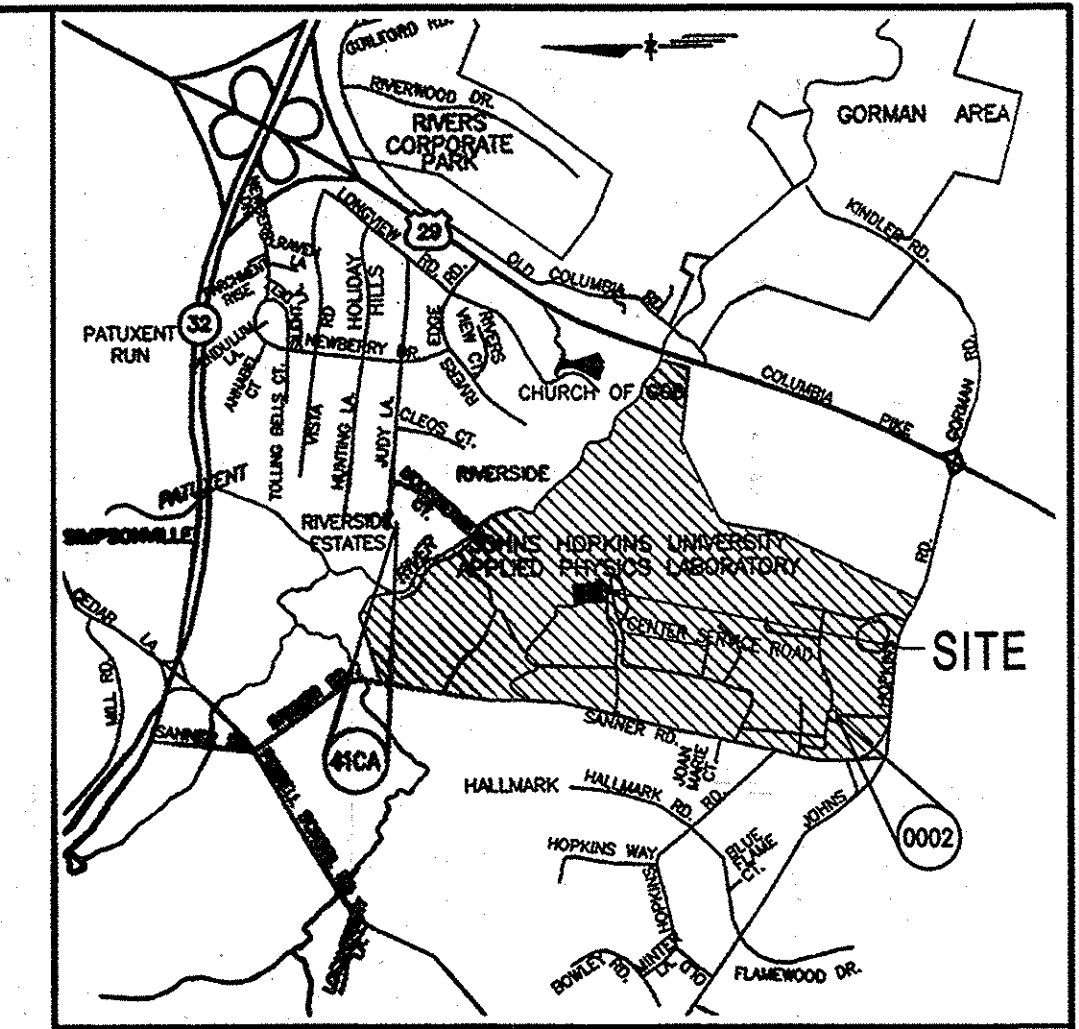
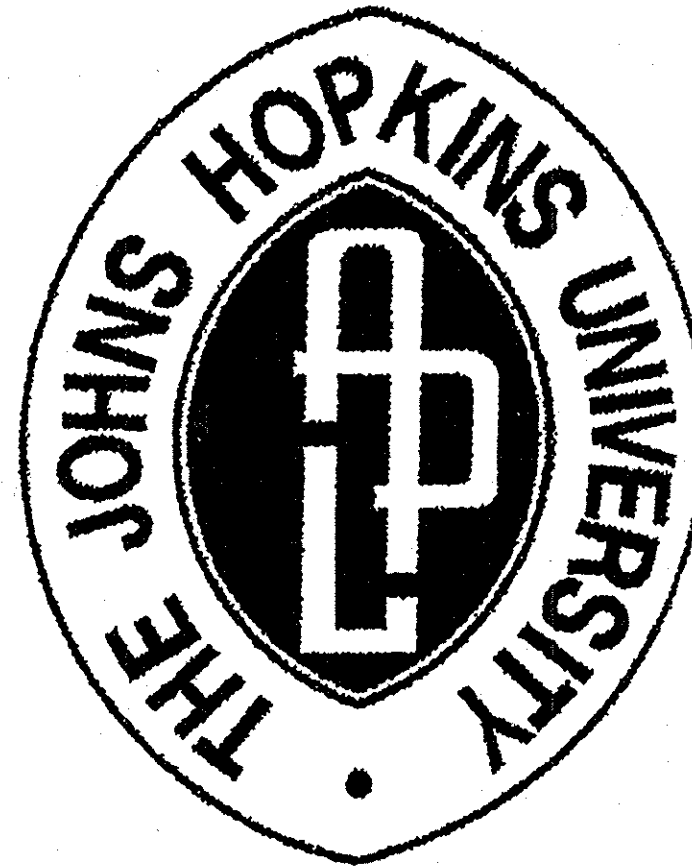


# THE JOHNS HOPKINS UNIVERSITY



VICINITY MAP

Scale: 1"=2000'

GEODETIC CONTROL  
 0002: N 544836.5284 E 1340825.353 NOVD ELEV. 444.991  
 41CA: N 550124.8623 E 1342960.8820 NOVD ELEV. 295.397  
 ADC MAP 19, GRID A2

# APPLIED PHYSICS LABORATORY

## LEGEND

EX. MINOR CONTOUR	---	391
EX. MAJOR CONTOUR	---	390
EX. SPOT ELEVATION	X	387.6
EX. FIRE HYDRANT	⊕	
EX. STORM DRAIN	SD	
EX. WATER LINE	W	W
EX. SANITARY SEWER	S	S
EX. ELECTRIC LINE	Elec	
EX. COMMUNICATIONS LINE		
EX. MANHOLE	o	
EX. INLET	□	
EX. TREE LINE	~	
EX. BUILDING	▭	
EX. CURB AND GUTTER	---	
EX. BITUMINOUS PAVING	▨	
EX. CONCRETE SIDEWALK	▩	
EX. FENCE	X	X
EX. WALL	▬	
EX. CLEANOUT	o	
EX. LIGHT STANDARD	⊕	
EX. BUSH	⊕	
EX. TREE	⊕	
EX. PIPE BOLLARD	⊕	
EX. UTILITY POLE	⊕	
PROP. MINOR CONTOUR	---	379
PROP. MAJOR CONTOUR	---	380
PROP. SPOT ELEVATION	X	+385.58
PROP. CURB & GUTTER	---	

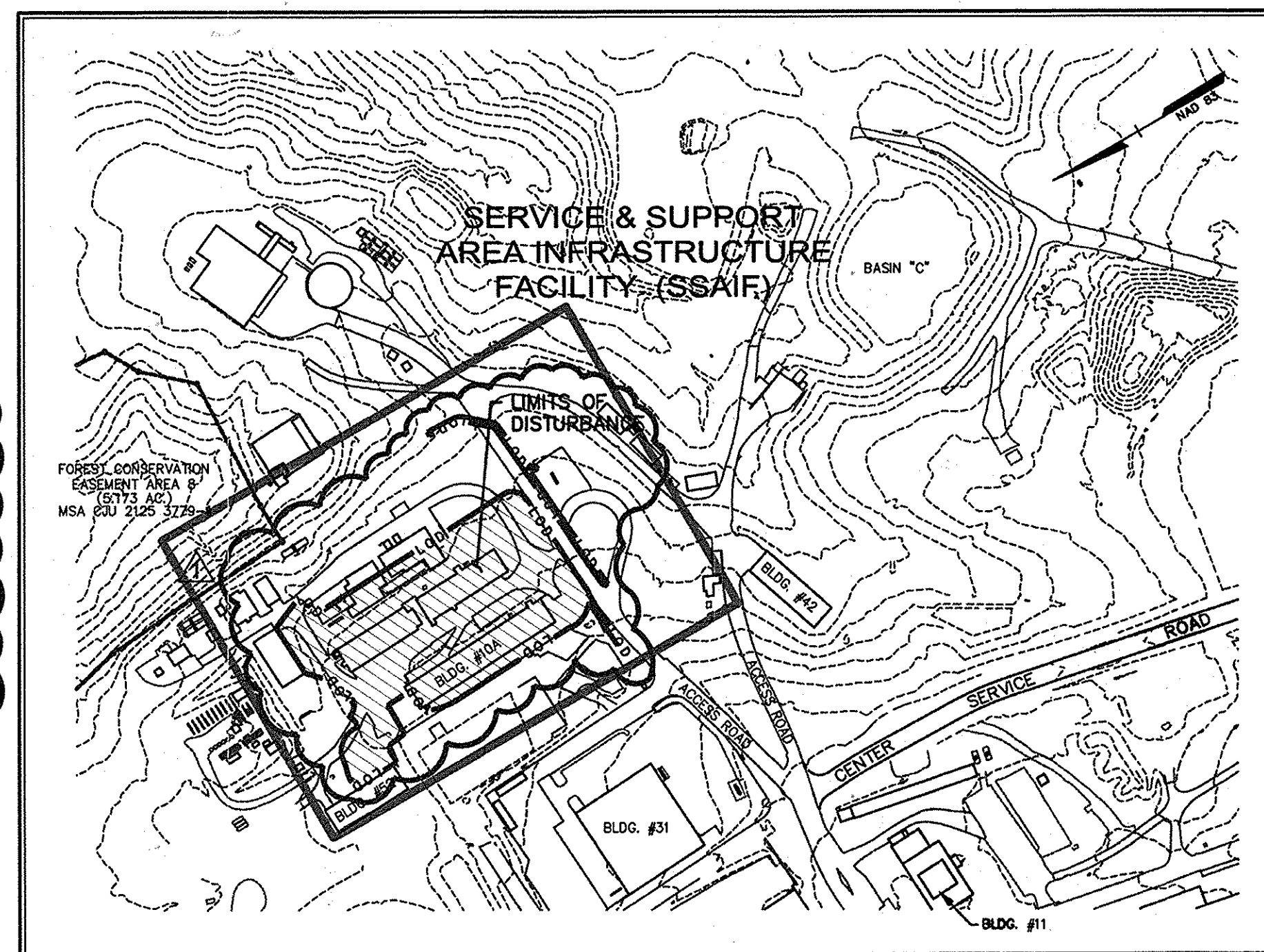


FOR REVISION

NOTE:  
 THIS RED LINE SUBMISSION RELOCATES SOME OF THE ON-SITE UTILITIES, REMOVES BUILDINGS 10A, 10B, AND 10C, AND SHOWS THE LOCATION OF THE EROSION CONTROLS

### SHEET INDEX

1	COVER SHEET
2	SITE PLAN
3	GRADING PLAN
4	UTILITY PLAN
5	UTILITY PROFILES AND NOTES
6	STORM DRAIN DRAINAGE AREA MAP AND FLOW TABULATIONS
7	EROSION & SEDIMENT CONTROL PLAN
8	EROSION & SEDIMENT CONTROL DRAINAGE AREA MAP
9	EROSION & SEDIMENT CONTROL SPECIFICATIONS AND NOTES
10	EROSION & SEDIMENT CONTROL DETAILS
11	SITE DETAILS
12	CHANGE IN IMPERVIOUS SURFACES PLAN
13	LOADING DOCK & CANOPY PLAN & DETAILS
14	LOADING DOCK & CANOPY PLAN & DETAILS



LOCATION MAP

Scale: 1"=200'

## SITE ANALYSIS CHART

- A. TOTAL PROJECT AREA: (JHU/APL CAMPUS) 357.98 ACRES/15,593,609 SQ.FT.
- B. AREA OF PLAN SUBMISSION: (SSAIF SITE) 1.72 AC.
- C. LIMIT OF DISTURBED AREA: 1.72 AC.
- D. PRESENT ZONING DESIGNATION: PEC
- E. PROPOSED USES FOR SITE AND STRUCTURES: RESEARCH CAMPUS PARK
- F. FLOOR SPACE ON EACH LEVEL OF BUILDING(S) PER USE: N/A
- G. TOTAL NUMBER OF UNITS ALLOWED FOR PROJECT AS SHOWN ON FINAL PLAT: N/A
- H. TOTAL NUMBER OF UNITS PROPOSED ON SUBMISSION: N/A
- I. MAXIMUM NUMBER OF EMPLOYEES, TENANTS ON SITE PER USE: 3937
- J. NUMBER OF PARKING SPACES REQUIRED BY HOWARD COUNTY ZONING REGULATIONS AND/OR FDP CRITERIA: 2450 (SDP-09-11)
- K. NUMBER OF PARKING SPACES PROVIDED ON SITE: 4940 (SDP-0466)
- L. OPEN SPACE ON SITE: N/A
- M. AREA OF RECREATION OPEN SPACE REQUIRED BY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS: N/A
- N. BUILDING COVERAGE OF SITE: N/A
- O. APPLICABLE DPZ FILE REFERENCES: N/A
- P. ANY OTHER INFORMATION WHICH MAY BE RELEVANT: N/A
- Q. FLOOR AREA RATIO (FAR): N/A

## PREVIOUS SDP AND FINAL PLAN REFERENCES

- SDP-04-76: SERVICES AREA COMPLEX
- F-02-40: SWM BASIN 'A', AFFO, FOREST CONSERVATION
- SDP-04-35: SWM BASIN 'G'
- SDP-90-218: BUILDING NO. 31 AND SWM BASIN 'G'
- SDP-09-63: B52
- F-02-77: SWM BASIN 'B'
- SDP-04-66: MAIN PARKING LOT
- SDP-04-133: BASIN 'C' SWM FACILITIES AND LAYDOWN AREA
- SDP-05-042: JHU/LIBRARIES SERVICE CENTER (FOREST CONSERVATION AND WETLANDS UPDATES)
- SDP-03-043: SANNER ROAD IMPROVEMENTS (NEW AFFO NUMBER 4,600)
- SDP-05-050: BUILDINGS 12 AND 15, CENTER SERVICE ROAD AND 53-3
- SDP-05-133: PRECINCT 21, BUILDINGS 21 AND 43 (PARKING RATIO 1.62/1000)
- SDP-07-080: MP-8 CONDUIT PATHWAY
- F-04-106: FOREST CONSERVATION EASEMENT RE-PLAT
- F-04-140: SANNER ROAD SWM, STORM DRAINS AND UTILITY EASEMENT
- F-07-035: FOREST CONSERVATION, RE-PLAT EASEMENT
- SDP-08-061: CENTRAL GREEN PHASE II

## PURPOSE OF PLAN

THIS SITE DEVELOPMENT PLAN IS FOR THE FIRST PHASE OF THE DEVELOPMENT OF THE SERVICE AND SUPPORT AREA INFRASTRUCTURE FACILITY. THIS FACILITY WILL ULTIMATELY SERVE AS A CENTRAL CAMPUS BASE FOR THE COLLECTION OF SURPLUS MATERIALS AND RECYCLING. PHASE ONE WILL COVER THE CONSTRUCTION OF THE LOADING DOCK AND TRANSFER PLATFORM FOR RECYCLED MATERIALS.

## 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 NUMBER: 20906 EXPIRATION DATE: 2/28/17

## 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 NUMBER: 32514 EXPIRATION DATE: 1/16/18

## APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division  
 Chief, Division of Land Development  
 Director

2-22-16  
 3-01-16  
 3-2-16  
 Date

**CENTURY ENGINEERING**  
 CONSULTING ENGINEERS - PLANNERS  
 10710 Gilroy Road, Hunt Valley, MD 21031  
 Phone: 443.589.2400 Fax: 443.589.2401



DESIGN BY:	A.J.D.		
DRAWN BY:	M.C.A./M.S.S.		
CHECKED BY:			
DATE:	7/18/08		
REVISION			
BY	NO.	REVISION	DATE
		RELOCATION OF UTILITIES AND REMOVAL OF BUILDINGS 10A, 10B, 10C	1/15/16

## THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY

11100 JOHNS HOPKINS ROAD  
 LAUREL, MARYLAND 20723-6099  
 443-778-5134

**COVER SHEET**  
**SERVICE & SUPPORT AREA INFRASTRUCTURE FACILITY PHASE I**  
 TAX MAP: 41 GRID: 18 PARCEL: 123  
 ELECTION DISTRICT 5-05 HOWARD COUNTY, MARYLAND  
 SHEET 1 OF 14

C.E.I. PROJECT NUMBER 22172.26  
 SCALE: AS SHOWN

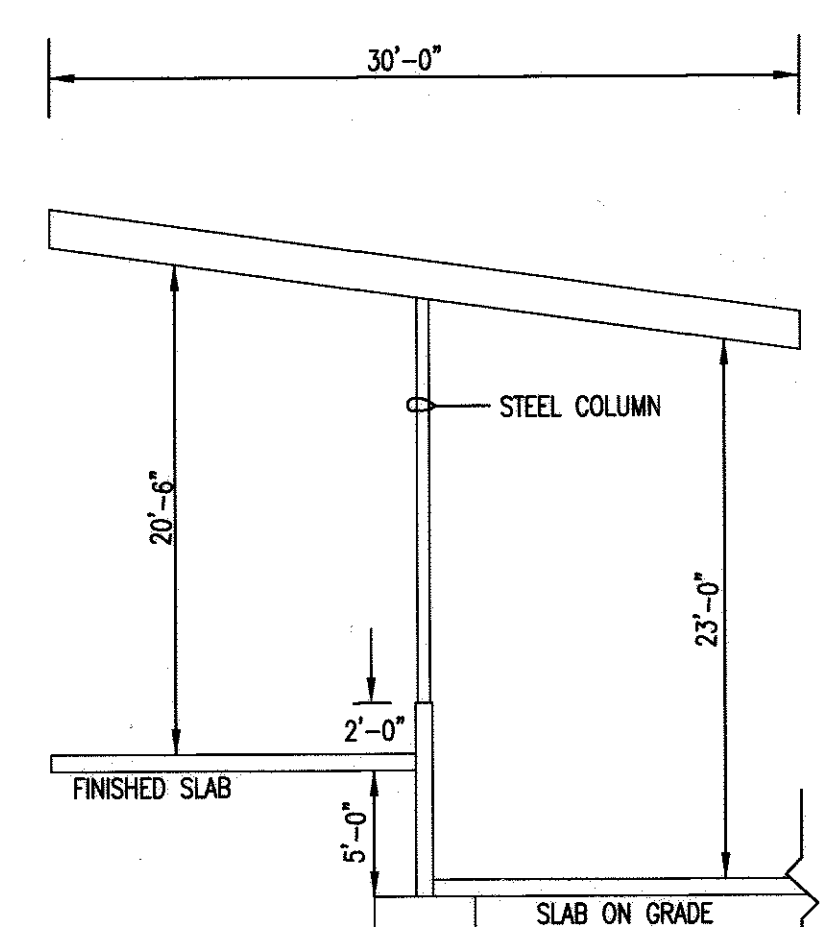
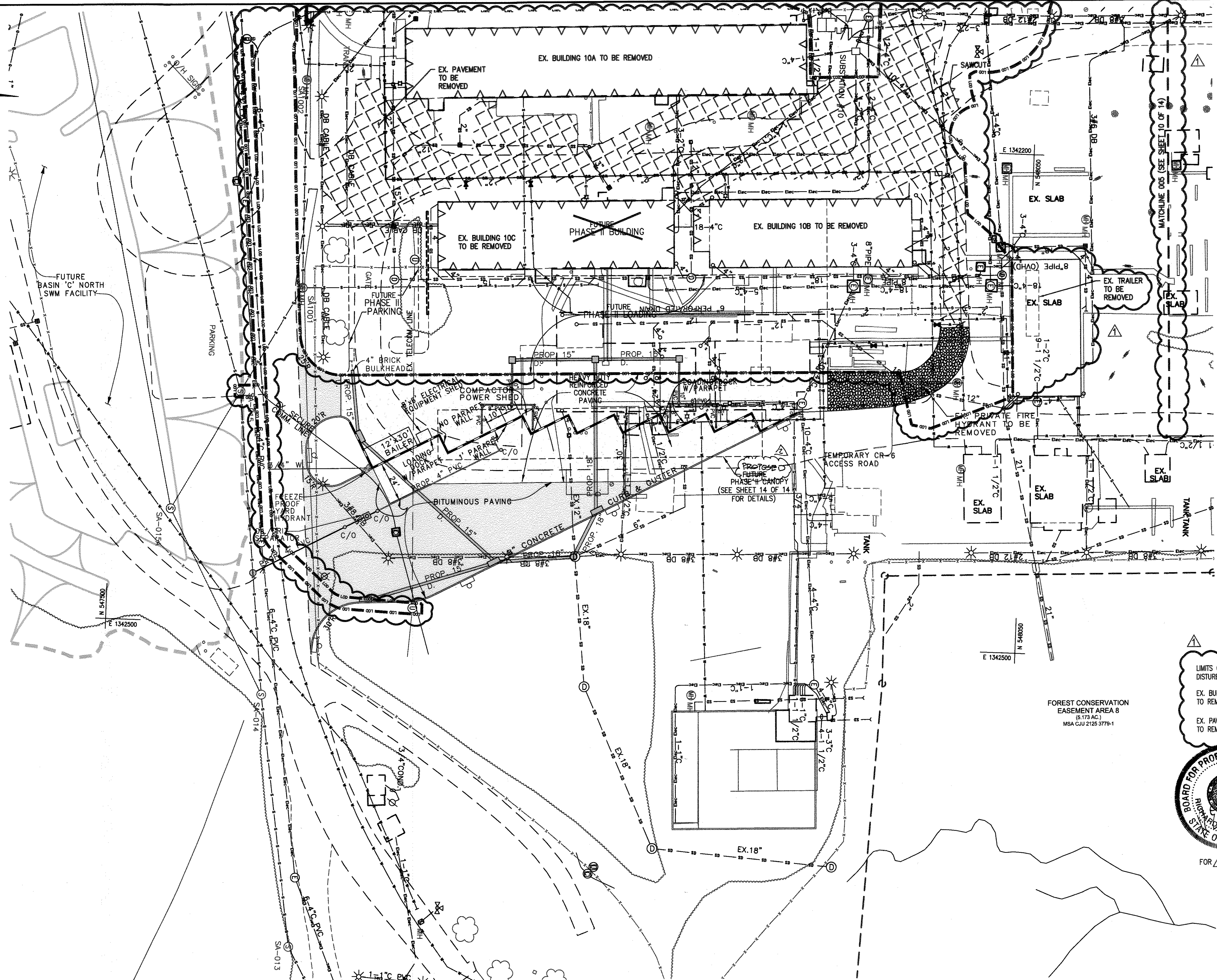
ADDRESS CHART	
LOT/PARCEL No.	STREET ADDRESS
1	11100 JOHNS HOPKINS ROAD

PERMIT INFORMATION CHART			
SUBMISSION NAME	SECTION/AREA	LOT/PARCEL No.	
JOHNS HOPKINS UNIV.-APL	N/A	1	
PLAN OR L.P.	16	TAX MAP No.	41
15429/15433	16	ELECT. DISTRICT	5-05
		CONDS TRACT	605102
WATER CODE	E-21	SEWER CODE	6480000



NAD 83



**PROPOSED FUTURE PHASE 2 CANOPY SCHEMATIC**  
 NOT TO SCALE  
 (SEE SHEET 14 OF 14 FOR DETAILS)

**LEGEND**

- EX. CONCRETE SIDEWALK
- EX. FENCE
- EX. WALL
- EX. TREE LINE
- EX. BUILDING TO REMOVED
- EX. CURB AND GUTTER
- EX. BITUMINOUS PAVING
- EX. RETAINING WALL TO REMAIN
- PROP. CURB & GUTTER
- PROP. A.D.A. COMPLIANT MULCH SIDEWALK
- PROPOSED PAVING
- PROPOSED REPAVING
- EX. LIGHT FIXTURES
- BITUMINOUS ASPHALT PAVING
- REINFORCED CONCRETE PAVING
- LOADING DOCK W/ PARAPET
- LOADING DOCK W/O PARAPET
- TRENCH DRAIN
- FUTURE STRUCTURE (SEE SHEET 14 OF 14)
- PROPOSED LIGHT FIXTURE



FOR REVISION

**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 NUMBER: 20906 EXPIRATION DATE: 2/28/2017

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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 NUMBER: 32574 EXPIRATION DATE: 1/16/18

**JHU/APL INTERNAL USE**  
 THIS DATA SHALL NOT BE DISCLOSED TO A THIRD PARTY AND SHALL NOT BE DUPLICATED, USED, OR DISCLOSED IN WHOLE OR IN PART FOR ANY PURPOSE OTHER THAN TO EVALUATE THIS RFP OR, IN THE CASE OF A CONTRACT AWARD, TO PERFORM THE WORK REQUIRED HEREUNDER, WITHOUT THE EXPRESS WRITTEN CONSENT OF JHU/APL.

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 Chief, Development Engineering Division  
 Chief, Division of Land Development  
 Director

**CENTURY ENGINEERS - PLANNERS**  
 CONSULTING ENGINEERS - PLANNERS  
 10710 Gilroy Road, Hunt Valley, MD 21031  
 Phone: 443.589.2400 Fax: 443.589.2401



DESIGN BY:	A.J.D.
DRAWN BY:	M.S.S./M.C.A.
CHECKED BY:	REB
DATE:	7/18/08
REVISION	NOTED CANOPY AS PROPOSED 2/3/17
REVISION	REMOVAL OF PAVEMENT, EX. BURIED SLABS, AND BUILDINGS 10A, 10B, AND 10C 1/15/18
BY	NO.
DATE	

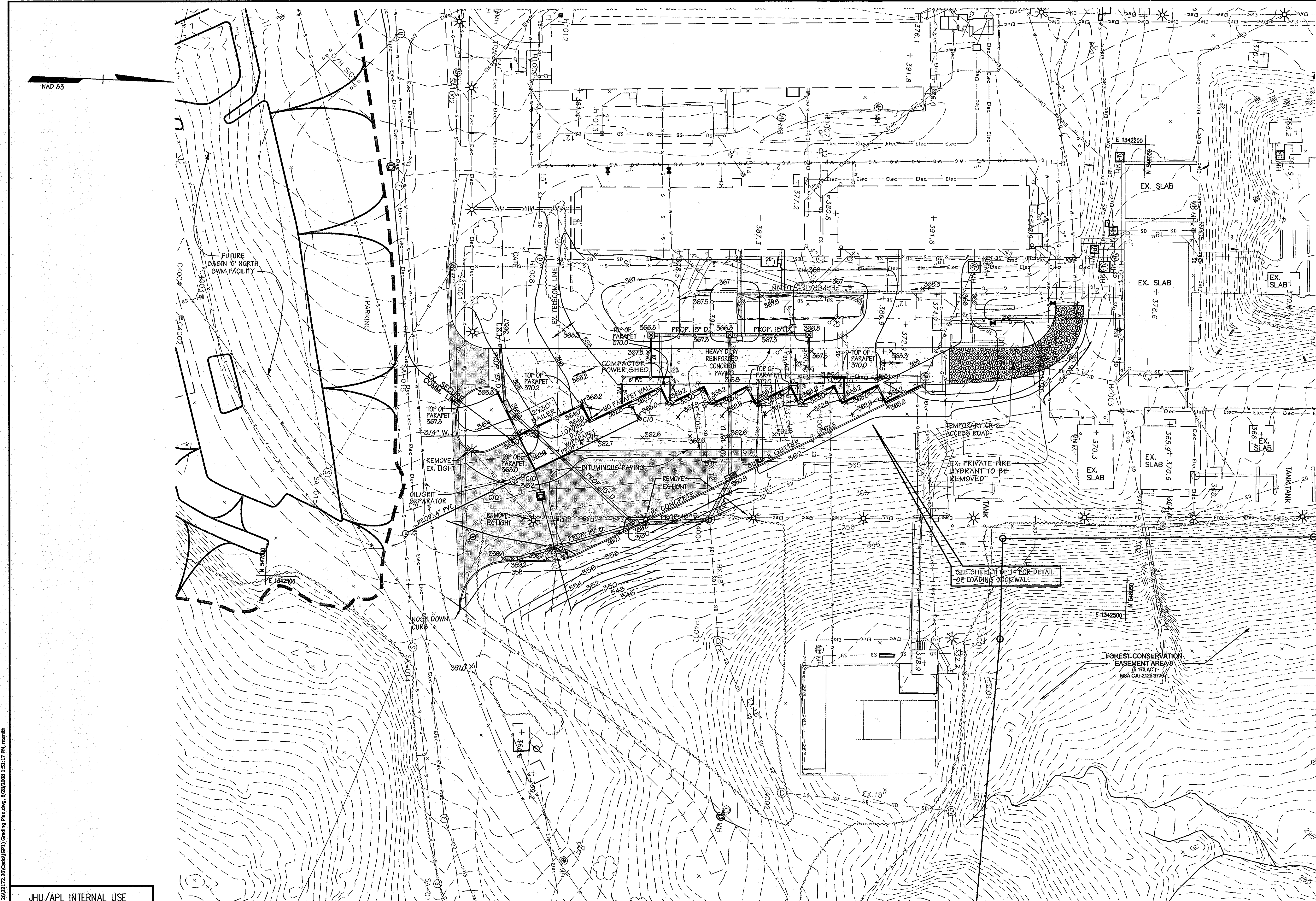
**THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY**  
 11100 JOHNS HOPKINS ROAD  
 LAUREL, MARYLAND 20723-6099  
 443-778-5134

**SITE PLAN SERVICE & SUPPORT AREA INFRASTRUCTURE FACILITY PHASE I**  
 TAX MAP: 41 GRID: 18 PARCEL: 123  
 ELECTION DISTRICT 5-05 HOWARD COUNTY, MARYLAND  
 SHEET 2 OF 14

C.E.I. PROJECT NUMBER 22172.26  
 SCALE: 1"=30'



NAD 83



**LEGEND**

- EX. CONCRETE SIDEWALK
- EX. FENCE
- EX. WALL
- EX. TREE LINE
- EX. BUILDING
- EX. CURB AND GUTTER
- EX. BITUMINOUS PAVING
- EX. RETAINING WALL TO REMAIN
- PROP. CURB & GUTTER
- PROP. A.D.A. COMPLIANT MULCH SIDEWALK
- PROPOSED PAVING
- PROPOSED REPAVING
- LIGHT FIXTURES
- BITUMINOUS ASPHALT PAVING
- REINFORCED CONCRETE PAVING
- LOADING DOCK W/ PARAPET
- LOADING DOCK W/O PARAPET
- TRENCH DRAIN

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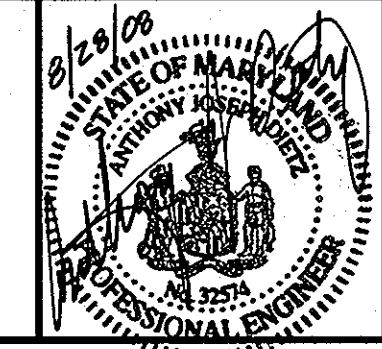
LICENSE NUMBER: 32514 EXPIRATION DATE: 1/16/10

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APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 10/12/08  
 10/15/08  
 10/15/08

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 10710 Gilroy Road, Hunt Valley, MD 21031  
 Phone: 443.589.2400 Fax: 443.589.2401



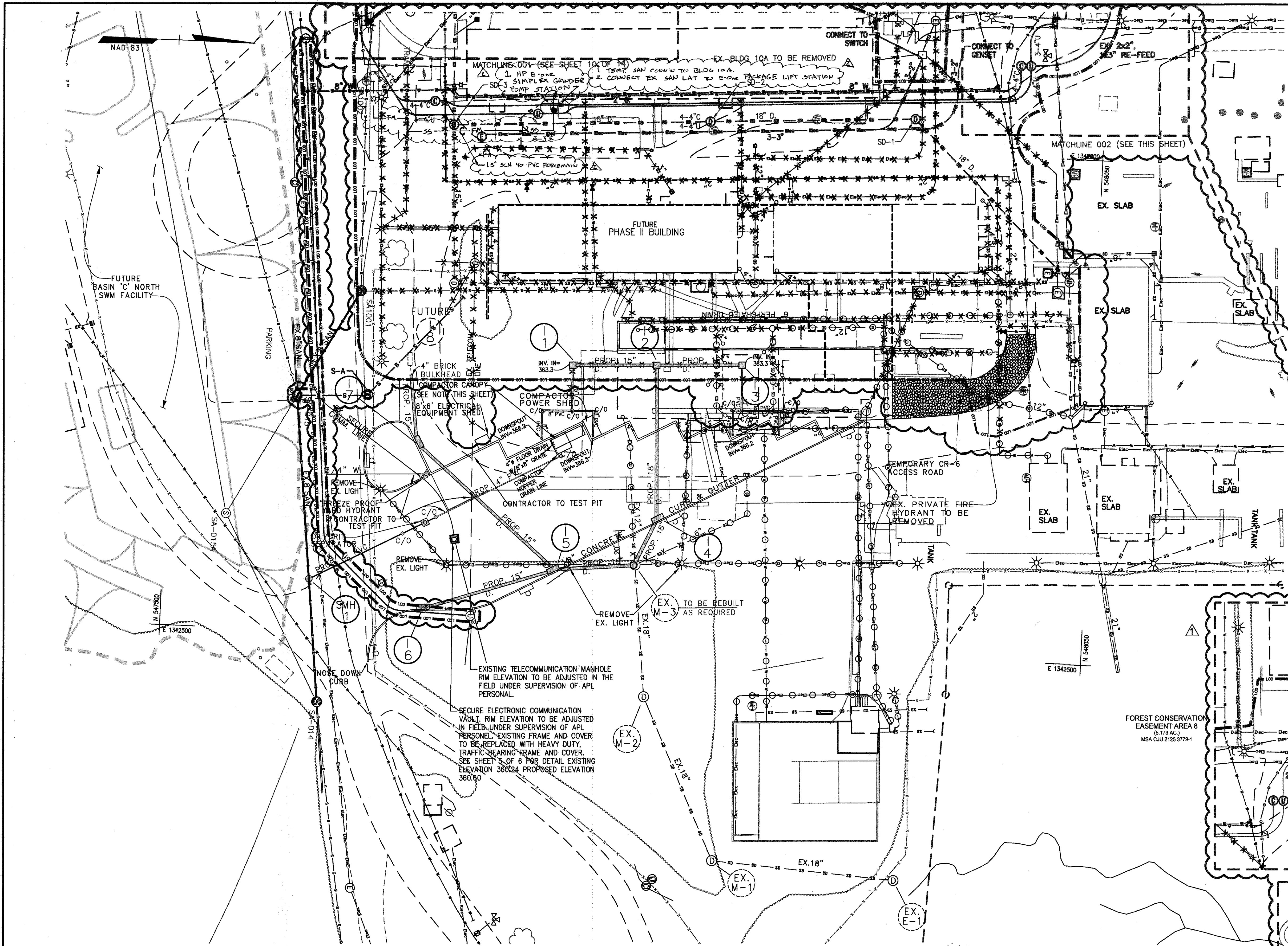
DESIGN BY:	A.J.D.			
DRAWN BY:	M.S.S./M.C.A.			
CHECKED BY:				
DATE:	7/18/08	BY	NO.	REVISION

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 LAUREL, MARYLAND 20723-6099  
 443-778-5134

**GRADING PLAN  
 SERVICE & SUPPORT AREA  
 INFRASTRUCTURE FACILITY PHASE I**  
 TAX MAP: 41 GRID: 16 PARCEL: 123  
 ELECTION DISTRICT 5-05 HOWARD COUNTY, MARYLAND  
 SHEET 3 OF 14

C.E.I. PROJECT NUMBER  
 22172.26  
 SCALE:  
 1"=30'





**SANITARY SEWER STRUCTURE SCHEDULE**

STRUCTURE NUMBER	TOP ELEV.	INVERT IN	INVERT IN	INVERT OUT	STRUCTURE TYPE	HOWARD CO. STD. DETAIL No.
SMH-1	*	351.84	352.54	351.84	4'-0" DIA. PRE-CAST	GS-14

**SANITARY SEWER STRUCTURE SCHEDULE (REDLINE REVISION)**

STRUCTURE NUMBER	TOP ELEV.	INVERT IN	INVERT IN	INVERT OUT	STRUCTURE TYPE	HOWARD CO. STD. DETAIL No.
S-A	365.20	359.39		359.39	CLEANOUT LAMPHOLE	S-3.21

**STORM DRAIN STRUCTURE SCHEDULE**

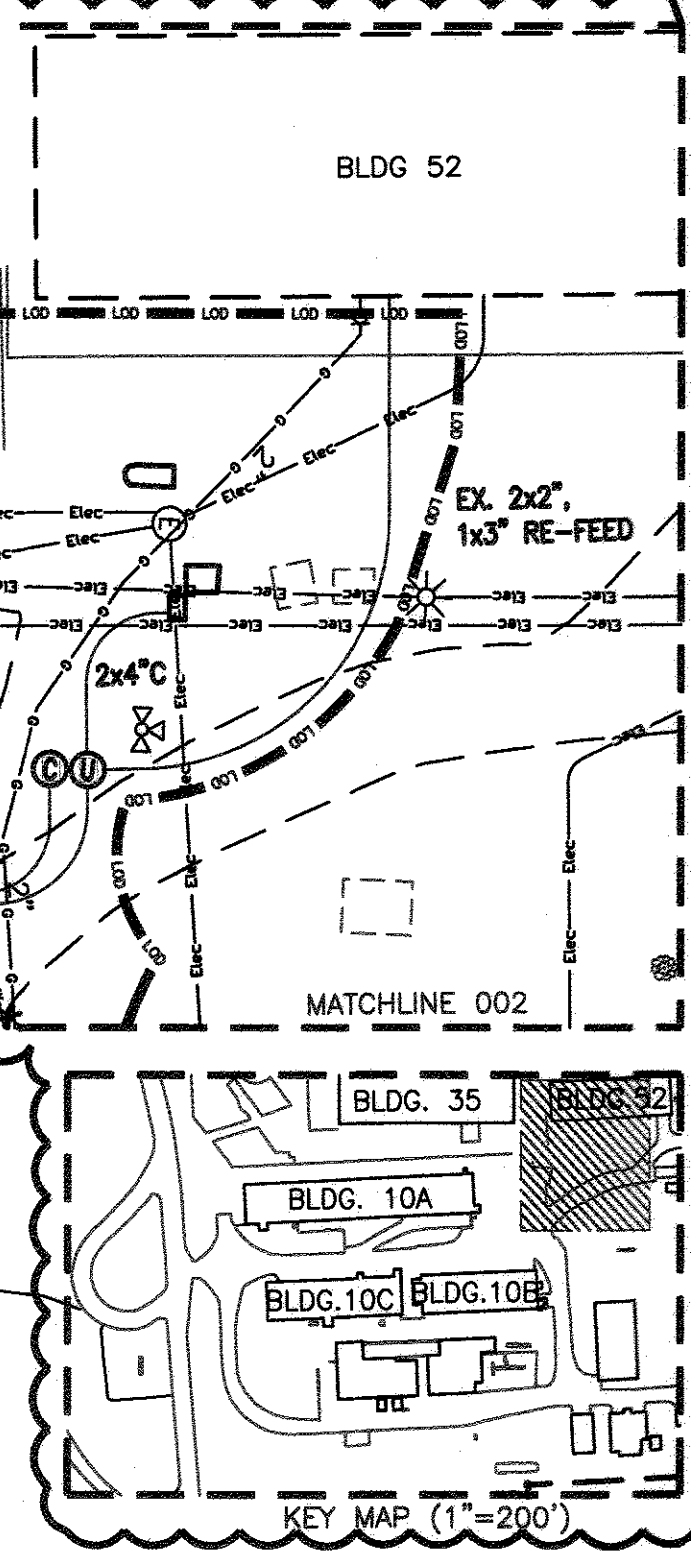
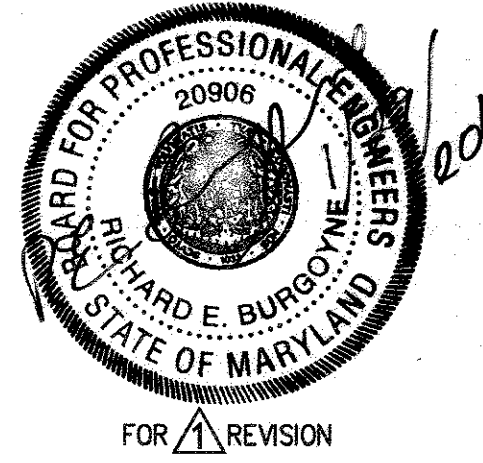
STRUCTURE NUMBER	TOP ELEV.	INVERT IN	INVERT IN	INVERT OUT	STRUCTURE TYPE	HOWARD CO. STD. DETAIL No.
I-1	366.80*	363.30***		362.90	DOUBLE TYPE 'S'	SD-4.23
I-2	366.80*	361.90	361.90	362.90	DOUBLE TYPE 'S'	SD-4.23
I-3	366.80*	363.30***		362.90	DOUBLE TYPE 'S'	SD-4.23
I-4	360.90*	354.00		353.80	DOUBLE TYPE 'S' COMBINATION	SD-4.34
I-5	359.80**	354.00	354.00	353.75	DOUBLE TYPE 'S' COMBINATION	SD-4.34
I-6	359.20**			356.00	DOUBLE TYPE 'S' COMBINATION	SD-4.34
I-7	365.90**	361.00		355.10	DOUBLE TYPE 'S' COMBINATION	SD-4.34

**STORM DRAIN STRUCTURE SCHEDULE (REDLINE REVISION)**

STRUCTURE NUMBER	TOP ELEV.	INVERT IN	INVERT IN	INVERT OUT	STRUCTURE TYPE	HOWARD CO. STD. DETAIL No.
SD-1	367.82	354.90		354.80	MANHOLE	G-5.12
SD-2	366.03	355.76		355.51	YARD INLET	D-4.14
SD-3	369.47	366.84		366.74	MANHOLE	G-5.12

**LEGEND**

- EX. MINOR CONTOUR --- 391 ---
- EX. MAJOR CONTOUR --- 390 ---
- EX. SPOT ELEVATION X 387.6
- EX. FIRE HYDRANT
- EX. STORM DRAIN --- SD ---
- EX. WATER LINE --- W ---
- EX. SANITARY SEWER --- S ---
- EX. ELECTRIC LINE --- Elec ---
- EX. COMMUNICATIONS LINE --- ---
- EX. MANHOLE
- EX. INLET
- EX. TREE LINE
- EX. BUILDING
- EX. CURB AND GUTTER
- EX. BITUMINOUS PAVING
- EX. CONCRETE SIDEWALK
- EX. FENCE
- EX. WALL
- EX. CLEANOUT
- EX. LIGHT STANDARD
- EX. BUSH
- EX. TREE
- EX. PIPE BOLLARD
- EX. UTILITY POLE
- EX. RETAINING WALL TO REMAIN
- EX. UTILITY TO BE REMOVED
- EX. UTILITY TO BE ABANDONED IN PLACE
- PROP. MINOR CONTOUR --- 379 ---
- PROP. MAJOR CONTOUR --- 380 ---
- PROP. SPOT ELEVATION + 385.58
- PROP. CURB & GUTTER
- PROP. SEWER
- PROP. STORM DRAIN
- PROP. 6" S.
- PROP. 15" D.
- PROP. STORM DRAIN
- LOADING DOCK W/ PARAPET
- LOADING DOCK W/O PARAPET
- TRENCH DRAIN
- PROPOSED LIGHT FIXTURE



- NOTE:**
- CANOPY ROOF DRAINS SET @ MINIMUM 2% GRADE
  - CLEANOUTS FOR CANOPY ROOF DRAINS TO BE TRAFFIC BEARING AND COMPLY WITH HOWARD COUNTY STANDARD DETAIL S-3.21 (SEE SHEET 11 OF 14 FOR DETAIL)
  - CONTRACTOR TO CAP/PLUG EXISTING UTILITIES TO BE ABANDONED IN PLACE. ALL LINES 8" OR LARGER TO BE FILLED WITH CONCRETE SLURRY.

NOTE: THE OWNER IS TO PROVIDE A TEMPORARY CANOPY OVER THE COMPACTOR HOPPER UNTIL SUCH TIME AS THE PERMANENT LOADING DOCK CANOPY IS INSTALLED.

**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 NUMBER: 20906 EXPIRATION DATE: 2/9/2017

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 LICENSE NUMBER: 32574 EXPIRATION DATE: 1/6/18

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APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 Chief, Development Engineering Division  
 Chief, Division of Land Development  
 Director

**CENTURY ENGINEERING**  
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 10710 Gilroy Road, Hunt Valley, MD 21031  
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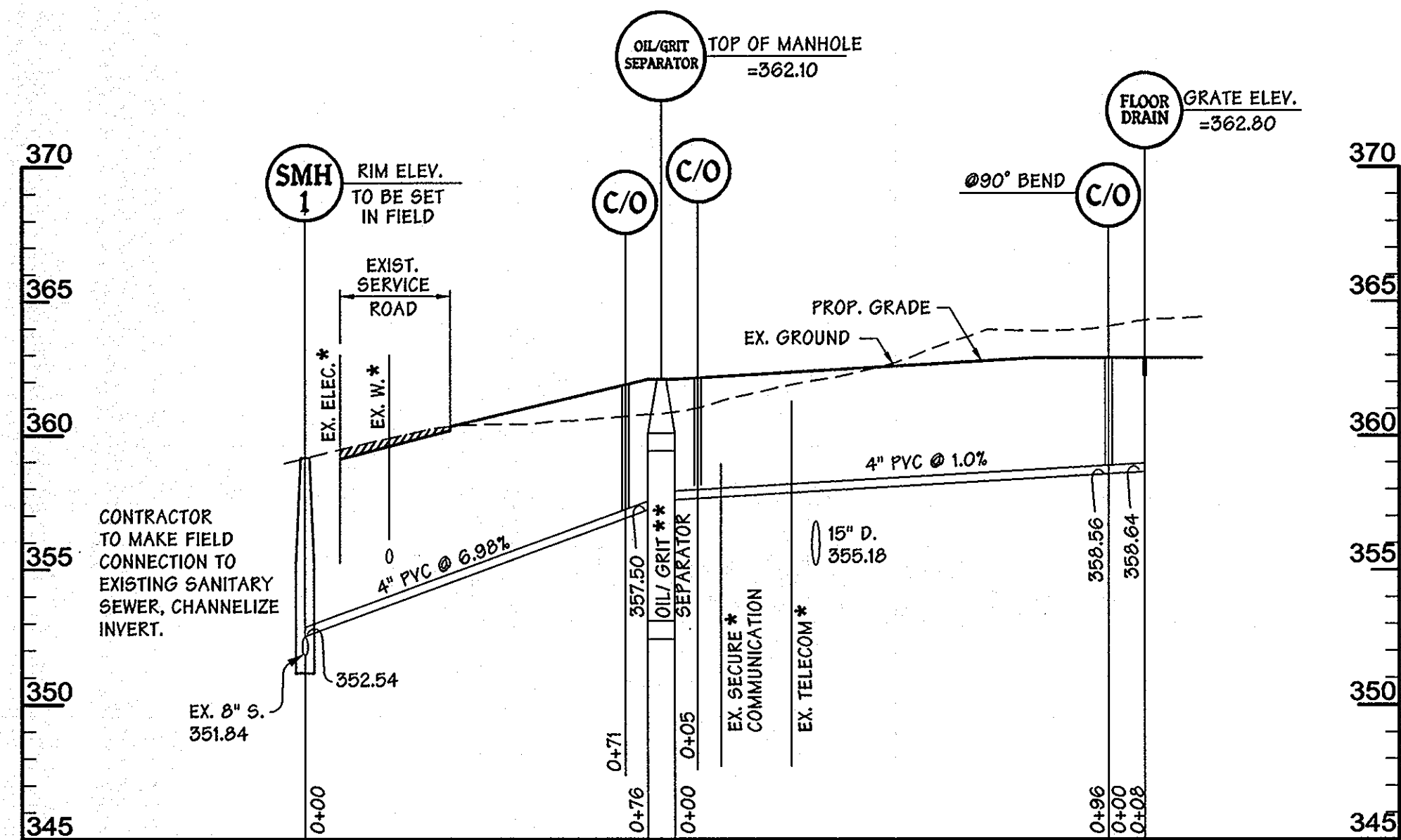
REVISION	DATE	BY	NO.
ADDED PERCEMAN AND Fume PUMP STATION	2/3/17		
RELOCATION AND REMOVAL OF UTILITIES, REVISED SANITARY SEWER AND STORM DRAIN STRUCTURE TABLES	1/15/16		

**THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY**  
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 LAUREL, MARYLAND 20723-6099  
 443-778-5134

**UTILITY PLAN SERVICE & SUPPORT AREA INFRASTRUCTURE FACILITY PHASE I**  
 TAX MAP: 41 GRID: 16 PARCEL: 123  
 ELECTION DISTRICT 5-05 HOWARD COUNTY, MARYLAND  
 SHEET 4 OF 14

C.E.I. PROJECT NUMBER 22172.26  
 SCALE: 1"=30'

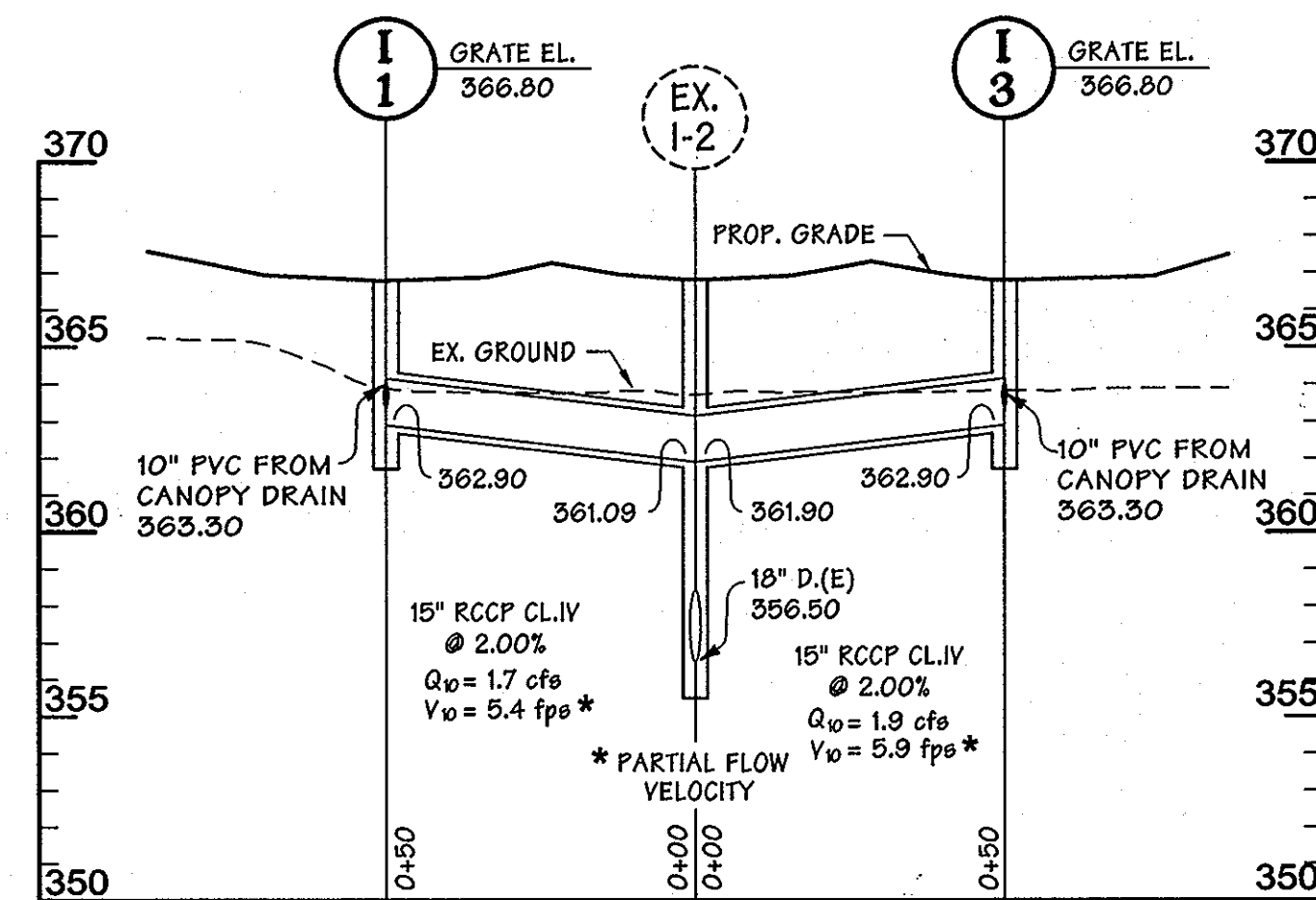
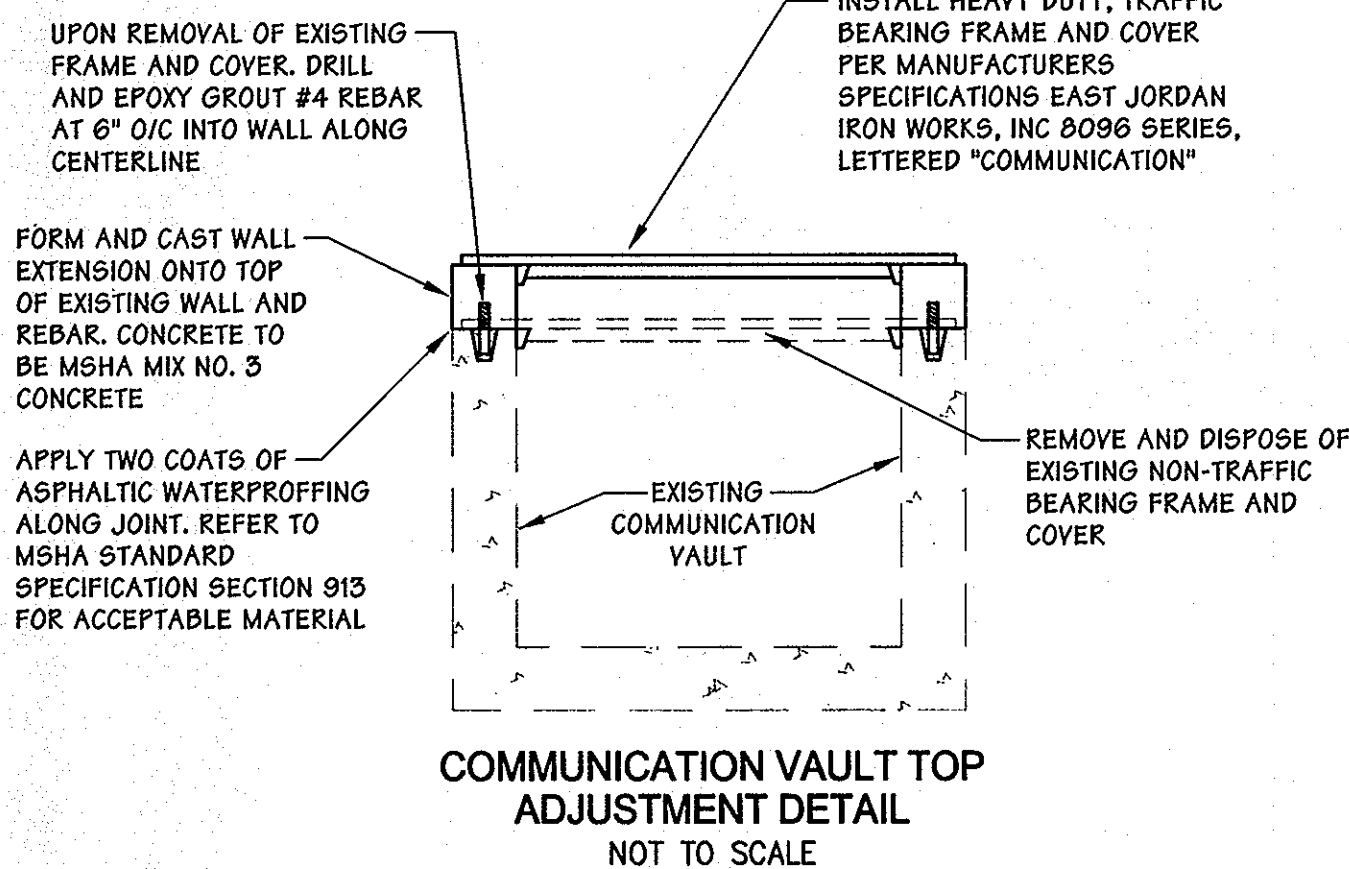




\* CONTRACTOR TO TEST PIT  
\*\* SEE DETAIL SHEET 11 OF 14

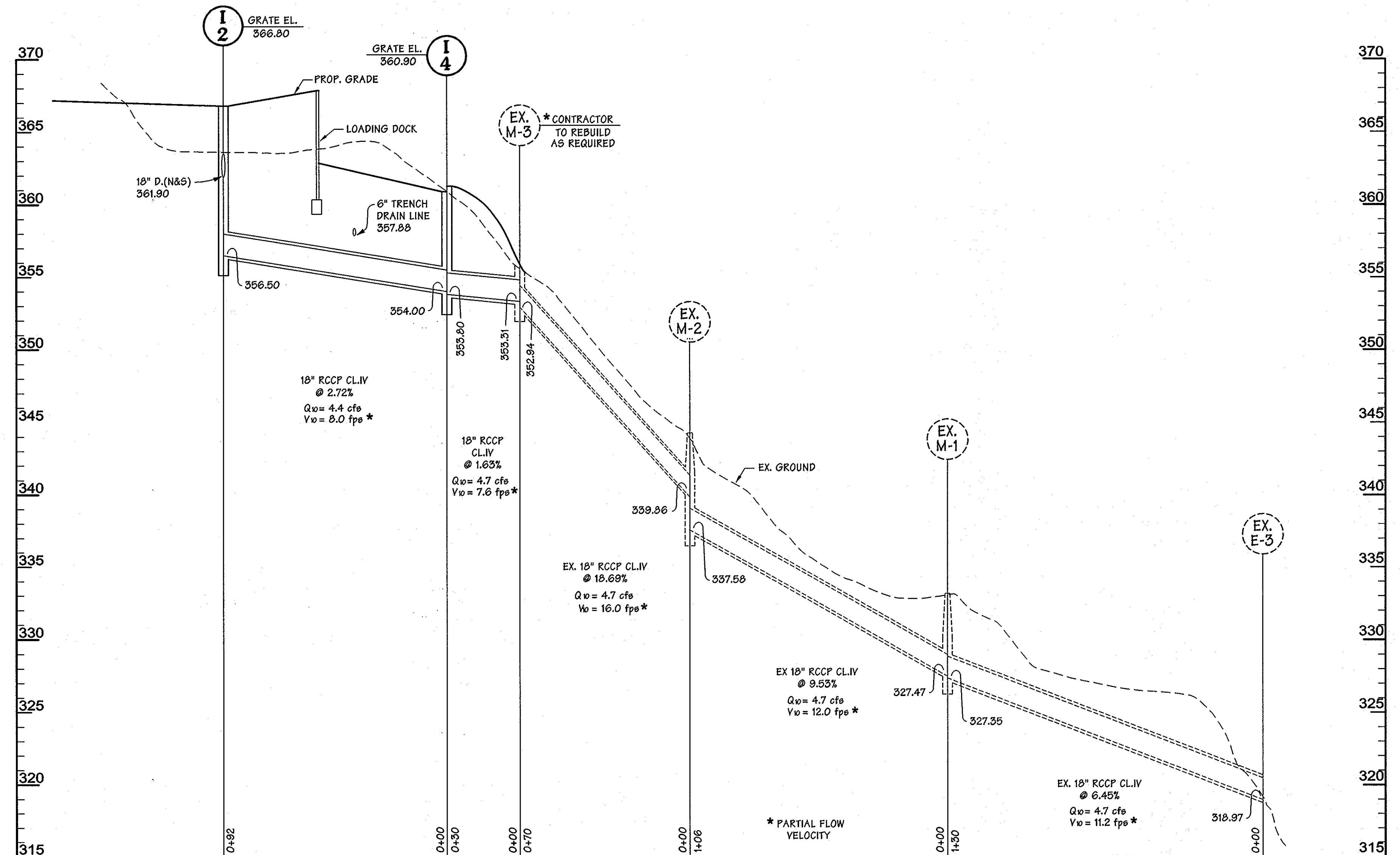
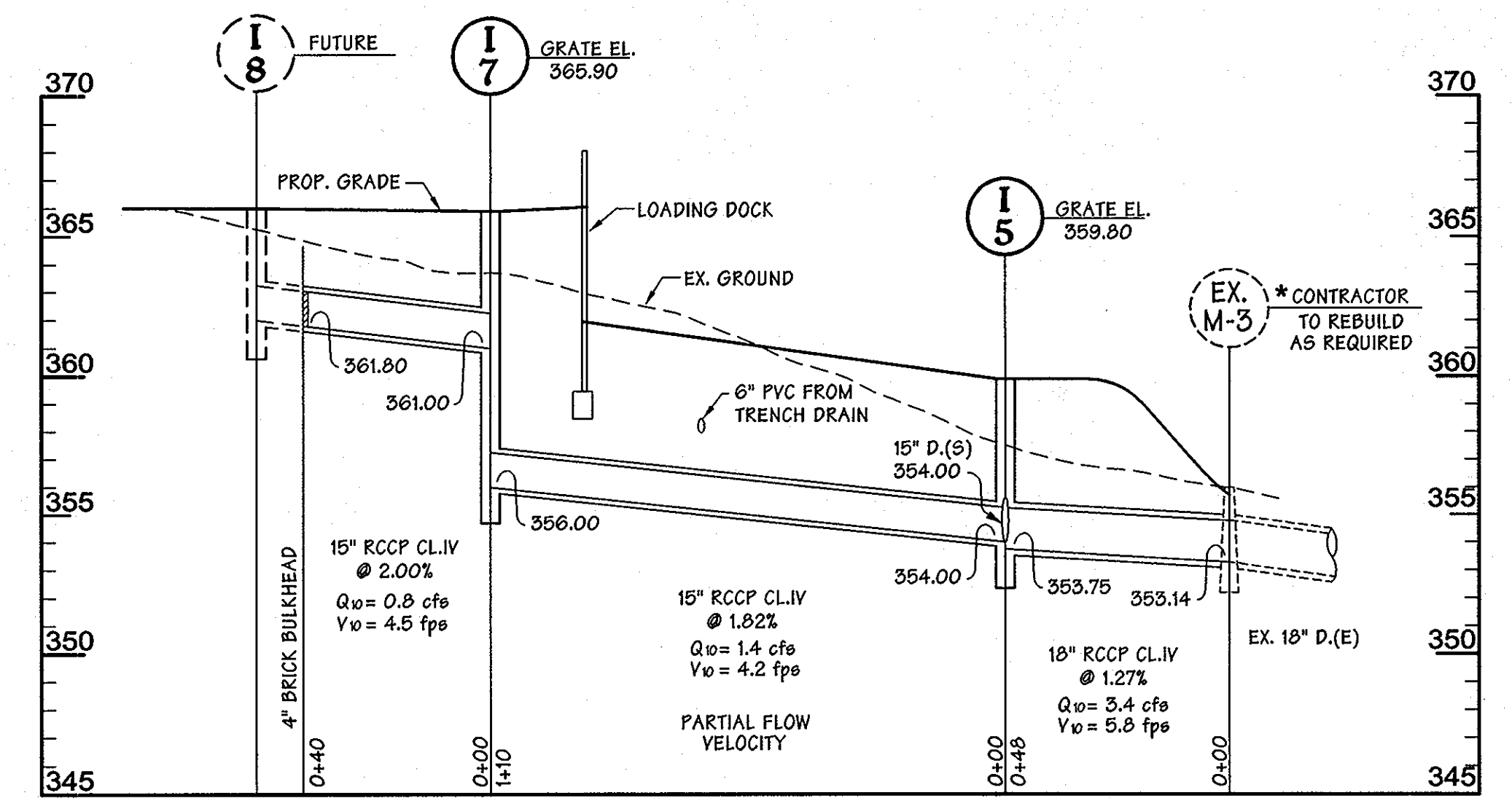
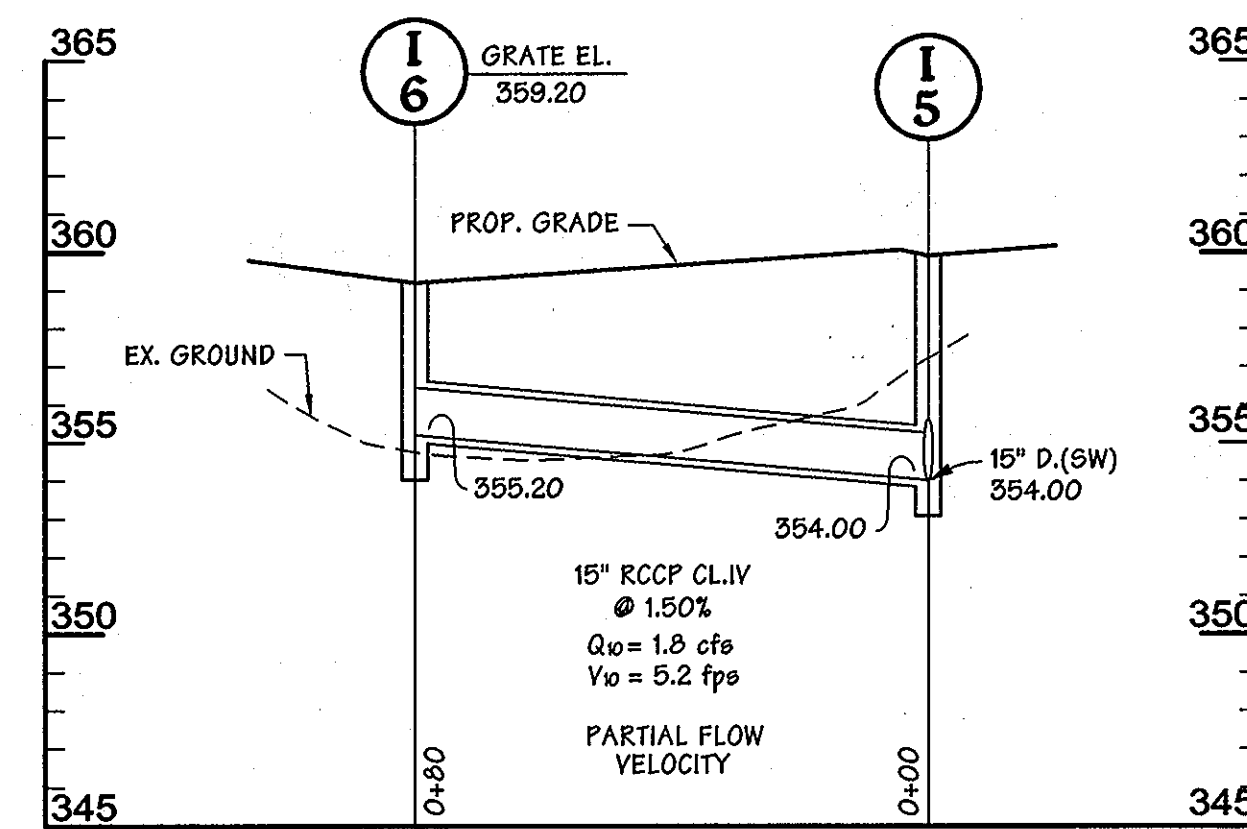
**SANITARY SEWER PROFILE**

SCALE: HORIZ. 1"=30'  
VERT. 1"=5'



**STORM DRAIN PROFILES**

SCALE: HORIZ. 1"=30'  
VERT. 1"=5'



**JHU/APL INTERNAL USE**

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APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division  
Chief, Division of Land Development  
Director

**CENTURY ENGINEERING**  
CONSULTING ENGINEERS - PLANNERS  
10710 Gilroy Road, Hunt Valley, MD 21031  
Phone: 443.589.2400 Fax: 443.589.2401



DESIGN BY:	A.J.D.		
DRAWN BY:	M.S.S./M.C.A.		
CHECKED BY:			
DATE:	7/18/08	BY:	NO.
		REVISION	DATE

**THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY**

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LAUREL, MARYLAND 20723-6099  
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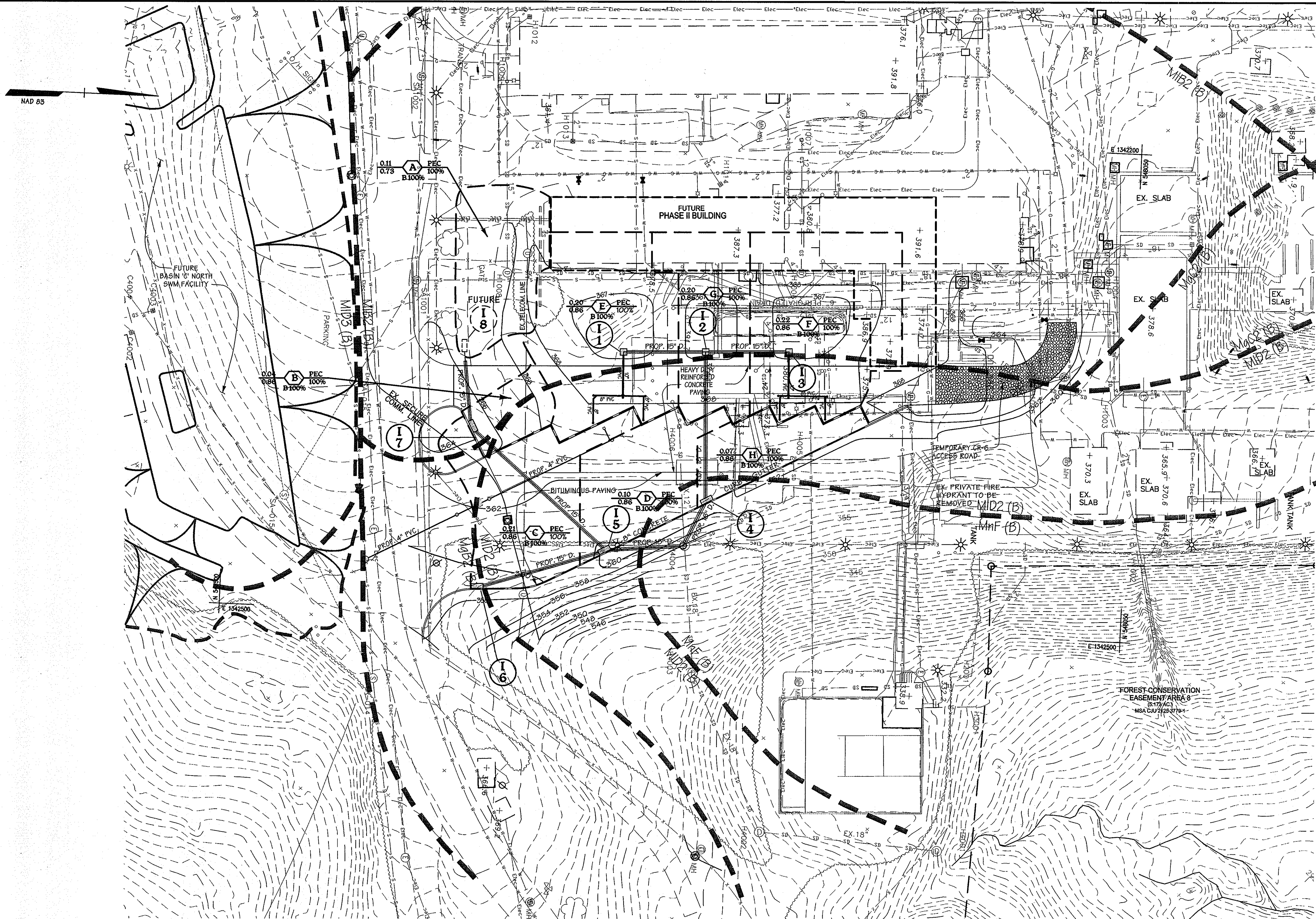
**UTILITY PLAN PROFILES AND NOTES SERVICE & SUPPORT AREA INFRASTRUCTURE FACILITY PHASE I**

TAX MAP: 41 GRID: 16 PARCEL: 123  
ELECTION DISTRICT 5-05 HOWARD COUNTY, MARYLAND  
SHEET 5 OF 14

C.E.I. PROJECT NUMBER 22172.26

SCALE: 1"=30'





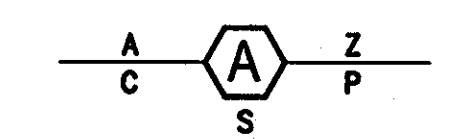
**LEGEND**

- EX. MINOR CONTOUR --- 391 ---
- EX. MAJOR CONTOUR --- 390 ---
- EX. SPOT ELEVATION X 367.6
- EX. FIRE HYDRANT dh
- EX. STORM DRAIN SD
- EX. WATER LINE W W
- EX. SANITARY SEWER S S
- EX. ELECTRIC LINE Elec
- EX. COMMUNICATIONS LINE
- EX. MANHOLE o
- EX. INLET ct
- EX. BUILDING
- EX. CURB AND GUTTER
- EX. BITUMINOUS PAVING
- EX. CONCRETE SIDEWALK
- EX. FENCE
- EX. WALL
- EX. CLEANOUT
- EX. LIGHT STANDARD
- EX. BUSH
- EX. TREE
- EX. PIPE BOLLARD
- EX. UTILITY POLE
- EX. RETAINING WALL TO REMAIN
- EX. UTILITY TO BE REMOVED X X SD X X X
- EX. UTILITY TO BE ABANDONED IN PLACE
- PROP. MINOR CONTOUR 379
- PROP. MAJOR CONTOUR 380
- PROP. SPOT ELEVATION + 385.58
- PROP. CURB & GUTTER PROP. 6" S.
- PROP. SEWER
- PROP. STORM DRAIN PROP. 15" D.
- DRAINAGE AREA
- SOIL LIMITS
- SOIL SERIES MIB2(B)
- HYDROLOGIC SOIL GROUP
- FUTURE BUILDING

**SOIL INFORMATION**

SYMBOL	SERIE	HYDROLOGIC SOIL GROUP
MgB2	MANOR	B
MgC2	MANOR	B
MIB2	MANOR	B
MID2	MANOR	B
MID3	MANOR	B
MnF	MANOR	B

**DRAINAGE AREA INFORMATION**



A = AREA (ACRE)  
 B = AREA (L.D.)  
 C = COMPOSITE RATIONAL 'C'  
 Z = ZONING  
 P = WEIGHTED% IMPERVIOUS COVER  
 S = % SCS SOIL NOTE 'C' SOILS ASSUMED HSG

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 THIS DATA SHALL NOT BE DISCLOSED TO A THIRD PARTY AND SHALL NOT BE DUPLICATED, USED, OR DISCLOSED IN WHOLE OR IN PART FOR ANY PURPOSE OTHER THAN TO EVALUATE THIS RFP OR, IN THE CASE OF A CONTRACT AWARD, TO PERFORM THE WORK REQUIRED HEREUNDER, WITHOUT THE EXPRESS WRITTEN CONSENT OF JHU/APL.

**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 NUMBER: 32574      EXPIRATION DATE: 1/16/10

**APPROVED: DEPARTMENT OF PLANNING AND ZONING**  
 Chief, Development Engineering Division  
 Chief, Division of Land Development  
 Director

**CENTURY ENGINEERING**  
 CONSULTING ENGINEERS - PLANNERS  
 10710 Gilroy Road, Hunt Valley, MD 21031  
 Phone: 443.589.2400 Fax: 443.589.2401

DESIGN BY: A.J.D.  
 DRAWN BY: M.S.S./M.C.A.  
 CHECKED BY: [Signature]  
 DATE: 7/18/08

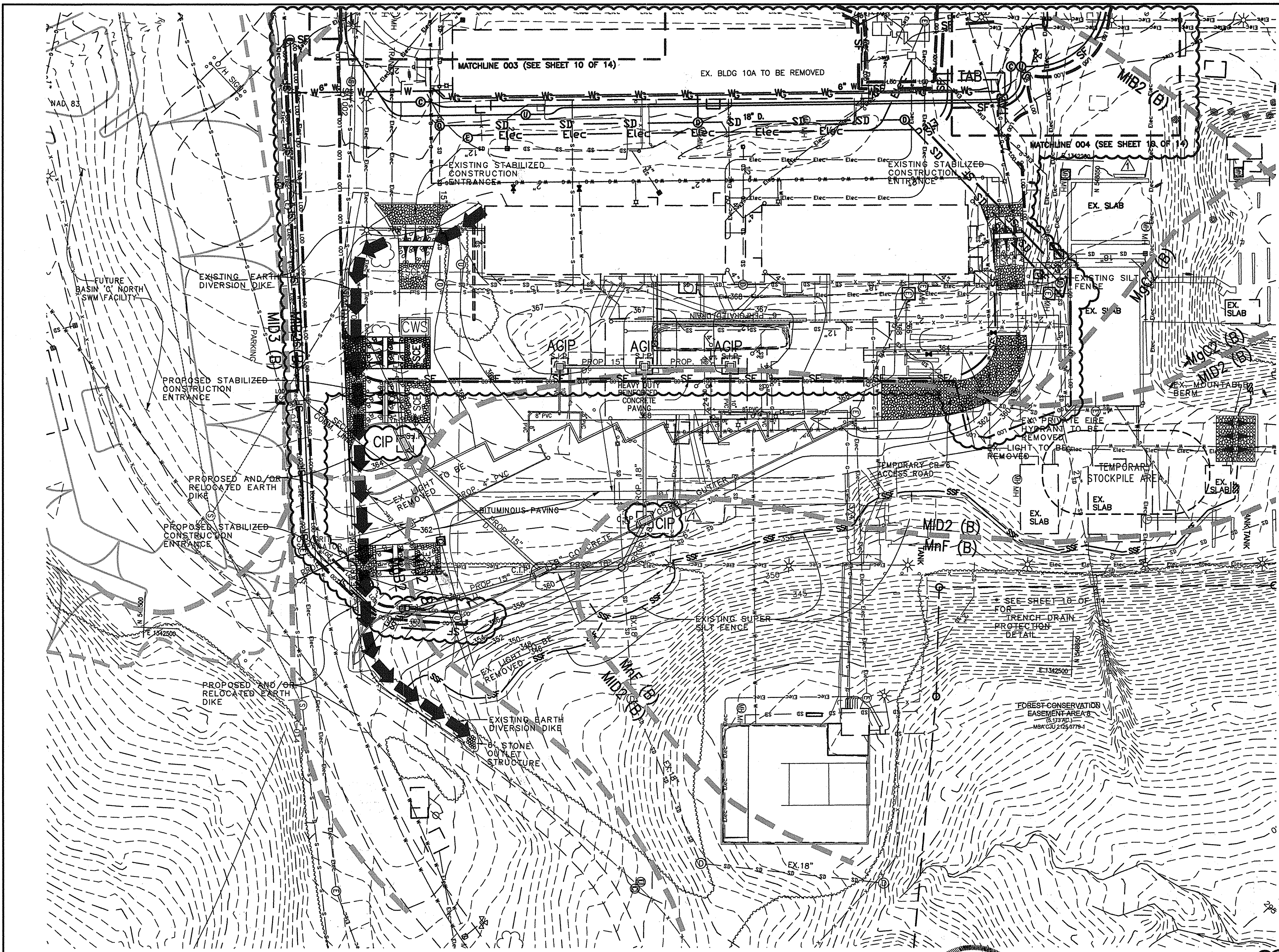
BY	NO.	REVISION	DATE

**THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY**  
 11100 JOHNS HOPKINS ROAD  
 LAUREL, MARYLAND 20723-6099  
 443-778-5134

**PHASE I STORM DRAIN DRAINAGE AREA MAP AND FLOW TABULATIONS SERVICE & SUPPORT AREA INFRASTRUCTURE FACILITY PHASE I**  
 TAX MAP: 41      GRID: 16      PARCEL: 123  
 ELECTION DISTRICT 5-05      HOWARD COUNTY, MARYLAND  
 SHEET 6 OF 14

C.E.I. PROJECT NUMBER 22172.26  
 SCALE: 1"=30'





- HOWARD SOIL CONSERVATION DISTRICT  
STANDARD SEDIMENT CONTROL NOTES**
- A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (313-1855).
  - ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.
  - FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, B) 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
  - ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL 1, CHAPTER 12 OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
  - ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING (SEC. 51) SOD (SEC. 54), TEMPORARY SEEDING (SEC. 50) AND MULCHING (SEC. 52). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
  - 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.
  - SITE ANALYSIS:
 

STOCKPILE AREA		
TOTAL AREA OF SITE	1.72 ACRES	SEE SHEET 9A OF 14 FOR STANDARD SEDIMENT CONTROL NOTES
AREA DISTURBED	1.72 ACRES	
AREA TO BE ROOFED OR PAVED	0.73 ACRES	
AREA TO BE VEGETATIVELY STABILIZED	0.99 ACRES	
TOTAL CUT	183 CU. YDS.	
TOTAL FILL	1163 CU. YDS./JHU/APL CAMPUS	
OFFSITE WASTE/BORROW AREA LOCATION	JHU/APL CAMPUS	
  - ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
  - ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
  - ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
- TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THE LENGTH SHALL BE BACK-FILLED AND STABILIZED BY THE END OF EACH WORK DAY, WHICHEVER IS SHORTER.

**LEGEND**

<p>EX. MINOR CONTOUR --- 391 ---</p> <p>EX. MAJOR CONTOUR --- 390 ---</p> <p>EX. SPOT ELEVATION X 387.6</p> <p>EX. FIRE HYDRANT</p> <p>EX. STORM DRAIN --- SD ---</p> <p>EX. WATER LINE --- W --- W ---</p> <p>EX. SANITARY SEWER --- S --- S ---</p> <p>EX. ELECTRIC LINE --- Elec ---</p> <p>EX. COMMUNICATIONS LINE --- ---</p> <p>EX. MANHOLE</p> <p>EX. INLET</p> <p>EX. TREE LINE</p> <p>EX. BUILDING</p> <p>EX. CURB AND GUTTER</p> <p>EX. BITUMINOUS PAVING</p> <p>EX. CONCRETE SIDEWALK</p> <p>EX. FENCE</p> <p>EX. WALL</p> <p>EX. CLEANOUT</p> <p>EX. LIGHT STANDARD</p> <p>EX. BUSH</p> <p>EX. TREE</p> <p>EX. PIPE BOLLARD</p> <p>EX. UTILITY POLE</p> <p>EX. LIGHT</p> <p>LIMITS OF DISTURBANCE --- L00 ---</p>	<p>PROP. MINOR CONTOUR --- 379 ---</p> <p>PROP. MAJOR CONTOUR --- 380 ---</p> <p>PROP. SPOT ELEVATION + 385.58</p> <p>PROP. CURB &amp; GUTTER</p> <p>PROP. SILT FENCE --- SF ---</p> <p>PROP. SUPER SILT FENCE --- SSF ---</p> <p>PROP. LIMIT OF DISTURBANCE --- ---</p> <p>EX. EARTH DIKE</p> <p>EX. STABILIZED CONSTRUCTION ENTRANCE</p> <p>EX. MOUNTABLE BERM</p> <p>PROP. EARTH DIKE</p> <p>PROP. STABILIZED CONSTRUCTION ENTRANCE</p> <p>MOUNTABLE BERM</p> <p>EX. SILT FENCE --- SF ---</p> <p>EX. SUPER SILT FENCE --- SSF ---</p> <p>CONCRETE WASHOUT AREA</p> <p>INLET PROTECTION</p> <p>TEMPORARY ASPHALT BERM</p>
---	--

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**PROFESSIONAL CERTIFICATION**

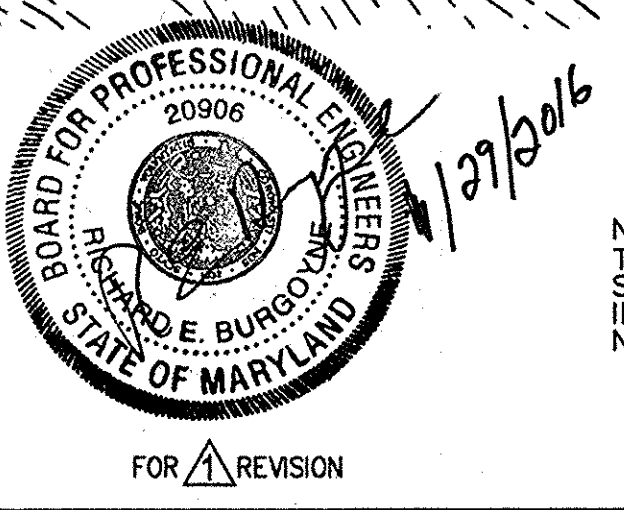
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND

LICENSE NUMBER: 20706      EXPIRATION DATE: 2/9/2017

**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 NUMBER: 22574      EXPIRATION DATE: 1/10/16



NOTE: THERE ARE NO DRAINAGE AREAS ON THIS SITE GREATER THAN 2.0 ACRES THEREFORE INTERIM STORMWATER MANAGEMENT IS NOT REQUIRED.

ONLY EROSION CONTROL BMPs SHALL BE CONSTRUCTED AND MAINTAINED FOR SDP 08-084 REVISION 1.

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

*Anthony J. D'Arcy*      7/18/08  
SIGNATURE OF ENGINEER      DATE

BY THE DEVELOPER:  
"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY 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."

*Glen M. Carey*      2/3/16  
SIGNATURE OF DEVELOPER      DATE

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

*John R. Roberts*      2/17/16  
HOWARD S.C.D.      DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

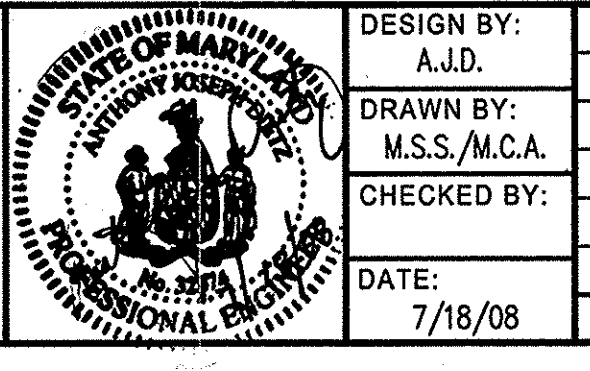
*Chad Edwards*      2.22.16  
Chief, Development Engineering Division      Date

*Valdino Jaffee*      3-2-16  
Chief, Division of Land Development      Date

Director

**CENTURY ENGINEERING**  
CONSULTING ENGINEERS - PLANNERS

10710 Gilroy Road, Hunt Valley, MD 21031  
Phone: 443.589.2400 Fax: 443.589.2401



DESIGN BY: A.J.D.	
DRAWN BY: M.S.S./M.C.A.	
CHECKED BY:	
DATE: 7/18/08	
REVISIONS:	
BY NO.	REVISION
	DATE

**THE JOHNS HOPKINS UNIVERSITY  
APPLIED PHYSICS LABORATORY**

11100 JOHNS HOPKINS ROAD  
LAUREL, MARYLAND 20723-6099  
443-778-5134

**EROSION AND SEDIMENT CONTROL  
SERVICE & SUPPORT AREA  
INFRASTRUCTURE FACILITY PHASE I**

TAX MAP: 41      GRID: 16      PARCEL: 123  
ELECTION DISTRICT 5-05      HOWARD COUNTY, MARYLAND

SHEET 7 OF 14

C.E.I. PROJECT NUMBER  
22172.26

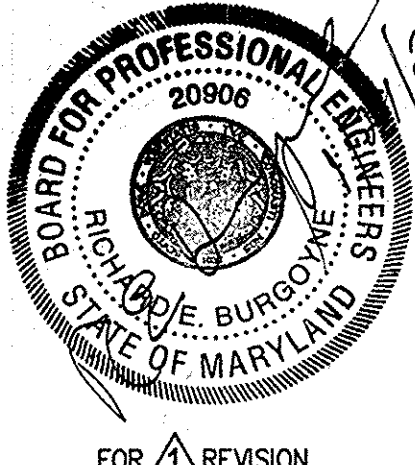
SCALE:  
1"=30'



**LEGEND**

- EX. MINOR CONTOUR --- 391 ---
- EX. MAJOR CONTOUR --- 390 ---
- EX. SPOT ELEVATION X 387.6
- EX. FIRE HYDRANT
- EX. STORM DRAIN --- SD ---
- EX. WATER LINE --- W ---
- EX. SANITARY SEWER --- S ---
- EX. ELECTRIC LINE --- Elec ---
- EX. COMMUNICATIONS LINE --- ---
- EX. MANHOLE
- EX. INLET
- EX. TREE LINE
- EX. BUILDING
- EX. CURB AND GUTTER
- EX. BITUMINOUS PAVING
- EX. CONCRETE SIDEWALK
- EX. FENCE
- EX. WALL
- EX. CLEANOUT
- EX. LIGHT STANDARD
- EX. BUSH
- EX. TREE
- EX. PIPE BOLLARD
- EX. UTILITY POLE
- PROP. MINOR CONTOUR --- 379 ---
- PROP. MAJOR CONTOUR --- 380 ---
- PROP. SPOT ELEVATION + 385.58
- PROP. CURB & GUTTER
- PROP. SILT FENCE --- SF ---
- PROP. SUPER SILT FENCE --- SSF ---
- EX. D.A. LIMITS
- PROP. D.A. LIMITS
- PROP. LIMIT OF DISTURBANCE
- EX. EARTH DIKE
- EX. STABILIZED CONSTRUCTION ENTRANCE
- EX. MOUNTABLE BERM
- PROP. EARTH DIKE
- PROP. STABILIZED CONSTRUCTION ENTRANCE
- MOUNTABLE BERM
- STANDARD INLET PROTECTION
- CURB INLET PROTECTION

ONLY EROSION CONTROL BMPs SHALL BE CONSTRUCTED AND MAINTAINED FOR SDP 08-084 REVISION 1.



BY THE ENGINEER:  
 "I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."  
*Anthony J. Ditz* 1/16/18  
 SIGNATURE OF ENGINEER DATE

BY THE DEVELOPER:  
 "I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY 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."  
*Klaus M. Carey* 3/10/08  
 SIGNATURE OF DEVELOPER DATE

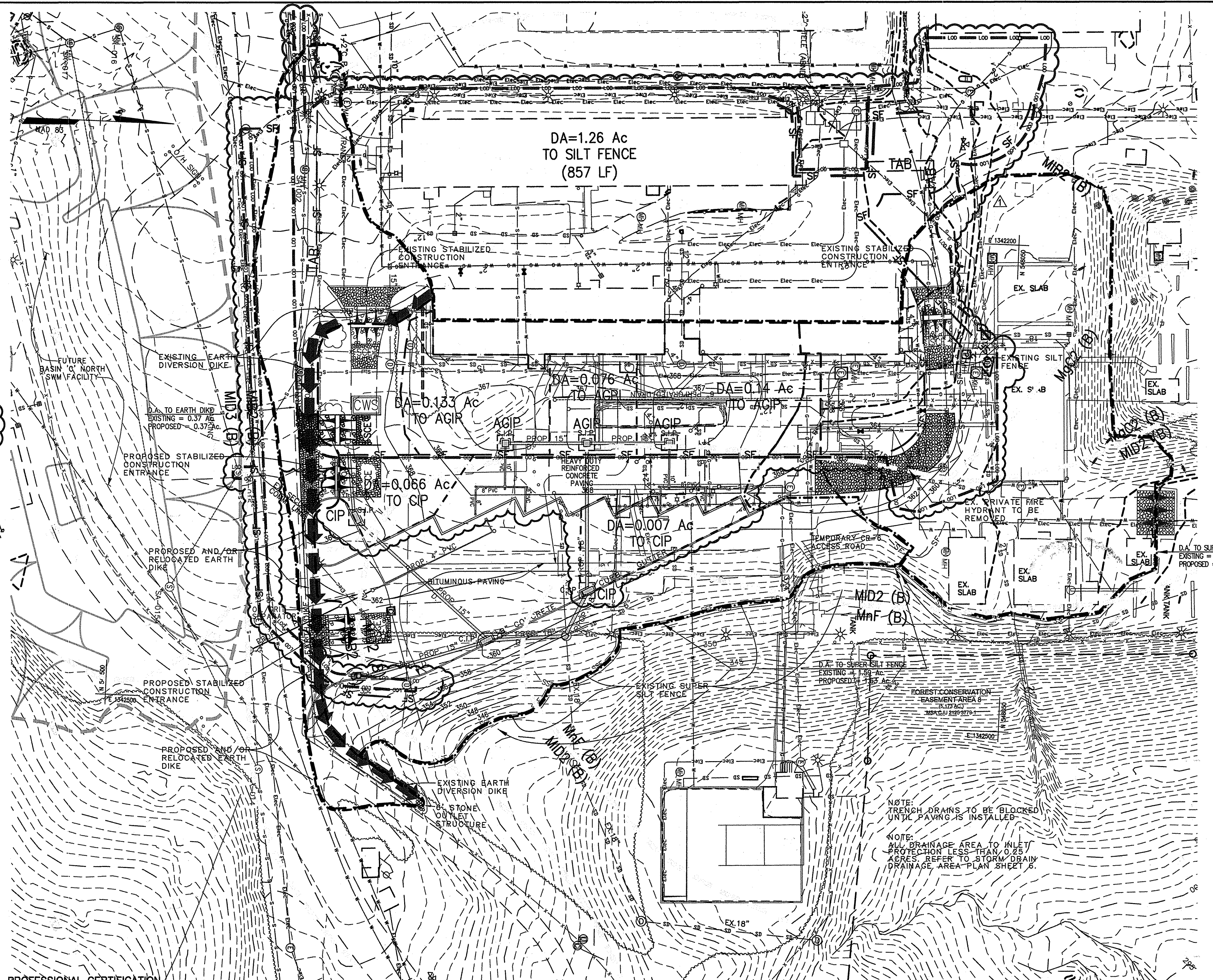
THIS DEVELOPMENT PLAN IS AS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.  
*John R. Retten* 2/17/16  
 HOWARD S.C.D. DATE

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NOTE: THERE ARE NO DRAINAGE AREAS ON THIS SITE GREATER THAN 2.0 ACERS THEREFORE INTERIM STORMWATER MANAGEMENT IS NOT REQUIRED.

**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 NUMBER: 20906 EXPIRATION DATE: 1/16/2017

**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 NUMBER: 32574 EXPIRATION DATE: 1/16/18



NOTE: TRENCH DRAINS TO BE BLOCKED UNTIL PAVING IS INSTALLED.  
 NOTE: ALL DRAINAGE AREA TO INLET PROTECTION LESS THAN 0.25 ACRES REFER TO STORM DRAIN DRAINAGE AREA PLAN SHEET 8.

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
*Chad Clarke* 2-22-16  
 Chief, Development Engineering Division Date  
*V. J. Casanova* 3-01-16  
 Chief, Division of Land Development Date  
*Valerie J. Casanova* 3-2-16  
 Director Date

**CENTURY ENGINEERING**  
 CONSULTING ENGINEERS - PLANNERS  
 10710 Gilroy Road, Hunt Valley, MD 21031  
 Phone: 443.589.2400 Fax: 443.589.2401

DESIGN BY: A.J.D.  
 DRAWN BY: M.S.S./M.C.A.  
 CHECKED BY:  
 DATE: 7/18/08

REB	NO.	REVISION OF EROSION CONTROL LOCATIONS	DATE
			1/15/18

**THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY**  
 11100 JOHNS HOPKINS ROAD  
 LAUREL, MARYLAND 20723-6099  
 443-778-5134

**EROSION AND SEDIMENT CONTROL PLAN DRAINAGE AREA MAP SERVICE & SUPPORT AREA INFRASTRUCTURE FACILITY PHASE I**  
 TAX MAP: 41 GRID: 16 PARCEL: 123  
 ELECTION DISTRICT 5-05 HOWARD COUNTY, MARYLAND  
 SHEET 8 OF 14

C.E.I. PROJECT NUMBER 22172.26  
 SCALE: 1"=30'



**HOWARD SOIL CONSERVATION DISTRICT**

**PERMANENT SEEDING NOTES (BORROW & STOCKPILE AREAS)**

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

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS: IN LIEU OF SOIL TEST RECOMMENDATIONS, USE ONE OF THE FOLLOWING SCHEDULES:

1. PREFERRED - APPLY 2 TONS/ACRE DOLOMITIC LIMESTONE (92,000 LBS/1000 SQ. FT.) AND 600 LBS/ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ. FT.) BEFORE SEEDING. HARROW OR DISK INTO UPPER THREE INCHES OF SOIL. AT TIME OF SEEDING, APPLY 400 LBS/ACRE 30-0-0 UREA-FORM FERTILIZER (9 LBS/1000 SQ. FT.).
2. ACCEPTABLE - APPLY 2 TONS/ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ. FT.) AND 1000 LBS/ACRE 10-10-10 FERTILIZER (23 LBS/1000 SQ. FT.) BEFORE SEEDING. HARROW OR DISK INTO UPPER THREE INCHES OF SOIL.

SEEDING - FOR THE PERIODS MARCH 1 - APRIL 30 AND AUGUST 1 - OCTOBER 15, SEED WITH 60 LBS/ACRE (1.4 LBS/1000 SQ. FT.) OF KENTUCKY 31 TALL FESCUE. FOR THE PERIOD MAY - JULY 31, SEED WITH 60 LBS. KENTUCKY 31 TALL FESCUE PER ACRE AND 2 LBS/ACRE (.05 LBS/1000 SQ. FT.) OF KEEPING LOVEGRASS. DURING THE PERIOD OF OCTOBER 16 - FEBRUARY 28, PROTECT SITE BY: OPTION 1 - TWO 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 30 TALL FESCUE AND MULCH WITH 2 TONS/ACRE WELL ANCHORED STRAW.

MULCHING - APPLY 1 1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SQ. FT.) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GALLONS PER ACRE (5 GAL/1000 SQ. FT.) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPE 8 FEET OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SQ. FT.) FOR ANCHORING.

MAINTENANCE: INSPECT ALL SEEDING AREAS AND MAKE NEEDED REPAIRS, REPLACEMENTS AND RESEEDINGS.

**PERMANENT SEEDING NOTES (CENTRAL GREEN)**

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

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED. PROVIDE A MINIMUM OF 4" OF SCREENED TOP-SOIL (NO DEBRIS 3/4" OR LARGER).

SOIL AMENDMENTS: IN LIEU OF SOIL TEST RECOMMENDATIONS, USE ONE OF THE FOLLOWING SCHEDULES:

1. PREFERRED - APPLY 2 TONS/ACRE DOLOMITIC LIMESTONE (92,000 LBS/1000 SQ. FT.) AND 600 LBS/ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ. FT.) BEFORE SEEDING. HARROW OR DISK INTO UPPER THREE INCHES OF SOIL. AT TIME OF SEEDING, APPLY 400 LBS/ACRE 30-0-0 UREA-FORM FERTILIZER (9 LBS/1000 SQ. FT.).
2. ACCEPTABLE - APPLY 2 TONS/ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ. FT.) AND 1000 LBS/ACRE 10-10-10 FERTILIZER (23 LBS/1000 SQ. FT.) BEFORE SEEDING. HARROW OR DISK INTO UPPER THREE INCHES OF SOIL.

SEEDING - FOR THE PERIODS MARCH 1 - MAY 15 AND AUGUST 15 - OCTOBER 15, SEED WITH 125 LBS/ACRE (2.9 LBS/1000 SF) 3-WAY TALL FESCUE MIX & 25 LBS/ACRE (0.6 LBS/1000 SF) OF PERENNIAL RYE GRASS. FOR THE PERIOD MAY 15 - AUGUST 14, SEED WITH 125 LBS/ACRE (2.9 LBS/100 SF) OF 3-WAY TALL FESCUE MIX & 25 LBS/ACRE (0.6 LBS/1000 SF) OF PERENNIAL RYE GRASS. DURING THE PERIOD OF OCTOBER 16 - FEBRUARY 28, PROTECT SITE BY: OPTION 1 - TWO 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 125 LBS/ACRE 3-WAY TALL FESCUE MIX AND MULCH WITH 2 TONS/ACRE WELL ANCHORED STRAW.

MULCHING - APPLY 1 1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SQ. FT.) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GALLONS PER ACRE (5 GAL/1000 SQ. FT.) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPE 8 FEET OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SQ. FT.) FOR ANCHORING.

MAINTENANCE: INSPECT ALL SEEDING AREAS AND MAKE NEEDED REPAIRS, REPLACEMENTS AND RESEEDINGS.

**TEMPORARY SEEDING NOTES**

APPLY TO GRADED OR CLEARED AREAS LIKELY TO BE RE-DISTURBED WHERE A SHORT-TERM VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION - LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISKING OR OTHER MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS - APPLY 600 LBS/ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ. FT.).

SEEDING - FOR PERIOD MARCH 1 - APRIL 30 FROM AUGUST 15 - OCTOBER 15, SEED WITH 1 1/2 BUSHEL PER ACRE OF ANNUAL RYE (3.2 LBS/1000 SQ. FT.). FOR THE PERIOD MAY 1 - AUGUST 14, SEED WITH 3 LBS/ACRE OF WEEPING LOVEGRASS (.07 LBS/1000 SQ. FT.). FOR THE PERIOD NOVEMBER 16 - FEBRUARY 28, PROTECT SITE BY APPLYING 2 TONS/ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING, OR USE SOD.

MULCHING - APPLY 1 1/2 TO 2 TONS/ACRE (70 TO 90 LBS/1000 SQ. FT.) OF UNROTTED WEED-FREE, SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GAL. PER ACRE (5 GAL/1000 SQ. FT.) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPE 8 FT. OR HIGHER, USE 348 GAL. PER ACRE (8 GAL/1000 SQ. FT.) FOR ANCHORING.

REFER TO THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR ADDITIONAL RATES AND METHODS NOT COVERED.

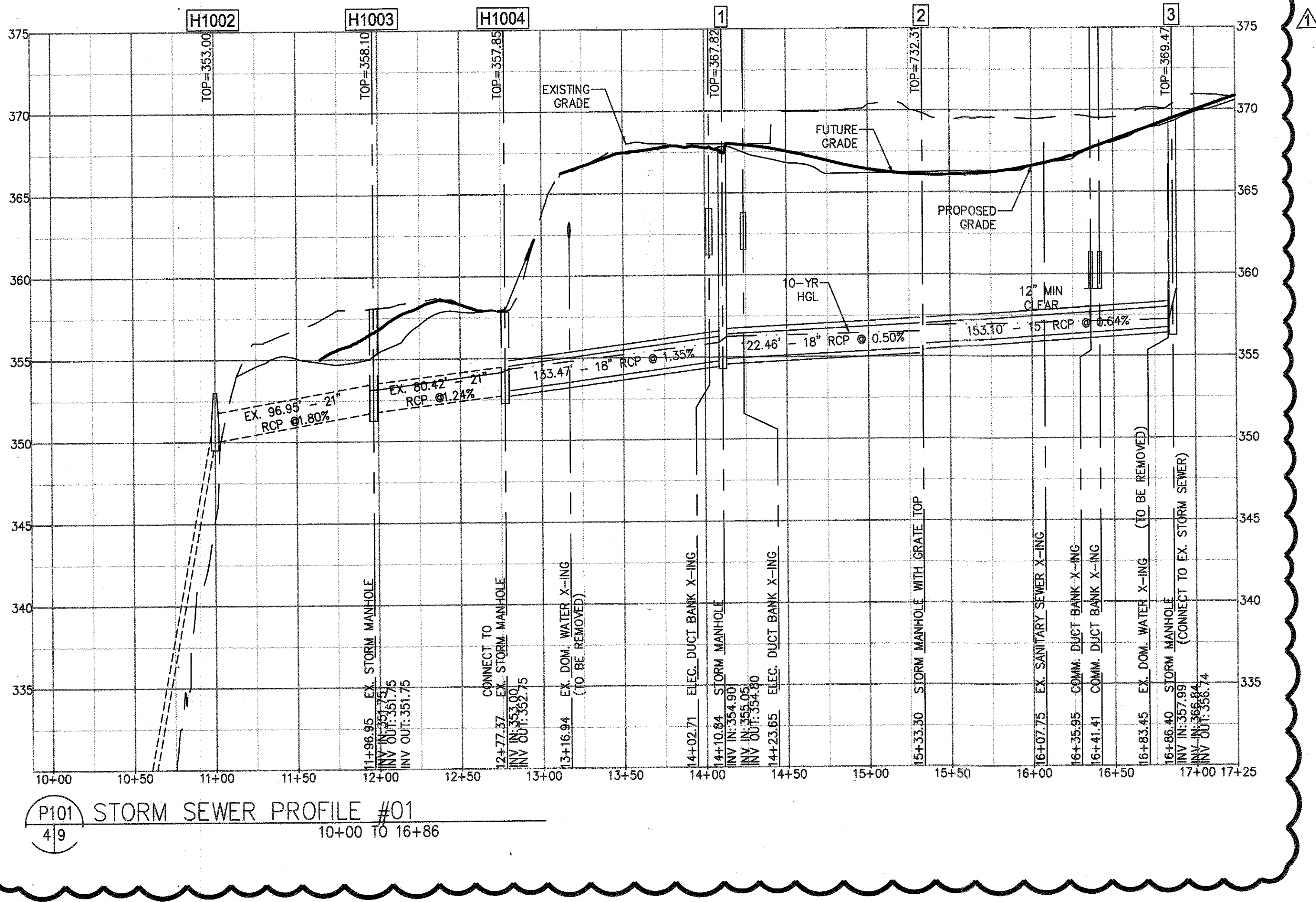
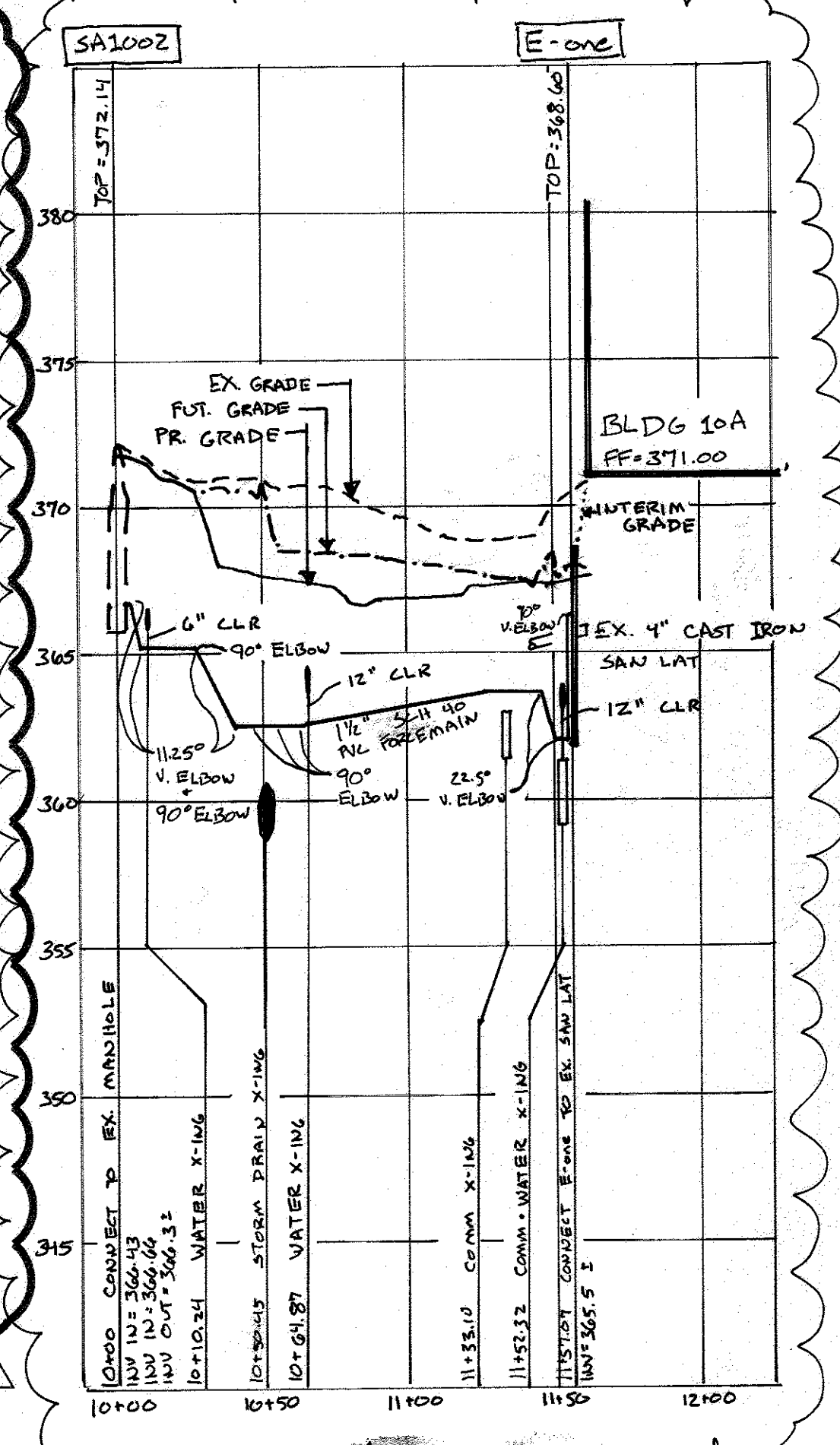
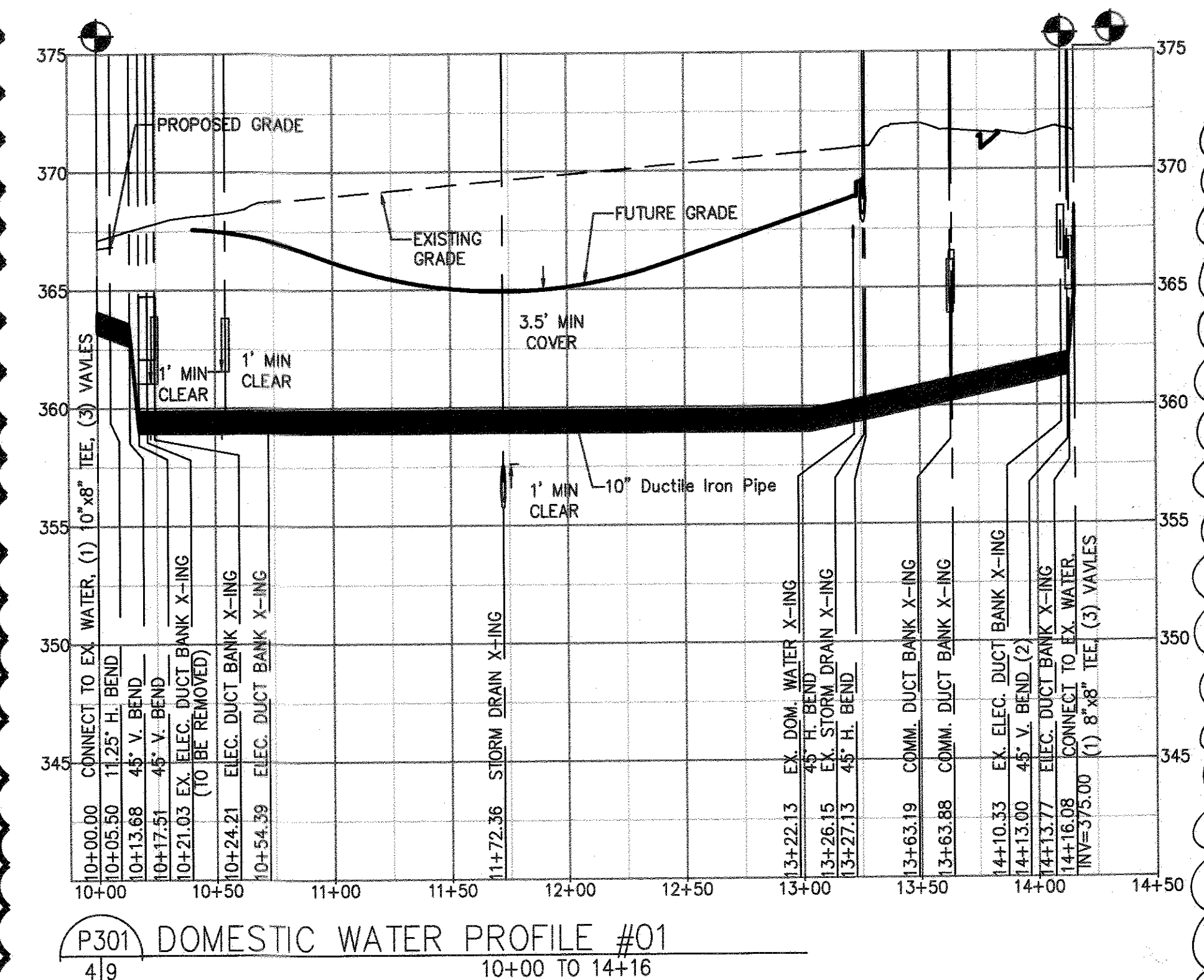
**UTILITY NOTES**

1. CONTRACTOR SHOULD OPEN THAT SECTION OF TRENCH THAT CAN BE BACKFILLED AND STABILIZED EACH DAY. IF TRENCH MUST REMAIN OPEN LONGER THAN ONE DAY, SILT FENCE SHALL BE PLACED BELOW (DOWNSLOPE) THE TRENCH.
2. PLACE ALL EXCAVATED MATERIAL ON UPHILL SIDE OF TRENCH.
3. ANY SEDIMENT CONTROLS DISTURBED BY UTILITY CONSTRUCTION ARE TO BE REPAIRED IMMEDIATELY.

SEE SHEET 9A OF 12 FOR SEEDING NOTES

**REQUIRED SEQUENCE OF CONSTRUCTION TIMETABLE**

1. OBTAIN ALL REQUIRED PERMITS FROM HOWARD COUNTY.	1 WEEK
2. NOTIFY JAMES LOESCH, PE AT THE APPLIED PHYSICS LABORATORY AT 443-778-5134 AT LEAST 10 DAYS PRIOR TO BEGINNING WORK.	1 DAY
3. NOTIFY THE HOWARD COUNTY DEPARTMENT OF PERMITS & LICENSES, GRADING AND SEDIMENT CONTROL INSPECTIONS AT 410-313-1855, AT LEAST 48 HOURS PRIOR TO BEGINNING WORK.	1 DAY
4. INSTALL PROPOSED STABILIZED CONSTRUCTION ENTRANCE, 6" DIA. DIMENSION-DWG. STORM OUTLET STRUCTURE, RELOCATE EXISTING MOUNTABLE BERM AND SILT FENCE ON NORTH SIDE OF SITE. INSTALL SILT FENCE AND TEMPORARY ASPHALT BERM	1 WEEK
5. CLEAR AND GRUB AREA OUTSIDE OF EXISTING STOCKPILE AND WITHIN THE LIMIT OF DISTURBANCE. DEMOLISH BUILDINGS	4 WEEKS
6. REMOVE OR ABANDON IN PLACE DESIGNATED UTILITIES.	1 WEEK
7. MASS GRADE SITE.	2 WEEKS
8. INSTALL STORM DRAIN & 4" WATER. INSTALL INLET PROTECTION, ONCE INLETS ARE INSTALLED.	2 WEEKS
9. INSTALL PROPOSED RETAINING WALL AND ADJUTMENTS INCLUDING GANGWAY COLUMN FOOTINGS.	1 MONTH
11. FINE GRADE ROAD & LOADING DOCK AREAS.	1 WEEK
12. INSTALL CURB & GUTTER.	2 DAYS
13. INSTALL ROAD AND LOADING DOCK SUBBASE.	2 DAYS
14. INSTALL TEMPORARY GRAVEL ACCESS ROAD.	1 DAY
15. PAVE ALL ROAD & LOADING DOCK AREAS WITH EITHER CONTINUOUS PAVING OR REINFORCED HEAVY DUTY CONCRETE PAVING.	2 WEEKS
16. FINE GRADE AND STABILIZE ALL REMAINING NON-PAVED SURFACES.	2 DAYS
17. INSTALL CANOPIES, BALER, AND COMPACTOR POWER SUPPLY BUILDINGS.	2 WEEKS
18. REMOVE ALL SEDIMENT CONTROLS, FINE GRADE AND STABILIZE THOSE AREAS.	1 WEEKS



**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 NUMBER: 20906 EXPIRATION DATE: 2/17/2016

BY THE ENGINEER:  
I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.  
*Richard E. Burdick* 7/10/09  
SIGNATURE OF ENGINEER DATE

BY THE DEVELOPER:  
I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY 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.  
*Eileen M. Carey* 2/8/16  
SIGNATURE OF DEVELOPER DATE

THIS DEVELOPMENT PLAN IS AS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.  
*John A. Robertson* 2/17/16  
HOWARD S.C.D. 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 NUMBER: 92574 EXPIRATION DATE: 1/16/18

**JHU/APL INTERNAL USE**  
THIS DATA SHALL NOT BE DISCLOSED TO A THIRD PARTY AND SHALL NOT BE DUPLICATED, USED, OR DISCLOSED IN WHOLE OR IN PART FOR ANY PURPOSE OTHER THAN TO EVALUATE THIS RFP, OR IN THE CASE OF A CONTRACT AWARD, TO PERFORM THE WORK REQUIRED HEREUNDER, WITHOUT THE EXPRESS WRITTEN CONSENT OF JHU/APL.

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
*Chad E. Clark* 2-22-16  
Chief, Development Engineering Division Date  
*Valerie J. Jolly* 3-2-16  
Chief, Division of Land Development Date  
Director

**M CENTURY ENGINEERING**  
CONSULTING ENGINEERS - PLANNERS  
10710 Gilroy Road, Hunt Valley, MD 21031  
Phone: 443.589.2400 Fax: 443.589.2401

DESIGN BY: A.J.D.  
DRAWN BY: M.S.S./M.C.A.  
CHECKED BY:  
DATE: 7/18/08

REB	ADDED FOREMAN PROFILE	7/3/17
REB	RELOCATED STORM AND WATER PROFILES	1/15/18
BY	NO.	DATE

**THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY**  
11100 JOHNS HOPKINS ROAD  
LAUREL, MARYLAND 20723-6099  
443-778-5134

**EROSION AND SEDIMENT CONTROL SPECIFICATIONS AND NOTES**  
**SERVICE & SUPPORT AREA INFRASTRUCTURE FACILITY PHASE I**  
TAX MAP: 41 GRID: 16 PARCEL: 123  
ELECTION DISTRICT 5-05 HOWARD COUNTY, MARYLAND  
SHEET 9 OF 14  
C.E.I. PROJECT NUMBER 22172.26  
SCALE: 1"=30'  
SDP-08-04A



**B-4.2 STANDARDS AND SPECIFICATIONS**

**FOR**

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

**Definition**

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

**Purpose**

To provide a suitable soil medium for vegetative growth.

**Conditions Where Practice Applies**

Where vegetative stabilization is to be established.

**Criteria**

- A. Soil Preparation
1. Temporary Stabilization
    - a. Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must not be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
    - b. Apply fertilizer and lime as prescribed on the plans.
    - c. Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
  2. Permanent Stabilization
    - a. A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
      - i. Soil pH between 6.0 and 7.0.
      - ii. Soluble salts less than 500 parts per million (ppm).
      - iii. Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: if lovegrass will be planted, then a sandy soil (less than 30 percent silt plus clay) would be acceptable.
      - iv. Soil contains 1.5 percent minimum organic matter by weight.
      - v. Soil contains sufficient pore space to permit adequate root penetration.
    - b. Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
    - c. Graded areas must be maintained in a true and even grade as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.

B.12

- B. Topsoiling
1. Topsoil is placed over prepared subsoil prior to establishment of permanent vegetation. The purpose is to provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.
  2. Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-NRCS.
  3. Topsoiling is limited to areas having 2:1 or flatter slopes where:
    - a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
    - b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
    - c. The original soil to be vegetated contains material toxic to plant growth.
    - d. The soil is so acidic that treatment with limestone is not feasible.
  4. Areas having slopes steeper than 2:1 require special consideration and design.
  5. Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:
    - a. Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Topsoil must not be a mixture of contrasting textured subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1 1/2 inches in diameter.
    - b. Topsoil must be free of noxious plants or plant parts such as Bermuda grass, quack grass, Johnson grass, nut sedge, poison ivy, thistle, or others as specified.
    - c. Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.
  6. Topsoil Application
    - a. Erosion and sediment control practices must be maintained when applying topsoil.
    - b. Uniformly distribute topsoil in a 5 to 8 inch layer and lightly compact to a minimum thickness of 4 inches. Spreading is to be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations must be corrected in order to prevent the formation of depressions or water pockets.
    - c. Topsoil must not be placed if the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading.

B.13

**JHU/APL INTERNAL USE**

THIS DATA SHALL NOT BE DISCLOSED TO A THIRD PARTY AND SHALL NOT BE DUPLICATED, USED, OR DISCLOSED IN WHOLE OR IN PART FOR ANY PURPOSE OTHER THAN TO EVALUATE THIS RFP OR, IN THE CASE OF A CONTRACT AWARD, TO PERFORM THE WORK REQUIRED HEREUNDER, WITHOUT THE EXPRESS WRITTEN CONSENT OF JHU/APL.

**APPROVED: DEPARTMENT OF PLANNING AND ZONING**

Chief, Development Engineering Division *7-22-16*  
 Chief, Division of Land Development *3-01-16*  
 Director *3-2-16*

**B-4.3 STANDARDS AND SPECIFICATIONS**

**FOR**

**SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)**

**Definition**

The application of seed and mulch to establish vegetative cover.

**Purpose**

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

**Conditions Where Practice Applies**

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

**Criteria**

- A. Soil Amendments (Fertilizer and Lime Specifications)
1. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more. Soil analysis may be performed by a recognized private or commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analysis.
  2. Fertilizers must be uniform in composition, free flowing and suitable for accurate application by appropriate equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers must all be delivered to the site fully labeled according to the applicable laws and must bear the name, trade name or trademark and warranty of the producer.
  3. Lime materials must be ground limestone (hydrated or burnt lime may be substituted except when hydrosceding) which contains at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone must be ground to such fineness that at least 50 percent will pass through a #100 mesh sieve and 98 to 100 percent will pass through a #20 mesh sieve.
  4. Lime and fertilizer are to be evenly distributed and incorporated into the top 3 to 5 inches of soil by disking or other suitable means.
  5. Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil.

**B-4.3 STANDARDS AND SPECIFICATIONS**

**FOR**

**SEEDING AND MULCHING**

**Definition**

The application of seed and mulch to establish vegetative cover.

**Purpose**

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

**Conditions Where Practice Applies**

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

**Criteria**

- A. Seeding
1. Specifications
    - a. All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to Table B.4 regarding the quality of seed. Seed tags must be available upon request to the inspector to verify type of seed and seeding rate.
    - b. Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. The appropriate seeding mixture must be applied when the ground thaws.
    - c. Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. Use four times the recommended rate when hydrosceding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.
    - d. Sod or seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.
  2. Application
    - a. Dry Seeding: This includes use of conventional drop or broadcast spreaders.
      - i. Incorporate seed into the subsoil at the rates prescribed on Temporary Seeding Table B.1, Permanent Seeding Table B.3, or site-specific seeding summaries.
      - ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Roll the seeded area with a weighted roller to provide good seed to soil contact.

B.15

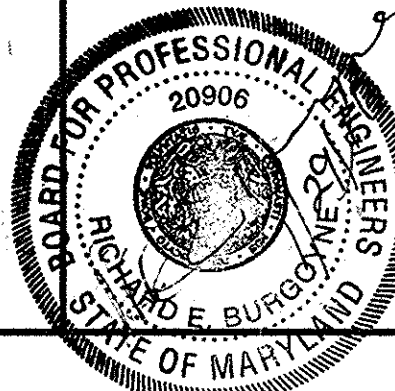
**Temporary Seeding Summary**

Hardiness Zone (from Figure B.3):					Fertilizer Rate (10-20-20)	Lime Rate
Seed Mixture (from Table B.1):						
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths		
	ANNUAL RYEGRASS	40	MAR 1 - MAY 15; AUG 15 - OCT 15	0.5"	436 lb/ac (10 lb/1000 sf)	2 tons/ac (90 lb/1000 sf)

**Permanent Seeding Summary**

Hardiness Zone (from Figure B.3):					Fertilizer Rate (10-20-20)			Lime Rate
Seed Mixture (from Table B.3):					N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths				
	3-WAY TALL FESCUE MIX	60	MAR 1 - MAY 15; AUG 15 - OCT 15	1/4 - 1/2 in	45 pounds per acre (1.0 lb/1000 sf)	90 lb/ac (2 lb/1000 sf)	90 lb/ac (2 lb/1000 sf)	2 tons/ac (90 lb/1000 sf)
				1/4 - 1/2 in				
				1/4 - 1/2 in				

FOR REVISION



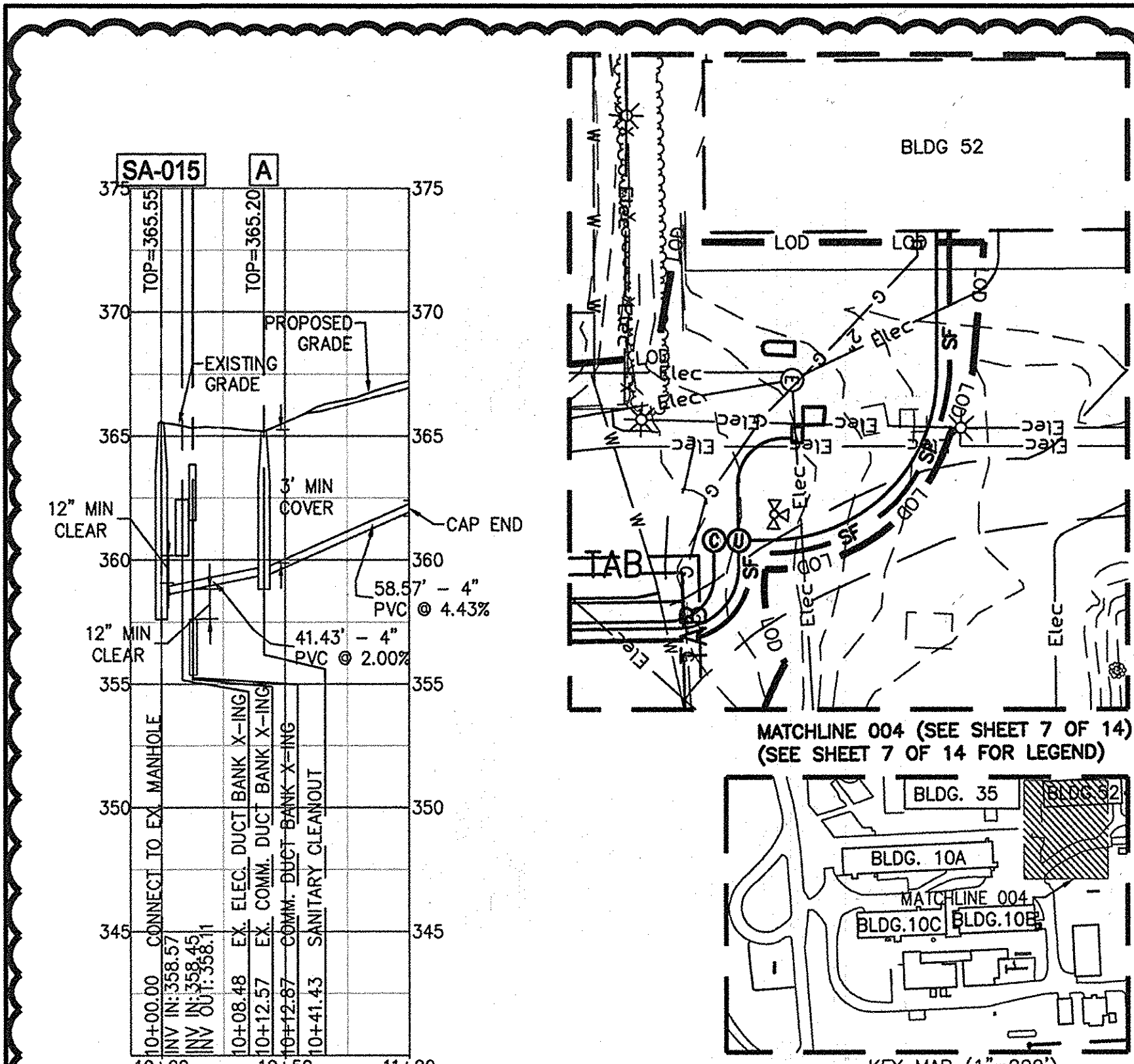
DESIGN BY: J.M.  
 DRAWN BY: J.M.  
 CHECKED BY: D.B.  
 DATE: 1/15/16

REVISION	DATE	BY	NO.
NEW SHEET	1/15/16		

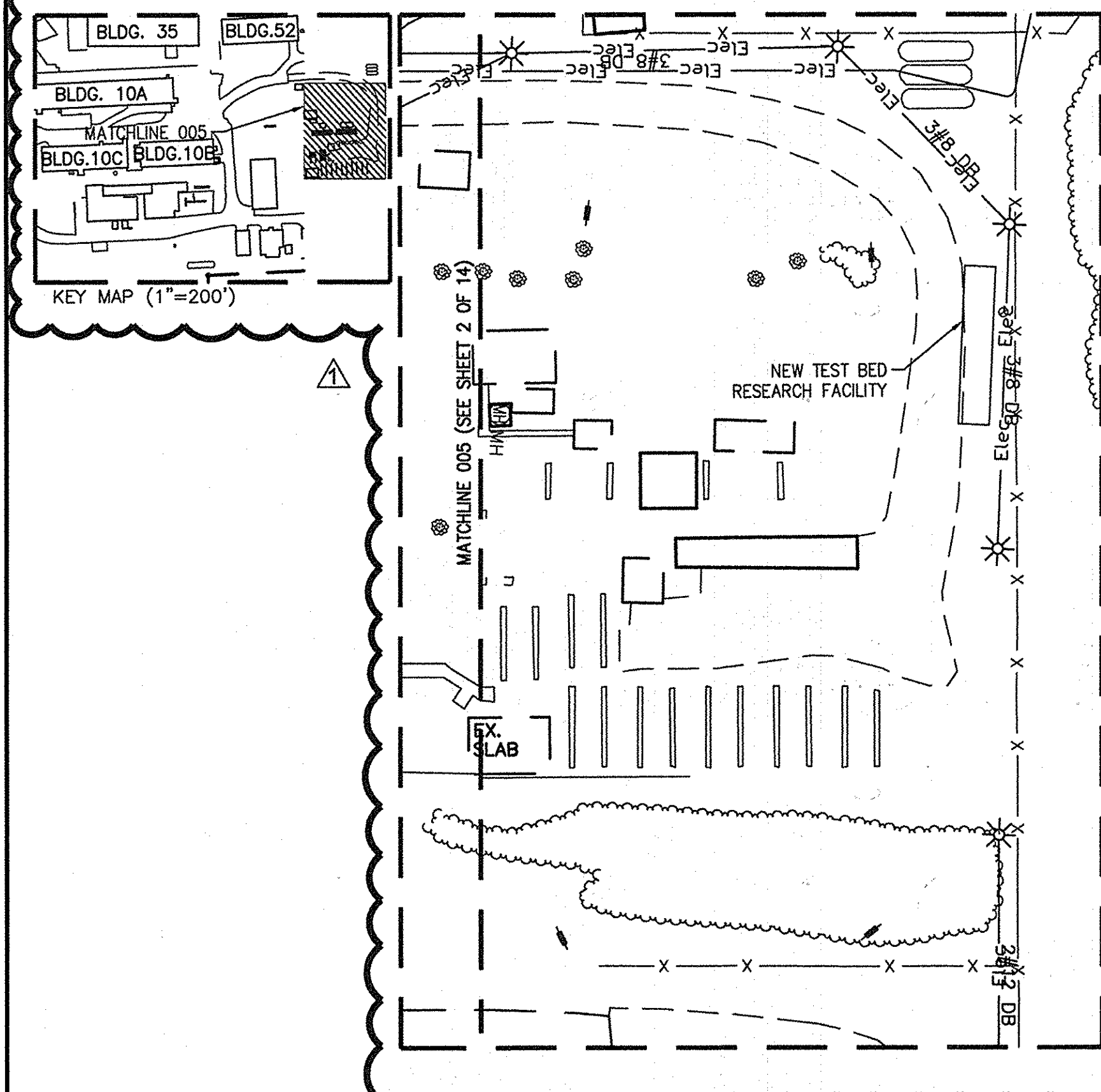
**HOWARD SOIL CONSERVATION DISTRICT  
STANDARD SEDIMENT CONTROL NOTES**

1. A PRE-CONSTRUCTION MEETING MUST OCCUR WITH THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION INSPECTION DIVISION (CID) 4100 HIGGINS BLVD. THE FUTURE LOD AND PROTECTED AREAS ARE MARKED CLEARLY IN THE FIELD. A MINIMUM OF 48 HOUR NOTICE TO CID MUST BE GIVEN TO THE START OF DIRT DISTURBANCE.
2. PRIOR TO THE START OF DIRT DISTURBANCE, PERIMETER EROSION AND SEDIMENT CONTROLS, BUT NOT LIMITED TO THE INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, MUST BE IN PLACE TO PREVENT THE START OF ANOTHER PHASE OF CONSTRUCTION OR OPENING OF ANOTHER GRADING UNIT.
3. PRIOR TO THE REMOVAL OR MODIFICATION OF SEDIMENT CONTROL PRACTICES, ALL OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL REVIEW OF THE REMOVAL OR MODIFICATION OF SEDIMENT CONTROL PRACTICES AND PERMITS SHALL BE REFERENCED, TO ENSURE COORDINATION AND TO AVOID CONFLICTS WITH THIS ACT.
4. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. PERMANENT OR TEMPORARY STABILIZATION IS REQUIRED WITHIN THREE (3) CALENDAR DAYS TO THE SURFACE OF ALL AREAS DISTURBED BY THE DISC DIVISION OF DISTURBANCE. ALL AREAS STEEPER THAN 1:1 HORIZONTAL TO 1 VERTICAL SHALL BE PROTECTED WITHIN 72 HOURS OF DISTURBANCE. ALL AREAS DISTURBED MUST BE STABILIZED WITHIN THE SAME PERIOD OF TIME AS ABOVE IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. MULCHING SHALL BE USED TO PROTECT AREAS WITH SLOPES OF 1:1 TO 2:1. MULCHING SHALL BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES FOR THE GROUND IS FROZEN. MULCHING SHALL BE APPLIED TO ALL AREAS WITH SLOPES OF 1:1 TO 2:1. MULCHING SHALL BE APPLIED TO ALL AREAS WITH SLOPES OF 2:1 TO 3:1. 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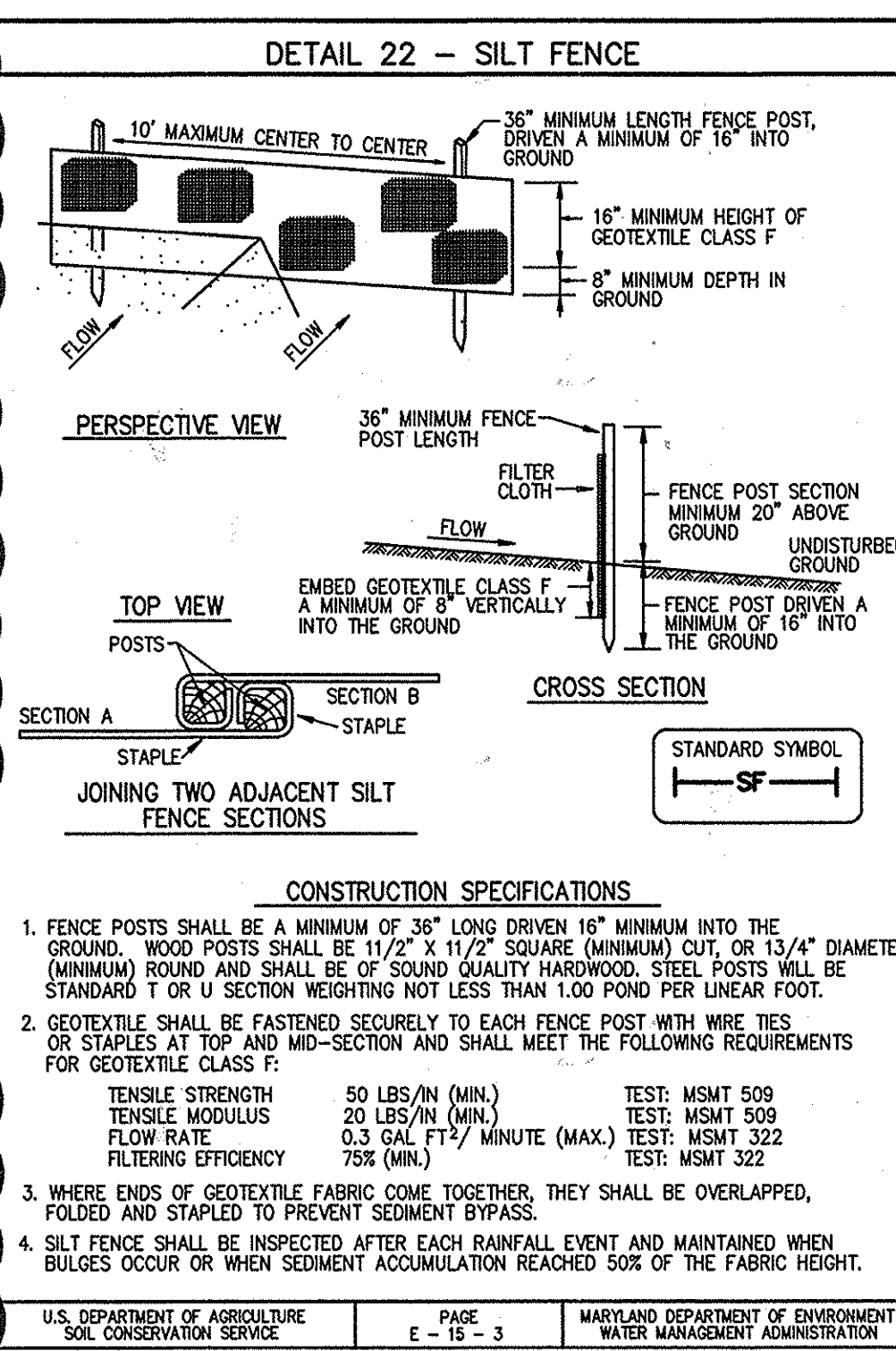


P201 SANITARY SEWER PROFILE #01  
10+00 TO 11+00

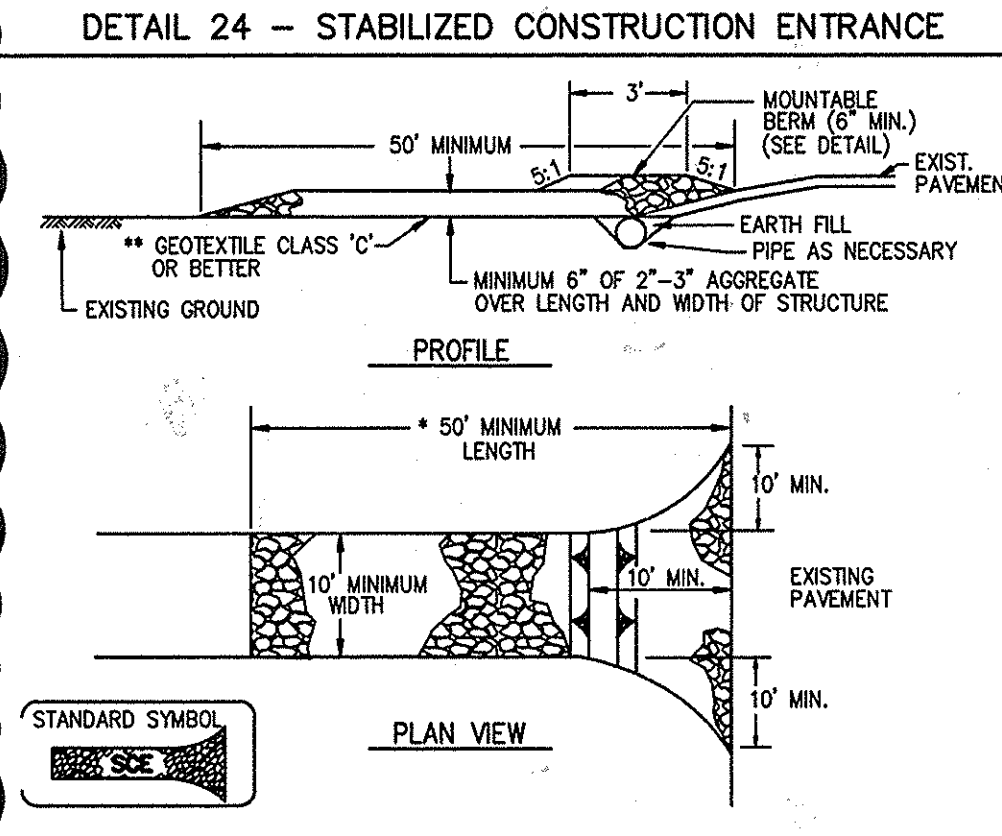


JHU/APL INTERNAL USE  
THIS DATA SHALL NOT BE DISCLOSED TO A THIRD PARTY AND SHALL NOT BE DUPLICATED, USED, OR DISCLOSED IN WHOLE OR IN PART FOR ANY PURPOSE OTHER THAN TO EVALUATE THIS RFP OR, IN THE CASE OF A CONTRACT AWARD, TO PERFORM THE WORK REQUIRED HEREUNDER, WITHOUT THE EXPRESS WRITTEN CONSENT OF JHU/APL.

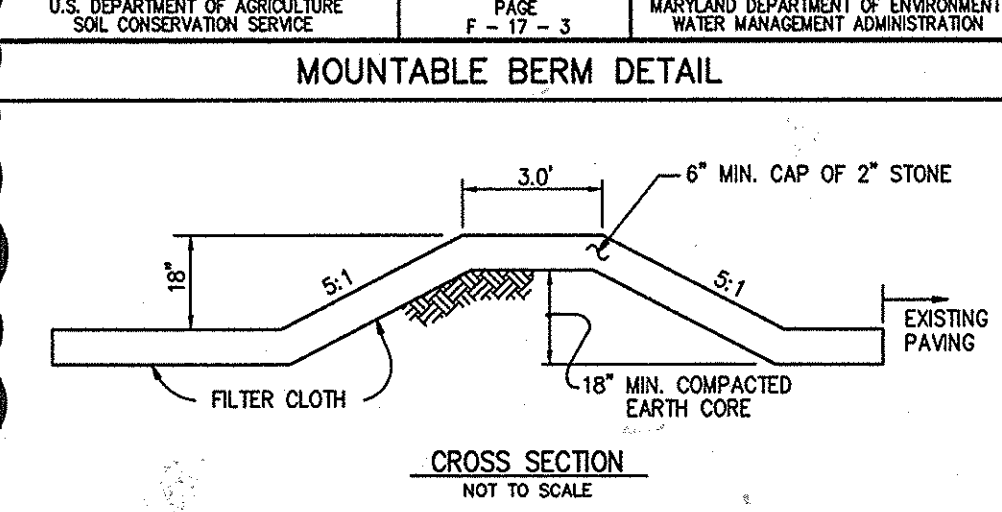
**PROFESSIONAL CERTIFICATION**  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NUMBER: 32574 EXPIRATION DATE: 1/16/18



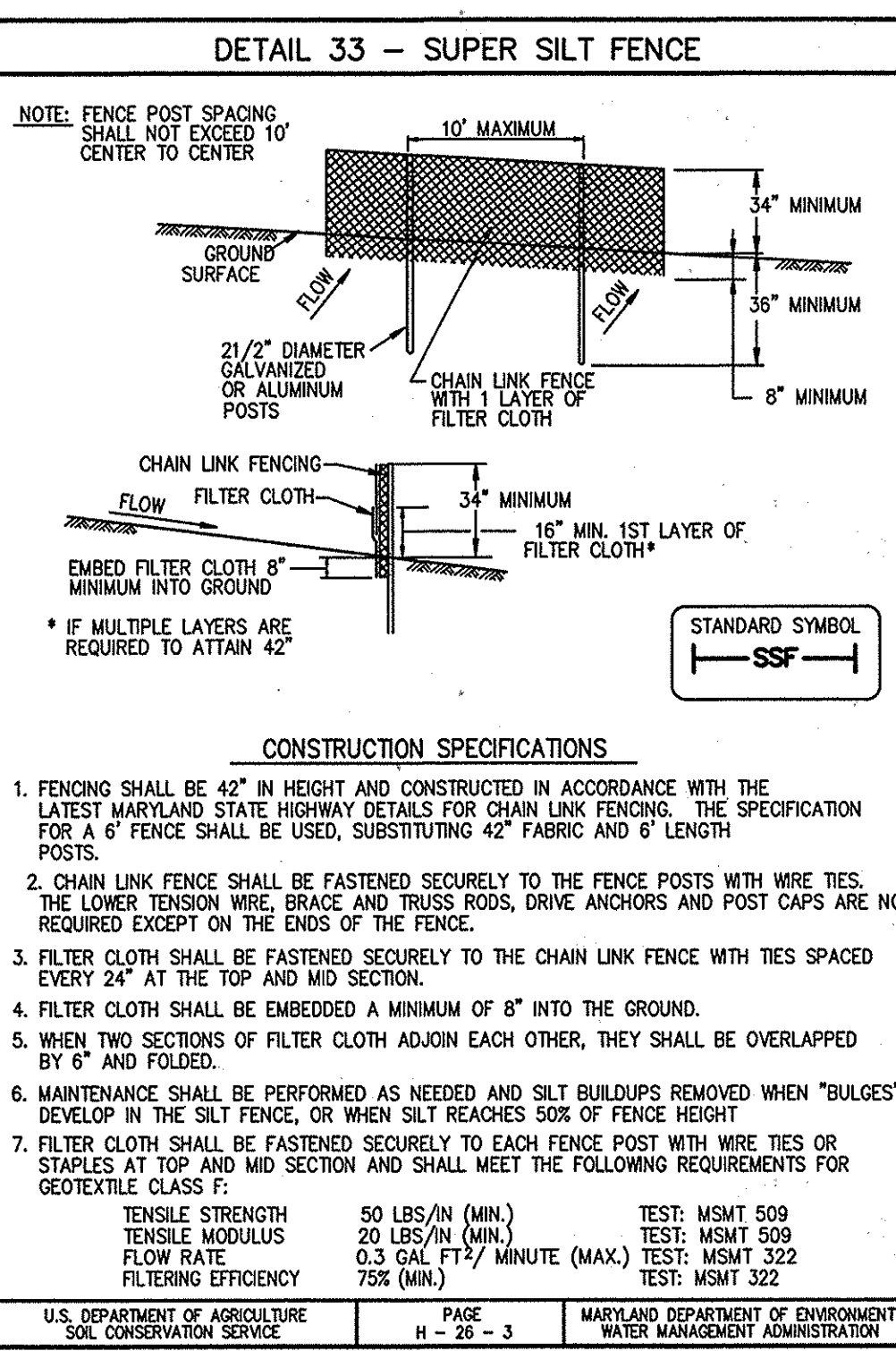
CONSTRUCTION SPECIFICATIONS  
1. FENCE POSTS SHALL BE A MINIMUM OF 36" LONG DRIVEN 16" MINIMUM INTO THE GROUND. WOOD POSTS SHALL BE 1 1/2" X 1 1/2" SQUARE (MINIMUM) CUT, OR 1 3/4" DIAMETER (MINIMUM) ROUND AND SHALL BE OF SOUND QUALITY HARDWOOD. STEEL POSTS WILL BE STANDARD T OR U SECTION WEIGHING NOT LESS THAN 1.00 POUND PER LINEAR FOOT.  
2. GEOTEXTILE SHALL BE FASTENED SECURELY TO EACH FENCE POST WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION AND SHALL MEET THE FOLLOWING REQUIREMENTS FOR GEOTEXTILE CLASS F:  
TENSILE STRENGTH 50 LBS/IN (MIN.) TEST: MSMT 509  
TENSILE MODULUS 20 LBS/IN (MIN.) TEST: MSMT 509  
FLOW RATE 0.3 GAL FT<sup>2</sup>/MINUTE (MAX.) TEST: MSMT 322  
FILTERING EFFICIENCY 75% (MIN.) TEST: MSMT 322  
3. WHERE ENDS OF GEOTEXTILE FABRIC COME TOGETHER, THEY SHALL BE OVERLAPPED, FOLDED AND STAPLED TO PREVENT SEDIMENT BYPASS.  
4. SILT FENCE SHALL BE INSPECTED AFTER EACH RAINFALL EVENT AND MAINTAINED WHEN BULGES OCCUR OR WHEN SEDIMENT ACCUMULATION REACHED 50% OF THE FABRIC HEIGHT.



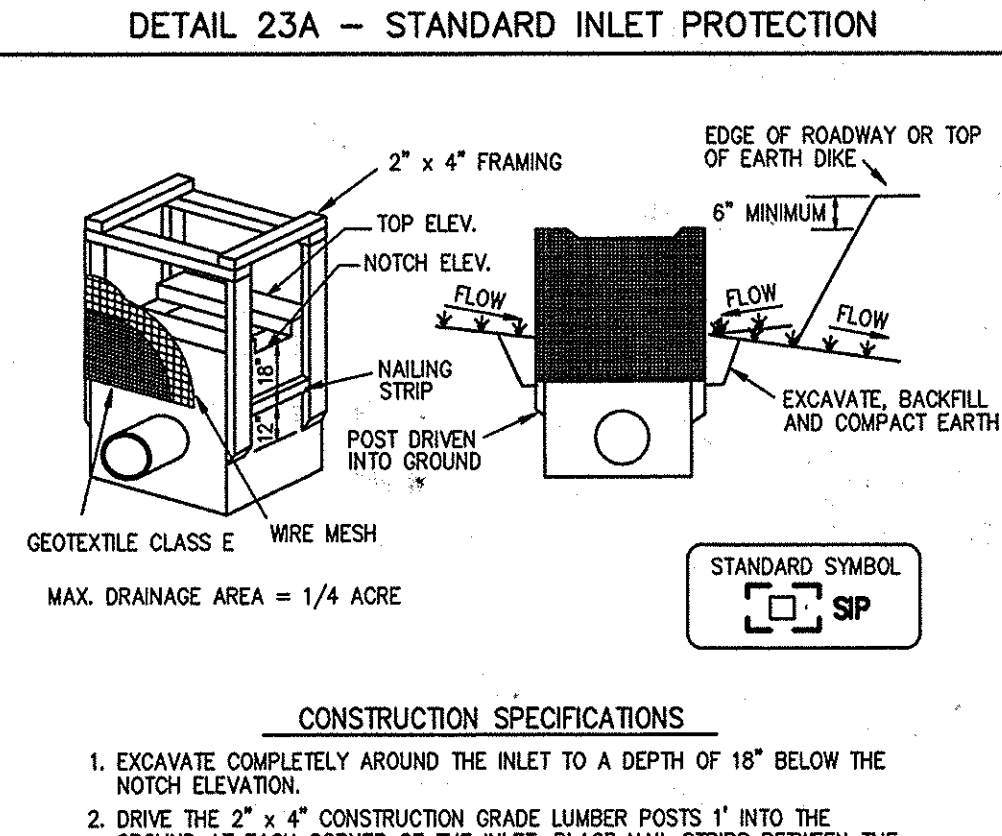
CONSTRUCTION SPECIFICATIONS  
1. LENGTH - MINIMUM OF 50' (30' FOR SINGLE RESIDENCE LOT).  
2. WIDTH - 10' MINIMUM, SHOULD BE FLARED AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.  
3. GEOTEXTILE FABRIC (FILTER CLOTH) SHALL BE PLACED OVER THE EXISTING GROUND PRIOR TO PLACING STONE. \*\*THE PLAN APPROVAL AUTHORITY MAY NOT REQUIRE SINGLE FAMILY RESIDENCES TO USE GEOTEXTILE.  
4. STONE - CRUSHED AGGREGATE (2" TO 3") OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT SHALL BE PLACED AT LEAST 6" DEEP OVER THE LENGTH AND WIDTH OF THE ENTRANCE.  
5. SURFACE WATER - ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED THROUGH THE ENTRANCE. MAINTAINING POSITIVE DRAINAGE. PIPE INSTALLED THROUGH THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROTECTED WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 6" OF STONE OVER THE PIPE. PIPE HAS TO BE SIZED ACCORDING TO THE DRAINAGE WHEN THE PIPE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY A PIPE WILL NOT BE NECESSARY. PIPE SHOULD BE SIZED ACCORDING TO THE AMOUNT OF RUNOFF TO BE CONVEYED. A 6" MINIMUM WILL BE REQUIRED.  
6. LOCATION - A STABILIZED CONSTRUCTION ENTRANCE SHALL BE LOCATED AT EVERY POINT WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES A CONSTRUCTION SITE. VEHICLES LEAVING THE SITE MUST TRAVEL OVER THE ENTIRE LENGTH OF THE STABILIZED CONSTRUCTION ENTRANCE.



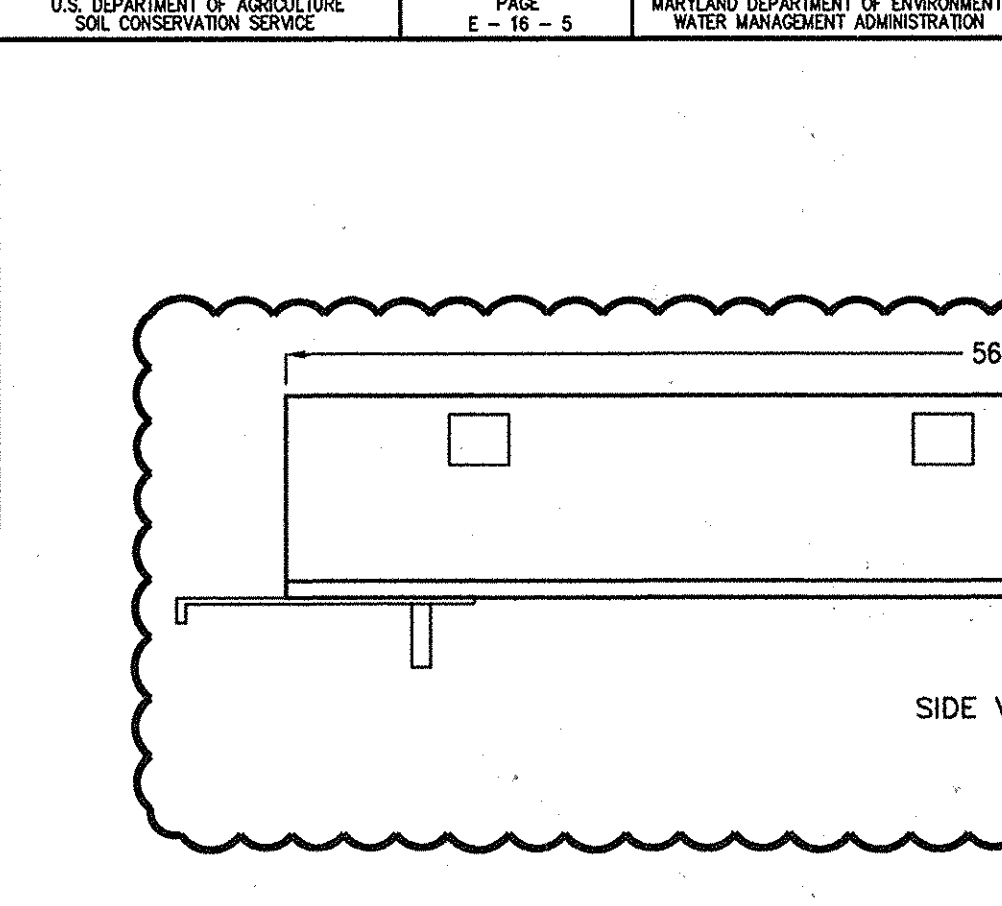
**PROFESSIONAL CERTIFICATION**  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NUMBER: 20966 EXPIRATION DATE: 2/18/2017



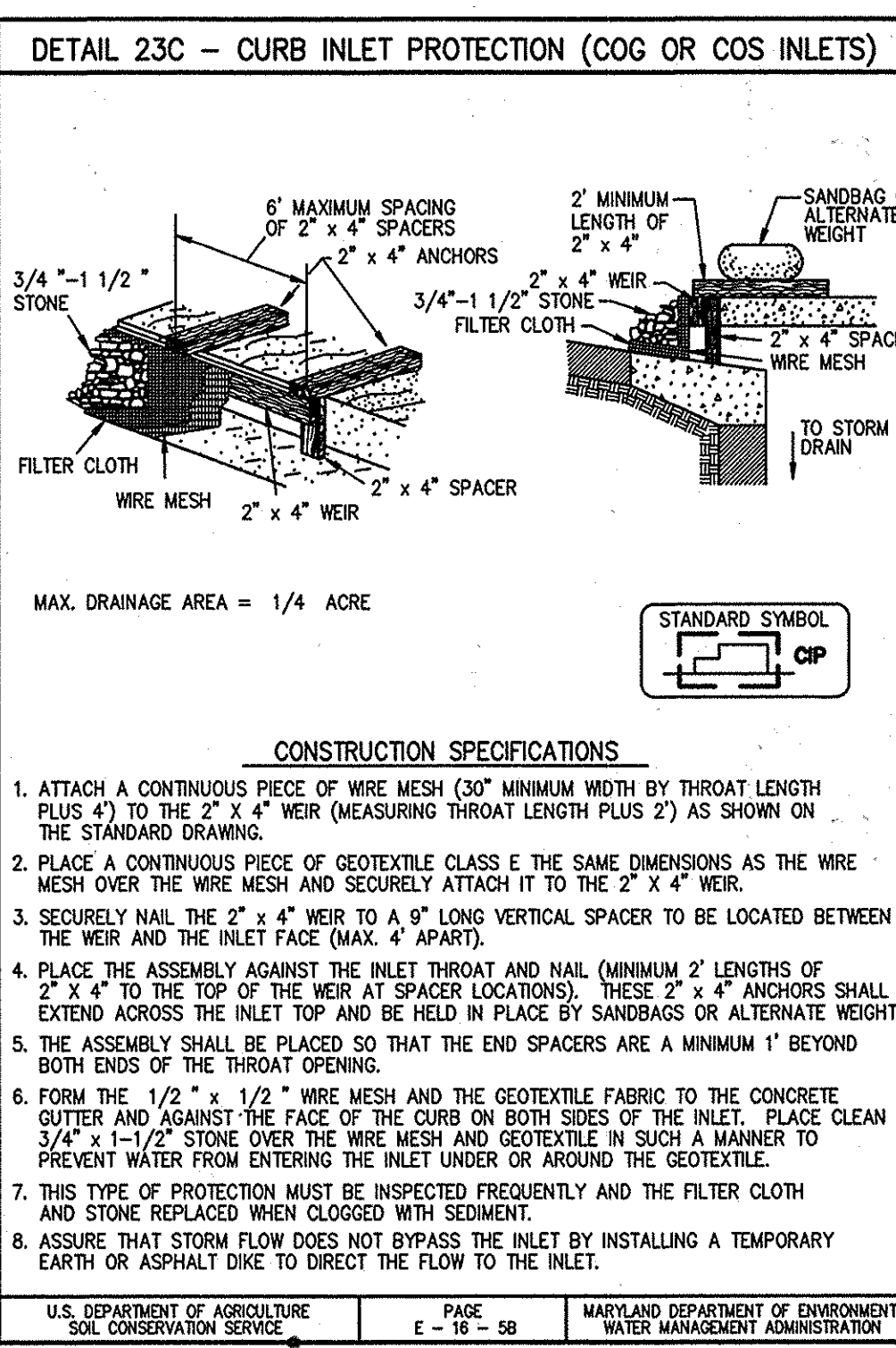
CONSTRUCTION SPECIFICATIONS  
1. FENCING SHALL BE 42" IN HEIGHT AND CONSTRUCTED IN ACCORDANCE WITH THE LATEST MARYLAND STATE HIGHWAY DETAILS FOR CHAIN LINK FENCING. THE SPECIFICATION FOR A 6' FENCE SHALL BE USED, SUBSTITUTING 42" FABRIC AND 6' LENGTH POSTS.  
2. CHAIN LINK FENCE SHALL BE FASTENED SECURELY TO THE FENCE POSTS WITH WIRE TIES. THE LOWER TENSION WIRE BRACE AND TRUSS RODS, DRIVE ANCHORS AND POST CAPS ARE NOT REQUIRED EXCEPT ON THE ENDS OF THE FENCE.  
3. FILTER CLOTH SHALL BE FASTENED SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24" AT THE TOP AND MID SECTION.  
4. FILTER CLOTH SHALL BE EMBEDDED A MINIMUM OF 8" INTO THE GROUND.  
5. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6" AND FOLDED.  
6. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SILT BUILDSUP REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE, OR WHEN SILT REACHES 50% OF FENCE HEIGHT.  
7. FILTER CLOTH SHALL BE FASTENED SECURELY TO EACH FENCE POST WITH WIRE TIES OR STAPLES AT TOP AND MID SECTION AND SHALL MEET THE FOLLOWING REQUIREMENTS FOR GEOTEXTILE CLASS F:  
TENSILE STRENGTH 50 LBS/IN (MIN.) TEST: MSMT 509  
TENSILE MODULUS 20 LBS/IN (MIN.) TEST: MSMT 509  
FLOW RATE 0.3 GAL FT<sup>2</sup>/MINUTE (MAX.) TEST: MSMT 322  
FILTERING EFFICIENCY 75% (MIN.) TEST: MSMT 322



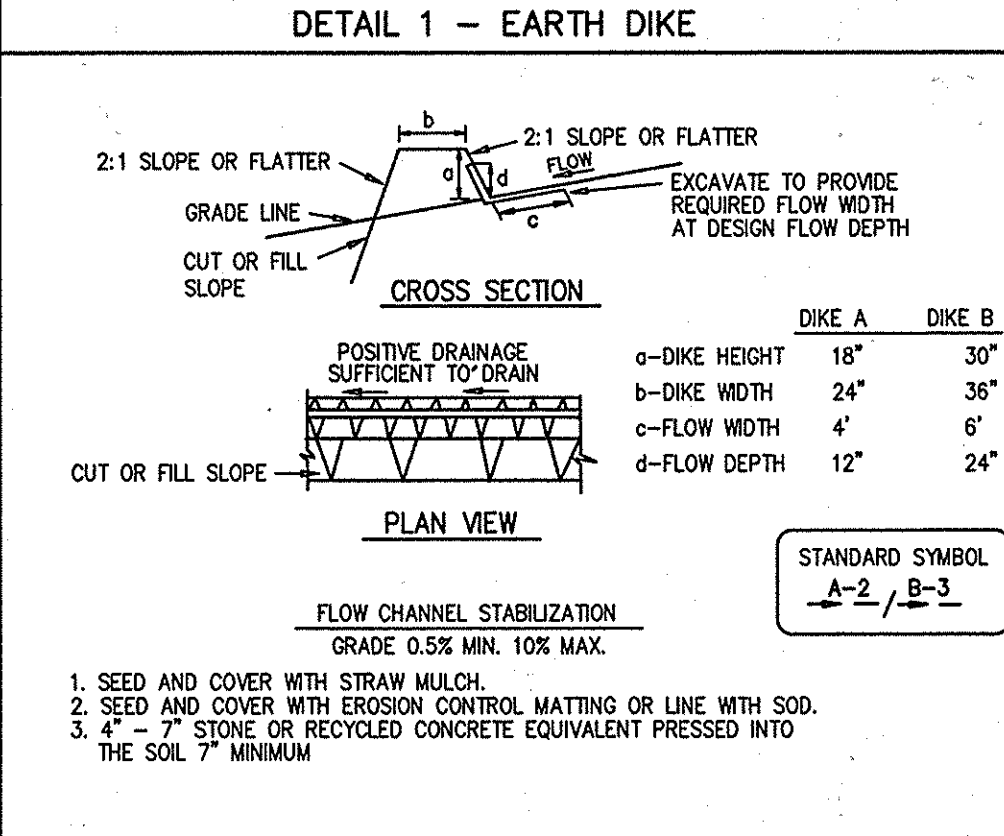
CONSTRUCTION SPECIFICATIONS  
1. EXCAVATE COMPLETELY AROUND THE INLET TO A DEPTH OF 18" BELOW THE NOTCH ELEVATION.  
2. DRIVE THE 2" X 4" CONSTRUCTION GRADE LUMBER POSTS 1' INTO THE GROUND AT EACH CORNER OF THE INLET. PLACE NAIL STRIPS BETWEEN THE POSTS ON THE ENDS OF THE INLET. ASSEMBLE THE TOP PORTION OF THE 2" X 4" FRAME USING THE OVERLAP JOINT SHOWN ON DETAIL 23A. THE TOP OF THE FRAME (WEIR) MUST BE 6" BELOW ADJACENT ROADWAYS WHERE FLOODING AND SAFETY ISSUES MAY ARISE.  
3. STRETCH THE 1 1/2" X 1 1/2" WIRE MESH TIGHTLY AROUND THE FRAME AND FASTEN SECURELY. THE ENDS MUST MEET AND OVERLAP AT A POST.  
4. STRETCH THE GEOTEXTILE CLASS E TIGHTLY OVER THE WIRE MESH WITH THE GEOTEXTILE EXTENDING FROM THE TOP OF THE FRAME TO 18" BELOW THE INLET NOTCH ELEVATION. FASTEN THE GEOTEXTILE FIRMLY TO THE FRAME. THE ENDS OF THE GEOTEXTILE MUST MEET AT A POST, BE OVERLAPPED AND FOLDED, THEN FASTENED DOWN.  
5. BACKFILL AROUND THE INLET IN COMPACTED 6" LAYERS UNTIL THE LAYER OF EARTH IS LEVEL WITH THE NOTCH ELEVATION ON THE ENDS AND TOP ELEVATION ON THE SIDES.  
6. IF THE INLET IS NOT IN A SWAMP, CONSTRUCT A COMPACTED EARTH DIKE ACROSS THE DITCH LINE DIRECTLY BELOW IT. THE TOP OF THE EARTH DIKE SHOULD BE AT LEAST 6" HIGHER THAN THE TOP OF THE FRAME.  
7. THE STRUCTURE MUST BE INSPECTED PERIODICALLY AND AFTER EACH RAIN AND THE GEOTEXTILE REPLACED WHEN IT BECOMES FLOODED.



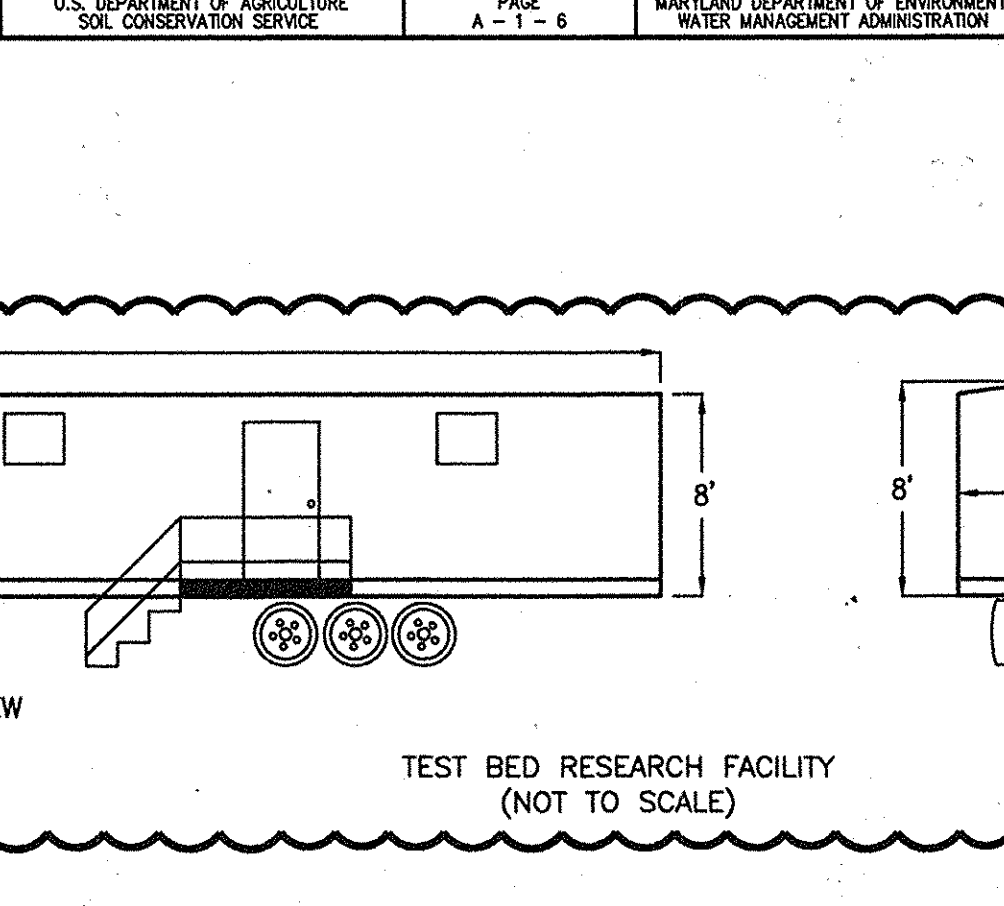
CONSTRUCTION SPECIFICATIONS  
1. ALL TEMPORARY EARTH DIKES SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET. SPOT ELEVATIONS MAY BE NECESSARY FOR GRADES LESS THAN 1%.  
2. RUNOFF DIVERTED FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.  
3. RUNOFF DIVERTED FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED, STABILIZED AREA AT A NON-EROSIVE VELOCITY.  
4. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBSTRUCTIONAL MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE DIKE.  
5. THE DIKE SHALL BE EXCAVATED OR SHAPED TO LINE. GRADE AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.  
6. FILL SHALL BE COMPACTED BY EARTH MOVING EQUIPMENT.  
7. ALL EARTH REMOVED AND NOT NEEDED FOR CONSTRUCTION SHALL BE PLACED SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE DIKE.  
8. INSPECTION AND MAINTENANCE MUST BE PROVIDED PERIODICALLY AND AFTER EACH RAIN EVENT.



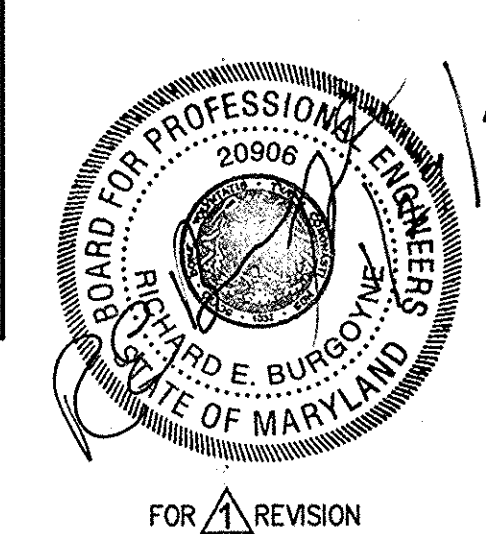
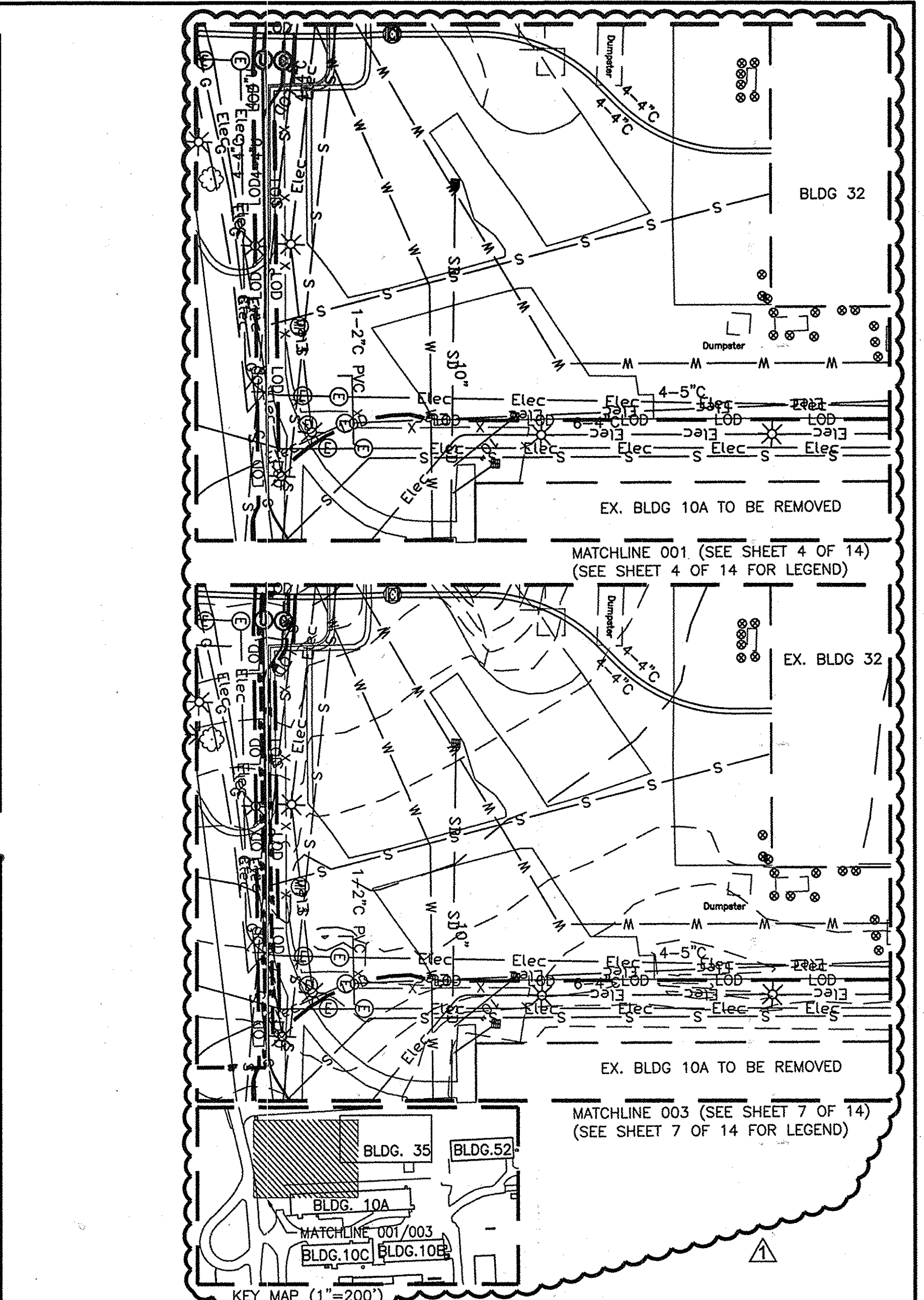
CONSTRUCTION SPECIFICATIONS  
1. ATTACH A CONTINUOUS PIECE OF WIRE MESH (30" MINIMUM WIDTH BY THROAT LENGTH PLUS 4") TO THE 2" X 4" WEIR (MEASURING THROAT LENGTH PLUS 2") AS SHOWN ON THE STANDARD DRAWING.  
2. PLACE A CONTINUOUS PIECE OF GEOTEXTILE CLASS E THE SAME DIMENSIONS AS THE WIRE MESH OVER THE WIRE MESH AND SECURELY ATTACH IT TO THE 2" X 4" WEIR.  
3. SECURELY NAIL THE 2" X 4" WEIR TO A 9" LONG VERTICAL SPACER TO BE LOCATED BETWEEN THE WEIR AND THE INLET FACE (MAX. 4" APART).  
4. PLACE THE ASSEMBLY AGAINST THE INLET THROAT AND NAIL (MINIMUM 2" LENGTHS OF 2" X 4" TO THE TOP OF THE WEIR AT SPACER LOCATIONS). THESE 2" X 4" ANCHORS SHALL EXTEND ACROSS THE INLET TOP AND BE HELD IN PLACE BY SANDBAGS OR ALTERNATE WEIGHT.  
5. THE ASSEMBLY SHALL BE PLACED SO THAT THE END SPACERS ARE A MINIMUM 1" BEYOND BOTH ENDS OF THE THROAT OPENING.  
6. FORM THE 1/2" X 1/2" WIRE MESH AND THE GEOTEXTILE FABRIC TO THE CONCRETE GUTTER AND AGAINST THE FACE OF THE CURB ON BOTH SIDES OF THE INLET. PLACE CLEAN 3/4" X 1-1/2" STONE OVER THE WIRE MESH AND GEOTEXTILE IN SUCH A MANNER TO PREVENT WATER FROM ENTERING THE INLET UNDER OR AROUND THE GEOTEXTILE.  
7. THIS TYPE OF PROTECTION MUST BE INSPECTED FREQUENTLY AND THE FILTER CLOTH AND STONE REPLACED WHEN CLOGGED WITH SEDIMENT.  
8. ASSURE THAT STORM FLOW DOES NOT BYPASS THE INLET BY INSTALLING A TEMPORARY EARTH OR ASPHALT DIKE TO DIRECT THE FLOW TO THE INLET.



CONSTRUCTION SPECIFICATIONS  
1. EXCAVATE COMPLETELY AROUND THE INLET TO A DEPTH OF 18" BELOW THE NOTCH ELEVATION.  
2. DRIVE THE 2" X 4" CONSTRUCTION GRADE LUMBER POSTS 1' INTO THE GROUND AT EACH CORNER OF THE INLET. PLACE NAIL STRIPS BETWEEN THE POSTS ON THE ENDS OF THE INLET. ASSEMBLE THE TOP PORTION OF THE 2" X 4" FRAME USING THE OVERLAP JOINT SHOWN ON DETAIL 23A. THE TOP OF THE FRAME (WEIR) MUST BE 6" BELOW ADJACENT ROADWAYS WHERE FLOODING AND SAFETY ISSUES MAY ARISE.  
3. STRETCH THE 1 1/2" X 1 1/2" WIRE MESH TIGHTLY AROUND THE FRAME AND FASTEN SECURELY. THE ENDS MUST MEET AND OVERLAP AT A POST.  
4. STRETCH THE GEOTEXTILE CLASS E TIGHTLY OVER THE WIRE MESH WITH THE GEOTEXTILE EXTENDING FROM THE TOP OF THE FRAME TO 18" BELOW THE INLET NOTCH ELEVATION. FASTEN THE GEOTEXTILE FIRMLY TO THE FRAME. THE ENDS OF THE GEOTEXTILE MUST MEET AT A POST, BE OVERLAPPED AND FOLDED, THEN FASTENED DOWN.  
5. BACKFILL AROUND THE INLET IN COMPACTED 6" LAYERS UNTIL THE LAYER OF EARTH IS LEVEL WITH THE NOTCH ELEVATION ON THE ENDS AND TOP ELEVATION ON THE SIDES.  
6. IF THE INLET IS NOT IN A SWAMP, CONSTRUCT A COMPACTED EARTH DIKE ACROSS THE DITCH LINE DIRECTLY BELOW IT. THE TOP OF THE EARTH DIKE SHOULD BE AT LEAST 6" HIGHER THAN THE TOP OF THE FRAME.  
7. THE STRUCTURE MUST BE INSPECTED PERIODICALLY AND AFTER EACH RAIN AND THE GEOTEXTILE REPLACED WHEN IT BECOMES FLOODED.



CONSTRUCTION SPECIFICATIONS  
1. ALL TEMPORARY EARTH DIKES SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET. SPOT ELEVATIONS MAY BE NECESSARY FOR GRADES LESS THAN 1%.  
2. RUNOFF DIVERTED FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.  
3. RUNOFF DIVERTED FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED, STABILIZED AREA AT A NON-EROSIVE VELOCITY.  
4. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBSTRUCTIONAL MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE DIKE.  
5. THE DIKE SHALL BE EXCAVATED OR SHAPED TO LINE. GRADE AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.  
6. FILL SHALL BE COMPACTED BY EARTH MOVING EQUIPMENT.  
7. ALL EARTH REMOVED AND NOT NEEDED FOR CONSTRUCTION SHALL BE PLACED SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE DIKE.  
8. INSPECTION AND MAINTENANCE MUST BE PROVIDED PERIODICALLY AND AFTER EACH RAIN EVENT.



BY THE ENGINEER:  
"I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."  
*Richard E. Burdick* 7/18/08  
SIGNATURE OF ENGINEER DATE

BY THE DEVELOPER:  
"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY 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."  
*Flora M. Cary* 2/8/16  
SIGNATURE OF DEVELOPER DATE

THIS DEVELOPMENT PLAN IS AS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.  
*John R. Kohnen* 2/17/16  
HOWARD S.C.D. DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
*Chad Clark* 1-27-16  
Chief, Development Engineering Division NY Date  
*Walter J. J. J.* 3-01-16  
Chief, Division of Land Development Date  
*Walter J. J. J.* 3-2-16  
Director Date

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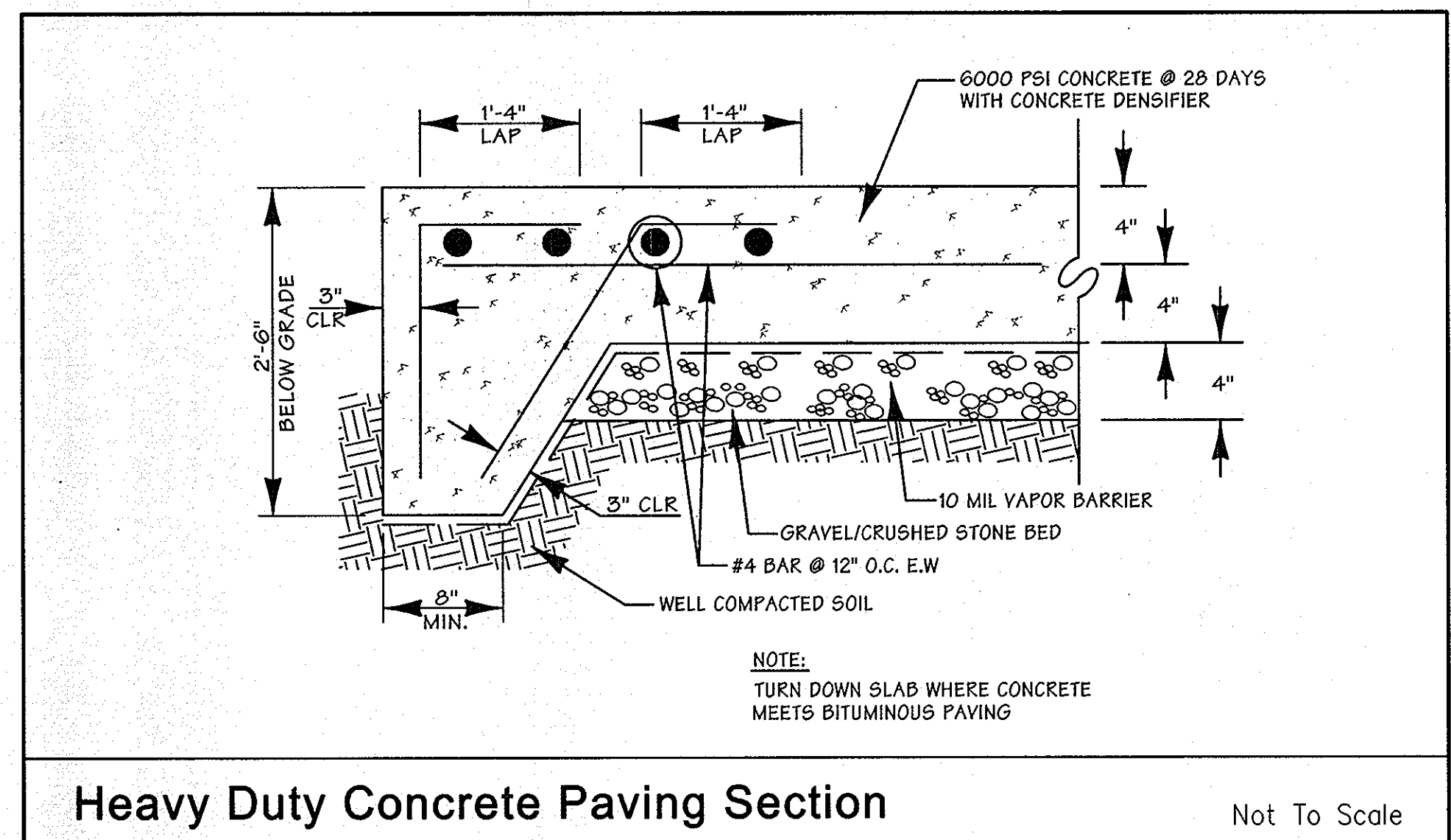
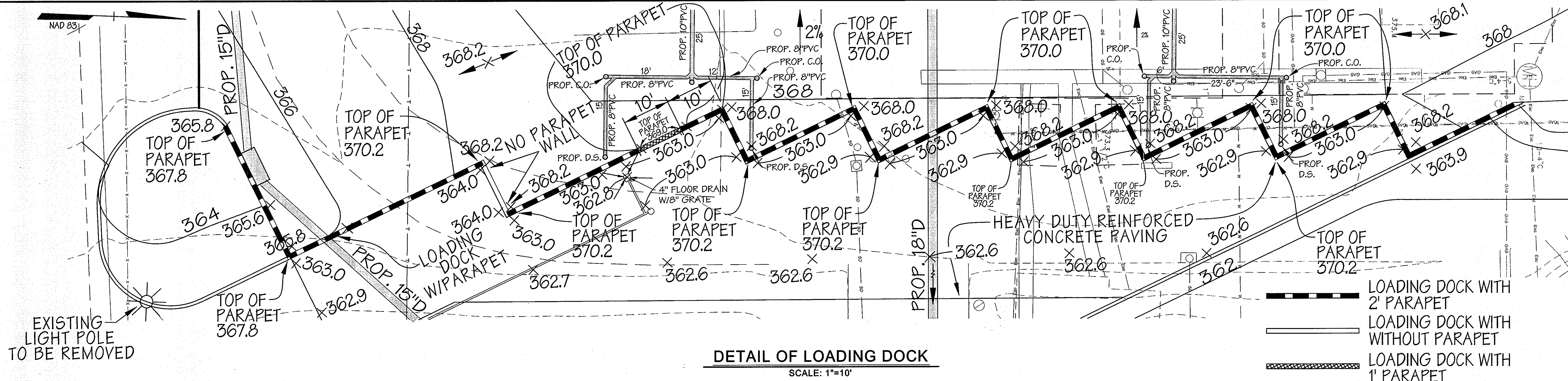
DESIGN BY: A.J.D.  
DRAWN BY: M.S.S./M.C.A.  
CHECKED BY:  
DATE: 7/18/08

REVISIONS  
NO. DATE REVISION  
1/15/16 SITE PLAN, UTILITY PLAN, AND EROSION CONTROL PLAN REFERENCES, RELOCATED SANITARY PROFILE. NOMINAL DIMENSIONS OF TEST BED RESEARCH FACILITY.  
7/18/08 REVISION

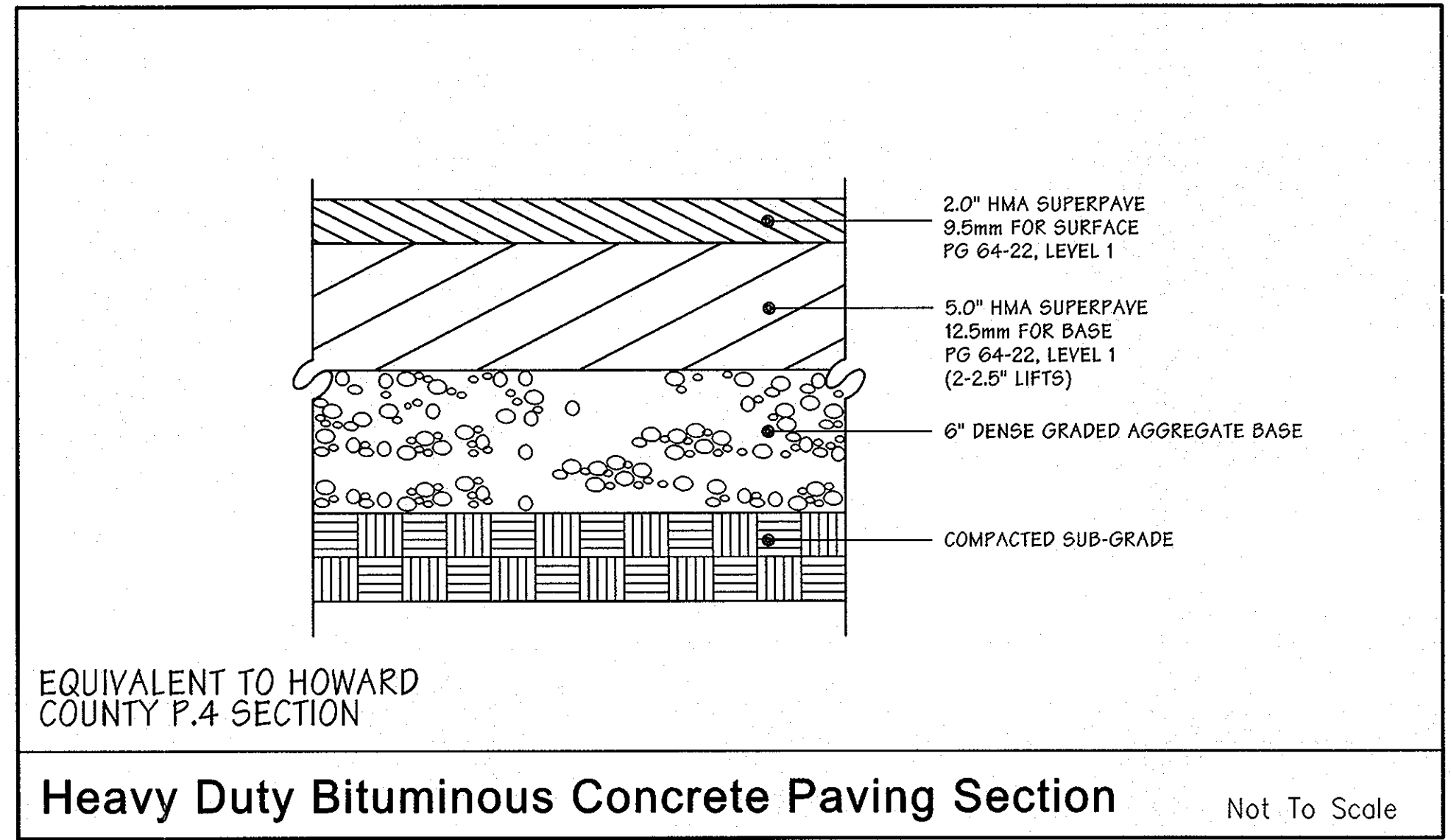
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EROSION AND SEDIMENT CONTROL PLAN  
SERVICE & SUPPORT AREA  
INFRASTRUCTURE FACILITY PHASE I  
TAX MAP: 41 GRID: 16 PARCEL: 123  
ELECTION DISTRICT 5-05 HOWARD COUNTY, MARYLAND  
SHEET 10 OF 14  
SCALE: 1"=30'  
C.E.I. PROJECT NUMBER: 22172.26





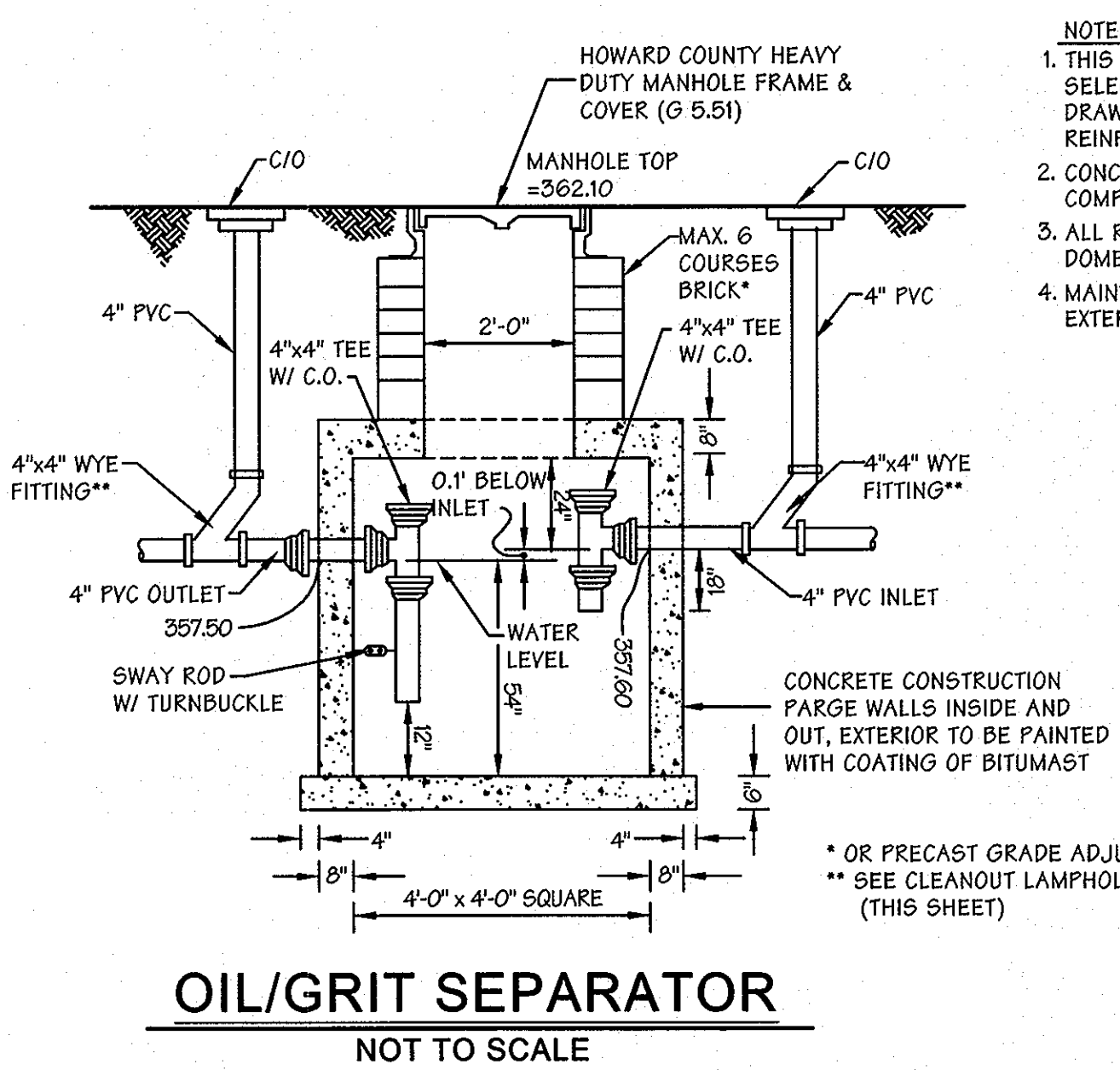
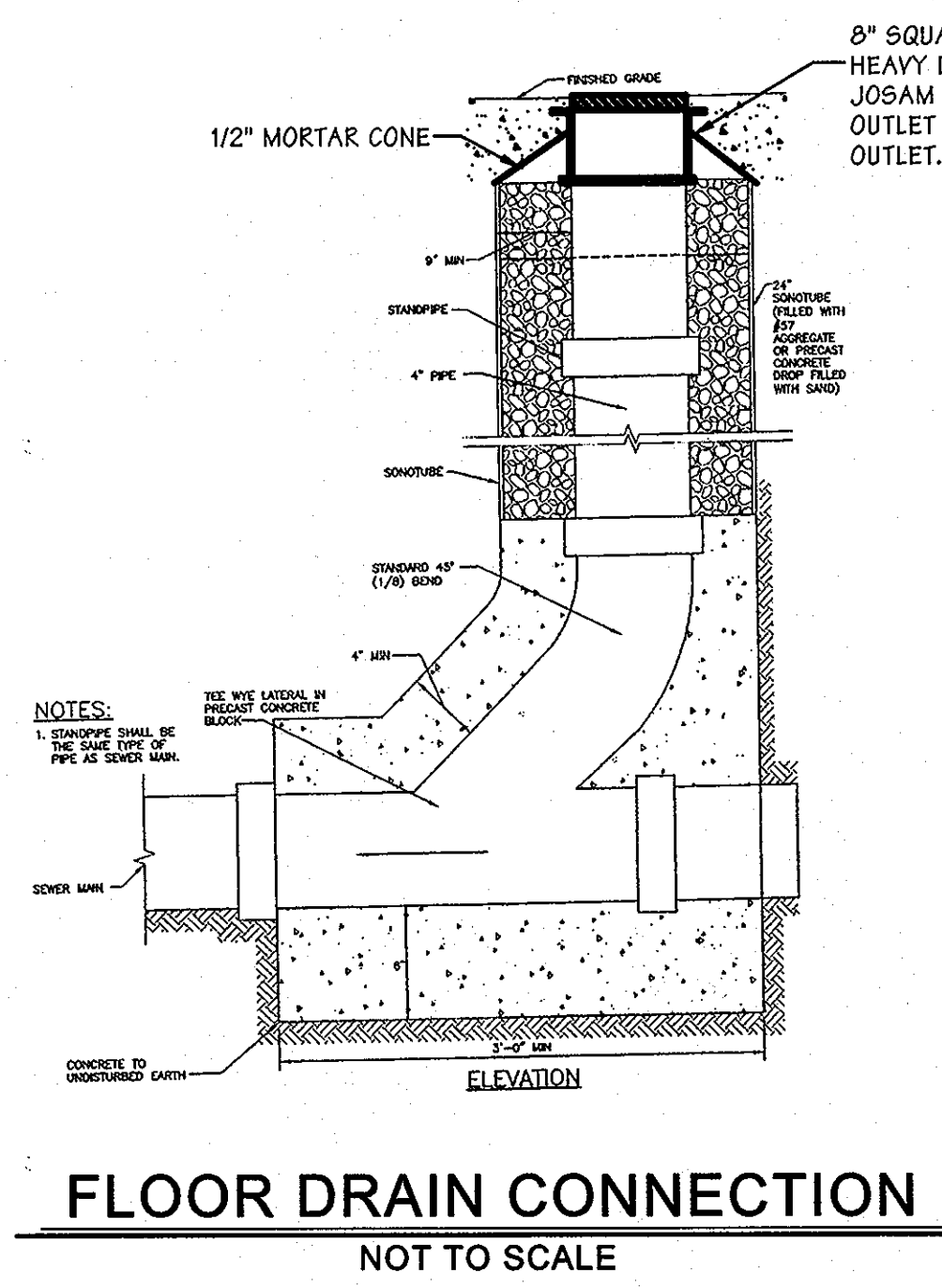
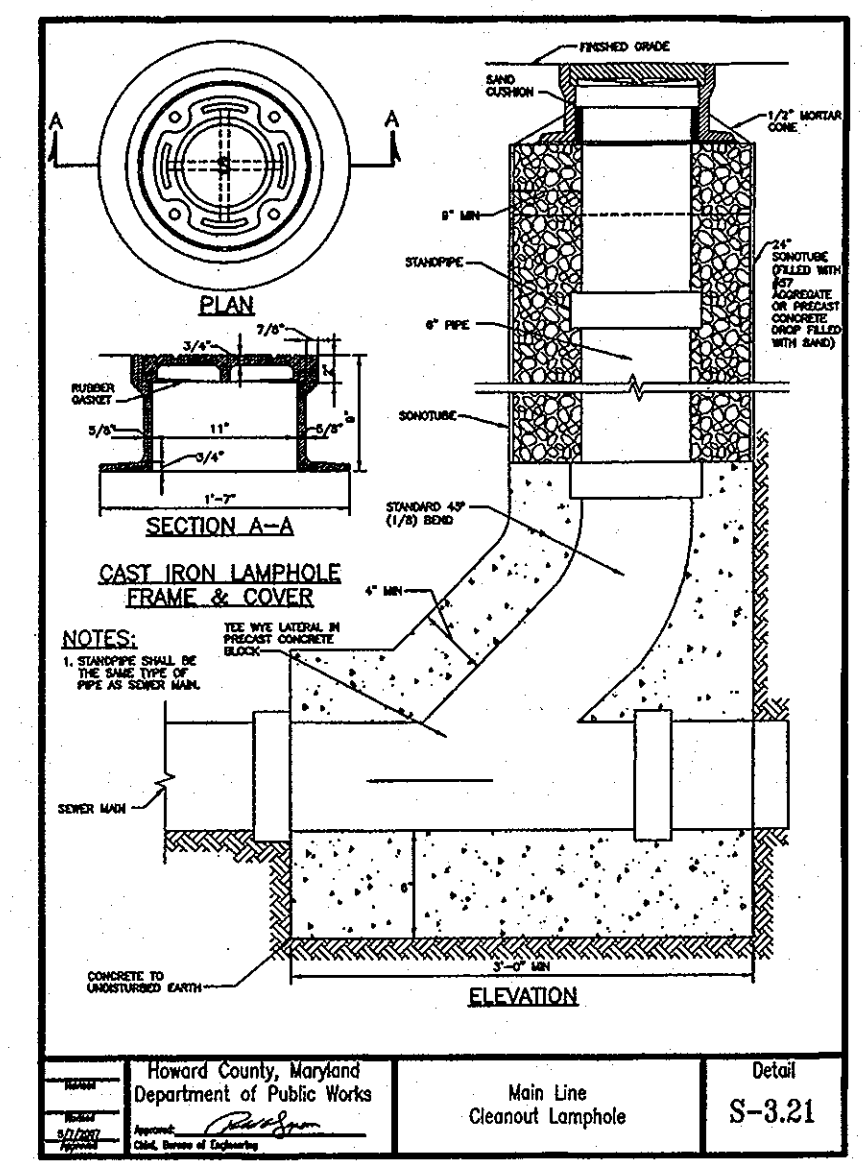
REFER TO SHEETS 13 AND 14 OF 14 FOR STRUCTURAL DETAILS OF LOADING DOCK



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**PROFESSIONAL CERTIFICATION**  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND

LICENSE NUMBER: 32574      EXPIRATION DATE: 1/16/10



APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division  
 Chief, Division of Land Development  
 Director

Date: 10/10/08  
 Date: 10/18/08  
 Date: 11/10/08

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DESIGN BY: A.J.D.  
 DRAWN BY: M.S.S./M.C.A.  
 CHECKED BY: [Signature]  
 DATE: 7/18/08

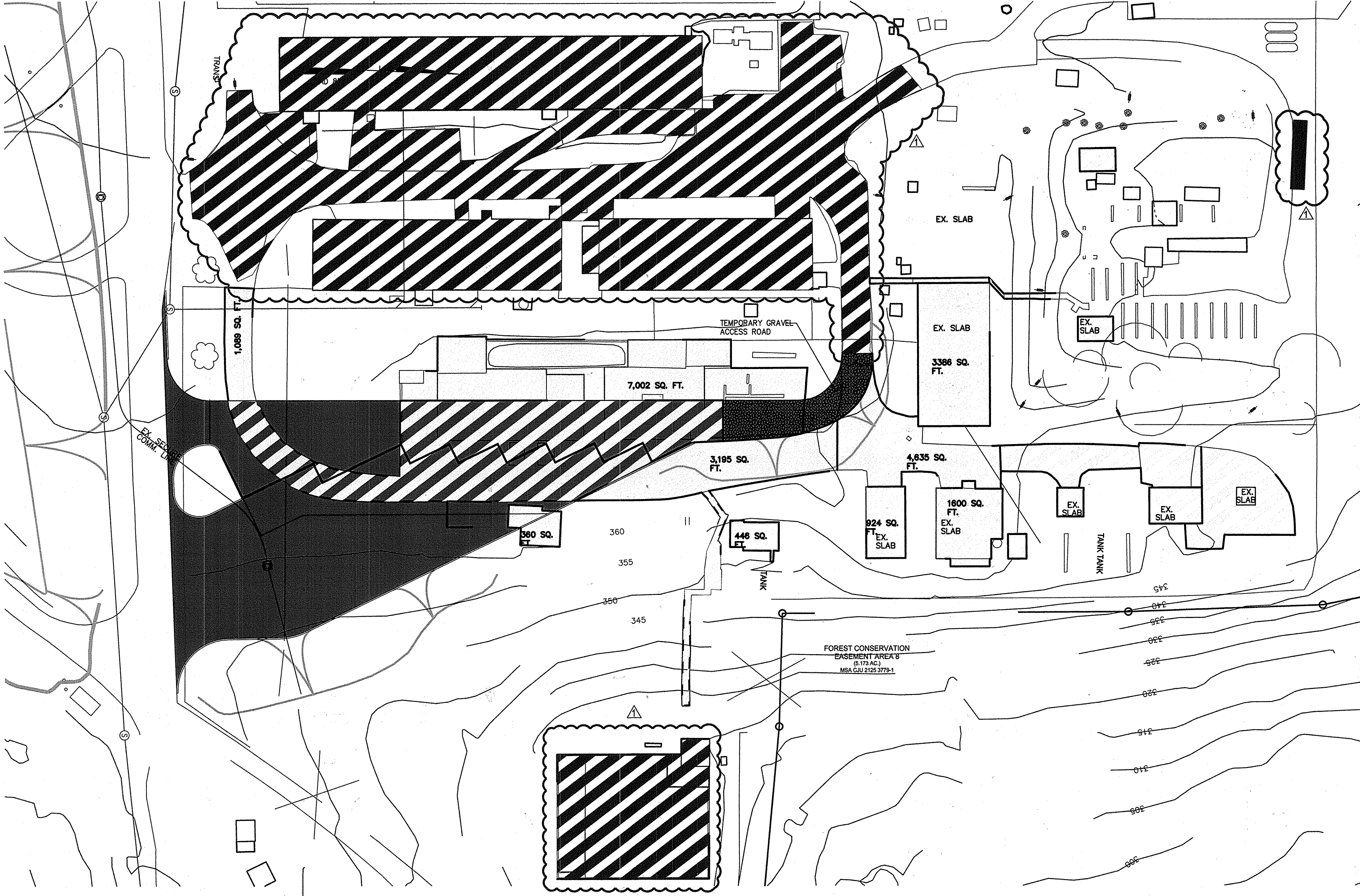
BY	NO.	REVISION	DATE

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**SITE DETAILS**  
 SERVICE & SUPPORT AREA  
 INFRASTRUCTURE FACILITY PHASE I  
 TAX MAP: 41      GRID: 16      PARCEL: 123  
 ELECTION DISTRICT 5-05      HOWARD COUNTY, MARYLAND  
 SHEET 11 OF 14

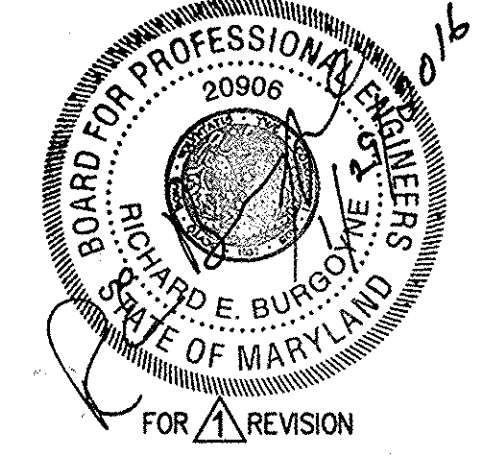
C.E.I. PROJECT NUMBER: 22172.26  
 SCALE: 1"=30'





1. PROPOSED IMPERVIOUS SURFACES THAT WILL BE CONSTRUCTED OVER EXISTING IMPERVIOUS SURFACES WILL BE EXCHANGED AT A RATIO OF 1.0 SQ. FT. OF EXISTING IMPERVIOUS FOR 1.0 SQ. FT. OF PROPOSED IMPERVIOUS AREA.
2. PROPOSED IMPERVIOUS SURFACES THAT WILL BE CONSTRUCTED OVER EXISTING PERVIOUS SURFACES WILL BE COMPENSATED FOR BY REMOVING ADDITIONAL EXISTING IMPERVIOUS AREAS AT A RATIO OF 1.25 SQ. FT. OF EXISTING IMPERVIOUS AREA FOR 1.0 SQ. FT. OF NEW PROPOSED IMPERVIOUS AREA.

	PROPOSED IMPERVIOUS OVER EXISTING IMPERVIOUS (11,745 SQ. FT.) (1:1 RATIO)
	NEW PROPOSED IMPERVIOUS AREA OVER EXISTING PERVIOUS AREA (16,749 SQ. FT.) (1.25:1 RATIO) (REQUIRED EXISTING IMPERVIOUS AREA TO BE REMOVED (6,749 x 1.25 = 20,937 SQ. FT.))
	IMPERVIOUS TO BE REMOVED TO MEET MINIMUM REQUIRED REDUCTION IN IMPERVIOUS AREA (1.25:1 RATIO) (21,037 SQ. FT. > 20,937 SQ. FT.)
	ADDITIONAL IMPERVIOUS AVAILABLE FOR REMOVAL
	REMOVAL OF EXISTING IMPERVIOUS
	NEW PROPOSED IMPERVIOUS AREA OVER EXISTING PERVIOUS AREA



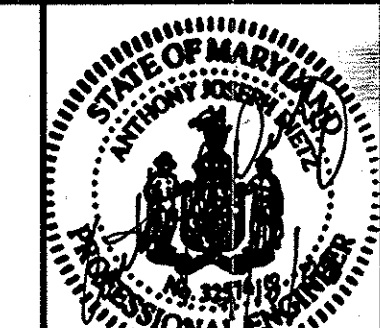
**PROFESSIONAL CERTIFICATION**  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND  
 LICENSE NUMBER: 20906 EXPIRATION DATE: 2/9/2017

**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 NUMBER: 32579 EXPIRATION DATE: 1/16/18

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APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 Chief, Development Engineering Division  
 Chief, Division of Land Development  
 Director

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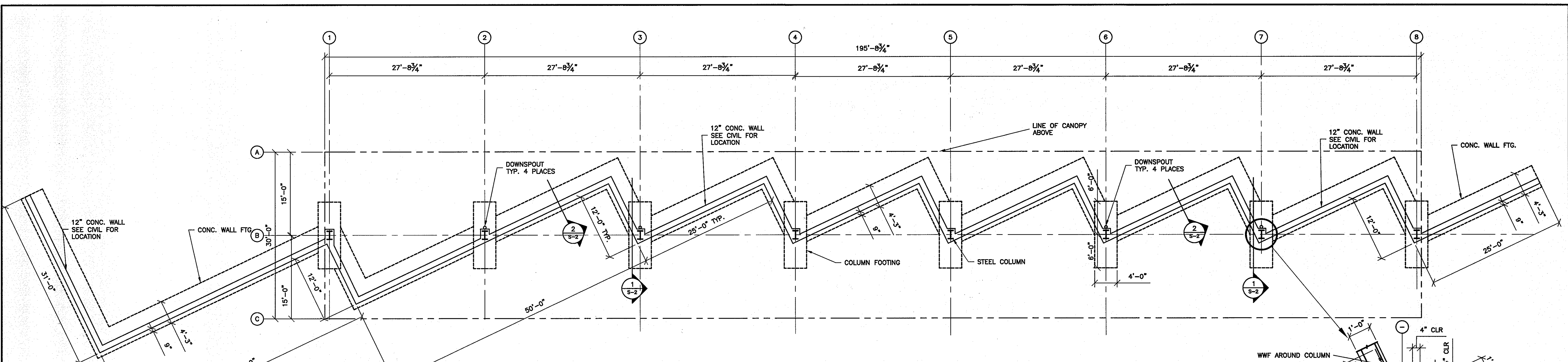
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DRAWN BY:	M.S.S./M.C.A.	REVISION	
CHECKED BY:		BY	NO.
		DATE	1/15/16
		REVISION	

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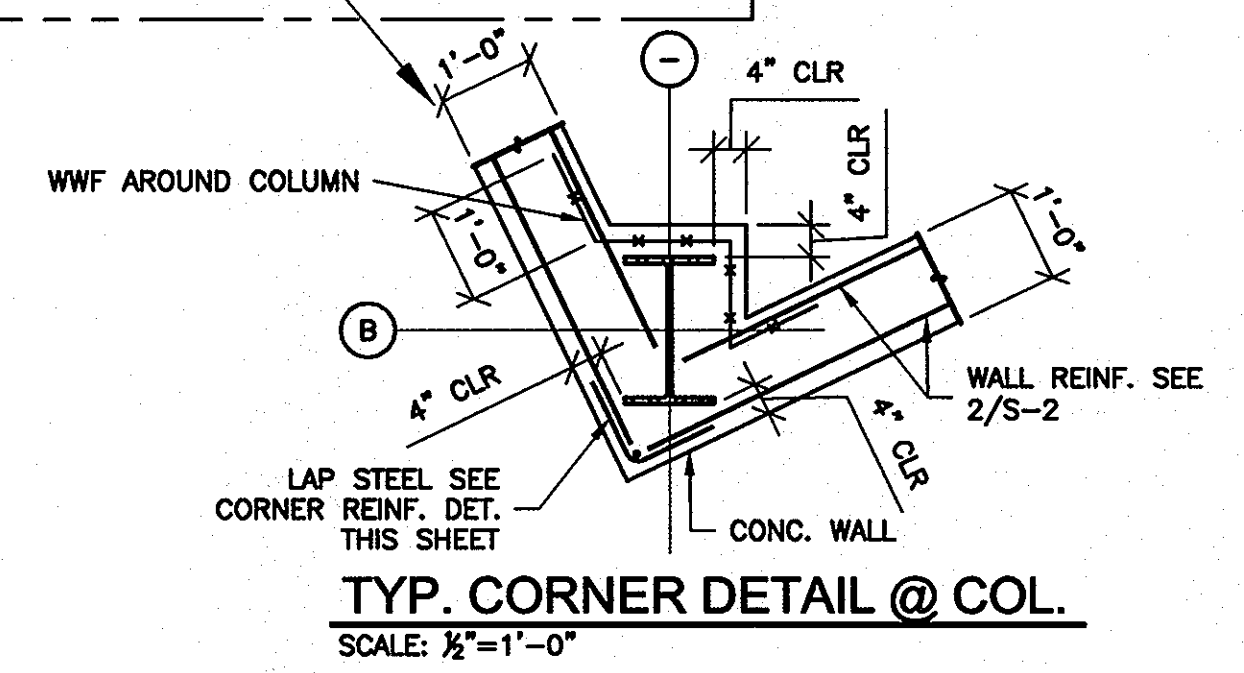
**STORMWATER MANAGEMENT CHANGE IN IMPERVIOUS AREA SERVICE & SUPPORT AREA INFRASTRUCTURE FACILITY PHASE I**  
 SHEET 12 OF 14

C.E.I. PROJECT NUMBER 22172.26  
 SCALE: 1"=30'

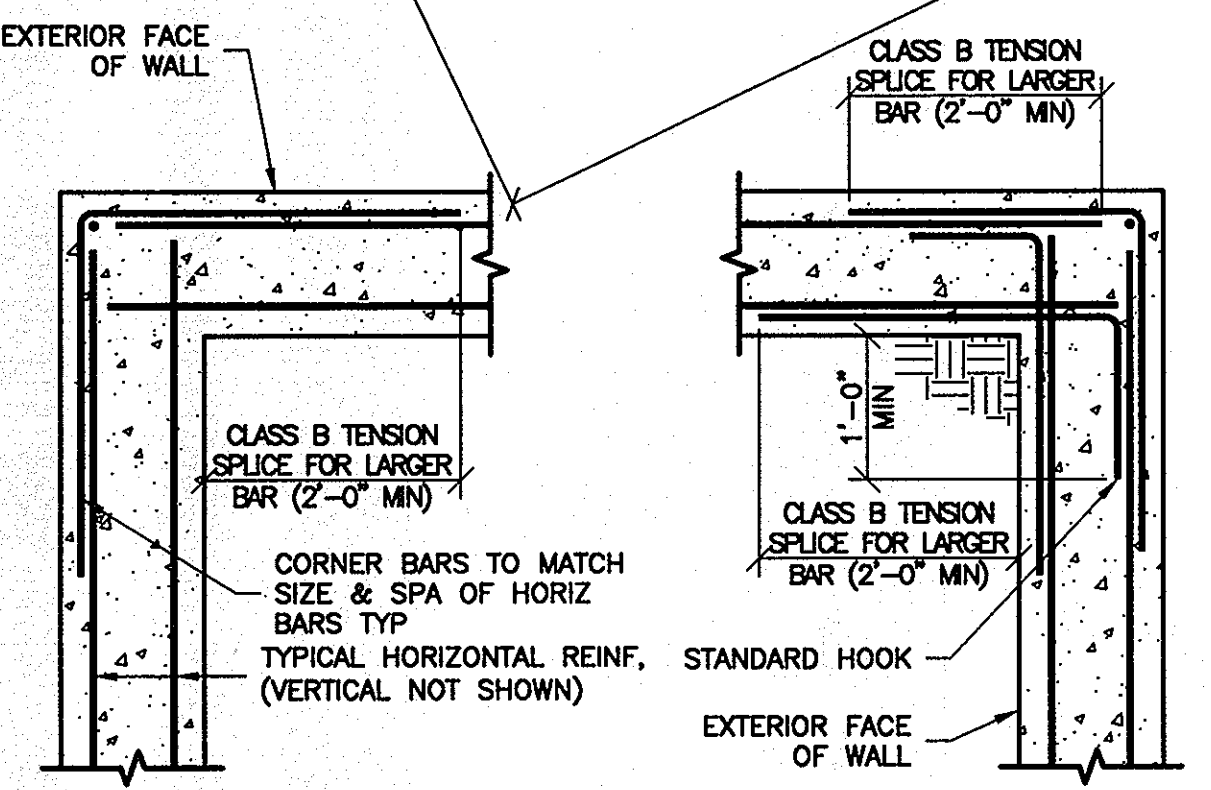




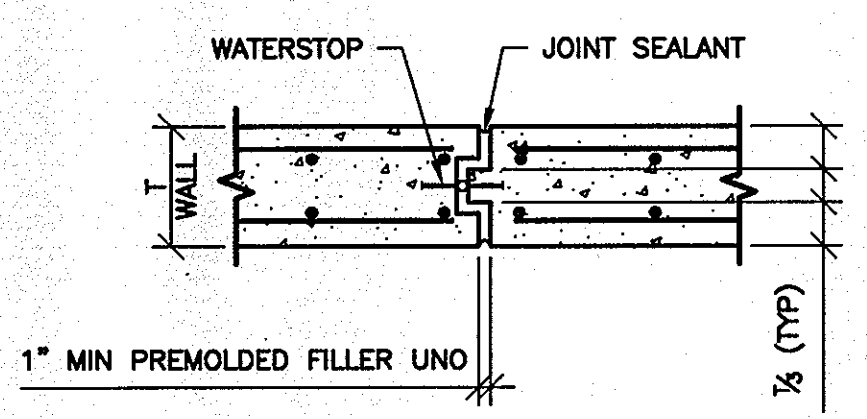
**FOUNDATION PLAN**  
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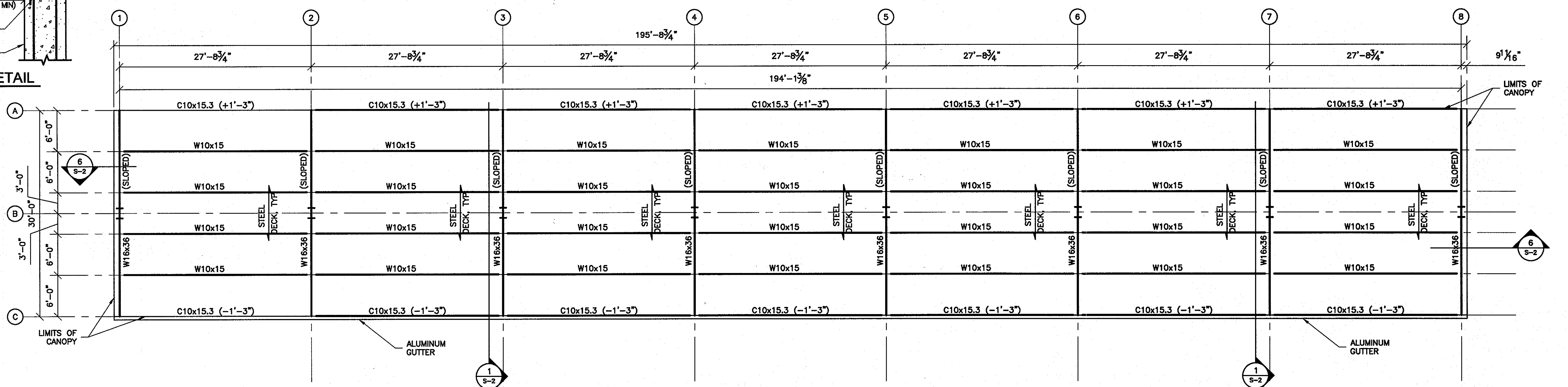
**TYP. CORNER DETAIL @ COL.**  
SCALE: 1/2"=1'-0"



**TYP. WALL CORNER REINF. DETAIL**  
SCALE: 3/4"=1'-0"



**TYP. WALL CONSTR. JOINT**  
SCALE: 3/4"=1'-0"



**CANOPY ROOF FRAMING PLAN**  
SCALE: 1/8"=1'-0"

- NOTES:
1. TOP OF STEEL ON COLUMN LINE B (BOTTOM OF METAL DECK) ELEVATIONS SHALL BE +25'-7", UNLESS NOTED THUS T/STL = ±0'-0".
  2. ALL ELEVATIONS SHOWN ON PLAN ARE REFERENCED FROM ELEVATION 0'-0".
  3. ROOF CONSTRUCTION CONSISTS OF EPDM ROOF OVER 1/2" PLYWOOD OVER 1 1/2"x22 GA. TYPE B STEEL DECK.
  4. SLOPE STEEL BETWEEN ELEVATIONS SHOWN.
  5. STEEL TO BE PRIMED & PAINTED WITH STANDARD "SHERWIN WILLIAMS" PAINT SPECIFICATIONS.
  6. ALL STEEL COLUMNS W18x86 UNLESS NOTED OTHERWISE.

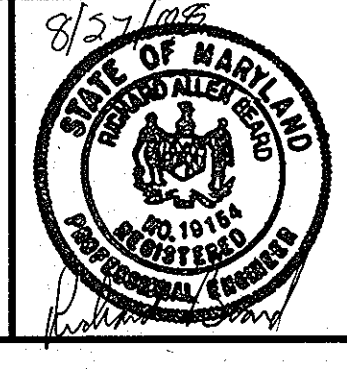
**PROFESSIONAL CERTIFICATION**  
I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 19154, Expiration Date May 31, 2009

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APPROVED: DEPARTMENT OF PLANNING AND ZONING  
Chief, Development Engineering Division  
Chief, Division of Land Development  
Director

Date: 10/5/08  
Date: 12/4/08  
Date:

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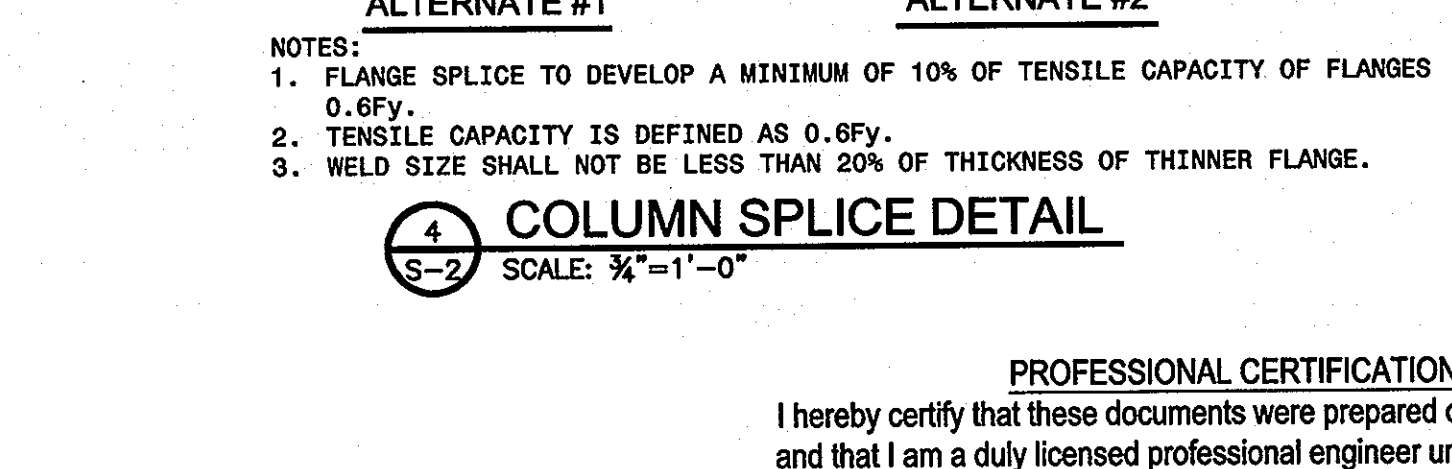
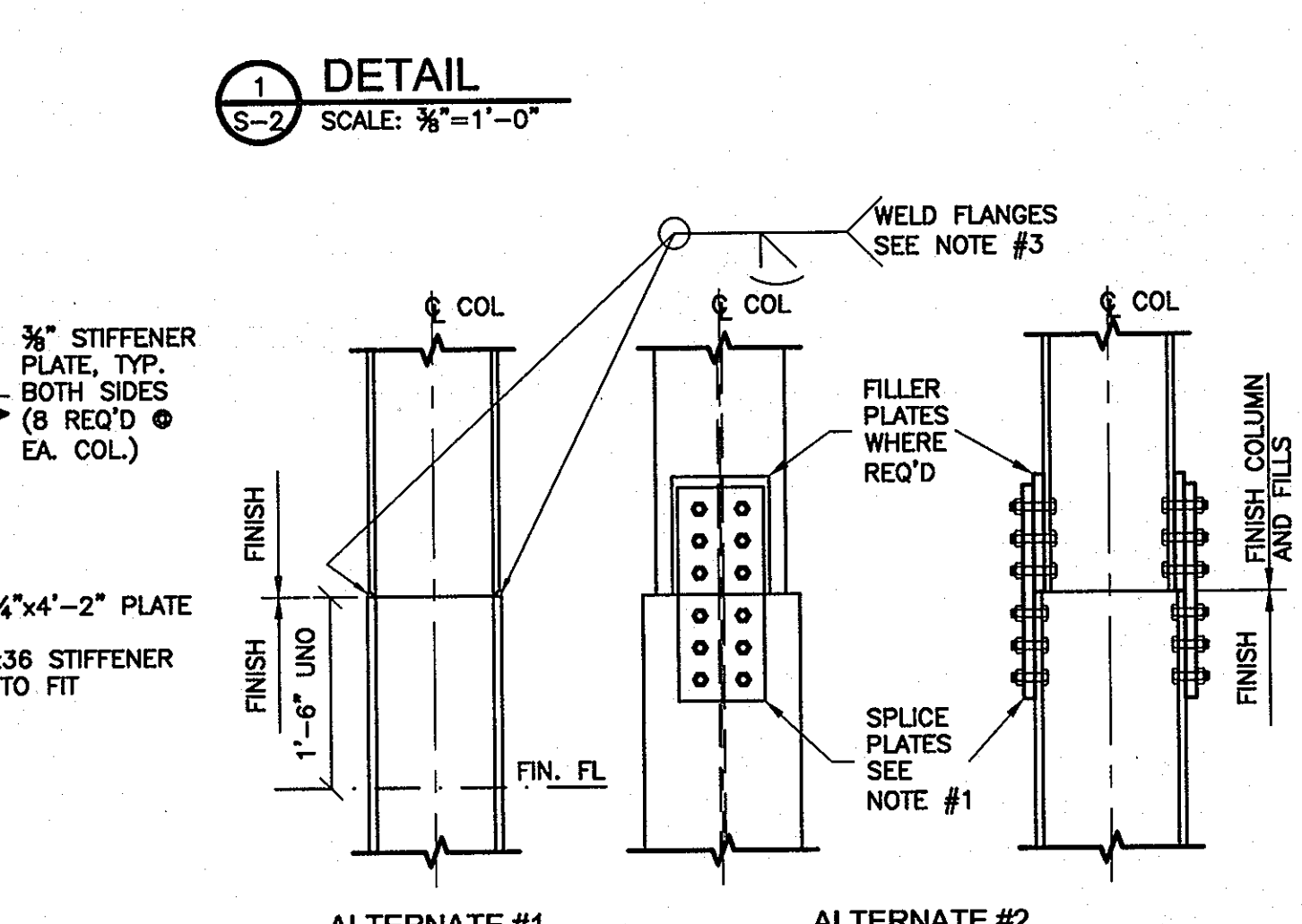
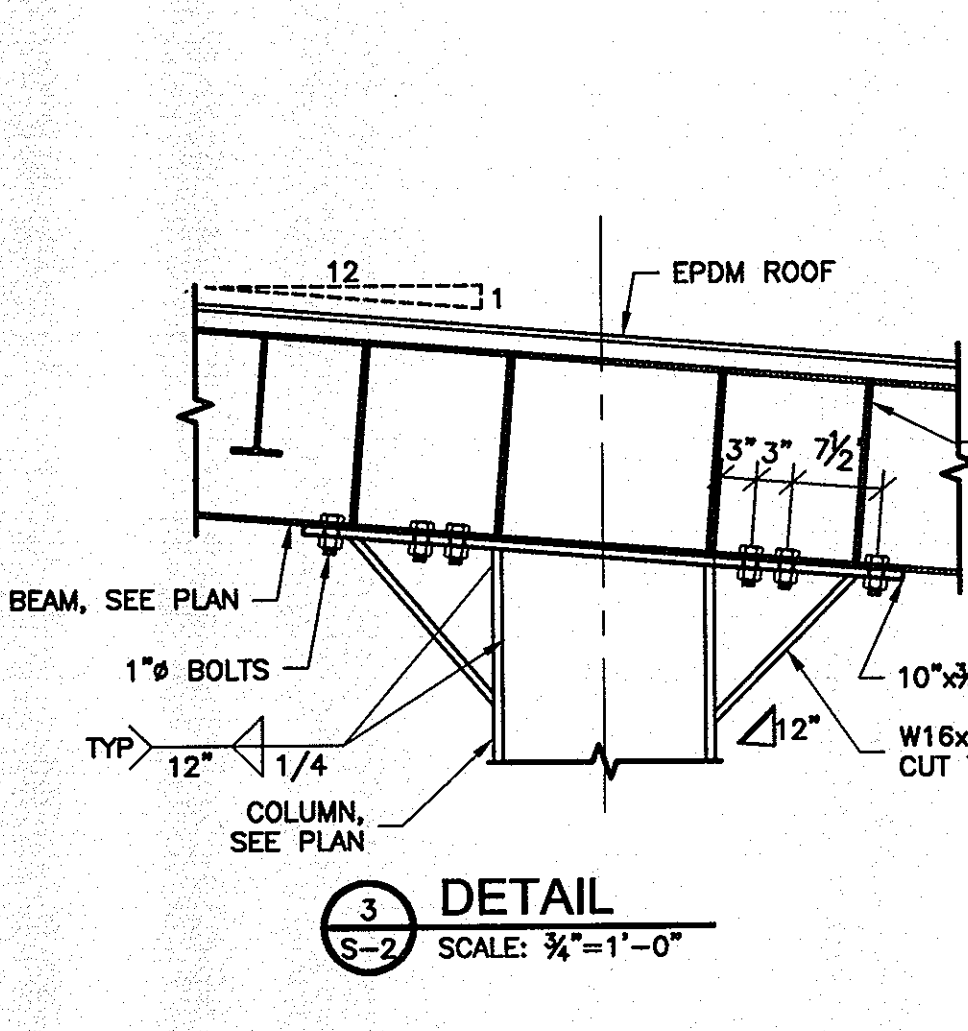
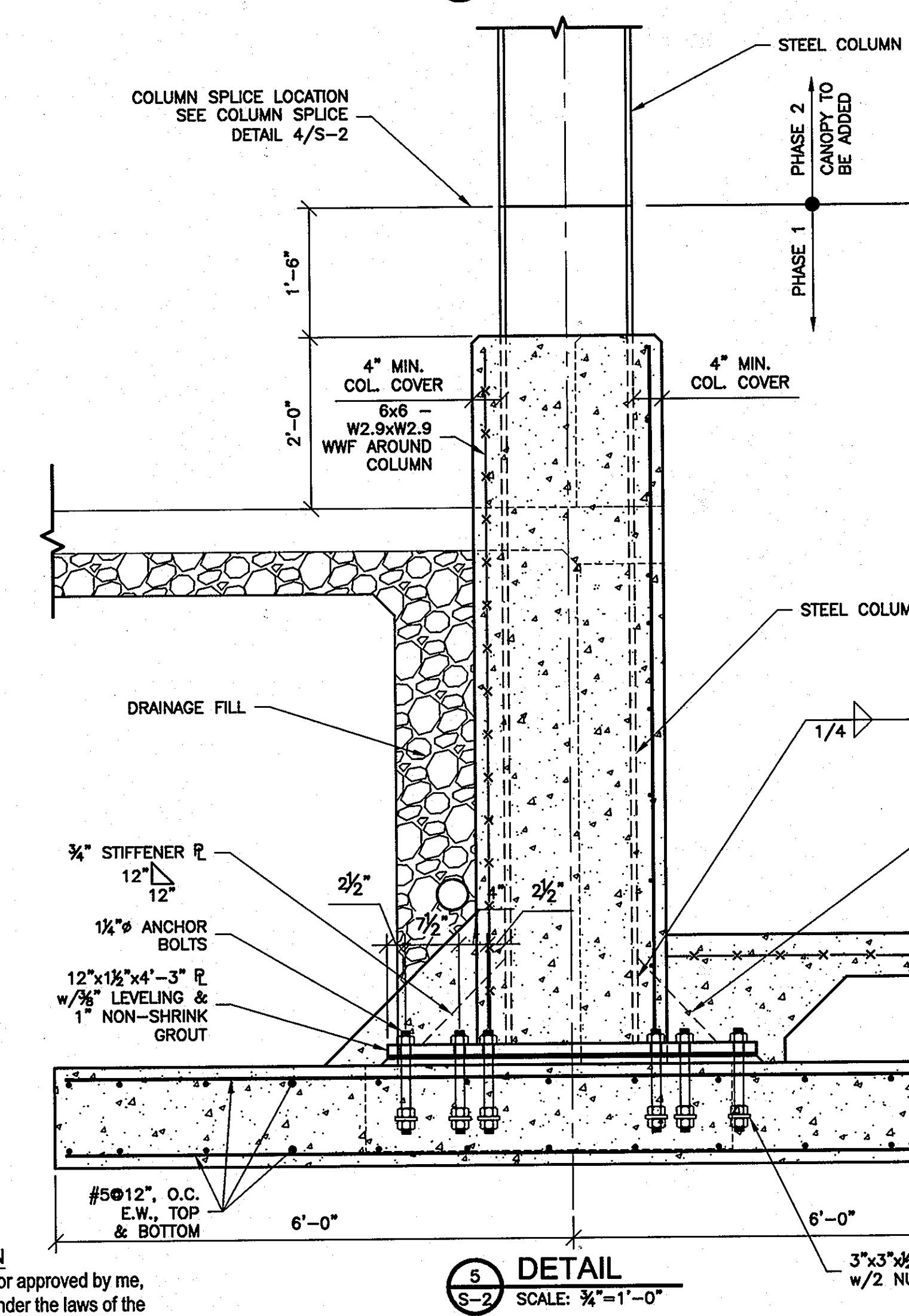
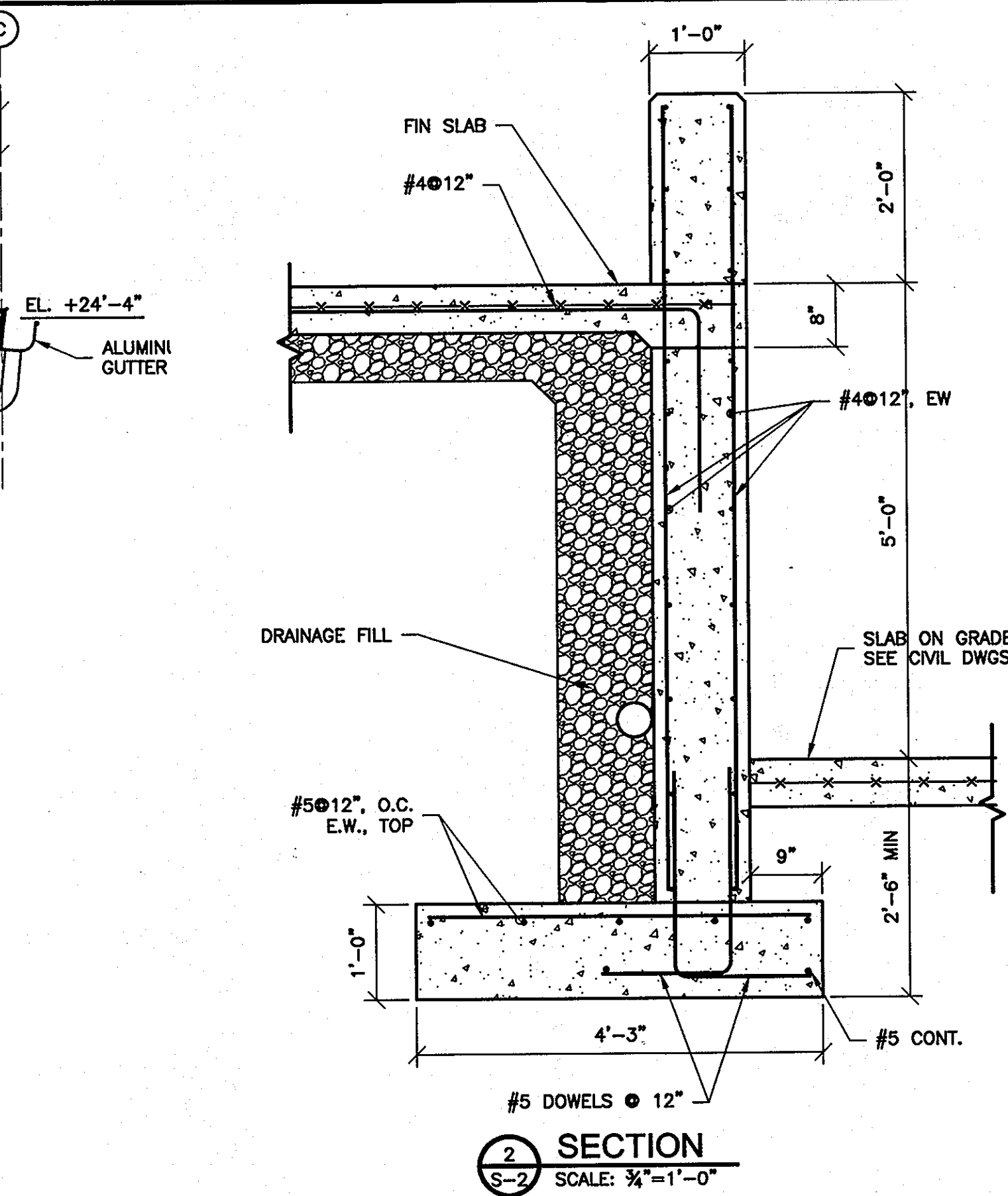
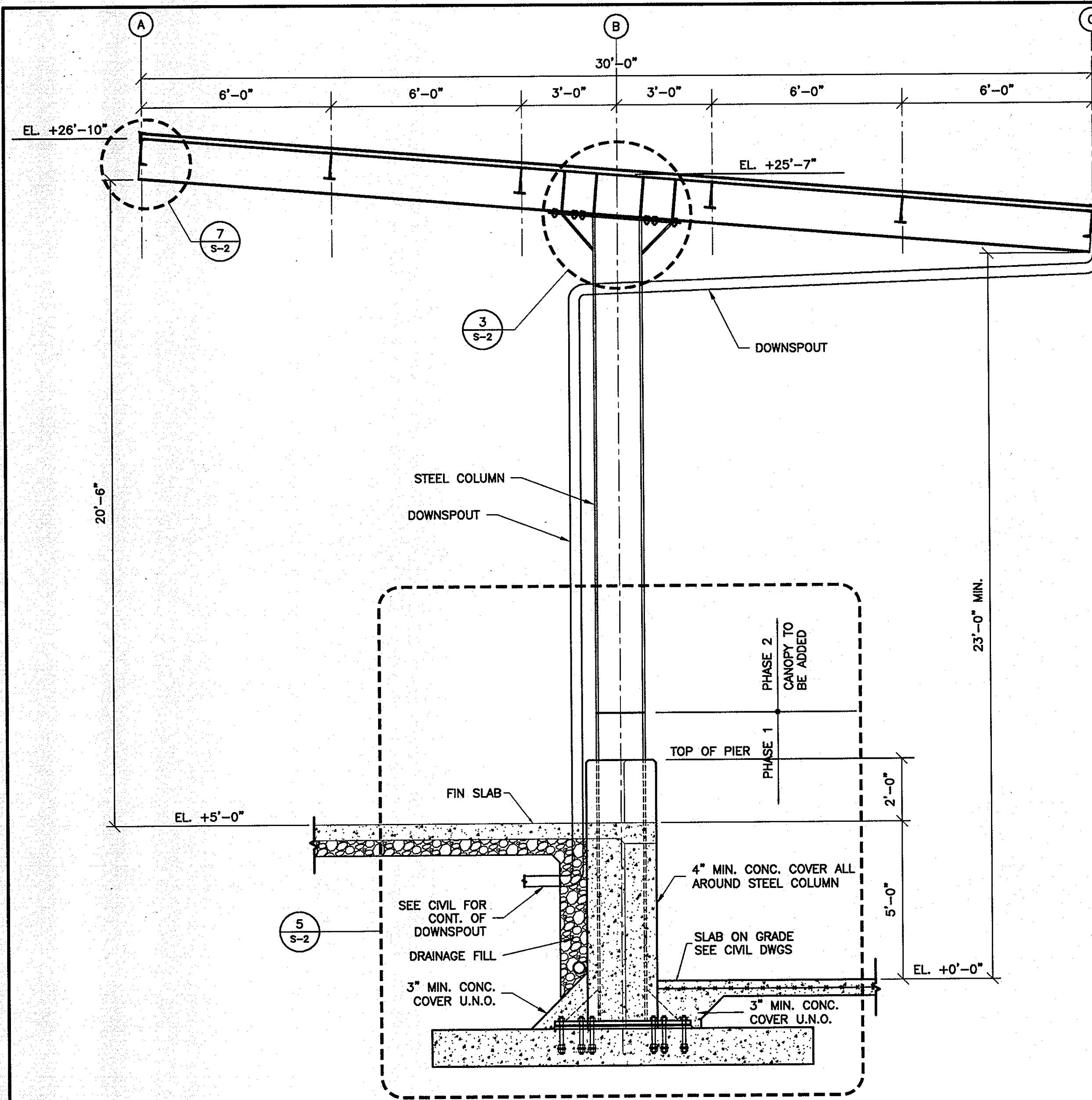
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DATE: 04.25.08	BY	NO.	REVISION	DATE	

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**STRUCTURAL PLANS AND NOTES**  
SERVICE & SUPPORT AREA  
INFRASTRUCTURE FACILITY PHASE I  
TAX MAP: 41 GRID: 16 PARCEL: 123  
ELECTION DISTRICT 5-05 HOWARD COUNTY, MARYLAND  
SHEET 13 of 14  
SDP-08-084

C.E.I. PROJECT NUMBER  
22172.26  
SCALE:  
AS NOTED





- DESIGN CRITERIA**
- THE DESIGN OF THE STRUCTURE IS IN ACCORDANCE WITH IBC 2003.
  - DESIGN LIVE LOADS:
    - ROOF LIVE LOAD = 30 PSF
  - SNOW LOADING:
    - GROUND SNOW LOAD (Pg): 25 psf
    - FLAT ROOF SNOW LOAD (Pf): 27 psf
    - SNOW EXPOSURE FACTOR (Ce): 0.9
    - IMPORTANCE FACTOR (Is): 1.0
    - THERMAL FACTOR (Ct): 1.2
  - WIND LOADING ON MAIN WIND FORCE - RESISTING SYSTEM:
    - BASIC WIND SPEED: 90 MPH
    - IMPORTANCE FACTOR (Iw): 1.0
    - WIND EXPOSURE: C
    - BUILDING CATEGORY: II
    - PRESSURE COEFFICIENTS (Cp1): +0.00
    - PRESSURES FOR COMPONENTS AND CLADDING: 10 psf

- MISCELLANEOUS**
- CONTRACTOR SHALL VERIFY CONDITIONS IN THE FIELD AND IMMEDIATELY NOTIFY ENGINEER OR ARCHITECT OF ANY CONDITIONS NOT AS SHOWN. CONTRACTOR SHALL TAKE FIELD MEASUREMENTS AS REQUIRED.
  - CONTRACTOR SHALL COORDINATE DETAILING, FABRICATION AND ERECTION WITH ALL RELATED TRADES.
  - NO OPENINGS SHALL BE MADE IN ANY STRUCTURAL MEMBER UNLESS SPECIFICALLY SHOWN ON THE STRUCTURAL DRAWINGS OR UPON WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER.
  - THE DESIGN LIVE LOADS SHALL NOT BE EXCEEDED DURING CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE SHORING AND/OR BRACING DURING CONSTRUCTION TO ACCOUNT FOR ALL LOADING, INCLUDING BUT NOT LIMITED TO GRAVITY, WIND, EARTHQUAKE, EARTH AND CONSTRUCTION LOADING. BRACING MEMBERS SHOWN ARE THOSE REQUIRED FOR THE FINISHED STRUCTURE AND MAY NOT BE ADEQUATE FOR CONSTRUCTION LOADS.

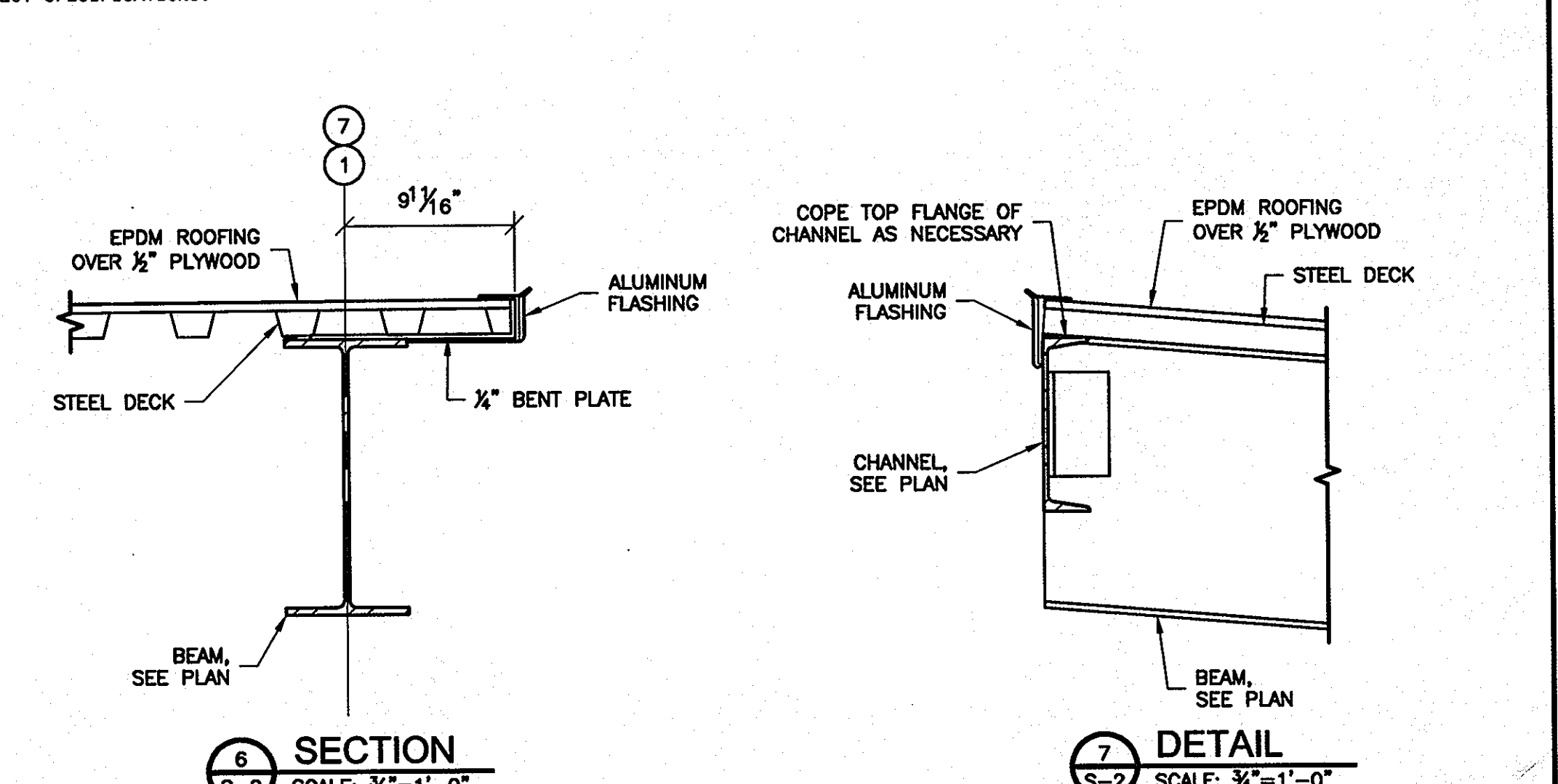
- FOUNDATIONS**
- THE FOUNDATION DESIGN IS BASED ON AN ASSUMED SOIL BEARING PRESSURE OF 3 KSF. PRIOR TO PLACING FOOTINGS, CONTRACTOR SHALL VERIFY SOIL BEARING PRESSURE.
  - ALL EXISTING FILL MATERIALS, CONSISTING OF GRAVEL, BRICK FRAGMENTS, CONCRETE CHIPS, WOOD CHIPS, AND DEMOLITION DEBRIS SHALL BE REMOVED IN THE REGIONS OF ALL FOUNDATIONS AND UNDER AREAS OF SLAB-ON-GRADE.
  - PROOF ROLL SLAB SUBGRADE UNDER THE DIRECTION OF THE INSPECTION AGENCY. REMOVE ALL UNSUITABLE AREAS AND REPLACE WITH COMPACTED STRUCTURAL FILL MATERIALS. PLACE FILL IN 8" LIFTS AND COMPACT FILL TO AT LEAST 95% OF THE MAXIMUM DENSITY AS DETERMINED BY THE ASTM D1557 MODIFIED PROCTOR TEST. FILL MATERIAL SHALL BE SM OR BETTER AS CLASSIFIED PER ASTM D2487.
  - SHALLOW FOUNDATIONS SHALL BE SPREAD FOOTINGS TO BEAR ON UNDISTURBED NATURAL SOIL OR CONTROLLED STRUCTURAL FILL, HAVING A MINIMUM SAFE BEARING CAPACITY OF 3 KSF.
  - THE TESTING AND INSPECTION AGENCY SHALL VERIFY SOIL BEARING CAPACITY AT EACH FOOTING PRIOR TO INSTALLATION OF FOOTING. NOTIFY ENGINEER OF ANY VARIATION FROM ANTICIPATED BEARING CAPACITY FOR APPROPRIATE REDESIGN OR LOWERING OF FOOTING.
  - THE BOTTOMS OF ALL EXTERIOR FOOTINGS SHALL BE 2'-6" MINIMUM BELOW FINISHED GRADE UNLESS ROCK OF SPECIFIED BEARING CAPACITY IS ENCOUNTERED AT A HIGHER ELEVATION, IN WHICH CASE FOOTING MAY BE RAISED IF APPROVED BY THE ENGINEER.
  - THE CONTRACTOR SHALL SAFEGUARD AND PROTECT ALL EXCAVATIONS, AND ADJACENT STRUCTURES, PAVEMENTS, AND UTILITIES. ALL EXCAVATIONS SHALL BE KEPT FREE OF WATER. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN, INSTALLATION, MAINTENANCE, AND REMOVAL OF ALL SHORING, BRACING, AND Dewatering REQUIRED TO PROPERLY CONSTRUCT THE FOUNDATIONS AND TO PROTECT ADJACENT STRUCTURES, PAVEMENTS AND UTILITIES. DO NOT REMOVE SHORING SUCH AS SHEET PILING IF IT WILL CAUSE SETTLEMENT OR DAMAGE TO EXISTING OR NEW STRUCTURES, PAVEMENT, AND/OR UTILITIES.
  - THE CONTRACTOR SHALL REFER TO THE CIVIL DRAWINGS FOR LOCATIONS OF THE DRAIN TRENCH.

- CONCRETE**
- ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH ACI 301 - "SPECIFICATIONS FOR STRUCTURAL CONCRETE" AND ACI 318 - "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE."
  - CONCRETE DESIGN MIX SHALL BE NORMAL WEIGHT WITH A 3,000 PSI 28-DAY COMPRESSIVE STRENGTH. ALL CONCRETE SHALL CONTAIN A WATER-REDUCING ADMIXTURE. CALCIUM CHLORIDE IS PROHIBITED.
  - REPRESENTATIVE TEST CYLINDERS WILL BE TAKEN FROM THE CONCRETE PLACED EACH DAY.
  - REINFORCING STEEL SHALL BE DEFORMED BARS OF NEW BILLET STEEL CONFORMING TO ASTM A615, GRADE 60. REINFORCING STEEL FOR WELDED APPLICATIONS SHALL BE DEFORMED BARS CONFORMING TO ASTM A706.
  - CONCRETE COVER OVER REINFORCING UNLESS OTHERWISE SHOWN, SHALL BE 3" FOR FOOTINGS AND OTHER STRUCTURAL CONCRETE DEPOSITED AGAINST GROUND, 2" FOR CONCRETE PERMANENTLY EXPOSED TO EARTH OR WEATHER AND 3/4" FOR SLABS.
  - NO CONCRETE SHALL BE PLACED IN WATER OR ON FROZEN SUBGRADE.
  - ALL SLABS-ON-GRADE SHALL HAVE THICKENED SECTIONS, DEPRESSIONS, JOINTS, PENETRATIONS, ETC. AS SHOWN IN TYPICAL DETAILS OR AS REQUIRED BY VARIOUS TRADES.
  - FOR ADDITIONAL CONCRETE WORK NOT SHOWN ON STRUCTURAL DRAWINGS, SEE CIVIL DRAWINGS.
  - NO OPENINGS SHALL BE MADE IN ANY STRUCTURAL MEMBER, UNLESS SPECIFICALLY SHOWN ON THE STRUCTURAL DRAWINGS, WITHOUT WRITTEN APPROVAL FROM THE ENGINEER.
  - PROVIDE BAR SUPPORTS AND SPACERS IN ACCORDANCE WITH CRSI MANUAL OF STANDARD PRACTICE AND PROJECT SPECIFICATIONS.

- STRUCTURAL STEEL**
- STRUCTURAL STEEL WORK SHALL CONFORM TO THE AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN AISC 336.
  - STRUCTURAL STEEL MATERIALS SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS:
    - STRUCTURAL STEEL WIDE FLANGE SHAPES: A992 HAVING A MINIMUM YIELD STRENGTH OF 50 KSI.
    - OTHER STRUCTURAL STEEL SHAPES, BARS AND PLATES: A36 HAVING A MINIMUM YIELD STRENGTH OF 36 KSI.
  - FASTENERS SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS:
    - HIGH STRENGTH BOLTS: A490, TYPE 1.
    - ANCHOR RODS: F1554, GRADE 36.
    - TWIST-OFF-TYPE, TENSION CONTROL BOLTS: F1552
    - COMMON BOLTS: A307, GRADE A
    - NUTS: A563
    - WASHERS: F438
  - ALL WELDING SHALL BE DONE BY CERTIFIED WELDERS IN ACCORDANCE WITH AWS D.1.1, STRUCTURAL WELDING CODE - STEEL. ALL WELDING ELECTRODES SHALL CONFORM TO THE E-70 SERIES OF THE AWS. REMOVE BACKING BARS AND RUNOFF TABS.
  - ALL BOLTS SHALL BE MINIMUM 3/4" DIAMETER, INSTALLED IN STANDARD HOLES UNLESS OTHERWISE SHOWN OR NOTED.
  - ALL JOINTS USING HIGH STRENGTH BOLTS SHALL BE CONSIDERED PRETENSIONED JOINTS, UNLESS SPECIFICALLY NOTED AS "SNUG TIGHT" ON THE DRAWINGS. ALL HIGH STRENGTH BOLTS IN STANDARD HOLES SHALL BE CONSIDERED TYPE N BOLTS, UNLESS NOTED OTHERWISE. INSTALL BOLTS IN PRETENSIONED JOINTS AND SLIP CRITICAL JOINTS BY THE TURN-OF-NUT METHOD, BY USING A DIRECT TENSION INDICATOR, BY CALIBRATED WRENCH OR USE TWIST-OFF-TYPE TENSION CONTROL BOLTS.
  - ALL FIELD CONNECTIONS SHALL BE HIGH STRENGTH BOLTED EXCEPT WHERE DETAILS INDICATE WELDING.
  - NO PENETRATIONS ARE PERMITTED THROUGH STRUCTURAL STEEL MEMBERS UNLESS INDICATED ON STRUCTURAL DRAWINGS OR WITH WRITTEN APPROVAL OF ENGINEER.
  - BRACE STEEL FRAME DURING ERECTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MEANS, METHODS AND SAFETY OF ERECTION OF THE STEEL FRAME.
  - CONNECTIONS NOT SHOWN SHALL BE DETAILED IN ACCORDANCE WITH AISC "MANUAL FOR STEEL CONSTRUCTION", NINTH ED. (AISC 336) SHEAR CONNECTIONS SHALL BE DESIGNED PER AISC FOR REACTION EQUAL TO 1/2 THE ALLOWABLE UNIFORM LOAD ON BEAM PER MANU. (MINIMUM OF 6 KIPS). SHEARS, MOMENTS AND AXIAL FORCES ARE GIVEN AT SERVICE LOAD LEVEL.
  - GROUT UNDER STEEL PLATES SHALL BE NON-SHRINK AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI, UNLESS NOTED OTHERWISE.

- METAL DECKING**
- METAL DECK WORK SHALL BE IN ACCORDANCE WITH STEEL DECK INSTITUTE SPECIFICATION FOR STEEL ROOF DECK.
  - METAL DECKING SHALL BE MADE OF STEEL CONFORMING TO ASTM A653 FOR GALVANIZED DECK, HAVING A MINIMUM YIELD STRENGTH OF 33,000 PSI
  - ROOF DECKING SHALL BE GALVANIZED PER ASTM A924 WITH A MINIMUM COATING CLASS, AS DEFINED IN ASTM A653, OF G-90
  - ALL METAL DECK HAS BEEN DESIGNED TO BE CONTINUOUS OVER 3 SPANS MINIMUM, UNLESS OTHERWISE INDICATED AND SHALL BEAR AT LEAST 1-1/2 INCHES ON STEEL SUPPORTS. FOR ONE OR TWO SPAN CONDITIONS, THE CONTRACTOR SHALL PROVIDE SHORING AS REQUIRED, OR FURNISH HEAVY GAGE DECK AS REQUIRED TO SUPPORT ALL THE APPLICABLE LOADS. CONTRACTOR SHALL SUBMIT ALTERNATE FOR APPROVAL.
  - DECK SHALL BE WELDED TO SUPPORTING STEEL AT ENDS OF UNITS AND AT ALL INTERMEDIATE SUPPORTS IN ACCORDANCE WITH DETAILS SHOWN OR WHEN NOT SHOWN, IN ACCORDANCE WITH SDI SPECIFICATIONS. WELDING SHALL BE IN ACCORDANCE WITH AWS D1.3-STRUCTURAL WELDING CODE-SHEET STEEL AND SHALL BE DONE BY CERTIFIED WELDERS. SIDE LAPS SHALL BE WELDED OR SCREWED AT 3" O/C MAXIMUM FOR SPANS OVER 5' AND AT END OF AND AT MAXIMUM 12 INCHES ON CENTER FROM THE END OF CANTILEVERED DECK.
  - PROVIDE STANDARD CLOSURES, GANT STRIPS, FINISH STRIPS, AND OTHER ACCESSORIES AS SHOWN ON DRAWINGS OR AS REQUIRED FOR A COMPLETE JOB. ATTACH ACCESSORIES TO SUPPORTS WITH WELDS OR SELF-DRILLING SCREWS SPACED A MAXIMUM OF 12 INCHES O/C.
  - METAL DECK SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES PER FOOT OF WIDTH:
    - 1-1/2", TYPE B, WIDE RIB, 22 GAGE
    - I = 0.17 IN. ^4
    - S = 0.19 IN. ^3

- FIELD DRILLED ADHESIVE ANCHORS**
- FIELD DRILLED ADHESIVE ANCHORS SHALL BE HILTI HVA ADHESIVE ANCHORS AS MANUFACTURED BY HILTI FASTENING SYSTEMS, INC., OR APPROVED EQUAL. ADHESIVE ANCHORS SHALL CONSIST OF ALL-THREAD ANCHOR ROD, NUT, WASHER AND ADHESIVE CAPSULE. THE ADHESIVE CAPSULE USED SHALL CONTAIN A VINYLESTER RESIN AS SUPPLIED IN THE HILTI HEA ADHESIVE CAPSULES, OR APPROVED EQUAL.
  - ANCHORS SHALL BE INSTALLED PER CONTRACT DOCUMENTS AND PER MANUFACTURER'S RECOMMENDATIONS. WHERE THE PROVISIONS ARE IN CONFLICT, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN.
  - DO NOT DRILL THROUGH EXISTING EMBEDDED REINFORCING STEEL. LOCATE EXISTING REINFORCING STEEL, CREATE TEMPLATES AND ADJUST LOCATIONS OF HOLES IN MEMBERS BEING ATTACHED TO CLEAR EXISTING EMBEDDED REINFORCING.
  - DO NOT INSTALL ANCHORS WITH LESS THAN MINIMUM BOLT SPACINGS OR LESSER EDGE DISTANCE THAN SHOWN ON DRAWINGS OR IN THE MANUFACTURER'S LITERATURE.
  - ALL ABANDONED HOLES DRILLED IN THE CONCRETE SHALL BE COMPLETELY FILLED WITH GROUT.
  - TYPICALLY HOLES IN CONNECTION PLATES SHALL BE NO MORE THAN 1/16" LARGER THAN THE ADHESIVE ANCHOR ROD DIAMETER. IF LARGER DIAMETER HOLES ARE USED FOR ERECTION PURPOSES THE CONTRACTOR MUST PROVIDE PLATE WASHERS. PLATE WASHERS MUST BE WELDED TO THE CONNECTION PLATE TO TRANSFER THE LOAD.



**JHU/APL INTERNAL USE**

THIS DATA SHALL NOT BE DISCLOSED TO A THIRD PARTY AND SHALL NOT BE DUPLICATED, USED, OR DISCLOSED IN WHOLE OR IN PART FOR ANY PURPOSE OTHER THAN TO EVALUATE THIS RFP OR, IN THE CASE OF A CONTRACT AWARD, TO PERFORM THE WORK REQUIRED HEREUNDER, WITHOUT THE EXPRESS WRITTEN CONSENT OF JHU/APL.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

10/2/08  
10/5/08  
10/6/08

**CENTURY ENGINEERING**

CONSULTING ENGINEERS - PLANNERS

10710 Gilroy Road, Hunt Valley, MD 21031  
Phone: 443.589.2400 Fax: 443.589.2401

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. 19154, Expiration Date May 31, 2009

DESIGN BY:	GWS	DATE:	04.25.08
DRAWN BY:	ROM	BY:	NO.
CHECKED BY:	RAB	REVISION:	
DATE:		DATE:	

**THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY**

11100 JOHNS HOPKINS ROAD  
LAUREL, MARYLAND 20723-6099  
443-778-5134

**STRUCTURAL SECTIONS AND DETAILS**

SERVICE & SUPPORT AREA  
INFRASTRUCTURE FACILITY PHASE I

TAX MAP: 41 GRID: 16 PARCEL: 123  
ELECTION DISTRICT 5-05 HOWARD COUNTY, MARYLAND

SHEET 14 of 14

C.E.I. PROJECT NUMBER 22172.26

SCALE: AS NOTED

SOP-08-084