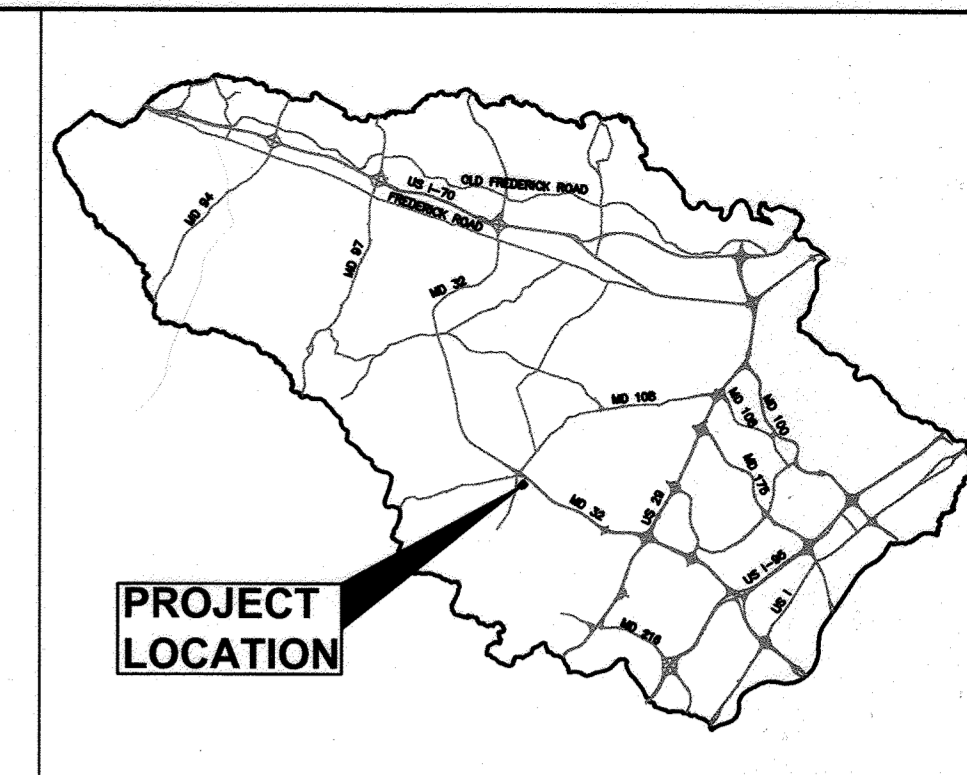


HERITAGE HEIGHTS WATER AND SEWER EXTENSIONS CAPITAL PROJECT NO. W-8332 CONTRACT NO. 34-5057 HOWARD COUNTY, MARYLAND

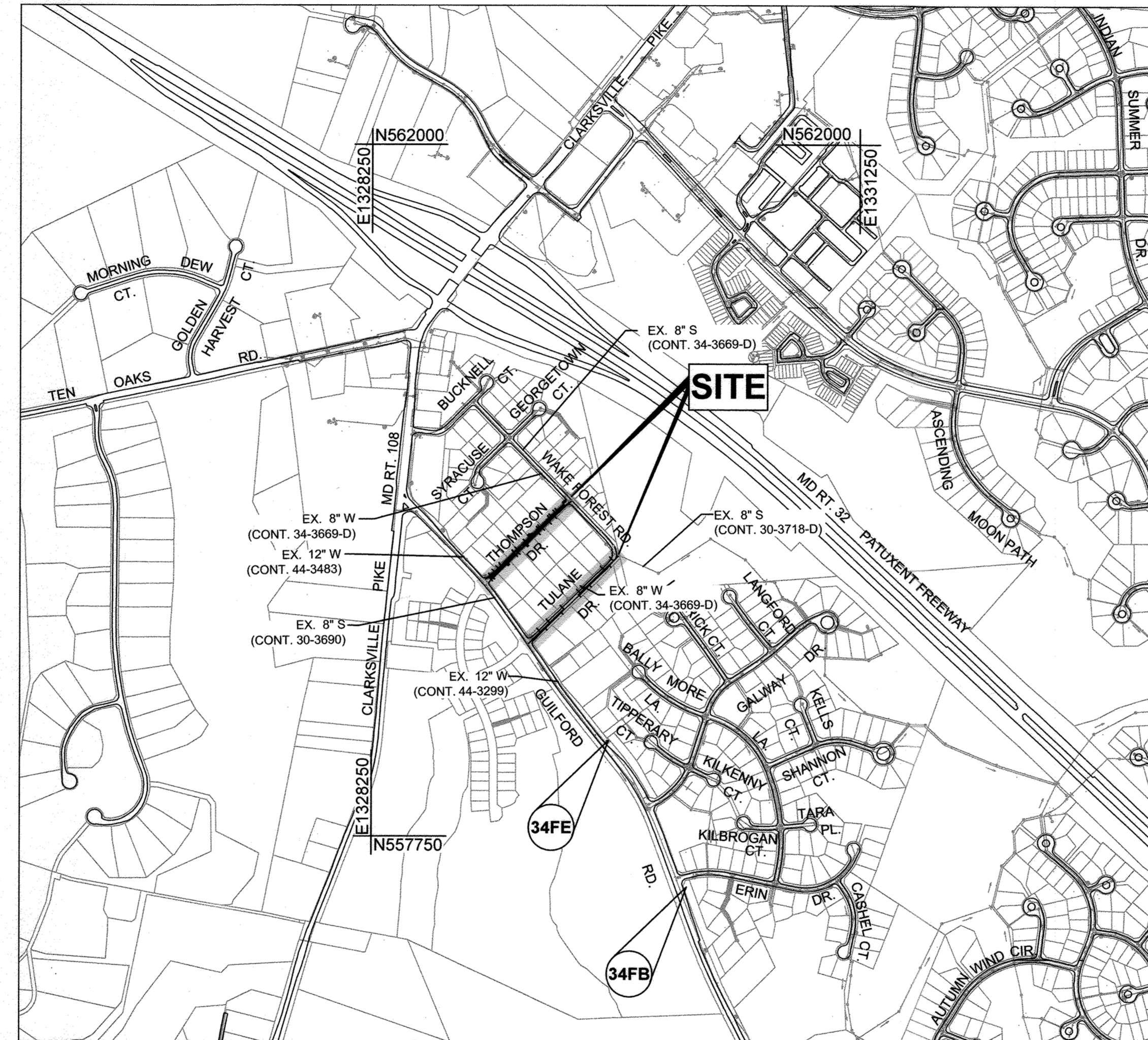


LOCATION MAP
NOT TO SCALE

GENERAL NOTES

1. APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES AND SERVICES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR EXPENSE.
2. TOPOGRAPHIC FIELD SURVEYS WERE PERFORMED ON 11/21/2017 BY KCI TECHNOLOGIES, INC.
3. HORIZONTAL AND VERTICAL SURVEY CONTROLS:
THE COORDINATES SHOWN ON THE DRAWINGS ARE BASED ON MARYLAND STATE REFERENCE SYSTEM NAD 83/07 AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL POINTS 35F1 AND 35I2. ALL VERTICAL CONTROLS ARE BASED ON NAVD 88. VERTICAL CONTROLS PROVIDED ON THE DRAWINGS ARE 35F1 AND 35I2.
4. ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
5. CLEAR ALL UTILITIES BY A MINIMUM OF 12". 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 REQUIRED. IN THE EVENT THE CONTRACTOR'S WORK REQUIRES THE BRACING OF ADDITIONAL POLES, ANY COST INCURRED BY THE OWNER FOR THE BRACING OF 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, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL HAVE A COPY OF VOLUME IV ON THE JOB.
7. ALL EXISTING UTILITIES SHALL BE TEST PITTED / LOCATED AS NECESSARY AND IN ADVANCE OF THE PROPOSED CONSTRUCTION. IN ORDER TO PROPERLY MAKE ALL REQUIRED UTILITY CROSSINGS AND / OR CONNECTIONS. ANY DISCREPANCIES OR UTILITY CONFLICTS SHALL BE IMMEDIATELY REPORTED TO THE ENGINEER. WHERE TEST PITS HAVE BEEN MADE ON EXISTING UTILITIES, THEY ARE NOTED BY THE SYMBOL AT THE LOCATION OF THE TEST PIT. A NOTE OR NOTES CONTAINING THE RESULTS OF THE TEST PIT OR PITS IS INCLUDED ON THE DRAWINGS OR IN THE SPECIFICATIONS. LOCATIONS OF OTHER EXISTING UTILITIES IN THE VICINITY OF THE PROPOSED WORK FOR WHICH TEST PITS HAVE NOT BEEN NOTED SHALL BE LOCATED BY THE CONTRACTOR TWO WEEKS IN ADVANCE OF CONSTRUCTION OPERATIONS AT HIS OWN EXPENSE.
8. 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
BG&E (CONSTRUCTION SERVICES).....	410-637-8713
BG&E (EMERGENCY).....	410-685-0123
BUREAU OF UTILITIES (DPW).....	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 LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR 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 ANY OPEN CUT OF ANY COUNTY ROAD OR BORING/JACKING OPERATION IN COUNTY ROADS 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.
12. THE CONTRACTOR SHALL PROVIDE SURVEY CONSTRUCTION STAKEOUT FOR ALL NECESSARY LINES. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY LINES, GRADES AND ELEVATIONS, AND CUT SHEETS SHALL BE PREPARED BASED ON THE LINES AND GRADES SHOWN ON THE CONTRACT DRAWINGS.
13. SPOIL FROM TRENCHING OPERATIONS SHALL BE PLACED ON THE UPHILL SIDE OF THE TRENCH.
14. THE CONTRACTOR SHALL USE THE AREA DESIGNATED ON THE PLANS AS THE STAGING / STORAGE AREA. THE WORK SHALL BE CONDUCTED UNDER STRICT ADHERENCE TO SECTION 308 - EROSION AND SEDIMENT CONTROL OF THE HOWARD COUNTY DESIGN MANUAL, VOLUME IV. PRECONSTRUCTION CONTOURS SHALL BE RESTORED ONCE THE UTILITY HAS BEEN INSTALLED.
15. SEE SHEET 2 FOR WATER MAIN NOTES AND SANITARY SEWER MAIN NOTES.



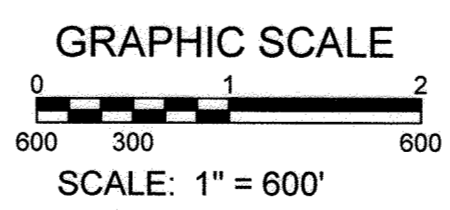
VICINITY MAP

SCALE: 1" = 600'

TYPE OF BUILDING:	N/A	PRESSURE ZONE:	630-W
NUMBER OF PARCELS:	0	WATER TEST GRADIENT:	907
NUMBER OF SEWER HOUSE CONNECTIONS:	25		
NUMBER OF WATER HOUSE CONNECTIONS:	13		
DRAINAGE AREA:	MIDDLE PATUXENT		

CONTROL NOTE
THE HORIZONTAL AND VERTICAL DATUM SHOWN HEREON ARE BASED ON THE FOLLOWING HOWARD COUNTY GEODETIC CONTROL STATIONS.

NAD83/2011 (HORIZONTAL) NAVD 88 (VERTICAL)	
34FE N 558339.589 E 1329709.089 ELEV. 431.118	34FB N 557439.902 E 1330191.388 ELEV. 406.151



PROFESSIONAL CERTIFICATION: 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. 31363, Expiration Date 01/16/2020.

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND, ABBREVIATIONS, WATER MAIN NOTES, SEWER MAIN NOTES, SEQUENCE OF CONSTRUCTION AND PAVING RESTORATION
3	SEWER PLAN & PROFILE THOMPSON DRIVE
4	SEWER PLAN & PROFILE TULANE DRIVE
5	WATER PLAN & PROFILE THOMPSON DRIVE
6	EROSION & SEDIMENT CONTROL PLAN
7	EROSION & SEDIMENT CONTROL NOTES AND DETAILS
8	EROSION & SEDIMENT CONTROL NOTES

BILL OF MATERIALS

ITEM	UNIT	ESTIMATE	AS-BUILT	MANUFACTURER
8" PVC SDR35 SEWER	L.F.	1335	1253	NATIONAL
8" PVC C-900 DR18 WATER	L.F.	629	629	NATIONAL
8" DIP CL54 WATER	L.F.	54	54	U S PIPE
48" (4" DIA.) PRECAST MANHOLE	EA.	8	9	ATLANTIC
48" (4" DIA.) MANHOLE RISER > 6'	V.F.	50	53.9	ATLANTIC
4" PVC SHC	L.F.	640	640	NATIONAL
4" PVC SHC VERTICAL STANDPIPE	V.F.	32	32	NATIONAL
1" WATER HOUSE CONNECTION	L.F.	319	319	CAMBRIDGE LEE

NAME OF UTILITY CONTRACTOR: W.F. WILSON & SONS INC.

CHECKBOX	
AS-BUILT DATE	FEBRUARY, 2020
SURVEY AND DRAFTING DIVISION	

PURPOSE STATEMENT:
IN RESPONSE TO PROPERTY OWNERS' REQUESTS, CONTRACT NO. 34-5057 WILL EXTEND PUBLIC WATER AND SEWER TO THIS AREA, WHICH WAS RECENTLY INCORPORATED INTO THE METROPOLITAN DISTRICT.

OWNER'S/DEVELOPER'S CERTIFICATION

"I/WE CERTIFY THAT ALL CLEARING, GRADING, CONSTRUCTION OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN, INCLUDING INSPECTING AND MAINTAINING CONTROLS, AND THAT THE RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF TRAINING AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENT PRIOR TO THE BEGINNING OF THE PROJECT. I CERTIFY RIGHT-OF-ENTRY FOR PERIODIC ON-SITE EVALUATION BY HOWARD COUNTY, THE HOWARD SOIL CONSERVATION DISTRICT AND/OR MDE."

Zachary C. Knight
OWNERS'/DEVELOPERS' SIGNATURE DATE: 12-20-2018
ZACHARY C. KNIGHT, PROJECT MANAGER
PRINTED NAME & TITLE

DESIGN CERTIFICATION

"I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

Guihua Wang
DESIGNERS SIGNATURE DATE: 12/18/2018
PRINTED NAME: GUIHUA WANG
MD REGISTRATION NO. 31363
(E, R.L.S. OR R.L.A. (CIRCLE ONE))

HOWARD SOIL CONSERVATION DISTRICT

THIS PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
Chelle A. Kelly
HOWARD SOIL CONSERVATION DISTRICT DATE: 12/20/18
E.P. 18-31

AS-BUILT REPLACEMENT SHEET

<p style="text-align: center;">DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND</p> <p><i>John J. Kelly</i> 12/25/18 DIRECTOR OF PUBLIC WORKS DATE</p> <p><i>Thomas E. Butler</i> 12/26/18 CHIEF, BUREAU OF ENGINEERING DATE</p> <p><i>John J. Kelly</i> 12-27-18 CHIEF, BUREAU OF UTILITIES DATE</p> <p><i>John J. Kelly</i> 12-27-18 CHIEF, UTILITY DESIGN DIVISION DATE</p>	 KCI TECHNOLOGIES 936 Riddick Road Sparks, MD 21152 PHONE: (410) 316-7800 FAX: (410) 316-7817 www.kci.com	 GUIHUA WANG PROFESSIONAL ENGINEER 03/03/2020	DES: KJ DRN: KJ CHK: GW DATE: MARCH 2020 BY: NO. REVISION: AS-BUILT, RECORD DRAWING DATE: 3/3/20	TITLE SHEET	HERITAGE HEIGHTS WATER AND SEWER EXTENSIONS CAPITAL PROJECT No. W-8332 CONTRACT No. 34-5057 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 1 of 8
---	--	---	--	--------------------	--	--------------------------------------

KCI TECHNOLOGIES PROJECT NO.: 13122677.63

M:\2018\122677\AS-Built\AS-Built.dwg
User: kevin.ladson
Date: 12/27/18

WATER MAIN NOTES

- ALL WATER MAINS SHALL BE PVC CLASS C900 & C905 PIPE UNLESS OTHERWISE NOTED. SEE THE HOWARD COUNTY DESIGN MANUAL VOLUME IV-STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION AND ALL SUBSEQUENT AMENDMENTS THERETO.
- TOPS OF WATER MAIN SHALL HAVE A MINIMUM OF 3'-6" OF COVER UNLESS OTHERWISE NOTED.
- VALVES ADJACENT TO TEES SHALL BE STRAPPED TO TEES.
- THE CONTRACTOR SHALL NOTIFY THE BUREAU OF UTILITIES HOWARD COUNTY, 15 DAYS PRIOR TO WATER MAIN SHUT DOWN.
- ALL FITTINGS SHALL BE BUTTRESSED OR ANCHORED WITH CONCRETE IN ACCORDANCE WITH STANDARD DETAILS UNLESS OTHERWISE PROVIDED FOR ON THE DRAWINGS.
- FIRE HYDRANTS SHALL BE SET TO THE BURY LINE ELEVATIONS SHOWN ON THE DRAWINGS. ALL FIRE HYDRANTS SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD DETAILS. THE SOIL AROUND THE FIRE HYDRANT SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 1000 AND SECTION 1005 OF THE STANDARD DETAIL AND SPECIFICATIONS. ALL FIRE HYDRANT LEADS SHALL BE PVC PIPE AND CONSTRUCTED IN ACCORDANCE WITH HOWARD COUNTY DESIGN MANUAL VOLUME IV-STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION.
- WHERE CONNECTING TO EX. CAST IRON PIPE, THE CONTRACTOR SHALL USE PE X PE SPOOL PIECE, A RESTRAINED COUPLING AND BUTTRESS OR ANCHORAGE.
- THE CONTRACTOR SHALL NOT OPERATE ANY WATER MAIN VALVES ON THE EXISTING WATER SYSTEM.
- TRACER WIRES AND CONTINUITY TEST STATIONS SHALL BE INSTALLED ON ALL DIP AND PVC WATER MAINS IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL.
- FOR PVC WATER MAINS, ALL RECORDS FOR THE QUALITY CONTROL AND QUALIFICATION TEST REQUIREMENTS NOTED IN SECTION 5.1 OF THE AWWA STANDARD C900 FOR PVC PRESSURE PIPE SHALL BE SUBMITTED WITH THE PIPE MATERIAL CERTIFICATIONS OR SHOP DRAWINGS PRIOR TO APPROVAL OF THE MATERIAL FOR USE. THE TEST RECORDS SHALL BE FOR THE PIPE TO BE INSTALLED UNDER THIS CONTRACT. ALL PVC PIPE SHALL CONTAIN MARKINGS TO ALLOW CROSS REFERENCING OF THE PIPE SUPPLIED TO THE TEST RECORDS RECEIVED.
- UNLESS OTHERWISE NOTED ON THE PLANS OR IN THE SPECIFICATIONS SACRIFICIAL ANODES SHALL BE INSTALLED ON ALL VALVES AND METALLIC FITTINGS USED WITH PVC WATER MAINS IN ACCORDANCE WITH VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION. SEVENTEEN (17) POUND MAGNESIUM ANODES SHALL BE INSTALLED ON ALL VALVES AND DUCTILE IRON FITTINGS INCLUDING RESTRAINTS AND HARNESSSES. TWELVE (12) POUND ZINC ANODES SHALL BE INSTALLED ON ALL STAINLESS STEEL FITTINGS AND SADDLES USED WITH PVC MAINS. ALL "TEES" USED WITH PVC MAINS SHALL BE DUCTILE IRON.
- PROPER ASSEMBLY OF GASKETED PVC PIPE JOINTS: THE MANUFACTURER'S INSERTION LINE OF GASKETED PVC PIPE JOINTS INDICATES THE MAXIMUM DEPTH OF INSERTION OF THE SPIGOT INTO THE BELL. AFTER ASSEMBLY OF THE JOINT, THE INSERTION LINE SHALL REMAIN VISIBLE. DUAL INSERTION LINES ON GASKETED PVC PIPE INDICATE THE MAXIMUM AND MINIMUM DEPTH OF INSERTION OF THE SPIGOT INTO THE BELL. THE CONTRACTOR SHALL NOT OVER INSERT OR OVER HOME THE SPIGOT INTO THE BELL OF PVC PIPE.
- ALL CHANGES IN HORIZONTAL OR VERTICAL DIRECTION OF PVC WATER PIPE SHALL BE MADE WITH STANDARD BENDS, 5-DEGREE SWEEPS OR HIGH DEFLECTION (HD) COUPLINGS. NO BENDING OF THE PIPE OR DEFLECTING OF PVC PIPE JOINTS IS PERMITTED. WHERE HIGH DEFLECTION COUPLINGS OR 5-DEGREE SWEEPS ARE PERMITTED, THE CONTRACTOR SHALL PROVIDE ONE FULL PIPE LENGTH (20-FOOT LONG) ON EITHER SIDE OF THE HIGH DEFLECTION COUPLING OR 5-DEGREE SWEEP. THE CONTRACTOR SHALL USE A VIBRATORY PLATE COMPACTOR OR OTHER APPROVED MEANS TO THOROUGHLY COMPACT THE #7 STONE ON BOTH SIDES OF THE HIGH DEFLECTION COUPLING OR 5-DEGREE SWEEP, TAKING CARE NOT TO USE COMPACTOR EQUIPMENT DIRECTLY OVER THE FITTING.

PVC HIGH DEFLECTION COUPLINGS SHALL BE LIMITED TO A TOTAL DEFLECTION OF 3-DEGREES (1 1/2-DEGREE ON EITHER END OF THE COUPLING). SHALL BE RATED FOR A MINIMUM 200 PSI MEETING THE REQUIREMENTS OF AWWA C900. SHALL HAVE A MINIMUM LAY LENGTH OF 9-INCHES AND SHALL HAVE CENTER STOPS. PVC HIGH DEFLECTION COUPLINGS SHALL BE CERTAINTED PVC HIGH DEFLECTION (HD) STOP COUPLINGS OR EQUAL.

FIVE DEGREE SWEEPS SHALL BE BELL BY SPIGOT, RATED FOR A MINIMUM 225 PSI, DR18 MEETING THE REQUIREMENTS OF AWWA C900 AND SHALL BE MULTI FITTINGS (IPEX) BLUE BRUTE DR18 OR EQUAL.
- WHEN PVC HIGH DEFLECTION COUPLINGS OR PVC 5-DEGREE SWEEPS ARE USED TO FACILITATE CHANGES IN HORIZONTAL OR VERTICAL ALIGNMENTS OF AWWA C-900 PVC PIPE LINES, THE CONTRACTOR SHALL INSTALL DEVICES FOR THE PREVENTION OF OVER-INSERTION OF THE PVC PIPE SPIGOTS OR PLAIN ENDS INTO THE PUSH ON BELL JOINT ON BOTH SIDES OF THE HIGH DEFLECTION COUPLINGS AND 5 DEGREE SWEEPS. BELL STOPS SHALL BE PLACED AT THE PROPER INSERTION LINE FOR THE FITTING. THE BELL STOP SHALL BE MANUFACTURED OF DUCTILE IRON AND INCORPORATE AN EXPANSION RETENTION SPRING TO ALLOW FOR PIPE EXPANSION AND CONTRACTION. THE BELL STOPS SHALL BE SERIES 5000 MEGA-STOP, AS MANUFACTURED BY EBAA IRON, INC. OR APPROVED EQUAL.
- THE STATIC GRADIENT FOR THE WATER MAINS AT THE PROJECT LOCATION IS 630 FEET. HYDROSTATIC AND LEAKAGE TESTING OF NEW WATER MAINS SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 1006 OF THE HOWARD COUNTY DESIGN MANUAL VOLUME IV (LATEST EDITION). THE TEST PRESSURE TO BE INDUCED AT THE LOW POINT OF THE TEST SECTION SHALL BE 200 PSI MINIMUM.

SANITARY SEWER MAIN NOTES

- ALL SEWER MAINS SHALL BE D.I.P. or P.V.C. UNLESS OTHERWISE NOTED.
- ALL MANHOLES SHALL BE 4'-0" INSIDE DIAMETER UNLESS OTHERWISE NOTED.
- FORCE MAINS SHALL BE D.I.P. ONLY.
- MANHOLES SHOWN WITH 12" AND 16" WALLS ARE FOR BRICK MANHOLES ONLY.
- 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 FRAME 1'-6" ABOVE FINISHED GRADE UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- HOUSE(S) WITH THE SYMBOL "C.N.S." INDICATES THAT THE CELLAR CANNOT BE SERVED.

SUGGESTED SEQUENCE OF CONSTRUCTION

THE FOLLOWING SEQUENCE OF CONSTRUCTION IS NOT A COMPLETE LIST OF TASKS OR WORK REQUIRED TO COMPLETE THE CONTRACT REQUIREMENTS. THE SEQUENCE OF CONSTRUCTION MAY BE MODIFIED OR REVISED AT THE REQUEST OF THE CONTRACTOR WITH THE APPROVAL OF THE COUNTY PRIOR TO THE START OF CONSTRUCTION. SUGGESTED SEQUENCE LISTS A, B AND C BELOW MAY BE PERFORMED IN ANY ORDER.

A. CONSTRUCTION OF 8" WATER MAIN ALONG THOMPSON DRIVE

- INSTALL EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH ESC PLANS.
- INSTALL 8" WATER MAIN FROM STA. 0+02 TO STA. 6+74.
- PERFORM PRESSURE TESTING AND DISINFECT THE 8" WATER MAIN. PERFORM BACTERIOLOGICAL TESTING.
- MAKE CONNECTIONS TO THE EXISTING WATER MAIN ON GUILFORD ROAD AND WAKE FOREST ROAD.
- OPEN THE EXISTING VALVE AT GUILFORD ROAD (CONTRACT NO. 44-3483), AND EXISTING VALVE AT WAKE FOREST ROAD (CONTRACT NO. 34-6669).
- INSTALL ALL HOUSE CONNECTIONS AND OUTSIDE METERS.
- PERFORM TEMPORARY PAVING RESTORATION AND TEMPORARY RESTORATION OF ALL GRASS AREAS IN ACCORDANCE WITH THE PLANS.

B. CONSTRUCTION OF 8" SEWER MAIN ALONG THOMPSON DRIVE

- INSTALL EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH ESC PLANS.
- INSTALL 8" SEWER MAIN AND MANHOLES ALONG THOMPSON DRIVE.
- PERFORM TEMPORARY PAVING RESTORATION IN ACCORDANCE WITH THE PLANS.
- INSTALL ALL SEWER HOUSE CONNECTIONS AND CLEAN-OUTS.
- PERFORM TEMPORARY RESTORATION TO ALL GRASS AREAS.
- MAKE CONNECTION TO THE EXISTING SEWER MANHOLE AT WAKE FOREST ROAD.
- PERMANENTLY RESTORE THE GRASS AREAS FOR BOTH WATER AND SEWER HOUSE CONNECTIONS IN ACCORDANCE WITH THE PLANS AND PERFORM PERMANENT PAVING RESTORATION.
- WITH PERMISSION FROM THE HOWARD COUNTY INSPECTOR, REMOVE THE SEDIMENT CONTROL MEASURES

C. CONSTRUCTION OF 8" SEWER MAIN ALONG TULANE DRIVE

- INSTALL EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH ESC PLANS.
- INSTALL 8" SEWER MAIN AND MANHOLES ALONG TULANE DRIVE.
- PERFORM TEMPORARY PAVING RESTORATION IN ACCORDANCE WITH THE PLANS.
- INSTALL ALL SEWER HOUSE CONNECTIONS AND CLEAN-OUTS.
- PERFORM TEMPORARY RESTORATION TO ALL GRASS AREAS.
- MAKE CONNECTION TO THE EXISTING SEWER MANHOLES AT GUILFORD ROAD AND WAKE FOREST ROAD.
- PERMANENTLY RESTORE THE GRASS AREAS FOR SEWER HOUSE CONNECTIONS IN ACCORDANCE WITH THE PLANS AND PERFORM PERMANENT PAVING RESTORATION.
- WITH PERMISSION FROM THE HOWARD COUNTY INSPECTOR, REMOVE THE SEDIMENT CONTROL MEASURES

LEGEND

EXISTING

	DECIDUOUS TREE		FIRE HYDRANT
	CONIFEROUS TREE		WATER VALVE
	BUSH		SEWER MANHOLE
	HEDGE		STORM DRAIN MANHOLE
	UTILITY POLE		WATER MAIN
	GUY		SEWER MAIN
	LIGHT POST		STORM DRAIN
	MAIL BOX		OVERHEAD WIRE
	TELECOM PEDISTAL		CABLE TV
	WATER WELL		FENCE
	WATER METER / CURB STOP		PROPERTY BOUNDARY
	SEWER CLEAN-OUT		MAJOR CONTOUR
	SIGN		MINOR CONTOUR
	TRAVERSE POINT		

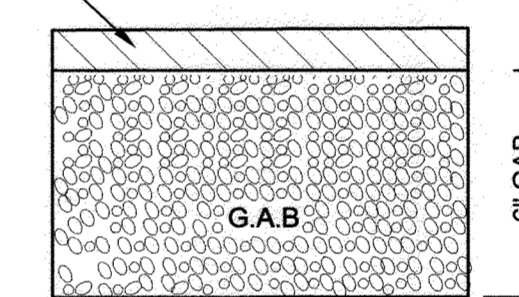
PROPOSED

	SEWER MANHOLE		SEWER MAIN
	SHC WITH CLEAN-OUT		WATER MAIN
	WATER METER		SILT FENCE
	TEST HOLE		LIMIT OF DISTURBANCE
	SOIL BORING		
	FLOW ARROW		

ABBREVIATIONS

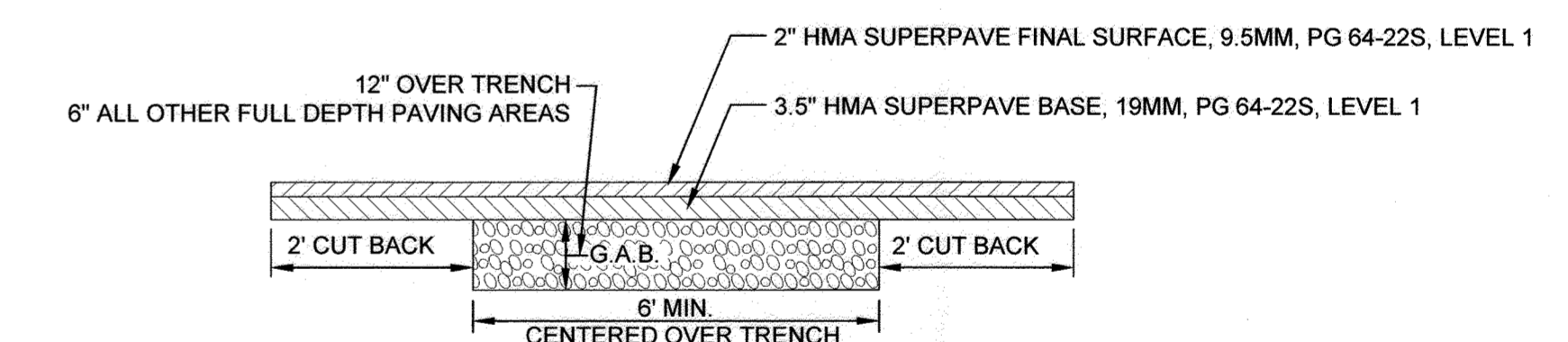
SYMBOL	DESCRIPTION
CMP	CORRUGATED METAL PIPE
CNF	CANNOT FIND
CNS	CELLAR NOT SERVED
CO	CLEAN-OUT
C.T.S.	CONTINUITY TEST STATION
DHC	DROP HOUSE CONNECTION
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
FF	FIRST FLOOR ELEVATION
FHT	FIRE HYDRANT TEE
(H)	HORIZONTAL
HB	HORIZONTAL BEND
HDC	HIGH DEFLECTION COUPLING
HO. CO.	HOWARD COUNTY
INV	INVERT
MCE	MINIMUM CELLAR ELEVATION
MH	MANHOLE
PVC	POLYVINYL CHLORIDE
R/W	RIGHT OF WAY
SHC	SEWER HOUSE CONNECTION
STD	STANDARD
TRAV	TRAVERSE
(V)	VERTICAL
VB	VERTICAL BEND
WHC	WATER HOUSE CONNECTION

3" TEMPORARY BITUMINOUS CONCRETE (HOT PATCH) OR HMA SUPERPAVE BASE 19MM, PG-22S.



DETAIL 1 - TEMPORARY UTILITY TRENCH PAVING RESTORATION

NOT TO SCALE
FOR TRENCH DETAIL REFER TO HOWARD COUNTY STANDARD DETAIL G-2.12



DETAIL 2 - PERMANENT UTILITY TRENCH AND OTHER FULL DEPTH AREAS PAVING RESTORATION

NOT TO SCALE
REFER TO HOWARD COUNTY STANDARD DETAIL G-4.01 FOR ADDITIONAL NOTES
FOR TRENCH DETAIL REFER TO HOWARD COUNTY STANDARD DETAIL G-2.12

THE PERMANENT PAVING RESTORATION DETAIL APPLIES TO THOMPSON DRIVE, TULANE DRIVE AND WAKE FOREST ROADS ONLY. FOR WORK IN GUILFORD ROAD THE EXISTING PAVEMENT THICKNESS SHALL BE MATCHED PER DETAIL 4.01 USING THE NECESSARY COMBINATION OF BASE, INTERMEDIATE AND SURFACE COURSE HMA.

AS-BUILT REPLACEMENT SHEET

PROFESSIONAL CERTIFICATION 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. 31363, Expiration Date 01/16/2020.

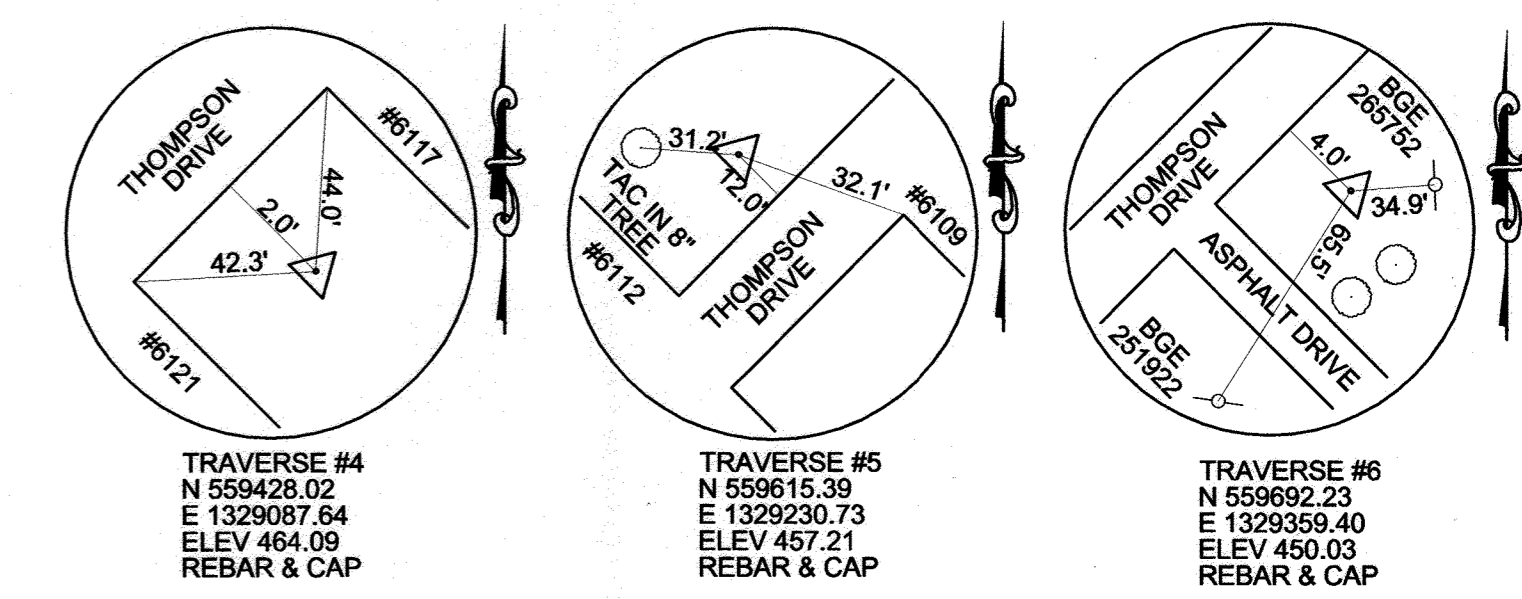
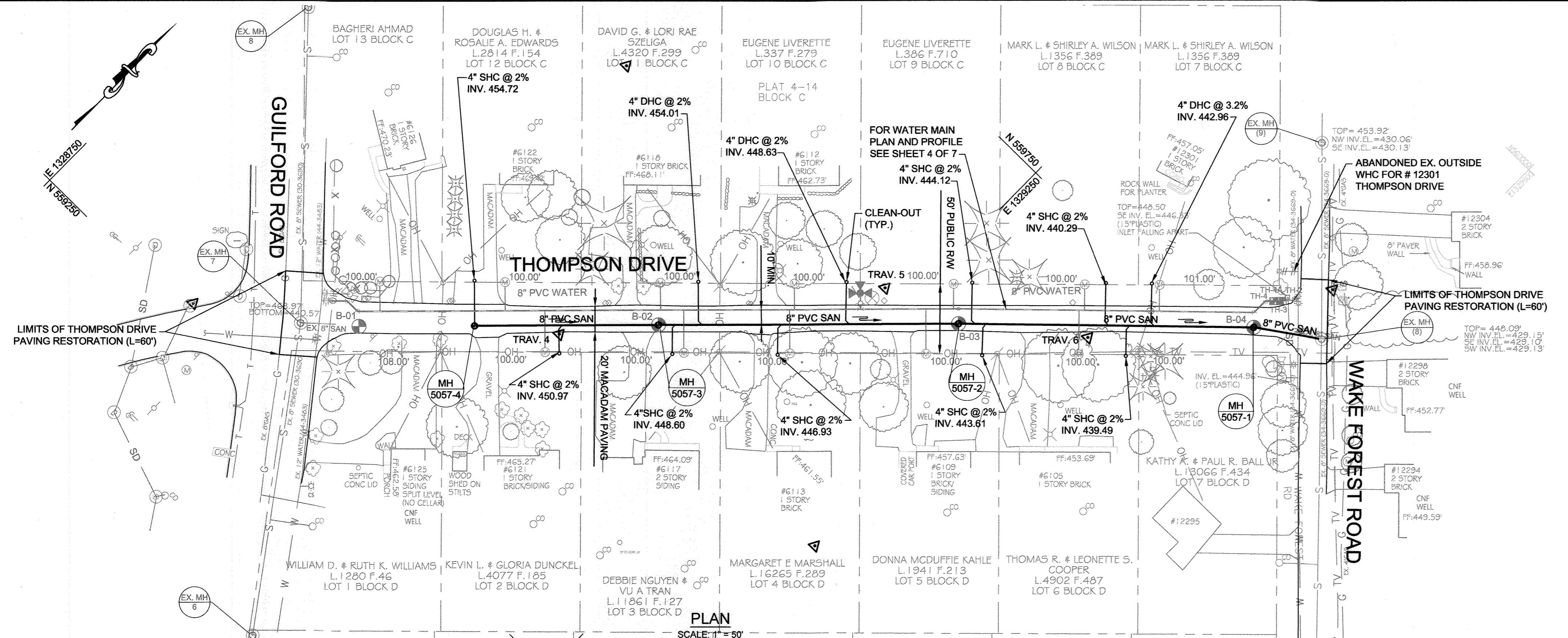
KCI TECHNOLOGIES PROJECT NO. : 13122877.63

Mar 05, 2020, 9:06am User: Kevin Jackson M:\0171312877_63\Drawings\AsBuilt\CAD\MapG-02 Home & Legend_ASBuilt.dwg

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Director: <i>[Signature]</i> 12/25/13 Chief, Bureau of Utilities: <i>[Signature]</i> 12-27-18		ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS KCI TECHNOLOGIES 936 Reisterstown Road Sparks, MD 21152 Phone: (410) 316-7800 Fax: (410) 316-7817 www.kci.com		STATE OF MARYLAND PROFESSIONAL ENGINEER License No. 31363 Expiration Date 03/03/2020		DES: KJ DRN: KJ CHK: GW DATE: MARCH 2020		LEGEND, ABBREVIATIONS, WATER MAIN NOTES, SEWER MAIN NOTES, SEQUENCE OF CONSTRUCTION AND PAVING RESTORATION		HERITAGE HEIGHTS WATER AND SEWER EXTENSIONS CAPITAL PROJECT No. W-8332 CONTRACT No. 34-5057 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND		SCALE AS SHOWN
AS-BUILT, RECORD DRAWING						3/3/20	REVISION		SHEET		2 of 8	

KCI TECHNOLOGIES PROJECT No. : 13122677.63

Mar 13, 2020, 8:50am User: Kevin Jackson
M:\02\13122677_63\Drawings\AS-Built CAD files\CAD files\CAD files\AS-Built.dwg



MANHOLE STAKE-OUT SCHEDULE

DESCRIPTION	NORTHING	EASTING
5057-1	559780.92	1329438.95
5057-2	559634.11	1329286.23
5057-3	559482.70	1329133.59
5057-4	559389.62	1329039.99

- GENERAL SHEET NOTES:
- AS INCIDENTAL TO THE WATER AND SEWER TRENCH RESTORATION, THE CONTRACTOR SHALL RESTORE THE PAVEMENT FOR THE ENTIRE LIMITS OF PAVEMENT RESTORATION FOR THOMPSON ROAD.
 - ALL GRASS AREAS DISTURBED BY THE INSTALLATION OF WATER HOUSE CONNECTIONS AND SEWER HOUSE CONNECTIONS SHALL BE RESTORED WITH SEED AND MULCH PER THE DETAILS SHOWN ON SHEET 8 OF 8.

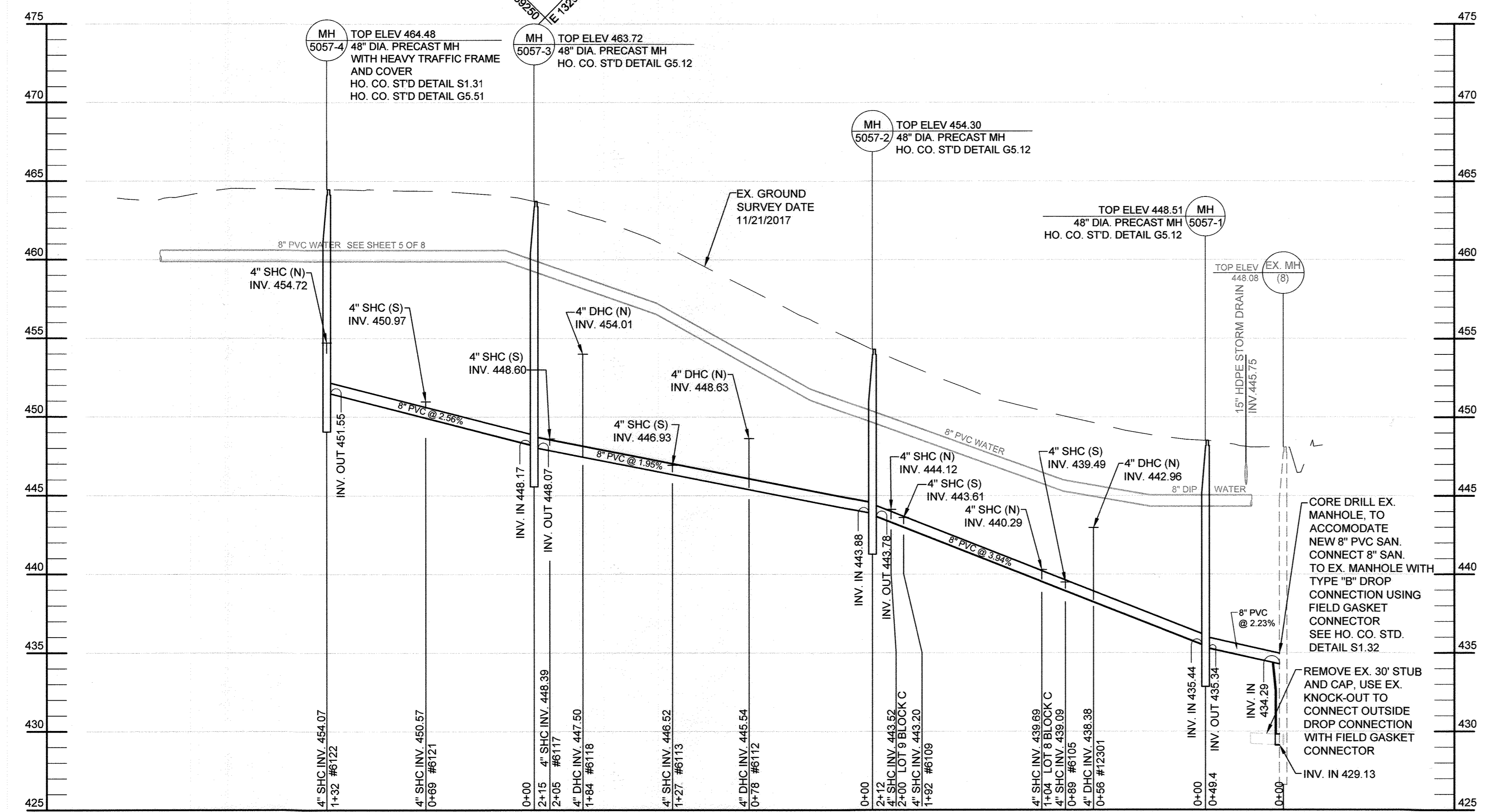
SEWER HOUSE CONNECTION SCHEDULE

SERVICE ADDRESS	BUILDING TYPE	SHC TYPE	PROP. SHC SIZE	SHC SLOPE	MINIMUM CELLAR ELEV (FT)	APPROX LENGTH OF PROP. SHC (LF)
12301 WAKE FOREST ROAD	RESIDENTIAL	DHC	4"	3.2%	448.05	30
6105 THOMPSON DRIVE	RESIDENTIAL	SHC	4"	2.0%	444.69	20
6109 THOMPSON DRIVE	RESIDENTIAL	SHC	4"	2.0%	448.63	20
LOT 8 BLOCK C THOMPSON DRIVE	RESIDENTIAL	SHC	4"	2.0%	444.89	30
LOT 9 BLOCK C THOMPSON DRIVE	RESIDENTIAL	SHC	4"	2.0%	448.73	30
6112 THOMPSON DRIVE	RESIDENTIAL	DHC	4"	2.0%	453.73	30
6113 THOMPSON DRIVE	RESIDENTIAL	SHC	4"	2.0%	452.55	20
6117 THOMPSON DRIVE	RESIDENTIAL	SHC	4"	2.0%	455.09	20
6118 THOMPSON DRIVE	RESIDENTIAL	DHC	4"	2.0%	459.11	30
6121 THOMPSON DRIVE	RESIDENTIAL	SHC	4"	2.0%	456.27	20
6122 THOMPSON DRIVE	RESIDENTIAL	SHC	4"	2.0%	460.42	30

- STANDARD DETAILS:
- S-2.11 SEWER HOUSE CONNECTION
 - S-2.12 SEWER HOUSE CONNECTION DROP
 - S-2.22 SEWER HOUSE CONNECTION CLEANOUT IN VEGETATED AREA
 - S-2.23 CLEANOUT COVER ASSEMBLY FOR ALL PAVED AREAS

THOMPSON DR. SEWER HOUSE CONNECTION AS-BUILT LOCATION TABLE

ADDRESS	LOCATION DIMENSION 1	LOCATION DIMENSION 2
12301 WAKE FOREST RD.	MH 5057-1 TO MH 5057-2	MH 5057-1 - 80'
	BGE 265752 - 50'	BGE 251922 - 92'
	MH 5057-2 - 31'	BGE 251922 - 55'
LOT 9 BLOCK C	BGE 265752 - 10'	BGE 251922 - 91'
	MH 5057-2 - 30'	BGE 251922 - 12'
6112	MH 5057-2 TO MH 5057-3	BGE 263491 - 90'
	MH 5057-2 - 86'	BGE 263491 - 85'
6113	FIRE HYDRANT, THOMPSON DR. - 74'	BGE 263491 - 62'
6117	MH 5057-3 - 26'	BGE 263491 - 16'
6118	MH 5057-3 - 42'	BGE 263491 - 16'
	MH 5057-3 TO MH 5057-4	MH 5057-4 - 68'
6121	MH 5057-3 - 75'	MH 5057-4 - 68'
6122		



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

PROFESSIONAL CERTIFICATION: 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. 31383, Expiration Date 01/18/2020.

DES: KJ
DRN: KJ
CHK: GW
DATE: MARCH 2020

BY: KFJ
NO.: AS-BUILT, RECORD DRAWING
REVISION: 3/3/20

DATE: 600' SCALE MAP NO. 34
BLOCK NO. 12

AS-BUILT REPLACEMENT SHEET

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *Kevin Jackson* 12/25/18
Chief, Bureau of Utilities: *Kevin Jackson* 12/27/18

Chief, Utility Design Division: *Kevin Jackson* 12/27/18

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

KCI TECHNOLOGIES
936 Ringbrook Road
Sparks, MD 21152
PHONE: (410) 316-7800
FAX: (410) 316-7817
www.kci.com

STATE OF MARYLAND
Professional Engineer
Guohua Wang
No. 31383
Expiration Date 01/18/2020

SEWER PLAN & PROFILE
THOMPSON DRIVE

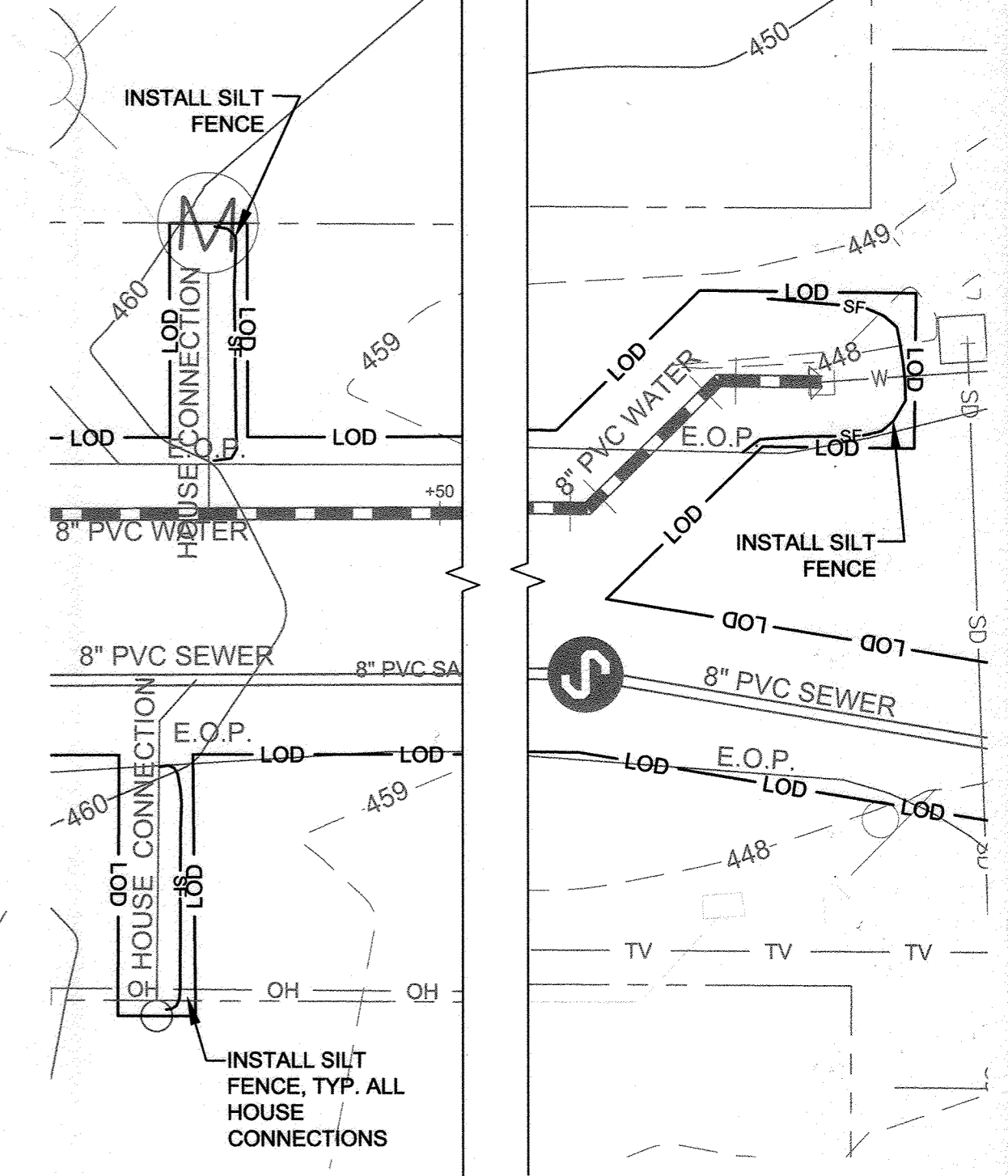
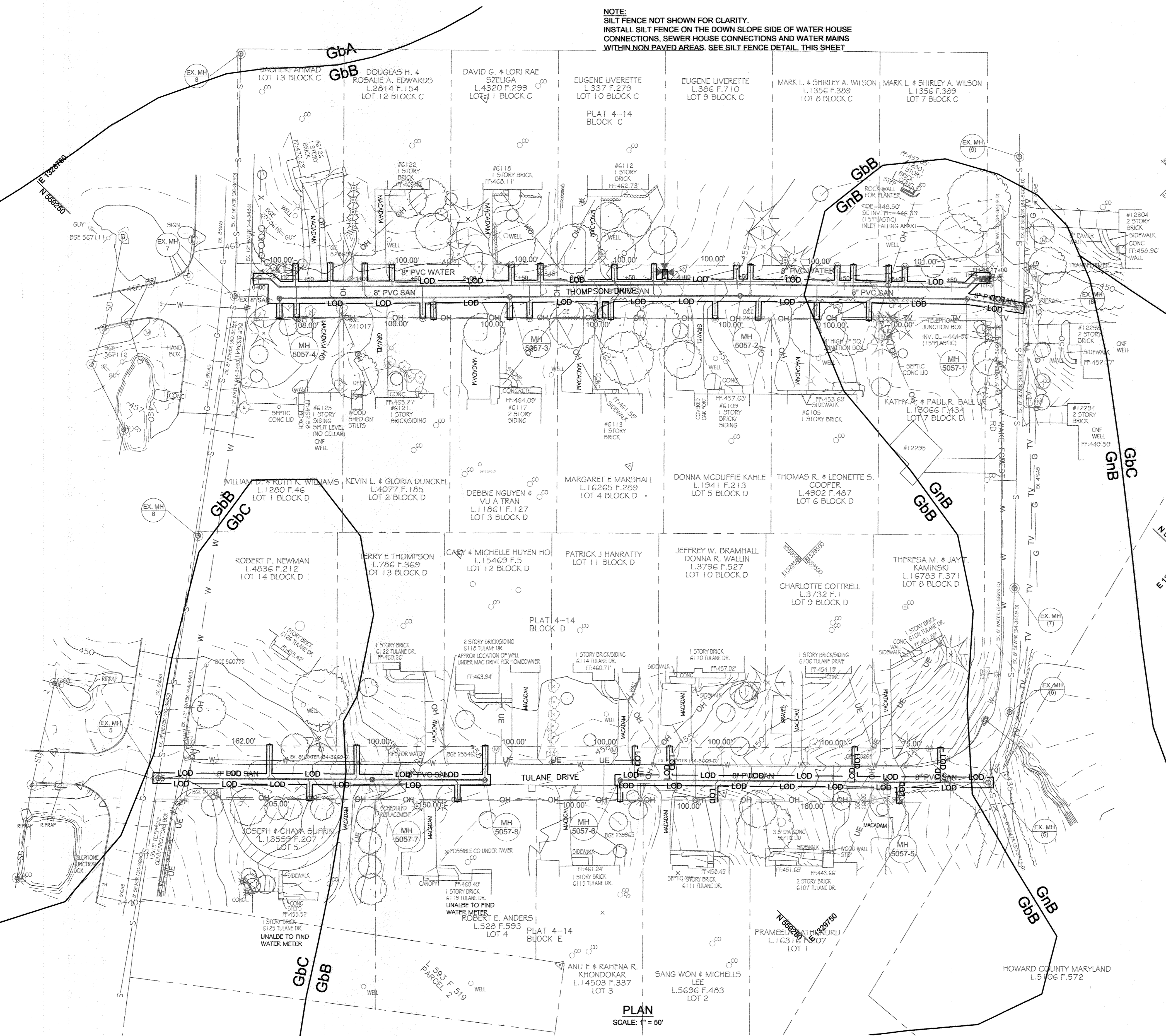
HERITAGE HEIGHTS
WATER AND SEWER EXTENSIONS

CAPITAL PROJECT No. W-8332
CONTRACT No. 34-5057

ELECTION DISTRICT NO. 5
HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN
SHEET: 3 OF 8

NOTE:
SILT FENCE NOT SHOWN FOR CLARITY.
INSTALL SILT FENCE ON THE DOWN SLOPE SIDE OF WATER HOUSE
CONNECTIONS, SEWER HOUSE CONNECTIONS AND WATER MAINS
WITHIN NON PAVED AREAS. SEE SILT FENCE DETAIL. THIS SHEET



DETAIL - SILT FENCE
SCALE: 1" = 10'

LEGEND

EXISTING

- DECIDUOUS TREE
- CONIFEROUS TREE
- BUSH
- HEDGE
- UTILITY POLE
- LIGHT POST
- MAIL BOX
- TELECOM PEDISTAL
- WATER WELL
- WATER METER / CURB STOP
- SEWER CLEAN-OUT
- SIGN
- TRAVERSE POINT
- FIRE HYDRANT
- WATER VALVE
- SEWER MANHOLE
- STORM DRAIN MANHOLE
- WATER MAIN
- SEWER MAIN
- STORM DRAIN
- OVERHEAD WIRE
- CABLE TV
- PROPERTY BOUNDARY
- MAJOR CONTOUR
- MINOR CONTOUR

PROPOSED

- SEWER MANHOLE
- SHC WITH CLEAN-OUT
- WATER METER
- SEWER MAIN
- WATER MAIN
- SILT FENCE
- LIMIT OF DISTURBANCE

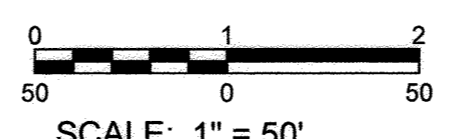
SOIL MAPPING UNIT

- GbA GLADSTONE LOAM, 0 TO 3 PERCENT SLOPES, Kw=0.20
- GbB GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES, Kw=0.20
- GbC GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES, Kw=0.20
- GbN GLENVILLE-BAILE SILT LOAMS, 0 TO 8 PERCENT SLOPES, Kw=0.37

NOTES:

- THE CONTRACTOR SHALL IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ON TO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.
- THE CONTRACTOR SHALL HAUL AWAY EXCAVATED MATERIAL OFF-SITE WITHIN THE SAME WORKING DAY.

PLAN
SCALE: 1" = 50'



PROFESSIONAL CERTIFICATION: 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. 31363, Expiration Date 01/16/2020.

KCI TECHNOLOGIES PROJECT No. 13122677.63

Dec 16, 2018, 8:13am, User: keni.jackson, File: 13122677_20181216_10:51:15.dwg, Plot: 13122677.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Jay W. ... 12-22-18
DIRECTOR OF PUBLIC WORKS DATE

Thomas B. ... 12/26/18
CHIEF, BUREAU OF ENGINEERING DATE

... 12/21/18
CHIEF, UTILITY DESIGN DIVISION DATE

KCI TECHNOLOGIES

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

936 Ridgebrook Road
Sparks, MD 21152
Phone: (410) 316-7800
Fax: (410) 316-7817
www.kci.com

STATE OF MARYLAND
KCI TECHNOLOGIES
PROFESSIONAL ENGINEER
12/18/2018

DES: KJ	BY	NO.	REVISION	DATE
DRN: KJ				
CHK: GW				
DATE: DEC. 2018				

EROSION & SEDIMENT CONTROL PLAN

800' SCALE MAP NO. 34 BLOCK NO. 12

HERITAGE HEIGHTS
WATER AND SEWER EXTENSIONS

CAPITAL PROJECT No. W-8332
CONTRACT No. 34-5057

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN SHEET 6 OF 8

**HOWARD SOIL CONSERVATION DISTRICT (HSCD)
STANDARD SEDIMENT CONTROL NOTES**

- A pre-construction meeting must occur with the Howard County Department of Public Works, Construction Inspection Division (CID), 410-313-1855 after the future LOD and protected areas are marked clearly in the field. A minimum of 48 hour notice to CID must be given at the following stages:
 - Prior to the start of earth disturbance,
 - Upon completion of the installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading,
 - Prior to the start of another phase of construction or opening of another grading unit,
 - Prior to the removal or modification of sediment control practices.

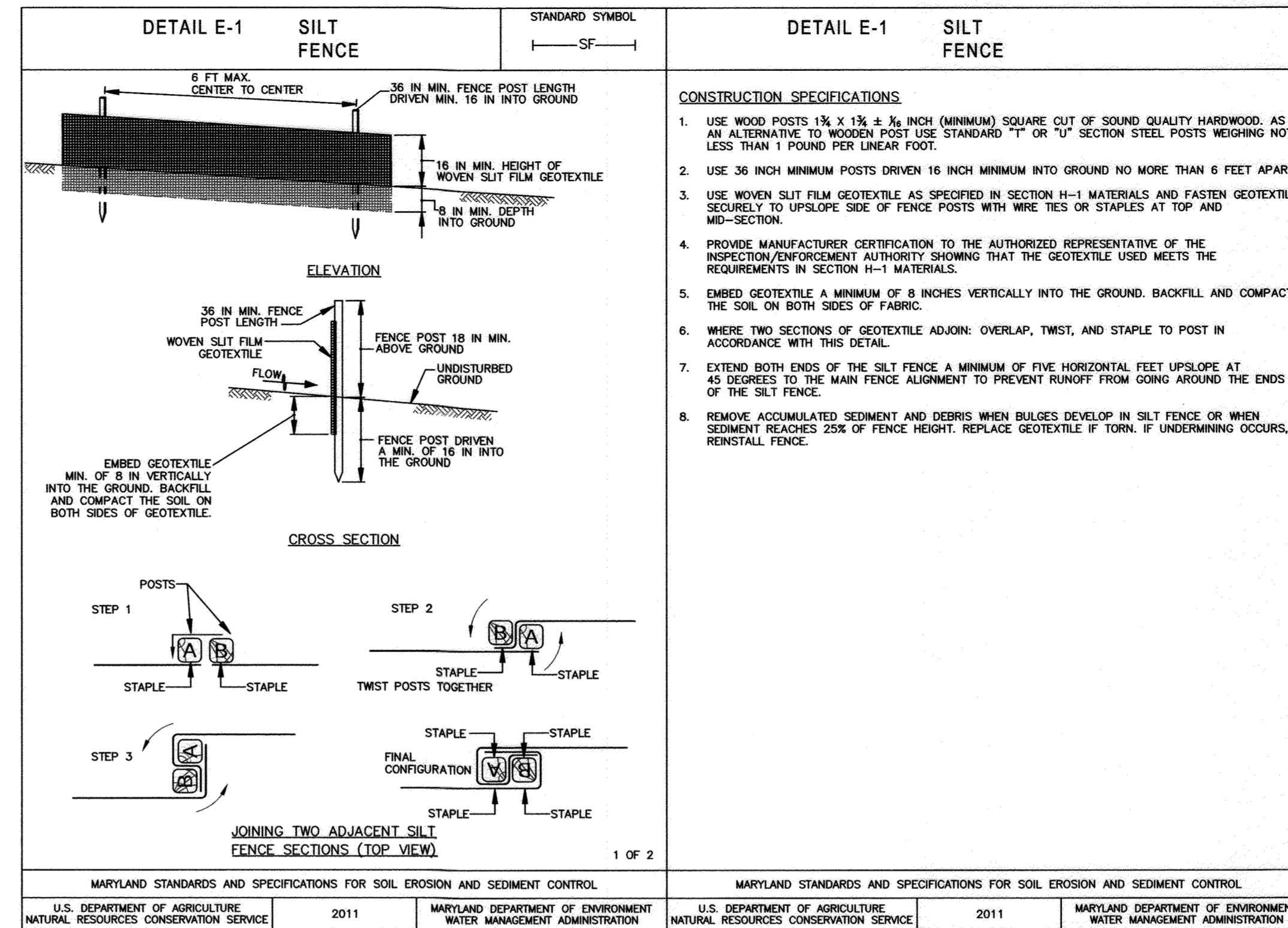
Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made. Other related state and Federal permits shall be referenced, to ensure coordination and to avoid conflicts with this plan.

- All vegetative and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and revisions thereto.
- Following initial soil disturbance or re-disturbance, permanent or temporary stabilization is required within three (3) calendar days as to the surface of all perimeter controls, dikes, swales, ditches, perimeter slopes, and all slopes steeper than 3 horizontal to 1 vertical (3:1); and seven (7) calendar days as to all other disturbed areas on the project site except for those areas under active grading.
- All disturbed areas must be stabilized within the time period specified above in accordance with the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for topsoil (Sec. B-4-2), permanent seeding (Sec. B-4-3), temporary seeding (Sec. B-4-4) and mulching (Sec. B-4-3). Temporary stabilization with mulch alone can only be applied between the fall and spring seeding dates if the ground is frozen. Incremental stabilization (Sec. B-4-1) specifications shall be enforced in areas with >15' of cut and/or fill. Stockpiles (Sec. B-4-8) in excess of 20 ft. must be benched with stable outlet. All concentrated flow, steep slope, and highly erodible areas shall receive soil stabilization matting (Sec. B-4-6).
- All sediment control structures are to remain in place, and are to be maintained in operative condition until permission for their removal has been obtained from the CID.
- Site Analysis:

Total Area of Site:	0.56	Acres
Area Disturbed:	0.27	Acres
Area to be roofed or paved:	0.165	Acres
Area to be vegetatively stabilized:	0.305	Acres
Total Cut:	3145	Cu. Yds.
Total Fill:	3145	Cu. Yds.
Offsite waste/borrow area location:	CONTRACTOR COORDINATE	
- Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
- Additional sediment control must be provided, if deemed necessary by the CID. The site and all controls shall be inspected by the contractor weekly; and the next day after each rain event. A written report by the contractor, made available upon request, is part of every inspection and should include:
 - Inspection date
 - Inspection type (routine, pre-storm event, during rain event)
 - Name and title of inspector
 - Weather information (current conditions as well as time and amount of last recorded precipitation)
 - Brief description of project's status (e.g., percent complete) and/or current activities
 - Evidence of sediment discharges
 - Identification of plan deficiencies
 - Identification of sediment controls that require maintenance
 - Identification of missing or improperly installed sediment controls
 - Compliance status regarding the sequence of construction and stabilization requirements
 - Photographs
 - Monitoring/sampling
 - Maintenance and/or corrective action performed
 - Other inspection items as required by the General Permit for Stormwater Associated with Construction Activities (NPDES, MDE).

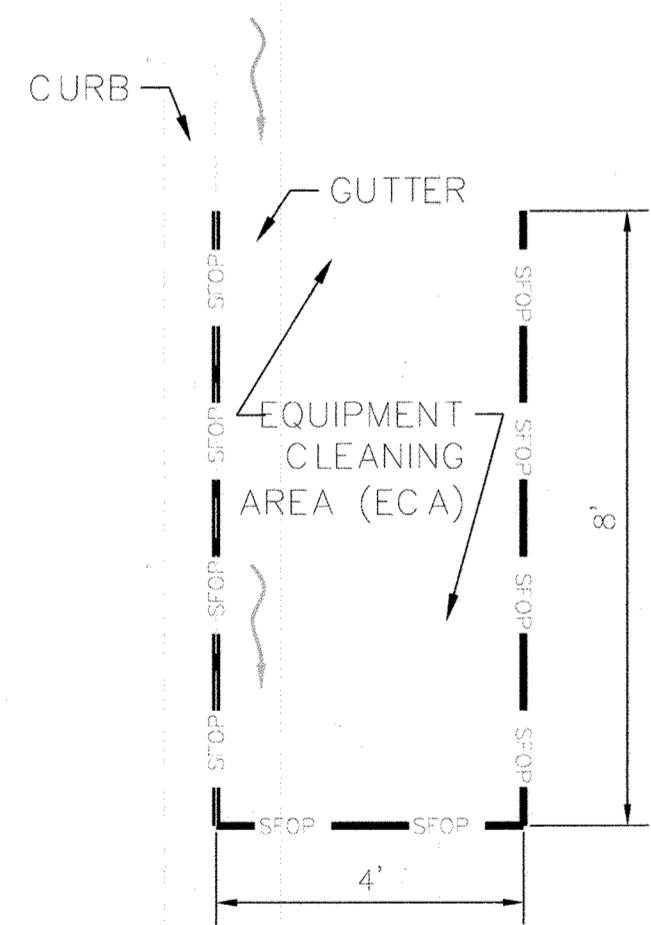
- Trenches for the construction of utilities is limited to three pipe lengths or that which can and shall be back-filled and stabilized by the end of each workday, whichever is shorter.
- Any major changes or revisions to the plan or sequence of construction must be reviewed and approved by the HSCD prior to proceeding with construction. Minor revisions may be allowed by the CID per the list of HSCD-approved field changes.
- Disturbance shall not occur outside the L.O.D. A project is to be sequenced so that grading activities begin on one grading unit (maximum acreage of 20 ac. per grading unit) at a time. Work may proceed to a subsequent grading unit when at least 50 percent of the disturbed area in the preceding grading unit has been stabilized and approved by the HSCD. Unless otherwise specified and approved by the HSCD, no more than 30 acres cumulatively may be disturbed at a given time.
- Wash water from any equipment, vehicles, wheels, pavement, and other sources must be treated in a sediment basin or other approved washout structure.
- Topsoil shall be stockpiled and preserved on-site for redistribution onto final grade.
- All Silt Fence and Super Silt Fence shall be placed on-the-contour, and be imbricated at 25' minimum intervals, with lower ends curled uphill by 2' in elevation.
- Stream channels must not be disturbed during the following restricted time periods (inclusive):
 - Use I and II March 1 - June 15
 - Use III and IIII October 1 - April 30
 - Use IV March 1 - May 31
- A copy of this plan, the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and associated permits shall be on-site and available when the site is active.

Rev. 7.2016



SEQUENCE OF CONSTRUCTION

- OBTAIN GRADING PERMIT.
- LAYOUT ALIGNMENT AT SITE. (2 DAYS)
- REQUEST PRE-CONSTRUCTION MEETING ON-SITE WITH REPRESENTATIVE OF HOWARD COUNTY DPW CONSTRUCTION INSPECTION DIVISION. (1 DAY)
- IF NECESSARY, THE CONTRACTOR SHALL INSTALL SEDIMENT CONTROL DEVICES AT THE DIRECTION OF THE HOWARD DPW CID INSPECTOR. (1 DAY)
- EXCAVATE TRENCH TO THE GRADE SPECIFIED ON THE PROFILE, INSTALL SEWER MAIN AND WATER MAIN AND BACKFILL AND STABILIZE TRENCH AND RESURFACE WITH BITUMINOUS PAVING AS APPROPRIATE (45 DAYS). TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO 3 LENGTHS OF PIPE OR THAT WHICH CAN BE BACK FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER. AT THE END OF EACH WORK DAY, ALL VEGETATED AREAS DISTURBED DURING THE COURSE OF CONSTRUCTION SHALL BE TEMPORARILY STABILIZED IN ACCORDANCE WITH THE TEMPORARY SEEDING SUMMARY SHOWN ON SHEET 8 OF 8 AND THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, SECTION B-4-4. AT THE END OF EACH WORKING DAY ALL DISTURBED PAVING AREAS WITHIN THE EXISTING ROAD SHALL BE REPLACED WITH PERMANENT SUBGRADE AND BASE ASPHALT, THEN TEMPORARILY PATCHED, SEE TEMPORARY PAVING DETAIL ON SHEET 2 OF 8.
- UPON COMPLETION OF PIPE INSTALLATION AND INSPECTOR'S APPROVAL, PERMANENTLY STABILIZE ALL DISTURBED VEGETATED AREAS IN ACCORDANCE WITH STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION SHOWN ON SHEET 8 OF 8 AND THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, SECTION B-4-5. (1 DAY)
- CLEAN UP CONSTRUCTION SITE. (1 DAY)
- REMOVE SEDIMENT CONTROL DEVICES AFTER SEED/MULCH HAS COMPLETED VEGETATIVE ESTABLISHMENTS AND THE HOWARD COUNTY CID INSPECTOR APPROVES THE REMOVAL. (1 DAY)



NOTES:

- SFOP TO MEET DETAIL E-2 AND CONSTRUCTION SPECIFICATIONS THEREOF.
- ECA TO BE PLACED AT LOWEST END OF LOD AND CLEANED DAILY.
- IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING.
- CID MAY WAIVE INSTALLATION OF EAC IF INSPECTOR ACCEPTS SAME-DAY STABILIZATION WITH SEED/SSM OR SOD.

U-SHAPED EQUIPMENT CLEANING AREA

PROFESSIONAL CERTIFICATION 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. 31363, Expiration Date 01/16/2020.

AS-BUILT
DATE 03-03-2020

KCI TECHNOLOGIES PROJECT No.: 13122877.63

Dec 18, 2018 - 8:13am User: Kevin Jackson M:\2013\13122877\2013\13122877\ES&S Erosion Sed. Ctrl Details.dwg

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Director: [Signature] 12/28/18 Chief, Bureau of Engineering: [Signature] 12/28/18 Chief, Bureau of Utilities: [Signature] 12-22-18 Chief, Utility Design Division: [Signature] 12/28/18		ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS KCI TECHNOLOGIES 936 Ridgebrook Road Sykes, MD 21152 Phone: (410) 316-7800 Fax: (410) 316-7817 www.kci.com	STATE OF MARYLAND PROFESSIONAL ENGINEER Kevin Jackson License No. 31363 Expiration Date 01/16/2020	DES: KJ DRN: KJ CHK: GW DATE: DEC. 2018	EROSION & SEDIMENT CONTROL NOTES AND DETAILS 600' SCALE MAP NO. 34 BLOCK NO. 12	HERITAGE HEIGHTS WATER AND SEWER EXTENSIONS CAPITAL PROJECT No. W-8332 CONTRACT No. 34-5057 ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 7 OF 8
---	--	--	--	--	---	--	--------------------------------

B-4.2 STANDARDS AND SPECIFICATIONS

**FOR
SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS**

Definition

The process of preparing the soils to sustain adequate vegetative stabilization.

Purpose

To provide a suitable soil medium for vegetative growth.

Conditions Where Practice Applies

Where vegetative stabilization is to be established.

Criteria

- A. Soil Preparation
 - 1. Temporary Stabilization
 - a. Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must not be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
 - b. Apply fertilizer and lime as prescribed on the plans.
 - c. Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
 - 2. Permanent Stabilization
 - a. A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
 - i. Soil pH between 6.0 and 7.0.
 - ii. Soluble salts less than 500 parts per million (ppm).
 - iii. Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: if leveevass will be planted, then a sandy soil (less than 30 percent silt plus clay) would be acceptable.
 - iv. Soil contains 1.5 percent minimum organic matter by weight.
 - v. Soil contains sufficient pore space to permit adequate root penetration.
 - b. Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
 - c. Graded areas must be maintained in a true and even grade as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.
 - d. Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
 - e. Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. Rake lawn areas to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface where site conditions will not permit normal seedbed preparation. Track slopes 3:1 or flatter with tracked equipment leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. Leave the top 1 to 3 inches of soil loose and friable. Seedbed loosening may be unnecessary on newly disturbed areas.
- B. Topsoiling
 - 1. Topsoil is placed over prepared subsoil prior to establishment of permanent vegetation. The purpose is to provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.
 - 2. Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-NRCS.
 - 3. Topsoiling is limited to areas having 2:1 or flatter slopes where:
 - a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
 - b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
 - c. The original soil to be vegetated contains material toxic to plant growth.
 - d. The soil is so acidic that treatment with limestone is not feasible.
 - 4. Areas having slopes steeper than 2:1 require special consideration and design.
 - 5. Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:
 - a. Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Topsoil must not be a mixture of contrasting textured subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1 1/2 inches in diameter.
 - b. Topsoil must be free of noxious plants or plant parts such as Bermuda grass, quack grass, Johnson grass, nut sedge, poison ivy, thistle, or others as specified.
 - c. Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.
 - 6. Topsoil Application
 - a. Erosion and sediment control practices must be maintained when applying topsoil.
 - b. Uniformly distribute topsoil in a 5 to 8 inch layer and lightly compact to a minimum thickness of 4 inches. Spreading is to be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations must be corrected in order to prevent the formation of depressions or water pockets.
 - c. Topsoil must not be placed if the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.
- C. Soil Amendments (Fertilizer and Lime Specifications)
 - 1. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more. Soil analysis may be performed by a recognized private or commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses.
 - 2. Fertilizers must be uniform in composition, free flowing and suitable for accurate application by appropriate equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers must all be delivered to the site fully labeled according to the applicable laws and must bear the name, trade name or trademark and warranty of the producer.

- 3. Lime materials must be ground limestone (hydrated or burnt lime may be substituted except when hydroseeding) which contains at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone must be ground to such fineness that at least 50 percent will pass through a #100 mesh sieve and 98 to 100 percent will pass through a #20 mesh sieve.
- 4. Lime and fertilizer are to be evenly distributed and incorporated into the top 3 to 5 inches of soil by disking or other suitable means.
- 5. Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil.

B-4.3 STANDARDS AND SPECIFICATIONS

FOR

SEEDING AND MULCHING

Definition

The application of seed and mulch to establish vegetative cover.

Purpose

To protect disturbed soils from erosion during and at the end of construction.

Conditions Where Practice Applies

To the surface of all perimeter controls, slopes, and any disturbed area not under active grading.

Criteria

- A. Seeding
 - 1. Specifications
 - a. All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to Table B.4 regarding the quality of seed. Seed tags must be available upon request to the inspector to verify type of seed and seeding rate.
 - b. Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. The appropriate seeding mixture must be applied when the ground thaws.
 - c. Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.
 - d. Sod or seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.
 - 2. Application
 - a. Dry Seeding: This includes use of conventional drop or broadcast spreaders.
 - i. Incorporate seed into the subsoil at the rates prescribed on Temporary Seeding Table B.1, Permanent Seeding Table B.3, or site-specific seeding summaries.
 - ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Roll the seeded area with a weighted roller to provide good seed to soil contact.
 - b. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.
 - i. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting.
 - ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction.
 - c. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer).
 - i. If fertilizer is being applied at the time of seeding, the application rates should not exceed the following: nitrogen, 100 pounds per acre total of soluble nitrogen; P₂O₅ (phosphorous), 200 pounds per acre; K₂O (potassium), 200 pounds per acre.
 - ii. Lime: Use only ground agricultural limestone (up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.
 - iii. Mix seed and fertilizer on site and seed immediately and without interruption.
 - iv. When hydroseeding do not incorporate seed into the soil.
 - B. Mulching
 - 1. Mulch Materials (in order of preference)
 - a. Straw consisting of thoroughly threshed wheat, rye, oat, or barley and reasonably bright in color. Straw is to be free of noxious weed seeds as specified in the Maryland Seed Law and not musty, moldy, caked, decayed, or excessively dusty. **Note: Use only sterile straw mulch in areas where one species of grass is desired.**
 - b. Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state.
 - i. WCFM is to be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
 - ii. WCFM, including dye, must contain no germination or growth inhibiting factors.
 - iii. WCFM materials are to be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material must form a blotter-like ground cover, on application, having moisture absorption and percolation properties and must cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
 - iv. WCFM material must not contain elements or compounds at concentration levels that will be phyto-toxic.
 - v. WCFM must conform to the following physical requirements: fiber length of approximately 10 millimeters, diameter approximately 1 millimeter, pH range of 4.0 to 8.5, ash content of 1.6 percent maximum and water holding capacity of 90 percent minimum.
 - 2. Application
 - a. Apply mulch to all seeded areas immediately after seeding.
 - b. When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution and depth so that the soil surface is not exposed. When using a mulch anchoring tool, increase the application rate to 2.5 tons per acre.

- c. Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 pounds per acre. Mix the wood cellulose fiber with water to attain a mixture with a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
- 3. Anchoring
 - a. Perform mulch anchoring immediately following application of mulch to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon the size of the area and erosion hazard:
 - i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of 2 inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should follow the contour.
 - ii. Wood cellulose fiber may be used for anchoring straw. Apply the fiber binder at a net dry weight of 750 pounds per acre. Mix the wood cellulose fiber with water at a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
 - iii. Synthetic binders such as Acrylic DLR (Agro-Tack), DCA-70, Petrost, Terra Tex II, Terra Tack AR or other approved equal may be used. Follow application rates as specified by the manufacturer. Application of liquid binders needs to be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. **Use of asphalt binders is strictly prohibited.**
 - iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer recommendations. Netting is usually available in rolls 4 to 15 feet wide and 300 to 3,000 feet long.

B-4.4 STANDARDS AND SPECIFICATIONS

FOR

TEMPORARY STABILIZATION

Definition

To stabilize disturbed soils with vegetation for up to 6 months.

Purpose

To use fast growing vegetation that provides cover on disturbed soils.

Conditions Where Practice Applies

Exposed soils where ground cover is needed for a period of 6 months or less. For longer duration of time, permanent stabilization practices are required.

Criteria

- 1. Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant Hardiness Zone (from Figure B.3), and enter them in the Temporary Seeding Summary below along with application rates, seeding dates and seeding depths. If this Summary is not put on the plan and completed, then Table B.1 plus fertilizer and lime rates must be put on the plan.
- 2. For sites having soil tests performed, use and show the recommended rates by the testing agency. Soil tests are not required for Temporary Seeding.
- 3. When stabilization is required outside of a seeding season, apply seed and mulch or straw mulch alone as prescribed in Section B-4.3.A.1.b and maintain until the next seeding season.

Temporary Seeding Summary

Hardiness Zone (from Figure B.3): <u>6b</u>				Fertilizer Rate (10-20-20)	Lime Rate
No.	Species	Application Rate (lb/acre)	Seeding Dates		
	ANNUAL RYEGRASS	40	3/15 - 5/15 8/1 - 10/15	436 lb/acre (10 lb/1000 sf)	2 tons/acre (90 lb/1000 sf)
	BARLEY	96	3/15 - 5/15 8/1 - 10/15		
	OATS	72	3/15 - 5/31 8/1 - 9/30		
	FOXTAIL MILLET	30	5/16 - 7/31		

NOTES:

- 1/ Seeding rates for the warm-season grasses are in pounds of Pure Live Seed (PLS). Actual planting rates shall be adjusted to reflect percent seed germination and purity, as tested. Adjustments are usually not needed for the cool-season grasses.
- Seeding rates listed above are for temporary seedings, when planted alone. When planted as a nurse crop with permanent seed mixes, use 1/3 of the seeding rate listed above for barley, oats, and wheat. For smaller-seeded grasses (annual ryegrass, pearl millet, foxtail millet), do not exceed more than 5% (by weight) of the overall permanent seeding mix. Cereal rye generally should not be used as a nurse crop, unless planting will occur in very late fall beyond the seeding dates for other temporary seedings. Cereal rye has allelopathic properties that inhibit the germination and growth of other plants. If it must be used as a nurse crop, seed at 1/3 of the rate listed above.
- Oats are the recommended nurse crop for warm-season grasses.
- 2/ For sandy soils, plant seeds at twice the depth listed above.
- 3/ The planting dates listed are averages for each Zone and may require adjustment to reflect local conditions, especially near the boundaries of the zone.

B-4.5 STANDARDS AND SPECIFICATIONS

FOR

PERMANENT STABILIZATION

Definition

To stabilize disturbed soils with permanent vegetation.

Purpose

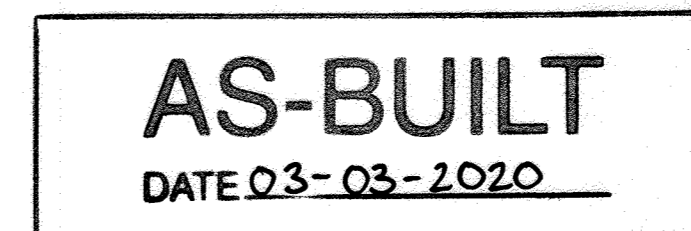
To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.

Conditions Where Practice Applies

Exposed soils where ground cover is needed for 6 months or more.

Criteria

- A. Seed Mixtures
 - 1. General Use
 - a. Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The Summary is to be placed on the plan.
 - b. Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Field Office Guide, Section 342 - Critical Area Planting.



- c. For sites having disturbed area over 5 acres, use and show the rates recommended by the soil testing agency.
 - d. For areas receiving low maintenance, apply urea form fertilizer (46-0-0) at 3 1/2 pounds per 1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary.
 - 2. Turfgrass Mixtures
 - a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
 - b. Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
 - i. Kentucky Bluegrass: Full Sun Mixture: For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
 - ii. Kentucky Bluegrass/Perennial Rye: Full Sun Mixture: For use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Ryegrass Cultivars/Certified Kentucky Bluegrass Seeding Rate: 2 pounds mixture per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
 - iii. Tall Fescue/Kentucky Bluegrass: Full Sun Mixture: For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixture includes; Certified Tall Fescue Cultivars 95 to 100 percent, Certified Kentucky Bluegrass Cultivars 0 to 5 percent. Seeding Rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended.
 - iv. Kentucky Bluegrass/Fine Fescue: Shade Mixture: For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes; Certified Kentucky Bluegrass Cultivars 30 to 40 percent and Certified Fine Fescue and 60 to 70 percent. Seeding Rate: 1 1/2 to 3 pounds per 1000 square feet.
- Notes:**
Select turfgrass varieties from those listed in the most current University of Maryland Publication, Agronomy Memo #77, "Turfgrass Cultivar Recommendations for Maryland"
- c. Ideal Times of Seeding for Turf Grass Mixtures
 - Western MD: March 15 to June 1, August 1 to October 1 (Hardiness Zones: 5b, 6a)
 - Central MD: March 1 to May 15, August 15 to October 15 (Hardiness Zone: 6b)
 - Southern MD, Eastern Shore: March 1 to May 15, August 15 to October 15 (Hardiness Zones: 7a, 7b)
 - d. Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches, level and rake the area to prepare a proper seedbed. Remove stones and debris over 1 1/2 inches in diameter. The resulting seedbed must be in such condition that future mowing of grasses will pose no difficulty.
 - e. If soil moisture is deficient, supply new seedlings with adequate water for plant growth (1/2 to 1 inch every 3 to 4 days depending on soil texture) until they are firmly established. This is especially true when seedings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

Permanent Seeding Summary

Hardiness Zone (from Figure B.3): <u>6b</u>				Fertilizer Rate (10-20-20)			Lime Rate
No.	Species	Application Rate (lb/acre)	Seeding Dates	N	P ₂ O ₅	K ₂ O	
	TALL FESCUE	40	5/1 - 5/15 8/1 - 10/15	45 pounds per acre (10 lb/1000 sf)	90 lb/acre (2 lb/1000 sf)	90 lb/acre (2 lb/1000 sf)	2 tons/acre (90 lb/1000 sf)
	PERENNIAL RYEGRASS	25	5/1 - 5/15 8/1 - 10/15				
	WHITE CLOVER	5	5/1 - 5/15 8/1 - 10/15				

- B. Sod: To provide quick cover on disturbed areas (2:1 grade or flatter).

1. General Specifications

- a. Class of turfgrass sod must be Maryland State Certified. Sod labels must be made available to the job foreman and inspector.
- b. Sod must be machine cut at a uniform soil thickness of 1/2 inch, plus or minus 1/4 inch, at the time of cutting. Measurement for thickness must exclude top growth and thatch. Broken pads and torn or uneven ends will not be acceptable.
- c. Standard size sections of sod must be strong enough to support their own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10 percent of the section.
- d. Sod must not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.
- e. Sod must be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period must be approved by an agronomist or soil scientist prior to its installation.
- 2. Sod Installation
 - a. During periods of excessively high temperature or in areas having dry subsoil, lightly irrigate the subsoil immediately prior to laying the sod.
 - b. Lay the first row of sod in a straight line with subsequent rows placed parallel to it and tightly wedged against each other. Stagger lateral joints to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots.
 - c. Wherever possible, lay sod with the long edges parallel to the contour and with staggering joints. Roll and tamp, peg or otherwise secure the sod to prevent slippage on slopes. Ensure solid contact exists between sod roots and the underlying soil surface.
 - d. Water the sod immediately following rolling and tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. Complete the operations of laying, tamping and irrigating for any piece of sod within eight hours.
- 3. Sod Maintenance
 - a. In the absence of adequate rainfall, water daily during the first week or as often and sufficiently as necessary to maintain moist soil to a depth of 4 inches. Water sod during the heat of the day to prevent wilting.
 - b. After the first week, sod watering is required as necessary to maintain adequate moisture content.
 - c. Do not mow until the sod is firmly rooted. No more than 1/2 of the grass leaf must be removed by the initial cutting or subsequent cuttings. Maintain a grass height of at least 3 inches unless otherwise specified.

PROFESSIONAL CERTIFICATION: 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. 31363, Expiration Date 01/16/2020.

KCI TECHNOLOGIES PROJECT No.: 13122677-63

DATE: 10/18/2018, 9:24 am User: kwhelle
FILED: 10/18/2018 9:24 am User: kwhelle
PROJECT: 13122677-63

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John A. Whelle 12/27/18
DIRECTOR OF PUBLIC WORKS DATE

Thomas E. Whelle 12/26/18
CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 12/27/18
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 12/27/18
CHIEF, UTILITY DESIGN DIVISION DATE

KCI TECHNOLOGIES
936 Ridgebrook Road
Stowes, MD 21152
PHONE: (410) 316-7800
FAX: (410) 316-7817
www.kci.com

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

[Signature]
PROFESSIONAL ENGINEER
12/18/2018

DES: KJ
DRN: KJ
CHK: GW
DATE: DEC 2018

BY	NO.	REVISION	DATE

600' SCALE MAP NO. 34 BLOCK NO. 12

**HERITAGE HEIGHTS
WATER AND SEWER EXTENSIONS**

CAPITAL PROJECT No. W-8332
CONTRACT No. 34-5057

ELECTION DISTRICT NO. 5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 8 OF 8