APPENDICES

APPENDIX A

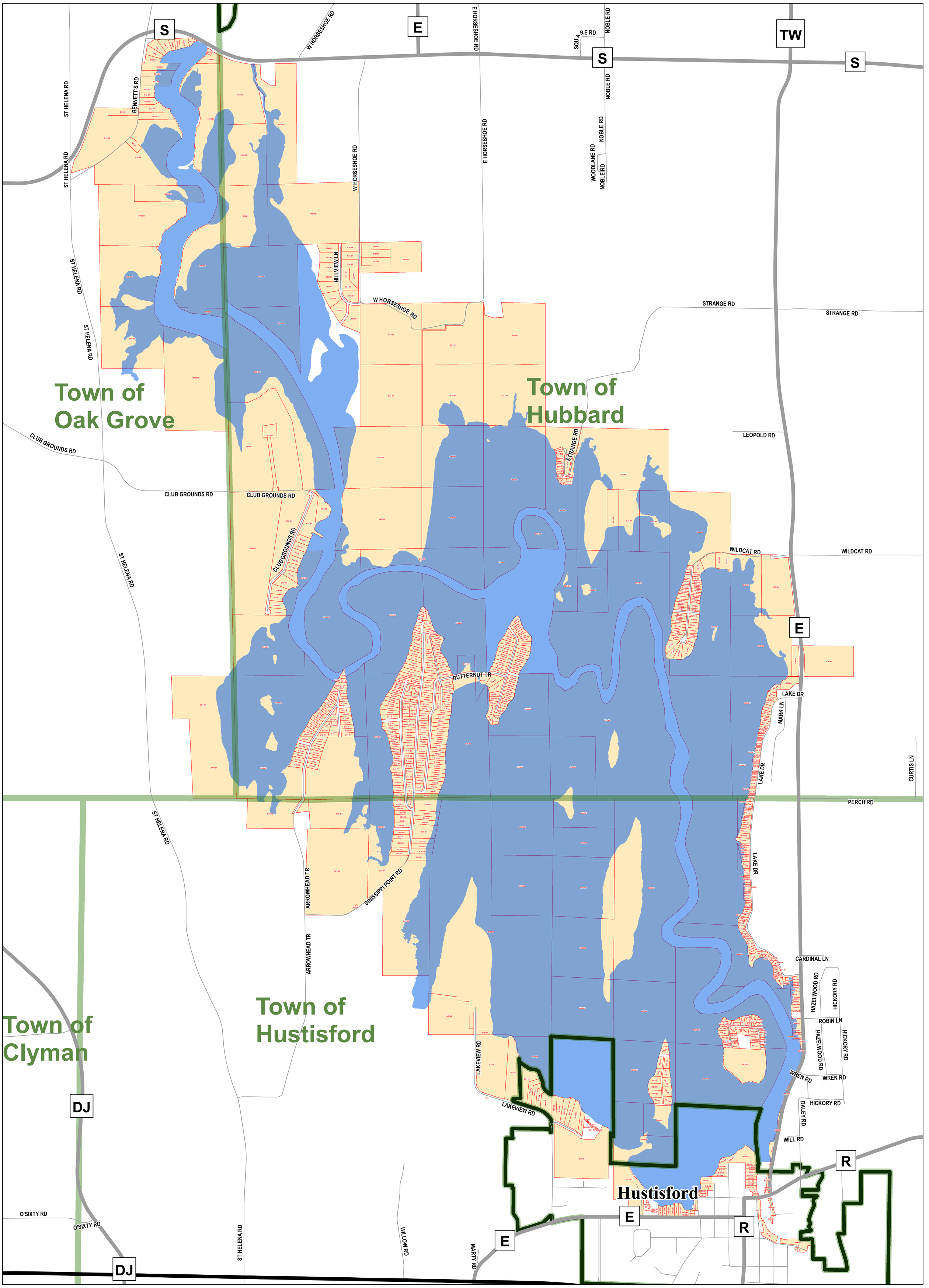
APPENDIX A1: Boundary Map of Lake Sinissippi Improvement District

APPENDIX A2: Upstream Watershed Stakeholders Memo

APPENDIX A3: Sample Charter for LMWG

APPENDIX A4: List of LSID Speakers and Partnerships over Past 5 Years

LAKE SINISSIPPI IMPROVEMENT DISTRICT



- Roads
- Town Boundaries
- City & Village Boundaries
- Lake Sinisippi
- Improvement District Parcels

The data used to create this map is a compilation of records, information, and data from various city, county and state offices, and other sources. This map is only advisory, does not replace a survey, and may not be used for any legal purpose. Dodge County assumes no liability for any use or misuse of this information.

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June 27, 2022

Lake Sinissippi Improvement District
c/o Christine Lilek, Chairman
P.O. Box 89
Hustisford, WI 53034

RE: Partnership and Project Planning

Dear Christine:

Geosyntec Consultants has reviewed the Wisconsin Permit Discharge Elimination System (WPDES) permit holders in the vicinity of Lake Sinissippi or in the upstream watershed and reached out to WDNR staff and some representative communities to discuss partnering potential. Communities with wastewater treatment facilities (WWTF) and Municipal Separate Storm Sewer Systems (MS4s) have permit requirements to address nutrients; more specifically, phosphorus reduction requirements for WWTFs and pollutant abatement for MS4s. In addition, other permit holders, such as food processing facilities and some commercial farms, are also required to permit discharges from their site(s). Under various conditions, costs to implement the necessary controls to meet the permit requirements exceed these permittees' financial means. In such cases, permittees are still required to meet permit requirements and typically consider opportunities to partner with other local communities, agencies, or not-for-profit (NFP) entities to obtain compliance through alternative compliance measures. While there are multiple avenues under which a water quality trade (WQT) can take place, that is not the focus of this memo. This memo helps identify measures being implemented to address phosphorous permit requirements and the permit holders obligated to meet these requirements, which may be potential future partners with Lake Sinissippi Improvement District (LSID).

If permit holders cannon meet the requirements of their WPDES permit, they typically may choose one of the following three measures to address their phosphorus permit requirements:

1. Adaptive Management: This is a watershed-based approach to minimizing phosphorus loading over a more extended period of time, focused on flexibility and partnerships (see attached fact sheet for more details on adaptive management in Attachment 1).

   One example of an adaptive management project active in the watershed is Seneca Foods in Mayville (permit #0050822-07-01), which has undertaken phosphorus credits by removing farming from rotation and putting in permanent cover vegetation.

2. Water Quality Trading: This strategy option is intended to offset a specific point source in the watershed with another viable reduction elsewhere within the watershed. It may not be phosphorus specific (see attached fact sheet for more details on water quality trading in Attachment 2).

3. Multi-Discharge Variance (MDV): This is a crediting mechanism where the WDNR allows a discharger to pay money to a sponsoring agency that uses the money to implement projects within the watershed. The agency may proactively choose the projects or reach out to other partners (see attached fact sheet for more details on Multi-Discharge Variance in Attachment 3). Andrew Johnson discussed this pool of money briefly at that May meeting.

The following partnering information has been compiled to help the LSID understand their options for identifying partners who may be under regulatory obligations:

1. Potential local partners are identified on Figure A in Attachment 4, all of which carry WPDES permits and are tributary to Lake Sinissippi. Table A provides a listing of each of those permit holders.
2. Additional potential partners are shown in Figure B in Attachment 5, with a corresponding listing of WPDES permit holders provided in Table B. According to WDNR Upper Rock River permit holders are all potential partners, several of which are downstream of Lake Sinissippi.
3. In addition to the possible partners shown in Figures A & B, there is further information on the phosphorus management programs established by WDNR (adaptive management, water quality trading, and multi-discharge variance).

It is worth noting that the Wisconsin Water Quality Clearinghouse is also anticipated to be operating sometime in 2023. While this process is still evolving, it may replace or greatly change the way adaptive management, water quality trading, or MDV function.

The following communities were identified as permit holders in the upstream watershed or the vicinity of Lake Sinissippi, all shown in Figure A. Each community was contacted directly or discussed directly with WDNR staff the potential for partnering with the LSID:

- City of Juneau: Per discussion with regional WDNR wastewater specialist Sean Spencer, Juneau is near compliance and will likely be working with the DNR to establish an easier way to offset the difference.
- Village of Hustisford: Geosyntec reached out to Todd Tessman at Hustisford and he recalled looking into the possibility of teaming with LSID in the past, but it did not make financial sense. Todd indicated it might be worth looking at their NPDES permitting strategy once the lake management plan is completed.
- City of Waupun: Based on a review of Waupun's permit, they have elected for Biological Nutrient Reduction (BNR) technology to reduce phosphorus loading. This multimillion-dollar investment will double the City's sewer utility bill based on documents posted on the City's website. It is considered a long-term investment and currently not looking for other phosphorus teaming opportunities. Similar design technology is used in Chicago (MWRDGC) to address the phosphorus concentrations in the District's wastewater discharges.
- City of Horicon: Per Sean Spencer, WDNR, the City of Horicon has elected to buy into the Multi-Variance Discharge (MDV) program. This is a pay-in program where the money goes to the County (or other participating entity), and that entity determines which projects the money goes to. This should be further explored as a potential partner for LSID.

- City of Beaver Dam: Per a discussion with Sean Spencer, WDNR, the City of Beaver Dam is working directly with the Beaver Dam Lake District.

As the stakeholder engagement and lake management workgroup process evolves in the development of the LMP, these implementation strategies and partnering opportunities are considerations that should go into the watershed workgroup networking efforts. The LSID can consider a way to engage all permit holders within the watershed at some point to understand their compliance status, permit cycle, and interest in engaging in potential watershed-related co-benefits.

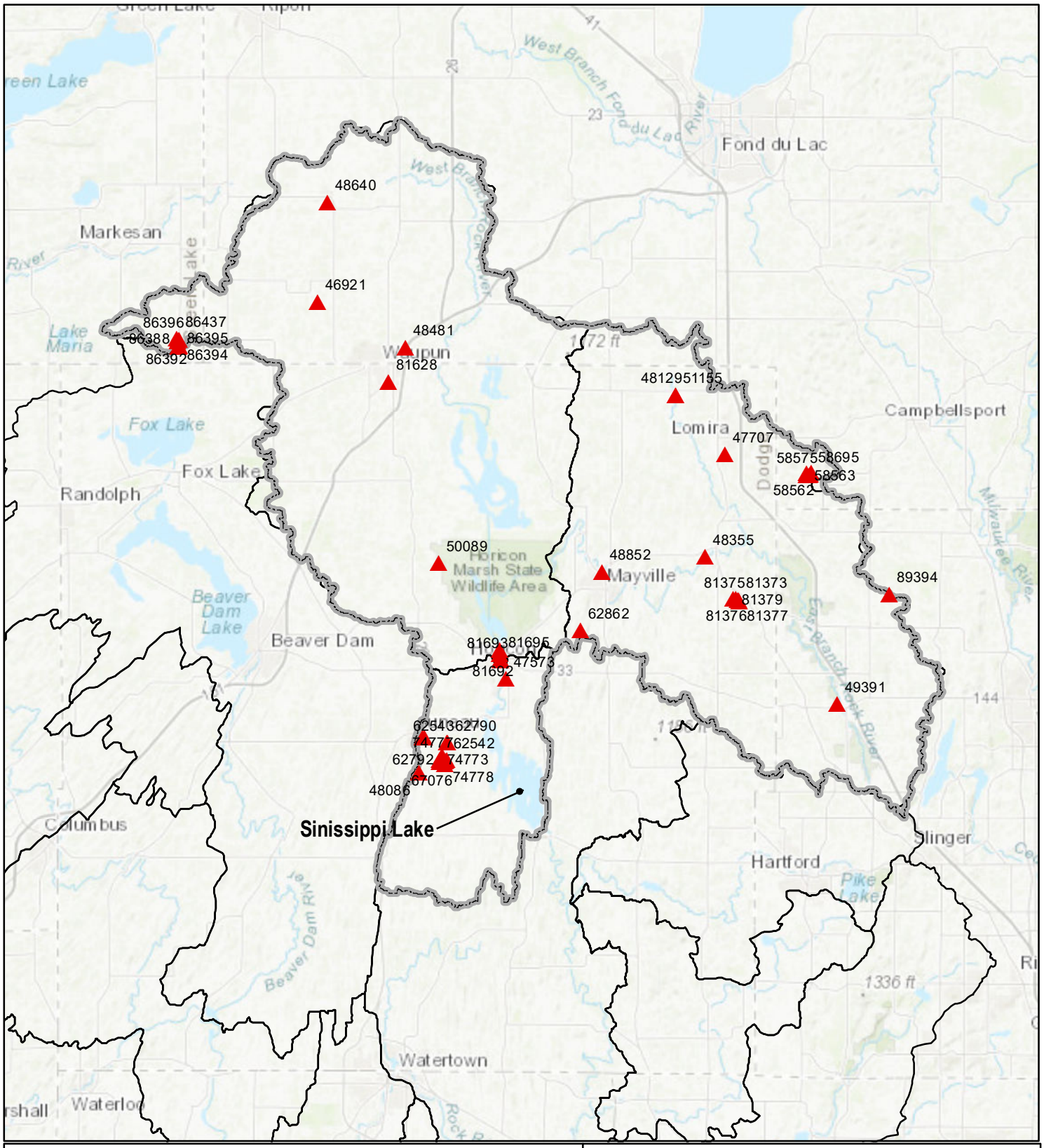
If you have further questions or concerns, please feel free to contact me.

Best Regards,

Brian Valleskey, CFM, CLP
Senior Professional
Geosyntec Consultants, Inc.

Attachments

1. Adaptive Management – WDNR Factsheet
2. Water Quality Trading – WDNR Factsheet
3. Multi-Discharge Variance (MDV) – WDNR Factsheet
4. Primary Partnering Opportunities – Figure A and Table A
5. Secondary Partnering Opportunities – Figures B and Table B



LEGEND

- Upstream Outfalls
- Upper Rock River Subbasins
- globalwatershed

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0 42,000 Feet

Upper Rock River Basin Outfalls Tributary to Lake Sinissippi

Upper Rock River Watershed, Wisconsin

Geosyntec consultants

MOW5563	June 2022

Figure A

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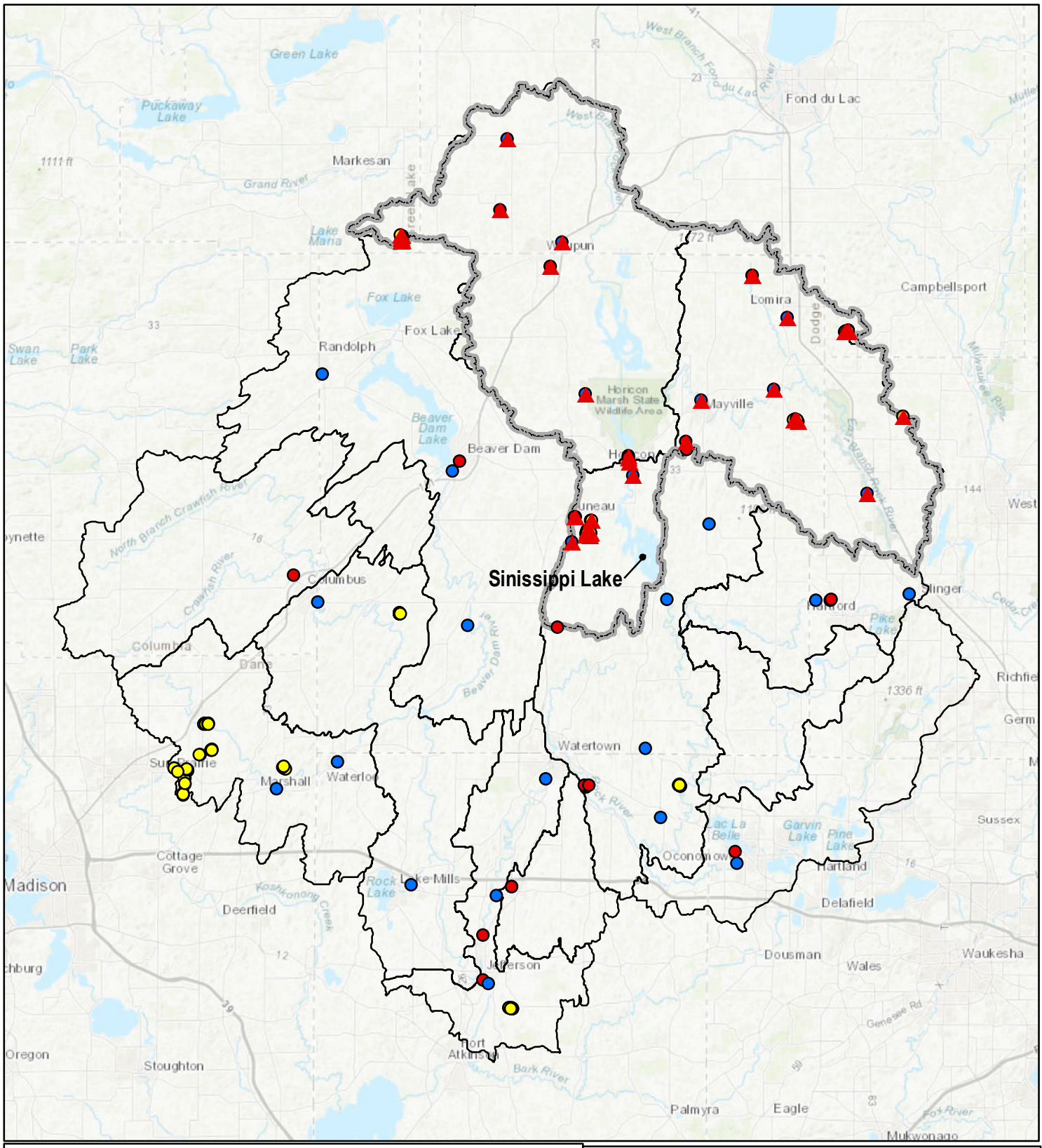
Table A: Outfalls Tributary to Lake Sinissippi

FID	SAMPLE_POI	SAMPLE_PT_	OUTFALL_NU	FAC_NAME	FAC_SITE_I	FID_	FIN	SIC_CODE	SIC_DESC	FACILITY_T	PERMIT_NUM	PERMIT_STA	ISSUE_DATE	PERMIT_EXP	WASTE_TYPE	OUTFALL_DE	REF_PT_X	REF_PT_Y	Lat	Long
0	46921	46921	2	SAPUTO CHEESE USA INC WAUPUN	5666	420038960	5666	2023	DRY, CONI	PRIVATE	2003	Current	12/20/2017 0:00	12/31/2022 0:00	Industrial	Process Wastewater, NCCW, COW	617594	356038	43.6701012	-88.7894974
1	50089	50089	1	BURNETT SANITARY DISTRICT #1 WWTF	6394	114008180	6394			MUNICIPAL	31551	Current	12/29/2014 0:00	12/31/2019 0:00	Municipal	EFFLUENT	0	0	43.5099983	-88.6869965
2	47050	47050	1	SENSIENT FLAVORS LLC	5697	114004770	5697	2099	FOOD PRE	PRIVATE	2534	Current	12/30/2015 0:00	12/31/2020 0:00	Industrial	NCCW w/ Chlorine	0	0	43.4026985	-88.6992035
3	47051	47051	2	SENSIENT FLAVORS LLC	5697	114004770	5697	2099	FOOD PRE	PRIVATE	2534	Current	12/30/2015 0:00	12/31/2020 0:00	Industrial	Cold Water Tank Overflow	0	0	43.4026985	-88.7004013
4	62862	62862	13	SENECA FOODS CORPORATION MAYVILLE	6972	114007520	6972	2033	CANNED FI	PRIVATE	50822	Current	3/31/2016 0:00	3/31/2021 0:00	Industrial	North Drain Tile	635919	333869	43.4687004	-88.566803
5	48355	48355	1	THERESA WASTEWATER TREATMENT FACILITY	5976	114002790	5976			MUNICIPAL	22322	Current	6/28/2013 0:00	6/30/2018 0:00	Municipal	EFFLUENT	0	0	43.5136986	-88.4608002
6	49391	49391	1	ALLENTON SANITARY DISTRICT WWTP	6214	267010480	6214	4941	WATER SU	MUNICIPAL	28053	Current	6/23/2015 0:00	6/30/2020 0:00	Municipal	EFFLUENT	0	0	43.4234009	-88.3492966
7	81628	81628	1	FEDERAL MOGUL SINTERED PRODUCTS PLANT WAUPUN	9194	114067910	9194	3499	FABRICATE	PRIVATE	44938	Current	7/27/2017 0:00	9/30/2022 0:00	Industrial	Noncontact cooling water 1	621901	349691	43.6211014	-88.7294998
8	48481	48481	1	WAUPUN WASTEWATER TREATMENT FACILITY	5999	420005630	5999			MUNICIPAL	22772	Current	6/27/2016 0:00	6/30/2021 0:00	Municipal	EFFLUENT	623628	352922	43.6422005	-88.7153015
9	81691	81691	5	JOHN DEERE HORICON WORKS	7247	114052510	7247	3524	LAWN AN	PRIVATE	44938	Current	7/27/2017 0:00	9/30/2022 0:00	Industrial	Noncontact cooling water 5	630384	332387	43.4561996	-88.634903
10	81692	81692	6	JOHN DEERE HORICON WORKS	7247	114052510	7247	3524	LAWN AN	PRIVATE	44938	Current	7/27/2017 0:00	9/30/2022 0:00	Industrial	Noncontact cooling water 6	630361	332166	43.4543991	-88.6353989
11	81693	81693	7	JOHN DEERE HORICON WORKS	7247	114052510	7247	3524	LAWN AN	PRIVATE	44938	Current	7/27/2017 0:00	9/30/2022 0:00	Industrial	Noncontact cooling water 7	630463	331720	43.4502983	-88.6343994
12	81695	81695	30	JOHN DEERE HORICON WORKS	7247	114052510	7247	3524	LAWN AN	PRIVATE	44938	Current	7/27/2017 0:00	9/30/2022 0:00	Industrial	Noncontact cooling water 30	630453	331755	43.4506989	-88.6343994
13	48640	48640	1	BRANDON WASTEWATER TREATMENT FACILITY	7288	420004310	7288			MUNICIPAL	23442	Current	2/8/2013 0:00	3/31/2018 0:00	Municipal	Effluent	618110	362734	43.7313004	-88.7813034
14	48852	48852	1	MAYVILLE WASTEWATER TREATMENT FACILITY	6078	114005760	6078			MUNICIPAL	24643	Current	6/28/2013 0:00	6/30/2018 0:00	Municipal	EFFLUENT	0	0	43.5042	-88.5483017
15	58561	58561	1	CLOVER HILL DAIRY	16778	420001230	16778	240	DAIRY FAR	PRIVATE	61689	Current	5/23/2011 0:00	5/31/2016 0:00	Animal Waste	Concrete Storage	651176	344730	43.5640984	-88.3753967
16	58562	58562	2	CLOVER HILL DAIRY	16778	420001230	16778	240	DAIRY FAR	PRIVATE	61689	Current	5/23/2011 0:00	5/31/2016 0:00	Animal Waste	Slurrystore Storage	651571	345119	43.5656013	-88.3714981
17	58563	58563	3	CLOVER HILL DAIRY	16778	420001230	16778	240	DAIRY FAR	PRIVATE	61689	Current	5/23/2011 0:00	5/31/2016 0:00	Animal Waste	Digested Solids Storage	651100	344775	43.5648003	-88.375
18	58575	58575	7	CLOVER HILL DAIRY	16778	420001230	16778	240	DAIRY FAR	PRIVATE	61689	Current	5/23/2011 0:00	5/31/2016 0:00	Animal Waste	Outdoor Lots - Dairy	651216	344697	43.5639	-88.3729019
19	58695	58695	6	CLOVER HILL DAIRY	16778	420001230	16778	240	DAIRY FAR	PRIVATE	61689	Current	5/23/2011 0:00	5/31/2016 0:00	Animal Waste	Feed Storage Tank	651213	344699	43.5643005	-88.3718033
20	48086	48086	1	JUNEAU WASTEWATER TREATMENT FACILITY	5915	114002130	5915			MUNICIPAL	21474	Current	12/20/2013 0:00	12/31/2018 0:00	Municipal	EFFLUENT	0	0	43.3811989	-88.7034988
21	48129	48129	1	BROWNSVILLE WASTEWATER TREATMENT FACILITY	5925	114001360	5925			MUNICIPAL	21601	Current	6/28/2014 0:00	6/30/2019 0:00	Municipal	EFFLUENT	0	0	43.6127014	-88.4865036
22	47707	47707	1	LOMIRA WASTEWATER TREATMENT FACILITY	5841	114002240	5841			MUNICIPAL	20532	Current	8/19/2014 0:00	6/30/2019 0:00	Municipal	EFFLUENT	0	0	43.5765991	-88.444603
23	89394	89394	2	VOLM FARMS	39374	267190330	39374	240	DAIRY FAR	PRIVATE	64700	Current	2/1/2012 0:00	1/31/2017 0:00	Animal Waste/Industrial	Concrete Manure Storage	656405	336409	43.4905014	-88.3052979
24	51155	51155	3	GRANDE CHEESE CO BROWNSVILLE	6956	114021710	6956	2022	CHEESE, N	PRIVATE	50016	Current	6/27/2014 0:00	6/30/2019 0:00	Industrial	PRIOR TO ENTRY TO KUMMEL CR	0	0	43.6127014	-88.4865036
25	62541	62541	1	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULT	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Liquid Storage - East	627403	324854	43.3888016	-88.6800995
26	62543	62543	3	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULT	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Solid Manure - Home Farm	626093	325879	43.3995018	-88.6800995
27	62782	62782	4	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULT	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Solid Manure - Hickey	626270	324911	43.3908005	-88.6848984
28	62788	62788	5	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULT	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Runoff Controls - East Farm	627579	324532	43.3861008	-88.6817017
29	62792	62792	7	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULT	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Runoff Controls - Hickey Farm	626281	324883	43.3911018	-88.6837997
30	62790	62790	6	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULT	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Runoff Controls - Home Farm	626092	325883	43.3995018	-88.6797028
31	67076	67076	8	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULT	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Liquid Manure - West Farm	626302	324659	43.3872986	-88.6863022
32	74778	74778	11	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULT	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	East Farm Feed Runoff Control	627433	324728	43.3879013	-88.6816025
33	74773	74773	9	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULT	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Liquid Storage - West Farm	626283	324852	43.3889999	-88.6865005
34	81376	81376	4	J M SCHMIDT AND SONS INC	38020	114118070	38020	240	DAIRY FAR	PRIVATE	63801	Current	9/1/2014 0:00	9/30/2019 0:00	Animal Waste	Separated Solids	647191	336257	43.4878998	-88.4348984
35	81377	81377	5	J M SCHMIDT AND SONS INC	38020	114118070	38020	240	DAIRY FAR	PRIVATE	63801	Current	9/1/2014 0:00	9/30/2019 0:00	Animal Waste	Solid manures	647239	335976	43.4860001	-88.4319992
36	81379	81379	7	J M SCHMIDT AND SONS INC	38020	114118070	38020	240	DAIRY FAR	PRIVATE	63801	Current	9/1/2014 0:00	9/30/2019 0:00	Animal Waste	Feed Storage Area	646143	335798	43.4875984	-88.4371033
37	81375	81375	3	J M SCHMIDT AND SONS INC	38020	114118070	38020	240	DAIRY FAR	PRIVATE	63801	Current	9/1/2014 0:00	9/30/2019 0:00	Animal Waste	Waste Storage Facilities #2-#3	647216	336188	43.4874001	-88.4339981
38	81373	81373	1	J M SCHMIDT AND SONS INC	38020	114118070	38020	240	DAIRY FAR	PRIVATE	63801	Current	9/1/2014 0:00	9/30/2019 0:00	Animal Waste	Waste Storage Facility #1	647225	336159	43.4872017	-88.433197
39	85537	85537	1	HILLTOP DAIRY LLC	39995	424015130	39995	240	DAIRY FAR	PRIVATE	63983	Current	10/15/2014 0:00	10/31/2019 0:00	Animal Waste	Liquids - North Cell Storage	608352	353181	43.6433983	-88.907402
40	85538	85538	2	HILLTOP DAIRY LLC	39995	424015130	39995	240	DAIRY FAR	PRIVATE	63983	Current	10/15/2014 0:00	10/31/2019 0:00	Animal Waste	Solids - Bottom of Storages	608369	353183	43.6433983	-88.9070969
41	86388	86388	3	HILLTOP DAIRY LLC	39995	424015130	39995	240	DAIRY FAR	PRIVATE	63983	Current	10/15/2014 0:00	10/31/2019 0:00	Animal Waste	Liquids - Middle Storage Cell	608352	353179	43.6428986	-88.907402
42	86392	86392	4	HILLTOP DAIRY LLC	39995	424015130	39995	240	DAIRY FAR	PRIVATE	63983	Current	10/15/2014 0:00	10/31/2019 0:00	Animal Waste	Solid Manure	608338	353182	43.6459999	-88.9084015
43	86394	86394	5	HILLTOP DAIRY LLC	39995	424015130	39995	240	DAIRY FAR	PRIVATE	63983	Current	10/15/2014 0:00	10/31/2019 0:00	Animal Waste	Concrete Lot Areas	608341	353184	43.6469994	-88.9068985
44	86395	86395	6	HILLTOP DAIRY LLC	39995	424015130	39995	240	DAIRY FAR	PRIVATE	63983	Current	10/15/2014 0:00	10/31/2019 0:00	Animal Waste	Liquids - South Cell Storage	608370	353180	43.6431007	-88.906601
45	86396	86396	7	HILLTOP DAIRY LLC	39995	424015130	39995	240	DAIRY FAR	PRIVATE	63983	Current	10/15/2014 0:00	10/31/2019 0:00	Animal Waste	Outdoor Lot Areas	608343	353183	43.6473007	-88.907402
46	86437	86437	8	HILLTOP DAIRY LLC	39995	424015130	39995	240	DAIRY FAR	PRIVATE	63983	Current	10/15/2014 0:00	10/31/2019 0:00	Animal Waste	Feed Storage Area	608437	353361	43.6478004	-88.908699
47	47573	47573	1	HORICON WASTEWATER TREATMENT FACILITY	5818	114001800	5818			MUNICIPAL	20231	Current	12/20/2013 0:00	12/31/2018 0:00	Municipal	EFFLUENT	0	0	43.4384995	-88.6299973
48	74777	74777	10	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULT	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Liquid Storage#2 - West Farm	626286	324856	43.3889999	-88.6844025
49	62542	62542	2	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULT	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Solid Manure - East	627406	324804	43.3885002	-88.6809998



LEGEND

- Upstream Outfalls
- Upper Rock River Subbasins
- globalwatershed

Outfall Waste Type

- Other
- Municipal
- Industrial
- Animal Waste/Industrial
- Animal Waste

N

0 60,000 Feet

Upper Rock River Basin Outfalls Tributary to Lake Sinissippi

Upper Rock River Watershed, Wisconsin

Geosyntec consultants

Figure B

MOW5563 | June 2022

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Table B: Upper Rock River Outfalls - potential trading partners

FID	SAMPLE_POI	SAMPLE_PT_	OUTFALL_NU	FAC_NAME	FAC_SITE_I	FID_	FIN	SIC_CODE	SIC_DESC	FACILITY_T	PERMIT_NUM	PERMIT_STA	ISSUE_DATE	PERMIT_EXP	WASTE_TYPE	OUTFALL_DE	REF_PT_X	REF_PT_Y	Lat	Long
31	78811	78811	1	KRAFT FOODS GLOBAL INC BEAVER DAM	9915	114044260	9915	2022	CHEESE, NATURAL AND PROCESSED	PRIVATE	44938	Current	7/27/2017 0:00	9/30/2022 0:00	Industrial	Noncontact cooling water 1	614004	331558	43.4510002	-88.8384018
41	46921	46921	2	SAPUTO CHEESE USA INC WAUPUN	5666	420038960	5666	2023	DRY, CONDENSED, EVAPORATED PRODUCTS	PRIVATE	2003	Current	12/20/2017 0:00	12/31/2022 0:00	Industrial	Process Wastewater, NCCW, COW	617594	356038	43.6701012	-88.7894974
42	46962	46962	1	SENECA FOODS CORPORATION - CLYMAN	5676	114042720	5676	2033	CANNED FRUITS AND VEGETABLES	PRIVATE	2160	Current	3/31/2015 0:00	3/31/2020 0:00	Industrial	Discharge to Clyman Creek	0	0	43.3067017	-88.7203979
47	50089	50089	1	BURNETT SANITARY DISTRICT #1 WWTF	6394	114008180	6394			MUNICIPAL	31551	Current	12/29/2014 0:00	12/31/2019 0:00	Municipal	EFFLUENT	0	0	43.5099983	-88.6869965
52	47050	47050	1	SENSIENT FLAVORS LLC	5697	114004770	5697	2099	FOOD PREPARATIONS, NEC	PRIVATE	2534	Current	12/30/2015 0:00	12/31/2020 0:00	Industrial	NCCW w/ Chlorine	0	0	43.4026985	-88.6992035
53	47051	47051	2	SENSIENT FLAVORS LLC	5697	114004770	5697	2099	FOOD PREPARATIONS, NEC	PRIVATE	2534	Current	12/30/2015 0:00	12/31/2020 0:00	Industrial	Cold Water Tank Overflow	0	0	43.4026985	-88.7004013
71	47909	47909	1	COLUMBUS WASTEWATER TREATMENT FACILITY	5879	114003010	5879			MUNICIPAL	21008	Current	12/29/2014 0:00	12/31/2019 0:00	Municipal	EFFLUENT	0	0	43.3283997	-89.0078964
92	65040	65040	14	SENECA FOODS CORPORATION MAYVILLE	6972	114007520	6972	2033	CANNED FRUITS AND VEGETABLES	PRIVATE	50822	Current	3/31/2016 0:00	3/31/2021 0:00	Industrial	South Drain Tile	636248	332863	43.4617004	-88.5656967
93	62862	62862	13	SENECA FOODS CORPORATION MAYVILLE	6972	114007520	6972	2033	CANNED FRUITS AND VEGETABLES	PRIVATE	50822	Current	3/31/2016 0:00	3/31/2021 0:00	Industrial	North Drain Tile	635919	333869	43.4687004	-88.566803
96	73941	73941	22	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Feedlot R. C. - Rich's Farm	589223	302831	43.1949997	-89.1493988
97	73942	73942	23	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Feedlot R. C. - Oberts Farm	590357	303254	43.1990013	-89.1356964
98	73943	73943	25	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Feedlot R. C. - Schuster Farm	586894	301717	43.1833992	-89.1807022
99	73933	73933	20	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Feedlot R. C. - B Dairy	587148	299164	43.1610985	-89.1700974
100	73944	73944	26	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Feedlot R. C. - L. Krebs Farm	587541	300770	43.1747017	-89.1679993
101	73945	73945	27	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Feedlot R. C. - B Shop	587724	299791	43.1696014	-89.1679993
102	73953	73953	24	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Feed Storage R. C. - Oberts	590355	303252	43.1991997	-89.1350021
103	73884	73884	1	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Liquid Manure Storage - Main	588372	301973	43.1818008	-89.1641998
104	73896	73896	3	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Solid Manure Storage - Main	588246	302009	43.1814995	-89.1656036
105	73898	73898	5	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Misc. Solid Manure - Main	588359	301973	43.1813011	-89.1640015
106	73901	73901	6	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Liq. Manure Storage - J.Blaska	587532	300766	43.1808014	-89.1761017
107	73902	73902	8	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Liq Manure Storage -B Dairy	587133	299141	43.160099	-89.1692963
108	73905	73905	9	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Misc. Solid Manure -B Dairy	587160	299179	43.1608009	-89.1692963
109	73906	73906	7	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Misc. Manure Solids -J Blaska	587532	300767	43.1801987	-89.175499
111	73908	73908	11	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Misc. Solid Manure - Richs	589238	302808	43.1948013	-89.1501999
112	73913	73913	13	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Misc. Solid Manure - Oberts	590379	303316	43.1996994	-89.1356964
113	73915	73915	12	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Liquid Manure Storage - Oberts	590336	303219	43.1988983	-89.1352997
114	73916	73916	14	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Misc. Solid Manure - Schuster	586875	301748	43.1836014	-89.1808014
115	73917	73917	15	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Misc. Solid Manure - L. Krebs	587544	300769	43.1749992	-89.1679993
116	73918	73918	16	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Misc Solid Manure- B Shop	587697	299786	43.1697998	-89.1679001
117	73919	73919	17	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Feedlot Runoff Control - Main	588043	302019	43.1815987	-89.1657028
118	73920	73920	18	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Feed Storage R.C.- Main Farm	588065	302017	43.1828003	-89.1648026
119	73921	73921	19	STATZ BROTHERS INC	7089	113239390	7089	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56791	Current	10/29/2013 0:00	9/30/2018 0:00	Animal Waste	Feedlot R. C. - J. Blaska	587536	300767	43.1805992	-89.1762009
163	47046	47046	1	NESTLE PURINA PETCARE CO - JEFFERSON	5695	128003700	5695	2047	DOG AND CAT FOOD	PRIVATE	2518	Current	12/30/2013 0:00	12/31/2018 0:00	Industrial	Cooling, Boiler, Retort, RO	0	0	42.9976006	-88.8095016
170	48307	48307	1	JOHNSON CREEK WASTEWATER TREATMENT FACILITY	5964	128001830	5964			MUNICIPAL	22161	Current	12/29/2014 0:00	12/31/2019 0:00	Municipal	EFFLUENT	0	0	43.0718002	-88.7938995
177	48355	48355	1	THERESA WASTEWATER TREATMENT FACILITY	5976	114002790	5976			MUNICIPAL	22322	Current	6/28/2013 0:00	6/30/2018 0:00	Municipal	EFFLUENT	0	0	43.5136986	-88.4608002
192	48559	48559	1	LEBANON SANITARY DISTRICT #2 WWTF	6020	114116200	6020			MUNICIPAL	23051	Current	6/28/2013 0:00	6/30/2018 0:00	Municipal	EFFLUENT	0	0	43.2010002	-88.6151962
208	49391	49391	1	ALLENTON SANITARY DISTRICT WWTP	6214	267010480	6214	4941	WATER SUPPLY	MUNICIPAL	28053	Current	6/23/2015 0:00	6/30/2020 0:00	Municipal	EFFLUENT	0	0	43.4234009	-88.3492966
217	49498	49498	1	REESEVILLE WASTEWATER TREATMENT FACILITY	6241	114002680	6241	9199	GENERAL GOVERNMENT, NEC	MUNICIPAL	28509	Current	6/29/2015 0:00	6/30/2020 0:00	Municipal	EFFLUENT	0	0	43.3079987	-88.8280029
302	81628	81628	1	FEDERAL MOGUL SINTERED PRODUCTS PLANT WAUPUN	9194	114067910	9194	3499	FABRICATED METAL PRODUCTS, NEC	PRIVATE	44938	Current	7/27/2017 0:00	9/30/2022 0:00	Industrial	Noncontact cooling water 1	621901	349691	43.6211014	-88.7294998
309	48481	48481	1	WAUPUN WASTEWATER TREATMENT FACILITY	5999	420005630	5999			MUNICIPAL	22772	Current	6/27/2016 0:00	6/30/2021 0:00	Municipal	EFFLUENT	623628	352922	43.6422005	-88.7153015
316	46928	46928	1	VALERO RENEWABLE FUELS COMPANY, LLC	5545	128002930	5545	2869	INDUSTRIAL ORGANIC CHEMICALS, NEC	PRIVATE	2038	Current	7/1/2014 0:00	6/30/2019 0:00	Industrial	Process WW and Non-Process WW	0	0	43.0367012	-88.8097
372	89272	89272	1	JIM HERMAN INC	41471	113381510	41471	211	BEEF CATTLE FEEDLOTS	PRIVATE	64220	Current	10/30/2015 0:00	9/30/2020 0:00	Animal Waste	Beef Barn - Main Farm	597058	301560	43.1836014	-89.0494003
373	89273	89273	2	JIM HERMAN INC	41471	113381510	41471	211	BEEF CATTLE FEEDLOTS	PRIVATE	64220	Current	10/30/2015 0:00	9/30/2020 0:00	Animal Waste	Springer Barn - Main Farm	597848	301463	43.1822014	-89.046402
374	89274	89274	3	JIM HERMAN INC	41471	113381510	41471	211	BEEF CATTLE FEEDLOTS	PRIVATE	64220	Current	10/30/2015 0:00	9/30/2020 0:00	Animal Waste	Compost Pad - Main Farm	597091	301741	43.1843987	-89.0498962
381	81691	81691	5	JOHN DEERE HORICON WORKS	7247	114052510	7247	3524	LAWN AND GARDEN EQUIPMENT	PRIVATE	44938	Current	7/27/2017 0:00	9/30/2022 0:00	Industrial	Noncontact cooling water 5	630384	332387	43.4561996	-88.634903
382	81692	81692	6	JOHN DEERE HORICON WORKS	7247	114052510	7247	3524	LAWN AND GARDEN EQUIPMENT	PRIVATE	44938	Current	7/27/2017 0:00	9/30/2022 0:00	Industrial	Noncontact cooling water 6	630361	332166	43.4543991	-88.6353989
383	81693	81693	7	JOHN DEERE HORICON WORKS	7247	114052510	7247	3524	LAWN AND GARDEN EQUIPMENT	PRIVATE	44938	Current	7/27/2017 0:00	9/30/2022 0:00	Industrial	Noncontact cooling water 7	630463	331720	43.4502983	-88.6343994
384	81695	81695	30	JOHN DEERE HORICON WORKS	7247	114052510	7247	3524	LAWN AND GARDEN EQUIPMENT	PRIVATE	44938	Current	7/27/2017 0:00	9/30/2022 0:00	Industrial	Noncontact cooling water 30	630453	331755	43.4506989	-88.6343994
386	48640	48640	1	BRANDON WASTEWATER TREATMENT FACILITY	7288	420004310	7288			MUNICIPAL	23442	Current	2/8/2013 0:00	3/31/2018 0:00	Municipal	Effluent	618110	362734	43.7313004	-88.7813034
416	47976	47976	1	OCONOMOWOC WASTEWATER TREATMENT PLNT	5893	268004550	5893	4952	SEWERAGE SYSTEMS	MUNICIPAL	21181	Current	4/1/2014 0:00	3/31/2019 0:00	Municipal	EFFLUENT	0	0	43.1002998	-88.5047989
456	48603	48603	1	BEAVER DAM WASTEWATER TREATMENT FACILITY	6030	114001250	6030			MUNICIPAL	23345	Current	6/30/2014 0:00	6/30/2019 0:00	Municipal	EFFLUENT	0	0	43.4429016	-88.8463974
471	48807	48807	1	JEFFERSON WASTEWATER TREATMENT FACILITY	6071	128001720	6071	4952	SEWERAGE SYSTEMS	MUNICIPAL	24333	Current	3/31/2016 0:00	3/31/2021 0:00	Municipal	EFFLUENT	0	0	42.9948006	-88.8037033
475	48845	48845	1	MARSHALL WASTEWATER TREATMENT FACILITY	6076	113002450	6076			MUNICIPAL	24627	Current	3/19/2014 0:00	3/31/2019 0:00	Municipal	EFFLUENT	0	0	43.1655006	-89.0580978
476	48852	48852	1	MAYVILLE WASTEWATER TREATMENT FACILITY	6078	114005760	6078			MUNICIPAL	24643	Current	6/28/2013 0:00	6/30/2018 0:00	Municipal	EFFLUENT	0	0	43.5042	-88.5483017
516	58561	58561	1	CLOVER HILL DAIRY	16778	420001230	16778	240	DAIRY FARMS	PRIVATE	61689	Current	5/23/2011 0:00	5/31/2016 0:00	Animal Waste	Concrete Storage	651176	344730	43.5640984	-88.3753967
517	58562	58562	2	CLOVER HILL DAIRY	16778	420001230	16778	240	DAIRY FARMS	PRIVATE	61689	Current	5/23/2011 0:00	5/31/2016 0:00	Animal Waste	Slurrystore Storage	651571	345119	43.5656013	-88.3714981
518	58563	58563	3	CLOVER HILL DAIRY	16778	420001230	16778	240	DAIRY FARMS	PRIVATE	61689	Current	5/23/2011 0:00	5/31/2016 0:00	Animal Waste	Digested Solids Storage	651100	344775	43.5648003	-88.375
520	58575	58575	7	CLOVER HILL DAIRY	16778	420001230	16778	240	DAIRY FARMS	PRIVATE	61689	Current	5/23/2011 0:00	5/31/2016 0:00	Animal Waste	Outdoor Lots - Dairy	651216	344697	43.5639	-88.3729019
522	58695	58695	6	CLOVER HILL DAIRY	16778	420001230	16778	240	DAIRY FARMS	PRIVATE	61689	Current	5/23/2011 0:00	5/31/2016 0:00	Animal Waste	Feed Storage Tank	651213	344699	43.5643005	-88.3718033
537	49993	49993	1	IXONIA UTILITY DISTRICT #1 WWTF	6367	128001610	6367	4952	SEWERAGE SYSTEMS	MUNICIPAL	31038	Current	3/27/2017 0:00	3/31/2022 0:00	Municipal	EFFLUENT	0	0	43.1399002	-88.5964966
538	50002	50002	1	RANDOLPH WASTEWATER TREATMENT FACILITY	6370	114002570	6370			MUNICIPAL	31160	Current	3/21/2014 0:00	3/31/2019 0:00	Municipal	EFFLUENT	0	0	43.5273018	-89.0025024
597	90515	90515	1	LAKE COUNTRY FOODS INC	5694	268005870	5694	2023	DRY, CONDENSED, EVAPORATED PRODUCTS	PRIVATE	44938	Current	7/27/2017 0:00	9/30/2022 0:00	Industrial	Noncontact cooling water 1	640711	294205	43.1104012	-88.5074005
651	48086	48086	1	JUNEAU WASTEWATER TREATMENT FACILITY	5915	114002130	5915			MUNICIPAL	21474	Current	12/20/2013 0:00	12/31/2018 0:00	Municipal	EFFLUENT	0	0	43.3811989	-88.7034988
655	48129	48129	1	BROWNSVILLE WASTEWATER TREATMENT FACILITY	5925	114001360	5925			MUNICIPAL	21601	Current	6/28/2014 0:00	6/30/2019 0:00	Municipal	EFFLUENT	0	0	43.6127014	-88.4865036
747	47687	47687	1	IRON RIDGE WASTEWATER TREATMENT FACILITY	7342	114002020	7342			MUNICIPAL	20486	Current	6/28/2017 0:00	6/30/2022 0:00	Municipal	EFFLUENT	0	0	43.3965988	-88.5388031
806	89275	89275	4	JIM HERMAN INC	41471	113381510	41471	211	BEEF CATTLE FEEDLOTS	PRIVATE	64220	Current	10/30/2015 0:00	9/30/2020 0:00	Animal Waste	Leachate Storage - Main Farm	597113	301777	43.1846008	-89.0494995
884	47556	47556	1	HARTFORD WATER POLLUTION CONTROL FACILITY	5815	267003110	5815			MUNICIPAL	20192	Current	6/29/2012 0:00	6/30/2017 0:00	Municipal	MECHANICAL PLANT EFFLUENT	0	0	43.3302994	-88.4105988
890	47603	47603	1	HUSTISFORD WASTEWATER TREATMENT FACILITY	5824	114001910	5824			MUNICIPAL	20303	Current	6/28/2013 0:00	6/30/2018 0:00	Municipal	EFFLUENT	0	0	43.3307991	-88.5891037
898	47707	47707	1	LOMIRA WASTEWATER TREATMENT FACILITY	5841	114002240	5841			MUNICIPAL	20532	Current	8/19/2014 0:00	6/30/2019 0:00	Municipal	EFFLUENT	0	0	43.5765991	-88.444603
1051	82635	82635	1	ROCHE FARMS INC	38893	114058230	38893	211	BEEF CATTLE FEEDLOTS	PRIVATE	63916	Current	2/28/2014 0:00	12/31/2018 0:00	Animal Waste	Liquid - Underbarn Storage	608689	316694	43.3179016	-88.9103012
1052	82636	82636	2	ROCHE FARMS INC	38893	114058230	38893	211	BEEF CATTLE FEEDLOTS	PRIVATE	63916	Current	2/28/2014 0:00	12/31/2018 0:00	Animal Waste	Solids - North Barn	608710	316809	43.3190994	-88.9096985
1053	82638	82638	3	ROCHE FARMS INC	38893	114058230	38893	211	BEEF CATTLE FEEDLOTS	PRIVATE	63916	Current	2/28/2014 0:00	12/31/2018 0:00	Animal Waste	Solids - West Barn	608685	316747	43.3189011	-88.9103012
1054	82639	82639	4	ROCHE FARMS INC	38893	114058230	38893	211	BEEF CATTLE FEEDLOTS	PRIVATE	63916	Current	2/28/2014 0:00	12/31/2018 0:00	Animal Waste	Solids - Monoslope Bldg	608686	316703	43.3184013	-88.9098969
1055	82640	82640	5	ROCHE FARMS INC	38893	114058230	38893	211	BEEF CATTLE FEEDLOTS	PRIVATE	63916	Current	2/28/2014 0:00	12/31/2018 0:00	Animal Waste	Solids - Compost Storage Area	608708	316790	43.3190994	-88.9103012
1056	82643	82643	8	ROCHE FARMS INC	38893	114058230	38893	211	BEEF CATTLE FEEDLOTS	PRIVATE	63916	Current	2/28/2014 0:00	12/31/2018 0:00	Animal Waste	Composting Runoff Controls	608686	316711	43.3181	-88.9101028
1057	82687	82687	6	ROCHE FARMS INC	38893	114058230	38893	211	BEEF CATTLE FEEDLOTS	PRIVATE	63916	Current	2/28/2014 0:00	12/31/2018 0:00	Animal Waste	Solids-Active Composting Site	608688	316706	43.3181	-88.9103012
1058	82642	82642	7	ROCHE FARMS INC	38893	114058230	38893	211	BEEF CATTLE FEEDLOTS	PRIVATE	63916	Current	2/28/2014 0:00	12/31/2018 0:00	Animal Waste	Feed Storage Runoff Control	608685	316809	43.3185997	-88.9091034
1062	82787	82787	5	TAG LANE DAIRY FARM	39217	128119090	39217	240	DAIRY FARMS	PRIVATE	63932	Current	9/5/2008 0:00	9/30/2013 0:00	Animal Waste	Manure Solids General	636396	300414	43.1679993	-88.5737
1063	82788	82788	6	TAG LANE DAIRY FARM	39217	128119090	39217	240	DAIRY FARMS	PRIVATE	63932	Current	9/5/2008 0:00	9/30/2013 0:00	Animal Waste	Manure Solids - Calves	636344	300265	43.1674004	-88.572998
1064	82789	82789	7	TAG LANE DAIRY FARM	39217	128119090	39217	240	DAIRY FARMS	PRIVATE	63932	Current	9/5/2008 0:00	9/30/2013 0:00	Animal Waste	Feed Storage RCS	636392	300404	43.1677017	-88.5727005
1065	82790	82790	8	TAG LANE DAIRY FARM	39217	128119090	39217	240	DAIRY FARMS	PRIVATE	63932	Current	9/5/2008 0:00	9/30/2013 0:00	Animal Waste	Outdoor Lots	636408	300433	43.1679001	-88.5727005
1066	82786	82786	4	TAG LANE DAIRY FARM	39217	128119090	39217	240	DAIRY FARMS	PRIVATE	63932	Current	9/5/2008 0:00	9/30/2013 0:00	Animal Waste	Concrete manure storage 004	636403	300436	43.168499	-88.5737
1067	82784	82784	2	TAG LANE DAIRY FARM	39217	128119090	39217	240	DAIRY FARMS	PRIVATE	63932	Current	9/5/2008 0:00	9/30/2013 0:00	Animal Waste	Concrete manure storage 002	636398	300410	43.1679993	-88.5749969
1068	82785	82785	3	TAG LANE DAIRY FARM	39217	128119090	39217	240	DAIRY FARMS	PRIVATE	63932	Current	9/5/2008 0:00	9/30/2013 0:00	Animal Waste	Concrete manure storage 003	636411	300435	43.1693993	-88.5738983
1069	82783	82783	1	TAG LANE DAIRY FARM	39217	128119090	39217	240	DAIRY FARMS	PRIVATE	63932	Current	9/5/2008 0:00	9/30/2013 0:00	Animal Waste	Manure storage 001	636387	300390	43.1683998	-88.5744019

1078	89394	89394	2	VOLM FARMS	39374	267190330	39374	240	DAIRY FARMS	PRIVATE	64700	Current	2/1/2012 0:00	1/31/2017 0:00	Animal Waste/Industrial	Concrete Manure Storage	656405	336409	43.4905014	-88.3052979
1200	50007	50007	1	LAKE MILLS WASTEWATER TREATMENT FACILITY	6372	128001940	6372	4952	SEWERAGE SYSTEMS	MUNICIPAL	31194	Current	10/31/2016 0:00	9/30/2021 0:00	Municipal	EFFLUENT	0	0	43.0808983	-88.8963013
1250	81548	81548	1	RHODES BAKE-N-SERV COMPANY	27824	111095050	27824			PRIVATE	44938	Current	7/27/2017 0:00	9/30/2022 0:00	Industrial	Noncontact cooling water 2	598331	320637	43.3521996	-89.0371017
1314	51155	51155	3	GRANDE CHEESE CO BROWNSVILLE	6956	114021710	6956	2022	CHEESE, NATURAL AND PROCESSED	PRIVATE	50016	Current	6/27/2014 0:00	6/30/2019 0:00	Industrial	PRIOR TO ENTRY TO KUMMEL CR	0	0	43.6127014	-88.4865036
1397	52620	52620	1	WATERLOO WASTEWATER TREATMENT FACILITY	6359	128002380	6359			MUNICIPAL	30881	Current	7/28/2014 0:00	6/30/2019 0:00	Municipal	EFFLUENT	0	0	43.1887016	-88.9844971
1409	47600	47600	1	SLINGER WASTEWATER TREATMENT FACILITY	5823	267003440	5823			MUNICIPAL	20290	Current	7/1/2014 0:00	6/30/2019 0:00	Municipal	EFFLUENT	0	0	43.3352013	-88.2975998
1465	62541	62541	1	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Liquid Storage - East	627403	324854	43.3888016	-88.6800995
1466	62543	62543	3	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Solid Manure - Home Farm	626093	325879	43.3995018	-88.6800995
1467	62782	62782	4	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Solid Manure - Hickey	626270	324911	43.3908005	-88.6848984
1468	62788	62788	5	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Runoff Controls - East Farm	627579	324532	43.3861008	-88.6817017
1469	62792	62792	7	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Runoff Controls - Hickey Farm	626281	324883	43.3911018	-88.6837997
1470	62790	62790	6	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Runoff Controls - Home Farm	626092	325883	43.3995018	-88.6797028
1471	67076	67076	8	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Liquid Manure - West Farm	626302	324659	43.3872986	-88.6863022
1472	74778	74778	11	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	East Farm Feed Runoff Control	627433	324728	43.3879013	-88.6816025
1473	74773	74773	9	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Liquid Storage - West Farm	626283	324852	43.3889999	-88.6865005
1521	90948	90948	1	BROAN NUTONE LLC	1225	267008720	1225	3634	ELECTRIC HOUSEWARES AND FANS	PRIVATE	44938	Current	7/27/2017 0:00	9/30/2022 0:00	Industrial	Noncontact cooling water 4	650222	318092	43.3297005	-88.3929977
1522	90949	90949	2	BROAN NUTONE LLC	1225	267008720	1225	3634	ELECTRIC HOUSEWARES AND FANS	PRIVATE	44938	Current	7/27/2017 0:00	9/30/2022 0:00	Industrial	Noncontact cooling water 5	650219	318094	43.3310013	-88.3923035
1589	49506	49506	1	WATERTOWN WASTEWATER TREATMENT FACILITY	6243	128002490	6243	4952	SEWERAGE SYSTEMS	MUNICIPAL	28541	Current	9/8/2014 0:00	9/30/2019 0:00	Municipal	EFFLUENT	0	0	43.1736984	-88.7342987
1618	60898	60898	3	WI ELECTRIC POWER CO CONCORD STATION	15797	128065080	15797	4911	ELECTRIC SERVICES	PRIVATE	61441	Current	11/29/2013 0:00	12/31/2018 0:00	Industrial	Combined Outlet (003)	626957	300018	43.167099	-88.6860962
1619	60903	60903	2	WI ELECTRIC POWER CO CONCORD STATION	15797	128065080	15797	4911	ELECTRIC SERVICES	PRIVATE	61441	Current	11/29/2013 0:00	12/31/2018 0:00	Industrial	Multimedia Filter Backwash	627037	300367	43.168499	-88.6878967
1620	60897	60897	1	WI ELECTRIC POWER CO CONCORD STATION	15797	128065080	15797	4911	ELECTRIC SERVICES	PRIVATE	61441	Current	11/29/2013 0:00	12/31/2018 0:00	Industrial	12 Inch Concrete Pipe Outlet	627042	300344	43.1683006	-88.683197
1760	71506	71506	1	KUTZ DAIRY	28700	128115900	28700	240	DAIRY FARMS	PRIVATE	62804	Current	12/23/2015 0:00	12/31/2020 0:00	Animal Waste	WSF #1 - Liquid Storage	620312	278102	42.9720993	-88.7749023
1761	71507	71507	2	KUTZ DAIRY	28700	128115900	28700	240	DAIRY FARMS	PRIVATE	62804	Current	12/23/2015 0:00	12/31/2020 0:00	Animal Waste	WSF #2 - Liquid Storage	620316	278123	42.9724007	-88.774498
1762	71508	71508	3	KUTZ DAIRY	28700	128115900	28700	240	DAIRY FARMS	PRIVATE	62804	Current	12/23/2015 0:00	12/31/2020 0:00	Animal Waste	WSF #3 - Liquid Storage	620339	278147	42.9724998	-88.7742004
1763	71509	71509	4	KUTZ DAIRY	28700	128115900	28700	240	DAIRY FARMS	PRIVATE	62804	Current	12/23/2015 0:00	12/31/2020 0:00	Animal Waste	Recycling Center Liquids	620334	278140	42.9733009	-88.7751999
1764	71510	71510	6	KUTZ DAIRY	28700	128115900	28700	240	DAIRY FARMS	PRIVATE	62804	Current	12/23/2015 0:00	12/31/2020 0:00	Animal Waste	Dry Cow Solids	619432	278886	42.9732018	-88.7764969
1765	71511	71511	7	KUTZ DAIRY	28700	128115900	28700	240	DAIRY FARMS	PRIVATE	62804	Current	12/23/2015 0:00	12/31/2020 0:00	Animal Waste	Calf Pens (solids)	619424	278879	42.9732018	-88.778801
1766	71512	71512	8	KUTZ DAIRY	28700	128115900	28700	240	DAIRY FARMS	PRIVATE	62804	Current	12/23/2015 0:00	12/31/2020 0:00	Animal Waste	Calf Pens (Liquid)	619399	278875	42.9730988	-88.7790985
1767	71513	71513	9	KUTZ DAIRY	28700	128115900	28700	240	DAIRY FARMS	PRIVATE	62804	Current	12/23/2015 0:00	12/31/2020 0:00	Animal Waste	Heifer Barn Solids	620314	278103	42.9724998	-88.7762985
1809	81376	81376	4	J M SCHMIDT AND SONS INC	38020	114118070	38020	240	DAIRY FARMS	PRIVATE	63801	Current	9/1/2014 0:00	9/30/2019 0:00	Animal Waste	Separated Solids	647191	336257	43.4878998	-88.4348984
1810	81377	81377	5	J M SCHMIDT AND SONS INC	38020	114118070	38020	240	DAIRY FARMS	PRIVATE	63801	Current	9/1/2014 0:00	9/30/2019 0:00	Animal Waste	Solid manures	647239	335976	43.4860001	-88.4319992
1811	81379	81379	7	J M SCHMIDT AND SONS INC	38020	114118070	38020	240	DAIRY FARMS	PRIVATE	63801	Current	9/1/2014 0:00	9/30/2019 0:00	Animal Waste	Feed Storage Area	646143	335798	43.4875984	-88.4371033
1812	81375	81375	3	J M SCHMIDT AND SONS INC	38020	114118070	38020	240	DAIRY FARMS	PRIVATE	63801	Current	9/1/2014 0:00	9/30/2019 0:00	Animal Waste	Waste Storage Facilities #2-#3	647216	336188	43.4874001	-88.4339981
1813	81373	81373	1	J M SCHMIDT AND SONS INC	38020	114118070	38020	240	DAIRY FARMS	PRIVATE	63801	Current	9/1/2014 0:00	9/30/2019 0:00	Animal Waste	Waste Storage Facility #1	647225	336159	43.4872017	-88.433197
1835	85537	85537	1	HILLTOP DAIRY LLC	39995	424015130	39995	240	DAIRY FARMS	PRIVATE	63983	Current	10/15/2014 0:00	10/31/2019 0:00	Animal Waste	Liquids - North Cell Storage	608352	353181	43.6433983	-88.907402
1836	85538	85538	2	HILLTOP DAIRY LLC	39995	424015130	39995	240	DAIRY FARMS	PRIVATE	63983	Current	10/15/2014 0:00	10/31/2019 0:00	Animal Waste	Solids - Bottom of Storages	608369	353183	43.6433983	-88.9070969
1837	86388	86388	3	HILLTOP DAIRY LLC	39995	424015130	39995	240	DAIRY FARMS	PRIVATE	63983	Current	10/15/2014 0:00	10/31/2019 0:00	Animal Waste	Liquids - Middle Storage Cell	608352	353179	43.6428986	-88.907402
1838	86392	86392	4	HILLTOP DAIRY LLC	39995	424015130	39995	240	DAIRY FARMS	PRIVATE	63983	Current	10/15/2014 0:00	10/31/2019 0:00	Animal Waste	Solid Manure	608338	353182	43.6459999	-88.9084015
1839	86394	86394	5	HILLTOP DAIRY LLC	39995	424015130	39995	240	DAIRY FARMS	PRIVATE	63983	Current	10/15/2014 0:00	10/31/2019 0:00	Animal Waste	Concrete Lot Areas	608341	353184	43.6469994	-88.9068985
1840	86395	86395	6	HILLTOP DAIRY LLC	39995	424015130	39995	240	DAIRY FARMS	PRIVATE	63983	Current	10/15/2014 0:00	10/31/2019 0:00	Animal Waste	Liquids - South Cell Storage	608370	353180	43.6431007	-88.906601
1841	86396	86396	7	HILLTOP DAIRY LLC	39995	424015130	39995	240	DAIRY FARMS	PRIVATE	63983	Current	10/15/2014 0:00	10/31/2019 0:00	Animal Waste	Outdoor Lot Areas	608343	353183	43.6473007	-88.907402
1842	86437	86437	8	HILLTOP DAIRY LLC	39995	424015130	39995	240	DAIRY FARMS	PRIVATE	63983	Current	10/15/2014 0:00	10/31/2019 0:00	Animal Waste	Feed Storage Area	608437	353361	43.6478004	-88.908699
1843	85297	85297	2	MAUNESHA RIVER DAIRY	40048	113381730	40048	240	DAIRY FARMS	PRIVATE	63991	Current	11/23/2010 0:00	9/30/2015 0:00	Animal Waste	Future Manure Digester(s)	590023	305863	43.2220993	-89.143898
1844	89294	89294	7	MAUNESHA RIVER DAIRY	40048	113381730	40048	240	DAIRY FARMS	PRIVATE	63991	Current	11/23/2010 0:00	9/30/2015 0:00	Animal Waste	Parlor Washwater Tank	589895	305621	43.2216988	-89.1435013
1845	85248	85248	1	MAUNESHA RIVER DAIRY	40048	113381730	40048	240	DAIRY FARMS	PRIVATE	63991	Current	11/23/2010 0:00	9/30/2015 0:00	Animal Waste	Manure Storage 1 - 8 MG	590032	306019	43.2224998	-89.1443024
1846	85344	85344	3	MAUNESHA RIVER DAIRY	40048	113381730	40048	240	DAIRY FARMS	PRIVATE	63991	Current	11/23/2010 0:00	9/30/2015 0:00	Animal Waste	Future Solids Processing Blds.	589899	305628	43.2215996	-89.1445007
1847	85345	85345	4	MAUNESHA RIVER DAIRY	40048	113381730	40048	240	DAIRY FARMS	PRIVATE	63991	Current	11/23/2010 0:00	9/30/2015 0:00	Animal Waste	Barns - Solid Manure	589912	305647	43.2215004	-89.1416016
1848	85346	85346	5	MAUNESHA RIVER DAIRY	40048	113381730	40048	240	DAIRY FARMS	PRIVATE	63991	Current	11/23/2010 0:00	9/30/2015 0:00	Animal Waste	Solid Manure	590016	305859	43.2220001	-89.1421967
1849	85347	85347	6	MAUNESHA RIVER DAIRY	40048	113381730	40048	240	DAIRY FARMS	PRIVATE	63991	Current	11/23/2010 0:00	9/30/2015 0:00	Animal Waste	Headland Stacking	590011	305844	43.2223015	-89.1397018
1850	85348	85348	8	MAUNESHA RIVER DAIRY	40048	113381730	40048	240	DAIRY FARMS	PRIVATE	63991	Current	11/23/2010 0:00	9/30/2015 0:00	Animal Waste	Feed Storage Area	590022	305830	43.2219009	-89.1393967
1851	85349	85349	9	MAUNESHA RIVER DAIRY	40048	113381730	40048	240	DAIRY FARMS	PRIVATE	63991	Current	11/23/2010 0:00	9/30/2015 0:00	Animal Waste	Feedlot Runoff Controls	590023	305763	43.2218018	-89.139801
1903	47573	47573	1	HORICON WASTEWATER TREATMENT FACILITY	5818	114001800	5818			MUNICIPAL	20231	Current	12/20/2013 0:00	12/31/2018 0:00	Municipal	EFFLUENT	0	0	43.4384995	-88.6299973
1988	74777	74777	10	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Liquid Storage#2 - West Farm	626286	324856	43.3889999	-88.6844025
1989	62542	62542	2	NEHLS BROS FARMS LTD	5029	114088480	5029	200	AGRICULTURAL PRODUCTION LIVESTOCK	PRIVATE	56812	Current	12/6/2016 0:00	12/31/2021 0:00	Animal Waste	Solid Manure - East	627406	324804	43.3885002	-88.6809998
2009	87056	87056	1	AVON HI LIFE INC	2433	128007550	2433	3069	FABRICATED RUBBER PRODUCTS, NEC	PRIVATE	44938	Current	7/27/2017 0:00	9/30/2022 0:00	Industrial	Noncontact cooling water 1	619592	289952	43.0794983	-88.7754974
2010	87057	87057	2	AVON HI LIFE INC	2433	128007550	2433	3069	FABRICATED RUBBER PRODUCTS, NEC	PRIVATE	44938	Current	7/27/2017 0:00	9/30/2022 0:00	Industrial	Noncontact cooling water 2	619668	289926	43.0798988	-88.7750015

Adaptive Management

Phosphorus Criteria (NR 102.06)
Rivers: 100 ug/L
Streams: 75 ug/L
Reservoirs: 30 - 40 ug/L
Lakes: 15 - 40 ug/L

TOOLS FOR DETERMINING ELIGIBILITY

- Use the DNR Surface Water Data Viewer mapping tool to see if the P concentration in your receiving water is exceeding the criteria http://dnr.wi.gov/topic/surfacewater/swdv/
- Use the PRESTO modeling tool to find the average annual P loads from point sources and NPS in your basin (NPS loads must exceed point source loads to be eligible) http://dnr.wi.gov/topic/surfacewater/presto.html

PRESTO Pollutant Load Ratio Estimation Tool

ACRONYMS

AM: adaptive management

BMPs: best management practices

DNR: Wisconsin Department of Natural Resources

NPS: nonpoint source

P: phosphorus

TMDL: total maximum daily load

WPDES: Wisconsin Pollutant Discharge Elimination System

WQBEL: water quality based effluent limit

WQT: water quality trading

What is Adaptive Management (AM)?

ADAPTIVE MANAGEMENT IS...

- A voluntary compliance option for point source facilities to comply with phosphorus limits in NR 217
- A watershed approach to control phosphorus (P), where a point source facility funds management measures at other point or nonpoint sources
- An adaptive process to work towards water quality improvements
- Based on achieving the applicable water quality criteria in the receiving water
- Often flexible for the permittee — many different approaches could achieve the desired result
- A strategy built on partnerships between point source facilities and other landowners, municipalities, private and public entities

ADAPTIVE MANAGEMENT IS NOT...

- Water quality trading (a.k.a. pollutant trading)
- The appropriate solution for all point source facilities

Adaptive Management vs. Water Quality Trading (WQT)

Both AM and WQT are designed to be used when it is economically preferable to control nonpoint sources or other point sources of P compared with upgrading a particular point source facility (to achieve overall P reduction). However, there are some key differences in how the two compliance options are implemented.

1. **End Goals** — WQT focuses on compliance with a discharge *limit*; AM focuses on compliance with P *criterion* (an in-stream concentration).
2. **Implementation Area** — WQT typically only allows strategies upstream of the point source; AM includes reduction strategies in a watershed.
3. **Offsets** — Calculation of WQT offsets requires trade ratios and margins of safety; AM does not.
4. **Timing** — WQT credits must be generated prior to permit issuance; AM allows permittees to reduce effluent P over time.
5. **Monitoring** — AM requires in-stream monitoring and annual reports; WQT does not.
6. **Eligibility** — Eligibility requirements differ for AM and WQT.

WHO IS ELIGIBLE?

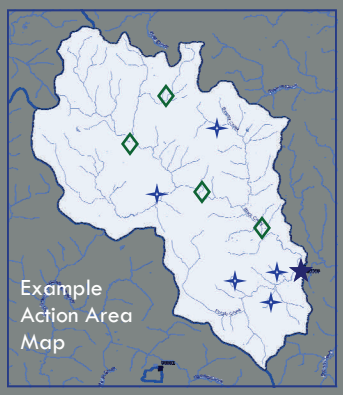
Facilities must meet the following conditions to be eligible for AM:

1. The P concentration in the receiving water exceeds the applicable water quality criterion.
2. The amount of phosphorus coming from nonpoint* sources (NPS) in the watershed exceeds the P loading from point sources or NPS must be controlled to comply with the P criteria.
3. Filtration or equivalent technology is required to meet the WQBEL.

*For the purposes of AM, municipal separate storm sewer systems (MS4s) are considered a NPS.

Adaptive Management Plan

Once eligibility is confirmed, and DNR approves AM as the chosen compliance strategy, an AM Plan must be prepared by the permittee and approved by DNR.



- AM Applicant's Facility
- Agricultural BMP
- Other BMP

NINE REQUIREMENTS TO DEVELOP A SUCCESSFUL PLAN:

	REQUIRED ELEMENTS	DESCRIPTION
1	Identify Partners	Potential partner can include other point sources, county land and water conservation departments, local municipalities, funding partners, DNR, etc.
2	Describe the Watershed & Set Load Reduction Goals	Describe the adaptive management action area including the counties in the watershed, available water quality data, number of reaches, hydraulic retention time, etc.
3	Conduct a Watershed Inventory	Gather current and historic land use and water quality data to identify potential opportunities in the watershed
4	Identify Where Reductions Will Occur	Create an "action area" map including locations of your facility, proposed reduction strategies, monitoring, and potential future strategies (where applicable)
5	Describe Management Measures	Identify strategies for reducing P, with installation and maintenance activities; see examples below
6	Estimate Load Reductions Expected from Strategies	Employ models (SNAP-PLUS, SWAT, SLAMM, SPARROW, etc.) to estimate expected P load reductions
7	Measuring Success	Collect effluent and in-stream samples; using the monitoring results with modeling, show the expected water quality improvements and BMP effectiveness
8	Financial Security	Show how project costs will be funded (costs may include installation, maintenance, and monitoring of BMPs; outreach and education)
9	Implementation Schedule and Milestones	Provide a detailed implementation schedule to be put into your permit; annual reporting to DNR is required

Example Management Measures

Any best management practice (BMP) which is proven to reduce phosphorus in runoff can be considered in an AM strategy.

Urban
- Grass swales
- Infiltration practices
- Porous pavement
- Retention/detention basins
- Sand filters

Agricultural
- Use of cover crops
- Contour farming
- Buffer strips
- No-till practices
- Grazing land protection
- Nutrient management

Other
- Stream bank stabilization
- Wetland restoration
- Constructed wetlands

WHAT IS INCLUDED IN A WPDES PERMIT?

The following components of an AM plan are included in the facility's WPDES permit, and are enforceable. The facility is assigned a final WQBEL and interim (effluent) limits, which get more stringent each permit term.

- Interim limits*
  - First permit term: 0.6 mg/L
  - Second permit term: 0.5 mg/L
  - Third permit term: final WQBEL (varies by facility)
- Compliance schedules for achieving interim and final limits, if necessary
- Actions proposed in AM plan
- Monitoring requirements
- Annual reporting requirements

*Permit includes 6-month and 1-month average interim limits; final WQBEL can be recalculated if water quality improved

FOR MORE INFORMATION

- Visit the DNR phosphorus website: http://dnr.wi.gov/topic/surfacewater/phosphorus.html
- Review DNR phosphorus implementation guidance
- Send questions to the email address dnrphosphorus@wisconsin.gov
- View informational webinars
- See Ch. NR 217.18 Wis. Admin. Code

WISCONSIN DEPT. OF NATURAL RESOURCES

Fact sheet for information only
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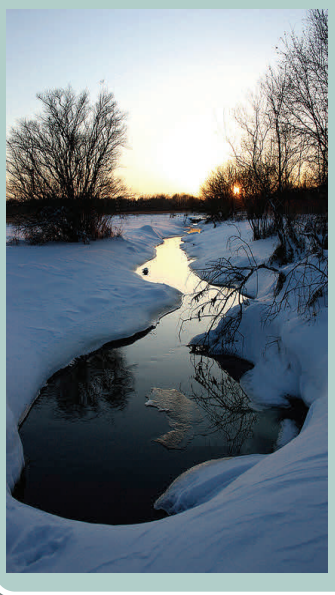
Water Quality Trading

What is Water Quality Trading (WQT)?



WATER QUALITY TRADING IS...

- A compliance option that provides point sources with the flexibility to acquire pollutant reductions from other sources in the watershed to offset their point source load to comply with a permit limit (WQBEL)
- A strategy built on partnerships between point source facilities and their trading affiliates including other point sources, landowners, municipalities, private or public entities
- A compliance approach that must result in an overall reduction in pollutant load

WATER QUALITY TRADING IS NOT...

- Adaptive management
- The appropriate solution for all point source facilities

POLLUTANTS THAT CAN BE TRADED:

- Phosphorus
- Total Suspended Solids (TSS)
- Temperature
- Nitrogen
- Other pollutants excluding toxic bioaccumulative chemicals of concern

ACRONYMS

AM: adaptive management

BMPs: best management practices

DNR: Wisconsin Department of Natural Resources

NPS: nonpoint source

WPDES: Wisconsin Pollutant Discharge Elimination System

WQBEL: water quality based effluent limit

WQT: water quality trading

Urban BMPs can be used to generate credits for WQT.

Feasibility in your watershed:

Although WQT may be an economically viable compliance option in some watersheds, it may not be a feasible option for everyone. To determine the trading feasibility in your watershed, DNR recommends that you:

1. Calculate the pollutant offset needed: The difference between the pollutant load from the point source and the permit discharge limit.
2. Identify a credit broker/exchange, if applicable: The goal of this step is to determine if a credit broker or exchange can be used to establish the trade and identify credit generators in the watershed. A credit broker or exchange does not need to be used, but they can improve the administrative feasibility of water quality trading. County Land Conservation Departments or other entities may be willing to serve as a broker or exchange in your watershed.
3. Identify potential credit generators: Any land use feature in your watershed that contributes the pollutant of concern may be a potential trading opportunity. This can include point sources or nonpoint sources. This step helps to verify that trading partners are available in your watershed.
4. Assess availability of credit: This step verifies that there is sufficient credit in your watershed to cover the offset needed.

Once you have determined that WQT is a feasible compliance option, and preferable to other options, the next step is to develop a WQT plan.

ROLES OF PARTNERS IN WQT:

There are several potential roles for WQT participants:

- **Credit User–** The point source using trading credits to comply with a permit limit
- **Credit Generator–** A permitted discharge or other entity that reduces their own pollutant load so that "credit" is generated.
- **Credit Broker/Exchange-** A third party that brings potential trading partners together. A broker performs the research necessary to match credit users and credit generators based on location, pollutant type, amount, and timing.

Water Quality Trading Plan

Seven trading elements must be adequately addressed in order to develop a successful water quality trading strategy. The purpose of the water quality trading plan is to verify that the regulatory requirements for WQT have been met, and submit the plan to WDNR for review and approval.

Upon approval. WDNR will reissue the WPDES permit with trading requirements built in.

A grass waterways is an example of a n agricultural BMP that can be used to generate credits for WQT.

THE SEVEN ELEMENTS OF WATER QUALITY TRADING:

	ELEMENTS OF TRADING	DESCRIPTION
1	Pollutant	The regulated contaminant being traded (ex. Phosphorus).
2	Participants	The persons or entities involved in the water quality trade which can include the credit user, credit generator, credit broker or exchange.
3	Credit	The standardized unit of a given pollutant that is available for trading. This amount is usually measured in pounds.
4	Credit Threshold	The amount of pollution reduction that needs to be achieved before credits are generated.
5	Trade Ratio	Trade ratios are used to ensure the amount of reduction resulting from the trade has the same effect as the reduction that would be required without the trade. Potential components of a trade ratio include delivery, uncertainty, equivalency, and retirement.
6	Location	The location of the credit user compared to the generator. The credit user and generator *must* discharge, either directly or indirectly, to the same water body.
7	Timing	Credits must be generated before they can be used to offset a permit limit. This means that trading practices must be established and effective before the limit takes effect.

Trade Ratios

Trade ratios are used to account for uncertainties associated with WQT resulting from location, delivery, equivalency, reserve, and practice uncertainty. A trade ratio can also be thought of as a multiplier. For example, a trade ratio of 2:1 means two pounds of pollutant reduction is equivalent to one pound of pollutant reduction credit.

Every trade will have a unique trade ratio given the site-specific concerns of the trade in question. There are several ways to reduce the trade ratio multiplier:

- Avoid trading with credit generators downstream of the discharge point.
- Use practices with a high margin of certainty, i.e., those practices with a high probability of success.
- Consider point to point source trades before trading with nonpoint sources.

To calculate a trade ratio you need to know the practice that will be used to generate the credits, and the location where the credits will be generated. See available guidance for specific details about calculating trade ratios.

WHAT IS INCLUDED IN A WPDES PERMIT?

Before a point source can use WQT to demonstrate compliance with a permit limit, the permit must be modified or reissued to allow for WQT. The following components of the WQT plan are included in the facility's WPDES permit, and are enforceable.

- Final permit limit (WQBEL)
- Summary of pollutant reduction credits
- Language referring to the trade agreements submitted with the WQT plan
- Annual reporting requirements
- A requirement that the permittee notify the WDNR when becoming aware that credits become unavailable or the s. 283.84 trade agreement must be modified or concluded
- Other permit conditions

If changes to the WQT plan occur during the term of the permit, the change may need to be public noticed or the permit may need to be modified to reflect the change.

FOR MORE INFORMATION

- Visit the DNR website: http://dnr.wi.gov/, search "trading"
- Review available guidance– *Water Quality Trading How-To Manual* and *Guidance for Implementing Water Quality Trading in WPDES Permits*
- Send questions to the email address: dnrphosphorus@wisconsin.gov
- View informational webinars

WISCONSIN DEPT. OF NATURAL RESOURCES

Fact sheet for information only
Prepared by:
Wisconsin Department of Natural Resources
Box 7921
Madison, WI 53707-7921

Multi-discharger Phosphorus Variance

ELIGIBLE POINT SOURCES:

A point source must meet all of the following to request a MDV:

- Must be an **existing facility**
- Requires **a major facility upgrade** to comply with their phosphorus WQBELs
- Meets the primary and secondary **substantial** indicators
- Agrees to **reduce its phosphorus load** during the variance timeline
- Implements a **watershed project** to help curb nonpoint source phosphorus pollution

An eligibility quiz is available online to help point sources make this determination.

ACRONYMS

DNR: Wisconsin Department of Natural Resources

DOA: Wisconsin Department of Administration

EIA: Economic Impact Analysis

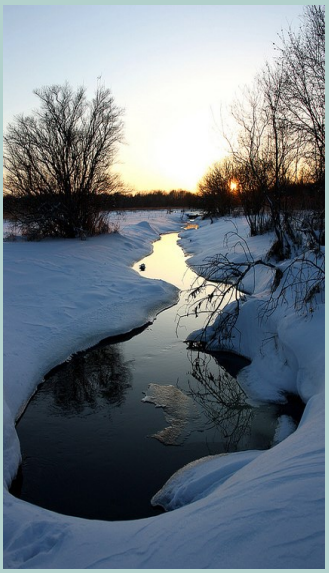
LCD: Land and Water Conservation Department

MDV: Multi-Discharger Variance

WPDES: Wisconsin Pollutant Discharge Elimination System

WQBEL: Water quality-based effluent limit

What is a multi-discharger variance?



A MULTIDISCHARGE VARIANCE (MDV) IS...

- A time extension for point sources facing restrictive phosphorus limits to comply with limits
- An opportunity for point sources to make meaningful strides towards water quality improvements in a more economically effective manner
- Approved on a case-by-case basis and implemented in a WPDES permit

A MDV IS NOT...

- An individual variance pursuant to s. 283.15
- A final compliance option for point sources
- Water quality trading or adaptive management
- Permanent

What the MDV requires:

A point source is responsible for evaluating its compliance options such as facility upgrades, water quality trading, adaptive management, and, potentially, a phosphorus MDV. If a facility meets the eligibility requirements and requests the MDV, the WPDES permit will, upon approval, be modified or reissued with the following requirements:

1. Reductions of effluent phosphorus: Point sources are required to reduce their phosphorus load each permit term. Interim limitations will be included in the permit based on current effluent quality, opportunities for optimization, and other site-specific considerations.

2. Implement a watershed project: Point sources must implement one of the following watershed project options to help reduce nonpoint source of phosphorus pollution:

- Enter into an agreement with DNR to implement a project to offset the amount of phosphorus their discharge exceeds the target value.
- Enter into a DNR-approved agreement with a third party to implement a project to offset the amount of phosphorus their discharge exceeds the target value.
- Make payments to county LCDs of $50 per pound times the number of pounds of phosphorus their discharge exceeds the target value.

The approval determination must be re-evaluated each permit reissuance of the MDV project timeline. The legal requirements of the MDV determination as well as general implementation procedures can be found in s. 283.16, Wis. Stat.

MDV APPROVAL & DURATION

EPA approved the MDV on February 6, 2017, which is effective until February 5, 2027. Permit terms and conditions that reflect the MDV cannot extend beyond the term of the variance expiration date. Several options are available to extend the current MDV approval to encompass the full time period allotted in s. 283.16, Wis. Stat., including:

- Seeking EPA approval on updated MDV packages, and
- Providing a compliance schedule after MDV expiration.

The Department will continue to work with EPA and stakeholders to pursue these options to maximize the duration of the MDV as necessary and appropriate. Section 283.16, Wis. Stat., authorized the DNR to seek MDV approval for up to 3 permit terms.

ONLINE RESOURCES

- MDV Implementation Guidance
- Informational Webinars
- Application Materials
- County Resources
- Watershed Project Resources
- MDV Package Submitted to EPA
- Local contact information

A grass waterways is an example of an agricultural BMP that can be used as part of a watershed project.

County Payment Option

It is voluntary for County LCDs to participate in the MDV. County LCDs should submit the "County Participation Form" to the DNR by January 1st of each year they wish to receive funding. At least 65% of MDV funds must be spent to bring farmers and other agricultural sources into compliance with NR 151 agricultural performance standards. The remaining funding may be spent on staffing, innovative projects, monitoring, modeling, demonstrations, etc. If a County chooses to participate, they will agree to:

- Develop a plan to use funds (due 1 year after funds received)
- Use the MDV funds appropriately
- Submit annual reports to the DNR until funds are used

Funds must be targeted to the highest phosphorus loading areas within the participating county. This may or may not be the same watershed the MDV funds were generated in. A "watershed plan" form has been created to help streamline the development and submittal of MDV watershed plans to DNR. Section 3.04 of the MDV Implementation Guidance is also designed to provide instructions to County LCDs on how to develop a successful MDV plan. Visit http://dnr.wi.gov/, search "statewide phosphorus variance" for more information.

Determining Substantial Impacts

A two-step process was used to determine if phosphorus standards compliance has a substantial impact to point source discharges. The purpose of the first step, commonly referred to as the "primary screener", is to determine the phosphorus standards' economic impact on dischargers in each category. The second step, referred to as the "secondary screener", gauges the wider community's socioeconomic well-being and ability to adapt to changes that accompany implementation of phosphorus standards. In order to meet the "substantial determination" test, a facility must meet the primary screener and one or more secondary screeners. Permittees should review Appendices A-G of the MDV Implementation Guidance or the "eligibility quiz" at dnr.wi.gov, keywords "statewide phosphorus variance" for specific eligibility information:

Primary Screeners:

- Median household income (municipal WWTFs)
- Estimated compliance costs within the discharge category (industries)
- Estimated compliance costs within the county (industries)

Secondary Screeners:

- Median household income (industries only)
- Transfer receipts as a share of total personal income
- Jobs per square mile
- Population change
- Net earnings by place of residence
- Job growth
- Capital costs as a share of total wages

REVIEWING THE MDV

- In order to comply with federal requirements, DNR must triennially review new information to determine if revisions are needed to the MDV including the substantial and widespread socioeconomic determination.
- DNR will also review facility-specific applications of the MDV upon permit reissuance to re-evaluate the need for the variance and update permit terms and conditions associated with s. 283.16, Wis. Stat. and the EPA-approved MDV.
- DNR may request EPA approval of revised phosphorus MDV packages in the future based on new information gathered from these analyses. This may extend the duration of the MDV.

FOR MORE INFORMATION

- Visit the DNR website: http://dnr.wi.gov/, search "phosphorus"
- Send comments or questions to DNRphosphorus@wisconsin.gov

WISCONSIN DEPT. OF NATURAL RESOURCES

Fact sheet for information only
Prepared by:
Wisconsin Department of Natural Resources
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Madison, WI 53707-7921

Sample group charter

Lake Sinissippi Lake Management Plan Advisory Group Charter

Purpose
The [WORKING GROUP] will develop a Purpose and Need statement for the [PROJECT] and identify multiple alternatives that address that purpose and need.
The [WORKING GROUP] will also help the project team in selecting the wisest course of action and preferred alternative. The preferred alternative will reflect consideration of various community goals, issues, environmental factors and concerns, and find the appropriate balance among competing interests.

Advisory Group Goals
Advise [CONVENER] about key aspects of the project, provide a community perspective on key considerations, and be a sounding board for project deliverables.
Work towards consensus among [WORKING GROUP] members on the desired project goals, alternatives, construction phasing, and mitigation measures to include in the EIS.

Project Outcome
The process will be considered a success if:

- The [WORKING GROUP] establishes clear, consensus-based recommendations on the best alternatives to include in the EIS;
- The public is engaged in a meaningful way in evaluating the proposed project alternatives and in reviewing and commenting on the project EIS;
- Project decisions fit into the context of the surrounding communities and recognize and respect the unique transportation needs along the corridor;
- The project schedule takes the least amount of time and makes the most effective use of limited project funding;
- Appropriate regulatory and government agency staff is involved throughout the process to avoid surprises that lead to delays.

Terms of membership
Members agree to volunteer until the initiation of the EIS environmental review process and possibly through the EIS process.

A member's position on the [WORKING GROUP] may be declared vacant if the member:

- Resigns from the [WORKING GROUP] (this should be in writing and forwarded to the [CONVENER])
- Fails to attend more than two meetings without prior notice

In a case where a member's position is declared vacant, the [CONVENER] may appoint an alternative representative from the same interest group to fill the position.

Advisory Group Operating Guidelines
Convening of Meetings

- Meetings will be held at the time and place chosen by the [WORKING GROUP] in the course of their meetings.
- It is anticipated that there will be [INSERT NUMBER] meetings leading up to the official opening of the environmental impact statement preparation process. Once the EIS is underway, it is anticipated that the group will meet quarterly.
- [WORKING GROUP] members will be informed of meetings through email or direct mail, depending on his/her preference, at least two weeks prior to the meeting.

Communication

- Meetings will be advertised in the [LIST MEDIA AND/OR LOCATION].

- Project documents and notices will be posted on the project website.
- Email: [CONVENER] should be copied on all correspondence, and if [CONVENER] chooses to open a dialogue via email, all [WORKING GROUP] members will be copied.

Conduct of meetings

- Meetings will be open to all.
- Meetings will be facilitated.
- Informed alternates are acceptable and encouraged if the [WORKING GROUP] member cannot attend.
- All cell phones will be turned off during the meetings.
- After all meeting agenda items have been addressed, time will be provided for non members in attendance to voice their opinions.
- Meetings will end with a clear understanding of expectations and assignments for next steps.
- Meetings are expected to be two to three hours and not exceed three hours. Extension of time, in 15 minute increments, will require the consent of the majority of members attending that meeting. Consensus will be indicated with a show of hands.
- The consultant will keep a record of meeting attendees, key issues raised, and actions required. Comments from individual members will generally not be attributed and a verbatim record of the meeting will not be prepared.
- The previous meeting record and a meeting agenda will be forwarded to members of the [WORKING GROUP] at least one week before the next meeting. Any changes to the record of the past meetings shall be in writing and forwarded to the [CONVENER] prior to the next meeting.

Meeting Ground Rules

- Speak one at a time – refrain from interrupting others.
- Wait to be recognized by facilitator before speaking.
- Facilitator will call on people who have not yet spoken before calling on someone a second time for a given subject.
- Share the oxygen – ensure that all members who wish to have an opportunity to speak are afforded a chance to do so.
- Maintain a respectful stance toward towards all participants.
- Listen to other points of view and try to understand other interests.
- Share information openly, promptly, and respectfully.
- If requested to do so, hold questions to the end of each presentation.
- Make sure notes taken on newsprint are accurate.
- Remain flexible and open-minded, and actively participate in meetings.

Roles and Responsibilities

THE [WORKING GROUP] is an advisory group to [CONVENER]:

[WORKING GROUP] members agree to:

- Provide specific local expertise, including identifying emerging local issues;
- Review project reports and comment promptly;
- Attend all meetings possible and prepare appropriately;

- Complete all necessary assignments prior to each meeting;
- Relay information to their constituents after each meeting and gather information/feedback from their constituents as practicable before each meeting;
- Articulate and reflect the interests that advisory group members bring to the table;
- Maintain a focus on solutions that benefit the entire study area;
- Present its recommendations for the project at the end of the planning process. The presentation would include subjects such as: project's Purpose and Need Statement, alternatives to be studied in the EIS, mitigation measures, and phasing plan. The [WORKING GROUP] shall select from among its members a presenter or team of presenters.

[CONVENER] and the consultant team agree to:

- Provide [WORKING GROUP] members the opportunity to collaborate with other agencies and groups on making recommendations for the project;
- Effectively manage the scope, schedule and budget;
- Keep [WORKING GROUP] partners informed of progress;
- Provide documentation to support recommendations;
- Provide technical expertise;
- Brief local decision makers and produce briefing materials and reports;
- Provide early notification of [WORKING GROUP] meetings and provide ten working days to review and comment on technical reports and other documents;
- Conduct public meetings necessary to inform and engage the community.
- Manage logistics for meetings; and
- Explain the reasons when deviations are taken from [WORKING GROUP] recommendations.

Communication

[WORKING GROUP] members will be informed of meetings through email or direct mail, depending on his/her preference, at least two weeks prior to the meeting.

- Meetings will be advertised in the [LIST MEDIA AND/OR LOCATION].
- Project documents and notices will be posted on the project website.
- Email: [CONVENER] should be copied on all correspondence, and if [CONVENER] chooses to open a dialogue via email, all [WORKING GROUP] members will be copied.

Decision Making

The [WORKING GROUP] is primarily advisory. In those areas where it has some decision-making authority, members will strive to reach agreement by consensus at a level that indicates that all partners are willing to "live with" the proposed action. Partners will strive to work expeditiously and try to avoid revisiting decisions once made. If agreement cannot be reached on a particular issue, [CONVENER] will retain final decision-making authority.

Conflict Resolution

When an issue arises that cannot be easily resolved, [WORKING GROUP] members agree to:

- Remember that controversial projects are unlikely to receive funding, so the intent of all parties is to resolve issues so the project can be funded.
- Determine if the issue should be resolved within or outside of the [WORKING GROUP] and participate however is appropriate.
- Ensure the appropriate decision makers are at the table to resolve the issue.

List of LSID Speakers and Partnerships
2018 - 2022

January 9, 2018, LSID Meeting

Presentations by:

- Tony Pierick, Bill Boettge, Marty Weiss, and John Bohonek spoke about the **Healthy Soil/Healthy Water Conference** and cover seed planting.

February 13, 2018, LSID Meeting

Presentations by:

- Bruce Nekich and Bob Knueppel – **Village of Hustisford** spoke on the Neider Park Boat Ramp improvements.
- Ruth Johnson - **Dodge Co Healthy Soils-Healthy Waters** representatives spoke on farmer cover crop projects.
- Eric Johnson – **Anthony Island Association** spoke on shoreline protection improvements on the island.
- Steven Hjort -Senior Biologist, Director of **Ecological Services - Eco-Resource Consulting, Inc** and Clayton Frazer – Biologist summarized the January 2018 Anthony Island Invasive Plant Assessment Report.

April 28, 2018

LSID representatives participated in Hustisford Public Library's "**Love your Library – Love the Lake**" event.

July 14, 2018

LSID and Jackie Scharfenberg, WI DNR held **Learn to Fish/Safe Boating Day**.

August 18, 2018

Annual Meeting. Tony Peirick and Marty Weiss **from Dodge County Healthy Soils and Healthy Waters** provided an update on the current projects HS/HW farmers are working on; including an update on farm acreage cover crops in the LSID drainage area at LSID Annual Meeting.

August 25, 2018, LSID Meeting

Farmer Pontoon Boat tour of Lake Sinissippi sponsored by Lake Sinissippi Improvement District, the Dodge County Lakes Group and Dodge County Healthy Soil – Healthy Water Farmers.

September 2018

LSID and LSA representatives work on **Welcome Folders for new homeowners.** Folders will be given to realtors and mailed to new property owners listed in the Milwaukee Journal real estate transaction lists.

List of LSID Speakers and Partnerships
2018 - 2022

October 9, 2018, LSID Meeting

Marc Garlock – **Ultimate Excavating** gave a presentation on the Anthony Island Shoreline Restoration Project.

February 6, 2019
LSID presented a display on the Anthony Island Project Lakeshore Projection Project at the Healthy Soils and Healthy Waters Lake Property Owners Evening meeting.

February 19, 2019, LSID Meeting

Greg Farnham spoke to the Board about water quality testing that he conducted from 2001 to 2015. He explained the parameters of water quality management. The importance of water quality management affects public health, monitors the physical and chemical parameters of the water, and provides data over time. He spoke of the contamination that was discovered near Horicon through water testing. He presented handouts and data charts to explain the process.

March 12, 2019, LSID Meeting

Fish Stocking by **Travis Motl – DNR**. Travis reported that in the last 10 years, Lake Sinissippi has been stocked with Crappie, Catfish, Walleye, Northern, Perch and adult pike. During the last fishing count by DNR at Lake Sinissippi, DNR staff have found mostly carp, buffalo and bullhead fish. Catfish are native to the Rock River, and if shoreline owners are seeing too many fingerlings in and around their docks and piers, the Lake District should consider not stocking this type of fish for several years. Native Buffalo fish eat mainly algae, while carp are bottom eaters and uproot plants. Catfish will eat other fish, but mainly swim along the bottom of the river/lake.

April 16, 2019, LSID Meeting

DJ – Lake Shore Pier gave a summary of previous rip rap projects he has done in the past. DJ said he had been doing rip rap projects for 23 years, mainly on property owner shorelines.

May 14, 2019, LSID Meeting

Jordan from **Carp Solutions** in the Twin Cities of Minnesota phoned in and gave the meeting attendees a description of their carp removal services. While commercial fishing is the most effective way to remove excess carp, Carp Solutions has had success in small lakes by removing carp with setting baited box traps.

May 29, 2019

C. Lilek reported that playing the Watershed Protection Game with Jonathon Ganske's **Advanced Ag Class at Beaver Dam High School** on May 29, 2019 went very well.

June 4, 2019

A pontoon boat drive around the lake shore was done on June 4, 2019, to check the status of the shorelines. LSID Commissioners talked with several of the **lakeshore owners** about the damage and will continue to collect information on what might be a better water draw down level for Lake Sinissippi.

July 7, 2019

Meeting with the **Island property owners** and LSID representatives to discuss future invasive plant management in the future.

July 9, 2019, LSID Meeting

Bob Knueppel – **Village of Hustisford Trustee** gave the LSID Commissioners an update on the boat ramp installation.

July 24, 2019,

A summer meeting for **lake property owners** to learn the basics about manure management was held on July 24, 2019, from 6 to 7:30 pm at the Bayside Supper Club in Beaver Dam, Wisconsin. **Mark Riedel – DNR Hydrologist** did the presentation.

August 23, 2019

Farmers and lake property owners met at Tony Perlick's farm to see the cover crops and other successful land management examples.

November 12, 2019, LSID Meeting

Suzan Limberg, Alex Delvoye, Thomas Pearce, and Marty Dillenburg from the **Wisconsin Department of Natural Resources** provided a slide presentation on the water and sediment sampling research project done to assess the health of Beaver Dam Lake watershed from 2015 – 2017. This research project was sponsored by the Beaver Dam Lake Improvement Association and the DNR. The group monitored water levels and sampled creek sediment at five research points from Paradise Marsh to Beaver Dam Lake, in all types of weather.

December 10, 2019, LSID Meeting

Eric Olson and Michelle Scarpace -**UW-Extension** came to December 2019 LSID Board meeting to explain Strategic Planning for Lake Districts.

January 2020

Travis Motl – DNR Fisheries is working with M. Kadinger on locating a retired biologist that could help place trackers on carp in Lake Sinissippi. M. Kadinger explained that we need to have a plan in place and money budgeted for 2021 for carp removal. So, the areas of habitat

restoration that are occurring because of previous carp removal years are not damaged. M. Kadinger has reached out to the offices of **State Senator Scott Fitzgerald** and **State Assemblymen Mark Born** for their help with funding and contacting the DNR.

June 9, 2020, LSID Meeting

Presentation by **Kurt Welkey – retired DNR biologist** on Carp Tagging and Management Options. M. Kadinger gave Welkey a pontoon boat lake tour before the meeting to view the various carp aggregation areas. Welkey explained that carp management involves knowing where the carp come into the lake, how many carp (and age of the carp) are in the lake, and how many carp are leaving the lake. It is also important to determine winter aggregation areas and spring spawning areas.

July 14, 2020, LSID Meeting

Presentation by **John Reimer – Dane Co Land and Water Department** – Legacy Sediment Removal (aka "Suck the Muck") The Legacy Sediment Removal Project (known as Suck the Muck) is removing sediment that is up to two feet thick in some stream sections and is exposing the original gravel stream beds to improve habitat for fish and other aquatic species, and decrease problems of flooding throughout the watershed. The project is planned for six site, in five phases during four years. The cost is approximately $10 million-$15 million dollars of county tax money. Project committee members made over 60 visits to local municipal boards, non-profit organizations, and business groups prior to requesting and obtaining approval for County tax money.

August 2020

A survey for local farmers was mailed to **Gloria Hoffmeister – Local Farmer** by E. Perkins for her review and comments.

August 20, 2020

Annual Meeting. Boating Safety Presentation: **Sheriff Dale J. Schmidt and Deputy Sheriff Cameron Vorhies** explained the boating safety checks they perform while patrolling the county lakes and reviewed the Wisconsin State Statue 30.678 boating safety certificates, requirements, exemptions, and operation rules. In 2021, Deputy Vorhies will be offering free boat safety checks at area events and planning boat safety training.

October 6, 2020, LSID Meeting
Brian Hinrichs, Senior Client Manager, **Foth Infrastructure & Environment, LLC** gave a presentation on capabilities of Foth Infrastructure & Environment.
LSID gave Brian a lake tour in the afternoon. Funding is key and a lake management plan will be necessary to get funding for any Lake Sinissippi projects.

December 2020

LSID representative Shane Kaemmerer attended the Hustisford Business Owners Meeting and the group discussed getting in touch with the lake groups. LSID and LSA may be asked to engage in future HBOM initiatives.

January 21, 2021, LSID Meeting

Paul Cunningham, DNR, Mike Sorge, DNR, Laura Stremick-Thompson- DNR and LSID commissioners discussed the status of an LSID Lake Management Plan.

May 11, 2021, LSID Meeting

Mark Apfelbacher, **CD3 Systems** provided a presentation on a possible boat cleaning station for the lake to prevent the introduction of invasive species. Units range from mobile to static units and are eligible for surface water grants from the DNR.

August 14, 2021, LSID Meeting

Andrew Johnson, **County Board Supervisor District 9** introduced himself and shared that the County was busy with strategic management planning this year and that is additional sewer treatment capacity management needed for the Town of Hubbard Sanitary District. Extra sewage volumes in 2020 and 2021 are putting a strain on the system. He will keep us informed on any activities and planning that both the County and Lake District can do together.

August 22, 2021

Sediment Sampling Training with **Rock River Coalition** trainer.

Meet and Greets with Lake Property Owners

Sept 18 0900 Ox-Bo Marina
Sept 18 1000 Arrowhead (SK will talk with property owner)
Sept 18 1100 Spearhead/Sinissippi Pt/Butternut meet at little free library intersection of Spearhead and Sinissippi Pt Road.
Sept 25 0900 Village and Hwy E residents meet at Lion's Park
Sept 25 1000 Lake Drive, Wildcat and Strange Road residents meet below SLP deck

November 9, 2021, LSID Meeting

JoAnn Matheus – **Wisconsin Master Naturalist** and has been communicating with the Naturalists at Horicon Marsh Education Center. The Center would like to have plant orders ready by March to help put together flowers and plants that could be bought and planted by shoreline property owners.

Tanya Lemke - **Hustisford Path Project** – Community Improvements
Tanya Lemke presented us with the flyers about the Path Project. In 2020 a group of community leaders and local business owners reached out to Design Wisconsin, a program through the UW- Extension to work together and develop a vision for the future of Hustisford.

January 10, 2021

LSA received the **Zilber Family Foundation** (Mike Mervis – Fund Manager) $5,000 donation for the future lake sediment measurement and mapping project. Another $5000 will be donated after the project scope has been finalized.

February 8, 2022, LSID Meeting

Addie Schlussel - **Rock River Coalition** reported on their Rock River and Lake Sinissippi water monitoring program. Monitoring has occurred for several years. Water results are posted on the DNR webpage and at rockrivercoalition.org. LSID posted Addie's slide show on their webpage at: Rock River Coalition Dodge County Stream Monitoring 2022and Rock River Coalition Total Phosphorus Data 2022 http://lakesinissippi.org/2017/environmental-documents/ LSID, LSA, Dodge County, and Rock River Coalition will work together in the future to coordinate water and sediment sampling.

March 8, 2022, LSID Meeting

Addie Schlussel – **Rock River Coalition** explained that LSID could apply for a DNR grant to help LSID do Invasive Species Education in 2023. The grant would be for $4,000 which would pay for staff to do the required education hours to apply for a Boat Cleaning station grant in 2024. LSID's portion would be $1,300. Grant applications are due September 1st.

March 19, 2022
Ron French Attended a DNR Horicon Marsh meeting. He let the meeting attendees know that LSID is working on a Lake Management Plan.

May 10, 2022, LSID Meeting

Arland Kluewer and Loren Kirchoff from the **Hustisford Sanitary District #1** and LSID Commissioners discussed common goals.

Charles Crave from the **Dodge County Drainage District** gave an overview of what the drainage district does helping farmers with drainage. Charles gave us several examples of drainage issues on various properties. He reviewed the status of the Springbrook LLC lawsuit which LSID has been following for many years. Crave stated that an agreement between parties was being finalized. All new systems installed will have minimal water and sediment impact on our Lake.

June 14, 2022, LSID Meeting

Mark Reidel from the **DNR** provided a presentation to the Commissioners regarding the restoration of the Sugar River Watershed. This example was provided to support the need for farmers using cover crops around waterways. The Sugar River Watershed had improvements in water quality and wildlife in the area. We received a Power Point slide desk which illustrated the success of the project.

July 12, 2022, LSID Meeting

Joe Adamson – LSID attended the **Dodge County Healthy Soils – Healthy Water** meeting in June. Joe noted that they are doing demo plots and planter boxes at the Dodge County Fair. Will also do cover crop demonstrations.

List of LSID Speakers and Partnerships
2018 - 2022

August 20, 2022, LSID Meeting

Carol Pfalz - **Pelican Path** group asked for LSID's support. Pelican Path is proposing a bike path from Hustisford to Wild Goose trail on Hwy 60. Christine made a motion and Shane seconded the motion, and this was approved by unanimous consent.

September 13, 2022, LSID Meeting

Andrew Steele from **Michels** reviewed the barometric survey from the Hwy S bridge to Ox-Bo Marine. This survey was a mapping of the top of the sediment river levels. Challenges with the river, it has widened thus slowing the flow, and removal of sediment. If the river channel can be narrowed, this would improve the flow.

October 29, 2022

Shoreline Stories meeting with **lake property owners** at Hustisford Public Library.

November 8, 2022, LSID Meeting

Todd Tessmann **Hustisford Dam Manager** and Kristina Pechacek – **DNR Fish Biologist** presented to LSID Commissioners on their current work.

APPENDIX B

APPENDIX B1: Comparative Cost Analyses and Considerations of Sediment Dredging

To: Board of Commissioners, Lake Sinissippi Improvement District
From: Greg Farnham
Date: February 9, 2010

Re: Comparative Cost Analyses and Considerations of Sediment Dredging

Now that we've completed the technical project with the US Army Corps of Engineers, we need to investigate options for sediment dredging in the lake and river and decide where we go from here. Superficially, it appears that we only have to consider two options: hire subcontractors to do the work or acquire a dredge and do the work ourselves. However, within those options the devil is in the details.

I've investigated a number of the details over the past few weeks and would like to share with you what I've learned and how these details impact the decision process.

I see the interrelationship of these details in many different dimensions, much like multi-dimensional checkers.

- Sediment Quantities
- Sediment Placement Volumes
- Equipment Specifications and Selection
- Equipment Ownership and Operating Costs
- Financing
- Cost to the Taxpayer
- Operating Parameters and Costs of Placement
- Regulatory Permits
- Personnel
- Supervision and Management

<u>Sediment Quantities</u>

First, it is important that we quantitatively compare apples with apples when assessing the volumes of sediment to be removed from lake sites.

The industry generally considers the volume of sediment to be dredged as the in-situ sediment volume as it rests on the lake or river bottom. The in-situ sediment will have a certain percentage of moisture, usually bound or otherwise trapped water within the semi-solid particulate matrix. So, if we wish to dredge 100 CY (cubic yards) of sediment from the lake bottom and the sediment has an in-situ moisture content of 10% (90% solids), then after the sediment has dewatered and desiccated at the upland placement site the actual volume of dried sediment will be only 90 CY. If the in-situ moisture content were 20%, then the dewatered volume of sediment would be 80 CY, and so on.

However, this is only part of the story regarding sediment quantities.

The pump on a hydraulic dredge is not capable of pumping in-situ sediment with high solids content and, therefore, the sediment must be diluted with lake water to form a slurry of low solids content. The dredge that was used for the Geotube breakwater project in 2005 pumped sediment slurry at a solids content of about 12%; the US Army Corps Lake

Sinissippi Alternatives Report references a solids content of 10% for calculating the capacities of potential upland placement sites. For illustration purposes I'll assume a solids content of 10%.

The parameter of slurry solids content is significant in terms of the quantity of sediment slurry that must be pumped and stored at placement in order to remove a given quantity of in-situ sediment. For example, to dredge 100 CY of in-situ sediment we need to determine the volume of sediment slurry so as to size a sufficiently large placement site. That relationship can be described mathematically as:

$$Q_1 \times X = Q_2 \times Y$$

where, Q_1 is the quantity of in-situ sediment to be dredged
X is the solids content of the in-situ sediment
Q_2 is the quantity of pumped sediment slurry
Y is the solids content of the pumped sediment slurry

In this example, Q_1 is 100 CY of sediment on the lake bottom with 10% moisture content in-situ (X = 90% solids content). The desired solids content for pumping is 10% (Y) and we want to find Q_2, the quantity of sediment slurry that will be pumped to and held in an upland placement site.

$$100 \text{ CY} \times 0.90 = Q_2 \times 0.10$$
$$Q_2 = 900 \text{ CY}$$

If Y is changed to 20%, for example, then the equation will be

$$100 \text{ CY} \times 0.90 = Q_2 \times 0.20$$

and, $$Q_2 = 450 \text{ CY}$$

In general, the quantity of in-situ sediment to be moved (Q_1) multiplied by the ratio of in-situ solids content to pumped slurry solids content (X/Y) will yield the quantity of slurry to be pumped (Q_2). Thus, in the first example

$$Q_1 \times (0.90/ 0.10) = Q_2$$
$$100 \text{ CY} \times 9 = 900 \text{ CY}$$

and in the second example

$$Q_1 \times (0.90/ 0.20) = Q_2$$
$$100 \text{ CY} \times 4.5 = 450 \text{ CY}$$

In both examples, the final volume of dewatered sediment at the placement site will be 90 CY.

<u>Sediment Placement Volumes</u>

As I mentioned above, the parameter of solids content of the pumped slurry becomes especially significant when sizing upland placement sites.

To dredge 100,000 CY of in-situ sediment (90% solids) at a 10% solids content of pumped slurry, would require 900,000 CY of slurry to be moved to an upland placement site where the slurry would be held for a sufficient time to decant the clear water and allow the sediment to dewater and desiccate.

A quantity of 900,000 CY of slurry is huge! If a 5-foot (1.67 yd) high earthen berm were constructed to hold the pumped slurry, then the surface area of the containment berm would need to be 538,922 yd^2. If this areal size were in the shape of a square, the dimensions of the square would be 734 yd x 734 yd, or 2,202 ft x 2,202 ft, which is almost 1/5 of a square mile!

The significance of this factor also comes into play when we look at the economy and efficiency of production rates of dredging. I'll review this again in a later section, but for purposes of a brief explanation let's assume we're using a small dredge with a rated capacity of 125 CY/hr. Given planned and unplanned downtime, I'll assume that the dredge has a nominal production rate of 75% of capacity, or 94 CY/hr. To maximize efficiency and economy, we would normally run the dredge 1,260 hours during the season (1,260 hours is the standard working hours per year in Region 4, US Army Corps).

94 CY/hr x 1,260 hrs = 118,440 CY of in-situ sediment

Assuming the same solids content as in the above example, this quantity of sediment (Q_1) would be transformed into 1,065,960 CY of sediment slurry (Q2) to be pumped and stored at upland placement sites. This is a non-trivial challenge!

The Lake Sinissippi Alternatives Report specifies that a containment basin for placement of 3,000 CY of sediment would need a volume of 37,500 CY, assuming 10% solids, 90% water and a safety factor of 35%. This is a similar ratio of dredged sediment to containment volume as in the above example.

Other references recommend that the volume of a containment basin should be at least 1.3 times the volume of sediment to be dredged, with at least a foot of freeboard; this, of course, is significantly smaller than the US Army Corps' recommendation and the examples above. Presumably, the smaller containment volume could be used in the case of sediment with a high concentration of heavier particles, such as sand and gravel, which would quickly settle out of suspension. With rapid settling of particulates, the slurry water would clear quickly and the decant water could flow over the crest of the containment weir and drain to the lake. Decantation and drainage of return water from the settling basin could be at the same rate as filling of the basin with sediment slurry from the dredge pump.

Not so with sediment of high concentration of silt, clay and organic material, as we have in Lake Sinissippi. The time for fine silt and clay particles to settle out of suspension can be a matter of an hour to 24 hours. In this situation, the rate of decantation from the basin, whether by gravity or pump, would be less than the in-fill rate of the dredge pump. Running the dredge pump continuously in excess of the decantation rate would risk overtopping the containment berm.

<u>Equipment Specifications and Selection</u>

I contacted Ellicott Dredges, Baltimore, MD, and IMS Dredges, Prairie Village, KS (with factory in New Richmond, WI). I learned that Ellicott specializes in large cutterhead dredges for sediment with high sand content and large volume productions – I didn't pursue Ellicott further. IMS manufactures smaller augerhead dredges with self-propulsion, i.e. no cable winches or spuds. In the references section is an email from the IMS sales director with price quotations of three pieces of equipment: 7012 HP, 5012 HP and 5012 LP. Specification sheets of each of the models are included in the Dredge Specifications section.

I discussed with the IMS sales director the general physical conditions of our lake and sediment and general volumes of sediment to be moved. The director recommended Model 7012 HP as the most cost-effective dredge for our purposes, given a sediment content of high silt, clay and light sand with a semi-solid consistency. Model 5012 LP is a smaller dredge with similar capability.

Note: I didn't investigate other dredge manufacturers, suppliers of used dredges, etc or spend more time in evaluating types of dredges best suited for our lake conditions -- this is not the purpose of my report. My contact with Ellicott and IMS was to obtain current pricing for new equipment in the 8-inch to 12-inch discharge size range of dredges. I wanted to use those numbers in several different cost analysis worksheets to get a general idea of the costs of ownership and operation. If the Lake District goes further with this investigation, then at some point we would be wise to hire a dredging consultant to advise on equipment specifications and selection.

Equipment Ownership and Operating Costs

Equipment costs include the capital costs of purchasing or leasing the equipment and the regular, usual and customary recurring costs of operating the equipment. There are also a number of personnel and indirect costs that must be determined to arrive at a final estimate of total cost of owning and operating equipment.

One reference indicated that the initial capital cost of equipment is usually 25% of the total cost incurred during the useful life of the equipment ("Cost of owning and operating construction equipment." Chapter 2 in Construction Equipment Management for Engineers, Estimators and Owners by D.D. Gransberg et al. 2006. CRC Press, Boca Raton, FL). Thus, a piece of equipment that lists for $100,000 could cost the owner about $400,000 in ownership, operating, personnel and indirect expenses over its expected life.

Ownership Costs:

- Initial Capital Costs including dredge equipment price, discount, extra equipment, taxes, cost of shipping and cost of assembly
- The cost of a transportation trailer is not included in the prices quoted by the dredge manufacturer – I added an amount to capital cost to cover purchase of a commercial trailer for the dredge
- Investment Costs including allowance for depreciation and interest costs or lease payments

Operating Costs:

- Fuel Consumption Cost is a function of engine size, type of fuel, engine condition, engine power factor, operating time factor and fuel cost
- Filter, Oil and Grease Cost is a function of engine size, engine condition, cost of parts and supplies, oil change frequency, crankcase capacity, make-up oil between changes, service cost, hydraulic fluid, service truck and shop allowance, handling and disposal of hazardous materials
- Repair and Maintenance Cost is a function of equipment condition, major overhaul, mechanics' labor, cost of parts and supplies, service truck, repair shop overhead
- Special Items such as cutter blades

Personnel:

- Operating Labor Cost including wages and labor burden expenses of FICA/FUTA/SUTA taxes, insurance and workers' compensation

Indirect Costs:

- License fees
- Storage
- Utilities
- Insurances – fire, theft, accident, liability
- Property taxes
- Jobsite and storage security
- Inspection fees
- Record keeping
- Operator's training
- Regulatory permits
- Administrative overhead
- Accounting and audit fees
- Construct temporary placement sites
- Land spread, close and grade placement sites
- Engineering
- Land rights
- Legal and professional fees
- Contingency

Equipment Downtime – Planned and Unplanned:

- Refueling
- Equipment breakdown and repair
- Weather and lake conditions
- Mobilization and demobilization
- Holidays

There are several methods of estimating costs of ownership and operation including the Caterpillar method, the Association of General Contractor's method, the US Army Corps of Engineer's method, the University of Florida method and others. I selected the Caterpillar method, the US Army Corps' method (of which there are two different worksheets) and the University of Florida method as illustrations to develop cost estimates of ownership and operation; the methods are available on-line. [Work sheet forms and instructions for the US Army Corps and Florida methods are in the Cost Schedules section.] These methods do

not include estimates of personnel costs and indirect costs, which have to be added to the ownership and operating cost estimates. Equipment downtime does not influence direct or indirect costs, but is a significant factor in determining production rates and thereby influences total operating cost per hour and cost per CY of sediment dredged.

(Note: I found another reference on costing: "Estimating dredging costs". Appendix 9 in Handbook of Dredging Engineering, 2nd ed by John Herbich, 2000, McGraw-Hill, New York. I was unable to access the appendix on-line, so we would need to locate the book in a library or order a copy.)

The Cost Analyses section includes worksheets of the costing methods:
Schedules A – D are worksheets of the four costing methods for IMS Model 7012 HP (12 in).
Schedules E – H are worksheets of the four costing methods for IMS Model 5012 LP (10 in).

I've estimated personnel costs by assuming two technicians to operate the dredge, as specified by the manufacturer. I used $15 per hour to include the wage and labor burden expenses per technician. There are other considerations regarding personnel that I cover in a later section.

Indirect costs will add up quickly, I suspect. The costs of sediment placement activities could be significant -- perhaps $20,000 per year (engineering to design placement berms, construction and closure of berms, possible land rental, monitoring, etc). I received a quotation from our insurance broker that property and liability coverage on equipment valued at $500,000 will run at least $2,500 per year. Lake District financial activities will also expand dramatically, moving us away from handling the bookkeeping internally with a volunteer financial review committee. With much larger sums of money involved, we will more than likely be advised to hire a part-time bookkeeper/accountant and have a formal independent audit of the annual financial records. This alone would probably add another $2,000 per year in expenses. For costing purposes I assumed an additional $30,000 per year in indirect costs.

The table below summarizes results of the four costing methods for Model 7012 HP and reports costs per hour using 1,260 hours per year as time available for work (USACE factor).

Model 7012 HP

Costs/hr	CAT	USACE 1	USACE 2	FLORIDA
Ownership Cost	$ 66.59	$ 42.52	$ 65.28	$ 61.22
Operating Cost	87.34	86.87	106.21	79.41
Total Ownership and Operating Costs	$ 153.93	$ 129.39	$ 171.49	$ 140.63
Personnel Cost	30.00	30.00	30.00	30.00
Indirect Cost	24.00	24.00	25.00	24.00
Total Cost/hr	$ 207.93	$ 183.39	$ 225.49	$ 194.63

The table below summarizes results of the costing methods for Model 5012 LP and reports costs per hour using 1,260 hours per year as time available for work.

Model 5012LP

Costs/hr	CAT	USACE 1	USACE 2	FLORIDA
Ownership Cost	$ 47.92	$ 30.59	$ 46.97	$ 44.05
Operating Cost	65.29	64.97	79.58	59.57
Total Ownership and Operating Costs	$ 113.21	$ 95.56	$ 126.55	$ 103.62
Personnel Cost	30.00	30.00	30.00	30.00
Indirect Cost	24.00	24.00	24.00	24.00
Total Cost/hr	$ 167.21	$ 149.56	$ 180.55	$ 157.62

The cost analysis methods above are instructive, in as much as they attempt to quantify various cost parameters. These methods would be used by commercial firms to budget a pro forma profit and loss statement for a proposed dredging project. These numbers don't present projected cash flow, however, which would be the main interest for the Lake District. Depreciation is a P&L cost for commercial firms; however, depreciation would not be charged against income for a governmental unit. Also, the four methods of cost analysis do not include repayment of principal, which would be a major cash outflow for the Lake District.

With this in mind, I prepared several cash flow statements using different values for the parameters of interest rate and maturity. In these examples, the ownership cost consists of the annual amortized payments (principal repayment and interest) expressed as cost per hour (based on 1,260 hours of work time per year). To those ownership costs, I added the average values of operating costs given in the four methods above and the same amounts for personnel and indirect costs.

The four cash-flow examples use current interest rates and maturities: (1) Conventional bank loan at 6.5% for 10 years, (2) Municipal note at 3.75% for 10 years, (3) Municipal bond at 4.5% for 20 years, and (4) State trust fund loan program at 5.5% for 20 years.

Model 7012 HP Principal amount $596,070, fully amortized

Costs/hr	6.5% Loan 10 yr	3.75% Note 10 yr	4.5% Bond 20 yr	5.5% Loan 20 yr
Ownership Cost (P&I)	$ 64.46	$ 56.80	$ 35.91	$ 39.05
Operating Cost	89.96	89.96	89.96	89.96
Total Ownership and Operating Costs	$ 154.42	$ 146.76	$ 125.87	$ 129.01
Personnel Cost	30.00	30.00	30.00	30.00
Indirect Cost	24.00	24.00	24.00	24.00
Total Cost/hr	$ 208.42	$ 200.76	$ 179.87	$ 183.01

Model 5012 LP Principal amount $428,881, fully amortized

Costs/hr	6.5% Loan 10 yr	3.75% Note 10 yr	4.5% Bond 20 yr	5.5% Loan 20 yr
Ownership Cost (P&I)	$ 46.38	$ 40.87	$ 25.84	$ 28.10
Operating Cost	67.35	67.35	67.35	67.35
Total Ownership and Operating Costs	$ 113.73	$ 108.22	$ 93.19	$ 95.45
Personnel Cost	30.00	30.00	30.00	30.00
Indirect Cost	24.00	24.00	24.00	24.00
Total Cost/hr	$ 167.73	$ 162.22	$ 147.19	$ 149.45

Note: Used dredge equipment is available at lower cost than that of new equipment, of course. However, there are other factors to be evaluated with used equipment, such as unknown prior use, equipment condition, anticipated equipment life, repair and maintenance requirements, uncertain salvage value, lack of warranty and service and whether financing is available. The cost analyses done with new equipment can be done with used equipment based on different assumptions. The capital cost and investment cost will be lower with less expensive machinery, although many of the operating, personnel and indirect costs will likely be unchanged. A reference stated: "Due diligence is a must if you are considering a used dredge."

Financing

Section 33.31, Wis. Stats., gives lake districts the power to finance. Section 33.30(4)(a) limits the annual tax that lake districts can levy to a rate not to exceed 2.5 mills of equalized value. The 2009 equalized value for the Lake District is $109,253,353, which equates to a tax levy maximum of $273,133.

Conventional Loan

January 22nd I spoke with representatives of M&I Bank for information on conventional bank loans, secured by the dredging equipment as collateral, and on leasing options for the equipment. In the case of a conventional loan, the Lake District would own the equipment and would be obligated for repayment of principal plus interest. The bank quoted a current rate and maturity of 6.5% for 10 years, fully amortized.

Equipment Lease

An equipment lease is a financial lease that is written for a term not to exceed the economic life of the equipment. Normally, an equipment lease is noncancellable and the lessee must maintain the equipment. A discounted cash flow analysis can be done to analyze the costs of lease versus purchase.

I provided information on Lake District finances to the leasing arm of M&I in order to obtain lease pricing. The bank has advised that it is unable to offer a lease proposal at this time due to continued credit challenges in the public financing arena. The bank advised

that lease options will become available as the municipal lease markets stabilize and improve.

Municipal Financing

On January 27th Jim Gronowski and I spoke with a representative of Ehlers and Associates, Inc., the largest municipal finance broker in the state. Public financing generally includes municipal notes issued for public purpose projects with maturities of 10 years or less, and general obligation bonds and revenue bonds (for specifically identified revenue enhancement project) issued with maturities of 11 – 20 years. Current rates vary from 3.75% to 4.5%.

There is considerable flexibility in structuring the bond amounts, maturities and repayment schedules, although the normal repayment schedule is one principal payment and two interest payments per year.

An option recommended by the representative would be for the Lake District and Village of Hustisford to enter into an intergovernmental agreement that would provide for the village to issue general obligation bonds in the amount of a note from the Lake District to the village. The village would be able to obtain better pricing on public financing than would be available to the Lake District as a first-time borrower. The pricing differential to the Lake District would be about 0.5% and the underwriting issuance costs, including bond counsel fees, would be higher.

The representative also mentioned the possibility of borrowing from the Wisconsin State Trust Fund Loan Program, under the Board of Commissioners of Public Lands. Current rates are 5.5% for a 20-year maturity. Information on the program is in the Funding and Grants section. Also included in the same section is information on the Wisconsin Waterways Commission financial assistance program.

Our attorney has also arranged a number of financing packages for lake districts. One package that has been used periodically is for a lake district to sell promissory notes funded by a special charge or special assessment, and simultaneously approve an annual, irrepealable tax secured by a mill levy in the amount of the notes. The approved mill levy is to provide credit enhancement to the promissory notes. Each year that funds raised by special charge/assessment are paid to the note holders the levy tax is then abated, and so on each year until the note is paid off.

Included in the References section are capital project forms used by Dodge County for its budgeting and capital approval process.

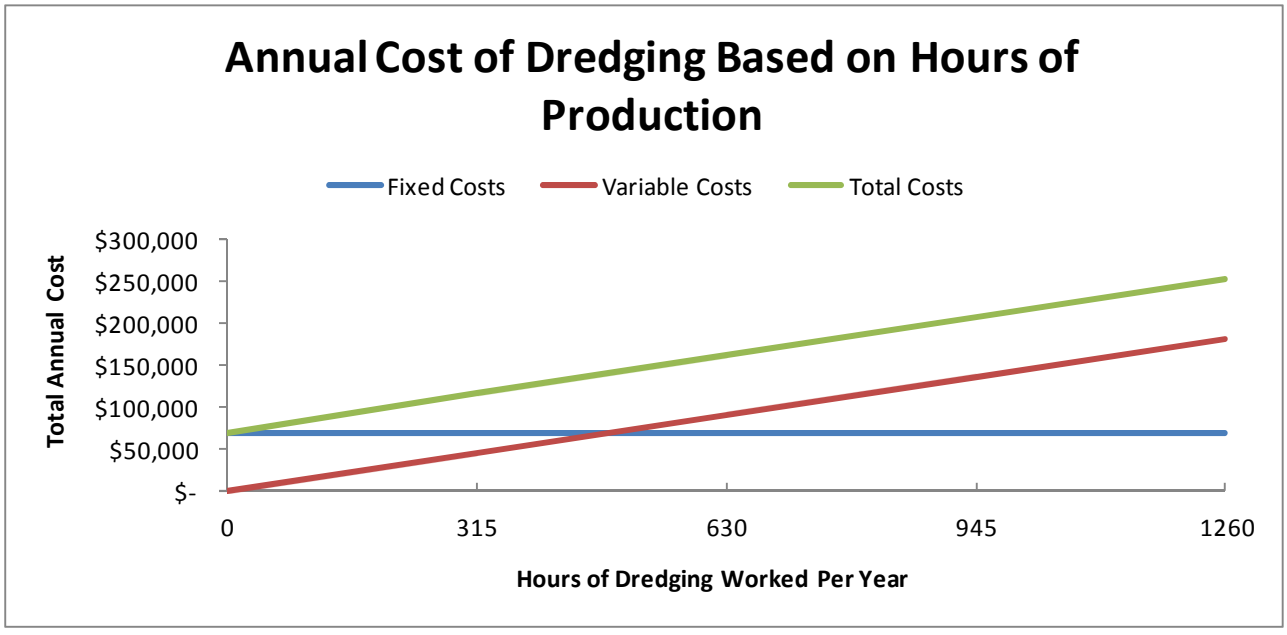
Cost to the Taxpayer

It is tempting to look at the total cost per hour to run a dredge, for example $200/hr for the 7012 HP and $160/hr for the smaller 5012 LP, and conclude that purchasing or leasing a dredge for such an operation is quite doable. As I indicated earlier, however, the devil is in the details; the cost impact to the Lake District and ultimately to the taxpayer lies in the aggregate of fixed costs plus variable costs, rather than simply cost per hour for dredging.

The per hour dredging costs given in the previous section are based on full absorption of capital and investment costs spread over 1,260 hours of work each year. Capital and investment costs have to be paid regardless of the number of hours worked, however. Under full cost absorption, if only 630 hours are worked in one year, the hourly cost of ownership will double. If no dredging is done, the fixed costs to the Lake District and taxpayer remain in any case.

Total fixed costs per year to the Lake District include annual repayment of amortized principal and interest on any loan, note or bond, or the annual payments under a lease, plus certain personnel and indirect costs, such as insurance and accounting fees. That is, with purchase or lease of dredge equipment the Lake District assumes a long-term financial obligation with high fixed costs, whether or not the dredge is operated.

As an example, I used the data for purchase of the Model 7012 HP dredge financed by a municipal note at 3.75% for 10 years. The quarterly amortized payments would be $17,893, or $71,572 annually. Thus the fixed cost to the Lake District to own the dredge would be well over $70,000 annually, including some of the indirect costs, without any production. As dredging production begins, the variable costs kick in and total costs increase linearly with an increase in variable costs. The graph below from Economics 101 shows the relationship among fixed costs, variable costs of production and total costs to the Lake District and, ultimately, to the taxpayer.



The taxpayers would pay for the dredging work by special charge, special assessment, general mill rate tax levy or a combination of these. If we assume a full year's production at 1,260 hours with the Model 7012 HP in the example above, then the costs of dredging will be $252,957. If we add to that amount the Lake District's current operating budget of $45,000, the total becomes $297,957, an amount that exceeds the legal maximum for tax levy ($273,133).

With 520 taxable parcels and an equal value of special charge, a budget at the tax levy limit of $273,133 would translate to $525.26 per parcel each year. On a mill rate basis, the tax on a $100,000 property would be $250 per year; on a $200,000 property the tax would be $500 per year; $750 on a $300,000 property; and, the tax on a $400,000 property would be $1,000 per year.

Operating Parameters and Costs of Placement

The interplay of operating efficiency, economical production and the ability to handle the quantities of dredged sediment poses some interesting constraints.

To maximize operating efficiency and minimize cost per CY of sediment dredged, we would want to pump as much sediment as possible in any given time period; that is, we would aim for a high production rate. Economical production suggests that we operate the dredge at a high production rate for the maximum number of hours available during the season (1,260 hours), so as to reduce the percentage that fixed costs represent out of total cost of production. Doing both of these activities well will result in a maximum volume of sediment to be handled, placed, dewatered, disposed or otherwise utilized. This quickly becomes its own limiting factor, as the sediment volume that has to be handled builds dramatically at high rates of production.

To use two examples, the first with Model 5012 LP that has a nominal production rate of 150 CY of silt sediment per hour at 20% solids over a pumping distance of 1,000 feet. Given downtime at 25% of available work time, the actual production rate would be 75% of 150 CY, or 112.5 CY of sediment per hour.

Using a total cost per hour of $160 to pump 112.5 CY, the cost per CY pumped would be $1.42 per CY.

To maximize economical production, we would run at that rate for the working season of 1,260 hours. The total sediment pumped during that time would be 141,750 CY!

$$Q_1 \times .90 = Q_2 \times .20$$
$$141{,}750 \text{ CY} \times .90 = Q_2 \times .20$$

Thus Q_2, the volume of sediment slurry to be placed at upland sites or used in-lake, would be 637,875 CY in just one year!

The same scenario with the larger dredge Model 7012 HP is even more dramatic. The nominal production rate with silt at 20% solids over 1,000 feet is 350 CY per hour. Assuming an actual running rate of 75%, the production rate would be 262.5 CY per hour at a cost of only $0.76 per CY.

However, running the 7012 HP for 1,260 hours a year would move 330,750 CY of sediment. This would equate to a total volume of sediment slurry of 1,488,375 CY for a year. To hold this quantity for dewatering would require constructing the equivalent of a 5-ft earthen berm with side dimensions of 2,800 ft by 2,800 ft, which is about one third of a square mile! In actual practice, the berm volume could be less since water would be removed from the

contained slurry on a continuous basis. Nevertheless, the quantities of pumped sediment that we would likely need to handle at high production rates are huge!

The limiting factor becomes the availability of upland placement sites and in-lake placement sites and the manpower and costs to handle sediment placement and re-use activities.

The costs for placement activities and site post-restoration, as listed in indirect costs in a previous section, could be significant. These costs would likely include:

- Land rental or acquisition cost for upland placement sites
- Engineering cost to design placement berms and obtain regulatory permits
- Contractor's cost for constructing temporary placement sites
- Costs of personnel and equipment to monitor pumping of sediment into berms and flow of return water
- Contractor's cost to grade, close and re-seed sediment placement sites
- Transportation cost if dried sediment must be moved to a final placement site
- Cost of possible on-going monitoring of groundwater and surface water

I used $16 an hour in indirect costs to cover the expense of such placement activities. Depending on the design details, size and complexity of a dredging project, $16 an hour ($20,000 for a year) might be a low estimate.

Note: References indicate quite a range of dredging costs per CY. For example, data from the US Army Corps for total dredging during 2008 show a range of costs from $2.37 per CY to $14.06 per CY, with an average of $4.67 per CY. This wide range of production costs demonstrates the inherent variability of values for the various parameters of ownership, operation, personnel and indirect costs.

Regulatory Permits

The Lake District has completed three dredging projects (Geotube® breakwater at Wildcat Road, Marban agriculture ditch and Dead Creek) and has one in process (Butternut Island Causeway). Each of these projects involved removal of a quantity of sediment not in excess of 3,000 CY. As such, the regulatory permits were issued by Wisconsin Department of Natural Resources, US Army Corps of Engineers and Dodge County Land Resources Department without the requirement of an environmental assessment (EA).

The dredging projects that are contemplated going forward will be larger projects, removing more than 3,000 CY of sediment, and will require the preparation and review of an EA by the WDNR. This means that considerable time will likely be involved in developing detailed construction plans, preparing the EA and review by WDNR staff. Additional expenses associated with permit applications may include obtaining sediment chemistry data, special engineering studies, evaluating methods to protect water quality and aquatic habitat, determining suitability of upland sediment placement sites and plans for handling return water.

If in-lake placement projects are envisioned, such as use of geotextile containment berms and island restoration, then other engineering and consulting studies will be required.

There is no assurance that permits will be issued in a timely manner nor that they will be issued at all. Obviously, the Lake District would be advised to not purchase dredge equipment without permits in hand!

This poses another planning constraint. If the Lake District plans on utilizing dredging equipment for a 10- to 20-year period, then what might be the regulatory position on issuing multiple permits or issuing a blanket permit for maintenance dredging? If the WDNR will only issue permits on a project basis, then how could the Lake District justify a long-term financial commitment to dredging with uncertainty about future permits? I've not talked with the WDNR about this issue, but obviously this is a critical part of the entire equation.

Personnel

For purposes of cost exercises, I assumed two technicians would be hired to operate the dredge equipment (IMS Dredge specifies two operators each for the Model 7012 and 5012. The dredging work done on the 2006 Geotube project on Lake Sinissippi used two technicians and one supervisor). On the surface this seems to be quite easy, but again, it becomes a Pandora's Box when you consider issues such as:

- Finding suitable individuals – this would not be a simple task for which we could hire high school kids for the summer!
- Training
- Who will be the employer?
- Costs of employment
- Will the individuals remain with the project during the 8-month work period?
- Since this would be limited term employment, what happens during off season?
- Is it reasonable to assume that the same individuals would be available year after year, or would the Lake District be faced with high turnover and annual recruitment of technicians?
- The same technicians on the dredge cannot simultaneously take care of activities on shore, such as arranging for refueling, monitoring sediment discharge at the placement site, etc.
- Supervision

The last bullet point leads directly to the concluding section of this report.

Supervision and Management

The Lake District board of commissioners comprises seven volunteers and most of the work is done by a handful of commissioners. It is unrealistic in my view to assume that the existing board can also take on ownership of equipment, management of major dredging projects and supervision of two or more technicians and placement site activities. I don't believe the board is presently constituted to handle such direct and continuous responsibilities.

If the board concurs with this assessment, then we are faced with establishing a structure that could handle the dredging work. This might include hiring a staff person for the Lake

District with sole responsibilities to supervise and manage the dredging projects, which of course would add to the indirect costs. We might investigate entering into a collaborative agreement with a commercial firm that would hire operators and do the actual dredging work – the Lake District might do a sale-leaseback of the dredge equipment or continue to own the dredge and provide it to the commercial firm for use. Perhaps there is another lake group or governmental agency that would partner with the Lake District and share personnel, costs, etc.

We might consider conducting a medium-sized dredging project with a rental dredge to gain experience. Alternatively, we might partner with a commercial firm to do a dredging project with Lake District personnel providing assistance. Our best decisions will likely be made with some direct experience under our collective belts; it may be premature to reach any decision on dredge ownership without hands-on experience.

In many ways, the issue of supervision and management may be the sine qua non for the Lake District as it considers how best to handle large-scale dredging projects.

Note: Bill Graham, Dredging Coordinator for the Illinois Waterway, Operations Division, US Army Corps of Engineers-Rock Island District, and Ron Barker, Deputy Director-Operations, Fox Waterway Agency, Fox Lake, IL, have reviewed this memorandum.

Caterpillar Method of Calculating Ownership and Operating Cost: Schedule A

IMS Hydraulic Dredge Model 7012 HP with auger excavator head, stern drive self-propulsion, 300' of floating hose, 1,000' of 12" discharge pipe with floats, GPS and training. Commercial transport trailer extra.

Engine HP 425

Average Condition of Use	Estimated Annual Use in Hours 1,260
Total Expected Use in Hours 16,000	Useful Life 16,000/ 1,260 = 12.7 yrs
Fuel Cost $3.00 per gallon	Factors from Reference

CALCULATION OF DEPRECIATION VALUE

1. Delivered Price (including taxes, freight and installation	
List Price	$571,071
Trailer	$ 20,000
Discount	0
Sales Tax	0
Freight	$ 4,999
2. Net Value for Depreciation	$596,070

OWNERSHIP COST

3. Depreciation (Net Value)/ (Depreciation Period in Hours)	
($596,070)/ (16,000)	$ 37.25
4. Interest, Insurance, Taxes: interest 6.5%; insurance 3%; taxes 2%	
Interest: {[(12.7 + 1)/ 2(12.7)] [(596,070) (0.065)}/ (1260)	$ 16.59
Insurance: {[(12.7 + 1)/ 2(12.7)] [(596,070) (0.03)}/ (1260)	$ 7.65
Taxes: {[(12.7 + 1)/ 2(12.7)] [(596,070) (0.02)}/ (1260)	$ 5.10
5. TOTAL HOURLY OWNERSHIP COST	**$ 66.59/hr**

OPERATING COST

6. Equipment Fuel (Factor) (HP) (Fuel Cost per Gallon)	
(0.038)(425)($3.00/gal)	$ 48.45
7. Filter, Oil and Grease (Factor) (Fuel Cost)	
(0.119)(48.45)	$ 5.77
8. Tires	0
9. Repair [(Factor) (Net Value)]/ (1260)	
[(0.07) (596,070)]/ (1260)	$ 33.12
10. TOTAL HOURLY OPERATING COST	**$ 87.34/hr**
11. TOTAL HOURLY OWNERSHIP AND OPERATING COST	**$ 153.93/hr**

NOT INCLUDING PERSONNEL COST AND INDIRECT COST

US Army Corps of Engineers 1 Construction Equipment Ownership and Operating Expense: Schedule B

1. **EQUIPMENT INFORMATION AND EXPENSE FACTORS**

a. Equipment Specification Data:

(1) Equipment Description: IMS Hydraulic Dredge with auger excavator head, stern drive self-propulsion, 300' of floating hose, 1,000' of 12" pipe with floats, GPS and training. Commercial transport trailer extra.

(2) Model and Series: **IMS Model 7012 HP Versi-Dredge**

(3) Year of Use: 2010

(4) Year Manufactured: 2010

(5) Horsepower: John Deere Diesel 425 HP

(6) Fuel Type: Diesel, 400gal capacity

(7) Shipping Weight: 47,700 lbs (477 cwt)

b. Category and Subcategory Number: M10 0.23

c. Hourly Expense Calculation Factors:

(1) Economic Key (EK): 105

(2) Condition (C): Average

(3) Discount Code (DC): B = 7.5%

(4) Federal Cost of Money Rate: 3.25%

(5) Life in Hours (LIFE): 16,000

(6) Salvage Value Percentage (SLV): 0.10

(7) Fuel Factor (D): 0.038

(8) Filter, Oil and Grease (FOG) Factor: 0.119

(9) Repair Cost Factor (RCF): 0.80

2. **EQUIPMENT VALUE**

a. List Price + Accessories:	$571,071
Trailer	$ 20,000
(1) Discount: (List Price + Accessories) X (Discount Code)	
($571,071) X (0) Less:	0
(2) Subtotal:	$591,071
(3) Sales Tax: (Subtotal) X (Tax Rate)	
($528,241) X (0.0)	$ 0
(4) Total Discounted Price:	$591,071
b. Freight: (Shipping Weight) X (Freight Weight per CWT)	
(477 cwt) X ($10.48):	$ 4,999
c. **Total Equipment Value (TEV)**:	**$596,070**

3. **DEPRECIATION PERIOD (N)**

(LIFE hours)/ (Working Hours Per Year (WHPY)) = N

(16,000 hr)/ (1260 hr/yr) 12.7 years

4. **OWNERSHIP COST**

a. Depreciation: [(TEV) X [1.0 – (SLV)]]/(LIFE)

[$596,070 X (1.0 – 0.1)]/ (16,000 hrs) $ 33.53/hr

b. Facilities Capital Cost of Money (FCCM):

(1) [[(N) – 1.0] X [1.0 + (SLV)] + 2.0]/[2.0 X (N)] = Average Value Factor (AVF)

[[(12.7 – 1) X [1.0 + 0.1] + 2.0]/[2.0 X (12.7)] = AVF 0.585

(2) [(TEV) X (AVF) X (Cost of Money)]/ (WHPY)

[($596,070) X (0.585) X (0.0325)]/ (1260 hrs) $ 8.99/hr

c. **TOTAL HOURLY OWNERSHIP COST (1260 hrs/yr):** **$ 42.52/hr**

5. **OPERATING COST**

a. Fuel Cost:
[Fuel Factor X Horsepower (HP)] X [Fuel Cost Per Gallon (gal)]
(0.038) X (425 HP) X $3.00/gal $ 48.45/hr

b. FOG Cost:
(FOG Factor) X (Equipment Fuel Cost) X [Labor Adjustment Factor (LAF)]
(0.119) X ($48.45)/hr X (1.08) $ 6.23/hr

c. Repair Cost:
(1) Economic Adjustment Factor (EAF) 1.0
(2) Repair Factor (RF):
(RCF) X (EAF) X (LAF) = 0.80 X 1.0 X 1.08 = 0.864
(3) Repair Cost:
[(TEV) X (RF)]/ (LIFE)
[($596,070) X (0.864)]/ (16,000 hrs) $ 32.19`/hr

d. **TOTAL HOURLY OPERATING COST:** **$ 86.87/hr**

6. **TOTAL HOURLY OWNERSHIP AND OPERATING COST:** **$ 129.39/hr**

NOT INCLUDING PERSONNEL COST AND INDIRECT COST

US Army Corps of Engineers 2 Marine and Dredging Plant Expense: Schedule C

1. MARINE AND DREDGING PLANT INFORMATION AND EXPENSE FACTORS

a. Plant Pertinent Data:

(1)	Equipment Description:	IMS Hydraulic Dredge with auger excavator head, stern drive self-propulsion, 300' of floating hose, 1,000' of 12" pipe with floats, GPS and training. Commercial transport trailer extra.
(2)	Model and Series:	**IMS Model 7012 HP Versi-Dredge**
(3)	Year of Use:	2010
(4)	Year Manufactured:	2010
(5)	Horsepower:	John Deere Diesel 425 HP
(6)	Fuel Type:	Diesel, 400gal capacity
(7)	Hours Worked Per Year:	1,260
(8)	Life in Hours (LIFE):	16,000
(9)	Plant Value:	
	(a) Acquisition Cost	$571,071
	(b) Trailer	$ 20,000
	(c) Freight	$ 4,999
	Total Plant Value	**$596,070**

b. Appendix B, Area Factors Data:

(1)	Labor Adjustment Factor (LAF):	1.08
(2)	Fuel Type:	Diesel
(3)	Federal Cost of Money Rate:	3.25%

c. Available Time to Dredge: 8 months/yr

d. Dredging Plant Cost Factors Data:

(1)	Useful Life (in Years) for Ownership (N):	8 yrs
(2)	Salvage Value Factor:	0.05
(3)	Engine Fuel Factor (gal/bhp-hr):	0.045
(4)	WLS (Water, Lube & Supplies Factor):	22%
(5)	RPR (Repair Cost Factor):	0.90
(6)	Economic Adjustment Factor (EAF):	1.0

2. ANNUAL OWNERSHIP PERCENTAGE FACTORS

a. Depreciation Percent Per Year (DEPR)
(1.0 – SLV)/N
(1.0 – 0.05)/8 yrs 11.9%/yr

b. Facilities Capital Cost of Money Percent Per Year (FCCM)
[[(N – 1) X (1 + SLV) + 2] X Rate]/2N
[[(7 X 1.05) + 2] X 0.0325]/16 1.9%/yr

b. Total Ownership Percent Per Year (DEPR + FCCM) 13.8%/yr

3. OWNERSHIP COST

a. Ownership per Year
[Plant Value X (DEPR + FCCM)]
($596,070 X 13.8%) $82,258/yr

b. Monthly Ownership Expense (for 8 months) $ 10,282/mo

c. TOTAL HOURLY OWNERSHIP COST (1260 hrs/yr) $ 65.28/hr

4. OPERATING COST

a. Fuel Cost

(Fuel Factor) X (HP) X (Fuel Cost per Gallon)

(0.045 gal/bhp-hr) X (425 hp) X ($3.00/gal) $ 57.38/hr

b. Water, Lube and Supply (WLS) Cost

(WLS Factor) X (Hourly Fuel Cost)

(0.22) X ($57.38/hr) $ 12.62/hr

c. Repair Cost

(Total Plant Value) X (RPR) X (EAF) X (LAF)/ (LIFE)

($596,070) X (0.90) X (1.0) X (1.08)/ (16,000) $ 36.21/hr

d. TOTAL HOURLY OPERATING COST (Fuel + WLS + Repair) $ 106.21/hr

5. TOTAL HOURLY OWNERSHIP AND OPERATING COST $ 171.49/hr

NOT INCLUDING PERSONNEL COST AND INDIRECT COST

Equipment Description: IMS Hydraulic Dredge, **Model 7012 HP Versi-Dredge**, with auger excavator head, stern drive self-propulsion, 300' of floating hose, 1,000' of 12" pipe with floats, GPS and training. Commercial transport trailer extra.

List Price:	$571,071
Trailer:	$ 20,000
Freight:	$ 4,999
Total Cost of Equipment (COE):	$596,070
Salvage Value (10%) (SLV):	$ 59,607
Expected Life (N):	12.7 yrs
Hours Worked Per Year:	1,260 hrs

Average Book Value: [COE (N + 1) + SLV (N – 1)] / 2N
[($596,070) (13.7) + $ 59,607 (11.7)] / 25.4 $348,959

OWNERSHIP COST

Straight Line Depreciation: (COE - SLV)/ (N X 1260)
($596,070 - $ 59,607) / (12.7 X 1260) $ 33.52/hr

Annual Investment Cost (10% of Average Book Value):
(0.10 X $348,959) / 1260 hrs $ 27.70/hr

TOTAL HOURLY OWNERSHIP COST (1260 hrs/yr): $ 61.22/hr

OPERATING COST

Fuel:
Total Fuel Consumed (gal/hr) =
(Operating Factor) X (fwhp) X (gal/fwhp-hr) X (Cost/gal)
(1.0) X (425 fwhp) X (0.04 gal/fwhp-hr) X ($3.00/gal) $ 51.00/hr

Lube Oil:
[(fwhp) X (Operating Factor) X (lb/fwhp-hr)] /(7.4 lb/gal) + (Crankcase Capacity) / (Hrs Per Change)
{[(425 fwhp) X (1.0) X (0.006 lb/fwhp-hr)] / (7.4 lb/gal) + (8 gal) / (150 hrs)} x $4.00/gal
$ 1.59/hr

Maintenance and Repair:
(Repair Factor 80%) X (Depreciation Per Hour)
(0.80 X $33.52/hr) $ 26.82/hr

TOTAL HOURLY OPERATING COST: $ 79.41/hr

TOTAL HOURLY OWNERSHIP AND OPERATING COST: $ 140.63/hr

NOT INCLUDING PERSONNEL COST AND INDIRECT COST

Caterpillar Method of Calculating Ownership and Operating Cost: Schedule E

IMS Hydraulic Dredge Model 5012 LP with auger excavator head, stern drive self-propulsion, 300' of floating hose, 1,000' of 10" discharge pipe with floats, GPS and training. Commercial transport trailer extra.

Engine HP 325

Average Condition of Use	Estimated Annual Use in Hours 1,260
Total Expected Use in Hours 16,000	Useful Life 16,000/ 1,260 = 12.7 yrs
Fuel Cost $3.00 per gallon	Factors from Reference

CALCULATION OF DEPRECIATION VALUE

1. Delivered Price (including taxes, freight and installation)	
List Price	$405,821
Trailer	$ 20,000
Discount	0
Sales Tax	0
Freight	$ 3,060
2. Net Value for Depreciation	$428,881

OWNERSHIP COST

3. Depreciation (Net Value)/ (Depreciation Period in Hours)	
($428,881)/ (16,000)	$ 26.81
4. Interest, Insurance, Taxes: interest 6.5%; insurance 3%; taxes 2%	
Interest: {[(12.7 + 1)/ 2(12.7)] [(428,881) (0.065)}/ (1260)	$ 11.93
Insurance: {[(12.7 + 1)/ 2(12.7)] [(428,881) (0.03)}/ (1260)	$ 5.51
Taxes: {[(12.7 + 1)/ 2(12.7)] [(428,881) (0.02)}/ (1260)	$ 3.67
5. TOTAL HOURLY OWNERSHIP COST	**$ 47.92/hr**

OPERATING COST

6. Equipment Fuel (Factor) (HP) (Fuel Cost per Gallon)	
(0.038)(325)($3.00/gal)	$ 37.05
7. Filter, Oil and Grease (Factor) (Fuel Cost)	
(0.119)(37.05)	$ 4.41
8. Tires	0
9. Repair [(Factor) (Net Value)]/ (1260)	
[(0.07) (428,881)]/ (1260)	$ 23.83
10. TOTAL HOURLY OPERATING COST	**$ 65.29/hr**
11. TOTAL HOURLY OWNERSHIP AND OPERATING COST	**$ 113.21/hr**

NOT INCLUDING PERSONNEL COST AND INDIRECT COST

US Army Corps of Engineers 1 Construction Equipment Ownership and Operating Expense: Schedule F

7. **EQUIPMENT INFORMATION AND EXPENSE FACTORS**

b. Equipment Specification Data:

(1) Equipment Description: IMS Hydraulic Dredge with auger excavator head, stern drive self-propulsion, 300' of floating hose, 1,000' of 10" pipe with floats, GPS and training. Commercial transport trailer extra.

(2) Model and Series: **IMS Model 5012 LP Versi-Dredge**

(3) Year of Use: 2010

(4) Year Manufactured: 2010

(5) Horsepower: John Deere Diesel 325 HP

(6) Fuel Type: Diesel, 300gal capacity

(7) Shipping Weight: 29,200 lbs (292 cwt)

b. Category and Subcategory Number: M10 0.23

c. Hourly Expense Calculation Factors:

(10)Economic Key (EK): 105

(11)Condition (C): Average

(12)Discount Code (DC): B = 7.5%

(13)Federal Cost of Money Rate: 3.25%

(14)Life in Hours (LIFE): 16,000

(15)Salvage Value Percentage (SLV): 0.10

(16)Fuel Factor (D): 0.038

(17)Filter, Oil and Grease (FOG) Factor: 0.119

(18)Repair Cost Factor (RCF): 0.80

8. **EQUIPMENT VALUE**

a. List Price + Accessories:	$405,821
Trailer	$ 20,000
(1) Discount: (List Price + Accessories) X (Discount Code)	
($571,071) X (0) Less:	0
(2) Subtotal:	$425,821
(3) Sales Tax: (Subtotal) X (Tax Rate)	
($528,241) X (0.0)	$ 0
(4) Total Discounted Price:	$425,821
b. Freight: (Shipping Weight) X (Freight Weight per CWT)	
(477 cwt) X ($10.48):	$ 3,060
c. **Total Equipment Value (TEV)**:	**$428,881**

9. **DEPRECIATION PERIOD (N)**

(LIFE hours)/ (Working Hours Per Year (WHPY)) = N

(16,000 hr)/ (1260 hr/yr) 12.7 years

10. **OWNERSHIP COST**

a. Depreciation: [(TEV) X [1.0 – (SLV)]]/(LIFE)

[$428,881 X (1.0 – 0.1)]/ (16,000 hrs) $ 24.12/hr

b. Facilities Capital Cost of Money (FCCM):

(1) [[(N) – 1.0] X [1.0 + (SLV)] + 2.0]/[2.0 X (N)] = Average Value Factor (AVF)

[[(12.7 – 1) X [1.0 + 0.1] + 2.0]/[2.0 X (12.7)] = AVF 0.585

(2) [(TEV) X (AVF) X (Cost of Money)]/ (WHPY)

[($428,881) X (0.585) X (0.0325)]/ (1260 hrs) $ 6.47/hr

c. **TOTAL HOURLY OWNERSHIP COST (1260 hrs/yr):** **$ 30.59/hr**

11. **OPERATING COST**

a. Fuel Cost:
[Fuel Factor X Horsepower (HP)] X [Fuel Cost Per Gallon (gal)]
(0.038) X (325 HP) X $3.00/gal $ 37.05/hr

b. FOG Cost:
(FOG Factor) X (Equipment Fuel Cost) X [Labor Adjustment Factor (LAF)]
(0.119) X ($37.05)/hr X (1.08) $ 4.76/hr

c. Repair Cost:
(1) Economic Adjustment Factor (EAF) 1.0
(2) Repair Factor (RF):
(RCF) X (EAF) X (LAF) = 0.80 X 1.0 X 1.08 = 0.864
(3) Repair Cost:
[(TEV) X (RF)]/ (LIFE)
[($428,881) X (0.864)]/ (16,000 hrs) $ 23.16`/hr

d. **TOTAL HOURLY OPERATING COST:** **$ 64.97/hr**

12. **TOTAL HOURLY OWNERSHIP AND OPERATING COST:** **$ 95.56/hr**

NOT INCLUDING PERSONNEL COST AND INDIRECT COST

US Army Corps of Engineers 2 Marine and Dredging Plant Expense: Schedule G

2. MARINE AND DREDGING PLANT INFORMATION AND EXPENSE FACTORS

b. Plant Pertinent Data:

(1)	Equipment Description:	IMS Hydraulic Dredge with auger excavator head, stern drive self-propulsion, 300' of floating hose, 1,000' of 12" pipe with floats, GPS and training. Commercial transport trailer extra.
(2)	Model and Series:	**IMS Model 5012 LP Versi-Dredge**
(3)	Year of Use:	2010
(4)	Year Manufactured:	2010
(5)	Horsepower:	John Deere Diesel 325 HP
(6)	Fuel Type:	Diesel, 300gal capacity
(7)	Hours Worked Per Year:	1,260
(8)	Life in Hours (LIFE):	16,000
(9)	Plant Value:	
	(a) Acquisition Cost	$405,821
	(b) Trailer	$ 20,000
	(c) Freight	$ 3,060
	Total Plant Value	**$428,881**

b. Appendix B, Area Factors Data:

(1)	Labor Adjustment Factor (LAF):	1.08
(2)	Fuel Type:	Diesel
(3)	Federal Cost of Money Rate:	3.25%

c. Available Time to Dredge: 8 months/yr

d. Dredging Plant Cost Factors Data:

(1)	Useful Life (in Years) for Ownership (N):	8 yrs
(2)	Salvage Value Factor:	0.05
(3)	Engine Fuel Factor (gal/bhp-hr):	0.045
(4)	WLS (Water, Lube & Supplies Factor):	22%
(5)	RPR (Repair Cost Factor):	0.90
(6)	Economic Adjustment Factor (EAF):	1.0

2. ANNUAL OWNERSHIP PERCENTAGE FACTORS

a. Depreciation Percent Per Year (DEPR)
(1.0 – SLV)/N
(1.0 – 0.05)/8 yrs 11.9%/yr

b. Facilities Capital Cost of Money Percent Per Year (FCCM)
[[(N – 1) X (1 + SLV) + 2] X Rate]/2N
[[(7 X 1.05) + 2] X 0.0325]/16 1.9%/yr

b. Total Ownership Percent Per Year (DEPR + FCCM) 13.8%/yr

3. OWNERSHIP COST

a. Ownership per Year
[Plant Value X (DEPR + FCCM)]
($428,881 X 13.8%) $59,186/yr

b. Monthly Ownership Expense (for 8 months) $ 7,398/mo

c. TOTAL HOURLY OWNERSHIP COST (1260 hrs/yr) $ 46.97/hr

4. <u>OPERATING COST</u>

a. Fuel Cost

(Fuel Factor) X (HP) X (Fuel Cost per Gallon)

(0.045 gal/bhp-hr) X (325 hp) X ($3.00/gal) $ 43.88/hr

b. Water, Lube and Supply (WLS) Cost

(WLS Factor) X (Hourly Fuel Cost)

(0.22) X ($43.88/hr) $ 9.65/hr

c. Repair Cost

(Total Plant Value) X (RPR) X (EAF) X (LAF)/ (LIFE)

($428,881) X (0.90) X (1.0) X (1.08)/ (16,000) $ 26.05/hr

e. TOTAL HOURLY OPERATING COST (Fuel + WLS + Repair) $ 79.58/hr

5. <u>TOTAL HOURLY OWNERSHIP AND OPERATING COST</u> $ 126.55/hr

NOT INCLUDING PERSONNEL COST AND INDIRECT COST

Equipment Description: IMS Hydraulic Dredge, **Model 5012 LP Versi-Dredge**, with auger excavator head, stern drive self-propulsion, 300' of floating hose, 1,000' of 10" pipe with floats, GPS and training. Commercial transport trailer extra.

List Price:	$405,821
Trailer:	$ 20,000
Freight:	$ 3,060
Total Cost of Equipment (COE):	$428,881
Salvage Value (10%) (SLV):	$ 42,888
Expected Life (N):	12.7 yrs
Hours Worked Per Year:	1,260 hrs

Average Book Value: [COE (N + 1) + SLV (N – 1)] / 2N
[($428,881) (13.7) + $ 42,888 (11.7)] / 25.4 $251,081

OWNERSHIP COST

Straight Line Depreciation: (COE - SLV)/ (N X 1260)
($428,881 - $ 42,888) / (12.7 X 1260) $ 24.12/hr

Annual Investment Cost (10% of Average Book Value):
(0.10 X $251,081) / 1260 hrs $ 19.93/hr

TOTAL HOURLY OWNERSHIP COST (1260 hrs/yr): $ 44.05/hr

OPERATING COST

Fuel:
Total Fuel Consumed (gal/hr) =
(Operating Factor) X (fwhp) X (gal/fwhp-hr) X (Cost/gal)
(1.0) X (325 fwhp) X (0.04 gal/fwhp-hr) X ($3.00/gal) $ 39.00/hr

Lube Oil:
[(fwhp) X (Operating Factor) X (lb/fwhp-hr)] /(7.4 lb/gal) + (Crankcase Capacity) / (Hrs Per Change)
{[(325 fwhp) X (1.0) X (0.006 lb/fwhp-hr)] / (7.4 lb/gal) + (8 gal) / (150 hrs)} x $4.00/gal
$ 1.27/hr

Maintenance and Repair:
(Repair Factor 80%) X (Depreciation Per Hour)
(0.80 X $24.12/hr) $ 19.30/hr

TOTAL HOURLY OPERATING COST: $ 59.57/hr

TOTAL HOURLY OWNERSHIP AND OPERATING COST: $ 103.62/hr

NOT INCLUDING PERSONNEL COST AND INDIRECT COST

APPENDIX C

APPENDIX C1: Shoreline Stories Event Flyer

Lake Sinissippi Improvement District

SHORELINE STORIES

- Gathering Your Property Stories & Planning for Future Improvements

SATURDAY, OCTOBER 29 2022 | 10 – 11 AM

HUSTISFORD LIBRARY
609 W JUNEAU ST, HUSTISFORD, WI 53034
ZOOM CONNECTION
HTTPS://US02WEB.ZOOM.US/J/87935494405?PWD=CHLYNJDITUZ4UGRYQ2X4VFHYBM8ZZZ09
MEETING ID: 879 3549 4405
PASSCODE: 183823

We are gathering at the library to collect your lake shore success stories and challenges for inclusion in our future Lake Management Plan.

Do you have stories and photos of your shoreline improvements, natural habitat plants, animals who have visited your shore? Do you have stories and photos of your shoreline erosion or ice damage?

Could you attend our meeting and share these stories and photos either in-person or by connecting to Zoom?

We will be including these real-life photos and stories in the plan we prepare for the Wisconsin Department of Natural Resources.

Contact LSID Chairman Chris Lilek for more details at clilek1@yahoo.com

APPENDIX D

APPENDIX D1: Engineering Plans for Hustisford Dam

APPENDIX D2: Latest Inspection Report of Hustisford Dam

APPENDIX D3: WI Statutes Establishing Normal Pool Operating Level for Lake Sinissippi

Dam Sequence No 00251

Plan

Year: 2012

CO Copy # 14.04 (251)

Engineers • Consultants • Inspectors

PROJECT MANUAL

For

2012 DAM IMPROVEMENTS

Village of Hustisford
Dodge County, Wisconsin

June 2012

Prepared by:

GENERAL ENGINEERING COMPANY
916 Silver Lake Drive
P.O. Box 340
Portage, WI 53901
Phone: (608) 742-2169
GEC No. 0212-67

Owner:

VILLAGE OF HUSTISFORD
Kim Hopfinger, Clerk
201 S. Lake Street
Hustisford, WI 53034
Phone: (920) 349-3188

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Alternate A - Full Deck Enclosure

Archtectural

A1.0-A	Proposed Building Floor Plan
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-

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Structural

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SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

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State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
South Central Region Headquarters
3911 Fish Hatchery Road
Fitchburg WI 53711-5397

Scott Walker, Governor
Cathy Stepp, Secretary
Lloyd L. Eagan, Regional Director
Telephone 608-275-3266
FAX 608-275-3338
TTY Access via relay - 711

August 6, 2012

Village of Hustisford
Mr. Dennis Uecker, Village President
201 S. Lake Street
P.O. Box 345
Hustisford, WI 53034-0345

Subject: Hustisford Dam Reconstruction Plans and Specifications Conditional Approval, Field File #14.04, IP-SC-2012-14-02977, Rock River, Village of Hustisford, Dodge County
(251)

Dear Mr. Uecker:

We have reviewed the plans submitted for the proposed reconstruction of the Hustisford Dam, located in the Village of Hustisford, Dodge County. You will be pleased to know that the plans are hereby approved with a few limitations. Please notify me when you plan to begin the project and again when the project has been completed.

I have attached a copy of your plan approval that lists the conditions which must be followed. A copy of the document must be posted for reference at the project site. Please read your plan approval conditions carefully so that you are fully aware of what is expected of you. You must also follow the requirements of the Municipal Dam Grant in order to receive the grant money.

Please note that you are required to submit a verified statement to the Department within 10 days after completion of the repairs to the dam stating that it was reconstructed in accordance with the plans and specifications approved by the Department.

Proposed bid alternates A and B for enclosing the operator's deck are not grant eligible and neither are the engineering costs associated with the enclosures. If either of these alternates are selected, separate permitting may be needed. The approval process is unclear to us as we do not recall having seen such a structure before. If the proposed structure is selected, it is not approved under this Chapter 31 approval and may require alternate approvals. Additionally, if bid alternate C is selected, a separate Chapter 30 permit is required.

If you have questions concerning this document please feel free to contact me.

Sincerely,

Robert R. Davis, P.E.
Water Management Engineer
Southern District
Robert.Davis@Wisconsin.gov
608-275-3316

cc: Bill Sturtevant, P.E. - WT/3
Travis Schroeder - WMS (via email)
Paul Nell - Conservation Warden (via email)
Svet Roussev, P.E. - General Engineering (via email)
Eileen Trainor - Grant Manager, Municipal Dam Grant Program (via email)

BEFORE THE STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

IN THE MATTER of Dam Plan Approval for the Reconstruction of the Hustisford Dam located on the Rock River in the Village of Hustisford, Dodge County, Wisconsin.	))))	IP-SC-2012-14-02977

FINDINGS OF FACT, CONCLUSIONS OF LAW, PLAN APPROVAL, AND ORDER

The Village of Hustisford, 201 S. Lake Street, Hustisford, WI 53034 submitted final plans, through their consultant General Engineering Company, for reconstruction of the Hustisford Dam on June 12, 2012. The Hustisford Dam is on the Rock River, Village of Hustisford, Dodge County. Plan approval granted and order issued.

FINDINGS OF FACT

The Department of Natural Resources finds that:

1. The Village of Hustisford, 201 S. Lake Street, Hustisford, WI 53034 submitted final plans, through their consultant, for reconstruction of the Hustisford Dam on June 12, 2012 in accordance with Section 31.12, Wisconsin Statutes. The proposed reconstruction and the resulting plans are required as a result of an inspection of the dam by The Department of Natural Resources on September 20, 2007 and were noted in the inspection report dated December 21, 2007.

2. Final plans and specifications, stamped on June 11, 2012, for reconstruction of the Hustisford Dam were submitted by Svetoslav Roussev, P.E. of General Engineering Company for the Village of Hustisford on June 12, 2012.

3. The dam is on the Rock River, located in Section 9, Township 10 North, Range 16 East, Village of Hustisford, Dodge County. The dam is owned, operated, and maintained by the Village of Hustisford.

4. The Rock River is navigable in fact at the location of the dam. It is identified as a "Fish and Aquatic Life Water" of the state in NR 102 Wisconsin Administrative Code and supports a warm water sport fishery. The waterway is not listed as a trout stream in Department of Natural Resources Publication 6-3600(80).

5. The proposed dam reconstruction will mainly consist of concrete rehabilitation and gate pier reconstruction.

6. The operation and maintenance of the Hustisford Dam and flowage are in the public interest considering ecological, aesthetic, economic, and recreational values, provided the conditions in the order are complied with. The proposed dam repair will not result in significant adverse effects on this resource upon compliance with the conditions in the order.

7. The Hustisford Dam has been previously assigned a hazard rating of High Hazard. The Village is working to complete channel improvements downstream of the dam that may allow a hazard rating of Low Hazard.

8. The Hustisford Dam meets the flow capacity standards of NR 333.07 Wisconsin Administrative Code.

9. The reconstruction of the Hustisford Dam scored well enough to be awarded a grant through the Municipal Dam Grant Program which is administered by the Department.

10. If either of the deck enclosures are selected they are not grant eligible and may require additional permitting.

CONCLUSIONS OF LAW

1. The Department has the authority under Section 31.12, Wisconsin Statutes, and the foregoing Findings of Fact, to issue the plan approval requested, subject to the conditions in the Order which follows.

2. The review has been conducted in accordance with Chapter 31, Wisconsin Statutes, and Chapter NR 333, Wisconsin Administrative Code.

PLAN APPROVAL

AND HEREBY THERE DOES ISSUE AND IS GRANTED to the applicant, a plan approval under Section 31.12, Wisconsin Statutes, for reconstruction of the Hustisford Dam across the Rock River, located in Section 9, Township 10 North, Range 16 East, Village of Hustisford, Dodge County, subject to the conditions of the order which hereinafter follows. Construction of the proposed cofferdams is also approved under this approval. A copy of this plan approval shall constitute the certificate evidencing a grant of the permit as provided in Section 31.11, Wisconsin Statutes.

ORDER

THE DEPARTMENT OF NATURAL RESOURCES THEREFORE ORDERS:

1. You must notify Rob Davis at phone 608-275-3316 before starting construction and again not more than 5 days after the project is complete.

2. The approved plans are not transferable, and shall become null and void unless the repairs are completed within 2 years from the date the plans were approved.

3. In order to adequately complete the construction as approved, it is necessary that a temporary cofferdam be constructed. The contractor must submit an addendum to the plans for a final cofferdam design to Rob Davis for review and approval prior to placement of the cofferdam. The design must be stamped by a professional engineer registered in the State of Wisconsin and will be approved under this plan approval. All material used for construction of the temporary cofferdam must be removed completely upon completion of the project. Nothing may be stored behind the temporary cofferdam that may contain materials that would be hazardous to the waterway during times when the contractor is not at the site working. All work must be suspended and materials removed from behind the cofferdam during times of high water.

4. In accordance with Section 31.34, Wisconsin Statutes, the dam must pass at least 25% of the natural low flow of water at all times. At no time can the flow be cut off to the river downstream of the dam. When the proposed cofferdam is in place at the dam, provisions must be made to pass required minimum flow to the river downstream of the dam through the unblocked gate and/or over the fixed crest spillway.

5. This plan approval does not authorize any work other than what is specifically described in the plans or other work incidental to completing the project, and as modified by the conditions of this permit. If you wish to

alter the project or conditions, you must first obtain written approval of the Department. Any change orders during construction must be approved by the Department **prior to** the work being completed or the work will not be covered under the Municipal Dam Grant.

6. You are responsible for obtaining any permit or approval that may be required for your project by local zoning ordinances or by the U.S. Army Corps of Engineers prior to starting your project.

7. Upon reasonable notice, you shall allow access to your project site during reasonable hours to any Department employee who is investigating the project's construction, operation, maintenance or plan approval compliance.

8. The Department may modify or revoke this approval if the project is not completed according to the terms of the plan approval, or if the Department determines the activity is detrimental to the public interest.

9. You must post a copy of this plan approval at a conspicuous location on the project site, visible from the waterway, for at least five days prior to construction, and remaining at least five days after construction. You must also have a copy of the plan approval and approved plan available at the project site at all times until the project is complete.

10. Your acceptance of this permit and efforts to begin work on this project signify that you have read, understood and agreed to follow all conditions of this plan approval and order.

11. The sponsor shall implement and maintain proper soil erosion and sediment control best management practices (BMPs) during construction of the project. Erosion and sediment control BMPs shall be accomplished using the guidelines in the Wisconsin Stormwater Technical Standards available via the internet at http://dnr.wi.gov/runoff/stormwater/techstds.htm. BMPs shall be properly installed, inspected, and maintained to function as intended until the project site is stabilized. All temporary erosion and sediment control practices (e.g. silt fence, etc.) shall be removed once the construction site has undergone final stabilization. Construction sites associated with land disturbing activities over one acre and grading sites of 10,000 sq. ft. or more on the bank of a navigable waterway require an erosion control and stormwater management plan prepared by the sponsor. Construction sites disturbing one or more acres of land require coverage under a construction site stormwater discharge permit prior to commencing any land disturbing construction activity.

12. **Section 31.12(4), Wisconsin Statutes, requires a verified statement to be filed with the Department within 10 days after completion of the repairs to the dam, stating that it was constructed in accordance with the plans and specifications approved by the Department.** This must be received prior to receiving final grant payment.

13. You, your agent, and any involved contractors or consultants may be considered a party to the violation pursuant to Section 30.292, Wis. Stats., for any violations of Chapter 30, Wisconsin Statutes or this plan approval.

14. The Department shall retain jurisdiction for the purpose of monitoring water quality and shall cause the applicant to install such devices or make such modifications to the dam and flowage as may be reasonably necessary to protect water quality in the Rock River and prevent violation of the water quality standards enumerated in Chapter NR 102, Wisconsin Administrative Code. If water quality standards are violated and no feasible method is available to prevent such violation from continuing, the Department shall initiate proceedings for the revocation of the plan approval herein issued.

15. On site inspection by a professional engineer registered in the State of Wisconsin shall be performed periodically and during the critical stages of construction. Critical stages are considered anytime that the

work performed will be covered and cannot be inspected at a later time (i.e. footings being covered with soil or reinforcing steel with concrete). Monthly inspection reports including photographs or video tape shall be submitted by the inspecting registered engineer.

16. The permittee shall not hinder the portaging of watercraft around the dam for the purpose of access to the flowage and the upstream and downstream reaches of the Rock River.

17. Within 30 business days after completion of your project you must supply 2 copies of signed and sealed as-built plans documenting the reconstruction of the Hustisford Dam.

18. The embankments of the dam will need to be maintained to prevent the growth of woody vegetation. The embankments shall be maintained regularly so that grass growth over the entire embankment does not exceed 6 inches.

19. If bid alternate C is selected, a separate Chapter 30 permit is required.

20. To receive funding from the Municipal Dam Grant, all of the requirements of the program must be met. No work may be completed prior to receiving the grant award. The dam must be fully NR 333 compliant to receive the final grant payment. This means that an EAP and IOM must be approved and up to date and that zoning must be in place within the hydraulic shadow downstream of the dam.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that the Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed. For judicial review of a decision pursuant to sections 227.52 and 227.53, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review must name the Department of Natural Resources as the respondent.

To request a contested case hearing pursuant to section 227.42, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. All requests for contested case hearings must be made in accordance with section NR 2.05(5), Wis. Adm. Code, and served on the Secretary in accordance with section NR 2.03, Wis. Adm. Code. The filing of a request for a contested case hearing does not extend the 30 day period for filing a petition for judicial review.

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES
For the Secretary

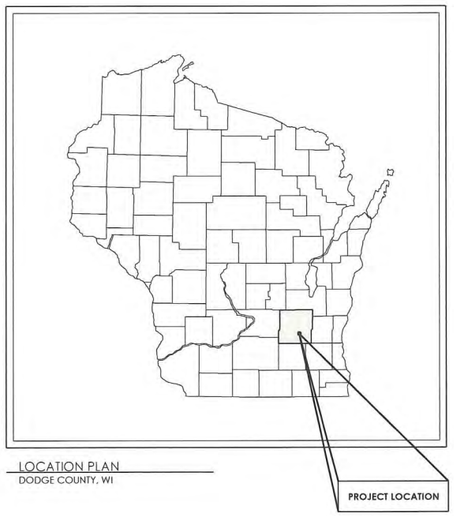
By _____
Robert R. Davis, P.E.
Water Management Engineer

2012 DAM IMPROVEMENTS
Village of Hustisford
Dodge County, WI
February 2012

C.O.
Copy #14.04

ARCHITECTURAL LEGEND

- SECTION NO. / SHEET NO. — BUILDING SECTION
- SECTION NO. / SHEET NO. — WALL SECTION
- DETAIL NO. / SHEET NO. — ENLARGED DETAIL
- DETAIL NO. / SHEET NO. — ELEVATION DETAIL
- LABEL NO. — WINDOW LABEL
- LABEL NO. — WALL LABEL
- DETAIL NO. / TITLE PAGE / SCALE: AS SHOWN — SHEET TITLE
- 9'-0"± / DROP CLG — VERTICAL ELEV.



LOCATION PLAN
DODGE COUNTY, WI

PROJECT LOCATION

N
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NOT TO SCALE

LOCATION PLAN
CITY OF HUSTISFORD

PROJECT LOCATION

OWNER

VILLAGE OF HUSTISFORD
201 S. LAKE ST.
HUSTISFORD, WI 53034

UTILITIES

ELECTRIC
HUSTISFORD POWER & LIGHT CO
201 S. LAKE STREET
P.O. BOX 365
HUSTISFORD, WI 53034
PHONE: (920) 349-3650

ABBREVIATIONS

EOP = EDGE OF PAVEMENT
BOC = BACK OF CURB
EOSW = EDGE OF SIDEWALK
TOF = TOP OF FOOTING
TOW = TOP OF WALL
FFE = FIRST FLOOR ELEVATION
SFE = SECOND FLOOR ELEVATION
ELEV. = ELEVATION
RO = ROUGH OPENING
BM = BENCHMARK
SQ. FT. = SQUARE FEET
DIA. = DIAMETER
TYP. = TYPICAL
HM = HOLLOW METAL
SS = STAINLESS STEEL
ALUM. = ALUMINUM
IBC = INTERNATIONAL BUILDING CODE
WD = WOOD
MTL. = METAL
STL. = STEEL
HSS = HOLLOW STEEL STRUCTURE
SPF = SPRUCE PINE FUR
DF = DOUGLAS FIR
SP = SOUTHERN PINE
CONC. = CONCRETE
WWF = WIRE WELDED FABRIC
OC = ON CENTER
EW = EACH WAY
EF = EACH FACE
WH = WATER HEATER
DW = DISHWASHER
REF. = REFRIDGERATOR
FRZ. = FREEZER
FTG. = FOOTING
PC = PRECAST
OHD = OVERHEAD DOOR
T/O = TOP OF
GALV. = GALVANIZED
BRG. = BEARING
OH = OVERHANG
MFG. = MANUFACTURER
DIM. = DIMENSION

SEAL

WISCONSIN
SVETOSLAV S. ROUSSEV
E-39738
MADISON
WI
PROFESSIONAL ENGINEER
6/11/12

BUILDING DESIGN CRITERIA

INDEX OF DRAWINGS

BID ALTERNATE A (Full Deck Enclosure)

BID ALTERNATE B (Partial Deck Enclosure)

BID ALTERNATE C (Safety Cable Adjustment Column)

GEC
General Engineering Company
P.O. Box 340 • 916 Silver Lake Dr. • Portage, WI 53901
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www.generalengineering.net

TITLE PAGE
2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

NO.	BY	DATE
REVISIONS		

SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
G1.0

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CONSTRUCTION NOTES

GENERAL

1. ALL EXISTING UNDERGROUND UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND SHOULD BE FIELD VERIFIED BY CONTRACTOR, PRIOR TO CONSTRUCTION.

2. ENGINEER ASSUMED 4,000 PSF SOIL BEARING CAPACITY BASED ON IBC TABLE 1804.2. (BEDROCK)

3. PRIOR TO CONSTRUCTION, VERIFY OPENINGS IN FOOTINGS & FOUNDATION WALLS FOR ALL OTHER TRADES.

4. THE CONTRACTOR IS RESPONSIBLE FOR TAKING PRECAUTIONS, AS REQUIRED, TO SUPPORT THE EXCAVATED BANK DURING CONSTRUCTION.

5. ALL FOOTINGS SHALL BE PLACED ON UNDISTURBED GROUND. GRANULAR FILL UNDER SLABS SHALL BE COMPACTED IN 8" LIFTS TO 95% OF MAXIMUM DENSITY BY MODIFIED PROCTOR TEST.

6. CONCRETE MEMBERS SHALL BE CAST USING THE FOLLOWING CONCRETE STRENGTHS:
   A. 5000 PSI, USE FOR BRIDGE TOPPING AND PIERS.
   B. 4000 PSI, USE FOR MASS CONCRETE.

7. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCEMENT:
   A. CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH = 3"
   B. EXPOSED TO MOISTURE OR WEATHER:
      1. #6 THROUGH #18 BARS = 2"
      2. #5 BARS, 5/8" WIRE AND SMALLER = 1-1/2"
   C. NOT EXPOSED TO EARTH, MOISTURE OR WEATHER:
      1. SLABS, WALLS, AND JOISTS
         A. #14 AND #18 BARS = 1-1/2"
         B. #11 AND SMALLER = 3/4"
      2. BEAMS, GIRDERS, AND COLUMNS
         A. PRINCIPAL REINFORCEMENT, TIES, STIRRUPS, OR SPIRALS = 1-1/2"

8. BEND REINFORCING STEEL AROUND ALL CORNERS AND LAP A MINIMUM OF 44 x BAR DIAMETER.
   LAP SLICE STEEL BARS AS FOLLOWS:
   #6 BARS: MINIMUM OF 36"
   #5 BARS: MINIMUM OF 28"
   #4 BARS: MINIMUM OF 24"

9. MINIMUM STEEL TENSILE STRENGTH SHALL BE 60 KSI.

10. CLEAR DISTANCE BETWEEN BARS OR LAYERS OF BARS SHALL BE ONE FLEXURAL BAR DIAMETER BUT NOT LESS THAN 1" OR LESS THAN 1-1/3 TIMES THE MAXIMUM SIZE OF COURSE AGGREGATE, WHICHEVER IS GREATER.

STRUCTURAL STEEL

STRUCTURAL STEEL

1. ALL ROLLED STRUCTURAL STEEL SHALL CONFORM TO ASTM A-992 GR50, UNLESS OTHERWISE NOTED, SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE AISC SPECIFICATIONS AND CODE OF STANDARD PRACTICES AS AMENDED TO DATE.

2. WEATHERING STEEL SHALL CONFORM TO ASTM A 588.

3. STRUCTURAL TUBES SHALL CONFORM TO ASTM A-500, GRADE B.

4. ALL BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A-325 UNLESS OTHERWISE NOTED. BOLTED CONNECTIONS WILL BE ASSEMBLED AND INSPECTED ACCORDING TO SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A-325 BOLTS.

5. STRUCTURAL STEEL SHALL BE DELIVERED TO THE JOB SITE FREE OF EXCESSIVE RUST, MILL SCALE, GREASE, ETC. AND SHALL BE PRIMED.

6. EXCEPT WHERE ENCASED IN CONCRETE, MASONRY OR SPRAYED-ON FIREPROOFING, ALL STEEL SHALL BE PAINTED UNLESS NOTED OTHERWISE.

7. OPENINGS SHALL NOT BE PLACED IN STEEL MEMBERS UNLESS SPECIFICALLY DETAILED. STEEL MEMBERS SHALL BE SHORED WHEN PERMISSIBLE. SHORES SHALL REMAIN IN PLACE UNTIL THE STEEL TEMPERATURE HAS RETURNED TO AIR TEMPERATURE.

8. THE STRUCTURAL STEEL FABRICATOR SHALL FURNISH SHOP DRAWINGS OF ALL STEEL FOR THE ENGINEERS REVIEW PRIOR TO FABRICATION.

9. ALL WELDING SHALL BE PERFORMED BY EXPERIENCED CERTIFIED WELDERS USING THE ELECTRIC ARC WELDING PROCESS AND E70XX SERIES ELECTRODES. WELDING SHALL CONFORM TO AISC AND AWS STANDARDS.

10. ALL WELDS NOT SPECIFIED SHALL BE CONTINUOUS FILLET WELDS. THE SIZE OF THE WELD SHALL BE BASED ON AISC STANDARDS FOR THE THICKER PART JOINED.

GRADING & EROSION CONTROL NOTES

1. ALL EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO CONSTRUCTION.
2. SILT FENCE, TEMPORARY SEDIMENT BASIN, & ROCK CONSTRUCTION ENTRANCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES, INCLUDING CLEARING & GRUBBING.
3. CONTRACTOR IS RESPONSIBLE FOR WEEKLY DNR INSPECTION REPORTS IN ACCORDANCE WITH NR 216.46(9).
4. ADDITIONAL EROSION CONTROL MEASURES MAY BE ADDED ON AN AS-NEEDED BASIS.
5. ANY AREAS WHERE GRADING IS COMPLETE SHALL BE STABILIZED WITH FERTILIZER, SEED, & MULCH AS SOON AS POSSIBLE.
6. ALL BEST MANAGEMENT PRACTICES WILL BE INSTALLED BY THE TIME THE CONSTRUCTION SITE IS CONSIDERED STABILIZED.
7. A COPY OF THIS EROSION CONTROL PLAN SHALL BE KEPT ON SITE THROUGHOUT THE DURATION OF THE PROJECT.
8. ALL WASTE AND UNUSED BUILDING MATERIALS (INCLUDING GARBAGE, DEBRIS, CLEANING WASTES, OR OTHER CONSTRUCTION MATERIALS) SHALL BE PROPERLY DISPOSED OF AND NOT ALLOWED TO BE CARRIED BY RUNOFF INTO RECEIVING CHANNEL.
9. ALL DEWATERING PERMITTING, IF REQUIRED, IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE IN ACCORDANCE WITH DNR TECHNICAL STANDARD 1061.
10. STREETS SHALL BE SWEPT AT THE END OF EACH WORK DAY OR AS DIRECTED BY THE CITY.
11. TRACKING PADS SHALL BE USED AT THE TRUCK ENTRANCE AND EXITS.
12. CONTRACTOR WILL BE RESPONSIBLE FOR ALL DUST CONTROL.
13. ALL BANK AREAS DISTURBED SHALL BE STABILIZED WITH EROSION CONTROL MAT IMMEDIATELY.
14. SEDIMENT WILL BE REMOVED FROM BEHIND SEDIMENT FENCES AND BARRIERS BEFORE IT REACHES A DEPTH THAT IS EQUAL TO HALF THE BARRIER'S HEIGHT.
15. BREAKS AND GAPS IN SEDIMENT FENCES AND BARRIERS WILL BE REPAIRED IMMEDIATELY. DECOMPOSING STRAW BALES WILL BE REPLACED (TYPICAL BALE LIFE IS THREE MONTHS).
16. ALL SEDIMENT THAT MOVES OFF-SITE DUE TO CONSTRUCTION ACTIVITY OR STORM EVENTS WILL BE CLEANED UP BEFORE THE END OF THE SAME WORKDAY.
17. ALL INSTALLED EROSION CONTROL PRACTICES WILL BE MAINTAINED UNTIL THE DISTURBED AREAS THEY PROTECT ARE STABILIZED.
18. ALL EROSION CONTROL MAT SHALL BE INSTALLED WITHIN 24 HOURS OF FINAL GRADES BEING ESTABLISHED.

DESIGN LOADS

1. DESIGN LOADS:
   - NEW OPERATOR BRIDGE DECK LL = 200PSF
   - EXISTING GATES BRIDGE DECK CAPACITY REMAINS APPROX. UNCHANGED, AS DESIGNED BY OTHERS.

EXISTING LINETYPES LEGEND

- San — SANITARY SEWER
- ST — STORM SEWER
- WM — WATER MAIN
- FM — FORCE MAIN
- E — ELECTRIC
- OE — OVERHEAD ELECTRIC
- G — GAS
- FO — FIBER OPTIC
- T — TELEPHONE
- TV — TV
- X X X X — FENCE
- GUARD RAIL
- GL GL GL — GRADING LIMITS
- SF SF SF — SILT FENCE
- DB DB DB — DOUBLE SEDIMENT BARRIER
- TRAIN TRACKS
- TREELINE

SYMBOLS LEGEND

- EXISTING MANHOLE
- PROPOSED MANHOLE
- EXISTING HYDRANT
- PROPOSED HYDRANT
- VALVE
- CURB STOP
- TRACER WIRE TERMINAL BOX
- WELL
- PROPERTY CORNER
- LIGHT POLE
- POWER / TELEPHONE POLE GUY WIRE
- UTILITY PEDESTAL
- SIGN
- SOIL BORING
- MONITORING WELL
- MAILBOX
- CAUTION — POTENTIAL HAZARD
- BENCHMARK
- GEC-CP # — CONTROL POINT
- DECIDUOUS TREE
- CONIFEROUS TREE
- HANDICAP SYMBOL

DIGGERS HOTLINE NOTE

Member One Call System International — To Obtain Location of Participants Underground Facilities Before You Dig In Wisconsin

CALL DIGGERS HOTLINE
1-800-242-8511

Wis Statute 182.0175 (1974)
Requires Min. 3 Work Days
Notice Before You Excavate

GEC
General Engineering Company
P.O. Box 340 • 916 Silver Lake Dr. • Portage, WI 53901
608-742-2169 (Office) • 608-742-2592 (Fax)
www.generalengineering.net

LEGEND & NOTES
2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

REVISIONS	NO.	BY	DATE

SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.

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BENCHMARK TABLE

BENCHMARK	DESCRIPTION	ELEVATION
TBM #1	WESTERN BENCHMARK (ADJ.) – USGS BM – NE CORNER OF E. JUNEAU ST. & RIDGE ST.	867.47'
TBM #2	DAM BENCHMARK – SQUARE CHISELED IN UPSTREAM ABUTMENT WALL/ PER DAM FAILURE ANALYSIS	857.30'
TBM #3	EASTERN BENCHMARK (ADJ.)–TOP NUT ON HYDRANT, SW CORNER OF N. RIVERVIEW RD. & RIVERVIEW DR.	862.40'

General Engineering Company
P.O. Box 340 • 916 Silver Lake Dr. • Portage, WI 53901
608-742-2169 (Office) • 608-742-2592 (Fax)
www.generalengineering.net

EXISTING SITE PLAN

2012 Dam Improvements
Lake Sinissippi Improvement District

Village of Hustiford
Dodge County, WI

	DATE	BY	NO.	REVISIONS

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DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
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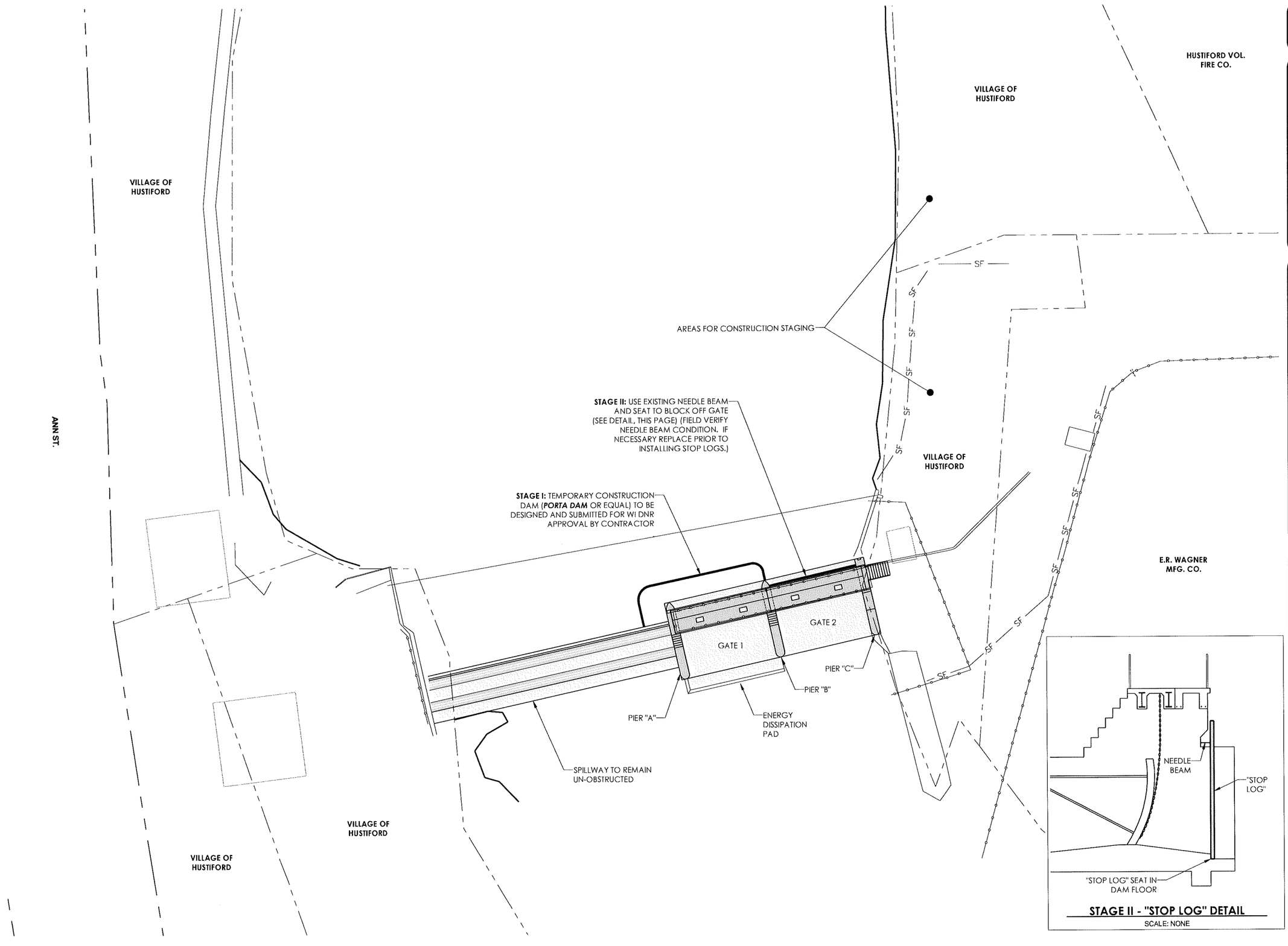

CONSTRUCTION STAGING PLAN

2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

GEC
General Engineering Company
P.O. Box 340 • 916 Silver Lake Dr. • Portage, WI 53901
608-742-2169 (Office) • 608-742-2592 (Fax)
www.generalengineering.net

REVISIONS	NO.	BY	DATE

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SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
C2.0

Member Diggers Hotline
One Call System International

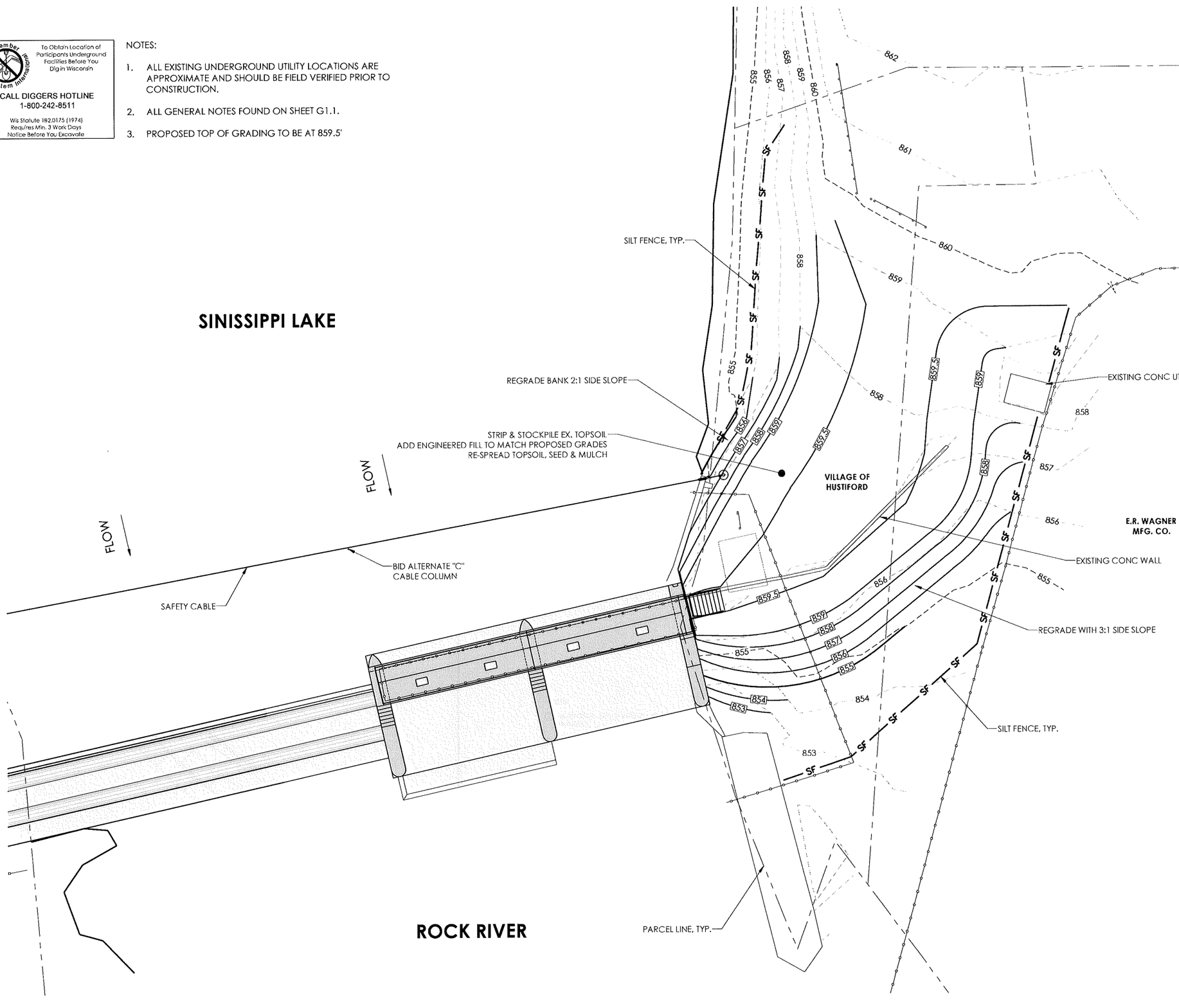
To Obtain Location of Participants Underground Facilities Before You Dig in Wisconsin

CALL DIGGERS HOTLINE
1-800-242-8511

Wis Statute 182.0175 (1974)
Requires Min. 3 Work Days
Notice Before You Excavate

NOTES:

1. ALL EXISTING UNDERGROUND UTILITY LOCATIONS ARE APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL GENERAL NOTES FOUND ON SHEET G1.1.
3. PROPOSED TOP OF GRADING TO BE AT 859.5'



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GRADING & EROSION CONTROL PLAN

2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

DATE	BY	NO.	REVISIONS

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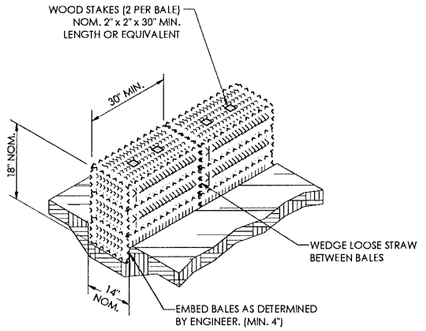
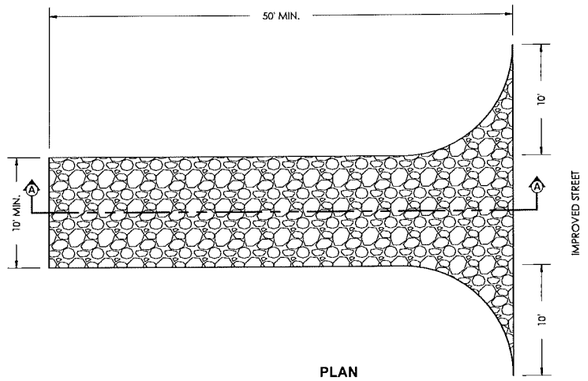
SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
C3.0



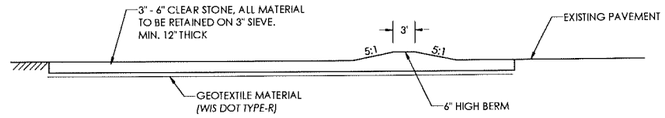
NOTE: ALL DIMENSIONS ARE APPROXIMATE.

EROSION BALE INSTALLATION



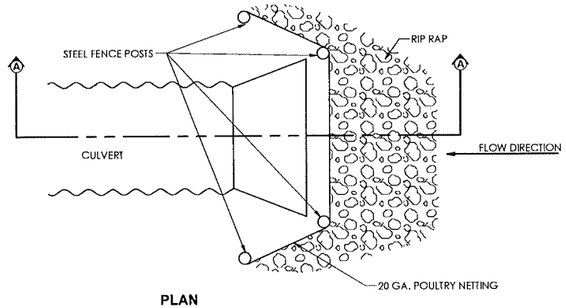
PLAN

NOTE:
MAINTAIN THE ROCK ENTRANCE TO
PREVENT TRACKING ONTO PAVEMENT



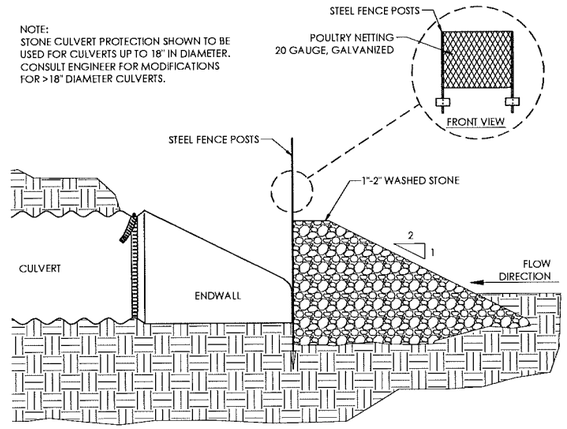
SECTION A-A

ROCK CONSTRUCTION ENTRANCE



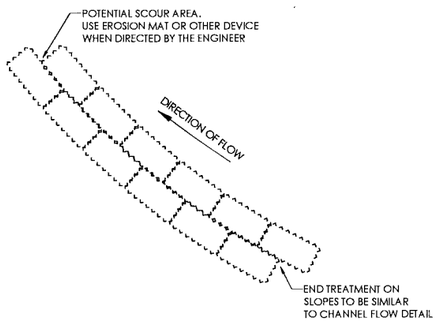
PLAN

NOTE:
STONE CULVERT PROTECTION SHOWN TO BE
USED FOR CULVERTS UP TO 18" IN DIAMETER.
CONSULT ENGINEER FOR MODIFICATIONS
FOR > 18" DIAMETER CULVERTS.



SECTION A-A

STONE CULVERT PROTECTION

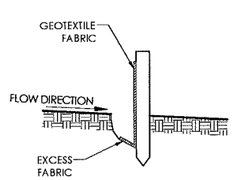


PLAN

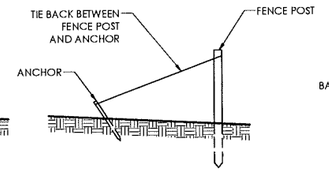
EROSION BALE WHEN ALTERING FLOW DIRECTION

NOTES:

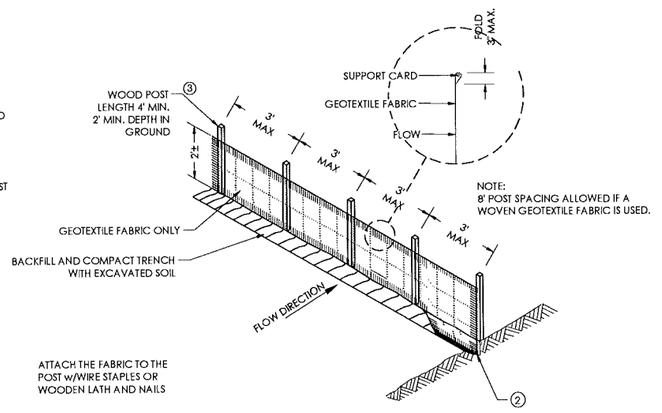
1. HORIZONTAL BRACE WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POST AS DIRECTED BY THE ENGINEER.
2. TRENCH SHALL BE A MINIMUM OF 4" WIDE BY 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC, FOLD MATERIAL TO FIT TRENCH AND BACKFILL AND COMPACT TRENCH AND COMPACT WITH EXCAVATED SOIL.
3. WOOD POST SHALL BE A MINIMUM SIZE OF 1 1/8" X 1 1/8" OF OAK OR HICKORY.



TRENCH DETAIL



TIE BACK DETAIL
WHEN REQUIRED BY ENGINEER



NOTE:
8' POST SPACING ALLOWED IF A
WOVEN GEOTEXTILE FABRIC IS USED.

ATTACH THE FABRIC TO THE
POST w/WIRE STAPLES OR
WOODEN LATH AND NAILS

SILT FENCE

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EROSION CONTROL DETAILS
2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

DATE	BY	NO.	REVISIONS

SCALE

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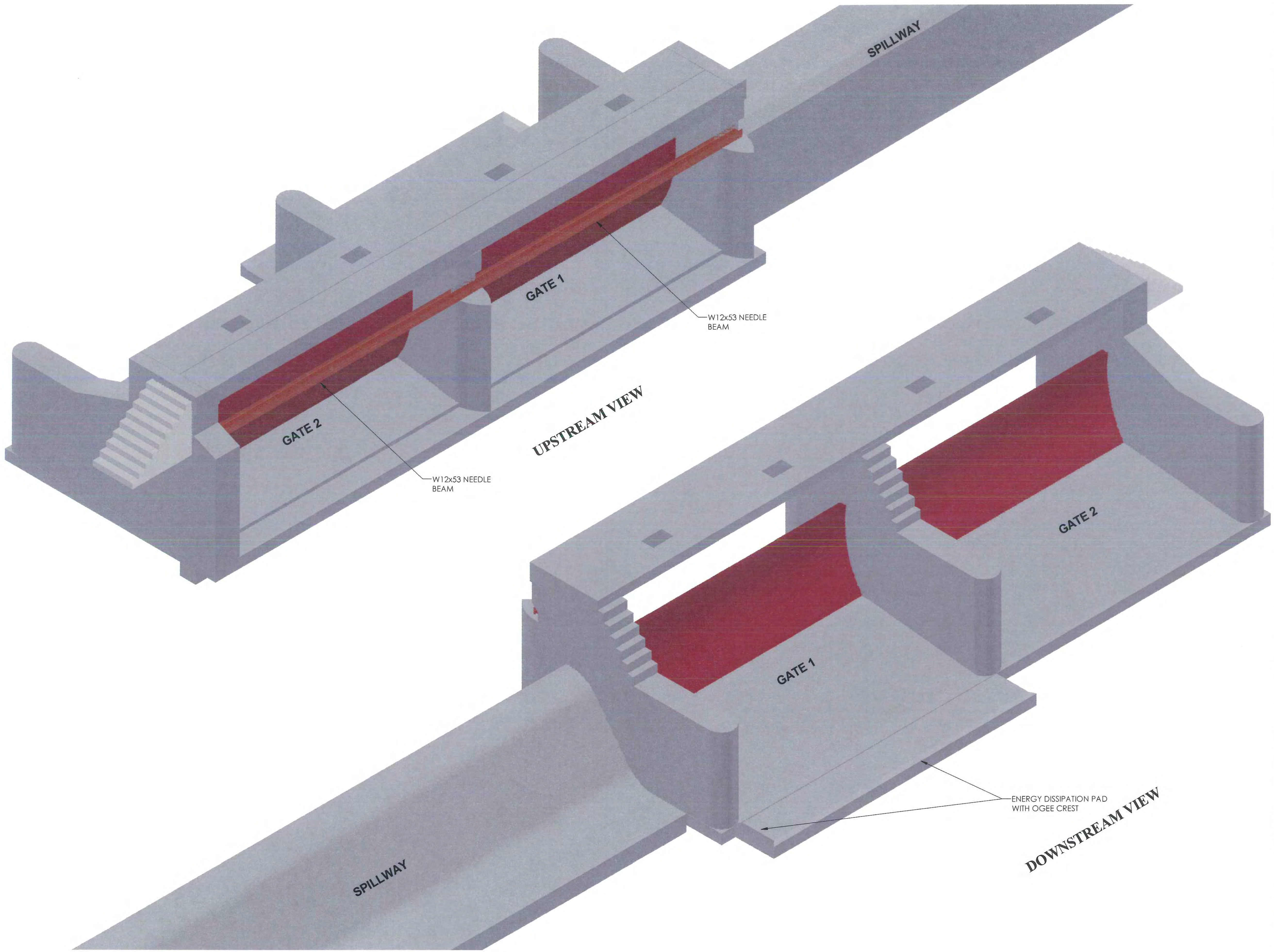

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EXISTING STRUCTURE

2012 Dam Improvements
Village of Hustisford

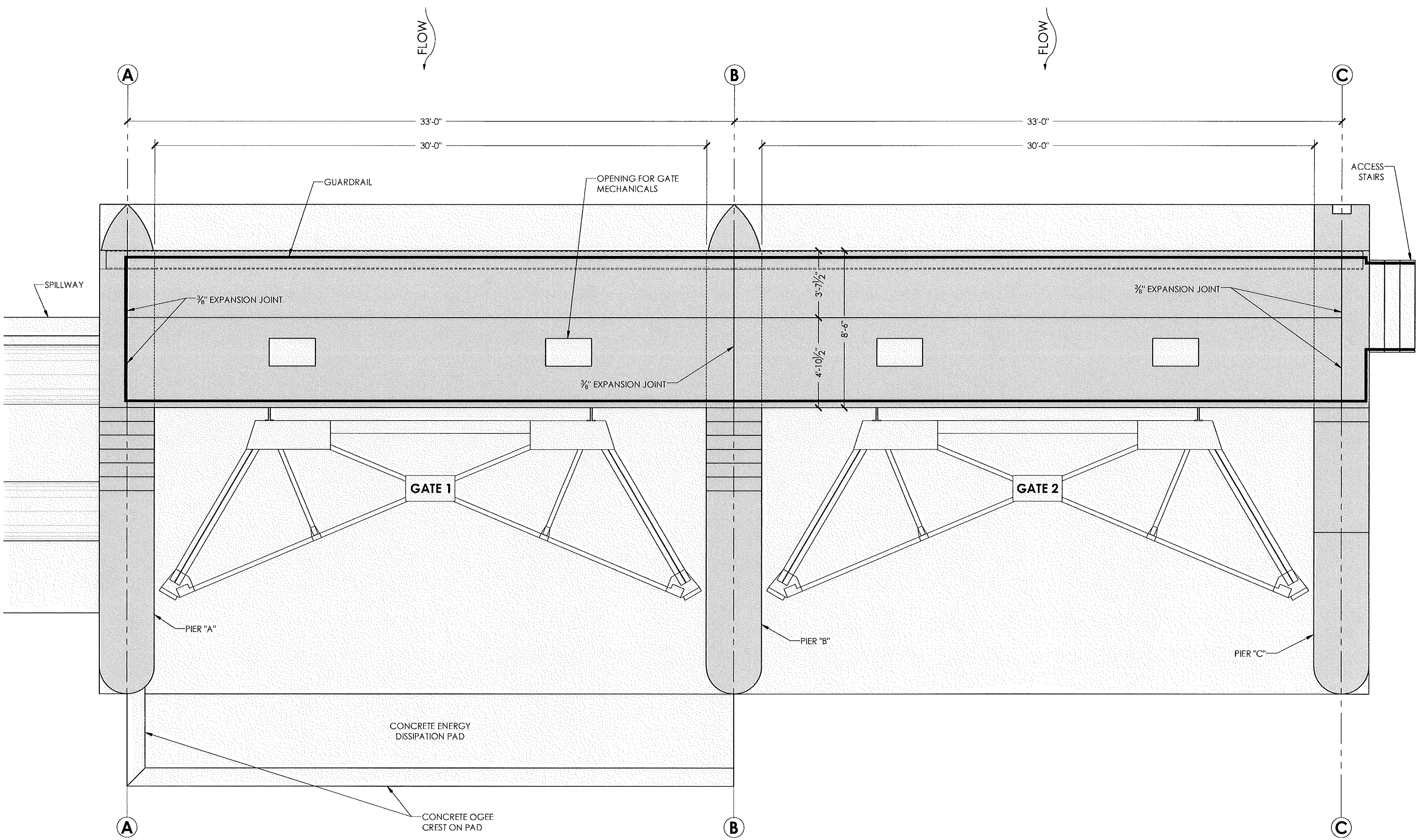
Village of Hustisford
Dodge County, WI

REVISIONS	NO.	BY	DATE

SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
S1.0

G:\Current Files E-K\Hustisford, Village of 2-0212-67\CAD 2-0212-67\2012 Plan Set Sheets\BID SHEETS\3-S1.0-3D-2-0212-67-(2012.0224).dwg, 3/21/2012 11:52:45 AM, 1:1



EXISTING PLAN VIEW

SCALE: AS SHOWN

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EXISTING DAM PLAN VIEW

2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

REVISIONS	NO.	BY	DATE

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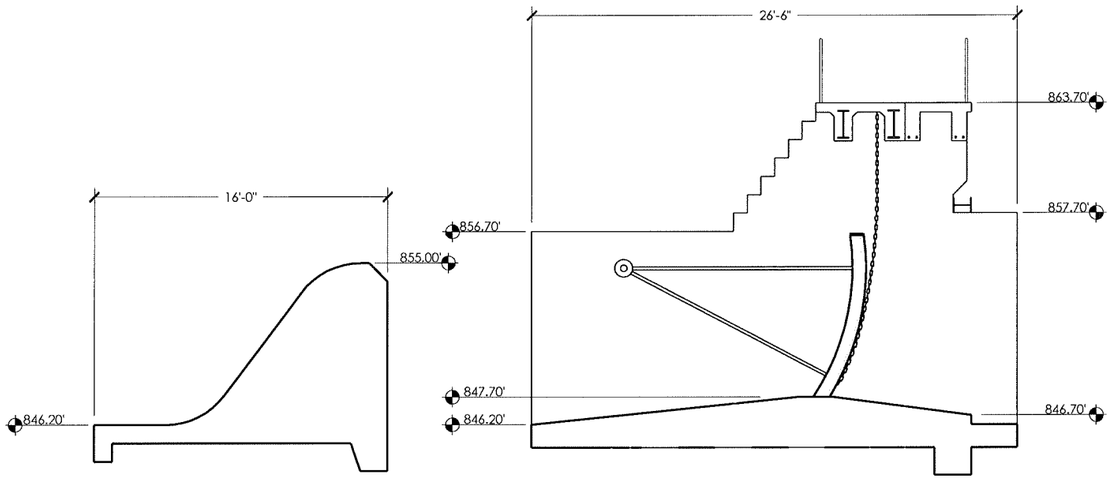
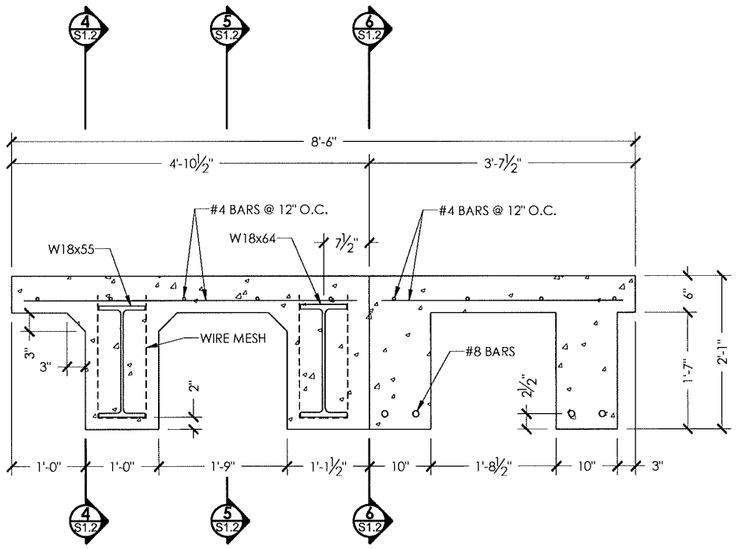
3/16"=1'-0" (11x17)
SCALE

DRAWN BY	SRR
DATE	Feb. 2012
GEC FILE NO.	2-0212-67
SHEET NO.	S1.1

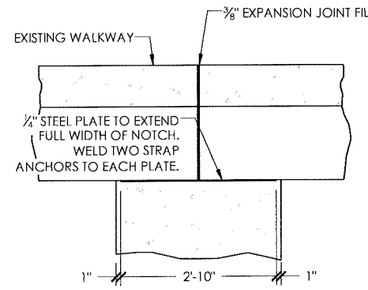


1 SPILLWAY SECTION
SCALE: ⅛"=1'-0"

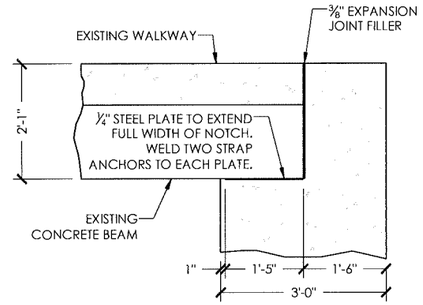
2 DAM SECTION
SCALE: ⅛"=1'-0"



3 WALKWAY SECTION
SCALE: ½"=1'-0"

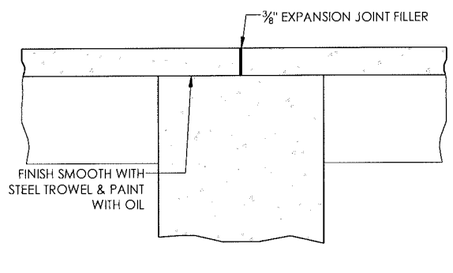


CENTER PIER

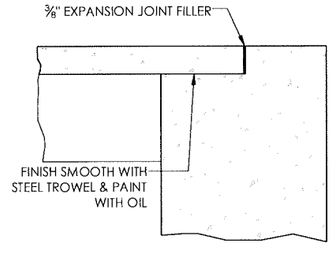


END PIER

4 WALKWAY SECTION
SCALE: ⅜"=1'-0"

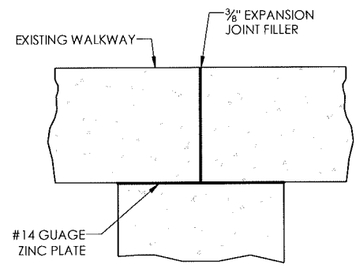


CENTER PIER



END PIER

5 WALKWAY SECTION
SCALE: ⅜"=1'-0"



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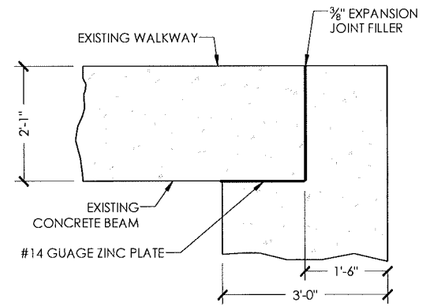

END PIER

6 WALKWAY SECTION
SCALE: ⅜"=1'-0"

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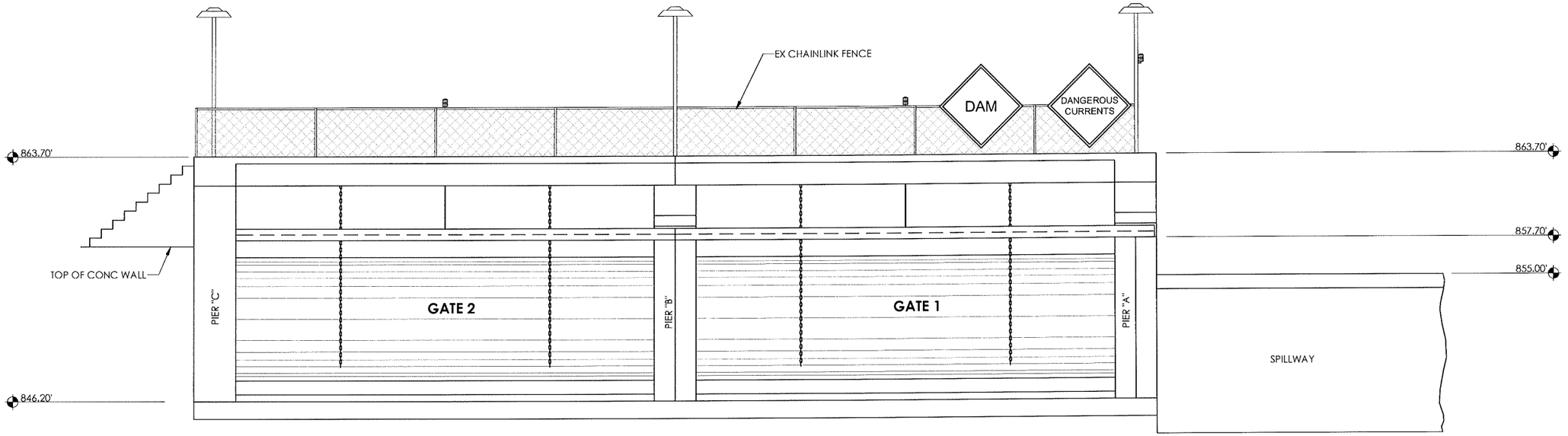
EXISTING DAM SECTIONS
2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

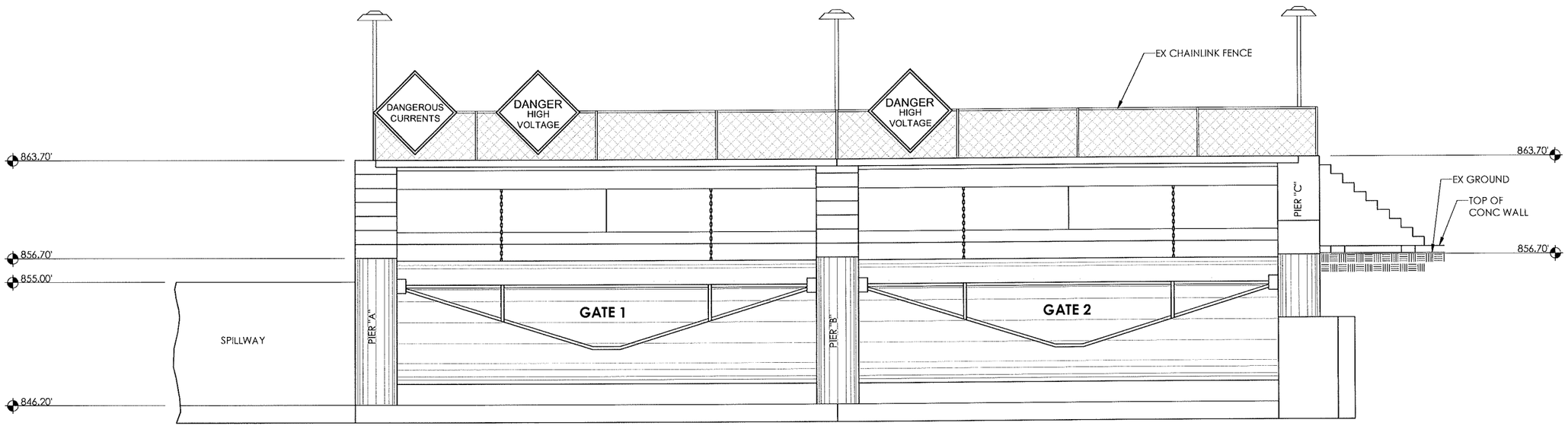
DATE	BY	NO.	REVISIONS

AS SHOWN
SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
S1.2



1 **UPSTREAM ELEVATION**
SCALE: ⅛"=1'-0"



2 **DOWNSTREAM ELEVATION**
SCALE: ⅛"=1'-0"

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EXISTING DAM ELEVATIONS

2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

DATE	BY	NO.	REVISIONS

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⅛"=1'-0" (11x17)
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DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
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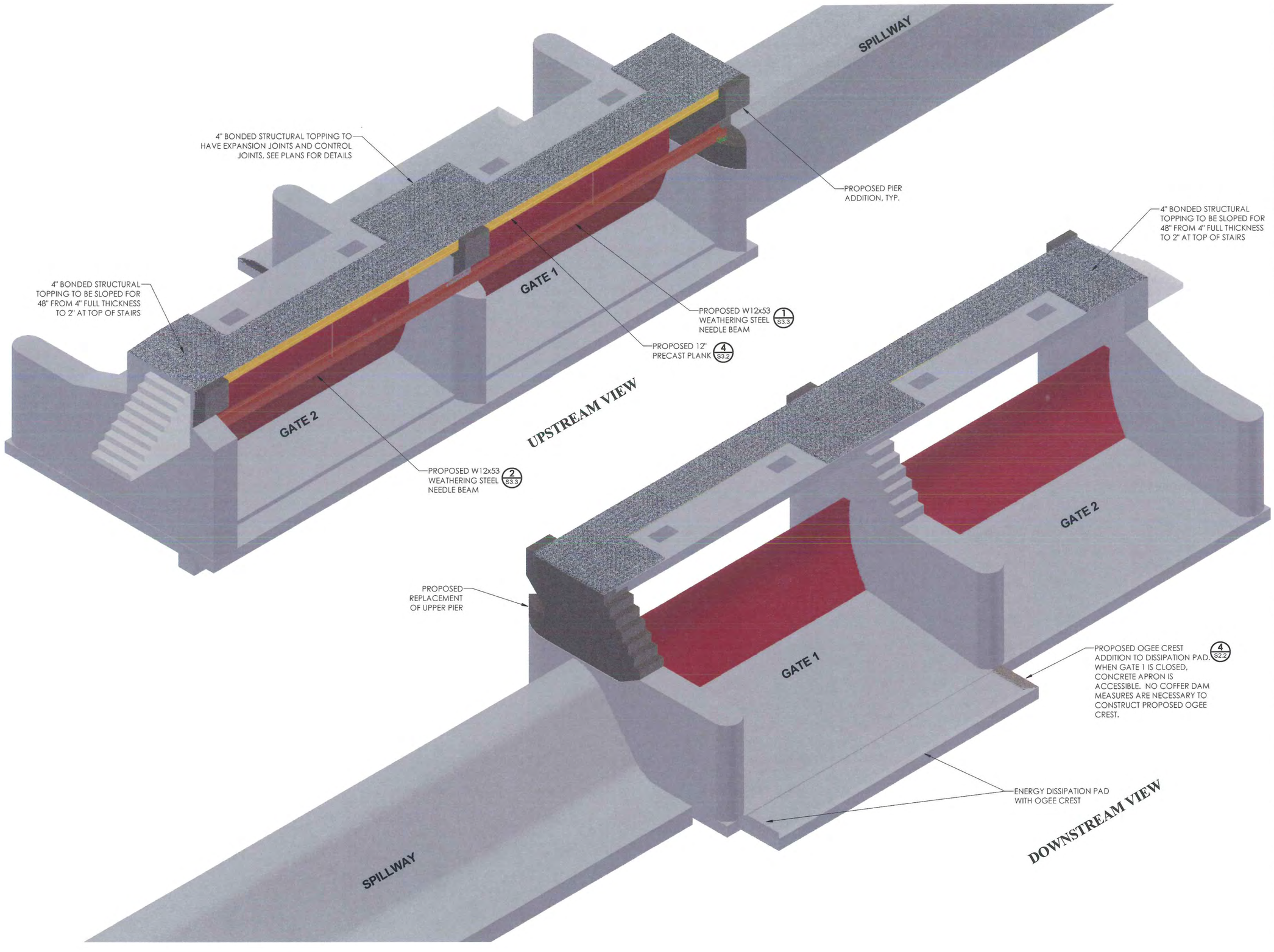

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PROPOSED STRUCTURE
2012 Dam Improvements
Village of Hustisford

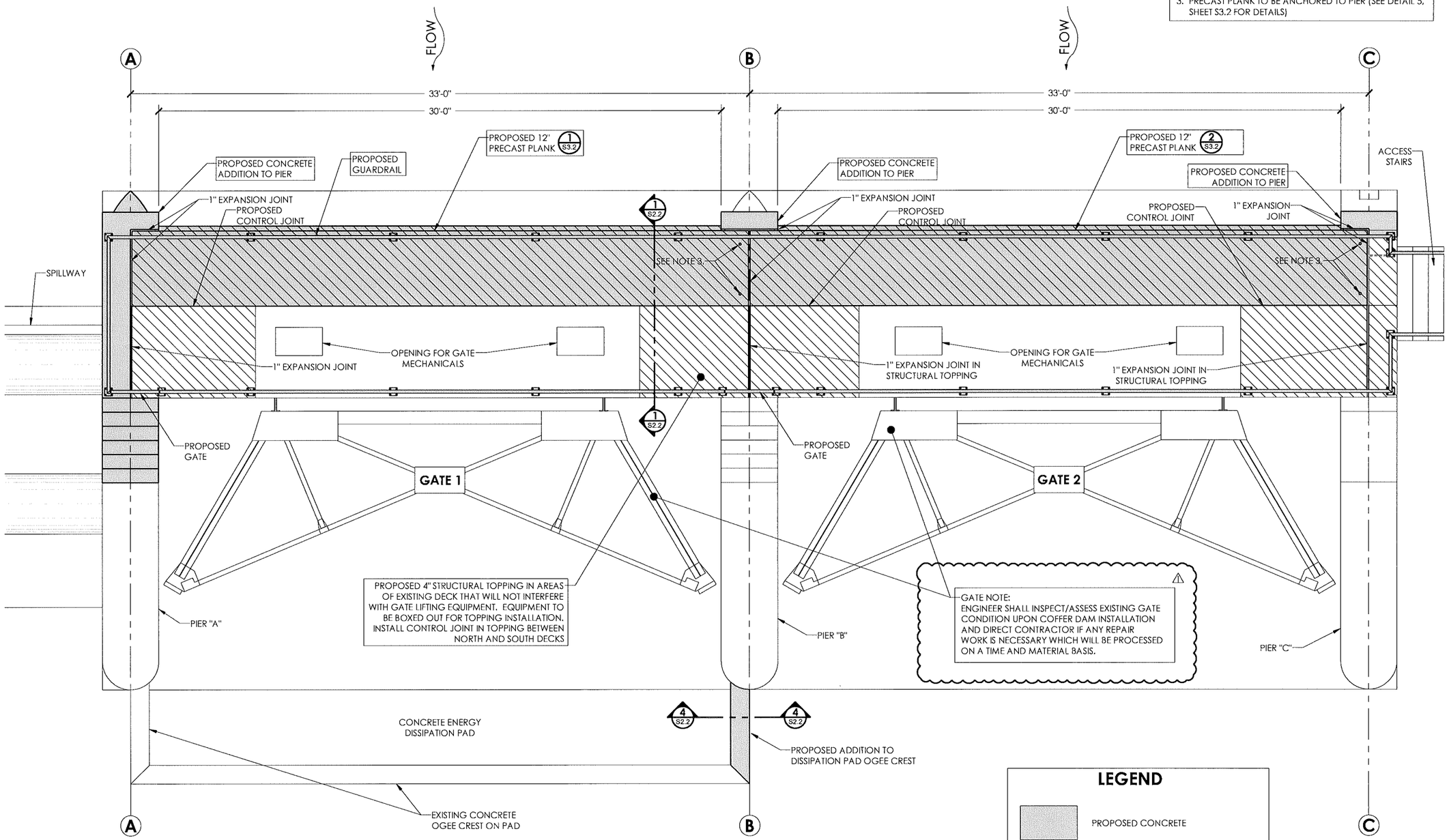
Village of Hustisford
Dodge County, WI

DATE	
BY	
NO.	
REVISIONS	

SCALE

DRAWN BY	SRR
DATE	Feb. 2012
GEC FILE NO.	2-0212-67
SHEET NO.	S2.0

NOTES:
1. GATE LIFTING EQUIPMENT NOT SHOWN FOR CLARITY.
2. GATE LIFTING EQUIPMENT SHALL NOT BE DISTURBED DURING CONSTRUCTION.
3. PRECAST PLANK TO BE ANCHORED TO PIER (SEE DETAIL 5, SHEET S3.2 FOR DETAILS)



PROPOSED PLAN VIEW
SCALE: AS SHOWN

LEGEND
- PROPOSED CONCRETE
- PROPOSED 12" THICK SPANCRETE WITH 4" STRUCTURAL TOPPING
- PROPOSED 4" STRUCTURAL TOPPING OVER EXISTING CONCRETE DECK

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PROPOSED DAM PLAN VIEW
2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

NO.	BY	DATE	REVISIONS
1	SRR	06/06/2012	Addition of Note.

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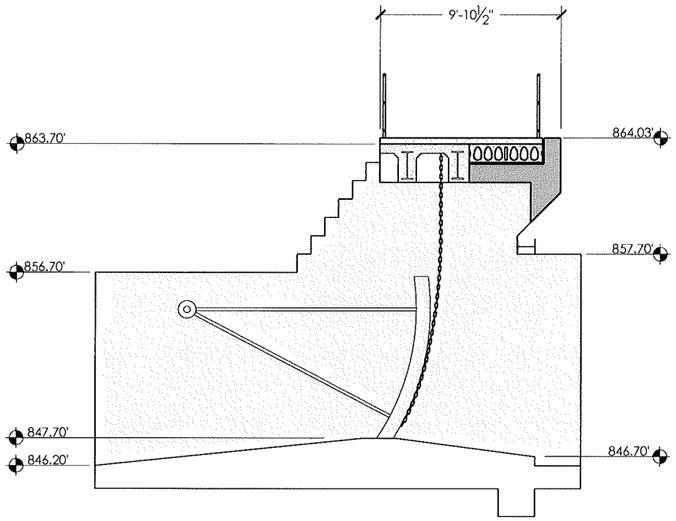
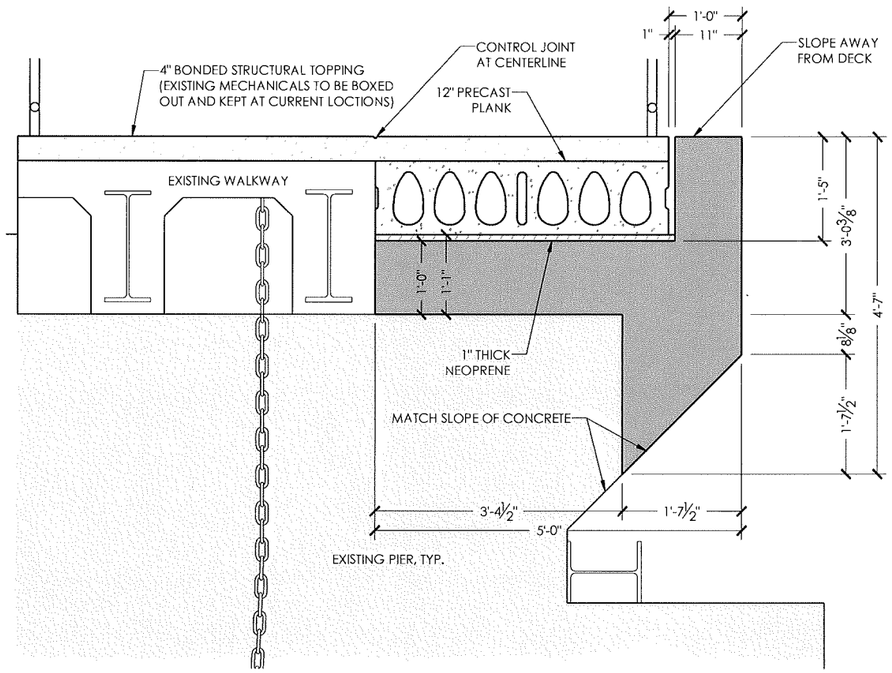
3/16"=1'-0" (11x17)
SCALE

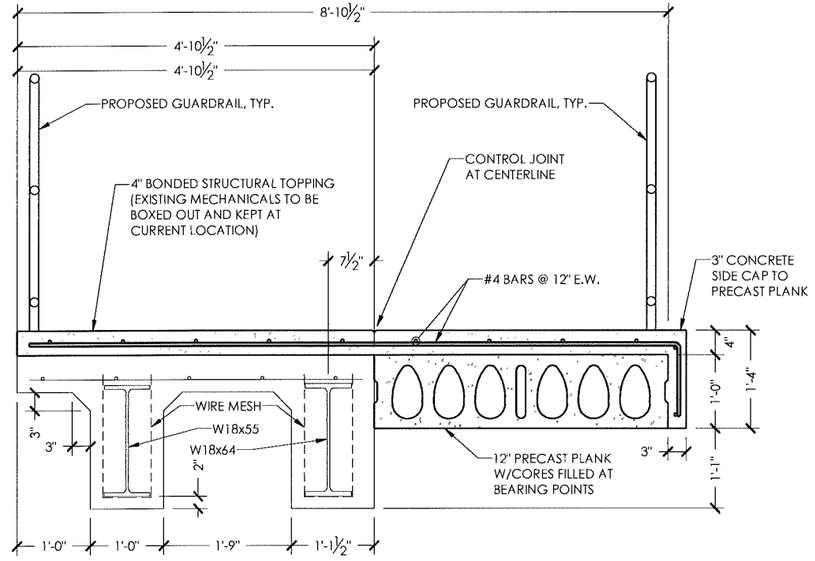
DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
S2.1



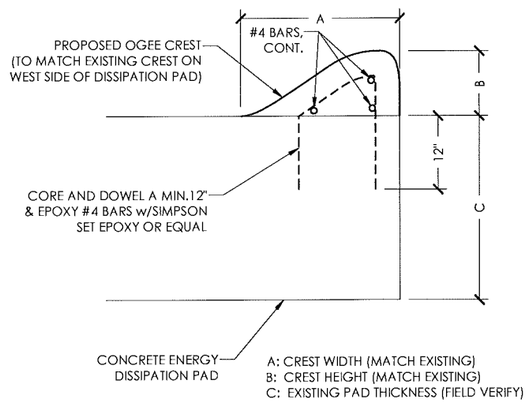
1 TYPICAL DAM SECTION
SCALE: ⅛"=1'-0"



2 TYPICAL PIER ADDITION SECTION
SCALE: ½"=1'-0"

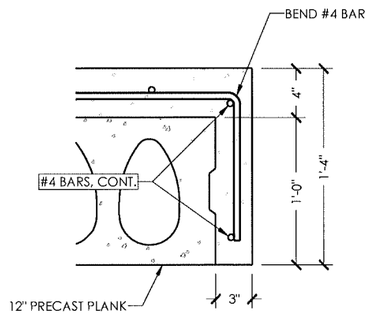


3 TYPICAL WALKWAY SECTION
SCALE: ½"=1'-0"



4 TYPICAL DISSIPATION PAD CREST
SCALE: NTS

SIDE CAP NOTE:
1. AT PIER LOCATION, OMIT SIDE CAP.
2. AT PIERS, LEAVE 1" CLEARANCE BETWEEN SIDE CAP AND PIER CONCRETE.



5 PRECAST PLANK SIDE CAP DETAIL
SCALE: 1"=1'-0"

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PROPOSED DAM SECTIONS
2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

NO.	BY	DATE
REVISIONS		

AS SHOWN
SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
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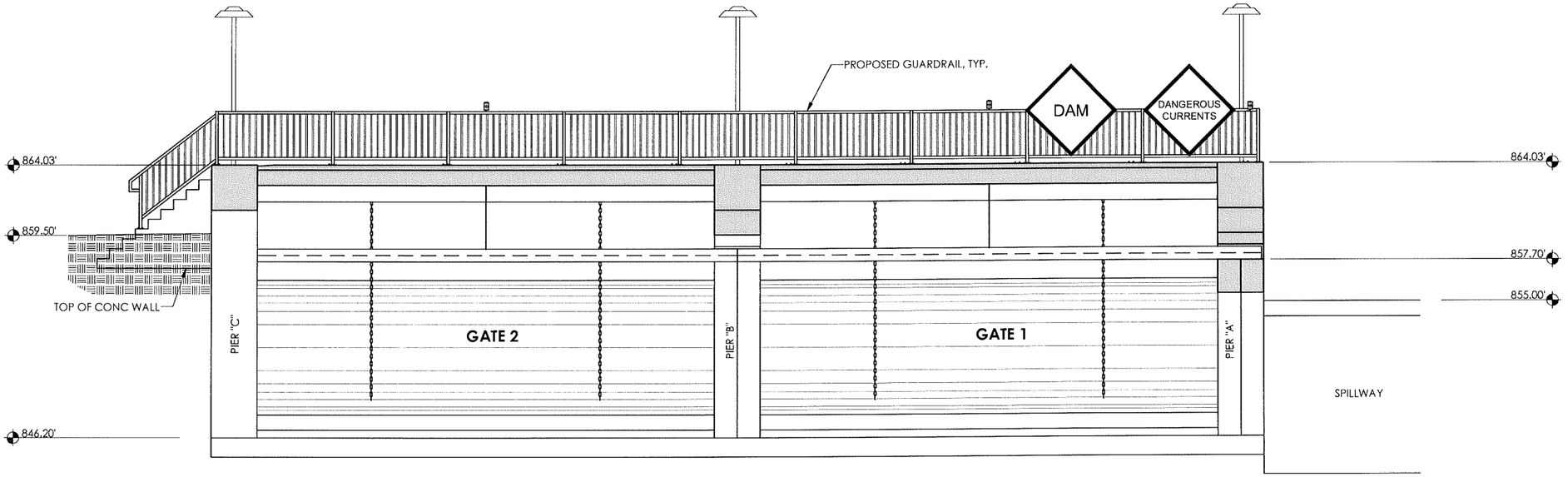
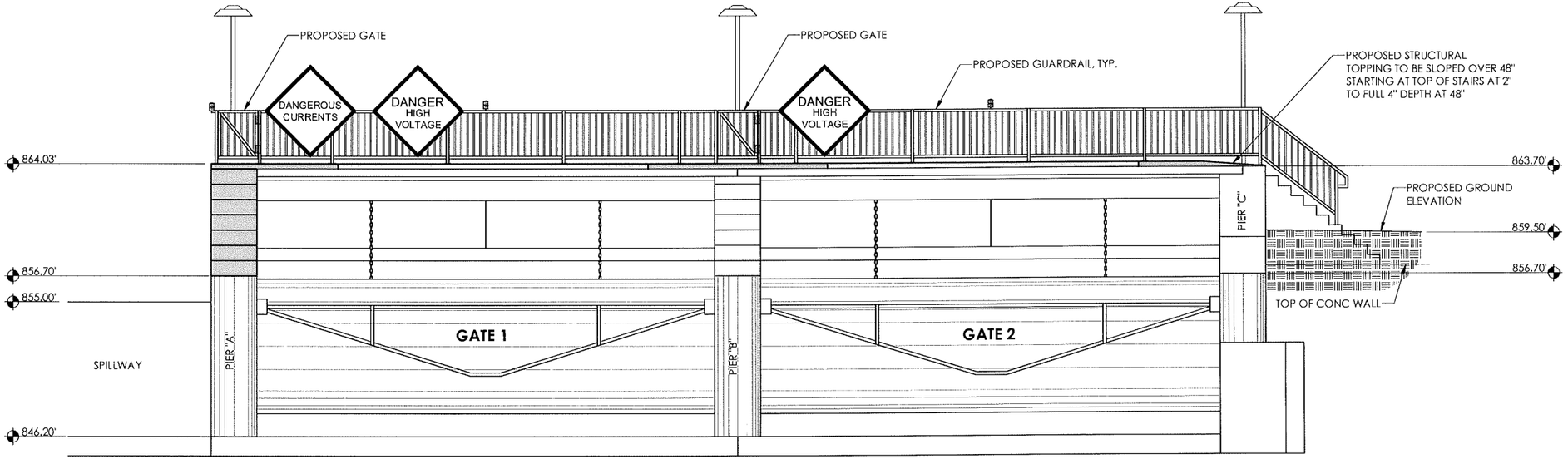
S2.2



1 UPSTREAM ELEVATION

SCALE: ⅛"=1'-0"



2 DOWNSTREAM ELEVATION

SCALE: ⅛"=1'-0"

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PROPOSED DAM ELEVATIONS

2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

NO.	REVISIONS	BY	DATE

0 4
⅛"=1'-0" (11x17)
SCALE

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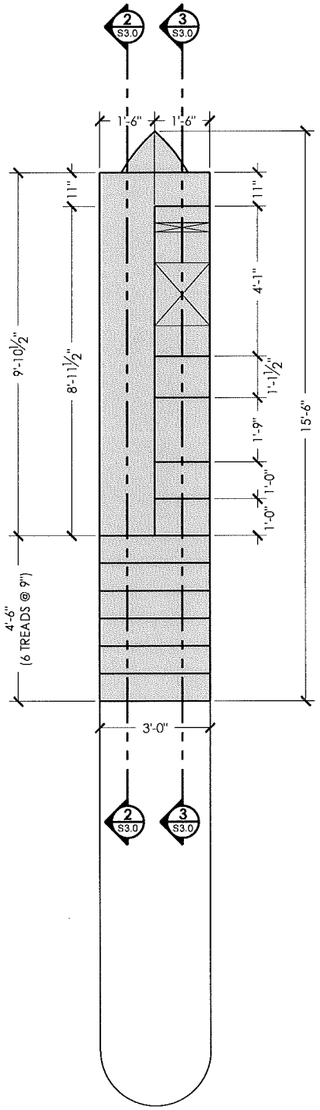
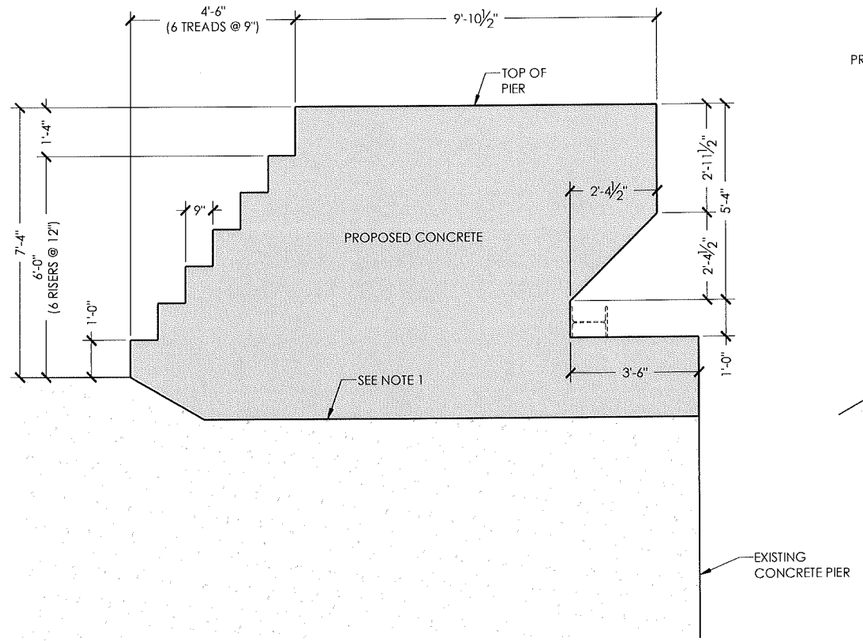
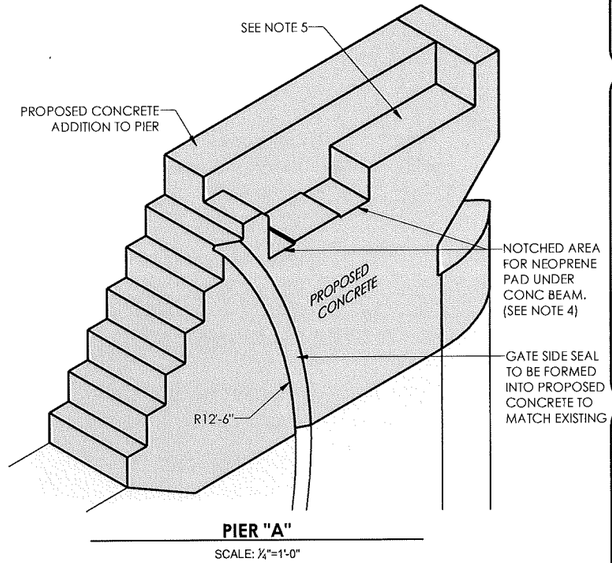
SHEET NO.
S2.3



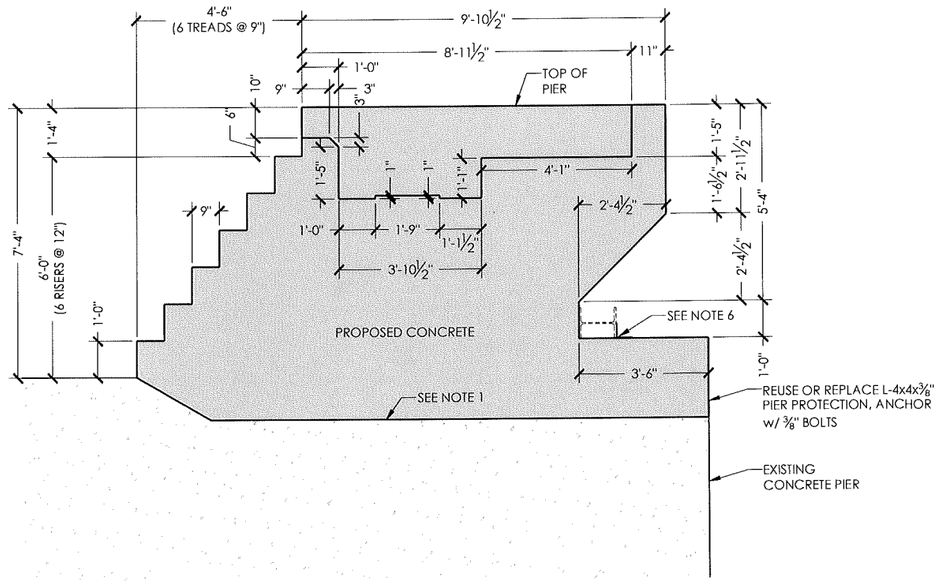
1 PIER "A" PLAN VIEW
SCALE: AS SHOWN



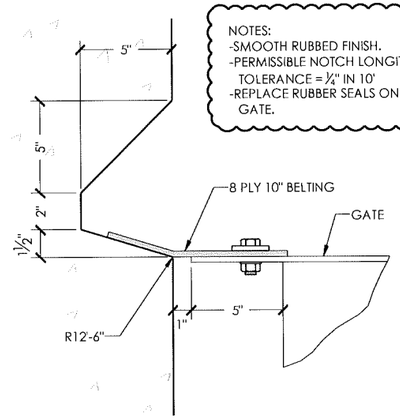
2 PIER "A" SECTION
SCALE: AS SHOWN



PIER "A"
SCALE: ¼"=1'-0"



3 PIER "A" SECTION
SCALE: AS SHOWN



4 SIDE SEAL DETAIL
SCALE: 1½"=1'-0"

NOTES:
-SMOOTH RUBBED FINISH.
-PERMISSIBLE NOTCH LONGITUDINAL TOLERANCE = ¼" IN 10'
-REPLACE RUBBER SEALS ON EACH GATE.

NOTES:
1. LOWER LIMITS OF PROPOSED CONCRETE ADDITION TO PIER WILL DEPEND ON THE CRACK LOCATION AND CONCRETE REMOVED.
2. SEE SHEET S3.5 FOR REINFORCEMENT DETAILS.
3. PROPOSED SECTION OF THE PIER INCLUDES A RECESSED GATE SIDE SEAL THAT WILL NEED TO MATCH EXISTING FOR PROPER GATE OPERATION.
4. IN THE BEARING LOCATION FOR THE EXISTING SOUTHERN CONCRETE WALKWAY, INSTALL 12"x12" NEOPRENE PADS. (SEE DETAIL 6, SHEET S3.2 FOR DETAILS.)
5. IN THE BEARING LOCATION FOR THE PROPOSED NORTHERN CONCRETE PLANK, INSTALL 12"x48" NEOPRENE PAD. (SEE DETAIL 6, SHEET S3.2 FOR DETAILS.)
6. L-5x5x⅜" GUIDE ANGLE, SEE SHEET S3.3 FOR DETAILS.

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PROPOSED PIER ADDITION DETAILS
2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

NO.	REVISIONS	BY	DATE
1	Addition of Note	SRR	06/08/2012

0 4
¼"=1'-0" (11x17) SCALE

DRAWN BY SRR
DATE Feb. 2012
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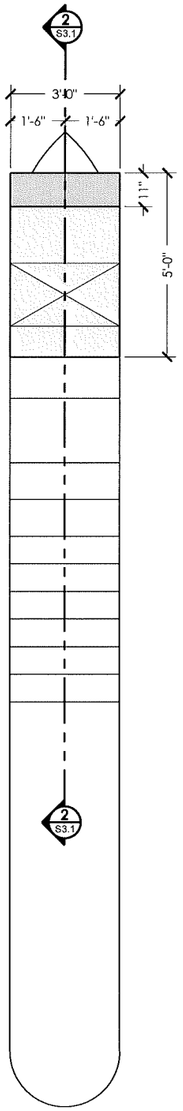
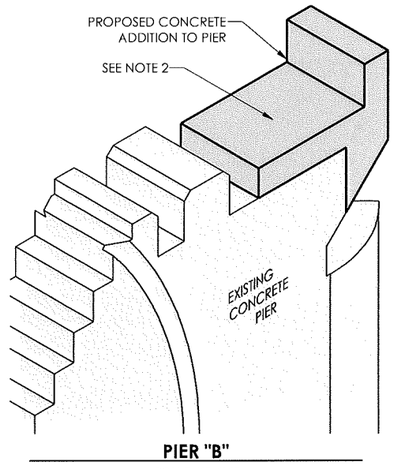
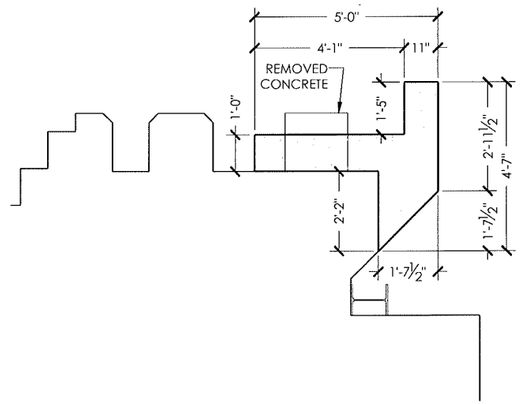
SHEET NO.
S3.0



1 **PIER "B" PLAN VIEW**
SCALE: AS SHOWN

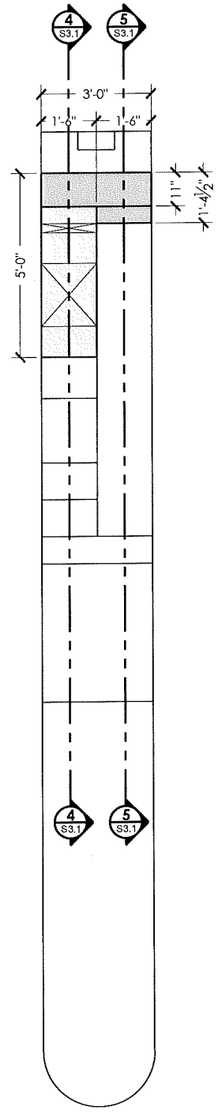


PIER "B"
SCALE: ¼"=1'-0"

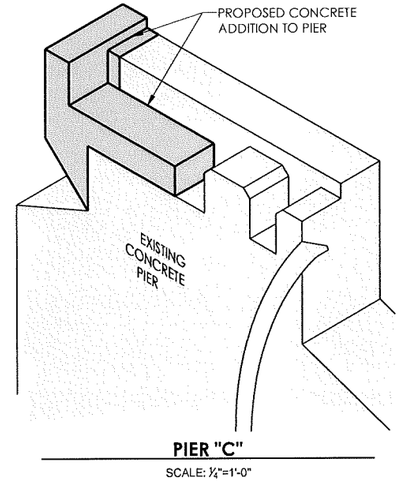


2 **PIER "B" SECTION**
SCALE: AS SHOWN

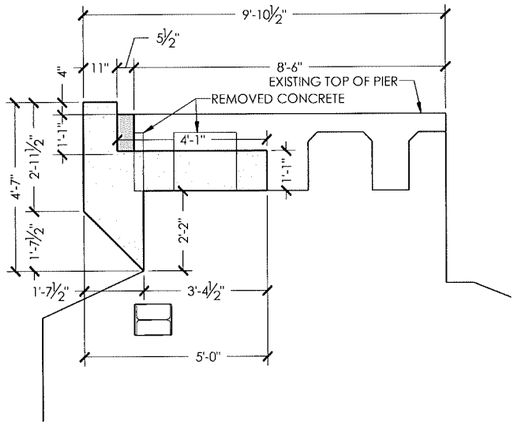
NOTES:
1. SEE SHEET S3.6-S3.7 FOR REINFORCEMENT DETAILS.
2. IN THE BEARING LOCATION FOR THE PROPOSED NORTHERN CONCRETE PLANK, INSTALL NEOPRENE PAD. (SEE DETAIL 6, SHEET S3.2 FOR DETAILS.)



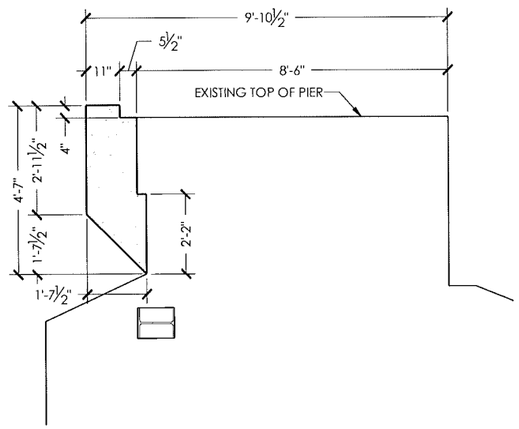
3 **PIER "C" PLAN VIEW**
SCALE: AS SHOWN



PIER "C"
SCALE: ¼"=1'-0"



4 **PIER "C" SECTION**
SCALE: AS SHOWN



5 **PIER "C" SECTION**
SCALE: AS SHOWN

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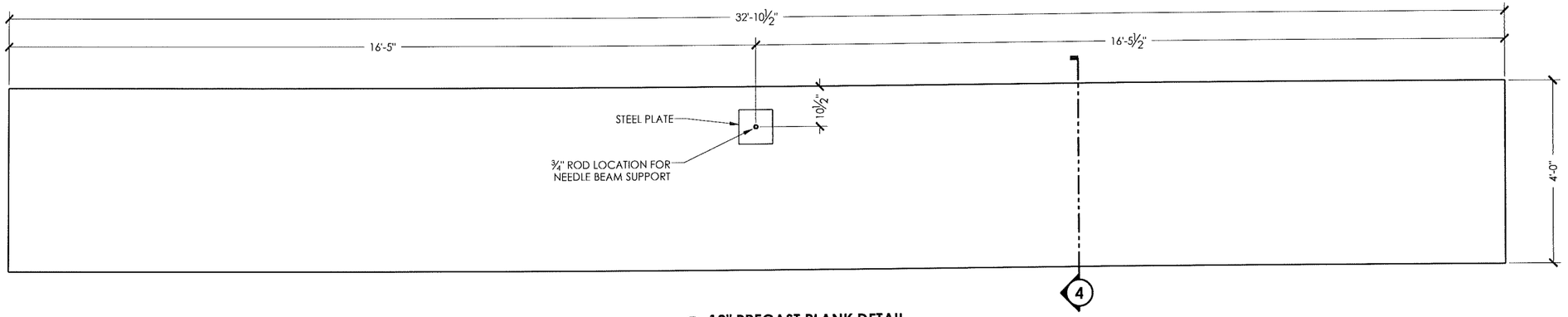
PROPOSED PIER ADDITION DETAILS
2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

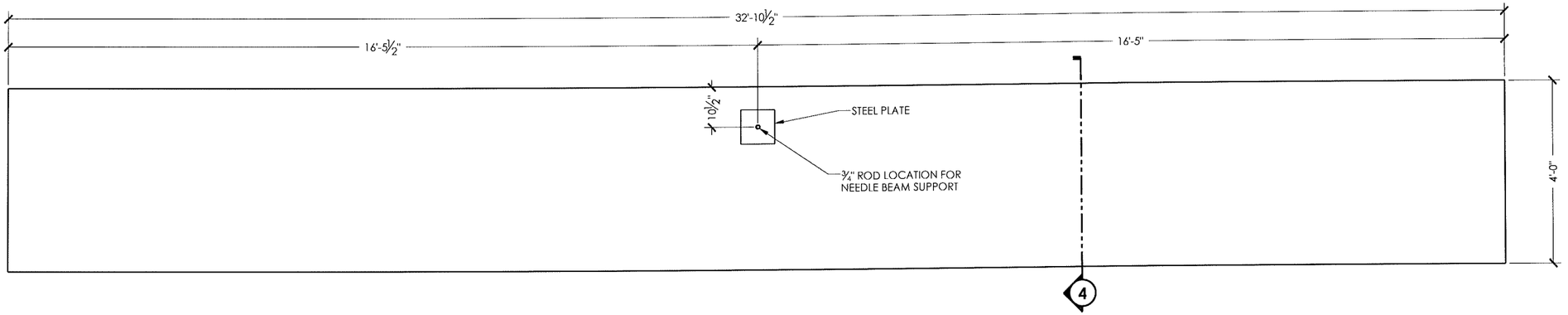
REVISIONS	NO.	BY	DATE

0 4
¼"=1'-0" (11x17)
SCALE

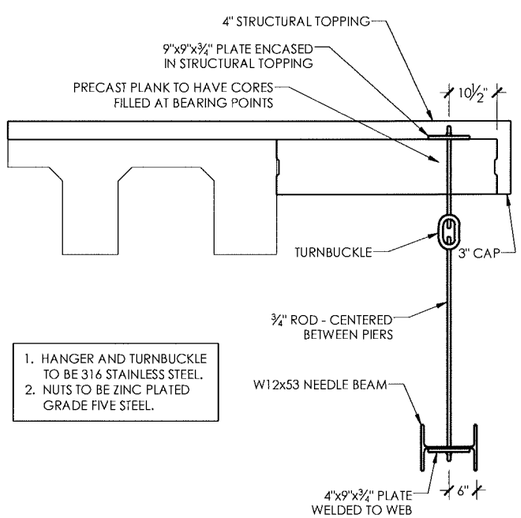
DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
S3.1



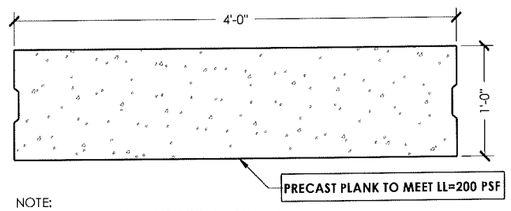
1 12" PRECAST PLANK DETAIL
SCALE: ⅜"=1'-0"



2 12" PRECAST PLANK DETAIL
SCALE: ¾"=1'-0"

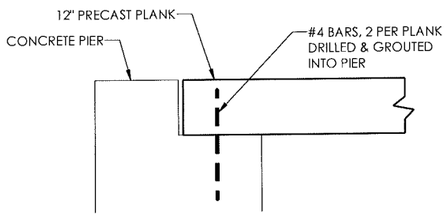


3 NEEDLE BEAM SUPPORT ROD DETAIL
SCALE: ⅜"=1'-0"

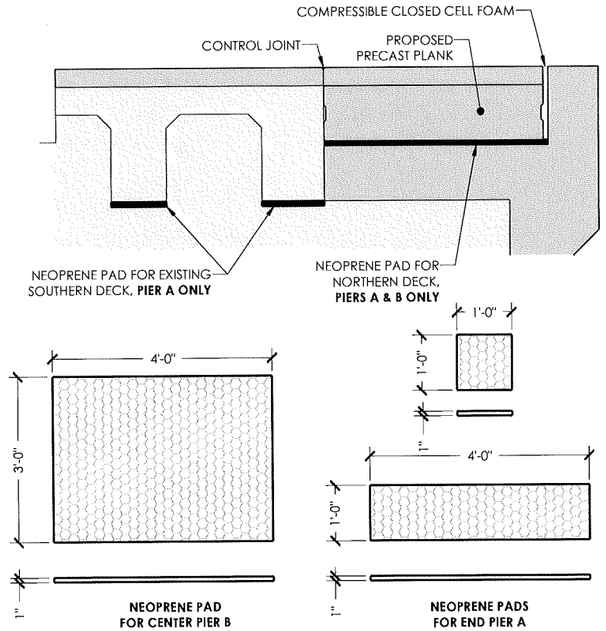


NOTE:
PRECAST PLANK TO HAVE CORES (NOT SHOWN) FILLED @ BEARING POINTS

4 TYPICAL 12" THICK PRECAST PLANK SECTION
SCALE: ¾"=1'-0"



5 TYPICAL PRECAST PLANK ANCHOR DETAIL
SCALE: ⅜"=1'-0"



6 TYPICAL NEOPRENE DETAIL
SCALE: ⅜"=1'-0"

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PROPOSED PRECAST PLANK DETAILS
2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

REVISIONS	NO.	BY	DATE

AS SHOWN
SCALE

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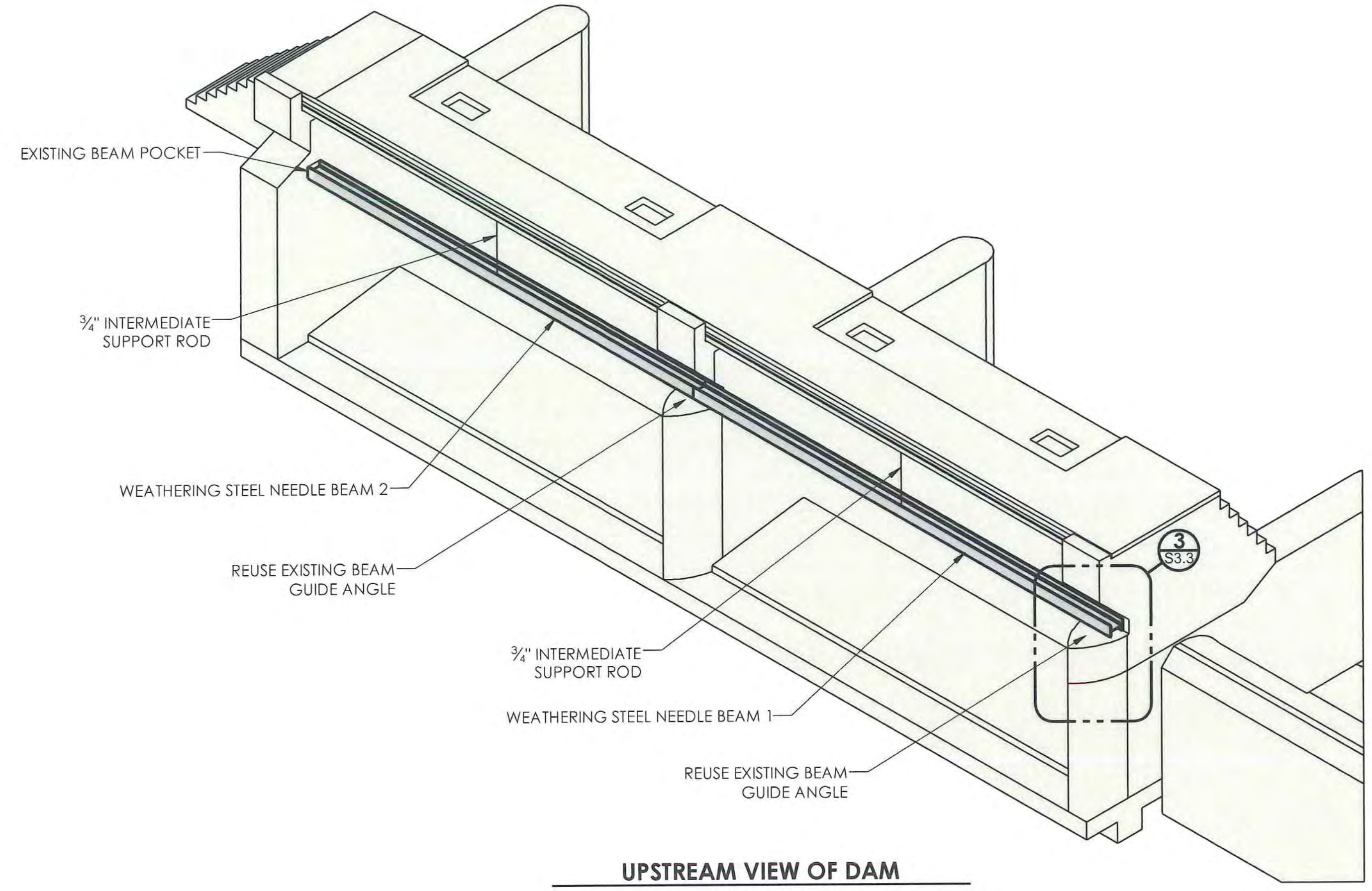
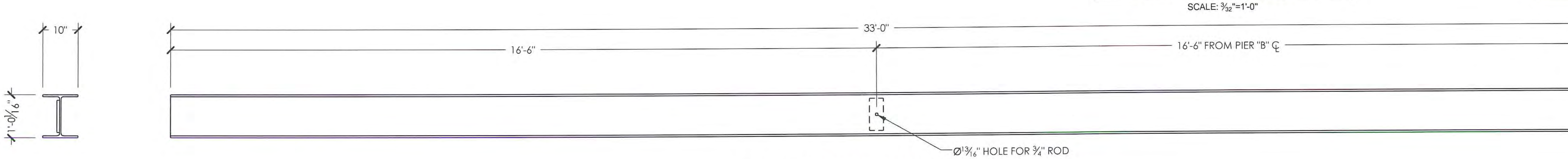
SHEET NO.
S3.2

BEAM POCKET IMAGE



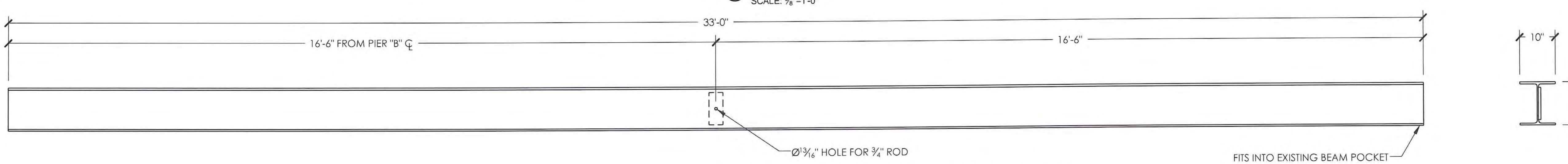
UPSTREAM VIEW OF DAM

SCALE: 3/32"=1'-0"



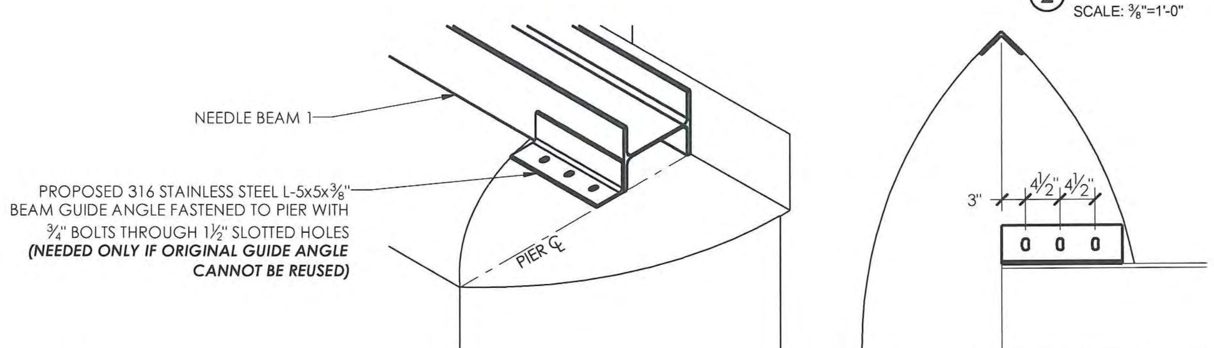
① W12x53 NEEDLE BEAM 1 (WEATHERING STEEL)

SCALE: 3/8"=1'-0"



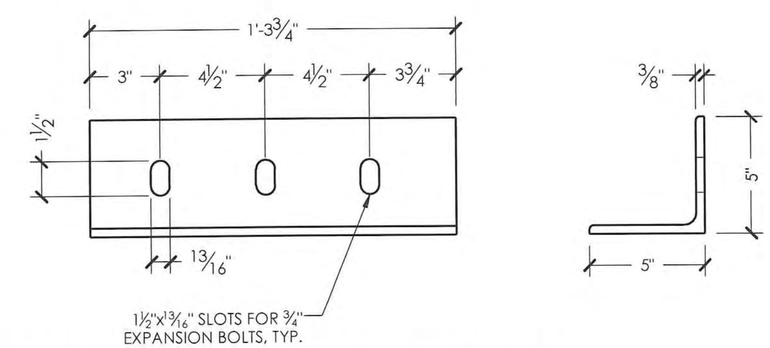
② W12x53 NEEDLE BEAM 2 (WEATHERING STEEL)

SCALE: 3/8"=1'-0"



③ GUIDE ANGLE DETAILS

SCALE: ½"=1'-0"



④ 316 STAINLESS STEEL L-5x5x3/8" GUIDE ANGLE

SCALE: 1½"=1'-0"

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PROPOSED NEEDLE BEAM DETAILS

2012 Dam Improvements

Village of Hustisford

Village of Hustisford
Dodge County, WI

REVISIONS	NO.	BY	DATE

AS SHOWN
SCALE

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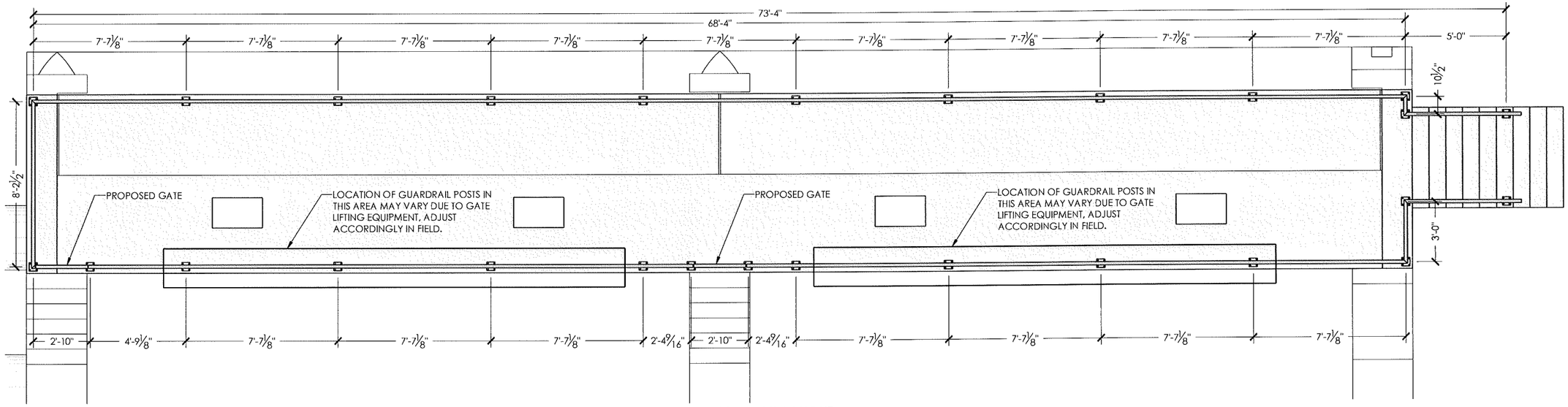
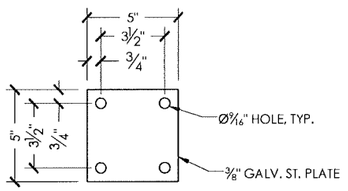
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.

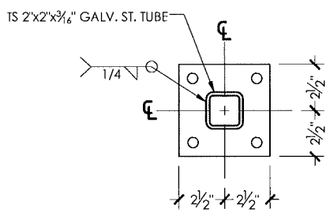
S3.3



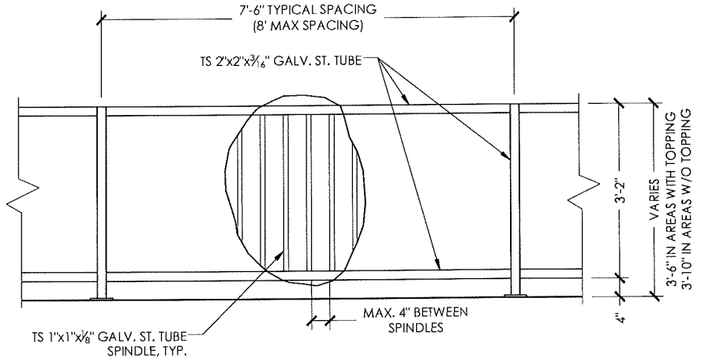
TYPICAL GUARDRAIL LAYOUT
SCALE: 3⁄16"=1'-0"



1 TYPICAL BASE PLATE
SCALE: 1½"=1'-0"



2 TYPICAL POST TO BASE PLATE DETAIL
SCALE: 1½"=1'-0"



3 TYPICAL GUARDRAIL DETAILS
SCALE: ⅜"=1'-0"

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PROPOSED GUARDRAIL DETAILS
2012 Dam Improvements
Village of Hustisford
Village of Hustisford
Dodge County, WI

NO.	REVISIONS	BY	DATE

AS SHOWN
SCALE

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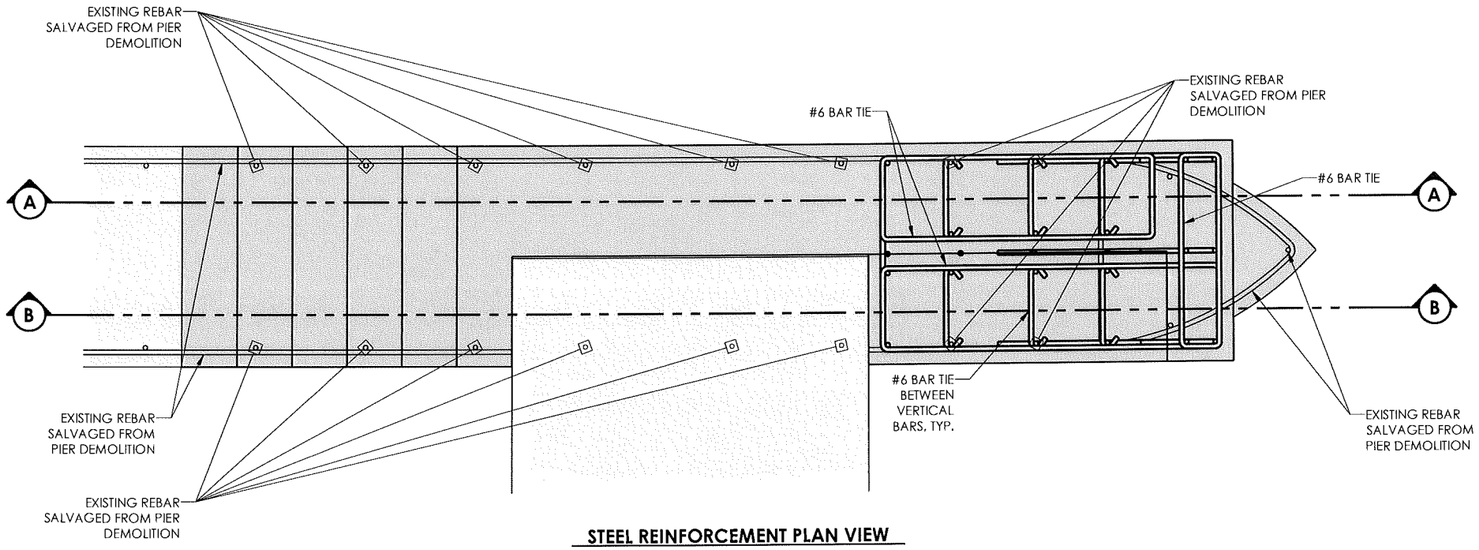
GEC FILE NO. 2-0212-67
SHEET NO.
S3.4

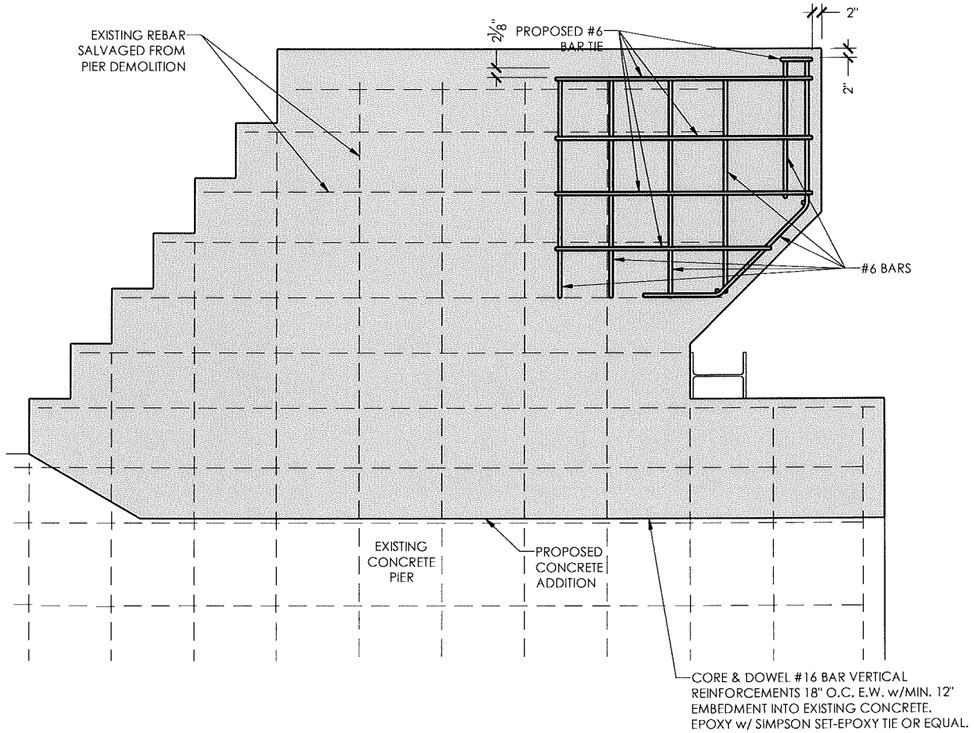


STEEL REINFORCEMENT PLAN VIEW

SCALE: ½"=1'-0"

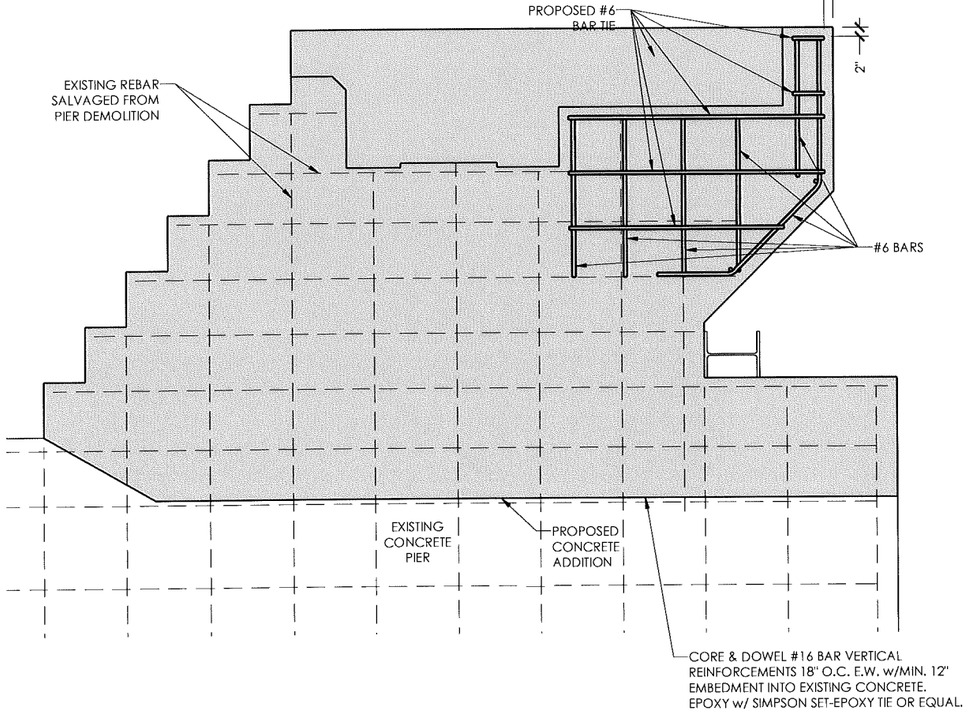
NOTES:

1. LAP SPLICE STEEL BARS AS FOLLOWS:
   #8 BARS: MINIMUM OF 48"
   #6 BARS: MINIMUM OF 36"
   #4 BARS: MINIMUM OF 24"
2. PLACE FELT TO SEPARATE EXISTING CONCRETE DECK FROM PROPOSED PIER CONSTRUCTION TO AVOID ADHESION BETWEEN DECK AND PIER.
3. PROVIDE 1" GAP ON END OF EXISTING DECK FOR EXPANSION. GAP TO BE FILLED WITH COMPRESSIBLE CLOSED CELL FOAM.



STEEL REINFORCEMENT SECTION A-A

SCALE: ⅜"=1'-0"



STEEL REINFORCEMENT SECTION B-B

SCALE: ⅜"=1'-0"

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REINFORCEMENT DETAILS - PIER "A"

2012 Dam Improvements
Village of Hustisford

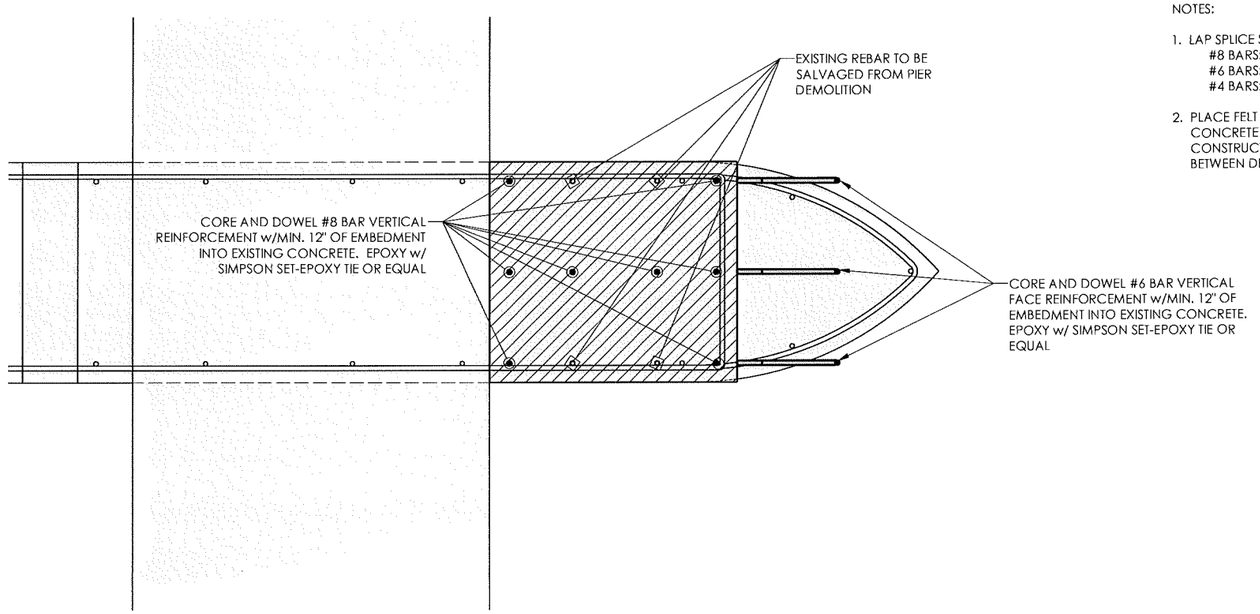
Village of Hustisford
Dodge County, WI

DATE	BY	NO.	REVISIONS

SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.

S3.5



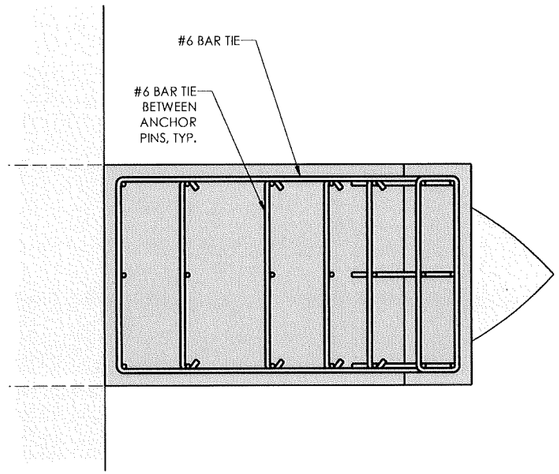
PIER DOWEL PLAN VIEW

SCALE: ½"=1'-0"

NOTES:

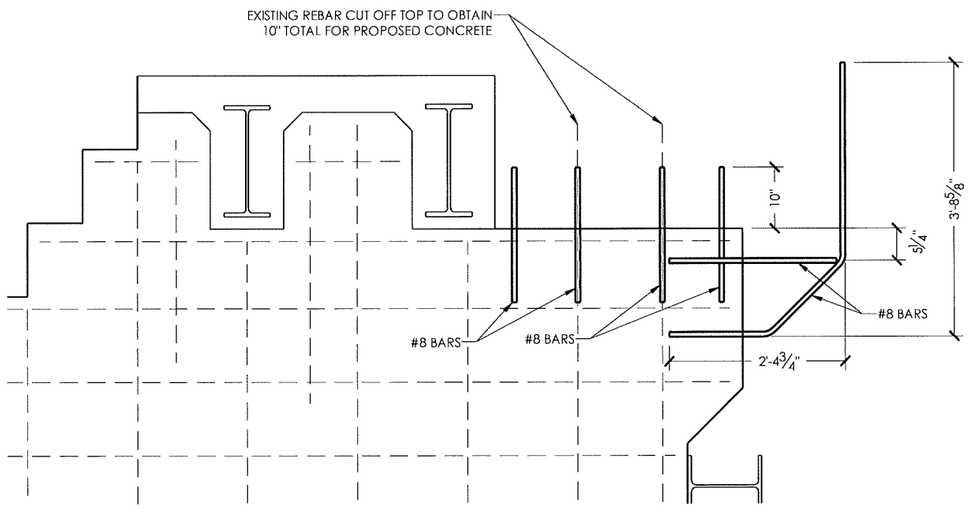
1. LAP SPLICE STEEL BARS AS FOLLOWS:
   #8 BARS: MINIMUM OF 48"
   #6 BARS: MINIMUM OF 36"
   #4 BARS: MINIMUM OF 24"

2. PLACE FELT TO SEPARATE EXISTING CONCRETE DECK FROM PROPOSED PIER CONSTRUCTION TO AVOID ADHESION BETWEEN DECK AND PIER.



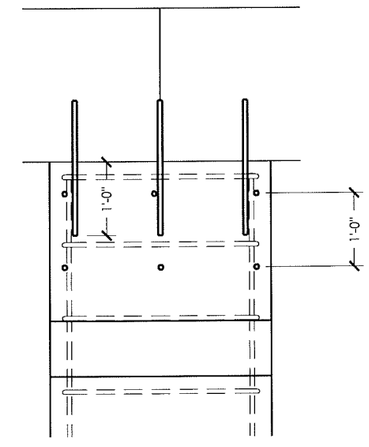
STEEL REINFORCEMENT PLAN VIEW

SCALE: ½"=1'-0"



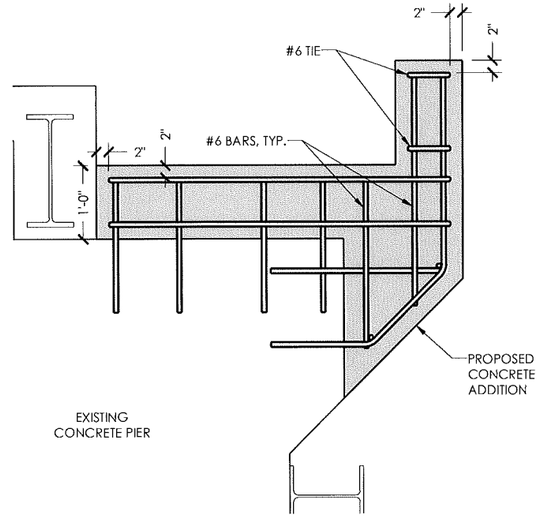
PIER DOWEL SIDE VIEW

SCALE: ½"=1'-0"



PIER DOWEL END VIEW

SCALE: ½"=1'-0"



STEEL REINFORCEMENT SIDE VIEW

SCALE: ½"=1'-0"

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REINFORCEMENT DETAILS - PIER "B"

2012 Dam Improvements
Village of Hustisford

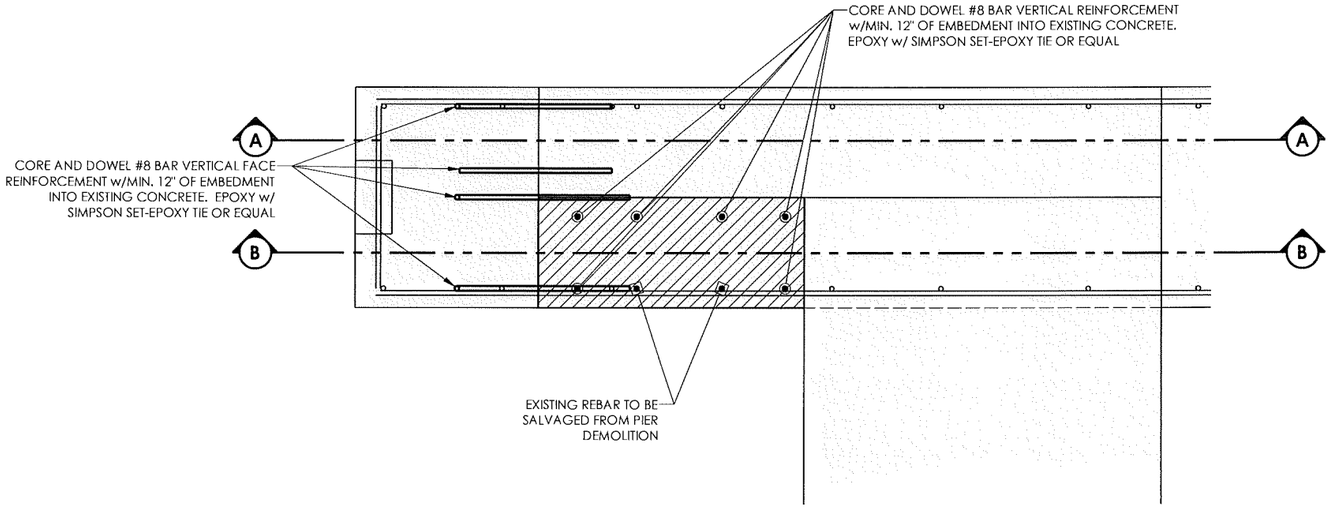
Village of Hustisford
Dodge County, WI

NO.	REVISIONS	BY	DATE

SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.

S3.6



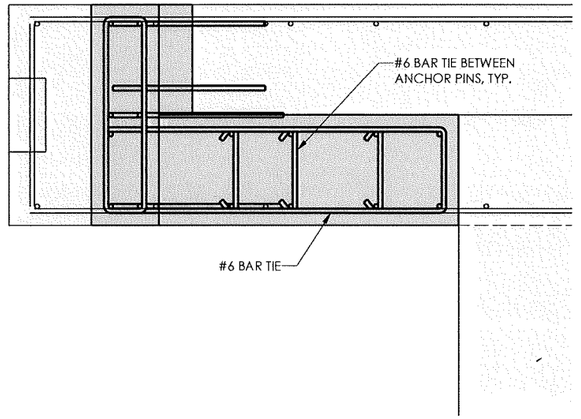
PIER DOWEL PLAN VIEW

SCALE: ½"=1'-0"

NOTES:

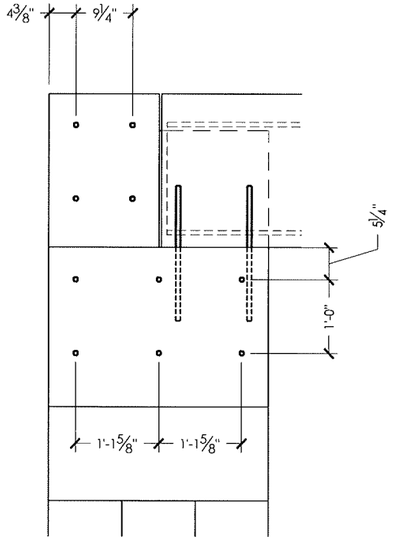
1. LAP SPLICE STEEL BARS AS FOLLOWS:
   #8 BARS: MINIMUM OF 48"
   #6 BARS: MINIMUM OF 36"
   #4 BARS: MINIMUM OF 24"

2. PLACE FELT TO SEPARATE EXISTING CONCRETE DECK FROM PROPOSED PIER CONSTRUCTION TO AVOID ADHESION BETWEEN DECK AND PIER.



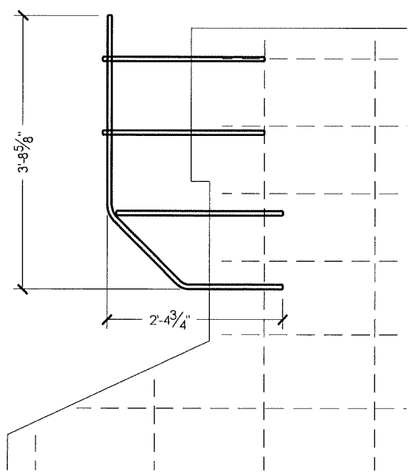
STEEL REINFORCEMENT PLAN VIEW

SCALE: ½"=1'-0"

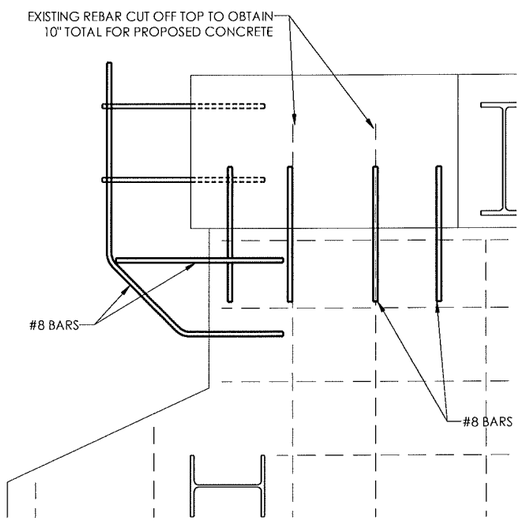


PIER DOWEL END VIEW

SCALE: ½"=1'-0"



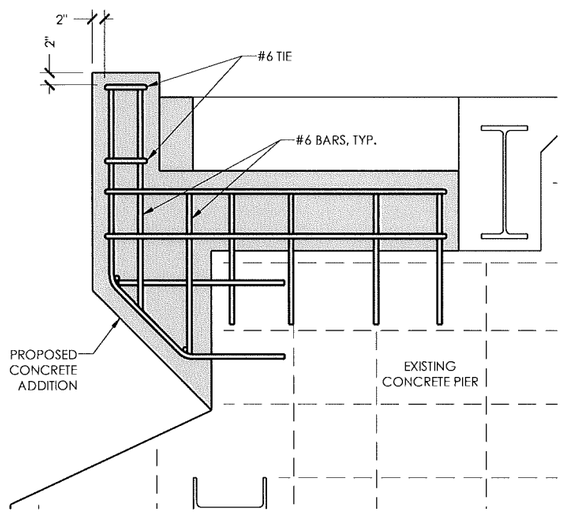
SECTION A-A



SECTION B-B

PIER DOWEL SECTION VIEWS

SCALE: ½"=1'-0"



STEEL REINFORCEMENT SIDE VIEW

SCALE: ½"=1'-0"

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REINFORCEMENT DETAILS - PIER "C"

2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

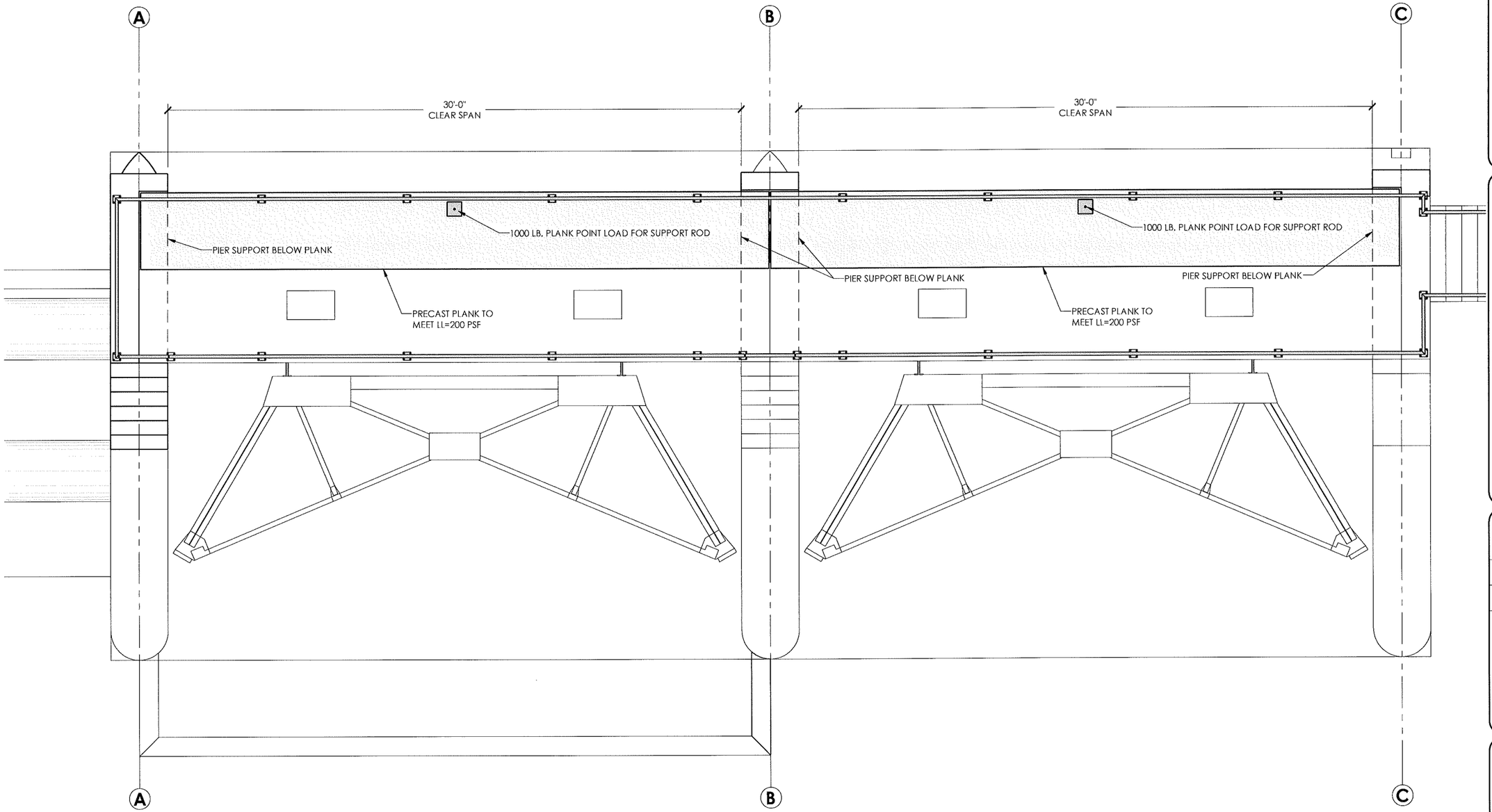
DATE	BY	NO.	REVISIONS

SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.

S3.7

NOTES:
1. PRECAST PLANK TO HAVE CORES FILLED @ BEARING POINTS.



PROPOSED LOADINGS
SCALE: AS SHOWN

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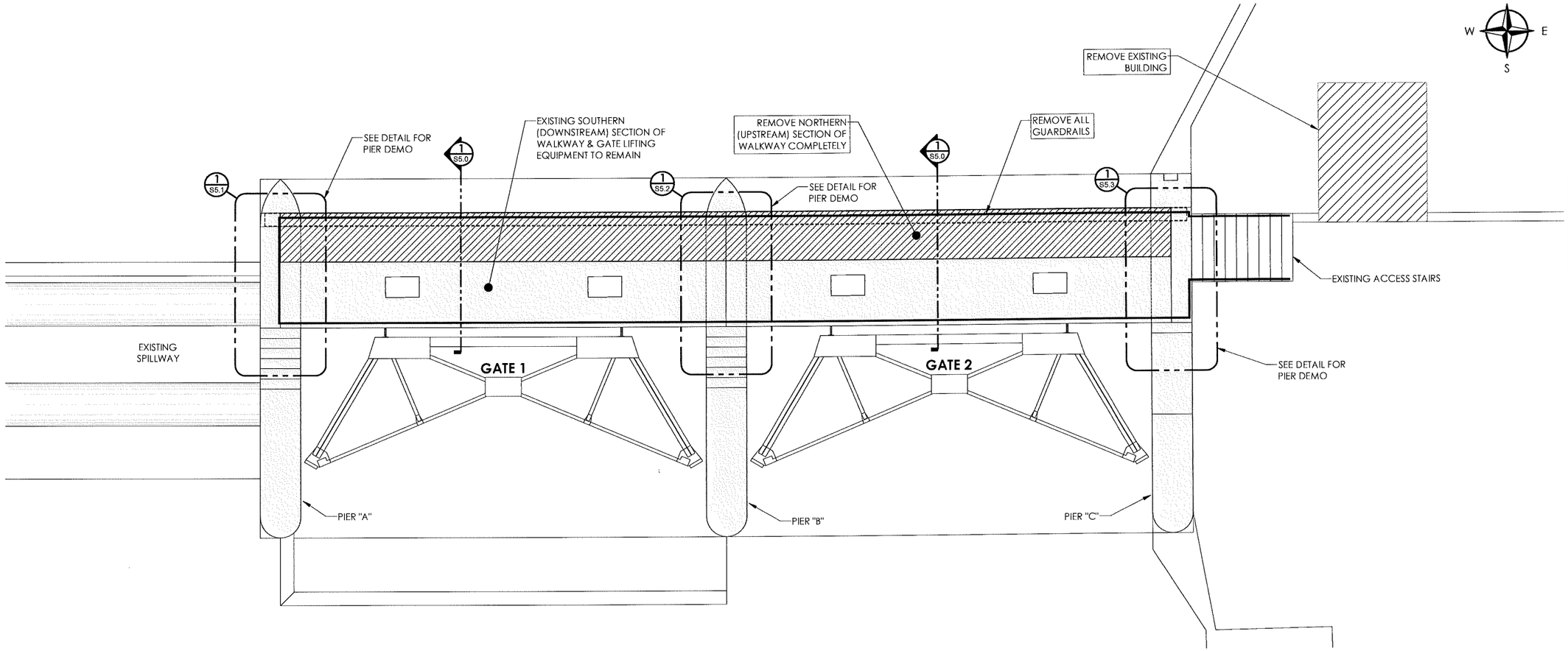
BRIDGE DECK LOADING DETAILS
2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

REVISIONS	NO.	BY	DATE

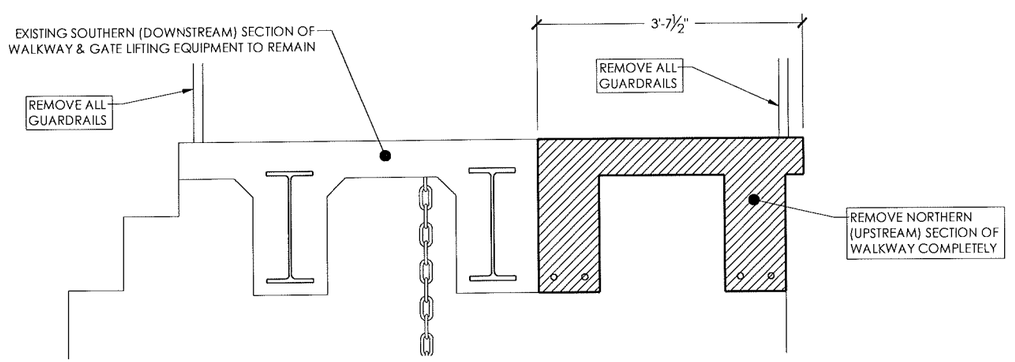
N
W E
S
0 3
3/16"=1'-0" (11x17)
SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
S4.0



OVERALL DAM REMOVAL & DEMO PLAN

SCALE: ⅛"=1'-0"



① WALKWAY SECTION

SCALE: ½"=1'-0"

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PROPOSED DAM DEMO PLAN VIEW

2012 Dam Improvements
Village of Hustisford

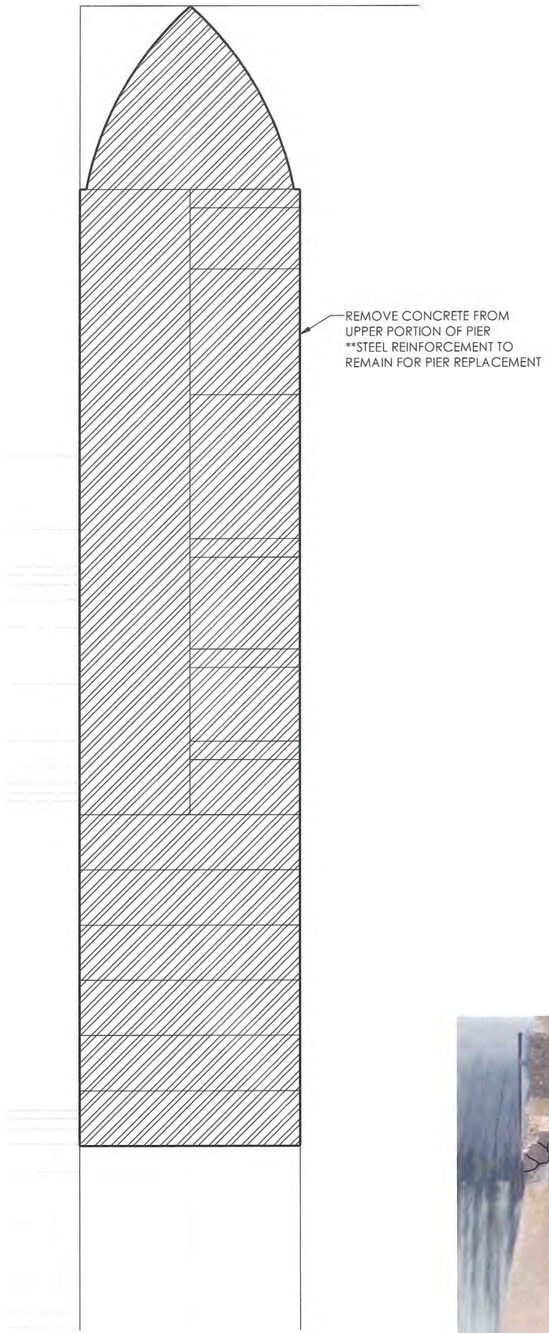
Village of Hustisford
Dodge County, WI

NO.	REVISIONS	BY	DATE

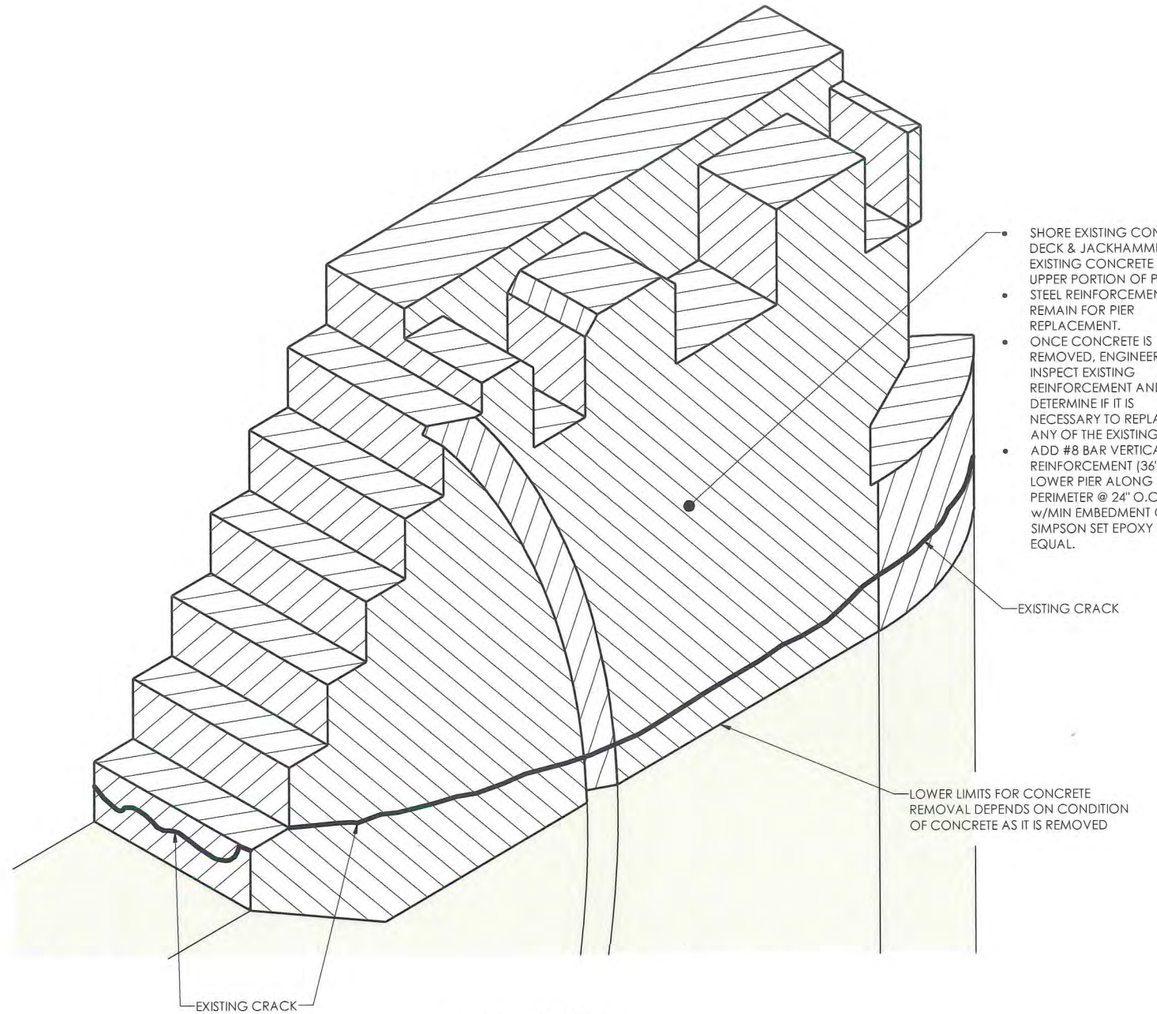
AS SHOWN
SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.

S5.0



1 **PIER "A" DETAIL**
SCALE: ½"=1'-0"



A **PIER "A" ISOMETRIC**
SCALE: ½"=1'-0"

PIER IMAGES
SCALE: NONE

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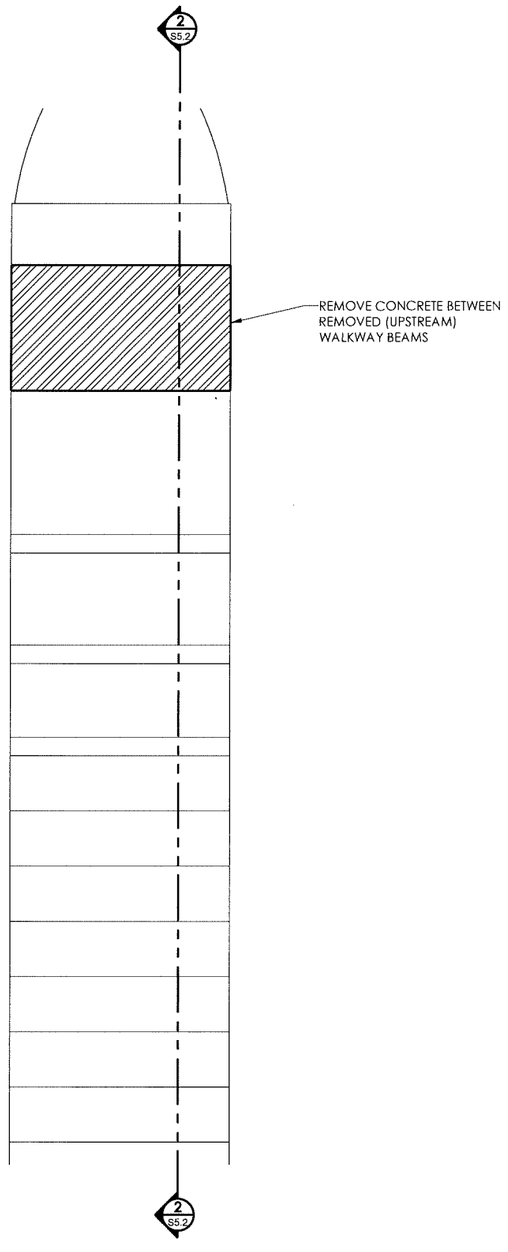
PROPOSED DAM PIER DEMO
2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

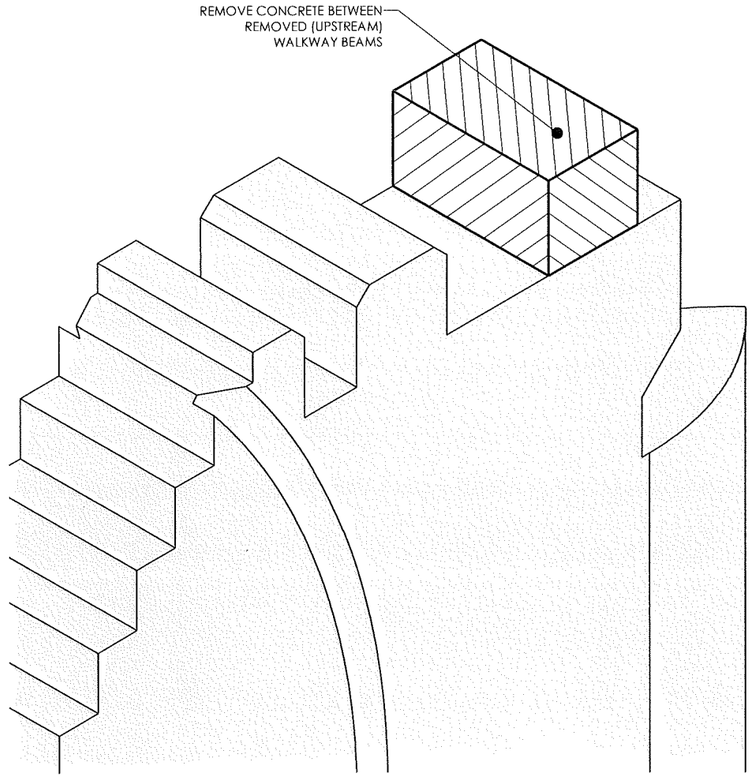
REVISIONS	NO.	BY	DATE

0 1
½"=1'-0" (11x17)
SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
S5.1



1 **PIER "B" DETAIL**
SCALE: ½"=1'-0"



A **PIER "B" ISOMETRIC**
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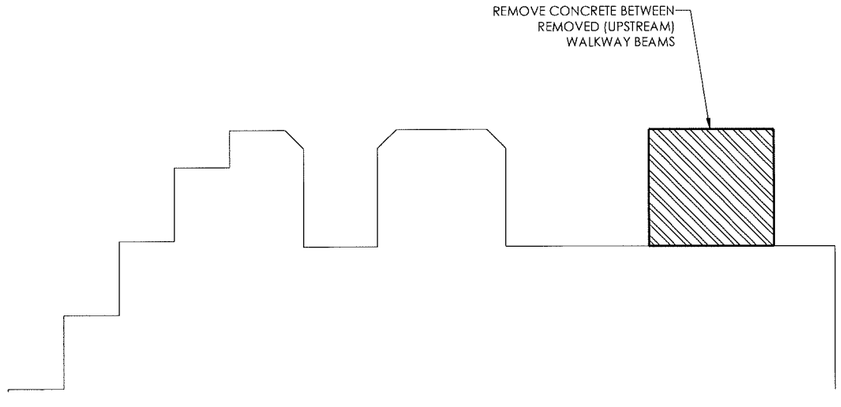

2 **PIER "B" SECTION**
SCALE: ½"=1'-0"

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PROPOSED DAM PIER DEMO
2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

REVISIONS	NO.	BY	DATE

0 1
½"=1'-0" (11x17)
SCALE

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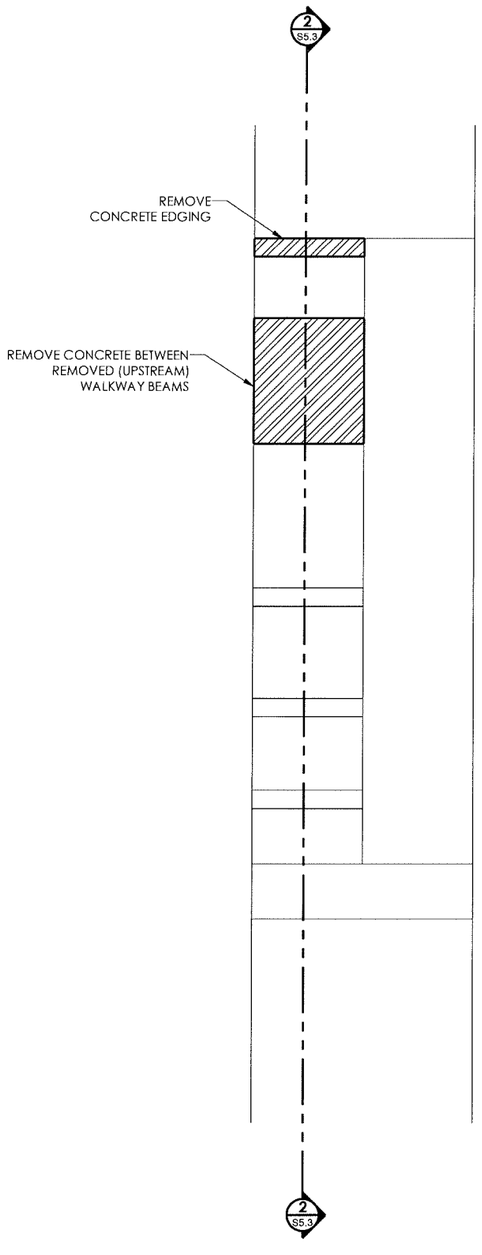
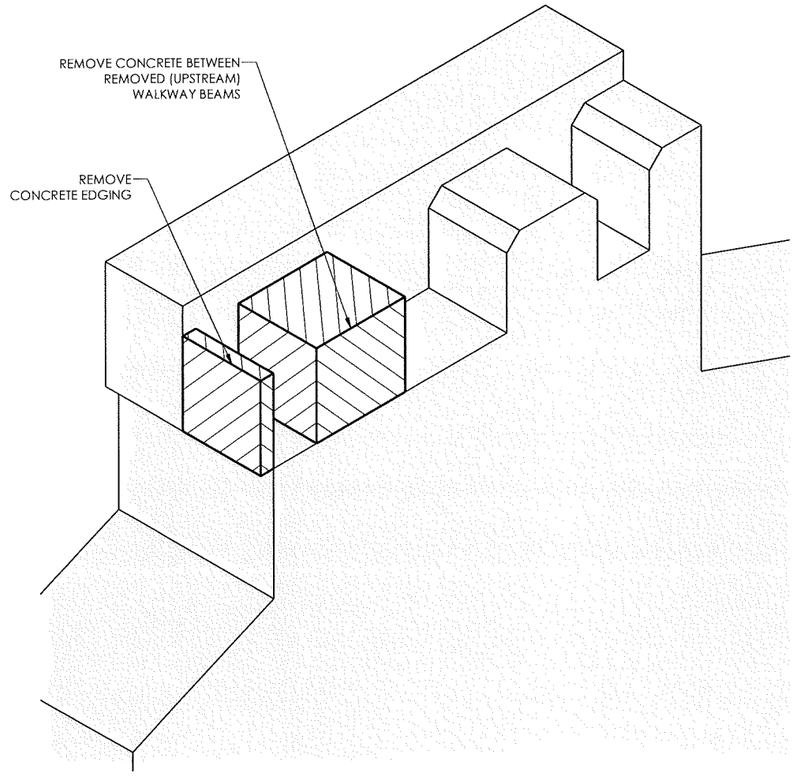
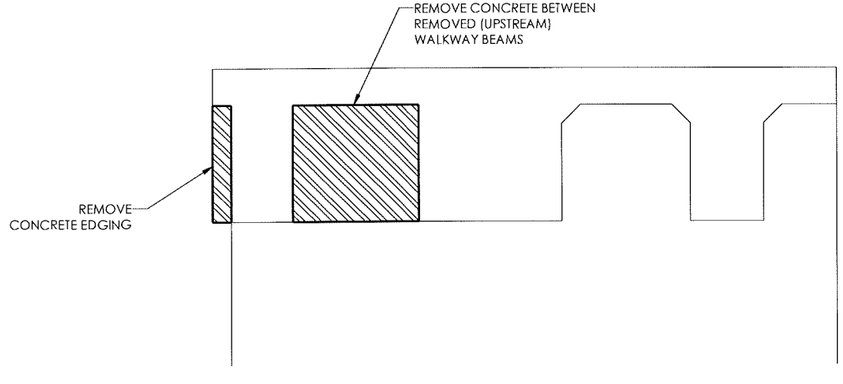
GEC FILE NO. 2-0212-67
SHEET NO.
S5.2



1 **PIER "C" DETAIL**
SCALE: ½"=1'-0"



A **PIER "C" ISOMETRIC**
SCALE: ½"=1'-0"



2 **PIER "C" SECTION**
SCALE: ½"=1'-0"

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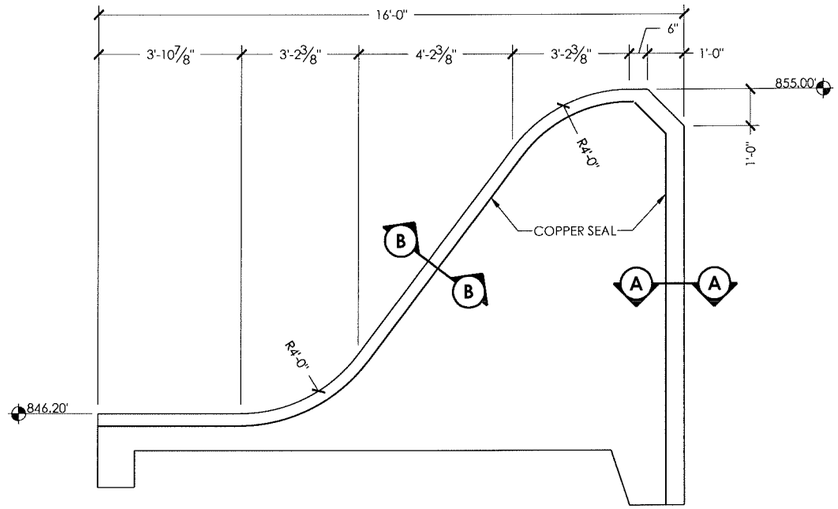
PROPOSED DAM PIER DEMO
2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

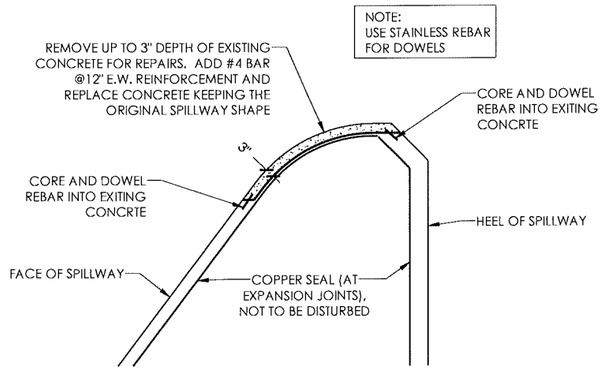
NO.	REVISIONS	BY	DATE

0 1
½"=1'-0" (11x17)
SCALE

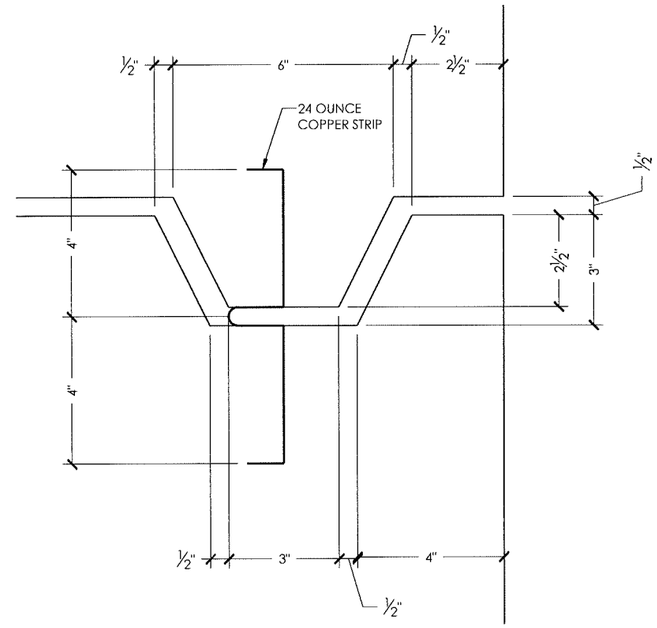
DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
S5.3



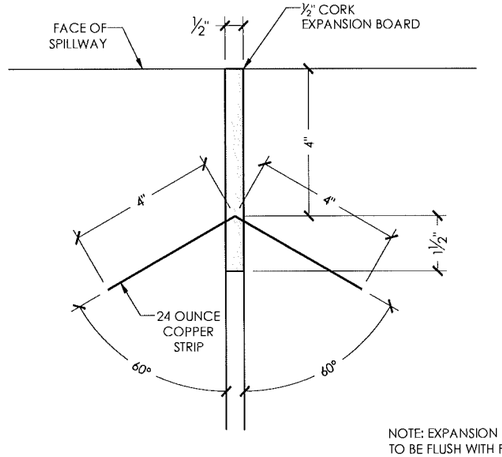
1 SPILLWAY SECTION
SCALE: ¼"=1'-0"



2 TYPICAL REPAIR DETAIL
SCALE: ¼"=1'-0"



DETAIL OF EXPANSION JOINT IN HEEL OF SPILLWAY: SECTION A-A
SCALE: 3"=1'-0"



NOTE: EXPANSION BOARD TO BE FLUSH WITH FACE OF SPILLWAY.

DETAIL OF EXPANSION JOINT ON FACE OF SPILLWAY: SECTION B-B
SCALE: 3"=1'-0"

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EXISTING SPILLWAY REPAIRS
2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

REVISIONS	NO.	BY	DATE

AS SHOWN
SCALE

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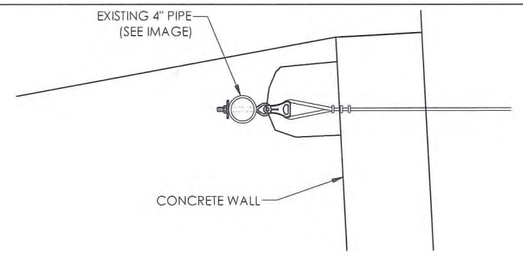
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
S6.0

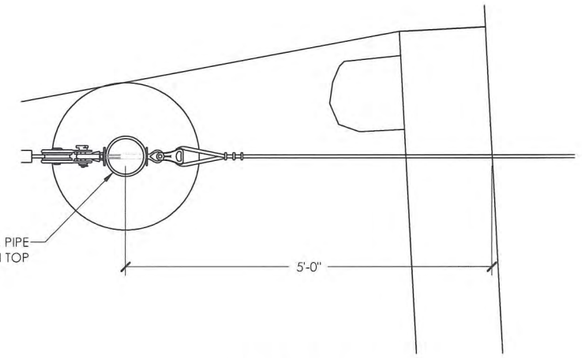
EXISTING ANCHOR IMAGE

SCALE: NONE



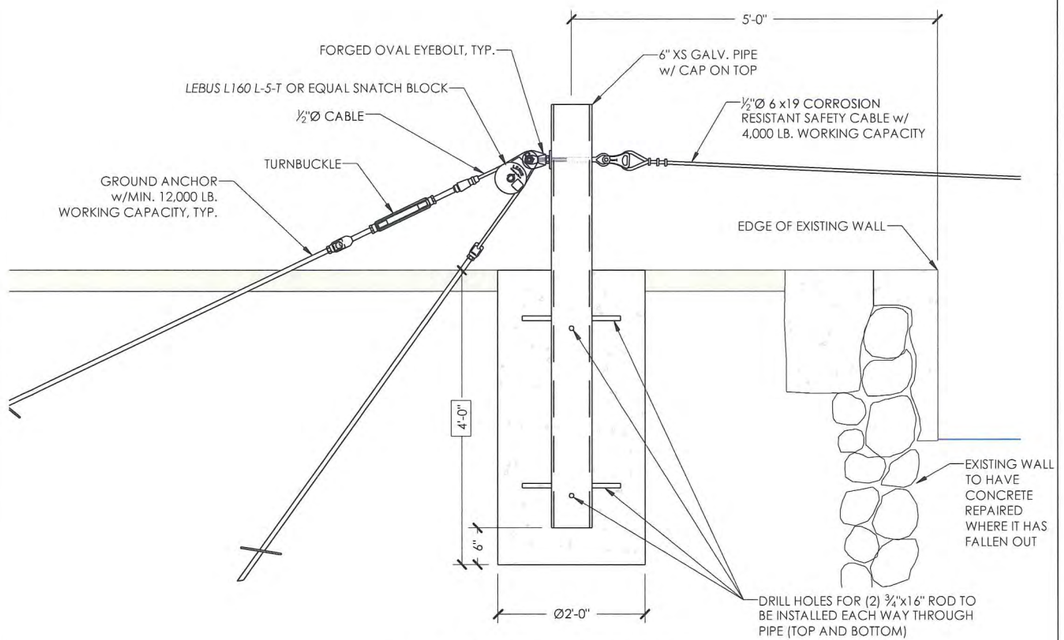
EXISTING PLAN VIEW

SCALE: ½"=1'-0"



PROPOSED PLAN VIEW

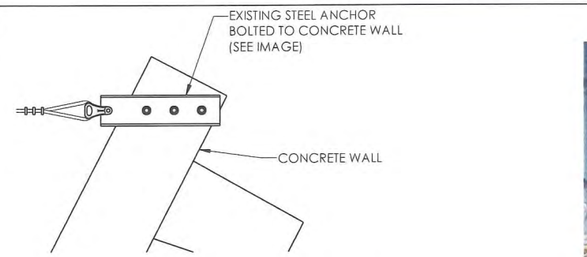
SCALE: ½"=1'-0"



① WEST BANK FOUNDATION DETAIL

SCALE: ½"=1'-0"

WESTERN CABLE ANCHOR

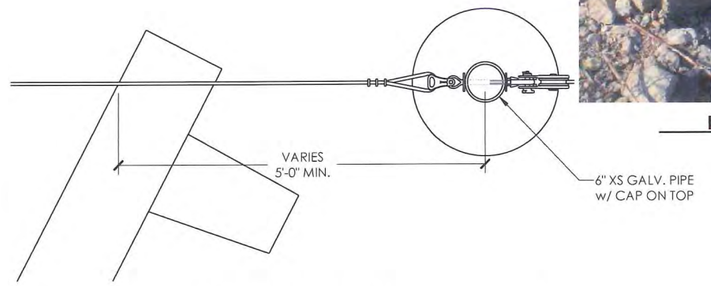


EXISTING PLAN VIEW

SCALE: ½"=1'-0"

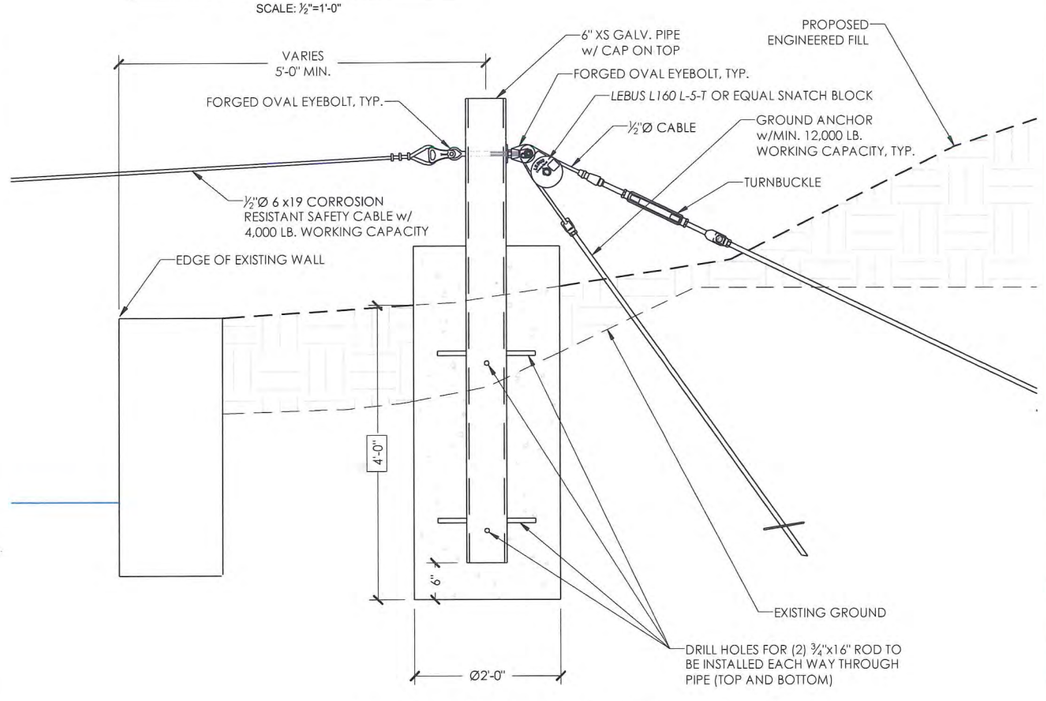
EXISTING ANCHOR IMAGE

SCALE: NONE



PROPOSED PLAN VIEW

SCALE: ½"=1'-0"



② EAST BANK FOUNDATION DETAIL

SCALE: ½"=1'-0"

EASTERN CABLE ANCHOR

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CABLE ANCHOR REPAIRS
2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

REVISIONS	NO.	BY	DATE

AS SHOWN

SCALE

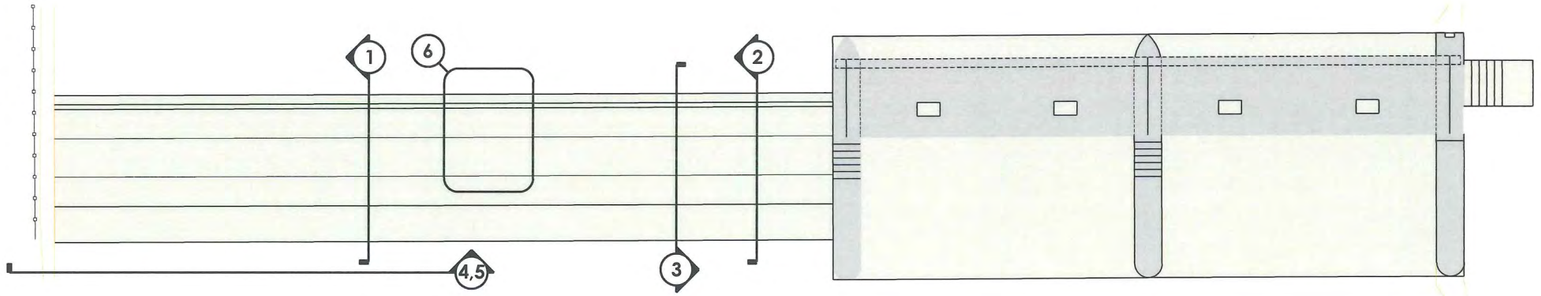
DRAWN BY SRR

DATE Feb. 2012

GEC FILE NO. 2-0212-67

SHEET NO.

S6.1

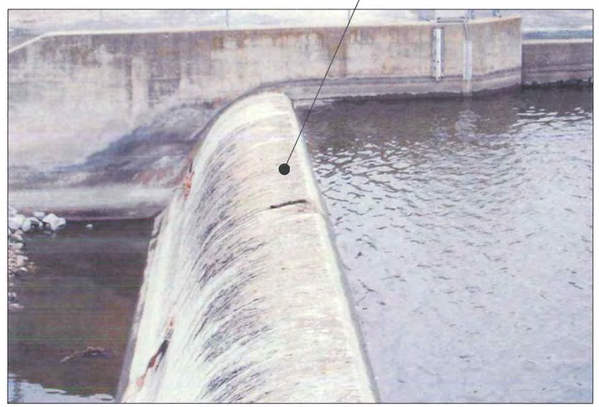


NOTES:

1.0 CONTRACTOR IS TO PERFORM SAND BLASTING AND POTENTIAL SPILLWAY REPAIRS AFTER LAKE SINISSIPPI IS LOWERED AT THE END OF OCTOBER. NO COFFERDAM IS PLANNED FOR THIS WORK.

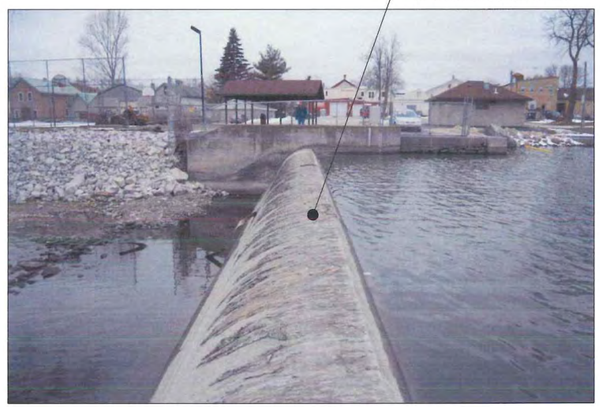
2.0 ONCE CLEANED, SPILLWAY SURFACE SHALL BE INSPECTED BY THE OWNER AND IT SHALL BE DETERMINED IF ADDITIONAL REPAIRS ARE NEEDED.

SAND BLAST TOP AND DOWNSTREAM FACE OF FIXED CREST SPILLWAY



1

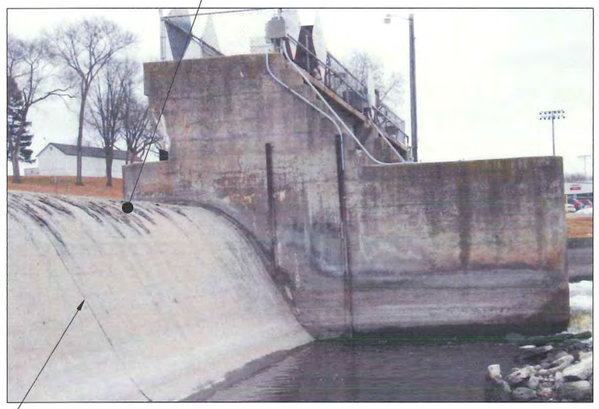
SAND BLAST TOP AND DOWNSTREAM FACE OF FIXED CREST SPILLWAY



2

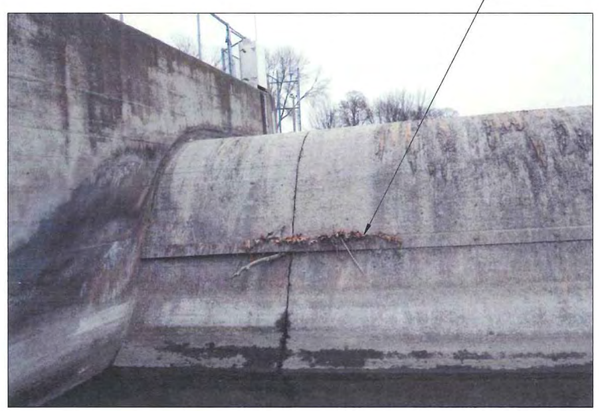
SAND BLAST TOP AND DOWNSTREAM FACE OF FIXED CREST SPILLWAY

EXPANSION JOINT, TYP.
FIELD VERIFY ½" CORK EXPANSION BOARD CONDITION

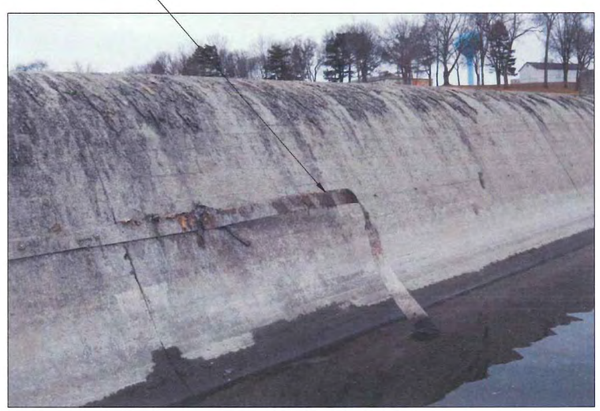


3

REMOVE EX. METAL STRIP CONDUCTOR, PART OF AN OLD ELECTRONIC FISH BARRIER



4



5

6

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MISC. CONCRETE REPAIR DETAILS

2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

REVISIONS	NO.	BY	DATE

NONE
SCALE

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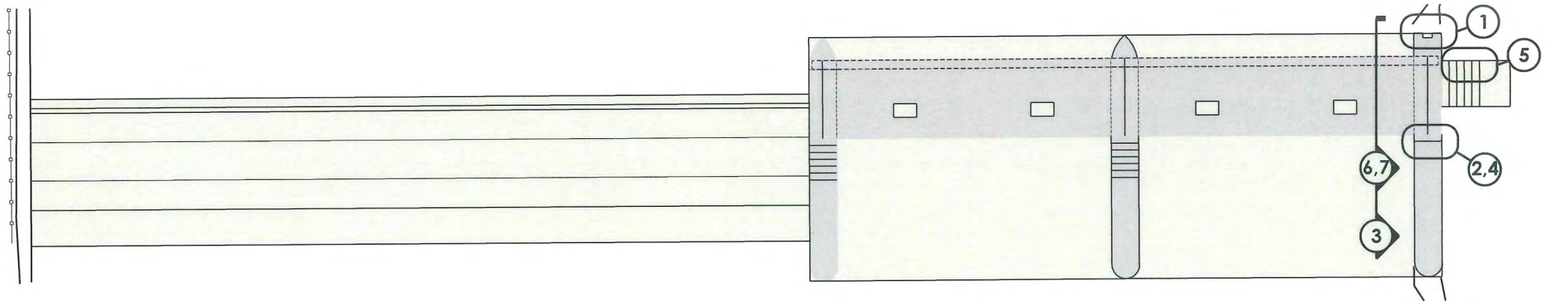
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.

S6.2

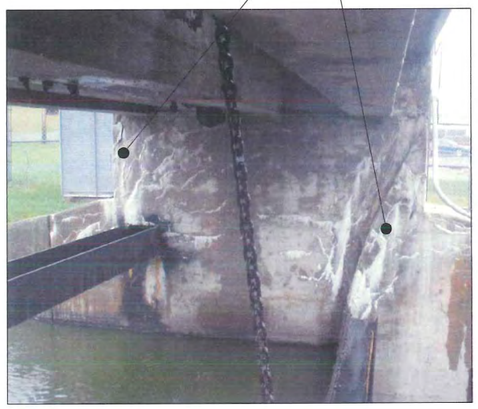


TAP EXISTING CRACKED AREAS AND REMOVE LOOSE CONCRETE.
ALL CONCRETE REPAIRS DEEPER THAN 2" SHALL BE MECHANICALLY ANCHORED.

1

2

TAP EXISTING CRACKED AREAS AND REMOVE LOOSE CONCRETE.
ALL CONCRETE REPAIRS DEEPER THAN 2" SHALL BE MECHANICALLY ANCHORED.



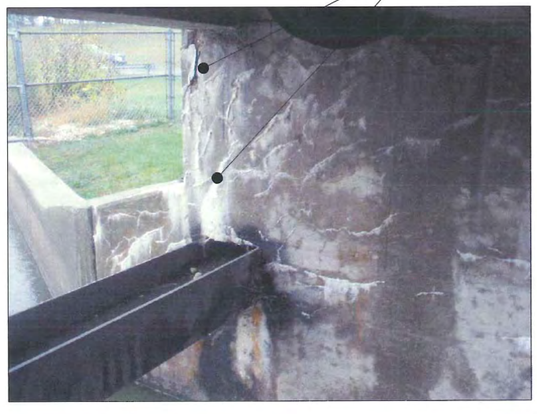
3

4

REPAIR CONCRETE STAIRS, TYP.

5

TAP EXISTING CRACKED AREAS AND REMOVE LOOSE CONCRETE.
ALL CONCRETE REPAIRS DEEPER THAN 2" SHALL BE MECHANICALLY ANCHORED.



6

7

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MISC. CONCRETE REPAIR DETAILS

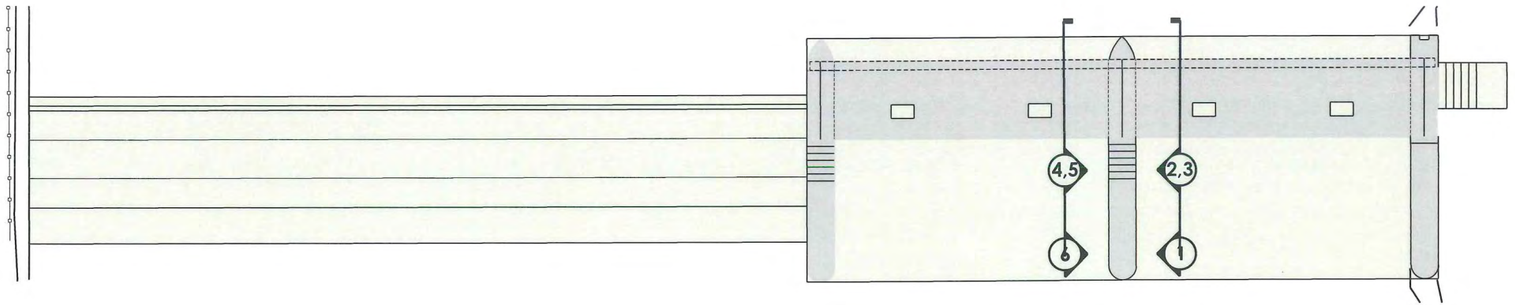
2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

REVISIONS	NO.	BY	DATE

NONE
SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
S6.3



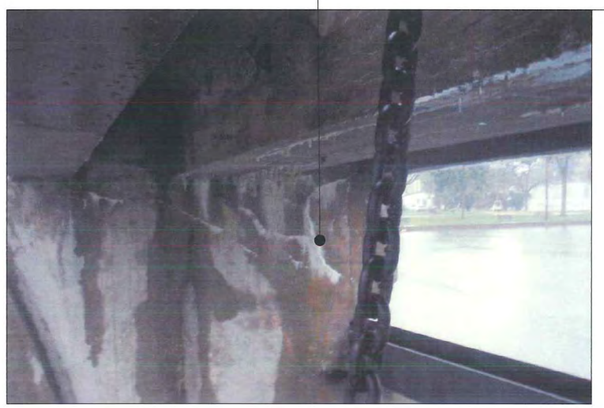
MIDDLE PIER
EAST FACE

1

MIDDLE PIER APPEARS TO HAVE LIMITED CRACK/SPALLED AREAS,
INSPECT CRACKED AREAS AND REMOVE LOOSE CONCRETE.
ALL CONCRETE REPAIRS DEEPER THAN 2" SHALL BE MECHANICALLY ANCHORED.

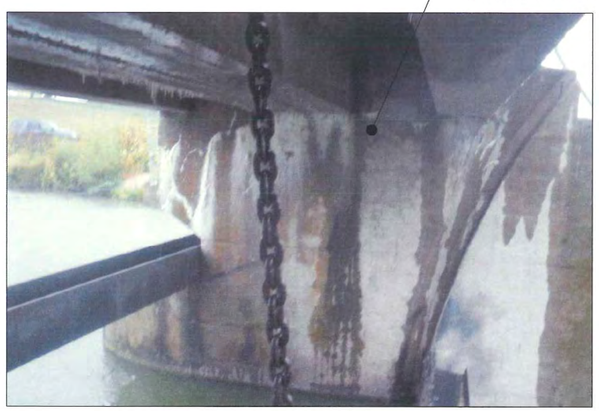
2

MIDDLE PIER APPEARS TO HAVE LIMITED CRACK/SPALLED AREAS,
INSPECT CRACKED AREAS AND REMOVE LOOSE CONCRETE.
ALL CONCRETE REPAIRS DEEPER THAN 2" SHALL BE MECHANICALLY ANCHORED.



3

MIDDLE PIER APPEARS TO HAVE LIMITED CRACK/SPALLED AREAS,
INSPECT CRACKED AREAS AND REMOVE LOOSE CONCRETE.
ALL CONCRETE REPAIRS DEEPER THAN 2" SHALL BE MECHANICALLY ANCHORED.



4

MIDDLE PIER APPEARS TO HAVE LIMITED CRACK/SPALLED AREAS,
INSPECT CRACKED AREAS AND REMOVE LOOSE CONCRETE.
ALL CONCRETE REPAIRS DEEPER THAN 2" SHALL BE MECHANICALLY ANCHORED.

5

MIDDLE PIER
WEST FACE

6

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MISC. CONCRETE REPAIR DETAILS

2012 Dam Improvements
Village of Hustisford

Village of Hustisford
Dodge County, WI

REVISIONS	NO.	BY	DATE

NONE
SCALE

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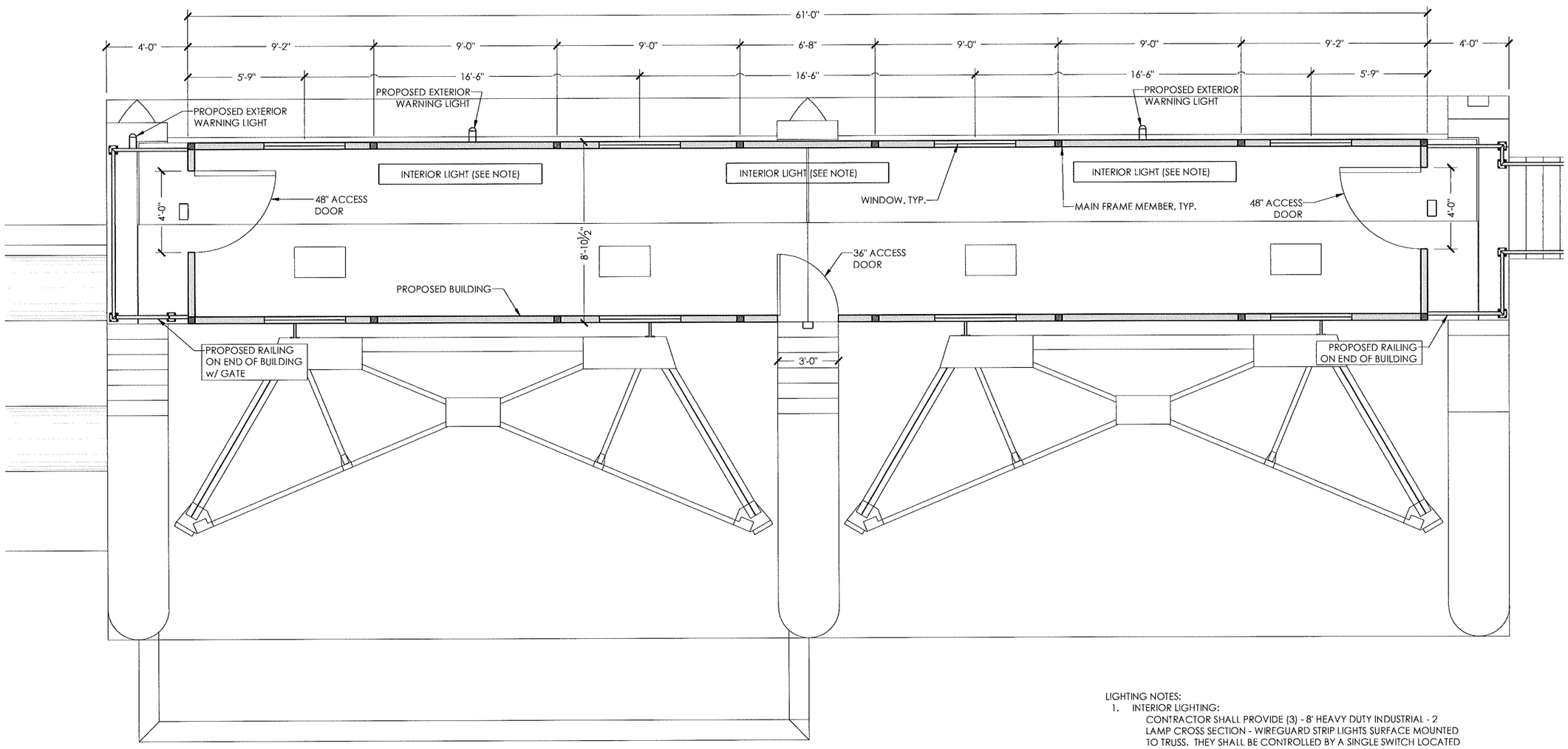
SHEET NO.

S6.4



LIGHTING NOTES:

1. INTERIOR LIGHTING:
   CONTRACTOR SHALL PROVIDE (3) - 8' HEAVY DUTY INDUSTRIAL - 2 LAMP CROSS SECTION - WIREGUARD STRIP LIGHTS SURFACE MOUNTED TO TRUSS. THEY SHALL BE CONTROLLED BY A SINGLE SWITCH LOCATED AT THE EAST ENTRANCE DOOR.
2. EXTERIOR LIGHTING:
   A. DAM WARNING LIGHT SHALL BE INSTALLED ABOVE EACH GATE OPENING AND FOR THE SPILLWAY. (3 TOTAL)
   B. CONTRACTOR SHALL PROVIDE (3) - LED WALL PACK - TRAPEZOID FULL CUT-OFF - INTEGRAL PHOTOCELL - BRONZE LIGHTS ABOVE BUILDING DOORS.

PROPOSED FLOOR PLAN
SCALE: AS SHOWN

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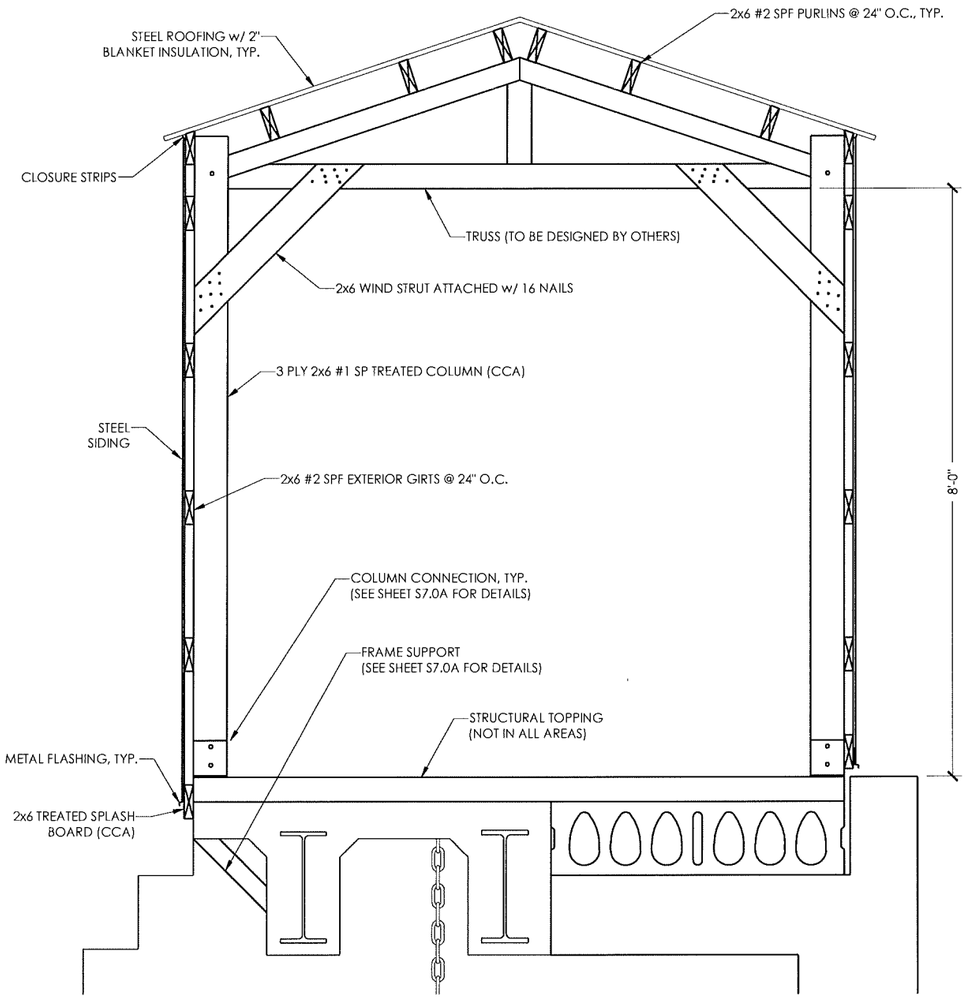
PROPOSED BUILDING FLOOR PLAN
2012 Dam Improvements
Village of Hustisford
ALTERNATE A: FULL DECK ENCLOSURE
Village of Hustisford
Dodge County, WI

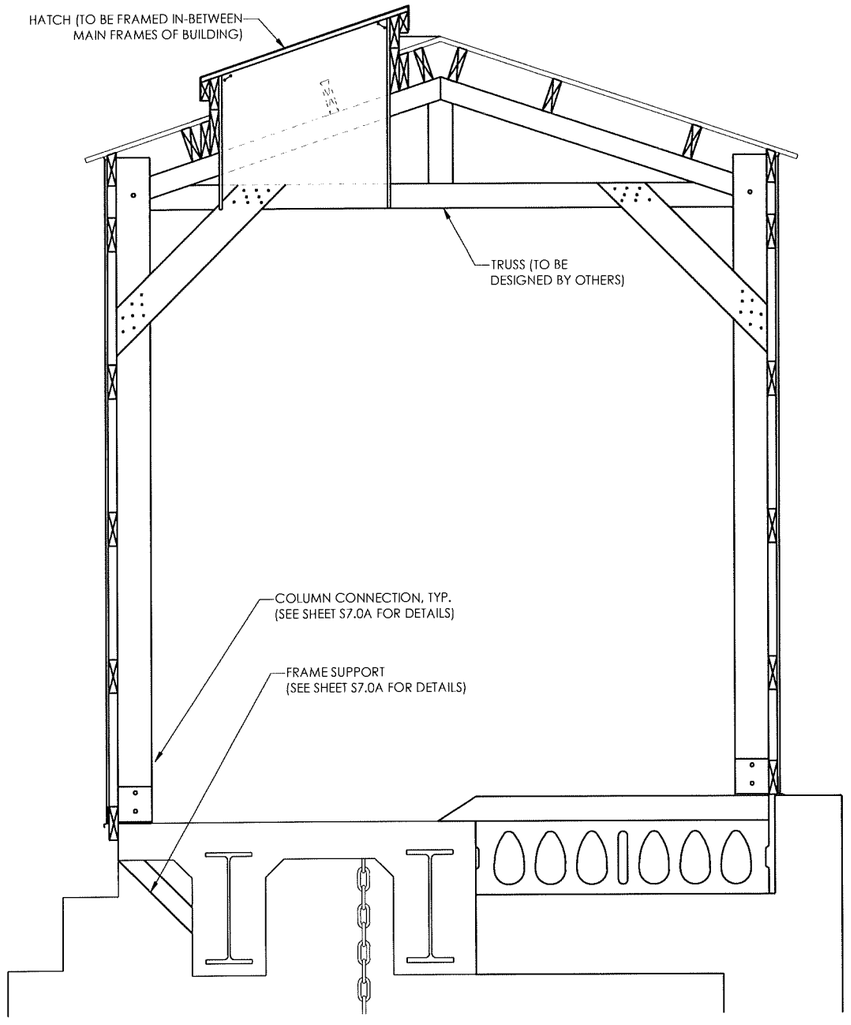
NO.	BY	DATE	REVISIONS

N
W E
S
0 3
3/16"=1'-0" (11x17)
SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
A1.0-A



1 **TYPICAL SECTION AT BUILDING FRAME**
SCALE: ½"=1'-0"



STRUCTURAL DESIGN DATA:

DESIGN CODE:
2011 WISCONSIN ENROLLED COMMERCIAL BUILDING CODE

SOIL LOAD:

ALLOWABLE NET SOIL BEARING PRESSURE (ASSUMED)	2,000 PSF

***SEISMIC LOAD:**

SEISMIC USE GROUP / OCCUPANCY CATEGORY	II
SEISMIC LOAD IMPORTANCE FACTOR (Ie)	1.0
SEISMIC SITE CLASS	D (ASSUMED)
MAPPED SPECTRAL RESPONSE ACCELERATION (Ss)	0.122
MAPPED SPECTRAL RESPONSE ACCELERATION (Sl)	0.048
SPECTRAL RESPONSE COEFFICIENT (Sds)	0.131
SPECTRAL RESPONSE COEFFICIENT (Sdl)	0.770
SEISMIC DESIGN CATEGORY	A

***WIND LOAD:**

BASIC WIND SPEED	90 MPH
BUILDING OCCUPANCY CATEGORY	II
WIND LOAD IMPORTANCE FACTOR (Iw)	1.0
WIND EXPOSURE	B
INTERNAL PRESSURE COEFFICIENTS	± 0.18

ROOF DESIGN LOAD:

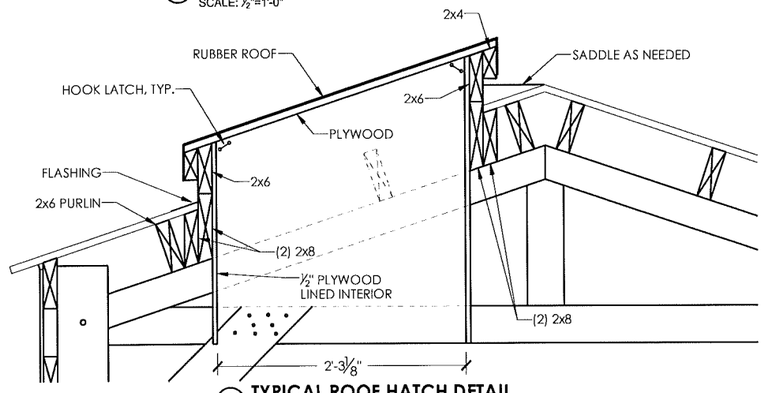
ROOF LIVE LOAD	25.50 PSF
ROOF DEAD LOAD	15 PSF

***SNOW LOAD:**

GROUND SNOW LOAD	30 PSF
SNOW EXPOSURE FACTOR (Ce)	1.0
SNOW IMPORTANCE FACTOR	1.0
THERMAL FACTOR	1.2
OCCUPANCY CATEGORY	II

***SEISMIC, WIND, AND SNOW LOAD CALCULATIONS AND DESIGN DATA SHALL BE PERFORMED AND SUPPLIED BY THE TRUSS MANUFACTURER.**

2 **TYPICAL SECTION AT ROOF HATCH**
SCALE: ½"=1'-0"



3 **TYPICAL ROOF HATCH DETAIL**
SCALE: ¾"=1'-0"

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PROPOSED BUILDING SECTIONS
2012 Dam Improvements
Village of Hustisford
ALTERNATE A: FULL DECK ENCLOSURE
Village of Hustiford
Dodge County, WI

NO.	BY	DATE	REVISIONS

AS NOTED
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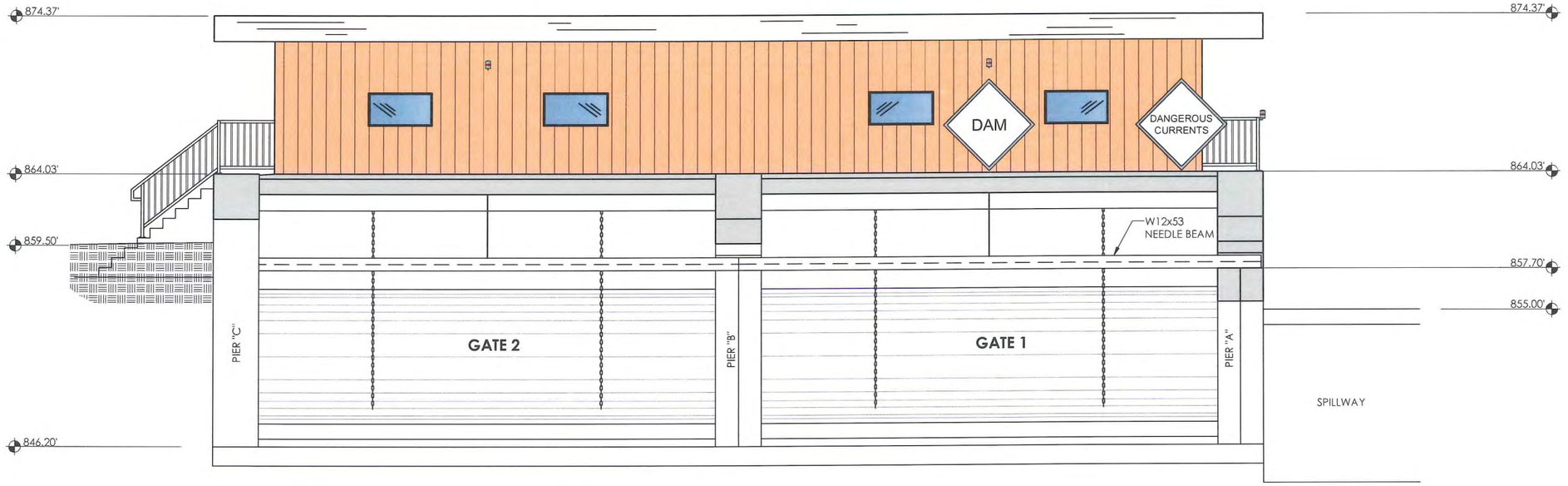
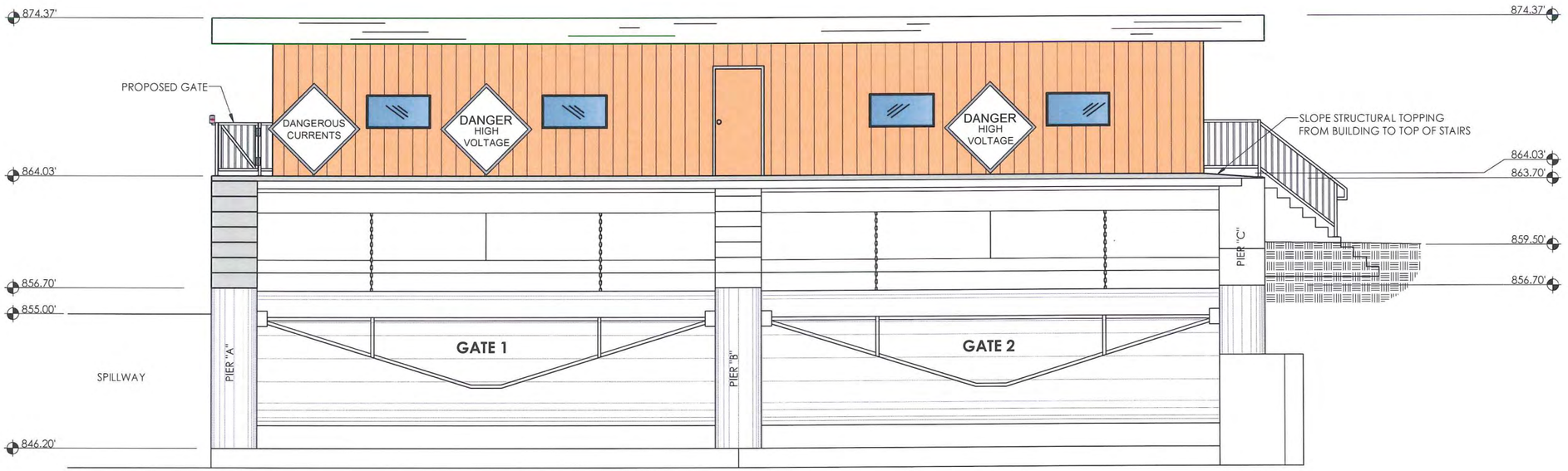
SHEET NO.
A2.0-A



1 **UPSTREAM ELEVATION**
SCALE: ⅛"=1'-0"



2 **DOWNSTREAM ELEVATION**
SCALE: ⅛"=1'-0"

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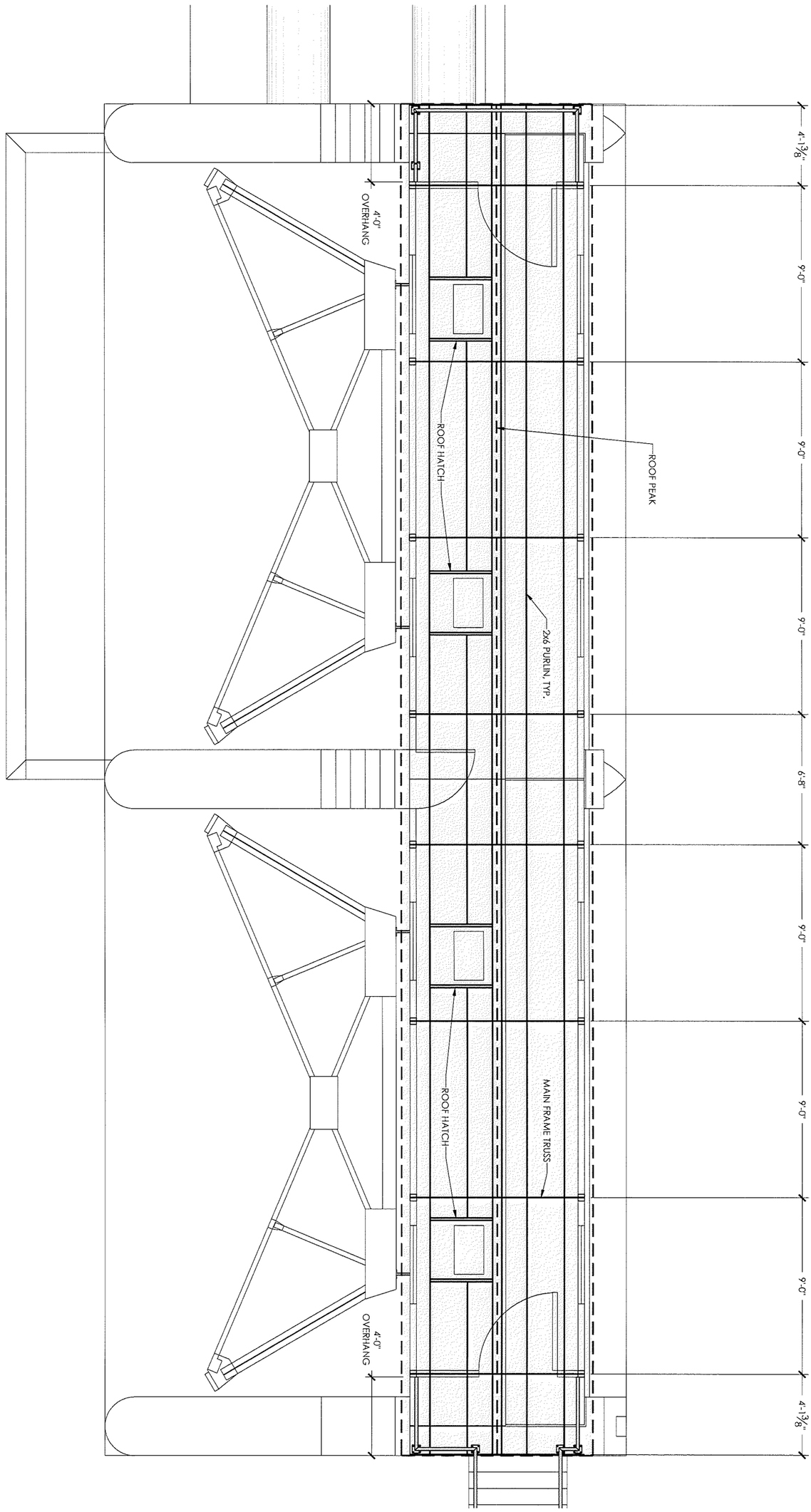
PROPOSED BUILDING ELEVATIONS

2012 Dam Improvements
Lake Sinissippi Improvement District
ALTERNATE A: FULL DECK ENCLOSURE
Village of Hustiford
Dodge County, WI

NO.	BY	DATE	REVISIONS

⅛"=1'-0" (11x17)
0 4
SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
A3.0-A



PROPOSED ROOF PLAN

SCALE: AS SHOWN

DRAWN BY	SRR
DATE	Feb. 2012
GEC FILE NO.	2-0212-67
SHEET NO.	**A4.0-A**

3/16"=1'-0" (11x17) SCALE

REVISIONS	NO.	BY	DATE

PROPOSED BUILDING ROOF PLAN

2012 Dam Improvements

Village of Hustisford

ALTERNATE A: FULL DECK ENCLOSURE

Village of Hustisford
Dodge County, WI

General Engineering Company

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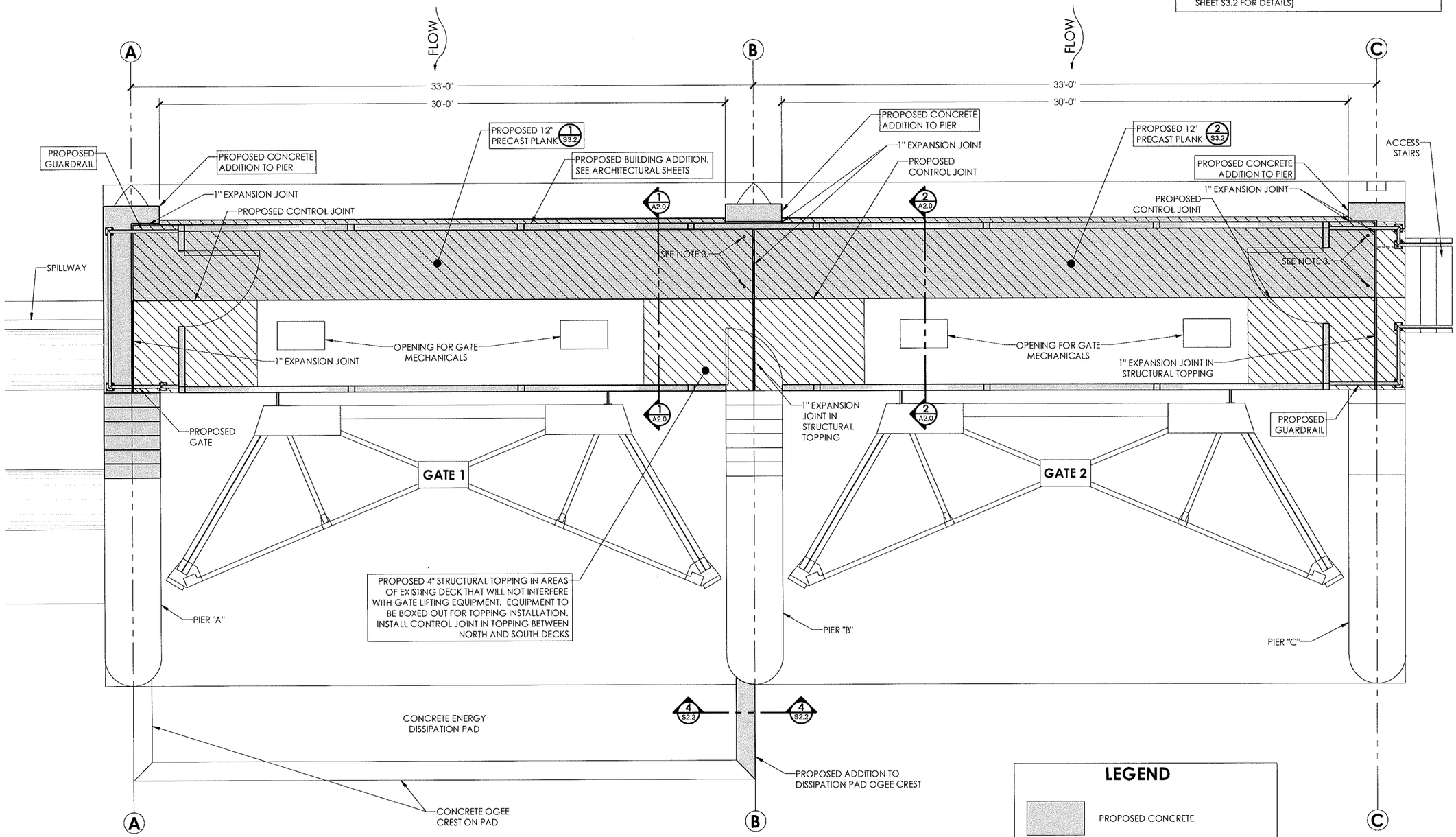
NOTES:
1. GATE LIFTING EQUIPMENT NOT SHOWN FOR CLARITY.
2. GATE LIFTING EQUIPMENT SHALL NOT BE DISTURBED DURING CONSTRUCTION.
3. PRECAST PLANK TO BE ANCHORED TO PIER (SEE DETAIL 5, SHEET S3.2 FOR DETAILS)



PROPOSED PLAN VIEW
SCALE: AS SHOWN

LEGEND

- PROPOSED CONCRETE
- PROPOSED 12" THICK SPANCRETE WITH 4" STRUCTURAL TOPPING
- PROPOSED 4" STRUCTURAL TOPPING OVER EXISTING CONCRETE DECK

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PROPOSED DAM PLAN VIEW
2012 Dam Improvements
Village of Hustisford
ALTERNATE A: FULL DECK ENCLOSURE
Village of Hustisford
Dodge County, WI

REVISIONS	NO.	BY	DATE

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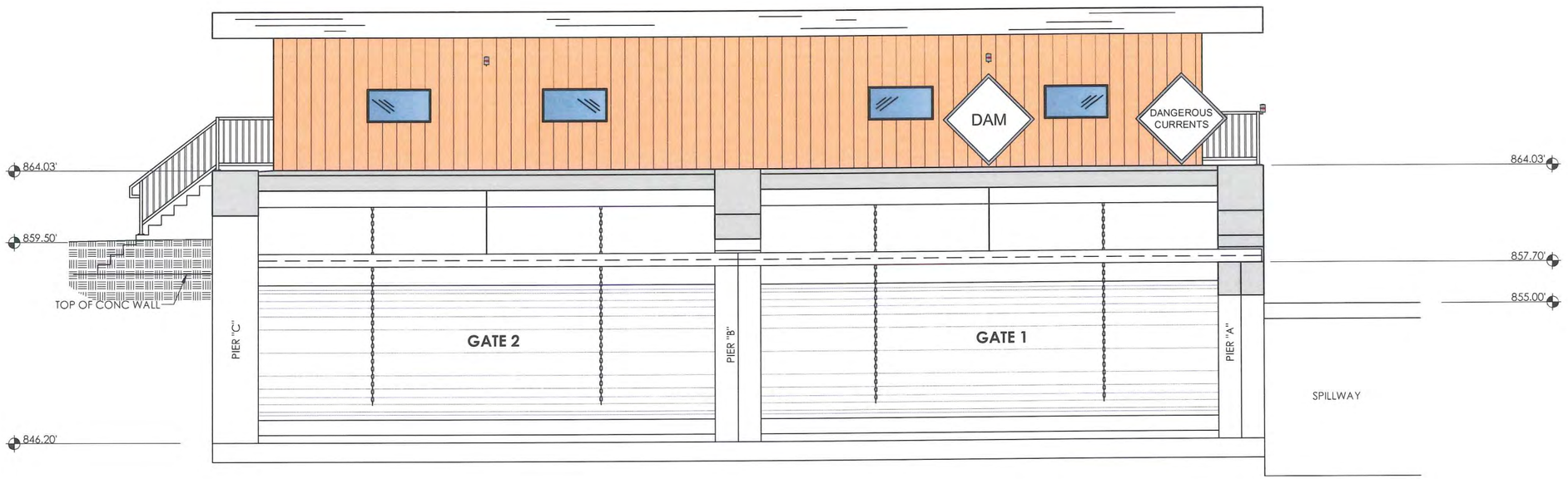
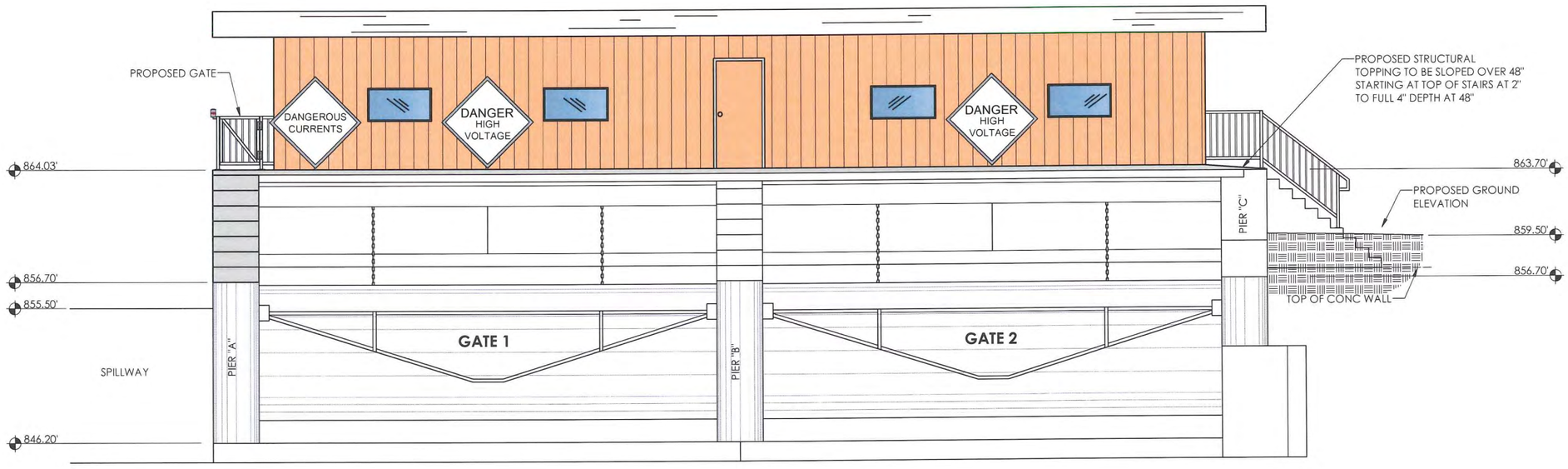
3/16"=1'-0" (11x17) SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
S2.1-A



1 UPSTREAM ELEVATION

SCALE: ⅛"=1'-0"



2 DOWNSTREAM ELEVATION

SCALE: ⅛"=1'-0"

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PROPOSED DAM ELEVATIONS

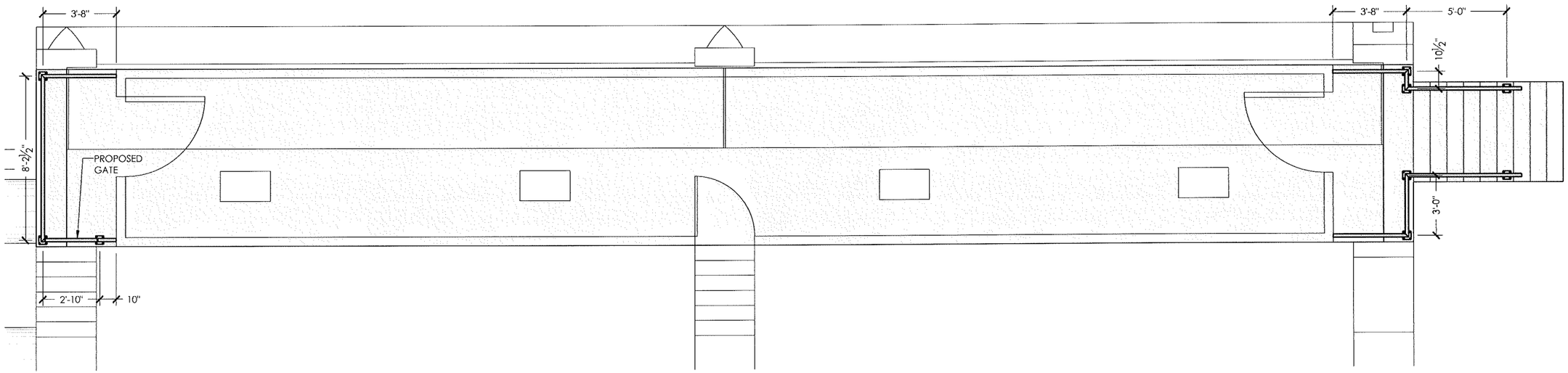
2012 Dam Improvements
Village of Hustisford
ALTERNATE A: FULL DECK ENCLOSURE
Village of Hustisford
Dodge County, WI

NO.	BY	DATE	REVISIONS

0 4
⅛"=1'-0" (11x17)
SCALE

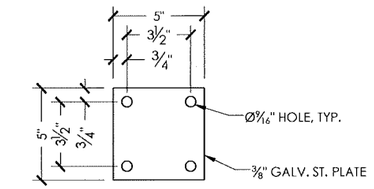
DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.

S2.3-A



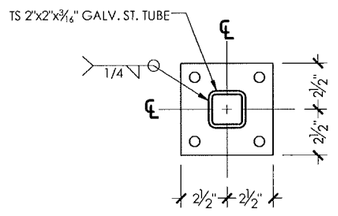
TYPICAL GUARDRAIL LAYOUT

SCALE: 3/16"=1'-0"



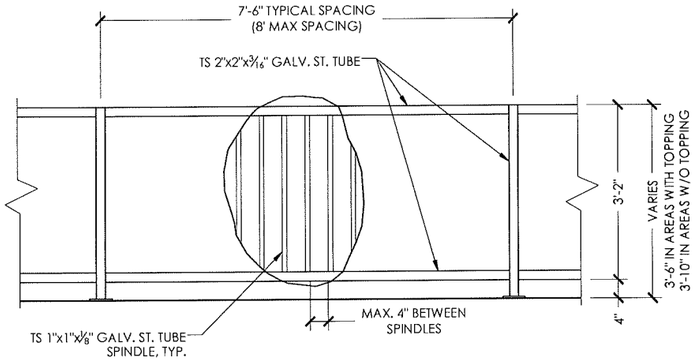
1 TYPICAL BASE PLATE

SCALE: 1½"=1'-0"



2 TYPICAL POST TO BASE PLATE DETAIL

SCALE: 1½"=1'-0"



3 TYPICAL GUARDRAIL DETAILS

SCALE: ¾"=1'-0"

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PROPOSED GUARDRAIL DETAILS

2012 Dam Improvements
Village of Hustisford

ALTERNATE A: FULL DECK ENCLOSURE

Village of Hustisford
Dodge County, WI

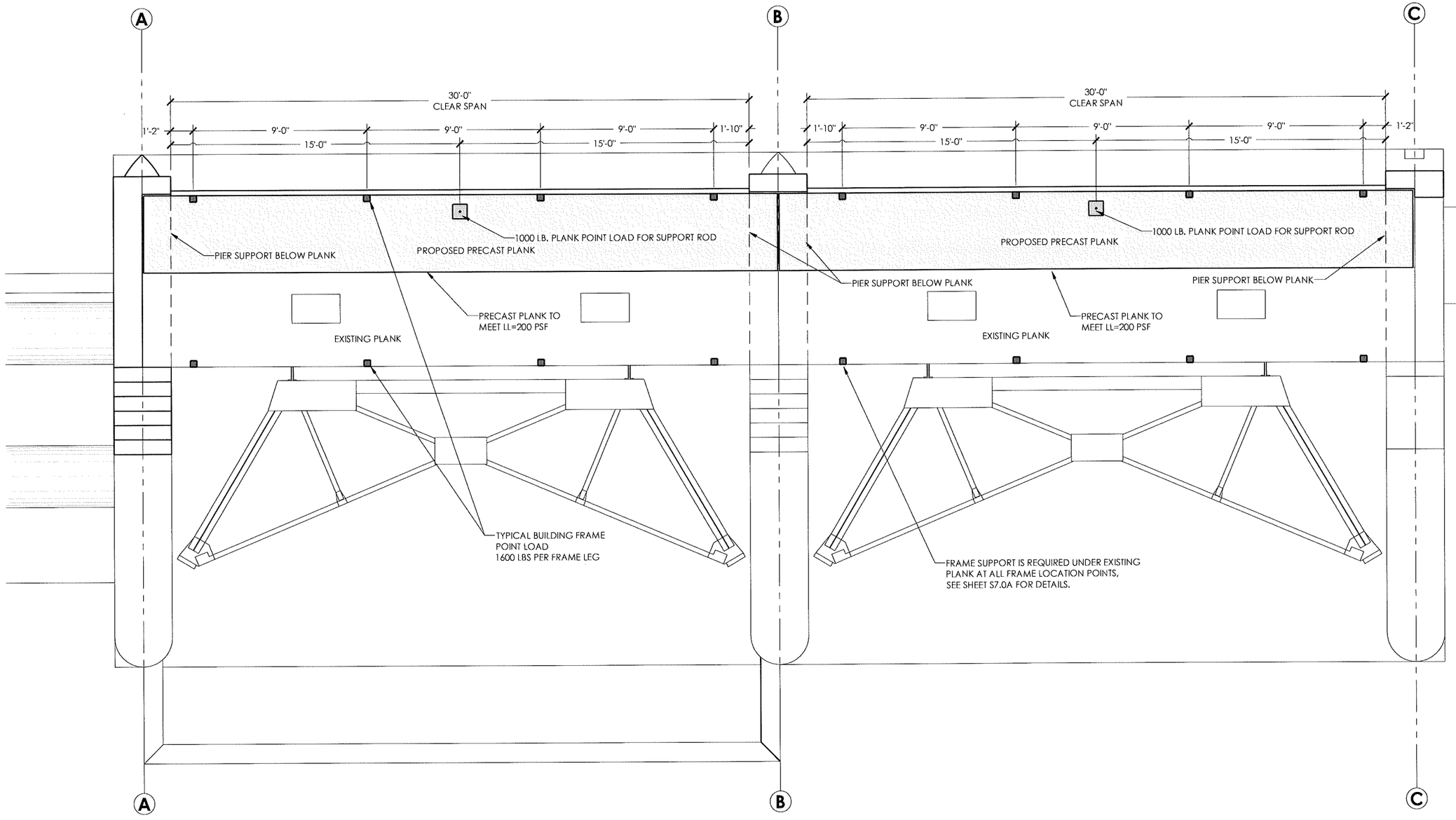
REVISIONS	NO.	BY	DATE

AS SHOWN
SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.

S3.4-A

NOTES:
1. PRECAST PLANK TO HAVE CORES FILLED @ BEARING POINTS.
2. SUPPORT BRACKET WILL BE REQUIRED UNDER ALL BUILDING FRAME LOCATION POINTS. (SEE SHEET S7.0A, FOR DETAILS.)



PROPOSED LOADINGS

SCALE: AS SHOWN

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BRIDGE DECK LOADING DETAILS

2012 Dam Improvements
Village of Hustisford
ALTERNATE A: FULL DECK ENCLOSURE
Village of Hustisford
Dodge County, WI

REVISIONS	NO.	BY	DATE

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3/16"=1'-0" (11x17)
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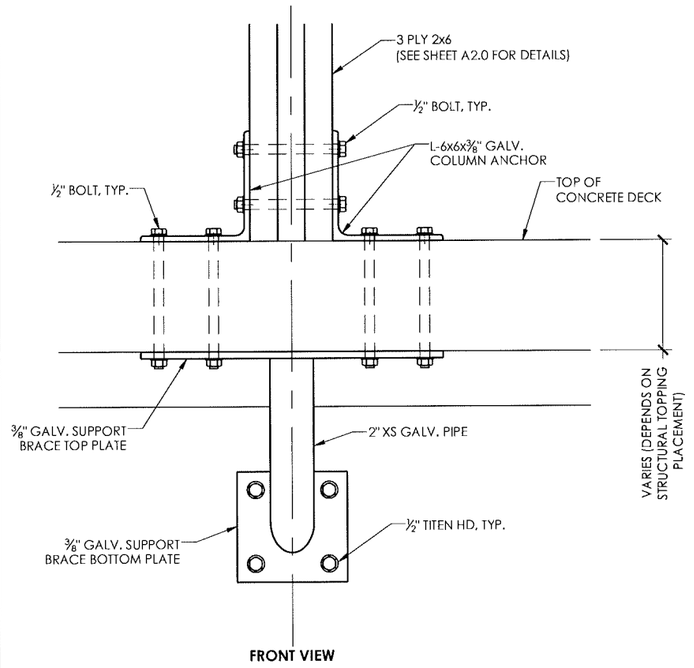
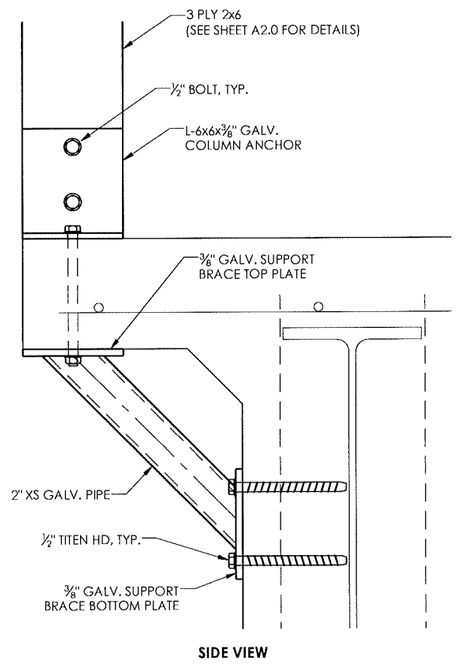
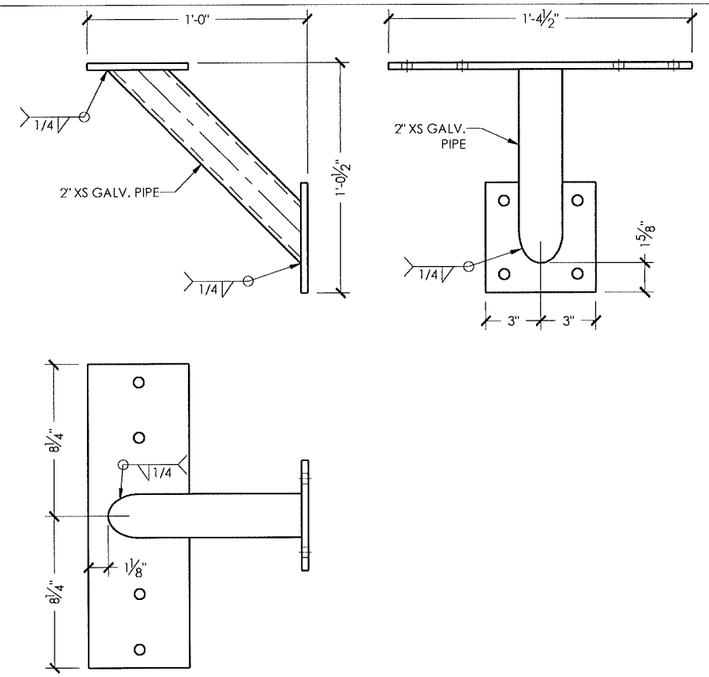
DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
S4.0-A





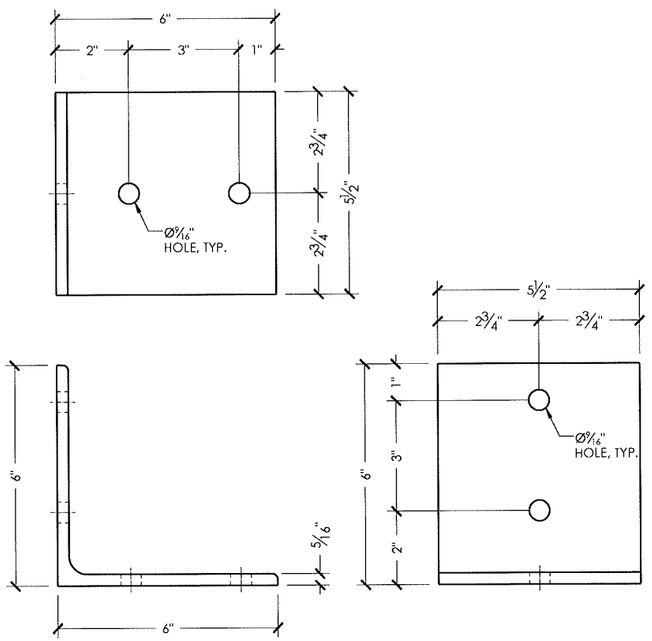
BUILDING COLUMN CONNECTION & SUPPORT DETAIL

SCALE: 1½"=1'-0"



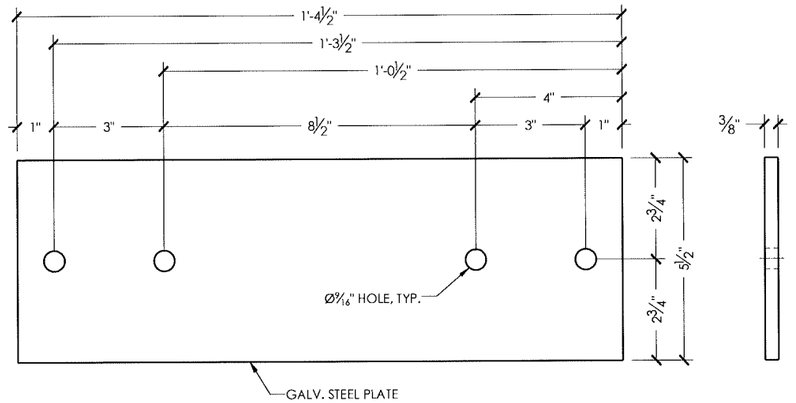
COLUMN SUPPORT DETAIL

SCALE: 1½"=1'-0"



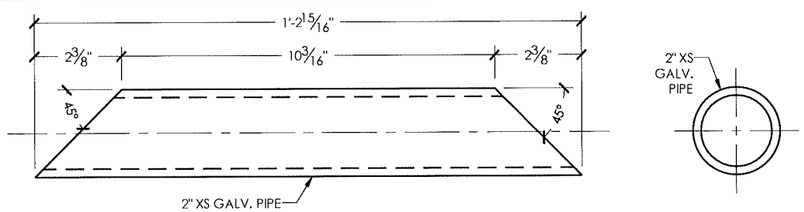
① COLUMN BASE PLATE

SCALE: 3"=1'-0"



② ⅜" STEEL TOP PLATE

SCALE: 3"=1'-0"

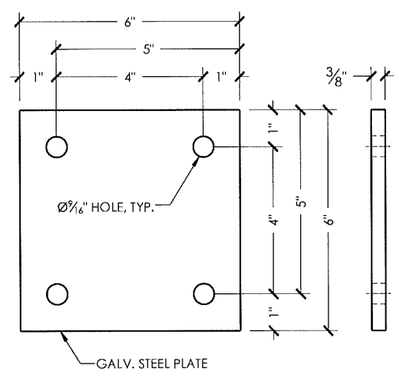


③ 2" XS PIPE

SCALE: 3"=1'-0"

- DETAILS SHOWN ON THIS SHEET ARE FOR CONNECTING & SUPPORTING THE BUILDING COLUMNS ONTO THE ***EXISTING BEAM DECK.***
- FOR COLUMN CONNECTIONS ONTO THE ***PROPOSED BEAM DECK***, USE OF THE BASE PLATES ONLY IS REQUIRED. FASTEN BASE PLATES TO DECK USING ZINC PLATED TITEN HD ANCHOR BOLTS, NOT THROUGH BOLTS AS SHOWN FOR EXISTING BEAM DECK. NO LOWER COLUMN SUPPORT IS NEEDED. PROPOSED BEAM DECK TO BE CONSTRUCTED TO SUPPORT BUILDING FRAME LOADING.

COLUMN CONNECTION & SUPPORT NOTES



④ ⅜" STEEL BOTTOM PLATE

SCALE: 3"=1'-0"

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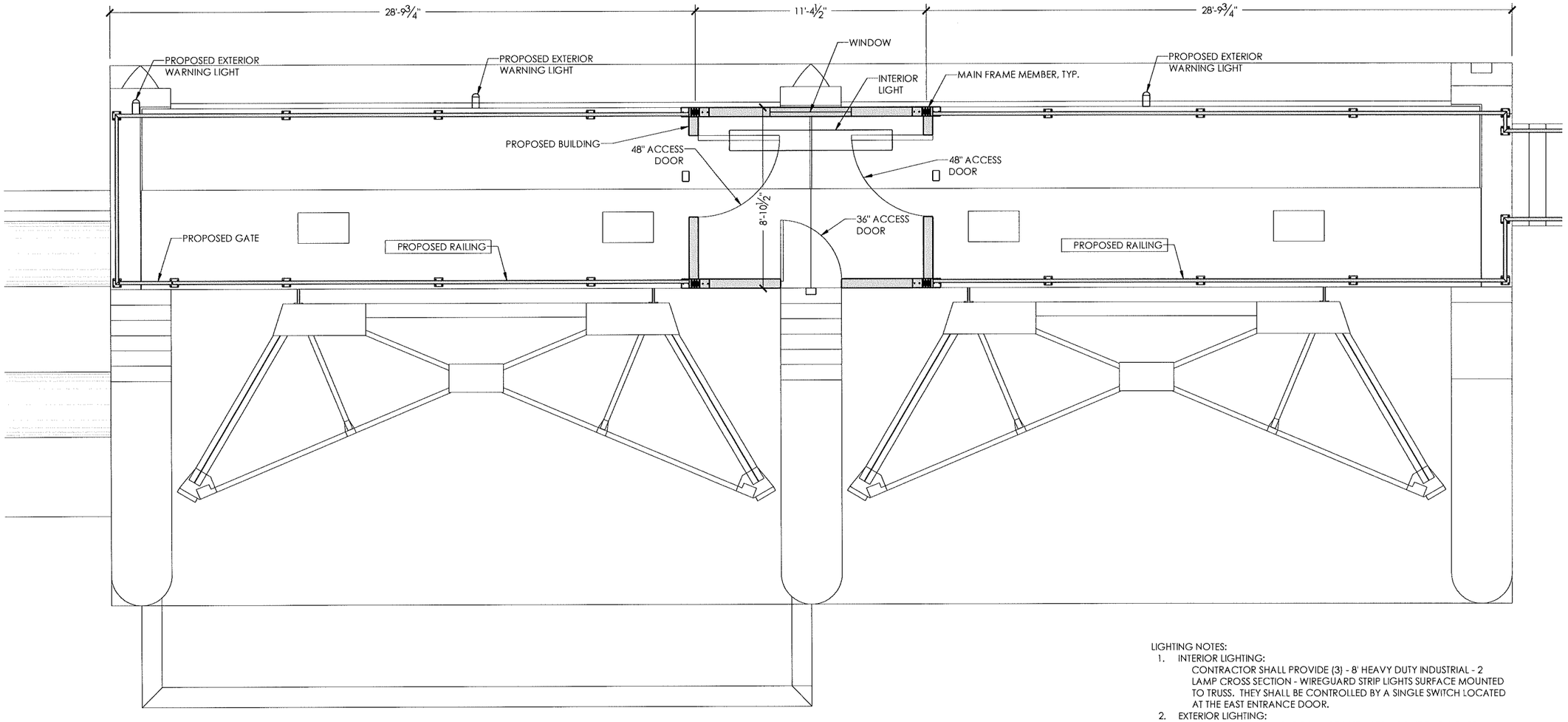
MISC DETAILS
2012 Dam Improvements
Village of Hustisford
ALTERNATE A: FULL DECK ENCLOSURE
Village of Hustisford
Dodge County, WI

NO.	REVISIONS	BY	DATE

AS NOTED
SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
S7.0-A



LIGHTING NOTES:

1. INTERIOR LIGHTING:
   CONTRACTOR SHALL PROVIDE (3) - 8' HEAVY DUTY INDUSTRIAL - 2 LAMP CROSS SECTION - WIREGUARD STRIP LIGHTS SURFACE MOUNTED TO TRUSS. THEY SHALL BE CONTROLLED BY A SINGLE SWITCH LOCATED AT THE EAST ENTRANCE DOOR.
2. EXTERIOR LIGHTING:
   A. DAM WARNING LIGHT SHALL BE INSTALLED ABOVE EACH GATE OPENING AND FOR THE SPILLWAY. (3 TOTAL)
   B. CONTRACTOR SHALL PROVIDE (3) - LED WALL PACK - TRAPEZOID FULL CUT-OFF - INTEGRAL PHOTOCELL - BRONZE LIGHTS ABOVE BUILDING DOORS.

PROPOSED FLOOR PLAN

SCALE: AS SHOWN

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PROPOSED BUILDING FLOOR PLAN
2012 Dam Improvements
Village of Hustisford
ALTERNATE B: FULL DECK ENCLOSURE
Village of Hustisford
Dodge County, WI

NO.	BY	DATE	REVISIONS

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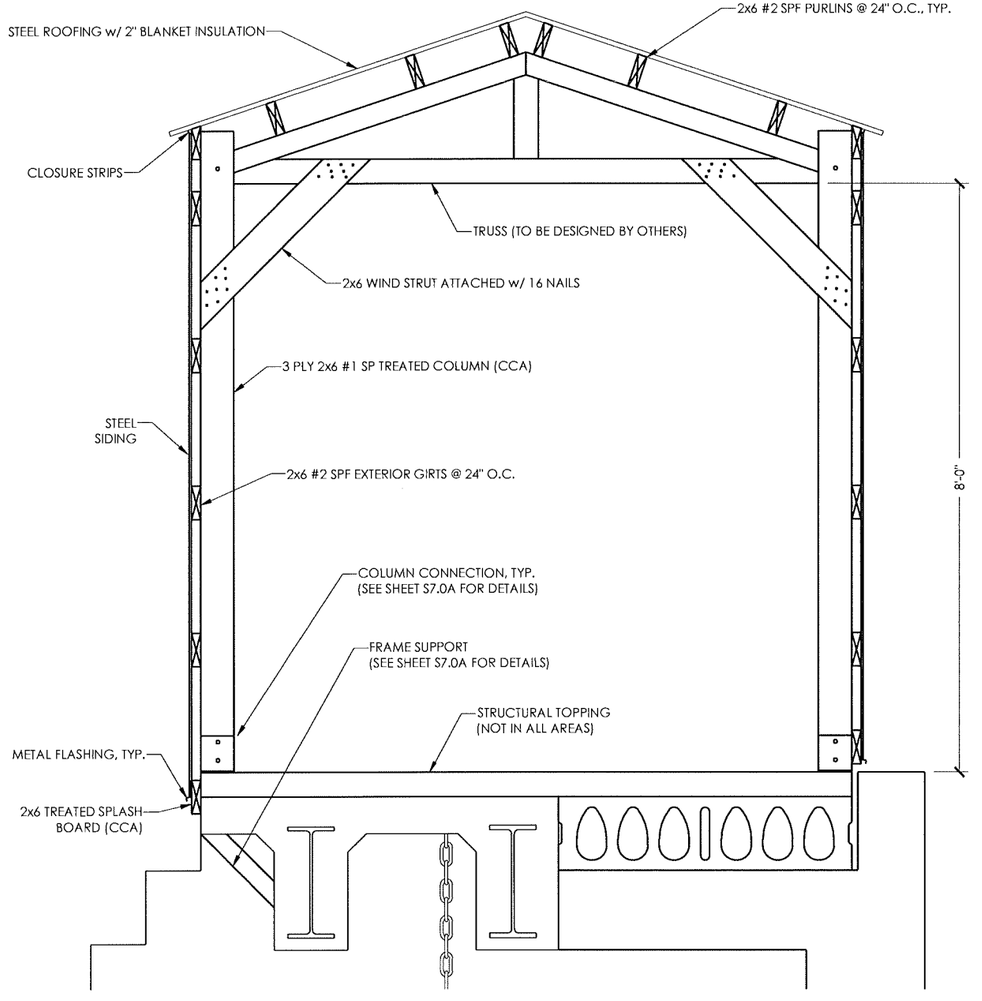
3/16"=1'-0" (11x17)
SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
A1.0-B



1 TYPICAL SECTION AT BUILDING FRAME

SCALE: ½"=1'-0"

STRUCTURAL DESIGN DATA:

DESIGN CODE:

2011 WISCONSIN ENROLLED COMMERCIAL BUILDING CODE

SOIL LOAD:

ALLOWABLE NET SOIL BEARING PRESSURE (ASSUMED)	2,000 PSF

***SEISMIC LOAD:**

SEISMIC USE GROUP / OCCUPANCY CATEGORY	II
SEISMIC LOAD IMPORTANCE FACTOR (Ie)	1.0
SEISMIC SITE CLASS	D (ASSUMED)
MAPPED SPECTRAL RESPONSE ACCELERATION (Ss)	0.122
MAPPED SPECTRAL RESPONSE ACCELERATION (Si)	0.048
SPECTRAL RESPONSE COEFFICIENT (Sds)	0.131
SPECTRAL RESPONSE COEFFICIENT (Sdl)	0.770
SEISMIC DESIGN CATEGORY	A

***WIND LOAD:**

BASIC WIND SPEED	90 MPH
BUILDING OCCUPANCY CATEGORY	II
WIND LOAD IMPORTANCE FACTOR (Iw)	1.0
WIND EXPOSURE	B
INTERNAL PRESSURE COEFFICIENTS	± 0.18

ROOF DESIGN LOAD:

ROOF LIVE LOAD	25.50 PSF
ROOF DEAD LOAD	15 PSF

***SNOW LOAD:**

GROUND SNOW LOAD	30 PSF
SNOW EXPOSURE FACTOR (Ce)	1.0
SNOW IMPORTANCE FACTOR	1.0
THERMAL FACTOR	1.2
OCCUPANCY CATEGORY	II

***SEISMIC, WIND, AND SNOW LOAD CALCULATIONS AND DESIGN DATA SHALL BE PERFORMED AND SUPPLIED BY THE TRUSS MANUFACTURER.**

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PROPOSED BUILDING SECTIONS

2012 Dam Improvements
Village of Hustisford
ALTERNATE B: FULL DECK ENCLOSURE
Village of Hustisford
Dodge County, WI

NO.	BY	DATE	REVISIONS

AS NOTED
SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
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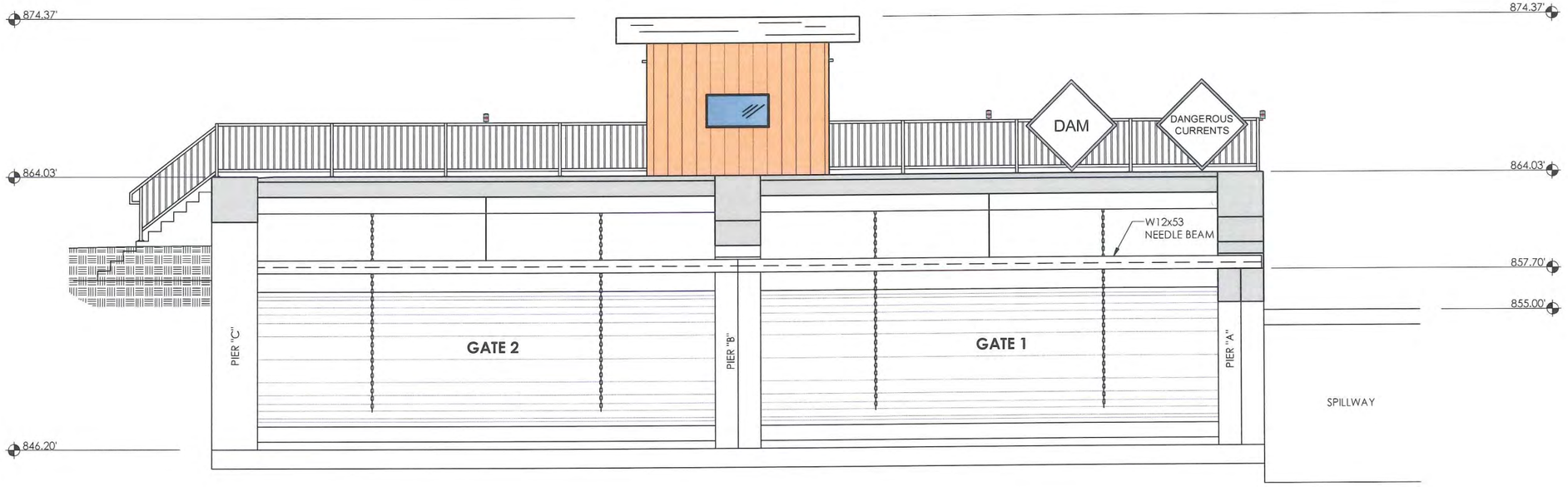
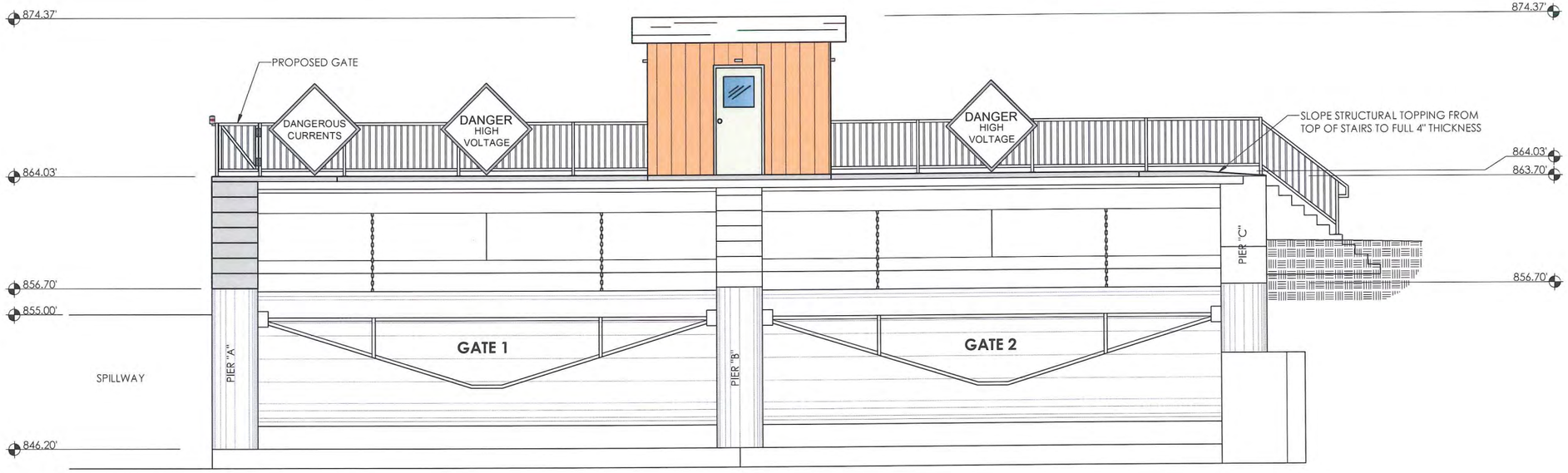


1 **UPSTREAM ELEVATION**
SCALE: ⅛"=1'-0"



2 **DOWNSTREAM ELEVATION**
SCALE: ⅛"=1'-0"

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PROPOSED BUILDING ELEVATIONS

2012 Dam Improvements
Lake Sinissippi Improvement District
ALTERNATE B: PARTIAL DECK ENCLOSURE
Village of Hustiford
Dodge County, WI

NO.	REVISIONS	BY	DATE

⅛"=1'-0" (11x17)
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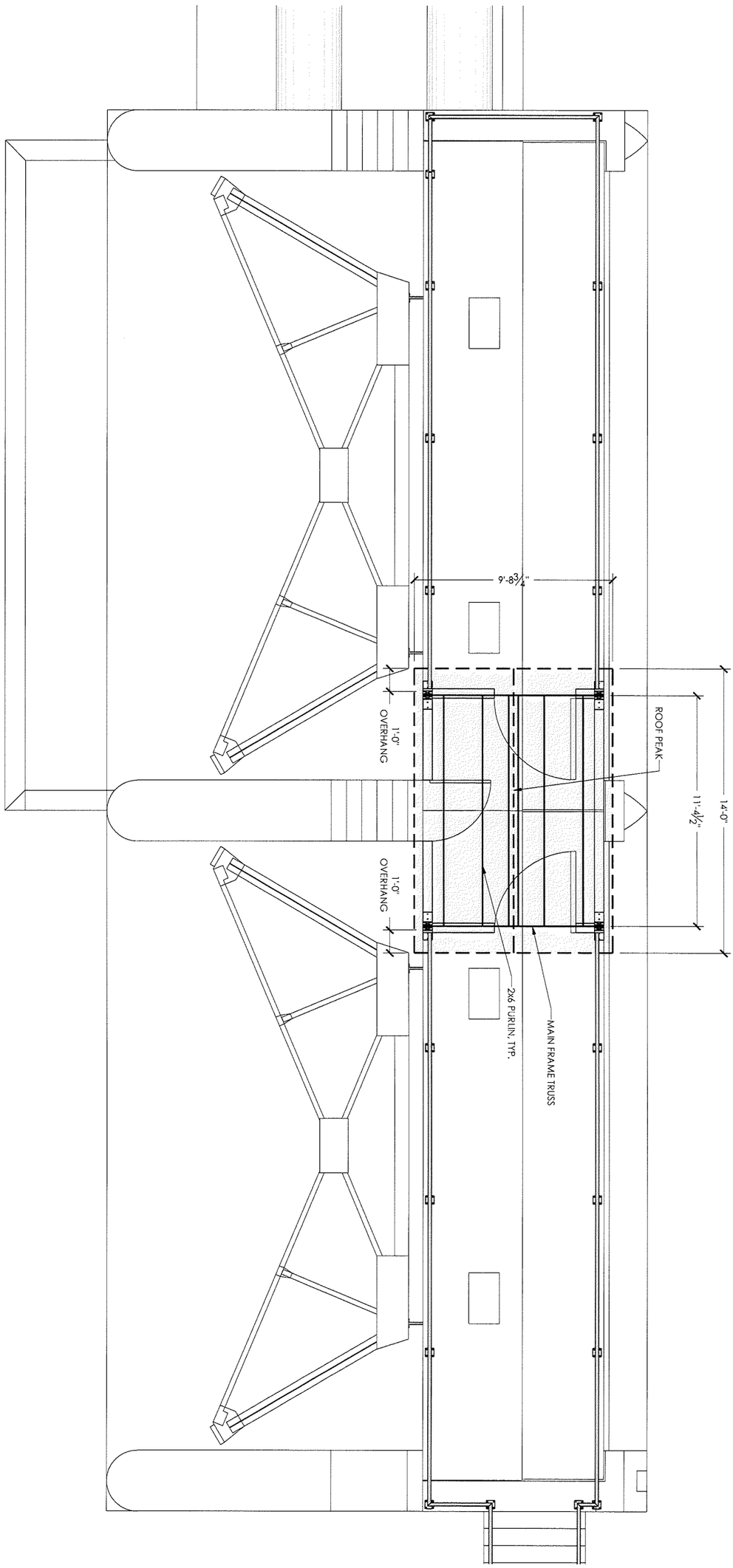
SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
A3.0-B



PROPOSED ROOF PLAN

SCALE: AS SHOWN

REVISIONS	NO.	BY	DATE

PROPOSED BUILDING ROOF PLAN
2012 Dam Improvements
Village of Hustisford
ALTERNATE B: PARTIAL DECK ENCLOSURE
Village of Hustisford
Dodge County, WI

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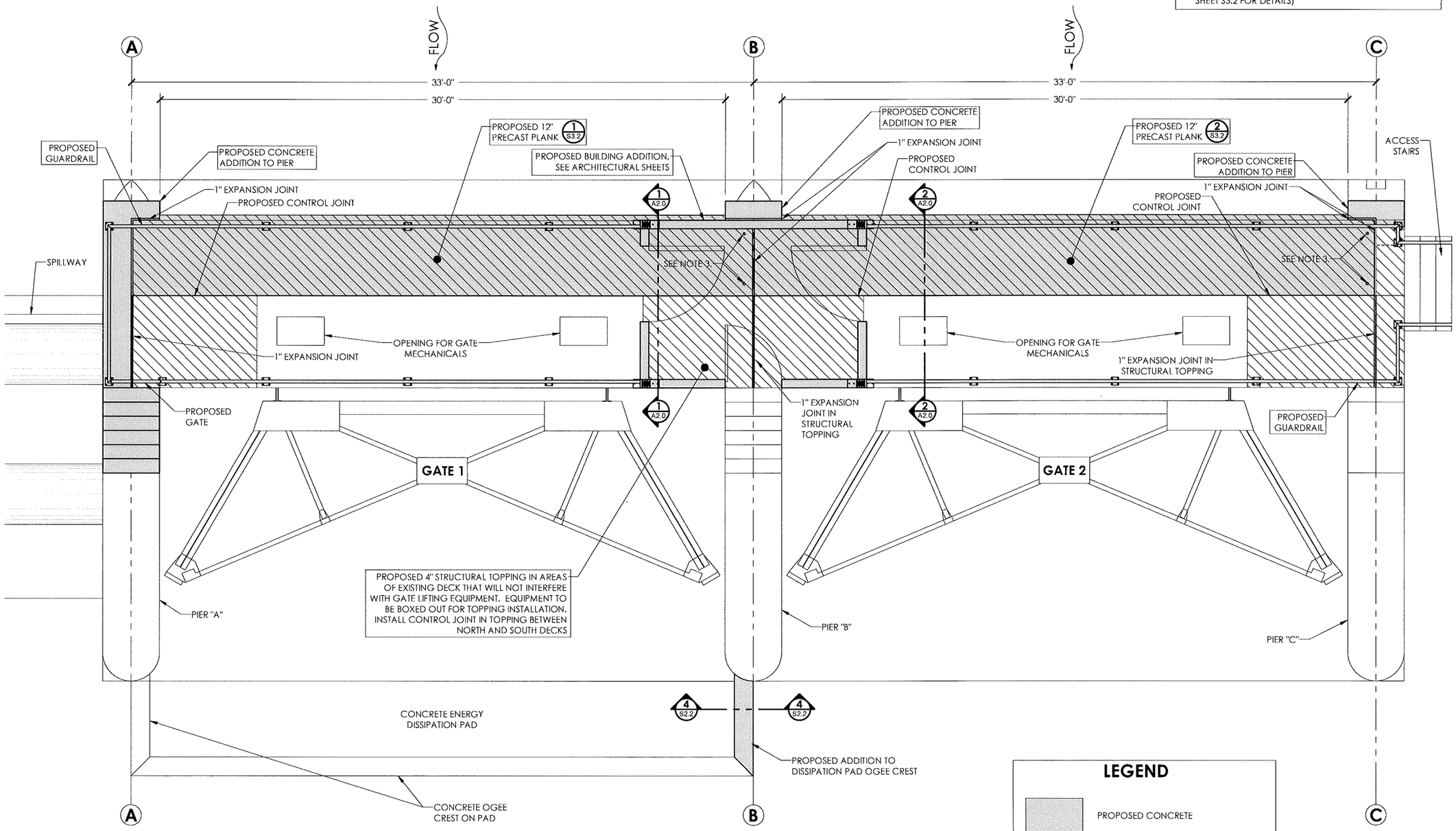
DRAWN BY: SRR
DATE: Feb. 2012
GEC FILE NO.: 2-0212-67
SHEET NO.: **A4.0-B**

3/16"=1'-0" (11X17)
SCALE

NOTES:
1. GATE LIFTING EQUIPMENT NOT SHOWN FOR CLARITY.
2. GATE LIFTING EQUIPMENT SHALL NOT BE DISTURBED DURING CONSTRUCTION.
3. PRECAST PLANK TO BE ANCHORED TO PIER (SEE DETAIL 5, SHEET S3.2 FOR DETAILS)



PROPOSED PLAN VIEW
SCALE: AS SHOWN

LEGEND

- PROPOSED CONCRETE
- PROPOSED 12" THICK SPANCRETE WITH 4" STRUCTURAL TOPPING
- PROPOSED 4" STRUCTURAL TOPPING OVER EXISTING CONCRETE DECK

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PROPOSED DAM PLAN VIEW
2012 Dam Improvements
Village of Hustisford
ALTERNATE B: PARTIAL DECK ENCLOSURE
Village of Hustisford
Dodge County, WI

NO.	REVISIONS	BY	DATE

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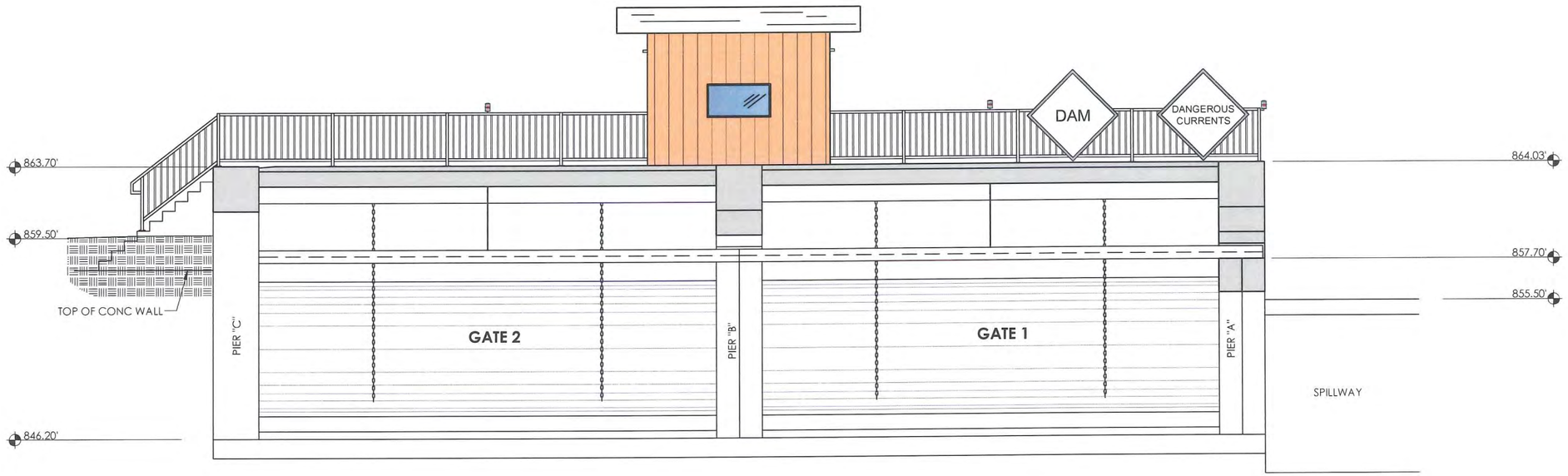
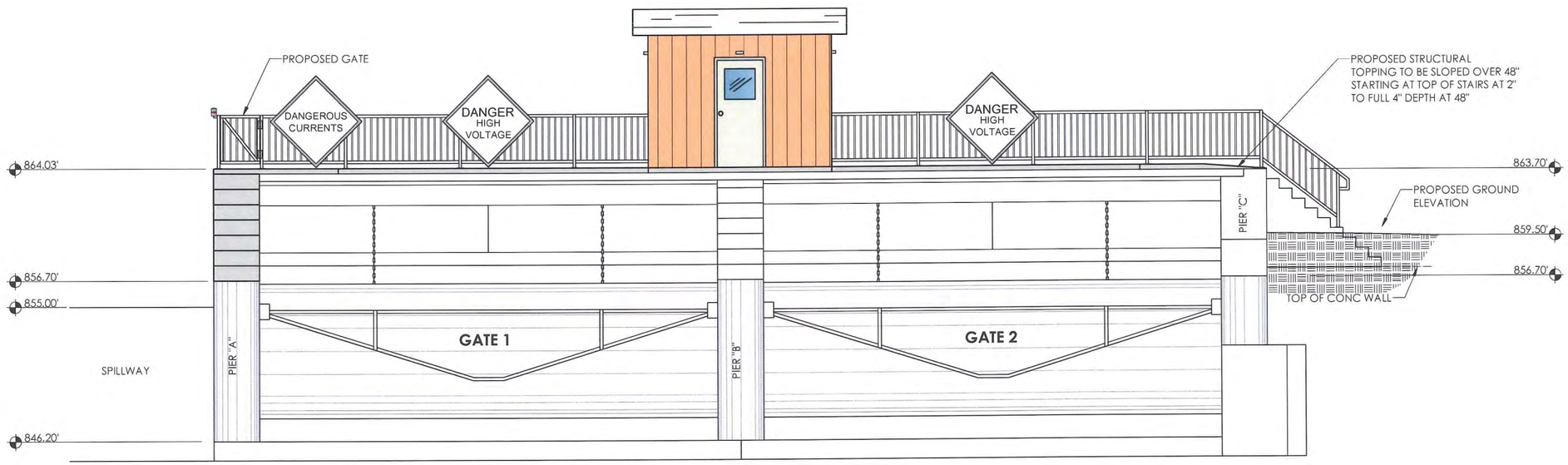
3/16"=1'-0" (11x17)
SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
S2.1-B



1 UPSTREAM ELEVATION

SCALE: ⅛"=1'-0"



2 DOWNSTREAM ELEVATION

SCALE: ⅛"=1'-0"

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PROPOSED DAM ELEVATIONS

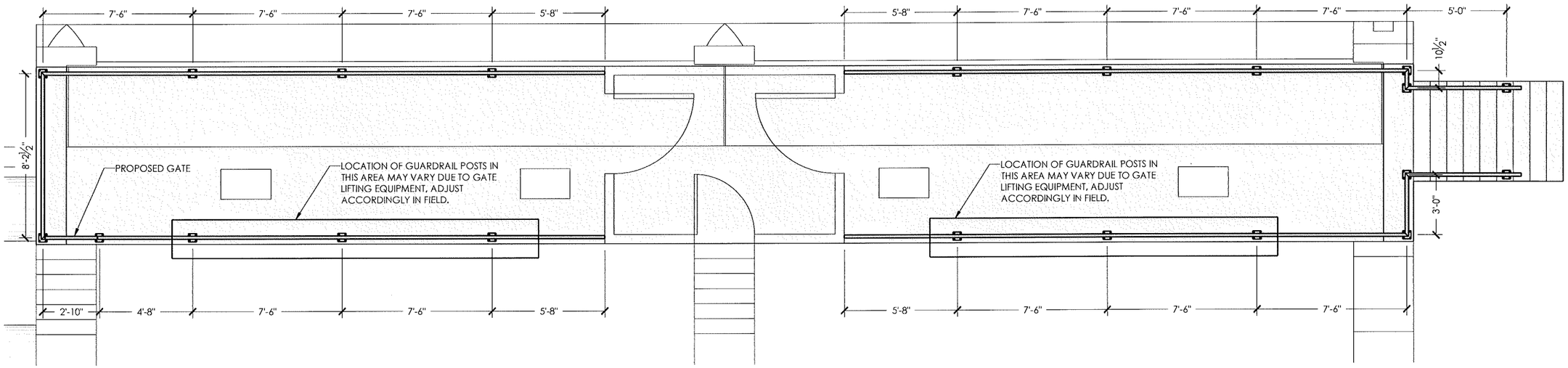
2012 Dam Improvements
Village of Hustisford
ALTERNATE B: PARTIAL DECK ENCLOSURE
Village of Hustisford
Dodge County, WI

NO.	BY	DATE	REVISIONS

0 4
⅛"=1'-0" (11x17)
SCALE

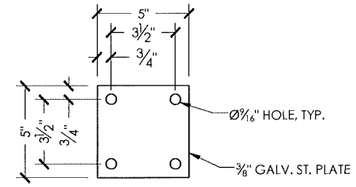
DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.

S2.3-B



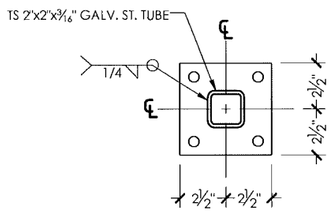
TYPICAL GUARDRAIL LAYOUT

SCALE: 3/16"=1'-0"



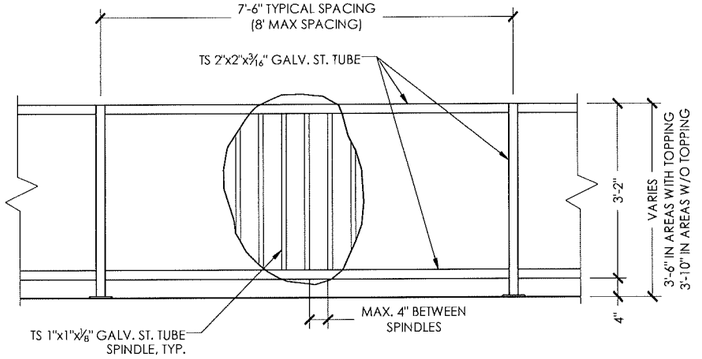
1 TYPICAL BASE PLATE

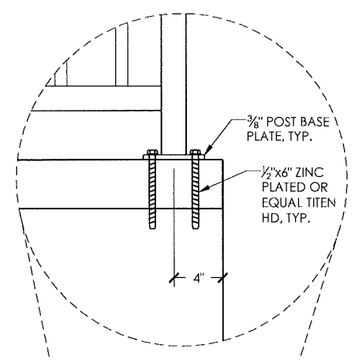
SCALE: 1½"=1'-0"

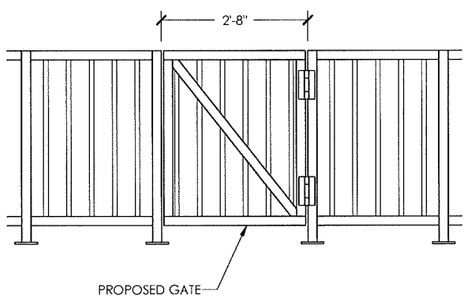


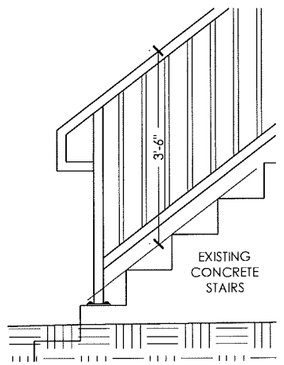
2 TYPICAL POST TO BASE PLATE DETAIL

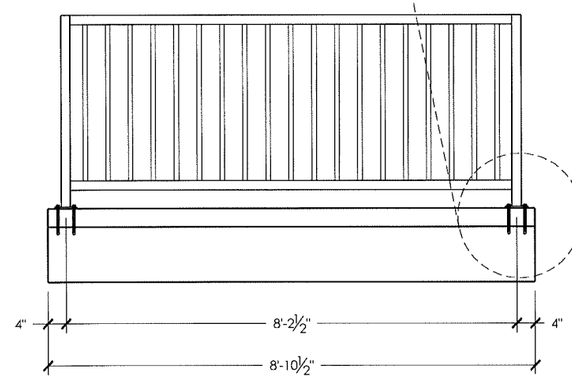
SCALE: 1½"=1'-0"











3 TYPICAL GUARDRAIL DETAILS

SCALE: ⅜"=1'-0"

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PROPOSED GUARDRAIL DETAILS

2012 Dam Improvements
Village of Hustisford
ALTERNATE B: PARTIAL DECK ENCLOSURE
Village of Hustisford
Dodge County, WI

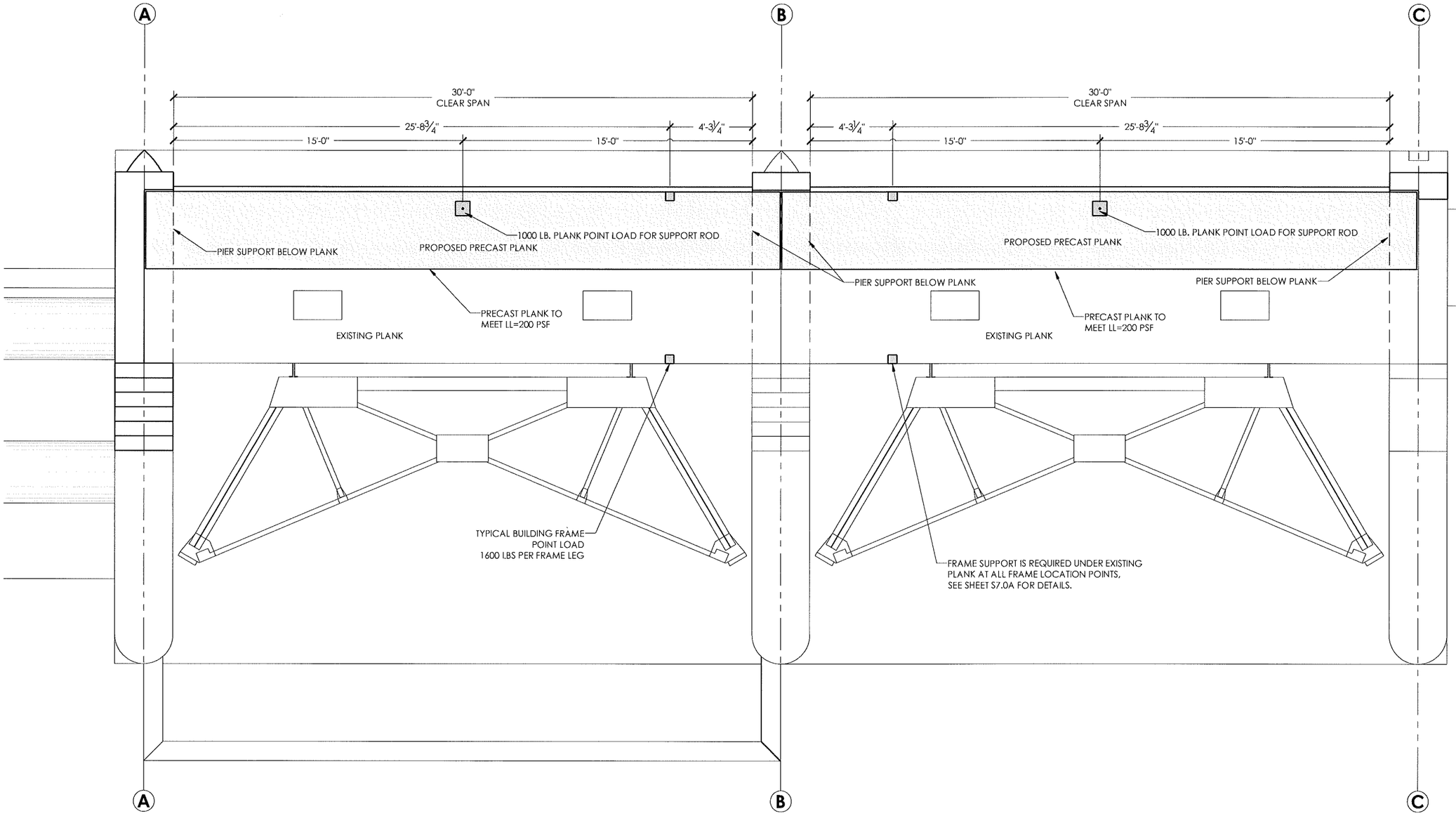
REVISIONS	NO.	BY	DATE

AS SHOWN
SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.

S3.4-B

NOTES:
1. PRECAST PLANK TO HAVE CORES FILLED @ BEARING POINTS.
2. SUPPORT BRACKET WILL BE REQUIRED UNDER ALL BUILDING FRAME LOCATION POINTS. (SEE SHEET S7.0A, FOR DETAILS.)



PROPOSED LOADINGS

SCALE: AS SHOWN

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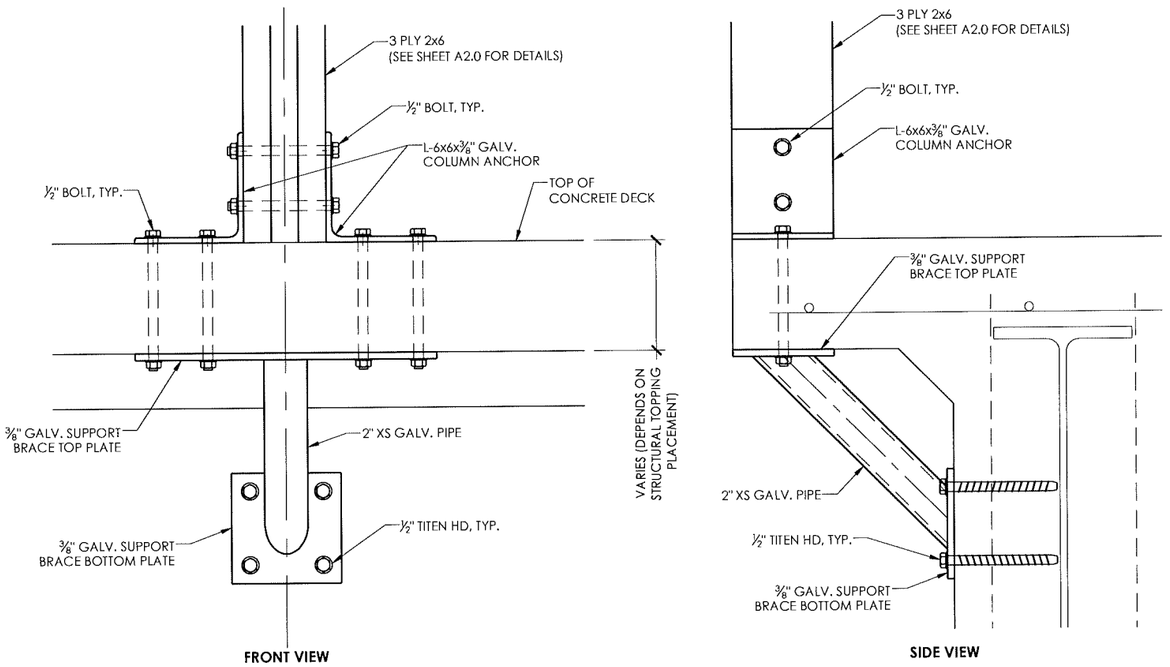
BRIDGE DECK LOADING DETAILS
2012 Dam Improvements
Village of Hustisford
ALTERNATE B: PARTIAL DECK ENCLOSURE
Village of Hustisford
Dodge County, WI

REVISIONS	NO.	BY	DATE

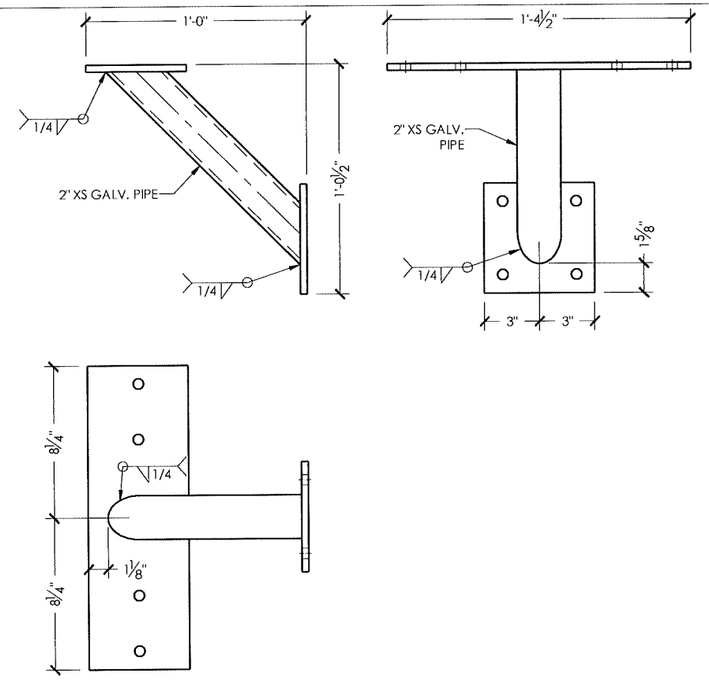
N W E S
0 3
3/16"=1'-0" (11x17) SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
S4.0-B



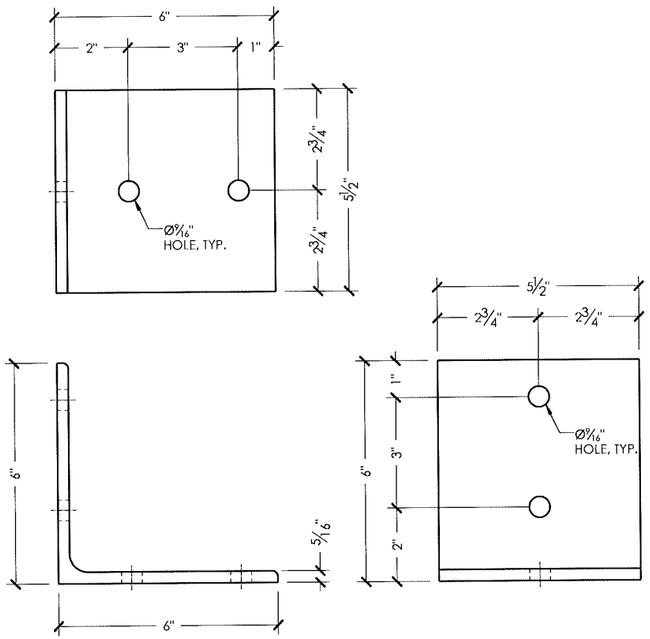
BUILDING COLUMN CONNECTION & SUPPORT DETAIL

SCALE: 1½"=1'-0"



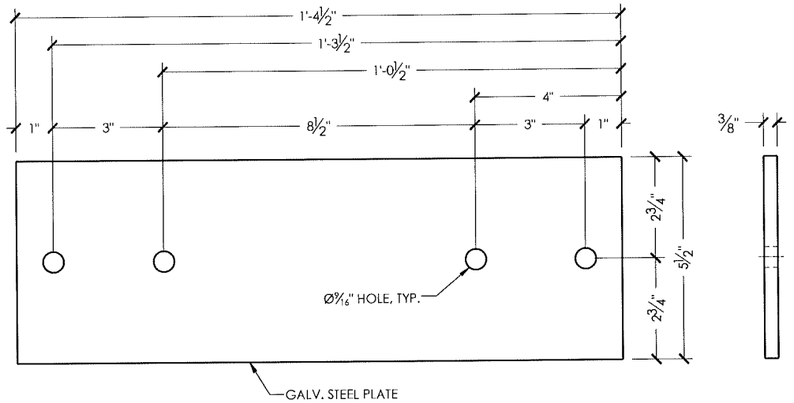
COLUMN SUPPORT DETAIL

SCALE: 1½"=1'-0"



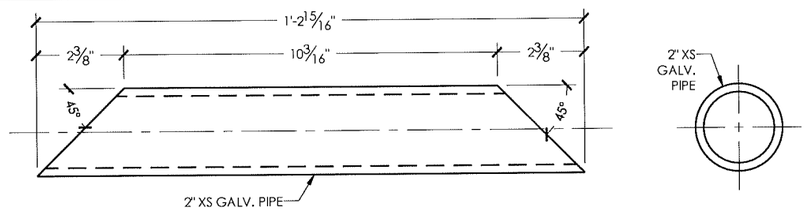
① COLUMN BASE PLATE

SCALE: 3"=1'-0"



② ⅜" STEEL TOP PLATE

SCALE: 3"=1'-0"

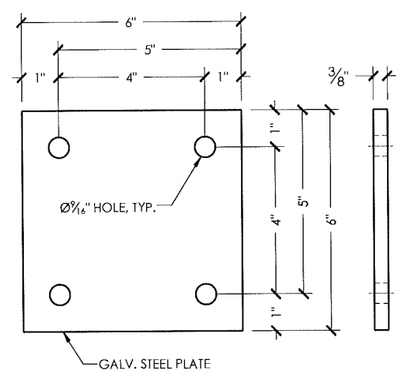


③ 2" XS PIPE

SCALE: 3"=1'-0"

- DETAILS SHOWN ON THIS SHEET ARE FOR CONNECTING & SUPPORTING THE BUILDING COLUMNS ONTO THE ***EXISTING BEAM DECK***.
- FOR COLUMN CONNECTIONS ONTO THE ***PROPOSED BEAM DECK***, USE OF THE BASE PLATES ONLY IS REQUIRED. FASTEN BASE PLATES TO DECK USING ZINC PLATED TITEN HD ANCHOR BOLTS, NOT THROUGH BOLTS AS SHOWN FOR EXISTING BEAM DECK. NO LOWER COLUMN SUPPORT IS NEEDED. PROPOSED BEAM DECK TO BE CONSTRUCTED TO SUPPORT BUILDING FRAME LOADING.

COLUMN CONNECTION & SUPPORT NOTES



④ ⅜" STEEL BOTTOM PLATE

SCALE: 3"=1'-0"

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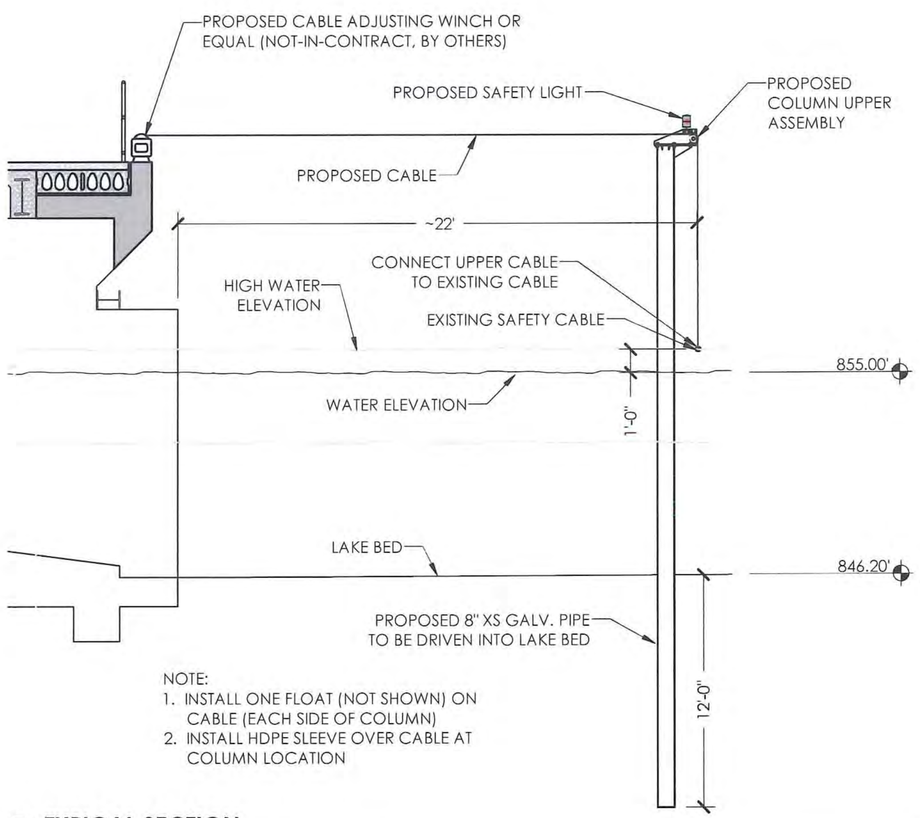
MISC DETAILS
2012 Dam Improvements
Village of Hustisford
ALTERNATE B: PARTIAL DECK ENCLOSURE
Village of Hustisford
Dodge County, WI

NO.	REVISIONS	BY	DATE

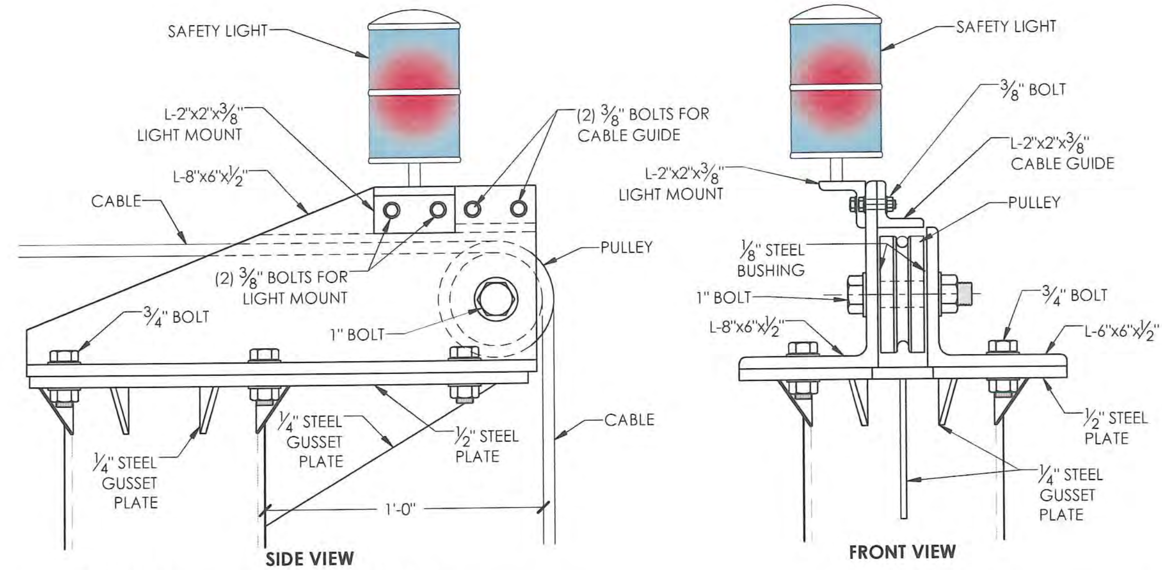
AS NOTED
SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
S7.0-B

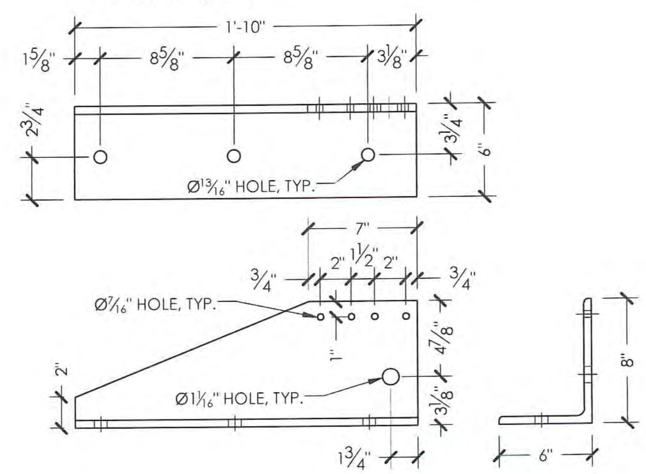
AERIAL VIEW
(NOT TO SCALE)



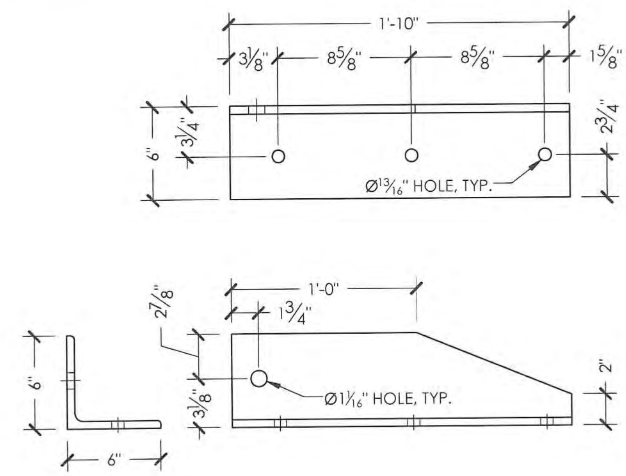
1 TYPICAL SECTION
SCALE: ⅛" = 1'-0"



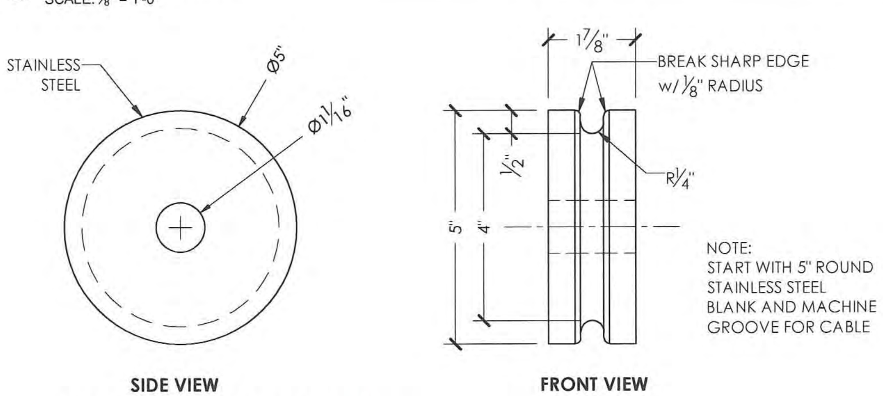
3 COLUMN UPPER ASSEMBLY DETAIL
SCALE: 1½" = 1'-0"



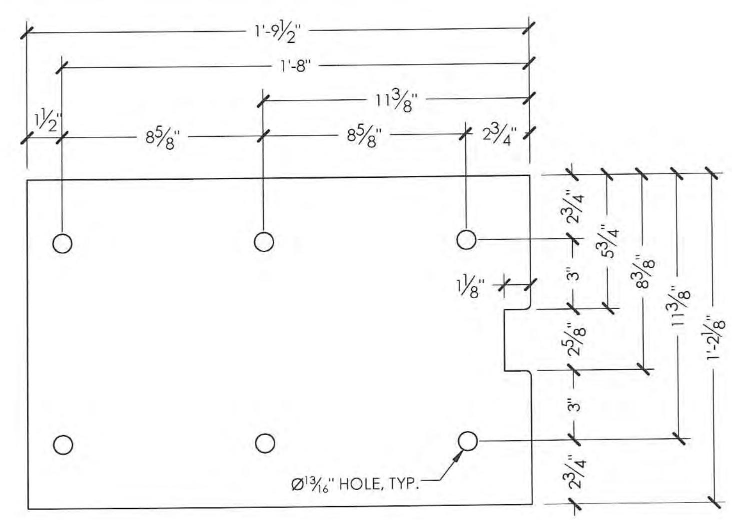
4 L-8"x6"x½" ANGLE
SCALE: 1" = 1'-0"



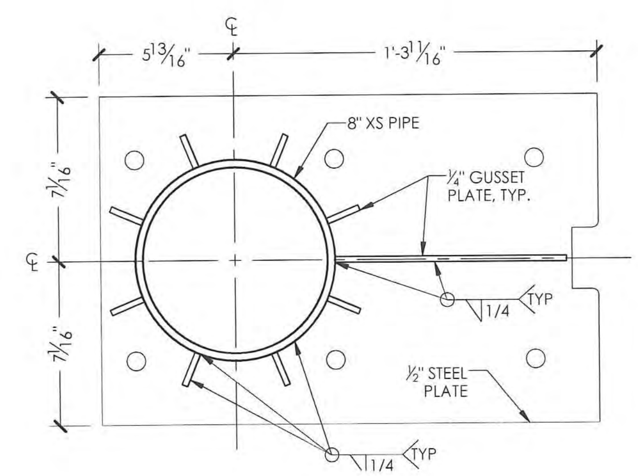
5 L-6"x6"x½" ANGLE
SCALE: 1" = 1'-0"



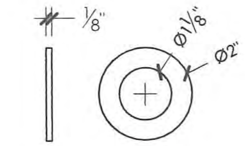
2 SS CABLE PULLEY ASSEMBLY
SCALE: 3" = 1'-0"



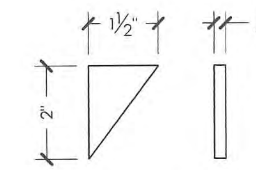
6 ½" STEEL PLATE
SCALE: 1½" = 1'-0"



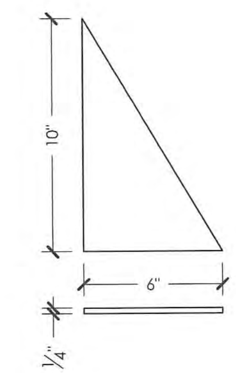
7 CONNECTION: ½" STEEL PLATE TO 8" XS PIPE
SCALE: 1½" = 1'-0"



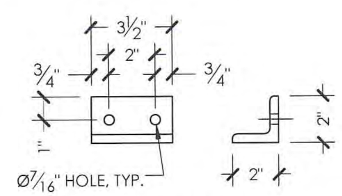
8 ⅛" SS STEEL BUSHING
SCALE: 3" = 1'-0"



9 ¼" STEEL GUSSET
SCALE: 3" = 1'-0"



10 ¼" STEEL GUSSET
SCALE: 1½" = 1'-0"



11 L-2"x2"x⅜" ANGLE
SCALE: 1½" = 1'-0"

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CABLE REPAIR DETAILS
2012 Dam Improvements
Village of Hustisford
ALTERNATE C: SAFETY CABLE ADJUSTMENT COLUMN
Village of Hustisford
Dodge County, WI

NO.	BY	DATE	REVISIONS

AS SHOWN
SCALE

DRAWN BY SRR
DATE Feb. 2012
GEC FILE NO. 2-0212-67
SHEET NO.
S6.1-C

G:\Current Files E-K\Hustisford, Village of 2-0212-67\CAD 2-0212-67\2012 Plan Set Sheets\ALTERNATE C SHEETS\S-6.1-CRD-2-0212-67-(2012.0312).dwg, 4/12/2012 3:44:31 PM, 1:1

14.04
(251)

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
3911 Fish Hatchery Road
Fitchburg WI 53711-5397

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

WISCONSIN DEPT. OF NATURAL RESOURCES

August 30, 2012

RECEIVED

AUG 30 2012

WT/3 - WY/3 - OGL/3

Village of Hustisford
Mr. Dennis Uecker, Village President
201 S. Lake Street
P.O. Box 345
Hustisford, WI 53034-0345

Subject: Hustisford Dam, Field File #14.04, Village of Hustisford, Dodge County. Amendment to Plan Approval Docket IP-SC-2012-14-02977 for a Cofferdam Plan Approval.

Dear Mr. Uecker:

We have reviewed the plans and calculations that were submitted for the proposed temporary cofferdam that is needed for the reconstruction of the Hustisford Dam, located in the Village of Hustisford, Dodge County. You will be pleased to know that the plans are hereby approved with a few limitations.

The construction of a cofferdam and submission of cofferdam plans complies with Order number 3 from the plan approval granted for the reconstruction of the Hustisford Dam dated August 6, 2012 with docket number IP-SC-2012-14-02977. The cofferdam is necessary to adequately complete the construction as approved.

The temporary cofferdam plan was submitted as an amendment to the original plans. The plans and calculations were submitted by General Engineering Company on August 27, 2012 under the professional seal of Svet Roussev, P.E. The plan is approved under the plan approval dated August 6, 2012 with docket number IP-SC-2012-14-02977. All original permit conditions remain in effect, except where modified by this document.

All materials placed in the water for construction of the temporary cofferdam must be completely removed when construction is completed. Nothing may be stored behind the temporary cofferdam that may contain materials that would be hazardous to the waterway during times when the contractor is not at the site working.

If you have questions concerning this document please feel free to contact me.

Sincerely,

Robert R. Davis, P.E.
Water Management Engineer
Southern District
Robert.Davis@Wisconsin.gov
608-275-3316

cc: Bill Sturtevant, P.E. - WT/3
Svet Roussev, P.E. - General Engineering (via email)

General Engineering Company
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916 Silver Lake Drive
Portage, WI 53901

608-742-2169 (Office)
608-742-2592 (Fax)
gec@generalengineering.net
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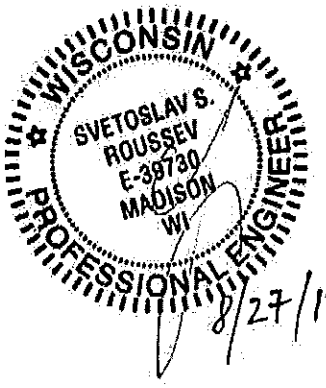
STRUCTURAL CALCULATIONS

TITLE PAGE

Assumptions

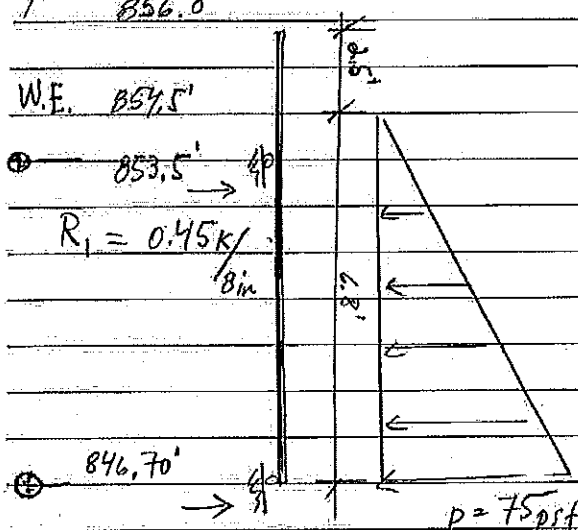
- Allowable Soil Load=2000 psf
- Assumed Water & Silt Pressure=75psf
- Concrete Compressive Strength=3500 psi
- Rebar Yield Strength=60000 psi
- Structural Steel Yield Strength=36000 psi

Table of Contents



Subject:	Title page
	Hustisford Dam Cofferdam
Date:	8/27/2012 Engineer: SSR
Sheet:	1 File: 2-0212-67

1) Load Analysis

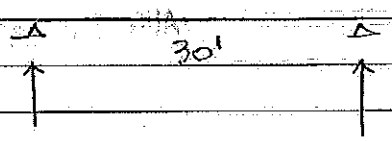


$p = 75\text{psf}(6.8') = 510\text{ psf} \times \frac{8''}{12} = 340\text{ plf}$ (minor axis load)

Assume Water Pressure + Silt = 75 psf

6x8 Southern Yellow Pine #1 Needles loaded to 17% of their capacity ∴ ok

2) Steel Beam W12x53



$R_1 = 0.45\text{K/8in} = 0.68\text{ K/FT}$

$DL = 0.053\text{K/FT}$

$R_A = 11.0$ kips $\quad R_B = 11.0$ kips

Steel Beam is loaded to 0.59% of its capacity

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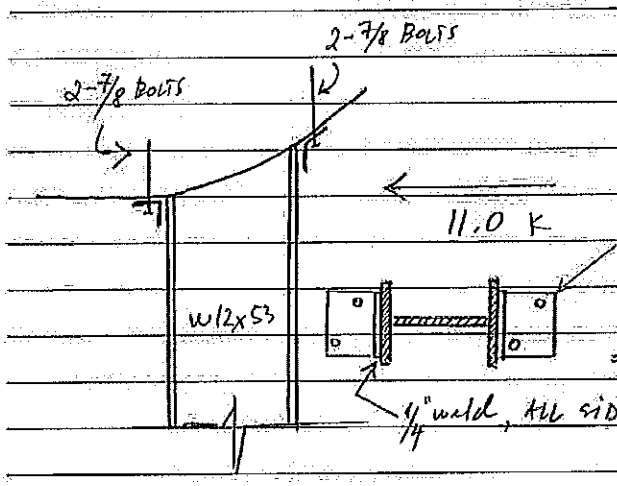
General Engineering Company

Subject:	Cofferdam Load Analysis Hustisford Dam
Engineer: SSR	Date: 8/27/12
Sheet: 2	File: 2-02/2-67

- Connection to ex. Pier



- Anchor Shear Capacity

4 - 7/8" A307 Bolts

w/ shear capacity of $4 \times \left(\frac{\pi \cdot 0.875^2}{4}\right) \cdot 10\ ksi$ = 24 kip

$\Rightarrow$ 4-7/8" Bolts capacity = 24 kip > 11.0 K ∴ Ok.

- Shear Loads in Normal-Weight Concrete w/ embedment of min 5 3/4"

$V_{conc} = (0.82) \cdot 5560\ lbs = 4559\ lbs$ / per bolt (spacing)

$\Rightarrow$ 4 x 4559 lbs = 18236 lbs > 11.0 kip ∴ Ok.

Use 4 - 7/8" Anchor bolts w/ min embedment of 8" into the existing pier

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E-mail: gec@generalengineering.net

General Engineering Company

Subject: Beam to Pier Connection	
Hustisford Dam	
Engineer: SSR	Date: 8/27/12
Sheet: 3	File: 2-0212-67

Engineers • Consultants • Inspectors

General Timber Beam

Description 6x8 Needles

General Information

Code Ref: 1997/2001 NDS, 2000/2003 IBC, 2003 NFPA 5000. Base allowables are user defined

Section Name	6x8	Center Span	5.80 ft	.....Lu	0.00 ft
Beam Width	7.500 in	Left Cantilever	3.50 ft	.....Lu	0.00 ft
Beam Depth	5.500 in	Right Cantilever	ft	.....Lu	0.00 ft
Member Type	Manuf/So.Pine	Southern Pine (Wet), No.1 SR			
		Fb Base Allow	1,350.0 psi		
Load Dur. Factor	1.000	Fv Allow	165.0 psi		
Beam End Fixity	Pin-Pin	Fc Allow	375.0 psi		**Repetitive Member**
		E	1,500.0 ksi		

#1 DL @ Left	#/ft	LL @ Left	#/ft	Start Loc	-1.000 ft
DL @ Right	#/ft	LL @ Right	340.00 #/ft	End Loc	5.800 ft

Summary

Beam Design OK

Span= 5.80ft, Left Cant= 3.50ft, Beam Width = 7.500in x Depth = 5.5in, Ends are Pin-Pin

Max Stress Ratio	0.170 : 1				
Maximum Moment	0.8 k-ft		Maximum Shear * 1.5		0.8 k
Allowable	4.9 k-ft		Allowable		6.8 k
Max. Positive Moment	0.83 k-ft at 3.235 ft		Shear:	@ Left	0.43 k
Max. Negative Moment	-0.00 k-ft at 5.800 ft			@ Right	0.71 k
Max @ Left Support	-0.01 k-ft		Camber:	@ Left	0.000 in
Max @ Right Support	0.00 k-ft			@ Center	0.000 in
				@ Right	0.000 in
Max. M allow	4.89	Reactions...			
fb 264.10 psi	fv 20.33 psi	Left DL	0.00 k	Max	0.45 k
Fb 1,652.50 psi	Fv 165.00 psi	Right DL	0.00 k	Max	0.71 k

Deflections

Center Span...	Dead Load	Total Load	Left Cantilever...	Dead Load	Total Load
Deflection	0.000 in	-0.032 in	Deflection	0.000 in	0.058 in
...Location	5.800 ft	2.974 ft	...Length/Defl	0.0	1,460.7
...Length/Defl	0.0	2,184.49	Right Cantilever...		
Camber (using 1.5 * D.L. Defl) ...			Deflection	0.000 in	0.000 in
@ Center	0.000 in		...Length/Defl	0.0	0.0
@ Left	0.000 in				
@ Right	0.000 in				

Stress Calcs

Bending Analysis

Ck	27.033	Le	0.000 ft	Sxx	37.813 in3	Area	41.250 in2
Cf	1.000	Rb	0.000	Cl	0.000		

	Max Moment	Sxx Req'd	Allowable fb
@ Center	0.83 k-ft	6.43 in3	1,552.50 psi
@ Left Support	0.01 k-ft	0.06 in3	1,552.50 psi
@ Right Support	0.00 k-ft	0.00 in3	1,552.50 psi

Shear Analysis	@ Left Support	@ Right Support
Design Shear	0.60 k	0.84 k
Area Required	3.632 in2	5.081 in2
Fv: Allowable	165.00 psi	165.00 psi

Bearing @ Supports

Max. Left Reaction	0.45 k	Bearing Length Req'd	0.161 in
Max. Right Reaction	0.71 k	Bearing Length Req'd	0.251 in

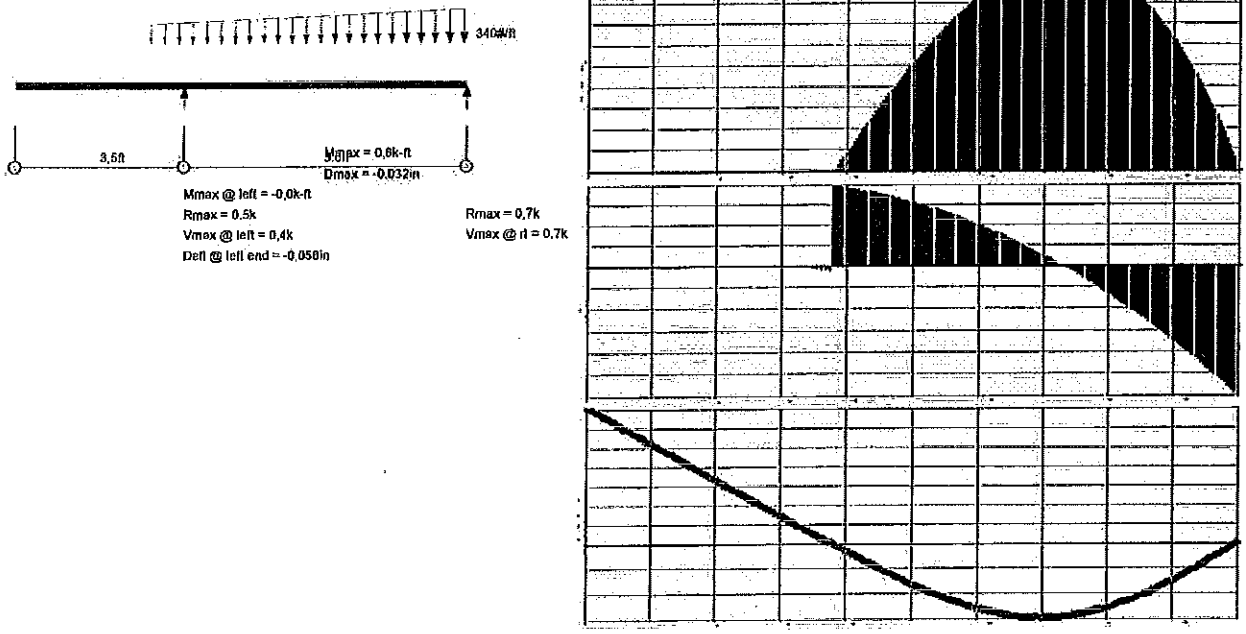
Query Values

M, V, & D @ Specified Locations		Moment	Shear	Deflection
@ Center Span Location =	0.00 ft	-0.01 k-ft	0.43 k	0.0000 in
@ Right Cant. Location =	0.00 ft	0.00 k-ft	0.00 k	0.0000 in
@ Left Cant. Location =	0.00 ft	-0.01 k-ft	0.43 k	0.0000 in

General Timber Beam

Description 6x8 Needles

Sketch & Diagram



Steel Beam Design

Description W12x53

General Information

Code Ref: AISC 9th ASD, 1997 UBC, 2003 IBC, 2003 NFPA 5000

Steel Section : W12X53

		Pinned-Pinned	Fy	36.00ksi
Center Span	30.00 ft	Bm Wt. Added to Loads	Load Duration Factor	1.00
Left Cant.	0.00 ft	LL & ST Act Together	Elastic Modulus	29,000.0ksi
Right Cant	0.00 ft			
Lu : Unbraced Length	1.00 ft			

Distributed Loads

Note! Short Term Loads Are WIND Loads.

	#1	#2	#3	#4	#5	#6	#7	
DL	0.680							k/ft
LL								k/ft
ST								k/ft
Start Location								ft
End Location	30.000							ft

Summary

Beam OK
Static Load Case Governs Stress

Using: W12X53 section, Span = 30.00ft, Fy = 36.0ksi
End Fixity = Pinned-Pinned, Lu = 1.00ft, LDF = 1.000

	Actual	Allowable		
Moment	82.461 k-ft	139.788 k-ft	Max. Deflection	-1.084 in
fb : Bending Stress	14.016 ksi	23.760 ksi	Length/DL Defl	332.2 : 1
fb / Fb	**0.590 : 1**		Length/(DL+LL Defl)	332.2 : 1
Shear	10.995 k	59.914 k		
fv : Shear Stress	2.643 ksi	14.400 ksi		
fv / Fv	**0.184 : 1**			

Force & Stress Summary

<<-- These columns are Dead + Live Load placed as noted -->>

	Maximum	DL Only	LL @ Center	LL+ST @ Center	LL @ Cants	LL+ST @ Cants	
Max. M +	82.46 k-ft	82.46					k-ft
Max. M -							k-ft
Max. M @ Left							k-ft
Max. M @ Right							k-ft
Shear @ Left	10.99 k	10.99					k
Shear @ Right	10.99 k	10.99					k
Center Defl.	-1.084 in	-1.084	0.000	-1.084	0.000	0.000	in
Left Cant Defl	0.000 in	0.000	0.000	0.000	0.000	0.000	in
Right Cant Defl	0.000 in	0.000	0.000	0.000	0.000	0.000	in
...Query Defl @	0.000 ft	0.000	0.000	0.000	0.000	0.000	in
Reaction @ Left	10.99	10.99		10.99			k
Reaction @ Rt	10.99	10.99		10.99			k

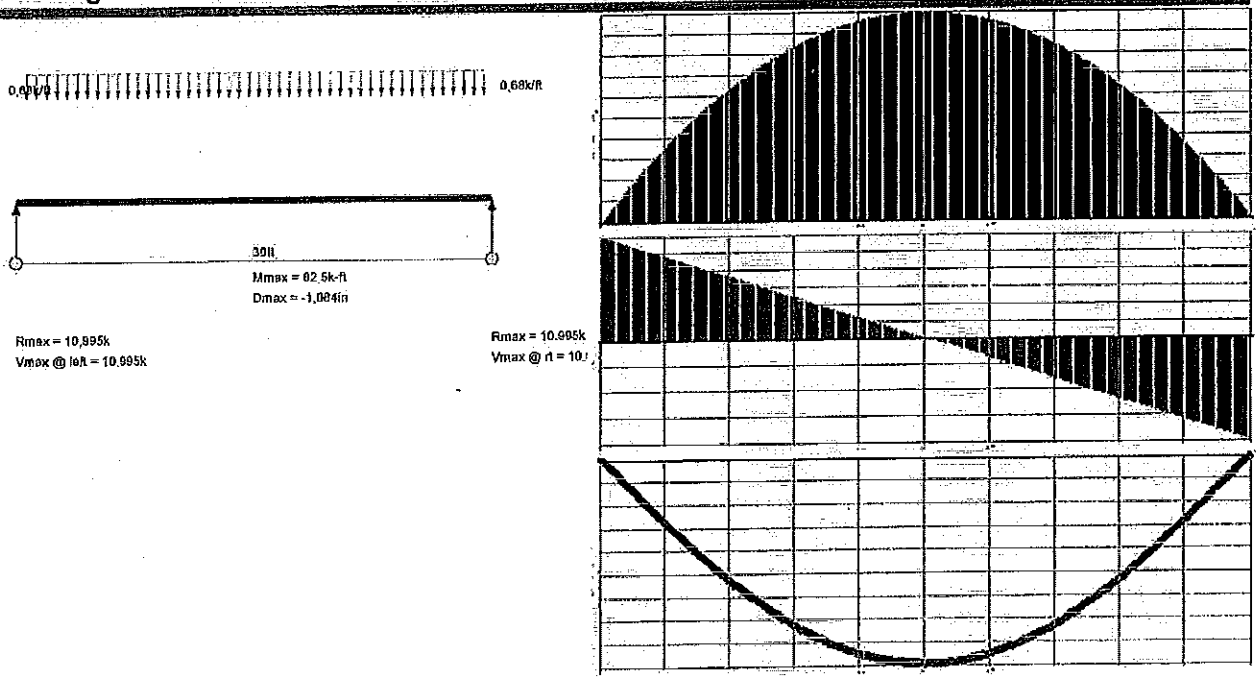
Fa calc'd per Eq. E2-1, K*L/r < Cc
I Beam Passes Table B5.1, Fb per Eq. F1-1, Fb = 0.66 Fy

Description W12x53

Section Properties W12X53

Depth	12.060 in	Weight	52.99 #/ft
Web Thick	0.345 in	Ixx	425.000 in4
Width	9.995 in	Iyy	95.800 in4
Flange Thick	0.575 in	Sxx	70.600 in3
Area	15.60 in2	Syy	19.200 in3
Rt	2.710 in	R-xx	5.230 in
		R-yy	2.480 in
Values for LRFD Design....			
J	1.580 in4	Zx	77.900 in3
Cw	3,160.00 in6	Zy	29.100 in3
		K	1.170 in

Sketch & Diagram



14.04
(251)

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
3911 Fish Hatchery Road
Fitchburg WI 53711-5397

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

WISCONSIN DEPT. OF NATURAL RESOURCES

RECEIVED
FEB 15 2016
WT/3 - WY/3 - OGL/3

February 11, 2016

Village of Hustisford
Mr. Dennis Uecker, Village President
201 S. Lake Street
P.O. Box 345
Hustisford, WI 53034-0345

Subject: Hustisford Dam Municipal Dam Grant Reconstruction Final Approval, Field File #14.04, IP-SC-2012-14-02977 Village of Hustisford, Dodge County. As-built Plan Approval, Supplemental Dam Failure Analysis Approval, Hazard Rating Reassignment, Emergency Action Plan Approval, and Final Inspection

Dear Mr. Uecker:

Please accept my congratulations on the completion of this project, and sincere thanks for the great deal of cooperation. The purpose of this document is to provide a number of final approvals which will ultimately allow for a final payment from the Municipal Dam Grant to be made. This document will approve the as-built plans from the reconstruction of the Hustisford Dam. It will also approve the Supplemental Dam Failure Analysis completed by Eric Maki of Stantec. Based on the adoption of the study into the Village's Floodplain Ordinance that was completed and approved by the Department last week, this document will also reassign the hazard rating for the Hustisford Dam to low hazard. Based on a dam with a hazard rating of low hazard the dam is required to be formally inspected by a consultant every 10 years. The Village will be responsible for hiring a consultant to inspect the Hustisford Dam in 2023. Finally, this document will formally approve the Emergency Action Plan (EAP) for the Hustisford Dam. Please remember to review and update the EAP at least annually. Updated information is critical during an emergency. Please contact me if you have any questions about this document.

FINDINGS OF FACT

1. The Department of Natural Resources has examined the final as-built plans for the reconstruction of the Hustisford Dam, prepared by General Engineering and submitted to this office on November 22, 2013.

2. The Department received a completion statement signed by Svet Roussev, P.E., confirming that the dam had been constructed in accordance with approved plans and specifications.

3. General Engineering has submitted photographic proof demonstrating completion of the project. Additionally, the Department inspected the dam on May 29, 2013 after the completion of the reconstruction.

4. With this document, the Hustisford Dam is being reassigned a hazard rating of low hazard. The Hustisford Dam currently meets the flow capacity standards of NR 333.07 Wisconsin Administrative Code.

CONCLUSIONS OF LAW

1. The review has been conducted in accordance with Chapter 31, Wisconsin Statutes, and Chapter NR 333, Wisconsin Administrative Code.

APPROVAL

1. The as-built plans are hereby approved in accordance with Chapter 31, Wisconsin Statutes.

2. The Supplemental Dam Failure Analysis for the Hustisford Dam is hereby approved as an addendum to the original dam failure analysis based on review by State Dam Safety Engineer, Bill Sturtevant, and written approval in an email from July 6, 2015.

3. Based on adoption of the Supplemental Dam Failure Analysis into the Village's Floodplain Ordinance and approval of the adoption by the Department dated February 5, 2016, the hazard rating of the Hustisford Dam is hereby reassigned to low hazard.

4. As a dam with a hazard rating of low hazard the dam is required to be formally inspected every 10 years. Based on the Department's last formal inspection in 2013, the Village will be required to hire a consultant to inspect the Hustisford Dam in 2023.

5. The Emergency Action Plan for the Hustisford Dam is hereby approved. The EAP should be reviewed regularly to ensure that it is kept up to date.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that the Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed. For judicial review of a decision pursuant to sections 227.52 and 227.53, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review must name the Department of Natural Resources as the respondent.

To request a contested case hearing pursuant to section 227.42, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. All requests for contested case hearings must be made in accordance with section NR 2.05(5), Wis. Adm. Code, and served on the Secretary in accordance with section NR 2.03, Wis. Adm. Code. The filing of a request for a contested case hearing does not extend the 30 day period for filing a petition for judicial review.

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES
For the Secretary

By _____
Robert R. Davis, P.E.
Water Management Engineer

cc: Bill Sturtevant, P.E. - WT/3
Kari Beetham - DNR Municipal Dam Grant Program Manager (via email)
Kim Hopfinger - Village Clerk (via email)

Detailed Information for Dam Hustisford

Dam Key Seq No	251	Field File No	14.04
Size	LARGE	NID	254
Popular Name		Former Name	

Location

County	Dodge		
Latitude	43.346007	Longitude	-88.598579

Permitted TRS

QQQ:SW QQ:NE Q:SE - Sec:09 T:10N R:16E

Contacts

Owner	Village of Hustisford	Contact	

Waterbody

Drainage Basin (sq mi)	509.00		
Stream		**Impoundment**	
Local Name	ROCK	Local Name	SINISSIPPI LAKE
Row and Official Name		Row and Official Name	
Navigable?	navigable	Size (acres)	2,855.00
When was navigability determined?	1,939.00	Maximum Depth (ft)	8.00

Regulatory/Inspection

NR 333 Years	EAP:2016 IOM:2009 HYD:2011 STAB:2011 ZONE:2016		
Auth. Approval Desc	GEN LAWS	Regulatory Agency	WIDNR
Hazard Rating	Low	Estimated Hazard Rating	Low
Ferc. No		Exempt Issue Date	
Ferc. Inspection Year		License Expiration Year	

Construction Characteristics

Normal Storage (acre-ft)	13,000.00	Max Storage (acre-ft)	18,700.00
Structural Height (ft)	11.00	Hydraulic Height (ft)	7.00
Crest Length (ft)	225.00	Spillway Type	Controlled
Discharge Through Principal Spillway (cfs)	1,131.00	Width/Diameter of Principal Spillway (ft)	98.70
Total Discharge Through All Spillways (cfs)	6,760.00	Total Width/Diameter of All Spillways (ft)	158.70
Core Type	None	Position	None
Foundation Type	None	Foundation Certainty	
Purposes	Recreation	Structural Types	Gravity
	None		Earth
	None		Other

Detailed Information for Dam Hustisford

Water Levels

	Normal		Winter	
	MSL	Datum	MSL	Datum
Minimum	97.70	None	0.00	None
Normal	0.00	None	0.00	None
Maximum	99.50	None	0.00	None

Construction History

Designer	Construction Firm	Complete Year
MEAD WARD&HUNT	HUSTISFORD POWER&LIGHT	1939

Outlet Gates

No data found.

Inspection History

Inspection Date	Inspection Report Date	DNR Engineer Initials	Inspection Type
5/29/2013	2/11/2016	RRD	FINAL
10/17/2012		RRD	50%
9/7/2012		RRD	CONST
6/16/2008		WMS	CHECK
6/15/2008		MMG	CHECK
6/12/2008		DP	GEN
9/20/2007	12/21/2007	RRD	31.19
4/18/1988	6/21/1988	WDS	31.19
6/13/1980		XXX	GEN
8/25/1969	8/26/1969	XXX	LEVEL
3/30/1961		XXX	GEN
3/30/1961	4/3/1961	XXX	LEVEL
3/31/1960	2/7/1961	XXX	LEVEL
2/29/1952	3/3/1952	XXX	LEVEL
8/6/1947	9/15/1947	XXX	LEVEL
8/6/1947		XXX	GEN
5/29/1945	6/15/1945	XXX	LEVEL
6/21/1940		XXX	GEN
6/11/1940	6/25/1940	XXX	LEVEL
8/3/1934		XXX	GEN
4/3/1934	4/3/1934	XXX	LEVEL
6/27/1931	6/27/1931	XXX	LEVEL
8/11/1928	8/13/1928	XXX	LEVEL
4/10/1924		XXX	CHECK
9/19/1923	9/21/1923	XXX	OTHER
10/20/1919	12/10/1919	XXX	OTHER
4/30/1919		XXX	GEN
4/30/1919	5/16/1919	XXX	LEVEL
4/30/1919	10/21/1923	XXX	LEVEL

Followups

Type of Followup	Due Date	Extension Date	Completion Date
Concrete repairs	12/1/2010		5/29/2013
Emergency Action Plan	6/1/2010		10/26/2015
Dam failure analysis	12/1/2009		6/2/2011
Inspection by P.E.	12/31/2008		8/6/2012
Benchmarks	12/1/2008		12/23/2008
Inspection, Operation & Maintenance Manual	12/1/2008		1/20/2009
Other	6/1/2008		12/18/2009
Embankment repairs	6/1/2008		4/20/2011
Embankment repairs	10/1/1989		4/20/2011

Prepare and paint metal components	10/1/1988		9/20/2007
Gate(s)	9/1/1988		9/20/2007
Schedule	9/1/1988		9/20/2007
Emergency Action Plan	6/21/1988		9/20/2007
Inspection, Operation & Maintenance Manual	6/21/1988		1/23/2009
Concrete repairs	6/21/1988		9/20/2007

Approvals

Approval Date	Docket ID	Approval Type	DNR Engineer Initials
2/11/2016	Supplemental	DAM FAILURE ANALYSIS	RRD
2/10/2016		EMERGENCY ACTION PLAN	RRD
2/5/2016		ASSIGN HAZARD RATING	WDS
2/5/2016		COMMUNITY HAS ADOPTED FAILURE ZONING	RRD
8/1/2012	IP-SC-2012-14-02977	COFFER DAM PLAN APPROVAL	RRD
8/1/2012	IP-SC-2012-14-02977	PLAN APPROVAL-REPAIR, RECON; STAT 31.18	RRD
8/1/2012		BID APPROVAL. GRANT PROGRAM NR335	RRD
6/1/2011		ASSIGN HAZARD RATING	WDS
6/1/2011		STABILITY ANALYSIS	WDS
5/1/2011		DAM FAILURE ANALYSIS	WDS
4/1/2011	SEE COMMENTS	APPROVAL OF REPAIR/MAINTENANCE WORK	RRD
1/1/2009		INSPECTION, OPERATION AND MAINTENANCE PLAN	RRD
12/1/1975	2-WP-888	LEVELS; STAT 31.02	XXX
3/1/1952	2-WP-888	LEVELS; STAT 31.02	XXX
6/1/1945	2-WP-620	LEVELS; STAT 31.02	XXX
8/1/1931	WP-444	LEVELS; STAT 31.02	XXX
12/1/1919	WP-122	LEVELS; STAT 31.02	XXX

Orders

Issue Date	Complied On Date	Docket ID	Order Description
3/12/1984		3-SD-83-906	Warning Signs

Inspection Schedule

Inspection Year	Inspection Type
2023	Owner
2033	Owner

BEFORE THE

PUBLIC SERVICE COMMISSION OF WISCONSIN

- - - -

In the matter of the application of William Mauthe, E. M. Dahlberg, Haskell Noyes, O. C. Lemke, A. W. Icks, and L. M. Hobbins, constituting the Conservation Commission of Wisconsin, for a permit to raise or enlarge an existing dam in the Rock River at Horicon, Dodge County, Wisconsin

WP-430

Pursuant to the authority vested in the Conservation Commission by Chapters 475 and 479 of the Laws of 1927 which provide for the restoration of the water levels in the Horicon Marsh and in the Rock River above the City of Horicon to the natural levels which existed prior to the digging of certain ditches in the Horicon Marsh, the Conservation Commission during the year 1930 caused to be erected across the Rock River in the City of Horicon a dam equipped with two tainter gates and two stop log gates. The dam is capable of raising the waters of the Rock River to an elevation of approximately 76 feet, Railroad Commission datum, by the closing of said gates. The tainter gates are 30 feet wide and the stop log gates are 15 feet wide, and the four gates reach across practically the entire width of the river.

The dam is so constructed that the concrete gate sills have an elevation of 68.0 feet, and stop logs may be installed to elevation 70.5 feet, which is the elevation of the natural barrier which existed in the Rock River in the City of Horicon prior to the dredging operations.

The dam was constructed pursuant to an order of the Railroad Commission dated the 20th day of September, 1928. In that order the Railroad Commission finds and determines the normal elevations of the waters in the Rock River and in the marsh at different points unaffected by the drainage ditches, or, in other words, as they were prior to the drainage operations.

Roughly speaking, the marsh is about 16 miles long from north to south and 2 to 4 miles broad. A main ditch was constructed from the northern limits of the marsh in a southerly direction to the City of Horicon. Many lateral ditches connect with the main ditch on both the east and west sides of the main ditch.

The Railroad Commission further finds in said order that due to the great differences in the normal height of the water in different parts of the marsh prior to drainage and the changes in the runoff due to the drainage ditches, the said normal water elevations in such different portions of the marsh cannot be restored by the construction of a single dam at the outlet, since a dam carrying a head of water which would restore the normal elevation at the upper end of the marsh would flood lands in the lower end of the marsh to a greater depth than they were flooded prior to drainage.

The Commission further finds in said order that the normal elevations of the marsh can be restored by filling in the drainage ditches and causing the waters again to flow through the old river channels as they did prior to the ditching. It, however, finds that this may be impracticable because of the expense involved, and because the old river bed may have changed considerably through the growth of vegetation, and probably would require some dredging to restore former conditions in the river bed. That the restoration of the normal levels in the

various portions of the marsh can be accomplished to a reasonable degree by the construction and maintenance of a series of dams across the main drainage ditch, and by a modification of the earth spoil banks on the sides of the main and lateral drainage ditches.

In said order the Commission further finds that the high point in the Rock River in the City of Horicon prior to the drainage operations was at elevation 70.5 feet, Railroad Commission datum, and that the high point after the drainage operations was one and one-half feet lower or at elevation 69 feet.

It further finds that by the restoration of the bed of the Rock River in the City of Horicon to elevation 70.5 feet, the normal elevations of the waters in the Rock River in the City of Horicon and upstream for some distance will be restored as they existed prior to the drainage operations.

The Commission further finds in said order that to provide against unusually low stages of water in the Rock River in the City of Horicon and the lower end of the Horicon Marsh, a sutiable barrier may be erected in the Rock River in the City of Horicon at elevation 70.5 feet. That such barrier will maintain a level of water not lower nor higher than the elevation maintained by the high section in the bed of the Rock River in the City of Horicon prior to the drainage operations. That such a barrier may consist of either a submerged dam or an earth and rock fill in the bed of the stream.

The said order further authorizes the applicants to maintain and operate across the waters of the Rock River at any locations which they may select, a dam or dams and other works necessary or convenient for the purpose of restoring and maintaining the normal elevations of the Horicon Marsh as found in said order. It is, however, provided in said order that

before the work of construction of any such dams is begun, the plans for the same, including locations, are to be submitted to the Commission for its approval.

On May 28, 1931 the applicants filed an application requesting permission to raise and enlarge the Horicon Dam from the authorized elevation of 70.5 feet to an elevation which will maintain a maximum pond level of 75.3 feet, Railroad Commission datum. The application states that the dam is being used for the purpose of controlling and regulating the flood waters of the Rock River, and to maintain the natural levels of the waters of the Horicon Marsh. It further states that the applicants propose to maintain fish and game refuges in the Horicon Marsh pursuant to authority given by Chapter 23, Statutes.

A public hearing was held thereon on June 25, 1931 after due notice of hearing as directed by the Commission. The appearances were: L. S. Keely and B. J. Husting, Attorneys, Mayville, appearing for Horicon Marsh Farm Land Protective Association; George A. Hartman appearing for the Hustisford Light & Power Company and the Juneau Sporting Club; Thompson, Myers & Helm, Attorneys, Racine, represented by Peter J. Myers, appearing for answering land owners and the Title Insurance and Trust Company of Los Angeles, California, the latter firm also appearing specially for G. A. McWilliams, a non-resident of the state; the City of Horicon was represented by Senator William H. Markham and Mr. Louis Radke; the Chicago, Milwaukee, St Paul & Pacific Railroad Company appeared by Mr. Charles Lapham, and Mr. William Mauthe, O. C. Lemke and Mr. Matt Patterson appeared on behalf of the applicants.

Considerable testimony was offered both on behalf of the applicants and by persons appearing in opposition to the application. Mr. Matt Patterson, on behalf of the applicants, testified that the authorized elevation of the crest of the dam

at 70.5 feet does not permit the Conservation Commission to carry out the mandate of the legislature, and that, therefore, it desired authority to maintain the pond elevation at 75.3 feet. It also appeared from the testimony that the applicants did not intend to raise the waters above the dam above their normal levels until the right to do so had been acquired from the private owners of the lands to be flowed.

On September 1, 1931 the Public Service Commission made its findings on the facts required by Chapter 31, Statutes, and granted authority to the applicants to raise and enlarge its said dam so as to maintain a maximum pond elevation of 75.3 feet, Public Service Commission datum.

On September 19, 1931, Mr. Frank Adelmeyer and many other persons, represented by B. J. Husting and L. S. Keeley and Thompson, Myers and Helm, filed an application for a rehearing upon the following grounds:

1. That the findings made by the Commission are not supported by the evidence;

2. That the dam in question is not a lawful structure erected under lawful authority;

3. That the Public Service Commission of Wisconsin is without jurisdiction to hear the application and is without authority to make any further determinations concerning the water levels in the Rock River and on Horicon Marsh;

4. That the Public Service Commission of Wisconsin cannot grant any right or power to the Conservation Commission to raise or maintain the water levels of the Rock River at Horicon and on the Horicon Marsh above the elevation of 70.5 feet, which elevation has been found by the Railroad Commission of Wisconsin to have been the natural level prior to the private drainage of the same;

5. That the order entered is unlawful for the reason that the Legislature of the State of Wisconsin, by Chapter 475

and Chapter 479 of the Laws of 1927, has limited the height to which the Conservation Commission is authorized to raise the waters of the Rock River on the Horicon Marsh to the "natural level prior to the private drainage of the same";

6. That the conclusions and permit granted by the Public Utilities Commission in said order are contrary to law and void.

The motion for a rehearing was granted by the Public Service Commission on September 24, 1931, and the matter was set for hearing on the 9th day of October, 1931. At that time the following appearances were entered: Present, Commissioner McDonald and Examiner Kanneberg. Appearances, L. S. Keeley and B. J. Husting, Attorneys, Mayville, appearing for the Horicon Marsh Farm Land Protective Association; Thompson, Myers & Helm, by Mr. Peter J. Myers, appeared for answering land owners; the City of Horicon and Izaak Walton League by Louis Radke; Wisconsin Federation of Women's Clubs by Mrs. Minnie La Budde, Milwaukee; Chicago, Milwaukee, St. Paul & Pacific Railroad Company by Charles Lapham, Engineer; and the Conservation Commission by Mr. Matt Patterson and Mr. Arthur D. Krohne.

It developed at the hearing that the applicants had caused the two tainter gates to be closed, and had ordered stop logs to be placed in the stop log gates whereby the waters of the Rock River were raised above the normal elevations which would have been maintained with the dam at the authorized elevation of 70.5 feet.

The Commission deems it desirable that authority to raise and enlarge said dam be withheld until the right to flow

private lands has been obtained by the applicants.

IT IS THEREFORE ORDERED that the order of the Public Service Commission of Wisconsin dated September 1, 1931, authorizing the applicants to maintain a maximum pond elevation of 75.3 feet, Public Service Commission datum, at the Horicon Dam be and the same is hereby set aside, without prejudice to file a new application to raise and enlarge said dam at any time after the applicants have obtained the right to flow all lands which will be flowed by means of the pond elevation which applicants may request to have authorized.

Dated at Madison, Wisconsin, this 8th day of March, 1932.

PUBLIC SERVICE COMMISSION OF WISCONSIN

Theo. Kronshage, Jr.
Chairman

A. R. McDonald
Commissioner

David E. Lilienthal
Commissioner

Attest:

Wm. M. Dinneen
Secretary

BEFORE THE

PUBLIC SERVICE COMMISSION OF WISCONSIN

In the matter of the application of Ralph M. Immell, R. B. Goodman, Louis M. Hobbins, Nelson Le Clair, James A. Corcoran, and T. J. Koerner, Constituting the Conservation Commission of Wisconsin, for a permit to raise and enlarge an existing dam in the Rock River at Horicon, Dodge County, Wisconsin

WP-430

The application of Ralph M. Immell, R. B. Goodman, Louis M. Hobbins, Nelson Le Clair, James A. Corcoran, and T. J. Koerner, constituting the Conservation Commission of Wisconsin, for authority to operate the dam in the Rock River in the City of Horicon so as to raise and maintain a headwater elevation in the Rock River above said dam and in Horicon Marsh of not exceeding 75.3 feet, Public Service Commission datum, at a point where the Rock River crosses the south line of Section 25, Township 12 North of Range 15 East, came on to be heard on the 6th day of October, 1934, at the offices of the Public Service Commission in the City of Madison.

The appearances were:

For the applicant,
Col. A. H. Smith; and
Mary Eschweiler, Law Fellow, Attorney General's Department.

For the respondent,
Ralph W. Jackman appeared specially on his own behalf as a land owner; and
Peter J. Meyers appeared specially on behalf of land owners.

W. P. Aberg appeared on behalf of the Izaak Walton League.

The applicant, in order to carry out the mandate of the legislature to restore the public waters of the Rock River on Horicon Marsh to the natural levels existing prior to the private drainage of the same, requests authority to so operate its dam

across the Rock River in the City of Horicon as to maintain a headwater elevation of not exceeding the maximum elevation of 75.3 feet, when referred to Public Service Commission bench mark No. 7190, at a point upstream from the dam, namely where the Rock River crosses the south line of Section 25, Township 12 North, of Range 15 East.

Benoh mark No. 7190 consists of a square cut in the east end of concrete walk over the gates of the dam. Elevation 84.07 feet.

From the evidence and from the files in former proceedings had before the Commission in relation to the restoration of the water of the Rock River by the applicant, pursuant to Chapters 475 and 479 of the Laws of 1927, it appears that in order to maintain an elevation not exceeding 75.3 feet in the Rock River at the point above mentioned by the operation of the dam in the City of Horicon, it will be necessary to flow certain lands between the dam and said point, namely where the Rock River crosses the south line of said Section 25, to an elevation higher than the normal elevations of the waters of the Rock River. The evidence in this proceeding shows and the Commission finds that the applicant has heretofore acquired the right to flow all lands which will be flowed above their normal elevations when the maximum elevation of water in the Rock River at a point where it crosses the south boundary of said Section 25 is at or below elevation 75.3 feet, Public Service Commission datum.

IT IS THEREFORE ORDERED that the applicant be and it is hereby authorized to operate the dam in the Rock River in the City of Horicon, and to raise the level of water in the Rock River above said dam to any elevation not exceeding, however, a maximum elevation of 75.3 feet, Public Service Commission datum,

at the point where the Rock River crosses the south line of Section 35, Township 12 North of Range 15 East.

Jurisdiction is retained by the Public Service Commission to make such further order in the premises as may be necessary.

Dated at Madison, Wisconsin, this 10th day of October, 1934.

PUBLIC SERVICE COMMISSION OF WISCONSIN

Chairman

Commissioner

Commissioner

Attest:

Secretary