FINAL ROAD CONSTRUCTION PLANS
WILLOW POND
LOTS 1 THRU 13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D' & NON-BUILDABLE PARCEL 'E'
(A Resubdivision of Naecker Property Lot 4, Plat #7288, and Lot 6, Plat #20373-20375 HOWARD COUNTY, MARYLAND)

GENERAL NOTES

1. Subject property Zoned "RR-DEO" per 2/2/04 Comprehensive Zoning Plan and per the Comp Lite Zoning Amendments effective 07/28/06.
2. Private water and private sewer is to be utilized for lots 1 and 4 thru 12. Private water and public shared septic is to be utilized by lots 2, 3 and 13. Water and sewer service for this subdivision is subject to Section 18.122B of the Howard County Code. Public water and /or sewer service has been granted under the terms and provisions, thereof, effective on which date developer agreement #50-4491-D was filed and accepted.
3. Soils map no. 23.
4. Total area of property: 51.664 ac.±
5. Area of proposed public r/w: 1.505 ac.±
6. Number of proposed buildable lots: 13
   Area of proposed buildable lots: 28.683 ac.±
   Number of proposed Buildable Preservation Parcels: 1 (Parcel 'A')
   Area of proposed Buildable Preservation Parcels: 10.452 ac.±
   Number of Non-Buildable Preservation Parcels: 3 (Parcels 'B', 'C', 'D')
   Area of proposed Non-Buildable Preservation Parcels: 10.891 ac.±
   Number of Non-Buildable Parcels: 1 (Parcel 'E'-area to be transferred to Naecker Property Lot 2)
   Area of Proposed Non-Buildable Parcel: 0.133 ac.±
7. The project is in conformance with the latest standards and specifications of Howard County plus MSHA standards and specifications if applicable, unless Waivers have been approved.
8. The lots shown hereon comply with the minimum ownership, width and lot area as required by the Maryland State Department of the Environment.
9. To the best of our knowledge, there are no cemeteries on-site.
10. Field Run Boundary Survey prepared by FSH Associates in July, 2006.
11. The existing topography and utilities were based on a field run Topographic Survey prepared by FSH Associates in Oct. 2006, contours are on 2 foot contour interval.
12. The coordinates shown hereon are based upon the Howard County Geodetic Control which is based upon the Maryland State Plane Coordinate System. Howard County Monuments 34IA and 34IB were used for this project.
13. Stormwater management for this project is provided by sheet flow to buffer and rooftop and non-rooftop disconnect credits.
14. A.P.F.O. Traffic Study prepared by Street Traffic Studies Ltd. on Sept. 5, 2008. Approved on 10/09/2008, under SP-09-03.
15. Wetlands Delineation and Report and Forest Stand Delineation and Report prepared by Exploration Research Inc. on November 13th, 2006 and approved on 10/09/2008 under SP-09-03.
16. All landscaping requirements will be the responsibility of the developer. The landscaping surety will be posted with the developer's agreement in the amount of $58,800 (103 shade trees @ $300.00 each and 186 evergreen and ornamental trees @ $150.00 each).
17. The historic barn previously shown on Lot 6 and listed on the Howard County Historic Sites Inventory as HO-468, and known as Lambing Meadow Bank Barn and Farm, has been removed. The demolition of the barn was reviewed by the Howard County Historic District Commission on March 2007 and approved under SP-07-011 and SP-09-03.
18. Area of Floodplain: 10.795 ac.± The floodplain study for this project was prepared by F.S.H. Associates on September 2008 and approved on 10/09/2008 under SP-09-03.
19. Density Calculations:
    a. Gross Area of Property = 51.664 ac.±
    b. Area of 3 ac Lots = 21.873 ac±
    c. Area of Cluster Subdivision = 51.664 ac.± -21.873 ac.±= 29.791 ac.±
    d. Number of Cluster Lots (1 ac. Lots) allowed= 29.791 ac.±/4.25 ac/unit = 7 units
20. a. Buildable preservation parcel 'A' and non-buildable preservation parcel 'B' shall be privately owned and maintained, with H.O.A. and Howard County being Easement Holders.
    b. Non-buildable preservation parcel 'C' shall be Howard County owned and maintained with H.O.A. being an Easement Holder.
    c. Non-buildable preservation parcel 'D' (shared septic) shall be H.O.A. owned and maintained with Howard County being an Easement Holder.
    d. Parcel 'E' will be transfered to Naecker Property Lot 2 (Plat #4289)
    e. Preservation Parcel Uses:
       1) Parcel 'A' - Buildable
       2) Parcel 'B' - Non-Buildable (Fire Protection Pond)
       3) Parcel 'C' - Environmental
       4) Parcel 'D' - Non-Buildable Shared Septic
21. All wells along the public road right-of-way shall be set the farthest away from the road right-of-way.
22. This plan is subject to the amended 5th Edition of the Subdivision Regulations (CB 45-2003) and the 2004 Zoning Regulations (CB 75-2003). Development or construction on these lots or parcels must comply with the setback and buffer regulations in effect at the time of submission of the building or grading permit applications.
23. All wells and septic systems on adjacent properties within 100' of proposed wells and septic systems have been shown.
24. Driveway culverts shall be constructed in accordance with standard Howard County Design Manual Volume IV detail R-6.06.
25. [hatch symbol] This area designates a private sewage easement of at least 10,000 square feet (or 10,000 square feet per lot for shared drain fields associated with a shared sewage disposal facility) as required by the Maryland State Department of the Environment for individual sewage disposal (COMAR 26.04.03). Improvements of any nature in this area are restricted until public sewage is available. These easements shall become null and void upon connection to a public sewage system. The County Health Officer shall have the authority to grant adjustments to the private sewage easement.
26. Lots 2, 3 and 13 of this subdivision are connected to the Shared Sewage Disposal Facility governed by Section 18.1200 et seq, of the Howard County Code. The shared septic plans were prepared under Contract #50-4491-D. The developer is obligated to construct the Facility under the provisions of the Developer Agreement. A building permit for lots 2, 3 and 13 may not be issued until the construction of the Facility is completed. Activity on these lots is restricted and is subject to the Declaration of Covenants, Conditions, Right-of-Entry, and Restrictions for Shared Sewage Disposal Facility intended to be recorded among the Land Records of Howard County, Maryland. Lots 2, 3 and 13 shall be assessed Shared Sewage Facilities Charges and Assessments pursuant to Section 20.800 et seq, of the Howard County Code.
27. No grading, removal or vegetative cover or trees, paving and new structures shall be permitted within the limits of wetlands, streams, or required buffers, 100 year flood plain and forest conservation easement areas.
28. The following DPZ files are applicable to this property, F-96-170, F87-174, F-79-115, F-89-112, F-09-13, VP-87-103, SP-07-011, WP-09-62 and SP-09-03.
29. The Forest Conservation Plan was prepared in accordance with Section 16.1200 of the Howard County Code and the Forest Conservation Manual. The total 6.86 acre forest conservation obligation for the site is for 0.3 acres of reforestation and 6.56 acres of afforestation. This obligation will be met partially by 0.22 acres of 1/2 credit retention (see Easement Table, Sheet 13) and partially with 6.66 acres of afforestation to be provided on site. A total forest conservation surety amount of $148,889.00 shall be posted as part of the Developer's Agreement per sectioin 5.2.F.2 of Howard County Design Manual III.
30. No noise study is required for this project, per Section 5.2.F.2 of Howard County Design Manual III.
31. The environmental buffer, stream and floodplain disturbances associated with the construction of the public emergency access driveway extension connecting to Heather Glen Way, in the adjoining subdivision, were considered to be an essential disturbance by DPZ and DPW for emergency access in accordance with Sections 16.115 and 16.116(c) of the Subdivision and Land Development Regulations.
32. Approved sand mound location on Preservation Parcel 'A' is to be protected with barrier(s) during construction of the Public Emergency Service Access Driveway.
33. The garage apartment on Preservation Parcel 'A' is to be vacated and plumbing removed with exception of washer for cleaning items related to stables.
34. Any repairs or upgrades to the sewage disposal system within Preservation Parcel 'A' shall be located within the septic easements shown on this plan.
35. Construction of the proposed Public Emergency Service Access drive located from the Prestwick Drive cul-de-sac to Heather Glen Way cul-de-sac, shall be the responsibility of the developer of this project. The emergency driveway shall be pubilcally owned and maintained by Howard County, Maryland.
36. Lots 1 thru 12 shall access Prestwick Drive and Lot 13 and Buildable Preservation Parcel 'A' shall access Heather Glen Way via the Emergency Service Access Drive.
37. Lots 1 thru 7 shall pay a fee-in-lieu, of $10,500.00 (7x$1,500.00), to satisfy their open space requirement for non-cluster lots in accordance with Section 16.121(a)(2) of the Subdivision Regulations.
38. Waiver petition WP-09-62 was approved by the Director of the Department of Planning and Zoning on November 25, 2008. Waivers from Section 16.144(K)(3) for a six month extension of the Final Plan APFO milestone date established for the subject project previously approved under SP-07-11, Section 16.120(b)(4)(iii)b to allow environmental features and their required buffers on residential lots or parcels less than 10 arces in size, and from Section 16.120(c)(2)(i) and (ii) to allow residential lots and preservation parcels to front onto the proposed public emergency access road to satisfy their minimum public road frontage requirements rather than an approved public road right-of-way, were approved subject to the following three conditions:
    a. A six month APFO milestone extension is granted for SP-07-11. The applicant shall proceed with the submission of the final plan application for SP-07-11 for this project within 6 months from the previous established APFO milestone deadline date of November 2, 2008 or until (on or before May 2, 2009), unless the new subdivision plan SP-09-03 is approved and the previous file SP-07-11 has been voided by DPZ prior to that time.
    b. Subject to the SRC agency comments previously issued for Preliminary Equivalent Sketch Plan, SP-09-03 in the DPZ letter dated October 24, 2008.
    c. No grading, removal of vegetative cover and trees, paving and new structures is permitted within the 75' stream bank buffers, wetlands and 25' wetlands buffers located within the residential lots within this subdivision in accordance with Section 16.116 of the Subdivision and Land Development Regulations. A 35' residential structure setback is required from the edge of any environmental buffer or feature located within the subject lots in accordance with Section 16.120(b)(4)(iii) of the Subdivision Regulations. No waivers will be granted for impacts to the environmental features or their required buffers located within the subject lots during the future processing of this subdivision project.
39. Electrical conductor and transformer shall be removed from Lot 5 prior to issuance of the septic permit. See plan for location.
40. Driveway(s) shall be provided prior to issuance of a use and occupancy permit for any new dwellings to ensure safe access for fire and emergency vehicles per the following requirements:
    1) Width - 12 feet (16 feet serving more than one residence).
    2) Surface - six (6") inches of compacted crusher run base with tar and chip coating (1-1/2' Minimum).
    3) Geometry - Maximum 15% grade, Maximum 10% grade change and 45-foot turning radius.
    4) Structures (culverts/bridges) - capable of supporting 25 gross tons (H25-loading).
    5) Drainage elements - capable of safely passing 100 year flood with no more than 1 foot depth over driveway surface.
    6) Maintenance - sufficient to ensure all weather use
41. For flag or pipestem lots, refuse collection, snow removal and road maintenance are provided to the junction of the flag or pipestem and the road right-of-way line only and not onto the flag or pipestem lot driveway.
42. There is an existing dwelling and structures on Lot 5 and Buildable Preservation Parcel 'A' to remain. No new buildings, extensions or additions to the existing dwelling(s) are to be constructed at a distance less than the zoning regulation requirements.
43. The contractor shall notify the Department of Public Works/Bureau of Engineering/Construction Inspection Division at (410) 313-1880 at least five (5) working days prior to the start of work.
44. The contractor shall notify Miss Utility at 1-800-257-7777 at least 48 hours prior to any excavation work being done.
45. Traffic control devices, markings and signing shall be in accordance with the latest edition of the Manual of Uniform Traffic Control Devices (MUTCD). All street and regulatory signs shall be in place prior to the placement of any asphalt.
46. All sign posts used for traffic control signs installed in the County right-of-way shall be mounted on a 2" galvanized steel, perforated, square tube post (14 gauge) inserted into a 2-1/2" galvanized steel, perforated, square tube sleeve (12 gauge) - 3' long. A galvanized steel pole cap shall be mounted on top of each post.
47. Safe, adequate and uninterrupted vehicular access must be provided for Naecker Property Lot 2 to access a public road at all times during construction and until such time that a permanent driveway access is provided.

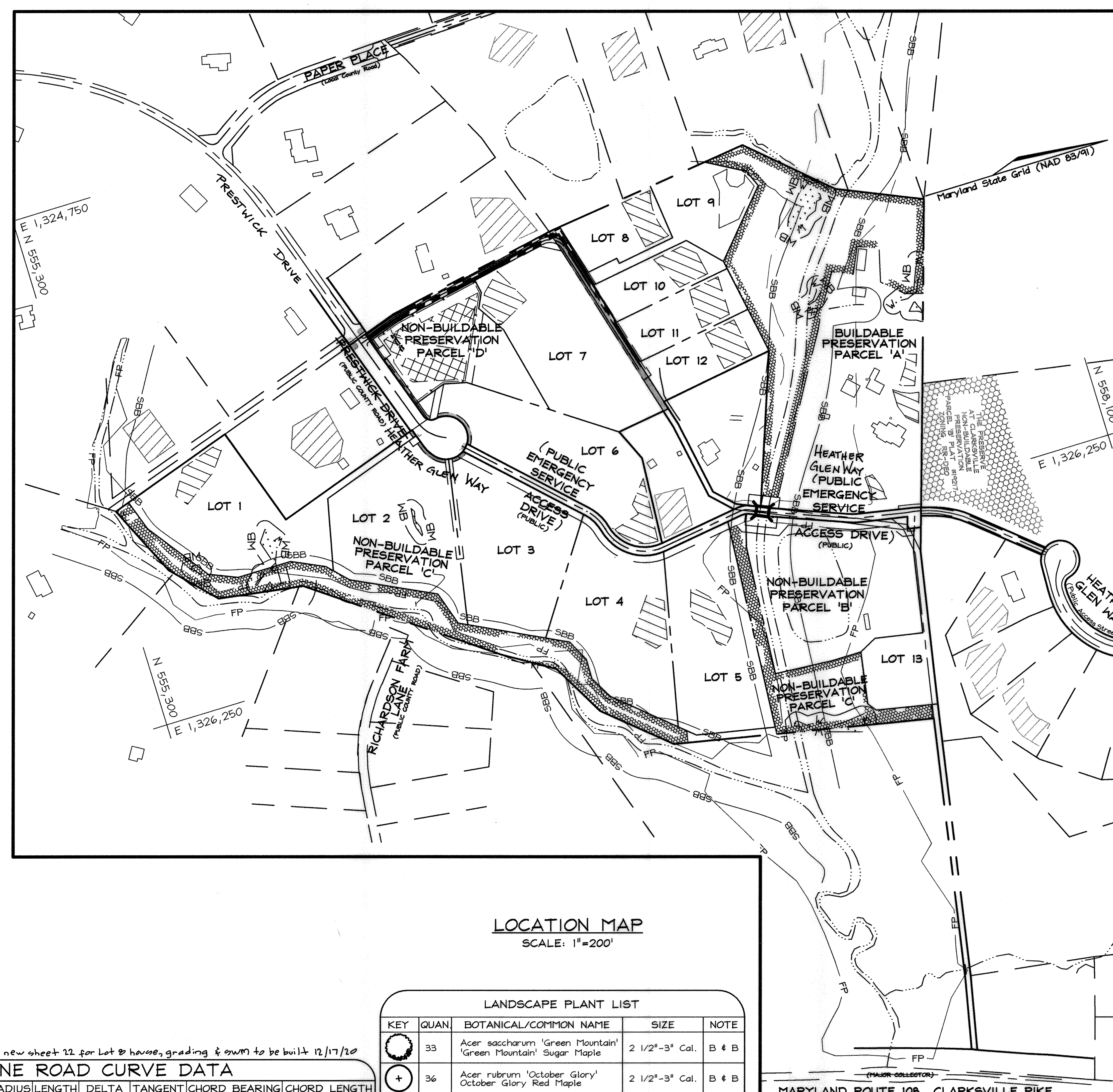
APPROVED: DEPARTMENT OF PUBLIC WORKS

[signature] 11-17-10
CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[signature] 11/19/10
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

[signature] 11/18/10
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE



LOCATION MAP
SCALE: 1"=200'

⚠2 Revision #2 (by GLW): Added new sheet 22 for Lot 8 house, grading & swm to be built 12/17/20

CENTERLINE ROAD CURVE DATA

ROAD NAME	CURVE No.	RADIUS	LENGTH	DELTA	TANGENT	CHORD BEARING	CHORD LENGTH
Prestwick Drive	C1	113.00'	99.20'	50°17'50"	53.05	N46°17'37"E	96.04'
Emergency Access Drive	C2	130.02'	72.36'	31°53'10"	37.14	S60°45'30"W	71.43'
Emergency Access Drive	C3	130.00'	192.38'	84°47'20"	118.68	N34°18'34"E	175.30'
Emergency Access Drive	C4	48.00'	26.84'	32°02'07"	13.78	S07°55'57"W	26.49'
Emergency Access Drive	C5	300.00'	13.09'	2°30'02"	6.55	N22°42'00"E	13.09'
Emergency Access Drive	C6	200.00'	37.48'	10°44'11"	18.79	N16°04'53"E	37.42'
Emergency Access Drive	C7	284.57'	41.22'	8°17'57"	20.65	S09°15'18"W	41.18'

LANDSCAPE PLANT LIST

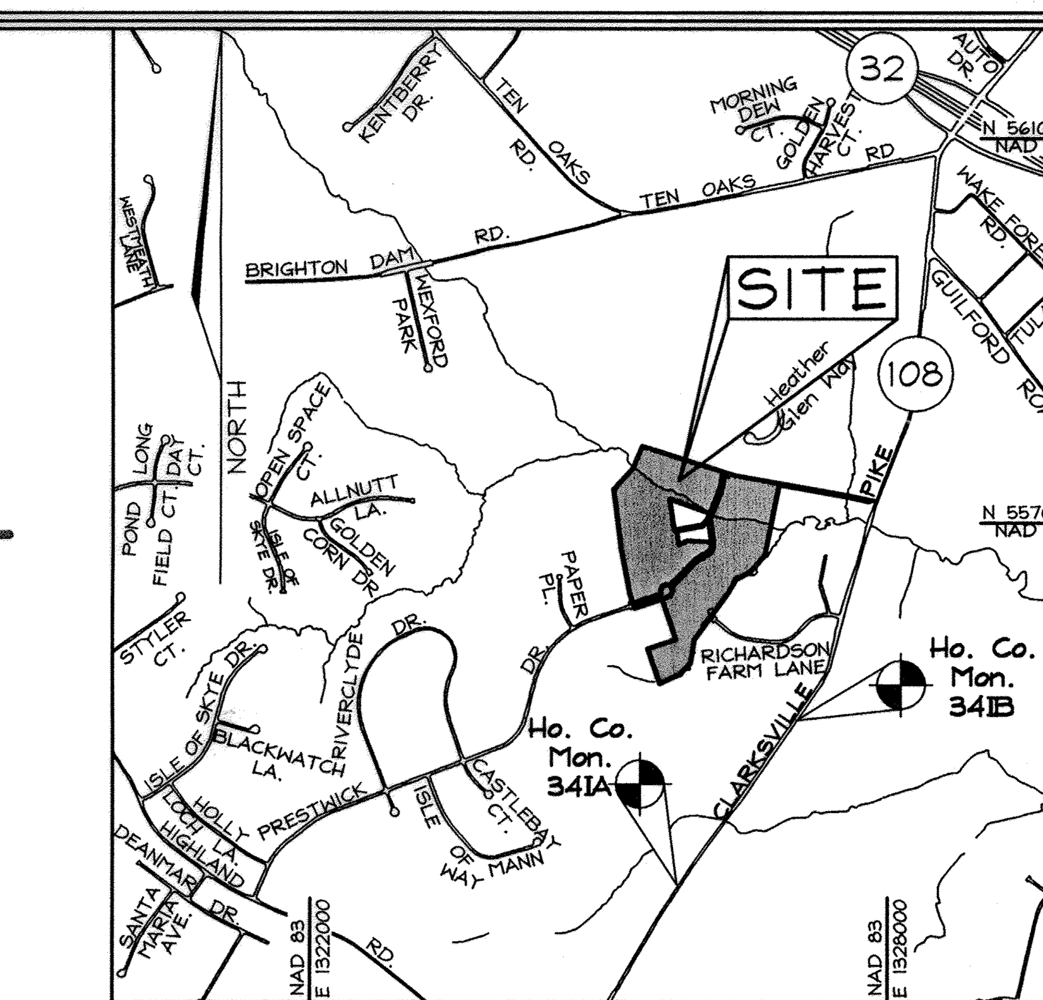
KEY	QUAN.	BOTANICAL/COMMON NAME	SIZE	NOTE
[symbol]	33	Acer saccharum 'Green Mountain' 'Green Mountain' Sugar Maple	2 1/2"-3" Cal.	B & B
[symbol]	36	Acer rubrum 'October Glory' October Glory Red Maple	2 1/2"-3" Cal.	B & B
[symbol]	34	Quercus coccinea Scarlet Oak	2 1/2"-3" Cal.	B & B
[symbol]	25	Amelanchier arborea Downy Shadbush	2 1/2"-3" Cal.	B & B
[symbol]	73	Ilex opaca American Holly	5-6' Ht.	B & B
[symbol]	82	Picea abies Norway Spruce	6-8' Ht.	B & B

LEGEND

- Existing contours — 552
- Proposed Contour — 82
- Future Lot Grading 2' Contour — 82
- Future Lot Grading 10' Contour — 90
- Existing Spot Elevation — 382.3
- Proposed Spot Elevation — +82.53
- Future Lot Grading Proposed Spot Elevation — +82.53
- Direction of Flow
- Future Lot Grading Direction of Flow
- Soils Line — MIC2
- Limit of Disturbance — LOD
- Future Lot Grading Limit of Disturbance — LOD
- Super Silt Fence — SSF
- Future Lot Grading Super Silt Fence — SSF
- Existing Trees / Proposed Trees
- Ditch Erosion Control Matting — ECM
- Future Ditch E.C.M. — ECM
- Earth Dike
- Temporary Swale — T.S.
- Stone Outlet Structure — S.O.S.
- Area of Erosion Control Matting
- Existing Fence Line — X
- Proposed Fence Line — X — X
- Proposed Single Sewer Grinder Pump — S
- Proposed Well Area
- Forest Conservation Easement
- Proposed Shared Septic Area
- Proposed Septic Area
- Existing Septic Area
- Moderate Slopes (Greater Than/or Equal to 15.00% & Less Than 24.99%)
- Steep Slopes (Greater Than 25%)
- Easement
- Percolation Symbols — Pass 600, Fail 626
- Percolation Symbols for Sand Mound Testing — SM Pass 702, SM Fail 703
- Top of Streambank
- Streambank Buffer — SBB
- Wetland — W
- Wetland Buffer — WB
- Existing Underground Electrical Cable — E
- 100 Year Floodplain Limits — FP
- Landscaping Perimeter
- Future Lot House and Driveway
- Existing Pavement to be Removed

⚠2 For Revision #2 by G.L.W.
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. 12975
Expiration Date: May 26, 2022

[seal, signature] 12-22-20



VICINITY MAP
SCALE: 1"=2000'
ADC Map 4933, Grid H-9

BENCHMARKS

The coordinates shown hereon are based upon the Howard County geodetic Control which is based on the Maryland state Plane coordinate system. Howard Co. Monument No. 34IA and 34IB were used for this project.

Sta. 34IA N 553,271.9128 E 1,325,838.7481 El.: 471.945 (feet)
Sta. 34IB N 554,973.5265 E 1,327,078.7729 El.: 442.801 (feet)

MINIMUM LOT SIZE CHART

LOT NUMBER	GROSS AREA (sf)	PIPESTEM AREA (sf)	MINIMUM LOT SIZE
1	3.143 AC±	0.142 AC±	3.001 AC±
7	3.579 AC±	0.032 AC±	3.547 AC±
8	45,174±	2,528 ±	42,646 sf±
9	64,417±	10,814 ±	53,603 sf±
10	43,436 ±	3,234 ±	40,202 sf±
11	48,926 ±	3,696 ±	45,230 sf±
12	48,961 ±	4,189 ±	44,772 sf±
13	45,721±	5,954 ±	39,767 sf±

SHEET INDEX

"AS-BUILT" CERTIFICATION

I hereby certify, by my seal, that the roads and storm drains shown on this plan were constructed as shown on this "AS-BUILT" plan meet the Approved Plans and Specifications.

[signature, seal] 11/3/15
C. BROOKE MILLER, PROP. L.S. #135 — DATE

SCHEDULE A PERIMETER LANDSCAPE EDGE

CATEGORY	ADJACENT TO PERIMETER PROPERTIES							
Perimeter/Frontage Designation Landscape Type	1 A	2 A	3 A	4 A/D*	5 A	6 D	7 D	8 A
Linear Feet of Roadway Frontage/Perimeter	485'	1559'	2695'	1072' 435' D*	845'	503'	600'	854'
Credit for Existing Vegetation (Yes, No, Linear Feet) Remaining Perimeter Length	No	No	Yes** (1539') 1156'	No	No	No	No	No
Credit for Wall, Fence or Berm (Yes, No, Linear Feet Describe below if needed)	No	No	No	No	No	No	No	No
Number of Plants Required Shade Trees Evergreen Trees Shrubs	 1:60 8 - -	 1:60 26 - -	 1:60 19 - -	 1:60 18 1:10 44 -	 1:60 14 - -	 1:60 8 1:10 50 -	 1:60 10 1:10 60 -	 1:60 14 - -
Number of Plants Provided Shade Trees Evergreen Trees Ornamental Trees Shrubs	 8 - - -	 26 - - -	 19 - - -	 16 50 - -	 10 - 8*** -	 - 45 17*** -	 10 60 - -	 14 - - -

* Buffer 4 contains 435' of pipestem perimeter which requires a D-type buffer.
** Credit taken for existing trees to remain
*** Smaller trees due to power lines

DEVELOPER
GREENFIELD HOMES, Inc.
6656 Luster Drive
Highland, Maryland 20777
410.781.6782

OWNER/
(NAECKER PROPERTY Plat #20373-20375 Lot6)
GREENFIELD HOMES, Inc.
6656 Luster Drive
Highland, Maryland 20777
410.781.6782

OWNER/
(NAECKER PROPERTY Plat #7288 Lot 4)
Robert L. Naecker
12740 Route 108
ClarksVille MD 21029-1531
443.864.6445

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. #34689, Expiration Date: 07/08/2011.

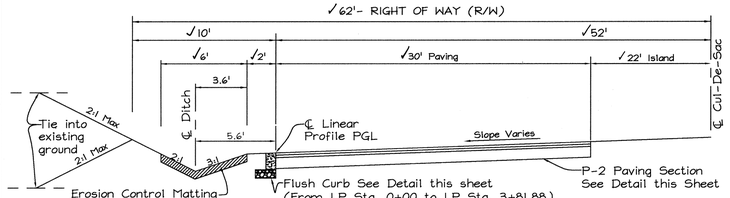
COVER SHEET
WILLOW POND

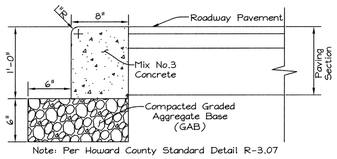
LOTS 1-13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D' & NON-BUILDABLE PARCEL 'E' A RESUBDIVISION OF NAECKER PROPERTY LOT 4, PLAT NO. 7288 AND LOT 6, PLAT NO. 20373-20375

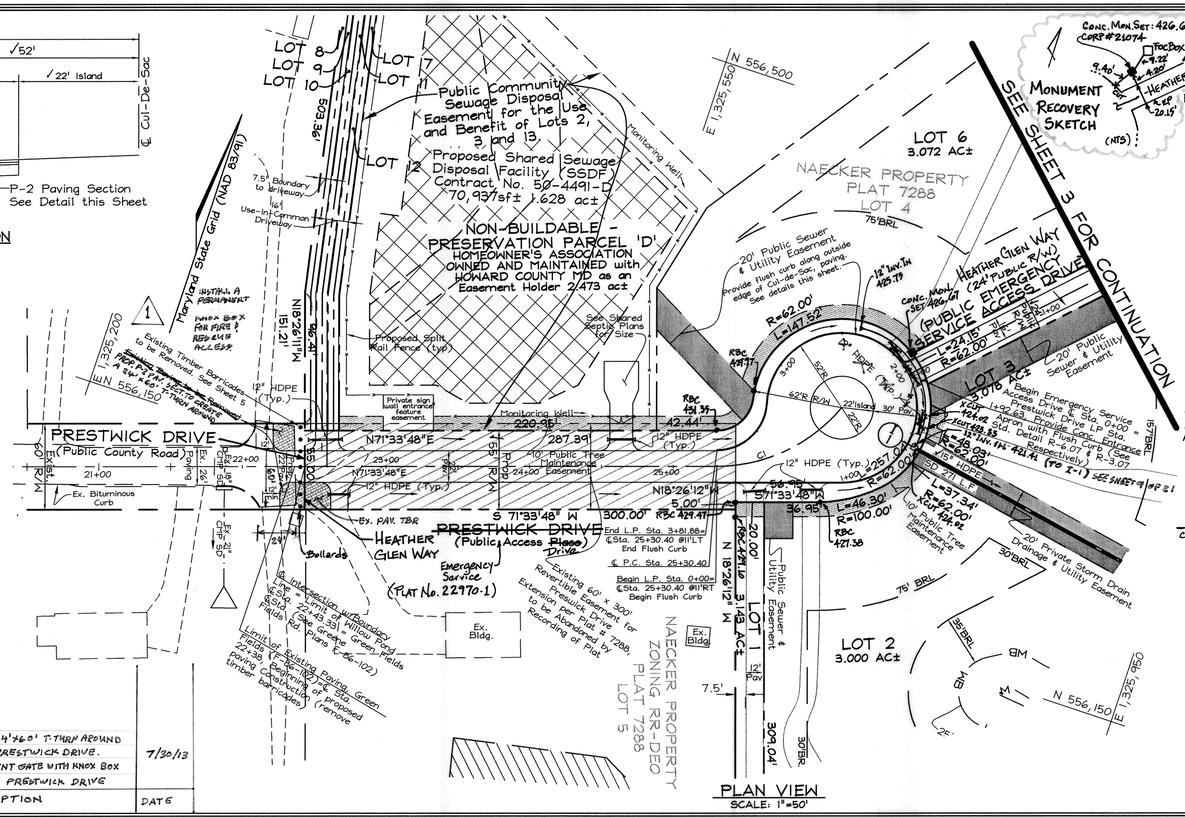
TAX MAP 34 GRID 17 — PARCEL 382
FIFTH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY: MT
DRAWN BY: AY
CHECKED BY: ZYF, MLT
SCALE: As Shown
DATE: Oct. 29, 2010
W.O. No.: 3199
SHEET No. 1 OF 22







TYPICAL ~~PRESTWICK DRIVE~~ HEATHER GLEN WAY CUL-DE-SAC ROADWAY SECTION

NOT TO SCALE

Note:
Paving sections shown relates to a CBR value of 7. Actual CBR test results may cause modification of these paving sections.

Note: Per Howard County Standard Detail R-3.07

FLUSH CURB DETAIL

NOT TO SCALE

APPROVED: DEPARTMENT OF PUBLIC WORKS

11-17-10
CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

11/18/10
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

11/18/10
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

REV. #	DESCRIPTION	DATE
1	RECONSTRUCT 24'x60' T-TURN AROUND AT STA. 22+35 PRESTWICK DRIVE. INSTALL PERMANENT GATE WITH KNOX BOX AT STA. 22+45 PRESTWICK DRIVE	7/30/13

PLAN VIEW

SCALE: 1"=50'

① DITCH CROSS SECTION SLOPE MAY BE FLATTENED TO PROVIDE A SWALE AT OR NEAR THE CREST OF VERTICAL CURVES WHERE QUANTITY OF SWALE FLOW IS SMALL, AS APPROVED BY DPW.

ROAD NAME	CLASSIFICATION	A	B	C	DI	D2	E	F	PAVING SECTION	DESIGN SPEED	REMARKS
PRESTWICK DRIVE	PUBLIC ACCESS PLACE 200 A.D.T.	22' ✓	4' ✓	4' ✓	6' ✓	11' ✓	14' ✓	19' ✓	P-2 ✓	25 MPH	℄ STA. 22+38 TO ℄ STA. 25+30.40*

* Note: Linear profile begins @ ℄ Sta. 25+30.40 = Beginning of Linear Profile Sta. 0+00 = End of Linear Profile Sta. 3+81.88
** Note: The PGL for the Linear Profile is the Edge of Paving, See typical Prestwick Drive Cul-De-Sac Roadway Section this sheet for linear profile section.

TYPICAL ~~PRESTWICK DRIVE~~ HEATHER GLEN WAY ROADWAY SECTION

NOT TO SCALE

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the roads & storm drains shown on this plan were constructed as shown on this "As-Built" plan meet the APPROVED PLANS and SPECIFICATIONS.

C. BROOKE MILLER, PROP. L.S. #135 — 11/13/15 DATE

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. #34689, Expiration Date: 07/08/2011.

OWNER/
(NAECKER PROPERTY
Plat #7288 Lot 4)
Robert L. Naecker
12740 Route 108
ClarksVille MD 21029-1531
443.864.6445

OWNER/
(NAECKER PROPERTY
Plat #20373-20375 Lot 6)
GREENFIELD HOMES, Inc.
6656 Luster Drive
Highland, Maryland 20777
410.781.6782

DEVELOPER
GREENFIELD HOMES, Inc.
6656 Luster Drive
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ROAD PLAN AND PROFILES
WILLOW POND

LOTS 1-13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B ', 'C' & 'D' AND NON-BUILDABLE PARCEL 'E' A RESUBDIVISION OF NAECKER PROPERTY LOT 4, PLAT NO. 7288 AND LOT 6, PLAT NOs. 20373-20375

TAX MAP 34 GRID 17 — PARCEL 382
FIFTH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

No. 34689

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY: MLT
DRAWN BY: AY
CHECKED BY: ZYF
SCALE: As Shown
DATE: Oct. 29, 2010
W.O. No.: 3199
SHEET No. 2 OF 22

"As-Built PGL Elevations taken from existing "Greene Fields" subdivision, see plans F-86-102.

ROAD PROFILE

SCALE- HORIZONTAL: 1"=50'
VERTICAL: 1"=5'

LINEAR ROAD PROFILE

SCALE- HORIZONTAL: 1"=50'
VERTICAL: 1"=5'

NOTES:
1. Driveway must be paved from edge of public road to right of way line using standard paving section P-1 or alternate section equal to or better than P-1, as approved by DPW.
2. Drainage Culvert shall be sized for a 10 year frequency storm and the minimum size shall be 12" Dia. round or 14"x9" arch pipe if larger pipe is required, ditch invert shall be lowered to provide min. ditch gradient of 0.5% and clearance shown.
3. Swale flow may be provided over driveway located at or near the crest of vertical curves on the public road where quantity of flow is small, as approved by DPW.
4. Tie-In grade of private driveway shall not exceed 15%.
5. See typical sections for layout and grading of ditch and pipe culvert.
6. Use of the alternative ornamental headwall shall require approval by the DPW director. Howard County will not maintain ornamental headwalls, an HOA agreement is required.

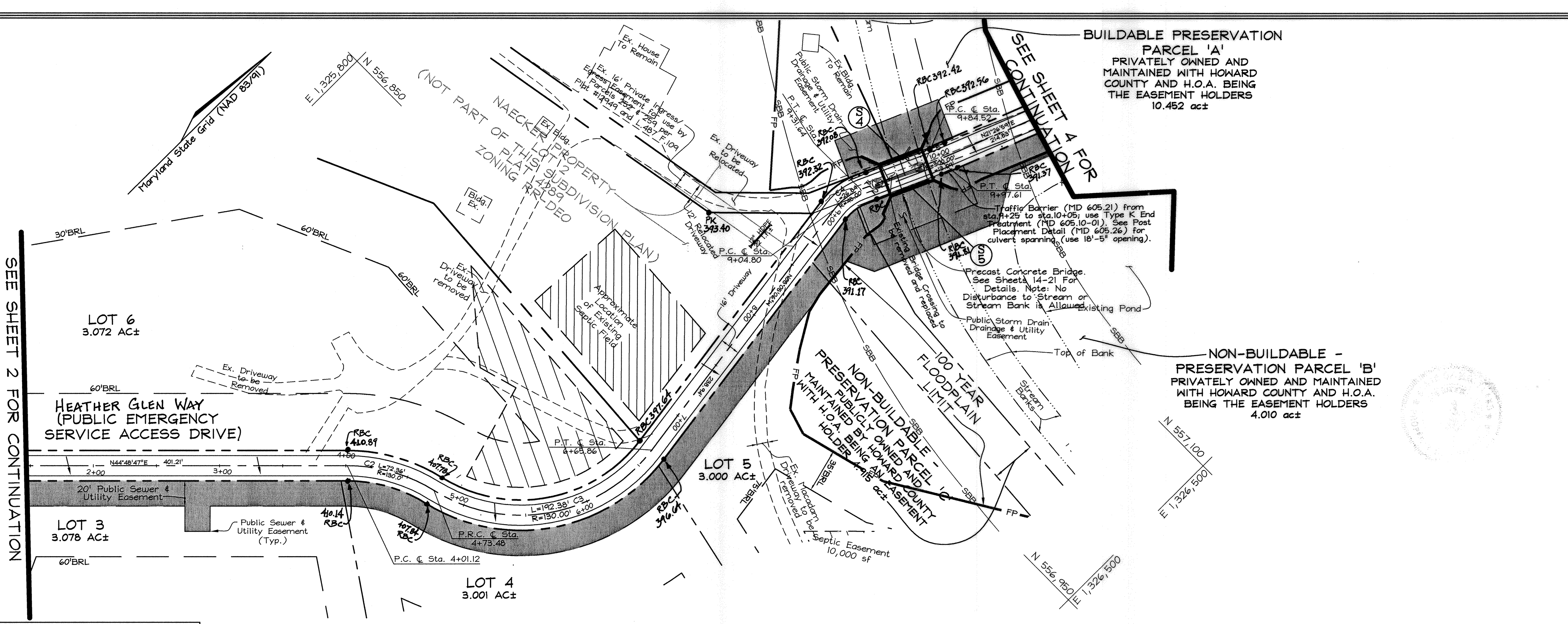
Revised
Revised 5/7/2007
Approved

Howard County, Maryland
Department of Public Works
Approved:
Chief, Bureau of Engineering

RESIDENTIAL DRIVEWAY ENTRANCE
Open Section Roadway
Not to Scale

Detail R-6.06

F-10-106



PLAN VIEW

SCALE: 1"=50'

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/19/10

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/18/10

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 11-17-10

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. #34689, Expiration Date: 07/08/2011.

AS-BUILT CERTIFICATION

I hereby certify, by my seal, that the roads and storm drains shown on this plan were constructed as shown on this "As-Built" plan meet the Approved Plans and Specifications.

C. Brooke Miller — DATE 11/3/15
Prop. L.S.# 135

OWNER/ (NAECKER PROPERTY Plat #7288 Lot 4)

Robert L. Naecker
12740 Route 108
ClarksVille MD 21029-1531
443.864.6445

OWNER/ (NAECKER PROPERTY Plat #20373-20375 Lot 6)

GREENFIELD HOMES, Inc.
6656 Luster Drive
Highland, Maryland 20777
410.781.6782

DEVELOPER

GREENFIELD HOMES, Inc.
6656 Luster Drive
Highland, Maryland 20777
410.781.6782

ROAD PROFILES
WILLOW POND

LOTS 1-13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C' & 'D' AND NON-BUILDABLE PARCEL 'E' A RESUBDIVISION OF NAECKER PROPERTY LOT 4, PLAT NO. 7288 AND LOT 6, PLAT NOs. 20373-20375

TAX MAP 34 GRID 17 — PARCEL 382
FIFTH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

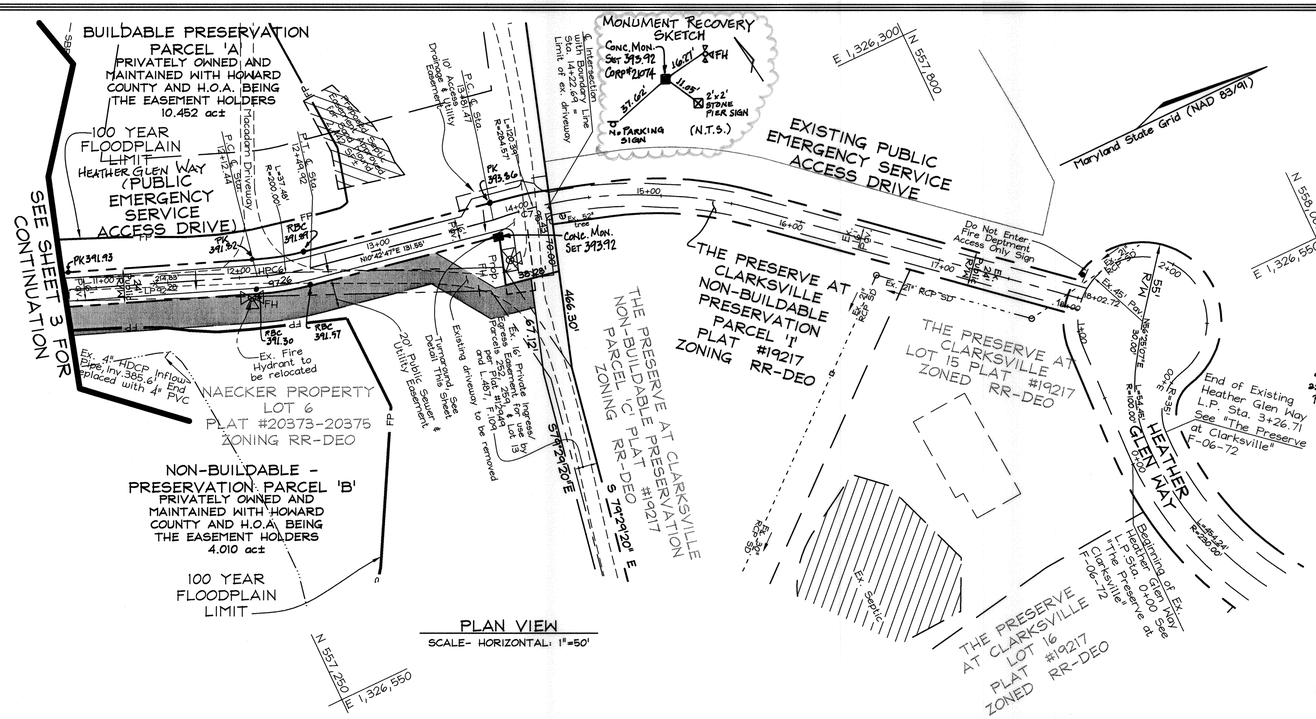
FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY:	MLT
DRAWN BY:	AY
CHECKED BY:	ZYF
SCALE:	As Shown
DATE:	Oct. 29, 2010
W.O. No.:	3199
SHEET No.	3 OF 22

ROAD PROFILE

SCALE- HORIZONTAL: 1"=50'
VERTICAL: 1"=5'

F-10-106



PLAN VIEW
SCALE- HORIZONTAL: 1"=50'

TYPICAL PUBLIC EMERGENCY SERVICE ACCESS DRIVE ROADWAY SECTION

NOT TO SCALE

AS-BUILT CERTIFICATION

I hereby certify, by my seal, that the roads and storm drains shown on this plan were constructed as shown on this "As-Built" plan meet the Approved Plans and Specifications.

11/3/15

C. BROOKE MILLER DATE
PROP. L.S. #135

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. #34689, Expiration Date: 07/08/2011.

OWNER/
(NAECKER PROPERTY
Plat #7288 Lot 4)
Robert L. Naecker
12740 Route 108
ClarksVille MD 21029-1531
443.864.6445

OWNER/
(NAECKER PROPERTY
Plat #20373-20375 Lot 6)
GREENFIELD HOMES, Inc.
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Highland, Maryland 20777
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LOTS 1-13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B ', 'C' & 'D' AND NON-BUILDABLE PARCEL 'E' A RESUBDIVISION OF NAECKER PROPERTY LOT 4, PLAT NO. 7288 AND LOT 6, PLAT NOs. 20373-20375

TAX MAP 34 GRID 17 PARCEL 382
FIFTH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY:	MLT
DRAWN BY:	AY
CHECKED BY:	ZYF
SCALE:	As Shown
DATE:	Oct. 29, 2010
W.O. No.:	3199
SHEET No.	4 OF 22

APPROVED: DEPARTMENT OF PLANNING AND ZONING

11/19/10
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

11/18/10
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

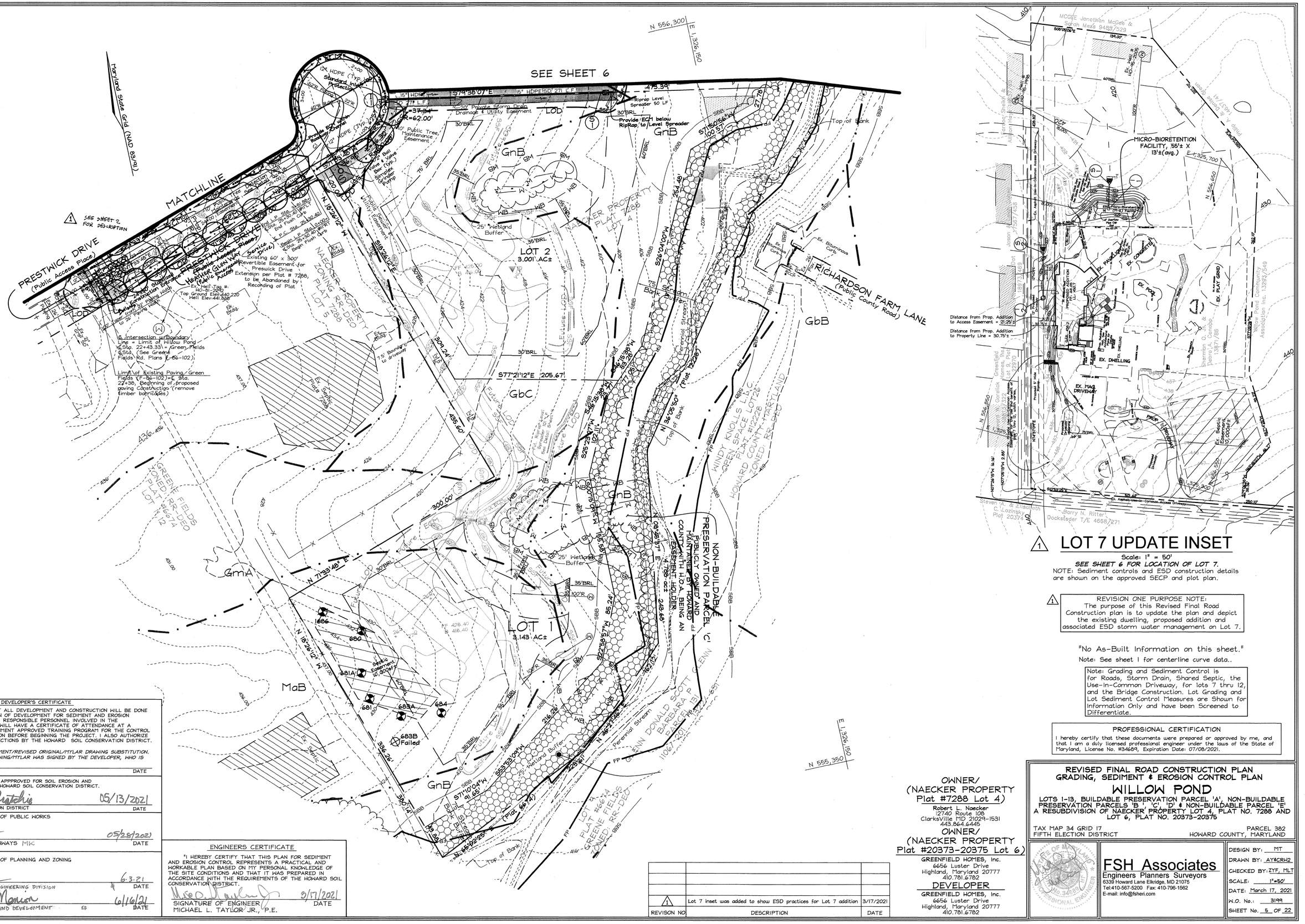
APPROVED: DEPARTMENT OF PUBLIC WORKS

11-17-10
CHIEF, BUREAU OF HIGHWAYS DATE

LINEAR ROAD PROFILE
SCALE- HORIZONTAL: 1"=50'
VERTICAL: 1"=5'

ROAD PROFILE
SCALE- HORIZONTAL: 1"=50'
VERTICAL: 1"=5'

TURNAROUND
ENLARGEMENT DETAIL
SCALE: 1" = 20'
(NOTE: See Sheet 4 for 50 scale plan view of this area)



⚠1 LOT 7 UPDATE INSET

Scale: 1" = 50'

SEE SHEET 6 FOR LOCATION OF LOT 7.

NOTE: Sediment controls and ESD construction details are shown on the approved SECP and plot plan.

⚠1 REVISION ONE PURPOSE NOTE:
The purpose of this Revised Final Road Construction plan is to update the plan and depict the existing dwelling, proposed addition and associated ESD storm water management on Lot 7.

"No As-Built Information on this sheet."

Note: See sheet 1 for centerline curve data..

Note: Grading and Sediment Control is for Roads, Storm Drain, Shared Septic, the Use-In-Common Driveway, for lots 7 thru 12, and the Bridge Construction. Lot Grading and Lot Sediment Control Measures are Shown for Information Only and have been Screened to Differentiate.

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. #34689, Expiration Date: 07/08/2021.

DEVELOPER'S CERTIFICATE

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

THIS IS A REPLACEMENT/REVISED ORIGINAL/MYLAR DRAWING SUBSTITUTION. THE PREVIOUS DRAWING/MYLAR WAS SIGNED BY THE DEVELOPER, WHO IS NOW DECEASED.

SIGNATURE OF DEVELOPER DATE

THIS DEVELOPMENT PLAN IS APPPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

Alexander Bratchie 05/13/2021
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS

05/28/2021
CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

6.3.21
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

6/16/21
CHIEF, DIVISION OF LAND DEVELOPMENT EB DATE

ENGINEERS CERTIFICATE

"I HEREBY CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION 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.

3/17/2021
SIGNATURE OF ENGINEER DATE
MICHAEL L. TAYLOR JR., P.E.

⚠1	Lot 7 inset was added to show ESD practices for Lot 7 addition	3/17/2021
REVISON NO	DESCRIPTION	DATE

OWNER/
(NAECKER PROPERTY
Plat #7288 Lot 4)
Robert L. Naecker
12740 Route 108
ClarksVille MD 21029-1531
443.864.6445

OWNER/
(NAECKER PROPERTY
Plat #20373-20375 Lot 6)
GREENFIELD HOMES, Inc.
6656 Luster Drive
Highland, Maryland 20777
410.781.6782

DEVELOPER
GREENFIELD HOMES, Inc.
6656 Luster Drive
Highland, Maryland 20777
410.781.6782

REVISED FINAL ROAD CONSTRUCTION PLAN
GRADING, SEDIMENT & EROSION CONTROL PLAN
WILLOW POND

LOTS 1-13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D' & NON-BUILDABLE PARCEL 'E'
A RESUBDIVISION OF NAECKER PROPERTY LOT 4, PLAT NO. 7288 AND LOT 6, PLAT NO. 20373-20375

TAX MAP 34 GRID 17 PARCEL 382
FIFTH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY:	MT
DRAWN BY:	AY&CRH2
CHECKED BY:	ZYF, MLT
SCALE:	1"=50'
DATE:	March 17, 2021
W.O. No.:	3199
SHEET No.	5 OF 22

F-10-106

M:\4115 Canapp Sports\dwgs\Production Drawings\4115_Plot Plan & WPLot7-Red Line_SHT5-MYLAR-REDUX.dwg, WP Sht5 MYLAR REDUX, 3/17/2021 10:39:57 AM, HP DesignJet T2530 Mylar 36x24 Grayscale Best.pc3, Arch D (landscape), 1:1

SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	SOIL GROUP
Ba	Baile silt loam	D
CgB2	Chester gravelly silt loam, 3 to 8 percent slopes, moderately eroded	B
CgC2	Chester gravelly silt loam, 8 to 15 percent slopes, moderately eroded	B
ChA	Chester silt loam, 0 to 3 percent slopes	B
ChB2	Chester silt loam, 3 to 8 percent slopes, moderately eroded	B
Cs	Comus silt loam	B
GlB2	Glenelg loam, 3 to 8 percent slopes, moderately eroded	B
GlC2	Glenelg loam, 8 to 15 percent slopes, moderately eroded	B
GnA	Glenville silt loam, 0 to 3 percent slopes	C
Ha	Hatboro silt loam	D
MgB2	Manor gravely loam, 3 to 8 percent slopes, moderately eroded	B
MgC2	Manor gravely loam, 8 to 15 percent slopes, moderately eroded	B
MlA	Manor loam, 0 to 3 percent slopes	C
MlD2	Manor loam, 15 to 25 percent slopes, moderately eroded	B
MlD3	Manor loam, 15 to 25 percent slopes, severely eroded	B

"No As-Built information on this sheet"

Note: See sheet 1 for centerline curve data..

Note: Grading and Sediment Control is for Roads, Storm Drain, Shared Septic, the Use-In-Common Driveway, for lots 7 thru 12, and the Bridge Construction. Lot Grading and Lot Sediment Control Measures are Shown for Information Only and have been Screened to Differentiate.

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. #34689, Expiration Date: 7/08/2011.

REVISION #	DESCRIPTION	DATE
3	LOT 7 INSET WAS ADDED TO SHEET 5 TO SHOW ESD PRACTICES FOR LOT 7 ADDITION.	3/11/2021

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 11-17-10

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Kent Sheubrooks — CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/19/10

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/18/10

THIS DEVELOPMENT PLAN IS APPPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE 11/9/10

ENGINEERS CERTIFICATE

"I HEREBY CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION 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.

Michael L Taylor Jr — 10/29/10

SIGNATURE OF ENGINEER — DATE
MICHAEL L. TAYLOR JR., P.E

2 For Revision #2 (by GLW)

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. 12975
Expiration Date: May 26, 2022

12-22-20

2 Revision #2 (by G.L.W.) add new sheet 22 for Lot 8 house, grading & SWM to be built 12/17/20

DEVELOPER'S CERTIFICATE

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

Wayne M — 10/29/10

SIGNATURE OF DEVELOPER — DATE

OWNER/
(NAECKER PROPERTY
Plat #7288 Lot 4)
Robert L. Naecker
12740 Route 108
ClarksVille MD 21029-1531
443.864.6445

OWNER/
(NAECKER PROPERTY
Plat #20373-20375 Lot 6)
GREENFIELD HOMES, Inc.
6656 Luster Drive
Highland, Maryland 20777
410.781.6782

DEVELOPER
GREENFIELD HOMES, Inc.
6656 Luster Drive
Highland, Maryland 20777
410.781.6782

GRADING, SEDIMENT & EROSION CONTROL PLAN

WILLOW POND

LOTS 1-13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D' & NON-BUILDABLE PARCEL 'E' A RESUBDIVISION OF NAECKER PROPERTY LOT 4, PLAT NO. 7288 AND LOT 6, PLAT NO. 20373-20375

TAX MAP 34 GRID 17
FIFTH ELECTION DISTRICT

PARCEL 382
HOWARD COUNTY, MARYLAND

MICHAEL LEE TAYLOR JR. No. 34689

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY: MT
DRAWN BY: AY
CHECKED BY: ZYF, MLT
SCALE: 1"=50'
DATE: Oct. 29, 2010
W.O. No.: 3199
SHEET No. 6 OF 22

F-10-106

Note: See sheet 1 for centerline curve data..

Note: Grading and Sediment Control is for Roads, Storm Drain, Shared Septic, the Use-In-Common Driveway, for lots 7 thru 12, and the Bridge Construction. Lot Grading and Lot Sediment Control Measures are Shown for Information Only and have been Screened to Differentiate.

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SIGNATURE OF DEVELOPER — DATE 10/29/10

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SIGNATURE OF ENGINEER — DATE 10/29/10
MICHAEL L. TAYLOR JR., P.E.

THIS DEVELOPMENT PLAN IS APPPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE 11/9/10

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 11-17-10

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/19/10

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/18/10

OWNER/ (NAECKER PROPERTY Plat #7288 Lot 4)	OWNER/ (NAECKER PROPERTY Plat #20373-20375 Lot6)	DEVELOPER
Robert L. Naecker 12740 Route 108 ClarksVille MD 21029-1531 443.864.6445	GREENFIELD HOMES, Inc. 6656 Luster Drive Highland, Maryland 20777 410.781.6782	GREENFIELD HOMES, Inc. 6656 Luster Drive Highland, Maryland 20777 410.781.6782

GRADING, SEDIMENT & EROSION CONTROL PLAN

WILLOW POND

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TAX MAP 34 GRID 17 — PARCEL 382
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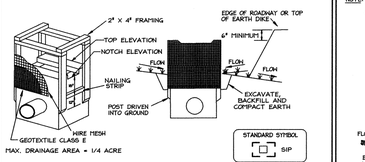
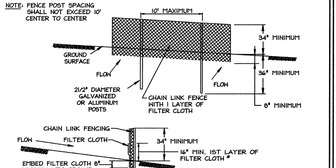
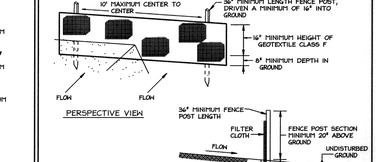
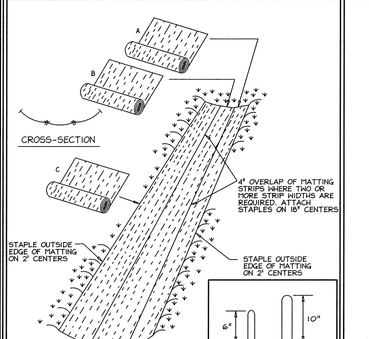
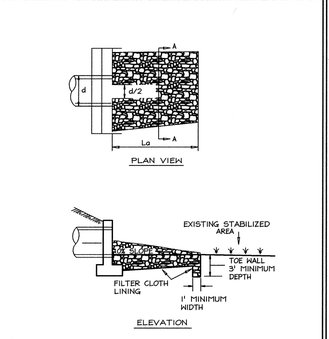
DESIGN BY: MT
DRAWN BY: AY
CHECKED BY: ZYF, MLT
SCALE: 1"=50'
DATE: Oct. 29, 2010
W.O. No.: 3199
SHEET No. 7 OF 22

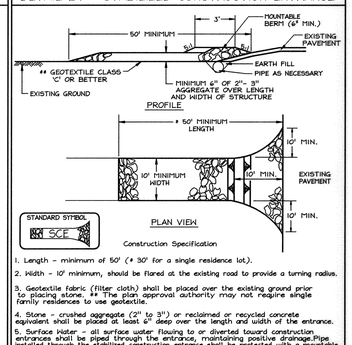


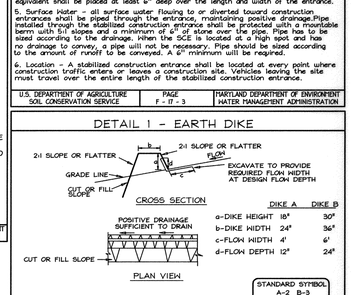


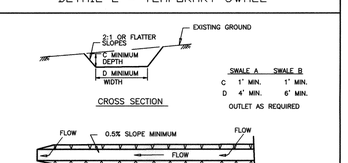


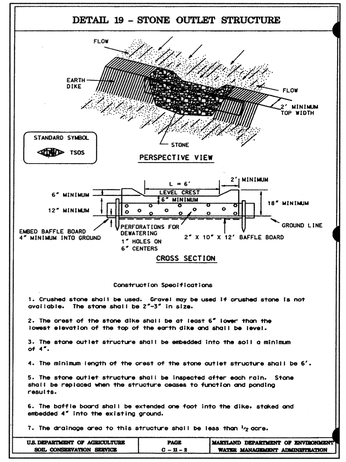












DETAIL 23A - STANDARD INLET PROTECTION

MAX. DRAINAGE AREA = 1/4 ACRE

Construction Specifications

1. Excavate completely around the inlet to a depth of 18" below the notch elevation.

2. Drive the 2" x 4" construction grade lumber posts 1' into the ground at each corner of the inlet. Place nail strips between the posts on the ends of the inlet. Assemble the top portion of the 2" x 4" frame using the overlap joint shown on Detail 23A. The top of the frame (weir) must be 6" below adjacent roadways where flooding and safety issues may arise.

3. Stretch the 1/2" x 1/2" wire mesh tightly around the frame and fasten securely. The ends must meet and overlap at a post.

4. Stretch the Geotextile Class E tightly over the wire mesh with the geotixtile extending from the top of the frame to 18" below the inlet notch elevation. Fasten the geotextile firmly to the frame. The ends of the geotextile must meet at a post, be overlapped and folded, then fastened down.

5. Backfill around the inlet in compacted 6" layers until the layer of earth is level with the notch elevation on the ends and top elevation on the sides.

6. If the inlet is not in a sump, construct a compacted earth dike across the ditch line directly below it. The top of the earth dike should be at least 6" higher than the top of the frame.

7. The structure must be inspected periodically and after each rain and the geotextile replaced when it becomes clogged.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E - 16 - 5	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 30 - EROSION CONTROL MATTING

Construction Specifications

1. Key-in the matting by placing the top ends of the matting in a narrow trench, 6" in depth. Backfill the trench and tamp firmly to conform to the channel cross-section. Secure with a row of staples about 4" down slope from the trench. Spacing between staples is 6".

2. Staple the 4" overlap in the channel center using an 18" spacing between staples.

3. Before stapling the outer edges of the matting, make sure the matting is smooth and in firm contact with the soil.

4. Staples shall be placed 2' apart with 4 rows for each strip, 2 outer rows, and 2 alternating rows down the center.

5. Where one roll of matting ends and another begins, the end of the top strip shall overlap the upper end of the lower strip by 4", shiplap fashion. Reinforce the overlap with a double row of staples spaced 6" apart in a staggered pattern on either side.

6. The discharge end of the matting liner should be similarly secured with 2 double rows of staples.

Note: If flow will enter from the edge of the matting then the area effected by the flow must be keyed-in.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE G - 22 - 2	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 33 - SUPER SILT FENCE

NOTE: FENCE POST SPACING SHALL NOT EXCEED 10' CENTER TO CENTER

Construction Specifications

1. Fencing shall be 42" in height and constructed in accordance with the latest Maryland State Highway Details for Chain Link Fencing. The specification for a 6' fence shall be used, substituting 42" fabric and 6' length posts.

2. Chain link fence shall be fastened securely to the fence posts with wire ties. The lower tension wire, brace and truss rods, drive anchors and post caps are not required except on the ends of the fence.

3. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.

4. Filter cloth shall be embedded a minimum of 8" into the ground.

5. When two sections of filter cloth adjoin each other, they shall be overlapped by 6" and folded.

6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when silt reaches 50% of fence height

7. Filter cloth shall be fastened securely to each fence post with wire ties or staples at top and mid section and shall meet the following requirements for Geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal/ft /minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE H - 26 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 27 - ROCK OUTLET PROTECTION III

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ROCK OUTLET PROTECTION III

Construction Specifications

1. The subgrade for the filter, rip-rap, or gabion shall be prepared to the required lines and grades. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.

2. The rock or gravel shall conform to the specified grading limits when installed respectively in the rip-rap or filter.

3. Geotextile shall be protected from punching. cutting. or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of geotextile over the damaged part or by completely replacing the geotextile. All overlaps whether for repairs or for joining two pieces of geotextile shall be a minimum of one foot.

4. Stone for the rip-rap or gabion outlets may be placed by equipment. They shall be constructed to the full course thickness in one operation and in such a manner as to avoid displacement of underlying materials. The stone for rip-rap or gabion outlets shall be delivered and placed in a manner that will ensure that it is reasonably homogeneous with the smaller stones and spalls filling the voids between the larger stones. Rip-rap shall be placed in a manner to prevent damage to the filter blanket or geotextile. Hand placement will be required to the extent necessary to prevent damage to the permanent works.

5. The stone shall be placed so that it blends in with the existing ground. If the stone is placed too high then the flow will be forced out of the channel and scour adjacent to the stone will occur.

DETAIL 22 - SILT FENCE

Construction Specifications

1. Fence posts shall be a minimum of 36" long, driven 16" minimum into the ground. Wood posts shall be 1 1/2" x 1 1/2" square (minimum) cut, or 1 3/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighing not less than 1.00 pound per linear foot.

2. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for Geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal ft /minute (max.)	Test: MSMT 322
Filtering Eggeciency	75% (min.)	Test: MSMT 322

3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.

4. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reaches 50% of the fabric height.

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DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE

Construction Specification

1. Length - minimum of 50' (* 30' for a single residence lot).

2. Width - 10' minimum, should be flared at the existing road to provide a turning radius.

3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. ** The plan approval authority may not require single family residences to use geotextile.

4. Stone - crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.

5. Surface Water - all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage.Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and has no drainage to convey, a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.

6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

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DETAIL 1 - EARTH DIKE

	DIKE A	DIKE B
a-DIKE HEIGHT	18"	30"
b-DIKE WIDTH	24"	36"
c-FLOW WIDTH	4'	6'
d-FLOW DEPTH	12"	24"

FLOW CHANNEL STABILIZATION
GRADE 0.5% MIN. 10% MAX.

1. Seed and cover with straw mulch.
2. Seed and cover with Erosion Control Matting or line with sod.
3. 4" - 7" stone or recycled concrete equivalent pressed into the soil 7" minimum

Construction Specifications

1. All temporary earth dikes shall have uninterrupted positive grade to an outlet. Spot elevations may be necessary for grades less than 1%.

2. Runoff diverted from a disturbed area shall be conveyed to a sediment trapping device.

3. Runoff diverted from an undisturbed area shall outlet directly into an undisturbed, stabilized area at a non-erosive velocity.

4. All trees, brush, stumps, obstructions, and other objectional material shall be removed and disposed of so as not to interfere with the proper functioning of the dike.

5. The dike shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.

6. Fill shall be compacted by earth moving equipment.

7. All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the dike.

8. Inspection and maintenance must be provided periodically and after each rain event.

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APPROVED: DEPARTMENT OF PUBLIC WORKS

11-17-10
CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

11/19/10
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

11/18/10
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

THIS DEVELOPMENT PLAN IS APPPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

11/9/10
HOWARD SOIL CONSERVATION DISTRICT — DATE

21.0 STANDARDS AND SPECIFICATIONS FOR TOPSOIL

Definition

Placement of topsoil over a prepared subsoil prior to establishment of permanent vegetation.

Purpose

To provide a suitable soil medium for vegetable growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.

Conditions Where Practice Applies

I. This practice 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.

II. For the purpose of these Standards and Specifications, areas having slopes steeper than 2:1 require special consideration and design for adequate stabilization. Areas having slopes steeper than 2:1 shall have the appropriate stabilization shown on the plans.

Construction and Material Specifications

I. Topsoil salvaged from the existing site may be used provided that 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-SCS in cooperation with Maryland Agricultural Experimental Station.

II. Topsoil Specifications - Soil to be used as topsoil must meet the following:

i. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or a soil scientist and approved by the appropriate approval authority. Regardless, topsoil shall not be a mixture of contrasting textured subsoils and shall contain less than 5% by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger that 1 and 1/2" in diameter.

ii. Topsoil must be free of plants or plant parts such as Bermuda grass, quackgrass, Johnsongrass, nutsedge, poison ivy, thistle, or others as specified.

iii. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.

III. For sites having disturbed areas under 5 acres:

i. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials.

IV. For sites having disturbed areas over 5 acres:

i. On soil meeting topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:

a. pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be prescribed to raise the pH to 6.5 or higher.

b. Organic content of topsoil shall be not less than 1.5 percent by weight.

c. Topsoil having soluble salt content greater than 500 parts per million shall not be used.

d. No sod or seed shall be placed on soil 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.

NOTE: 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.

ii. Place topsoil (if required) and apply soil ammendments specified in 20.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials.

V. Topsoil Application

i. When topsoiling, maintain needed erosion and sediment control practices such as diversions, Grade Stabilization Structures, Earth Dikes, Slope Silt Fence and Sediment Traps and Basins.

ii. Grades on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4"-8" higher in elevation.

iii. Topsoil shall be uniformly distributed in a 4"-8" layer and lightly compacted to a minimum thickness of 4". Spreading shall 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 shall be corrected in order to prevent the formation of depressions or water pockets.

iv. Topsoil shall not be place while 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.

BEST MANAGEMENT PRACTICES

FOR WORKING IN NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, AND 100-YEAR FLOODPLAINS

1. NO EXCESS FILL, CONSTRUCTION MATERIAL, OR DEBRIS SHALL BE STOCKPILED OR STORED IN NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR 100 YEAR FLOODPLAIN.
2. PLACE MATERIALS IN A LOCATION AND MANNER WHICH DOES NOT ADVERSELY IMPACT SURFACE OR SUBSURFACE WATER FLOW INTO OR OUT OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
3. DO NOT USE THE EXCAVATED MATERIAL AS BACKFILL IF IT CONTAINS WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE. IF ADDITIONAL BACKFILL IS REQUIRED, USE CLEAN MATERIAL FREE OF WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE.
4. PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
5. REPAIR AND MAINTAIN ANY SERVICEABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT LOSS OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, OR WATERWAYS, OR PERMANENT MODIFICATION OF THE 100-YEAR FLOODPLAIN IN EXCESS OF THAT LOST UNDER THE ORIGINALLY AUTHORIZED STRUCTURE OR FILL.
6. RECTIFY ANY NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS OR 100-YEAR FLOODPLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.
7. ALL STABILIZATION IN THE NONTIDAL WETLAND AND NONTIDAL WETLAND BUFFER SHALL CONSIST OF THE FOLLOWING SPECIES:
   ANNUAL RYE GRASS (Lolium multiflorum)
   MILLET (Setaria italica)
   BARLEY (Hordeum sp.)
   OATS (Uniola sp.)
   RYE (Secale cereale)
   THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING FOR THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES. OTHER NON-PERSISTENT VEGETATION MAY BE ACCEPTABLE, BUT MUST BE APPROVED BY THE NONTIDAL WETLANDS AND WATERWAYS DIVISION. KENTUCKY 31 FESCUE SHALL NOT BE UTILIZED IN WETLAND OR BUFFER AREAS. THE AREA SHOULD BE SEEDED AND MULCHED TO REDUCE EROSION AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.
8. AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST-CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
9. TO PROTECT AQUATIC SPECIES, IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM
   USE I AND I-P WATERS: IN STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH JUNE 15, INCLUSIVE, DURING ANY YEAR.
10. STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAY.
11. CULVERTS SHALL BE CONSTRUCTED AND ANY RIPRAP PLACED SO AS NOT TO OBSTRUCT THE MOVEMENT OF AQUATIC SPECIES, UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER.

ENGINEERS CERTIFICATE

"I HEREBY CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION 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.

10/29/10
SIGNATURE OF ENGINEER — DATE
MICHAEL L. TAYLOR JR., P.E.

DEVELOPER'S CERTIFICATE

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

10/29/10
SIGNATURE OF DEVELOPER — DATE

PERMANENT SEEDING NOTES

APPLY TO GRADED OR CLEARED AREAS NOT SUBJECT TO IMMEDIATE FURTHER DISTURBANCE WHERE A PERMANENT LONG-LIVED VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: Loosen upper three inches of soil by raking, discing or other acceptable means before seeding, if not previously loosened.

SOIL AMENDMENTS: In lieu of soil test recommendations, use the following schedule: Apply 2 tons per acre dolomitic limestone(92 lbs/1000 s.f.) And 900 lbs. / acre (20.7 lbs./1000s.f.) of 10-20-20 before seeding. Harrow or disc into upper 3 in. Of soil.
SEEDING: Apply a mixture of Turf Type Tall fescue(80%) and Hard Fescue (20%) in accordance with seeding dates and rates shown in the Permanent Seeding Summary shown on this sheet. For stabilization outside of the seeding dates, apply straw mulch at rates and methods specified below and apply permanent seeding when within proper seeding dates.
MULCHING: Immediately following seeding, apply a uniform 1- 2 in. Deep layer of un-rotted small grain straw at a rate of 2 tons/acre. (Apply 2.5 Tons/acre if a mulch anchoring tool is used).Straw may be anchored with wood cellulose fiber at a rate of 750 lbs. / acre mixed at a ratio of 50 lbs. Of wood fibre/ 100 gal. of water. Synthetic liquid binders such as Terra Tax II, Acrylic DLR (Agro- Tack), DCA-70, Petroset and other approved equals may be used at rates recommended by the manufacturers.

Permanent Seeding Summary

Seed Mixture (Hardiness Zone 7a and 6b) From Table 25					Fertilizer Rate (10-20-20)			Lime Rate
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths	N	P205	K20	
10	Tall Fescue (80%) Hard Fescue (20%)	120 30	3/1-5/15 8/15-11/15	0.5 in.	90lb/ac (2.0lb/ 1000sf)	175lb/ac (4lb/ 1000sf)	175lb/ac (4lb/ 1000sf)	2tons/ac (100lb/ 1000sf)

TEMPORARY SEEDING NOTES

SEEDBED PREPARATION: Loosen upper three inches of soil by raking, discing or other acceptable means before seeding, if not previously loosened.

SOIL AMENDMENTS: In lieu of soil test recommendations, use the following schedule: Apply 2 tons per acre dolomitic limestone(92 lbs/1000 s.f.) And 600 lbs. / acre (15 lbs./1000s.f.) of 10-10-10 before seeding. Harrow or disc into upper 3 in. Of soil.
SEEDING: Apply the Maryland State Highway approved seed mixture of Barley or Rye plus Foxtail Millet in accordance with seeding dates and rates shown in the Temporary Seeding Summary shown on this sheet. For stabilization outside of the seeding dates, apply straw mulch at rates and methods specified below.
MULCHING: Immediately following seeding, apply a uniform 1- 2 in. Deep layer of un-rotted small grain straw at a rate of 2 tons/acre. (Apply 2.5 Tons/acre if a mulch anchoring tool is used).Straw may be anchored with wood cellulose fiber at a rate of 750 lbs. / acre mixed at a ratio of 50 lbs. Of wood fibre/ 100 gal. of water. Synthetic liquid binders such as Terra Tax II, Acrylic DLR (Agro- Tack), DCA-70, Petroset and other approved equals may be used at rates recommended by the manufacturers.

REFER TO THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROLFOR RATE AND METHODS NOT COVERED.

Temporary Seeding Summary

Seed Mixture (Hardiness Zone 6a and 7a) From Table 26					Fertilizer Rate (10-10-10)	Lime Rate
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths		
2	Barley or Rye plus Foxtail Millet	150 lbs (3.5lbs/1000saf)	2/1-11/30 (7a) 3/15-10/31 (6a)	1/4 in-1/2 in	600 lb/ac (15lb/1000sf)	2 tons/ac (100lb/1000sf)

DETAIL 2 - TEMPORARY SWALE

DRAINAGE AREA = 10 ac (MAX)
SLOPE = 10% (MAX)

FLOW CHANNEL STABILIZATION
GRADE 0.5% MIN. 10% MAX.

1. Seed and cover with straw mulch.
2. Seed and cover with Erosion Control Matting or line with sod.
3. 4"–7" stone or recycled concrete equivalent pressed into soil in a minimum 7" layer.

Construction Specifications

1. All temporary swales shall have uninterrupted positive grade to an outlet. Spot elevations may be necessary for grades less than 1%.

2. Runoff diverted from a disturbed area shall be conveyed to a sediment trapping device.

3. Runoff diverted from an undisturbed area shall outlet directly into an undisturbed stabilized area at a non–erosive velocity.

4. All trees, brush, stumps, obstructions, and other objectional material shall be removed and disposed of so as not to interfere with the proper functioning of the swale.

5. The swale shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.

6. Fill, if necessary, shall be compacted by earth moving equipment.

7. All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the swale.

8. Inspection and maintenance must be provided periodically and after each rain event.

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SEQUENCE OF CONSTRUCTION

NOTE: THIS SEQUENCE OF CONSTRUCTION IS FOR THE CONSTRUCTION OF ROADS (INCLUDES PRESTWICK DRIVE, EMERGENCY SERVICE ACCESS DRIVE AND THE SHARED USE-IN-COMMON ACCESS DRIVE FOR LOTS 7-12), STORM DRAINS AND SHARED SEPTIC SYSTEM ONLY. THE LOTS AND GRADING AROUND LOTS ARE FUTURE CONSTRUCTION SHOWN ON PLANS FOR REPRESENTATION ONLY.

1. Obtain Howard County grading permit, MDE Permit for Construction Activity / MDE Wetland & Waterway Permit #201060872 and contact Howard County Sediment Control Inspector (SCI) to arrange a pre-construction meeting. (1 Day)
2. The contractor shall notify the Department of Public Works/Bureau of Engineering/Construction Inspection Division at (410) 313-1880 at least five (5) working days prior to the start of work.
3. The contractor shall notify "Miss Utility" at 1-800-257-7777 at least 48 hours prior to any excavation work being done.
4. Install Stabilized Construction Entrance at Prestwick Drive and Emergency Service Access Driveway (℄ Sta. 13+50±).
5. Clear and grub for and install super silt fence, earth dikes, temporary swales, stone outlet structures, use-in-common access driveway (ultimately to be used for lots 7-12, as shown on sheet 6) and temporary driveway access connection to Naecker Lot 2 (to be used for access during roadway construction, see sheet 7). Stabilize all disturbed areas. (2 weeks)
6. Excavate for and install new bridge subfootings on both sides of the stream (See sheets 14 thru 21 for all bridge construction specifications and details). Note no disturbance shall occur within the stream channel at any time during construction. Upon completion of the bridge sub-footings remove the existing bridge structure and install new precast bridge structures (footers, wingwalls, bridge, etc.). (2 Weeks)
7. With the permission of the sediment control inspector grade roads to subgrade install subbase , storm drain with riprap outfall, erosion control matting, sewer force mains with pumps, flush curb, and shared septic. Install inlet protection around inlet I-1 after construction and stabilize all disturbed areas. Note: Access shall be maintained at all times during construction for the existing dwellings. (4 weeks)
8. Fine grade road as necessary and pave roads. (1 week)
9. With permission of SCI, remove all sediment control measures and apply permanent stabilization to those areas. (5 Days)

SEDIMENT CONTROL NOTES

1. A minimum of 48 hours notice must be given to the Howard County Department of Inspection, License and Permits Sediment Control Division prior to the start of any construction (410-313-1855).

2. All vegetation and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL; and revisions thereto.

3. Following initial soil disturbance or redisturbance, permanent or temporary stabilization shall be completed within: (a) 3 calendar days for all perimeter sediment control structures, dikes, perimeter slopes, and all slopes greater than 3:1, (b) 7 days as to all other disturbed or graded areas on the project site.

4. All sediment traps/basins shown must be fenced and warning signs posted around their perimeter in accordance with Vol. I, Chapter 7, HOWARD COUNTY DESIGN MANUAL, Storm Drainage.

5. All disturbed areas must be stabilized within the time period specified above in accordance with the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seeding, sod, temporary seeding, and mulching (Sec. G). Temporary stabilization with mulch alone shall be done when recommended seeding dates do not allow for proper germination and establishment of grasses.

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 Howard County Sediment Control Inspector.

7. Site Analysis :

Total Area	51.664 Acres +/-
Area Disturbed	5.85 Acres +/-
Area to be roofed or paved	0.90 Acres +/-
Area to be vegetatively stabilized	4.95 Acres +/-
Total Cut	5,000 CY
Total Fill	5,000 CY
Offsite waste/borrow area location	**

8. Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.

9. Additional sediment controls must be provided, if deemed necessary by the Howard County Sediment Control Inspector.

10. On all sites with disturbed areas in excess of 2 acres, approval of the inspection agency shall be requested upon completion of installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading. Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made.

11. Trenches for the construction of utilities is limited to three pipe lengths or that which shall be back-filled and stabilized within one working day, whichever is shorter.

* Earthwork quantities are solely for the purpose of calculating fees. Contractor to verify all quantities prior to the start of construction.

** To be determined by contractor, with pre-approval of the Sediment Control Inspector with an approved and active grading permit.

DETAIL 19 - STONE OUTLET STRUCTURE

Construction Specifications

1. Crushed stone shall be used. Gravel may be used if crushed stone is not available. The stone shall be 2"-3" in size.

2. The crest of the stone dike shall be at least 6" lower than the lowest elevation of the top of the earth dike and shall be level.

3. The stone outlet structure shall be embedded into the soil a minimum of 4".

4. The minimum length of the crest of the stone outlet structure shall be 6'.

5. The stone outlet structure shall be inspected after each rain. Stone shall be replaced when the structure ceases to function and ponding results.

6. The baffle board shall be extended one foot into the dike, staked and embedded 4" into the existing ground.

7. The drainage area to this structure shall be less than ½ acre.

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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. #34689, Expiration Date: 07/08/2011.

DEVELOPER

GREENFIELD HOMES, Inc.
6656 Luster Drive
Highland, Maryland 20777
410.781.6782

"No As-Built information on this sheet"

OWNER/
(NAECKER PROPERTY
Plat #7288 Lot 4)
Robert L. Naecker
12740 Route 108
ClarksVille MD 21029-1531
443.864.6445

OWNER/
(NAECKER PROPERTY
Plat #20373-20375 Lot6)
GREENFIELD HOMES, Inc.
6656 Luster Drive
Highland, Maryland 20777
410.781.6782

SEDIMENT & EROSION CONTROL DETAILS

WILLOW POND

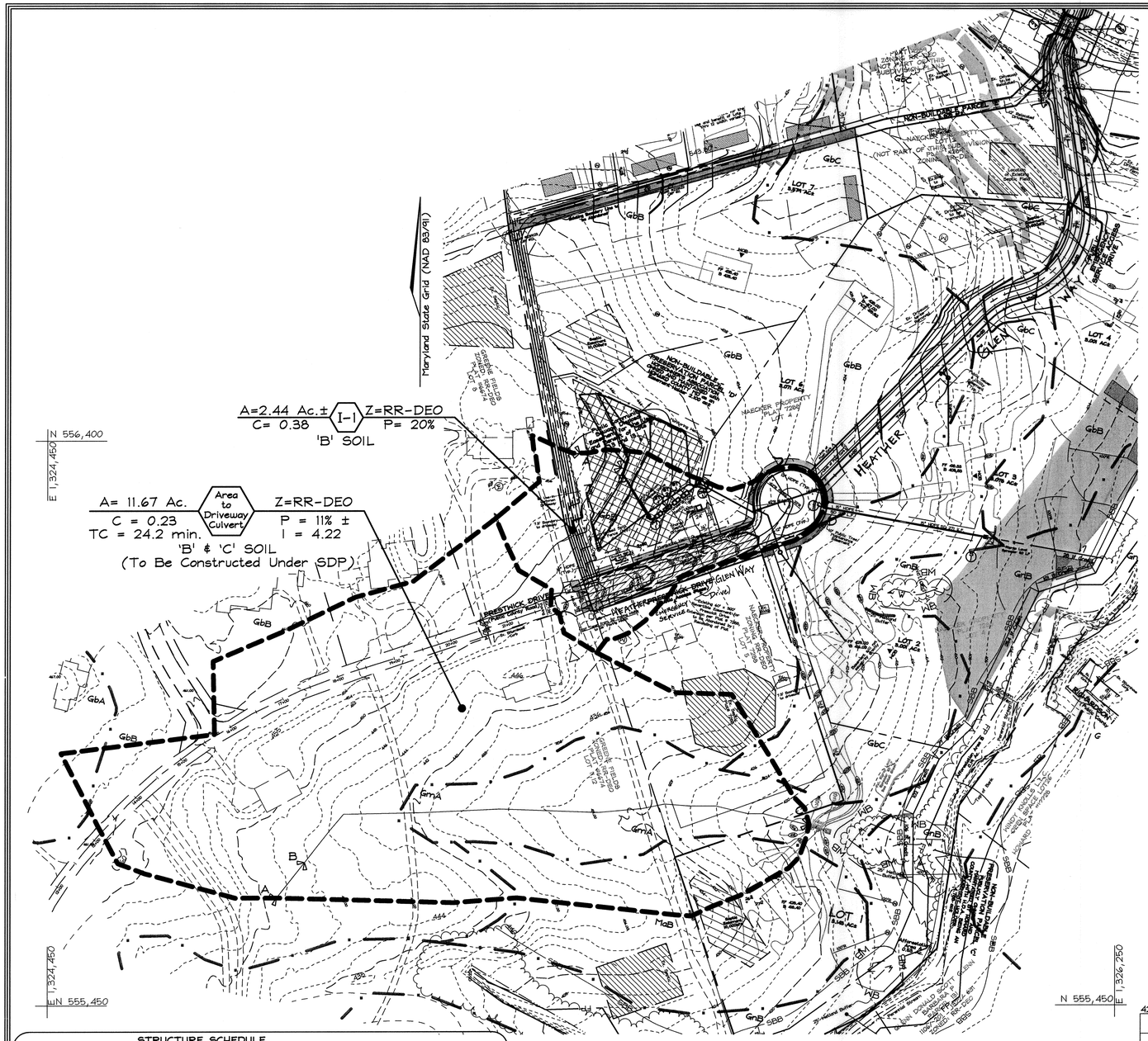
LOTS 1-13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B ', 'C', 'D' & NON-BUILDABLE PARCEL 'E' A RESUBDIVISION OF NAECKER PROPERTY LOT 4, PLAT NO. 7288 AND LOT 6, PLAT NO. 20373-20375

TAX MAP 34 GRID 17 — PARCEL 382
FIFTH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY: MT
DRAWN BY: CW
CHECKED BY: ZYF, MLT
SCALE: Not to Scale
DATE: Oct. 29, 2010
W.O. No.: 3199
SHEET No. 8 OF 22

F-10-106



PLAN VIEW

SCALE: 1"=100'

STRUCTURE SCHEDULE

NO.	TYPE	LOCATION	TOP ELEV.	INV. IN	INV. OUT	REMARKS
I-1	Precast Open End Grate	Prestwick Drive L.P. Sta. 1+42.40, @ ℄ Ditch (57.6' RT)	424.50	----	421.17	S.D. 4.36
S-1	HDPE End Section	N 556,238.75, E 1,326,025.98	----	406.13	406.03	15" HDPE End Section
Fut.S-2*	HDPE or Metal End Section	N 555,753.29, E 1,325,733.74	----	415.00	414.80	18" HDPE or Metal End Section Culvert to be Constructed Under SDP for Lot 1
Fut.S-3*	HDPE or Metal End Section	N 555,744.94, E 1,325,759.44	----	414.80	414.78	18" HDPE or Metal End Section Culvert to be Constructed Under SDP for Lot 1
S-4**	CONSPAN Concrete Bridge	N 557,102.31, E 1,326,156.644	----	N/A*	N/A*	See bridge construction plan sheets 14-21
S-5**	CONSPAN Concrete Bridge	N 557,091.35, E 1,326,181.32	----	N/A*	N/A*	See bridge construction plan sheets 14-21

NOTES:
1. Location of the Precast Open End Grate Inlet is to the Center Line of Open Roadway Ditch. The top elevation corresponds to the throat opening (not the grate elevation).
2. The End Sections location correspond to the centerline point were the end section meets the incoming pipe.
*Private, To be Constructed under SDP for Lot 1.
**The Bridge is a Bottomless Concrete Span Structure.

APPROVED: DEPARTMENT OF PUBLIC WORKS

Wilt R. Whall 11-17-10

CHIEF, BUREAU OF HIGHWAYS MB DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Kent Sheubrooks 11/19/10

CHIEF, DIVISION OF LAND DEVELOPMENT DATE

11/18/10

CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

PIPE SCHEDULE

SIZE	TYPE	LENGTH
15"	HDPE	271 LF
Fut.18"*	HDPE	27 LF

*Private, Not Constructed under this Contract, To be Constructed under SDP for Lot 1.

SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	SOIL GROUP
BaA	Baile silt loam, 0 to 3 percent slopes	D
Co	Codorus and Hatboro silt loams, 0 to 3 percent slopes	C
GbA	Gladstone loam, 0 to 3 percent slopes	B
GbB	Gladstone loam, 3 to 8 percent slopes	B
GbC	Gladstone loam, 8 to 15 percent slopes	B
GgA	Glenelg loam, 0 to 3 percent slopes	B
GgB	Glenelg loam, 3 to 8 percent slopes	B
GgC	Glenelg loam, 8 to 15 percent slopes	B
GmA	Glenville silt loam, 0 to 3 percent slopes	C
GmB	Glenville silt loam, 3 to 8 percent slopes	C
GnB	Glenville-Baile silt loams, 0 to 8 percent slopes	C
MaB	Manor loam, 3 to 8 percent slopes	B
MaC	Manor loam, 8 to 15 percent slopes	B

See Howard County Standard detail SD 4.36 for more information

Detail Inlet I-1

No Scale

LEGEND

Drainage Area Line	▬ ▬ ▬
Soils Line	▬ · ▬
'B' Soil	☐
'C' Soil	▨
Time of Concentration Line	A → B → C

SCOUR HOLE DIMENSION TABLE

OUTFALL	DIMENSIONS						PIPE SIZE
	A	B	C	D	E	F	
S-1	7.5'	3.75'	1.88'	2.5'	6.25'	0.63'	15" HDPE
*FUT. S-3	9'	4.5'	2.25'	3.0'	7.50'	0.75'	18" HDPE

* Private, for Lot 1 Driveway.

RIPRAP LEVEL SPREADER SECTION

LEVEL SPREADER PLAN VIEW

LEVEL SPREADER DETAILS

NOT TO SCALE
See plan for level spreader lengths

SECTION 'A'-'A'

NOT TO SCALE

SECTION 'B'-'B'

NOT TO SCALE

TYPICAL SCOUR HOLE OUTFALL DETAIL

NOT TO SCALE

STORM DRAIN PROFILE

Scale: Hor.: 1"=50'
Vert.: 1"=5'

FUTURE LOT 1 DRIVEWAY CULVERT PROFILE

NOTE: Not to be Constructed, Shown for Design and Informational Purposes Only, to be Constructed under Plot Plan for Lot 1.
Scale: Hor.: 1"=30'
Vert.: 1"=3'

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. #34689, Expiration Date: 07/08/2011.

OWNER/
(NAECKER PROPERTY
Plat #7288 Lot 4)

Robert L. Naecker
12740 Route 108
ClarksVille MD 21029-1531
443.864.6445

OWNER/
(NAECKER PROPERTY
Plat #20373-20375 Lot6)

GREENFIELD HOMES, Inc.
6656 Luster Drive
Highland, Maryland 20777
410.781.6782

DEVELOPER

GREENFIELD HOMES, Inc.
6656 Luster Drive
Highland, Maryland 20777
410.781.6782

AS-BUILT
CERTIFICATION
I hereby certify, by my seal, that the roads and storm drains shown on this plan were constructed as shown on this "As-Built" plan and meet the Approved Plans and Specifications.

CLYDE BROOKE MILLER
135

11/3/15
C. BROOKE MILLER
PROP. L.S. # 135
DATE

STORM DRAIN AND LOT 1 DRIVEWAY CULVERT
DRAINAGE AREA MAP
WILLOW POND

LOTS 1-13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D' & NON-BUILDABLE PARCEL 'E'
A RESUBDIVISION OF NAECKER PROPERTY LOT 4, PLAT NO. 7288 AND LOT 6, PLAT NO. 20373-20375

TAX MAP 34 GRID 17
FIFTH ELECTION DISTRICT

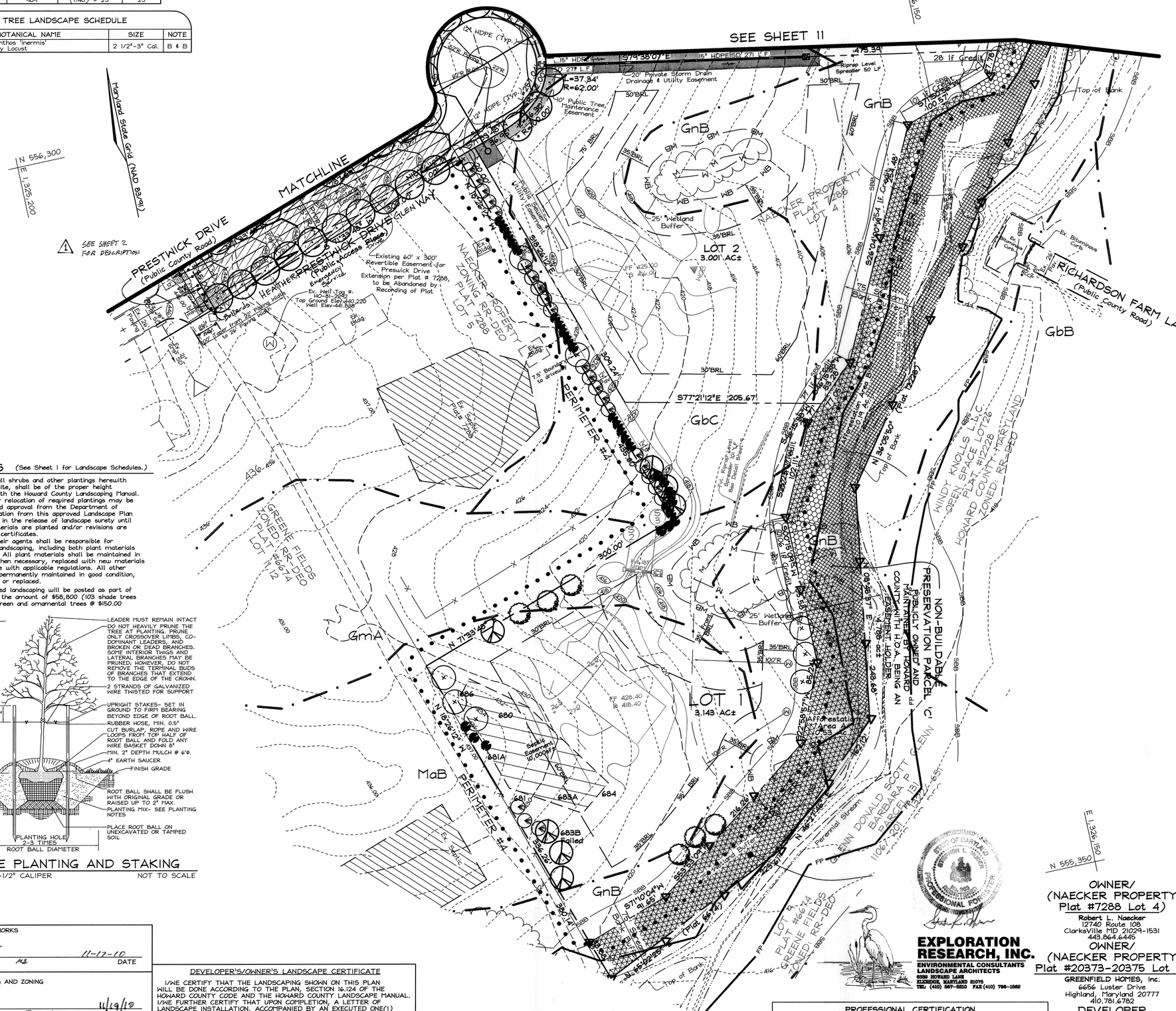
PARCEL 382
HOWARD COUNTY, MARYLAND

MICHAEL LEE TAYLOR
No. 34689

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY: MLT
DRAWN BY: AY
CHECKED BY: ZYF, MLT
SCALE: As Shown
DATE: Oct. 29, 2010
W.O. No.: 3199
SHEET No. 9 OF 22

F-10-106



STREET TREE SCHEDULE

STREET NAME	LF REQUIRED	TREES REQUIRED	PROVIDED
PRESTWICK DRIVE	989'	(1:40) = 25	25

STREET TREE LANDSCAPE SCHEDULE

KEY	QUAN.	BOTANICAL NAME	SIZE	NOTE
⊙	25	Gleditsia triacanthos 'inermis' Thornless Honey Locust	2 1/2"-3" Cal.	B & B

LANDSCAPE NOTES (See Sheet 1 for Landscape Schedules.)

1. At the time of installment, all shrubs and other plantings herewith listed and approved for this site, shall be of the proper height requirements in accordance with the Howard County Landscaping Manual. In addition, no substitutions or relocation of required plantings may be made without prior review and approval from the Department of Planning and Zoning. Any deviation from this approved Landscape Plan may result in denial or delay in the release of landscape surety until such time as all required materials are planted and/or revisions are made to applicable plans and certificates.
2. The owner, tenant, and/or their agents shall be responsible for maintenance of the required landscaping, including both plant materials and berms, fences and walls. All plant materials shall be maintained in good growing condition, and when necessary, replaced with new materials to ensure continued compliance with applicable regulations. All other required landscaping shall be permanently maintained in good condition, and when necessary, repaired or replaced.
3. Financial surety for the required landscaping will be posted as part of the Developer's Agreement in the amount of $58,800 (103 shade trees @ $300.00 each and 186 evergreen and ornamental trees @ $150.00 each).

NOTES

1. CONSULT INTERNATIONAL SOCIETY OF ARBORICULTURE GUIDELINES FOR FURTHER DETAILS OF PLANTING SPECIFICATIONS, OR CONSULT WITH A QUALIFIED PROFESSIONAL.
2. EACH TREE SHALL BE PLANTED SUCH THAT THE TRUNK FLARE IS VISIBLE AT THE TOP OF THE ROOT BALL.
3. STAKES SHALL BE REMOVED NO LATER THAN THE END OF THE FIRST GROWING SEASON AFTER PLANTING.
4. PLACE UPRIGHT STAKES PARALLEL TO WALKS & BUILDINGS.
5. KEEP MULCH 1" FROM TRUNK
6. SEE ARCHITECTURAL PLANS FOR ADDITIONAL PLANTINGS WHICH EXCEED HOWARD COUNTY MINIMUM REQUIREMENTS.
7. TREES ARE NOT TO BE PLANTED OVER PRIVATE SEWAGE EASEMENT.

LEADER MUST REMAIN INTACT

DO NOT HEAVILY PRUNE THE TREE AT PLANTING. PRUNE ONLY CROSSOVER LIMBS, CO-DOMINANT LEADERS, AND BROKEN OR DEAD BRANCHES. SOME INTERIOR TWIGS AND LATERAL BRANCHES MAY BE PRUNED; HOWEVER, DO NOT REMOVE THE TERMINAL BUDS OF BRANCHES THAT EXTEND TO THE EDGE OF THE CROWN.

2 STRANDS OF GALVANIZED WIRE TWISTED FOR SUPPORT

UPRIGHT STAKES- SET IN GROUND TO FIRM BEARING BEYOND EDGE OF ROOT BALL.

RUBBER HOSE, MIN. 0.5"

CUT BURLAP, ROPE AND WIRE LOOPS FROM TOP HALF OF ROOT BALL AND FOLD ANY WIRE BASKET DOWN 8"

MIN. 2" DEPTH MULCH @ 6'φ.

4" EARTH SAUCER

FINISH GRADE

ROOT BALL SHALL BE FLUSH WITH ORIGINAL GRADE OR RAISED UP TO 2" MAX.

PLANTING MIX- SEE PLANTING NOTES

PLACE ROOT BALL ON UNEXCAVATED OR TAMPED SOIL

TYPICAL TREE PLANTING AND STAKING

DECIDUOUS TREES UP TO 2-1/2" CALIPER — NOT TO SCALE

LEGEND

Existing Contour	- - - - - - - - 382
Existing Spot Elevation	382.3
Existing Trees	☁
15% - 25% slopes	▒
25% or greater slopes	▩
Existing Septic Easement	▨
Existing Well	Ⓦ
Stream Centerline	— · · — · · —
Stream Bank Buffer	—— SBB ——
Wetland	—W——W—
Wetland Buffer	—WB——WB—
Floodplain	—— FP ——
Soil Boundary	▬ · ▬
Soil Label	Ba
FCE Signage	△
Tree Protection Fence	—— TPF ——
Forest Conservation Easement Retention Area	⬡
Forest Conservation Easement Non-Credited Floodplain Retention Area	▩
Forest Conservation Easement Afforestation Area	▨
Street Tree	⊙

SIGN DETAIL: PERMANENT SIGN

SIGNAGE NOTE: ALL TREE PROTECTION SIGNS SHALL BE PLACED ON METAL 'T' POSTS OR PRESSURE TREATED WOOD POLES. NO ATTACHMENT OF SIGNS TO TREES IS PERMITTED.

TWO STRAND SMOOTH WIRE

NOTES:
1. FOREST PROTECTION DEVICE ONLY.
2. RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
3. BOUNDARIES OF RETENTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICE.
4. ROOT DAMAGE SHOULD BE AVOIDED.
5. PROTECTIVE SIGNAGE MAY ALSO BE USED.
6. DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.

TREE PROTECTION DETAIL

NOT TO SCALE

"No As-Built information on this sheet"

APPROVED: DEPARTMENT OF PUBLIC WORKS

11-12-10
CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Kent Sheubrooks 11/19/10
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

11/18/10
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

DEVELOPER'S/OWNER'S LANDSCAPE CERTIFICATE

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION, A LETTER OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE(1) YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

Wayne m. 10/28/10
SIGNATURE OF DEVELOPER — DATE

State of Maryland Stephen L. Huber Registered Professional Forester No. 383

EXPLORATION RESEARCH, INC.
ENVIRONMENTAL CONSULTANTS
LANDSCAPE ARCHITECTS
6339 HOWARD LANE
ELKRIDGE, MARYLAND 21075
TEL: (410) 567-5210 FAX:(410) 796-1562

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. #34689, Expiration Date: 07/08/2011.

OWNER/
(NAECKER PROPERTY
Plat #7288 Lot 4)
Robert L. Naecker
12740 Route 108
ClarksVille MD 21029-1531
443.864.6445

OWNER/
(NAECKER PROPERTY
Plat #20373-20375 Lot 6)
GREENFIELD HOMES, Inc.
6656 Luster Drive
Highland, Maryland 20777
410.781.6782

DEVELOPER
GREENFIELD HOMES, Inc.
6656 Luster Drive
Highland, Maryland 20777
410.781.6782

FOREST CONSERVATION, LANDSCAPING & STREET TREE PLAN
WILLOW POND

LOTS 1-13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D' & NON-BUILDABLE PARCEL 'E'
A RESUBDIVISION OF NAECKER PROPERTY LOT 4, PLAT NO. 7288 AND LOT 6, PLAT NO. 20373-20375

TAX MAP 34 GRID 17 — PARCEL 382
FIFTH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

State of Maryland Michele Lee Taylor No. 34689 Professional Engineer

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY: MT
DRAWN BY: AY/SMM
CHECKED BY: ZYF, MLT
SCALE: 1"=50'
DATE: Oct. 29, 2010
W.O. No.: 3199
SHEET No. 10 OF 22

F-10-106

LEGEND

Existing Contour	----------382
Existing Spot Elevation	382.3
Existing Trees	
15% - 25% slopes	▨
25% or greater slopes	▨
Existing Septic Easement	▨
Existing Well	Ⓦ
Stream Centerline	— · · — · · —
Stream Bank Buffer	—— SBB ——
Wetland	—W——W—
Wetland Buffer	—WB——WB—
Floodplain	—— FP ——
Soil Boundary	━━ · ━━
Soil Label	Ba
FCE Signage	△
Tree Protection Fence	—— TPF ——
Forest Conservation Easement Retention Area	▨
Forest Conservation Easement Non-Credited Floodplain Retention Area	▨
Forest Conservation Easement Afforestation Area	▨

SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	SOIL GROUP
Ba	Baile silt loam	D
CgB2	Chester gravelly silt loam, 3 to 8 percent slopes, moderately eroded	B
CgC2	Chester gravelly silt loam, 8 to 15 percent slopes, moderately eroded	B
ChA	Chester silt loam, 0 to 3 percent slopes	B
ChB2	Chester silt loam, 3 to 8 percent slopes, moderately eroded	B
Cs	Comus silt loam	B
GlB2	Glenelg loam, 3 to 8 percent slopes, moderately eroded	B
GlC2	Glenelg loam, 8 to 15 percent slopes, moderately eroded	B
GnA	Glenville silt loam, 0 to 3 percent slopes	C
Ha	Hatboro silt loam	D
MgB2	Manor gravely loam, 3 to 8 percent slopes, moderately eroded	B
MgC2	Manor gravely loam, 8 to 15 percent slopes, moderately eroded	B
MlA	Manor loam, 0 to 3 percent slopes	C
MlD2	Manor loam, 15 to 25 percent slopes, moderately eroded	B
MlD3	Manor loam, 15 to 25 percent slopes, severely eroded	B

APPROVED: DEPARTMENT OF PUBLIC WORKS

11-17-10
CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Kent Sheubrooks 11/19/10
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

11/18/10
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

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No. 383

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(NAECKER PROPERTY
Plat #7288 Lot 4)
Robert L. Naecker
12740 Route 108
ClarksVille MD 21029-1531
443.864.6445

OWNER/
(NAECKER PROPERTY
Plat #20373-20375 Lot 6)
GREENFIELD HOMES, Inc.
6656 Luster Drive
Highland, Maryland 20777
410.781.6782

DEVELOPER
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Highland, Maryland 20777
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"No As-Built information on this sheet"

FOREST CONSERVATION, LANDSCAPING & STREET TREE PLAN
WILLOW POND

LOTS 1-13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D' & NON-BUILDABLE PARCEL 'E'
A RESUBDIVISION OF NAECKER PROPERTY LOT 4, PLAT NO. 7288 AND LOT 6, PLAT NO. 20373-20375

TAX MAP 34 GRID 17 — PARCEL 382
FIFTH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

No. 34689

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY:	MT
DRAWN BY:	AY/SMM
CHECKED BY:	ZYF, MLT
SCALE:	1"=50'
DATE:	Oct. 29, 2010
W.O. No.:	3199
SHEET No.	11 OF 22

F-10-106

LEGEND

FCE Signage	△
Tree Protection Fence	—TPF—
Forest Conservation Easement Retention Area	▨
Forest Conservation Easement Non-Credited Floodplain Retention Area	▨
Forest Conservation Easement Afforestation Area	▨

* See Sheet 8 or 9 for remainder of legend.

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6656 Luster Drive
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410.781.6782

"No As-Built
INFORMATION
ON THIS SHEET"

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GREENFIELD HOMES, Inc.
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Highland, Maryland 20777
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APPROVED: DEPARTMENT OF PUBLIC WORKS

11-17-10
CHIEF, BUREAU OF HIGHWAYS HS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Kent Sheubrooks 11/19/10
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

11/18/10
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

FOREST CONSERVATION, LANDSCAPING & STREET TREE PLAN
WILLOW POND

LOTS 1-13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D' & NON-BUILDABLE PARCEL 'E'
A RESUBDIVISION OF NAECKER PROPERTY LOT 4, PLAT NO. 7288 AND LOT 6, PLAT NO. 20373-20375

TAX MAP 34 GRID 17
FIFTH ELECTION DISTRICT
PARCEL 382
HOWARD COUNTY, MARYLAND

No. 34689

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DESIGN BY: MT
DRAWN BY: AY/SMM
CHECKED BY: ZYF, MLT
SCALE: 1"=50'
DATE: Oct. 29, 2010
W.O. No.: 3199
SHEET No. 12 OF 22

FOREST CONSERVATION WORKSHEET

	Acres
Net Tract Area	
A. Total Tract Area	51.67
B. Area Within 100 Year Floodplain	0.34#
C. Other deductions	19.30##
D. Net Tract Area	32.03
Zoning Use Category: RESIDENTIAL-SUBURBAN	
Land Use Category	
E. Afforestation Minimum (20 % x D)	6.41
F. Conservation Threshold (25 % x D)	8.01
Existing Forest Cover	
G. Existing Forest on Net Tract Area	0.15
H. Forest Area Above Conservation Threshold	0
Breakeven Point	
I. Forest Retention Above Threshold with no Mitigation	8.01
J. Clearing Permitted without Mitigation	0
Proposed Forest Clearing	
K. Forest Areas to be Cleared	0.15
L. Forest Areas to be Retained	0
Planting Requirements	
M. Reforestation for Clearing Above Threshold	0
N. Reforestation for Clearing Below the Threshold	0.30
P. Credit for Retention Above Conservation Threshold	0
Q. Total Reforestation Required	0.30
R. Total Afforestation Required	6.56
S. Total Reforestation and Afforestation Requirement	6.86

* The majority of floodplain area was deducted as part of the exclusion of Preservation Parcels A, B and C per Rural Cluster rules. This figure represents the remainder of the floodplain on-site.
** Exclusion of Parcels A, B and C.

FOREST CONSERVATION NARRATIVE

This Forest Conservation Plan has been developed in accordance with the Howard County Forest Conservation Act of 1991 and utilizes the guidelines for "Rural Cluster Option C" as outlined in Appendix L of the Forest Conservation Manual.

The total tract area consists of 51.67 acres of land. The Preservation Parcels on the site are handled in the following ways: Preservation Parcels A, B and C are netted out of the tract acreage because there is no change of use on those parcels, and Parcel D is included in the net tract because it is less than 3 acres in size. The area of floodplain on site, above what was netted out with Parcels A and B is 0.34 acres. There are 0.15 acres of forest within the net tract area and no specimen trees. The net tract is 32.03 acres.

The total 6.86 acre forest conservation obligation for the site is for 0.3 acres of reforestation and 6.56 acres of afforestation. Planting requirements will be met entirely on-site in three easements. The three easements are partly on parcels netted out of the Net Tract area, therefore any retention is considered to be "offsite" and given half credit. The three easements will enhance existing nearby wooded and forest areas on surrounding properties to enhance forest diversity and wildlife habitat corridors and add forest in priority areas (floodplain, wetlands, streams and their buffers). The easements contain some areas of non-credited floodplain planting retention, as delineated in the chart below. Total easement area is 9.42 acres.

The total forest conservation obligation met on this site is 6.88 acres (6.66 afforestation + half of the 0.44 offsite acreage retained). The total acreage to be bonded is 7.10 acres (6.66 afforestation + 0.44 retention), with a total forest conservation surety amount of $148,889.00 (retention of 0.44 Ac/19,166 sf x 0.20/sf = $3,833.20) + (afforestation planting of 6.66 Ac./290,110 sf X $ 0.50/sf = $145,055.00).

FOREST CONSERVATION EASEMENT TABLE

EASEMENT	TYPE	AREA (AC.)
1	Afforestation	1.27
	Retention	0.28
	Floodplain Retention	1.02
2	Afforestation	1.37
	Retention	0.13
	Floodplain Retention	0.20
3	Afforestation	4.02
	Retention	0.03
	Floodplain Retention	1.10
TOTALS	Afforestation	6.66
	Retention (1/2 credit)	0.44(0.22)
	Floodplain Retention-(Not for credit)	2.32
	Total Easement Area	9.42

The forest conservation easements have been established to fulfill the requirements of Section 16.1200 of the Howard County Code and the Forest Conservation Manual. No clearing, grading or construction is permitted within the forest conservation easements, however, forest management practices as defined in the Deed of Forest Conservation Easement are allowed.

EASEMENT #1 - AFFORESTATION AREA A : 23,087 Sq. ft. (0.53 Ac)

23,087 Sq. ft. (350 TPA) 2'-3' Whip planting
0.53 acre x 350 TPA = 186 trees required

Qty	Botanical Name	Common Name	Min. Size	Spacing	Notes
20	Acer rubrum	Red Maple	WHIP 2-3'	11' o.c.	1-3 Gallon Container Grown with Tree Shelters
20	Acer negundo	Boxelder	WHIP 2-3'	11' o.c.	
20	Amelanchier arborea	Shadbush	WHIP 2-3'	11' o.c.	
21	Carpinus carolina	American Hornbeam	WHIP 2-3'	11' o.c.	
21	Liriodendron tulipifera	Tulip Poplar	WHIP 2-3'	11' o.c.	
21	Prunus serotina	Black Cherry	WHIP 2-3'	11' o.c.	
21	Quercus alba	White Oak	WHIP 2-3'	11' o.c.	
21	Quercus phellos	Willow Oak	WHIP 2-3'	11' o.c.	
21	Sassafras albidum	Sassafras	WHIP 2-3'	11' o.c.	

EASEMENT #1 - AFFORESTATION AREA B : 8,276 Sq. ft. (0.19 Ac)

8,276 Sq. ft. (350 TPA) 2'-3' Whip planting
0.19 acre x 350 TPA = 67 trees required

Qty	Botanical Name	Common Name	Min. Size	Spacing	Notes
7	Acer rubrum	Red Maple	WHIP 2-3'	11' o.c.	1-3 Gallon Container Grown with Tree Shelters
7	Acer negundo	Boxelder	WHIP 2-3'	11' o.c.	
7	Amelanchier arborea	Shadbush	WHIP 2-3'	11' o.c.	
7	Carpinus carolina	American Hornbeam	WHIP 2-3'	11' o.c.	
7	Liriodendron tulipifera	Tulip Poplar	WHIP 2-3'	11' o.c.	
8	Prunus serotina	Black Cherry	WHIP 2-3'	11' o.c.	
8	Quercus alba	White Oak	WHIP 2-3'	11' o.c.	
8	Quercus phellos	Willow Oak	WHIP 2-3'	11' o.c.	
8	Sassafras albidum	Sassafras	WHIP 2-3'	11' o.c.	

EASEMENT #1 - AFFORESTATION AREA C : 23,958 Sq. ft. (0.55 Ac)

23,958 Sq. ft. (350 TPA) 2'-3' Whip planting
0.55 acre x 350 TPA = 193 trees required

Qty	Botanical Name	Common Name	Min. Size	Spacing	Notes
21	Acer rubrum	Red Maple	WHIP 2-3'	11' o.c.	1-3 Gallon Container Grown with Tree Shelters
21	Acer negundo	Boxelder	WHIP 2-3'	11' o.c.	
21	Amelanchier arborea	Shadbush	WHIP 2-3'	11' o.c.	
21	Carpinus carolina	American Hornbeam	WHIP 2-3'	11' o.c.	
21	Liriodendron tulipifera	Tulip Poplar	WHIP 2-3'	11' o.c.	
22	Prunus serotina	Black Cherry	WHIP 2-3'	11' o.c.	
22	Quercus alba	White Oak	WHIP 2-3'	11' o.c.	
22	Quercus phellos	Willow Oak	WHIP 2-3'	11' o.c.	
22	Sassafras albidum	Sassafras	WHIP 2-3'	11' o.c.	

EASEMENT #2 - AFFORESTATION AREA D : 14,375 Sq. ft. (0.33 Ac)

14,375 Sq. ft. (350 TPA) 2'-3' Whip planting
0.33 acre x 350 TPA = 116 trees required

Qty	Botanical Name	Common Name	Min. Size	Spacing	Notes
12	Acer rubrum	Red Maple	WHIP 2-3'	11' o.c.	1-3 Gallon Container Grown with Tree Shelters
13	Acer negundo	Boxelder	WHIP 2-3'	11' o.c.	
13	Amelanchier arborea	Shadbush	WHIP 2-3'	11' o.c.	
13	Carpinus carolina	American Hornbeam	WHIP 2-3'	11' o.c.	
13	Liriodendron tulipifera	Tulip Poplar	WHIP 2-3'	11' o.c.	
13	Prunus serotina	Black Cherry	WHIP 2-3'	11' o.c.	
13	Quercus alba	White Oak	WHIP 2-3'	11' o.c.	
13	Quercus phellos	Willow Oak	WHIP 2-3'	11' o.c.	
13	Sassafras albidum	Sassafras	WHIP 2-3'	11' o.c.	

EASEMENT #2 - AFFORESTATION AREA E : 45,295 Sq. ft. (1.04 Ac)

50,530 Sq. ft. (350 TPA) 2'-3' Whip planting
1.04 acre x 350 TPA = 364 trees required

Qty	Botanical Name	Common Name	Min. Size	Spacing	Notes
40	Acer rubrum	Red Maple	WHIP 2-3'	11' o.c.	1-3 Gallon Container Grown with Tree Shelters
44	Acer negundo	Boxelder	WHIP 2-3'	11' o.c.	
40	Amelanchier arborea	Shadbush	WHIP 2-3'	11' o.c.	
40	Carpinus carolina	American Hornbeam	WHIP 2-3'	11' o.c.	
40	Liriodendron tulipifera	Tulip Poplar	WHIP 2-3'	11' o.c.	
40	Prunus serotina	Black Cherry	WHIP 2-3'	11' o.c.	
40	Quercus alba	White Oak	WHIP 2-3'	11' o.c.	
40	Quercus phellos	Willow Oak	WHIP 2-3'	11' o.c.	
40	Sassafras albidum	Sassafras	WHIP 2-3'	11' o.c.	

EASEMENT #3 - AFFORESTATION AREA F : 89,298 Sq. ft. (2.05 Ac)

89,298 Sq. ft. (350 TPA) 2'-3' Whip planting
2.05 acre x 350 TPA = 718 trees required

Qty	Botanical Name	Common Name	Min. Size	Spacing	Notes
80	Acer rubrum	Red Maple	WHIP 2-3'	11' o.c.	1-3 Gallon Container Grown with Tree Shelters
80	Acer negundo	Boxelder	WHIP 2-3'	11' o.c.	
80	Amelanchier arborea	Shadbush	WHIP 2-3'	11' o.c.	
80	Carpinus carolina	American Hornbeam	WHIP 2-3'	11' o.c.	
80	Liriodendron tulipifera	Tulip Poplar	WHIP 2-3'	11' o.c.	
80	Prunus serotina	Black Cherry	WHIP 2-3'	11' o.c.	
80	Quercus alba	White Oak	WHIP 2-3'	11' o.c.	
79	Quercus phellos	Willow Oak	WHIP 2-3'	11' o.c.	
79	Sassafras albidum	Sassafras	WHIP 2-3'	11' o.c.	

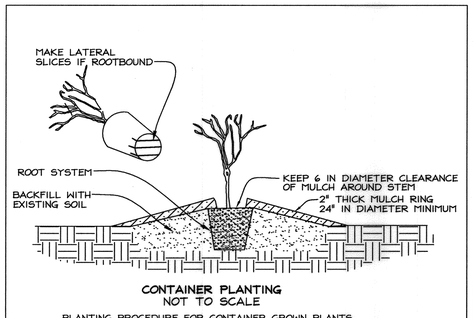
EASEMENT #3 - AFFORESTATION AREA G : 85,813 Sq. ft. (1.97 Ac)

85,813 Sq. ft. (350 TPA) 2'-3' Whip planting
1.95 acre x 350 TPA = 683 trees required

Qty	Botanical Name	Common Name	Min. Size	Spacing	Notes
77	Acer rubrum	Red Maple	WHIP 2-3'	11' o.c.	1-3 Gallon Container Grown with Tree Shelters
77	Acer negundo	Boxelder	WHIP 2-3'	11' o.c.	
77	Amelanchier arborea	Shadbush	WHIP 2-3'	11' o.c.	
77	Carpinus carolina	American Hornbeam	WHIP 2-3'	11' o.c.	
77	Liriodendron tulipifera	Tulip Poplar	WHIP 2-3'	11' o.c.	
77	Prunus serotina	Black Cherry	WHIP 2-3'	11' o.c.	
76	Quercus alba	White Oak	WHIP 2-3'	11' o.c.	
76	Quercus phellos	Willow Oak	WHIP 2-3'	11' o.c.	
76	Sassafras albidum	Sassafras	WHIP 2-3'	11' o.c.	

Management Notes for Forest Retention Areas

1. All proposed activities shall adhere to the conditions, schedules and terms of an approved sediment control and erosion plan.
2. After the boundaries of the retention area have been staked and flagged and before any disturbance has taken place on-site, a preconstruction meeting at the construction site shall take place. The developer, contractor or project manager, and appropriate County inspectors shall attend.
3. Tree protection for all retained areas:
   a. All retention areas within 50 feet of proposed construction activities shall be protected by highly visible, well anchored temporary protection devices (silt fence or blaze orange plastic mesh).
   b. All protection devices shall be in place prior to any grading or land clearing.
   c. All protection devices shall be properly maintained and shall remain in place until construction has ceased.
   d. Attachment of signs, fencing or other objects to trees is prohibited.
   e. No equipment, machinery, vehicles, materials or excessive pedestrian traffic shall be allowed within protected areas.
4. If the critical root zone (see detail) is affected by construction activities such as grade change, digging for foundations and roads or utility installation:
   a. Prune roots with a clean cut using proper pruning equipment (see root pruning detail)
   b. Water and fertilize as needed.
5. During construction phase, monitor and correct condition of retained trees for: soil compaction, root injury, flood conditions, drought conditions and other stress signs.
6. Post-Construction Phase
   a. Inspect existing trees around the perimeter of disturbed limits for evidence of soil compaction, root injury, limb injury, or other stress signs and correct with proper management techniques such as root or limb pruning, soil aeration, fertilization, crown reduction or watering. Inspection and evaluation shall be performed by a licensed arborist.
   b. Inspect for dead or dying trees or limbs which may pose safety hazard and remove.
   c. No burial of discarded materials will occur onsite within the conservation areas.
   d. No burning within 100 feet of wooded area.
   e. All temporary forest protection structures will be removed after construction. Temporary signage shall be replaced with permanent signage on posts in locations shown.
   f. Following completion of construction, prior to use, the County inspector shall inspect the entire area.

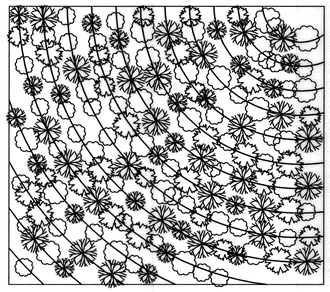


CONTAINER PLANTING
NOT TO SCALE

PLANTING PROCEDURE FOR CONTAINER GROWN PLANTS

1. REMOVE THE PLANT EITHER BY CUTTING OR INVERTING THE CONTAINER
2. USE A KNIFE TO CUT THROUGH BOTTOM HALF OF THE ROOT BALL.
3. PLANT SHRUBS ON FORMED UP MOUNDS 4" ABOVE THE EXISTING GRADE WHEN HIGH WATER TABLE CONDITIONS EXIST, OTHERWISE PLANT FLUSH WITH EXISTING GRADE.
4. PLANTING HOLE TO BE 2-3 TIMES THE DIAMETER OF THE CONTAINER.
5. INSERT FERTILIZER TABLET, BACKFILL 2/3 OF THE ROOT BALL AND WATER.
6. AFTER WATER PERCOLATES, BACKFILL HOLE TO TOP OF ROOT BALL AND GENTLY TAMP SOIL TO FIRM CONTACT WITH PLANT.
7. APPLY MULCH RING AROUND PLANT KEEPING A 6 IN CLEARANCE FROM STEM.

CURVILINEAR RANDOMIZED PLANTING



PLANT PLACEMENT DETAIL
NOT TO SCALE

1. MIX TREE AND SHRUB SPECIES IN THE STAGING AREA.
2. SET THE GUIDE CURVILINEAR LINE AS CLOSE TO CONTOUR AS POSSIBLE

Planting Area Monitoring Notes

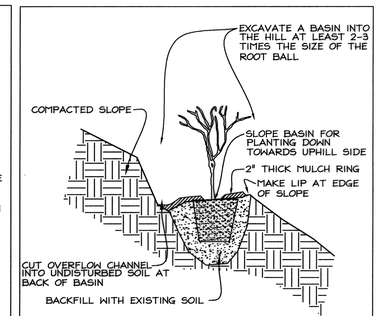
1. Monthly visits during the first growing season are to assess the success of the plantings and to determine if supplemental watering, pest control, invasive plant control, mowing, deer protection or other actions are necessary. Early spring visits will document winter kill and autumn visits will document summer kill.
2. The minimum survival rate shall be 75% of the total number of trees planted per acre at the end of the two year maintenance period. Wild tree seedlings from natural regeneration on the planting site may be counted up to 50% toward the total survival number if they are healthy native species at least 12 inches tall.
3. Survival will be determined by a stratified random sampling of the plantings.
4. Effective monitoring will assess plant survivability during the first growing season and make recommendations for reinforcement plantings if required at that time.
5. A final inspection and certification by the ERI qualified professional is required after the second growing season.

Plant Selection and Density Spacing Requirements

Planting Material Size and Density Planting:
Planting size and density shall be varied with a combination of planting stock. Planting quantity and spacing are based on square footage credit, which varies by material size. A total of 43,560 sq. ft. of planting credit must be fulfilled for each acre planted. This credit can be fulfilled with any combination of material size in accordance with the following chart.

Plant Material Size Table.

Material Size	Spacing	TPA	Sq. Ft. Credit per Plant	Comments
2" caliper trees	20' x 20'	100	435.6	B & B
1" caliper trees	15' x 15'	200	217.8	B & B
seedlings or whips	11' x 11'	350	125	Container 1-3 gal w/tree shelters
seedlings or shrubs	8' x 8'	700	62	Bare root

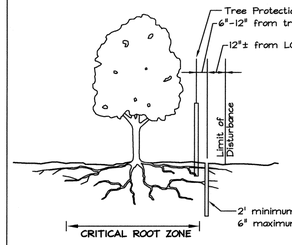


PLANTING ON STEEP SLOPES
NOT TO SCALE

1. PLANT AS PER CONTAINER PLANTING DETAIL EXCEPT PREP OF PLANTING AREA
2. A BASIN FOR PLANTING IS CUT INTO THE SLOPE WITH PLANT BEING PLACED NEAR THE DOWNHILL EDGE OF THE BASIN.
3. BASIN SHOULD SLOPE TOWARD UPHILL SIDE TO ALLOW RAIN TO BE CAPTURED AND INFILTRATE.
4. AN OVERFLOW CHANNEL SHALL BE CUT INTO UNDISTURBED SOIL AT THE REAR OF THE BASIN TO ALLOW EXCESS RUNOFF AND SEDIMENT TO ESCAPE WITHOUT DAMAGING THE BASIN.
5. MULCH AROUND PLANT IN BASIN.

ROOT PRUNING

1. Retention areas shall be set prior to construction
2. Boundaries of retention areas shall be flagged, and location of trench shall be specified by ERI Qualified Professional.
3. Roots shall be cut cleanly with root pruning equipment. Where roots 2½" are found, trenching shall be done by air spade or hand tools. Roots >1" shall be cut with a hand saw.
4. Trench shall be immediately backfilled with soil removed or high organic content soil.
5. Any other techniques shall be approved by the ERI Qualified Professional before implementation.



Afforestation Area Planting Notes

1. Afforestation areas may be planted as soon as reasonable to do so. Late winter- early spring plantings are preferred. Earliest planting dates will vary from year to year but planting may generally begin as soon as the ground is no longer frozen. Alternate planting dates may be considered as conditions warrants.
2. Soil amendments and fertilization recommendations will be made based upon the results of soil analysis for nitrogen, phosphorus, potassium, organic matter content and pH. If required, fertilizer will be provided using a slow release, soluble 16-8-16 analysis designed to last 5-8 years contained in polyethylene perforated bags such as manufactured by ADCO Works, P.O. Box 310 Hollins, N.Y. 11423 or approved equal.
3. Plant materials shall be planted in accordance with the planting diagram, planting details and planting schedule.
4. Plant stock must be protected from desiccation at all times prior to planting. Materials held for planting shall be moistened and placed in cool shaded areas until ready for placement.
5. Planting materials shall be nursery grown and inspected prior to planting. Plants not conforming to the American Standards for Nursery Stock specifications for size, form, vigor, or roots, or due to trunk wounds, breakage, desiccation, insect or disease must be replaced.
6. Newly planted trees may require watering at least once per week during the first growing season depending on rainfall in order to get established. The initial planting operation should allow for watering during installation to completely soak backfill materials.
7. Mulch shall be applied in accordance with the diagram provided and shall consist of woodchips or shredded hardwood bark mulch, free of wood alcohol.
8. Planting holes should be excavated to a minimum diameter of 2.5 to 3 times the diameter of the root ball or container. Mechanical angering is preferred with scarification of the sides of each hole.
9. Site preparation for planting shall include moving of entire planting area, then banded tilling of 4 ft. wide bands spaced 11'o.c. and laid out in curvilinear rows. Stabilize disturbed areas with perennial rye after planting.

CRITICAL ROOT ZONE

For the edge of large areas, use the greater of the two choices below:

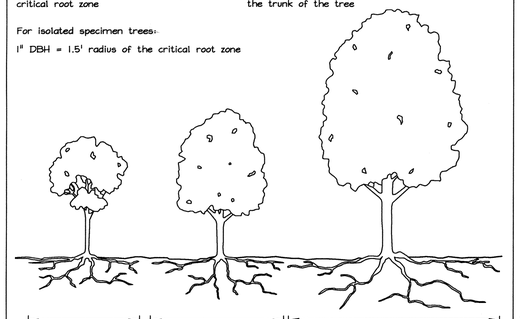
1" DBH of the tree = 1' radius of the critical root zone

or

8 ft radius circle around the trunk of the tree

For isolated specimen trees:

1" DBH = 1.5' radius of the critical root zone



Soil Protection Zone Notes

1. The Soil Protection Zone shall include all areas contained inside the Limit of Disturbance.
2. Where possible, the Soil Protection Zone shall extend to the drip line of specimen trees. For other groups of trees, the zone shall be the drip line or 40% of the height of the tree, whichever is greater.
3. No construction activity is permitted within the Soil Protection Zone.
4. If soil has been compacted or grading has taken place in the vicinity of the Soil Protection Zone, root pruning shall be implemented per Root Pruning detail, shown on this plan.
5. Root pruning shall occur prior to the beginning of construction.
6. Where the Soil Protection Zone must encroach inside the Critical Root Zone of a tree, soil disturbance shall be mitigated with vertical mulching, radial trenching, or another method approved by the ERI Forest Conservation Professional.
7. Prior to construction, the Limits of Disturbance shall be marked and the ERI Professional shall determine which trees will need preventative treatment or removal.
8. Tree maintenance and removal shall be undertaken by a qualified MD Tree Expert to ensure damage to surrounding trees is minimized.
9. Brush and limbs removed for construction shall be chipped and spread at the edge of the Soil Protection Zone to a depth of 6 inches. This shall occur outside the Soil Protection Zone where compaction could impact otherwise unprotected Critical Root Zone.

"No As-Built information on this sheet"

EXPLORATION RESEARCH, INC.
ENVIRONMENTAL CONSULTANTS
LANDSCAPE ARCHITECTS
6339 HOWARD LANE
ELKRIDGE, MARYLAND 21075
TEL: (410) 567-5210 FAX (410) 796-1562

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. #34689, Expiration Date: 07/08/2011.

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 11-17-10

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/19/10

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/18/10

OWNER/
(NAECKER PROPERTY
Plat #7288 Lot 4)
Robert L. Naecker
12740 Route 108
ClarksVille MD 21029-1531
443.864.6445

OWNER/
(NAECKER PROPERTY
Plat #20373-20375 Lot 6)
GREENFIELD HOMES, Inc.
6656 Luster Drive
Highland, Maryland 20777
410.781.6782

DEVELOPER
GREENFIELD HOMES, Inc.
6656 Luster Drive
Highland, Maryland 20777
410.781.6782

FOREST CONSERVATION NOTES AND DETAIL SHEET
WILLOW POND

LOTS 1-13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D' & NON-BUILDABLE PARCEL 'E' A RESUBDIVISION OF NAECKER PROPERTY LOT 4, PLAT NO. 7288 AND LOT 6, PLAT NO. 20373-20375

TAX MAP 34 GRID 17 — PARCEL 382
FIFTH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY:	MT
DRAWN BY:	SMM
CHECKED BY:	ZYF, MLT
SCALE:	N/A
DATE:	Oct. 29, 2010
W.O. No.:	3199
SHEET No.	13 OF 22

F-10-106

NOTES
GENERAL NOTES:

1. THIS BRIDGE HAS BEEN DESIGNED FOR GENERAL SITE CONDITIONS. THE PROJECT ENGINEER SHALL BE RESPONSIBLE FOR THE STRUCTURE'S SUITABILITY TO THE EXISTING SITE CONDITIONS AND FOR THE HYDRAULIC EVALUATION -- INCLUDING SCOUR AND CONFIRMATION OF SOIL CONDITIONS.

2. PRIOR TO CONSTRUCTION, CONTRACTOR MUST VERIFY ALL ELEVATIONS SHOWN THROUGH THE ENGINEER.

3. ONLY CONTECH BRIDGE SOLUTIONS INC. THE CON/SPAN® APPROVED PRECASTER IN MARYLAND MAY PROVIDE THE STRUCTURE DESIGNED IN ACCORDANCE WITH THESE PLANS.

4. THE USE OF ANOTHER PRECAST STRUCTURE WITH THE DESIGN ASSUMPTIONS USED FOR THE CON/SPAN® STRUCTURE MAY LEAD TO SERIOUS DESIGN ERRORS. USE OF ANY OTHER PRECAST STRUCTURE WITH THIS DESIGN AND DRAWINGS VOIDS ANY CERTIFICATION OF THIS DESIGN AND WARRANTY. CONTECH BRIDGE SOLUTIONS INC. ASSUMES NO LIABILITY FOR DESIGN OF ANY ALTERNATE OR SIMILAR TYPE STRUCTURES.

5. ALTERNATE STRUCTURES MAY BE CONSIDERED, PROVIDED THAT SIGNED AND SEALED DESIGN DRAWINGS (AND CALCULATIONS) ARE SUBMITTED TO THE ENGINEER 2 WEEKS PRIOR TO THE BID DATE FOR REVIEW AND APPROVAL.

6. PROPOSED ALTERNATES TO A CON/SPAN® BRIDGE SYSTEM MUST SUBMIT AT LEAST TWO (2) INDEPENDENTLY VERIFIED FULL SCALE LOAD TESTS THAT CONFIRM THE PROPOSED DESIGN METHODOLOGY OF THE THREE SIDED/ARCH STRUCTURE(S). THE PROPOSED ALTERNATE, UPON SATISFACTORY CONFIRMATION OF DESIGN METHODOLOGY, MAY BE CONSIDERED AN ACCEPTABLE ALTERNATE.

DESIGN DATA

DESIGN LOADING:
BRIDGE UNITS: HS25-44
HEADWALLS: EARTH PRESSURE ONLY
WINGWALLS: EARTH PRESSURE ONLY
DESIGN FILL HEIGHT: 1'-6" MIN. TO 3'-0" MAX.
FROM TOP OF CROWN TO TOP OF PAVEMENT.
DESIGN METHOD: LOAD FACTOR PER AASHTO SPECIFICATION
ASSUMED NET ALLOWABLE SOIL BEARING PRESSURE: 4000 PSF *
ASSUMED GROSS ALLOWABLE SOIL BEARING PRESSURE: 4000 PSF *

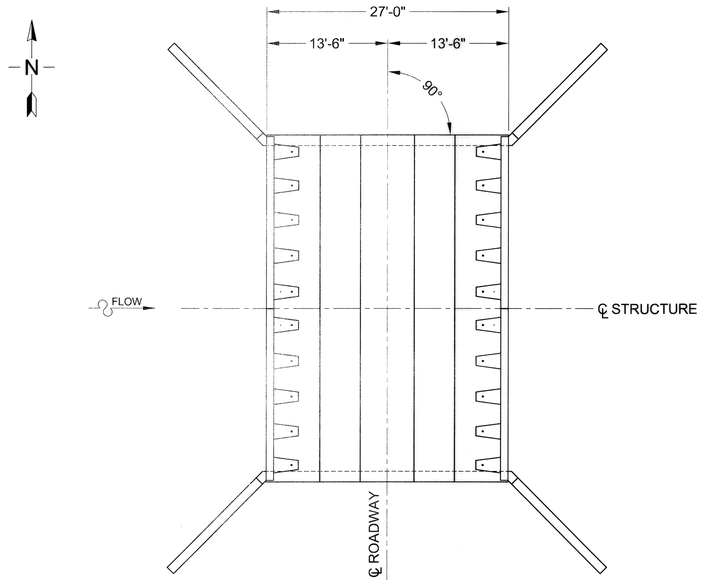
*AT THE TIME OF DESIGN, A GEOTECHNICAL REPORT FOR THE PROJECT SITE WAS NOT AVAILABLE. IT IS THE PROJECT ENGINEER'S, OWNER'S AND/OR THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THAT THE ACTUAL SITE CONDITIONS AT THE TIME OF CONSTRUCTION ARE CONSISTENT WITH THE ASSUMED ALLOWABLE SOIL BEARING PRESSURE WITH A GEOTECHNICAL INVESTIGATION FROM A QUALIFIED GEOTECHNICAL ENGINEER.

MATERIALS

PRECAST UNITS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH CON/SPAN® SPECIFICATIONS. CONCRETE FOR FOOTINGS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI. REINFORCING STEEL FOR FOOTINGS SHALL CONFORM TO ASTM A615 OR A996-GRADE 60.

WILLOW POND

HOWARD COUNTY, MARYLAND



LOCATION PLAN

NOT TO SCALE

10/21/10

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. 36225, EXPIRATION DATE: 6/19/2012.

"No As-Built information on this sheet"

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 11-17-10

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/9/10

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/10/10

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH® CONSTRUCTION PRODUCTS INC.
www.contech-cpi.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

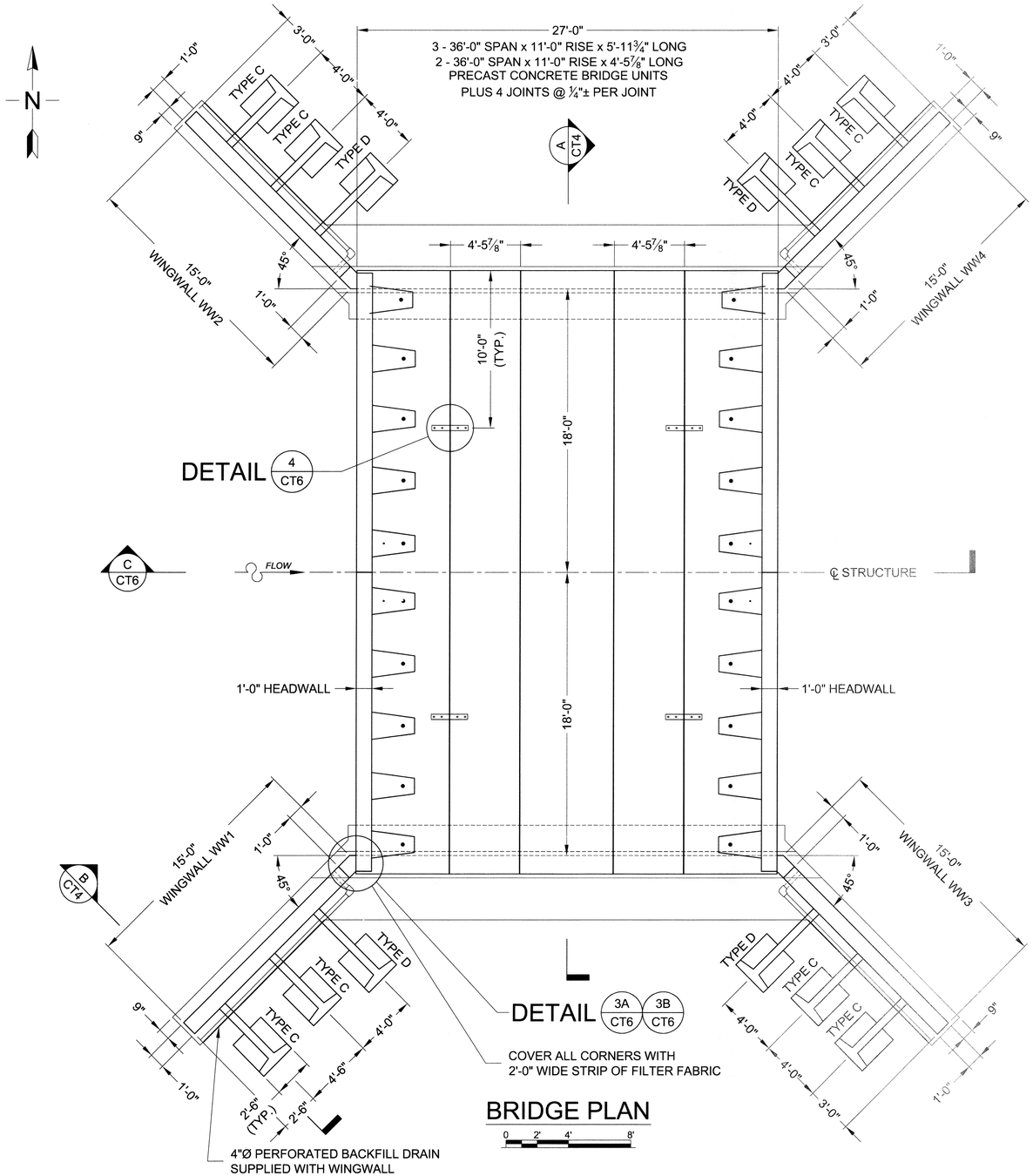
CON/SPAN® BRIDGE SYSTEMS
CONTECH **CONTRACT** DRAWING

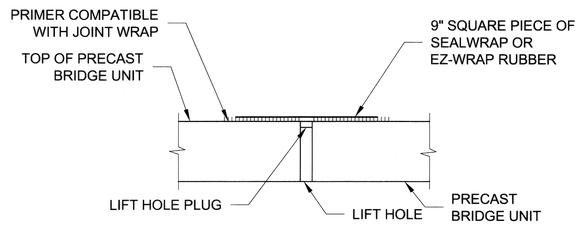
WILLOW POND

LOTS 1-13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B ', 'C', 'D' & NON-BUILDABLE PARCEL 'E'
A RESUBDIVISION OF NAECKER PROPERTY LOT 4, PLAT NO. 7288 AND LOT 6, PLAT NO. 20373-20375
TAX MAP 34 GRID 17 — PARCEL 382
FIFTH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

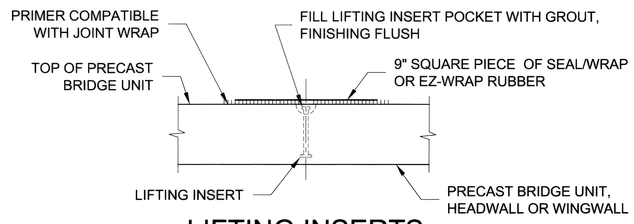
PROJECT NUMBER: 352689	DATE: 4/23/2010
DESIGNED: DMR	DRAWN: TRL
CHECKED: JMF	APPROVED: PAC
SHEET NO.: CT1 14	OF CT8 21

F-10-106





LIFTING HOLES



LIFTING INSERTS

TYPICAL LIFT POINT SEALING DETAIL

NOT TO SCALE

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 11-17-10

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/19/10

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/18/10

MARK	DATE	REVISION DESCRIPTION	BY

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. 36225, EXPIRATION DATE: 8/19/2012.

10/21/10

"NO AS-BUILT INFORMATION ON THIS SHEET"

CONTECH® CONSTRUCTION PRODUCTS INC.
www.contech-cpi.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CONTRACT DRAWING

CONSPAN® BRIDGE SYSTEMS

WILLOW POND

LOTS 1-13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B ', 'C', 'D' & NON-BUILDABLE PARCEL 'E'
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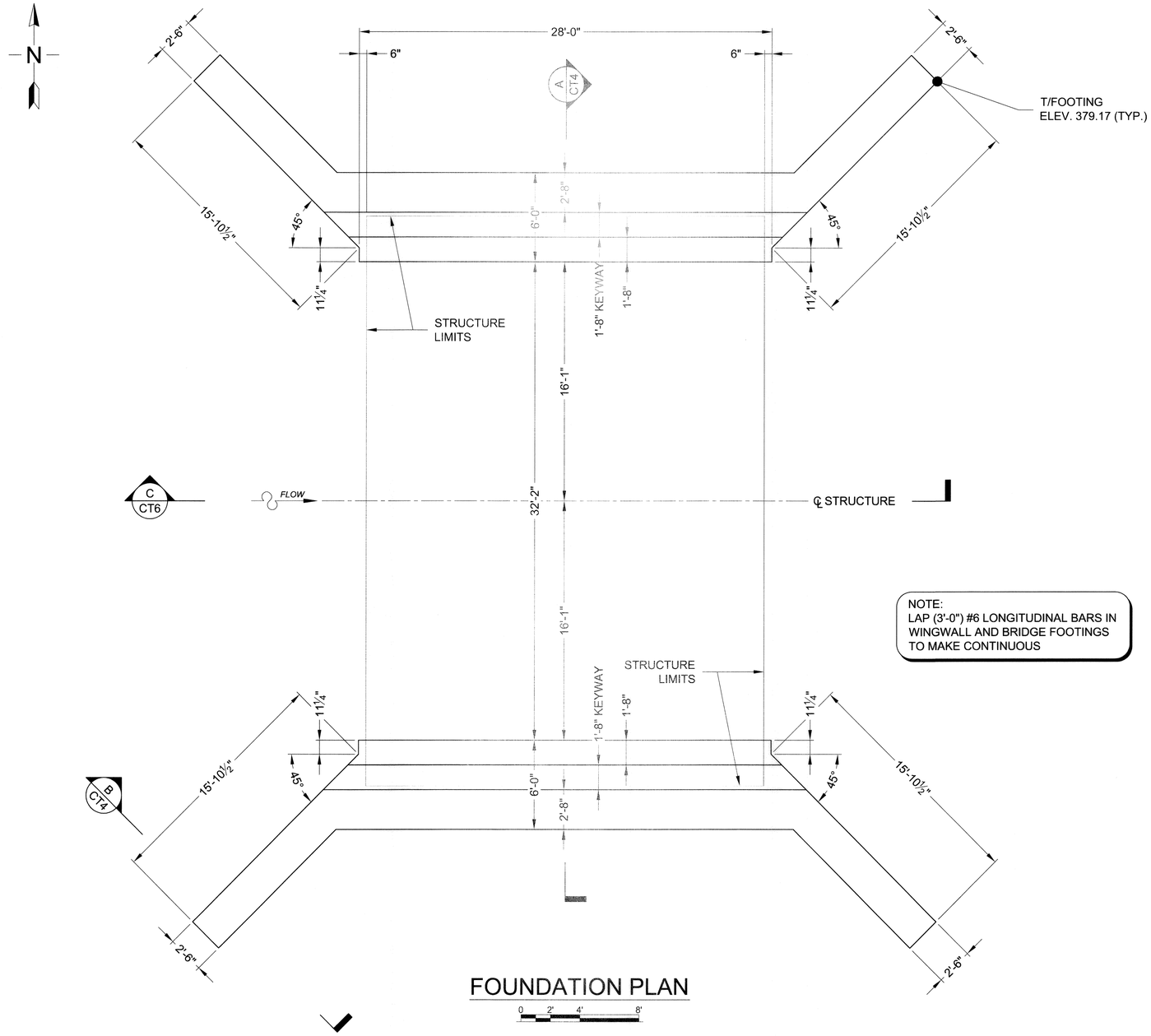
TAX MAP 34 GRID 17 — PARCEL 382
FIFTH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

PROJECT NUMBER:	DATE:
352689	4/23/2010
DESIGNED: DMR	DRAWN: TRL
CHECKED: JMF	APPROVED: PAC
SHEET NO.: CT2 15	OF CT8 22

F-10-106



FOUNDATION PLAN

0 2' 4' 8'

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 11-17-10

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/19/10

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/18/10

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH®
CONSTRUCTION PRODUCTS INC.
www.contech-cpi.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONSPAN® BRIDGE SYSTEMS

CONTECH **CONTRACT** DRAWING

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. 36225, EXPIRATION DATE: 8/19/2012

10/21/10

STATE OF MARYLAND — PHILIP A. CERTAINE — Lic. No. 36225 — PROFESSIONAL ENGINEER

"NO AS-BUILT INFORMATION ON THIS SHEET"

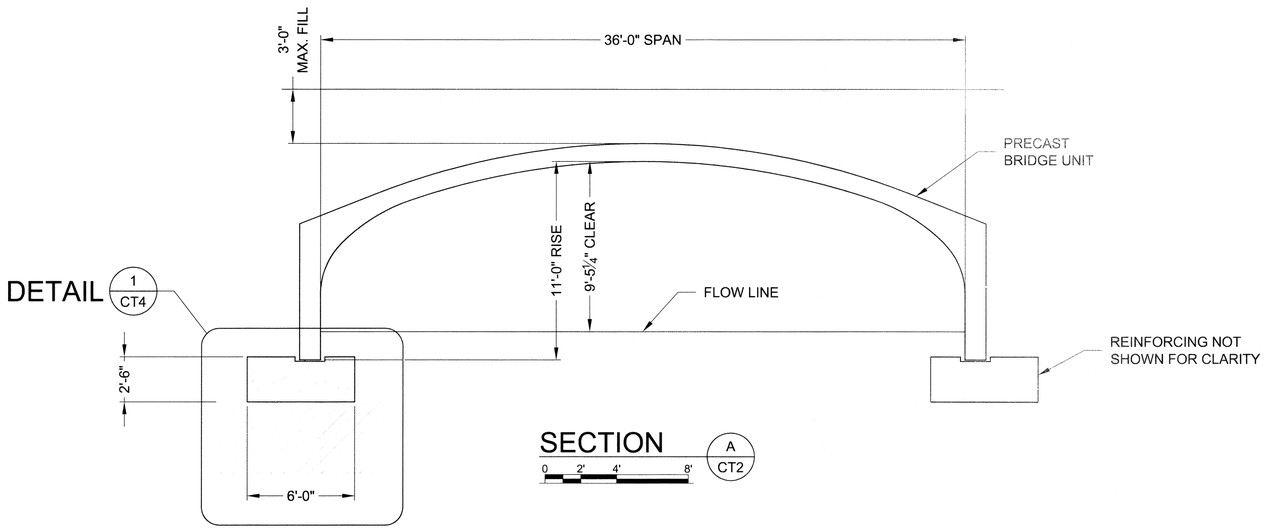
WILLOW POND

LOTS 1-13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B ', 'C', 'D' & NON-BUILDABLE PARCEL 'E'
A RESUBDIVISION OF NAECKER PROPERTY LOT 4, PLAT NO. 7288 AND LOT 6, PLAT NO. 20373-20375

TAX MAP 34 GRID 17 — PARCEL 382
FIFTH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

PROJECT NUMBER:	DATE:
352689	4/23/2010
DESIGNED: DMR	DRAWN: TRL
CHECKED: JMF	APPROVED: PAC
SHEET NO.: CT3 16	OF CT8 22

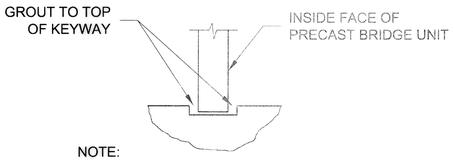
F-10-106



DETAIL 1 / CT4

SECTION A / CT2

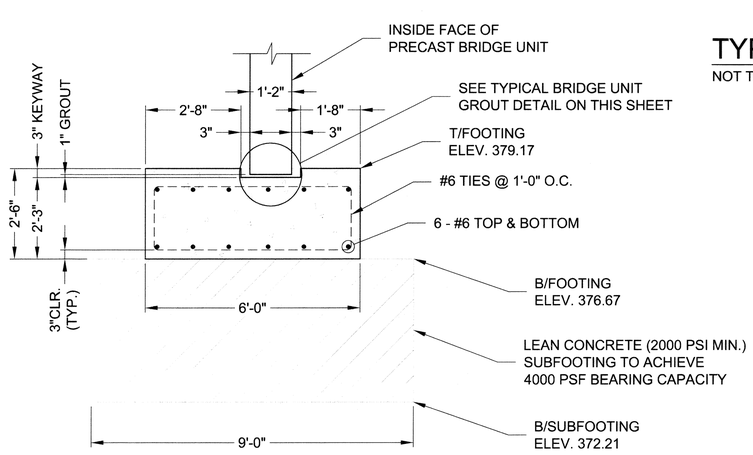
0 2' 4' 8'



NOTE:
FILL ENTIRE KEYWAY INCLUDING NOMINAL 1" VOID BETWEEN BOTTOM OF KEYWAY AND BOTTOM OF PRECAST BRIDGE UNIT LEG WITH GROUT.

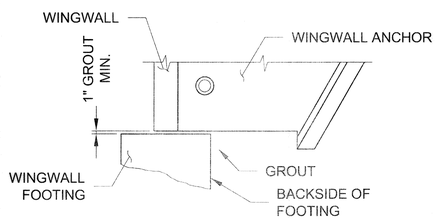
TYPICAL BRIDGE UNIT GROUT DETAIL

NOT TO SCALE



DETAIL 1 / CT4

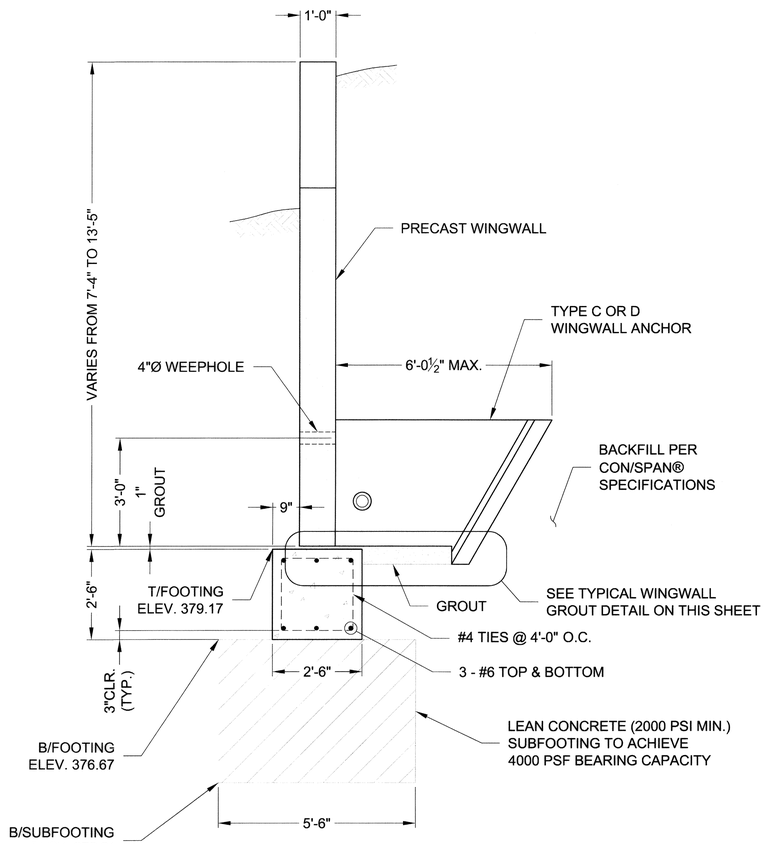
0 1' 2' 4'



NOTES:
1 MINIMUM 1" GROUT UNDER WINGWALL LEG & ANCHOR STEM.
2 AREA BETWEEN WINGWALL FOOTING AND WINGWALL ANCHOR SHALL BE GROUTED SOLID BEFORE BACKFILL.
3 FORM BACKSIDE OF FOOTING TO DIMENSIONS SHOWN ON FOUNDATION PLAN.

TYPICAL WINGWALL GROUT DETAIL

NOT TO SCALE



SECTION B / CT2

0 1' 2' 4'

10/21/10

"No As-Built information on this sheet"

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 11-17-10

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/9/10

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/8/10

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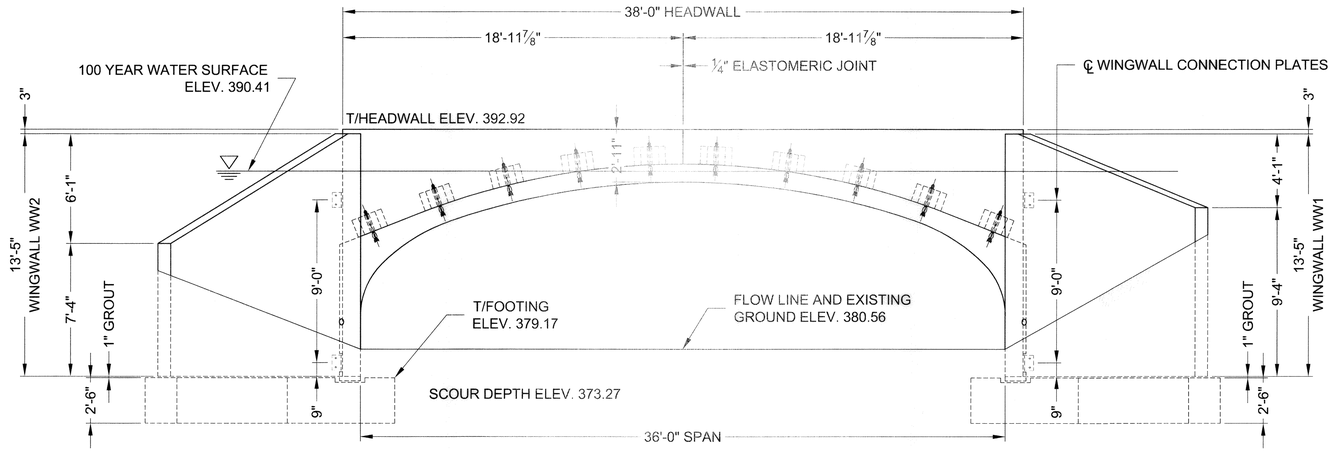
TAX MAP 34 GRID 17 — PARCEL 382
FIFTH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

PROJECT NUMBER:	DATE:
352689	4/23/2010
DESIGNED:	DRAWN:
DMR	TRL
CHECKED:	APPROVED:
JMF	PAC

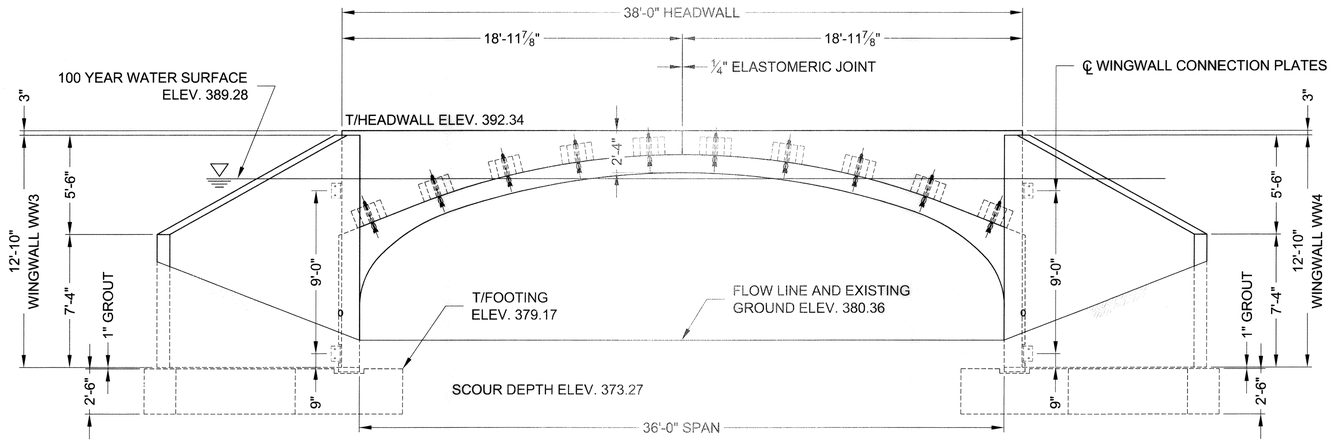
SHEET NO.: CT4 17 OF CT8 22

F-10-106



UPSTREAM END ELEVATION

0 2' 4' 8'



DOWNSTREAM END ELEVATION

0 2' 4' 8'

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PROJECT NUMBER:	DATE:
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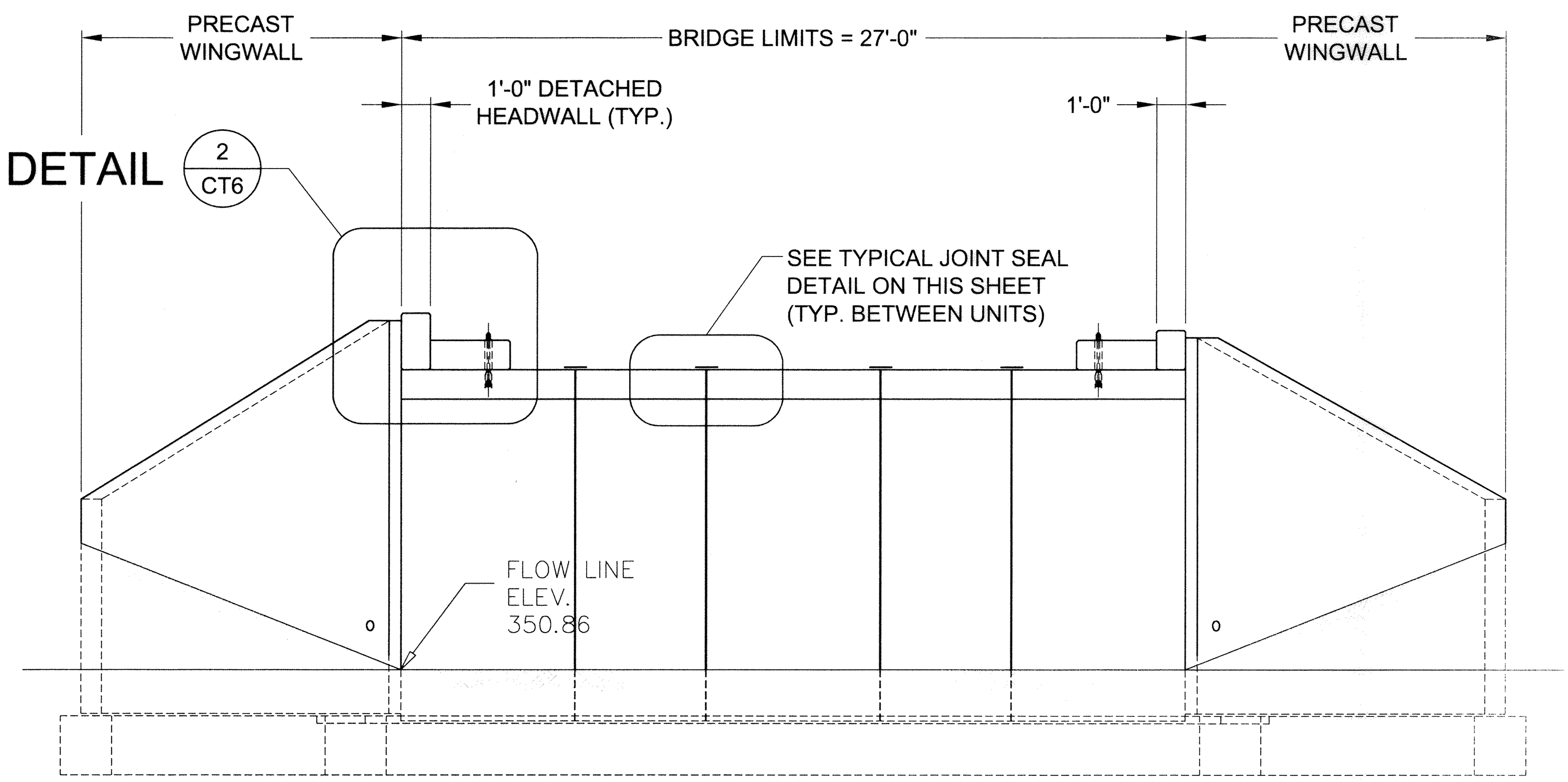
CHECKED: JMF	APPROVED: PAC
SHEET NO.: CT5 18	OF CT8 22

F-10-106



SECTION C CT2

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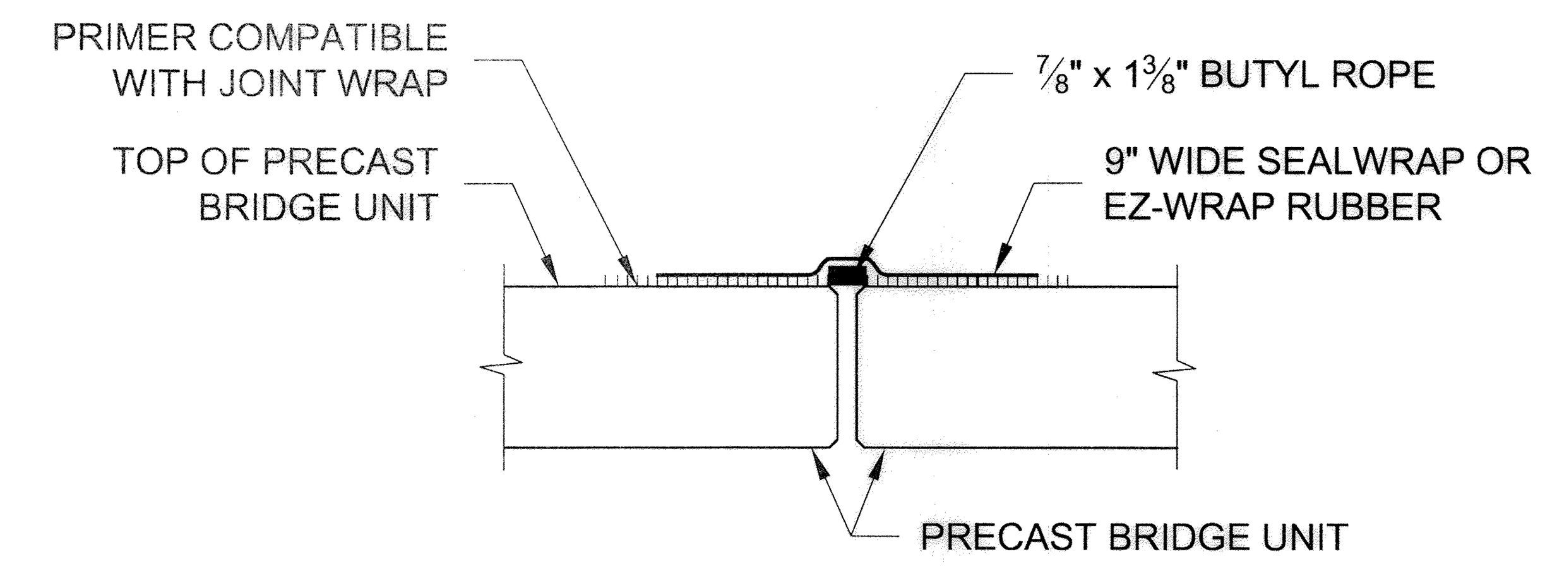
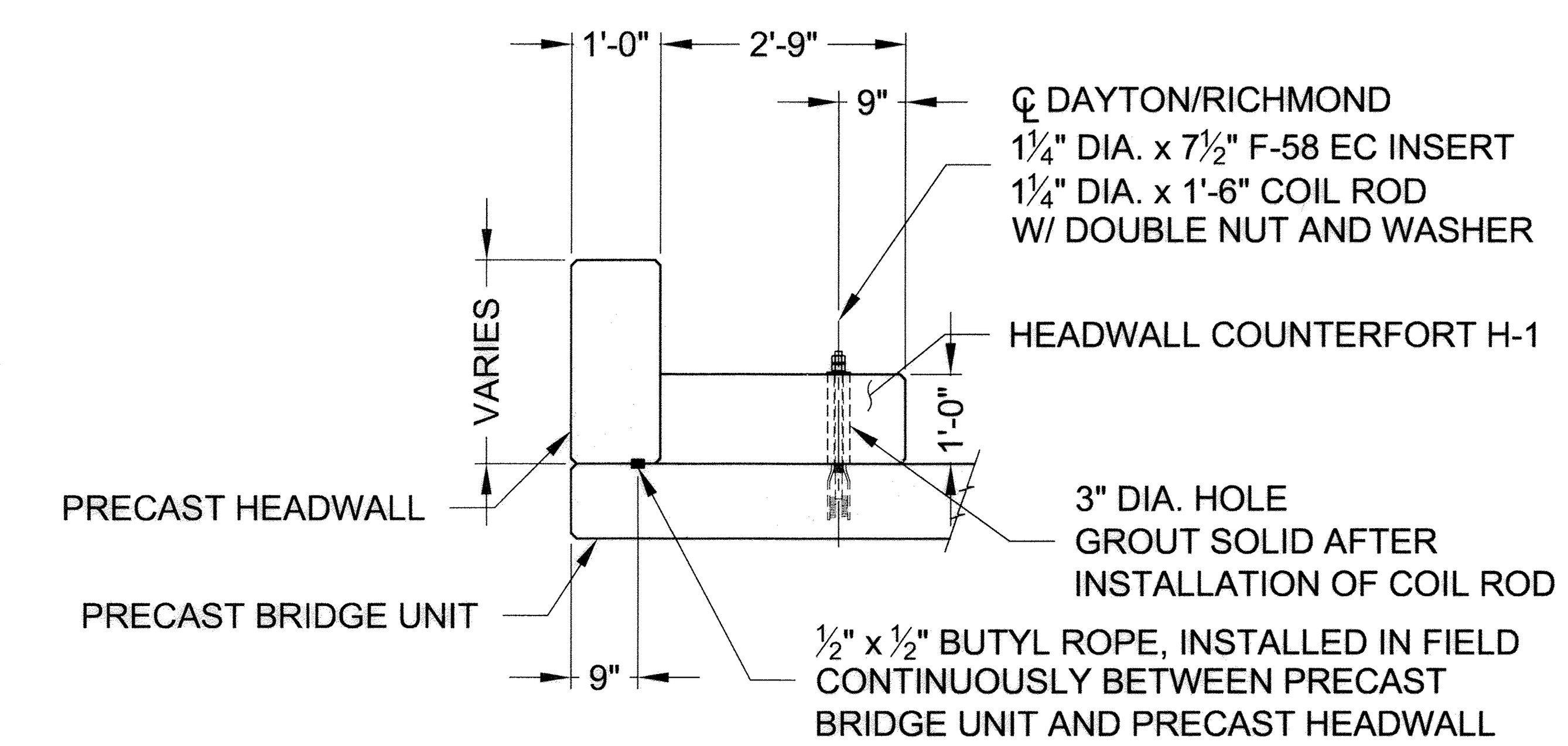


TYPICAL JOINT SEAL DETAIL

NOT TO SCALE



DETAIL 2 CT6

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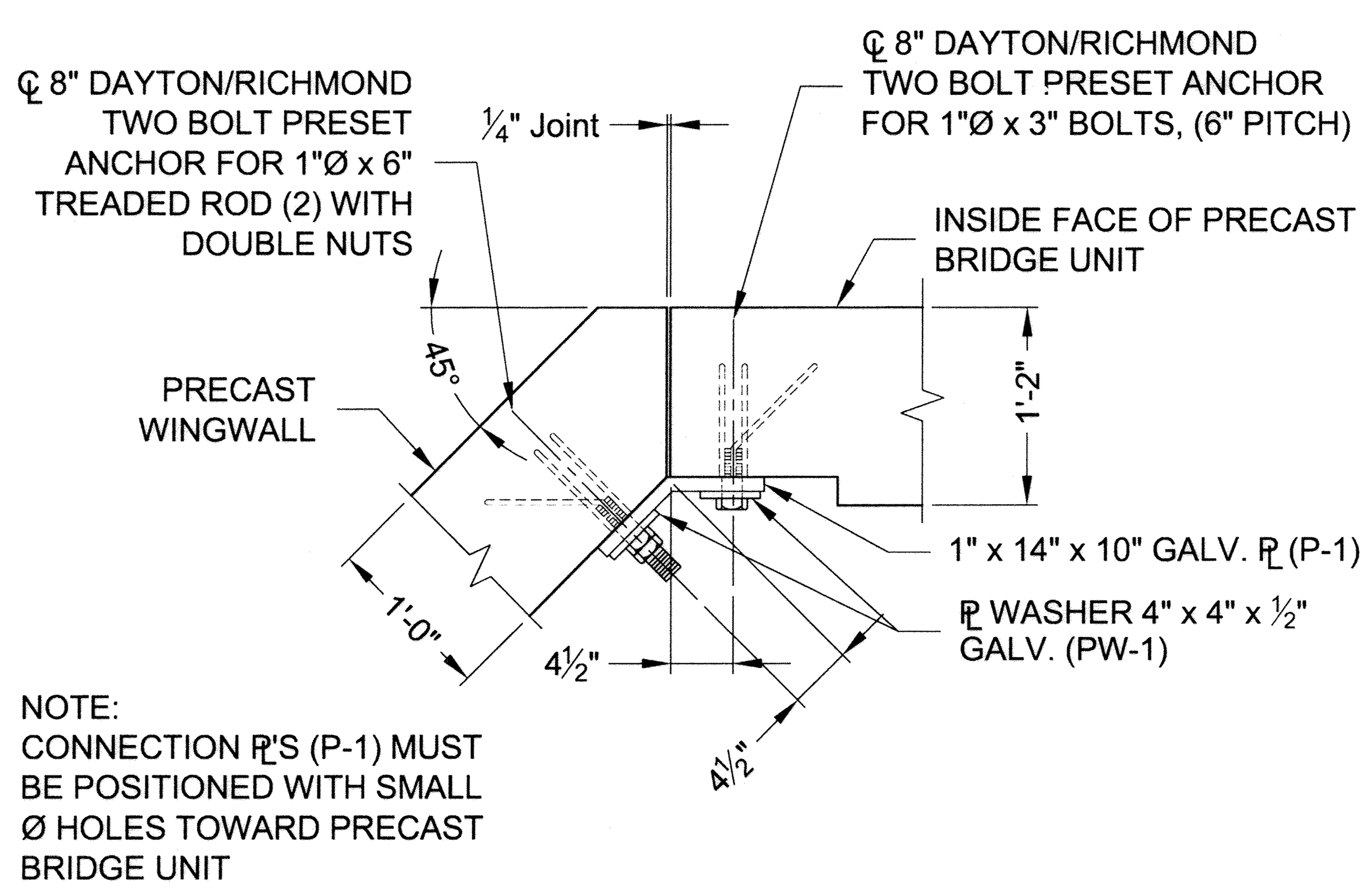
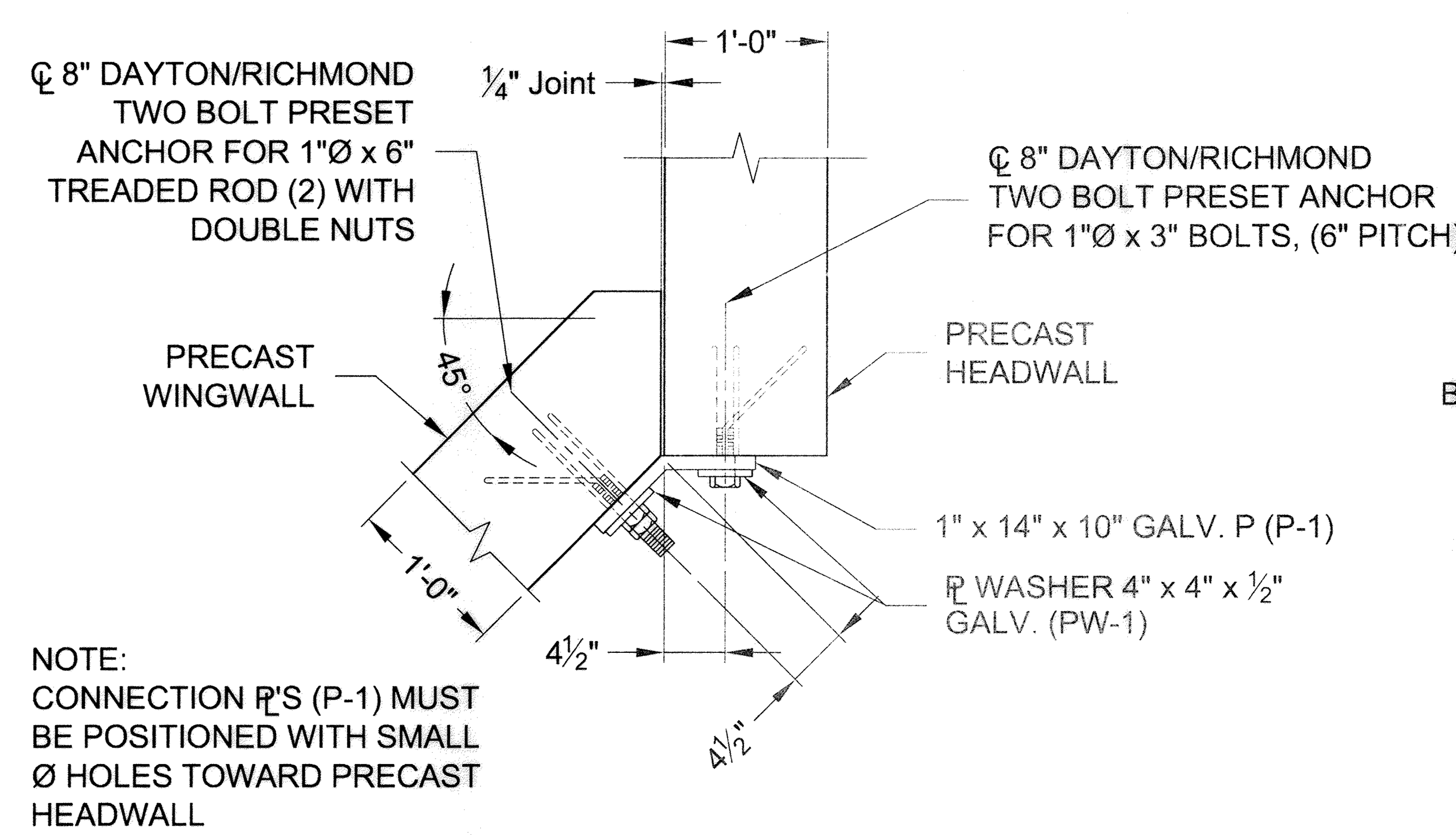


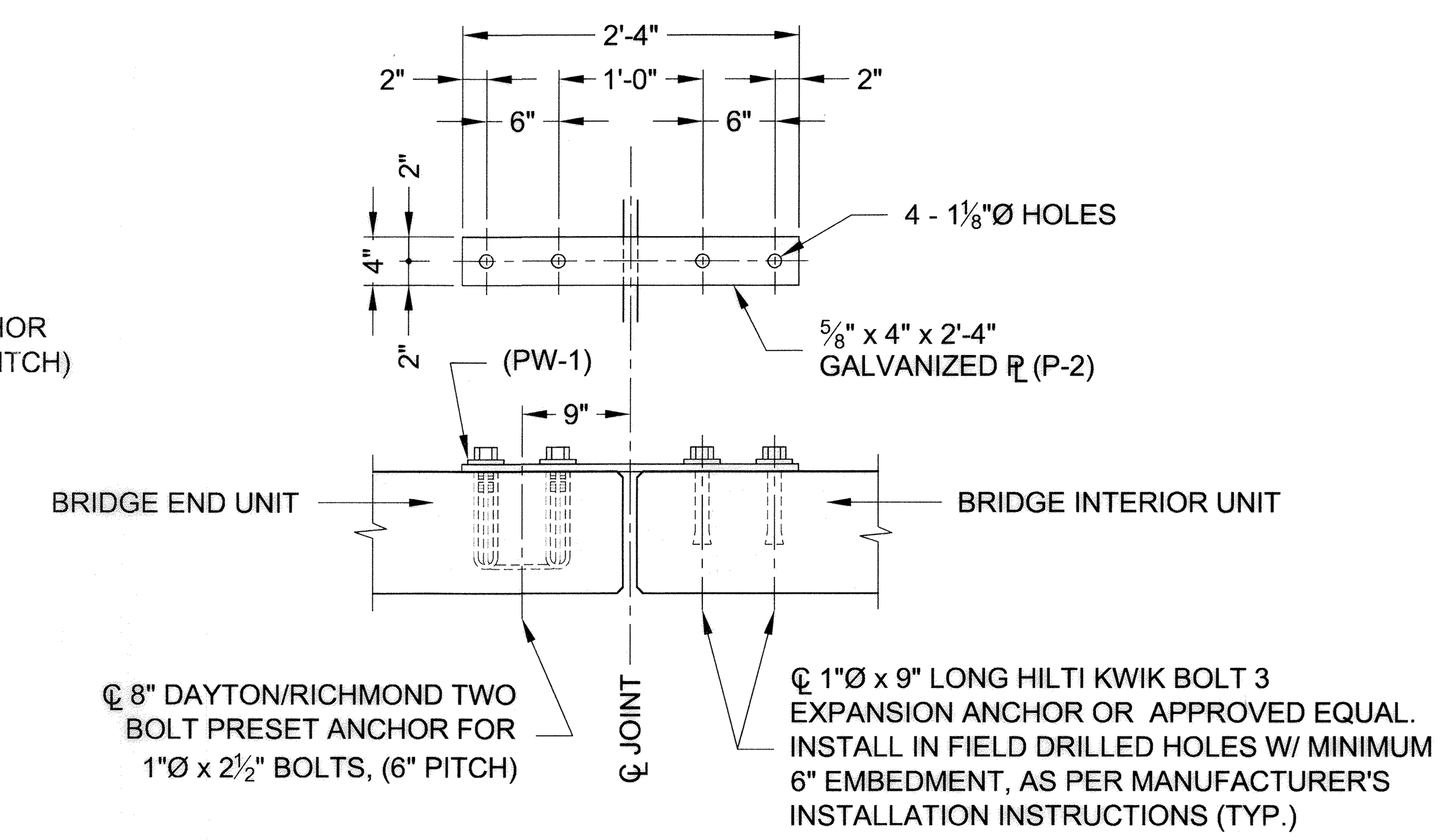
DETAIL @ UNIT LEG 3A CT2

0 1' 2'



DETAIL @ HEADWALL 3B CT2

0 1' 2'



DETAIL 4 CT2

NOT TO SCALE

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SHEET NO.: CT6 19	OF CT8 22

F-10-106

SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS

1. DESCRIPTION
   1.1. TYPE - THIS WORK SHALL CONSIST OF FURNISHING AND CONSTRUCTING A CON/SPAN® BRIDGE SYSTEM IN ACCORDANCE WITH THESE SPECIFICATIONS AND IN REASONABLY CLOSE CONFORMITY WITH THE LINES, GRADES, DESIGN AND DIMENSIONS SHOWN ON THE PLANS OR AS ESTABLISHED BY THE ENGINEER. IN SITUATIONS WHERE TWO OR MORE SPECIFICATIONS APPLY TO THIS WORK, THE MOST STRINGENT REQUIREMENTS SHALL GOVERN.
   1.2. DESIGNATION - PRECAST REINFORCED CONCRETE CON/SPAN® BRIDGE UNITS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY SPAN AND RISE. PRECAST REINFORCED CONCRETE WINGWALLS AND HEADWALLS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY LENGTH, HEIGHT, AND DEFLECTION ANGLE.

2. DESIGN
   2.1. SPECIFICATIONS - THE PRECAST ELEMENTS ARE DESIGNED IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" 17TH EDITION, ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2002. A MINIMUM OF ONE FOOT OF COVER ABOVE THE CROWN OF THE BRIDGE UNITS IS REQUIRED IN THE INSTALLED CONDITION. (UNLESS NOTED OTHERWISE ON THE SHOP DRAWINGS AND DESIGNED ACCORDINGLY.)

3. MATERIALS
   3.1. CONCRETE - THE CONCRETE FOR THE PRECAST ELEMENTS SHALL BE AIR-ENTRAINED WHEN INSTALLED IN AREAS SUBJECT TO FREEZE-THAW CONDITIONS, COMPOSED OF PORTLAND CEMENT, FINE AND COARSE AGGREGATES, ADMIXTURES AND WATER. AIR-ENTRAINED CONCRETE SHALL CONTAIN 6 ± 2 PERCENT AIR. THE AIR- ENTRAINING ADMIXTURE SHALL CONFORM TO AASHTO M154. THE MINIMUM CONCRETE COMPRESSIVE STRENGTH SHALL BE AS SHOWN ON THE SHOP DRAWINGS.
      3.1.1. PORTLAND CEMENT - SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATIONS C150-TYPE I, TYPE II, OR TYPE III CEMENT.
      3.1.2. COARSE AGGREGATE - SHALL CONSIST OF STONE HAVING A MAXIMUM SIZE OF 1 INCH. AGGREGATE SHALL MEET REQUIREMENTS FOR ASTM C33.
      3.1.3. WATER REDUCING ADMIXTURE - THE MANUFACTURER MAY SUBMIT, FOR APPROVAL BY THE ENGINEER, A WATER-REDUCING ADMIXTURE FOR THE PURPOSE OF INCREASING WORKABILITY AND REDUCING THE WATER REQUIREMENT FOR THE CONCRETE.
      3.1.4. CALCIUM CHLORIDE - THE ADDITION TO THE MIX OF CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CALCIUM CHLORIDE WILL NOT BE PERMITTED.
      3.1.5. MIXTURE - THE AGGREGATES, CEMENT AND WATER SHALL BE PROPORTIONED AND MIXED IN A BATCH MIXER TO PRODUCE A HOMOGENEOUS CONCRETE MEETING THE STRENGTH REQUIREMENTS OF THIS SPECIFICATION. THE PROPORTION OF PORTLAND CEMENT IN THE MIXTURE SHALL NOT BE LESS THAN 564 POUNDS (6 SACKS) PER CUBIC YARD OF CONCRETE.
   3.2. STEEL REINFORCEMENT
      3.2.1. THE MINIMUM STEEL YIELD STRENGTH SHALL BE 60,000 PSI, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS.
      3.2.2. ALL REINFORCING STEEL FOR THE PRECAST ELEMENTS SHALL BE FABRICATED AND PLACED IN ACCORDANCE WITH THE DETAILED SHOP DRAWINGS SUBMITTED BY THE MANUFACTURER.
      3.2.3. REINFORCEMENT SHALL CONSIST OF WELDED WIRE FABRIC CONFORMING TO ASTM SPECIFICATION A 185 OR A 497, OR DEFORMED BILLET STEEL BARS CONFORMING TO ASTM SPECIFICATION A 615, GRADE 60. LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY CONSIST OF WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS.
   3.3. STEEL HARDWARE
      3.3.1. BOLTS AND THREADED RODS FOR WINGWALL CONNECTIONS SHALL CONFORM TO ASTM A 307. NUTS SHALL CONFORM TO AASHTO M292 (ASTM A194) GRADE 2H. ALL BOLTS, THREADED RODS AND NUTS USED IN WINGWALL CONNECTIONS SHALL BE MECHANICALLY ZINC COATED IN ACCORDANCE WITH ASTM B695 CLASS 50.
      3.3.2. STRUCTURAL STEEL FOR WINGWALL CONNECTION PLATES AND PLATE WASHERS SHALL CONFORM TO AASHTO M 270 (ASTM A 709) GRADE 36 AND SHALL BE HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
      3.3.3. INSERTS FOR WINGWALLS SHALL BE 1" DIAMETER TWO-BOLT PRESET WINGWALL ANCHORS AS MANUFACTURED BY DAYTON/RICHMOND CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700.
      3.3.4. FERRULE LOOP INSERTS SHALL BE F-64 FERRULE LOOP INSERTS AS MANUFACTURED BY DAYTON/RICHMOND CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700.
      3.3.5. HOOK BOLTS USED IN ATTACHED HEADWALL CONNECTIONS SHALL BE ASTM A307.
      3.3.6. INSERTS FOR DETACHED HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL, F-58 EXPANDED COIL INSERTS AS MANUFACTURED BY DAYTON/RICHMOND CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700. COIL RODS AND NUTS USED IN HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL. WASHERS USED IN HEADWALL CONNECTIONS SHALL BE EITHER AISI TYPE 304 STAINLESS STEEL PLATE WASHERS OR AASHTO M270 (ASTM A709) GRADE 36 PLATE WASHERS HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
      3.3.7. REINFORCING BAR SPLICES SHALL BE MADE USING THE DOWEL BAR SPLICER SYSTEM AS MANUFACTURED BY DAYTON/RICHMOND CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700, AND SHALL CONSIST OF THE DOWEL BAR SPLICER (DB-SAE) AND DOWEL-IN (DI).

4. MANUFACTURE OF PRECAST ELEMENTS - SUBJECT TO THE PROVISIONS OF SECTION 5, BELOW, THE PRECAST ELEMENT DIMENSION AND REINFORCEMENT DETAILS SHALL BE AS PRESCRIBED IN THE PLAN AND SHOP DRAWINGS PROVIDED BY THE MANUFACTURER.
   4.1. FORMS - THE FORMS USED IN MANUFACTURE SHALL BE SUFFICIENTLY RIGID AND ACCURATE TO MAINTAIN THE REQUIRED PRECAST ELEMENT DIMENSIONS WITHIN THE PERMISSIBLE VARIATIONS GIVEN IN SECTION 5 OF THESE SPECIFICATIONS. ALL CASTING SURFACES SHALL BE OF A SMOOTH MATERIAL.
   4.2. PLACEMENT OF REINFORCEMENT
      4.2.1. PLACEMENT OF REINFORCEMENT IN PRECAST BRIDGE UNITS - THE COVER OF CONCRETE OVER THE OUTSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 2" MINIMUM. THE COVER OF CONCRETE OVER THE INSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 1¼" MINIMUM, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS. THE CLEAR DISTANCE OF THE END CIRCUMFERENTIAL WIRES SHALL NOT BE LESS THAN 1" NOR MORE THAN 2" FROM THE ENDS OF EACH SECTION. REINFORCEMENT SHALL BE ASSEMBLED UTILIZING SINGLE OR MULTIPLE LAYERS OF WELDED WIRE FABRIC (NOT TO EXCEED 3 LAYERS), SUPPLEMENTED WITH A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS. WHEN WELDED WIRE FABRIC SHALL BE COMPOSED OF CIRCUMFERENTIAL AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE BRIDGE UNIT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW. THE ENDS OF THE LONGITUDINAL DISTRIBUTION REINFORCEMENT SHALL BE NOT MORE THAN 3" AND NOT LESS THAN 1½" FROM THE ENDS OF THE BRIDGE UNIT.
      4.2.2. BENDING OF REINFORCEMENT FOR PRECAST BRIDGE UNITS - THE OUTSIDE AND INSIDE CIRCUMFERENTIAL REINFORCING STEEL FOR THE CORNERS OF THE BRIDGE SHALL BE BENT TO SUCH AN ANGLE THAT IS APPROXIMATELY EQUAL TO THE CONFIGURATION OF THE BRIDGE'S OUTSIDE CORNER.
      4.2.3. PLACEMENT OF REINFORCEMENT FOR PRECAST WINGWALLS AND HEADWALLS - THE COVER OF CONCRETE OVER THE LONGITUDINAL AND TRANSVERSE REINFORCEMENT SHALL BE 2" MINIMUM. THE CLEAR DISTANCE FROM THE END OF EACH PRECAST ELEMENT TO THE END OF REINFORCEMENT STEEL SHALL NOT BE LESS THAN 1½" NOR MORE THAN 3". REINFORCEMENT SHALL BE ASSEMBLED UTILIZING A SINGLE LAYER OF WELDED WIRE FABRIC, OR A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS. WELDED WIRE FABRIC SHALL BE COMPOSED OF TRANSVERSE AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE ELEMENT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW.
   4.3. LAPS, WELDS, SPACING
      4.3.1. LAPS, WELDS, AND SPACING FOR PRECAST BRIDGE UNITS - TENSION SPLICES IN THE CIRCUMFERENTIAL REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.30.2 AND 8.32.6. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.30.1 AND 8.32.5. THE OVERLAP OF WELDED WIRE FABRIC SHALL BE MEASURED BETWEEN THE OUTER-MOST LONGITUDINAL WIRES OF EACH FABRIC SHEET. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.25. FOR SPLICES OTHER THAN TENSION SPLICES, THE OVERLAP SHALL BE A MINIMUM OF 1'-0" FOR WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS. THE SPACING CENTER TO CENTER OF THE CIRCUMFERENTIAL WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES SHALL NOT BE MORE THAN 8". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL DISTRIBUTION STEEL FOR EITHER LINE OF REINFORCING IN THE TOP SLAB SHALL BE NOT MORE THAN 1'-4".
      4.3.2. LAPS, WELDS, AND SPACING FOR PRECAST WINGWALLS AND HEADWALLS - SPLICES IN THE REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.30.2 AND 8.32.6. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.30.1 AND 8.32.5. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.25. THE SPACING CENTER-TO-CENTER OF THE WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 8".
   4.4. CURING - THE PRECAST CONCRETE ELEMENTS SHALL BE CURED FOR A SUFFICIENT TIME SO THAT THE CONCRETE WILL DEVELOP THE SPECIFIED COMPRESSIVE STRENGTH IN 28 DAYS OR LESS. ANY ONE OF THE FOLLOWING METHODS OF CURING OR COMBINATIONS THERE OF SHALL BE USED:
      4.4.1. STEAM CURING - THE PRECAST ELEMENTS MAY BE LOW-PRESSURE STEAM CURED BY A SYSTEM THAT WILL MAINTAIN A MOIST ATMOSPHERE.
      4.4.2. WATER CURING - THE PRECAST ELEMENTS MAY BE WATER CURED BY ANY METHOD THAT WILL KEEP THE SECTIONS MOIST.
      4.4.3. MEMBRANE CURING - A SEALING MEMBRANE CONFORMING TO THE REQUIREMENTS OF ASTM SPECIFICATION C309 MAY BE APPLIED AND SHALL BE LEFT INTACT UNTIL THE REQUIRED CONCRETE COMPRESSIVE STRENGTH IS ATTAINED. THE CONCRETE TEMPERATURE AT THE TIME OF STRENGTH IS ATTAINED. THE CONCRETE TEMPERATURE AT THE TIME OF APPLICATION SHALL BE WITHIN +/- 10 DEGREES F OF THE ATMOSPHERIC TEMPERATURE. ALL SURFACES SHALL BE KEPT MOIST PRIOR TO THE APPLICATION OF THE COMPOUNDS AND SHALL BE DAMP WHEN THE COMPOUND IS APPLIED.
   4.5. STORAGE, HANDLING & DELIVERY
      4.5.1. STORAGE - PRECAST CONCRETE BRIDGE ELEMENTS SHALL BE LIFTED AND STORED IN "AS-CAST" POSITION. PRECAST CONCRETE HEADWALL AND WINGWALL UNITS ARE CAST, STORED AND SHIPPED IN A FLAT POSITION. THE PRECAST ELEMENTS SHALL BE STORED IN SUCH A MANNER TO PREVENT CRACKING OR DAMAGE. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE. THE UNITS SHALL NOT BE MOVED UNTIL THE CONCRETE COMPRESSIVE STRENGTH HAS REACHED A MINIMUM OF 2500 PSI, AND THEY SHALL NOT BE STORED IN AN UPRIGHT POSITION.
      4.5.2. HANDLING - HANDLING DEVICES SHALL BE PERMITTED IN EACH PRECAST ELEMENT FOR THE PURPOSE OF HANDLING AND SETTING. SPREADER BEAMS MAY BE REQUIRED FOR THE LIFTING OF PRECAST CONCRETE BRIDGE ELEMENTS TO PRECLUDE DAMAGE FROM BENDING OR TORSION FORCES.
      4.5.3. DELIVERY - PRECAST CONCRETE ELEMENTS MUST NOT BE SHIPPED UNTIL THE CONCRETE HAS ATTAINED THE SPECIFIED DESIGN COMPRESSIVE STRENGTH, OR AS DIRECTED BY THE DESIGN ENGINEER. PRECAST CONCRETE ELEMENTS MAY BE UNLOADED AND PLACED ON THE GROUND AT THE SITE UNTIL INSTALLED. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE.
   4.6. QUALITY ASSURANCE - THE PRECASTER SHALL DEMONSTRATE ADHERENCE TO THE STANDARDS SET FORTH IN THE NPCA QUALITY CONTROL MANUAL. THE PRECASTER SHALL MEET EITHER SECTION 4.7.1 OR 4.7.2
      4.6.1. CERTIFICATION - THE PRECASTER SHALL BE CERTIFIED BY THE PRECAST/PRESTRESSED CONCRETE INSTITUTE PLANT CERTIFICATION PROGRAM OR THE NATIONAL PRECAST CONCRETE ASSOCIATION'S PLANT CERTIFICATION PROGRAM PRIOR TO AND DURING PRODUCTION OF THE PRODUCTS COVERED BY THIS SPECIFICATION.
      4.6.2. QUALIFICATIONS, TESTING AND INSPECTION
         4.6.2.1. THE PRECASTER SHALL HAVE BEEN IN THE BUSINESS OF PRODUCING PRECAST CONCRETE PRODUCTS SIMILAR TO THOSE SPECIFIED FOR A MINIMUM OF THREE YEARS. HE SHALL MAINTAIN A PERMANENT QUALITY CONTROL DEPARTMENT OR RETAIN AN INDEPENDENT TESTING AGENCY ON A CONTINUING BASIS. THE AGENCY SHALL ISSUE A REPORT, CERTIFIED BY A LICENSED ENGINEER, DETAILING THE ABILITY OF THE PRECASTER TO PRODUCE QUALITY PRODUCTS CONSISTENT WITH INDUSTRY STANDARDS.
         4.6.2.2. THE PRECASTER SHALL SHOW THAT THE FOLLOWING TESTS ARE PERFORMED IN ACCORDANCE WITH THE ASTM STANDARDS INDICATED. TESTS SHALL BE PERFORMED AS INDICATED IN SECTION 6 OF THESE SPECIFICATIONS.
            4.6.2.2.1. AIR CONTENT: C231 OR C173
            4.6.2.2.2. COMPRESSIVE STRENGTH: C31,C39,C497
         4.6.2.3. THE PRECASTER SHALL PROVIDE DOCUMENTATION DEMONSTRATING COMPLIANCE WITH THIS SECTION TO CONTECH® BRIDGE SOLUTIONS AT REGULAR INTERVALS OR UPON REQUEST.
         4.6.2.4. THE OWNER MAY PLACE AN INSPECTOR IN THE PLANT WHEN THE PRODUCTS COVERED BY THIS SPECIFICATION ARE BEING MANUFACTURED.
      4.6.3. DOCUMENTATION - THE PRECASTER SHALL SUBMIT PRECAST PRODUCTION REPORTS TO CONTECH® BRIDGE SOLUTIONS AS REQUIRED.

5. PERMISSIBLE VARIATIONS
   5.1. BRIDGE UNITS
      5.1.1. INTERNAL DIMENSIONS - THE INTERNAL DIMENSION SHALL VARY NOT MORE THAN 1% FROM THE DESIGN DIMENSIONS NOR MORE THAN 1½" WHICHEVER IS LESS.
      5.1.2. SLAB AND WALL THICKNESS - THE SLAB AND WALL THICKNESS SHALL NOT BE LESS THAN THAT SHOWN IN THE DESIGN BY MORE THAN ½". A THICKNESS MORE THAN THAT REQUIRED IN THE DESIGN SHALL NOT BE CAUSE FOR REJECTION.
      5.1.3. LENGTH OF OPPOSITE SURFACES - VARIATIONS IN LAYING LENGTHS OF TWO OPPOSITE SURFACES OF THE BRIDGE UNIT SHALL NOT BE MORE THAN ½" IN ANY SECTION, EXCEPT WHERE BEVELED ENDS FOR LAYING OF CURVES ARE SPECIFIED BY THE PURCHASER.
      5.1.4. LENGTH OF SECTION - THE UNDERRUN IN LENGTH OF A SECTION SHALL NOT BE MORE THAN ½" IN ANY BRIDGE UNIT.
      5.1.5. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1" FOR THE INSIDE CIRCUMFERENTIAL STEEL AS MEASURED TO THE EXTERNAL OR INTERNAL SURFACE OF THE BRIDGE. THESE TOLERANCES OR COVER REQUIREMENTS DO NOT APPLY TO MATING SURFACES OF THE JOINTS.
      5.1.6. AREA OF REINFORCEMENT - THE AREAS OF STEEL REINFORCEMENT SHALL BE THE DESIGN STEEL AREAS AS SHOWN IN THE MANUFACTURER'S SHOP DRAWINGS. STEEL AREAS GREATER THAN THOSE REQUIRED SHALL NOT BE CAUSE FOR REJECTION. THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCEMENT SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCEMENT.
   5.2. WINGWALLS & HEADWALLS
      5.2.1. WALL THICKNESS - THE WALL THICKNESS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ¼".
      5.2.2. LENGTH/HEIGHT OF WALL SECTIONS - THE LENGTH AND HEIGHT OF THE WALL SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.2.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN THE POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½".
      5.2.4. SIZE OF REINFORCEMENT - THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCING SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCING. STEEL AREA GREATER THAN THAT REQUIRED SHALL NOT BE CAUSE FOR REJECTION.

6. TESTING/ INSPECTION
   6.1. TESTING
      6.1.1. TYPE OF TEST SPECIMEN - CONCRETE COMPRESSIVE STRENGTH SHALL BE DETERMINED FROM COMPRESSION TESTS MADE ON CYLINDERS OR CORES. FOR CYLINDER TESTING, A MINIMUM OF 4 CYLINDERS SHALL BE TAKEN FOR EACH BRIDGE ELEMENT. EACH ELEMENT SHALL BE CONSIDERED SEPARATELY FOR THE PURPOSE OF TESTING AND ACCEPTANCE.
      6.1.2. COMPRESSION TESTING - CYLINDERS SHALL BE MADE AND TESTED AS PRESCRIBED BY THE ASTM C39 SPECIFICATION. CYLINDERS SHALL BE CURED IN THE SAME ENVIRONMENT AS THE BRIDGE ELEMENTS. CORES SHALL BE OBTAINED AND TESTED FOR COMPRESSIVE STRENGTH IN ACCORDANCE WITH THE PROVISIONS OF THE ASTM C42 SPECIFICATION.
      6.1.3. ACCEPTABILITY OF CYLINDER TESTS - WHEN THE AVERAGE COMPRESSIVE STRENGTH OF ALL CYLINDERS TESTED IS EQUAL TO OR GREATER THAN THE DESIGN COMPRESSIVE STRENGTH, AND NOT MORE THAN 10% OF THE CYLINDERS TESTED HAVE A COMPRESSIVE STRENGTH LESS THAN THE DESIGN CONCRETE STRENGTH, AND NO CYLINDER TESTED HAS A COMPRESSIVE STRENGTH LESS THAN 80% OF THE DESIGN COMPRESSIVE STRENGTH, THEN THE ELEMENT SHALL BE ACCEPTED. WHEN THE COMPRESSIVE STRENGTH OF THE CYLINDERS TESTED DOES NOT CONFORM TO THESE ACCEPTANCE CRITERIA, THE ACCEPTABILITY OF THE ELEMENT MAY BE DETERMINED AS DESCRIBED IN SECTION 6.1.4, BELOW.
      6.1.4. ACCEPTABILITY OF CORE TESTS - THE COMPRESSIVE STRENGTH OF THE CONCRETE IN A BRIDGE ELEMENT IS ACCEPTABLE WHEN THE AVERAGE CORE TEST STRENGTH IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH. WHEN THE COMPRESSIVE STRENGTH OF A CORE TESTED IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH THAT CORE WAS TAKEN MAY BE RE-CORED. WHEN THE COMPRESSIVE STRENGTH OF THE RE-CORE IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH, THE COMPRESSIVE STRENGTH OF THE CONCRETE IN THAT BRIDGE ELEMENT IS ACCEPTABLE.
         6.1.4.1. WHEN THE COMPRESSIVE STRENGTH OF ANY RECORE IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH THAT CORE WAS TAKEN SHALL BE REJECTED.
         6.1.4.2. PLUGGING CORE HOLES - THE CORE HOLES SHALL BE PLUGGED AND SEALED BY THE MANUFACTURER IN A MANNER SUCH THAT THE ELEMENTS WILL MEET ALL OF THE TEST REQUIREMENTS OF THIS SPECIFICATION. PRECAST ELEMENTS SO SEALED SHALL BE CONSIDERED SATISFACTORY FOR USE.
         6.1.4.3. TEST EQUIPMENT - EVERY MANUFACTURER FURNISHING PRECAST ELEMENTS UNDER THIS SPECIFICATION SHALL FURNISH ALL FACILITIES AND PERSONNEL NECESSARY TO CARRY OUT THE TEST REQUIRED.
   6.2. INSPECTION - THE QUALITY OF MATERIALS, THE PROCESS OF MANUFACTURE, AND THE FINISHED PRECAST ELEMENTS SHALL BE SUBJECT TO INSPECTION BY THE PURCHASER.

7. JOINTS
   THE BRIDGE UNITS SHALL BE PRODUCED WITH FLAT BUTT ENDS. THE ENDS OF THE BRIDGE UNITS SHALL BE SUCH THAT WHEN THE SECTIONS ARE LAID TOGETHER THEY WILL MAKE A CONTINUOUS LINE WITH A SMOOTH INTERIOR FREE OF APPRECIABLE IRREGULARITIES, ALL COMPATIBLE WITH THE PERMISSIBLE VARIATIONS IN SECTION 5, ABOVE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED ¾".

8. WORKMANSHIP/ FINISH
   THE BRIDGE UNITS, WINGWALLS, AND HEADWALLS SHALL BE SUBSTANTIALLY FREE OF FRACTURES. THE ENDS OF THE BRIDGE UNITS SHALL BE NORMAL TO THE WALLS AND CENTERLINE OF THE BRIDGE SECTION, WITHIN THE LIMITS OF THE VARIATIONS GIVEN IN SECTION 5, ABOVE, EXCEPT WHERE BEVELED ENDS ARE SPECIFIED. THE FACES OF THE WINGWALLS AND HEADWALLS SHALL BE PARALLEL TO EACH OTHER, WITHIN THE LIMITS OF VARIATIONS GIVEN IN SECTION 5, ABOVE. THE SURFACE OF THE PRECAST ELEMENTS SHALL BE A SMOOTH STEEL FORM OR TROWELED SURFACE. TRAPPED AIR POCKETS CAUSING SURFACE DEFECTS SHALL BE CONSIDERED AS PART OF A SMOOTH, STEEL FORM FINISH.

9. REPAIRS
   PRECAST ELEMENTS MAY BE REPAIRED, IF NECESSARY, BECAUSE OF IMPERFECTIONS IN MANUFACTURE OR HANDLING DAMAGE AND WILL BE ACCEPTABLE IF, IN THE OPINION OF THE PURCHASER, THE REPAIRS ARE SOUND, PROPERLY FINISHED AND CURED, AND THE REPAIRED SECTION CONFORMS TO THE REQUIREMENTS OF THIS SPECIFICATION.

10. REJECTION
    THE PRECAST ELEMENTS SHALL BE SUBJECT TO REJECTION ON ACCOUNT OF ANY OF THE SPECIFICATION REQUIREMENTS. INDIVIDUAL PRECAST ELEMENTS MAY BE REJECTED BECAUSE OF ANY OF THE FOLLOWING:
    10.1. FRACTURES OR CRACKS PASSING THROUGH THE WALL, EXCEPT FOR A SINGLE END CRACK THAT DOES NOT EXCEED ONE HALF THE THICKNESS OF THE WALL.
    10.2. DEFECTS THAT INDICATE PROPORTIONING, MIXING, AND MOLDING NOT IN COMPLIANCE WITH SECTION 4 OF THESE SPECIFICATIONS.
    10.3. HONEYCOMBED OR OPEN TEXTURE.
    10.4. DAMAGED ENDS, WHERE SUCH DAMAGE WOULD PREVENT MAKING A SATISFACTORY JOINT.

11. MARKING
    EACH BRIDGE UNIT SHALL BE CLEARLY MARKED BY WATERPROOF PAINT. THE FOLLOWING SHALL BE SHOWN ON THE INSIDE OF THE VERTICAL LEG OF THE BRIDGE SECTION:
    BRIDGE SPAN x BRIDGE RISE
    DATE OF MANUFACTURE
    NAME OR TRADEMARK OF THE MANUFACTURER

10/21/10

"NO AS-BUILT INFORMATION ON THIS SHEET"

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 11-17-10

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/9/10

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/10/10

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH® CONSTRUCTION PRODUCTS INC.
www.contech-cpi.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CON/SPAN® BRIDGE SYSTEMS
CONTECH **CONTRACT** DRAWING

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. 36225, EXPIRATION DATE: 8/19/2012.

WILLOW POND

LOTS 1-13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B ', 'C', 'D' & NON-BUILDABLE PARCEL 'E'
A RESUBDIVISION OF NAECKER PROPERTY LOT 4, PLAT NO. 7288 AND LOT 6, PLAT NO. 20373-20375

TAX MAP 34 GRID 17 — PARCEL 382
FIFTH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

PROJECT NUMBER:	DATE:
352689	4/23/2010
DESIGNED:	DRAWN:
DMR	TRL
CHECKED:	APPROVED:
JMF	PAC
SHEET NO.: CT7 20 OF CT8 22	

F-10-106

SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS (CONT'D)

12. INSTALLATION PREPARATION
TO ENSURE CORRECT INSTALLATION OF THE PRECAST CONCRETE BRIDGE SYSTEM, CARE AND CAUTION MUST BE EXERCISED IN FORMING THE SUPPORT AREAS FOR BRIDGE UNITS, HEADWALL, AND WINGWALL ELEMENTS. EXERCISING SPECIAL CARE WILL FACILITATE THE RAPID INSTALLATION OF THE PRECAST COMPONENTS.

12.1. FOOTINGS
DO NOT OVER EXCAVATE FOUNDATIONS UNLESS DIRECTED BY SITE SOIL ENGINEER TO REMOVE UNSUITABLE SOIL.

THE SITE SOILS ENGINEER SHALL CERTIFY THAT THE BEARING CAPACITY MEETS OR EXCEEDS THE FOOTING DESIGN REQUIREMENTS, PRIOR TO THE CONTRACTOR POURING OF THE FOOTINGS. A COPY OF THE REPORT SHALL BE SUBMITTED TO CONTECH® BRIDGE SOLUTIONS PRIOR TO SHIPMENT OF PRECAST CONCRETE ELEMENTS.

THE BRIDGE UNITS AND WINGWALLS SHALL BE INSTALLED ON EITHER PRECAST OR CAST-IN-PLACE CONCRETE FOOTINGS. THE SIZE AND ELEVATION OF THE FOOTINGS SHALL BE AS DESIGNED BY THE ENGINEER. A KEYWAY SHALL BE FORMED IN THE TOP SURFACE OF THE BRIDGE FOOTING AS SPECIFIED ON THE PLANS. NO KEYWAY IS REQUIRED IN THE WINGWALL FOOTINGS, UNLESS OTHERWISE SPECIFIED ON THE PLANS.

THE FOOTINGS SHALL BE GIVEN A SMOOTH FLOAT FINISH AND SHALL REACH A COMPRESSIVE STRENGTH OF 2,000 PSI BEFORE PLACEMENT OF THE BRIDGE AND WINGWALL ELEMENTS. BACKFILLING SHALL NOT BEGIN UNTIL THE FOOTING HAS REACHED THE FULL DESIGN COMPRESSIVE STRENGTH WITHOUT WRITTEN APPROVAL FROM CONTECH® BRIDGE SOLUTIONS.

THE FOOTING SURFACE SHALL BE CONSTRUCTED IN ACCORDANCE WITH GRADES SHOWN ON THE PLANS. WHEN TESTED WITH A 10'-0" STRAIGHT EDGE, THE SURFACE SHALL NOT VARY MORE THAN ¼" IN 10'-0".

IF A PRECAST CONCRETE FOOTING IS USED, THE CONTRACTOR SHALL PREPARE A 4" THICK BASE LAYER OF COMPACTED GRANULAR MATERIAL THE FULL WIDTH OF THE FOOTING PRIOR TO PLACING THE PRECAST FOOTING.

THE FOUNDATIONS FOR PRECAST CONCRETE BRIDGE ELEMENTS AND WINGWALLS MUST BE CONNECTED BY REINFORCEMENT TO FORM ONE MONOLITHIC BODY. EXPANSION JOINTS SHALL NOT BE USED.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONSTRUCTION OF THE FOUNDATIONS PER THE PLANS AND SPECIFICATIONS.

13. INSTALLATION
13.1. GENERAL - THE INSTALLATION OF THE PRECAST CONCRETE ELEMENTS SHALL BE AS EXPLAINED IN THE PUBLICATION CON/SPAN BRIDGE SYSTEMS INSTALLATION HANDBOOK.
13.1.1. LIFTING - IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT A CRANE OF THE CORRECT LIFTING CAPACITY IS AVAILABLE TO HANDLE THE PRECAST CONCRETE UNITS. THIS CAN BE ACCOMPLISHED BY USING THE WEIGHTS GIVEN FOR THE PRECAST CONCRETE COMPONENTS AND BY DETERMINING THE LIFTING REACH FOR EACH CRANE UNIT. SITE CONDITIONS MUST BE CHECKED WELL IN ADVANCE OF SHIPPING TO ENSURE PROPER CRANE LOCATION AND TO AVOID ANY LIFTING RESTRICTIONS. THE LIFT ANCHORS OR HOLES PROVIDED IN EACH UNIT ARE THE ONLY MEANS TO BE USED TO LIFT THE ELEMENTS. THE PRECAST CONCRETE ELEMENTS MUST NOT BE SUPPORTED OR RAISED BY OTHER MEANS THAN THOSE GIVEN IN THE MANUALS AND DRAWINGS WITHOUT WRITTEN APPROVAL FROM CONTECH® BRIDGE SOLUTIONS.
13.1.2. CONSTRUCTION EQUIPMENT WEIGHT RESTRICTIONS - IN NO CASE SHALL EQUIPMENT OPERATING IN EXCESS OF THE DESIGN LOAD (HS20 OR HS25) BE PERMITTED OVER THE BRIDGE UNITS UNLESS APPROVED BY CONTECH® BRIDGE SOLUTIONS.
13.1.2.1. IN THE IMMEDIATE AREA OF THE BRIDGE UNITS, THE FOLLOWING RESTRICTIONS FOR THE USE OF HEAVY CONSTRUCTION MACHINERY DURING BACKFILLING OPERATIONS APPLY:
- NO CONSTRUCTION EQUIPMENT SHALL CROSS THE BARE PRECAST CONCRETE BRIDGE UNIT.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF 4" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 10 TONS MAY CROSS THE BRIDGE.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF 1'-0" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 30 TONS MAY CROSS THE BRIDGE.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED THE DESIGN COVER, OR 2'-0" MINIMUM, OVER THE CROWN OF THE PRECAST CONCRETE BRIDGE, CONSTRUCTION EQUIPMENT WITHIN THE DESIGN LOAD LIMITS FOR THE ROAD MAY CROSS THE PRECAST CONCRETE BRIDGE.

13.2. LEVELING PAD/SHIMS - THE BRIDGE UNITS AND WINGWALLS SHALL BE SET ON MASONITE OR STEEL SHIMS MEASURING 6" x 6", MINIMUM, UNLESS SHOWN OTHERWISE ON THE PLANS. A MINIMUM GAP OF ½" SHALL BE PROVIDED BETWEEN THE FOOTING AND THE BOTTOM OF THE BRIDGE'S VERTICAL LEGS OR THE BOTTOM OF THE WINGWALL.
13.3. PLACEMENT OF BRIDGE UNITS - THE BRIDGE UNITS SHALL BE PLACED AS SHOWN ON THE ENGINEER'S PLAN DRAWINGS. SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE AND GRADE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED ¾".

IT IS IMPERATIVE THAT ANY LATERAL SPREADING OF THE BRIDGE ELEMENTS BE AVOIDED DURING AND AFTER THEIR PLACEMENT. GENERALLY, HORIZONTAL CABLE TIES ARE SHIPPED IN THE LARGER BRIDGE ELEMENTS TO PREVENT THIS SPREADING. IF, DUE TO SITE RESTRICTIONS, THESE TIES MUST BE REMOVED PRIOR TO PLACEMENT OF THE BRIDGE ELEMENT, THE CONTRACTOR MUST PROVIDE HARDWOOD WEDGES ON SITE. THESE HARDWOOD WEDGES ARE PLACED IN THE KEYWAY OUTSIDE THE LEGS OF THE BRIDGE ELEMENTS, AND SMALLER SHIMS AND WEDGES ARE ADDED BEFORE COMPLETE RELEASE OF THE BRIDGE ELEMENT FROM THE CRANE. ALSO, A SUPPLY OF ¼", ½" & ⅛" THICK STEEL OR MASONITE SHIMS FOR VARIOUS SHIMMING PURPOSES SHOULD BE ON SITE, PER SECTION 13.2.

13.4. PLACEMENT OF WINGWALLS & HEADWALLS - THE WINGWALLS AND HEADWALLS SHALL BE PLACED AS SHOWN ON THE PLAN DRAWINGS. SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE AND GRADE.
13.5. WATERPROOFING/JOINT PROTECTION AND SUBSURFACE DRAINAGE
13.5.1. EXTERNAL PROTECTION OF JOINTS - THE BUTT JOINT MADE BY TWO ADJOINING BRIDGE UNITS SHALL BE COVERED WITH A 7½" x 13½" PREFORMED BITUMINOUS JOINT SEALANT AND A MINIMUM OF A 9" WIDE JOINT WRAP. THE SURFACE SHALL BE FREE OF DIRT BEFORE APPLYING THE JOINT MATERIAL. A PRIMER COMPATIBLE WITH THE JOINT WRAP TO BE USED SHALL BE APPLIED FOR A MINIMUM WIDTH OF 9" ON EACH SIDE OF THE JOINT. THE EXTERNAL WRAP SHALL BE EITHER EZ-WRAP RUBBER BY PRESS-SEAL GASKET CORPORATION, SEAL WRAP BY MAR MAC MANUFACTURING CO. INC. OR APPROVED EQUAL. THE JOINT SHALL BE COVERED CONTINUOUSLY FROM THE BOTTOM OF ONE BRIDGE SECTION LEG, ACROSS THE TOP OF THE BRIDGE AND TO THE OPPOSITE BRIDGE SECTION LEG. ANY LAPS THAT RESULT IN THE JOINT WRAP SHALL BE A MINIMUM OF 6" LONG WITH THE OVERLAP RUNNING DOWNHILL.
13.5.2. IN ADDITION TO THE JOINTS BETWEEN BRIDGE UNITS, THE JOINT BETWEEN THE END BRIDGE UNIT AND THE HEADWALL SHALL ALSO BE SEALED AS DESCRIBED ABOVE. IF PRECAST WINGWALLS ARE USED, THE JOINT BETWEEN THE END BRIDGE UNIT AND THE WINGWALL SHALL BE SEALED WITH A 2'-0" STRIP OF FILTER FABRIC. ALSO, IF LIFT HOLES ARE FORMED IN THE BRIDGE UNITS, THEY SHALL BE PRIMED AND COVERED WITH A 9" x 9" SQUARE OF JOINT WRAP.
13.5.3. DURING THE BACKFILLING OPERATION, CARE SHALL BE TAKEN TO KEEP THE JOINT WRAP IN ITS PROPER LOCATION OVER THE JOINT.
13.5.4. SUBSOIL DRAINAGE SHALL BE AS DIRECTED BY THE ENGINEER.

13.6. GROUTING
13.6.1. GROUTING SHALL NOT BE PERFORMED WHEN TEMPERATURES ARE EXPECTED TO GO BELOW 35° FOR A PERIOD OF 72 HOURS. FILL THE BRIDGE-FOUNDATION KEYWAY WITH CEMENT GROUT (PORTLAND CEMENT AND WATER OR CEMENT MORTAR COMPOSED OF PORTLAND CEMENT, SAND AND WATER) WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI. VIBRATE AS REQUIRED TO ENSURE THAT THE ENTIRE KEY AROUND THE BRIDGE ELEMENT IS COMPLETELY FILLED. IF BRIDGE ELEMENTS HAVE BEEN SET WITH TEMPORARY TIES (CABLES, BARS, ETC.) GROUT MUST ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI BEFORE TIES MAY BE REMOVED.
13.6.2. ALL GROUT SHALL HAVE A MAXIMUM AGGREGATE SIZE OF ¼".
13.6.3. LIFTING AND ERECTION ANCHOR RECESSES SHALL BE FILLED WITH GROUT.

13.7. BACKFILL
13.7.1. DO NOT PERFORM BACKFILLING DURING WET OR FREEZING WEATHER.
13.7.2. NO BACKFILL SHALL BE PLACED AGAINST ANY STRUCTURAL ELEMENTS UNTIL THEY HAVE BEEN APPROVED BY THE ENGINEER.
13.7.3. BACKFILL SHALL BE CONSIDERED AS ALL REPLACED EXCAVATION AND NEW EMBANKMENT ADJACENT TO THE PRECAST CONCRETE ELEMENTS. THE PROJECT CONSTRUCTION AND MATERIAL SPECIFICATIONS, WHICH INCLUDE THE SPECIFICATIONS FOR EXCAVATION FOR STRUCTURES AND ROADWAY EXCAVATION AND EMBANKMENT CONSTRUCTION, SHALL APPLY EXCEPT AS MODIFIED IN THIS SECTION.
13.7.4. BACKFILL ZONES:
- IN-SITU SOIL
- ZONE A: CONSTRUCTED EMBANKMENT OR OVERFILL.
- ZONE B: FILL THAT IS DIRECTLY ASSOCIATED WITH PRECAST CONCRETE BRIDGE INSTALLATION.
- ZONE C: ROAD STRUCTURE.

13.7.5. REQUIRED BACKFILL PROPERTIES
13.7.5.1. IN-SITU SOIL - NATURAL GROUND IS TO BE SUFFICIENTLY STABLE TO ALLOW EFFECTIVE SUPPORT TO THE PRECAST CONCRETE BRIDGE UNITS. AS A GUIDE, THE EXISTING NATURAL GROUND SHOULD BE OF SIMILAR QUALITY AND DENSITY TO ZONE B MATERIAL FOR MINIMUM LATERAL DIMENSION OF ONE BRIDGE SPAN OUTSIDE OF THE BRIDGE FOOTING.
13.7.5.2. ZONE A - ZONE A REQUIRES FILL MATERIAL WITH SPECIFICATIONS AND COMPACTING PROCEDURES EQUAL TO THAT FOR NORMAL ROAD EMBANKMENTS.
13.7.5.3. ZONE B - GENERALLY, SOILS SHALL BE REASONABLY FREE OF ORGANIC MATTER, AND, NEAR CONCRETE SURFACES, FREE OF STONES LARGER THAN 3" IN DIAMETER SEE CHARTS FOR DETAILED DESCRIPTIONS OF ACCEPTABLE SOILS.
13.7.5.4. ZONE C - ZONE C IS THE ROAD SECTION OF GRAVEL, ASPHALT OR CONCRETE BUILT IN COMPLIANCE WITH LOCAL ENGINEERING PRACTICES.

13.7.6. PLACING AND COMPACTING BACKFILL
DUMPING FOR BACKFILLING IS NOT ALLOWED ANY NEARER THAN 3'-0" FROM THE BRIDGE LEG.

THE FILL MUST BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE MAXIMUM DIFFERENCE IN THE SURFACE LEVELS OF THE FILL ON OPPOSITE SIDES OF THE BRIDGE MUST NOT EXCEED 2'-0".

THE FILL BEHIND WINGWALLS MUST BE PLACED AT THE SAME TIME AS THAT OF THE BRIDGE FILL. IT MUST BE PLACED IN PROGRESSIVELY PLACED HORIZONTAL LAYERS NOT EXCEEDING 8" PER LAYER.

THE BACKFILL OF ZONE B SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95% OF THE STANDARD PROCTOR, AS REQUIRED BY AASHTO T-99.

SOIL WITHIN 1'-0" OF CONCRETE SURFACES SHOULD BE HAND-COMPACTED. ELSEWHERE, USE OF ROLLERS IS ACCEPTABLE. IF VIBRATING ROLLER-COMPACTORS ARE USED, THEY SHOULD NOT BE STARTED OR STOPPED WITHIN ZONE B AND THE VIBRATION FREQUENCY SHOULD BE AT LEAST 30 REVOLUTIONS PER SECOND.

THE BACKFILL MATERIAL AND COMPACTING BEHIND WINGWALLS SHOULD SATISFY THE CRITERIA FOR THE BRIDGE BACKFILL, ZONE B.

BACKFILL AGAINST A WATERPROOFED SURFACE SHALL BE PLACED CAREFULLY TO AVOID DAMAGE TO THE WATERPROOFING MATERIAL.

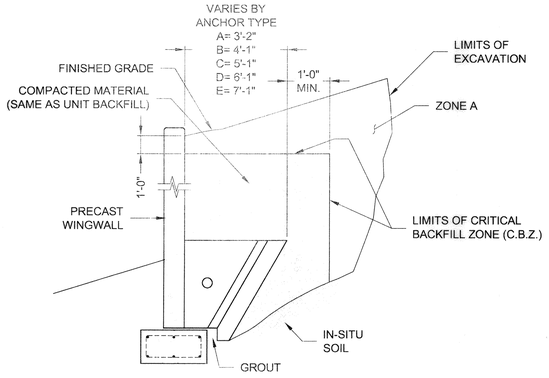
13.7.7. BRIDGE UNITS
FOR FILL HEIGHTS OVER 12'-0", NO BACKFILLING MAY BEGIN UNTIL A BACKFILL COMPACTION TESTING PLAN HAS BEEN COORDINATED WITH AND APPROVED BY CONTECH® BRIDGE SOLUTIONS. COST OF THE BACKFILL COMPACTION TESTING SHALL BE INCLUDED IN THE COST OF THE PRECAST UNITS. THIS INCLUDED COST APPLIES ONLY TO PROJECTS WITH FILL HEIGHTS OVER 12'-0" (AS MEASURED FROM TOP CROWN OF BRIDGE TO FINISHED GRADE).

13.7.8. WINGWALLS
BACKFILL IN FRONT OF WINGWALLS SHALL BE CARRIED TO GROUND LINES SHOWN IN THE PLANS.

13.7.9. MONITORING
THE CONTRACTOR SHALL CHECK SETTLEMENTS AND HORIZONTAL DISPLACEMENT OF FOUNDATION TO ENSURE THAT THEY ARE WITHIN THE ALLOWABLE LIMIT PROVIDED BY THE ENGINEER. THESE MEASUREMENTS SHOULD GIVE AN INDICATION OF THE SETTLEMENTS AND DEFORMATIONS ALONG THE LENGTH OF THE FOUNDATIONS.

THE FIRST MEASUREMENT ROW SHOULD TAKE PLACE AFTER THE ERECTION OF ALL PRECAST BRIDGE SYSTEM ELEMENTS, A SECOND AFTER COMPLETION OF BACKFILLING, AND A THIRD BEFORE OPENING OF THE BRIDGE TO TRAFFIC. FURTHER MEASUREMENTS MAY BE MADE ACCORDING TO LOCAL CONDITIONS.

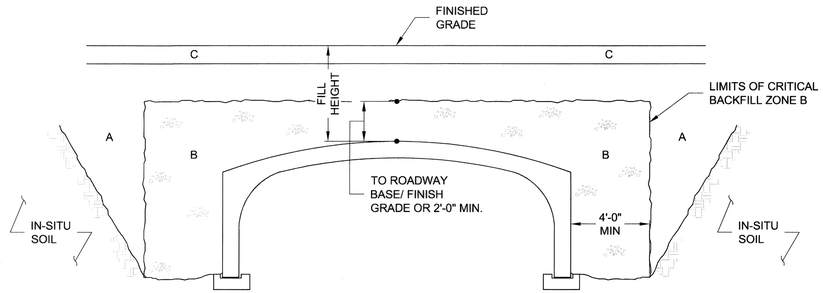
THE MAXIMUM DIFFERENCE IN VERTICAL DISPLACEMENTS 'V' SHOULD NOT EXCEED 1" ALONG THE LENGTH OF ONE FOUNDATION.



WALL BACKFILL REQUIREMENTS

ACCEPTABLE SOILS FOR USE IN ZONE B BACKFILL

TYPICAL USCS MATERIALS	AASHTO GROUP	AASHTO SUBGROUP	PERCENT PASSING US SIEVE NO.			CHARACTER OF FRACTION PASSING NO. 40 SIEVE		SOIL DESRIPTION
			#10	#40	#200	LIQUID LIMIT	PLASTICITY INDEX	
GW, GP, SP	A1	A-1a	50 MAX	30 MAX	15 MAX		6 MAX	LARGELY GRAVEL BUT CAN INCLUDE SAND AND FINES
GM, SW, SP, SM		A-1b		50 MAX	25 MAX		6 MAX	GRAVELLY SAND OR GRADED SAND, MAY INCLUDE FINES
GM, SM, ML, SP, GP	A2	A-2-4			35 MAX	40 MAX	10 MAX	SANDS, GRAVELS WITH LOW-PLASTICITY SILT FINES
SC, GC, GM		A-2-5			35 MAX	41 MIN	10 MAX	SANDS, GRAVELS WITH PLASTIC SILT FINES
SP, SM, SW	A3			51 MIN	10 MAX		NON-PLASTIC	FINE SANDS
ML, SM, SC	A4				36 MIN	40 MAX	10 MAX	LOW-COMPRESSIBILTY SILTS



SPAN	FILL HEIGHT	ACCEPTABLE MATERIAL INSIDE ZONE B
≤ 24'-0"	≥ 12'-0"	A1, A3
≤ 24'-0"	< 12'-0"	A1, A2, A3, A4
> 24'-0"	ALL	A1, A3

BACKFILL REQUIREMENTS

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 11-17-10

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/19/10

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/18/10

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH® CONSTRUCTION PRODUCTS INC.
www.contech-cpi.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CON/SPAN® BRIDGE SYSTEMS
CONTECH **CONTRACT** DRAWING

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. 36225, EXPIRATION DATE: 8/19/2012

10/21/10

STATE OF MARYLAND — STEPHEN L. GREENER — LIC. NO. 36225 — PROFESSIONAL ENGINEER

"NO AS-BUILT INFORMATION ON THIS SHEET"

WILLOW POND

LOTS 1-13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B ', 'C', 'D' & NON-BUILDABLE PARCEL 'E'
A RESUBDIVISION OF NAECKER PROPERTY LOT 4, PLAT NO. 7288 AND LOT 6, PLAT NO. 20373-20375

TAX MAP 34 GRID 17 — PARCEL 382
FIFTH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

PROJECT NUMBER:	DATE:
352689	4/23/2010
DESIGNED: DMR	DRAWN: TRL
CHECKED: JMF	APPROVED: PAC
SHEET NO.: CT8 21	OF CT8 22

F-10-106

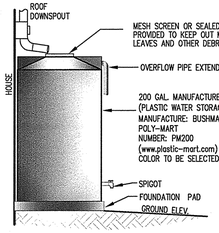
OPERATION AND MAINTENANCE SCHEDULE FOR
PRIVATELY OWNED AND MAINTAINED RAINWATER HARVESTING (M-1)

a. THE OWNER SHALL EMPTY BARRELS ON A MONTHLY BASIS AND CLEAN BARREL WITH A HOSE.

b. THE OWNER SHALL VERIFY INTEGRITY OF LEAF SCREENS, GUTTERS, DOWNSPOUTS, SPIGOTS, AND MOSQUITO SCREENS, AND CLEAN AND REMOVE ANY DEBRIS.

c. THE OWNER SHALL REPLACE DAMAGED COMPONENTS AS NEEDED.

d. THE OWNER SHALL DISCONNECT THE BARREL PRIOR TO WINTER, OR ALLOW THE BARREL TO DRAIN BY BOTTOM SPIGOT DURING THE WINTER SEASON.



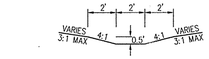
RAIN BARREL NO SCALE

OPERATION AND MAINTENANCE SCHEDULE FOR
PRIVATELY OWNED AND MAINTAINED GRASS SWALE (M-8)

A. THE OWNER SHALL MAINTAIN THE PLANT MATERIAL AND SOIL LAYER ANNUALLY. MAINTENANCE OF SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUME II, TABLE A.4.1 AND 2.

B. THE OWNER SHALL PERFORM A PLANT IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL, TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.

C. THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.



GRASS SWALE (M-8) DETAILS NO SCALE

OPERATION AND MAINTENANCE SCHEDULE FOR
PRIVATELY OWNED AND MAINTAINED DISCONNECTION OF NON-ROOFTOP RUNOFF (N-2)

A. MAINTENANCE OF AREAS RECEIVING DISCONNECTED RUNOFF IS GENERALLY NO DIFFERENT THAN THAT REQUIRED FOR OTHER LAWN OR LANDSCAPED AREAS. THE OWNER SHALL ENSURE THE AREAS RECEIVING RUNOFF ARE PROTECTED FROM FUTURE COMPACTION OR DEVELOPMENT OF IMPERVIOUS AREA. IN COMMERCIAL AREA, FOOT TRAFFIC SHOULD BE DISCOURAGED AS WELL.

SWM PRACTICE CHART (HEATHER GLEN WAY)

	M-1 (quantity)	M-5 (quantity)	M-8 (quantity)	N-1 (Y/N)	N-2 (Y/N)	N-3 (Y/N)
LOT 8	2	7	1	NO	YES	NO

LEGEND

- 430 — EXISTING CONTOUR
- 434.5 PROPOSED ODD CONTOUR
- 430 PROPOSED 2-FT CONTOUR
- F.F.E. / B.S.E. / T.O.W. — FIRST FLOOR ELEVATION, BASEMENT SLAB ELEVATION, TOP OF FOUNDATION WALL
- SEWAGE DISPOSAL AREA
- # PERCOLATION TEST HOLES (PASSED)
- # PERCOLATION TEST HOLES (FAILED)
- (W) EXISTING WELL LOCATION
- ALT.WELL ALTERNATE WELL LOCATION
- DW DRYWELL PER HO. CO. DPW DET. D-9.01 (SIZE & LOCATION AS SHOWN ON THIS SHEET)
- CLEANOUT (TYPICAL AT BENDS IN PVC PIPE)
- MANUFACTURED 200 GALLON RAIN BARREL (DETAIL THIS SHEET)
- NRD PROPOSED DISCONNECTION OF NON-ROOFTOP RUNOFF (N-2) AREA NOT TO EXCEED 5% GRADE. PRIVATELY OWNED AND MAINTAINED
- GRASS SWALE (M-8), 2' BOTTOM WIDTH WITH EROSION CONTROL MATTING

NOTES:

1. EXISTING TOPOGRAPHY SHOWN ON THIS SHEET IS FROM FIELD RUN SURVEY BY GUTSCHICK, LITTLE & WEBER, PA IN DECEMBER 2019.
2. THE SIMPLIFIED ECP FOR LOT 8 WAS APPROVED ON 9/2/2020.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

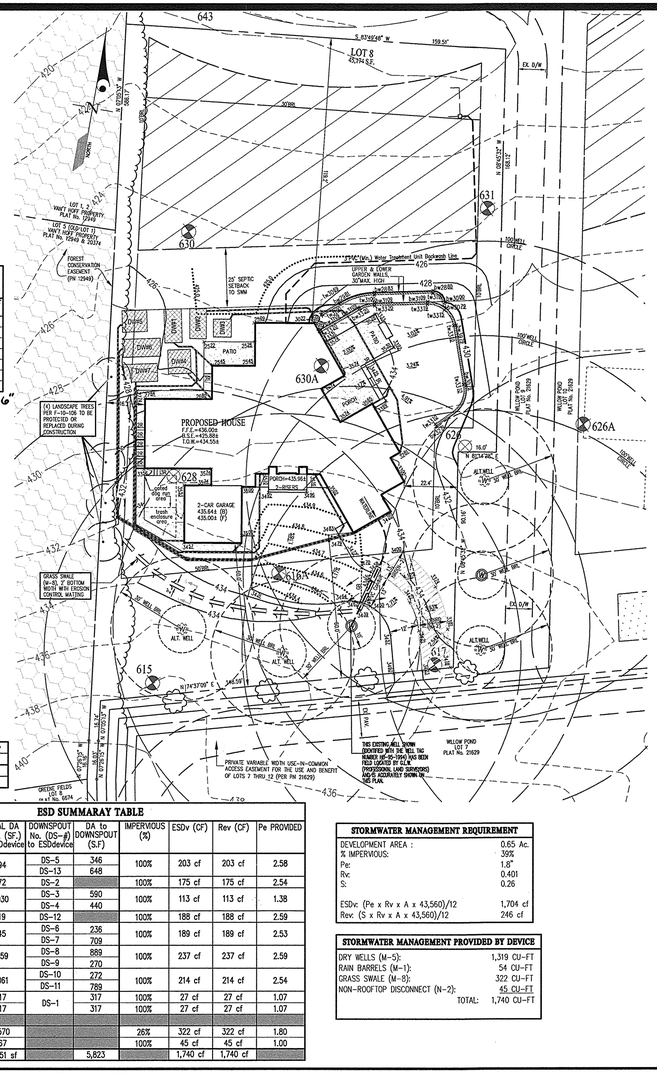
Chief, Division of Land Development — Date 2/10/21

Chief, Development Engineering Division — Date 2.3.21

PROPOSED DRYWELL (M-5) SIZE CHART

DRYWELL No.	LENGTH x WIDTH	DEPTH OF STONE
DW#1	14' x 7'-3"	5'
DW#2	12'-6" x 7'	5'
DW#3	~~12'-6" x 7'~~ *	5'
DW#4	9'-5" x 10'	5'
DW#5	10'-6" x 9'	5'
DW#6	15'-10" x 7'-6"	5'
DW#7	14'-3" x 7'-6"	5'

* DW #3 7'-6" x 7'-6"



REQUIRED ESDv	PROVIDED ESDv
1,704 cf	1,740 cf
REQUIRED Rev	PROVIDED Rev
246 cf	1,740 cf

ESD SUMMARAY TABLE

ESD DEVICE	DA AREA NO.	TOTAL DA AREA (SF.) to ESDdevice	DOWNSPOUT No. (DS-#) to ESDdevice	DA to DOWNSPOUT (S.F)	IMPERVIOUS (%)	ESDv (CF)	Rev (CF)	Pe PROVIDED
DRYWELL (DW#1)	DA-1	994	DS-5	346	100%	203 cf	203 cf	2.58
			DS-13	648				
DRYWELL (DW#2)	DA-2	872	DS-2		100%	175 cf	175 cf	2.54
DRYWELL (DW#3)	DA-3	1,030	DS-3	590	100%	113 cf	113 cf	1.38
			DS-4	440				
DRYWELL (DW#4)	DA-4	919	DS-12		100%	188 cf	188 cf	2.59
DRYWELL (DW#5)	DA-5	945	DS-6	236	100%	189 cf	189 cf	2.53
			DS-7	709				
DRYWELL (DW#6)	DA-6	1,159	DS-8	889	100%	237 cf	237 cf	2.59
			DS-9	270				
DRYWELL (DW#7)	DA-7	1,061	DS-10	272	100%	214 cf	214 cf	2.54
			DS-11	789				
RAIN BARREL #1	DA-8ab	317	DS-1	317	100%	27 cf	27 cf	1.07
RAIN BARREL #2	DA-8ab	317		317	100%	27 cf	27 cf	1.07
GRASS SWALE	DA-10	7,570			26%	322 cf	322 cf	1.80
NON-ROOFTOP DISC.	DA-11	567			100%	45 cf	45 cf	1.00
	TOTAL	15,751 sf		5,823		1,740 cf	1,740 cf	

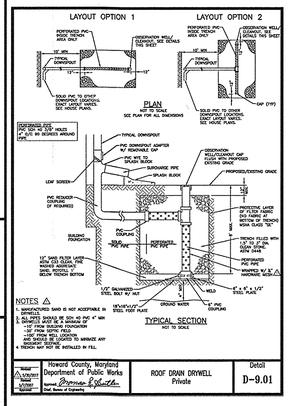
STORMWATER MANAGEMENT REQUIREMENT

DEVELOPMENT AREA :	0.65 Ac.
% IMPERVIOUS:	39%
Pe:	1.8"
Rv:	0.401
S:	0.26
ESDv: (Pe x Rv x A x 43,560)/12	1,704 cf
Rev. (S x Rv x A x 43,560)/12	246 cf

STORMWATER MANAGEMENT PROVIDED BY DEVICE

DRY WELLS (M-5):	1,319 CU-FT
RAIN BARRELS (M-1):	54 CU-FT
GRASS SWALE (M-8):	322 CU-FT
NON-ROOFTOP DISCONNECT (N-2):	45 CU-FT
TOTAL:	1,740 CU-FT

LOT 8 GRADING for HOUSE CONSTRUCTION (From GP) SCALE: 1"=30'



Howard County, Maryland Department of Public Works	ROOF DRAIN DRYWELL Private	Detail D-9.01

OPERATION AND MAINTENANCE SCHEDULE FOR
PRIVATELY OWNED AND MAINTAINED DRY WELLS (M-5)

A. THE OWNER SHALL INSPECT THE MONITORING WELLS AND STRUCTURES ON A QUARTERLY BASIS AND AFTER EVERY HEAVY STORM EVENT.

B. THE OWNER SHALL RECORD THE WATER LEVELS AND SEDIMENT BUILD UP IN THE MONITORING WELLS OVER A PERIOD OF SEVERAL DAYS TO INSURE TRENCH DRAINAGE.

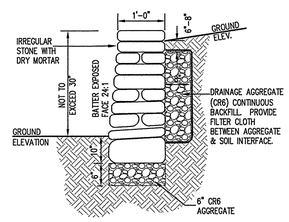
C. THE OWNER SHALL MAINTAIN A LOG BOOK TO DETERMINE THE RATE AT WHICH THE FACILITY DRAINS.

D. WHEN THE FACILITY BECOMES CLOGGED SO THAT IT DOES NOT DRAIN DOWN WITHIN A SEVENTY-TWO (72) HOUR TIME PERIOD, CORRECTIVE ACTION SHALL BE TAKEN.

E. THE MAINTENANCE LOG BOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.

F. ONCE THE PERFORMANCE CHARACTERISTICS OF THE INFILTRATION FACILITY HAVE BEEN VERIFIED, THE MONITORING SCHEDULE CAN BE REDUCED TO AN ANNUAL BASIS UNLESS THE PERFORMANCE DATA INDICATES THAT A MORE FREQUENT SCHEDULE IS REQUIRED.

NOTE:
MODULAR KEYSTONE OR VERSA-LOK WALL MAY ALSO BE USED. NOT TO EXCEED 30" HIGH



GARDEN WALL DETAIL for LOT 8 NO SCALE

0 15 30 60
GRAPHIC SCALE

GLW
PLANNING | ENGINEERING | SURVEYING
3909 NATIONAL DRIVE | SUITE 250 | BURTONSVILLE, MD 20866 | GLWPA.COM
PHONE: 301-421-4024 | BALT: 410-880-1820 | DC&VA: 301-989-2524 | FAX: 301-421-4186

DESIGNED BY:				
DRAWN BY: KLP				
CHECKED BY: CKG	12-17-2020	New sheet added to this F-plan to show actual house, grading & SWM on Lot 8		
	DATE	REVISION	BY	APP'R.

PREPARED FOR:

BUILDER (for Lot 8)
SAMS PARRIL CUSTOM HOMES, LLC
P.O. BOX 0438
HIGHLAND, MD 20777
ATTN.: JASON COHEN
PH: 301-908-5163
jc@samsparrilhomes.com

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE PLANS 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. 12975, EXPIRATION DATE: MAY 26, 2022

STATE OF MARYLAND — CHRISTOPHER K. GUTSCHICK — 12975 — REGISTERED PROFESSIONAL ENGINEER

12-22-20

(REVISED) GRADING PLAN FOR HOUSE CONSTRUCTION

WILLOW POND

LOTS 1 - 13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D' & NON-BUILDABLE PARCEL 'E'
A RESUBDIVISION OF NAECKER PROPERTY LOT 4, PLAT No. 7288
and LOT 6, PLAT No. 20373-20375

ELECTION DISTRICT No. 5 — HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE No.
AS SHOWN	RR-DEO	19136
DATE	TAX MAP - GRID	SHEET
DEC. 2020	34-17	22 OF 22

F-10-106

L:\CADD\DRAWINGS\19136\PLANS BY GLW\REDLINE 01 (Lot 8)\19136_F-10-106 REPLACEMENT SHEET.dwg, 12/17/2020 7:30 PM, LAST SAVED:12/17/2020 10:17 AM, PLOTTED BY: Kristy Pierce