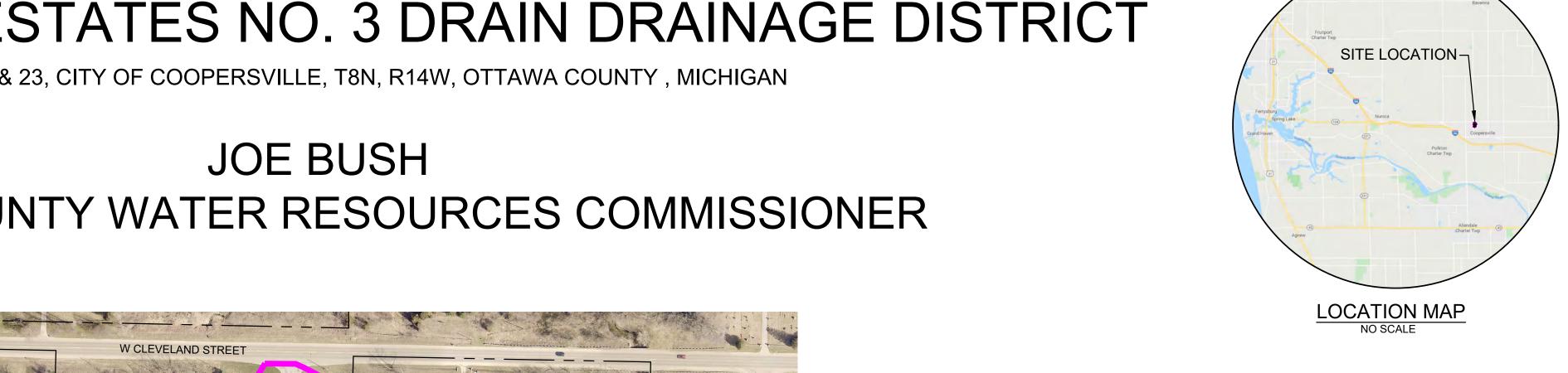


MEADOW GREEN ESTATES NO. 3 DRAIN DRAINAGE DISTRICT

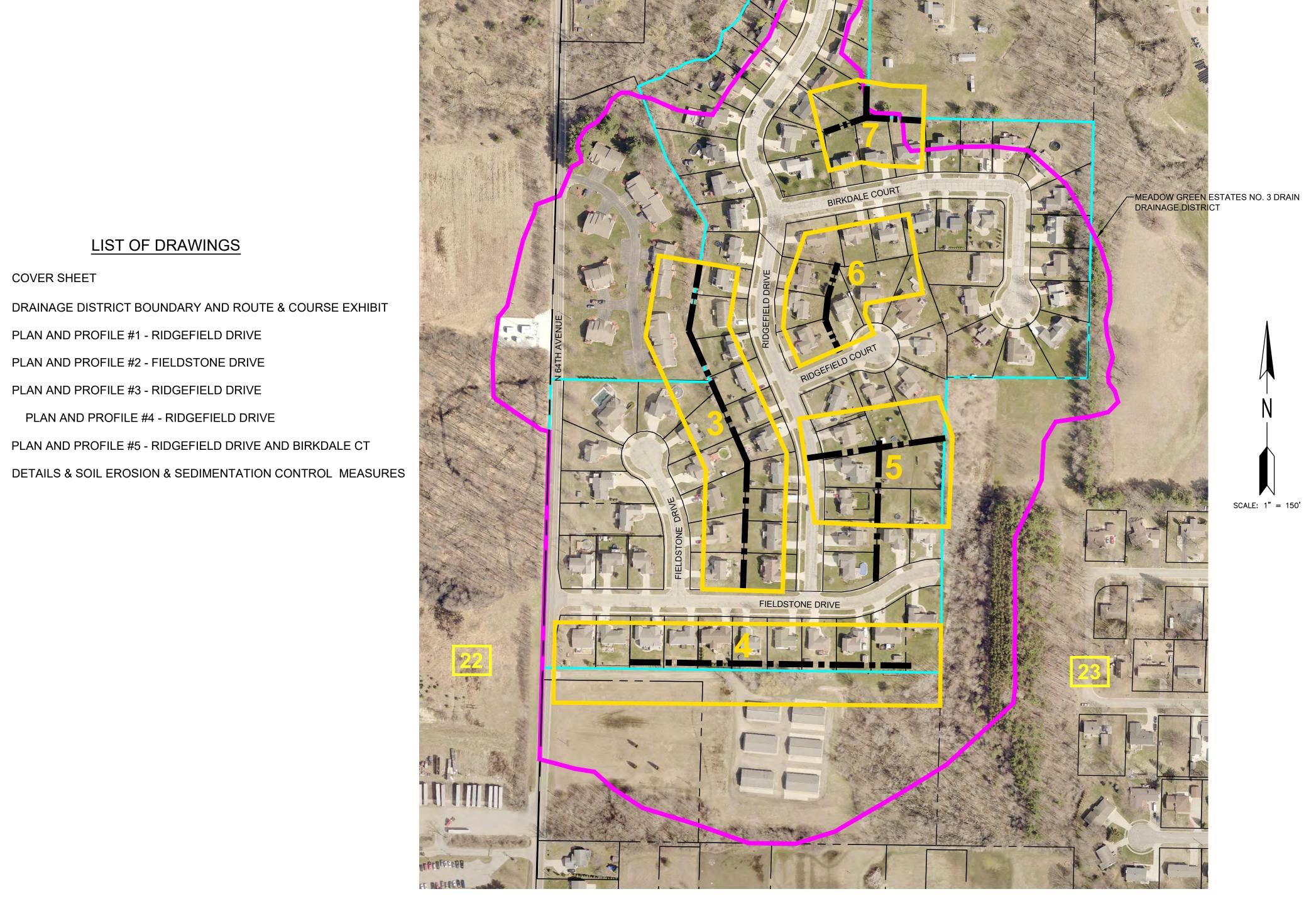
SECTIONS 22 & 23, CITY OF COOPERSVILLE, T8N, R14W, OTTAWA COUNTY, MICHIGAN

JOE BUSH OTTAWA COUNTY WATER RESOURCES COMMISSIONER



LIST OF DRAWINGS

- DRAINAGE DISTRICT BOUNDARY AND ROUTE & COURSE EXHIBIT
- 3 PLAN AND PROFILE #1 RIDGEFIELD DRIVE
- PLAN AND PROFILE #2 FIELDSTONE DRIVE
- PLAN AND PROFILE #3 RIDGEFIELD DRIVE
- PLAN AND PROFILE #4 RIDGEFIELD DRIVE
- PLAN AND PROFILE #5 RIDGEFIELD DRIVE AND BIRKDALE CT



LIST OF CONTACTS

WATER RESOURCES COMMISSIONER 12220 FILLMORE STREET

waterresourcescommissioner@miottawa.org

14110 LAKESHORE DRIVE GRAND HAVEN, MI 49417

4063 GRAND OAK DRIVE, STE A109

3500 PATTERSON AVE SE, SUITE A

ELECTRIC
CONSUMERS ENERGY
ATTN: RICHARD HOULTEMAN (231)-323-2622 4000 CLAY AVENUE SW

LEGEND



RYAN C McENHILL, P.E. #56096

DATE

COVER SHEET

JOE BUSH

PROJECT NO. 19045

SHEET NO.



MEADOW GREEN ESTATES NO. 3 DRAIN DRAINAGE DISTRICT

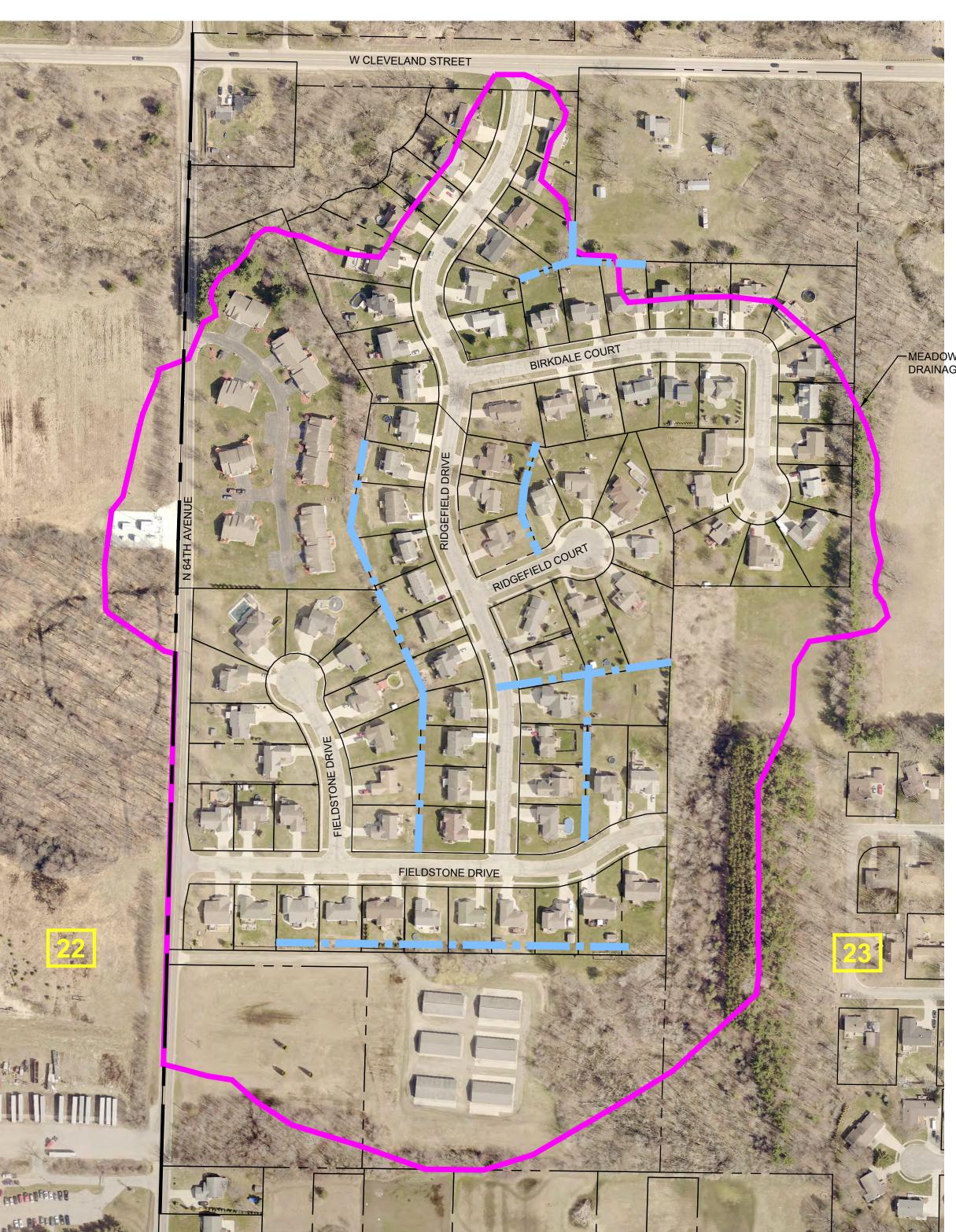
SECTIONS 22 & 23, CITY OF COOPERSVILLE, T8N, R14W, OTTAWA COUNTY, MICHIGAN

JOE BUSH OTTAWA COUNTY WATER RESOURCES COMMISSIONER

SCALE: 1" = 150'







DRAINAGE DISTRICT BOUNDARY DESCRIPTION

FEET, THENCE N 1°22' W 87 FEET, THENCE N 7°20' E 109 FEET, THENCE N 38°4' E 36 FEET, THENCE N 13°19' E 136 FEET, THENCE N 14°20' E 33 FEET, THENCE N 22°31' E 73 FEET, THENCE N 13°12' E 21 FEET, THENCE EAST A DISTANCE OF 52 FEET MORE OR LESS TO THE POINT OF BEGINNING.

CONTAINING 51.4 ACRES MORE OR LESS.

THE BASIS OF THIS DESCRIPTION WAS THE OTTAWA COUNTY GIS MAPPING SYSTEM AND IS SUBJECT TO ITS ACCURACY.

PREPARED BY: ENG., INC. DATED: 1/15/20

ROUTE & COURSE DESCRIPTION

BEGINNING AT A POINT 253 FEET EAST AND 292 FEET SOUTH OF THE NORTHWEST CORNER OF SAID SECTION 23, TOWNSHIP 8 NORTH, RANGE 14 WEST, CITY OF COOPERSVILLE, OTTAWA COUNTY, MICHIGAN, THENCE S 64°56' E 219 FEET, THENCE S 66°14' E 36 FEET, THENCE S 12°12' W 88 FEET, THENCE S 19°18' E 23 FEET, THENCE S 21°22' E 135 FEET, THENCE S 6°50' W 181 FEET, THENCE S 1°7' W 106 FEET, THENCE S 20°36' E 157 FEET, THENCE S 21°22' E 123 FEET, THENCE S 16°44' E 67 FEET, THENCE S 0°41' W 361 FEET TO THE POINT OF ENDING.

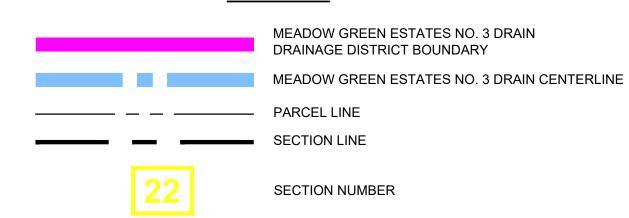
AND ALSO INCLUDING:

COMMENCING AT A POINT 14 FEET EAST AND 540 FEET SOUTH OF THE NORTHWEST CORNER OF SAID SECTION 23, THENCE S 57°50' E 176 FEET, THENCE S 10°13' E 89 FEET, THENCE S 1°24' E 268 FEET, THENCE S 1°6' E 50 FEET, THENCE S 0°8' E 161 FEET, THENCE S 29°30' E 87 FEET, THENCE S 16°34' E 179 FEET, THENCE S 2°26' E 156 FEET TO THE POINT OF ENDING.

THE BASIS OF THIS DESCRIPTION WAS THE OTTAWA COUNTY GIS MAPPING SYSTEM AND IS SUBJECT TO ITS ACCURACY.

PREPARED BY: ENG., INC. DATED: 1/23/20

LEGEND



DRAINAGE DISTRICT BOUNDARY AND ROUTE & COURSE EXHIBIT



JOE BUSH

PROJECT NO.

19045

SHEET NO.

BENCHMARK #1: ELEV 647.76 ENE FLANGE BOLT ON HYDRANT AT SE CORNER OF RIDGEFIELD DR AND RIDGEFIELD CT



THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND

LEGEND

= PROPERTY LINE OR R.O.W. LINE ---- = EDGE OF PAVEMENT

____ X ___ = FENCE

ا سلا مالا الله = WETLANDS (AS MARKED BY OTHERS)

= EXISTING SPOT ELEVATION = EXISTING CONTOUR ELEVATION = EDGE OF WOODS

——○——○——○— = EXISTING GUARDRAIL

= DECIDUOUS TREE

= CONIFEROUS TREE = BUSH

= STUMP — GAS — GAS — EXISTING GAS LINE

----= EXISTING STORM SEWER

- = EXISTING SANITARY SEWER

= EXISTING MANHOLE

= EXISTING STORM CATCH BASIN = EXISTING WELL LOCATION

= EXISTING WATER VALVE

= EXISTING CURB STOP / METER = EXISTING CATCH BASIN

= BENCH MARK LOCATION

= EXISTING SIGN

= EXISTING MAILBOX = EXISTING LIGHT POLE

= EXISTING GUY ANCHOR

= EXISTING UTILITY POLE

= EXISTING TELEPHONE PEDESTAL = EXISTING DRAIN Q

■ ■ ■ ■ PROPOSED DRAIN Ç

= PROPOSED TOP OF BANK

La--- = SOIL TYPE

= TEMPORARY SOIL EROSION CONTROL MEASURE

= PERMANENT SOIL EROSION CONTROL MEASURE

OR RESTORATION DETAIL --- = EXISTING DRAINAGE EASEMENT

----- = PROPOSED DRAINAGE EASEMENT

= SUMP LEAD

SCALE:

HORIZONTAL 1" = 40' VERTICAL = 1" =4'

RIDGEFIELD CT (66' R.O.W.)

CONSTRUCTION NOTES:

1+00

SAW CUT AND REMOVE HMA ROADWAY AND DRIVEWAYS ONLY AT LIMITS OF CONSTRUCTION AS STAKED BY THE ENGINEER. PAVEMENT NOT SPECIFIED FOR REMOVAL AND DAMAGED BY WORK OPERATIONS SHALL BE REPAIRED AND

COSTS BORNE BY THE CONTRACTOR VERIFY ELEVATIONS OF EXISTING UTILITIES PRIOR TO CONSTRUCTION OF STORM SEWER WHERE CONFLICTS MAY EXIST. CLEARING THAT INCLUDES CUTTING AN REMOVAL OF TREES, BRUSH AND SHRUBS UP TO 6 INCHES AS MEASURED AT

BREAST HEIGHT (DBH) SHALL BE CONSIDERED AS INCLUDED WITH OTHER RELATED PAY ITEMS. THE SIZE, TYPE AND LOCATION OF THE EXISTING UTILITY INFORMATION SHOWN ON THIS DRAWING ARE FROM RECORD DRAWINGS MADE AVAILABLE TO ENG. THIS PLAN IS NOT INTENDED FRO THE PURPOSE OF FIELD LOCATING UTILITIES.

NOTIFY MISS DIG FOR ACTUAL FIELD LOCATIONS OF UNDERGROUND UTILITIES. ALL SPOIL MATERIALS, INCLUDING HMA AND CONCRETE, SHALL BE REMOVED FROM THE SITE IMMEDIATELY. NO

STOCKPILING OF SPOIL MATERIALS WILL BE ALLOWED UNLESS APPROVED IN WRITING BY THE ENGINEER. ALL NEW CONNECTIONS INTO EXISTING STRUCTURES SHALL BE PROFESSIONALLY CORED

2+00

3+00

INCLUDED WITH THE PAY ITEM BEING INSTALLED. EXISTING TREES AND SHRUBS SHOWN AS BEING REMOVED AND/OR SALVAGED ON THE DRAWINGS, SHALL BE COORDINATED WITH EACH HOMEOWNER. IF THE HOMEOWNER WISHES TO SALVAGE THE EXISTING TREE AND/OR SHRUBS, THE CONTRACTOR SHALL SALVAGE EACH FOR THE HOMEOWNERS REPLANTING OUTSIDE OF THE EASEMENT IF THEY DO NOT WISH TO SALVAGE, THE CONTRACTOR SHALL DISPOSE OF THEM.

367 LF INFILTRATION SWALE

4+00

REMOVAL AND REINSTALLATION OF LANDSCAPING ITEMS AS NOTED ON THE DRAWINGS SHALL BE CONSIDERED AS

	SOIL TYPES AND ABBREVIATIONS
BeB	Belding sandy loam, 0 to 2 percent slopes
NeC	Onekama loam, Lake Michigan Lobe, 6 to 12 percent slopes
RcB	Richter sandy loam, 2 to 6 percent slopes
SnkabB	Spinks-Fern complex, 2 to 6 percent slopes

WORK ITEM	LOCATION	QUANTITY
FENCE REMOVAL & REPLACEMENT	SEE PLAN VIEW	170 LF
TREE REMOVAL, 6-18 INCH DIA.	WHERE NEEDED	2 EA
6-INCH SDR 26 PVC STORM SEWER	SEE PLAN VIEW	90 LF
12-INCH DUAL WALL PERF HDPE STORM SEWER	STA 2+01 TO 4+19 STA 4+19 TO 5+69	367 LF
2-FOOT DIA DRAINAGE STRUCTURE (W/ 2' SUMP)	STA 2+01 STA 5+69	2 EA
DR STRUCTURE TAP, 12 INCH	STA 4+19	2 EA

INFILTRATION SWALE

SURFACE RESTORATION

7+00

EX PVT. EASEMENT FOR

OTTAWA CO. WATER

STA 2+01 TO STA 5+69

EASEMENT LIMITS

8+00

9+00

9+50.02

DRAINAGE PURPOSES TO

RESOURCES COMMISSIONER

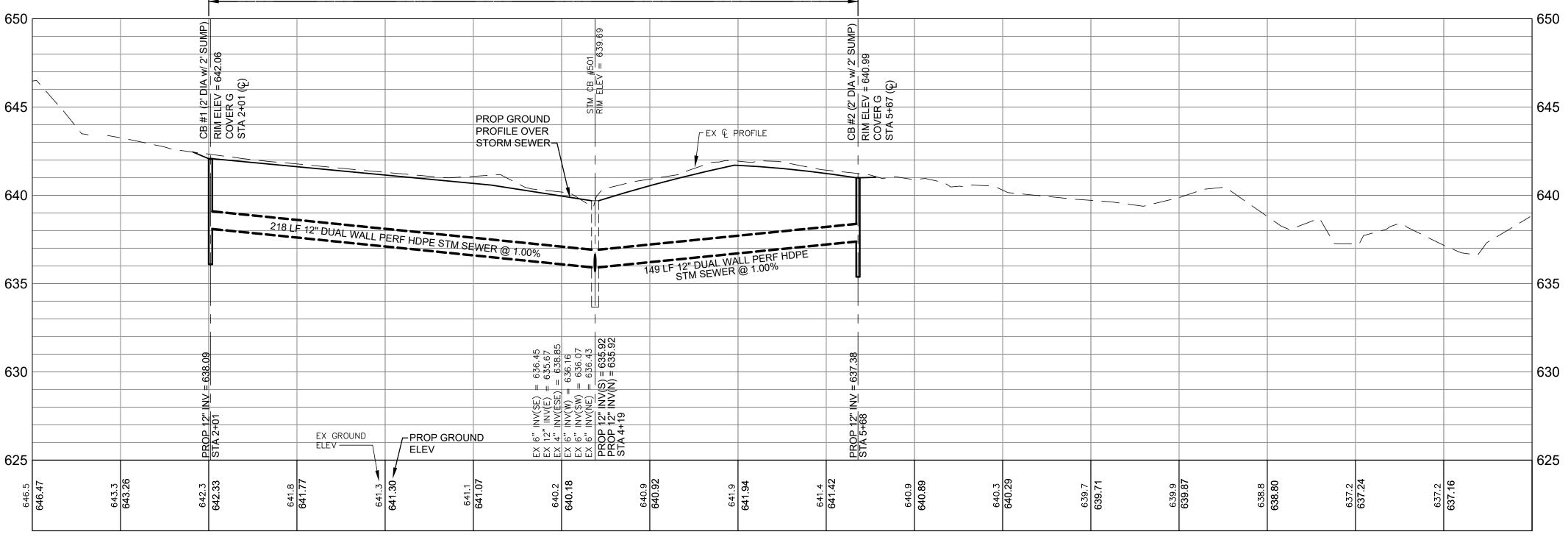
367 LFT

900 SYD

When bare soil is exposed, temporarily or permanently, to erosive forces from wind and or water on flat areas, mild slopes, grassed waterways and spillways, diversion ditches and dikes, borrow and stockpile areas, and spoil piles. MULCH ALL On flat areas, mild slopes, grassed waterways and spillways, diversion ditches and dikes, borrow and stockpile areas, and sppiles when areas are subject to raindrop impact, and erosive forces from wind or water. Protects areas which cannot otherwise be protected, but increases runoff volume and velocity regular surface will help slow velocity Keeps high velocity runoff on paved areas from leaving paved surface Collects and conducts runoff to enclosed drainage system or prepared drainageway Where surface water accumulates and needs an outlet or an open drain discharges to a stream or drain at erosive velocities. Within an enclosed drain system to provide an inlet and a sump Remove sediment from pavement minimizing non-poin

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES





5+00

6+00



KEY PLAN
NO SCALE

PLAN AND PROFILE #1 -RIDGEFIELD DRIVE

JOE BUSH PROJECT NO.

19045

COUNTY

OTTAWA

DISTRIC

REEN CITY OF CC

AD

ME,

COMMISSIONER

SHEET NO.

SOIL TYPES AND ABBREVIATIONS

Richter sandy loam, 2 to 6 percent slopes

Spinks-Fern complex, 2 to 6 percent slopes

RcB

SnkabB

Know what's **below**. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THI EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

LEGEND

= PROPERTY LINE OR R.O.W. LINE = EDGE OF PAVEMENT

_____ X ___ = FENCE — → → → → = EXISTING GUARDRAIL

BENCHMARK #2:

ELEV 646.84

ا علله علله = WETLANDS (AS MARKED BY OTHERS) = EXISTING SPOT ELEVATION

= EXISTING CONTOUR ELEVATION = EDGE OF WOODS

= DECIDUOUS TREE = CONIFEROUS TREE

= BUSH = STUMP

— GAS — GAS — = EXISTING GAS LINE ----= EXISTING STORM SEWER

> = EXISTING MANHOLE = EXISTING STORM CATCH BASIN

---- = EXISTING SANITARY SEWER

= EXISTING WELL LOCATION

= EXISTING WATER VALVE = EXISTING CURB STOP / METER

= EXISTING CATCH BASIN = BENCH MARK LOCATION

> = EXISTING SIGN = EXISTING MAILBOX

= EXISTING LIGHT POLE = EXISTING GUY ANCHOR

> = EXISTING UTILITY POLE = EXISTING TELEPHONE PEDESTAL

——— = EXISTING DRAIN ℚ

La--- = SOIL TYPE

= TEMPORARY SOIL EROSION CONTROL MEASURE

= PERMANENT SOIL EROSION CONTROL MEASURE OR RESTORATION DETAIL

--- = EXISTING DRAINAGE EASEMENT

= PROPOSED DRAINAGE EASEMENT

SCALE: HORIZONTAL 1" = 40' VERTICAL = 1" =4'

PLAN AND PROFILE #2 -FIELDSTONE DRIVE

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES

QUANTITY

230 LF

60 LF

2 EA

30 LF

1000 SYD

9+00

1	SEEDING SEEDING	When bare soil is exposed, temporarily or permanently, to erosive forces from wind and or water on flat areas, mild slopes, grassed waterways and spillways, diversion ditches and dikes, borrow and stockpile areas, and spoil piles.
2	MULCH	On flat areas, mild slopes, grassed waterways and spillways, diversion ditches and dikes, borrow and stockpile areas, and spoil piles when areas are subject to raindrop impact, and erosive forces from wind or water.
15	Paving	Protects areas which cannot otherwise be protected, but increases runoff volume and velocity Irregular surface will help slow velocity
16	Curb and Gutter	Keeps high velocity runoff on paved areas from leaving paved surface Collects and conducts runoff to enclosed drainage system or prepared drainageway
41	CATCH BASIN	Where surface water accumulates and needs an outlet or an open drain discharges to a stream or drain at erosive velocities. Within an enclosed drain system to provide an inlet and a sump
56	Street Sweeping	Remove sediment from pavement minimizing non-point Source pollution.
61	SILT FENCE	As a temporary measure used to capture sediment from sheet flow. May also divert small volumes of sheet flow to protected outlets.

T = TEMPORARY MEASURE

10+00

8-INCH DUAL WALL PERF HDPE STORM SEWER STA 9+70 TO 10+52 80 LF 12-INCH DUAL WALL PERF HDPE STORM STA 2+06 TO 4+63 426 LF STA 8+01 TO 9+70 2-FOOT DIA DRAINAGE STRUCTURE (W/ 2' SUMP) STA 2+06 1 EA DRAINAGE STRUCTURE TAP, 8 INCH 1 EA DRAINAGE STRUCTURE TAP, 12 INCH STA 4+63 1 EA STA 2+06 TO 4+63 INFILTRATION SWALE STA 8+01 TO 10+57

8+00

LOCATION

WHERE ENCOUNTERED

SEE PLAN VIEW

SEE PLAN VIEW

WHERE NEEDED

EASEMENT LIMITS

WORK ITEM

STORM SEWER REMOVAL, LESS THAN 36"

FENCE REMOVAL & REPLACEMENT

6-INCH SDR26 PVC STORM SEWER

TREE REMOVAL, 6-18 INCH DIA.

SURFACE RESTORATION

7+00

	STOCKPILING OF SPOIL MATERIALS WILL BE ALLOWED UNLESS APPROVED IN WRITING BY THE ENGINEER.	SnkabB	Spinks-Fern complex, 2 to 6 percent slopes
6.		_	T 1 1 20 1 1
7.	REMOVAL AND REINSTALLATION OF LANDSCAPING ITEMS AS NOTED ON THE DRAWINGS SHALL BE CONSIDERED AS INCLUDED WITH THE PAY ITEM BEING INSTALLED.	Tc	Toledo silty clay loam
8.	EXISTING TREES AND SHRUBS SHOWN AS BEING REMOVED AND/OR SALVAGED ON THE DRAWINGS, SHALL BE		
	COORDINATED WITH EACH HOMEOWNER. IF THE HOMEOWNER WISHES TO SALVAGE THE EXISTING TREE AND/OR		
	SHRUBS, THE CONTRACTOR SHALL SALVAGE EACH FOR THE HOMEOWNERS REPLANTING OUTSIDE OF THE EASEMENT.		
	IF THEY DO NOT WISH TO SALVAGE, THE CONTRACTOR SHALL DISPOSE OF THEM.		

4+00

5+00

					252 LF INFILTRATION SWALE	
650	245.27 (T)	102	90 4 57	2088		650
	2 ELEV = 6 (3' ELE	B # 50 64	8 4 5 7 7	B # 50 # 50 # 50 # 50		
	PROP GROUND SURFACE PROFILE			S S S S S S S S S S S S S S S S S S S	ROP GROUND OVER	
645	OVER STORM SEWER	RIM El	\frac{\omega}{\omega}	N S	TORM SEWER BUSINESS B	645
				PROFILE	¥ ∞ 	
	257 LF 12" DUAL WALL PERF HDPE STM SEWER	REMOVE		REMOVE 170 LF EX 12" STM	(TO REMAIN)	
640	- E SIM SEWER	R @ 1.00% STM	FV 12" CTU	EX 12" ST	WALL PERF HDPE R @ 0.50% (TO REMAIN) 82 LF 8" DUAL WALL PERF HDPE STM SEWER @ 0.50%	640
			EX_12"_STM	169 LF 12" DUAL V	VALUPERF HDPE PERF HDPE STM SEWER @ 0.50%	
635						635
		OVE)		JOVE I	VE)	
			70 = M	7.65 8 8 8 8 8 9 7 6 6 6 7 6 6 6 6 6 6 6 6 6 6 6 6 6 6	EX 12" INV(W) = 639.37 (REN EX 6" INV(NW) = 639.37 (REN EX 6" INV(NW) = 640.93 EX 6" INV(NW) = 639.98 ELEV = 639.98	
630	1.22	638.6 638.6 638.9 638.81 V) = 63	6.37.93 6.38.331 5.93.13	637.54 637.65 638.43 638.39 638.39 638.39	639.3 639.6 639.6 639.7 639.9	630
						<u> </u>
	EX GROUND PROF	EX 12" INV(RE) = EX 6" INV(NE)	12" IN ((N) (N) (N) (N) (N) (N) (N) (N) (N) (DA 4 6 6 12 12 12 12 12 12 12 12 12 12 12 12 12	ND PROP GROUND 1 2 4 4 4	
625	ELEV — ELEV	7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	∏	X X X X X X X X X X X X X X X X X X X	ETEN STATE TO SET THE STATE TO SET THE STATE TO SET THE SET TH	625
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648.	645. 645. 644. 644. 644.	643.	643.89 643.9 642.5 642.5 642.5	642.75 643.09 641.7 641.67 643.2 643.2		642.6 642.7

6+00



KEY PLAN
NO SCALE

CONSTRUCTION NOTES:

COSTS BORNE BY THE CONTRACTOR.

SAW CUT AND REMOVE HMA ROADWAY AND DRIVEWAYS ONLY AT LIMITS OF CONSTRUCTION AS STAKED BY THE

BREAST HEIGHT (DBH) SHALL BE CONSIDERED AS INCLUDED WITH OTHER RELATED PAY ITEMS.

NOTIFY MISS DIG FOR ACTUAL FIELD LOCATIONS OF UNDERGROUND UTILITIES.

ENGINEER. PAVEMENT NOT SPECIFIED FOR REMOVAL AND DAMAGED BY WORK OPERATIONS SHALL BE REPAIRED AND

VERIFY ELEVATIONS OF EXISTING UTILITIES PRIOR TO CONSTRUCTION OF STORM SEWER WHERE CONFLICTS MAY EXIST.

CLEARING THAT INCLUDES CUTTING AN REMOVAL OF TREES, BRUSH AND SHRUBS UP TO 6 INCHES AS MEASURED AT

4. THE SIZE, TYPE AND LOCATION OF THE EXISTING UTILITY INFORMATION SHOWN ON THIS DRAWING ARE FROM RECORD

5. ALL SPOIL MATERIALS, INCLUDING HMA AND CONCRETE, SHALL BE REMOVED FROM THE SITE IMMEDIATELY. NO

DRAWINGS MADE AVAILABLE TO ENG. THIS PLAN IS NOT INTENDED FRO THE PURPOSE OF FIELD LOCATING UTILITIES.

3+00

19045

4 of 8

SHEET NO.

PROJECT NO.

COMMISSIONER

JOE BUSH

COUNTY WATER

OTTAWA

DRAIN DISTRIC
TTAWA COUNTY, MICHIGAN

GREEN ESTATES
23, CITY OF COOPERSVILLE, T8

MEADOW SECTIONS 22 & 2

rex € PROFILE

-EX GRADE = 0.25%

645

640

630 635. 635. 635. 635.

INV(N) INV(E) INV(SE)

∤EX € ELEV

CONSTRUCTION NOTES:

- 1. SAW CUT AND REMOVE HMA ROADWAY AND DRIVEWAYS ONLY AT LIMITS OF CONSTRUCTION AS STAKED BY THE ENGINEER. PAVEMENT NOT SPECIFIED FOR REMOVAL AND DAMAGED BY WORK OPERATIONS SHALL BE REPAIRED AND COSTS BORNE BY THE CONTRACTOR.
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- ALL NEW CONNECTIONS INTO EXISTING STRUCTURES SHALL BE PROFESSIONALLY CORED. REMOVAL AND REINSTALLATION OF LANDSCAPING ITEMS AS NOTED ON THE DRAWINGS SHALL BE CONSIDERED AS
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	SOIL TYPES AND ABBREVIATIONS
BeB	Belding sandy loam, 2 to 6 percent slopes
RcB	Richter sandy loam, 2 to 6 percent slopes
SnkabB	Spinks-Fern complex, 2 to 6 percent slopes

WORK ITEM	LOCATION	QUANTITY
STORM SEWER REMOVAL, LESS THAN 36"	WHERE ENCOUNTERED	110 LF
12-INCH DUAL WALL PERF HDPE STORM SEWER	STA 1+10 TO 2+99	189 LF
2-FOOT DIA. DRAINAGE STRUCTURE (W/ 2' SUMP)	STA 2+99	1 EA
4-FOOT DIA. DRAINAGE STRUCTURE (W/ 2' SUMP)	STA 2+18	1 EA
DRAINAGE STRUCTURE TAP, 12 INCH	STA 1+10	1 EA
INFILTRATION SWALE	STA 1+10 TO STA 2+99	189 LF
6-INCH SDR-26 PVC STORM SEWER	SEE PLAN VIEW	30 LF
SURFACE RESTORATION	EASEMENT LIMITS	400 SYD

<u>SOIL</u>	EROSION AND SEDIM	IENTATION CONTROL MEASURES
1	SEEDING	When bare soil is exposed, temporarily or permanently, to erosive forces from wind and or water on flat areas, mild slopes, grassed waterways and spillways, diversion ditches and dikes, borrow and stockpile areas, and spoil piles.
2	MULCH	On flat areas, mild slopes, grassed waterways and spillways, diversion ditches and dikes, borrow and stockpile areas, and spoil piles when areas are subject to raindrop impact, and erosive forces from wind or water.
15	Paving	Protects areas which cannot otherwise be protected, but increases runoff volume and velocity Irregular surface will help slow velocity
16	Curb and Gutter	Keeps high velocity runoff on paved areas from leaving paved surface Collects and conducts runoff to enclosed drainage system or prepared drainageway
41	CATCH BASIN	Where surface water accumulates and needs an outlet or an open drain discharges to a stream or drain at erosive velocities. Within an enclosed drain system to provide an inlet and a sump
56	Street Sweeping	Remove sediment from pavement minimizing non-point Source pollution.

BENCHMARK #1: ELEV 647.76 ENE FLANGE BOLT ON HYDRANT AT SE CORNER OF RIDGEFIELD DR AND RIDGEFIELD CT



THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THI EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY

LOCATE AND PRESERVE ANY AND ALL UNDERGROUND

LEGEND

_____ X ___ = FENCE — → → → → = EXISTING GUARDRAIL

= PROPERTY LINE OR R.O.W. LINE = EDGE OF PAVEMENT

ا سلا عالله = WETLANDS (AS MARKED BY OTHERS)

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= BUSH

= STUMP — GAS — GAS — EXISTING GAS LINE

----= EXISTING STORM SEWER

----- = EXISTING SANITARY SEWER = EXISTING MANHOLE

= EXISTING STORM CATCH BASIN

= EXISTING WELL LOCATION = EXISTING WATER VALVE

= EXISTING CURB STOP / METER

= EXISTING CATCH BASIN = BENCH MARK LOCATION

= EXISTING SIGN

= EXISTING MAILBOX = EXISTING LIGHT POLE

= EXISTING GUY ANCHOR

— = EXISTING UTILITY POLE

= EXISTING TELEPHONE PEDESTAL ---- = EXISTING DRAIN (

■■■■ = PROPOSED DRAIN (

= PROPOSED TOP OF BANK

La = = = SOIL TYPE

= TEMPORARY SOIL EROSION CONTROL MEASURE

COMMISSIONER

JOE BUSH

DRAIN DISTRIC
TTAWA COUNTY, MICHIGAN

GREEN 23, CITY OF CC

MEADOW SECTIONS 22 & 2

COUNTY

OTTAWA

PROJECT NO.

19045

SHEET NO.

5 of 8

= PERMANENT SOIL EROSION CONTROL MEASURE OR RESTORATION DETAIL

■ ■ ■ ■ = EXISTING DRAINAGE EASEMENT

= PROPOSED DRAINAGE EASEMENT

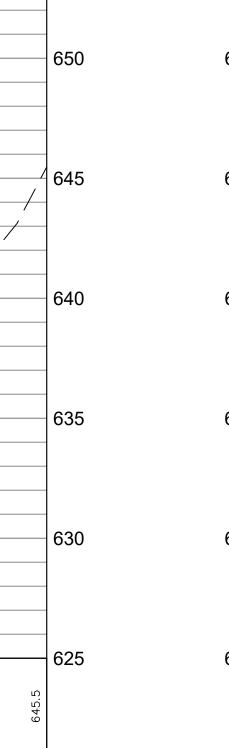
= PROPOSED DRAINAGE EASEMENT

= SUMP LEAD

KEY PLAN
NO SCALE

PLAN AND PROFILE #3 -RIDGEFIELD DRIVE

SCALE: 1" = 40'



1+00

655

EX 12"

EX 44"

PROP 1

4+00

189 LF INFILTRATION SWALE 650 645 PROP GROUND PROFILE OVER STORM SEWER-108 LF 12" DUAL WALL PERF HDPE STM SEWER @ 1.00%

2+00

3+00

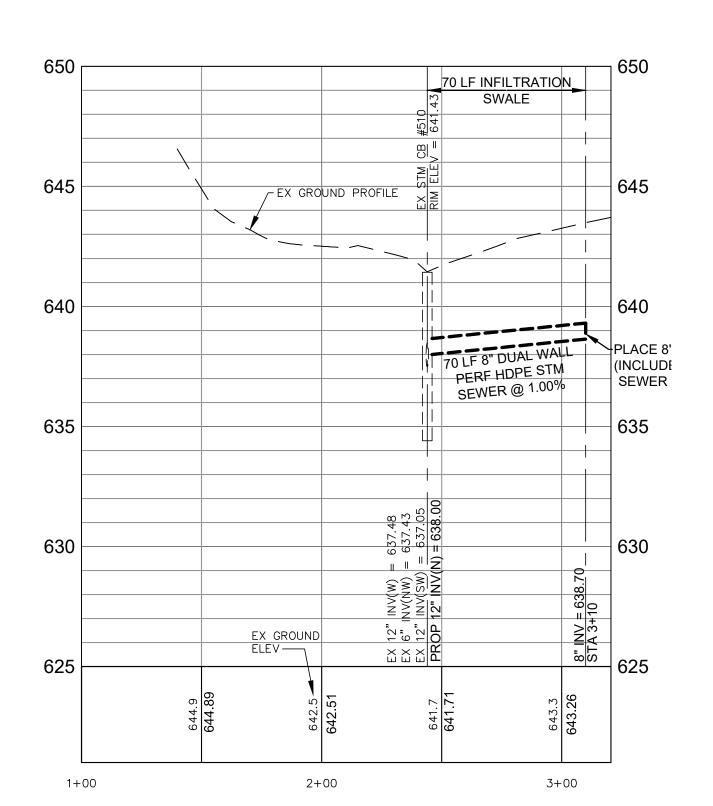
REMOVE AND REPLACE CHAIN LINK FENCING FOR CONSTRUCTION

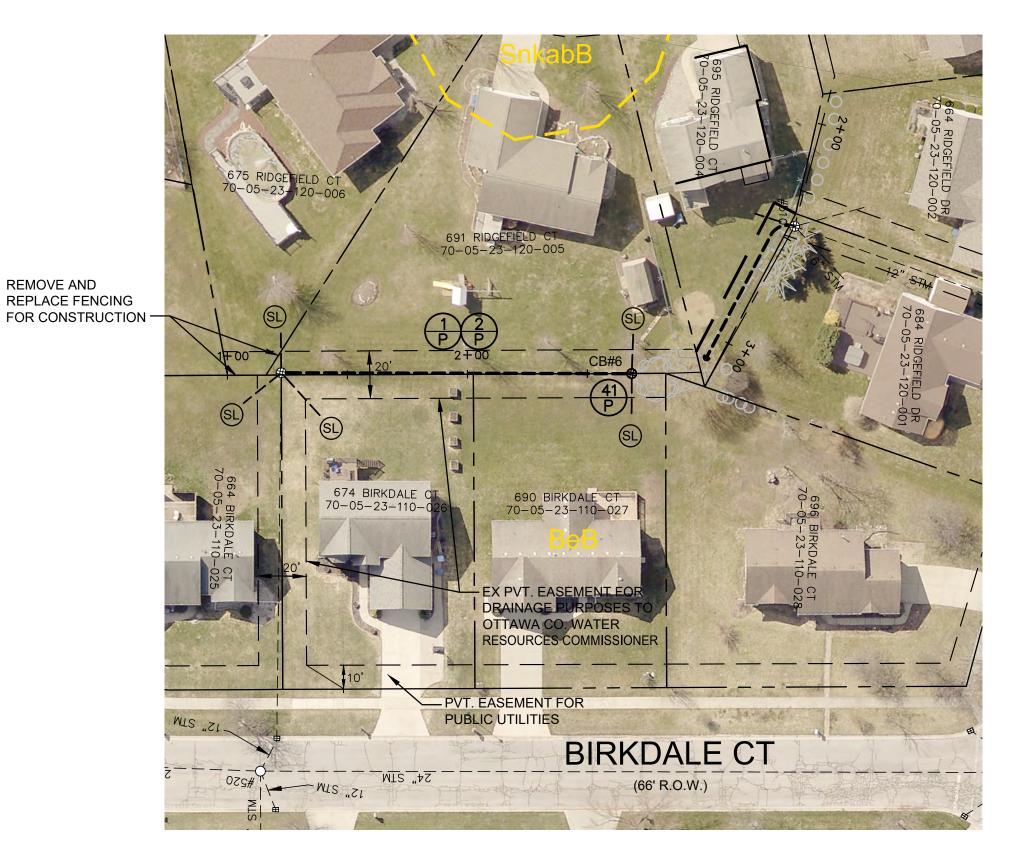
REMOVE AND

SCALE: 1" = 40'

CONSTRUCTION NOTES:

- 1. SAW CUT AND REMOVE HMA ROADWAY AND DRIVEWAYS ONLY AT LIMITS OF CONSTRUCTION AS STAKED BY THE ENGINEER. PAVEMENT NOT SPECIFIED FOR REMOVAL AND DAMAGED BY WORK OPERATIONS SHALL BE REPAIRED AND
- COSTS BORNE BY THE CONTRACTOR. 2. VERIFY ELEVATIONS OF EXISTING UTILITIES PRIOR TO CONSTRUCTION OF STORM SEWER WHERE CONFLICTS MAY EXIST. 3. CLEARING THAT INCLUDES CUTTING AN REMOVAL OF TREES, BRUSH AND SHRUBS UP TO 6 INCHES AS MEASURED AT
- BREAST HEIGHT (DBH) SHALL BE CONSIDERED AS INCLUDED WITH OTHER RELATED PAY ITEMS. 4. THE SIZE, TYPE AND LOCATION OF THE EXISTING UTILITY INFORMATION SHOWN ON THIS DRAWING ARE FROM RECORD DRAWINGS MADE AVAILABLE TO ENG. THIS PLAN IS NOT INTENDED FRO THE PURPOSE OF FIELD LOCATING UTILITIES. NOTIFY MISS DIG FOR ACTUAL FIELD LOCATIONS OF UNDERGROUND UTILITIES.
- 5. ALL SPOIL MATERIALS, INCLUDING HMA AND CONCRETE, SHALL BE REMOVED FROM THE SITE IMMEDIATELY. NO STOCKPILING OF SPOIL MATERIALS WILL BE ALLOWED UNLESS APPROVED IN WRITING BY THE ENGINEER.
- ALL NEW CONNECTIONS INTO EXISTING STRUCTURES SHALL BE PROFESSIONALLY CORED.
- 7. REMOVAL AND REINSTALLATION OF LANDSCAPING ITEMS AS NOTED ON THE DRAWINGS SHALL BE CONSIDERED AS INCLUDED WITH THE PAY ITEM BEING INSTALLED.
- 8. EXISTING TREES AND SHRUBS SHOWN AS BEING REMOVED AND/OR SALVAGED ON THE DRAWINGS, SHALL BE COORDINATED WITH EACH HOMEOWNER. IF THE HOMEOWNER WISHES TO SALVAGE THE EXISTING TREE AND/OR SHRUBS, THE CONTRACTOR SHALL SALVAGE EACH FOR THE HOMEOWNERS REPLANTING OUTSIDE OF THE EASEMENT. IF THEY DO NOT WISH TO SALVAGE, THE CONTRACTOR SHALL DISPOSE OF THEM.





	SOIL TYPES AND ABBREVIATIONS
BeB	Belding sandy loam, 2 to 6 percent slopes
RcB	Richter sandy loam, 2 to 6 percent slopes
SnkabB	Spinks-Fern complex, 2 to 6 percent slopes

	-	150 LF INFILTRATION BASIN	
650	= 642.27	7. SUMP	650
645	EX STM CB	CB #6 (2' DIA w/ 2' SUMP) CB #6 (2' DIA w/ 2' SUMP) COVER G	645
640		146 LF 12" DUAL WALL PERF HDPE STM SEWER @ 1.00%	640
635			635
630	INV(N) = 634.26 INV(SW) = 637.28 INV(E) = 633.14 INV(W) = 633.21 INV(NW) = 637.85 12" INV(W) = 637.85	= 639 639.43	630
625	EX 12" EX 12" EX 21" EX 24" EX 12" PROP P	642.5 EX GROUND ETEX CANON IN ITEM 12	625

2+00

1+00

COLLEGGIONIANO SEDIMENTATION CONTROL MEASURES

SCALE: 1" = 40'

SOIL	<u>EROSION AND SEDIM</u>	MENTATION CONTROL MEASURES
1	SEEDING WARMAN CONTROL OF THE PARTY OF THE P	When bare soil is exposed, temporarily or permanently, to erosive forces from wind and or water on flat areas, mild slopes, grasse waterways and spillways, diversion ditches and dikes, borrow and stockpile areas, and spoil piles.
2	MULCH	On flat areas, mild slopes, grassed waterways and spillways, diversion ditches and dikes, borrow and stockpile areas, and spoi piles when areas are subject to raindrop impact, and erosive forces from wind or water.
15	Paving	Protects areas which cannot otherwise be protected, but increase runoff volume and velocity Irregular surface will help slow velocity
16	Curb and Gutter	Keeps high velocity runoff on paved areas from leaving paved surface Collects and conducts runoff to enclosed drainage system or prepared drainageway
41	CATCH BASIN	Where surface water accumulates and needs an outlet or an open drain discharges to a stream or drain at erosive velocities Within an enclosed drain system to provide an inlet and a sum
56	Street Sweeping	Remove sediment from pavement minimizing non-point Source pollution.
61	SILT FENCE	As a temporary measure used to capture sediment from sheet flow. May also divert small volumes of sheet flow to protected outlets.

WORK ITEM	LOCATION	QUANTITY
6-INCH SDR26 PVC STORM SEWER	SEE PLAN VIEW	70 LF
8-INCH DUAL WALL PERF HDPE STORM SEWER	STA 2+44 TO 3+10	70 LF
12-INCH DUAL WALL PERF HDPE STORM SEWER	STA 1+22 TO 2+68	146 LF
2-FOOT DIA. DRAINAGE STRUCTURE (W/ 2' SUMP)	STA 2+68	1 EA
DRAINAGE STRUCTURE TAP, 8 INCH DRAINAGE STRUCTURE TAP, 12 INCH	STA 2+44 STA 1+22	1 EA 1 EA
INFILTRATION SWALE	STA 2+44 TO 3+10 STA 1+22 TO 2+68	220 LF
SURFACE RESTORATION	EASEMENT LIMITS	450 SYD
FENCE REMOVAL AND REPLACEMENT	STA 2+44 TO 3+10	70 I F

T = TEMPORARY P = PERMANENT MEASURE

BENCHMARK #1: ELEV 647.76 ENE FLANGE BOLT ON HYDRANT AT SE CORNER OF RIDGEFIELD DR AND RIDGEFIELD CT



THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND

LEGEND

= PROPERTY LINE OR R.O.W. LINE = EDGE OF PAVEMENT

— → → → → = EXISTING GUARDRAIL علاد علاد الله = WETLANDS (AS MARKED BY OTHERS) = EXISTING SPOT ELEVATION

____ X ___ = FENCE

= EXISTING CONTOUR ELEVATION = EDGE OF WOODS

= DECIDUOUS TREE = CONIFEROUS TREE = BUSH

— GAS — GAS — EXISTING GAS LINE ----= EXISTING STORM SEWER

= STUMP

---- = EXISTING SANITARY SEWER = EXISTING MANHOLE = EXISTING STORM CATCH BASIN

= EXISTING WELL LOCATION = EXISTING WATER VALVE

= EXISTING CURB STOP / METER = EXISTING CATCH BASIN = BENCH MARK LOCATION

= EXISTING SIGN = EXISTING MAILBOX

= EXISTING LIGHT POLE = EXISTING GUY ANCHOR

> = EXISTING UTILITY POLE = EXISTING TELEPHONE PEDESTAL

■ ■ ■ PROPOSED DRAIN Q

= PROPOSED TOP OF BANK La -- = SOIL TYPE

= TEMPORARY SOIL EROSION CONTROL MEASURE = PERMANENT SOIL EROSION CONTROL MEASURE

OR RESTORATION DETAIL ■ ■ ■ ■ = EXISTING DRAINAGE EASEMENT

= PROPOSED DRAINAGE EASEMENT --- = EXISTING DRAINAGE EASEMENT

= PROPOSED DRAINAGE EASEMENT = SUMP LEAD



KEY PLAN
NO SCALE

PLAN AND PROFILE #4 -RIDGEFIELD DRIVE & BIRKDALE COURT

COMMISSIONER DRAIN DISTRIC
TTAWA COUNTY, MICHIGAN GREEN ESTATES
23, CITY OF COOPERSVILLE, T8

JOE BUSH

COUNTY

OTTAWA MEAD(SECTIONS PROJECT NO.

SHEET NO.

19045

LEGEND

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ا علله علله = WETLANDS (AS MARKED BY OTHERS) = EXISTING SPOT ELEVATION = EXISTING CONTOUR ELEVATION

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= EXISTING TELEPHONE PEDESTAL ------== EXISTING DRAIN Q

■ ■ ■ PROPOSED DRAIN © = PROPOSED TOP OF BANK La -- = SOIL TYPE

= TEMPORARY SOIL EROSION CONTROL MEASURE

= PERMANENT SOIL EROSION CONTROL MEASURE OR RESTORATION DETAIL ■ ■ ■ ■ = EXISTING DRAINAGE EASEMENT

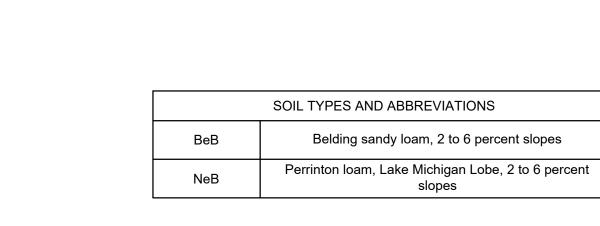
= PROPOSED DRAINAGE EASEMENT = SUMP LEAD

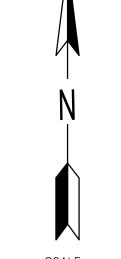


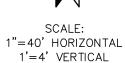
BIRKDALE COURT

CONSTRUCTION NOTES:

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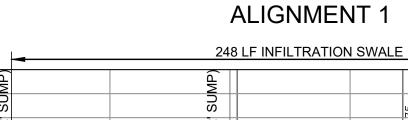




WORK ITEM	LOCATION	QUANTITY
SEWER REMOVAL, LESS THAN 36"		88 LF
DRAINAGE STRUCTURE REMOVAL		1 EA
FENCE REMOVAL & REPLACEMENT	SEE PLAN VIEW	85 LF
TREE REMOVAL, 6-18 INCH DIA.	WHERE NEEDED	5 EA
12-INCH DUAL WALL PERF HDPE STORM SEWER	STA 1+09 TO 3+57 STA 1+11 TO 1+75	163 LF
4-FOOT DIA. DRAINAGE STRUCTURE (W/ 2' SUMP)	STA 2+03	1 EA
DR STRUCTURE TAP, 12 INCH	STA 2+72	1 EA
INFILTRATION SWALE	STA 1+09 TO 3+57 STA 1+11 TO 1+75	315 LF
2-FOOT DIA. DRAINAGE STRUCTURE (W/ 2' SUMP)	STA 1+09	1 EA
6-INCH SDR26 PVC STORM SEWER	SEE PLAN VIEW	50 LF
DR STRUCTURE TAP, 8 INCH	STA 2+72	1 EA
8-INCH DUAL WALL PERF HDPE STORM SEWER	STA 1+11 TO 1+75 STA 2+72 TO 3+57	149 LF
SURFACE RESTORATION	EASEMENT LIMITS	700 SYD

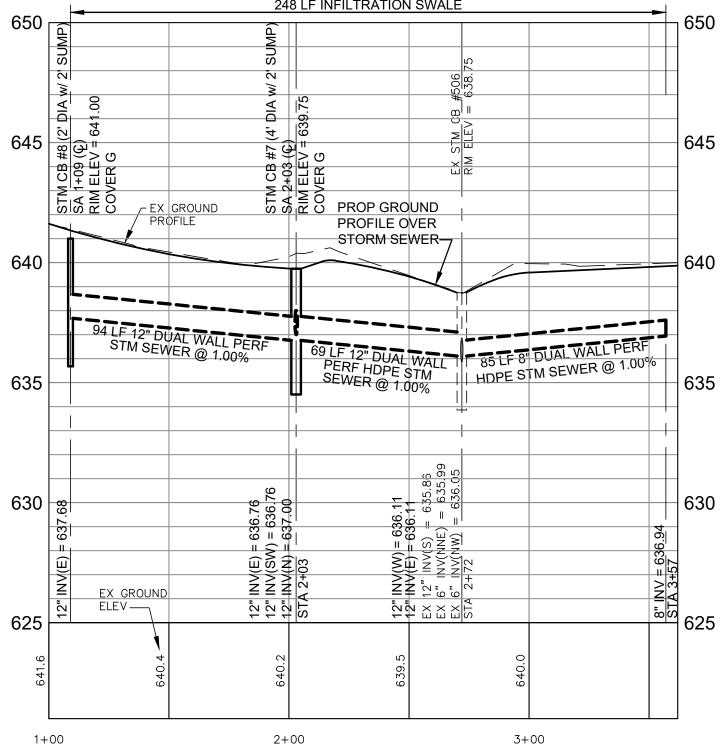
SOIL EROSION AND SEDIMENTATION CONTROL MEASURES

1	SEEDING	When bare soil is exposed, temporarily or permanently, to erosive forces from wind and or water on flat areas, mild slopes, grassed waterways and spillways, diversion ditches and dikes, borrow and stockpile areas, and spoil piles.
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15	Paving	Protects areas which cannot otherwise be protected, but increases runoff volume and velocity Irregular surface will help slow velocity
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41	CATCH BASIN	Where surface water accumulates and needs an outlet or an open drain discharges to a stream or drain at erosive velocities. Within an enclosed drain system to provide an inlet and a sump
56	Street Sweeping	Remove sediment from pavement minimizing non-point Source pollution.
61	SILT FENCE	As a temporary measure used to capture sediment from sheet flow. May also divert small volumes of sheet flow to protected outlets.
	XX T = TEMPORARY MEASURE	P = PERMANENT MEASURE



VT. EASEMENT FOR

PUBLIC UTILITIES



754 RIDGEFIELD DR 20' DRAIN 79-05-23-110-003 EASEMENT—

SEWER ALIGNMENT 2—

REPLACE 85 LF EX CHAIN LINK FENCE—

PROP STORM

REMOVE EX STORM >

STRUCTURE AND

654 CLEVELAND ST

SEWER ALIGNMENT 1-

70-05-23-100-032

PROPOSED 30'

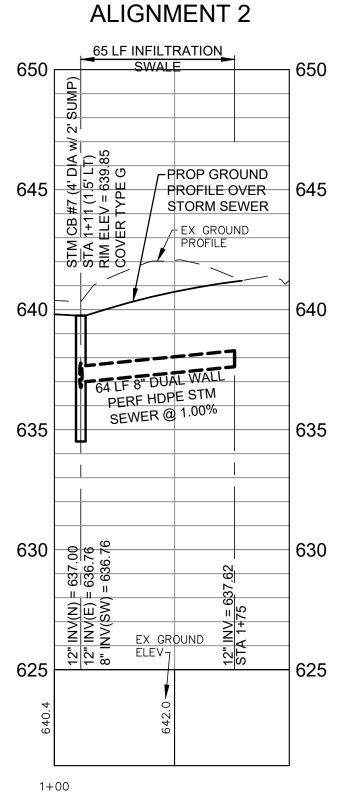
663 BIRKDALE CT

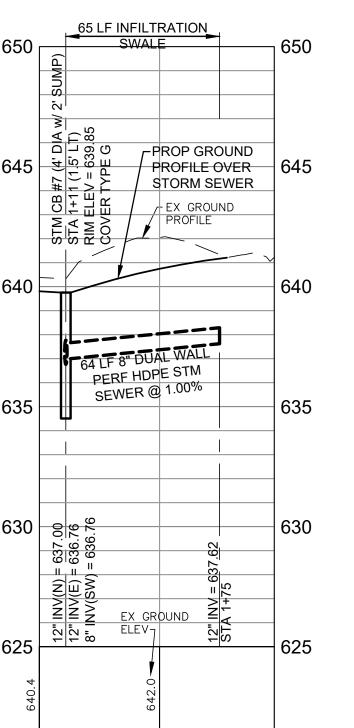
DRAIN EASEMENT

DRAINAGE PURPOSES TO

RESOURCES COMMISSIONER

OTTAWA CO. WATER





PLAN AND PROFILE #4 -RIDGEFIELD DRIVE AND

SHEET NO. 7 of 8

COMMISSIONER

JOE BUSH

DRAIN DISTRIC
TTAWA COUNTY, MICHIGAN

GREEN 1 23, CITY OF CC

MEADOW SECTIONS 22 & 3

COUNTY

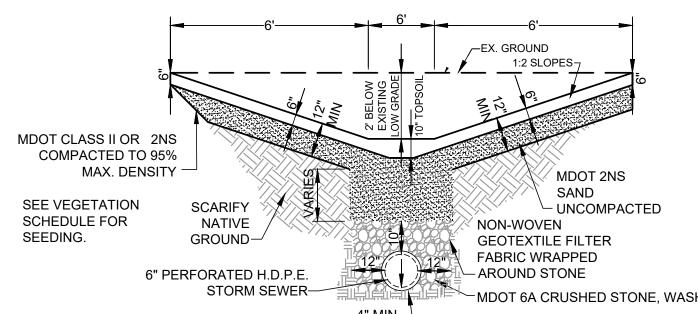
OTTAWA

PROJECT NO.

19045

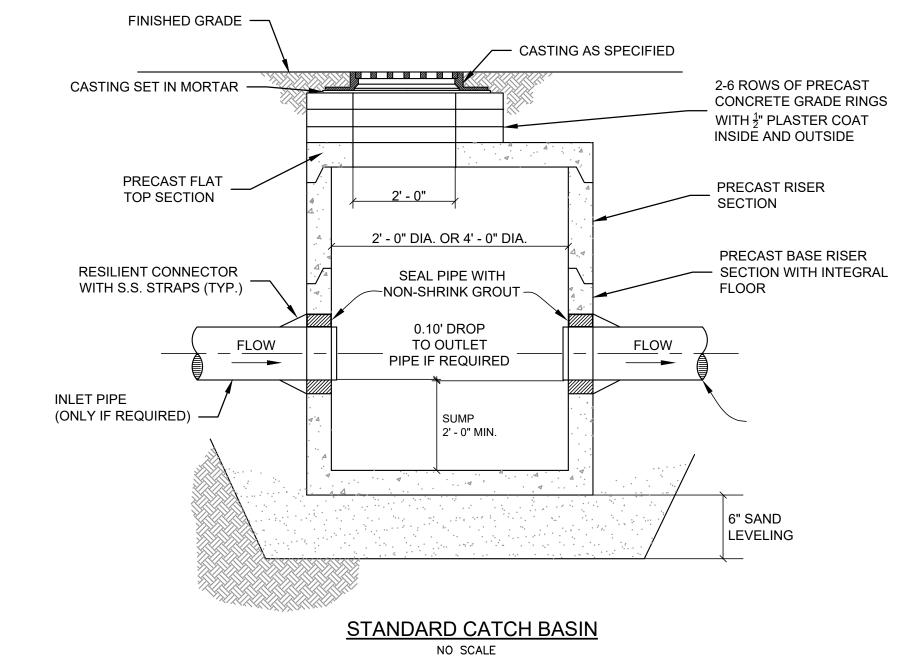
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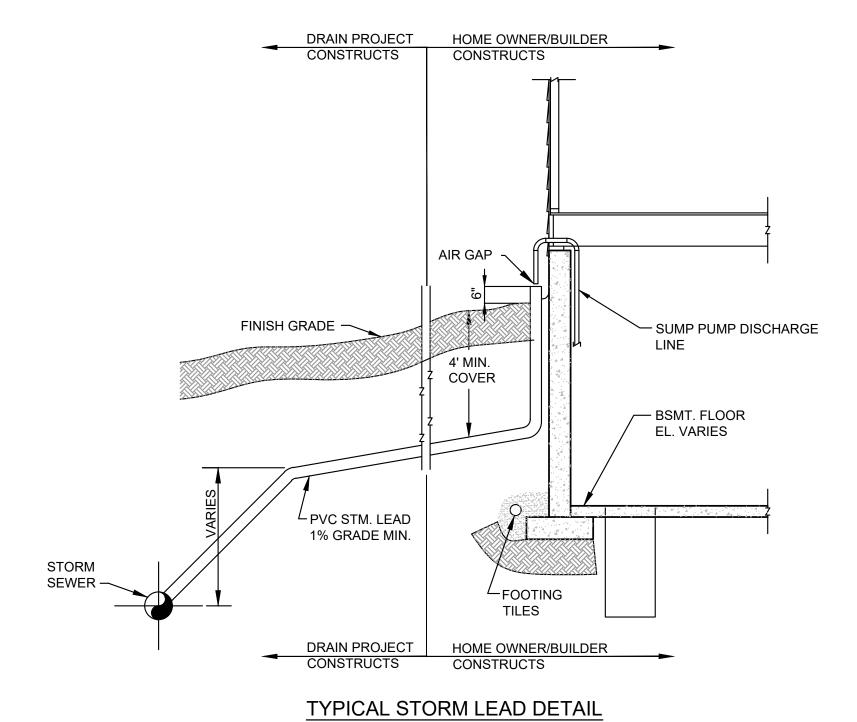
TRENCH OUTSIDE INFLUENCE OF ROADWAY OR STRUCTURE

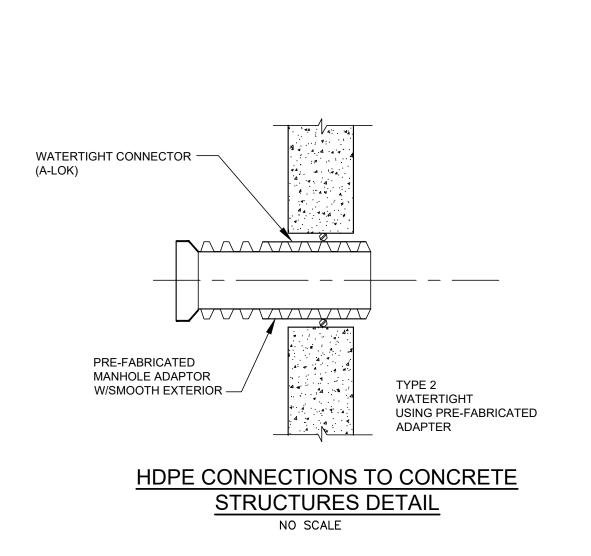


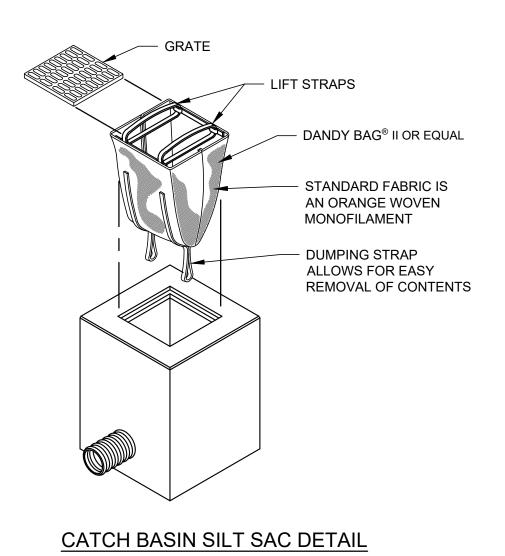
4" MIN.

TYPICAL INFILTRATION SWALE CROSS-SECTION / H.D.P.E. TRENCH DETAIL A









CONSTRUCTION & SOIL EROSION AND SEDIMENTATION CONTROL NOTES:

- 1. ALL TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IN PLACE BEFORE CONSTRUCTION BEGINS. THE CONTRACTOR IS RESPONSIBLE FOR INSPECTING ALL MEASURES AT LEAST ONCE EACH WEEK AND/OR WITHIN 24 HOURS OF A PRECIPITATION EVENT THAT RESULTS IN STORM WATER RUNOFF OR DISCHARGE.
- 2. SURFACE RESTORATION OF ALL SEWER TRENCHES IN LAWN AREAS SHALL BE TOP SOILED, SEEDED, AND MULCHED WITHIN 5 CALENDAR DAYS OF BACKFILLING THE TRENCH.
- 3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL AND SHALL PROVIDE ALL EQUIPMENT AND MATERIAL NECESSARY TO KEEP DUST IN CHECK AT ALL TIMES. THE CONTRACTOR SHALL RESPOND IMMEDIATELY TO ANY AND ALL COMPLAINTS. STREETS, PARKING LOTS, DRIVEWAYS, PAVED ACCESS ROADS, AND ALL OTHER PAVED SURFACES SHALL BE SWEPT AT LEAST ONCE A DAY AND/OR AS NEEDED THROUGHOUT THE DAY.
- 4. MULCH AND/OR MULCH BLANKET SHALL BE APPLIED AND ANCHORED APPROPRIATELY ON ALL SLOPES 3:1 OR GREATER ON ALL SLOPES DEEMED NECESSARY TO PREVENT OR CORRECT EROSION PROBLEMS AND ON ALL DISTURBED AREA DUE TO CONSTRUCTION.
- 5. ALL TEMPORARY SOIL EROSION MEASURES SHALL BE REMOVED AFTER PERMANENT MEASURES HAVE BEEN ESTABLISHED.
- 6. ALL CONSTRUCTION SHALL BE CONFINED TO AREAS OF DISTURBANCE WITHIN THE ROAD RIGHT OF WAY AND/OR WITHIN STORM SEWER EASEMENTS. NO WORK, MATERIAL, OR STOCKPILES WILL BE ALLOWED OUTSIDE OF THESE LIMITS.
- 7. ALL TRENCHES SHALL BE BACKFILLED TO GRADE OR PROPERLY PROTECTED IN ACCORDANCE WITH PROJECT PLANS & SPECIFICATIONS AT THE END OF EVERY DAY. AT NO TIME SHALL A TRENCH BE LEFT OPEN FOR A PERIOD LONGER THAN 48 HOURS.
- 8. UNLESS SPECIFICALLY NOTED OTHERWISE, ALL UTILITY TRENCHES SHALL CONFORM TO TYPICAL TRENCH DETAIL. SEE SHEET 10 OF 10.
- 9. PROTECT ALL TREES AND VEGETATION NOT SCHEDULED TO BE REMOVED. ENGINEER APPROVAL IS REQUIRED FOR ANY UNSCHEDULED REMOVAL OF TREES, SHRUBS OR LANDSCAPING.
- 10. EROSION AND SEDIMENTATION FROM WORK ON THIS PROJECT SHALL BE CONTAINED WITHIN THE WORK AREA AND NOT ALLOWED TO COLLECT ON OFF-SITE AREAS OR IN WATERWAYS WATERWAYS INCLUDE BOTH NATURAL AND MAN-MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND PONDS.
- 11. SILT FENCE MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY BUILT-UP SEDIMENT. CONTRACTORS SHALL BE RESPONSIBLE TO REMOVE, REPLACE, RETRENCH OR REBACKFILL THE SILT FENCE SHOULD IT FAIL OR BECOME DAMAGED DURING THE CONSTRUCTION.
- 12. INLET FILTER MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY ACCUMULATED SILT OR OTHER DEBRIS. IF INLET FILTERS CANNOT BE CLEANED, OR ARE DAMAGED, THEN THE FILTER AND/OR STONE SHALL BE REPLACED.

SESC Notes

<u>General Maintenance</u> •Temporary SESC measures to be maintained by the contractor at all times.

Temporary SESC measures to be maintained by the contractor at all times.
 Silt fence
 Silt fence is to be trenched in no less than 6 inches below the ground surface
 Inspect silt fence immediately following each rainfall

Repair when silt fence is sagging or has been removed/torn down
 When silt collects to half the height of the fence all silt is to be removed and fence repaired
 Remove silt fence when permanent SESC measures are in place and vegetation is established

Seeding and Mulching

Seeding practices include topsoil (as required), and mulch or mulch blanket (as directed by Engineer or required on plans).

Where necessary, appropriate mulch blanket must be applied based on slope and growing conditions as approved by the engineer.

All slopes and highly erosive areas will be temporarily seeded and mulched when construction activity is not taking place

Seed and mulch is to be inspected following each rain event to determine if concentrated flows are present

In the event that seed and mulch are removed by erosive runoff, repairs are to be made immediately.

Site will be permanently stabilized within 5 days of final grade

Storm drain inlet protection
Storm drain inlets to be inspected weekly and after each rain event.
Empty sediment and keep inlet protection clean during inspection and maintenance operations.

Compliance with Part 91 of PA 451
 Respond immediately to stormwater operator and/or soil erosion and sedimentation control inspector concerns. Make corrective measures as Required

Stormwater operator/APA owner or maintenance supervisor will inspect monthly through the first growing season. Non established vegetation will be repaired/reseeded as necessary

APPROXIMATE CONSTRUCTION SCHEDULE FOR SESC MEASURES JULY 2021 | AUG 2021 | SEP 2021 | OCT 2021 | SESC - CONSTRUCTION SEQUENCE MAR 2022 | APR 2022 | MAY 2022 | JUN 2022 **INSTALL TEMPORARY SESC MEASURES:** A. STABILIZED CONSTRUCTION ACCESSES B. CONSTRUCTION/TREE PROTECTION FENCE C. CATCH BASIN PROTECTION D. STORM DRAIN INLET PROTECTION E. SEEDING MAINTAIN TEMPORARY SESC MEASURES SITE GRADING STORM SEWER CONSTRUCTION FINAL GRADE FINAL SITE STABILIZATION (TO BE COMPLETED WITHIN 24 HOURS OF FINAL GRADING OR ACTIVITY WITHIN THAT AREA) REMOVE TEMPORARY SESC MEASURES PERMANENT SESC MEASURES

DETAILS & SOIL EROSION & SEDIMENTATION CONTROL

NO. REVISIONS

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TM 16930 Robbins Road Suite 105 Grand Haven, MI 49417 616.743.7070



JOE BUSH
COUNTY WATER RESOURCES COMMISSIONER

OTTAW OTTAW SECTIONS

19045

SHEET NO.

8 OF 8