | BACKDRAFT DAMPER |
| | ACOUSTICALLY LINED DUCT |
| | FLEXIBLE DUCT CONNECTOR |
| | SQUARE ELBOW WITH TURNING VANES |
| | FLEXIBLE DUCT |
| T | THERMOSTAT |
| S | REMOTE TEMERATURE SENSOR |
| P | AIR PRESSURE SENSOR |
| DG | DOOR GRILLE |
| UC | UNDERCUT DOOR |
| A.P. | ACCESS PANEL |

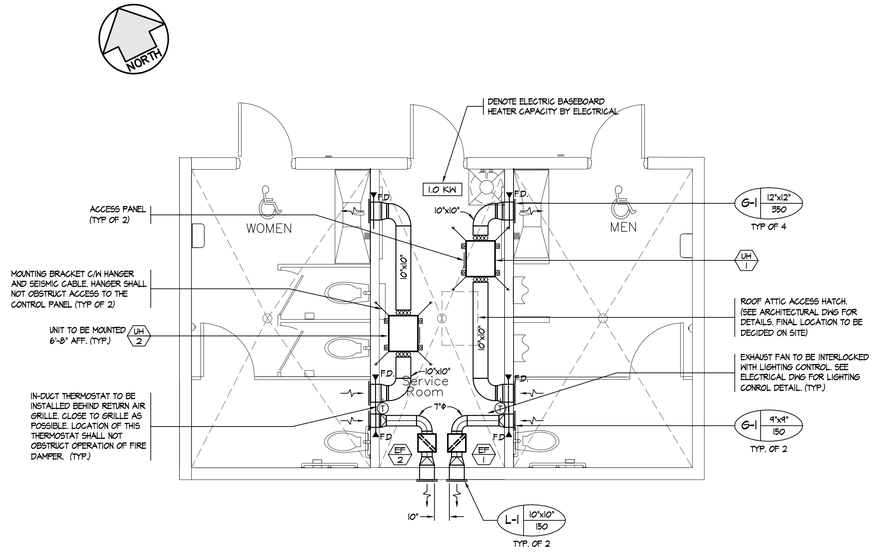
GENERAL NOTES:

1) VISIT THE SITE PRIOR TO TENDERING AND EXAMINE ALL LOCAL AND EXISTING CONDITIONS ON WHICH WORK IS DEPENDENT. NO CONSIDERATION WILL BE GRANTED FOR FAILURE TO VISIT THE SITE OR FOR ANY RESULTING MISUNDERSTANDING OF WORK TO BE DONE.
2) DRAWINGS ARE DIAGRAMATIC AND ARE INTENDED TO INDICATE THE SCOPE AND GENERAL ARRANGEMENT OF WORK. DO NOT SCALE THE DRAWINGS. TAKE FIELD MEASUREMENTS WHERE EQUIPMENT AND MATERIAL ARE DEPENDENT UPON BUILDING DIMENSION.
3) CONTRACTOR TO MAKE GOOD ANY DAMAGE TO PROPERTIES THAT OCCURS AS A RESULT OF THE WORK BEING DONE IN THIS CONTRACT.
4) CONTRACTOR SHALL RETURN REVISED AREA BACK TO ORIGINAL CONDITION AND/OR TO THE DIRECTION AND SATISFACTION OF THE ENGINEER AND THE ARCHITECT, INCLUDING ALL CONCRETE RESURFACING, PAINTING, PATCHING ETC. ALL COSTS TO BE INCLUDED IN BASE TENDER QUOTE.
5) LOCATION OF ALL EXISTING EQUIPMENT, DUCTWORK, PIPING, SENSORS, THERMOSTATS, AND OTHER ACCESSORIES AS SHOWN ON THESE DRAWINGS ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL CONFIRM THE ACTUAL LOCATION ON SITE.
6) CONTRACTOR SHALL BALANCE THE EXISTING SUPPLY AIR DIFFUSERS TO THE CFM AS SHOWN ON DRAWING AND AS PER SPECIFICATION.
7) ALL CEILING DIFFUSERS BEHIND DRY WALL CEILING SHALL BE COMPLETE WITH OPPOSED BLADE DAMPERS FOR BALANCING.
8) NOTIFY ENGINEER IMMEDIATELY FOR INSTRUCTION IF ASBESTOS MATERIAL ARE ENCOUNTERED IN EXISTING STRUCTURE UPON WHICH WORK IS BEING DONE.
9) PROVIDE SEPARATED COST FOR SUPPLY & INSTALLATION OF FIRE DAMPERS.




## Foundation Plan (Plumbing)

SCALE: 1/4" = 1'-0"




## Floor Plan (HVAC)

SCALE: 1/4" = 1'-0"

| No. | Revision/Issue | yy/mm/dd Date |
|---|---|---|
| 08 | Re-Issued for Building Permit Deletion of Drinking Fountain | 12/08/30 |
| 07 | Re-Issued for Building Permit Add Water Hammer Arresters | 12/07/17 |
| 06 | Re-Issued for Building Permit | 12/07/03 |
| 05 | Issued for Tender | 12/06/28 |
| 04 | Issued for Review | 12/06/22 |
| 03 | Issued for Building Permit | 12/04/10 |
| 02 | Re-Issued for Review | 12/03/26 |
| 01 | Issued for Review | 12/03/07 |

General Notes


Mechanical Name and Address

DEC engineering sustainability

DEC ENGINEERING
309-713 COLUMBIA STREET,
NEW WESTMINSTER, B.C. CANADA V3M 1B2
TEL. 604 525-3341
ENGINEERINGSUSTAINABILITY.COM

Architect Name and Address

Forum Projects Ltd.
Box 32120
Walnut Grove P.O.
Langley B.C. V1M-3S7
604-888-6672(o)
604-888-7857(f)


Sheet Name and Disipline

**FLOOR PLAN -PLUMBING & HVAC**

Project Name and Address

Mackin Park
Washroom Building
Coquitlam B.C.

| Project | Sheet |
|---|---|
| D12-006 | P1.1 |
| Date: 2012-02-17 | |
| Scale: AS NOTED | |

PLOT DATE: Aug 30, 2012 - 1:34pm CAD FILE: P:\2012\D12-006 Mackin Park Washroom Bldg\Drawings\D12006- P1.1 (Floor Plan).DWG

# PLUMBING SPECIFICATIONS:

1. GENERAL CONDITIONS

1.1 The general conditions for the project shall apply to this sub-trade.

1.2 Contractors shall familiarize themselves with site conditions prior to submitting bids. Claims for extras due to site conditions will not be accepted.

1.3 At start of construction, verify the layout of facilities. Inform the Engineer of any conflicts between the design and the existing conditions prior to starting installation. Be responsible for any corrective action required due to failure to report the conflicts in a timely manner.

1.4 Provide functioning systems that are complete in every detail and installed in accordance with good practice.

2. SERVICE CONNECTIONS

2.1 The locations and sizes of buried services as shown on the drawings are based on the available information. No guaranty is provided by the engineer as to the accuracy of this information and the contractor must verify such accuracy prior to commencing work.

2.2 If there are existing service connections, excavate and confirm the location and invert elevation of existing storm and sanitary connections at property line prior to work commencing.

2.3 If the connections are found to be unsuitable (insufficient size or unacceptable invert) plumbing contractor shall inform the engineer. Be responsible for any corrective action required due to failure to verify or report the unsuitability in a timely manner.

3. SCOPE OF WORK:

3.1 Install a complete sanitary drainage system complete from all plumbing fixtures and floor drains to the existing sanitary drain and vent as indicated on the plumbing drawings.

3.2 Install a complete domestic water distribution system including hot, nad cold water lines as indicated on the plumbing drawings.

4. CODES AND PERMITS:

4.1 Comply with all applicable codes, obtain all necessary approvals and pay for all necessary permits prior to commencement of work.

4.2 Plumbing and drainage systems to be installed as per approved drawings and in accordance with the B.C. Plumbing Code, B.C. Building Code (latest editions and amendments) and local authority's requirements.

4.3 All materials and equipment shall have prior approval for the application by the authorities having jurisdiction, e.g. Canadian Standards Association (C.S.A.)

5. TESTING:

5.1 Drainage piping: test under 3.0m (10 feet) standing head.

5.2 Water piping: pressure test at 200 psi with pressure held steady for 2hours, with no significant pressure drop. Alternate tests as called for by plumbing inspector.

6. INSPECTIONS AND APPROVALS:

6.1 All work and materials will be subject to inspection from time to time by the engineer and the authority having jurisdiction. Inform the engineer 48 hours in advance of any tests or covering burying or concealment of services to allow for inspection. Do not cover, bury or conceal services without the engineer's approval.

6.2 Do not change any material, equipment or construction method from what is shown on the drawings and specification without the approval of the engineer. Any changes made without the engineer's authorisation may result in the work not being accepted and/or delay in issuance of the final letter of assurance.

6.3 The documents indicate the minimum standards to be applied to the work. Any approval of, or agreement to, a lower standard, by any person or authority will not necessarily be approved by the engineer and may result in the work not being accepted and/or delay in issuance of the final letter of assurance.

7. SUBMITTALS:

7.1 Prior to commencement of work, submit at least 6 copies of complete shop drawings (spec book) on all specified or approved equal materials to be used. Allow 5 working days for DEC Design to review.

7.2 The contractor shall be responsible for delays caused by any required resubmission of shop drawings.

7.3 The engineer's review is for general compliance with the intent of the contract documents and will not relieve the contractor from responsibility for correctness of performance, function, details and dimensions.

7.4 Where alternate equipment has been submitted the contractor bears responsibility for any redesign and construction required to accommodate the equipment.

8. MAINTENANCE MANUALS:

8.1 At completion of construction, submit to engineer 3 sets of maintenance information covering the operation and maintenance of plumbing systems. Incorporate with the HVAC maintenance information in a suitable 3 ring binder.

8.2 Manuals shall include: copies of all permits, test reports, final inspection certificates and approvals; copies of all shop drawings; operating instructions for all equipment; maintenance schedules for all equipment; copies of all guaranties; names and addresses of contractors and suppliers.

9. AS BUILT DRAWINGS:

9.1 Obtain from the engineer extra sets of drawings on which to mark, as the work progresses, any changes and deviations in runs of piping, risers or equipment locations from that shown. These drawings shall be kept on site and available for review at all times.

9.2 When the installation is complete, submit the complete marked-up as-builts to DEC Design Mechanical Consultants Ltd. Drawings shall be clean and legible with an acceptable standard of drafting and each sheet shall bear the contractors name and be identified as as-built. Provide a letter certifying that these drawings accurately reflect the building as-built

10. GUARANTIES:

10.1 Provide a written guaranty of all material, workmanship and system performance for a period of(1) year after final acceptance. And replace forthwith any defective work during this period.

10.2 Such guaranty shall not override any specific guaranties provided or requested of longer duration.

11. CO-OPERATION WITH OTHER TRADES:

11.1 Give full co-operation to other sub-trades and furnish any information necessary to permit the work of all subtrades to be installed satisfactorily and with the least possible interference or delay.

11.2 Install all equipment, piping and ductwork to obtain ceiling heights specified or shown on the architectural drawings. In case of conflict, notify the engineer before fabricating and installing any item referred to above. Carry out any required adjustment

12. PIPING MATERIALS

12.1 The following piping material shall be used unless otherwise specified on the drawings or approved by the engineer..

| SERVICE | MATERIAL |
|---|---|
| Sanitary drainage above slab on grade | Cast iron with mechanical joints, CSA-B70 |
| Sanitary drainage below slab on grade and to property line | ABS DWV grade or PVC DWV schedule 40, CSA-B181.1 and B181.2 |
| Domestic hot and cold water branch lines up to 2" in size inside building | IPEX Aquarise CPVC pipe and fittings to CSA B137.6 |
| Domestic cold water service line 2" in size outside & under building | Polyethylene pipe and fittings to Series 160 CSA B137.1 |

Note: Connection between PE pipe and Aquarise CPVC shall be with approved fittings.

13. INSTALLATION

13.1 Provide chrome plated escutcheon plates wherever plumbing lines penetrate a finished wall. Holes larger than the escutcheon shall be patched with the finish material.

13.2 Provide shut off valves and accessories in accessible locations to each appliance ,piece of equipment, fixture group or fixture. Provide valves in accordance with codes and where shown on the drawings.

13.3 Identify each piping system with stick on decals to indicate service and direction of flow.

13.4 Do not run water pipes in outside walls without protection from freezing to the engineer's approval.

13.5 Co-ordinate with general contractor locations and sizes of required plumbing chases and any additional bracing between studs for wall hung fixtures.

13.6 Co-ordinate with general contractor any required cutting of structure to facilitate passage of pipes.

14. CLEANOUTS:

14.1 Cleanouts shall be installed on all interior sanitary drainage piping in accordance with local plumbing codes.

14.2 Cleanouts shall be full size for pipes of 4" diameter and less, and 4" size for all larger pipes.

14.3 Cleanouts in sidewalks, concrete or paved areas for outside drainage piping and footing drains to be extended to surface in Cast Iron Pipe with pipe anchored in 12" x 12" x 6" collar of concrete.

14.4 Where cleanouts must be installed in finished floors use appropriate cleanout covers.

15. ACCESS DOORS/PANELS:

15.1 Provide access to all concealed mechanical equipment for operation, maintenance, calibration and adjustment, including: valves, solenoid valves, mixing valves, unions, and cleanouts.

15.2 Access doors/panels for cleanouts shall be 8" x 8" (200 x 200 mm) minimum. All other access doors/panels shall be a minimum of 12" x 12" (300 x 300 mm). Where full body or head and shoulders access is required, doors/panels shall be 24" x 24" (610 x 610 mm).

15.3 Access doors/panels to have primer finish except for ceramic tiled areas where access door shall be stainless steel. Access doors shall have lock and key.

15.4 Access doors/panels required in fire partitions and similar fire rated structures shall be U.L.C. Approved fire doors/panels, suitable for the structure in which they are to be located. Access doors/panels shall be as manufactured by Acudor or approved equal.

16. FIRE STOP:

16.1 Material penetrations through the structure (mechanical room walls) shall be sized to allow 12mm (1/2") clearance between the pipe and the structure.

16.2 Pipes passing through fire rated ceilings shallhave the 12mm (1/2") space between the pipe and the structure caulked with UL approved high temperature insulation cement to avoid to avoid sound, smoke and dust transmission.

16.3 All redundant unsused holes are to be firestopped.

16.4 Provide 1 hour F rated fire stop assemblies through rated walls and ceiling. this work shall be undertaken by qualified trades people only.

17. INSULATION:

.1 All insulation work shall be in strict accordance with B.C.I.C.A. standards and the 2006 b.c. building code and be carried out by an experienced firm with an established reputation in this field, and to the satisfaction of the architect/engineer.

.2 All hot water domestic water piping to be insulated with 1" fibreglass insulation with vapour barrier. All cold water domestic water piping to be with 1/2" fibreglass insulation with vapour barrier. Seal all joints.

.3 Insulation to be as manufactured by manson insulation or knauf industries. one piece moulded insulation with self sealing adhesive. all fittings to be complete with one piece pre moulded high impact pvc fitting covers.

18. DISINFECTION & FLUSHING:

.1 At the end of the rough-in stage of the project, flush all domestic water piping within the building and disinfect in accordance with AWWA C651 and be carried out by an experienced firm with an established reputation in this field, and to the satisfaction of the architect/engineer.

.2 Retain 25mg/L of chlorine solution in pipe for a period of 24 hours. Pay for and submit results to independent labatory and have test results forwarded to architect/engineer for review.

.3 After chlorination test are approved, flush chlorinated water from system, until concentration in remaining water is less than 0.3 mg/L chlorine residual.

19. PLUMBING FIXTURES:

19.1 SUPPLY AND INSTALL THE FOLLOWING FIXTURES IN LOCATIONS INDICATED ON THE DRAWINGS, COMPLETE WITH SUPPLIES, HANGERS, AND ALL ACCESSORIES REQUIRED FOR A COMPLETE INSTALLATION. TOGGLE BOLTS, EXPANSION ANCHORS, OR SIMILAR FASTENERS SHALL BE USED FOR SECURING FIXTURES TO CONCRETE AND CONCRETE BLOCK WALLS. IN FRAME WALLS, INSTALL 50X150MM (2"X6" BRACING BETWEEN STUDS TO ACT AS SUPPORT FOR WALL HUNG FIXTURES. EACH FIXTURE SHALL BE INSTALLED COMPLETE WITH CHROME PLATED ANGLE STOPS, FLEXIBLE SUPPLIES AND ESCUTCHEONS. PIPING, ACCESSORIES ARE TO BE CONCEALED IN STAINLESS STEEL ACCESS PANELS WHEREEVER POSSIBLE TO REDUCE THE CHANCE OF VANDALISM.

ALL FIXTURE COLOUR TO BE WHITE.

**L-1 LAVATORY- BARRIER FREE- (LAVATORY IS CUSTOM UNIT, SEE ARCHITECT DRAWING FOR DESIGN & SPECIFICATION)**
SEE ARCHITECTURAL DRAWING FOR CUSTOM LAVATORY SPECIFICATION.
TOTO MODEL TEL5GS10#CP AUTOMATIC INFRARED SENSOR ACTIVATED FAUCET WITH TH559EDV908 1.0 GPM LAMINAR FLOW NOZZLE AND TN71V100S 4" CC COVER PLATE. ANTI-SCALD, THERMAL MIXING CHAMBER. AUTOMATIC SENSOR ADJUSTMENT ON INSTALLATION. MAXIMUM DISCHARGE 0.17 GALLONS PER 10 SECOND CYCLE. THERMOSTATIC MIXING VALVE, CONTROLLER AND ELECTRONIC CONTROLS ARE MOUNTED IN MECHANCIAL ROOM BEHIND LAVATORY. MAXIMUM TEMPERATURE IS 104 DEGREES FARENHEIT. PROVIDE TECK 33T260 C.P. CAST BRASS LAVATORY WASTE AND 33T311 P-TRAP. TECK 47T2312 SUPPLIES AND STOPS. P-TRAP TO BE LOCATED IN MECHANICAL ROOM BEHIND LAVATORY.

**WC-1 WATER CLOSET - CONCEALED FLUSH VALVE - BARRIER FREE**
ACORN MODEL 2100-W-1-ULF-FVBO-CN-HS-OFWC ADJUST MOUNTING HEIGHT TO BCBC 2006 REQUIREMENTS FOR BARRIER FREE DESIGN USING UNISTRUTS AND RODS AND BOLTS, STAINLESS STEEL ELONGATED BLOWOUT JET TYPE BOWL, LOW CONSUMPTION 6 LPF (1.6 GPF), 1-1/2" BACK SPUD WITH PUNCH OUT FOR SEAT, BOLT CAPS, FOR USE WITH CONCEALED FLUSH VALVE.

CENTOCO MODEL AM500STSCC TOILET SEAT, ELONGATED HEAVY DUTY ANTI-MICROBIAL SOLID PLASTIC OPEN FRONT LESS COVER, WITH REINFORCED STAINLESS STEEL CHECK HINGE, POSTS, WASHERS AND NUTS.

TOTO MODEL TET3GN31#SS AUTOMATIC INFRARED SENSOR ACTIVATED, CONCEALED FLUSH VALVE UNIT, 1.6 LPF, HEAVY DUTY 4"x4" COVER PLATE WITH STAINLESS STEEL SATIN FINISH AND VANDAL RESISTANT MOUNTING SCREWS. PISTON VALVE WITH SS SELF-CLEANING SCREEN AND SELF CLEANING SOLENOID. AUTOMATIC FLUSH EVERY 24 HOURS IF NOT USED. ELECTRICAL SENSOR SEPARATED FROM VALVE AND SEALED IN WATERPROOF COMPARTMENT. MANUAL OVERIDE BUTTON INCORPORATED.

**WC-2 WATER CLOSET - CONCEALED FLUSH VALVE - REGULAR**
ACORN MODEL 2100-W-1-ULF-FVBO-CN-HS-OFWC ADJUST MOUNTING HEIGHT TO MANUFACTURE'S RECOMMENDATIONS USING UNISTRUTS AND RODS AND BOLTS, STAINLESS STEEL ELONGATED BLOWOUT JET TYPE BOWL, LOW CONSUMPTION 6 LPF (1.6 GPF), 1-1/2" BACK SPUD WITH PUNCH OUT FOR SEAT, BOLT CAPS, FOR USE WITH CONCEALED FLUSH VALVE.

CENTOCO MODEL AM500STSCC TOILET SEAT, ELONGATED HEAVY DUTY ANTI-MICROBIAL SOLID PLASTIC OPEN FRONT LESS COVER, WITH REINFORCED STAINLESS STEEL CHECK HINGE, POSTS, WASHERS AND NUTS.

TOTO MODEL TET3GN31#SS AUTOMATIC INFRARED SENSOR ACTIVATED, CONCEALED FLUSH VALVE UNIT, 1.6 LPF, HEAVY DUTY 4"x4" COVER PLATE WITH STAINLESS STEEL SATIN FINISH AND VANDAL RESISTANT MOUNTING SCREWS. PISTON VALVE WITH SS SELF-CLEANING SCREEN AND SELF CLEANING SOLENOID. AUTOMATIC FLUSH EVERY 24 HOURS IF NOT USED. ELECTRICAL SENSOR SEPARATED FROM VALVE AND SEALED IN WATERPROOF COMPARTMENT. MANUAL OVERIDE BUTTON INCORPORATED.

**U-1 URINAL - CONCEALED FLUSH VALVE- BARRIER FREE**
KINDRED MODEL CMPX538 URINAL, WALL HUNG FOR CONCEALED FLUSH VALVE, 18 GAUGE T304 STAINLESS STEEL COMPLETE WITH WASTE FITTING, FLEXIBLE HOSE, FLOW REGULATOR, DOWELS, BACK PLATE, URINAL ADAPTER, FLUSHOMETER ADAPTER, COUPLINGS AND STAINLESS STEEL SCREWS. 0.5 GPF. PROVIDE P-TRAP. MOUNTING HEIGHT TO BCBC 2006 REQUIREMENTS FOR BARRIER FREE DESIGN.

TOTO MODEL TEU3LN11#SS AUTOMATIC INFRARED SENSOR ACTIVATED CONCEALED FLUSH VALVE UNIT, 0.5 GPF, HEAVY DUTY 4"x4" COVER PLATE WITH STAINLESS STEEL SATIN FINISH AND VANDAL RESISTANT MOUNTING SCREWS. PISTON VALVE WITH SS SELF-CLEANING SCREEN AND SELF CLEANING SOLENOID. AUTOMATIC FLUSH EVERY 24 HOURS IF NOT USED. ELECTRICAL SENSOR SEPARATED FROM VALVE AND SEALED IN WATERPROOF COMPARTMENT. MANUAL OVERIDE BUTTON INCORPORATED.

**JS-1 MOP SINK**
FIAT MODEL MSB 2424 (24X24") MOLDED STONE SERVICE SINK 10" DEEP, COMPLETE WITH STRAINER, 3" CAST IRON P-TRAP
TECK NO. 28T2313 WALL MOUNTED FAUCET COMPLETE WITH TOP BRACE, DOUBLE CHECK VACUUM BREAKER, INTEGRAL STOPS, HOSE FITTING AND 36" LENGTH OF RUBBER HOSE.

**FD-1 AREA FLOOR DRAIN -**
WATTS FD-200-6-1 EPOXY COATED CAST IRON DRAIN BODY WITH 6" NICKEL BRONZE STRAINER WITH TRAP SEAL PRIMER

**HB-1 WALL HYDRANT -**
ZURN Z-1300 NON-FREEZE ENCASED ECOLOTROL ANTI-SIPHON AUTOMATIC DRAINING WALL HYDRANT FOR FLUSH INSTALLATION, INTEGRAL BACKFLOW PREVENTER, BRONZE CASING, ALL BRONZE INTERIOR PARTS, NICKEL BRONZE BOX AND HINGED COVER WITH OPERATING KEY LOCK.

**HB-2 HOSE BIBB -**
NIBCO 763-CL-LS-VB ¾" THREAD SILL COCK WITH LOCK SHIELD AND C750 VACUUM BREAKER

**TSP TRAP SEAL PRIMER -**
PPP MODEL P1-500 PRIME VALVE WITH INTEGRAL VACUUM BREAKER AND DU-4 DISTRIBUTION UNIT AND ISOLATION VALVE. MOUNT 12" MINIMUM ABOVE FLOOR

**HWT ELECTRIC HOT WATER - SUSPENDED**
WATER HEATER TO BE RHEEN MODEL RE6 ELECTRIC
HOT WATER TANK FOR EACH UNIT, 6 USGAL. CAPACITY, 1.5 KW, 120/1/60. TANK SHALL BE C/W TEMPERATURE AND PRESSURE RELIEF VALVE, VACUUM RELIEF VALVE AND THERMOMETER. TANK SHALL BE CSA APPROVED AND HAVE A MINIMUM 1-YEAR WARRANTY. INSTALLATION SHALL BE IN ACCORDANCE WITH BC BUILDING CODE 2006.

**WHA WATER HAMMER ARRESTOR -**
ZURN Z-1700 SERIES BELLOW TYPR TO SUITE SERVICE
INSTALL ONE AT EACH CONNECTION TO FLUSH VALVE UNITS

General Notes

| No. | Revision/Issue | yy/mm/dd Date |
|---|---|---|
| 08 | Re-Issued for Building Permit Deletion of Drinking Fountain | 12/08/30 |
| 07 | Re-Issued for Building Permit Add Water Hammer Arresters | 12/07/17 |
| 06 | Re-Issued for Building Permit | 12/07/03 |
| 05 | Issued for Tender | 12/06/28 |
| 04 | Issued for Review | 12/06/22 |
| 03 | Issued for Building Permit | 12/04/10 |
| 02 | Re-Issued for Review | 12/03/26 |
| 01 | Issued for Review | 12/03/07 |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Langley B.C. V1M-3S7
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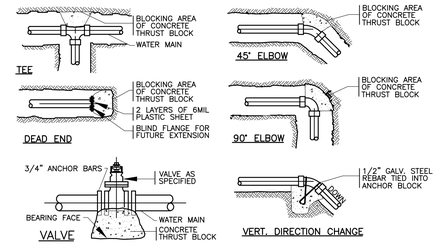
604-888-7857(f)


Sheet Name and Disipline
**SPECIFICATION -PLUMBING**

Project Name and Address
Mackin Park
Washroom Building
Coquitlam B.C.

| Project | Sheet |
|---|---|
| D12-006 | P2.1 |
| Date: 2012-02-17 | |
| Scale: AS NOTED | |



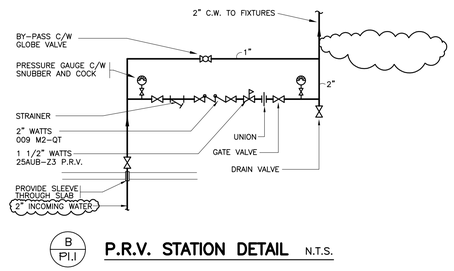

BLOCKING AREA REQUIRED (ft²) FOR A SOIL OF 1000 lbs/ft² (SAND) OF ALLOWABLE BEARING PRESSURE

| SIZE OF PIPE | BENDS | | | |
|---|---|---|---|---|
| | TEES | 90° | 45° | 22 1/2° |
| 4" | 2.6 | 3.6 | 2.2 | 1.5 |
| 6" | 5.8 | 8 | 4.6 | 3 |
| 8" | 10.2 | 14.4 | 8.2 | 4.5 |
| 10" | 15.8 | 22.4 | 12.6 | 6 |
| 12" | 22.6 | 32 | 18.2 | 9 |

MAXIMUM WATER PRESSURE: 200 PSI

NOTES:
- PLACE CONCRETE AGAINST UNDISTURBED GROUND. KEEP CONCRETE CLEAR OF FITTINGS AND JOINTS.
- PROTECT PIPES AND FITTINGS FROM DIRECT CONTACT WITH CONCRETE.
- NUTS, BOLTS AND TIE RODS SHALL BE ANTI CORROSIVE MATERIAL.

A / P1.1 **THRUST BLOCK DETAIL** N.T.S.



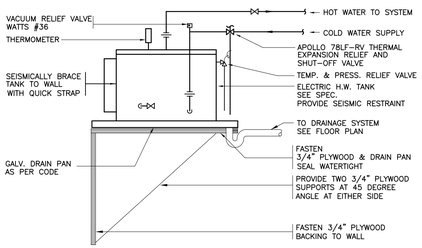

B / P1.1 **P.R.V. STATION DETAIL** N.T.S.



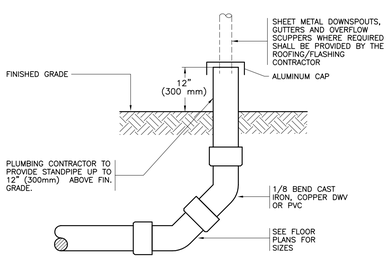

| BWV SIZE | a | b | c |
|---|---|---|---|
| 4" | 30" | 17" | 12" |
| 6" | 36" | 18" | 12" |
| 8" | 42" | 24" | 12" |

| BWV SIZE | a | b | c |
|---|---|---|---|
| 10" | 48" | 30" | 18" |
| 12" | 54" | 30" | 18" |
| 15" | 72" | 36" | 18" |

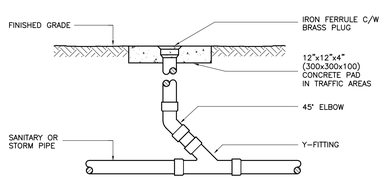
F / P1.1 **STORM SUMP DETAIL** N.T.S.




C / P1.1 **HOT WATER TANK DETAIL** N.T.S.




E / P1.1 **R.W.L. STUB-UP DETAIL** N.T.S.




D / P1.1 **CLEANOUT DETAIL** N.T.S.

## General Notes

| No. | Revision/Issue | yy/mm/dd Date |
|---|---|---|
| 08 | Re-Issued for Building Permit Deletion of Drinking Fountain | 12/08/30 |
| 07 | Re-Issued for Building Permit Add Water Hammer Arresters | 12/07/17 |
| 06 | Re-Issued for Building Permit | 12/07/03 |
| 05 | Issued for Tender | 12/06/28 |
| 04 | Issued for Review | 12/06/22 |
| 03 | Issued for Building Permit | 12/04/10 |
| 02 | Re-Issued for Review | 12/03/26 |
| 01 | Issued for Review | 12/03/07 |


Mechanical Name and Address

DEC engineering sustainability

DEC ENGINEERING
309-713 COLUMBIA STREET,
NEW WESTMINSTER, B.C. CANADA V3M 1B2
TEL. 604 525-3341
ENGINEERINGSUSTAINABILITY.COM

Architect Name and Address

Forum Projects Ltd.
Box 32120
Walnut Grove P.O.
Langley B.C. V1M-3S7
604-888-6672(o)
604-888-7857(f)


Sheet Name and Disipline

**DETAILS**

**-PLUMBING**

Project Name and Address

Mackin Park
Washroom Building
Coquitlam B.C.

| Project | Sheet |
|---|---|
| D12-006 | P2.2 |
| Date: 2012-02-17 | |
| Scale: AS NOTED | |


PLOT DATE: Aug 30, 2012 - 1:36pm CAD FILE: P:\2012\012-006 Mackin Park Washroom Bldg\Drawings\012006- P2.1 (PLG Det & Spec).DWG

# HVAC SPECIFICATIONS:

**1. GENERAL CONDITIONS:**

1. The instructions to the contractor and requirements of general conditions apply to work under this trade.
2. All bids must be based on materials specified as standard.
3. Contractors shall familiarise themselves with site conditions prior to submitting bids. claims for extras due to site conditions will not be accepted.
4. Provide operating systems that are complete in every detail and in accordance with good practice.

**2. SCOPE OF WORK:**

1. The sub-contractor's scope of work shall include but not be limited to the supply of all labour and materails to complete the sheet metal, ventilation and exhaust systems, heating system and control system, as shown on the drawings.

**3. DRAWINGS AND SPECIFICATIONS**

1. Contract drawings for mechanical work are in part diagrammatic, intended to convey the scope of work and indicate general arrangement of equipment, piping and ductwork. the contractor shall lay out the work at the site and provide any necessary offsets and adjustments to suit site conditions and avoid conflict with other trades.
2. Care shall be taken to ensure that the installation is in accordance with detailed drawings, where given, and that the installation meets the design requirement.
3. The drawings and specifications are intended to be complementary. anything called for in these specifications or shown on the drawings shall be considered as appearing in both and shall form part of the contract documents.
4. Take any information involving accurate dimensions of the building from the figured dimensions of the structural and architectural drawings or by measurements of the building of the site.
5. Any discrepancies found between drawings and specifications, leaving in doubt the true intent or meaning shall be brought to the attention of the engineer prior to the work being performed.
6. The term "provide" where used shall be understood to include labour, materials and services to supply and install the item or work referred to.

**4. CODES AND PERMITS:**

1. Comply with all applicable codes, obtain all necessary approvals and pay for all necessary permits prior to commencement of work.
2. All materials and equipment shall have prior approval for the application by the Authorities Having Jurisdiction, e.g. Canadian Standards Association (C.S.A.) Canadian Gas Association (CGA) etc.
3. All work shall conform to the applicable codes including but not limited to the following:
   - .1 The BC BUILDING CODE latest edition and local Building By-law.
   - .2 S.M.A.C.N.A. HVAC Duct Construction Standards, 1st Edition, 1995, CLASS C PRESSURE RATING.
   - .3 B.C. Electrical Code.
   - .4 Natural Gas and Propane Installation Code B149.1–10 AND B. C. Gas Safty Code/Amendments

**5. INSPECTIONS AND APPROVALS:**

1. All work and materials will be subject to inspection from time to time by the engineer and the authority having jurisdiction. inform the engineer 48 hours in advance of any tests or covering burying or concealment of services to allow for inspection. Do not cover, bury or conceal services without the engineer's approval.
2. Do not change any material, equipment or construction method from what is shown on the drawings and specification without the approval of the engineer. Any changes made without the engineer's authorization may result in the work not being accepted and/or delay in issuance of the final Letter of Assurance.
3. The documents indicate the minimum standards to be applied to the work. Any approval of, or agreement to, a lower standard, by any person or authority will not necessarily be approved by the engineer and may result in the work not being accepted and/or delay in issuance of the final Letter of Assurance.

**6. SUBMITTALS:**

1. Prior to commencement of work, submit at least 3 copies of complete shop drawings (spec book) on all specified or approved equal materials to be used. Allow 5 working days for DEC to review.
2. The contractor shall be responsible for delays caused by any required resubmission of shop drawings.
3. The engineer's review is for general compliance with the intent of the contract documents and will not relieve the contractor from responsibility for correctness of performance, function, details and dimensions.
4. Where alternate equipment has been submitted the contractor bears responsibility for any redesign and construction required to accommodate the equipment. Time required to review alternatives will be charged to the contractor.
5. If approval is recieved to use other than specified items, responsibility for specified capacities and insuring that items to be furnished will fit space available lies with the mechanical contractor.
6. If non–specified equipment is used and it will not fit job site conditions or not meet with local code requirements, the mechanical contractor assumes responsibility for replacement with items named in contract documents or other equipment to fit site conditions.
7. The shop drawing do not supersede the contract documents.

**7. MAINTENANCE MANUALS:**

1. At completion of construction, submit to engineer 3 sets of maintenance information covering the operation and maintenance of H.V.A.C. systems. Incorporate with the HVAC maintenance information in a suitable 3 ring binder.
2. Manuals shall include: description of the operation of the hvac system, approved balance report, copies of all permits, test reports, final inspection certificates and approvals; copies of all shop drawings; operating instructions for all equipment; maintenance schedules for all equipment; copies of all guaranties; names and addresses of contractors and suppliers.

**8. AS BUILT DRAWINGS:**

1. Obtain from the engineer extra sets of drawings on which to mark, as the work progresses, any and all changes and deviations in runs of ductwork, piping, risers or equipment locations from that shown. These drawings shall be kept on site and available for review at all times.
2. When the installation is complete, submit the complete marked–up as–builts to DEC Design Mechanical Consultants Ltd.. Drawings shall be clean and legible with an acceptable standard of drafting and each sheet shall bear the contractors name and be identified as as–built. provide a letter certifying that these drawings accurately reflect the building as–built.

**9. GUARANTIES:**

1. Provide a written guaranty of all material, workmanship and system performance for a period of (1) year after final acceptance. and replace forthwith any defective work during this period.
2. Such guaranty shall not override any specific guaranties provided or requested of longer duration.

**10. INSTALLATION:**

1. Provide access doors for all concealed serviceable components. access doors shall maintain required fire ratings.
2. Provide isolating valves in branch lines to each equipment.
3. Identify each equipment and piping system with lables and stick on decals to indicate service and direction of flow. Label shall be in black formica with white reveal on engraving. Label shall contain equipment tag and area served.
4. Install pipes with allowance for expansion, contraction and settling. Heating hot water pipes shall have expansion joints, loops or offsets as shown on the drawings and/or at least every 100 feet of straight run. Provide pipe anchors between expansion elements.
5. Co–ordinate with general contractor locations and sizes of required H.V.A.C. chases and any additional bracing between studs for wall hung equipment.
6. Co–ordinate with general contractor any required cutting of structure to facilitate passage of pipes and duct.
7. Ensure that the integrity of all fire separations is maintained where piping and ductwork systems penetrate rated structures. contractor to seal tight around all piping with approved caulking materail and provide fire damper or fire flap for ductwork with required fire–protection rating at closure.
8. Thermostats and wall mounted sensors/equipment shall be located generally as shown but their exact location shall be field coordinated to avoid interference with wall mounted items and excessive radiant or other heat sources.

**11. CO–OPERATION WITH OTHER TRADES:**

1. Give full co–operation to other subtrades and furnish any information necessary to permit the work of all subtrades to be installed satisfactorily and with the least possible interference or delay.
2. Install all equipment, piping and ductwork to obtain ceiling heights specified or shown on the architectural drawings. in case of conflict, notify the engineer before fabricating and installing any item referred to above. Carry out any required adjustment.

**12. MATERIALS AND WORKMANSHIP:**

1. Unless otherwise specified, all materials and apparatus required for work shall be new, of first class quality and shall be furnished, delivered, erected, connected and finished in every detail, and shall be selected and arranged so as to fit properly into the building spaces. where no specific kind or quality of material is given, a first class standard article as approved by the engineer shall be furnished.
2. Use skilled and qualified, fitters, plumbers, metal workers, welders, helpers, and labour required to unload, transfer, erect, connect up, adjust, start, operate and test such systems. helpers and unqualified workers will be directly supervised at all times while working on the site by qualified trades persons.
3. Upon request produce copies of trade qualifications of any selected workers.
4. The engineer shall have the right to reject any item that, in his/her opinion, does not conform to an acceptable standard of quality, quietness of operation, finish, appearance and performance. unacceptable material and/or workmanship must be rectified to the approval of the engineer.

**13. TESTING AND BALANCING OF THE SYSTEM:**

1. The contractor is responsible for the inspection of the complete ventilation and exhaust systems to see that they are installed in accordance with the intent of the plans and specifications. During the inspection ensure that:
   - .1 Adjust fan drives to get required and rated cfm and specified rpm;
   - .2 Adjust temperature and fan control sequence;
   - .3 Adjust the entire installation as to minimize noise and vibration from fans, compressors, starters and relays.
   - .4 Eliminate any duct pulsation by use of stiffeners or additional supports as required;
   - .5 Correct any equipment or component which is generating objectionable noise in the opinion of the owner or by local authorities;
   - .6 There are no air leaks;
   - .7 The ductwork is properly supported;
   - .8 All duct connections are securely fastened to their respective collars or other fittings so they will not come off under maximum system pressure.
2. The contractor shall be responsible for the capacities of the ventilation and exhaust systems and equipment specified. Tolerance to be +/–10% of quantities noted on drawings or in the equipment schedules.
3. Contractor to provide and coordinate services of an independent air testing and balance agency which specializes in testing and balancing or heating, ventilating and cooling system.
4. At completion of project, the independent air testing and balance agency to submit balance report to DEC Design Mechanical Consultants Ltd for review.

**14. SHEET METAL DUCTWORK:**

1. Fabricate all ductwork from G90 galvanized sheet in accordance with S.M.A.C.N.A.. do not use ridged fiberglass ductwork. All ducts to constructed for one inch pressure class seal class c.
2. Seal all sheet metal duct joints with S2 duct sealer by DURO DYNE.
3. Elbows are to be minimum radius 1.5 times duct dimensions.
4. Duct dimensions are noted as clear inside.
5. When flexible duct is used, it shall be flexmaster FAB 4T ULC approved class 1 duct and isulated with 1" fiberglass insulation and vinyl jacketed. Flexible duct to be installed such that the connection will not come off when pulled with a minimum 25 lb force. Flexible metal duct is not acceptable.
6. Provide conical take offs on all right angle take offs in supply air ductwork.
7. All ductwork behind side wall registers and return air grilles to be painted flat black.
8. Supply and install access panels/doors for all concealed serviceable components. all access panels/doors shall be installed by mechanical contractor except those on the drywall ceiling/enclosure.
9. Transition all ducts as required to attach to equipment
10. All square elbows shall have turning vanes.
11. All exposed round duct shall be galvanized spiral round duct and have a minimum thickness of 22 gauge.

**15. VIBRATION ISOLATION:**

1. Each fan shall be provided with vibration isolation and flexible duct connections of a minimum of 4" of reinforced neoprene.
2. Select isolation equipment in accordance with the manufacturers instructions for the appropriate loads and frequencies to provide optimum isolation.

**16. SEISMIC REQUIREMENTS:**

GENERAL

The Contractor shall provide Seismic Restraints for all equipment, piping, and duct–work, that meet the requirements defined by the National Building Code of Canada (NBCC), British Columbia Building Code (BCBC), and "Guidelines for Seismic Restraints of Mechanical Systems and Plumbing Piping Systems" (SMACNA and PPIC)

The Contractor shall retain a B.C. Professional Structural Engineer to review the adequacy of seismic restraint of all equipment, piping, and duct work and shall abide by all recommendations of the structural engineer.

The Contractor shall provide the Engineer of Record with the necessary shop drawings, including details of seismic restraint, sealed by the Structural Engineer.

The Structural Engineer shall issue letters of assurance (Schedules B1, B2 and C–B) for the structural capacity of mechanical, plumbing, and fire protection systems, including anchorage and seismic restraint.

The Equipment Manufacturer shall design equipment such that the strength and anchorage of internal components exceeds the force level used to restrain and anchor the equipment to the supporting structure.

SPECIFIC

The following rules apply to the attachment of restraints to structural members:

Loads applied to unsupported spans of wood framing shall be carried by bracing to adjacent framing.

Do not apply lateral loads to the bottom chord of OWSJ.

Apply vertical loads to the bottom chord of OWSJ only at the panel point.

Anchors on framing members shall be coach bolts passing through the member with oversize washers.

Anchors in concrete shall be expansion and sleeve type.

Screws in wood framing shall be used for shear loads only, not pull–out loads.

The following rules apply to the restraint of piping:

Where the hangers are more than 12" (300mm) in length from the top of the pipe or duct to the bottom of the structural support, seismic restraints shall be provided for the following.

Fuel, gas, oil, and compressed air piping 1" diameter and larger. Lateral or transverse restraints at 20ft. spacing and longitudinal restraint at 40ft. spacing.

All other piping in boiler and mechanical equipment rooms 1" diameter and larger.

All other piping 2" diameter and larger, including domestic water and drainage piping.

All rectangular ductwork 6 sq.ft. (0.5 sq. m) cross sectional area and larger, or round ductwork 28" (700 mm) diameter and larger.

The following rules apply to the restraint of equipment:

All resiliently mounted equipment shall be provided with seismic snubbers.

All floor–mounted equipment shall be bolted to the floor.

Vertical tanks and water heaters shall be bolted to the floor and further secured with an encircling strap at the mid point, with rigid bracing to the structure.

**17. INSULATION:**

1. External ductwork insulation shall be one inch reinforced foil faced fiberglass duct insulation. Use rigid insulation in exposed locations. tape all joints. All material shall conform to NFPA 98a standards. externally insulate the following ducts:
   - .1 Outside air intakes inside heated space;
   - .2 Exhaust duct thru. unheated space;
   - .3 All ductwork inside attic space and service room;
   - .4 Supply and return air duct except those exposed in air conditioning space.
2. All ductwork shown cross hatched on the drawings shall be lined on all surfaces with one inch neoprene faced fiberglass acoustic insulation. secure insulation to clean sheet metal duct with continuous 100% coat of adhesive with mechanical pin fasteners at 12" on centre maximum.
3. No external insulation is required for internal lined ductwork. only provide 12" overlap on all sides.
4. Minimum insulation r–values shall be in accordance with table 9–1 and 9–2 of ASHRAE 90.1 – 1989.

**18. CONTROLS**

Provide a complete electric/electronic control system for the HVAC system.

1. **Unit Heater UH–1 and UH–2**

   .1 When there is a drop in space temperature, the duct type thermostat will start the heater first, the blower will be enable after 30 second delay (adjustable) to ensure there will not be a cold blast of air to the space. When the space temperature is higher than the set point, the duct type thermostat will stop the heater, the fan off delays allows the fan to run for another 60 second (adjustable) to remove all residual heat from the heater.

2. **WASHROOM EXHAUST FAN (EF–1 to EF–2)**

   .1 To be connected to the occupancy sensor that controlled the lighting fixture.

3. **TESTING AND COMMISIONING**

   The contractor shall, on the completion of the project, carry out a performance test and commision on the control system to the satisfaction of the engineer and owner.

**19. DIFFUSERS, GRILLES AND REGISTERS**

**G1 Supply Register** — **RISK RESISTANT PERFORATED FACE REGISTER**
**Return Register**

3/16" hot rolled steel with 3/16" diameter holes staggered 60 degree on 9/32" center with sleeve, 4–sided mounting frame, rear angle frame with weldnuts and tamper–proof bolt to suit the wall thickness and white baked enamel finish,
E. H. PRICE MSRRP – B12

**20. LOUVRES**

**L1 Exhaust Louvre** — **Louvre**

Extruded aluminium, stationary drainable, 4" blades with 39° angle. all welded construction with butt corners. external flange, aluminium bug screens and clear anodized finish. customized size 10"x10".
**PRICE DE439**

**21. FIRE DAMPERS:**

1. **FIRE DAMPERS IN DUCTWORK.**
   - .1 UL tested – folded shutter Type B Fire Damper
   - .2 1 1/2 hour minimum fire rating and to the approval of the authority having jurisdiction.
2. **FIRE DAMPERS BETWEEN TRANSFER GRILLES.**
   - .1 UL tested – folding shutter type.
   - .2 1 1/2 hour minimum fire rating and approval of the authority having jurisdiction.
   - .3 UL approved fusible links with a melting point 50 deg.F above the maximum temperature that would be encountered with the system in operation or shut down.
   - .4 Combination volume control and fire damper is acceptable as alternate to individual volume control and fire damper.
   - .5 Fire damper ratings shall be suitable for the building fire separation rating. See Architectural Drawings for fire ratings.
   - .6 All fire dampers shall be rated for dynamic systems application except those hvac systems which are automatically shut down in the event of a fire (not smoke).
3. **Submit fire damper drop test to comfirm fire damper operation**

## INSULATION SCHEDULE FOR PIPING AND DUCTWORK

TABLE 6.2.4.1.3
MINIMUM PIPE INSULATION THICKNESS[a]

| FLUID DESIGN OPERATING TEMPERATURE RANGE, (°F) | INSULATION CONDUCTIVITY | | NOMINAL PIPE DIAMETER (IN.) | | | | |
|---|---|---|---|---|---|---|---|
| | CONDUCTIVITY BTU IN./(H.FT2. °F) | MEAN RATING TEMPERATURE °F | LESS THAN 1 | 1 TO <1.5 | 1.5 TO <4 | 4 TO <8 | 8 AND ABOVE |
| HEATING SYSTEMS (STEAM, STEAM CONDENSATE, AND HOT WATER)[bc] | | | | | | | |
| ABOVE 350 | 0.32 – 0.34 | 250 | 2.5 | 3.0 | 3.0 | 4.0 | 4.0 |
| 251 – 350 | 0.29 – 0.32 | 200 | 1.5 | 2.5 | 3.0 | 3.0 | 3.0 |
| 201 – 250 | 0.27 – 0.30 | 150 | 1.5 | 1.5 | 2.0 | 2.0 | 2.0 |
| 141 – 200 | 0.25 – 0.29 | 125 | 1.0 | 1.0 | 1.0 | 1.5 | 1.5 |
| 105 – 140 | 0.24 – 0.28 | 100 | 0.5 | 0.5 | 1.0 | 1.0 | 1.0 |
| DOMESTIC AND SERVICE HOT WATER SYSTEMS | | | | | | | |
| 105 & GREATER | 0.22 – 0.28 | 100 | 0.5 | 0.5 | 1.0 | 1.0 | 1.0 |
| COOLING SYSTEMS (CHILLED WATER, BRINE, AND REFRIGERANT)[d] | | | | | | | |
| 40 – 60 | 0.22 – 0.28 | 100 | 0.5 | 0.5 | 1.0 | 1.0 | 1.0 |
| BELOW 40 | 0.22 – 0.28 | 100 | 0.5 | 1.0 | 1.0 | 1.0 | 1.5 |

a FOR INSULATION OUTSIDE THE STATED CONDUCTIVITY RANGE, THE MINIMUM THICKNESS (T) SHALL BE DETERMINED AS FOLLOWS:

$$T = r\{(1+t/r)^{K/k} - 1\}$$

WHERE T = MINIMUM INSULATION THICKNESS (IN), r = ACTUAL OUTSIDE RADIUS OF PIPE (IN), t = INSULATION THICKNESS LISTED IN THIS TABLE FOR APPLICABLE FLUID TEMPERATURE AND PIPE SIZE, K = CONDUCTIVITY OF ALTERNATE MATERIAL AT MEAN RATING TEMPERATURE INDICATED FOR THE APPLICABLE FLUID TEMPERATURE (BTU.IN./(H.FT2.°F)), AND k = THE UPPER VALUE OF THE CONDUCTIVITY RANGE LISTED IN THIS TABLE FOR THE APPLICABLE FLUID TEMPERATURE.

b THESE THICKNESSES ARE BASED ON ENERGY EFFICIENCY CONSIDERATIONS ONLY. ADDITIONAL INSULATION IS SOMETIMES REQUIRED RELATIVE TO SAFETY ISSUES/SURFACE TEMPERATURE.

c PIPING INSULATION IS NOT REQUIRED BETWEEN THE CONTROL VALVE AND COIL ON RUN–OUTS WHEN THE CONTROL VALVE IS LOCATED WITHIN 4 FT. OF THE COIL AND THE PIPE SIZE IS 1 IN OR LESS.

d THESE THICKNESS ARE BASED ON ENERGY EFFICIENCY CONSIDERATIONS ONLY. ISSUES SUCH AS WATER VAPOUR PERMEABILITY OR SURFACE CONDENSATION SOMETIMES REQUIRE VAPOUR RETARDERS OR ADDITIONAL INSULATION.

TABLE 6.2.4.1.2A
MINIMUM DUCT INSULATION R–VALUE[a] COOLING AND HEATING ONLY SUPPLY DUCTS AND RETURN DUCTS

| | DUCT LOCATION | | | | | | |
|---|---|---|---|---|---|---|---|
| EXTERIOR | VENTILATED ATTIC | UNVENTED ATTIC ABOVE INSULATED CEILING | UNVENTED ATTIC WITH ROOF INSULATION | UNCONDITIONED SPACE[b] | INDIRECTLY CONDITIONED SPACE[c] | BURIED |
| HEATING DUCTS ONLY | | | | | | | |
| R–6 | R–3.5 | NONE | NONE | NONE | NONE | R–3.5 |
| COOLING ONLY DUCTS | | | | | | | |
| R–1.9 | R–1.9 | R–1.9 | R–1.9 | R–1.9 | NONE | NONE |
| RETURN DUCTS | | | | | | | |
| R–3.5 | R–3.5 | R–3.5 | NONE | NONE | NONE | NONE |

a INSULATION R–VALUES, MEASURED IN (h.ft2.°F)/Btu, ARE FOR THE INSULATION AS INSTALLED AND DO NOT INCLUDE FILM RESISTANCE. THE REQUIRED MINIMUM THICKNESS DO NOT CONSIDER WATER VAPOUR TRANSMISSION AND POSSIBLE SURFACE CONDENSATION. WHERE EXTERIOR WALLS ARE USED AS PLENUM WALLS, WALL INSULATION SHALL BE AS REQUIRED BY THE MOST RESTRICTIVE CONDITION OF 6.2.4.2 OR SECTION 5. INSULATION RESISTANCE MEASURED ON A HORIZONTAL PLANE IN ACCORDANCE WITH ASTM C518 AT A MEAN TEMPERATURE OF 75°F AT THE INSTALLED THICKNESS.

b INCLUDES CRAWL SPACE, BOTH VENTILATED AND NONVENTILATED.

c INCLUDES RETURN AIR PLENUMS WITH OR WITHOUT EXPOSED ROOFS ABOVE.

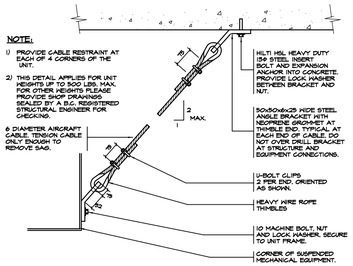
TABLE 6.2.4.1.2B
MINIMUM DUCT INSULATION R–VALUE[a] COMBINED HEATING AND COOLING DUCTS

| | DUCT LOCATION | | | | | | |
|---|---|---|---|---|---|---|---|
| EXTERIOR | VENTILATED ATTIC | UNVENTED ATTIC ABOVE INSULATED CEILING | UNVENTED ATTIC WITH ROOF INSULATION | UNCONDITIONED SPACE[b] | INDIRECTLY CONDITIONED SPACE[c] | BURIED |
| R–6 | R–3.5 | R–3.5 | R–1.9 | R–3.5 | NONE | R–3.5 |

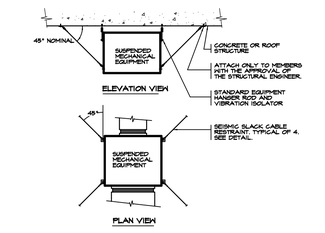
a INSULATION R–VALUES, MEASURED IN (h.ft2.°F)/Btu, ARE FOR THE INSULATION AS INSTALLED AND DO NOT INCLUDE FILM RESISTANCE. THE REQUIRED MINIMUM THICKNESS DO NOT CONSIDER WATER VAPOUR TRANSMISSION AND POSSIBLE SURFACE CONDENSATION. WHERE EXTERIOR WALLS ARE USED AS PLENUM WALLS, WALL INSULATION SHALL BE AS REQUIRED BY THE MOST RESTRICTIVE CONDITION OF 6.2.4.2 OR SECTION 5. INSULATION RESISTANCE MEASURED ON A HORIZONTAL PLANE IN ACCORDANCE WITH ASTM C518 AT A MEAN TEMPERATURE OF 75°F AT THE INSTALLED THICKNESS.

b INCLUDES CRAWL SPACE, BOTH VENTILATED AND NON–VENTILATED.

c INCLUDES RETURN AIR PLENUMS WITH OR WITHOUT EXPOSED ROOFS ABOVE.




SEISMIC SLACK CABLE CONNECTION DETAIL (N.T.S.)




SEISMIC RESTRAINT DETAIL FOR SUSPENDED EQUIPMENT (N.T.S.)

## FAN SCHEDULE

| UNIT TAG | SERVICE | LOCATION | AIR CAP CFM | S.P. "WG | FAN RPM | FAN HP | MOTOR HP (W) | ELECTRICAL V/PH/HZ | SOUND PRESS. SONES | MANUFAC. | MODEL | NOTES 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EF– 1 | NEW BATHROOM | CEILING | 150 | 0.3 | 1400 | – | (100) | 115/1/60 | 2.8 | GREENHECK | CSP–A190 | * | * | * | * |
| EF– 2 | NEW BATHROOM | CEILING | 150 | 0.3 | 1400 | – | (100) | 115/1/60 | 2.8 | GREENHECK | CSP–A190 | * | * | * | * |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

NOTES:
1. ELECTRONIC SPEED CONTROL MOUNTED ON FAN CABINET AND WIRED TO MOTOR FOR AIR BALANCING.
2. PREMIUM INLINE FAN TO BE C/W BACKDRAFT DAMPER, INLET COLLAR, OUTLET COLLAR, ACCESS PANEL, AND DISCONNECT SWITCH.
3. UNIT TO BEAR THE AMCA SEAL FOR SOUND AND AIR.
4. INTERLOCK WITH OCCUPANCY SENSOR.

## ELECTRIC UNIT HEATER

| UNIT TAG | SERVICE | LOCATION | SUPPLY AIR FAN: AIR CAP CFM | E.S.P. "WG | FAN HP | FAN RPM | HEATING CAPACITY: ELECTRIC HEATER kW | EER | OUTDOOR AIR QTY. CFM | ELECTRICAL: V/PH/HZ | MCA | MANU | MODEL | NOTES 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UH–1 | WOMEN'S WASHROOM | CEILING | 350 | – | – | – | 3 | – | – | 240/1/60 | 13.4 | QMARK | MSPH132124 | * | * | | | | |
| UH–2 | MEN'S WASHROOM | CEILING | 350 | – | – | – | 3 | – | – | 240/1/60 | 13.4 | QMARK | MSPH132124 | * | * | | | | |
| | | | | | | | | | | | | | | | | | | | |

NOTES:
1. UNIT C/W INLET/OUTLET DUCT COLLAR, FIBERGLASS INSULAITON CASING, DISCONNECT SWITCH, BLOWER DELAY OFF, 2–SPEED MOTOR AND ELECTRIC HEATER.
2. CFM SHOWN IS AT LOW SPEED.

General Notes

| No. | Revision/Issue | yy/mm/dd Date |
|---|---|---|
| 08 | Re–Issued for Building Permit Deletion of Drinking Fountain | 12/08/30 |
| 07 | Re–Issued for Building Permit Add Water Hammer Arresters | 12/07/17 |
| 06 | Re–Issued for Building Permit | 12/07/03 |
| 05 | Issued for Tender | 12/06/28 |
| 04 | Issued for Review | 12/06/22 |
| 03 | Issued for Building Permit | 12/04/10 |
| 02 | Re–Issued for Review | 12/03/26 |
| 01 | Issued for Review | 12/03/07 |


Mechanical Name and Address

DEC engineering sustainability

DEC ENGINEERING
309-713 COLUMBIA STREET,
NEW WESTMINSTER, B.C. CANADA V3M 1B2
TEL. 604 525-3341
ENGINEERINGSUSTAINABILITY.COM

Architect Name and Address

Forum Projects Ltd.
Box 32120
Walnut Grove P.O.
Langley B.C. V1M–3S7
604–888–6672(o)
604–888–7857(f)


Sheet Name and Disipline

**DETAILS & SPECIFICATION -HVAC**

Project Name and Address

Mackin Park
Washroom Building
Coquitlam B.C.

| Project | Sheet |
|---|---|
| D12–006 | P2.3 |
| Date: 2012–02–17 | |
| Scale: AS NOTED | |

PLOT DATE: Aug 30, 2012 – 1:35pm CAD FILE: P:\2012\D12–006 Mackin Park Washroom Bldg\Drawings\D12006– P2.3 (HVAC Det & Spec).DWG