

15100 BASIC REQUIREMENTS

1.0 SCOPE OF WORK

- 1.1 The work includes the supply and installation of materials, equipment and services to upgrade the plumbing and HVAC systems as shown on the drawings.
- 1.2 The work consists of but is not necessarily limited to:
  - Remove ducting as noted in order to install new walls.
  - Modify plumbing systems as noted.
  - Install new ducting, grilles and diffusers for the HVAC system.
  - Re-commission the HVAC system, and balance the air flows.
- 1.3 Upon completion of the work leave all systems in proper operating order and the premises in a clean and tidy condition to the satisfaction of the Consultant.

2.0 REGULATIONS, CODES AND STANDARDS

- 2.1 The work shall accord strictly with all rules, regulations, by-laws and the requirements and interpretations of all authorities having jurisdiction.
- 2.2 Drawings and specifications should not conflict with the above regulations, but where there are apparent discrepancies the Contractor shall notify the Consultant in writing and obtain clarification before proceeding with the work.
- 2.3 The work of the mechanical division shall conform to the following Codes, Regulations and Standards including, unless referenced otherwise, latest revisions issued up to date of tender submission.
  1. The Ontario Building Code, to Ontario Regulation 332/12 with amendments.
  2. NFPA 90A with respect to Air Conditioning and Ventilating Systems.
  3. NFPA 90B with respect to Warm Air Heating and Air Conditioning Systems.
  4. ASHRAE Guide and Data Books.
  5. SMACNA "HVAC Duct Construction Standards"
  6. All other codes, standards, regulations referred to in the above documents, adopted by the authorities having jurisdiction and/or applicable to the work of this Division as shown on the contract documents.
  7. Ontario Natural Gas Utilization Code CGA/CSA B149.1.

3.0 EXAMINATION OF SITE

- 3.1 The actual location of existing services shall be verified in the field before work is commenced.

4.0 DRAWINGS, CHANGES AND INSTALLATIONS

- 4.1 The drawings shall be considered to show the general character and scope of the work and not the exact details of the installation. The installation shall be complete with all accessories required for a complete and operative installation. The Consultant reserves the right to make reasonable changes required to accommodate conditions arising during the progress of the work, at no extra cost to the Owner.

5.0 RECORD DRAWINGS

- 5.1 The Contractor shall clearly mark, as the job progresses, all changes and deviations from that shown on contract drawings. On project completion, the Contractor shall forward to the Consultant one set of drawings indicating the as-built conditions.

6.0 SHOP DRAWINGS

- 6.1 Submit three copies of shop drawings or digital pdfs which indicate clearly the materials and/or equipment actually being supplied, all details of construction, accurate dimensions, capacity, operating characteristics and performance shall be submitted to the Consultant for approval. Each shop drawing shall give the identifying number of the specific pump, fan, etc. for which it was prepared (e.g. Fan F-7) Shop Drawings in pdf format are acceptable.

- 6.2 Prior to submission to the Consultant, THE CONTRACTOR SHALL REVIEW ALL SHOP DRAWINGS AND APPROVE THEM, indicating that the drawings have been checked and the described equipment has been co-ordinated.

- 6.3 Installation of any equipment shall not be commenced until after shop drawings have been reviewed by the Consultant.

- 6.4 Bind one complete set of reviewed Shop Drawings into each operating and maintenance instruction manual.

7.0 QUALIFICATION OF TRADESMEN

- 7.1 The Contractor shall maintain at the job site, at all times, qualified personnel and supporting staff, with proven experience in erecting, supervising, testing and adjusting projects of comparable nature and complexity.

8.0 PRODUCT DELIVERY, STORAGE AND HANDLING

- 8.1 Inspect products delivered to the site, and before acceptance ensure that the product is: new, the best of its respective kind, free from defects, is as specified, and is as per reviewed shop drawings, all in accordance with the Contract Documents.

- 8.2 Store materials only in designated areas and protect as necessary to maintain materials in new condition.

- 8.3 Any unpainted steel surface shall be prime coated under this Division.

9.0 WARRANTY

- 9.1 The Contractor shall provide a warranty of one year for all systems and equipment installed under this contract. The Contractor agrees to correct promptly, at his own expense, defects or deficiencies in the Work which appear prior to and during the period of one year from the date of acceptance by the Owner of the Work or portions of the work.

10.0 OPERATION AND MAINTENANCE INSTRUCTIONS

- 10.1 Three (3) copies of complete operating and maintenance instructions for all mechanical equipment and systems, bound in hard covered manuals, shall be supplied.

11.0 INSTRUCTIONS TO OWNER

- 11.1 Instruct the Owner's representative(s) in all respects of the operation and maintenance of systems and equipment. Obtain in writing from the Consultant a list of the Owner's representative(s) qualified to receive instructions.

15200 BASIC MATERIALS AND METHODS

1.0 MATERIALS

- 1.1 Make and quality of materials in the construction of this project shall be subject to the approval of the Consultant.
- 1.2 Materials and equipment supplied by this Division shall be new and free from defects and shall be equivalent in physical characteristics and performance to that specified by the manufacturer's name and catalogue number.

2.0 CUTTING, PATCHING, SLEEVES AND ESCUTCHEONS

- 2.1 The Contractor shall co-ordinate on site the position of all sleeves and openings required for the work.
- 2.2 Openings shall be made at the expense of the mechanical division, except for lower openings which shall be co-ordinated with the general contractor. Cutting of structural members shall not be permitted without specified written approval by the Consultant.
- 2.3 All drilling for hangers, rod inserts and work of similar nature shall be done under this contract.
- 2.4 It shall be the responsibility of the mechanical division to locate and provide anchor bolts, equipment bases and curbs.

3.0 HANGERS AND EQUIPMENT SUPPORTS

- 3.1 Piping and equipment provided under the mechanical division shall be complete with all necessary supports and hangers required for a safe and workmanlike installation. Auxiliary structural members shall be provided under the mechanical section concerned, where piping, ducts or equipment must be suspended between the joists or beams of the structure.

4.0 ELECTRICAL CHARACTERISTICS

- 4.1 Electric motors for all driven equipment supplied under the mechanical division shall be provided and installed under this Division.
- 4.2 Motors shall have the following electrical characteristics, unless otherwise specified:  
For 1/3 HP or larger - 240 volt - 1 ph - 60 Hz  
For 1/4 HP and smaller - 120 volt - 1 ph - 60 Hz

15200 BASIC MATERIALS AND METHODS (CON'T)

5.0 ACCESS PANELS AND ACCESSIBILITY

- 5.1 All parts of the installation requiring periodic maintenance shall be accessible. Wherever valves, dampers, etc. are concealed by the building construction, access doors or panels shall be furnished by this section and installed under this contract. The mechanical division shall be responsible for their proper location.

6.0 CLEANING

- 6.1 Clean thoroughly all fixtures and equipment from grease, dirt, plaster or any other foreign material. Any dirt, rubbish or grease on walls, floors or fixtures accumulated from the work of the mechanical division shall be removed promptly from the premises by this division.

7.0 COOPERATION WITH OTHER DIVISIONS

- 7.1 Each section shall confine itself to installing all materials in the spaces shown without encroaching upon space for materials installed under other sections or divisions. Where the space allotted to another section or division is encroached upon, the materials shall be relocated to their proper space allotments in such a manner to complete the work using space allotted to the various sections and divisions. Relocation of materials and work involved shall be paid for by the section responsible for the encroachment at no extra cost to the Owner.

15300 INSULATION AND LININGS

- 1.1 All new exhaust round rigid ducting is to be insulated with 1 1/2" thick .75# fibreglass, equal to Manson Alley Wrap FSK. Fasten with wire bands at 12" centres. Tape all joints with foil tape.

15400 PLUMBING SPECIFICATIONS

- 1.1 Reference: Ontario Building Code
- 1.2 Submit product data for plumbing fixtures, floor drains, etc.
- 1.3 Architectural drawings to govern the number and location of fixtures.
- 1.4 Fixtures to be the product of one manufacturer and of the same type.
- 1.5 Trim in any one washroom to be the product of one manufacturer.
- 1.6 Exposed plumbing brass to be chrome plated.
- 1.7 DOW and DWH above ground piping to be copper tube, hard drawn, type L to ASTM B88M. Bronze or copper fittings, soldering with lead free solder.
- 1.8 Isolation valves: Class 150, screwed or soldered, bronze body, chrome plated brass ball, PTFE teflon adjustable packing, brass gland, PTFE teflon seat, plastic coated steel handle.
- 1.9 Check valves: 200 lb. class, bronze body, Watts CV or equal.
- 1.10 Below Grade Sanitary: ABS to CAN/CSA B181.1 or PVC to CAN/CSA B181.2, solvent welded to ASTM D2235.
- 1.11 Above Grade Sanitary and Venting: PVC to CAN/CSA B182.2, solvent welded to ASTM D2235 with a flame spread rating of 25 or less. Pipe to be IPEX System 15. Piping in the ceiling of return air plenums (all floors) to have a smoke developed rating of 50. Pipe to be equal to IPEX XFR.
- 1.12 Pipe insulation to be 1" thick rigid fibre glass with factory applied vapour barrier and self seal lap joint equal to Manson Alley K with APT jacket. Use premolded PVC covers for fittings over 1" in size.

2.0 Execution

- 2.1 Install buried pipe on a 6" bed of clean washed sand, shaped to accommodate fittings and to line and grade as indicated. Backfill with a further 6" layer of sand.
- 2.2 Install clean-outs as indicated and as required by code at base of soil stacks.
- 2.3 Sanitary and floor drains are to be trap seal primed from the nearest cold potable water supply.
- 2.4 Assemble piping using Code and ANSI standards. Maintain straight lines along walls for pipe routing.
- 2.5 Install isolation valves on each plumbing fixture supply line.
- 2.6 Pipe hot water relief lines to nearest floor drain or janitor's sink. Provide drain and vent if no floor drain is nearby.
- 2.7 Insulate oil plumbing supply lines with fibrous glass split sectional pipe insulation as per 15300.
- 2.8 Flush out and rinse systems. Clean out operator screens and strainers. Leak test according to plumbing code before plumbing is closed in or buried. Notify Consultant 48 hours in advance.
- 2.9 Connect trap seal primer to floor drains from nearby faucet. Provide metering valve.

15600 SHEET METAL DUCTWORK AND SPECIALTIES

- 1.1 Make all ductwork, unless specifically noted otherwise, of galvanized sheet steel to ASTM A525-83, and according to the requirements of SMACNA for a 1" wg pressure class and a seal class of 'C'. Provide reinforcements fabricated from angles, zees, or channels as per SMACNA. Support ducts with hangers and tie-rods.
- 1.2 Where ductwork passes through a wall or floor, other than when a fire damper is required, pack around the duct using a fire resistant material to ensure a sound and air-tight joint.
- 1.3 Make changes in direction of horizontal ducts with elbows having an inside radius not less than the width of the duct. Make a change of direction from horizontal to vertical duct with elbows having an inside radius equal to the depth of the duct. Where this is not possible due to the building construction, use turning vanes. These shall be hollow "Duro Vane Roll" manufactured by Duro Dyne or similar turning vanes acceptable to the Consultant. Square throat elbows are not acceptable.
- 1.4 Provide flexible connections at each air handling unit and fan to duct connection. The frame shall be galvanized sheet metal with fire-resistant neoprene coated glass fabric, clenched by double locked seams. Temperature rating shall be -40oF to 190oF.
- 1.5 Provide access panels at all gravity dampers, fire dampers, motorized dampers, coils, fan bearings or similar equipment requiring occasional maintenance or inspections Panels shall be 1" thick, insulated, low leakage, cam lock closure, and equal to Nalor Series 0800. Minimum size to be 6x12 or 2" less than the duct width squared.
- 1.6 For duct expansions, the angle formed at each side of the duct shall not exceed 20°. For contractions, the angle formed at each side of the duct shall not exceed 30°.
- 1.7 Provide take-off boots and balancing dampers at all branches according to SMACNA standards.
- 1.8 Grilles and Diffusers: Refer to schedules on drawings for size, colour and supplier.
- 1.9 Insulated flexible ducting is to be used to connect ductwork to ceiling diffusers. Maximum length of the flex ducting to be four feet. Ducting and insulation to meet NFPA requirements for flame spread and smoke developed, 25/ 50. Support flexible ducting a minimum of every 5 feet.
- 1.10 Fire Dampers (FD) shall be installed at all fire separations, which includes the floor between the basement and living area. Dampers shall have a 165oF fusible link, be Type B, ULC listed and be rated for 1 1/2 hours. Where necessary, provide access doors (minimum 6"x6") in the ductwork for resetting the dampers. Where necessary, provide drywall access doors, minimum 8" square.

15700 EXHAUST FANS

- 1.1 Ceiling exhaust fans shall be as indicated on schedule.
- 1.2 Fan shall be with true centrifugal wheel, in acoustically insulated metal housing with integral back draft damper.
- 1.3 Fan shall be complete with disconnect consisting of cord plug and receptacle in fan casing. Fan, motor and wheel assembly shall be removable from casing without disturbing the housing.
- 1.4 Install where shown on drawings. Seal exhaust duct to prevent the escape of vapours.

15900 CONTROLS

- 1.1 All controls are local. The contractor is to prove the operation of controls for thermostats and ensure they are in working order before balancing.

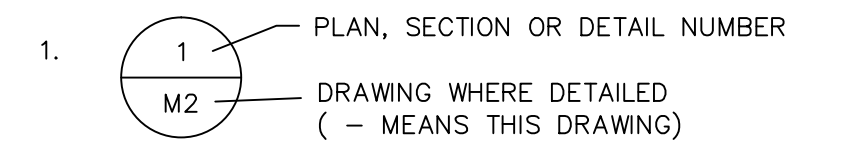
15950 BALANCING AND TESTING & COMMISSIONING

- 1.0 Hire an independent balancing contractor and balance and test the existing fresh air ventilation HVAC system according to the most recent SMACNA standards. Prepare a written air balance report and submit for approval. All air flows are to be measured on forced air systems, along with motor HP, rpm, amperage draw, static pressures, fresh air intake, exhaust air, etc.
- 2.0 The mechanical contractor shall not start up new equipment until the site has been cleaned and dust and dirt has been removed.

DRAWING LIST - MECHANICAL

- M1 TITLE AND SPECIFICATIONS  
M2 MAIN FLOOR PLANS

GENERAL NOTES

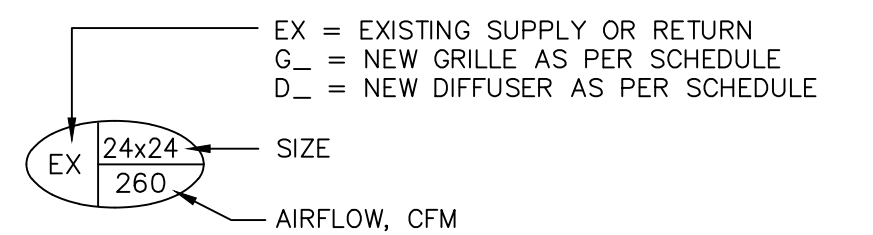


2. CONTRACTOR SHALL VERIFY SITE CONDITIONS AND REPORT ANY DISCREPANCIES AND INCONSISTENCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

LOCATION AND SETTING OUT IS THE RESPONSIBILITY OF THE CONTRACTOR.

UNLESS NOTED OTHERWISE, DIMENSIONS ARE IN IMPERIAL UNITS.

LEGEND



--	--	--	--	--
--	--	--	--	--
--	--	--	--	--
0	JAN 2 18	FOR PERMIT	AB	--
Rev.	Date	Description	By	App.

## NOVADYNE

269 North Indian Road Tel: (705) 696-2119  
Hastings, ON, Canada Fax: (705) 696-2912  
K1L 1Y0

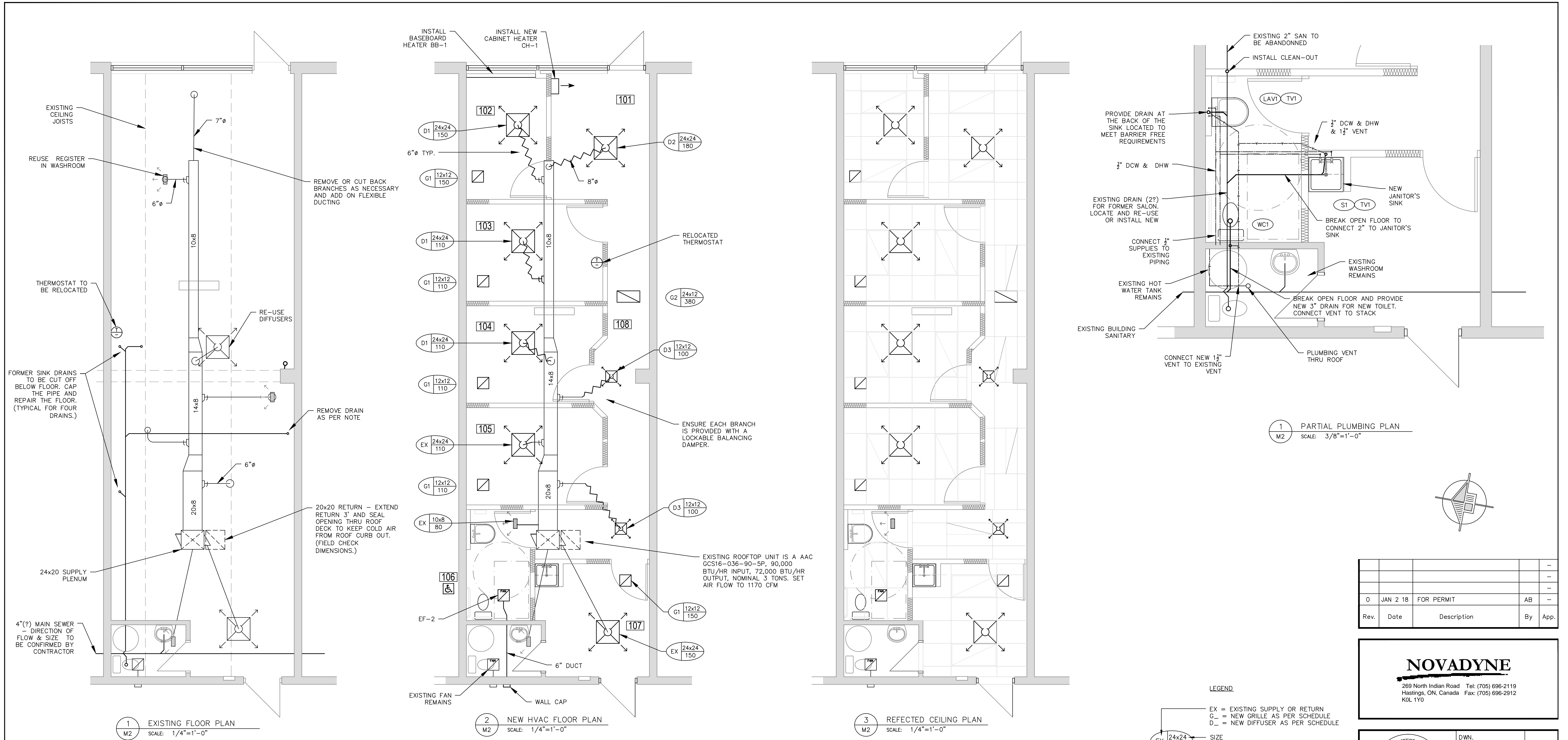
	DWN.	AB	DEC 2017
	CHK.		
	DSN.	A. BUCHKOWSKI	DEC 2017
	SCALE:	AS NOTED	

CLIENT  
**CHRISTOPHER TWORKOWSKI  
ARCHITECT**

PROJECT  
**KAWARTHA LEARNING ACADEMY  
1123 WATER STREET, PETERBOROUGH, ON**

<b>SPECIFICATIONS</b>		
FILE No. 0533-M1	DWG. No. <b>M1</b>	Rev. No. <b>0</b>
CLIENT FILE No.		

PLUMBING FIXTURE SCHEDULE						
REF.	FIXTURE NAME	HOT	COLD	DRAIN	VENT	REMARKS
C.O.	CLEAN OUT	-	-	-	-	ZURN ZN-1602, ADJUSTABLE HEAD WITH BODY SLEEVE SEAL
LAV1	LAVATORY	1/2"	1/2"	1 1/2"	1 1/4"	ADA COMPLIANT LAVATORY: 27" X 20" LAVATORY FRONT OVERFLOW, FIRE CLAY CHINA, WALL HUNG WITH WALL HANGER, WITH ONE CENTRE HOLE FOR FAUCET, AMERICAN STANDARD #9140.011. FAUCET TO BE POLISHED CHROME PLATE FINISH, SOLID METAL CONSTRUCTION, PIVOT ACTION LEVER STYLE HANDLE, AERATOR LIMITED TO 8.3 l/MIN, C/W METAL DRAIN, EQUAL TO MOEN 8215F15. INSTALL WITH MIXING VALVE NOTED BELOW. DRAIN TO BE MCGUIRE #155wc CHROME PLATED BRASS, POLISHED DRAIN, OFFSET OPEN GRID STRAINER, CAST BRASS 1 1/2". MCGUIRE #LF165 SUPPLIES, CHROME PLATED, POLISHED SHORT RIGID ANGLE WITH ESCUTCHEONS AND BRAIDED FLEXIBLE HOSES. MCGUIRE #8088 C.P. POLISHED P TRAP, CAST BRASS, 1 1/2" WITH CLEAN-OUT AND ESCUTCHEON.
WC1	WATER CLOSET (ACCESSIBLE)	-	-	3"	1 1/2"	ADA COMPLIANT, WHITE VITREOUS CHINA, ELONGATED BOWL, FLOOR MOUNTED, INSULATED TANK WATER CLOSET, 6 LPF TOILET, AMERICAN STANDARD CADET PRO 215AA 054 OR EQUAL. SEAT TO BE BEMIS COMMERCIAL HEAVY DUTY, SOLID PLASTIC, IMPACT RESISTANT. "STA-TITE" PLASTIC HINGES WITH SS POSTS, DURAGUARD PROTECTED, WHITE, CLOSED FRONT.
S1	SLOP SINK	1/2"	1/2"	2"	1 1/2"	24" X 24" X 10" HIGH - FLOOR MOUNTED, MOLDED HIGH DENSITY COMPOSITE JANITOR'S BASIN WITH STAINLESS STEEL GUARDS ON 1 SIDE. DRAIN TO BE 2" STAINLESS STEEL WITH SS STRAINER. PROVIDE 24" SS WALL GUARD SET. EQUAL TO PROFLO PFB2424S, PFB24S BUMPER GUARD AND PFWG24S WALL GUARD. FAUCET TO BE CHROME PLATED FINISH BRASS CONSTRUCTION, SPOUT WITH BUCKET HOOK AND THREADED HOSE END, FITTING WITH VACUUM BREAKER, 1/2" CONNECTIONS, EQUAL TO PROFLO PF1118 AND PFSHE FLEXIBLE HOSE. INSTALL WITH MIXING VALVE.
TV1	THERMOSTATIC MIXING VALVE	1/2"	1/2"	-	-	ADJUSTABLE TEMPERATURE SETTING, CAST BRASS BODY, INTEGRAL CHECK VALVE, MAX 200°F, 150 PSI TO CSA B125, UNION SWEAT CONNECTIONS, EQUAL TO POWERS #LM-491-10-2. PROVIDE ONE VALVE PER LAVATORY AND SET FOR 110oF



**LEGEND**

EX = EXISTING SUPPLY OR RETURN  
 G\_ = NEW GRILLE AS PER SCHEDULE  
 D\_ = NEW DIFFUSER AS PER SCHEDULE

SIZE  
 AIRFLOW, CFM

DIFFUSER SCHEDULE					
Item	Size	Nozzle	Colour	EH Price Model	Remarks
D1	24x24	6"	WHITE	6/24x24/SCDA/3/3C/B12	
D2	24x24	8"	WHITE	8/24x24/SCDA/3/3C/B12	
D3	12x12	6"	WHITE	6/12x12/SCDA/3/3C/B12	

GRILLE SCHEDULE				
Item	Type	Colour	EH Price Model	Remarks
G1	RET	WHITE	12x12/80/F/A/B12	
G2	RET	WHITE	24x12/80/F/A/B12	

FAN SCHEDULE							
Item	Name	Airflow (cfm)	ESP (wc")	Motor	Power (v-ph-hz)	Model	Description
EF-2	WASHROOM EXHAUST FAN	100	.25	81 watts	120-1-60	GREENHECK SPA 125	CEILING MOUNTED EXHAUST FAN, CENTRIFUGAL, DIRECT DRIVE, HOUSING MADE OF GALVANIZED STEEL WITH 3" ACOUSTICAL LINING, FAN WHEEL TO BE FORWARD CURVED, AMCA RATED, WITH PLASTIC CEILING GRILLE, DISCONNECT, INSTALLATION: MOUNT IN T-BAR CEILING, OPERATED BY WALL SWITCH, PROVIDE WALL CAP GREENHECK WC-6.

BASEBOARD HEATERS				
Item	Heat (watts)	Length (inches)	Model	Remarks
BB-1	1500	65"	OUELLET OFM1500	WHITE ELECTRIC BASEBOARD HEATER, 208 VOLTS, c/w LINE VOLTAGE TAMPERPROOF BUILT-IN THERMOSTAT

CABINET HEATERS			
Item	Capacity	Model	Remarks
CH-1	2 kW/208-1PH	OUELLET OAC 2008	ELECTRIC CABINET HEATER, WHITE, 208 VOLTS, c/w TAMPERPROOF BUILT-IN THERMOSTAT, DISCONNECT, SUPPLIED AND INSTALLED BY DIVISION 15, WIRED BY DIV 16.

Rev.	Date	Description	By	App.
0	JAN 2 18	FOR PERMIT	AB	

**NOVADYNE**  
 269 North Indian Road Tel: (705) 696-2119  
 Hastings, ON, Canada Fax: (705) 696-2912  
 K0L 1Y0

REGISTERED PROFESSIONAL ENGINEER  
 A.G. BUCHKOWSKI  
 JAN 3, 2018  
 PROVINCE OF ONTARIO  
 MECHANICAL

DWN. AB DEC 2017  
 CHK.  
 DSN. A. BUCHKOWSKI DEC 2017  
 SCALE: As Noted

CLIENT  
**CHRISTOPHER TWORKOWSKI ARCHITECT**

PROJECT  
**KAWARTHA LEARNING ACADEMY**  
 1123 WATER STREET, PETERBOROUGH, ON

TITLE  
**MAIN FLOOR PLANS**

FILE No. 0533-M2  
 CLIENT FILE No. M2  
 DWG. No. M2  
 Rev. No. 0