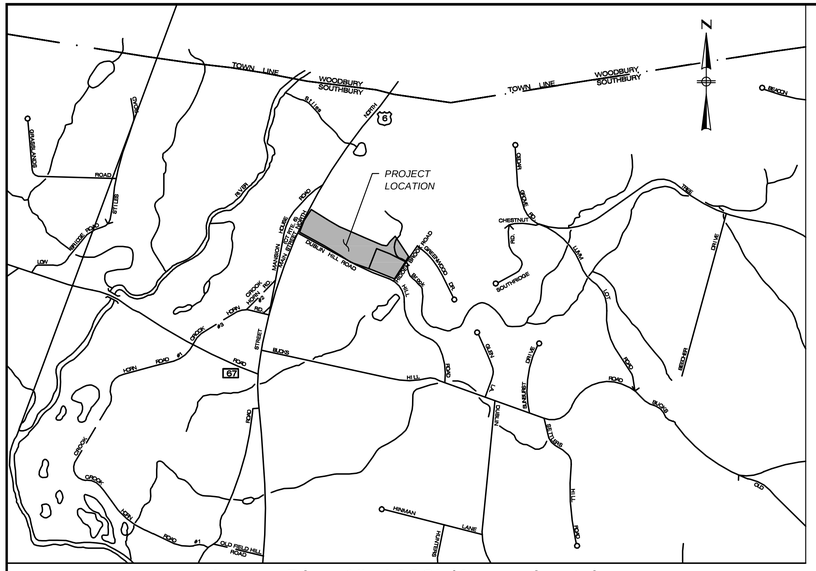
Appendix B: Technical Plans (OWRS 302)

LUTHERAN HOME OF SOUTHBURY
ON-SITE WASTEWATER RENOVATION SYSTEM IMPROVEMENTS & MODIFICATIONS



Locus Plan 1"=1000' (Approximate)

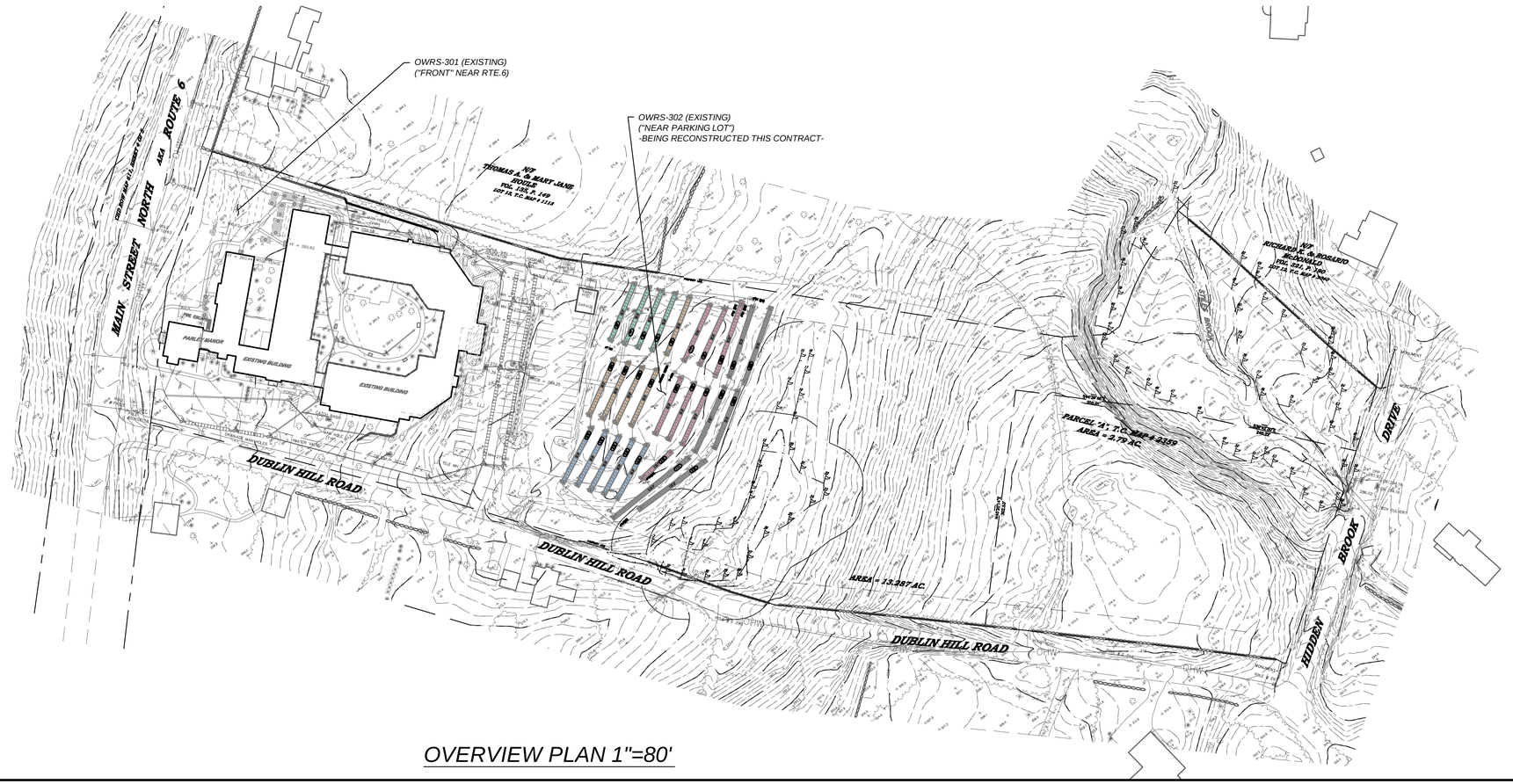
LEACHING FIELD GPS COORDINATES

OWRS-301 (EXISTING)
("FRONT" NEAR RTE.6)
73° 12' 37.87" W
41° 30' 15.03" N

OWRS-302 (EXISTING)
-BEING RECONSTRUCTED THIS CONTRACT-
("NEAR PARKING LOT"):
73° 12' 31.26" W
41° 30' 11.66" N

LEGEND (EXISTING)

SMH	SEWER MANHOLE
DMH	DRAIN MANHOLE
CB	CATCH BASIN
MH	MANHOLE
LP	LIGHT POLE
HYD	HYDRANT
WG	WATERGATE
GG	GAS GATE
E	UNDERGROUND ELECTRIC
UC	UNDERGROUND COMMUNICATION LINES
G	GAS LINE
W	WATER LINE
OHW	OVERHEAD WIRES
	EXISTING WALL
	EXISTING TREELINE
B-1	SEPTIC DEEP TEST HOLE
MW-1	GROUNDWATER MONITORING WELL
	MOUNDED SHGW ELEVATION
	EXISTING GRADE



OVERVIEW PLAN 1"=80'

"I certify that, based on reasonable investigation, including my inquiry of the individuals responsible for obtaining the information, the submitted information is true, accurate and complete, and in my professional judgment, proper operation and maintenance of the subsurface sewage disposal system installed to treat the wastewater which is the subject of this registration will ensure that the discharge of such wastewater meets all conditions in the General Permit to Discharge from Subsurface Sewage Disposal Systems Serving Existing Facilities. This certification is based in part on my review of the Plan, past and current uses of the site at which such wastewater is generated and detailed and reliable information about subsurface sewage disposal systems located on the subject site. I understand that any false statement in this certification is may be punishable as a criminal offence under Section 53a-157b of the Connecticut General Statutes and under any other applicable law."

STATE OF CONNECTICUT
JOSEPH FEDERICO, JR.
No. 13744
LICENSED
PROFESSIONAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER DATE

OWNER/APPLICANT:
SOUTHBURY REAL ESTATE GROUP, LLC
990 MAIN STREET NORTH, SOUTHBURY, CT

ENGINEER:
BETA GROUP, INC.
6 BLACKSTONE VALLEY PLACE, LINCOLN, RI 02865

INDEX OF DRAWINGS:

BETA
6 Blackstone Valley Place
Suite 101
Lincoln, Rhode Island 02865
401.333.2382
www.BETA-Inc.com

DATE: APRIL 2016

PERMIT DRAWINGS

I. GENERAL NOTES

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH GUIDANCE FOR DESIGN OF LARGE-SCALE ON-SITE WASTEWATER RENOVATION SYSTEMS, FEBRUARY 2006, BY THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION, BUREAU OF MATERIALS MANAGEMENT AND COMPLIANCE ASSURANCE, AND PER THE STATE OF CONNECTICUT PUBLIC HEALTH CODE

1. BASEMAPPING SUPPLIED BY THE FOLLOWING:
   A. ORIGINAL BASEMAPPING/SURVEY PROVIDED IN AUTOCAD FORMAT BY CIVIL-1, INC. OF WOODBURY, CT.
   B. CIVIL-1 BASEMAPPING/SURVEY, WAS VERIFIED AND SUPPLEMENTED BY STUART SOMERS, INC., SOUTHBURY, CT. FOR ACCURACY AND DATUM VERIFICATION.
   C. STUART-SOMERS PROVIDED BETA GROUP WITH CORRECTED AUTOCAD FORMAT SURVEY DATA AS FOLLOWS:
      HORIZONTAL DATUM - CONNECTICUT STATE PLANE,
      VERTICAL 1.40-FT HIGHER THAN NAVD 88, 2.32-FT HIGHER THAN NGVD 29.

2. ELECTRICAL AND PLUMBING/GAS-FITTING DRAWINGS ARE DESIGNED BY SED ASSOCIATES, 132 LINCOLN STREET, BOSTON, MA.

3. ALL CONSTRUCTION IS SUBJECT TO THE INSPECTION OF THE ENGINEER, THE LOCAL OFFICIALS, AND THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION (CT DEEP), AND THE LOCAL HEALTH DISTRICT. THE CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF THREE BUSINESS DAYS ADVANCE WHEN A FIELD INSPECTION IS REQUIRED OF THE PROPOSED SYSTEM, AND IN ACCORDANCE WITH CT DEEP REGULATIONS.

4. THE CONTRACTOR SHALL SPECIFICALLY REQUEST IN WRITING ANY PROPOSED CHANGES OR SUBSTITUTIONS IN THE WORK AS SHOWN ON THE PLANS AND SPECIFIED PRIOR TO ORDERING MATERIALS OR EXECUTION OF THE WORK INVOLVED. THE CONTRACTOR MUST RECORD ANY CHANGES OR ALTERATIONS IN THE PROPOSED DESIGN ON "AS-BUILT DRAWINGS" AND PROVIDE A MINIMUM OF 3 COPIES (THIS ALSO APPLIES TO SUB-CONTRACTORS "AS-BUILT" DRAWINGS) TO THE ENGINEER PRIOR TO FINAL INSPECTION AND ACCEPTANCE OF THE WORK.

5. THE CONTRACTOR SHALL CONDUCT THE CLEAN WATER HYDRAULIC TESTING 0F THE SYSTEM IN THE PRESENCE OF THE ENGINEER, LOCAL REGULATORS, CT DEEP AND MANUFACTURER'S REPRESENTATIVES AND MAKE ANY ADJUSTMENTS AND/OR ALTERATIONS AS MAY BE REQUIRED INITIALLY AT SYSTEM STARTUP FOR PROPER OPERATION. THE OWNER SHALL PROVIDE THE TESTING WATER AS REQUIRED, CONTRACTOR TO COORDINATE AS REQUIRED. SHOULD ANY DELAY OCCUR REQUIRING MULTIPLE TESTS OR ADDITIONAL WATER, BEYOND THE BASE SCOPE OF WORK, THE CONTRACTOR SHALL REIMBURSE THE OWNER FOR THE COST OF ADDITIONAL TESTING WATER.

6. THE LOCATION, SIZE, AND MATERIAL OF EXISTING PIPES, DUCTS, CONDUITS AND OTHER UNDERGROUND STRUCTURES AND/OR UTILITIES SHOWN ON THESE PLANS ARE FROM THE BEST SOURCES AVAILABLE AT PRESENT AND ARE NOT WARRANTED TO BE EXACT, NOR IS IT WARRANTED THAT ALL UNDERGROUND PIPES, UTILITIES OR STRUCTURES ARE SHOWN. EXACT LOCATION TO BE DETERMINED BY CONTRACTOR IN FIELD.

7. EXISTING UTILITIES HAVE BEEN PLOTTED FROM THE BEST AVAILABLE DATA AND ARE APPROXIMATE ONLY. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL VERIFY LOCATIONS OF ALL EXISTING UTILITIES AND NOTIFY ALL UTILITY COMPANIES (PUBLIC AND PRIVATE). IN ADDITION, "CONNECTICUT CALL BEFORE YOU DIG" MUST BE CONTACTED: DIALING 811 or 1-800-922-4455.

8. EXISTING UTILITIES ENCOUNTERED DURING CONSTRUCTION SHALL BE PROTECTED AND SUPPORTED AT ALL TIMES BY THE CONTRACTOR. THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS TO INTERFERE AS LITTLE AS POSSIBLE WITH EXISTING UTILITIES. PAYMENT FOR PROVIDING SAID PROTECTION AND SUPPORTS SHALL BE CONSIDERED A PART OF THE LUMP SUM PRICE FOR THE CONTRACT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION BY REASON OF DELAY AND/OR INCONVENIENCE IN ADAPTING HIS OPERATIONS ACCORDINGLY.

9. BORING LOGS & DEEP OBSERVATION HOLE LOGS CAN BE PROVIDED UPON REQUEST. THE ORIGINAL DOCUMENTS/LOGS ARE AVAILABLE IN THE HYDRO-GEOLOGICAL INVESTIGATION PREPARED WITH THE GROUNDWATER DISCHARGE PERMIT APPLICATION AND WASTEWATER MANAGEMENT REPORT.

10. GROUNDWATER LEVELS INDICATED ON THE BORING LOGS ARE THOSE LEVELS OBSERVED AT THE TIME THE BORINGS WERE TAKEN. PRESENT GROUNDWATER LEVELS MAY VARY FROM THOSE INDICATED.

11. IN GENERAL, UTILITY TEST PITS HAVE NOT BEEN SHOWN ON THE DRAWINGS. THE INTENT IS TO CONDUCT TEST PITS THROUGHOUT THE PROJECT AREA DURING THE COURSE OF WORK. CONTRACTOR SHALL CONDUCT TEST PITS WHERE CONFLICTS BETWEEN EXISTING PIPING AND PROPOSED PIPING MAY OCCUR OR AS DIRECTED BY ENGINEER.

12. ALL DIMENSIONS AND JOB RELATED CONDITIONS ARE TO BE VERIFIED BY THE CONTRACTOR. ANY DISCREPANCIES FOUND ARE TO BE BROUGHT TO THE ATTENTION OF THE OWNER/ENGINEER AND PROPERLY RESOLVED BEFORE PROCEEDING WITH THAT PORTION OF THE WORK. CONTINUATION WITH OTHER ASPECTS OF THE WORK SHALL PROCEED WITHOUT DELAY OR CAUSE FOR CLAIM.

13. WHERE EXISTING MATERIALS ARE ENCOUNTERED WHICH, IN THE OPINION OF THE OWNER/ENGINEER ARE UNSUITABLE FOR BEDDING, BACK FILLING OR OTHER INTENDED USE, SUCH MATERIALS SHALL BE REMOVED AS DIRECTED AND REPLACED WITH SUITABLE BANK-RUN GRAVEL, CRUSHED STONE AND/OR SELECTED BORROW, OR SELECT FILL, AS DIRECTED BY THE OWNER/ENGINEER.

14. EXCEPT WHERE NOTED BY PROPOSED CONTOUR LINES, ALL FINAL ELEVATIONS SHALL BE THE SAME AS EXISTING ELEVATIONS.

15. ALL CURBING, SIDEWALKS, WALKWAYS, PAVED AREAS, IRRIGATION LINES, ETC. DISTURBED BY CONSTRUCTION OPERATIONS SHALL BE REPLACED AND RESTORED, IN KIND, AS DIRECTED BY THE OWNER/ENGINEER.

16. ALL GRASSED AREAS DISTURBED BY THE CONSTRUCTION OPERATIONS SHALL BE LOAMED AND SEEDED. FINAL RESTORATION SHALL BE EQUAL TO OR BETTER THAN THAT WHICH EXISTED PRIOR TO CONSTRUCTION AS DETERMINED SOLELY BY THE OWNER/ENGINEER. PAYMENT SHALL BE CONSIDERED PART OF AND PAID FOR UNDER THE LUMP SUM CONTRACT. THE CONTRACTOR IS RESPONSIBLE FOR RESTORING ANY EXISTING STRUCTURES, FENCES, WALLS, WALKWAYS, DRIVEWAYS, ETC. THAT ARE DISTURBED DUE TO ANY OF THE WORK REQUIRED UNDER THIS SECTION AT NO ADDITIONAL COST TO THE OWNER.

17. ALL BUILDING PERMITS, MECHANICAL, GAS FITTING, ELECTRICAL, ETC., ARE THE RESPONSIBILITY OF THE CONTRACTOR. SCHEDULING OF ALL APPURTENANT INSPECTIONS W/ THE INSPECTOR OF BUILDING, GAS FITTING, PLUMBING, ELECTRICAL INSPECTOR, ETC., ARE THE RESPONSIBILITY OF THE CONTRACTOR.

18. CONTRACTOR TO SUBMIT "REDLINE" AS-BUILT DRAWINGS TO ENGINEER PRIOR TO SUBSTANTIAL COMPLETION, AND SHALL BE RESPONSIBLE TO OBTAIN AND FURNISH TO THE ENGINEER REDLINE AS-BUILT DRAWINGS FROM ALL SUBCONTRACTORS PRIOR TO SUBSTANTIAL COMPLETION. FINAL PAYMENT WILL NOT BE ISSUED UNTIL REDLINE DRAWINGS FROM ALL TRADES ARE PROVIDED AND ACCEPTED BY THE ENGINEER.

19. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING EXISTING FLOWS AT ALL TIMES DURING CONSTRUCTION AS REQUIRED. THE EXISTING ON-SITE WASTEWATER SYSTEM SHALL REMAIN IN SERVICE THROUGHOUT CONSTRUCTION OF THIS PROJECT. THE CONTRACTOR'S WORK SHALL INCLUDE PROVISIONS FOR CONSTRUCTING TEMPORARY BYPASS PUMPING AND TANKAGE AS NECESSARY TO MAINTAIN EXISTING WASTEWATER FLOW TO THE EXISTING DISPOSAL AREAS UNTIL THE NEW SYSTEM IS COMPLETE, AND CT DEEP ALLOWS WASTEWATER TO BE DIRECTED TO THE NEW SYSTEM AFTER CLEAN WATER TESTING AND CERTIFICATION.

20. CONTRACTOR TO COORDINATE PUMPING OF CONTENTS OF THE TANKS AND SEPTIC GALLERIES WITH THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT AND COORDINATION OF SEPTAGE PUMPING FOR ALL BYPASS OPERATIONS REQUIRED TO PERFORM THE WORK AS NECESSARY. THE MATERIALS AND CONSTRUCTION METHODS REQUIRED FOR COMPLETING THE WORK SHALL INCLUDE BUT NOT BE LIMITED TO, REMOVING ALL LIQUID AND SOLID MATERIAL FROM THE EXISTING TANKS AND GALLERIES, SUBSEQUENT HAULING AND DISPOSAL OF SAID MATERIAL, IN ORDER TO ADEQUATELY AND SAFELY PERFORM THE PROPOSED MODIFICATIONS TO THE EXISTING SYSTEMS, EXCAVATION, BACKFILL, FILL, GRADING AND RESTORATION TO COMPLETE THE WORK AS REQUIRED. THE CONTRACTOR SHALL CONFORM TO THE REQUIREMENTS OF THE POMPERAUG HEALTH DISTRICT RULES AND REGULATIONS AND TO THE CONNECTICUT PUBLIC HEALTH CODE IN ITS ENTIRETY.

21. THE CONTRACTOR MAY NOT DRIVE OVER WITH EQUIPMENT, STOCKPILE, OR STORE ANY MATERIALS, HEAVY EQUIPMENT, ETC., OVER THE EXISTING SEPTIC FACILITIES REMAINING IN SERVICE, OR ANY EFFLUENT DISPOSAL AREA, OR AREA DESIGNATED FOR FUTURE LEACHING FACILITIES.

II. SUGGESTED CONSTRUCTION SEQUENCING & NOTES

1. ALL WORK SHALL BE SUPERVISED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT, INCLUDING, BUT NOT LIMITED TO LAYOUT, STRIPPING OF TOPSOIL, EXCAVATION, SUBGRADE PREPARATION, REMOVAL/STOCKPILING OF EXISTING GALLERY SECTIONS AND STONE AGGREGATE, SCARIFICATION OF SUBGRADE, INSTALLATION AND BACKFILL OF SELECT FILL, INSTALLATION OF GST-6212 TRENCHES, INSTALLATION OF PIPING, TESTING, BACKFILLING, FINAL LOAM/SEEDING, RE-CONSTRUCTION OF PARKING AREA

2. CONTRACTOR TO PROVIDE 10-DAYS WRITTEN NOTIFICATION PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION, TO CT DEEP, THE LOCAL HEALTH DISTRICT, AND THE ENGINEER. CONTRACTOR SHALL PROVIDE CPM CONSTRUCTION/COMMISSIONG SCHEDULE, AS WELL AS A SCHEDULE OF VALUES OF PROJECT ITEMS, PRIOR TO THE PRE-CONSTRUCTION MEETING.

3. ALL WORK SHALL BE PERFORMED BY A LICENSED SUBSURFACE SEWAGE DISPOSAL SYSTEM INSTALLER UNDER THE PROVISIONS OF CHAPTER 393a, SECTION 20-341 OF THE CONNECTICUT GENERAL STATUTES.

4. LAYOUT SHALL BE PROVIDED BY A SURVEYOR LICENSED IN THE STATE OF CONNECTICUT. BETA GROUP UTILIZED STUART AND SOMERS, INC. OF SOUTHBURY, CT, ATTN: CHARLES SPATH, PLS, FOR SURVEY SERVICES FOR THE DESIGN WORK.

5. THE SURVEYOR SHALL CREATE RECORD DRAWINGS SHOWING THE ACTUAL INSTALLED LAYOUT OF THE SAS. THIS SHALL INCLUDE LOCATION AND ELEVATIONS OF ALL PIPES, FITTINGS, LIMITS OF EXCAVATIONS, CLEANOUTS, THRUSTBLOCKS, TANK LOCATIONS WITH ALL APPURTENANT ELEVATIONS, ELECTRICAL CONDUIT LOCATION, ELECTRICAL DISTRIBUTION AND GENERATION EQUIPMENT, EDGE OF FINISHED DRIVEWAYS, ACCESS ROADS, OR PARKING AREAS, ETC.

6. EXCAVATION AND DISPOSAL OF ALL EXCESS MATERIAL SHALL CONFORM TO FORM 816A AND SECTION 2.02 AND 2.03. IF THE EXCAVATIONS ARE UNCLASSIFIED, THE EXCESS MATERIAL MAY BE STOCKPILED OFFSITE, AT THE CONTRACTORS DISCRETION AND LOCATION APPROVED BY THE ENGINEER AND OWNER. EXCESS MATERIAL MAY ALSO BE TESTED FOR SUITABILITY FOR USE FOR GRAVEL BASE MATERIAL FOR A TEMPORARY CONSTRUCTION ACCESS DRIVEWAY. RESULTS OF SIEVE AND COMPACTION/PROCTOR TESTS OF REPRESENTATIVE SAMPLES, PER APPLICABLE ASTM STANDARDS, SHALL BE SUBMITTED TO ENGINEER FOR REVIEW

7. SUGGESTED CONSTRUCTION SEQUENCE/PHASING:

PHASE 1: TANKS AREA AND UTILITIES

7.1. COORDINATE TEMPORARY PARKING PROVISIONS, SITE CONSTRUCTION PARKING AREA SIGNAGE AND/OR WARNING/CAUTION BARRIERS, BARRELS ETC. WITH THE OWNER
7.2. ESTABLISH/INSTALL CONSTRUCTION BENCHMARKS AND OFFSETS, STABILIZED CONSTRUCTION ENTRANCE, SEDIMENTATION AND EROSION CONTROL MEASURES PER CONNECTICUT STANDARDS AND PER LOCAL AUTHORITY
7.3. INSTALL , GRAVEL ACCESS ROAD, AND PREPARE MATERIALS STORAGE/STOCKPILING AREA.
7.4. INSTALL NEW CONCRETE TANKS, TEST FOR WATER TIGHTNESS (PUMP STATION / FLOW EQUALIZATION CHAMBER AND VALVE CHAMBERS).
7.5. EXTEND UTILITIES TO TANKS/CONTROLS AREA
  7.5.1. UNDERGROUND ELECTRICAL SERVICE
  7.5.2. NATURAL GAS SERVICE FOR GENERATOR
  7.5.3. 3-INCH DIAMETER PVC SDR-21 RAW SEWAGE FORCE MAIN PIPE (LEAVE STUBBED NEAR CONNECTION POINT UNTIL READY TO CONNECT TANK.)
  7.5.4. INSTALL PRESSURE PIPES THAT FEED GST TRENCHES, ALONG WITH THE ABOVE UTILITIES IN CORRIDOR ALONG ACCESS ROAD, STUB OFF ACCORDINGLY.
7.6. INSTALL ELECTRICAL SWITCHGEAR, NEW GENERATOR, GAS METER,
7.7. INSTALL PUMPS AND PIPING
7.8. PERFORM LEAKAGE TESTS (TANKS AND PIPING)
7.9. FUNCTIONAL CHECK ON PUMPING/ALARMS

PHASE 2: LEACHING FIELD RE-CONSTRUCTION:

PHASE 2A - PREPARATIONS

7.9.1. COORDINATE AND PROTECT EXISTING GALLERY AND VALVES ACCESS RISERS THAT WILL BE UTILIZED DURING CONSTRUCTION TO MINIMIZE REQUIRED BYPASS PUMPING DURING FIELD CONSTRUCTION
7.9.2. COORDINATE WITH OWNER, AND ENSURE WHICH TRENCHES/"MODE" IS ACTIVE. BETA RECOMMENDS THE CONTRACTOR PREPARE CONSTRUCTION EQUIPMENT ACCESS AS REQUIRED. COORDINATE WITH OWNER AS REQUIRED
7.9.3. PROTECT AND MAINTAIN EXISTING SEWER FORCE MAIN FEEDING EXISTING D-BOX AND IN-SERVICE GALLERIES, AS REQUIRED
7.9.4. THE PRIMARY TRENCHES AND GROUP 3 (NEAR WETLAND) NEED TO BE ONLINE AND ACTIVELY RECEIVING WASTEWATER FOR PHASE 2B. THIS WILL ALLOW THE RECONSTRUCTION WORK TO OCCUR IN THE REMAINING GROUPS THAT ARE PLACED OFFLINE. PROPOSED GST ZONES 1 - 4 CAN BE CONSTRUCTED AND COMMISSIONED IN THE OFFLINE AREA, WHILE PRIMARY AND GROUP 3 TRENCHES ARE IN SERVICE. ALL TANKS, ELECTRICAL, MECHANICAL WORK MUST BE INSTALLED PRIOR TO PERFORMING THE LEACHFIELD WORK, SO THAT UPON COMPLETION OF GST-ZONES 1-4, THE NEW GST TRENCHES CAN BE TESTED, COMMISSIONED, AND WASTEWATER FLOW DIRECTED TO THEM, TO ALLOW DEMO OF PRIMARY TRENCHES AND GROUP 3, AND SUBSEQUENT CONSTRUCTION OF NEW GST ZONES 5-6 TO BE COMPLETED.

PHASE 2B: FIELD RE-CONSTRUCTION

7.9.5. PUMP DRY EXISTING GALLERY GROUPS 1, 2A, AND 2B, TO PREPARE FOR EXCAVATION OPERATIONS
7.9.6. STRIP AND STOCKPILE TOPSOIL, UTILIZING CONNECTICUT APPROVED EROSION AND SEDIMENTATION CONTROL MEASURES.
7.9.7. EXCAVATE AREA (WITH THE TRENCHES OFFLINE: STARTING WITH GROUPS 1, 2A, 2B) TO THE TOP ELEVATION OF EXISTING CONCRETE GALLERIES, REMOVING AND DISPOSING EXISTING ACCESS RISERS, AS REQUIRED. THE EXCESS SOIL EXCAVATED SHALL BE STOCKPILED IN THE DESIGNATED MATERIALS STORAGE / STAGING AREA, FOR SCREENING, AND AND FOR UTILIZATION FOR OTHER SITE WORK FEATURES (ACCESS ROADWAY, PERMANENT PARKING LOT ON RECONSTRUCTED LEACHING FIELD)
7.9.8. REMOVE, CRUSH, AND DISPOSE OF EXISTING CONCRETE GALLERIES AND ASSOCIATED CRUSHED STONE.
7.9.9. SCARIFY/PREPARE VOID/SUBGRADE (WHERE THE EXISTING CONCRETE GALLERY STONE AGGREGATE WERE REMOVED FROM) BY LOOSENING THE TOP 3-INCHES OF THE SUB-GRADE SURFACE USING THE TEETH OF THE EXCAVATOR BUCKET OR OTHER MEANS APPROVED BY THE DESIGN ENGINEER. PROVIDE A CLEAN FREE-DRAINING INTERFACE BETWEEN THE SUB-GRADE, AND THE BACKFILL FOR THE VOID. THE VOID SHALL BE BACKFILLED WITH SELECT FILL, PLACED AND COMPACTED INTO THE SCARIFIED VOID WHERE THE EXISTING CONCRETE GALLERY STONE AGGREGATE WERE REMOVED FROM), AND BACK TO ORIGINAL TOP OF GALLERY ELEVATION.
7.9.10. EXTEND FORCE MAIN PIPING AND PRESSURE DOSING MANIFOLD PIPING INTO DISPOSAL ARE, AND INSTALL SEEPAGE COLLARS.
7.9.11. EXCAVATE AND INSTALL GST-6212 TRENCH SECTIONS TO INVERT OF PRESSURIZED LATERAL PIPE, AND IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS, DEPARTMENT OF ENVIRONMENTAL PROTECTION, AND LOCAL HEALTH DISTRICT REGULATIONS
7.9.12. INSTALL BRANCH/ZONE LATERAL PIPING, VALVES, AND ORIFICES.
  (FOR PRE-DRILLED LATERAL PIPING INSTALLATION):
  7.9.12.1. ASSEMBLE AND GLUE ALL LATERAL PIPING WITH ORIFICES INITIALLY INSTALLED AT 12'OCLOCK (POINTING STRAIGHT UP - FOR TESTING PURPOSES),, AND INSTALL ORIFICE SHIELDS TO PROTECT ORIFICES FROM DIRT AND DEBRIS.
  7.9.12.2. INSTALL BEDDING STONE AND THRUST BLOCKS AS REQUIRED TO BRACE PIPING DURING FLUSHING AND TESTING
  7.9.12.3. CLEAN INTERIOR OF ASSEMBLED PIPING NETWORKS, WITH COMPRESSED AIR AND FLUSHING WATER.
  7.9.12.4. REMOVE END CAPS/CLEANOUTS FROM DISTAL ENDS. OPERATE BOTH PUMPS (WITH CLEAN WATER IN THE PUMP CHAMBER), AT THE SAME TIME, AND FLUSH EACH FORCEMAIN/ZONE UNTIL THE ENGINEER AGREES THAT THE WATER COMING OUT IS CLEAN. THE CONTRACTOR SHALL MAKE PROVISIONS O HANDLE THE FLUSHING WATER AND NOT LET THE WATER DRAIN INTO THE SAS/GST AREA.
  7.9.12.5. UTILIZE CLEAR PVC STANDPIPES AND THE VALVES ON THE LATERAL ENDS TO VERIFY AND BALANCE DISTAL END PRESSURE, WHILE VERIFYING FLOW RATES AND PUMP PERFORMANCE. THE ORIFICE SHIELDS SHALL BE REMOVED DURING HYDRAULIC TESTING SO A VISUAL OBSERVATION OF THE FLOW DISTRIBUTION ALONG THE LENGTH LATERAL CAN BE MADE BY THE ENGINEER.
  7.9.12.6. CONTRACTOR SHALL CARRY A MINIMUM OF TWO COMPLETE DAYS FOR BALANCING AND TESTING EACH CONSTRUCTED PORTION OF THE SYSTEM (TWO DAYS FOR ZONES 1 - 4, AND TWO DAYS FOR ZONES 5-6).
  7.9.12.7. AT COMPLETION OF HYDRAULIC/DISTAL BALANCING, LOOSEN THE UNION ON THE BALANCING AND ISOLATION VALVES AT EITHER END OF THE LATERAL. ROTATE THE ENTIRE LATERAL PIPE SO ORIFICES ARE FACING 6-O'CLOCK, OR DEAD BOTTOM OF THE LATERAL. REINSTALL ORIFICE SHIELDS OVER ORIFICES. COMPLETE FOR EACH LATERAL.
  7.9.12.8. REMOVE END CAPS AND PERFORM FINAL FLUSH OF SYSTEM.
  7.9.12.9. REPLACE END CAPS, AND INSTALL CAST-IRON ROAD-BOX / CLEAN-OUT ACCESS STRUCTURES, AND OBSERVATION PORTS.
7.9.13. INSTALL H-20 STONE SYSTEM, FILTER FABRIC AND GEO-MEMBRANE MATERIAL OVER THE TOPS OF THE COMPLETED GST-6212 TRENCH SECTION, PER GEOMATRIX RECOMMENDATION
7.9.14. INSTALL COMMON FILL TO 6" BELOW FINISH GRADE,
7.9.15. REPEAT PHASE 2B PROCEDURE, FOR REMAINING GROUPS OF EXISTING GALLERIES 3, AND 4, AND CONSTRUCT AND TEST ZONES 5 AND 6.

III. CONSTRUCTION REQUIREMENTS BY SYSTEM COMPONENT

PROPRIETARY GST-SOILAIR SYSTEM

-SIX SETS OF MANUFACTURER'S LITERATURE OF THE MATERIALS OF THIS SECTION SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.

SHOP DRAWINGS AND PRODUCT DATA

A. SHOP DRAWINGS INCLUDING MANUFACTURER'S DATA SHEETS, SHOWING ILLUSTRATED CUTS OF THE ITEMS (S) WITH SCALE DETAILS, SIZES, DIMENSIONS, CAPACITIES, PERFORMANCE CHARACTERISTICS, WIRING DIAGRAMS, CONTROLS, AND OTHER PERTINENT INFORMATION SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. IF MORE THAN ONE SIZE OR TYPE IS SHOWN, THE PROPOSED ITEMS SHALL BE CLEARLY INDICATED.

B. PROVIDE DESCRIPTIVE LITERATURE, BULLETINS, AND/OR CATALOG CUTS FOR EACH ITEM OF EQUIPMENT.

C. PROVIDE DATA ON THE CHARACTERISTICS AND PERFORMANCE OF ALL PUMPS, BLOWERS, DEVICES, CONTROLLERS AND MOTORS. PUMP DATA SHALL INCLUDE GUARANTEED PERFORMANCE CURVES, BASED ON ACTUAL SHOP TESTS OF SIMILAR UNITS, WHICH SHOW THAT THEY MEET THE SPECIFIED REQUIREMENTS FOR HEAD, CAPACITY, EFFICIENCY, ALLOWABLE NPSH, AND HORSEPOWER. CURVES SHALL BE SUBMITTED ON 8- 1/2-INCH BY 11-INCH SHEETS.

D. PROVIDE THE TOTAL WEIGHT OF EACH ITEM OF EQUIPMENT INCLUDING THE WEIGHT OF THE SINGLE LARGEST COMPONENT OF EACH ITEM.

E. PROVIDE A COMPLETE TOTAL BILL OF MATERIALS FOR ALL EQUIPMENT.

DESIGN DATA

A. PROVIDE COMPLETE WIRING DIAGRAMS AND SCHEMATICS OF ALL CONTROLLERS, CONTROL PANELS, CONTROL DEVICES, AND OPERATORS STATIONS.

B. SUBMIT DETAILS ON ALL ITEMS WHICH ARE TO BE SUPPLIED AND INSTALLED AS PART OF THE ON-SITE WASTEWATER DISPOSAL SYSTEM.

C. IN THE EVENT THAT IT IS IMPOSSIBLE TO CONFORM WITH CERTAIN DETAILS OF THE SPECIFICATIONS DUE TO DIFFERENT MANUFACTURING TECHNIQUES, DESCRIBE COMPLETELY ALL NONCONFORMING ASPECTS.

PRECAST PROCESS TANKS AND MANHOLES

A. ALL BELOW GROUND STRUCTURES TO BE DESIGNED AGAINST FLOTATION. ALL STRUCTURES TO HAVE AN ANTI-FLOTATION SYSTEM, OR MONOLITHIC, REINFORCED BASE SLAB EXTENSION INTEGRAL TO THE BOTTOM SECTION OF THE PRECAST SECTION. JOINTS ARE NOT ALLOWED AT THE AT THE BASE SLAB / WALL SECTION INTERFACE. BOTTOM PRE-CAST SECTION MUST BE MONOLITHIC, WITH INTEGRAL, REINFORCED CONCRETE ANTI-FLOATATION WING/EXTENSION, DESIGNED AND CERTIFIED BY THE PRECAST SUPPLIER'S REGISTERED STRUCTURAL ENGINEER REGISTERED IN THE STATE OF CONNECTICUT. ANTI-FLOTATION CALCULATION SHALL ASSUME WATER AT FINISHED GRADE WHEN PUMPED COMPLETELY EMPTY, OMIT EARTH COVER, ON TOP OF TANK, AND UTILIZE A SAFETY FACTOR OF 1.25 OR GREATER. STRUCTURAL CALCULATIONS SHALL INCLUDE H-20 LOAD DESIGN WITH OVERBURDEN AS SHOWN ON CONTRACT DRAWINGS.

B. THE CONCRETE SHALL BE A MINIMUM OF 5,000 PSI CONCRETE, SHALL HAVE A MINIMUM WALL THICKNESS OF 6 INCHES AND SHALL BE TAR-COATED INSIDE AND OUT TO RESIST CHEMICAL ATTACK. REINFORCING STEEL SHALL BE 60,000 PSI PER ASTM 615.

C. TANKS AND VALVE PITS SHALL BE PROVIDED WITH WATERTIGHT PRE-CAST CONCRETE RISER SECTIONS OF SIMILAR CONSTRUCTION, WITH FRAMES AND COVERS OR ACCESS HATCHES, INTEGRALLY CAST INTO THE LOCATIONS, AND EXTEND TO THE GRADES AS SHOWN ON THE DRAWINGS. ALL HATCH FRAME DRAIN PIPING SHALL BE ROUTED AWAY FROM THE TANKS, AND NOT DISCHARGE DRAINAGE WATER INTO THE TANKS.

D. PROVIDE COMPLETE SHOP DRAWINGS OF THE ALL TANKS AND STRUCTURES, FOR REVIEW.

E. PROVIDE CONCRETE DESIGN MIX DATA AND CONCRETE TEST CYLINDERS REPORTS FROM AN APPROVED CONCRETE TESTING LABORATORY CERTIFYING THAT THE CONCRETE USED IN THE STRUCTURE CONFORMS WITH THE STRENGTH REQUIREMENTS OF 5000 PSI AND H-20 LOAD RATING.

F. PROVIDE CONCRETE DESIGN MIX DATA AND CONCRETE TEST CYLINDERS REPORTS FROM AN APPROVED CONCRETE TESTING LABORATORY CERTIFYING THAT THE CONCRETE USED IN THE STRUCTURE CONFORMS WITH THE STRENGTH REQUIREMENTS OF 5000 PSI AND H-20 LOAD RATING.

G. PROVIDE COMPLETE SHOP DRAWINGS (DIMENSIONAL, AND RE-BAR/STRUCTURAL DESIGN CALCULATIONS) OF ALL TANKS AND STRUCTURES, FOR REVIEW.

H. ALL CONSTRUCTION SHALL BE WATER TIGHT. INTERIOR AND EXTERIOR OF ALL PRECAST STRUCTURES, SHALL RECEIVE TWO COATS OF BITUMASTIC WATERPROOFING SUCH AS CARBOLINE BITUMASTIC 300M AS MANUFACTURED BY SOMAY PRODUCTS, INC., MIAMI, FL; SONNOSHIELD HLM 5000 AS MANUFACTURED BY SONNEBORN, SHAKOPEE, MN AT A MINIMUM THICKNESS OF 7 MILS PER COAT AND A TOTAL THICKNESS OF 14 MILS; HOWEVER, IN NO CASE SHALL THE THICKNESS PER COAT BE LESS THAN THAT RECOMMENDED BY THE MANUFACTURER

I. PRECAST CONSTRUCTION FOR ALL CONCRETE STRUCTURES SHALL MEET FORM 814A, SECTION 8.02 FOR ALL PORTIONS.

J. THE STRUCTURES SHALL BE PROVIDED WITH WATERTIGHT PRE-CAST CONCRETE RISER SECTIONS WITH INTEGRAL/CAST-IN FRAMES/COVERS OR ACCESS HATCHES IN THE LOCATIONS AND EXTENDING TO THE GRADES AS SHOWN ON THE DRAWINGS. THE JOINING SURFACE OF THE RISER TO TANK MUST BE DESIGNED BY THE MANUFACTURER TO BE WATER-TIGHT.

K. WATERTIGHT WALL-SLEEVES SLEEVES, OR GASKETS SHALL BE USED AT THE PIPE CONNECTIONS TO TANK INLETS AND OUTLETS. LINK-SEALS TYPE SLEEVES W/ SS HARDWARE SHALL BE INSTALLED IN THE FIELD, WITH SIZES AND MATERIALS TO SUIT THE PIPING AND TEMPERATURE RATINGS.

L. ALL ELECTRICAL WIRING SHALL COMPLY WITH NEC, STATE, AND LOCAL CODES.

M. SEAL ALL JOINTS WITH WATER-PROOFING KENT-SEAL OR EQUAL. ALL JOINTS AND PIPING/CONDUIT PENETRATIONS MUST WATER TIGHT AND PASS THE CONNECTICUT DEPARTMENT OF PUBLIC HEALTH CODE TEST FOR WATER TIGHTNESS. LEAKAGE MEASUREMENTS SHALL BE CONDUCTED IN THE RISER SECTION SECTIONS WATER IS USED TESTING.

N. EXCAVATED SUB-GRADE SHALL BE INSPECTED BY A GEO-TECHNICAL ENGINEER TO VERIFY THAT THE SOIL WILL SUPPORT THE INTENDED LOADS BEFORE ANY TANK CAN BE PLACED. STRUCTURAL FILL SHALL BE PLACED IN 6" LIFTS COMPACTED TO 95% PROCTOR DENSITY, INSPECTED, AND TESTED BY A GEO-TECHNICAL ENGINEER AND A CERTIFIED SOIL TESTING LABORATORY.

O. A MUD-MAT SHALL BE PLACED WITH HIGH-EARLY STRENGTH CONCRETE PRIOR TO PLACEMENT OF THE COMPACTED BROKEN STONE LAYER, TO ASSIST IN CONTROLLING DE-WATERING OPERATIONS.

P. DE-WATERING SHALL BE IN COMPLIANCE PER FORM 814A SECTION 2.04 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, LATEST EDITION. DE-WATERING IS THE RESPONSIBILITY OF THE CONTRACTOR.

Q. DE-WATERING WASTEWATER SHALL BE HANDLED IN CONFORMANCE WITH FORM 814A, CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, LATEST EDITION.

R. TANKS ARE TO BE SET ON 12" OF COMPACTED 3/8" CLEAN BROKEN STONE (814A #8, M1.01.01). STRUCTURAL FILL SHALL BE PLACED WHERE SHALLOW TANKS WILL BE PLACED PRIOR TO PLACEMENT OF STONE AND FABRIC. THE FILTER FABRIC SHALL BE MIRAFI 1100N OR EQUAL, PLACED PRIOR TO STONE ON THE EXCAVATED SUB-GRADE.

S. COMPACTED STONE SHALL BE LEVEL IN ANY DIRECTION. THE CONTRACTOR SHALL TAKE SPOT GRADE SHOTS ON A 5'x5' GRID UNDER THE TANKS, AND RECORD THEM ON THE AS-BUILT PLANS.

T. TANKS SHALL BE SET UNDER THE SUPERVISION OF THE TANK MANUFACTURER AND CONTRACTOR. BOTH PARTIES SHALL SUBMIT SIGNED DOCUMENTATION FOR EACH TANK THAT THE REPRESENTATIVE OBSERVED ALL INSTALLATION PROCEDURES FOR EACH TANK, AND THAT THE MANUFACTURER'S RECOMMENDATION WERE FOLLOWED.

U. THE JOINTS MUST BE KEPT CLEAN OF ANY FOREIGN MATERIAL WHILE THE SECTIONS ARE BEING DRAWN TOGETHER.

V. ALL STRUCTURES MUST BE BACKFILLED WITHIN 24 HOURS OF INSTALLATION. TANKS MUST NOT BE INSTALLED DURING INCLEMENT WEATHER OR WITHIN 48-HOURS OF RAINFALL EVENTS.

W. ALL TANKS SHALL BE GUARANTEED BY THE MANUFACTURER AND CONTRACTOR TO BE WATER-TIGHT AFTER INSTALLATION.

X. MANUFACTURER SHALL VERIFY THAT ALL GASKETS WILL NOT REACT NEGATIVELY.WITH THE COMPONENTS OF THE LIQUID CONTENTS OF THE TANKS.

MANHOLE FRAMES AND COVERS

1. FURNISH ALL CAST-IRON MANHOLE FRAMES AND COVERS CONFORMING TO THE DETAILS SHOWN ON THE DRAWINGS, OR AS HEREINBEFORE SPECIFIED WITH 24,OR 30-INCH OPENING (PER THE DRAWINGS) BY EAST JORDAN IRON WORKS, OR EQUIVALENT.
2. THE CASTINGS SHALL BE OF GOOD QUALITY, STRONG, TOUGH, EVEN-GRAINED CAST IRON, SMOOTH, FREE FROM SCALE, LUMPS, BLISTERS, SAND HOLES, AND DEFECTS OF EVERY NATURE WHICH WOULD RENDER THEM UNFIT FOR THE SERVICE FOR WHICH THEY ARE INTENDED. CONTACT SURFACES OF COVERS AND FRAME SEATS SHALL BE MACHINED TO PREVENT ROCKING OF COVERS.
3. ALL CASTING SHALL BE THOROUGHLY CLEANED AND SUBJECT TO A CAREFUL HAMMER INSPECTION.
4. CASTINGS SHALL BE AT LEAST CLASS 25 CONFORMING TO ASTM A48.
5. SURFACE OF MANHOLE COVERS SHALL HAVE A DIAMOND PATTERN WITH THE WORDS "SEWER", AS APPROPRIATE, CAST ON THE COVER.

B. BRICK
1. SOUND, HARD, AND UNIFORMLY BURNED BRICK, REGULAR AND UNIFORM IN SHAPE AND SIZE, OF COMPACT TEXTURE, AND SATISFACTORY TO THE ENGINEER.
2. IN ACCORDANCE WITH ASTM C32, RED SEWER BRICK ONLY GRADE SS.
3. IN ACCORDANCE WITH AASHTO M91-42, RED SEWER BRICK ONLY GRADE SS.
4. REJECT BRICK SHALL BE IMMEDIATELY REMOVED FROM THE WORK.

C. MORTAR FOR BRICKWORK
1. COMPOSED OF PORTLAND CEMENT, HYDRATED LIME, AND SAND IN WHICH THE VOLUME OF SAND SHALL NOT EXCEED THREE TIMES THE SUM OF THE VOLUME OF CEMENT AND LIME.
2. THE PROPORTIONS OF CEMENT AND LIME SHALL BE 1:1/4.
3. CEMENT SHALL BE TYPE II PORTLAND CEMENT
4. HYDRATED LIME SHALL BE TYPE S CONFORMING TO THE ASTM C207.
5. "4X HYDRATE" MANUFACTURED BY THE NEW ENGLAND LIME COMPANY OR
6. THE SAND SHALL CONFORM TO ASTM C144.

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Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

GENERAL NOTES

Revisions

No.	Description	Date

File: G-1_GeneralNotes.dwg

Drawn By: RMB

Designed By: RMB

Checked By: JF

Job No: 5051 Date: April 2015

North Arrow

Scale

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

For Regulatory Review Only

Sheet No.:

G-1

Plot Date: May 06, 2016 6:20pm

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IV. PIPES AND VALVES

GENERAL

A. PIPE MATERIALS SHALL BE AS SHOWN IN THE PIPING SCHEDULE ON THIS SHEET.

B. ALL EXTERIOR PROCESS AND DRAIN PIPES (EXCEPT AIR PIPING) WITH LESS THAN 4 FEET OF COVER SHALL BE INSULATED AND HEAT TRACED TO MAINTAIN 70°F AT AN AMBIENT TEMP. OF -30°F.

UNDERGROUND UTILITY MARKING TAPE

A. MARKING TAPE TO BE INSTALLED OVER ALL PIPE LINES AND CONDUITS INSTALLED UNDER THIS CONTRACT.

B. MARKING TAPE FOR NON-FERROUS PIPE OR CONDUITS TO BE DETECTABLE, MAGNETIC TYPE BY THOR ENTERPRISES, INC., SUN PRARIE, WI, OR EQUAL.

C. MARKING TAPE FOR FERROUS PIPE OR CONDUITS TO BE NON-DETECTABLE, NON-MAGNETIC TYPE.

D. TAPE TO BE 6-INCHES WIDE.

INSULATION FOR PIPELINES AND VALVES

A. ALL EXTERIOR PROCESS AND DRAIN PIPES (EXCEPT AIR PIPING) WITH LESS THAN 4-FEET OF COVER SHALL BE INSULATED AND HEAT TRACED TO MAINTAIN 70°F AT AN AMBIENT TEMP. OF -30°F. REFER TO ELECTRICAL DRAWINGS FOR HEAT TRACING SPECIFICATIONS.

B. THE INSULATION SHALL BE RIGID FOAM EXTRUDED POLYSTYERENE BY UCI INDUSTRIES, INC. OR APPROVED EQUAL. INSULATION SHALL BE A MINIMUM OF 2-INCHES THICK, UNLESS OTHERWISE SHOWN ON THE DRAWINGS.

C. INSULATION SHALL HAVE AN R-VALUE OF 5 PER INCH.

D. INSULATION SHALL HAVE A MINIMUM 60 PSI COMPRESSIVE RESISTANCE.

E. STRUCTURE SHALL BE CLOSED CELL WITH CONTINUOUS SKIN SURFACES, FRONT AND BACK WITH MOISTURE RESISTANCE.

SEWER COLLECTION PIPING AND FORCEMAINS.

(A) WASTEWATER PIPES SHALL BE SEPARATED FROM A WATER SERVICE, FIRE SERVICE, PRIVATE WATER SUPPLY WELL, OR SUCTION LINE BY A MINIMUM OF 10 FEET HORIZONTALLY. WHERE SAID HORIZONTAL DISTANCE CANNOT BE MAINTAINED DUE TO SITE CONSTRAINTS, THE FORCEMAIN SHALL BE PLACED IN A D.I. SLEEVE CARRIER PIPE, WITH THE JOINTS PLACED AS FAR FROM THE CROSSING AS POSSIBLE. A MINIMUM OF 10 FEET HORIZONTALLY SHALL BE MAINTAINED FOR THE SLEEVED CROSSING. THE ENDS OF THE D.I. SLEEVE SHALL BE CONNECTED TO THE SEWER FORCEMAIN BY MEANS OF A FLEXIBLE FERNCO OR EQUAL COUPLING W/ STAINLESS STEEL HARDWARE. THE CONTRACTOR MAY ALSO ELECT TO ENCASE THE SEWER PIPE IN CONCRETE IN ACCORDANCE WITH THE CIVIL CONSTRUCTION DETAILS.

(B) WASTEWATER PIPING SHALL BE LAID ON COMPACTED FIRM BASE AT A CONTINUOUS UNIFORM GRADE AND IN A STRAIGHT LINE, AS NEARLY AS POSSIBLE.

(C) ALL PIPE JOINTS SHALL BE MADE WATERTIGHT AND PROTECTED AGAINST ROOT DAMAGE.

(D) ALL PRESSURE PIPES INSTALLED WITHIN THE FROST ZONE, SHALL BE INSULATED AND PROTECTED AGAINST FREEZING

FIELD QUALITY CONTROL

PRESSURE AND LEAKAGE TESTS EXCEPT AS OTHERWISE DIRECTED, ALL PIPELINES SHALL BE GIVEN COMBINED PRESSURE AND LEAKAGE TESTS IN SECTIONS OF SUITABLE LENGTH. THE CONTRACTOR SHALL FURNISH AND INSTALL SUITABLE TEMPORARY TESTING PLUGS OR CAPS; ALL NECESSARY PRESSURE PUMPS, PIPE CONNECTIONS, METERS, GAGES, RELIEF VALVES, AND OTHER NECESSARY EQUIPMENT: AND ALL LABOR REQUIRED. SUBJECT TO THE PERMISSION OF THE ENGINEER AND PROVIDED THAT THE TESTS ARE MADE WITH A REASONABLE TIME CONSIDERING THE PROGRESS OF THE PROJECT AS A WHOLE, AND THE NEED TO PUT THE SECTION INTO SERVICE, THE CONTRACTOR MAY MAKE THE TESTS WHEN HE DESIRES. UNLESS IT HAS ALREADY BEEN DONE, THE SECTION OF PIPE TO BE TESTED SHALL BE FILLED WITH WATER OF ACCEPTABLE QUALITY, AND ALL AIR SHALL BE EXPELLED FROM THE PIPE. IF HYDRANTS OR BLOWOFFS ARE NOT AVAILABLE AT HIGH POINTS FOR RELEASING AIR THE CONTRACTOR SHALL MAKE THE NECESSARY TAPS AT SUCH POINTS AND SHALL PLUG SAID HOLES AFTER COMPLETION OF THE TEST. THE SECTION UNDER TEST SHALL BE MAINTAINED FULL OF WATER FOR A PERIOD OF 24 HOURS PRIOR TO THE COMBINED PRESSURE AND LEAKAGE TEST BEING APPLIED. THE PRESSURE AND LEAKAGE TEST SHALL CONSIST OF FIRST RAISING THE WATER PRESSURE (BASED ON THE ELEVATION OF THE LOWEST POINT OF THE SECTION UNDER TEST AND CORRECTED TO THE GAGE LOCATION) TO A PRESSURE IN POUNDS PER SQUARE INCH NUMERICALLY EQUAL TO THE PRESSURE RATING OF THE PIPE BUT NOT TO EXCEED 125 PSI. CARE SHALL BE TAKEN NOT TO APPLY THIS PRESSURE TO ITEMS OF EQUIPMENT KNOWN TO BE INCAPABLE OF WITHSTANDING SUCH PRESSURE. IF THE CONTRACTOR CANNOT ACHIEVE THE SPECIFIED PRESSURE AND MAINTAIN IT FOR A PERIOD OF ONE HOUR WITH NO ADDITIONAL PUMPING, THE SECTION SHALL BE CONSIDERED AS HAVING FAILED TO PASS THE TEST. IF THE SECTION FAILS TO PASS THE PRESSURE AND LEAKAGE TEST, THE CONTRACTOR SHALL DO EVERYTHING NECESSARY TO LOCATE, UNCOVER, AND REPAIR OR REPLACE THE DEFECTIVE PIPE, FITTING, OR JOINT, ALL AT HIS OWN EXPENSE AND WITHOUT EXTENSION OF TIME FOR COMPLETION OF THE WORK. ADDITIONAL TESTS AND REPAIRS SHALL BE MADE UNTIL THE SECTION PASSES THE SPECIFIED TEST AND IS CONSIDERED ACCEPTABLE BY THE ENGINEER. IF, IN THE JUDGMENT OF THE ENGINEER, IT IS IMPRACTICABLE TO FOLLOW THE FOREGOING PROCEDURE EXACTLY FOR ANY REASON, MODIFICATIONS IN THE PROCEDURE MAY BE MADE AS REQUIRED AND PERMITTED BY THE ENGINEER, BUT IN ANY EVENT THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE ULTIMATE TIGHTNESS OF THE LINE WITHIN THE ABOVE LEAKAGE AND PRESSURE REQUIREMENTS. THE CONTRACTOR SHALL VERIFY PUMP CAPACITY AGAINST RATED CAPACITY IN THE PRESENCE OF THE ENGINEER BY MEASURING WETWELL DRAW-DOWN. ALL ALARM CONDITIONS SHALL BE VERIFIED IN THE FIELD TO ASSURE THAT THEY PERFORM AS INTENDED. AT THE CONCLUSION OF THE WORK, THE CONTRACTOR SHALL THOROUGHLY CLEAN ALL PIPING BY FLUSHING WITH WATER OR OTHER MEANS TO REMOVE DIRT, STONES, AND/OR OTHER MATERIAL. PRIOR TO ACCEPTANCE, ALL PIPELINES SHALL BE INSPECTED FOR CLEANLINESS AND TO INSURE THAT NO GRIT, WELDING SLAG, PIPE SHAVINGS, BROKEN PIPE, OR OTHER OBSTRUCTIONS EXIST.

POLYVINYL CHLORIDE INFLUENT FORCEMAIN PIPE

A. PVC FORCE MAIN PIPE SHALL BE AWWA C900 (BY OTHERS). PVC PIPE SHALL BE CLASS 150 AND MEET THE REQUIREMENTS OF SDR 21.
B. PVC FOR GRAVITY SEWER SHALL CONFORM TO ASTM D3034 WITH AN SDR OF 35.
C. JOINTS FOR PVC PIPE SHALL BE BELL AND SPIGOT TYPE OF GASKETED JOINT. THE ELASTOMERIC GASKETS SHALL BE OIL RESISTANT AND SHALL CONFORM TO THE ASTM F477. SUCH JOINTS SHALL BE INSTALLED IN ACCORDANCE WITH THE PIPE MANUFACTURER'S WRITTEN INSTRUCTIONS. ANY JOINT WHICH IS NOT PROPERLY MADE, SHOWS SIGNS OF LEAKAGE OR IS THE OPINION OF THE ENGINEER, DEFECTIVE IN ANY WAY SHALL BE REDONE TO THE SATISFACTION OF THE ENGINEER.
D. RECEIVING, STORAGE AND HANDLING
D.A. ALL PIPE AND FITTINGS DELIVERED TO THE JOB SITE SHALL BE ACCOMPANIED BY TEST REPORTS CERTIFYING THAT THE PIPE CONFORMS TO THE ABOVE MENTIONED ASTM SPECIFICATIONS. PIPE SHALL BE STORED AND HANDLED IN A MANNER CONSISTENT WITH THE WRITTEN RECOMMENDATIONS OF THE MANUFACTURER OF THE PIPE. STORAGE LOCATIONS SHALL BE APPROVED BY THE ENGINEER. ANY UNIT FOUND TO BE DEFECTIVE SHALL BE REMOVED FROM THE JOB SITE AND REPLACED WITH A SOUND UNIT.

DUCTILE-IRON PIPE AND FITTINGS

-PIPE
A. ALL CAST-IRON PIPE SHALL BE DESIGNED IN ACCORDANCE WITH ANSI A21.1 AND SHALL BE MANUFACTURED IN ACCORDANCE WITH ANSI A21.6, ANS 21.8 OR ANS A21.15.
B. ALL DUCTILE-IRON PIPE SHALL BE DESIGNED IN ACCORDANCE WITH ANSI A21.50 AND SHALL BE MANUFACTURED IN ACCORDANCE WITH ANSI A21.15 OR ANS A21.51.
C. UNLESS OTHERWISE INDICATED OR SPECIFIED, DUCTILE-IRON PIPE SHALL BE AT LEAST THICKNESS CLASS 52 FOR PIPE 4-INCH. AND SMALLER AND AT LEAST THICKNESS CLASS 53 FOR PIPE 6-INCH. AND LARGER.

-FITTINGS
A. GENERAL
1. FITTINGS SHALL CONFORM TO THE REQUIREMENTS OF ANS A21.10, MINIMUM CLASS 150.
2. PUSH-ON OR MECHANICAL-JOINT FITTINGS SHALL BE ALL-BELL FITTINGS UNLESS OTHERWISE INDICATED OR SPECIFIED.
B. WHERE IT IS NECESSARY TO JOINT PIPES OF DIFFERENT TYPE, THE CONTRACTOR SHALL FURNISH AND INSTALL THE NECESSARY ADAPTERS UNLESS SOLID SLEEVES ARE INDICATED ON THE DRAWINGS OR PERMITTED.

-JOINTS

A. WHERE SO INDICATED, PIPE AND FITTINGS SHALL BE FURNISHED WITH APPROVED LUGS OR HOOKS CAST INTEGRALLY FOR USE WITH BOLTS OR BRIDLE RODS AND SOCKET CLAMPS TO KEEP THE PIPING FROM PULLING APART UNDER PRESSURE.

B. JOINTS FOR PUSH-ON AND MECHANICAL-JOINT PIPE SHALL CONFORM TO ANS A21.11.

C. GASKETS SHALL BE OF A COMPOSITION SUITABLE FOR EXPOSURE TO THE PRODUCT WHICH THE PIPE IS INTENDED.

D. FLANGES FOR FLANGED PIPE SHALL CONFORM TO ANS A21.15 EXCEPT THAT SPECIAL DRILLING OR TAPPING SHALL BE DONE AS NECESSARY TO ENSURE CORRECT ALIGNMENT AND BOLTING.
1. JOINTS IN BURIED EXTERIOR PIPELINES SHALL BE EITHER PUSH ON JOINTS OR MECHANICAL JOINTS.

-COUPLINGS

A. WHERE FLEXIBLE CONNECTIONS IN THE PIPING ARE SPECIFIED OR INDICATED ON THE DRAWINGS, THEY SHALL BE OBTAINED BY THE USE OF SLEEVE-TYPE COUPLINGS, SPLIT COUPLINGS, OR MECHANICAL-JOINT PIPE AND/OR FITTINGS AS HEREIN SPECIFIED.

B. SLEEVE-TYPE COUPLINGS
1. TO ENSURE CORRECT FITTING OF PIPE AND COUPLINGS, ALL SLEEVE-TYPE COUPLINGS AND ACCESSORIES SHALL BE FURNISHED BY THE SUPPLIER OF THE PIPE AND SHALL BE OF A PRESSURE RATING AT LEAST EQUAL TO THAT OF THE PIPELINE IN WHICH THEY ARE TO BE INSTALLED. SLEEVE-TYPE COUPLINGS SHALL BE STYLE 38 OR 138, MADE BY DRESSER MFG. DIV., BRADFORD, PA.; OR BE ACCEPTABLE EQUIVALENT PRODUCTS.
2. COUPLINGS FOR BURIED PIPE SHALL BE OF CAST IRON AND SHALL BE DRESSER STYLE 153, OR ACCEPTABLE EQUIVALENT PRODUCTS. THE COUPLINGS SHALL BE PROVIDED WITH GALVANIZED-STEEL BOLTS AND NUTS, UNLESS NOTED OTHERWISE.
3. ALL COUPLINGS SHALL BE FURNISHED WITH THE PIPE STOP REMOVED.
4. ALL COUPLINGS SHALL BE PROVIDED WITH GASKETS OF A COMPOSITION SUITABLE FOR EXPOSURE TO THE LIQUID WITHIN THE PIPE.
5. ALL GASKETS PROVIDED WITH METALLIC TIPS FOR ELECTRICAL CONTINUITY THROUGH JOINTS.

C. SPLIT COUPLINGS
1. SPLIT COUPLINGS MAY BE USED FOR CONNECTING CAST-IRON PIPE. IF SPLIT COUPLINGS ARE USED WITH GROOVED PIPE, THE MINIMUM PIPE WALL THICKNESS SHALL BE AS SPECIFIED UNDER AWWA C606.
2. SPLIT COUPLINGS SHALL BE MADE OF MALLEABLE IRON AND SHALL BE NAPPCO COUPLINGS MADE BY NORTH AMERICAN PIPE PRODUCTS CO.; OR ACCEPTABLE EQUIVALENT PRODUCTS.
3. WHERE SPLIT COUPLINGS ARE FURNISHED IN LIEU OF FLANGED JOINTS THE JOINT SHALL BE OF THE RIGID TYPE WITH PIPE GROOVES CUT TO BRING THE ENDS OF THE PIPE SOLIDLY TOGETHER. THE BEAM STRENGTH OF THE JOINT SHALL BE EQUAL TO OR GREATER THAN THAT OF A FLANGED JOINT.
4. WHERE SPLIT COUPLINGS ARE INDICATED TO PROVIDE FOR EXPANSION OR FLEXIBILITY, THE PIPE GROOVES SHALL BE CUT TO PROVIDE THE NECESSARY EXPANSION OR FLEXIBILITY.

2.05 ACCESSORIES

A. GASKETS, BOLTS, AND NUTS
1. FOR FLANGED JOINTS, GASKETS SHALL BE RING GASKETS OF RUBBER WITH CLOTH INSERTION. GASKETS 12-INCH DIAMETER AND SMALLER SHALL BE 1/16-INCH THICK; LARGER THAN 12-INCH, TO BE 1/8-INCH THICK.
2. SUBMERGED FLANGED JOINTS SHALL BE MADE UP WITH TYPE 316 STAINLESS STEEL

-FINISHES

A. LINING
1. INSIDE OF PIPE AND FITTINGS SHALL BE COATED WITH DOUBLE THICKNESS CEMENT LINING AND BITUMINOUS SEAL COAT CONFORMING TO AN A21.4. THE STANDARD BITUMINOUS COATING IS SPECIFIED UNDER THE APPROPRIATE AN STANDARD FOR THE PIPE AND FITTINGS.

B. COATING
1. THE OUTSIDE OF PIPE AND FITTINGS WITHIN STRUCTURES SHALL NOT BE COATED WITH THE BITUMINOUS COATING, BUT SHALL BE THOROUGHLY CLEANED AND GIVEN ONE SHOP COAT OF INTERTOL RUSTINHIBITIVE PRIMER 621 MADE BY KOPPERS CO., INC., PITTSBURGH, PA.; MULTIPRIME MADE BY PPG INDUSTRIES, INC., PITTSBURGH, PA.; CHROMOX 13R50 PRIMER MADE BY MOBIL CHEMICAL CO., EDISON, NJ; OR AN ACCEPTABLE EQUIVALENT PRODUCT.
2. OUTSIDE OF OTHER PIPE AND FITTINGS SHALL BE COATED WITH THE STANDARD BITUMINOUS COATING CONFORMING TO APPROPRIATE AN STANDARD.
3. OUTSIDE SURFACES OF CASTINGS TO BE ENCASED IN CONCRETE SHALL NOT BE COATED.
4. MACHINED SURFACES SHALL BE CLEANED AND COATED WITH A SUITABLE RUST-PREVENTATIVE COATING AT THE SHOP IMMEDIATELY AFTER BEING MACHINED.

PIPING SUPPORT

A. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL SUPPORTS NECESSARY TO HOLD THE PIPING AND APPURTENANCES IN A FIRM, SUBSTANTIAL MANNER (AS DETERMINED AND/OR DIRECTED BY THE ENGINEER) AT THE LINES AND GRADES INDICATED ON THE DRAWINGS OR SPECIFIED. THE DESIGN AND FABRICATION OF SUCH SUPPORTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AS PART OF THE WORK.

B. ALL PIPE AND APPURTENANCES CONNECTED TO EQUIPMENT SHALL BE SUPPORTED IN SUCH A MANNER AS TO PREVENT ANY STRAIN BEING IMPOSED ON THE EQUIPMENT. WHEN MANUFACTURERS HAVE INDICATED REQUIREMENTS THAT PIPING LOADS SHALL NOT BE TRANSMITTED TO THEIR EQUIPMENT, THE CONTRACTOR SHALL SUBMIT A CERTIFICATION FROM THE MANUFACTURER STATING THAT SUCH REQUIREMENTS HAVE BEEN COMPLIED WITH.

STUD BOLTS AND NUTS.
C. PIPING WITHIN BUILDINGS AND STRUCTURES SHALL BE ADEQUATELY SUPPORTED FROM FLOORS, WALLS, CEILINGS AND BEAMS. SUPPORTS FROM THE FLOOR SHALL BE BY APPROVED SADDLE STANDS OR SUITABLE CONCRETE OR BRICK PIERS AS INDICATED OR APPROVED BY THE ENGINEER. PIPE SADDLES SHALL BE SHAPED TO FIT THE PIPE WITH WHICH THEY WILL BE USED AND SHALL BE CAPABLE OF SCREW ADJUSTMENT. BRICK AND CONCRETE PIERS SHALL CONFORM ACCURATELY TO THE BOTTOM ONE-THIRD TO ONE-HALF OF THE PIPE. PIPING ALONG WALLS SHALL BE SUPPORTED BY APPROVED WALL BRACKETS WITH ATTACHED PIPE ROLLS OR SADDLES OR BY WALL BRACKETS WITH ADJUSTABLE HANGER RODS. FOR PIPING SUPPORTED FROM THE CEILING, APPROVED ROD HANGERS OF A TYPE CAPABLE OF SCREW ADJUSTMENT AFTER ERECTION OF THE PIPING AND WITH SUITABLE ADJUSTABLE CONCRETE INSERTS OR BEAM CLAMPS SHALL BE USED.

D. PIPING WITHIN BUILDINGS AND STRUCTURES SHALL BE ADEQUATELY SUPPORTED FROM FLOORS. NO PIPING SHALL BE SUPPORTED FROM THE WALLS OR CEILING UNLESS OTHERWISE PERMITTED BY THE ENGINEER. SUPPORTS FROM THE FLOOR SHALL BE BY SADDLE STANDS OR SUITABLE CONCRETE PIERS. PIPE SADDLES SHALL BE SHAPED TO FIT THE PIPE WITH WHICH THEY WILL BE USED AND SHALL BE CAPABLE OF SCREW ADJUSTMENT. CONCRETE PIERS SHALL CONFORM ACCURATELY TO THE BOTTOM ONE-THIRD TO ONE-HALF OF THE PIPE.

E. WHERE NECESSARY, BENDS, TEES, AND OTHER FITTINGS IN PIPELINES BURIED IN THE GROUND SHALL BE BACKED UP WITH CLASS B CONCRETE PLACED AGAINST UNDISTURBED EARTH WHERE FIRM SUPPORT CAN BE OBTAINED. IF THE SOIL DOES NOT PROVIDE FIRM SUPPORT, THEN SUITABLE BRIDLE RODS, CLAMPS, AND ACCESSORIES TO BRACE THE FITTING PROPERLY SHALL BE PROVIDED. SUCH BRIDLE RODS, ETC., SHALL BE COATED THOROUGHLY AND HEAVILY WITH AN APPROVED BITUMINOUS PAINT AFTER ASSEMBLY OR, IF NECESSARY, PRIOR TO ASSEMBLY.

F. BENDS, TEES, AND OTHER FITTINGS IN PIPELINES BURIED IN THE GROUND SHALL BE BACKED UP WITH CONCRETE THRUST BLOCKS PLACED AGAINST UNDISTURBED EARTH WHERE FIRM SUPPORT CAN BE OBTAINED.

BURIED PIPING INSTALLATION

A. THE CONTRACTOR SHALL CONTACT THE ENGINEER, AND THE CT DEEP, AND THE LOCAL HEALTH DISTRICT PRIOR TO CONSTRUCTION OF THE SYSTEM TO INSPECT THE SITE, ISSUE THE REQUIRED CERTIFICATES AND/OR TO TAKE SUCH OTHER ACTION AS IT MAY DEEM APPROPRIATE TO COMPLY WITH THE APPLICABLE CODES OF THE STATE OF CONNECTICUT AND ANY AND ALL LOCAL REGULATIONS.

B. ALL PIPE AND APPURTENANCES SHALL BE LAID WITH EXTREME CARE AS TO GRADE AND ALIGNMENT. EACH SECTION SHALL BE SO LAID AS TO FORM A CLOSE JOINT WITH THE NEXT ADJOINING SECTION AND TO BRING THE INVERTS CONTINUOUSLY TO THE REQUIRED GRADE.

C. LAYING PIPE. EXCAVATIONS SHALL BE MADE TO ACCOMMODATE THE BEDDING MATERIAL AS PREVIOUSLY SPECIFIED. ALL EXCAVATIONS ARE TO BE KEPT DRY WHILE PIPE IS BEING LAID AND UNTIL EACH JOINT AND PIPE HAS BEEN INSPECTED BY THE ENGINEER AND APPROVAL GIVEN TO COMMENCE BACKFILLING OPERATIONS. ANY PIPE WHICH IS NOT LAID TO GRADE AND ALIGNMENT SHALL BE RE-LAID TO THE SATISFACTION OF THE ENGINEER. NO BLOCKING SHALL BE USED. PIPE SHALL BE INSTALLED IN ACCORDANCE WITH PUBLISHED RECOMMENDATIONS OF THE PIPE MANUFACTURER.

D. CONCRETE THRUST BLOCKS SHALL BE PLACED AT ALL FORCE MAIN BENDS 11-1/4 DEGREES AND GREATER, AT FITTINGS, TEES, ETC. AND AS DESIGNATED BY THE ENGINEER.

E. CLEANOUTS SHALL BE PROVIDED FOR ALL CHANGES IN DIRECTION OF GRAVITY WASTEWATER PIPING WHERE NO MANHOLE IS PRESENT. THE CLEANOUT ROADBOX SHALL ACCOMMODATE 6 INCH DIAMETER PIPING, WITH THE COVER CONSTRUCTED FLUSH WITH GRADE. ROADBOXES SHALL BE CONSTRUCTED OF CAST IRON FRAMES, PROVIDED WITH A LID LABELED "SEWER". COVERS SHALL BE GENECO PRODUCTS, LEBARON FOUNDRY OR EQUAL. A 6" THICK CONCRETE COLLAR SHALL BE USED FOR ANY NECESSARY GRADE ADJUSTMENT. BACKFILL SHALL BE SUFFICIENTLY COMPACTED TO PREVENT SETTLEMENT.

HDPE PIPE AND FITTINGS

A. HDPE PIPE SHALL BE MANUFACTURED OF EXTRA HIGH MOLECULAR WEIGHT, HIGH DENSITY PE 3408 POLYETHYLENE RESIN.

B. PIPE SHALL HAVE A NOMINAL IPS (IRON PIPE SIZE) OD. PIPE SHALL HAVE A DR (DIMENSION RATIO) OF 17.

C. HDPE FITTINGS SHALL BE IN ACCORDANCE WITH ASTM D3261 AND SHALL BE MANUFACTURED BY INJECTION MOLDING, A COMBINATION OF EXTRUSION AND MACHINING, OR FABRICATION FROM HDPE PIPE CONFORMING TO THIS SPECIFICATION. THE FITTINGS SHALL BE FULLY PRESSURE RATED AND PROVIDE A WORKING PRESSURE EQUAL TO THAT OF THE PIPE WITH AN INCLUDED 2:1 SAFETY FACTOR. THE FITTINGS SHALL BE MANUFACTURED FROM THE SAME BASE RESIN TYPE AND CELL CLASSIFICATION AS THE PIPE ITSELF. THE FITTINGS SHALL BE HOMOGENEOUS THROUGHOUT AND FREE FROM CRACKS, HOLES, FOREIGN INCLUSIONS, VOIDS, OR OTHER INJURIOUS DEFECTS.

PVC PIPE AND FITTINGS FOR PRESSURE SERVICE

A. ALL PVC PRESSURE PIPE FOR SERVICE WITHIN THE TANKS AREA SHALL BE SCHEDULE 80 PVC. ALL PVC PRESSURE PIPE FOR SERVICE OUTSIDE THE TANKS AREA (I.E., FORCE MAIN) SHALL BE AWWA C-900 DR-14, OR SDR-21 PVC, RATED FOR 200 PSI SERVICE, WITH BELL/SPIGOT PUSH-ON JOINTS W/ EPDM GASKETS. ALL PVC PIPING ASSOCIATED WITH THE GST PRESSURE DOSING ZONES SHALL BE SCH.40 PVC, SOLVENT-WELDED .

B. POLYVINYLCHLORIDE (PVC) PIPE AND FITTINGS
1. PVC PIPE AND FITTINGS SHALL BE TYPE 1, HIGH CHEMICAL RESISTANCE, NORMAL IMPACT, SCHEDULE 40 PIPE MADE OF VIRGIN POLYVINYLCHLORIDE AND CONFORMING TO ASTM D 1784 LATEST EDITION. PIPE FITTINGS SHALL BE OF THE SAME MATERIAL AND SHALL BE OF THE PROPER CLASSIFICATION AND WALL THICKNESS FOR USE WITH SCHEDULE 80 PIPE. JOINTS SHALL BE SOLVENT WELD CONNECTIONS. A SUFFICIENT NUMBER OF UNIONS SHALL BE PROVIDED TO ALLOW FOR CONVENIENT REMOVAL OF PIPING. CONNECTIONS TO PIPE OF OTHER MATERIALS, CONNECTIONS TO EQUIPMENT, AND CONNECTIONS AT SUCH OTHER LOCATIONS, AS INDICATED OR DIRECTED, SHALL BE MADE WITH FLANGES. ALL FLANGES SHALL BE 150-POUND PVC PIPE FLANGES AND FLANGED CONNECTIONS SHALL BE MADE USING 1/16-INCH THICK NEOPRENE RUBBER GASKETS AND TYPE 316 STAINLESS STEEL BOLTS AND NUTS. FLANGES SHALL BE FACED AND DRILLED TO AMERICAN 125 STANDARD AND AS REQUIRED TO MATCH THE FACING AND DRILLING OF THE FLANGES TO WHICH THEY ARE TO BE CONNECTED.

C. SDR 18 POLYVINYLCHLORIDE (PVC) PIPE AND FITTINGS
1. PIPE SHALL BE SDR 18 AWWA C 900, CLASS 150
2. FITTINGS FOR USE WITH POLYVINYLCHLORIDE (PVC) PRESSURE PIPE SHALL BE MECHANICAL JOINT, CONFORMING TO ANSI A21.10. FITTINGS SHALL BE OF A PRESSURE CLASSIFICATION AT LEAST EQUAL TO THAT OF THE PIPING WITH WHICH THEY ARE TO BE USED.
3. GASKETS SHALL BE OF A COMPOSITION AND TEXTURE WHICH IS RESISTANT TO COMMON INGREDIENTS OF SEWAGE AND INDUSTRIAL WASTES, INCLUDING OILS AND GROUNDWATER, AND WHICH WILL ENDURE PERMANENTLY UNDER THE CONDITIONS OF THE PROPOSED USE.
4. LUBRICANTS SHALL BE IN ACCORDANCE WITH MANUFACTURERS REQUIREMENTS.
5. JOINTS SHALL BE PUSH-ON BELL AND SPIGOT JOINTS CONFORMING TO THE REQUIREMENTS OF ANSI A21.11.
6. ALL PIPE SHALL BE PROPERLY MARKED BY THE MANUFACTURER IN ACCORDANCE WITH ASTM D-2241.

BALL VALVES

A. PVC BALL VALVES SHALL BE MANUFACTURED BY SPEARS MANUFACTURING OR APPROVED EQUAL.

B. VALVES SHALL BE FULL BORE, TRUE UNION, QUARTER TURN TYPE, CONSTRUCTED OF HEAVY-DUTY PVC, AND CAPABLE OF PRESSURES OF AT LEAST 150 PSI. VALVES SHALL USE EPDM O-RINGS.

PLUG & GATE VALVES (PVC)

A. PVC PLUG VALVES SHALL BE MANUFACTURED BY SPEARS, ASHAI OR APPROVED EQUAL.
1. VALVES SHALL BE OF THE NON-LUBRICATED, RESILIENT SEATED, QUARTER-TURN TYPE FURNISHED WITH FLANGED OR MECHANICAL JOINT END CONNECTIONS. PORT AREAS FOR ALL VALVES SHALL BE AT 100% OF FULL PIPE AREA. ONLY 100% PORT AREA VALVES ARE ALLOWED. VALVE SEATING SHALL PROVIDE A CONSISTENT OPENING/CLOSING TORQUE THAT IS NOT DEPENDENT ON ADJUSTMENT OF STOP. RESILIENT SEATING SHALL BE FIELD REPLACEABLE ON THE EXISTING PLUG.
2. ACTUATORS FOR ACCESSIBLE VALVES SHALL BE INTREGRAL TO EACH VALVE. PORTABLE ACTUATORS WILL NOT BE ALLOWED.
3. ACTUATORS FOR VALVES IN INACCESSIBLE LOCATIONS SHALL BE BY EXTENSION STEM, STEM GUIDES, 2-INCH OPERATING NUT WITH MOUNTING BRACKET OR FLOORBOX, OR FLOOR STAND, AND LEVER OR HANDWHEEL AS APPROPRIATE. THE PLUG VALVE MANUFACTURER SHALL PROVIDE ALL OPERATOR ACCESSORIES AS REQUIRED TO MAKE EACH OPERATOR SYSTEM COMPLETELY OPERATIONAL.
4. VALVE ACTUATORS FOR BURIED OR SUBMERGED SERVICE SHALL HAVE SEALS ON ALL SHAFTS AND GASKETS ON THE VALVE AND ACTUATOR COVERS TO PREVENT THE ENTRY OF WATER. ACTUATOR MOUNTING BRACKETS FOR BURIED OR SUBMERGED SERVICE SHALL BE TOTALLY ENCLOSED AND SHALL HAVE GASKET SEALS. ALL EXPOSED NUTS, BOLTS, SPRINGS AND WASHERS USED IN BURIED SERVICE SHALL BE STAINLESS STEEL.

CHECK VALVES

A. PVC CHECK VALVES SHALL BE OF SWING DESIGN, RATED FOR A MINIMUM OF 150 PSI, AND BE TRUE-UNION TYPE. DISC SHALL SEAT AGAINST RESILIENT SEAT INSTALLED IN THE VALVE BODY. VALVE SHALL BE CAPABLE OF FULL CLOSURE AT LOW BACK PRESSURE. VALVE CLOSURE SHALL BE ASSURED BY MEANS OF OUTSIDE LEVER AND WEIGHT.

B. DUCTILE IRON CHECK VALVES SHALL BE OF SWING DESIGN AND WITH IRON BODIES. VALVES SHALL HAVE A BRONZE OR BRONZE-FACED FACED CAST IRON DISC PLATE SUSPENDED AT THE TOP FROM A STAINLESS STEEL SHAFT. VALVE SHAFT SHALL BE SUPPORTED BY BRONZE BUSHINGS AND BEARINGS AND SHALL BE PACKED THROUGH EXTERNALLY ACCESSIBLE STUFFING BOX. DISC SHALL SEAT AGAINST RESILIENT SEAT INSTALLED IN THE VALVE BODY. VALVE CLOSURE SHALL BE ASSURED BY MEANS OF OUTSIDE LEVER AND WEIGHT.

V. TESTING AND CLEANING

A. THE CONTRACTOR SHALL VERIFY CAPACITY OF ALL PUMPS, AGAINST THEIR RATED CAPACITY IN THE PRESENCE OF THE ENGINEER BY MEASURING TANK DRAW-DOWN. ALL ALARM CONDITIONS SHALL BE VERIFIED IN THE FIELD TO ASSURE THAT THEY PERFORM AS INTENDED.

B. AT THE CONCLUSION OF THE WORK, THE CONTRACTOR SHALL THOROUGHLY CLEAN ALL PIPING BY FLUSHING WITH WATER OR OTHER MEANS TO REMOVE DIRT, STONES, AND/OR OTHER MATERIAL. PRIOR TO ACCEPTANCE, ALL PIPELINES SHALL BE INSPECTED FOR CLEANLINESS AND TO INSURE THAT NO GRIT, WELDING SLAG, PIPE SHAVINGS, BROKEN PIPE, OR OTHER OBSTRUCTIONS EXIST.

C. ALL PIPELINES, TANKS, AND MANHOLES SHALL BE FIELD TESTED FOR LEAKAGE. GRAVITY PIPES SHALL BE TESTED WITH LOW PRESSURE AIR, AND PRESSURE PIPES WITH WATER TO THEIR RATED PRESSURE. CONTRACTOR TO PROVIDE ALL FITTINGS, APPURTENANCES, AND DEVICES NECESSARY FOR TESTING.

D. CERTIFIED STARTUPS OF ALL PUMPING AND CONTROL SYSTEMS SHALL BE CONDUCTED TO ENSURE AND CERTIFY THAT THE SUPPLIED EQUIPMENT MEETS THE DESIGN CRITERIA, AND SPECIFICATIONS, AND ALL SYSTEMS ARE FULLY FUNCTIONAL.

VI. SPARE PARTS

A. CONTRACTOR SHALL SUBMIT A LIST OF MANUFACTURER'S RECOMMENDED SPARE PARTS FOR ALL EQUIPMENT AND MATERIALS THAT TYPICALLY WEAR OR OTHERWISE DEGRADE WITHIN A ONE-YEAR PERIOD FROM ENGINEER-APPROVED & ACCEPTED STARTUP AND INSTALLED/INSPECTED INSTALLATION, FOR REVIEW AND APPROVAL BY THE ENGINEER. 28 DAYS PRIOR TO CLEARWATER TESTING, ALL SPARE PARTS SHALL BE ON SITE, INVENTORIED AND DOCUMENTED IN A LIST, AND THE LIST APPROVED BY THE ENGINEER.

VII. SUBMITTALS

1. SUBMIT SHOP DRAWINGS AND SAMPLES FOR ALL ITEMS TO BE FURNISHED. SUBMITTALS REQUIRED UNDER THIS SECTION INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING: SHOP DRAWINGS FOR ALL PRECAST CONCRETE STRUCTURES, TANKS AND EQUIPMENT, PIPING & VALVES, MANHOLE FRAMES AND COVERS, HATCHES, ELECTRICAL AND MECHANICAL EQUIPMENT, CONDUIT AND DEVICES, AND ALL OTHER EQUIPMENT AND MATERIALS RELATING TO THE PROJECT, SHOWING DIMENSIONS, SIZES, AND TYPES OF MATERIALS. PROVIDE MATERIAL BROCHURES FOR ALL PIPING, PUMPS, EQUIPMENT, AND COLOR/TEXTURE SAMPLES OF ALL ARCHITECTURAL FEATURES.

2. OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS OPERATING INSTRUCTION - PROVIDE OPERATING INSTRUCTIONS TO THE ENGINEER AND THE OWNER'S DESIGNATED REPRESENTATIVE WITH RESPECT TO OPERATION FUNCTIONS AND MAINTENANCE PROCEDURES AND INCLUDE A COMPLETE LISTING OF SPARE PARTS.

3. MAINTENANCE MANUALS - AT THE COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL TURN OVER TO THE ENGINEER SIX COMPLETE MANUALS CONTAINING ALL ELEMENTS AND COMPONENTS OF THE PROJECT COMPONENTS. THE MANUAL SHALL BE CUSTOMIZED INSOFAR AS ALL OPTIONS, TYPES, SIZES, CONFIGURATIONS, ETC. SHALL BE INDICATED EITHER AS ONE ENCLOSURE WITHIN THE MANUAL OR BY ELIMINATING ALL INCORRECT REFERENCES OF EACH OCCURRENCE WITHIN A STANDARD TYPE OF MANUAL. THE MANUAL SHALL CONTAIN A BILL OF MATERIALS WHICH SHALL BE A PARTS LIST DETAILING THE MANUFACTURER AND HIS CATALOG NUMBER OF EACH EQUIPMENT PART. THE MANUAL SHALL INCLUDE ALL NECESSARY INSTRUCTIONS FOR THE OPERATION, AND MAINTENANCE, IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS INCLUDING INSPECTION SCHEDULES. ALL DRAWINGS, PLATES, LISTS, SCHEMATICS, AND THE LIKE SHALL BE INCLUDED IN THE MANUALS. THE FRONT PAGE OF EACH MANUAL SHALL BEAR THE PERTINENT CONTACT INFORMATION, OF THE REPRESENTATIVE/MANUFACTURER OF THE EQUIPMENT OR MATERIALS.

4. THE ENGINEER HAS THE RIGHT TO REJECT MANUALS SUBMITTED AS BEING UNSATISFACTORY OR TO REQUIRE THE SUBMITTAL OF ADDITIONAL INFORMATION.

VIII. MANUFACTURER'S AND VENDOR TRAINING

A. CONTRACTOR SHALL SUBMIT A LIST OF MANUFACTURER'S & VENDORS RECOMMENDED TRAINING REQUIREMENTS, INCLUDING A MANHOUR AND NUMBER OF DAYS REQUIRED BREAKDOWN.

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Client:

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Southbury, CT 06488

Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

SPECIFICATIONS AND NOTES

Revisions

No.	Description	Date

File: G-1_GeneralNotes.dwg
Drawn By: RMB
Designed By: RMB
Checked By: JF
Job No: 5051 Date: April 2015

North Arrow

Scale

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

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Sheet No.:

G-2

EQUIPMENT MOTORS	MAKE/MODEL/TYPE	PHASE/VOLTAGE	# SIMUL.RUN	RATED HP (kW)	RATED AMPS	FLA	START AMPS	LOCKED ROTOR AMPS	POWER FACTOR %
PUMPS									
ZONES 1- 6 PUMPS	EBARA/80DLMFU62.2/NONCLOG SUBMERSIBLE	3/480	1	3.0 HP (2.2)	4.6	-	-	31.5	84.0
REGEN. BLOWERS									
ZONES 1-6 BLOWERS	FPZ 4-HP, (INTEGRAL TO SOILAIR MODULE)	3/480	6	4.0 HP (3.0)	6.1	36.6	(6.0 START CURRENT RATIO)		85.0

EXISTING 2,000 GALLON GREASE TRAP NO.1

EXISTING 1,500 GALLON GREASE TRAP NO.2

EXISTING SMH'S

RAW INFLUENT WASTEWATER FROM NURSING HOME

EXISTING 12,000 GALLON SEPTIC TANK NO.1

EXISTING 6,000 GALLON SEPTIC TANK NO.2

EXISTING 6,000 GALLON SEPTIC TANK NO.3

FSH 1A

NEW EFFLUENT TEE FILTERS (TYP.)

NEW ACCESS RISER

EXISTING 6,000 GALLON PUMP CHAMBER NO.1

FSH 4B

FSH 3B

FSL 2B

FSL 1B

PUMPS INF-1, INF-2 2.0 2.0

REPLACE EXISTING 1.5 HP DOSING PUMPS WITH NEW 2-HP, 200V, 3-PHASE, SUBMERSIBLE INFLUENT PUMPS.

NEW CHECK AND GATE VALVES AS REQUIRED

EXISTING 3" SCH.40 PVC FORCEMAIN

NEW NEMA 6P RATED MAGNETIC FLOW METER, WITH FLOW TOTALIZING/DATA LOGGING CAPABLE CONTROLLER/TRANSMITTEER

FE 01

FT 01

NEW 1/3 HP SUMP PUMP WITH FLOAT CONTROLS AND HIGH LEVEL ALARM

FM-01

Q

FSL 1C

NEW 5-FT DIA. FLOW METER VAULT NO.1

EXISTING 3" SCH.40 PVC FORCEMAIN TO BE EXTENDED TO NEW EFFLUENT DOSING TANKS

3" SCH.40 PVC DELIVERY FORCEMAIN (TYP.)

PRESSURE SENSOR & TRANSMITTER (TYPICAL AND INTEGRAL FOR ALL SOILAIR UNITS)

PT-01

PT 01

PE 01

FSH 4D

FSL 3D

NEW 10,000 GALLON EFFLUENT DOSING TANK NO.1

FSL 1E

NEW 10,000 GALLON EFFLUENT DOSING TANK NO. 2

6 5 4 3.0 3.0 3.0

FSL 2D

FSL 1D

3 2 1 3.0 3.0 3.0

A6 4.0 SOILAIR BLOWER #6

A5 4.0 SOILAIR BLOWER #5

A4 4.0 SOILAIR BLOWER #4

A3 4.0 SOILAIR BLOWER #3

A2 4.0 SOILAIR BLOWER #2

A1 4.0 SOILAIR BLOWER #1

SOILAIR MODULE MODEL RF 29450MP WITH INTERGRAL 4HP REGENERATIVE BLOWER PACKAGES AND CONTROLS (TYP)

3" SCH.40 PVC PVC AERATION PIPING CONNECTED TO ENDS OF 6" ZONE MANIFOLD PIPING ADJACENT TO TRENCH ENDS (LOCATION DEPICTED IS DIAGRAMMATIC ONLY), TYP.

ZONES 1 - 6 SUBMERSIBLE PUMPS: 3.0 HP, 3-PHASE, 480V, 125 GPM @ 35-FT TDH

8" DIA.D.I. PLUG VALVE FOR BURIED SERVICE, WITH EXTENSION NUT / ROADBOX (TYP.) PROVIDE SUITABLE LENGTH VALVE OPERATING WRENCH AS REQUIRED

EXISTING FIELD NEAR PARKING LOT (OWRS-302)

2" SCH.40 PVC GATE VALVE (TYP.) AT MANIFOLD END FOR FLOW BALANCING

2" SCH.40 PVC GATE VALVE (TYP.) AT DISTAL END CLEANOUT FOR FLOW BALANCING

90-LF EFF. LENGTH

90-LF EFF. LENGTH

ZONE 6: 540-LF OF GST-6212 180-LF PER TRENCH CENTER-FED MANIFOLD SIX (6) "LATERALS", 90-LF EACH

6" SCH.40 PVC MANIFOLD (TYP.)

2" SCH.40 PVC LATERALS (TYP.)

90-LF EFF. LENGTH

90-LF EFF. LENGTH

90-LF EFF. LENGTH

TYPICAL ZONES 1 - 5: 540-LF OF GST-6212 270-LF PER "TRENCH" CENTER-FED MANIFOLD SIX (6) "LATERALS", 90-LF EACH

6" SCH.40 PVC MANIFOLD (TYP.)

2" SCH.40 PVC LATERALS (TYP.)

CONTINUATION TO RESPECTIVE ZONE

EXISTING 3" SCH.40 PVC FORCEMAIN

LEGEND

- EXISTING PIPE
- EXISTING STRUCTURE
- PROPOSED LIQUID PIPE
- PROPOSED AIR PIPE
- CHECK VALVE
- GATE VALVE
- BUTTERFLY VALVE
- BALL VALVE
- AIR RELEASE VALVE
- SUBMERSIBLE NON-CLOG SEWAGE PUMP
- SOILAIR REGENERATIVE BLOWER UNIT
- FLOWMETER, TYPE CALLED OUT
- FLOAT SWITCH

STREAM ID	DESIGN FLOW DATA
LIQUID FLOW:	
Q - INFLUENT FLOW	12,855 GPD
OWRS-302	
1 - ZONE 1 PRESSURE DISTRIBUTION	2,727 GPD
2 - ZONE 2 PRESSURE DISTRIBUTION	2,727 GPD
3 - ZONE 3 PRESSURE DISTRIBUTION	2,727 GPD
4 - ZONE 4 PRESSURE DISTRIBUTION	2,727 GPD
5 - ZONE 5 PRESSURE DISTRIBUTION	2,727 GPD
6 - ZONE 6 PRESSURE DISTRIBUTION	2,727 GPD

NOTE: ONLY FIVE OF THE SIX ZONES TO OPERATE ON ANY ONE DAY, SEQUENTIALLY. THE SIXTH ZONE IS SPARE/RESERVE, AND WILL REST ON A ROTATING BASIS.

AIR FLOW:	
OWRS-1 (NEAR EXISTING PARKING LOT)	
A1 - ZONE 1 AERATION	200 SCFM
A2 - ZONE 2 AERATION	200 SCFM
A3 - ZONE 3 AERATION	200 SCFM
A4 - ZONE 4 AERATION	200 SCFM
A5 - ZONE 5 AERATION	200 SCFM
A6 - ZONE 6 AERATION	200 SCFM

NOTE: ONLY FIVE OF THE SIX ZONES TO OPERATE ON ANY ONE DAY. THE SIXTH ZONE IS SPARE/RESERVE, AND WILL REST ON A ROTATING BASIS.

NOTES:
1.

EXISTING 3" SCH.40 PVC FORCEMAIN

EXISTING D-BOX

GROUP 1 (PRIMARY)

VALVE #3

GROUP 3 (NEAR WOODS)

VALVE #2

VALV #1

VALVE #4

VALVE #5

GROUP 1 (BEHIND SHED)

GROUP 2A (MIDDLE / NEAR PARKING LOT)

GROUP 2B (FRONT/RIGHT NEAR PARK LOT)

EXISTING SEPTIC GALLERYS FOR OWRS-1, (SYSTEM NEAR PARKING LOT)

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Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

PROCESS FLOW DIAGRAM - SOILAIR-GST

Revisions

No.	Description	Date

File: G-X Process Flow Diagram.dwg

Drawn By:	RMB		
Designed By:	RMB		
Checked By:	JF		
Job No:	5051	Date:	April 2015

North Arrow

Scale

For Regulatory Review Only

Sheet No.:

G-3

J:\5051 Southbury Lutheran Home\Cad\Plans\G-X Process Flow Diagram.dwg

Plot Date: May 06, 2016 6:21pm

DEEP TEST HOLE # B-1

DEPTH		ELEV.
0		306.51'
	A HORIZON FINE SANDY LOAM 10YR 4/3	
14"		305.34'
	Bw HORIZON FINE SANDY LOAM 10YR 4/4 SBK / FRIABLE, 1%GRAVEL, 0%C/S	
32"		303.84'
	BC HORIZON FINE SANDY LOAM 7.5YR 4/4 MA / FIP-FIH, 1%GRAVEL, 0%C/S	
60"		301.51'
	C1 HORIZON FINE SANDY LOAM 10YR 5/4 MA / FIP-FIH, 25%GRAVEL, 0%C/S	
72"		300.51'
TUBE TEST SAMPLE 84"	C2 HORIZON FINE SANDY LOAM 10YR 5/4 MA / FIP-FIH, 2%GRAVEL, 2%C/S	
WEEPING & STANDING @ 132" 128"+		295.84'
	C3 HORIZON SANDY LOAM 7.5YR 4/4 MA / FIP-FIH, 0%GRAVEL, 0%C/S	

REDOX FEATURES OBSERVED: 48" (EL. 302.51 (REDOX 5%)
DATE OF TEST : 5/21/2015
CT DEEP REPRESENTATIVE: RAMONA GOODE - CT DEEP
SOIL EVALUATOR: ROBERT BAGLINI (BETA)
(SEE LBG HYDROGEOLOGICAL REPORT)

DEEP TEST HOLE # B-2

DEPTH		ELEV.
0		291.77'
	A HORIZON FINE SANDY LOAM	
8"		291.10'
	Bw1 HORIZON FINE SANDY LOAM 7.5YR 4/4 SBK / FIP-FIH, 2%GRAVEL, 0%C/S	
23"		289.85'
	BC HORIZON FINE SANDY LOAM 7.5YR 3/4 MA / FIP-FIH, 2%GRAVEL, 2%C/S	
40"		288.44'
	C1 HORIZON FINE SANDY LOAM 2.5YR 4/3 SG / LOOSE, 25%GRAVEL, 0%C/S	
WEEPING 61"		286.69
TUBE TEST SAMPLE 66"	C2 HORIZON FINE SANDY LOAM 2.5YR 4/3 MA / FIP-FIH, 0%GRAVEL, 0%C/S	
71"+		285.85
TUBE TEST SAMPLE 86"	C3 HORIZON FINE SANDY LOAM 2.5YR 4/3 MA / FIP-FIH, 10%GRAVEL, 0%C/S	

WEEPING GW OBSERVED 61" (EL. 286.69')
DATE OF TEST : 5/21/2015
CT DEEP REPRESENTATIVE: RAMONA GOODE - CT DEEP
SOIL EVALUATOR: ROBERT BAGLINI (BETA)
(SEE LBG HYDROGEOLOGICAL REPORT)

DEEP TEST HOLE # B-3

DEPTH		ELEV.
0		289.12'
	A HORIZON FINE SANDY LOAM	
8"		288.45'
	Bw HORIZON FINE SANDY LOAM 5YR 5/8 SBK / FIP-FIH, 10%GRAVEL, 2%C/S	
41"		285.70'
	C1 HORIZON LOAMY SAND 7.5YR 5/8 MA / FIP-FIH, 20%GRAVEL, 15%C/S	
55"		284.54'
TUBE TEST SAMPLE 66"	C2 HORIZON FINE SANDY LOAM 7.5YR 5/2 MA / FIP-FIH, 25%GRAVEL, 1%C/S	
WEEPING @138" 144"+		277.12'
	C3 HORIZON FINE SANDY LOAM 7.5YR 6/2 MA / FIP-FIH, 0%GRAVEL,0%C/S	

REDOX FEATURES OBSERVED 55" (EL. 284.54')
DATE OF TEST : 5/21/2015
CT DEEP REPRESENTATIVE: RAMONA GOODE - CT DEEP
SOIL EVALUATOR: ROBERT BAGLINI (BETA)
(SEE LBG HYDROGEOLOGICAL REPORT)

DEEP TEST HOLE # B-4

DEPTH		ELEV.
0		288.11'
	NOT LOGGED	
-		-
	SIMILAR TO	
-		-
	HOLE #'S 2 & 3	
-		-

EVALUATED ESHGW DEPTH: (NONE OBSERVED)
DATE OF TEST : 5/21/2015
CT DEEP REPRESENTATIVE: RAMONA GOODE - CT DEEP
SOIL EVALUATOR: ROBERT BAGLINI (BETA)
(SEE LBG HYDROGEOLOGICAL REPORT)

DEEP TEST HOLE # B-5

DEPTH		ELEV.
0		301.19'
	A HORIZON LOAM 7.5YR 4/2	
12"		300.19'
	Bw HORIZON FINE LOAMY SAND 7.5YR 4/4 SBK / FR, 2%GRAVEL, 2%C/S	
43"		297.61'
TUBE TEST SAMPLE 48"	C1 HORIZON SANDY LOAM 10YR 4/4 MA / FIP-FIH, 15%GRAVEL, 15%C/S	
96"		293.19
TUBE TEST SAMPLE 112"	C2 HORIZON FINE LOAMY SAND 10YR 4/3 MA / FIP-FIH, 25%GRAVEL, 0%C/S	
144"		289.19'

EVALUATED ESHGW DEPTH: (SEE LBG HYDROGEOLOGICAL REPORT)
DATE OF TEST : 5/26/2015
CT DEEP REPRESENTATIVE: RAMONA GOODE - CT DEEP
SOIL EVALUATOR: ROBERT BAGLINI (BETA)

DEEP TEST HOLE # B-6

DEPTH		ELEV.
0		304.50'
	A HORIZON LOAM	
6"		304.00'
	Bw HORIZON FINE SANDY LOAM 7.5YR 5/3 SBK / FIP-FIH, 3%GRAVEL, 2%C/S	
21"		302.75'
	C1 HORIZON SANDY LOAM 2.5YR 4/4 SG / LOOSE, 15%GRAVEL, 15%C/S	
48"		300.50'
	C2 HORIZON FINE SANDY LOAM 2.5YR 4/4 MA / FIP-FIH, 25%GRAVEL, 0%C/S	
144"+		292.50

ESHGW DEPTH: (SEE LBG HYDROGEOLOGICAL REPORT)
DATE OF TEST : 5/26/2015
CT DEEP REPRESENTATIVE: RAMONA GOODE - CT DEEP
SOIL EVALUATOR: ROBERT BAGLINI (BETA)

DEEP TEST HOLE # B-7

DEPTH		ELEV.
0		306.79'
	A HORIZON LOAM	
9"		306.04'
	Bw1 HORIZON FINE SANDY LOAM 7.5YR 5/3 SBK / FIP-FIH, 5%GRAVEL, 2%C/S	
54"		302.29'
	BC HORIZON FINE to MED. SAND 2.5YR 4/4 MA / FIP-FIH, 15-20%GRAVEL, 5%C/S	
120"		296.79
	2C HORIZON FINE SANDY LOAM 10YR 4/3 MA / FIP-FIH, 25%GRAVEL, 0%C/S	
156"		293.79'

ESHGW DEPTH: (SEE LBG HYDROGEOLOGICAL REPORT)
DATE OF TEST : 5/26/2015
CT DEEP REPRESENTATIVE: RAMONA GOODE - CT DEEP
SOIL EVALUATOR: ROBERT BAGLINI (BETA)

DEEP TEST HOLE # B-8

DEPTH		ELEV.
0		309.86'
	A HORIZON LOAM	
8"		309.19'
	Bw1 HORIZON FINE SANDY LOAM 7.5YR 4/4 SBK / FIP-FIH, 2%GRAVEL, 2%C/S	
36"		306.86'
	BC HORIZON FINE SANDY LOAM 10YR 4/6 MA / FIP-FIH, 2%GRAVEL, 5%C/S	
68"		304.19'
	C1 HORIZON FINE to MED. SAND 10YR 4/4 MA / FIP-FIH, 25%GRAVEL, 5%C/S	
120"		299.86'
	C2 HORIZON FINE SANDY LOAM 10YR 4/3 MA / FIP-FIH, 0%GRAVEL, 0%C/S	
144"		297.86'

ESHGW DEPTH: (SEE LBG HYDROGEOLOGICAL REPORT)
DATE OF TEST : 5/26/2015
CT DEEP REPRESENTATIVE: RAMONA GOODE - CT DEEP
SOIL EVALUATOR: ROBERT BAGLINI (BETA)

DEEP TEST HOLE # B-9

DEPTH		ELEV.
0		298.66'
	A HORIZON FINE SANDY LOAM 7.5YR 4/2	
6"		298.16'
	Bw1 HORIZON FINE SANDY LOAM 10YR 4/3 SBK / FIP-FIH, 5%GRAVEL, 0%C/S	
33"		295.91'
TUBE TEST SAMPLE 40"	BC HORIZON F/MED. SANDY LOAM 10YR 4/4 MA / FIP-FIH, 5%GRAVEL, 0%C/S	
WEEPING @78" 72"		292.66'
	C1 HORIZON F/MED. SANDY LOAM 10YR 5/2 SG / LOOSE, 25%GRAVEL, 15%C/S	
88"+		291.33'
TUBE TEST SAMPLE 90"	C2 HORIZON F/MED. SANDY LOAM 10YR 6/2 MA / FIP-FIH, 1%GRAVEL, 0%C/S	
STANDING @116"		

ESHGW DEPTH: 78" (EL. 292.24')
DATE OF TEST : 5/26/2015
CT DEEP REPRESENTATIVE: RAMONA GOODE - CT DEEP
SOIL EVALUATOR: ROBERT BAGLINI (BETA)
(SEE LBG HYDROGEOLOGICAL REPORT)

DEEP TEST HOLE # B-10

DEPTH		ELEV.
0		281.81'
	A/HTM HORIZON 7.5YR 3/3	
31"		279.23'
	Bb HORIZON FINE SANDY LOAM 10YR 4/4 SBK / FR, 0%GRAVEL, 0%C/S	
41"		278.39'
TUBE TEST SAMPLE 66"	C1 HORIZON FINE SANDY LOAM 10YR 6/2 MA / FIRM, 5%GRAVEL, 5%C/S	
120"		271.81'

ESHGW DEPTH: (SEE LBG HYDROGEOLOGICAL REPORT)
DATE OF TEST : 6/23/2015
CT DEEP REPRESENTATIVE: RAMONA GOODE - CT DEEP
SOIL EVALUATOR: ROBERT BAGLINI (BETA)

DEEP TEST HOLE # B-11

DEPTH		ELEV.
0		281.14'
	A/HTM(FILL) HORIZON 7.5YR 3/3 (SLIGHT ODOR OF DECAYING ORGANIC MATTER)	
WEEPING & STANDING @ 132"		
144"		269.14'

ESHGW DEPTH: (SEE LBG HYDROGEOLOGICAL REPORT)
DATE OF TEST : 6/23/2015
CT DEEP REPRESENTATIVE: RAMONA GOODE - CT DEEP
SOIL EVALUATOR: ROBERT BAGLINI (BETA)

DEEP TEST HOLE # B-12

DEPTH		ELEV.
0		285.22'
	A HORIZON 7.5YR 3/3	
8"		284.55'
	Bw HORIZON FINE SANDY LOAM 7.5YR 4/6 SBK / FR, 0%GRAVEL, 0%C/S	
38"		282.05'
	C1 HORIZON FINE SANDY LOAM 7.5YR 5/2 MA / V.FIRM, 10%GRAVEL, 5%C/S	
62"		280.05'
	C2 HORIZON FINE SANDY LOAM 7.5YR 4/3 MA / FIRM, 5%GRAVEL, 5%C/S	
120"		275.22'

EVALUATED ESHGW DEPTH: (SEE LBG HYDROGEOLOGICAL REPORT)
DATE OF TEST : 6/23/2015
CT DEEP REPRESENTATIVE: RAMONA GOODE - CT DEEP
SOIL EVALUATOR: ROBERT BAGLINI (BETA)

NOTE: REFER TO HYDROGEOLOGICAL REPORT BY LEGETTE, BRASHEARS, AND GRAHAM FOR FINAL SEASONAL HIGH GROUNDWATER ADJUSTMENTS, BASED ON WET SEASON MONITORING

Engineered by:
BETA Group, Inc.
Engineers • Planners • Landscape Architects
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Client:

Southbury Real Estate Group, LLC
990 Main Street North
Southbury, CT 06488

Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

DEEP TEST PITS LOGS

Revisions

No.	Description	Date

File: G-X_DesignCalculations.dwg
Drawn By: RMB
Designed By: RMB
Checked By: JF
Job No: 5051 Date: April 2015

North Arrow

Scale

For Regulatory Review Only

Sheet No.:

G-4

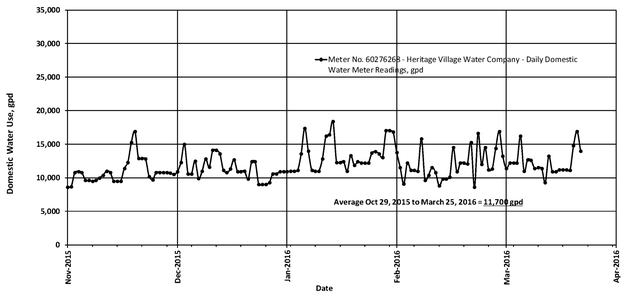
J:\5051 Southbury Lutheran Home\Cad\Plans\G-X_DesignCalculations.dwg

Plot Date: May 06, 2016 6:21pm

1. DESIGN DATA

A. Existing Wastewater Flows:

1. Based on daily domestic water meter readings (Heritage Village Water Company):



11,700 gpd average, water use from October 29, 2015 to March 25, 2016 - (logged daily at 8:00am data from Lutheran Home Maintenance staff).
The average daily flow for January 2016 was 13,135 gpd. This will be the design flow for the facility. During flow monitoring period, the facility was operating at 100% bed occupancy.

2. Determine Flow Split between two existing septic systems:

OWRS-301: 14 are beds connected - However, based on inspection of plumbing, only several water closets are connected. Based on dye testing of the connectivity of the plumbing, and CCTV inspection of the interior of all septic systems on the property, it was found the high water use fixtures and facilities serving the Parley Manor beds such as; cooking, bathing, and laundry were relocated to the more modern wing of the building. This results in discharge of that portion of the flow from those 14 beds to dischcarge to OWRS-302. Accordingly, sanitary flow generation for the 14 beds located in Parley Manor is conservatively estimated at 20gpd/bed discharging to OWRS-301.

Estimated average wastewater flow to existing old front system = 14 beds x 20 gpd/bed = 280 gpd

OWRS-302: 120 are beds connected + (Kitchen/Laundry/Bathing facilities, for the fourteen Parley Manor Beds) -
Existing system consists of 28 galleries of precast concrete, adjacent to larger, main parking lot
Remainder of the average wastewater flows to existing field near Parking Lot = 13,135 - 280 = 12,855 gpd**

B. Flow Allocation Summary:

Description	Number	Based on Metered Flows
Existing # of Beds	120 - Certified Nursing	12,855 gpd (107 gpd/bed)**
	14 - Residential Care Home (Parley Manor)	280 gpd (20 gpd/bed)
Totals		
Existing Beds	134	13,135 gpd

Note: See Section 4 Tank Capacity Calculations on this sheet for flow equalization storage calculation

C. Influent Wastewater Characteristics:	(Sampling Date)* 1/16/2015	6/24/2015	Design Value
BOD-5	320 mg/L	190 mg/L	250 mg/L
Total Nitrogen	26 mg/L	38 mg/L	30 mg/L**
Total Phosphorus	2.5 mg/L	ND	20 mg/L***
Total Suspended Solids	72 mg/L	660 mg/L	250 mg/L

* Grab Samples obtained from Existing Pumping Chamber on date indicated
** Value is based on operational data for two similar nursing homes, both in terms of number of beds, and day-to-day establishment operations. Composite influent samples are collected in accordance with the WWTF/Pre-Treatment operating permits, and are collected from effluent pump station discharge pipe at the headworks. The pump chambers are preceded by septic tanks. see attached engineering report.
*** Maximum literature values reported in CT DEEP Guidance for Design of Large-Scale On-Site Wastewater Renovation Systems

D. Groundwater Quality Sampling - Monitoring Wells Sampling/Testing Results

Well/PZ Identification	Sampling Date	Total-N	N03	N02	NH-4	Total-P	Ortho-P	TKN	Tot Dissolved P	Fecal Coliform
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	CFU/100mL
MW-1	9/23/2015	19.00	ND<0.10	ND<0.10	22.00	26.00	1.90	19.00	2.40	
	2/10/2016	N.S. - Buried	N.S. - Buried	N.S. - Buried	N.S. - Buried	N.S. - Buried	N.S. - Buried	N.S. - Buried	N.S. - Buried	N.S. - Buried
MW-2	9/23/2015	13.00	ND<0.10	ND<0.10	12.00	2.10	1.60	13.00	1.90	
	2/10/2016	14.00	ND	ND	12.00	2.50	0.74	14.00		
MW-3	9/23/2015	5.10	ND<0.10	0.16	4.40	ND<0.10	0.12	4.90	ND<0.10	
	2/10/2016	5.50	ND	ND	4.50	ND	0.11	5.50		
MW-4	9/23/2015	2.80	ND<0.10	2.80	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	
	2/10/2016	2.80	2.80	ND	ND	ND	ND	ND		
MW-5	9/23/2015	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	10.00
	2/10/2016	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
MW-6	9/23/2015	ND<12	ND<0.10	0.37	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	< 1.0
	2/10/2016	ND	0.38	ND	0.2	ND	ND	ND		
MW-7	9/23/2015	2.20	ND<0.10	ND<0.10	0.14	3.60	ND<0.10	2.20	1.60	>2419
	2/10/2016	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
MW-8***	9/23/2015	1.40	ND<0.10	ND<0.10	ND<0.10	0.11	ND<0.10	1.40	0.10	< 1.0
	2/10/2016	6.10	0.10	ND	0.24	29.00	0.85	4.70		
PZ-A	10/1/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/10/2016	3.30	ND	ND	0.50	0.32	0.13	3.30		
PZ-B	10/1/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/10/2016	1.80	ND	ND	0.23	ND	ND	1.80		
--- Additional Wells Requested by CT DEEP ---										
MW-9	2/9/2016	12.00	ND	ND	12.00	0.36	0.33	12.00	N.S.	N.S.
MW-10	2/10/2016	6.10	4.40	ND	0.13	0.87	0.13	1.70	N.S.	N.S.
MW-11	2/9/2016	ND	ND	ND	ND	ND	0.16	ND	N.S.	N.S.
MW-12***	2/10/2016	98.00	ND	ND	ND	31.0	ND	98	N.S.	N.S.
MW-13	2/10/2016	2.70	ND	ND	2.60	ND	ND	2.7	N.S.	N.S.

*** Note: Monitoring wells MW-8 and MW-12 are likely located in the presence of decaying matter which could skew sampling results for nitrogen and phosphorus. Refer to the boring logs included in the Hydrogeological Report.

E. Soils Hydraulic Conductivity Summary

1. Saturated Zone (Values are in ft/day)

Well ID	Location	Slug Testing	Sieve Testing	Sieve Testing	Sieve Testing
MW-1	Exist. System	6.8 ft/day (@15-20')	3.9 ft/day (@8-10')	6.9 ft/day (@19-20')	-
MW-2	Exist. System	1.3 ft/day (@15-20')	4.8 ft/day (@8-10')	8.7 ft/day (@19-20')	-
MW-3	Exist. System	2.2 ft/day (@15-20')	5.3 ft/day (@8-10')	3.0 ft/day (@19-20')	-
MW-4	Exist. System	2.1 ft/day (@15-20')	16.0 ft/day (@8-10')	5.8 ft/day (@19-20')	-
MW-5	Future Area	1.7 ft/day (@15-20')	6.7 ft/day (@8-10')	4.1 ft/day (@19-20')	5.6 ft/day (@ 29-30')
MW-6	Future Area	0.3 ft/day (@15-20')	8.6 ft/day (@8-10')	10.0 ft/day (@19-20')	-
MW-7	Future Area	0.5 ft/day (@15-20')	12.1 ft/day (@8-10')	8.5 ft/day (@19-20')	-
MW-8	Future Area	6.8 ft/day (@15-20')	0.4 ft/day (@8-10')	6.9 ft/day (@19-20')	-

Note: Refer to Hydro-geological Report by Legette, Brashears, and Graham

2. Unsaturated/Vadose Zone (Values are in ft/day)

Testpit ID	Location	Permeability	Sample Thickness	Max Head
B-1 @ 7.0-ft, El. 299.51	Future Area	1.54 ft/day	2.75"	7"
B-2 @ 5.5-ft, El. 286.27	Future Area	0.81 ft/day	3.00"	7"
B-2 @ 8.0-ft, El. 283.77	Future Area	0.26 ft/day	3.00"	7"
B-3 @ 5.5-ft, El. 283.62	Future Area	0.50 ft/day	3.00"	7"
B-5 @ 4.0-ft, El. 297.19	Future Area	0.67 ft/day	3.25"	7"
B-5 @ 9.3-ft, El. 291.89	Future Area	1.53 ft/day	3.50"	7"
B-9 @ 3.5-ft, El. 295.16	Future Area	0.61 ft/day	2.50"	7"
B-9 @ 7.5-ft, El. 291.16	Future Area	0.65 ft/day	2.00"	7"
B-10 @ 7.0-ft, El. 274.81	Exist. System	2.80 ft/day	3.00"	Not Reported

Values obtained via CT DEEP tube testing methodology, samples obtained and analyzed by Clarence Welti Associates, Inc., Glastonbury, CT. Sample B-10 obtained by BETA Group, Inc. Ramona Goode, CT DEEP, present during sampling

(Data compares favorably to that reported by Dudley Ashwood Data 1985)
DP 110 @ 48" 1.600 ft/day
DP 111 @ 72" 0.655 ft/day
DP 111 also @ 72" 0.792 ft/day

2. LONG TERM ACCEPTANCE RATE (LTAR) CALCULATION:

A. OWRS-302 (Existing / Eastern Larger SWAS "1980's/1995 repair, adjacent to Large Parking Lot)

Per Section X, Pg. 4 of 82, CT DEEP Large Scale OWRS Design Guidance, Feb. 2006
Adjustment Factor for LTAR to account for BOD-5 and TSS concentrations in the wastewater, is as follows:
--- Use BOD=300mg/L, TSS=300mg/, based on testing data, and other similar facility data ---
[250/(BOD5+TSS)]^(1/3)
= [250/(250+250)]^(1/3)
= 0.794

Per Section X, Pg. 4 of 82, CT DEEP Large Scale OWRS Design Guidance, Feb. 2006
LTAR, gpd/sf = 5K - [1.2 / (Log(base-10)K)] , where K is in units of ft/min.

For OWRS-302, available vadose zone permeability values available were obtained from the most restrictive layer observed during deep hole testing. The following permeability values are representative of the soils in the area of the existing OWRS-302.

- BETA Group Data
  Testhole #B-10, from the C1-Layer, 2.80 ft/day
- Dudley Ashwood Report
  Testhole # DP110, from 48" depth, 1.600 ft/day
  Testhole # DP111, from 72" depth, 0.655 ft/day
  Testhole # DP111, also from 72" depth, 0.792 ft/day

conservatively use K = 0.655 ft/day, which is the lowest value of stated in the Dudley Ashwood Report
5 [(0.655 ft/day) / (1440min/day)] - [1.2 / (Log(base-10)(0.655/1440))]
= 0.361 gpd/sf

Therefore adjusted LTAR = 0.361 x 0.794 = **0.287 gpd/sf** (Note Prior / CT DEEP Approved Dudley Ashwood Report assessed 0.37 to 0.41 gpd/sf, based on permeability testing1980's)

B. OWRS-301 (Existing / Western SWAS "Old original SWAS serving Parley Manor, adjacent to Route 6 / Main Street North")
No test pits were performed in this area.

3. INFILTRATIVE SURFACE AREA CALCULATIONS

1. Determine Effective Leaching Surface Area (ELA): Use Geomatrix GST 6212 (12.0" Height, 62" wide), with Soilair system, provides 17.6 SF/LF, as follows:

CT DEEP
ELA/lf = [1.5 X inside clear (unmasked) bottom of leaching unit + 1.0 X effective stone masked bottom area] + [1.0 X effective stone-masked sidewall areas of leaching units]

Effective Leaching Area (ELA) in an 8" System Section: (Refer to Calculation Definition Sketch):

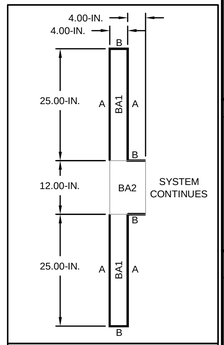
A. Unmasked Bottom Area ("UBA"):
None.

B. Masked Bottom Area ("MBA"):
MBA = Area of (2 X BA1) + BA2 (see attached diagram)
BA1 Area = 2(25 in. X 4 in.) = 200 sq.in.
BA2 Area = (8 in. X 12 in.) = 96 sq.in.
MBA = 296 sq.in. / (144 sq.in. / 1 sf) = 2.1 sf

C. Effective Sidewall Area ("ESA")
SA Sidewall (SW) = Height x Length x number of segments (in.)
SA SW (Side A x 4) = 12 in. x 25 in. x 4 = 1200 sq.in. / (144 sq.in / 1 sf) = 8.3 sf
SA SW (Side B x 4) = 12 in. x 4 in. x 4 = 192 sq.in. / (144 sq.in. / 1 sf) = 1.3 sf
TOTAL ALLOWABLE SIDEWALL AREA 9.6 sf

Total ELA/lf = [[1.5 X 0.0 (UBA) + 1 X 2.1 (MBA)] + [1.0 X 9.6 (ESA)]] X 1.5 = 17.55 sf/lf, use 17.6

Note: The value 1.5 Conversion from 8 in. section of system to 1 ft. section of system.
Interior Storage Volume = 9.23 gallons/linear foot, per Geomatrix



DEFINITION SKETCH FOR GST-6212
(FOR ELA CALCULATION)
SCALE 3/4" = 1'

Notes:
1. Typical 8-inch section of gst-6212
2. BA1, BA2 represent bottom area segments
3. A, B represent sidewall segments

2. Provide repair/replacement for Existing/Average Flows (12,855 gpd)
Assumptions:
0.287 gpd/sf loading rate for OWRS-302:

OWRS-1: Five (5) zones of GST-6212, consisting of two (2), 270-ft long trenches per zone, totaling 2,700 LF (Zones 1 - 5)
One (1) zone of GST-6212, consisting of three (3), 180-ft long trenches per zone, totaling 540 LF (Zone 6)

Zones 1 - 5:
2,700 LF x 17.6 SF/LF x 0.287 gpd/sf = 13,638 gpd

Zone 6:
540 LF x 17.6 SF/LF x 0.287 gpd/sf = 2,728 gpd (Spare Zone)

3. Overall Capacity :

Zone 1	2,728 gpd
Zone 2	2,728 gpd
Zone 3	2,728 gpd
Zone 4	2,728 gpd
Zone 5	2,728 gpd
Zone 6	Spare (can handle 2,728 gpd during it's rotation)

Total Infiltrative Capacity Provided: 16,362 gpd (including spare) > 12,855 gpd

5. Nitrogen Reduction Calculations

(All of Zone 6 resting)

$$Ngw = \frac{[Qww\ x\ Nww] + [Qprecip + Nprecip]}{Qww + Qprecip}$$

Reference: CT DEEP Manual 2006
Design, Operation and Maintenance
of Large-Scale On-site
Wastewater Renovation Systems
Section X, pages 41 - 48

where:

Ngw	Nitrate Nitrogen leaving property, or at sensitive receptor, as N, mg/L
Qww	Sewage Discharge Flowrate, gpd
Nww	Nitrogen concentration of wastewater, discharging from the sewage system, as N, mg/L
Qprecip	Infiltrating precipitation available for diluting sewage discharge, gpd
Nprecip	Nitrogen concentration of precipiptation, as N, mg/L

Nitrogen Dilution Calculation:

	Nitrogen Analysis Area, per Figure 4, BETA Engineering Report	Wastewater Contribution, to each dilution analysis area (assess at average flow of 11,700) Qww, gpd		Hydrologic Soil Group (NRCS)	Composite Curve Number (USDA, TR-55, Table 2-2c)	% Precipitation Infiltration, per Figure N-1, Section X, Page 42 of 82, CT DEEP 2006 %	Effective Area for Precipitation Infiltration (sq.ft.)	Infiltrated Precipitation Qprecip, gpd	Calculated Nitrogen at downgradient receptor or property line, mg/L Ngw, mg/L
A.	Area 1A (Toward Rte.6)	Parley Manor	280	B	79	39.00%	36,605	1,229	-
	Area 1B (Toward Rte.6)	GST Zones 1 through 5, Zone 6 Offline	10,278	B	*Subsurface Infiltration System, 5 to 10 year storm capacity*	*75.00%*	187,265	12,089	-
	Areas 1A & 1B, weighted		**10,558**			-		**13,317**	***8.38***
B.	Area 2 (Toward Wetland)[1, 2]	GST Zone 6 Offline, 1/2 of Zone 5 contributes to Area 2	**1,142**	B	69	44.50%	50,530	**1,935**	***6.99***
			11,700						

Notes:
1. Existing Total-N values MW-10, MW-11 are currently less than 7.0 mg/L with existing non-conforming system
2. Analysis does not include upland "Area-3"

Analysis Criteria and Assumptions:

1	Average annual precipitation, inches. Refer to LBG report	-	50.4	inches/year
2	Fertilizer Use, lbs./day/sq.ft.	-	None	-
3	Precipitation Total-N Concentration, mg/L	**Nprecip**	0.5	mg/L
4	Total N Concentration discharged from existing septic tanks, to new GST-Soilair zones 1 - 6, and future zones, and Parley Manor mg/L	**Nww**	30	mg/L
5	GST-Soilair N-removal % through leaching field, repair projects, per CT DEEP letter dated Aug. 8, 2008	-	40%	-
6	Total-N concentration discharged from GST-Soilair Zones, mg/L	**Nww**	18	mg/L
7	Total N Concentration discharged from existing septic tanks, to new GST-Soilair zones 1 - 6, and future zones, and Parley Manor mg/L	**Nww**	18.32	mg/L
9	Infiltrative Capacity @ Max Month:		12,855	gpd
10	Average Monthly Wasteater Flow, entire Facility:		11,700	gpd
11	GST-Soilair Infiltrative Capacity: Zones 1 through 6, gpd	=(11,700-280)/5 zones ... Timer & PLC controlled	**Qww** **Qww**	2,284 gpd (per zone)

4. TANKS CAPACITY CALCULATIONS

(Existing Tanks to Remain in Operation)

1. Grease Trap Capacity:

Flow from the kitchen is not metered separately therefore direct effluent flow values are not available. To estimate the flow from the kitchen a value of 5 gallons per meal served was used (Table 4 Connecticut Public Health Code Technical Guidance for Take Out Restaurant). A 24-hour retention time is required for kitchen flow to a grease trap (CTDEEP Guidance Section IX page 3).

Required Volume: 134 beds x 3 meals per day x 5 gallons per meal = 2,010 gallons
Provided Volume: 2(number of grease traps in series) x 5'x10'x5.33'x7.48 gallon per cubic foot = 3,986 gallons (>2,010 gallons so OK)

2. Septic Tank Capacity:

A: Required Volume: CTDEEP Design Flows - 150 gallons per bed-day x 120 beds = 18,000 gallons per day
Actual Flows - 107 gallons per bed-day x 120 beds = 12,855 gallons per day
Provided Volume: 12,042 gallons + 5,864 gallons + 5,864 gallons = 23,770 gallons of septic tank provided (> than actual and required so OK)

B: Required Detention Time: CTDEEP requires 2-hour detention time during peak flow
Peak Flow = 13,135 gallons per day x 4.2 (Ten State Standard Ratio Q-peak hour / Q-design daily flow) / 24 hours per day = 2,299 gallons per hour
Detention Time = 23,770 gallons / 2,299 gallons per hour = 10.3-hour detention time (> 2-hour required during peak flow so OK)

3. Flow Equalization Calculation (Proposed Tanks):

Water use data for the facility was evaluated in order to assess flow equalization storage requirements. The month of January and the first few days of February had the highest monthly average daily flow of 12,855 gpd to OWRS-302. The volume available for equalization in the proposed pump chambers is 17,232 gallons. The control strategy for OWRS-302 will uniformly distribute 12,855 gallons of septic tank effluent on a daily basis. Flow beyond this value will be temporarily stored in the flow equalization storage capacity provided. During this time period the proposed flow equalization capacity provided 1,067 gallons of capacity beyond what was observed.

Required Volume: Flow equalization storage greater than peak cumulative flow during max month.
Provided Volume: The Maximum Stored Volume = 16,165 gallons (<17,232 gallons of storage provided)

Note: two tanks are provided for both flow equalization volume as well as for commissioning of theOWRS-302 . The existing system is being re-constructed in place to maintain xisting flows.

5. HYDRO-GEOLOGICAL MODELING - GROUNDWATER MOUNDING ANALYSIS:
Refer to Wastewater Management Plan (BETA) and Hydrogeological Investigation / Report by Legette, Brashears, and Graham, Inc.

6. VIRUS AND BACTERIA REMOVAL ANALYSIS / TRAVEL TIME - PARTICLE TRACKS
Refer to Wastewater Management Plan (BETA) and Hydrogeological Investigation / Report by Legette, Brashears, and Graham, Inc.

Date	Water Use (GPD)	Volume to be Stored (Gal.)[1]	Cumulative Stored Volume (Gal.)	Storage Remaining (Gal.)[2]
01/01/16	10,620	(2,235)	-	17,232
01/02/16	10,620	(2,235)	-	17,232
01/03/16	10,720	(2,135)	-	17,232
01/04/16	10,720	(2,135)	-	17,232
01/05/16	10,820	(2,035)	-	17,232
01/06/16	13,320	465	465	16,767
01/07/16	17,120	4,265	4,730	12,502
01/08/16	13,720	865	5,595	11,637
01/09/16	10,820	(2,035)	3,560	13,672
01/10/16	10,720	(2,135)	1,425	15,807
01/11/16	10,720	(2,135)	-	17,232
01/12/16	12,520	(335)	-	17,232
01/13/16	15,920	3,065	3,065	14,167
01/14/16	16,120	3,265	6,330	10,902
01/15/16	18,120	5,265	11,595	5,637
01/16/16	12,020	(835)	10,760	6,472
01/17/16	12,020	(835)	9,925	7,307
01/18/16	12,120	(735)	9,190	8,042
01/19/16	10,720	(2,135)	7,055	10,177
01/20/16	13,020	165	7,220	10,012
01/21/16	11,620	(1,235)	5,985	11,247
01/22/16	12,120	(735)	5,250	11,982
01/23/16	11,920	(935)	4,315	12,917
01/24/16	11,920	(935)	3,380	13,852
01/25/16	11,920	(935)	2,445	14,787
01/26/16	13,420	565	3,010	14,222
01/27/16	13,620	765	3,775	13,457
01/28/16	13,320	465	4,240	12,992
01/29/16	12,720	(135)	4,105	13,127
01/30/16	16,720	3,865	7,970	9,262
01/31/16	16,720	3,865	11,835	5,397
02/01/16	16,520	3,665	15,500	1,732
02/02/16	13,520	665	16,165	1,067
02/03/16	11,220	(1,635)	14,530	2,702
02/04/16	8,820	(4,035)	10,495	6,737
02/05/16	11,920	(935)	9,560	7,672
02/06/16	10,820	(2,035)	7,525	9,707
02/07/16	10,820	(2,035)	5,490	11,742

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Client:

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990 Main Street North
Southbury, CT 06488

Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

DESIGN DATA & CALCULATIONS 1 OF 2

Revisions

No.	Description	Date

File: G-X_DesignCalculations.dwg
Drawn By: RMB/AJG
Designed By: RMB/AJG
Checked By: SJR
Job No: 5051 Date: April 2015

North Arrow

Scale

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Sheet No.: G-5

J:\5051 Southbury Lutheran Home\Cad\Plans\G-X_DesignCalculations.dwg

Plot Date: May 06, 2016 6:21pm

8. PHOSPHORUS SORPTION ANALYSIS

(Note: Only Zones 1 through 5 were considered in this calculation. Additional phosphorus storage is available if Zone 6 is utilized.)

Length of Trenches (ft)	Width of Trench (ft)	Height of Trench (ft)	Avg Phosphorus Loading (mg/L)[2]	Average Daily Flow (gal/day)	Thickness Unsaturated Soil (ft)	Soil P Adsorption (mg/100g)[5]	Soil Density (lb/cf)[1]
2,700	5.167	1	20	11,420	4.8	9	120

Total Effective Area[4] (ft^2)=	[=(2,700')*(5.167'+2*1')] =	19,350
Phosphorus Loading (mgP/day) =	[=(11,420 gal/day)*(20 mg/L)*(3.785 L/Gal.)] =	864,494
Phosphorus Loading (mgP/Month)	[=(30.4 day/month)*(864,494 mg P/day)] =	26,280,618
Soil Density (gm/cf)[1] =	[=(120 lb/cf)* 90% * (454 grams/lb)] =	49,032
Soil Adsorption of P (mg P)[3] =	[=(49,032 gm/cf) * (19,350 ft^2) * (4.8 ft) * 50% *(9 mgP/100gm)] =	204,934,147
Soil Capacity (months)=	[= (204,934,147 mg P) / (26,280,618 mg P/Month)] =	7.80 (> 6 months so OK[6])

Notes:

1: Soil density from Connecticut Experiment Station Bulletin 706 for Charlton soils maximum dry density = 120 lb/cf for C layer 30-48". Use 90% of max density based on typical insitu soil density.

2: Lab testing of two pump chamber effluent grab samples from the site were 2.5 mg/L and non detect. The previous report by Dudley Ashwood used 20 mg/l This value was used as a conservative estimate. The CTDEEP Design Guidance Section IV pg 14 also lists 20 mg/L as a maximum phosphorus value under Manuals & Textbooks.

3: As required in CTDEEP Design Guidance Section X pg 50 the unsaturated soil zone was reduced by 50%.

4: The effective leaching area is based on standard trench area (bottom and sidewalls),not the effective leaching area provided by the GST system.

5: The soil at the site is Charlton and was classified by Sawhney & Hill to have a sorption capacity of 21.8 mg P/100g of soil (B2 layer). Since test data has shown that sorption capacity is lower in the C soil layer the Merrimac soil sorption value of 9.0 mg/ 100 g soil was used as a conservative value.

6: CTDEEP Design Guidance Section X pg 50 item #5 requires the SWAS to adsorb at least 6 months of phosphorus in the percolate from the SWAS.

9.PUMPING SYSTEM / HYDRAULIC CALCULATIONS

(Reference: Richard Otis, Jan. 1981 - Design of Pressure Distribution Networks for Septic Tank Soil Absorption Systems, University of Wisconsin - Madison)

Based on Design Calculations the dosing pumps are required to meet the following conditions (See Design Calculation Below):

TDH (maximum) = 37 (feet)

Flow = 125 gpm

9.1 Force Main Headloss:

Force Main Headloss

DESIGN CRITERIA / ASSUMPTIONS

Static head from Pump off in Pump Chamber to top of 2" lateral
Friction losses in 3" force main from pump discharge to start of 6" manifold

A) Static Head

1)Static Head worst case will be from pump off to top of 2" lateral

ELEVATIONS	*Elevation (ft)*
Top 2" pipe in leaching trench	281.00
Pump Off Elevation	269.30
Total Static Head (ft)	11.70

B) Friction Losses

Pipe

3" PVC

Type	*Equiv. Length*	*No. of Fittings*	*Total Length*
45 Deg	4.09	6	24.54
90 Deg	7.67	2	15.34
T-thru flo	5.11	1	5.11
T-thru branch	15.30	0	0.00
Reducer	8.00	1	8.00
Check Valve	25.50	1	25.50
Gate Valve	2.04	2	4.08
		∑=	**82.57**

Inside Diam= 3
Area= 0.049

Length (ft)= 320
Inside Diam= 3
Area= 0.049
Total L.(ft)= 402.57

Based on Hazen-Williams formula of $f = 0.002083Lx\ ((100/C)^{1.852}) \times ((Q^{1.852}) / (D^{4.8655}))$

Length (ft)= 402.57
Inside Diam= 3
Area= 0.049

Flowrate (gpm)	*Velocity (ft/s)*	*Friction Losses (ft) from Different Values of C* 130	100
0	0.00	0.00	0.00
25	1.13	0.96	1.55
50	2.27	3.45	5.61
75	3.40	7.31	11.88
100	4.54	12.45	20.23
125	5.67	18.82	30.59
150	6.81	26.38	42.88
175	7.94	35.09	57.04
200	9.08	44.93	73.05
225	10.21	55.89	90.85
250	11.35	67.93	110.43
275	12.48	81.04	131.75
300	13.62	95.21	154.78
325	14.75	110.43	179.52
350	15.89	126.67	205.93

9.2 Zones 1 through 5 Pressure Distribution Calculations:

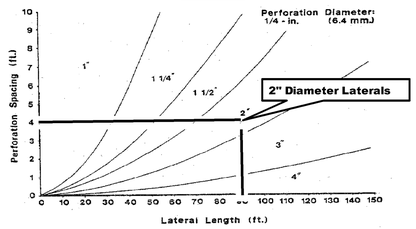
Project: Lutheran Home
Date: 2/24/2016
Guidance: CTDEEP Guidance for Design of Large-Scale On-Site Wastewater Renovation Systems

1: Determine lateral size and spacing.

Number of laterals =	6	(total number of laterals for zones 1 thru 5)
Length of laterals =	90	(total number of laterals for zones 1 thru 5)

Use 3/16 orifices spaced at 4.00 feet. (maximum spacing = 5' so OK)

APPENDIX B



Minimum Lateral Diameter for Plastic Pipe (C_h = 150) Versus Perforation Spacing and Lateral Length for 1/4 in. Diameter Perforations (Otis, 1981)

FIGURE 8a & 8b: Minimum Lateral Diameter vs. Perforation Spacing & Lateral Length. (Figure 8a can be used for 1/8 inch diameter perforations).

Based on guidance Appendix B Figure 8A the required lateral diameter is **2-inches**.

2: Determine lateral discharge rate.

Pressure Distribution Guidance Table 1: Perforation Discharge Rates (GPM)

In-Line	Perforation Diameter								
Pressure (ft)	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"
1.0	0.18	0.41	0.74	1.15	1.66	2.26	2.95	3.73	4.6
1.5	0.22	0.51	0.9	1.41	2.03	2.76	3.61	4.57	5.64
2	0.26	0.59	1.04	1.63	2.34	3.19	4.17	5.27	6.51
2.5	0.29	0.66	1.17	1.82	2.62	3.57	4.66	5.9	7.28
3	0.32	0.72	1.28	1.99	2.87	3.91	5.1	6.46	7.97
3.5	0.34	0.78	1.38	2.15	3.1	4.22	5.51	6.98	8.61
4	0.34	0.83	1.47	2.3	3.31	4.51	5.89	7.46	9.21
4.5	0.39	0.88	1.56	2.44	3.52	4.79	6.25	7.91	9.77
5	0.41	0.93	1.65	2.57	3.71	5.04	5.59	8.34	10.29

Number of perforations at 4'-0" spacing =	22
Lateral Discharge Rate (gpm) =	**20.4**

3: Determine the manifold size.

$$D_m = \left(\frac{\sum_{i=1}^{M} L_i \ F_i}{f h_d}\right)^{0.21}$$

Where Dm = manifold diameter L_i = length of manifold segment F_i = friction factor in each manifold segment
f = fraction of total head loss in manifold (10% allowed) and hd = distal head in feet

Note: L_i =	90	(*feet based on the design layout)

Where Qi = the flow in each manifold segment

h_d = 5

Segment	Q_i	F_i	ΣF_i	Dm (Inches)	
1	41	0.9	0.9	2.9	
2	82	3.4	4.3	4.0	
inlet	122	7.1	11.4	5.0	**Use 6-inch diameter**

(minimum 3 feet required per CTDEEP - 5 feet provided)

4: Determine the dose volume.

guidance requires 5 to 10 volumes of laterals per dose cycle Use = 7

Pipe Areas (ft^2):	2-0"=	0.0218	3"=	0.0491		6"=	0.1963

Total lateral length (ft) =	540	
Volume of Laterals (gallons) =	88.1	
7 x Lateral Volume (gallons) =	617	
Manifold Volume (gallon) =	264.4	
Force Main Volume (gallon) =	128.5	Length (ft) = 350

Dosing Volume (gallon) =	**1100**	(Vol. = lateral volume x 7 + manifold vol. + force main vol.)
Number of Doses per Day =	2	Design Flow (GPD) = 2,566

5: Determine Pump Flow Rate

Pump Flow Rate (gpm) =	**122**	(Based on 6 laterals times flow per lateral in gpm)

6: Total Head loss Pump Flow Rate

Distal Head (h_d) =	5.0	
Net Work Losses =	6.6	(Equal to 1.31xh_d per Guidance)
Force Main Losses =	18.8	(See calc sheet for force main head loss)
Static Head =	11.7	
TDH (feet) =	**37.1**	

9.3 Zone 6 Pressure Distribution Calculations:

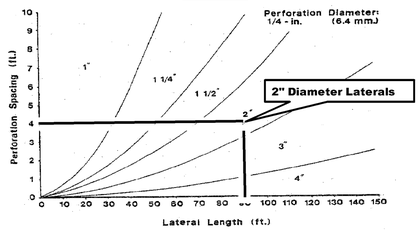
Project: Lutheran Home
Date: 3/7/2016
Guidance: CTDEEP Guidance for Design of Large-Scale On-Site Wastewater Renovation Systems

1: Determine lateral size and spacing.

Number of laterals =	6	(total number of laterals for zones 1 thru 5)
Length of laterals =	90	(length of laterals for zone 6)

Use 3/16 orifices spaced at 4.00 feet. (maximum spacing = 5' so OK)

APPENDIX B



Minimum Lateral Diameter for Plastic Pipe (C_h = 150) Versus Perforation Spacing and Lateral Length for 1/4 in. Diameter Perforations (Otis, 1981)

FIGURE 8a & 8b: Minimum Lateral Diameter vs. Perforation Spacing & Lateral Length. (Figure 8a can be used for 1/8 inch diameter perforations).

Based on guidance Appendix B Figure 8A the required lateral diameter is **2-inches**.

2: Determine lateral discharge rate.

Pressure Distribution Guidance Table 1: Perforation Discharge Rates (GPM)

In-Line	Perforation Diameter								
Pressure (ft)	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"
1.0	0.18	0.41	0.74	1.15	1.66	2.26	2.95	3.73	4.6
1.5	0.22	0.51	0.9	1.41	2.03	2.76	3.61	4.57	5.64
2	0.26	0.59	1.04	1.63	2.34	3.19	4.17	5.27	6.51
2.5	0.29	0.66	1.17	1.82	2.62	3.57	4.66	5.9	7.28
3	0.32	0.72	1.28	1.99	2.87	3.91	5.1	6.46	7.97
3.5	0.34	0.78	1.38	2.15	3.1	4.22	5.51	6.98	8.61
4	0.34	0.83	1.47	2.3	3.31	4.51	5.89	7.46	9.21
4.5	0.39	0.88	1.56	2.44	3.52	4.79	6.25	7.91	9.77
5	0.41	0.93	1.65	2.57	3.71	5.04	5.59	8.34	10.29

Number of perforations at 4'-0" spacing =	22
Lateral Discharge Rate (gpm) =	**20.4**

3: Determine the manifold size.

$$D_m = \left(\frac{\sum_{i=1}^{M} L_i \ F_i}{f h_d}\right)^{0.21}$$

Where Dm = manifold diameter L_i = length of manifold segment F_i = friction factor in each manifold segment
f = fraction of total headloss in manifold (10% allowed) and hd = distal head in feet

Note: L_i =	12	(*feet based on the design layout)

Where Qi = the flow in each manifold segment

h_d = 5

Segment	Q_i	F_i	ΣF_i	Dm (Inches)	
1	41	0.9	0.9	1.9	
2	82	3.4	4.3	2.6	
inlet	122	7.1	11.4	3.3	**Use 4-inch diameter**

(minimum 3 feet required per CTDEEP - 5 feet provided)

4: Determine the dose volume.

guidance requires 5 to 10 volumes of laterals per dose cycle Use = 7

Pipe Areas (ft^2):	2-0"=	0.0218	3"=	0.0491	4"=	0.0873	6"=	0.1963

Total lateral length (ft) =	540	
Volume of Laterals (gallons) =	88.1	
7 x Lateral Volume (gallons) =	617	
Manifold Volume (gallon) =	31.3	Length (ft) = 24
Force Main Volume (gallon) =	106.5	Length (ft) = 290

Dosing Volume (gallon) =	**800**	(Vol. = lateral vol. x 7 + manifold vol. + force main vol.)
Number of Doses per Day =	3	Design Flow (GPD) = 2,566

5: Determine Pump Flow Rate

Pump Flow Rate (gpm) =	**122**	(Based on 6 laterals times flow per lateral in gpm)

6: Total Headloss Pump Flow Rate

Distal Head (h_d) =	5.0	
Net Work Losses =	6.6	(Equal to 1.31xh_d per Guidance)
Force Main Losses =	17.2	(See calc sheet for force main headloss)
Static Head =	11.7	(See calc sheet for force main static head)
TDH (feet) =	**35.5**	

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Southbury, CT 06488**

Project

**Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications**

Title

DESIGN DATA & CALCULATIONS 2 OF 2

Revisions

No.	Description	Date

File: G-X_DesignCalculations.dwg
Drawn By: AJG
Designed By: AJG
Checked By: RMB/SJR
Job No: 5051 Date: April 2015

North Arrow

Scale

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Sheet No.:

G-6

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Plot Date: May 06, 2016 6:21pm

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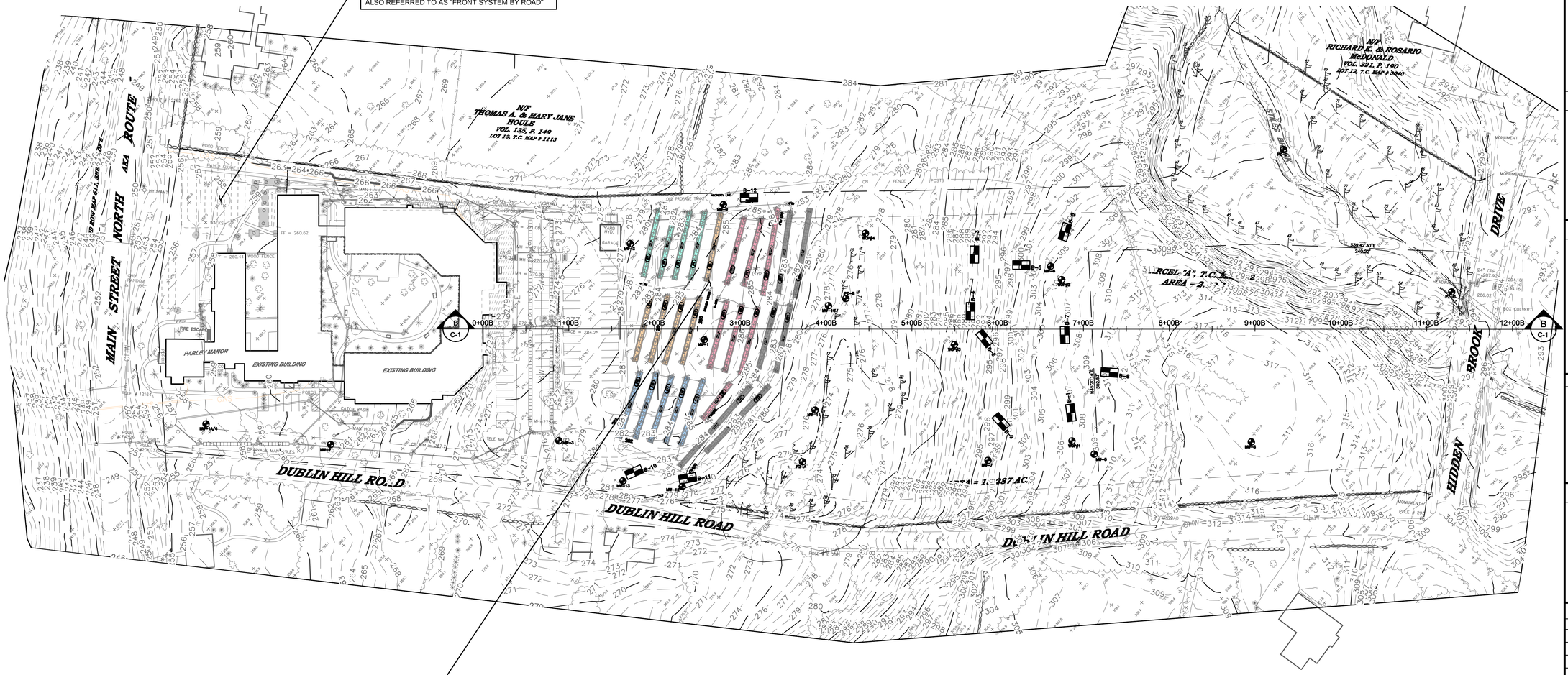
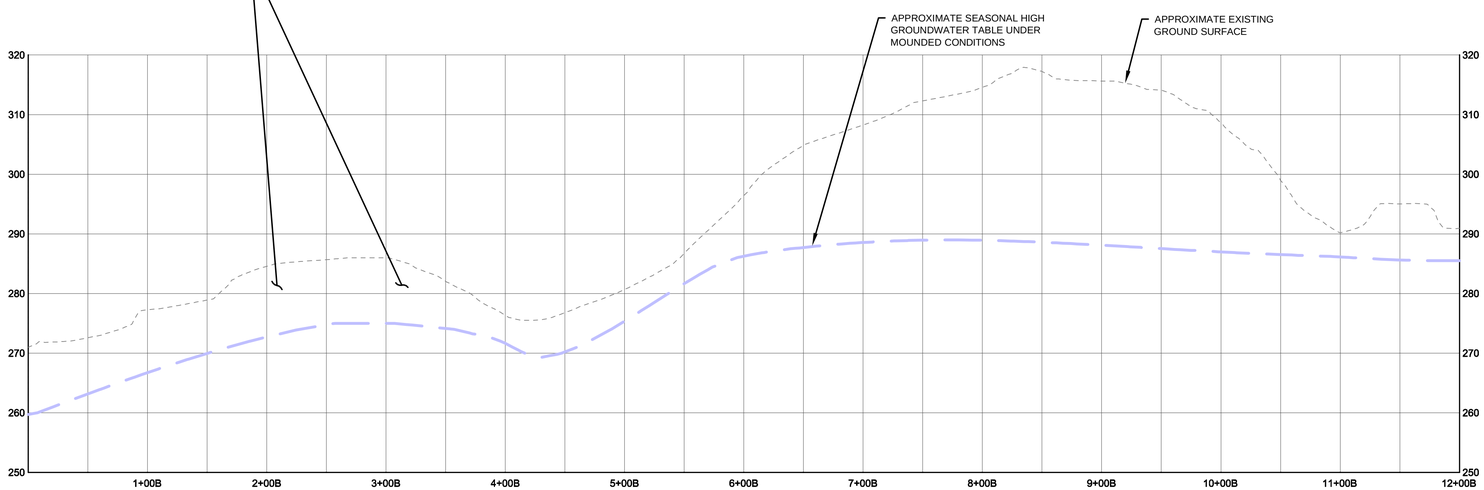
ALSO REFERRED TO AS "FRONT SYSTEM BY ROAD"



EXISTING SUBSURFACE SEWAGE DISPOSAL SYSTEM
NO. OWRS-302 (TO BE REPAIRED)
(SEE C-SERIES SHEETS)



SECTION B-B
C-1

SCALE: 1"=6' (VERT.)
1"=60' (HORIZ.)

J:\5051 Southbury Lutheran Home\Cad\Plans\C-xx to C-xx.dwg

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Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

OVERALL SITE & EXISTING CONDITIONS PLAN

Revisions

No.	Description	Date

File: C-XX to C-XX.dwg

Drawn By:	RMB		
Designed By:	RMB		
Checked By:	JF		
Job No:	5051	Date:	April 2015

North Arrow

Scale

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HORIZ. SCALE IN FEET: 1"=60'

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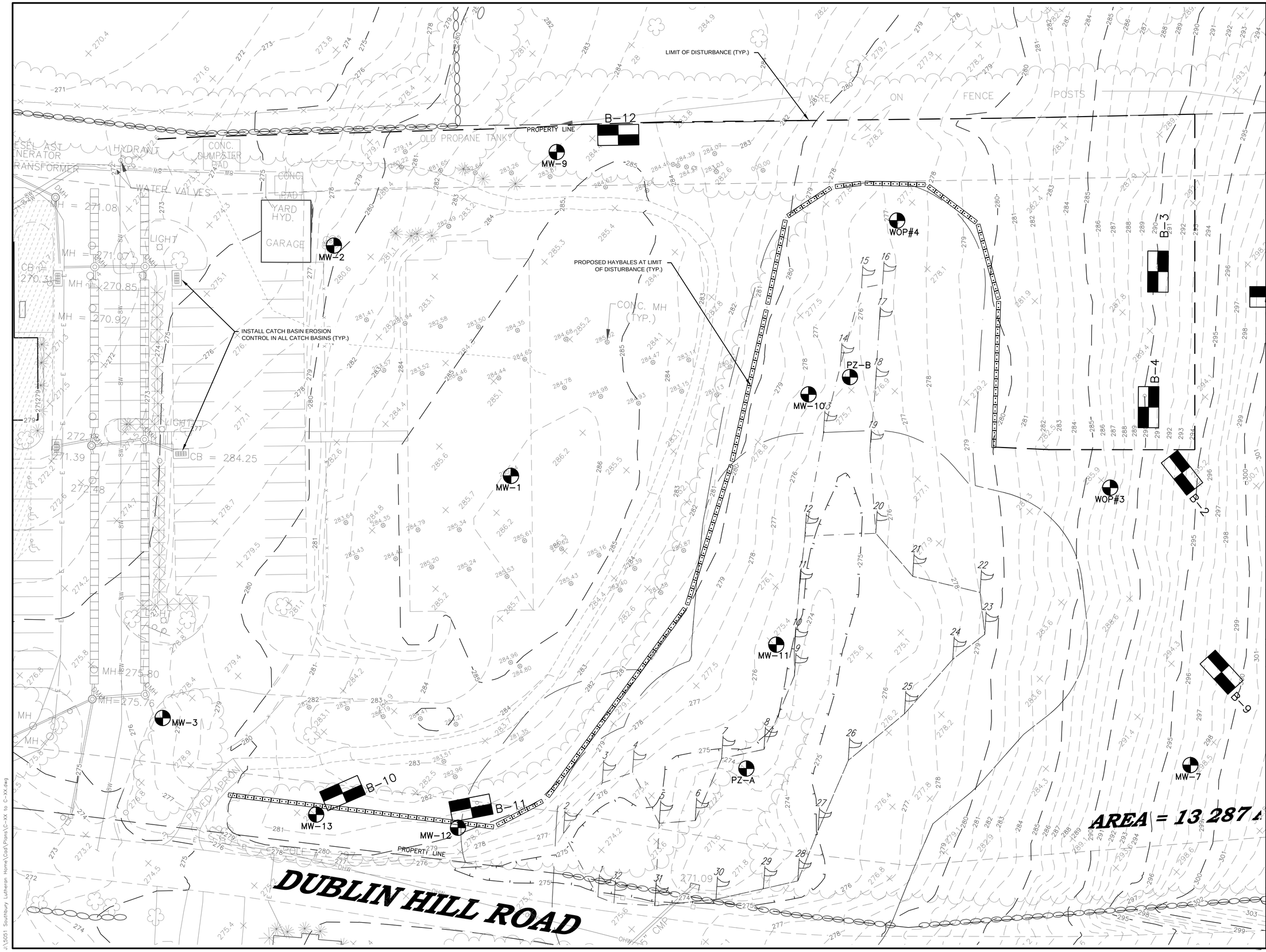
Sheet No.:

C-1

Plot Date: May 06, 2016 6:22pm



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Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

EROSION & SEDIMENTATION CONTROL PLAN

Revisions

No.	Description	Date

File: C-XX to C-XX.dwg

Drawn By:	RMB		
Designed By:	RMB		
Checked By:	JF		
Job No:	5051	Date:	April 2015

North Arrow

Scale

SCALE IN FEET: 1"=20'

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Sheet No.:

C-2

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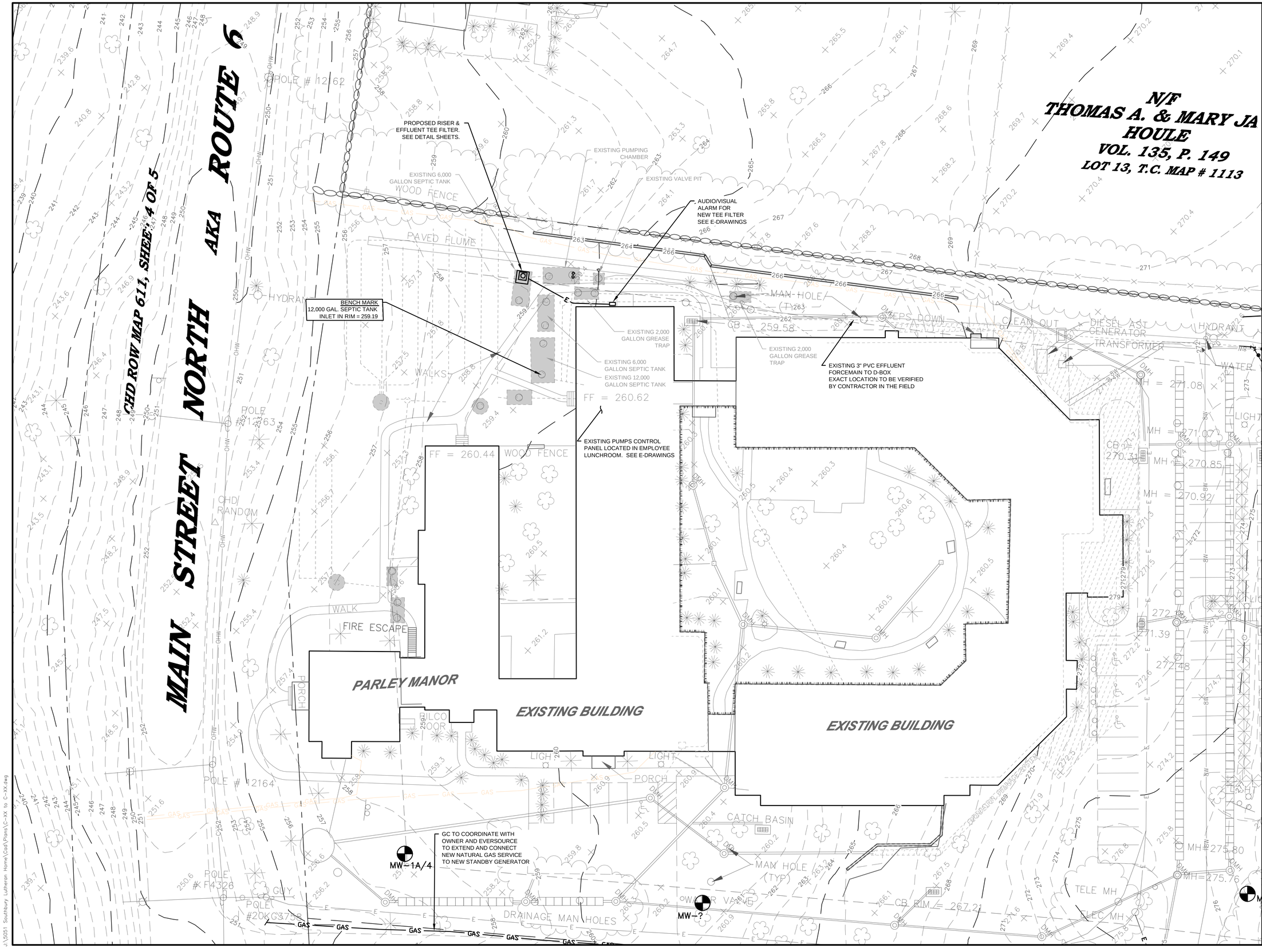
Plot Date: May 06, 2016 6:22pm



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Client:

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Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

OWRS 301 - EXIST. TANKS AREA MODIFICATIONS PLAN & SECTIONS

Revisions

No.	Description	Date

File: C-XX to C-XX.dwg

Drawn By:	RMB
Designed By:	RMB
Checked By:	JF
Job No: 5051	Date: April 2015

North Arrow

Scale

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SCALE IN FEET: 1"=20'

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Sheet No.:

C-3

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Plot Date: May 06, 2016 6:22pm

LOT 13, T.C. MAP # 1113

DUBLIN HILL ROAD

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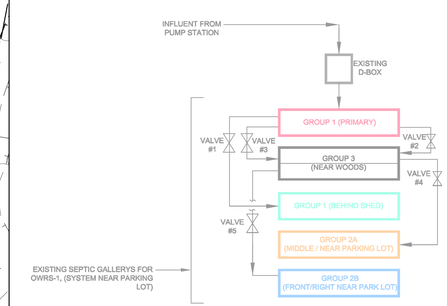
SCALE: NONE



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Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

OWRS 302 - EXIST. GALLERIES OVERVIEW PLAN & LEGEND

Revisions

No.	Description	Date

File: C-XX to C-XX.dwg

Drawn By: RMB

Designed By: RMB

Checked By: JF

Job No: 5051 Date: April 2015

North Arrow

Scale

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SCALE IN FEET: 1"=20'

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Sheet No.:

C-4

J:\5051 Southbury Lutheran Home\Cad\Plans\C-XX to C-XX.dwg

Plot Date: May 06, 2016 6:22pm

LOT 13, T.C. MAP # 1113

NEW BURIED GATE VALVES, WITH ROAD BOX ADJUSTED TO FINISH GRADE

CONNECT TO EXISTING 3-INCH FORCE MAIN, AND EXTEND FORCE MAIN TO NEW PUMPING CHAMBER WITH4-INCH SDR-21 PVC.PROVIDE REDUCERS, FITTINGS, AND ADAPTERS AS REQUIRED.

PROTECT MONITORING WELL DURING CONSTRUCTION (TYP. FOR ALL MW-WELLS).

5-FT DIA. INFLUENT FLOW METERING VAULT

3-INCH PVC GST ZONES 1-6 FEEDER FORCEMAINS

3-INCH FORCE MAIN. (TYP. FOR 6)

POWER & CONTROL CONDUIT/WIRING FOR SOILAIR MODULES SEE ELECTRICAL DRAWINGS

BOLLARD (TYP.)

3" DIA. PVC SOILAIR AERATION PIPING, CONNECTED TO 6" PRESSURE DISTRIBUTION MANIFOLD (TYP.)

4-HP SOILAIR BLOWER MODULE (TYP. OF 6)

PAD MOUNTED UTILITY TRANSFORMER

ELECTRICAL DISTRIBUTION & CONTROLS EQUIPMENT

8-INCH. D.I. PIPING CONNECTING TANKS AT FLOOR ELEVATION

STANDBY POWER GENERATOR SEE E-DRAWINGS

GAS METER & SERVICE

10,000 GALLON PUMP CHAMBER. (TYP. FOR 2)

3" DIA. FORCEMAIN STUBS, FOR FUTURE FIELD #3

6" DIA. PVC MANIFOLD ZONES 1-5. (TYP. FOR 5)

6" DIA. PVC MANIFOLD ZONE 6 (TYP. FOR 1)

BENCH MARK
MW-10
TOP OF COVER = 278.19

6' DIA.VALVE PIT. (TYP. FOR 4)

NEW NATURAL GAS SERVICE GC TO COORDINATE WITH EVERSOURCE. SEE PLUMBING DRAWING

NEW POWER SERVICE DUCTBANK. SEE E-SERIES SHEETS

LATERAL END CLEANOUT (TYP.) SEE DETAIL.

VALVE (TYP.)

VALVE (TYP.)

DUBLIN HILL ROAD

AREA

J:\5051 Southbury Lutheran Home\Cad\Plans\C-XX to C-XX.dwg

Plot Date: May 06, 2016 6:22pm

Engineered by:

BETA Group, Inc.
Engineers • Planners • Landscape Architects
Lincoln, RI - Norwood, MA - Hartford, CT

6 Blackstone Valley Place
Lincoln, RI 02865
401.333.2382
email: BETA@BETA-inc.com

P.E. Stamp:

STATE OF CONNECTICUT JOSEPH FEDERICO, JR. No. 13744 LICENSED PROFESSIONAL ENGINEER

Client:

Southbury Real Estate Group, LLC
990 Main Street North
Southbury, CT 06488

Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

OWRS 302 - SITE PLAN - SWAS RECONSTRUCTION

Revisions

No.	Description	Date

File: C-XX to C-XX.dwg

Drawn By:	RMB		
Designed By:	RMB		
Checked By:	JF		
Job No:	5051	Date:	April 2015

North Arrow

Scale

20 0 20 40
SCALE IN FEET: 1"=20'

For Regulatory Review Only

Sheet No.:

C-5

PROPERTY LINE

B-12

OLD PROPANE TANK

FENCE POSTS

DIESEL AST GENERATOR TRANSFORMER

HYDRANT

CONC. DUMPSTER PAD

CONC. PAD

WATER VALVES

YARD HYD.

GARAGE

LIGHT

MH = 271.08

MH = 271.07

CB 270.31

MH = 270.85

MH = 270.92

CB = 284.25

271.39

272.48

MH=275.80

MH=275.76

MW-1

MW-2

MW-3

MW-9

MW-10

MW-11

MW-13

PZ-A

PZ-B

WOP#4

WOP#3

MW-7

B-1

B-2

B-3

B-4

B-9

B-10

B-11

SOILAIR BLOWER MODULES (TYP.)

CONC. MH (TYP.)

PROVIDE CRUSHED STONE ACCESS DRIVE FOR SERVICE AND EMERGENCY VEHICLES LIMITS TO BE DETERMINED BY ENGINEER IN THE FIELD

PRECAST CONCRETE BLOCKS FOR SLOPE STABILIZATION SEE DETAIL SHEETS.

RESTORE SUBSURFACE DISPOSAL FIELD TO EXISTING COVER CONDITIONS (LOAM/SEED, ETC.)

PRESSURE DISTRIBUTION VALVE ACCESS BOX LOCATION (TYP.)

PRESSURE DISTRIBUTION LATERAL END CLEANOUT ACCESS BOX LOCATION (TYP.)

PAVED APRON

POOL

PROPERTY LINE

AREA = 13,287 s.f.

DUBLIN HILL ROAD

0+00D 0+00E 0+00F 1+00C 2+00C 3+00C 4+00C 5+00C 6+00C 1+00B 2+00B 3+00B 4+00B 5+00B 6+00B 1+00A 2+00A 3+00A 4+00A 5+00A 6+00A

J:\5051 Southbury Lutheran Home\Cad\Plans\C-XX to C-XX.dwg

Plot Date: May 06, 2016 6:22pm

Engineered by:

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P.E. Stamp:

STATE OF CONNECTICUT JOSEPH FEDERICO, JR. No. 13744 LICENSED PROFESSIONAL ENGINEER

Client:

**Southbury Real Estate Group, LLC
990 Main Street North
Southbury, CT 06488**

Project

**Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications**

Title

OWSR 302 - FINAL GRADING PLAN

Revisions

No.	Description	Date

File: C-XX to C-XX.dwg

Drawn By: RMB

Designed By: RMB

Checked By: JF

Job No: 5051 Date: April 2015

North Arrow

Scale

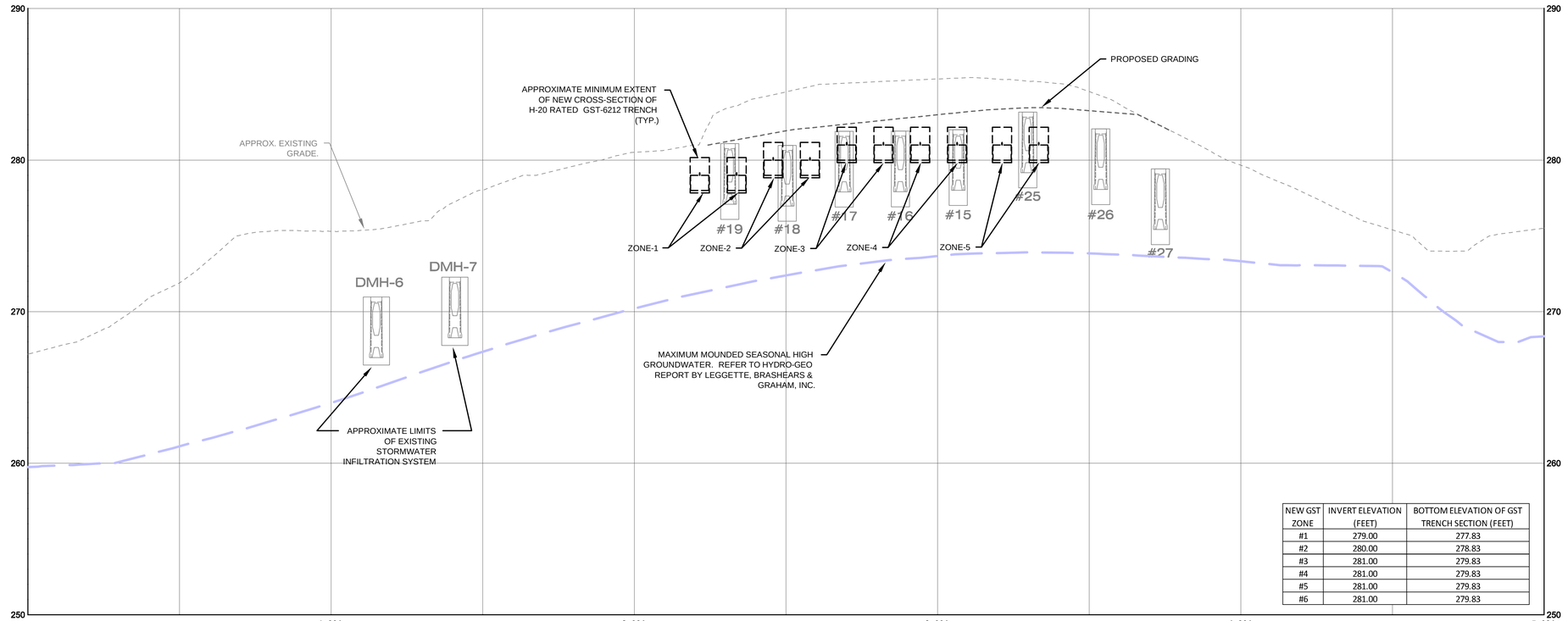
20 0 20 40

SCALE IN FEET: 1"=20'

For Regulatory Review Only

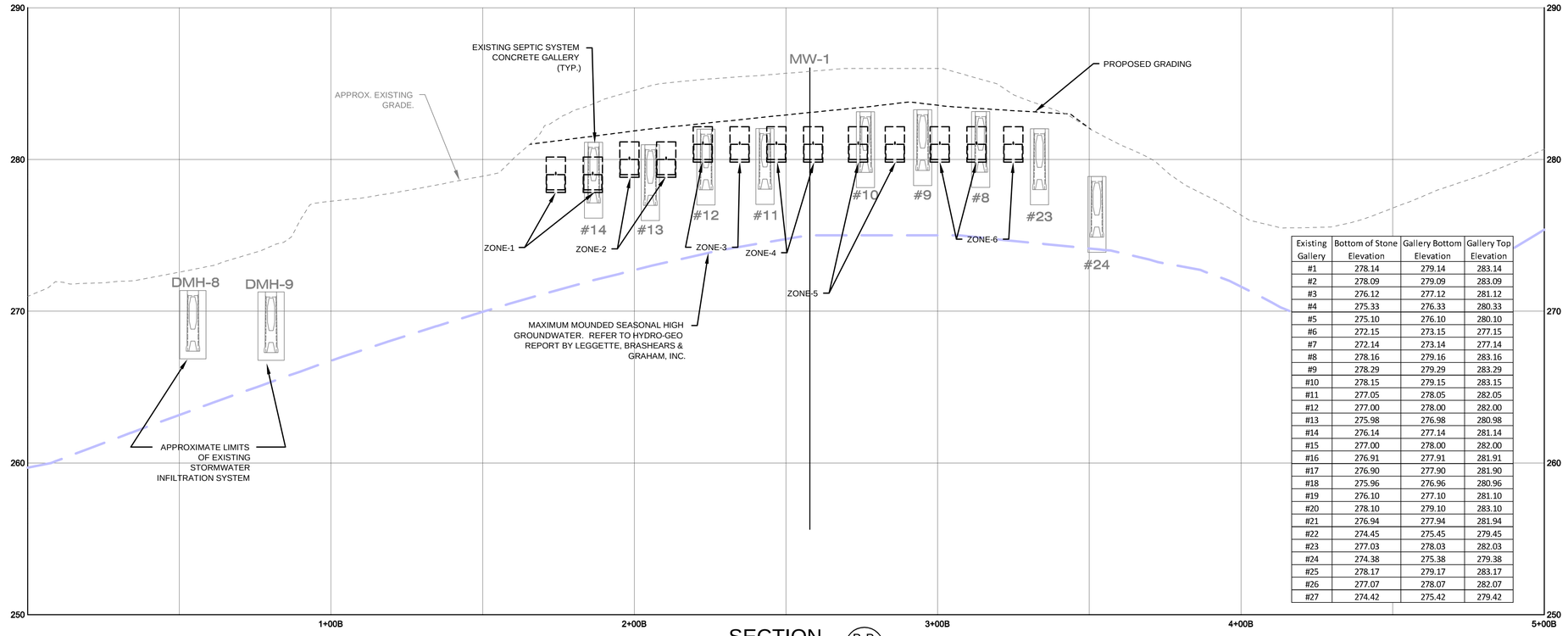
Sheet No.:

C-6



NEW GST ZONE	INVERT ELEVATION (FEET)	BOTTOM ELEVATION OF GST TRENCH SECTION (FEET)
#1	279.00	277.83
#2	280.00	278.83
#3	281.00	279.83
#4	281.00	279.83
#5	281.00	279.83
#6	281.00	279.83

SECTION A-A (C-4 & C-5)
SCALE: 1"=4' (VERT.)
1"=20' (HORIZ.)



Existing Gallery	Bottom of Stone Elevation	Gallery Bottom Elevation	Gallery Top Elevation
#1	278.14	279.14	283.14
#2	278.09	279.09	283.09
#3	276.12	277.12	281.12
#4	275.33	276.33	280.33
#5	275.10	276.10	280.10
#6	272.15	273.15	277.15
#7	272.14	273.14	277.14
#8	278.16	279.16	283.16
#9	278.29	279.29	283.29
#10	278.15	279.15	283.15
#11	277.05	278.05	282.05
#12	277.00	278.00	282.00
#13	275.98	276.98	280.98
#14	276.14	277.14	281.14
#15	277.00	278.00	282.00
#16	276.91	277.91	281.91
#17	276.90	277.90	281.90
#18	275.96	276.96	280.96
#19	276.10	277.10	281.10
#20	278.10	279.10	283.10
#21	276.94	277.94	281.94
#22	274.45	275.45	279.45
#23	277.03	278.03	282.03
#24	274.38	275.38	279.38
#25	278.17	279.17	283.17
#26	277.07	278.07	282.07
#27	274.42	275.42	279.42

SECTION B-B (C-4 & C-5)
SCALE: 1"=4' (VERT.)
1"=20' (HORIZ.)

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BETA Group, Inc.
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STATE OF CONNECTICUT
JORDEN FEDERICO, JR.
No. 13744
LICENSED PROFESSIONAL ENGINEER

Client:

Southbury Real Estate Group, LLC
990 Main Street North
Southbury, CT 06488

Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

CROSS SECTIONS 1 - OWRS-302

Revisions

No.	Description	Date

File: C-XX to C-XX.dwg
Drawn By: RMB
Designed By: RMB
Checked By: JF
Job No: 5051 Date: April 2015

North Arrow

Scale

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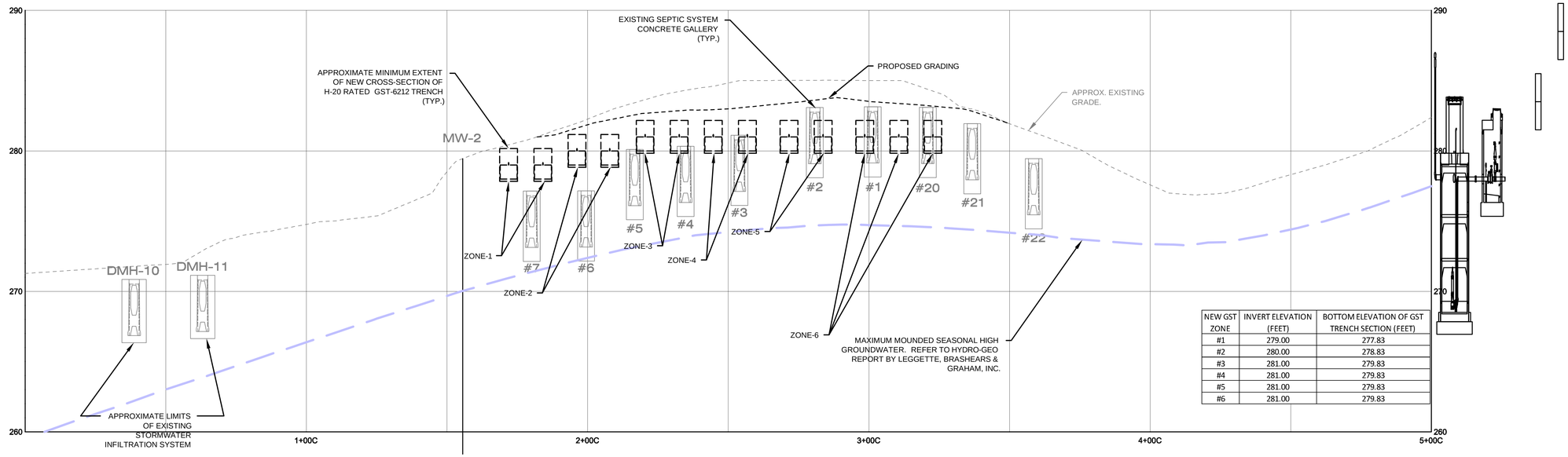
Sheet No.:

C-8

J:\5051 Southbury Lutheran Home\Cad\Plans\C-XX to C-XX.dwg

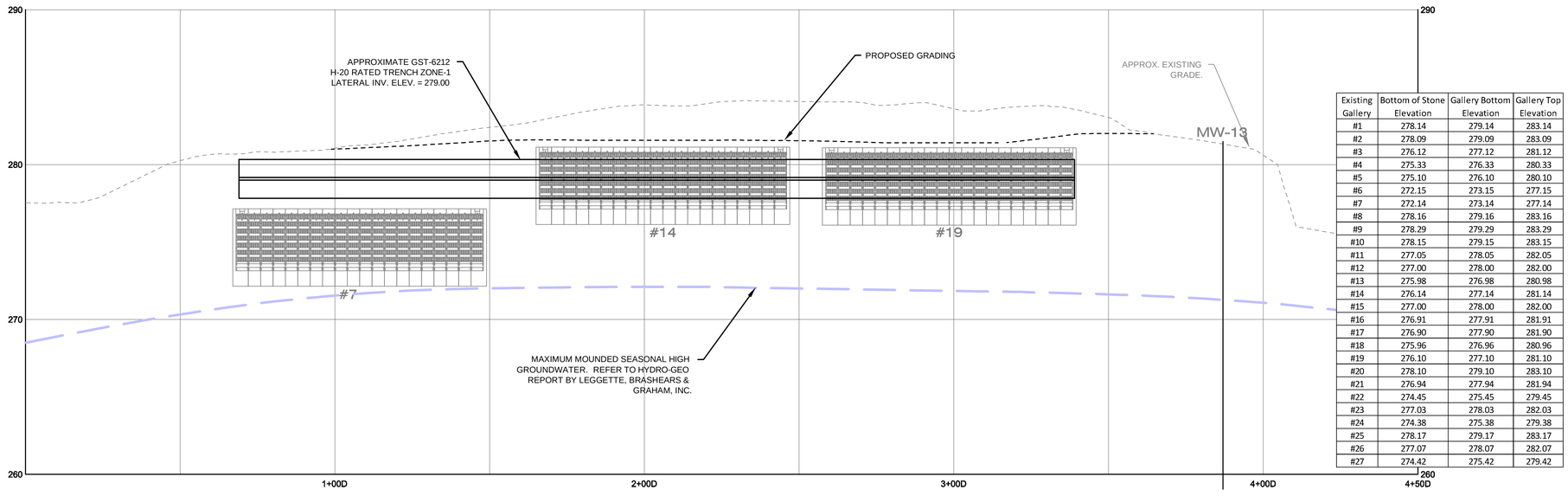
Plot Date: May 06, 2016 6:22pm



NEW GST ZONE	INVERT ELEVATION (FEET)	BOTTOM ELEVATION OF GST TRENCH SECTION (FEET)
#1	279.00	277.83
#2	280.00	278.83
#3	281.00	279.83
#4	281.00	279.83
#5	281.00	279.83
#6	281.00	279.83

SECTION C-C
C-4 & C-5

SCALE: 1"=4' (VERT.)
1"=20' (HORIZ.)



Existing Gallery	Bottom of Stone Elevation	Gallery Bottom Elevation	Gallery Top Elevation
#1	278.14	279.14	283.14
#2	278.09	279.09	283.09
#3	276.12	277.12	281.12
#4	275.33	276.33	280.33
#5	275.10	276.10	280.10
#6	272.15	273.15	277.15
#7	272.14	273.14	277.14
#8	278.16	279.16	283.16
#9	278.29	279.29	283.29
#10	278.15	279.15	283.15
#11	277.05	278.05	282.05
#12	277.00	278.00	282.00
#13	275.98	276.98	280.98
#14	276.14	277.14	281.14
#15	277.00	278.00	282.00
#16	276.91	277.91	281.91
#17	276.90	277.90	281.90
#18	275.96	276.96	280.96
#19	276.10	277.10	281.10
#20	278.10	279.10	283.10
#21	276.94	277.94	281.94
#22	274.45	275.45	279.45
#23	277.03	278.03	282.03
#24	274.38	275.38	279.38
#25	278.17	279.17	283.17
#26	277.07	278.07	282.07
#27	274.42	275.42	279.42

SECTION D-D
C-4 & C-5

SCALE: 1"=4' (VERT.)
1"=20' (HORIZ.)

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email: BETA@BETA-inc.com

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STATE OF CONNECTICUT
JORDAN FEDERICO, JR.
No. 13744
LICENSED PROFESSIONAL ENGINEER

Client:

Southbury Real Estate Group, LLC
990 Main Street North
Southbury, CT 06488

Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

CROSS SECTIONS 2 - OWRS-302

Revisions

No.	Description	Date

File: C-XX to C-XX.dwg

Drawn By: RMB

Designed By: RMB

Checked By: JF

Job No: 5051 Date: April 2015

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Scale

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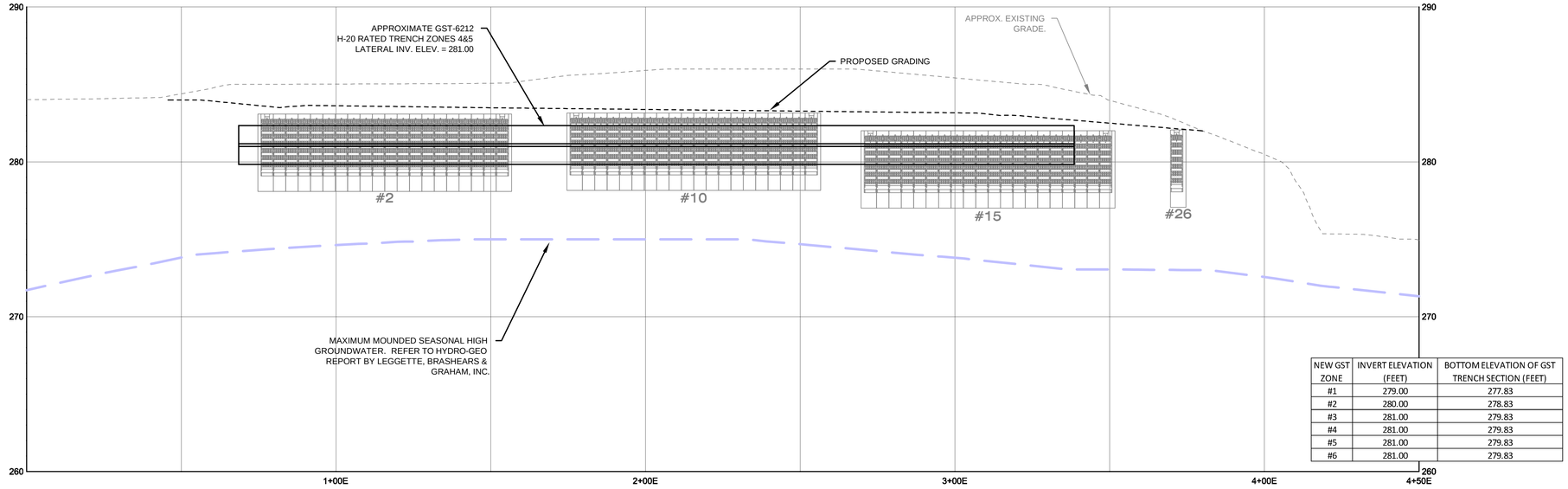
Sheet No.:

C-9

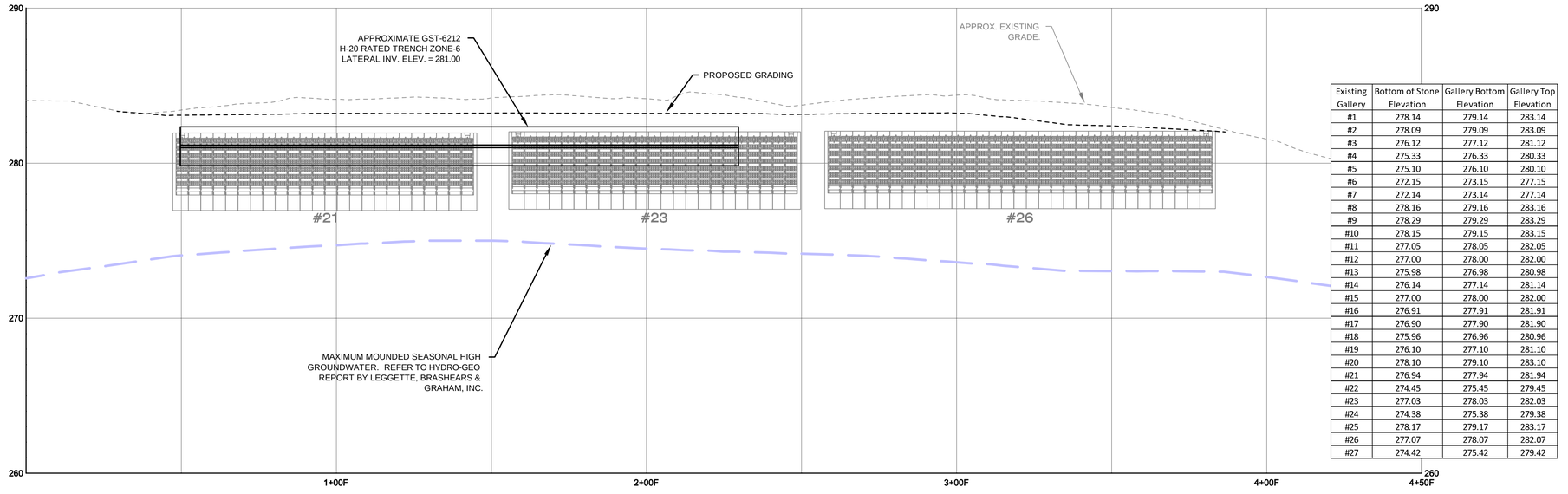
J:\5051 Southbury Lutheran Home\Cad\Plans\C-XX to C-XX.dwg

Plot Date: May 06, 2016 6:22pm



NEW GST ZONE	INVERT ELEVATION (FEET)	BOTTOM ELEVATION OF GST TRENCH SECTION (FEET)
#1	279.00	277.83
#2	280.00	278.83
#3	281.00	279.83
#4	281.00	279.83
#5	281.00	279.83
#6	281.00	279.83

SECTION E-E (C-4 & C-5)
SCALE: 1"=4' (VERT.)
1"=20' (HORIZ.)



Existing Gallery	Bottom of Stone Elevation	Gallery Bottom Elevation	Gallery Top Elevation
#1	278.14	279.14	283.14
#2	278.09	279.09	283.09
#3	276.12	277.12	281.12
#4	275.33	276.33	280.33
#5	275.10	276.10	280.10
#6	272.15	273.15	277.15
#7	272.14	273.14	277.14
#8	278.16	279.16	283.16
#9	278.29	279.29	283.29
#10	278.15	279.15	283.15
#11	277.05	278.05	282.05
#12	277.00	278.00	282.00
#13	275.98	276.98	280.98
#14	276.14	277.14	281.14
#15	277.00	278.00	282.00
#16	276.91	277.91	281.91
#17	276.90	277.90	281.90
#18	275.96	276.96	280.96
#19	276.10	277.10	281.10
#20	278.10	279.10	283.10
#21	276.94	277.94	281.94
#22	274.45	275.45	279.45
#23	277.03	278.03	282.03
#24	274.38	275.38	279.38
#25	278.17	279.17	283.17
#26	277.07	278.07	282.07
#27	274.42	275.42	279.42

SECTION F-F (C-4 & C-5)
SCALE: 1"=4' (VERT.)
1"=20' (HORIZ.)

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P.E. Stamp:
STATE OF CONNECTICUT
JORGEN FEDERICH, JR.
No. 13744
LICENSED
PROFESSIONAL ENGINEER

Client:
Southbury Real Estate Group, LLC
990 Main Street North
Southbury, CT 06488

Project
Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title
CROSS SECTIONS 3 - OWRS-302

Revisions

No.	Description	Date

File: C-XX to C-XX.dwg
Drawn By: RMB
Designed By: RMB
Checked By: JF
Job No: 5051 Date: April 2015

North Arrow

Scale

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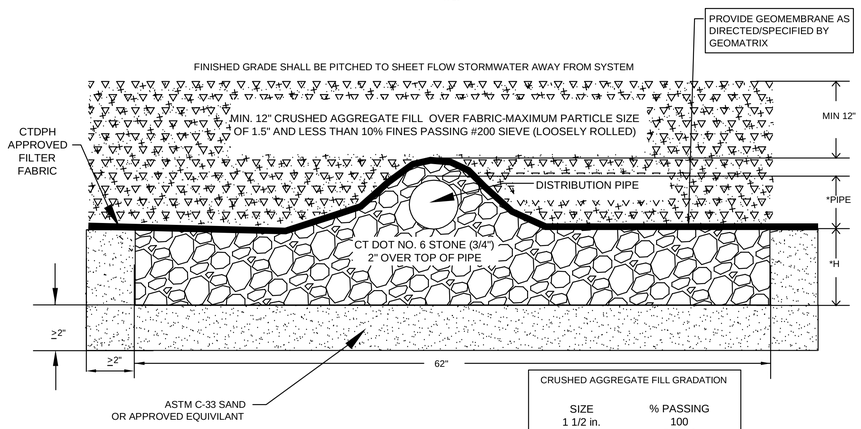
Sheet No.:
C-10

J:\5051 Southbury Lutheran Home\Cad\Plans\C-XX to C-XX.dwg

Plot Date: May 06, 2016 6:22pm

GEOMATRIX GST™ 62" LEACHING SYSTEM
H-20



CRUSHED AGGREGATE FILL GRADATION	
SIZE	% PASSING
1 1/2 in.	100
3/4 in.	50-100
#4	25-50
#40	10-20
#100	5-15
#200	LESS THAN 10

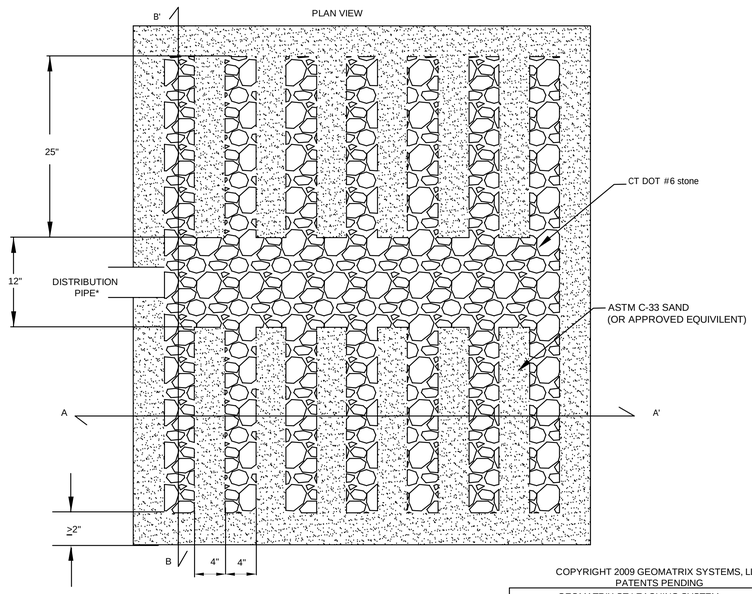
*H= 6" (GST6206)
12" (GST6212)
18" (GST6218)
24" (GST6224)
30" (GST6230)
36" (GST6236)

*DISTRIBUTION PIPE:
SDR 35 OR SCHD. 40, ASTM D-1785 PVC PIPE FOR GRAVITY APPLICATIONS
SCHD. 40, ASTM D-1785 PVC PIPE FOR PRESSURE APPLICATIONS

GEOMATRIX ST LEACHING SYSTEM H-20 GEOMATRIX SYSTEMS, LLC., OLD SAYBROOK, CT 860-510-0730	
SCALE NONE	REV. B
DATE 11/16/2010	ACAD GST H-20.DWG
DRAWN BY: ERP	No. SHEET 1 OF 1

GEOMATRIX GST™ LEACHING SYSTEM
PLAN VIEW

6" (GST6206)
12" (GST6212)
18" (GST6218)
24" (GST6224)
30" (GST6230)
36" (GST6236)



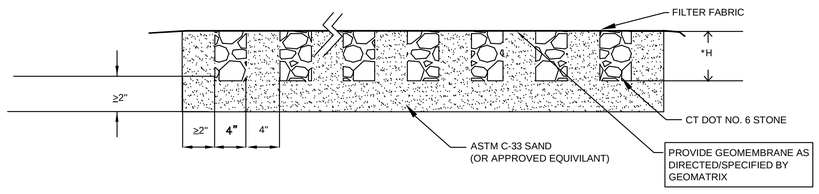
*3" MIN. I.D., ASTM D-3034, SDR 35 PIPE FOR GRAVITY APPLICATIONS
0.75" MIN. I.D., ASTM D-2665, SCH 40 PVC PIPE FOR PRESSURE APPLICATIONS

GEOMATRIX ST LEACHING SYSTEM PLAN VIEW GEOMATRIX SYSTEMS, LLC., OLD SAYBROOK, CT 860-510-0730	
SCALE: NONE	REV. C-04/28/09
DATE: 6/28/2007	ACAD Geo st ls Plan View.DWC
Drawn: ERP By:	No. SHEET 1 OF 3

GEOMATRIX GST™ LEACHING SYSTEM
A-A' CROSS SECTION

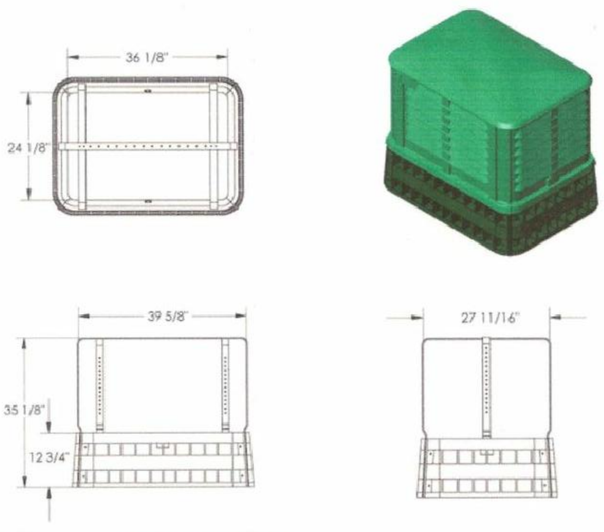
FINISHED GRADE SHALL BE PITCHED TO SHEET FLOW STORMWATER AWAY FROM SYSTEM

COVER MATERIAL DEPTH SHALL BE >6" AND SHALL BE UNIFORM OVER SYSTEM
(>12" OF COVER REQUIRED FOR H20 LOADING; SEE H20 CONSTRUCTION DETAIL)



*H= 6" (GST6206)
12" (GST6212)
18" (GST6218)
24" (GST6224)
30" (GST6230)
36" (GST6236)

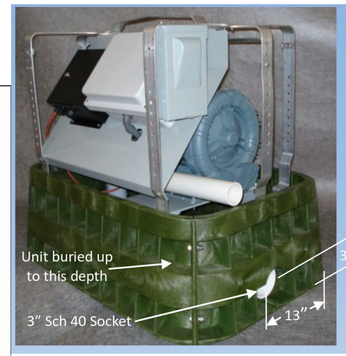
GEOMATRIX ST LEACHING SYSTEM A–A' CROSS SECTION GEOMATRIX SYSTEMS, LLC., OLD SAYBROOK, CT 860–510–0730	
SCALE: NONE	REV. C-04/28/09
DATE: 6/28/2007	ACAD No. GEO ST LS PLAN VIEW.DW
DRAWN BY: ERP	SHEET 2 OF 3



Enclosure for SoilAir Model(s)
RF9858MP, RF15652MP, RF21650MP, RF29450MP

Geomatrix, LLC
114 Mill Rock Road East
Old Saybrook, CT 06475
860-510-0730
www.soilair.com

SoilAir™ systems
Restoring and Enhancing
Leachfield Performance



SPECIFICATIONS

Enclosure:
H.D.P.E., weather/UV rated. Pedestal base for burial - Nominal dimensions:
38" long x 26" wide x 33" high
38" long x 26" wide x 25" high - installed/buried

Weight:

RF-9858MP	RF15652MP	RF21650MP	RF29450MP
167 lbs	175 lbs	192 lbs	226 lbs

Electrical:

Model	HP	Volts	FLA -1 ph	FLA – 3 ph
RF9858	1.5	208/230	7.3	5.0
RF15652	2.0	208/230	12.0	6.3
RF21650	3.0	208/230	N/A	9.0
RF29450	4.0	~~208/230~~	N/A	12.9

@ full load with surge protection
Breakers to be determined by electrician
PROVIDE 460/480 Volt

Air pipe: sch. 40 PVC

RF9858MP	RF15652MP	RF21650MP	RF29450MP
Min. 3" Max run 50 '	Min. 3" Max run 50'	Min. 4" Max run 100'	Min. 4" Max run 100'

Sound level: dbA @ 10'

RF9858MP	RF15652MP	RF21650MP	RF29450MP
64.8	70.5	73.0	78.7

Treatment capacity*

Model	Max ft²	Max gpd
RF 9858MP	2178	1742
RF 15652MP	3467	2774
RF 21650MP	4800	3840
RF 29450MP	6533	5226

*contact representative for additional information

Time dosing, dual alternating pump controls and other options available.

Engineered by:
BETA Group, Inc.
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Lincoln, RI 02865
401.333.2382
email: BETA@BETA-inc.com

P.E. Stamp:

Client:

Southbury Real Estate Group, LLC
990 Main Street North
Southbury, CT 06488

Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

GST-TRENCH DETAIL & SOILAIR MODULES

Revisions

No.	Description	Date

File: CD-1 & CD-2.dwg
Drawn By: RMB
Designed By: RMB
Checked By: JF
Job No: 5051 Date: April 2015

North Arrow

Scale

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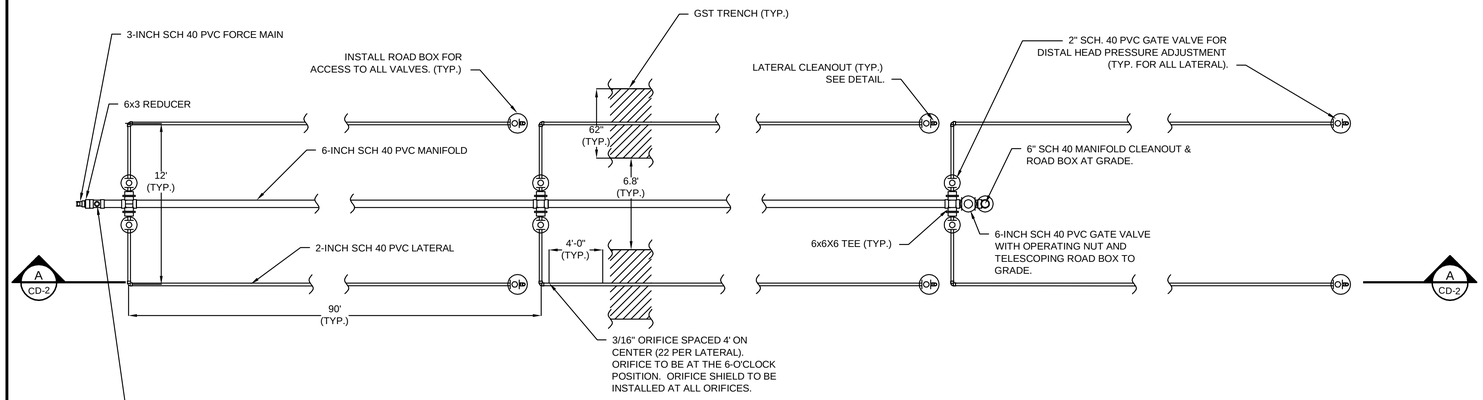
Sheet No.:

CD-1

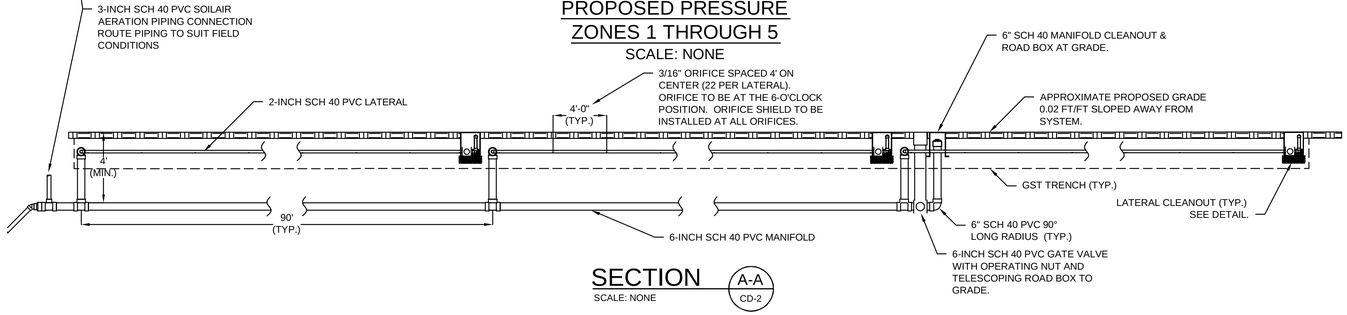
J:\5051 Southbury Lutheran Home\Cad\Plans\CD-1 & CD-2.dwg

Plot Date: May 06, 2016 6:23pm



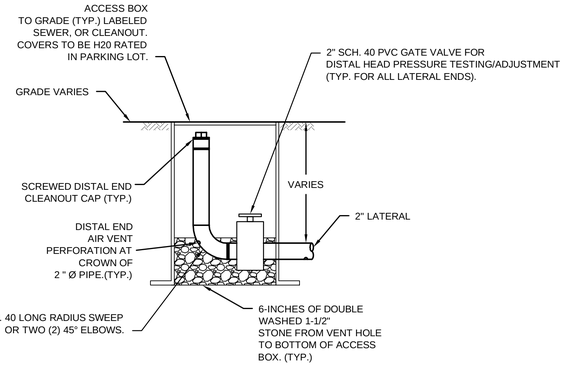
TYPICAL PLAN VIEW: PROPOSED PRESSURE ZONES 1 THROUGH 5

SCALE: NONE



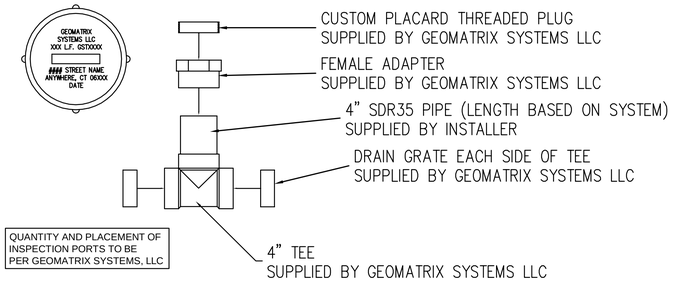
SECTION A-A

SCALE: NONE



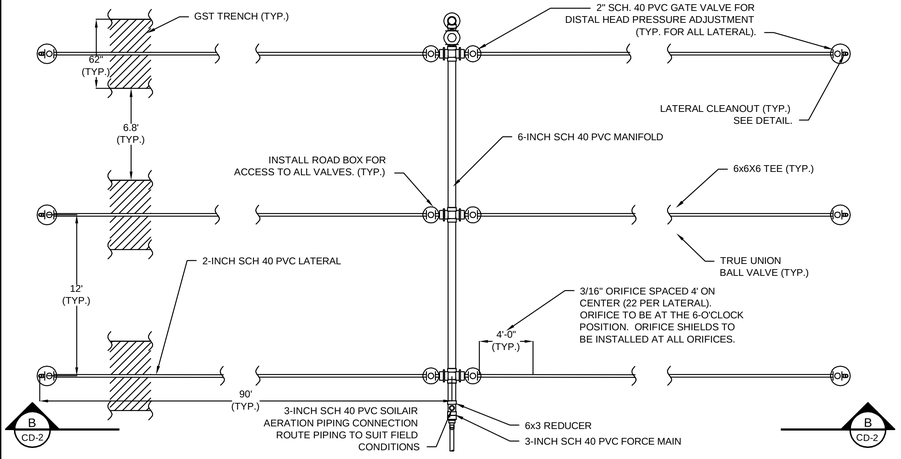
2" LATERAL DISTAL END/CLEANOUT DETAIL

SCALE: NONE



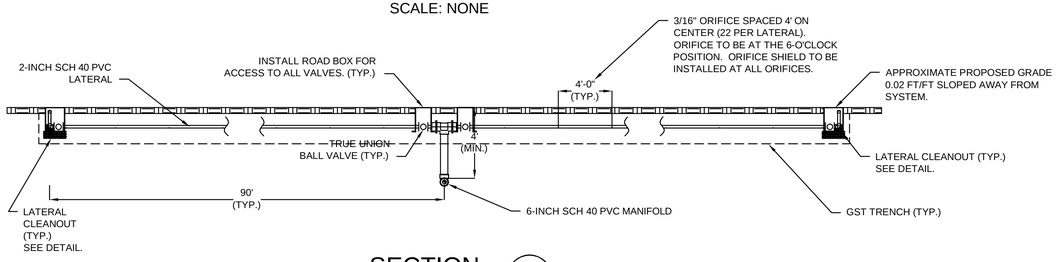
GST INSPECTION LEACHING PORT DETAIL

SCALE: NONE



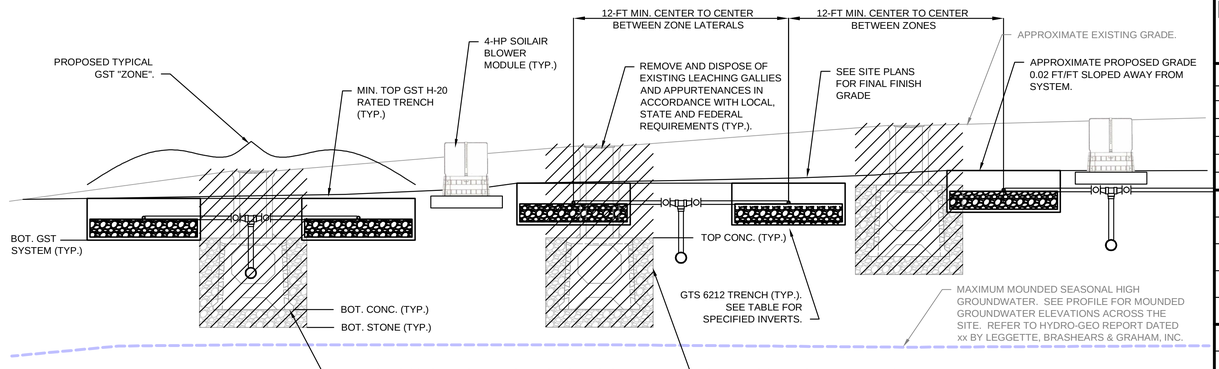
TYPICAL PLAN VIEW: PROPOSED PRESSURE ZONE 6

SCALE: NONE



SECTION B-B

SCALE: NONE



TYPICAL SECTIONAL VIEW: EXISTING LEACHING GALLERIES DEMOLITION/REMOVAL & NEW GST 6212 TRENCHES

SCALE: NONE

CT PUBLIC HEALTH CODE SPECIFICATIONS FOR SELECT FILL MATERIAL			
	SIEVE SIZE	WET % PASSING SIEVE	DRY % PASSING SIEVE
COARSE SANDS	#4	100	100
MEDUIM SANDS	#10	70-100	70-100
FINE SANDS	#40	10-50*	10-75
V.F. SANDS	#100	0-20	0-5
SILT/CLAYS	#200	0-5	0-2.5

*PERCENT PASSING THE #40 SIEVE CAN BE INCREASED TO NO GREATER THAT 75 IF THE PERCENT PASSING THE #100 SIEVE DOES NOT EXCEED 10 AND THE #200 SIEVE DOES NOT EXCEED 5.

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P.E. Stamp:

STATE OF CONNECTICUT JOSEPH FEDERICO, JR. No. 13744 LICENSED PROFESSIONAL ENGINEER

Client:

Southbury Real Estate Group, LLC
990 Main Street North
Southbury, CT 06488

Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

PRESSURE ZONE SCHEMATIC DETAILS & TYPICAL CROSS SECTION

Revisions

No.	Description	Date

File: CD-1 & CD-2.dwg

Drawn By: AJG

Designed By: RMB

Checked By: JF

Job No: 5051 Date: April 2015

North Arrow

Scale

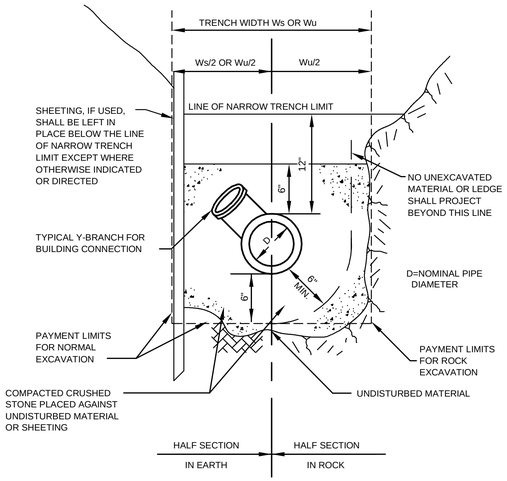
For Regulatory Review Only

Sheet No.:

CD-2

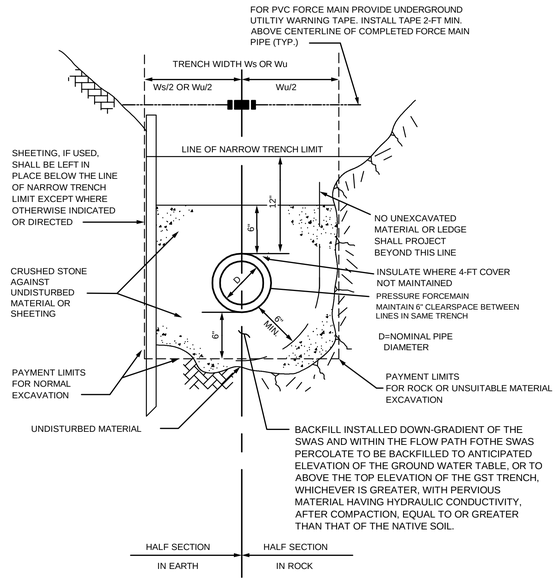
J:\5051 Southbury Lutheran Home\Cad\Plans\CD-1 & CD-2.dwg

Plot Date: May 06, 2016 6:23pm



GRAVITY PIPING TRENCH DETAIL

SCALE: NOT TO SCALE



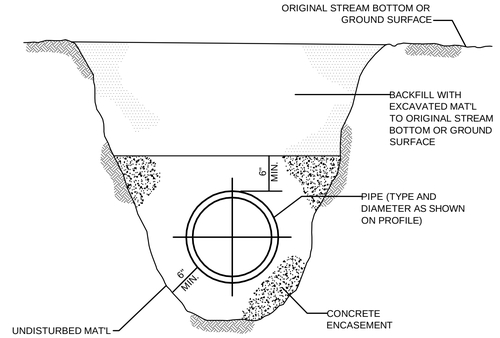
FORCE MAIN TRENCH SECTION

SCALE: NOT TO SCALE

TRENCH WIDTH Ws OR Wu		
DIAMETER OF PIPE D	Wu UNSHEETED	Ws SHEETED
12" AND SMALLER	3'-0"	4'-2"
15"	3'-2"	4'-4"
18"	3'-6"	4'-8"
21"	3'-10"	5'-0"
24"	4'-2"	5'-4"
27"	4'-6"	5'-8"
30"	4'-10"	6'-0"
36"	5'-6"	6'-8"
42"	6'-2"	7'-4"
48"	6'-10"	8'-0"
54"	7'-6"	8'-8"
60"	8'-2"	9'-4"
72"	9'-6"	10'-8"
78"	10'-2"	11'-4"
84"	10'-10"	12'-0"

TRENCH WIDTH TABLE

SCALE: NOT TO SCALE

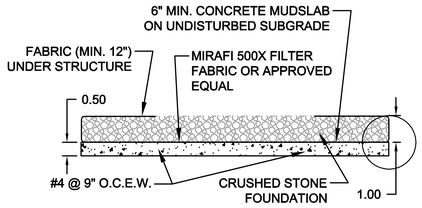


NOTES:

1. THE PIPE SHALL BE PROPERLY SECURED TO PREVENT DISPLACEMENT DURING THE POURING OF CONCRETE ENCASEMENT.
2. LIMIT OF CONCRETE ENCASEMENT SHALL BE SHOWN ON THE PROFILE OR AS DIRECTED.

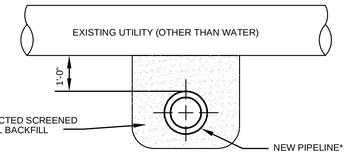
CONCRETE ENCASEMENT DETAIL (FOR POTABLE WATER CROSSINGS)

SCALE: NOT TO SCALE



BELOW GRADE TANKS STRUCTURE SUPPORT DETAIL

SCALE: NOT TO SCALE



* ONE FULL LENGTH OF PIPE CENTERED UNDER EXISTING PIPE OTHER THAN SEWERS

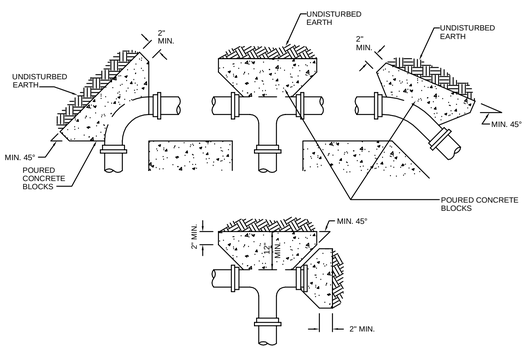
NOTE: DETAIL APPLICABLE FOR PIPE SECTIONS EXPOSED DURING CONSTRUCTION

TYPICAL SECTION AT EXISTING UTILITIES

SCALE: NOT TO SCALE

NOMINAL PIPE SIZE (INCHES)	MAXIMUM PIPE OD (INCHES)	REQUIRED BEARING AREA (SQ FT)					
		TEES& WYES	90 DEG	45 DEG	30 DEG	22.5 DEG	11.25 DEG
4	4.80	1.3	1.8	1	0.7	0.5	0.3
6	6.90	2.6	3.7	2	1.4	1	.5

MINIMUM THRUST BLOCK BEARING AREAS



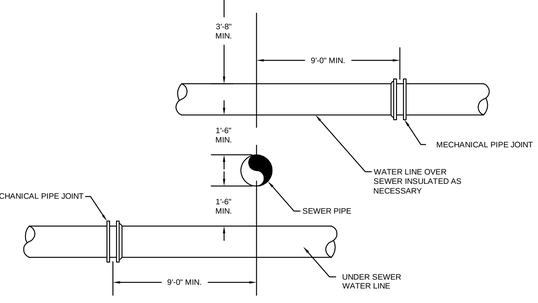
PLAN VIEWS

NOTES:

1. SPECIFIC THRUST BLOCK DESIGN SHALL CONFORM TO AWWA GUIDELINES.
2. PLACE 4 mil. POLYETHYLENE BETWEEN CONCRETE AND FITTING (CONCRETE SHALL NOT INTERFERE WITH JOINT).
3. MINIMUM CONCRETE THICKNESS SHALL BE 12 INCHES.
4. THRUST BLOCK ORIENTATION SHALL BE SUCH THAT THE CENTER OF THE FITTING CORRESPONDS WITH THE CENTER OF THE THRUST BLOCK.
5. THE MINIMUM ALLOWABLE ANGLE (EITHER VERTICAL OR HORIZONTAL) SHALL BE 45 DEGREES.

TYPICAL THRUST BLOCK DETAIL

SCALE: NOT TO SCALE

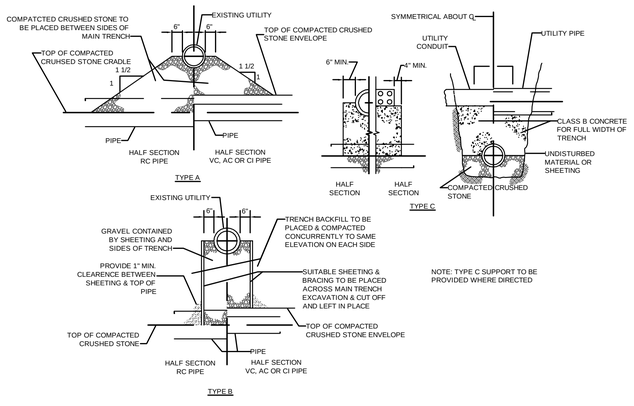


NOTES:

1. SEWER PIPING SHALL BE KEPT REMOTE FROM WATER SUPPLY PIPING AND STRUCTURES. WHEREVER FEASIBLE, SEWER PIPING SHOULD BE LAID AT A MINIMUM HORIZONTAL DISTANCE OF 10 FEET FROM WATER PIPING. IF LOCAL CONDITIONS PREVENT THIS, THE WATER PIPING SHOULD BE LAID IN A SEPARATE TRENCH, AND THE ELEVATIONS OF THE CROWN OF THE SEWER PIPING PLACED AT LEAST 18 INCHES BELOW THE INVERT OF THE WATER PIPING.
2. WHENEVER SEWERS MUST CROSS WATER PIPING, THE CROWN OF THE SEWER PIPING SHOULD BE PLACED A MINIMUM OF 18 INCHES BELOW THE INVERT OF THE WATER PIPING. IN ADDITION, THE WATER PIPING MUST BE CONSTRUCTED WITH ONE FULL LENGTH OF PIPE CENTERED ABOUT THE SEWER PIPING CROSSING. THE WATER PIPING SHALL HAVE MECHANICAL JOINTS FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE SEWER CROSSING.
3. WHEN IT IS IMPOSSIBLE TO OBTAIN HORIZONTAL OR VERTICAL SEPARATION AS STIPULATED ABOVE, BOTH THE WATER AND THE SEWER SHOULD BE ENCASED IN CONCRETE OR CONTROL DENSITY FILL FOR A DISTANCE OF 10 FEET ON EITHER SIDE OF THE CROSSING OR BOTH PIPES PLACED IN A SLEEVE PIPE WITH MECHANICAL JOINTS PLACED 10-FT AWAY FROM THE CROSSING.

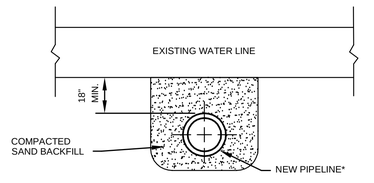
SEWER LINE / WATER LINE CROSSING

SCALE: NONE



TYPICAL SUPPORTS FOR UTILITIES

SCALE: NOT TO SCALE



* ONE FULL LENGTH OF PIPE CENTERED UNDER EXISTING PIPE

NOTE: DETAIL APPLICABLE FOR PIPE SECTIONS EXPOSED DURING CONSTRUCTION

TYPICAL SECTION AT EXISTING WATER

SCALE: NOT TO SCALE

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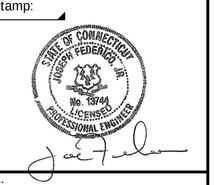

Client:

Southbury Real Estate Group, LLC
990 Main Street North
Southbury, CT 06488

Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

MISCELLANEOUS CONSTRUCTION DETAILS-1

Revisions

No.	Description	Date

File: CD-XX to CD-XX Civil & Yard Piping Details.dwg

Drawn By: RMB

Designed By: RMB

Checked By: JF

Job No: 5051 Date: April 2015

North Arrow

Scale

None

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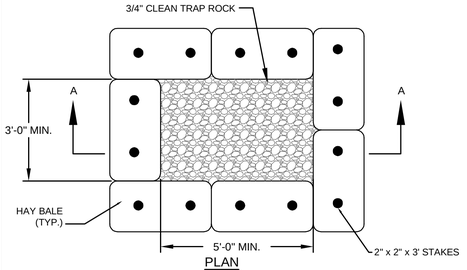
Sheet No.:

CD-3

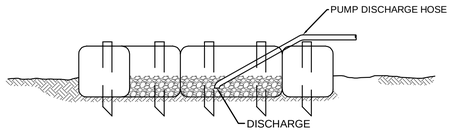
J:\5051 Southbury Lutheran Home\Cad\Plans\CD-XX to CD-XX Civil & Yard Piping Details.dwg

Plot Date: May 06, 2016 6:23pm



PLAN

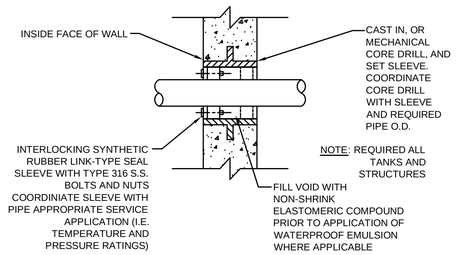
NOTE: ALL DEWATERING DISCHARGES SHALL BE THROUGH SEDIMENT CONTROL TRAPS, CONTRACTOR SHALL MAINTAIN AND CLEAN TRAP AS REQUIRED.



SECTION A-A

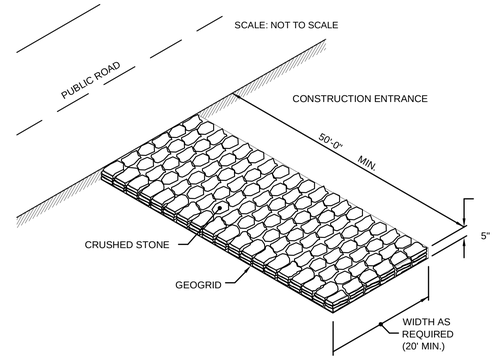
SEDIMENT CONTROL TRAP

SCALE: NOT TO SCALE



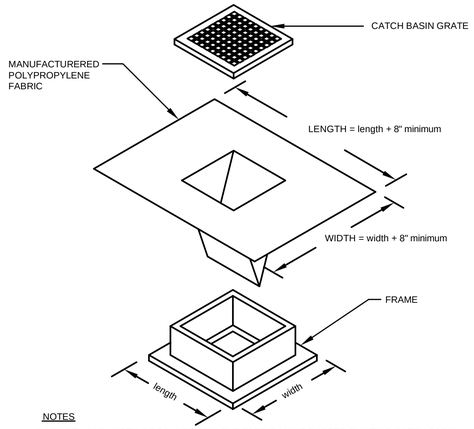
TANK AND VALVE VAULT PIPE SLEEVE

SCALE: NOT TO SCALE



STABILIZED CONSTRUCTION ACCESS

SCALE: NOT TO SCALE

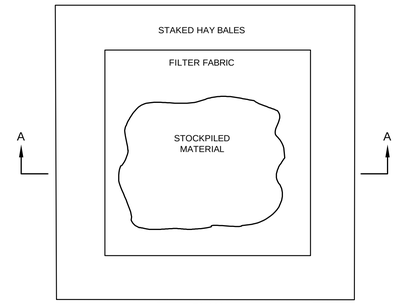


NOTES

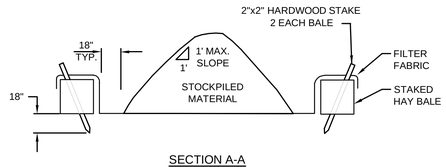
1. LENGTH AND WIDTH OF POLYPROPYLENE FABRIC MUST EXCEED EXISTING CATCH BASIN FRAME DIMENSIONS BY A MINIMUM OF 8".
2. REMOVE CATCH BASIN GRATE AND INSTALL POLYPROPYLENE FABRIC OVER CATCH BASIN FRAME. REPLACE CATCH BASIN GRATE TO SECURE POLYPROPYLENE FABRIC IN PLACE.

TYPICAL CATCH BASIN EROSION CONTROL PROTECTION

SCALE: NOT TO SCALE



PLAN

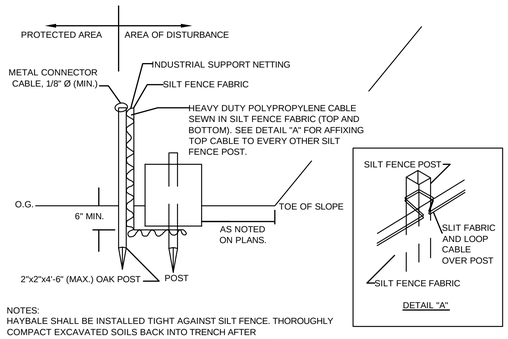


SECTION A-A

NOTE:
DIMENSIONS OF STOCKPILE AREA MAY VARY DEPENDING ON QUANTITY OF EXCAVATED MATERIAL. AVOID OVERTOPPING OR SLOPES IN EXCESS OF 1:1.

PLAN OF TEMPORARY STOCKPILED AREA

SCALE: NOT TO SCALE



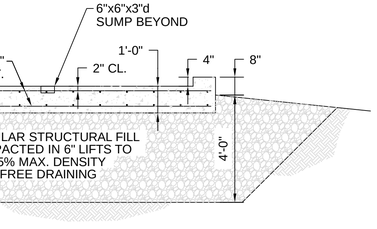
NOTES:
HAYBALE SHALL BE INSTALLED TIGHT AGAINST SILT FENCE. THOROUGHLY COMPACT EXCAVATED SOILS BACK INTO TRENCH AFTER INSTALLATION OT EROSION CONTROL DEVICES. SILT FENCE FABRIC SHALL NOT BE SLIT - POST SHALL BE DRIVEN THROUGHT SILT FENCE FABRIC. 2"x2"x4'-6"(MAX.) OAK POST FOR SILT FENCE SHALL BE LOCATED ON 8'-0"(MAX.) CENTERS IN WETLAND AREAS.

HAY BALE WITH SILT FENCE

SCALE: NOT TO SCALE

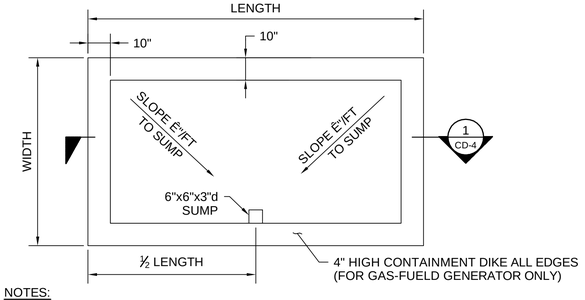
4" SCH. 80 PVC TANK VENT PIPING DETAIL

SCALE: NOT TO SCALE



SECTION 1 CD-4

SCALE: 3/8"=1'-0"



NOTES:

1. REFER TO ELECTRICAL DRAWINGS FOR CONTROLS, ELECTRICAL DISTRIBUTION EQUIPMENT ANC CONTROL PANEL PAD DETAILS
2. LENGTH AND WIDTH OF CONCRETE PAD TO BE COORDINATED WITH GENERATOR AND ELECTRICAL EQUIPMENT SUPPLIER(S).
3. CONCRETE TO BE 4000 PSI WITH A MAX 4" SUMP.
4. TOP SURFACE OF PAD TO BE STEEL TROWELED TO LEVEL SMOOTH FINISH.
5. REFER TO MANUFACTURERS DRAWINGS FOR GENERATOR ANCHOR REQUIREMENTS AND LOCATIONS.
6. SUMP APPLICABLE FOR NATURAL GAS OR PROPANE GENERATOR SETS. OMIT 4" CONTAINMENT DIKE FOR DIESEL FIRED GENERATORS WITH INTEGRAL FUEL AND FLUIDS CONTAINMENT PROVISIONS.

GENERATOR PAD DETAIL

SCALE: 3/8"=1'-0"

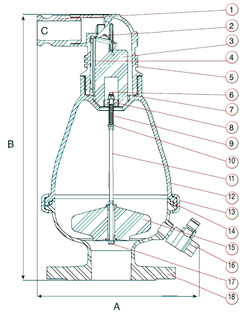
D-025 ST A.R.I.

DIMENSIONS AND WEIGHTS

Inlet Size	Dimensions Inch A	B	Connection C	Weight Lbs. ST	STST	Orifice Area Sq.in Air Rel.	A / V
2" Threaded	10.2	17.9	1½" NPT Female	31.7	31.7	0.018	1.246
2" Flanged	10.2	18.1	1½" NPT Female	35.7	35.7	0.018	1.246
3" Flanged	10.2	18.1	1½" NPT Female	-	-	0.018	1.246
4" Flanged	10.2	18.1	1½" NPT Female	40.5	40.5	0.018	1.246

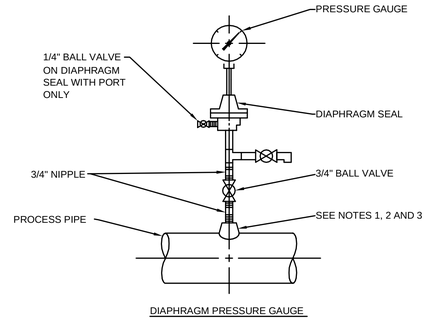
PARTS LIST AND SPECIFICATION

No.	Part	Material
1.	Camlock Connection	Polypropylene
2.	Rolling Seal Assembly	Polypropylene / Reinforced Nylon + E.P.D.M. + ST ST
3.	Float	Foamed Polypropylene
4.	Clamping Stem	Polypropylene / Reinforced Nylon
5.	Body	Reinforced Nylon / Stainless Steel SAE 316
6.	Domed Nut	Stainless Steel SAE 316
7.	O-Ring	BUNA-N
8.	Stopper	Polypropylene
9.	Spring	Stainless Steel SAE 316
10.	Washer	Stainless Steel SAE 316
11.	Stem	Stainless Steel SAE 316
12.	Body	Stainless Steel SAE 316
13.	Clamp	Stainless Steel SAE 316
14.	O-Ring	BUNA-N
15.	Float	Foamed Polypropylene
16.	Ball Valve 1/4 "	Stainless Steel
17.	Washer	Stainless Steel SAE 316
18.	Base	Stainless Steel SAE 316



COMBINATION VACUUM/AIR RELEASE VALVE

SCALE: NOT TO SCALE



DIAPHRAGM PRESSURE GAUGE

NOTES:

1. FOR STEEL, GALVANIZED STEEL, AND PVC 2 1/2" AND SMALLER USE A BUSHING IN A TEE.
2. FOR DUCTILE IRON AND FIBERGLASS REINFORCED PLASTIC PIPE, ALL SIZES, USE PIPE SADDLE WITH BUSHING.
3. FOR STEEL AND STAINLESS STEEL PIPES 3" AND LARGER, AND PRESSURE VESSELS, USE THRED-O-LET AS SHOWN.
4. PROVIDE SNUBBER FOR POSITIVE DISPLACEMENT PUMP INSTALLATIONS.
5. FOR WASTEWATER, SLUDGE, SCUM AND GRIT PIPING UTILIZE THE DIAPHRAGM PRESSURE GAUGE.

PRESSURE GAUGE MOUNTING DETAILS

SCALE: NOT TO SCALE

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P.E. Stamp:

STATE OF CONNECTICUT JORGEN FEDERICK JR. No. 13744 LICENSED PROFESSIONAL ENGINEER

Client:

Southbury Real Estate Group, LLC
990 Main Street North
Southbury, CT 06488

Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

MISCELLANEOUS CONSTRUCTION DETAILS-2

Revisions

No.	Description	Date

File: CD-XX to CD-XX Civil & Yard Piping Details.dwg

Drawn By: RMB

Designed By: RMB

Checked By: JF

Job No: 5051 Date: April 2015

North Arrow

Scale

None

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

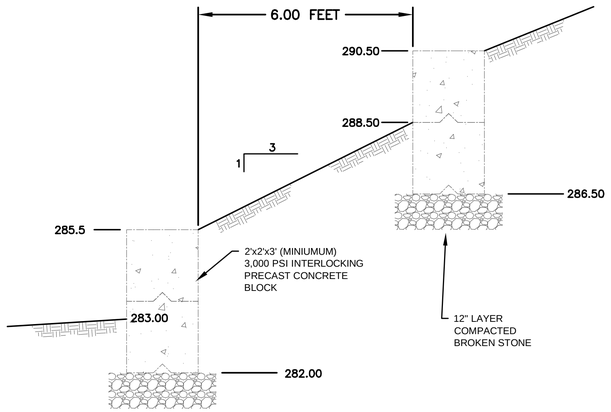
For Regulatory Review Only

Sheet No.:

CD-4

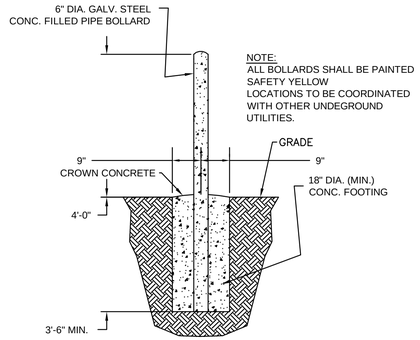
J:\5051 Southbury Lutheran Home\Cad\Plans\CD-XX to CD-XX Civil & Yard Piping Details.dwg

Plot Date: May 06, 2016 6:24pm



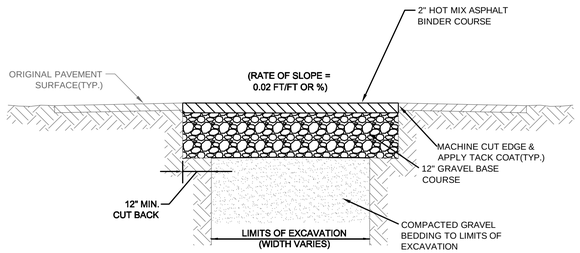
TANKS AREA SLOPE STABILIZATION

SCALE: NOT TO SCALE



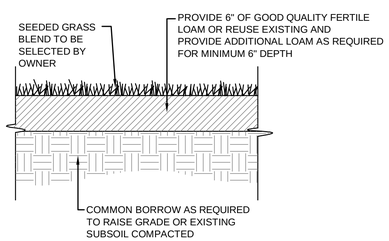
PIPE BOLLARD

SCALE: NOT TO SCALE



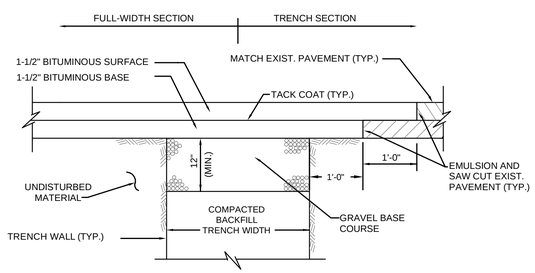
TEMPORARY PAVEMENT RESTORATIONS

SCALE: NOT TO SCALE



LOAM AND SEED DETAIL

SCALE: NOT TO SCALE



PERMANENT PAVING RESTORATIONS

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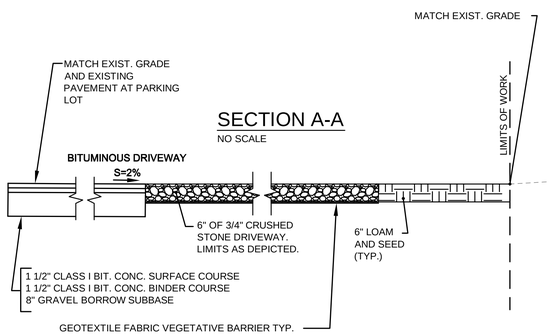

CRUSHED STONE DRIVEWAY EXTENSION

SCALE: NOT TO SCALE

J:\5051 Southbury Lutheran Home\Cad\Plans\CD-XX to CD-XX Civil & Yard Piping Details.dwg

Engineered by:

BETA Group, Inc.
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STATE OF CONNECTICUT
JORDEN FEDERICO, JR.
No. 13744
LICENSED
PROFESSIONAL ENGINEER

Client:

Southbury Real Estate Group, LLC
990 Main Street North
Southbury, CT 06488

Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

MISCELLANEOUS CONSTRUCTION DETAILS-3

Revisions

No.	Description	Date

File: CD-XX to CD-XX Civil & Yard Piping Details.dwg

Drawn By: RMB

Designed By: RMB

Checked By: JF

Job No: 5051 Date: April 2015

North Arrow

Scale

None

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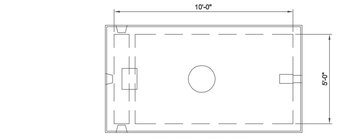
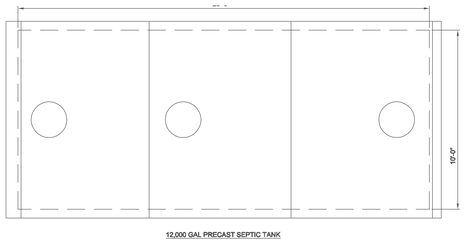
Sheet No.:

CD-5

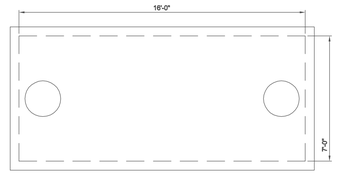
Plot Date: May 06, 2016 6:24pm



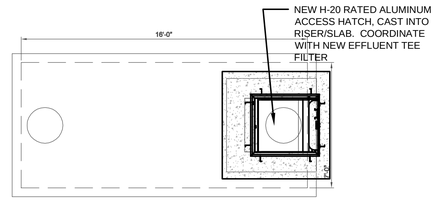
EXIST. PRECAST GREASE TRAP



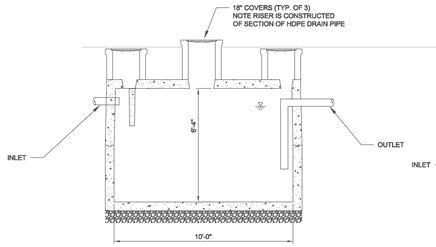
12,000 GAL PRECAST SEPTIC TANK



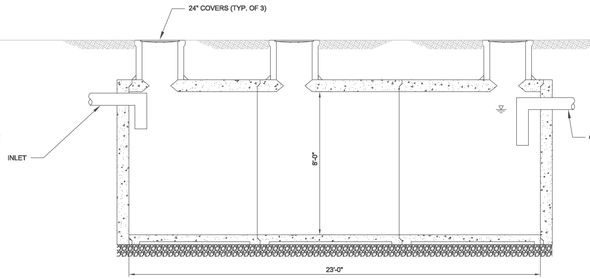
6,000 GAL PRECAST SEPTIC TANK



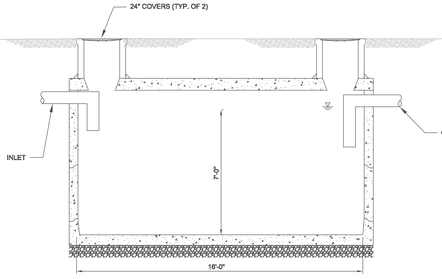
6,000 GAL PRECAST SEPTIC TANK



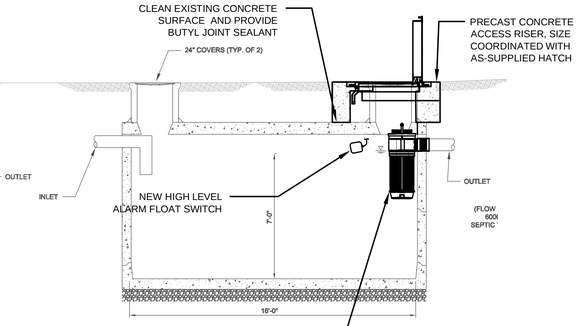
EXIST. PRECAST GREASE TRAP
(TYPICAL FOR 2 IN SERIES)
(VOLUME = 1,993 GAL. PER TANK)
RECORD DRAWING WAS NOT TO SCALE: PLACEMENT OF COVERS VARY



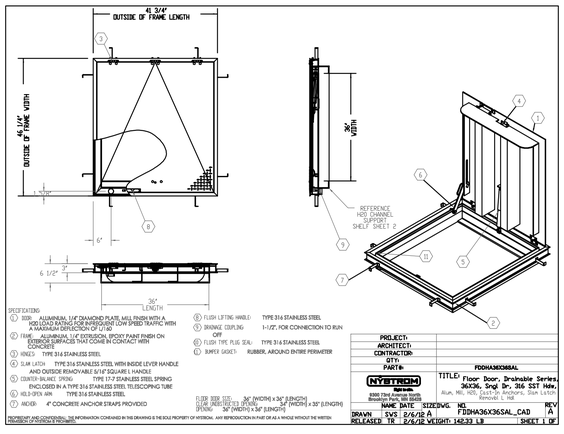
12,000 GAL PRECAST SEPTIC TANK
(VOLUME = 12,042 GAL.)

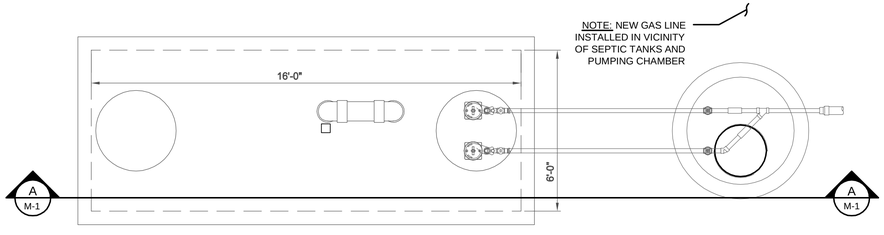


6,000 GAL PRECAST SEPTIC TANK
(VOLUME = 5,864 GAL.)



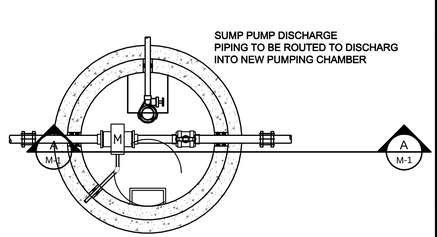
6,000 GAL PRECAST SEPTIC TANK
(VOLUME = 5,864 GAL.)





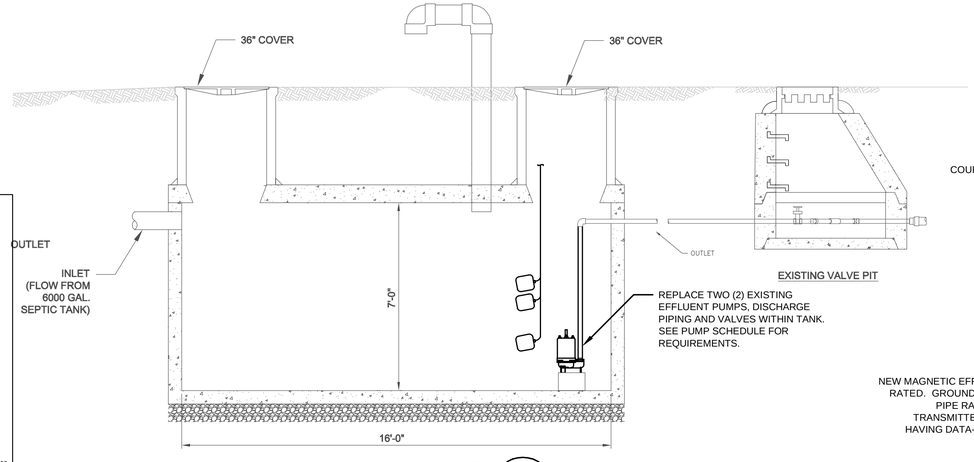
5,000 GAL PRECAST PUMP CHAMBER

EXISTING VALVE PIT



PROPOSED PUMP STATION MODIFICATIONS - PLAN VIEW

SCALE: 3/8" = 1'-0"



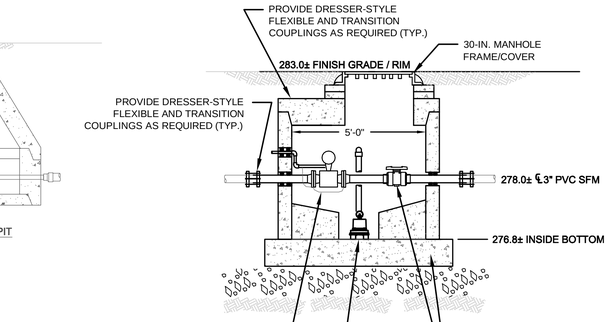
5,000 GAL PRECAST PUMP CHAMBER
(718 GAL. PER VERTICAL FOOT)

NO AS BUILT INFO FOR PUMP ALARM LEVELS

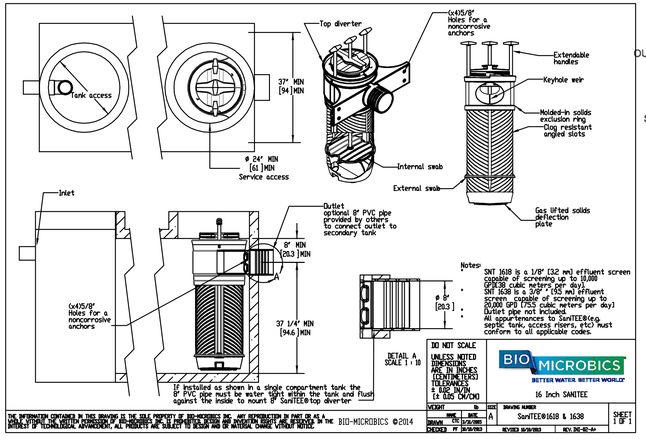
A-A
M-1
SECTION
SCALE: 3/8" = 1'-0"

PROPOSED INFLUENT FLOW METERING VAULT PLAN VIEW

SCALE: 3/8" = 1'-0"



B-B
M-1
SECTION
SCALE: 3/8" = 1'-0"



Description	Pump Mfr./Model #	No. of Pumps	Type	Duty Point	Motor HP	Voltage/Phase/Freq.	Other Requried Features	
Existing Pump Chamber: Influent/Conveyance Pump	Gould WE2038H	2	Submersible/Centrifugal	72 gpm @ 78 ft TDH	2	208/3-Ph./60Hz	-	-
New Flow Meter Pit - Sump Pump	Zoeller	1	Submersible/Centrifugal	55 gpm @ 15 ft TDH	1/3	120/1-Ph./60Hz	Integral Float Switch	-

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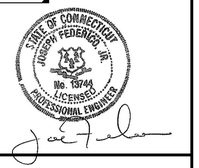

Client:

Southbury Real Estate Group, LLC
990 Main Street North
Southbury, CT 06488

Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

MISC. PROCESS MECH. WORK - PLAN & SECTIONS

Revisions

No.	Description	Date

File: M-X Tank Dwgs.dwg

Drawn By: RMB

Designed By: RMB

Checked By: JF

Job No: 5051 Date: April 2015

North Arrow

Scale

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Sheet No.:

M-1

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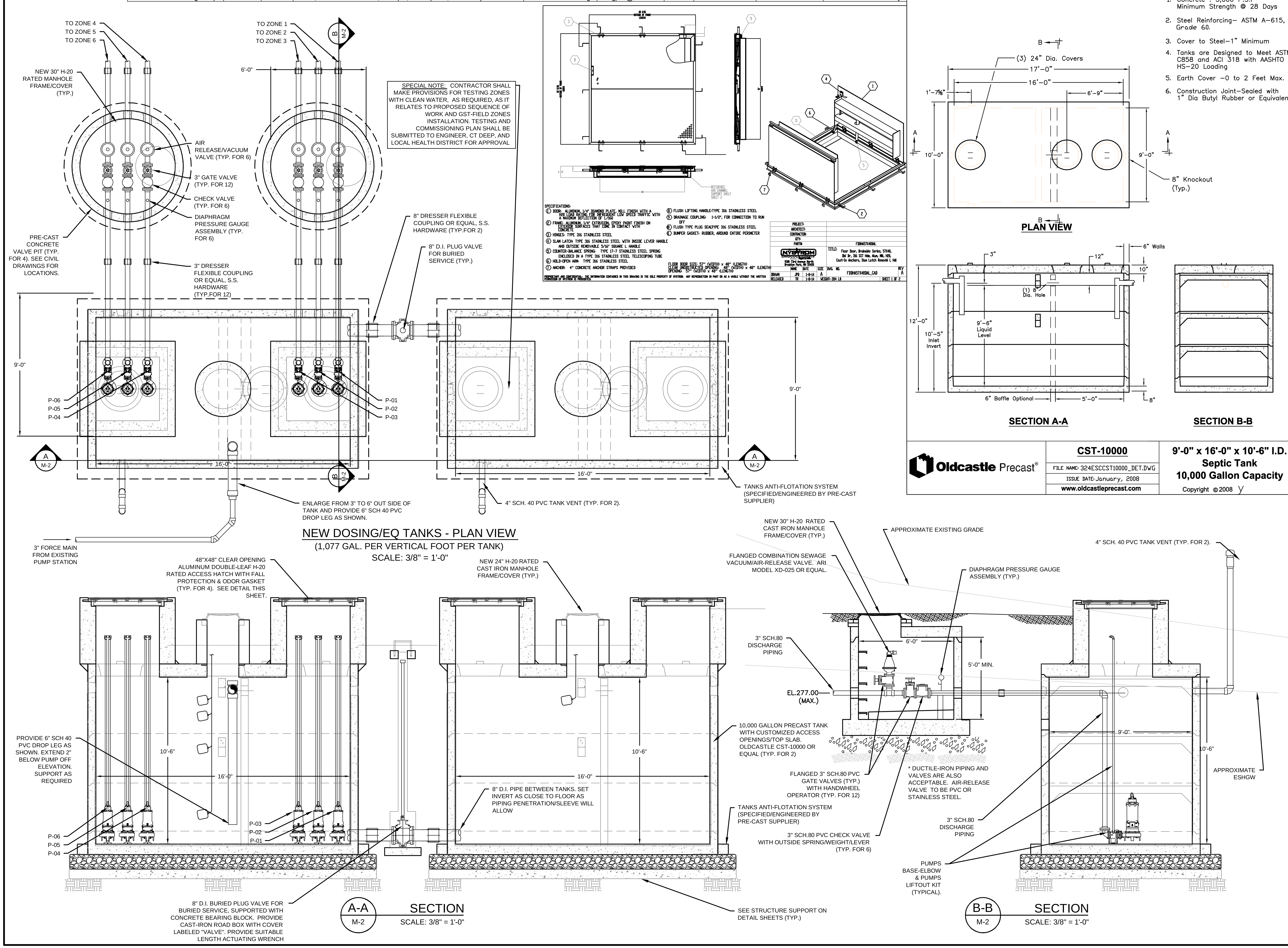
Plot Date: May 06, 2016 6:24pm

PUMP SCHEDULE:								
Description	Pump Mfr./Model #	No. of Pumps	Type	Duty Point	Motor HP	Voltage/Phase/Freq.	Other Requried Features	
GST Zones 1 - 6 Dosing Pumps (P-01 to P-06)	Ebara, Model 80DLMFU62.2, 1750rpm, 7.4" Imp.Dia., 3" Disch.	6	Submersible/Centrifugal	125 gpm @ 37 ft TDH	3	460/3-Ph./60Hz	Base Elbow/Liftout Kit	Seal/Leak Probes & Relays



TO ZONE 4
TO ZONE 5
TO ZONE 6
TO ZONE 1
TO ZONE 2
TO ZONE 3
NEW 30" H-20 RATED MANHOLE FRAME/COVER (TYP.)
AIR RELEASE/VACUUM VALVE (TYP. FOR 6)
3" GATE VALVE (TYP. FOR 12)
CHECK VALVE (TYP. FOR 6)
DIAPHRAGM PRESSURE GAUGE ASSEMBLY (TYP. FOR 6)
PRE-CAST CONCRETE VALVE PIT (TYP. FOR 4). SEE CIVIL DRAWINGS FOR LOCATIONS.
3" DRESSER FLEXIBLE COUPLING OR EQUAL, S.S. HARDWARE (TYP.FOR 12)
SPECIAL NOTE: CONTRACTOR SHALL MAKE PROVISIONS FOR TESTING ZONES WITH CLEAN WATER, AS REQUIRED, AS IT RELATES TO PROPOSED SEQUENCE OF WORK AND GST-FIELD ZONES INSTALLATION. TESTING AND COMMISSIONING PLAN SHALL BE SUBMITTED TO ENGINEER, CT DEEP, AND LOCAL HEALTH DISTRICT FOR APPROVAL
8" DRESSER FLEXIBLE COUPLING OR EQUAL, S.S. HARDWARE (TYP.FOR 2)
8" D.I. PLUG VALVE FOR BURIED SERVICE (TYP.)
6'-0"
9'-0"
16'-0"
P-01
P-02
P-03
P-04
P-05
P-06
ENLARGE FROM 3" TO 6" OUT SIDE OF TANK AND PROVIDE 6" SCH 40 PVC DROP LEG AS SHOWN.
4" SCH. 40 PVC TANK VENT (TYP. FOR 2).
TANKS ANTI-FLOTATION SYSTEM (SPECIFIED/ENGINEERED BY PRE-CAST SUPPLIER)
3" FORCE MAIN FROM EXISTING PUMP STATION
NEW DOSING/EQ TANKS - PLAN VIEW
(1,077 GAL. PER VERTICAL FOOT PER TANK)
SCALE: 3/8" = 1'-0"
48"X48" CLEAR OPENING ALUMINUM DOUBLE-LEAF H-20 RATED ACCESS HATCH WITH FALL PROTECTION & ODOR GASKET (TYP. FOR 4). SEE DETAIL THIS SHEET.
NEW 24" H-20 RATED CAST IRON MANHOLE FRAME/COVER (TYP.)
PROVIDE 6" SCH 40 PVC DROP LEG AS SHOWN. EXTEND 2" BELOW PUMP OFF ELEVATION. SUPPORT AS REQUIRED
10'-6"
8" D.I. PIPE BETWEEN TANKS. SET INVERT AS CLOSE TO FLOOR AS PIPING PENETRATION/SLEEVE WILL ALLOW
10,000 GALLON PRECAST TANK WITH CUSTOMIZED ACCESS OPENINGS/TOP SLAB. OLDCASTLE CST-10000 OR EQUAL (TYP. FOR 2)
TANKS ANTI-FLOTATION SYSTEM (SPECIFIED/ENGINEERED BY PRE-CAST SUPPLIER)
8" D.I. BURIED PLUG VALVE FOR BURIED SERVICE, SUPPORTED WITH CONCRETE BEARING BLOCK. PROVIDE CAST-IRON ROAD BOX WITH COVER LABELED "VALVE". PROVIDE SUITABLE LENGTH ACTUATING WRENCH
A-A SECTION M-2 SCALE: 3/8" = 1'-0"
SEE STRUCTURE SUPPORT ON DETAIL SHEETS (TYP.)
NEW 30" H-20 RATED CAST IRON MANHOLE FRAME/COVER (TYP.)
APPROXIMATE EXISTING GRADE
FLANGED COMBINATION SEWAGE VACUUM/AIR-RELEASE VALVE. ARI MODEL XD-025 OR EQUAL.
DIAPHRAGM PRESSURE GAUGE ASSEMBLY (TYP.)
4" SCH. 40 PVC TANK VENT (TYP. FOR 2).
3" SCH.80 DISCHARGE PIPING
6'-0"
5'-0" MIN.
EL.277.00 (MAX.)
9'-0"
FLANGED 3" SCH.80 PVC GATE VALVES (TYP.) WITH HANDWHEEL OPERATOR (TYP. FOR 12)
* DUCTILE-IRON PIPING AND VALVES ARE ALSO ACCEPTABLE. AIR-RELEASE VALVE TO BE PVC OR STAINLESS STEEL.
3" SCH.80 PVC CHECK VALVE WITH OUTSIDE SPRING/WEIGHT/LEVER (TYP. FOR 6)
APPROXIMATE ESHGW
PUMPS BASE-ELBOW & PUMPS LIFTOUT KIT (TYPICAL).
B-B SECTION M-2 SCALE: 3/8" = 1'-0"
NOTES:
1. Concrete : 5,000 P.S.I Minimum Strength @ 28 Days
2. Steel Reinforcing– ASTM A–615, Grade 60.
3. Cover to Steel–1" Minimum
4. Tanks are Designed to Meet ASTM C858 and ACI 318 with AASHTO HS–20 Loading
5. Earth Cover –0 to 2 Feet Max.
6. Construction Joint–Sealed with 1" Dia Butyl Rubber or Equivalent
(3) 24" Dia. Covers
17'–0"
16'–0"
6'–9"
10'–0"
9'–0"
8" Knockout (Typ.)
PLAN VIEW
6" Walls
12'–0"
10'–5" Inlet Invert
9'–6" Liquid Level
6" Baffle Optional
5'–0"
SECTION A-A
SECTION B-B
Oldcastle Precast
CST-10000
FILE NAME: 324ESCCST10000_DET.DWG
ISSUE DATE: January, 2008
www.oldcastleprecast.com
9'-0" x 16'-0" x 10'-6" I.D. Septic Tank 10,000 Gallon Capacity
Copyright © 2008

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P.E. Stamp:

STATE OF CONNECTICUT JOSEPH FEDERICO, JR. No. 13744 LICENSED PROFESSIONAL ENGINEER

Client:

Southbury Real Estate Group, LLC
990 Main Street North
Southbury, CT 06488

Project

Lutheran Home of Southbury, CT On-Site Wastewater Renovation System Improvements & Modifications

Title

PROPOSED TANKS - PLAN & SECTIONS

Revisions

No.	Description	Date

File: M-X Tank Dwgs.dwg

Drawn By:	RMB		
Designed By:	RMB		
Checked By:	JF		
Job No:	5051	Date:	April 2015

North Arrow

Scale

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

For Regulatory Review Only

Sheet No.:

M-2

Plot Date: May 06, 2016 6:24pm

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ELECTRICAL SYMBOLS

- DUPLEX WALL MTD RECEPTACLE
- SURFACE MTD RACEWAY W/RECEPTACLES
- TELEPHONE WALL MTD OUTLET
- TELEPHONE/DATA WALL MTD OUTLET
- S — TOGGLE SWITCH WALL MTD
- S_3 — TOGGLE SWITCH: 3 WAY
- S_R — 3 POSITION MAINTAINED TOGGLE SW HAND–OFF–AUTO
- (T) — THERMOSTAT
- (J) — JUNCTION BOX
- —— CONDUIT INSTALLED EXPOSED
- —— CONDUIT INSTALLED CONCEALED
- ~ CONDUIT – FLEXIBLE METAL
- —o CONDUIT – TURNING UP
- —• CONDUIT – TURNING DOWN
- N1 — BRANCH CIRCUIT HOMERUN TO PANELBOARD WITH NO. OF CONDUCTORS AND PNLBD CKT NO. NOTED
- C–1 — CONDUIT AND WIRE HOMERUN TO EQUIPMENT NOTED WITH CONDUIT NUMBER (REFER TO C&W SCHEDULE)
- A A1 a — PENDANT MOUNTED LIGHTING FIXTURE WITH TYPE, CKT NO. AND LTG. CONTROL SWITCH NOTED
- B A2 b — SURFACE MOUNTED LIGHTING FIXTURE WITH TYPE, CKT NO. AND LTG. CONTROL SWITCH NOTED
- WALL MOUNTED FIXTURE WITH TYPE, CKT NO. AND LTG. CONTROL SWITCH NOTED
- WALL MOUNTED EXIT CEILING MTD (SINGLE FACE) LIGHTING FIXTURE WITH TYPE AND CKT NO. NOTED
- EGRESS/EXIT LIGHTING BATTERY UNIT WITH TYPE AND CIRCUIT NUMBER NOTED
- EGRESS SINGLE HEAD LIGHTING FIXTURE (WALL MTD, EMERGENCY POWERED) WITH TYPE AND CKT NO. NOTED
- EGRESS DOUBLE HEAD LIGHTING FIXTURE (WALL MTD, EMERGENCY POWERED) WITH TYPE AND CKT NO. NOTED
- EGRESS SINGLE HEAD LIGHTING FIXTURE (CEILING MTD, EMERGENCY POWERED) WITH TYPE AND CKT NO. NOTED
- EGRESS DOUBLE HEAD LIGHTING FIXTURE (CEILING MTD, EMERGENCY POWERED) WITH TYPE AND CKT NO. NOTED
- MOTOR WITH HORSEPOWER RATING NOTED
- FUSED DISCONNECTED SAFETY SWITCH WITH RATINGS NOTED
- FVNR 2a2b 3 — COMBINATION MOTOR STARTER WITH CUT BKR AND NEMA STARTER SIZES NOTED TYPES NOTED:
  - C = CONTACTOR
  - FVNR = FULL VOLTAGE NON–REVERSING
  - RVNR = REDUCED VOLTAGE NON–REVERSING
  - FVTS = FULL VOLTAGE TWO SPEED
  - 3 = NEMA STARTER SIZE
  - a = NORMALLY OPEN CONTACTS
  - b = NORMALLY CLOSED CONTACTS
- INDICATING LIGHT – PUSH–TO–TEST TYPE
  - R = RED
  - G = GREEN
  - A = AMBER
- 100/20 — THERMAL/MAGNETIC CIRCUIT BREAKER WITH FRAME AND TRIP SIZES NOTED
- 3/MCP — MOTOR CIRCUIT PROTECTOR CIRCUIT BREAKER WITH TYPE AND CONTINUOUS RATING NOTED
- LP — PANELBOARD – SURFACE MTD WITH TAG NO. NOTED
- CURRENT TRANSFORMERS
- POTENTIAL TRANSFORMERS
- (E) — PERSONNEL – EMERGENCY STATION
- (S_D) — FIRE DETECTION – SMOKE DETECTOR–DUCT MTD
- (S) — FIRE DETECTION – SMOKE DETECTOR
- (H_F) — FIRE DETECTION – HEAT DETECTOR
  - "R" = RATE OF RISE TEMP
  - "F" = FIXED TEMP
- (FS) — FIRE ALARM –SPRINKLER FLOW SWITCH
- (TS) — FIRE ALARM – SPRINKLER TAMPER SWITCH
- (F) — FIRE ALARM – MANUAL PULL STATION
- HV–1 (FT) F — FIRE ALARM – REMOTE "ALARM/TEST"
- (M) F — FIRE ALARM – HORN/LIGHT
- (M) — FIRE ALARM – MINI HORN/LIGHT
- FIRE ALARM – STROBE LIGHT
- (SV) — SOLENOID VALVE

- HMI — INTRUSION – MOTION DETECTOR
- DS — INTRUSION – DOOR SWITCH
- HOA — CONTROL STATION: FOR TYPES SEE LIST BELOW
  - "FSOR" – FAST/SLOW/OFF/REMOTE SEL SWITCH
  - "HOA" – HAND/OFF/AUTO SEL SWITCH
  - "LOR" – LOCAL/OFF/REMOTE SEL SWITCH
  - "OCA" – OPEN/CLOSE/AUTO SEL SWITCH
- DENOTES DEVICE OR EQUIPMENT WHICH IS RECESSED MOUNTED
- DENOTES DEVICE AND EQUIPMENT WHICH IS SURFACE MOUNTED
- DENOTES ELECTRICAL DEMOLITION
- ESP — ELECTRIC DOOR STRIKE RELEASE PUSHBUTTON
- ES — ELECTRIC DOOR STRIKE
- PS — PRESSURE SWITCH

NOTE, NOT ALL SYMBOLS & ABBREVIATIONS USED, PROVIDED FOR REFERENCE (ONLY)

ELECTRICAL ABBREVIATIONS LIST

A	AMPERES
ACP	ALARMS CONTROL PANEL
AF	AMP FRAME
AFF	ABOVE FINISHED FLOOR
AIC	AMPERES INTERRUPTING CAPACITY
AL	ALUMINUM
AT	AMP TRIP
ATC	AUTOMATIC TEMPERATURE CONTROL
ATS	AUTOMATIC TRANSFER SWITCH
AUX	AUXILIARY
AWG	AMERICAN WIRE GAUGE
C	COUNTER HEIGHT MOUNTED
CLF	CURRENT LIMITING FUSE
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CT	CURRENT TRANSFORMER
CTL	CONTROL
CWS	CONDUIT WALL SLEEVE
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
E/G	ENGINE GENERATOR
EPB	ELECTRICAL PANELBOARD
ESP	EMERGENCY STOP PUSHBUTTON
EUH	ELECTRIC UNIT HEATER
EST	ELECTRIC SERVICE TRANSFORMER
ETM	ELAPSED TIME METER
F	FIXED TEMPERATURE
FA	FIRE ALARM
FE	FLOW ELEMENT
FIT	FLOW INDICATING TRANSMITTER
FLEX	FLEXIBLE
FLUOR	FLUORESCENT
FS	FLOAT SWITCH
FSOR	FAST–SLOW–OFF–REMOTE CTL SWITCH
G	GROUND CABLE
GCB	GENERATOR CIRCUIT BREAKER
GF	GROUND FAULT INTERRUPTER
GRD	GROUND
HOA	HAND–OFF–AUTO CTL SWITCH
HP	HORSEPOWER
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HV	HEATING/VENTILATION
I&C	INSTRUMENTATION & CONTROL
IMC	INTERMEDIATE METAL CONDUIT
JB	JUNCTION BOX
KVA	KILO–VOLT AMPERES
KW	KILO–WATTS
LOR	LOCAL–OFF–REMOTE CTL SWITCH
LTG	LIGHTING
M	MOTOR STARTER CONTACTOR
MS	MOTOR STARTER UNIT SEPARATELY MOUNTED
MBS	MANUAL BYPASS SWITCH
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MTD	MOUNTED
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NIC	NOT IN CONTRACT
NO	NUMBER OR NORMALLY OPEN
NTS	NOT TO SCALE
OCA	OPEN–CLOSE–AUTO CTL SW
OL	OVERLOAD
OHE	OVERHEAD ELECTRIC
P	POLES
PFC	POWER FACTOR CORRECTION CAPACITOR
PFR	POWER FAILURE RELAY
PH	PHASE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PNLBD	PANELBOARD
PPS	PUMPS
PS	PRESSURE SWITCH
PSO	PUMP STATION OPERATORS
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYLCHLORIDE CONDUIT
PWR	POWER
R	RATE OF RISE TEMPERATURE
RPB	RESET PUSHBUTTON
RGS	RIGID GALVANIZED STEEL
RT	RUNNING TIME METER
SP	SPACE
SW	SWITCH
T	TRANSFORMER
TD	TIME DELAY RELAY
TELE	TELEPHONE
TRANSF	TRANSFORMER
UL	UNDERWRITERS LABORATORY
UON	UNLESS OTHERWISE NOTED
V	VOLTS
W	WIRE OR WATERTIGHT
WP	WEATHERPROOF
XP	EXPLOSION–PROOF

ELECTRICAL GENERAL NOTES

1) ALL ELECTRICAL EQUIPMENT AND INSTALLATION WORK SHALL BE IN ACCORDANCE WITH THE NATIONAL, CONNECTICUT STATE AND LOCAL TOWN BUILDING AND ELECTRICAL CODES APPLICABLE SECTIONS. ALL ELECTRICAL PERMITS AND INSPECTIONS AND ANY ASSOCIATED APPROVAL COSTS SHALL BE OBTAINED AND PAID FOR BY THE ELECTRICAL CONTRACTOR (EC).

2) ALL ELECTRICAL MATERIAL SHALL BE OF THE HIGHEST QUALITY SPECIFICATION GRADE AND UL LISTED. THE ELECTRICAL CONTRACTOR SHALL SUBMIT ALL ELECTRICAL MATERIAL SHOP DRAWINGS TO THE ENGINEER FOR REVIEW AND ACCEPTABILITY PRIOR TO RELEASE AND INSTALLATION.

3) ALL ELECTRICAL INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE LOCAL ELECTRICAL INSPECTOR REQUIREMENTS. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL ELECTRICAL INSPECTOR REQUIREMENTS PRIOR TO ANY ELECTRICAL CONSTRUCTION. ANY MISCOORDINATION REVISIONS SHALL BE PROVIDED BY THE EC AT NO ADDITIONAL COST TO THE OWNER.

4) ALL ELECTRICAL CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE SPECIFIED PROJECT'S CONSTRUCTION PHASING PLAN. THE ELECTRICAL CONTRACTOR SHALL PROVIDE TEMPORARY ELECTRICAL POWER AND LIGHTING AS REQUIRED FOR THE NEW PROPOSED CONSTRUCTION.

5) ALL ELECTRICAL EQUIPMENT SHALL HAVE ENGRAVED PLASTIC NAMEPLATES. ALL PANELBOARDS CIRCUIT DIRECTORIES SHALL BE TYPED. ALL WIRING SHALL BE IDENTIFIED BY ALPHA–NUMERICAL TAGS AND COLOR CODING.

6) THE ELECTRICAL CONTRACTOR SHALL PROVIDE "AS BUILT" ELECTRICAL DRAWINGS AND INTERCONNECTION WIRING DIAGRAM ELECTRICAL DRAWINGS. THE ELECTRICAL WORK SHALL NOT BE CONSIDERED SUBSTANTIALLY COMPLETE UNTIL ALL "AS BUILT" ELECTRICAL DRAWINGS HAVE BEEN SUBMITTED AND REVIEWED TO BE ACCEPTABLE BY THE ENGINEER. NO ROUGH WIRING SHALL COMMENCE UNTIL THE INTERCONNECTION WIRING DIAGRAMS HAVE BEEN SUBMITTED/APPROVED.

7) ALL ELECTRICAL POWER CONDUCTORS SHALL BE COPPER WITH TYPE "THHN/THWN" INSULATION. THE MINIMUM CONDUCTOR SIZE FOR POWER CIRCUITS SHALL BE NO.12 AWG. RACEWAYS SHALL BE TERMINATED WITH FLEXIBLE RACEWAYS TO EQUIPMENT FOR BOTH VIBRATION ISOLATION AND MAINTENANCE.

8) ALL ELECTRICAL EQUIPMENT, DEVICES AND WIRING SHALL BE IN CONFORMANCE WITH THE RELEVANT APPLICABLE PROCESS/CIVIL DRAWING DETAILS. THE ELECTRICAL CONTRACTOR SHALL FULLY REVIEW THE DRAWINGS TO VERIFY ALL GENERAL AND ELECTRICAL CONSTRUCTION COORDINATION REQUIREMENTS PRIOR TO THE START OF ANY ELECTRICAL CONSTRUCTION. NOTIFY ENGINEER OF ANY DISCREPANCIES.

9) ALL MATERIAL AND CONSTRUCTION WORK SHALL BE ROUGH AND FINAL IN–SPECTED BY THE ENGINEER AND TOWN CODE ENFORCEMENT OFFICIALS PRIOR TO ACCEPTANCE AND PAYMENTS. ALL CIRCUITS AND EQUIPMENT SHALL BE VERIFIED FOR PROPER WIRING AND OPERATION. ELECTRICAL CONTRACTOR SHALL GUARAN–TEE ALL WORK AND MATERIAL (PARTS AND LABOR) FOR ONE YEAR AFTER FINAL WRITTEN ACCEPTANCE BY THE ENGINEER. EC SHALL FIELD DEMONSTRATE TO THE ENGINEER ALL CONTROLS, ALARMS, ETC, PRIOR TO FINAL ACCEPTANCE.

10) CONDUIT RUNS ARE SHOWN DIAGRAMMATICALLY ONLY AND SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH EQUIPMENT AND SITE CONDITIONS. ALL "AS SUPPLIED" ELECTRICAL EQUIPMENT AND WIRING MUST BE FULLY COOR–DINATED BY THE EC PRIOR TO INSTALLATION.

11) THE EQUIPMENT LAYOUTS, CONDUIT/WIRE SIZES AND WIRING DIAGRAM REPRE–SENTS A SUGGESTED DESIGN BASED UPON GENERALLY AVAILABLE ELECTRICAL EQUIP–MENT SIZES AND WIRING REQUIREMENTS. THIS ALSO APPLIES TO EQUIPMENT PRO–VIDED BY OTHERS BUT WIRED BY THE ELECTRICAL CONTRACTOR. MODIFICATIONS ACCEPTABLE TO THE ENGINEER MAY BE MADE BY THE ELECTRICAL CONTRACTOR TO ACCOMMODATE ACTUALLY INSTALLED EQUIPMENT. THE BASIC SEQUENCE AND METHOD OF CONTROL MUST BE MAINTAINED AS INDICATED ON THE DRAWINGS AND SPECIFI–CATIONS. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL EQUIPMENT WIR–ING REQUIREMENTS, PRIOR TO ANY CONSTRUCTION. DIFFERING EQUIPMENT LOCA–TIONS OR WIRING DUE TO INCOMPLETE COORDINATION SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

12) CONDUIT AND WIRE AS INDICATED BY THE CONDUIT/WIRE SCHEDULE SHALL BE EMT, MC, ALUM OR PVC AS SPECIFIED FOR DIFFERENT AREAS. IN ADDITION, ALL CONDUIT AND WIRE NOT SHOWN INTERCONNECTING THE LIGHTING, RECEPTACLES, LV SYSTEMS AND EQUIPMENT SHALL BE AS SPECIFIED. GENERALLY, THE TYPES OF WIRING PER BUILDING AREA ARE AS FOLLOWS:

IN THE PROJECT AREAS, GENERALLY ALL ELECTRICAL WIRING SHALL BE CON–CEALED WITHIN THE CONCRETE FLOOR SLABS AND WITHIN THE BUILDING WALLS, UNLESS OTHERWISE INDICATED.

A) USE TYPE "PVC–40" FOR ALL ELECTRICAL DUCTBANKS SITE WIRING.

B) USE TYPE "EMT" FOR ALL EXPOSED WIRING IN THE ELECTRICAL EQUIPMENT ENCLOSURE FOR AREAS WHICH ARE RATED NEMA "1".

C) USE TYPE "PVC–80" FOR ALL EXPOSED WIRING IN THE FLOW METER AND PUMPS TANKS FOR AREAS WHICH ARE RATED NEMA "4X".

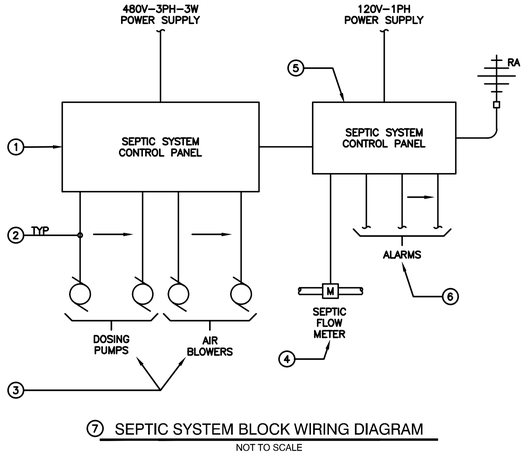
13) CONDUIT AND WIRE NOT SHOWN INTERCONNECTING THE FIRE ALARM, INTRU–SION, TELEPHONE, DATA AND INSTRUMENTATION/CONTROL SYSTEMS SHALL BE PROVIDED AS INDICATED ON THE SYSTEMS RISER DIAGRAMS AND ASSOCIATED WIRING DETAILS.

14) PANELBOARD 3–PHASE BRANCH CIRCUIT HOMERUNS SHALL BE INSTALLED IN RACEWAYS WITH OVERSIZED NO.10 NEUTRALS OR INSTALLED WITH SEPARATE PHASE NEUTRAL CONDUCTORS.

15) OUTLET BOXES, SWITCHES, RECEPTACLES, PULL/JUNCTION BOXES, TERMINAL BOXES, ETC. SHALL BE PROVIDED WITH NEMA ENCLOSURES AS INDICATED ON THE ELECTRICAL DRAWINGS.

16) ALL WIRING PENETRATIONS THRU FIRE RATED WALLS AND FLOORS SHALL BE SEALED WITH A FIRE STOPPING CAULKING. ALL WIRING CROSSING EXPANSION JOINTS SHALL HAVE EXPANSION FITTINGS. FOR LOCATIONS OF FIRE RATED WALLS AND EXPANSION JOINTS REFER TO THE APPLICABLE PROCESS AND STRUCTURAL DRAWINGS. ALL FIRE STOPPING SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. WIRING PENETRATIONS FROM THE HAZARDOUS TO THE NON–HAZARDOUS SHALL BE SEALED WITH EXPLOSION–PROOF GAS–TIGHT SEALING FITTINGS AS REQUIRED BY THE ELECTRICAL CODE.

17) ALL EQUIPMENT WIRING SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL RECOMMENDED WIRING PRIOR TO ANY ROUGH AND FINAL WIRING TERMINATIONS. ALL ELECTRICAL EQUIPMENT INSTALLATION AND WIRING SHALL BE CERTIFIED BY THE MANUFACTURER'S REPRESENTATIVE PRIOR TO ENERGIZING BY THE ELECTRICAL CONTRACTOR.



⑦ SEPTIC SYSTEM BLOCK WIRING DIAGRAM
NOT TO SCALE

ELECTRICAL CONTRACTORS NOTES

① THE ELECTRICAL CONTRACTOR SHALL HAVE THE FOLLOWING QUALIFICATIONS IN ORDER TO BE CONSIDERED ACCEPTABLE FOR THE WWTF INDUSTRIAL PROCESS TYPE ELECTRI–CAL CONSTRUCTION WORK:

- MINIMUM OF FIVE (5) YEARS OF SIMILAR INDUSTRIAL ELEC WORK
- PROVIDE A MINIMUM OF THREE (3) PROJECT REFERENCES ON SIMILAR PROJECTS WITH CONTACT INFORMATION.
- CONNECTICUT STATE CERTIFIED WITHOUT ANY MAJOR POOR WORK EVALUATIONS
- HAVE COMPLETED SIMILAR SIZED PROJECTS IN ELEC WORK CONSTRUCTION COSTS
- PROVIDE BANK REFERENCES ON FINANCIAL STABILITY AND NET WORTH. (IF REQUESTED)

② THE EC AFTER BID ACCEPTANCE SHALL PROVIDE WRITTEN DOCUMENTATION ON THE ITEM "1" TO ENABLE THE ENGINEER TO VERIFY AND CHECK.

ELECTRICAL UTILITIES WORK NOTES

① THE EC SHALL CONTACT THE POWER UTILITY COMPANY AFTER THEIR CONTRACT AWARD.

② THE EXISTING HIGH VOLTAGE POWER SERVICE SHALL BE REVISED AS INDICATED ON THE EXIST AND NEW POWER SYSTEM RISER DIAGRAMS.

③ THE CELL TELEPHONE SERVICE SHALL BE USED FOR REMOTE ALARMS VIA THE CELL TELEPHONE CONTROL PANEL.

④ THE EC WITH THE OWNER SHALL OBTAIN BOTH THE POWER SERVICES IN COMPLIANCE WITH THE PROJECT'S COMPLETION SCHEDULE.

⑤ ANY POWER UTILITY SERVICES COSTS WHICH ARE UNKNOWN DURING THE BIDDING SHALL BE PAID BY THE OWNER WHEN DETERMINED. THE EC AND GC SHALL NOT CHARGE THE OWNER ANY TIME OR MARK–UPS SINCE THIS WORK IS REQUIRED.

SEPTIC SYSTEM BLOCK WIRING DIAGRAM NOTES

① GC SHALL FURNISH THE SEPTIC SYSTEM CONTROL PANEL. EC SHALL INSTALL AND WIRE.

② EC SHALL FURNISH/INSTALL ALL ELEC FIELD WIRING

③ GC SHALL FURNISH/INSTALL THE SEPTIC PUMPS AND BLOWERS. EC SHALL FIELD WIRE.

④ GC SHALL FURNISH/INSTALL THE FLOW METER. EC SHALL FIELD WIRE.

⑤ EC SHALL FURNISH/INSTALL THE CELL TELEPHONE CONTROL PANEL AND ITS CELL TELEPHONE ANTENNA. THE PANEL WORK SHALL INCLUDE THE FIRST YEAR CELL TELE SERVICE AND REMOTOE FLOW REPORTING AND ALARMS NOTIFICATION

⑥ EC SHALL FURNISH/INSTALL THE ALARMS FIELD WIRING

⑦ EC/GC SHALL COORDINATE WITH THE NEW SEPTIC SYSTEM EQUIPMENT, EXISTING CONDITIONS AND NEW CONSTRUCTION.EC AND GC WORK SHALL INCLUDE ALL START–UP AND FIELD TESTING.

ELECTRICAL DRAWINGS REFERENCE NOTES

1) FOR NOTES, SYMBOLS AND ABBREVIA–TIONS, REFER TO DWG # E–1
2) FOR SITE PLAN AND DETAILS, REFER TO DWGS # E–2 THRU E–5
3) FOR SYSTEMS RISER DIAGRAMS, REFER TO DWG # E–6
4) FOR SCHEDULES, REFER TO DWG # E–7
5) FOR ELECTRICAL SPECIFICATIONS, RE–FER TO DWG # E–8

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Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

ELECTRICAL SYMBOLS, ABBREV AND GENERAL NOTES

Revisions

No.	Description	Date

File: 1601700 E1.DWG
Drawn By: ELD
Designed By: ELD/WPE
Checked By: RMB
Job No: 16017.00 Date: April 2016

North Arrow

NONE

Scale

NONE

Sheet No.:

E-1

Plot Date: 5/3/2016

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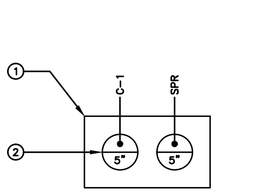
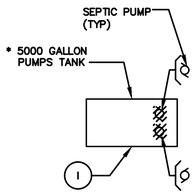
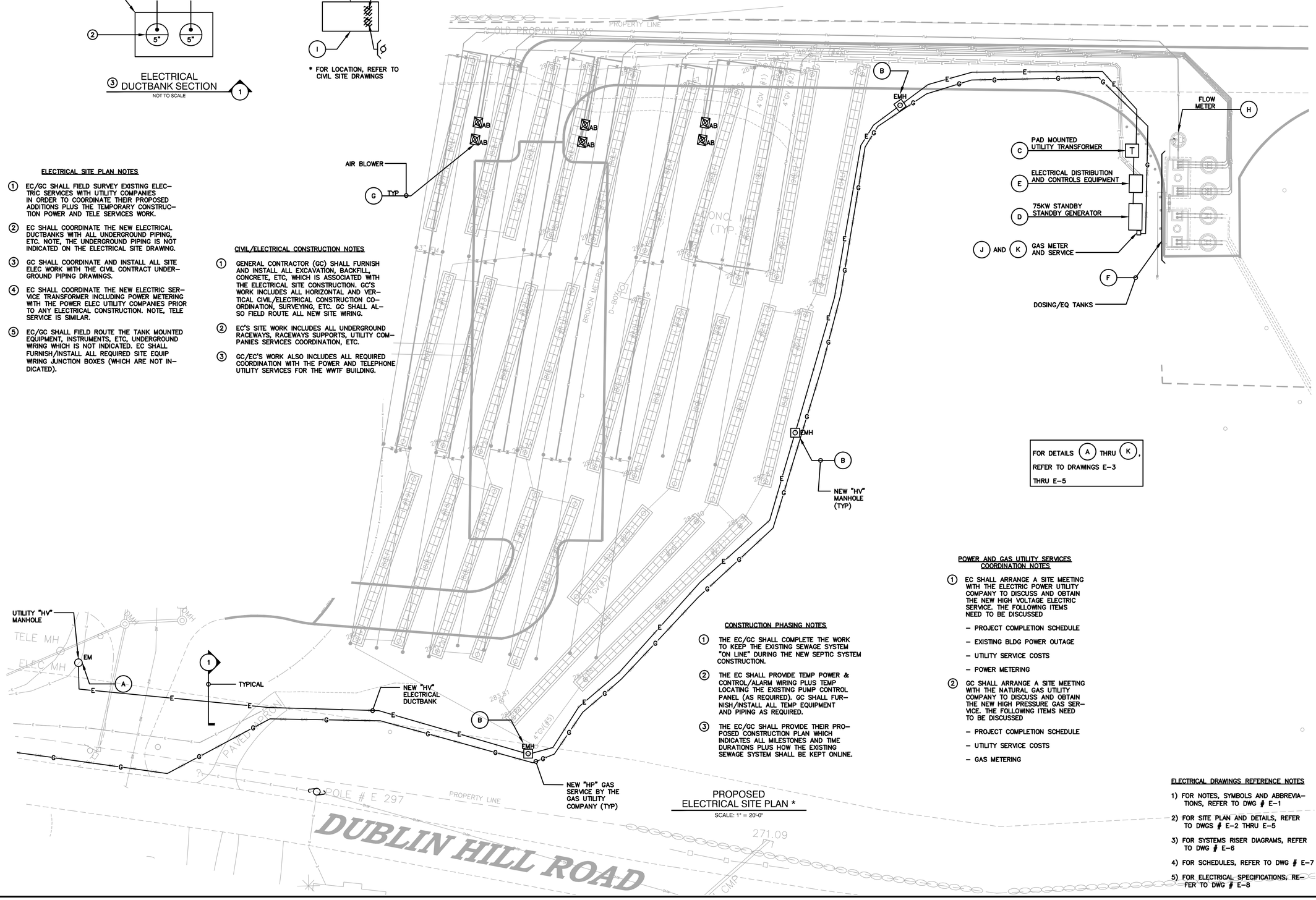


③ ELECTRICAL DUCTBANK SECTION
NOT TO SCALE



* FOR LOCATION, REFER TO CIVIL SITE DRAWINGS



ELECTRICAL SITE PLAN NOTES

1. EC/GC SHALL FIELD SURVEY EXISTING ELECTRIC SERVICES WITH UTILITY COMPANIES IN ORDER TO COORDINATE THEIR PROPOSED ADDITIONS PLUS THE TEMPORARY CONSTRUCTION POWER AND TELE SERVICES WORK.
2. EC SHALL COORDINATE THE NEW ELECTRICAL DUCTBANKS WITH ALL UNDERGROUND PIPING, ETC. NOTE, THE UNDERGROUND PIPING IS NOT INDICATED ON THE ELECTRICAL SITE DRAWING.
3. GC SHALL COORDINATE AND INSTALL ALL SITE ELEC WORK WITH THE CIVIL CONTRACT UNDERGROUND PIPING DRAWINGS.
4. EC SHALL COORDINATE THE NEW ELECTRIC SERVICE TRANSFORMER INCLUDING POWER METERING WITH THE POWER ELEC UTILITY COMPANIES PRIOR TO ANY ELECTRICAL CONSTRUCTION. NOTE, TELE SERVICE IS SIMILAR.
5. EC/GC SHALL FIELD ROUTE THE TANK MOUNTED EQUIPMENT, INSTRUMENTS, ETC, UNDERGROUND WIRING WHICH IS NOT INDICATED. EC SHALL FURNISH/INSTALL ALL REQUIRED SITE EQUIP WIRING JUNCTION BOXES (WHICH ARE NOT INDICATED).

CIVIL/ELECTRICAL CONSTRUCTION NOTES

1. GENERAL CONTRACTOR (GC) SHALL FURNISH AND INSTALL ALL EXCAVATION, BACKFILL, CONCRETE, ETC, WHICH IS ASSOCIATED WITH THE ELECTRICAL SITE CONSTRUCTION. GC'S WORK INCLUDES ALL HORIZONTAL AND VERTICAL CIVIL/ELECTRICAL CONSTRUCTION COORDINATION, SURVEYING, ETC. GC SHALL ALSO FIELD ROUTE ALL NEW SITE WIRING.
2. EC'S SITE WORK INCLUDES ALL UNDERGROUND RACEWAYS, RACEWAYS SUPPORTS, UTILITY COMPANIES SERVICES COORDINATION, ETC.
3. GC/EC'S WORK ALSO INCLUDES ALL REQUIRED COORDINATION WITH THE POWER AND TELEPHONE UTILITY SERVICES FOR THE WWTF BUILDING.

CONSTRUCTION PHASING NOTES

1. THE EC/GC SHALL COMPLETE THE WORK TO KEEP THE EXISTING SEWAGE SYSTEM "ON LINE" DURING THE NEW SEPTIC SYSTEM CONSTRUCTION.
2. THE EC SHALL PROVIDE TEMP POWER & CONTROL/ALARM WIRING PLUS TEMP LOCATING THE EXISTING PUMP CONTROL PANEL (AS REQUIRED). GC SHALL FURNISH/INSTALL ALL TEMP EQUIPMENT AND PIPING AS REQUIRED.
3. THE EC/GC SHALL PROVIDE THEIR PROPOSED CONSTRUCTION PLAN WHICH INDICATES ALL MILESTONES AND TIME DURATIONS PLUS HOW THE EXISTING SEWAGE SYSTEM SHALL BE KEPT ONLINE.

PROPOSED
ELECTRICAL SITE PLAN *
SCALE: 1" = 20'-0"

FOR DETAILS (A) THRU (K), REFER TO DRAWINGS E-3 THRU E-5

POWER AND GAS UTILITY SERVICES COORDINATION NOTES

1. EC SHALL ARRANGE A SITE MEETING WITH THE ELECTRIC POWER UTILITY COMPANY TO DISCUSS AND OBTAIN THE NEW HIGH VOLTAGE ELECTRIC SERVICE. THE FOLLOWING ITEMS NEED TO BE DISCUSSED
   - PROJECT COMPLETION SCHEDULE
   - EXISTING BLDG POWER OUTAGE
   - UTILITY SERVICE COSTS
   - POWER METERING
2. GC SHALL ARRANGE A SITE MEETING WITH THE NATURAL GAS UTILITY COMPANY TO DISCUSS AND OBTAIN THE NEW HIGH PRESSURE GAS SERVICE. THE FOLLOWING ITEMS NEED TO BE DISCUSSED
   - PROJECT COMPLETION SCHEDULE
   - UTILITY SERVICE COSTS
   - GAS METERING

ELECTRICAL DRAWINGS REFERENCE NOTES

1) FOR NOTES, SYMBOLS AND ABBREVIATIONS, REFER TO DWG # E-1
2) FOR SITE PLAN AND DETAILS, REFER TO DWGS # E-2 THRU E-5
3) FOR SYSTEMS RISER DIAGRAMS, REFER TO DWG # E-6
4) FOR SCHEDULES, REFER TO DWG # E-7
5) FOR ELECTRICAL SPECIFICATIONS, REFER TO DWG # E-8

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Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

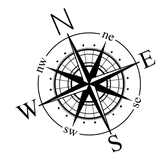
ELECTRICAL SITE PLAN

Revisions

No.	Description	Date

File: 1601700 E2.DWG
Drawn By: ELD
Designed By: ELD/WPE
Checked By: RMB
Job No: 16017.00 Date: April 2016

North Arrow



Scale

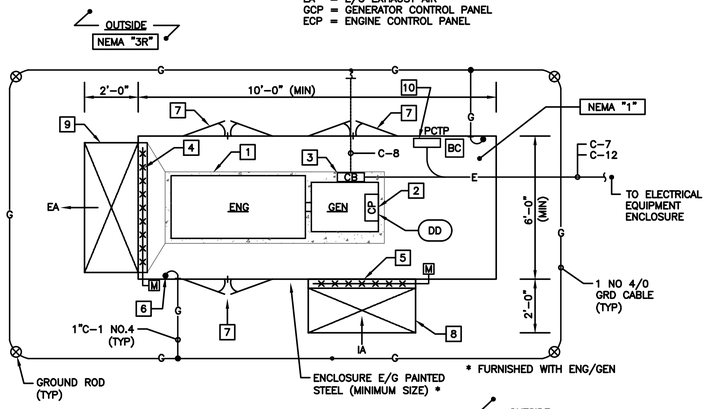
1"=20'-0"

Sheet No.:

E-2

Plot Date: 5/3/2016

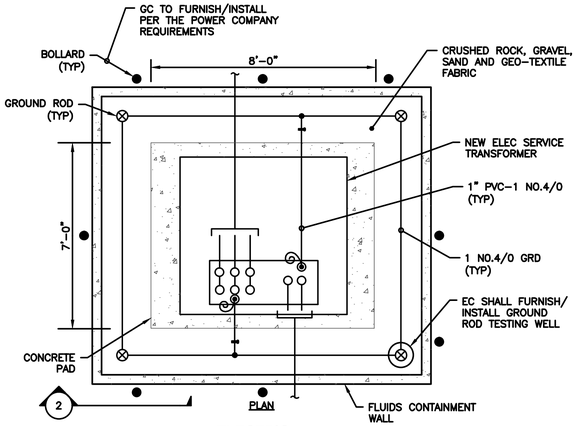
IA = E/G INTAKE AIR
EA = E/G EXHAUST AIR
GCP = GENERATOR CONTROL PANEL
ECP = ENGINE CONTROL PANEL



ENGINE/GENERATOR EQUIPMENT LIST		
NO	TAG NO	DESCRIPTION
1	ENG	NATURAL GAS ENGINE PRIME MOVER
2	EGCP	ENGINE/GENERATOR CONTROL PANEL
3	EGCB	ENGINE/GENERATOR CIRCUIT BREAKER
4	EAMOD	EXHAUST AIR MOTOR OPERATED DAMPER
5	IAMOD	INTAKE AIR MOTOR OPERATED DAMPER
6	EGE	ENGINE/GENERATOR DROP OVER ENCLOSURE
7	EGED	ENGINE/GENERATOR ACCESS DOORS
8	IASB	INTAKE AIR SOUND BAFFLE HOOD
9	EASB	EXHAUST AIR SOUND BAFFLE HOOD
10	PCTP	POWER & CONTROL TERMINAL PANEL

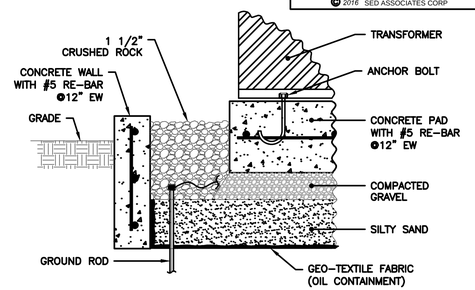
NOTES –

1) REFER TO THE ELECTRICAL ENG/GEN SPEC #16620 FOR THE ENG/GEN SYSTEM SCOPE OF WORK.



ELECTRIC
SERVICE TRANSFORMER DETAIL * C
NOT TO SCALE
DWG #E-2

* ORIENT THE CONDUITS TO THE ELEC SITE DRAWING

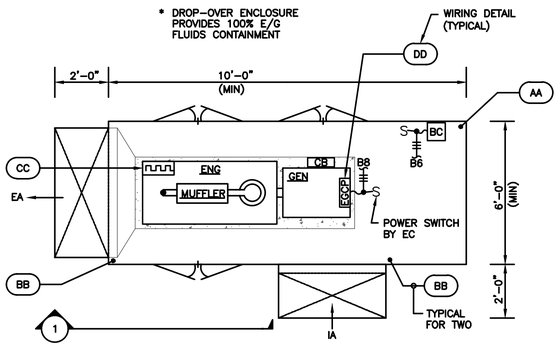


TRANSFORMER PAD SECTION * 2
NOT TO SCALE

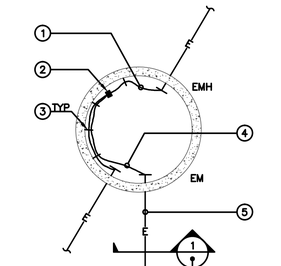
* CONSTRUCT THE TRANSFORMER PAD TO THE POWER COMPANY STANDARDS
* GALVANIZED CONCRETE EXPANSION BOLTS ARE AN ACCEPTABLE CONTRACT DEVIATION
* E/G AND ENCLOSURE ANCHORING DETAIL IS SIMILAR, HOWEVER "GC" MUST COORDINATE WITH "AS SUPPLIED" E/G ENCLOSURE.
* SECTION IS GENERAL INFO ONLY. EC/GC SHALL FURNISH/INSTALL TRANSFORMER PAD TO THE PWR UTILITY'S LATEST TECHNICAL STANDARDS.

STANDBY POWER ENG/GEN
EQUIPMENT LAYOUT PLAN * D
NOT TO SCALE
DWG #E-2

* ORIENT PER SITE PLANS
* E/G SHALL BE FIELD WIRED BY ELEC CONTRACTOR
* DROP-OVER ENCLOSURE PROVIDES 100% E/G FLUIDS CONTAINMENT



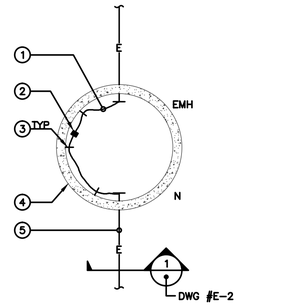
STANDBY POWER ENG/GEN
POWER AND LIGHTING PLAN D
NOT TO SCALE
DWG #E-3



EXISTING/MODIFIED
6 ELEC "HV" MANHOLE PLAN A
NOT TO SCALE
DWG #E-3

EXISTING/MOFIFIED ELECTRIC "HV" MANHOLE PLAN DETAIL "A" NOTES

1. EXISTING UTILITY "HV" ELECTRIC SERVICE POWER CABLES
2. NEW "HV" POWER CABLES "T" FACTORY KIT SPLICES BY POWER COMPANY
3. EXISTING "HV" CABLES SUPPORT RACKS
4. NEW UTILITY "HV" ELECTRIC SERVICE POWER CABLES BY POWER COMPANY
5. NEW UTILITY "HV" ELECTRIC SERVICE DUCTBANK BY GC AND EC.
6. EC/GC SHALL COORDINATE THE HV UTILITY WORK WITH THE POWER COMPANY PLUS COORDINATE THE EXISTING BUILDING POWER OUTAGE WITH THE OWNER.



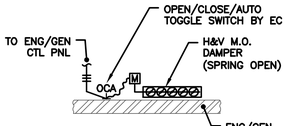
NEW
6 ELEC "HV" MANHOLE PLAN B
NOT TO SCALE
DWG #E-3

NEW ELECTRIC "HV" MANHOLE PLAN DETAIL "B" NOTES

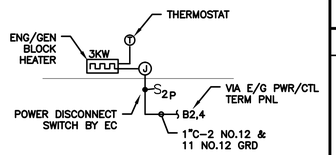
1. NEW UTILITY "HV" ELECTRIC SERVICE POWER CABLES
2. NEW "HV" POWER CABLES "BUTT" FACTORY KIT SPLICES (WHERE REQUIRED DUE TO CABLE PULL LENGTHS)
3. NEW "HV" CABLES SUPPORT RACKS BY THE ELEC CONTRACTOR
4. NEW UTILITY "HV" CABLE MANHOLE BY THE GNL CONTRACTOR. THE MH SHALL BE F/I IN STRICT ACCORDANCE WITH THE POWER UTILITY COMPANY REQUIREMENTS.
5. NEW UTILITY "HV" ELECTRIC SERVICE DUCTBANK BY GC AND EC.
6. EC/GC SHALL COORDINATE THE HV UTILITY WORK WITH THE POWER COMPANY PLUS COORDINATE THE EXISTING BUILDING POWER OUTAGE WITH THE OWNER.

ELECTRIC SERVICE TRANSFORMER DETAIL "H" NOTES

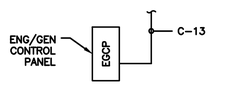
1. ELEC & GNRL CONTRACTORS SHALL COORDINATE PAD WITH POWER COMPANY.
2. EXCAVATION, BACKFILL, SAND, GRAVEL, CONCRETE, REINFORCEMENT AND PAVEMENT WORK BY THE GNL CONTRACTOR.
3. GNL CONTRACTOR SHALL COORDINATE PAD TYPE (I.E. POURED OR PRECAST) WITH POWER COMPANY AND PROVIDE EITHER TYPE AT NO ADDITIONAL COST TO THE OWNER.
4. GNL CONTRACTOR SHALL FURNISH/INSTALL 8" DIAMETER GALV STEEL CONCRETE FILLED BOLLARDS. (COORDINATE NUMBER & LOCATION WITH POWER COMPANY)
5. EC SHALL FURNISH/INSTALL ALL CONDUITS/WIRES, GROUND RODS, GROUND CABLES, ETC.



ENG/GEN H&V M.O.
DAMPER WIRING DETAIL BB
NOT TO SCALE

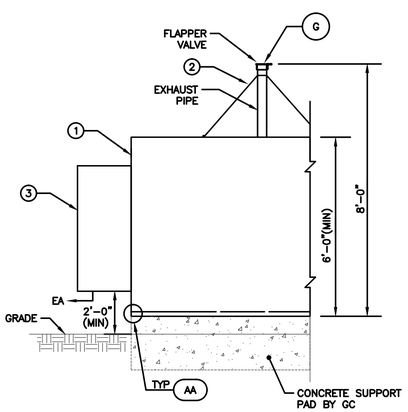


ENG/GEN BLOCK
HEATER WIRING DETAIL CC
NOT TO SCALE



ENGINE/GENERATOR
CONTROL/ALARM/SIGNAL
AND DATA WIRING DETAIL * DD
NOT TO SCALE

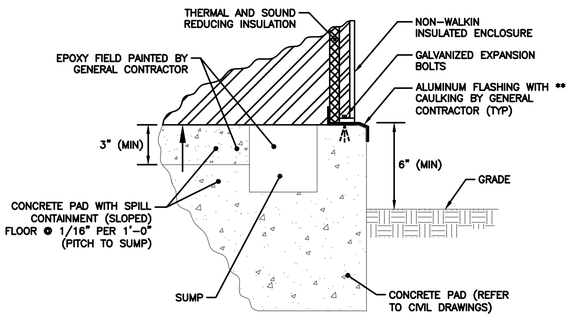
* PROVIDE E/G "START/STOP" CONTROLS AND E/G "FAIL" ALARM



STANDBY POWER ENG/GEN
4 INSTALLMENT SECTION 1
NOT TO SCALE

STANDBY POWER ENG/GEN INSTALLMENT SECTION "1" NOTES

1. PAINTED STEEL SOUND ATTENUATED NON-WALKIN ENCLOSURE WITH CONCRETE DIKE CONTAINMENT TYPE SUPPORT PAD (100% FLUIDS CONTAINMENT)
2. STAINLESS STEEL ENGINE EXHAUST PIPE WITH ENCLOSURE WALL THIMBLE (FIRE/HEAT RATED)
3. PAINTED STEEL ENGINE EXHAUST SILENCER BAFFLE WITH STAINLESS STEEL BIRD SCREEN
4. ELEC AND GNL CONTRACTORS SHALL COORDINATE THE "AS SUPPLIED" E/G ENCLOSURE'S MOUNTING, PIPING AND WIRING WITH THE EXISTING SITE CONDITIONS AND NEW CONSTRUCTION.



ENG/GEN CONCRETE PAD DETAIL AA
NOT TO SCALE

* FOR REINFORCEMENT AND DIMENSIONS, REFER TO STRUCTURAL DWGS
* LOCATE SUMP FROM STRUCTURAL DWGS
** ALTERNATE IS 1/2" THICK NEOPRENE BY 4" WIDTH FOR WATER SEALING ENCLOSURE TO CONCRETE

WASTEWATER SEPTIC SYSTEM PANELBOARDS CIRCUITS SCHEDULE	
CKTS	FED BY PANELBOARD
"A"	480 VOLTS PNLBD "SS HVPB"
"B"	120/240 VOLTS PNLBD "SS LVPB"

NONE

EC & GC SHALL ADJUST THE ENGINE/GENERATOR WORK BASED UPON THE "AS-SUPPLIED" E/G

FOR THE ENGINE/GENRATOR NATURAL GAS PIPING WORK, REFER TO DRAWING "E-5"

ELECTRICAL WIRING DETAILS NOTES

1. THE EC SHALL COORDINATE THE INSTALLATION AND FIELD WIRING OF THE "AS SUPPLIED" EQUIPMENT WITH THE EXISTING SITE CONDITIONS AND THE NEW CONSTRUCTION.
2. THE EC SHALL LOCATE & FIELD ROUTE THE NEW ELEC EQUIPMENT AND WIRING. THE EC'S WORK INCLUDES ALL CORING, SEALS, ETC.
3. THE EC SHALL ASSIST THE GENERAL CONTRACTOR WITH REGARDS TO THE TEMP SEWAGE PUMPING SYSTEM AND DEMO/NEW WORK CONSTRUCTION PHASING. EC SHALL PROVIDE ANY AND ALL REQUIRED OVERTIME WORK TO COMPLETE ANY POWER OUTAGES, ETC.
4. THE EC SHALL ASSIST THE GC AND THEIR SUPPLIER DURING THE EQUIP STARTUP AND FIELD TESTING. THE EC SHALL FIELD MEASURE (AS REQUIRED) VOLTS, AMPS, ETC, PLUS SIMULATE CONTROLS AND ALARMS.

ELECTRICAL DRAWINGS REFERENCE NOTES

1) FOR NOTES, SYMBOLS AND ABBREVIATIONS, REFER TO DWG # E-1
2) FOR SITE PLAN AND DETAILS, REFER TO DWGS # E-2 THRU E-5
3) FOR SYSTEMS RISER DIAGRAMS, REFER TO DWG # E-6
4) FOR SCHEDULES, REFER TO DWG # E-7
5) FOR ELECTRICAL SPECIFICATIONS, REFER TO DWG # E-8

SED ASSOCIATES CORP.
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P.E. Stamp:

Client:

Southbury Real Estate Group, LLC
990 Main Street North
Southbury, CT 06488

Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

ELECTRICAL SITE PLAN DETAILS "I"

Revisions

No.	Description	Date

File: 1601700 E3.DWG
Drawn By: ELD
Designed By: ELD/WPE
Checked By: RMB
Job No: 16017.00 Date: April 2016

North Arrow

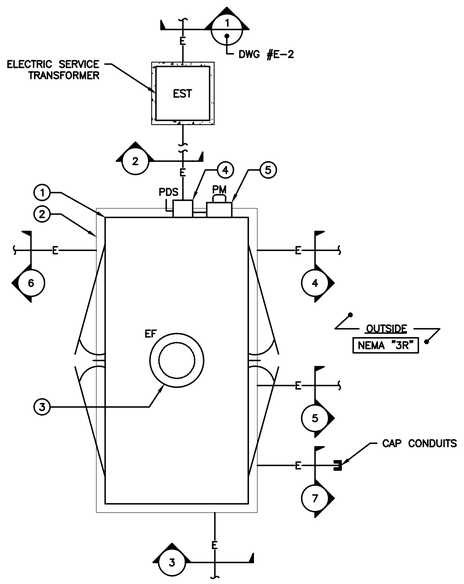
Scale

NONE

Sheet No.:

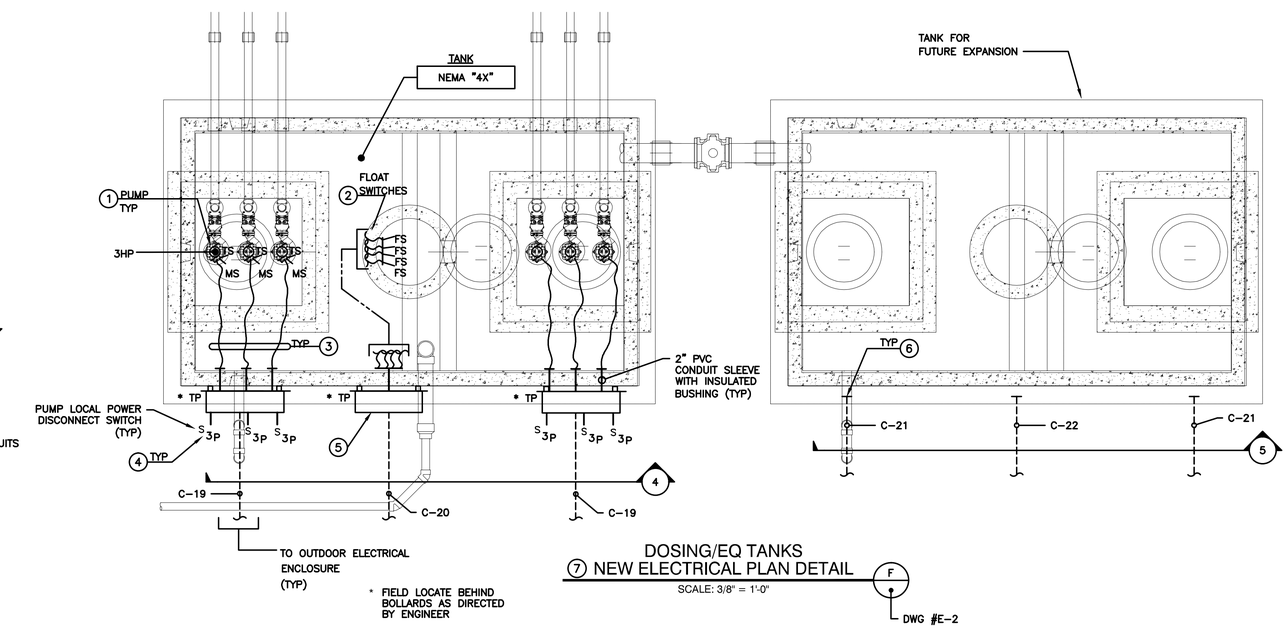
E-3

Plot Date: 5/3/2016



OUTDOOR ELECTRICAL ENCLOSURE PLAN DETAIL (23) — NOT TO SCALE — E — DWG #E-2

* BOTH SIDES ARE SIMILAR

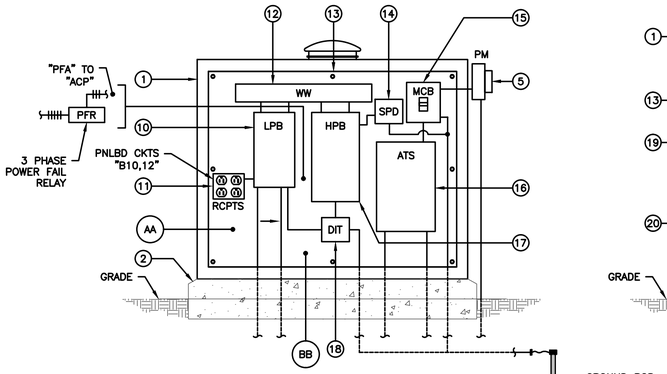


* FIELD LOCATE BEHIND BOLLARDS AS DIRECTED BY ENGINEER

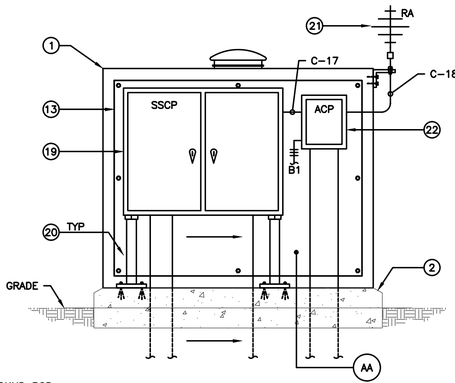
DOSING/EQ TANKS (7) NEW ELECTRICAL PLAN DETAIL — SCALE: 3/8" = 1'-0" — F — DWG #E-2

DOSING/EQ TANKS NEW ELECTRICAL POWER PLAN DETAIL "F" NOTES

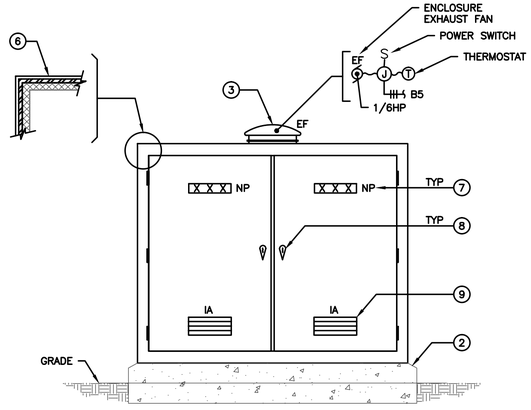
1. SUBMERSIBLE SEWAGE PUMP WITH TEMP AND LEAK SENSORS. EC TO FIELD WIRE.
2. SUBMERSIBLE FLOAT SWITCHES FOR PUMP CONTROL AND LEVEL ALARMS. EC TO FIELD WIRE.
3. SUBMERSIBLE POWER/CONTROL CABLES WHICH ARE FURNISHED WITH THE PUMPS. EC TO FIELD CUT AND TERMINATE.
4. EC SHALL FURNISH/INSTALL PRESSURE TREATED WOOD SUPPORTS AND GALV HARDWARE TO SUPPORT A NEW TERMINAL PANEL. THE PANEL SHALL BE NEMA "4X" RATED AND FIELD SIZED BY THE ELEC CONTRACTOR
5. EC SHALL FURNISH/INSTALL PT SUPPORTS AND TERMINAL PANEL. THE PANEL SHALL TERMINATE THE FLOAT SUBMERSIBLE CABLES.
6. EC SHALL CAP THE FUTURE PUMPS AND FLOAT SWITCHES SITE CONDUITS. THE CONDUITS LOCATIONS SHALL BE CLEARLY MARKED.
7. EC SHALL COORDINATE WITH THE NEW PROCESS EQUIPMENT AND THE NEW CONSTRUCTION.



OUTDOOR ELECTRICAL ENCLOSURE INTERIOR ELEVATION "I" DETAIL (23) — NOT TO SCALE — E — DWG #E-2

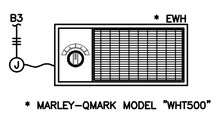


OUTDOOR ELECTRICAL ENCLOSURE INTERIOR ELEVATION "II" DETAIL (23) — NOT TO SCALE — E — DWG #E-2



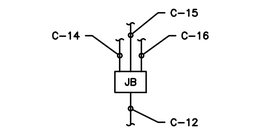
OUTDOOR ELECTRICAL ENCLOSURE EXTERIOR ELEVATION DETAIL * (23) — NOT TO SCALE — E — DWG #E-2

* BOTH SIDES ARE SIMILAR



* MARLEY-QMARK MODEL "WHT500"

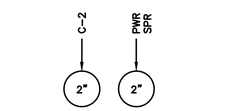
ELECTRIC WALL HEATER WIRING DETAIL (AA) — NOT TO SCALE



ENG/GEN CIRCUITS & CONTROLS WIRING DETAIL (BB) — NOT TO SCALE

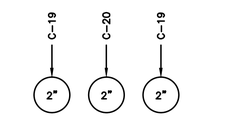
OUTDOOR ELECTRICAL ENCLOSURE PLAN AND ELEVATIONS DETAIL "E" NOTES

1. PAINTED ALUMINUM NEMA "3R" RATED HINGED ENCLOSURE. SIZED TO SUIT BY THE ELECTRICAL CONTRACTOR.
2. CONCRETE SUPPORT PAD BY THE GENERAL CONTRACTOR. SIZED TO SUIT THE NEW OUTDOOR ELECTRICAL ENCLOSURE
3. ENCLOSURE COOLING EXHAUST FAN.SIZED FOR THE INTERIOR ELEC EQUIPMENT HEAT GAINS BY THE ENCLOSURE SUPPLIER
4. POWER DISCONNECT SAFETY SWITCH FOR THE POWER UTILITY METER MAINTENANCE
5. POWER UTILITY METER AND SOCKET PER THE POWER COMPANY REQUIREMENTS
6. 1" RIGID INSULATION ON THE ENCLOSURE WALLS AND CEILING.
7. ENGRAVED PLASTIC NAMEPLATE PER THE ENGINEER. EC SHALL F/I NAMEPLATES ON ALL EQUIPMENT INCLUDING NEC ELEC SHOCK & NFPA ARC FLASH WARNING LABELS
8. STAINLESS STEEL HARDWARE WHICH IS PAD LOCKABLE
9. STAINLESS STEEL AIR INTAKE LOUVERS WITH PAPER AIR FILTERS
10. 120/240 VOLT PANELBOARD. FOR DETAILS REFER TO ITS SCHEDULE
11. QUAD-PLEX "GF" TYPE RECEPTACLES
12. PAINTED STEEL WIRE WAY (SIZED TO SUIT BY ELECTRICAL CONTRACTOR
13. PAINTED STEEL EQUIPMENT MOUNTING PLATE WITH 1" AIR GAP
14. SURGE PROTECTION (TVSS) DEVICE WITH "MOV" ELECTRONIC MODULES
15. MAIN CIRCUIT BREAKER IN A NEMA "1" PAINTED STEEL ENCLOSURE
16. AUTOMATIC TRANSFER SWITCH WITH HMI FOR CONTROL AND POWER MONITORING
17. 277/480 VOLT PANELBOARD. FOR DETAILS, REFER TO ITS SCHEDULE
18. 480 TO 120/240 VOLT DRY TYPE TRANSFORMER. FOR DETAILS, REFER TO ITS SCHEDULE
19. SEPTIC SYSTEM EQUIPMENT CONTROL PANEL. THE PANEL IS SUPPLIED WITH THE SEPTIC EQUIPMENT (PUMPS & BLOWERS).
20. HEAVY DUTY "U" CHANNELS FOR SUPPORTING THE WALL MOUNTED CONTROL PANEL
21. CELLULAR TELEPHONE RADIO ANTENNA.IT IS SUPPLIED WITH THE ALARMS CONTROL PANEL
22. CELLULAR TELEPHONE RADIO ALARMS CONTROL PANEL WITH REMOTE I&C SCADA MONITORING
23. THE EC AND GC MUST COORDINATE THE ELECTRICAL WORK WITH BOTH THE EXIST SITE CONDITIONS, NEW PROCESS EQUIP AND THE NEW CONSTRUCTION.



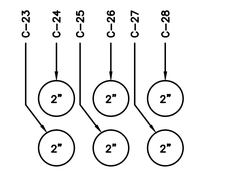
ELECTRICAL DUCTBANK SECTION * (2) — NOT TO SCALE

* POWER SERVICE



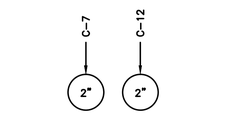
ELECTRICAL DUCTBANK SECTION * (4) — NOT TO SCALE

* DOSING PUMPS #1 THRU #6



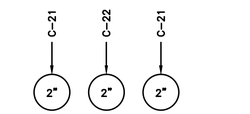
ELECTRICAL DUCTBANK SECTION * (6) — NOT TO SCALE

* AIR BLOWERS #1 THRU #6



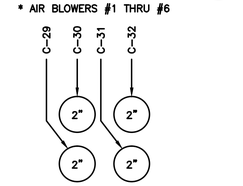
ELECTRICAL DUCTBANK SECTION * (3) — NOT TO SCALE

* ENGINE/GENERATOR



ELECTRICAL DUCTBANK SECTION * (5) — NOT TO SCALE

* FUTURE DOSING PUMPS #7 THRU #10



ELECTRICAL DUCTBANK SECTION * (7) — NOT TO SCALE

* AIR BLOWERS #7 THRU #10

WASTEWATER SEPTIC SYSTEM PANELBOARD CIRCUITS SCHEDULE	
CKTS	FED BY PANELBOARD
"A"	480 VOLTS PNLBD "SS HVPB"
"B"	120/240 VOLTS PNLBD "SS LVPB"

ELECTRICAL DRAWINGS REFERENCE NOTES

1) FOR NOTES, SYMBOLS AND ABBREVIATIONS, REFER TO DWG # E-1
2) FOR SITE PLAN AND DETAILS, REFER TO DWGS # E-2 THRU E-5
3) FOR SYSTEMS RISER DIAGRAMS, REFER TO DWG # E-6
4) FOR SCHEDULES, REFER TO DWG # E-7
5) FOR ELECTRICAL SPECIFICATIONS, REFER TO DWG # E-8

SED ASSOCIATES CORP.
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STATE OF CONNECTICUT · W. PETER EVANS · No. 19606 · REGISTERED PROFESSIONAL ENGINEER

Client:

Southbury Real Estate Group, LLC
990 Main Street North
Southbury, CT 06488

Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

ELECTRICAL SITE PLAN DETAILS "II"

Revisions

No.	Description	Date

File: 1601700 E4.DWG

Drawn By: ELD

Designed By: ELD/WPE

Checked By: RMB

Job No: 16017.00 Date: April 2016

North Arrow

NONE

Scale

NONE

Sheet No.:

E-4

Plot Date: 5/3/2016

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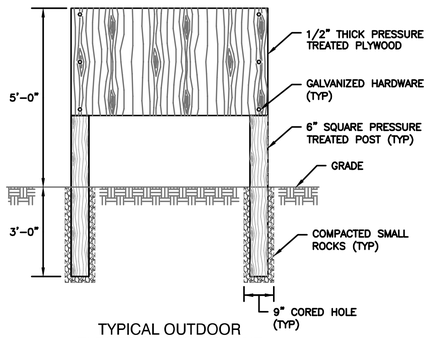
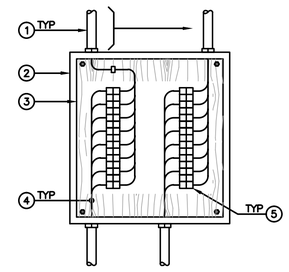


TYPICAL OUTDOOR ELECTRICAL EQUIPMENT SUPPORT FRAME/BOARD DETAIL *

NOT TO SCALE

* FIELD SIZED BY EC

* FIELD PAINT PER OWNER SELECTION



TYPICAL ELECTRICAL WIRING TERMINAL PANEL WIRING DETAIL * (6)

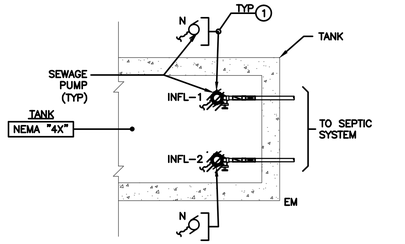
NOT TO SCALE

* ADJUST MATERIAL TO EACH ROOM'S NEMA RATING

* ADJUST WHEN RELAYS ARE INSIDE

TYPICAL ELECTRICAL WIRING TERMINAL PANEL WIRING DETAIL NOTES

1. EC SHALL FURNISH AND INSTALL ELECTRICAL WIRING AS REQUIRED BY THE POWER BLDG PLANS, WIRING DETAILS, ETC.
2. EC SHALL FURNISH AND INSTALL ELECTRICAL FIELD WIRING TERMINAL PANELS, PANELS SHALL BE FIELD SIZED BY EC.
3. EC SHALL FURNISH AND INSTALL PAINTED WOOD INTERIOR MOUNTING BOARD.
4. EC SHALL FURNISH AND INSTALL FIELD WIRING AS REQUIRED BY THE BLDG POWER PLANS, WIRING DETAILS AND RISER/WIRING DIAGRAMS.
5. EC SHALL FURNISH AND INSTALL SCREW TYPE FIELD WIRING TERMINAL STRIPS. STRIPS SHALL BE NUMBERED AND FIELD WIRING SHALL HAVE ALPHA-NUMERIC TAGGING.
6. EC'S WORK INCLUDES ALL COORDINATION WITH THE "AS SUPPLIED" EQUIPMENT AND NEW CONSTRUCTION PRIOR TO ANY EQUIPMENT RELEASE AND/OR ROUGH WIRING.



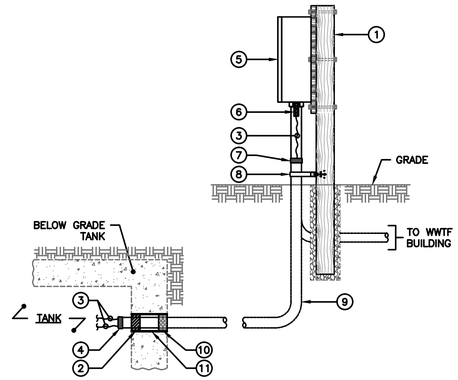
5000 GALLON PUMPS TANK WIRING DETAIL (2) (3) (I)

NOT TO SCALE

DWG #E-2

5000 GALLON SEWAGE PUMPS TANKS WIRING DETAIL "I" NOTES

1. EC SHALL DISCONNECT THE EXIST SUBMERSLBE SEWAGE PUMP AND RE-CONNECT THE NEW SEWAGE PUMP.
2. THE GC'S NEW PUMPS SUPPLIER SHALL RE-ADJUST THE PUMP MOTOR OVERLOAD HEATERS, ETC. AS RE-QUIRED FOR THE NEW LARAGER SEWAGE PUMPS (2 TO 3 HP).
3. EC/GC SHALL COORDINATE WITH THE EXISITNG SITE CONDITIONS, NEW PUMPING EQUIPMENT AND THE NEW CONSTRUCTION

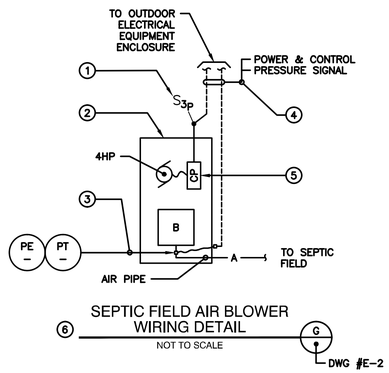


TYPICAL TANK WIRING DETAIL

NOT TO SCALE

TYPICAL TANK WIRING DETAIL NOTES

1. PRESSURE TREATED POSTS AND MOUNTING BOARD WITH GALVANIZED HARDWARE
2. CONDUIT "LINK SEAL" WALL SEAL WITH STAINLESS STEEL HARDWARE
3. EQUIPMENT SUBMERSIBLE CABLES
4. INSULATED CONDUIT BUSHING
5. ELEC PWR DISC SWITCH TERMINAL PANEL, ETC, BY EC (REFER TO WIRING DETAILS)
6. CABLE "KELLUM" STAINLESS STEEL GRIP
7. CONDUIT SEALING FITTING (OZ GEDNEY OR EQUAL)
8. STAINLESS STEEL CONDUIT SUPPORT FITTING AND HARDWARE
9. ALUMINUM CONDUIT SLEEVE WITH PROTECTIVE PVC COATING
10. CONDUIT WATER/GAS TIGHT DUC-SEAL CAULKING BY EC
11. TANK CONCRETE WALL CORE (AS REQ'D) BY EC
12. EC TO COORDINATE WITH "AS SUPPLIED" PROCESS EQUIPMENT



SEPTIC FIELD AIR BLOWER WIRING DETAIL (6) (G)

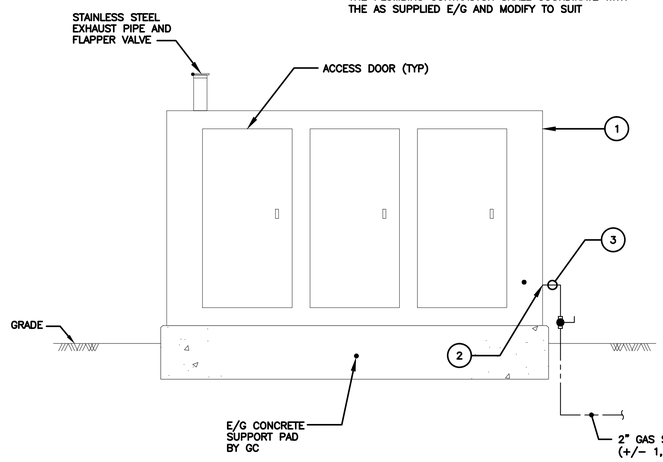
NOT TO SCALE

DWG #E-2

SEPTIC FIELD AIR BLOWER WIRING DETAIL "G" NOTES

1. EC SHALL FURNISH/INSTALL A 20A-3P TOGGLE TYPE (HP RATED) POWER DISC SWITCH (RATED NEMA "3R/4/4X")
2. GC SHALL FURNISH/INSTALL THE OUT-DOOR ENCLOSED AIR BLOWER ENCLO-SURE. UNIT IS FACTORY ASSEMBLED, PIPED AND WIRED.
3. AIR PIPE PRESSURE SENSOR WHICH 24VDC LOOP POWERED. THE UNIT IS PART OF THE BLOWER ASSEMBLY.
4. EC/GC SHALL FURNISH/INSTALL THE ELEC SITE WIRING. THE WORK IN-CLUDES SITE ROUTING PLUS THE CONCRETE COMPOSITE "H20" RATED SITE ELEC JUNCTION BOXES.
5. BLOWER CONTROL PANEL WHICH IS PART OF THE EQUIP ASSEMBLY.
6. EC/GC SHALL COORDINATE WITH THE EXISITNG SITE CONDITIONS, NEW BLOWER EQUIPMENT AND THE NEW CONSTRUCTION

NOTE:
THE PLUMBING CONTRACTOR SHALL COORDINATE WITH THE AS SUPPLIED E/G AND MODIFY TO SUIT



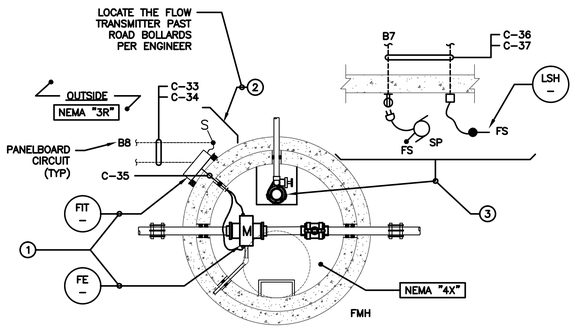
DETAIL NOTES:

1. SUPPLIED /WIRED BY ELECT. CONTR., AS PART OF PACKAGED ENGINE/GENERATOR ENCLOSURE. UNLOADED/INSTALLED BY GENERAL CONTRACTOR
2. PACKAGED E/G ENCLOSURE PENETRATION. PLUMBING CONTRACTOR TO PROVIDE WATER-TIGHT WEATHER SEAL.
3. SEE SITE PLAN FOR EXACT LOCATION.

PACKAGED E/G ENCLOSURE PLUMBING DETAIL (J)

NOT TO SCALE

DWG #E-2



NEW FLOW METER MANHOLE WIRING DETAIL (4) (H)

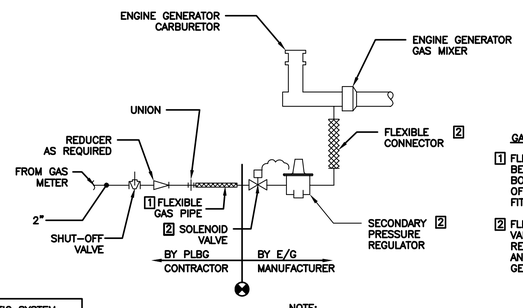
NOT TO SCALE

DWG #E-2

NEW SEWAGE FLOW METER MANHOLE WIRING DETAIL "H" NOTES

1. EC SHALL FIELD WIRE THE NEW MAGNETIC FLOW METER. THE GC SHALL INSTALL/PIPE.
2. EC SHALL INSTALL/WIRE PT WOOD TRANSMITTER STAND AND THE LOCAL 120V-1P POWER DISC SWITCH
3. EC SHALL FURNISH/INSTALL THE SUMP PUMP RECEPTACLE AND THE "FLOOD" FLOAT SWITCH. GC SHALL FURNISH/INSTALL THE SUMP PUMP.
4. EC/GC SHALL COORDINATE WITH THE EXISITNG SITE CONDITIONS, NEW BLOWER EQUIPMENT AND THE NEW CONSTRUCTION

WASTEWATER SEPTIC SYSTEM PANELBOARDS CIRCUITS SCHEDULE	
CKTS	FED BY PANELBOARD
"A"	480 VOLTS PNLBD "SS HVPB"
"B"	120/240 VOLTS PNLBD "SS LVPB"



NOTE:
THE PLUMBING CONTRACTOR SHALL COORDINATE WITH THE AS SUPPLIED ENGINE/GENERATOR

E/G/ GAS PIPING DETAIL (K)

NOT TO SCALE

DWG #E-2

GAS PIPING DETAIL NOTES:

1 FLEXIBLE CONNECTOR SHALL BE APPROVED BY THE BOARD OF STATE EXAMINERS OF PLUMBERS AND GAS FITTERS.

2 FLEXIBLE CONNECTOR, SOLENOID VALVE AND SECONDARY PRESSURE REGULATOR SHALL BE SUPPLIED AND INSTALLED BY ENGINE GENERATOR MANUFACTURERS

ENGINE/GENERATOR NATURAL GAS SCHEDULE	
NG FUEL FLOW	+/- 1100 CFH
NG FUEL PRES	+/- 11" TO 14" H2O

NATURAL GAS SCHEDULE NOTES

1) THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE NEW ENG/GEN NA-TURAL GAS SERVICE WITH THE BLDG OWNER.

2) THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE "AS SUPPLIED" ENG/GEN FUEL SUPPLY REQUIREMENTS DUE TO THE VARIATIONS ON THE NG E/GS.

ELECTRICAL DRAWINGS REFERENCE NOTES

1) FOR NOTES, SYMBOLS AND ABBREVIA-TIONS, REFER TO DWG # E-1

2) FOR SITE PLAN AND DETAILS, REFER TO DWGS # E-2 THRU E-5

3) FOR SYSTEMS RISER DIAGRAMS, REFER TO DWG # E-6

4) FOR SCHEDULES, REFER TO DWG # E-7

5) FOR ELECTRICAL SPECIFICATIONS, RE-FER TO DWG # E-8

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990 Main Street North
Southbury, CT 06488

Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

ELECTRICAL SITE PLAN DETAILS "III"

Revisions

No.	Description	Date

File: 1601700 E5.DWG

Drawn By: ELD

Designed By: ELD/WPE

Checked By: RMB

Job No: 16017.00 Date: April 2016

North Arrow

NONE

Scale

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Sheet No.:

E-5

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Plot Date: 5/3/2016

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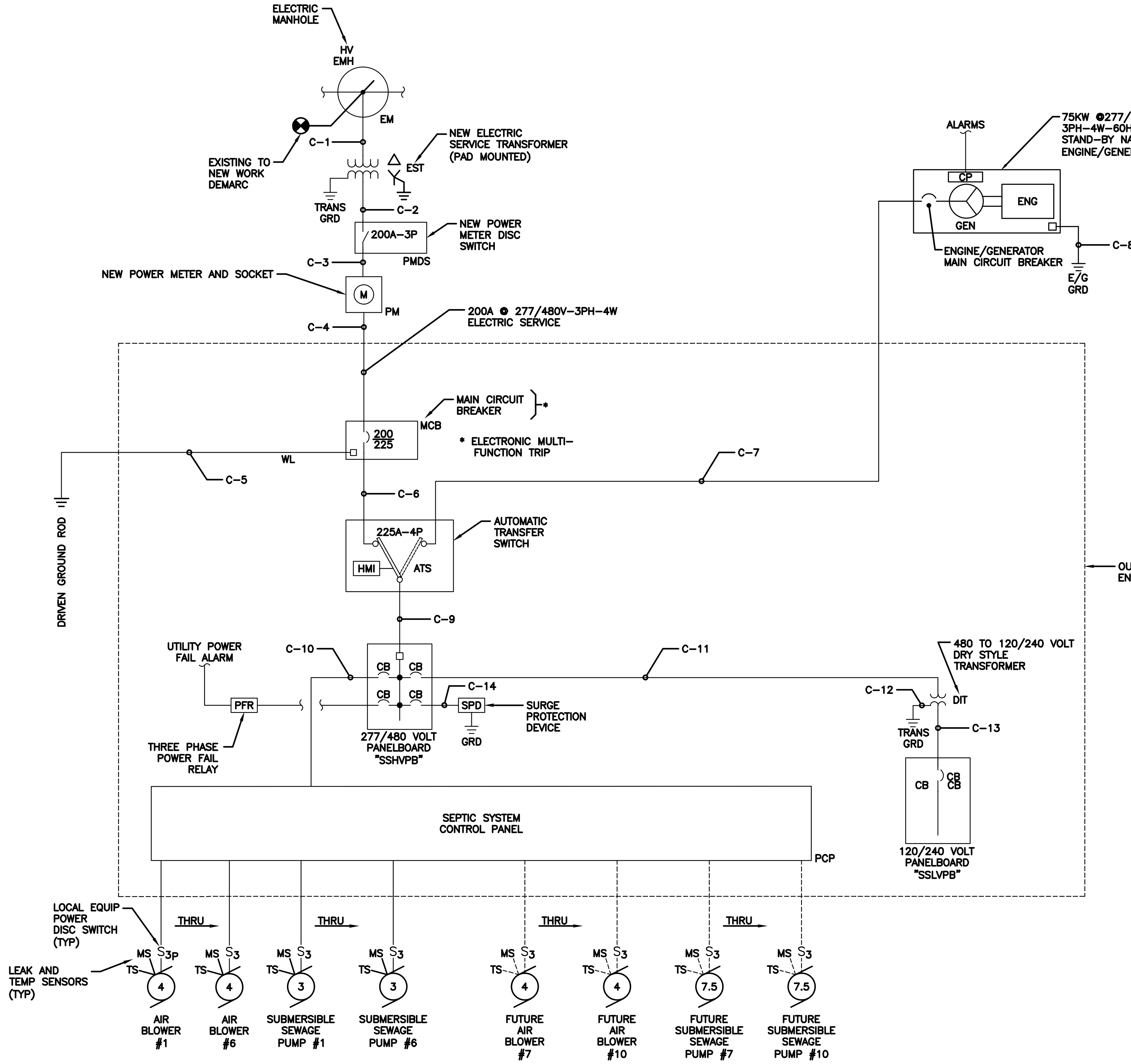
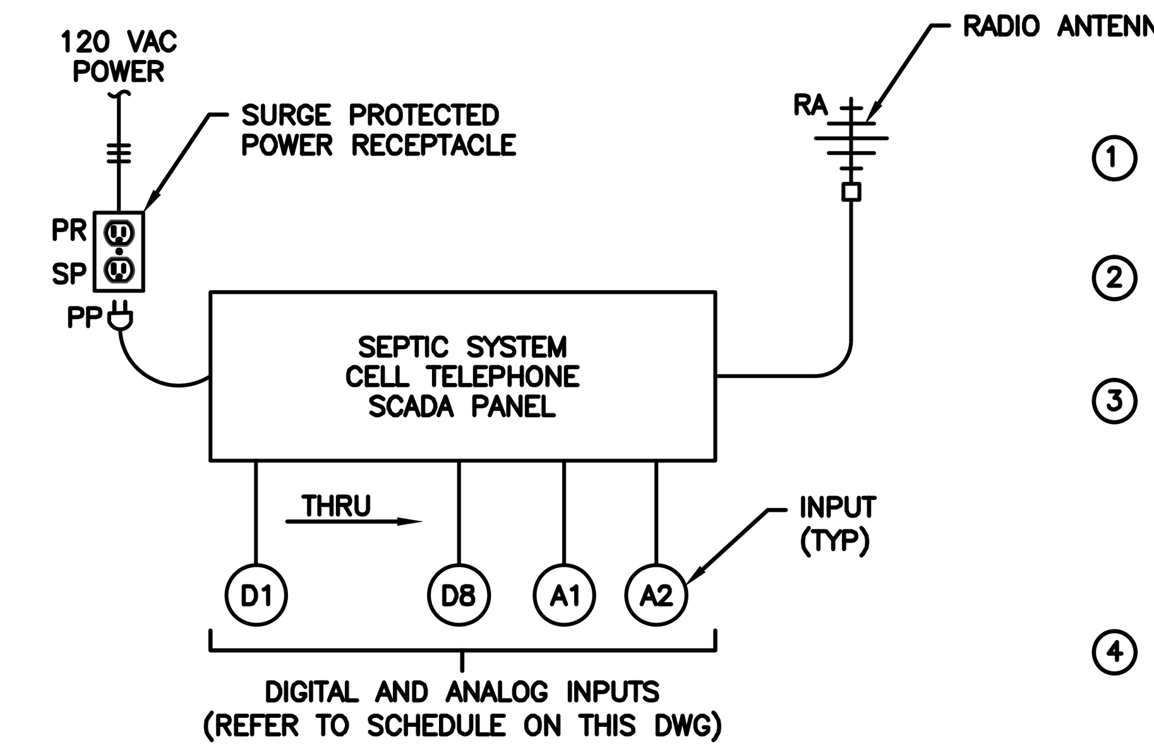


SEPTIC SYSTEM
ELECTRICAL POWER DISTRIBUTION
SYSTEM RISER DIAGRAM
NOT TO SCALE



SEPTIC SYSTEM
ELECTRICAL CELL TELEPHONE
SYSTEM RISER DIAGRAM
NOT TO SCALE

SEPTIC SYSTEM ELECTRICAL CELL TELEPHONE SYSTEM RISER DIAGRAM NOTES

1. EC SHALL FURNISH/INSTALL THE NEW CELL TELEPHONE PANEL, RADIO ANTENNA AND ASSOCIATED WIRING.
2. FOR THE CELL TELEPHONE PANEL INPUTS (ANALOG AND DIGITAL), REFER TO THE I/O'S SCHEDULE.
3. THE PANEL INCLUDING ITS FIRST YEAR MONITORING (CELL TELE SERVICE AND UL MONITORING) SHALL BE FURNISHED BY MISSION COMMUNICATIONS. THE CONTROL PANEL SHALL BE A MODEL "M-800" WITH A REMOTE CELL TELE ANTENNA. THE PANEL IS AVAILABLE FROM HAYES PUMP INC, CONCORD, MASS.
4. THE EC WILL PROVIDE TECH ASSISTANCE TO THE OWNER ON COORDINATING THE ALARMS NOTIFICATIONS AND THE MONTHLY SEPTIC FLOWS REPORTS WITH THE PANEL MANUFACTURER.
5. THE PANEL WORK INCLUDES ALL STARTUP AND FIELD TESTING PLUS DEMONSTRATION/TRAINING TO THE OWNER.
6. EC SHALL NOT RELEASE THE NEW ELEC EQUIP AND/OR ROUGH WIRE UNTIL THE EC COORDINATES WITH THE POWER UTILITY COMPANY AND THE "AS SUPPLIED" SEPTIC SYSTEM EQUIP INCLUDING ITS CONTROL PANEL.

SEPTIC SYSTEM CELL TELEPHONE RADIO PANEL INPUTS LIST

AI-1	SEPTIC FLOW METER
AI-2	SPARE
DI-1	SEPTIC SYSTEM FAIL
DI-2	UTILITY POWER FAIL
DI-3	ENGINE/GENERATOR FAIL
DI-4	FLOW METER FLOOD
DI-5	DOSING TANK FLOOD
DI-6	SPARE
DI-7	SPARE
DI-8	SPARE

SEPTIC SYSTEM ENGINE/GENERATOR SYSTEM LOADS STARTING SCHEDULE

LOAD STEPS	LOADS DESCRIPTION	KVA/HP	KW
STEP # 1	MISCELLANEOUS (RCPTS CTLS, HTR, ETC)	5.0 KVA	4.0 KW
STEP # 2	SEPTIC DOSING PUMP # 1	3 HP	2.9 KW
STEP # 3	SEPTIC DOSING PUMP # 2	7.5 HP	7.2 KW
STEP # 4	AIR BLOWERS # 1 THRU 10	5 HP/EA	47.0 KW

ENG/GEN SYSTEM LOADS STARTING NOTES

1) THE SEPTIC SYSTEM CONTROL PANEL SHALL ONLY ALLOW ONE (1) @ 3 HP SEPTIC DOSING PUMP TO RUN AT THE SAME TIME.
2) THE SEPTIC SYSTEM CONTROL PANEL SHALL ONLY ALLOW ONE (1) @ 7.5 HP SEPTIC DOSING PUMP TO RUN AT THE SAME TIME.
3) THE SEPTIC SYSTEM AIR BLOWERS WILL ALL START AT THE SAME TIME.
4) THE ENG/GEN SUPPLIER SHALL SUBMIT THEIR VOLTAGE STARTING CALCULATIONS WHICH VERIFIES THEIR PROPOSED NATURAL GAS ENGINE/GENARATOR SHALL START THE LISTED ENG/GEN LOADS WITH A MAXIUM STARTING VOLTAGE LOSS OF MINUS 25%.

SEPTIC SYSTEM ELECTRICAL POWER DISTRIBUTION SYSTEM RISER DIAGRAM NOTES

1. EC SHALL FURNISH/INSTALL THE NEW POWER DISTRIBUTION AND STANDBY POWER ENG/GEN PLUS ITS ASSOCIATED WIRING.
2. EC SHALL CONTACT THE POWER UTILITY COMPANY AS SOON AS POSSIBLE AFTER CONTRACT AWARD TO OBTAIN THE NEW ELECTRIC SERVICE. NOTE, THERE IS A NEW WORK ORDER OPEN. BETA GROUP CAN PROVIDE ASSISTANCE
3. EC'S WORK INCLUDES AN OUTDOOR ELECTRICAL EQUIPMENT ENCLOSURE WHICH MUST BE SIZED FOR THE NEW "AS SUPPLIED" ELECTRICAL EQUIP.
4. EC SHALL PROVIDE COMPLETE NAMEPLATES FOR ALL OF THE ELECTRICAL EQUIPMENT.
5. EC SHALL PROVIDE GENERAL WARNING LABELS, FOR NEC "ELECTRICAL SHOCK" AND NFPA "ARC FLASH HAZARDS".
6. EC SHALL NOT RELEASE THE NEW ELEC EQUIP AND/OR ROUGH WIRE UNTIL THE EC COORDINATES WITH THE POWER UTILITY COMPANY AND THE "AS SUPPLIED" SEPTIC SYSTEM EQUIP INCLUDING ITS CONTROL PANEL.

ELECTRICAL DRAWINGS REFERENCE NOTES

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2) FOR SITE PLAN AND DETAILS, REFER TO DWGS # E-2 THRU E-5
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Project
Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title
ELECTRICAL RISER DIAGRAM

Revisions

No.	Description	Date

File: 1601700 E6.DWG
Drawn By: ELD
Designed By: ELD/WPE
Checked By: RMB
Job No: 16017.00 Date: April 2016

North Arrow
NONE

Scale
NONE
UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

Sheet No.:
E-6

Plot Date: 5/3/2016

SEPTIC SYSTEM PANELBOARD "SS HVHP" SCHEDULE
277/480V – 225A – 3PH – 4W – 25KAIC – 20P

SURFACE MOUNTED : MAIN LUGS ONLY

POLE NO.	LOAD	KVA	CB	POLE NO.	LOAD	KVA	CB
1	SEPTIC SYSTEM CONTROL PANEL	100.0	200A– 3P	2	SURGE PROTECTION DEVICE	0.1	60A – 3P
3				4	* * * * *		
5	* * * * * * *			6	* * * * *		
7	POWER FAILURE RELAY	0.1	20A – 3P	8	SPARE		200A – 3P
9	* * * * * *			10	* *		
11	* * * * * *			12	* *		
13	TRANSFORMER "DTT"	8.4	30A – 2P	14	SPARE		30A – 3P
15	(120/208V PANELBOARD "LP")			16	* *		
17				18	* *		
19	SPACE		1P	20	SPACE		1P

TOTAL CONNECTED LOAD "KVA" = 108.6

PANELBOARD "SS HVPB" SCHEDULE NOTES –

1) PANELBOARD SHALL BE FURNISHED WITH SIDE PIANO HINGE, GROUND BUS, TYPED CIRCUITS DIRECTORY, ENGRAVED PLASTIC NAMEPLATE AND NEC SHOCK/OSHA ARC FLASH WARNING LABELS.
2) COORDINATE THE PANELBOARD BRANCH CIRCUITS WITH THE "AS SUPPLIED" SPS PUMP STATION ELECTRICAL EQUIPMENT PRIOR TO RELEASE AND WIRING.
3) BRANCH CIRCUITS SHALL BE NOTED AS "A" CIRCUITS.

SEPTIC SYSTEM PANELBOARD "SS LVPB" SCHEDULE
120 / 240V – 100A – 1PH – 3W – 10KAIC – 20P

SURFACE MOUNTED : 60AT / 100AF MCB

POLE NO.	LOAD	KVA	CB	POLE NO.	LOAD	KVA	CB
1	CELL TELE RADIO PANEL	0.4	20A	2	ENG / GEN BLOCK HEATER	3.0	20A– 2P
3	ELEC ENCLOSURE HEATERS	1.0	20A	4	* * * * * *		
5	ELEC ENCLOSURE EXHAUST FAN	0.5	20A	6	ENG / GEN BATTERY CHARGER	1.0	20A
7	FLOW METER MH SUMP PUMP	0.8	20A	8	SEPTIC FLOW METER	0.1	20A
9	SPARE		30A –	10	ELEC ENCLOSURE RECEPTACLES	0.8	20A
11	* *		2P	12	ELEC ENCLOSURE RECEPTACLES	0.8	20A
13	SPARE		30A	14	SPARE		20A
15	SPARE		20A	16	SPARE		20A
17	SPACE		1P	18	SPACE		1P
19	SPACE		1P	20	SPACE		1P

TOTAL CONNECTED LOAD "KVA" = 8.4

PANELBOARD "SS LVPB" SCHEDULE NOTES –

1) PANELBOARD SHALL BE FURNISHED WITH SIDE PIANO HINGE, GROUND BUS, TYPED CIRCUITS DIRECTORY, ENGRAVED PLASTIC NAMEPLATE AND NEC SHOCK/OSHA ARC FLASH WARNING LABELS.
2) COORDINATE THE PANELBOARD BRANCH CIRCUITS WITH THE "AS SUPPLIED" SPS PUMP STATION ELECTRICAL EQUIPMENT PRIOR TO RELEASE AND WIRING.
3) BRANCH CIRCUITS SHALL BE NOTED AS "B" CIRCUITS.

SEPTIC SYSTEM UPGRADE
DRY TYPE TRANSFORMER SCHEDULE

TAG NO	KVA SIZE	PRIMARY VOLTS	SECONDARY VOLTS	PHASE NO	WIRE NO	TYPE NO	EQUIPMENT SERVED
DTT	9	480	120/240	1	3	1	120/208 VOLT PNLBD "SS LV PB"

TRANSFORMER TYPE :

1) VENTILATED 115 DEGREE C RISE STANDARD EFFICIENCY WHICH MEETS FEDERAL AND MASS STATE EFFICIENCY STANDARDS.

LUTHERAN NURSING HOME SEPTIC SYSTEM UPGRADE
CONDUIT AND WIRE SCHEDULE

CONDUIT NUMBER "C–"	CONDUIT SIZE	NO. OF WIRES	WIRE SIZE (#/MCM)	FROM	TO	COMMENTS
C – 1	5.0"	SEE	NOTE # 1	ELECTRIC HV MANHOLE	ELECTRIC SERVICE TRANSFORMER	HV ELECTRIC SERVICE
C – 2	2.0"	4	3 / 0	ELECTRIC SERVICE TRANSFORMER	POWER METER POWER DISC SWITCH	LV ELECTRIC SERVICE
C – 3	2.0"	4 1	3 / 0 6	POWER METER POWER DISC SWITCH	POWER UTILITY METER AND SOCKET	480V POWER GROUND
C – 4	2.0"	4 1	3 / 0 6	POWER UTILITY METER AND SOCKET	MAIN POWER CIRCUIT BREAKER	480V POWER GROUND
C – 5	1.0"	1	6	MAIN POWER CIRCUIT BREAKER	DRIVEN GROUND ROD	ELECTRIC SERVICE GROUND
C – 6	2.0"	4 1	3 / 0 6	MAIN POWER CIRCUIT BREAKER	AUTOMATIC TRANSFER SWITCH	480V POWER GROUND
C – 7	2.0"	4 1	2 / 0 6	AUTOMATIC TRANSFER SWITCH	ENG/GEN MAIN PWR CIRCUIT BREAKER	480V POWER GROUND
C – 8	1.0"	1	6	ENG/GEN MAIN PWR CIRCUIT BREAKER	DRIVEN GROUND ROD	ENG/GEN GROUND
C – 9	2.0"	4 1	3 / 0 6	AUTOMATIC TRANSFER SWITCH	PANELBOARD "SS HV PB"	480V POWER GROUND
C – 10	2.0"	3 1	3 / 0 6	PANELBOARD "SS HV PB"	SEPTIC SYSTEM CONTROL PANEL	480V POWER GROUND
C – 11	1.5"	4 1	8 8	PANELBOARD "SS HV PB"	SURGE PROTECTION DEVICE	POWER GROUND
C – 12	2.0"	6 1 8	10 10 14	E/G PWR & CTLS TERMINAL PANEL	OUTDOOR ELEC ENCL PWR/CTLS JUNCT BOX	E/G CKTS GROUND CONTROL & ALARM
C – 13	0.75"	2 1	12 12	E/G CONTROL PANEL	E/G PWR & CTLS TERMINAL PANEL	MO DAMPERS PWR GROUND
C – 14	1.0"	6 1	10 10	OUTDDOOR ELEC ENCL PWR/CTLS JUNCT BOX	PANELBOARD "SSLVPB"	E/G CKTS GROUND
C – 15	0.75"	4	14	OUTDOOR ELEC ENCL PWR/CTLS JUNCT BOX	AUTOMATIC TRANSFER SWITCH	E/G CONTROL
C – 16	0.75"	4	14	OUTDOOR ELEC ENCL PWR/CTLS JUNCT BOX	CELL TELE RADIO CONTROL PANEL	E/G FAIL ALARM
C – 17	1.0"	8	14	SEPTIC SYSTEM CONTROL PANEL	CELL TELE RADIO CONTROL PANEL	SEPTIC SYSTEM ALARMS
C – 18	1.0"	SEE	NOTE # 4	CELL TELE RADIO CONTROL PANEL	CELL TELE RADIO ANTENNA	CELL TELE RADIO SIGNALS
C – 19	2.0"	9 1 2 ❶ 12/C	10 10 14	DOSING PUMPS TERMINAL PANEL	SEPTIC SYSTEM CONTROL PANEL	PUMPS POWER GROUND CONTROLS
C – 20	2.0"	1 ❶ 12/C	14	DOSING FLOAT SWS TERMINAL PANEL	SEPTIC SYSTEM CONTROL PANEL	PUMPS CONTROS
C – 21	2.0"	EMPTY	W/ PULL STRING	FUT DOSING PUMPS TERMINAL PANEL	SEPTIC SYSTEM CONTROL PANEL	FUTURE CONDUIT
C – 22	2.0"	EMPTY	W/ PULL STRING	FUT DOSING FLOAT SWS TERMINAL PANEL	SEPTIC SYSTEM CONTROL PANEL	FUTURE CONDUIT
C – 23	2.0"	6 1 2 ❶ 12/C	10 10 14	AIR BLOWERS # 1 & 2 EQUIP ENCLOSURE	SEPTIC SYSTEM CONTROL PANEL	POWER GROUND CONTROLS
C – 24	2.0"	2 ❶ 2/C	16 SH	AIR BLOWERS # 1 & 2 EQUIP ENCLOSURE	SEPTIC SYSTEM CONTROL PANEL	AIR PRESSURE SIGNAL
C – 25	2.0"	6 1 2 ❶ 12/C	10 10 14	AIR BLOWERS # 3 & 4 EQUIP ENCLOSURE	SEPTIC SYSTEM CONTROL PANEL	POWER GROUND CONTROLS
C – 26	2.0"	2 ❶ 2/C	16 SH	AIR BLOWERS # 3 & 4 EQUIP ENCLOSURE	SEPTIC SYSTEM CONTROL PANEL	AIR PRESSURE SIGNALS
C – 27	2.0"	6 1 2 ❶ 12/C	10 10 14	AIR BLOWERS # 5 & 6 EQUIP ENCLOSURE	SEPTIC SYSTEM CONTROL PANEL	POWER GROUND CONTROLS
C – 28	2.0"	2 ❶ 2/C	16 SH	AIR BLOWERS # 5 & 6 EQUIP ENCLOSURE	SEPTIC SYSTEM CONTROL PANEL	AIR PRESSURE SIGNALS

LUTHERAN NURSING HOME SEPTIC SYSTEM UPGRADE
CONDUIT AND WIRE SCHEDULE

CONDUIT NUMBER "C–"	CONDUIT SIZE	NO. OF WIRES	WIRE SIZE (#/MCM)	FROM	TO	COMMENTS
C – 29	2.0"	EMPTY	W/ PULL STRING	FUTURE AIR BLOWERS # 7 & 8	SEPTIC SYSTEM CONTROL PANEL	FUTURE PWR FUTURE GRD FUTURE CTLS
C – 30	2.0"	EMPTY	W/ PULL STRING	FUTURE AIR BLOWERS # 7 & 8	SEPTIC SYSTEM CONTROL PANEL	FUTURE AIR PRES SIGNALS
C – 31	2.0"	EMPTY	W/ PULL STRING	FUTURE AIR BLOWERS # 9 & 10	SEPTIC SYSTEM CONTROL PANEL	FUTURE PWR FUTURE GRD FUTURE CTLS
C – 32	2.0"	EMPTY	W/ PULL STRING	FUTURE AIR BLOWERS # 9 & 10	SEPTIC SYSTEM CONTROL PANEL	FUTURE AIR PRES SIGNALS
C – 33	1.0"	2 1	12 12	SEPTIC FLOW TRANSMITTER	PANELBOARD "SS LVPB"	POWER GROUND
C – 34	1.0"	1 ❶ 2/C	16 SH	SEPTIC FLOW TRANSMITTER	CELL TELE RADIO CONTROL PANEL	FLOW SIGNAL
C – 35	2.0"	SEE	NOTE # 3	SEPTIC FLOW SENSOR	SEPTIC FLOW TRANSMITTER	FLOW SIGNAL
C – 36	1.0"	2 1	12 12	FLOW METER MH SUMP PUMP	PANELBOARD "SS LVPB"	POWER GROUND
C – 37	1.0"	2	14	FLOW METER MH FLOAT SWITCH	CELL TELE RADIO CONTROL PANEL	FLOOD ALARM

CONDUIT & WIRE SCHEDULE NOTES

1) POWER UTILITY COMPANY SHALL FURNISH/INSTALL HV PRIMARY CABLES. EC SHALL FURNISH/INSTALL EMPTY WITH PULLSTRING PRIMARY ELECTRICAL SERVICE CONDUITS.
2) EC SHALL COORDINATE ALL EQUIPMENT "AS SUPPLIED" PRIOR TO ANY ROUGH WIRING OR EQUIPMENT RELEASE.
3) EC SHALL FURNISH/INSTALL LOW VOLTAGE WIRING AS REQUIRED FOR THE I&C FIELD INSTRUMENTS.
4) EC SHALL FURNISH/INSTALL RADIO COAXIAL CABLE AS REQUIRED FOR THE RADIO ANTENNA
5) EC SHALL INSTALL THE SUBMERSIBLE CABLES FURNISHED WITH THE INSTRUMENTS.

ELECTRICAL DRAWINGS REFERENCE NOTES

1) FOR NOTES, SYMBOLS AND ABBREVIATIONS, REFER TO DWG # E–1
2) FOR SITE PLAN AND DETAILS, REFER TO DWGS # E–2 THRU E–5
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Client:

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990 Main Street North
Southbury, CT 06488

Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

ELECTRICAL SCHEDULES

Revisions

No.	Description	Date

File:

Drawn By: ELD

Designed By: ELD/WPE

Checked By: RMB

Job No: 16017.00 Date: April 2016

North Arrow

NONE

Scale

NONE

Sheet No.:

E-7

Plot Date: 5/3/2016

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LUTHERAN NURSING HOME SEPTIC SYSTEM UPGRADE
ELECTRICAL SYSTEM CONSTRUCTION SPECIFICATIONS

1) SCOPE OF WORK –

THE ELECTRICAL CONTRACTOR (EC) SHALL FURNISH ALL LABOR, MATERIAL, SUPPLIES, EQUIPMENT, TOOLS AND SERVICES NECESSARY FOR AND REASONABLY INCIDENTAL TO COMPLETION OF THE ELECTRICAL WORK AS SPECIFIED AND AS SHOWN ON THE ELECTRICAL DRAWINGS. THE ELECTRICAL SYSTEMS SHALL BE FULLY INSTALLED, ADJUSTED, TESTED AND MADE READY FOR USE BY THE OWNER INCLUDING ELEC O&M AND OWNER TRAINING.

THE SCOPE OF WORK SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING MAJOR ITEMS. IN ADDITION, THE EC SHALL PROVIDE ALL MATERIAL AND WORK IN STRICT REQUIREMENTS WITH THE OWNER'S CONSTRUCTION REQUIREMENTS INCLUDING MEETING THE PROJECT'S SCHEDULE.

A) PROVIDE POWER DISTRIBUTION SYSTEM INCLUDING NEW POWER EQUIPMENT (MAIN CIRCUIT BREAKER, POWER DISCONNECT SWITCHES, POWER SOCKET/METER, DRY TYPE TRANSFORMER, AUTOMATIC TRANSFER SWITCH AND PANELBOARDS WHICH ARE HOUSED IN A PAINTED ALUMINUM OUTDOOR ELEC EQUIPMENT ENCLOSURE.

PROVIDE A "PACKAGED" STANDBY POWER ENGINE/GENERATOR WHICH IS HOUSED IN A PAINTED STEEL OR ALUMINUM "DROP OVER" ENCLOSURE. THE E/G FLUIDS (OIL AND ANTI–FREEZE) MUST ALL BE 100% CONTAINED DUE TO ADJACENT SITE "WET LANDS".

THE ELEC WORK INCLUDES A NEW ELECTRIC POWER UTILITY SERVICE. IT SHALL BE OBTAINED VIA A HIGH VOLTAGE "TAP" FROM THE EXISTING NURSING BUILDINGS HV ELECTRIC SERVICE.MANHOLE. THE EC'S WORK INCLUDES CONTACTING THE POWER AND GAS UTILITY COMPANIES (AS SOON AS POSSIBLE AFTER CONTRACT AWARD) IN ORDER TO OBTAIN POWER AND ENGINE/GENERATOR NATURAL GAS UTILITY SERVICES. NOTE, THERE ARE VARIATIONS ON THE ENG/GEN NG FUEL SUPPLY "FLOW" AND "PRESSURE" REQUIREMENTS. EC SHALL COORDINATE ACCORDING.

THE GENERAL CONTRACTOR SHALL SUB–CONTRACT WITH A CT LICENSED PLUMBER IN ORDER TO FURNISH/INSTALL THE E/G PLUMBING WORK. THE E/G PLUMBING WORK INCLUDES PAINTED BLACK IRON GAS PIPING, ISOLATION VALVES, FLEXIBLE PIPING, REDUCERS, ETC. THE PLUMBING WORK MUST BE COORDINATED WITH THE "AS SUPPLIED" ENGINE/GENERATOR.

THE EXISTING SEWAGE PUMPS, CONTROL PANEL AND WIRING SHALL BE FIELD SURVEYED BY THE EC AS PART OF THE DEMO AND REPLACEMENT OF THE PUMPS. THE GC'S NEW SEWAGE PUMPS SUPPLIER WORK INCLUDES REVISING THE EXIST–TING SEWAGE PUMPS CONTROL PANEL AS REQUIRED FOR THE NEW PUMPS. THE PUMPS MUST BE REPLACED ONE AT TIME WITH START–UP/FIELD TESTING TO VERIFY PROPER OPERATION PRIOR TO THE REPLACEMENT OF THE NEXT PUMP.

THE ELEC WORK INCLUDES TEMPORARY CONSTRUCTION POWER AND WIRING AS REQUIRED. THE EC AND GC SHALL COORDINATE SINCE A PORTABLE TEMP E/G MAY BE REQUIRED.

ALL NEW POWER COMPANY SERVICE AND METERING SHALL BE IN STRICT ACCORDANCE WITH THE POWER COMPANY REQUIREMENT. EC'S WORK INCLUDES ALL NECESSARY POWER COMPANY PLANS REVIEW, COORDINATION, ETC PRIOR TO ANY ELECTRICAL EQUIPMENT RELEASE AND CONSTRUCTION OF ANY ELECTRICAL SYSTEMS INCLUDING MATERIAL RELEASE AND ROUGH WIRING. THE ENGINEER HAS STARTED A POWER COMPANY WORK ORDER HOWEVER NO SITE MEETINGS HAVE BEEN ATTENDED.

EC SHALL NOTE THE ELECTRICAL EQUIPMENT CAN BE AFFECTED BY THE "AS SUPPLIED" WASTEWATER PROCESS EQUIPMENT. EC'S WORK INCLUDES ALL REQUIRED COORDINATION WITH THE "AS SUPPLIED" PROCESS EQUIPMENT PRIOR TO ANY ELEC EQUIPMENT RELEASE AND/OR ROUGH WIRING. ANY MISS WORK COORDINATION SHALL BE COMPLETED BY THE CONTRACTOR(S) AT NO ADDITIONAL COSTS TO THE OWNER.

B) PROVIDE STANDBY POWER ENGINE/GENERATOR INCLUDING WEATHER–PROOF SOUND ATTENUATED (CT STATE NOISE COMPLIANT) ENG/GEN ENCLOSURE. ENG/GEN SHALL BE SUPPLIED COMPLETE WITH ALL REQUIRED COMPONENTS (IE – BATTERY CHARGER, EXHAUST SYSTEM, M.O. DAMPERS, ETC.) HOWEVER, THE GENERAL CONTRACTOR SHALL UNLOAD, SET–PLACE/ANCHOR, ETC INCLUDING FURNISHING THE CONCRETE SUPPORT PAD. THE MECHANICAL PLUMBING CONTRACTOR SHALL FURNISH/INSTALL THE ENG/GEN NATURAL GAS SUPPLY PIPING, SHUT–OFF VALVE, ETC WHICH COORDINATES WITH THE "AS SUPPLIED" ENG/GEN.

C) INSTALL/WIRE THE SEPTIC SYSTEM CONTROL PANEL WHICH ALSO INCLUDES EQUIPMENT MOTOR CONTROLLERS. THE PANEL IS FURNISHED BY THE GC AS PART OF THE SEPTIC EQUIPMENT. EC'S WORK INCLUDES ALL PANEL FIELD WIRING PLUS COORDINATION.

D) FURNISH/INSTALL CELLULAR TELEPHONE RADIO ALARMS PANEL. THE PANEL WORK INCLUDES THE FIRST YEAR CELL TELE SERVICE PLUS REMOTE CENTRAL STATION MONITORING. THE PANEL SHALL BE MANUFACTURED BY MISSION COMMUNICATIONS INC. FOR DETAILS, WIRING DIAGRAM AND ZONES SCHEDULE,REFER TO THE ELECTRICAL DRAWINGS.

E) FURNISH/INSTALL "GFI" MAINTENANCE RECEPTACLES AND OTHER WIRING DEVICES INCLUDING NECESSARY NEW BRANCH WIRING. THE WORK ALSO INCLUDES ELECTRIC HEATERS AND COOLING EXHAUST FAN WITH COOLING THERMOSTAT IN THE ELECTRICAL EQUIPMENT OUTDOOR ENCLOSURE.

F) INSTALL/WIRE THE SEPTIC FLOW TRANSMITTER WHICH IS FURNISHED BY THE GENERAL CONTRACTOR. ALSO FIELD WIRE THE FLOW SENSOR WHICH IS FURNISHED AND INSTALLED BY THE GENERAL CONTRACTOR. THE SENSOR FIELD WIRING MUST BE WATER–PROOF VIA THE "POTTING" KIT PROVIDED WITH THE FLOW SENSOR.

2) CODE REQUIREMENTS –

THE ENTIRE ELECTRICAL INSTALLATION SHALL BE SUPPLIED AND INSTALLED IN STRICT ACCORDANCE WITH ALL APPLICABLE CT STATE AND LOCAL BUILDING/ELECTRICAL CODES, LAWS, ORDINANCES AND INSURANCE REQUIREMENTS. ALL NEW WORK SHALL BE COORDINATED WITH THE LOCAL BLDG/ELEC/MECH INSPECTORS PRIOR TO RELEASE AND INSTALLATION. NOTE, PER THE PROCESS ENGINEER (BETA GROUP) THE SEPTIC SYSTEM TANKS ARE NOT CONSIDERED AN NEC HAZARDOUS NEMA "7" ENVIRONMENT. THE TANKS EQUIPMENT AND WIRING SHALL BE RATED FOR A NEMA "4X" ENVIRONMENT WITH ALL TYPE 316 STAINLESS STEEL HARDWARE AND PVC CONDUITS.

3) INTERPRETATION OF DRAWINGS –

THE DRAWINGS ARE DIAGRAMMATIC ONLY AND ARE NOT INTENDED TO SHOW THE EXACT LOCATIONS OF NEW OR EXISTING UTILITIES AND ARE SUBJECT TO FIELD INSTALLATION ADJUSTMENTS AT THE TIME OF INSTALLATION BY THE ELECTRICAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL BE HELD ACCOUNTABLE TO VERIFY WITH THE PROCESS ENGINEER, THE EXACT LOCATIONS OF EXISTING UTILITIES AND NEW WORK PRIOR TO ITS ACTUAL INSTALLATION.

ANY WORK INSTALLED CONTRARY TO OR WITHOUT SUCH APPROVAL BY THE ENGINEER SHALL BE SUBJECT TO CHANGE AS DIRECTED BY THE AE. NO ADDITIONAL COMPENSATION WILL BE ALLOWED TO THE ELECTRICAL CONTRACTOR FOR ANY POOR COORDINATION.

4) FIELD SURVEYS –

THE CONTRACTORS SHALL FIELD DETAIL SURVEY THE EXISTING/AFFECTED BUILDING AND SITE EQUIPMENT, WIRING, PIPING, ETC. NOTE, THERE ARE SOME EXISITNG ENGINEERING DRAWINGS WHICH ARE NOT "AS BUILT". FOR THE EXISTING UNDERGROUND PIPING AND WIRING, THE CONTRACTORS SHALL CONTACT "DIG SAFE" WHO CAN "MARK OUT" ANY KNOWN SITE WIRING AND PIPING.

5) EXAMINATION OF PREMISES –

THE ELECTRICAL CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING THE BID AND FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR EXTRA WORK REQUIRED DUE TO THE LACK OF KNOWLEDGE OF THE EXISTING BUILDING/SITE CONDITIONS.

6) COOPERATIONS –

THE ELECTRICAL CONTRACTOR SHALL COOPERATE WITH ANY OTHER CONTRACTORS THAT MAY BE ON THE SITE. ANY CONFLICTING CONDITIONS SHALL BE CALLED TO THE ATTENTION OF THE ENGINEER. EC'S WORK INCLUDES ALL NECESSARY COORDINATION WORK WITH THE "AS SUPPLIED" WASTEWATER PROCESS EQUIPMENT AND INSTRUMENTATION/CONTROL EQUIPMENT.

7) QUALITY OF WORKMANSHIP –

THE WORKMANSHIP OF THE ENTIRE ELECTRICAL INSTALLATION SHALL BE FIRST CLASS IN EVERY RESPECT AND ONLY COMPETENT AND EXPERIENCED LICENSED LABOR SHALL BE ALLOWED ON THE JOB. THE ENGINEER RESERVES THE RIGHT TO REQUEST THE DISMISSAL OF ANY WORKMAN WHOSE WORK AND PERFORMANCE IS NOT SATISFACTORY.

8) GUARANTEE –

THE ELECTRICAL CONTRACTOR SHALL GUARANTEE (PARTS AND LABOR) ALL THE ELECTRICAL MATERIALS AND WORKMANSHIP AGAINST DEFECTS AND FAULTY INSTALLATION FOR A PERIOD OF ONE (1) YEAR STARTING FROM THE DATE OF FINAL ACCEPTANCE OF THE WORK (IN WRITING) BY THE ARCHITECT. THE ELECTRICAL CONTRACTOR SHALL MAKE GOOD AT THEIR EXPENSE ANY DEFECTS IN MATERIAL AND WORKMANSHIP EXCEPT WHERE SUCH IS CAUSED BY ABUSE OR MISUSE BY THE BUILDING MAINTENANCE PERSONNEL.

9) CORING, CUTTING, PATCHING AND SEALING –

THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CORING, CUTTING, PATCHING AND DRILLING AND ALL NECESSARY "U" CHANNEL FOR SUPPORT AND INSTALLATION OF THE ELECTRICAL MATERIAL AND EQUIPMENT. THIS INCLUDES ANY REQUIRED SCAFFOLDING OR SIMILAR EQUIPMENT FOR THE ELECTRICAL WORK INSTALLATION.

IN ADDITION, ALL CONCRETE TANK WALLS SHALL HAVE "LINK–SEAL" TYPE CONDUIT WALL SEALS TO EXCLUDE WATER. ALL MATERIAL SHALL MATCH ITS AREA'S "NEMA" RATING. ALL MATERIAL SHALL BE CORROSION RESISTANT.

10) PERMITS, FEES AND INSPECTIONS –

THE ELECTRICAL CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, INSPECTIONS, LICENSES AND CERTIFICATIONS REQUIRED FOR WORK SPECIFIED OR SHOWN ON THE ELECTRICAL DRAWINGS. NO ELECTRICAL WORK SHALL COMMENCE UNTIL ALL ELECTRICAL CONSTRUCTION IS COORDINATED WITH THE LOCAL CITY ELECTRICAL INSPECTOR. ANY DIFFERING INSPECTOR REQUIREMENTS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR WITHOUT ANY ADDITIONAL COMPENSATION.

ALL ASSOCIATED UTILITY SERVICE BACK–CHARGE COSTS SHALL BE PAID BY THE OWNER AS NO MARK–UP COST CONTRACTOR CHANGE ORDERS OR DIRECTLY PAID BY THE OWNER. THE EC'S WORK INCLUDES ALL REQUIRED UTILITIES COORDINATION WORK IN ORDER TO OBTAIN ANY UTILITY SERVICES BACK CHARGES. UPON DETERMINATION, THE BBEC SHALL PROVIDE AS CONTRACT CHANGE ORDERS TO THE OWNER WITHOUT ANY SUB OR GENERAL CONTRACTOR MARK–UPS FOR REINBURSEMENT BY THE OWNER. THIS ASSUMES NO BACK CHARGES WILL BE KNOWN PRIOR TO BIDDING.

11) COORDINATION –

THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL OF THE ELECTRICAL WIRING WITH THE "AS SUPPLIED" AND "EXISTING" EQUIPMENT. NO WIRING SHALL BE INSTALLED OR EQUIPMENT RELEASED UNTIL THE ELECTRICAL CONTRACTOR HAS VERIFIED THE EXACT REQUIRED POWER AND INTERCONNECTION WIRING. NO ADDITIONAL COMPENSATION SHALL BE PROVIDED FOR COORDINATION CONSTRUCTION PROBLEMS.

12) MATERIAL AND EQUIPMENT –

A) MATERIAL – ALL ELECTRICAL CONSTRUCTION MATERIAL SHALL BE OF THE HIGHEST QUALITY (SPECIFICATION GRADE) AND U.L. LISTED. SUBMIT ALL MATERIAL SHOP DRAWINGS FOR REVIEW AND ACCEPTABILITY TO THE ENGINEER (PRIOR TO ANY INSTALLATION) FOR REVIEW /APPROVAL. ENGINEER'S REVIEWS ARE LIMITED TO ONLY TWO PER ITEM. ADDITIONAL REVIEWS SHALL BE BACK–CHARGED TO THE EC AT THE ENGINEER'S STANDARD HOURLY BILLING RATES AND EXPENSES. ALL PROJECT SHOP DWGS, RFIS, MEMOS, ETC. SHALL BE SENT VIA EMAILS. THE O&M MANUAL SHALL BE SUBMITTED WITH ONE PAPER COPY AND ELECTRONIC MEMORY STICKS.

ANY MATERIAL NOT SUBMITTED AND APPROVED WHICH DOES NOT MEET THE DRAWINGS AND SPECIFICATIONS REQUIREMENTS MAY, AT THE OPTION OF THE ENGINEER, BE REMOVED AND REPLACED BY THE ELECTRICAL CONTRACTOR AT NO ADDITIONAL COST.

B) ELECTRICAL EQUIPMENT – ALL ELECTRICAL DISTRIBUTION EQUIPMENT SHALL BE MANUFACTURED BY THE SAME COMPANY. PANELBOARDS MUST MEET FEDERAL SPEC W–P–115B WITH BOLT–ON CIRCUIT BREAKERS, ALUMINUM BUSSES AND EQUIPMENT GROUND BUS. EC SHALL COORDINATE POWER METERING REQUIREMENTS PRIOR TO RELEASE. ACCEPTABLE MANUFACTURERS ARE GENERAL ELECTRIC CO., CUTLER/HAMMER CORP, SIEMENS CORP OR SQUARE D COMPANY. LOAD CENTERS ARE NOT ACCEPTABLE.

AUTOMATIC TRANSFER SWITCH MUST BE UL LISTED SWITCHED CONTACT TYPE WITH OPEN TRANSITION NEUTRAL POSITION DELAY FOR MOTOR STARTING/STOPPING INCLUDING ENG/GEN EXERCISING, TIME DELAYS, ETC. THE SWITCH SHALL HAVE A PROGRAMMABLE HMI DIGITAL DISPLAY AND KEYPAD FOR BOTH SOURCE MONITORING (IE – VOLTAGE, AMPS, FREQUENCY, ETC), PROGRAMMING AND SWITCH MANUAL OPERATION. AN ENGRAVED PLASTIC NAMEPLATE MUST BE INCLUDED TO ASSIST THE OPERATOR ON MANUAL/AUTOMATIC ATS OPERATION. THE ATS SHALL BE MANUFACTURED BY GE–ZENITH, RUSS ELECTRIC OR ASCO.

MCC SHALL ALSO CONTAIN THE DRY TYPE TRANSFORMER AND LIGHTING/RECEPTACLES PANELBOARD. TRANSFORMER SHALL BE A "TP1" COMPLIANT HIGH EFFICIENCY UNIT.

STANDBY POWER ENGINE/GENERATOR SHALL BE PACKAGED UNIT CONSISTING OF A NATURAL GAS FUELED ENGINE, GENERATOR, CONTROL PANEL AND PAINTED STEEL OR ALUMINUM FACTORY ENCLOSURE WHICH IS BOTH WEATHER–PROOF AND SOUND ATTENUATING INCLUDING ALL REQUIRED MISCELLANEOUS ITEMS (IE – BATTERIES, CHARGER, EXHAUST SYSTEM, GAS TRAIN, M.O. DAMPERS, ETC). THE UNIT SHALL BE LOCATED OUTSIDE AND WITHIN AN ENCLOSURE WHICH CONTAINS ALL OF THE E/G FLUIDS. THE ENG/GEN SHALL BE MANUFACTURED BY KOHLER, CATERPILLAR, CUMMINS OR GENERAC.

THE E/G SHALL HAVE A CT STATE COMPLIANT FUEL/GAS TRAIN INCLUDING SAFETIES, ETC. THE CONTRACTOR MUST COORDINATE THE ENG/GEN FUELD SYSTEM WITH THE GAS UTILITY COMPANY WITH REGARDS TO FLOW AND PRESSURE REQUIREMENTS.

MAIN UTILITY AND ENGINE/GENERATOR CIRCUIT BREAKERS SHALL BE ENCLOSED SERVICE ENTRANCE RATED TYPES WITH GALVANIZED PAINTED STEEL ENCLOSURES WITH LOCKING HANDLES (BOTH ON AND OFF). POWER COMPANY "CURRENT TRANSFORMERS" CABINET SHALL BE NEMA "3R" RATED (SIMILAR TO MAIN BREAKERS) INCLUDING THE POWER METER / SOCKET AND IN CONFORMANCE WITH APPLICABLE POWER UTILITY COMPANY TECHNICAL STANDARDS. IF ALLOWED BY THE POWER COMPANY, THE "CTS" CABINET CAN BE DELETED AND REPLACED WITH A 200 AMPERE AT 277/480 VOLTS POWER SOCKET AND METER.

C) WIRING –
ALL SITE WIRING SHALL BE CONCEALED WITH PVC–40 RACEWAYS. ALL EXPOSED ELEC ENCLOUSRE WIRING SHALL BE "EMT" RACEWAYS INSTALLED EXPOSED. ALL EXPOSED OUTSIDE WIRING SHALL BE RIGID GALVANIZED STEEL. THE TANKS AND FLOW MANHOLE WIRING SHALL BE PVC–40 INSTALLED EXPOSED WITH STAINLESS STEEL HARDWARE.

ALL POWER, CONTROL, ALARM, SIGNAL, ETC WIRING SHALL BE COORDINATED WITH THE "AS SUPPLIED" WASTEWATER PROCESS EQUIPMENT. EC SHALL NOT ROUGH WIRE ANY NEW EQUIPMENT UNTIL THIS SPECIFIED COORDINATION HAS BEEN COMPLETED.

ALL SIGNAL CABLES SHALL BE FURNISHED IN STRICT CONFORMANCE WITH EACH EQUIPMENT SUPPLIER'S TECHNICAL REQUIREMENTS PLUS HAVE 300 VOLT INSULATION. THE CELL RADIO COAXIAL CABLE SHALL BE FURNISHED PER THE PANEL SUPPLIER.

ALL POWER, CONTROL AND ALARM WIRES SHALL BE COPPER WITH TYPE "THHN/THWN" INSULATION RATED 600 VOLTS. ALL WIRING TERMINATIONS IN NEMA "3R" AND "4X" AREAS SHALL BE WATER–PROOF. ALL WIRES SHALL BE COLOR CODED AND HAVE TYPED ALPHA–NUMERIC WIRE TAGS. THE EC SHALL PROVIDE A "AS INSTALLED" POINT TO POINT WIRING DIAGRAM IN THE ELECTRICAL O&M.

D) NAMEPLATES AND PANELBOARD CIRCUIT DIRECTORIES – ALL ELECTRICAL EQUIPMENT (PANELBOARDS, STARTERS, CONTROL STATIONS, SWITCHES, ETC.) SHALL HAVE ENGRAVED PLASTIC NAMEPLATES WITH THE VOLTAGE INDICATED. ALL PANELBOARD BRANCH CIRCUIT DIRECTORIES SHALL BE TYPED.

SPECIAL PURPOSE POWER RECEPTACLES SHALL BE IDENTIFIED WITH SMALL ENGRAVED PLASTIC NAMEPLATES (IE: COPIER).

E) WIRING DEVICES – ALL WIRING DEVICES SHALL BE HEAVY DUTY SPECIFICATION GRADE QUALITY. ALL SWITCHES SHALL BE RATED FOR 20 AMPERES AT 120/277 VAC AND ALL RECEPTACLES SHALL BE 15 AMPERES AT 120VAC. ALL WIRING DEVICES AND FACEPLATES SHALL BE "STAINLESS STEEL". THE TOGGLE TYPE DISCONNECT SWITCHES SHALL BE HORSEPOWER INDUCTIVE LOAD RATED. THE LIGHTING CONTROL SWITCHES SHALL MATCH THE DIMMER SWITCHES. ALL WIRING DEVICES SHALL BE MOUNTED IN STRICT CONFORMANCE WITH ADA HANDICAP MOUNTING HEIGHT REQUIREMENTS.

13) INSTALLATION –

A) WIRING IDENTIFICATION – ALL POWER WIRING SHALL BE COLOR CODED PER ITS VOLTAGE CLASS AND HAVE SELF ADHESIVE NUMERICAL IDENTIFICATION TAGS THAT INDICATE THE PANELBOARD AND BRANCH CIRCUIT NUMBER. ALL FIELD WIRING SHALL HAVE NUMERICAL SELF ADHESIVE IDENTIFICATION AT ALL TERMINATIONS WHICH MATCH THE CONTROL PANELS TERMINAL NUMBERS.

B) JUNCTION BOX IDENTIFICATION – ALL POWER JUNCTION BOXES SHALL HAVE THE VOLTAGE AND PANELBOARD/CIRCUIT NUMBERS OF ITS CONDUCTORS MARKED ON ITS COVER PLATE.

C) POWER WIRING TERMINATIONS – ANY FEEDER TERMINATIONS SHALL BE COMPLETED WITH HIGH COMPRESSION BUTT FACTORY TYPE SPLICES. SPLIT–BOLT TAPED CONNECTORS ARE NOT ACCEPTABLE. ALL LUGS AT THE CONNECTORS AND EQUIPMENT SHALL BE TORQUED TO THE RECOMMENDED PRESSURES.

D) INSPECTIONS – ALL ELECTRICAL WORK AND MATERIAL SHALL BE ROUGH AND FINAL INSPECTED BY THE ENGINEER, PRIOR TO ACCEPTANCE AND PROGRESS PAYMENTS. ALL CIRCUITS AND EQUIPMENT CONTROL/ALARM SHALL BE FIELD DEMONSTRATED BY THE ELECTRICAL CONTRACTOR AND THE ENGINEER TO INDICATE PROPER COORDINATION, WIRING AND OPERATION. WHEN FINISHED THE ELECTRICAL EQUIPMENT SHALL BE FIELD DEMONSTRATED TO THE ENGINEER AND OWNER FOR FINAL ACCEPTANCE AND PAYMENT.

E) WIRING DIAGRAMS – EC SHALL FURNISH AUTO–CAD COMPUTERIZED DRAFTED MOTOR ELEMENTARY AND POINT TO POINT INTERCONNECTION WIRING DIAGRAMS WHICH ARE COORDINATED WITH THE "AS SUPPLIED" EQUIPMENT. ALL WIRING DIAGRAMS MUST INCLUDE FIELD LABELED WIRING IDS AND EQUIPMENT TERMINAL NUMBERS FOR DOCUMENTATION OF THE "AS BUILT" CONDITIONS.

F) START–UP / FIELD TESTING – EC'S WORK INCLUDES ALL REQUIRED EQUIPMENT START–UP AND FIELD TESTING TECHNICAL ASSISTANCE INCLUDING BUT NOT LIMITED TO VOLTAGE, CURRENT, ETC INCLUDING VERIFYING ALL CONTROLS, ALARMS, INTERLOCKS, ETC. THE E/G SHALL BE 100 % LOAD TESTED FOR TWO HOURS PLUS OPERATE THE PROCESS EQUIPMENT FOR TWO HOURS FOR FINAL ACCEPTANCE.

ELECTRICAL DRAWINGS REFERENCE NOTES

1) FOR NOTES, SYMBOLS AND ABBREVIATIONS, REFER TO DWG # E–1

2) FOR SITE PLAN AND DETAILS, REFER TO DWGS # E–2 THRU E–5

3) FOR SYSTEMS RISER DIAGRAMS, REFER TO DWG # E–6

4) FOR SCHEDULES, REFER TO DWG # E–7

5) FOR ELECTRICAL SPECIFICATIONS, REFER TO DWG # E–8

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Project

Lutheran Home of Southbury, CT
On-Site Wastewater Renovation System Improvements & Modifications

Title

ELECTRICAL SPECIFICATIONS

Revisions

No.	Description	Date

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Designed By: ELD/WPE

Checked By: RMB

Job No: 16017.00 Date: April 2016

North Arrow

NONE

Scale

NONE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

Sheet No.:

E-8

Plot Date: 5/3/2016