

SEAWALL REPAIR LETTING DATE 7-18-2019  
19-01-30-05

DICKINSON COUNTY

DICKINSON COUNTY

**LEGEND**

INTERSTATE ROUTE	
FREEWAY OR EXPRESSWAY ROUTE	
U.S. NUMBERED ROUTE	
BUSINESS ROUTE	
STATE NUMBERED ROUTE	
UNSIGNED ROUTE	
COUNTY NUMBERED ROUTE	
SECONDARY ROAD OR ADJOINING CITY STREET	
CITY STREET	
PARK, INSTITUTION, OR FEDERAL ROAD	
RAILROAD	
CORPORATION LINE	
SECTION LINE	
CUL-DE-SAC	
SECTION, TOWNSHIP & RANGE NUMBERS	9, T-81N, R-30W

# IOWA DEPARTMENT OF NATURAL RESOURCES

## DICKINSON COUNTY

### PROJECT NO. 19-01-30-05 SEAWALL REPAIR

*IN THE CITY OF ARNOLDS PARK  
ON THE SHORE OF WEST LAKE OKOBOJI*

INDEX OF SEALS		
SHEET NO.	NAME	TYPE
1	BHOOSHAN KARNIK	GENERAL DESIGN

TOTAL SHEETS	
	12
PROJECT NUMBER	
	19-01-30-05

INDEX OF SHEETS	
NO.	DESCRIPTION
1	TITLE SHEET
2	QUANTITY SUMMARY
3	GENERAL NOTES
4	SITUATION PLAN
5	STRUCTURAL DETAILS 1
6	STRUCTURAL DETAILS 2
7	CONDUIT DETAILS
8	DRAINAGE DETAILS
9	SOIL PROFILE SHEET
10 - 12	AVAILABLE AS-BUILT INFORMATION

281-1  
10-18-16

**SECTION 404 PERMIT AND CONDITIONS**

Construct this project according to the requirements of U.S. Army Corps of Engineers \_\_\_\_\_, Permit No. \_\_\_\_\_. A copy of this permit is available from the Iowa DOT website (<http://www.envpermits.iowadot.gov/>). The U.S. Army Corps of Engineers reserves the right to visit the site without prior notice.

THIS PROJECT IS COVERED BY IOWA DNR FLOODPLAIN CONSTRUCTION PERMIT NO. \_\_\_\_\_

VALUE ENGINEERING SAVES. REFER TO ARTICLE 1105.16 OF THE SPECIFICATIONS.

262-6  
10-18-05

**UTILITIES  
(NOT A POINT 25 PROJECT)**

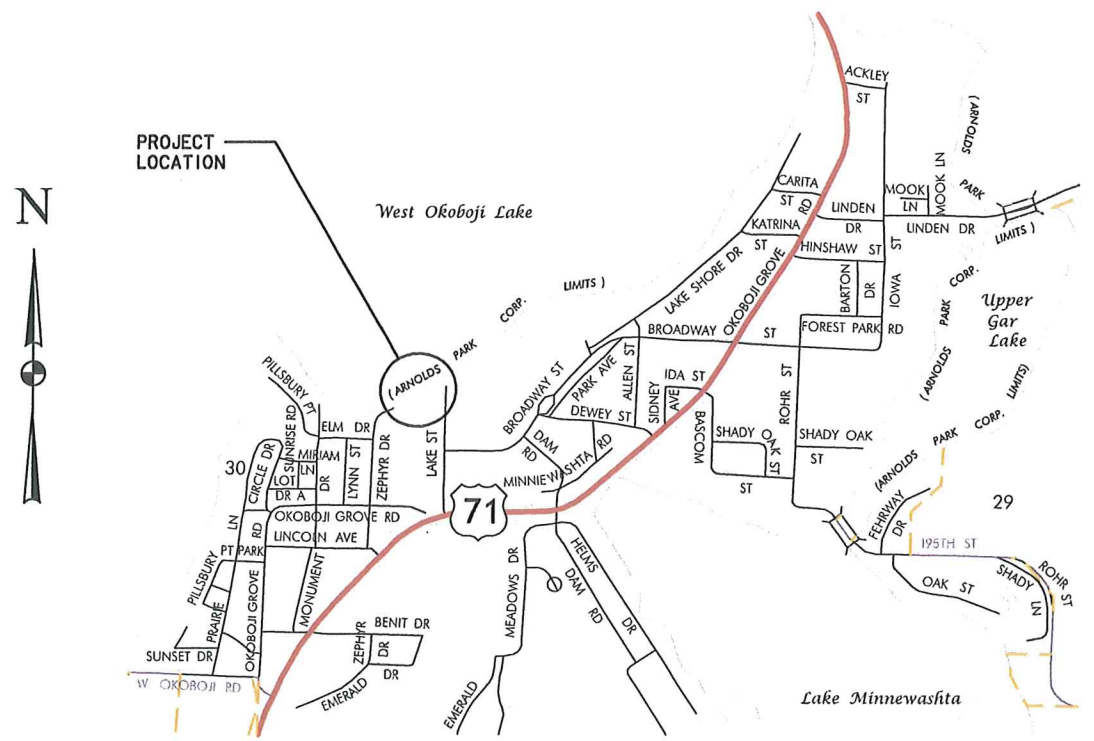
This is NOT a POINT 25 project and is not subject to the provisions of IAC 761-115.25.

105-4  
10-18-11

**STANDARD ROAD PLANS**

The following Standard Road Plans apply to construction work on this project.

Number	Date	Title
DR-202	04-21-15	Low Clearance Concrete Pipe Aprons
DR-213	10-17-17	Pipe Apron Guard
PV-101	04-16-19	Joints
SW-211	04-17-18	Storm Sewer Pipe Connections
SW-401	04-17-18	Circular Storm Sewer Manhole
SW-402	04-17-18	Rectangular Storm Sewer Manhole
SW-602	04-21-15	Castings for Storm Sewer Manholes



**LOCATION MAP  
(NOT TO SCALE)**

**IOWA ONE CALL**

1-800-292-8989 | 811

[www.iowaonecall.com](http://www.iowaonecall.com) | Know where you dig. Call before you dig.

**UTILITY CONTACT INFORMATION**

ARNOLDS PARK, CITY OF CONTACT NAME: WANDA THIELEN CONTACT PHONE: (712) 332-2341 CONTACT EMAIL: APHALL@MCHS1.COM	MILFORD COMMUNICATIONS CONTACT NAME: JOSH SANDBULTE CONTACT PHONE: (712) 338-4967 CONTACT EMAIL: JOSHS@MILFORDCOMM.NET
IOWA GREAT LAKES SANITARY DIST CONTACT NAME: STEVE ANDERSON CONTACT PHONE: (712) 338-2626 CONTACT EMAIL: IGLSD@IGLSD.COM	BLACK HILLS ENERGY SPENCER CONTACT NAME: JASON NOCK CONTACT PHONE: (712) 262-2878 CONTACT EMAIL: JASON.NOCK@BLACKHILLSCORP.COM

**AUTHORIZATION TO BID**

*[Signature]* 8-5-19

AUTHORIZATION - PARKS | WILDLIFE | FISHERIES | LAW ENFORCEMENT | FORESTRY DATE

*[Signature]* 6/5/19

ENGINEERING BUREAU CHIEF DATE

**GENERAL DESIGN**

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

*[Signature]* 06/04/2019

Signature: Bhooshan A. Karnik Date: \_\_\_\_\_

Printed or Typed Name: \_\_\_\_\_

My license renewal date is December 31, 2019

Pages or sheets covered by this seal: SHEETS 1 THRU 12 OF 12

### ESTIMATED STRUCTURE QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUANTITY
1	2102-2713090	EXCAVATION, CLASS 13, WASTE	CY	507	
2	2402-0425031	GRANULAR BACKFILL	TON	51.7	
3	2403-0100000	STRUCTURAL CONCRETE (MISCELLANEOUS)	CY	18.63	
4	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	2,994	
5	2416-0102236	APRON, LOW CLEARANCE CONCRETE, EQUIVALENT DIAMETER 36 IN.	EACH	1	
6	2435-0140160	MANHOLE, STORM SEWER, SW-401, 60 IN.	EACH	1	
7	2435-0140200	MANHOLE, STORM SEWER, SW-402	EACH	1	
8	2503-0111024	STORM SEWER GRAVITY MAIN, TRENCHED, HIGH DENSITY POLYETHYLENE PIPE (HDPE), 24 IN.	LF	251	
9	2503-0116336	STORM SEWER GRAVITY MAIN, TRENCHED, 2000D LOW CLEARANCE CONCRETE PIPE, EQUIVALENT DIAMETER 36 IN.	LF	2.5	
10	2503-0200036	REMOVE STORM SEWER PIPE LESS THAN OR EQUAL TO 36 IN.	LF	45	
11	2507-3250005	ENGINEERING FABRIC	SY	1,351	
12	2511-6745900	REMOVAL OF SIDEWALK	SY	637	
13	2511-7526106	SIDEWALK, REINFORCED P.C. CONCRETE, 6 IN.	SY	637	
14	2526-8285000	CONSTRUCTION SURVEY	LS	1	
15	2533-4980005	MOBILIZATION	LS	1	
16	2599-9999003	('CUBIC YARDS' ITEM) PERMEABLE LOW DENSITY CELLULAR CONCRETE	CY	492	
17	2599-9999008	('POUNDS' ITEM) STEEL SHEET PILING	LB	72,879.4	

### ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
1	2102-2713090	EXCAVATION, CLASS 13, WASTE ITEM IS INCLUDED FOR EXCAVATION OF THE EXISTING BACKFILL MATERIAL. QUANTITY IS ESTIMATED BASED ON A 2:1 GRADING SURFACE. ITEM INCLUDES AN ESTIMATED 10 CY OF EXCAVATION OF MISCELLANEOUS CONCRETE STRUCTURES AS NEEDED TO INSTALL THE STORM SEWER PIPES AND STRUCTURES. ALSO INCLUDES ALL DEWATERING NECESSARY BEHIND SEAWALL THROUGHOUT CONSTRUCTION, AS WELL AS STORAGE, TREATMENT, AND DISPOSAL OF ALL COLLECTED WATER.
2	2402-0425031	GRANULAR BACKFILL ITEM IS INCLUDED FOR PLACEMENT BEHIND THE PROPOSED SHEET PILE WALL UNDERNEATH THE PROPOSED 6" CONCRETE CAP. SEE SHEET NO. 5 FOR DETAILS.
3	2403-0100000	STRUCTURAL CONCRETE (MISCELLANEOUS) INCLUDES ALL PREFORMED EXPANSION JOINT FILLER REQUIRED. SEE SHEET NOS. 5 AND 6 FOR DETAILS.
4	2404-7775005	REINFORCING STEEL, EPOXY COATED --
5	2416-0102236	APRON, LOW CLEARANCE CONCRETE, EQUIVALENT DIAMETER 36 IN. REUSE EXISTING CONCRETE PAD FOR NEW APRON. SEE SHEET NO. 8 FOR DETAILS.
6	2435-0140160	MANHOLE, STORM SEWER, SW-401, 60 IN. SEE SHEET NO. 8 FOR DETAILS.
7	2435-0140200	MANHOLE, STORM SEWER, SW-402 SEE SHEET NO. 8 FOR DETAILS.
8	2503-0111024	STORM SEWER GRAVITY MAIN, TRENCHED, HIGH DENSITY POLYETHYLENE PIPE (HDPE), 24 IN. SEE SHEET NO. 8 FOR DETAILS.
9	2503-0116336	STORM SEWER GRAVITY MAIN, TRENCHED, 2000D LOW CLEARANCE CONCRETE PIPE, EQUIVALENT DIAMETER 36 IN. SEE SHEET NO. 8 FOR DETAILS.
10	2503-0200036	REMOVE STORM SEWER PIPE LESS THAN OR EQUAL TO 36 IN. INCLUDES REMOVAL OF EXISTING APRONS AS SHOWN ON SHEET NO. 8.

### ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
11	2507-3250005	ENGINEERING FABRIC INCLUDES 690 SY OF ENGINEERING FABRIC MATERIAL AS SPECIFIED FOR EMBANKMENT EROSION CONTROL IN ACCORDANCE WITH ARTICLE 4196.01,B,3, OF THE STANDARD SPECIFICATIONS. ALSO INCLUDES 661 SY OF ENGINEERING FABRIC MATERIAL (GEOMEMBRANE) AS SPECIFIED IN ACCORDANCE WITH ARTICLE 15008.02,A,3, OF THE DEVELOPMENTAL SPECIFICATIONS. MATERIAL SHALL MEET REQUIREMENTS OF MATERIALS I.M. 496.01, APPENDIX F. SEE SHEET NO. 8 FOR PLACEMENT DETAILS AND LOCATIONS. QUANTITY ESTIMATE DOES NOT INCLUDE ANY OVERLAP.
12	2511-6745900	REMOVAL OF SIDEWALK INCLUDES SAWCUT AS NECESSARY FOR SIDEWALK REMOVAL.
13	2511-7526106	SIDEWALK, REINFORCED P.C. CONCRETE, 6 IN. INCLUDES 6"X6" W10XW10 WELDED WIRE REINFORCEMENT (WWR) AS SHOWN ON STRUCTURAL DETAILS 2 SHEET.
14	2526-8285000	CONSTRUCTION SURVEY --
15	2533-4980005	MOBILIZATION --
16	2599-9999003	('CUBIC YARDS' ITEM) PERMEABLE LOW DENSITY CELLULAR CONCRETE PERMEABLE LOW DENSITY CELLULAR CONCRETE SHALL BE AS SPECIFIED IN THE "SPECIAL PROVISION FOR PERMEABLE LOW DENSITY CELLULAR CONCRETE" PROVIDED WITH THESE PLANS. INCLUDES MATERIAL AND LABOR ASSOCIATED WITH PROVIDING AND INSTALLING APPROXIMATELY 1090 LF OF 2" DIAMETER PVC CONDUITS (INCLUDING CAPS AND ALL OTHER HARDWARE) IN ACCORDANCE WITH THESE PLANS AND ALL 3'-0 GALVANIZED STRAP ANCHORS. SEE SHEET NOS. 5 AND 7 FOR DETAILS.
17	2599-9999008	('POUNDS' ITEM) STEEL SHEET PILING MEASUREMENT FOR STEEL SHEET PILING WILL BE BY POUND OF SHEET PILE INSTALLED. PAYMENT FOR STEEL SHEET PILE IS FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EQUIPMENT, AND LABOR, AND PERFORMANCE OF ALL WORK NECESSARY FOR INSTALLATION OF THE SHEET PILE. INCLUDES FURNISHING AND APPLYING ANTI-CORROSION COATING ON BOTH SIDES OF TOP 4 FEET OF EACH SHEET PILE, HEADED WELD STUDS, AND BEVELING AND RECOATING TOP OUTER EDGE OF SHEET PILE WALL AS SHOWN ON SHEET NO. 5. USED SHEET PILING WILL NOT BE ALLOWED FOR THIS PROJECT.

**ARNOLDS PARK SEAWALL REPAIR**

**QUANTITY SUMMARY**

ARNOLDS PARK, IA

JULY 2019

**DICKINSON COUNTY**

IOWA DEPARTMENT OF NATURAL RESOURCES

**GENERAL NOTES:**

THIS DESIGN IS TO PROTECT THE EXISTING SEAWALL AND PREVENT ADDITIONAL SCOUR FROM BEHIND THE SEAWALL WEST OF STATE PIER ON THE SOUTH SHORE OF WEST LAKE OKOBOJI IN THE CITY OF ARNOLDS PARK. THE INTENT OF THE DESIGN IS TO PROTECT THE SEAWALL WITH MINIMAL ENCROACHMENT IN THE WEST OKOBOJI LAKE.

THE SHEET PILE MATERIAL SHALL CONFORM TO SECTION 4167 OF THE IOWA DOT STANDARD SPECIFICATIONS FOR STRENGTH AND WELDABILITY. OTHER SHEET PILE MAY BE USED IN PLACE OF THE ONE DETAILED, BUT THE MINIMUM SECTION MODULUS REQUIRED SHALL NOT BE LESS THAN 3.53 CU. IN. PER FOOT OF WALL. SHEET PILES SHALL BE DRIVEN TO DEPTH SHOWN IN THESE PLANS.

ALL DIMENSIONS AND DETAILS SHOWN ON THESE PLANS PERTINENT TO NEW CONSTRUCTION SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE STARTING CONSTRUCTION.

FAINT LINES ON PLANS INDICATE THE EXISTING STRUCTURE.

THE CONTRACTOR IS TO PROVIDE ALL NECESSARY PROTECTIONS TO PREVENT DAMAGE, MOVEMENT, AND SETTLEMENT OF THE EXISTING SEAWALL AND ALL OTHER EXISTING INFRASTRUCTURE DURING SHEET PILE DRIVING AND ALL OTHER CONSTRUCTION.

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DISPOSE OF EXCAVATED MATERIAL OFFSITE. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR OFFSITE DISPOSAL. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT ANY MATERIAL FROM ENTERING THE LAKE.

ALL STRUCTURAL CONCRETE IN THE CONCRETE CAP AND CAP ENDS SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI.

ALL VISIBLE CONCRETE EDGES SHALL HAVE A 3/4" CHAMFER.

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

ALL REINFORCING STEEL SHALL COMPLY WITH ASTM A615, GRADE 60.

ALL REINFORCING BARS AND BARS NOTED AS DOWELS SUPPLIED FOR THIS STRUCTURE SHALL BE DEFORMED REINFORCEMENT UNLESS OTHERWISE NOTED OR SHOWN.

THE VOLUME OF VOIDS BENEATH THE EXISTING SIDEWALK SLAB IS UNKNOWN AND AS A RESULT, THE PLAN QUANTITY FOR CLASS 13 EXCAVATION SHOWN ON SHEET NO.2 IS AN ESTIMATE.

ANY WATER PUMPED FROM BEHIND THE SEAWALL AT ANY POINT DURING CONSTRUCTION SHALL NOT BE IMMEDIATELY DRAINED TO THE LAKE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COLLECT ALL WATER ACCUMULATED DURING DEWATERING EFFORTS OR FROM ANY POINT DURING CONSTRUCTION. THE SUSPENDED SOLIDS IN THE WATER SHALL BE ALLOWED TO SETTLE OR FILTERED OUT PRIOR TO DRAINING WATER TO THE STORM SEWER. DEWATERING AND ASSOCIATED TREATMENT AND DISPOSAL ARE INCIDENTAL TO EXCAVATION, CLASS 13, WASTE.

**GENERAL NOTES, CONT.:**

PROPOSED CONSTRUCTION SEQUENCE:

1. INSTALL SHEET PILE BETWEEN THE LIMITS SHOWN ON THE PLANS.
2. REMOVE EXISTING SIDEWALK.
3. GRADE/EXCAVATE AS NEEDED FOR PERMEABLE LOW DENSITY CELLULAR CONCRETE (PLDCC), STORM SEWER STRUCTURE AND PIPE PLACEMENT.
4. CONNECT GALVANIZED METAL STRAPS TO BACK OF EXISTING SEAWALL.
5. CONSTRUCT STORM SEWER STRUCTURES AND PIPES.
6. PLACE PLDCC.
7. PACE GRANULAR BACKFILL AND CONCRETE CAP BETWEEN SHEET PILE AND SEAWALL.
8. INSTALL NEW SIDEWALK.

**SPECIFICATIONS:**

IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT INCLUDING DEVELOPMENTAL SPECIFICATIONS FOR MASS CONCRETE - CONTROL OF HEAT OF HYDRATION.

THESE STRUCTURE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (4G1 IS 1/2 INCH DIAMETER BAR). ENGLISH REINFORCING STEEL RECEIVED IN THE FIELD MAY DISPLAY THE FOLLOWING "BAR DESIGNATION". THE "BAR DESIGNATION" IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

ENGLISH SIZE	3	4	5	6	7	8	9	10	11
BAR DESIGNATION	10	13	16	19	22	25	29	32	36

**ARNOLDS PARK SEAWALL REPAIR**

**GENERAL NOTES**

ARNOLDS PARK, IA

JULY 2019

**DICKINSON COUNTY**

IOWA DEPARTMENT OF NATURAL RESOURCES

# LOCATION

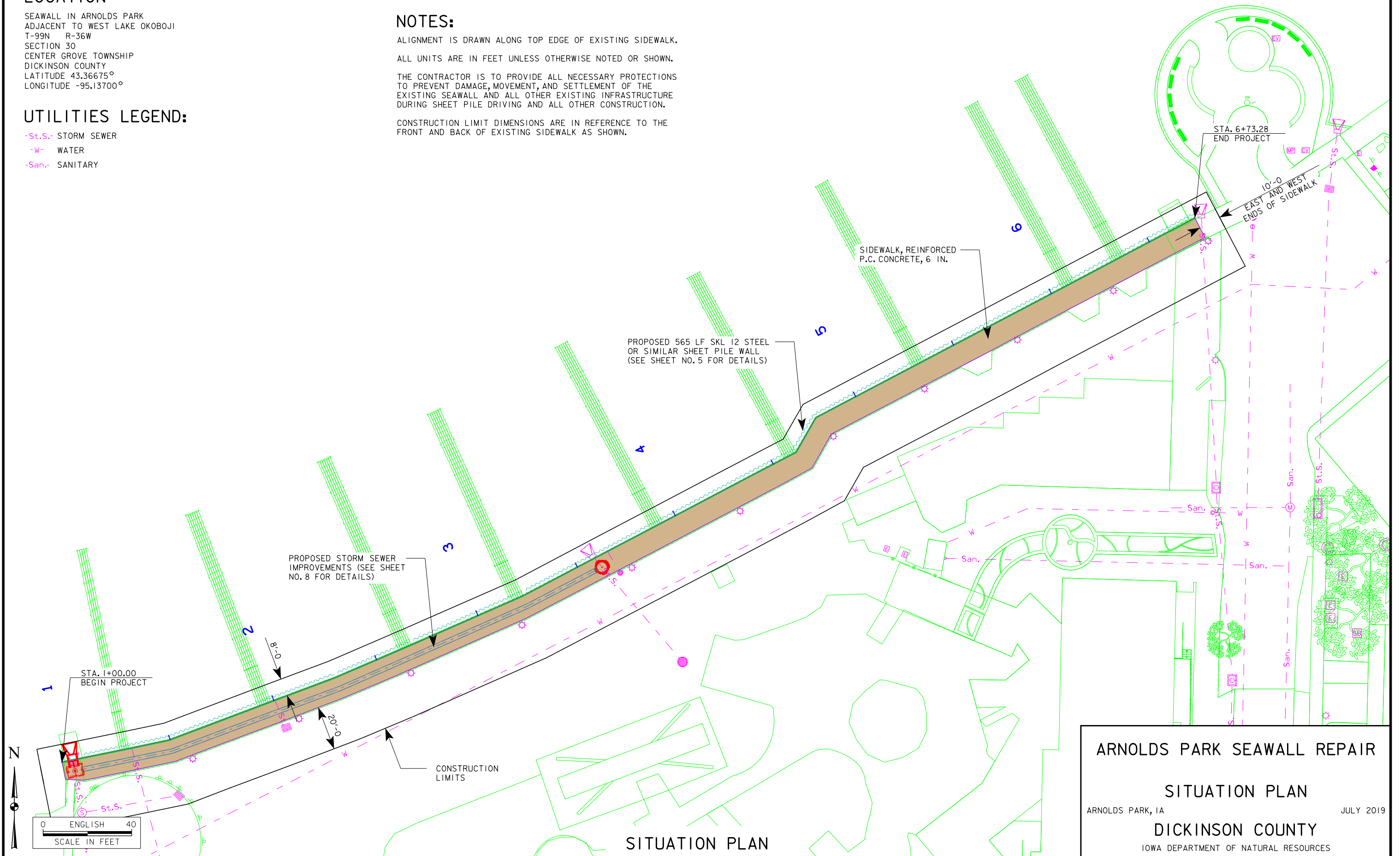
SEAWALL IN ARNOLDS PARK  
 ADJACENT TO WEST LAKE OKOBOJI  
 T-99N R-36W  
 SECTION 30  
 CENTER GROVE TOWNSHIP  
 DICKINSON COUNTY  
 LATITUDE 43.36675°  
 LONGITUDE -95.13700°

# UTILITIES LEGEND:

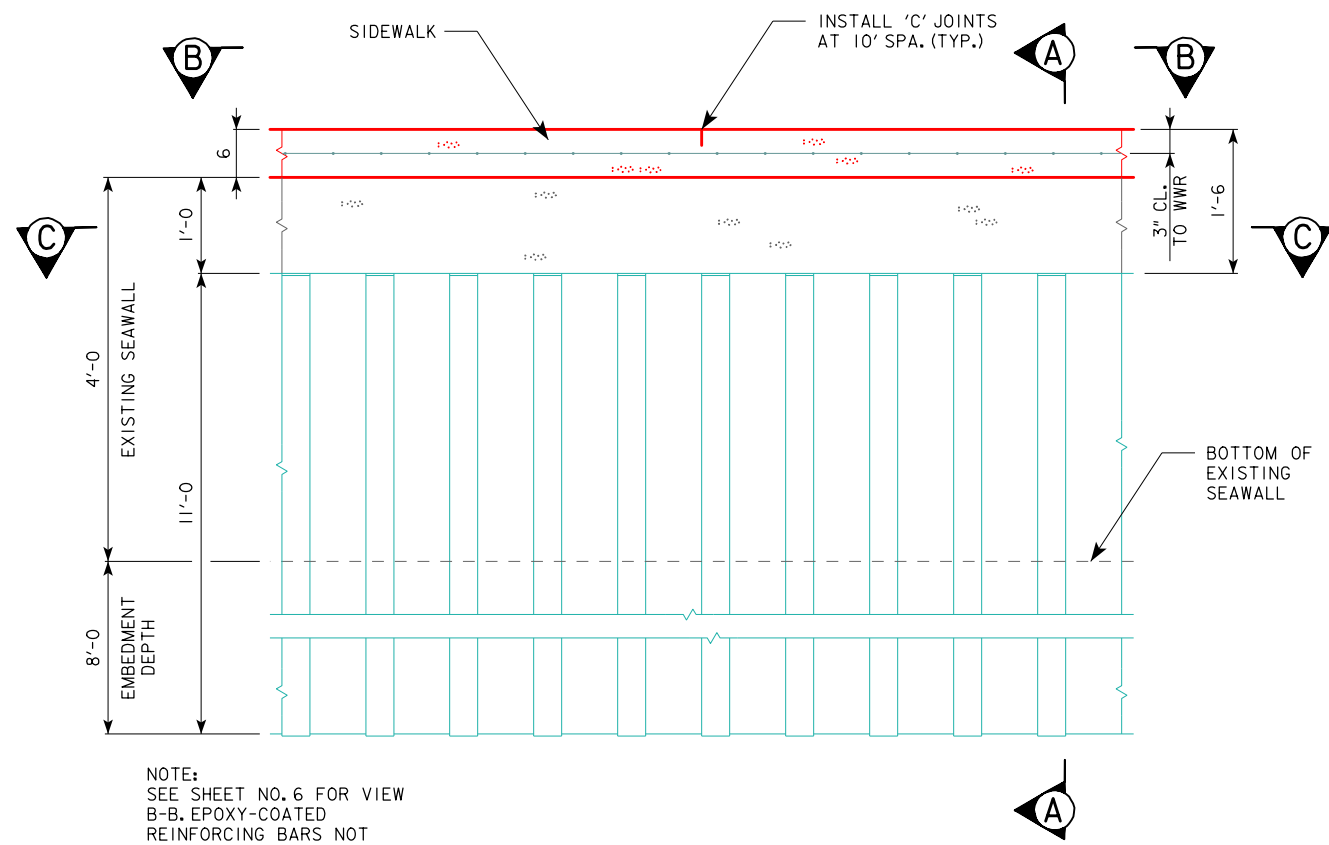
- St.S.- STORM SEWER
- W- WATER
- San.- SANITARY

# NOTES:

ALIGNMENT IS DRAWN ALONG TOP EDGE OF EXISTING SIDEWALK.  
 ALL UNITS ARE IN FEET UNLESS OTHERWISE NOTED OR SHOWN.  
 THE CONTRACTOR IS TO PROVIDE ALL NECESSARY PROTECTIONS TO PREVENT DAMAGE, MOVEMENT, AND SETTLEMENT OF THE EXISTING SEAWALL AND ALL OTHER EXISTING INFRASTRUCTURE DURING SHEET PILE DRIVING AND ALL OTHER CONSTRUCTION.  
 CONSTRUCTION LIMIT DIMENSIONS ARE IN REFERENCE TO THE FRONT AND BACK OF EXISTING SIDEWALK AS SHOWN.

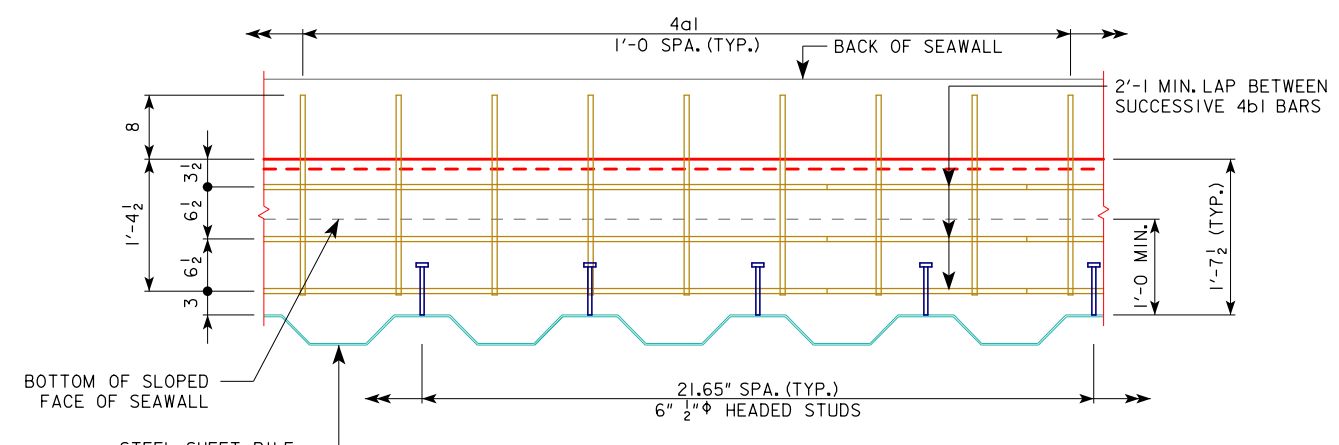


**ARNOLDS PARK SEAWALL REPAIR**  
**SITUATION PLAN**  
 ARNOLDS PARK, IA JULY 2019  
**DICKINSON COUNTY**  
 IOWA DEPARTMENT OF NATURAL RESOURCES

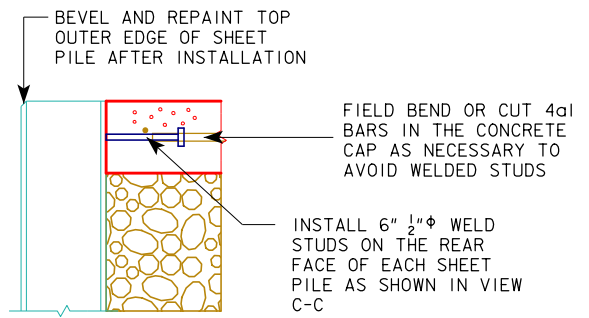


**SHEET PILE WALL - ELEVATION VIEW**

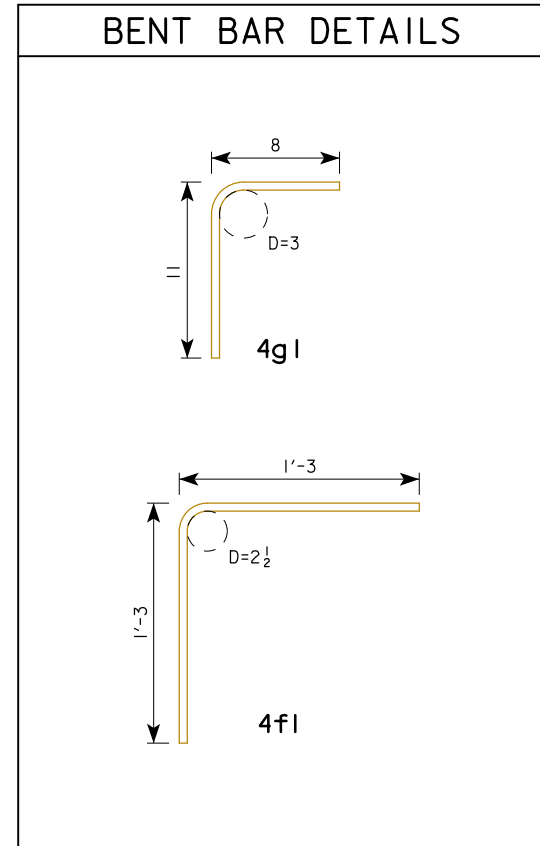
NOTE:  
SEE SHEET NO. 6 FOR VIEW  
B-B. EPOXY-COATED  
REINFORCING BARS NOT  
SHOWN FOR CALRITY.



**VIEW C-C**



**DETAIL A**



**BENT BAR DETAILS**

NOTE:  
QUANTITIES SHOWN ON THIS SHEET ARE INCLUDED ON  
SHEET NO. 2.

**NOTES:**

USE 'SKL 12' OR APPROVED SIMILAR STEEL SHEET PILE. PRIOR TO INSTALLATION, THE FRONT AND BACK OF THE TOP 4'-0" OF STEEL SHEET PILE SHALL BE COATED WITH INTERZONE 954 EPOXY BARRIER COAT OR APPROVED SIMILAR. COATING COLOR SHALL BE COORDINATED WITH THE ENGINEER. ANTI-CORROSION COATING IS INCIDENTAL TO THE STEEL SHEET PILE.

THE TOP OF THE EXISTING SEAWALL SHALL BE THE REFERENCE ELEVATION FOR SHEET PILE INSTALLATION DEPTH. INSTALL SHEET PILE UNTIL THE TOP OF SHEET PILE IS 1'-0" BELOW THE TOP OF THE EXISTING SEAWALL.

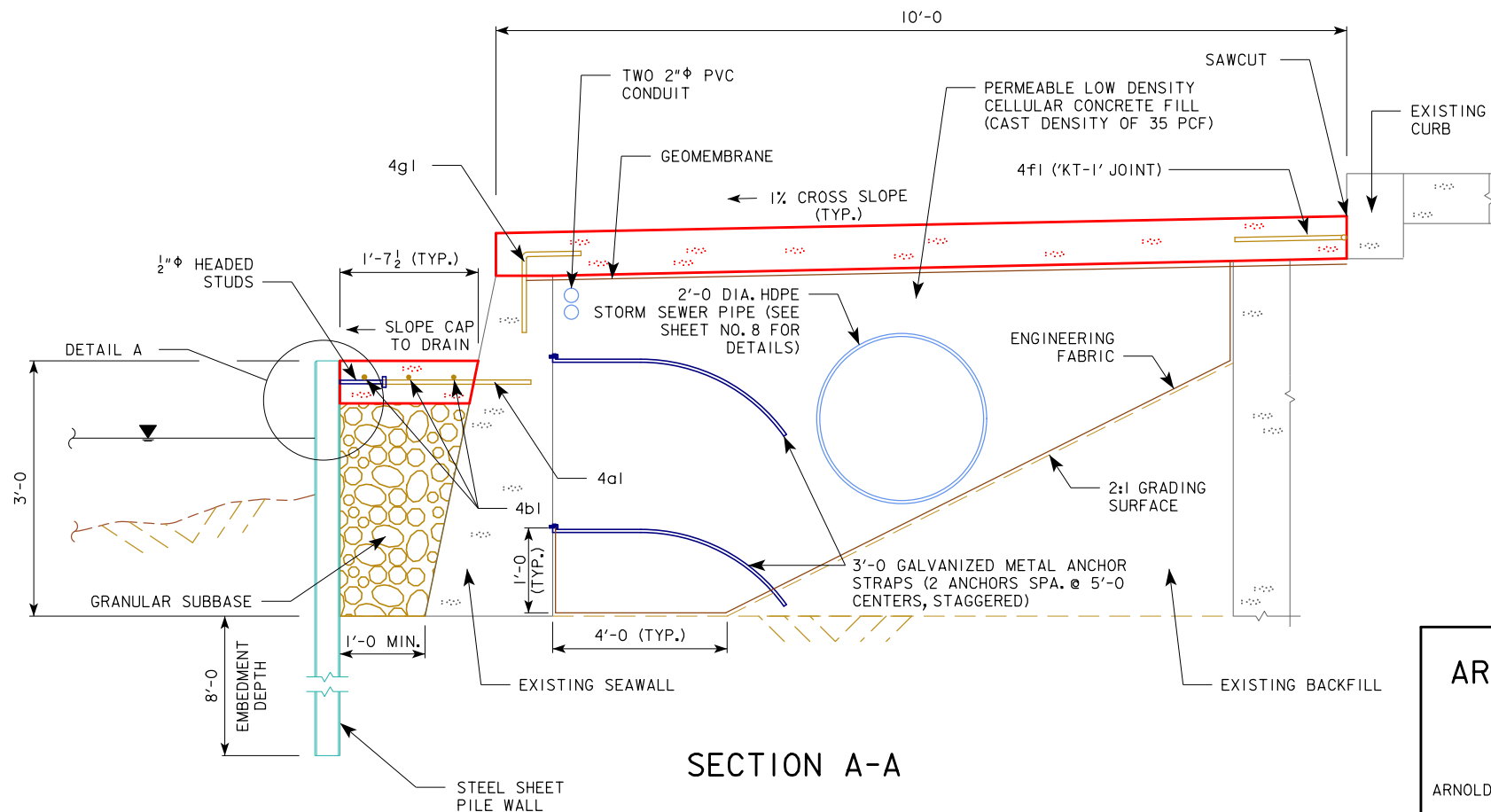
INSTALL TRANSVERSE CONSTRUCTION JOINTS IN 6" CONCRETE CAP BEHIND SHEET PILE WALL AT ALL LOCATIONS OF CONSTRUCTION JOINTS IN EXISTING SEAWALL. PLACE 1/2" WIDTH RESILIENT JOINT FILLER THAT CONFORMS TO SECTION 4136 OF THE IOWA DOT STANDARD SPECIFICATIONS FOR THE FULL 6" DEPTH BETWEEN SUCCESSIVE POURS OF THE CONCRETE CAP. JOINTS ARE INCIDENTAL TO STRUCTURAL CONCRETE.

GALVANIZED METAL STRAPS ARE INCIDENTAL TO PERMEABLE LOW DENSITY CELLULAR CONCRETE. STRAPS SHALL BE RIBBED TOP AND BOTTOM, 2" WIDE AND 5/32" THICK.

WELD STUDS ARE INCIDENTAL TO STEEL SHEET PILE.

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

PRIOR TO POURING REINFORCED SIDEWALK PAVEMENT, INSTALL AN ENGINEERING FABRIC (GEOMEMBRANE) THAT CONFORMS TO THE SPECIFICATIONS LISTED IN IOWA DOT DEVELOPMENTAL SPECIFICATION 15008 OVERTOP THE PERMEABLE LOW DENSITY CELLULAR CONCRETE FILL.



**SECTION A-A**

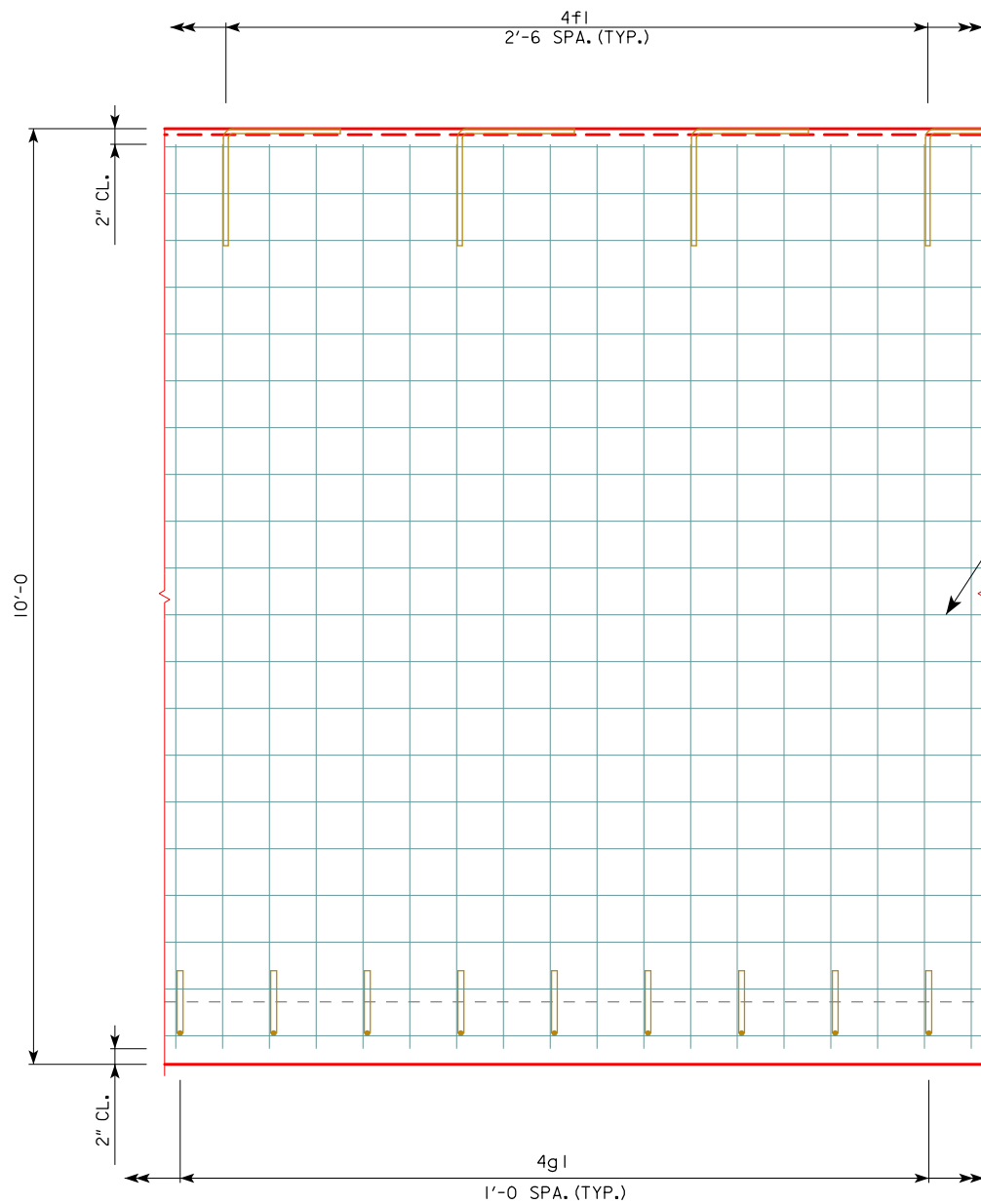
**ARNOLDS PARK SEAWALL REPAIR**

**STRUCTURAL DETAILS I**

ARNOLDS PARK, IA JULY 2019

**DICKINSON COUNTY**

IOWA DEPARTMENT OF NATURAL RESOURCES

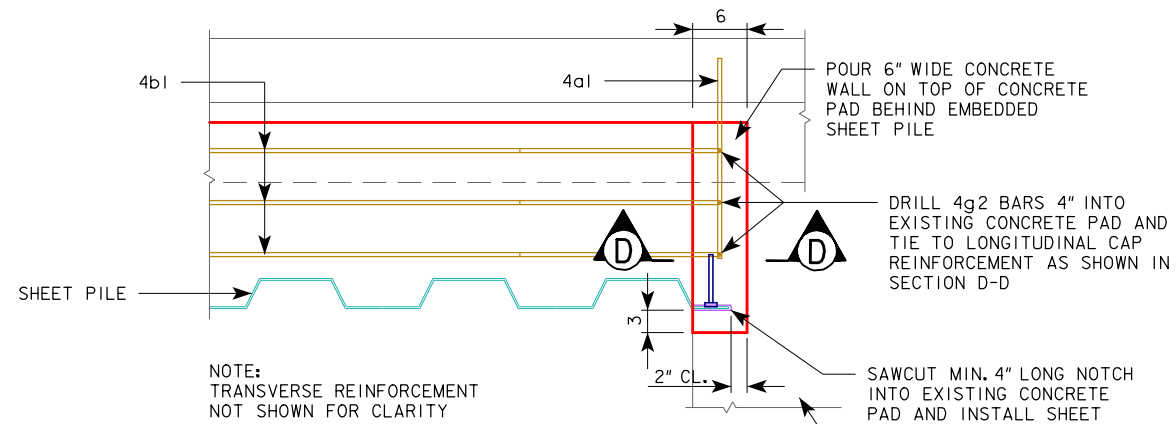


VIEW B-B

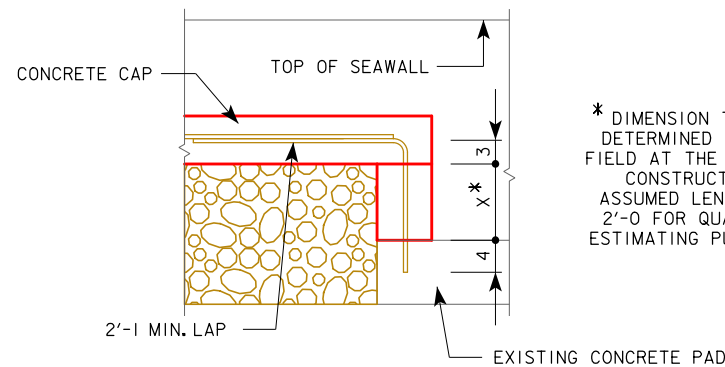
**NOTES:**

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR OR WELDED WIRE REINFORCEMENT IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

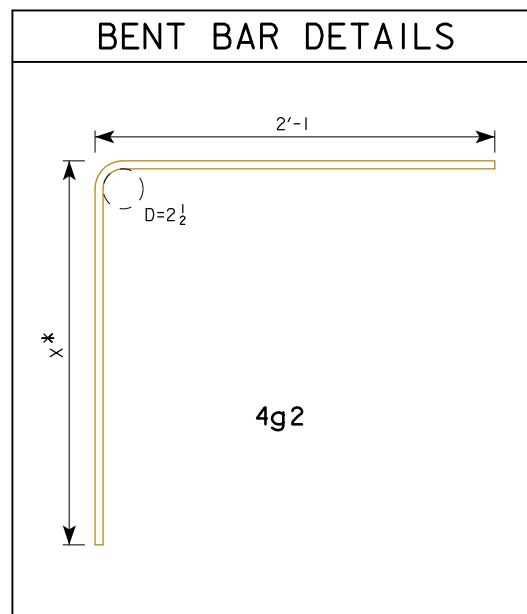
6" x 6" W10 X W10 WWR



SHEET PILE END PLAN VIEW (WEST END SHOWN, EAST END SIMILAR)



SECTION D-D



**REINFORCING BAR LIST**

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4a1	SEAWALL/CONCRETE CAP CONNECTION	—	565	2'-1	787
4b1	LONGITUDINAL CAP REINFORCEMENT	—	30	60'-0	1203
4f1	KEYWAY TIE JOINT	┘	226	2'-6	378
4g1	SEAWALL/SIDEWALK SLAB CONNECTION	┘	575	1'-7	609
4g2	CAP END REINFORCEMENT	┘	6	VARIES	17
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)					2994
NON-COATED W10 6"X6" W10XW10 WWR (200' ROLLS)					330
REINFORCING STEEL - TOTAL (LBS.)					

**CONCRETE PLACEMENT QUANTITIES**

LOCATION	QUANTITY
CONCRETE CAP	18.55
CONCRETE CAP END (EAST)	0.04
CONCRETE CAP END (WEST)	0.04
TOTAL (CU. YDS.)	18.63

NOTE: CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED ON SHEET NO. 2.

CONCRETE CAP AND CAP ENDS ARE BID AS "STRUCTURAL CONCRETE." SIDEWALK SLAB CONCRETE IS BID SEPARATELY.

ARNOLDS PARK SEAWALL REPAIR

STRUCTURAL DETAILS 2

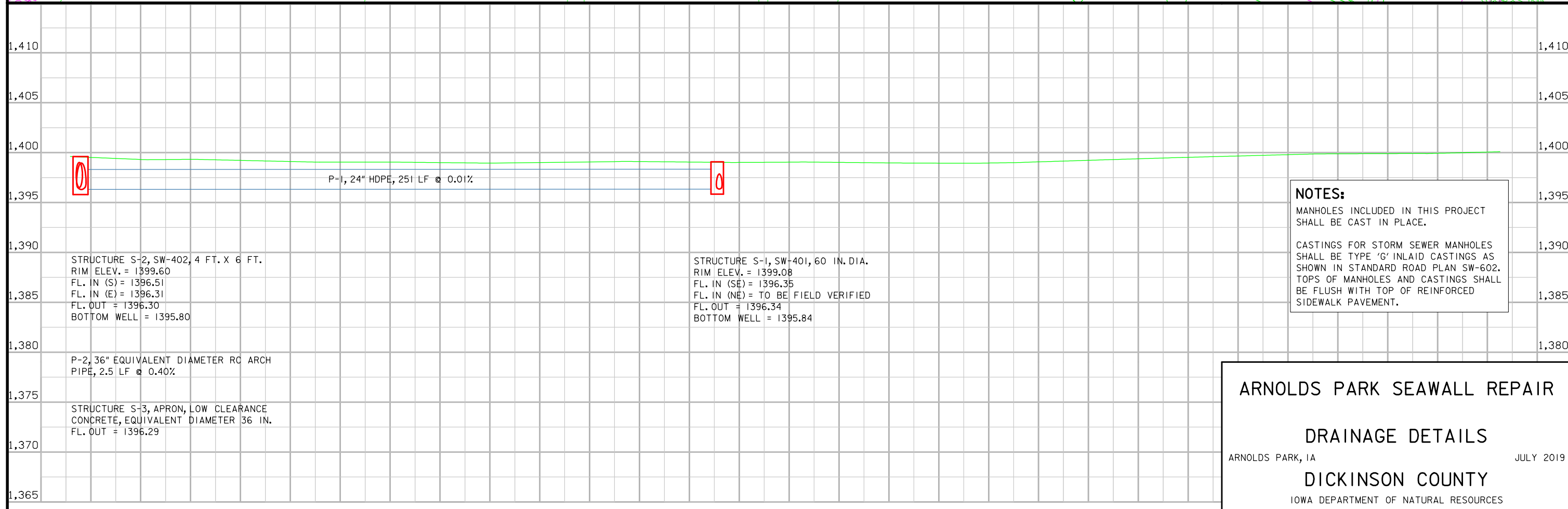
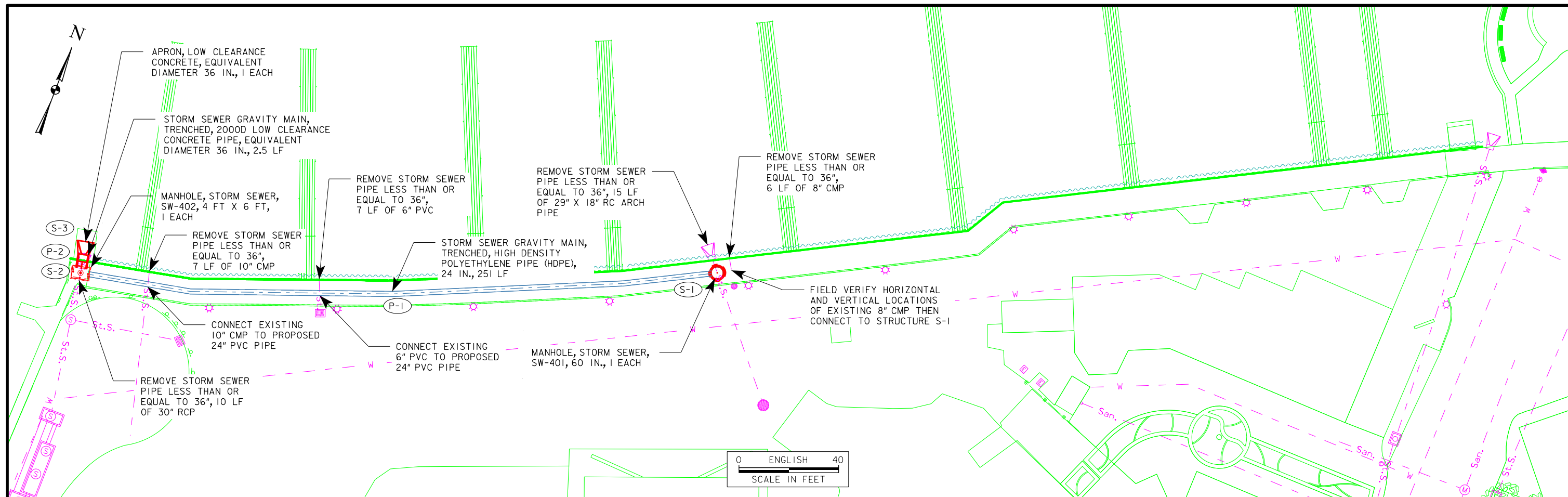
ARNOLDS PARK, IA

JULY 2019

DICKINSON COUNTY

IOWA DEPARTMENT OF NATURAL RESOURCES





STRUCTURE S-2, SW-402, 4 FT. X 6 FT.  
 RIM ELEV. = 1399.60  
 FL. IN (S) = 1396.51  
 FL. IN (E) = 1396.31  
 FL. OUT = 1396.30  
 BOTTOM WELL = 1395.80

STRUCTURE S-1, SW-401, 60 IN. DIA.  
 RIM ELEV. = 1399.08  
 FL. IN (SE) = 1396.35  
 FL. IN (NE) = TO BE FIELD VERIFIED  
 FL. OUT = 1396.34  
 BOTTOM WELL = 1395.84

P-2, 36" EQUIVALENT DIAMETER RC ARCH PIPE, 2.5 LF @ 0.40%

STRUCTURE S-3, APRON, LOW CLEARANCE CONCRETE, EQUIVALENT DIAMETER 36 IN. FL. OUT = 1396.29

**ARNOLDS PARK SEAWALL REPAIR**

**DRAINAGE DETAILS**

ARNOLDS PARK, IA JULY 2019

**DICKINSON COUNTY**

IOWA DEPARTMENT OF NATURAL RESOURCES





IOWA DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION PLANS  
FOR

ARNOLD'S PARK

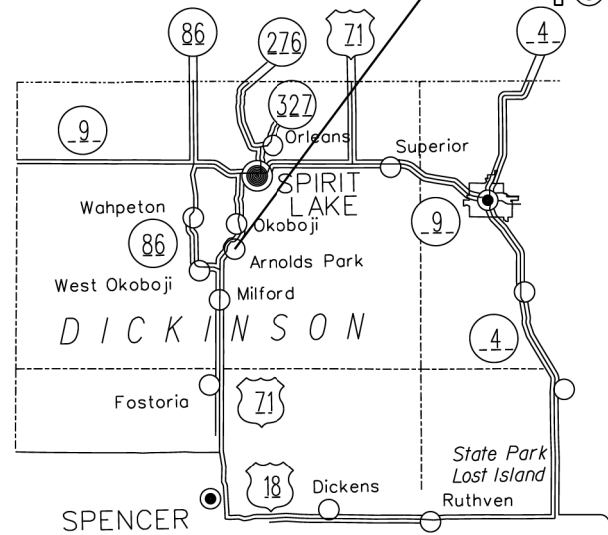
DICKINSON COUNTY

SIDEWALK REPAIRS

PROJECT NO. 98-01-30-02

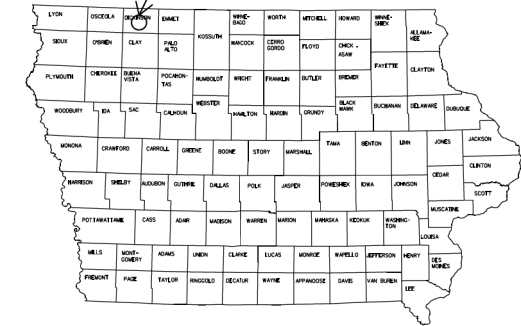
PLANS PREPARED BY  
BUREAU OF CONSTRUCTION SERVICES  
DIVISION OF ADMINISTRATION

PROJECT LOCATION



VICINITY MAP

PROJECT LOCATION



LOCATION MAP

ESTIMATE OF QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY
1	SIDEWALK REMOVAL, BACKFILL AS REQUIRED	883 S.Y.
2	SIDEWALK, P. C. CONCRETE, CLASS C4, 6 IN.	1080 S.Y.
3	P. C. CONCRETE, CLASS C4, VARIABLE THICKNESS	12 S.Y.
4	CULVERT, CMP, 10 IN. DIA.	10 L.F.
5	CULVERT, CMP, 8 IN. DIA.	30 L.F.
6	CULVERT, CMP, 6 IN. DIA.	20 L.F.
7	FLOWABLE MORTAR	25 C.Y.
8	MOBILIZATION	LUMP SUM
9	6" P. V. C. PIPE	420 L.F.
10	6" P. V. C. STRAINER	15 L.F.
11	6" P.V.C. 90° ELBOW	3 EA.
12	6" P.V.C. 45° ELBOW	6 EA.
13	UNDER WATER STRAINER SUPPORT INCLUDING PIPE AND CLAMP	3 EA.
14	RISER INSULATION SLEEVE	24 L.F.
15	DRY HYDRANT HEAD ASSEMBLY WITH BRONZE THREADED CAP	3 EA.
16	SAW CUT	660 L.F.

\_\_\_\_\_  
CHIEF ENGINEER  
\_\_\_\_\_  
ADMINISTRATOR - PARKS, PRESERVES & RECREATION DIVISION  
\_\_\_\_\_  
DIRECTOR - DEPARTMENT OF NATURAL RESOURCES

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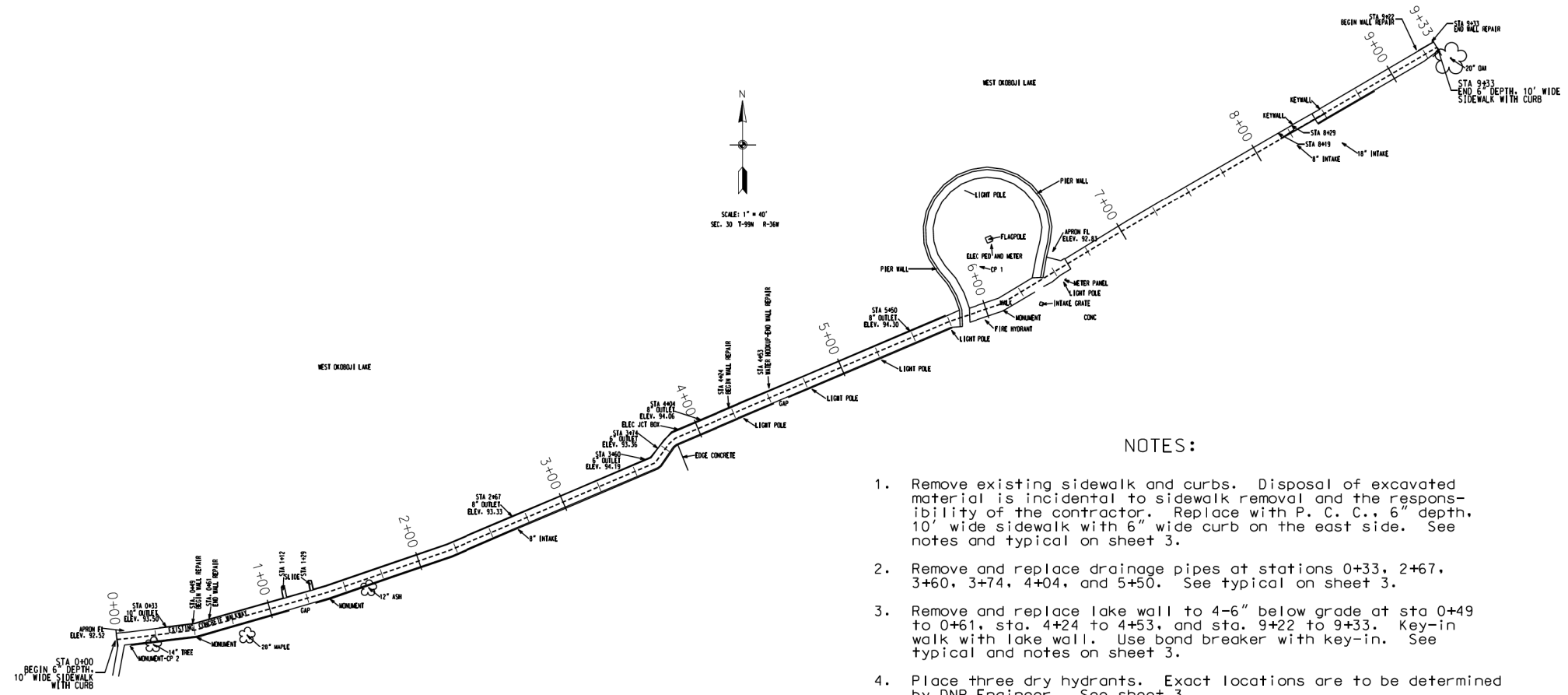
DRAWING INDEX

TITLE	SHEET NO.
TITLE SHEET, ESTIMATE OF QUANTITIES, LOCATION MAPS	1
AREA PLAN, CONSTRUCTION SITE, GENERAL NOTES	2
TYPICAL SECTIONS AND NOTES	3

PROJECT SIDEWALK REPAIRS PROJ. NO. 98-01-30-02  
AREA ARNOLD'S PARK - SPIRIT LAKE COUNTY DICKINSON

SHEET 1 OF 3

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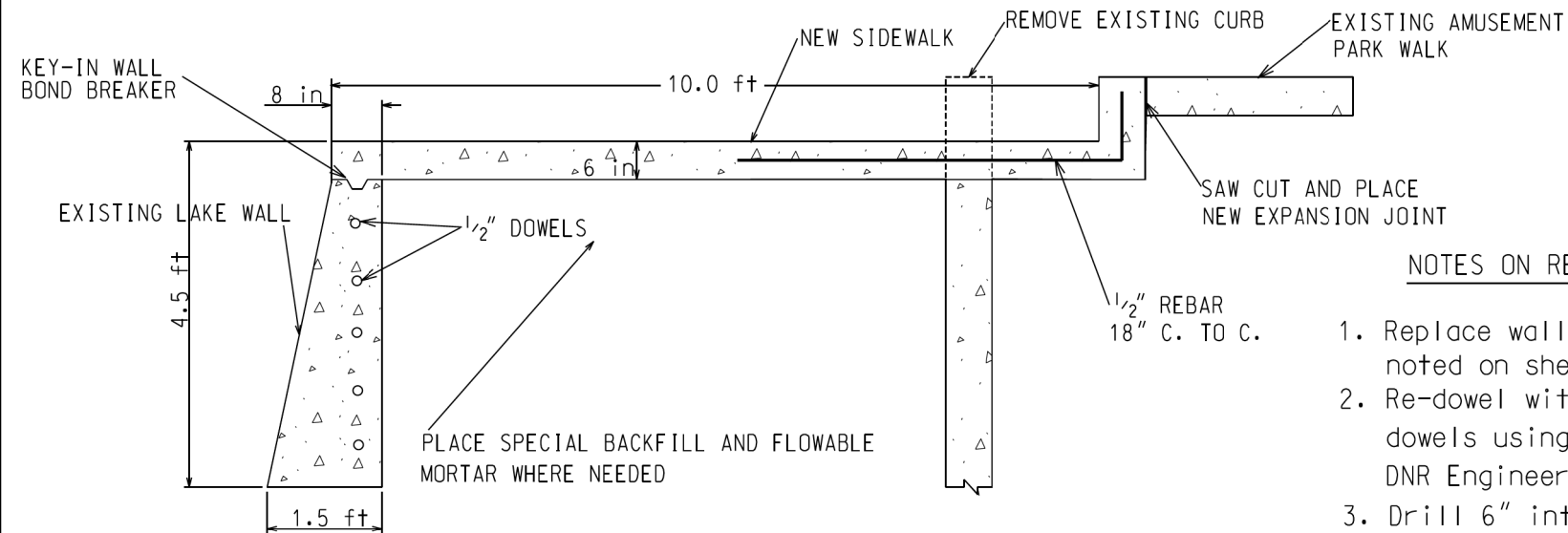


NOTES:

1. Remove existing sidewalk and curbs. Disposal of excavated material is incidental to sidewalk removal and the responsibility of the contractor. Replace with P. C. C., 6" depth, 10' wide sidewalk with 6" wide curb on the east side. See notes and typical on sheet 3.
2. Remove and replace drainage pipes at stations 0+33, 2+67, 3+60, 3+74, 4+04, and 5+50. See typical on sheet 3.
3. Remove and replace lake wall to 4-6" below grade at sta 0+49 to 0+61, sta. 4+24 to 4+53, and sta. 9+22 to 9+33. Key-in walk with lake wall. Use bond breaker with key-in. See typical and notes on sheet 3.
4. Place three dry hydrants. Exact locations are to be determined by DNR Engineer. See sheet 3.
5. Remove and dispose of concrete slides (as shown on site plan) at sta. 1+12 and 1+29.
6. Remove and dispose of concrete slab at sta. 8+19 to 8+29.
7. Do not disturb pier wall.
8. Light poles and electrical junction boxes are to be removed and replaced by others.

TITLE AREA PLAN - SIDEWALK REPAIRS DRAWN BY VLB DATE JANUARY 1998  
 PROJECT ARNOLD'S PARK - SPIRIT LAKE COUNTY DICKINSON PROJ. NO. 98-01-30-02  
 SHEET 2 OF 3

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For Information Only

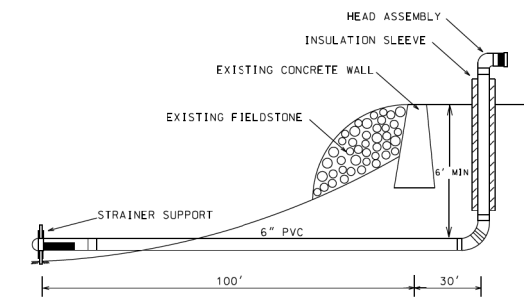


**TYPICAL SIDEWALK, CURB, & EXISTING LAKE WALL**  
NOT TO SCALE

**NOTES ON REPAIRED SEAWALL:**

1. Replace wall 4-6" below grade as noted on sheet 2.
2. Re-dowel with 1/2" dia., 12" long dowels using epoxy approved by the DNR Engineer.
3. Drill 6" into the existing wall and 6" into the replaced wall.
4. Dowels to be incidental to sidewalk.
5. Wall removal to be incidental to sidewalk removal.

**DRY HYDRANT INSTALLATIONS**

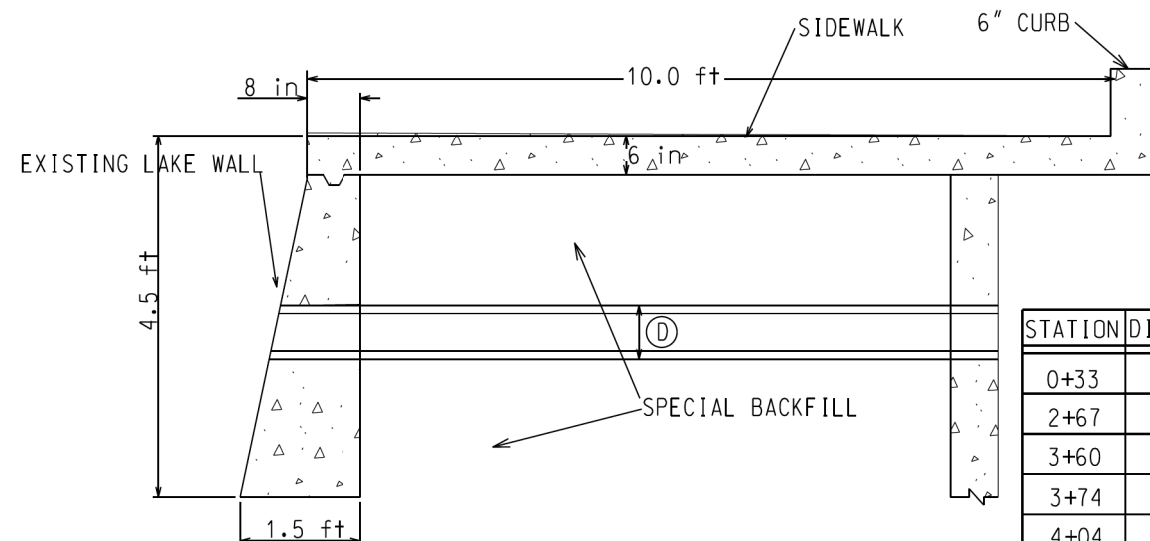


**NOTES:**

1. WORK INCLUDES THE INSTALLATION OF THREE DRY HYDRANTS ALONG THE SOUTH SHORE OF WEST OKBOBUI LAKE, ARNOLDS PARK, IOWA. EXACT LOCATIONS ARE TO BE DETERMINED BY DNR ENGINEER. ONE INSTALLATION WILL INCLUDE REMOVAL AND REPLACEMENT OF EXISTING CONCRETE WALL. THE OTHER TWO HYDRANTS DO NOT HAVE ANY WALL REMOVAL AND REPLACEMENT.
2. ALL PVC PIPE SHALL BE SCHEDULE 40
3. DRY HYDRANT STRAINER SHALL BE 6" SCHLUMBERGER PART NO. 224, OR APPROVED EQUAL.
4. HEAD ASSEMBLY SHALL BE SCHLUMBERGER PART NO. 227-B, OR APPROVED EQUAL.
5. SUPPORT CLAMP SHALL BE SCHLUMBERGER PART NO. 230, OR APPROVED EQUAL.
6. RISER INSULATION SLEEVE SHALL BE SCHLUMBERGER PART NO. 247, OR APPROVED EQUAL.
7. INSULATION SLEEVES TO BE 6' LENGTHS, AND ARE TO BE INCIDENTAL TO HYDRANT.

**NOTE:**

PLACE SPECIAL BACKFILL AROUND DRAINAGE PIPE AS APPROVED BY DNR ENGINEER.



**TYPICAL DRAINAGE PIPE UNDER SIDEWALK**  
NOT TO SCALE

STATION	DIA. (IN.) (D)	LENGTH (L.F.)
0+33	10"	10'
2+67	8"	10'
3+60	6"	10'
3+74	6"	10'
4+04	8"	10'
5+50	8"	10'

**NOTES ON SIDEWALK AND CURB REPLACEMENT:**

1. Saw cut existing amusement park walks on the east side of the curb and sidewalk to accommodate the new 10' wide sidewalk and 6" wide curb.
2. Place 1/4" expansion joint and joint sealer between new curb and existing saw cut amusement park walk.
3. Place special backfill and flowable mortar underneath replaced sidewalk where needed as approved by DNR Engineer. Special backfill is incidental to sidewalk removal.
4. Pour curb to match grade of existing amusement park walks.
5. Place L shaped reinforcing rod in curb to sidewalk on 18" centers, 1/2" diameter. Incidental to sidewalk.
6. Control joints are to be placed at a minimum of every 6' on sidewalk.
7. Dowelled expansion joints are to be every 50' on sidewalk. Use 3/4 x 12" dowels, wrapped on one end to prevent bond.

TITLE: SIDEWALK REPAIRS DRAWN BY: VLB DATE: JANUARY 1998  
PROJECT: ARNOLD'S PARK - SPIRIT LAKE COUNTY: DICKINSON PROJ. NO.: 98-01-30-02  
SHEET: 3 OF 3

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