K.A.R. 5-40-70. Construction notification to the chief engineer. Each holder of a permit to construct, or an approval to repair or modify a dam, shall notify the chief engineer at least 48 hours before any of the following stages of construction and shall obtain the approval of the chief engineer before proceeding with each of these stages of construction:

(a) Starting construction;
(b) placing backfill in the cutoff trench;
(c) placing backfill around the primary spillway conduit or any other conduit that extends through the dam embankment and exits the downstream slope; and
(d) starting any stage of construction not specified in this regulation for which the permit requires that the chief engineer shall be notified.

The contractor shall notify the Engineer of Record 72 hours prior to the required inspections to allow for the required 48 hours notice to the Chief Engineer.

(Authorized by K.S.A. 2006 Supp. 82a-303a; implementing K.S.A. 2006 Supp. 82a-301a and 82a-303a; effective May 18, 2007.)

K.A.R. 5-40-71. Inspection during dam construction, repair, and modification. (a) Except as specified in subsection (d), each high-impact dam shall be inspected by an engineer competent in the design of dams, or that engineer's authorized representative, at all times during any construction activity.

(b) Each low-impact dam shall be inspected by an engineer qualified in the design of dams, or that engineer's authorized representative, whenever any of the following conditions is met:
(1) Backfill is being placed in the cutoff trench of a dam.
(2) Conduits and their appurtenances are being placed.
(3) Backfill is being placed around a conduit.
(4) Drain material and outlets are being installed.
(5) Concrete forms and reinforcing steel are being placed.
(6) Concrete is being placed.
(7) Any other stage of construction required by the permit, approved plans, or approved specifications to be inspected occurs.

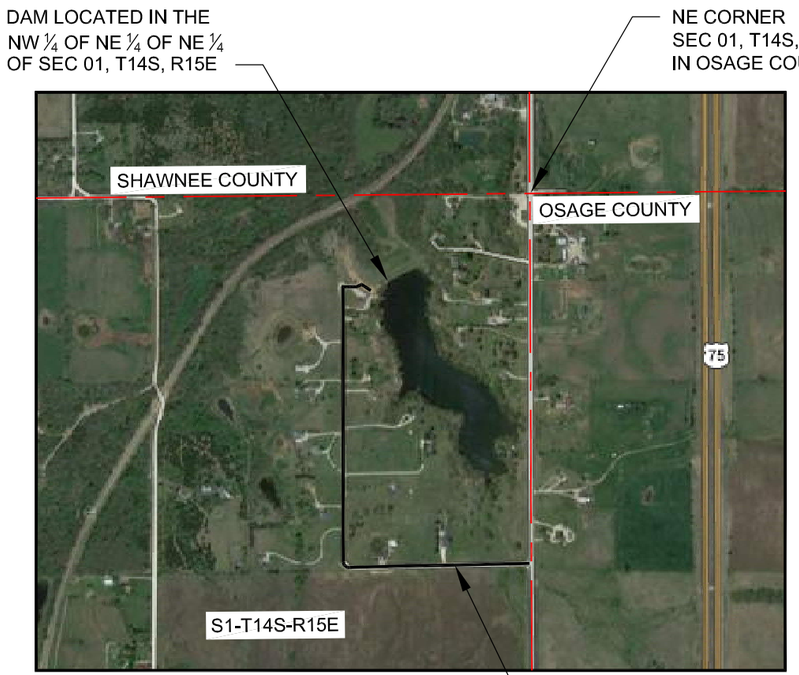
(c) Before the start of construction, the permit holder shall provide the chief engineer in writing with the name, address, and telephone number of the engineer responsible for the inspection.

(d) The inspecting engineer, or the engineer's authorized representative, shall not be required to be present during any of the following construction activities for a high-impact dam:
(1) The clearing and grubbing of the construction site;
(2) the removal of structures from the reservoir area other than the removal of a dam;
(3) the installation of pollution-control measures, unless required by other authorities; (4) seeding;
(5) mulching; and
(6) the construction of a fence.

(e) If the inspecting engineer, or the engineer's authorized representative, observes construction activity that is not in compliance with the approved permit, plans, or specifications and the contractor fails to correct the item or items that are not in compliance with the approved permit, plans, or specifications after being notified by the inspector, the inspector shall notify the chief engineer of the noncompliant activity.

(Authorized by K.S.A. 2006 Supp. 82a-303a; implementing K.S.A. 2006 Supp. 82a-301a and 82a-303a; effective May 18, 2007.)

LAKE OSHAWNO
PRIMARY SPILLWAY REHABILITATION
SPONSORED BY
OSHAWNO LAKE ASSOCIATION
OSAGE COUNTY, KANSAS
DWR WSN: DOS-0055



LAND OWNER
OSHAWNO LAKE ASSOCIATION INC.
P.O. BOX 417
CARBONDALE, KS 66414
OSAGE COUNTY, KS

LOCATION MAP

SCALE: 1" = 1000'

SCHMIDT ENGINEERING CONSULTANTS, INC
CIVIL, STRUCTURAL, AND ARCHITECTURAL ENGINEERING
311 COTTONWOOD ST STRONG CITY, KS 66869
620-273-8384

MICHAEL L. SCHMIDT LICENSED 8982 KANSAS PROFESSIONAL ENGINEER

SCHMIDT Engineering Consultants, Inc.
CIVIL, STRUCTURAL, AND ARCHITECTURAL ENGINEERING
311 Cottonwood, Strong City, Kansas 66869 / 815 Graham St., Emporia, Kansas 66801 / 620-343-0302

TECH CAD SERVICES, LLC
Building Designer
CAD Drafting Services
Factory Built Consulting

NO	DATE:	DESCRIPTION	BY	APP:

REVISIONS

SHEET TITLE: COVER SHEET
PROJECT: PRIMARY SPILLWAY REHABILITATION
OSHAWNO LAKE ASSOCIATION

REF:
PROJ NO:
DATE: Mar 18, 2015
DRAWN BY: KH GIRARDIN
CHK'D BY: ML SCHMIDT
DRAWING: 1

TOPOGRAPHIC MAP.DWG

PROJECT DESCRIPTION

This project is located south of the Osage / Shawnee County line in Osage County. The purpose of this project activity is to replace the Primary Spillway Pipe. The dam is being design to meet all current design standards except where appropriate waivers are granted by the Chief Engineer, State Board of Agriculture.

The CMP Primary Spillway Pipe that was installed 50 years ago has deteriorated. This pipe will be replaced with a PVC pipe that meets current design standards. In addition, the detention storage capacity of the reservoir and the auxiliary spillway are being modified to ensure long term protection of the dam. It is anticipated that the proposed maintenance actions will result in an improved structure and reservoir with the result that the effective life of the project will be extended another 40 to 50 years.

OSHAWNO LAKE ASSOCIATION
PRIMARY SPILLWAY REHABILITATION

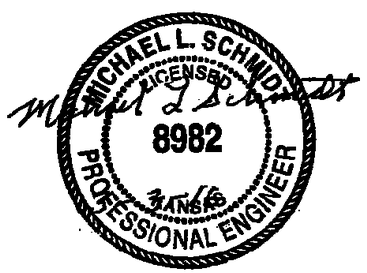
NW ¼ OF, NE ¼ OF, NE ¼ OF
SECTION 01, TOWNSHIP 14 S, RANGE 15 E

DWR WSN: DOS-0055
OSAGE COUNTY, KANSAS

INDEX OF DRAWINGS:

DOWNSTREAM LANDOWNERS

NAME	ADDRESS	CITY	STATE	ZIP
JANET JACKSON	449 SW COKER RD	WAKARUSA	KANSAS	66546
BURLINGTON NORTHERN SANTA FE RAILROAD (BNSF)	2650 LOU MENK DRIVE	FORT WORTH	TEXAS	76131



SCHMIDT Engineering Consultants, Inc.
CIVIL, STRUCTURAL, AND ARCHITECTURAL ENGINEERING
311 Cottonwood, Strong City, Kansas 66869 / 815 Graham St., Emporia, Kansas 66801 / 620-343-0302

TECH CAD SERVICES, LLC
Building Designer
CAD Drafting Services
Factory Built Consulting

NO	DATE:	DESCRIPTION
1	6/15	DWR REVIEW COMMENTS

REVISIONS

BY	APP:
KHG	MLS

SHEET TITLE: PROJECT DESCRIPTION

PROJECT: PRIMARY SPILLWAY REHABILITATION
OSHAWNO LAKE ASSOCIATION

REF:
PROJ NO:
DATE: Mar. 18, 2015
DRAWN BY: KH GIRARDIN
CHK'D BY: ML SCHMIDT
DRAWING: 2

PLAN SET.DWG

TABLE OF QUANTITIES

ITEM	UNITS	QUANTITY
SITE PREPARATION, CLEARING, EXCAVATION	LUMP SUM	1
SEEDING AND MULCHING	ACRES	0.65
MOBILIZATION	LUMP SUM	1
WATER	M GAL.	10
EARTHFILL; EMBANKMENT	CU YD	7408
EARTHFILL; HAND COMPACTION	CU YD	71
EARTHFILL; MISC.	CU YD	713
EARTHFILL; RAISE DAM TO 1015	CU YD	1004
AUXILIARY SPILLWAY EXCAVATION (ROCK)	CU YD	112
DRAINAGE DIAPHRAGM (SAND)	TONS	17
SALVAGE AND SPREAD TOP SOIL	CU YD	664
CONCRETE PIPE SUPPORT	EACH	1
16"ø SDR-21 P.V.C. PIPE (AWWA C905)	LIN. FT.	156
4"ø SDR-28 P.V.C. PIPE, DIAPHRAGM DRAIN (AW WA C905)	LIN. FT.	60
4"ø SDR-28 P.V.C. PIPE PERFORATED, DIAPHRA GM DRAIN	LIN. FT.	7
6"ø C.M.P. PIPE	LIN. FT.	32
TRASH RACK	EACH	1
RIPRAP	TONS	30
CONTRACTOR CONSTRUCTION STAKING	LUMP SUM	1

SLOPE OF TOP OF DAM AND BACK BERM

The top of the dam shall slope so that the upstream edge of the top of dam is 0.3' lower than the downstream edge of the top of dam. Design height shall be measured along the centerline of the top of dam.

The top of the back berm shall slope in the downstream direction with the inside edge of the berm 0.3' higher than the outside (downstream) edge of the berm. Design height shall be measured along the centerline of the top of the back berm.

TREE CLEARING

Trees within the outlet channel are to be removed or cut. Trees greater than 12" in diameter will be completely removed. The rootballs shall be removed and the area backfilled, compacted, and reseeded. Trees on the dam embankments shall be removed or cut flush to the ground and treated with an appropriate herbicide.

SLOPE PROTECTION

A protective cover of vegetation shall be established on all exposed surfaces of the structure and borrow area. Vegetation shall be per ITEM 11; SEEDING as noted in the Construction Specifications.

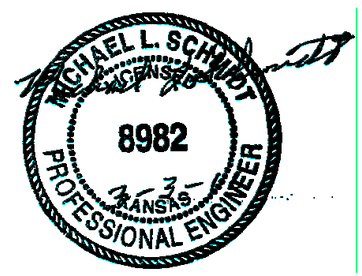
PVC PROTECTION FROM SUNLIGHT

Each portion of polyvinyl chloride pipe that is exposed to sunlight shall be protected by painting with a dark shade of "latex" paint as recommended by the manufacturer (or by encasing in a protective material). The Primary Spillway pipe shall be painted, the 4 inch drain pipes shall be encased in a CMP as noted in the drawings.

PIPE REPAIR INSTRUCTIONS

1. EXCAVATE AREA INDICATED, BE AWARE OF SAFE TRENCH STANDARDS.
2. REMOVE EXISTING TRASH RACK AND THE 30" ø CONCRETE RISER.
3. REMOVE THE EXISTING PRIMARY SPILLWAY PIPE AND PIPE SUPPORTS.
4. BACKFILL AREA BY STANDARD COMPACTING METHODS TO THE PROPOSED PVC PRIMARY SPILLWAY PIPE GRADE.
5. INSTALL NEW 16" ø PVC PRIMARY SPILLWAY PIPE, CONSTRUCT CONCRETE PIPE SUPPORT.
6. CONSTRUCT SAND DIAPHRAGM WITH DRAIN PIPE FOR NEW PVC PRIMARY SPILLWAY PIPE.
7. HAND COMPACT BACKFILL MATERIAL AROUND THE PRIMARY PIPE.
8. BACKFILL AREA BY STANDARD COMPACTING METHODS, THE PROJECT SPECIFICATIONS AND AS NOTED IN THE PROJECT DRAWINGS.
9. INSTALL TRASH RACK.
10. SEED AND MULCH DISTURBED AREA.
11. EXCAVATE STILLING BASIN. RIP RAP UPSTREAM EMBANKMENT AND THE STILLING BASIN WITH SALVAGED RIP RAP AND ADDITIONAL RIP RAP TO COMPLETE THIS ITEM.

NOTE: EMERGENCY ACTION PLAN (EAP) TO ADDRESS TEMPORARY EMERGENCY DRAW DOWN OF THE LAKE BY SIPHON OR PORTABLE PUMP.



SCHMIDT Engineering Consultants, Inc.
CIVIL, STRUCTURAL, AND ARCHITECTURAL ENGINEERING
311 Cottonwood, Strong City, Kansas 66869 / 816 Graham St., Emporia, Kansas 66801 / 620-343-1002

NO	DATE:	DESCRIPTION	BY	APP:
1	9/15	DWR REVIEW COMMENTS	KHG	MLS
2	12/15	DWR REVIEW COMMENTS	KHG	MLS
3	01/16	DWR REVIEW COMMENTS	KHG	MLS
4	02/16	DWR REVIEW COMMENTS	KHG	MLS
5	03/16	DWR REVIEW COMMENTS	KHG	MLS

REVISIONS

SHEET TITLE: TABLE of QUANTITIES / STORAGE TABLE

PROJECT: PRIMARY SPILLWAY REHABILITATION
OSHAWND LAKE ASSOCIATION

REF:

PROJ NO:

DATE: Mar. 18, 2015

DRAWN BY: KH GIRARDIN

CHK'D BY: ML SCHMIDT

DRAWING: 3

PLAN SET.DWG

TOP OF DAM ELEVATIONS

STATION	EXISTING	PLANNED	CUT/FILL	SETTLEMENT	NOTES
0+00	1012.00	1012.00	0.0	0.0	OUTSIDE A.S.
0+18	1007.00	1006.00	-1.0	0.0	INSIDE A.S
0+38	1007.00	1006.00	-1.0	0.0	CL A.S
0+58	1007.10	1006.10	-1.0	0.0	INSIDE A.S
0+82	1012.40	1012.40	2.6	0.0	END OF DAM
1+22	1013.00	1015.00	2.0	0.0	@ WEST SIGN
1+89	1014.60	1015.00	0.5	0.0	P.S. LOCATION
2+89	1015.70	1015.00	0.0	0.0	
3+89	1015.80	1015.00	0.0	0.0	
4+89	1014.30	1015.00	0.7	0.0	
5+50	1014.20	1015.00	0.8	0.0	END OF DAM (EXISTING)
6+30	1014.00	1015.00	1.0	0.0	END OF DAM (NEW)

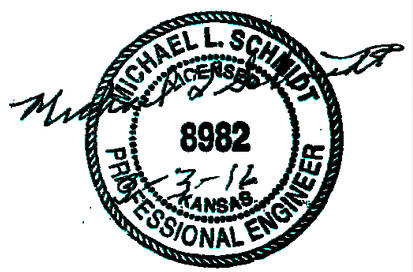
Note: The original dam was constructed in approximately 1957. Therefore, settlement is designed only for that portion of the dam which will be disturbed by repairs and any areas needing added settlement as a result of the increase in design dam height.

TABLE OF DISCHARGES

Elevation MLS (feet)	Pipe Flow (cfs)	Aux. Spillway Flow (cfs)	Outlet Elev. MLS
1001	0.0	0.00	985.2
1002	17.8	0.00	985.2
1003	18.3	0.00	985.2
1004	18.8	0.00	985.2
1005	19.2	0.00	985.2
1006	19.7	0.00	985.2
1007	20.2	0.00	985.2
1008	20.6	136.00	985.2
1009	21.0	384.00	985.2
1010	21.5	705.00	985.2
1011	21.9	1085.00	985.2
1012	22.3	1516.00	985.2

STORAGE TABLE

Elevation MLS (feet)	Surface area (acres)	Incremental volume (ac-ft)	Accumulative volume (ac-ft)
974	0.0	0.00	0.00
976	0.26	0.26	0.26
980	1.08	2.68	2.94
984	2.88	7.92	10.86
988	5.16	16.08	26.94
992	6.69	23.70	50.64
996	8.71	30.80	81.44
1000	11.69	40.80	122.24
1001	12.17	11.93	134.17
1004	14.00	39.26	173.43
1007	15.80	44.70	218.13
1008	16.50	16.15	234.28
1012	20.30	73.60	307.88
1013	21.50	20.90	328.78
1014	23.80	22.65	351.43
1015	26.30	25.05	376.48
1016	28.80	27.55	404.03



SCHMIDT Engineering Consultants, Inc.
CIVIL, STRUCTURAL, AND ARCHITECTURAL ENGINEERING
311 Cottonwood, Strong City, Kansas 66869 / 816 Graham St, Emporia, Kansas 66801 / 620-343-0302

NO	DATE:	DESCRIPTION	BY	APP:
3	3/16	ADDED ITEM #12 RIP RAP	KHG	MLS
1	9/15	DWR REVIEW COMMENTS	KHG	MLS
2	12/15	DWR REVIEW COMMENTS	KHG	MLS
3	01/16	DWR REVIEW COMMENTS	KHG	MLS
4	02/16	DWR REVIEW COMMENTS	KHG	MLS

REVISIONS

SHEET TITLE: DESIGN of DAM SUPPLEMENT

PROJECT: PRIMARY SPILLWAY REHABILITATION
OSHAWND LAKE ASSOCIATION

REF:

PROJ NO:

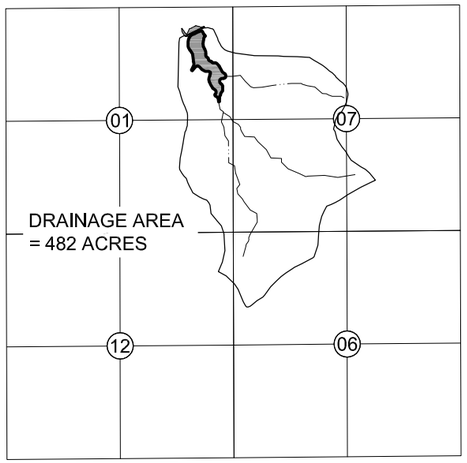
DATE: Mar. 18, 2015

DRAWN BY:KH GIRARDIN

CHK'D BY: ML SCHMIDT

DRAWING: 4

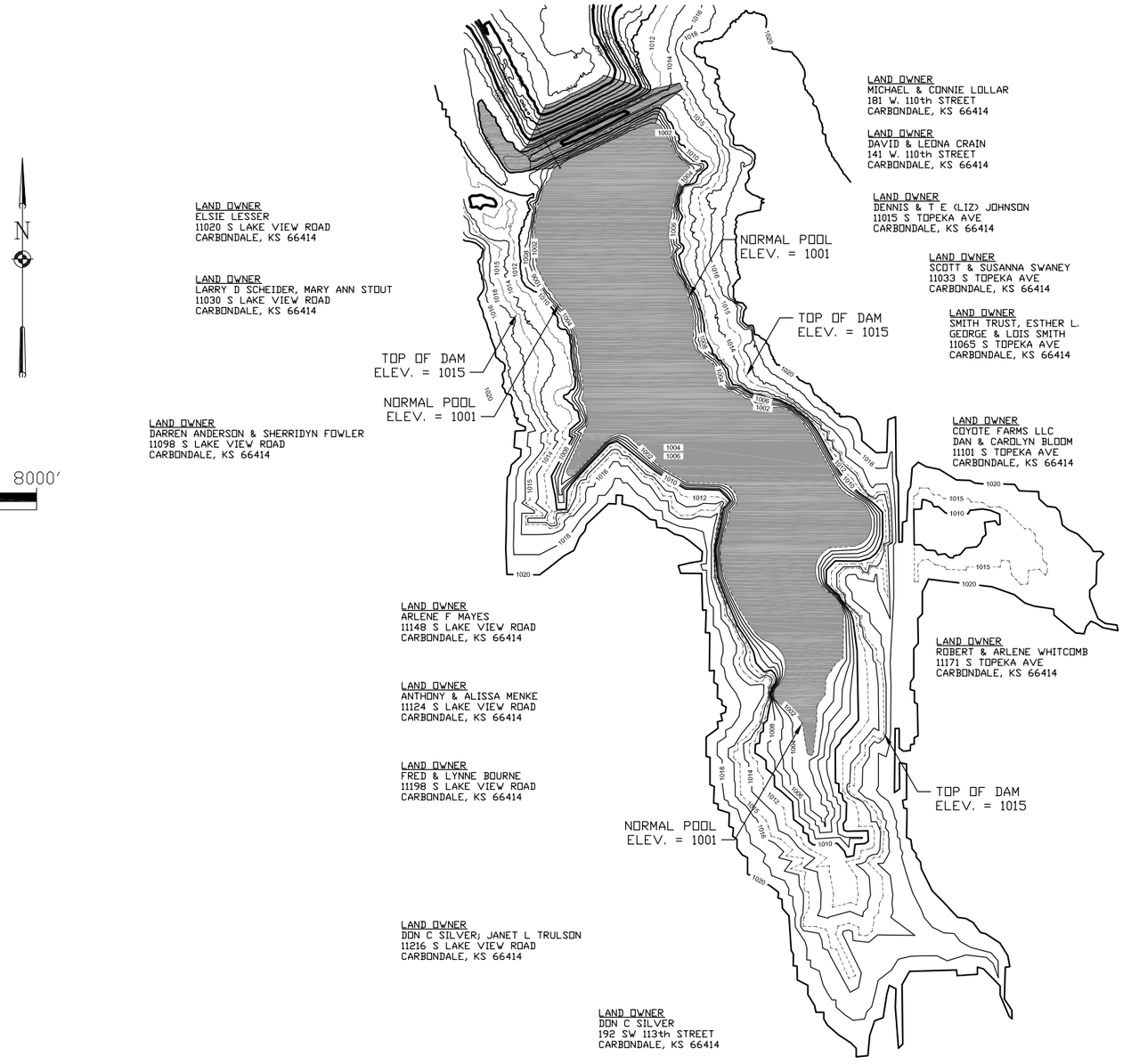
PLAN SET.DWG



NOTE:
DRAINAGE AREA = 482 ACRES
= 0.75 SQUARE MILES AS DWR

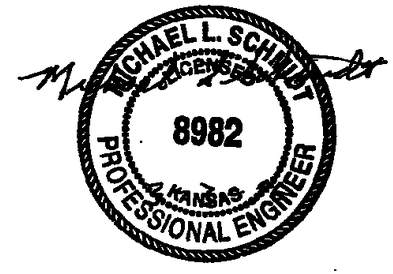
0 4000′ 8000′

2 DRAINAGE AREA MAP
Scale: 1" = 4000'



0 400′ 800′

1 TOPOGRAPHICAL MAP
Scale: 1" = 400'



SCHMIDT Engineering Consultants, Inc.
CIVIL, STRUCTURAL, AND ARCHITECTURAL ENGINEERING
311 Cottonwood, Strong City, Kansas 66869 / 815 Graham St., Emporia, Kansas 66801 / 620-343-1002

TECH CAD SERVICES, LLC
Building Designer
CAD Drafting Services
Factory Built Consulting

NO	DATE:	DESCRIPTION	BY	APP:
1	9/15	DWR REVIEW COMMENTS	KHG	MLS
2	1/16	NORMAL POOL ELEVATION	KHG	MLS
3	2/16	NORMAL POOL ELEVATION	KHG	MLS

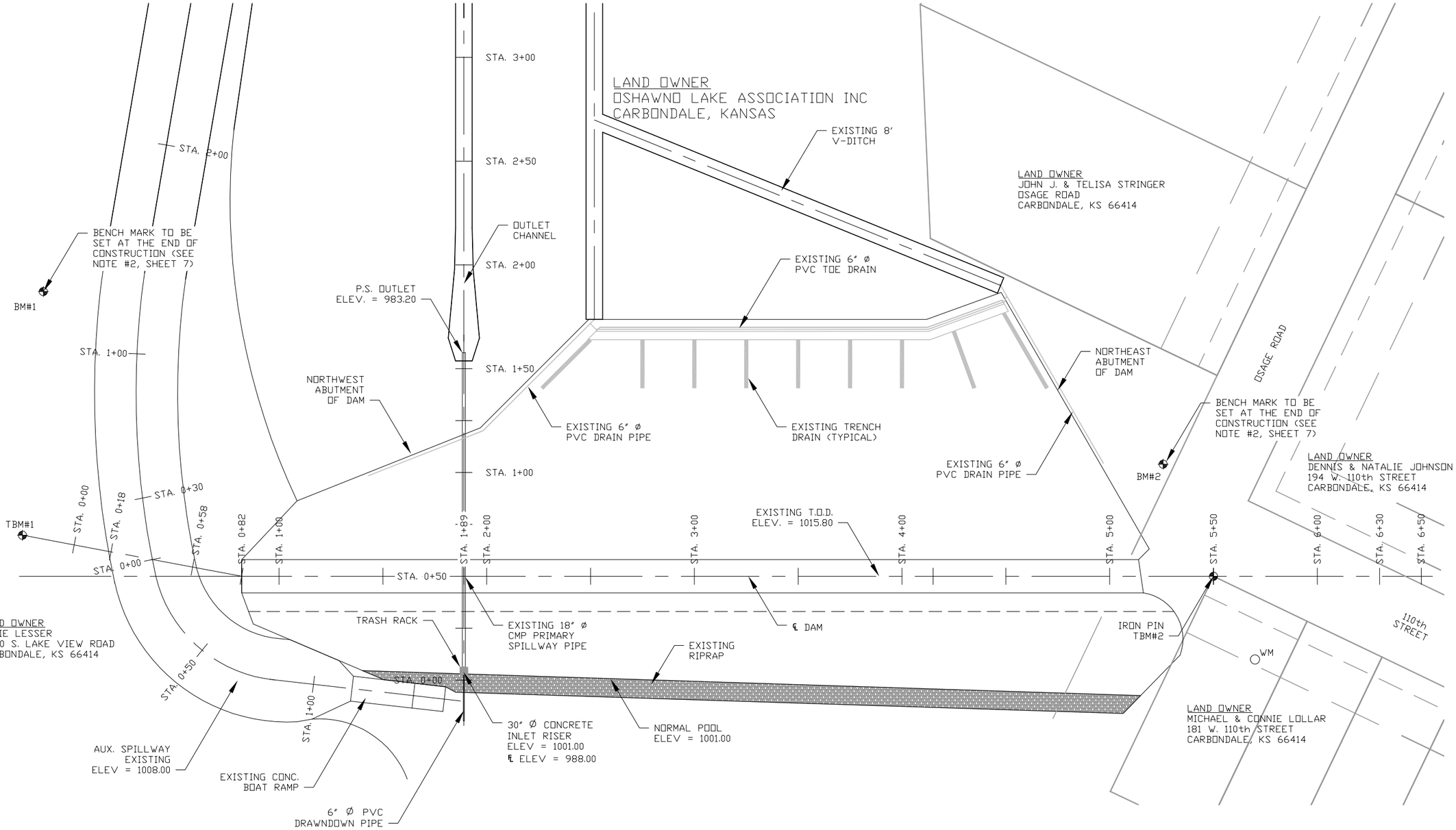
REVISIONS

SHEET TITLE: SITE PLAN/DRAINAGE BASIN

PROJECT: PRIMARY SPILLWAY REHABILITATION
OSHAWND LAKE ASSOCIATION

REF:
PROJ NO:
DATE: JUNE 8, 2015
DRAWN BY:KH GIRARDIN
CHK'D BY:ML SCHMIDT
DRAWING: 5

TOPOGRAPHIC MAP.DWG



BENCHMARK LOCATIONS

TBM#1 ½" DIA. REBAR ELEV. 1012.00

TBM#2 ½" DIA. REBAR ELEV. 1014.20

1 EXISTING PLAN

Scale: 1" = 50'-0"

0 50' 100'

SCHMIDT Engineering Consultants, Inc.
CIVIL, STRUCTURAL, AND ARCHITECTURAL ENGINEERING
311 Cottonwood, Strong City, Kansas 66869 / 816 Graham St., Emporia, Kansas 66801 / 620-343-1002

TECH CAD SERVICES, LLC
Building Designer
CAD Drafting Services
Factory Built Consulting

NO	DATE:	DESCRIPTION	BY	APP:
3	3/16	ADDED ITEM #12 RIP RAP	KHG	MLS
1	9/15	DWR REVIEW COMMENTS	KHG	MLS
2	12/15	ADDED EMBANKMENT DRAINS	KHG	MLS
3	01/16	REVISED EMBANKMENT DRAINS	KHG	MLS
4	02/16	REVISED EMBANKMENT DRAINS	KHG	MLS

REVISIONS

SHEET TITLE: EXISTING PLAN

PROJECT: PRIMARY SPILLWAY REHABILITATION
OSHAWNO LAKE ASSOCIATION

REF:

PROJ NO:

DATE: Mar. 18, 2015

DRAWN BY: KH GIRARDIN

CHK'D BY: ML SCHMIDT

DRAWING: 6

MICHAEL L. SCHMIDT LICENSED 8982 KANSAS PROFESSIONAL ENGINEER

PLAN SET.DWG

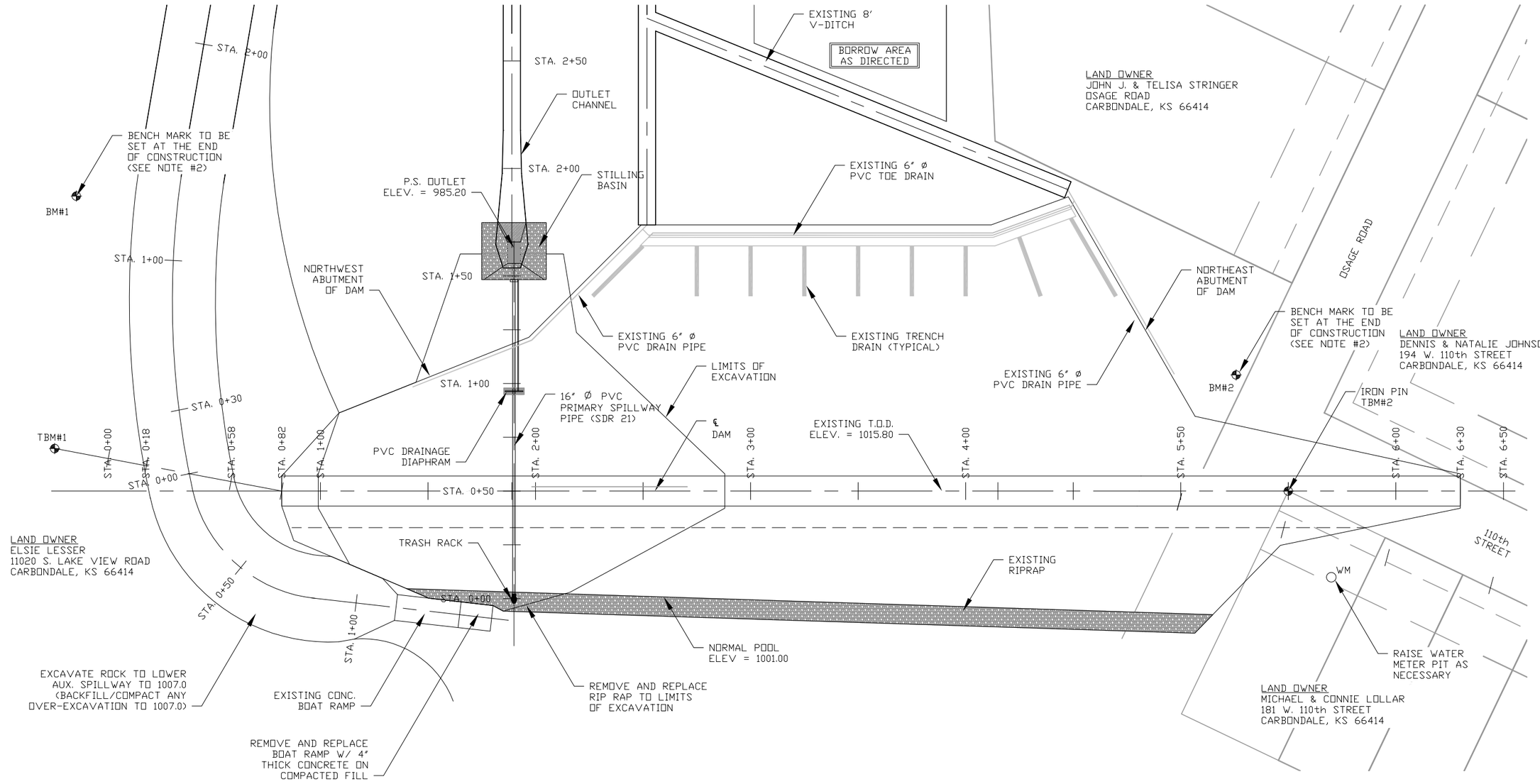
NOTE

1. EXCVATED ROCK AND SPOILS SHALL BE SHALL BE DISPOSED OF ON-SITE AND SPREAD AS DIRECTED.

NOTE

1. EXISTING DOWNSTREAM EMBANKMENT DRAINS THAT ARE DISTURBED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED. DETAIL AVAILABLE UPON REQUEST.

LAND OWNER
OSHAWNO LAKE ASSOCIATION INC
CARBONDALE, KANSAS



BENCHMARK LOCATIONS

BM #1 ½" DIA. REBAR LOCATION AND ELEVATION TO BE NOTED ON AS BUILT DRAWINGS

BM #2 ½" DIA. REBAR LOCATION AND ELEVATION TO BE NOTED ON AS BUILT DRAWINGS

TBM#1 ½" DIA REBAR ELEV 1012.00

TBM#2 ½" DIA REBAR ELEV 1014.20

NOTES

1. TEMPORARY BENCH MARKS (TBM) SHALL BE PER PLAN. ELEVATION SHALL BE VERIFIED PRIOR TO THE START OF CONSTRUCTION.
2. NEW BENCHMARKS (BM) SHALL BE PLACED PER PLAN MEETING THE REQUIREMENTS OF KANSAS D.W.R. 5-40-2a (a, b, d, e). THE BENCHMARK SHALL BE 36" LONG, ½" DIA REINFORCEMENT BAR.

1 PROPOSED PLAN
Scale: 1" = 50'-0"

0 50' 100'

N

MICHAEL L. SCHMIDT LICENSED 8982 KANSAS PROFESSIONAL ENGINEER

SCHMIDT Engineering Consultants, Inc.
CIVIL, STRUCTURAL, AND ARCHITECTURAL ENGINEERING
311 Cottonwood, Strong City, Kansas 66869 / 815 Graham St., Emporia, Kansas 66801 / 620-343-0302

NO	DATE:	REVISIONS	BY	APP:
3	3/16	ADDED ITEM #12 RIP RAP	KHG	MLS
2	12/15	ADDED EMBANKMENT DRAINS	KHG	MLS
1	9/15	DWR REVIEW COMMENTS	KHG	MLS
3	01/16	REVISED EMBANKMENT DRAINS	KHG	MLS
4	02/16	REVISED EMBANKMENT DRAINS	KHG	MLS

SHEET TITLE: PROPOSED PLAN

PROJECT: PRIMARY SPILLWAY REHABILITATION OSHAWNO LAKE ASSOCIATION

REF:

PROJ NO:

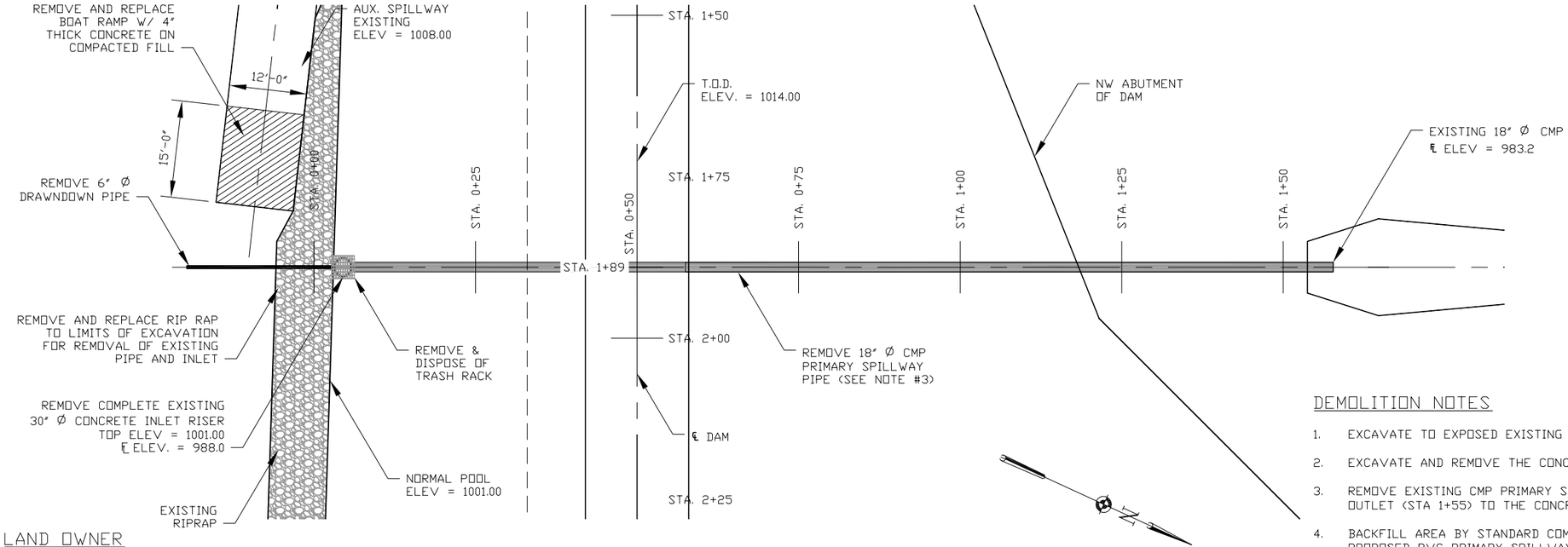
DATE: Mar. 18, 2015

DRAWN BY: KH GIRARDIN

CHK'D BY: ML SCHMIDT

DRAWING: 7

PLAN SET.DWG

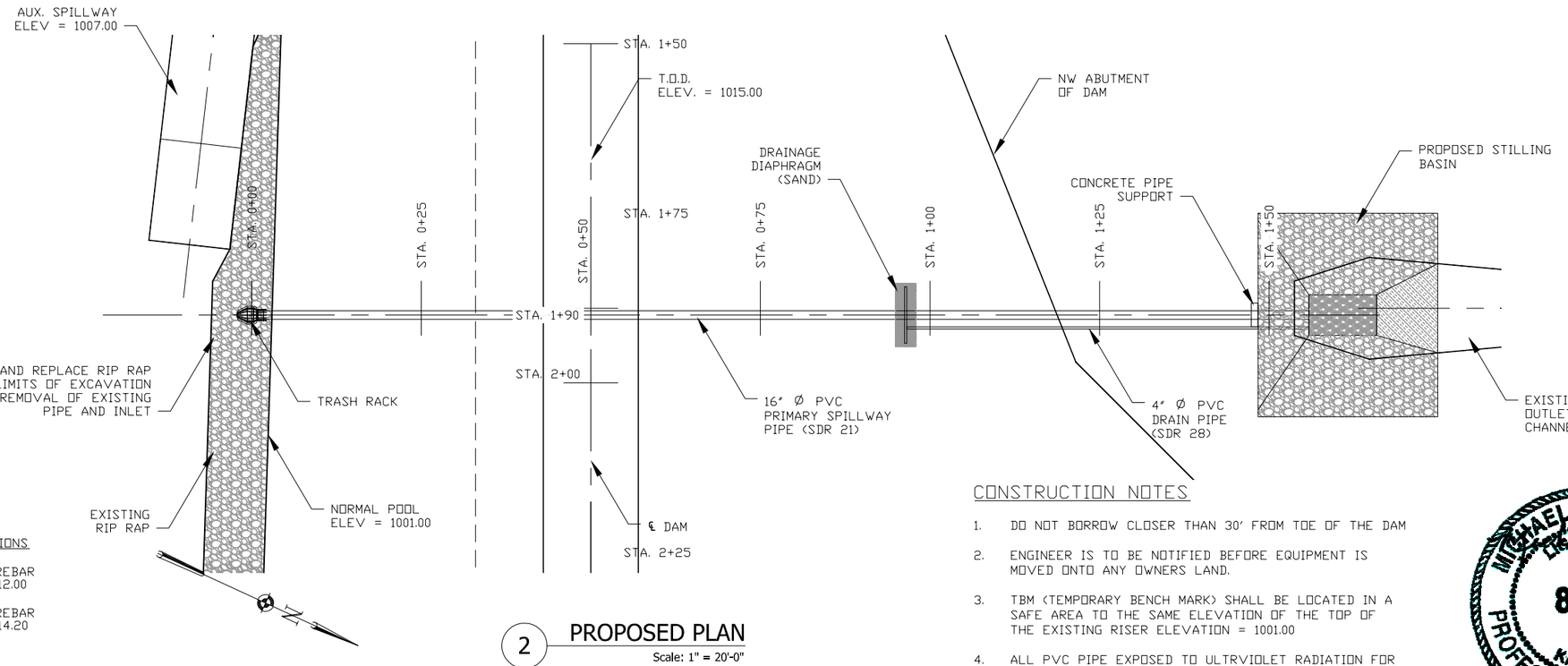


LAND OWNER
OSHAWND LAKE ASSOCIATION INC
CARBONDALE, KANSAS

1 **DEMOLITION PLAN**
Scale: 1" = 20'-0"

DEMOLITION NOTES

1. EXCAVATE TO EXPOSED EXISTING CMP PRIMARY SPILLWAY PIPE.
2. EXCAVATE AND REMOVE THE CONCRETE INLET RISER; 13' DEEP.
3. REMOVE EXISTING CMP PRIMARY SPILLWAY PIPE FROM THE OUTLET (STA 1+55) TO THE CONCRETE RISER (STA 0+5.75).
4. BACKFILL AREA BY STANDARD COMPACTING METHODS TO THE PROPOSED PVC PRIMARY SPILLWAY PIPE GRADE.



BENCHMARK LOCATIONS

TBM#1 ½" DIA REBAR ELEV 1012.00

TBM#2 ½" DIA REBAR ELEV 1014.20

2 **PROPOSED PLAN**
Scale: 1" = 20'-0"

CONSTRUCTION NOTES

1. DO NOT BORROW CLOSER THAN 30' FROM TOE OF THE DAM
2. ENGINEER IS TO BE NOTIFIED BEFORE EQUIPMENT IS MOVED ONTO ANY OWNERS LAND.
3. TBM (TEMPORARY BENCH MARK) SHALL BE LOCATED IN A SAFE AREA TO THE SAME ELEVATION OF THE TOP OF THE EXISTING RISER ELEVATION = 1001.00
4. ALL PVC PIPE EXPOSED TO ULTRVIOLET RADIATION FOR EXTENDED PERIODS OF TIME (I.E. PERMANENTLY) SHALL BE PAINTED WITH A WATER BASED LATEX PAINT FORMULATED FOR EXTERIOR USE.

MICHAEL L. SCHMIDT LICENSED 8982 KANSAS PROFESSIONAL ENGINEER

SCHMIDT Engineering Consultants, Inc.
CIVIL, STRUCTURAL, AND ARCHITECTURAL ENGINEERING
311 Cottonwood, Strong City, Kansas 66869 / 816 Graham St., Emporia, Kansas 66801 / 620-343-1002

TECH CAD SERVICES, LLC
Building Designer
CAD Drafting Services
Factory Built Consulting

NO	DATE:	DESCRIPTION	BY	APP:
1	9/15	DWR REVIEW COMMENTS	KHG	MLS
2	01/16	REMOVE CMP P.S. PIPE	KHG	MLS
3	02/16	REMOVE CMP P.S. PIPE	KHG	MLS
3	3/16	ADDED ITEM #12 RIP RAP	KHG	MLS

REVISIONS

SHEET TITLE: PROPOSED PLAN / DEMOLITION PLAN

PROJECT: PRIMARY SPILLWAY REHABILITATION
OSHAWND LAKE ASSOCIATION

REF:

PROJ NO:

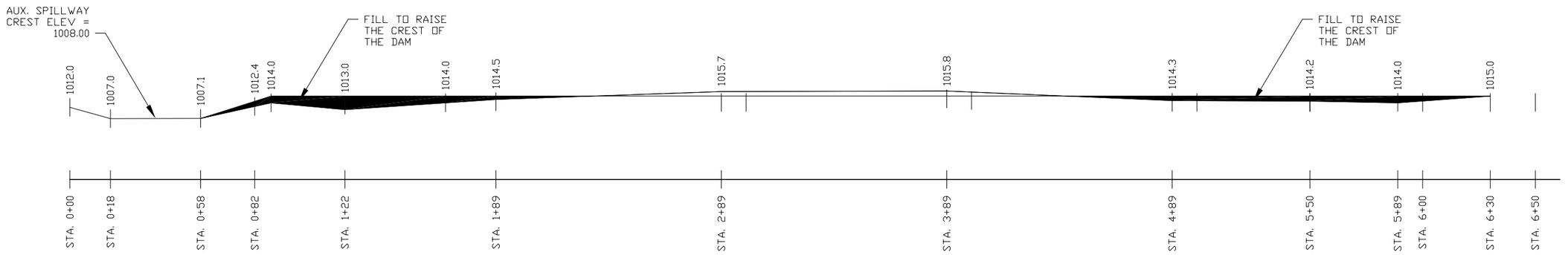
DATE: Mar. 18, 2015

DRAWN BY: KH GIRARDIN

CHK'D BY: ML SCHMIDT

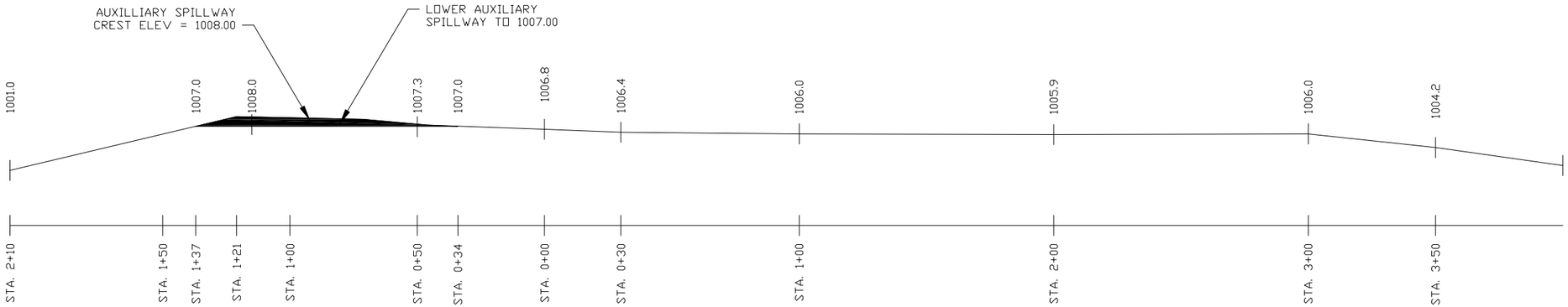
DRAWING: 8

PLAN SET.DWG



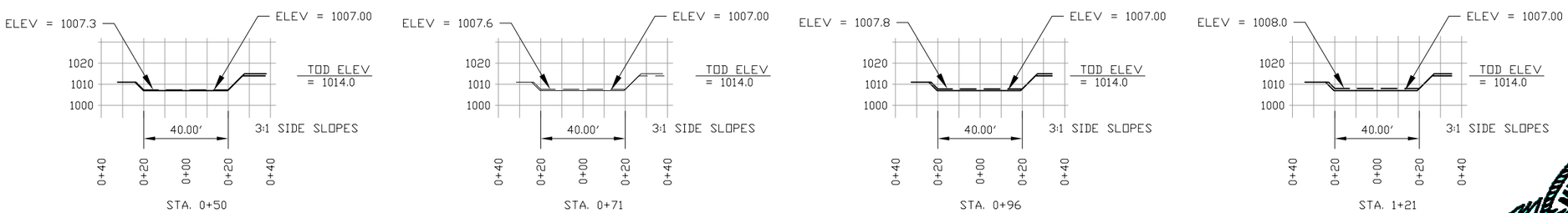
1 DAM PROFILE ALONG THE CENTER LINE

Scale: 1" = 50'-0" HORIZ
Scale: 1" = 20'-0" VERT



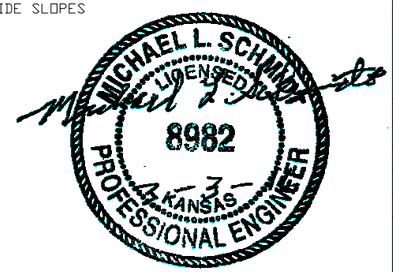
2 AUXILIARY SPILLWAY PROFILE ALONG THE CENTER LINE

Scale: 1" = 50'-0" HORIZ
Scale: 1" = 20'-0" VERT



3 AUXILIARY SPILLWAY CROSS SECTIONS

Scale: 1" = 60'-0" HORIZ
Scale: 1" = 20'-0" VERT



PLAN SET.DWG

SCHMIDT Engineering Consultants, Inc.
CIVIL, STRUCTURAL, AND ARCHITECTURAL ENGINEERING
311 Cottonwood, Strong City, Kansas 66869 / 816 Graham St., Emporia, Kansas 66801 / 620-343-0302

TECH CAD SERVICES, LLC
Building Designer
CAD Drafting Services
Factory Built Consulting

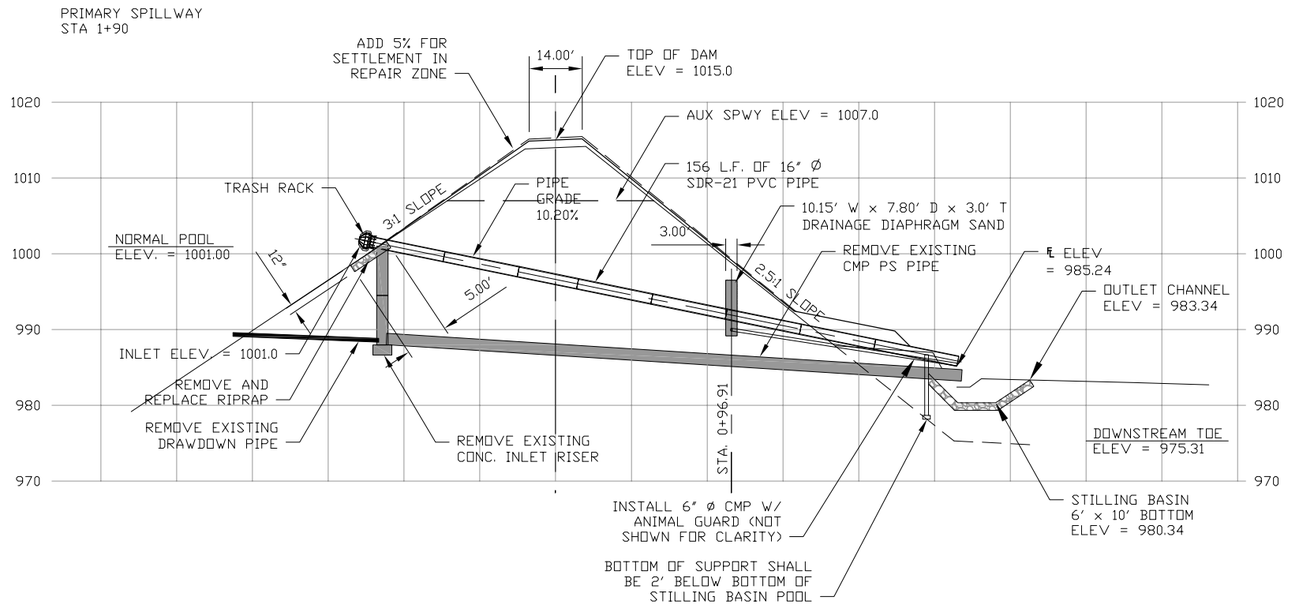
NO	DATE:	DESCRIPTION	BY	APP:
1	9/15	DWR REVIEW COMMENTS	KHG	MLS
2	12/15	DWR REVIEW COMMENTS	KHG	MLS
3	01/16	DWR REVIEW COMMENTS	KHG	MLS

REVISIONS

SHEET TITLE: DAM AND AUXILIARY SPILLWAY PROFILE

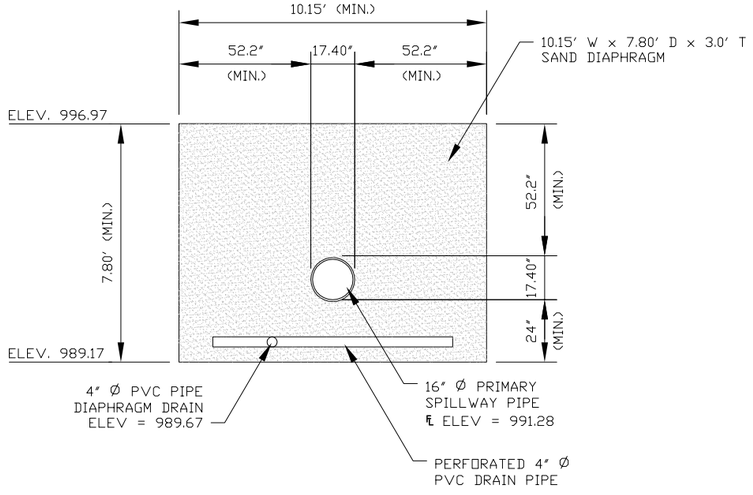
PROJECT: PRIMARY SPILLWAY REHABILITATION
OSHAWND LAKE ASSOCIATION

REF:
PROJ NO:
DATE: Mar. 18, 2015
DRAWN BY: KH GIRARDIN
CHK'D BY: ML SCHMIDT
DRAWING: 9



1 SECTION AT PRIMARY SPILLWAY

Scale: 1" = 40'-0" HORIZ

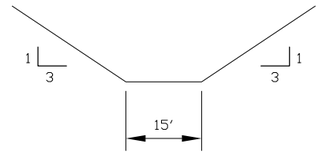


3 PVC SAND DIAPHRAM DETAIL

Scale: 1" = 5'-0"

NOTES:

1. INSTALL 60 LF 4" ø SDR-28 PVC OUTLET PIPE FOR NEW PVC PRIMARY SPILLWAY PIPE DRAINAGE DIAPHRAGM.
2. 4" DRAINAGE PIPE SHALL EXTEND FROM THE DRAINAGE DIAPHRAGM TO STILLING BASIN. THE 4" PVC PIPE IS PLACED ALONG THE SIDE AND PARALLEL WITH THE PRIMARY SPILLWAY PIPE. EXIT ELEVATION TO BE AT 985.0 OR HIGHER.



2 PRIMARY SPILLWAY TRENCH

Scale: N.T.S.

TABLE OF PIPE GRADES

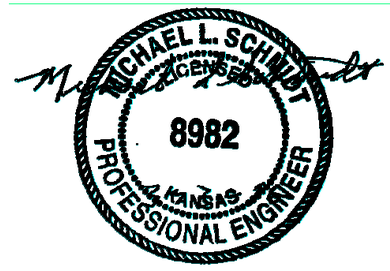
PIPE STATION	P.S. GRADE	ELEV.	4" ø GRADE	ELEV.
0+00.69		1001.00		
0+40.00	10.20	996.99		
0+80.00	10.20	992.91		
0+96.91	10.20	991.18		989.67
1+20.00	10.20	988.83	7.67	987.90
1+55.20	10.20	985.24	7.67	985.20

FINE DRAINFILL GRADATION

SIEVE	% PASSING
3/8	100
4	95 - 100
8	80 - 100
16	50 - 85
30	25 - 60
50	10 - 30
100	2 -10
200	0 -5

NOTES:

1. INSTALL 6" CMP OUTLET PROTECTION ON LAST 16' OF 4" PVC OUTLET. USE ANIMAL GUARD ON OUTLET.
2. USE CLAY PLUGS 3' LONG BELOW 4" PVC ELBOW BELOW DRAINAGE DIAPHRAGM AND ABOVE PLACEMENT OF 6" CMP.
3. BACKFILL OVER 4" PVC PIPE SHALL INCLUDE 3' BELOW PIPE & 6" OVER PIPE.



SCHMIDT Engineering Consultants, Inc.
CIVIL, STRUCTURAL, AND ARCHITECTURAL ENGINEERING
311 Cottonwood, Strong City, Kansas 66869 / 815 Graham St., Emporia, Kansas 66801 / 620-343-1002

TECH CAD SERVICES, LLC
Building Designer
CAD Drafting Services
Factory Built Consulting

NO	DATE:	DESCRIPTION
3	3/16	ADDED ITEM #12 RIP RAP
1	9/15	DWR REVIEW COMMENTS
2	7/15	DWR REVIEW COMMENTS
3	12/15	DWR REVIEW COMMENTS
4	01/16	REMOVE CMP P.S. PIPE

REVISIONS

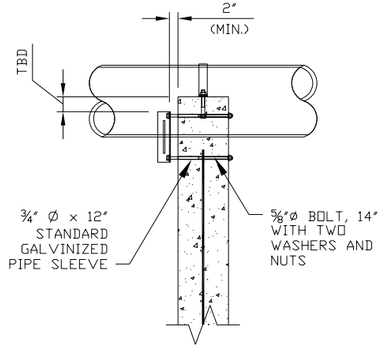
BY: KHG MLS | APP: MLS

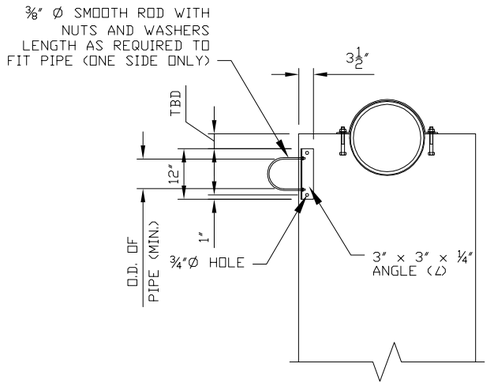
SHEET TITLE: CROSS SECTION / DRAINAGE DIAPHRAM

PROJECT: PRIMARY SPILLWAY REHABILITATION
OSHAWNO LAKE ASSOCIATION

REF:
PROJ NO:
DATE: Mar. 18, 2015
DRAWN BY:KH GIRARDIN
CHK'D BY: ML SCHMIDT
DRAWING: 10

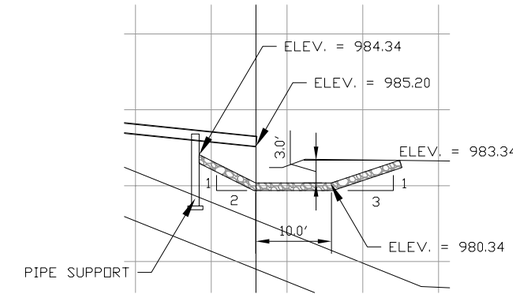
PLAN SET.DWG





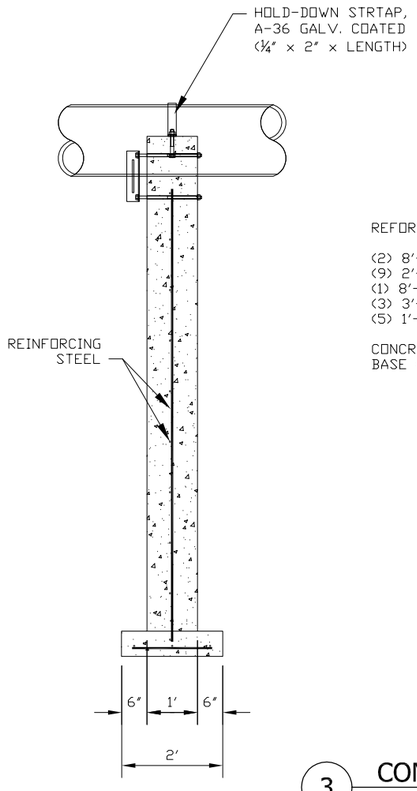
4 PIPE SUPPORT BRACKETS

Scale: NOT TO SCALE



2 STILLING BASIN SIDE VIEW

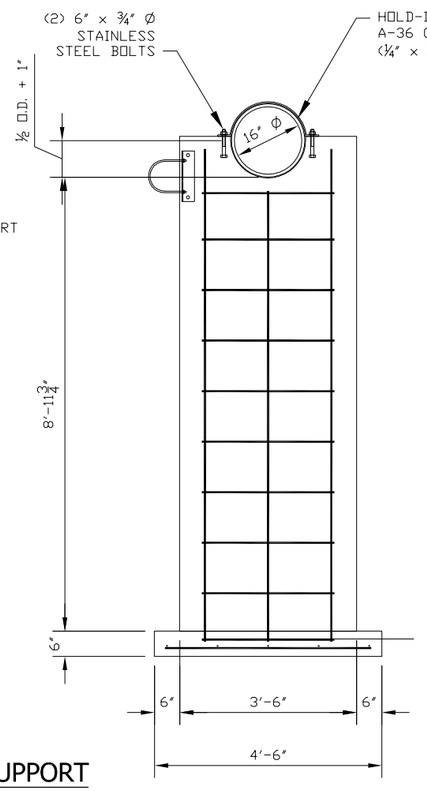
Scale: NOT TO SCALE



REFORCING STEEL PER SUPPORT

(2) 8'-9" #4 BARS @ 12" O.C.
(9) 2'-6" #4 BARS @ 12" O.C.
(1) 8'-0" #4 BARS @ 12" O.C.
(3) 3'-6" #4 BARS @ 12" O.C.
(5) 1'-6" #4 BARS @ 12" O.C.

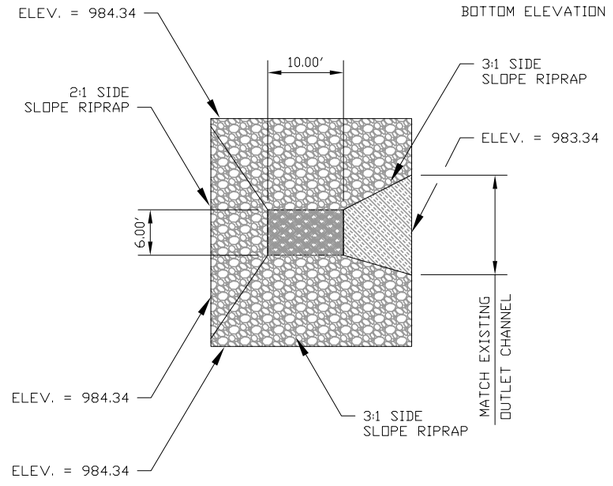
CONCRETE SUPPORT W/
BASE = 1.33 CUBIC YARDS



3 CONCRETE PIPE SUPPORT

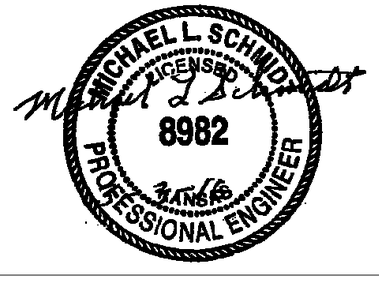
Scale: NOT TO SCALE

NOTE:
ALL RIPRAP AREAS 12" THICK
BOTTOM ELEVATION = 980.34



1 STILLING BASIN PLAN VIEW

Scale: NOT TO SCALE



SCHMIDT Engineering Consultants, Inc.
CIVIL, STRUCTURAL, AND ARCHITECTURAL ENGINEERING
311 Cottonwood, Strong City, Kansas 66869 / 816 Graham St., Emporia, Kansas 66801 / 620-343-0302

TECH CAD SERVICES, LLC
Building Designer
CAD Drafting Services
Factory Built Consulting

NO	DATE:	DESCRIPTION	BY	APP:
3	3/16	ADDED ITEM #12 RIP RAP	KHG	MLS

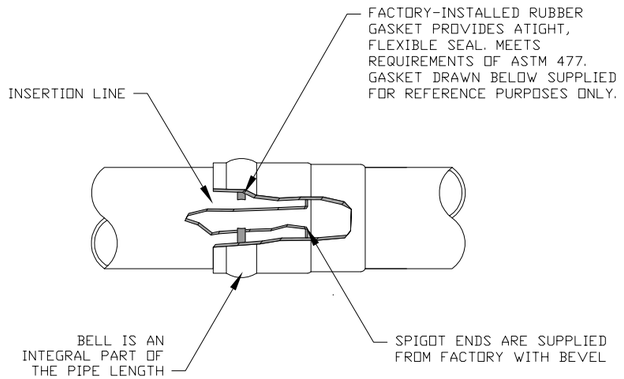
REVISIONS

SHEET TITLE: STILLING BASIN/CONCRETE PIPE SUPPORT

PROJECT: PRIMARY SPILLWAY REHABILITATION
OSHAWND LAKE ASSOCIATION

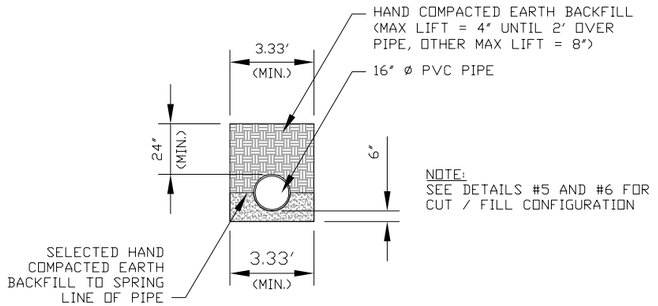
REF:
PROJ NO:
DATE: Mar. 18, 2015
DRAWN BY: KH GIRARDIN
CHK'D BY: ML SCHMIDT
DRAWING: 11

PLAN SET.DWG



1 BELL AND SPIGOT CONNECTION

Scale: NOT TO SCALE



4 BACKFILL DETAIL

Scale: NOT TO SCALE

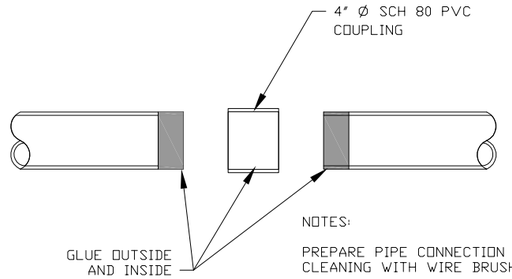
NOTE:

16" ø 12.87 CU. FT./FT OF EARTH FILL HAND COMPACTION.

PIPE SHALL BE LAID ON COMPACTED SOIL.

KEEP ALL EARTH-MOVING EQUIPMENT A MIN. 2' FROM PIPE. INSTALL AND VIBRATE SELECTED BACKFILL MATERIAL AFTER INSTALLATION OF PIPE. SELECTED SOILS FOR HAND COMPACTION TO BE APPROVED BY ENGINEER.

CONTRACTOR MAY EXCAVATE TRENCH WIDTH WIDER, AT HIS EXPENSE.

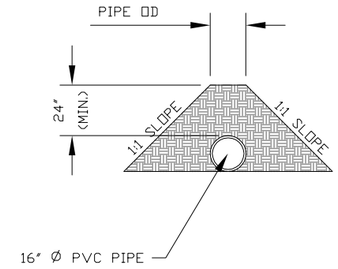


2 4" PIPE JOINT CONNECTION

Scale: NOT TO SCALE

NOTES:

FURNISH AND PLACE PVC PIPE MATERIAL ACCORDING TO THE FOLLOWING A.S.T.M. D1784-PVC COMPOUNDS, D1785 PVC SCHEDULE RATED PIPE, D2564-PVC SOLVENT CEMENT, D2564-PVC EXTRERNAL LOADING PROPERTIES AND D2444-PVC IMPACT RESISTANCE OF THERMO PLASTIC PIPE.



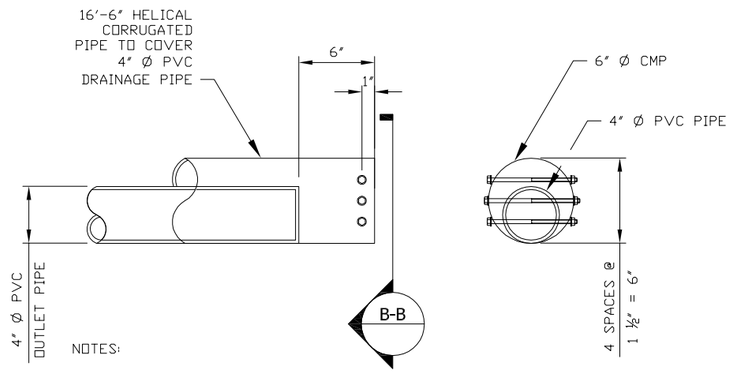
EARTH BACKFILL

5 P.S. OUTLET PIPE DETAIL

Scale: NOT TO SCALE

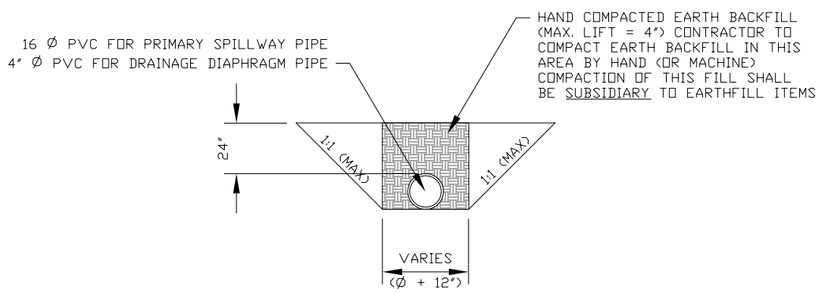
7 CMP PIPE EXCAVATION TRENCH

Scale: N.T.S.



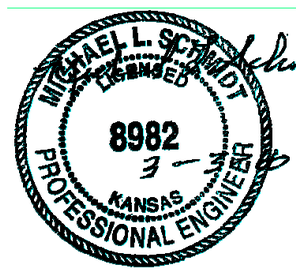
3 ANIMAL GUARD

Scale: NOT TO SCALE



6 HAND COMPACTION DETAIL

Scale: NOT TO SCALE



SCHMIDT Engineering Consultants, Inc.
CIVIL, STRUCTURAL, AND ARCHITECTURAL ENGINEERING
311 Cottonwood, Strong City, Kansas 66869 / 816 Graham St., Emporia, Kansas 66801 / 620-343-1002

TECH CAD SERVICES, LLC
Building Designer
CAD Drafting Services
Factory Built Consulting

NO	DATE:	DESCRIPTION	BY	APP:
1	9/15	DWR REVIEW COMMENTS	KHG	MLS
2	12/15	DWR REVIEW COMMENTS	KHG	MLS
3	01/16	ADDED TRENCH DETAIL	KHG	MLS
3	3/16	ADDED ITEM #12 RIP RAP	KHG	MLS

REVISIONS

SHEET TITLE: PIPE DETAILS

PROJECT: PRIMARY SPILLWAY REHABILITATION
OSHAWND LAKE ASSOCIATION

REF:

PROJ NO:

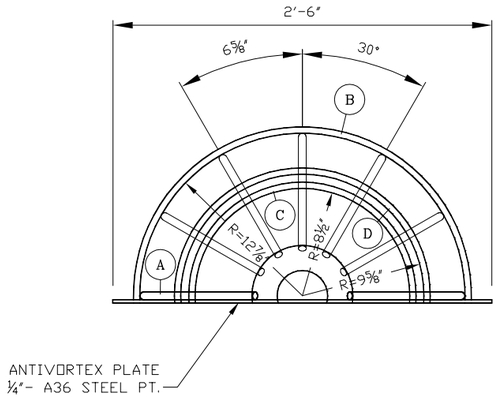
DATE: June 1, 2015

DRAWN BY: KH GIRARDIN

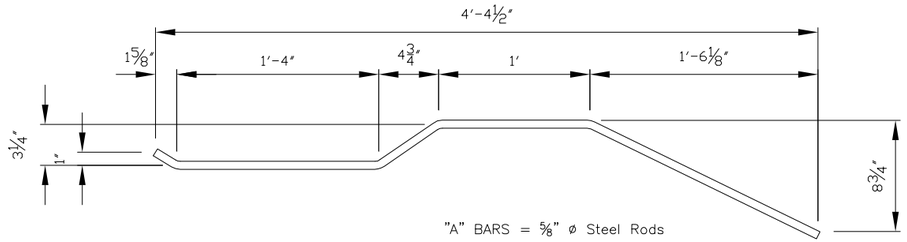
CHK'D BY: ML SCHMIDT

DRAWING: 12

PLAN SET.DWG



1 TOP VIEW
Scale: 1" = 1'-0"



3 BENDING DIAGRAM "A" RODS
Scale: 1" = 1'-0"

MATERIAL LIST AND FABRICATION INSTRUCTIONS						
PART DESCRIPTION	MATERIAL TYPE AND QUANTITY			LENGTH & OR WIDTH	TOTALS LENGTH	TOTALS WT
ROUND BARS	ø	QTY.	WT.	EACH	NEXT FT.	OR #
"A" ROD	⅝"	12	1.04	4'-7 13/16"	56	58
"B" ROD	½"	4	0.67	3'-6 11/16"	15	10
"C" ROD	½"	1	0.67	4'-8 9/16"	5	4
"D" ROD	½"	2	0.67	5'-3 5/8"	11	7.10
	THICK	QTY.	WT.			
ANTI-VORTEX PLATE	1/4"	7.3	10.21	2'-6" X 2'-11"		*64.45
		#'S/SQ. FT.				
TANK LUG		2	3			6

*DOES NOT INCLUDE WASTE
ALL BARS AND PLATES TO BE TYPE A/36 STEEL

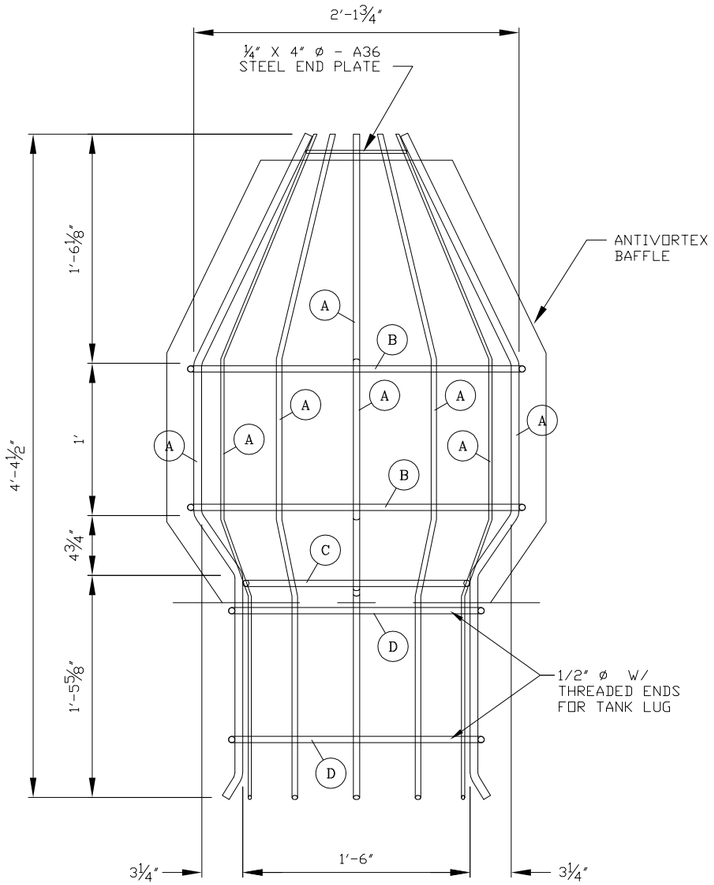
ADD 1 BAR WIDTH PER 90 DEGREE OF BENDS TO LENGTH

BAR LENGTHS ARE FROM CENTER LINE OF BAR AT BEND

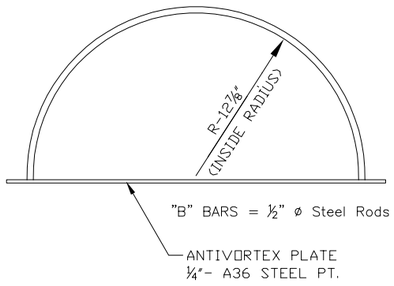
TOTAL UNIT WEIGHT AFTER FABRICATION= 150 +/- LBS. (UNCOATED)

WELD ALL CONNECTION POINT OF BARS WITH ALL ROUND BUTT WELD. MIN. 1" TACK WELD ON 6" CENTERS VORTEX PL. TO BARS.

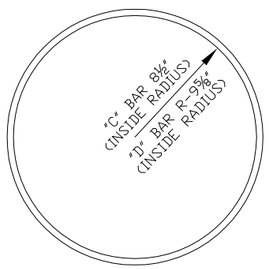
CHIP AND WIRE BRUSH ALL WELDS. REMOVE ALL RUST FROM FABRICATED UNIT AND HOT DIP GALVANIZED AS PER ASTM A123, EXCEPT HOLD DOWN RINGS.



2 SIDE VIEW
Scale: 1" = 1'-0"



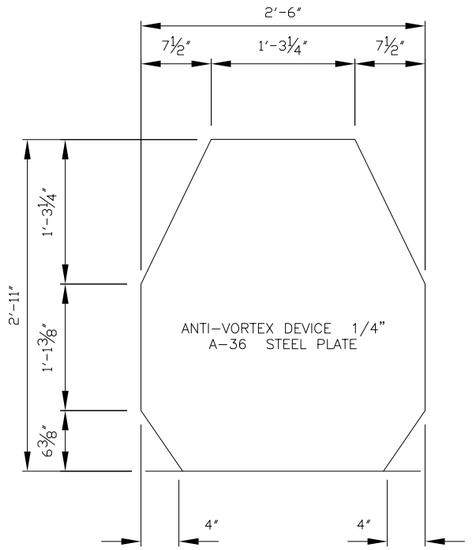
4 BENDING DIAGRAM "B" RODS
Scale: 1" = 1'-0"



"C" BARS = ½" ø Steel Rods

"D" BARS = ½" ø Steel Rods

5 BENDING DIAGRAM "C" AND "D" RODS
Scale: 1" = 1'-0"



6 ANTI-VORTEX PLATE DETAIL
Scale: 3/4" = 1'-0"

MICHAEL L. SCHMIDT
8982
KANSAS
PROFESSIONAL ENGINEER

SCHMIDT Engineering Consultants, Inc.
CIVIL, STRUCTURAL, AND ARCHITECTURAL ENGINEERING
311 Cottonwood, Strong City, Kansas 66869 / 816 Graham St., Emporia, Kansas 66801 / 620-343-1002

TECH CAD SERVICES, LLC
Building Designer
CAD Drafting Services
Factory Built Consulting

NO	DATE:	DESCRIPTION	BY	APP:
3	3/16	ADDED ITEM #12 RIP RAP	KHG	MLS

REVISIONS

SHEET TITLE: TRASH RACK DETAILS
PROJECT: PRIMARY SPILLWAY REHABILITATION
OSHAWND LAKE ASSOCIATION

REF:
PROJ NO:
DATE: Mar. 18, 2015
DRAWN BY: KH GIRARDIN
CHK'D BY: ML SCHMIDT
DRAWING: 13

PLAN SET.DWG

CONSTRUCTION SPECIFICATIONS

1. SCOPE:
   The work shall consist of all construction operations and furnishing all materials as required by the drawings and specifications for the complete installation of this project.

2. LOCATION:
   The location of the embankment, auxiliary spillway, and appurtenances shall be as specified on the drawings.

3. SITE PREPARATION
   Foundation Area: The foundation area will be thoroughly scarified to a minimum depth of 6 inched, before placement of fill material and any needed moisture is added, to insure that the first layer of fill material can be bonded to the foundation. To facilitate compaction equipment and to provide safety, all channel banks and breaks shall be sloped no steeper the 2 horizontal to 1 vertical.

4. EXCAVATION:
   To the extent they are suitable and approved by the inspector, excavated materials are to be used as fill materials.
   Cutoff and Primary Spillway Trenches: These trenches shall be excavated to the lines, grades, and width shown on the drawings, or as specified by the inspector for a depth adjustment during excavation. The trenches shall be kept free of standing water during backfill operations. Backfill shall be made with selected impervious material, approved by the inspector, and will be placed in the same manner as specified for earth fill.
   Auxiliary Spillway and Outlet Channel: These excavations shall confirm to the lines, grades, bottom width, and side slopes shown on the drawings or as staked in the field.
   Borrow: The location of the borrow area shall be as determined by the landowner. Borrow pits wall be excavated and maintained in a manner to eliminate steep and unstable side slopes, or other hazardous condition. Side slopes shall be no steeper than 3:1.

5. PRIMARY SPILLWAY:
   The materials and manufacture of the pipe, drainage diaphragms, coupling bands, coatings, and other appurtenances shall be as shown on the drawings, and shall confirm to the appropriate federal or ASTM specifications suitable for the intended purpose. The pipe shall be laid to the line and grades shown on the drawings, be placed on properly compacted earth fill, and be uniformly bedded to the depth and in the manner specified. A static pressure test is not required for PVC pipe with the proper water-tight couplings. Selected, impervious backfill material shall be placed around the conduit and appurtenances in layers not more than 4 inches thick before compaction and each layer shall be thoroughly compacted by hand tamping, manually directed power tampers, or plate vibrators to the density of the surrounding material. The height of the fill shall be increased at approximately the same rate on all sides of the structure. Heavy equipment shall not be operated within 2 feet of any structure.

6. PLACEMENT OF EARTHFILL
   The material placed in the fill shall be free of sod, roots, frozen soil, stones over 3 inched in diameter. The placing and spreading of fill material shall be started at the lowest point of the foundation and the fill brought up in horizontal layers of such thickness that the required compaction can be obtained. The fill shall be constructed in continuous, horizontal layers, except where openings or sectionalized fills are called for. In those cases the slope of the bonding surfaces between the embankment-in-place and the embankment to be placed will not be steeper than 3:1. The distribution and gradation of materials shall be such that there will be no lenses, pockets, streaks, or layers of material differing substantially in texture or gradation from the surrounding material. Stockpiled topsoil strippings will be placed on the outer portion of the embankment as a part of each lift. Topsoil shall not be less than 6 inches nor more than 2 feet thick, measured vertically, and shall be compacted concurrently with the earth fill. The completed work shall conform to the lines, grades, and elevations shown on the drawings, or as staked in the filed.

7. MOISTURE CONTROL:
   The moisture content of the fill material shall be such that the required compaction can be obtained. Material that is too wet shall be dried to meet the requirement, and material that is too dry shall have water added and mixed until the requirement is met.
   The contractor shall engage the services of a qualified soils testing firm. the soils testing firm shall obtain samples of proposed fill soil and provide Standard Proctor Moisture/Density (ASTM D698) curves for the material and make recommendations as to the moisture content. The recommended moisture content shall be no less than 2% below nor 5% above optimum moisture, unless recommended differently by the soils firm.

8. COMPACTION:
   The earth fill materials shall be placed in layers not exceeding 9 inches before compaction. Construction equipment shall be operated over the areas of each lift of earth fill in a way that will result in the required compaction. Special compaction equipment will be used when the required compaction cannot be obtained without it.
   The moisture content at the time of compaction shall be within limits required to:
   a. Prevent bulking of material under action of the grading or compacting material.
   b. Prevent the adherence of the fill material to the treads and tracks of the equipment.
   c. Insure the crushing and blending of the soil clods and aggregations into a reasonably homogeneous mass.
   The soils testing firm shall have a qualified technician on site during the back filling operations for fill in the dam structure. The technician shall test compaction and moisture content of the fill material at the time of back filling to insure requirements are met. Fill soil placed in the dam structure shall be compacted to 90% of Standard Proctor (minimum) at the required moisture content, unless recommended differently by the soils firm.

9. SUPPLEMENTARY CONDITIONS:
   Per K.S.A.82a-303a, further defined in Division of the Water Resources rules and regulations, the followings conditions apply:
   Landowner Duties: The landowner shall provide adequate supervision and inspection of the project during the period of construction in accordance with all requirements and conditions of the permit to construct.
   Contractor Duties:
   a. It is required that the primary spillway and appurtenances, including fill material around the pipe, be inspected and approved by a representative of DWR prior to placing fill material over the pipe.
   b. It is required that no construction shall proceed on the project until each respective DWR requirement is complied with.
   c. It is required that the contractor shall be responsible for notifying the supervisory inspector and DWR 48 hours in advance per K.A.R. 5-40-70:
   1) Commencement of construction on the project.
   2) Placement of any material on any portion of the foundation.
   3) Installation of the primary spillway pipe and appurtenances.

10. DEWATERING
    Excavations through the dam shall be dewatered as required to maintain the excavations free of water and to keep the groundwater surface sufficiently below the bottom of the excavations so as not to cause settlement, pumping, subsidence, etc. Dewatering shall be achieved by lowering the Lake level sufficiently below the upper level of the new primary spillway pipe to control the ground water level, IF approved by the Owner. If sufficient dewatering of the excavations cannot be achieved by lowering the lake level, a ground water pumping system shall be used. The system shall be designed by a Kansas licensed Geologist or Geotechnical Engineer and the system design shall be submitted to the Project Engineer for review. Discharge of the water from the dewatering system shall comply with EPA and KDHE regulations and requirements. The contractor shall be responsible for the cost of and all issues relating to all dewatering operations, system design, and adverse results of dewatering operations, permitting, and discharge requirements, water disposal, etc.

11. SEEDING:
    a. SCOPE: A protective cover of vegetation shall be established on all exposed surfaces of the structure and borrow area.
    b. SEEDBED PREPARATION: The area to be seeded will be reasonably smooth with all washed and gullies filled to confirm to the desired cross section. All debris, such as wood, stones, or other objects that will interfere with the mowing or seeding will be removed from the area. Prior to seeding, the entire area will be "roughened" by at least two passes with a spike-tooth harrow. Additional tillage may be required.
    c. METHOD OF SEEDING: Drilling: Grass seed will be planted with a grass drill equipped with double coulter furrow openers with depth bands. Seed shall be planted ¼ to ¾ inch deep. Broadcasting: On small seeding projects (generally less than 3 acres), and on areas not safely accessible, broadcasting may be used. When broadcasting is used, at least one pass with a spike-tooth harrow, or equivalent operations, will be made over the seeded area to cover the seed.
    d. SEED MIXTURE: Upland Mixture: The grass seed mixture used on the dam embankment and auxiliary spillway shall be applied at a minimum rate of 16 PLS pounds per acre. The following composition should be used:

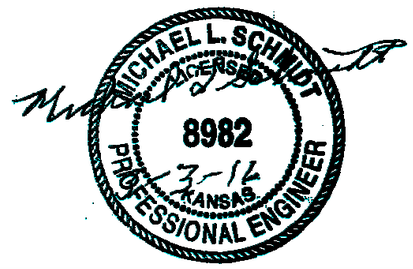
Western Wheatgrass (Barton)	6.0 PLS pounds
Smooth Brome	5.0 PLS pounds
Kentucky Fescue	5.0 PLS pounds

12. RIP RAP:

Stone for Rip Rap shall be crushed linestone free of earth, chert, cracks, seams, soapstone, and shale or other easily disintegrated material. Size shall be as follows.

Sieve Size:	Percent Retained on Sieve Size:
12"	0
9"	20 / 40
6"	30 / 70
4"	65 / 85
3"	80 / 100
2"	90 / 100

Stone shall be placed so that the spaces between larger stones are filled with smaller stones to achieve full coverage of subgrade. The surface of the rip rap shall be rammed and compacted to obtain as tight a surface as practical for the gradation, and to conform to the lines, grades, and slopes on the drawings.



SCHMIDT Engineering Consultants, Inc.
CIVIL, STRUCTURAL, AND ARCHITECTURAL ENGINEERING
311 Cottonwood, Strong City, Kansas 66869 / 815 Graham St., Emporia, Kansas 66801 / 620-343-4002

TECH CAD SERVICES, LLC
Building Designer
CAD Drafting Services
Factory Built Consulting

NO	DATE:	DESCRIPTION	BY	APP:
1	9/15	DWR REVIEW COMMENTS	KHG	MLS
2	12/16	DWR REVIEW COMMENTS	KHG	MLS
3	3/16	ADDED ITEM #12 RIP RAP	KHG	MLS

REVISIONS

SHEET TITLE: CONSTRUCTION SPECIFICATIONS

PROJECT: PRIMARY SPILLWAY REHABILITATION
OSHAWND LAKE ASSOCIATION

REF:
PROJ NO:
DATE: Mar. 18, 2015
DRAWN BY: KH GIRARDIN
CHK'D BY: ML SCHMIDT
DRAWING: 14

PLAN SET.DWG