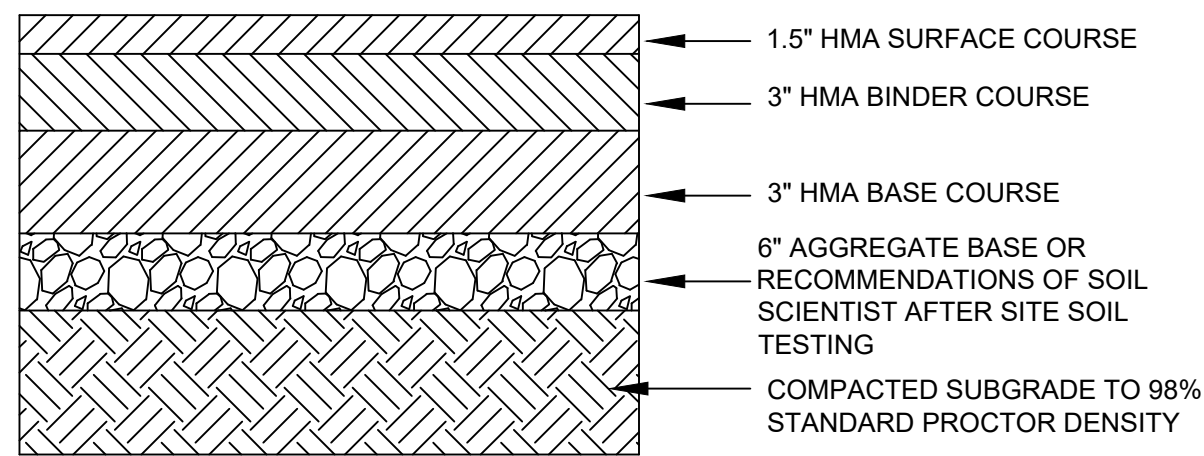
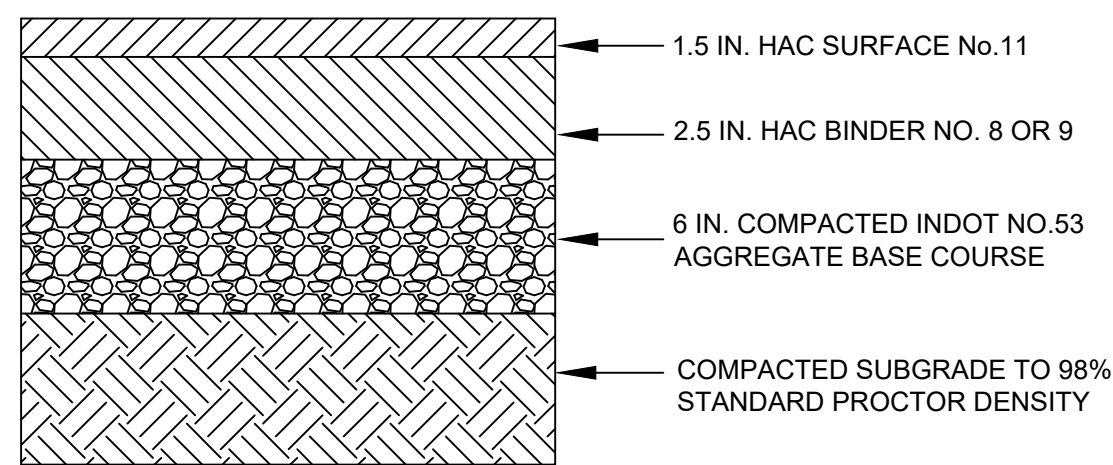


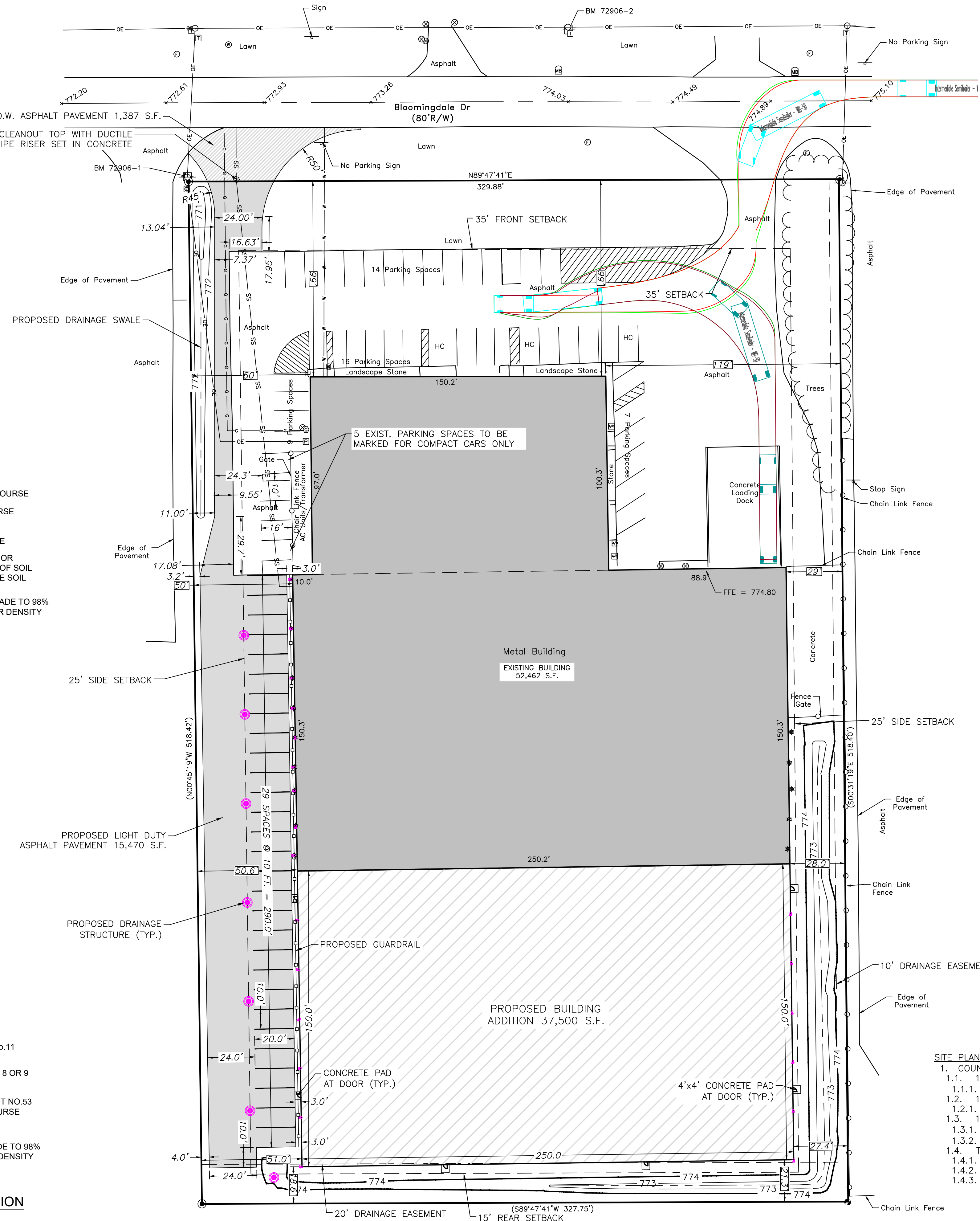
SANITARY SEWER CLEAN-OUT TOP IN PAVEMENT
Not to scale



ASPHALT PAVEMENT SECTION TOWN OF BRISTOL R.O.W.
NOT TO SCALE



LIGHT-DUTY ASPHALT PAVEMENT SECTION
NOT TO SCALE



- SYMBOL DESCRIPTION**
- AIR CONDITIONING UNIT
 - WATER VALVE
 - ELECTRIC PULL BOX
 - GAS METER
 - WELL LOCATION
 - SIGN
 - FIBER OPTIC VAULT
 - POLE
 - TELEPHONE PEDESTAL
 - MAILBOX
 - ELECTRIC VAULT
 - WATER MANHOLE
 - 80D NAIL SET
 - REBAR SET
 - REBAR FOUND
 - IRON PIPE FOUND
 - BENCHMARK SET
- CHAIN LINK FENCE**
- TREE LINE**
- TOP OF BANK**
- TOE OF SLOPE**
- CENTERLINE ASPHALT**
- OVERHEAD ELECTRIC**

SITE BENCHMARKS:

BM 72906-1
Bench Tie found in the North face of Nipsco Power Pole 1-063/111 at the NW corner of Property.
Elevation = 773.23

BM 72906-2 A Gear set in the SE face of Nipsco Power Pole 1-058/096 near the SE corner of StayLock storage on Bloomingdale Dr.
Elevation = 775.28

LAND USE CALCULATIONS	SF	AC	PERCENT
PROPERTY AREA	170,450	3.91	100%
EXISTING BUILDING	52,462	1.20	31%
PROPOSED BUILDING	37,500	0.86	22%
TOTAL BUILDING	89,962	2.07	53%

- SITE PLAN NOTES:**
1. COUNTY PARKING REQUIREMENTS: LIGHT INDUSTRIAL (SEC. 7.2.4)
 - 1.1. 1 SPACE PER 300 S.F. OFFICE SPACE
 - 1.1.1. EXISTING OFFICE: 6,200 S.F./300 = 21 SPACES
 - 1.2. 1 SPACE PER 1,000 S.F. OUTDOOR STORAGE AREA
 - 1.2.1. OUTDOOR STORAGE: 0 S.F.
 - 1.3. 1 SPACE PER 2,500 S.F. INDOOR STORAGE AREA
 - 1.3.1. EXISTING INDOOR STORAGE: 46,262 S.F./2500 = 19 SPACES
 - 1.3.2. PROPOSED INDOOR STORAGE: 37,500 S.F./2500 = 15 SPACES
 - 1.4. TOTAL REQUIRED PARKING: 55 SPACES
 - 1.4.1. EXISTING PARKING: 46 SPACES
 - 1.4.2. PROPOSED PARKING: 30 SPACES
 - 1.4.3. TOTAL PROPOSED PARKING: 76 SPACES

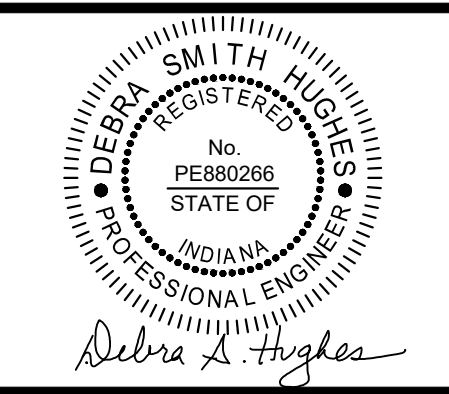
1)A submittal is required for the Town of Bristol Commercial Driveway Road Impact Agreement in accordance with the Town Standards. See Figure 2.13 for commercial driveway standard detail

NO.	REVISIONS	BY	DATE
1	ADD WEST FIRE LANE AND PARKING	DSH	10/26/2023



2810 Dexter Drive
Elkhart, IN 46514
Phone: 574-266-1010
Email: info@sam.biz

DRAWING FILE: 1022072906-DESIGN.DWG
CERTIFICATION DATE: 11/20/2023
HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: NONE
ENGINEER: Debra S. Hughes, P.E.
TECHNICIAN: GJS / AKM

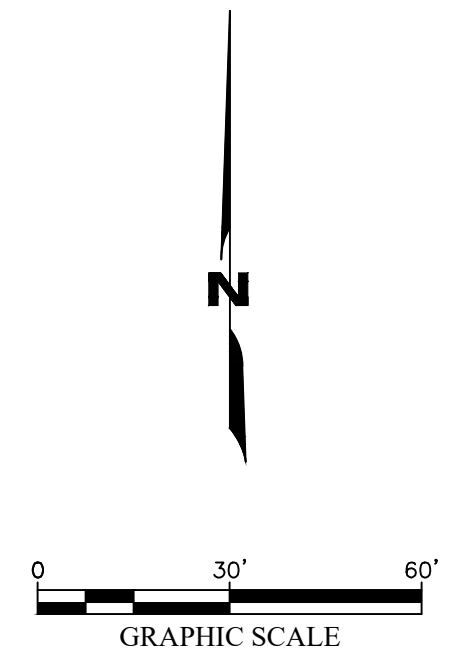
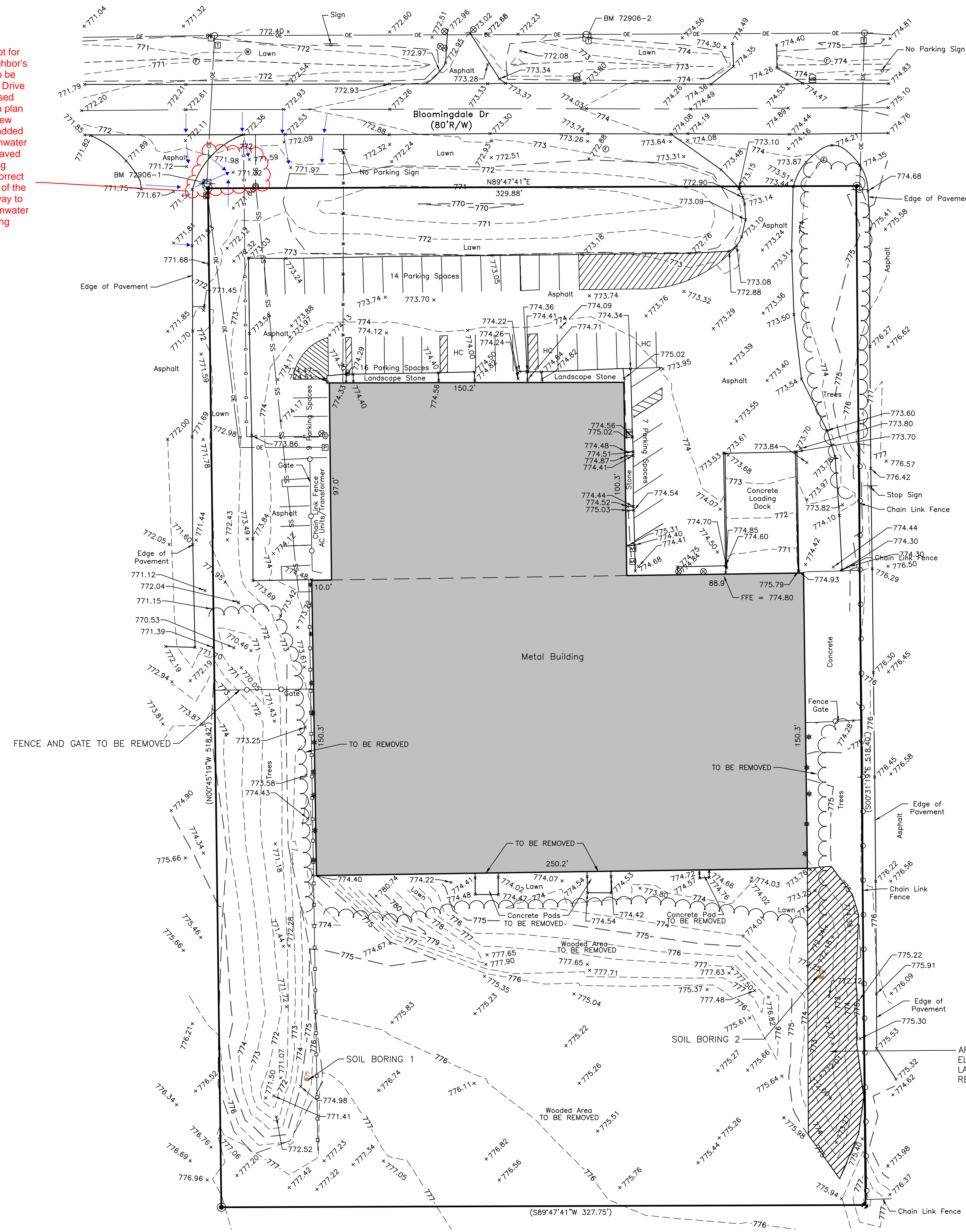


PROPOSED SITE PLAN

COMBINED TECHNOLOGIES, INC., 503 BLOOMINGDALE DRIVE, BRISTOL
PT. BRISTOL INDUSTRIAL PARK,
PT. SE 1/4, SEC 27, T38N, R6E
WASHINGTON TWP., ELKHART CO., INDIANA

JOB NUMBER: 1022072906

The existing low spot for drainage of the neighbor's driveway appears to be within the proposed Drive location. The proposed driveway grading on plan sheet 5 shows for new hard surface to be added and now drain stormwater to pond within the paved area on the adjoining driveway. Please correct the grading/drainage of the new proposed driveway to not pond more stormwater within the neighboring driveway.



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- AIR CONDITIONING UNIT
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 - ELECTRIC PULL BOX
 - GAS METER
 - WELL LOCATION
 - SIGN
 - FIBER OPTIC VAULT
 - POLE
 - TELEPHONE PEDESTAL
 - MAILBOX
 - ELECTRIC VAULT
 - WATER MANHOLE
 - ROD NAIL SET
 - REBAR SET
 - REBAR FOUND
 - IRON PIPE FOUND
 - BENCHMARK SET
 - CHAIN LINK FENCE
 - TREE LINE
 - TOP OF BANK
 - TOE OF SLOPE
 - CENTERLINE ASPHALT
 - OVERHEAD ELECTRIC

UTILITY NOTES:

INDIANA 811 WAS CONTACTED ON 6/12/2023 REQUESTING THE LOCATION OF BURIED UTILITIES FOR THIS PROJECT. TICKET NUMBER 2306121351 WAS ISSUED. ALL BURIED UTILITIES MARKED AS A RESULT OF THE CONTACT WERE LOCATED IN THE FIELD AND ARE SHOWN. OTHER BURIED UTILITIES MAY EXIST ON THIS SITE THAT WERE NOT MARKED.

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BM 72906-2 A Gear set in the SE face of NipSCO Power Pole 1-058/096 near the SE corner of StayLock storage on Bloomingdale Dr.
Elevation = 775.28

DATE: 11/20/2023 11:02:29 AM PROJECT: 1022072906 (10/26/2023) USER: DSH (10/26/2023) 2:15:50 PM

NO.	REVISIONS	BY	DATE
1	ADD SOIL BORING LOCATIONS	DSH	10/26/2023



2810 Dexter Drive
Elkhart, IN 46514
Phone: 574-266-1010
Email: info@sam.biz

DRAWING FILE: 1022072906-DESIGN.DWG

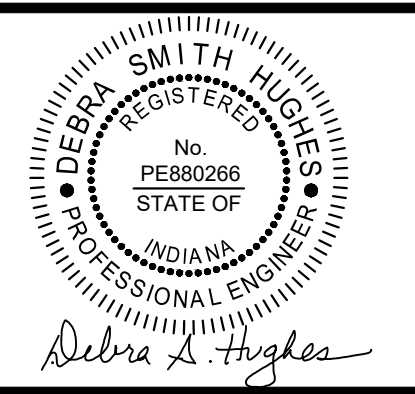
CERTIFICATION DATE: 11/20/2023

HORIZONTAL SCALE: 1"=30'

VERTICAL SCALE: NONE

ENGINEER: Debra S. Hughes, P.E.

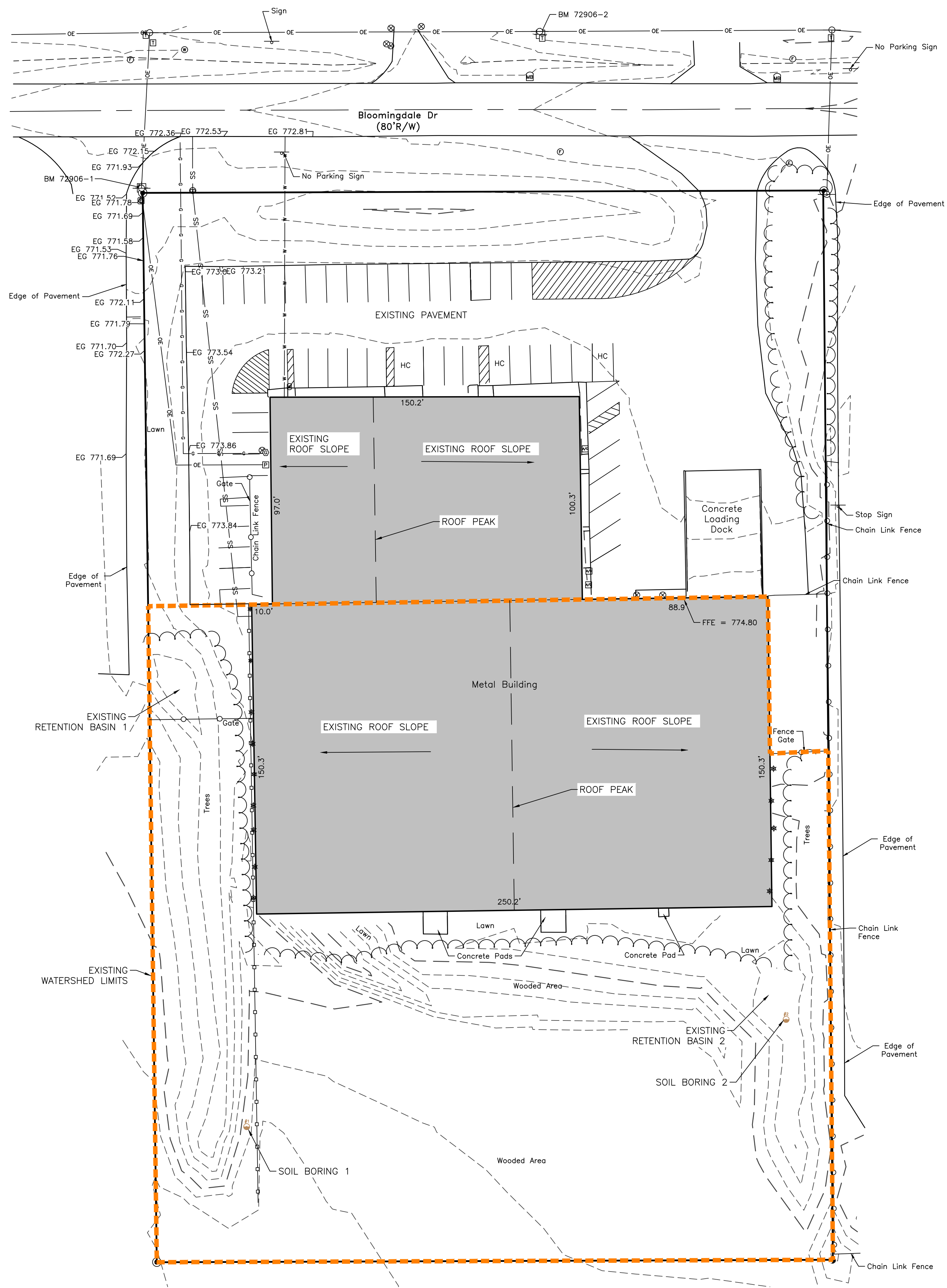
TECHNICIAN: GJS



EXISTING CONDITIONS PLAN

COMBINED TECHNOLOGIES, INC., 503 BLOOMINGDALE DRIVE, BRISTOL
PT. BRISTOL INDUSTRIAL PARK,
PT. SE 1/4, SEC 27, T38N, R6E
WASHINGTON TWP., ELKHART CO., INDIANA

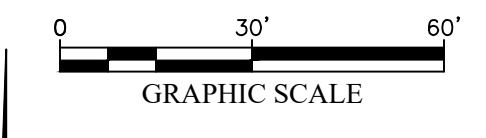
JOB NUMBER: 1022072906



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 - ⊙ GAS METER
 - ⊗ WELL LOCATION
 - ⊡ SIGN
 - ⊕ FIBER OPTIC VAULT
 - ⊖ POLE
 - ⊞ TELEPHONE PEDESTAL
 - ⊠ MAILBOX
 - ⊞ ELECTRIC VAULT
 - ⊕ WATER MANHOLE
 - ⊙ 800 NAIL SET
 - ⊙ REBAR SET
 - ⊙ REBAR FOUND
 - ⊙ IRON PIPE FOUND
 - ⊙ BENCHMARK SET

- CHAIN LINK FENCE
- TREE LINE
- TOP OF BANK
- TOE OF SLOPE
- CENTERLINE ASPHALT
- OVERHEAD ELECTRIC



Determination of Coefficient "C" for Existing South Watershed

Watershed	Roof (sf)	Pavement (sf)	Pervious (sf)	Total Area (sf)	Impervious x 0.95	Pervious x 0.30	Weighted total area (sf)	Average C	Area (Ac.)	C * A
Existing Watershed	37,542	260	65,129	102,931	35,912	19,539	55,451	0.54	2.36	1.27

Existing Basin 1

Elevation	Area (sf)	Volume (cf)
771.5	1,547	
771.0	451	500
770.5	113	141
Total Volume:		641

Existing Basin 2

Elevation	Area (sf)	Volume (cf)
773.7	3,393	
773.5	2,810	620
773.0	1,595	1,101
772.5	611	552
772.3	289	90
Total Volume:		1,722

Table 4.5 Computation Sheet for Storm Water Storage Calculations - Existing South Watershed

Storm Duration (Tc) hours	100 Year Rainfall (I) inches/hour	Inflow Rate Q (Q@Tc=CIA)	Outflow Rate O (S=Q-O)	Storage Rate (Tc*S=AF)	Required Storage in Acre Feet (AF) * 43,560=CF	
0.50	3.96	5.04	0.11	4.93	0.205	
1.00	1.98	2.52	0.11	2.41	0.201	
2.00	1.55	1.97	0.11	1.86	0.310	
3.00	1.14	1.45	0.11	1.34	0.334	
4.00	0.92	1.17	0.11	1.06	0.352	
5.00	0.77	0.98	0.11	0.87	0.361	
6.00	0.67	0.85	0.11	0.74	0.369	
9.00	0.48	0.61	0.11	0.50	0.373	
15.00	0.32	0.41	0.11	0.29	0.366	
18.00	0.25	0.32	0.11	0.20	0.306	
24.00	0.22	0.28	0.11	0.17	0.331	
					Storage Volume Required	16,226
Developed CA					Total volume provided	2,362
					% storage	15%

Existing Drainage Basin Infiltration Calculation

Area	4,940 s.f.
Soil Infiltration Rate	Estimated Infiltration Rate: 1 in/hr
Rate	2.31481E-05 ft/sec
Calculation: Q	0.11 c.f.s.
Time to Drain for peak volume:	17.0 hours

Soil infiltration data from Weaver Consultants soil testing report Sept. 3, 2023

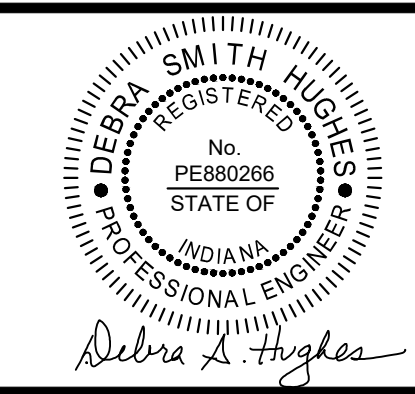
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NO.	REVISIONS	BY	DATE
1	ADD SOIL BORING LOCATIONS	DSH	10/26/2023

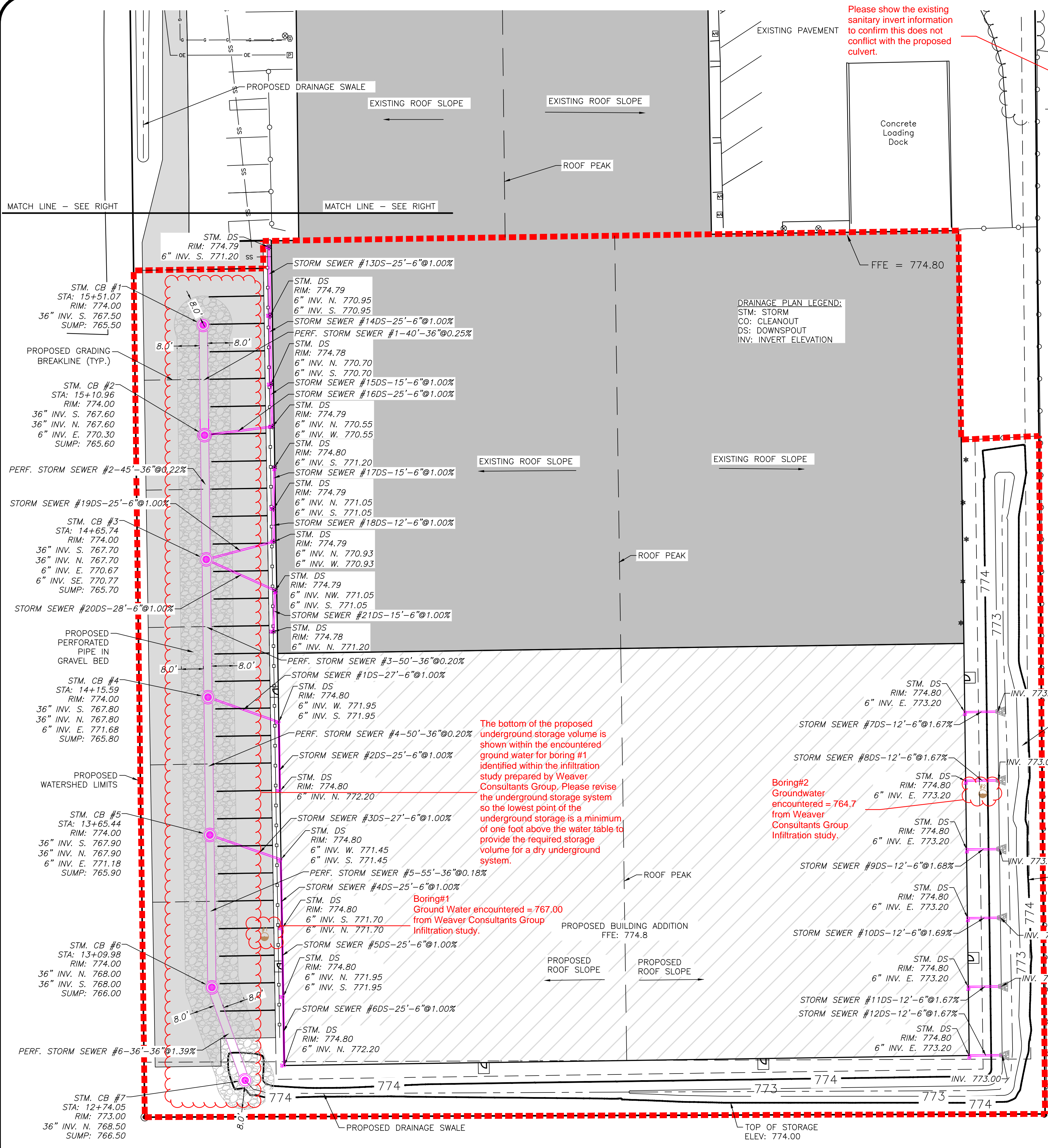


2810 Dexter Drive
 Elkhart, IN 46514
 Phone: 574-266-1010
 Email: info@sam.biz

DRAWING FILE: 1022072906-DESIGN.DWG
 CERTIFICATION DATE: 11/20/2023
 HORIZONTAL SCALE: 1"=30'
 VERTICAL SCALE: NONE
 ENGINEER: Debra S. Hughes, P.E.
 TECHNICIAN: GJS / AKM



EXISTING DRAINAGE PLAN
 COMBINED TECHNOLOGIES, INC., 503 BLOOMINGDALE DRIVE, BRISTOL
 PT. BRISTOL INDUSTRIAL PARK,
 PT. SE 1/4, SEC 27, T38N, R6E
 WASHINGTON TWP., ELKHART CO., INDIANA
 JOB NUMBER: 1022072906



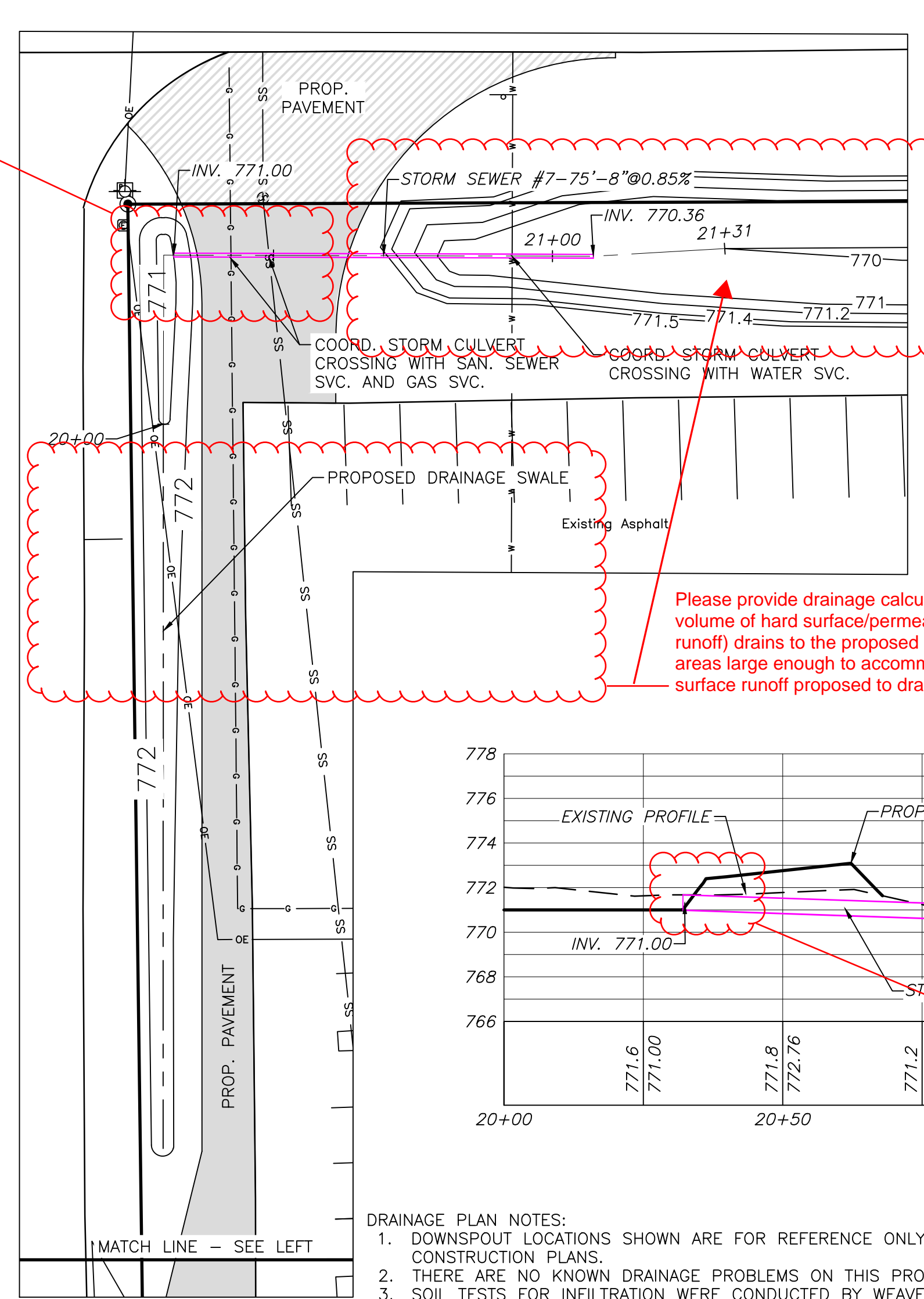
Please show the existing sanitary invert information to confirm this does not conflict with the proposed culvert.

DRAINAGE PLAN LEGEND:
 STM: STORM
 CO: CLEANOUT
 DS: DOWNSPOUT
 INV: INVERT ELEVATION

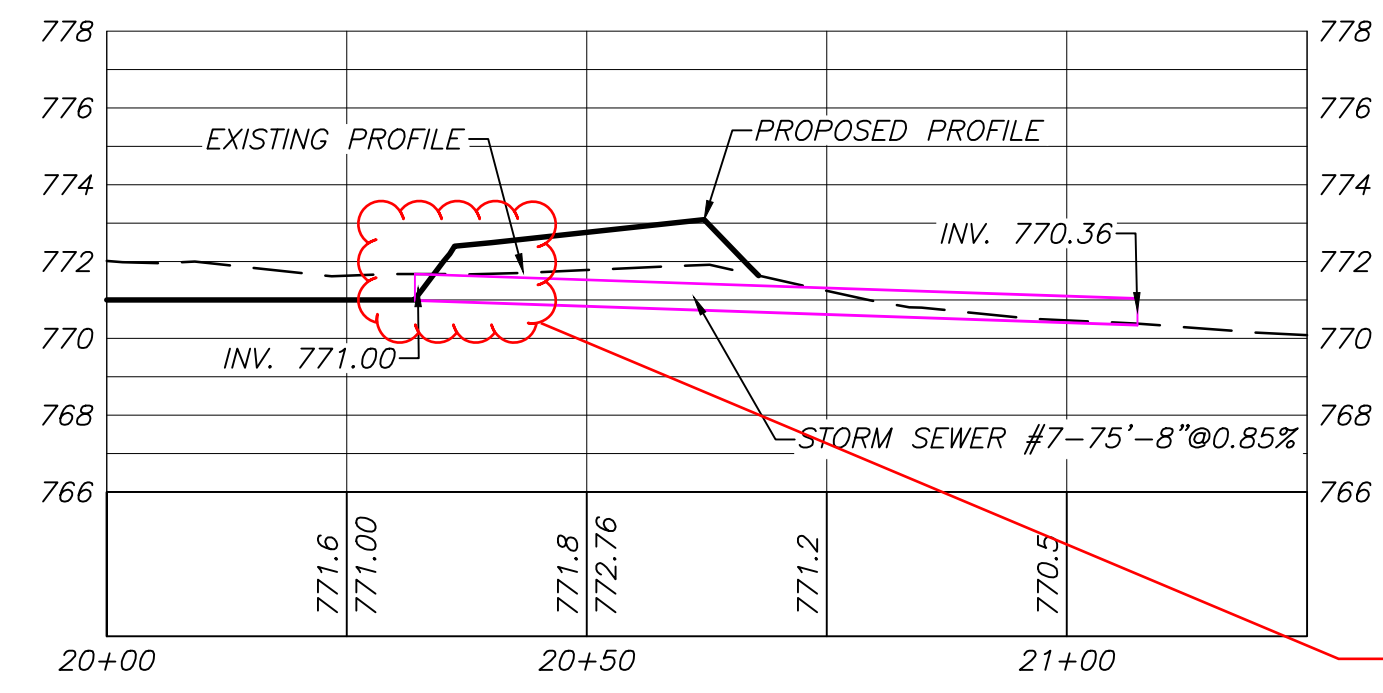
The bottom of the proposed underground storage volume is shown within the encountered ground water for boring #1 identified within the infiltration study prepared by Weaver Consultants Group. Please revise the underground storage system so the lowest point of the underground storage is a minimum of one foot above the water table to provide the required storage volume for a dry underground system.

Boring#1 Ground Water encountered = 767.00 from Weaver Consultants Group Infiltration study.

Boring#2 Groundwater encountered = 764.7 from Weaver Consultants Group Infiltration study.



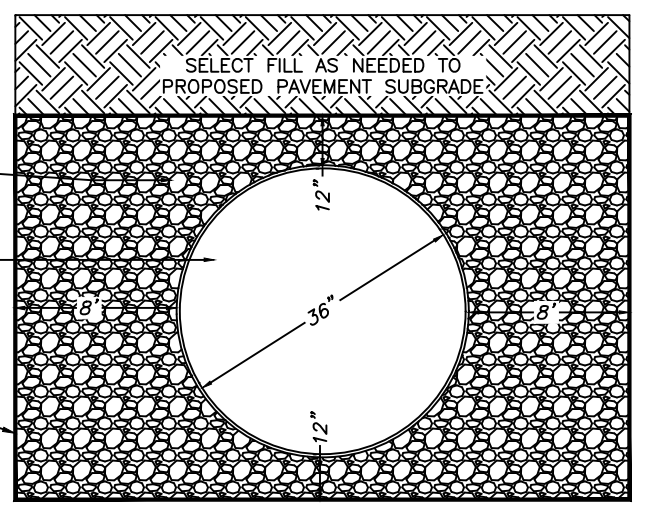
Please provide drainage calculations to show what volume of hard surface/permeable areas (stormwater runoff) drains to the proposed drainage swales. Are these areas large enough to accommodate the new hard surface runoff proposed to drain into them?



The proposed 8" culvert has less than one foot of cover over the pipe underneath the proposed pavement. Recommend revising this.

- DRAINAGE PLAN NOTES:
1. DOWNSPOUT LOCATIONS SHOWN ARE FOR REFERENCE ONLY. CONTRACTOR TO COORDINATE DOWNSPOUT LOCATIONS WITH BUILDING CONSTRUCTION PLANS.
 2. THERE ARE NO KNOWN DRAINAGE PROBLEMS ON THIS PROPERTY.
 3. SOIL TESTS FOR INFILTRATION WERE CONDUCTED BY WEAVER CONSULTANTS GROUP ON JULY 27, 2023. A REPORT WITH THE RESULTS OF THIS TESTING WAS ISSUED ON SEPT. 3, 2023. THE SOILS TESTED HAVE INFILTRATION RATES OF 8 TO 15 INCHES PER HOUR. THIS WILL ALLOW COLLECTED DRAINAGE TO QUICKLY INFILTRATE INTO THE RETENTION BASIN SOIL.
 4. THE ELKHART COUNTY DRAINAGE DESIGN REQUIREMENTS DO NOT ALLOW CONSIDERATION OF INFILTRATION RATES IN THE COMPUTATIONS. HOWEVER, THE SOIL INFILTRATION RATE WAS INCLUDED IN THESE STORM WATER STORAGE CALCULATIONS.

SITE BENCHMARKS:
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Calculation of Weighted Coefficient "C" for Proposed South Watershed and C*A Calculation

Watershed	Roof (sf)	Pavement (sf)	Pervious (sf)	Total Area (sf)	(Roof + Pavement) x 0.95	Pervious x 0.30	Weighted total area (sf)	Average C	Area (Ac.)	C * A
Proposed Watershed	74,983	13,090	14,410	102,483	83,669	4,323	87,992	0.86	2.35	2.02

Proposed Retention Basin

Elevation	Area (sf)	Volume (cf)
774.0	5,188	
773.0	1,727	3,458
Total Volume:		3,458

Computation Sheet for Storm Water Storage Calculations - Proposed South Watershed

Storm Duration (Tc) hours	100 Year Rainfall (i) inches/hour	Inflow Rate Q (c.f.s.)	Outflow Rate (c.f.s.)	Storage Rate (c.f.s.)	Required Storage in Acre Feet (AF)	Required Storage in Cubic Feet (CF)
0.50	3.96	8.00	1.21	6.79	0.283	12,327
1.00	1.98	4.00	1.21	2.79	0.233	10,136
2.00	1.55	3.13	1.21	1.92	0.321	13,966
3.00	1.14	2.30	1.21	1.10	0.274	11,929
4.00	0.92	1.86	1.21	0.65	0.217	9,453
5.00	0.77	1.56	1.21	0.35	0.145	6,316
6.00	0.67	1.35	1.21	0.15	0.073	3,180
9.00	0.48	0.97	1.21	-0.24	-0.178	-7,769
15.00	0.32	0.65	1.21	-0.56	-0.701	-30,546
18.00	0.25	0.51	1.21	-0.70	-1.054	-45,895
24.00	0.22	0.44	1.21	-0.76	-1.526	-66,473
Developed CA					2.02	
Storage Volume Required						13,966
Total volume provided						13,903
% storage						100%

GRAVEL VOID CALCULATION

19	Gravel Width (Ft.)	
5	Gravel Depth (Ft.)	
276	Gravel Length (Ft.)	
26,220	Gravel Volume (C.F.)	
1,951	Pipe Volume (C.F.)	
24,269	Gravel - Pipe Volume (C.F.)	
8,494	Gravel Voids(35% Volume)	
10,445	Total Storage Volume (Pipe+Voids)	

Pipe Storage Volume

Pipe Length (ft.)	Diam.(ft.)	Volume(cf)
1	40	3
2	45	3
3	50	3
4	50	3
5	55	3
6	36	3
Total	276	1,951

Proposed Drainage Basin Infiltration Calculation

Area	10,156 s.f.
Soil Infiltration Rate	Estimated Infiltration Rate: 5 in/hr
Rate	0.000115741 ft/sec
Q:	1.18 c.f.s.
Calculation:	Time to Drain for peak volume: 3.4 hours

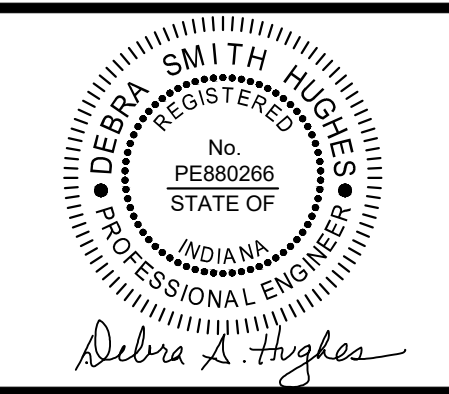
Soil infiltration data from Weaver Consultants soil testing report Sept. 3, 2023

NO.	REVISIONS	BY	DATE

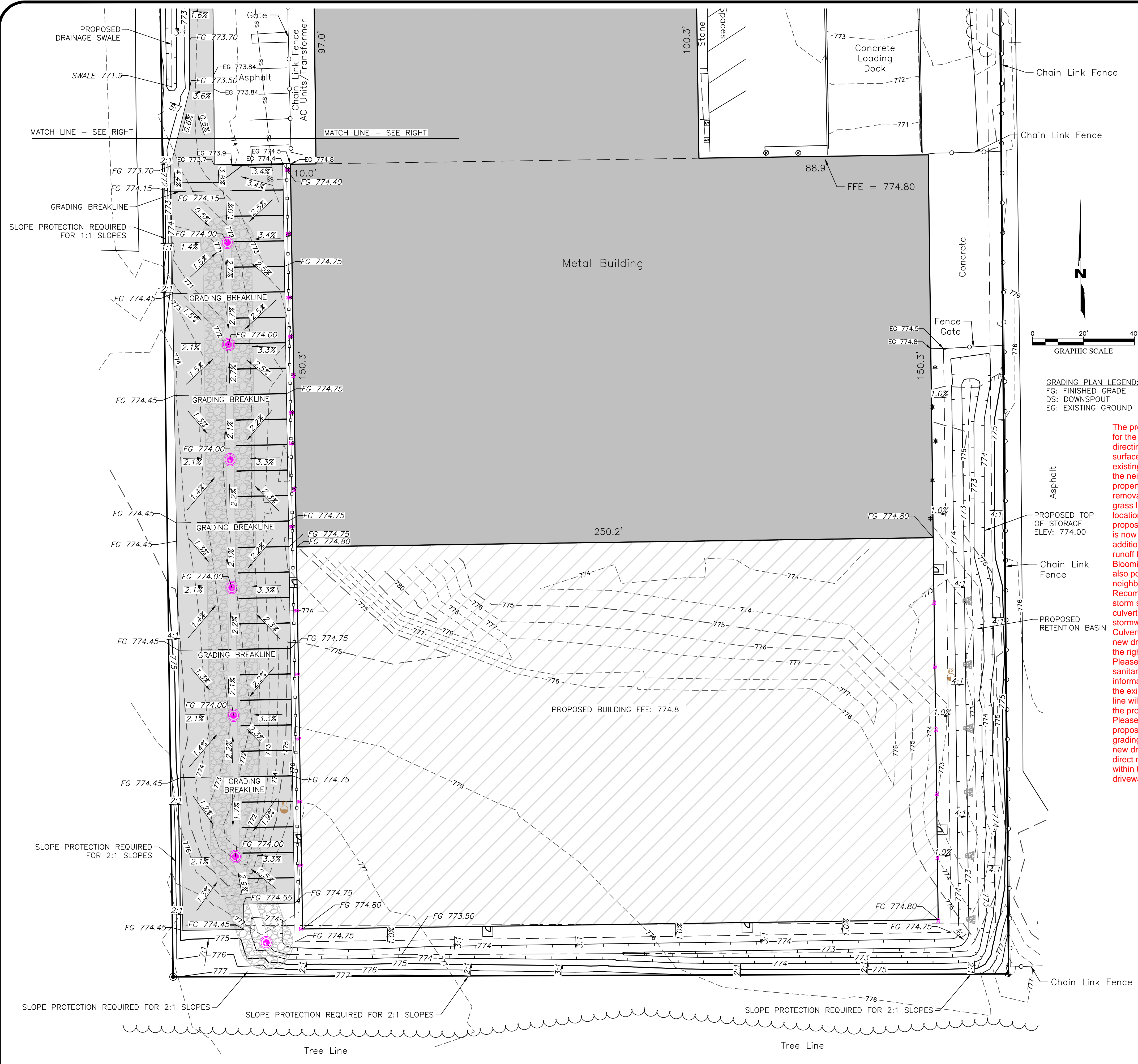


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 VERTICAL SCALE: NONE
 ENGINEER: Debra S. Hughes, P.E.
 TECHNICIAN: GJS / AKM

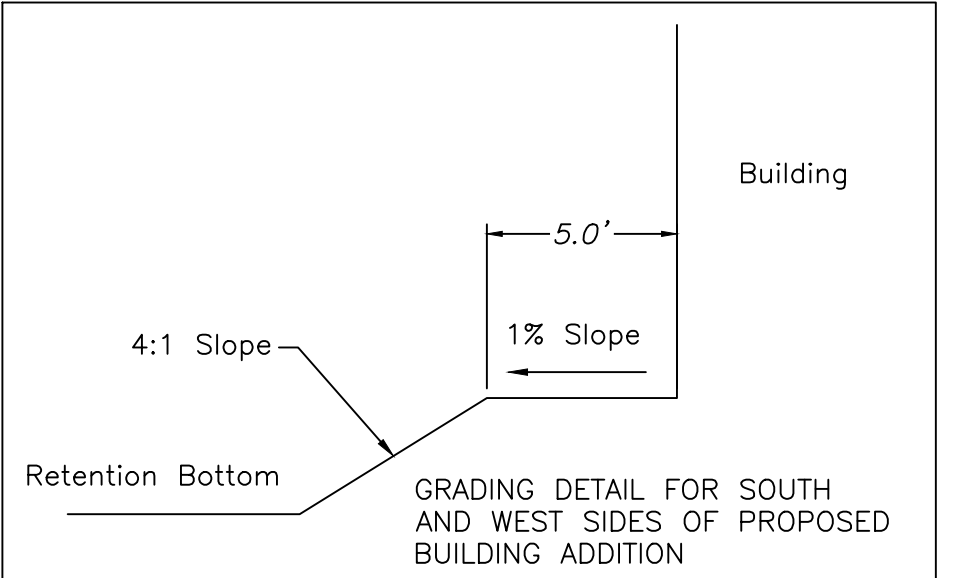


PROPOSED DRAINAGE PLAN
 COMBINED TECHNOLOGIES, INC., 503 BLOOMINGDALE DRIVE, BRISTOL
 PT. BRISTOL INDUSTRIAL PARK,
 PT. SE 1/4, SEC 27, T38N, R6E
 WASHINGTON TWP., ELKHART CO., INDIANA
 JOB NUMBER: 1022072906



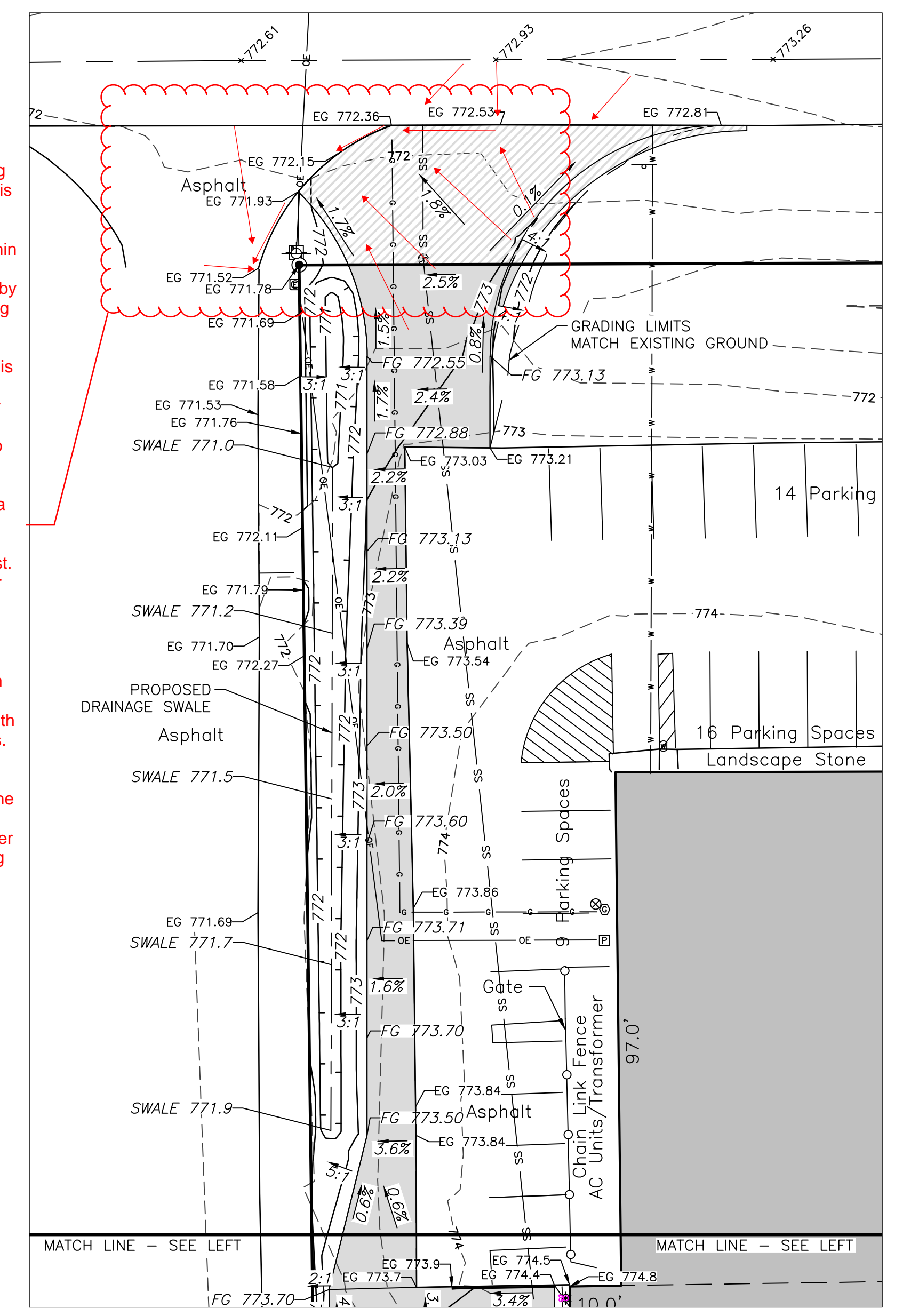
- SYMBOL DESCRIPTION UNIT**
- ⊠ AIR CONDITIONING UNIT
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 Elevation = 775.28



GRADING PLAN LEGEND:
 FG: FINISHED GRADE
 DS: DOWNSPOUT
 EG: EXISTING GROUND

The proposed grading for the new driveway is directing new hard surface runoff to an existing low point within the neighboring property. In addition, by removal of the existing grass low point in the location of the proposed driveway this is now directing additional stormwater runoff from Bloomingdale drive to also pond within the neighbor's driveway. Recommend adding a storm structure and culvert to direct stormwater to the east. Culvert is required for new driveways within the right-of-way. Please show the sanitary invert information to confirm the existing sanitary line will not conflict with the proposed culverts. Please correct the proposed grading/drainage of the new driveway to not direct more stormwater within the neighboring driveway.



- GRADING PLAN NOTES:**
- SLOPE PROTECTION IS REQUIRED ON SOUTH BANK OF SOUTH DRAINAGE SWALE AND ANY OTHER AREAS WITH 2:1 OR STEEPER SLOPE.
 - SLOPE PROTECTION TO INCLUDE EROSION CONTROL BLANKET AS SHOWN ON SHEET 8 AND SEEDING WITH MIX FOR STEEP BANKS AS SHOWN ON SHEET 9.

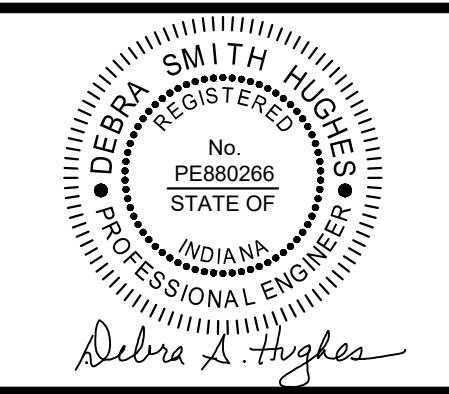
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NO.	REVISIONS	BY	DATE



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PROPOSED GRADING PLAN
 COMBINED TECHNOLOGIES, INC., 503 BLOOMINGDALE DRIVE, BRISTOL
 PT. BRISTOL INDUSTRIAL PARK,
 PT. SE 1/4, SEC 27, T38N, R6E
 WASHINGTON TWP., ELKHART CO., INDIANA
 JOB NUMBER: 1022072906

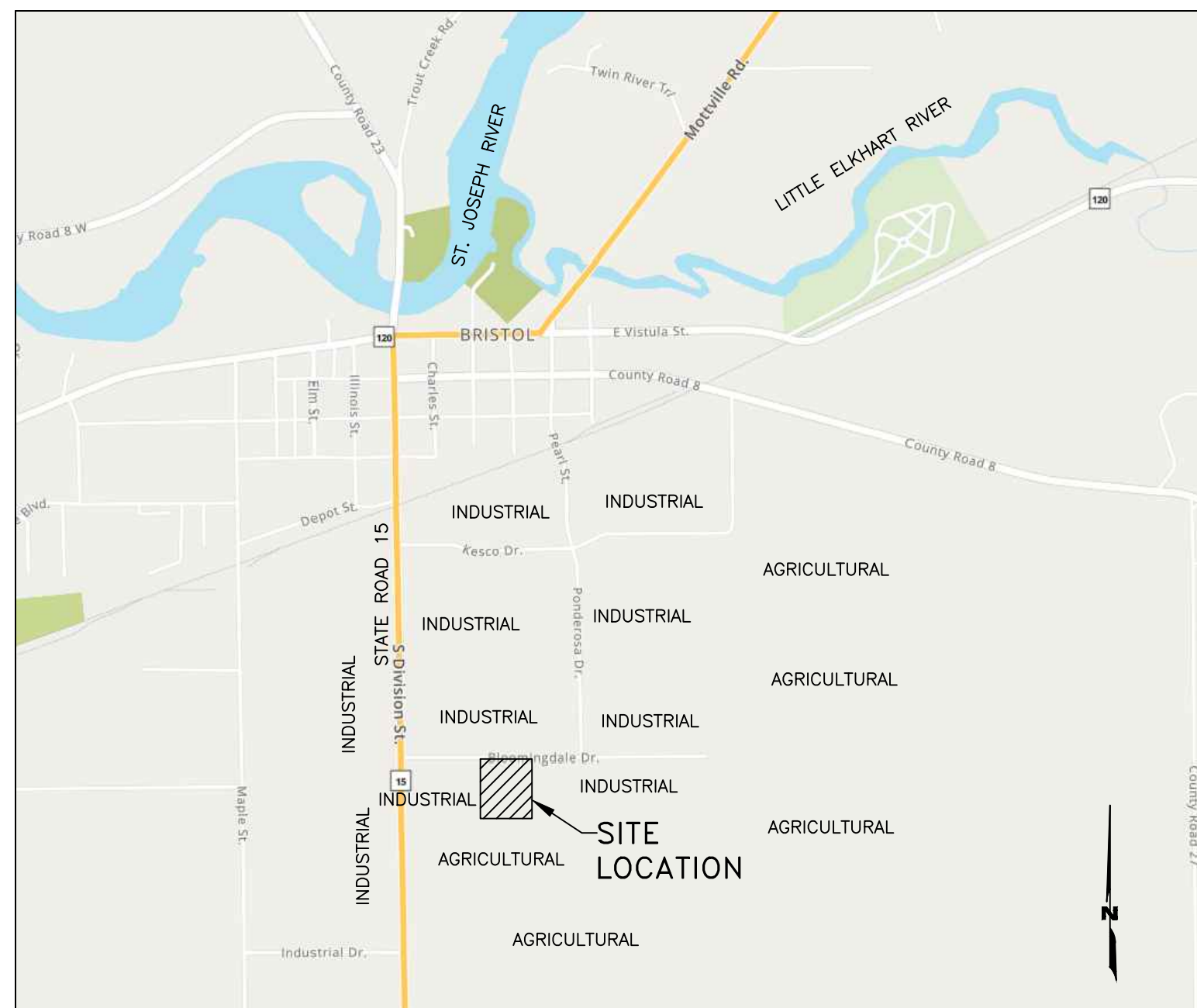
STORMWATER POLLUTION PREVENTION PLAN PART A

ITEM#	DESCRIPTION	LOCATION
A1	INDEX SHOWING LOCATION OF REQUIRED PLAN ELEMENTS:	SHEET 6
A2	VICINITY MAP SHOWING PROJECT LOCATION:	SHEET 6
A3	NARRATIVE DESCRIBING THE NATURE AND PURPOSE OF THE PROJECT: THE PURPOSE OF THIS PROJECT IS TO ADD ON TO AN EXISTING BUILDING WITH ASSOCIATED DRAINAGE AND GRADING IMPROVEMENTS	SHEET 6
A4	LATITUDE AND LONGITUDE TO THE NEAREST FIFTEEN (15) SECONDS:	SHEET 6
A5	LEGAL DESCRIPTION OF THE PROJECT SITE TO NEAREST QUARTER SECTION, TOWNSHIP, RANGE:	SHEET 6
A6	11X17 INCH PLAT SHOWING BUILDING LOT NUMBERS/BOUNDARIES AND ROAD LAYOUT/NAMES:	NOT APPL.
A7	BOUNDARIES OF THE ONE HUNDRED (100) YEAR FLOODPLAINS, FLOODWAY FRINGES, AND FLOODWAYS: THIS SITE LIES IN ZONE X PER THE FLOOD INSURANCE RATE MAP OF ELKHART COUNTY, INDIANA COMMUNITY PANEL NUMBER 18039C0154D WITH AN EFFECTIVE DATE OF AUGUST 2, 2011.	SHEET 6
A8	LAND USE OF ALL ADJACENT UPSTREAM AND DOWNSTREAM PROPERTIES:	SHEET 6
A9	IDENTIFICATION OF A U.S. EPA APPROVED OR ESTABLISHED TMDL: THIS SITE WILL DISCHARGE THROUGH OTHER WATERWAYS TO THE ST. JOSEPH RIVER WATERSHED TMDL, IN. LISTED IMPAIRMENTS - E. COLI	SHEET 6
A10	IDENTIFICATION OF ALL RECEIVING WATERS: ST. JOSEPH RIVER IS LOCATED NORTH OF THE SITE. LITTLE ELKHART RIVER IS LOCATED NORTH OF THE SITE.	SHEET 6
A11	IDENTIFICATION OF RECEIVING WATERS ON 303(D) LIST OF IMPAIRED WATERS: ST. JOSEPH RIVER IS 303(D) LISTED. LITTLE ELKHART RIVER IS 303(D) LISTED.	SHEET 6
A12	SOILS MAP INCLUDING SOIL DESCRIPTIONS AND LIMITATIONS:	SHEET 6
A13	LOCATION AND NAME OF ALL WETLANDS, LAKES AND WATER COURSES ON AND ADJACENT TO THE SITE: THERE ARE NO EXISTING WETLANDS LOCATED ON SITE.	SHEET 6
A14	NOTATION OF ANY STATE OR FEDERAL WATER QUALITY PERMITS: THERE ARE NO STATE OR FEDERAL WATER QUALITY PERMITS ASSOCIATED WITH THIS PROJECT	NOT APPL.
A15	IDENTIFICATION AND DELINEATION OF EXISTING COVER, INCLUDING NATURAL BUFFERS: EXISTING GROUND COVER IS GRASS AND WOODS. THERE ARE NO EXISTING NATURAL BUFFERS.	SHEET 2
A16	EXISTING SITE TOPOGRAPHY AT AN INTERVAL APPROPRIATE TO INDICATE DRAINAGE PATTERNS:	SHEET 2
A17	LOCATION(S) WHERE RUN-OFF ENTERS THE PROJECT SITE: THIS SITE RECEIVES RUN-OFF FROM THE SOUTH.	SHEET 6
A18	LOCATION(S) WHERE RUN-OFF DISCHARGE FROM THE PROJECT SITE PRIOR TO LAND DISTURBANCE: RUN-OFF FROM THIS SITE DRAINS TO THE WEST PRIOR TO LAND DISTURBANCE.	SHEET 6
A19	LOCATION OF ALL EXISTING STRUCTURES ON THE PROJECT SITE:	SHEET 2
A20	EXISTING PERMANENT RETENTION OR DETENTION FACILITIES, INCLUDING MANMADE WETLANDS:	SHEET 2
A21	IDENTIFICATION OF POTENTIAL DISCHARGES TO GROUND WATER: FUELING OF VEHICLES AND STORAGE OF CHEMICALS IS TO BE AVOIDED ON SITE. ABANDONED WELLS (IF DISCOVERED ON THE PROPERTY) MUST BE SEALED ACCORDING TO INDIANA WELL DRILLERS CODE. STORM WATER IN DRAINAGE BASIN WILL DISCHARGE TO GROUNDWATER.	SHEET 6
A22	SIZE OF THE PROJECT AREA INCLUDING UNDISTURBED AREAS EXPRESSED IN ACRES: THE AREA OF THIS PROJECT SITE IS 3.9 ACRES.	SHEET 6
A23	TOTAL EXPECTED LAND DISTURBANCE EXPRESSED IN ACRES:	SHEET 7
A24	PROPOSED FINAL TOPOGRAPHY AT AN INTERVAL APPROPRIATE TO INDICATE DRAINAGE PATTERNS:	SHEET 5
A25	LOCATIONS AND APPROXIMATE BOUNDARIES OF ALL DISTURBED AREAS:	SHEET 7
A26	LOCATIONS, SIZE AND DIMENSIONS OF PROPOSED STORM WATER SYSTEMS:	SHEET 4
A27	LOCATION(S) OF SPECIFIC POINT(S) WHERE RUN-OFF DISCHARGE WILL LEAVE THE PROJECT SITE: THE SITE DRAINAGE WILL BE RETAINED ON SITE.	NOT APPL.
A28	LOCATION OF ALL LOTS AND PROPOSED SITE IMPROVEMENTS:	SHEET 1
A29	LOCATION OF ALL ON-SITE AND OFF-SITE SOIL STOCKPILES AND/OR BORROW AREAS:	SHEET 7
A30	CONSTRUCTION SUPPORT ACTIVITIES EXPECTED AS PART OF THE PROJECT:	SHEET 7
A31	LOCATION OF AN IN-STREAM ACTIVITIES PLANNED FOR THE PROJECT:	NOT APPL.

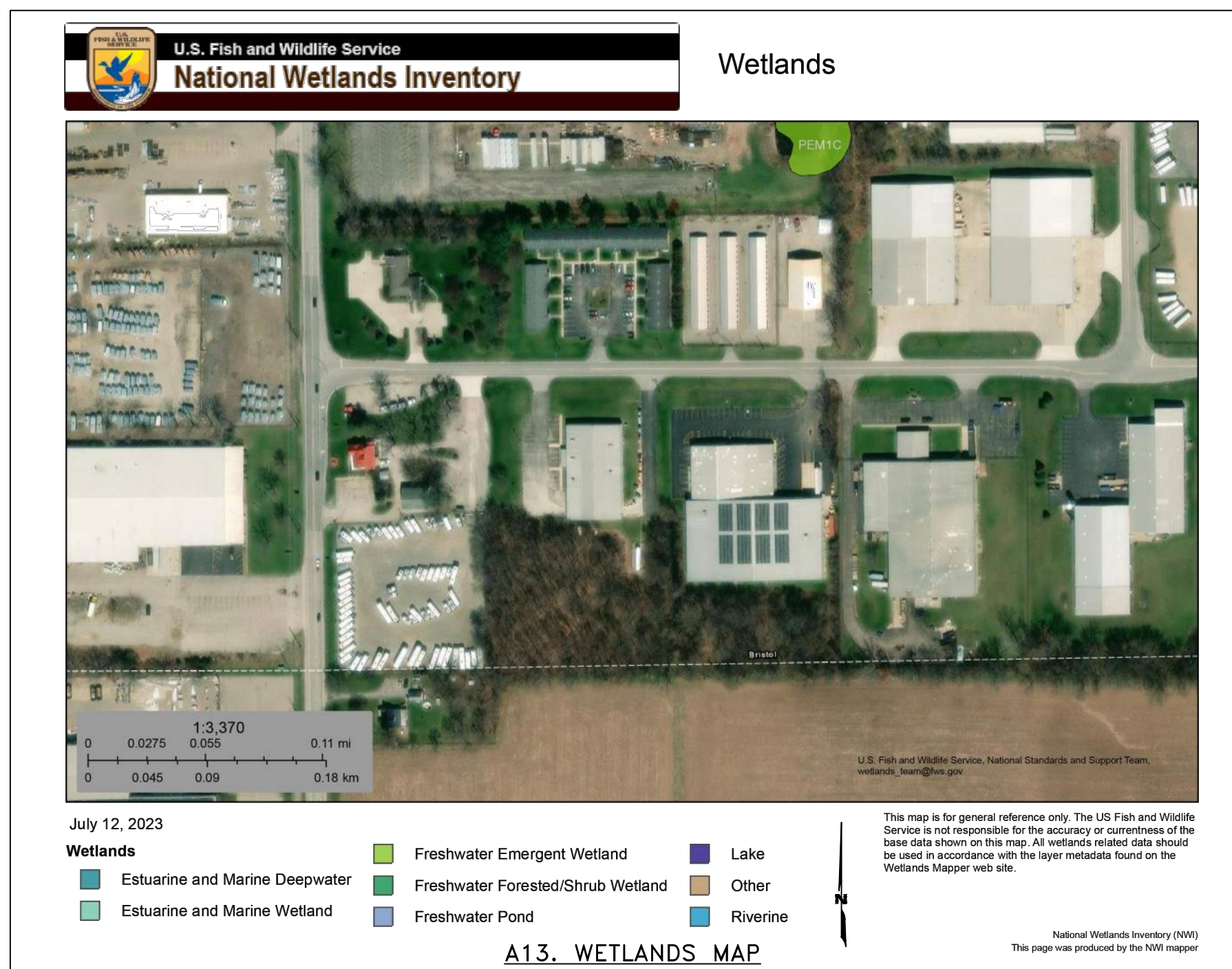
STORMWATER POLLUTION PREVENTION PLAN PART B - CONSTRUCTION COMPONENT SHEET 7

STORMWATER POLLUTION PREVENTION PLAN PART C - POST CONSTRUCTION COMPONENT

ITEM#	DESCRIPTION	LOCATION
C1	DESCRIPTION OF POLLUTANTS AND THEIR SOURCES ASSOCIATED WITH THE PROPOSED LAND USES	POST CONST. PLAN
C2	SEQUENCE DESCRIBING STORMWATER QUALITY MEASURE IMPLEMENTATION	POST CONST. PLAN
C3	DESCRIPTION OF PROPOSED POST CONSTRUCTION STORMWATER QUALITY MEASURES	POST CONST. PLAN
C4	LOCATION, DIMENSION, SPECIFICATIONS AND CONSTRUCTION DETAILS OF EACH STORMWATER	POST CONST. PLAN
C5	DESCRIPTION OF MAINTENANCE GUIDELINES FOR POST CONSTRUCTION STORMWATER QUALITY MEASURES	POST CONST. PLAN
C6	ENTITY RESPONSIBLE FOR OPERATION AND MAINTENANCE OF POST-CONSTRUCTION STORMWATER MEASURES	POST CONST. PLAN



LOCATION MAP
A2. VICINITY MAP A8. ADJACENT LANDUSE
NOT TO SCALE



A13. WETLANDS MAP



LATITUDE: N 41.7115'
LONGITUDE: W 85.8143'

HYDROLOGIC UNIT CODE: 04050001150020

Ufza—Urban land—Mishawaka complex, 0 to 1 percent slopes
Map Unit Setting
National map unit symbol: 5k6x
Elevation: 360 to 1,540 feet
Mean annual precipitation: 34 to 40 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 140 to 170 days
Farmland classification: Not prime farmland
Map Unit Composition
Urban land: 50 percent
Mishawaka and similar soils: 45 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Urban Land
Setting
Landform: Outwash plains
Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: Unranked
Description of Mishawaka
Setting
Landform: Outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy outwash
Typical profile
Ap - 0 to 12 inches: sandy loam
Bt1 - 12 to 18 inches: sandy loam
Bt2 - 18 to 25 inches: gravelly loamy sand
BC - 25 to 58 inches: sand
C - 58 to 80 inches: sand
Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)
Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F098XA014M - Dry Sandy Drift Plains
Other vegetative classification: Mixed/Transitional (Mixed Native Vegetation)
Hydric soil rating: No
Minor Components
Eleton
Percent of map unit: 5 percent
Landform: Outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R098XA016M - Prairie Loamy Drift Plains
Other vegetative classification: Grass/Prairie (Herbaceous Vegetation)
Hydric soil rating: No



A12. SOIL MAP

A12. SOIL DESCRIPTIONS

Soil Map Legend				
Map Unit Symbol	Map Unit Name	Limitations (Small Commercial Buildings)	Acres in AOI	Percent of AOI
Ufza	Urban land—Mishawaka complex, 0 to 1 percent slopes	Not limited	5.2	100.0%

A5. LEGAL DESCRIPTION

DOC. #2014-14911
A PART OF THE RECORDED PLAT OF BRISTOL INDUSTRIAL PARK (PLAT RECORD 15, PAGE 40), SAID PLAT BEING SITUATE IN THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 27 AND THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 26, ALL IN TOWNSHIP 38 NORTH, RANGE 6 EAST, WASHINGTON TOWNSHIP, ELKHART COUNTY, TOWN OF BRISTOL, STATE OF INDIANA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:
COMMENCING AT THE NORTHWEST CORNER OF SAID PLAT; THENCE SOUTH 00 DEGREES 05 MINUTES WEST ALONG THE CENTERLINE OF INDIANA STATE ROAD 15, A DISTANCE OF 320 FEET TO A POINT ON THE SOUTH LINE OF BLOOMINGDALE DRIVE AS SAID DRIVE IS KNOWN AND DESIGNATED IN THE SAID PLAT OF BRISTOL INDUSTRIAL PARK; THENCE SOUTH 89 DEGREES 22 MINUTES EAST ALONG THE SOUTH LINE OF SAID BLOOMINGDALE DRIVE, A DISTANCE OF 329.88 FEET; THENCE SOUTH 00 DEGREES 19 MINUTES WEST, A DISTANCE OF 518.40 FEET TO A POINT ON THE SOUTH LINE OF SAID BRISTOL INDUSTRIAL PARK; THENCE NORTH 89 DEGREES 22 MINUTES WEST ALONG THE SOUTH LINE OF SAID BRISTOL INDUSTRIAL PARK, A DISTANCE OF 327.75 FEET; THENCE NORTH 00 DEGREES 05 MINUTES EAST A DISTANCE OF 518.42 FEET TO THE PLACE OF BEGINNING OF THIS DESCRIPTION.

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DESIGN:DWG

NO.	REVISIONS	BY	DATE



2810 Dexter Drive
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DRAWING FILE: 1022072906-DESIGN.DWG
CERTIFICATION DATE: 11/20/2023
HORIZONTAL SCALE: NONE
VERTICAL SCALE: NONE
ENGINEER: Debra S. Hughes, P.E.
TECHNICIAN: AKM



STORM WATER POLLUTION PREVENTION PLAN - PART A
COMBINED TECHNOLOGIES, INC., 503 BLOOMINGDALE DRIVE, BRISTOL PT. BRISTOL INDUSTRIAL PARK, PT. SE 1/4, SEC 27, T38N, R6E WASHINGTON TWP., ELKHART CO., INDIANA
JOB NUMBER: 1022072906

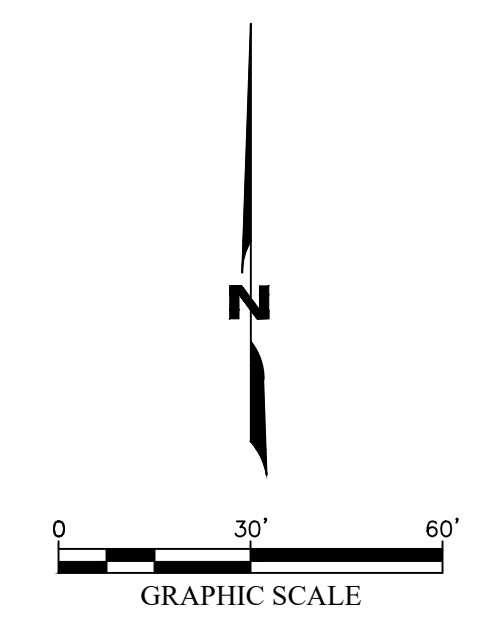
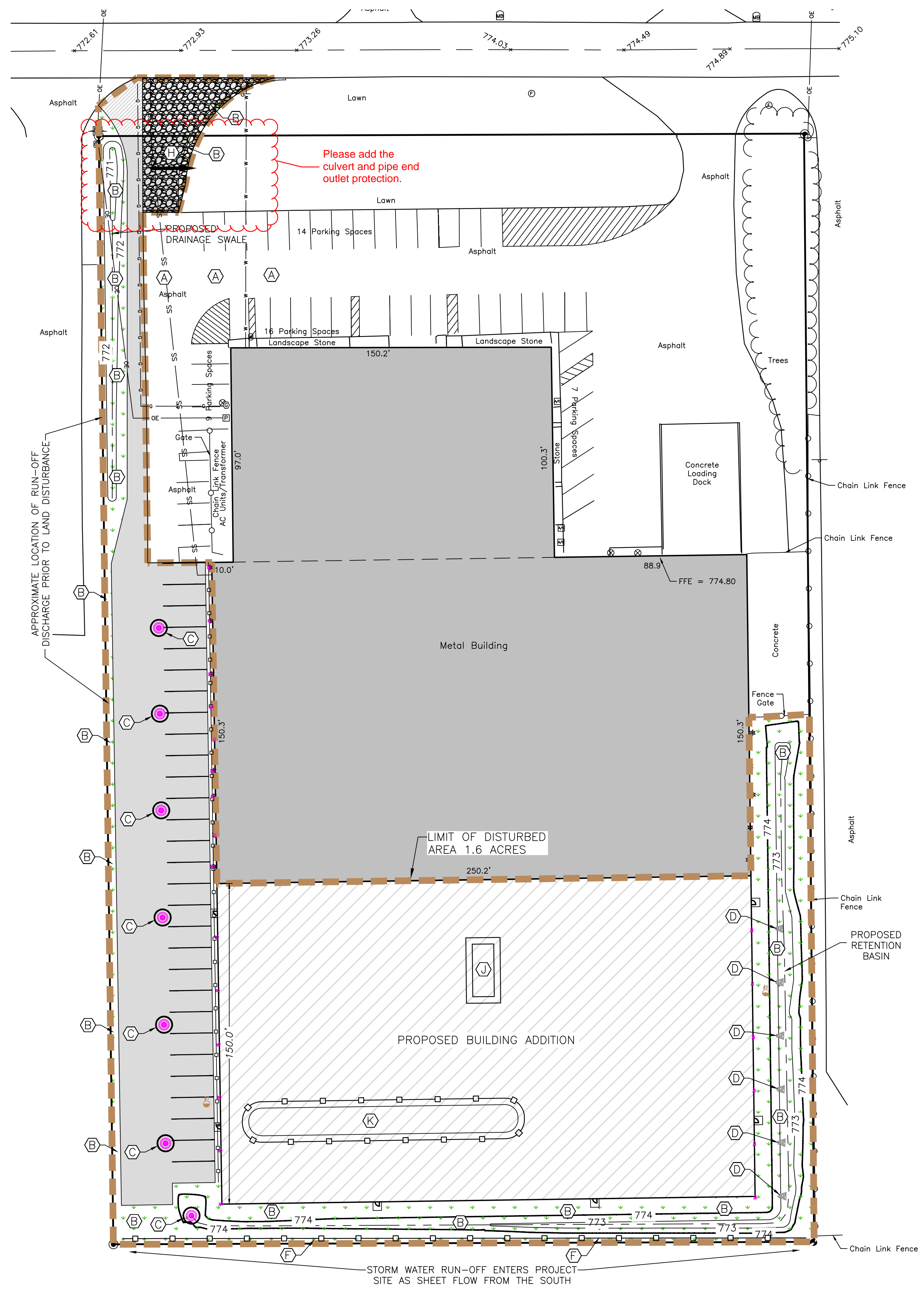
STORMWATER POLLUTION PREVENTION PLAN - PART B - CONSTRUCTION COMPONENT

- B1 POTENTIAL POLLUTANT SOURCES DURING CONSTRUCTION AND SPILL PREVENTION PLAN**
- SEE TEXT THIS SHEET
- B2 STABLE CONSTRUCTION ENTRANCE**
- EXISTING ASPHALT PAVEMENT TO SERVE AS CONSTRUCTION ENTRANCE. ANY SEDIMENT TO BE SWEEPED AND REMOVED DAILY.
 - SEE DETAILS ON SHEET 8 FOR INSTALLATION SPECIFICATIONS.
- B3 TEMPORARY AND PERMANENT SURFACE STABILIZATION SPECIFICATIONS**
- SEE PLAN AND LEGEND THIS SHEET.
 - SEE DETAILS ON SHEETS 9.
- B4 SEDIMENT CONTROL MEASURES FOR CONCENTRATED FLOW AREAS:**
- PIPE OUTLET SHALL BE PROTECTED WITH STONE RIPRAP AS SHOWN ON PLAN AND LEGEND THIS SHEET.
 - SEE DETAILS ON SHEET 10.
- B5 SEDIMENT CONTROL MEASURES FOR SHEET FLOW AREAS:**
- INLET PROTECTION AS SHOWN ON PLAN AND LEGEND THIS SHEET.
 - SEEDING AND MULCHING IN DISTURBED AREAS AS SHOWN ON PLAN AND LEGEND THIS SHEET.
 - SEE DETAILS ON SHEETS 9 FOR INSTALLATION SPECIFICATIONS.
- B6 RUNOFF CONTROL MEASURES:**
- SILT FENCE OR STRAW WATTLES TO BE INSTALLED AT THE LIMITS OF DISTURBED AREAS AS SHOWN ON PLAN AND LEGEND THIS SHEET.
 - SOIL STOCKPILE TO BE PROTECTED WITH SILT FENCE OR STRAW WATTLE AS SHOWN ON THE PLAN AND LEGEND ON THIS SHEET.
 - SEE DETAILS ON SHEET 8 FOR INSTALLATION SPECIFICATIONS.
- B7 STORM WATER OUTLET PROTECTION:**
- NOT APPLICABLE
- B8 GRADE STABILIZATION STRUCTURE LOCATIONS AND SPECIFICATIONS:**
- NOT APPLICABLE
- B9 DE-WATERING APPLICATIONS AND MANAGEMENT METHODS:**
- IF DE-WATERING IS NECESSARY ON SITE, FILTER BAGS MUST BE USED WHERE SHOWN ON PLAN AND LEGEND THIS SHEET.
 - SEE DETAIL ON SHEET 11.
- B10 MEASURES UTILIZED FOR WORK WITHIN WATER-BODIES:**
- NOT APPLICABLE
- B11 MONITORING AND MAINTENANCE GUIDELINES FOR EACH PROPOSED STORM WATER QUALITY MEASURE:**
- CONSTRUCTION CONTRACTOR TO PROVIDE NECESSARY INSPECTION REPORTS.
 - SEE DETAILS ON SHEETS 8-11.
 - NOTE THAT STORM WATER QUALITY MEASURES MUST BE INSPECTED WEEKLY AND AFTER EACH 1/2 INCH OF RAINFALL OCCURRING WITHIN A 24 HOUR PERIOD.
- B12 SEQUENCE OF STORM WATER QUALITY MEASURES RELATIVE TO LAND DISTURBING ACTIVITIES:**
- SEE TEXT THIS SHEET
- B13 EROSION & SEDIMENT CONTROL SPECIFICATIONS FOR INDIVIDUAL BUILDING LOTS:**
- NOT APPLICABLE
- B14 MATERIAL HANDLING AND SPILL PREVENTION AND RESPONSE PLAN:**
- SEE TEXT THIS SHEET
- B15 MATERIAL HANDLING AND STORAGE PROCEDURES ASSOCIATED WITH CONSTRUCTION:**
- SEE TEXT THIS SHEET

B2, B3, B4, B5, B6, B7, B8, B10, B11, B12:
STORM WATER POLLUTION PREVENTION PLAN LEGEND

- B2 (A) EXISTING PAVEMENT TO SERVE AS CONSTRUCTION ENTRANCE. ANY SEDIMENT TO BE SWEEPED AND REMOVED DAILY.
- B3 (B) SEEDING FOR TEMPORARY SURFACE STABILIZATION AS NEEDED. EROSION CONTROL FABRIC TO BE INSTALLED OVER SEED.
- B3 (C) SEEDING FOR PERMANENT SURFACE STABILIZATION AS NEEDED. EROSION CONTROL FABRIC TO BE INSTALLED OVER SEED.
- B4 (D) CONCENTRATED FLOW PROTECTION.
- B5 (E) PROTECTION FOR SHEET FLOW OVER UNPAVED SURFACES.
- B5 (F) INLET PROTECTION.
- B6 (G) BOUNDARY PROTECTION SILT FENCE, STRAW WATTLES, SILTWORM OR EQUAL.
- B7 (H) OUTLET PROTECTION. DE-WATERING OUTLET LOCATION WITH FILTER BAG (IF NEEDED). ACTUAL LOCATION MAY VARY AS DETERMINED BY SITE CONTRACTOR. PRIOR APPROVAL REQUIRED BY TOWN FOR ANY DEWATERING ACTIVITY.
- B9 (J) CONCRETE WASHOUT PIT: ACTUAL LOCATION MAY VARY AS DETERMINED BY SITE CONTRACTOR. LOCATION TO BE A MIN. OF 50 FT. FROM ANY STORMWATER CONVEYANCE ELEMENT.
- A29 (K) SOIL STOCKPILE AREA: ACTUAL LOCATION MAY VARY AS DETERMINED BY SITE CONTRACTOR.

— BOUNDARY OF DISTURBED AREAS.



SYMBOL	DESCRIPTION
(Square with X)	AIR CONDITIONING UNIT
(Circle with W)	WATER VALVE
(Circle with E)	ELECTRIC PULL BOX
(Circle with G)	GAS METER
(Circle with W)	WELL LOCATION
(Circle with S)	SIGN
(Circle with F)	FIBER OPTIC VAULT
(Circle with P)	POLE
(Square with T)	TELEPHONE PEDESTAL
(Square with M)	MAILBOX
(Square with E)	ELECTRIC VAULT
(Circle with W)	WATER MANHOLE
(Circle with N)	800 NAIL SET
(Circle with R)	REBAR SET
(Circle with F)	REBAR FOUND
(Circle with I)	IRON PIPE FOUND
(Circle with B)	BENCHMARK SET
(Line with circles)	CHAIN LINK FENCE
(Line with humps)	TREE LINE
(Dashed line)	TOP OF BANK
(Dotted line)	TOE OF SLOPE
(Line with dashes)	CENTERLINE ASPHALT
(Line with circles)	OVERHEAD ELECTRIC

B1: POTENTIAL POLLUTANT SOURCES DURING CONSTRUCTION / SPILL PREVENTION PLAN:

- DIESEL FUEL / GASOLINE:** FUEL POINT SHOULD BE ESTABLISHED AT THE BEGINNING OF SITE WORK. ALL EQUIPMENT SHOULD BE FUELED AT THE PRE-ESTABLISHED POINT. ANY SOIL CONTAMINATED WITH FUEL SHOULD BE REMOVED AND PROPERLY DISPOSED.
- OIL / LUBRICANTS:** ALL MACHINERY SHOULD BE INSPECTED PERIODICALLY FOR ANY SEVERE LEAKAGE. SEVERE LEAKS SHOULD BE FIXED BEFORE SAID EQUIPMENT IS RETURNED TO SERVICE. ANY OIL OR LUBRICANTS SHOULD BE STORED AT THE FUELING POINT.
- TRASH:** ALL TRASH SHOULD BE REMOVED FROM THE SITE DAILY.
- CONCRETE WASHOUT:** CONCRETE WASHOUT AREA MUST BE LOCATED AT LEAST 50 FEET AWAY FROM ANY WATERWAY OR STORMWATER CONVEYANCE SYSTEM. AN EXCAVATED AREA LINED WITH PLASTIC SHOULD BE PROVIDED, AND CONCRETE SHOULD BE DISPOSED OF WHEN SOLIDIFIED. WASHOUT AREA IS TO BE CLEARLY MARKED DURING CONSTRUCTION. CONCRETE WASHOUT AREA SHOULD NOT BE CONSTRUCTED UNTIL THE START OF CONCRETE ACTIVITY ON SITE. WASHOUT LOCATION TO BE DESIGNATED BY CONSTRUCTION CONTRACTOR. CONCRETE WASHOUT AREA SHALL BE EMPTIED OR REMOVED AND REPLACED WHEN 3/4 FULL.
- SEDIMENT:** INSPECTION FOR SEDIMENT SHOULD BE PERFORMED WEEKLY AND AFTER A 1/2 INCH OR MORE RAINFALL. SEDIMENT SHALL BE PROPERLY CONTAINED.
- PORTABLE TOILETS:** A PORTABLE TOILET MAY BE ON SITE FOR THIS PROJECT. IF PRESENT, PORTABLE TOILET SHALL BE MAINTAINED WEEKLY DURING TIME ON SITE. PORTABLE TOILETS SHALL BE SECURED TO THE GROUND AND AT LEAST 50 FT. FROM ANY WATER BODY OR STORM WATER CONVEYANCE INLET OR PIPE.
- CHEMICALS OR DANGEROUS LIQUIDS:** CHEMICALS OR DANGEROUS LIQUIDS USED ON SITE SHOULD BE STORED IN A LEAKPROOF CONTAINER. ANY SPILLS SHALL BE PROPERLY CONTAINED AND CLEANED UP.

B12: SEQUENCING OF STORM WATER QUALITY MEASURES RELATIVE TO LAND DISTURBING ACTIVITIES

- POST THE NOTICE OF INTENT AND LOCATION OF THE SWPPP IN A PUBLICLY VISIBLE LOCATION.
- PRE-CONSTRUCTION MEETING AND NOTIFICATION: A PRE-CONSTRUCTION MEETING INCLUDING THE ELKHART COUNTY MS4 IS REQUESTED TO BE HELD PRIOR TO ANY LAND DISTURBANCE. THE ELKHART COUNTY MS4 MUST BE NOTIFIED 48 HOURS BEFORE BEGINNING ANY LAND DISTURBANCE ACTIVITY, PHONE NUMBER (574) 523-2030.
- INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES. NOTE THAT CONCRETE WASHOUT PIT SHOULD NOT BE INSTALLED UNTIL SHORTLY BEFORE CONCRETE ACTIVITY STARTS.
- SITE CLEARING
- EARTHMOVING TO CONSTRUCT BUILDING PAD
- FOUNDATION CONSTRUCTION
- FLOOR SLAB CONSTRUCTION
- BUILDING STEEL INSTALLATION FOR STRUCTURE AND ROOF
- INSTALL BUILDING ROOF AND WALLS
- EARTHMOVING FOR RETENTION BASIN, DRAINAGE STRUCTURES, GRAVEL STORMWATER STORAGE AREA AND PAVEMENT.
- PAVEMENT CONSTRUCTION
- TEMPORARY SEEDING OF ANY DISTURBED AREA THAT IS SCHEDULED TO BE LEFT INACTIVE FOR 7 DAYS OR MORE (THROUGHOUT THE ENTIRE CONSTRUCTION PERIOD). EROSION CONTROL FABRIC TO BE PLACED OVER SEED.
- FINAL GRADING AND PERMANENT SEEDING. EROSION CONTROL FABRIC TO BE PLACED OVER SEED.
- ALL EROSION AND SEDIMENT CONTROL DEVICES ARE TO BE CHECKED, MAINTAINED, AND REPLACED WHEN NEEDED THROUGHOUT THE ENTIRE CONSTRUCTION PROCESS.
- ONCE ALL DISTURBED AREAS ARE STABILIZED, ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES WILL BE REMOVED.
- A FINAL INSPECTION WILL TAKE PLACE TO ASSURE THAT ALL REQUIREMENTS OF THE SWPPP, CONSTRUCTION PLANS AND SUPPORTING DOCUMENTS HAVE BEEN FULFILLED. THEN A NOTICE OF TERMINATION (NOT) MUST BE SUBMITTED TO AND APPROVED BY THE ELKHART COUNTY MS4, ELKHART, IN. OFFICE. THE NOT FORM CAN BE FOUND AT: http://www.in.gov/idem/5157.htm#owq_stormwater. THE FORM IS "NOTICE OF TERMINATION (NOT) STORM WATER RUNOFF ASSOCIATED WITH CONSTRUCTION ACTIVITY - 51514".

B14: MATERIAL HANDLING AND SPILL PREVENTION AND RESPONSE PLAN:

- MATERIALS SHOULD BE STORED IN A MANNER THAT PREVENTS OR MINIMIZES THE CHANCE THAT A SPILL WILL REACH SOILS, GROUNDWATER OR SURFACE WATER.
- MATERIALS STORED INSIDE SHALL BE PLACED IN A MANNER TO PREVENT A SPILL FROM MIGRATING OUTSIDE THE CONFINES OF ANY BUILDING OR INTO ANY DRAIN LEAVING THE BUILDING AND DISCHARGING TO SOILS, GROUNDWATER OR SURFACE WATER.
- IF A SPILL DOES OCCUR, THEN THE SPILL MUST BE CONTAINED IMMEDIATELY UTILIZING APPROPRIATE RESPONSE TECHNIQUES INCLUDING DIKING AND ABSORBENTS. CLEAN UP OF THE SPILL SHOULD OCCUR AS SOON AS POSSIBLE ONCE THE SPILL IS STABILIZED AND CONTAINED. SPILLS SHALL BE CLEANED UP USING ACCEPTABLE METHODS SUCH AS ABSORBENTS OR REMOVAL OF CONTAMINATED SOILS. IN ALL CASES CLEANUP STANDARDS MUST ADHERE TO LOCAL, STATE AND FEDERAL REQUIREMENTS.
- FAILURE TO CLEAN UP ANY SPILL IS A VIOLATION OF THE INDIANA STATE SPILL RULE (327 IAC 2-6.1), WHICH IS ENFORCED BY THE INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT (IDEM). CERTAIN SPILLS MUST BE REPORTED TO THE LOCAL RESPONSE AGENCY, LOCAL EMERGENCY PLANNING COMMITTEE, ELKHART COUNTY HEALTH DEPT. (ECHO) AND/OR IDEM. INITIAL CALLS SHOULD BE MADE TO THE 911 SYSTEM IF THE SPILL EXCEEDS REPORTABLE QUANTITIES OR IS A THREAT TO PUBLIC SAFETY. THE 911 SYSTEM WILL TYPICALLY NOTIFY THE FIRE DEPARTMENT AND THE ECHD. THE ECHD AND/OR IDEM (1-888-233-7745) CAN TYPICALLY ASSIST WITH INFORMATION ON CLEAN UP OPERATIONS OR CLEAN UP CONTRACTORS.
- ALL SPILLS THAT OCCUR NEAR ANY INLET TO THE STORMWATER CONVEYANCE SYSTEM MUST HAVE "CURBING" IMPLEMENTED IMMEDIATELY. "CURBING" IS THE USE OF A BARRIER (ABSORBENT MATERIAL) WHICH PREVENTS THE SPILL FROM MAKING CONTACT WITH THE STORMWATER CONVEYANCE SYSTEM OR STORMWATER RUNOFF. SPILL PREVENTION STARTS WITH PRE-PLANNING. A SPILL PREVENTION AND CONTROL PLAN SHOULD BE DEVELOPED AND UTILIZED PRIOR TO ANY EMERGENCY. THIS PLAN SHOULD BE SHARED WITH ALL EMPLOYEES AND REVIEWED ANNUALLY.

B15: CONSTRUCTION MATERIAL HANDLING AND STORAGE PROCEDURES:

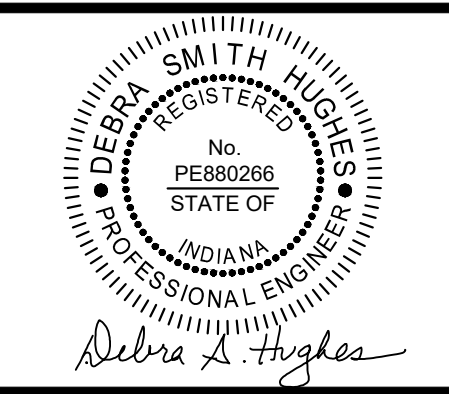
- APPROPRIATE MEASURES MUST BE IMPLEMENTED TO MANAGE WASTES OR UNUSED MATERIALS INCLUDING, BUT NOT LIMITED TO GARBAGE, DEBRIS, CLEANING WASTES, WASTEWATER, CONCRETE, OR CEMENTITIOUS WASHOUT WATER, MORTAR/MASONRY PRODUCTS, SOIL STABILIZERS, LIME STABILIZATION MATERIALS, AND OTHER SUBSTANCES. WASTES AND UNUSED MATERIALS MUST BE MANAGED AND DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE STATUTES AND REGULATIONS. PROPER STORAGE AND HANDLING OF MATERIALS SUCH AS FUELS OR HAZARDOUS WASTES, AND SPILL PREVENTION AND CLEAN-UP MEASURES MUST BE IMPLEMENTED TO MINIMIZE THE POTENTIAL FOR POLLUTANTS TO CONTAMINATE SURFACE OR GROUND WATER OR DEGRADE SOIL QUALITY.
- CONCRETE OR CEMENTITIOUS WASHOUT AREAS, WHERE WASHOUT IS PERMISSIBLE, MUST BE IDENTIFIED FOR THE SITE AND LOCATIONS CLEARLY POSTED. WASHOUT WATER MUST BE DIRECTED INTO LEAK-PROOF CONTAINERS OR LEAK-PROOF CONTAINMENT AREAS WHICH ARE LOCATED AND DESIGNATED TO DIVERT STORMWATER RUN-OFF AWAY FROM THE MEASURE AND SIZED TO PREVENT THE DISCHARGE AND/OR OVERFLOW OF THE WASH WATER.

NO.	REVISIONS	BY	DATE



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CERTIFICATION DATE: 11/20/2023
HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: NONE
ENGINEER: Debra S. Hughes, P.E.
TECHNICIAN: GJS / AKM

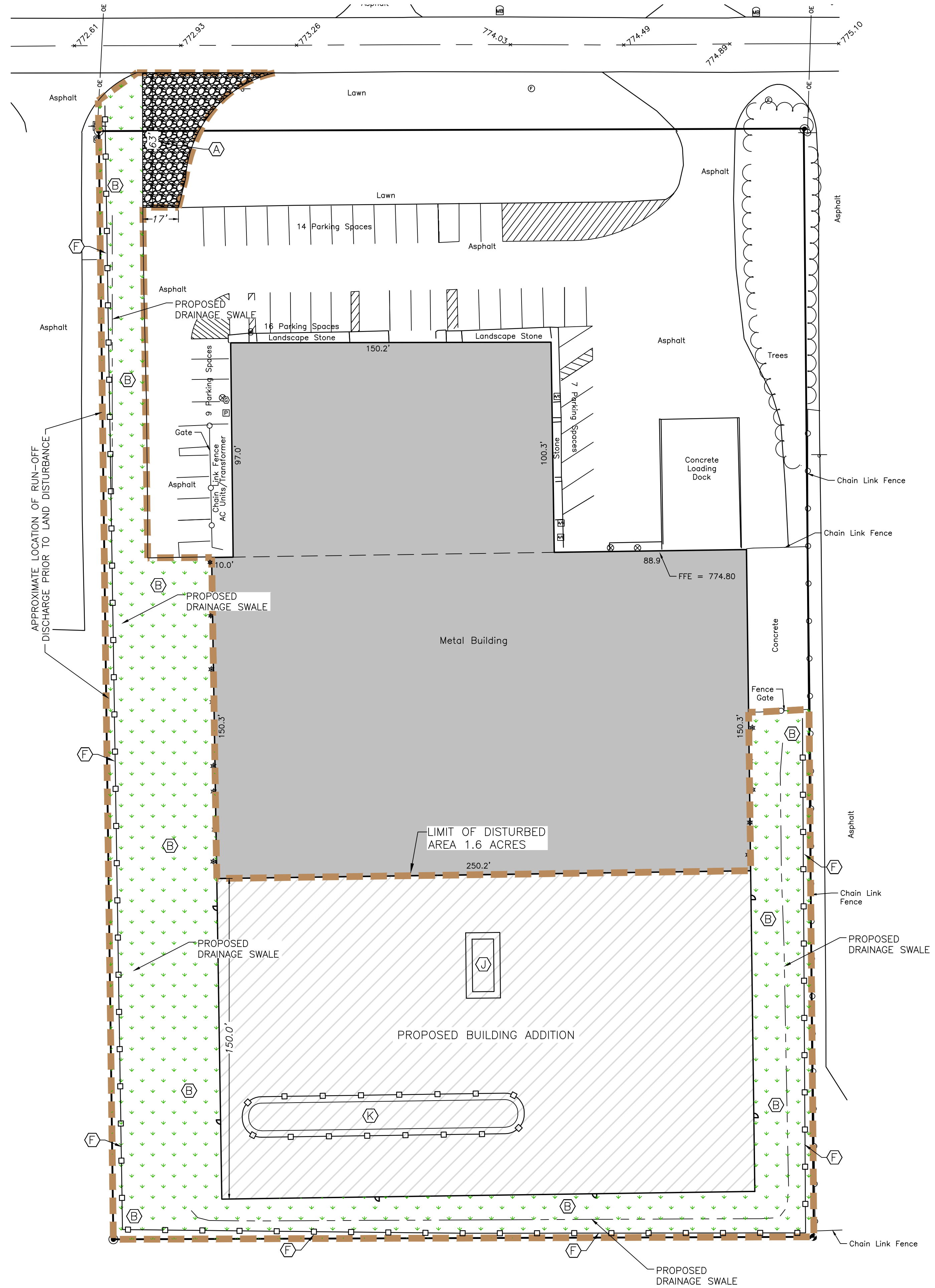


STORM WATER POLLUTION PREVENTION PLAN - PART B

COMBINED TECHNOLOGIES, INC., 503 BLOOMINGDALE DRIVE, BRISTOL
PT. BRISTOL INDUSTRIAL PARK,
PT. SE 1/4, SEC 27, T38N, R6E
WASHINGTON TWP., ELKHART CO., INDIANA

JOB NUMBER: 1022072906

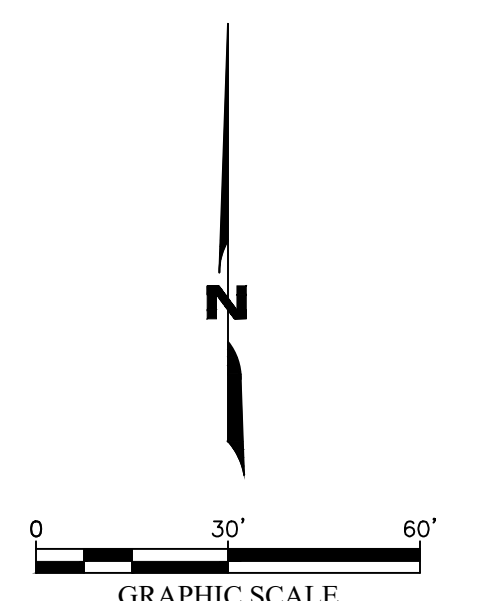
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- STORMWATER POLLUTION PREVENTION PLAN NOTES**
1. THE CONTRACTOR IS REQUIRED TO CONDUCT A PRE-CONSTRUCTION MEETING WITH THE TOWN REPRESENTATIVE AND THE SWCD INSPECTOR PRIOR TO START OF ANY CONSTRUCTION ACTIVITY.
 2. THIS PLAN IS INTENDED FOR USE DURING THE BUILDING CONSTRUCTION PHASE.
 3. THE GENERAL CONTRACTOR SHALL ADVISE THE SOIL AND WATER DISTRICT INSPECTOR OF ANY CHANGES NEEDED TO THIS PLAN.
 4. IT IS EXPECTED THAT THERE WILL BE CHANGES NEEDED. THIS CHANGES MUST BE COORDINATED WITH THE SWCD INSPECTOR.
 5. CHANGES MAY BE NECESSARY FOR THE CONSTRUCTION ENTRANCE, CONCRETE WASHOUT AND STOCKPILE LOCATIONS.
 6. MAINTENANCE OF THE CONSTRUCTION ENTRANCE WILL BE NECESSARY TO AVOID SEDIMENT TRACKING ONTO THE PUBLIC ROAD.
 7. IT IS EXPECTED THAT MATERIALS WILL BE REMOVED FROM THIS PROPERTY. THE CONTRACTOR MUST OBTAIN APPROVAL FOR THE DISPOSAL LOCATION FOR REMOVED MATERIALS. IF THE DISPOSAL LOCATION HAS A DISTURBED AREA OF MORE THAN 1 ACRE, A SWPPP WILL BE REQUIRED.
 8. IT IS EXPECTED THAT FILL MATERIALS WILL BE BROUGHT TO THIS PROPERTY. THE CONTRACTOR MUST OBTAIN APPROVAL FOR THE LOCATION OF THE FILL MATERIALS. IF THE SOURCE LOCATION FOR FILL MATERIAL HAS A DISTURBED AREA OF MORE THAN 1 ACRE, A SWPPP WILL BE REQUIRED.

**B2, B3, B4, B5, B6, B7, B8, B10, B11, B12:
 STORM WATER POLLUTION PREVENTION PLAN LEGEND**

B2	(A)	PROPOSED CONSTRUCTION ENTRANCE-ANY SEDIMENT TO BE SWEEPED AND REMOVED DAILY FROM PUBLIC ROAD.
B3	(B)	SEEDING FOR TEMPORARY SURFACE STABILIZATION AS NEEDED. EROSION CONTROL FABRIC TO BE INSTALLED OVER SEED.
B3	(B)	SEEDING FOR PERMANENT SURFACE STABILIZATION AS NEEDED. EROSION CONTROL FABRIC TO BE INSTALLED OVER SEED.
B5	(B)	PROTECTION FOR SHEET FLOW OVER UNPAVED SURFACES.
B6	(F)	BOUNDARY PROTECTION SILT FENCE, STRAW WATTLES, SILTWORM OR EQUAL.
B9	(J)	CONCRETE WASHOUT PIT: ACTUAL LOCATION MAY VARY AS DETERMINED BY SITE CONTRACTOR. LOCATION TO BE A MIN. OF 50 FT. FROM ANY STORMWATER CONVEYANCE ELEMENT.
A29	(K)	SOIL STOCKPILE AREA: ACTUAL LOCATION MAY VARY AS DETERMINED BY SITE CONTRACTOR.
— — — — — BOUNDARY OF DISTURBED AREAS.		



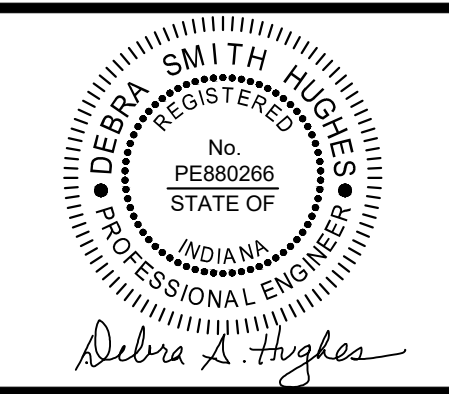
SYMBOL	DESCRIPTION
(A)	AIR CONDITIONING UNIT
(B)	WATER VALVE
(E)	ELECTRIC PULL BOX
(G)	GAS METER
(W)	WELL LOCATION
(S)	SIGN
(F)	FIBER OPTIC VAULT
(P)	POLE
(T)	TELEPHONE PEDESTAL
(M)	MAILBOX
(E)	ELECTRIC VAULT
(W)	WATER MANHOLE
(N)	80D NAIL SET
(R)	REBAR SET
(R)	REBAR FOUND
(I)	IRON PIPE FOUND
(B)	BENCHMARK SET
(— — — — —)	CHAIN LINK FENCE
(— — — — —)	TREE LINE
(— — — — —)	TOP OF BANK
(- - - - -)	TOE OF SLOPE
(— — — — —)	CENTERLINE ASPHALT
(— — — — —)	OVERHEAD ELECTRIC

NO.	REVISIONS	BY	DATE



2810 Dexter Drive
 Elkhart, IN 46514
 Phone: 574-266-1010
 Email: info@sam.biz

DRAWING FILE: 1022072906-DESIGN.DWG
 CERTIFICATION DATE: 11/20/2023
 HORIZONTAL SCALE: 1"=30'
 VERTICAL SCALE: NONE
 ENGINEER: Debra S. Hughes, P.E.
 TECHNICIAN: GJS / AKM



**STORM WATER POLLUTION PREVENTION PLAN - PART B
 BUILDING CONSTRUCTION PHASE**
 COMBINED TECHNOLOGIES, INC., 503 BLOOMINGDALE DRIVE, BRISTOL
 PT. BRISTOL INDUSTRIAL PARK,
 PT. SE 1/4, SEC 27, T38N, R6E
 WASHINGTON TWP., ELKHART CO., INDIANA
 JOB NUMBER: 1022072906

SURFACE STABILIZATION

Temporary Seeding

Purpose

- To provide vegetative cover where permanent seeding is not desirable or practical.
- To reduce erosion and sedimentation damage by stabilizing disturbed areas.
- To reduce problems associated with mud or dust from unvegetated soil surfaces during construction.
- To reduce sediment-laden storm water runoff from being transported to downstream areas.
- To improve visual aesthetics of construction areas.

Specifications

Seedbed Preparation

Grade and apply soil amendments.

Seeding Frequency

Seed rough graded areas daily while soil is still loose and moist.

Density of Vegetative Cover

Eighty percent or greater over the soil surface.

Materials

- Soil Amendments - Select materials and rates as determined by a soil test (contact your county soil and water conservation district or cooperative extension office for assistance and soil information, including available soil testing services) or 400 to 600 pounds of 12-12-12 analysis fertilizer, or equivalent. Consider the use of reduced phosphorus application where soil tests indicate adequate phosphorous levels in the soil profile.
- Seed - Select appropriate plant species seed or seed mixtures on the basis of quick germination, growth, and time of year to be seeded (see Table 1).
- Mulch -
 - Straw, hay, wood fiber, etc. (to protect seedbed, retain moisture, and encourage plant growth).
 - Anchored to prevent removal by wind or water or covered with manufactured erosion control blankets.

Table 1. Temporary Seeding Specifications

Seed Species ¹	Rate per Acre	Planting Depth	Optimum Dates ²
Wheat or Rye	150 lbs.	1 to 1 1/2 inches	Sept. 15 - Oct. 30
Spring Oats	100 lbs.	1 inch	March 1 - April 15
Annual Ryegrass	40 lbs.	1/4 inch	March 1 - May 1 Aug. 1 - Sept. 1
German Millet	40 lbs.	1 to 2 inches	May 1 - June 1
Sudangrass	35 lbs.	1 to 2 inches	May 1 - July 30
Buckwheat	60 lbs.	1 to 2 inches	April 15 - June 1
Corn (broadcast)	300 lbs.	1 to 2 inches	May 11 - Aug. 10
Sorghum	35 lbs.	1 to 2 inches	May 1 - July 15

¹ Perennial species may be used as a temporary cover, especially if the area to be seeded will remain idle for more than one year (see **Permanent Seeding** on page 35).

² Seeding done outside the optimum seeding dates increases the chances of seeding failure. Dates may be extended or shortened based on the location of the project site within the state.

Notes:
Mulch alone is an acceptable temporary cover and may be used in lieu of temporary seeding, provided that it is appropriately anchored.

A high potential for fertilizer, seed, and mulch to wash exists on steep banks, cuts, and in channels and areas of concentrated flow.

Application

Seedbed Preparation

- Test soil to determine pH and nutrient levels.
- Apply soil amendments as recommended by the soil test. If testing is not done, apply 400 to 600 pounds per acre of 12-12-12 analysis fertilizer, or equivalent.
- Work the soil amendments into the upper two to four inches of the soil with a disk or rake operated across the slope.

Seeding

- Select a seed species or an appropriate seed mixture and application rate from Table 1.
- Apply seed uniformly with a drill or cultipacker seeder or by broadcasting. Plant or cover seed to the depth shown in Table 1.
 - Notes:
 - If drilling or broadcasting the seed, ensure good seed-to-soil contact by firming the seedbed with a roller or cultipacker after completing seeding operations.
 - Daily seeding when the soil is moist is usually most effective.
 - If seeding is done with a hydroseeder, fertilizer and mulch can be applied with the seed in a slurry mixture.
- Apply mulch (see **Mulching** on page 55 or **Compost Mulching** on page 59) and anchor it in place.

Maintenance

- Inspect within 24 hours of each rain event and at least once every seven calendar days.
- Check for erosion or movement of mulch and repair immediately.
- Monitor for erosion damage and adequate cover (80 percent density); reseed, fertilize, and apply mulch where necessary.
- If nitrogen deficiency is apparent, top-dress fall seeded wheat or rye seeding with 50 pounds per acre of nitrogen in February or March.

SURFACE STABILIZATION

Dormant Seeding & Frost Seeding

Purpose

- To provide early germination and soil stabilization in the spring.
- To reduce sediment-laden storm water runoff from being transported to downstream areas.
- To improve the visual aesthetics of the construction area.
- To repair or enhance previous seeding.

Specifications

Seedbed Preparation

Grade and apply soil amendments as recommended by a soil test (incorporate soil amendments into soil prior to soil freezing).

Density of Vegetative Cover

Eighty percent or greater over the soil surface.

Materials

- Soil Amendments - Select materials and rates as determined by a soil test (contact your county soil and water conservation district or cooperative extension office for assistance and soil information, including available soil testing services) or 200 to 300 pounds of 12-12-12 analysis fertilizer, or equivalent. Consider the use of reduced phosphorus application where soil tests indicate adequate phosphorous levels in the soil profile.
- Seed - Select an appropriate plant species seed or seed mixture on the basis of soil type, soil pH, region of the state, time of year, and intended land use of the area to be seeded (see Table 1 or Table 2).
- Mulch -
 - Straw, hay, wood fiber, compost, etc. (to protect seedbed, retain moisture, and encourage plant growth).
 - Anchored to prevent removal by wind or water or covered with premanufactured erosion control blankets.

Application

(see Tables 1 and 2)

Site Preparation

- Grade the site to achieve positive drainage.
- Add topsoil (see **Topsoil Salvage and Utilization** on page 25) to achieve needed depth for establishment of vegetation.

Dormant Seeding

Site preparation, seedbed preparation and mulching can be done months ahead of actual seeding or if the existing ground cover is adequate, seeding can be done directly into it.

- Test soil to determine pH and nutrient levels.

- Broadcast soil amendments as recommended by a soil test and work into the upper two to four inches of soil. If testing was not done, apply 200 to 300 pounds per acre of 12-12-12 analysis fertilizer, or equivalent.

- Apply and anchor mulch (see **Mulching** on page 55 and **Compost Mulching** on page 59) immediately after completion of grading and addition of soil amendments.

- Select an appropriate seed species or mixture from Table 1 for temporary seeding or Table 2 for permanent seeding. Broadcast the seed on top of the mulch and/or into existing ground cover at the rate shown. (Seed areas when soil temperatures are below 50° F but the soil is not frozen.)

Frost Seeding

Seed is broadcast over the prepared seedbed and incorporated into the soil by natural freeze-thaw action.

- Test soil to determine pH and nutrient levels.
- Broadcast soil amendments as recommended by a soil test and work into the upper two to four inches of soil before it freezes. If testing was not done, apply 200 to 300 pounds per acre of 12-12-12 analysis fertilizer, or equivalent.
- Select an appropriate seed species or mixture from Table 1 for temporary seeding or Table 2 for permanent seeding. Broadcast the seed on the seedbed or into the existing ground cover at the rate shown. (Seed areas when the soil is frozen. Do not work the seed into the soil.)

Maintenance

- Inspect at least once every seven calendar days.
- Check for erosion or movement of mulch.
- Check for inadequate cover (less than 80 percent density over the soil surface); reseed and mulch in mid to late April if necessary. For best results, reseed within the recommended dates shown in Temporary Seeding on page 31 and Permanent Seeding on page 35.
- Apply 200 to 300 pounds per acre of 12-12-12 analysis fertilizer, or equivalent, between April 15 and May 10 or during periods of vigorous growth.
- Fertilize turf areas annually. Apply fertilizer in a split application. For cool-season grasses, apply one-half of the fertilizer in late spring and one-half in early fall. For warm-season grasses, apply one-third in early spring, one-third in late spring, and the remaining one-third in middle summer.

Table 1. Temporary Dormant or Frost Seeding Recommendations

Seed Species	Rate per Acre
Wheat or rye	150 lbs.
Spring oats	150 lbs.
Annual ryegrass	60 lbs.

Table 2 provides several seeding options. Additional seed mixtures are available commercially. When selecting a mixture, consider site conditions, including soil properties (e.g., soil pH and drainage), slope aspect, and the tolerance of each species to shade and drought.

Table 2. Permanent Dormant or Frost Seeding Recommendations

Open Low-Maintenance Areas (remaining idle more than six months)

Seed Mixtures	Rate per Acre Pure Live Seed	Optimum Soil pH
1. Perennial ryegrass - white clover ¹	75 lbs. 3 lbs.	5.6 to 7.0
2. Kentucky bluegrass - smooth bromegrass - switchgrass - timothy - perennial ryegrass - white clover ¹	30 lbs. 15 lbs. 5 lbs. 6 lbs. 15 lbs. 3 lbs.	5.6 to 7.5
3. Perennial ryegrass - tall fescue ²	45 lbs. 45 lbs.	5.6 to 7.0
4. Tall fescue ² - white clover ¹	75 lbs. 3 lbs.	5.5 to 7.5

Steep Banks and Cuts, Low-Maintenance Areas (not mowed)

Seed Mixtures	Rate per Acre Pure Live Seed	Optimum Soil pH
1. Smooth bromegrass - red clover ¹	50 lbs. 30 lbs.	5.5 to 7.5
2. Tall fescue ² - white clover ¹	75 lbs. 3 lbs.	5.5 to 7.5
3. Tall fescue ² - red clover ¹	75 lbs. 30 lbs.	5.5 to 7.5
4. Orchardgrass - red clover ¹ - white clover ¹	45 lbs. 30 lbs. 3 lbs.	5.6 to 7.0
5. Crownvetch ¹ - tall fescue ²	18 lbs. 45 lbs.	5.6 to 7.0

Lawns and High-Maintenance Areas

Seed Mixtures	Rate per Acre Pure Live Seed	Optimum Soil pH
1. Bluegrass	210 lbs.	5.5 to 7.0
2. Perennial ryegrass (turf type) - bluegrass	90 lbs. 135 lbs.	5.6 to 7.0
3. Tall fescue (turf type) ² - bluegrass	250 lbs. 45 lbs.	5.6 to 7.5

Channels and Areas of Concentrated Flow

Seed Mixtures	Rate per Acre Pure Live Seed	Optimum Soil pH
1. Perennial ryegrass - white clover ¹	225 lbs. 3 lbs.	5.6 to 7.0
2. Kentucky bluegrass - smooth bromegrass - switchgrass - timothy - perennial ryegrass - white clover ¹	30 lbs. 15 lbs. 5 lbs. 6 lbs. 15 lbs. 3 lbs.	5.5 to 7.5
3. Tall fescue ² - white clover ¹	225 lbs. 3 lbs.	5.5 to 7.5
4. Tall fescue ² - perennial ryegrass - Kentucky bluegrass	225 lbs. 30 lbs. 30 lbs.	5.5 to 7.5

¹ For best results: (a) legume seed should be inoculated; (b) seeding mixtures containing legumes should preferably be spring-seeded, although the grass may be fall-seeded and the legume frost-seeded; and (c) if legumes are fall-seeded, do so in early fall.

² Tall fescue provides little cover for, and may be toxic to some species of wildlife. The Indiana Department of Natural Resources recognizes the need for additional research on alternatives such as buffalograss, orchardgrass, smooth bromegrass, and switchgrass. This research, in conjunction with demonstration areas, should focus on erosion control characteristics, wildlife toxicity, turf durability, and drought resistance.

Notes:

- If using mixtures other than those listed in this table, increase seeding rates by 50 percent over the conventional seeding rates.
- A high potential for fertilizer, seed, and mulch to wash exists on steep banks, cuts, and in channels and areas of concentrated flow.

SURFACE STABILIZATION

Permanent Seeding

Purpose

- To provide permanent vegetative cover and improve visual aesthetics of a project site.
- To reduce erosion and sedimentation damage by stabilizing disturbed areas.
- To reduce problems associated with mud or dust from unvegetated soil surfaces.
- To reduce sediment-laden storm water runoff from being transported to downstream areas.

Specifications

Seedbed Preparation

Grade and apply soil amendments.

Seeding Frequency

Seed final graded areas daily while soil is still loose and moist.

Density of Vegetative Cover

Ninety percent or greater over the soil surface.

Materials

- Soil Amendments - Select materials and rates as determined by a soil test (contact your county soil and water conservation district or cooperative extension office for assistance and soil information, including available soil testing services) or 400 to 600 pounds of 12-12-12 analysis fertilizer, or equivalent. Consider the use of reduced phosphorus application where soil tests indicate adequate phosphorous levels in the soil profile.
- Seed - Select an appropriate plant species seed or seed mixture on the basis of soil type, soil pH, region of the state, time of year, and intended land use of the area to be seeded (see Table 1).
- Mulch -
 - Straw, hay, wood fiber, etc. (to protect seedbed, retain moisture, and encourage plant growth).
 - Anchored to prevent removal by wind or water or covered with premanufactured erosion control blankets.

Application

Site Preparation

- Grade the site to achieve positive drainage.
- Add topsoil (see **Topsoil Salvage and Utilization** on page 25) or compost mulch (see **Compost Mulching** on page 59) to achieve needed depth for establishment of vegetation. (Compost material may be added to improve soil moisture holding capacity, soil friability, and nutrient availability.)

Seedbed Preparation

- Test soil to determine pH and nutrient levels.
- Apply soil amendments as recommended by the soil test and work into the upper two to four inches of soil. If testing is not done, apply 400 to 600 pounds per acre of 12-12-12 analysis fertilizer, or equivalent.
- Till the soil to obtain a uniform seedbed. Use a disk or rake, operated across the slope, to work the soil amendments into the upper two to four inches of the soil.

Seeding

Optimum seeding dates are March 1 to May 10 and August 10 to September 30. Permanent seeding done between May 10 and August 10 may need to be irrigated. Seeding outside or beyond optimum seeding dates is still possible with the understanding that reseeding or overseeding may be required if adequate surface cover is not achieved. Reseeding or overseeding can be easily accomplished if the soil surface remains well protected with mulch.

- Select a seeding mixture and rate from Table 1. Select seed mixture based on site conditions, soil pH, intended land use, and expected level of maintenance.
- Apply seed uniformly with a drill or cultipacker seeder (see Figure 1) or by broadcasting (see Figure 2). Plant or cover the seed to a depth of one-fourth to one-half inch. If drilling or broadcasting the seed, ensure good seed-to-soil contact by firming the seedbed with a roller or cultipacker after completing seeding operations. (If seeding is done with a hydroseeder (see Figure 3), fertilizer and mulch can be applied with the seed in a slurry mixture.)
- Mulch all seeded areas (see **Mulching** on page 55 and **Compost Mulching** on page 59) and use appropriate methods to anchor the mulch in place. Consider using erosion control blankets on sloping areas and conveyance channels (see **Erosion Control Blanket** on page 63).

Maintenance

- Inspect within 24 hours of each rain event and at least once every seven calendar days until the vegetation is successfully established.
- Characteristics of a successful stand include vigorous dark green or bluish-green seedlings with a uniform vegetative cover density of 90 percent or more.
- Check for erosion or movement of mulch.
- Repair damaged, bare, gullied, or sparsely vegetated areas and then fertilize, reseed, and apply and anchor mulch.
- If plant cover is sparse or patchy, evaluate the plant materials chosen, soil fertility, moisture condition, and mulch application; repair affected areas either by overseeding or preparing a new seedbed and reseeding. Apply and anchor mulch on the newly seeded areas.
- If vegetation fails to grow, consider soil testing to determine soil pH or nutrient deficiency problems. (Contact your soil and water conservation district or cooperative extension office for assistance.)
- If additional fertilization is needed to get a satisfactory stand, do so according to soil test recommendations.
- Add fertilizer the following growing season. Fertilize according to soil test recommendations.
- Fertilize turf areas annually. Apply fertilizer in a split application. For cool-season grasses, apply one-half of the fertilizer in late spring and one-half in early fall. For warm-season grasses, apply one-third in early spring, one-third in late spring, and the remaining one-third in middle summer.

Table 1. Permanent Seeding Recommendations

This table provides several seed mixture options. Additional seed mixtures are available commercially. When selecting a mixture, consider intended land use and site conditions, including soil properties (e.g., soil pH and drainage), slope aspect, and the tolerance of each species to shade and drought.

Open Low Maintenance Areas (remaining idle more than six months)

Seed Mixtures	Rate per Acre Pure Live Seed	Optimum Soil pH
1. Perennial ryegrass - white clover ¹	70 lbs. 2 lbs.	5.6 to 7.0
2. Perennial ryegrass - tall fescue ²	70 lbs. 50 lbs.	5.6 to 7.0
3. Tall fescue ² - white clover ¹	70 lbs. 2 lbs.	5.5 to 7.5

Steep Banks and Cuts, Low-Maintenance Areas (not mowed)

Seed Mixtures	Rate per Acre Pure Live Seed	Optimum Soil pH
1. Smooth bromegrass - red clover ¹	35 lbs. 20 lbs.	5.5 to 7.0
2. Tall fescue ² - white clover ¹	50 lbs. 2 lbs.	5.5 to 7.0
3. Tall fescue ² - red clover ¹	50 lbs. 20 lbs.	5.5 to 7.5
4. Orchardgrass - red clover ¹ - white clover ¹	30 lbs. 20 lbs. 2 lbs.	5.6 to 7.0
5. Crownvetch ¹ - tall fescue ²	12 lbs. 30 lbs.	5.6 to 7.0

Lawns and High-Maintenance Areas

Seed Mixtures	Rate per Acre Pure Live Seed	Optimum Soil pH
1. Bluegrass	140 lbs.	5.5 to 7.0
2. Perennial ryegrass (turf type)	60 lbs. 90 lbs.	5.6 to 7.0
3. Tall fescue (turf type) ² - bluegrass	50 lbs. 20 lbs.	5.6 to 7.5

Channels and Areas of Concentrated Flow

Seed Mixtures	Rate per Acre Pure Live Seed	Optimum Soil pH
1. Perennial ryegrass - white ¹	150 lbs. 2 lbs.	5.5 to 7.0
2. Kentucky bluegrass - smooth bromegrass - switchgrass - timothy - perennial ryegrass - white clover ¹	20 lbs. 10 lbs. 3 lbs. 4 lbs. 10 lbs. 2 lbs.	5.5 to 7.5
3. Tall fescue ² - white clover ¹	150 lbs. 2 lbs.	5.5 to 7.5
4. Tall fescue ² - perennial ryegrass - Kentucky bluegrass	150 lbs. 20 lbs. 20 lbs.	5.5 to 7.5

¹ For best results: (a) legume seed should be inoculated; (b) seeding mixtures containing legumes should preferably be spring-seeded, although the grass may be fall-seeded and the legume frost-seeded (see **Dormant Seeding and Frost Seeding** on page 41); and (c) if legumes are fall-seeded, do so in early fall.

² Tall fescue provides little cover for, and may be toxic to some species of wildlife. The Indiana Department of Natural Resources recognizes the need for additional research on alternatives such as buffalograss, orchardgrass, smooth bromegrass, and switchgrass. This research, in conjunction with demonstration areas, should focus on erosion control characteristics, wildlife toxicity, turf durability, and drought resistance.

Notes:

- An oat or wheat companion or nurse crop may be used with any of the above permanent seeding mixtures, at the following rates:
 - spring oats- one-fourth to three-fourths bushel per acre
 - wheat - no more than one-half bushel per acre
- A high potential for fertilizer, seed, and mulch to wash exists on steep banks, cuts, and in channels and areas of concentrated flow.

SURFACE STABILIZATION

Mulching

Purpose

- To prevent erosion by protecting the soil from wind and water impact.
- To provide temporary surface stabilization.
- To prevent soil from crusting.
- To conserve soil moisture, moderate soil temperature, and promote seed germination and seedling growth.

Note: **This measure should not be used in storm water runoff channels or areas where concentrated flow is attempted.**

Specifications

Materials

Table 1. Mulch Specifications

Material ¹	Rate per Acre	Comments
Straw or hay	2 tons	Should be dry, free of undesirable seeds. Spread by hand or machine. Must be crimped or anchored (see Table 2).
Wood fiber or cellulose	1 ton	Apply with a hydraulic mulch machine and use with tacking agent.

¹ Mulching is not recommended in concentrated flows. Consider erosion control blankets or other stabilization methods.

Coverage

The mulch should have a uniform density of at least 75 percent over the soil surface.

Anchoring

Table 2. Mulch Anchoring Methods

Anchoring Method ¹	How to Apply
Mulch anchoring tool or farm disk (dull, serrated, and blades set straight)	Crimp or punch the straw or hay two to four inches into the soil. Operate machinery on the contour of the slope.
Cleating with dozer tracks	Operate dozer up and down slope to prevent formation of rills by dozer cleats.
Wood hydromulch fibers	Apply according to manufacturer's recommendations.
Synthetic tackifiers, binders, or soil stabilizers	Apply according to manufacturer's recommendations.
Netting (synthetic or biodegradable material)	Install netting immediately after applying mulch. Anchor netting with staples. Edges of netting strips should overlap with each up-slope strip overlapping four to six inches over the adjacent down-slope strip. Best suited to slope applications. In most instances, installation details are site specific, so manufacturer's recommendations should be followed.

¹ All forms of mulch must be anchored to prevent displacement by wind and/or water.

Application

OUTLET PROTECTION & GRADE STABILIZATION

Energy Dissipater (Outlet Protection)

Purpose

To prevent erosion at the outlet of a channel or conduit by reducing the velocity of storm water flow and dissipating its energy.

Specifications

Note: **Designed by a qualified individual/professional engineer. Additional design considerations will be required when discharge velocities are very high or tailwater conditions are very low.**

Capacity:

Peak runoff from a 10-year frequency, 24-hour storm event or the design discharge of the water conveyance structure, whichever is greater.

Maximum Velocity

Ten feet per second.

Tailwater Depth

- Determined immediately below the structure outlet.
- Based on design discharge plus other contributing flows.

Apron

- Length and width determined according to tailwater conditions.
- Aligned straight with channel flow. If a curve is necessary to align the apron with the receiving stream, locate the curve in the upstream section of the apron.
- Plunge pool (used with higher velocity flows).
- Thickness
 - 1.2 times the maximum stone diameter for a d_{50} stone size of 15 inches or larger.
 - 1.5 times the maximum stone diameter for a d_{50} stone size of 15 inches or less.

Table 1. Sizing for Flow Dissipaters at Culvert Pipe Outlets¹

Pipe Size	Average Riprap Diameter	Apron Width ²	Apron Length ³
8 in.	3 in.	2 to 3 ft.	5 to 7 ft.
12 in.	5 in.	3 to 4 ft.	6 to 12 ft.
18 in.	8 in.	4 to 6 ft.	8 to 18 ft.
24 in.	10 in.	6 to 8 ft.	12 to 22 ft.
30 in.	12 in.	8 to 10 ft.	14 to 28 ft.
36 in.	14 in.	10 to 12 ft.	16 to 32 ft.

¹ For larger or higher flows consult a registered engineer.
² Apron width at the narrow end of apron (pipe or channel outlet).
³ Select length taking into consideration the low flow (no pressure head or high flow (pressure head) conditions of the culvert pipe.

Materials

- Riprap
- Hard, angular, highly weather resistant.
- Specific gravity of at least 2.5.
- Size and gradation that will withstand velocities of storm water discharge flow design.
- Well-graded mixture of stone with 50 percent of the stone pieces, by weight, larger than the d_{50} size and the diameter of the largest stone equal to 1.5 times the d_{50} size.

Note: **Concrete, gabion baskets, grouted riprap, interlocking concrete blocks, cabled concrete, and turf reinforcement products are alternative options to riprap.**

- Geotextile fabric or well-graded aggregate [INDOT CA No. 9, 11, or 12 (see Appendix D)].

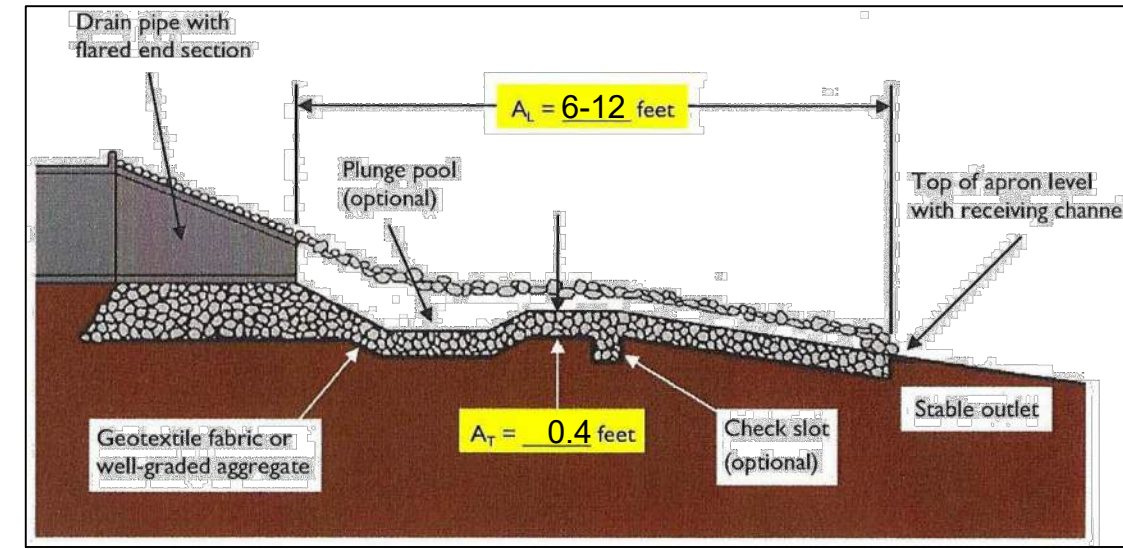
Installation

1. Divert surface water runoff around the structure during construction so that the site can be properly dewatered for foundation preparation.
2. Excavate foundation and apron area subgrades below design elevation to allow for thickness of the filter medium and riprap.
3. Compact any fill used in subgrade preparation to the density of surrounding undisturbed soil material.
4. Smooth subgrade enough to protect geotextile fabric from tearing.
5. Place geotextile fabric or aggregate bedding material (for stabilization and filtration) on the compacted and smoothed foundation.
6. Install riprap to the lines and elevations shown in the construction plans. Blend riprap smoothly to surrounding grade. If the channel is well defined, extend the apron across the channel bottom and up the channel banks to an elevation of six inches above the maximum tail water depth or to the top of the bank, whichever is less.
7. If geotextile fabric tears when placing riprap, repair immediately by laying and stapling a piece of fabric over damaged area, overlapping the undamaged areas by at least 12 inches.
8. Construct a small plunge pool within the outlet apron. (Riprap aprons must be level with or slightly lower than the receiving channel and should not produce an overfall or restrict flow of the water conveyance structure.)

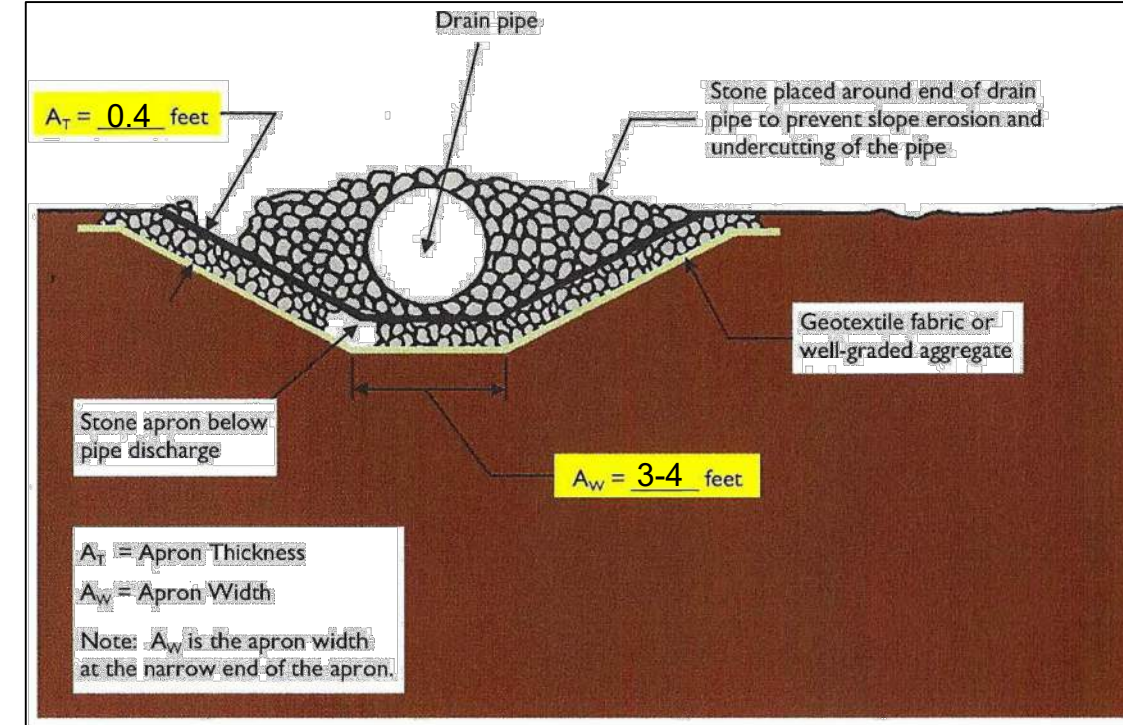
Maintenance

- Inspect within 24 hours of a rain event and at least once every seven calendar days.
- Inspect for stone displacement; replace stones ensuring placement at finished grade.
- Check for erosion or scouring around sides of the apron; repair immediately.
- Check for piping or undercutting; repair immediately.

Energy Dissipater Worksheet 1



Energy Dissipater Worksheet 2



SITE MANAGEMENT MEASURES
Concrete Washout

Purpose

Concrete washout systems are implemented to reduce the discharge of pollutants that are associated with concrete washout waste through consolidation of solids and retention of liquids. Uncured concrete and associated liquids are highly alkaline which may reach into the soil and contaminate ground water or discharge to a waterbody or wetland which can elevate the pH and be harmful to aquatic life. Performing concrete washout in designated areas and into specifically designed systems reduces the impact concrete washout will have on the environment.

Specifications

Site Management

- Complete construction/installation of the system and have washout locations operational prior to concrete delivery.
- Do not wash out concrete trucks or equipment into storm drains, wetlands, streams, rivers, creeks, ditches, or streets.
- Never wash out into a storm sewer drainage system. These systems are typically connected to a natural conveyance system.
- Where necessary, provide stable ingress and egress (see **Temporary Construction Ingress/Egress Pad** on page 17).
- It is recommended that washout systems be restricted to washing concrete from mixer and pump trucks and not used to dispose of excess concrete or residual loads due to potential to exceed the design capacity of the washout system. Small amounts of excess or residual concrete (not washout water) may be disposed of in areas that will not result in flow to an area that is to be protected.
- Install systems at strategic locations that are convenient and in close proximity to work areas and in sufficient number to accommodate the demand for disposal.
- Install signage identifying the location of concrete washout systems.

Location

- Locate concrete washout systems at least 50 feet from any creeks, wetlands, ditches, karst features, or storm drains/manmade conveyance systems.
- To the extent practical, locate concrete washout systems in relatively flat areas that have established vegetative cover and do not receive runoff from adjacent land areas.
- Locate in areas that provide easy access for concrete trucks and other construction equipment.
- Locate away from other construction traffic to reduce the potential for damage to the system.

General Design Considerations

- The structure or system shall be designed to contain the anticipated washout water associated with construction activities.
 - The system shall be designed, to the extent practical, to eliminate runoff from entering the washout system.
 - Runoff from a rainstorm or snowmelt should not carry wastes away from the washout location.
 - Washout will not impact future land uses (i.e., open spaces, landscaped areas, home sites, parks).
 - Washout systems/containment measures may also be utilized on smaller individual building sites. The design and size of the system can be adjusted to accommodate the expected capacity.
- Prefabricated Washout Systems/Containers**
- Self-contained sturdy containment systems that are delivered to a site and located at strategic locations for concrete disposal.
 - These systems are manufactured to resist damage from construction equipment and protect against leaks or spills.
 - Manufacturer or supplier provides the containers. The project site manager maintains the system or the supplier provides complete service that includes maintenance and disposal.
 - Units are often available with or without ramps. Units with ramps lend themselves to accommodate pump trucks.
 - Maintain according to the manufacturer's recommendations.

Designed and Installed Units

These units are designed and installed on site. They tend to be less reliable than prefabricated systems and are often prone to failure. Concrete washout systems can be constructed above or below grade. It is not uncommon to have a system that is partly below grade with an additional containment structure above grade.

Washout systems shall utilize a pit or bermed area designed and maintained at a capacity to contain all liquid and concrete waste generated by washout operations.

The volume of the system must also be designed to contain runoff that drains to the system and rainfall that enters the system for a two-year frequency, 24-hour storm event.

Below Grade System

- A washout system installed below grade should be a minimum of ten feet wide by ten feet long, but sized to contain all liquid and waste that is expected to be generated between scheduled cleanup periods. The size of the pit may be limited by the size of polyethylene available. The polyethylene lining should be of adequate size to extend over the entire excavation.
- Include a minimum 12-inch freeboard to reasonably ensure that the structure will not overtop during a rain event.
- Line the pit with ten millimeter polyethylene lining to control seepage.
- The bottom of excavated pit should be above the seasonal high water table.

Above Grade System

- A system designed and built above grade should be a minimum of ten feet wide by ten feet long, but sized to contain all liquid and waste that is expected to be generated between scheduled cleanup periods. The size of the containment system may be limited by the size of

- polyethylene available. The polyethylene lining should be of adequate size to extend over the berm or containment system
- The system design may utilize an earthen berm, straw bales, sandbags, or other acceptable barriers that will maintain its shape and integrity and support the polyethylene lining.
- Include a minimum four-inch freeboard as part of the design.

Washout Procedures

Do not leave excess mud in the chutes or hopper after the pour. Every effort should be made to empty the chutes and hopper at the pour. The less material left in the chutes and hopper, the quicker and easier the cleanup. Small amounts of excess concrete (not washout water) may be disposed of in areas that will not result in flow to an area that is to be protected.

At the washout location, scrape as much material from the chutes as possible before washing them. Use non-water cleaning methods to minimize the chance for waste to flow off site.

Remove as much mud as possible when washing out.

Stop washing out in an area if you observe water running off the designated area or if the containment system is leaking or overflowing and ineffective.

Do not back flush equipment at the project site. Back flushing should be restricted to the plant as it generates large volumes of waste that more than likely will exceed the capacity of most washout systems. If an emergency arises, back flush should only be performed with the permission of an on-site manager for the project.

Do not use additives with wash water. Do not use solvents or acids that may be used at the target plant.

Materials

- Minimum of ten millimeter polyethylene sheeting that is free of holes, tears, and other defects. The sheeting selected should be of an appropriate size to fit the washout system without seams or overlap of the lining (**designed and installed systems**).
- Signage.
- Orange safety fencing or equivalent.
- Straw bales, sandbags (bags should be ultraviolet-stabilized geotextile fabric), soil material, or other appropriate materials that can be used to construct a containment system (**above grade systems**).
- Metal pins or staples at a minimum of six inches in length, sandbags, or alternative fastener to secure polyethylene lining to the containment system.
- Non-collapsing and non-water holding cover for use during rain events (optional).

Installation

Prefabricated Washout Systems/Containers

- Install and locate according to the manufacturer's recommendations.

Designed and Installed Systems

- Utilize and follow the design in the storm water pollution prevention plan to install the system.
- Dependent upon the type of system, either excavate the pit or install the containment system.
- A base shall be constructed and prepared that is free of rocks and other debris that may cause tears or punctures in the polyethylene lining.
- Install the polyethylene lining. For excavated systems, the lining should extend over the entire excavation. The lining for bermed systems should be installed over the pooling area with enough material to extend the lining over the berm or containment system. The lining should be secured with pins, staples, or other fasteners.

- Place flags, safety fencing, or equivalent to provide a barrier to construction equipment and other traffic.

- Place a non-collapsing, non-water holding cover over the washout facility prior to a predicted rainfall event to prevent accumulation of water and possible overflow of the system (optional).

- Install signage that identifies concrete washout areas.

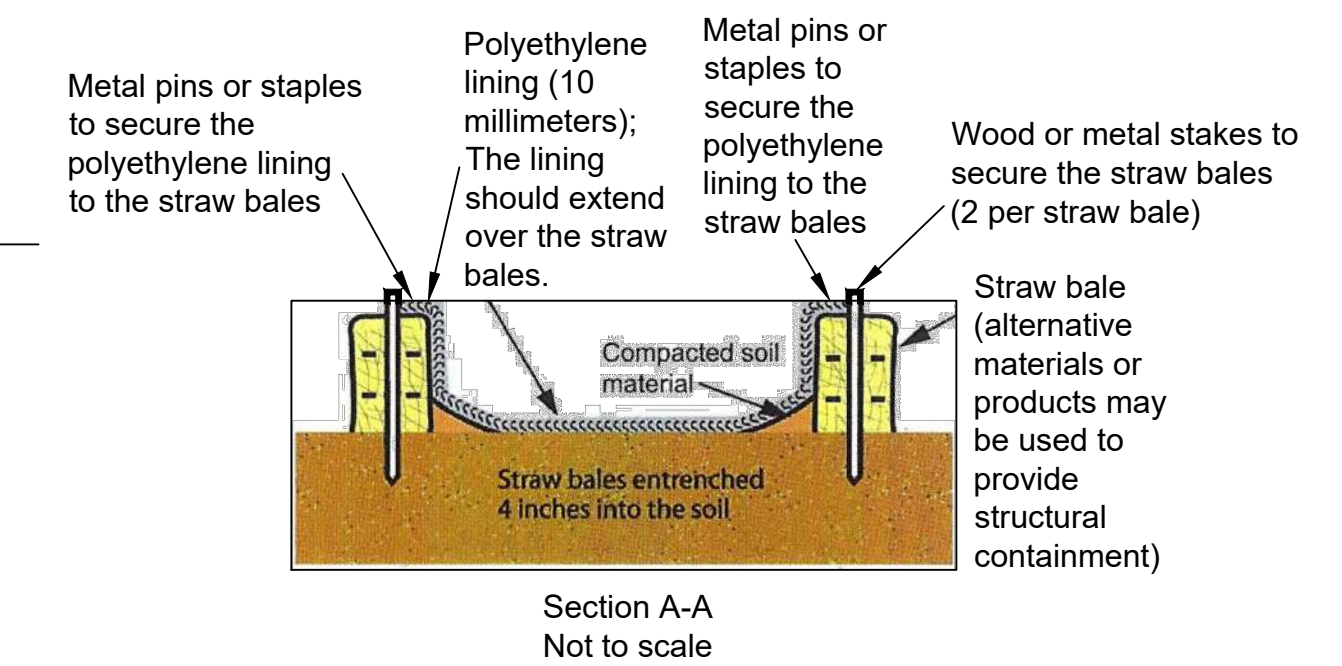
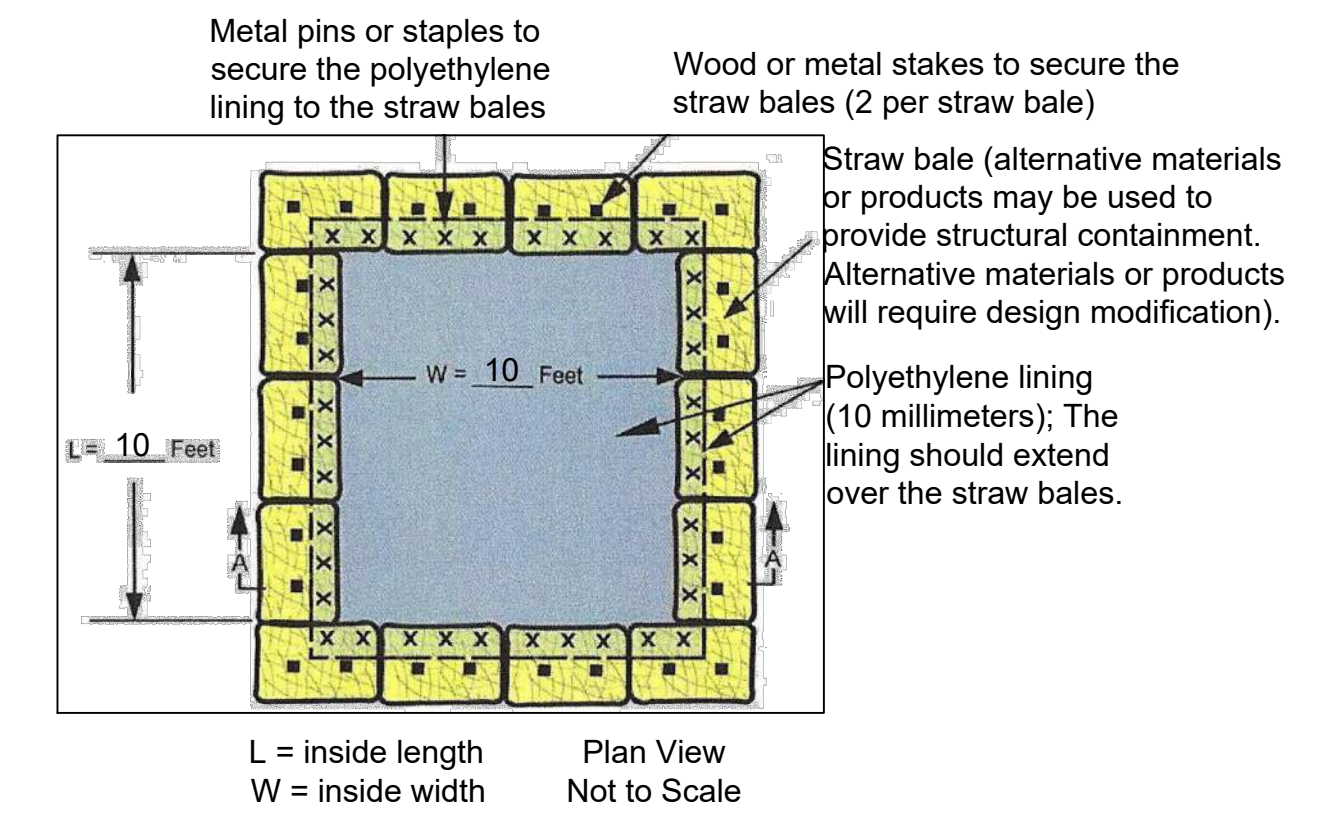
- Post signs directing contractors and suppliers to designated locations.

- Where necessary, provide stable ingress and egress (see **Temporary Construction Ingress/Egress Pad** on page 17) or alternative approach pad for concrete washout systems.

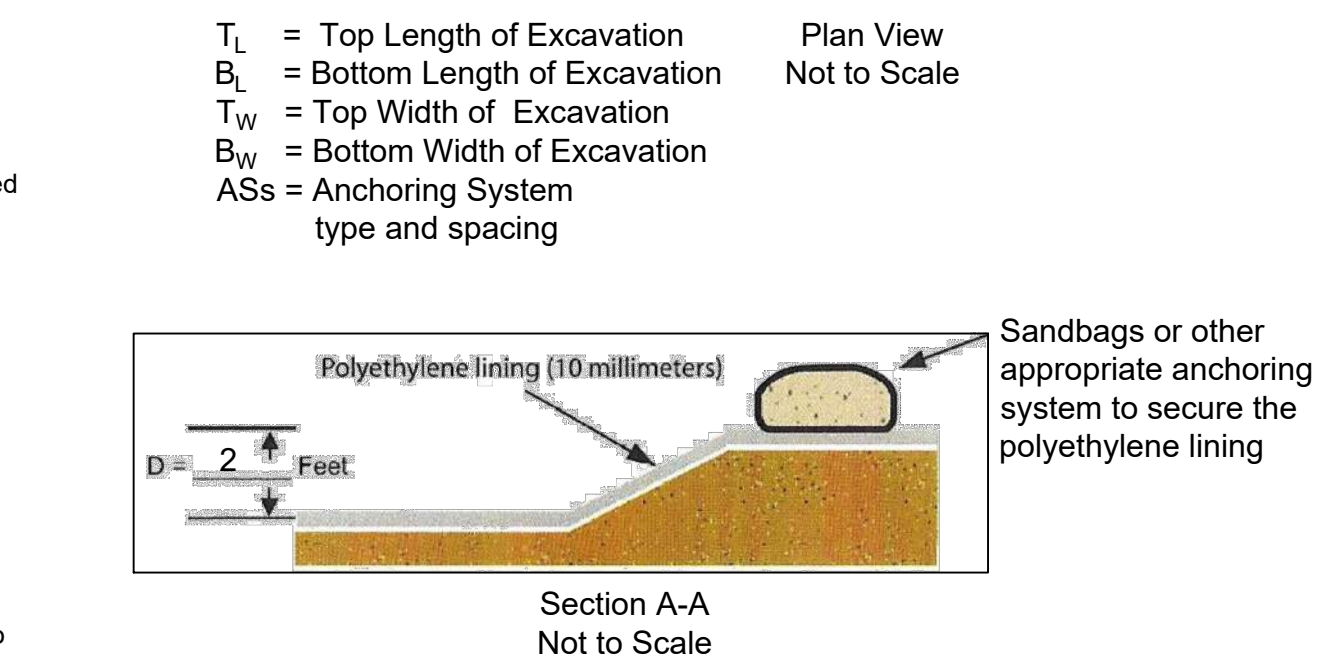
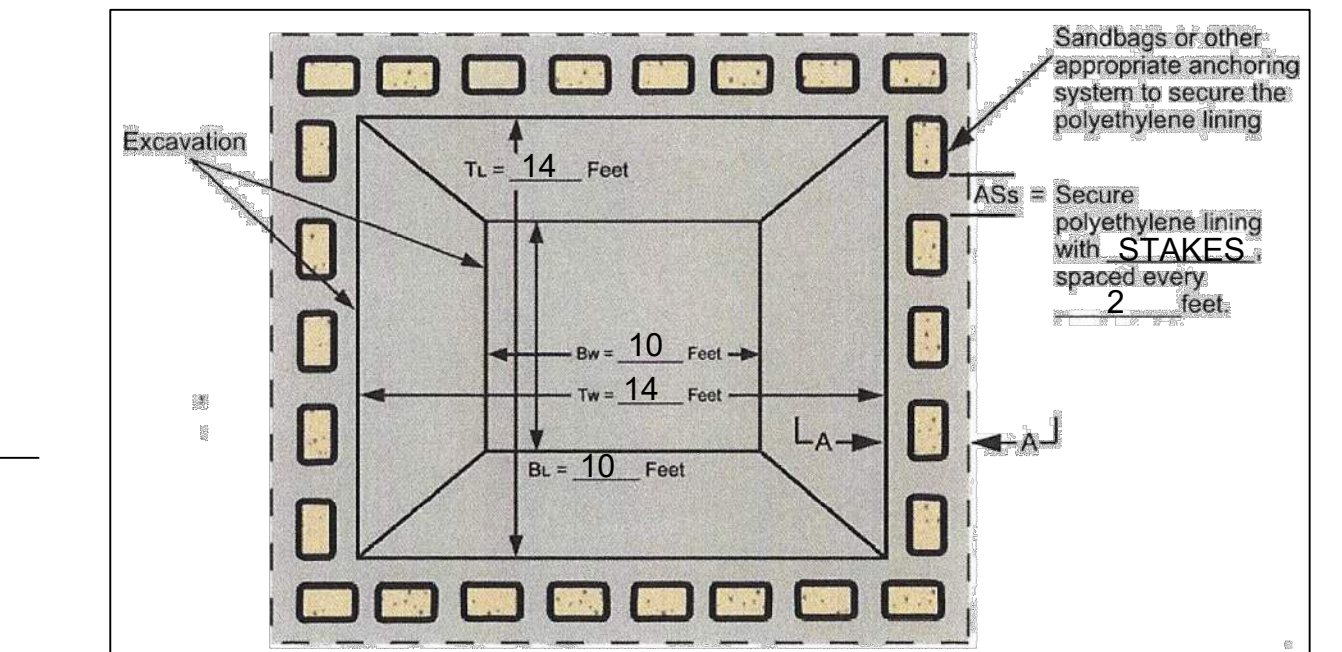
Maintenance

- Inspect daily and after each storm event.
- Inspect the integrity of the overall structure including, where applicable, the containment system.
- Inspect the system for leaks, spills, and tracking of soil by equipment.
- Inspect the polyethylene lining for failure, including tears and punctures.
- Once concrete wastes harden, remove and dispose of the material.
- Excess concrete should be removed when the washout system reaches 50 percent of the design capacity. Use of the system should be discontinued until appropriate measures can be initiated to clean the structure. Prefabricated systems should also utilize this criterion, unless the manufacturer has alternate specifications.
- Upon removal of the solids, inspect the structure. Repair the structure as needed or construct a new system.
- Dispose of all concrete in a legal manner. Reuse the material on site, recycle, or haul the material to an approved construction/demolition landfill site. Recycling of material is encouraged. The waste material can be used for multiple applications including but not limited to roadbeds and building. The availability for recycling should be checked locally.
- The plastic liner should be replaced after every cleaning; the removal of material will usually damage the lining.
- The concrete washout system should be repaired or enlarged as necessary to maintain capacity for concrete waste.
- Concrete washout systems are designed to promote evaporation. However, if the liquids do not evaporate and the system is near capacity it may be necessary to vacuum or remove the liquids and dispose of them in an acceptable method. Disposal may be allowed at the local sanitary sewer authority provided their National Pollutant Discharge Elimination System permits allow for acceptance of this material. Another option would be to utilize a secondary containment system or basin for further dewatering.
- Prefabricated units are often pumped and the company supplying the unit provides this service.

Concrete Washout (Above Grade System) Worksheet



Concrete Washout (Below Grade System) Worksheet



NOTE: DETAILS FROM INDIANA STORM WATER QUALITY MANUAL, 2007 AND OTHER SOURCES

DRAWN: VANANCS, E.L.A. 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FILTER BAGS (PUMP DISCHARGE FILTER BAGS)

Purpose

To minimize the discharge of sediment from pump induced dewatering activities by filtering sediment laden pump discharges from wet excavations or ponded areas encountered in construction activities. Filter bags may be used in combination with flocculants refer to Flocculants – Polymers (714.05) and manufacturer's requirements.

Note: This measure is not intended to treat or remove contaminants other than sediment. Dewatering of contaminated ground water will require additional control measures/treatments that will require appropriate permitting to discharge.

Specifications

Implementation Criteria:

When implementing pump filter bags locate bags where the discharge outflows will not impact construction activities, cause erosion, have increased sediment load, and/or overwhelm site sediment control (refer to Water Pumping (713.02) practice for additional practice information regarding water pumping activities). Filter bags may be used in combination with flocculants refer to Flocculants – Polymers (714.05) and follow manufacturer's requirements.

Size/Capacity:

- The necessary dimensions of a filter bag are dependent on the pumping rate (pump size). If the filter bag is too small increases the potential of bursting (bag failure), seam ripping and/or hose detachment resulting in sediment discharge.
- When dewatering excavations with high clay content soil materials larger filter bags will likely be required due to the rapid clogging potential of the geotextile filter bag.
- Follow manufacturer's recommendations/requirements when sizing bags based upon pump size and soil conditions.

Location:

- Locate filter bags where outflows can easily drain away. Avoid concave locations.
- Filter bags must be placed on nearly level to slightly sloping surface (less than 5% slope) to prevent bag rolling. Aggregate pads can be implemented to level slopes of 5% or greater but yet less than 10%.
- Preferred locations for filter bags are areas of undisturbed stable densely grass vegetated areas where bag out flows can be further filtered by the surrounding vegetation and away from water resources.
- Filter bags can be located on flat bed trailers or truck beds (without rough edges) for ease of removal and disposal.
- Implement secondary containment Rock Berm (709.06) down slope of bags when near sensitive water resources such as streams and wetland areas or when near adjacent properties.
- Filter bags are to be located for ease of access for monitoring, maintenance and filter bag removal (filter bags become very heavy once they become filled with sediment).
- Filter bags shall be protected from objects or items that could puncture or tear the filter bag when stored and during dewatering operations.
- Do not locate filter bags in water resources, wetlands, stream channels, or in concentrated flows or pipe outlet flow paths.

Materials:

- Filter bags made of nonwoven polyethylene geotextile meeting the minimum requirements of Exhibit 713.01-B.
- Geotextile filter bag seams must be durable and adequately burst resistant. These seams maybe double stitched with high strength thread.
- Steel hose clamps or equivalent to tightly attach pump hose to the filter bag (Exhibit 713.01-C).
- Elevated drainage pad (optional): Aggregate INDOT CA No. 8 (Refer to Appendix D), wood mulch/tree grinding, straw bales, wood pallet (free of protruding nails or other sharp objects or broken wood slats).
- Secondary containment berm (optional): refer to Rock Berm (709.06)
- Outflow pathway stabilization materials: dependent upon design, site conditions and pumping requirements.

The table below provides the minimum properties for filter bag geotextile.

Geotextile Filter Bag Minimum Properties		
Property	Test Method	Value
Mass Per Unit Area	ASTM D-5261	8 oz/yd ²
Grab Tensile Strength	ASTM D-4632	180 lbs
Grab Elongation	ASTM D-4632	50%
Trapezoid Tear Strength	ASTM D-4533	80 lbs
CBR Puncture Strength	ASTM D-6241	475 lbs
Water Flow Rate	ASTM D-4491	70 gal/min/ft ²
Apparent Opening Size	ASTM D-4751	80 U.S. Sieve
UV Resistance (500 hrs)	ASTM D-4355	70%

Installation:

- Ensure to remove all sharp objects, sticks and debris etc. from filter bag location.
- Install a level elevated drainage pad for best outflow results. Extend pad at least 1 foot beyond the footprint of the filter bag. A variety of options to elevate the filter bag to promote/facilitate more efficient outflows from the filter bag from the bottom side. Option 1. Aggregate pad INDOT CA No. 8 a minimum of 6 inches thick. Option 2. Wood mulch/tree grindings a minimum of 6 inches thick. Option 3. Strawbale pad of bales. Option 4. Wood pallets.
- To correct excessive slopes, install a level aggregate pad of INDOT CA No. 8 gravel a minimum of 6 inches thick and sufficient to create a level pad.
- Install if necessary, a stabilize outflow pathway to receiving water resources or unstable receiving sloping areas. Filter bag outflows should not cause erosion along the pathway to the discharge point (such as the receiving conveyance or water resource). Install outlet and outflow pathway protection or energy dissipation measures appropriate for the flows/pumping rate and duration of pumping activities such as the following (refer to Water Pumping 713.02):
 - Riprap outlet protection Energy Dissipater (Outlet Protection) (705.01) (refer to Exhibit 713.01-D).
 - Plastic sheeting (refer to Exhibit 713.02-B).
 - Riprap-Lined Channel (704.02)
- Where needed or in close proximity to water resources or adjacent properties install a secondary containment Rock Berm (709.06) on the downslope sides and tie into higher ground or for level or less sloping locations encircle the outflow pad with a rock berm or like the Gravel Donut Drop Inlet Protection (706.02) (Chapter 7, page 149).
- Connect the pump hose to the filter bag using a tight connection such as with a steel hose band clamp over the rigid hose connector area to form a watertight connection. (refer to refer to Exhibit 713.01-C). Do not clamp or tie around flexible hose areas since a tight connection cannot be achieved. To obtain a tight leak free filter bag connection do not connect more than one pump hose to a bag.
- Wherever possible implement measures to minimize sediment entry to pump intake area by implementing floating inlets (refer to Water Pumping 713.02) or use a sump pit for dewatering (refer to Exhibit 713.02-I).

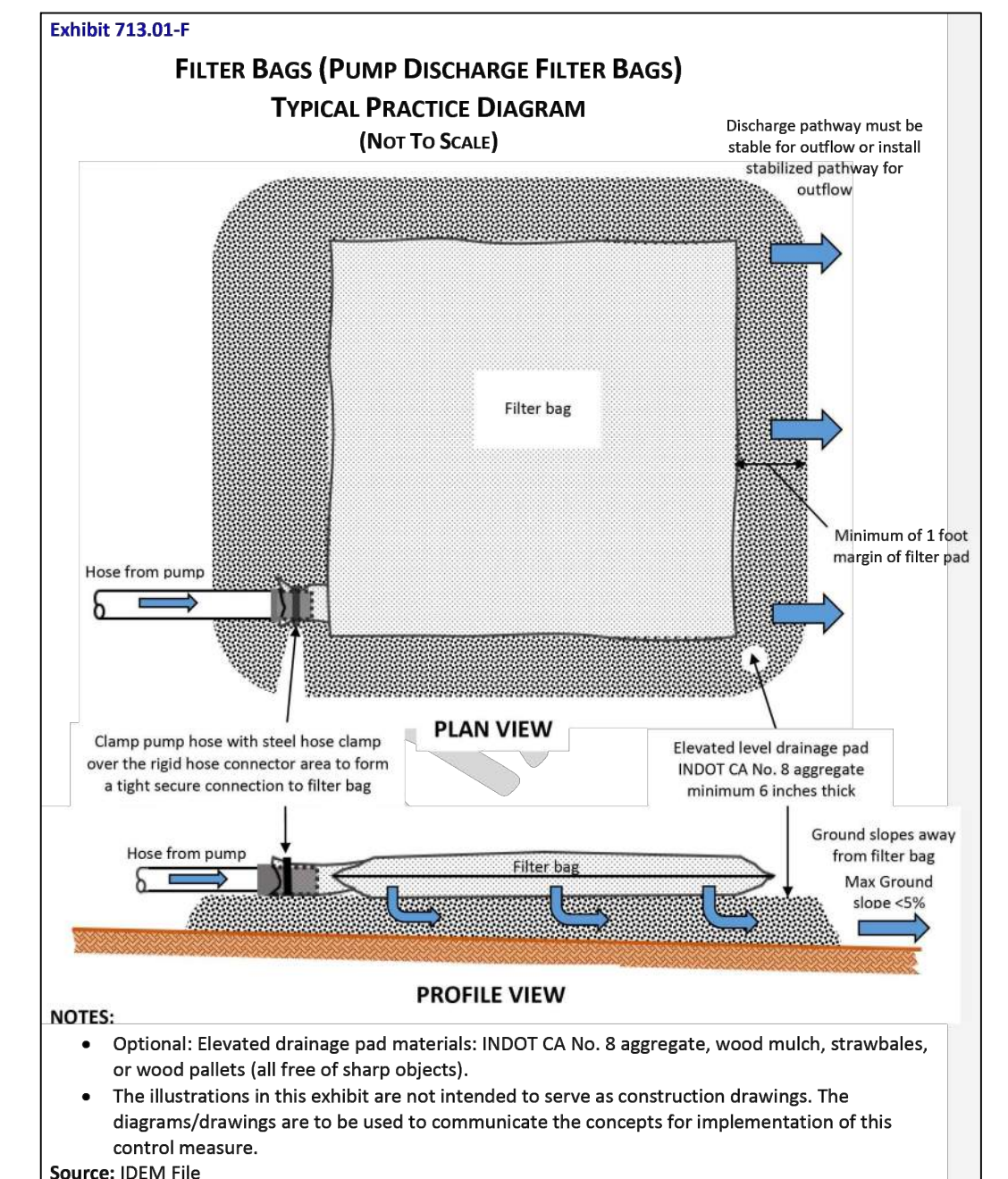
Note: When continuous pumping is required during sub-freezing conditions special provisions are needed to reduce bag freezing and rupture potential.

Disposal:

- Allow bag to dewater prior to attempting to moving, disconnecting pump hose or opening bag. Where site characteristics allow, the bag may be left in place and cut open and the contents spread out and stabilized. Remove all visible fabric.
- Do not empty bags or leave contents where runoff can carry sediment into wetland, waterways or conveyances.
- Bags and contents can be buried or taken to areas allowing clean fill (when pumping from uncontaminated sites).
- When using in combination with flocculants or polymers dispose bag and contents according to manufacturer's requirements and refer to Flocculants – Polymers (714.05)

Maintenance:

- Monitor the outflow to nearby water resources, off-site properties and receiving conveyances such as storm sewer inlets and swales for excessive sedimentation. Cease pumping when impacts are identified and evaluate for improvements.
- Filter bags require frequent monitoring. At a minimum, inspect at the beginning of pumping operations and at a minimum of once every hour thereafter until the cessation of pumping of sediment-laden water.
- Cease pumping when bag can no longer pass water at a reasonable rate and threatens to rupture and replace with a new filter bag.
- When secondary containments are used and begin to exhibit sediment deposits then cease pumping and implement a new filter bag.
- Monitor hose-bag connection and ensure a watertight connection with no leakage.
- Monitor bag for holes, rips or tears. Immediately cease pumping when holes, rips or tears are identified and replace filter bag prior to resumption of pumping of sediment-laden water.
- Store replacement bags in a protected location to prevent exposure to sunlight, punctures, abrasion, rips and tears.
- Do not use damaged, punctured or torn bags.
- Maintain positive drainage away from filter bags for efficient operation.
- If erosion from filter bag outflow is identified, cease pumping and stabilize outflow pathway prior to the resumption of pumping activities.
- For continuous pumping activities have on-site or ready access to additional filter bags in the event of bag failure or bag is full.



NOTE: ALTERNATE METHODS FOR INLET PROTECTION ARE PERMISSIBLE
NOTE: DETAILS FROM INDIANA STORM WATER QUALITY MANUAL 2007 AND OTHER SOURCES

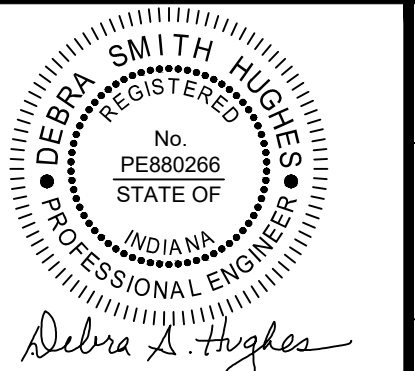
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NO.	REVISIONS	BY	DATE



3220 Southview Drive
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Phone: 574-266-1010
Email: info@sam.biz

DRAWING FILE: 72906_SWPPP_DETAILS.DWG
CERTIFICATION DATE: 11/20/2023
HORIZONTAL SCALE: NONE
VERTICAL SCALE: NONE
ENGINEER: Debra S. Hughes, P.E.
TECHNICIAN: AKM



DETAILS: PUMP DISCHARGE FILTER BAG
COMBINED TECHNOLOGIES, INC., 503 BLOOMINGDALE DRIVE, BRISTOL PT. BRISTOL INDUSTRIAL PARK, PT. SE 1/4, SEC 27, T38N, R6E WASHINGTON TWP., ELKHART CO., INDIANA
JOB NUMBER: 1022072906

SHEET 11
OF 11