

WEATHERVANE GOLF ACADEMY

SEPTIC SYSTEM UPGRADE
306 WHITING STREET,
HINGHAM, MA

FOR
OLD DERBY NOMINEE TRUST

OWNER/ APPLICANT

OLD DERBY NOMINEE TRUST
37 DERBY ST, HINGHAM, MA

SEPTIC SYSTEM DESIGN

CHA CONSULTING, INC.
101 ACCORD PARK DRIVE
NORWELL, MA 02360
781-982-5400



LOCUS MAP

SCALE: 1"=300'



DRAWING INDEX:

- S-0 COVER SHEET
- S-1 SEPTIC SYSTEM LAYOUT PLAN
- S-2 DETAILS SHEET
- S-3 DETAILS SHEET
- S-4 DETAILS SHEET
- S-5 DETAILS SHEET

THE CONTRACTOR IS RESPONSIBLE FOR
NOTIFYING THE HINGHAM HEALTH DEPT. TEL.
781-741-1465 FOR INSPECTIONS AS REQUIRED
IN BOARD OF HEALTH SPECIFICATIONS.

THE CONTRACTOR SHALL WORKS
IN ACCORDANCE WITH ALL
TIMES DURING INSTALLATION

NO CHANGE SHALL BE MADE
IN LOCATION OF BUILDING
OR SEWAGE INSTALLATION
UNLESS AUTHORIZED IN
WRITING!

A BOH APPROVED PLAN MUST BE ON
SITE AT ALL TIMES DURING
INSTALLATION

APPROVED
TOWN OF HINGHAM
HEALTH DEPT.

Date: 4/14/15

No.	By	Date
	JPM	11/15/15
	JPM	3/8/15

Submit/ Revision	GC	COMMENTS

Applicant / Owner:
OLD DERBY NOMINEE TRUST
37 DERBY ST, HINGHAM, MA



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101 Accord Park Drive
Norwell, MA 02360
Main: (781) 982-5400 • www.chaconline.com

Design: SZA Drawn: SZA Checked: GC

Project name and address:
WEATHERVANE GOLF ACADEMY
306 WHITING ST, HINGHAM, MA

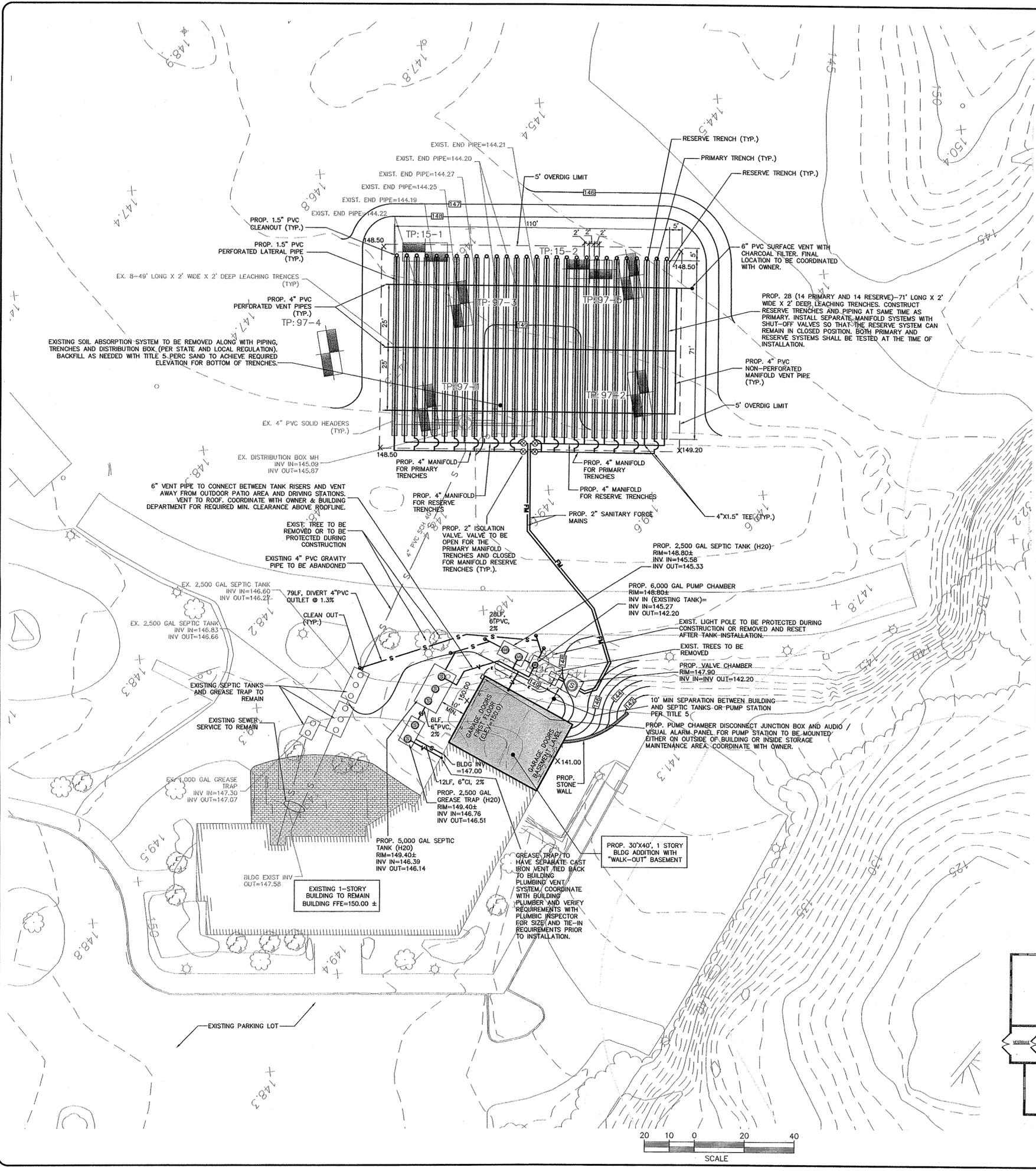
Page name:
COVER SHEET

Issue Date: 12/22/14 Project No: 26-214 Scale: as noted

Sheet number:
S-0

File: G:\CIVIL\26-214 DERBY ST HINGHAM\MAJOR OVERLAY PLAN\DRIVING RANGE\DWG\01 COVER SHEET.DWG
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File: G:\CIVIL\28-214 DERBY ST HINGHAM\MAJOR OVERLAY PLAN\DRIVING RANGE\DWG\01 SITE UTILITY PLAN DRIVING RANGE.DWG
 Saved: 3/6/2015 8:45:08 AM Plotted: 3/6/2015 8:58:38 AM User: Rose, Donald LaatsSveBy: dnr



SEPTIC SYSTEM SIZING INFORMATION

- EXISTING SEPTIC SYSTEM DESIGNED FOR 1,238 GALLONS PER DAY.
- NEW DESIGN FLOW RATE CALCULATED TO BE 3,300 GPD.
- APPLICANT PROPOSES TO MAINTAIN EXISTING SEPTIC GREASE TRAP AND SEPTIC TANKS AS THE EXISTING SEWER PIPE WILL CONTINUE TO SERVE THE BATHROOMS. THERE WILL BE A NEW SERVICE TO ACCOMMODATE THE TAVERN KITCHEN AND THE BALANCE OF THE NEW DESIGN FLOW RATE (2,062 GPD) IS ACCOMMODATED THROUGH NEW SEPTIC TANKAGE AND GREASE TRAP. THE TWO DISCHARGES ULTIMATELY COMBINE IN A NEW LIFT STATION THAT WILL DOSE THE NEW SOIL ABSORPTION SYSTEM.
- NEW SEPTIC TANKS ARE PROPOSED FOR NEW KITCHEN SEWER SERVICE FOR THE DIFFERENCE IN THE DESIGN FLOW OF 3,300 GPD AND THE EXISTING FLOW OF 1,238 GPD, WHICH EQUATES TO 2,062 GPD. FIRST SEPTIC TANK SIZED FOR GREATER THAN 200% OF THE DAILY DESIGN FLOW AT 5,000 GALLONS. SECOND SEPTIC TANK SIZED FOR GREATER THAN ONE TIMES DAILY DESIGN FLOW AT 2,500 GPD.
- GREASE TRAP SIZED IN ACCORDANCE WITH DEP TITLE 5 CRITERIA AT 15 GALLONS PER SEAT. THE SIZE FOR 136 SEATS IS 2,040 GALLONS (MINIMUM). THUS A 2,500 GALLON TANK HAS BEEN SELECTED. AT THE REQUEST OF THE BOARD OF HEALTH, THE FIRST COMPARTMENT HAS BEEN SIZED FOR 40% CAPACITY AND 60% CAPACITY FOR THE SECOND CHAMBER.

DESIGN FLOW RATE COMPUTATION:

- 78 DRIVING STATIONS @3.5 GPD/STATION=273 GPD
- 136 SEATS IN TAVERN/LOUNGE @20 GPD/SEAT=2,720 GPD
- 330 SF OF OFFICE @75 GPD/1,000 SF=25 GPD
- 3 GOLF SIMULATORS @20GPD/SIMULATOR=60 GPD
- 1,185 SF RETAIL SPACE @50 GPD/1,000 SF=60 GPD
- 32 PEOPLE AT SHORT GAME HOLES @3.5 GPD/PERSON=112 GPD

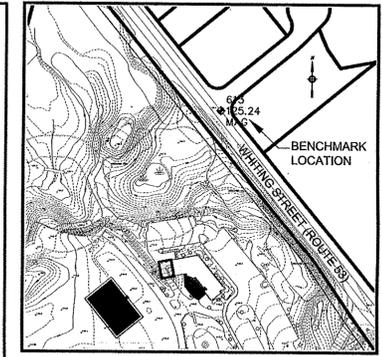
TOTAL 3,250 GPD (ROUND UP TO 3,300 GPD)

SOIL ABSORPTION SYSTEM SIZING INFORMATION:

- DESIGN FLOW = 3,300 GPD
- SAS DESIGN BASED ON ORIGINAL SOIL EVALUATION PERFORMED BY MERRILL CORP. ON 12/24/1997 AND WITNESSED BY NICK LANNEY FOR THE HINGHAM BOARD OF HEALTH AND SUPPLEMENTAL TEST PITS PERFORMED BY CHA CONSULTING ON MARCH 4, 2015 AND WITNESSED BY PAUL BROGNA OF SEACOAST ENGINEERING.
- PER DEP TITLE 5, SECTION 15.242, LOADING RATE FOR CLASS II SOILS IS 15 MIN/INCH=0.56 GPD/SF
- CONTROLLING SEASON HIGH GROUNDWATER ELEVATION IS WITHIN TEST PIT 15-1 WHICH RESULTS IN A SEASON HIGH GROUNDWATER ELEVATION OF 139.3' (GROUND ELEVATION = 148.8 MINUS 7.5 TO SIGHT= 139.3). SINCE SOME PERC TESTS RESULTED IN RATES OF LESS THAN 2 MPI, THE SYSTEM HAS ALSO BEEN DESIGNED TO COMPLY WITH SECTION V1.9 WHICH REQUIRES AT LEAST SIX FEET OF SEPARATION FOR SOILS BETWEEN 2 AND 5 MPI.
- SOIL ABSORBING SYSTEM SHALL UTILIZE LEACHING TRENCHES IN ACCORDANCE WITH SECTION 15.251
- USE 2' WIDE X 2' DEEP TRENCHES SPACED 8' O.C. WITH RESERVE TRENCHES SPACED EVENLY IN BETWEEN.
- REQUIRED AREA = (3,300 GPD) / (0.56 GPD/S.F.) = 5,897 S.F.
- LENGTH OF TRENCHES REQUIRED = 5,897 SF / (6 SF/LF) = 983 FT
- PROVIDE 14 TRENCHES AT 71' LONG = 426 SF PER TRENCH (EACH 2' WIDE X 2' DEEP X 71) 14 X 426 SF = 5,964 SF
- 5,964 SF > 5,897 SF

TOTAL OF 28 TRENCHES, 14 PRIMARY AND 14 RESERVE.

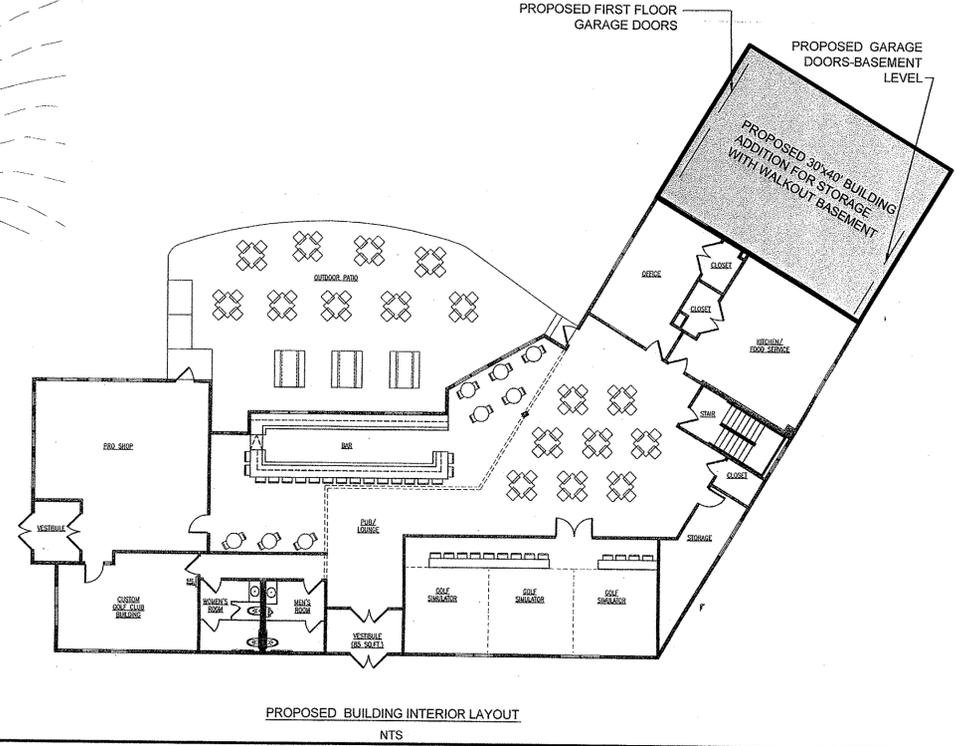
NOTE:
 APPLICANT PROPOSES TO INSTALL BOTH PRIMARY AND RESERVE TRENCHES AND PIPING AT THE SAME TIME. SEPARATE MANIFOLD SYSTEMS WILL BE INSTALLED FOR THE PRIMARY AND RESERVE SYSTEMS. MANIFOLDS WILL BE EQUIPPED WITH VALVES SUCH THAT THE PRIMARY SYSTEM WILL BE OPEN AND ACTIVE AND THE RESERVE SYSTEM CLOSED. BOTH SYSTEMS SHALL BE TESTED AND INSPECTED AT THE TIME OF INSTALLATION. IF AT SOME TIME IN FUTURE, THE RESERVE SYSTEM IS NEEDED, THE APPLICANT (WITH BOARD OF HEALTH APPROVAL) WOULD CLOSE THE PRIMARY VALVES AND OPEN THE RESERVE VALVES.



BENCHMARK:
 MAG NAIL SET IN ASPHALT.
 N: 2894101.785, E: 815755.040
 ELEVATION = 125.24

ELEVATIONS REFER TO NAVD 88.
 COORDINATES REFER TO MASS STATE PLANE GRID

*CONTRACTOR SHALL TRANSFER BENCHMARK ONTO THE PROPERTY WITHIN 50' OF THE SITE PRIOR TO THE START OF CONSTRUCTION.



No.	Submit/Revision	Appr. By	Date
1	RESPONSE TO COMMENTS	JPM	1/10/15
2	RESPONSE TO SEACOAST ENG. COMMENTS	JPM	3/6/15

Applicant / Owner:
OLD DERBY NOMINEE TRUST
 37 DERBY ST, HINGHAM, MA

Professional Engineer
GABRIEL R. CROCKER
 No. 47917
 REGISTERED
 3-6-2015

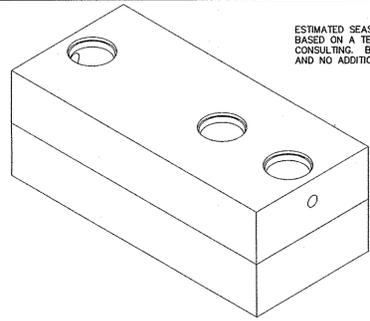
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Designed: SZA
 Drawn: SZA
 Checked: GC

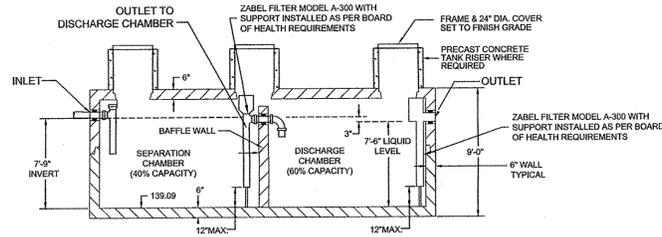
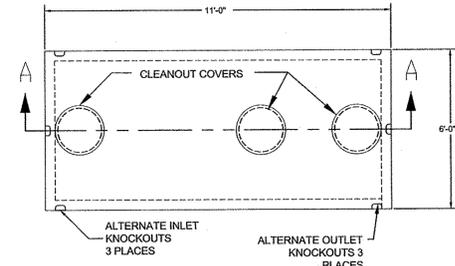
Project name and address:
WEATHERVANE GOLF ACADEMY
 306 WHITING ST, HINGHAM, MA

Page name:
SEPTIC SYSTEM LAYOUT PLAN

Issue Date: 12/22/14 | Project No.: 26-214 | Scale: 1"=20'

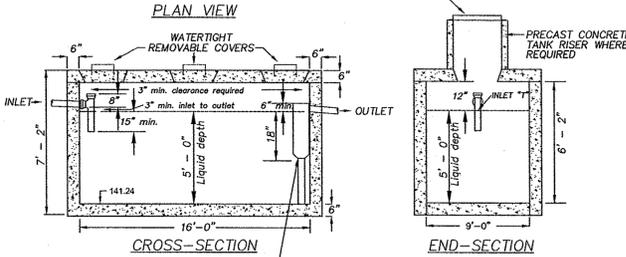
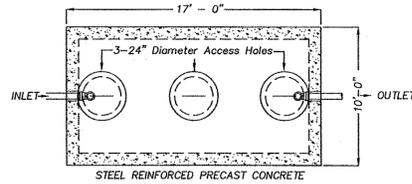


ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION = 139.3
 BASED ON A TEST PIT PERFORMED ON MARCH 4, 2015 BY CHA
 CONSULTING. BUOYANCY CALCULATIONS HAVE BEEN PERFORMED
 AND NO ADDITIONAL BALLAST IS REQUIRED.



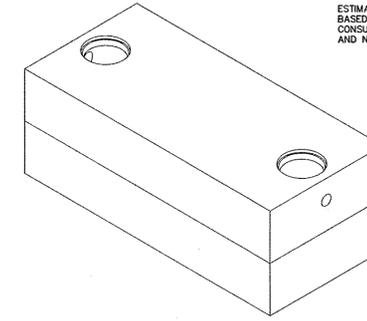
2,500 GAL GREASE TRAP (H-20)

NOT TO SCALE

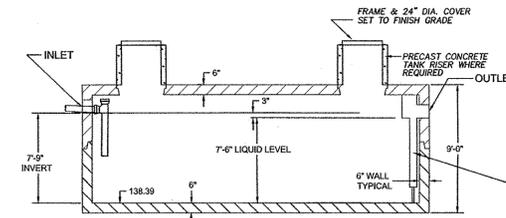
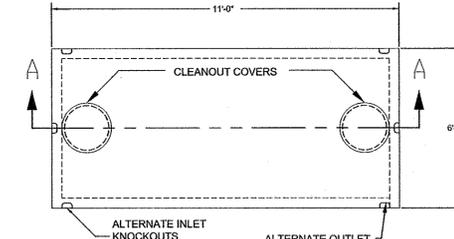


5,000 GALLON SEPTIC TANK (H-20)

NOT TO SCALE

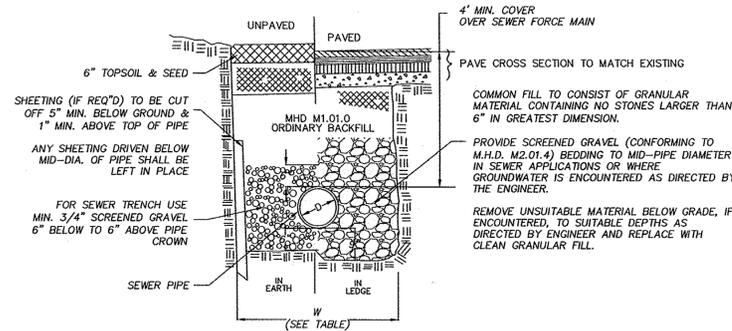


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2,500 SEPTIC TANK (H-20)

NOT TO SCALE



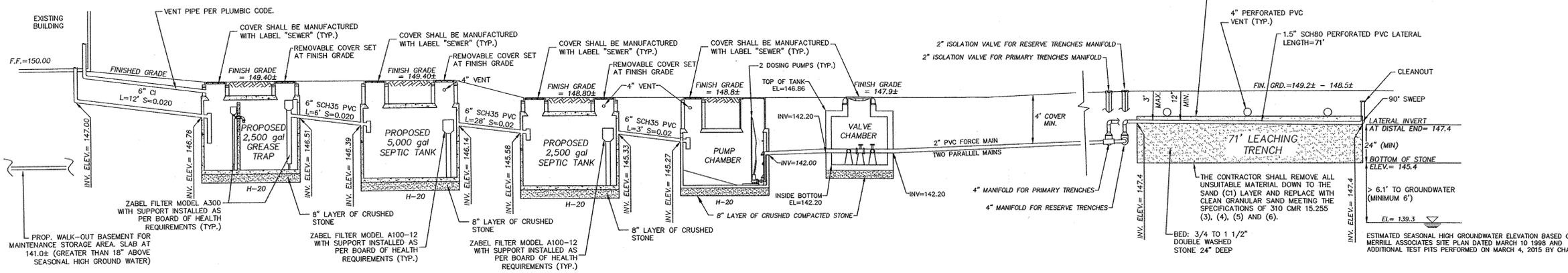
NOTES:

1. ALL TRENCH CONSTRUCTION TO CONFORM TO APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.
2. COMPACT FILL AND TAMP PIPE TO 95% MAX. DRY DENSITY IN 6" LIFTS UNLESS OTHERWISE SPECIFIED.
3. MATERIALS FOR SEWER BEDDING, HAUNCHING, AND BACKFILL TO CONFORM TO CLASSES I, II, OR III AS DESCRIBED IN ASTM D 2321 AND TR-16 GUIDES FOR THE DESIGN OF WASTEWATER TREATMENT WORKS.
4. PROVIDE MINIMUM 4 FT. COVER OVER FORCE MAIN AS MEASURED FROM BOTTOM OF CURB LINE.

TRENCH WIDTH, W		
D	W UNSHEEDED	W SHEEDED
TO 12"	3'	4'
14" TO 24"	4'	5'
30" TO 36"	5'	6'

TYPICAL TRENCH SECTION

NOT TO SCALE



SANITARY SYSTEM PROFILE

NOT TO SCALE

File: G:\VAL\28-214 DERBY ST HINGHAM MA OR LAY PLAN\DRIVING RANGE\DWG\07 DETAIL SHEET.DWG
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No.	Submittal / Revision	App'd	By	Date
1	RESPONSE TO COMMENTS	GC	JPM	1/19/15
2	RESPONSE TO SEACAST ENG. COMMENTS	GC	JPM	3/6/15

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Professional Engineer Seal:
GABRIEL R. CROCKER
 CIVIL
 No. 47917
 REGISTERED
 PROFESSIONAL ENGINEER
 COMMONWEALTH OF MASSACHUSETTS
 3-6-2015

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Project name and address:
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DETAIL SHEET

Project No.: 28-214
 Scale: as noted
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CONSTRUCTION & INSPECTION REQUIREMENTS FOR TANKS

THE FOLLOWING ARE THE MINIMUM INSPECTION AND PERFORMANCE REQUIREMENTS. THESE REQUIREMENTS MAY BE ALTERED AT THE DISCRETION OF THE APPROVING AUTHORITY. INSPECTED MEANS INSPECTED BY THE TOWN HEALTH AGENT OR THEIR CONSULTANT AND THE DESIGN ENGINEER.

GENERAL REQUIREMENTS:

1. AN INSTALLER LICENSED BY THE HEALTH DEPARTMENT SHALL BE ON SITE AT ALL TIMES DURING THE INSTALLATION AND TESTING OF ALL COMPONENTS OF THE WASTEWATER SYSTEM.

2. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF SCHEDULES FOR INSPECTIONS WITH THE HEALTH AGENT AND DESIGN ENGINEER. 24 HOURS ADVANCE NOTICE IS REQUIRED.

3. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL REQUIRED EQUIPMENT AND PERSONNEL ARE ON SITE AS NEEDED TO TEST MECHANICAL SYSTEMS INCLUDING, BUT NOT LIMITED TO ELECTRICIANS AND PLUMBERS.

PRECAST CONCRETE TANKS AND VAULTS:

1. THE BOTTOM EXCAVATION AND GRAVEL BASE MATERIAL IS AS PER THE DESIGN PLAN.

2. WEEP HOLES AND/OR OTHER PENETRATIONS FROM THE MANUFACTURER ARE SEALED.

3. SEAMS ARE SEALED.

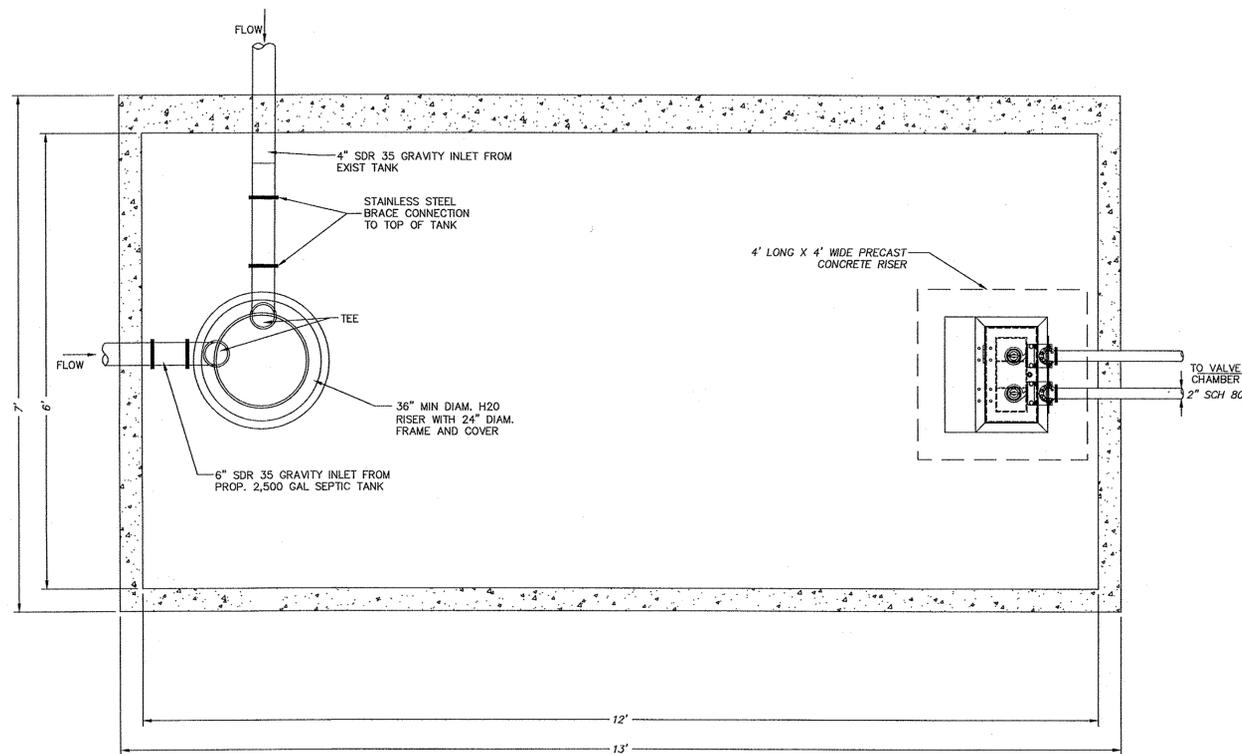
4. A 24 HOUR EXFILTRATION HAS BEEN OBSERVED AND APPROVED.

5. A 24 HOUR INFILTRATION TEST HAS BEEN OBSERVED AND APPROVED (IF APPLICABLE).

6. ACCESS COVERS/HATCHES AND INVERTS ARE AS SHOWN ON THE APPROVED PLANS INCLUDING SIZE AND COVERS SET AT FINISH GRADE WHERE REQUIRED.

7. CONCRETE FOR COMPRESSIVE STRENGTH TO A MINIMUM OF 5,000 PSI AND TO THE DIMENSIONS AS SHOWN ON THE DETAILS AND MANUFACTURED BY SCITUATE RAY PRECAST, OR APPROVED EQUAL.

8. SAFETY NET IS INSTALL WITH STAINLESS STEEL FASTENERS.



LIFT STATION / PUMP CHAMBER PLAN VIEW

PUMP CHAMBER NOTES:

1. PUMP EQUIPMENT SHALL BE DUPLEX SUBMERSIBLE PUMPS AS MANUFACTURED BY FLYGT, OR APPROVED EQUAL. THE UNITS SHALL OPERATE FROM A 240 VOLT, 3 PHASE, 3 WIRE A.C. POWER SOURCE. PUMPS SHALL BE APPROVED BY CHA, BEFORE INSTALLATION. CONTRACTOR TO VERIFY AVAILABLE VOLTAGE AND PHASE POWER PRIOR TO ORDERING PUMPS TO CONFIRM SELECTED PUMPS.

2. PUMP STATION AND VALVE CHAMBER SHALL BE PROVIDED BY THE CONTRACTOR AND SHALL BE STANDARD H2O LOADING, CONSTRUCTED OF REINFORCED CONCRETE FOR COMPRESSIVE STRENGTH TO A MINIMUM OF 5,000 PSI AND TO THE DIMENSIONS AS SHOWN ON THE DETAILS AND MANUFACTURED BY SCITUATE RAY PRECAST, OR APPROVED EQUAL.

3. ALL STEEL REINFORCEMENT SHALL CONFORM TO ASTM A 615-75 GRADE 60 WITH 1" MINIMUM COVER.

4. THE SUBMERSIBLE PUMPS SHALL BE INSTALLED WITH A HYDRAULICALLY SEALED SLIDE COUPLING ARRANGEMENT SO THAT THE PUMPS CAN BE REMOVED FROM THE WET WELL FOR SERVICE AND INSPECTION AND THEN RETURNED TO SERVICE WITHOUT THE WET WELL TO UNBOLT OR UNLOCK THE CONNECTION BETWEEN THE PUMP AND PIPING.

5. CONTRACTOR TO SUBMIT SHOP DRAWINGS TO CHA FOR THE PROPOSED HATCH. DRAWINGS SHALL CONFIRM DIMENSIONS PROPOSED FOR SUITABLE ACCESS TO SERVICE THE PUMPS AND FLOATS.

6. EACH SUBMERSIBLE PUMP SHALL BE EQUIPPED WITH SUFFICIENT POWER CABLE LENGTH WITH EPOXY SEALED HOUSING WITH SECONDARY PRESSURE GROMMET FOR SEALING AND STRAIN RELIEF. ALL INCOMING LEAD WIRES SHALL BE SPLICED IN THE MOTOR TERMINAL HOUSING. NO SPLICING SHALL OCCUR WITHIN THE CHAMBER.

7. THE CONTRACTOR SHALL FURNISH AND INSTALL NON-MERCURY LIQUID LEVEL SENSORS WITH SUFFICIENT LENGTH OF CABLE FOR EACH TANK. SUSPENDED TYPE OF LEVEL SENSORS SHALL BE MOUNTED IN A CORROSION RESISTANT POLYPROPYLENE HOUSING, AND MOUNTED TO TANK INTERIOR BY A DETACHABLE BRACKET.

8. ELECTRICAL SUPPLY AND CONTROL CIRCUITS SHALL BE DESIGNED TO ALLOW DISCONNECTION AT POST-MOUNTED JUNCTION BOX AS SHOWN ON SITE PLANS. SUPPLY AND CONTROL WIRING SHALL BE PLACED IN SEPARATE CONDUIT. ALL CONDUITS ARE TO BE SEALED. CONTROL AND ALARM WIRING SHALL CONNECT TO CONTROL PANEL.

9. DISCHARGE PIPING WITHIN WET WELLS AND VALVE CHAMBERS, AS WELL AS THE PIPING BETWEEN THE LIFT STATION AND THE VALVE CHAMBER, SHALL BE PVC, SCHEDULE 80. PIPING BEYOND VALVE CHAMBERS SHALL BE PVC, SDR 21.

10. CORE ALL HOLES IN FIELD AND NOT LOCATED ON TANK JOINTS.

11. STAINLESS STEEL SHALL BE USED FOR BRACKETS, RAILS AND LIFTING CHAINS.

12. PROVIDE THRUST BLOCKING FOR ALL FITTINGS AND BENDS ETC. IN THE FORECMAIN.

13. ALL PRE-CAST CONCRETE STRUCTURES TO BE WATER-TIGHT, WATERPROOF, AND CAPABLE OF WITHSTANDING H-20 LOADING. SEAL JOINTS WITH WATERPROOFING MEMBRANE - TREMPROOF 60 OR APPROVED EQUAL, AND INSTALL IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.

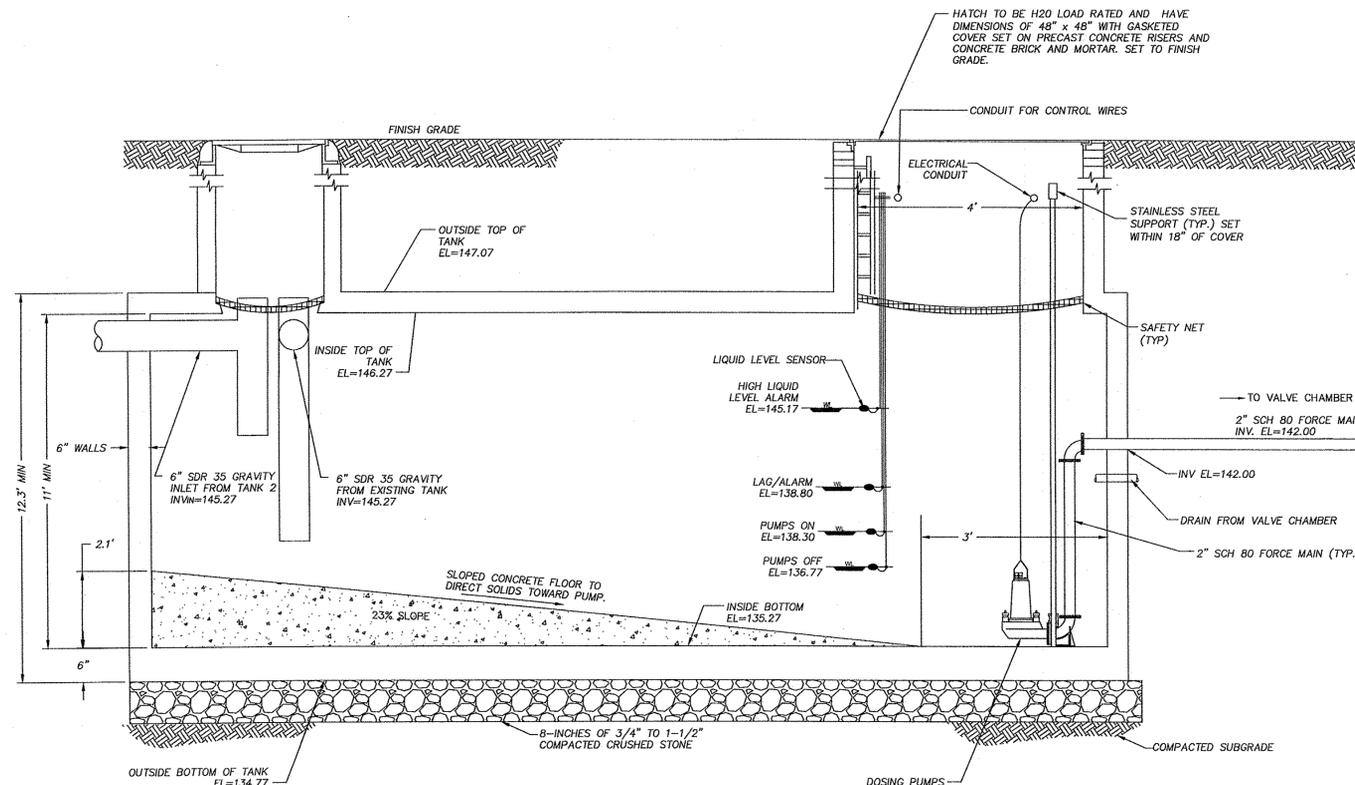
14. THE BOTTOM OF THE INFLUENT PUMP STATION SHALL HAVE A CONCRETE FILLET INSTALLED WITH A SLOPE OF NOT LESS THAN 23% TO THE PUMPS.

15. ANY RAIL LONGER THAN 10' SHOULD HAVE INTERMEDIATE GUIDE RAILS.

16. POWER REQUIREMENTS FOR PUMP SHALL BE CONFIRMED BY CONTRACTOR PRIOR TO PLACING ORDER.

17. CONTROL PANEL IS FITTED WITH LOCK.

18. ALL SWITCHES AND BREAKERS WITHIN CONTROL PANEL ARE CLEARLY LABELED.



ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION = 139.3 BASED ON A TEST PIT PERFORMED ON MARCH 4, 2015 BY CHA CONSULTING. BUOYANCY CALCULATIONS HAVE BEEN PERFORMED AND NO ADDITIONAL BALLAST IS REQUIRED.

PUMP CHAMBER ELEVATION VIEW

Pressure Distribution System & Pump Station Design

Leaching Area

Project: Weathervane Golf Academy
Date: 12/19/14
Location: Weathervane, Hingham, MA
SZA

Total Daily Flow:		
Total Flow	=	3,300 GPD
Design Flow (two manifolds)	=	1,650 GPD
Loading Rate (Use Title 5 or WWTP regulations)	=	0.56 GPD/SF
Leaching Trench Layout & Capacity:		
Trench Length (Stone only)	=	71.00 FT
Trench Width (typically 2, check local regulations)	=	2.00 FT
Trench Depth (typically 2, check local regulations)	=	2.00 FT
Number of Trenches	=	7.00
Total Bottom Area Provided (per trench)	=	142.00 S.F.
Total Side Area Provided (per trench)	=	292.00 S.F.
Total Area Provided	=	3,038.00 S.F.
Design Capacity	=	1,701.28 GPD GOOD

Determine Lateral Pipe Diameter:		
Lateral Spacing (3 * width of trench)	=	8.00 FT. O.C.
Desired Number of Laterals	=	7.00
Design Length of Lateral (Perforated and Non-Perforated)	=	71.00 FT.
Number of Equal Spaces	=	15.00 (Perforated Section Only)
Lateral Hole Spacing (see pressure dosing chart)	=	4.47 FT. O.C.
Number of Perforations in Lateral	=	16.00 (Perforated Section Only)
Lateral Length (Sum of all Laterals)	=	497.00 L.F.

Determine Lateral Discharge Rate:		
Lateral Hole Diameter	=	0.250 IN.
Lateral Diameter (Figure 2)	=	1.50 IN.
Lateral Hole Diameter (Figure 2)	=	0.021 FT.
In-Line Distal Pressure (Desired Min. at Distal End = Hd, Above 3 Preferable)	=	3.0 FT.
Perforation Discharge Rate = (Q)	=	1.28 GPM
Lateral Discharge Rate (per Lateral)	=	20.48 GPM

Manifold Diameter:	(Table 2)	4 Inch	
Manifold Length Allowed (Table 2)			120.00 FT.
Manifold Length Provided			115.00 FT. GOOD

Dose Volume:			
Lateral Pipe Radius	=	0.0625 FT.	
Lateral Pipe Area	=	0.0123 S.F.	
Lateral Pipe Volume (All Laterals)	=	45.73 GAL	
Manifold Pipe Radius	=	0.1667 FT.	
Manifold Pipe Area	=	0.0872 S.F.	
Manifold Pipe Volume	=	75.01 GAL	
Total Network Volume (Does Not Have to Include Manifold Volume)	=	121.00 GAL	
Times Per Day Per Manifold	=	2 Per Day	
Preferred Minimum Dose	=	5 x Network Volume	
			605.00 GAL GOOD

Minimum Pump Discharge Rate: for alternating pumps		
Pump Discharge Rate = (Lateral Discharge Rate x No. of Laterals)	=	143.36 GPM
Actual Discharge Rate	=	150.00 GPM

Friction Losses:		
Coefficient	C	130.00 PVC
Delivery Pipe Length (To Manifold)	2 INCH	114.00 FT.
Friction Loss in Delivery Pipe per 100 feet		46.68 FT/100 FT

Equivalent Length of Pipe for Fittings & Valves		
	No.	Eq. Length
Enlargement	1.0	3.5
Check Valve	1.0	14.0
45° Elbow	4.0	2.5
Square Elbow	2.0	12.0
Medium Sweep Elbow	2.0	3.5
Gate Valve	2.0	1.3
Equivalent Length from Fittings		57.60 FT.
Total Equivalent Length of Pipe		171.60 FT.
Total Head Loss From Delivery Pipe & Fittings		80.10 FT.
Manifold & Lateral Losses = (1.31 x Distal Pressure)		39.30 FT.
Total System Friction Head Loss		84.03 FT.
Static Head Loss (Invert Lateral (Elev. 147.4) - All Pumps Off (Elev. 136.77))		10.63 FT.
Total Dynamic Head = Static + Friction	IDH	94.66 FT.

Pump Station & Working Volume Design		
Design Flow	3,300 Gallons	442.20 CF
Tank Size	5,500 Gallons	735.29 CF
Interior Length		12.00 FT.
Interior Width		6.00 FT.
Maximum Liquid Depth (Up to Lowest Invert In)		10.00 FT.
Inlet Invert Information		145.27
Outlet Invert Information		142.00
Volume Pumped Per Cycle	825 Gallons	110.29 CF
Standing Water Level in Chamber (1.5 ft. typical and 2 ft. preferred)		1.50 FT.
Elevation of Tank Bottom (lowest invert - maximum liquid depth)		135.27
L1 = Elevation of All Pumps Off (anterior tank bottom + standing water level)		136.77
L2 = Elevation of Lead Pump On (pumps off + working volume)		138.30
L3 = Elevation of Lag & Alarm On (lead pump on + .5' min., 1' typ.)		138.80
Separation Between Float Switches (Lead On - All Pumps Off)	L2-L1	1.53 FT. GOOD
Separation Between Float Switches (Lag and Alarm - Lead On)	L3-L2	0.50 FT. GOOD
Available Space Above Lag and Alarm On		6.47 FT.
Storage Above Alarm (24 Hours for cases w/o generators, 6 with)		25.34 Hours
Storage Between Lead Pump and Lag Pump/Alarm		1.96 Hours
Storage Between All Pumps Off and Lead Pump		6.00 Hours

Pump Requirements		
Pump Must be Capable of Pumping		150.00 GPM
Against a Total Dynamic Head of		94.70 FEET
Pump Running Time Per Cycle		5.50 Min. GOOD

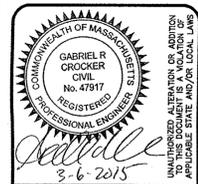
System Curve			
GPM	145	150	200
TDH	89.8	94.7	151

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Saved: 3/6/2015 9:16:53 AM User: Rose, Donald LastSavedBy: dnr

Date	1/19/15
By	JPM
App'd	JPM
GC	JPM
Submittal / Revision	
RESPONSE TO COMMENTS	
RESPONSE TO SEACAST ENG. COMMENTS	

No.	
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Applicant / Owner:
OLD DERBY NOMINEE TRUST
37 DERBY ST, HINGHAM, MA



CHA
101 Accord Park Drive
Norwell, MA 02061
Phone: (617) 962-6400 • www.chaincorporation.com

Project name and address:
WEATHERVANE GOLF ACADEMY
306 WHITING ST, HINGHAM, MA

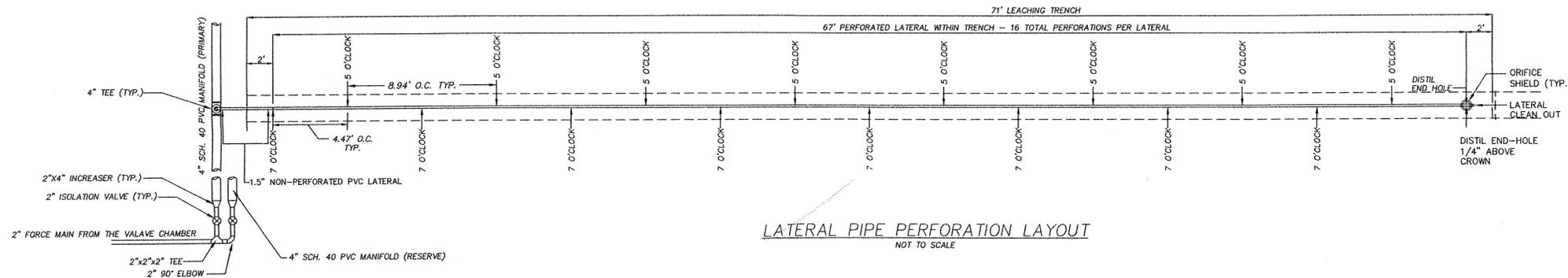
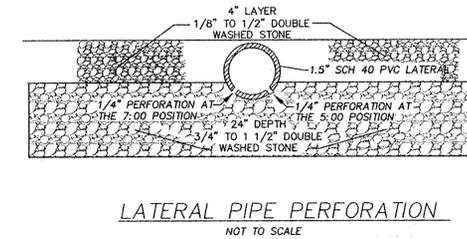
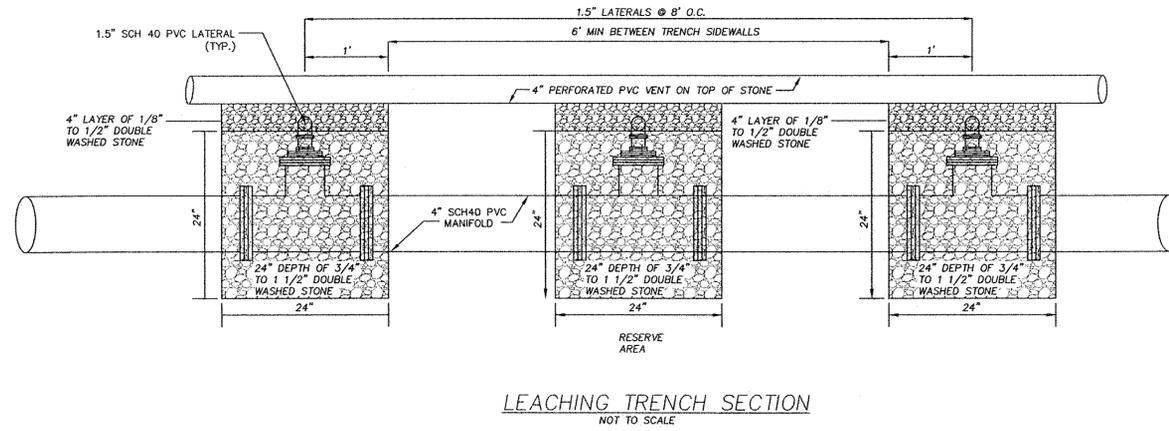
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Project No.: 28-214
Issue Date: 12/22/14
Scale: as noted

Sheet number:
S-3

SCHEDULE OF LATERALS	
S.A.S.	
NUMBER OF LATERALS	14 (each for primary and reserve)
LATERAL PIPE DIAMETER	1.5"
PERFORATION DIAMETER	1/4"
PERFORATED LENGTH	67'
TOTAL LENGTH	71'
NUMBER OF PERFORATIONS	16
PERFORATION SPACING	4.47' O.C. ALTERNATING 5 & 7 O'CLOCK
LATERAL SPACING IN FIELD	8' O.C.

* NOTE: ENGINEER SHALL BE ON SITE TO INSPECT LATERAL HOLE DRILLING AND LATERAL INSTALLATION. LATERAL HOLES SHALL BE EVENLY SPACED IN THE LATERAL PERFORATED SECTION TO PROVIDE THE NUMBER OF HOLES REQUIRED.



TEST PIT LOGS

TEST PIT 15-1

Depth from Surface (in)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders Consistency, % Gravel)
0" - 5"	A	Loamy Sand	7.5Y3/4	None	Blocky
5" - 14"	B	Loamy Sand	2.5Y4/4	None	Single Grain
14" - 68"	C1	Sand	2.5Y5/4	None	Loose, Single Grain, 15% Gravel, 1% Cobbles
68" - 124"	C2	Loamy Sand	2.5Y6/2	@90°	5% Gravel, 2% Cobbles

TEST PIT No. 15-1 Date: 3/4/15 ESTIMATED High Ground Water: 90"
 ELEV. @ SURFACE= 146.8± PERC. DEPTH= 34" - 52" PERC. RATE= <2 MPI
 SOIL EVAL: Gabe Crocker WITNESS: Paul Brogna

TEST PIT 15-2

Depth from Surface (in)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders Consistency, % Gravel)
0" - 7"	A	Loamy Sand	2.5Y3/4	None	Blocky
7" - 20"	B	Loamy Sand	2.5Y4/4	None	Single Grain
20" - 123"	C1	Sand	2.5Y5/4	@101°	Loose, Single Grain, 15% Gravel, 1% Cobbles
123" - 152"	C2	Fine Loamy Sand	2.5Y6/3		Massive

TEST PIT No. 15-2 Date: 3/4/15 ESTIMATED High Ground Water: 101"
 ELEV. @ SURFACE= 146.2± PERC. DEPTH= 36" - 54" PERC. RATE= <2 MPI
 SOIL EVAL: Gabe Crocker WITNESS: Paul Brogna

TEST PIT 97-1

Depth from Surface (in)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders Consistency, % Gravel)
0" - 3"	A	Sandy Loam	10YR3/6	None	Single Grain, V. Friable
3" - 18"	B	Sandy Loam	10YR5/8	None	Single Grain, V. Friable
18" - 72"	C1	Sand	2.5Y5/4	None	Single Grain, Loose, <5% Gravel
72" - 114"	C2	Sandy Loam	2.5Y5/4	@90°	V. Friable, Blocky
114"	CR				

TEST PIT No. 97-1 Date: 12/24/1997 Standing Ground Water: 90"
 ELEV. @ SURFACE= ± PERC. DEPTH= 42" PERC. RATE= 11 MPI
 SOIL EVAL: Paul Fellini, Merrill Associates WITNESS: Nick Lanney

TEST PIT 97-2

Depth from Surface (in)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders Consistency, % Gravel)
0" - 3"	A	Sandy Loam	10YR3/2	None	Single Grain, V. Friable
3" - 18"	B	Loamy Sand	10YR5/8	None	Single Grain, V. Friable, <5% Gravel
18" - 56"	1C1	Sand	2.5Y6/8	None	Single Grain, 10-15% Gravel, Loose
56" - 94"	1C2	Sandy Loam	2.5Y6/3	@82°	Single Grain, V. Friable
94" - 106"	2C	Loamy Fine Sand	2.5Y6/3		Single Grain, 10-15% Gravel

TEST PIT No. 97-2 Date: 12/24/1997 Standing Ground Water: 82"
 ELEV. @ SURFACE= ± PERC. DEPTH= 42" PERC. RATE= 11 MPI
 SOIL EVAL: Paul Fellini, Merrill Associates WITNESS: Nick Lanney

TEST PIT 97-3

Depth from Surface (in)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders Consistency, % Gravel)
0" - 2"	A	Sandy Loam	10YR3/2	None	Single Grain, V. Friable
2" - 21"	B	Sandy Loam	10YR5/8	None	Single Grain, V. Friable, <5% Gravel
21" - 46"	1C	Sand	2.5Y6/8	None	Single Grain, V. Friable, 10-15% Gravel
46" - 108"	2C	Sandy Loam	2.5Y6/3	@55°	Single Grain, Firm, 10-15% Gravel
108"	CR				

TEST PIT No. 97-3 Date: 12/24/1997 Estimated Ground Water: 95"
 ELEV. @ SURFACE= ± PERC. DEPTH= 46" PERC. RATE= 11 MPI
 SOIL EVAL: Paul Fellini, Merrill Associates WITNESS: Nick Lanney

TEST PIT 97-4

Depth from Surface (in)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders Consistency, % Gravel)
0" - 6"	A	Sandy Loam	10YR3/3	None	Single Grain, V. Friable, <5% Gravel
6" - 24"	B	Loamy Sand	10YR5/8	None	Single Grain, V. Friable, <5% Gravel
24" - 120"	C	Loamy Fine Sand	2.5Y6/3	@90°	Single Grain, Firm, 15-20% Gravel
120"	Cr				

TEST PIT No. 97-4 Date: 12/24/1997 Standing Ground Water: 90"
 ELEV. @ SURFACE= ± PERC. DEPTH= 42" 97-4A, 36" 97-4B PERC. RATE= -- MPI
 SOIL EVAL: Paul Fellini, Merrill Associates WITNESS: Nick Lanney

TEST PIT 97-5

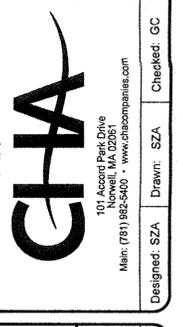
Depth from Surface (in)	Soil Horizon	Soil Texture (USDA)	Soil Color (Munsell)	Soil Mottling	Other (Structure, Stones, Boulders Consistency, % Gravel)
0" - 6"	A	Sandy Loam	10YR3/2	None	Single Grain, V. Friable
6" - 24"	B	Loamy Sand	10YR5/8	None	Single Grain, V. Friable
24" - 84"	C1	Gravelly Sand	2.5Y6/3	None	Single Grain, 15-20% Gravel, Loose
84" - 102"	C2	Sandy Loam	5Y6/3	None	Single Grain, V. Friable
102"	CR				

TEST PIT No. 97-5 Date: 12/24/1997 Standing Ground Water: None
 ELEV. @ SURFACE= ± PERC. DEPTH= 48" PERC. RATE= 11 MPI
 SOIL EVAL: Paul Fellini, Merrill Associates WITNESS: Nick Lanney

Date	By	App'd	Revision
11/15/15	JPM	GC	RESPONSE TO COMMENTS
3/9/15	JPM	GC	RESPONSE TO SEACOAST ENG. COMMENTS

No.	App'd	Revision
1	GC	RESPONSE TO COMMENTS
2	GC	RESPONSE TO SEACOAST ENG. COMMENTS

Applicant / Owner:
OLD DERBY NOMINEE TRUST
 37 DERBY ST., HINGHAM, MA



Project name and address:
WEATHERVANE GOLF ACADEMY
 306 WHITING ST., HINGHAM, MA

Page name:
DETAIL SHEET

Issue Date: 12/22/14 Project No.: 26-214 Scale: as noted