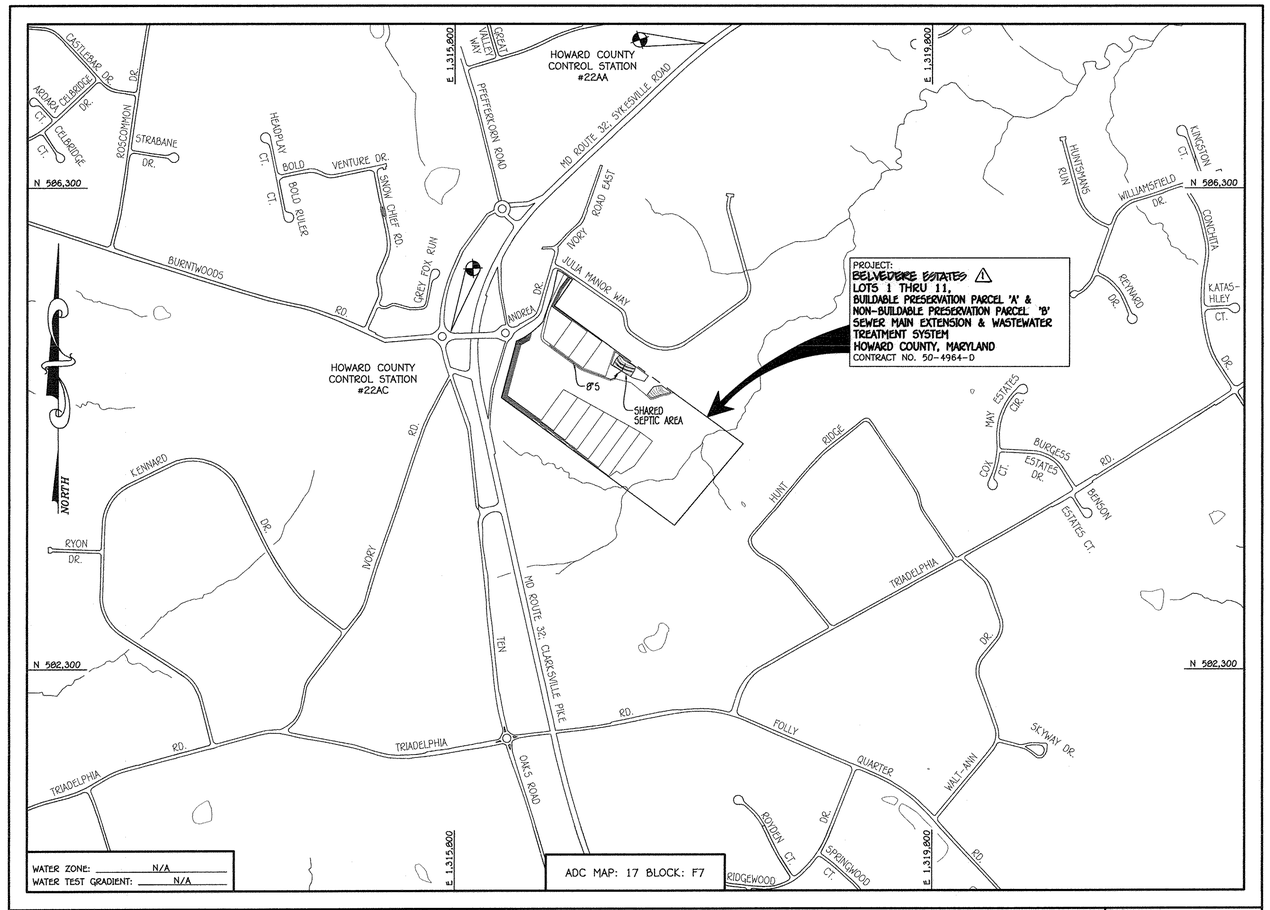
QUANTITIES

ITEM	ESTIMATED	AS-BUILT QUANTITIES	AS-BUILT TYPE	AS-BUILT SUPPLIER
8"S; SDR-35	634 L.F.	611 LF	SDR-35	NORTH AMERICAN
4"S; SDR-35	40 L.F.	36 LF	SDR-35	JM EAGLE
MANHOLES	5 EACH	5 EA	CONCRETE	BACK RIVER
CLEAN-OUT	4 EACH	4 EA	CONCRETE	BACK RIVER
3" L.P.S.; PVC	478 L.F.	320 LF		
2" LATERAL; PVC	1,864 L.F.	1057 LF		
DRAINFIELD TRENCH	2,084 L.F.	2084 LF		
3,000 GAL. SETTLING TANK	2 EACH	2 EA		BACK RIVER
9,000 GAL. PUMP TANK	1 EACH	1 EA		BACK RIVER
ELECTRICAL CONTROLS & TELEMETRY	1 EACH			
CONTROL / MAINTENANCE BUILDING	1 EACH			
8" ISOLATION GATE VALVE	1 EACH			
NAME OF UTILITY CONTRACTOR: HTI CONTRACTORS & HYDROTERRA GROUP				
SURVEY & DRAFTING DIVISION AS-BUILT DATE:				

BENCHMARK INFORMATION

B.M.#1 – HOWARD COUNTY CONTROL STATION #22AA – HORIZONTAL – NAD '83)
(LOCATED ALONG ROUTE 32, APPROX. 2.3' OFF EDGE OF PAVING, APPROX. .45 MILES EAST OF PFEFFERCORN ROAD AND APPROX. .25 MILES WEST OF WEST IVORY ROAD)
N 587,502.739
E 1,317,898.020
ELEVATION = 568.926 – VERTICAL – (NAVD '88)

B.M.#2 – HOWARD COUNTY CONTROL STATION #22AC – HORIZONTAL – (NAD '83)
(LOCATED ALONG THE ROUND ABOUT AT PFEFFERCORN ROAD & BURNTWOOD ROAD. ALONG THE NORTH/EAST SIDE OF THE ROUND ABOUT, APPROX. 4' OFF EDGE OF PAVING AND 7' NORTH OF A YIELD TRAFFIC SIGN)
N 585,110.802
E 1,315,766.722
ELEVATION = 643.880 – VERTICAL – (NAVD '88)

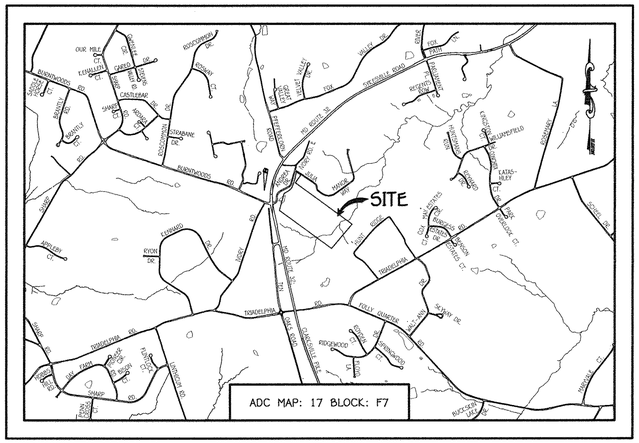


LOCATION MAP

SCALE: 1"= 600'

TYPE OF BUILDING:	RESIDENTIAL: SINGLE FAMILY DETACHED DWELLINGS
NUMBER OF LOTS:	11
NO. OF WATER HOUSE CONNECTIONS:	N/A
NO. OF SEWER HOUSE CONNECTIONS:	4
SEWER SHED:	N/A
TREATMENT PLANT:	SHARED CENTRAL TREATMENT FACILITY & SHARED SEPTIC DISPOSAL FACILITY ON NON-BUILDABLE PRESERVATION PARCEL 'C'

PLAN REFERENCE NUMBERS:
SP-10-004
F-16-065 (RECORD PLAT)



VICINITY MAP

SCALE: 1"= 2000'

GENERAL NOTES

PART A
1. APPROXIMATE LOCATIONS OF EXISTING MAINS ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING MAINS AND SERVICES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.
2. TOPOGRAPHIC FIELD SURVEYS WERE PERFORMED ON OR ABOUT JUNE, 2009 BY FISHER, COLLINS & CARTER, INC.
3. HORIZONTAL AND VERTICAL SURVEY CONTROLS:
THE COORDINATES SHOWN ON THE DRAWINGS ARE BASED ON MARYLAND STATE REFERENCE SYSTEM NAD '83/91' AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS NO. 22AA & NO. 22AC.
ALL VERTICAL CONTROLS ARE BASED ON NAVD '88. VERTICAL CONTROLS PROVIDED ON THE DRAWINGS.
4. ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
5. CLEAR ALL UTILITIES BY A MINIMUM OF 12 INCHES. CLEAR ALL POLES BY 5'-0" MINIMUM OR TUNNEL AS REQUIRED UNLESS OTHERWISE NOTED. THE OWNER HAS CONTACTED THE UTILITY COMPANIES AND HAS MADE ARRANGEMENTS FOR BRACING OF POLES AS SHOWN ON THE DRAWINGS. IN THE EVENT THE CONTRACTOR'S WORK REQUIRES BRACING OF ADDITIONAL POLES, ANY COST INCURRED BY THE OWNER FOR THE BRACING OF THE ADDITIONAL POLES OR DAMAGES SHALL BE DEDUCTED FROM MONIES OWED THE CONTRACTOR. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO SCHEDULE THE BRACING OF THE POLES.
6. FOR DETAILS NOT SHOWN ON THE DRAWINGS, AND FOR MATERIALS AND CONSTRUCTION METHODS, USE HOWARD COUNTY DESIGN MANUAL IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL HAVE A COPY OF VOLUME IV ON THE JOB SITE.
7. WHERE TEST PITS HAVE BEEN MADE ON EXISTING UTILITIES, THEY ARE NOTED BY THE SYMBOL ⊗. AT THE LOCATIONS OF THE TEST PITS, A NOTE OR NOTES CONTAINING THE RESULTS OF THE TEST PIT OR PITS IS INCLUDED ON THE DRAWINGS. EXISTING UTILITIES IN THE VICINITY OF THE PROPOSED WORK FOR WHICH TEST PITS HAVE NOT BEEN DUG, SHALL BE LOCATED BY THE CONTRACTOR TWO WEEKS IN ADVANCE OF CONSTRUCTION OPERATIONS AT HIS OWN EXPENSE.
8. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS:

AT&T	1-800-252-1133
BGE (CONTRACTOR SERVICES)	410-637-8713
BGE (EMERGENCY)	410-685-0123
BUREAU OF UTILITIES	410-313-4900
COLONIAL PIPELINE CO	410-795-1390
MISS UTILITY	1-800-257-7777
STATE HIGHWAY ADMINISTRATION	410-531-5533
VERIZON	1-800-743-0033 / 410-224-9210

9 TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT. TREES AND SHRUBS LOCATED WITHIN THE CONSTRUCTION STRIP ARE NOT TO BE REMOVED OR DAMAGED BY THE CONTRACTOR.
10. CONTRACTOR SHALL REMOVE TREES, STUMPS AND ROOTS ALONG THE LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE CONSTRUCTION OF THE MAIN.
11. THE CONTRACTOR SHALL NOTIFY THE BUREAU OF HIGHWAYS, HOWARD COUNTY, AT (410)-313-7450 AT LEAST FIVE WORKING DAYS BEFORE OPEN CUTTING OR BORING/JACKING OF ANY COUNTY ROAD FOR LAYING WATER/SEWER MAINS OR HOUSE CONNECTIONS. THE APPROVAL OF THESE DRAWINGS WILL CONSTITUTE COMPLIANCE WITH DPW REQUIREMENTS PER SECTION 18.114(a) OF THE HOWARD COUNTY CODE.

PART B: WATER MAIN GENERAL NOTES
1. WATER SERVICE TO ALL BUILDABLE LOTS SHALL BE PROVIDED BY INDIVIDUAL PRIVATE ON-SITE WELLS.

PART C: SEWER MAIN GENERAL NOTES
1. ALL SEWER MAINS SHALL BE D.I.P. OR P.V.C. UNLESS OTHERWISE NOTED.
2. ALL MANHOLES SHALL BE 4'-0" INSIDE DIAMETER UNLESS OTHERWISE NOTED.
3. FORCE MAINS SHALL BE D.I.P. ONLY.
4. MANHOLES SHOWN WITH 12" AND 16" WALLS ARE FOR BRICK MANHOLES ONLY.
5. MANHOLES DESIGNATED W.T. IN PLAN AND PROFILE SHALL HAVE WATERTIGHT FRAME AND COVER, STANDARD DETAIL G5.52. WHERE WATERTIGHT MANHOLE FRAMES AND COVERS ARE USED, SET TOP OF FRAME 1'-6" ABOVE FINISHED GRADE UNLESS OTHERWISE NOTED ON THE DRAWINGS.
6. HOUSE(S) WITH THE SYMBOL "C.N.S." INDICATES THAT CELLAR CANNOT BE SERVED.
7. LOTS 5 THRU 11 SHALL HAVE PRIVATE ON-SITE SEWAGE DISPOSAL SYSTEMS.

NOTE: THE WASTEWATER TREATMENT FACILITY & SHARED SEWAGE SYSTEM IS DESIGNED BASED ON THE FOLLOWING PARAMETERS:

TOTAL NUMBER OF DWELLINGS CONNECTED TO THE SYSTEM: 4
NUMBER OF BEDROOMS PER DWELLING: 5
TOTAL NUMBER OF BEDROOMS: 4 DWELLINGS X 5 BEDROOMS PER DWELLING = 20 BEDROOMS
DAILY DESIGN FLOW = 150 gdp per BEDROOM
TOTAL DAILY DESIGN FLOW = 150 gpd per BEDROOM X 20 BEDROOMS = 3,000 GALLONS PER DAY

DEVELOPER'S CERTIFICATION

" I/WE HEREBY CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT AND PLAN FOR EROSION AND SEDIMENT CONTROL AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT THE DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT OR THEIR AUTHORIZED AGENTS, AS ARE DEEMED NECESSARY."

Paul W. Kriebel; FOR: MR. GEORGE BOARMAN — 1/18/17
SIGNATURE OF DEVELOPER — DATE

ENGINEER'S CERTIFICATION

" I HEREBY CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

Paul W. Kriebel — 1/18/17
SIGNATURE OF ENGINEER — DATE

SEDIMENT CONTROL MEASURES FOR THIS CONTRACT WILL BE IMPLEMENTED IN ACCORDANCE WITH SECTION 308 OF THE HOWARD COUNTY DESIGN MANUAL – VOLUME IV: STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION AND AS SHOWN ON THE ROAD CONSTRUCTION PLAN, F-16-065.

Paul W. Kriebel; FOR: MR. GEORGE BOARMAN — 1/18/17
SIGNATURE OF DEVELOPER — DATE

F-16-065

THIS DEVELOPMENT IS APPROVED FOR EROSION AND SEDIMENT CONTROL BY HOWARD SOIL CONSERVATION DISTRICT.

APPROVED:
HOWARD SOIL CONSERVATION DISTRICT — 2/8/17 DATE

LEGEND	
SYMBOL	DESCRIPTION
	EX. WATER MAIN
	EX. SEWER MAIN
	EX. SEWER MANHOLE
	EX. SEWER, WATER & UTILITY EASEMENT
	EX. FIRE HYDRANT
	EX. VALVE
	PROP. WATER MAIN
	PROP. SEWER MAIN
	PROP. SEWER MANHOLE
	PROP. SEWER, WATER & UTILITY EASEMENT
	PROP. WHC
	PROP. SHC
	PROP. FIRE HYDRANT
	PROP. VALVE

CONTRACT NO. 50-4964-D

⚠ BELVEDERE ESTATES

LOTS 1 THRU 11, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCEL 'B' ⚠

SEWER MAIN EXTENSION & WASTEWATER TREATMENT SYSTEM

HOWARD COUNTY, MARYLAND

APPROVED: FOR PRIVATE WATER AND SHARED SEWAGE DISPOSAL FOR LOTS 1-4.
HOWARD COUNTY HEALTH OFFICER — 3/17/17 DATE

OWNER ⚠
BOARMAN PROPERTY INVESTMENT, LLC
12126 MARYLAND ROUTE 216
FULTON, MARYLAND 20759
PHONE: (301) 725-4704

DEVELOPER
BELVEDERE ESTATES DEVELOPMENT CORPORATION
13426 CLARKSVILLE PIKE
HIGHLAND, MARYLAND 20777
PHONE: (410) 707-1976

0' 50' 100' 200'
SCALE: 1" = 50'

⚠ CONTRACT NO. 50-4964-D
BELVEDERE ESTATES
LOTS 1 THRU 11, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCEL 'B'
SEWER MAIN EXTENSION & WASTEWATER TREATMENT SYSTEM
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
CHIEF, BUREAU OF UTILITIES — 12/5/17 DATE

DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY, MARYLAND
CHIEF, DEVELOPMENT ENGINEERING DIVISION — 2-22-17 DATE

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 12043 EXPIRATION DATE IS 7/16/18.

FISHER, COLLINS & CARTER, INC.
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
CENTENNIAL SQUARE OFFICE PARK – 10272 BALTIMORE NATIONAL PIKE
ELLICOTT CITY, MARYLAND 21042
(410) 461 – 2855

#12043 STATE OF MARYLAND PAUL WALTER KRIEBEL PROFESSIONAL ENGINEER
PAUL W. KRIEBEL

DESIGNED BY :	B.C.R.
DRAWN BY :	B.C.R.
CHECKED BY :	P.W.K.
DATE :	JANUARY, 2017

BY	NO.	REVISION	DATE
FCC	⚠	REVISED TITLE BLOCK WITH NEW PROPERTY INFORMATION & REVISED QUANTITIES TO REFLECT 9,000 GALLON SETTLING TANKS	7/7/17

SEWER MAIN EXTENSION & WASTEWATER TREATMENT SYSTEM TITLE SHEET

600' SCALE MAP NO. 22 BLOCK NO. 8
F.C.C. WORK ORDER NO. 71160
FILE NAME : SEWER MAIN EXTENSION PLAN

⚠ BELVEDERE ESTATES
LOTS 1 THRU 11,
BUILDABLE PRESERVATION PARCEL 'A' AND
NON-BUILDABLE PRESERVATION PARCEL
SEWER MAIN EXTENSION & WASTEWATER TREATMENT SYSTEM
CONTRACT NO. 50-4964-D
THIRD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 1 OF 7

K:\SDSKPRO\7\71160 Boarman Property\dwg\Sewer Contract Plan\Finals\Sewer Contract Plan.dwg

APPROVED: FOR PRIVATE WATER AND SHARED SEWAGE DISPOSAL FOR LOTS 1-4.

HOWARD COUNTY HEALTH OFFICER — DATE 3/17/17 MGH

E IVORY ROAD

JULIA MANOR WAY
(PRIVATE ACCESS DRIVE)

SWING GATE ASSEMBLY SEE DETAILS SHEET 3

NON-BUILDABLE PRESERVATION PARCEL 'B'

EX. PAVING

EX. 15"SD

EX. 18"SD

PRESERVATION PARCEL 'A' THE PADDOCKS

EX. DWELLING PARCEL 7; LOT 1 JEAN YOUNG PARK HYONG K. BAE

EX. DWELLING PARCEL 7; LOT 2 PAUL S. YI SUNNY S. YI

EX. DWELLING PARCEL 7; LOT 3 SUNG H. SONG SEYOON J. SONG

EX. DWELLING PARCEL 7; LOT 4 BALAGAN ARUMUGASWAMY SANTHAKUMARI T. ARUMUGASWAMY

EX. DWELLING PARCEL 7; LOT 5 YONG N. KIM JULIE KIM

THE PADDOCKS EAST
LOTS 1 THRU 22, RESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THRU 'G'
PLAT Nos. 16834-16838

EX. DWELLING PARCEL 7; LOT 6 ASIF MAHMUD SAMARA T. KHALIQ

EX. SEPTIC

EX. SEPTIC

NON-BUILDABLE PRESERVATION PARCEL 'B'

NORTH

THE PADDOCKS EAST
LOTS 1 THRU 22, RESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCELS 'B' THRU 'G'

ANDREA DRIVE
(VARIABLE WIDTH PUBLIC RIGHT-OF-WAY)

EX. 18"SD

EX. PAVING

TERGEO DRIVE
(PRIVATE ACCESS DRIVE)

EX. 18"SD

N 584,890
E 1,317,390

PAVING

PUBLIC SEWER & UTILITY EASEMENT

4' HIGH SPLIT RAIL FENCE SEE DETAIL SHEET 3

INTIAL SHARED SEWAGE DISPOSAL AREA FOR LOTS 1 THRU 4, SEE THIS CONTRACT & (F-16-065)

3" FORCE MAIN

5,000 GALLON PUMP TANK

PART OF NON-BUILDABLE PRESERVATION PARCEL 'B'

RESERVED SHARED SEWAGE DISPOSAL AREAS SEE THIS CONTRACT & (F-16-065)

BUILDABLE PRESERVATION PARCEL 'A'

4' HIGH SPLIT RAIL FENCE SEE DETAIL SHEET 3

100'R

4" ROOF LEADER (TYPICAL ALL LOTS)

LOT 1
FF = 598.00
M.C.E. = 593.02

LOT 2
FF = 592.00
M.C.E. = 584.11

LOT 3
FF = 580.00
M.C.E. = 574.00

LOT 4
FF = 568.00
M.C.E. = 564.27

CONTROL & MAINTENANCE SHED

3,000 GALLON SETTING TANK

3,000 GALLON SETTING TANK

SEE SHEETS 4 THRU 7 FOR COMPUTATIONS, DETAILS & NOTES FOR THE WASTEWATER TREATMENT SYSTEM FACILITIES

PUBLIC SEWER & UTILITY EASEMENT

8" ISOLATION VALVE

BUILDABLE PRESERVATION PARCEL 'A'

EXISTING STORMWATER MANAGEMENT FACILITY No. 6

100' WELL RADIUS

4" SHCH

MH 200

MH 205

MH 210

MH 215

MH 220

4" HIGH SPLIT RAIL FENCE SEE DETAIL SHEET 3

EX. WETLANDS

WETLAND BUFFER 25'

EX. 18"SD

EX. PAVING

20' PUBLIC SEWER & UTILITY EASEMENT

CHECKDAMS

SHARED SEPTIC SYSTEM DRIVEWAY
(PRIVATE 12' ACCESS DRIVE)

EX. 5' CONC. CISTERN

BUILDABLE PRESERVATION PARCEL 'A'

N 584,850
E 1,317,390

BUILDABLE PRESERVATION PARCEL 'A'

PAUPERS FOLLY LANE
(PRIVATE ACCESS DRIVE)

EX. WETLANDS

EX. WOOD SPRING HOUSE (TO REMAIN)

EX. WOOD HORSE STALLS (TO REMAIN)

EX. 24"SD

EX. 12"SD

EX. 30"SD

EX. PAVING

NOTE: LOTS 5 THRU 11 SHALL HAVE PRIVATE ON-SITE SEWAGE DISPOSAL SYSTEMS

20' PRIVATE DRAINAGE & UTILITY EASEMENT

LOT 5

LOT 6

LOT 7

LOT 8

LOT 9

LOT 10

LOT 11

SEPTIC AREA

12' GRASS SWM ACCESS

PLAN

SCALE: 1" = 50'

0' 50' 100' 200'

SCALE: 1" = 50'

CONTRACT NO. 50-4964-D
BELVEDERE ESTATES
LOTS 1 THRU 11, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCEL 'B'
SEWER MAIN EXTENSION & WASTEWATER TREATMENT SYSTEM
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
CHIEF, BUREAU OF UTILITIES — DATE 1/30/17

DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY, MARYLAND
CHIEF, DEVELOPMENT ENGINEERING DIVISION M.G. — DATE 2.22.17

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 12043 EXPIRATION DATE IS 7/16/18.

FISHER, COLLINS & CARTER, INC.
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
CENTENNIAL SQUARE OFFICE PARK - 10272 BALTIMORE NATIONAL PIKE
ELLICOTT CITY, MARYLAND 21042
(410) 461 - 2855

#12043
STATE OF MARYLAND
PAUL WALTER KREBEL
PROFESSIONAL ENGINEER
PAUL W. KREBEL

DESIGNED BY :	B.C.R.
DRAWN BY :	B.C.R.
CHECKED BY :	P.W.K.
DATE :	JANUARY, 2017

BY	NO.	REVISION	DATE
FCC	1	REVISED TITLE BLOCK WITH NEW PROPERTY INFORMATION & REVISED SEPTIC TANKS FROM 2,000 GALLON TO 3,000 GALLON	7/7/17

SEWER MAIN EXTENSION & WASTEWATER TREATMENT SYSTEM PLAN

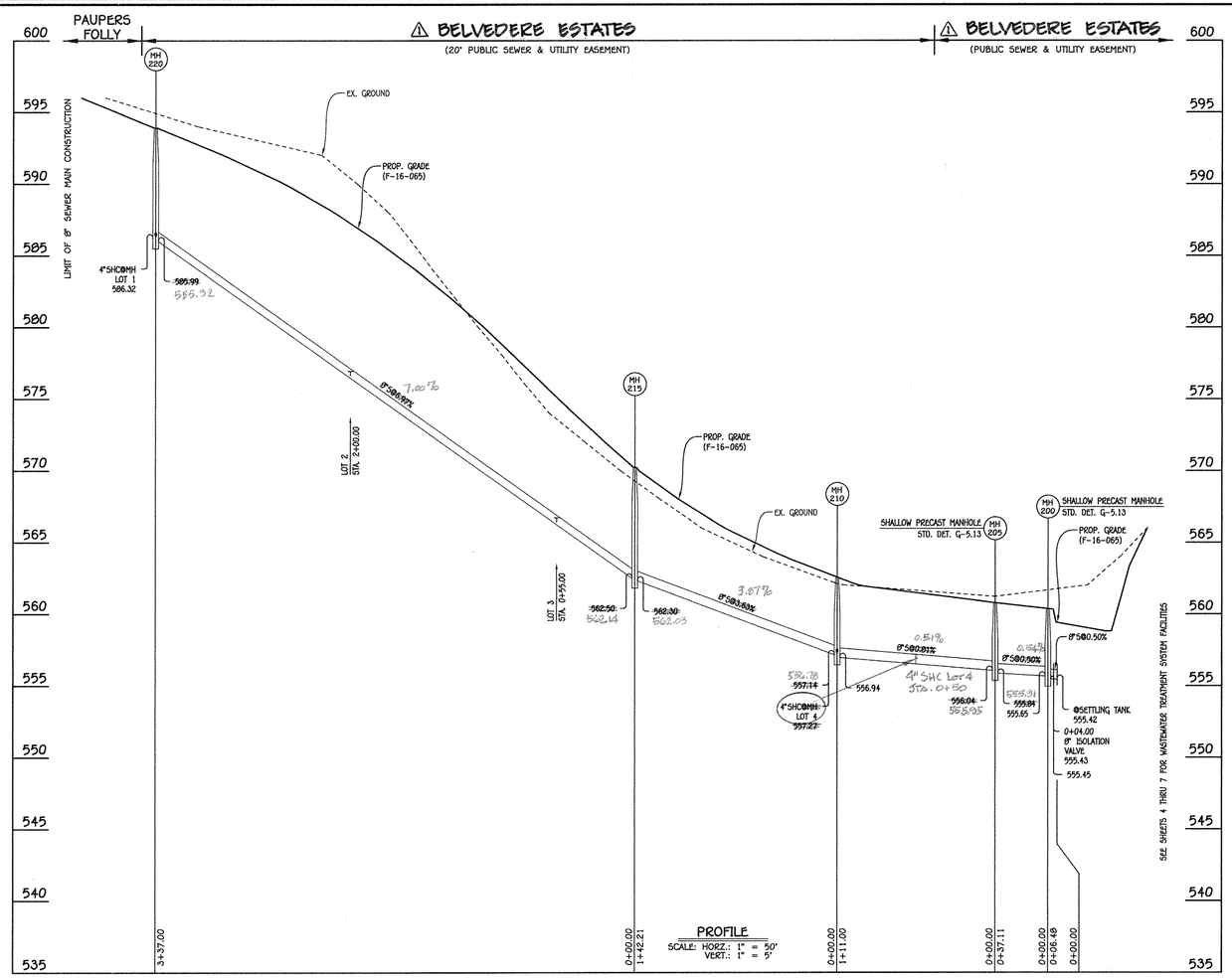
600' SCALE MAP NO. 22 BLOCK NO. 8
F.C.C. WORK ORDER NO. 71160
FILE NAME : SEWER MAIN EXTENSION PLAN

BELVEDERE ESTATES
LOTS 1 THRU 11,
BUILDABLE PRESERVATION PARCEL 'A' AND
NON-BUILDABLE PRESERVATION PARCEL 'B'
SEWER MAIN EXTENSION & WASTEWATER TREATMENT SYSTEM
CONTRACT NO. 50-4964-D
THIRD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 2 OF 7

K:\SDSKPRO\71160 Bowman Property\dwg\Sewer Contract Plan\Finals\Sewer Contract Plan.dwg



PROFILE
SCALE: HORZ.: 1" = 50'
VERT.: 1" = 5'

8" SEWER MAIN: LOTS 1 THRU 4; TO WASTEWATER TREATMENT SYSTEM FACILITIES

MANHOLE TABULATION CHART

NO.	NORTHING	EASTING	RIM ELEVATION
200	584719.70	1317142.78	560.35
205	584708.23	1317107.48	560.77
210	584745.79	1317003.03	562.56
215	584793.92	1316869.21	570.23
220	584991.59	1316596.27	593.91

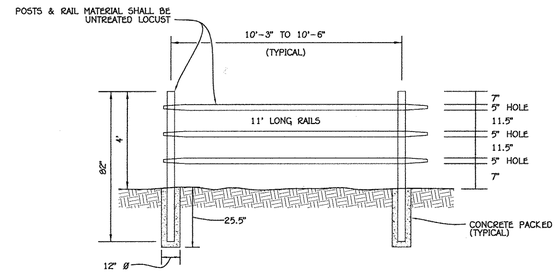
NOTE: SET MH RIMS FLUSH W/PROPOSED GRADE.

SEWER HOUSE CONNECTION CHART

STATION	LOT	ELEVATION AT MAIN	ELEVATION AT EASEMENT	M.C.E.	B.E.	F.F.
MH 205 TO MH 210						
@MH 210 RT.	4	557.27	557.47	564.27	0	568.00
MH 215 TO MH 220						
0+55 RT.	3	566.50	566.70	574.00	0	580.00
2+00 RT.	2	576.61	576.81	584.11	0	592.00
@MH 220 RT.	1	586.32	586.52	593.02	0	598.00

SEWER HOUSE CONNECTION AS-BUILT LOCATION TABLE

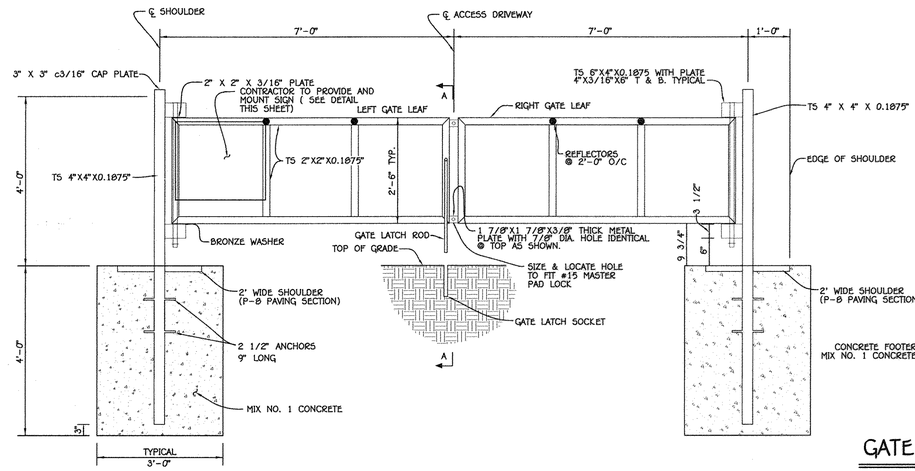
LOT NUMBER	ADDRESS	LOCATION DIMENSION 1	LOCATION DIMENSION 2
1		MH 220 11'	SHC LOT 2 139'
2		SHC LOT 1 139'	SHC LOT 3 146'
3		SHC LOT 2 146'	MH 215 56'
4		MH 200 86'	MH 210 55'



DETAIL: SPLIT RAIL FENCE

NO SCALE

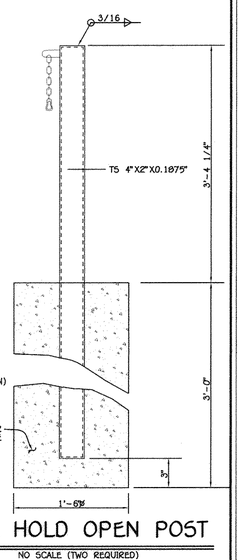
NOTE: SEE SHEET 2 FOR PLAN LOCATION



SWING GATE ASSEMBLY

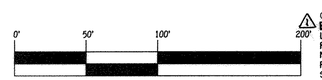
NO SCALE

NOTE: SEE SHEET 2 FOR PLAN LOCATION



GATE HOLD OPEN POST

NO SCALE (TWO REQUIRED)



SCALE: 1" = 50'

CONTRACT NO. 50-4964-D
BELVEDERE ESTATES
LOTS 1 THRU 11, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCEL 'B'
SEWER MAIN EXTENSION & WASTEWATER TREATMENT SYSTEM
HOWARD COUNTY, MARYLAND

APPROVED: FOR PRIVATE WATER AND SHARED SEWAGE DISPOSAL FOR LOTS 1-4.

for Maura J. Rossman — 3/13/17
HOWARD COUNTY HEALTH OFFICER — DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
CHIEF, BUREAU OF UTILITIES — 3.13.17 DATE

DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY, MARYLAND
CHIEF, DEVELOPMENT ENGINEERING DIVISION M.G. — 3-22-17 DATE

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 12043 EXPIRATION DATE IS 7/16/18.

FISHER, COLLINS & CARTER, INC.
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
CENTENNIAL SQUARE OFFICE PARK - 10272 BALTIMORE NATIONAL PIKE
ELLICOTT CITY, MARYLAND 21042
(410) 461 - 2855

#12043 STATE OF MARYLAND PAUL WALTER KNIEBEL ENGINEER
PAUL W. KNIEBEL

DESIGNED BY : B.C.R.
DRAWN BY : B.C.R.
CHECKED BY : P.W.K.
DATE : JANUARY, 2017

BY	NO.	REVISION	DATE
PWK	1	REVISED TITLE BLOCK & SEWER MAIN PROFILE WITH NEW PROPERTY LINES	7/7/17

SEWER MAIN EXTENSION & WASTEWATER TREATMENT SYSTEM
PROFILE & CHARTS
SWING GATE ASSEMBLY DETAIL & SPLIT RAIL FENCE DETAIL
600' SCALE MAP NO. 22 BLOCK NO. 8
F.C.C. WORK ORDER NO. 71160
FILE NAME : SEWER MAIN EXTENSION PLAN

BELVEDERE ESTATES
LOTS 1 THRU 11,
BUILDABLE PRESERVATION PARCEL 'A' AND
NON-BUILDABLE PRESERVATION PARCEL 'B'
SEWER MAIN EXTENSION & WASTEWATER TREATMENT SYSTEM
CONTRACT NO. 50-4964-D
THIRD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 3 OF 7

K:\SDSKPROJ\71160 Boarman Property\dwg\Sewer Contract Plan\Finals\Sewer Contract Plan.dwg

Use Projections	
Houses served by on-site system	*4*
Bedrooms per house	*5*
Total Bedrooms	*20*
Total design flow at 150 gpd/bedroom (gpd)	*3,000*
ADF (gpd)	*1,500*
Settling tank volume required (gal)	*6,000* ⚠1

Notes
calculated values in italics
ADF = average daily flow
unit rates from Howard County Well and Septic memo Nov 2014

USE PROJECTIONS

QUANTITIES

ITEMS	QUANTITIES ESTIMATED	AS–BUILT QUANTITIES	AS–BUILT TYPE	AS–BUILT MANUFACTURER/ SUPPLIER
3W X 3'H DRAINFIELD TRENCHES	2,084 L.F.			
3"ø PVC FORCE MAIN	478 L.F.			
2"ø PVC LATERAL	1,864 L.F.			
⚠1 2,000 GALLON SETTLING TANK(S)	2			
5,000 GALLON PUMP TANK	1			
DRAINFIELD DOSING PUMPS	3			
8' x 12' CONTROL SHED	1			

NAME OF UTILITY CONTRACTOR:

SURVEY AND DRAFTING DIV. CHECKBOX: ☐ AS–BUILT DATE: ☐

SYMBOLS

A / 1 — INDICATES DETAIL

A / 1 — INDICATES SECTION OR VIEW

A / 1 — LETTER INDICATES A SECTION. SHEET NUMBER ON WHICH THE DETAIL OR SECTION IS DRAWN OR, THE SHEET NUMBER FROM WHERE THE DETAIL OR SECTION IS REFERENCED.

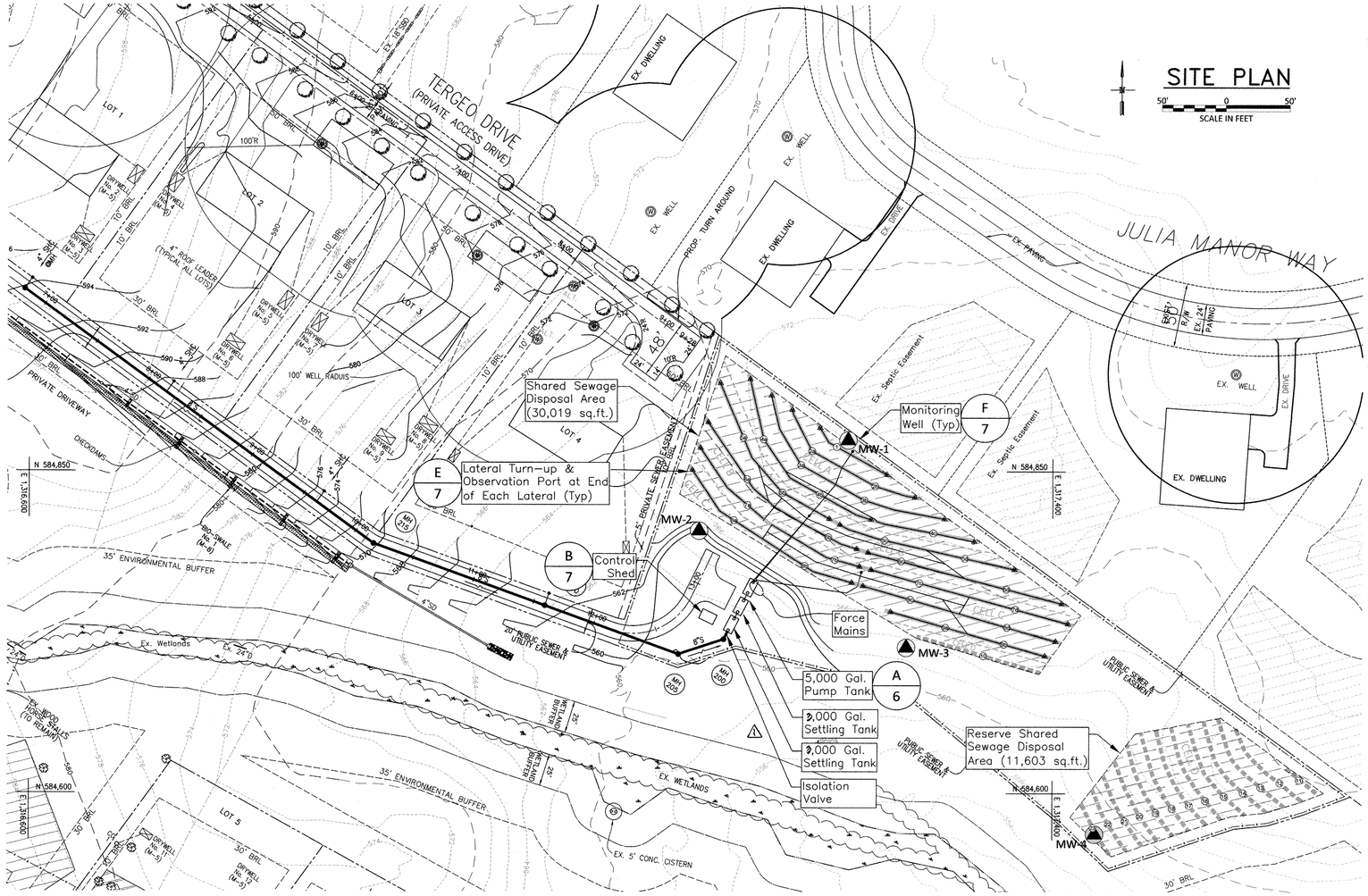
line symbol	description
WW	wastewater
TW	treated water
AA	aeration air
V	vent (to atmosphere)
PE	polyethylene
E	electric power wire
PVC	sch 40 polyvinyl chloride
DWV	drain waste vent polyvinyl chloride
ECPVC	polyvinyl chloride electrical conduit

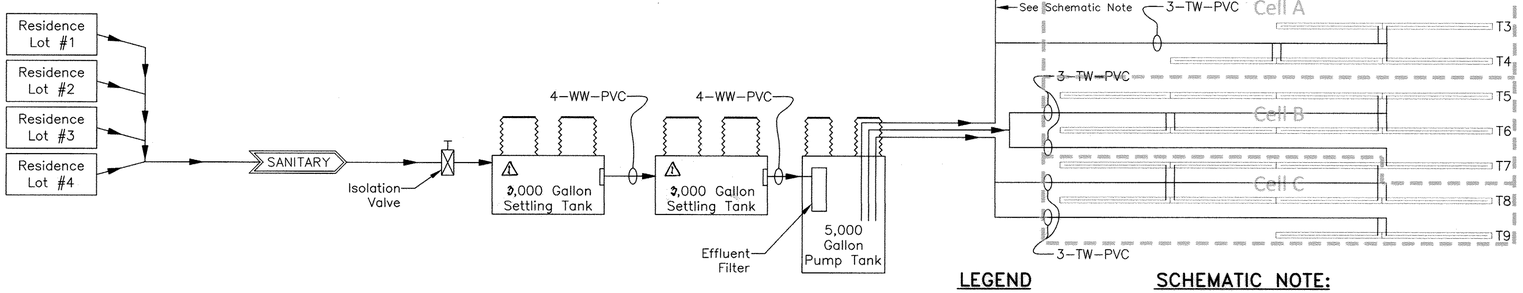
PIPE IDENTIFIER:

#–XX–XXX
- #–XX–XXX — PIPE MATERIAL
- #–XX–XXX — PIPE FUNCTION
- #–XX–XXX — NOMINAL PIPE SIZE (IN INCHES)

P&ID Key Notes

part symbol	component	nominal size	notes	material	#
ST1-2	top-seam settling tank	⚠1 3,000 gal	(2) 24"dia PE manholes	concrete	2
PT	pumping tank	4700 gal	(2) 24"dia PE manholes	concrete	1
P1-3	dose pumps - Goulds WE20H	230 vac	sewage pump		3
T1-T9	treatment trenches	length varies	3' wide, 1' gravel		9





WWTS SCHEMATIC KEY

WASTEWATER TREATMENT SYSTEM SCHEMATIC

NO SCALE

LEGEND
- CONTROL VALVE
- FLOW ARROW
- TO OR FROM OUTSIDE PROJECT LIMITS

SCHEMATIC NOTE:
ALL DISTRIBUTION/MANIFOLD PIPING IS IDENTIFIED AS 3–TW–PVC. LATERAL PIPING WITHIN TRENCHES IS 2–TW–PVC, SEE DETAIL SHEET FOR MORE INFORMATION.

APPROVED: FOR PRIVATE WATER AND SHARED SEWAGE FOR LOTS 1–4

for Michael J. Pavia 3/17/17
HOWARD COUNTY HEALTH OFFICER DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
CHIEF, BUREAU OF UTILITIES 1/25/17 DATE

DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY, MARYLAND
CHIEF, DEVELOPMENT ENGINEERING DIVISION M.G. 2.22.17 DATE

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 7803 EXPIRATION DATE IS 4/22/17.

Hydro-Terra GROUP
Hydro-Terra Group
1106 Business Parkway South
Suite E
Westminster, Maryland 21157
(410) 861-5376 (phone)
(410) 861-5467 (fax)
www.hydro-terra.com

1-17-2017 #7803
STATE OF MARYLAND CHARLES R. CROCKEN PROFESSIONAL ENGINEER
CHARLES R. CROCKEN

DESIGNED BY : M.D.S.
DRAWN BY : M.D.S.
CHECKED BY : M.J.M.
DATE : January, 2017

BY	NO.	REVISION	DATE
FCC	⚠1	REVISED TANK SIZES FROM 3,000 GAL. TO 2,000 GAL. & REVISED TITLE BLOCK.	7/17/17

SEWER MAIN EXTENSION & WASTEWATER TREATMENT SYSTEM SITE PLAN & PFD

600' SCALE MAP NO. 22 BLOCK NO. 8
F.C.C. WORK ORDER NO. 71160
FILE NAME : SEWER MAIN EXTENSION PLAN

⚠1 BELVEDERE ESTATES
LOTS 1 THRU 11,
BUILDABLE PRESERVATION PARCEL 'A' AND
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SEWER MAIN EXTENSION & WASTEWATER TREATMENT SYSTEM
CONTRACT NO. 50–4964–D
THIRD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

CONTRACT NO. 50–4964–D
~~BELVEDERE ESTATES~~
LOTS 1 THRU 11, BUILDABLE PRESERVATION PARCEL 'A' AND NON–BUILDABLE PRESERVATION PARCEL 'B'
SEWER MAIN EXTENSION & WASTEWATER TREAMENT SYSTEM
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 4 OF 7

Trench Design: 200% capacity with 66/66/66 low pressure distribution system

	Trench	existing ground elevation (feet msl)	perc ID's	sidewall top elevation (feet msl)	perc rates (minutes per inch)	*trench bottom elevation (feet msl)*	trench length (feet)	application rate (gpd/sqft)	*capacity (gpd, L*W*AppR/ CF)*
Primary Capacity (200%)	1	573.5	P-26	567.5	5	*566.5*	75	0.8	*217*
	2	573.0	P-25, P-26	567.0	5	*566.0*	135	0.8	*390*
	3	572.5	P-25, P-27	566.5	5	*565.5*	190	0.8	*548*
	4	572.0	P-25, P-27, P-33	566.0	<30	*565.0*	250	0.8	*721*
	5	571.0	P-33	565.0	24	*564.0*	300	0.8	*865*
	6	570.0	P-32, P-33, P-34, P-28	564.0	<30	*563.0*	330	0.8	*952*
	7	569.0	P-32, P-48, P-34, P-28	563.0	<15	*562.0*	336	0.8	*968*
	8	567.5	P-32, P-48, P-34, P-28	561.5	<15	*560.5*	330	0.8	*950*
	9	566.0	P-29, P-30	560.0	<30	*559.0*	135	0.8	*389*
Reserve Capcaity (100%)	10	570.0	P-36	564.0	8	*563.0*	100	0.8	*288*
	11	569.0	P-35	563.0	4	*562.0*	30	0.8	*88*
	12	569.0	P-35	563.0	4	*562.0*	78	0.8	*226*
	13	568.5	P-35, P-43	562.5	<15	*561.5*	89	0.8	*256*
	14	568.0	P-43	562.0	12	*561.0*	89	0.8	*256*
	15	567.5	P-43	561.5		*560.5*	86	0.8	*248*
	16	566.5	P-46, P-42, P-42A	560.5		*559.5*	83	0.8	*239*
	17	565.5	P-46, P-42, P-42A	559.5	<30	*558.5*	85	0.8	*245*
	18	564.5	P-46, P-42, P-42A	558.5		*557.5*	86	0.8	*248*
	19	563.0	P-46, P-42, P-42A	557.0		*556.0*	80	0.8	*230*
	20	561.5	P-47	555.5	21	*554.5*	71	0.8	*206*
	21	560.0	P-47	554.0		*553.0*	63	0.8	*183*
	22	559.0	P-47, P-41	553.0	<30	*552.0*	55	0.8	*158*
	23	557.5	P-47, P-41	551.5		*550.5*	45	0.8	*130*

Trench width (ft)= 3.0 — *300 % total capacity (gpd)= 9,000*
Sidewall Height (ft)= 1.0 — ***100% capacity (gpd)= 3,000***
Trench bottom depth (ft)= 7.0 — *primary capacity (gpd)= 6,000*
reserve capacity (gpd)= 3,000

Notes

calculated values in italics
gpd = gallons per day
NA = not available
msl = mean sea level in feet
laterals in each cell are same elevation

TRENCHFIELD DESIGN

Distribution Design

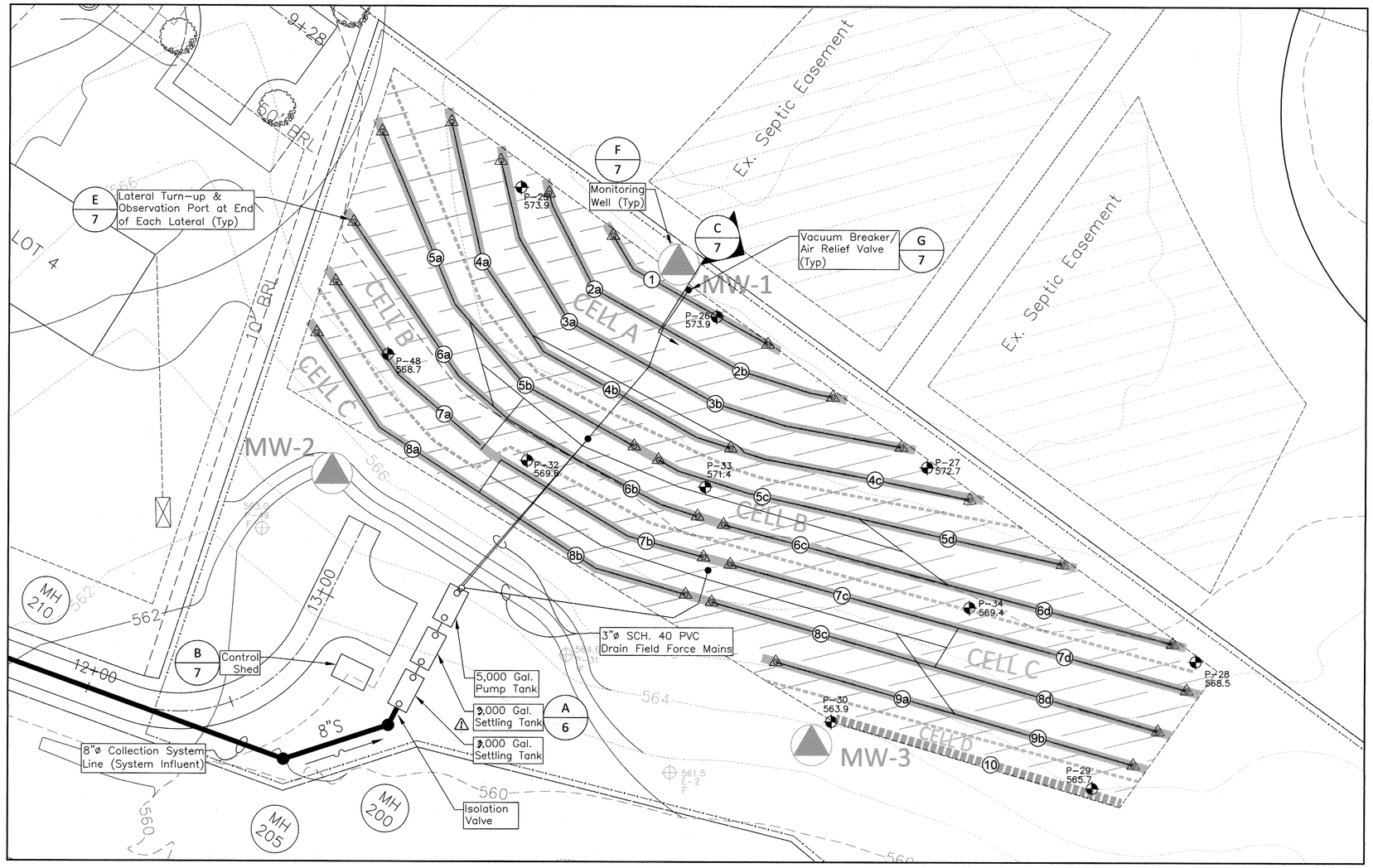
Cell	Trench	Lateral	treatment zone top elevation (feet msl)	lateral elevation (feet msl)	*Depth of lateral (ft)*	*Depth of gravel below lateral (ft)*	trench segment length (feet)	# holes - each lateral	perforation spacing (feet)	*lateral length (feet)*	perforation diameter (inches)	*Perforation flow (gpm)*	*lateral flow (gpm)*	*dose rate (gpm/foot of trench)*	*max. lateral friction loss (feet)*	*max. lateral friction loss (psi)*	*cell dose flow (gpm)*	*lateral dose velocity (ft/s)*
	1	a		567.5	4.0	*3.0*	38	4	*9.43*	*33.0*	9/32	*1.62*	*6.5*	*0.172*	*0.03*	*0.01*		*0.6*
		b				*3.0*	38	4	*9.43*	*33.0*	9/32	*1.62*	*6.5*	*0.172*	*0.03*	*0.01*		
	2	a		567.0	3.5	*3.5*	67	7	*9.57*	*62.2*	9/32	*1.62*	*11.3*	*0.169*	*0.18*	*0.08*		*1.1*
		b				*3.5*	67	7	*9.57*	*62.2*	9/32	*1.62*	*11.3*	*0.169*	*0.18*	*0.08*		*1.1*
A	3	a	569.5	566.5	3.0	*4.0*	95	10	*9.52*	*90.4*	9/32	*1.62*	*16.2*	*0.170*	*0.51*	*0.22*	***111.7***	*1.5*
		b				*4.0*	95	10	*9.52*	*90.4*	9/32	*1.62*	*16.2*	*0.170*	*0.51*	*0.22*		*1.5*
	4	a		566.0	2.5	*4.5*	84	9	*9.33*	*79.3*	9/32	*1.62*	*14.6*	*0.174*	*0.37*	*0.16*		*1.4*
		b				*4.5*	84	9	*9.33*	*79.3*	9/32	*1.62*	*14.6*	*0.174*	*0.37*	*0.16*		*1.4*
		c				*4.5*	84	9	*9.33*	*79.3*	9/32	*1.62*	*14.6*	*0.174*	*0.37*	*0.16*		*1.4*
	5	a		565.0	4.0	*3.0*	75	8	*9.38*	*70.3*	9/32	*1.62*	*13.0*	*0.173*	*0.26*	*0.11*		*1.2*
		b				*3.0*	75	8	*9.38*	*70.3*	9/32	*1.62*	*13.0*	*0.173*	*0.26*	*0.11*		*1.2*
		c				*3.0*	75	8	*9.38*	*70.3*	9/32	*1.62*	*13.0*	*0.173*	*0.26*	*0.11*		*1.2*
		d				*3.0*	75	8	*9.38*	*70.3*	9/32	*1.62*	*13.0*	*0.173*	*0.26*	*0.11*		*1.2*
B		a		567.0		*4.0*	83	9	*9.22*	*78.4*	9/32	*1.62*	*14.6*	*0.176*	*0.36*	*0.16*	***124.7***	*1.4*
	6	b		564.0	3.0	*4.0*	83	9	*9.22*	*78.4*	9/32	*1.62*	*14.6*	*0.176*	*0.36*	*0.16*		*1.4*
		c				*4.0*	83	9	*9.22*	*78.4*	9/32	*1.62*	*14.6*	*0.176*	*0.36*	*0.16*		*1.4*
		d				*4.0*	83	9	*9.22*	*78.4*	9/32	*1.62*	*14.6*	*0.176*	*0.36*	*0.16*		*1.4*
	7	a		563.0	2.0	*5.0*	84	9	*9.33*	*79.3*	9/32	*1.62*	*14.6*	*0.174*	*0.37*	*0.16*		*1.4*
		b				*2.5*	84	9	*9.33*	*79.3*	9/32	*1.62*	*14.6*	*0.174*	*0.37*	*0.16*		*1.4*
	7	c		563.0	4.5	*2.5*	84	9	*9.33*	*79.3*	9/32	*1.62*	*14.6*	*0.174*	*0.37*	*0.16*		*1.4*
		d				*2.5*	84	9	*9.33*	*79.3*	9/32	*1.62*	*14.6*	*0.174*	*0.37*	*0.16*		*1.4*
		a				*4.0*	83	9	*9.17*	*77.9*	9/32	*1.62*	*14.6*	*0.177*	*0.36*	*0.16*		*1.4*
C	8	b	564.5	561.5	3.0	*4.0*	83	9	*9.17*	*77.9*	9/32	*1.62*	*14.6*	*0.177*	*0.36*	*0.16*	***124.7***	*1.4*
		c				*4.0*	83	9	*9.17*	*77.9*	9/32	*1.62*	*14.6*	*0.177*	*0.36*	*0.16*		*1.4*
		d				*4.0*	83	9	*9.17*	*77.9*	9/32	*1.62*	*14.6*	*0.177*	*0.36*	*0.16*		*1.4*
	9	a		560.0	1.5	*5.5*	67	7	*9.57*	*62.2*	9/32	*1.62*	*11.3*	*0.169*	*0.18*	*0.08*		*1.1*
		b				*5.5*	67	7	*9.57*	*62.2*	9/32	*1.62*	*11.3*	*0.169*	*0.18*	*0.08*		*1.1*

Notes:

calculated values in italics
gpm = gallons per minute
msl = mean sea level in feet
All laterals within a cell are set at the same elevation.
Laterals end 1/2 hole spacing from end of trench

friction C factor for plastic pipe= 140
lateral inside diameter (2" PVC pipe, in)= 2.07
design distal head (feet)= 3.0

DISTRIBUTION DESIGN



***All results recorded here are for passed perc testing locations**

Test #	Limiting Zone Depth (feet)	Total Depth (feet)	Perc Rate (min/inch)	*Max Sidewall Depth (feet)*	*Elevation (feet msl)*	*Top of Treatment Zone (feet msl)*	*Bottom of Treatment Zone (feet msl)*
P-25	4.0	13.1	5	*5.1*	572.9	*568.9*	*563.8*
P-26	5.0	13.5	18	*4.5*	573.9	*568.9*	*564.4*
P-27	4.5	13.5	11	*5.0*	572.7	*568.2*	*563.2*
P-28	4.0	12.5	3	*4.5*	568.5	*564.5*	*560.0*
P-29	5.0	13.0	7	*4.0*	565.7	*560.7*	*556.7*
P-30	5.0	12.5	28	*3.5*	563.9	*558.9*	*555.4*
P-32	3.0	12.0	13	*5.0*	569.6	*566.6*	*561.6*
P-33	4.0	14.0	24	*6.0*	571.4	*567.4*	*561.4*
P-34	7.0	12.5	6	*1.5*	571.4	*564.4*	*562.9*
P-48	3.2	13.0	3	*5.8*	568.7	*565.5*	*559.7*
P-35	3.0	12.0	4	*5.0*	567.9	*564.9*	*559.9*
P-36	4.0	12.0	8	*4.0*	569.4	*565.4*	*561.4*
P-41	3.0	12.5	25	*5.5*	557.0	*554.0*	*548.5*
P-42	4.0	12.5	7	*4.5*	564.8	*560.8*	*556.3*
P-42A	5.5	13.0	11	*3.5*	564.5	*559.0*	*555.5*
P-43	3.5	14.0	12	*6.5*	568.4	*564.9*	*558.4*
P-46	3.0	13.0	13	*6.0*	564.5	*561.5*	*555.5*
P-47	3.3	13.0	21	*5.7*	559.2	*555.9*	*550.2*

PERC TEST RESULTS

DRAINFIELD PLAN

20' 0 20'
SCALE IN FEET

Notes:

1. Observation Port shall be located between the last and second to last perforation of each lateral.
2. Vacuum breaker/air relief valve shall be located at highest point of each cell.

APPROVED: FOR PRIVATE WATER AND SHARED SEWAGE FOR LOTS 1–4

for Richard C. Irvin 3/17/17
HOWARD COUNTY HEALTH OFFICER DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
CHIEF, BUREAU OF UTILITIES — DATE 11/2/17

DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY, MARYLAND
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 2.22.17

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 7803 EXPIRATION DATE IS 4/22/17.

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www.hydro-terra.com

1-17-2017
STATE OF MARYLAND CHARLES R. CROCKEN
CHARLES R. CROCKEN

M.D.S.
DRAWN BY : M.D.S.
CHECKED BY : M.J.M.
DATE : January, 2017

BY	NO.	REVISION	DATE
PCC	⚠	REVISED TITLE BLOCK & TANK SIZES FROM 2,000 GAL. TO 3,000 GAL.	7/17/17

SEWER MAIN EXTENSION & WASTEWATER TREATMENT SYSTEM ENLARGED DRAINFIELD PLAN

600' SCALE MAP NO. 22 BLOCK NO. 8
F.C.C. WORK ORDER NO. 71160
FILE NAME : SEWER MAIN EXTENSION PLAN

⚠ CONTRACT NO. 50-4964-D
BELVEDERE ESTATES
LOTS 1 THRU 11, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCEL 'B'
SEWER MAIN EXTENSION & WASTEWATER TREAMENT SYSTEM
HOWARD COUNTY, MARYLAND

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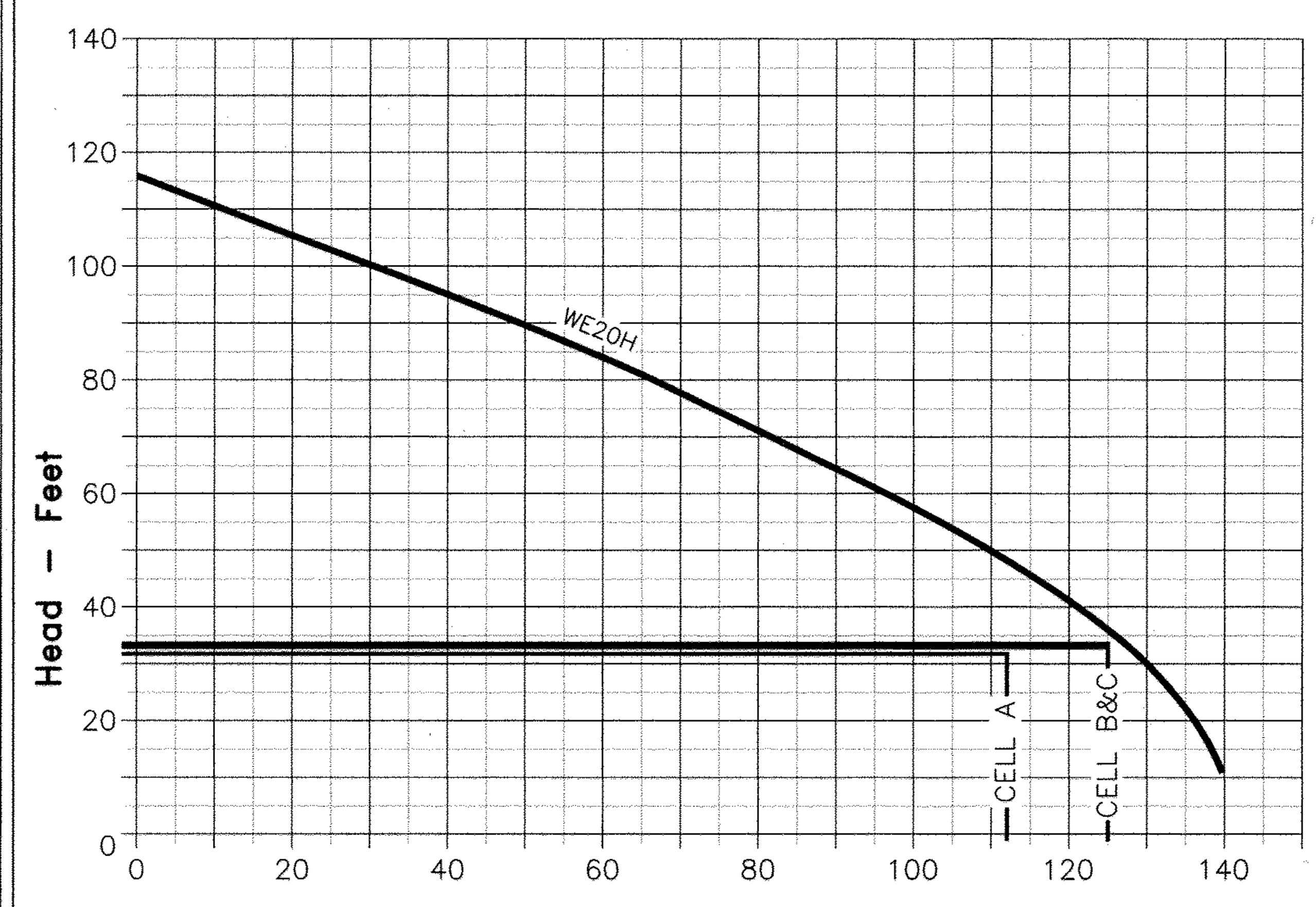
SEWER MAIN EXTENSION & WASTEWATER TREATMENT SYSTEM
CONTRACT NO. 50-4964-D
THIRD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 5 OF 7



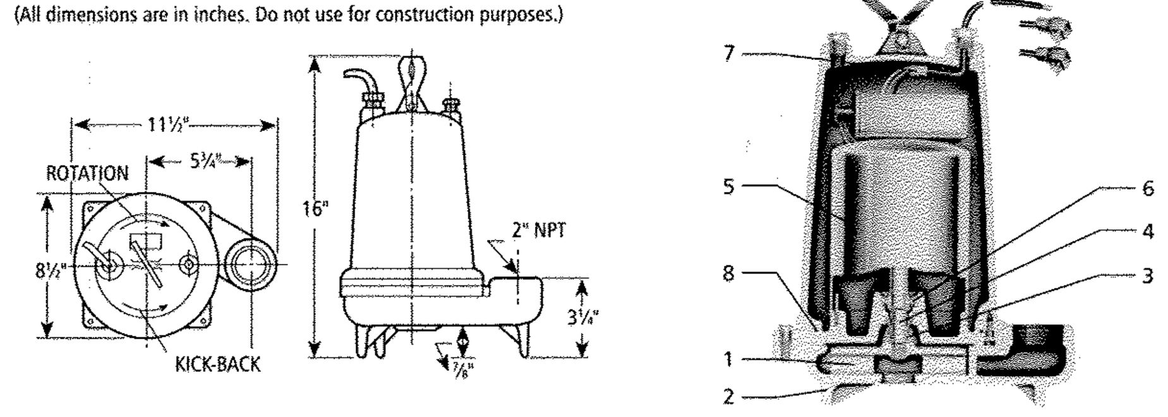
DOSE PUMP CURVE(S)
GOULDS WE20H

COMPONENTS

Item No.	Description
1	Impeller
2	Casing
3	Mechanical Seal
4	Motor Shaft
5	Motor
6	Ball Bearings
7	Power Cable
8	Casing O-Ring

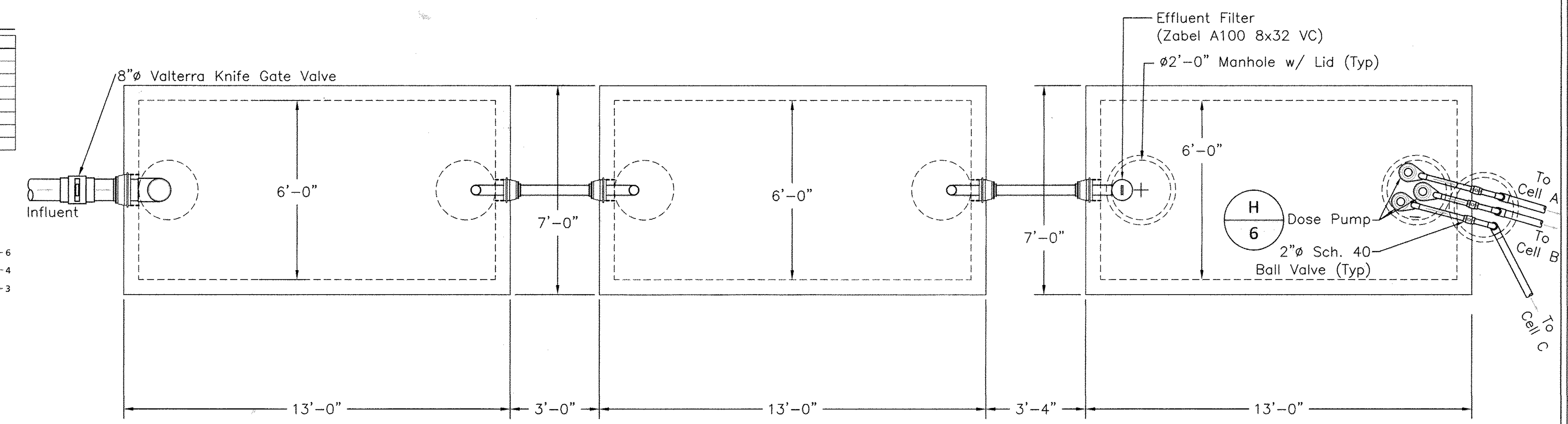
DIMENSIONS

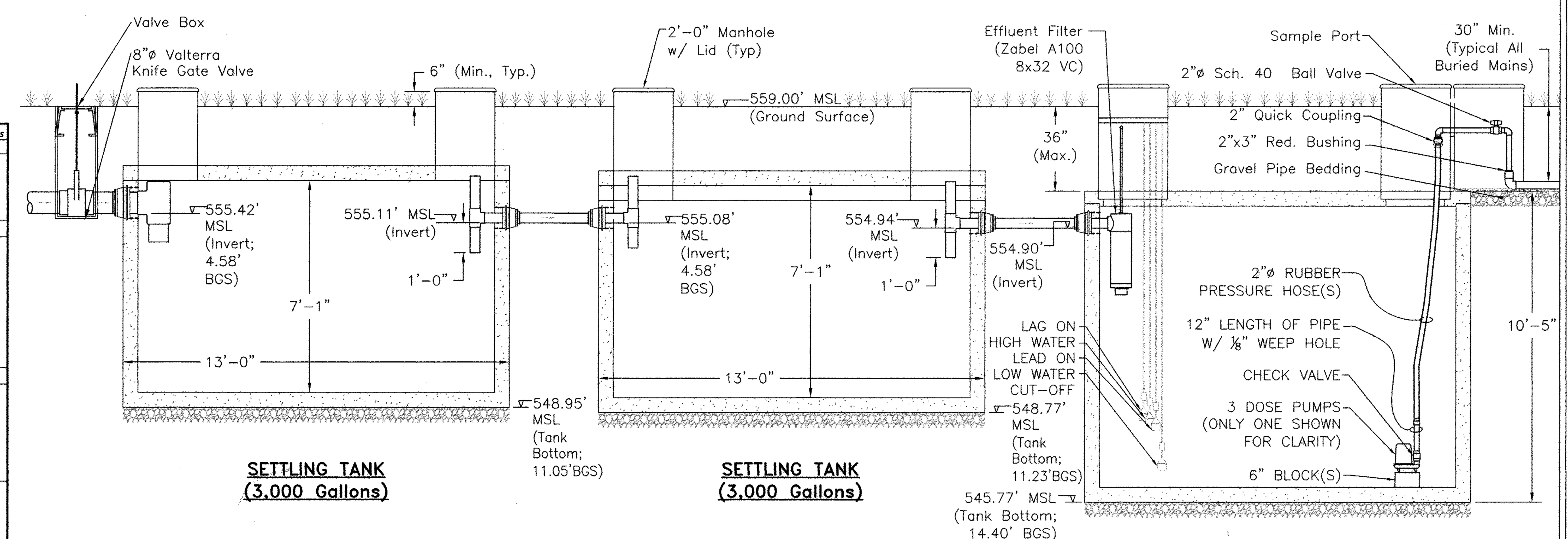
(All dimensions are in inches. Do not use for construction purposes.)



H / 6

DOSE PUMP
GOULDS WE20H





SETTLING TANK (3,000 Gallons)

SETTLING TANK (3,000 Gallons)

5,000 GALLON PUMP TANK

TREATMENT SYSTEM

A/4 A/5

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

Triplex Control Panel

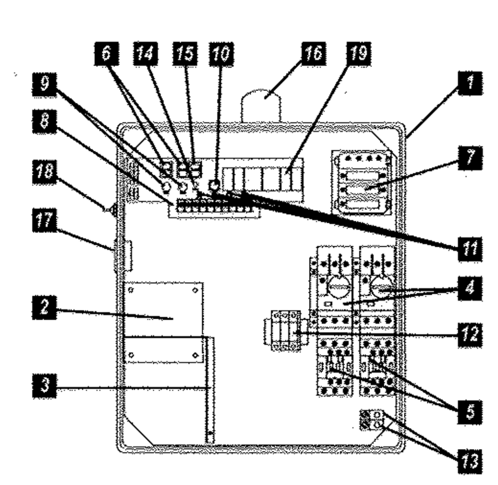
Three phase, triplex alternating pump control with intrinsically safe circuits.

The Model 324 control panel is designed for applications requiring intrinsically safe float circuits or other circuit extensions. This panel will alternately control two 208/240/480 VAC three phase pumps. The alternating action equalizes pump wear. In addition to the alternating pump control, this system provides override control should either pump fail. If an alarm condition occurs, an additional alarm switch activates the audio/visual alarm system. Common applications include pump chambers, lift stations, or other installations classified as hazardous locations requiring intrinsically safe circuits.

PANEL COMPONENTS

1. **Enclosure** measures 16 x 14 x 6 inches (40.64 x 35.56 x 15.24 cm) NEMA 4X (ultraviolet stabilized thermoplastic with removable mounting feet for outdoor or indoor use).
2. **Intrinsically Safe Module** limits the amount of energy to switches preventing ignition of flammable gases.
3. **Intrinsically Safe Partition** isolates intrinsically safe wiring.
4. **Motor Protective Switches** provide adjustable overload, branch circuit protection and pump disconnect.
5. **IEC Motor Contactors** control pumps by switching electrical lines.
6. **HOA Switches** for manual pump control (mounted on circuit board).
7. **Multi-Tap Transformer** (208/240/480 VAC primary) provides 120V control/alarm voltage or 600VAC primary transformer.
8. **Alternating Circuit Board** provides pump control and alternation of pumps (U.S. Patent # 5,909,352).
9. **Green Pump Run Indicator Lights** (mounted on circuit board).
10. **Control/Alarm Fuse** (mounted on circuit board).
11. **Float Status Indicator Lights** (mounted on circuit board).
12. **Input Power Terminal Block**
13. **Ground Lugs**
14. **Control/Alarm Power Indicator Light** (mounted on circuit board).
15. **Control ON/OFF Switch** (mounted on circuit board).

NOTE: Schematic/Wiring Diagram is located inside the panel on enclosure cover.



Model Shown 3241W511X

STANDARD ALARM PACKAGE

16. **Red Alarm Beacon** provides 360° visual check of alarm condition.
17. **Alarm Horn** provides audio warning of alarm condition (83 to 85 decibel rating).
18. **Exterior Alarm Test/Normal/Silence Switch** allows horn and light to be tested and horn to be silenced in an alarm condition. Alarm automatically resets once alarm condition is cleared.
19. **Horn Silence Relay** (mounted circuit board).

NOTE: other options available.

Model 324 control panels cannot be returned. Please refer to the Product Return section.

FEATURES

- Industrial control panel is UL Listed relating to hazardous locations with intrinsically safe circuit extensions
- Dual safety certification for the United States and Canada
- Standard package includes three 20' SJE MilliAmpMaster™ control switches
- Complete with step-by-step installation instructions
- Five-year limited warranty

c UL us LISTED

SEE BACKSIDE FOR COMPLETE LISTING OF AVAILABLE OPTIONS.
SEE PRICE BOOK FOR LIST PRICE.

SJE Rhombus
PO Box 1708, Detroit Lakes, MN 56502
1-888-DIAL-SJE • 1-218-847-1317
1-218-847-4617 Fax
email: customer.service@sjerhombus.com
www.sjerhombus.com

CONTROL PANEL SPECIFICATION

Design input			*Calculations*
Primary and Secondary Treatment			
settling tank capacity (gallons per inch)	89.8	*maximum daily flow (MDF) (gpd)*	*3,000*
normal settling tank fluid level (inches)	68	*average daily flow (ADF) (gpd)*	*1,500*
		settling tank volume required (gal)	*6,000*
		normal settling tank capacity (gal)	*6,104*
Static hydraulic profile (with invert elevations)			
ST1 influent invert elev. (feet msl)	555.42	**2'-4"' gravity sewer bury*	
ST2 influent invert elev. (feet msl)	555.08		
pump tank bottom elev. (feet msl)	545.77		
dose pump elev. (feet msl)	546.77	**Pump suction is 6" above tank bottom*	
Cell A lateral elev. (feet msl)	567.50	*Cell A in-service lift for dose pump (feet)*	*20.7*
Cell B lateral elev. (feet msl)	567.00	*Cell B in-service lift for dose pump (feet)*	*20.2*
Cell C lateral elev. (feet msl)	564.50	*Cell C in-service lift for dose pump (feet)*	*17.7*
Pumping and Dosing			
cell A flow (gpm)	***112***	*force main velocity (feet/second)*	*4.8*
Cell A force main length (feet)	137	*Cell A force main friction loss (feet)*	*6.7*
Cell A minor loss equivalent length (feet)	61.2	***Cell A max. total dynamic head (feet)***	***30.9***
		Cell A main volume (gal)	*53*
		Cell A total lateral volume (gal)	*113.6*
		Cell A dose vol. @ main + 5x lateral (gal)	*621*
cell B flow (gpm)	***125***	*force main velocity (feet/second)*	*5.4*
Cell B force main length (feet)	156	*Cell B force main friction loss (feet)*	*9.0*
Cell B minor loss equivalent length (feet)	61.2	***Cell B max. total dynamic head (feet)***	***32.6***
		Cell B main volume (gal)	*60*
		Cell B total lateral volume (gal)	*124.8*
		Cell B dose vol. @ main + 5x lateral (gal)	*684*
cell C flow (gpm)	***125***	*force main velocity (feet/second)*	*5.4*
Cell C force main length (feet)	185	*Cell C force main friction loss (feet)*	*10.2*
Cell C minor loss equivalent length (feet)	61.2	***Cell C max. total dynamic head (feet)***	***31.3***
		Cell C main volume (gal)	*71*
		Cell A total lateral volume (gal)	*124.8*
		Cell C dose vol. @ main + 5x lateral (gal)	*695*
dose tank diameter (inches)	144	***dose tank capacity (gals)***	***4,668***
dose tank width (inches)	72		
dose tank height to invert (inches)	104	*dose tank capacity (gals per inch)*	*44.88*
# cells in service	3	*design dose volume req'd (gals) (Cell C)*	*695*
timer override height (inches)	**38**	*dose volume (gal)*	*718*
high water alarm height (inches)	**36**	*min # daily doses @ MDF*	*4.3*
timer enable height (inches)	**34**	***min dose time (minutes)***	***29.0***
low water cutoff height (inches)	**18**	***max pump off time setting (hours)***	***5.1***
triplex effluent pumps (Goulds)	**WE20H**	*residual settling volume (gal)*	*808*
Triplex control panel (SJE Rhombus)		*normal equalization above enable (gal)*	*3,142*
tank height above invert (inches)	9	***volume above high water alarm (gal)***	***3,052***

Notes
gpd = gallons per day — design distal head (ft)= 3.0
gpm = gallons per minute — friction C factor for plastic pipe= 130
msl = mean sea level in feet — force main ID (3"dia sch40PVC, in)= 3.068
calculated values in italics — lateral inside diameter (2"dia sch40PVC, in)= 2.067
set floats based on weight +/- 3"
triplex control panel shall have individual hand/off/auto switches for each dose pump
two cells shall always be in service, with one cell resting

DESIGN INPUT

Notes

1. All inspection, viewing and pump out ports shall be secured to prevent accidental or unauthorized access.
3. No more than 3 FT of fill shall be placed anywhere over tank lid(s).
4. Tank measurements and elevations are based on septic tanks and pump chambers as manufactured by Gillespie Precast, LLC (1–800–638–6884); equal manufacturer may be accepted with shop drawing submittal and engineer approval.
5. Dose Pump control panel shall have event counters and elapsed time meters.
6. Minimum force main bury depth shall be 2'–6" (30") to top of pipe and shall maintain a positive or zero slope in the direction of flow.
7. All tanks shall be tested for water tightness prior to service.
8. All tanks shall be set upon 6"–8" of gravel bedding.
9. Pump control system shall automatically notify the county remotely in the event of a pump failure or high water alarm. Remote Notification shall be routinely tested as part of regular O&M.

PUMP TANK FLOAT	SETTING (Inches from Tank Bottom)
TIMER OVERRIDE	38
HIGH WATER	36
TIMER ENABLE	34
LOW WATER CUT–OFF	18

Float settings are based upon tank dimensions indicated, if different tanks are used, float settings will need to be adjusted accordingly.

⚠1 REPLACEMENT SHEET

CONTRACT NO. 50–4964–D
BELVEDERE ESTATES
LOTS 1 THRU 11, BUILDABLE PRESERVATION PARCEL 'A' AND NON–BUILDABLE PRESERVATION PARCELS 'B'
SEWER MAIN EXTENSION & WASTEWATER TREAMENT SYSTEM
HOWARD COUNTY, MARYLAND

APPROVED: FOR PRIVATE WATER AND SHARED SEWAGE FOR LOTS 1–4

[signature] 7/28/2017
HOWARD COUNTY HEALTH OFFICER — DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
[signature] 7/27/17
CHIEF, BUREAU OF UTILITIES — DATE

DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY, MARYLAND
[signature] 7/31/17
CHIEF, DEVELOPMENT ENGINEERING DIVISION M.G. — DATE

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 7803 EXPIRATION DATE IS 4/22/19.

Hydro-Terra Group
1106 Business Parkway South
Suite E
Westminster, Maryland 21157
(410) 861–5376 (phone)
(410) 861–5467 (fax
www.hydro-terra.com

7-13-2017
#7803
STATE OF MARYLAND — CHARLES R. CROCKEN — PROFESSIONAL ENGINEER
CHARLES R. CROCKEN
Exp. 4-22-19.

	BY	NO.	REVISION	DATE
DESIGNED BY : M.D.S.				
DRAWN BY : M.D.S.				
CHECKED BY : M.J.M.				
DATE : JULY, 2017	MJM	⚠1	Redline Revisions to signed Mylars – REPLACEMENT SHEET	5/3/17

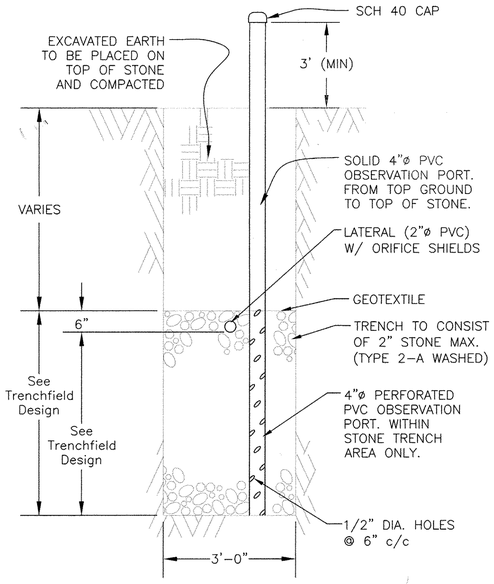
SEWER MAIN EXTENSION & WASTEWATER TREATMENT SYSTEM DETAILS SHEET 1

600' SCALE MAP NO. 22 BLOCK NO. 8
F.C.C. WORK ORDER NO. 71160
FILE NAME : SEWER MAIN EXTENSION PLAN

BELVEDERE ESTATES
LOTS 1 THRU 11,
BUILDABLE PRESERVATION PARCEL 'A' AND
NON–BUILDABLE PRESERVATION PARCEL 'B'
SEWER MAIN EXTENSION & WASTEWATER TREATMENT SYSTEM
CONTRACT NO. 50–4964–D
THIRD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

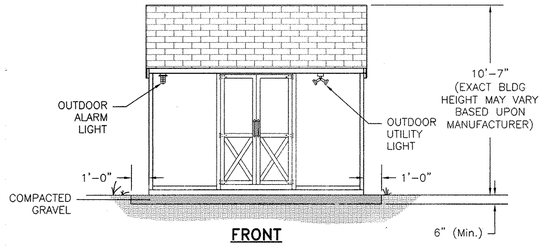
SCALE AS SHOWN

H:\Projects\Fisher Collins Carter\Paupers Folly\CADD\FCC-PF-WWTS-Design.DWG

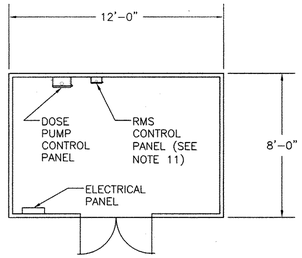


TYPICAL OBSERVATION PORT (E/5)

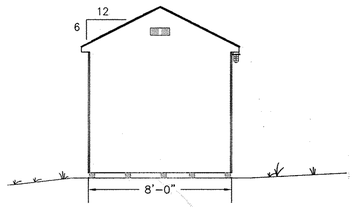
NOT TO SCALE



FRONT



FLOOR PLAN



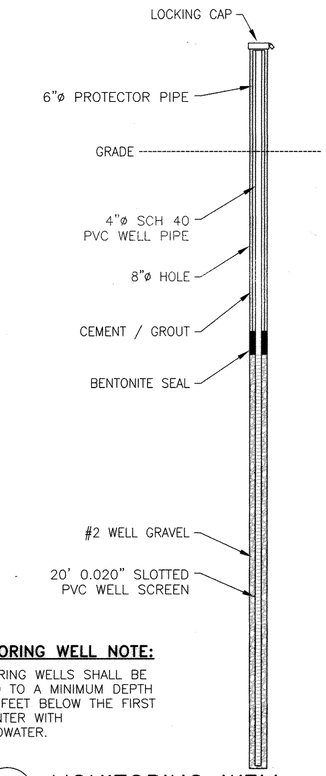
GABLE

UTILITY SHED NOTES:

1. UTILITY STORAGE BUILDING SHALL BE PROVIDED AT PUMP STATION WITH CONTROL PANEL MOUNTED INSIDE.
2. BUILDING SHALL BE RIDGE CABINET COMPANY HIGH WALL BARN STYLE STORAGE BUILDING. 8' X 12', VINYL SIDED WITH 8' SIDE WALLS AND NO WINDOWS, WITH ONE DOUBLE DOOR ON END OF BUILDING. BUILDING SHALL HAVE 10" RIDGE VENT, 4"X4" PRESSURE TREATED SKIDS, 2"X4" FLOOR JOISTS (16" ON CENTER), ⅝" PLYWOOD FLOOR SHEATHING, 2'X4' VENT, ALL WALLS TO BE PLATED AT BOTTOM AND DOUBLE PLATED AT THE TOP, ½" ROOF SHEATHING, 240 POUND ASPHALT 20 YEAR SHINGLES, DOORS AND FRAME TO BE REINFORCED, DOOR HINGES MUST BE "T" TYPE OR STRAP TYPE, 3 HINGES PER DOOR SIDE (PIANO HINGES ARE NOT ACCEPTABLE), LOCKS ARE TO BE KEYED ALIKE WITH BAUER CH751 LOCK.
3. VINYL SIDING SHALL BE ALMOND COLOR AND SHINGLES SHALL BE BROWN COLOR.
4. A RED ALARM BEACON SHALL BE MOUNTED ON THE OUTSIDE OF THE BUILDING.
5. BUILDING SHALL BE PLACED ON TOP OF 6" (MIN.) CR6 COMPACTED STONE.
6. GRADING TO BE LEVEL AND COMPACTED PRIOR TO PLACEMENT OF BUILDING.
7. FIELD PLACEMENT OF PANELS, PIPING, BLOWERS, AND TANKS SHALL BE APPROVED BY SITE ENGINEER.
8. ALL PIPING AND CONDUIT PENETRATIONS SHALL BE THROUGH THE FLOOR OF THE BUILDING AND SHALL BE SEALED WITH SPRAY FOAM INSULATION.
9. BUILDING SHALL HAVE A 230 VAC LOAD CENTER WITH APPROPRIATE CIRCUIT BREAKERS.
10. BUILDING SHALL HAVE AT LEAST 3 DOUBLE-DUPLEX CONVENIENCE OUTLETS, A CEILING LIGHT, OUTDOOR FLOODLIGHTS, AND AN OUTDOOR ALARM LIGHT.
11. A REMOTE MONITORING SYSTEM (RMS) SHALL BE INSTALLED THAT SHALL REMOTELY NOTIFY THE COUNTY IN THE EVENT OF A PUMP FAILURE OR A HIGH WATER ALARM. THE RMS SHALL BE COMPATIBLE WITH THE COUNTY'S EXISTING REMOTE MONITORING NETWORK AND INFRASTRUCTURE. RMS ALERT SYSTEM TESTING SHALL BE PART OF REGULAR O&M.

CONTROL SHED (B/4, B/5)

¼" = 1'-0"

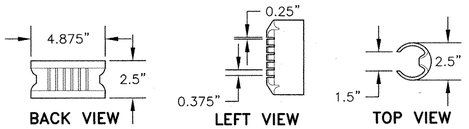


MONITORING WELL NOTE:

MONITORING WELLS SHALL BE DRILLED TO A MINIMUM DEPTH OF 15 FEET BELOW THE FIRST ENCOUNTER WITH GROUNDWATER.

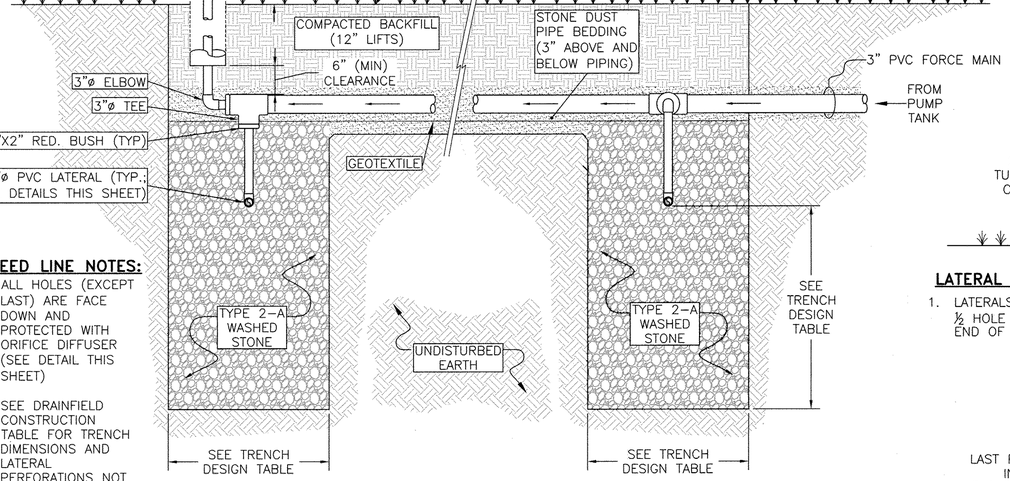
MONITORING WELL (F/4, F/5)

NOT TO SCALE



SIM TECH ORIFICE SHIELD 2" (STF-106-2.0)

NOT TO SCALE

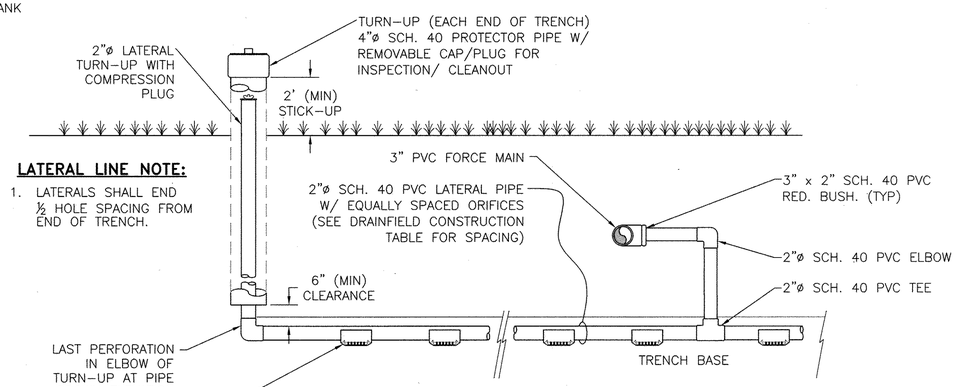


FEED LINE NOTES:

1. ALL HOLES (EXCEPT LAST) ARE FACE DOWN AND PROTECTED WITH ORIFICE DIFFUSER (SEE DETAIL THIS SHEET)
2. SEE DRAINFIELD CONSTRUCTION TABLE FOR TRENCH DIMENSIONS AND LATERAL PERFORATIONS NOT SHOWN.

FEED LINE/DEEP TRENCH DETAIL (TYP) (C/5)

NOT TO SCALE

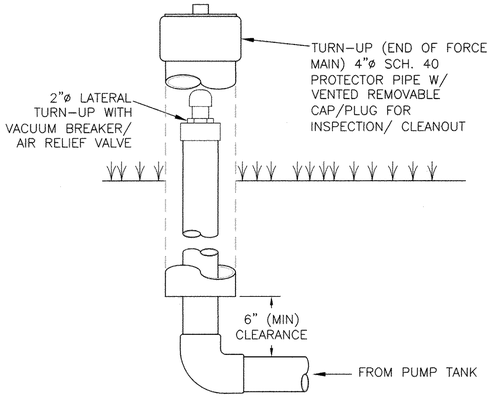


LATERAL LINE NOTE:

1. LATERALS SHALL END ½ HOLE SPACING FROM END OF TRENCH.

DISTRIBUTION LATERAL DETAIL (D/7)

NOT TO SCALE



FORCE MAIN VACUUM BREAKER (G/5)

APPROVED: FOR PRIVATE WATER AND SHARED SEWAGE FOR LOTS 1-4

for Michael J. Nair — 3/17/17
HOWARD COUNTY HEALTH OFFICER — DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF UTILITIES — 3/15/17 DATE

DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY, MARYLAND

CHIEF, DEVELOPMENT ENGINEERING DIVISION — M.G. — 3.22.17 DATE

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 7803 EXPIRATION DATE IS 4/22/17.

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STATE OF MARYLAND — CHARLES R. CROCKEN — No. 7803 — PROFESSIONAL ENGINEER
1-17-2017
CHARLES R. CROCKEN

M.D.S.	
DRAWN BY : M.D.S.	
CHECKED BY : M.J.M.	
DATE : January, 2017	

BY	NO.	REVISION	DATE
FCC	⚠	REVISED TITLE BLOCK	7/12/17

SEWER MAIN EXTENSION & WASTEWATER TREATMENT SYSTEM DETAILS SHEET 2

600' SCALE MAP NO. 22 BLOCK NO. 8
F.C.C. WORK ORDER NO. 71160
FILE NAME : SEWER MAIN EXTENSION PLAN

⚠ CONTRACT NO. 50-4964-D ~~BELVEDERE ESTATES~~
LOTS 1 THRU 11, BUILDABLE PRESERVATION PARCEL 'A' AND NON-BUILDABLE PRESERVATION PARCEL 'B'
SEWER MAIN EXTENSION & WASTEWATER TREAMENT SYSTEM
HOWARD COUNTY, MARYLAND

⚠ BELVEDERE ESTATES
LOTS 1 THRU 11,
BUILDABLE PRESERVATION PARCEL 'A' AND
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SEWER MAIN EXTENSION & WASTEWATER TREATMENT SYSTEM
CONTRACT NO. 50-4964-D
THIRD ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 7 OF 7