

GENERAL SPECIFICATIONS

- THE LOCATION, ROUTING AND ELEVATIONS OF ALL NEW AND EXISTING SERVICES AND UTILITIES AS SHOWN ON THE DRAWINGS ARE TO BE CONSIDERED AS APPROXIMATIONS ONLY. VERIFY THE EXACT LOCATIONS, ROUTINGS AND ELEVATIONS OF ALL SERVICES PRIOR TO COMMENCING WORK, AND ASSUME RESPONSIBILITY FOR LAYING OUT ALL WORK. THE CONTRACTOR SHALL RETAIN RESPONSIBILITY FOR ANY DAMAGE TO EXISTING SERVICES AND UTILITIES.
- ALL ASPECTS OF THE INSTALLATION MUST COMPLY WITH THE MOST STRINGENT OF THE APPLICABLE BUILDING CODES, LOCAL REGULATIONS, AND BY-LAWS. BEFORE PROCEEDING WITH THE WORK, OBTAIN APPROVED DRAWINGS AND SPECIFICATIONS FROM THE AUTHORITIES HAVING JURISDICTION.
- PROVIDE ALL NECESSARY NOTICES, OBTAIN ALL REQUIRED PERMITS, PAY ALL FEES REQUIRED BY LAW, AND ARRANGE FOR ALL INSPECTIONS RELATED TO THE PERFORMANCE OF THE SPECIFIED WORK.
- PROVIDE ALL MATERIALS, LABOUR AND EQUIPMENT REQUIRED TO COMPLETE THE WORK AS SHOWN AND AS SPECIFIED, SO AS TO LEAVE THE OWNER WITH A COMPLETE AND FUNCTIONING SYSTEM.
 - ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND C.S.A. APPROVED, UNLESS SPECIFICALLY NOTED OTHERWISE.
 - ALL SIMILAR EQUIPMENT AND OR MATERIALS SHALL BE BY THE SAME MANUFACTURER.
- PROVIDE A MINIMUM OF SEVEN COPIES OF SHOP DRAWINGS FOR REVIEW BY THE CONTRACT ADMINISTRATOR. THE SHOP DRAWINGS MUST BE ASSEMBLED INTO COMPLETE BROCHURES, WITH NO LOOSE SHEETS. UNASSEMBLED SUBMISSIONS WILL BE RETURNED INCOMPLETE. THE REVIEW OF THE SHOP DRAWINGS IS FOR THE SOLE PURPOSE OF ASCERTAINING CONFORMANCE WITH THE GENERAL DESIGN CONCEPT. THE REVIEW SHALL NOT MEAN APPROVAL OF THE DETAILED DESIGN INHERENT IN THE EQUIPMENT, THE RESPONSIBILITY FOR WHICH SHALL REMAIN WITH THE CONTRACTOR. THE REVIEW SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO MEET THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL REMAIN RESPONSIBLE FOR CONFIRMING AND CORRELATING THE DIMENSIONS ON THE JOBSITE, AND FOR INFORMATION THAT PERTAINS TO THE FABRICATION PROCESS, CONSTRUCTION TECHNIQUES, AND INSTALLATION DETAILS, AND FOR COORDINATING ALL WORK OF THE RELATED SUB-TRADES.
- ALL CUTTING AND PATCHING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. EXISTING EXPOSED SURFACES SHALL BE RETURNED TO AN "AS-FOUND" CONDITION ACCEPTABLE TO THE CONTRACT ADMINISTRATOR.
- EACH CONTRACTOR SHALL COORDINATE THE WORK WITH OTHER CONTRACTORS IN ORDER TO AVOID CONFLICTS.
- NEATLY STORE ALL MATERIALS, AND CLEAN UP REFUSE ON A REGULAR BASIS. PROTECT AND MAINTAIN ALL WORK UNTIL THE PROJECT HAS BEEN COMPLETED AND TURNED OVER TO THE CONTRACT ADMINISTRATOR.
- THE INSTALLATION SHALL BE COMPLETELY TESTED, DEMONSTRATING THAT THE EQUIPMENT AND SYSTEMS INSTALLED ARE PERFORMING IN THE MANNER INTENDED.
- AT THE COMPLETION OF THE INSTALLATION, PROVIDE FOUR AS-BUILT CADD DRAWINGS AND ONE ELECTRONIC AUTOCAD COPY ON CD OF THE TENDER DRAWINGS FOR RECORD PURPOSES. PROVIDE FOUR SETS OF OPERATION AND MAINTENANCE MANUALS. PAY ALL COSTS ASSOCIATED WITH THE PRODUCTION OF THE RECORD DRAWINGS AND THE MANUALS. SUBMIT THE DOCUMENTS TO THE CONTRACT ADMINISTRATOR FOR REVIEW, AND MAKE ANY REQUESTED CHANGES BEFORE DELIVERING THEM TO THE CONTRACTOR ADMINISTRATOR.
- REVIEW THE OPERATION AND MAINTENANCE OF THE SYSTEMS WITH THE CONTRACT ADMINISTRATOR AND PROVIDE WRITTEN AND/OR VERBAL INSTRUCTIONS AS REQUIRED.
- FURNISH CERTIFICATES CONFIRMING THAT THE WORK HAS BEEN INSTALLED TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.
 - NO CERTIFICATE ISSUED, PAYMENT MADE, OR PARTIAL OR ENTIRE USE OF THE SYSTEMS BY THE CONTRACT ADMINISTRATOR SHALL BE CONSTRUED AS ACCEPTANCE OF DEFECTIVE WORK OR MATERIALS.
- PROVIDE TEMPORARY HEATING AS REQUIRED. DO NOT USE NEW EQUIPMENT FOR THIS PURPOSE WITHOUT THE EXPRESS CONSENT OF THE CONTRACT ADMINISTRATOR.
- SCHEDULING OF ALL WORK SHALL BE ARRANGED WITH THE CONTRACT ADMINISTRATOR. COORDINATE THE SHUT-DOWN OF EXISTING UTILITIES AND SERVICES AS REQUIRED FOR CONNECTIONS OF NEW WORK. WORK WITHIN THE BUILDING MAY HAVE TO BE PERFORMED DURING NON-REGULAR HOURS, AND MUST CONFORM TO THE WORK RULES OF THE BUILDING, AS DIRECTED BY THE CONTRACT ADMINISTRATOR.

MECHANICAL SPECIFICATIONS

SECTION 15100 - GENERAL

- PROVIDE ONE SET OF SPECIAL TOOLS REQUIRED TO SERVICE EQUIPMENT, AS RECOMMENDED BY THE MANUFACTURERS/SUPPLIERS.
- HOISTING AND PLACING OF MECHANICAL EQUIPMENT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR PROVIDING THE EQUIPMENT.
- PROVIDE ACCESS DOORS AS REQUIRED TO INSTALL, MAINTAIN AND ADJUST EQUIPMENT AND CONTROLS. ACCESS DOORS IN CEILINGS AND WALLS SHALL HAVE PIANO HINGES AND SCREWDRIVER CAM LOCKS.

SECTION 15180 - INSULATION

- PROVIDE 1" (25mm) THICK, FOIL-FACED RIGID (FIBREGLASS OR FIBREBOARD) OR FLEXIBLE FIBREGLASS EXTERNAL THERMAL INSULATION ON ALL NEW EXHAUST OR RELIEF DUCTWORK FOR 10'-0" (3.0M) ON THE WARM SIDE OF A PENETRATION THROUGH A WALL/FLOOR/CEILING/ROOF TO A COLD SPACE, WHERE A BACKDRAFT DAMPER IS PROVIDED AT THE PENETRATION TO THE COLD SPACE. WHERE THE BACKDRAFT DAMPER IS PROVIDED IN THE DUCTWORK, INSULATION SHALL EXTEND FROM THE PENETRATION TO 10'-0" (3.0M) UPSTREAM OF THE BACK DRAFT DAMPER
- PROVIDE 1" (25mm) THICK, FOIL-FACED EXTERNAL THERMAL INSULATION ON ALL NEW SUPPLY AIR DUCT MAINS, WHERE NOTED ON FLOOR PLANS. INSULATION SHALL BE FLEXIBLE FIBREGLASS, OR RIGID FIBREBOARD.
- SEAMS OF FOIL-FACED THERMAL INSULATION SHALL BE SEALED WITH ALUMINUM DUCT TAPE.
- FLEXIBLE INSULATION SHALL BE INSTALLED IN A MANNER THAT DOES NOT REDUCE ITS THICKNESS.

SECTION 15400 - PLUMBING

- NATURAL GAS PIPING SHALL BE SCHEDULE 80 STEEL, WITH SCREWED OR WELDED JOINTS AND FITTINGS AS PER CODE.
- NATURAL GAS VALVES SHALL BE APPROVED PLUG TYPE.
- PROVIDE UNIONS WHERE PIPING CONNECTS TO EQUIPMENT. UNIONS SHALL BE LOCATED SO THAT THE PIPING DOES NOT HAVE TO BE ADJUSTED IN ORDER TO REMOVE THE EQUIPMENT.
- DURING CONSTRUCTION, OPEN ENDED PIPING SHALL BE TEMPORARILY CAPPED TO PREVENT THE ENTRY OF DIRT AND DEBRIS. ON COMPLETION, PIPING SYSTEMS SHALL BE FLUSHED TO REMOVE ANY FOREIGN MATERIAL.

SECTION 15800 - VENTILATION

- ALL DUCTWORK AND RELATED ACCESSORIES SHALL BE INSTALLED AS PER THE LATEST SMACNA STANDARDS.
- DUCTWORK SHALL BE GALVANIZED SHEET METAL UNLESS NOTED OTHERWISE, AND SHALL BE OF THE FOLLOWING GAUGES:

RECTANGULAR

- DUCTS UP TO 12" (300 MM) ON LONGEST DIMENSION = 26 GA.
- DUCTS 13" TO 22" (325 TO 700 MM) ON LONGEST DIMENSION = 24 GA.
- DUCTS 29" TO 48" (725 TO 1200 MM) ON LONGEST DIMENSION = 22 GA.

ROUND

- DUCTS 8" (200 MM) AND SMALLER = 26 GA.
- DUCTS 9" TO 22" (225 TO 550 MM) = 24 GA.
- DUCTS 24" TO 36" (600 TO 900 MM) = 22 GA.

- BALANCING DAMPERS SHALL BE PROVIDED FOR EACH SUPPLY AIR OUTLET AND RETURN/EXHAUST AIR INLET. DAMPERS MOUNTED AT GRILLES SHALL BE MULTI-BLADE TYPE. BUTTERFLY DAMPERS IN DUCTWORK SHALL BE CONSTRUCTED OF SHEET METAL, TWO GAUGES HEAVIER THAN THE DUCTWORK. DUCT DAMPERS SHALL HAVE LOCKING QUADRANTS AND POSITION INDICATORS.
- ALL DUCTWORK SHALL BE SEALED WITH DUCT SEALANT.
- PROVIDE 4" (100mm) WIDE FLEXIBLE FABRIC DUCT CONNECTIONS AT INLETS AND OUTLETS OF FANS.
- WHERE SHOWN OR NOTED ON THE DRAWINGS, PROVIDE 1" (25mm) THICK, FLEXIBLE RESIN IMPREGNATED FIBREGLASS INTERNAL ACOUSTIC INSULATION WITH BLACK PLASTIC-COATED MATTE FINISH.
 - ACOUSTIC INSULATION SHALL BE INSTALLED USING PINS WELDED TO THE DUCTWORK, AND ADHESIVE. PROVIDE BLACK MASTIC TO SEAL ALL JOINTS.
- PROVIDE DUCT ACCESS DOORS AT ALL LOCATIONS REQUIRED FOR INSTALLATION, MAINTENANCE OR ADJUSTMENT OF EQUIPMENT OR CONTROLS. ACCESS DOORS SHALL HAVE GASKETS, PIANO HINGES AND THUMB LATCHES. DOORS SHALL BE INSTALLED TO ALLOW FOR INSTALLATION OF INTERNAL OR EXTERNAL INSTALLATION AS REQUIRED.
- SUPPORT HORIZONTAL DUCTWORK AT MAXIMUM 8'-0" (2400mm) ON CENTRE

FOR ROUND DUCTWORK UP TO 36" (900mm) DIAMETER, SUPPORT DUCT USING PERFORATED GALVANIZED STEEL STRAP, SUSPENDED USING THREADED RODS ATTACHED TO THE STRUCTURE. USE 3/8" (10mm) RODS FOR DUCTS 12" (300mm) DIAMETER AND LESS. USE 1/2" (12mm) RODS FOR DUCTS 14" TO 22" (350mm TO 550mm) DIAMETER. USE 5/8" (16mm) RODS FOR DUCTS OVER 24" (600mm) DIAMETER.

FOR ROUND DUCTWORK OVER 36" (900mm) DIAMETER, SUPPORT DUCT USING 1" x 1" x 1/8" (25mm x 25mm x 3mm) GALVANIZED ANGLE IRON TRAPEZE, SUSPENDED BY 5/8" (16mm) DIAMETER THREADED RODS ATTACHED TO THE STRUCTURE.

FOR RECTANGULAR DUCTWORK 18" (450mm) WIDE OR LESS, SUPPORT DUCT WITH PERFORATED GALVANIZED STEEL STRAP, SUSPENDED USING 1/2" (12mm) THREADED RODS ATTACHED TO THE STRUCTURE.

FOR RECTANGULAR DUCTWORK OVER 18" (450mm) WIDE, SUPPORT DUCT WITH 1" x 1" x 1/8" (25mm x 25mm x 3mm) GALVANIZED ANGLE IRON TRAPEZE, SUSPENDED BY 5/8" (16mm) DIAMETER THREADED RODS ATTACHED TO THE STRUCTURE.

IN CONCEALED SPACES FOR ROUND AND RECTANGULAR DUCTWORK 12" (300mm) WIDE OR LESS, PERFORATED GALVANIZED STEEL STRAP MAY BE USED IN LIEU OF THREADED ROD SUSPENSION.

- NEW EXHAUST GRILLES SHALL BE EQUAL TO E.H. PRICE 635-F-L-A-B12, ALUMINUM SIDEWALL GRILLE WITH HORIZONTAL BLADES AT 45° AND SPACED 1/2", AND WITH 1 1/4" FLAT BORDER SUITABLE FOR SCREW MOUNTING.

EG-1: SIZE 150mm X 150mm

EG-2: SIZE 200mm X 200mm

SECTION 15990 - TESTING AND BALANCING

- BALANCE EACH FAN AND EACH AIR OUTLET AND INLET TO THE AIR QUANTITY NOTED.
- PROVIDE A WRITTEN REPORT TO THE CONTRACT ADMINISTRATOR REGARDING THE TESTING AND BALANCING. MAKE ANY REQUESTED CHANGES TO THE REPORT BEFORE DELIVERING THREE FINAL COPIES.
- TESTING AND BALANCING COMPANY SHALL BE A MEMBER IN GOOD STANDING WITH A.A.B.C., OR SHALL PROVE EQUIVALENCY TO THE CONTRACT ADMINISTRATOR.

EQUIPMENT SCHEDULE

ROOFTOP UNIT RTU-1

- EQUAL TO CARRIER WEATHERMAKER 48-TM-D-009-θ-θ-θ-5-X WITH, 24" (610mm) HIGH ROOF CURB, ECONOMISER, 100% GRAVITY RELIEF, ELECTRONIC PROGRAMMABLE THERMOSTAT, AND STAINLESS STEEL HEAT EXCHANGER.
- UNIT SHALL BE GAS HEATING, ELECTRIC COOLING, SUITABLE FOR OUTDOOR MOUNTING ON ROOF, WITH VERTICAL DUCT CONFIGURATION.
- UNIT SHALL MEET OR EXCEED MINIMUM ASHRAE 90.1 ENERGY EFFICIENCY STANDARDS.
- UNIT SHALL BE NOMINAL 8.5 TON COOLING CAPACITY. SCROLL COMPRESSORS SHALL BE EQUIPPED WITH OVERCURRENT AND OVERTEMPERATURE PROTECTION. UNIT SHALL BE CAPABLE OF OPERATION DOWN TO 40°F.
- HEATING SECTION SHALL BE INDUCED DRAFT COMBUSTION TYPE WITH DIRECT SPARK IGNITION AND REDUNDANT MAIN GAS VALVE.
 - HEAT EXCHANGER SHALL BE STAINLESS STEEL.
 - HEAT INPUT SHALL BE 125 MBH, HEAT OUTPUT SHALL BE 100 MBH.
- UNIT POWER SHALL BE 208V/3φ/60HZ WITH SINGLE POINT POWER CONNECTION AND INTERNAL BREAKERS/FUSES/TERMINAL STRIPS/TRANSFORMERS/ETC. AS REQUIRED. UNIT TO BE ± 45 MCA WITH 50 AMP MOCB.
- UNIT SHALL OPERATE AT 3400 CFM @ 0.8" EXTERNAL STATIC PRESSURE USING A 3.0 HP BELT DRIVEN MOTOR.
- STANDARD 2" THROWAWAY FILTERS.
- ECONOMIZER/100% RELIEF DAMPERS SHALL BE STANDARD STAND-ALONE MICROPROCESSOR BASED CONTROLS.
- ELECTRONIC PROGRAMMABLE THERMOSTAT SHALL HAVE MINIMUM:
 - 7 DAY PROGRAMMING
 - 3 TIME PERIODS PER DAY
 - °C/°F CHANGEOVER
 - MANUAL OVERRIDE
 - FAN ON/ AUTO CONTROL
 - HEAT/COOL/AUTO SWITCH
 - AUTOMATIC HEAT/COOL CHANGEOVER
 - TIME/DAY/MONTH/YEAR ADJUSTMENT
 - BATTERY BACK-UP
- UNIT CASING TO BE HEAVY GAUGE GALVANIZED STEEL, PRIMED AND PAINTED. ALL JOINTS CAULKED WITH WATERPROOF SEALANT.

MAKE-UP AIR UNIT MAU-1

- PROVIDE A FACTORY BUILT, CONSTANT VOLUME, MAKE-UP AIR UNIT, SUITABLE FOR 208V/3 PHASE POWER, AND CONSTRUCTED WITH FEATURES AS FOLLOWS:
 - UNIT SHALL BE NATURAL GAS, INDIRECT FIRED, SUITABLE FOR 100% OUTSIDE AIR.
 - UNIT CASING: SUITABLE FOR OUTDOOR MOUNTING, HEAVY GAUGE GALVANIZED STEEL, PRIMED AND PAINTED, RIGIDLY REINFORCED, WITH 50mm (2") INTERIOR NEOPRENE COATED INSULATION, LIFTING LUGS AND BASE CHANNEL SUPPORTS. ALL JOINTS SHALL BE CAULKED WITH WATERPROOF SEALANT. DOWNFLOW CONFIGURATION.
 - ACCESS DOORS: SHALL BE PROVIDED WHERE REQUIRED FOR SERVICING, AND SHALL HAVE FULL LENGTH PIANO HINGES, AND SCREW DRIVER LOCKS.
 - INTAKE HOOD C/W WASHABLE METAL PRE-FILTERS.
 - INTAKE SECTION: C/W OUTSIDE AIR DAMPERS (LOW LEAKAGE, NORMALLY CLOSED).
 - INTEGRAL FILTERS: FLAT TYPE, 50mm (2") THICK, DISPOSABLE MEDIA WITH CARDBOARD FRAMES EQUAL TO FARR 30/30, MOUNTED IN SLIDE-OUT SIDE-REMOVAL PERMANENT METAL FRAMES. MAXIMUM FACE VELOCITY: 2.54 M/SEC (500 FPM). ALLOW FOR 250Pa (1"H2O) TOTAL STATIC PRESSURE DROP THROUGH DIRTY FILTERS.
 - FAN: STATICALLY AND DYNAMICALLY BALANCED CENTRIFUGAL FORWARD CURVED OR BACKWARD INCLINED, WITH SHAFTS OPERATING LESS THAN 80% OF FIRST CRITICAL SPEED, BEARINGS SELECTED FOR AVERAGE LIFE OF 150,000 HOURS AND PROVIDED WITH LUBRICATION FITTINGS EXTENDED TO THE DRIVE SIDE FOR CONVENIENT SERVICING.
 - DRIVE: COMPLETE WITH MOTOR, ADJUSTABLE MOTOR BASE, ADJUSTABLE SHEAVES, AND BELTS, ALL MOUNTED INSIDE THE UNIT.
 - HIGH EFFICIENCY (MINIMUM 82%) NATURAL GAS, INDIRECT FIRED, HEAT EXCHANGER C/W GAS TRAIN AND DISCHARGE TEMPERATURE SENSOR. GAS TRAIN SHALL HAVE SHUT-OFF VALVES, PRV'S AND ALL NECESSARY APPURTENANCES FOR A FULLY FUNCTIONING SYSTEM. UNIT SHALL HAVE SPARK IGNITION, AND MINIMUM 15-1 TURNDOWN RATIO.
 - INTEGRAL VIBRATION ISOLATION CONSISTING OF FAN FLEX CONNECTION(S), AND FAN/MOTOR BASE SPRING ISOLATION.
 - WIRING AND CONTROLS: FACTORY WIRED AND TESTED FOR MOTORIZED DAMPER, FAN AND HEATING CONTROLS. WHEN UNIT IS ENERGIZED, O/A DAMPERS SHALL OPEN, SUPPLY AIR FAN SHALL OPERATE, GAS BURNER SHALL MODULATE (BASED ON A DISCHARGE SUPPLY TEMPERATURE SENSOR). WHEN UNIT IS DE-ENERGIZED, O/A DAMPERS SHALL CLOSE, S/A FAN SHALL NOT OPERATE, AND HEATING SHALL NOT OPERATE.
 - REMOTE CONTROL PANEL: SHALL INCLUDE A SYSTEM ON SWITCH, STATUS LIGHT, DISCHARGE HEATING TEMPERATURE RESET CONTROLLER, RELAYS AND WIRING. HEATING SHALL BE AUTOMATIC, WITH MANUAL OVERRIDE.
 - 24" (610mm) HIGH ROOF CURB.
 - MAU-1 SHALL BE SUITABLE FOR:
 - 2172 1/sec (4600 CFM) AT 250 Pa (1"H2O) EXT. S.P., USING A 5 HP MOTOR.
 - 168 KW (574 MBH) HEAT OUTPUT AT 115°F RISE.
 - MAU-1 SHALL BE EQUAL TO A TRANE MODEL GRBA-70-GDHF0.

ROOF EXHAUST FAN EF-1


- EF-1 SHALL BE EQUAL TO A PENN DOMEX SPUN ALUMINUM BELT-DRIVEN CENTRIFUGAL ROOF EXHAUSTER MODEL DX06B CAPABLE OF 500 CFM @ 0.5" S.P. USING A 1/4HP/120V/1 PHASE MOTOR.

NO.	REVISIONS	DATE	BY
3	REVISED PRIOR TO TENDER	11/07/07	G.T.
2	ISSUED FOR TENDER	08/08/07	GT
1	ISSUED FOR FINAL REVIEW	07/16/07	GT
0	ISSUED FOR OWNERS REVIEW	01/31/07	GT

CONSULTANT


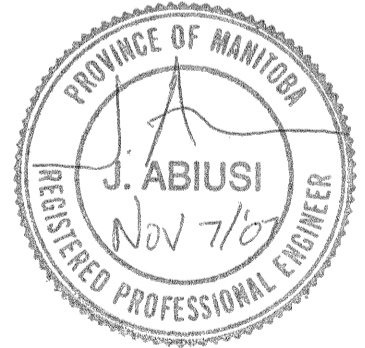
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The contractor is responsible to verify all dimensions with conditions on the site and report discrepancies to Tower Engineering for adjustment. All prints to be returned.



TOWER PROJECT NO. :6194

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<p>SEAL</p>  <p>Certificate of Authorization Tower Engineering Group No. 1918 Expiry: April 30, 2008</p>	<p>SEAL</p> 
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PROJECT

**CITY OF WINNIPEG
CENTENNIAL SWIMMING POOL**

**90 SINCLAIR STREET
WINNIPEG, MB**

DRAWING

**OFFICE ZONE SEPARATION
MECHANICAL
SPECIFICATIONS**

DESIGNED: GT	<p>SHEET</p> <h1 style="margin: 0;">M-2.0</h1> <p>REVISION</p> <h1 style="margin: 0;">R-3</h1>
DRAWN: GN	
CHECKED: GT	
SCALE: AS NOTED	
DATE: AUG 8/07	
PROJECT NO.: 6194	