

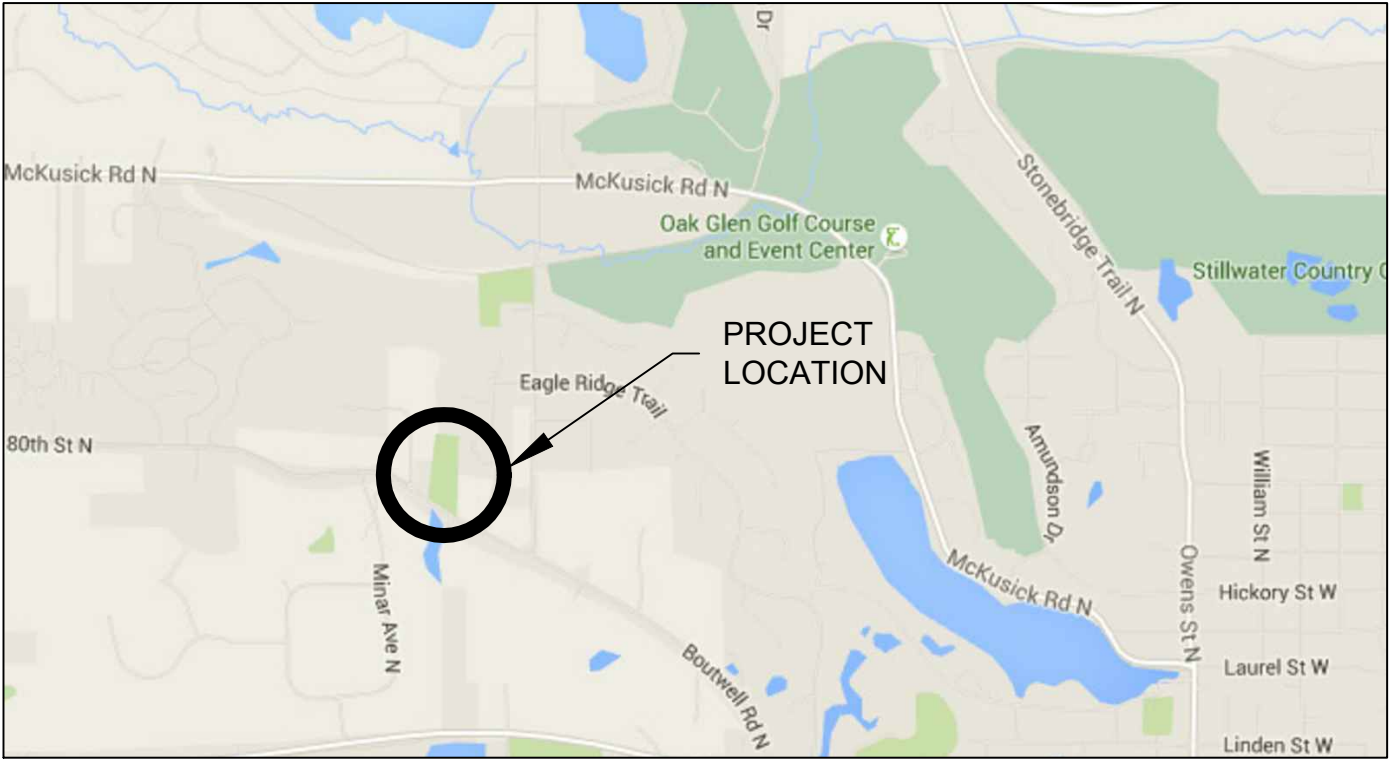
# BROWN'S CREEK WATERSHED DISTRICT

## LONG LAKE TRIBUTARY HEADCUT

### STILLWATER, WASHINGTON COUNTY, MINNESOTA

**GOVERNING SPECIFICATIONS**  
 THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN  
 ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM TO MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, INCLUDING FIELD MANUAL FOR TEMPORARY CONTROL ZONE LAYOUTS.

SHEET INDEX	
SHEET NO.	SHEET DESCRIPTION
01	TITLE & SCHEDULE OF QUANTITIES
02	EXISTING CONDITIONS
03	REMOVALS
04	STREAM HEADCUT
05	RESTORATION PLAN
06	DETAILS



LONG LAKE TRIBUTARY HEADCUT IMPROVEMENTS			
LINE ITEM	BID ITEM	ESTIMATED QUANTITY	UNIT
<b>Part 1 - General</b>			
1	MOBILIZATION		LS
2	TRAFFIC CONTROL		LS
3	TREE REMOVAL		LS
4	ROCK CHECK		TON
5	EROSION CONTROL		LS
6	TREE PROTECTION		LS
7	INLET PROTECTION		EA
8	CONSTRUCTION ENTRANCE		EA
9	NATIVE SEED		LB
10	NATIVE SEED		AC
11	DECIDUOUS TREE - 1.5" BB		EA
12	SHRUBS - #2 CONT.		EA
13	SHRUBS - #5 CONT.		EA
14	5-YEAR VEGETATION ESTABLISHMENT MAINTENANCE		YR

FEATURE	EXISTING	PROPOSED
SILT FENCE		~SF~SF~
CONSTRUCTION FENCE		~CF~CF~
DELINEATED WETLAND	-----W/D-----	
WATERLINE/Shoreline	.....	
OVERHEAD ELECTRIC LINES	=====	=====
BURIED ELECTRIC LINES	=====	=====
FIBER OPTIC LINES	=====	=====
GAS LINES	=====	=====
PIPELINE	=====	=====
OVERHEAD TELEPHONE	=====	=====
BURIED TELEPHONE	=====	=====
TELEPHONE MANHOLE	○	○
TELEPHONE CABLE PEDESTAL	□	□
OVERHEAD CABLE TV	=====	=====
BURIED CABLE TV	=====	=====
TV CABLE PEDESTAL	□	□
BARBED WIRE FENCE	-x-x-x-x-x-	-x-x-x-x-x-
CHAIN LINK FENCE	-o-o-o-o-o-	-o-o-o-o-o-
STOCKADE/WOOD FENCE	-□-□-□-□-	-□-□-□-□-
GUARD RAIL	-p-p-p-p-	-p-p-p-p-
CENTER LINE ROADWAY	- - - - -	- - - - -
CENTER LINE RAILROAD	+ + + + +	+ + + + +
SANITARY SEWER LINE	=====	=====
SANITARY SEWER FORCEMAIN	=====	=====
SANITARY SEWER MANHOLE	○	○
STORM SEWER LINE	=====	=====
STORM SEWER CULVERT	=====	=====
STORM SEWER FORCEMAIN	=====	=====
STORM SEWER MANHOLE	○	○
WATERMAIN	=====	=====
WATERMAIN MANHOLE	○	○
HYDRANT	○	○
WATER VALVE	×	×

**GOPHER STATE ONE-CALL**

IT IS THE LAW THAT ANYONE EXCAVATING AT ANY SITE MUST NOTIFY GOPHER STATE ONE CALL (GSOC) SO THAT UNDERGROUND ELECTRIC, NATURAL GAS, TELEPHONE OR OTHER UTILITY LINES CAN BE MARKED ON OR NEAR YOUR PROPERTY BEFORE ANY DIGGING BEGINS. A 48-HOUR NOTICE, NOT INCLUDING WEEKENDS, IS REQUIRED. CALLS CAN BE MADE TO GSOC AT 1-800-252-1166 OR (651)454-0002, MONDAY THROUGH FRIDAY (EXCEPT HOLIDAYS) FROM 7 A.M. TO 5 P.M.

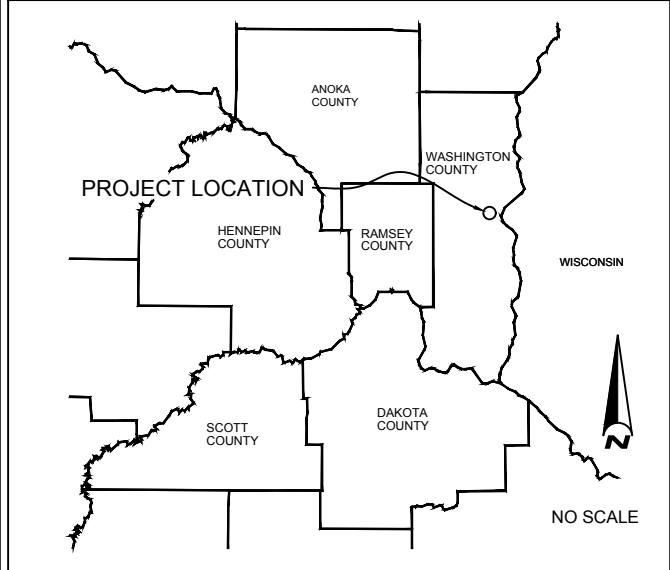
**EXISTING UTILITIES**

THE LOCATION OF UNDERGROUND FACILITIES AND/OR STRUCTURES AS SHOWN ON THE PLANS ARE BASED ON AVAILABLE RECORD AT THE TIME THE PLANS WERE PREPARED AND ARE NOT GUARANTEED TO BE COMPLETE OR CORRECT. THE SUBSURFACE UTILITY INFORMATION SHOWN IS UTILITY QUALITY LEVEL D, AS DETERMINED USING THE GUIDELINES OF "CI/ASCE 38-02 STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING ALL UTILITIES 72 HOURS PRIOR TO CONSTRUCTION TO DETERMINE THE EXACT LOCATION OF ALL FACILITIES AND TO PROVIDE ADEQUATE PROTECTION OF SAID UTILITIES DURING THE COURSE OF WORK.

**CONSTRUCTION NOTE**

CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO MAINTAIN OPERATION OF EXISTING UTILITIES THROUGHOUT THE DURATION OF THE PROJECT. IN THE EVENT THAT AN INTERRUPTION OF SERVICE IS UNAVOIDABLE IN ORDER TO COMPLETE THE WORK, CONTRACTOR SHALL PROVIDE ADEQUATE NOTIFICATION TO ALL AFFECTED BUSINESSES A MINIMUM OF 3 WORKING DAYS IN ADVANCE OF ANY INTERRUPTION.

**LOCATION MAP**



**CLIENT**

**BROWN'S CREEK WATERSHED DISTRICT**  
 455 HAYWARD AVENUE NORTH  
 OAKDALE, MN 55128  
 TELEPHONE: (651) 330-8220

**ENGINEER**

**EMMONS & OLIVIER RESOURCES, INC.**  
 651 HALE AVENUE NORTH  
 OAKDALE, MINNESOTA 55128-7534  
 TELEPHONE: (651) 770-8448  
 FAX: (651) 770-2552  
 eorinc.com

**DRAFT - NOT FOR CONSTRUCTION**

SUBMISSION DATE: 10-12-2017  
 DESIGN BY: MJM DRAWN BY: KDC  
 EOR PROJECT NO. 00041-0302  
**Emmons & Olivier Resources, Inc.**  
 651 Hale Avenue North  
 Oakdale, MN 55128  
 Tele: 651.770.8448  
 www.eorinc.com

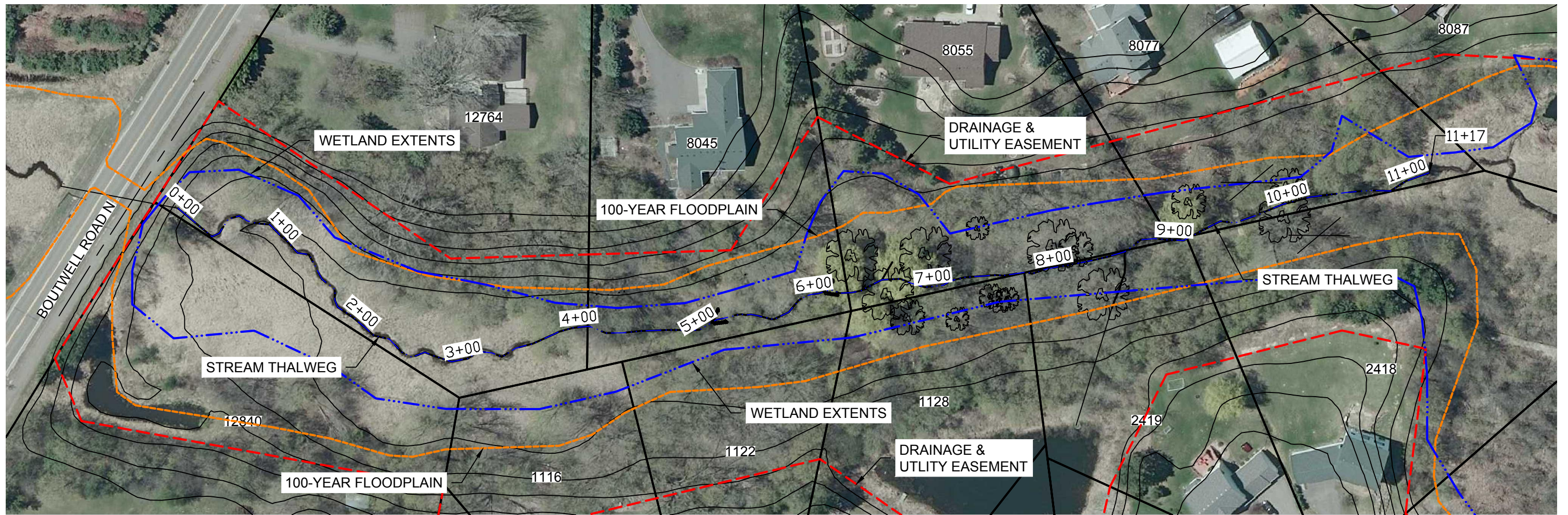


LONG LAKE TRIBUTARY HEADCUT  
 PHASE III  
 STILLWATER, WASH. COUNTY, MN  
 STATE PROJECT NO. CITY PROJECT NO.

TITLE AND SEQ  
 SHEET 01 OF 06 SHEETS

Plt Date: 10/12/2017  
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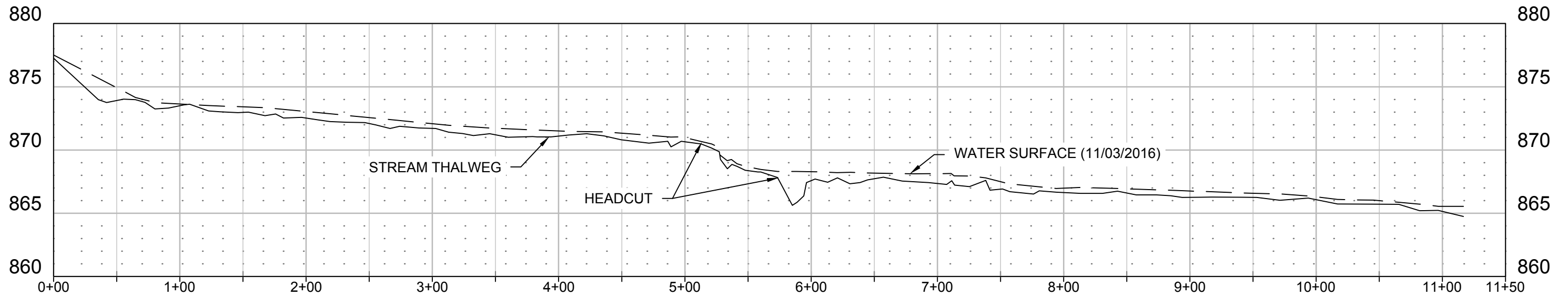
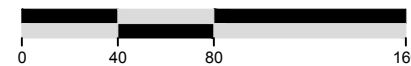
NO	DATE	BY	REVISION
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NOTES:  
 1. WETLAND EXTENTS SHOWN ARE BASED ON GIS DATA AND HAVE NOT BEEN SURVEYED. THE EXTENTS SHOWN ARE FOR PLANNING PURPOSES ONLY.



SCALE IN FEET



File Path: I:\10122017  
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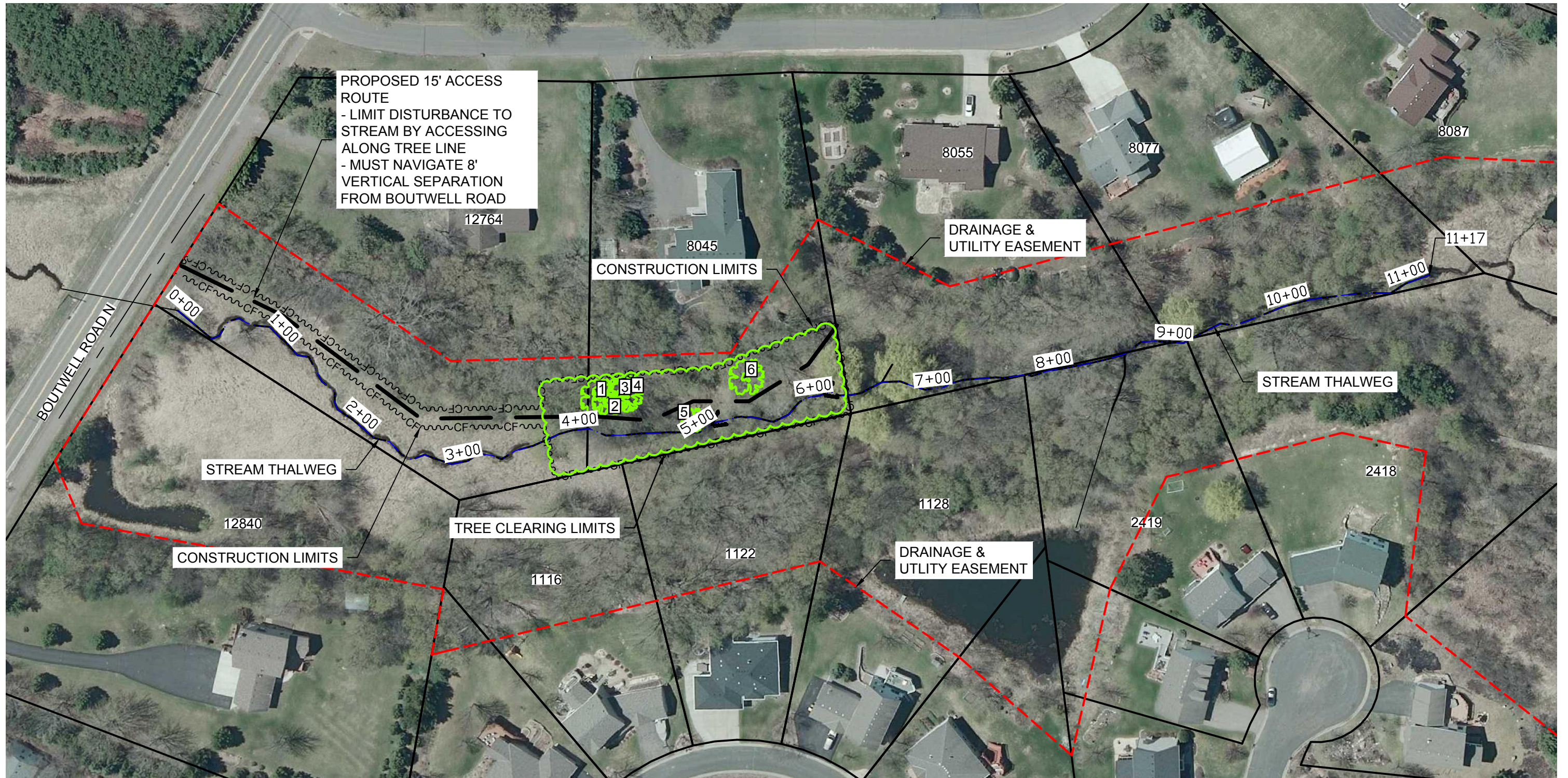
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10-12-2017  
 DESIGN BY: MJM    DRAWN BY: KDC  
 EOR PROJECT NO.  
00041-0302

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**BROWN'S CREEK WATERSHED DISTRICT**

LONG LAKE TRIBUTARY HEADCUT  
 PHASE III  
 STILLWATER, WASH. COUNTY, MN  
 STATE PROJECT NO.    CITY PROJECT NO.

EXISTING CONDITIONS  
 SHEET 02 OF 06 SHEETS



PROPOSED 15' ACCESS ROUTE  
 - LIMIT DISTURBANCE TO STREAM BY ACCESSING ALONG TREE LINE  
 - MUST NAVIGATE 8' VERTICAL SEPARATION FROM BOUTWELL ROAD

DRAINAGE & UTILITY EASEMENT

CONSTRUCTION LIMITS

STREAM THALWEG

STREAM THALWEG

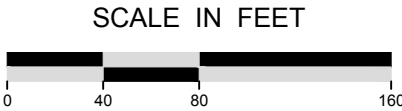
TREE CLEARING LIMITS

DRAINAGE & UTILITY EASEMENT

CONSTRUCTION LIMITS

NOTES:  
 1. ALL TREES SHALL BE REMOVED WITHIN THE TREE CLEARING LIMITS WITH THE EXCEPTION OF THE TREES SHOWN ABOVE. A TREE PRESERVATION TABLE APPEARS ON PAGE 6 OF THESE PLANS.  
 2. NO CROSSING OF THE STREAM SHALL BE PERMITTED.

3. CONTRACTOR SHALL SUBMIT PLAN FOR TEMPORARILY AMENDING AND RESTORING R/W TO NEGOTIATE 8' VERTICAL SEPARATION IN ORDER TO FACILITATE ACCESS TO THE SITE AND EXECUTE THE PROJECT. PROJECT ENGINEER AND LOCAL R/W AUTHORITY APPROVAL IS REQUIRED BEFORE CONSTRUCTION BEGINS.



File Path: I:\10162017  
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 Xrefs: P-Base\_BMH

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**DRAFT - NOT FOR CONSTRUCTION**

SUBMISSION DATE:  
10-16-2017  
 DESIGN BY: MJM  
 DRAWN BY: KDC  
 EOR PROJECT NO.: 00041-0302

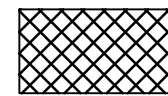
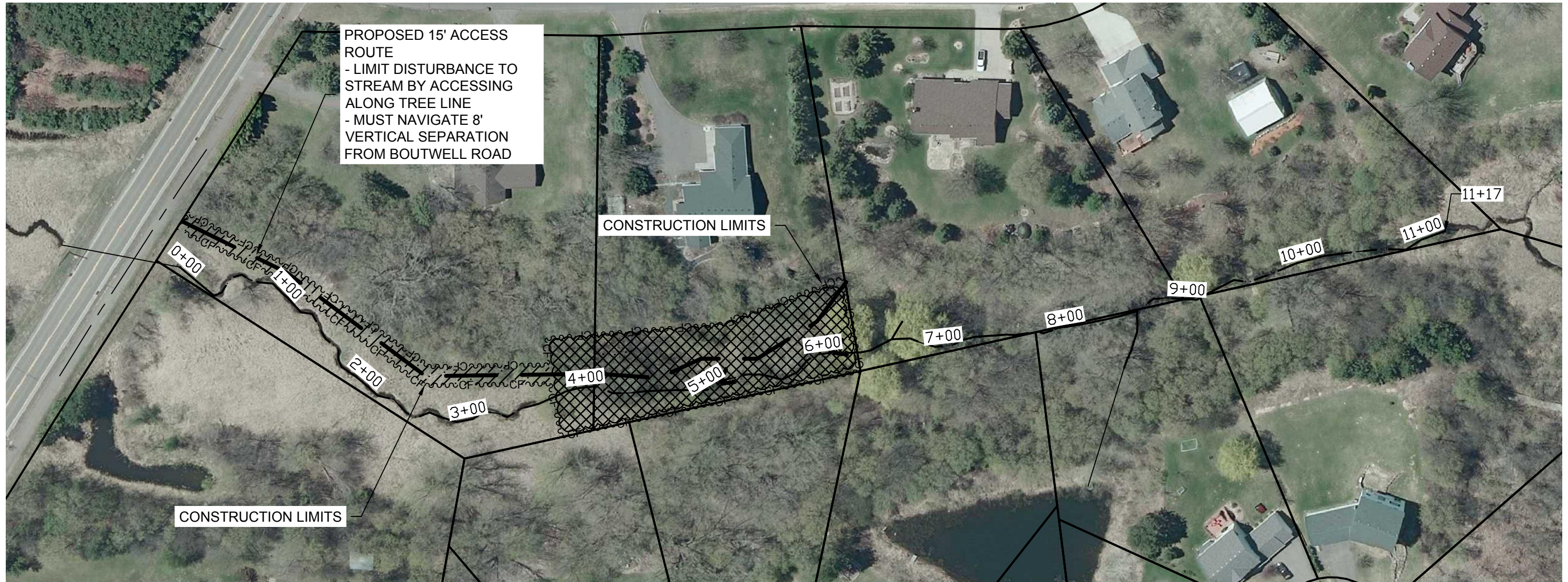
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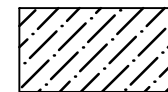
LONG LAKE TRIBUTARY HEADCUT  
 PHASE III  
 STILLWATER, WASH. COUNTY, MN  
 STATE PROJECT NO. CITY PROJECT NO.

REMOVALS PLAN  
 SHEET 03 OF 06 SHEETS





MN STATE SEED MIX 34-261: RIPARIAN SOUTH & WEST (TREE CLEARING ZONE)



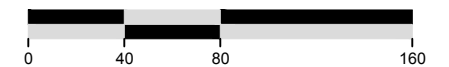
MN STATE SEED MIX 34-171: WETLAND REHABILITATION (ACCESS ROUTES)

TREE PLANTING SCHEDULE

Common Name	Scientific Name	Quantity
<i>Silver Maple</i>	<i>Acer saccharinum</i>	
<i>River Birch</i>	<i>Betula nigra</i>	
<i>Kentucky Coffeetree</i>	<i>Gymnocladus dioicus</i>	
<i>Swamp White Oak</i>	<i>Quercus bicolor</i>	
<i>Tamarack</i>	<i>Larix laricina</i>	



SCALE IN FEET



File Path: I:\162017  
 Drawing name: I:\162017\server\Clients\_VD\041\_BC\VD\0302\_Diversion\_Trib\_Headcut\_Phase\_III\09\_GIMS\_ProjectName.dwg  
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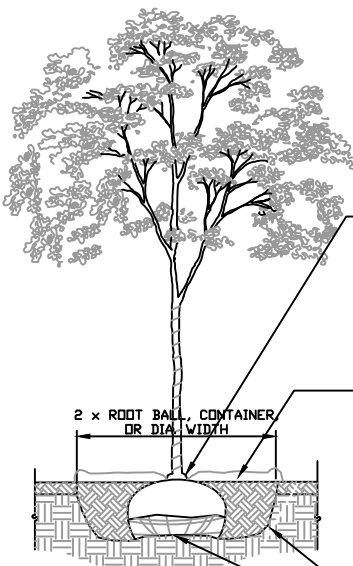
SUBMISSION DATE:  
10-16-2017  
DESIGN BY: MJM DRAWN BY: KDC  
EOR PROJECT NO.: 00041-0302

**EO****R** Emmons & Olivier Resources, Inc.  
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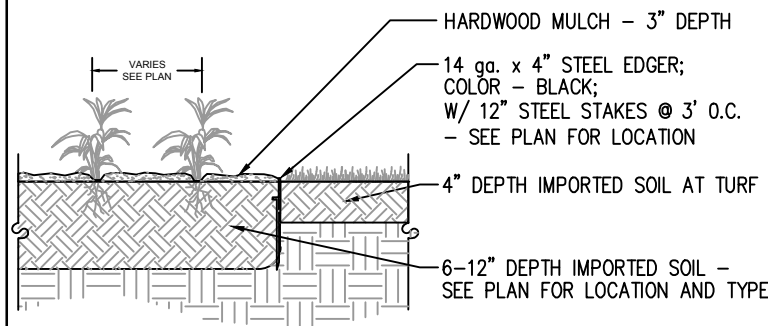
LONG LAKE TRIBUTARY HEADCUT  
 PHASE III  
 STILLWATER, WASH. COUNTY, MN  
 STATE PROJECT NO. CITY PROJECT NO.

SITE RESTORATION  
 SHEET 05 OF 06 SHEETS

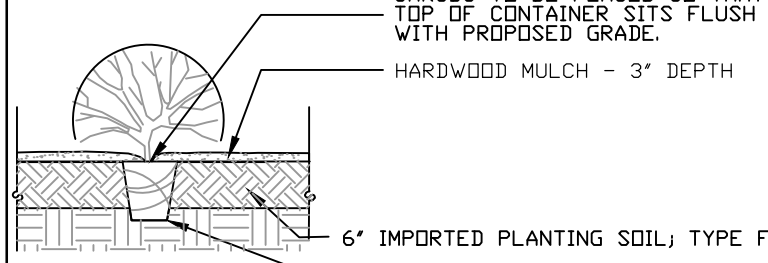


THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL TREES IN A PLUMB POSITION THROUGH THE WARRANTY PERIOD. STAKING IS NOT PERMITTED. PRUNE DAMAGED AND CROSSING BRANCHES AFTER PLANTING IS COMPLETE. REMOVE ALL FLAGGING AND LABELING FROM TREE. WATER TREE THOROUGHLY DURING PLANTING OPERATIONS. PLACE BACKFILL IN 8-12" LIFTS AND SATURATE SOIL WITH WATER. DO NOT COMPACT MORE THAN NECESSARY TO MAINTAIN PLUMB. CREATE A SHALLOW RING DEPRESSION AROUND TREE TO RETAIN WATER. PLANTS SHOULD BE AT THE PROPER DEPTH WHEREBY THE BEGINNING TAPER OF THE ROOT FLARE IS AT THE SAME ELEVATION AS THE FINISHED SOIL GRADE. THIS SHOULD BE THE SAME DEPTH AS THE PLANTS WERE GROWN AT IN THE NURSERY. NOTE THAT THE ROOTS OF BALLED AND BURLAPPED PLANTS ARE UNACCEPTABLE WHEN THEY ARE COVERED BY MORE THAN 4" OF SOIL IN THE TOP OF THE BALL. MULCH - 3" DEEP - SHREDDED HARD OR SOFT WOOD SHALL BE SUBSTANTIALLY FREE OF MOLD, DIRT, SAWDUST, AND FOREIGN MATERIAL AND SHALL NOT BE IN AN ADVANCED STATE OF DECOMPOSITION. THE MATERIAL SHALL PASS A 4 INCH SCREEN AND NOT MORE THAN 20 PERCENT BY MASS OF THE MATERIAL SHALL PASS A .1 INCH SIEVE. MAX. LENGTH OF INDIVIDUAL PIECES NOT TO EXCEED 20 INCHES. NO MULCH TO LAY AGAINST COLLAR. PLANTING SOIL - PER SPEC. 329300. SCARIFY BOTTOM AND SIDES OF HOLE PRIOR TO PLANTING. ROOT BALL SET ON MOUNDED SUBGRADE. PROVIDE RODENT PROTECTION ON ALL DECIDUOUS TREES UNLESS OTHERWISE SPECIFIED. ROOT BOUND CONTAINER TREES TO BE SCARIFIED ON THE SIDES AND BOTTOM.

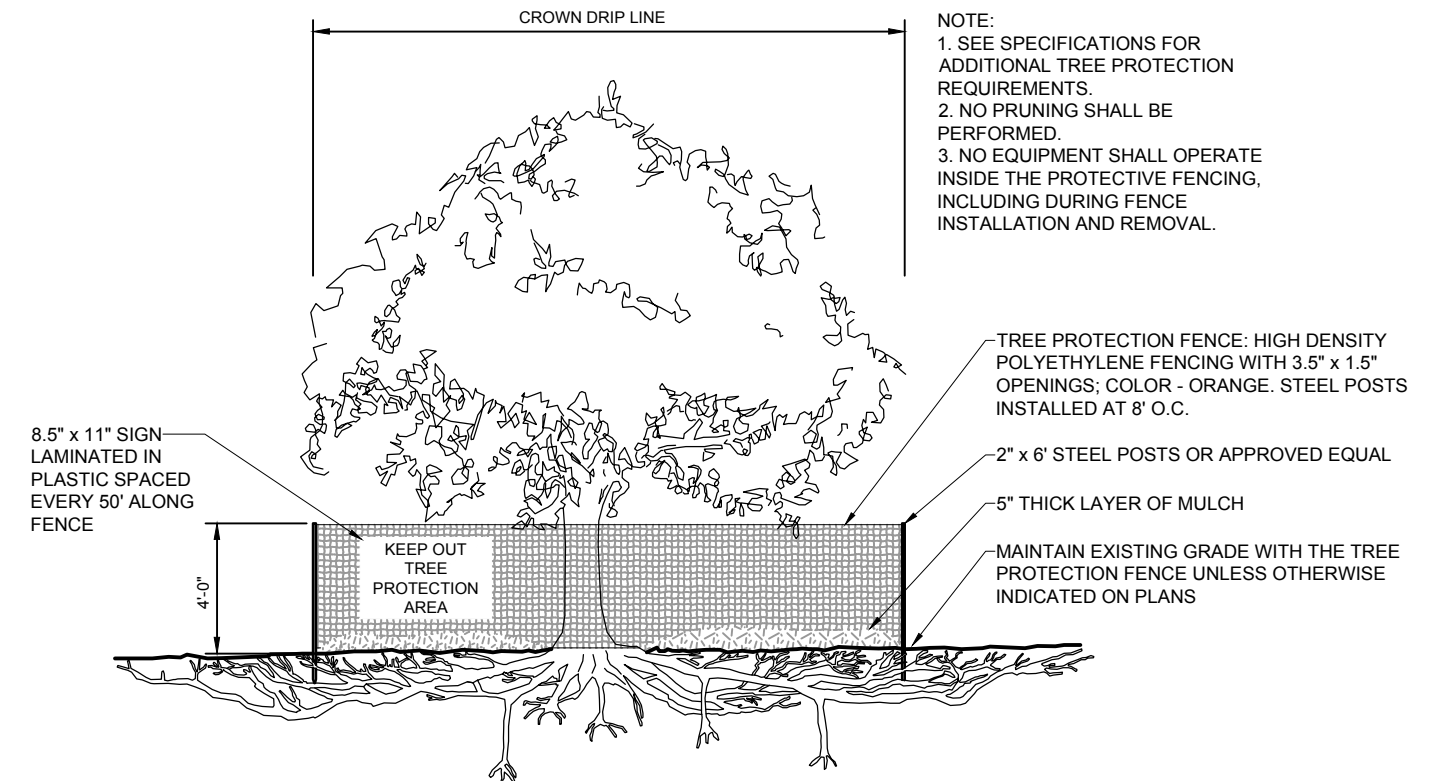
1 DECIDUOUS TREE PLANTING DETAIL  
5 NOT TO SCALE



2 PERENNIAL PLANTING & STEEL EDGER DETAIL  
6 NOT TO SCALE



3 DECIDUOUS SHRUB PLANTING DETAIL  
6 NOT TO SCALE



4 TREE PROTECTION DETAIL  
6 NOT TO SCALE

**34-171 WETLAND REHABILITATION**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
Virginia wild rye	Elymus virginicus	3.36	3	56.61%	4.63
fowl bluegrass	Poa palustris	1.12	1	18.89%	47.8
<b>Total Grasses</b>		<b>4.48</b>	<b>4</b>	<b>75.50%</b>	<b>52.43</b>
fox sedge	Carex vulpinoidea	0.22	0.2	3.85%	7.5
path rush	Juncus tenuis	0.18	0.16	3.03%	59
dark green bulrush	Scirpus atrovirens	0.4	0.36	6.70%	60
woolgrass	Scirpus cyperinus	0.09	0.08	1.51%	50
<b>Total Sedges and Rushes</b>		<b>0.9</b>	<b>0.8</b>	<b>15.09%</b>	<b>176.5</b>
nodding bur marigold	Bidens cernua	0.15	0.13	2.45%	1
Water Horehound	Lycopus americanus	0.37	0.33	6.29%	23.15
blue monkey flower	Mimulus ringens	0.04	0.04	0.67%	30
<b>Total Forbs</b>		<b>0.56</b>	<b>0.5</b>	<b>9.41%</b>	<b>54.15</b>
<b>Totals:</b>		<b>5.94</b>	<b>5.3</b>	<b>100.00%</b>	<b>283.08</b>

Purpose: Interseeding into establishing wetlands after weed control spraying. Also suitable for two to five year short term soil stabilization for areas with saturated soils.

Planting Area: Statewide

5 MN STATE SEED MIXES  
6 NOT TO SCALE

**34-261 RIPARIAN SOUTH & WEST**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
American slough grass	Beckmannia syzigachne	1.52	1.36	4.30%	24.9
riverbank wild rye	Elymus riparius	0.56	0.5	1.58%	0.53
Virginia wild rye	Elymus virginicus	1.96	1.75	5.56%	2.7
tall manna grass	Glyceria grandis	0.28	0.25	0.80%	6.5
fowl manna grass	Glyceria striata	0.1	0.09	0.29%	3
rice cut grass	Leersia oryzoides	0.18	0.16	0.51%	2
fowl bluegrass	Poa palustris	0.94	0.84	2.66%	40
prairie cordgrass	Spartina pectinata	0.34	0.3	0.96%	0.74
<b>Total Grasses</b>		<b>5.88</b>	<b>5.25</b>	<b>16.66%</b>	<b>80.37</b>
tussock sedge	Carex stricta	0.04	0.04	0.13%	0.8
pointed broom sedge	Carex scoparia	0.07	0.06	0.21%	2
fox sedge	Carex vulpinoidea	0.22	0.2	0.65%	7.5
path rush	Juncus tenuis	0.03	0.03	0.09%	10
dark green bulrush	Scirpus atrovirens	0.13	0.12	0.38%	20
woolgrass	Scirpus cyperinus	0.06	0.05	0.15%	30
<b>Total Sedges and Rushes</b>		<b>0.56</b>	<b>0.5</b>	<b>1.61%</b>	<b>70.3</b>
marsh milkweed	Asclepias incarnata	0.13	0.12	0.38%	0.21
common boneset	Eupatorium perfoliatum	0.03	0.03	0.11%	2
spotted Joe pye weed	Eutrochium maculatum	0.07	0.06	0.18%	2
autumn sneezeweed	Helenium autumnale	0.06	0.05	0.17%	2.5
giant sunflower	Helianthus giganteus	0.08	0.07	0.22%	0.25
spotted touch-me-not	Impatiens capensis	0.06	0.05	0.17%	0.08
great lobelia	Lobelia siphilitica	0.03	0.03	0.09%	5
blue monkey flower	Mimulus ringens	0.01	0.01	0.02%	5.07
Virginia mountain mint	Pycnanthemum virginianum	0.06	0.05	0.16%	4
tall coneflower	Rudbeckia laciniata	0.06	0.05	0.15%	0.25
giant goldenrod	Solidago gigantea	0.02	0.02	0.07%	2
blue vervain	Verbena hastata	0.17	0.15	0.46%	5
bunched ironweed	Vernonia fasciculata	0.07	0.06	0.18%	0.5
<b>Total Forbs</b>		<b>0.84</b>	<b>0.75</b>	<b>2.36%</b>	<b>28.86</b>
<b>Total Cover Crop</b>		<b>28.02</b>	<b>25</b>	<b>79.37%</b>	<b>11.14</b>
<b>Totals:</b>		<b>35.31</b>	<b>31.5</b>	<b>100.00%</b>	<b>190.66</b>

Oats or winter wheat (see note at beginning of list for recommended dates)

Purpose: Native riparian and floodplain plantings for wetland mitigation, ecological restoration, or general permanent cover after culvert or bridge work. Tolerates partial shade.

Planting Area: Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces. Mn/DOT Districts 2(west), 3B, 4, Metro, 6, 7 & 8.

**Point Table**

Point #	Type	Northing	Easting
1	27" RED MAPLE	216485.5204	496566.8416
2	27" RED MAPLE	216494.7361	496567.2292
3	24" RED MAPLE	216503.4596	496565.2526
4	20" RED MAPLE	216507.5796	496564.3508
5	12" AMERICAN ELM	216561.9807	496585.7101
6	20" BLACK WILLOW	216604.6766	496551.0081
7	40" WILLOW	216689.1539	496535.7459
8	40" WILLOW	216718.0172	496566.7178

NO	DATE	BY	REVISION
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**DRAFT - NOT FOR CONSTRUCTION**

SUBMISSION DATE: 10-12-2017  
DESIGN BY: MJM DRAWN BY: KDC  
EOR PROJECT NO. 00041-0302

**EOR** Emmons & Olivier Resources, Inc.  
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STILLWATER, WASH. COUNTY, MN  
STATE PROJECT NO. CITY PROJECT NO.

DETAILS  
SHEET 06 OF 06 SHEETS