CHARLES M. ARLINGHAUS
Commissioner

STATE of NEW HAMPSHIRE
DEPARTMENT of ADMINISTRATIVE SERVICES
DIVISION of PUBLIC WORKS - DESIGN & CONSTRUCTION
POB 483, 7 Hazen Drive – Room 250
Concord, New Hampshire 03302-0483
Phone 603-271-3516, Fax 603-271-3515

ADDENDUM NUMBER 01

FOR

NH Veterans Home

Facility Wide Heat Pump Replacement

NH Veterans Home
139 Winter Street
Tilton, NH

DIVISION OF PUBLIC WORKS PROJECT NUMBER 81068

Contract B

October 14, 2020

DOCUMENT 00911

ADDENDUM NUMBER 01

TO: ALL CONTRACT BIDDERS OF RECORD

This Addendum forms a part of the Contract Documents and modifies the Bidding Documents dated **October 1, 2020**, with amendments and additions noted below.
Acknowledge receipt of this Addendum in the space provided in the Proposal Form. Failure to do so may disqualify the Bidder.

This Addendum consists of 7 pages and the following Drawings:

No.	Drawing Title	Issue Date
M-001	Mechanical General Notes & Legend	11/2008
M-101	Welch Ground & First Floor New	11/2008
M-102	Tarr North & South Ground Floor New	11/2008
M-103	Tarr North First Floor New	11/2008
M-104	Tarr south First Floor New	11/2008
M-105	LEDU Ground Floor New	11/2008
M-106	LEDU First Floor New	11/2008
M-107	Tarr South Mechanical Ductwork Plan	11/2008
M-501	Schedules and Details	11/2008
M-502	Schedules and Details	11/2008
M-601	Control Diagrams	11/2008
M-602	Control Diagrams	11/2008
M-603	Control Diagrams	11/2008
M-604	Control Diagrams	11/2008
M-605	Control Diagrams	11/2008
M-701	Geothermal Site Plan	11/2008
M-702	Geothermal Plan Details	11/2008
M-703	Geothermal Details	11/2008
MD-101	Welch Ground Floor New	11/2008
MD-102	Welch First Floor New	11/2008
MD-103	Tarr North First Floor New	11/2008
MD-104	Tarr North First Floor New	11/2008
MD-105	Tarr South Ground Floor New	11/2008
MD-106	Tarr South First Floor New	11/2008
MD-107	LEDU Ground Floor New	11/2008
MD-108	LEDU First Floor New	11/2008

Sign-In sheets from two Mandatory Walk-throughs

VETERANS HOME HEAT PUMP REPLACEMENT

10.07.2020

NAME	COMPANY	PHONE	EMAIL	TIME IN	TIME OUT
David Glover	Glover P&H	6036649733	dglover@metrocast.net	8:53	9:55
Rich Sivigny	Alliance Mech.	603-573-6433	Richs@agusa.com	8:55	10:05
Bryan Covey	RTH Mechanical	603-772-9779	Bryan@RTHmechanical.com	8:55	10:05
Jeff Desrosiers	Oliver Mech.	603-724-3216	JDesrosiers@Olivermechanical Inc.	8:57	10:05
Steve Royer	DL King	603-867-8311	SteveR@DLKingNH.com	8:58	10:05

VETERANS HOME HEAT PUMP REPLACEMENT

10.12.2020

NAME	COMPANY	PHONE	EMAIL	TIME IN	TIME OUT
Scott LAunier	Brookstone Builders	603-494-0646	SLAunier@Brookbuild.com	8:52	10:30
Mike Casey	NPI	603-608-5179	mcasey@northernpeabody.com	8:55	10:30
Jacob Mahieu	Alliance	802-598-4698	JacobM@agusa.com	8:56	10:30
John Cote	LP Cote	603 623-1533	JohnDcote@lpcote.com	8:56	10:30
Mike Smith	M.A. Smith Electric	603-527-9473	info@masmithelectric.com	9am	10:30
Sean Scales	Brookstone Builders	603 641 9455	SScales@Brookbuild.com	8:55	10:30
David Mendzela	Ga LaFlamme Inc	432-0878	dav.d.mendzela@galaflammeinc.com	8:55	10:30
Joe Rubin	Palmer & Sicard	603 7706578	Jrubin@palmerandsicard.com	8:55	10:30
Jared lee	Alliance	802-373 3886	JLee@AMICH.com	9 -	10:30
Zak Nolan-Porter	Alliance	802-309-5748	zakaryNolanPorter@gmail.com	9 -	10:30
Fawn Parenteau	PMI	603-409-8200	pparenteauoffice@gmail.com	905	10:30

QUESTIONS FROM BIDDERS:

1. Can the owners provide existing mechanical drawings with RGD's and balancing valves to assist in pricing the water and air balancing?
RESPONSE: PLEASE SEE DRAWINGS ATTACHED OF ORIGINAL GEOTHERMAL/HEAT PUMP PROJECT.

2. Can the owner provide the make and model for the existing ceiling tiles? The facility has several styles and sizes.
RESPONSE:
ARMSTRONG #769a 2'X 4' Cortega Square lay in 12/case – Maintenance Shop; T.S. Resident room; Front Lobby; Housekeeping Supervisor Office; Housekeeping Break Room.

ARMSTRONG #770, 2'X2' Cortega Square lay in 16/case-Laundry Folding Room; Laundry Shower Room; Hallway by Freight Elevator.

ARMSTRON #1774 2'X2' Dune Angled Tegular 16/case – LEDU Building.

USG #2862 Illusion Thirty-two 12/case- Welch Unit; Tarr North Unit; Tarr South Unit Common Areas.

ARMSTRONG #1760 2'X4' Fine Fissured Second Look-1 10/case- Employee Break Room Area.

ARMSTRONG #605c 2'X4' Ceramagaurd 6/case-Kitchen?.

USG #3260 2'X2' Vinyl Sheetrock Lay In 4/case- Main Entrance Overhang.

Boucher Acoustic Contractor (Mark) 603.622.7278.

3. Is Granite State Automation the only building control vendor or can others be considered?
RESPONSE: CONTROL SYSTEM IS FACILITY EXPLORER. ANY CONTROL WORK MUST BE SEAMLESSLY INTEGRATED WITH EXISTING SYSTEM AND INCLUDE GRAPHICAL INTERFACE SIMILAR TO EXISTING.

4. Some heat pumps do not have flow control valves, should we be adding them?
RESPONSE: No. Rewire existing control valves to new heat pumps where existing, per Detail 5 on Drawing M3.6

5. There appears to be many "HP's" that are mis-labeled on the Drawings that do not match up with the items / designations listed on the Schedules…I am not sure what's what? Please advise how to proceed."

RESPONSE: The unit numbers (hexagon labels) generally correspond with the associated room number. Heat pump unit numbers are listed in the heat pump replacement schedule along with the corresponding existing and proposed model numbers. Information on the proposed model can then be located in the heat pump equipment schedules.

6. M1.1TS "Basis Of Design" narrative describes this project as "replacement of **142** water-source heat pumps". I count **175** heat pumps on Drawings M1.1TS ~ M1.2W. M2.1 & M2.2 Schedules designate **154** items. I don't know (as well as all the Vendors and Subs) how many Heat Pumps we are supposed to be replacing on this job…PLEASE CLARIFY. ***Please acknowledge receipt of this email."***

RESPONSE: Please be aware there are heat pumps shown on floor plans that are ETR. Heat pumps listed in the Replacement Schedules will be shown on the floor plans in bold and will include key notes indicating the unit is to be replaced. Please refer to the schedule titles for clarification. Heat pump replacement schedules provide existing and proposed model numbers for each unit. Heat pump equipment schedules provide data on the proposed models.

7. Is there an ACM Survey of areas of work?

RESPONSE: THOUGH IT IS NOT ANTICIPATED THAT THERE WILL BE ANY ACM, ANY MATERAIL IDENTIFIED AS QUESTIONABLE DURING CONSTRUCTION SHOULD BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE PROJECT MANAGER FOR TESTING AND REMOVAL IF NECESSARY.

8. DIV 07000 Fire Stopping; is GC to provide details for each type of Mech & Electrical Fire Stops; Typically Engineering DOCS provide type. Smoke Seals? Assume all penetrations require Fire Stopping?

RESPONSE: Maintain all existing boundaries. Project does not substantially affect penetrations.

9. Clarify Project work Start Installation Date is after heat system is taken off line; say April 2021.
   RESPONSE: Construction start date will depend on date of NTP, completion of submittal process, and delivery of equipment for the project.

10. Will Patient wings be vacated per Phasing schedule?
    RESPONSE: Units to be installed while the facility maintains occupancy and operation. Work area will be vacated temporarily while work is being performed. Additional notice is required to coordinate work in resident rooms and on units where replacement is expected to take longer than half a day. As noted on drawings SD1.1 and SD1.2, coordinate all schedules with owner.

11. We will have breaks in work especially due to COVID X weeks of downtime?
    RESPONSE: See response to question 10 above.

12. Will GC be required to have a commercial cleaner to clean wings after work?
    RESPONSE: It is anticipated that cleaning in accordance with the CDC guidelines will be completed as work is completed.

13. Section 01500 is GC required to have a job site trailer.
    RESPONSE- YES IN ACCORDANCE WITH Section 01500.

14. Confirm no Job sign is required.
    RESPONSE: No job sign is required.

15. Confirm no Clean Air Report is required.
    RESPONSE: Clean air report is not required.

16. Confirm any work required off shift State will pay OT cost

RESPONSE: Off hour work as indicated in the specifications and on the plans needs to be coordinated with the Owners, and any anticipated off shift differential needs to be included in the base price.

17. How many heat pumps can be disconnected at the same time?
RESPONSE: Temperature requirements of the space are to be maintained throughout the scope work, as the facility will maintain occupancy and operation.

18. When can electrical panels be de-energized to add circuits?
RESPONSE: Coordinate with owner per phasing notes on SD1.1 and SD1.2.

Theodore Kupper, P.E., Administrator
Division of Public Works Design and Construction

END OF DOCUMENT

HVAC GENERAL NOTES

1. ALL HVAC GENERAL NOTES, SYMBOLS LISTS & DETAILS ARE TO BE CONSIDERED AS APPLICABLE TO ALL HVAC DRAWINGS FOR THIS PROJECT.
2. THE DRAWINGS ARE DIAGRAMMATIC IN NATURE, AND EXACT LOCATIONS AND ARRANGEMENTS OF EXISTING/NEW EQUIPMENT, DUCTWORK, PIPING AND OTHER COMPONENTS SHALL BE DETERMINED IN THE FIELD WITH DUE CONSIDERATION OF STRUCTURAL, ELECTRICAL AND ARCHITECTURAL SYSTEMS. EXISTING STRUCTURAL SYSTEMS SHALL NOT BE MODIFIED WITHOUT THE EXPRESS PERMISSION OF THE ENGINEER.
3. THE PROJECT SHALL BE PHASED IN ACCORDANCE WITH THE CONTRACTOR'S APPROVED PHASING PLAN. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE OWNER FOR THE SEQUENCING AND TIMING OF OPERATIONS PRIOR TO COMMENCING WORK. SEE SPECIFICATIONS.
4. CONTRACTOR IS TO MAINTAIN SERVICE TO ROOMS OUTSIDE THE PROJECT SCOPE OF WORK AND PHASING SCHEDULE. IF INTERRUPTION OF SERVICE IS REQUIRED COORDINATE SHUTDOWN WITH OWNER. NOTIFY THE OWNER A MINIMUM OF 96 HOURS PRIOR TO SHUT-DOWN.
5. CARE SHALL BE TAKEN BY THE CONTRACTOR TO PROTECT EXISTING SYSTEMS AND SURFACES TO REMAIN. RESTORE DAMAGED AREAS THAT ARE BEYOND THE SCOPE OF THIS CONTRACT TO THEIR ORIGINAL CONDITION.
6. WHERE INDICATED ON THE DRAWINGS, REMOVE OR RELOCATE EXISTING COMPONENTS AS REQUIRED TO ACCOMMODATE THE NEW WORK. REMOVALS SHALL INCLUDE ALL ASSOCIATED OFF-SITE DISPOSAL COSTS.
7. COORDINATE REMOVALS AND RELOCATION'S INCLUDING SELECTIVE CUTTING AND PENETRATIONS WITH ARCHITECTURAL, MECHANICAL, STRUCTURAL AND ELECTRICAL CONTRACTORS.
8. MOST PARTITIONS ARE FULL HEIGHT AND REQUIRE UTILITIES PENETRATIONS TO BE SEALED, SEE ARCHITECTURAL DWGS FOR PARTITION HEIGHTS. UTILITIES SHOWN FOR CLARITY THAT MAY RUN PARALLEL TO WALL PARTITIONS WILL REQUIRE LOCATING IN THE FIELD TO MINIMIZE CONFLICT WITH PARTITIONS.
9. COORDINATE THE LOCATIONS OF ALL WALL MOUNTED TEMPERATURE SENSORS WITH OWNERS FINAL EQUIPMENT/FURNITURE LAYOUT.
10. PROVIDE SEISMIC RESTRAINTS PER SPECIFICATION.
11. MANUFACTURERS NAME & MODEL NUMBER ARE USED FOR DESCRIPTIVE PURPOSES ONLY & ARE INTENDED TO INDICATE THE STANDARD OF MATERIAL OR ARTICLES REQUIRED.
12. INSTALL EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND GOOD PRACTICE NORMAL TO THE TRADE. INSTALLATION SHALL INCLUDE PROVISIONS FOR ACCESS TO NORMAL MAINTENANCE ITEMS SUCH AS BELTS, BEARINGS, FILTERS AND MOTORS. PROVIDE ADEQUATE STRUCTURAL SUPPORTS AND SECURE MOUNTING METHODS WITH PROVISIONS FOR VIBRATION ISOLATION AND EXPANSION WHERE REQUIRED.
13. PROVIDE VOLUME DAMPERS DOWN STREAM OF VAV BOXES AT EACH BRANCH FROM MAIN DUCTWORK AND DUCT RUNNOUTS. PROVIDE OPPOSED BLADE DAMPERS AT EACH NECK TO AN INDIVIDUAL REGISTER OR DIFFUSER IN SUPPLY, RETURN AND EXHAUST DUCTS IRRESPECTIVE OF WHETHER OR NOT A DAMPER IS INDICATED ON THE PLANS.
14. DIFFUSER SIZES INDICATED ARE NECK SIZES. REGISTERS & GRILLES ARE INDICATED AS NOMINAL SIZES.
15. PERFORM ALL TESTS BEFORE INSULATING.
16. PIPING AND DUCTWORK SHALL BE CONCEALED UNLESS OTHERWISE NOTED.
17. INSTALLATION SHALL PERMIT ACCESSIBILITY FOR SERVICE AND/OR REPLACEMENT OF EQUIPMENT PROVIDED. PROVIDE ACCESS PANELS TO GAIN ACCESS TO SYSTEMS COMPONENTS THAT REQUIRE MAINTENANCE ACCORDING TO MANUFACTURER'S LITERATURE.
18. PROVIDE DUCTWORK WITH OFFSETS AND TRANSITIONS AS REQUIRED TO FIT UNDER STRUCTURAL STEEL OR OTHER OBSTRUCTIONS. FLAT OVAL OR ROUND SIZES MAY BE USED INTERCHANGEABLY BY THE CONTRACTOR. MAINTAIN DUCT CROSS SECTIONAL AREA.
19. PROVIDE CLAMPS, OFFSETS, EXPANSION JOINTS, ANCHORS & GUIDES AS NECESSARY TO PREVENT UNDUE STRAIN ON PIPING.
20. SEE DETAILS & PIPING DIAGRAMS FOR ADDITIONAL VALVES & FITTINGS NECESSARY FOR COMPLETE PIPING SYSTEM.
21. MECHANICAL CONTRACTOR TO COORDINATE ALL WORK WITH OTHER BUILDING TRADES. SOME RELOCATION OF EXISTING UTILITIES MAY BE NECESSARY TO ACCOMMODATE INSTALLATION OF NEW EQUIPMENT OR DUCTWORK.
22. PROVIDE FIRE OR FIRE/SMOKE DAMPERS WHERE INDICATED ON PLANS & WHERE REQUIRED BY APPLICABLE CODES FOR DUCTS & OPENINGS THROUGH FLOORS, FIRE WALLS & FIRE PARTITIONS. DAMPERS SHALL BE ENCLOSED IN #14 GAUGE STEEL SLEEVE. PROVIDE ACCESS DOORS LOCATED SO THAT FUSIBLE LINK & OTHER DAMPER COMPONENTS MAY BE INSPECTED REPLACED AND/OR SERVICED.
23. SEE SPECIFICATIONS FOR OTHER REQUIREMENTS.
24. AT THE END OF EACH WORKING DAY, THE CONSTRUCTION SITE SHALL BE LEFT IN A CLEAN AND NEAT CONDITION.
25. FIELD VERIFY EXISTING EQUIPMENT, DUCTWORK AND PIPING PRIOR TO REMOVAL OR REUSE. CONFIRM WITH HOSPITAL THAT ALL EQUIPMENT, DUCTWORK AND PIPING DESIGNATED TO BE REMOVED IS NO LONGER IN SERVICE PRIOR TO ITS REMOVAL.
26. EXISTING EQUIPMENT, DUCTWORK AND PIPING TO REMAIN IN SERVICE SHALL BE INSPECTED. ANY EQUIPMENT FOUND TO BE INOPERABLE SHALL BE REPORTED TO OWNER AND ENGINEER.
27. INFILL ALL NEW OR EXISTING ABANDONED FLOOR SLAB PENETRATIONS WITH GROUT, FULL THICKNESS OF SLAB. MAINTAIN 2 HR FIRE RATING. ALL EXISTING CONCRETE FLOORS AND CHASES ARE 2 HOUR FIRE RATED.
28. FILL AND PATCH ALL OPENINGS IN WALLS WHERE CONDUITS, PIPES, DUCTS ETC. ARE OR HAVE BEEN REMOVED WITH UL LISTED FIRE ASSEMBLY APPROVED BY THE ARCHITECT. MAINTAIN 2 HR FIRE RATING WHERE APPLICABLE.
29. ALL UNUSED (ABANDONED) DUCTWORK, PIPING AND EQUIPMENT INDICATED TO BE REMOVED SHALL BE REMOVED AND CAPPED.
30. ALL EXISTING PIPING, DUCTWORK AND EQUIPMENT NOT SHOWN ON DWGS. SHALL REMAIN WITH NO CHANGE UNLESS NOTED OTHERWISE.
31. TIE-IN POINT LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL DETERMINE EXACT LOCATIONS IN THE FIELD BASED ON EXISTING CONDITIONS.
32. PROVIDE SHALL MEAN FURNISH AND INSTALL.

GENERAL ABBREVIATIONS

ABBREVIATIONS	DESCRIPTIONS
A	AIR
AD	DUCT ACCESS DOOR
AC	AIR CONDITIONING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISH GRADE
AHU	AIR HANDLING UNIT
ALUM	ALUMINUM
AP	ACCESS PANEL
AS	AIR SEPARATOR
ATC	AUTOMATIC TEMPERATURE CONTROL
BEL	BELOW
BFP	BACK FLOW PREVENTER
BOD	BOTTOM OF DUCT
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR CLOSED
C&HW	COLD & HOT WATER
CA	COMBUSTION AIR
CAP	CAPACITY
CAR	COMBUSTION AIR RELIEF
CAS	COMBUSTION AIR SUPPLY
CC	COOLING COIL
CD	CEILING DIFFUSER
CFM	CUBIC FEET PER MINUTE
CLG	CEILING
COL	COLUMN
CONN	CONNECT
CP	CONTROL PANEL
CT	CURRENT TRANSFORMER
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
CV	CONTROL VALVE
DB	DRY BULB TEMPERATURE
DDC	DIRECT DIGITAL CONTROL
DIA	DIAMETER
DN	DOWN
DO	DIGITAL OUTPUT
DWG OR DWGS	DRAWINGS
E, EX OR (E)	EXISTING
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ECU	EVAPORATIVE CONDENSING UNIT
EF	EXHAUST FAN
EG	EXHAUST AIR GRILLE
EL	EXPANSION LOOP
EMS	ENERGY MANAGEMENT SYSTEM
ER	EXHAUST AIR REGISTER
ERV	EXHAUST ON ROOF
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
ETO	ETHYLENE OXIDE
ETR	EXISTING TO BE REMOVED
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
FA	FREE AREA
FAI	FRESH AIR INTAKE
FC	FLEXIBLE CONNECTION
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FLR	FLOOR
FPI	FINS PER INCH
FPM	FEET PER MINUTE
FSD	COMBINATION FIRE AND SMOKE DAMPER
FT	FEET
FTR	FIN TUBE RADIATION
GAL	GALLONS
GC	GENERAL CONTRACTOR
GE	GENERAL EXHAUST
GLV	GLOBE VALVE
GPM	GALLONS PER MINUTE
GV	GATE VALVE
HC	HEATING COIL
HE	HOOD EXHAUST
HP	HORSE POWER
HVAC	HEATING, VENTILATION AND AIR CONDITIONING
HW	HOT WATER
ID	INSIDE DIAMETER
IH	INTAKE HOOD
IN	INCHES
KE	KITCHEN EXHAUST
KW	KILOWATTS
LAT	LEAVING AIR TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSANDS OF B.T.U.'S PER HOUR
MOD	MOTOR OPERATED DAMPER
MECH	MECHANICAL
MTD	MOUNTED
N.C. OR NC	NORMALLY CLOSED
N.O. OR NO	NORMALLY OPEN
NIC	NOT IN CONTRACT
NOM	NOMINAL
NTS	NOT TO SCALE
O.A. OR OA	OUTSIDE AIR
OAT	OUTSIDE AIR TEMPERATURE
OBD	OPPOSED BLADE DAMPER
OD	OUTSIDE DIAMETER
OED	OPEN ENDED DUCT
PD	PRESSURE DROP
PSI	POUNDS PER SQUARE INCH
PRV	PRESSURE REDUCING VALVE
RA	RETURN AIR
RF	RETURN FAN
RG	RETURN AIR GRILLE
RHWR	REHEAT WATER RETURN
RHWS	REHEAT WATER SUPPLY
RM	ROOM
RR	RETURN AIR REGISTER
RV	RELIEF VALVE
SA	SUPPLY AIR
SAT	SUPPLY AIR TEMPERATURE
SF	SQUARE FEET
SP	STATIC PRESSURE
SPD	SPEED
SPEC	SPECIFICATION
SR	SUPPLY AIR REGISTER
SS	STAINLESS STEEL
TG	TRANSFER AIR GRILLE
TOD	TOP OF DUCT
TSTAT	THERMOSTAT
TYP	TYPICAL
UC	UNDERCUT DOOR
UH	UNIT HEATER
U.S.	UNDER SLAB
VAV	VARIABLE AIR VOLUME
VB	VACUUM BREAKER
VFD	VARIABLE FREQUENCY DRIVE
VTR	VENT THROUGH ROOF
W/	WITH
WB	WET BULB TEMPERATURE (°F)
WH	WALL HEATER
WMS	WIRE MESH SCREEN

PIPING SYMBOLS

SYMBOLS	ABBREVIATIONS	DESCRIPTIONS
6ø		EXISTING PIPING LINE WEIGHT
6ø		DEMOLITION PIPING LINE WEIGHT
6ø		NEW PIPING LINE WEIGHT
G	G	GAS PIPING
GS	GS	GLYCOL SUPPLY
GR	GR	GLYCOL RETURN
RS	RS	REFRIGERANT SUCTION
RL	RL	REFRIGERANT LIQUID
RHG	RHG	REFRIGERANT HOT GAS
D	D	A.C. CONDENSATE DRAIN
MUW	MUW	MAKE UP WATER
PC	PC	PUMPED CONDENSATE
HPC	HPC	HIGH-PRESSURE CONDENSATE
BBD	BBD	BOILER BLOWDOWN
FOD	FOD	FUEL OIL DISCHARGE
FOG	FOG	FUEL OIL GAGE
FOS	FOS	FUEL OIL SUCTION
FOR	FOR	FUEL OIL RETURN
FOV	FOV	FUEL OIL TANK VENT
MTWS	MTWS	MEDIUM-TEMPERATURE HOT WATER SUPPLY
HTWS	HTWS	HIGH-TEMPERATURE HOT WATER SUPPLY
MTWR	MTWR	MEDIUM-TEMPERATURE HOT WATER RETURN
HTWR	HTWR	HIGH-TEMPERATURE HOT WATER RETURN
SAN	SAN	SANITARY DRAIN ABOVE FLOOR OR GRADE
CHEM	CHEM	CHEMICAL SUPPLY PIPES
CHWS	CHWS	CHILLED WATER SUPPLY PIPING
CHWR	CHWR	CHILLED WATER RETURN PIPING
CWS	CWS	CONDENSER WATER SUPPLY
CWR	CWR	CONDENSER WATER RETURN
HPS	HPS	HIGH PRESSURE STEAM
HWS	HWS	HOT WATER SUPPLY PIPING
HWR	HWR	HOT WATER RETURN PIPING
RHWS	RHWS	RADIANT HOT WATER SUPPLY PIPING
RHWR	RHWR	RADIANT HOT WATER RETURN PIPING
LPC	LPC	LOW PRESSURE CONDENSATE RETURN
LPS	LPS	LOW PRESSURE STEAM
MPC	MPC	MEDIUM PRESSURE CONDENSATE RETURN
MPS	MPS	MEDIUM PRESSURE STEAM
		PIPE DROP
		PIPE RISER
		PIPE TEE – DOWN
		PIPE TEE – UP
		PIPE CONNECTION
		PIPE BREAK – TO CONTINUE
		DIRECTION OF FLOW
	ANCHOR	PIPE ANCHOR
		PIPE CAP
	GUIDE	PIPE GUIDE
		EXPANSION JOINT
	WHA	WATER HAMMER ARRESTOR
	U	UNION
	BLV	BALL VALVE
	BFV	BUTTERFLY VALVE
	SCV	SWING CHECK VALVE
	CBV	CIRCUIT BALANCE VALVE
	ACV	2-WAY AUTOMATIC CONTROL VALVE
	ACV	3-WAY AUTOMATIC CONTROL VALVE
	GV	GATE VALVE
	GLV	GLOBE VALVE
MPV	MPV	MULTIPURPOSE VALVE
	PRV	PRESSURE REGULATING VALVE
	T	THERMOMETER
	LCV	LIFT CHECK VALVE
	FLG	FLANGE
		STRAINER W/DRAIN VALVE AND CAP
		DRAIN VALVE AND CAP
	RSV	RELIEF OR SAFETY VALVE
	PGV	PLUG VALVE
	QC	QUICK CLOSING, FUSIBLE LINK
	QO	QUICK OPENING
	SHC	SQUARE HEAD COCK
	BFP	BACK FLOW PREVENTOR
	CRD	CONCENTRIC REDUCER (ENLARGER)
	ERD	ECCENTRIC REDUCER (ENLARGER)
		PIPE SLOPE

GENERAL SYMBOLS

SYMBOLS	DESCRIPTIONS
	POINT OF CONNECTION TO EXISTING
VAV 3	EQUIPMENT TAG
S-1 250	DIFFUSER, REGISTER OR GRILLE TAG, WITH CFM AIRFLOW
1	REVISION TAG
	REVISION CLOUD
RH-1	EQUIPMENT DESIGNATION
1	NOTE CALL OUT
P	PRESSURE GAUGE W/PETCOCK
P	DUCT STATIC PRESSURE SENSOR
PC	ROOM PRESSURIZATION CONTROLLER
S	DUCT MOUNTED SMOKE DETECTOR, MTD BY HVAC CONTR. SUPPLIED AND WIRED BY ELECTRICAL CONTR.
F	FLOW SWITCH
PS	PRESSURE SWITCH
T	THERMOMETER W/IMMERSION WELL
TP	PNEUMATIC TEMPERATURE SENSOR
TE	ELECTRONIC TEMPERATURE SENSOR
TD	DIGITAL TEMPERATURE SENSOR
ΔP	DIFFERENTIAL PRESSURE SENSOR
TS	TEMPERATURE SENSOR (DDC)
V	AUTOMATIC AIR VENT
V	MANUAL AIR VENT
PP	PRESSURE PORT ("PETE'S PLUG")
F&T	FLOAT & THERMOSTATIC TRAP
	HUMIDIFIER
	VARIABLE AIR VOLUME BOX
12ø, 12x12	DUCT SIZE
12"	PIPE SIZE (DIAMETER)
12"S UP 14"DN 1-1/2"	PIPE SIZE, GANG RISER (DIAMETER)
	ROOF EXHAUST FAN – EXISTING
	ROOF EXHAUST FAN – REMOVED
	ROOF EXHAUST FAN – NEW
	MANUAL VOLUME DAMPER
FD	FIRE DAMPER
FSD	COMBINATION FIRE SMOKE DAMPER
SD	SMOKE DAMPER

DIFFUSER SYMBOLS

SYMBOLS	ABBREVIATIONS	DESCRIPTIONS
	RG, RR	RETURN AIR GRILLE, REGISTER
	EG, ER	EXHAUST AIR GRILLE, REGISTER
	SD, SR, SG	SUPPLY AIR 4 WAY DIFFUSER, REGISTER, GRILLE
	SD, SR, SG	SUPPLY AIR 3 WAY DIFFUSER, REGISTER, GRILLE
	SD, SR, SG	SUPPLY AIR 2 WAY DIFFUSER, REGISTER, GRILLE
	SD, SR, SG	SUPPLY AIR 2 WAY DIFFUSER, REGISTER, GRILLE
	SD, SR, SG	SUPPLY AIR 1 WAY DIFFUSER, REGISTER, GRILLE

DUCTWORK SYMBOLS

SYMBOLS	DESCRIPTIONS
6x6	EXISTING RECTANGULAR DUCT RUN W/ SIZE DESIGNATION
6ø	EXISTING ROUND DUCT RUN W/ SIZE DESIGNATION
6ø	EXISTING FLEX DUCT RUN W/ SIZE DESIGNATION
6x6	DEMOLITION RECTANGULAR DUCT RUN W/ SIZE DESIGNATION
6ø	DEMOLITION ROUND DUCT RUN W/ SIZE DESIGNATION
6ø	DEMOLITION FLEX DUCT RUN W/ SIZE DESIGNATION
6x6	NEW RECTANGULAR DUCT RUN W/ SIZE DESIGNATION
6ø	NEW ROUND DUCT RUN W/ SIZE DESIGNATION
6ø	NEW FLEX DUCT RUN W/ SIZE DESIGNATION
10x16	SHADED DUCTWORK SHALL BE 16 GAUGE SHEETMETAL
	NEW RECTANGULAR DUCT – UP
	NEW ROUND DUCT RUN – UP
	NEW RECTANGULAR DUCT – DOWN
	NEW ROUND DUCT RUN – DOWN
	ACOUSTICALLY LINED DUCT RUN
	RECTANGULAR TO RECTANGULAR DUCTWORK TRANSITION
	RECTANGULAR TO RECTANGULAR DUCTWORK TRANSITION
	RECTANGULAR TO ROUND DUCTWORK TRANSITION
UP	ELEVATION CHANGE IN DUCTWORK – UP
DN	ELEVATION CHANGE IN DUCTWORK – DOWN
	DUCTWORK BREAK – TO CONTINUE

MECHANICAL DRAWING LIST

NUMBER	TITLE
M-001	MECHANICAL GENERAL NOTES & LEGEND
M-101	WELCH GROUND AND FIRST FLOOR NEW
M-102	TARR NORTH AND SOUTH GROUND FLOOR NEW
M-103	TARR NORTH FIRST FLOOR NEW
M-104	TARR SOUTH FIRST FLOOR NEW
M-105	LEDU GROUND FLOOR NEW
M-106	LEDU FIRST FLOOR NEW
M-107	TARR SOUTH MECHANICAL DUCTWORK PLAN
M-501	SCHEDULES AND DETAILS
M-502	SCHEDULES AND DETAILS
M-601	CONTROL DIAGRAMS
M-602	CONTROL DIAGRAMS
M-603	CONTROL DIAGRAMS
M-604	CONTROL DIAGRAMS
M-605	CONTROL DIAGRAMS
M-701	GEOTHERMAL SITE PLAN
M-702	GEOTHERMAL PLAN DETAILS
M-703	GEOTHERMAL DETAILS
MD-101	WELCH GROUND FLOOR NEW
MD-102	WELCH FIRST FLOOR NEW
MD-103	TARR NORTH GROUND FLOOR NEW
MD-104	TARR NORTH FIRST FLOOR NEW
MD-105	TARR SOUTH GROUND FLOOR NEW
MD-106	TARR SOUTH FIRST FLOOR NEW
MD-107	LEDU GROUND FLOOR NEW
MD-108	LEDU FIRST FLOOR NEW

MECHANICAL ALTERNATE LIST

NUMBER	TITLE
NONE	

Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com
Stantec

PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

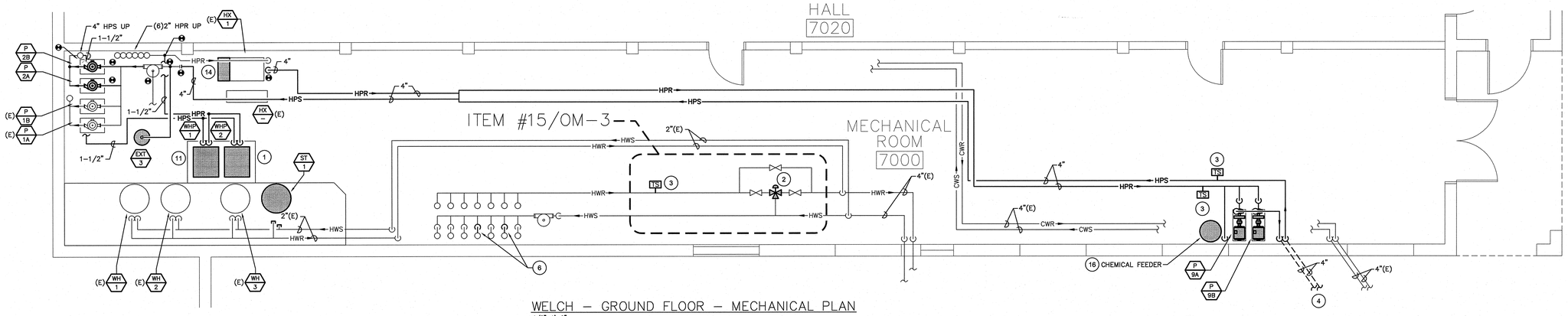
REVISIONS

DATE	DESCRIPTION	BY

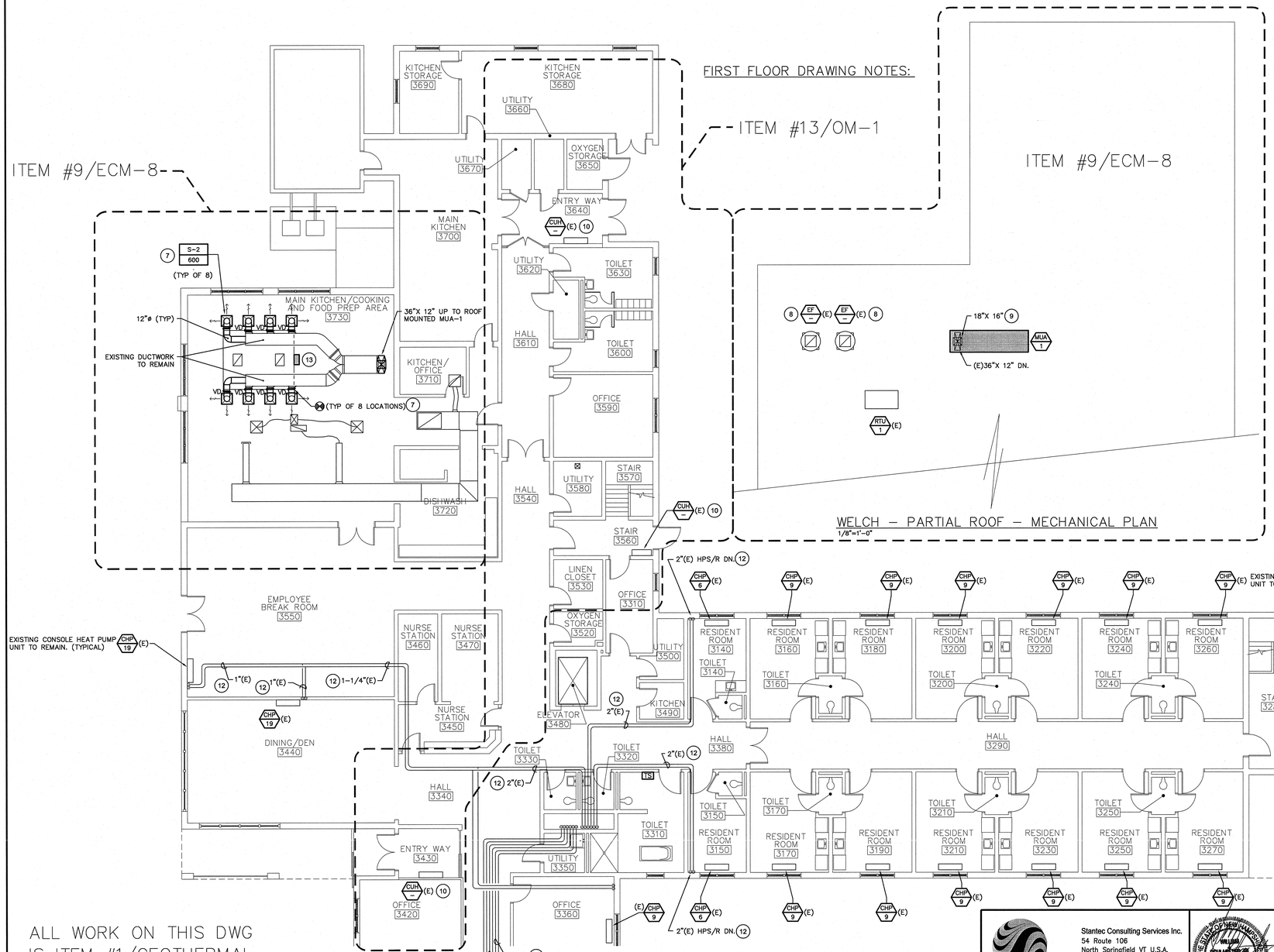
NH VETERANS HOME
ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

MECHANICAL LEGEND, ABBREVIATIONS AND NOTES

DRAWN BY:	SCALE:	DATE:	PROJECT No.	CONTRACT:	SHEET:
MAM/EJD	AS SHOWN	NOVEMBER 2008	80839R	B	M-001 (11 OF 57)

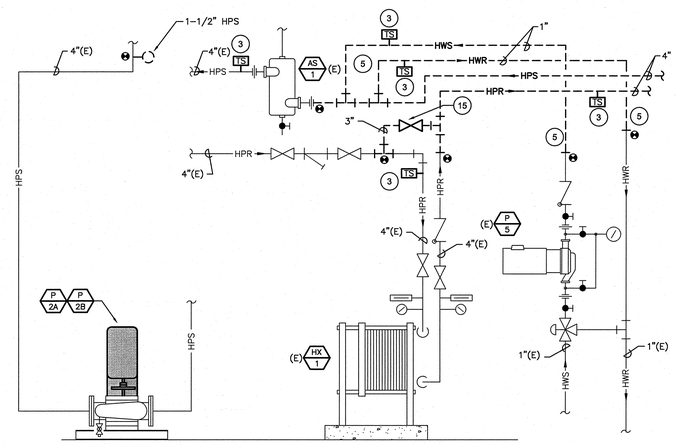


WELCH – GROUND FLOOR – MECHANICAL PLAN
1/8"=1'-0"



WELCH – PARTIAL ROOF – MECHANICAL PLAN
1/8"=1'-0"

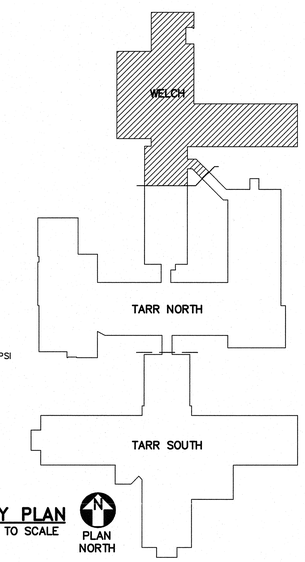
WELCH – FIRST FLOOR – MECHANICAL PLAN
1/8"=1'-0"



(E) HX-1 ELEVATION PIPING DETAIL
NOT TO SCALE

DRAWING NOTES:

1. EXTEND EXISTING EQUIPMENT PAD AS INDICATED.
2. PROVIDE 4" 3-WAY MIXING VALVE
3. PROVIDE NEW TEMPERATURE SENSOR
4. REFER TO GEOTHERMAL FIELD DESIGN DRAWINGS FOR CONTINUATION.
5. SUPPLEMENTAL HEAT LINE FOR HEAT PUMP LOOP
6. OM1: PROVIDE ANTI-GRAVITY FLOW TYPE CHECK VALVE; TACO FLO-CHECK OR EQUIVALENT.
7. PROVIDE 12"øx 14"X 14" DUCT TRANSITION
8. PROVIDE NEW 1.5 HP FAN MOTOR
9. TRANSITION 18"X 16" S.A. DUCT TO EXISTING 36"X 12" DUCT
10. REPLACE CUH TEMPERATURE CONTROLLER
11. REFER TO WHP PIPING DETAIL
12. INSULATE EXISTING HPS & HPR PIPING
13. PROVIDE KITCHEN DEMAND VENTILATION SYSTEM FOR EXHAUST FAN CONTROL: MELINK INTELLI-HOOD, OR APPROVED EQUAL.
14. PROVIDE ADDITIONAL HX-1 PLATES TO ACCOMODATE PRIMARY FLOW OF 300 GPM. MAXIMUM PRIMARY SIDE PRESSURE LOSS SHALL BE 3 PSI
15. PROVIDE THROTTLING TYPE GLOBE VALVE.
16. CHEMICAL SHOT FEEDER. SEE CHEMICAL SHOT FEEDER PIPING DETAIL



KEY PLAN
NOT TO SCALE
PLAN NORTH

ALL WORK ON THIS DWG IS ITEM #1/GEOTHERMAL SYSTEM EXCEPT AS NOTED.

Stantec
Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

"PLACE STAMP HERE"

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

DATE	DESCRIPTION	BY

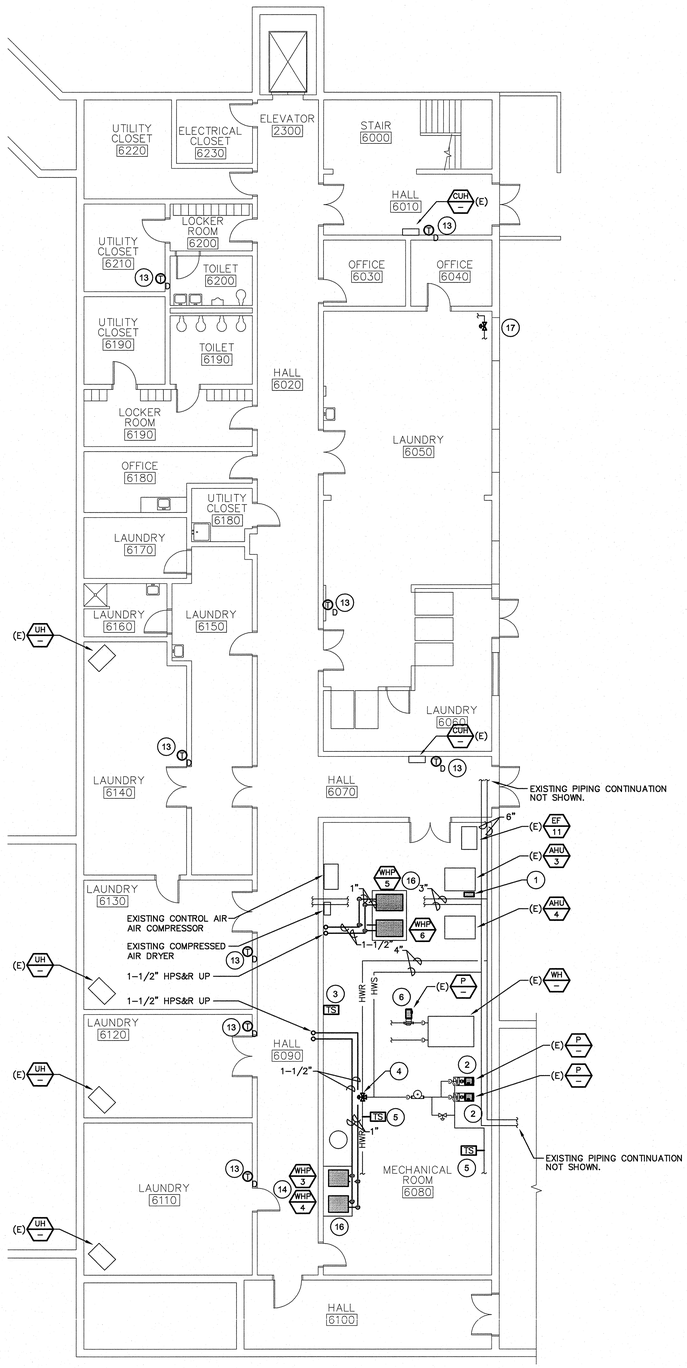
NH VETERANS HOME
ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

WELCH GROUND AND FIRST FLOOR MECHANICAL PLAN

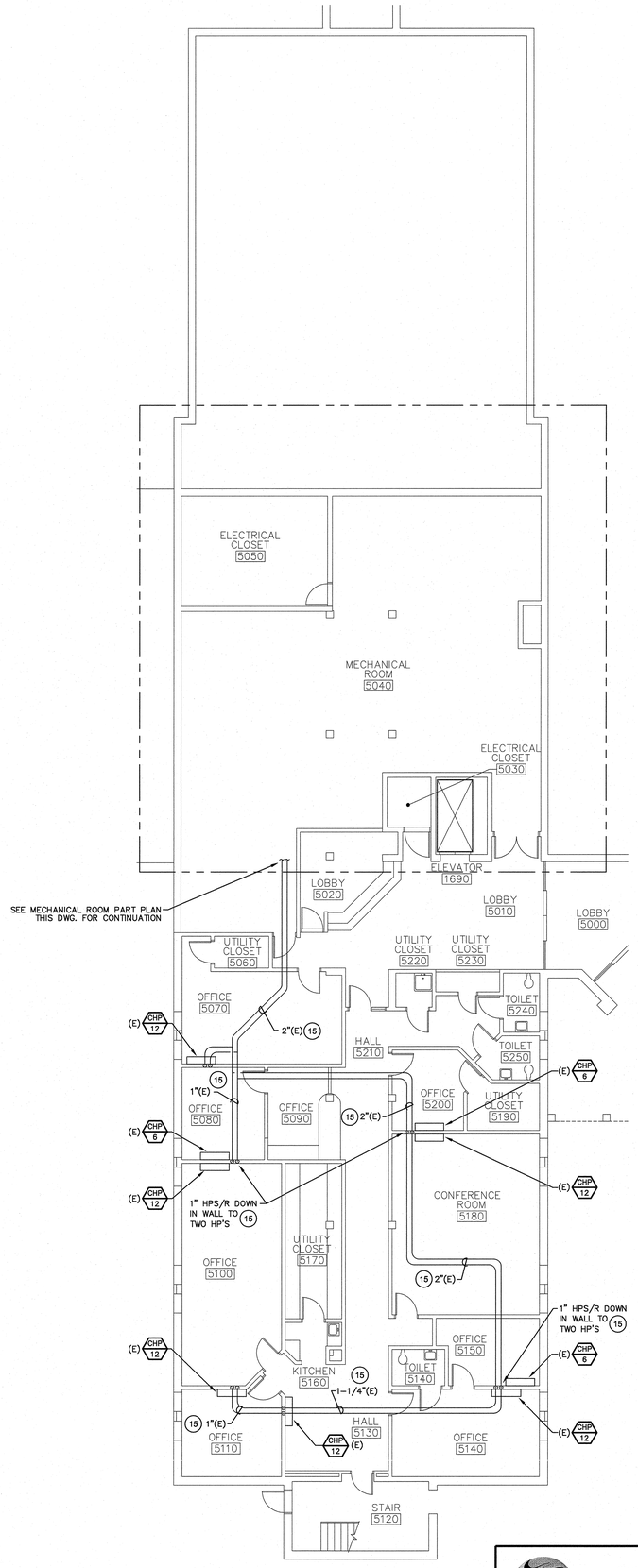
PROJECT No. 80839R
CONTRACT: B

DRAWN BY:	SCALE:	DATE:
MAM/EJD	AS SHOWN	NOVEMBER 2008

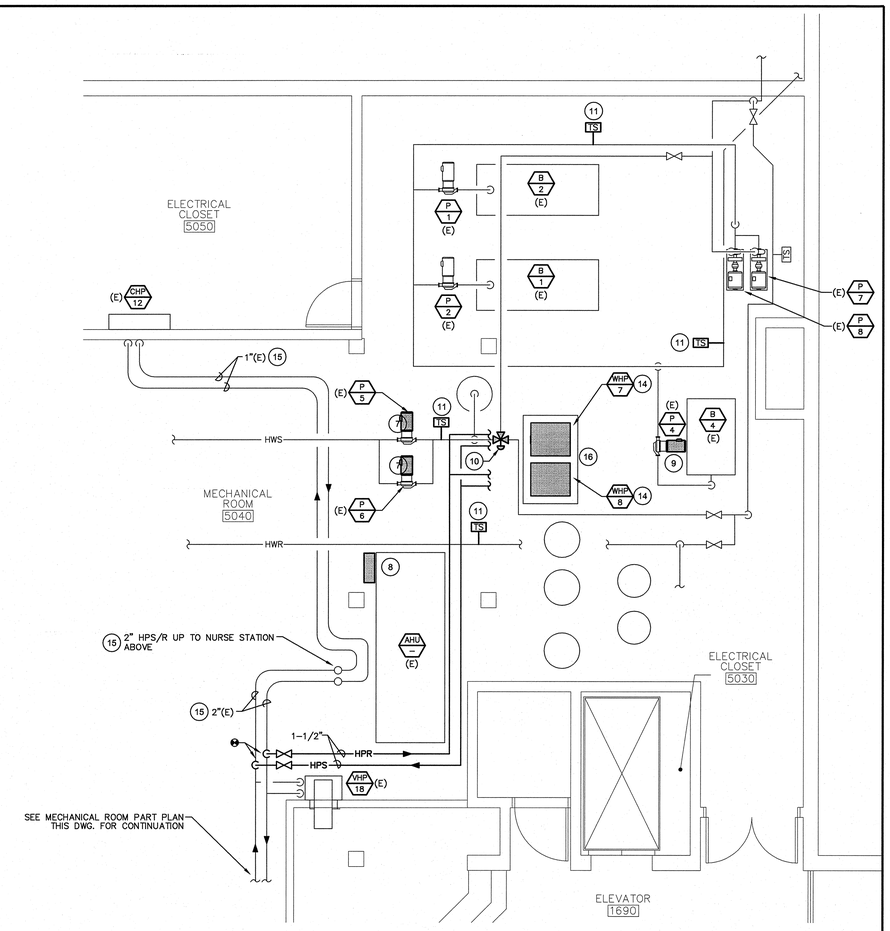
M-101
SHEET: 12 OF 57



TARR NORTH – GROUND FLOOR – MECHANICAL PLAN
1/8"=1'-0"



TARR SOUTH – GROUND FLOOR – MECHANICAL PLAN
1/8"=1'-0"

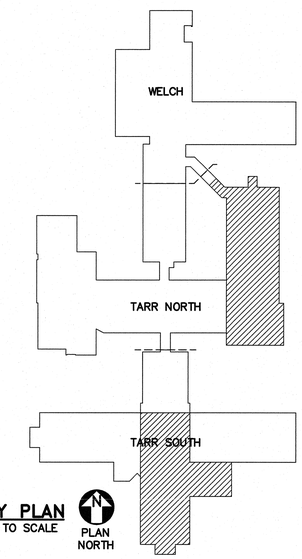


TARR SOUTH – GROUND FLOOR – MECHANICAL ROOM PART PLAN
1/4"=1'-0"

DRAWING NOTES:

1. ITEM #7/ECM-6: PROVIDE NEW 1HP FAN MOTOR
2. ITEM #7/ECM-6: PROVIDE NEW 7.5HP PUMP MOTOR
3. PROVIDE NEW DDC TEMPERATURE SENSOR SERVING (E) EF-11.
4. PROVIDE NEW 3-WAY CONTROL VALVE
5. PROVIDE NEW HEATING HW TEMPERATURE SENSOR
6. ITEM #7/ECM-6: PROVIDE NEW 2HP PUMP MOTOR
7. ITEM #7/ECM-6: PROVIDE NEW 1.5HP PUMP MOTOR
8. ITEM #7/ECM-6: PROVIDE NEW 3HP FAN MOTOR
9. ITEM #7/ECM-6: PROVIDE NEW 1.5HP PUMP MOTOR
10. PROVIDE NEW 3-WAY CONTROL VALVE ACTUATOR.
11. PROVIDE NEW HEATING HW TEMPERATURE SENSOR
13. PROVIDE DIGITAL THERMOSTAT
14. REFER TO WHP PIPING DETAIL
15. INSULATE EXISTING HPS & HPR PIPING
16. PROVIDE NEW EQUIPMENT PAD AS INDICATED
17. PROVIDE DDC CONTROL VALVE

ALL WORK ON THIS DWG IS ITEM #1/GEOTHERMAL SYSTEM EXCEPT AS NOTED.



KEY PLAN
NOT TO SCALE
PLAN NORTH

Stantec
Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

DATE	DESCRIPTION	BY

NH VETERANS HOME
ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

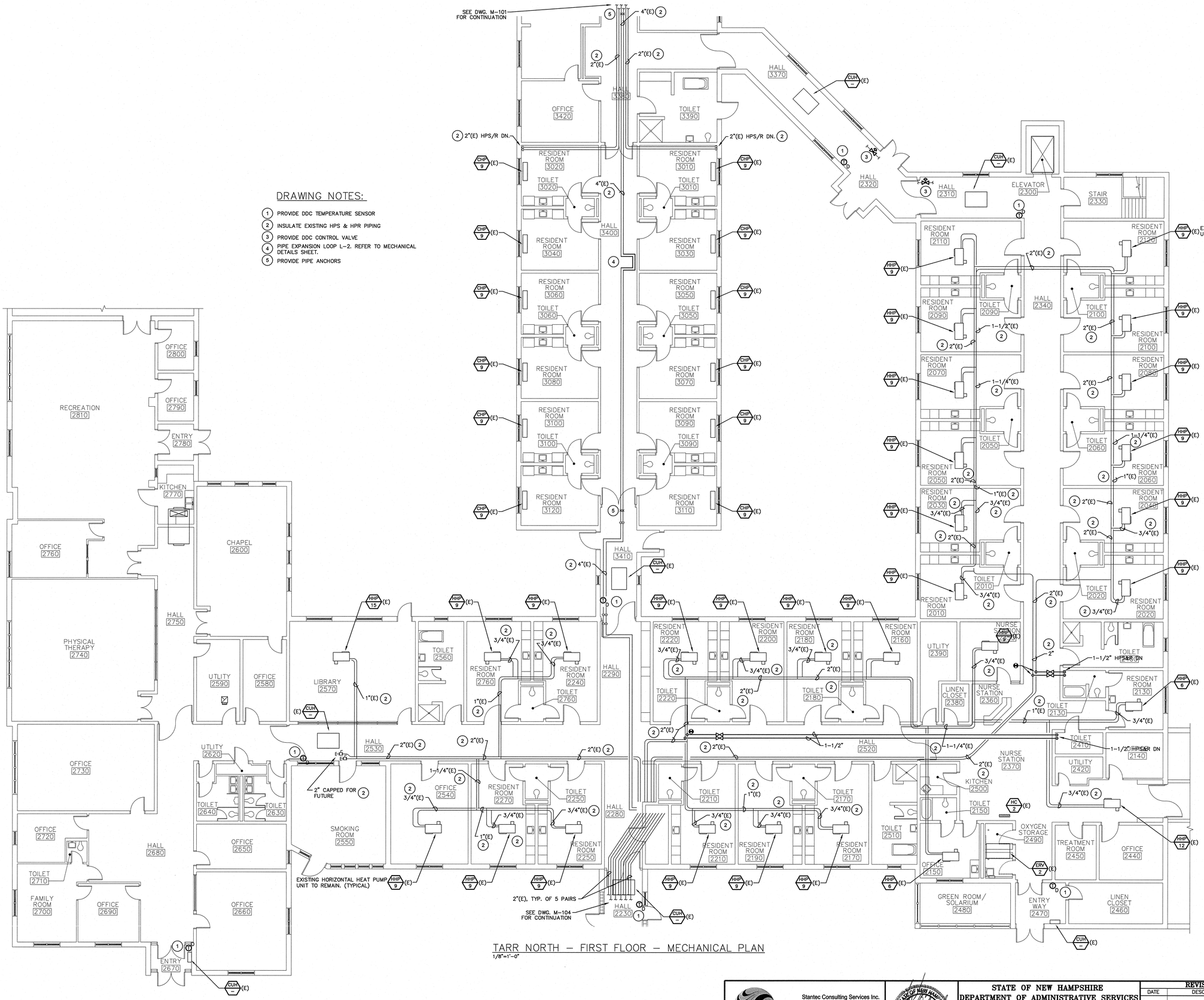
TARR NORTH AND SOUTH GROUND FLOOR MECHANICAL PLAN

DRAWN BY:	SCALE:	DATE:
MAM/EJD	AS SHOWN	NOVEMBER 2008

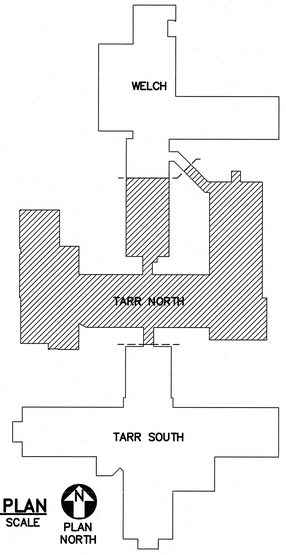
PROJECT No. 80839R
CONTRACT: B
SHEET: M-102
13 OF 57

DRAWING NOTES:

1. PROVIDE DDC TEMPERATURE SENSOR
2. INSULATE EXISTING HPS & HPR PIPING
3. PROVIDE DDC CONTROL VALVE
4. PIPE EXPANSION LOOP L-2. REFER TO MECHANICAL DETAILS SHEET.
5. PROVIDE PIPE ANCHORS



TARR NORTH – FIRST FLOOR – MECHANICAL PLAN
1/8"=1'-0"



KEY PLAN
NOT TO SCALE
PLAN NORTH

ALL WORK ON THIS DWG IS ITEM #1/GEOTHERMAL SYSTEM EXCEPT AS NOTED.

Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

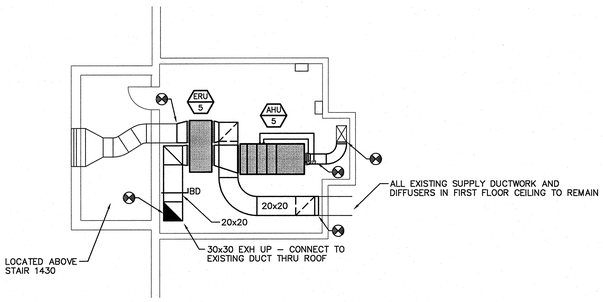
DATE	DESCRIPTION	BY

NH VETERANS HOME
ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

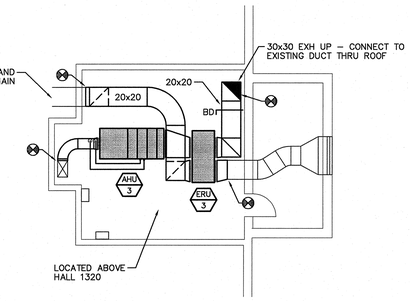
TARR NORTH FIRST FLOOR MECHANICAL PLAN

DRAWN BY:	SCALE:	DATE:
MAM/EJD	AS SHOWN	NOVEMBER 2008

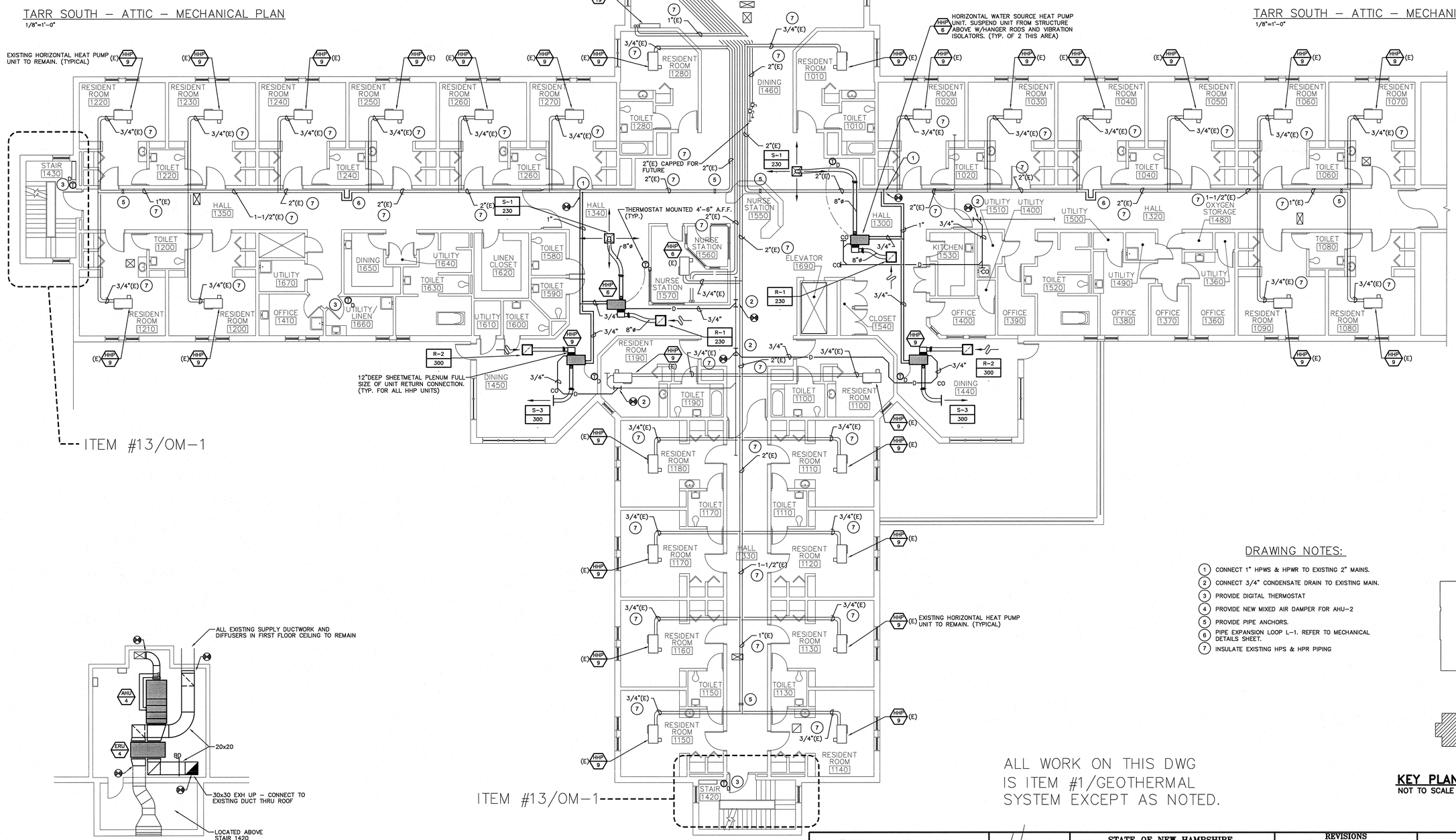
PROJECT No. 80839R
CONTRACT: B
M-103
SHEET: 14 OF 57



TARR SOUTH – ATTIC – MECHANICAL PLAN
1/8"=1'-0"



TARR SOUTH – ATTIC – MECHANICAL PLAN
1/8"=1'-0"



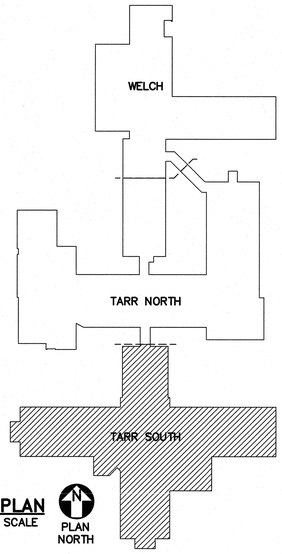
TARR SOUTH – FIRST FLOOR – MECHANICAL PLAN
1/8"=1'-0"

TARR SOUTH – ATTIC – MECHANICAL PLAN
1/8"=1'-0"

DRAWING NOTES:

1. CONNECT 1" HPWS & HPWR TO EXISTING 2" MAINS.
2. CONNECT 3/4" CONDENSATE DRAIN TO EXISTING MAIN.
3. PROVIDE DIGITAL THERMOSTAT
4. PROVIDE NEW MIXED AIR DAMPER FOR AHU-2
5. PROVIDE PIPE ANCHORS.
6. PIPE EXPANSION LOOP L-1. REFER TO MECHANICAL DETAILS SHEET.
7. INSULATE EXISTING HPS & HPR PIPING

ALL WORK ON THIS DWG IS ITEM #1/GEOTHERMAL SYSTEM EXCEPT AS NOTED.



KEY PLAN
NOT TO SCALE

Stantec
Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

DATE	DESCRIPTION	BY

NH VETERANS HOME ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

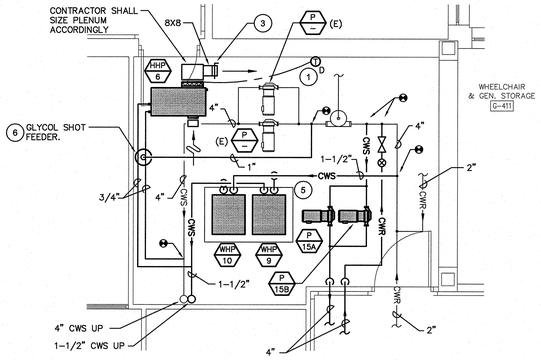
TARR SOUTH FIRST FLOOR MECHANICAL PLAN

PROJECT No. 80839R
CONTRACT: B

DRAWN BY:	SCALE:	DATE:	SHEET:
MAM/EJD	AS SHOWN	NOVEMBER 2008	M-104 15 OF 57

DRAWING NOTES:

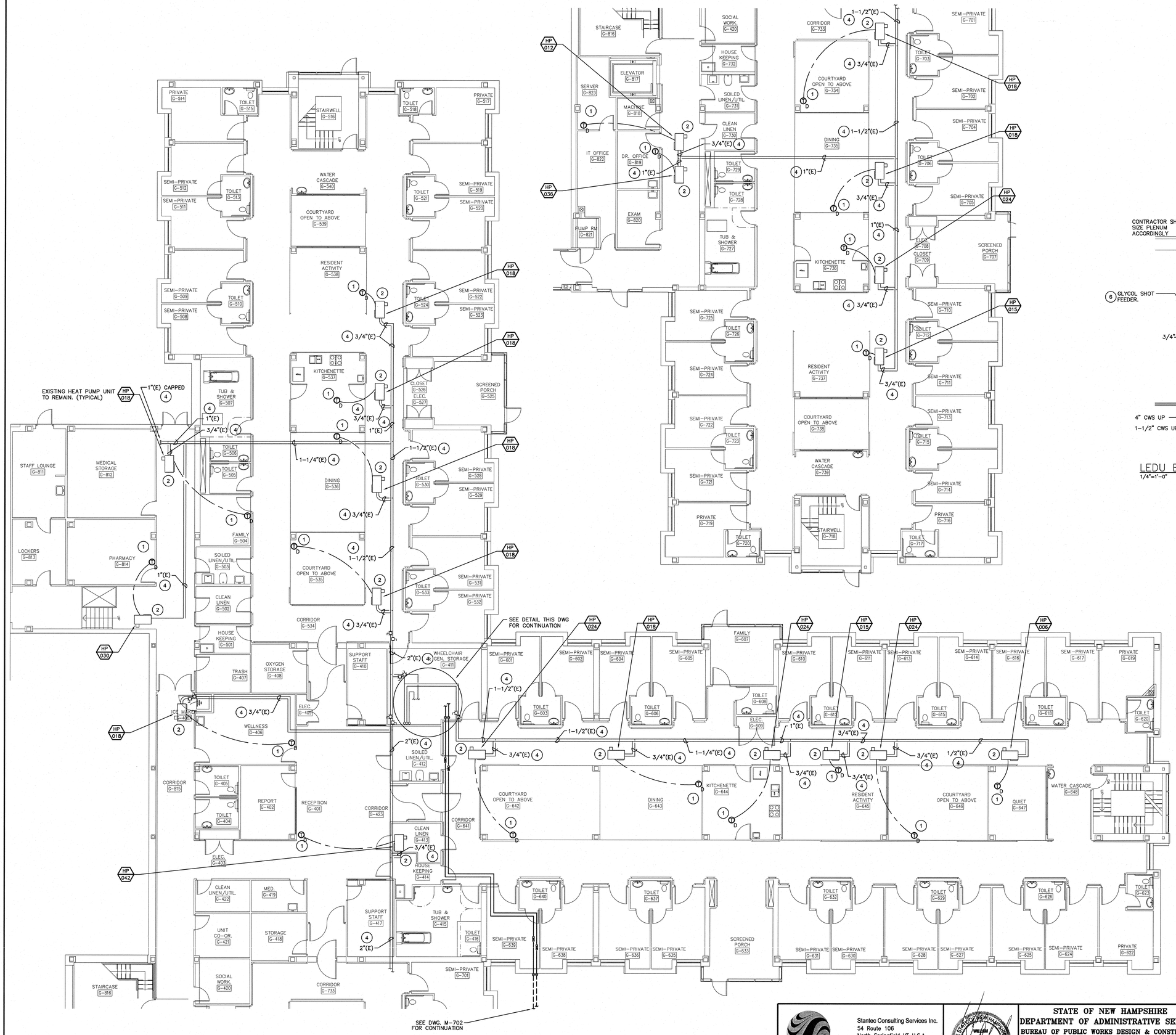
1. PROVIDE DIGITAL TEMPERATURE SENSOR
2. PROVIDE TWO-WAY HPS CONTROL VALVE AND DDC INTERFACE WITH EXISTING HEAT PUMP CONTROLLER.
3. BALANCE OPEN END DUCT WITH WIRE MESH SCREEN TO 230 CFM
4. INSULATE EXISTING HPS & HPR PIPING
5. PROVIDE NEW EQUIPMENT PAD AS INDICATED
6. GLYCOL SHOT FEEDER. SEE CHEMICAL FEEDER PIPING DETAIL. REMOVE EXISTING BYPASS FEEDER.



LEDU EAST – GROUND FLOOR – MECHANICAL PLAN

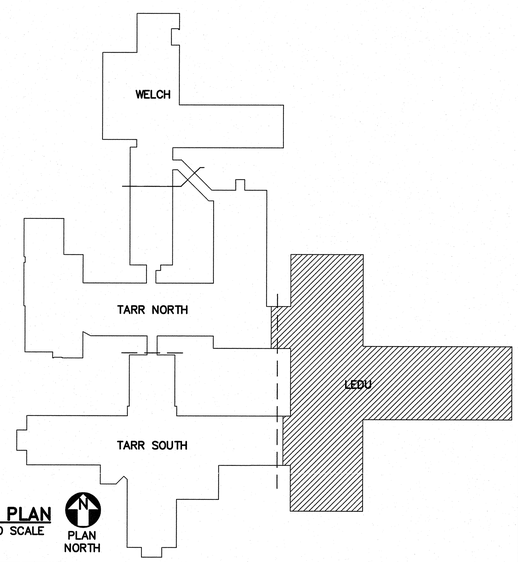
1/4"=1'-0"

ALL WORK ON THIS DWG IS ITEM #1/GEOTHERMAL SYSTEM EXCEPT AS NOTED.



LEDU – GROUND FLOOR – MECHANICAL PLAN

1/8"=1'-0"



KEY PLAN
NOT TO SCALE
PLAN NORTH

Stantec
Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

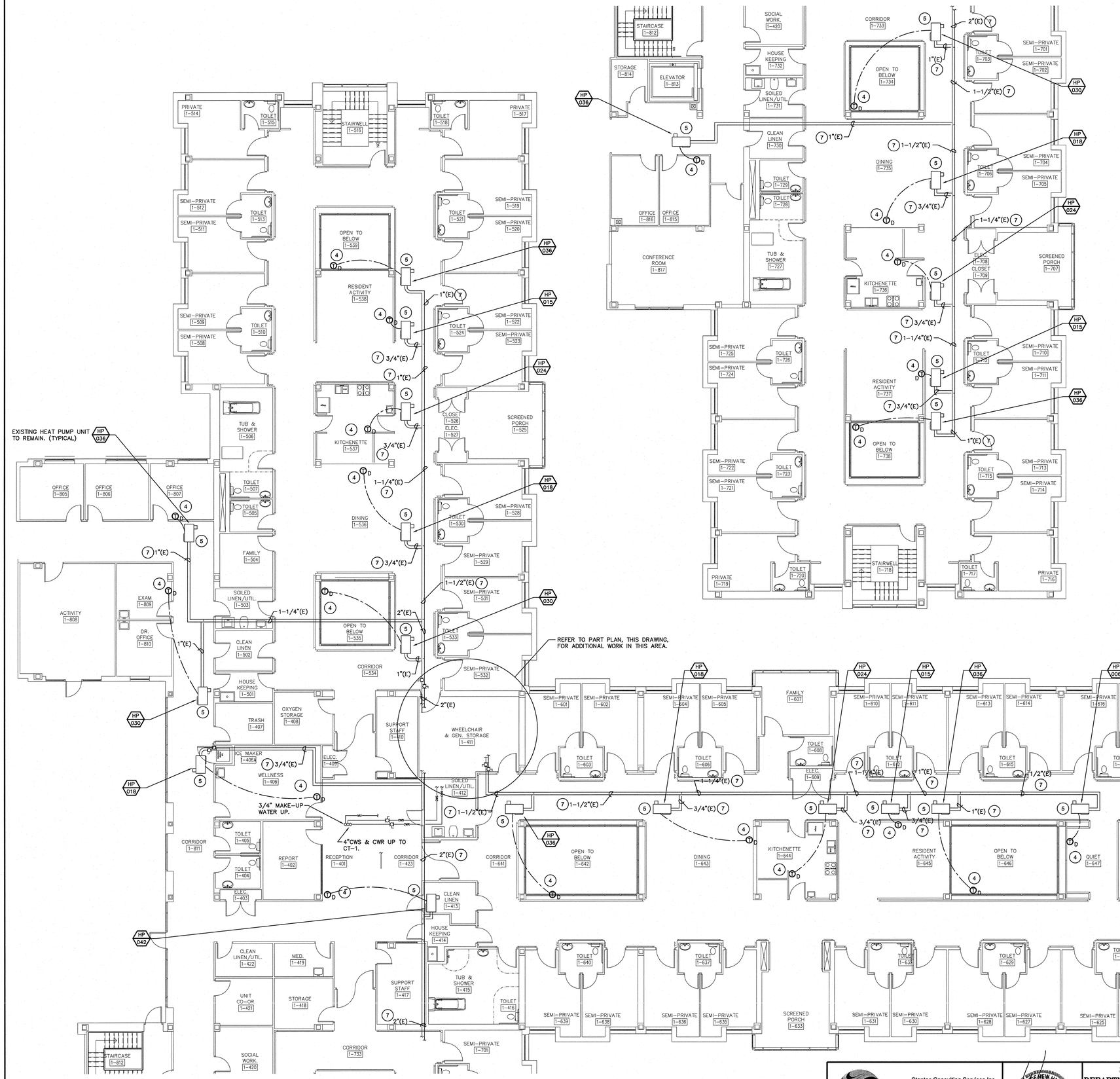
DATE	DESCRIPTION	BY

NH VETERANS HOME
ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

LEDU GROUND FLOOR
MECHANICAL PLAN

PROJECT No. 80839R
CONTRACT: 8

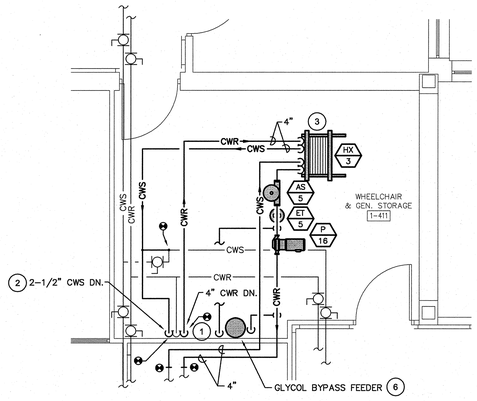
DRAWN BY:	SCALE:	DATE:	SHEET:
MAM/EJD	AS SHOWN	NOVEMBER 2008	M-105 16 OF 57



LEDU – FIRST FLOOR – MECHANICAL PLAN
1/8"=1'-0"

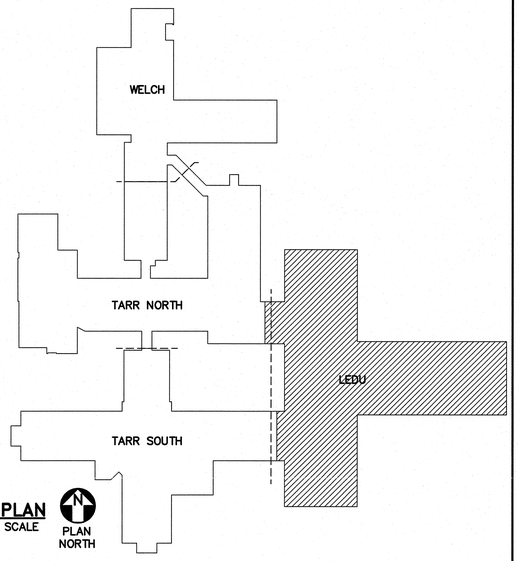
DRAWING NOTES:

1. CONNECT 4"CWR IN VERTICAL TO EXISTING 4"CWR.
2. CONNECT 2-1/2"CWS IN VERTICAL TO EXISTING 2-1/2" CWS.
3. HEAT EXCHANGER SUPPLY AND RETURN LINES SHOWN SIDE BY SIDE FOR CLARITY.
4. PROVIDE DIGITAL TEMPERATURE SENSOR.
5. PROVIDE UNITARY CONTROLLER TO INTERFACE WITH EXISTING HEAT PUMP CONTROLLER.
6. GLYCOL BYPASS FEEDER. SEE GLYCOL BYPASS FEEDER PIPING DETAIL
7. INSULATE EXISTING HPS & HPR PIPING



LEDU – FIRST FLOOR – ROOM 1-1141 PART PLAN
1/4"=1'-0"

ALL WORK ON THIS DWG IS ITEM #1/GEOTHERMAL SYSTEM EXCEPT AS NOTED.



KEY PLAN
NOT TO SCALE
PLAN NORTH

Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

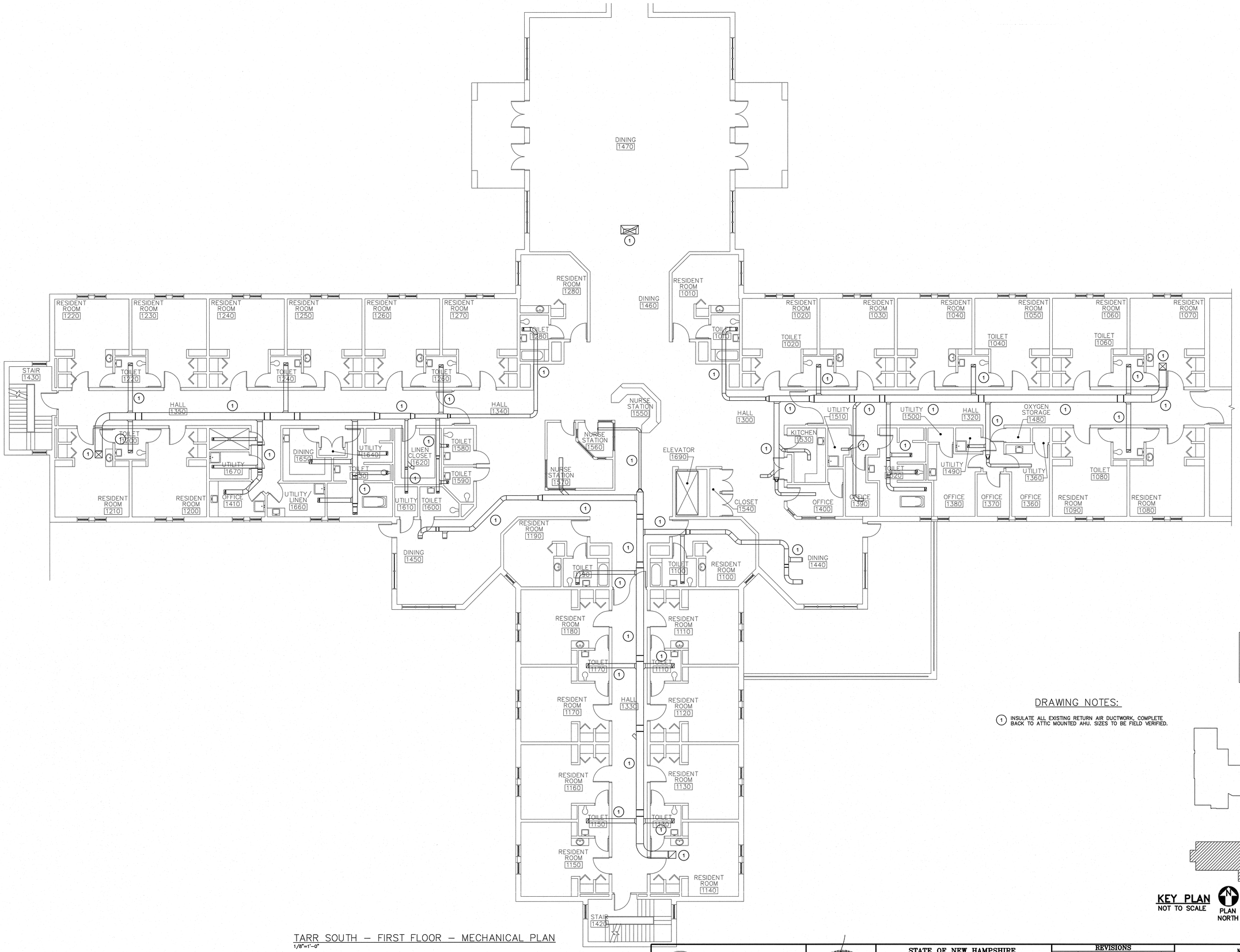
DATE	DESCRIPTION	BY

NH VETERANS HOME
ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

LEDU FIRST FLOOR
MECHANICAL PLAN

DRAWN BY:	SCALE:	DATE:
MAM/EJD	AS SHOWN	NOVEMBER 2008

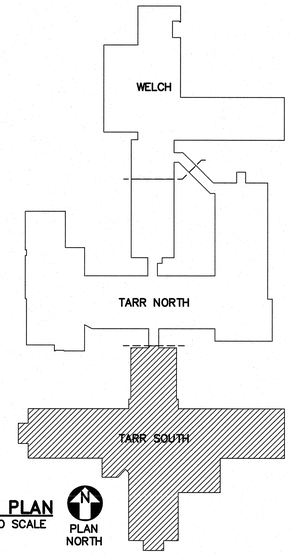
PROJECT No. 80839R
CONTRACT: B
M-106
SHEET: 17 OF 27



TARR SOUTH – FIRST FLOOR – MECHANICAL PLAN
1/8"=1'-0"

DRAWING NOTES:

1. INSULATE ALL EXISTING RETURN AIR DUCTWORK, COMPLETE BACK TO ATTIC MOUNTED AHU. SIZES TO BE FIELD VERIFIED.



KEY PLAN
NOT TO SCALE

PLAN NORTH

ALL WORK ON THIS DWG IS ITEM #1/GEOTHERMAL SYSTEM EXCEPT AS NOTED.

Stantec
Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

THE STATE OF NEW HAMPSHIRE
WILLIAM MCKINSTRY III
No. 6340
LICENSED
PROFESSIONAL ENGINEER
PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

DATE	DESCRIPTION	BY

NH VETERANS HOME
ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

TARR SOUTH FIRST FLOOR
MECHANICAL DUCTWORK PLAN

DRAWN BY:	SCALE:	DATE:
MAM/EJD	AS SHOWN	NOVEMBER 2008

PROJECT No. 80839R
CONTRACT: B
SHEET: M-107
18 OF 37

DIFFUSER/REGISTER/GRILLE SCHEDULE

ITEM	SERVICE	TYPE	CFM	FACE SIZE	MAX SP	MAX NC	MOUNTING	NECK	THROW @50 FPM	MANUFACTURER & MODEL	NOTES
S-1	SUPPLY	CEILING DIFFUSER	230	–	0.10	20	LAY-IN	8 – 9x9	15	PRICE, AMD	1
S-2	SUPPLY	CEILING DIFFUSER	600	–	0.10	22	SURFACE	12 – 15x15	21	PRICE, PDR	1
S-3	SUPPLY	SIDEWALL DIFFUSER	300	–	0.02	20	SURFACE	12x8	15	PRICE, SERIES 610-L	2
R-1	RETURN	CEILING RETURN	230	–	0.19	25	LAY-IN	8	–	PRICE, PDDR	1
R-2	RETURN	CEILING RETURN	300	–	0.18	30	LAY-IN	10	–	PRICE, PDDR	1

<u>NOTES</u> 1. 24x24 MODULE
2. OPTIONAL OPPOSED BLADE DAMPER
3. FURNISH WITH 4 CONTINUOUS SLOTS, BoRDER TYPE 16
4. FURNISH PLENUM W/ 1" INTERIOR INSULATION

INDICATES BLANKED OFF DIFFUSER QUADRANT
SEE PLANS FOR 1, 2 OR 3 WAY DIFFUSERS

PUMP SCHEDULE

ITEM	SERVICE	LOCATION	FLUID MEDIUM	MODEL NO.	FLOW RATE (GPM)	HEAD (FT)	SPEED (RPM)	POWER (HP)	POWER SUPPLY (V/PH/HZ)	STARTER LOCATION	VFD	NOTES
P-2A	WELCH, TARR GEOEXCHANGE	WELCH MECH RM	25% PG	KV4013	271	120	1750	15	208/3/60	LOCAL	YES	–
P-2B	WELCH, TARR GEOEXCHANGE	WELCH MECH RM	25% PG	KV4013	271	120	1750	15	208/3/60	LOCAL	YES	–
P-9A	WELCH, TARR GEOEXCHANGE	WELCH MECH RM	25% PG	KV4013	320	90	1750	20	208/3/60	LOCAL	YES	–
P-9B	WELCH, TARR GEOEXCHANGE	WELCH MECH RM	25% PG	KV4013	320	90	1750	20	208/3/60	LOCAL	YES	–
P-10	HP CIRC. SERVING WELCH DHW SYS.	TARR NORTH MECH RM	25% PG	KV1509	30	80	1750	5	208/3/60	LOCAL	NO	–
P-11	HP CIRC. SERVING TARR NORTH DHW SYS.	TARR SOUTH MECH RM	25% PG	KV1509	30	80	1750	5	208/3/60	LOCAL	NO	–
P-12	HP CIRC. SERVING TARR SOUTH DHW SYS.	TARR NORTH LAUNDRY	25% PG	KV1509	30	80	1750	5	208/3/60	LOCAL	NO	–
P-13	HP CIRC. SERVING LAUNDRY DHW SYS.	TARR NORTH MECH RM	25% PG	KV1509	30	80	1750	5	208/3/60	LOCAL	NO	–
P-14	HP CIRC. SERVING LEDU DHW SYS.	LEDU MECH RM	25% PG	KV4013	30	80	1750	5	208/3/60	LOCAL	NO	–
P-15A	LEDU GEOEXCHANGE	LEDU MECH RM	25% PG	KV2508	180	80	1750	10	208/3/60	LOCAL	YES	–
P-15B	LEDU GEOEXCHANGE	LEDU MECH RM	25% PG	KV2508	180	80	1750	10	208/3/60	LOCAL	YES	–
P-16	LEDU COOLING TOWER CT-2	LEDU MECH RM	40% PG	KV3007	148	50	1750	5	208/3/60	LOCAL	NO	–
–		–	–	–	–	–	–	–	–	–	–	–
–		–	–	–	–	–	–	–	–	–	–	–

NOTES:
1, PUMP SELECTIONS ARE BASED ON TACO .

WATER TO AIR HEAT PUMP SCHEDULE

DESIGNATION	LOCATION/ SERVICE	MANUFACTURER/ MODEL NO.	SUPPLY AIR FLOW (CFM)	E.S.P. (in. WG)	TOTAL COOLING CAP. (MBH)	SENSIBLE COOLING CAP. (MBH)	HEATING CAPACITY (MBH)	FLUID FLOW (GPM)	FLUID P.D. (ft. WG)	FLUID S & R CONN. ø (in.)	POWER SUPPLY (V/PH/FLA)
HHP 6	TARR SOUTH LEDU	CARRIER, 50 RHR	230	0.35	7.6	4.9	5.7	1.5	1.5	3/4	208/1/3.3
HHP 9	TARR SOUTH	CARRIER, 50 RHR	300	0.5	7.6	5.8	6.8	2.0	2.9	3/4	208/1/4.7
–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–

NOTES:
1. COOLING CAPACITY BASED ON 90°F E.W.T. & 80/67°F E.A.T.
2. HEATING CAPACITY BASED ON 35°F E.W.T. & 68°F E.A.T.
3. ALL HEAT PUMPS PERFORMANCE BASED ON A FLUID MEDIUM OF 20% ETHANOL AND 80% WATER BY VOLUME.
4. ALL HEAT PUMPS TO BE FURNISHED WITH ALL SOUND QUIETING OPTIONS.
5. ALL HEAT PUMPS TO BE HORIZONTAL TYPE, UNLESS NOTED OTHERWISE.
6. HEAT PUMP MANUFACTURER TO BE CLIMATEMASTER OR EQUAL (SEE SPECIFICATION FOR SUBSTITUTIONS)
7. PROVIDE WITH MANUFACTURERS DISCONNECT

PLATE HEAT EXCHANGER SCHEDULE

UNIT NO	HEAT PUMP (HOT) SIDE				CT (COLD) SIDE (40% PROP. GLYCOL)				MANUFACTURER AND MODEL NUMBER	NOTES
	EWT °F	LWT °F	GPM	PRESS DROP	EFT °F	LFT °F	GPM	PRESS DROP		
HX-3	113	103	148(250)	4.68	89	99.3	148	4.96	ALFA LAVAL M6-MFG	1

NOTES: 1. HOT SIDE DESIGN FLOW IS SHOWN; HX-3 SHALL BE EXPANDABLE FOR FUTURE FLOW (250) BY ADDING PLATES.

EXPANSION TANK SCHEDULE

UNIT NO	LOCATION	ACCEPTANCE VOLUME	DIMENSIONS INCHES	MANUFACTURER AND MODEL	NOTES
EXT-3	WELCH	20	38H x 20ø	TACO CBX 130	SERVES HP LOOP (25% PROP. GLYCOL)
EXT-5	LEDU	5	22H x 14ø	TACO CBX 30	SERVES CT-2 LOOP (40% PROP. GLYCOL)

NOTES:

AIR SEPARATOR SCHEDULE

UNIT NO	LOCATION	TYPE	SIZE INCHES	PRESSURE DROP	STRAINER	MANUFACTURER AND MODEL	NOTES
AS-5	LEDU	TANGENTIAL	4	1 FT	YES	TACO AC4F	SERVES CT-2 LOOP

NOTES:

WATER TO WATER HEAT PUMP SCHEDULE

DESIGNATION	LOCATION	MANUFACTURER	MODEL NO.	COOLING CAPACITY (MBH)	COOLING SOURCE EWT (°F)	COOLING SOURCE LWT (°F)	COOLING LOAD EWT (°F)	COOLING LOAD LWT (°F)	COOLING MEDIUM SOURCE/LOAD	COOLING FLOW (GPM)	COOLING P.D. (FT.HD)	HEATING CAPACITY (MBH)	HEATING SOURCE EWT (°F)	HEATING SOURCE LWT (°F)	HEATING LOAD EWT (°F)	HEATING LOAD LWT (°F)	HEATING MEDIUM SOURCE/LOAD	HEATING FLOW (GPM)	HEATING P.D. (FT.HD)	POWER (kW)	POWER SUPPLY (V/PH/HZ)	STARTER LOCATION	COP BTUH/W	RLA	LRA	MCA	MOCP	HOSE KIT SIZE	NOTES
WHP-1	WELCH	CLIMATE-MASTER	GSW060	–	–	–	–	–	–	–	–	49.1	40	48	60	68	25% P.G. WATER	15	15	–	208/3/60	UNIT	5.7	19.3	123.0	24.1	40	–	–
WHP-2	WELCH	CLIMATE-MASTER	GSW060	–	–	–	–	–	–	–	–	49.1	40	48	60	68	25% P.G. WATER	15	15	–	208/3/60	–	5.7	19.3	123.0	24.1	40	–	–
WHP-3	TARR NORTH	CLIMATE-MASTER	GSW060	–	–	–	–	–	–	–	–	49.1	40	48	60	68	25% P.G. WATER	15	15	–	208/3/60	–	5.7	19.3	123.0	24.1	40	–	–
WHP-4	TARR NORTH	CLIMATE-MASTER	GSW060	–	–	–	–	–	–	–	–	49.1	40	48	60	68	25% P.G. WATER	15	15	–	208/3/60	–	5.7	19.3	123.0	24.1	40	–	–
WHP-5	TARR NORTH	CLIMATE-MASTER	GSW120	–	–	–	–	–	–	–	–	88.2	40	48	60	68	25% P.G. WATER	15	17.5	–	208/3/60	–	5.2	38.6	246	43.4	60	–	–
WHP-6	TARR NORTH	CLIMATE-MASTER	GSW120	–	–	–	–	–	–	–	–	88.2	40	48	60	68	25% P.G. WATER	15	15	–	208/3/60	–	5.7	38.6	246	43.4	60	–	–
WHP-7	TARR SOUTH	CLIMATE-MASTER	GSW060	–	–	–	–	–	–	–	–	49.1	40	48	60	68	25% P.G. WATER	15	15	–	208/3/60	–	5.7	19.3	123.0	24.1	40	–	–
WHP-8	TARR SOUTH	CLIMATE-MASTER	GSW060	–	–	–	–	–	–	–	–	49.1	40	48	60	68	25% P.G. WATER	15	15	–	208/3/60	–	5.7	19.3	123.0	24.1	40	–	–
WHP-9	LEDU	CLIMATE-MASTER	GSW060	–	–	–	–	–	–	–	–	49.1	40	48	60	68	25% P.G. WATER	15	15	–	208/3/60	–	5.7	19.3	123.0	24.1	40	–	–
WHP-10	LEDU	CLIMATE-MASTER	GSW060	–	–	–	–	–	–	–	–	49.1	40	48	60	68	25% P.G. WATER	15	15	–	208/3/60	–	5.7	19.3	123.0	24.1	40	–	–

NOTES: 1. PROVIDE WITH MANUFACTURERS DISCONNECT

AIR HANDLING UNIT SCHEDULE

TAG	LOCATION	TOTAL CFM	MINIMUM OA CFM	SUPPLY FAN DATA ESP	SUPPLY FAN DATA TOTAL S.P.	SUPPLY FAN DATA RPM	SUPPLY FAN DATA BHP	SUPPLY FAN DATA H.P.	HEATING COIL TOTAL MBH	AIR DATA CFM	AIR DATA TEMP (F) ENT.	AIR DATA TEMP (F) LVG.	WATER DATA GPM	WATER DATA TEMP. ENT. (F)	WATER DATA TEMP. LVG. (F)	MAX FACE VEL	ROWS	FINS PER FT	ELECTRIC VOLTS	ELECTRIC FLA	ELECTRIC MCA	MANUFACTURER & MODEL NUMBER	NOTES
AHU-3	TARR SOUTH	2750	2750	1.20	2.20	1800	1.659	3	125	2750	30	72	12.6	130	110	564	2	111	208/3ø	–	–	TRANE-M-SERIES CLIMATE CHANGER	
AHU-4	TARR SOUTH	3000	3000	1.20	2.29	1800	1.847	3	137	3000	30	72	13.7	130	110	615	2	113	208/3ø	–	–	TRANE-M-SERIES CLIMATE CHANGER	
AHU-5	TARR SOUTH	2750	2750	1.20	2.20	1800	1.659	3	125	2750	30	72	12.6	130	110	564	2	111	208/3ø	–	–	TRANE-M-SERIES CLIMATE CHANGER	

NOTES: 1.

MAKEUP AIR UNIT

TAG	LOCATION	TOTAL CFM	SUPPLY FAN DATA ESP	SUPPLY FAN DATA TOTAL S.P.	SUPPLY FAN DATA RPM	SUPPLY FAN DATA BHP	SUPPLY FAN DATA H.P.	HEATER TYPE	HEATER EAT (DEG F)	HEATER LAT (DEG F)	HEATER INPUT (MBH)	HEATER OUTPUT (MBH)	ELECTRIC VOLTS	ELECTRIC FLA	ELECTRIC MCA	MANUFACTURER & MODEL NUMBER	NOTES
MUA-1	KITCHEN ROOF	4800	0.5	1.3	1725	3.13	5	LP GAS	-11	65	419	385.6	208/3ø	22.1	–	GRENHECK DGX-112-H22	1

NOTES: 1. UNIT SHALL BE EQUIPED WITH VARAIABLE AIR VOLUME FEATURE. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORAMTION ON OPTIONS AND ACCESSORIES

ENERGY RECOVERY UNIT SCHEDULE

DESIGNATION	MANUFACTURER	MODEL	SUPPLY FAN OUTDOOR TEMP. WINT./SUMMER (°Fdb.°Fdb/°Fwb)	SUPPLY FAN FLOW (CFM)	SUPPLY FAN E.S.P. (in.)	SUPPLY FAN RPM	SUPPLY FAN FAN MOTOR (HP)	EXHAUST FAN FLOW (CFM)	EXHAUST FAN E.S.P. (in.)	EXHAUST FAN ENT. TEMP. WINTER/SUMMER (°Fdb/%RH,°Fdb/%RH)	EXHAUST FAN RPM	EXHAUST FAN FAN MOTOR (HP)	PLATE PERFORMANCE SUMMER SENSIBLE RECOVERY (%)	PLATE PERFORMANCE WINTER SENSIBLE RECOVERY (%)	POWER SUPPLY (V/PH/HZ)	NOTES
ERU-3	RENEWAIRE	HE4XINV	-12, 89/73	2750	0.5	1480	3	2750	1.0	70/30, 72/50	1600	5	49	63	208/3/60	
ERU-4	RENEWAIRE	HE4XINV	-12, 89/73	3000	0.5	1550	5	3000	1.0	70/30, 72/50	1675	5	48	62	208/3/60	
ERU-5	RENEWAIRE	HE4XINV	-12, 89/73	2750	0.5	1480	3	2750	1.0	70/30, 72/50	1600	5	49	63	208/3/60	

NOTES:

Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com
Stantec

THE STATE OF NEW HAMPSHIRE
WILLIAM SCHLAGETER, JR.
No. 8395
LICENSED
PROFESSIONAL ENGINEER
PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

DATE	DESCRIPTION	BY

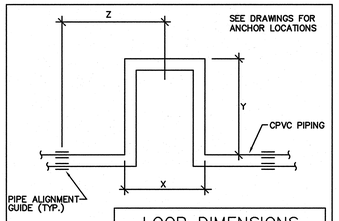
NH VETERANS HOME
ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

MECHANICAL SCHEDULES AND DETAILS

PROJECT No. 80839R
CONTRACT: B

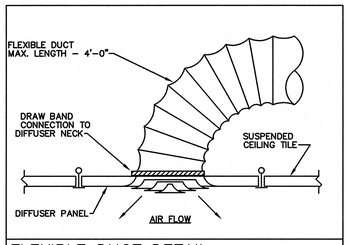
DRAWN BY:	SCALE:	DATE:
MAM/EJD	AS SHOWN	NOVEMBER 2008

M-501
SHEET: 19 OF 57

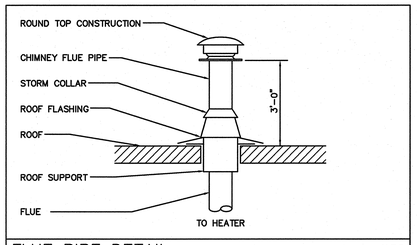


LOOP DIMENSIONS				
	TYPE	X	Y	Z
L-1	CPVC	10"	18"	36"
L-2	STEEL	24"	48"	96"

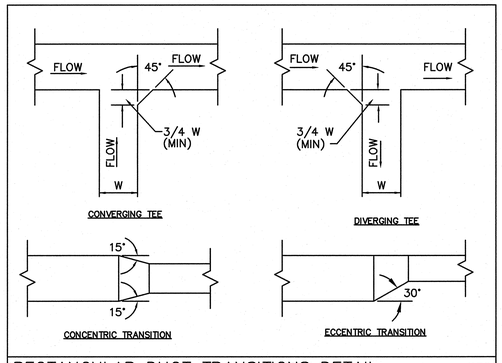
EXPANSION LOOP DETAIL N.T.S.



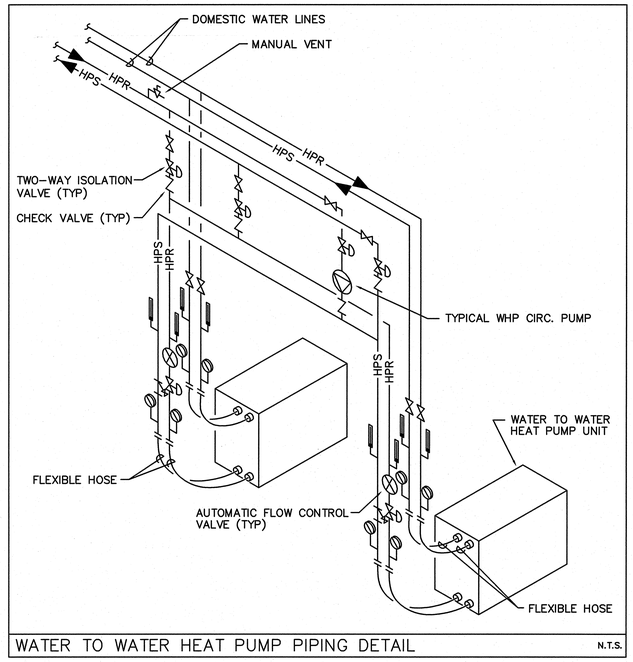
FLEXIBLE DUCT DETAIL N.T.S.



FLUE PIPE DETAIL N.T.S.



RECTANGULAR DUCT TRANSITIONS DETAIL N.T.S.



WATER TO WATER HEAT PUMP PIPING DETAIL N.T.S.

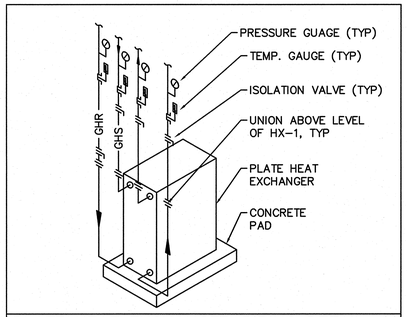
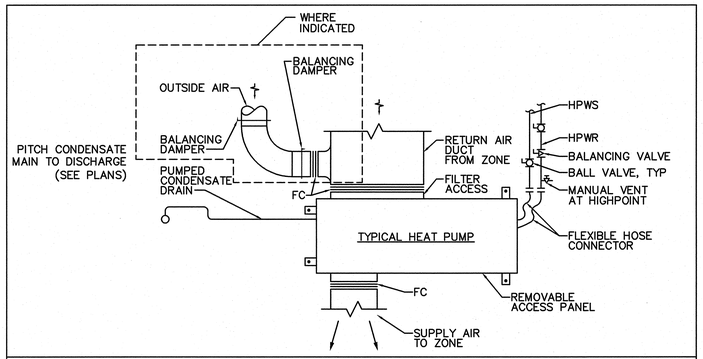
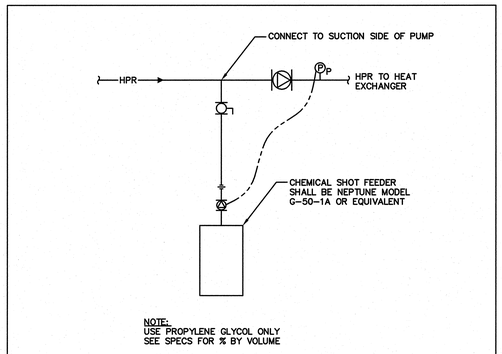


PLATE HEAT EXCHANGER PIPING DETAIL N.T.S.

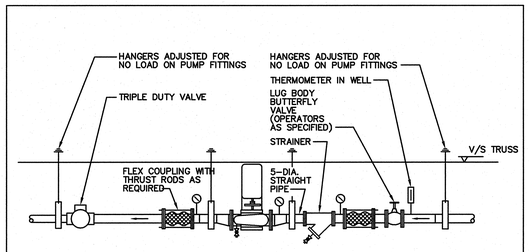


WATER-TO-AIR HEAT PUMP CONNECTION DETAIL N.T.S.



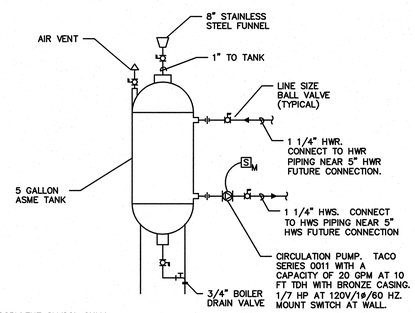
NOTE:
USE PROPYLENE GLYCOL ONLY
SEE SPECS FOR % BY VOLUME

CHEMICAL SHOT FEEDER DETAIL N.T.S.



NOTES
1. ALL PRESSURE-GAUGE FACES SHALL BE WITHIN
2. IF SPACES DOES NOT PERMIT 5-DIAMETER SHALL BE USED.

VERTICAL IN-LINE PUMP DETAIL N.T.S.



NOTE:
USE PROPYLENE GLYCOL ONLY
SEE SPECS FOR % BY VOLUME

GLYCOL BYPASS FEEDER DETAIL N.T.S.

Stantec

Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

THE STATE OF NEW HAMPSHIRE
KENNETH E. SCHEFF
No. 8326
PROFESSIONAL ENGINEER
PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

DATE	DESCRIPTION	BY

NH VETERANS HOME
ENERGY ENHANCEMENTS

139 WINTER STREET TILTON, NEW HAMPSHIRE

MECHANICAL SCHEDULES AND DETAILS

PROJECT No. 80839R
CONTRACT: B

DRAWN BY:	SCALE:	DATE:
MAM/EJD	AS SHOWN	NOVEMBER 2008

M-502
SHEET: 20 OF 57

POINTS LIST

SYSTEM/POINT	DO	DI	AO	AI	COMMENTS
MUA-1 START/ STOP	●				
MUA-1 SUPPLY FAN VFD			●		
MUA SUPPLY FAN VFD ALARM		●			
MUA SUPPLY FAN RUN STATUS		●			
MUA-1 MODULATING PROPANE GAS VALVE			●		
MUA-1 SUPPLY AIR TEMPERATURE				●	
MUA-1 SMOKE DETECTOR		●			
MUA-1 FREEZE STAT		●			
MUA-1 FILTER SWITCH		●			
KITCHEN HOOD EXHAUST FAN EF-1A VFD			●		
KITCHEN HOOD EXHAUST FAN EF-1B VFD			●		
EF-1A RUN STATUS		●			
EF-1B RUN STATUS		●			
EF-1A VFD ALARM		●			
EF-1B VFD ALARM		●			

MUA-1 AND KITCHEN HOOD EXHAUST FANS EF-1A AND EF-1B

THE KITCHEN EXHAUST HOOD FANS EF-1A AND EF-1B SHALL BE STARTED INDIRECTLY THROUGH A LOCAL WALL SWITCH WHICH WILL COMMAND THE EXHAUST HOOD DEMAND CONTROLLER TO START THE FANS. MUA-1 SHALL START/ STOP IN UNISON WITH EF-1A AND EF-1B.

THE EXHAUST HOOD DEMAND CONTROLLER SHALL SEND AN OUTPUT SIGNAL TO MUA-1 MODULATE EF-1A AND EF-1B VARAIBLE FREQUENCY DRIVES.

THE EXHAUST HOOD CONTROLLER SHALL SEND AN OUTLPUT SIGNAL TO THE ANSUL SYSTEM IN THE EVENT OF A FIRE CONDITION.

SUPPLY TEMPERATURE CONTROL

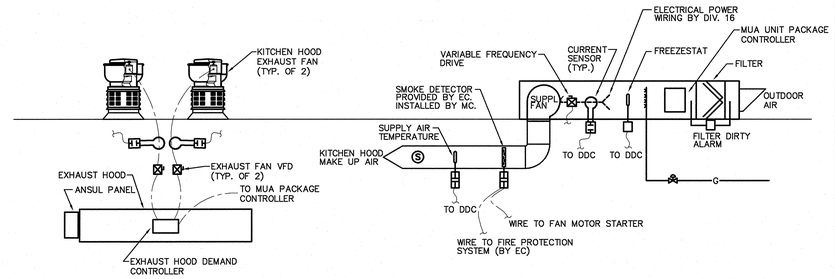
BMS SHALL MEASURE DUCT SUPPLY AIR TEMPERATURE AND CONTROL MUA-1 MODULATING LP GAS HEATING VALVE SHALL MODULATE TO MAINTAIN SETPOINT OF 65 DEG F (ADJ.).

SAFETY

MUA-1 SHALL SHUTDOWN WHEN SUPPLY AIR SMOKE IS DETECTED.

MUA-1 SHALL SHUTDOWN WHEN SUPPLY AIR TEMPERATURE IS AT A LOW LIMIT OF 40 DEG F (ADJ.).

REFER TO PLUMBING DRAWINGS FOR COMPLETE DHW HEATING CONTROL SCHEMATICS



MUA-1 AND KITCHEN HOOD EXHAUST FANS EF-1A AND EF-1B

ITEM #9/ECM-8

NO SCALE | CS-03

POINTS LIST

SYSTEM/POINT	DO	DI	AO	AI	COMMENTS
HP (LEAD) START/ STOP	●				
HP (LAG) START/ STOP	●				
HP (LEAD) RUN STATUS		●			
HP (LAG) RUN STATUS		●			
2-WAY CONTROL VALVE V-1	●				
2-WAY CONTROL VALVE V-2	●				
2-WAY CONTROL VALVE V-3	●				
2-WAY CONTROL VALVE V-4	●				
HP CIRC. PUMP START/ STOP	●				
HP CIRC. PUMP RUN STATUS		●			
HP (LEAD) ALARM STATUS		●			
HP (LAG) ALARM STATUS		●			

DOMESTIC HOT WATER HEAT PUMPS

HEAT PUMPS SHALL CYCLE IN SEQUENCE TO MAINTAIN DHW STORAGE TANK TEMPERATURE SETPOINT OF 120 DEG F (ADJ.).

DHW CIRCULATION PUMP SHALL START/STOP IN SYNC WITH HP OPERATION.

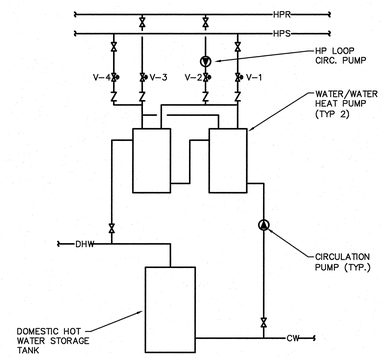
WHEN HPS WATER TEMPERATURE IS GREATER THAN HPR TEMPERATURE VALVES V-1 AND V-3 SHALL OPEN AND VALVES V-2 AND V-4 SHALL CLOSE.

WHEN HPR TEMPERATURE IS GREATER THAN HPS TEMPERATURE THE HP SOURCE WATER CIRCULATION PUMP SHALL START AND RESPECTIVE TWO-WAY VALVES V-2 AND V-4 SHALL OPEN. VALVES V-1 AND V-3 SHALL CLOSE.

SAFETY

A HEAT PUMP FAILURE SHALL GENERATE AN ALARM SIGNAL TO THE BAS.

* REFER TO PLUMBING DRAWINGS FOR DHW HEATING CONTROL SCHEMATIC.



DOMESTIC HOT WATER (DHW) HEAT PUMP (HP) CONTROL & PIPING SCHEMATIC (TYP 5 LOCATIONS)

ITEM #1/GEOTHERMAL SYSTEM

NO SCALE | CS-03

POINTS LIST

SYSTEM/POINT	DO	DI	AO	AI	COMMENTS
AHU-1 SUPPLY FAN START/ STOP	●				
AHU-1 RUN STATUS		●			
AHU-1 MIXED AIR DAMPER			●		
AHU-1 FACE AND BYPASS DAMPER			●		
AHU-1 FILTER STATUS		●			
AHU-1 FREEZESTAT		●			
AHU-1 DISCHAGRE AIR TEMP.		●		●	
AHU-1 SMOKE DETECTOR		●			
AHU-2 SUPPLY FAN START/ STOP	●				
AHU-2 RUN STATUS		●			
AHU-2 MIXED AIR DAMPER			●		
AHU-2 FACE AND BYPASS DAMPER			●		
AHU-2 HW CONTROL VALVE	●				
AHU-2 FREEZESTAT		●			
AHU-2 DISCHAGRE AIR TEMP.				●	
AHU-2 RETURN DUCT CO2 SENSOR				●	
AHU-2 SMOKE DETECTOR		●			

AHU-1 AND AHU-2

AHU SHALL START/ STOP AS COMMANDED BY THE BMS AND RUN AS SCHEDULED THROUGH THE BMS.

FACE AND BYPASS DAMPERS SHALL MIODULATE TO MAINTAIN A DISCHARGE AIR SETPOINT OF 70 DEG F (ADJ.).

AHU-1 MIXED AIR DAMPER CONTROL SHALL OPEN OA DAMPER TO ITS MINIMUM POSITION WHEN OCCUPIED SCHEDULING. DAMPER SHALL CLOSE WHEN THE UNIT IS SHUTDOWN DURING UNOCCUPIED HOURS.

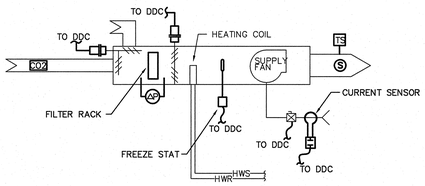
DEMAND CONTROLLED VENTIALTION (AHU-2 ONLY)

MIXED AIR DAMPERS SHALL MODULATE TO MAINTAIN CO2 SETPOINT OF 110 PPM (ADJ.). OA DAMPER SHALL OPEN TO A MAXIMUM POSITION OF APPROXIMATELY 50% TO ACHIEVE A DESIGN OA VENTILATION RATE OF 1500 CFM. ACTUAL DAMPER POSITION SHALL BE DETERMINED DURING TESTING AND BALANCING (TAB).

SAFETY

THE FREEZESTAT SHALL SHUTDOWN AHU WHEN A TEMPERATURE BELOW 38 DEG F (ADJ.) IS MEASURED.

AHU SHALL SHUTDOWN IF SMOKE IS DETECTED.



(E) TARR SOUTH AHU-1 AND AHU-2 CONTROL SCHEMATIC

ITEM #5/ECM-4

NO SCALE | CS-03

Stantec

Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

THE STATE OF NEW HAMPSHIRE WILLIAM E. SCHAFFER JR. No. 8267 PROFESSIONAL ENGINEER

PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

DATE	DESCRIPTION	BY

NH VETERANS HOME
ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

CONTROL DIAGRAMS

DRAWN BY:	SCALE:	DATE:
MAM/EJD	AS SHOWN	NOVEMBER 2008

PROJECT No. 80839R
CONTRACT: B
SHEET: M-601
21 OF 57

POINTS LIST

SYSTEM/POINT	DO	DI	AO	AI	COMMENTS
AHU-3 SUPPLY FAN START/ STOP	●				
AHU-3 RUN STATUS		●			
AHU-3 FILTER STATUS		●			
AHU-3 FACE AND BYPASS DAMPER			●		
AHU-3 FREEZESTAT		●			
AHU-3 DISCHAGRE AIR TEMP.				●	
AHU-3 SMOKE DETECTOR		●			REUSE EXISTING
AHU-4 SUPPLY FAN START/ STOP	●				
AHU-4 RUN STATUS		●			
AHU-4 HW CONTROL VALVE	●				
AHU-4 FACE AND BYPASS DAMPER			●		
AHU-4 FREEZESTAT		●			
AHU-4 DISCHAGRE AIR TEMP.				●	
AHU-4 SMOKE DETECTOR		●			REUSE EXISTING
OUTDOOR AIR TEMPERATURE				●	

AHU-3 AND AHU-4

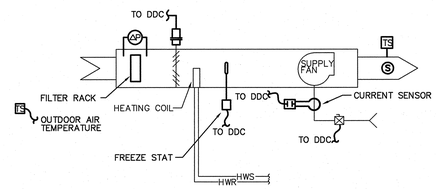
AHU SHALL START/ STOP AS COMMANDED BY THE BAS AND RUN AS SCHEDULED THROUGH THE BAS.

FACE AND BYPASS DAMPERS SHALL MIODULATE TO MAINTAIN A DISCHARGE AIR SETPOINT OF 70 DEG F (ADJ.).

SAFETY

THE FREEZESTAT SHALL SHUTDOWN AHU WHEN A TEMPERATURE BELOW 38 DEG F (ADJ.) IS MEASURED.

AHU SHALL SHUTDOWN IF SMOKE IS DETECTED.



TARR NORTH BASEMENT (E) AHU-3 AND (E) AHU-4 CONTROL SCHEMATIC — ITEM #16/OM-4

NO SCALE — CS-03

POINTS LIST

SYSTEM/POINT	DO	DI	AO	AI	COMMENTS
PRIMARY HW PUMP START/ STOP	●				
STANDBY HW PUMP START/ STOP	●				
PRIMARY HW PUMP RUN STATUS		●			
STANDBY HW PUMP RUN STATUS		●			
THREE-WAY VALVE			●		
HW SUPPLY TEMPERATURE				●	
HW DIFFERENTIAL PRESSURE				●	

TARR NORTH HEATING HOT WATER SYSTEM

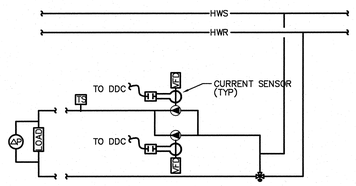
TARR NORTH PRIMARY HW PUMP SHALL BE DISABLED ABOVE BELOW OUTDOOR AIR TEMPERATRURES (OAT) OF 70 DEG F (ADJ.).

UPON FAILURE OF THE PRIMARY HW PUMP THE STANDBY PUMP SHALL AUTOMATICALLY START.

PRIMARY/ STANDBY PUMP STATUE SHALL ALTERNATE BI-WEEKLY.

THE PRIMARY HW PUMP SHALL MODULATE SPEED THROUGH ITS VFD TO MAINTAIN DIFFERENTAIL PRESSURE SETPOINT OF 15 FEET OF W.C. (ADJ.).

TARR NORTH SYSTEM THREE-WAY MIXING VALVE SHALL MODULATE TO MAINTAIN A HW SUPPLY TEMPERATURE BASED ON OUTDOOR AIR TEM[PERATURE AS FOLLOWS: 180 DEG F @ 20 DEGf OAT; 140 DEG F @ 65 DEG F OAT.



TARR NORTH HEATING HW SYSTEM CONTROL SCHEMATIC — ITEM #1/GEOTHERMAL SYSTEM

NO SCALE — CS-03

POINTS LIST

SYSTEM/POINT	DO	DI	AO	AI	COMMENTS
BOILER B-1 START/ STOP	●				
B-1 FLAME FAILURE		●			
P-1 START/ STOP	●				
P-1 RUN STATUS		●			
BOILER B-2 START/ STOP	●				
B-2 FLAME FAILURE		●			
P-2 START/ STOP	●				
P-1 RUN STATUS		●			
BOILER B-4 START/ STOP	●				
B-4 FLAME FAILURE		●			
P-4 START/ STOP	●				
P-4 RUN STATUS		●			
COMBUSTION AIR DAMPERS 1, 2, 3	●				
CA FAN LOW SPEED	●				
CA FAN HIGH SPEED	●				
CA FAN STATUS		●			
FUEL PUMPS PS-1A, PS-1B Alarm		●			
HW PUMP P-7 VFD START/ STOP	●				
HW PUMP P-8 VFD START/ STOP	●				
HW PUMP P-7 VFD RUN STATUS		●			
HW PUMP P-8 VFD RUN STATUS		●			
HW PUMP P-7 VFD SIGNAL			●		
HW PUMP P-8 VFD SIGNAL			●		
HW PUMP P-7 VFD ALARM		●			
HW PUMP P-8 VFD ALARM		●			
HW SUPPLY TEMPERATURE				●	
HW RETURN TEMPERATURE				●	
HW PUMP P-5 START/ STOP	●				
HW PUMP P-6 START/ STOP	●				
HW PUMP P-5 RUN STATUS		●			
HW PUMP P-6 RUN STATUS		●			
THREE-WAY HW MIXING VALVE			●		
HW SUPPLY TEMPERATURE				●	
OUTDOOR AIR TEMPERATURE				●	

TARR SOUTH HEATING HOT WATER SYSTEM

BOILERS B-1, B-2 AND B-3 SHALL CYCLE IN SEQUENCE TO MAINTAIN HW SUPPLY TEMPERATURE OF 180 DEG F (ADJ.). RESPECTIVE BOILER PUMPS SHALL START WHEN BOILER OPERATES.

COMBUSTION AIR DAMPERS SHALL OPEN WHEN ANY BOILER OPERATES. BOILER IOPERATION SHALL NOT BE PERMITTED WITHOUT DAMPER OPEN STATUS PROVEN.

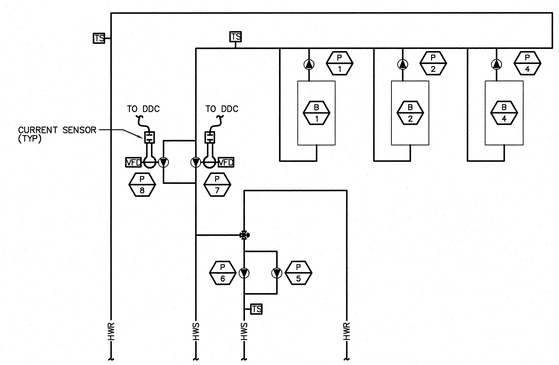
HW PUMPS P7 AND P-8 SHALL OPERATE IN PRIMARY/ STANDBY SEQUENCE. UPON FAILURE OF THE PRIMARY HW PUMP THE STANDBY PUMP SHALL AUTOMATICALLY START. PRIMARY/ STANDBY PUMP STATUE SHALL ALTERNATE BI-WEEKLY.

THE PRIMARY HW PUMP SHALL MODULATE SPEED THROUGH ITS VFD TO MAINTAIN DIFFERENTAIL PRESSURE SETPOINT OF 15 FEET OF W.C. (ADJ.).

HW PUMPS P5 AND P-6 SHALL OPERATE IN PRIMARY/ STANDBY SEQUENCE. UPON FAILURE OF THE PRIMARY HW PUMP THE STANDBY PUMP SHALL AUTOMATICALLY START. PRIMARY/ STANDBY PUMP STATUE SHALL ALTERNATE BI-WEEKLY.

TARR SOUTH HW SYSTEM THREE-WAY MIXING VALVE SHALL MODULATE TO MAINTAIN A HW SUPPLY TEMPERATURE BASED ON OUTDOOR AIR TEMPERATURE AS FOLLOWS: 180 DEG F @ 20 DEGf OAT; 140 DEG F @ 65 DEG F OAT.

P-5 AND P-6 SHALL BE DISABLED ABOVE OAT OF 65 DEG f (ADJ.).



TARR SOUTH HEATING HW SYSTEM CONTROL SCHEMATIC — ITEM #1/GEOTHERMAL SYSTEM

NO SCALE — CS-03

Stantec

Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

THE STATE OF NEW HAMPSHIRE — KEVIN E. SCHLAUTMAN — No. 8394 — LICENSED PROFESSIONAL ENGINEER

PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION

JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

DATE	DESCRIPTION	BY

NH VETERANS HOME
ENERGY ENHANCEMENTS

139 WINTER STREET TILTON, NEW HAMPSHIRE

CONTROL DIAGRAMS

DRAWN BY:	SCALE:	DATE:
MAM/EJD	AS SHOWN	NOVEMBER 2008

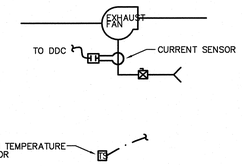
PROJECT No. 80839R
CONTRACT: B
SHEET: M-602
22 OF 37

POINTS LIST

SYSTEM/POINT	DO	DI	AO	AI	COMMENTS
EXHAUST FAN START/ STOP			●		
EXHAUST FAN STATUS			●		
SPACE TEMPERATURE	●				

TARR NORTH MECHANICAL ROOM EXHAUST FAN

EXHAUST FAN SHALL OPERATE ABOVE A SPACE TEMPERATURE SETPOINT OF 85 DEG F (ADJ.).



TARR NORTH MECHANICAL ROOM EXHAUST FAN CONTROL SCHEMATIC

ITEM #1/GEOTHERMAL SYSTEM

NO SCALE

CS-03

POINTS LIST

SYSTEM/POINT	DO	DI	AO	AI	COMMENTS
AHU-4 SUPPLY FAN START/ STOP	●				
AHU-4 RUN STATUS		●			
ERV-4 START/ STOP	●				
ERV-4 RUN STATUS		●			
ERV-4 S. FAN FILTER STATUS		●			
ERV-4 E. FAN FILTER STATUS		●			
AHU-4 FACE AND BYPASS DAMPER			●		
AHU-4 FREEZESTAT		●			
AHU-4 DISCHAGRE AIR TEMP.				●	
AHU-4 SMOKE DETECTOR		●			
AHU-5 SUPPLY FAN START/ STOP	●				
AHU-5 RUN STATUS		●			
ERV-5 START/ STOP	●				
ERV-5 RUN STATUS		●			
ERV-5 S. FAN FILTER STATUS		●			
ERV-5 E. FAN FILTER STATUS		●			
AHU-5 FACE AND BYPASS DAMPER			●		
AHU-5 FREEZESTAT		●			
AHU-5 DISCHAGRE AIR TEMP.				●	
AHU-5 SMOKE DETECTOR		●			
AHU-6 SUPPLY FAN START/ STOP	●				
AHU-6 RUN STATUS		●			
ERV-6 START/ STOP	●				
ERV-6 RUN STATUS		●			
ERV-6 S. FAN FILTER STATUS		●			
ERV-6 E. FAN FILTER STATUS		●			
AHU-6 FACE AND BYPASS DAMPER			●		
AHU-6 FREEZESTAT		●			
AHU-6 DISCHAGRE AIR TEMP.				●	
AHU-6 SMOKE DETECTOR		●			

TARR SOUTH AHUS AND ERVS

AHU SHALL START/ STOP AS COMMANDED BY THE BAS AND RUN AS SCHEDULED THROUGH THE BAS.

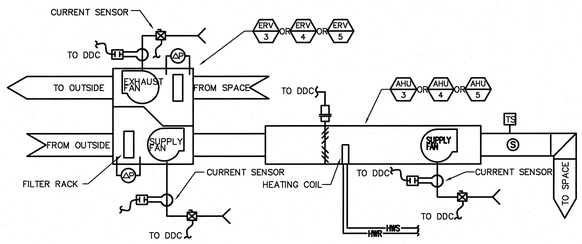
ARV SHALL START/ STOP AS COMMANDED BY THE BAS AND RUN AS SCHEDULED THROUGH THE BAS

FACE AND BYPASS DAMPERS SHALL MIODULATE TO MAINTAIN A DISCHARGE AIR SETPOINT OF 70 DEG F (ADJ.).

SAFETY

THE FREEZESTAT SHALL SHUTDOWN AHU WHEN A TEMPERATURE BELOW 38 DEG F (ADJ.) IS MEASURED.

AHU SHALL SHUT DOWN IS SMOKE IS DETECTED.



TARR SOUTH AHU-E,4,&5 AND ERV-3,4,&5 CONTROL SCHEMATIC

ITEM #1/GEOTHERMAL SYSTEM

NO SCALE

CS-03

POINTS LIST

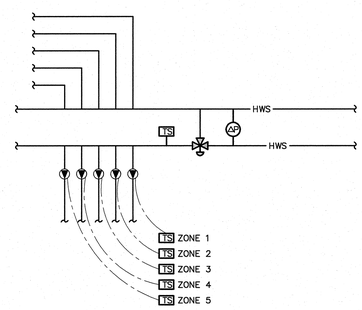
SYSTEM/POINT	DO	DI	AO	AI	COMMENTS
ZONE 1 PUMP START/ STOP	●				
ZONE 1 PUMP RUN STATUS		●			
ZONE 1 SPACE TEMPERATURE				●	
ZONE 2 PUMP START/ STOP	●				
ZONE 2 PUMP RUN STATUS		●			
ZONE 2 SPACE TEMPERATURE				●	
ZONE 3 PUMP START/ STOP	●				
ZONE 3 PUMP RUN STATUS		●			
ZONE 3 SPACE TEMPERATURE				●	
ZONE 4 PUMP START/ STOP	●				
ZONE 4 PUMP RUN STATUS		●			
ZONE 4 SPACE TEMPERATURE				●	
ZONE 5 PUMP START/ STOP	●				
ZONE 5 PUMP RUN STATUS		●			
ZONE 5 SPACE TEMPERATURE				●	
ZONE 6 PUMP START/ STOP	●				
ZONE 6 PUMP RUN STATUS		●			
ZONE 6 SPACE TEMPERATURE				●	
THREE-WAY MIXING VALVE			●		
DIFFERENTIAL PRESSURE				●	
HEATING HW SUPPLY TEMPERATURE				●	

TARR NORTH MECHANICAL ROOM EXHAUST FAN

WELCH BUILDING DIFFERNETIAL PRESSURE SENSOR SHALL ESTABLISH THE CONTROL SETPOINT FOR TARR SOUTH HW DISTRIBUTION PUMPS P-7 AND P-8. SETPOINT SHALL BE 15' W.C. (ADJ.).

SYSTEM THREE-WAY MIXING VALVE SHALL MODULATE TO MAINTAIN A HW SUPPLY TEMPERATURE BASED ON OUTDOOR AIR TEMPERATURE AS FOLLOWS: 180 DEG F @ 20 DEGf OAT; 140 DEG F @ 65 DEG F OAT.

ZONE PUMPS (6) SHALL BE DISABLED ABOVE OAT OF 70 DEG f (ADJ.).



WELCH HEATING HW SYSTEM CONTROL SCHEMATIC

ITEM #1/GEOTHERMAL SYSTEM

NO SCALE

CS-03

Stantec

Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

THE STATE OF NEW HAMPSHIRE
KEVIN E. SCHAEFER, JR.
No. 11708
LICENSED
PROFESSIONAL ENGINEER

PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

DATE	DESCRIPTION	BY

NH VETERANS HOME
ENERGY ENHANCEMENTS

139 WINTER STREET TILTON, NEW HAMPSHIRE

CONTROL DIAGRAMS

PROJECT No. 80839R
CONTRACT: B

DRAWN BY:	SCALE:	DATE:
MAM/EJD	AS SHOWN	NOVEMBER 2008

M-603

SHEET: 23 OF 37

POINTS LIST

SYSTEM/POINT	DO	DI	AO	AI	COMMENTS
PUMP P-2A VFD START/ STOP	●				
PUMP P-2B VFD START/ STOP	●				
PUMP P-2A VFD RUN STATUS		●			
PUMP P-2B VFD RUN STATUS		●			
PUMP P-2A VFD RUN SIGNAL			●		
PUMP P-2B VFD RUN SIGNAL			●		
PUMP P-2A VFD ALARM		●			
PUMP P-2B VFD ALARM		●			
PUMP P-1A START/ STOP			●		
PUMP P-1B START/ STOP			●		
PUMP P-1A RUN STATUS		●			
PUMP P-1B RUN STATUS		●			
PUMP P-4A START/ STOP			●		
PUMP P-4B START/ STOP			●		
PUMP P-4A RUN STATUS		●			
PUMP P-4B RUN STATUS		●			
GEOEXCHANGE LOOP SUPPLY TEMP				●	
GEOEXCHANGE LOOP RETURN TEMP				●	
HEAT PUMP LOOP SUPPLY TEMP.				●	
HEAT PUMP LOOP RETURN TEMP.				●	
HX-1 OUTLET TEMPERATURE				●	
CT-1 LOOP SUPPLY TEMP.				●	
CT-1 LOOP RETURN TEMP.				●	
PUMP P-5 START/ STOP	●				
PUMP P-5 START/ STOP		●		●	
INJECTION LOOP SUPPLY TEMP.					
INJECTION LOOP THREE-WAY VALVE			●		
PUMP 15A VFD RUN STATUS		●			
PUMP 15B VFD RUN STATUS		●			
PUMP 15A VFD RUN SIGNAL			●		
PUMP 15A VFD RUN SIGNAL			●		
PUMP 15A VFD RUN ALARM		●			
PUMP 15BED VFD RUN ALARM		●			
HP LOOP DIFFERENTIAL PRESSURE				●	
CT-1 VFD START/ STOP	●				
CT-1 VFD SIGNAL			●		
CT-1 VFD ALARM		●			
CT-1 PUMP START/ STOP	●				
CT-1 PUMP RUN STATUS		●			
HIGH LOOP TEMP ALARM		●			SET AT 95 DEG F (ADJ.)
LOW LOOP TEMP ALARM		●			SET AT 30 DEG F (ADJ.)

WELCH GEO-EXCHANGE SYSTEM

HEAT PUMP (HP) LOOP DISTRIBUTION PUMPS AND GEOEXCHANGE PUMPS SHALL OPERATE IN PRIMARY/ STANDBY MODE. PRIMARY PUMP STATUS SHALL ALTERNATE BI-WEEKLY. THE STANDBY PUMP SHALL AUTOMATICALLY START IF THE PRIMARY PUMP FAILS TO OPERATE.

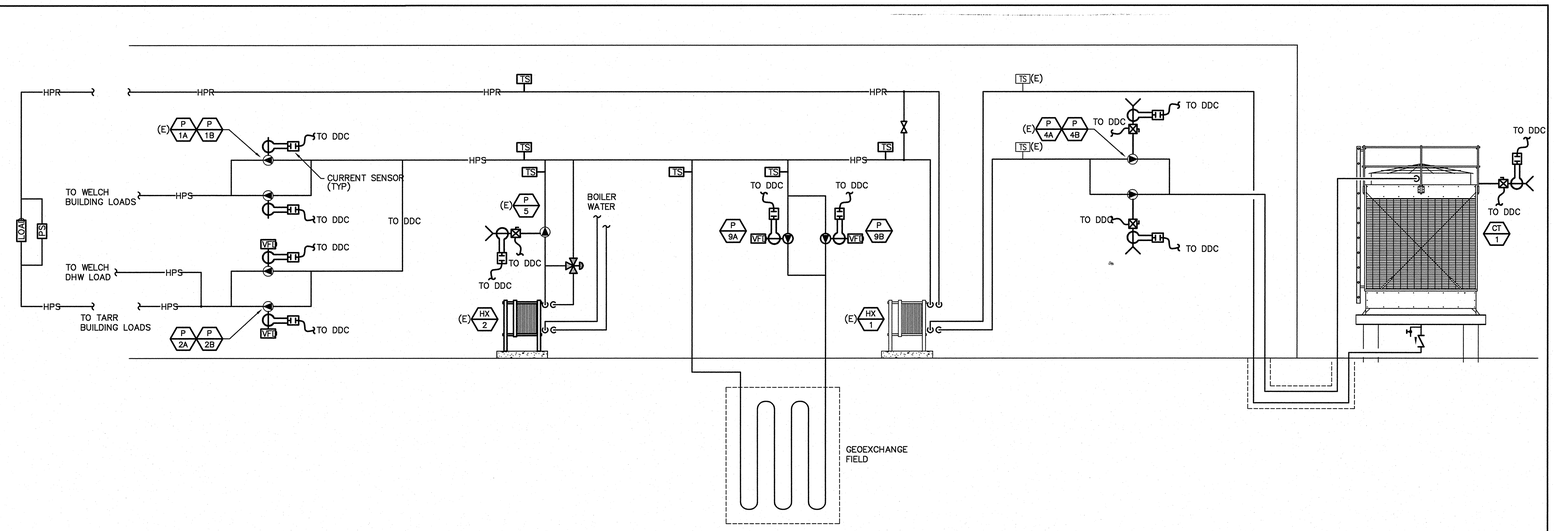
DISTRIBUTION PUMPS P-2A AND P-2B SHALL OPERATE WHEN THERE IS A CALL FOR HEATING OR COOLING. PUMPS SHALL MODULATE SPEED THROUGH THEIR RESPECTIVE VFDS TO MAINTAIN LOOP DIFFERENTAIL SETPOINT PRESSURE OF 10' W.C. (ADJ.).

GEOEXCHANGE PUMPS P-9A AND P-9B SHALL OPERATE BASED ON DEMAND AS DETERMINED BY THE GEOEXCAHNGE LOOP TEMPERATURE DIFFERENTIAL. THE PRIMARY PUMP SHALL MODULATE SPEED THROUGH ITS RESPECTIVE VFD TO MAINTAIN A 6 DEG F (ADJ.) DIFFERENTIAL DURING HEATING MODE, AND 8 DEG F (ADJ.) DIFFERENTIAL DURING THE SUMMER MODE.

EXISTING CLOSED LOOP COOLING TOWER CT-1, CT-1 PUMP, AND PRIMARY PUMP P-A SHALL START. CT-1 VFD SHALL MODULATE TO MAINTAIN A MAXIMUM LOOP SUPPLY TEMPERATURE OF 90 DEG F.

BOILER INJECTION LOOP SYSTEM PUMP P-5 AND THRE-WAY VALVE SHALL OPERATE TO MAINTAIN A MINIMUM LOOP SUPPLY TEMPERATURE OF 35 DEG F.

TARR NORTH AND TAR SOUTH EXISTING TWO-WAY VALVES SHALL BE EBNABLED TO CYCLE OPEN AND CLOSED WITH RESPECTIVE HEAT PUMP OPERATION.



WELCH MECHANICAL ROOM GEO-EXCHANGE CONTROL SCHEMATIC

ITEM #1/GEOTHERMAL SYSTEM

NO SCALE CS-03

POINTS LIST

SYSTEM/POINT	DO	DI	AO	AI	COMMENTS
(E) HP LOOP PUMP VFD START/ STOP	●				
(E) HP LOOP PUMP VFD START/ STOP	●				
(E) HP LOOP PUMP VFD RUN STATUS		●			
(E) HP LOOP PUMP VFD RUN STATUS		●			
(E) HP LOOP PUMP VFD RUN SIGNAL			●		
(E) HP LOOP PUMP VFD RUN SIGNAL			●		
(E) HP LOOP PUMP VFD ALARM		●			
(E) HP LOOP PUMP VFD ALARM		●			
GEOEXCHANGE LOOP SUPPLY TEMP				●	
GEOEXCHANGE LOOP RETURN TEMP				●	
HEAT PUMP LOOP SUPPLY TEMP.				●	
HEAT PUMP LOOP RETURN TEMP.				●	
CT-2 LOOP SUPPLY TEMP.				●	
CT-2 LOOP RETURN TEMP.				●	
HX-3 OUTLET TEMPERATURE				●	
PUMP 15A VFD START/ STOP	●				
PUMP 15B VFD START/ STOP	●				
PUMP 15A VFD RUN STATUS		●			
PUMP 15B VFD RUN STATUS		●			
PUMP 15A VFD RUN SIGNAL			●		
PUMP 15A VFD RUN SIGNAL			●		
PUMP 15A VFD RUN ALARM		●			
PUMP 15BED VFD RUN ALARM		●			
HEAT PUMP LOOP DIFF. PRESSURE				●	
(42) TWO-WAY HP CONTROL VALVE			●		
PUMP P-16 START/ STOP	●				
P-16 RUN STATUS		●			
CT-2 VFD START/ STOP	●				
CT-2 VFD SIGNAL			●		
CT-2 VFD ALARM		●			
CT-2 PUMP START/ STOP	●				
CT-2 PUMP RUN STATUS		●			
HIGH LOOP TEMP ALARM		●			SET AT 95 DEG F (ADJ.)
LOW LOOP TEMP ALARM		●			SET AT 30 DEG F (ADJ.)

LEDU GEO-EXCHANGE SYSTEM

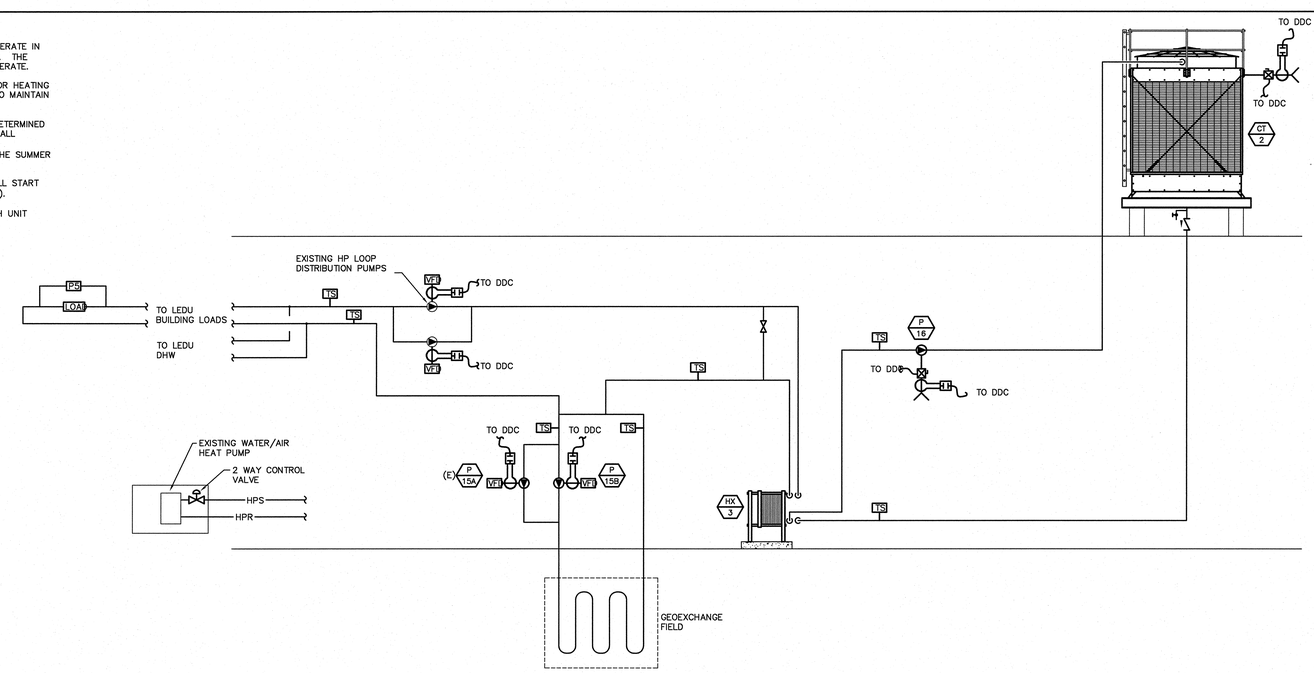
HEAT PUMP (HP) LOOP DISTRIBUTION PUMPS AND GEOEXCHANGE PUMPS SHALL OPERATE IN PRIMARY/ STANDBY MODE. PRIMARY PUMP STATUS SHALL ALTERNATE BI-WEEKLY. THE STANDBY PUMP SHALL AUTOMATICALLY START IF THE PRIMARY PUMP FAILS TO OPERATE.

DISTRIBUTION PUMPS P-2A AND P-2B SHALL OPERATE WHEN THERE IS A CALL FOR HEATING OR COOLING. PUMPS SHALL MODULATE SPEED THROUGH THEIR RESPECTIVE VFDS TO MAINTAIN LOOP DIFFERENTAIL SETPOINT PRESSURE OF 10' W.C. (ADJ.).

GEOEXCHANGE PUMPS P-9A AND P-9B SHALL OPERATE BASED ON DEMAND AS DETERMINED BY THE GEOEXCAHNGE LOOP TEMPERATURE DIFFERENTIAL. THE PRIMARY PUMP SHALL MODULATE SPEED THROUGH ITS RESPECTIVE VFD TO MAINTAIN A 6 DEG F (ADJ.) DIFFERENTIAL DURING HEATING MODE, AND 8 DEG F (ADJ.) DIFFERENTIAL DURING THE SUMMER MODE.

EXISTING CLOSED LOOP COOLING TOWER CT-2, CT-2 PUMP, AND PUMP P-16 SHALL START CT-2 VFD SHALL CYCLE TO MAINTAIN TEMPERATURE SETPOINT OF 90 DEG F (ADJ.).

WATER/ AIR HEAT PUMPS: TWO-WAY VALVE SHALL CYCLE OPEN AND CLOSED WITH UNIT OPERATION.



LEDU GEO-EXCHANGE CONTROL SCHEMATIC

ITEM #1/GEOTHERMAL SYSTEM

NO SCALE CS-03

Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

DATE	DESCRIPTION	BY

NH VETERANS HOME
ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

CONTROL DIAGRAMS

DRAWN BY:	SCALE:	DATE:
MAM/EJD	AS SHOWN	NOVEMBER 2008

PROJECT No. 80839R
CONTRACT: B
SHEET: M-604
24 OF 57

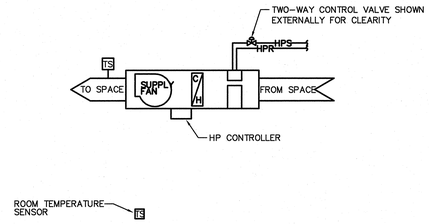
POINTS LIST

SYSTEM/POINT	DO	DI	AO	AI	COMMENTS
HEAT PUMP (HP) START/ STOP	●				
HP RUN STATUS		●			
HP ALARM		●			
HP FAN SPEED HIGH	●				
HP FAN SPEED LOW	●				
SPACE TEMP SENSOR				●	
TWO-WAY CONTROL VALVE	●				

WATER/ AIR HEAT PUMP

WATER/ AIR HEAT PUMP SHALL CYCLE TO MAINTAIN SPACE COOLING TEMPERATURE SETPOINT OF 75 DEG f (ADJ.). HEAT PUMP PACKAGED CONTROLS SHALL CONTROL UNIT FAN SPEED IN RESPONSE TO LOAD DEMAND.

TWO-WAY CONTROL VALVE SHALL CYCLE WITH UNIT OPERATION.



WATER/AIR HEAT PUMP CONTROL SCHEMATIC

ITEM #1/GEOTHERMAL SYSTEM

NO SCALE | CS-03

POINTS LIST

SYSTEM/POINT	DO	DI	AO	AI	COMMENTS
WELCH					
EF-1 ADMINISTATION	●				FIRE SMOKE ZONE STATUS
EF-2 DINING RM CORE	●				FIRE SMOKE ZONE STATUS
EF-3 PATIENT EAST	●				FIRE SMOKE ZONE STATUS
EF-4 PATIENT SOUTH	●				FIRE SMOKE ZONE STATUS
EF-5 PATIENT WEST	●				FIRE SMOKE ZONE STATUS
EXIST. CUH-1 START/ STOP	●				
EXIST. CUH-1 SPACE TEMP				●	
EXIST. CUH-2 START/ STOP	●				
EXIST. CUH-2 SPACE TEMP				●	
EXIST. CUH-3 START/ STOP	●				
EXIST. CUH-3 SPACE TEMP				●	
EXIST. CUH-4 START/ STOP	●				
EXIST. CUH-4 SPACE TEMP				●	
EXISIT. CUH-5 START/ STOP	●				
EXIST. CUH-5 SPACE TEMP				●	

POINTS LIST

SYSTEM/POINT	DO	DI	AO	AI	COMMENTS
TARR SOUTH					
EF-1 ADMINISTATION	●				FIRE SMOKE ZONE STATUS
EF-2 DINING RM CORE	●				FIRE SMOKE ZONE STATUS
EF-3 PATIENT EAST	●				FIRE SMOKE ZONE STATUS
EF-4 PATIENT SOUTH	●				FIRE SMOKE ZONE STATUS
EF-5 PATIENT WEST	●				FIRE SMOKE ZONE STATUS
EXIST. CUH-1 START/ STOP	●				
EXIST. CUH-1 SPACE TEMP				●	
EXIST. CUH-2 START/ STOP	●				
EXIST. CUH-2 SPACE TEMP				●	
EXIST. CUH-3 START/ STOP	●				
EXIST. CUH-3 SPACE TEMP				●	
EXIST. CUH-4 START/ STOP	●				
EXIST. CUH-4 SPACE TEMP				●	
EXIST. CUH-5 START/ STOP	●				
EXIST. CUH-5 SPACE TEMP				●	

POINTS LIST

SYSTEM/POINT	DO	DI	AO	AI	COMMENTS
TARR NORTH					
RM 6110 EXIST. UH START/ STOP	●				
UH SPACE TEMP.				●	
RM 6120 EXIST. UH START/ STOP	●				
UH SPACE TEMP.				●	
RM 6130 EXIST. UH START/ STOP	●				
UH SPACE TEMP.				●	
RM 6150 EXIST. UH START/ STOP	●				
UH SPACE TEMP.				●	
RM 6200 EXIST. FTR VALVE	●				
FTR SPACE TEMP.				●	
RM 6050 EXIST. FTR VALVE	●				
FTR SPACE TEMP.				●	
RM 6010 EXIST. CUH START/STOP	●				
CUH SPACE TEMP.				●	
RM 6070 EXIST. CUH START/STOP	●				
CUH SPACE TEMP.				●	
RM 2310 EXIST. FTR VALVE	●				
FTR SPACE TEMP.				●	
RM 2320 EXIST. FTR VALVE	●				
FTR SPACE TEMP.				●	
RM 2280 EXIST. UH START/ STOP	●				
UH SPACE TEMP.				●	
RM 2320 EXIST. UH START/ STOP	●				
UH SPACE TEMP.				●	
RM 2470 EXIST. UH START/ STOP	●				
UH SPACE TEMP.				●	
RM 2530 EXIST. UH START/ STOP	●				
UH SPACE TEMP.				●	
RM 3410 EXIST. UH START/ STOP	●				
UH SPACE TEMP.				●	
EXIST. RTU HALLWAY SPACE TEMP				●	
RTU COOL STAGE 1	●				
RTU COOL STAGE 2	●				
RTU FAN START/STOP	●				
RTU FAN STATUS		●			
RTU EH STAGE 1	●				
RTU EH STAGE 2	●				
RTU SUPPLY AIR TEMP.				●	
EXIST. RTU REC ROOM SPACE TEMP.				●	
RTU COOL STAGE 1	●				
RTU COOL STAGE 2	●				
RTU FAN START/STOP	●				
RTU FAN STATUS		●			
RTU EH STAGE 1	●				
RTU EH STAGE 2	●				
RTU EH STAGE 3	●				
RTU EH STAGE 4	●				
RTU SUPPLY AIR TEMP.				●	
RTU RETURN AIR TEMP.				●	
EXIST. DRI-STEAM HUMID. SPACE SUM.				●	
HUMID. START/STOP	●				
HUMID. SIGNAL			●		
EXIST. GREENHECK ERV START/STOP	●				
ERV SF & EF STATUS		●			
ERV SUPPLY AIR TEMP.				●	

POINTS LIST

SYSTEM/POINT	DO	DI	AO	AI	COMMENTS
LEDU					
EXIST. HWP-1A START/STOP	●				
EXIST. HWP-1A STATUS		●			
EXIST. HWP-1B START/STOP	●				
EXIST. HWP-1B STATUS		●			
EXIST. MIXING VALVE			●		
EXIST. MIX WATER TEMP				●	
EXIST. ERV-1 SF/EF START/STOP	●				TYP FOR ERV-2 & 3
EXIST. ERV-1 SF/EF STATUS		●			TYP FOR ERV-2 & 3
EXIST. ERV-1 HX ENABLE	●				TYP FOR ERV-2 & 3
EXIST. ERV-1 HW VALVE			●		TYP FOR ERV-2 & 3
EXIST. ERV-1 HW COIL FREEZESTA		●			TYP FOR ERV-2 & 3
EXIST. ERV-1 SUPPLY AIR TEMP.				●	TYP FOR ERV-2 & 3
EXIST. ERV-1 SMOKE DET.		●			TYP FOR ERV-2 & 3
EXIST. ERV-1 DX COOL STAGE 1	●				TYP FOR ERV-2 & 3
EXIST. ERV-1 DX COOL STAGE 2	●				TYP FOR ERV-2 & 3
EXIST. ROOM RADIATION SPACE TEMP.				●	TYP FOR 133 ROOMS
EXIST. FTR VALUE	●				TYP FOR 133 ROOMS
EXIST HEAT PUMP SPACE TEMP.				●	TYP FOR 41 ROOMS
EXIST HEAT PUMP FAN START/STOP	●				TYP FOR 41 ROOMS
EXIST HEAT PUMP COMP. START/STOP	●				TYP FOR 41 ROOMS
EXIST HEAT PUMP REVERS. VALVE	●				TYP FOR 41 ROOMS

MISCELLANEOUS CONTROL POINTS

ITEM #1/GEOTHERMAL SYSTEM

NO SCALE | CS-03

Stantec

Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

THE STATE OF NEW HAMPSHIRE
WILLIAM SCHLEETER III
No. 9708
LICENSED
PROFESSIONAL ENGINEER
PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

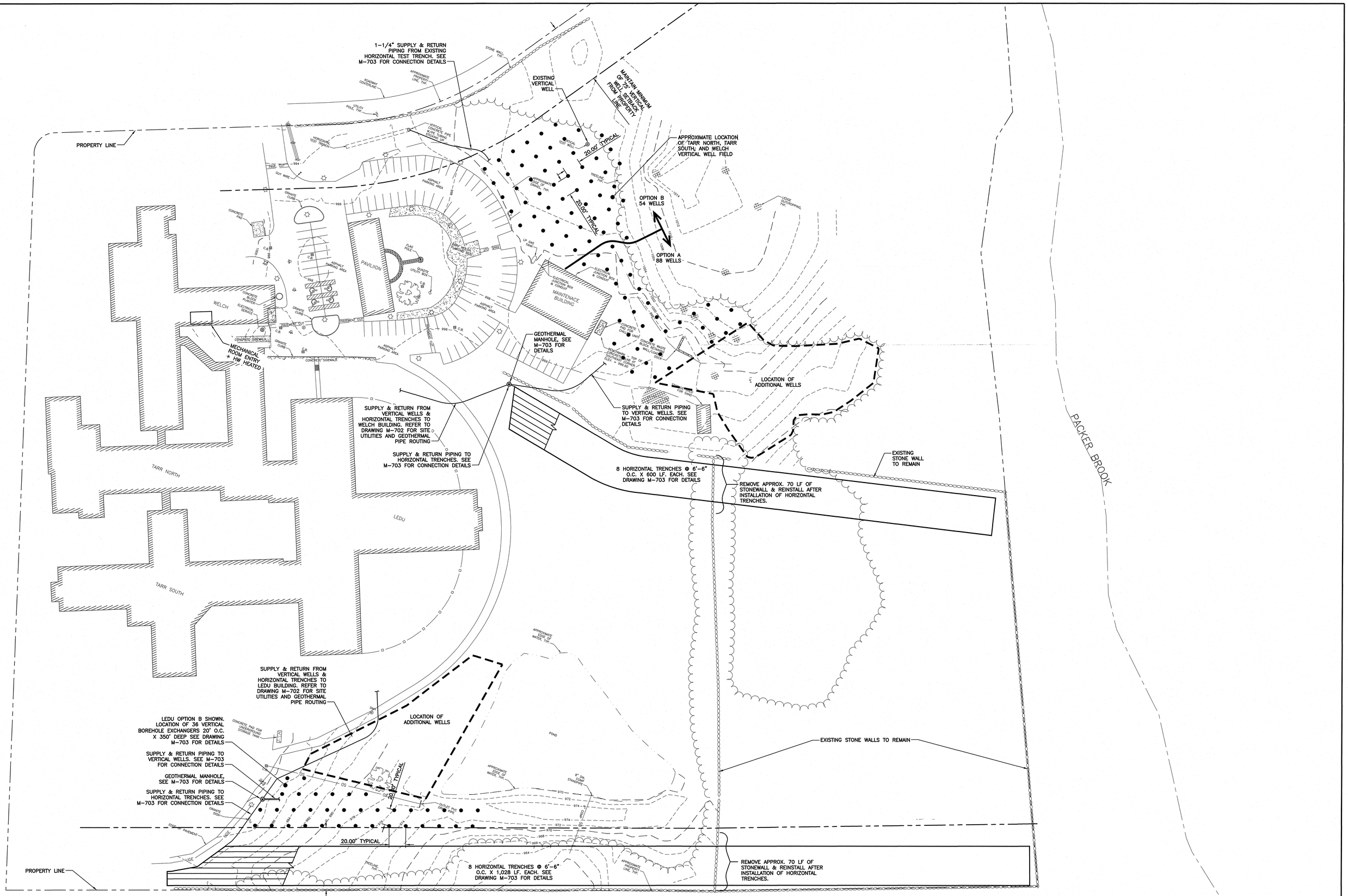
DATE	DESCRIPTION	BY

NH VETERANS HOME
ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

CONTROL DIAGRAMS

PROJECT No. 80839R
CONTRACT: B

DRAWN BY:	SCALE:	DATE:	SHEET:
MAM/EJD	AS SHOWN	NOVEMBER 2008	M-605 25 OF 57



ALL WORK ON THIS DWG IS ITEM #1/GEOTHERMAL SYSTEM EXCEPT AS NOTED.

GEOTHERMAL SITE PLAN
1"=40'-0"

Stantec
Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

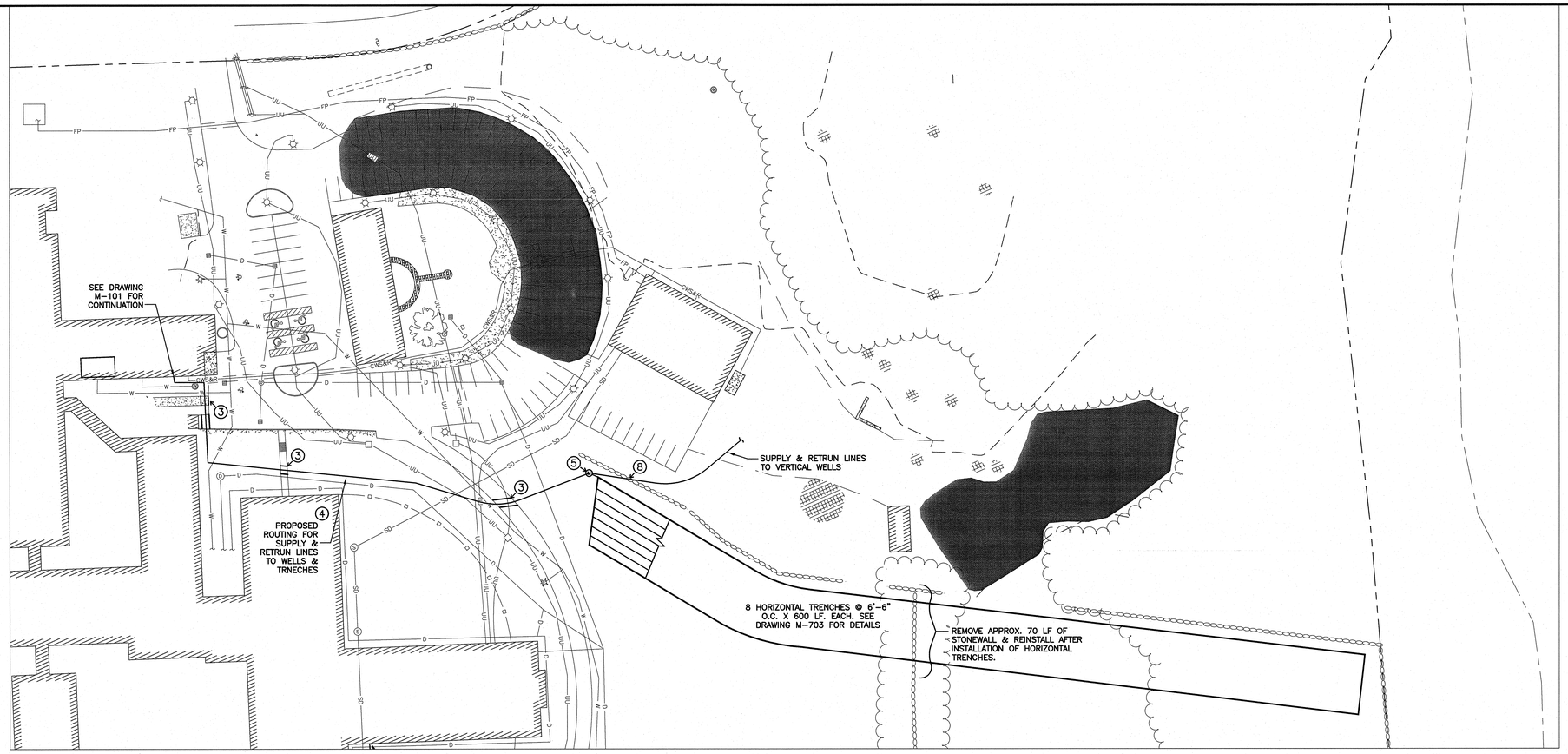
DATE	DESCRIPTION	BY

NH VETERANS HOME
ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

GEOTHERMAL SITE PLAN

DRAWN BY:	SCALE:	DATE:
MAM/EJD	AS SHOWN	NOVEMBER 2008

PROJECT No. 80639R
CONTRACT: 9
M-701
(SHEET): 26 OF 57



WELCH GEOTHERMAL PLAN DETAIL
1"=40'-0"

NOTES:

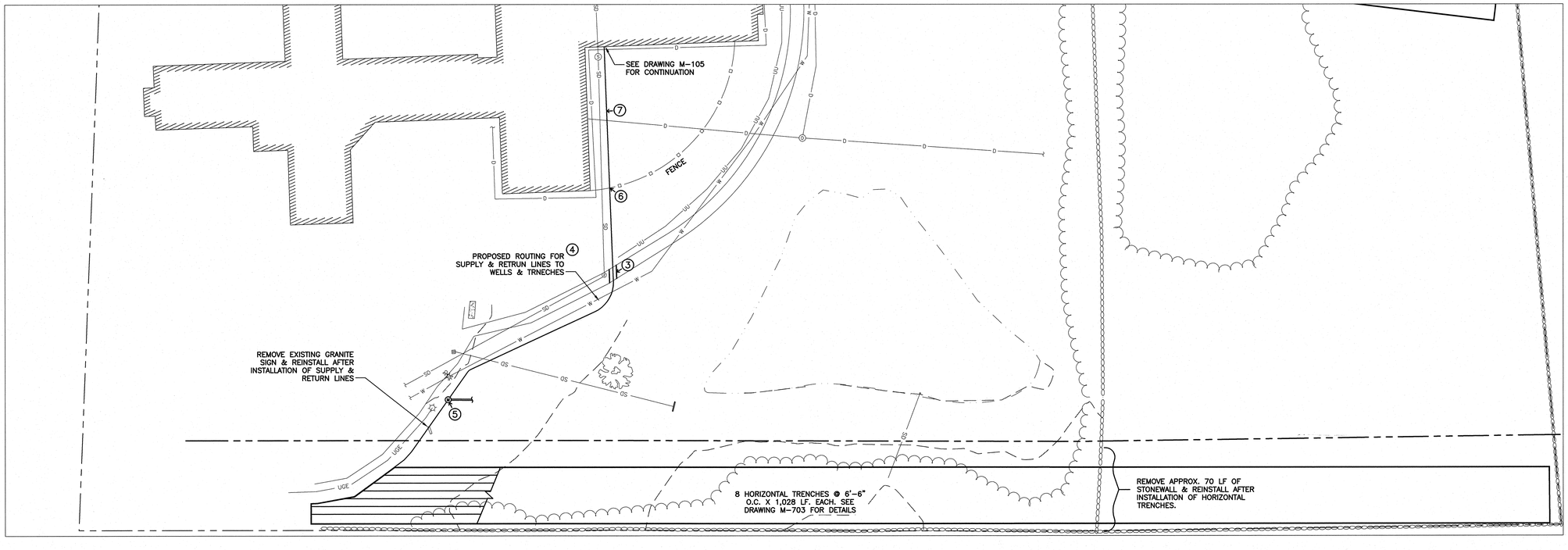
1. CONTACT DIG-SAFE PRIOR TO STARTING ANY CONSTRUCTION.
2. RETAIN SERVICES OF:

   MOORE LOCATE SERVICE INC.
   PO BOX 7329
   GONIC, NH 03839-7329

   TIM MOORE
   603-765-0993

   FOR LOCATION OF BURIED FACILITY SERVICES NOT COVERED BY DIG-SAFE.

3. SAWCUT EXISTING PAVEMENT. REMOVE AND REINSTALL TO MATCH EXISTING.
4. HAND DIG TRENCH IN ALL AREAS WHERE UTILITIES ARE SHOWN. SEE DRAWING M-703 FOR TRENCH DETAILS
5. GEOTHERMAL SUPPLY & RETURN PIPING CONNECTION MANHOLE. SEE DRAWING M-703 FOR DETAILS.
6. REMOVE AND REINSTALL EXISTING SECURITY FENCE.
7. THE AREA BETWEEN THE SECURITY FENCE AND THE LEDU BUILDING IS HEAVILY LANDSCAPED. EXACT PIPE ROUTING TO BE DETERMINED IN THE FIELD TO CAUSE MINIMUM DISRUPTION OF EXISTING FEATURED & PLANTINGS. ALL DISTURBED AREAS TO BE REINSTALLED TO MATCH EXISTING CONDITIONS.
8. REMOVE AND REINSTALL EXISTING STONEWALL AS NEEDED TO ACCOMMODATE PIPE CROSSING.



LEDU GEOTHERMAL PLAN DETAIL
1"=40'-0"

ALL WORK ON THIS DWG IS ITEM #1/GEOTHERMAL SYSTEM EXCEPT AS NOTED.

Stantec
Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

DATE	DESCRIPTION	BY

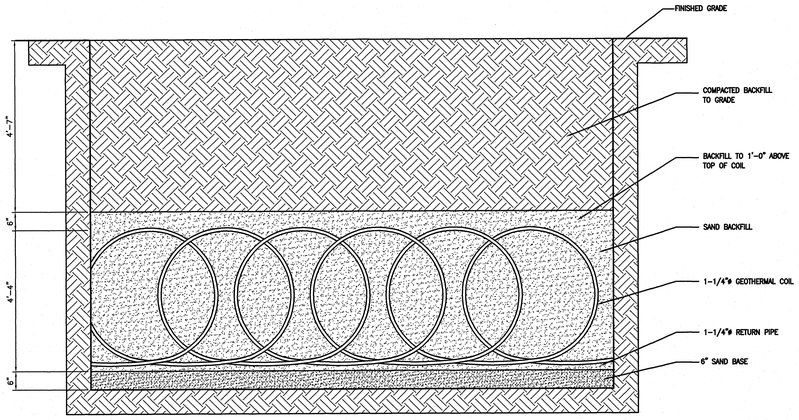
NH VETERANS HOME
ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

GEOTHERMAL PLAN DETAILS

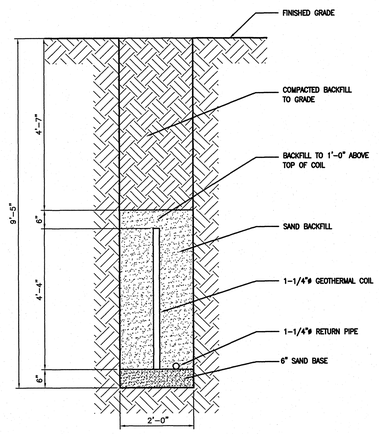
PROJECT No. 80839R
CONTRACT: B

DRAWN BY:	SCALE:	DATE:
MAM/EJD	AS SHOWN	NOVEMBER 2008

M-702
SHEET: 27 OF 57

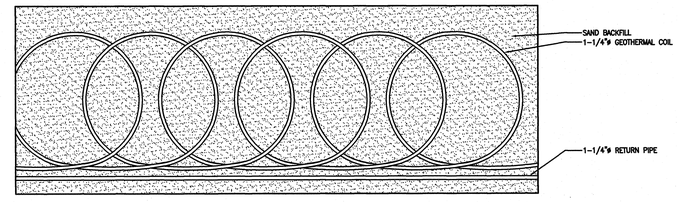


ELEVATION

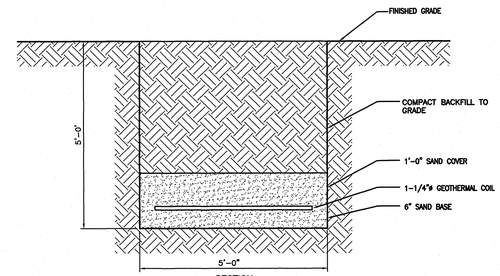


SECTION

1 M703 VERITCAL SLINKY INSTALLATION DETAIL
NTS

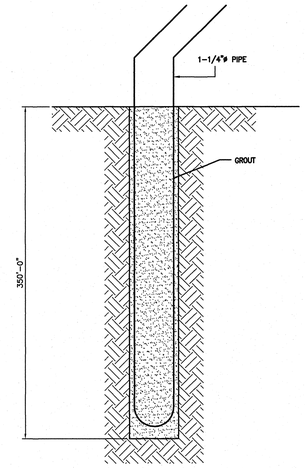


PLAN VIEW

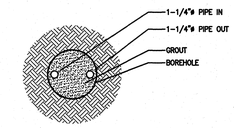


SECTION

3 M703 HORIZONTAL SLINKY INSTALLATION DETAIL
NTS

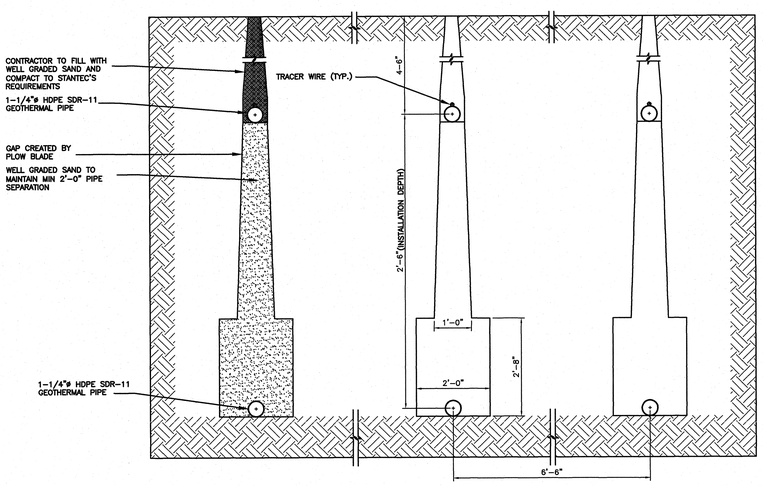


ELEVATION



PLAN

4 M703 BOREHOLE INSTALLATION DETAIL
NTS



2 M703 SPIDER PLOUGH HORIZONTAL FIELD DETAIL
NTS

Stantec
Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

DATE	DESCRIPTION	BY

NH VETERANS HOME
ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

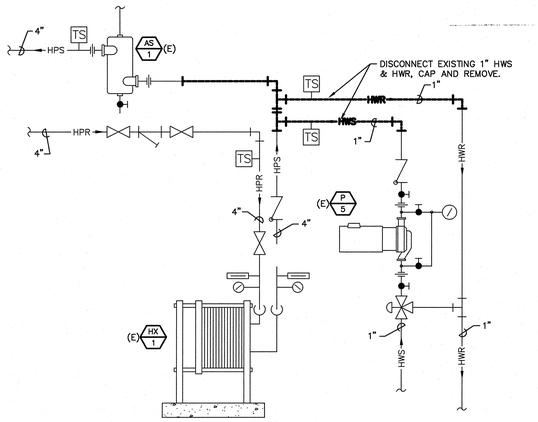
GEOTHERMAL DETAILS

DRAWN BY:	SCALE:	DATE:
MAM/EJD	AS SHOWN	NOVEMBER 2008

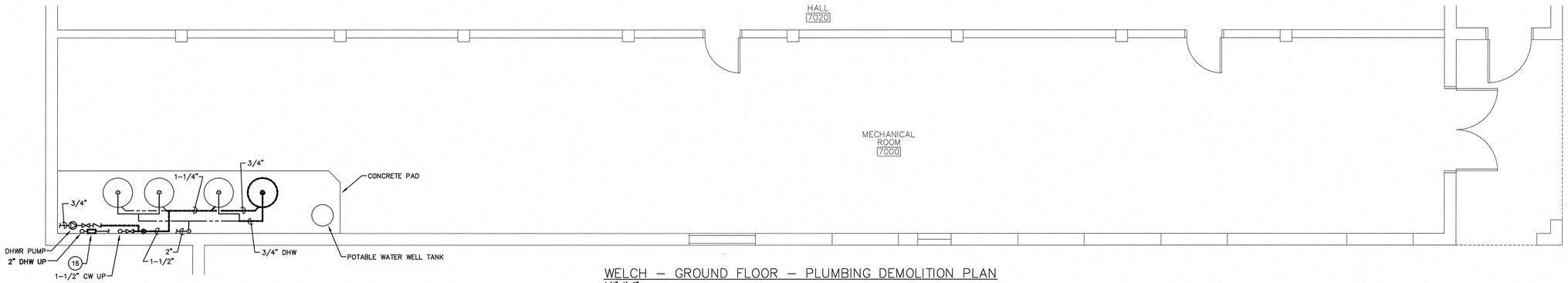
PROJECT No. 80839R
CONTRACT: B
M-703
SHEET: 28 OF 57

DEMOLITION NOTES:

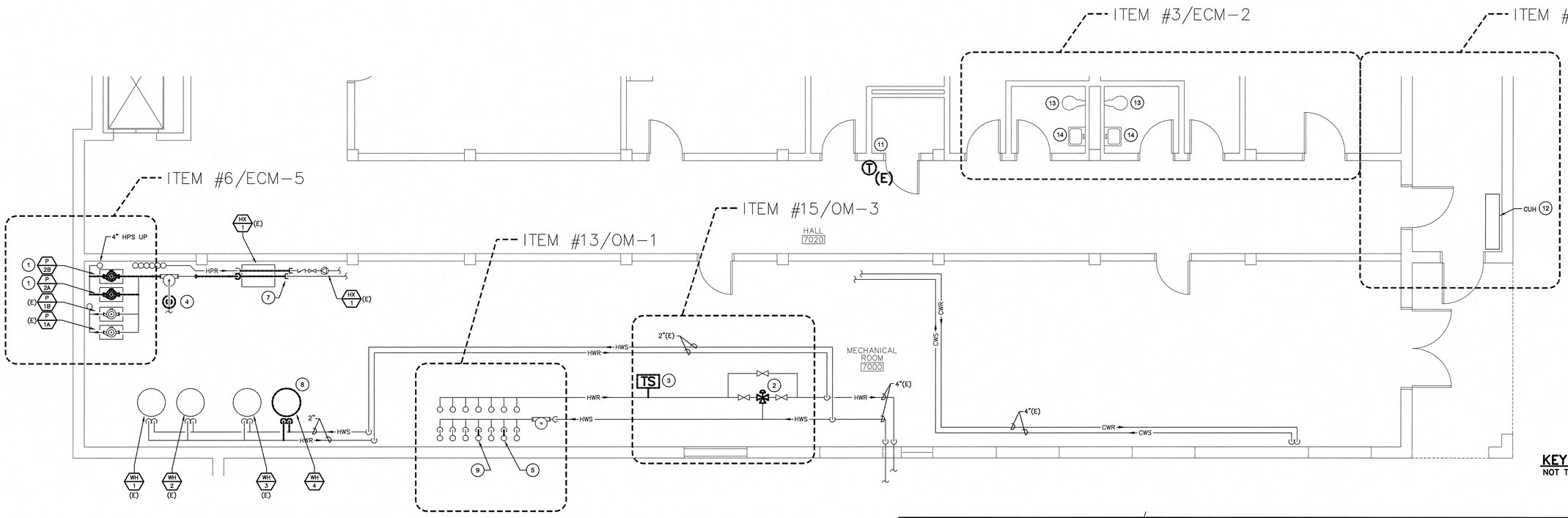
1. REMOVE PUMP
2. REMOVE EXISTING 3-WAY CONTROL VALVE
3. REMOVE EXISTING TEMPERATURE SENSOR
4. REMOVE EXISTING 5 GALLON EXPANSION TANK
5. REMOVE 2" SWING TYPE CHECK VALVE
6. NOT USED
7. DISCONNECT EXISTING 1" HWS & HWR, CAP AND REMOVE. SEE ELEVATION DETAIL, THIS DRAWING.
8. REMOVE REMOVE EXISTING DOMESTIC WATER HEATER AND ASSOCIATED HWS & HWR DHW HEATING LINES COMPLETE. CAP BRANCHES AT MAIN.
9. REMOVE 1" SWING TYPE CHECK VALVE
10. NOT USED
11. REMOVE ELECTRONIC THERMOSTAT
12. REPLACE CUH TEMPERATURE CONTROLLER
13. REMOVE EXISTING TOILET AND PROVIDE WITH NEW P-1 FIXTURE, UTILIZE EXISTING CONNECTIONS.
14. REMOVE EXISTING LAVATORY FAUCET AND PROVIDE NEW P-2B FIXTURE, UTILIZE EXISTING CONNECTIONS.
15. REMOVE DHW MIXING VALVE



(E)HX-1 ELEVATION DEMOLITION DETAIL
NOT TO SCALE



WELCH – GROUND FLOOR – PLUMBING DEMOLITION PLAN
1/4"=1'-0"



KEY PLAN
NOT TO SCALE
PLAN NORTH

ALL WORK ON THIS DWG IS ITEM #1/GEOTHERMAL SYSTEM EXCEPT AS NOTED.

WELCH – GROUND FLOOR – MECHANICAL DEMOLITION PLAN
1/4"=1'-0"

Stantec
Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

THE STATE OF NEW HAMPSHIRE
KEVIN E. SCHLAGER
No. 8288
PROFESSIONAL ENGINEER
PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

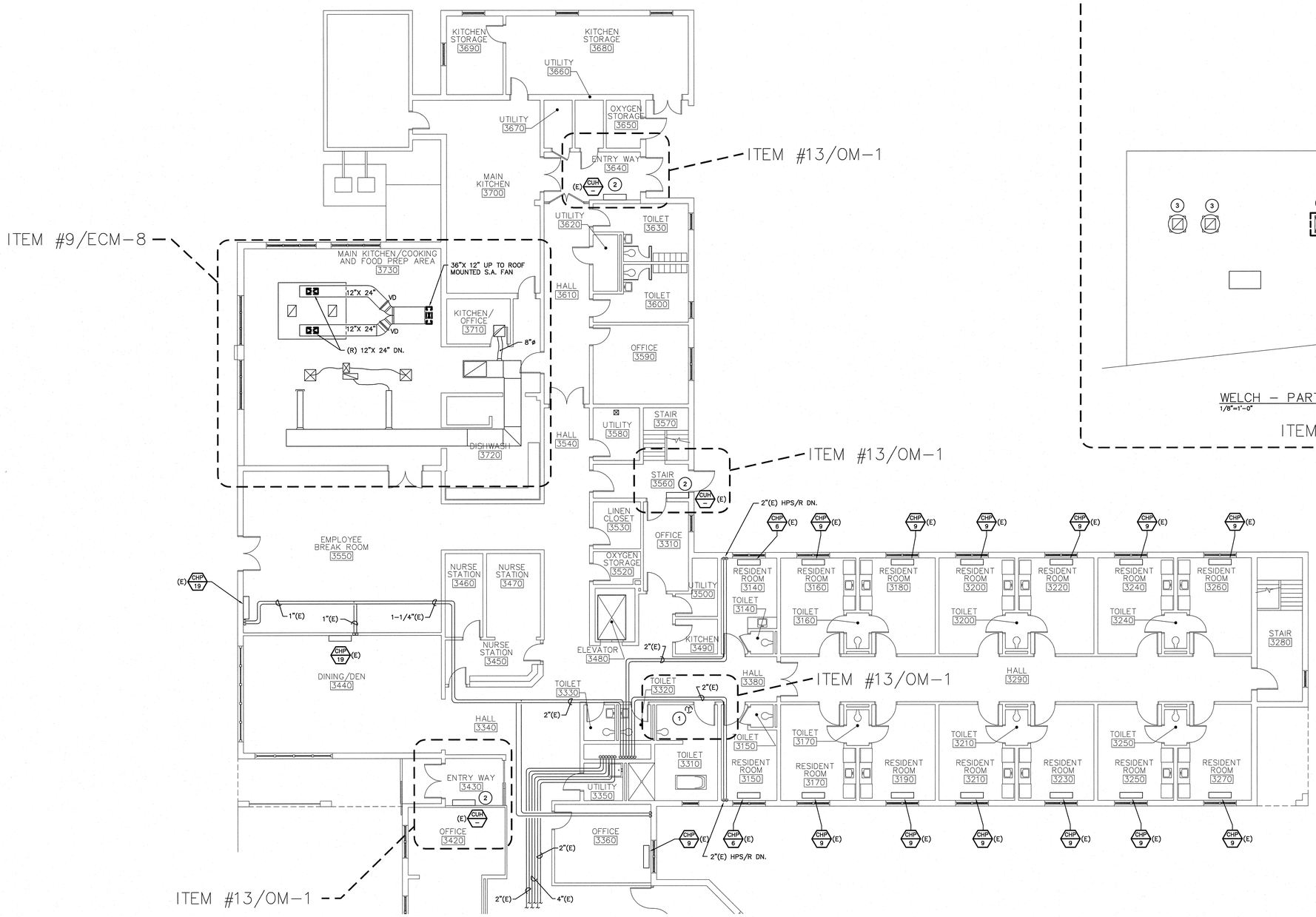
DATE	DESCRIPTION	BY

NH VETERANS HOME
ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

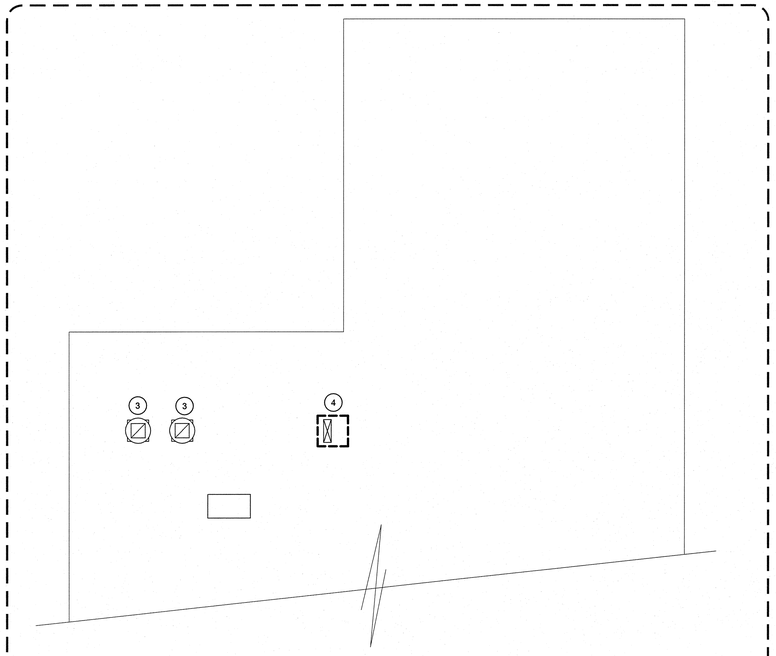
WELCH MECHANICAL ROOM AND KITCHEN PLAN

DRAWN BY:	SCALE:	DATE:
MAM/EJD	AS SHOWN	NOVEMBER 2008

PROJECT No. 80839R
CONTRACT: B
MD-101
SHEET: 29 OF 37

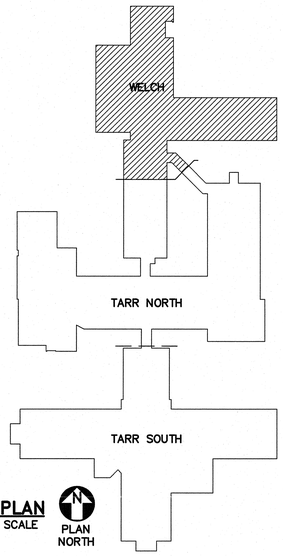


WELCH – FIRST FLOOR – DEMOLITION PLAN
1/8"=1'-0"



WELCH – PARTIAL ROOF – DEMOLITION PLAN
1/8"=1'-0"

ITEM #9/ECM-8



KEY PLAN
NOT TO SCALE
PLAN NORTH

MECHANICAL DEMOLITION NOTES:

1. REMOVE EXISTING ELECTRONIC THERMOSTAT
2. REPLACE CUH TEMPERATURE CONTROLLER
3. REMOVE 1.5HP FAN MOTOR
4. REMOVE 1.5HP SUPPLY FAN

ALL WORK ON THIS DWG IS ITEM #1/GEOTHERMAL SYSTEM EXCEPT AS NOTED.

Stantec
Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

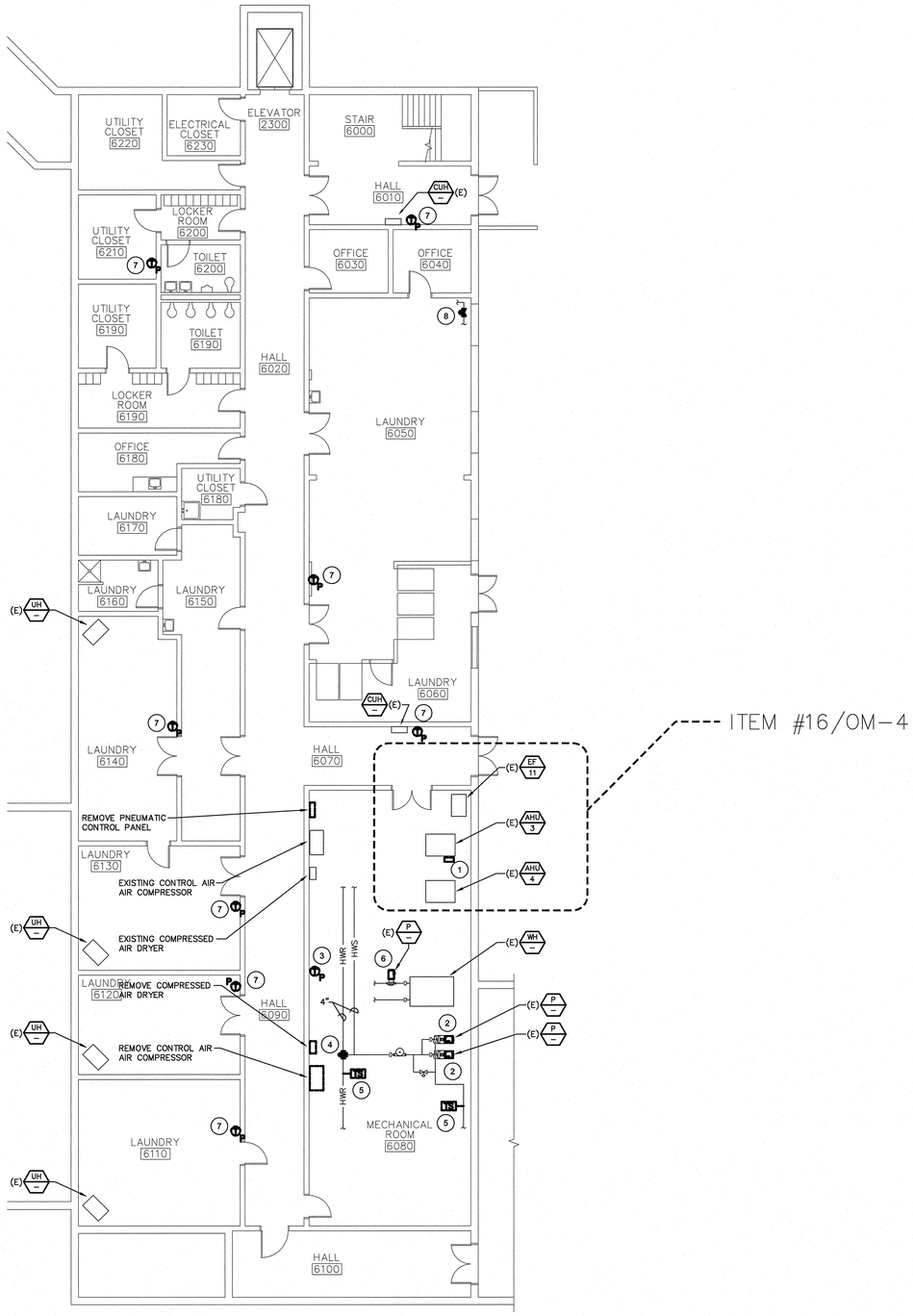
DATE	DESCRIPTION	BY

NH VETERANS HOME
ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

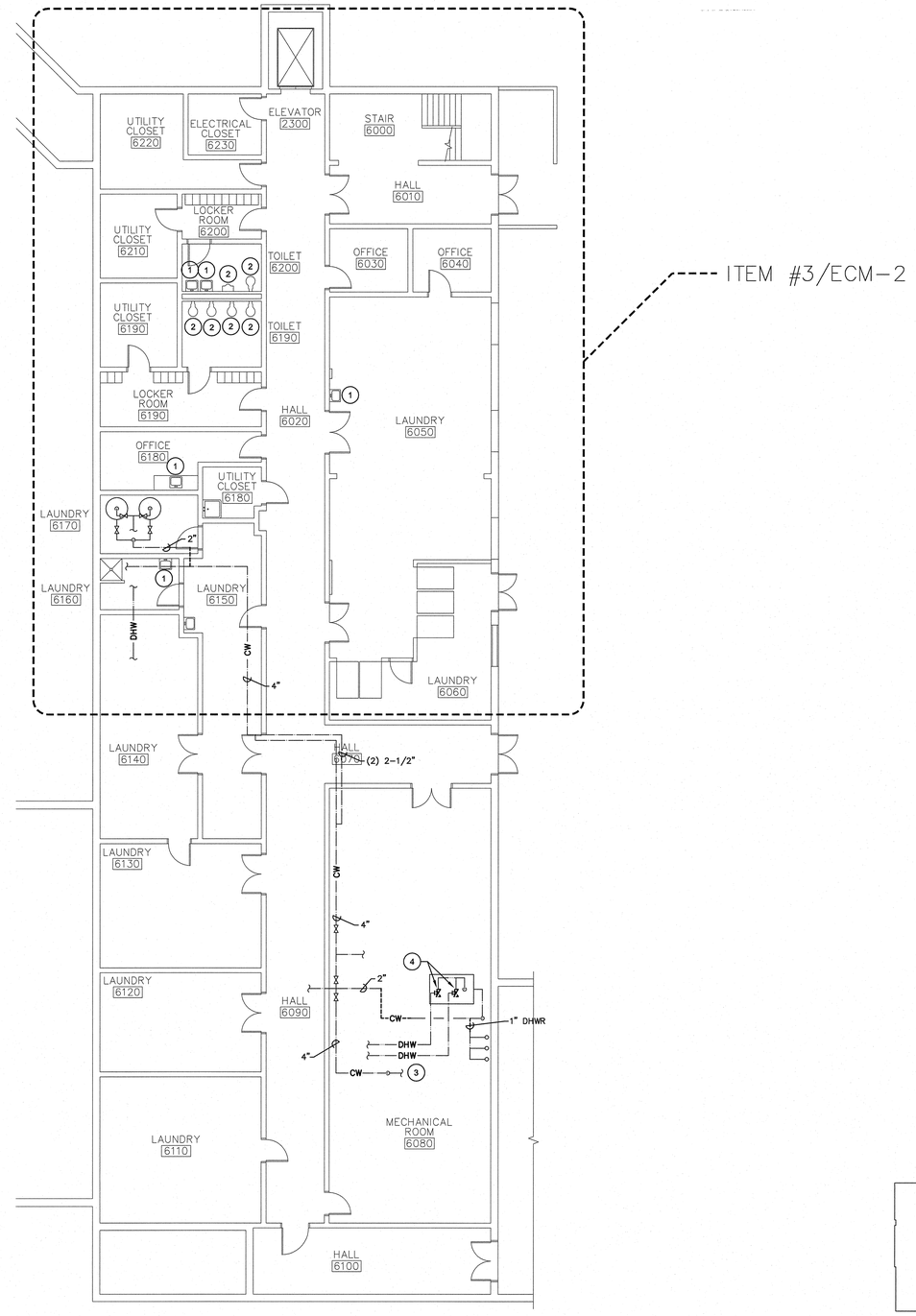
WELCH FIRST FLOOR
DEMOLITION PLAN

DRAWN BY:	SCALE:	DATE:
MAM/EJD	AS SHOWN	NOVEMBER 2008

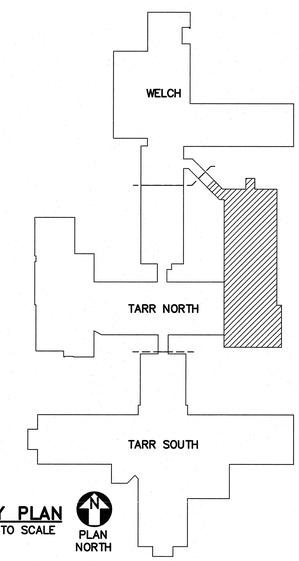
PROJECT No. 80839R
CONTRACT: 8
MD-102
SHEET: 30 OF 57



TARR NORTH – GROUND FLOOR – MECHANICAL DEMOLITION PLAN
1/8"=1'-0"



TARR NORTH – GROUND FLOOR – PLUMBING DEMOLITION PLAN
1/8"=1'-0"



KEY PLAN
NOT TO SCALE
PLAN NORTH

MECHANICAL DEMOLITION NOTES:

1. REMOVE EXISTING (E)AHU-3 1HP FAN MOTOR
2. ITEM #7/ECM-6: REMOVE EXISTING PUMP 7.5HP MOTOR
3. REMOVE EXISTING PNEUMATIC THERMOSTAT
4. REMOVE EXISTING 3-WAY CONTROL VALVE
5. REMOVE EXISTING HEATING HW TEMPERATURE SENSOR
6. ITEM #7/ECM-6: REMOVE EXISTING 2HP PUMP MOTOR
7. REMOVE PNEUMATIC THERMOSTAT
8. REMOVE FTR PNEUMATIC CONTROL VALVE

PLUMBING DEMOLITION NOTES:

1. REMOVE EXISTING LAVATORY FAUCET SEE NEW WORK PLAN FOR NEW WORK.
2. REMOVE EXISTING TOILET. SEE NEW WORK PLAN FOR NEW WORK.
3. POTABLE WATER SUPPLY FROM BACKFLOW PREVENTER ASSEMBLY
4. REMOVE MIXING VALVE

ALL WORK ON THIS DWG IS ITEM #1/GEOTHERMAL SYSTEM EXCEPT AS NOTED.

Stantec
Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE WILLIAM E. SCHAETTER JR. No. 9370
PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

DATE	DESCRIPTION	BY

NH VETERANS HOME
ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

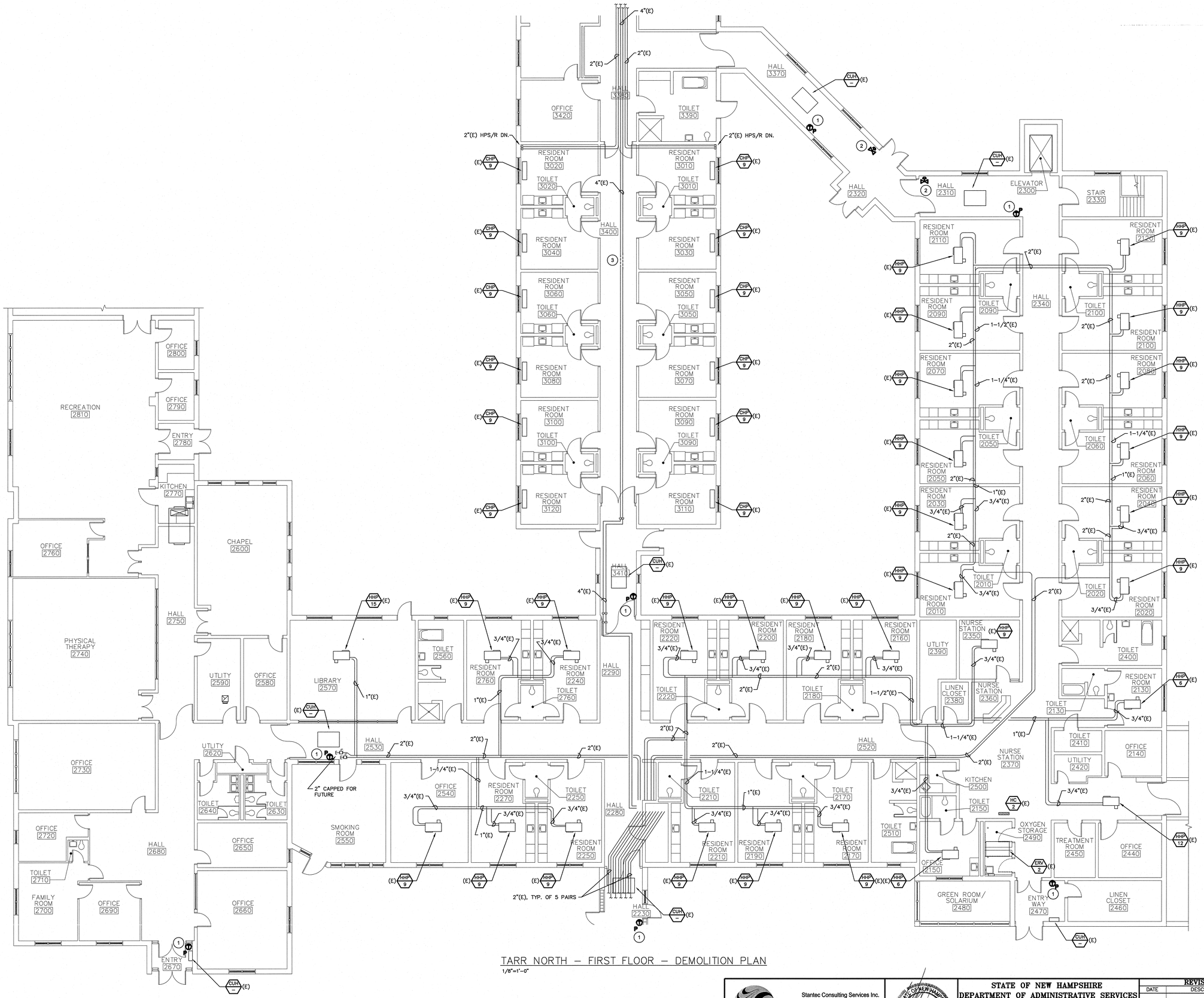
TARR NORTH GROUND FLOOR
DEMOLITION PLAN

DRAWN BY:	SCALE:	DATE:
MAM/EJD	AS SHOWN	NOVEMBER 2008

PROJECT No. 80839R
CONTRACT: B
MD-103
SHEET: 31 OF 57

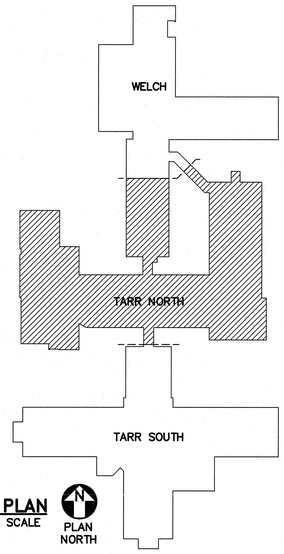
DEMOLITION NOTES:

1. REMOVE EXISTING PNUEMATIC THERMOSTAT
2. REMOVE EXISTING PNUEMATIC CONTROL VALVE
3. 30" SECTION OF 4" HPS & HPR PIPING TO ACCOMODATE INSTALLATION OF EXPANSION LOOP



TARR NORTH – FIRST FLOOR – DEMOLITION PLAN

1/8"=1'-0"



KEY PLAN
NOT TO SCALE

PLAN NORTH

ALL WORK ON THIS DWG IS ITEM #1/GEOTHERMAL SYSTEM EXCEPT AS NOTED.

Stantec

Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

THE STATE OF NEW HAMPSHIRE
WILLIAM A. SCHLAEFER JR.
No. 8089
LICENSED PROFESSIONAL ENGINEER
PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION

JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

DATE	DESCRIPTION	BY

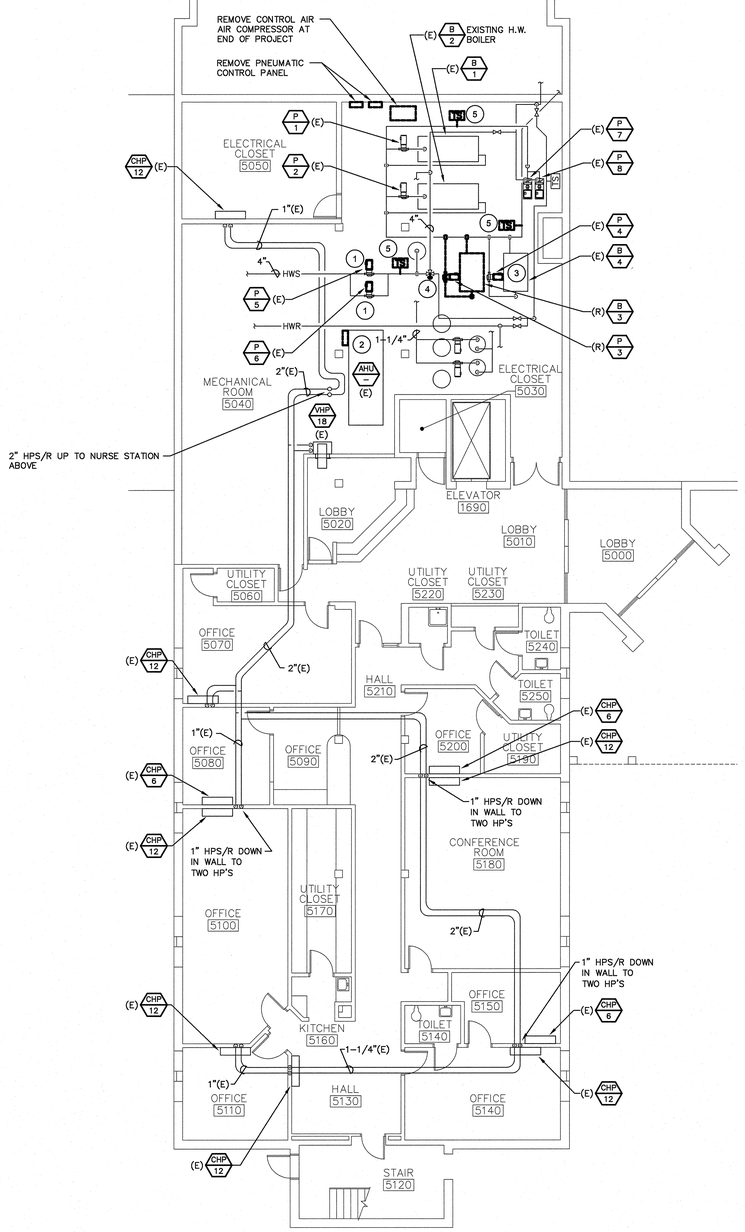
NH VETERANS HOME
ENERGY ENHANCEMENTS

139 WINTER STREET TILTON, NEW HAMPSHIRE

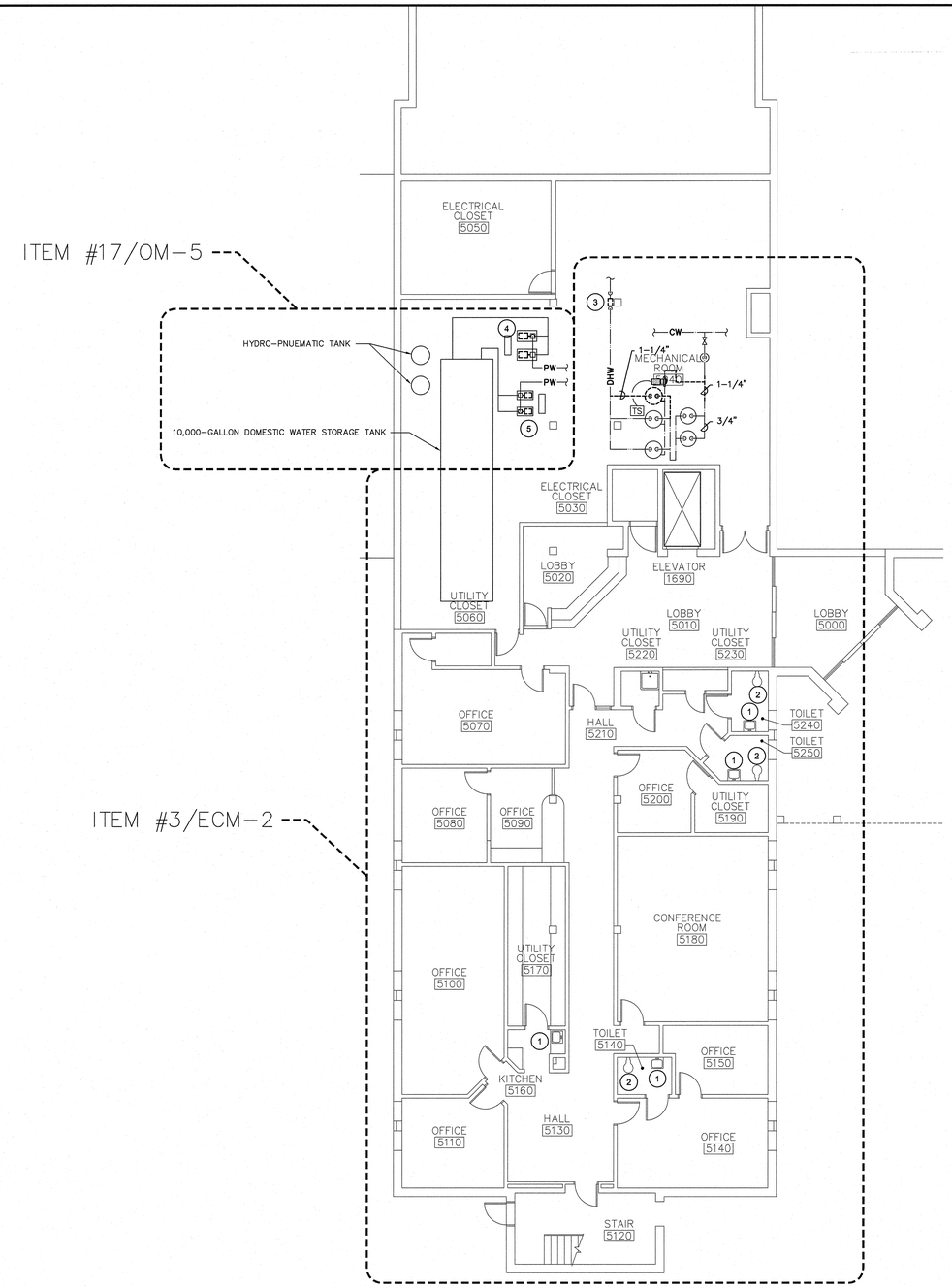
TARR NORTH FIRST FLOOR
DEMOLITION PLAN

PROJECT No. 80839R
CONTRACT: B

DRAWN BY:	SCALE:	DATE:	SHEET:
MAM/EJD	AS SHOWN	NOVEMBER 2008	MD-104 32 OF 57



TARR SOUTH – GROUND FLOOR – MECHANICAL DEMOLITION PLAN
1/8"=1'-0"



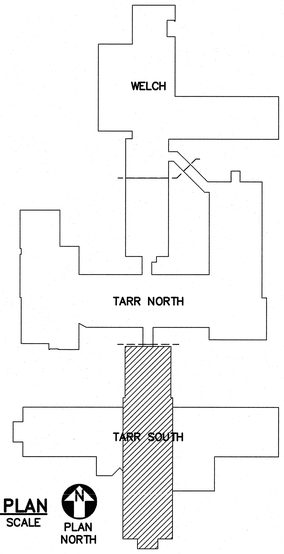
TARR SOUTH – GROUND FLOOR – PLUMBING DEMOLITION PLAN
1/8"=1'-0"

MECHANICAL DEMOLITION NOTES:

1. ITEM #7/ECM-6: REMOVE EXISTING 1.5HP PUMP MOTOR
2. ITEM #7/ECM-6: REMOVE EXISTING 3HP FAN MOTOR
3. ITEM #7/ECM-6: REMOVE EXISTING 1.5HP PUMP MOTOR
4. ITEM #13/OM-1: REMOVE EXISTING 3-WAY CONTROL VALVE ACTUATOR.
5. ITEM #13/OM-1: REMOVE EXISTING HEATING HW TEMPERATURE SENSOR

PLUMBING DEMOLITION NOTES:

1. ECM-2: REMOVE EXISTING LAVATORY FAUCET AND PROVIDE WITH NEW P-2A FIXTURE. UTILIZE EXISTING CONNECTIONS.
2. ECM-2: REMOVE EXISTING TOILET AND PROVIDE WITH NEW P-1 FIXTURE. UTILIZE EXISTING CONNECTIONS.
3. REMOVE MIXING VALVE ASSEMBLY
4. REMOVE 15 HP BOOSTER PUMP MOTOR – TWO LOCATIONS.
5. REMOVE 20 HP BOOSTER PUMP MOTOR – TOW LOCATIONS.



KEY PLAN
NOT TO SCALE
PLAN NORTH

ALL WORK ON THIS DWG IS ITEM #1/GEOTHERMAL SYSTEM EXCEPT AS NOTED.

Stantec
Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3516

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

DATE	DESCRIPTION	BY

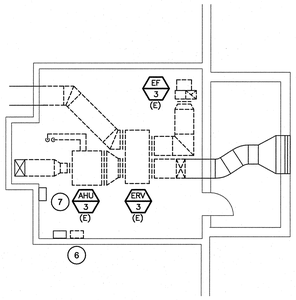
NH VETERANS HOME
ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

TARR SOUTH GROUND FLOOR DEMOLITION PLAN

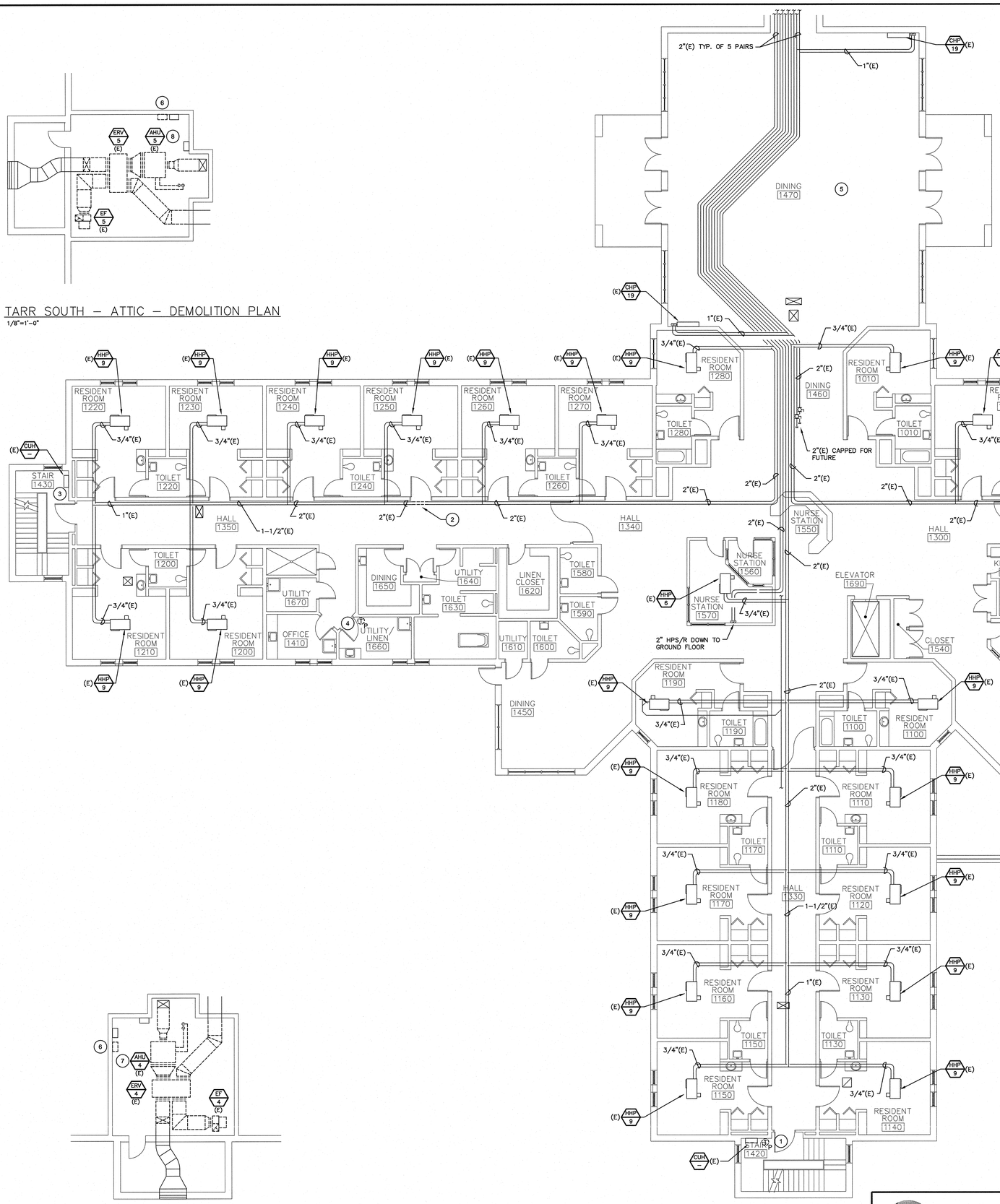
DRAWN BY:	SCALE:	DATE:
MAM/EJD	AS SHOWN	NOVEMBER 2008

PROJECT No. 80839R
CONTRACT: B
MD-105
SHEET: 33 OF 57

TARR SOUTH – ATTIC – DEMOLITION PLAN
1/8"=1'-0"



TARR SOUTH – ATTIC – DEMOLITION PLAN
1/8"=1'-0"



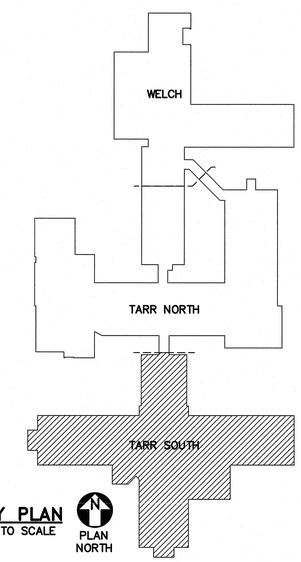
TARR SOUTH – ATTIC – DEMOLITION PLAN
1/8"=1'-0"

TARR SOUTH – FIRST FLOOR – DEMOLITION PLAN
1/8"=1'-0"

DRAWING NOTES:

1. REMOVE PNEUMATIC THERMOSTAT
2. 10" SECTION OF 2" HPS & HPR PIPING TO ACCOMODATED INSTALLATION OF EXPANSION LOOP
3. REMOVE CUH TEMPERATURE CONTROLLER
4. REMOVE PNEUMATIC THERMOSTAT CONTROLLING ROOM EXHAUST FAN.
5. REMOVE AHU-2 LOCATED IN MECHANICAL ROOM ABOVE DINING HALL MIXED AIR DAMPER
6. REMOVE EXISTING ELECTRONIC HUMIDIFICATION UNIT COMPLETE WITH ALL ASSOCIATED WIRING, PIPING, AND CONTROLS.
7. REMOVE AND REPLACE DOOR FRAMES IN BOTH MECHANICAL ROOM AND STAIRWELL TO ALLOW FOR REMOVAL OF AHU.
8. AHU-5 TO BE REMOVED THRU WALL

ALL WORK ON THIS DWG IS ITEM #1/GEOTHERMAL SYSTEM EXCEPT AS NOTED.



KEY PLAN
NOT TO SCALE

Stantec
Stantec Consulting Services Inc.
54 Route 106
North Springfield VT U.S.A.
05150
Tel. 802.886.2261
Fax. 802.886.2260
www.stantec.com

PLACE STAMP HERE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF PUBLIC WORKS DESIGN & CONSTRUCTION
JOHN O. MORTON BUILDING
7 HAZEN DRIVE BOX 483 ROOM 250
CONCORD, NEW HAMPSHIRE 03302-0483
(603) 271-3516 FAX(603) 271-3515

ENGINEER/ARCHITECT:	DESIGNED BY:	APPROVED BY:	CHECKED BY:
KES	MAM	KES	KES

REVISIONS

DATE	DESCRIPTION	BY

NH VETERANS HOME
ENERGY ENHANCEMENTS
139 WINTER STREET TILTON, NEW HAMPSHIRE

TARR SOUTH FIRST FLOOR DEMOLITION PLAN

PROJECT No. 80839R
CONTRACT: 8

DRAWN BY:	SCALE:	DATE:	SHEET:
MAM/EJD	AS SHOWN	NOVEMBER 2008	MD-106 34 OF 57