

CONSTRUCTION PLANS
FOR
SUNNYBROOKE SUBDIVISION
STORM WATER MANAGEMENT SYSTEM IMPROVEMENTS

PORTER CO. DEPARTMENT OF DEVELOPMENT & STORMWATER MANAGEMENT
MARCH 16, 2021

The following Construction Plans shall apply to and govern the project designated as **Sunnybrooke Subdivision – Storm Water Management System Improvements**. Such Technical Specifications supplement the specifications contained in the documents listed in the table below and, in case of conflict with any part or parts of said specifications, the Engineer shall determine which specifications shall take precedence and govern. The following hierarchy will be applied by the Engineer in resolving any conflict, error, ambiguity, or discrepancy in or between said specifications.

Specification	Issuing Agency	Adopted/Dated
Technical Specifications for Sunnybrooke Subdivision – Storm Water Management System Improvements	Porter Co. Department of Development & Storm Water Management	March 16, 2021
Construction Plans for Sunnybrooke Subdivision – Storm Water Management System Improvements	Porter Co. Department of Development & Storm Water Management	March 16, 2021
General Specifications to the Construction & Maintenance Services Agreements	Porter Co. Department of Development & Storm Water Management	February 1, 2021

PORTER CO. DEPT. OF DEVELOPMENT & STORM WATER MANAGEMENT

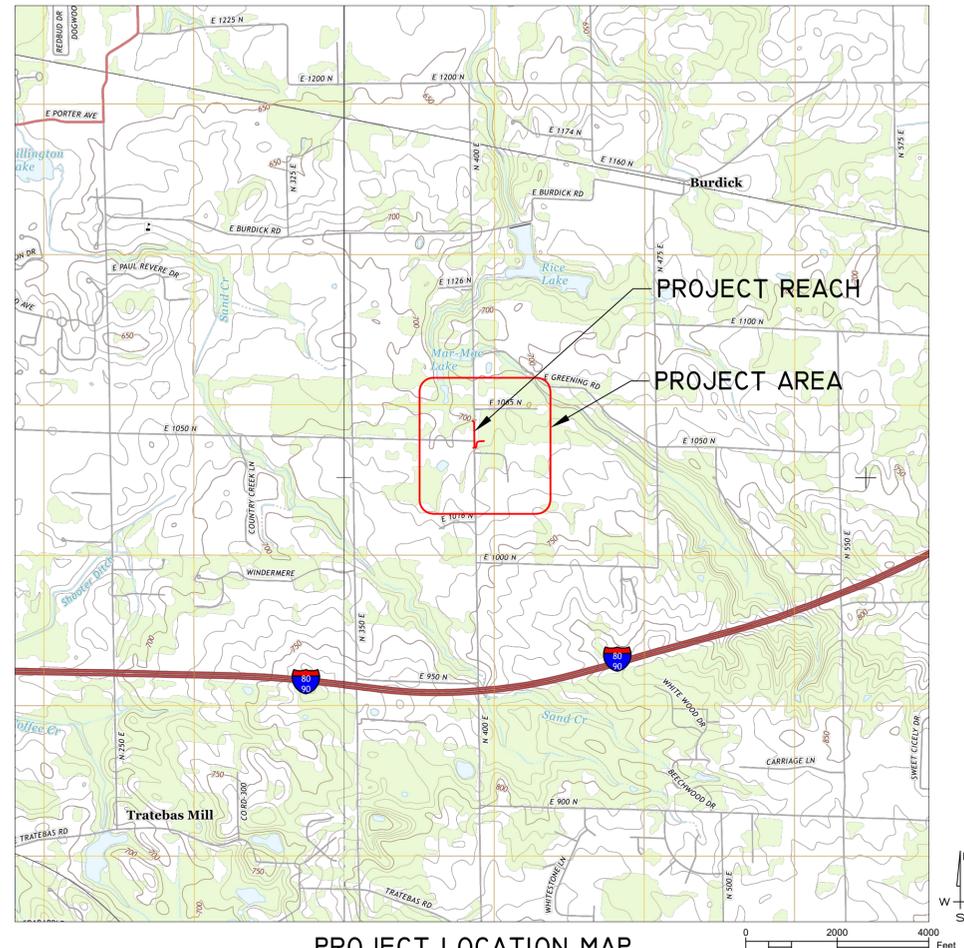
SUNNYBROOKE SUBDIVISION

STORM WATER MANAGEMENT SYSTEM IMPROVEMENTS

PORTER COUNTY, IN

OWNER:
 PORTER CO. DEPT. OF DEVELOPMENT &
 STORM WATER MANAGEMENT
 ATTN: MICHAEL E. NOVOTNEY, P.E.
 155 INDIANA AVE. STE. 311
 VALPARAISO, IN 46383
 P: (219) 465-3530

ENGINEER:
 PORTER CO. DEPT. OF DEVELOPMENT &
 STORM WATER MANAGEMENT
 ATTN: MICHAEL E. NOVOTNEY, P.E.
 155 INDIANA AVE. STE. 311
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PROJECT LOCATION MAP

- SHEET INDEX:**
1. COVER
 2. PLAN
 3. PROFILE
 4. DETAILS
 5. DETAILS AND STORM SEWER STRUCTURE SCHEDULE
 6. TRAFFIC CONTROL PLAN

NO.	DATE	REVISION	BY
1	3/16/21	FOR BIDDING	CRG

DESIGNED:	CRG
DRAWN:	CRG
CHECKED:	MEN
DATE:	4/9/2019
PROJECT NO.:	P21-021



**The Department of
 DEVELOPMENT &
 STORM WATER
 MANAGEMENT**
 Porter County, Indiana

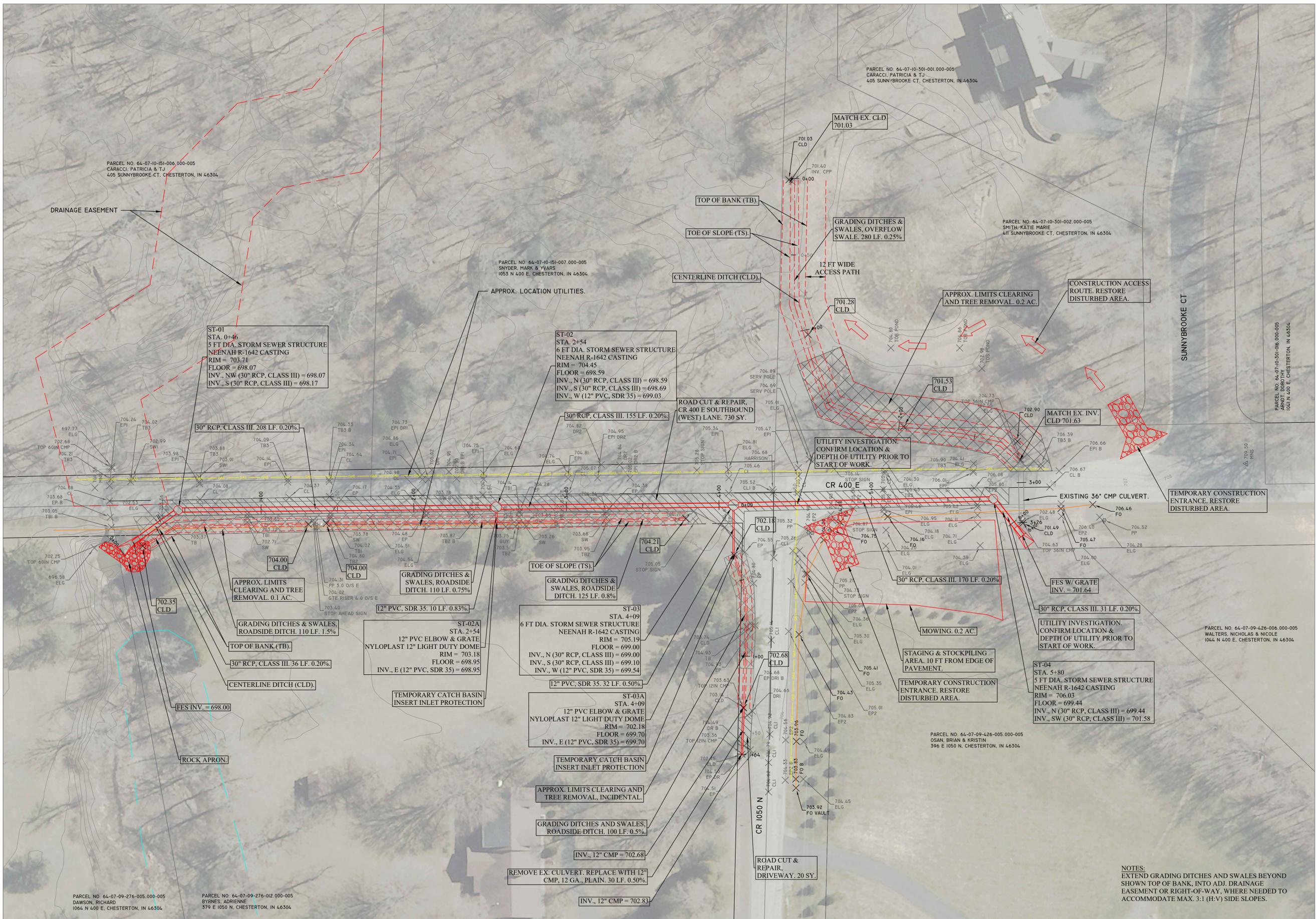
PROJECT:	SUNNYBROOKE SUBD. -SWM SYSTEM IMPROVEMENTS
LOCATION:	NEAR CR 400 E & CR 1050 N
SHEET TITLE:	SHEET I-COVER

I, THE UNDERSIGNED, A PROFESSIONAL ENGINEER REGISTERED WITH THE STATE OF INDIANA, WHOSE LICENSE IS IN GOOD STANDING, HEREBY CERTIFY THAT THESE PLANS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION.

 CHELSEY R. GORDON, PE
 INDIANA LICENSED PROFESSIONAL ENGINEER NO. PEI2100019
 EXPIRES 7/31/2022

APPROVED FOR CONSTRUCTION BY: _____
 MICHAEL E. NOVOTNEY, PE
 COUNTY ENGINEER

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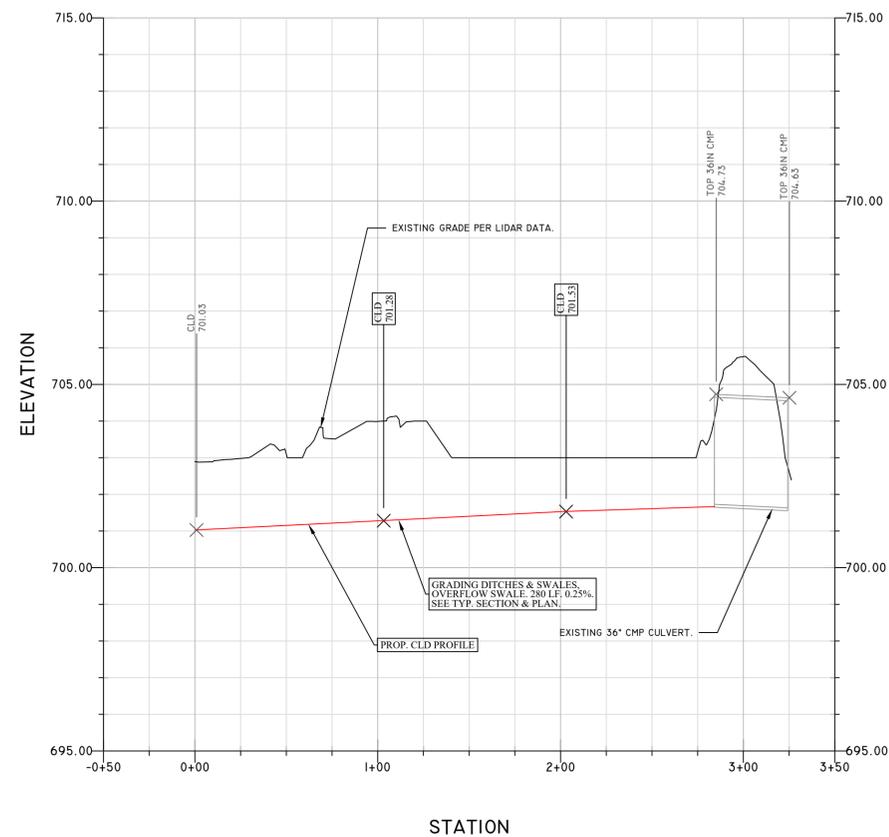
The Department of
**DEVELOPMENT &
STORM WATER
MANAGEMENT**
Porter County, Indiana

PROJECT:	SUNNYBROOKE SUBD. - S.W. SYSTEM IMPROVEMENTS
LOCATION:	NEAR CR 400 E & CR 1050 N
SHEET TITLE:	SHEET 2-PLAN

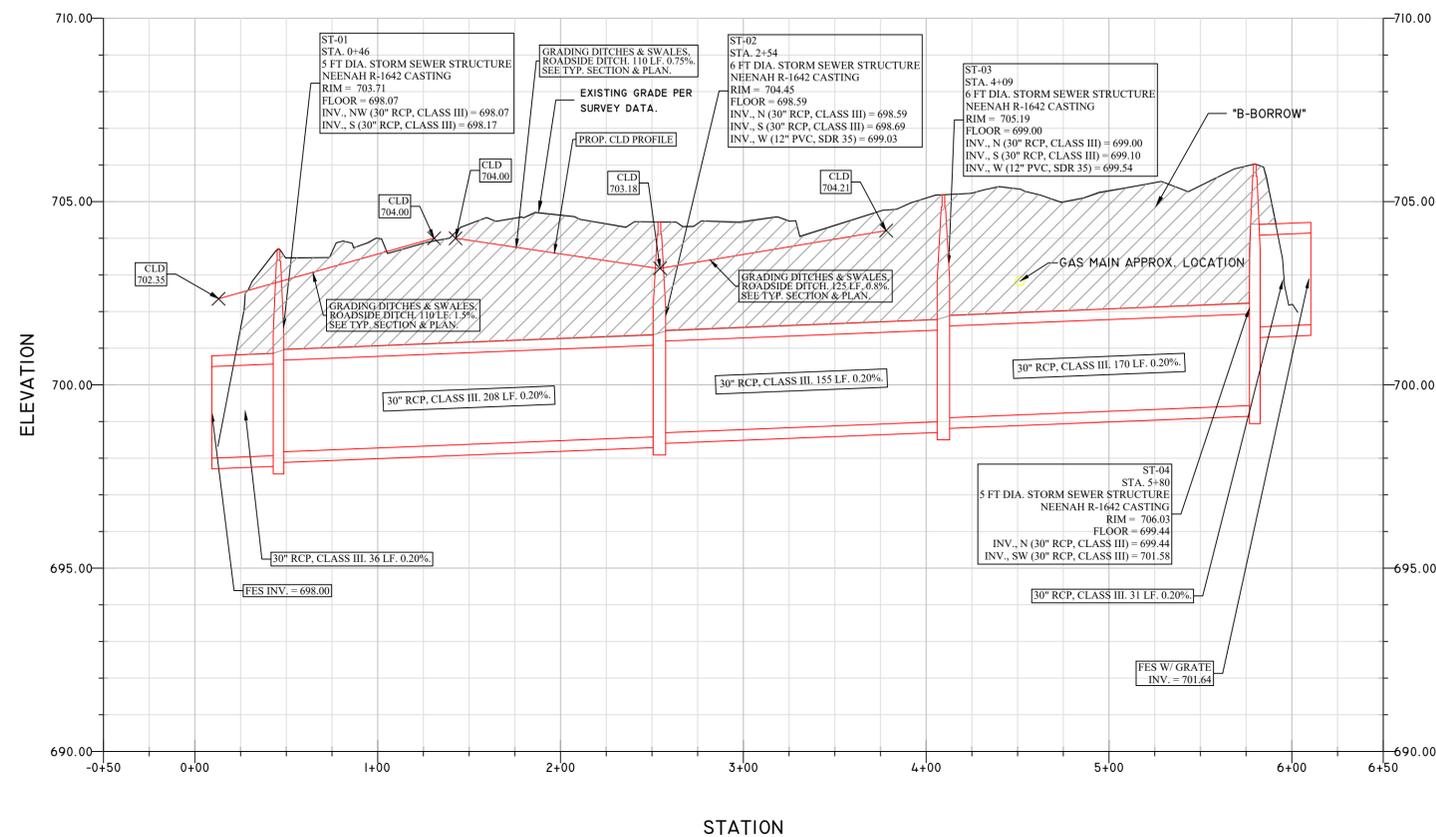
NOTES:
EXTEND GRADING DITCHES AND SWALES BEYOND SHOWN TOP OF BANK, INTO ADJ. DRAINAGE EASEMENT OR RIGHT-OF-WAY, WHERE NEEDED TO ACCOMMODATE MAX. 3:1 (H:V) SIDE SLOPES.

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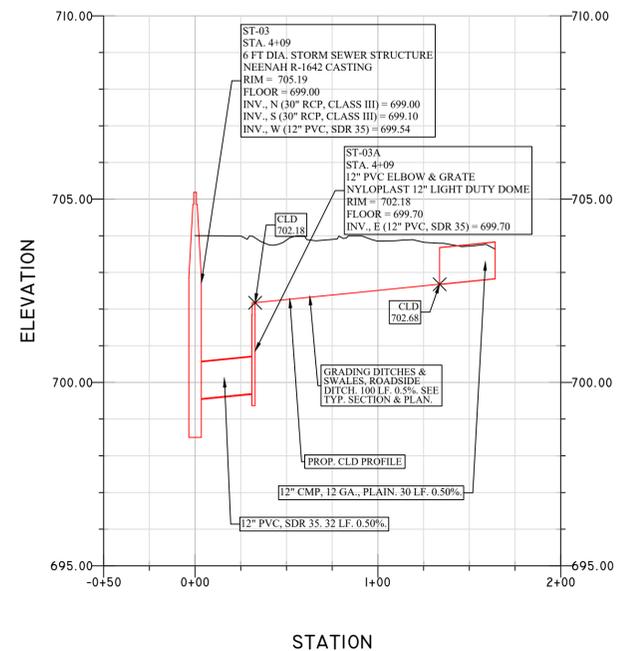
PROFILE VIEW OF OVERFLOW SWALE



PROFILE VIEW OF SUNNYBROOKE SUBD. SWM SYSTEM IMPROVEMENTS



PROFILE VIEW OF CR 1050 N ROADSIDE DITCH



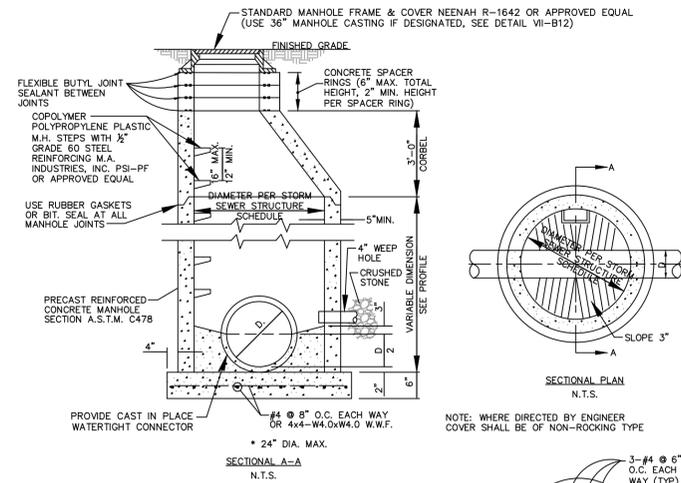
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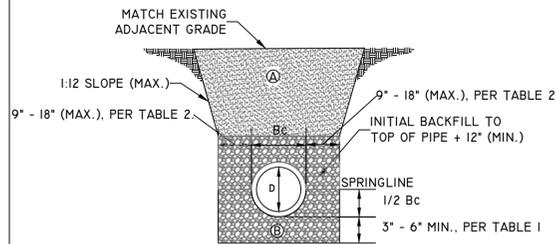


PROJECT:	SUNNYBROOKE SUBD. -SWM SYSTEM IMPROVEMENTS
LOCATION:	NEAR CR 400 E & CR 1050 N
SHEET TITLE:	SHEET 3-PROFILE

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STORM SEWER STRUCTURE



LEGEND

A UNDER PAVEMENT AND/OR WITHIN 2 FT OF PAVEMENT, TRENCH BACKFILL SHALL BE USED. ELSEWHERE, SUITABLE EXCAVATED MATERIAL MAY BE USED. INSTALL FINAL BACKFILL & COMPACT IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.

B CRUSHED STONE OR GRAVEL INDOT NO. 5, NO. 8, OR NO. 9 COARSE AGGREGATE WITH A 50% MECHANICAL CRUSH COUNT.

Bc PIPE OUTSIDE DIAMETER

NOTES:

I. ALL BEDDING & INITIAL BACKFILL SHALL BE INSTALLED IN 8" LIFTS (MAX.) & COMPACTED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS. BEDDING & INITIAL BACKFILL MATERIAL SHALL BE HAND PLACED AROUND THE HAUNCH AND SIDES OF THE PIPE TO ENSURE PROPER COMPACTION AND COMPLETE FILLING OF ALL VOIDS.

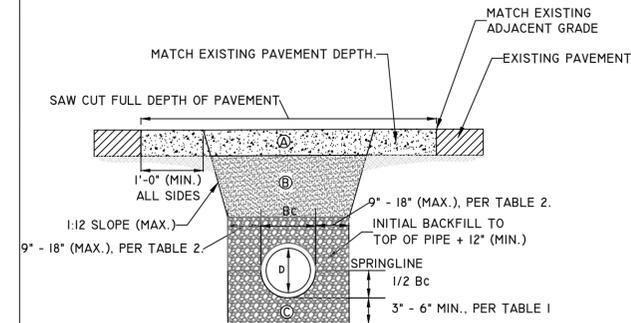
TABLE 1.

DEPTH OF BEDDING BELOW PIPE	
d	BEDDING (MIN.)
d ≤ 24 IN.	3 IN.
24 IN. ≤ d ≤ 60 IN.	4 IN.
d ≥ 60 IN.	6 IN.

TABLE 2.

WIDTH OF TRENCH, EACH SIDE OF PIPE	
d	WIDTH (MAX.)
d ≤ 24 IN.	9 IN.
24 IN. ≤ d ≤ 60 IN.	12 IN.
d ≥ 60 IN.	18 IN.

STORM SEWER BEDDING AND BACKFILL



LEGEND

A FULL DEPTH HMA REPAIR, SEE DETAIL.

B TRENCH BACKFILL, B BORROW OR CRUSHED STONE OR GRAVEL INDOT NO. 53 OR NO. 73 COARSE AGGREGATE. BACKFILL IN 8" LIFTS (MAX.) & COMPACT IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS.

C CRUSHED STONE OR GRAVEL INDOT NO. 5, NO. 8, OR NO. 9 COARSE AGGREGATE WITH A 50% MECHANICAL CRUSH COUNT.

Bc PIPE OUTSIDE DIAMETER

NOTES:

I. ALL BEDDING, INITIAL BACKFILL, & FINAL BACKFILL SHALL BE INSTALLED IN 8" LIFTS (MAX.) & COMPACTED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS. BEDDING & INITIAL BACKFILL MATERIAL SHALL BE HAND PLACED AROUND THE HAUNCH AND SIDES OF THE PIPE TO ENSURE PROPER COMPACTION AND COMPLETE FILLING OF ALL VOIDS.

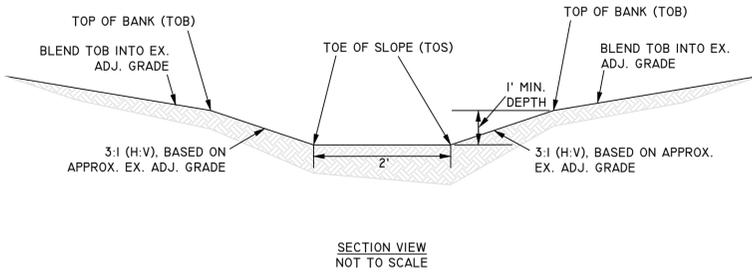
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ROAD CUT & REPAIR



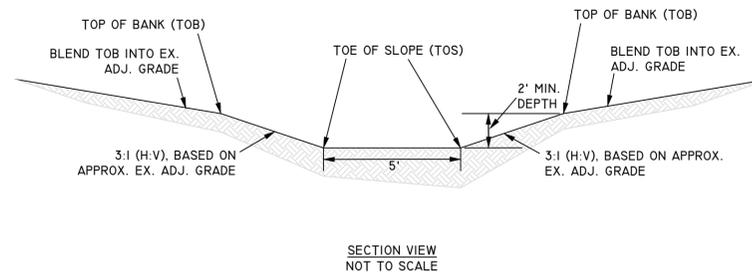
NOTES:

I. RESTORE DISTURBED AREA AS FOLLOWS:

A. WITHIN SWALE (TOB TO TOB): RESTORE DISTURBED AREA WITH TOPSOIL AND/OR GRASS SEED & EROSION CONTROL BLANKET (NAG S75BN).

B. OTHER AREAS: RESTORE DISTURBED AREA WITH TOPSOIL AND/OR GRASS SEED & STRAW MULCH.

GRADING DITCHES & SWALES, ROADSIDE DITCH



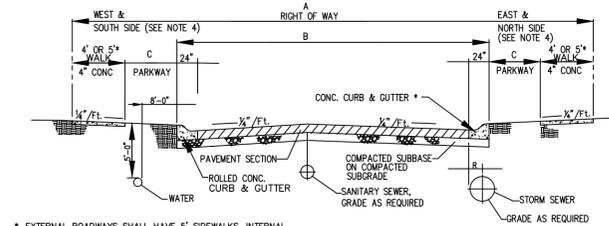
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B. OTHER AREAS: RESTORE DISTURBED AREA WITH TOPSOIL AND/OR GRASS SEED & STRAW MULCH.

GRADING DITCHES & SWALES, OVERFLOW SWALE



* EXTERNAL ROADWAYS SHALL HAVE 5' SIDEWALKS. INTERNAL ROADWAYS SHALL HAVE 4' SIDEWALKS UNLESS IT IS PART OF A MAJOR PATHWAY OR PEDESTRIAN NETWORK.

CLASSIFICATION	MIN. GRADE	MAX. GRADE	MIN. SIGHT DISTANCE
ARTERIAL	0.5%	6.0%	500'
COLLECTOR STREET	0.5%	6.0%	300'
LOCAL STREET, BOULEVARD	0.5%	6.0%	150'
ALLEY	0.5%	6.0%	-

* OR CALCULATED STOPPING SIGHT DISTANCE PER AASHTO IF GREATER

CLASSIFICATION	MINIMUM PAVEMENT THICKNESS			
	HMA SURFACE	HMA BINDER	AGG. BASE (SUBBASE)	GEOTEXT. RECD
ARTERIAL	1 1/2"	3"	20"	YES
COLLECTOR STREET	1 1/2"	3"	12"	YES
LOCAL STREET, BOULEVARD	1 1/2"	2 1/2"	10"	YES
ALLEY **	1 1/2"	2 1/2"	8"	YES

** NEW OR RECONSTRUCTED.

CLASSIFICATION	A	B	C	MIN. CURVE RADIUS	MIN. TANGENT	NOTES
ARTERIAL	80'	*	*	500**	100'	SIDEWALKS MAY BE REQUIRED*
COLLECTOR	80'	*	17.5'	300**	60'	SIDEWALKS REQUIRED
BOULEVARD (ONE WAY)	20'	0-11	200**	40'	40'	SIDEWALKS REQUIRED
LOCAL (RESIDENTIAL)	80'	30'	0-11	100**	40'	SIDEWALKS REQUIRED
ALLEY	16.5'	12'	N/A	N/A	N/A	NO SIDEWALK
FRONTAGE	40'	24'	*	100**	40'	SIDEWALKS MAY BE REQUIRED* 4' SHLDR., NO PARKING
FRONTAGE	40'	28'	*	100**	40'	SIDEWALKS MAY BE REQUIRED* 4' SHLDR., ONE SIDE PARKING

* PORTER COUNTY ENGINEERING DEPARTMENT DETERMINATION

** MINIMUM TANGENT OF 100' SHALL SEPARATE ALL REVERSE CURVES.

NOTES:

- UNDERDRAINS SHALL BE PROVIDED AT LOW POINTS.
- INDUSTRIAL STREETS SHALL HAVE MINIMUM ROADWAY DIMENSIONS AS LOCAL STREETS. MINIMUM PAVEMENT SECTION SHALL BE SAME AS LOCAL STREETS, BUT A THICKER SECTION SHALL BE USED IF TRAFFIC NEEDS AND SOIL CONDITIONS WARRANT. DESIGN AND CALCULATIONS SHALL BE PROVIDED BY REGISTERED PROFESSIONAL ENGINEER.
- FRONTAGE ROADS SHALL HAVE MINIMUM R/W WIDTH OF 40'.
- VARIATIONS TO THE EAST, WEST, NORTH, SOUTH RULE MAY BE APPROVED ON CASE-BY-CASE BASIS.
- HOUSE TELEPHONE DROPS SHALL BE 24" DEEP.

FULL DEPTH HMA REPAIR

NO.	DATE	REVISION
1	3/16/21	FOR BIDDING

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CHECKED:	MEN
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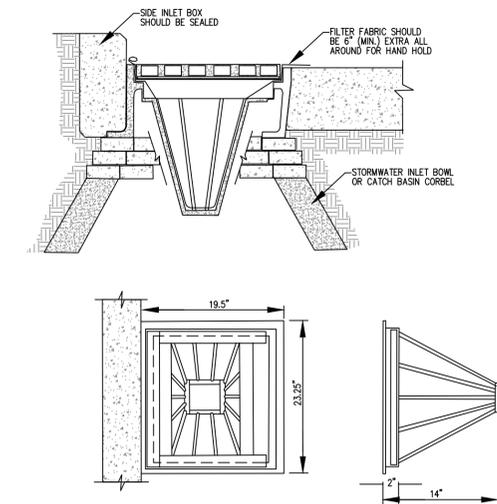
PROJECT: SUNNYBROOKE SUBD. -SWM SYSTEM IMPROVEMENTS

LOCATION: NEAR CR 400 E & CR 1050 N

SHEET TITLE: SHEET 4-DETAILS

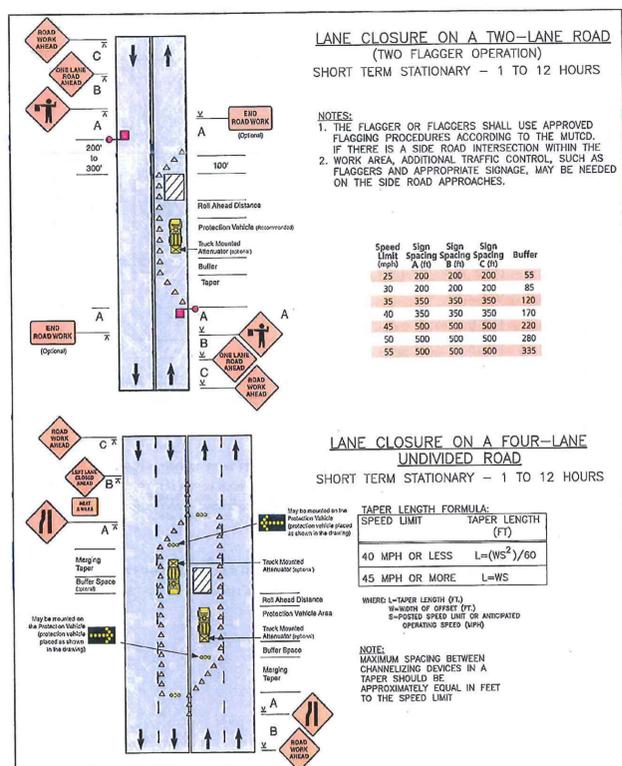
SHEET NO.:

STREAM DIVERSION STORM SEWER STRUCTURE SCHEDULE									
STRUCTURE NO.	STATION	DIAMETER (FT)	NORTHING	EASTING	RIM ELEV.	FLOOR ELEV.	PIPE OUT, INVERT(S)	PIPE IN, INVERT(S) AND ANGLE(S) (FROM OUT)	CASTINGS
ST-01	0+46	5	2308751.53	2978381.29	703.71	698.07	NW 30° RCP, CLASS III 698.07	S 30° RCP, CLASS III 698.17 215°	NEENAH R-1642 CASTING
ST-02	2+54	6	2308543.19	2978383.16	704.45	698.59	N 30° RCP, CLASS III 698.59	S 30° RCP, CLASS III 698.69, 180° W 12° PVC, SDR 35 699.03, 270°	NEENAH R-1642 CASTING
ST-02A	2+54	1	2308543.07	2978373.51	703.18	698.95	E 12° PVC, SDR 35 698.95	N/A	NYLOPLAST 12" LIGHT DUTY DOME
ST-03	4+09	6	2308387.85	2978384.58	705.19	699.00	N 30° RCP, CLASS III 699.00	S 30° RCP, CLASS III 699.10, 180° W 12° PVC, SDR 35 699.54, 270°	NEENAH R-1642 CASTING
ST-03A	4+09	1	2308387.79	2978352.64	702.18	699.70	E 12° PVC, SDR 35 699.70	N/A	NYLOPLAST 12" LIGHT DUTY DOME
ST-04	5+80	5	2308217.58	2978388.61	706.03	699.44	N 30° RCP, CLASS III 699.44	SW 30° RCP, CLASS III 701.58, 233°	NEENAH R-1642 CASTING



- PURPOSE:** 1. TO PREVENT EXCESSIVE SEDIMENT FROM ENTERING STORM SEWERS AT CURB INLETS, ALLOWING FULL USE OF THE STORM DRAIN SYSTEM DURING THE CONSTRUCTION PERIOD.
- REQUIREMENTS:** 1. BASKET: FABRICATED METAL WITH TOP WIDTH-LENGTH DIMENSIONS SUCH THAT THE BASKET FITS INTO THE INLET WITHOUT CAPS, AND LINE IT WITH GEOTEXTILE FABRIC FOR FILTRATION.
- INSTALLATION:** 1. INSTALL BASKET CURB INLET PROTECTIONS AS SOON AS INLET BOXES ARE INSTALLED IN A NEW DEVELOPMENT OR BEFORE LAND DISTURBING ACTIVITIES BEGON IN A STABILIZED AREA.
2. REMOVE THE GRATE AND PLACE THE BASKET IN THE INLET.
3. CUT AND INSTALL A PIECE OF FILTER FABRIC LARGE ENOUGH TO LINE THE INSIDE OF THE BASKET AND EXTEND AT LEAST 6" BEYOND THE FRAME.
4. REPLACE THE INLET GRATE WHICH ALSO SERVES TO ANCHOR THE FABRIC.
5. FOLLOW INSTRUCTIONS AS PROVIDED BY MANUFACTURER.
- MAINTENANCE:** 1. INSPECT WITHIN 24 HOURS AFTER EACH STORM EVENT.
2. REMOVE BUILT-UP SEDIMENT AND REPLACE THE GEOTEXTILE FABRIC AFTER EACH STORM EVENT.
3. REPLACE BASKET EVERY SIX (6) MONTHS.
4. REPLACE BASKET AFTER ANY OIL, GASOLINE OR SOLVENT SPILL, OR IF THERE IS A HOLE IN THE FABRIC.

CATCH BASIN INSERT INLET PROTECTION



LANE CLOSURE ON A TWO-LANE ROAD (TWO FLAGGER OPERATION) SHORT TERM STATIONARY - 1 TO 12 HOURS

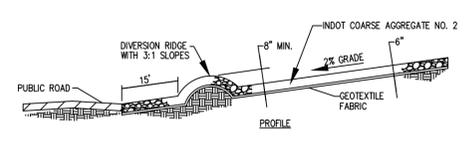
NOTES:
1. THE FLAGGER OR FLAGGERS SHALL USE APPROVED FLAGGING PROCEDURES ACCORDING TO THE MUTCD. IF THERE IS A SIDE ROAD INTERSECTION WITHIN THE WORK AREA, ADDITIONAL TRAFFIC CONTROL, SUCH AS FLAGGERS AND APPROPRIATE SIGNAGE, MAY BE NEEDED ON THE SIDE ROAD APPROACHES.

LANE CLOSURE ON A FOUR-LANE UNDIVIDED ROAD SHORT TERM STATIONARY - 1 TO 12 HOURS

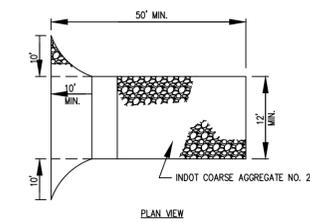
TAPER LENGTH FORMULA:
SPEED LIMIT TAPER LENGTH (FT)
40 MPH OR LESS $L = (WS^2)/60$
45 MPH OR MORE $L = WS$

NOTE: MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT

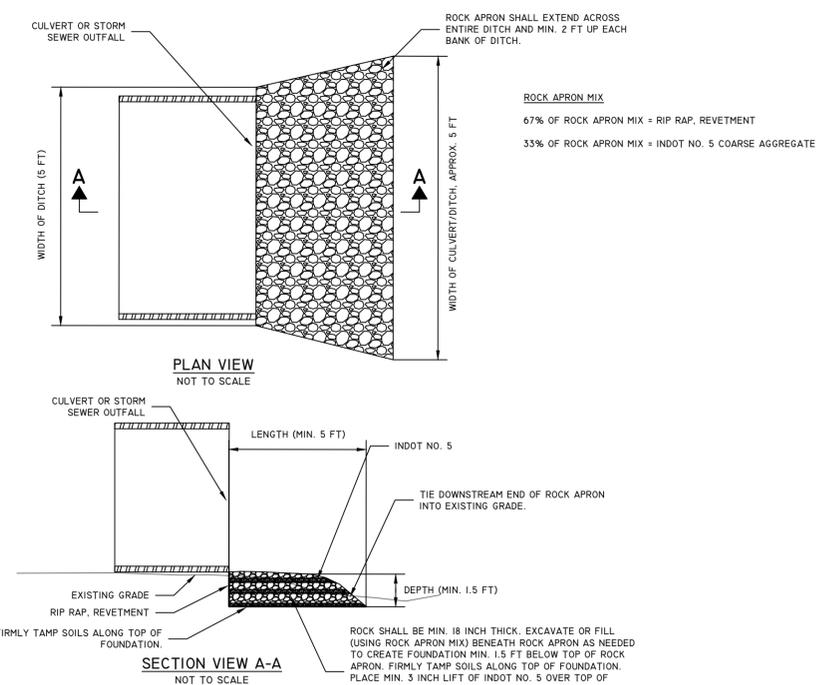
- REQUIREMENTS:** MATERIAL: 1-2.5 IN. WASHED STONE (INDOT CA NO. 2) OVER A STABLE FOUNDATION. THICKNESS: 6 IN. MINIMUM. WIDTH: 12 FT. MINIMUM OR FULL WIDTH OF ENTRANCE/EXIT ROADWAY, WHICHEVER IS GREATER. LENGTH: 50 FT. MINIMUM. THE LENGTH CAN BE SHORTER FOR SMALL SITES SUCH AS FOR AN INDIVIDUAL HOME, BUT SHALL BE OF SUFFICIENT LENGTH TO PREVENT TRACKING. WASHING FACILITY (OPTIONAL): LEVEL AREA WITH 3 IN. WASHED STONE MINIMUM OR A COMMERCIAL RACK, AND WASTE WATER DIVERTED TO A SEDIMENT TRAP OR BASIN. GEOTEXTILE FABRIC UNDERLAYER: REQUIRED TO PROVIDE GREATER BEARING STRENGTH.
- INSTALLATION:** 1. AVOID LOCATING ON STEEP SLOPES OR AT CURVES IN PUBLIC ROADS.
2. REMOVE ALL VEGETATION AND OTHER OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA, AND GRADE AND CROWN FOR POSITIVE DRAINAGE.
3. IF SLOPE TOWARDS THE ROAD EXCEEDS 2%, CONSTRUCT A 6-8 IN.-HIGH WATER BAR (RIDGE) WITH 3:1 SIDE SLOPES ACROSS THE FOUNDATION AREA ABOUT 15 FT. FROM THE ENTRANCE TO DIVERT RUNOFF AWAY FROM THE ROAD (SEE PROFILE).
4. INSTALL PIPE UNDER THE PAD IF NEEDED TO MAINTAIN PROPER PUBLIC ROAD DRAINAGE.
5. PLACE STONE TO DIMENSIONS AND GRADE SHOWN IN THE EROSION/SEDIMENT CONTROL PLAN, LEAVING THE SURFACE SMOOTH AND SLOPED FOR DRAINAGE.
6. DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE STONE PAD TO A SEDIMENT TRAP OR BASIN.



- MAINTENANCE:**
- INSPECT ENTRANCE PAD, SEDIMENT DISPOSAL AREA, AND ALL OTHER EROSION CONTROL MEASURES WEEKLY AND AFTER STORM EVENTS OR HEAVY USE. REQUIRED REPAIRS SHOULD BE COMPLETED IMMEDIATELY.
 - RESHAPE PAD AS NEEDED FOR DRAINAGE AND RUNOFF CONTROL.
 - TOPRESS WITH CLEAN STONE AS NEEDED.
 - IMMEDIATELY REMOVE MUD AND SEDIMENT TRACKED OR WASHED ONTO PUBLIC ROADS BY BRUSHING OR SWEEPING. FLUSHING SHOULD ONLY BE USED IF THE WATER IS CONVEYED INTO A SEDIMENT TRAP OR BASIN.
 - REPAIR ANY BROKEN ROAD PAVEMENT IMMEDIATELY.



TEMPORARY CONSTRUCTION ENTRANCE



- INSTALLATION:**
- EXCAVATION OR FILL (USING ROCK APRON MIX) BENEATH ROCK APRON AS NEEDED TO CREATE FOUNDATION MIN. 1.5 FT BELOW TOP OF APRON.
 - FIRMLY TAMP ALONG TOP OF FOUNDATION.
 - PLACE MIN. 5 INCH LIFT OF INDOT NO. 5 OVER TOP OF FOUNDATION.
 - PLACE ALTERNATING LIFTS OF RIP RAP, REVETMENT, INDOT NO. 5. SHALL FILL VOID SPACE BETWEEN LARGER STONE IN RIP RAP, REVETMENT.
 - RE-SHAPE BANKS OF DITCH ABOVE ROCK APRON TO 2:1 OR FLATTER (TYP.). BLEND INTO ADJ. GRADE.
 - RESTORE DISTURBED AREAS ON AND ABOVE RE-SHAPED BANKS OF DITCH PER DITCH TYPICAL SECTION AND TECHNICAL SPECIFICATIONS.

ROCK APRON

BY:	CRG
REVISION:	FOR BIDDING
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PROJECT: SUNNYBROOKE SUBD. -SWM SYSTEM IMPROVEMENTS

LOCATION: NEAR CR 400 E & CR 1050 N

SHEET TITLE: SHEET 5-DETAILS AND STORM SEWER STRUCTURE SCHEDULE

PORTER COUNTY, INDIANA

STANDARD DRAWINGS

MAINTENANCE OF TRAFFIC SHE. NO. VIII-1

5 of 6

