



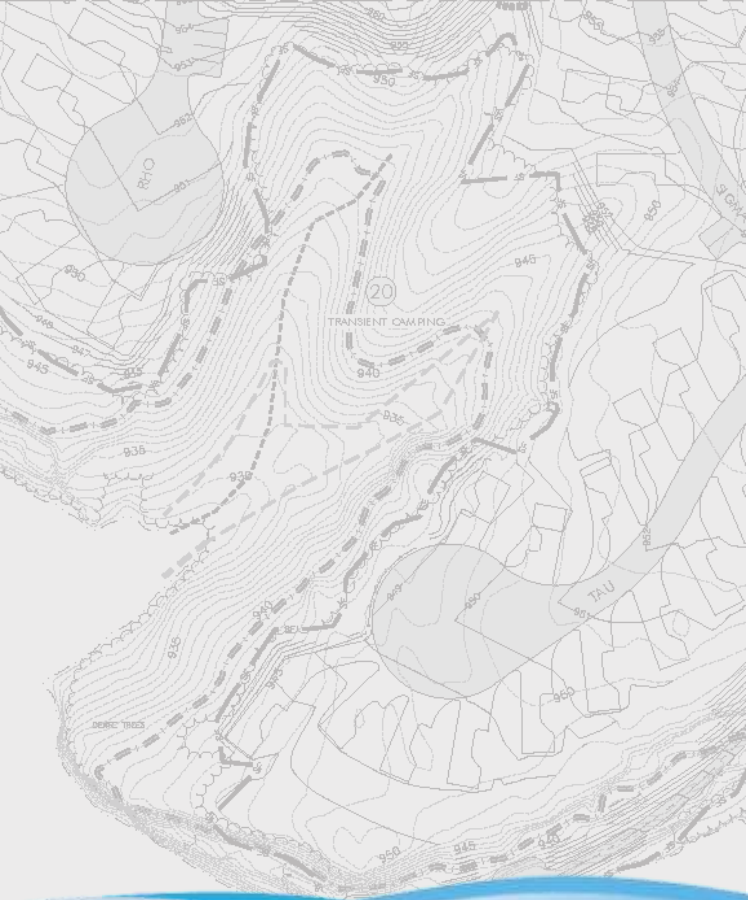
Common Errors and Challenges Found in SWPPP Design

2017 Storm Water Management & Drainage Conference
March 7, 2017



ms consultants, inc.
engineers, architects, planners





Mary Sharrett, PE, CPESC

Stone Environmental Engineering & Science, Inc.
MarySharrett@StoneEnvironmental.com

Brenda VanCleave, PE, CPESC

ms consultants, inc.
bvancleave@msconsultants.com



ms consultants, inc.
engineers, architects, planners




What does your SWPPP look like?

TABLE OF CONTENTS

1.0 INTRODUCTION AND GENERAL PERMIT COVERAGE	1
2.0 ODOT SUPPLEMENTAL SPECIFICATION 832.09 SUMMARY.....	1
3.0 SITE DESCRIPTION.....	4
A. NATURE AND TYPE OF CONSTRUCTION	4
B. TOTAL DISTURBED AREA	4
C. RUNOFF COEFFICIENTS PRE-CONSTRUCTION AND POST-CONSTRUCTION	5
D. ESTIMATE OF IMPERVIOUS AREA AND PERCENT IMPERVIOUSNESS	5
E. EXISTING SOIL DATA	5
F. PRIOR LAND USE	5
G. IMPLEMENTATION SCHEDULE	5
H. RECEIVING STREAMS	5
I. SUBDIVIDED DEVELOPMENTS	5
J. STORM WATER DISCHARGES FROM DEDICATED ASPHALT AND CONCRETE PLANTS	5
K. COPY OF THE PERMIT REQUIREMENTS	6
L. SITE MAP	6
4.0 CONTROLS	7
A. NON-STRUCTURAL PRESERVATION METHODS	7
B. EROSION CONTROL PRACTICES	7
C. RUNOFF CONTROL PRACTICES	8
D. SEDIMENT CONTROL PRACTICES	8
E. POST-CONSTRUCTION STORM WATER MANAGEMENT	9
F. SURFACE WATER PROTECTION	9
G. OTHER CONTROLS	9
H. MAINTENANCE	10
I. INSPECTIONS	10
5.0 APPROVED STATE OR LOCAL PLANS	12
6.0 EXCEPTIONS	12

APPENDICES

- APPENDIX A – OHIO EPA APPROVAL LETTER AND NPDES PERMIT OHC000004
- APPENDIX B – FIGURES
 - FIGURE 1 – U.S.G.S. TOPOGRAPHIC MAP
 - FIGURE 2 – TSEC BMP PLAN
- APPENDIX C – ODOT CONSTRUCTION EROSION CONTROL DRAWINGS DRAWING No. DM-4.4
- APPENDIX D – WEEKLY AND RAIN EVENT EROSION CONTROL CHECKLIST AND CONTRACTOR AND SUBCONTRACTOR SIGNATURE FORM



LOCATION MAP
LATTITUDE & LONGITUDE: 39° 45' 00" N, 82° 35' 00" W
SCALE IN FEET: 1" = 100'

PORTION TO BE IMPROVED:
PROJECTED HIGHWAY
FEDERAL AID
PLANT NUMBER:
COUNTY & TOWNSHIP CODES
OTHER NOTES:

SWPPP SHEETS TOTALS:

FILE ONLY	1
GENERAL NOTES	1-4
PROJECT MAP	5
SWPPP PLAN - PHASE 1: CLEARING & GRUBBING	6-7
SWPPP PLAN - PHASE 2: CONSTRUCTION	8-11
SWPPP DRAINAGE AREA - PHASE 1	12-13
SWPPP DRAINAGE AREA - PHASE 2	14-15
DETAILS	16-17

UNDERGROUND UTILITIES
CALL 811 BEFORE ANY EXCAVATION
NORTH ARROW: 1-800-362-2766
TOLL FREE
DO NOT EXCAVATE WITHOUT PROTECTIVE SERVICE CALL 1-800-362-2766
PLAN PREPARED BY: [Signature]

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

SCI-823-0.00

CITY OF PORTSMOUTH
PORTER, HARRISON, MADISON &
JEFFERSON TOWNSHIPS
SCIOTO COUNTY, OHIO

**STORM WATER
POLLUTION
PREVENTION PLAN**

SEGMENT 4 STA. 715+00.00 TO STA. 904+00.00

NOTES

NEW CONSTRUCTION OF 3.04 MILES OF FOUR-LANE, DIVIDED, LIMITED ACCESS HIGHWAY ON THE PORTSMOUTH BY-PASS FROM WOODS LANE/VEHICLE RAMP RD. TO US-124 TO BE TO THE SOUTH INTERCHANGE WITH ROUTE 42 APPROXIMATE AT 10+00

PROJECT TOTAL DISTURBED AREA: 438 ACRES

SEGMENT 4 TOTAL DISTURBED AREA: 100 ACRES

ESTIMATED CONSTRUCTION EROSION AREA: 10 ACRES

NOTICE OF INTENT EROSION DISTURBED AREA: 100 ACRES

NOTES

1. DEVELOPER SHALL USE THIS STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AS A GUIDE TO MINIMIZE STORM WATER POLLUTION DURING CONSTRUCTION. COMPLIANCE IS REQUIRED BY THE OHIO ENVIRONMENTAL PROTECTION AGENCY. DEVELOPER SHALL BE RESPONSIBLE FOR MONITORING AND OPERATING THE SWPPP AS REQUIRED THROUGHOUT CONSTRUCTION. DEVELOPER SHALL SUBMIT THE CONSTRUCTION EROSION CONTROL PLAN TO THE SWPPP REVIEWER AND MAINTAIN A COPY OF ALL SWPPP DOCUMENTS ON THE CONSTRUCTION SITE AT ALL TIMES. UPON COMPLETION OF WORK AND STABILIZATION OF THE SITE, DEVELOPER AND OWNER SHALL SUBMIT NOTICE OF TERMINATION TO THE ENVIRONMENTAL PROTECTION AGENCY.

2. THE SCOPE OF THIS SWPPP DOES NOT INCLUDE THE USE OF EROSION CONTROL MATERIALS USED IN THE FILL SLOPE AREAS, ROAD PLACEMENT AND CONSTRUCTION NECESSITIES. THESE ITEMS ARE INCLUDED IN THE PROJECT MAP FOR SCI-823-00.00.

Released For Construction
Independent Design Quality Manager
[Signature] 8-26-15
Name: [Name] Date: [Date]

CERTIFICATION

I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTORSHIP OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL, PROPERLY TRAINED AND EVALUATED, THE INFORMATION SUBMITTED. BASED ON MY KNOWLEDGE OF THE PERSONS OR PERSONS WHO MANAGE THE SYSTEM OR THESE PERSONS, I AM RESPONSIBLE FOR THE TRUTH AND ACCURACY OF THE INFORMATION SUBMITTED TO THE BEST OF MY KNOWLEDGE AND BELIEF. THIS DOCUMENT IS COMPLETE. I AM AWARE THAT THERE ARE CONSEQUENT PENALTIES FOR FURNISHING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

DESIGNED BY: [Signature]
DRAWN BY: [Signature]

Ohio CGP References

- Ohio EPA Construction General Permit
 - ODNR's Rainwater and Land Development Manual
 - Ohio EPA's SWP3 Checklist for Construction Activities
- http://www.epa.state.oh.us/portals/35/storm/CGP_SWP3_Checklist.pdf





John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

Storm Water Pollution Prevention Plan (SWP3) Checklist for Construction Activities (OHC000004)

Facility Name:	Date SWP3 Received:
SWP3 Reviewer:	Date SWP3 Reviewed:

Part III.G.1 - Site Description				
Does the SWP3.....	Y	N	N/A	Comments
(a) describe the nature and type of construction activity (e.g., low density residential, shopping mall, highway, etc.)?				
(b) describe the total area of the site that is expected to be disturbed (i.e., the area of grubbing, clearing, excavating, filling, or grading including off-site borrow areas)?				
(c) include a calculation of the runoff coefficients for both the pre-construction and post-construction site conditions?				
(d) include an estimation of the impervious area and percent imperviousness as a result of the construction activity?				
(e) include any existing data describing the soil? <i>NOTE: If this data is not available, it does not need to be included.</i>				
provide any information on the quality of the storm water discharge from the construction site? <i>NOTE: If this data is not available, it does not need to be included.</i>				
(f) include any information about prior land uses at the site (e.g., was the property used to manage solid or hazardous waste)?				

http://www.epa.state.oh.us/portals/35/storm/CGP_SWP3_Checklist.pdf

Construction General Permit

- Part III.A – “The SWP3 shall be a comprehensive, stand-alone document, which is not complete unless it contains the information required by Part III.G” of the Permit.
- Site controls should meet the standards and specifications of the most current edition of Ohio’s Rainwater and Land Development manual and include the following minimum components.
 - Non-structural Preservation Methods
 - Erosion Control Practices
 - Runoff Control Practices
 - Sediment Control Practices
 - Post-Construction Storm Water Management Requirements
 - Surface Water Protection
 - Other Controls

Non-Structural Preservation Methods

- Preserving Existing Vegetation and Vegetative Buffer Strips
- Phasing of Construction Operations
- Designation of Tree Preservations Areas



Sediment vs. Erosion Control

Sediment Controls

- Check dam
- Ditch Check
- Sediment basin
- Sediment trap
- Silt fence
- Inlet protection

Erosion Controls

- Seeding/Vegetation
- Mulch
- Erosion control mats
- Diversion ditch
- Diversion barrier
- Slope Drains



Erosion Control Practices

- Stabilization



Table 1: Permanent Stabilization

Area requiring permanent stabilization	Time frame to apply erosion controls
Any areas that will lie dormant for one year or more	Within seven days of the most recent disturbance
Any areas within 50 feet of a surface water of the state and at final grade	Within two days of reaching final grade
Any other areas at final grade	Within seven days of reaching final grade within that area

Table 2: Temporary Stabilization

Area requiring temporary stabilization	Time frame to apply erosion controls
Any disturbed areas within 50 feet of a surface water of the state and not at final grade	Within two days of the most recent disturbance if the area will remain idle for more than 14 days
For all construction activities, any disturbed areas that will be dormant for more than 14 days but less than one year, and not within 50 feet of a surface water of the state	Within seven days of the most recent disturbance within the area For residential subdivisions, disturbed areas must be stabilized at least seven days prior to transfer of permit coverage for the individual lot(s).
Disturbed areas that will be idle over winter	Prior to the onset of winter weather

Where vegetative stabilization techniques may cause structural instability or are otherwise unobtainable, alternative stabilization techniques must be employed. Permanent and temporary stabilization are defined in Part VII.



Sediment Control Practices

- Sediment Ponds
 - Concentrated storm water runoff (storm sewer or ditch)
 - Runoff from drainage areas which exceed the design capacity of silt fence and filter socks
 - Runoff from drainage areas that exceed the design capacity of inlet protection
 - All inlets receiving runoff from drainage areas of one or more acres will require a sediment pond.
 - Runoff from common drainage areas that exceed 10 acres disturbed land



Silt Fence

Table 6.3.1 Maximum area contributing area using slope length

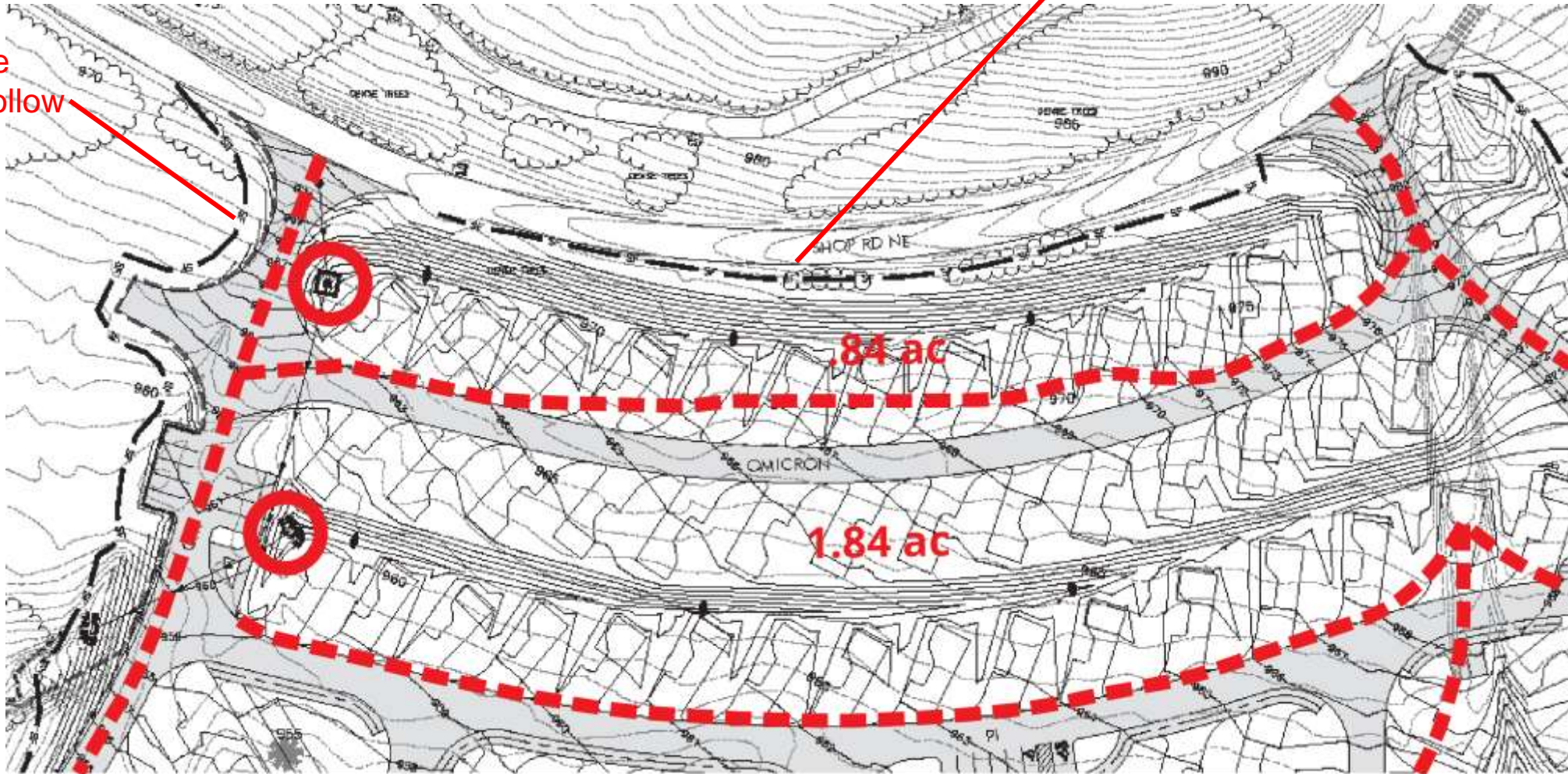
Maximum Slope Length Above Silt Fence		
Slope		Slope Length (ft.)
0% - 2%	Flatter than 50:1	250
2% - 10%	50:1 - 10:1	125
10% - 20%	10:1 - 5:1	100
20% - 33%	5:1 - 3:1	75
33% - 50%	3:1 - 2:1	50
> 50%	> 2:1	25

Note: For larger drainage areas, see standards for temporary diversions, sediment traps and sediment basins.

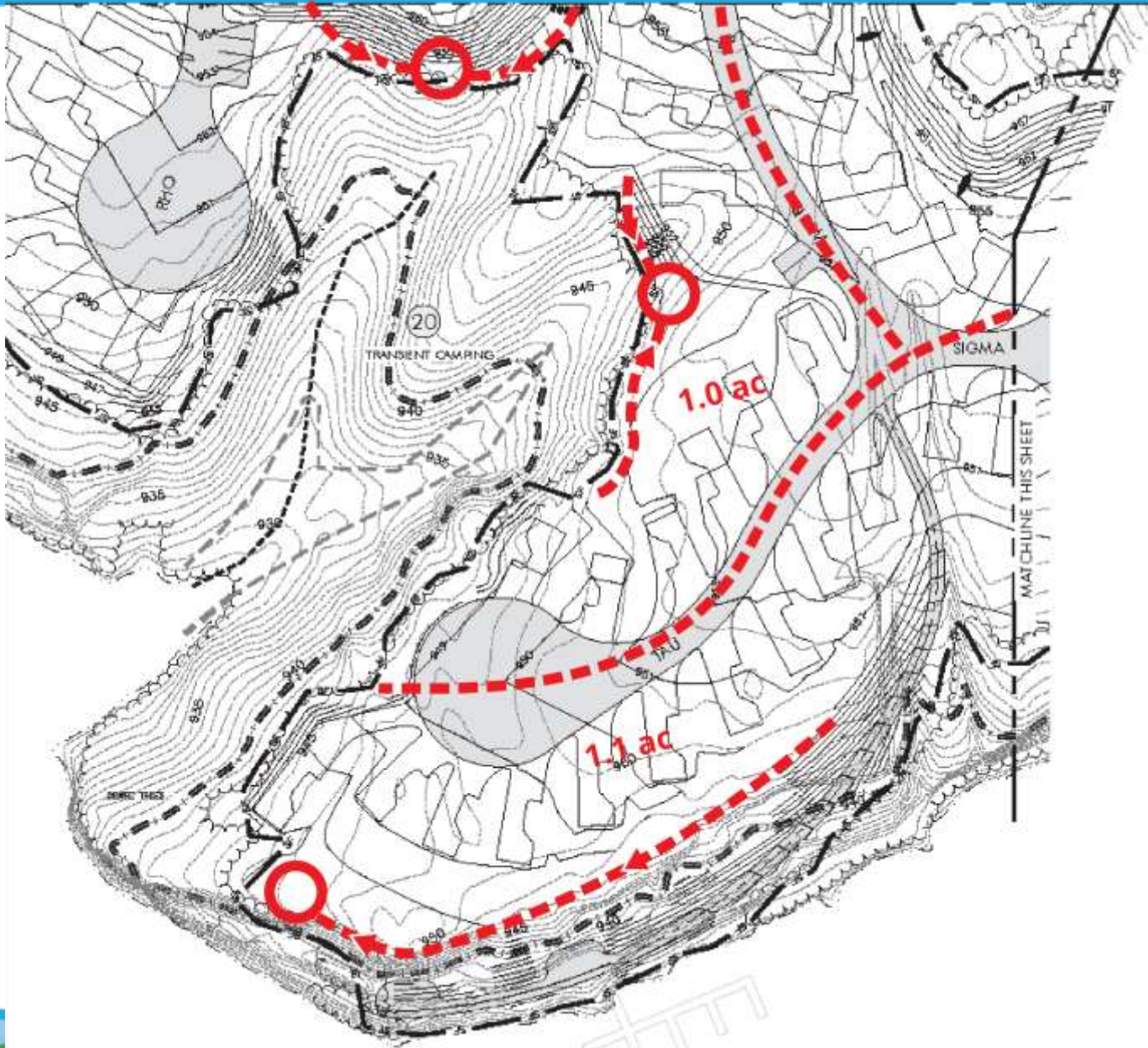


Silt fence
should follow
contours

Silt fence does not divert offsite flows



*Show drainage areas to the BMP



Structural practices implemented to protect all adjacent Surface Waters of the State (SWOTS)

- 50 ft undisturbed natural buffer, if feasible
- No controls in SWOTS



Existing ditchline

New drainage swale

Site drainage needs
treated prior to
entering stream

Good location for
sediment basins

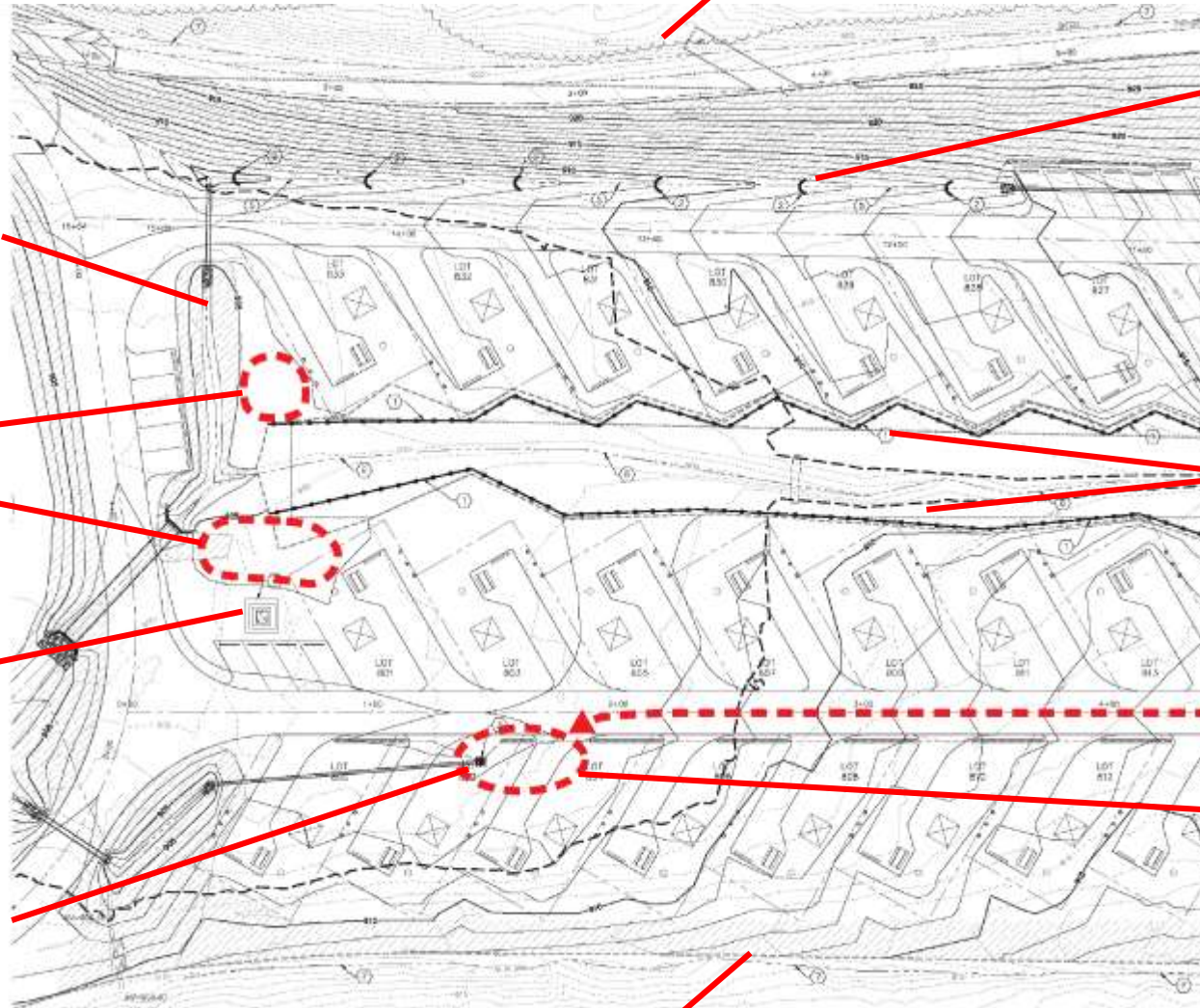
Stream protected with silt fence

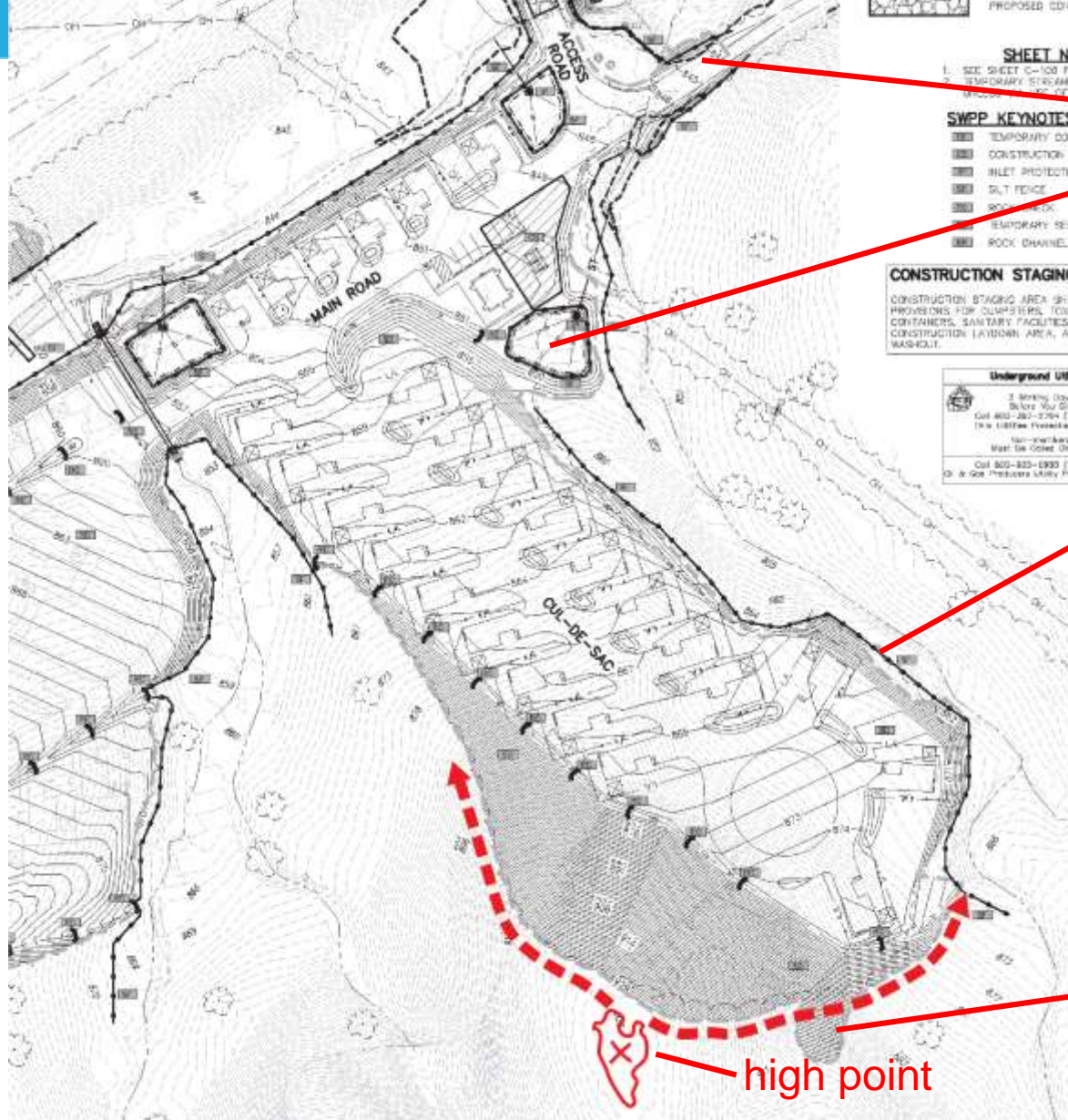
Designated
concrete
washout

Sediment basin –
divert site flows
for treatment

Inlet protection

Existing ditchline





Construction entrances required

Convert sediment basins to bioretention

- dredge sediment
- use outlet structures high water overflow
- use orifice in outlet structure that was used for skimmer as bioretention underdrain

Silt fence exceeding max slope length

Sediment basins:

- site area > 10 acres
- exceed silt fence
- exceed inlet protection

Divert clean water around site

high point

Common Errors related to SS832



So Add More to the OEPA General Permit Requirements...

- Ohio DOT Supplemental Specification 832 – Temporary Sediment and Erosion Control (1/17/2014)
- Ohio DOT Location and Design Manual, Volume 2, Drainage Design (2015)
- County or Local Requirement



SS832 – a bit more to consider...

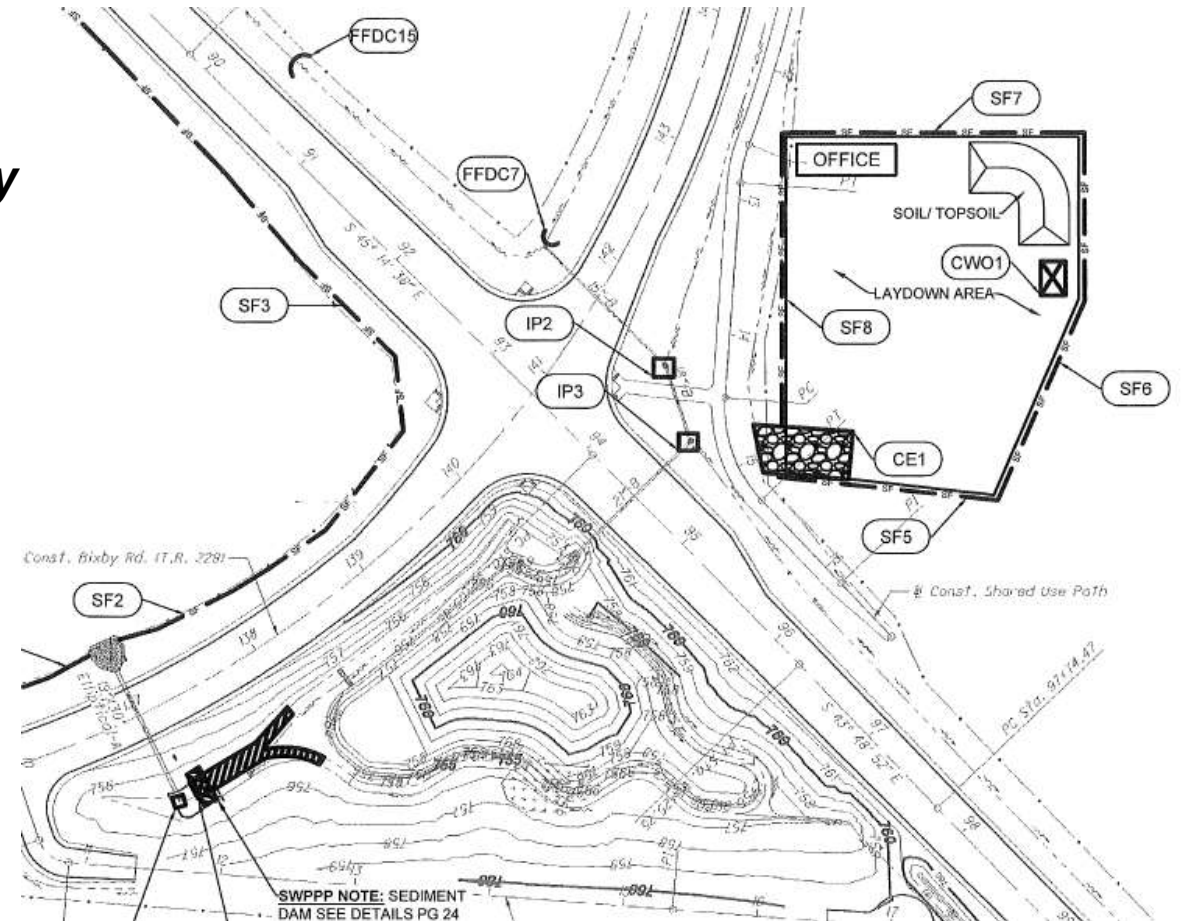
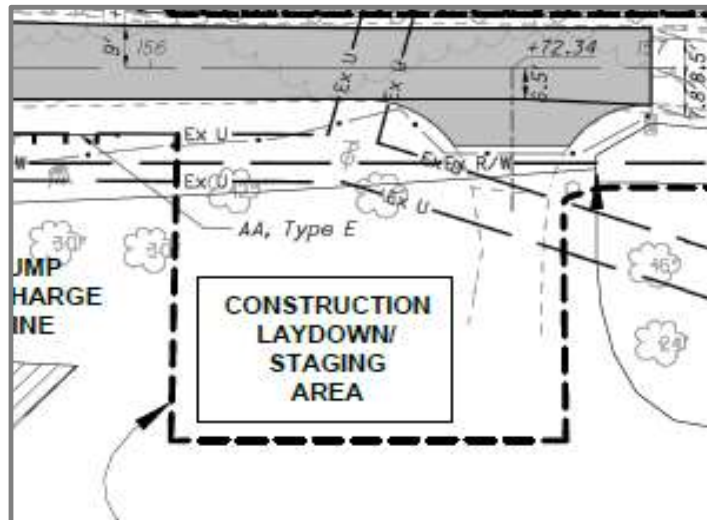
832.04 Locate, furnish, installs, and maintain BMPs that are compliant with:

- Related rules
 - Clean Water Act
 - Ohio Water Pollution Control Act (OWPCA)
 - Special Areas (e.g. Big Darby)
- Specifications
- Standard Construction Drawing (SCD)
- Permits
 - 404
 - Ohio 401 WQC
 - Isolated Wetland
 - Local government agency requirements



Waste/Borrow Areas and Areas Outside the Project Limits

- **832.02 - Contractor Earth Disturbing Activity (EDA) is any area not shown on the plans and is part of the project. This includes staging areas, waste areas, borrow areas.**



Illustrating Natural Resources

- **832.05I – Show all surface waters located within and adjacent to the Project and Contractor EDA on the SWPPP.**



Protection of Natural Resources

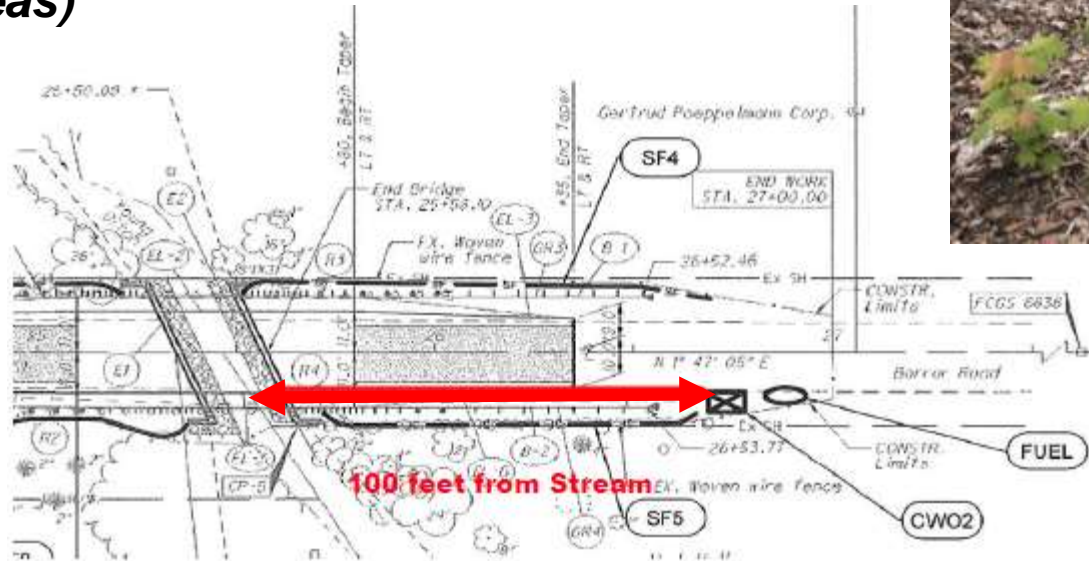
- ***832.05I - Provide appropriate river, stream and water body protection to all surface waters on and adjacent to the project.***

It appears that a large portion of the site drainage flows to the northwest, towards the demarcated wetland. Has consideration be given to protect the wetland from sediment and potential accelerated surface water flows?



100' Separation Distance

- **831.09D – Locate the following 100 feet from the waters edge of any stream, wetland, or body of water. (concrete or asphalt plant, staging or storage areas, dewatering areas, concrete truck wash outs, construction access, vehicle fueling and refueling areas)**



Considering Waterway Permit Requirements

- ***BMPs must be in compliance with the 401/404 permit and Isolated Wetland Permit***
- Native species are to be used for revegetation of disturbed areas.
- Straw bales shall not be used as a form of erosion/sediment control.
- Grass filter strips shall be established adjacent to all avoided/relocated and un-culverted waters of the state, including wetlands and existing buffer areas. Filter strips shall be vegetated with non-invasive species native to Ohio.
- No debris and/or soil piles from excavation will be placed within the 100-year floodplain boundary of any watercourse.
- A population of the state listed primrose-leaved violet is shown on the plans. The contractor shall protect this area from all ancillary construction activities (staging, storage, borrow, waste, refueling, etc.).



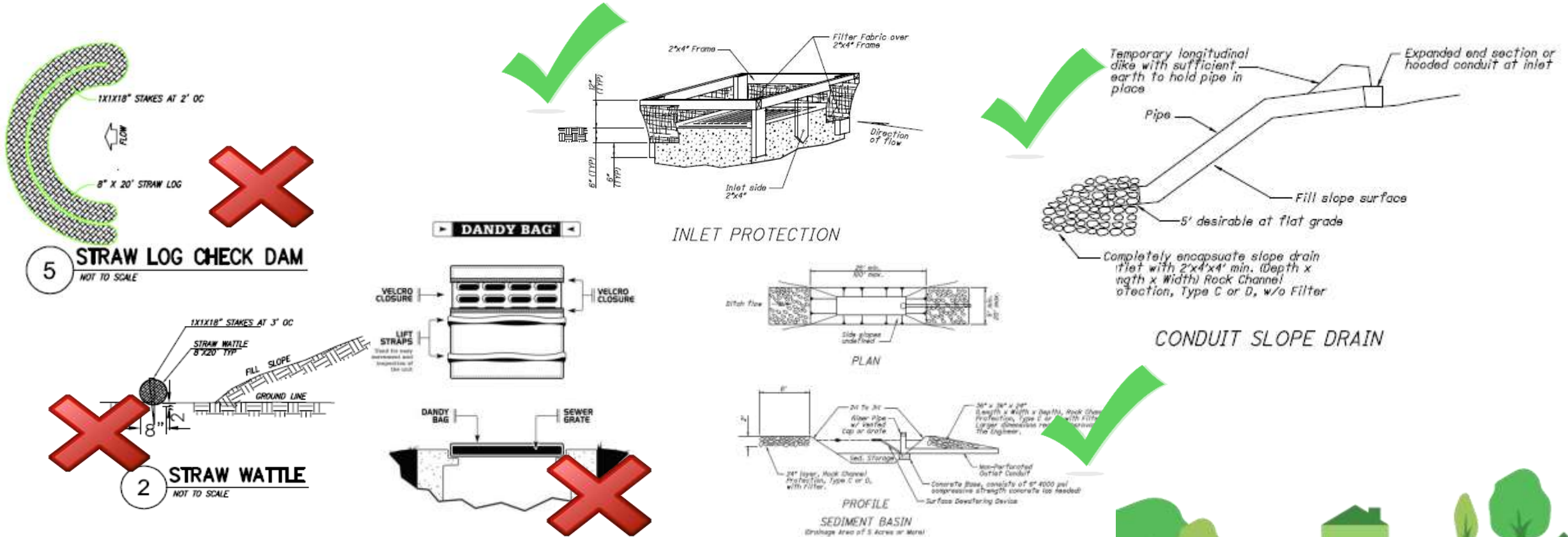
More Than Just a Qualified Individual

- SWPPP designed and sealed by a PE who also holds CPESC
- Think ahead – is the person local?
- Will they be available for the project duration?



Is the BMP a Pay Item?

- 832.14 – BMP compensation will be based on unit prices (16 items).



BMP Quantities

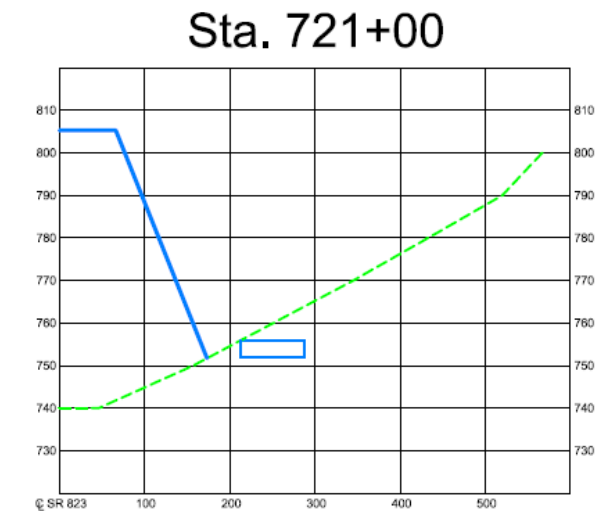
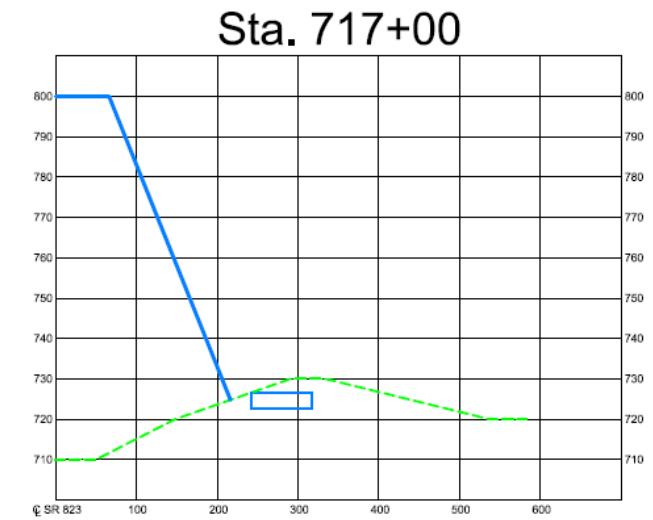
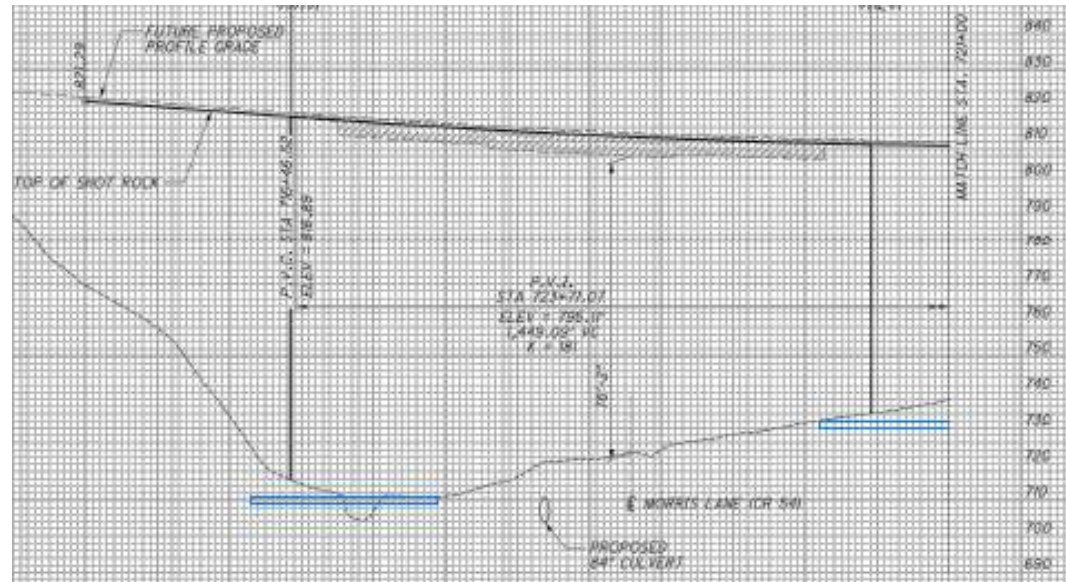
- 832.09 C – Furnish quantity totals for all BMP required for the execution of the proposed plan

BMP INVENTORY						
REFERENCE	SHEET	STATION	SIDE	SEDIMENT DAM (SD)	INLET PROTECTION (IP)	ROCK CHANNEL PROTECTION, TYPE C (RC)
				EACH	EACH	CU YD
SD-1	6	1310+60	LT	1		
SD-2	5	1307+00	RT	1		
SD-3	7	1315+90	LT	1		
SD-4	7	1316+20	RT	1		
IP-1	6	1311+90	LT		1	
IP-2	6	1312+75	LT		1	
IP-3	6	1311+00	RT		1	
RC-1	7	1314+15	LT			0.7
TOTAL				4	3	0.7

BMP Inventory

Label	Page	Station	Side	Perimeter Control	Yard Inlet Protection	Curb Inlet Protection	Construction Entrance	Filter Fabric Ditch Checks	Rock Ditch Checks	Sediment Basin	Diversion ditches	Concrete Washout	Construction Fence
IP1	5, 16	137+00	RT		20								
IP2	6, 12, 19	141+50	RT		20								
IP3	6, 19	142+75	RT		20								
IP4	7, 18	144+40	RT		20								
IP5	7, 18	146+25	RT		20								
IP6	12, 19	94+50	LT		20								
IP7	14	103+50	LT		20								
SF1	5, 16	135+75	LT	100									
SF2	5	137+25	LT	315									
SF3	10	86+50	RT	650									
SF4	10	85+75	RT	55									
SF5	20	95+00	LT	175									
SF6	20	96+75	LT+190	300									
SF7	20	143+00	RT	225									
SF8	20	141+00	RT	90									
FFDC1	5, 16	135+25	LT					15					
FFDC2	5, 16	135+45	RT					15					
FFDC3	5, 16	135+55	RT					15					
FFDC4	6	141+80	LT					15					
FFDC5	7, 18	145+50	LT					15					
FFDC6	8	150+35	RT					15					
FFDC7	9	82+00	LT					15					
FFDC8	9	81+50	RT					15					
FFDC9	10	82+65	LT					15					
FFDC10	10	84+75	LT					15					
FFDC11	10	83+25	RT					15					
FFDC12	10	85+25	RT					15					
FFDC13	10	86+45	LT					15					
FFDC14	10	86+55	LT					15					
FFDC15	11	90+50	LT					15					
FFDC16	14	103+60	RT					15					
FFDC17	14	105+75	RT					15					
FFDC18	15	108+25	LT					15					
FFDC19	15	109+00	RT					15					
SB1	5, 16	137+25	RT							1			
CF1	10	85+75	RT										100
CE1	2, 20	95+00	LT				38						
CWO1	2, 20	142+50	RT+290									1	
TOTAL				1910 LF	140 LF		38 CY	285 LF		1 EA		1 EA	100 LF

Not Considering Existing vs. Final Grade



Future Changes to SS832?

- Evaluation of drawdown/filtering effectiveness
- Performance Metric
- Existing Conditions Plan
- More Prescriptive
- Mobile Inspection Field App

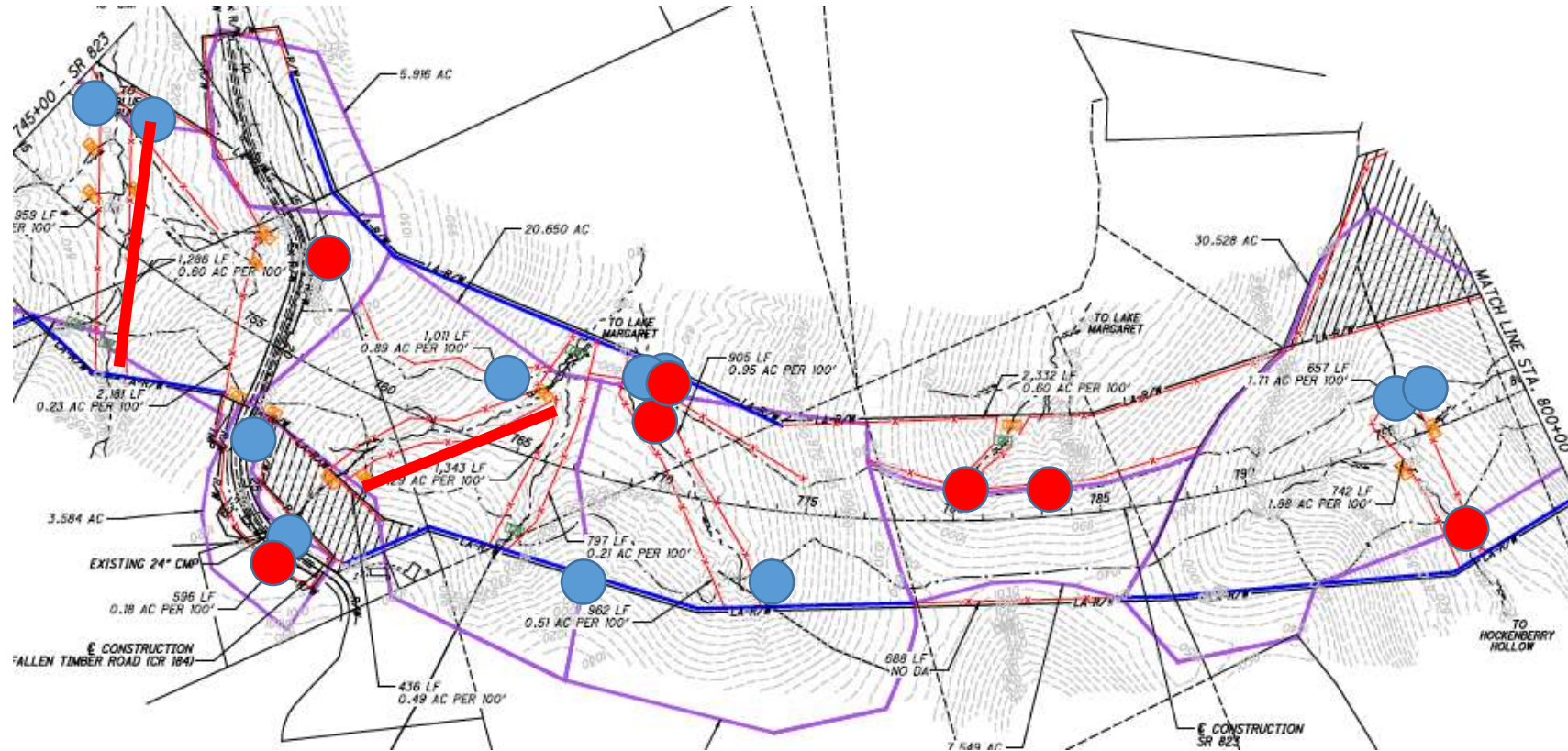


Design To Implementation – Common Errors



This just happens to be perfect!

Plan Amendments / Redlines



Plan Amendments / Redlines

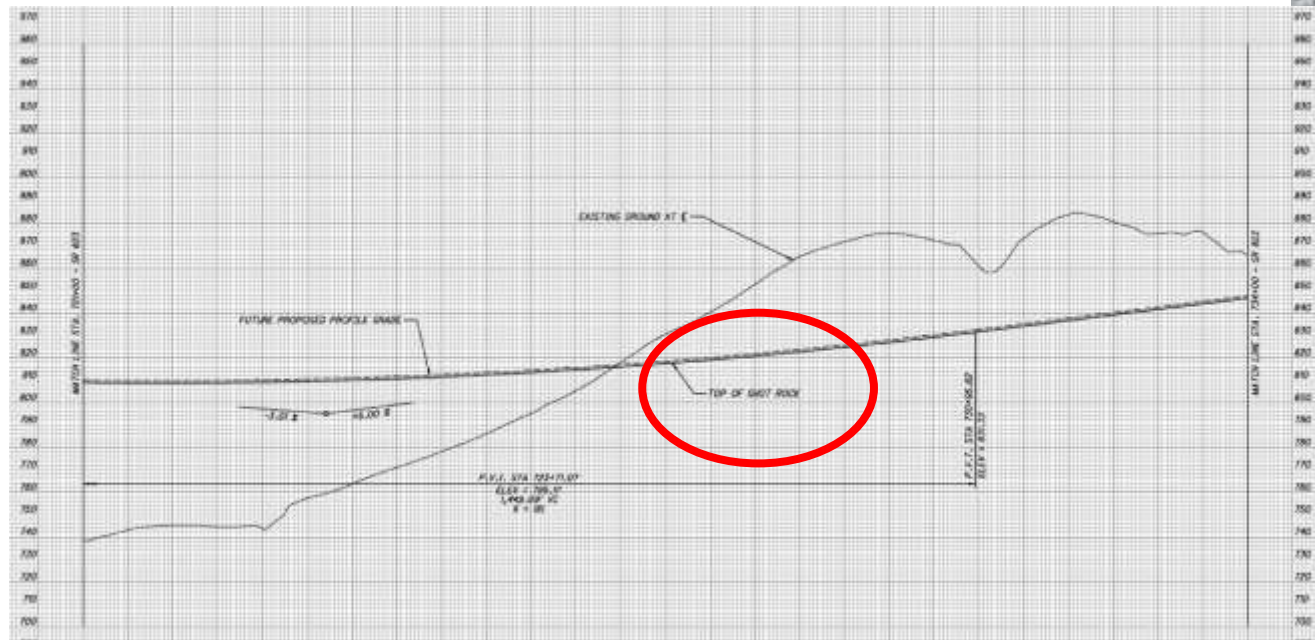
This one area had:

- Two sediment ponds
- Rows of silt fence
- Rock filter
- Clean water diversion

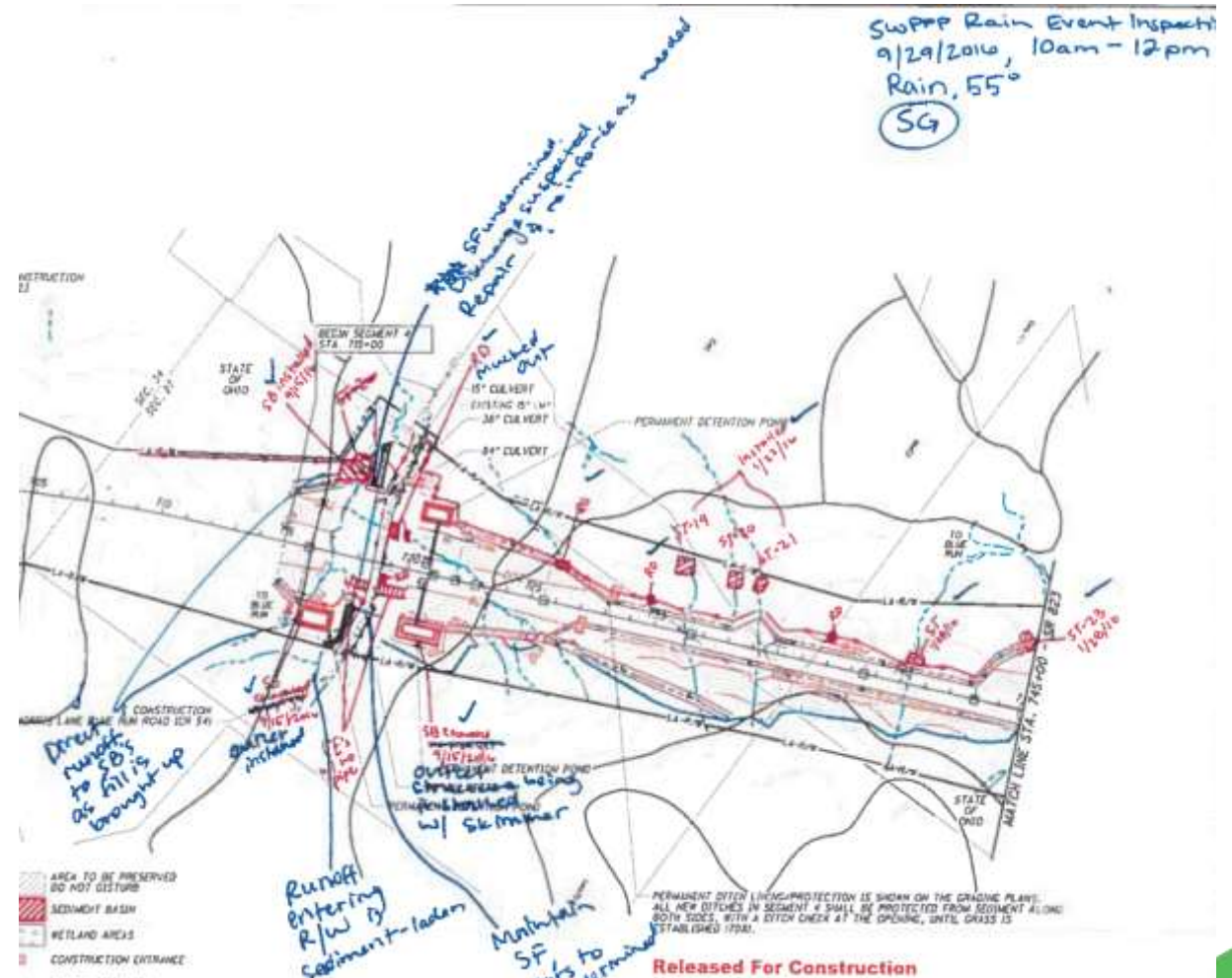


Subsurface Field Conditions

- Infiltration trenches won't work when they are in bedrock



- Weekly
- Monthly
- Rain Event
- Report timeliness
- Discharge point conditions





Thank You!

Mary Sharrett, PE, CPESC

Stone Environmental Engineering & Science, Inc.
MarySharrett@StoneEnvironmental.com

Brenda VanCleave, PE, CPESC

ms consultants, inc.
bvancleave@msconsultants.com



ms consultants, inc.
engineers, architects, planners

