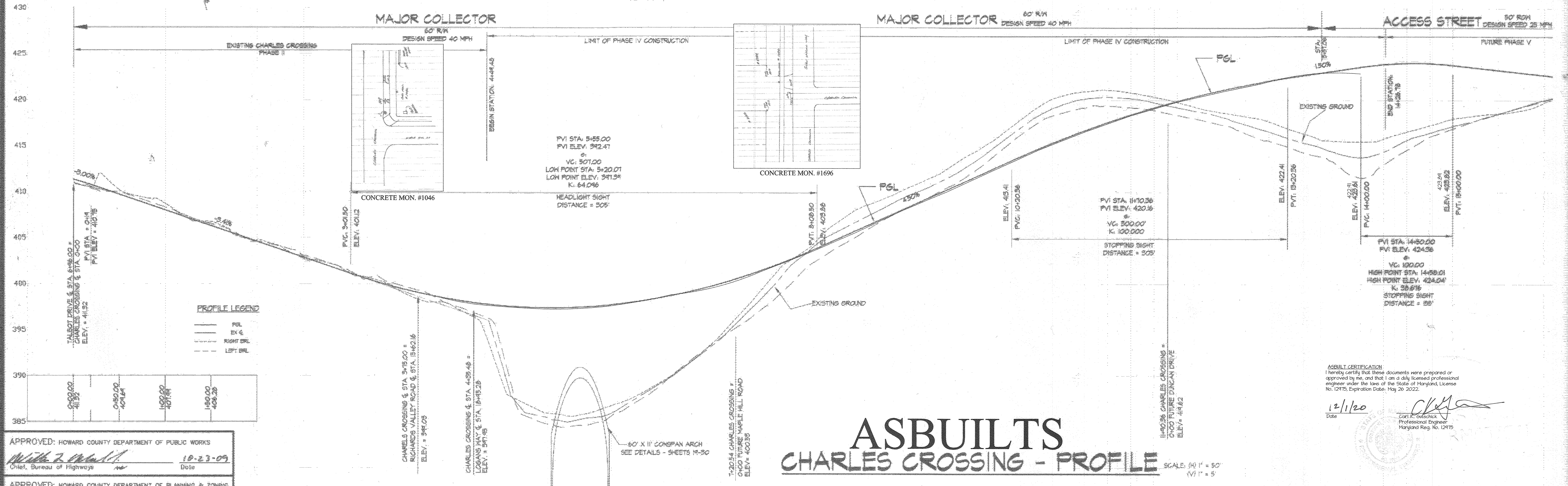


# CHARLES CROSSING - PLAN

SCALE: 1" = 50'



# ASBUILTS CHARLES CROSSING - PROFILE

SCALE: (H) 1" = 50'  
(V) 1" = 5'

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 With 2 sheets 10-23-09  
 Chief, Bureau of Highways

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
 10-27-09  
 Chief, Division of Land Development

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
 10/27/09  
 Chief, Development Engineering Division

**GLWGUTSCHICK LITTLE & WEBER, P.A.**  
 CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS  
 3909 NATIONAL DRIVE - SUITE 200 - BURTONGORLE OFFICE PARK  
 BURTONGORLE, MARYLAND 20868  
 TEL: 301-621-6024 FAX: 301-621-1866

DATE	REVISION
10-23-09	Rev. P&E No. 5
10-27-09	Rev. let numbers & let lines

OWNER PAR C-216 thru C-218:  
 BA WATERLOO TOWNHOMES, LLC.  
 c/o BOZZUTO HOMES, INC.  
 7850 WALKER DRIVE, SUITE 400  
 GREENBELT, MARYLAND 20770  
 ATTN: DUNCAN SLIDELL  
 301-823-1525

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. 14830  
 EXPIRATION DATE: NOV 21, 2020

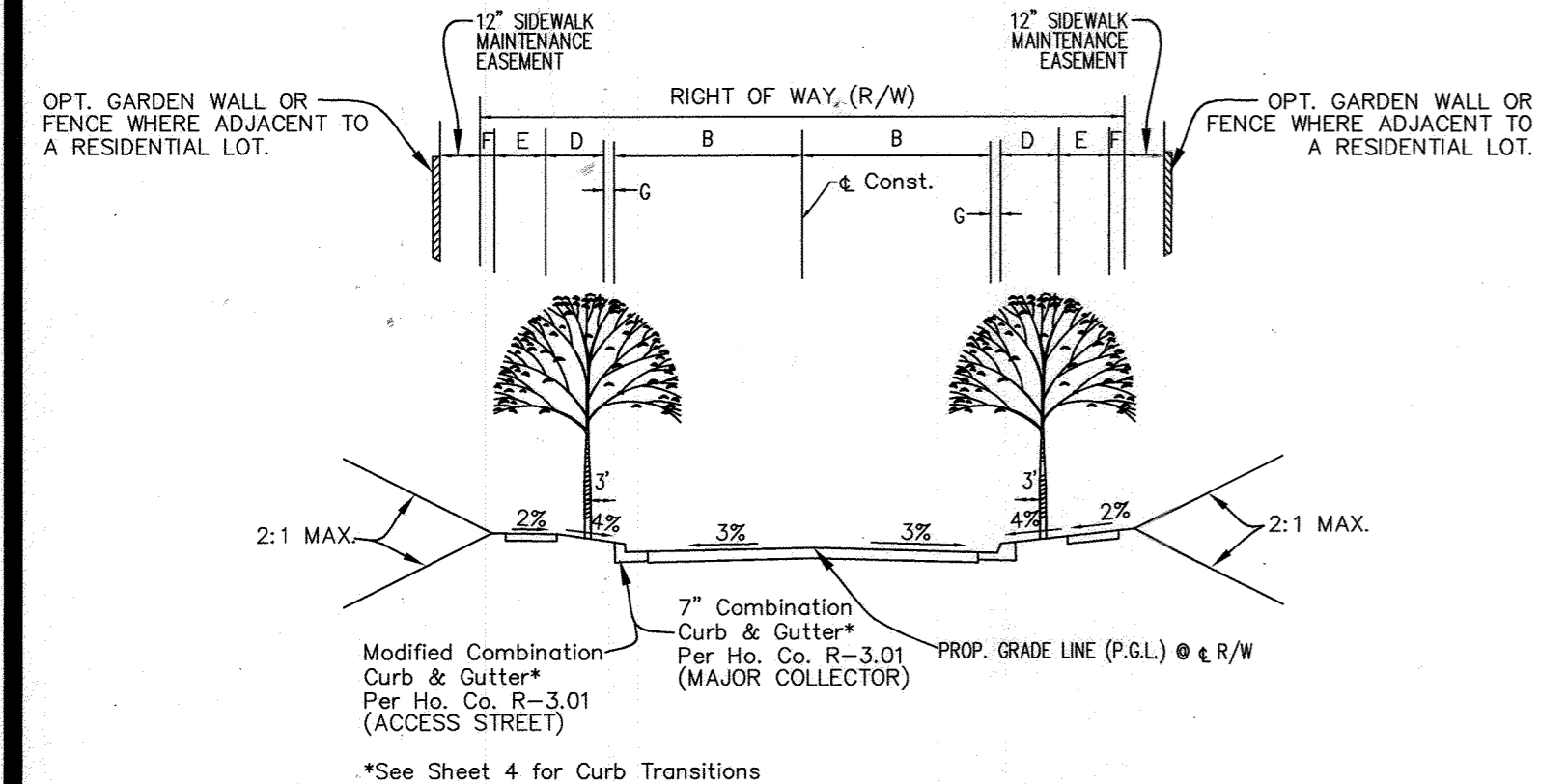
**CHARLES CROSSING PLAN AND PROFILE**  
**SHIPLEY'S GRANT**  
 PHASE IV  
 LOTS C-219 thru C-222, C-225 thru C-207, PARCELS D-2 and E-1,  
 OPEN SPACE LOTS C-202, D-1, E-2 & E-3 AND NON-BUILDABLE PARCELS D-3, D-4,  
 and NON-BUILDABLE LOT C-205  
 A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 thru C-218, "D" and "E"  
 HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE NO.
AS SHOWN	R-A-15, POR	07002
DATE	TAX MAP - GRID	SHEET
NOV. 2020	37-1&2	2 OF 31
SEPT., 2009		

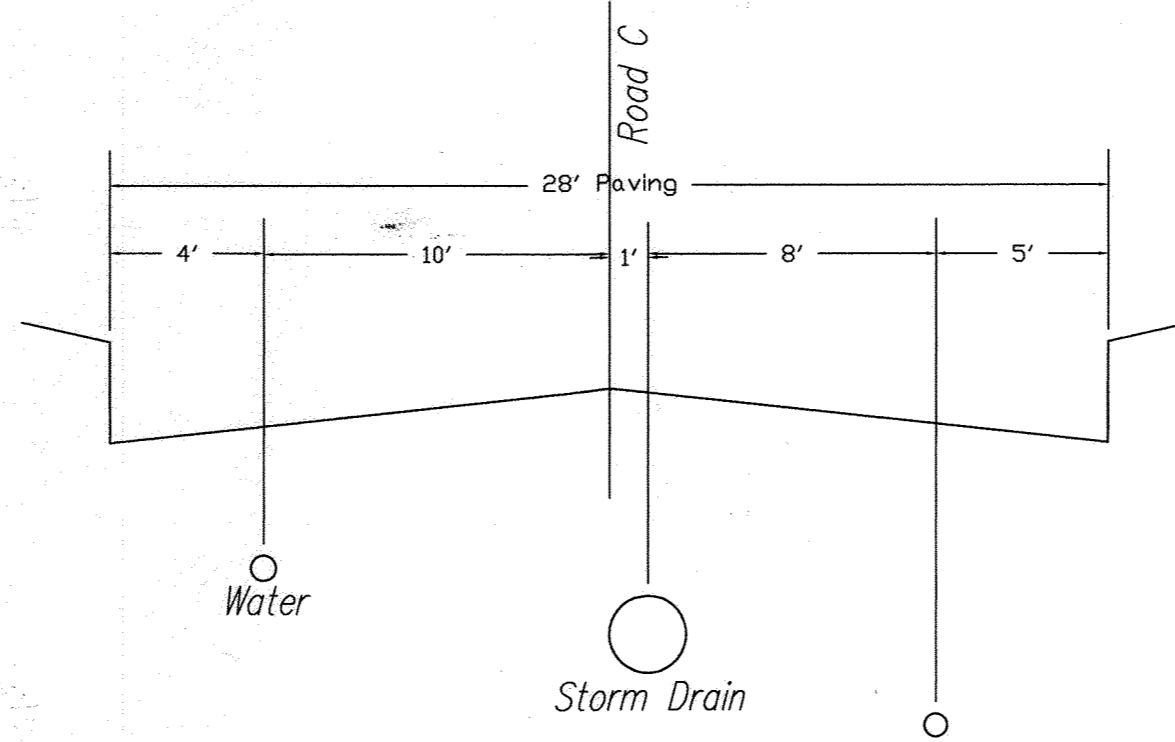


ROAD INFORMATION												
ROAD NAME	STATION	ROAD CLASSIFICATION	DESIGN SPEED	A	B	C	D	E	F	G	R/W	PAVING SECTION
CHARLES CROSSING	0+00.00 TO 13+57.06	MAJOR COLLECTOR	40 MPH	19'	6'	4'	4'	8'	60'			P-5
CHARLES CROSSING	13+57.06 TO 18+10.36	ACCESS STREET	25 MPH	14'	5'-6.75"	4'	4'	13.25'	50'			P-3

\*\*All proposed Phase 4 pavement is P-5



TYPICAL PUBLIC ROAD SECTION  
NOT TO SCALE

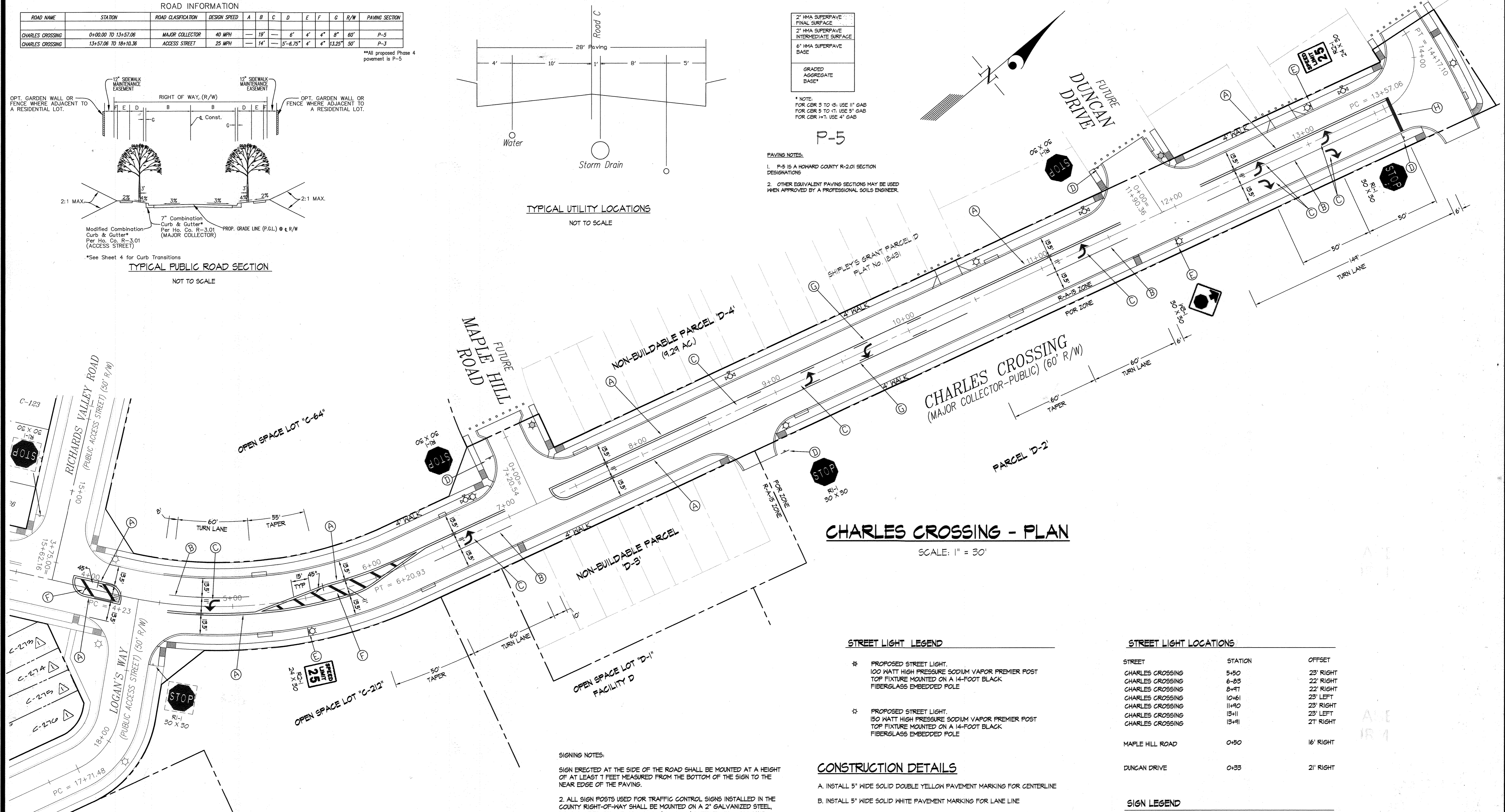


TYPICAL UTILITY LOCATIONS  
NOT TO SCALE

2" HMA SUPERPAVE FINAL SURFACE
2" HMA SUPERPAVE INTERMEDIATE SURFACE
6" HMA SUPERPAVE BASE
GRADED AGGREGATE BASE*

\* NOTE:  
FOR C&G 3 TO 5: USE 11" G&B  
FOR C&G 5 TO 7: USE 9" G&B  
FOR C&G 7+1: USE 4" G&B

PAVING NOTES:  
1. P-5 IS A HOWARD COUNTY R-2.01 SECTION DESIGNATION  
2. OTHER EQUIVALENT PAVING SECTIONS MAY BE USED WHEN APPROVED BY A PROFESSIONAL SOILS ENGINEER.



**CHARLES CROSSING - PLAN**

SCALE: 1" = 30'

**STREET LIGHT LEGEND**

- \* PROPOSED STREET LIGHT.  
100 WATT HIGH PRESSURE SODIUM VAPOR PREMIER POST  
TOP FIXTURE MOUNTED ON A 14-FOOT BLACK  
FIBERGLASS EMBEDDED POLE
- \* PROPOSED STREET LIGHT.  
150 WATT HIGH PRESSURE SODIUM VAPOR PREMIER POST  
TOP FIXTURE MOUNTED ON A 14-FOOT BLACK  
FIBERGLASS EMBEDDED POLE

**STREET LIGHT LOCATIONS**

STREET	STATION	OFFSET
CHARLES CROSSING	5+50	23' RIGHT
CHARLES CROSSING	6+83	22' RIGHT
CHARLES CROSSING	8+47	22' RIGHT
CHARLES CROSSING	10+61	23' LEFT
CHARLES CROSSING	11+40	23' RIGHT
CHARLES CROSSING	13+41	23' LEFT
CHARLES CROSSING	13+41	21' RIGHT
MAPLE HILL ROAD	0+50	16' RIGHT
DUNCAN DRIVE	0+33	21' RIGHT

**CONSTRUCTION DETAILS**

- A. INSTALL 5" WIDE SOLID DOUBLE YELLOW PAVEMENT MARKING FOR CENTERLINE
- B. INSTALL 5" WIDE SOLID WHITE PAVEMENT MARKING FOR LANE LINE
- C. INSTALL PAVEMENT MARKING SYMBOL AS SHOWN
- D. INSTALL GROUND MOUNTED SIGN
- E. INSTALL LIGHT POLE MOUNTED SIGN
- F. INSTALL 16" WIDE YELLOW PAVEMENT MARKING FOR MEDIAN
- G. INSTALL 5" WIDE SOLID/BROKEN (10' SEGMENT - 30' GAP) YELLOW PAVEMENT MARKING FOR TWO-WAY LEFT TURN LANE
- H. INSTALL 24" WIDE SOLID WHITE PAVEMENT MARKING FOR STOP BAR

**SIGN LEGEND**



**SIGNING NOTES:**

- 1. SIGN ERECTED AT THE SIDE OF THE ROAD SHALL BE MOUNTED AT A HEIGHT OF AT LEAST 1 FEET MEASURED FROM THE BOTTOM OF THE SIGN TO THE NEAR EDGE OF THE PAVING.
- 2. 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 (1/4 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED SQUARE TUBE SLEEVE (1/2 GAUGE) - 3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
- 3. SIGNS SHALL BE 12" TO 18" FROM EDGE OF SIGN TO CURBLINE. STOP SIGNS SHALL BE LOCATED 15' BACK FROM INTERSECTING STREET CURB LINE OR AS DIRECTED BY HOWARD COUNTY TRAFFIC DIVISION.
- 4. ALL SIGN LOCATIONS WITHIN THE PUBLIC RIGHT OF WAY SHALL BE APPROVED BY THE HOWARD COUNTY TRAFFIC DIVISION PRIOR TO ANY INSTALLATIONS.

**PAVEMENT MARKING NOTES**

- 1. ALL PAVEMENT MARKINGS TO BE APPLIED USING 'SETFAST PREMIUM ALKYD TRAFFIC PAINT' BY SHERWIN WILLIAMS OR APPROVED EQUAL.
- 2. ALL PAVEMENT MARKINGS ARE TO BE EITHER LOCATED OR APPROVED BY THE TRAFFIC DIVISION PRIOR TO THE PLACEMENT OF ANY MARKINGS

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*William D. Smith* 10-23-09  
 Chief, Bureau of Highways

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
*K. J. St. Louis* 10-27-09  
 Chief, Division of Land Development

*John D. Williams* 10/27/09  
 Chief, Development Engineering Division

**GLWGUTSCHICK LITTLE & WEBER, P.A.**  
 CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS  
 3909 NATIONAL DRIVE - SUITE 250 - BURTONSVILLE OFFICE PARK  
 BURTONSVILLE, MARYLAND 20886  
 TEL: 301-421-4024 BAL: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

NO.	DATE	REVISION	BY	APP'R.
1	10/20/09	Rev Lot numbers & Lot Lines Rev Title Block Per Floorplan	WJL	

OWNER PAR C-216 thru C-218:  
 BA WATERLOO TOWNHOMES, LLC.  
 c/o BOZZUTO HOMES, INC.  
 7850 WALKER DRIVE, SUITE 400  
 GREENBELT, MARYLAND 20770  
 ATTN: DUNCAN SLIDELL  
 301-623-1525

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. 14931, EXPIRATION DATE: MAY 21, 2010

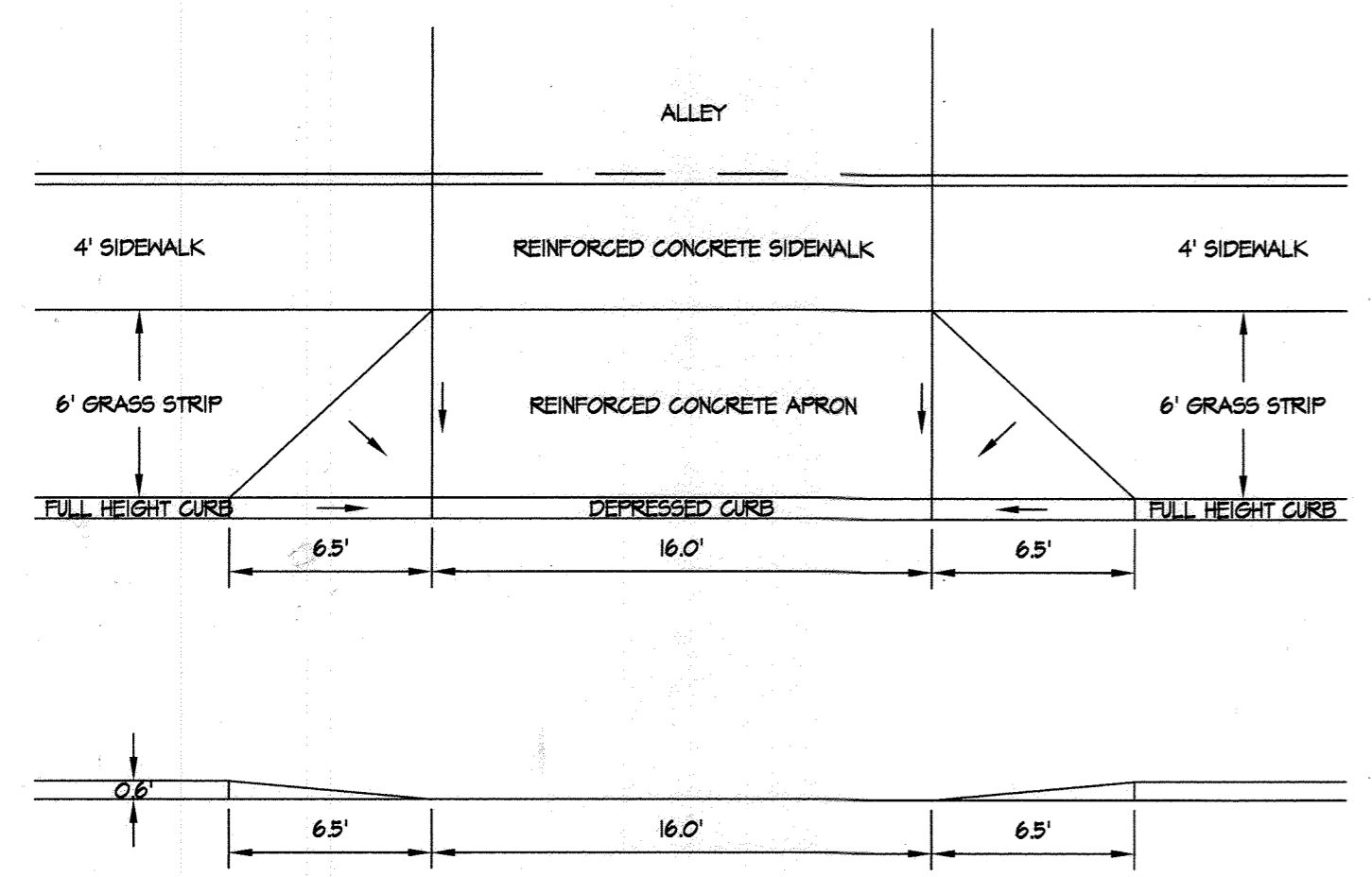


**SIGNING, PAVEMENT MARKING, AND LIGHTING PLAN AND DETAILS**

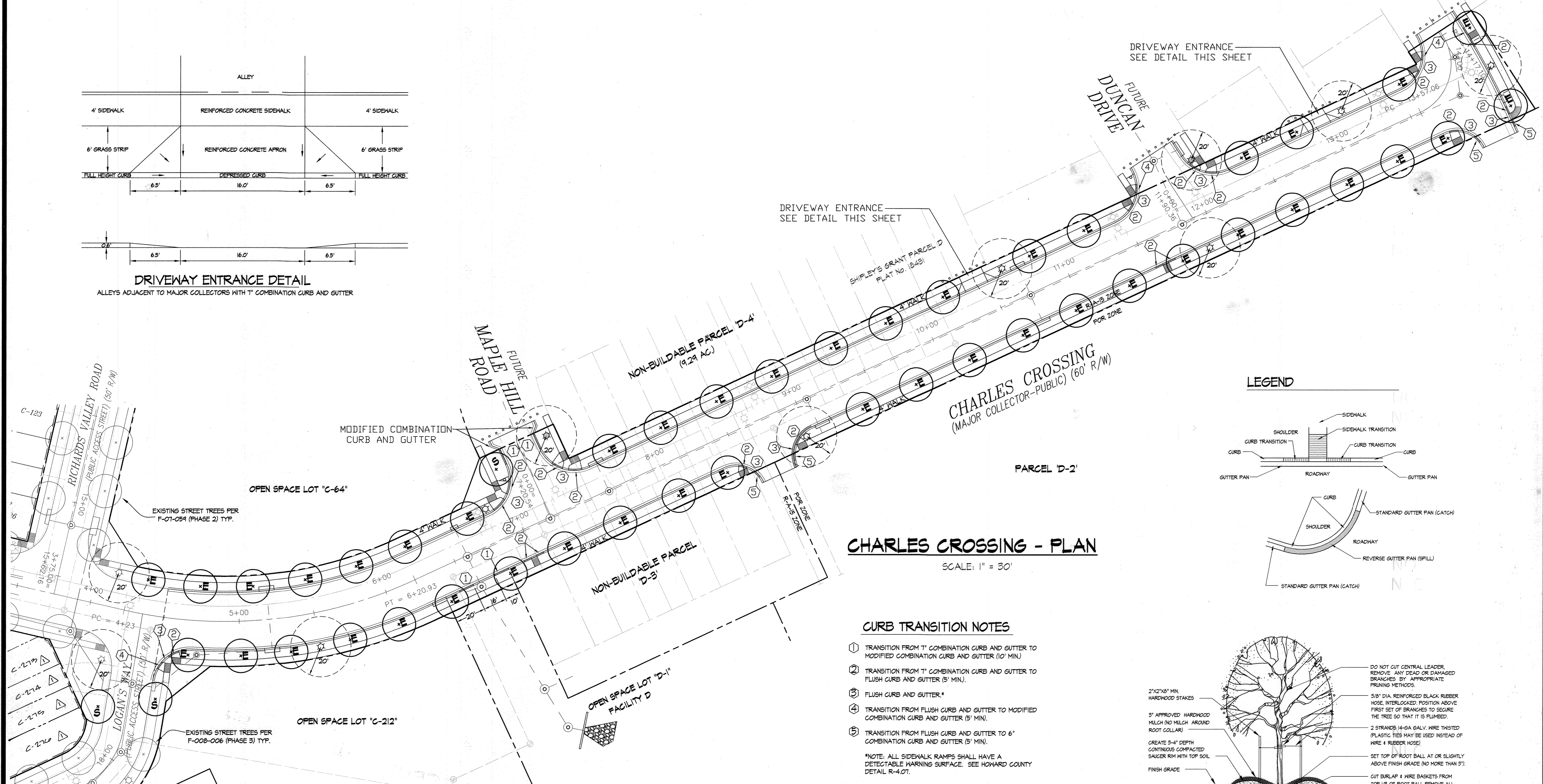
**SHIPLEY'S GRANT**  
 PHASE IV  
 LOTS C-219 thru C-222, C-215 thru C-207, PARCELS D-2 and E-1,  
 OPEN SPACE LOTS C-208, D-1, E-2 & E-3 and NON-BUILDABLE PARCELS \*D-3\*, \*D-4\*,  
 and NON-BUILDABLE LOT C-208  
 A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 thru C-218, \*D\* and \*E\*

SCALE	ZONING	G. L. W. FILE No.
AS SHOWN	R-A-15, POR	07002
DATE	TAX MAP - GRID	SHEET
SEPT., 2009	37-1&2	3 OF 31

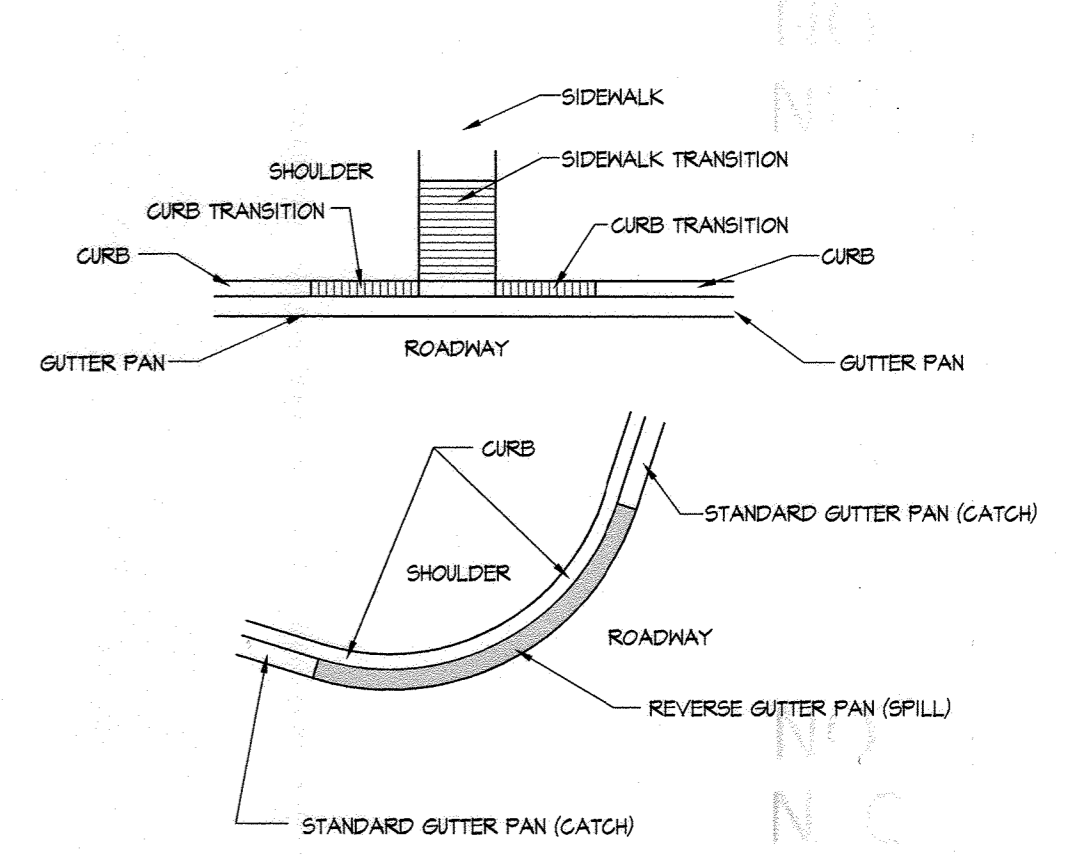




**DRIVEWAY ENTRANCE DETAIL**  
ALLEYS ADJACENT TO MAJOR COLLECTORS WITH T<sup>1</sup> COMBINATION CURB AND GUTTER



**LEGEND**



**CHARLES CROSSING - PLAN**  
SCALE: 1" = 30'

**CURB TRANSITION NOTES**

- ① TRANSITION FROM T<sup>1</sup> COMBINATION CURB AND GUTTER TO MODIFIED COMBINATION CURB AND GUTTER (10' MIN.)
  - ② TRANSITION FROM T<sup>1</sup> COMBINATION CURB AND GUTTER TO FLUSH CURB AND GUTTER (5' MIN.)
  - ③ FLUSH CURB AND GUTTER.
  - ④ TRANSITION FROM FLUSH CURB AND GUTTER TO MODIFIED COMBINATION CURB AND GUTTER (5' MIN.)
  - ⑤ TRANSITION FROM FLUSH CURB AND GUTTER TO 6" COMBINATION CURB AND GUTTER (5' MIN.)
- \*NOTE: ALL SIDEWALK RAMPS SHALL HAVE A DETECTABLE WARNING SURFACE. SEE HOWARD COUNTY DETAIL R-4.01.

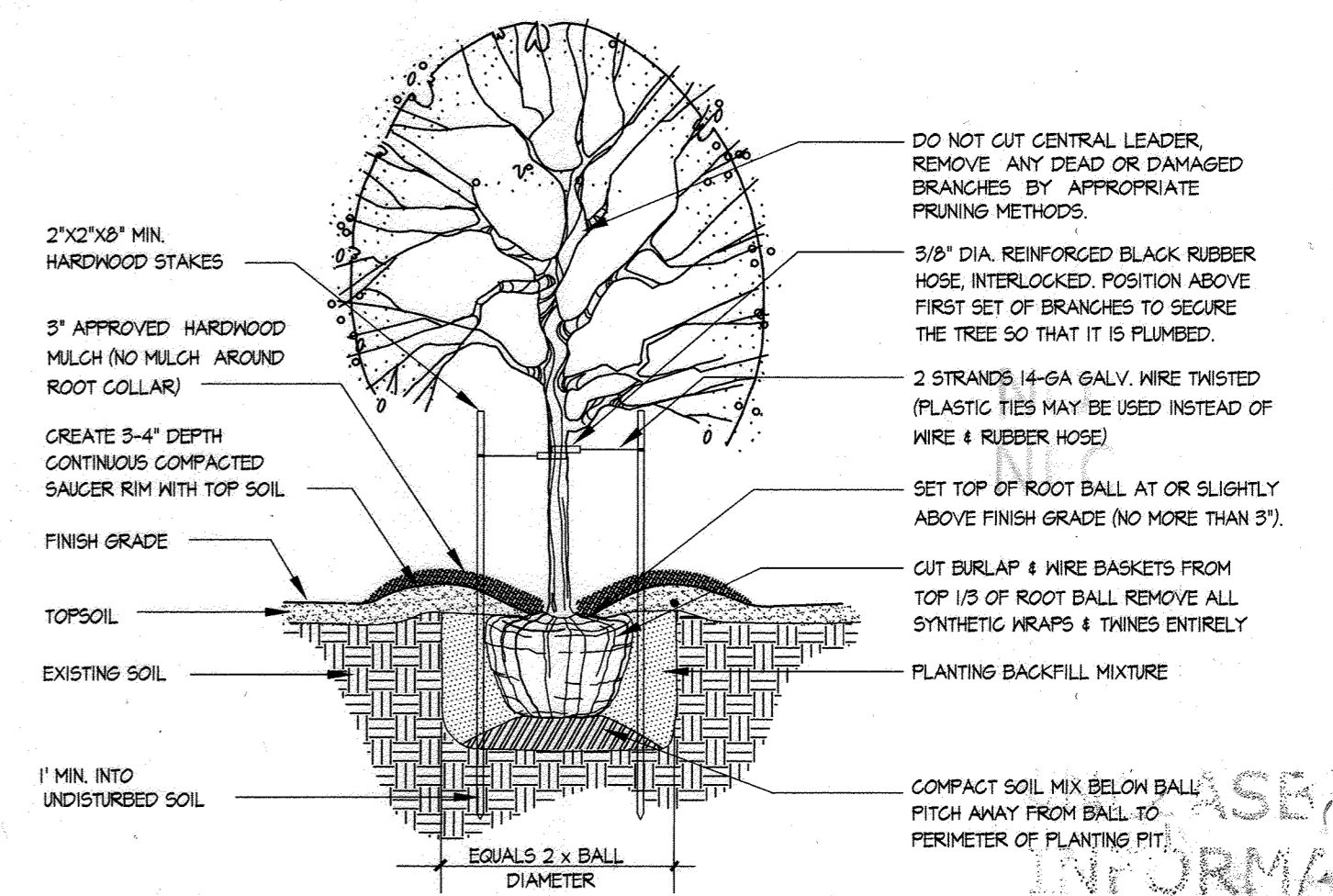
**PLANT LIST**

SYMBOL	QUANT.	SIZE	NAME (BOTANICAL/COMMON) OF PLANTS FOR SELECTION BY OWNER/BUYER	COMMENTS
TREES - STREET				
E	44	2.5' GAL. 12-14" HT. MIN.	ULMUS AMERICANA PRINCETON / PRINCETON ELM	B4B, FULL
S	5	2.5' GAL. 12-14" HT. MIN.	PLATANUS OCCIDENTALIS / SYCAMORE	B4B, FULL

**STREET TREE SCHEDULE**

LINEAR FEET OF CURBLINE	1645 L.F.
NUMBER OF STREET TREES REQUIRED: STREET TREES (1-40)	43
NUMBER OF STREET TREES PROVIDED: STREET TREES OTHER TREES (2:1 SUBSTITUTION)	44 0

- GENERAL NOTES:**
1. A 20' MINIMUM DISTANCE SHALL BE MAINTAINED BETWEEN ANY TREES LOCATED ALONG THE CURB LINE AND ANY STREET LIGHT.
  2. A 5' MINIMUM DISTANCE SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND A FIRE HYDRANT.



NOTE: ALL SUPPORTING DEVICES (STAKES, WIRES, ETC) SHALL BE REMOVED AFTER 2 GROWING SEASONS.

**DECIDUOUS TREE PLANTING DETAIL**  
FOR PLANTING MATERIAL UP TO 3 1/2" CALIFER

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Michelle Randall* 10-23-09  
Chief, Bureau of Highways

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
*Keith Shuler* 10-27-09  
Chief, Division of Land Development

*W. DeWitt* 10/27/09  
Chief, Development Engineering Division

**GLWGUTSCHICK LITTLE & WEBER, P.A.**  
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS  
3909 NATIONAL DRIVE - SUITE 250 - BURTONSVILLE OFFICE PARK  
BURTONSVILLE, MARYLAND 20866  
TEL: 301-421-4024 BAL: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4188

DATE	REVISION	BY	APP'R.
10/10	Rev Lot numbers & Plat Lines, Rev Title Block Per F-10-000	WGL	

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c/o BOZZUTO HOMES, INC.  
7850 WALKER DRIVE, SUITE 400  
GREENBELT, MARYLAND 20770  
ATTN: DUNCAN SLIDELL  
301-623-1525

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EXPIRATION DATE: MAY 21, 2010

**STREET TREE AND CURB DELINEATION PLAN**  
**SHIPLEY'S GRANT**  
PHASE IV  
LOTS C-219 thru C-222, C-225 thru C-207, PARCELS D-2 and E-1,  
OPEN SPACE LOTS C-202, D-1, E-2 & E-3 and NON-BUILDABLE PARCELS "D-3", "D-4",  
and NON-BUILDABLE LOT C-208.  
A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 thru C-218, "D" and "E"

SCALE	ZONING	G. L. W. FILE NO.
AS SHOWN	R-A-15, POR	07002
DATE	TAX MAP - GRID	SHEET
SEPT., 2009	37-1&2	4 OF 31

NO ASBUILT INFORMATION  
12/1/09

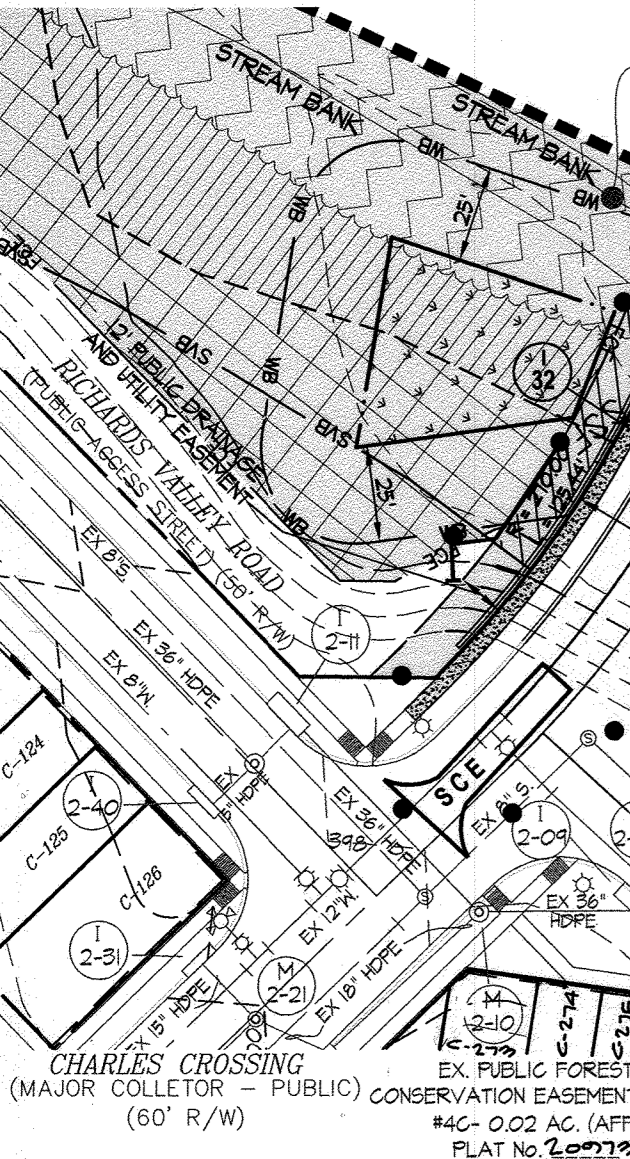
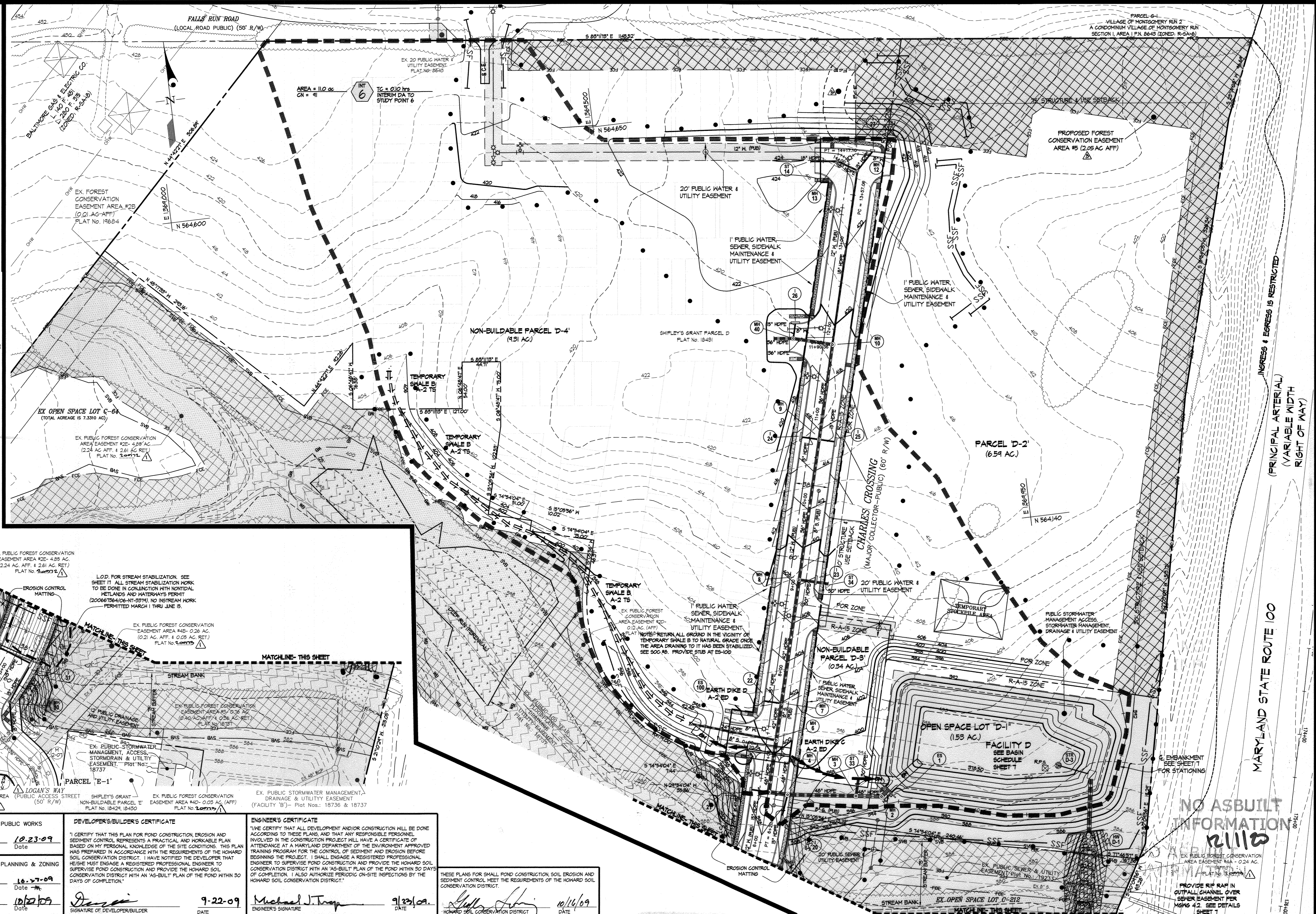


**LEGEND**

- 600 --- EXISTING CONTOUR
- 600 --- PROPOSED CONTOUR
- SSS --- PROPOSED SUPER SILT FENCE
- --- LIMIT OF DISTURBANCE
- --- TEMPORARY SWALE
- --- EARTH DIKE
- --- TEMPORARY DRAINAGE DIVIDE
- [SCE] STABILIZED CONSTRUCTION ENTRANCE
- [ ] PROPOSED TEMPORARY STOCKPILE AREA
- [ ] TIME OF CONCENTRATION PATH
- [ ] TYPE A MOUNTABLE BERM. SEE DETAIL SHEET 6
- [ ] EROSION CONTROL MATTING PER G-22-2

**SEDIMENT AND EROSION CONTROL SEQUENCE OF CONSTRUCTION**

1. OBTAIN GRADING PERMIT AND ARRANGE PRE-CONSTRUCTION MEETING WITH SEDIMENT CONTROL INSPECTOR (1 DAY). ALL STREAM STABILIZATION WORK TO BE DONE IN CONJUNCTION WITH NONTIDAL WETLANDS AND WATERWAYS PERMIT (200667564/06-NT-3374). NO INSTREAM WORK PERMITTED MARCH 1 THRU JUNE 15.
2. INSTALL THE STABILIZED CONSTRUCTION ENTRANCES AND SILT FENCE/SUPER SILT FENCE (3 DAYS).
3. CONSTRUCT SEDIMENT BASIN 'D' AND BASIN OUTFALL. REMOVE EXISTING STREAM CROSSING AND INSTALL STREAM STABILIZATION (SEE SHEETS 'T' & 'U' FOR DETAILS AND SEQUENCE FOR STREAM STABILIZATION). CONSTRUCT AND STABILIZE BRIDGE CROSSING (30 DAYS).
4. INSTALL STORM DRAIN FROM ES-1 TO ES-100 (10 DAYS).
5. INSTALL EARTH TEMPORARY SWALE B (3 DAYS).
6. ONCE PERMISSION HAS BEEN GRANTED FROM THE SEDIMENT CONTROL INSPECTOR, INSTALL EARTH DIKES C & D, AND MASS GRADE SITE. PROVIDE DUST CONTROL PER SPECIFICATIONS ON SHEET 6 (10 DAYS).
7. INSTALL REMAINDER OF UTILITIES, PAVEMENT, AND CURB & GUTTER. REMOVE EARTH DIKES C & D AS NECESSARY (23 DAYS).
8. ONCE AREAS DRAINING TO SEDIMENT CONTROLS HAS BEEN STABILIZED AND PERMISSION HAS BEEN OBTAINED FROM THE SEDIMENT CONTROL INSPECTOR, REMOVE/BACKFILL AND STABILIZE TEMPORARY EARTH DIKES AND SILT FENCE/SUPER SILT FENCE. RETURN GROUND IN THE VICINITY OF TEMPORARY SWALE B TO NATURAL GRADE. PROVIDE STUB AT ES-100 (5 DAYS).
9. AFTER COMPLETION OF THE PERMITTING PROCESS:
  - A. ONCE PERMISSION HAS BEEN GRANTED FROM THE SEDIMENT CONTROL INSPECTOR, CONVERT BASIN 'D' TO THE FINAL STORMWATER MANAGEMENT CONFIGURATION. (5 DAYS)
  - B. REMOVE ANY REMAINING SEDIMENT CONTROLS AND STABILIZE ANY REMAINING DISTURBED AREAS.
10. THE OWNER MUST PREPARE AN AS-BUILT OF STORMWATER MANAGEMENT FACILITY 'D' AND SUBMIT IT TO THE HOWARD SOIL CONSERVATION DISTRICT FOR REVIEW AND APPROVAL.



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*William J. Smith* 10-23-09  
 Chief, Bureau of Highways

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
*Vest Shubert* 10-27-09  
 Chief, Division Land Development

*Michael J. Troop* 10/23/09  
 Chief, Development Engineering Division

DEVELOPER'S/BUILDER'S CERTIFICATE  
 I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN AS-BUILT PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION.  
*[Signature]* 9-22-09  
 SIGNATURE OF DEVELOPER/BUILDER DATE

ENGINEER'S CERTIFICATE  
 I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN AS-BUILT PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT.  
*Michael J. Troop* 9/23/09  
 ENGINEER'S SIGNATURE DATE

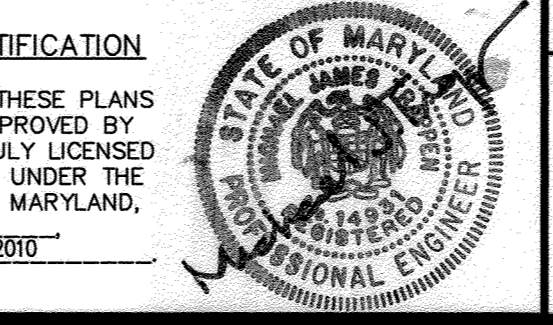
HOWARD SOIL CONSERVATION DISTRICT  
*[Signature]* 10/16/09  
 DATE

**GLWGUTSCHICK LITTLE & WEBER, P.A.**  
 CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS  
 3909 NATIONAL DRIVE - SUITE 250 - BURTINSVILLE OFFICE PARK  
 BURTINSVILLE, MARYLAND 20866  
 TEL: 301-421-4024 FAX: 410-880-1820 DC/VA: 301-889-2524 FAX: 301-421-4186

1. G. 112	REV. EEN 5	10/16/09	DATE
1. G. 112	REV. SET DUMPED LINES TO THE BLOCK PER P10-0004	10/16/09	DATE
1. G. 112	REV. SET DUMPED LINES TO THE BLOCK PER P10-0004	10/16/09	DATE

OWNER PAR C-216 thru C-218:  
 BA WATERLOO TOWNHOMES, LLC.  
 c/o BOZZUTO HOMES, INC.  
 7850 WALKER DRIVE, SUITE 400  
 GREENBELT, MARYLAND 20770  
 ATTN: DUNCAN SLIDELL  
 301-623-1525

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 EXPIRATION DATE: MAY 21, 2010



**SEDIMENT AND EROSION CONTROL PLAN**  
**SHIPLEY'S GRANT**  
**PHASE IV**  
 OPEN SPACE LOTS C-219 thru C-221, C-225 thru C-207, PARCELS D-2 AND E-1, AND NON-BUILDABLE PARCELS "D-3", "D-4", AND NON-BUILDABLE LOT C-208  
 A RESSUBDIVISION OF NON-BUILDABLE PARCELS C-216 thru C-218, "D" AND "E"  
 HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE NO.
1"=50'	R-A-15, POR	07002
DATE	TAX MAP - GRID	SHEET
SEPT., 2009	37-1&2	5 OF 31



STANDARD AND SPECIFICATIONS FOR TOPSOIL

DEFINITION
PLACEMENT OF TOPSOIL OVER A PREPARED SUBSOIL PRIOR TO ESTABLISHMENT OF PERMANENT VEGETATION.
APPLIES
I. THIS PRACTICE IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPE WHERE...

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...

II. TOPSOIL SPECIFICATIONS - SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING:
A. TOPSOIL SHALL BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, LOAMY SAND, OTHER SOILS MAY BE USED IF RECOMMENDED BY A GRADUATED SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY...

III. FOR SITES HAVING DISTURBED AREAS UNDER 5 ACRES:
A. PLACE TOPSOIL (IF REQUIRED) AND APPLY SOIL AMENDMENTS AS SPECIFIED IN 2.0 VEGETATIVE STABILIZATION - SECTION I - VEGETATIVE STABILIZATION METHODS AND MATERIALS (OR SEE SEEDING NOTES).

IV. FOR SITES HAVING DISTURBED AREAS OVER 5 ACRES:
A. ON SOIL MEETING TOPSOIL SPECIFICATIONS, OBTAIN TEST RESULTS DICTATING FERTILIZER LINE AMENDMENTS REQUIRED TO BRING THE SOIL INTO COMPLIANCE WITH THE FOLLOWING:
1. PH FOR TOPSOIL SHALL BE BETWEEN 6.0 AND 7.5. IF THE TESTED SOIL DEMONSTRATES A PH OF LESS THAN 6.0, SURFACE LIME SHALL BE PRESCRIBED TO RAISE THE PH TO 6.5 OR HIGHER...

VI. ALTERNATIVE FOR PERMANENT SEEDING - INSTEAD OF APPLYING THE FULL AMOUNTS OF LIME AND COMMERCIAL FERTILIZER, COMPOSTED SLUDGE AND AMENDMENTS MAY BE APPLIED AS SPECIFIED BELOW:
A. COMPOSTED SLUDGE MATERIAL FOR USE AS A SOIL CONDITIONER FOR SITES HAVING DISTURBED AREAS OVER 5 ACRES SHALL BE TESTED TO PRESCRIBED AMENDMENTS AND FOR SITES HAVING DISTURBED AREAS UNDER 5 ACRES SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

COMPOSTED SLUDGE SHALL BE SUPPLIED BY, OR ORIGINATE FROM, A PERSON OR PERSONS THAT ARE PERMITTED (AT THE TIME OF ACQUISITION OF THE COMPOST) BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT UNDER COMAR 26.04.06.
2. COMPOSTED SLUDGE SHALL CONTAIN AT LEAST 1 PERCENT NITROGEN, 15 PERCENT PHOSPHORUS, AND 0.2 PERCENT POTASSIUM AND HAVE A PH OF 1.0 TO 8.0. IF COMPOST DOES NOT MEET THESE REQUIREMENTS, THE APPROPRIATE CONSTITUENTS MUST BE ADDED TO MEET THE REQUIREMENTS PRIOR TO USE.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
APPROVED: DEVELOPER'S/BUILDER'S CERTIFICATE
ENGINEER'S CERTIFICATE

GLWGUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE - SUITE 250 - BURTNSVILLE OFFICE PARK
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TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

SEDIMENT CONTROL NOTES

1. A MINIMUM OF 24 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY OFFICE OF INSPECTION AND PERMITS PRIOR TO THE START OF ANY CONSTRUCTION. (40) 855-0345
2. ALL VEGETATIVE 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) 7 CALENDAR DAYS FOR ALL PERMANENT SEDIMENT CONTROL STRUCTURES, DIKES AND PERIMETER SLOPES AND ALL SLOPES GREATER THAN 5:1, B) 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
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 SEEDINGS, SOD, TEMPORARY SEEDINGS AND MULCHING (SEC. G), TEMPORARY STABILIZATION WITH MULCH ALONE, CAN ONLY 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.
9. ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED IF DEEMED NECESSARY BY THE HOWARD COUNTY DPM SEDIMENT CONTROL INSPECTOR. 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.

II. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO 3 PIPE LENGTHS OR THAT WHICH SHALL BE BACKFILLED AND STABILIZED WITHIN 1 WORKING DAY, WHICHEVER IS SHORTER.
PERMANENT SEEDING NOTES
APPLY TO GRADED OR CLEARED AREA NOT SUBJECT TO IMMEDIATE FURTHER DISTURBANCE WHERE A PERMANENT LONG-LIVED VEGETATIVE COVER IS NEEDED.

SEEDING: FOR THE PERIODS MARCH 1 THRU APRIL 30, AND AUGUST 1 THRU OCTOBER 15, SEED WITH 40 LBS PER ACRE (4 LBS/1000 SQ FT) OF KENTUCKY 31 TALL FESCUE. FOR THE PERIOD MAY 1 THRU JULY 31, SEED WITH 60 LBS KENTUCKY 31 TALL FESCUE PER ACRE AND 2 LBS PER ACRE (2 LBS/1000 SQ FT) OF KEEPING LOVEGRASS. DURING THE PERIOD OF OCTOBER 16 THRU FEBRUARY 28, PROTECT SITE BY OPTION (1) 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING. OPTION (2) USE SOD. OPTION (3) SEED WITH 60 LBS/ACRE KENTUCKY 31 TALL FESCUE AND MULCH WITH 2 TONS/ACRE WELL ANCHORED STRAW.
MULCHING: APPLY 1/2 TO 2 TONS PER ACRE (10 TO 40 LBS/1000 SQ FT) OF UNROTTED SMALL GRASS STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 210 GALLONS PER ACRE (6 GAL/1000 SQ FT) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPES 8 FEET OR HIGHER, USE 348 GALLONS PER ACRE (6 GAL/1000 SQ FT) FOR ANCHORING.

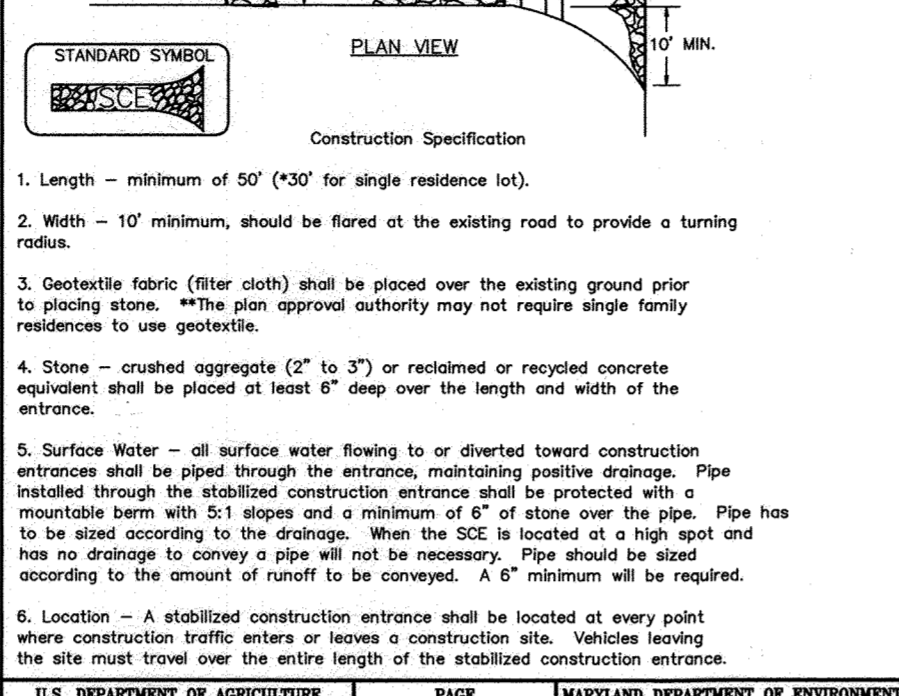
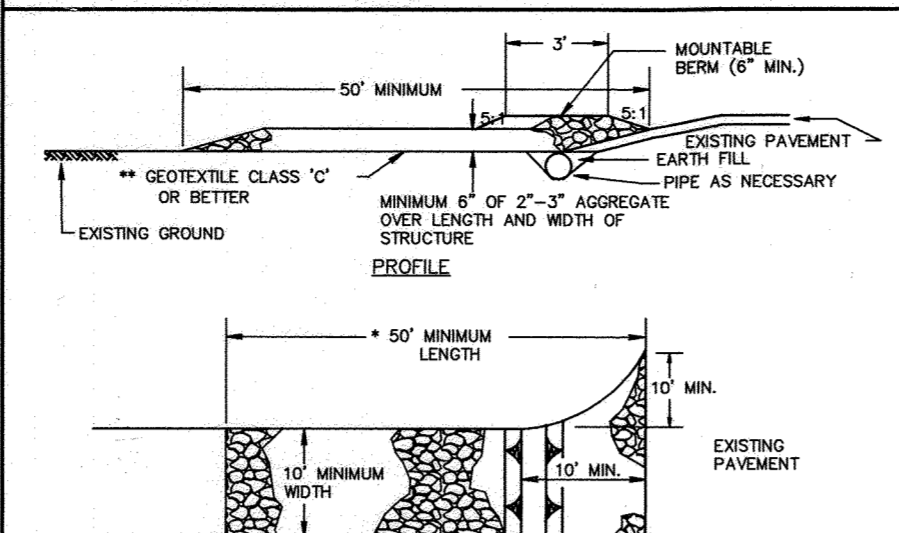
TEMPORARY SEEDING NOTES
APPLY TO GRADED OR CLEARED AREAS LIKELY TO BE REDISTURBED WHERE A SHORT-TERM VEGETATIVE COVER IS NEEDED.
SEEDING PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING (UNLESS PREVIOUSLY LOOSENED).

SEEDING: FOR PERIODS MARCH 1 THRU APRIL 30, AND AUGUST 1 THRU OCTOBER 15, SEED WITH 2 1/2 BUSHEL PER ACRE OF ANNUAL RYE (5.2 LBS/1000 SQ FT). FOR THE PERIOD MAY 1 THRU AUGUST 14, SEED WITH 3 LBS PER ACRE OF KEEPING LOVEGRASS (6 LBS/1000 SQ FT). FOR THE PERIOD NOVEMBER 16 THRU FEBRUARY 28, PROTECT SITE BY APPLYING 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING, OR USE SOD.
MULCHING: APPLY 1/2 TO 2 TONS PER ACRE (10 TO 40 LBS/1000 SQ FT) OF UNROTTED, NEED-FREE, SMALL GRASS STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 210 GAL PER ACRE (6 GAL/1000 SQ FT) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPES 8 FT OR HIGHER, USE 348 GAL PER ACRE (6 GAL/1000 SQ FT) FOR ANCHORING.

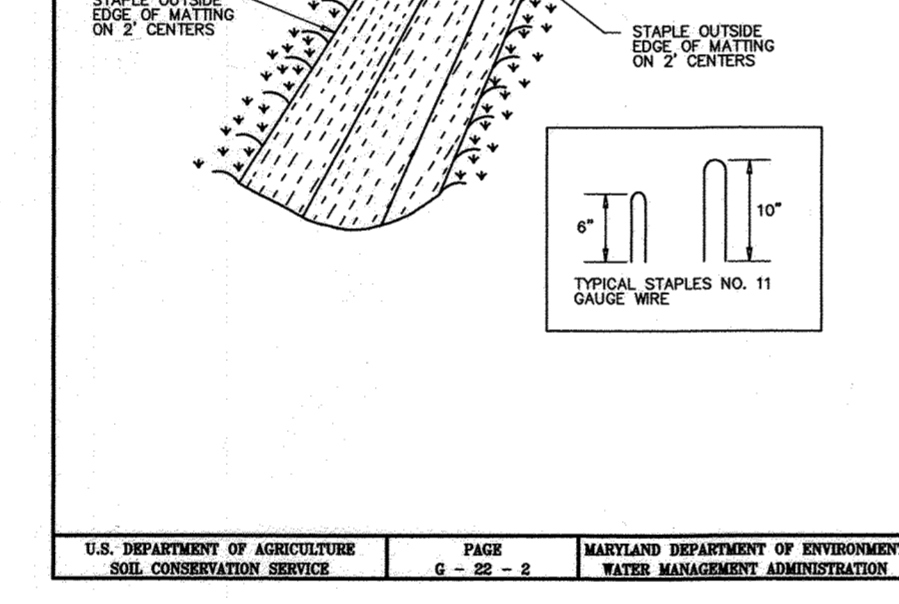
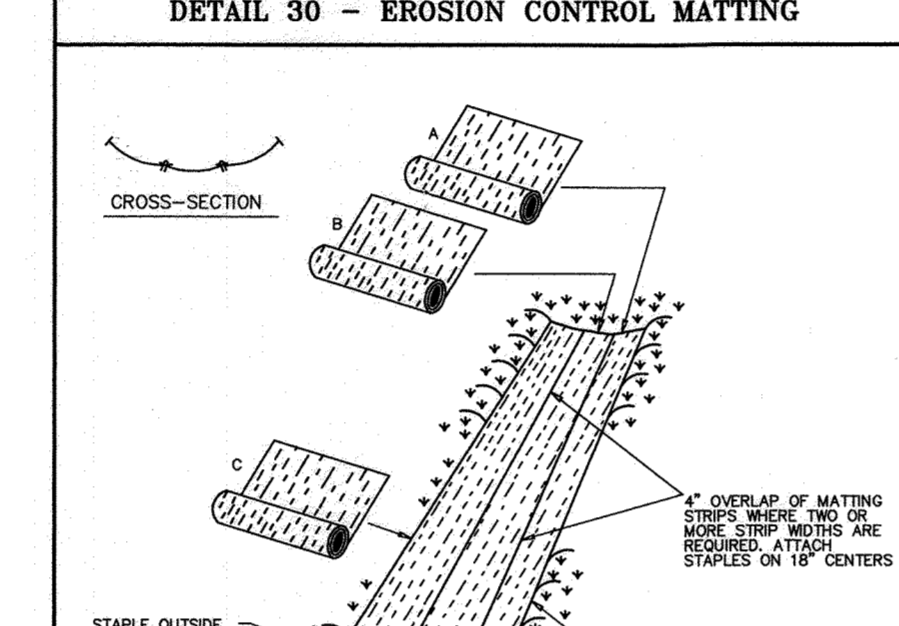
DEVELOPER'S/BUILDER'S CERTIFICATE
ENGINEER'S CERTIFICATE
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
APPROVED: DEVELOPER'S/BUILDER'S CERTIFICATE
ENGINEER'S CERTIFICATE

GLWGUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE - SUITE 250 - BURTNSVILLE OFFICE PARK
BURTNSVILLE, MARYLAND 20866
TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

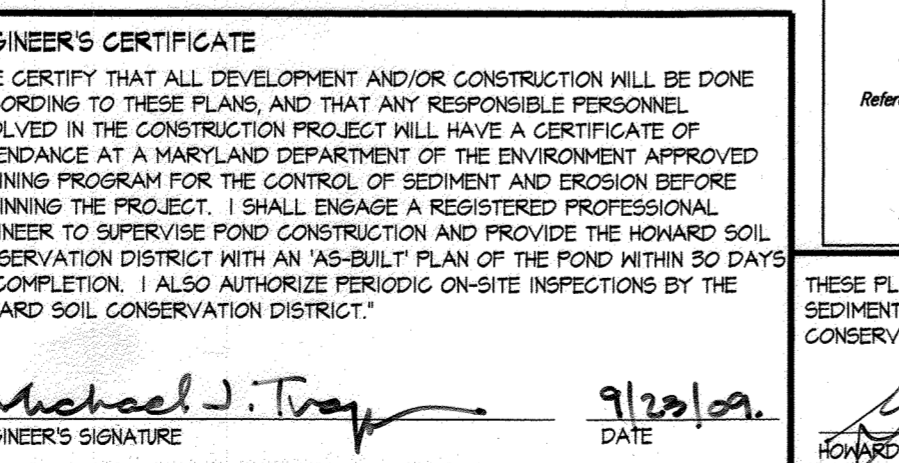
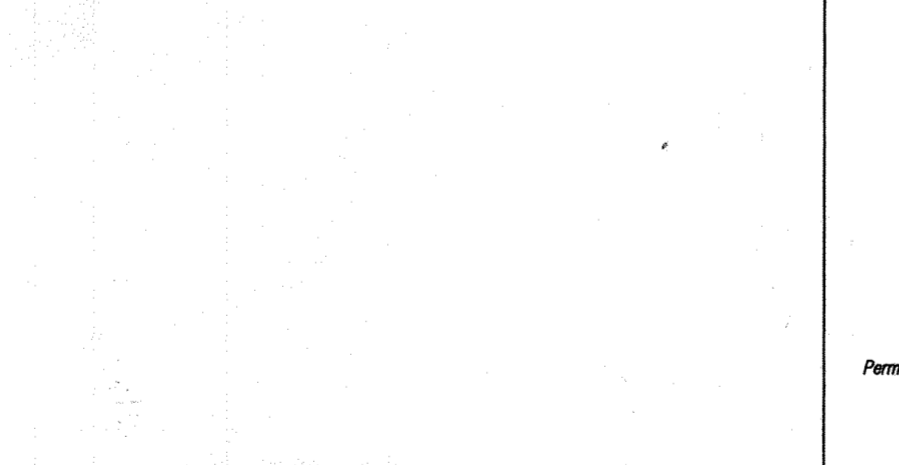
DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE



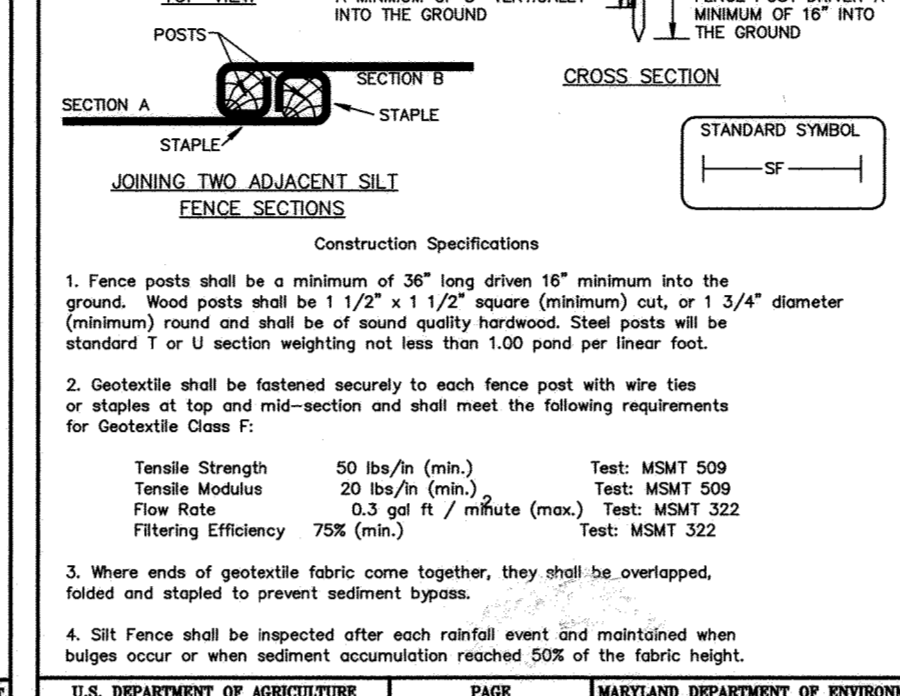
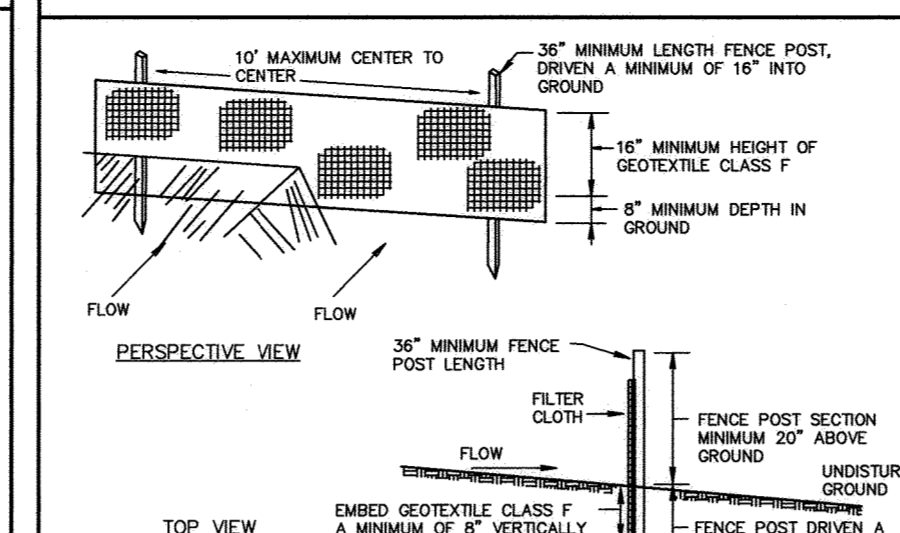
DETAIL 30 - EROSION CONTROL MATTING



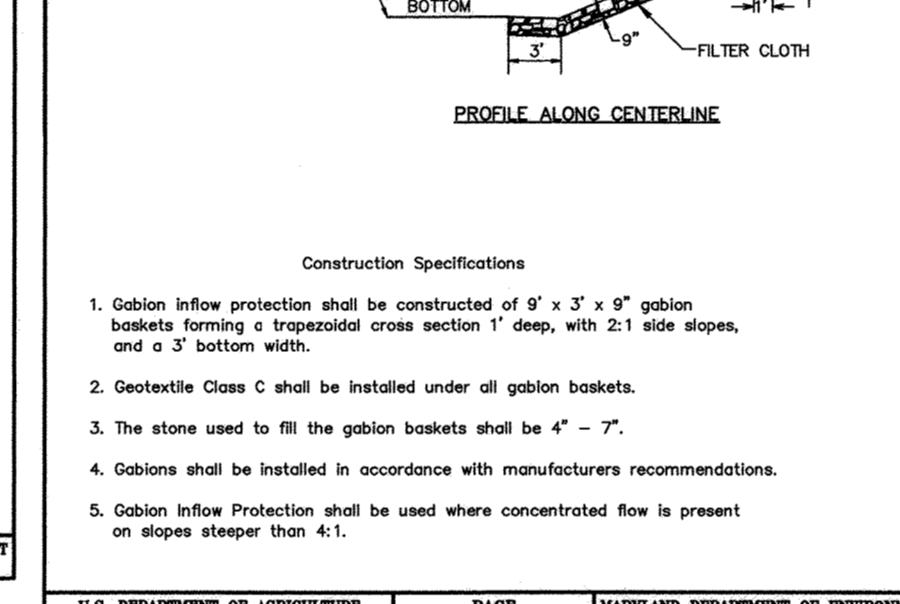
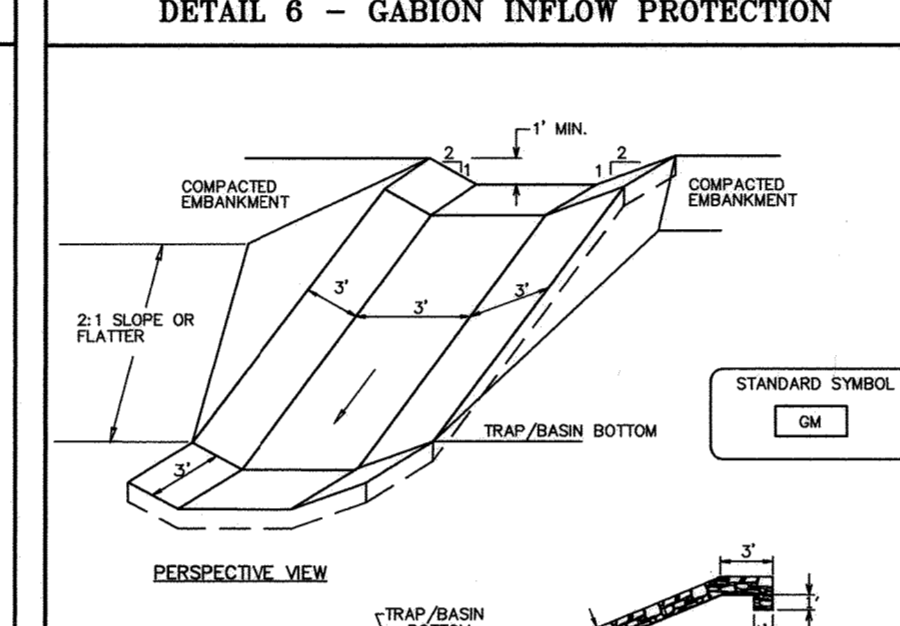
DETAIL 6 - GABION INFLOW PROTECTION



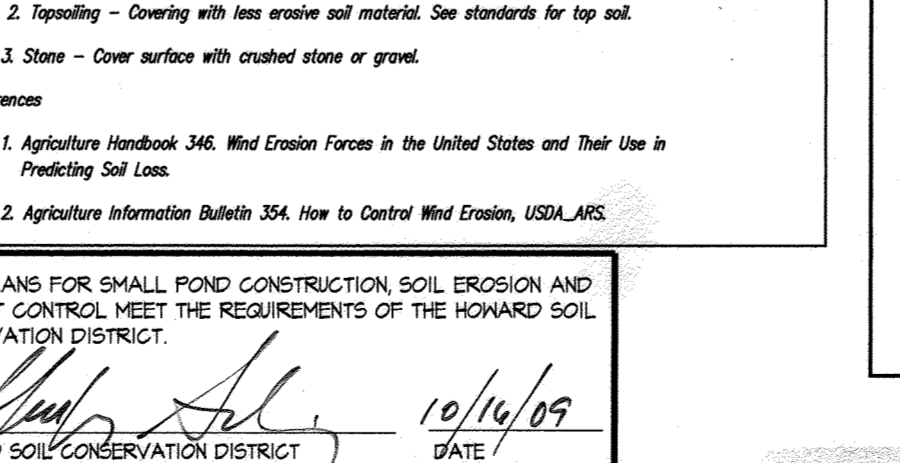
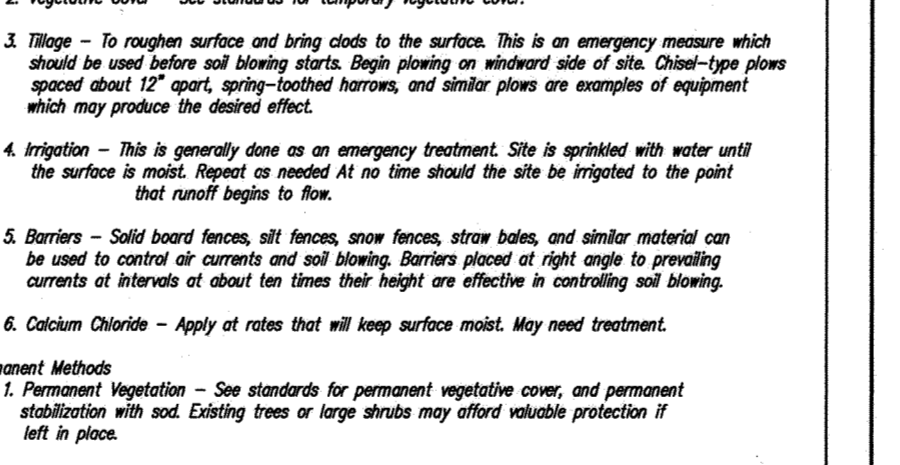
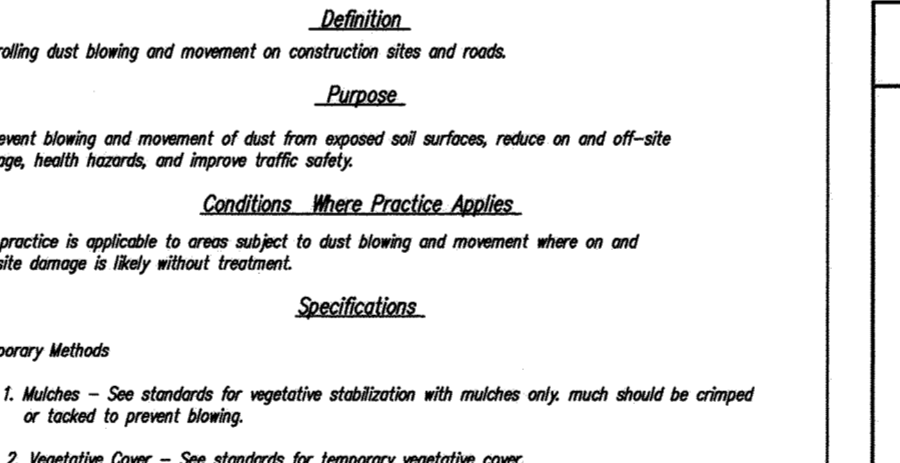
DETAIL 22 - SILT FENCE



DETAIL 18 - SEDIMENT BASIN BAFFLES

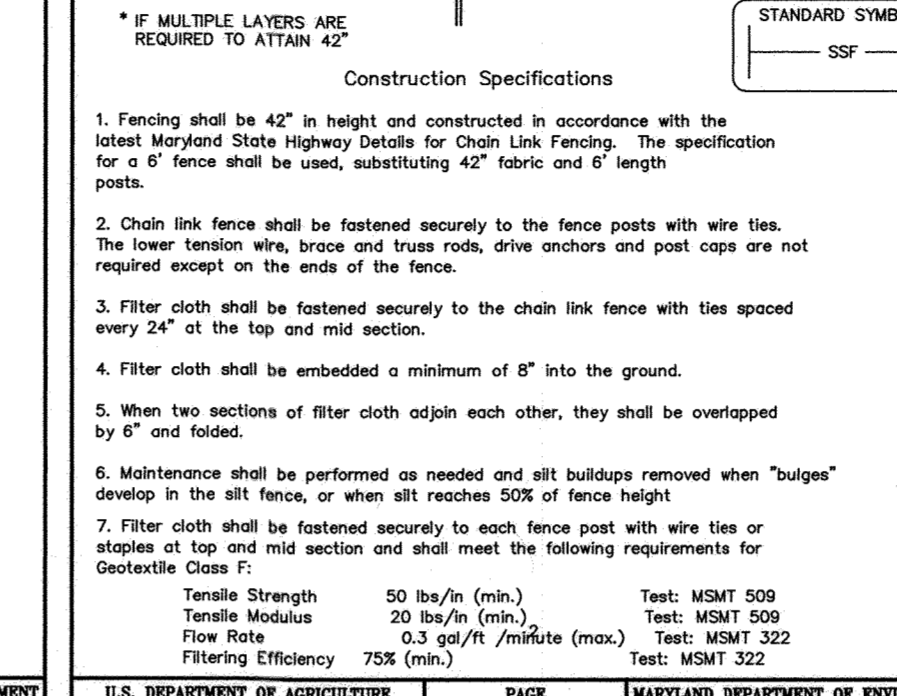
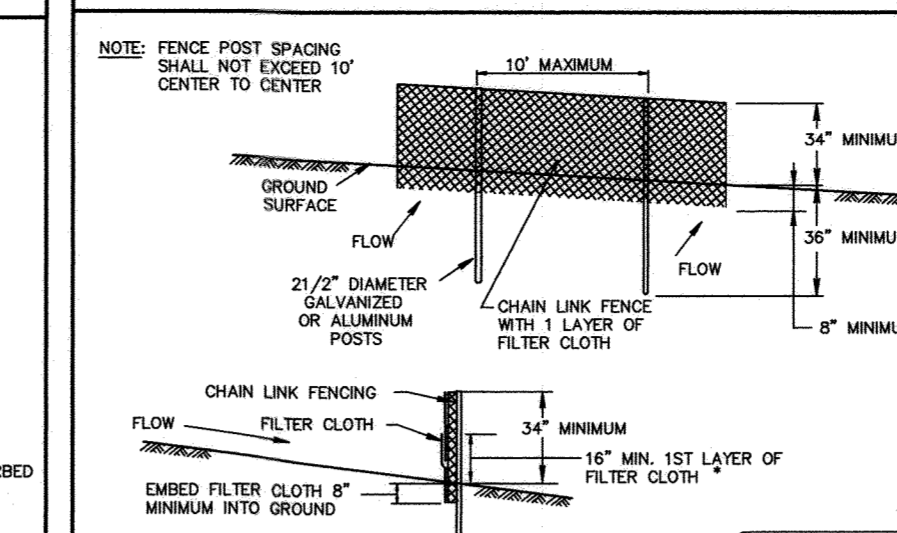


DETAIL 20A - REMOVABLE PUMPING STATION

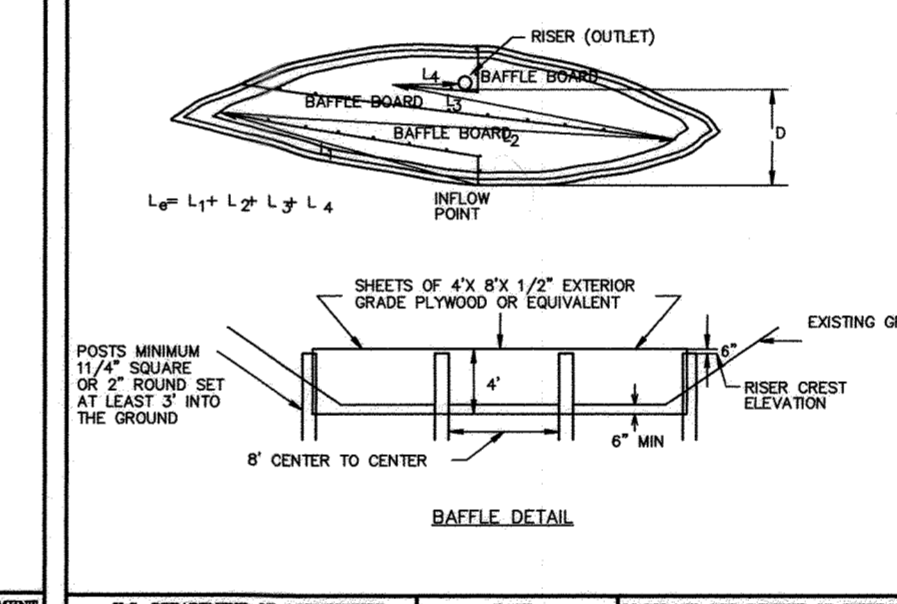
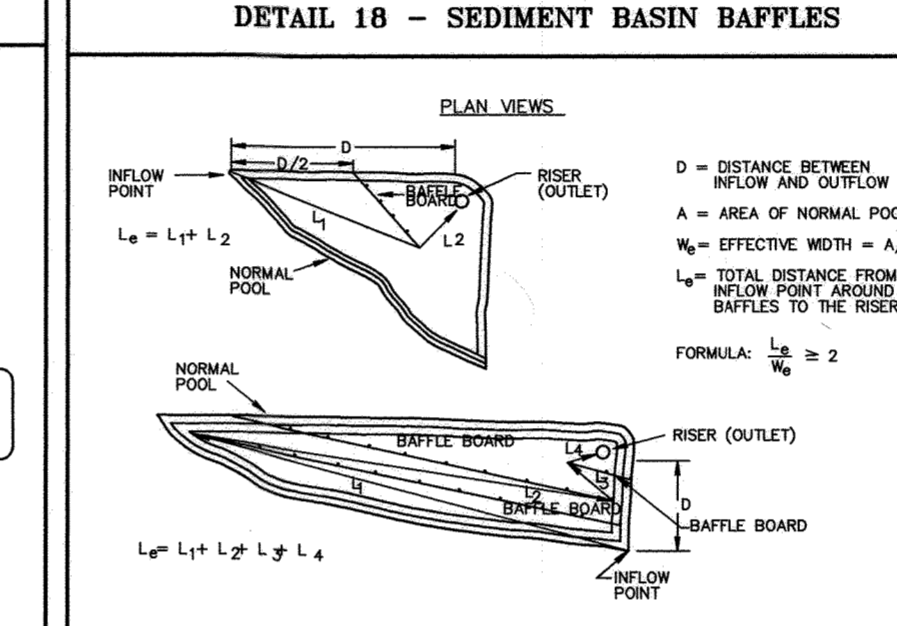


NO ASBUILT INFORMATION
12/1/20
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE 19 - 19 - 10A MARYLAND DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES WATER MANAGEMENT ADMINISTRATION

DETAIL 27 - ROCK OUTLET PROTECTION III



DETAIL 27 - ROCK OUTLET PROTECTION III





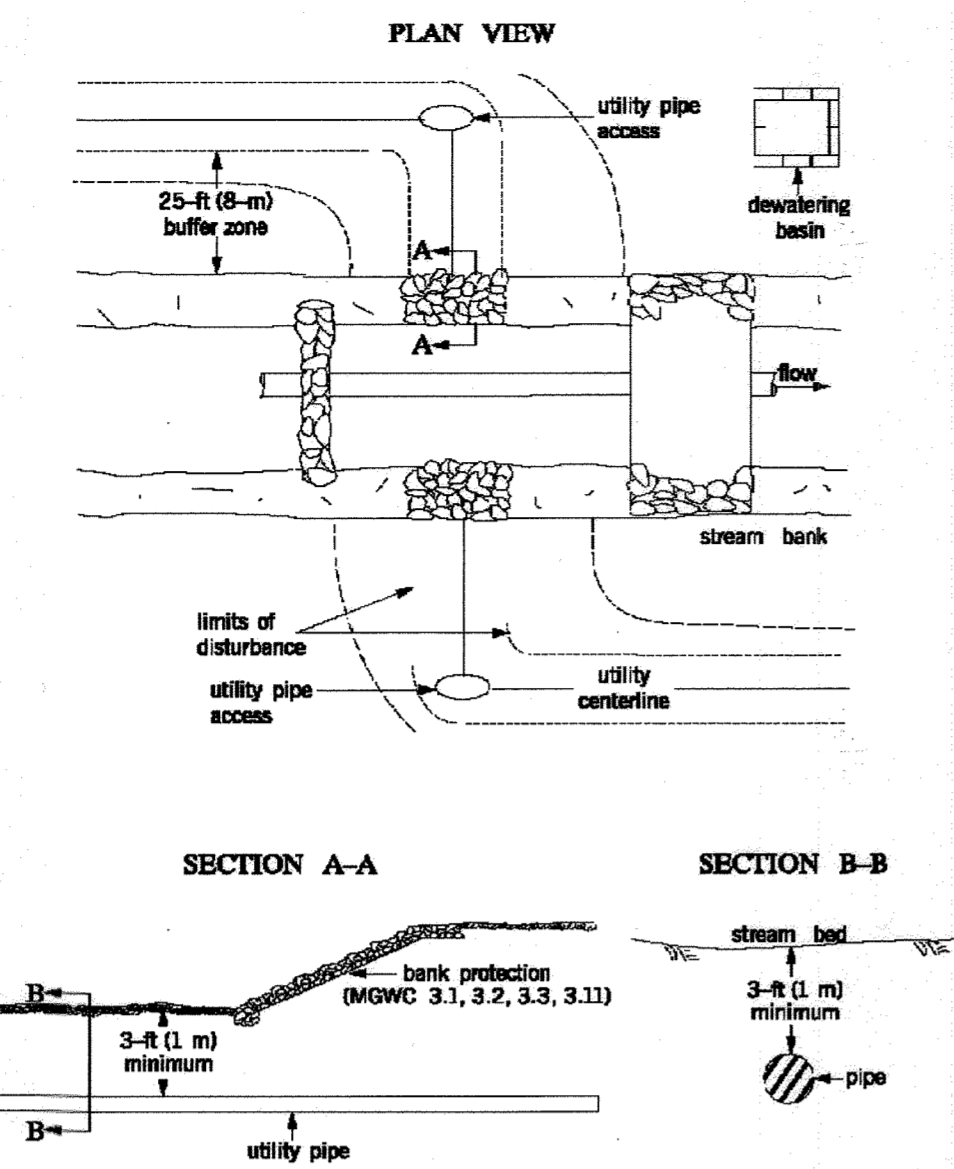
Temporary in-stream construction

**DESCRIPTION**  
The work should consist of installing erosion control devices in and adjacent to the construction of utility crossings.

**INSTALLATION GUIDELINES**  
All erosion and sediment control devices, including dewatering basins, should be implemented as the first order of business according to a plan approved by the WMA or local authority. (See the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control). The proposed construction sequence is as follows (refer to Detail 4.2):

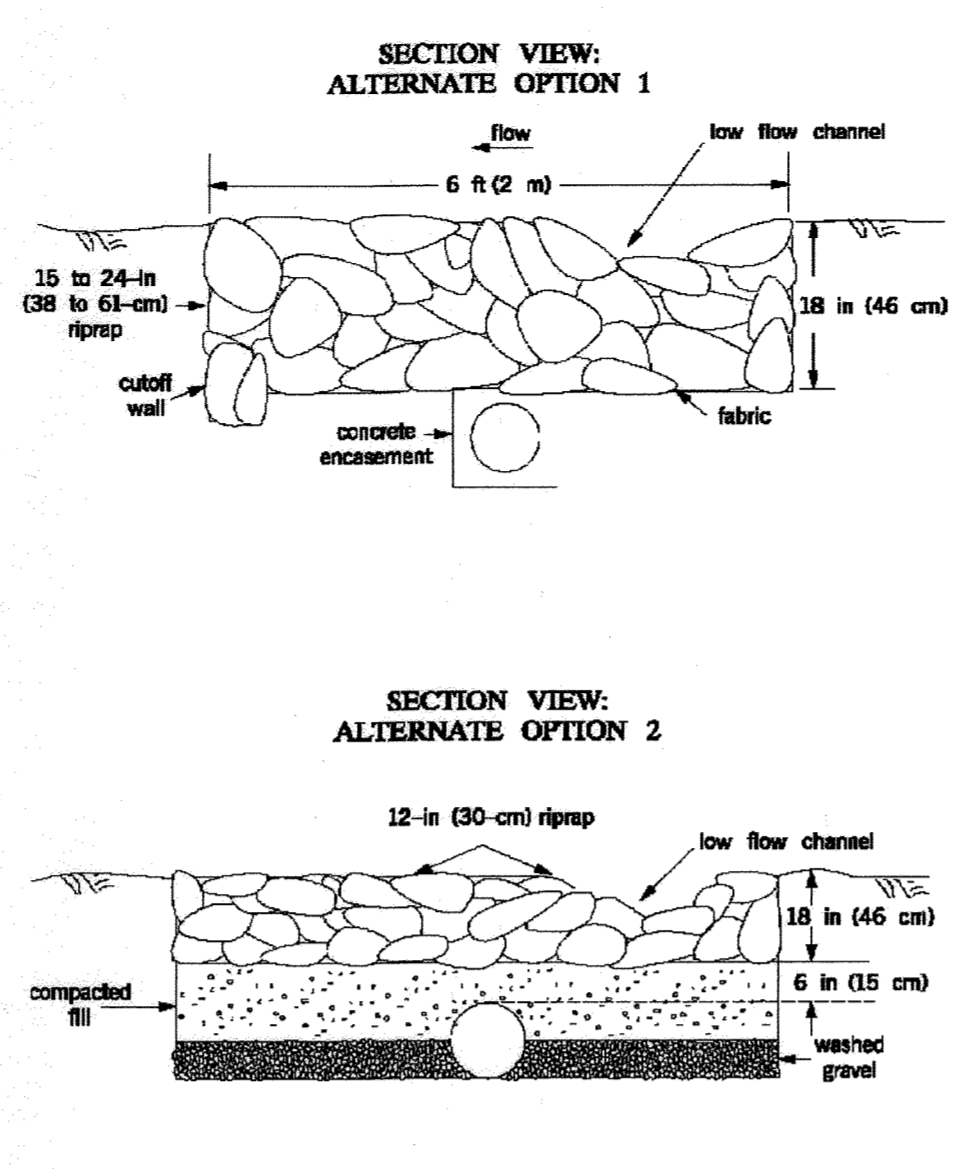
- The contractor should insure that a continuous perimeter control barrier is in place to minimize the amount of pollutants entering the flow. A diversion pipe as shown in MGWC 1.4, Diversion Pipe or other measure should be installed and snags or stone barriers as shown in MGWC 1.5, Snagging/Stone Diversion should be constructed according to specifications to divert the streamflow.
- Excavated topsoil and subsoil should be kept separate, placed on the upland side of the excavation, and replaced in their natural order.
- All construction should take place during stream low flows. The length of construction time should be limited to a maximum of 5 consecutive days for each crossing.
- All utility crossings should be placed a minimum of 3 feet (1 meter) beneath the stream bed unless an alternative section is specifically approved by the WMA. For instances where a 3-foot cover is not viable, two alternate stabilization options are given in the Detail 4.2. A low flow channel shall be constructed through all riprap placements across the stream bed.
- The stream should be diverted by an approved temporary stream diversion, the construction area should be dewatered, and any disturbed banks should be stabilized. The contractor may elect to construct the utility crossing in two stages. In this case, a WMA approved flow barrier may be constructed to keep the construction area dry.
- Once the crossing is completed, the diversion should be removed from upstream to downstream. Sediment control devices, including perimeter erosion controls, are to remain in place until all disturbed areas are stabilized in accordance with an approved sediment and erosion control plan and the inspection authority approves their removal.

Maryland's Guidelines To Waterway Construction  
DETAIL 4.2(a): UTILITY CROSSING



STREAM CROSSING: MARYLAND DEPARTMENT OF THE ENVIRONMENT WATERWAY CONSTRUCTION GUIDELINES REVISED NOVEMBER 2000

Maryland's Guidelines To Waterway Construction  
DETAIL 4.2(b): UTILITY CROSSING



STREAM CROSSING: MARYLAND DEPARTMENT OF THE ENVIRONMENT WATERWAY CONSTRUCTION GUIDELINES REVISED NOVEMBER 2000

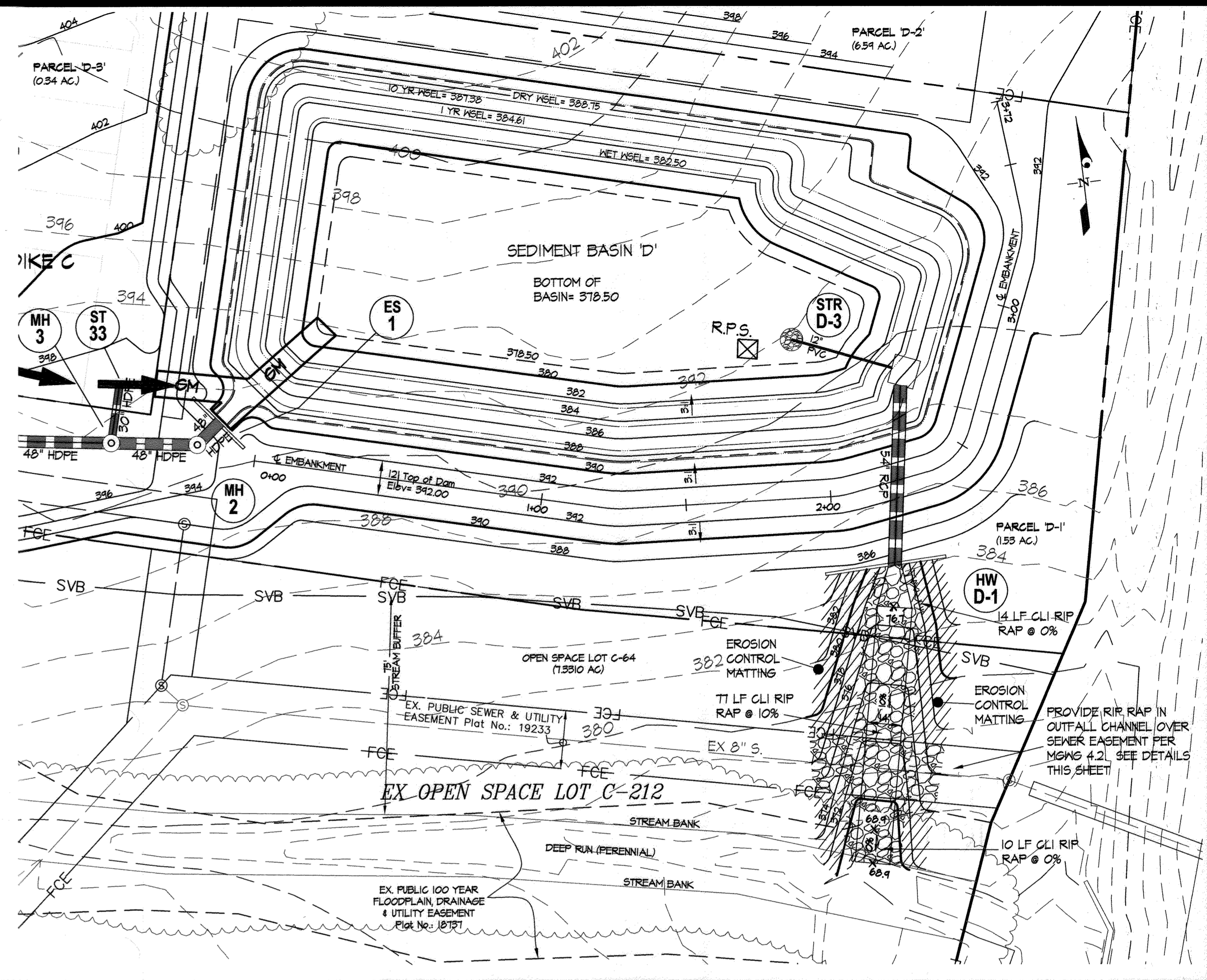
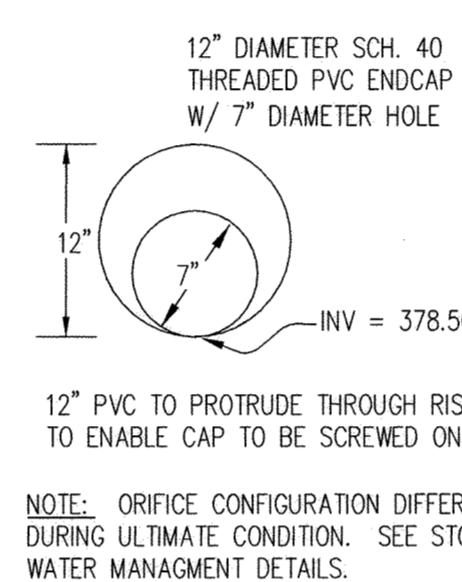
**BAFFLE COMPUTATION**  
D = 224 FT.  
A NET POOL = 17607 SQFT  
Me = A/D = 79 FT  
L6 = 246 = 150 FT  
L6 PROVIDED = 224 FT  
No Baffles Required

SEDIMENT BASIN D DATA TABLE

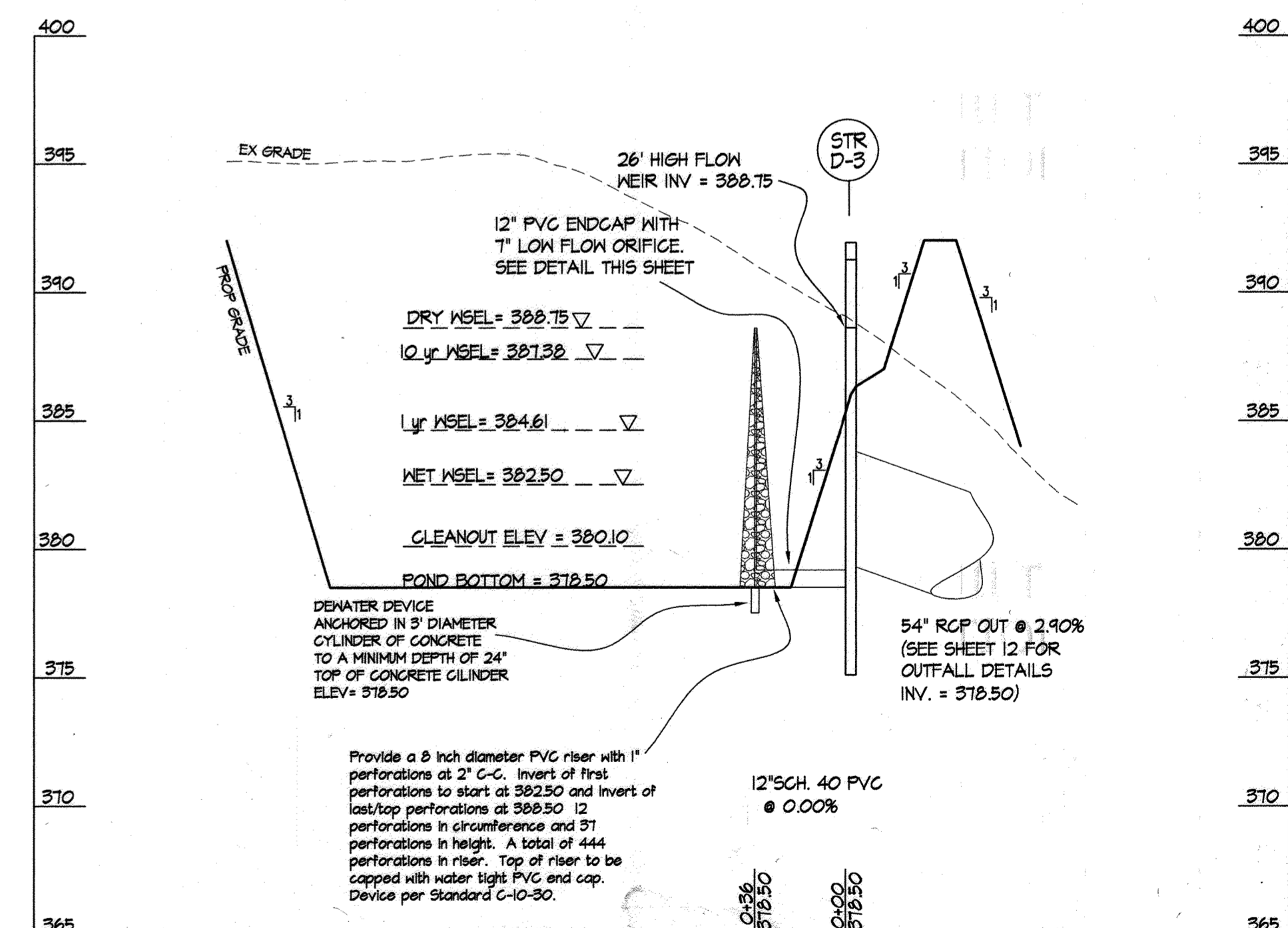
**PRECAST RISER OUTLET SEDIMENT BASIN**  
EXISTING DRAINAGE AREA TO STUDY POINT 3: 11.46 AC (EX-6)  
WORST CASE DRAINAGE AREA TO BASIN: 11.0 AC (INT-6)  
NET STORAGE VOL. REQUIRED: 0.48 AC-FT  
NET STORAGE VOL. PROVIDED: 1.16 AC-FT  
NET STORAGE ELEV: 382.50  
DRY STORAGE REQUIRED: 0.48 AC-FT  
DRY STORAGE PROVIDED: 3.14 AC-FT  
DRY STORAGE WSEL = 388.75  
EXISTING O-H-R = 2.41 cfs (STUDY POINT 6)  
INTERIM O-H-R = 1.68 cfs (STUDY POINT 6)  
SAFE PASS OF 10-YR STORM PROVIDED  
Q10 = 2.74 cfs  
10-YR WSEL = 381.58 ft.  
BOTTOM ELEVATION: 378.50  
TOP OF EMBANKMENT: 392.00  
OUTFALL: 62 LF 54" RCP @ 2.90%  
RISER WEIR CREST ELEVATION: 388.75  
RISER WEIR LENGTH: 26.0'  
RISER TRASH RACK/ANTIVORTEX: N/A

**DEWATERING DEVICE** = 8" PERFORATED PVC WITH 8" PVC BARREL AT 0.0%  
DEWATERING INVERT AT 8" RISER = 378.50  
INVERT FIRST PERFORATION = 382.50  
INVERT LAST PERFORATION = 388.50  
DEWATERING PERFORATION CONFIGURATION:  
WITH 1" HOLES @ 2' C-C  
12 HOLES PER CIRCUMFERENTIAL ROW  
37 HOLES RUNNING VERTICALLY  
444 HOLES TOTAL

**EMERGENCY SPILLWAY ELEV: NONE**  
CLEANOUT ELEVATION: 380.10  
EMBANKMENT TOP WIDTH: 12'  
SIDE SLOPES: 5:1 INTERIOR - 3:1 EXTERIOR



SEDIMENT BASIN 'D' ENLARGEMENT SCALE: 1" = 30'



Basin D Profile Along 12" Low Flow Dewatering Device (H) 1" = 50' (V) 1" = 5'

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
10-23-09  
Date

DEVELOPER'S/BUILDER'S CERTIFICATE  
I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN 'AS-BUILT' PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION.

ENGINEER'S CERTIFICATE  
I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN 'AS-BUILT' PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT.

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
10-27-09  
Date

9-22-09  
DATE

10/23/09  
DATE

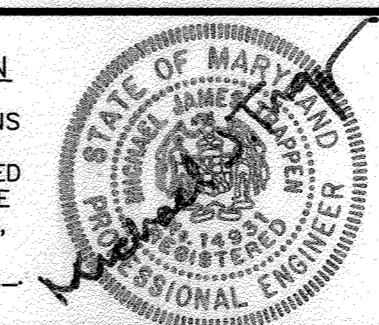
GLWGUTSCHICK LITTLE & WEBER, P.A.  
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS  
3909 NATIONAL DRIVE - SUITE 250 - BURTONSVILLE OFFICE PARK  
BURTONSVILLE, MARYLAND 20866  
TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

10/10  
DATE

Rev. Title Block Per F10-000  
REVISION

OWNER PAR C-216 thru C-218:  
BA WATERLOO TOWNHOMES, LLC.  
c/o BOZZUTO HOMES, INC.  
7850 WALKER DRIVE, SUITE 400  
GREENBELT, MARYLAND 20770  
ATTN: DUNCAN SLIDELL  
301-623-1525

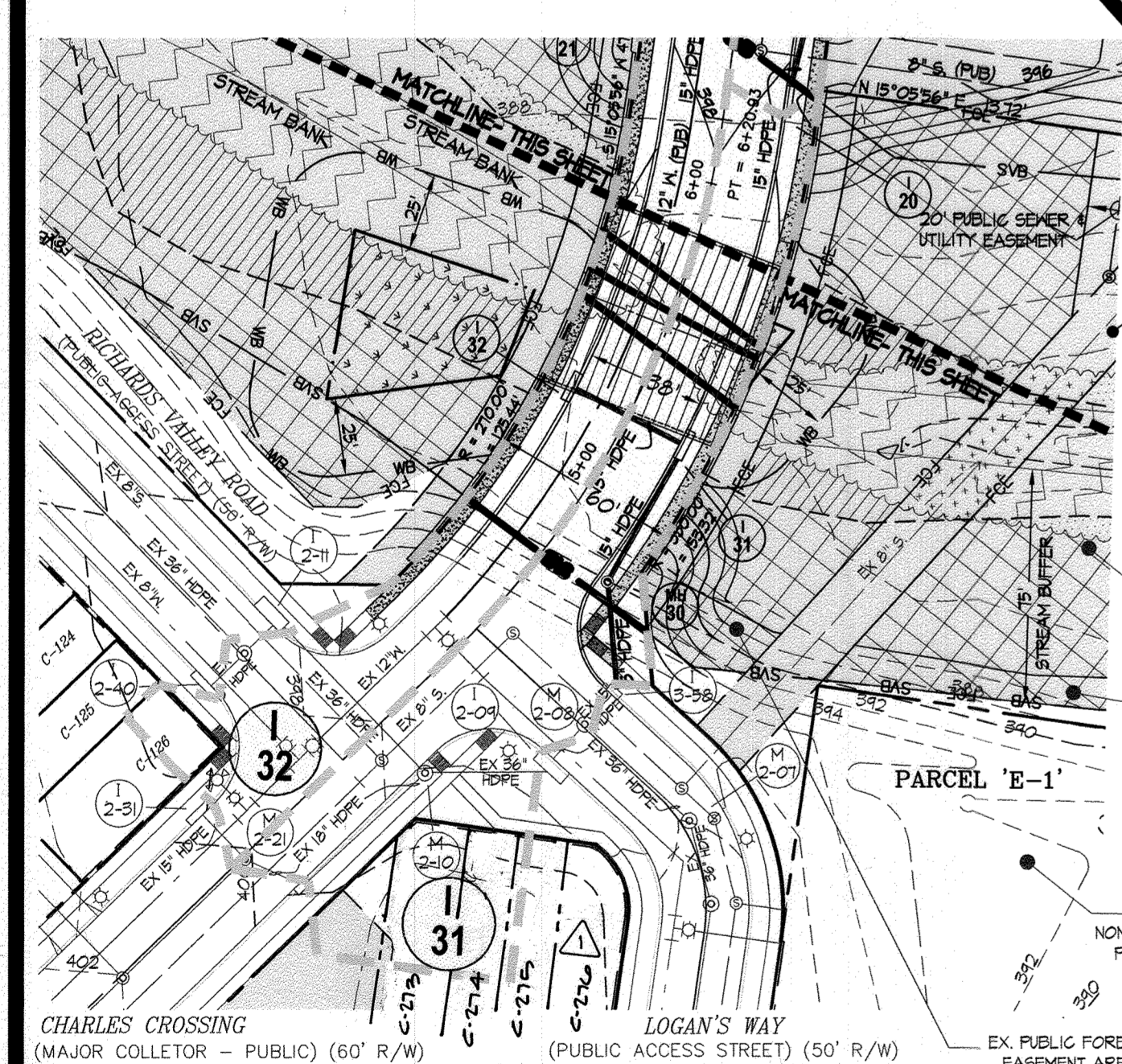
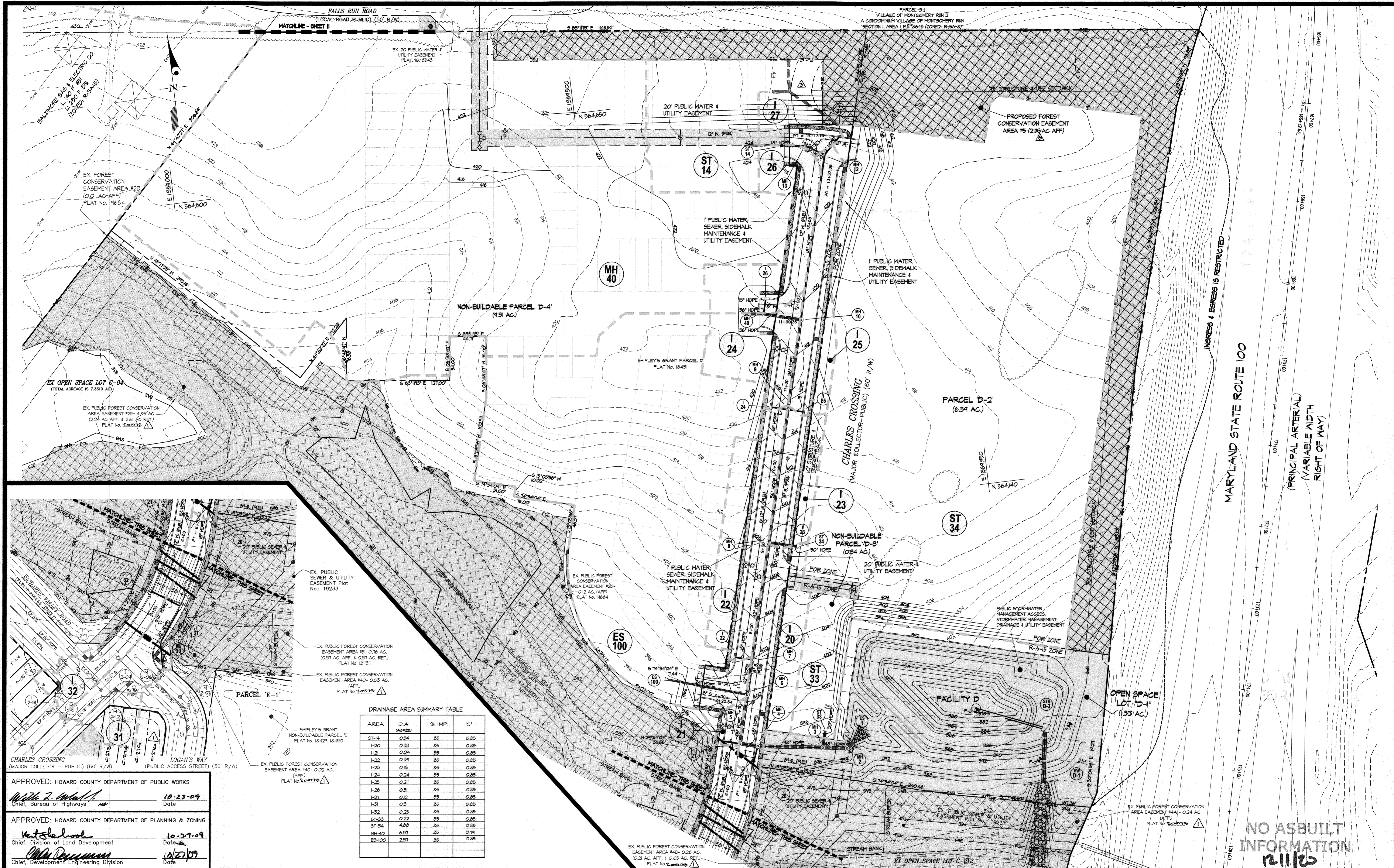
PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 14531  
EXPIRATION DATE: May 21, 2016



SEDIMENT AND EROSION CONTROL DETAILS  
SHIPLEY'S GRANT  
PHASE IV  
LOTS C-219 thru C-222, C-275 thru C-307, PARCELS D-2 and E-1,  
OPEN SPACE LOTS C-207, D-1, E-2 & E-3 and NON-BUILDABLE PARCELS 'D-3', 'D-4',  
and NON-BUILDABLE LOT C-208  
A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 thru C-218, 'D' and 'E'

SCALE	ZONING	G. L. W. FILE No.
AS SHOWN	R-A-15, POR	07002
DATE	TAX MAP - GRID	SHEET
SEPT., 2009	37-1&2	7 OF 31





Drainage Area Summary Table

AREA	D.A. (ACRES)	% IMP.	C'
ST-14	0.54	25	0.25
I-20	0.39	25	0.25
I-21	0.04	25	0.25
I-22	0.91	25	0.25
I-23	0.19	25	0.25
I-24	0.24	25	0.25
I-25	0.21	25	0.25
I-26	0.31	25	0.25
I-27	0.12	25	0.25
I-31	0.31	25	0.25
I-32	0.28	25	0.25
ST-33	0.22	25	0.25
ST-34	4.80	25	0.25
MH-40	6.37	25	0.14
ES-100	2.37	25	0.25

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 10-23-09  
 Chief, Bureau of Highways

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
 10-27-09  
 Chief, Division of Land Development

10-27-09  
 Chief, Development Engineering Division

**GLWGUTSCHICK LITTLE & WEBER, P.A.**  
 CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS  
 3909 NATIONAL DRIVE - SUITE 250 - BURTNSVILLE OFFICE PARK  
 BURTNSVILLE, MARYLAND 20866  
 TEL: 301-421-4024 BAL: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

DATE	REVISION	BY	APP'R.
10-23-09	REV. FEEDBACK	ST	
10-27-09	REV. LOT NUMBERS, LOT LINES, ADD PUBLIC UTILITY BLOCK PER F10-000	WJL	

OWNER PAR C-216 thru C-218:  
 BA WATERLOO TOWNHOMES, LLC.  
 c/o BOZZUTO HOMES, INC.  
 7850 WALKER DRIVE, SUITE 400  
 GREENBELT, MARYLAND 20770  
 ATTN: DUNCAN SLIDELL  
 301-623-1525

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. 14331  
 EXPIRATION DATE: May 21, 2010

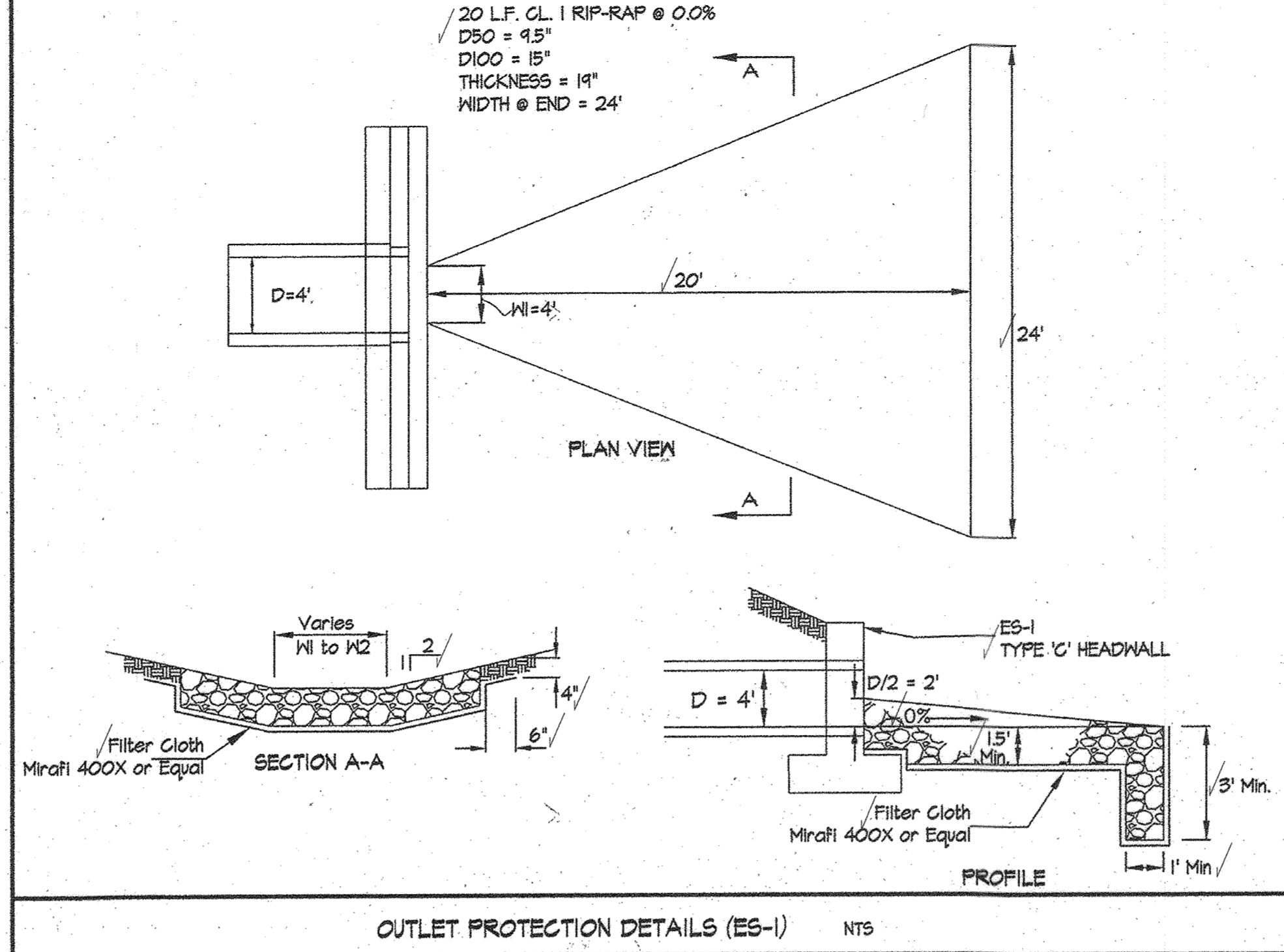
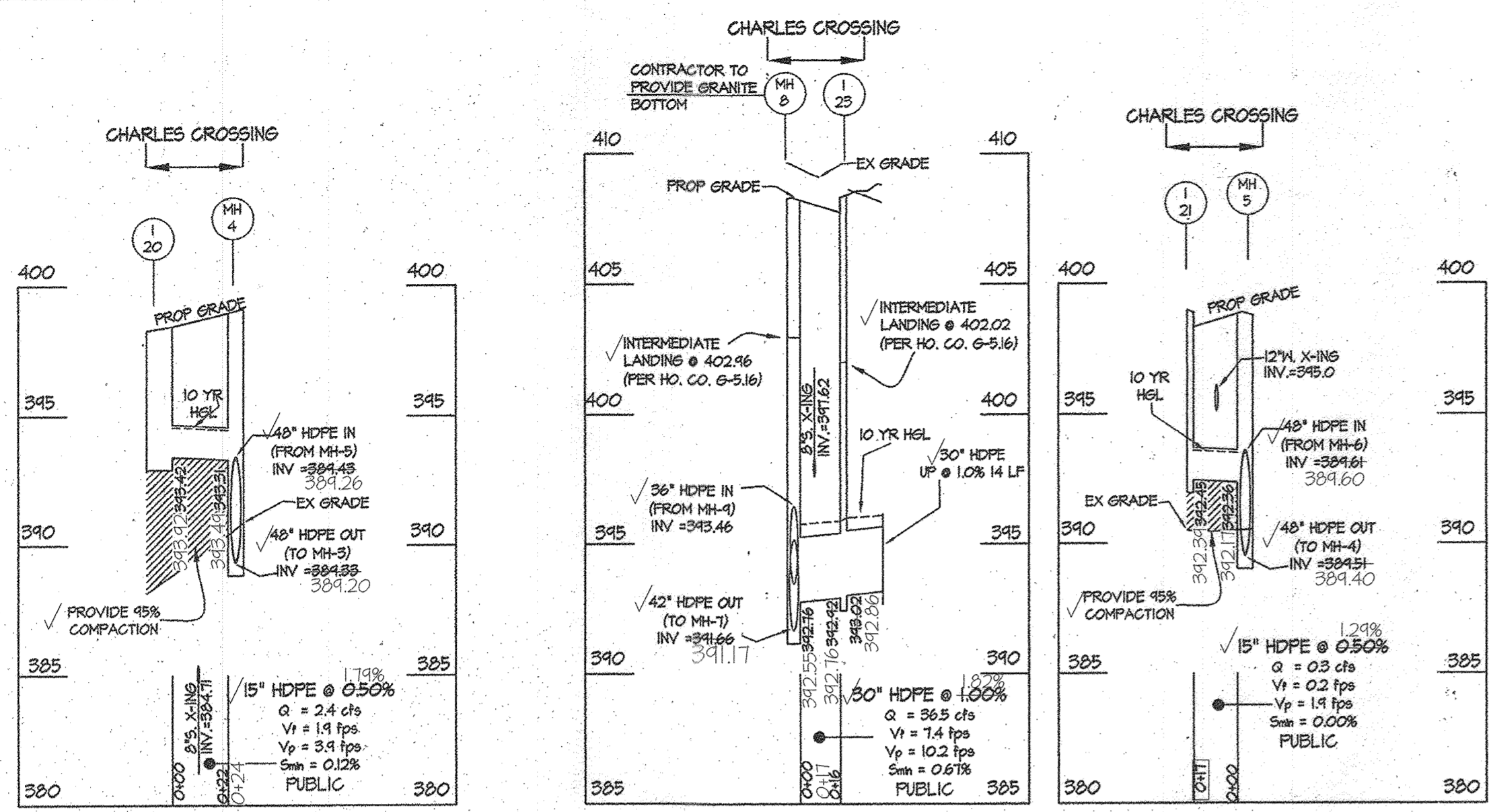


**STORM DRAIN DRAINAGE AREA MAP**  
**SHIPLEY'S GRANT**  
 PHASE IV  
 LOTS C-219 thru C-222, C-225 thru C-202, PARCELS D-2 and E-1, OPEN SPACE LOTS C-207, D-1, E-2 & E-3 and NON-BUILDABLE PARCELS "D-3", "D-4", and NON-BUILDABLE LOT C-203  
 A RESSUBDIVISION OF NON-BUILDABLE PARCELS C-216 thru C-218, "D" and "E"

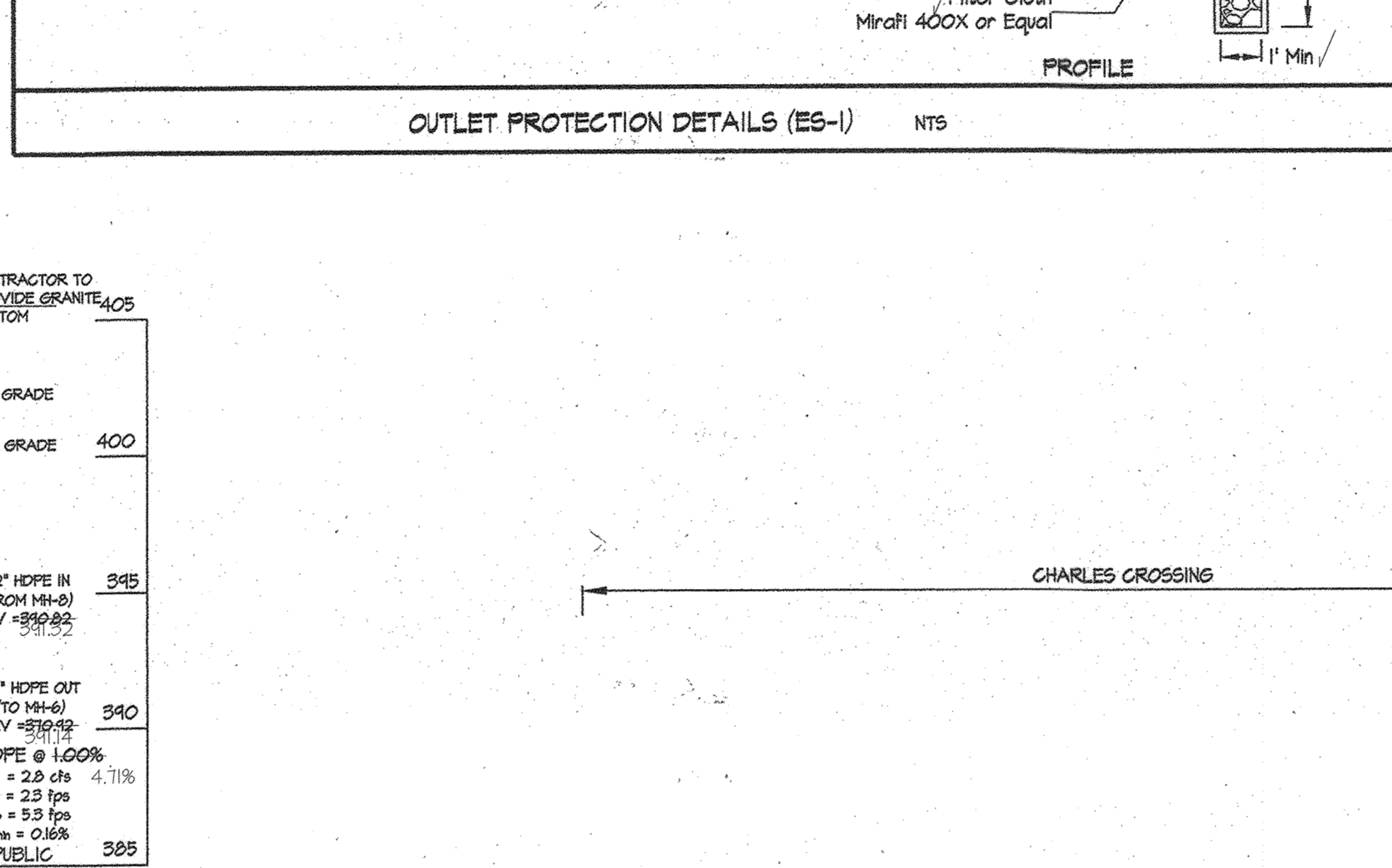
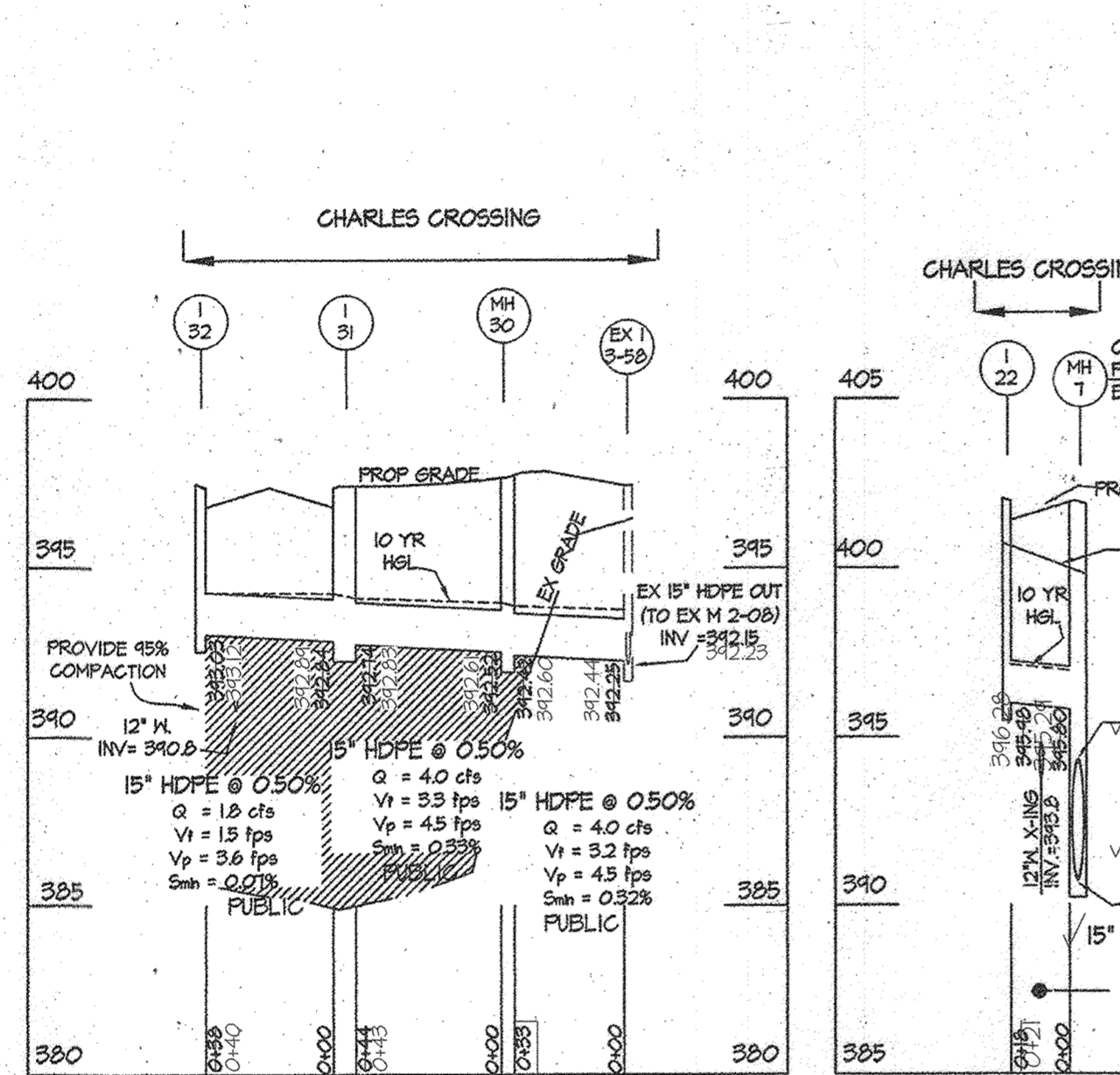
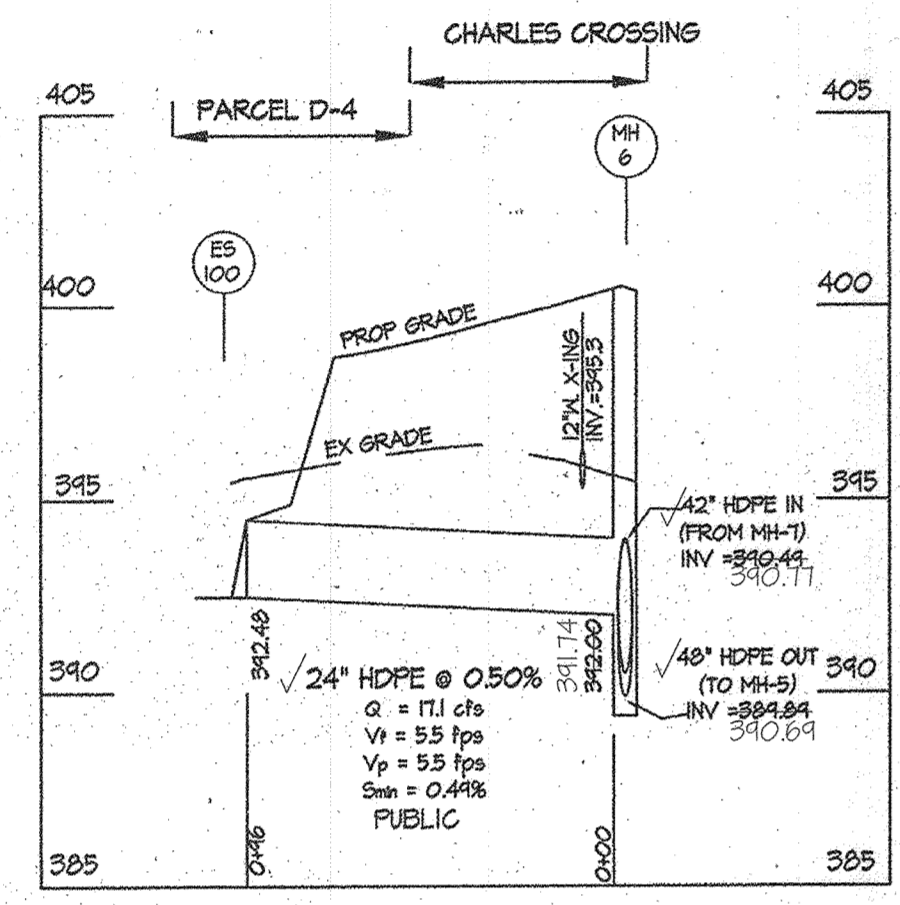
SCALE	ZONING	G. L. W. FILE NO.
1"=50'	R-A-15, POR	07002
DATE	TAX MAP - GRID	SHEET
SEPT., 2009	37-1&2	8 OF 31

NO ASBUILT INFORMATION  
 121112

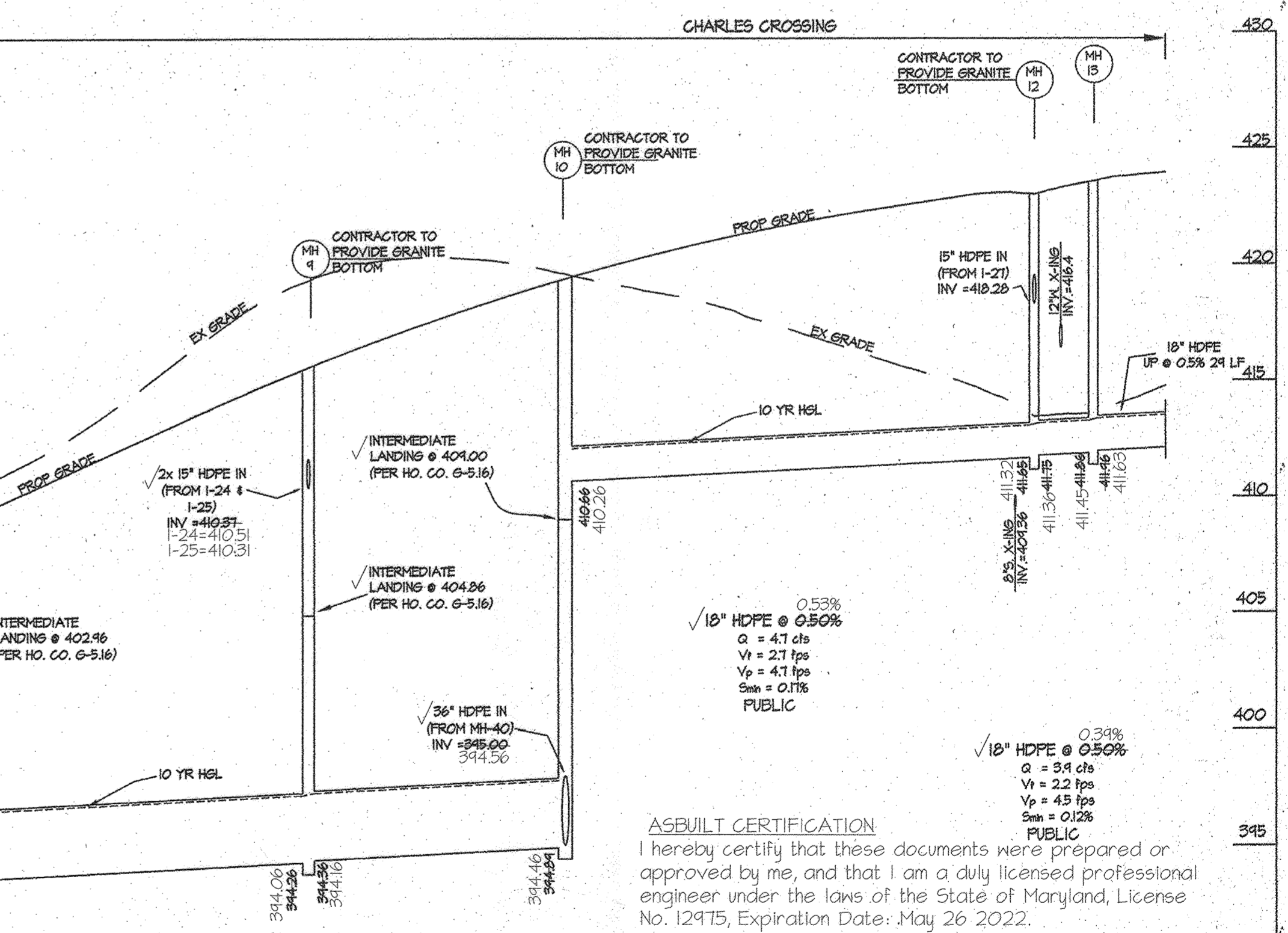
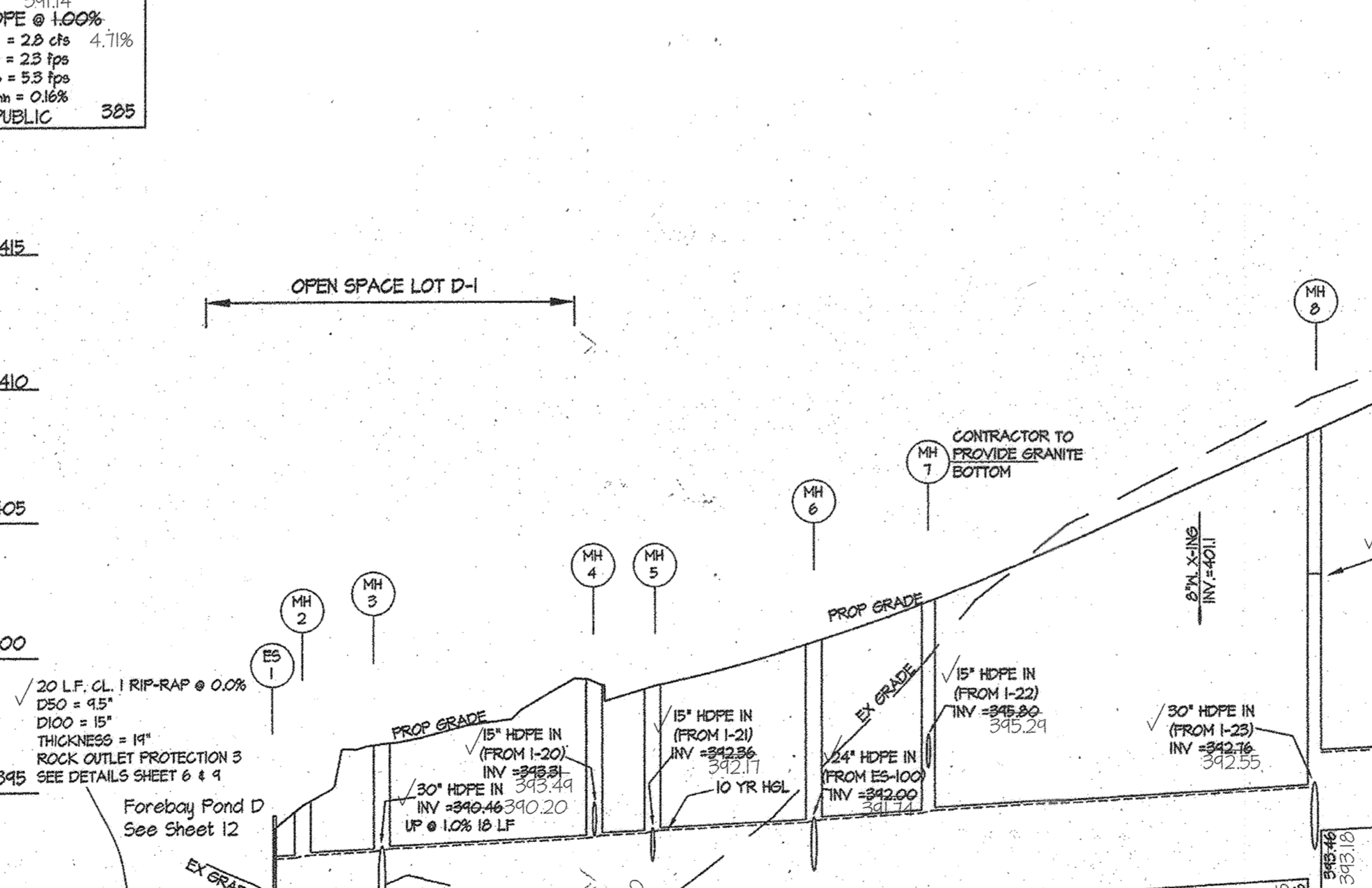
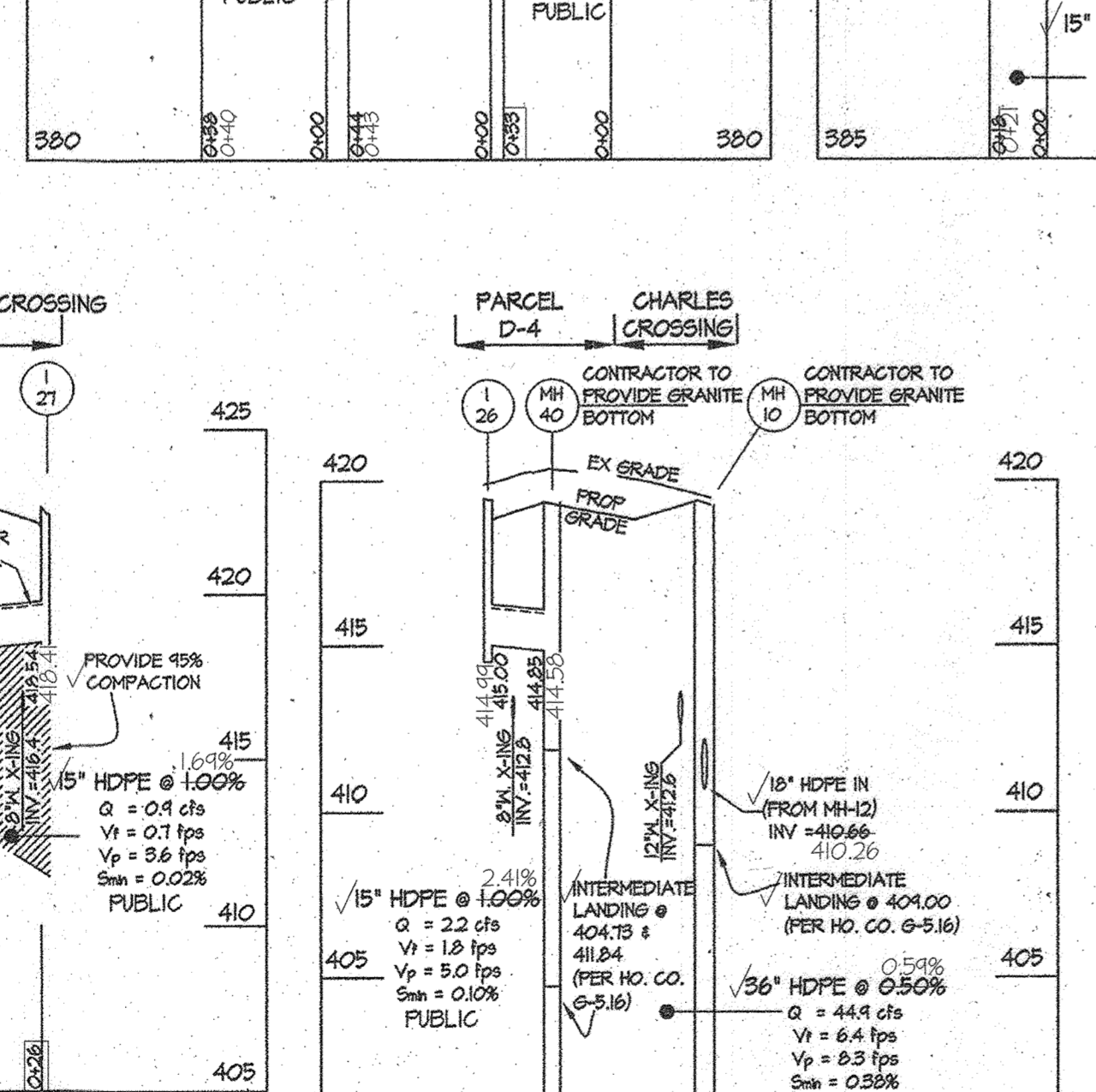
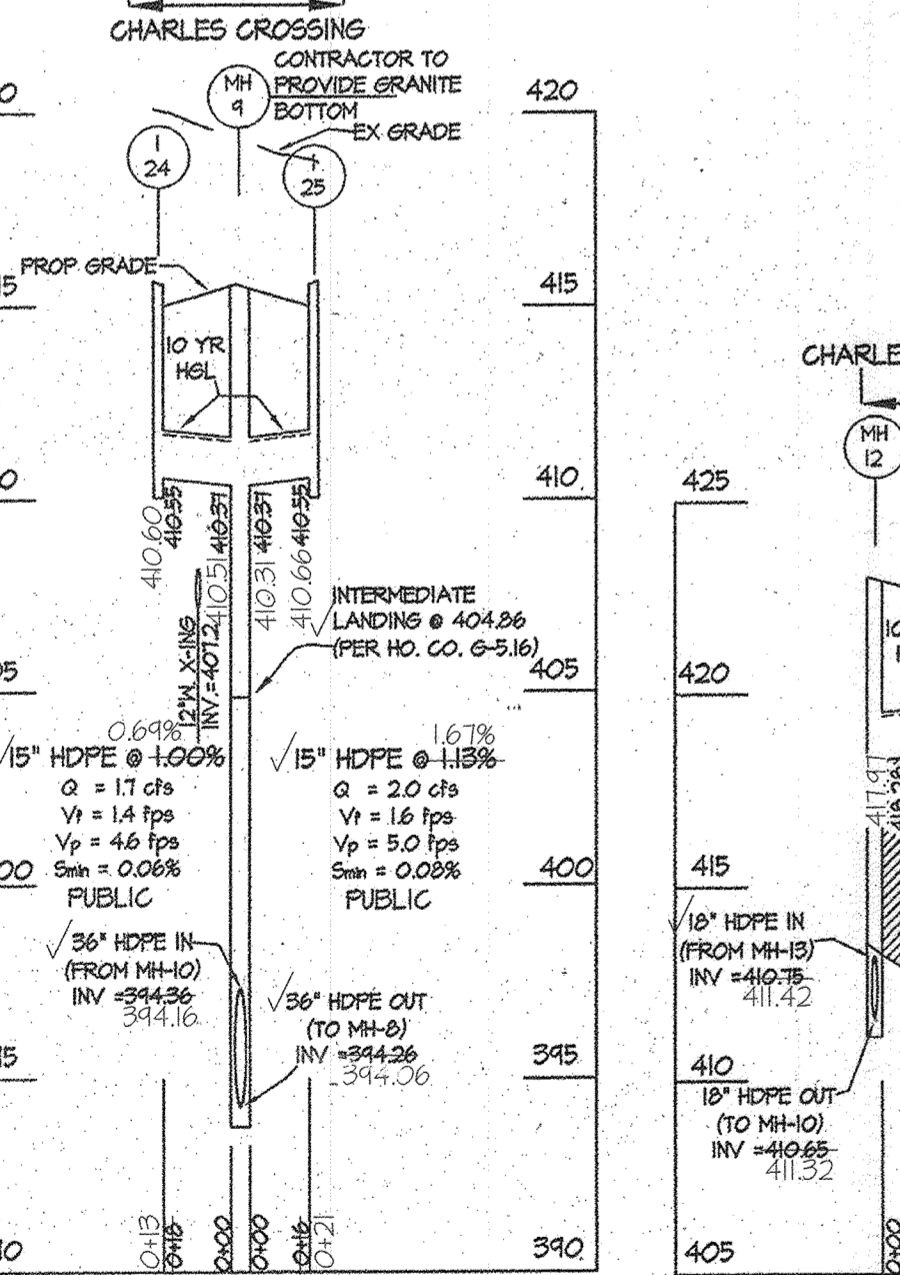




S.D. STRUCTURE SCHEDULE													
NO.	TYPE	WIDTH (INSIDE)	TOP ELEVATION		INVERT ELEVATION		STANDARD DETAIL	ASBUILTS ELEVATIONS				OWNERSHIP & MAINTENANCE	
			UPPER	LOWER	UPPER	LOWER		UPPER	LOWER	UPPER	LOWER		
ES-1	'C' HEADWALL	---	394.10	---	398.60	---	HO. CO. D 5.21	393.84	398.58	---	---	N 569.847 E 1364.748	PUBLIC
MH-2	MANHOLE	6'-0"	394.65	---	398.74	398.64	HO. CO. G 5.15	395.02	398.67	398.62	---	N 569.847 E 1364.748	PUBLIC
MH-3	MANHOLE	6'-0"	396.14	---	390.46	398.86	HO. CO. G 5.15	396.50	390.20	398.00	---	N 569.844 E 1364.710	PUBLIC
MH-4	MANHOLE	6'-0"	394.00	---	395.31	394.33	HO. CO. G 5.15	399.84	393.44	394.20	49.04 CC 22.84' R	---	PUBLIC
MH-5	MANHOLE	6'-0"	398.27	---	392.36	394.51	HO. CO. G 5.15	398.82	392.11	394.40	64.904 CC 1' R	---	PUBLIC
MH-6	MANHOLE	6'-0"	400.46	---	392.00	394.84	HO. CO. G 5.15	400.44	391.74	390.64	74.54 CC 1' R	---	PUBLIC
MH-7	MANHOLE	5'-0"	401.95	---	395.80	390.72	HO. CO. G 5.15	401.74	395.24	391.14	76.254 CC 1' R	---	PUBLIC
MH-8	MANHOLE	6'-0"	408.30	---	393.46	391.66	HO. CO. G 5.15	408.25	392.55	392.05	107.130 CC 1' R	---	PUBLIC
MH-9	MANHOLE	5'-0"	415.54	---	410.37	394.26	HO. CO. G 5.15	415.31	410.51	394.06	107.126 CC 1' R	---	PUBLIC
MH-10	MANHOLE	6'-0"	419.36	---	410.66	394.84	HO. CO. G 5.15	419.16	410.26	394.46	118.214 CC 1' R	---	PUBLIC
MH-11	MANHOLE	6'-0"	422.98	---	418.28	411.85	HO. CO. G 5.15	422.92	417.97	411.32	148.054 CC 10.96' R	---	PUBLIC
MH-12	MANHOLE	4'-0"	423.54	---	411.96	411.86	HO. CO. G 5.12	423.08	411.63	411.45	410.24 CC 2.81' R	---	PUBLIC
I-20	A-10	2'-6"	398.42	398.25	393.42	terminal	HO. CO. D 4.03	398.46	398.34	393.92	---	64.2165 CC 1' R	PUBLIC
I-21	A-5	2'-6"	398.96	398.85	392.45	terminal	HO. CO. D 4.03	398.97	398.86	392.94	---	64.904 CC 1' L	PUBLIC
I-22	A-10	2'-6"	402.18	401.80	395.88	terminal	HO. CO. D 4.03	402.11	401.85	396.28	---	76.254 CC 1' L	PUBLIC
I-23	COG-10	5'-0"	408.67	408.22	393.02	392.42	MD 374.62	408.62	408.21	392.86	392.26	107.130 CC 1' R	PUBLIC
I-24	A-10	2'-6"	415.78	415.38	410.55	terminal	HO. CO. D 4.03	415.80	415.44	410.60	---	107.126 CC 1' L	PUBLIC
I-25	A-10	2'-6"	415.78	415.38	410.55	terminal	HO. CO. D 4.03	415.75	415.44	410.66	---	107.126 CC 1' R	PUBLIC
I-26	A-10	2'-6"	419.30	419.35	415.00	terminal	HO. CO. D 4.03	419.44	419.34	414.94	---	148.054 CC 45.54' L	PUBLIC
I-27	A-5	2'-6"	422.90	422.74	418.54	terminal	HO. CO. D 4.01	422.74	422.71	418.41	---	148.054 CC 31.65' R	PUBLIC
MH-30	MANHOLE	4'-0"	391.70	---	392.52	392.42	HO. CO. G 5.12	391.63	392.61	392.60	---	412.96 CC 2.80' R	PUBLIC
I-31	A-10	3'-0"	391.40	---	392.84	392.74	HO. CO. D 4.03	391.34	391.32	392.84	392.83	52.07 CC 1' R	PUBLIC
I-32	A-10	2'-6"	391.40	---	393.03	terminal	HO. CO. D 4.03	391.34	391.35	---	393.12	52.07 CC 1' L	PUBLIC
MH-40	MANHOLE	5'-0"	419.33	---	414.85	395.21	HO. CO. G 5.15	419.88	414.50	394.85	---	148.275 CC 45.54' L	PUBLIC
ES-100	HDPE END SECTION	---	394.48	---	392.48	---	HO. CO. D 5.51	---	---	---	---	724.02 CC 71.44' L	PUBLIC



S.D. Pipe Summary Table PUBLICLY OWNED AND MAINTAINED			
Size (in.)	Type	Quantity (L.F.)	Remarks
15	HDPE	248	ADS N12 or equiv.
18	HDPE	241	ADS N12 or equiv.
24	HDPE	96	ADS N12 or equiv.
30	HDPE	30	ADS N12 or equiv.
36	HDPE	305	ADS N12 or equiv.
42	HDPE	178	ADS N12 or equiv.
48	HDPE	176	ADS N12 or equiv.



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 10-23-09  
 Chief, Bureau of Highways

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
 [Signature] 10-27-09  
 Chief, Division of Land Development

[Signature] 10/27/09  
 Chief, Development Engineering Division

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 10-23-09  
 Chief, Bureau of Highways

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
 [Signature] 10-27-09  
 Chief, Division of Land Development

[Signature] 10/27/09  
 Chief, Development Engineering Division

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 10-23-09  
 Chief, Bureau of Highways

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
 [Signature] 10-27-09  
 Chief, Division of Land Development

[Signature] 10/27/09  
 Chief, Development Engineering Division

ASBUILTS  
 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.

12/1/20  
 Date  
 [Signature]  
 Carl K. Gutschick  
 Professional Engineer  
 Maryland Reg. No. 12975

GLWGUTSCHICK LITTLE & WEBER, P.A.  
 CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS  
 3009 NATIONAL DRIVE - SUITE 250 - BURTNSVILLE OFFICE PARK  
 BURTNSVILLE, MARYLAND 20886  
 TEL: 301-421-4024 FAX: 301-421-4188

OWNER PAR C-216 thru C-218:  
 BA WATERLOO TOWNHOMES, LLC.  
 c/o BOZZUTO HOMES, INC.  
 7850 WALKER DRIVE, SUITE 400  
 GREENBELT, MARYLAND 20770  
 ATTN: DUNCAN SLIDELL  
 301-623-1525

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: 05/26/2022.

[Signature]  
 Michael J. Walker  
 Professional Engineer  
 Maryland Reg. No. 12975

STORM DRAIN PROFILES  
 SHIPLEY'S GRANT  
 PHASE IV  
 LOTS C-219 thru C-222, C-225 thru C-227, PARCELS D-2 and E-1,  
 OPEN SPACE LOTS C-207, D-1, E-2 & E-3 and NON-BUILDABLE PARCELS "D-3", "D-4",  
 and NON-BUILDABLE LOT C-208  
 A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 thru C-218, "D" and "E"  
 HOWARD COUNTY, MARYLAND

SCALE  
 1"=50' (H)  
 1"=5' (V)

ZONING  
 R-A-15, POR

G. L. W. FILE NO.  
 07002

DATE  
 NOV. 2020  
 SEPT., 2009

TAX MAP - GRID  
 37-1&2

SHEET  
 9 OF 31

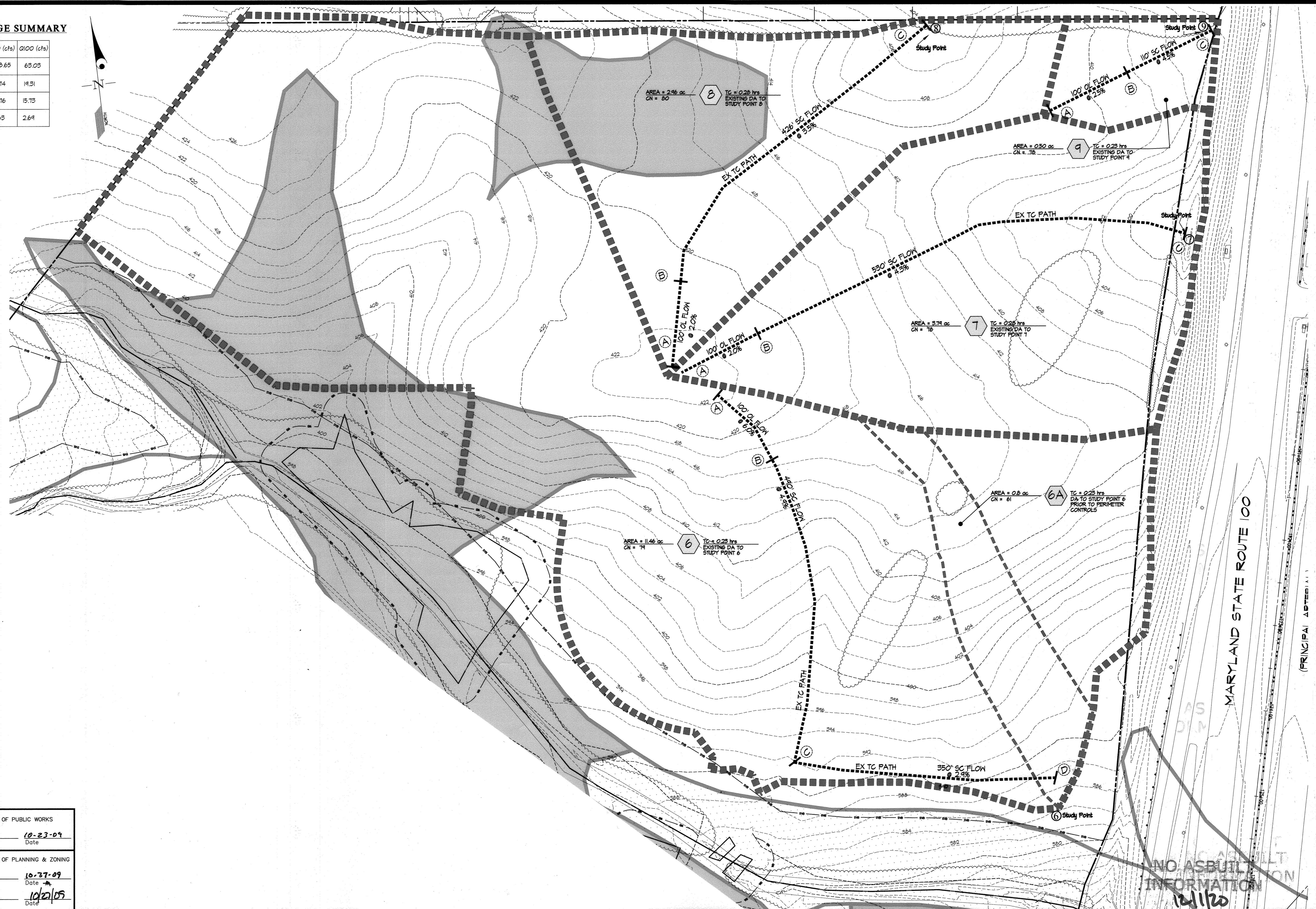


**EXISTING DISCHARGE SUMMARY**

	Q1 (cfs)	Q10 (cfs)	Q100 (cfs)
STUDY POINT 6	11.49	38.65	63.03
STUDY POINT 7	3.49	11.74	19.31
STUDY POINT 8	3.11	9.76	15.73
STUDY POINT 9	0.47	1.63	2.64

**LEGEND**

- SOILS DELINEATION LINE
- B' SOIL
- C' SOIL
- D' SOIL
- EXISTING DRAINAGE DIVIDE
- TC PATH
- DRAINAGE AREA LABEL



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*William R. Marshall*  
 Chief, Bureau of Highways  
 10-23-09  
 Date

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
*Kat Shelton*  
 Chief, Division of Land Development  
 10-27-09  
 Date

*Chris D'Amico*  
 Chief, Development Engineering Division  
 10/22/09  
 Date

**GLW GUTSCHICK LITTLE & WEBER, P.A.**  
 CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS  
 3909 NATIONAL DRIVE - SUITE 250 - BURTONSVILLE OFFICE PARK  
 BURTONSVILLE, MARYLAND 20866  
 TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

DATE	REVISION	BY	APPR.
10/21/09	Rev. Title Block Per F 10-000		

OWNER PAR C-216 thru C-218:  
 BA WATERLOO TOWNHOMES, LLC.  
 c/o BOZZUTO HOMES, INC.  
 7850 WALKER DRIVE, SUITE 400  
 GREENBELT, MARYLAND 20770  
 ATTN: DUNCAN SLIDELL  
 301-623-1525

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. 14831  
 EXPIRATION DATE: May 21, 2010

*Michael J. Trapp*

**EXISTING CONDITION SWM DRAINAGE AREA MAP**  
**SHIPLEY'S GRANT**  
 PHASE IV  
 OPEN SPACE LOTS C-207, D-1, E-2 & E-3 and NON-BUILDABLE PARCELS "D-3", "D-4",  
 and NON-BUILDABLE LOT C-208.  
 A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 thru C-218, "D" and "E"

SCALE	ZONING	G. L. W. FILE No.
1"=50'	R-A-15, POR	07002
DATE	TAX MAP - GRID	SHEET
SEPT., 2009	37-1&2	10 OF 31

MARYLAND STATE ROUTE 100

(PRINCIPAL) AS PER 11.1

NO AS-BUILT INFORMATION  
 12/1/20



**PEAK DISCHARGE SUMMARY**

	Q1 (cfs)	Q10 (cfs)	Q100 (cfs)
STUDY POINT 6			
EX.	11.99	38.65	63.05
PROP.	0.80	64.86	113.42
STUDY POINT 7			
EX.	3.49	11.74	19.31
PROP.	0.30	0.97	1.63
STUDY POINT 8			
EX.	3.11	9.76	15.75
PROP.	0.00	0.00	0.00
STUDY POINT 9			
EX.	0.47	1.63	2.64
PROP.	0.00	0.00	0.00

**LEGEND**

- SOILS DELINEATION LINE
- B' SOIL
- C' SOIL
- D' SOIL
- PROPOSED DRAINAGE DIVIDE
- TC PATH
- DRAINAGE AREA LABEL

**STORMWATER MANAGEMENT FOND D**

Stormwater Management Pond D provides Quality Control (N<sub>QV</sub>) and quantity control for 18.65 acres of the proposed development. N<sub>QV</sub> is provided via a permanent pool. CFV is provided via Extended Detention. Safe passage of the 100-year design storm has been analyzed for the blocked condition and a minimum 2-feet of freeboard has been provided.

Type (per MDE) : Wet Pond (P2)  
 MD-316 Hazard Class A Facility  
 Total Drainage Area To Facility = 19.68 acres (Area 6)  
 CN = 88  
 Zoning: Townhouse, 25% Impervious  
 T<sub>c</sub> = 0.250 hrs.  
 N<sub>QV</sub> Required = 0.82 ac-ft  
 N<sub>QV</sub> Provided = 0.82 ac-ft  
 N<sub>QV</sub>/Permanent Pool MS<sub>EL</sub> = 385.0  
 CFV Required = 136  
 CFV Provided = 171  
 CFV MS<sub>EL</sub> = 388.75  
 Rev Requirement = 0.24 ac-ft  
 Rev To Be Provided By Infiltration Trenches (See Below)\*  
 1-YR (Q<sub>p</sub> = 0.80 cfs) (MS<sub>EL</sub> = 388.74)  
 10-YR (Q<sub>p</sub> = 64.86 cfs) (MS<sub>EL</sub> = 389.57)  
 10-YR Blocked Flow (MS<sub>EL</sub> = 389.67)  
 100-YR (Q<sub>p</sub> = 113.42 cfs) (MS<sub>EL</sub> = 390.00)  
 100-YR Blocked Flow (MS<sub>EL</sub> = 390.01)  
 Lag: 18.6 hours  
 5 ft. Aquatic Bench = 384.00  
 12 ft. Safety/Maintenance Bench = 386.00  
 Outfall: Precast Riser Structure to 34" RCP to Stream Buffer  
 T.O.D. = 342.00

\* The recharge requirement for this drainage area (6) will be provided by infiltration trenches. These infiltration trenches will be designed under a future phase.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

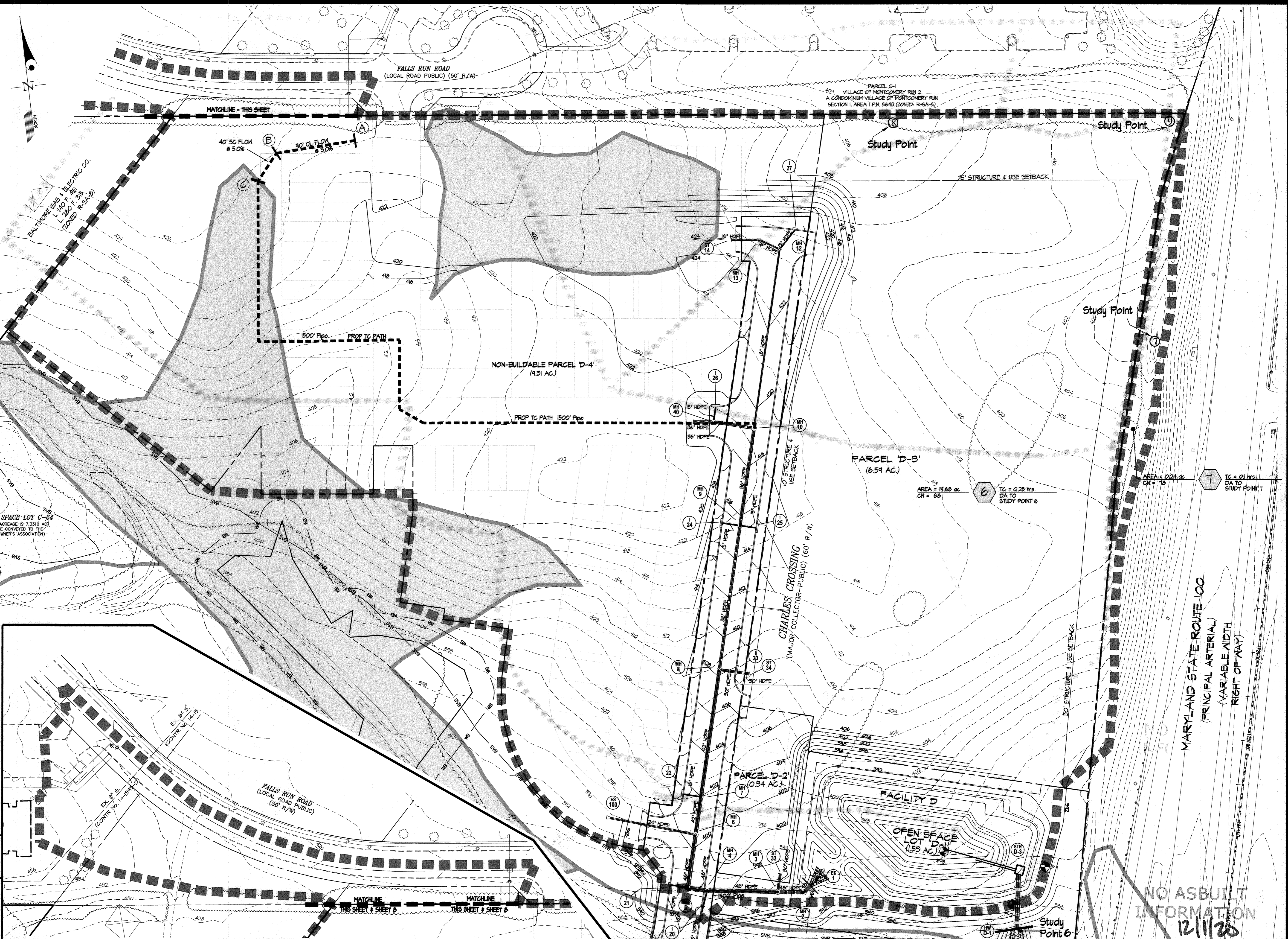
*William Z. ...* 10-23-09  
 Chief, Bureau of Highways Date

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

*Kent ...* 10-27-09  
 Chief, Division of Land Development Date  
*...* 10/27/09  
 Chief, Development Engineering Division Date

**GLWGUTSCHICK LITTLE & WEBER, P.A.**  
 CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS  
 3909 NATIONAL DRIVE - SUITE 250 - BURTONSVILLE OFFICE PARK  
 BURTONSVILLE, MARYLAND 20866  
 TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

DATE: 10/11/09 REV: Title Block Per F10-000 REVISION



DATE	10/11/09	REV	Title Block Per F10-000	REVISION
BY		APPR.		

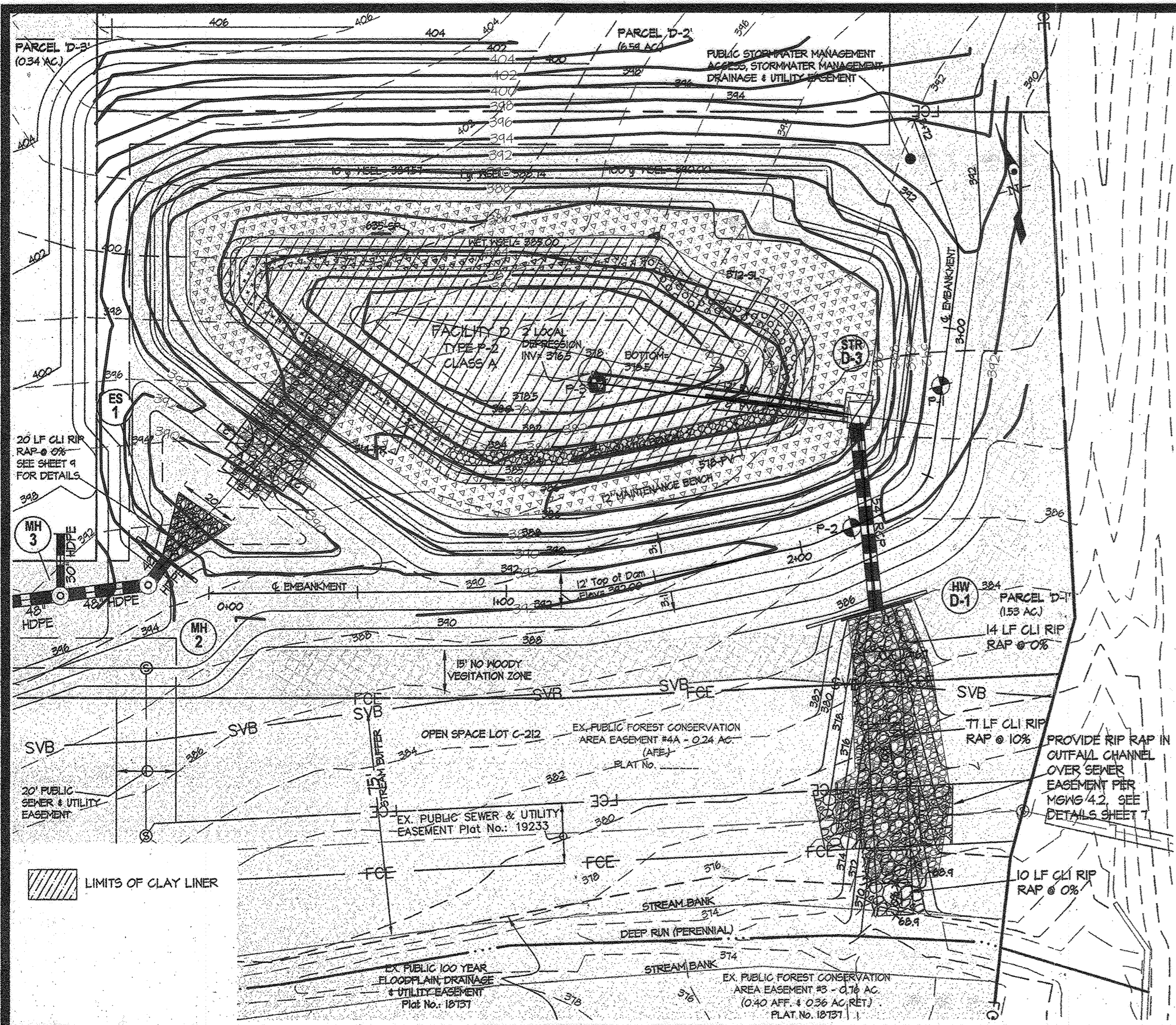
OWNER PAR C-216 thru C-218:  
 BA WATERLOO TOWNHOMES, LLC.  
 c/o BOZZUTO HOMES, INC.  
 7850 WALKER DRIVE, SUITE 400  
 GREENBELT, MARYLAND 20770  
 ATTN: DUNCAN SLIDELL  
 301-623-1525

**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. 14831  
 EXPIRATION DATE: MAY 21, 2008  
*Michael J. ...*

**PROPOSED CONDITION SWM DRAINAGE AREA MAP**  
**SHIPLEY'S GRANT**  
 PHASE IV  
 LOTS C-219 thru C-222, C-229 thru C-232, PARCELS D-2 and E-1, OPEN SPACE LOTS C-202, D-1, E-2 & E-3 and NON-BUILDABLE PARCELS "D-3", "D-4", and NON-BUILDABLE LOT C-203  
 A RESSUBDIVISION OF NON-BUILDABLE PARCELS C-216 thru C-218, "D" and "E"  
 ELECTION DISTRICT No. 1  
 HOWARD COUNTY, MARYLAND

SCALE	1"=50'	ZONING	R-A-15, POR	G. L. W. FILE No.	07002
DATE	SEPT., 2009	TAX MAP - GRID	37-1&2	SHEET	11 OF 31





STORMWATER MANAGEMENT POND D ENLARGEMENT / PLANTING PLAN SCALE: 1" = 30'

**STORMWATER MANAGEMENT POND D**  
 Stormwater Management Pond D provides Quality Control (MQV) and quantity control for 18.65 ac of the proposed development. MQV is provided via a permanent pool. CFV is provided via Extended Detention. Safe passage of the 100-year design storm has been analyzed for the blocked condition and a minimum 2-foot of freeboard has been provided.

Type (per MDE) : Met Pond (P2)  
 MD-37b Hazard Class A Facility  
 Total Drainage Area To Facility = 14.68 acres (Area 6)  
 CN = 88

Zoning: Townhouse, 25% impervious  
 Tc = 0.250 hrs  
 MQV Required = 0.82 ac-ft  
 MQV Provided = 0.82 ac-ft  
 MQV/Permanent Pool MEEL = 385.0  
 CFV Required = 1.56  
 CFV Provided = 1.71  
 CFV MEEL = 388.75

Rev Requirement = 0.29 ac-ft  
 Rev To Be Provided By Infiltration Trenches (See Below)\*  
 1-YR (Qp = 0.20 cfs) (MEEL = 388.74)  
 10-YR (Qp = 64.86 cfs) (MEEL = 384.57)  
 100-YR Blocked Flow (MEEL = 384.67)  
 100-YR (Qp = 113.42 cfs) (MEEL = 390.00)  
 100-YR Blocked Flow (MEEL = 390.01)  
 Lag: 18.6 hours  
 5 ft. Aquatic Bench = 384.00  
 12 ft. Safety/Maintenance Bench = 386.00  
 Outfall: Precast Riser Structure to 54" RCP to Stream Buffer T.O.D. = 392.00

\* The recharge requirement for this drainage area (6) will be provided by infiltration trenches. These infiltration trenches will be designed under a future phase.

**SWM FACILITY 'D' IS TO BE MAINTAINED JOINTLY BY HO. CO. & HOA**

**OPERATION AND MAINTENANCE SCHEDULE OF JOINTLY MAINTAINED STORMWATER MANAGEMENT FACILITY**

**ROUTINE MAINTENANCE (BY HOA)**

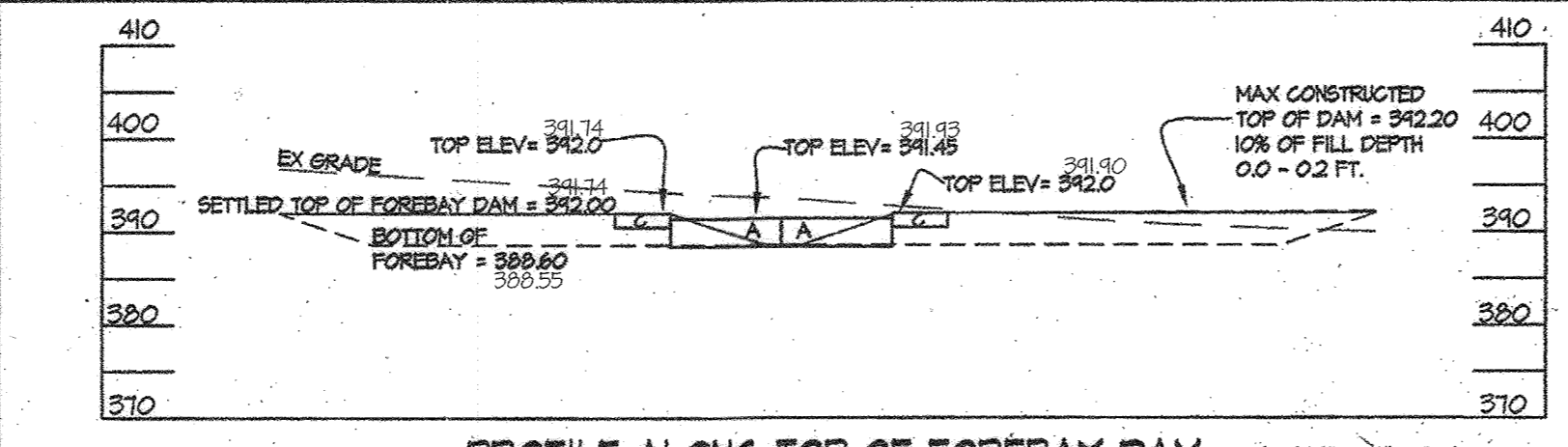
1. THE FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHOULD BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE POND IS FUNCTIONING PROPERLY.
2. TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOVED A MINIMUM OF TWO (2) TIMES A YEAR, ONCE IN JUNE AND ONCE IN SEPTEMBER. OTHER SIDE SLOPES, THE BOTTOM OF THE POND, AND MAINTENANCE ACCESS SHOULD BE MOVED AS NEEDED.
3. DEBRIS AND LITTER NEXT TO THE OUTLET STRUCTURE SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
4. VISIBLE SIGNS OF EROSION IN THE POND AS WELL AS RIPRAP OUTLET AREA SHALL BE REPAIRED AS SOON AS IT IS NOTICED.

**NON-ROUTINE MAINTENANCE (BY HOWARD COUNTY)**

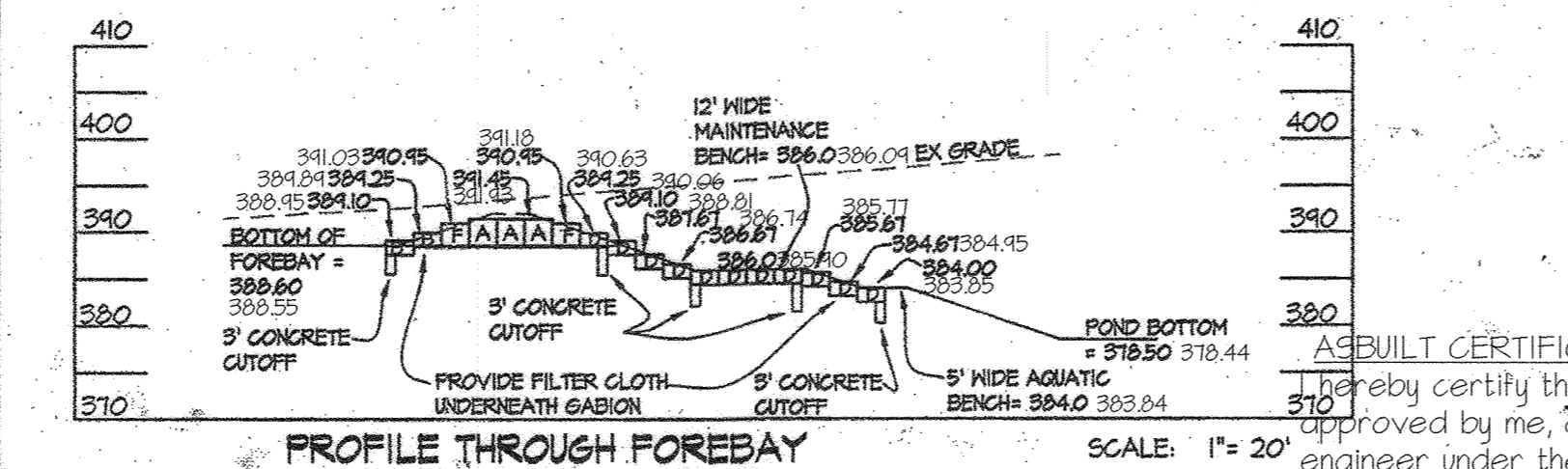
1. STRUCTURAL COMPONENTS OF THE POND SUCH AS THE DAM, THE RISER, AND THE PIPES SHALL BE REPAIRED UPON DETECTION OF ANY DAMAGE. THE COMPONENTS SHOULD BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.
2. SEDIMENT SHOULD BE REMOVED WHEN ITS ACCUMULATION SIGNIFICANTLY REDUCES THE DESIGN STORAGE, INTERFERES WITH THE FUNCTION OF THE RISER, WHEN DEEMED NECESSARY FOR AESTHETIC REASONS, OR WHEN DEEMED NECESSARY BY HOWARD COUNTY'S DEPARTMENT OF PUBLIC WORKS.

**HOWARD SOIL CONSERVATION DISTRICT OPERATION, MAINTENANCE AND INSPECTION NOTE**

INSPECTION OF THE POND(S) SHOWN HEREON SHALL BE PERFORMED AT LEAST ANNUALLY, IN ACCORDANCE WITH THE CHECKLIST AND REQUIREMENTS CONTAINED WITHIN THE USDA 225 "STANDARDS AND SPECIFICATIONS FOR PONDS" (M-578). THE POND OWNER(S) AND ANY HEIRS, SUCCESSORS OR ASSIGNS SHALL BE RESPONSIBLE FOR THE SAFETY OF THE POND AND THE CONTINUED OPERATION, SURVEILLANCE, INSPECTION, AND MAINTENANCE THEREOF. THE POND OWNER(S) SHALL PROMPTLY NOTIFY THE SOIL CONSERVATION DISTRICT OF ANY UNUSUAL OBSERVATIONS THAT MAY BE INDICATORS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, TURBID SEEPAGE, SLIDING OR SLUMPING.



PROFILE ALONG TOP OF FOREBAY DAM SCALE: 1" = 20'



PROFILE THROUGH FOREBAY SCALE: 1" = 20'

**PLANT LIST FOR STORMWATER MANAGEMENT PONDS**

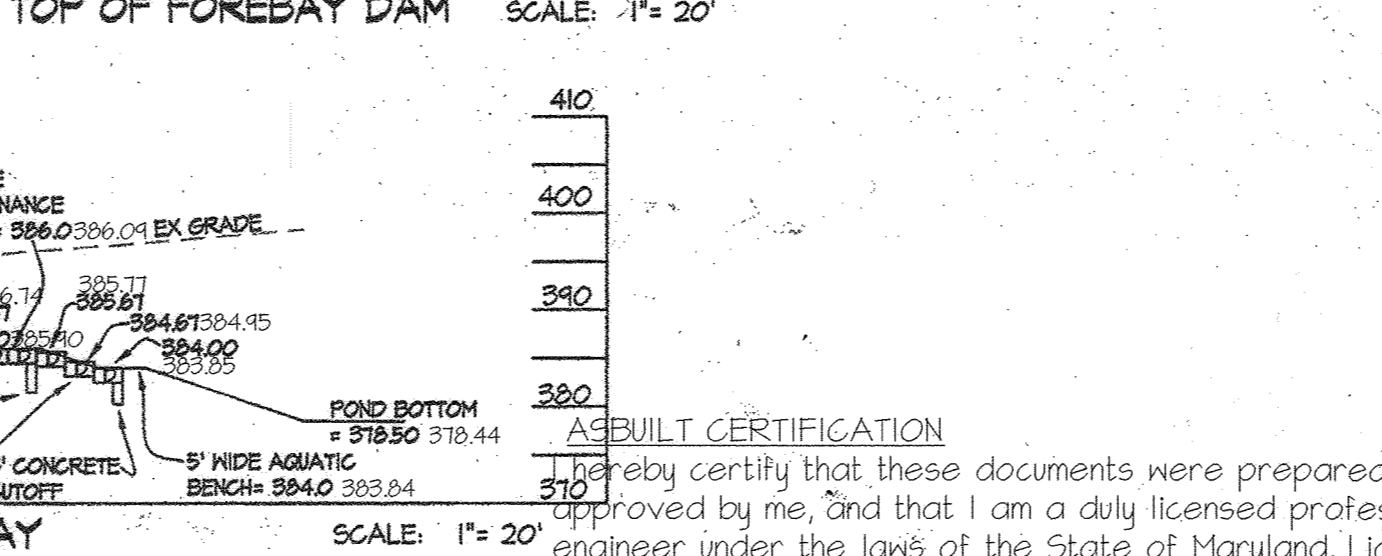
SYMBOL	QTY.	NAMES (BOTANICAL / SCIENTIFIC)	SIZE	NOTES
SL	372	Sagittaria latifolia Duck Potato	1 pint cont. or bare root	12" o.c.
SP	635	Scirpus pungens Three-Square Bulrush	1 pint cont. or bare root	12" o.c.
FR	514	Polemonium reptans Jacob's Ladder	1 pint cont. or bare root	12" o.c.
PV	578	Peltandra virginica Arton Arum	1 pint cont. or bare root	12" o.c.

NOTE: STORMWATER MANAGEMENT POND PLANTINGS ARE PER MDE 2000 REQUIREMENTS  
 SEE SHEET IS FOR PLANTING NOTES AND DETAILS

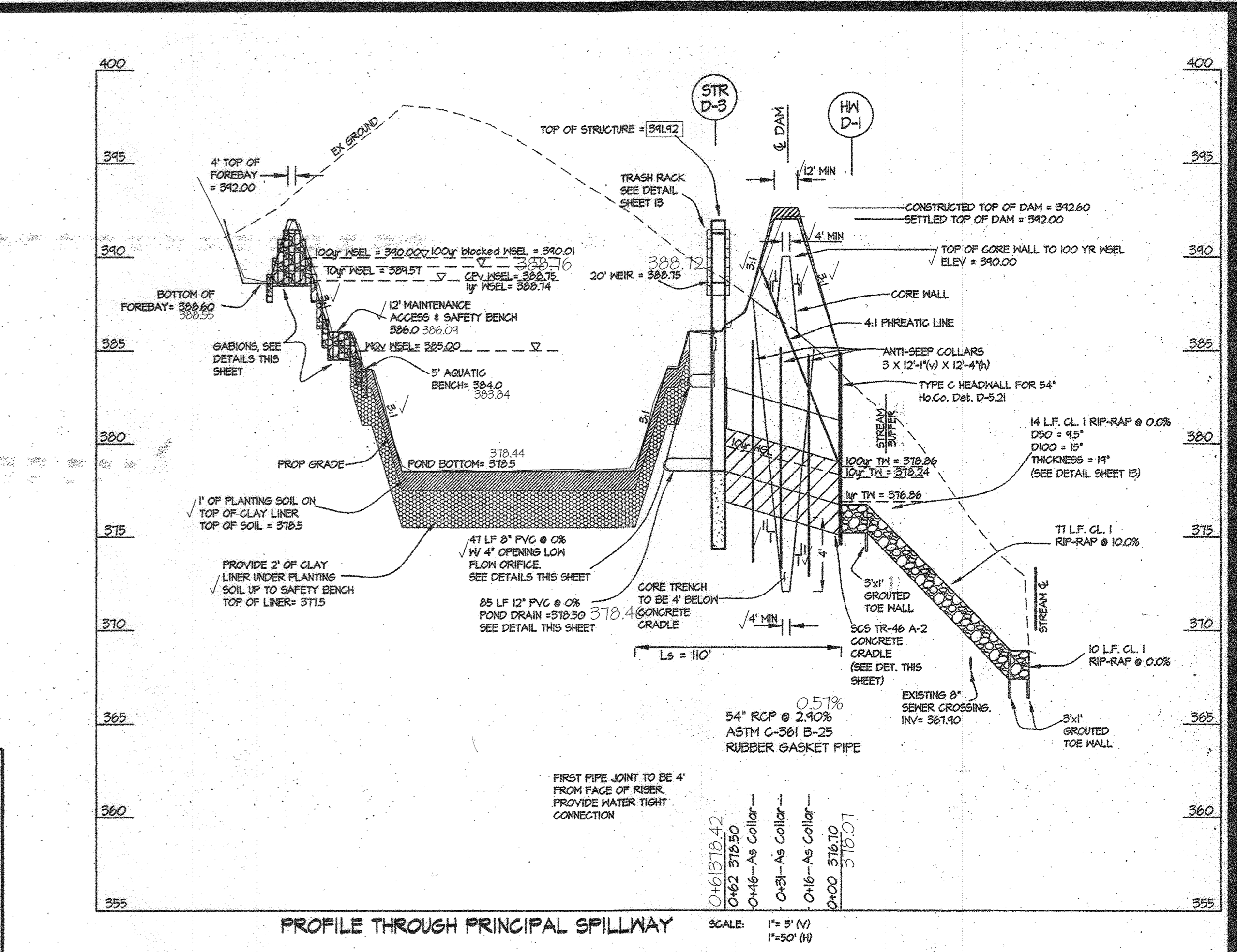
NOTE: STORMWATER MANAGEMENT POND PLANTINGS ARE PER MDE 2000 REQUIREMENTS  
 SEE SHEET IS FOR PLANTING NOTES AND DETAILS

**GABION SIZES**

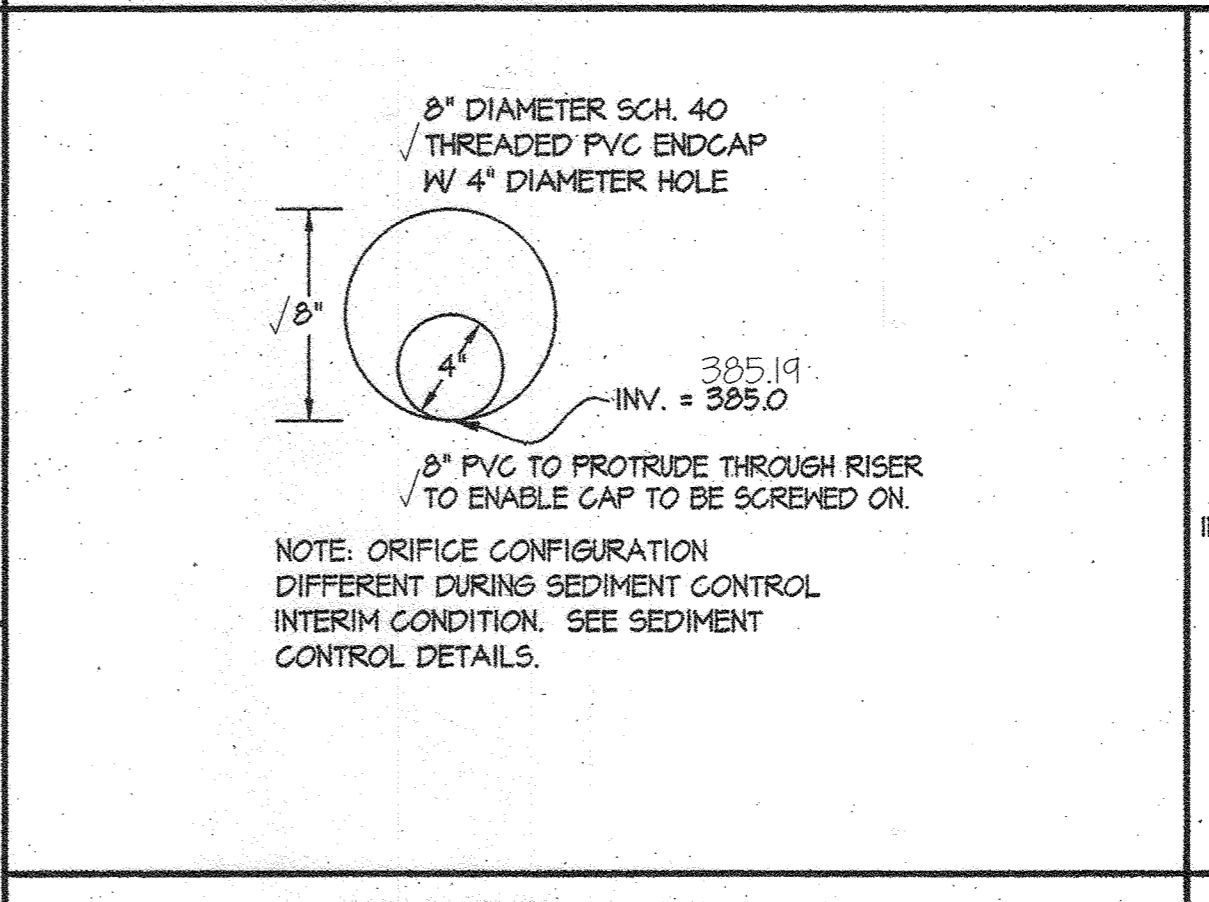
LETTER CODE	LENGTH	WIDTH	HEIGHT
A	12'	3'	3'
B	4'	3'	1'-6"
C	6'	3'	1'-6"
D	12'	3'	1'-6"
E	12'	3'	2'-6"
F	4'	3'	2'-6"



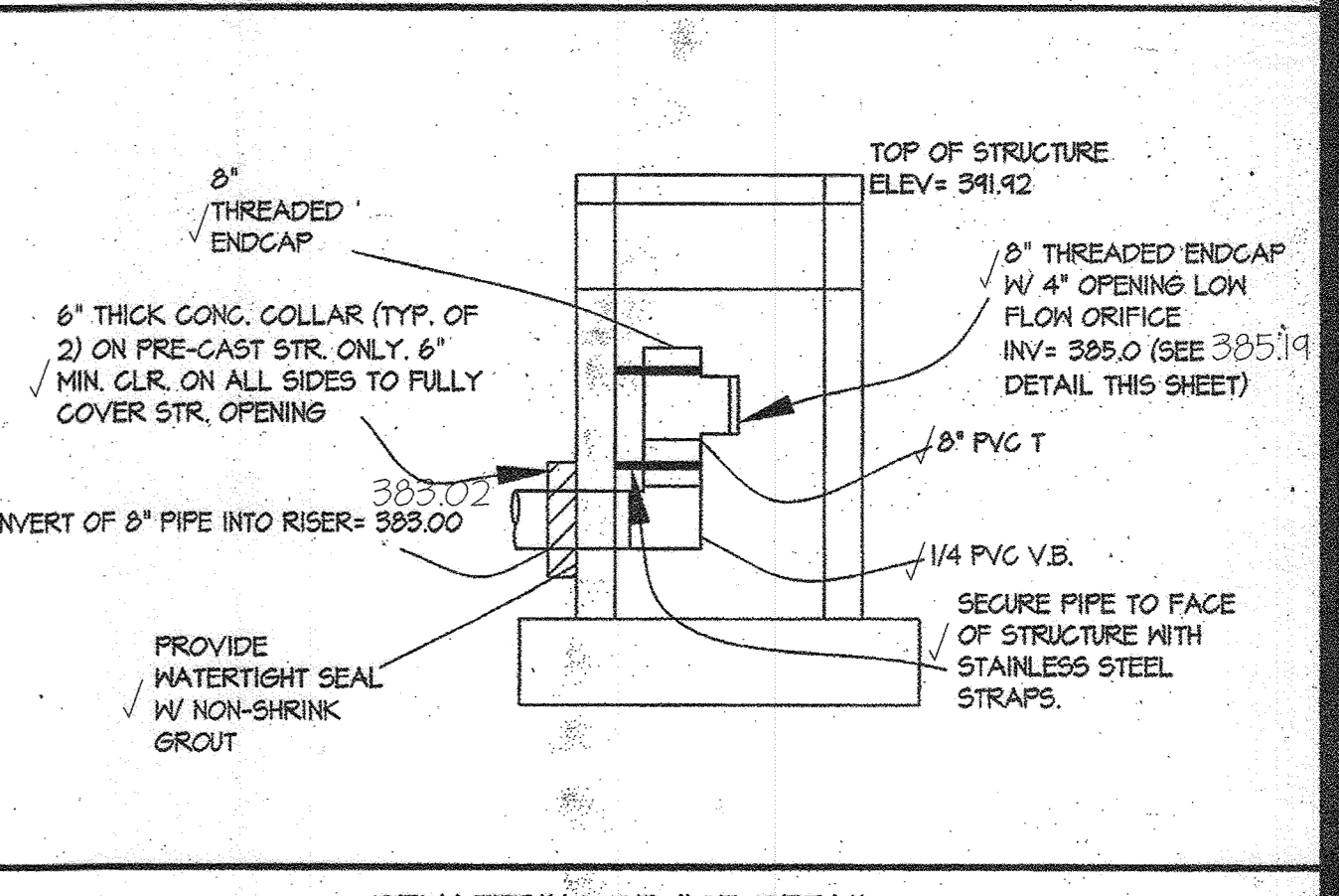
PROFILE THROUGH POND DRAIN AND LOW FLOW RELEASE SCALE: 1" = 5' / 1" = 50' (H)



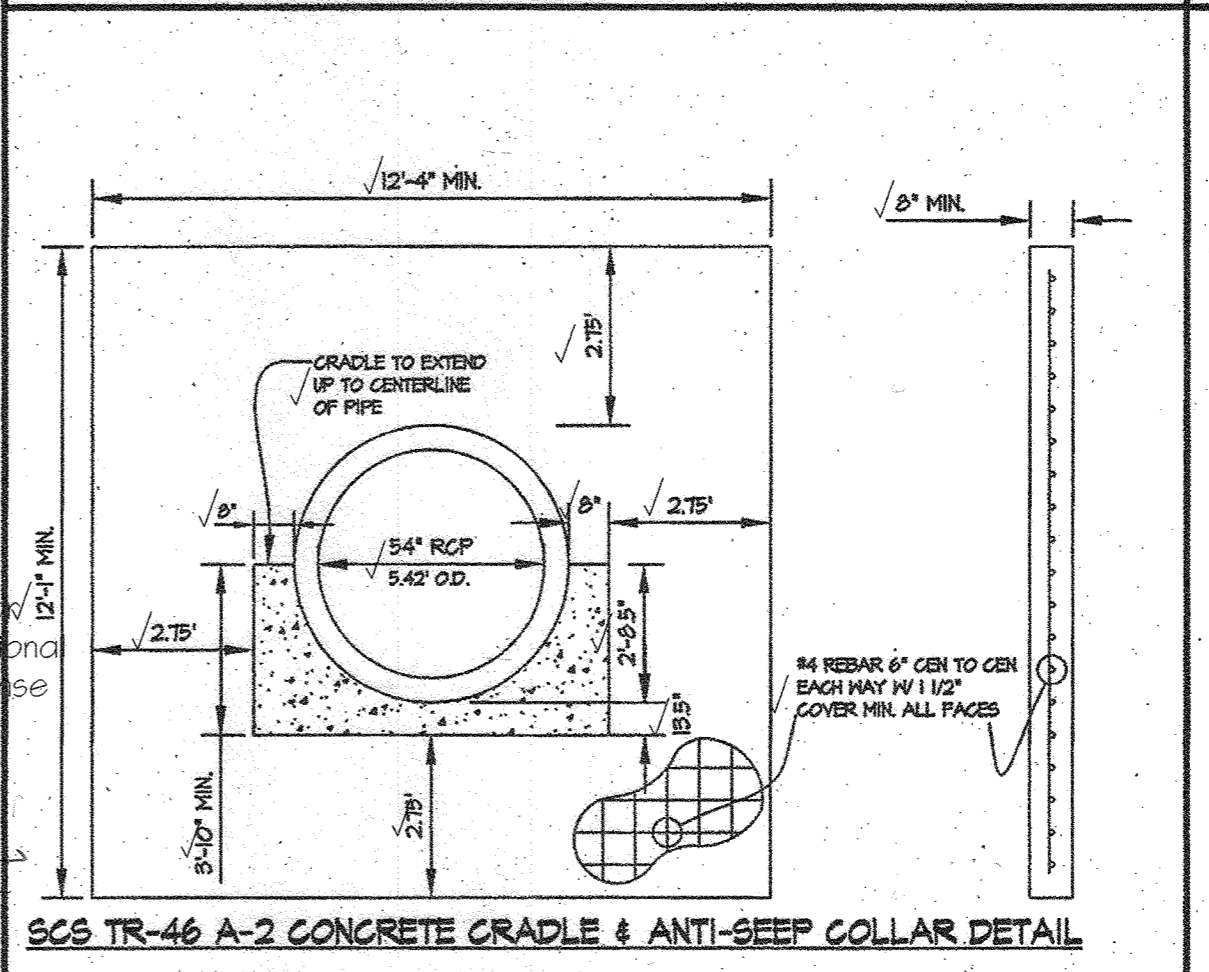
PROFILE THROUGH PRINCIPAL SPILLWAY SCALE: 1" = 5' (H) / 1" = 50' (H)



SWM LOW-FLOW ORIFICE DETAIL NTS



DENATERING DEVICE DETAIL NTS



GATE VALVE DETAIL NTS



**ASBUILTS**  
 STORMWATER MANAGEMENT POND D DETAILS

**SHIPLEY'S GRANT**  
 PHASE IV  
 LOTS C-219 thru C-222, C-225 thru C-227 PARCELS D-2 and E-1,  
 OPEN SPACE LOTS C-202, D-1, E-2 & E-3 AND NON-BUILDABLE PARCELS "D-3", "D-4",  
 AND NON-BUILDABLE LOT C-208  
 A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 thru C-218, "D" and "E"  
 HOWARD COUNTY, MARYLAND

ELECTION DISTRICT No. 1

SCALE	ZONING	G. L. W. FILE NO.
AS SHOWN	R-A-15, POR	07002
DATE	TAX MAP - GRID	SHEET
NOV. 2020	37-1&2	12 OF 31
SEPT. 2009		

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Walter Z. Smith* 10-23-09  
 Chief, Bureau of Highways

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
*Walter Z. Smith* 10-21-09  
 Chief, Division of Land Development

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
*Walter Z. Smith* 10-21-09  
 Chief, Development Engineering Division

**DEVELOPER'S/BUILDER'S CERTIFICATE**  
 I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT THESE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION.

*Michael J. Tracy* 9-22-09  
 SIGNATURE OF DEVELOPER/BUILDER DATE

**ENGINEER'S CERTIFICATE**  
 I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A HANDLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT.

*Michael J. Tracy* 9/22/09  
 ENGINEER'S SIGNATURE DATE

**AS-BUILT CERTIFICATION**  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 12475, EXPIRATION DATE: MAY 26, 2022.

*Carl K. Gutschick* 10/14/09  
 PROFESSIONAL ENGINEER MARYLAND REG. NO. 12475

**GLW GUTSCHICK LITTLE & WEBER, P.A.**  
 CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS  
 3909 NATIONAL DRIVE - SUITE 250 BURTONSVILLE OFFICE PARK  
 BURTONSVILLE, MARYLAND 20888  
 TEL: 301-421-4024 FAX: 301-421-4186

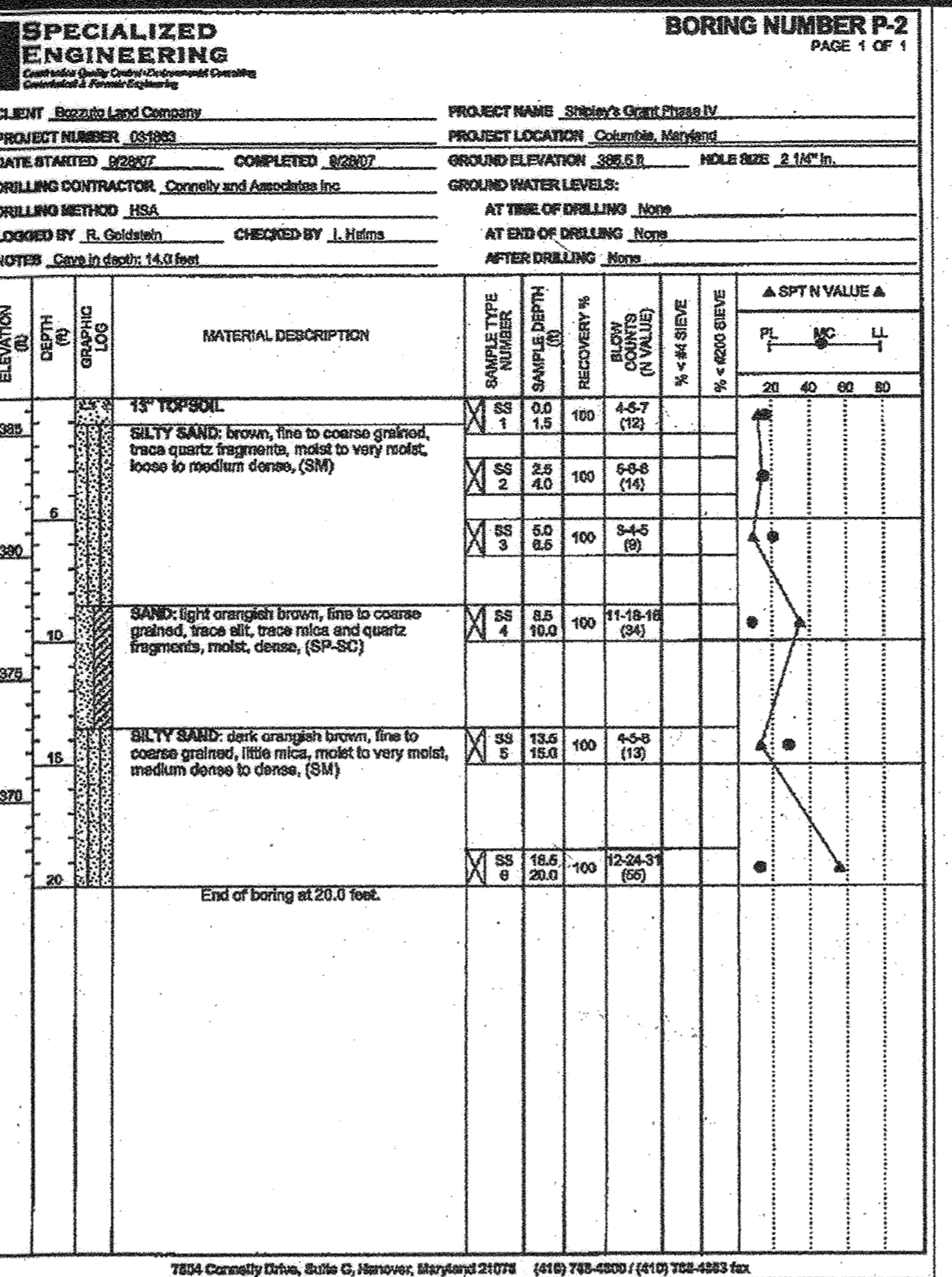
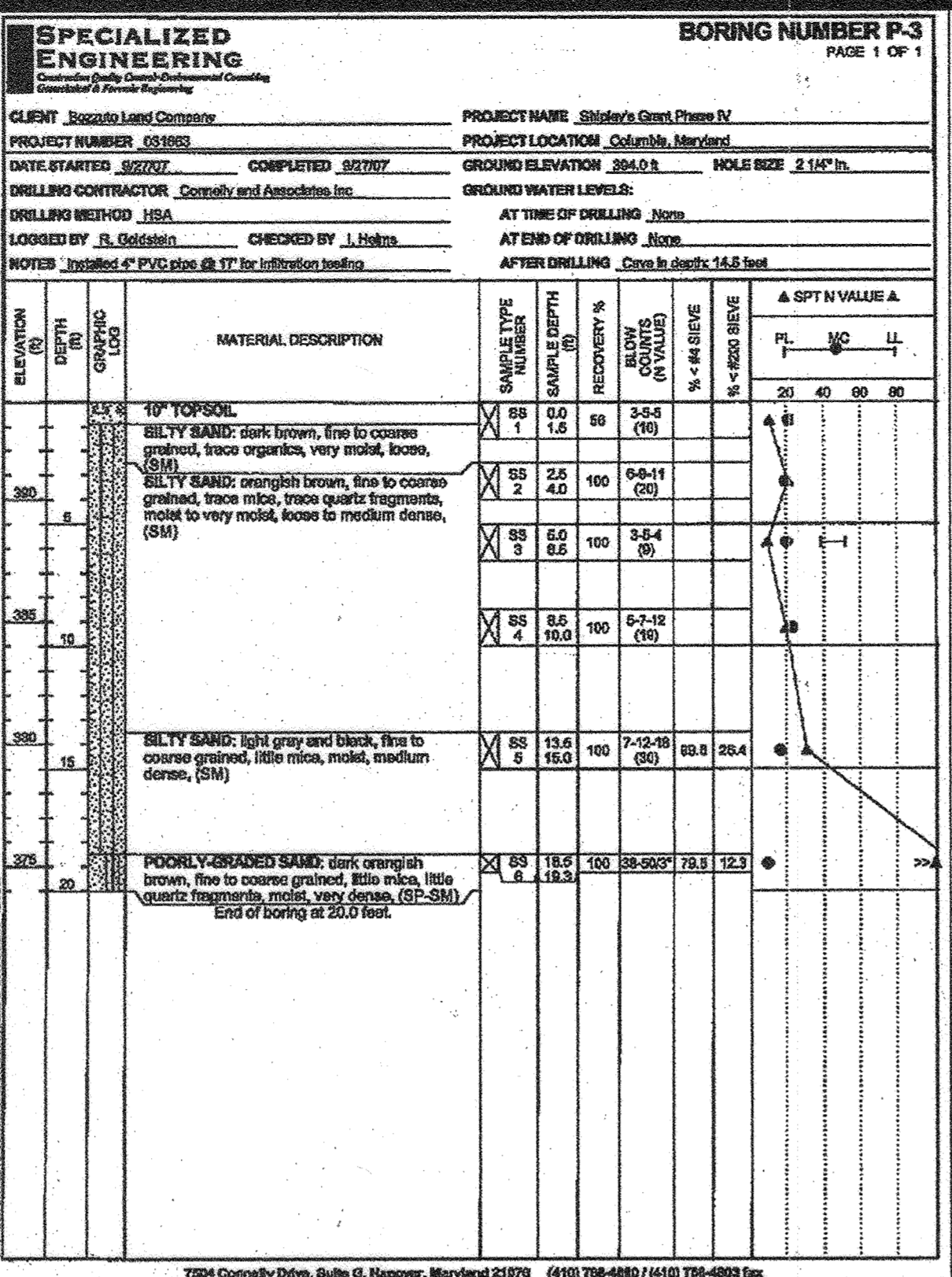
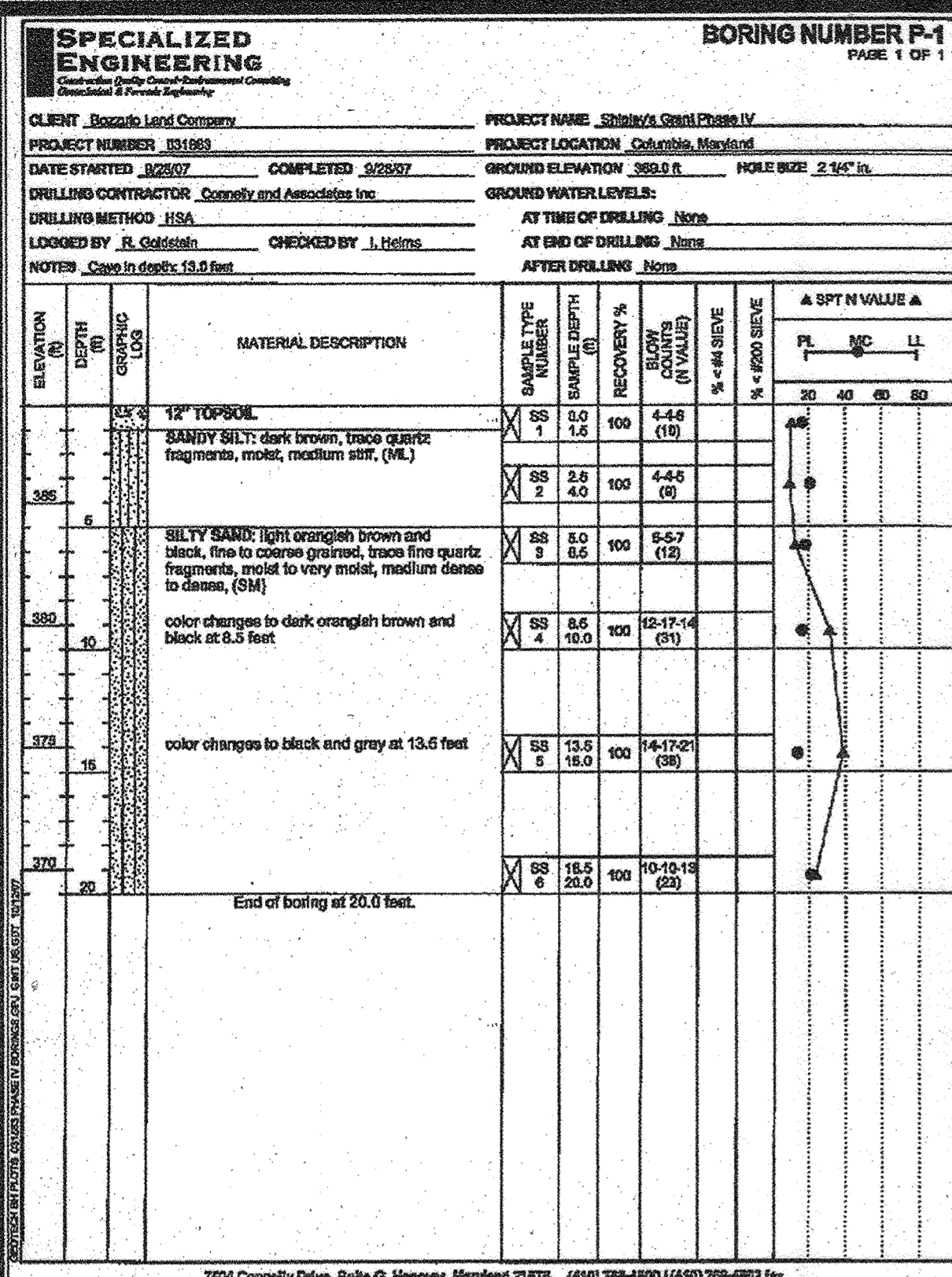
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 BY: [Signature]  
 APPR: [Signature]

OWNER PAR C-216 thru C-218:  
 BA WATERLOO TOWNHOMES, LLC.  
 c/o BOZZUTO HOMES, INC.  
 7850 WALKER DRIVE, SUITE 400  
 GREENBELT, MARYLAND 20770  
 ATTN: DUNCAN SLIDELL  
 301-623-1525

**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. 12475, EXPIRATION DATE: MAY 26, 2022.

*Carl K. Gutschick* 10/14/09  
 PROFESSIONAL ENGINEER MARYLAND REG. NO. 12475





**SMW CONSTRUCTION SPECIFICATIONS**

THESE SPECIFICATIONS ARE APPROPRIATE TO ALL PONDS WITHIN THE SCOPE OF THE STANDARD FOR PRACTICE MD-518. ALL REFERENCES TO ASTM AND AASHTO SPECIFICATIONS APPLY TO THE MOST RECENT VERSION.

**SITE PREPARATION**

AREAS DESIGNATED FOR BORROW AREAS, EMBANKMENT, AND STRUCTURAL WORKS SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL, ALL TREES, VEGETATION, ROOTS AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED, CHANNEL BANKS AND SHARP BREAKS SHALL BE SLOPED TO NO STEEPER THAN 1:1. ALL TREES SHALL BE CLEARED AND GRUBBED WITHIN 1 FEET OF THE TOE OF THE EMBANKMENT.

AREAS TO BE COVERED BY THE RESERVOIR WILL BE CLEARED OF ALL TREES, BRUSH, LOGS, FENCES, RUBBISH AND OTHER OBJECTIONABLE MATERIAL, UNLESS OTHERWISE DESIGNATED. ON THE PLANS, FOR DRY STORAGE/WATER MANAGEMENT PONDS, A MINIMUM OF A 25-FOOT RADIUS AROUND THE INLET STRUCTURE SHALL BE CLEARED.

ALL CLEARED AND GRUBBED MATERIAL SHALL BE DISPOSED OF OUTSIDE AND BELOW THE LIMITS OF THE DAM AND RESERVOIR AS DIRECTED BY THE OWNER OR HIS REPRESENTATIVE. WHEN SPECIFIED, A SUFFICIENT QUANTITY OF TOPSOIL WILL BE STOCKPILED IN A SUITABLE LOCATION FOR USE ON THE EMBANKMENT AND OTHER DESIGNATED AREAS.

**EARTH FILL**

MATERIAL - THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED DESIGNATED BORROW AREAS. IT SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN 6", FROZEN OR OTHER OBJECTIONABLE MATERIALS. FILL MATERIAL FOR THE CENTER OF THE EMBANKMENT AND CUT OFF TRENCH SHALL BE UNIFIED SOIL CLASSIFICATION GC, SG, GH OR CL AND MUST HAVE AT LEAST 5% PASSING THE #200 SIEVE. CONSIDERATION MAY BE GIVEN TO THE USE OF OTHER MATERIALS IN THE EMBANKMENT IF DESIGNED BY A GEOTECHNICAL ENGINEER. SUCH SPECIAL DESIGNS MUST HAVE CONSTRUCTION SUPERVISED BY A GEOTECHNICAL ENGINEER. MATERIALS USED IN THE OUTER SHELL OF THE EMBANKMENT MUST HAVE THE CAPABILITY TO SUPPORT VEGETATION OF THE QUALITY REQUIRED TO PREVENT EROSION OF THE EMBANKMENT.

PLACEMENT - AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED PRIOR TO PLACEMENT OF FILL. FILL MATERIALS SHALL BE PLACED IN MAXIMUM 8-INCH THICK LAYERS (BEFORE COMPACTION) LAYERS WHICH ARE TO BE CONTINUOUS OVER THE ENTIRE LENGTH OF THE FILL. THE MOST PERMEABLE BORROW MATERIAL SHALL BE PLACED IN THE DOWNSTREAM PORTIONS OF THE EMBANKMENT. THE PRINCIPAL SPILLWAY MUST BE INSTALLED CONCURRENTLY WITH FILL PLACEMENT AND NOT EXCAVATED INTO THE EMBANKMENT.

CONFACTION - THE MOVEMENT OF THE HAULING AND SPREADING EQUIPMENT OVER THE FILL SHALL BE CONTROLLED SO THAT THE ENTIRE SURFACE OF EACH LIFT SHALL BE TRAVERSED BY NOT LESS THAN ONE TREAD TRACK OF HEAVY EQUIPMENT OR CONFACTION SHALL BE ACHIEVED BY AGRICULTURAL OR CONFACTION ROLLERS. RUBBER TREAD OR VIBRATORY ROLLERS. FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE SUCH THAT THE REQUIRED DEGREE OF COMPACTION WILL BE OBTAINED WITH THE EQUIPMENT USED. THE FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE SO THAT IF FORMED INTO A BALL IT WILL NOT CRUMBLE, YET NOT BE SO WET THAT WATER CAN BE SQUEEZED OUT. WHEN REQUIRED BY THE REVENUE AGENCY THE MINIMUM REQUIRED DENSITY SHALL NOT BE LESS THAN 95% OF THE MAXIMUM DRY WEIGHT DENSITY OF THE OPTIMUM. EACH LAYER OF FILL SHALL BE COMPACTED AS NECESSARY TO OBTAIN THAT DENSITY, AND IS TO BE CERTIFIED BY THE ENGINEER AT THE TIME OF CONSTRUCTION. ALL COMPACTION IS TO BE DETERMINED BY AASHTO METHOD T-99 (STANDARD PRACTICE).

CUT OFF TRENCH - THE CUT OFF TRENCH SHALL BE EXCAVATED INTO IMPERVIOUS MATERIAL, ALONG OR PARALLEL TO THE CENTERLINE OF THE EMBANKMENT AS SHOWN ON THE PLANS. THE BOTTOM WIDTH OF THE TRENCH SHALL BE COVERED BY THE EQUIPMENT USED FOR EXCAVATION WITH THE MINIMUM WIDTH BEING FOUR FEET. THE DEPTH SHALL BE AT LEAST FOUR FEET BELOW EXISTING GRADE OR AS SHOWN ON THE PLANS. THE SIDE SLOPES OF THE TRENCH SHALL BE 1 TO 1 OR FLATTER. THE BACKFILL SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM DENSITY AND MINIMUM PERMEABILITY.

EMBANKMENT CORE - THE CORE SHALL BE PARALLEL TO THE CENTERLINE OF THE EMBANKMENT AS SHOWN ON THE PLANS. THE TOP WIDTH OF THE CORE SHALL BE A MINIMUM OF FOUR FEET. THE HEIGHT SHALL EXTEND UP TO AT LEAST THE 10-YEAR WATER ELEVATION OR AS SHOWN ON THE PLANS. THE SIDE SLOPES SHALL BE 1 TO 1 OR FLATTER. THE CORE SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM DENSITY AND MINIMUM PERMEABILITY. IN ADDITION, THE CORE SHALL BE PLACED CONCURRENTLY WITH THE OUTER SHELL OF THE EMBANKMENT.

**STRUCTURE BACKFILL**

BACKFILL ADJACENT TO PIPES OR STRUCTURES SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE ADJOINING FILL MATERIAL. THE FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED FOUR INCHES IN THICKNESS AND COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE MATERIAL NEEDS TO BE COMPACTED AND MAINTAINED ADJACENT TO THE PIPE AT NO TIME DURING THE BACKFILLING OPERATION. RUBBER TREAD OR VIBRATORY ROLLERS. EQUIPMENT IS ALLOWED TO OPERATE CLOSER THAN FOUR FEET, MEASURED HORIZONTALLY, TO ANY PART OF A STRUCTURE. UNDER NO CIRCUMSTANCES SHALL EQUIPMENT BE DRIVEN OVER ANY PART OF A CONCRETE STRUCTURE OR PIPE UNLESS THERE IS A COMPACTED FILL OF 24" OR GREATER OVER THE STRUCTURE OR PIPE. STRUCTURE BACKFILL WILL BE FLOVABLE FILL MEETING THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 518 AS MODIFIED. THE MIXTURE SHALL HAVE A 100-200 PSI, 28 DAY UNCONFINED COMPRESSIVE STRENGTH. THE FLOVABLE FILL SHALL HAVE A MINIMUM PH OF 4.0 AND A MINIMUM RESISTIVITY OF 2000 OHM-CM. MATERIAL SHALL BE PLACED SUCH THAT A MINIMUM OF 6" MEASURED PERPENDICULAR TO THE OUTSIDE OF THE PIPE OR FLOVABLE FILL SHALL BE UNDER (BEDDING) OVER AND ON THE SIDES OF THE PIPE. IT ONLY NEEDS TO EXTEND UP TO THE SPRING LINE FOR RIGID CONDUITS. AVERAGE SLOPE OF THE FILL SHALL BE 1 TO 1 TO ASSURE FLOVABILITY OF THE MATERIAL. ADEQUATE MEASURES SHALL BE TAKEN (SAND BAGS, ETC.) TO PREVENT FLOATING THE PIPE. WHEN USING FLOVABLE FILL, ALL METAL PIPE SHALL BE ENTIRELY COATED. ANY ADJOINING SOIL FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED FOUR INCHES IN THICKNESS AND COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE MATERIAL SHALL COMPLETELY FILL ALL VOIDS ADJACENT TO THE FLOVABLE FILL ZONE. AT NO TIME DURING THE BACKFILLING OPERATION SHALL DRIVEN EQUIPMENT BE ALLOWED TO OPERATE CLOSER THAN FOUR FEET, MEASURED HORIZONTALLY, TO ANY PART OF A STRUCTURE. UNDER NO CIRCUMSTANCES SHALL EQUIPMENT BE DRIVEN OVER ANY PART OF A STRUCTURE OR PIPE UNLESS THERE IS A COMPACTED FILL OF 24" OR GREATER OVER THE STRUCTURE OR PIPE. BACKFILL MATERIAL OUTSIDE THE STRUCTURE BACKFILL (FLOVABLE FILL) ZONE SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE CORE OF THE EMBANKMENT OR OTHER EMBANKMENT MATERIALS.

**PIPE CONDUITS**

ALL PIPES SHALL BE CIRCULAR IN CROSS SECTION.

**CORROGATED METAL PIPE**

ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR CORROGATED METAL PIPE:

- MATERIALS - POLYMER COATED STEEL PIPE - STEEL PIPES WITH POLYMERIC COATINGS SHALL HAVE A MINIMUM COATING THICKNESS OF 0.01 INCH (10 MIL) ON BOTH SIDES OF THE PIPE. THIS PIPE AND ITS APPURTENANCES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATION M-245. 14-INCH WITH WATER TIGHT COUPLING BANDS OR FLANGES.
- MATERIALS - ALUMINUM COATED STEEL PIPE - THIS PIPE AND ITS APPURTENANCES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATION M-274 WITH WATER TIGHT COUPLING BANDS OR FLANGES. ALUMINUM COATED STEEL PIPE WHEN USED WITH FLOVABLE FILL OR WHEN SOIL AND/OR WATER CONDITIONS WARRANT THE NEED FOR INCREASED DURABILITY, SHALL BE FULLY BURIED UNDER AASHTO SPECIFICATION M-245. 14-INCH WITH WATER TIGHT COUPLING BANDS OR FLANGES. ALUMINUM COATING DAMAGED OR OTHERWISE REMOVED SHALL BE REPLACED WITH COLD APPLIED BITUMINOUS COATING CONFORMING TO ALUMINUM SURFACES THAT ARE TO BE IN CONTACT WITH CONCRETE SHALL BE PAINTED WITH ONE COAT OF ZINC CHROMATE PRIMER OR TWO COATS OF ANTI-SEEP.
- MATERIALS - ALUMINUM PIPE - THIS PIPE AND ITS APPURTENANCES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATION M-116 OR M-211 WITH WATER TIGHT COUPLING BANDS OR FLANGES. ALUMINUM PIPE WHEN USED WITH FLOVABLE FILL OR WHEN SOIL AND/OR WATER CONDITIONS WARRANT THE NEED FOR INCREASED DURABILITY, SHALL BE FULLY BURIED UNDER AASHTO SPECIFICATION M-245. 14-INCH WITH WATER TIGHT COUPLING BANDS OR FLANGES. ALUMINUM COATING DAMAGED OR OTHERWISE REMOVED SHALL BE REPLACED WITH COLD APPLIED BITUMINOUS COATING CONFORMING TO ALUMINUM SURFACES THAT ARE TO BE IN CONTACT WITH CONCRETE SHALL BE PAINTED WITH ONE COAT OF ZINC CHROMATE PRIMER OR TWO COATS OF ANTI-SEEP.
- CONNECTIONS - ALL CONNECTIONS WITH PIPES MUST BE COMPLETELY WATER TIGHT. THE DRAIN PIPE OR BARREL CONNECTION TO THE RISER SHALL BE WELDED ALL AROUND WHEN THE PIPE AND RISER ARE METAL. ANTI-SEEP COLLARS SHALL BE USED ON ALL CONNECTIONS WITH PIPES WITH A CIRCULAR OR 3/8" CLOSED CELL NEOPRENE GASKET. NEOPRENE GASKETS ARE NOT TO BE USED ON ALL CONNECTIONS. ALL CONNECTIONS SHALL USE A RUBBER OR NEOPRENE GASKET WHEN JOINING PIPE SECTIONS. THE END OF EACH PIPE SHALL BE RE-ROLLED AN ADEQUATE NUMBER OF CORROGATIONS TO ACCOMMODATE THE BANDWIDTH. THE FOLLOWING TYPICAL CONNECTIONS ARE ACCEPTABLE FOR PIPES LESS THAN 24 INCHES IN DIAMETER. FLANGES ON BOTH ENDS OF THE PIPE WITH A CIRCULAR OR 3/8" CLOSED CELL NEOPRENE GASKET. PREPARED TO THE FLANGE BOLT CIRCLE. SANDWICHED BETWEEN ADJACENT FLANGES, A 12-INCH WIDE STANDARD LAP TYPE BAND WITH 12-INCH WIDE BY 3/8-INCH THICK CLOSED CELL CIRCULAR NEOPRENE GASKET; AND A 12-INCH WIDE HUGGER TYPE BAND WITH C-RING GASKETS HAVING A MINIMUM DIAMETER OF 1/2 INCH GREATER THAN THE CORROGATION DEPTH. PIPES 24 INCHES IN DIAMETER AND LARGER SHALL BE CONNECTED BY A 24 INCH LONG ANNULAR CORROGATED BAND USING A MINIMUM OF 4 (FOUR) RINGS AND LUGS, 2 ON EACH CONNECTING PIPE END. A 24-INCH WIDE BY 3/8-INCH THICK CLOSED CELL CIRCULAR NEOPRENE GASKET WILL BE INSTALLED WITH 12 INCHES ON THE END OF EACH PIPE. FLANGED JOINTS WITH 3/8" INCH CLOSED CELL GASKETS THE FULL WIDTH OF THE FLANGE IS ALSO ACCEPTABLE. RELIABLY CORROGATED PIPE SHALL HAVE EITHER CONTINUOUSLY WELDED SEAMS OR HAVE LOCK SEAMS WITH INTERNAL CAULKING OR A NEOPRENE BEAD.
- BEDDING - THE PIPE SHALL BE FIRMLY AND UNIFORMLY BEDDED THROUGHOUT ITS ENTIRE LENGTH. WHERE ROCK OR SOFT, PONEY OR OTHER UNSTABLE SOIL IS ENCOUNTERED, ALL SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE EARTH COMPACTED TO PROVIDE ADEQUATE SUPPORT.
- BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".
- OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

**REINFORCED CONCRETE PIPE**

ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR REINFORCED CONCRETE PIPE:

- MATERIALS - REINFORCED CONCRETE PIPE SHALL HAVE BELL AND SPIGOT JOINTS WITH RUBBER GASKETS AND SHALL BEAL OR EXCEED ASTM C-561.
- BEDDING - REINFORCED CONCRETE PIPE CONDUITS SHALL BE LAID IN A CONCRETE BEDDING/CRADE FOR THEIR ENTIRE LENGTH. THIS BEDDING/CRADE SHALL BE HIGH SLUMP CONCRETE PLACED UNDER THE PIPE AND UP THE SIDES OF THE PIPE AT LEAST 80% OF ITS OUTSIDE DIAMETER WITH A MINIMUM THICKNESS OF 6 INCHES. WHERE A CONCRETE CRADE IS NOT NEEDED FOR STRUCTURAL REASONS, FLOVABLE FILL MAY BE USED AS DESCRIBED IN THE "STRUCTURE BACKFILL" SECTION OF THIS STANDARD. GRAVEL BEDDING IS NOT PERMITTED.
- LAYING PIPE - BELL AND SPIGOT PIPE SHALL BE PLACED WITH THE BELL END UPSTREAM. JOINTS SHALL BE MADE IN ACCORDANCE WITH RECOMMENDATIONS OF THE MANUFACTURER OF THE MATERIAL. AFTER THE JOINTS ARE SEALED FOR THE ENTIRE LINE, THE BEDDING SHALL BE PLACED SO THAT ALL SPACES UNDER THE PIPE ARE FILLED. CARE SHALL BE EXERCISED TO PREVENT ANY DEVIATION FROM THE ORIGINAL LINE AND GRADE OF THE PIPE. THE FIRST JOINT MUST BE LOCATED WITHIN 4 FEET FROM THE RISER.
- BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".
- OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

**PLASTIC PIPE**

THE FOLLOWING CRITERIA SHALL APPLY FOR PLASTIC PIPE:

- MATERIALS - PVC PIPE SHALL BE PVC-1120 OR PVC-1220 CONFORMING TO ASTM D-1185 OR ASTM D-2241. CORRUGATED HIGH DENSITY POLYETHYLENE (HDPE) PIPE, COUPLINGS AND FITTINGS SHALL CONFORM TO THE FOLLOWING 4'-0" INCH PIPE SHALL MEET THE REQUIREMENTS OF AASHTO M252 TYPE 5, AND 12" THROUGH 24" INCH SHALL MEET THE REQUIREMENTS OF AASHTO M294 TYPE 5.
- JOINTS AND CONNECTIONS TO ANTI-SEEP COLLARS SHALL BE COMPLETELY WATER TIGHT.
- BEDDING - THE PIPE SHALL BE FIRMLY AND UNIFORMLY BEDDED THROUGHOUT ITS ENTIRE LENGTH. WHERE ROCK OR SOFT, PONEY OR OTHER UNSTABLE SOIL IS ENCOUNTERED, ALL SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE EARTH COMPACTED TO PROVIDE ADEQUATE SUPPORT.
- BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".
- OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

**DRAINAGE DIAPHRAGMS** - WHEN A DRAINAGE DIAPHRAGM IS USED, A REGISTERED PROFESSIONAL ENGINEER WILL SUPERVISE THE DESIGN AND CONSTRUCTION INSPECTION.

**CONCRETE**

CONCRETE SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 414, MIX NO. 3.

**EROSION AND SEDIMENT CONTROL**

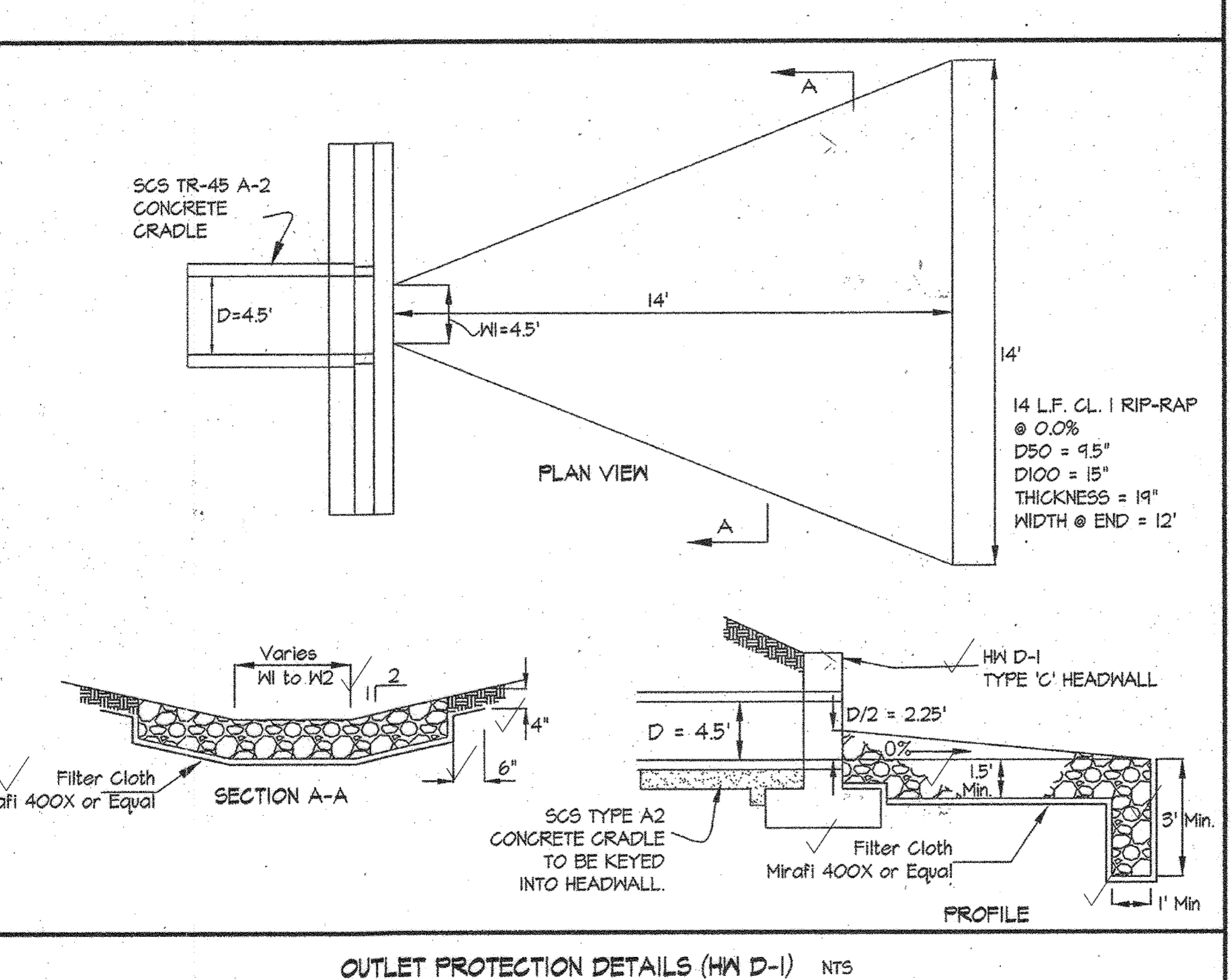
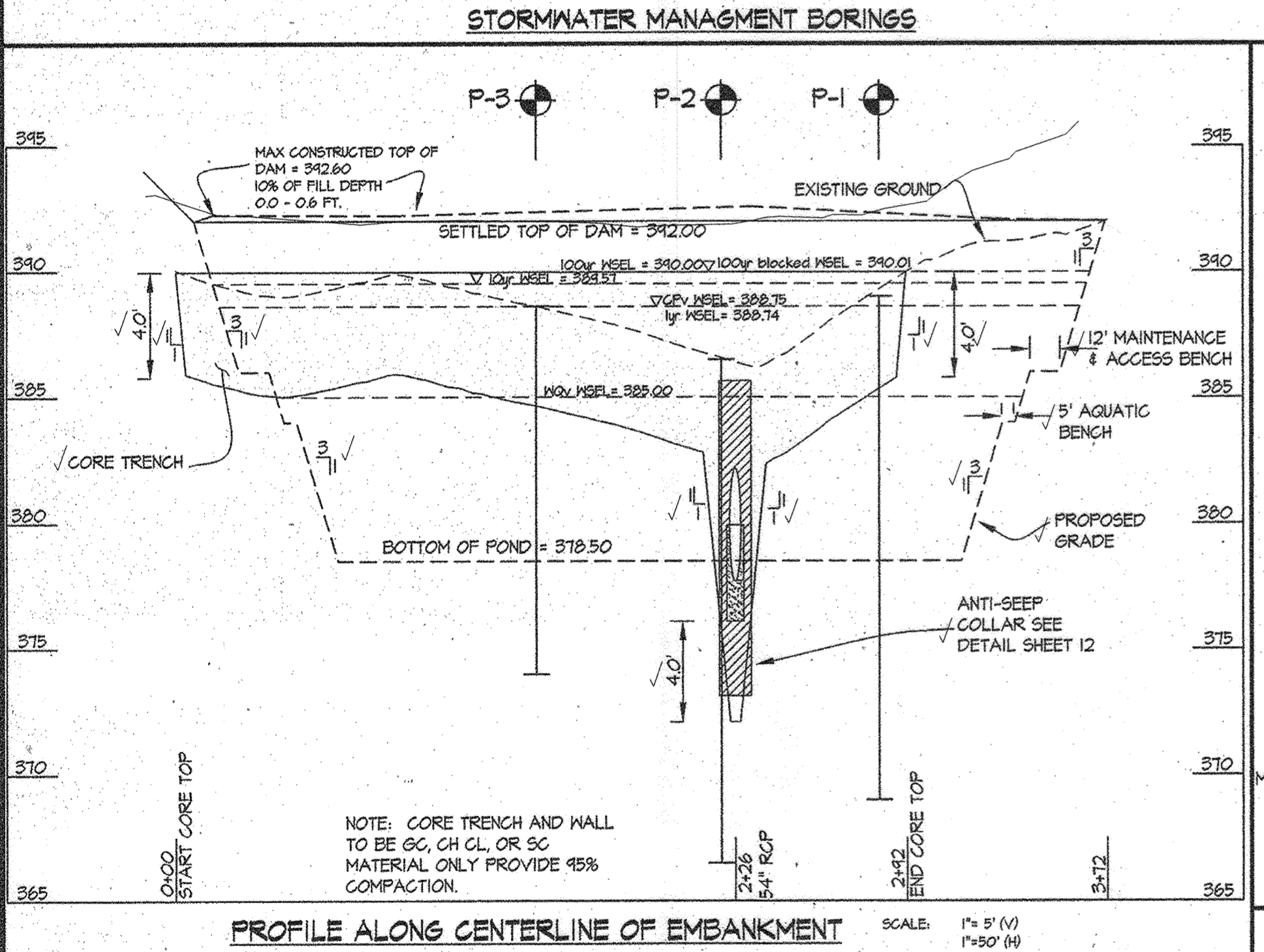
CONSTRUCTION OPERATIONS WILL BE CARRIED OUT IN SUCH A MANNER THAT EROSION, AND WATER AND AIR POLLUTION MINIMUM STATE AND LOCAL LAWS CONCERNING POLLUTION ABATEMENT WILL BE FOLLOWED. CONSTRUCTION PLANS SHALL DETAIL EROSION AND SEDIMENT CONTROL MEASURES.

**OPERATION AND MAINTENANCE**

AN OPERATION AND MAINTENANCE PLAN IN ACCORDANCE WITH LOCAL OR STATE REGULATIONS WILL BE PREPARED FOR ALL PONDS. AS A MINIMUM, THE DAM INSPECTION CHECKLIST LOCATED IN APPENDIX A SHALL BE INCLUDED AS PART OF THE OPERATION AND MAINTENANCE PLAN AND PERFORMED AT LEAST ANNUALLY. WRITTEN RECORDS OF MAINTENANCE AND MAJOR REPAIRS NEEDS TO BE RETAINED IN A FILE. THE ISSUANCE OF A MAINTENANCE AND REPAIR PERMIT FOR ANY REPAIRS OR MAINTENANCE THAT INVOLVES THE MODIFICATION OF THE DAM OR SPILLWAY FROM ITS ORIGINAL DESIGN AND SPECIFICATIONS IS REQUIRED. A PERMIT IS ALSO REQUIRED FOR ANY REPAIRS OR RECONSTRUCTION THAT INVOLVE A SUBSTANTIAL PORTION OF THE STRUCTURE. ALL INDICATED REPAIRS ARE TO BE MADE AS SOON AS PRACTICAL.

**NOTE**

APPENDIX A (DAM SAFETY CHECKLIST) IS LOCATED WITHIN THE NEDA NATURAL RESOURCES CONSERVATION SERVICE, MARYLAND CONSERVATION PRACTICE STANDARD, POND, CODE 518" OR THE "MARYLAND DAM SAFETY MANUAL", DEPT. OF NATURAL RESOURCES WATER RESOURCES ADMINISTRATION.



**CARE OF WATER DURING CONSTRUCTION**

ALL WORK ON PERMANENT STRUCTURES SHALL BE CARRIED OUT IN AREAS FREE FROM WATER. THE CONTRACTOR SHALL CONSTRUCT AND MAINTAIN ALL TEMPORARY LEVEES, COFFERDAMS, DRAINAGE CHANNELS, AND BERRIS NECESSARY TO PROTECT THE AREAS TO BE OCCUPIED BY THE PERMANENT WORKS. THE CONTRACTOR SHALL ALSO FURNISH, INSTALL, OPERATE, AND MAINTAIN ALL NECESSARY PUMPING AND OTHER EQUIPMENT REQUIRED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE WORK AND FOR MAINTAINING THE EXCAVATIONS, FOUNDATION, AND OTHER PARTS OF THE WORKS FREE FROM WATER AS REQUIRED OR DIRECTED BY THE ENGINEER FOR CONSTRUCTING EACH PART OF THE WORK. AFTER HAVING SERVED THEIR PURPOSE, ALL TEMPORARY PROTECTIVE WORKS SHALL BE REMOVED OR LEVELED AND GRADED TO THE EXTENT REQUIRED TO PREVENT OBSTRUCTION IN ANY DEGREE WHATSOEVER OF THE FLOW OF WATER TO THE SPILLWAY OR OUTLET WORKS AND SO AS NOT TO INTERFERE WITH THE OPERATION OR MAINTENANCE OF THE STRUCTURE. STREAM DIVERSIONS SHALL BE MAINTAINED UNTIL THE FILL FLOW CAN BE PASSED THROUGH THE PERMANENT WORKS. THE REMOVAL OF WATER FROM THE REQUIRED EXCAVATION AND THE FOUNDATION SHALL BE ACCOMPLISHED IN A MANNER AND TO THE EXTENT THAT WILL MAINTAIN STABILITY OF THE EXCAVATED SLOPES AND BOTTOM REQUIRED EXCAVATIONS AND WILL ALLOW SATISFACTORY PERFORMANCE OF ALL CONSTRUCTION OPERATIONS. DURING THE FLAGGING AND CONSTRUCTION OF MATERIAL IN REQUIRED EXCAVATIONS, THE WATER LEVEL AT THE LOCATIONS BEING REFILLED SHALL BE MAINTAINED BELOW THE BOTTOM OF THE EXCAVATION AT SUCH LOCATIONS WHICH MAY REQUIRE DRAINING THE WATER PUMPS FROM WHICH THE WATER SHALL BE PUMPED.

**STABILIZATION**

ALL BORROW AREAS SHALL BE GRADED TO PROVIDE PROPER DRAINAGE AND LEFT IN A SLIGHTLY CONDITION ALL EXPOSED SURFACES OF THE EMBANKMENT, SPILLWAY, SPOIL AND BORROW AREAS, AND BERRIS SHALL BE STABILIZED BY SEEDING, LIMING, FERTILIZING AND MULCHING IN ACCORDANCE WITH THE NATURAL RESOURCES CONSERVATION SERVICE STANDARDS AND SPECIFICATIONS FOR CRITICAL AREA PLANTING (MDS-542) OR AS SHOWN ON THE ACCOMPANYING DRAWINGS.

**ROCK RIPRAP**

ROCK RIPRAP SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 518. GEOTEXTILE SHALL BE PLACED UNDER ALL RIPRAP AND SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 421.04, CLASS C.

**ASBUILT 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. 12415, Expiration Date: May 26, 2022.

12/1/20  
Date: *Carl K. Gutschick*  
Professional Engineer  
Maryland Reg. No. 12415

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Walter Z. Marshall*  
Chief, Bureau of Highways  
Date: 10-23-09

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
*Walter Z. Marshall*  
Chief, Division of Land Development  
Date: 10/23/09

**DEVELOPER'S/BUILDER'S CERTIFICATE**

I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN AS-BUILT PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT.

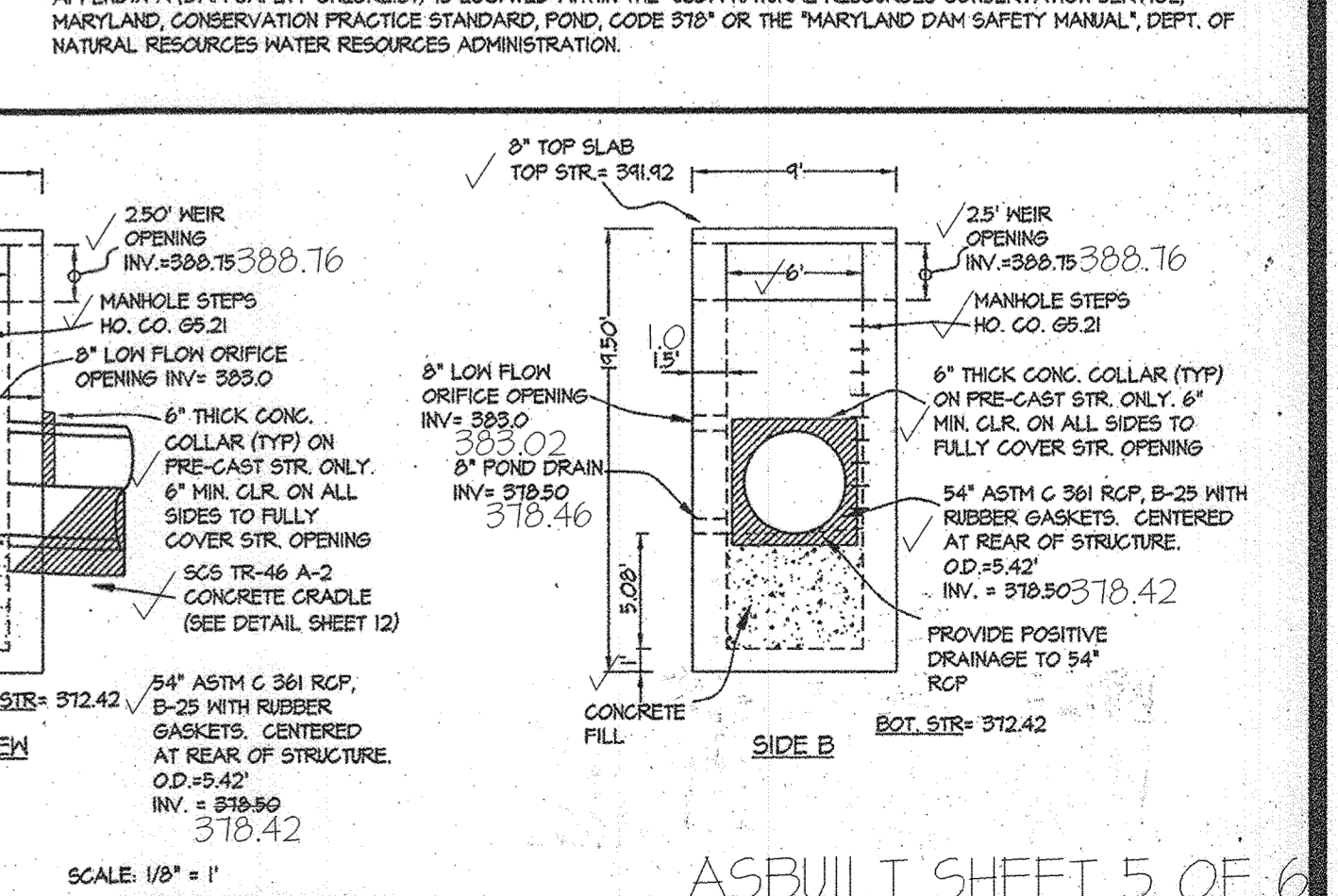
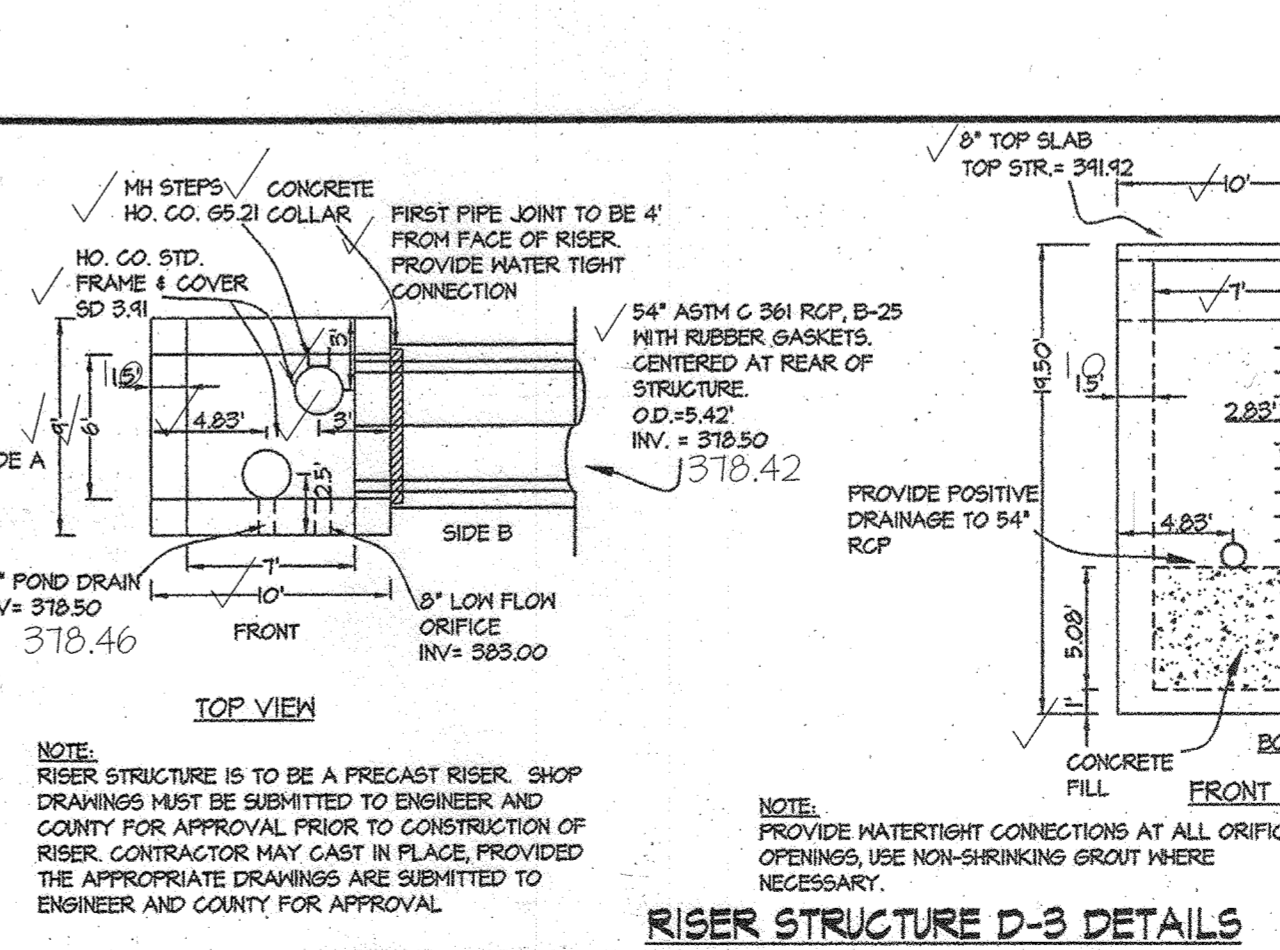
9-22-09  
Date: *Michael J. Trapp*  
SIGNATURE OF DEVELOPER/BUILDER

**ENGINEER'S CERTIFICATE**

"I" HEREBY CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY PERSONNEL PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN AS-BUILT PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT.

9/23/09  
Date: *Michael J. Trapp*  
ENGINEER'S SIGNATURE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.



**GLWGUTSCHICK LITTLE & WEBER, P.A.**  
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS  
3909 NATIONAL DRIVE - SUITE 250 - BURTONSVILLE OFFICE PARK  
BURTONSVILLE, MARYLAND 20866  
TEL: 301-421-4024 FAX: 301-421-4024

OWNER PAR C-216 thru C-218:  
BA WATERLOO TOWNHOMES, LLC.  
c/o BOZZUTO HOMES, INC.  
7850 WALKER DRIVE, SUITE 400  
GREENBELT, MARYLAND 20770  
ATTN: DUNCAN SLIDELL  
301-623-1525

**PROFESSIONAL CERTIFICATION**

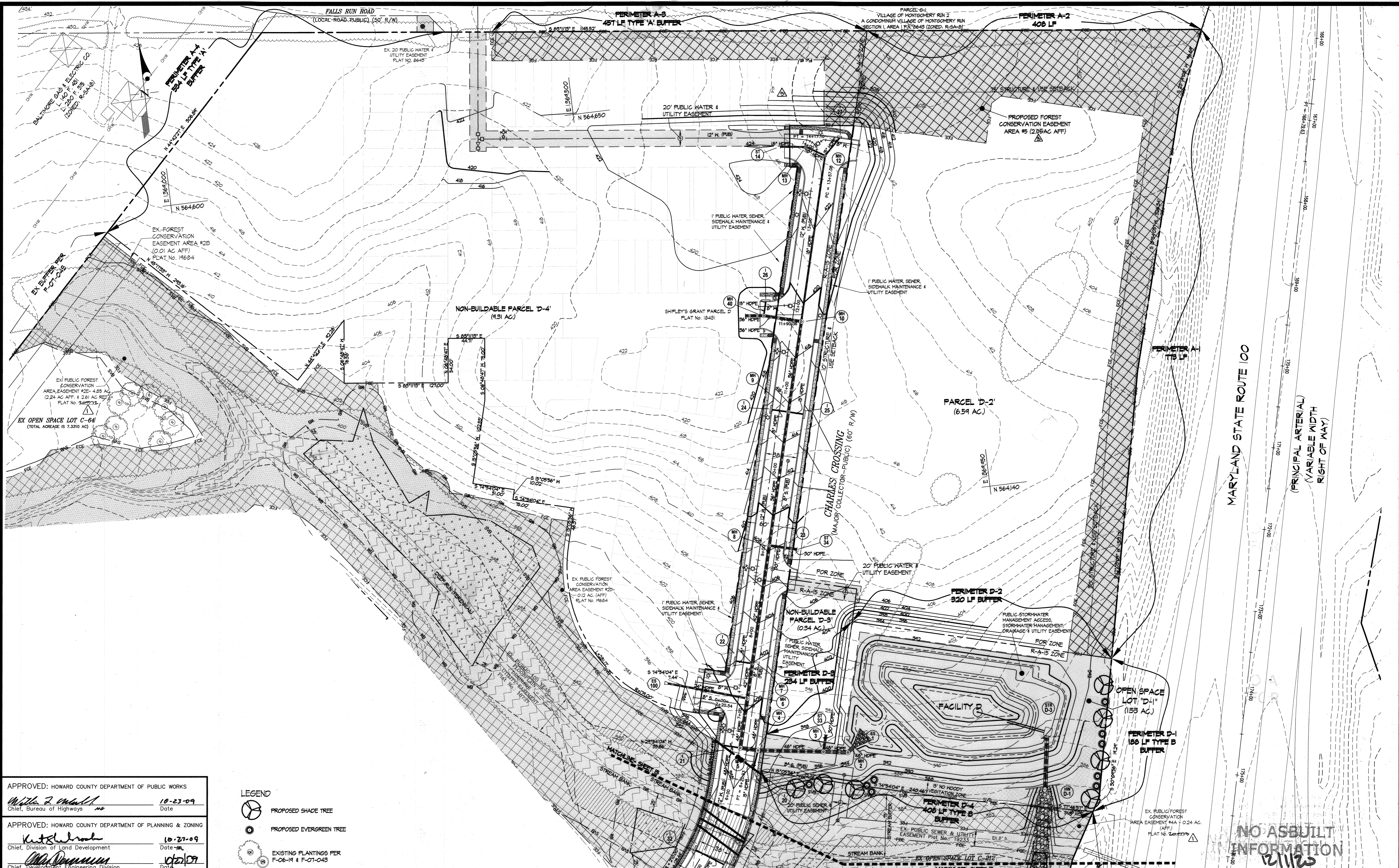
I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 14931  
EXPIRATION DATE: May 21, 2010

**STORMWATER MANAGEMENT POND D DETAILS**

**SHIPLEY'S GRANT**  
PHASE IV  
LOTS C-219 thru C-222, C-225 thru C-207, PARCELS D-2 and E-1  
OPEN SPACE LOTS C-207, D-1, E-2 & E-3 and NON-BUILDABLE PARCELS "D-3", "D-4", and NON-BUILDABLE LOT C-209  
A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 thru C-218, "D" and "E"  
ELECTION DISTRICT No. 1  
HOWARD COUNTY, MARYLAND

SCALE: AS SHOWN  
ZONING: R-A-15, POR  
G. L. W. FILE NO.: 07002  
DATE: NOV. 2020  
TAX MAP - GRID: 37-1&2  
SHEET: 13 OF 31





APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Walter Z. Small* 10-23-09  
 Chief, Bureau of Highways Date

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
*Kurt Schrock* 10-27-09  
 Chief, Division of Land Development Date

*Mike Dorman* 10/27/09  
 Chief, Development Engineering Division Date

**LEGEND**

- PROPOSED SHADE TREE
- PROPOSED EVERGREEN TREE
- EXISTING PLANTINGS PER F-06-19 & F-01-043

**GLW GUTSCHICK LITTLE & WEBER, P.A.**  
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DATE	REVISION	BY	APP'R.
10-23-09	Rev. F-06 No. 5 A	gt	
11-10-09	Rev. Title Block per F-10-02 Add Plat No's 1	gt	

OWNER PAR C-216 thru C-218:  
 BA WATERLOO TOWNHOMES, LLC.  
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 EXPIRATION DATE: May 21, 2018

**LANDSCAPE PLAN**  
**SHIPLEY'S GRANT**  
**PHASE IV**  
 LOTS C-219 thru C-222, C-225 thru C-207, PARCELS D-2 and E-1, OPEN SPACE LOTS C-207, D-1, E-2 & E-3 and NON-BUILDABLE PARCELS "D-3", "D-4", and NON-BUILDABLE LOT C-208  
 A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 thru C-218, "D" and "E"  
 ELECTION DISTRICT No. 1 HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE No.
1"=50'	R-A-15, POR	07002
DATE	TAX MAP - GRID	SHEET
SEPT., 2009	37-1&2	14 OF 31

**NO ASBUILT INFORMATION**  
 12/1/25



**PLANT MATERIALS AND PLANTING METHODS**

- A. PLANT MATERIALS**
- THE LANDSCAPE CONTRACTOR SHALL FURNISH AND INSTALL AND/OR DIG, BALL, BURLAP AND TRANSPORT ALL OF THE PLANT MATERIALS CALLED FOR ON DRAWINGS AND/OR LISTED IN THE PLANT SCHEDULE.
- PLANT NAMES**  
PLANT NAMES USED IN THE PLANT SCHEDULE SHALL CONFORM WITH "STANDARDIZED PLANT NAMES" LATEST EDITION.
  - PLANT STANDARDS**  
ALL PLANT MATERIAL SHALL BE EQUAL TO OR BETTER THAN THE REQUIREMENTS OF THE "USA STANDARD FOR NURSERY STOCK" LATEST EDITION, AS PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSEMEN (HEREAFTER REFERRED TO AS AAN STANDARDS). ALL PLANTS SHALL BE TYPICAL OF THEIR SPECIES AND VARIETY, SHALL HAVE A NORMAL HABIT OF GROWTH AND SHALL BE FIRST QUALITY, SOUND, VIGOROUS, WELL-BRANCHED AND WITH HEALTHY, WELL-FURNISHED ROOT SYSTEMS. THEY SHALL BE FREE OF DISEASE, INSECT PESTS AND MECHANICAL INJURIES.  
ALL PLANTS SHALL BE NURSERY GROWN AND SHALL HAVE BEEN GROWN UNDER THE SAME CLIMATE CONDITIONS AS THE LOCATION OF THIS PROJECT FOR AT LEAST TWO YEARS BEFORE PLANTING. NEITHER HEEL-IN PLANTS NOR PLANTS FROM GOLF STORAGE WILL BE ACCEPTED.
  - PLANT MEASUREMENTS**  
ALL PLANTS SHALL CONFORM TO THE MEASUREMENTS SPECIFIED IN THE PLANT SCHEDULE AS APPROVED BY THE ARC.
- A. CALIPER MEASUREMENTS SHALL BE TAKEN**  
SIX INCHES (6") ABOVE GRADE FOR TREES UNDER FOUR-INCH (4") CALIPER AND TWELVE (12") ABOVE GRADE FOR TREES FOUR INCHES (4") IN CALIPER AND OVER.
- B. MINIMUM BRANCHING HEIGHT FOR ALL TREES SHALL BE SIX FEET (6'), MAXIMUM EIGHT FEET (8').**
- C. MINIMUM SIZE FOR PLANTING SHADE TREES SHALL BE 3"-37" CALIPER, 14"-16" IN HEIGHT.**
- D. MINIMUM SIZE FOR PLANTING MINOR OR INTERMEDIATE FOCUS TREES (PINES, CRABAPPLES, ETC.) SHALL BE 3"-37" CALIPER, 10"-12" IN HEIGHT.**
- E. MINIMUM SIZE FOR PLANTING SHRUBS SHALL BE 18" - 24" SPREAD UNLESS NOTED OTHERWISE.**
- F. CALIPER, HEIGHT, SPREAD AND SIZE OF BALL SHALL BE GENERALLY AS FOLLOWS:**
- | CALIPER   | HEIGHT  | SPREAD  | SIZE OF BALL |
|-----------|---------|---------|--------------|
| 3" - 3.5" | 14'-16" | 6'-8"   | 32" DIAMETER |
| 3.5" - 4" | 14'-16" | 8'-10"  | 36" DIAMETER |
| 4" - 4.5" | 16'-18" | 8'-10"  | 40" DIAMETER |
| 4.5" - 5" | 16'-17" | 10'-12" | 44" DIAMETER |
| 5" - 5.5" | 16'-20" | 10'-12" | 48" DIAMETER |
| 5.5" - 6" | 18'-20" | 12'-14" | 52" DIAMETER |
- ALL PLANT MATERIAL SHALL GENERALLY AVERAGE THE MEDIAN FOR THE SIZE RANGES INDICATED ABOVE AS INDICATED IN THE "AAN STANDARDS".
- 4. PLANT IDENTIFICATION**  
LEGIBLE LABELS SHALL BE ATTACHED TO ALL SHADE TREES, MINOR TREES, SPECIMEN SHRUBS AND BUNDLES OR BOXES OF OTHER PLANT MATERIAL, GIVING THE BOTANICAL NAME AND COMMON NAME, SIZE AND QUANTITY OF EACH. EACH SHIPMENT OF PLANTS SHALL BEAR CERTIFICATES OF INSPECTION AS REQUIRED BY FEDERAL, STATE AND COUNTY AUTHORITIES.
- 5. PLANT INSPECTION**  
THE ARC MAY, UPON REQUEST BY THE BUILDER OR DEVELOPER, AT LEAST TEN (10) DAYS PRIOR TO THE INSTALLATION OF ANY PROPOSED PLANT MATERIAL, INSPECT ALL PROPOSED PLANT MATERIAL AT THE SOURCE OF ORIGIN.
- B. PLANTING METHODS**
- ALL PROPOSED PLANT MATERIALS THAT MEET THE SPECIFICATIONS IN SECTION A ARE TO BE PLANTED IN ACCORDANCE WITH THE FOLLOWING METHODS DURING THE PROPER PLANTING SEASONS AS DESCRIBED IN THE FOLLOWING:
- PLANTING SEASONS**  
THE PLANTING OF DECIDUOUS TREES, SHRUBS AND VINES SHALL BE FROM MARCH 15<sup>TH</sup> TO JUNE 15<sup>TH</sup> AND FROM SEPTEMBER 15<sup>TH</sup> TO DECEMBER 15<sup>TH</sup>. PLANTING OF DECIDUOUS MATERIAL MAY BE CONTINUED DURING THE WINTER MONTHS PROVIDING THERE IS NO FROST IN THE GROUND AND FROST-FREE TOPSOIL PLANTING MIXTURES ARE USED.  
THE PLANTING OF EVERGREEN MATERIAL SHALL BE FROM MARCH 15<sup>TH</sup> TO JUNE 15<sup>TH</sup> AND FROM AUGUST 15<sup>TH</sup> TO DECEMBER 15<sup>TH</sup>. NO PLANTING SHALL BE DONE WHEN GROUND IS FROZEN OR EXCESSIVELY MOIST. NO FROZEN OR WET TOPSOIL SHALL BE USED AT ANY TIME.
  - DIGGING**  
ALL PLANT MATERIAL SHALL BE DUG, BALLED AND BURLAPPED (B-B) IN ACCORDANCE WITH THE "AAN STANDARDS".
  - EXCAVATION OF PLANT PITS**  
THE LANDSCAPING CONTRACTOR SHALL EXCAVATE ALL PLANT PITS, VINE PITS, HEDGE TRENCHES AND SHRUB BEDS IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:

**LANDSCAPING NOTES:**

- THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE OF THE HOWARD COUNTY LANDSCAPE MANUAL.
- CONTRACTOR SHALL NOTIFY ALL UTILITIES AT LEAST (8) FIVE DAYS BEFORE STARTING WORK. ALL GENERAL NOTES, ESPECIALLY THOSE REGARDING UTILITIES, ON SHEET 1 SHALL APPLY.
- FIELD VERIFY UNDERGROUND UTILITY LOCATIONS AND EXISTING CONDITIONS BEFORE STARTING PLANTING WORK. CONTACT ENGINEER / LANDSCAPE ARCHITECT IF ANY RELOCATIONS ARE REQUIRED.
- PLANT QUANTITIES SHOWN ON PLANT LIST ARE PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. IF DISCREPANCIES EXIST BETWEEN QUANTITIES SHOWN ON THE PLAN AND THOSE SHOWN ON THE PLANT LIST, THE QUANTITIES ON THE PLAN SHALL TAKE PRECEDENCE.
- ALL PLANT MATERIAL SHALL BE FULL HEAVY, WELL FORMED, AND SYMMETRICAL, AND CONFORM TO THE A.A.N. SPECIFICATIONS, AND BE INSTALLED IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
- NO SUBSTITUTION SHALL BE MADE WITHOUT WRITTEN CONSENT OF THE OWNER OR HIS REPRESENTATIVE.
- ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES BUT NOT OTHERWISE PLANTED, PAVED, OR MULCHED SHALL BE SEEDED OR SODED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
- THE CONTRACTOR SHALL NOTIFY THE OWNER IN WRITING IF HE/SHE ENCOUNTERS SOIL DRAINAGE CONDITIONS WHICH MAY BE DETRIMENTAL TO THE GROWTH OF THE PLANTS.
- ALL EXPOSED EARTH WITHIN LIMITS OF PLANTING BEDS SHALL BE MULCHED WITH SHREDDED HARDWOOD MULCH PER PLANTING DETAILS.
- 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 AND REPLACED.
- "SCHEDULE D - STORMWATER MANAGEMENT AREA LANDSCAPING" IS PROVIDED FOR LANDSCAPE SURETY CALCULATION PURPOSES ONLY. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED WITH THE DPA DEVELOPER'S AGREEMENT IN THE AMOUNT OF \$3,450.00 FOR:  
7 SHADE TREES @ \$500/TREE = \$3,500.00  
9 EVERGREEN TREES @ \$150/TREE = \$1,350.00
- NO LANDSCAPING WILL BE ALLOWED WITHIN WATER AND SEWER EASEMENTS.

**STORM WATER MANAGEMENT AREA LANDSCAPING - SCHEDULE D**

PERIMETER	SWMP	ADJACENT LAND USE	LINEAR FEET OF PERIMETER	LANDSCAPE BUFFER TYPE	CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET)	# OF PLANTS REQUIRED	SHADE TREES	EVERGREEN TREES	ORN. TREES	SHADE TREES	EVERGREEN TREES	ORN. TREES
D-1	POND 17	ROADWAY	180'	B	NO	4	5	—	—	—	—	—
D-2*	POND 17	OFFICE	320'	B	NO	6	8	—	—	DEFERRED TO SOP FOR PARCEL D-2	—	—
D-3**	POND 17	S.F.A.	234'	B	NO	5	6	—	—	DEFERRED TO PHASE 6 ROAD PLANS	—	—
D-4	POND 17	OPEN SPACE	400'	B	YES	5	4	—	—	5	4	—

SCHEDULE D REQUIRED SURETY: 7 SHADE TREES @ \$500/TREE = \$3,500.00  
9 EVERGREEN TREES @ \$150/TREE = \$1,350.00  
TOTAL = \$3,450.00

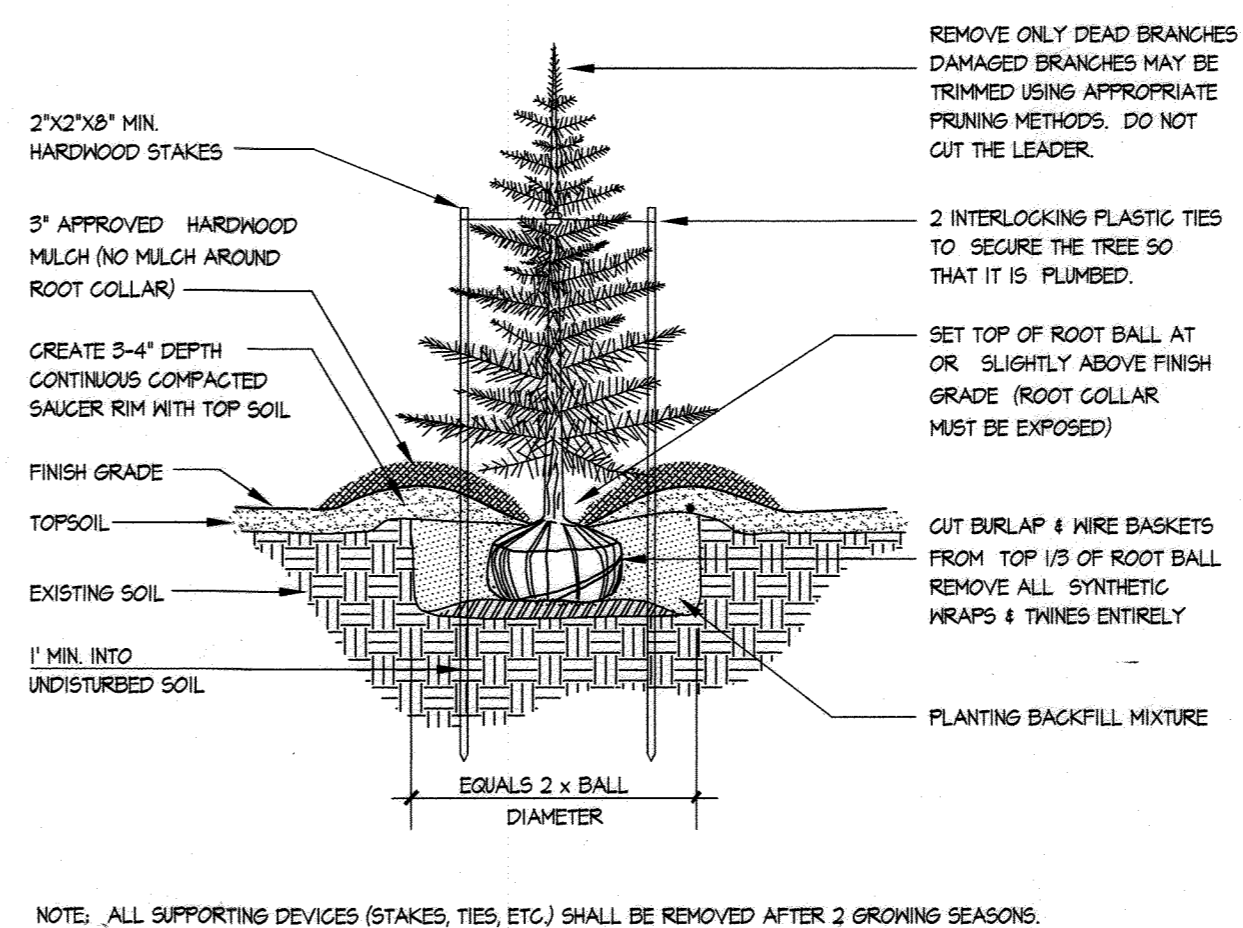
THE LANDSCAPE SURETY WILL BE INCLUDED IN THE DEVELOPER'S AGREEMENT

**SCHEDULE-A: PERIMETER LANDSCAPE EDGE**

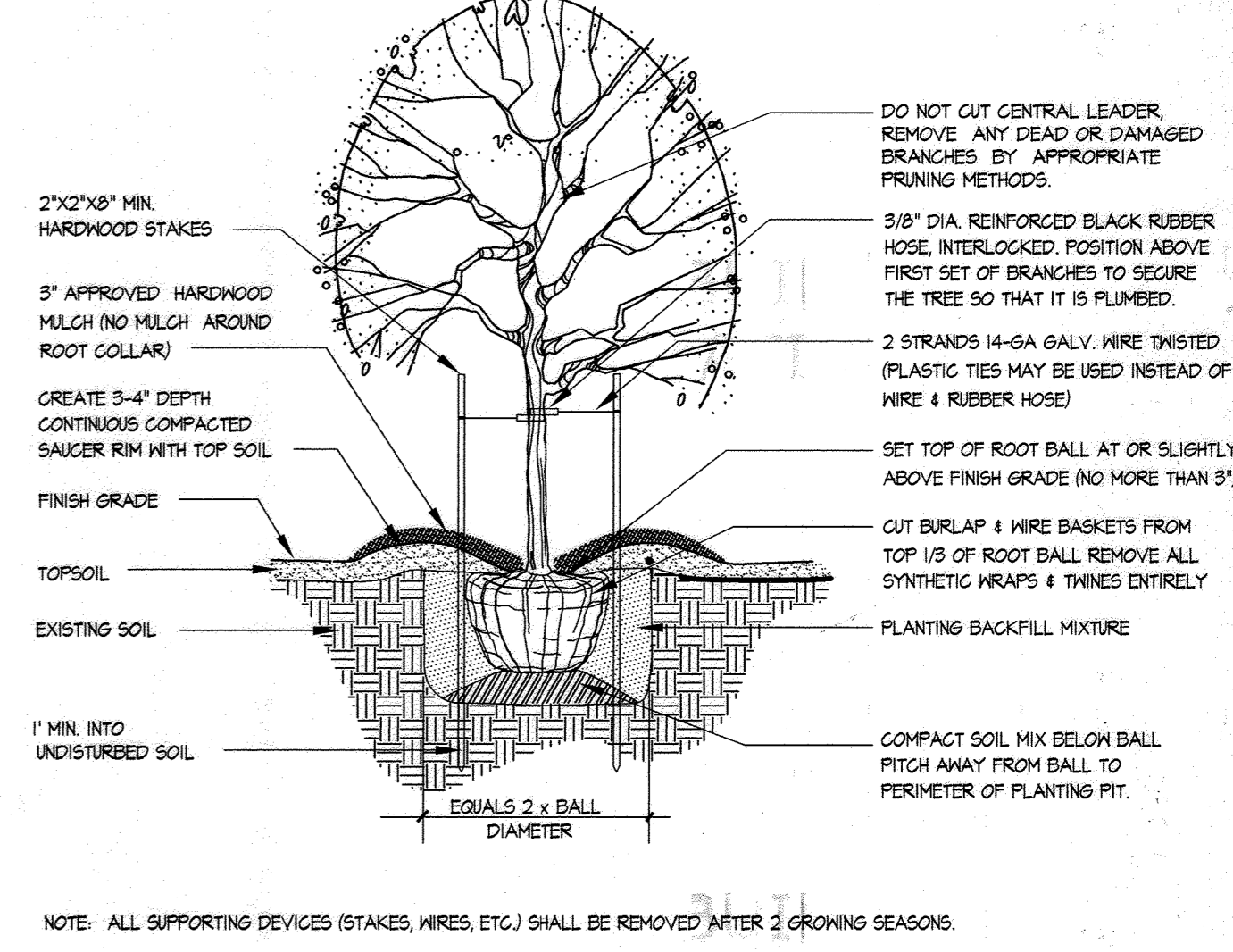
CATEGORY	ADJACENT TO PERIMETER PROPERTIES			ADJACENT TO ROADWAYS
	A-2	A-3	A-1	A-1
LANDSCAPE BUFFER TYPE	T.B.D. w/ SOP FOR PARCEL D-2	TYPE A	TYPE A	T.B.D. w/ SOP FOR PARCEL D-2
LINEAR FEET OF ROADWAY/ PERIMETER FRONTAGE/BLDG.	400'	451'	534'	713'
CREDIT FOR EX. VEGETATION (YES, NO, LINEAR FEET; DESCRIBE BELOW IF NEEDED)	NONE	NONE	NONE	NONE
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET; DESCRIBE BELOW IF NEEDED)	NONE	NONE	NONE	NONE
NUMBER OF PLANTS REQUIRED				
SHADE TREES		8 (at 1:60)	9 (at 1:60)	
EVERGREEN TREES		0	0	
ORNAMENTALS		0	0	
SHRUBS		0	0	
NUMBER OF PLANTS PROVIDED	T.B.D. w/ SOP FOR PARCEL D-2			T.B.D. w/ SOP FOR PARCEL D-2
SHADE TREES		WILL BE PROVIDED WITH ROAD PLANS FOR PHASE 5	WILL BE PROVIDED WITH ROAD PLANS FOR PHASE 6	
EVERGREEN TREES				
ORNAMENTALS				
SHRUBS				
SUBSTITUTIONS MADE				

**PLANT LIST**

SYMBOL	QTY.	NAMES (BOTANICAL / SCIENTIFIC)	SIZE	NOTES
<b>SHADE TREES</b>				
	7	Acer rubrum 'October Glory' October Glory Red Maple	2 1/2"-3" Cal. B&B 12' - 14' height 6' min. branching ht.	
<b>EVERGREEN TREES</b>				
	9	Pinus strobus White Pine	8'-10' height	



**EVERGREEN TREE PLANTING DETAIL**



**DECIDUOUS TREE PLANTING DETAIL**

- LEGEND**
- PROPOSED SHADE TREE
  - PROPOSED EVERGREEN TREE
  - EXISTING PLANTINGS PER F-06-19 & F-07-043

**NO ASBUILT INFORMATION**  
12/1/20

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Walter Z. ...* 10-27-09  
Chief, Bureau of Highways

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
*Kit ...* 10-27-09  
Chief, Division of Land Development

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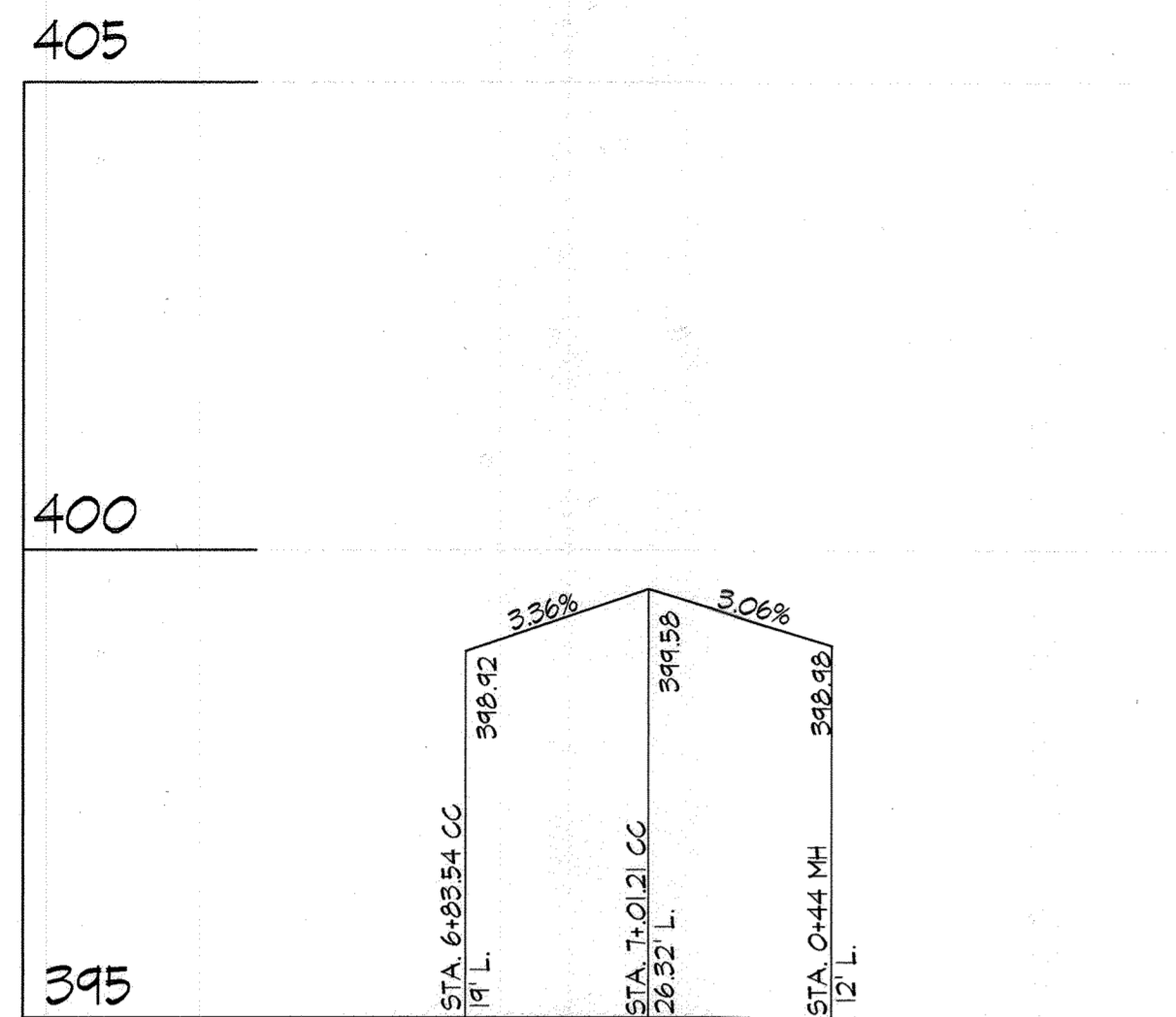
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EXPIRATION DATE: May 21, 2010



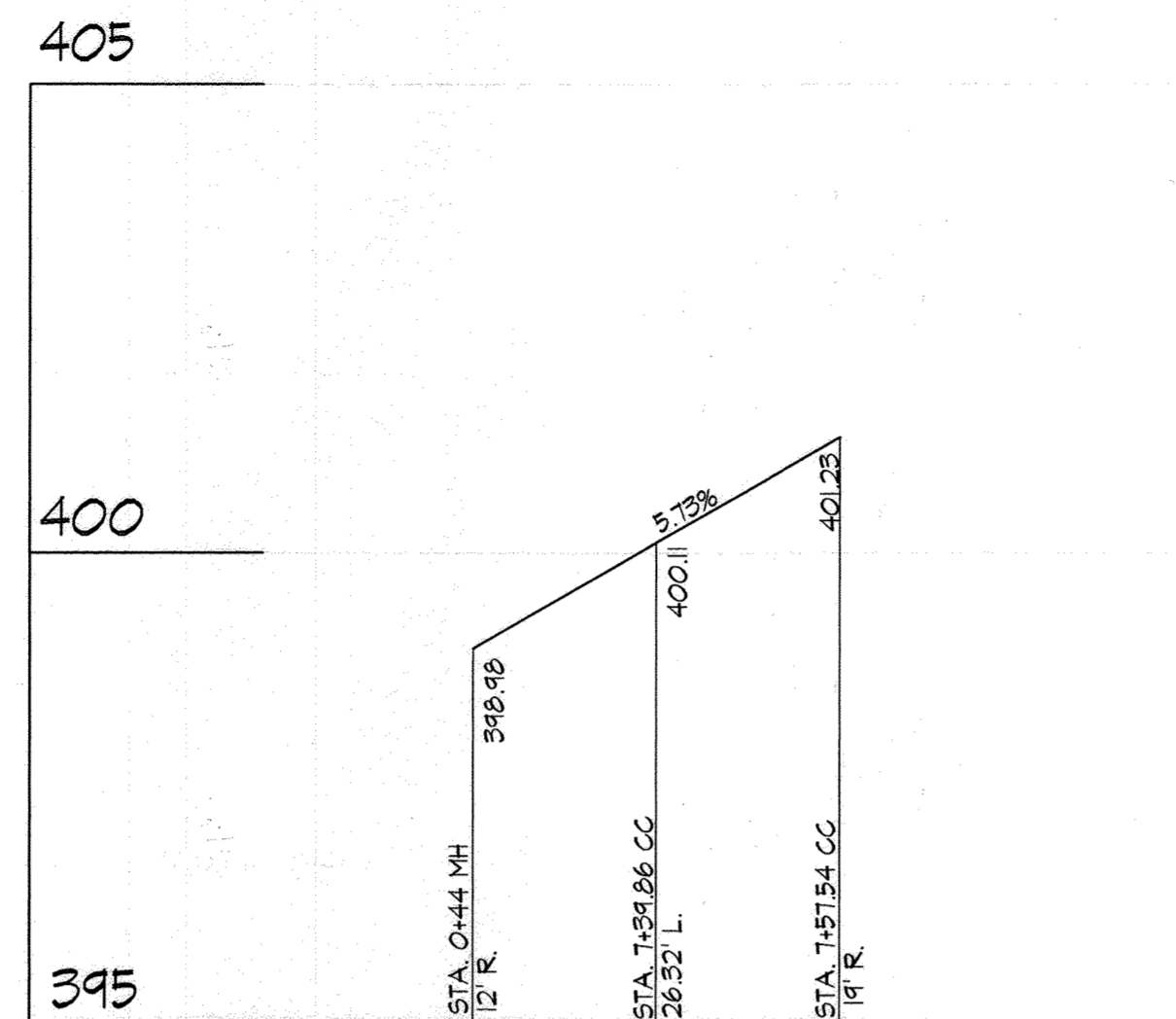
**LANDSCAPE PLAN, DETAILS AND NOTES**  
**SHIPLEY'S GRANT**  
PHASE IV  
LOTS C-219 thru C-222, C-215 thru C-207, PARCELS D-2 and E-1, OPEN SPACE LOTS C-203, D-1, E-2 & E-3 and NON-BUILDABLE PARCELS "D-3", "D-4", and NON-BUILDABLE LOT C-208  
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SCALE	ZONING	G. L. W. FILE NO.
1"=50'	R-A-15, POR	07002
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SEPT., 2009	37-1&2	15 OF 31

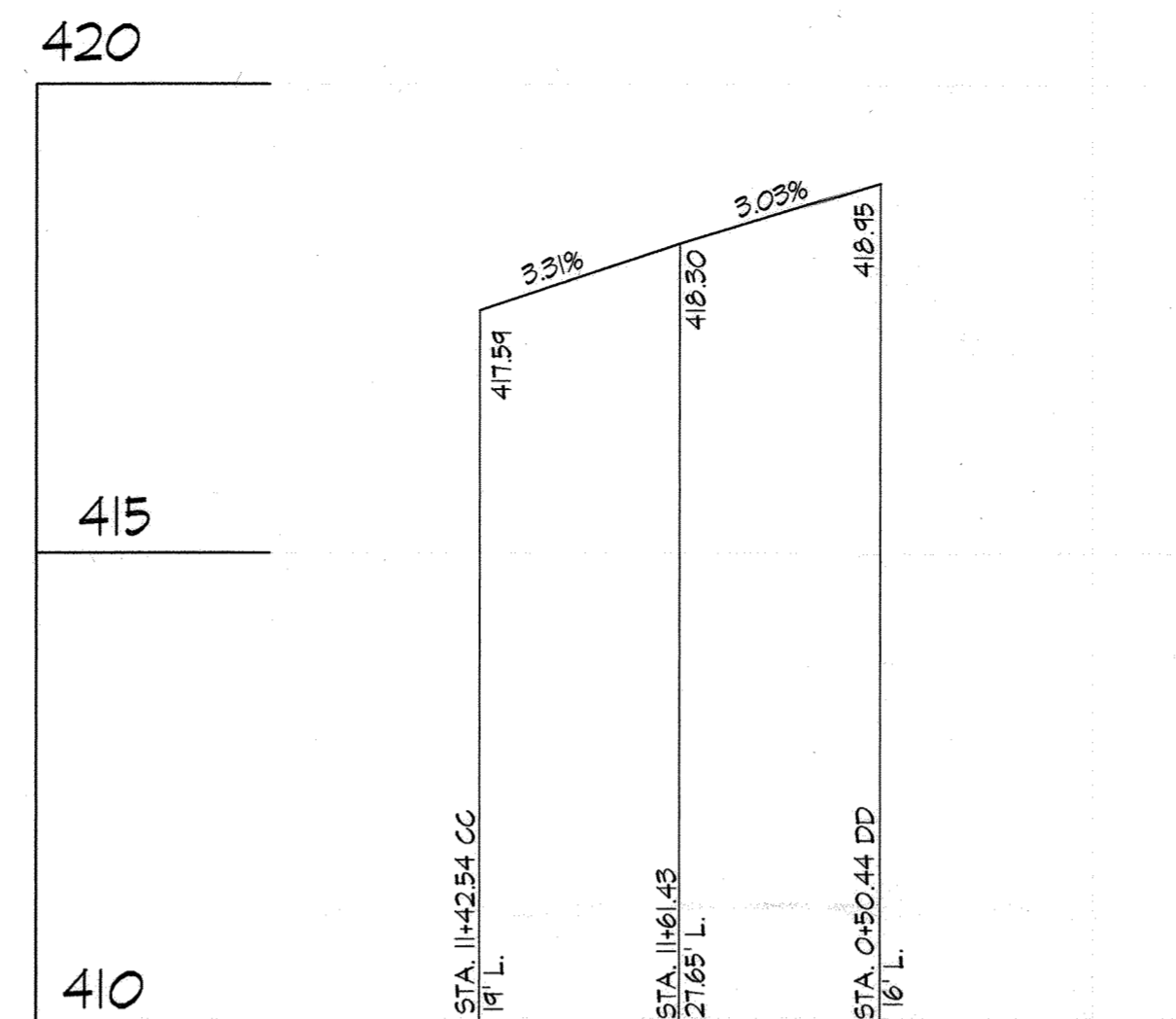




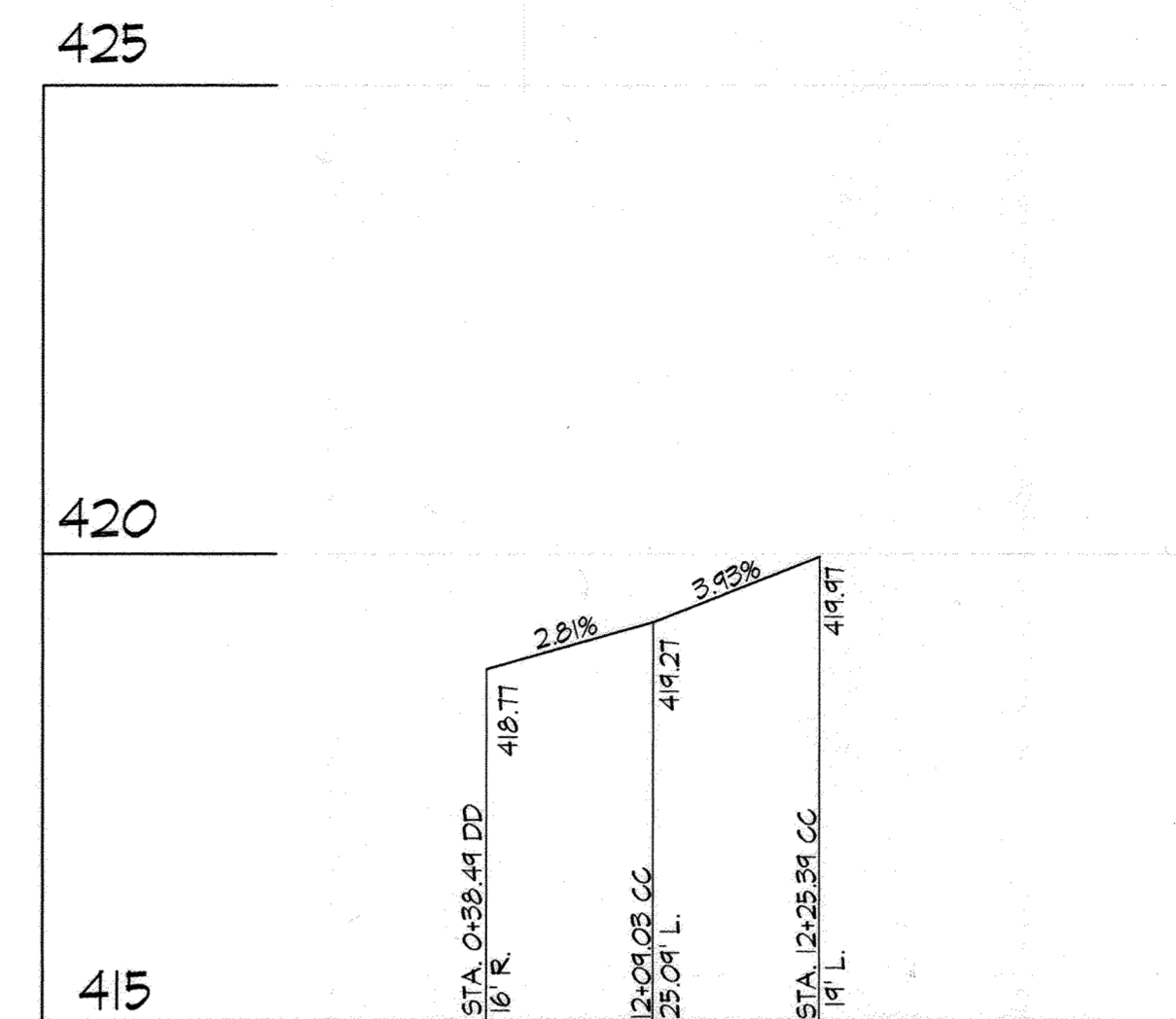
E.O.P. RETURN PROFILE FOR CHARLES CROSSING AND MAPLE HILL ROAD



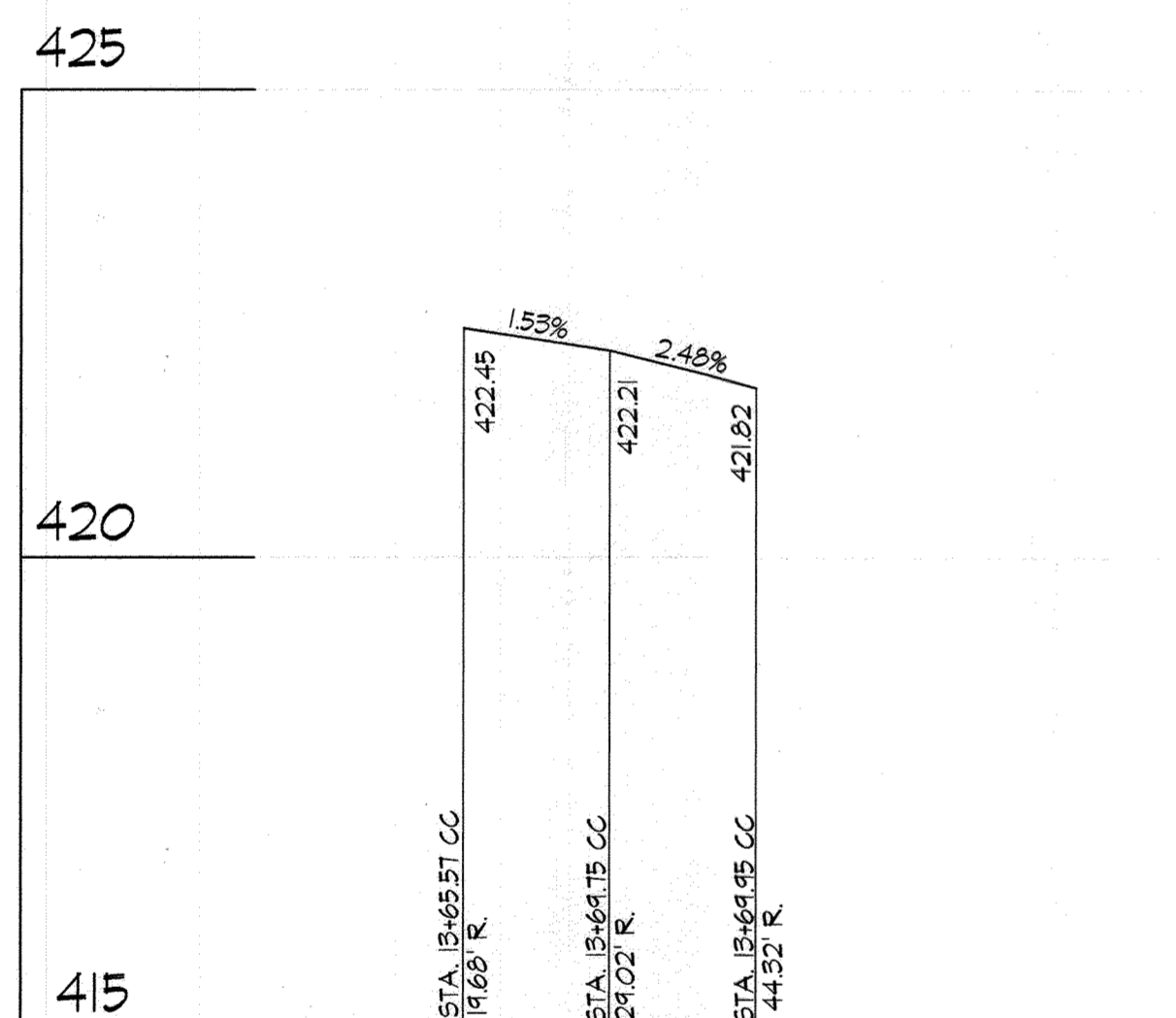
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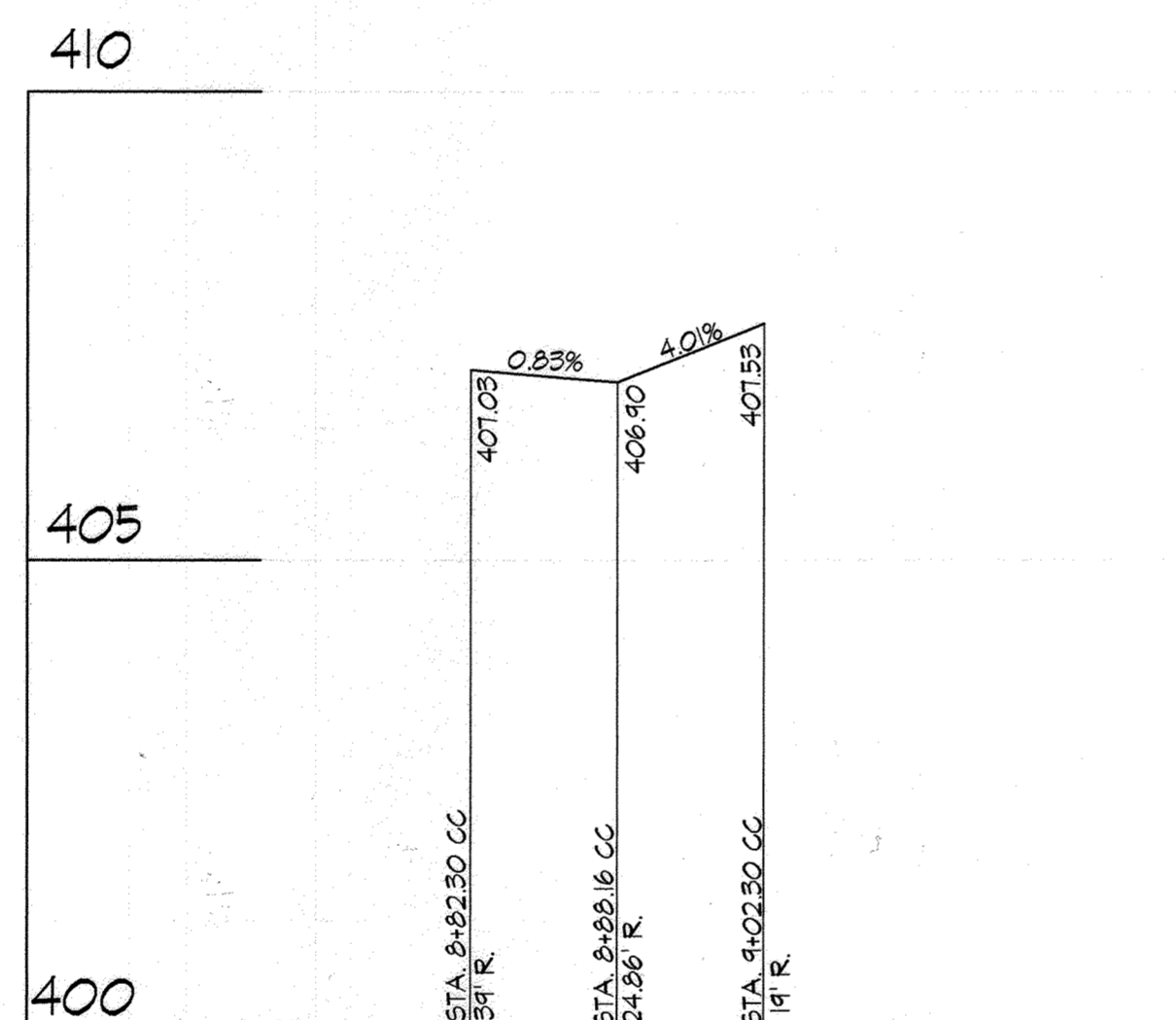
E.O.P. RETURN PROFILE FOR CHARLES CROSSING AND DUNCAN DRIVE



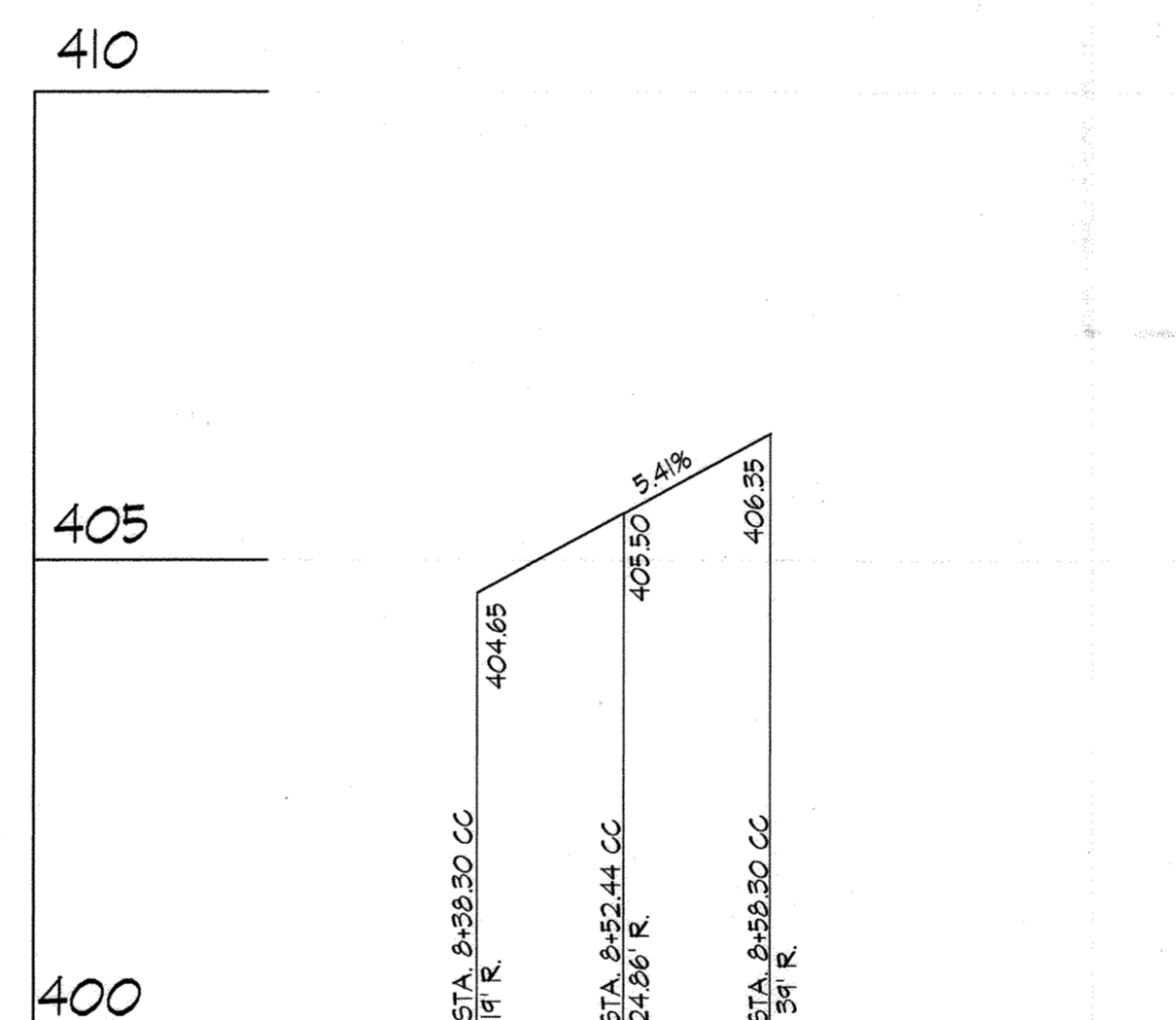
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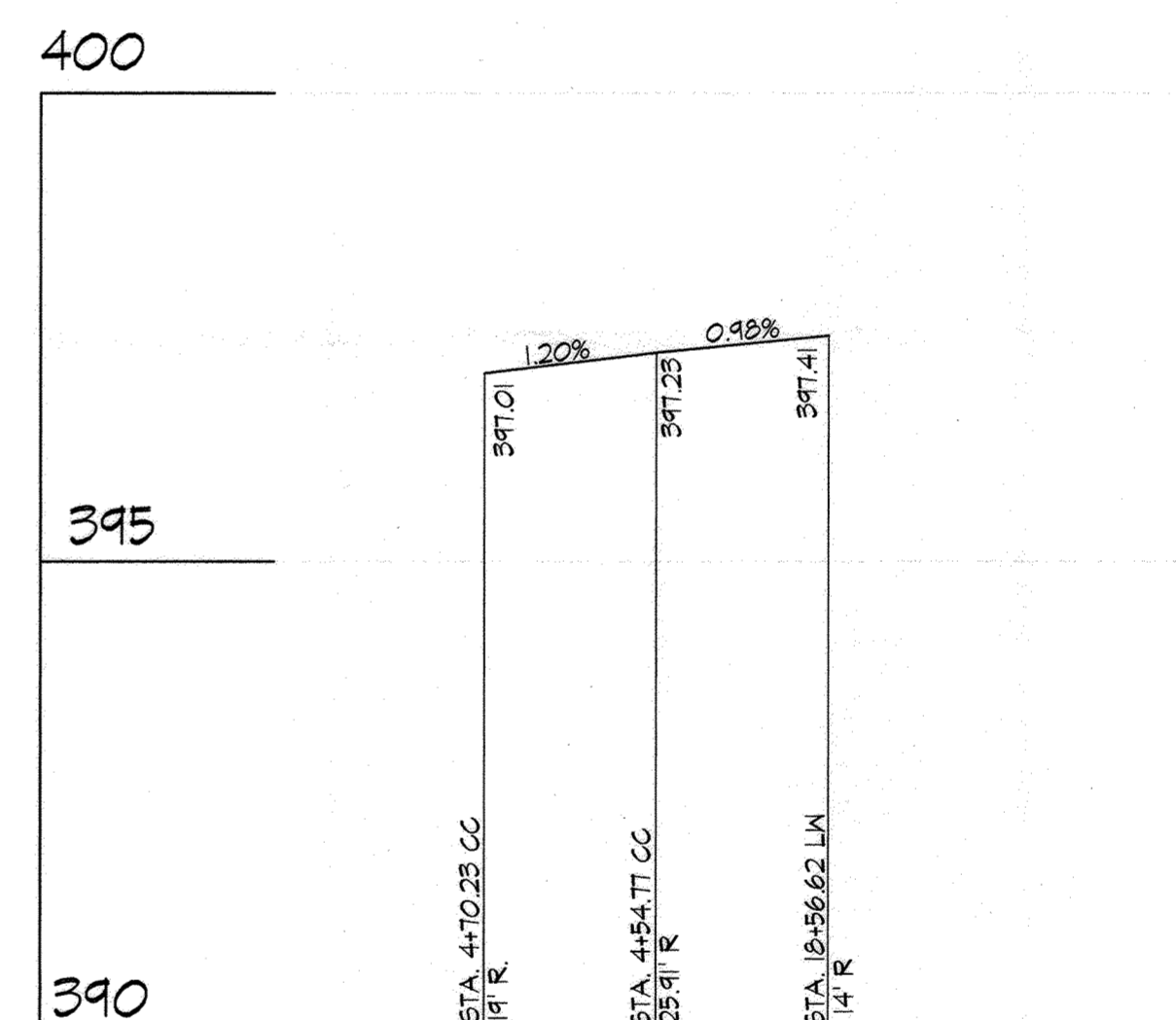
E.O.P. RETURN PROFILE FOR CHARLES CROSSING AND OFFICE DRIVEWAY



E.O.P. RETURN PROFILE FOR CHARLES CROSSING AND OFFICE DRIVEWAY



E.O.P. RETURN PROFILE FOR CHARLES CROSSING AND OFFICE DRIVEWAY



E.O.P. RETURN PROFILE FOR CHARLES CROSSING AND LOGAN'S WAY

CC= CHARLES CROSSING  
LN = LOGAN'S WAY  
MH= MAPLE HILL ROAD  
DD= DUNCAN DRIVE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Walter Z. ...* 10-23-09  
Chief, Bureau of Highways Date

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
*...* 10-27-09  
Chief, Division of Land Development Date

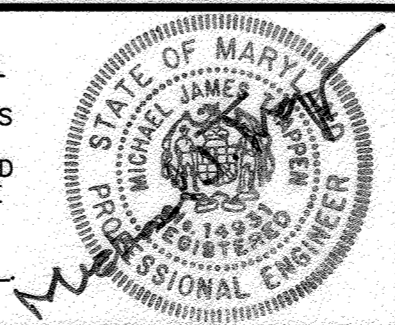
*...* 10/27/09  
Chief, Development Engineering Division Date

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DATE	REVISION	BY	APP'R.
10/27/09	Rev Title Block Per F-10000		

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**CURB RETURN PROFILES**  
**SHIPLEY'S GRANT**  
PHASE IV  
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SCALE	ZONING	G. L. W. FILE No.
1" = 20' (H) 1" = 2' (V)	R-A-15, POR	07002
DATE	TAX MAP - GRID	SHEET
SEPT., 2009	37-1&2	16 OF 31

NO ASBUILT INFORMATION  
12/1/20



**MGWC 2.: Pump-Around Practice**

Description:  
The work shall consist of installing a temporary pump around and supporting measures to divert flow around in-stream construction sites.  
Implementation Sequence:  
Sediment control measures, pump arounds, and associated channel and bank construction shall be completed in the following sequence:

- Construction activities including the installation of erosion and sediment control measures shall not begin until all necessary easements and/or right-of-ways have been acquired. All existing utilities shall be marked in the field prior to construction. The contractor is responsible for any damage to existing utilities that may result from construction and shall repair the damage at his/her own expense to the county's satisfaction.
- The contractor shall notify the Maryland Department of the Environment or MHA sediment control inspector at least 5 days before beginning construction. Additionally, the contractor shall inform the local environmental protection and resource management inspection and enforcement division and the provider of local utilities a minimum of 48 hours before starting construction.
- The contractor shall conduct a pre-construction meeting on site with the MHA sediment control inspector, the county project manager, and the engineer to review limits of disturbance, erosion and sediment control requirements, and the sequence of construction. (The contractor shall stake out all limits of disturbance prior to the pre-construction meeting.) The participants will also designate the contractor's staging areas and flag all trees within the limit of disturbance which will be removed for construction access. Trees shall not be removed within the limit of disturbance without approval from the MHA or local authority.
- Construction shall not begin until all sediment and erosion control measures have been installed and approved by the engineer and the sediment control inspector. The contractor shall stay within the limits of the disturbance as shown on the plans and minimize disturbance within the work area whenever possible.
- Upon installation of all sediment control measures and approval by the sediment control inspector and the local environmental protection and resource management inspection and enforcement division, the contractor shall begin work at the upstream section and proceed downstream beginning with the establishment of stabilized construction entrances. The sequence of construction must be followed unless the contractor gets written approval for deviations from the MHA or local authority. The contractor shall only begin work in an area which can be completed by the end of the day (including grading adjacent to the channel). At the end of each work day, the work area must be stabilized and the pump around removed from the channel. Work shall not be conducted in the channel during rain events.
- Sandbag dikes shall be situated at the upstream and downstream ends of the work area as shown on the plans, and stream flow shall be pumped around the work area. The pump shall discharge into a stable velocity dissipater made of riprap or sandbags.
- After an area is completed and stabilized, sandbag diversions, the water pump, and sediment filtering measure shall be located such that the water drains back into the channel below the downstream sandbag dike.
- Traversing a channel reach with equipment where no work is proposed should be avoided. If equipment has to traverse such a reach for access to another area, then timber mats or similar measures shall be used to minimize disturbance to the channel. Temporary stream crossings shall be used only when necessary and only where noted on the plans or specified by the engineer.
- All stream restoration measures shall be installed as indicated by the plans and all banks graded in accordance with the grading plans and typical cross-sections. All grading must be permanently stabilized at the end of each day with seed and mulch or seed and matting as specified on the plans.
- After an area is completed and stabilized, sandbag diversions, the water pump, and sediment filtering measure shall be moved to the next work area. This shall be accomplished by first moving the downstream sandbag dike to the new upstream pump around location and then by relocating the upstream sandbag dike, velocity dissipater, and sediment filter to the new downstream location.
- A pump around must be installed on any tributary or storm drain outfall which contributes base-flow to the work area. This should be accomplished by locating a sandbag dike at the downstream end of the tributary or storm drain outfall and pumping the stream flow around the work area. This water should discharge onto the same velocity dissipater used for the main stem pump around.
- If a tributary is to be restored, construction should take place on the tributary before work on the main stem reaches the tributary confluence. Construction in the tributary, including pump around practices, shall follow the same sequence as for the main stem of the river or stream. When construction on the tributary is completed, work on the main stem shall resume. Water from the tributary shall continue to be pumped around the work area in the main stem.
- The contractor is responsible for providing access to and maintaining all erosion and sediment control devices until the sediment control inspector approved their removal.
- After construction, all disturbed areas shall be regraded and revegetated as per the planting plan.
- The base flow of the stream as measured on 6/17/09 was flowing at a rate of 30 gal./minute. Contractor to supply pump-around capable to handling this flow rate.

**SCHEDULE OF SEED MIX**

BOTANICAL NAME	COMMON NAME	APPLICATION RATE (#/Ac.)	PERCENT OF MIX	REMARKS
LOLIUM MULTIFLORA	ANNUAL RYE GRASS	20	25	
AGROSTIS ALBA	RED TOP	4	40	
PANICUM CLANDESTINUM	DEER TONGUE GRASS	18	25	
BROMUS ARVENSIS	FIELD BROMEGRASS	4	10	WINTER SEED
OR	OR	OR	OR	OR
ONICUM RAMOSUM	BROWN TOP MILLET	4	10	SUMMER SEED

1. Apply fertilizer in accordance with rates and methods described for permanent seeding.

**MGWC 3.9: STEP POOLS**

**MATERIAL SPECIFICATIONS**

Natural steps in step-pool morphologies can be formed by large clasts, bedrock outcrops, and large woody debris aligned across the channel. Engineered steps can be made from boulders, logs, and large woody debris chosen according to the desired height of the step. Additionally, boulders should be sized to resist the design storm event using MGWC 2.1 Riprap as a guide.

**INSTALLATION GUIDELINES**

All erosion and sediment control devices, including dewatering basins, should be implemented as the first order of business according to a plan approved by the MHA or local authority. The proposed construction sequence for step pools is as follows (refer to Detail 3.9):

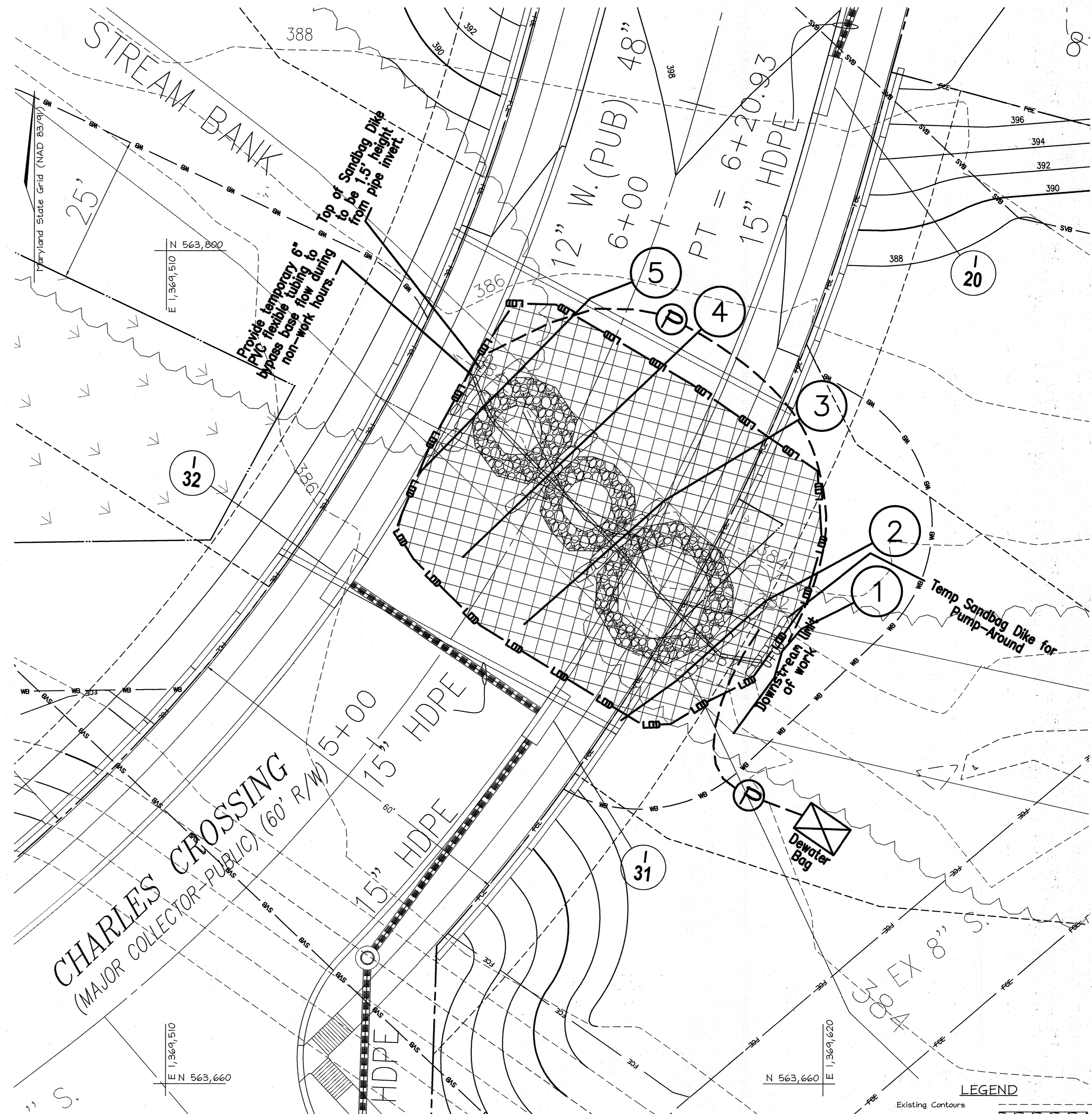
- The stream should be redirected by an approved temporary stream diversion (See Section 1: Temporary Instream Construction Measures, Maryland's Guidelines to Waterway Construction), the construction area should be dewatered, and any disturbed banks should be stabilized.
- Step-pool units should be designed and constructed to have a characteristic step height, H, and step length, L, as shown in Detail 3.9, and all steps should be firmly anchored into the stream bank.
- Step rocks shall be placed on footer rocks so that they rest on two halves of each footer rock below, and so that the step rock is offset in the upstream direction. Footer rocks should extend below the scour hole elevation.
- As a general guideline, the ratio of the mean steepness, defined as the averaged value of step height over step length, to the channel slope, S, should lie in the range of 1 to 2 ( $1 < (H/L)_{AVG}/S < 2$ ). Typical spacings for step pools and cascades are provided in Detail 3.9(b) relating to alluvial channel morphologies.
- Whenever practical, a reference reach with similar flow rates, bed and bank material characteristics, type and density of riparian vegetation, and channel gradient should be surveyed at low flows to determine appropriate values of H and L. At high discharges, step-pool characteristics may be obscured.
- Once construction is completed, the diversion should be removed from upstream to downstream. Sediment control devices, including perimeter erosion controls, are to remain in place until all disturbed areas are stabilized in accordance with an approved sediment and erosion control plan and the inspection authority approves their removal.

**CONSTRUCTION NOTES/SPECIFICATIONS**

- The contractor shall install appropriate sediment and erosion control devices before project. All work to be performed at the direction of the stream restoration specialist and these drawings.
- The foundation area shall be cleared of trees, stumps, roots, sod, loose rock, or other objectionable material.
- The cross-section shall be excavated to the neat lines and grades as shown on the plans. Over-excavated areas shall be backfilled with moist soil compacted to the density of the surrounding material.
- No abrupt deviations from the design grade or horizontal alignment shall be permitted unless authorized by the ERI Stream Restoration Specialist.
- Filter, bedding, and rock rip-rap shall be placed to line and grade in the manner specified.
- Construction operations shall be done in such a manner that erosion, air, and water pollution will be minimized and held within legal limits. The completed job shall present a workmanlike appearance. All disturbed areas shall be vegetated or otherwise protected against soil erosion.
- Filter cloth shall be placed beneath rip-rap where indicated. The filter cloth shall consist of either woven or non-woven monofilament fiber and shall conform to the ASTM D 1777, ASTM D 1682, Having a thickness of 20-60 Mils, and a grab strength of 90-120 LBS.
- All boulders shall be selected Class III Rip-rap boulders, natural in color and pre-approved by the Stream Restoration Specialist at Exploration Research, Inc. (ERI)
- 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.
- The rock or gravel shall conform to the specified grading limits when installed.
- 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.
- Stone and boulders for the rip-rap may be placed by equipment. It 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 small 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. Exact placement will be required as directed by the ERI Stream Specialist in the field.
- The stone shall be placed so that it blends in with the existing grade. 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.

**SEQUENCE OF CONSTRUCTION**

- Contact the MDE Compliance Inspector at 410-539-3510 48 hours prior to start of work.
- All stream stabilization work to be done in conjunction with Nontidal Wetlands and Waterways Permit (200667364/06-NT-3374). No instream work permitted March 1 thru June 15.
- With permission of the Howard County and MDE inspector, install sandbag dikes and establish pump-around device. (1 Day)
- Clear and begin construction of step pools while maintaining pump-around and 6" PVC bypass. (1 Week)
- Stabilize all disturbed areas with seed, erosion control matting and fertilizer. (1 Day)



PLAN VIEW  
SCALE: 1"=10'

**LEGEND**

- Existing Contours
- Class I Rip Rap
- Class III Rip Rap
- Tree Line
- Erosion Control Matting
- Limits of Disturbance
- Sandbag Dike

**NO ASBUILT AND ADDITIONAL INFORMATION FOR ERI**  
12/11/20

Stream Stabilization Plan and Notes  
**SHIPLEY'S GRANT**  
PHASE IV  
LOTS C-219 thru C-222, C-295 thru C-307, PARCELS D-2 and E-1, OPEN SPACE LOTS C-309, D-1, E-2 and E-3 and NON-BUILDABLE PARCELS "D-3", "D-4", and LOT C-308 A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 thru C-218, "D" and "E"

SCALE	ZONING	G. L. W. FILE No.
As Shown	R-A-15, POR	07002
DATE	TAX MAP - GRID	SHEET
SEPT. 14, 2009	37-1&2	17 OF 31

ELECTION DISTRICT No. 1  
HOWARD COUNTY, MARYLAND

**ENGINEERS CERTIFICATE**  
I 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.

*Zacharia Y. Fisch*  
SIGNATURE OF ENGINEER  
ZACHARIA Y. FISCH  
DATE: 9/15/09

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Walter R. Mahall*  
Chief, Bureau of Highways  
DATE: 10-23-09

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
*W. Mahall*  
Chief, Division of Land Development  
DATE: 10-23-09  
*W. Mahall*  
Chief, Development Engineering Division  
DATE: 10/23/09

**DEVELOPER'S CERTIFICATE**  
I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN 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 THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.

*Dennis*  
SIGNATURE OF DEVELOPER  
DATE: 9-22-09

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

*[Signature]*  
HOWARD SOIL CONSERVATION DISTRICT  
DATE: 10/16/09

**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. 22418 EXPIRATION DATE: JULY 29, 2011

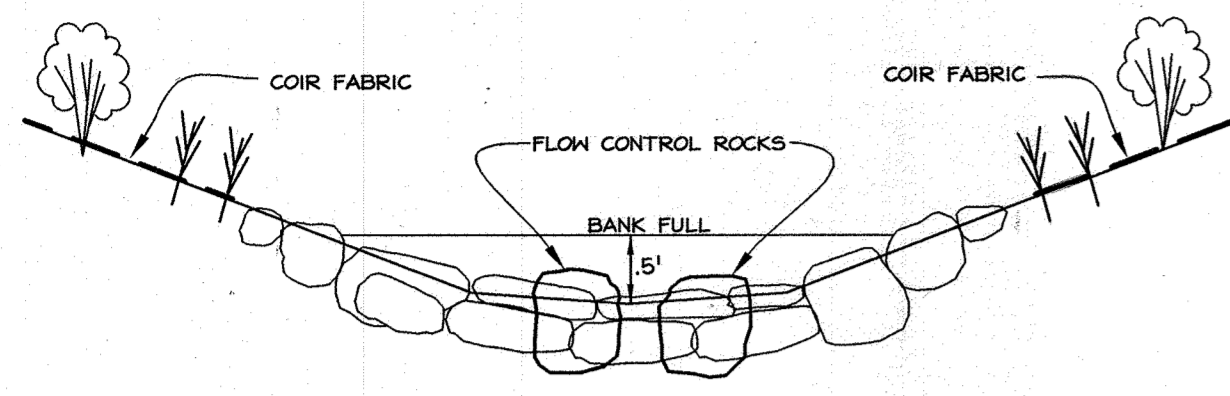
*[Signature]*  
STATE OF MARYLAND  
PROFESSIONAL ENGINEER  
22418

**EXPLORATION RESEARCH, INC.**  
ENVIRONMENTAL CONSULTANTS  
LANDSCAPE ARCHITECTS  
8330 HOWARD LANE  
ELKTON, MARYLAND  
TEL: (410) 557-5210 FAX: (410) 798-1582  
EMAIL: info@erh.com

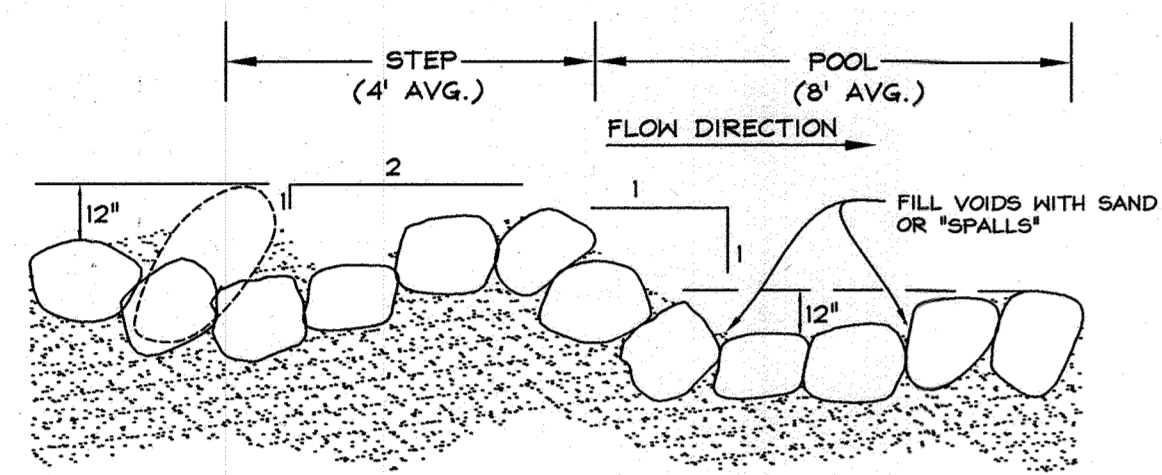
OWNER PAR C-216 thru C-218:  
BA WATERLOO TOWNHOMES, LLC.  
c/o BOZZUTO HOMES, INC.  
7850 WALKER DRIVE, SUITE 400  
GREENBELT, MARYLAND 20770  
ATTN: DUNCAN SLIDELL  
301-623-1525

DATE	REVISION	BY	APPR
10/10	Rev. Title Block Per F 10-2000	WJS	

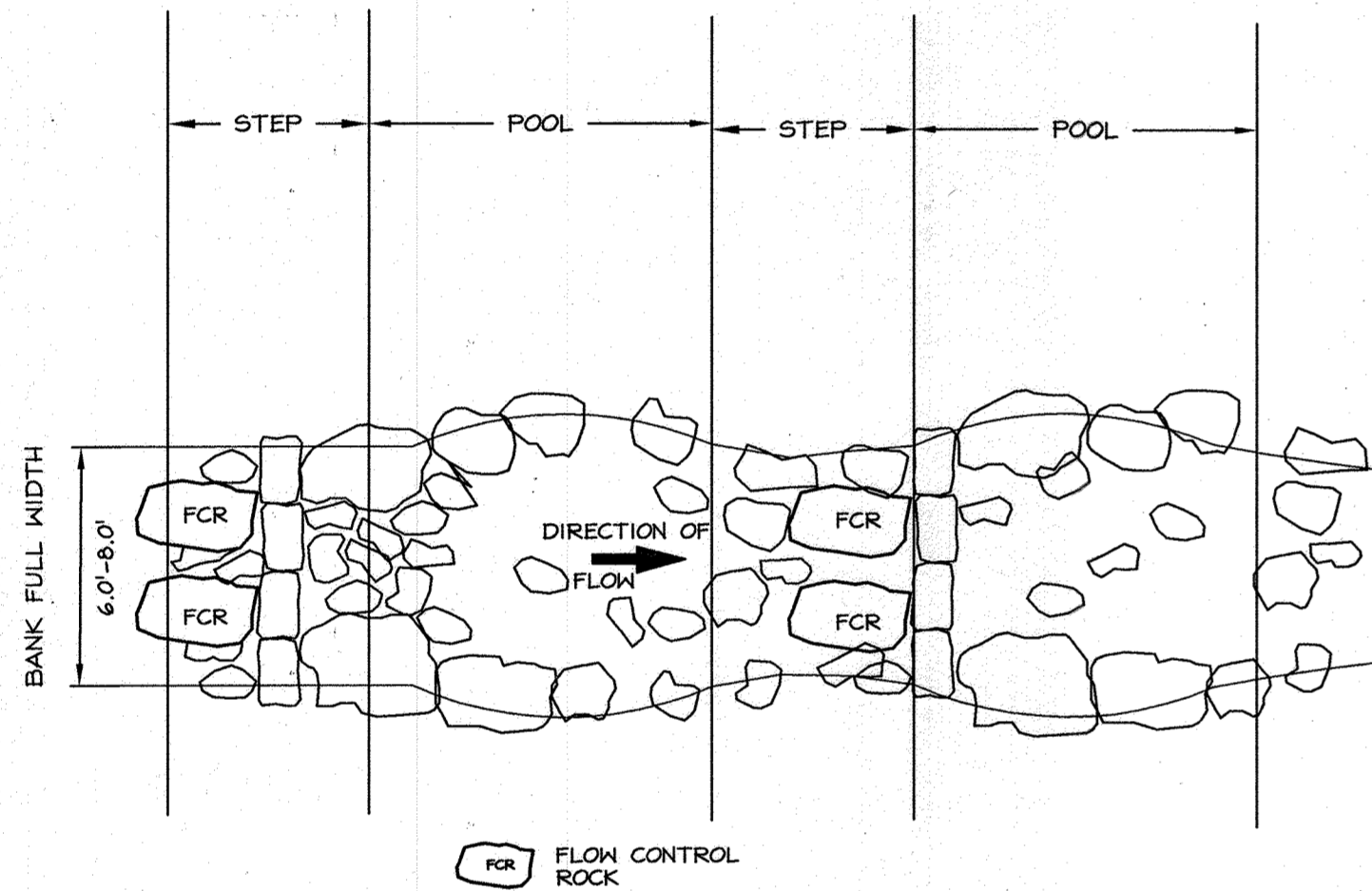




TYPICAL STEP GRADING AND STONE PLACEMENT  
CROSS SECTION (N.T.S.)



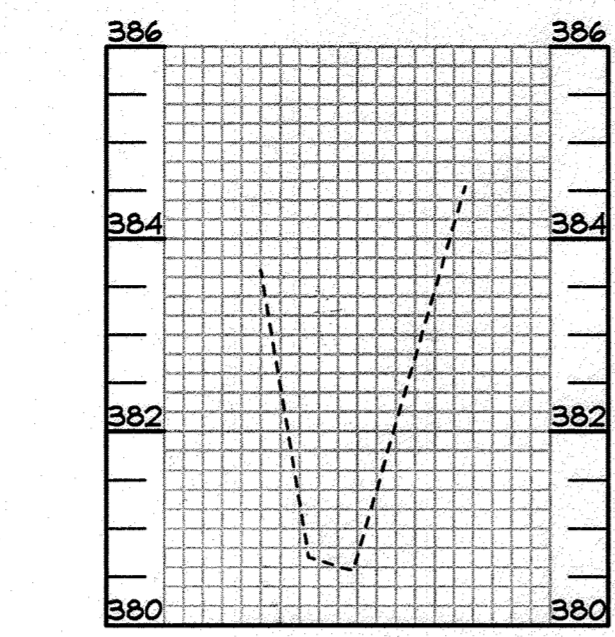
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PROFILE VIEW (N.T.S.)



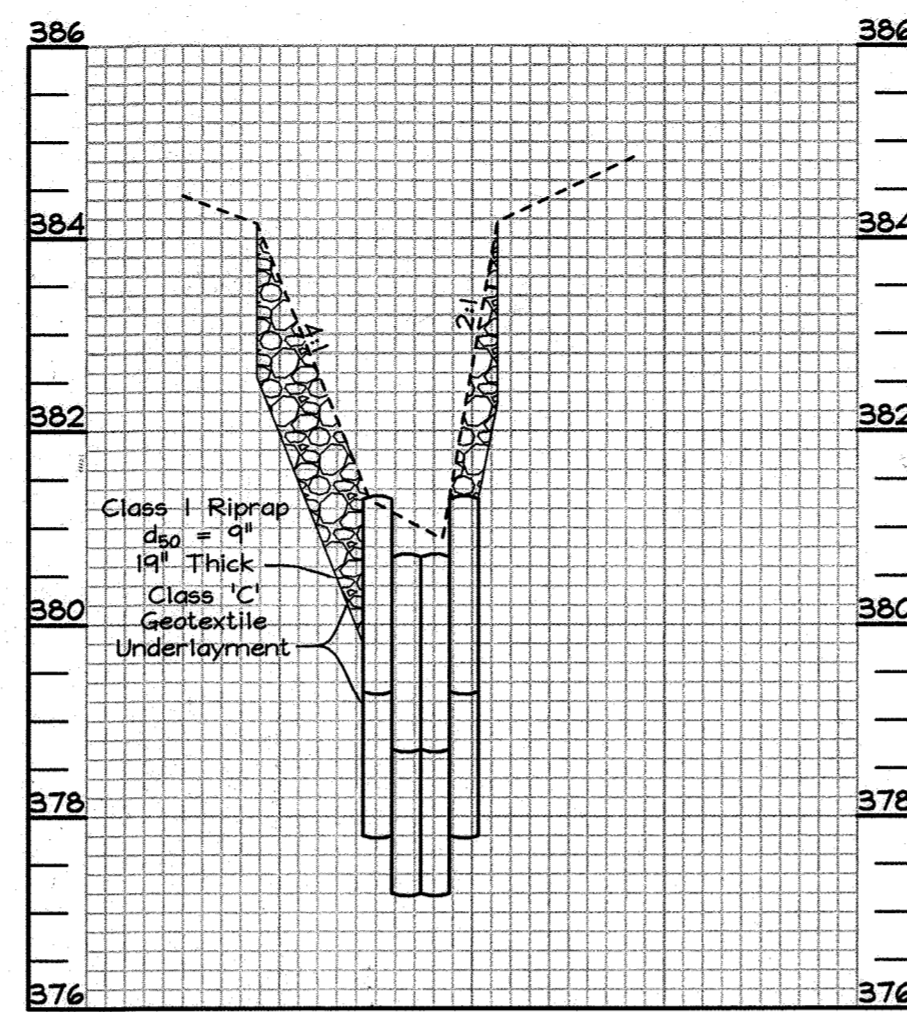
TYP. STEP-POOL GRADING AND STONE  
PLACEMENT (N.T.S.)

STEP POOL CONSTRUCTION AND STONE PLACEMENT

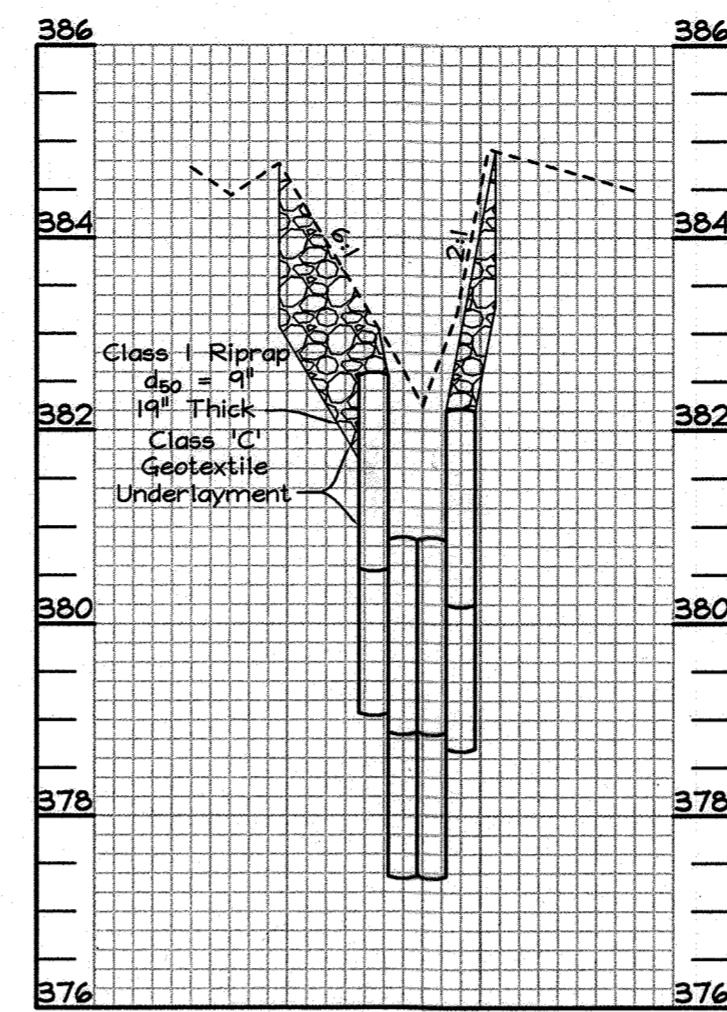
STEP-POOL STRUCTURE TO BE CONSTRUCTED WITH CLASS I & II RIPRAP SIZE STONE, GREY IN COLOR, FROM A FREDERICK COUNTY SOURCE. CONTRACTOR TO INSURE THAT BOULDERS/STONES ARE PROPERLY KEYED-IN WITH EACH UPSTREAM STONE PARTIALLY PLACED OVER TOP OF THE ADJACENT DOWNSTREAM STONE. VOIDS IN STONE TO BE FILLED WITH FLAGSTONE TAILINGS OR "SPALLS", AS APPROVED BY THE ERI STREAM RESTORATION SPECIALIST.



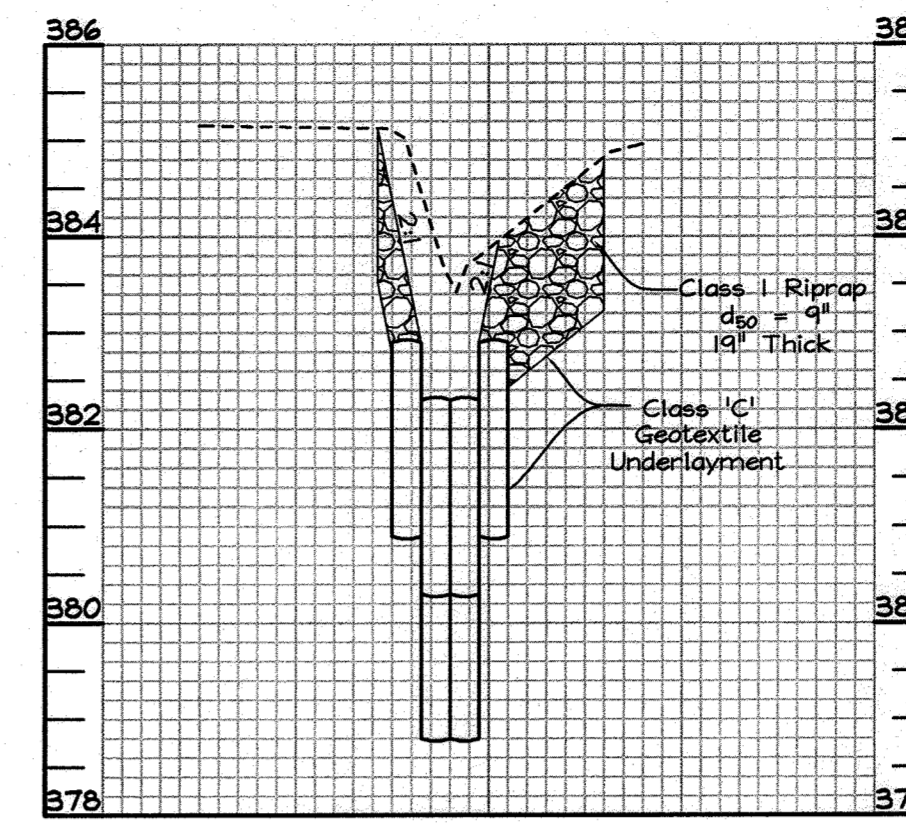
CROSS-SECTION #1  
SCALE: Horizontal 1"=20', Vertical 1"=2'



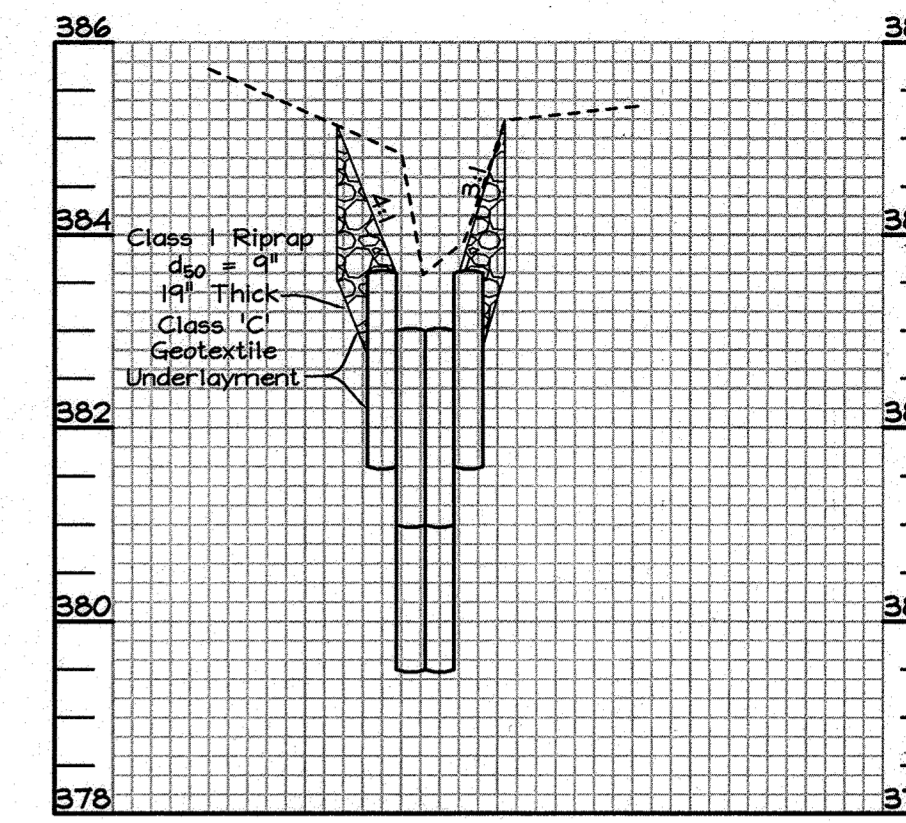
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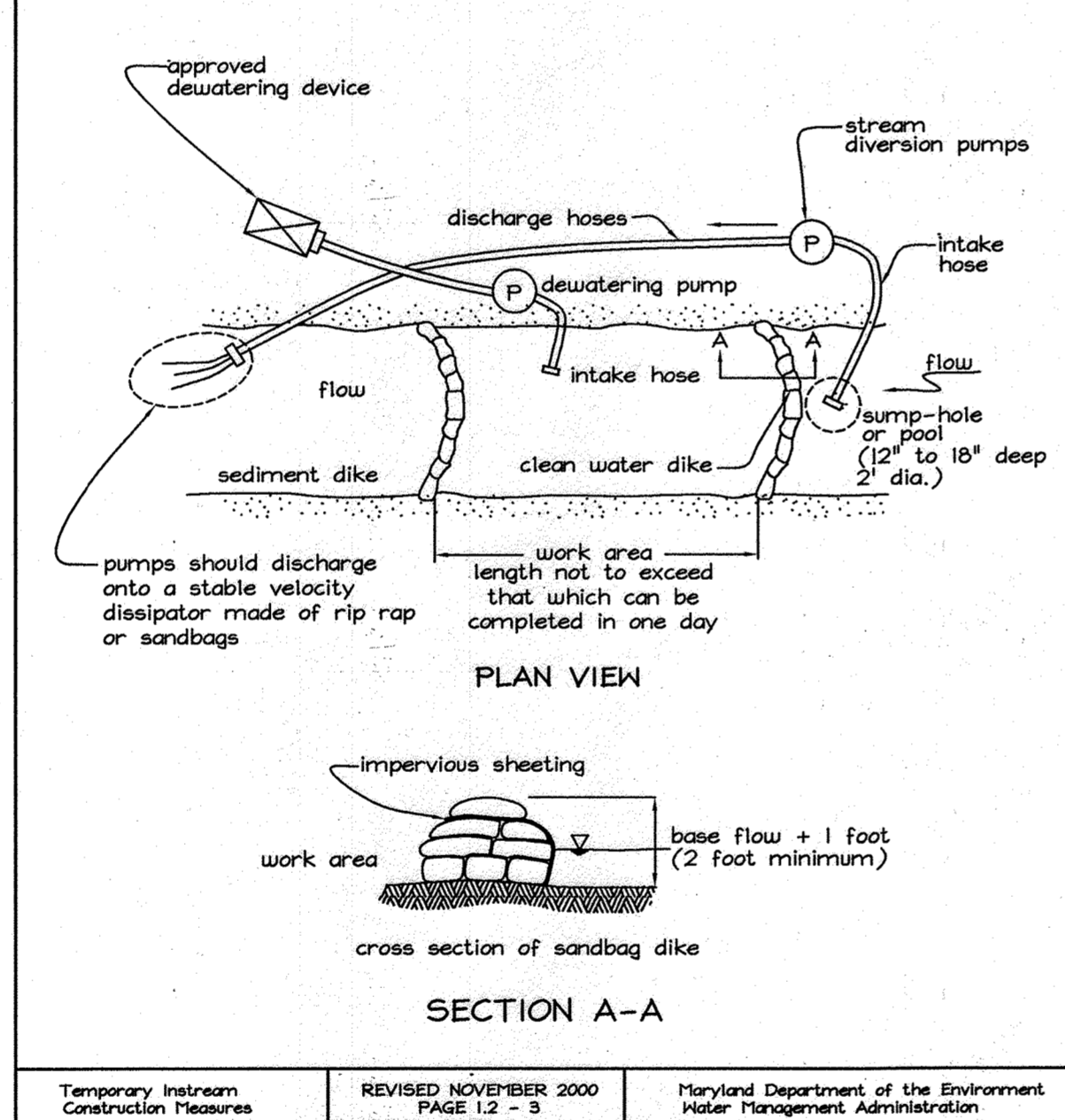


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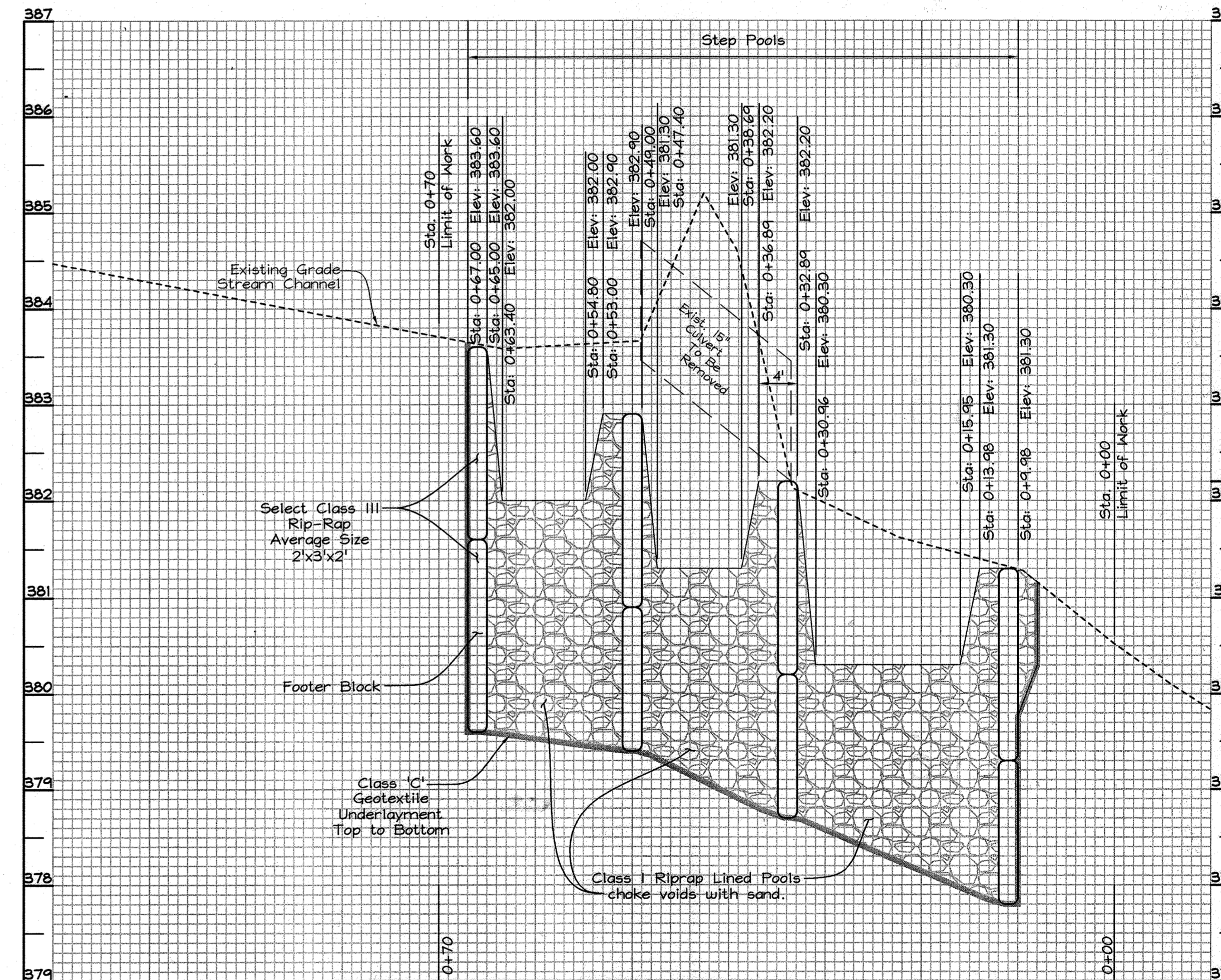
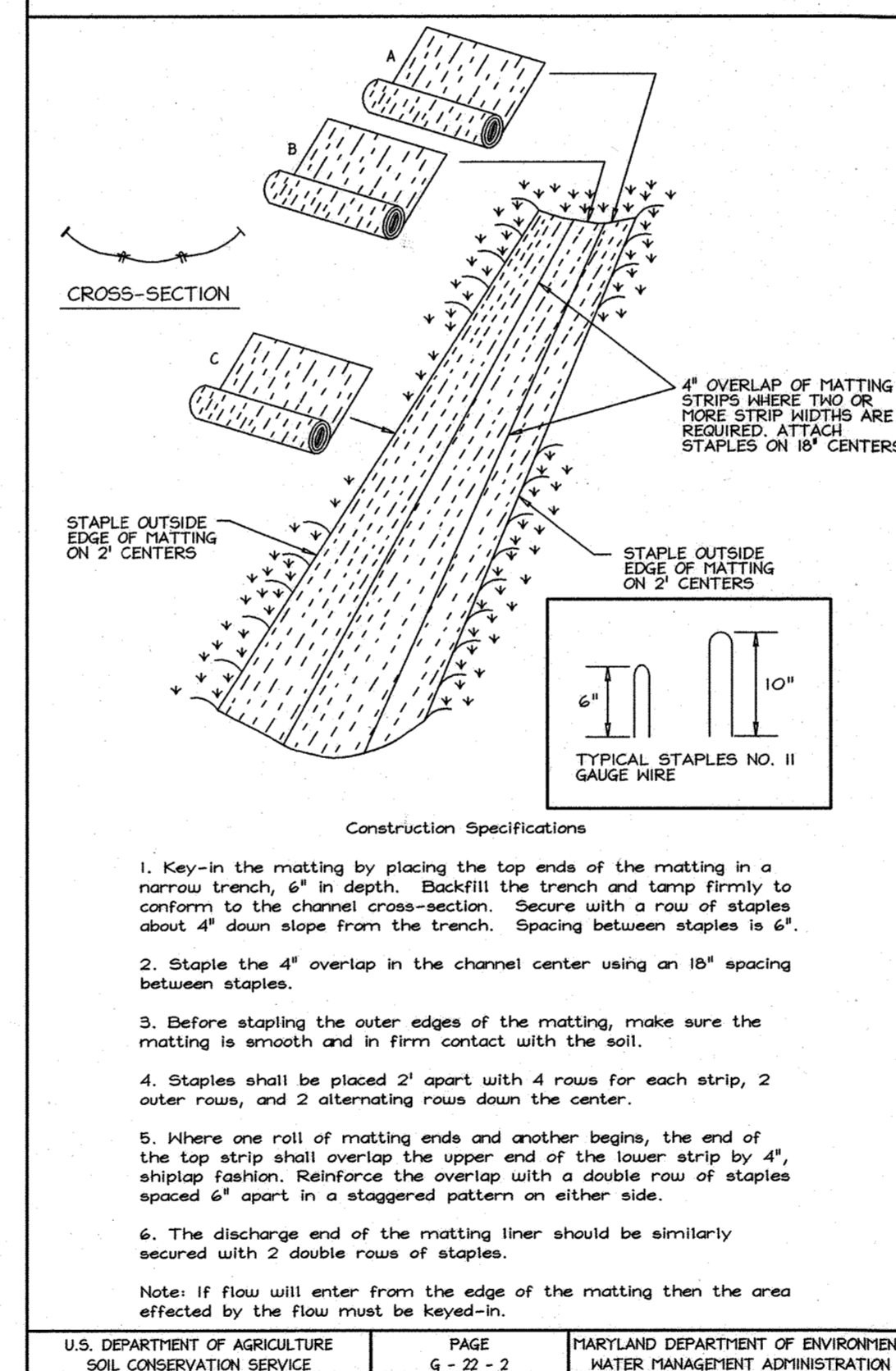


CROSS-SECTION #5  
SCALE: Horizontal 1"=20', Vertical 1"=2'

DETAIL I.2: PUMP-AROUND PRACTICE



DETAIL 30 - EROSION CONTROL MATTING



STREAM CHANNEL PROFILE THROUGH STEP-POOLS  
SCALE: Horizontal 1"=10', Vertical 1"=1'

ENGINEERS CERTIFICATE  
I 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.

Zacharia T. Fisch 9/15/09  
SIGNATURE OF ENGINEER DATE  
ZACHARIA T. FISCH

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
W. A. 10-23-09  
Chief, Bureau of Highways Date

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
W. A. 10/21/09  
Director Date  
W. A. 10/21/09  
Chief, Division of Land Development Date  
W. A. 10/21/09  
Chief, Development Engineering Division Date

DEVELOPER'S CERTIFICATE  
I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN 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 THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.

Signature of Developer 9-22-09 DATE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT  
Signature of District 10/14/09 DATE

EXPLORATION RESEARCH, INC.  
ENVIRONMENTAL CONSULTANTS  
LANDSCAPE ARCHITECTS  
6339 HOWARD LANE  
ELLENROSE, MARYLAND 21035  
TEL: (410) 567-5210 FAX: (410) 796-1562  
EMAIL: info@erinc.com

DES. SH	DRWN. CED.	CHK. SH
DATE	REVISION	BY
10/10	Rev. Title Block Per F 10-000	W. A.

OWNER PAR C-216 thru C-218:  
BA WATERLOO TOWNHOMES, LLC.  
C/O BOZZUTO HOMES, INC.  
7850 WALKER DRIVE, SUITE 400  
GREENBELT, MARYLAND 20770  
ATTN: DUNCAN SLIDELL  
301-623-1525

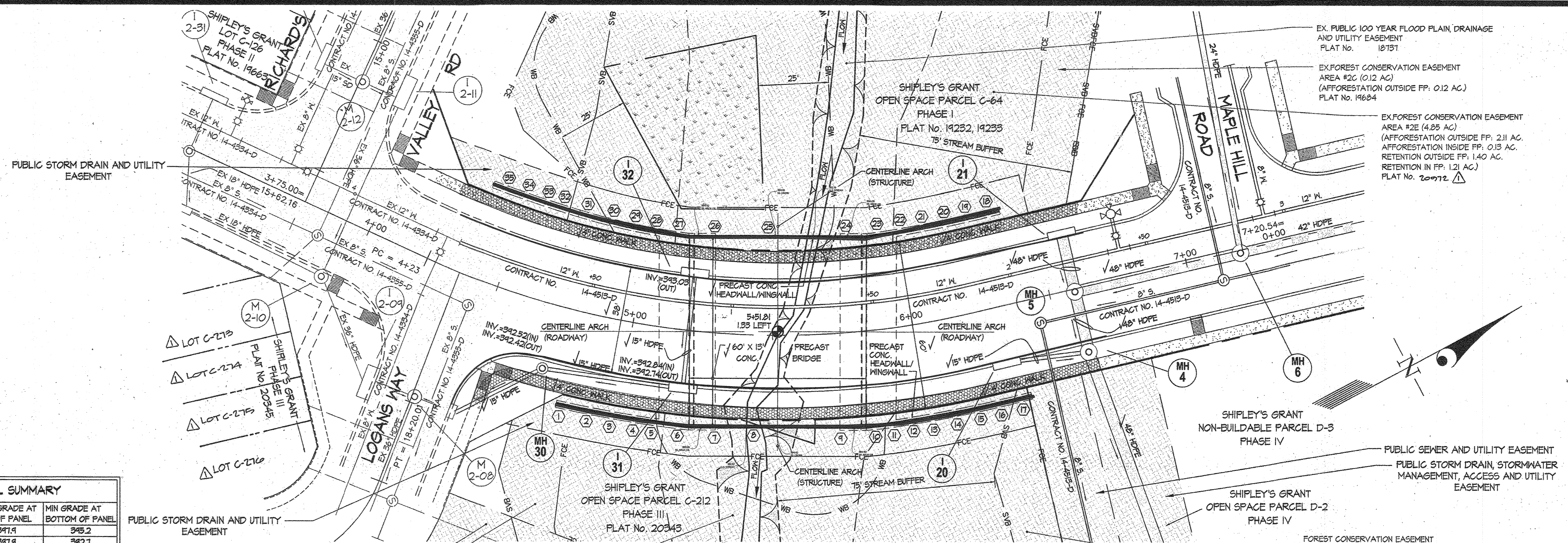
PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 22418  
EXPIRATION DATE: JULY 29, 2011

Stream Stabilization Profiles, Cross-Sections, and Details  
SHIPLEY'S GRANT  
PHASE IV  
LOTS C-219 thru C-222, C-295 thru C-307, PARCELS D-2 and E-1, OPEN SPACE LOTS C-309, D-1, E-2 and E-3 and NON-BUILDABLE PARCELS "D-3", "D-4", and LOT C-308  
A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 thru C-218, "D" and "E"  
ELECTION DISTRICT No. 1

SCALE	ZONING	G. L. W. FILE NO.
As Shown	R-A-15, POR	07002
DATE	TAX MAP - GRID	SHEET
AUG. 5, 2009	37-1&2	18 OF 31

NO ASBUILT INFORMATION  
12/1/20





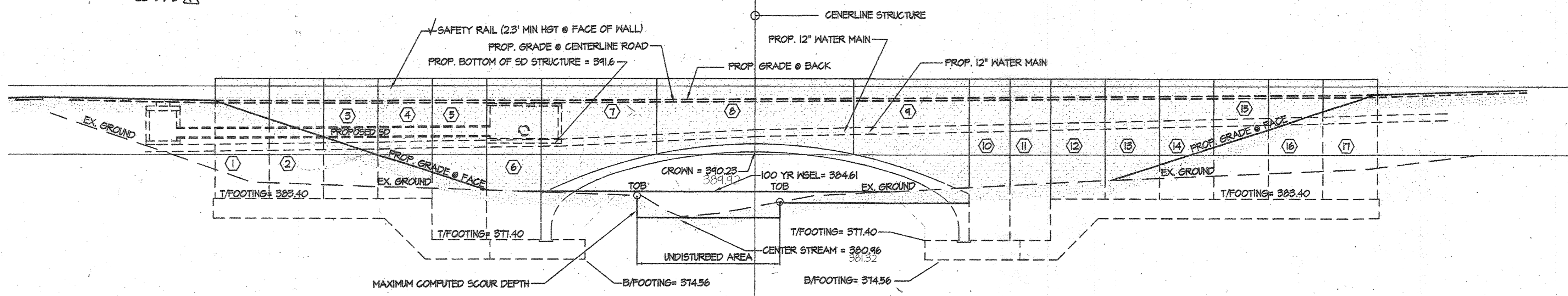
**PARTIAL PLAN - CHARLES CROSSING**  
SCALE: 1" = 20'

**DOWNSTREAM HEADWALL/MINGWALL SUMMARY**

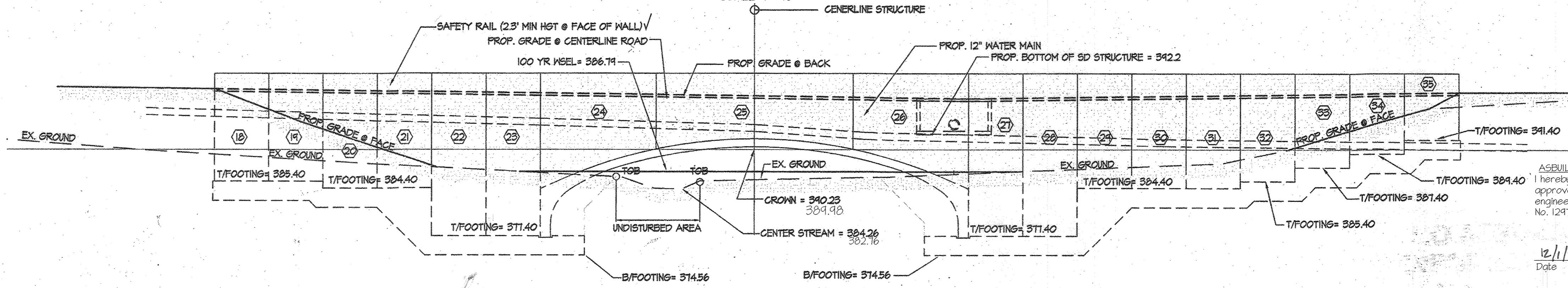
PANEL NO.	TOP OF PANEL	BOTTOM OF PANEL	MAX GRADE AT TOP OF PANEL	MIN GRADE AT BOTTOM OF PANEL
1	401.10	382.56	341.9	342.5
2	401.10	382.56	341.9	342.7
3	401.10	381.56	341.9	340.0
4	401.10	381.56	341.9	381.4
5	401.10	371.56	341.9	384.9
6	401.10	371.56	341.9	384.5
7	401.10	ARCH	340.0	384.5
8	401.10	ARCH	340.2	340.1
9	401.10	ARCH	340.3	340.1
10	401.10	371.56	340.4	385.2
11	401.10	371.56	340.4	385.6
12	401.10	382.56	340.5	385.9
13	401.10	382.56	340.6	386.3
14	401.10	383.56	340.6	386.6
15	401.10	383.56	340.7	341.2
16	401.10	383.56	340.7	343.1
17	401.10	383.56	340.8	346.4

**DOWNSTREAM HEADWALL/MINGWALL SUMMARY**

PANEL NO.	TOP OF PANEL	BOTTOM OF PANEL	MAX GRADE AT TOP OF PANEL	MIN GRADE AT BOTTOM OF PANEL
18	401.10	385.56	340.9	345.9
19	401.10	385.56	340.8	349.0
20	401.10	384.56	340.6	340.3
21	401.10	384.56	340.5	381.1
22	401.10	371.56	340.4	381.1
23	401.10	371.56	340.3	386.4
24	401.10	ARCH	340.2	340.1
25	401.10	ARCH	340.0	340.1
26	401.10	ARCH	341.6	386.3
27	401.10	371.56	341.5	386.5
28	401.10	371.56	341.6	386.8
29	401.10	384.56	341.7	381.1
30	401.10	384.56	341.8	381.5
31	401.10	384.56	341.9	381.6
32	401.10	385.56	340.1	386.5
33	401.10	387.56	340.1	340.3
34	401.10	389.56	340.1	342.1
35	401.10	391.56	340.3	349.0



**DOWNSTREAM HEADWALL/MINGWALL ELEVATION**  
SCALE: 1" = 10'



**UPSTREAM HEADWALL/MINGWALL ELEVATION**  
SCALE: 1" = 10'

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Willa Z. Mott* 10-23-09  
 Chief, Bureau of Highways Date

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
*Ken Sheehy* 10-27-09  
 Chief, Division of Land Development Date

*Chris D. ...* 10/21/09  
 Chief, Development Engineering Division Date

**GLWGUTSCHICK LITTLE & WEBER, P.A.**  
 CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS  
 3609 NATIONAL DRIVE - SUITE 250 - BURTONSVILLE OFFICE PARK  
 BURTONSVILLE, MARYLAND 20866  
 TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

DATE	REVISION	BY	APPR.

OWNER PAR C-216 thru C-218:  
 BA WATERLOO TOWNHOMES, LLC.  
 c/o BOZZUTO HOMES, INC.  
 7850 WALKER DRIVE, SUITE 400  
 GREENBELT, MARYLAND 20770  
 ATTN: DUNCAN SLEDELL  
 301-623-1525

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. 14931  
 EXPIRATION DATE: MAY 21, 2010



**ASBUILTS**  
**STREAM CROSSING DETAILS**  
**SHIPLEY'S GRANT**  
 PHASE IV  
 LOTS C-219 thru C-222, C-225 thru C-207, PARCELS D-2 and E-1,  
 OPEN SPACE LOTS C-207, D-1, E-2 & E-3 and NON-BUILDABLE PARCELS "D-3", "D-4",  
 and NON-BUILDABLE LOT C-203  
 A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 thru C-218, "D" and "E"  
 ELECTION DISTRICT No. 1 HOWARD COUNTY, MARYLAND

ASBUILT SHEET 6 OF 6

SCALE	ZONING	G. L. W. FILE NO.
AS SHOWN	R-A-15, POR	07002
DATE	TAX MAP - GRID	SHEET
NOV. 2009 SEPT. 1, 2009	37-1&2	19 OF 31



**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: HS20-44  
 HEADWALLS: EARTH PRESSURE ONLY  
 WINGWALLS: EARTH PRESSURE ONLY  
 DESIGN FILL HEIGHT: 2'-0" MIN. TO 7'-0" MAX.  
 FROM TOP OF CROWN TO TOP OF PAVEMENT.  
 DESIGN METHOD: LOAD FACTOR PER AASHTO SPECIFICATION  
 NET ALLOWABLE SOIL BEARING PRESSURE: 4000 PSF \*  
 (FOR ALL B/ C.I.P. CONCRETE FOOTINGS WITH ELEV. EQUAL TO 374.56)  
 NET ALLOWABLE SOIL BEARING PRESSURE: 2500 PSF \*  
 (FOR ALL B/ C.I.P. CONCRETE FOOTINGS WITH ELEV. GREATER THAN 374.56)

\*FOUNDATION EXCAVATION AND SUBGRADE PREPARATION SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT FOR THIS PROJECT PREPARED BY SPECIALIZED ENGINEERING DATED 1/9/2009 AND THE ADDENDUM REPORT DATED 7/30/2009.

**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.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

*Walter Z. Mahaffey* 10-23-09  
 CHIEF, BUREAU OF HIGHWAYS DATE

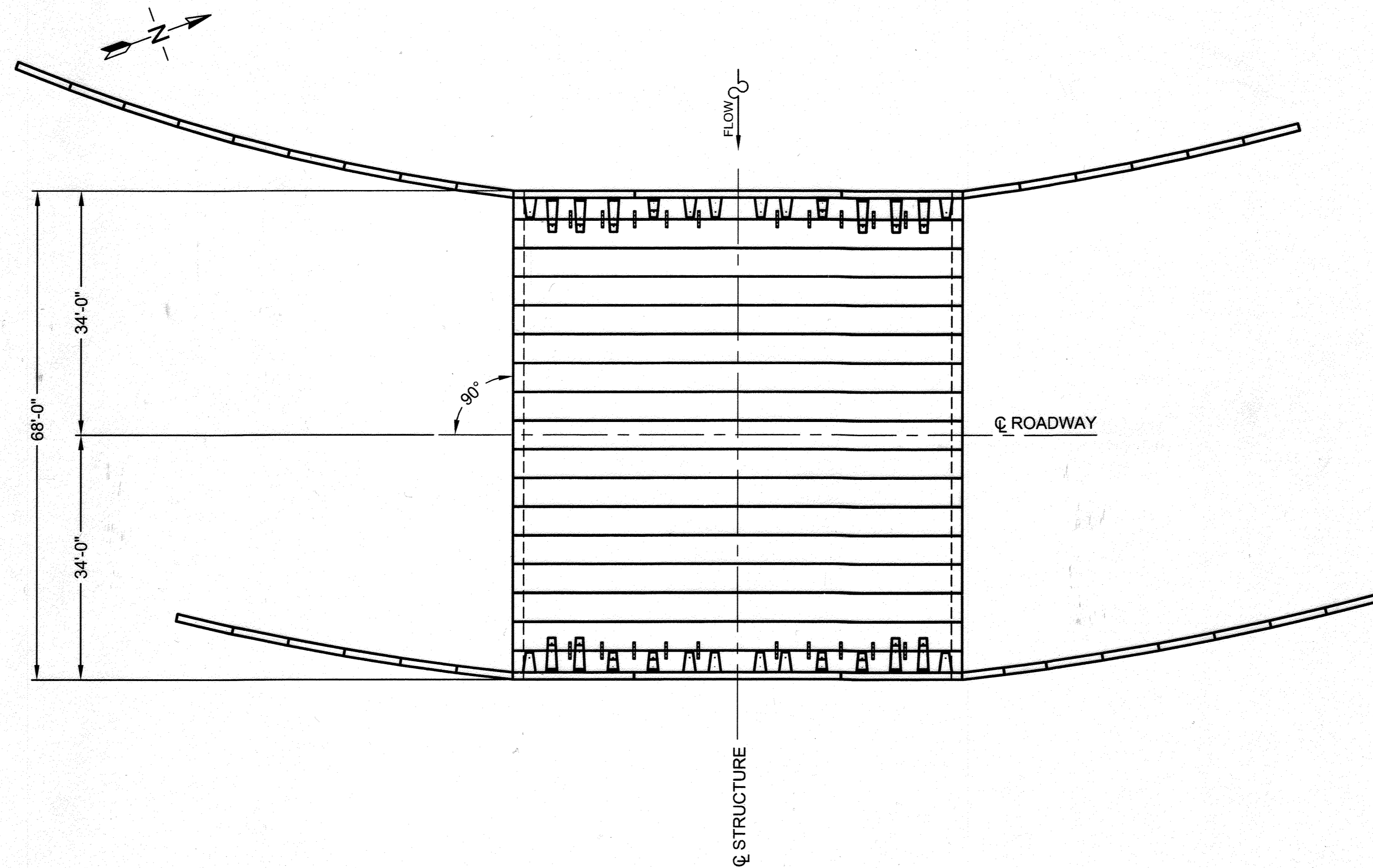
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Kevin D. ...* 10-27-09  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Debra ...* 10/27/09  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

# SHIPLEY'S GRANT

## ELLICOTT CITY, MARYLAND



**LOCATION PLAN**

NOT TO SCALE

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: 9/19/2010.

NO ASBUILT INFORMATION  
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CONTECH  
 CONTRACT  
 DRAWING

ELECTION DISTRICT NO. 1

**SHIPLEY'S GRANT**

PHASE IV

△ LOTS C-219 THRU C-222, C-295 THRU C-307, PARCELS D-2 AND E-1, OPEN SPACE LOTS C-302, D-1, E-2 AND E-3 AND NON-BUILDABLE PARCELS "D-3", "D-4", AND NON-BUILDABLE LOT C-208

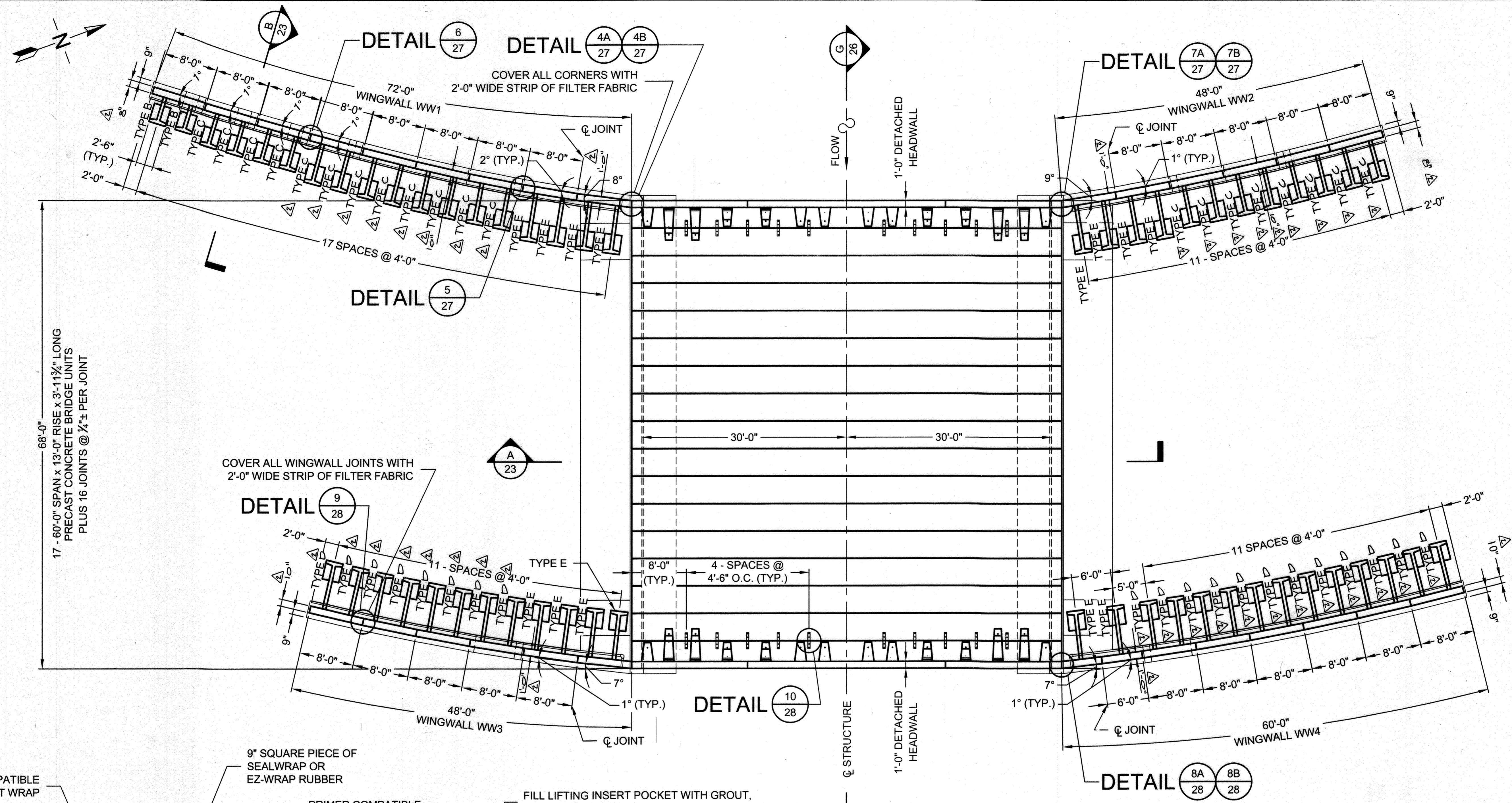
A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 THRU C-218, "D" AND "E"

HOWARD COUNTY, MARYLAND

PROJECT NUMBER: 52059	DATE: 8/7/2009
DESIGNED: JAL	DRAWN: RJB
CHECKED: BAP	APPROVED: PAC
SHEET NO.: 20	OF 31

F 009-088



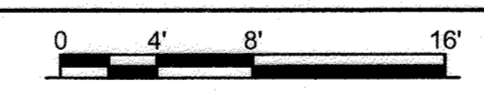


68'-0" LONG  
17 - 60'-0" SPAN x 13'-0" RISE x 3'-11 1/4" LONG  
PRECAST CONCRETE BRIDGE UNITS  
PLUS 16 JOINTS @ 1/4" PER JOINT

COVER ALL WINGWALL JOINTS WITH  
2'-0" WIDE STRIP OF FILTER FABRIC

COVER ALL CORNERS WITH  
2'-0" WIDE STRIP OF FILTER FABRIC

**BRIDGE PLAN**



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: 8/19/2010.

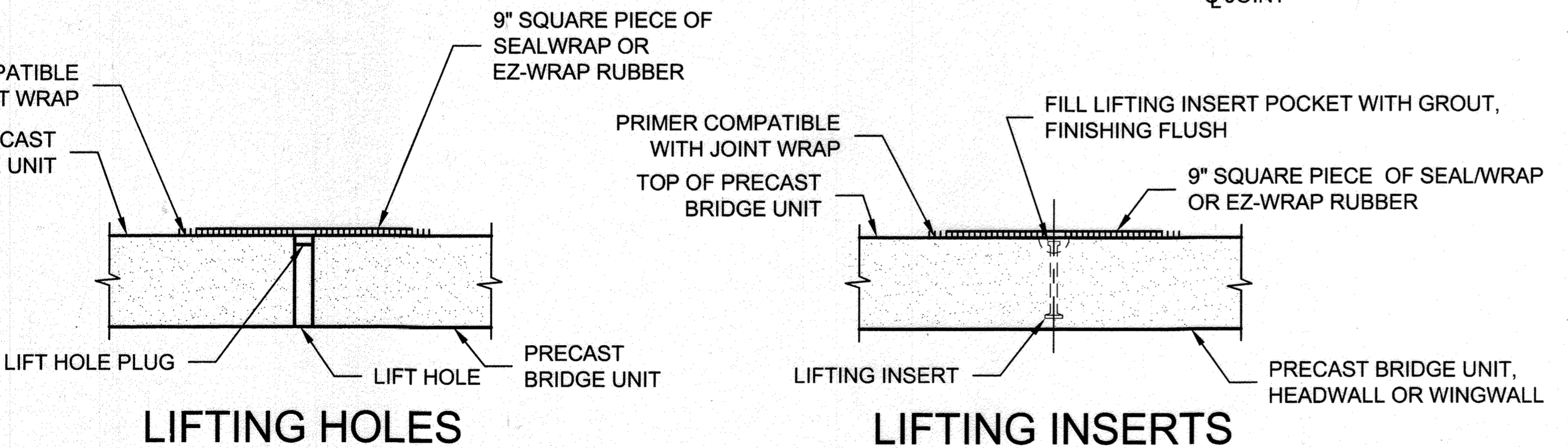
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*William Z. Marshall* 10-23-09  
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Kurt Schulz* 10-27-09  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*John P. ...* 10/27/09  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

9/21/09

**NO AS BUILT INFORMATION**  
12/1/20



**LIFTING HOLES**

**LIFTING INSERTS**

**TYPICAL LIFT POINT SEALING DETAIL**

NOT TO SCALE

PRIMER COMPATIBLE WITH JOINT WRAP  
TOP OF PRECAST BRIDGE UNIT

PRIMER COMPATIBLE WITH JOINT WRAP  
TOP OF PRECAST BRIDGE UNIT

FILL LIFTING INSERT POCKET WITH GROUT, FINISHING FLUSH  
9" SQUARE PIECE OF SEALWRAP OR EZ-WRAP RUBBER

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2/10/11		Rev. To Wingwalls & Anchors	WZJ
7/17/10		Rev. Title Block Per F10-070	WZJ

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BRIDGE SYSTEMS  
CONTECH CONTRACT DRAWING

ELECTION DISTRICT NO. 1

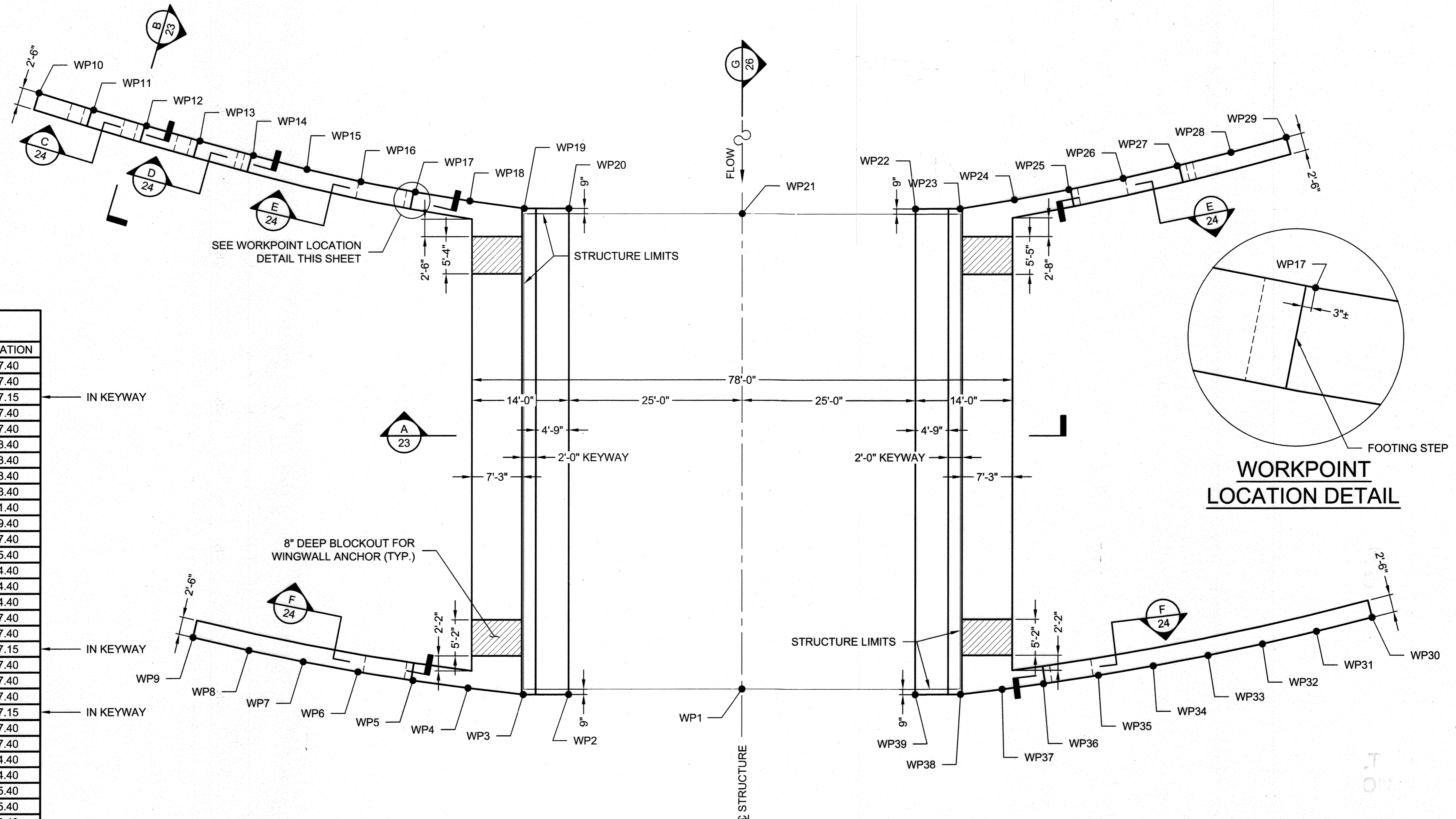
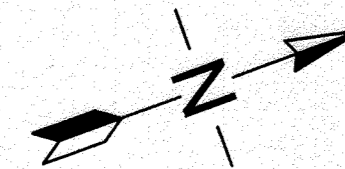
**SHIPLEY'S GRANT**  
PHASE IV  
 LOTS C-219 THRU C-222, C-295 THRU C-307, PARCELS D-2 AND E-1,  
 OPEN SPACE LOTS C-309, D-1, E-2 AND E-3 AND NON-BUILDABLE PARCELS "D-3", "D-4",  
 AND NON-BUILDABLE LOT C-308  
 A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 THRU C-218, "D" AND "E"  
 HOWARD COUNTY, MARYLAND

PROJECT NUMBER: 52059	DATE: 8/7/2009
DESIGNED: JAL	DRAWN: RJB
CHECKED: BAP	APPROVED: PAC
SHEET NO.: 21 OF 31	

F 09-088

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WORKPOINT TABLE			
WORKPOINT	DISTANCE (X)	DISTANCE (Y)	ELEVATION
WP1	0.00	0.00	377.40
WP2	-25.00	-0.75	377.40
WP3	-31.54	-0.75	377.15
WP4	-39.54	0.17	377.40
WP5	-47.48	1.26	377.40
WP6	-55.40	2.53	383.40
WP7	-63.28	3.95	383.40
WP8	-71.14	5.60	383.40
WP9	-79.19	7.46	383.40
WP10	-101.48	85.35	391.40
WP11	-93.60	82.92	389.40
WP12	-85.93	80.65	387.40
WP13	-78.25	78.48	385.40
WP14	-70.53	76.39	384.40
WP15	-62.80	74.41	384.40
WP16	-55.02	72.65	384.40
WP17	-47.19	71.11	377.40
WP18	-39.32	69.81	377.40
WP19	-31.45	68.75	377.15
WP20	-25.00	68.75	377.40
WP21	0.00	68.00	377.40
WP22	25.00	68.75	377.40
WP23	31.44	68.75	377.15
WP24	39.27	70.02	377.40
WP25	47.12	71.47	377.40
WP26	54.94	73.08	384.40
WP27	62.72	74.86	384.40
WP28	70.46	76.81	385.40
WP29	78.42	78.97	385.40
WP30	90.88	10.19	383.40
WP31	82.87	8.19	383.40
WP32	75.06	6.39	383.40
WP33	67.21	4.75	383.40
WP34	59.34	3.26	383.40
WP35	51.44	1.92	383.40
WP36	43.51	0.74	377.40
WP37	37.55	-0.05	377.40
WP38	31.54	-0.75	377.15
WP39	25.00	-0.75	377.40

IN KEYWAY

IN KEYWAY

IN KEYWAY

IN KEYWAY

\*ALL VALUES ARE GIVEN IN DECIMAL FEET, AND REPRESENT THE TOP OF FOOTING ELEVATION.

**FOUNDATION PLAN**

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. 86225, Expiration Date: 01/19/2010.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*William R. Adair* 10-23-09  
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Kent St. Louis* 10-27-09  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*John Deussen* 10/22/09  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

NO ASBUILT INFORMATION  
 12/1/20

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MARK	DATE	REVISION DESCRIPTION	BY
1	7/10/10	Rev. Title Block Per F10-000	WJD

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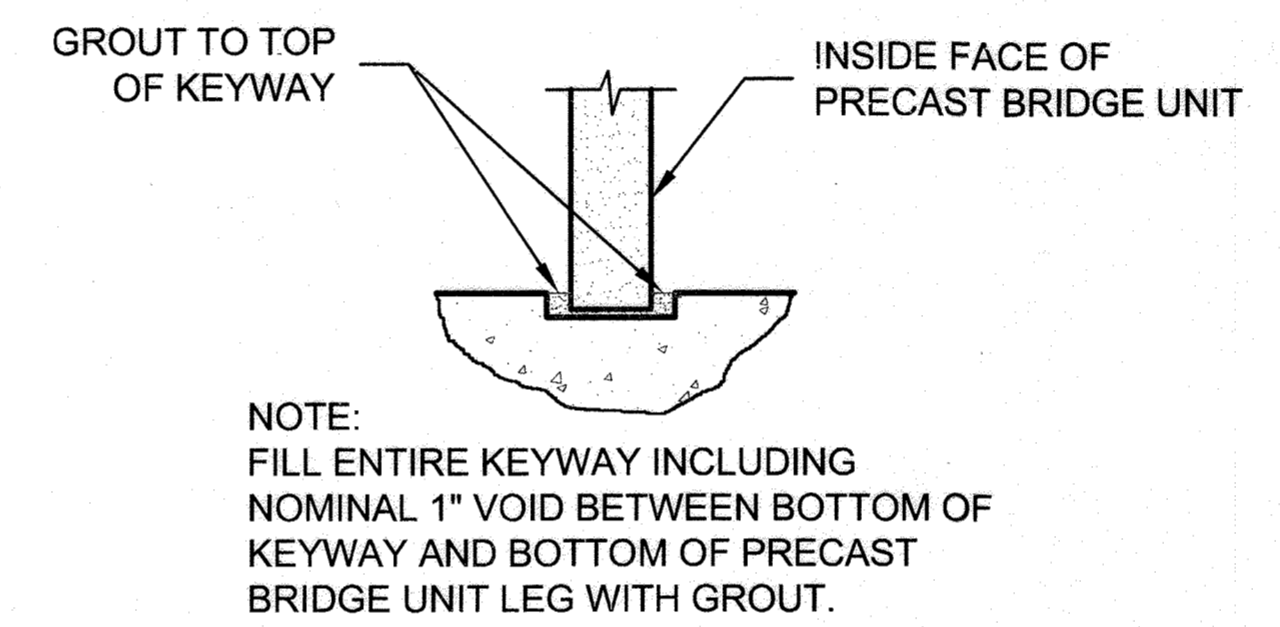
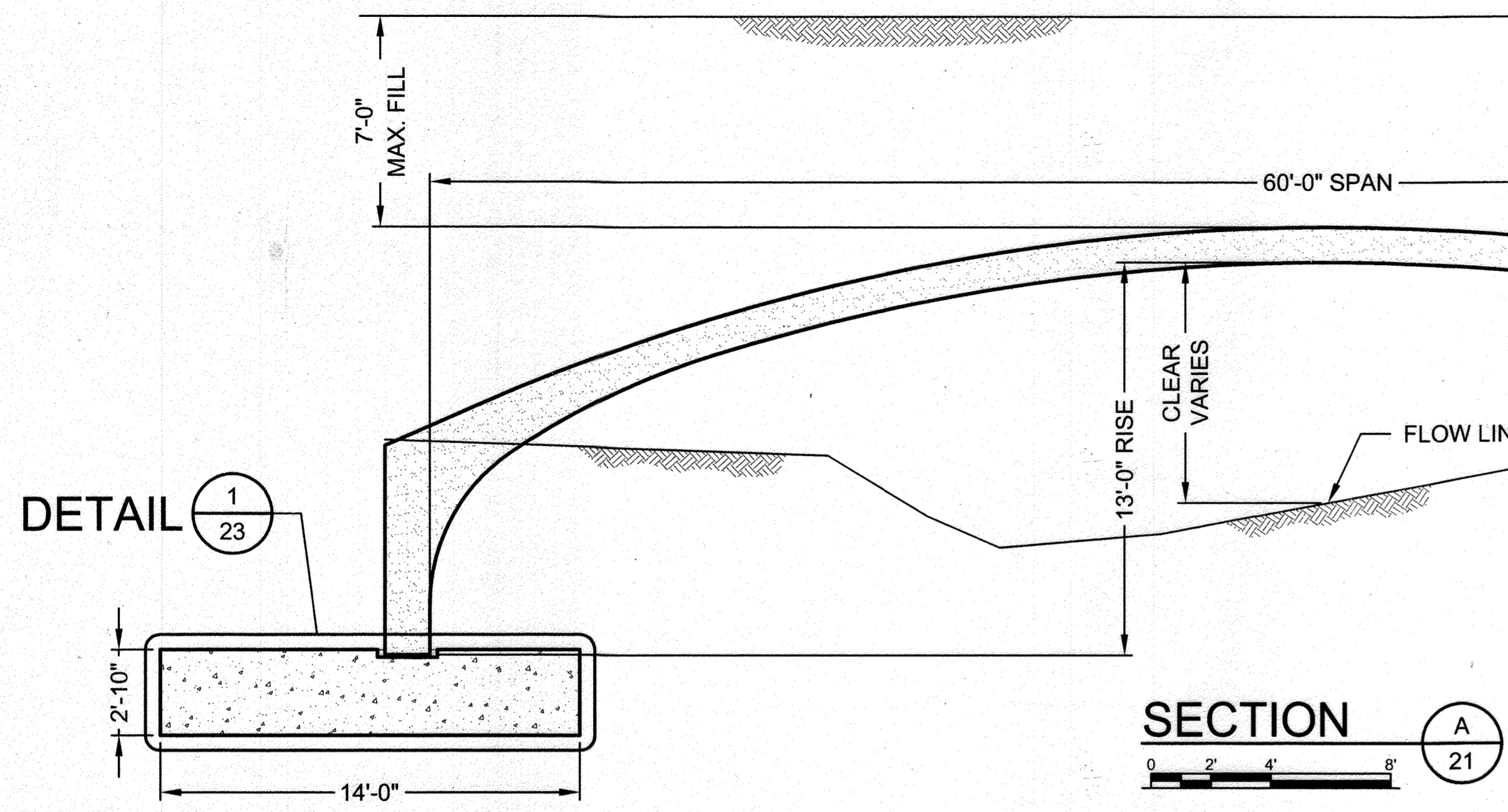
**CONISpan**  
 BRIDGE SYSTEMS  
 CONTECH CONTRACT DRAWING

**SHIPLEY'S GRANT**  
 PHASE IV  
 LOTS C-219 THRU C-222, C-295 THRU C-307, PARCELS D-2 AND E-1, OPEN SPACE LOTS C-309, D-1, E-2 AND E-3 AND NON-BUILDABLE PARCELS "D-3", "D-4", AND NON-BUILDABLE LOT C-308  
 A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 THRU C-218, "D" AND "E"  
 HOWARD COUNTY, MARYLAND

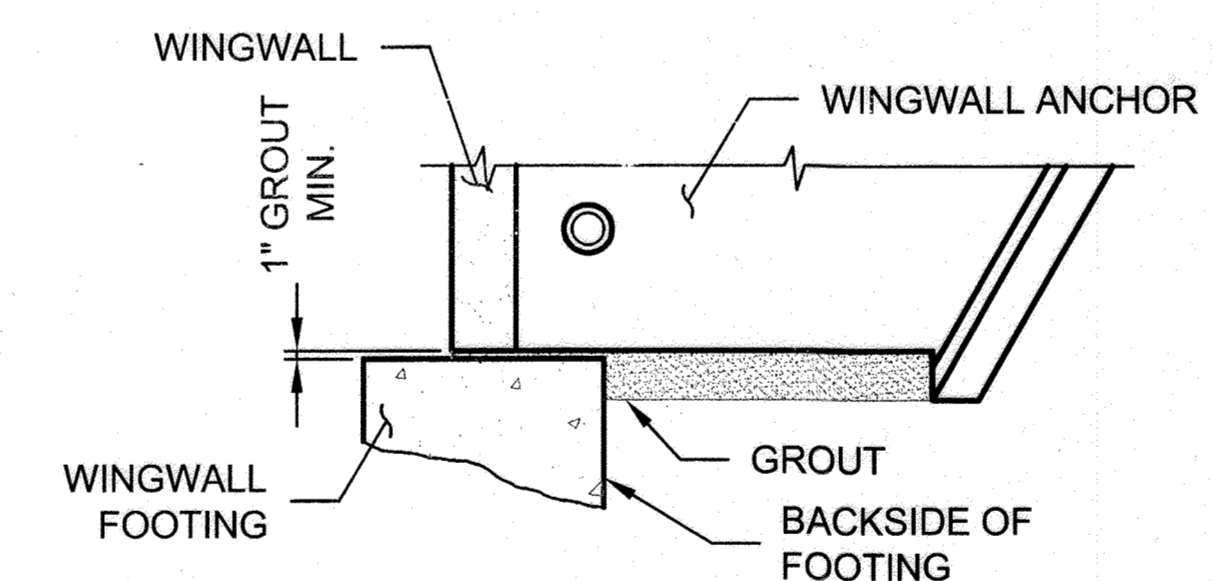
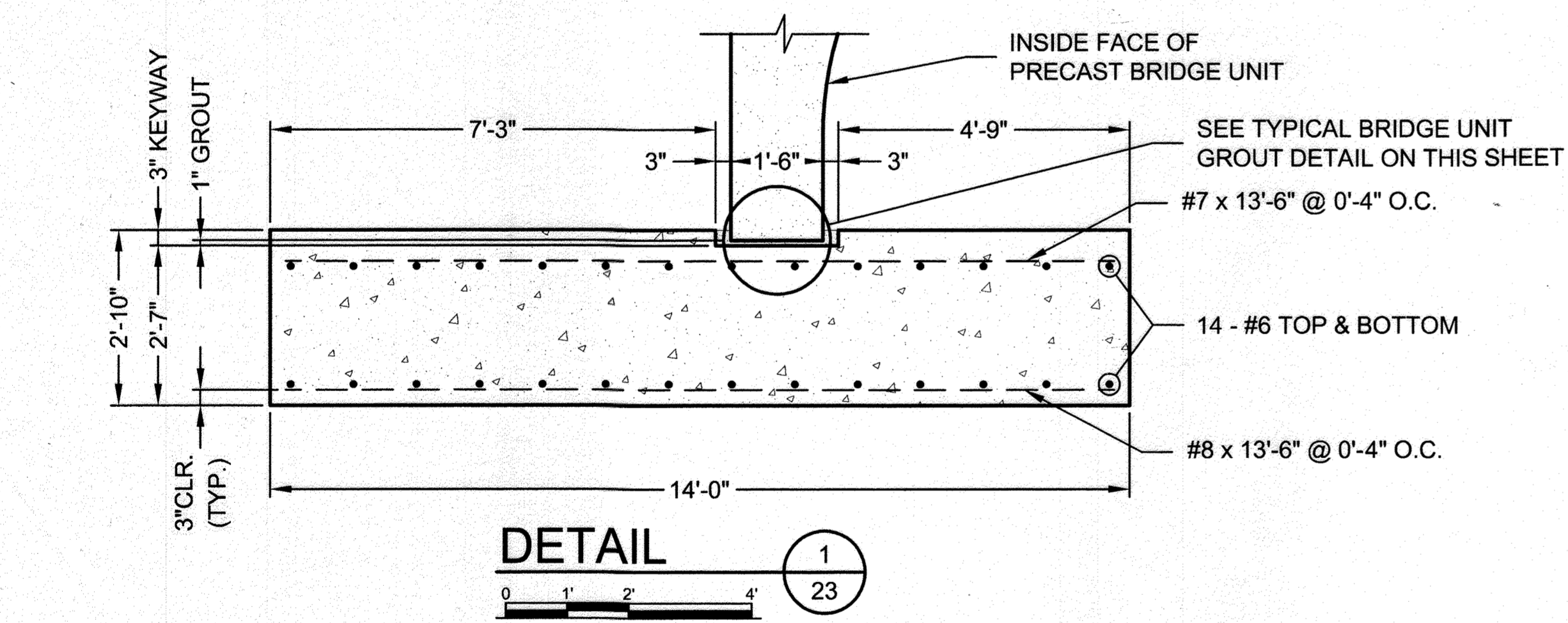
PROJECT NUMBER: 52059	DATE: 8/7/2009
DESIGNED: JAL	DRAWN: RJB
CHECKED: BAP	APPROVED: PAC
SHEET NO.: 22	OF 31

F 09-088

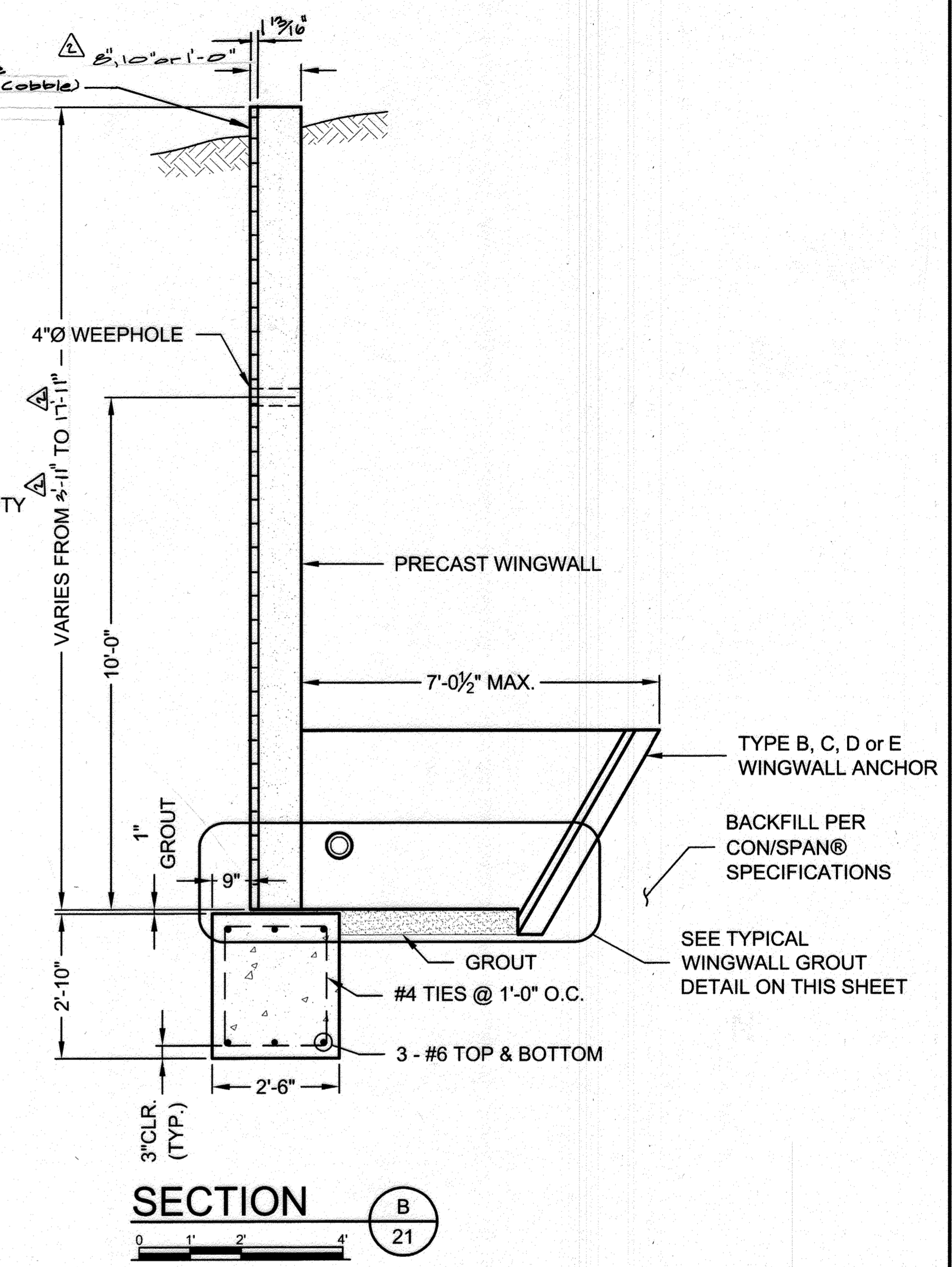




**TYPICAL BRIDGE UNIT GROUT DETAIL**  
NOT TO SCALE



**TYPICAL WINGWALL GROUT DETAIL**  
NOT TO SCALE



**SECTION B**  
NOT TO SCALE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Walter Z. ...* 10-23-09  
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Victor ...* 10-27-09  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*John ...* 10/27/09  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

MARK	DATE	REVISION DESCRIPTION	BY
3-13-14		Added stone Veneer	WJG
2/10/11		Rev. To Wingwalk & Anchors	WJG
7/10/10		Rev. Title Block Per F.10-000	WJG

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**CONSPAN**  
BRIDGE SYSTEMS  
CONTECH DRAWING

**SHIPLEY'S GRANT**  
PHASE IV  
 LOTS C-219 THRU C-222, C-215 THRU C-207, PARCELS D-2 AND E-1,  
 OPEN SPACE LOTS C-209, D-1, E-2 AND E-3 AND NON-BUILDABLE PARCELS "D-3", "D-4",  
 AND NON-BUILDABLE LOT C-208  
 A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 THRU C-218, "D" AND "E"  
 ELECTION DISTRICT NO. 1  
 HOWARD COUNTY, MARYLAND

PROJECT NUMBER: 52059	DATE: 8/7/2009
DESIGNED: JAL	DRAWN: RJB
CHECKED: BAP	APPROVED: PAC
SHEET NO.: 23 OF 31	

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: 8/19/2010

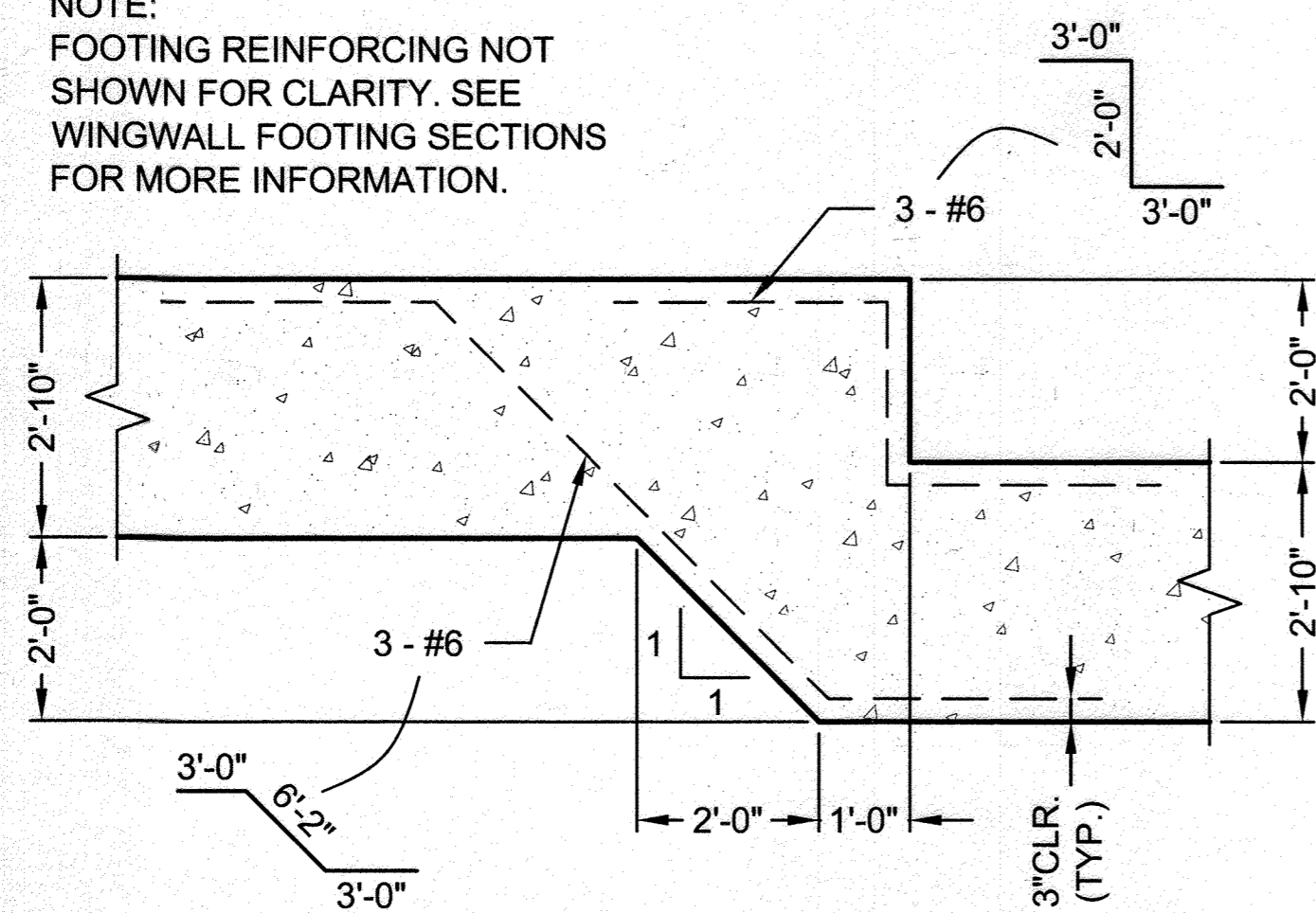
Professional Engineer Seal: STATE OF MARYLAND, PROFESSIONAL ENGINEER, License No. 36225, Expiration Date: 8/19/2010

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12/1/20  
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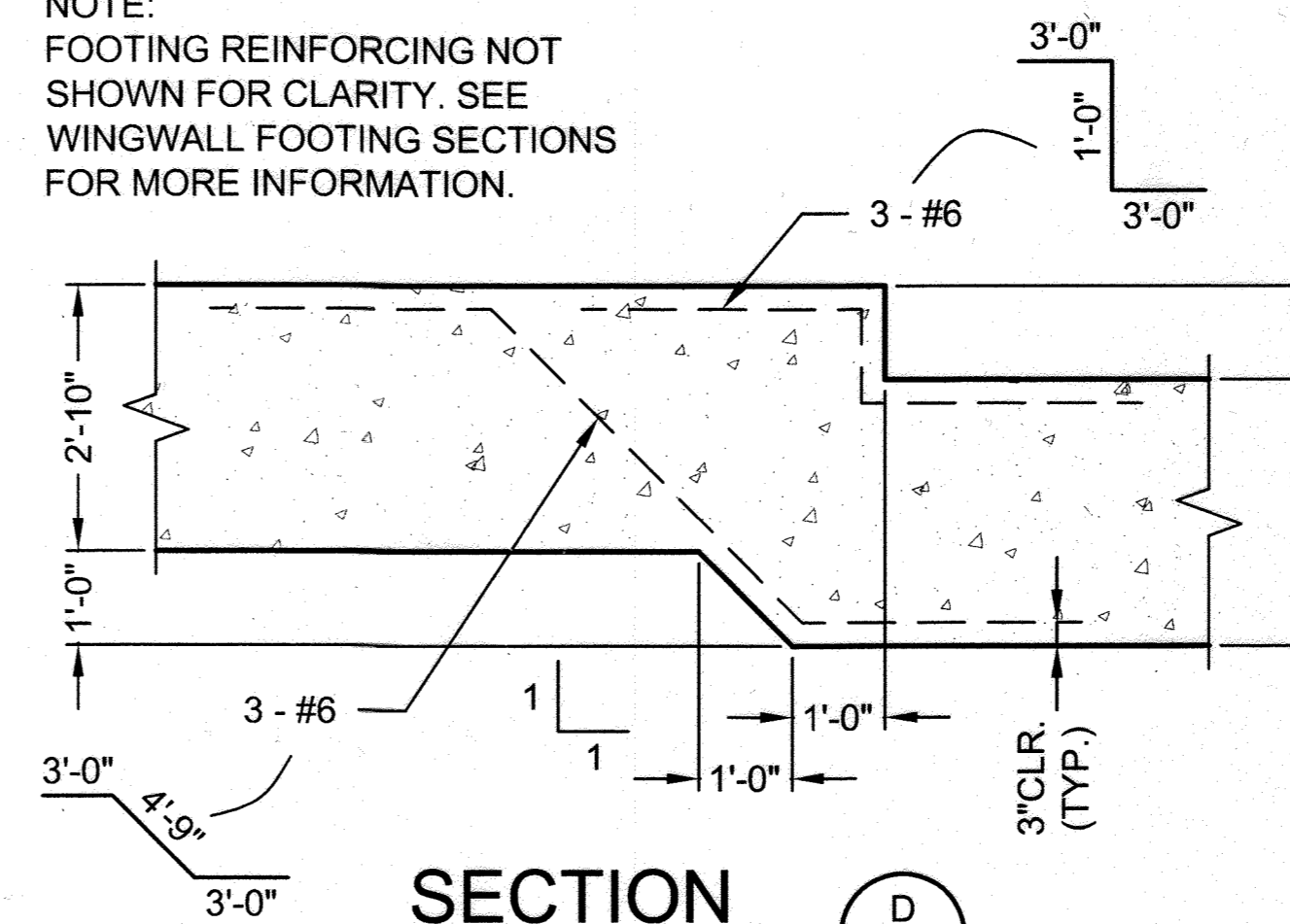


NOTE:  
FOOTING REINFORCING NOT  
SHOWN FOR CLARITY. SEE  
WINGWALL FOOTING SECTIONS  
FOR MORE INFORMATION.



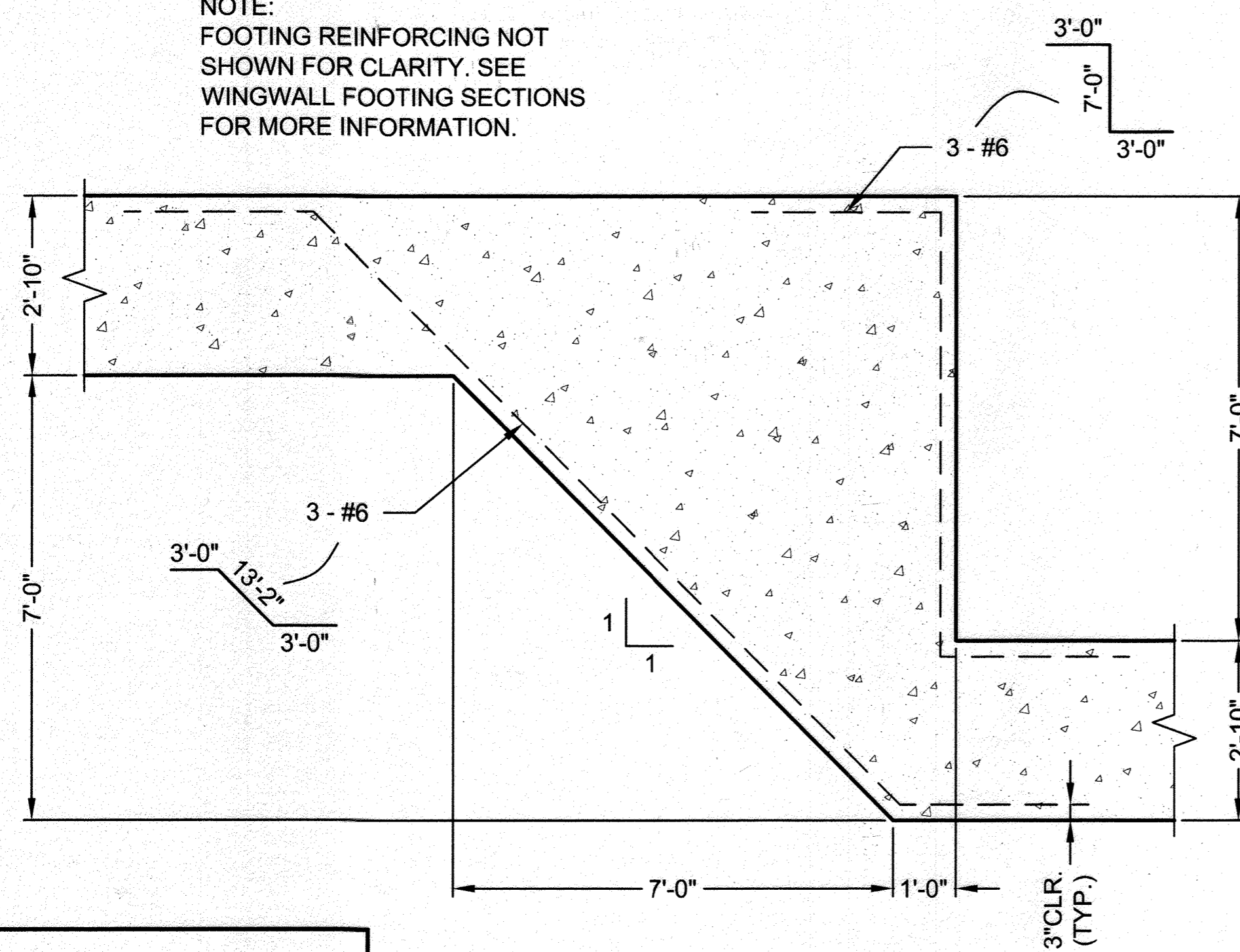
SECTION C  
0 1' 2' 4'

NOTE:  
FOOTING REINFORCING NOT  
SHOWN FOR CLARITY. SEE  
WINGWALL FOOTING SECTIONS  
FOR MORE INFORMATION.



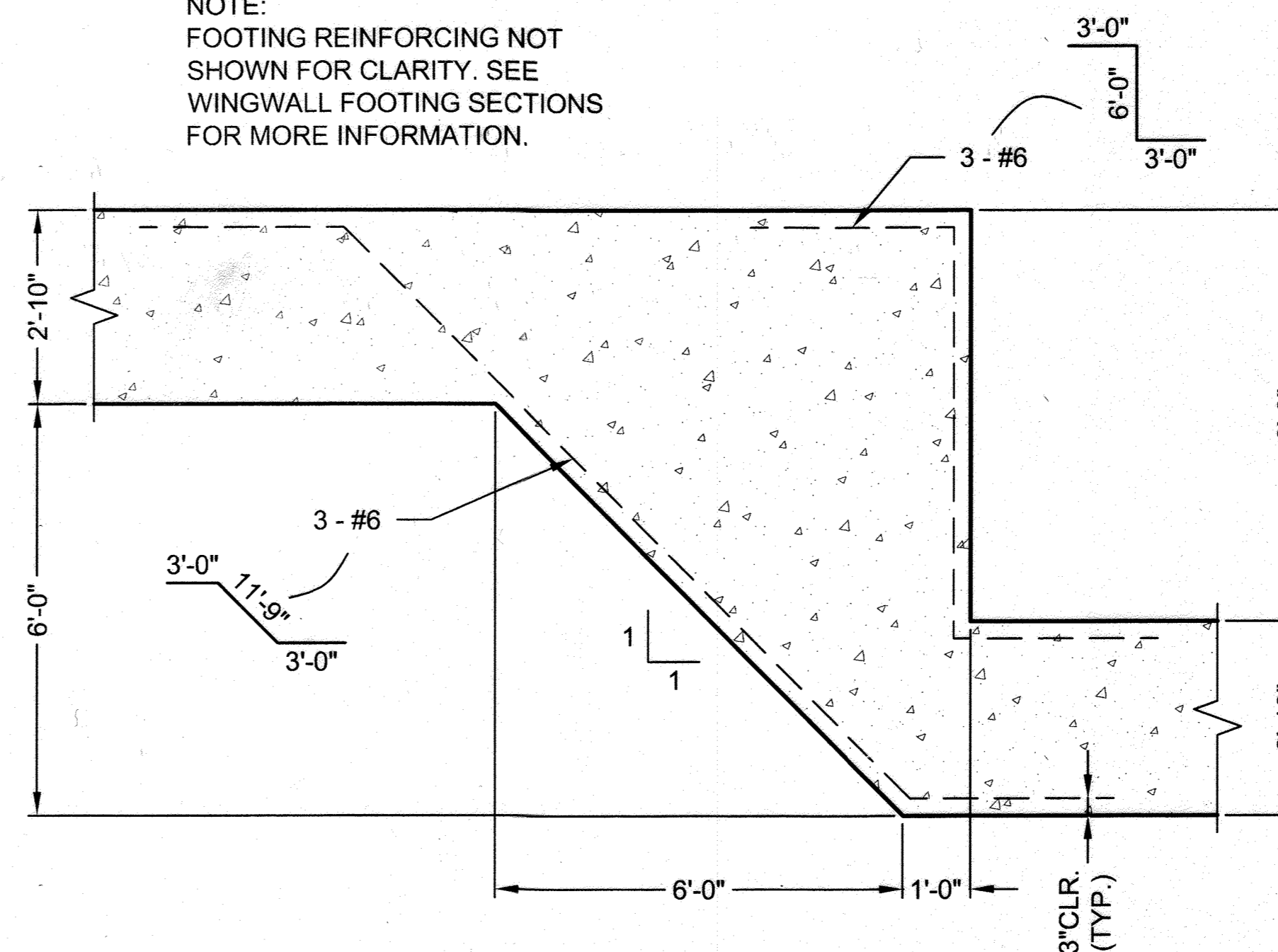
SECTION D  
0 1' 2' 4'

NOTE:  
FOOTING REINFORCING NOT  
SHOWN FOR CLARITY. SEE  
WINGWALL FOOTING SECTIONS  
FOR MORE INFORMATION.



SECTION E  
0 1' 2' 4'

NOTE:  
FOOTING REINFORCING NOT  
SHOWN FOR CLARITY. SEE  
WINGWALL FOOTING SECTIONS  
FOR MORE INFORMATION.



SECTION F  
0 1' 2' 4'

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

*Walter Z. ...* 10-23-09  
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Kent Shelton* 10-27-09  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*...* 10/22/09  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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SHIPLEY'S GRANT

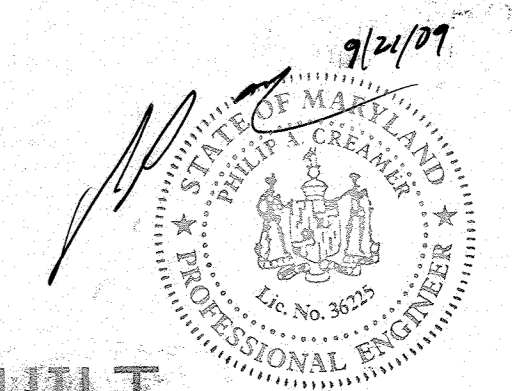
PHASE IV  
△ LOTS C-219 THRU C-222, C-296 THRU C-307, PARCELS D-2 AND E-1,  
OPEN SPACE LOTS C-309, D-1, E-2 AND E-3 AND NON-BUILDABLE PARCELS "D-3", "D-4",  
AND NON-BUILDABLE LOT C-308  
A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 THRU C-218, "D" AND "E"

ELECTION DISTRICT NO. 1

HOWARD COUNTY, MARYLAND

PROJECT NUMBER: 52059	DATE: 8/7/2009
DESIGNED: JAL	DRAWN: RJB
CHECKED: BAP	APPROVED: PAC
SHEET NO.: 24 OF 31	

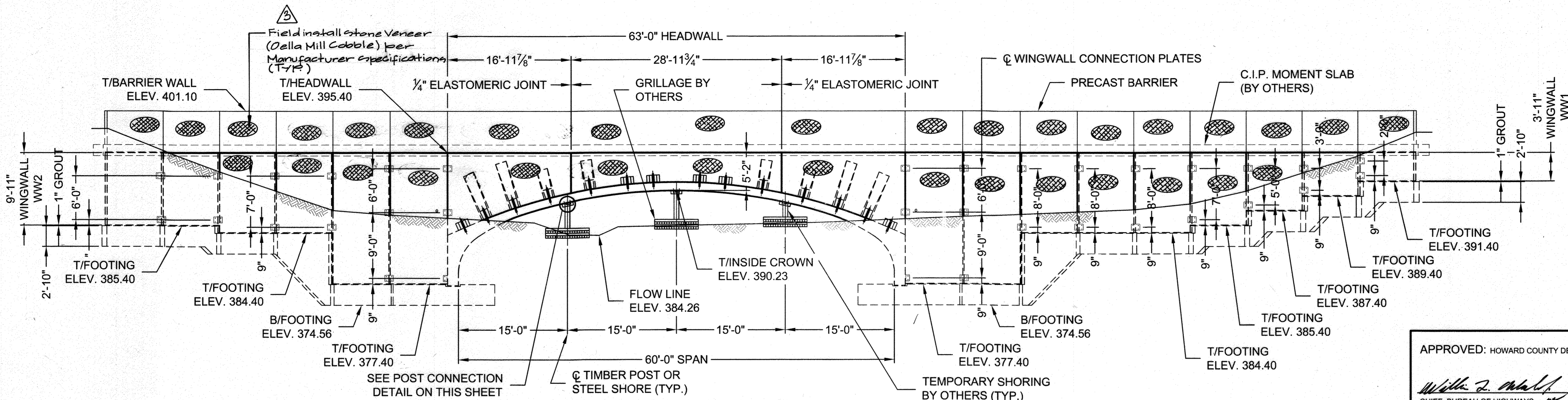
NO ASBUILT INFORMATION



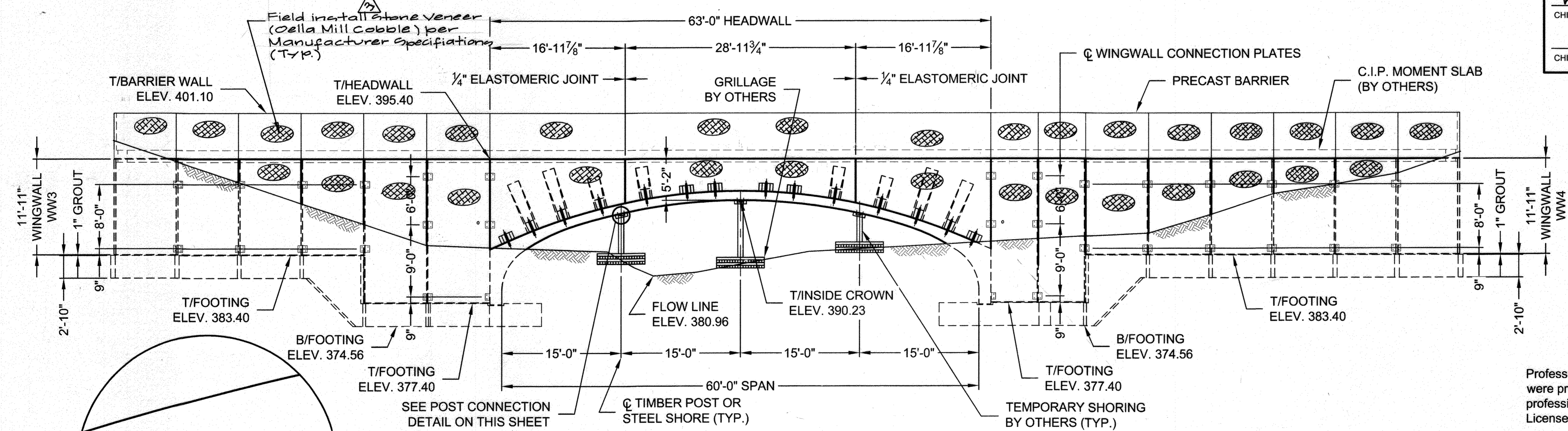
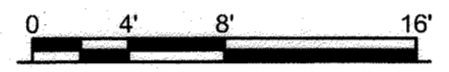
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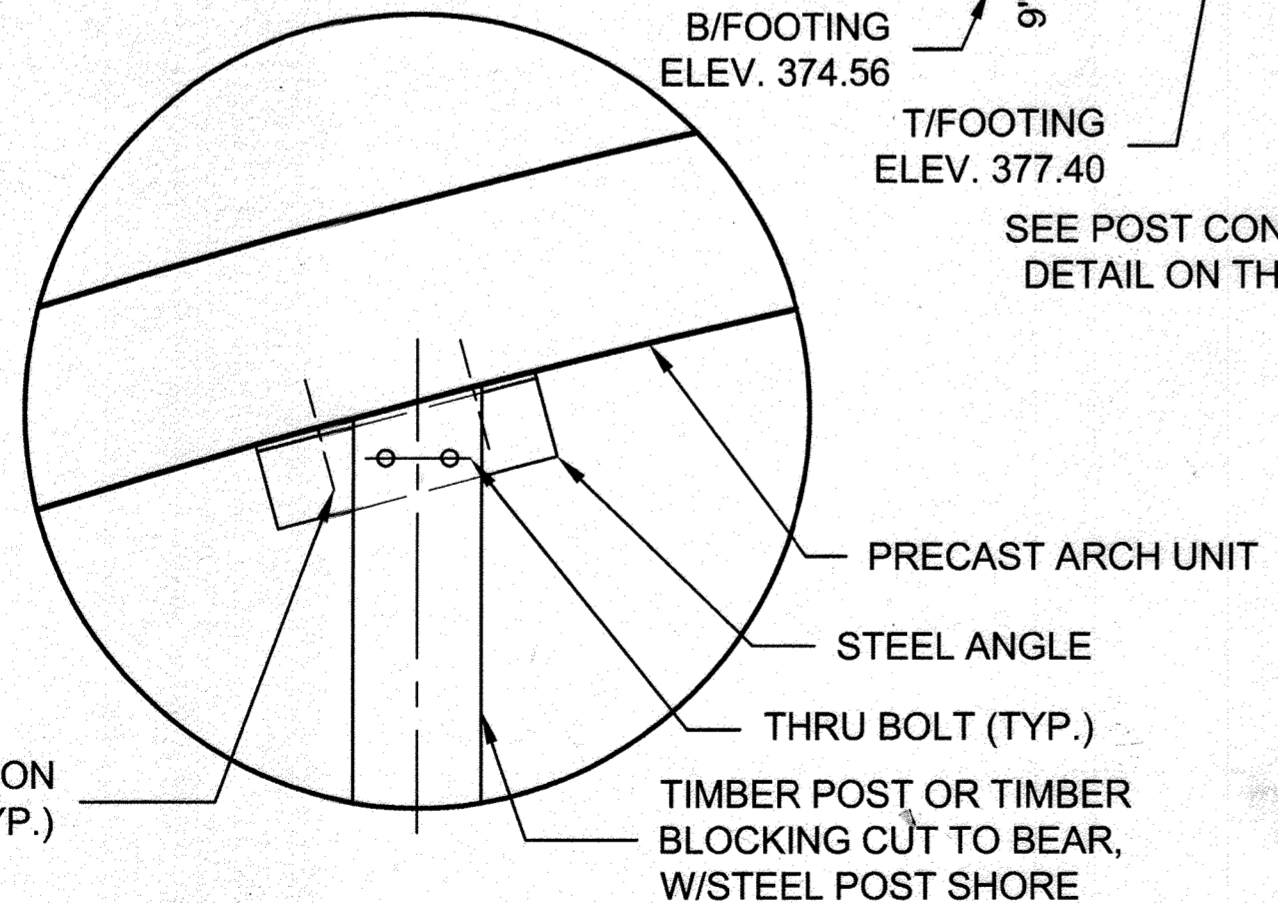
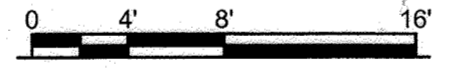




**UPSTREAM END ELEVATION**

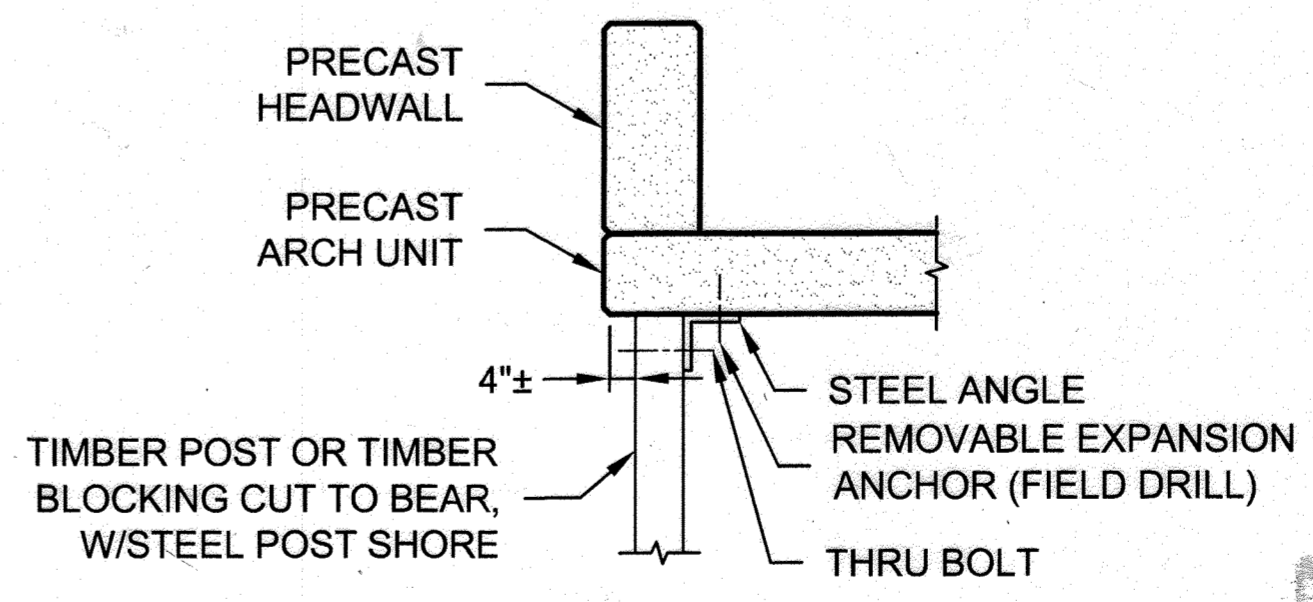


**DOWNSTREAM END ELEVATION**



**TEMPORARY SHORING POST CONNECTION DETAIL**

**NOTES:**  
 1. INSTALL TIMBER OR STEEL POSTS TIGHT AGAINST UNDERSIDE OF PRECAST ARCH UNIT PRIOR TO SETTING PRECAST HEADWALL UNITS.  
 2. POSTS SHALL REMAIN IN PLACE UNTIL BACKFILL IS AT LEAST 1'-0" FROM TOP OF THE STRUCTURE



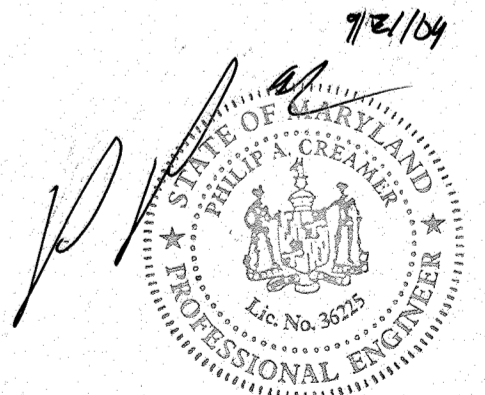
**TEMPORARY SHORING HEADWALL SECTION**

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Willie Z. Mahall* 10-23-09  
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Keith Schuch* 10-27-09  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*William D. ...* 10/27/09  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION 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. 36225, Expiration Date: 9/19/2010.



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 INFORMATION  
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MARK	DATE	REVISION DESCRIPTION	BY
△	8-19-14	Added stone Veneer	WBJ
△	7/10/10	Rev. Title Block Per F 10000	WBJ

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**CONSPAN**  
 BRIDGE SYSTEMS  
 CONTECH CONTRACT DRAWING

**SHIPLEY'S GRANT**  
 PHASE IV  
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 A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 THRU C-218, "D" AND "E"  
 ELECTION DISTRICT NO. 1 HOWARD COUNTY, MARYLAND

PROJECT NUMBER: 52059	DATE: 8/7/2009
DESIGNED: JAL	DRAWN: RJB
CHECKED: BAP	APPROVED: PAC
SHEET NO.: 25 OF 31	

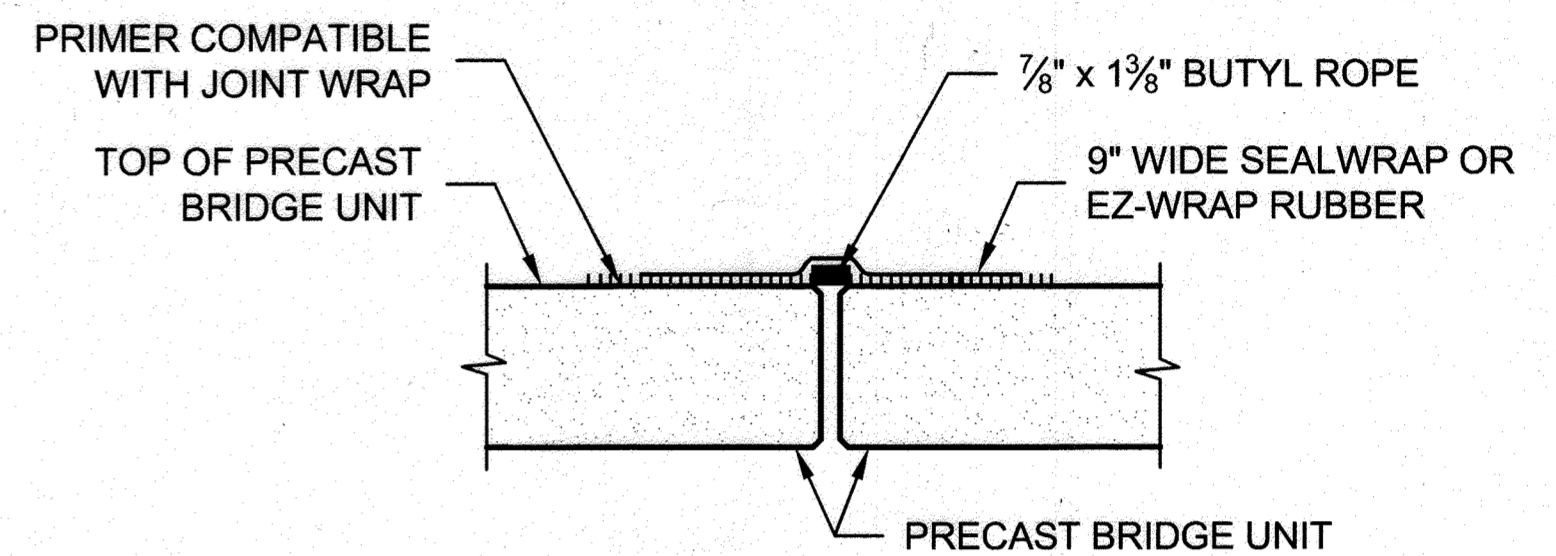
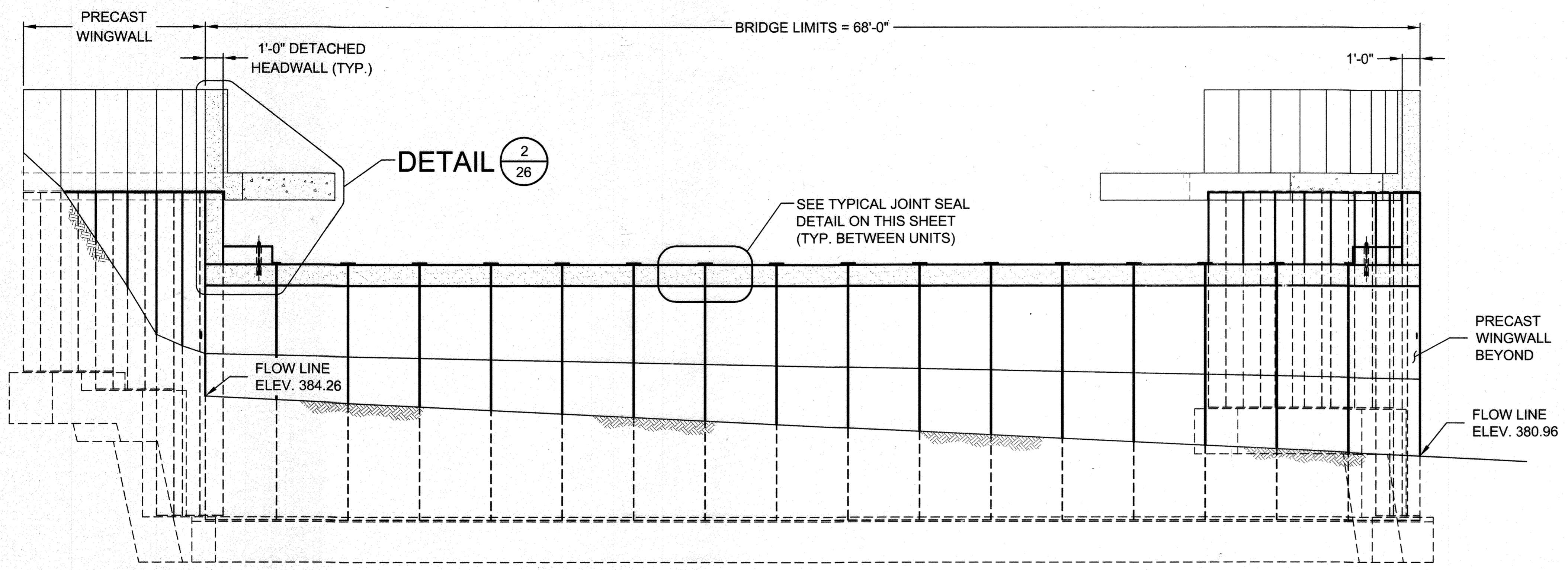
F00-088



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*William J. Mahaffey* 10-23-09  
 CHIEF, BUREAU OF HIGHWAYS DATE

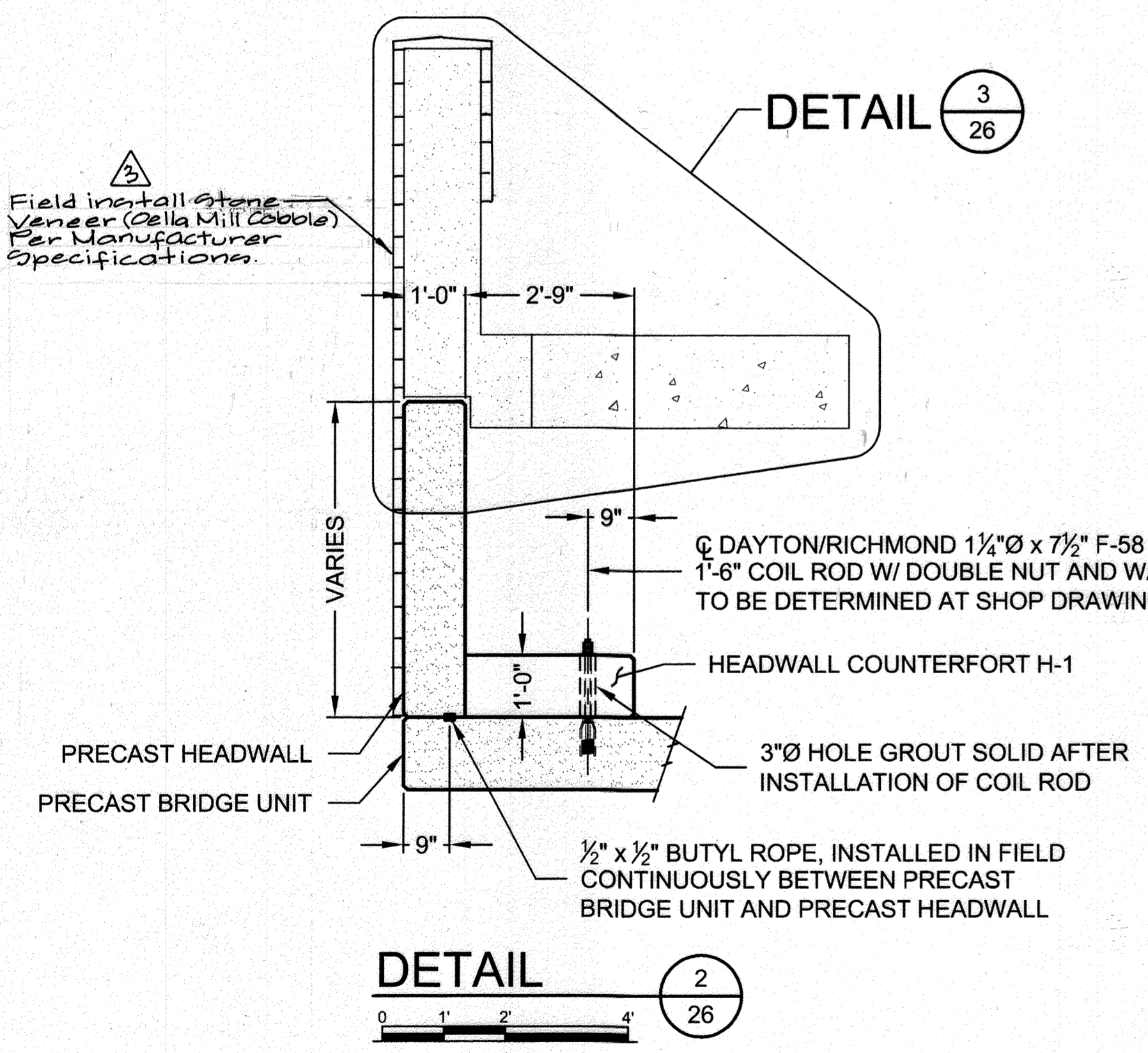
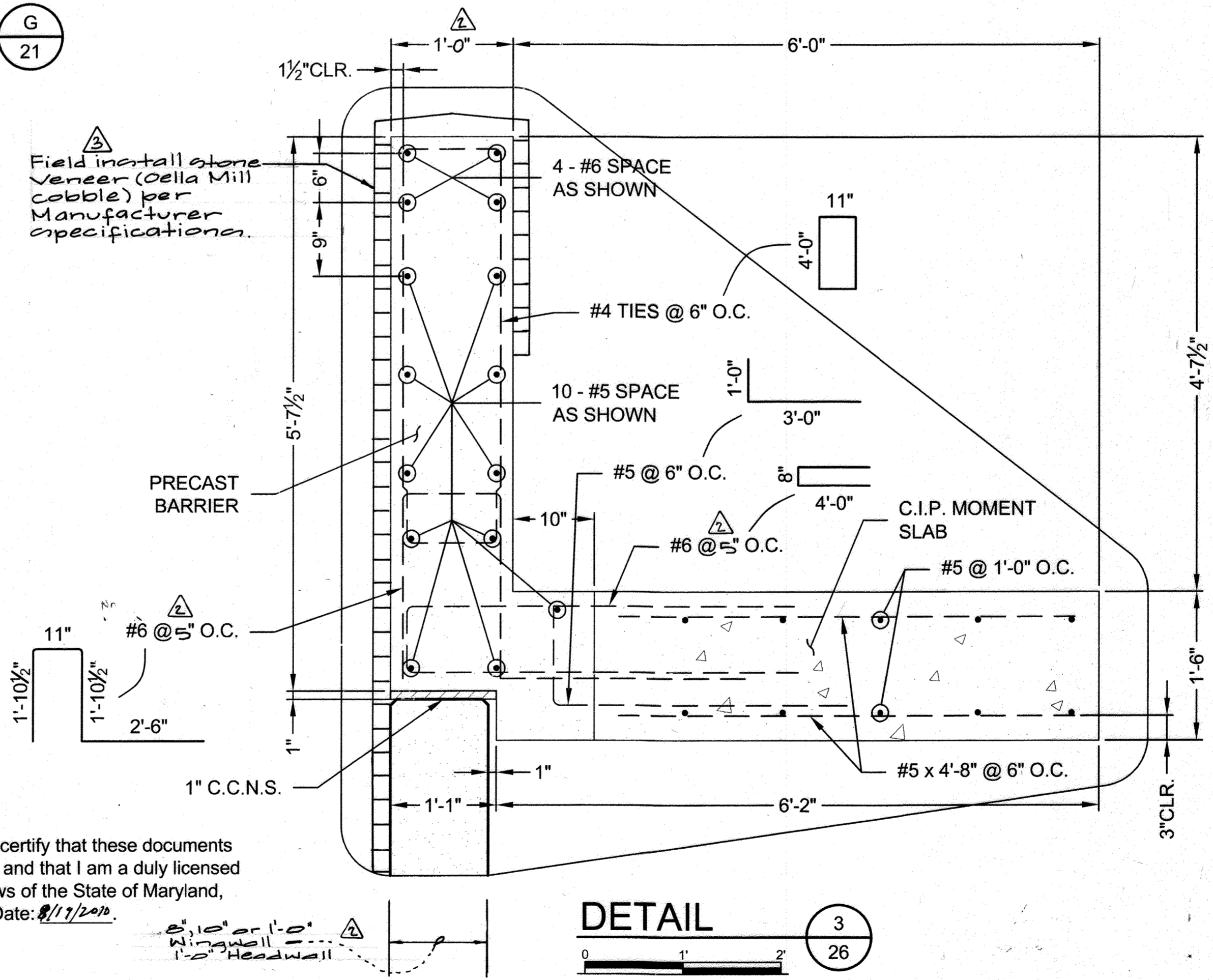
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Kate S. Shalton* 10-27-09  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Michael Summers* 10/27/09  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE



**TYPICAL JOINT SEAL DETAIL**  
 NOT TO SCALE

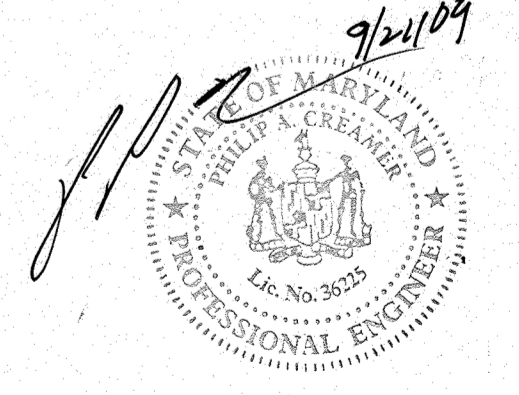
**SECTION G**  
 0 2' 4' 8'



**DETAIL 2**  
 0 1' 2' 4'

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: 8/1/2010.

NO ASBUILT INFORMATION  
 12/1/20



I:\BRIDGE\PROJECTS\ACTIVE\52059\DRAWINGS\52059-IN-C.DWG 9/21/2009 4:37 PM

MARK	DATE	REVISION DESCRIPTION	BY
2	8-13-14	Added Stone Veneer	WJS
3	2/10/11	Rev. To Wingwalls & Anchors	WJS
4	7/17/10	Rev. Title Block Per F 10-000	WJS

**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

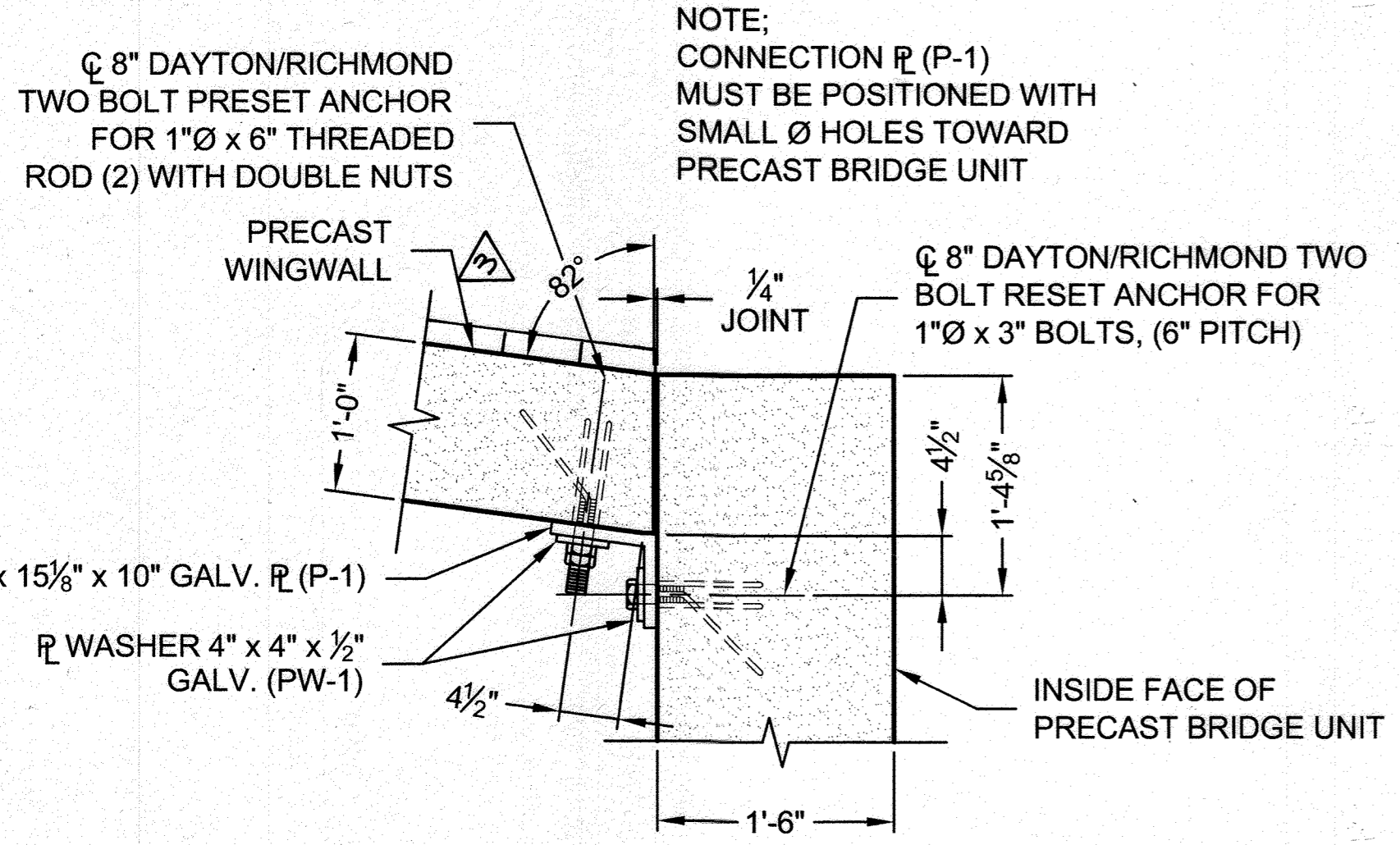
**CONSPAN**  
 BRIDGE SYSTEMS  
 CONTECH CONTRACT DRAWING

**SHIPLEY'S GRANT**  
 PHASE IV  
 LOTS C-219 THRU C-222, C-295 THRU C-307, PARCELS D-2 AND E-1, OPEN SPACE LOTS C-309, D-1, E-2 AND E-3 AND NON-BUILDABLE PARCELS "D-3", "D-4", AND NON-BUILDABLE LOT C-308  
 A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 THRU C-218, "D" AND "E"  
 HOWARD COUNTY, MARYLAND  
 ELECTION DISTRICT NO. 1

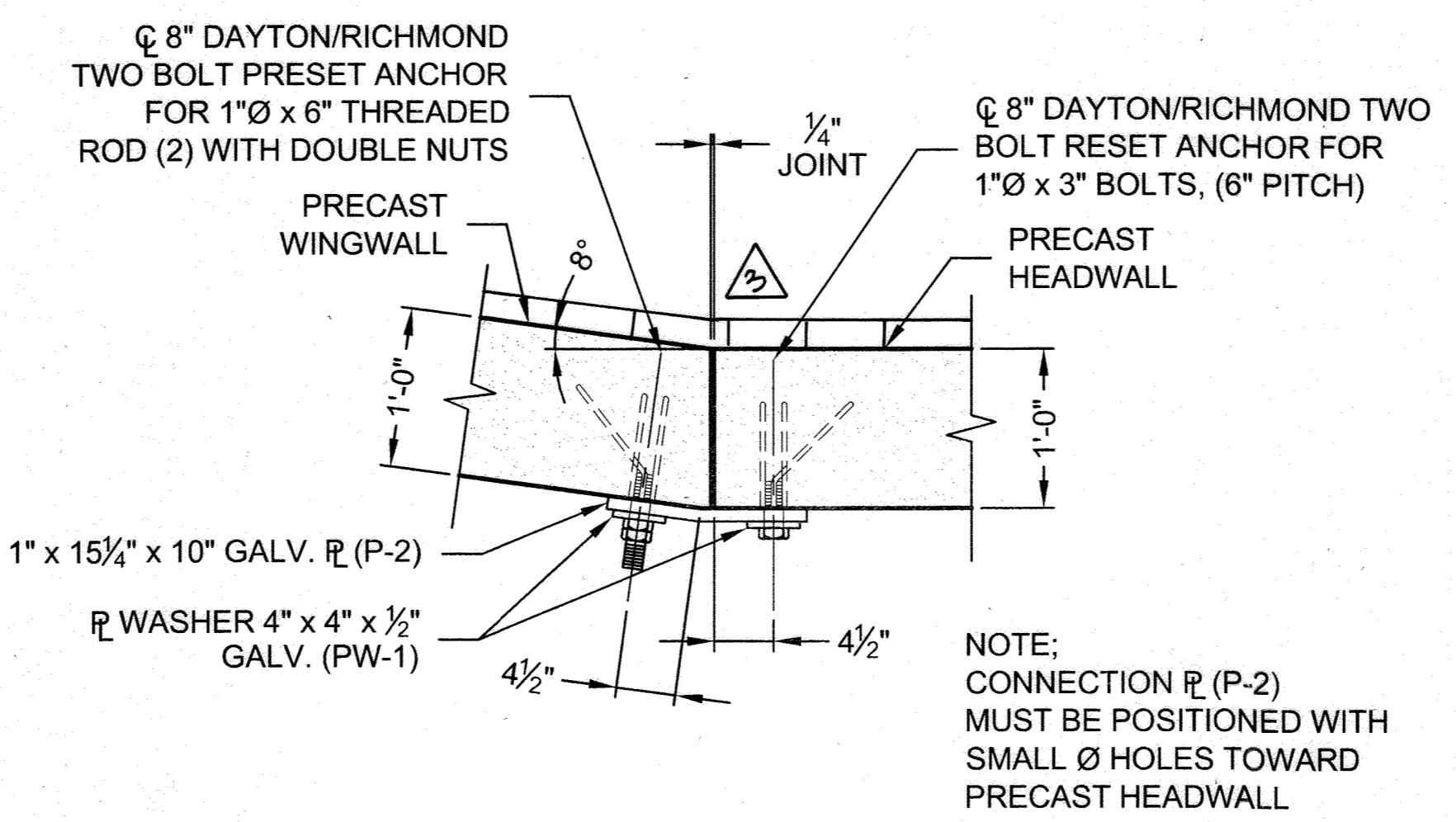
PROJECT NUMBER: 52059	DATE: 8/7/2009
DESIGNED: JAL	DRAWN: RJB
CHECKED: BAP	APPROVED: PAC
SHEET NO: 26 OF 31	

F09-088

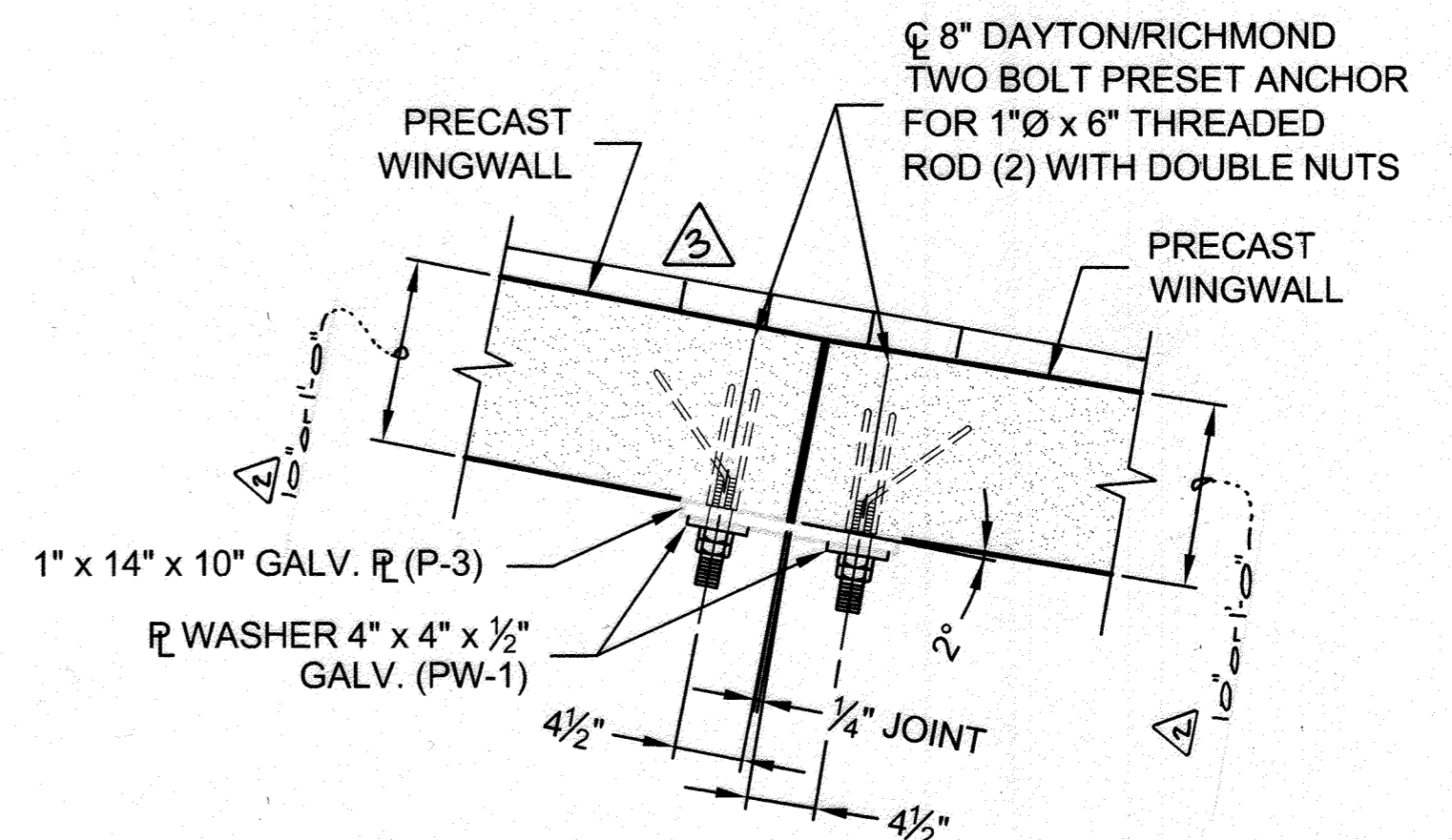




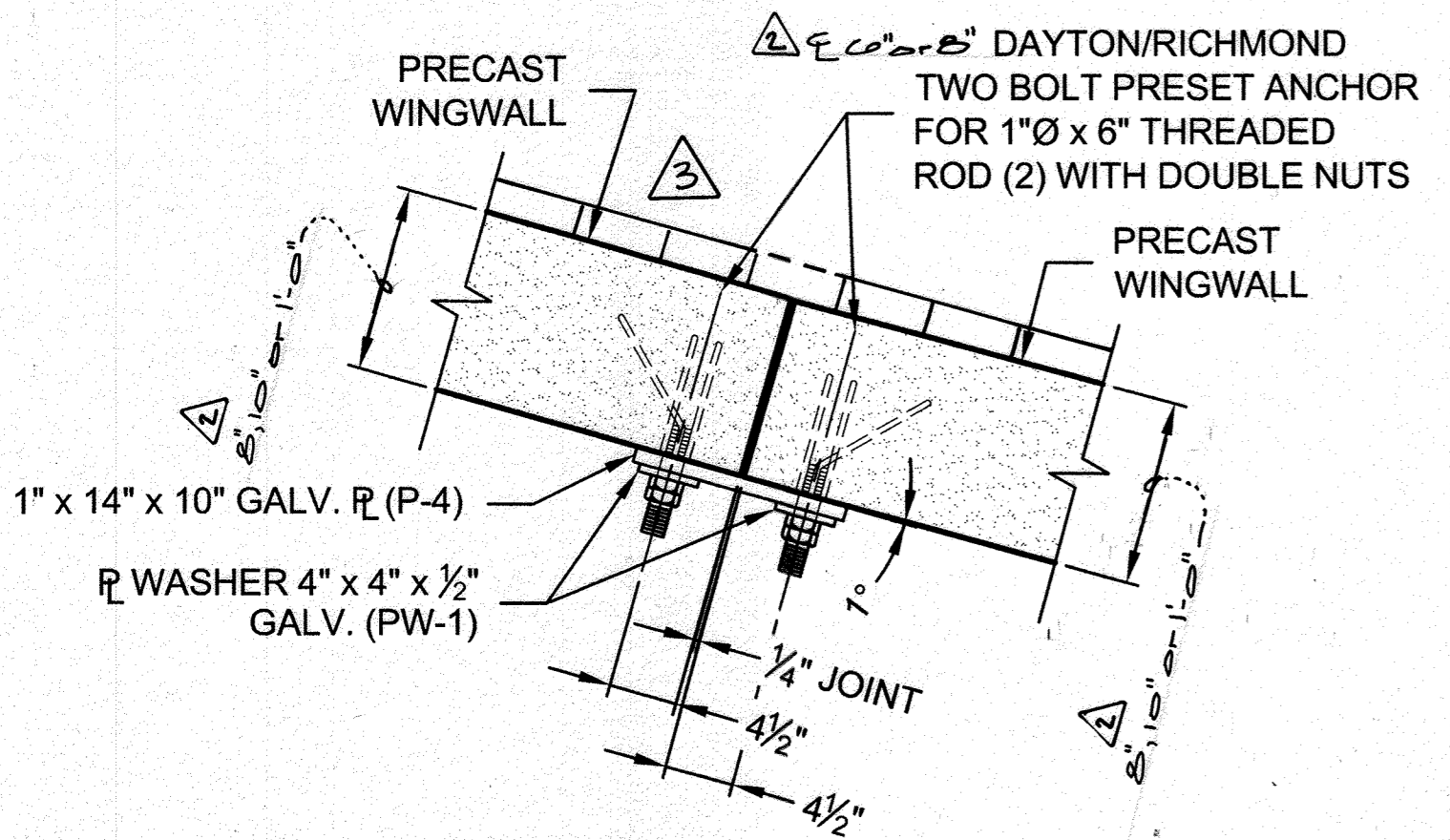
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0 1 2 21



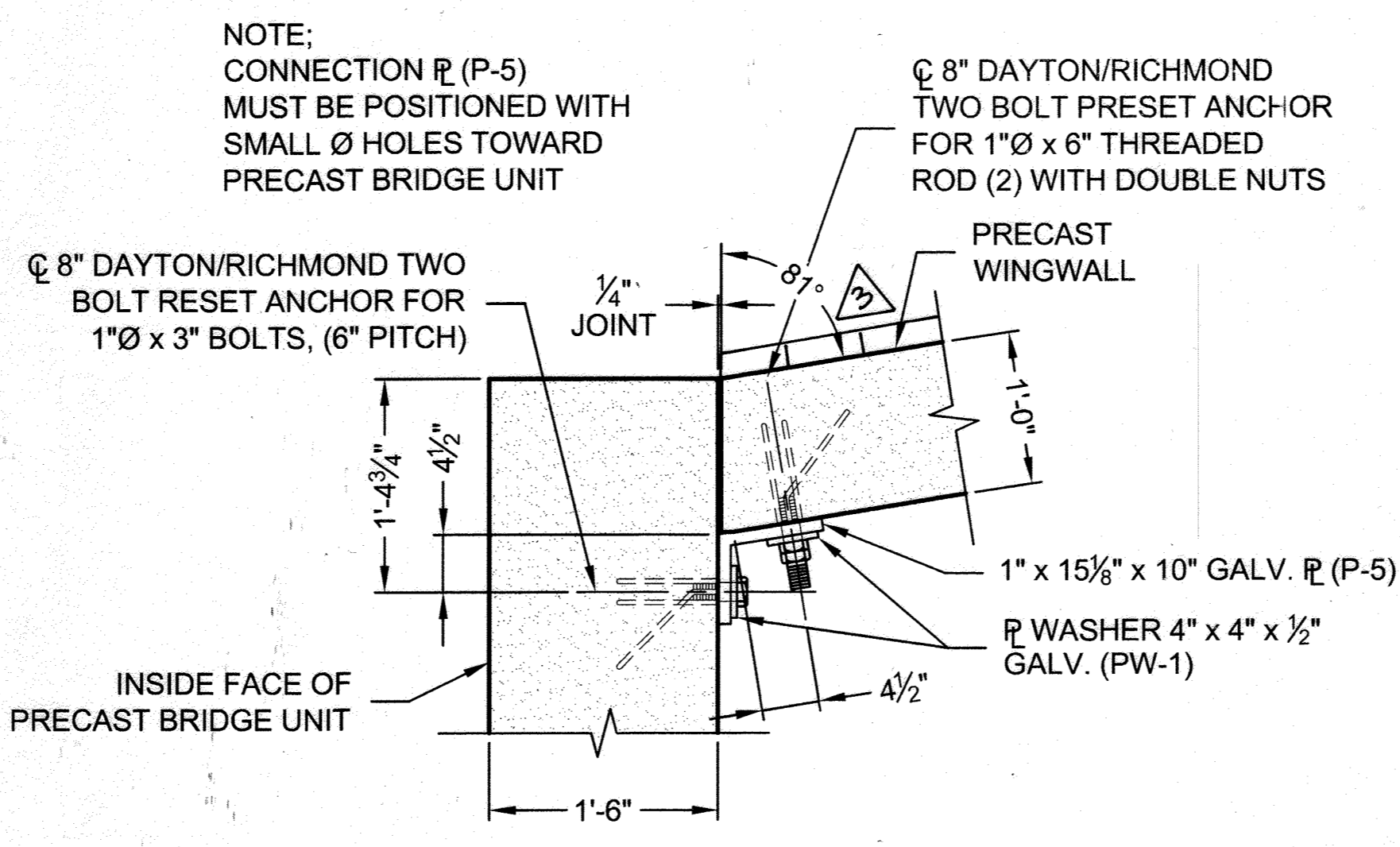
DETAIL @ HEADWALL 4B  
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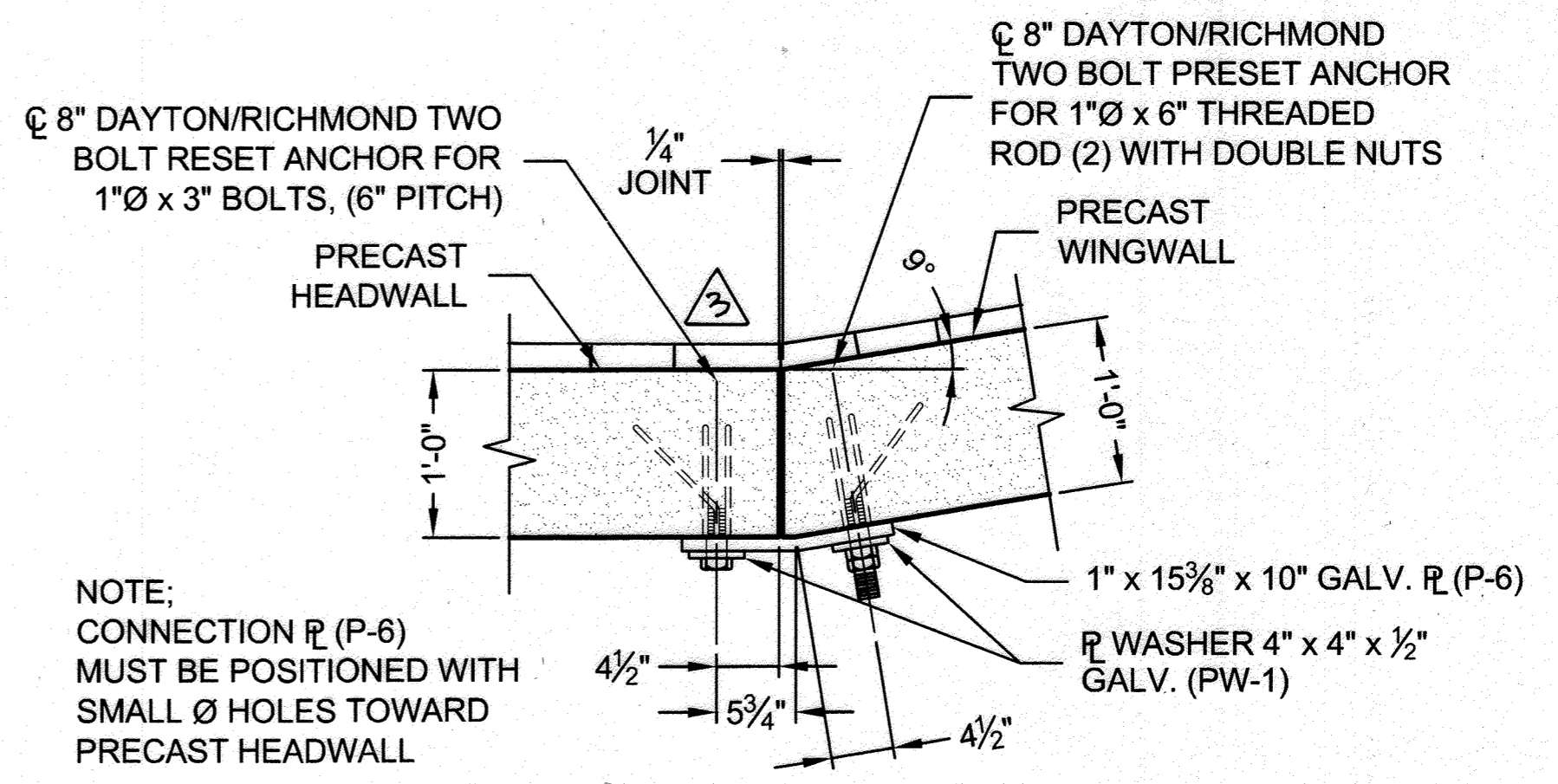
DETAIL 5  
0 1 2 21



DETAIL 6  
0 1 2 21



DETAIL @ UNIT LEG 7A  
0 1 2 21



DETAIL @ HEADWALL 7B  
0 1 2 21

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Walter Z. ...* 10-23-09  
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*...* 10-27-09  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*...* 10/27/09  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

MARK	DATE	REVISION DESCRIPTION	BY
△	8-17-14	Added stone veneer	WBJ
△	2/16/11	Rev To Wingwalls & Anchors	WBJ
△	7/10/10	Rev Title Block Per F 10-0000	WBJ

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 800-338-1122 513-645-7000 513-645-7993 FAX

**CONSPAN**  
 BRIDGE SYSTEMS  
 CONTECH  
 CONTRACT  
 DRAWING

**SHIPLEY'S GRANT**  
 PHASE IV  
 △ LOTS C-219 THRU C-222, C-225 THRU C-207, PARCELS D-2 AND E-1,  
 OPEN SPACE LOTS C-202, D-1, E-2 AND E-3 AND NON-BUILDABLE PARCELS "D-3", "D-4",  
 AND NON-BUILDABLE LOT C-208  
 A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 THRU C-218, "D" AND "E"  
 HOWARD COUNTY, MARYLAND

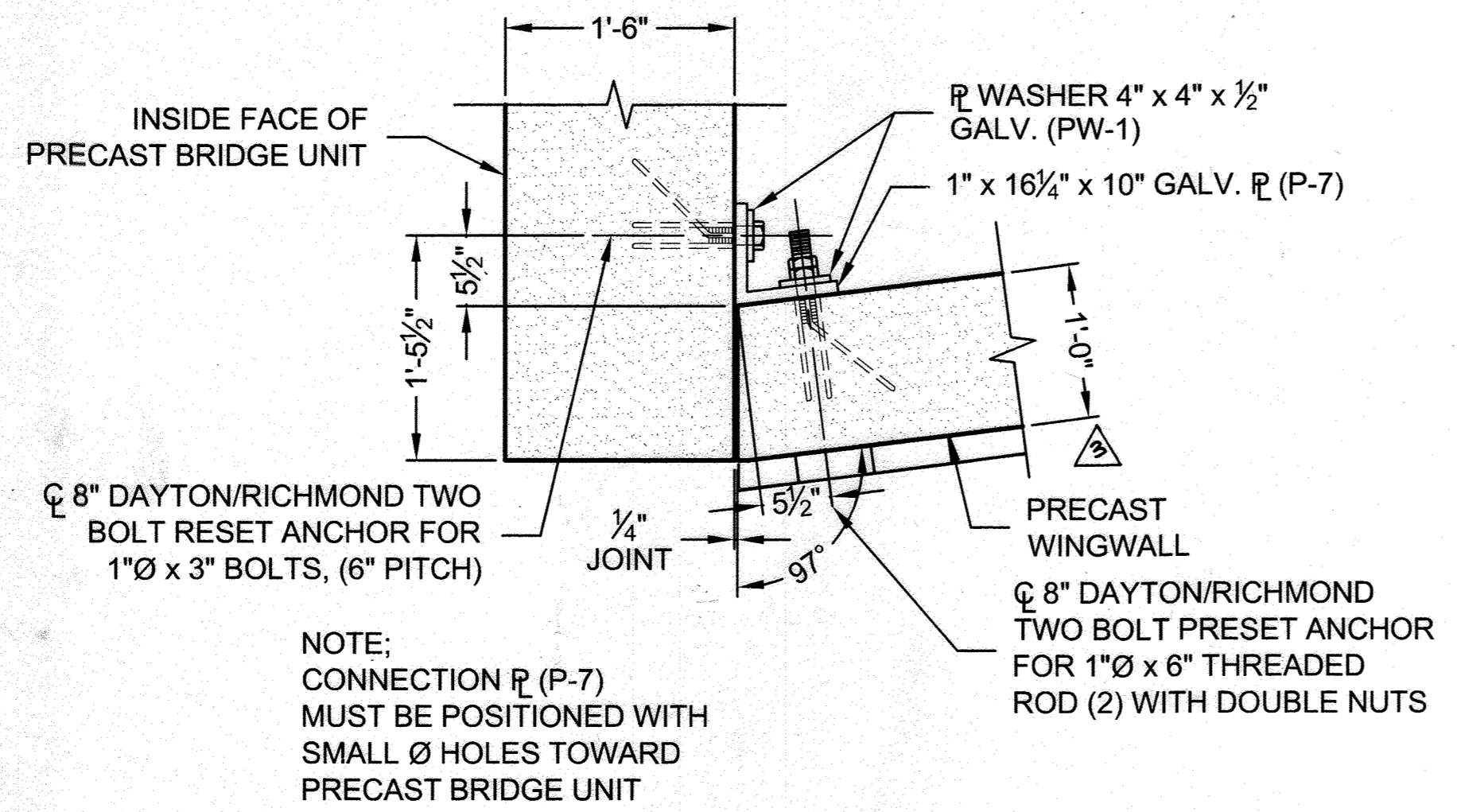
PROJECT NUMBER: 52059	DATE: 8/7/2009
DESIGNED: JAL	DRAWN: RJB
CHECKED: BAP	APPROVED: PAC
SHEET NO.: 27 OF 31	

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: 8/14/2012

NO ASBUILT INFORMATION  
 12/1/20

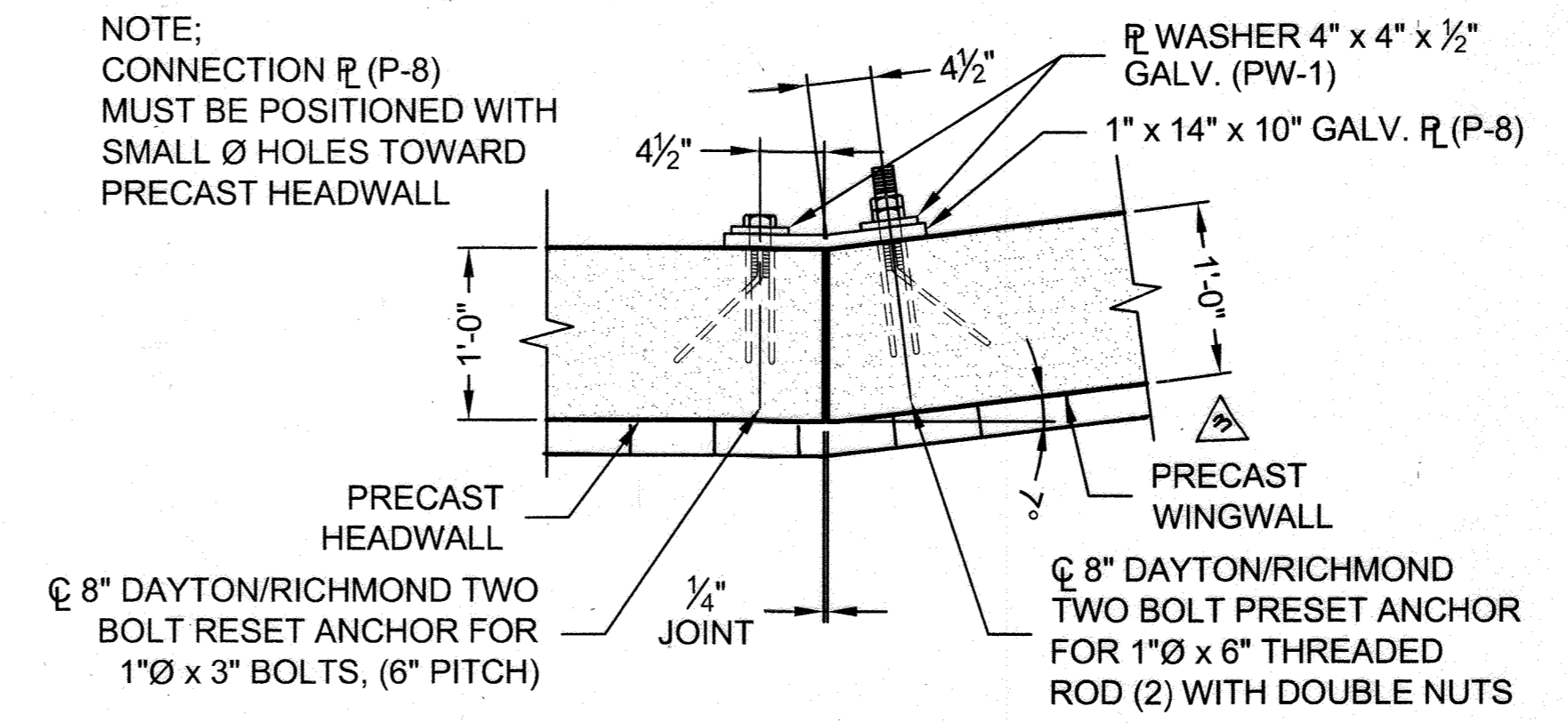
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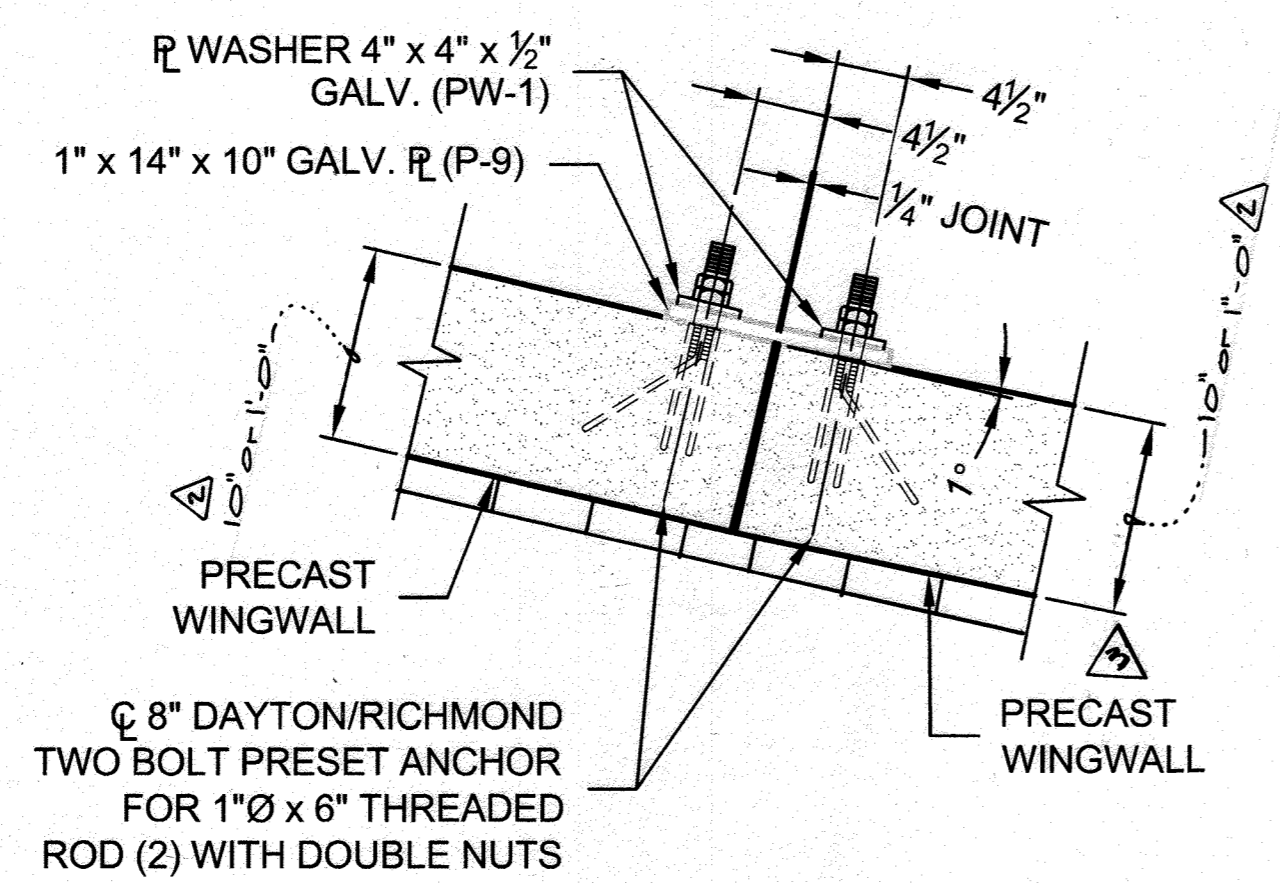
NOTE:  
CONNECTION P-7  
MUST BE POSITIONED WITH  
SMALL Ø HOLES TOWARD  
PRECAST BRIDGE UNIT

DETAIL @ UNIT LEG (8A)  
21

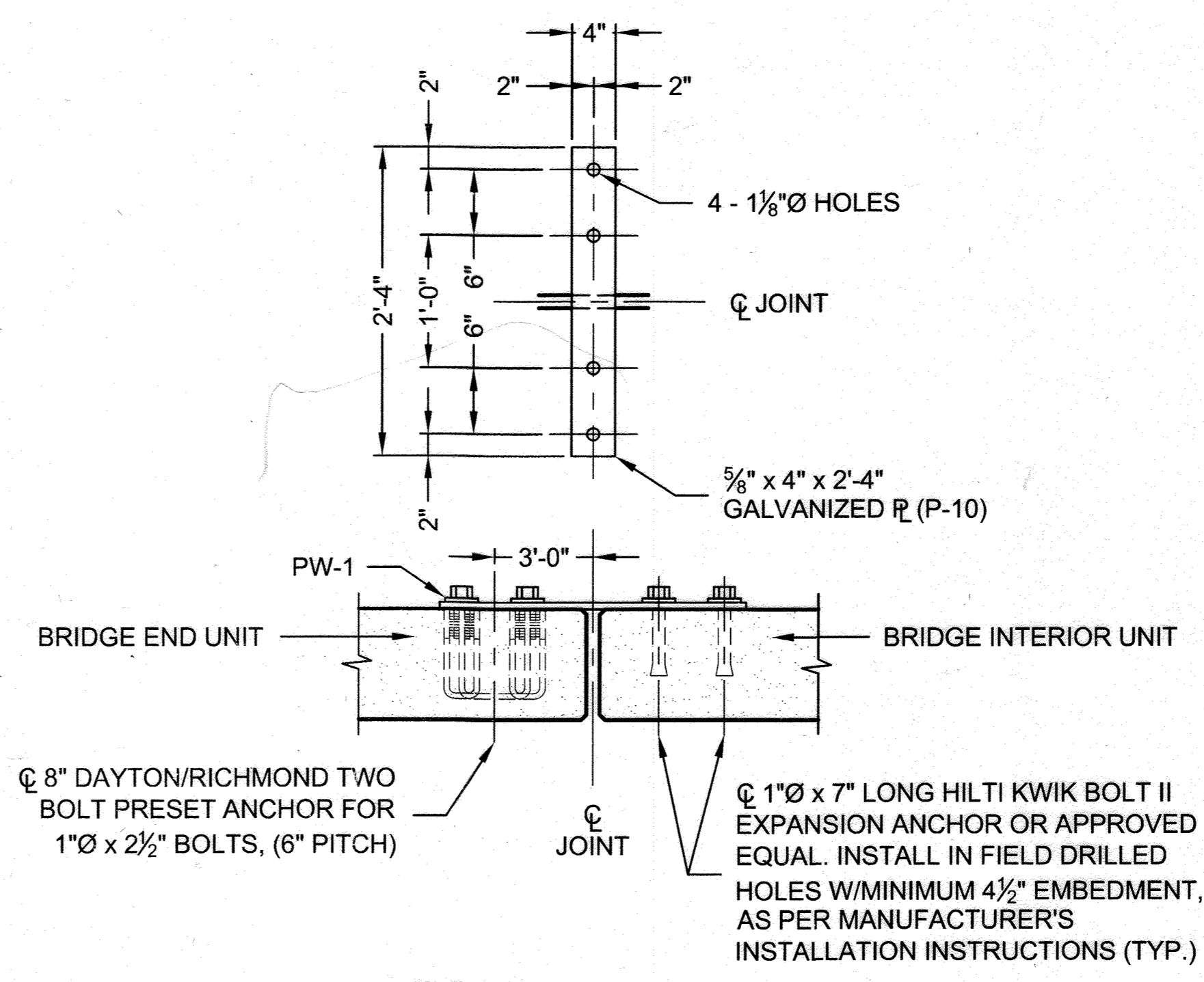


NOTE:  
CONNECTION P-8  
MUST BE POSITIONED WITH  
SMALL Ø HOLES TOWARD  
PRECAST HEADWALL

DETAIL @ HEADWALL (8B)  
21

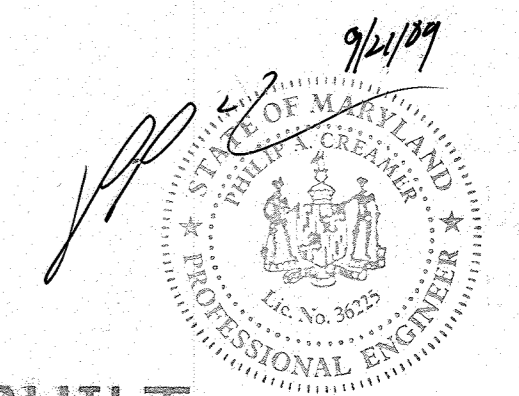


DETAIL (9)  
21



DETAIL (10)  
NOT TO SCALE  
21

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: 8/17/2015.



NO ASBUILT INFORMATION  
12/1/20

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*William Z. Mulla* 10-23-09  
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Kent Shelburne* 10-27-09  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*W. D. ...* 10/27/09  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

MARK	DATE	REVISION DESCRIPTION	BY
△	8-13-14	Add Stone Veneer	Wsj
△	2/16/11	Rev. To Wingwalls & Anchors	Wsj
△	7/10/10	Rev. Title Block Per 10-000	Wsj

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AND NON-BUILDABLE LOT C-208  
A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 THRU C-218, "D" AND "E"  
ELECTION DISTRICT NO. 1 HOWARD COUNTY, MARYLAND

PROJECT NUMBER: 52059	DATE: 8/7/2009
DESIGNED: JAL	DRAWN: RJB
CHECKED: BAP	APPROVED: PAC
SHEET NO.: 28 OF 31	

F 09-088

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# 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 A185 OR A 497, OR DEFORMED BILLET STEEL BARS CONFORMING TO ASTM SPECIFICATION A615, 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 A307. 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).
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 1 1/2" 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 NECESSARY. 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 1 1/2" 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 REINFORCING STEEL SHALL NOT BE LESS THAN 1/2" 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. THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 8.25. 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 4".
    - 4.4. CURING - THE PRECAST CONCRETE ELEMENTS SHALL BE CURED FOR A SUFFICIENT LENGTH OF 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 +4-10 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.
  - 4.5. 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.
    - 4.5.1. 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.
    - 4.5.2. QUALIFICATIONS, TESTING AND INSPECTION
      - 4.5.2.1. 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.
      - 4.5.2.2. 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.
        - 4.5.2.2.1. AIR CONTENT: C231 OR C173
        - 4.5.2.2.2. COMPRESSIVE STRENGTH: C31, C39, C497
      - 4.5.2.3. THE PRECASTER SHALL PROVIDE DOCUMENTATION DEMONSTRATING COMPLIANCE WITH THIS SECTION TO CONTECH® BRIDGE SOLUTIONS AT REGULAR INTERVALS OR UPON REQUEST.
      - 4.5.2.4. THE OWNER MAY PLACE AN INSPECTOR IN THE PLANT WHEN THE PRODUCTS COVERED BY THIS SPECIFICATION ARE BEING MANUFACTURED.
    - 4.5.3. 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 1 1/2" 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 1/2". 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 1/2" IN ANY SECTION, EXCEPT WHERE BEVELED ENDS FOR LAYING OF CURVES ARE SPECIFIED BY THE PURCHASER.
    - 5.1.4. LENGTH OF SECTION - THE UNDERRUR IN LENGTH OF A SECTION SHALL NOT BE MORE THAN 1/2" IN ANY BRIDGE UNIT.
    - 5.1.5. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN POSITION OF THE REINFORCEMENT SHALL BE ± 1/2", IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1 1/2" FOR THE OUTSIDE CIRCUMFERENTIAL STEEL OR 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 1/2".
    - 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 1/2".
    - 5.2.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN THE POSITION OF THE REINFORCEMENT SHALL BE ± 1/2", IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1 1/2".
    - 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 3 CYLINDERS SHALL BE TAKEN FOR EACH LOT OF BRIDGE ELEMENTS. (A LOT IS DEFINED AS THE PRECAST ELEMENTS MADE USING THE SAME CONCRETE MIX DURING A SINGLE DAY'S PRODUCTION.) FOR CORE TESTING, ONE CORE SHALL BE CUT FROM EACH OF 3 PRECAST ELEMENTS SELECTED AT RANDOM FROM EACH GROUP OF 15 OR FEWER ELEMENTS MADE USING A SINGLE CONCRETE MIX IN THE SAME DAY'S PRODUCTION. EACH LOT 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. 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 LOT SHALL BE ACCEPTED. WHEN THE COMPRESSIVE STRENGTH OF THE CYLINDERS TESTED DOES NOT CONFORM TO THESE ACCEPTANCE CRITERIA, THE ACCEPTABILITY OF THE LOT 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 LOT 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 LOT 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. TWO PRECAST ELEMENTS FROM THE REMAINDER OF THE LOT SHALL BE SELECTED AT RANDOM AND ONE CORE SHALL BE TAKEN FROM EACH. IF THE COMPRESSIVE STRENGTH OF BOTH CORES IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH, THE COMPRESSIVE STRENGTH OF THE REMAINDER OF THAT GROUP IS ACCEPTABLE. IF THE COMPRESSIVE STRENGTH OF EITHER OF THE TWO CORES TESTED IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE REMAINDER OF THE GROUP SHALL BE REJECTED OR, AT THE OPTION OF THE MANUFACTURER, EACH PRECAST ELEMENT OF THE REMAINDER OF THE GROUP SHALL BE CORED AND ACCEPTED INDIVIDUALLY. AND ANY OF THESE ELEMENTS THAT HAVE CORES WITH LESS THAN THE DESIGN CONCRETE STRENGTH SHALL BE REJECTED. 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.
  - 6.2. INSPECTION - THE QUALITY OF MATERIALS, THE PROCESS OF MANUFACTURE, AND THE FINISHED PRECAST ELEMENTS SHALL BE SUBJECT TO INSPECTION BY THE PURCHASER.
7. JOINTS
  - 7.1. 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 3/4".
8. WORKMANSHIP/ FINISH
  - 8.1. 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
  - 9.1. 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.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

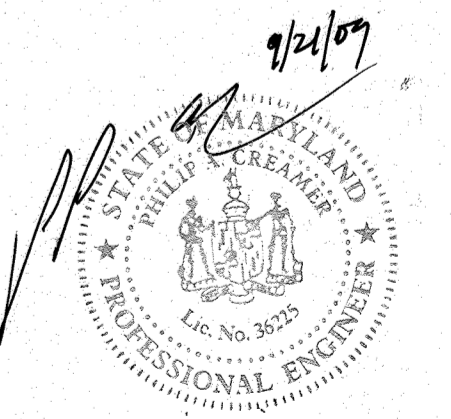
*Willie J. Wall* 10-23-09  
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Karl Shulman* 10-27-09  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*W. J. Wall* 10/21/09  
CHIEF, DEVELOPMENT ENGINEERING DIVISION 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. 36225, Expiration Date: 3/19/2010



NO ASBUILT INFORMATION 12/1/20

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**CON/SPAN®**  
BRIDGE SYSTEMS

CONTECH  
CONTRACT  
DRAWING

**SHIPLEY'S GRANT**  
PHASE IV

△ LOTS C-219 THRU C-222, C-225 THRU C-307, PARCELS D-2 AND E-1,  
OPEN SPACE LOTS C-307, D-1, E-2 AND E-3 AND NON-BUILDABLE PARCELS "D-3", "D-4",  
AND NON-BUILDABLE LOT C-208  
A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 THRU C-218, "D" AND "E"  
HOWARD COUNTY, MARYLAND

ELECTION DISTRICT NO. 1

PROJECT NUMBER: 52059	DATE: 8/7/2009
DESIGNED: JAL	DRAWN: RJB
CHECKED: BAP	APPROVED: PAC
SHEET NO: 29	OF 31

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

**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

**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 1/4" 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 1/2" 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 1/4".

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 1/2", 3/4" & 1" 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 1/2" x 1 1/2" 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 1/2".  
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.

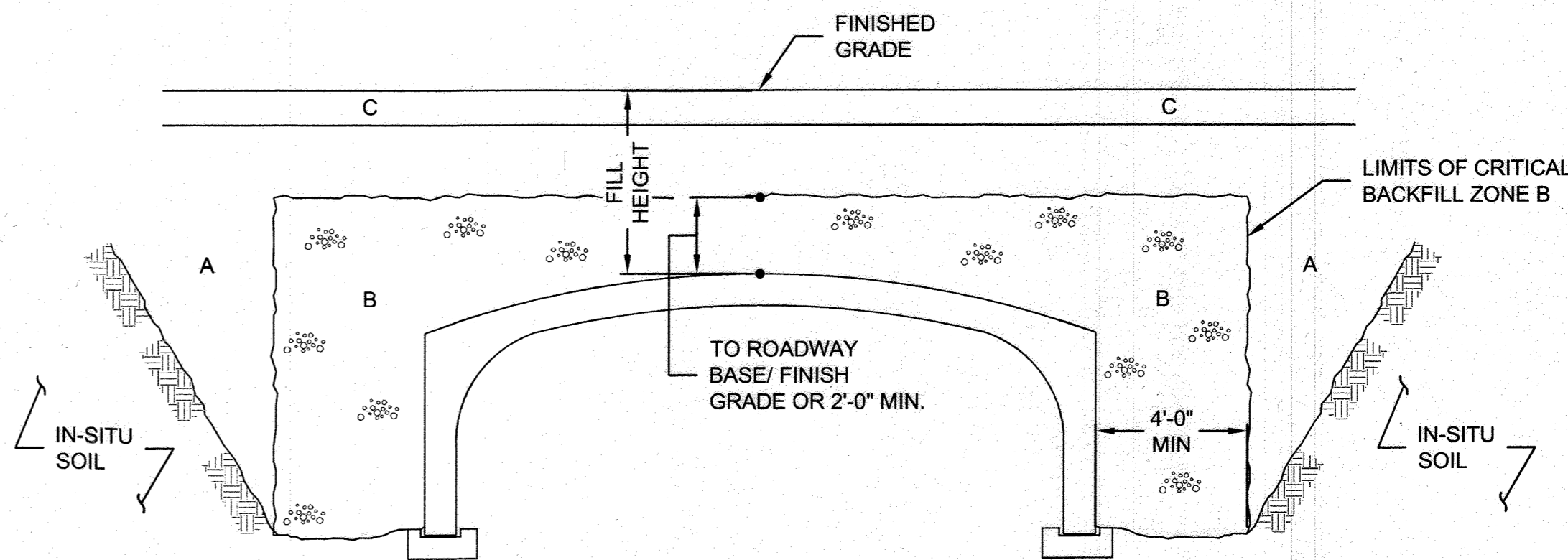
THE MAXIMUM DIFFERENCE IN VERTICAL DISPLACEMENTS 'V' SHOULD NOT EXCEED 1" ALONG THE LENGTH OF ONE FOUNDATION.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*William Z. M...* 10-23-09  
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*W. J. ...* 10-27-09  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE  
*John ...* 10/27/09  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

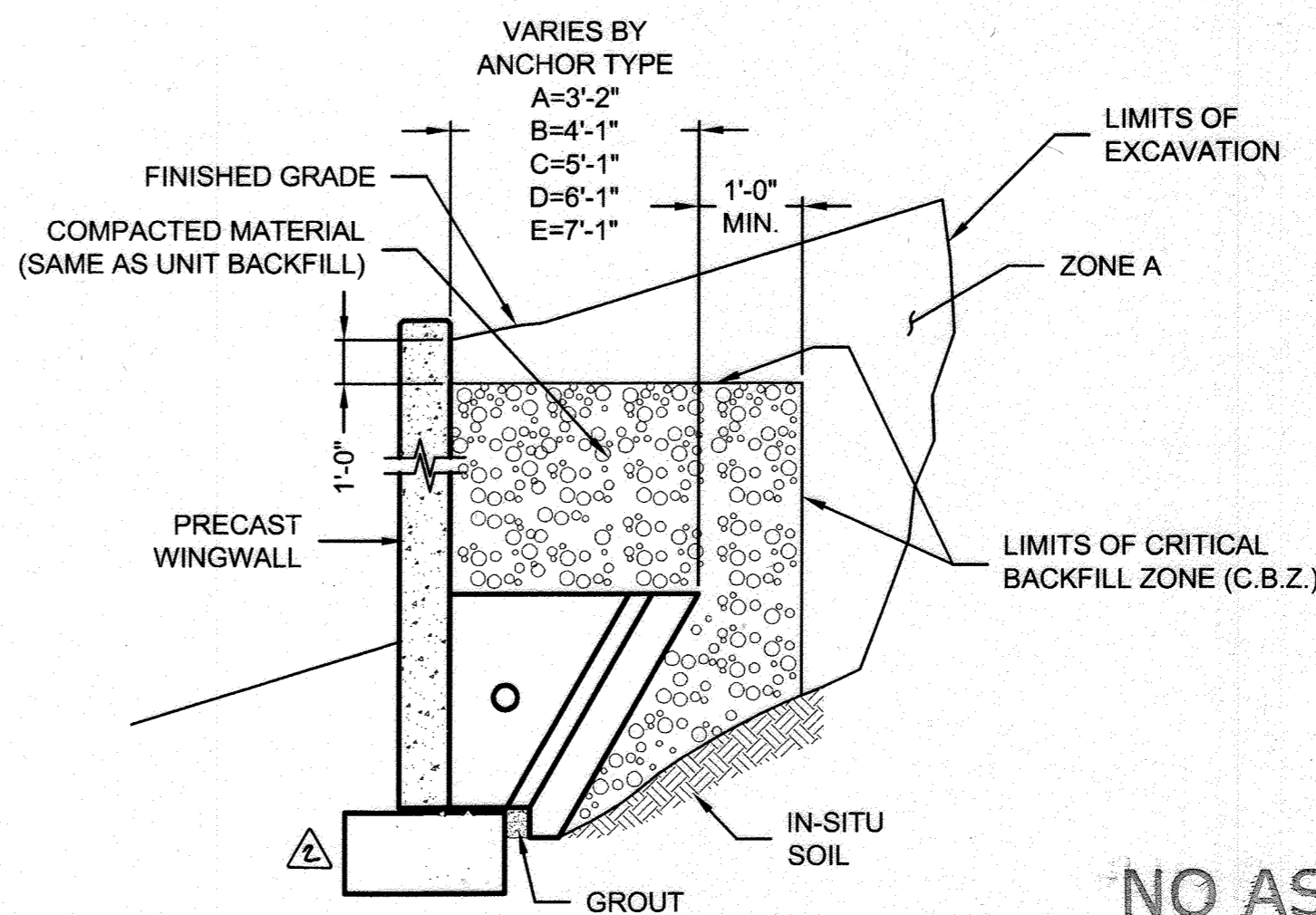
### ACCEPTABLE SOILS FOR USE IN ZONE B BACKFILL

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



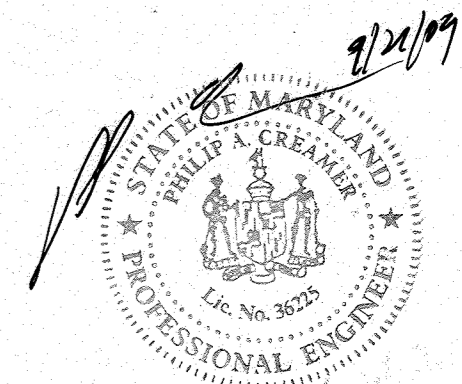
SPAN	FILL HEIGHT	ACCEPTABLE MATERIAL INSIDE ZONE B
≤ 24'-0"	≥ 12'-0"	A1, A3
≤ 24'-0"	< 12'-0"	A1, A2, A3, A4
> 24'-0"	ALL	A1, A3

### BACKFILL REQUIREMENTS



### WALL BACKFILL REQUIREMENTS

NO ASBUILT INFORMATION  
12/1/20



I:\BRIDGE\PROJECTS\ACTIVE\52059\DRAWINGS\52059-IN-C.DWG 9/21/2009 4:37 PM

MARK	DATE	REVISION DESCRIPTION	BY
2	11/11	Rev. To Wingwalls & Anchors	WJ
1	7/10/10	Rev. Title Block Per F 10-000	WJ

MARK	DATE	REVISION DESCRIPTION	BY
2	11/11	Rev. To Wingwalls & Anchors	WJ
1	7/10/10	Rev. Title Block Per F 10-000	WJ



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

ELECTION DISTRICT NO. 1

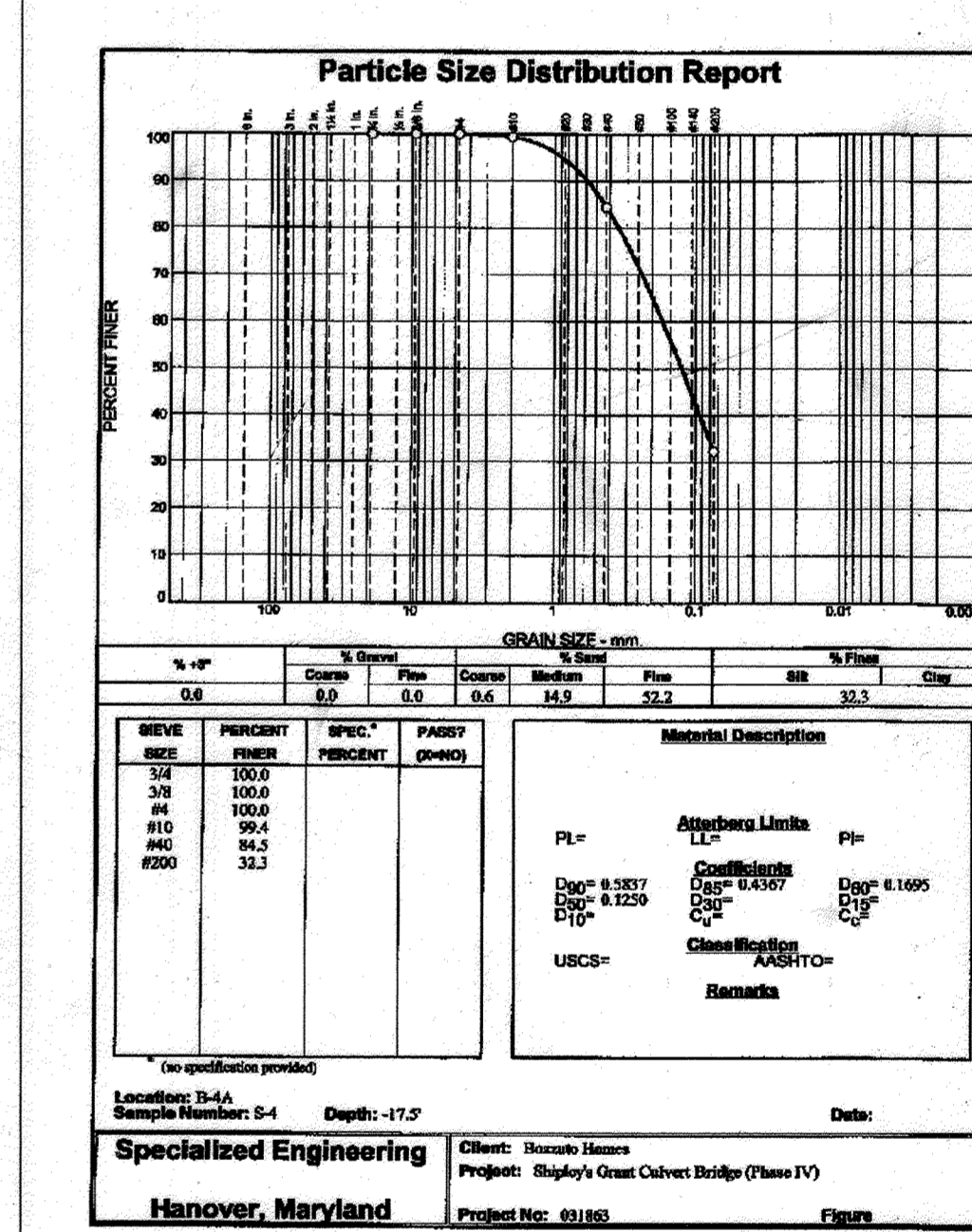
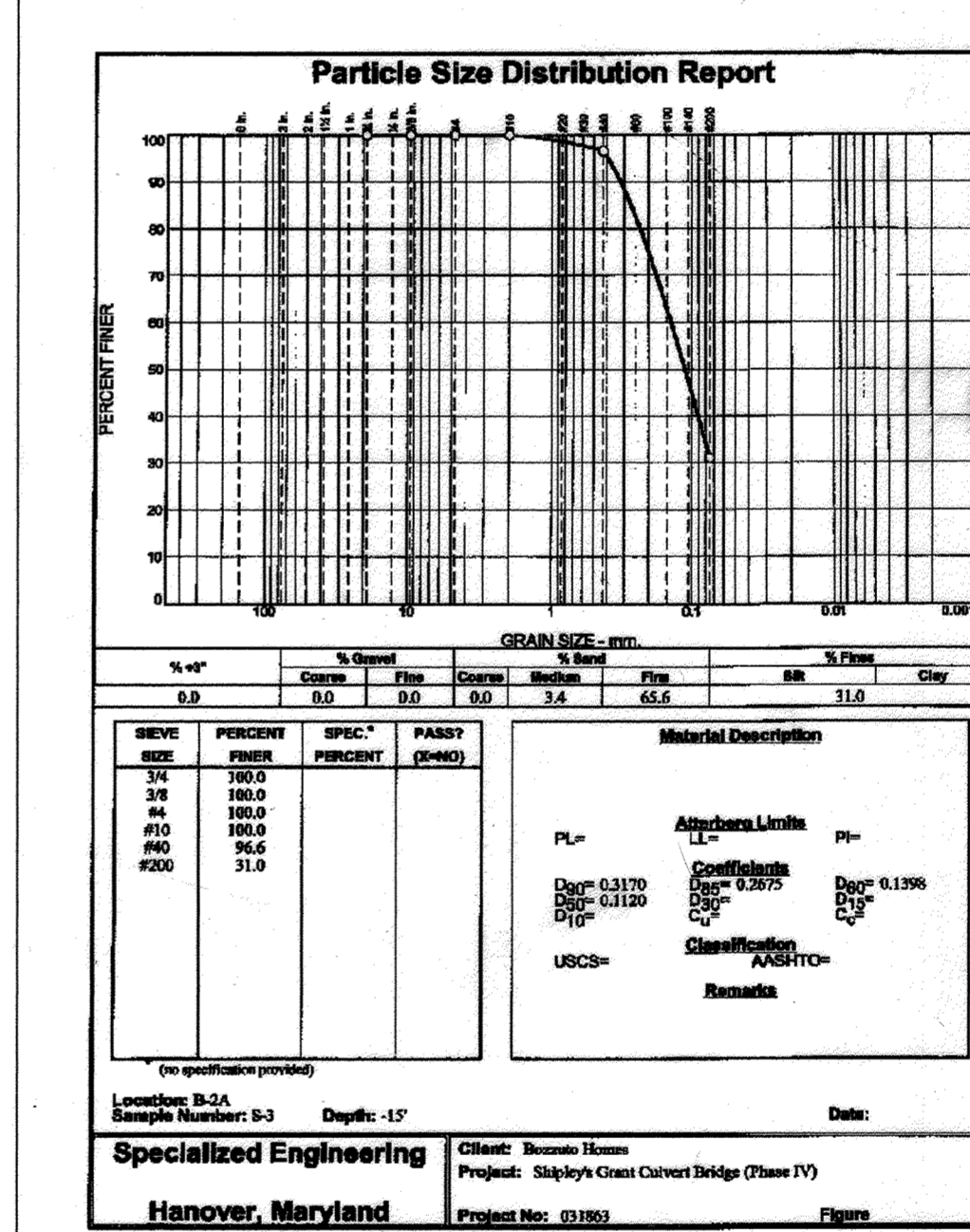
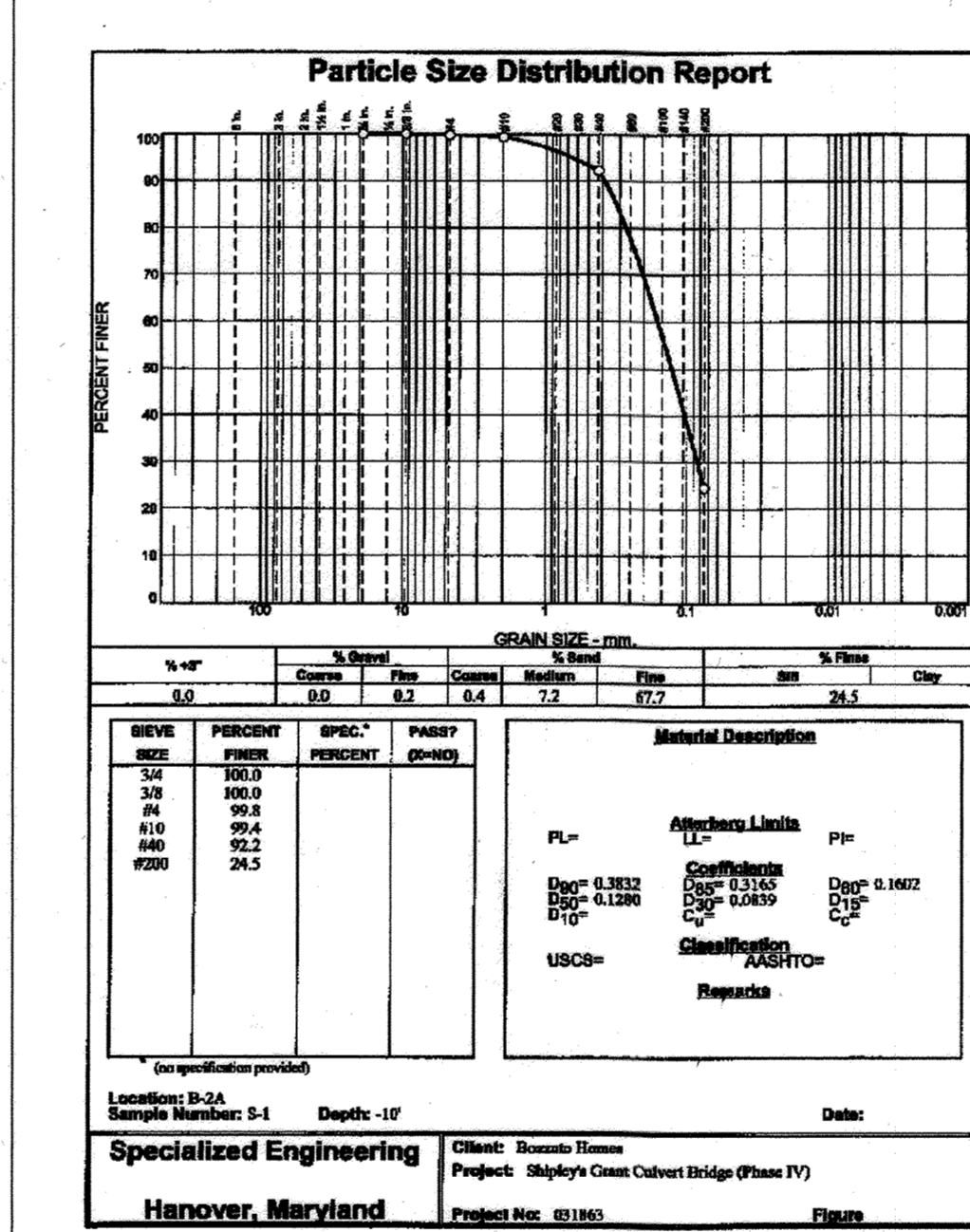
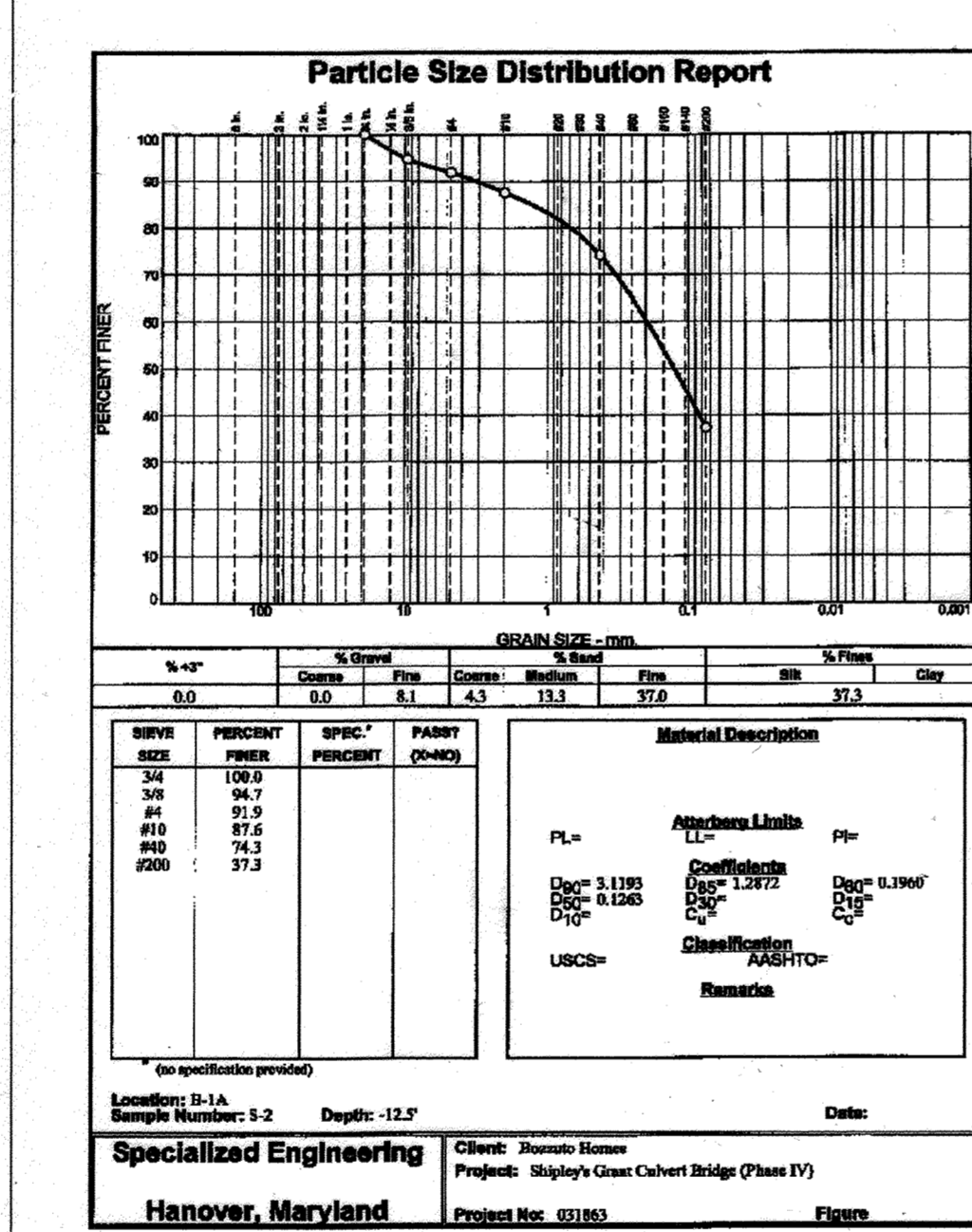
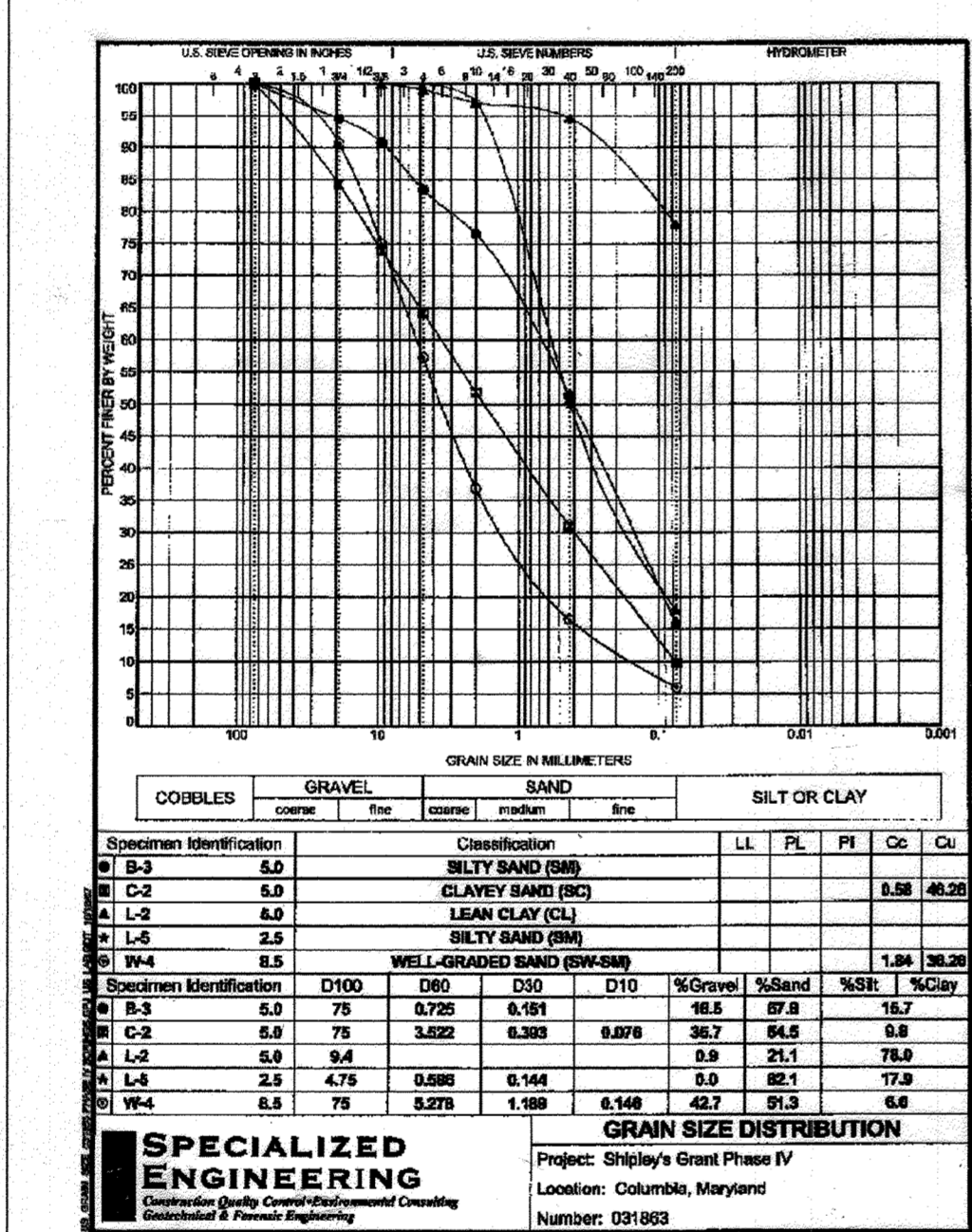
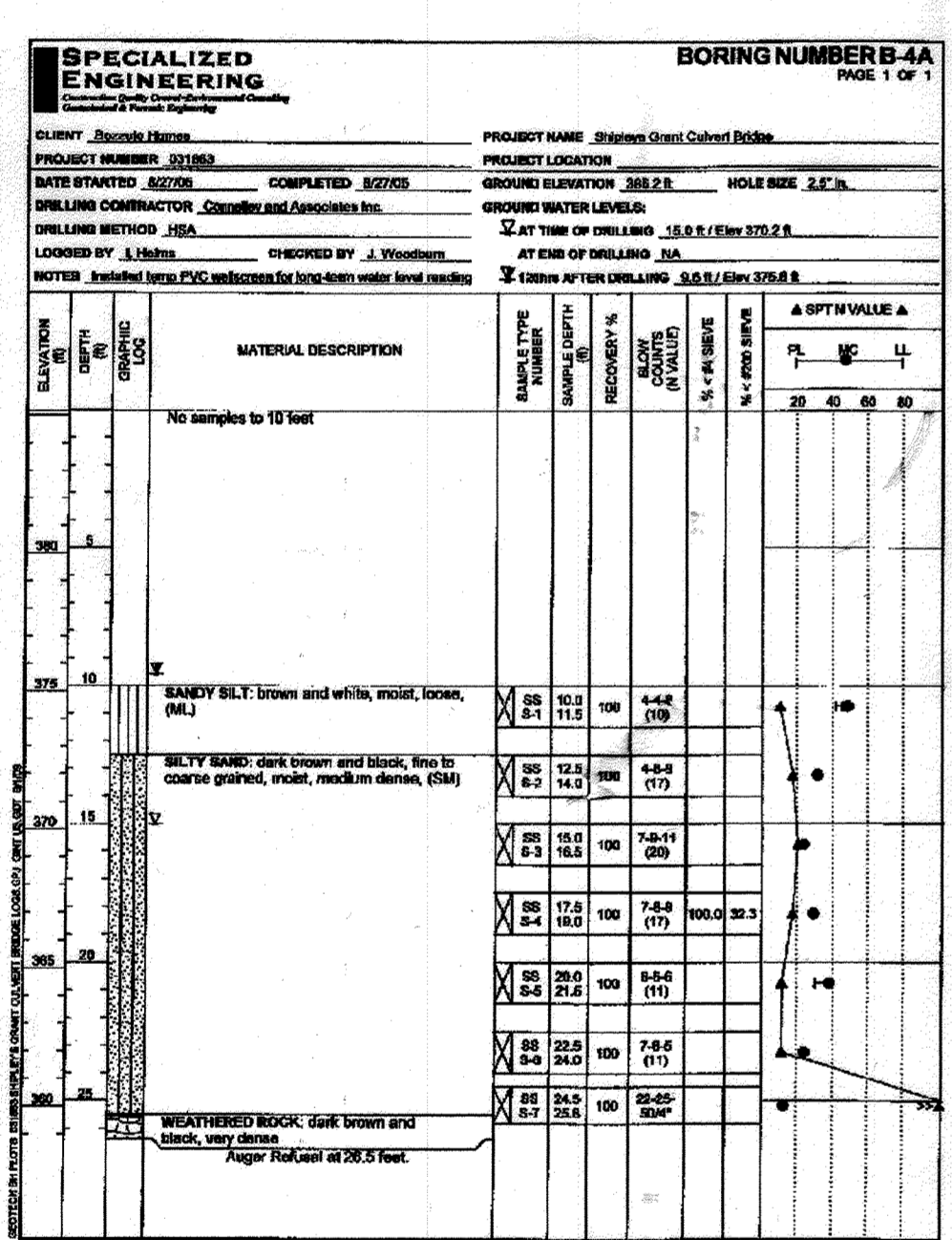
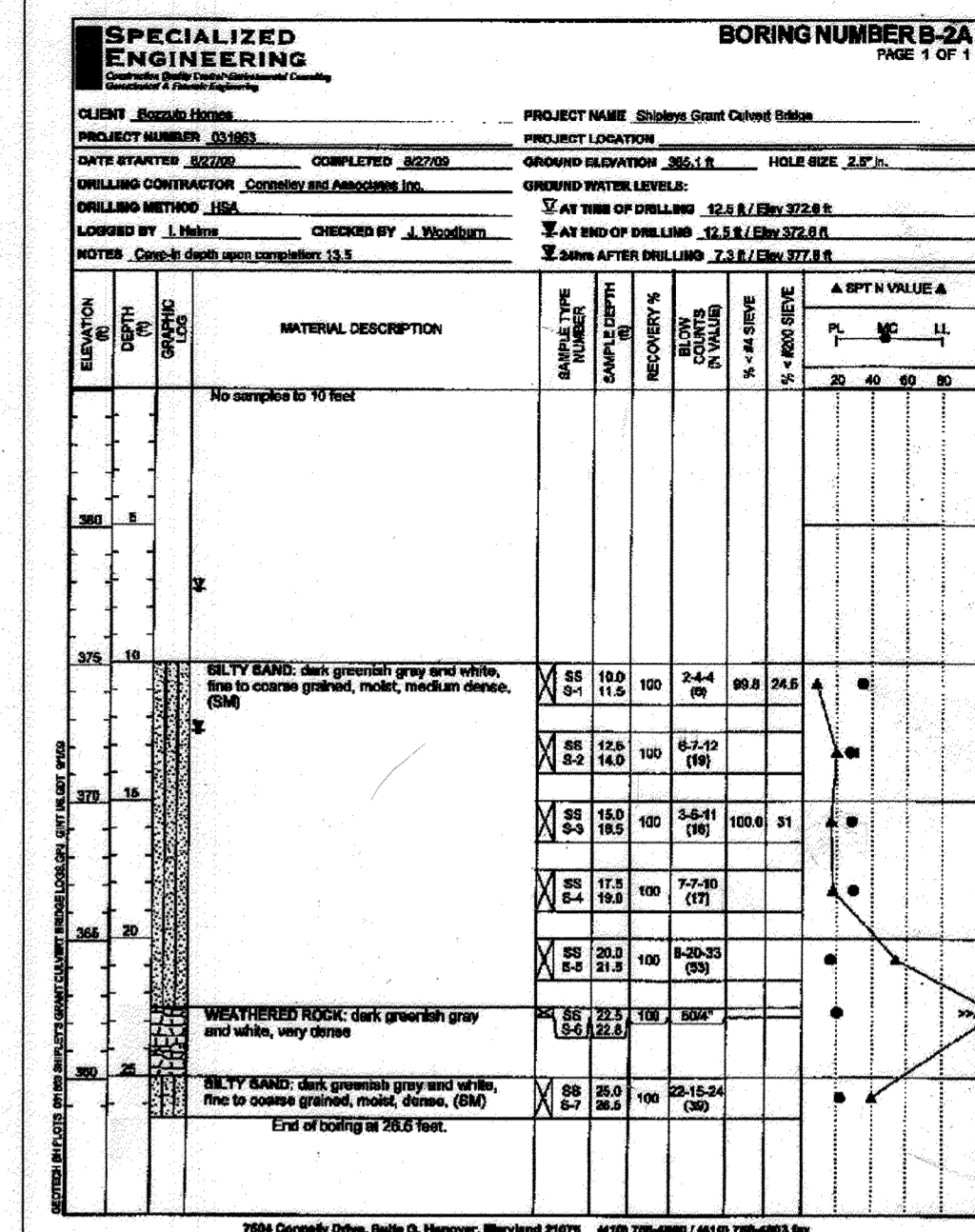
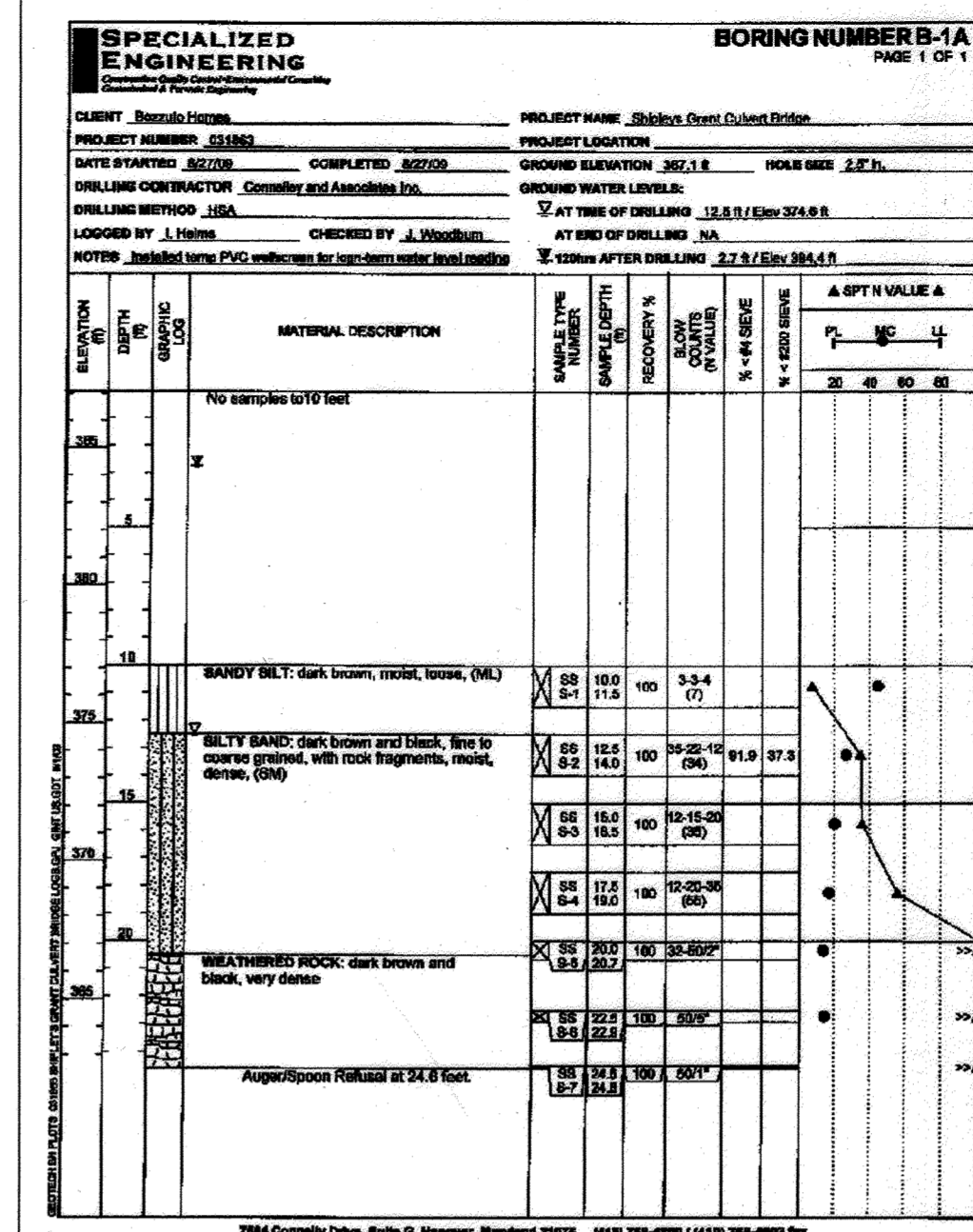
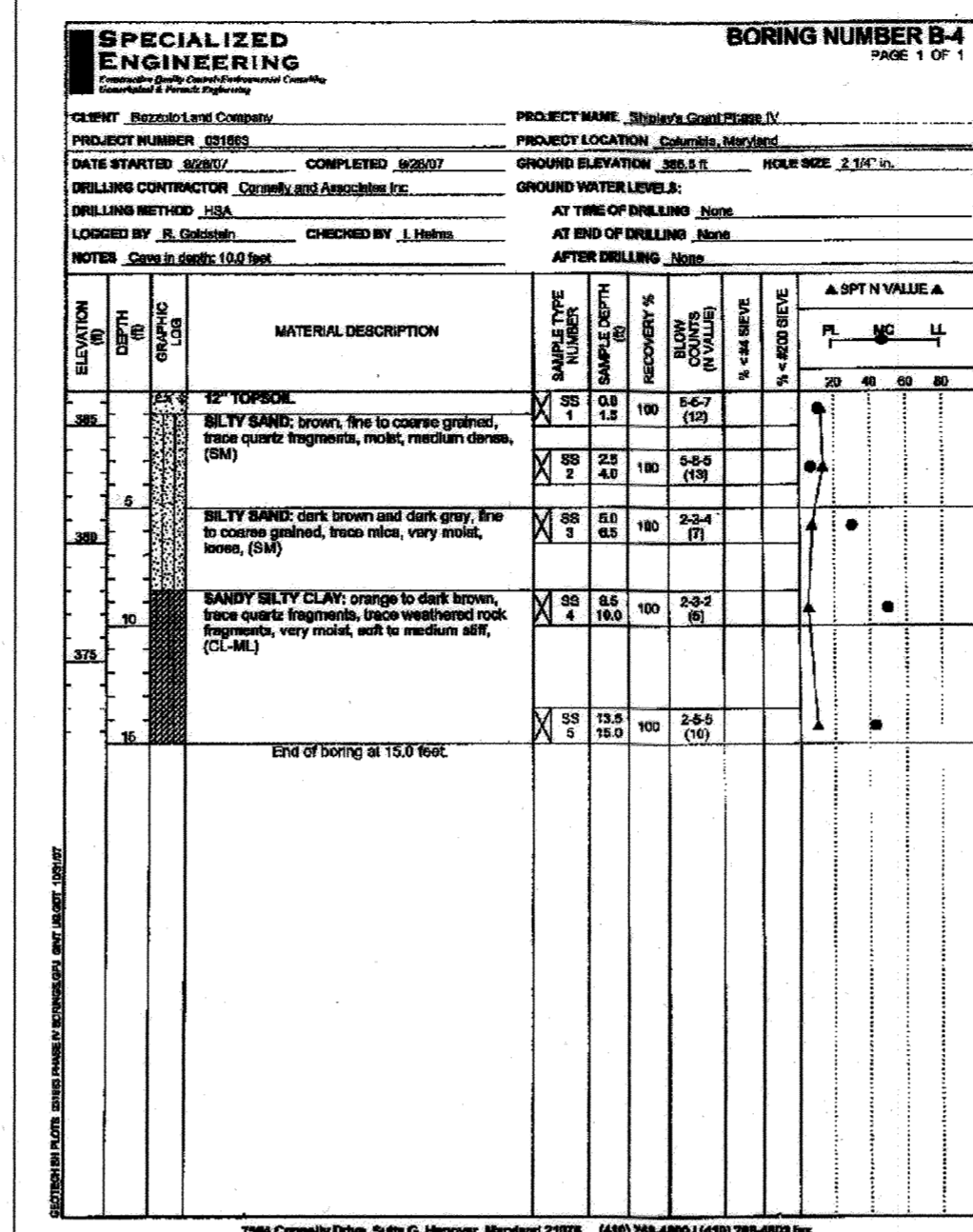
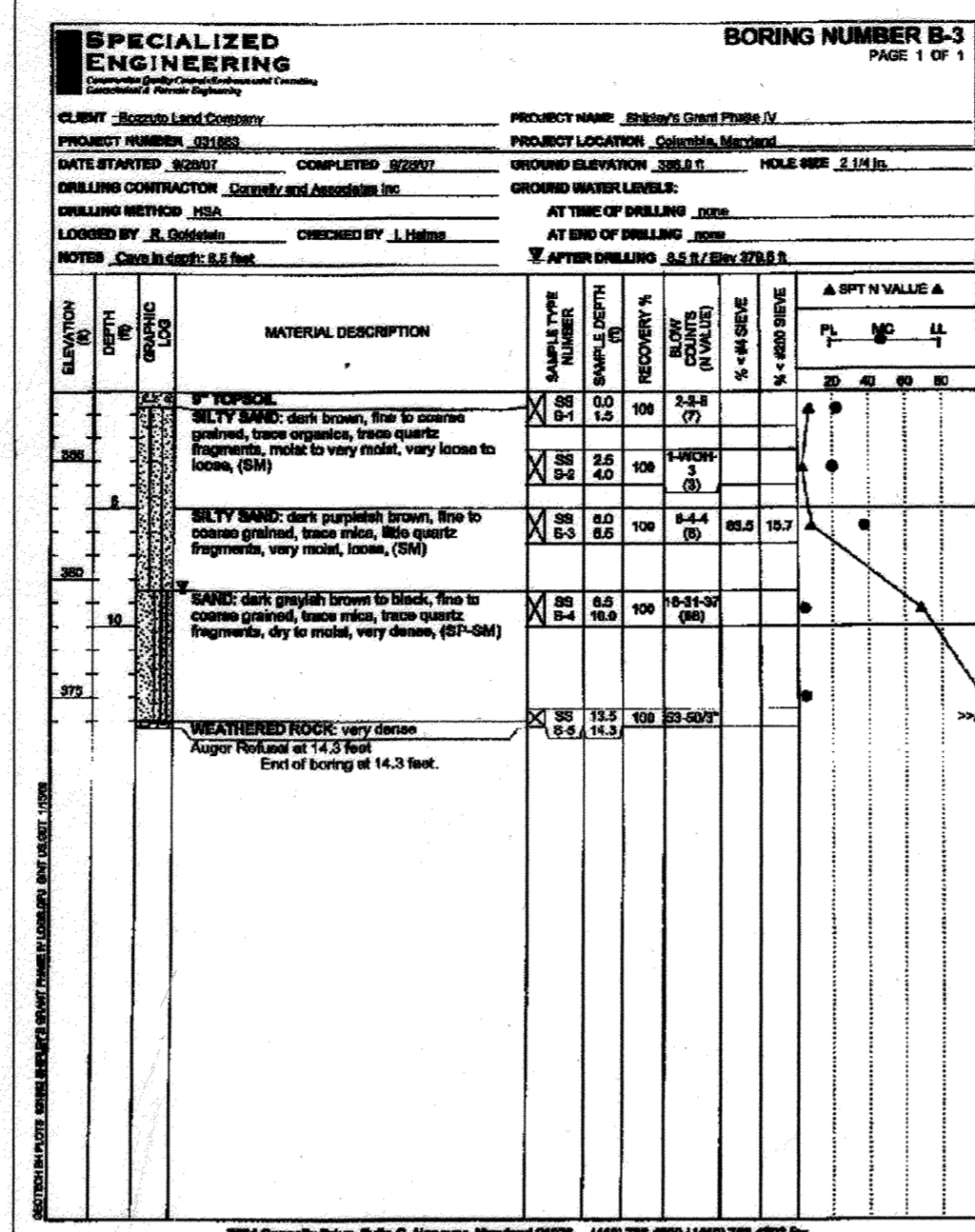
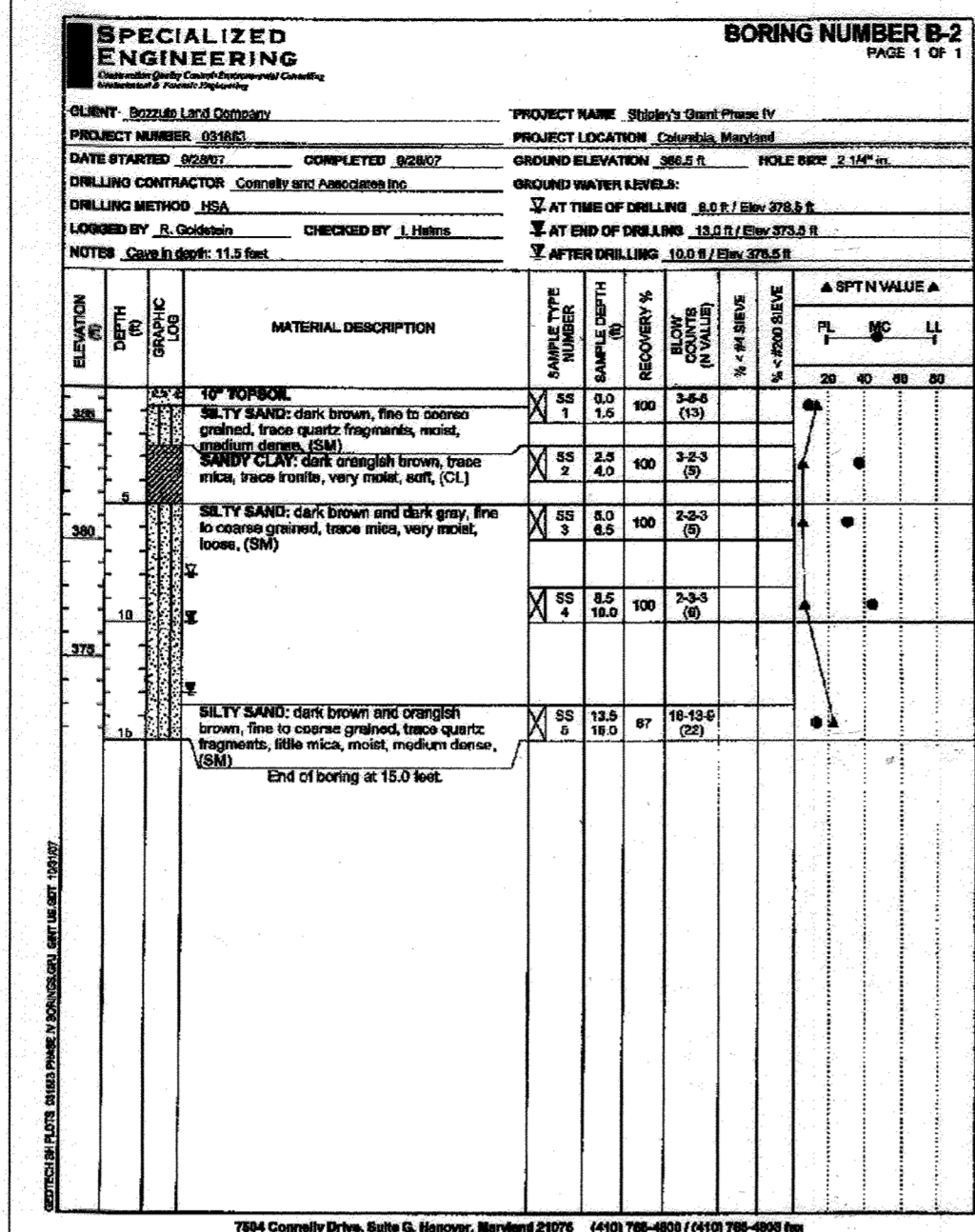
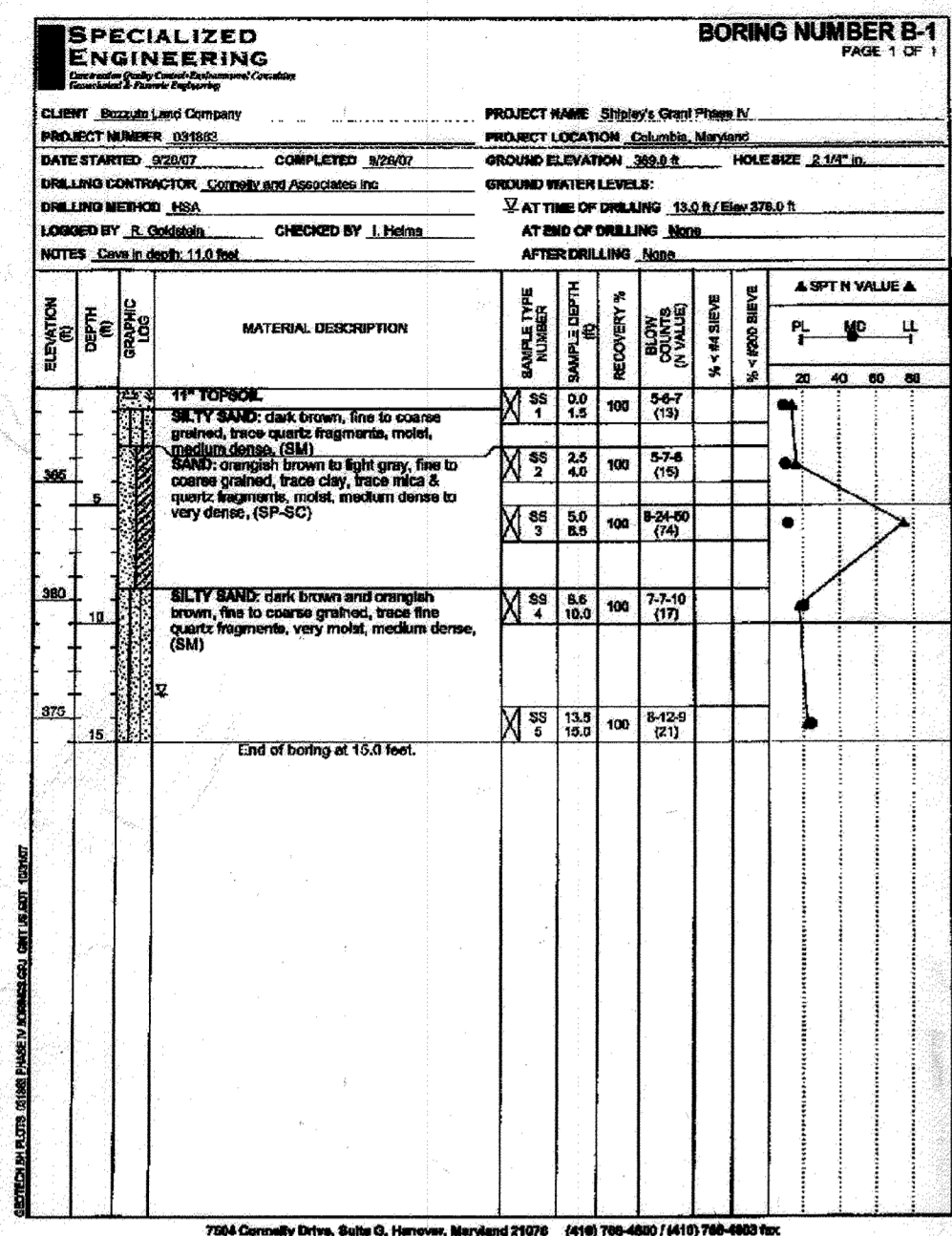
## SHIPLEY'S GRANT

PHASE IV  
LOTS C-219 THRU C-222, C-296 THRU C-302, PARCELS D-2 AND E-1,  
OPEN SPACE LOTS C-209, D-1, E-2 AND E-3 AND NON-BUILDABLE PARCELS "D-3", "D-4",  
AND NON-BUILDABLE LOT C-308  
A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 THRU C-218, "D" AND "E"

PROJECT NUMBER:	DATE:
52059	8/7/2009
DESIGNED:	DRAWN:
JAL	RJB
CHECKED:	APPROVED:
BAP	PAC
SHEET NO.:	
30	OF 31

F09-088





APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 10-23-09  
 Chief, Bureau of Highways

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING  
 [Signature] 10-27-09  
 Chief, Division of Land Development

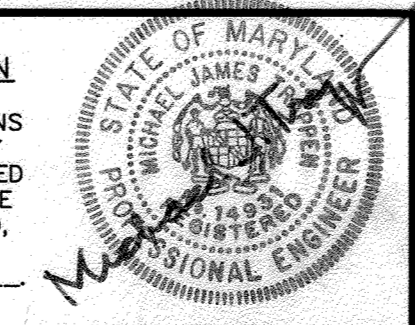
[Signature] 10/22/09  
 Chief, Development Engineering Division

**GLW GUTSCHICK LITTLE & WEBER, P.A.**  
 CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS  
 3909 NATIONAL DRIVE - SUITE 250 - BURTONSVILLE OFFICE PARK  
 BURTONSVILLE, MARYLAND 20866  
 TEL: 301-421-4024 FAX: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

Rev. Title Block Per F 10-000  
 DATE: 10/22/09

OWNER PAR C-216 thru C-218:  
 BA WATERLOO TOWNHOMES, LLC.  
 c/o BOZZUTO HOMES, INC.  
 7850 WALKER DRIVE, SUITE 400  
 GREENBELT, MARYLAND 20770  
 ATTN: DUNCAN SLIDELL  
 301-623-1525

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. 14531  
 EXPIRATION DATE: MAY 21, 2010



STREAM CROSSING STRUCTURE BORINGS  
**SHIPLEY'S GRANT**  
 PHASE IV  
 LOTS C-219 thru C-222, C-223 thru C-207, PARCELS D-2 and E-1,  
 OPEN SPACE LOTS C-207, D-1, E-2 & E-3 and NON-BUILDABLE PARCELS "D-3", "D-4",  
 and NON-BUILDABLE LOT C-208  
 A RESUBDIVISION OF NON-BUILDABLE PARCELS C-216 thru C-218, "D" and "E"

SCALE: AS SHOWN  
 ZONING: R-A-15, POR  
 G. L. W. FILE NO.: 07002  
 DATE: SEPT., 2009  
 TAX MAP - GRID: 37-1&2  
 SHEET: 31 OF 31

NO ASBUILT  
 INFORMATION  
 12/1/20