

# IOWA DEPARTMENT OF NATURAL RESOURCES

## CONSTRUCTION PLANS FOR

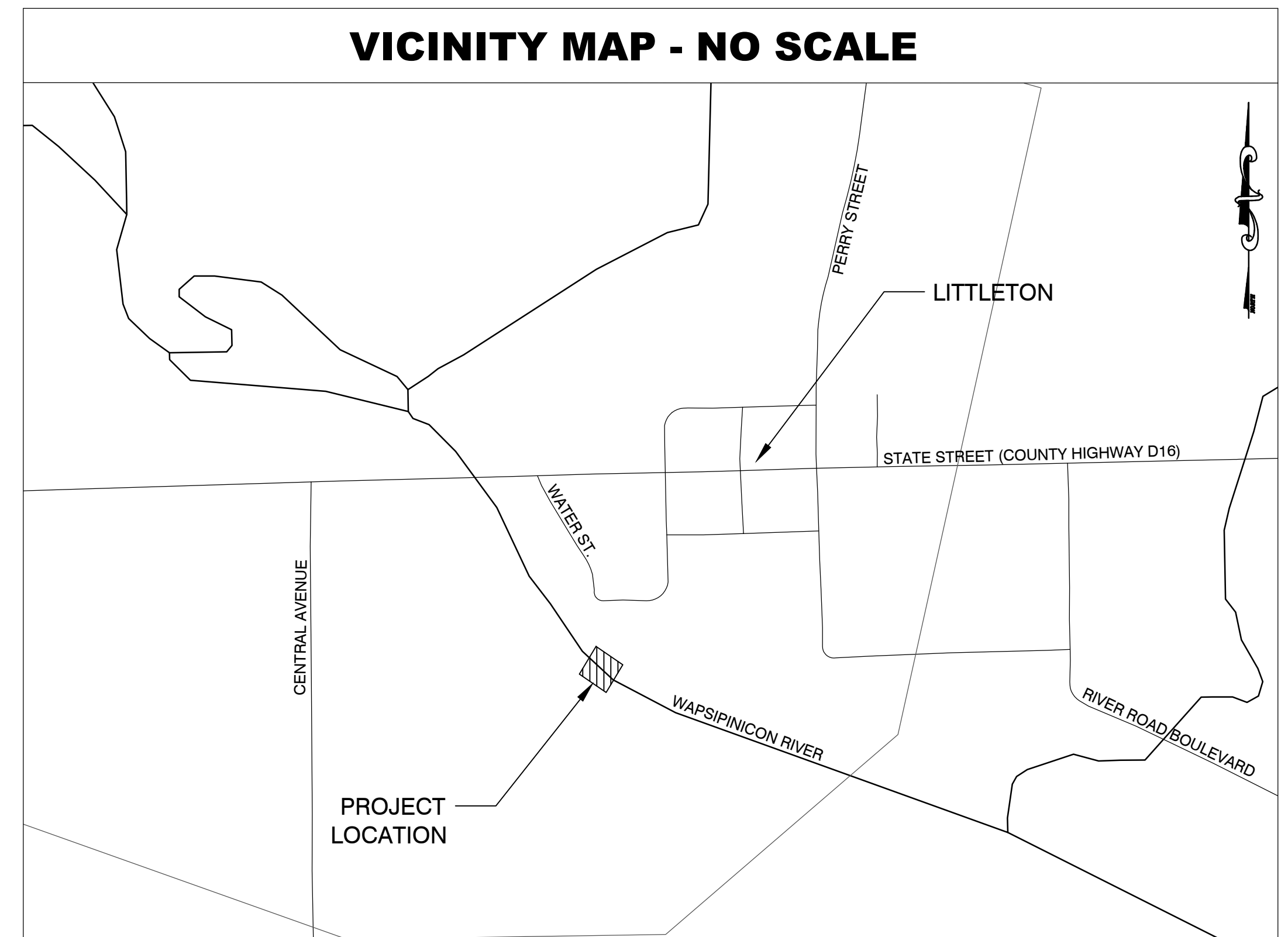
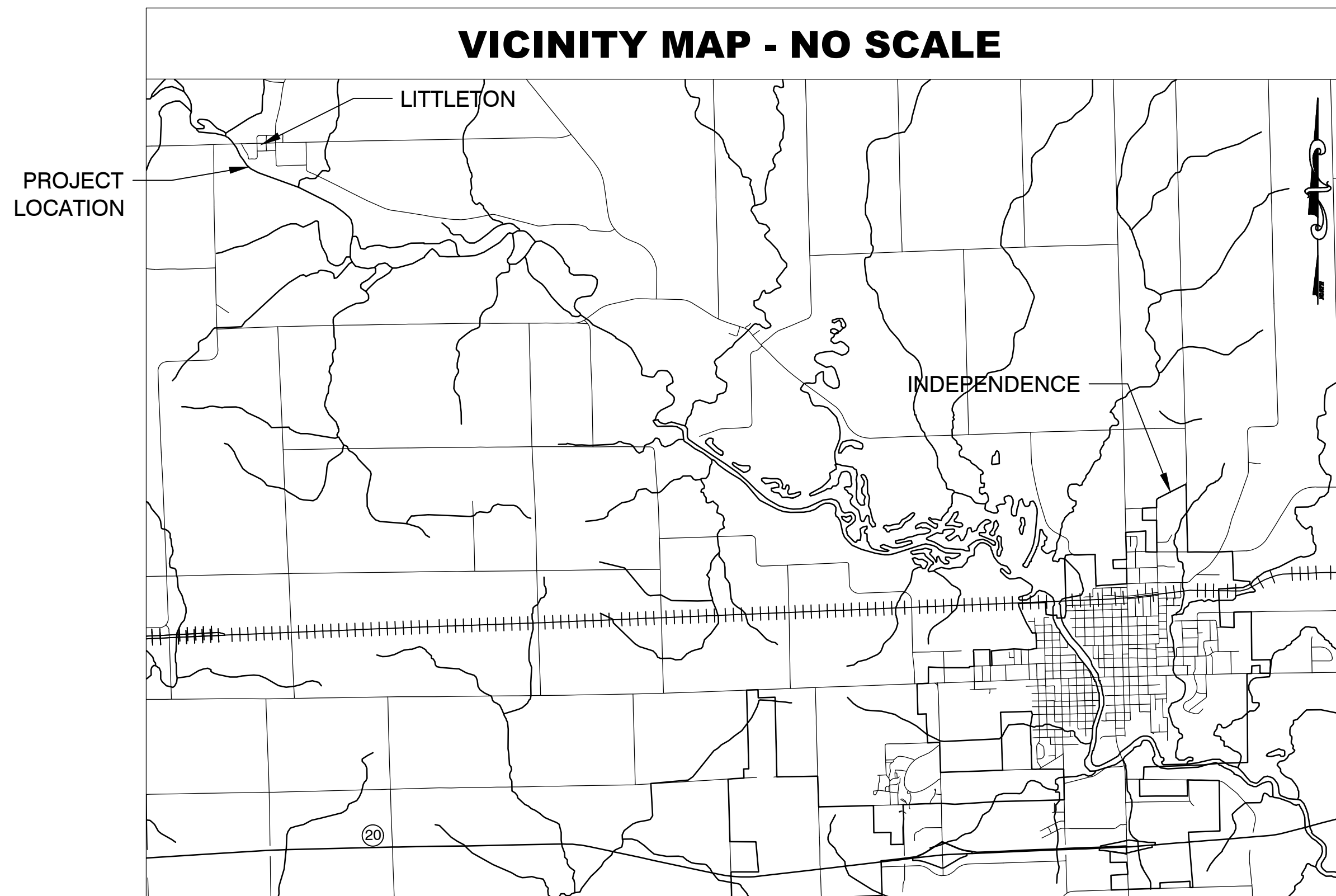
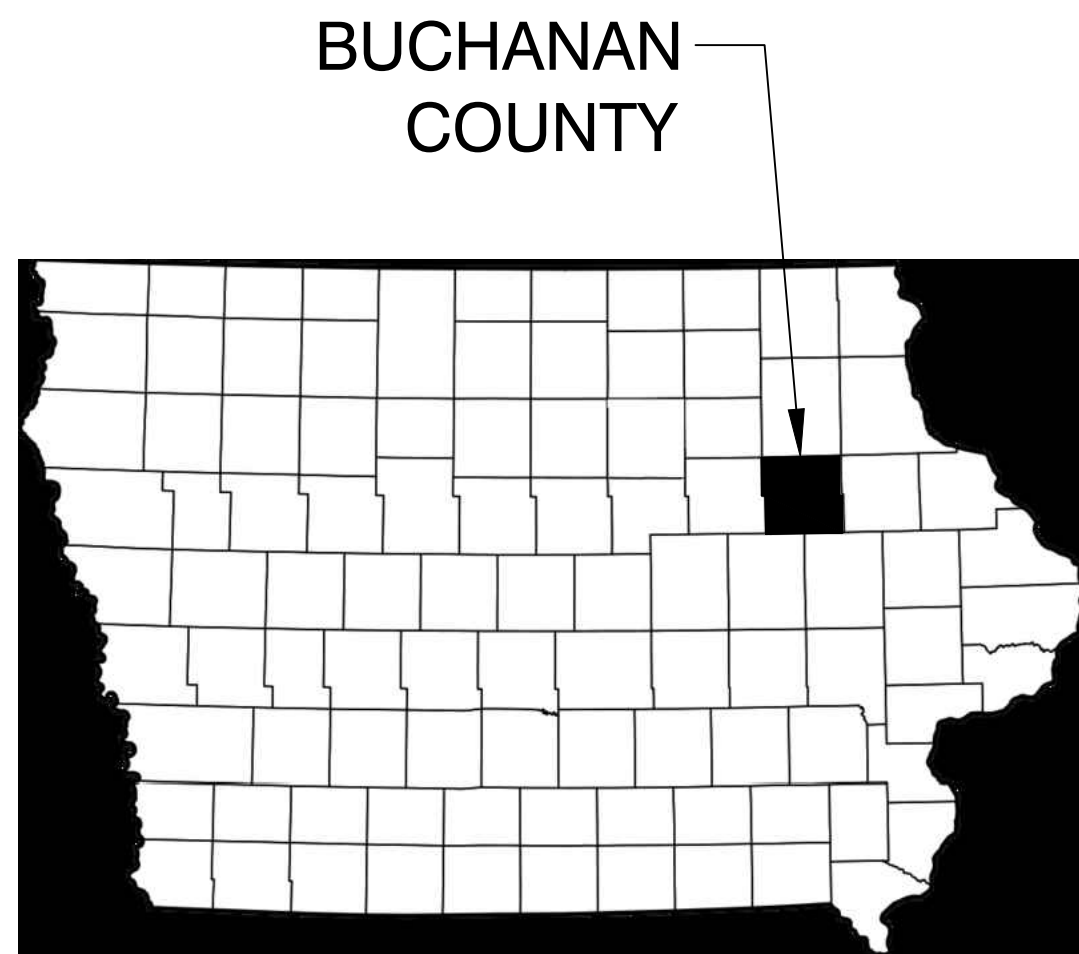
### LITTLETON DAM MITIGATION

### WAPSIPINICON RIVER

SW 1/4 SECTION 9, TOWNSHIP 89N, RANGE 10W, BUCHANAN COUNTY, IOWA  
 DNR PROJECT NO. 10-03-10-01

NO.	REVISION	BY	DATE

DESIGNED: LTL PROJECT NO.: 038.005  
 DRAFTED: BAY FILE NUMBER: 038.005  
 CHECKED: LTL SHEET NO.: A.01  
 SCALE: NO SCALE DATE: SEPTEMBER 19, 2018



#### INDEX OF SHEETS

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- B.01 DETAILS
- B.02 DETAILS - EXISTING DAM
- C.01 GENERAL NOTES
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- F.03 EROSION CONTROL PLAN
- W.01-W.04 CROSS SECTIONS
- W.05-W.06 TYPICAL CROSS SECTIONS

#### COUNTY ENGINEER

BUCHANAN COUNTY  
 BRIAN KEIERLEBER, ENGINEER  
 1511 1ST STREET E.  
 INDEPENDENCE, IA 50644  
 PH: (319) 334-6031  
 EMAIL: BKEIERLEBER@CO.BUCHANAN.IA.US

#### DEVELOPER

IOWA DEPARTMENT OF NATURAL RESOURCES  
 ATTN: NATE HOOGVEEN, RIVER PROGRAMS COORDINATOR  
 LAND AND WATERS BUREAU, CONSERVATION AND RECREATION DIVISION  
 WALLACE STATE OFFICE BUILDING  
 502 EAST NINTH STREET  
 DES MOINES, IA 50319  
 PH: (515) 281-3134  
 FAX: (515) 281-8895/(515) 281-6794  
 EMAIL: NATE.HOOGVEEN@DNR.IOWA.GOV

#### ENGINEER

LT LEON ASSOCIATES, INC.  
 LUIS LEON, P.E.  
 500 EAST LOCUST STREET, SUITE 400  
 DES MOINES, IOWA 50309  
 PH: (515) 422-0716  
 EMAIL: LLEON@LTLEON.COM

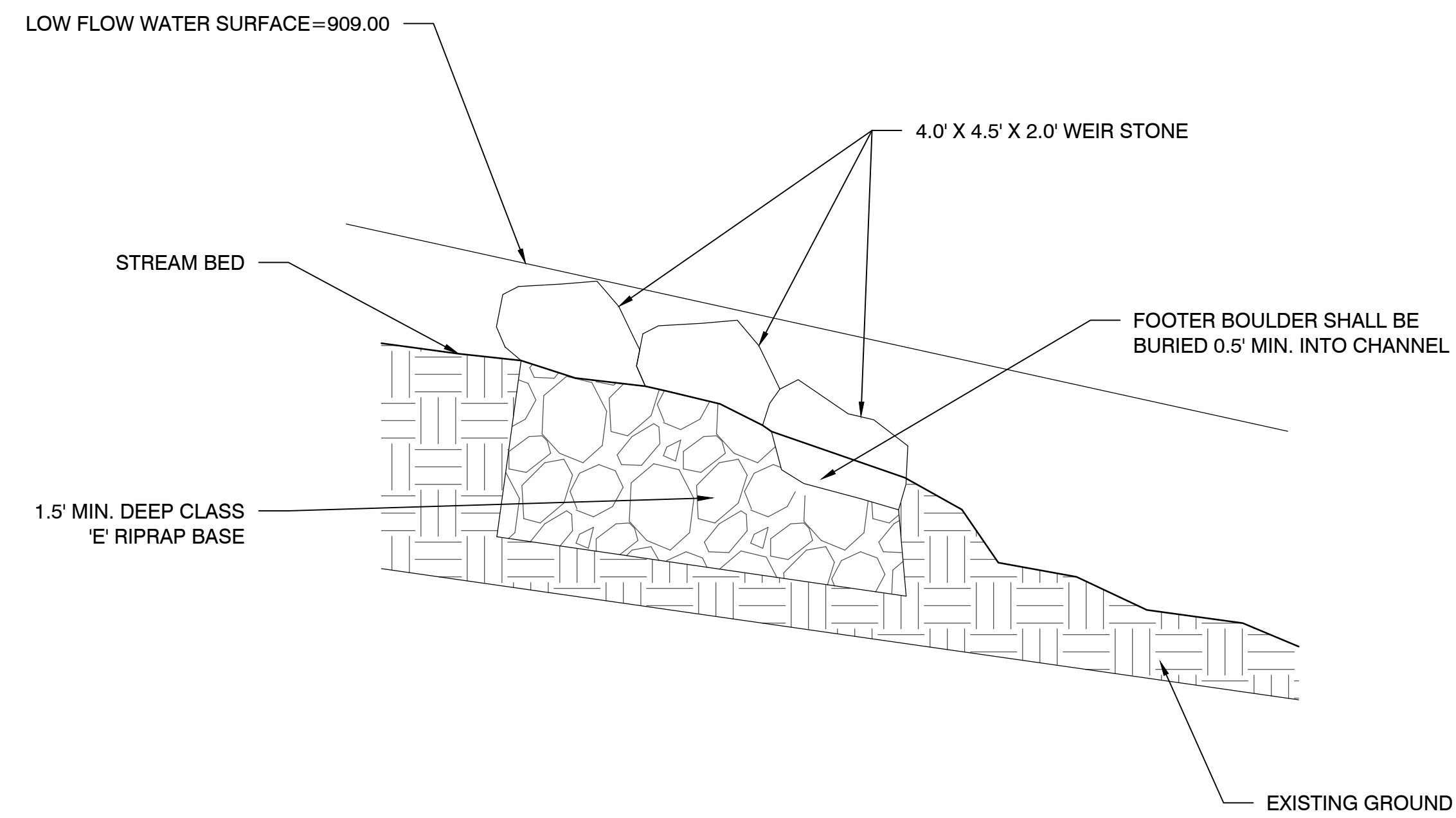
500 EAST LOCUST STREET SUITE 400  
 DES MOINES IOWA 50309 office 515-422-7016  
 www.ltleon.com

CALL 811 / 1-800-292-8989  
 2 Working Days BEFORE YOU DIG  
 DigSafeWait48.com

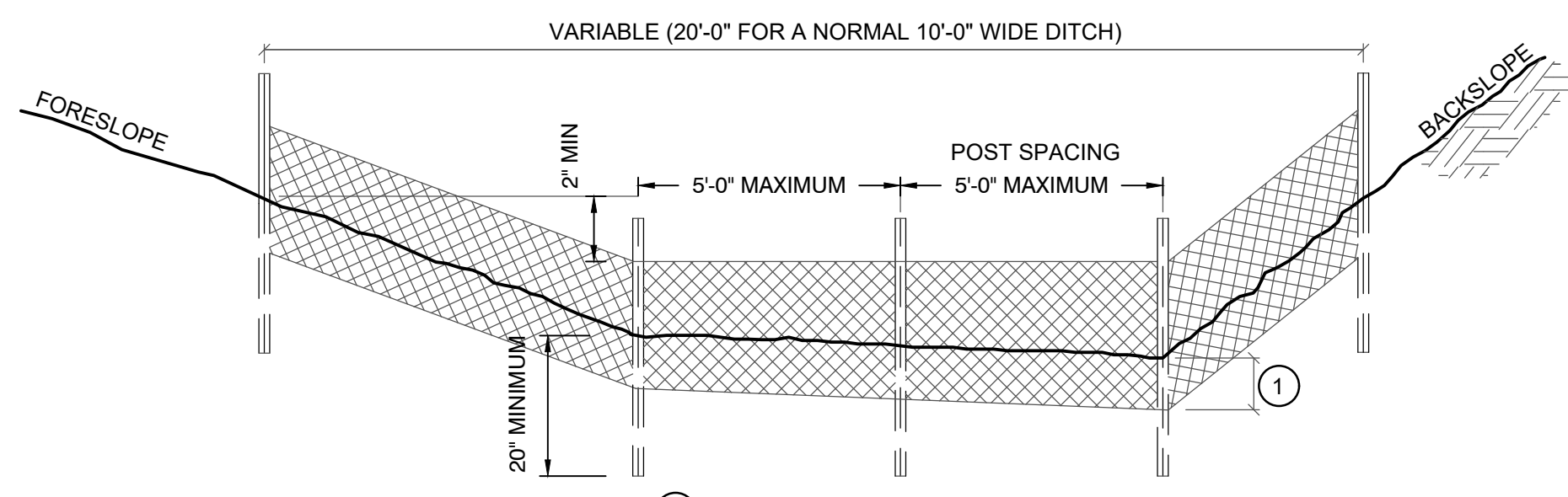
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature: *L.T. Leon* Date: 9/19/2018  
 Luis T. Leon, P.E.  
 Iowa License Number 18685  
 My license renewal date is December 31, 2019.

Pages or sheets covered by this seal: \_\_\_\_\_

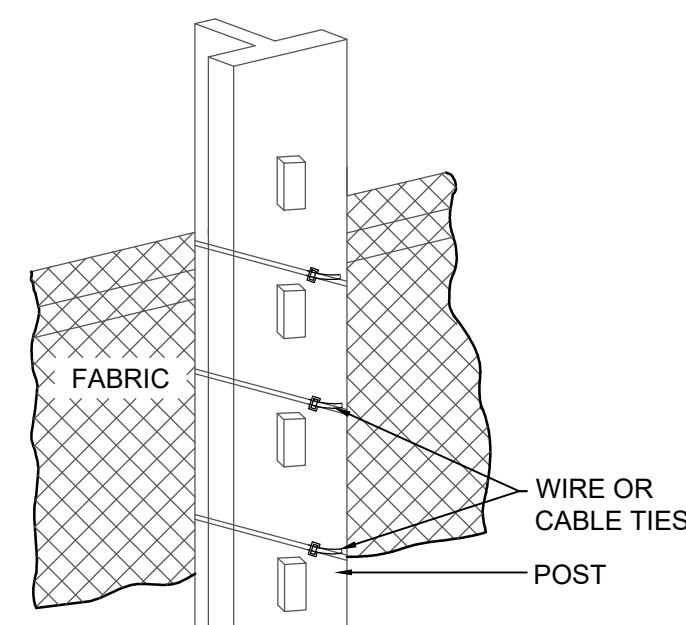


1 BOULDER CLUSTER DETAIL  
NOT TO SCALE



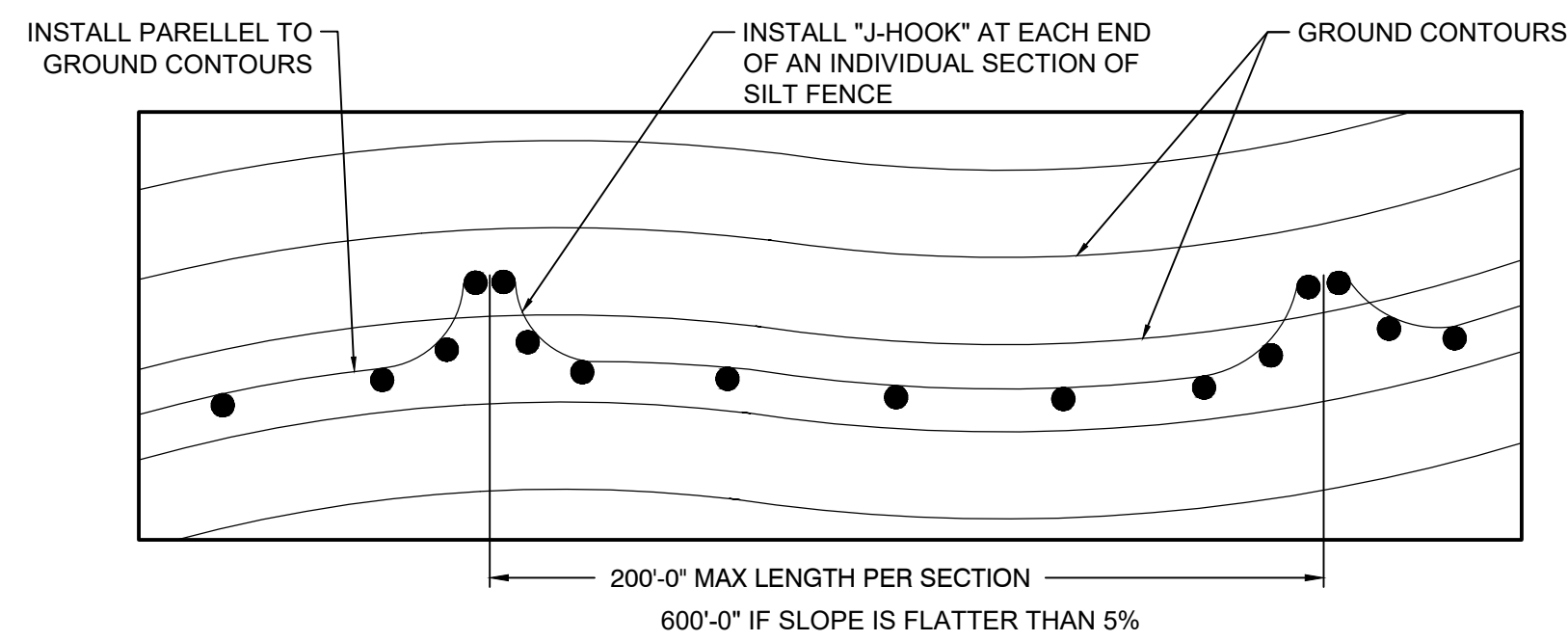
1 INSERT 12 INCHES OF FABRIC A MINIMUM OF 6 INCHES DEEP (FABRIC MAY BE FOLDED BELOW THE GROUND LINE)

TYPICAL SILT FENCE DITCH CHECK



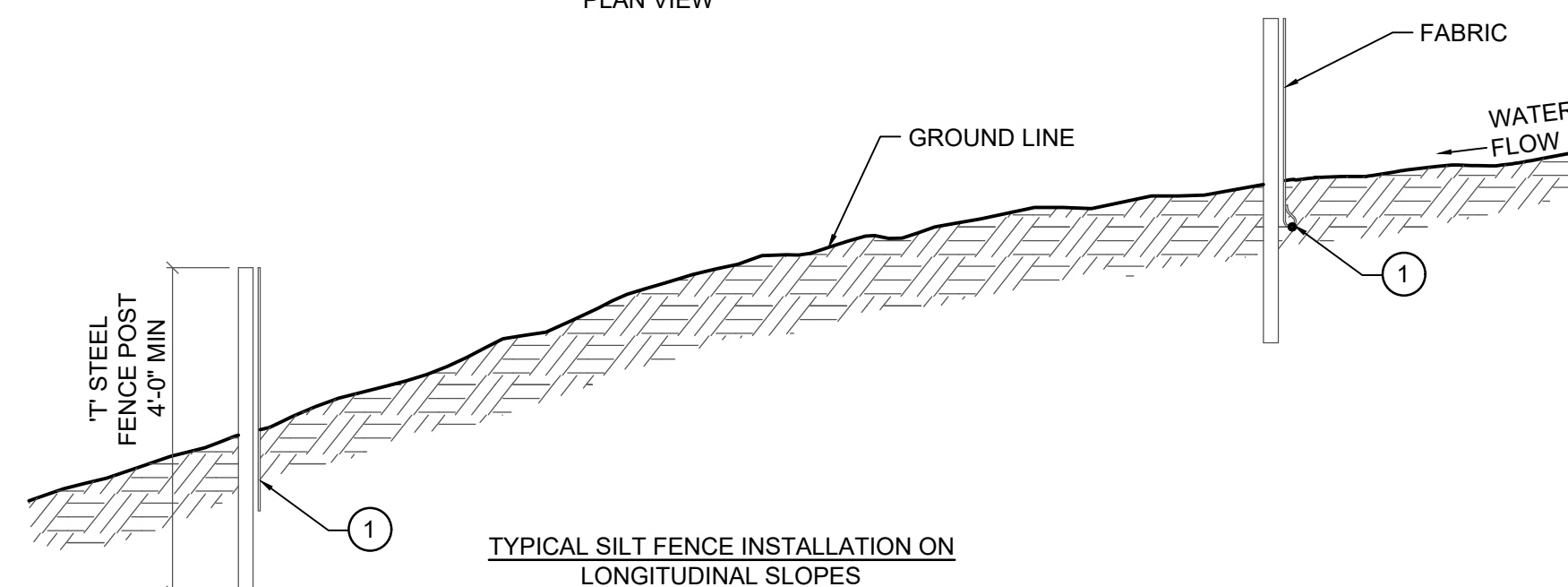
ATTACHMENT TO POST

3 SILT FENCE  
NOT TO SCALE



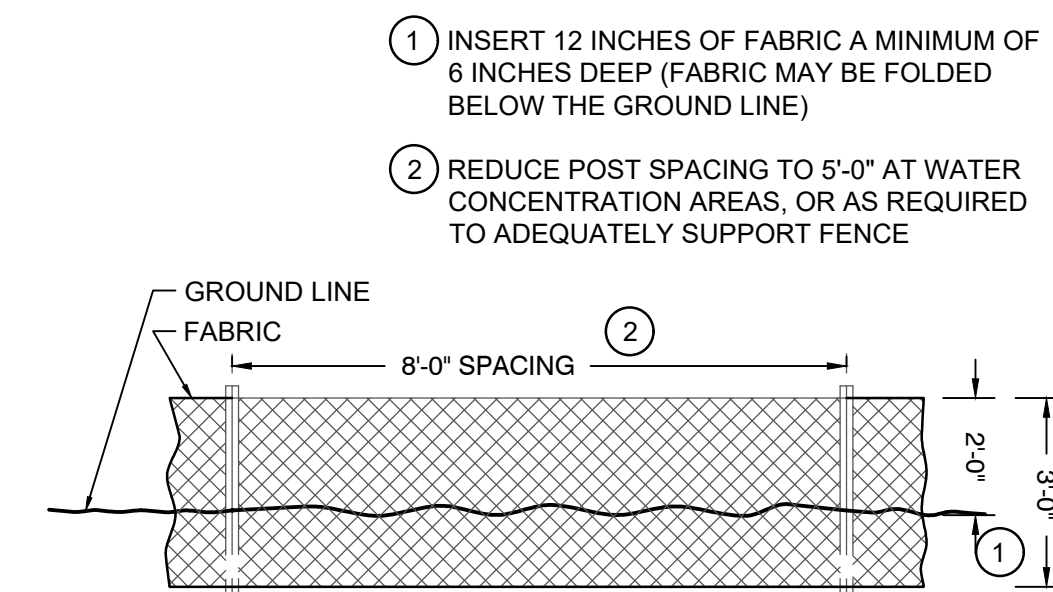
TYPICAL SILT FENCE INSTALLATION ON LONGITUDINAL SLOPES

PLAN VIEW



TYPICAL SILT FENCE INSTALLATION ON LONGITUDINAL SLOPES

PROFILE VIEW



DETAILS OF SILT FENCE ON LONGITUDINAL SLOPES

- 1 INSERT 12 INCHES OF FABRIC A MINIMUM OF 6 INCHES DEEP (FABRIC MAY BE FOLDED BELOW THE GROUND LINE)
- 2 REDUCE POST SPACING TO 5'-0" AT WATER CONCENTRATION AREAS, OR AS REQUIRED TO ADEQUATELY SUPPORT FENCE

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SCALE: NO SCALE			DATE: SEPTEMBER 19, 2018

LITTLETON DAM MITIGATION  
WAPSIPINCON RIVER  
LITTLETON, IOWA  
DETAILS

**LITTLETON ASSOCIATES INC**  
office: 515-427-7016  
www.ltleon.com  
500 EAST LOCUST STREET SUITE 400  
DES. MOHNS, IOWA 50309

PROJECT NO. 038.005

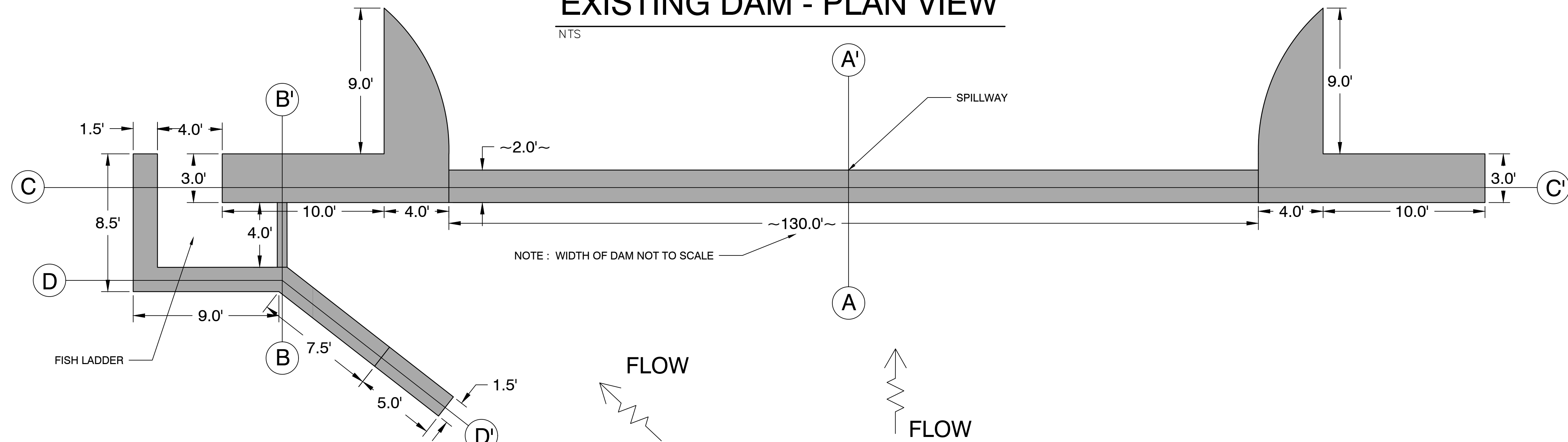
DETAILS

SHEET NO.

B.01

# EXISTING DAM - PLAN VIEW

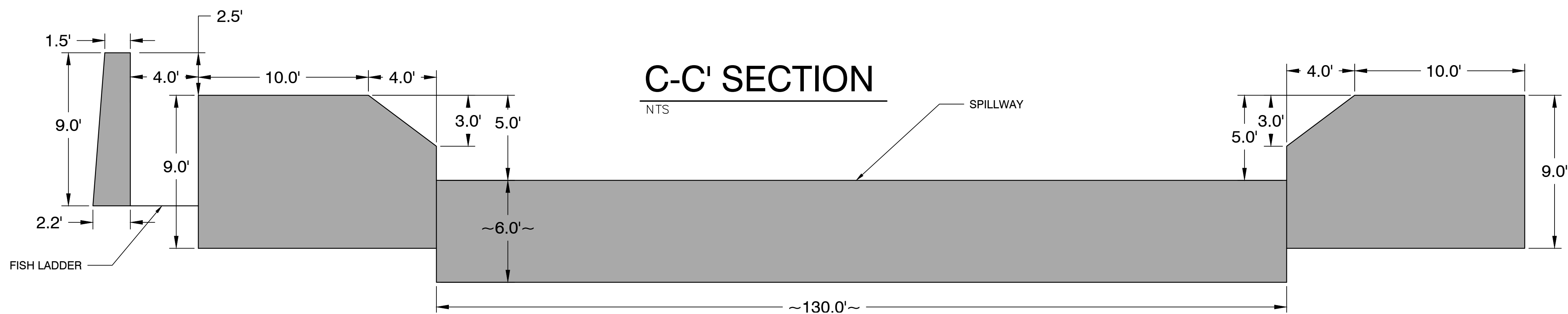
NTS



NOTE: WIDTH OF DAM NOT TO SCALE

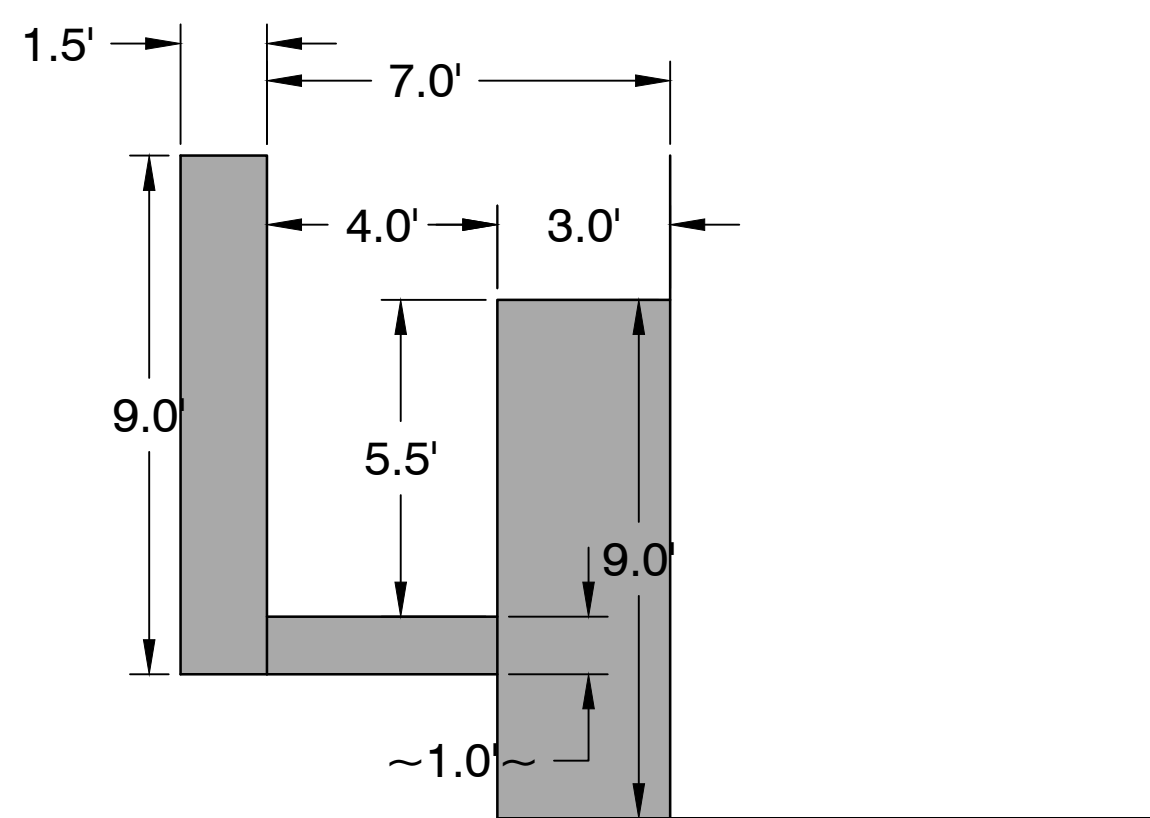
## C-C' SECTION

NTS



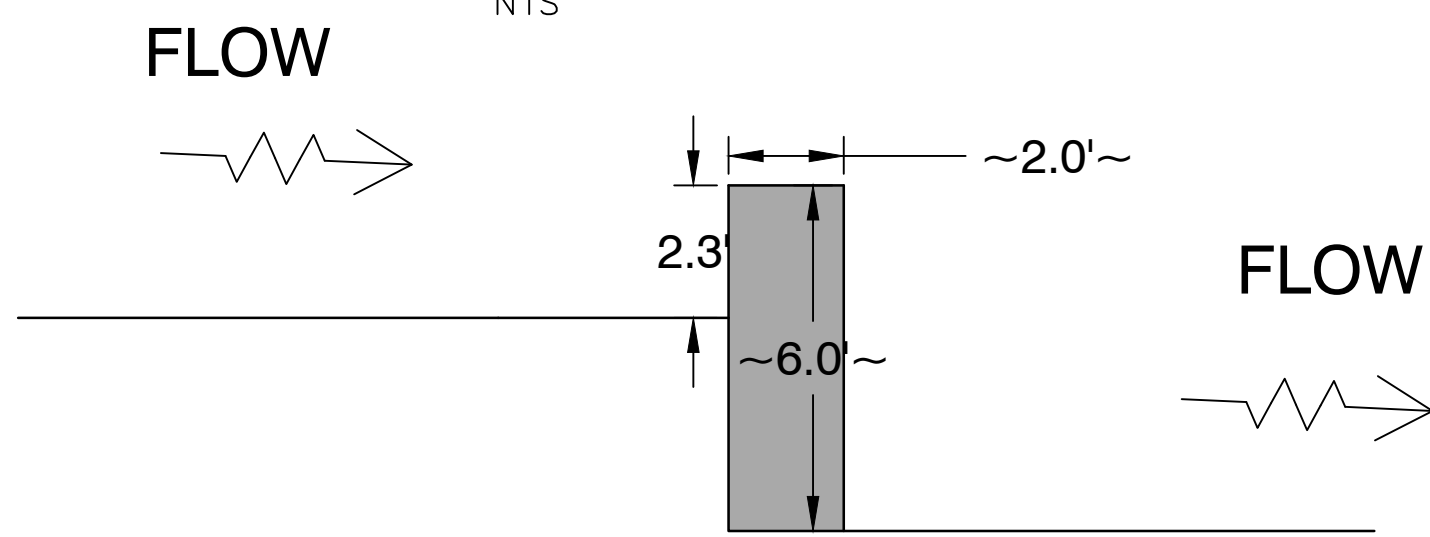
## B-B' SECTION

NTS



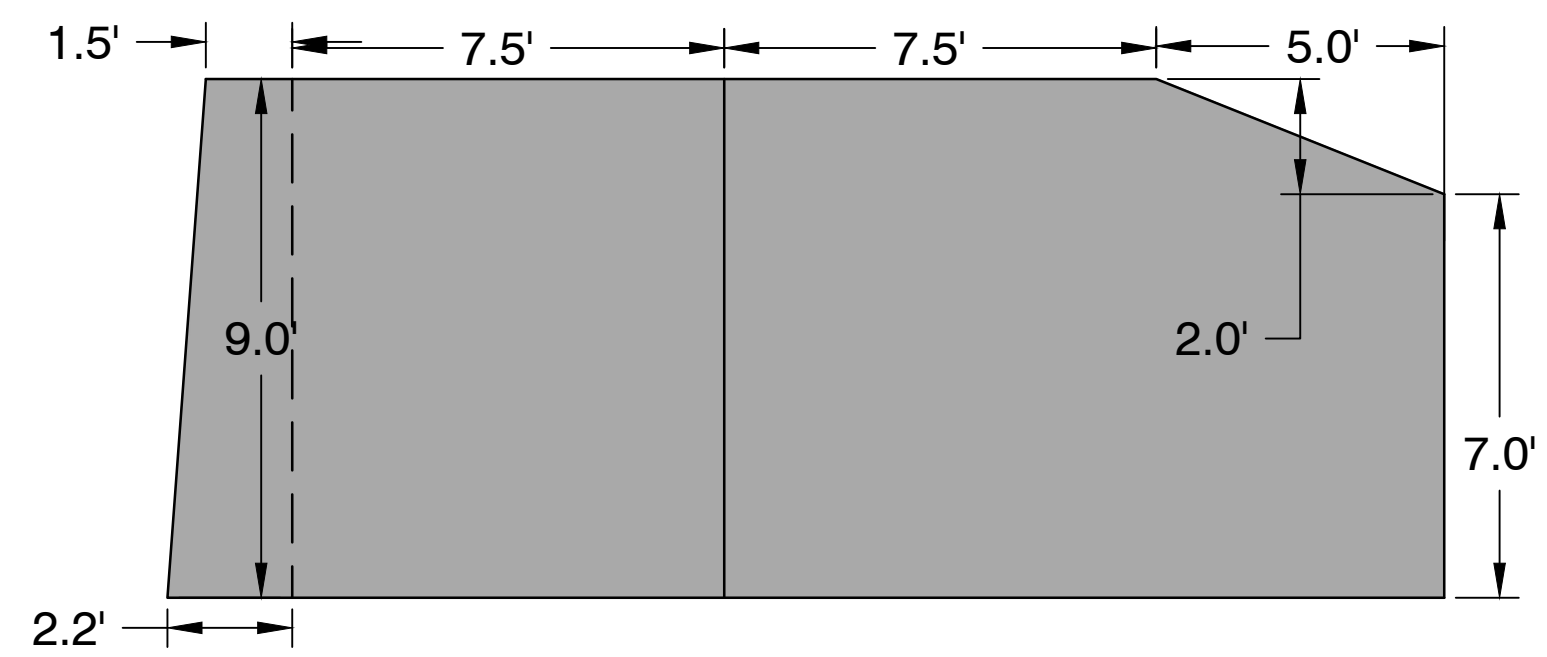
## A-A' SECTION

NTS



## D-D' SECTION

NTS



NOTE: DIMENSIONS OF EXISTING DAM ARE APPROXIMATE AND INTENDED FOR ESTIMATING CONCRETE QUANTITIES

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DESIGNED: PDS  
PROJECT NO.: 038.005  
DRAFTED: BAY  
FILE NUMBER: 038.005  
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SHEET NO.: B.02  
SCALE: NO SCALE  
DATE: SEPTEMBER 19, 2018

LITTLETON DAM MITIGATION  
WAQSPINICON RIVER  
LITTLETON, IOWA  
DETAILS - EXISTING DAM

**LITTLETON**  
ASSOCIATES INC.  
office: 565-427-7016  
www.ltleam.com  
500 EAST LOCUST STREET, SUITE 400  
DES MOINES, IOWA 50309



## UTILITY CONTACTS

**ONE CALL**  
1-800-292-8989

<p><b>ELECTRIC &amp; GAS:</b> MIDAMERICAN ENERGY 260 FAIRVIEW AVENUE P.O. BOX 600 WATERLOO, IA 50704 1-888-427-5632</p>	<p><b>TELEPHONE:</b> FARMERS MUTUAL TELEPHONE COMPANY 541 YOUNG STREET JESUP, IOWA 50648 (319) 827-1151</p>
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**WATER:**  
CENTRAL IOWA WATER ASSOCIATION  
1351 IOWA SPEEDWAY DRIVE  
NEWTON, IA 50208  
(641) 792-7011

## QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	Quantity
1	MOBILIZATION	LS	1
2	CLEARING AND GRUBBING	LS	1
3	DAM REMOVAL	LS	1
4	EXCAVATION, EXPORT	CY	1550
5	BASE STONE, CLASS 'E' REVETMENT	TON	4500
6	6" MINUS CHOKE STONE	TON	1160
7	WEIR STONE (3.5'x3.0'x1.5' MIN.)	TON	350
8	STABILIZED CONSTRUCTION ENTRANCE (MACADAM STONE)	TON	30
9	EROSION CONTROL	LS	1
10	SEEDING/FERTILIZING/MULCHING	LS	1

### NOTE:

1. BID ITEM #6 - BASE STONE, CLASS 'E' REVETMENT INCLUDES THE QUANTITY OF BASE STONE REQUIRED AFTER SUBTRACTING AN ESTIMATED 145 TONS OF SALVAGED CONCRETE FROM THE DAM REMOVAL.

## CONTROL POINTS

CONTROL POINT NO.	NORTHING	EASTING	ELEVATION
100	3659894.991	5318143.866	909.979
101	3659998.778	5318116.377	921.679
102	3659989.122	5318009.482	917.049
103	3660053.090	5317713.617	914.588

## PROJECT SEQUENCING

THE CONTRACTOR SHALL SUBMIT A CONSTRUCTION SEQUENCE PLAN 10 DAYS PRIOR TO CONSTRUCTION. THE PLAN SHALL INCLUDE METHODS TO CONTAIN AND MANAGE SEDIMENT WITHIN THE IMPOUNDMENT UPSTREAM OF THE DAM. ENGINEER SHALL APPROVE PLAN PRIOR TO DAM REMOVAL. SUGGESTIONS FOR PROJECT SEQUENCING ARE AS FOLLOWS:

1. IDENTIFY ALL SIGNIFICANT PROJECT BOUNDARIES, EASEMENTS, ARCHAEOLOGICAL SITES, ACCESS POINTS, CONSTRUCTION LIMITS AND CONTRACTOR STAGING AREAS WITH THE ENGINEER.
2. ESTABLISH HAUL ROUTES AND CONTRACTOR STAGING AREAS.
3. STAKE OUT CONSTRUCTION LIMITS PRIOR TO CONSTRUCTION.
4. INSTALL EROSION CONTROL MEASURES IN ACCORDANCE WITH THE EROSION CONTROL PLAN.
5. CLEAR AS DIRECTED WITHIN THE CONSTRUCTION LIMITS AS NEEDED TO EXCAVATE AND PLACE FILL MATERIAL WITHIN THE AREAS SHOWN ON THE PLANS. PROTECT TREES MARKED FOR PRESERVATION.
6. REMOVE AND STOCKPILE TOPSOIL WITHIN THE AREAS OF PROPOSED GRADING. BEGIN WORK AT THE UPSTREAM END OF THE PROJECT REACH AND WORK IN THE DOWNSTREAM DIRECTION.
7. EXCAVATE TO THE LINES AND GRADES SHOWN ON GRADING PLAN.
8. DEMOLISH EXISTING DAM PER DEMOLITION PLAN. CUT ALL EXPOSED STEEL REBAR FLUSH WITH THE REMAINING SURFACES. CONTROLLED REMOVAL IS REQUIRED TO MANAGE SEDIMENT UPSTREAM OF THE DAM.
9. LAYOUT THE PROPOSED CHANNEL CENTERLINE.
10. CONSTRUCT BASE STONE, CHOKE STONE, WEIR STONE, BANKFULL BENCH AND EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND DETAILS, PROCEEDING IN THE DOWNSTREAM DIRECTION.
11. RESPREAD TOPSOIL, PLANT, SEED AND MULCH ALL DISTURBED AREAS IMMEDIATELY AFTER CONSTRUCTION PER THE EROSION CONTROL PLAN.
12. WALK THE PROJECT SITE WITH THE ENGINEER TO DEVELOP A FINAL CHECK-LIST OF ITEMS LEFT TO BE COMPLETED.
13. REPAIR/COMPLETE ITEMS IDENTIFIED ON THE FINAL CHECK-LIST.
14. REMOVE ALL WASTE FROM THE PROJECT AREA AND RESTORE ALL STAGING AND STOCKPILE AREAS TO THEIR ORIGINAL APPEARANCE. SEED, FERTILIZE, AND MULCH ALL DISTURBED AREAS PER THE EROSION CONTROL PLAN.
15. WALK THE PROJECT SITE WITH THE ENGINEER AND OWNER TO APPROVE PROJECT COMPLETENESS.

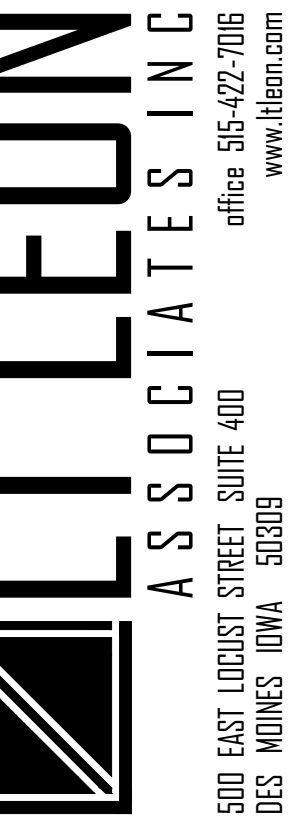
## ESTIMATE REFERENCE INFORMATION

ITEM NUMBER	DESCRIPTION
1	MOBILIZATION (LS) THIS ITEM INCLUDES PROVIDING AND REMOVING CONSTRUCTION EQUIPMENT TO THE SITE. THIS ITEM WILL BE PAID PER LUMP SUM.
2	CLEARING AND GRUBBING (LS) ITEM INCLUDES REMOVAL OF ALL VEGETATION, TREES, SHRUBS, STUMPS, AND MISCELLANEOUS DEBRIS ENCOUNTERED WITHIN THE PROJECT AREA AND AS NOTED IN THE CONTRACT DOCUMENTS. TREE PROTECTION IS INCIDENTAL TO THIS ITEM. CLEARING IS BASED ON CONSTRUCTION LIMITS AND SHOULD BE LIMITED TO ONLY THE AREAS NECESSARY TO COMPLETE THE PROJECT AND APPROVED BY THE ENGINEER. THIS ITEM WILL BE PAID PER LUMP SUM.
3	DAM REMOVAL (LS) CONTRACTOR TO REMOVE DAM AS SHOWN ON SHEET D.01. THIS ITEM WILL BE PAID PER LUMP SUM. SALVAGING CONCRETE FROM DAM REMOVAL (ESTIMATED 145 TONS) AND PLACING AS BASE STONE IS INCIDENTAL TO THIS BID ITEM. ITEM INCLUDES CUTTING REBAR FLUSH WITH SALVAGE MATERIAL INTENDED TO BE RE-USED AS BASE STONE.
4	EXCAVATION, EXPORT (CY) REFER TO SHEETS F.01, F.02, AND F.03 FOR LOCATIONS AND DETAILS. THIS ITEM WILL BE PAID AS DETERMINED BY ENGINEER PER TRUCK TICKETS. CONTRACTOR SHALL GRADE THE SITE AS DETAILED IN THE PLANS. ANY SPOILS GENERATED AND NOT SPREAD ON-SITE SHALL BE EXPORTED TO A LOCATION DETERMINED BY THE CONTRACTOR. ANY SPOILS CONSISTING OF GRAVEL OR COBBLE SHALL BE SALVAGED AND PLACED AS CHOKE STONE MATERIAL PER ENGINEER'S DIRECTION.
5	BASE STONE, CLASS 'E' REVETMENT (TON) REFER TO D.03, F.02 AND W SHEETS FOR LOCATIONS AND DETAILS. ITEM INCLUDES PROVIDING AND PLACING REVETMENT.
6	6" MINUS CHOKE STONE (TON) REFER TO SHEETS D.03, F.02, AND W SHEETS FOR LOCATIONS AND DETAILS. ITEM INCLUDES PROVIDING AND PLACING CHOKE STONE FOR FILLING VOIDS OF REVETMENT IN THE ROCK ARCH RAPIDS STRUCTURE. FILL VOIDS EVERY 2 FOOT LAYER OF REVETMENT. CHOKE STONE SHALL MEET PROJECT SPECIFICATIONS.
7	WEIR STONE (3.5'x3.0'x1.5' MIN.) (TON) REFER TO SHEETS D.03, F.02, W.05, AND W.06 FOR LOCATIONS AND DETAILS. ITEM INCLUDES PROVIDING AND PLACING WEIR (OR DERRICK) STONES ALONG WITH BOULDER CLUSTERS. MEASUREMENT AND PAYMENT FOR THE WEIR STONES SHALL BE BASED ON THE PLAN QUANTITY. THIS PAYMENT SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIALS, LABOR, AND EQUIPMENT NECESSARY TO INSTALL THE WEIR STONES AND BOULDER CLUSTERS PER PLAN. BID ITEM ESTIMATE ASSUMES 1.5 TONS +/- 0.5 TONS PER WEIR STONE. CONTRACTOR SHALL PROVIDE 10-15% OF THE WEIR STONE QUANTITY WITH STONES MEASURING 4.0'x5.0'x1.2' FEET FOR BOULDER CLUSTER STRUCTURES. WEIR STONES SHALL HAVE A SPECIFIC GRAVITY OF 2.65 OR GREATER AND SHALL BE APPROVED BY ENGINEER PRIOR TO PLACEMENT.
8	STABILIZED CONSTRUCTION ENTRANCE (MACADAM STONE) (LS) ITEM INCLUDES PROVIDING, PLACING, AND REMOVING STABILIZED CONSTRUCTION ENTRANCE. ENGINEERING FABRIC AND MAINTENANCE OF STABILIZED CONSTRUCTION ENTRANCE ARE CONSIDERED INCIDENTAL TO THIS ITEM.
9	EROSION CONTROL (LS) REFER TO SHEET F.03 FOR LOCATIONS AND DETAILS. THIS ITEM WILL BE PAID PER LUMP SUM. ITEM INCLUDES INSTALLATION, MAINTENANCE, AND REMOVAL OF 85 LF OF SILT FENCE INSTALLED PER PLANS AND SPECIFICATIONS. ITEM INCLUDES INSTALLATION AND MAINTENANCE OF 120 SY OF ROLLED EROSION CONTROL PRODUCT INSTALLED PER PLANS AND SPECIFICATIONS.
10	SEEDING/FERTILIZING/MULCHING (LS) THE CONTRACTOR SHALL SEED, FERTILIZE AND MULCH ALL DISTURBED AREAS (APPROXIMATELY 0.2 ACRES) PER EROSION CONTROL PLAN F.03 AND SPECIFICATIONS. THIS ITEM WILL BE PAID PER LUMP SUM. SEEDING, FERTILIZING, AND MULCHING SHALL COMPLY WITH SUDAS SECTION 9010.

## GENERAL NOTES

1. PRIOR TO ANY EXCAVATION AT THE SITE, THE CONTRACTOR SHALL EXAMINE ANY APPLICABLE DRAWINGS AVAILABLE FROM THE OWNER AND/OR ENGINEER, AND CONSULT WITH OWNER'S PERSONNEL AND UTILITY COMPANY'S REPRESENTATIVES TO DETERMINE POSSIBLE UTILITY LOCATIONS AND DEPTHS. NO COMPENSATION WILL BE ALLOWED FOR DAMAGE RESULTING FROM FAILURE TO COMPLY WITH THIS REQUIREMENT.
2. ALL DEBRIS SPILLED ON THE PUBLIC R.O.W. SHALL BE PICKED UP BY THE CONTRACTOR AT THE END OF EACH WORK DAY.
3. ALL WORK SHALL BE IN ACCORDANCE WITH OSHA CODES AND STANDARDS. NOTHING INDICATED ON THESE DRAWINGS SHALL RELIEVE THE CONTRACTOR FROM COMPLYING WITH ANY APPROPRIATE SAFETY REGULATIONS.
4. FIELD VERIFY EXISTING GRADES AND LOCATION OF EXISTING UTILITIES, CONDUIT LINES, POLES, TREES, PAVING, BUILDINGS AND OTHER SITE STRUCTURES PRIOR TO DEMOLITION OR CONSTRUCTION AND IMMEDIATELY INFORM THE ENGINEER OF ANY DISCREPANCIES.
5. CONTRACTOR SHALL PROTECT EXISTING UTILITIES, CONDUIT LINES, POLES, TREES, PAVING, BUILDINGS, SHORELINE, AND OTHER SITE STRUCTURES.
6. ALL DEMOLISHED ITEMS NOT TO BE SALVAGED SHALL BE LEGALLY DISPOSED OF OFF-SITE.
7. CONSTRUCTION LIMITS ARE INDICATED ON THE PLANS. CONTRACTOR TO CONSULT WITH DNR ON: STORAGE LOCATION OF MATERIALS, WORK AREA, JOB OFFICE AND EMPLOYEE PARKING. CONSULT WITH THE DNR IF CONSTRUCTION LIMITS NEED TO BE MODIFIED FROM THAT ILLUSTRATED ON THIS PLAN.
8. THE CONTRACTOR WILL HOLD THE OWNER AND OWNER'S CONSULTANTS HARMLESS FROM ANY AND ALL CLAIMS OF ANY TYPE WHATSOEVER RESULTING FROM DAMAGES TO ADJOINING PUBLIC OR PRIVATE PROPERTY, INCLUDING REASONABLE ATTORNEY FEES INCURRED TO THE OWNER.
9. ALL EXCESS EXCAVATED GRAVEL AND SAND FROM CHANNEL SHALL BE USED TO FILL VOIDS IN ROCK ARCH RAPIDS, PER DNR DIRECTION.
10. ADD CHOKE STONE AND COMPACT TO FILL VOIDS FOR EVERY 2 VERTICAL FEET OF BASE STONE INSTALLED.
11. CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS OUTSIDE OF THE RIVER CHANNEL, INCLUDING ACCESS ROAD, STAGING AREA, AND OVBANK AREAS. CONTRACTOR SHALL ROTOTILL SOILS TO A 6" DEPTH IN AREAS WHERE COMPACTION OCCURRED DUE TO CONSTRUCTION ACTIVITIES. CONTRACTOR SHALL SEED, FERTILIZE, AND MULCH ALL DISTURBED AREAS PER THE EROSION CONTROL PLAN AND SPECIFICATIONS. CONTRACTOR SHALL COORDINATE INSTALLATION, SPECIFICATIONS, AND WARRANTY REQUIREMENTS WITH ENGINEER.
12. CONTRACTOR SHALL REPLACE ANY FENCE DISTURBED DURING CONSTRUCTION TO DNR'S SATISFACTION.
13. CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN EROSION CONTROL UNTIL ESTABLISHMENT OF PERMANENT GROUND COVER.
14. TRAFFIC CONTROL DEVICES, PROCEDURES, AND LAYOUTS SHALL CONFORM TO THE CURRENT EDITION OF THE MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (MUTCD).
15. CONTRACTOR SHALL CONTACT THE BUCHANAN COUNTY ENGINEER A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION.
16. DNR TO PROVIDE CONSTRUCTION STAKING.
17. ALL BASE STONE AND WEIR STONE SHALL BE IOWA DOT CERTIFIED REVETMENT (RIPRAP) OR NATIVE STONE WITH A MINIMUM SPECIFIC GRAVITY OF 2.65.
18. WEIR ROCK PLACEMENT IS TO MEET A VERTICAL TOLERANCE OF 0.1'.
19. QUANTITIES FOR EXCAVATION, SPOIL, AND BASE STONE MAY BE REDUCED IF BEDROCK IS ENCOUNTERED. REMOVAL OF BEDROCK IS NOT PROPOSED. CONTACT DNR IF BEDROCK IS ENCOUNTERED.
20. THE ENGINEER RESERVES THE RIGHT TO MAKE ADJUSTMENTS IN THE FIELD TO THE DIMENSIONS, STRUCTURE LOCATION, STRUCTURE DETAILS, AND ALL OTHER RELEVANT EROSION CONTROL PRACTICES NEEDED TO PRESERVE TREES AND OTHER HABITAT AND TO FIT SITE CONDITIONS.
21. IF ARCHEOLOGICAL SITES AND/OR CONTAMINATION (SITES) ARE LOCATED DURING CONSTRUCTION, THEN STOP WORK IMMEDIATELY AND CALL ENGINEER.
22. THE CONTRACTOR IS REQUIRED TO UTILIZE THE UTILITY ONE-CALL SERVICE AT (800) 292-8989 AT LEAST 48 HOURS PRIOR TO EXCAVATING ANYWHERE ON THE PROJECT.
23. ALL TOPOGRAPHIC AND HYDROGRAPHIC SURVEYS, INCLUDING CONTROL POINTS, WERE PROVIDED BY IOWA DNR.

LITTLETON DAM MITIGATION  
 WAPSICON RIVER  
 LITTLETON, IOWA  
 GENERAL NOTES


 LTL LEON  
 ASSOCIATES INC  
 500 EAST LOCUST STREET SUITE 400  
 DES MOINES, IOWA 50309  
 office 515-472-7016  
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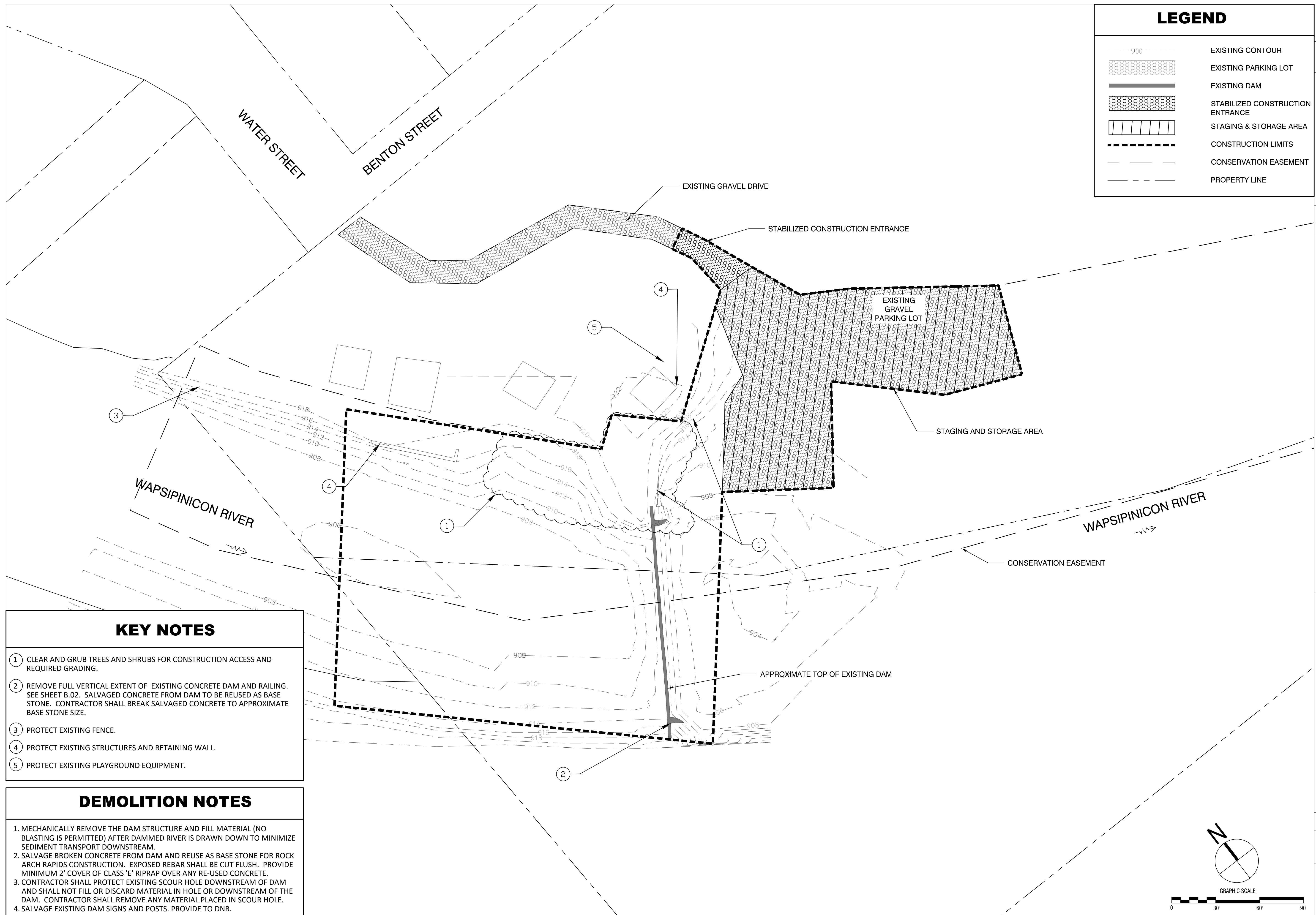
GENERAL NOTES

SHEET NO.

C.01

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 CHECKED: LTL  
 SCALE: NO SCALE



LEGEND	
	EXISTING CONTOUR
	EXISTING PARKING LOT
	EXISTING DAM
	STABILIZED CONSTRUCTION ENTRANCE
	STAGING & STORAGE AREA
	CONSTRUCTION LIMITS
	CONSERVATION EASEMENT
	PROPERTY LINE

NO.	REVISION	BY	DATE

PROJECT NO.: 038.005  
 FILE NUMBER: 038.005  
 SHEET NO.: D.01  
 DATE: SEPTEMBER 19, 2018  
 DESIGNED: PDS  
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 CHECKED: LTL  
 SCALE: 1:30

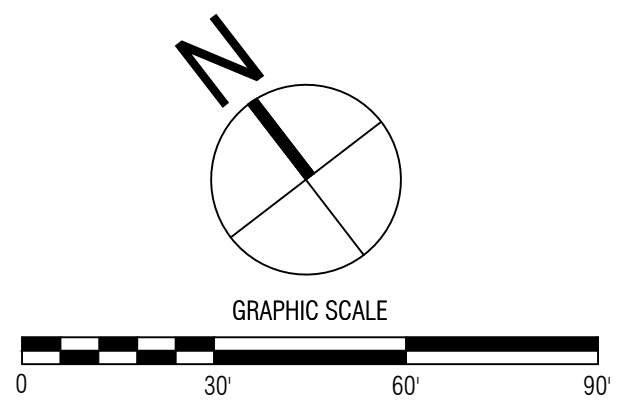
**LITTLETON DAM MITIGATION  
 WAPSIPINICON RIVER  
 LITTLETON, IOWA  
 DEMOLITION PLAN**

500 EAST LOCUST STREET SUITE 400  
 DES MOINES, IOWA 50309  
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 www.ltleon.com

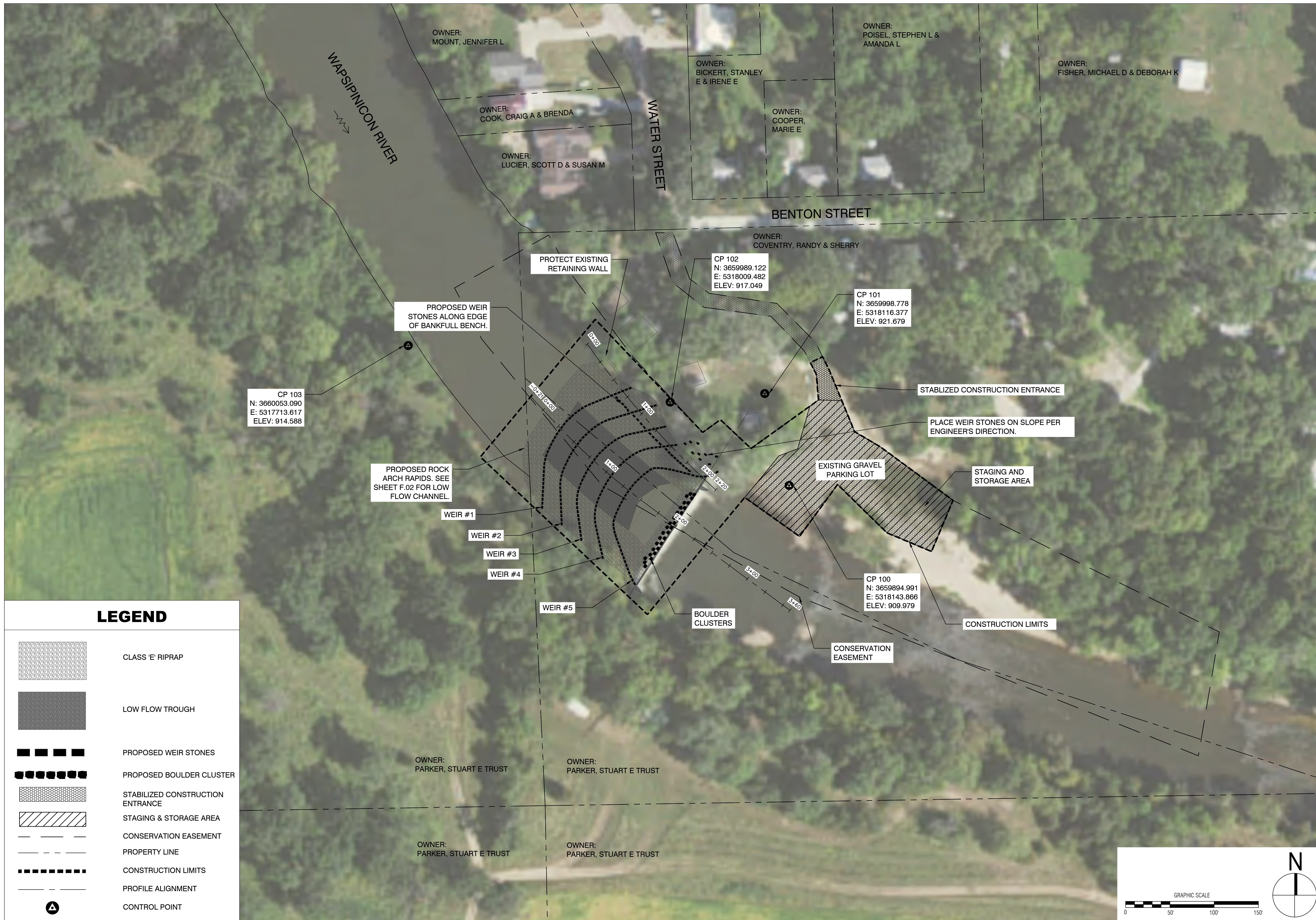
PROJECT NO. 038.005  
 DEMOLITION PLAN  
 SHEET NO.  
**D.01**

- ### KEY NOTES
- 1 CLEAR AND GRUB TREES AND SHRUBS FOR CONSTRUCTION ACCESS AND REQUIRED GRADING.
  - 2 REMOVE FULL VERTICAL EXTENT OF EXISTING CONCRETE DAM AND RAILING. SEE SHEET B.02. SALVAGED CONCRETE FROM DAM TO BE REUSED AS BASE STONE. CONTRACTOR SHALL BREAK SALVAGED CONCRETE TO APPROXIMATE BASE STONE SIZE.
  - 3 PROTECT EXISTING FENCE.
  - 4 PROTECT EXISTING STRUCTURES AND RETAINING WALL.
  - 5 PROTECT EXISTING PLAYGROUND EQUIPMENT.

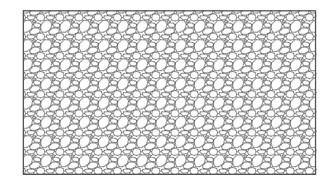
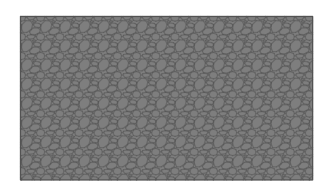




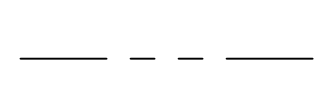




- ### DEMOLITION NOTES
1. MECHANICALLY REMOVE THE DAM STRUCTURE AND FILL MATERIAL (NO BLASTING IS PERMITTED) AFTER DAMMED RIVER IS DRAWN DOWN TO MINIMIZE SEDIMENT TRANSPORT DOWNSTREAM.
  2. SALVAGE BROKEN CONCRETE FROM DAM AND REUSE AS BASE STONE FOR ROCK ARCH RAPIDS CONSTRUCTION. EXPOSED REBAR SHALL BE CUT FLUSH. PROVIDE MINIMUM 2' COVER OF CLASS 'E' RIPRAP OVER ANY RE-USED CONCRETE.
  3. CONTRACTOR SHALL PROTECT EXISTING SCOUR HOLE DOWNSTREAM OF DAM AND SHALL NOT FILL OR DISCARD MATERIAL IN HOLE OR DOWNSTREAM OF THE DAM. CONTRACTOR SHALL REMOVE ANY MATERIAL PLACED IN SCOUR HOLE.
  4. SALVAGE EXISTING DAM SIGNS AND POSTS. PROVIDE TO DNR.







**LEGEND**

-  CLASS 'E' RIPRAP
-  LOW FLOW TROUGH
-  PROPOSED WEIR STONES
-  PROPOSED BOULDER CLUSTER
-  STABILIZED CONSTRUCTION ENTRANCE
-  STAGING & STORAGE AREA
-  CONSERVATION EASEMENT
-  PROPERTY LINE
-  CONSTRUCTION LIMITS
-  PROFILE ALIGNMENT
-  CONTROL POINT

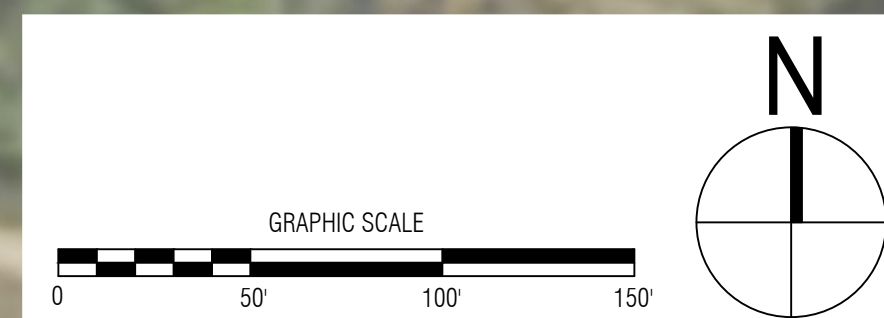
NO.	REVISION	BY	DATE

**LITTLETON DAM MITIGATION**  
**WAPSIPICON RIVER**  
**LITTLETON, IOWA**  
**SITE PLAN**

PROJECT NO: 038.005  
 FILE NUMBER: 038.005  
 SHEET NO.: D.02  
 DATE: SEPTEMBER 19, 2018


  
 LT LEON  
 ASSOCIATES INC  
 500 EAST LOCUST STREET SUITE 400  
 DES MOINES, IOWA 50309  
 office: 515-422-7016  
 www.ltleon.com

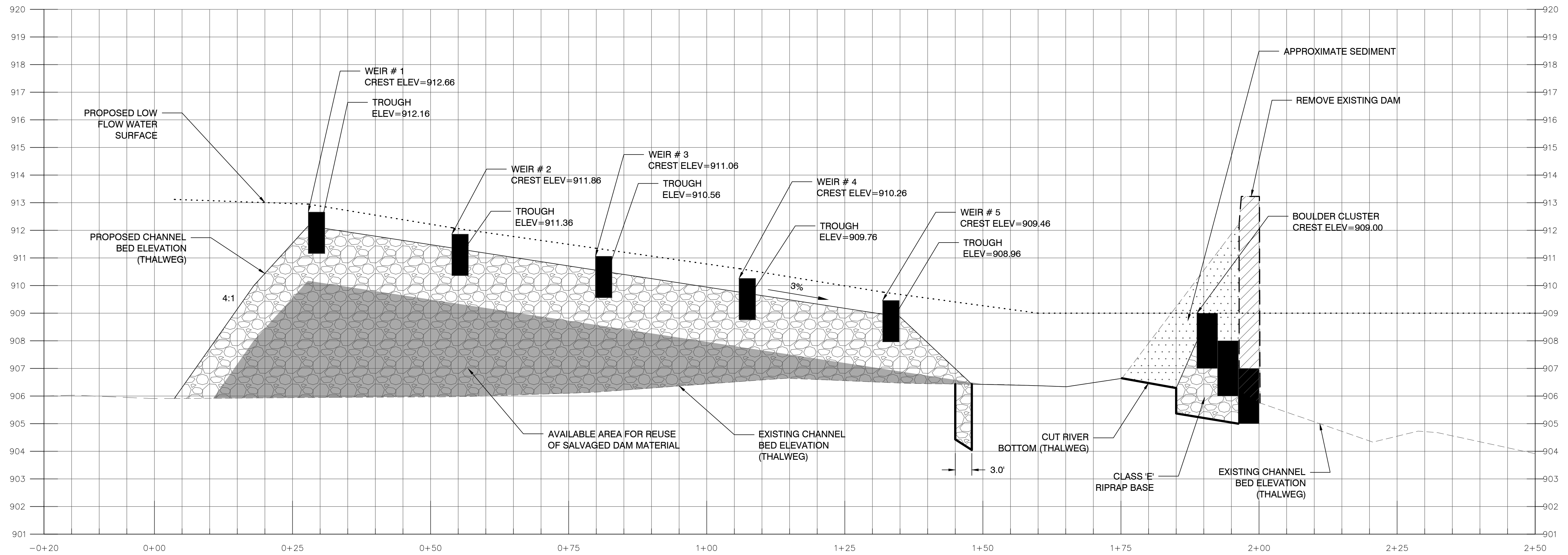
PROJECT NO. 038.005
SITE PLAN
SHEET NO. D.02





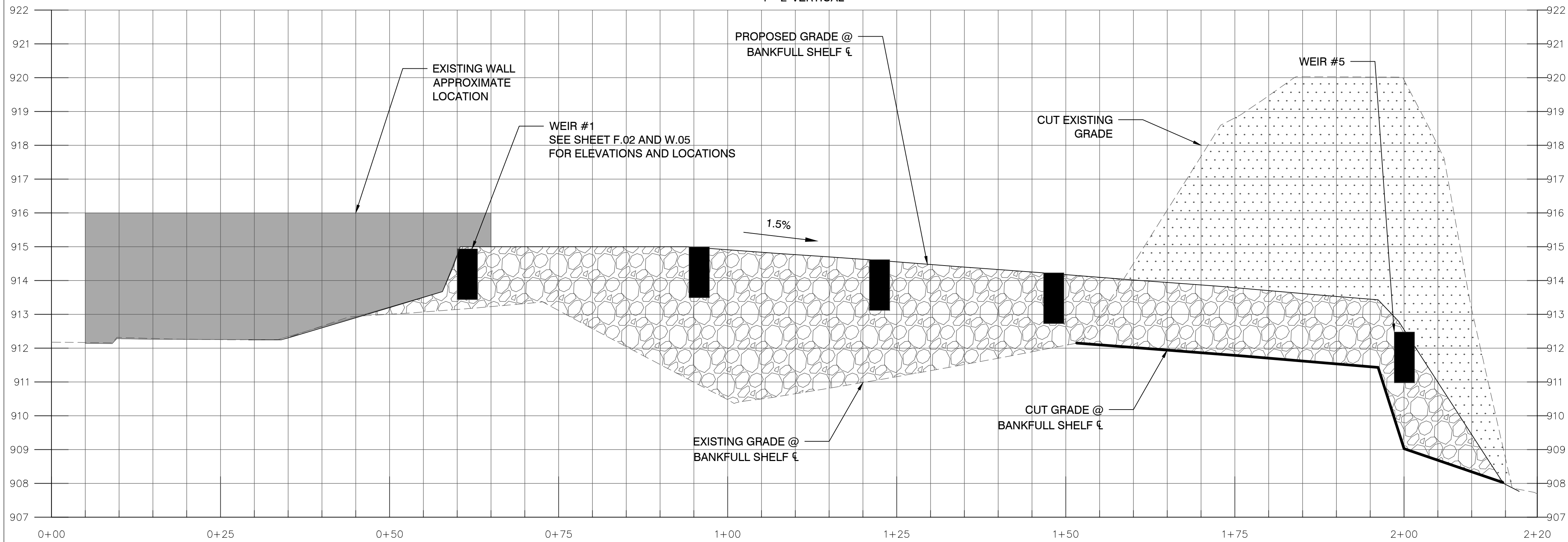
**PROPOSED THALWEG PROFILE**

SCALE: 1"=10' HORIZONTAL  
1"=2' VERTICAL



**BANKFULL BENCH PROFILE**

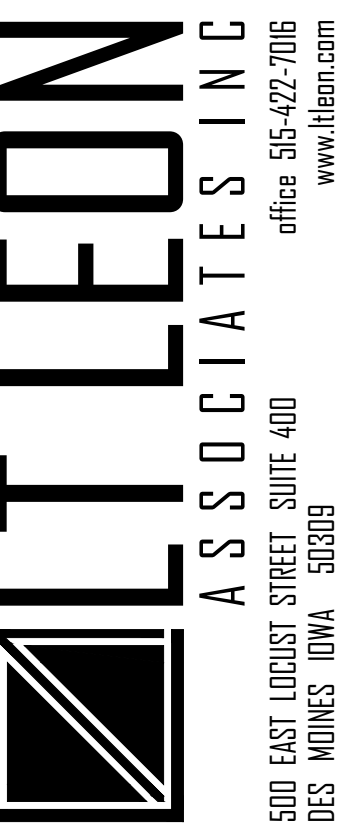
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1"=2' VERTICAL



**LEGEND**

- PROPOSED LOW-FLOW WATER SURFACE
- PROPOSED GRADE
- EXISTING GRADE
- PROPOSED BOTTOM OF EXCAVATION
- CLASS 'E' RIPRAP
- AVAILABLE AREA FOR REUSE OF SALVAGED DAM MATERIAL
- PROPOSED WEIR STONES
- CUT AREA
- DAM REMOVAL

LITTLETON RIFFLE CONSTRUCTION & FISH  
PASSAGE RESTORATION  
LITTLETON, IOWA  
PROFILE



PROJECT NO. 038.005

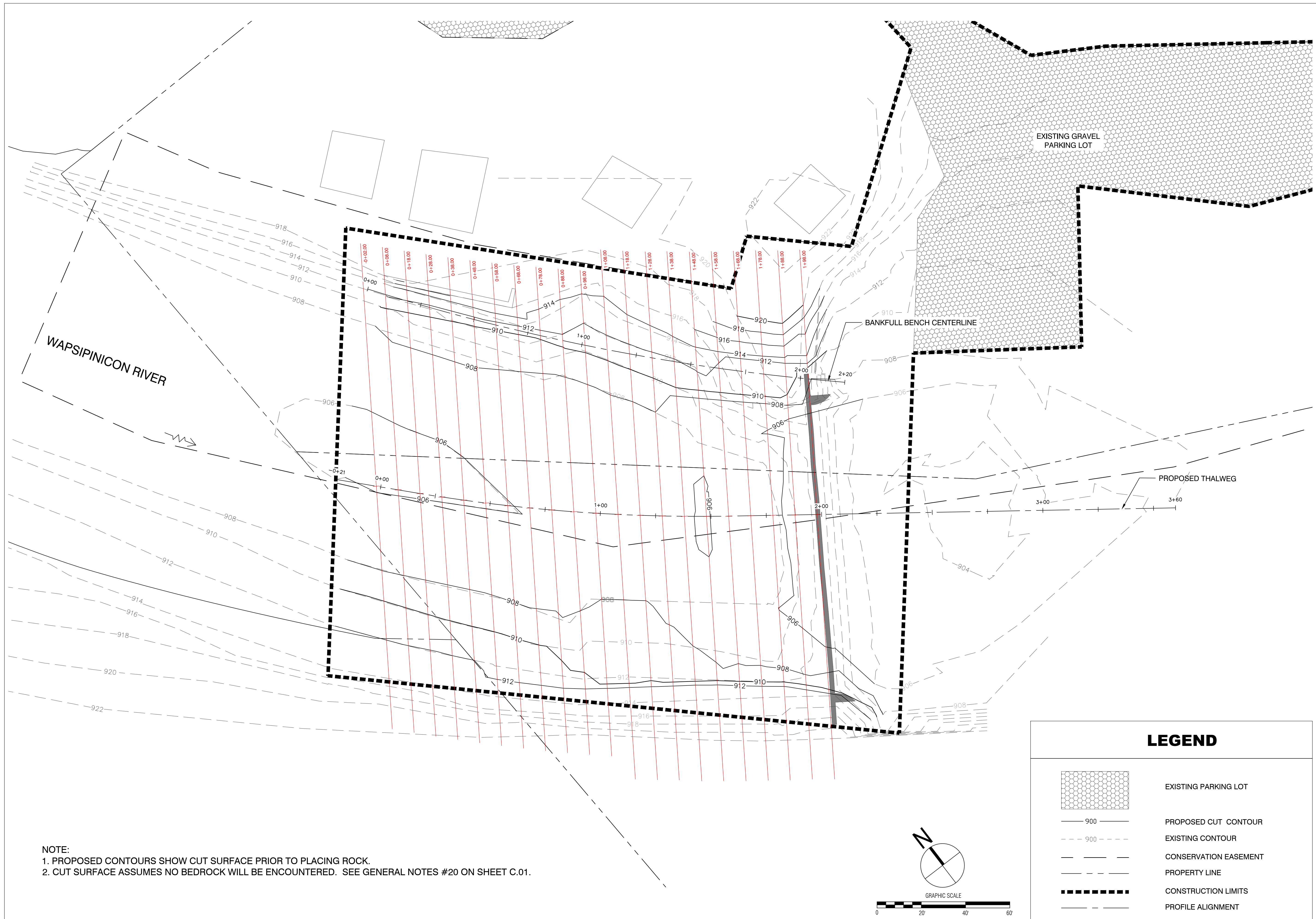
PROFILE

SHEET NO.

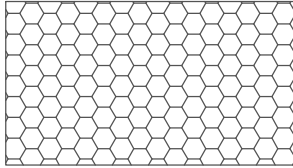




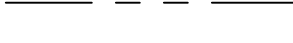

D.03

NO.	REVISION	BY	DATE
DESIGNED: PDS	PROJECT NO.: 038.005		
DRAFTED: BAY	FILE NUMBER: 038.005		
CHECKED: LTL	SHEET NO.: D.03		
SCALE: 1:10 H 1:2 V	DATE: SEPTEMBER 19, 2018		





NOTE:  
 1. PROPOSED CONTOURS SHOW CUT SURFACE PRIOR TO PLACING ROCK.  
 2. CUT SURFACE ASSUMES NO BEDROCK WILL BE ENCOUNTERED. SEE GENERAL NOTES #20 ON SHEET C.01.

LEGEND	
	EXISTING PARKING LOT
	PROPOSED CUT CONTOUR
	EXISTING CONTOUR
	CONSERVATION EASEMENT
	PROPERTY LINE
	CONSTRUCTION LIMITS
	PROFILE ALIGNMENT

NO.	REVISION	BY	DATE

LITTLETON DAM MITIGATION  
 WAPSIPICON RIVER  
 LITTLETON, IOWA  
 GRADING PLAN - CUT SURFACE

**LT LEON ASSOCIATES INC**  
 500 EAST LOCUST STREET SUITE 400  
 DES MOINES, IOWA 50309  
 office: 515-472-7016  
 www.ltleon.com

PROJECT NO. 038.005  
 GRADING PLAN-CUT  
 SHEET NO.  
**F.01**

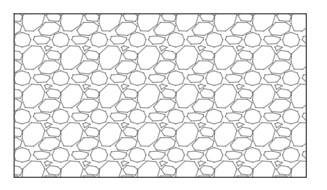
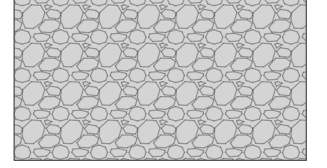
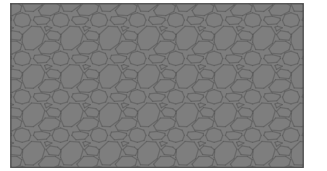


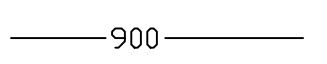

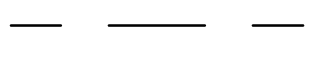
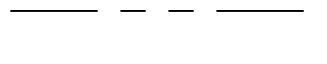


DESIGNED: PDS  
 DRAFTED: BAY  
 CHECKED: LTL  
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 PROJECT NO.: 038.005  
 FILE NUMBER: 038.005  
 SHEET NO.: F.01  
 DATE: SEPTEMBER 19, 2018

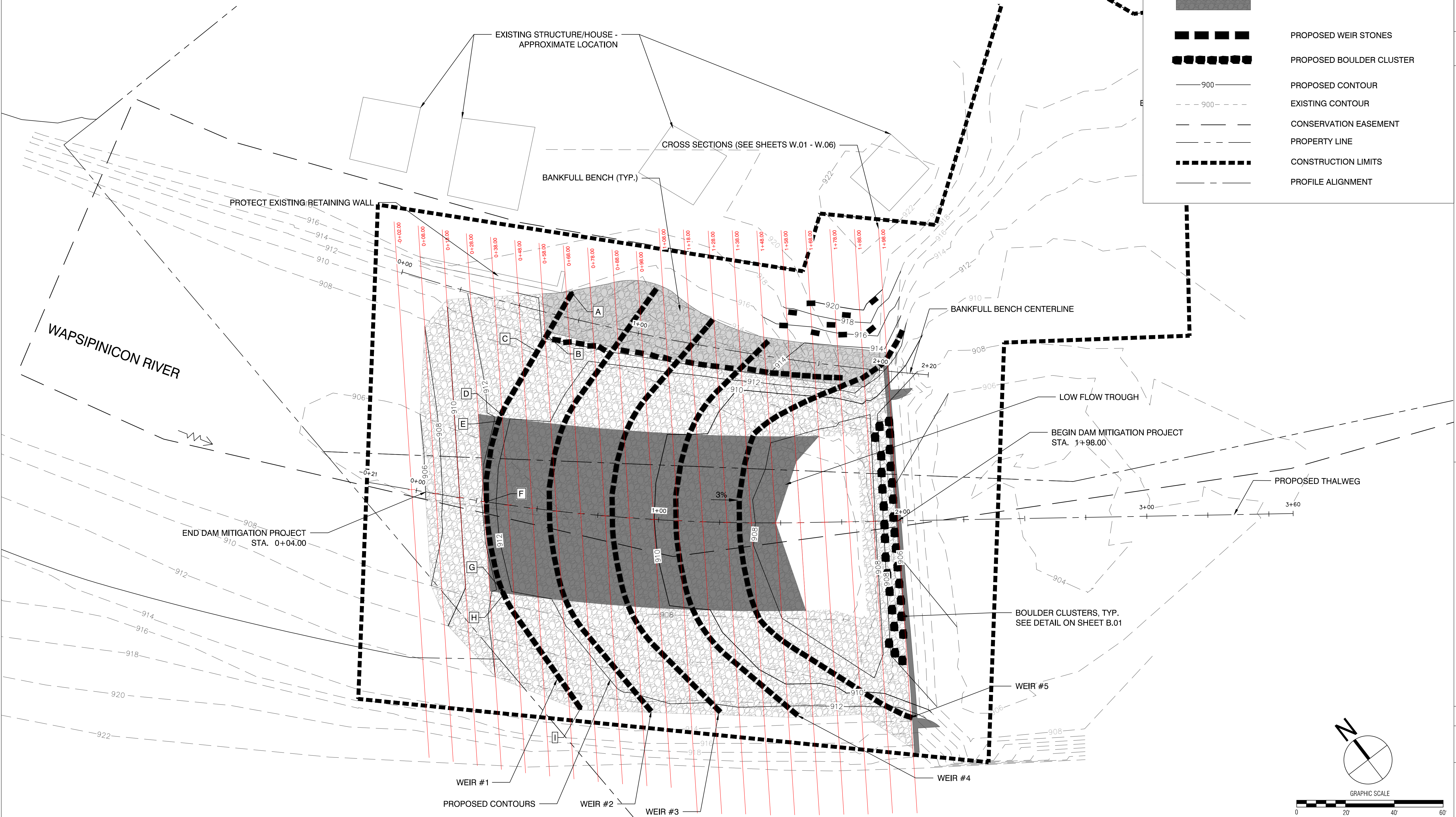


SPOT	DESCRIPTION	WEIR SPOT ELEVATIONS														
		WEIR #1			WEIR #2			WEIR #3			WEIR #4			WEIR #5		
		NORTHING	EASTING	ELEVATION	NORTHING	EASTING	ELEVATION	NORTHING	EASTING	ELEVATION	NORTHING	EASTING	ELEVATION	NORTHING	EASTING	ELEVATION
A	BANKFULL SHELF LEFT	3660005.539	5317965.899	915.00	3659986.845	5317993.976	915.00	3659962.781	5318004.531	914.61	3659941.967	5318017.417	914.22	3659907.968	5318054.739	913.43
B	BANKFULL SHELF RIGHT	3659998.085	5317947.183	915.00	3659977.974	5317965.774	915.00	3659958.181	5317983.32	914.61	3659939.922	5318000.541	914.22	3659905.354	5318033.644	913.43
C	CHANNEL BOTTOM LEFT	3659995.229	5317939.877	912.66	3659975.635	5317957.174	911.86	3659956.2	5317973.925	911.06	3659938.563	5317989.903	910.26	3659911.961	5318014.896	909.03
D	CHANNEL BOTTOM LEFT CENTER	3659983.766	5317912.564	912.66	3659966.263	5317930.418	911.86	3659947.263	5317949.891	911.06	3659931.501	5317968.495	910.26	3659914.853	5317988.464	909.46
E	LOW FLOW TROUGH LEFT	3659982.207	5317910.191	912.16	3659965.406	5317929.026	911.36	3659947.706	5317947.909	910.56	3659930.733	5317967.263	909.76	3659914.209	5317987.431	908.96
F	WEIR STONE CENTER	3659959.163	5317885.979	912.66	3659941.34	5317903.451	911.86	3659923.664	5317922.324	911.06	3659906.396	5317941.901	910.26	3659889.752	5317961.912	909.46
G	LOW FLOW TROUGH RIGHT	3659926.514	5317868.827	912.16	3659909.125	5317886.578	911.36	3659891.78	5317905.416	910.56	3659874.835	5317925.508	909.76	3659858.187	5317945.476	908.96
H	CHANNEL BOTTOM RIGHT CENTER	3659924.784	5317868.45	912.66	3659907.837	5317886.06	911.86	3659890.44	5317905.416	911.06	3659873.697	5317925.154	910.26	3659857.049	5317945.123	909.46
I	END OF WEIR	3659868.593	5317864.904	913.00	3659849.956	5317885.995	913.00	3659832.322	5317908.274	913.00	3659811.851	5317932.54	913.00	3659782.606	5317970.265	909.89

NOTE: SEE W.05 & W.06 FOR TYPICAL WEIR CROSS SECTIONS.

### LEGEND

-  CLASS 'E' RIPRAP
-  BANKFULL BENCH AREA (CLASS 'E' RIPRAP)
-  LOW FLOW TROUGH
-  PROPOSED WEIR STONES
-  PROPOSED BOULDER CLUSTER
-  PROPOSED CONTOUR
-  EXISTING CONTOUR
-  CONSERVATION EASEMENT
-  PROPERTY LINE
-  CONSTRUCTION LIMITS
-  PROFILE ALIGNMENT

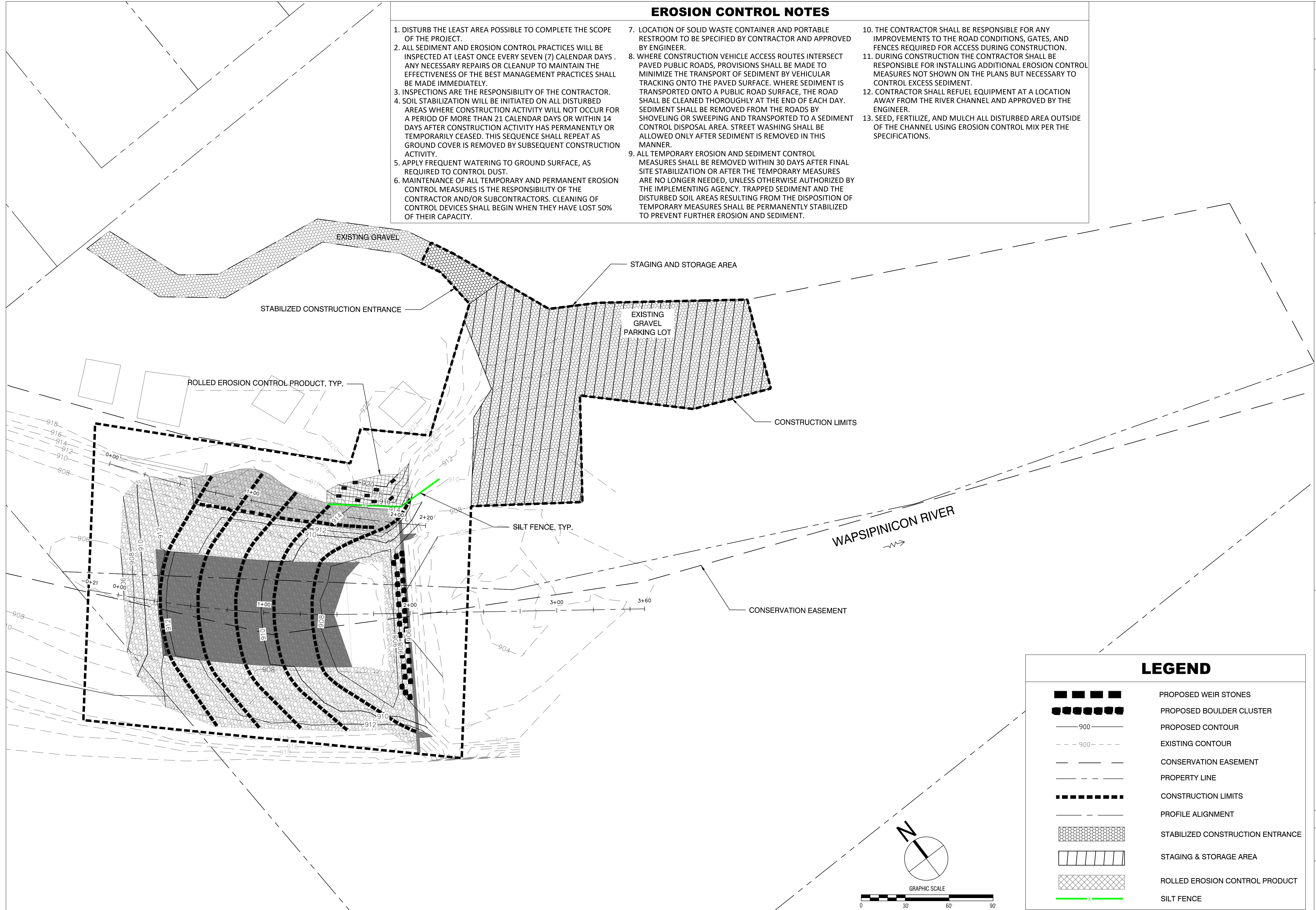


NO.	REVISION	BY	DATE	LITTLETON DAM MITIGATION WAPSIPINICON RIVER LITTLETON, IOWA GRADING PLAN - FINISHED SURFACE
PROJECT NO.: 038.005 FILE NUMBER: 038.005 SHEET NO.: F.02 DATE: SEPTEMBER 19, 2018				 <b>LITTLETON ASSOCIATES INC.</b> 500 EAST LOCUST STREET SUITE 400 DES MOINES, IOWA 50309 OFFICE: 515-472-7016 WWW.LITTLETON.COM
DESIGNED: PDS DRAFTED: BAY CHECKED: LTL SCALE: 1:20				
PROJECT NO. 038.005 GRADING PLAN-FINISH SHEET NO. F.02				



### EROSION CONTROL NOTES

1. DISTURB THE LEAST AREA POSSIBLE TO COMPLETE THE SCOPE OF THE PROJECT.
2. ALL SEDIMENT AND EROSION CONTROL PRACTICES WILL BE INSPECTED AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE BEST MANAGEMENT PRACTICES SHALL BE MADE IMMEDIATELY.
3. INSPECTIONS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
4. SOIL STABILIZATION WILL BE INITIATED ON ALL DISTURBED AREAS WHERE CONSTRUCTION ACTIVITY WILL NOT OCCUR FOR A PERIOD OF MORE THAN 21 CALENDAR DAYS OR WITHIN 14 DAYS AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED. THIS SEQUENCE SHALL REPEAT AS GROUND COVER IS REMOVED BY SUBSEQUENT CONSTRUCTION ACTIVITY.
5. APPLY FREQUENT WATERING TO GROUND SURFACE, AS REQUIRED TO CONTROL DUST.
6. MAINTENANCE OF ALL TEMPORARY AND PERMANENT EROSION CONTROL MEASURES IS THE RESPONSIBILITY OF THE CONTRACTOR AND/OR SUBCONTRACTORS. CLEANING OF CONTROL DEVICES SHALL BEGIN WHEN THEY HAVE LOST 50% OF THEIR CAPACITY.
7. LOCATION OF SOLID WASTE CONTAINER AND PORTABLE RESTROOM TO BE SPECIFIED BY CONTRACTOR AND APPROVED BY ENGINEER.
8. WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED PUBLIC ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT BY VEHICULAR TRACKING ONTO THE PAVED SURFACE. WHERE SEDIMENT IS TRANSPORTED ONTO A PUBLIC ROAD SURFACE, THE ROAD SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER.
9. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE IMPLEMENTING AGENCY. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENT.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY IMPROVEMENTS TO THE ROAD CONDITIONS, GATES, AND FENCES REQUIRED FOR ACCESS DURING CONSTRUCTION.
11. DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL EROSION CONTROL MEASURES NOT SHOWN ON THE PLANS BUT NECESSARY TO CONTROL EXCESS SEDIMENT.
12. CONTRACTOR SHALL REFUEL EQUIPMENT AT A LOCATION AWAY FROM THE RIVER CHANNEL AND APPROVED BY THE ENGINEER.
13. SEED, FERTILIZE, AND MULCH ALL DISTURBED AREA OUTSIDE OF THE CHANNEL USING EROSION CONTROL MIX PER THE SPECIFICATIONS.



NO.	REVISION	BY	DATE

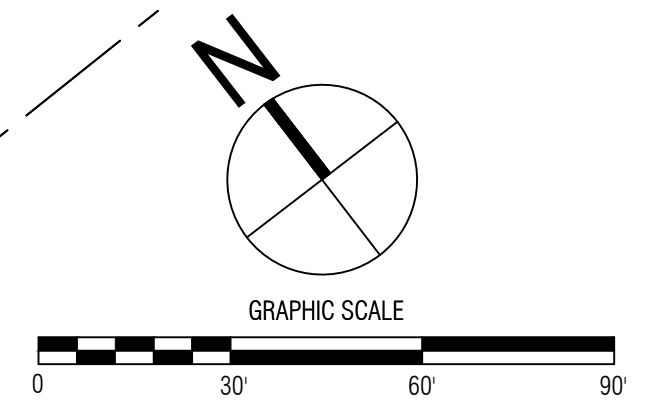
LITTLETON DAM MITIGATION  
 WAPSIPINICON RIVER  
 LITTLETON, IOWA  
 EROSION CONTROL PLAN

**LITTLETON ASSOCIATES INC.**  
 500 EAST LOCUST STREET SUITE 400  
 DES MOINES, IOWA 50309  
 office: 515-472-7016  
 www.ltleon.com

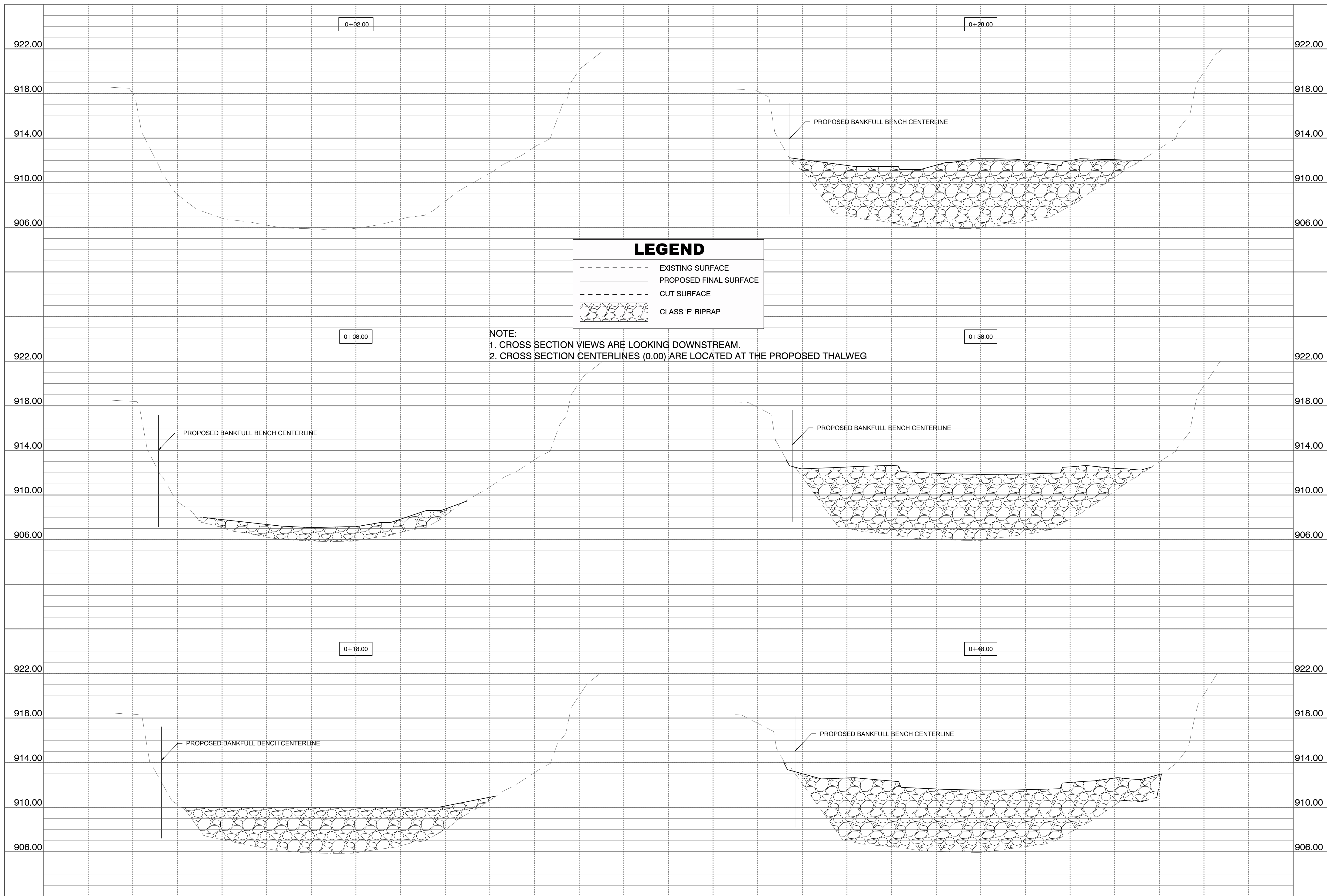
PROJECT NO. 038.005  
 EROSION CONTROL  
 SHEET NO.  
**F.03**

### LEGEND

	PROPOSED WEIR STONES
	PROPOSED BOULDER CLUSTER
	PROPOSED CONTOUR
	EXISTING CONTOUR
	CONSERVATION EASEMENT
	PROPERTY LINE
	CONSTRUCTION LIMITS
	PROFILE ALIGNMENT
	STABILIZED CONSTRUCTION ENTRANCE
	STAGING & STORAGE AREA
	ROLLED EROSION CONTROL PRODUCT
	SILT FENCE







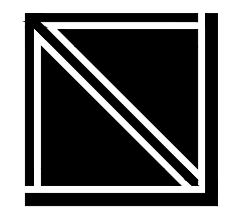
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1" = 4' VERTICAL

NO.	REVISION	BY	DATE

DESIGNED: PDS	PROJECT NO: 038.005
DRAFTED: BAY	FILE NUMBER: 038.005
CHECKED: LTL	SHEET NO.: W.01
SCALE: 1:20H 1:4V	DATE: SEPTEMBER 19, 2018

**LITTLETON DAM MITIGATION**  
**WAPSICON RIVER**  
**LITTLETON, IOWA**  
**CROSS SECTIONS**



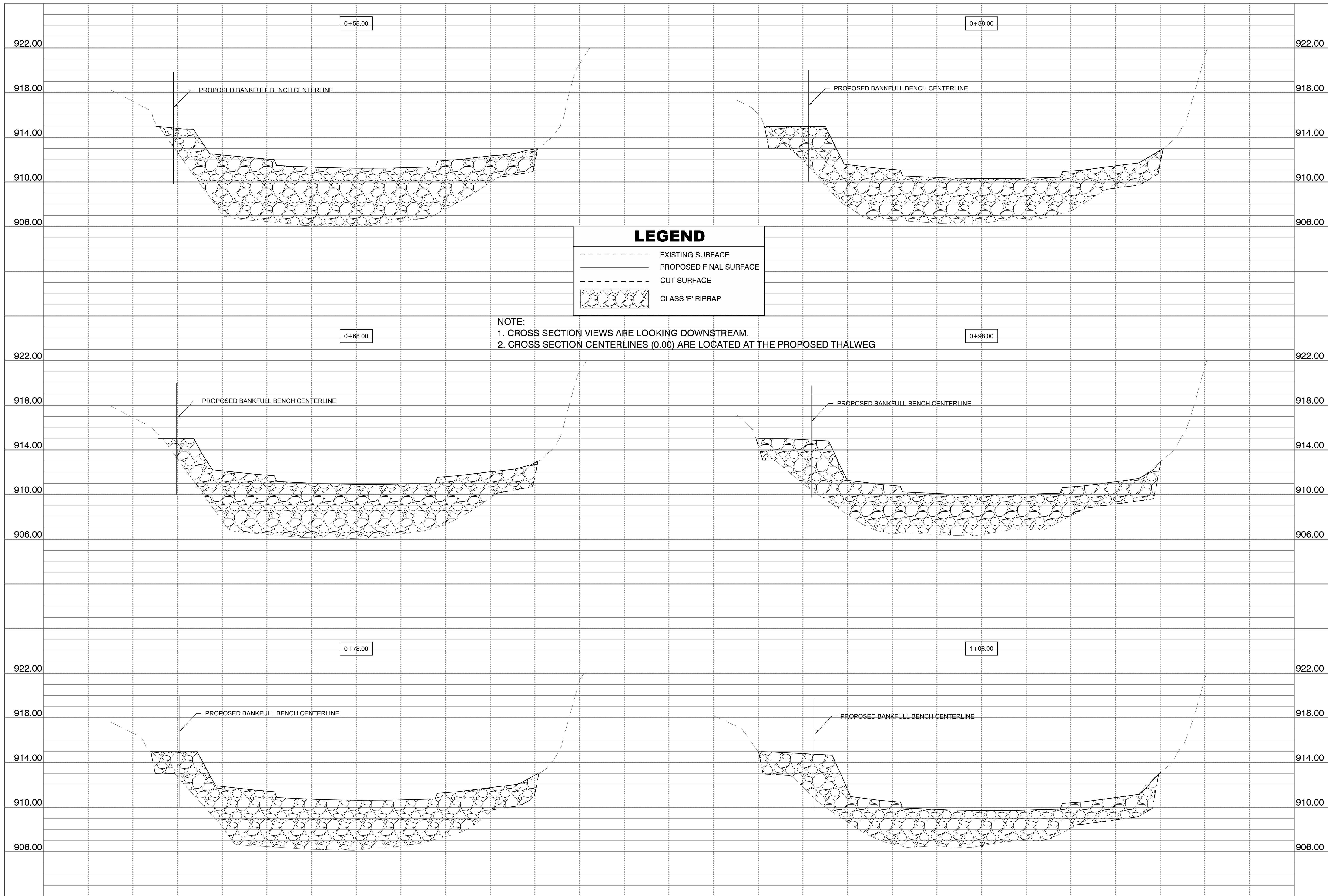
**LITTLETON ASSOCIATES INC.**  
 500 EAST LOCUST STREET SUITE 400  
 DES MOINES, IOWA 50309  
 office: 515-422-7016  
 www.ltleon.com

PROJECT NO. 038.005

CROSS SECTIONS

SHEET NO.  
**W.01**





**LEGEND**

- EXISTING SURFACE
- PROPOSED FINAL SURFACE
- - - CUT SURFACE
- CLASS 'E' RIPRAP

**NOTE:**  
 1. CROSS SECTION VIEWS ARE LOOKING DOWNSTREAM.  
 2. CROSS SECTION CENTERLINES (0.00) ARE LOCATED AT THE PROPOSED THALWEG

-120.00 -100.00 -80.00 -60.00 -40.00 -20.00 0.00 20.00 40.00 60.00 80.00 100.00 120.00      -120.00 -100.00 -80.00 -60.00 -40.00 -20.00 0.00 20.00 40.00 60.00 80.00 100.00 120.00

SCALE: 1" = 20' HORIZONTAL  
 1" = 4' VERTICAL

NO.	REVISION	BY	DATE

**LITTLETON DAM MITIGATION**  
**WAPINICON RIVER**  
**LITTLETON, IOWA**  
**CROSS SECTIONS**

**LITTLETON ASSOCIATES INC.**  
 500 EAST LOCUST STREET SUITE 400  
 DES MOINES, IOWA 50309  
 office: 515-422-7016  
 www.ltleon.com

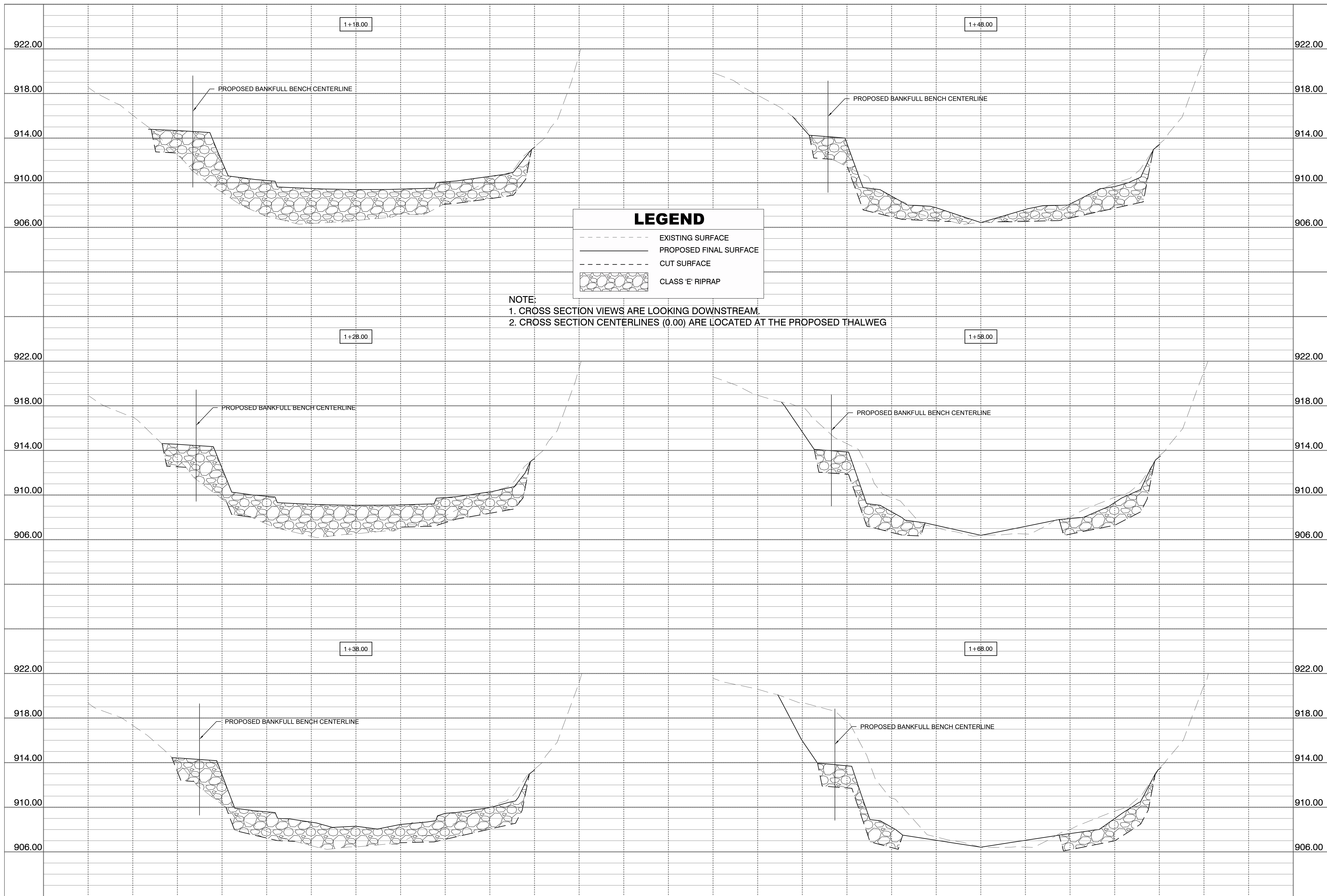
PROJECT NO. 038.005

CROSS SECTIONS

SHEET NO.  
**W.02**

DESIGNED: PDS  
 DRAFTED: BAY  
 CHECKED: LTL  
 SCALE: 1:20H 1:4V  
 PROJECT NO.: 038.005  
 FILE NUMBER: 038.005  
 SHEET NO.: W.02  
 DATE: SEPTEMBER 19, 2018





**LEGEND**

- EXISTING SURFACE
- PROPOSED FINAL SURFACE
- - - CUT SURFACE
- ▨ CLASS 'E' RIPRAP

**NOTE:**  
 1. CROSS SECTION VIEWS ARE LOOKING DOWNSTREAM.  
 2. CROSS SECTION CENTERLINES (0.00) ARE LOCATED AT THE PROPOSED THALWEG

SCALE: 1" = 20' HORIZONTAL  
 1" = 4' VERTICAL

NO.	REVISION	BY	DATE
DESIGNED: PDS	PROJECT NO: 038.005		
DRAFTED: BAY	FILE NUMBER: 038.005		
CHECKED: LTL	SHEET NO.: W.03		
SCALE: 1:20H 1:4V	DATE: SEPTEMBER 19, 2018		

LITTLETON DAM MITIGATION  
 WAPINICON RIVER  
 LITTLETON, IOWA  
 CROSS SECTIONS

LITTLETON

ASSOCIATES INC

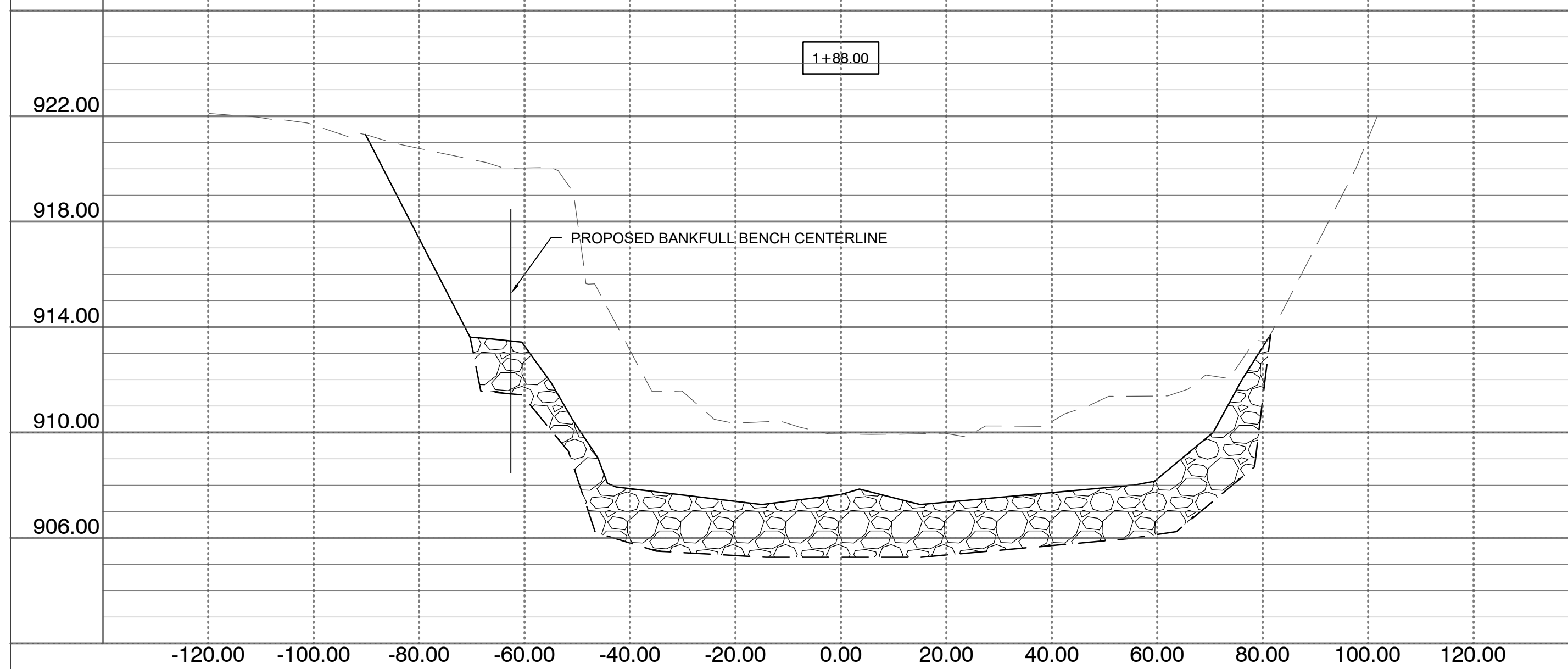
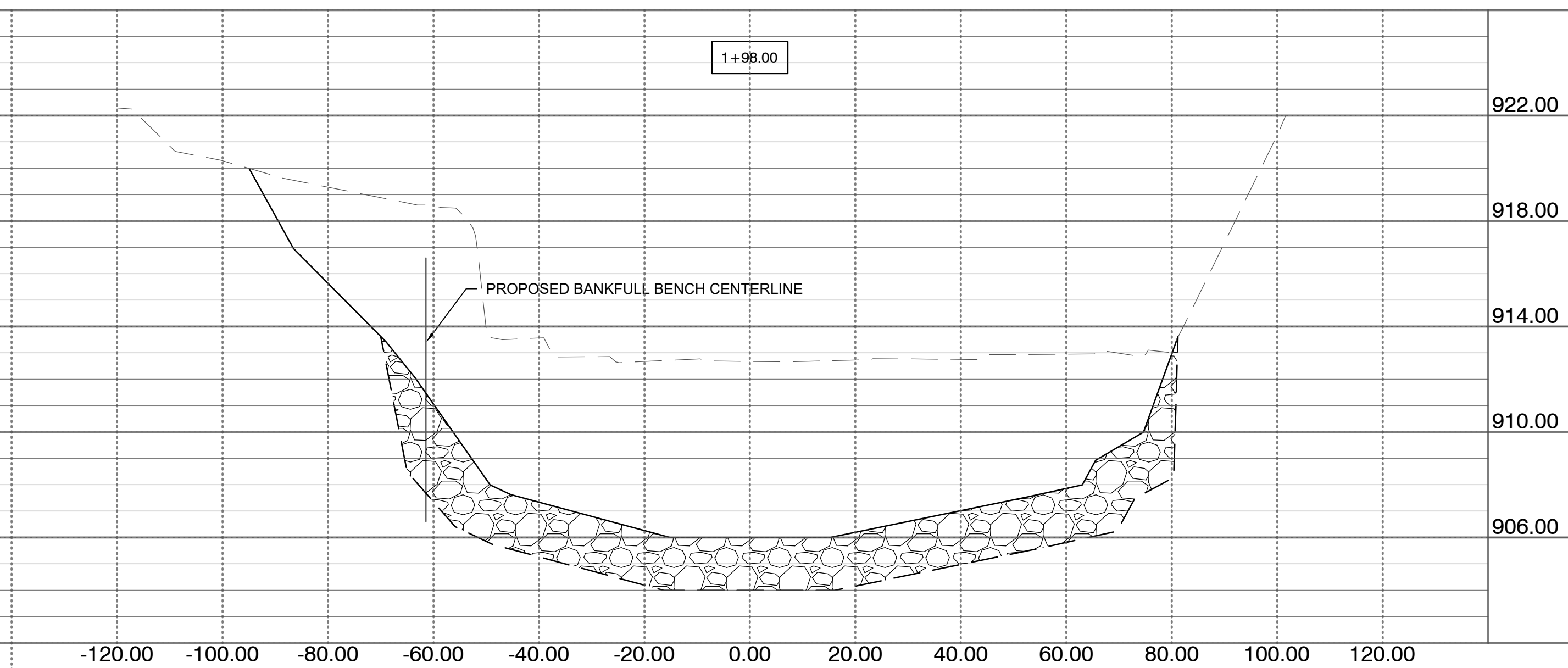
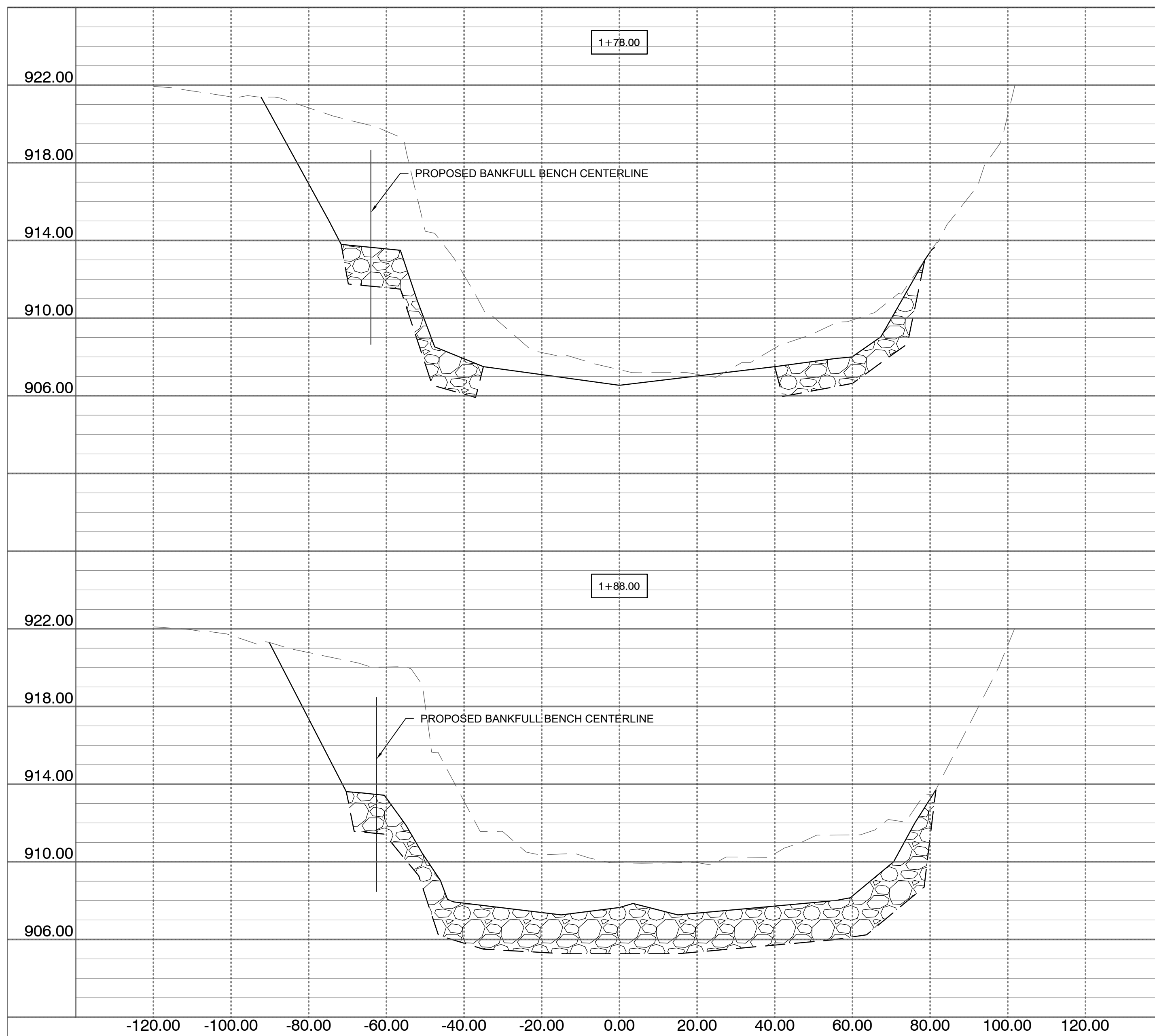
500 EAST LOCUST STREET SUITE 400  
 DES MOINES, IOWA 50309  
 office: 515-422-7016  
 www.ltleon.com

PROJECT NO. 038.005

CROSS SECTIONS

SHEET NO.  
**W.03**





LEGEND	
---	EXISTING SURFACE
—	PROPOSED FINAL SURFACE
- - -	CUT SURFACE
[Hatched Pattern]	CLASS 'E' RIPRAP

NOTE:  
 1. CROSS SECTION VIEWS ARE LOOKING DOWNSTREAM.  
 2. CROSS SECTION CENTERLINES (0.00) ARE LOCATED AT THE PROPOSED THALWEG

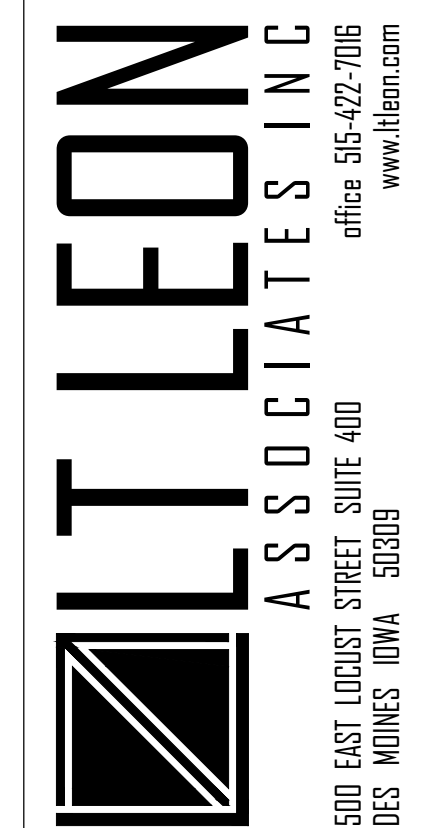
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 1" = 4' VERTICAL

NO.	REVISION	BY	DATE

DESIGNED: PDS	PROJECT NO: 038.005
DRAFTED: BAY	FILE NUMBER: 038.005
CHECKED: LTL	SHEET NO.: W.04
SCALE: 1:20H 1:4V	DATE: SEPTEMBER 19, 2018

LITTLETON DAM MITIGATION  
 WAPINICON RIVER  
 LITTLETON, IOWA  
 CROSS SECTIONS



PROJECT NO. 038.005

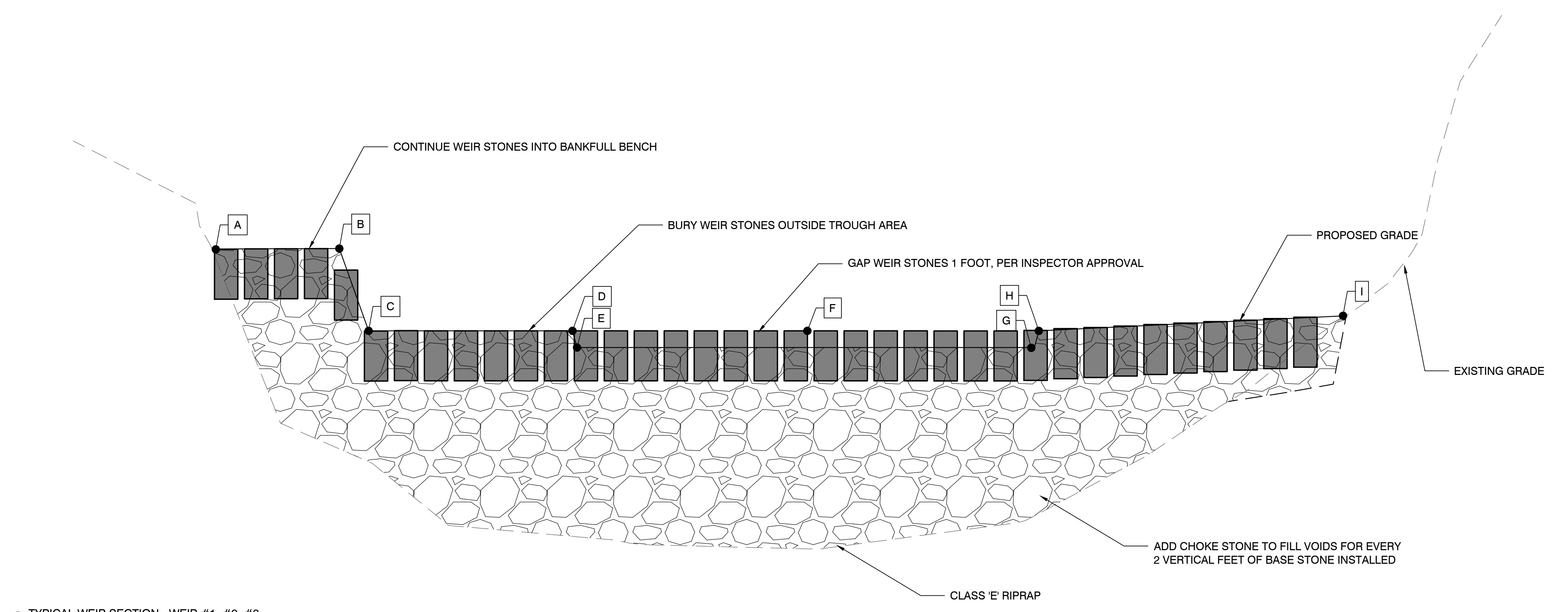
CROSS SECTIONS

SHEET NO.  
 W.04



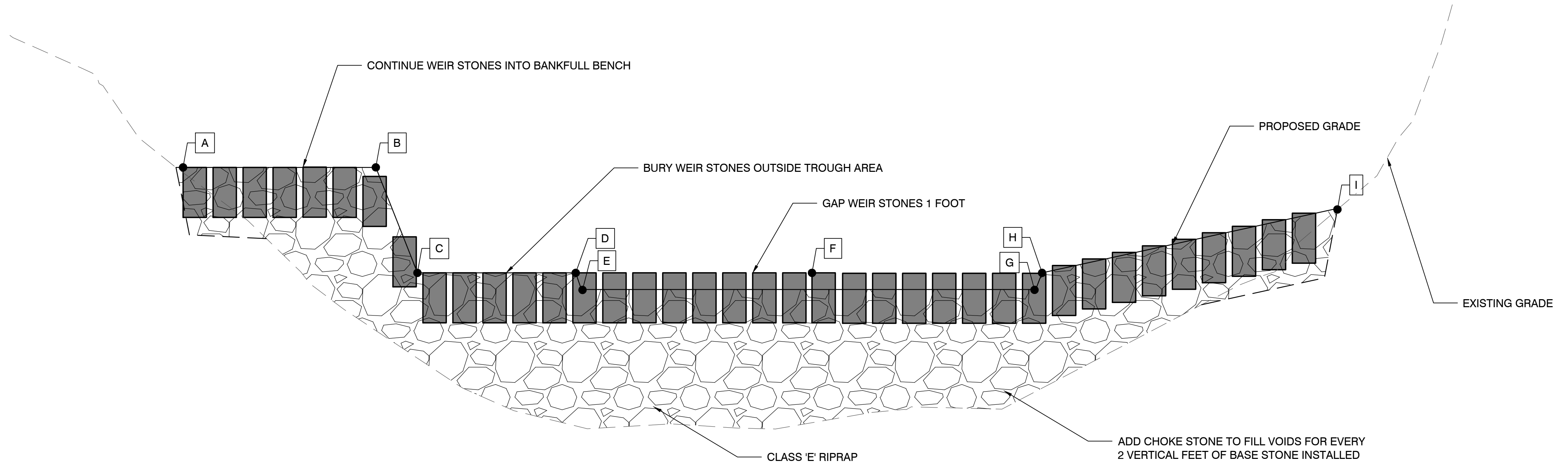
### LEGEND

- EXISTING SURFACE
- PROPOSED FINAL SURFACE
- CUT SURFACE
- CLASS 'E' RIPRAP
- WEIR STONE



① TYPICAL WEIR SECTION - WEIR #1, #2, #3  
NOT TO SCALE

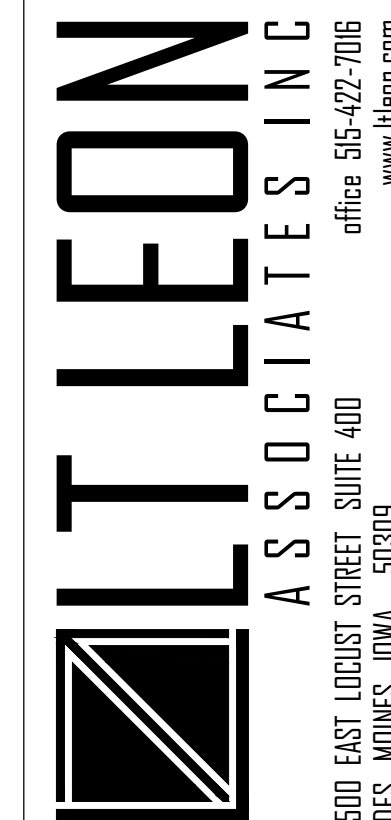
SPOT	DESCRIPTION	WEIR SPOT ELEVATIONS														
		WEIR #1			WEIR #2			WEIR #3			WEIR #4			WEIR #5		
		NORTHING	EASTING	ELEVATION	NORTHING	EASTING	ELEVATION	NORTHING	EASTING	ELEVATION	NORTHING	EASTING	ELEVATION	NORTHING	EASTING	ELEVATION
A	BANKFULL SHELF LEFT	3660005.539	5317965.899	915.00	3659986.845	5317993.976	915.00	3659962.781	5318004.531	914.61	3659941.967	5318017.417	914.22	3659907.968	5318054.739	913.43
B	BANKFULL SHELF RIGHT	3659998.085	5317947.183	915.00	3659977.974	5317965.774	915.00	3659958.181	5317983.32	914.61	3659939.922	5318000.541	914.22	3659905.354	5318033.644	913.43
C	CHANNEL BOTTOM LEFT	3659995.229	5317939.877	912.66	3659975.635	5317957.174	911.86	3659956.2	5317973.925	911.06	3659938.563	5317989.903	910.26	3659911.961	5318014.896	909.03
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E	LOW FLOW TROUGH LEFT	3659982.207	5317910.191	912.16	3659965.406	5317929.026	911.36	3659947.706	5317947.909	910.56	3659930.733	5317967.263	909.76	3659914.209	5317987.431	908.96
F	WEIR STONE CENTER	3659959.163	5317885.979	912.66	3659941.34	5317903.451	911.86	3659923.664	5317922.324	911.06	3659906.396	5317941.901	910.26	3659889.752	5317961.912	909.46
G	LOW FLOW TROUGH RIGHT	3659926.514	5317868.827	912.16	3659909.125	5317886.578	911.36	3659891.78	5317905.416	910.56	3659874.835	5317925.508	909.76	3659858.187	5317945.476	908.96
H	CHANNEL BOTTOM RIGHT CENTER	3659924.784	5317868.45	912.66	3659907.837	5317886.06	911.86	3659890.44	5317905.416	911.06	3659873.697	5317925.154	910.26	3659857.049	5317945.123	909.46
I	END OF WEIR	3659868.593	5317864.904	913.00	3659849.956	5317885.995	913.00	3659832.322	5317908.274	913.00	3659811.851	5317932.54	913.00	3659782.606	5317970.265	909.89



② TYPICAL WEIR SECTION - WEIR #4, #5  
NOT TO SCALE

NOTE: CROSS SECTION VIEWS ARE LOOKING DOWNSTREAM.

LITTLETON DAM MITIGATION  
WAPSICON RIVER  
LITTLETON, IOWA  
TYPICAL CROSS SECTIONS



PROJECT NO. 038.005

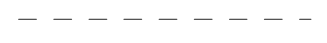
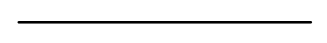
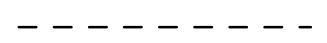
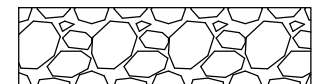

TYP. CROSS SECTIONS

SHEET NO.  
W.05

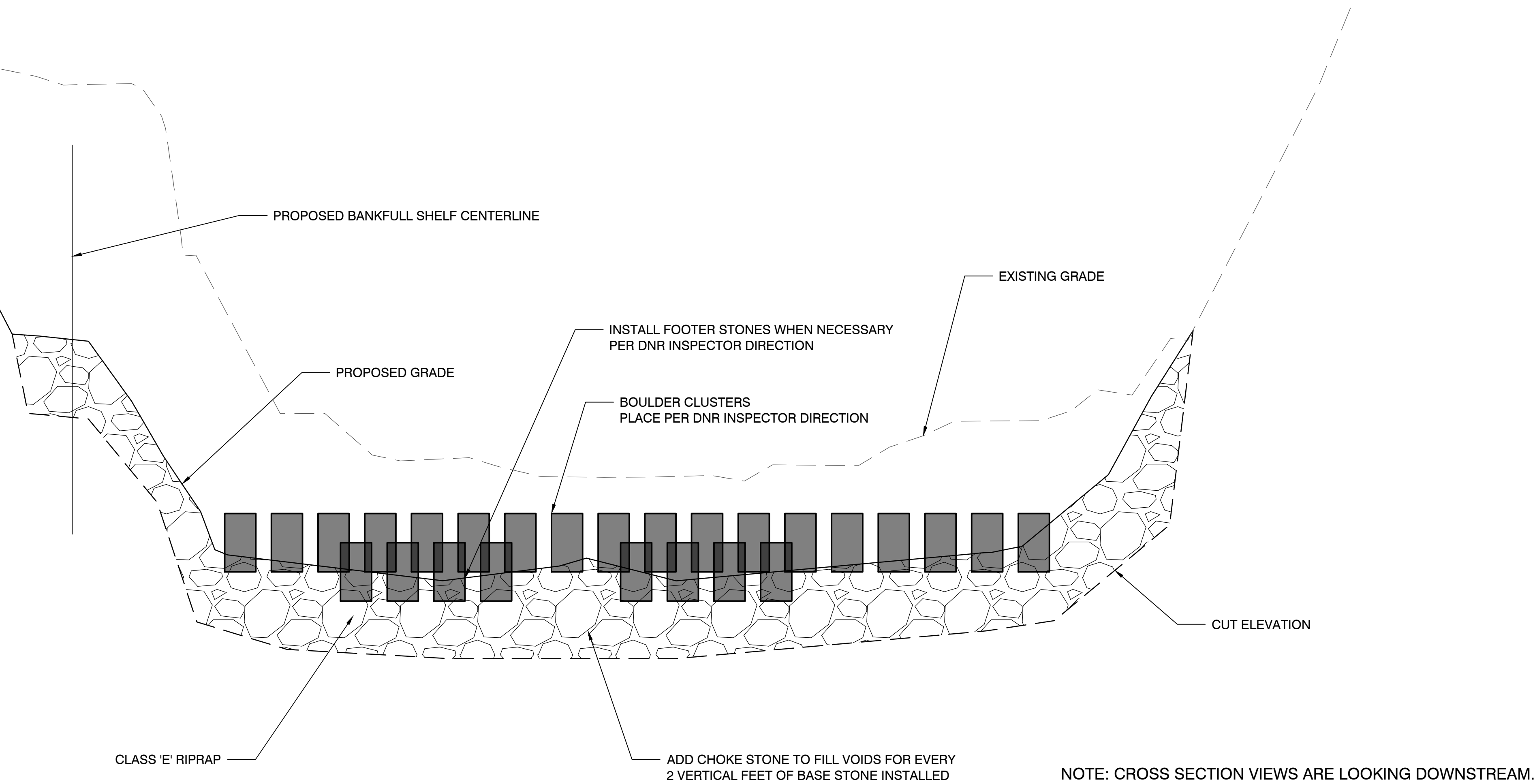
NO.	REVISION	BY	DATE

PROJECT NO.: 038.005  
 FILE NUMBER: 038.005  
 SHEET NO.: W.05  
 DATE: SEPTEMBER 19, 2018  
 NO SCALE



LEGEND	
	EXISTING SURFACE
	PROPOSED FINAL SURFACE
	CUT SURFACE
	CLASS 'E' RIPRAP
	WEIR STONE

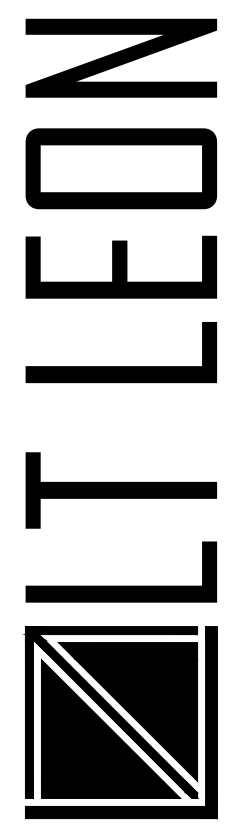
3 TYPICAL CROSS SECTION - BOULDER CLUSTERS  
NOT TO SCALE



NO.	REVISION	BY	DATE

DESIGNED: PDS  
PROJECT NO.: 038.005  
DRAFTED: BAY  
FILE NUMBER: 038.005  
CHECKED: LTL  
SHEET NO.: W.06  
SCALE: NO SCALE  
DATE: SEPTEMBER 19, 2018

LITTLETON DAM MITIGATION  
WAPINICON RIVER  
LITTLETON, IOWA  
TYPICAL CROSS SECTIONS



LT LEON  
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500 EAST LOCUST STREET SUITE 400  
DES MOINES IOWA 50309  
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PROJECT NO. 038.005  
TYP. CROSS SECTIONS

SHEET NO.  
W.06