

2023

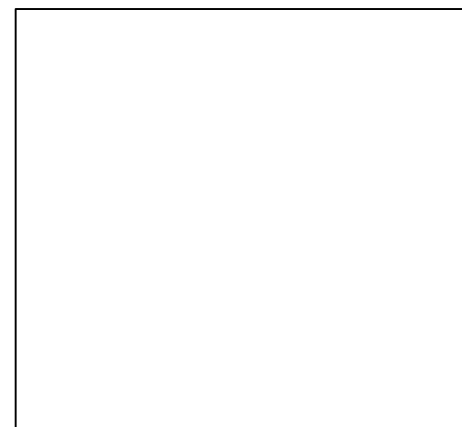
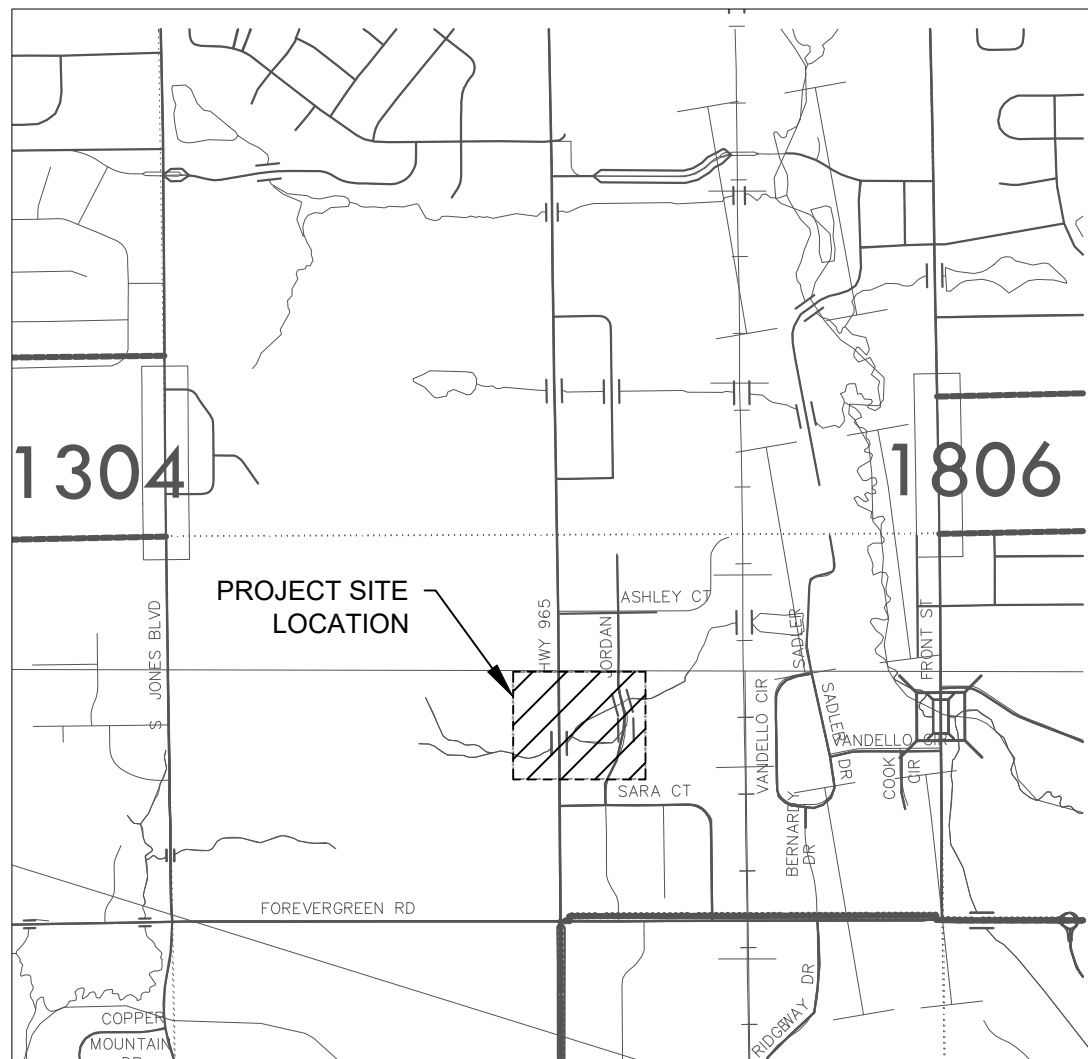
RANSHAW WAY TRAIL UNDERPASS

City of North Liberty

Ranshaw Way/HWY 965

North Liberty, IA 52317

PROJECT LOCATION MAP



Iowa City, IA 52240

Project Manager:

Mason Rahe, EIT

Completed By: Lucas Dahl, EIT

Loren Moffitt, EIT

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Cover Sheet

Ranshaw Way Trail
Underpass

| NO. | BY | DATE | REVISION |
|-----|----|------|----------|
| | | | |
| | | | |
| | | | |

01

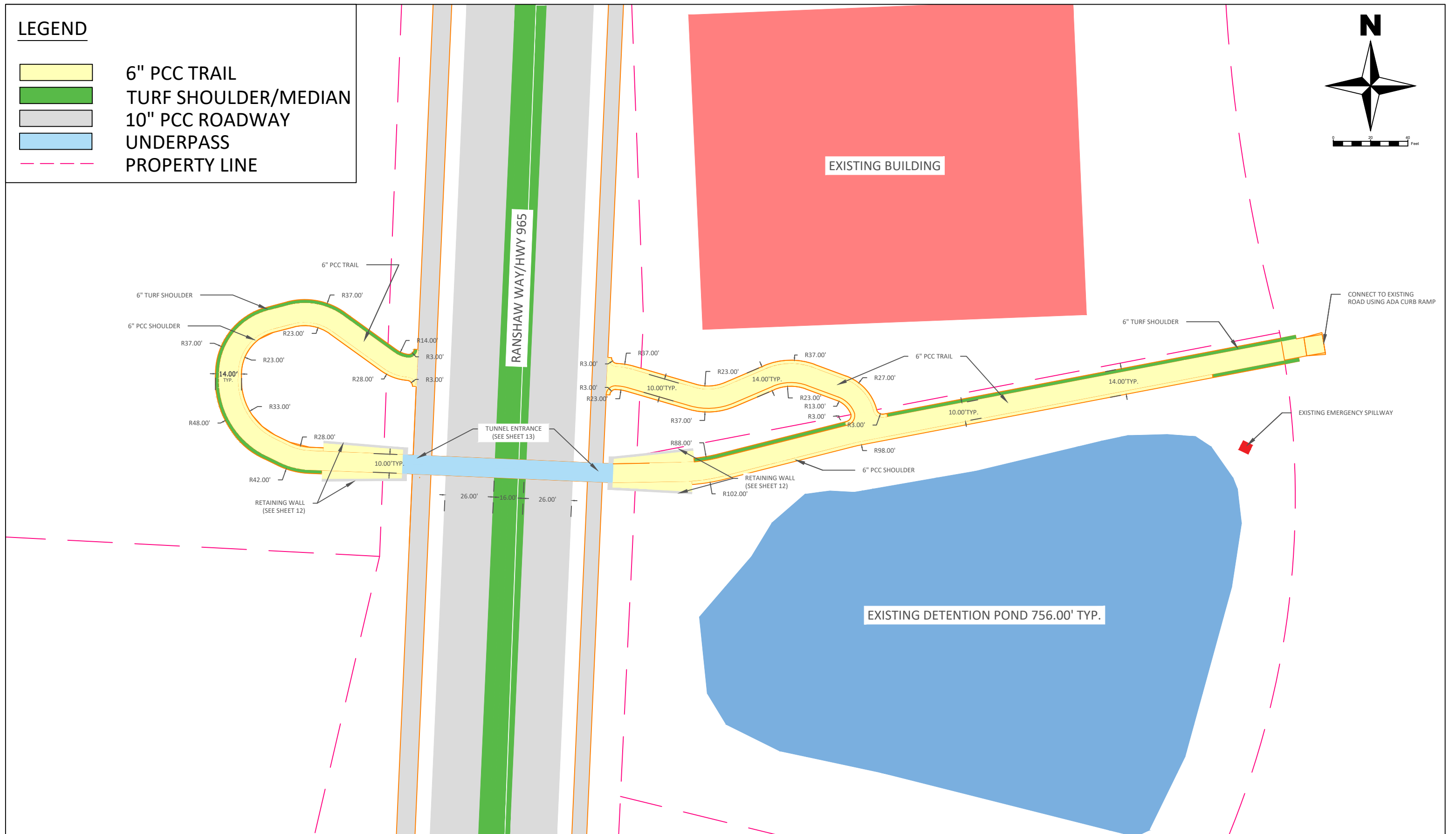
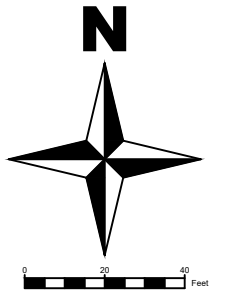
North Liberty, IA
Designed By: MJR
DWG: 01 - Cover Sheet



Scale: N/A

LEGEND

- 6" PCC TRAIL
- TURF SHOULDER/MEDIAN
- 10" PCC ROADWAY
- UNDERPASS
- PROPERTY LINE



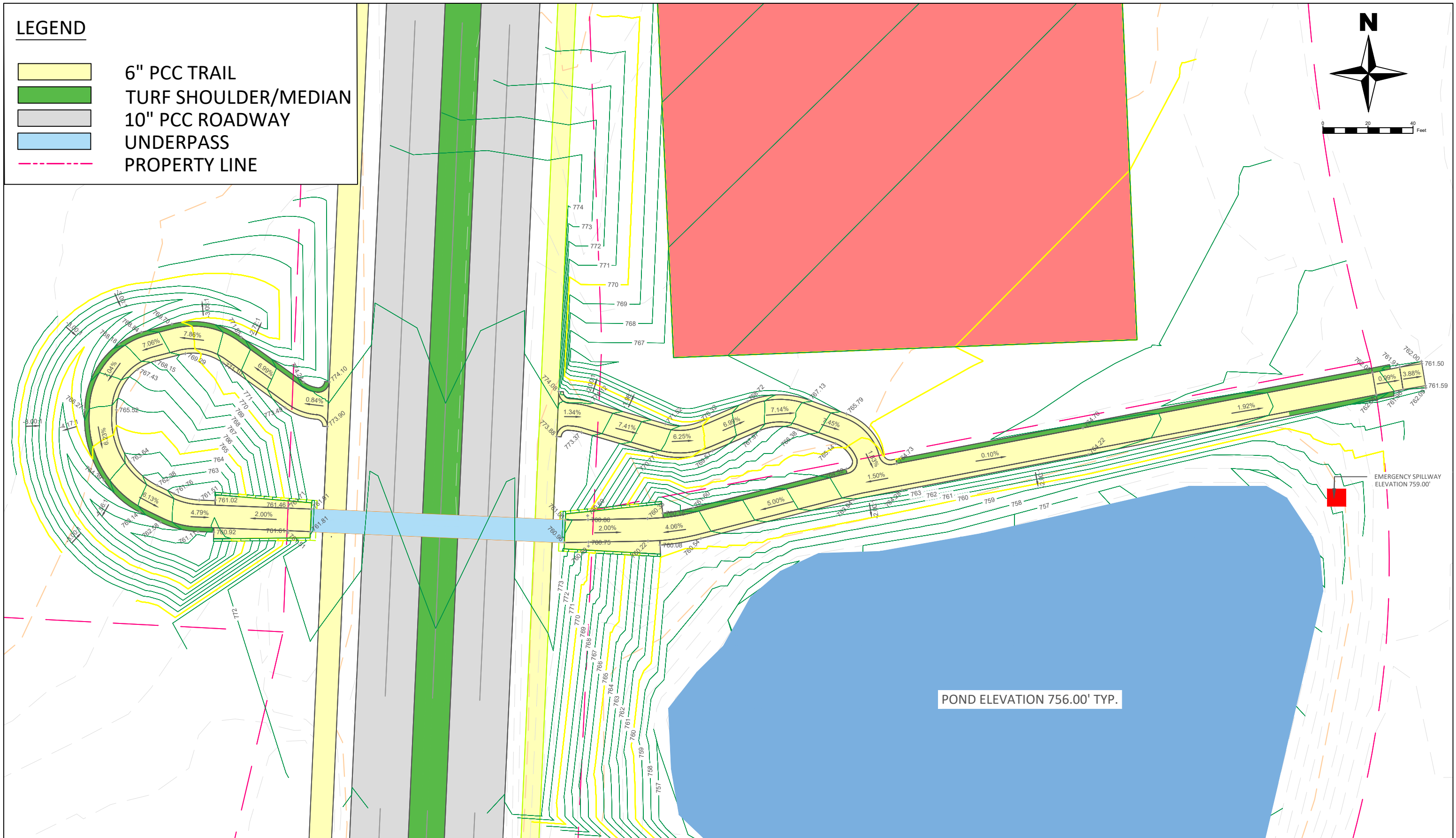
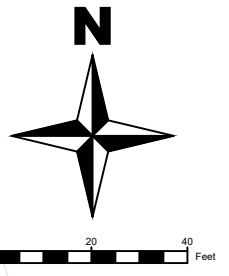
Site Plan
Ranshaw Way Trail Underpass

| | NO. | BY | DATE | REVISION |
|-----------|--|----|------|----------|
| | | | | |
| | | | | |
| | | | | |
| 02 | North Liberty, IA Designed By: MJR DWG: 02 - Site Plan | | | |

Scale: 1" = 40'

LEGEND

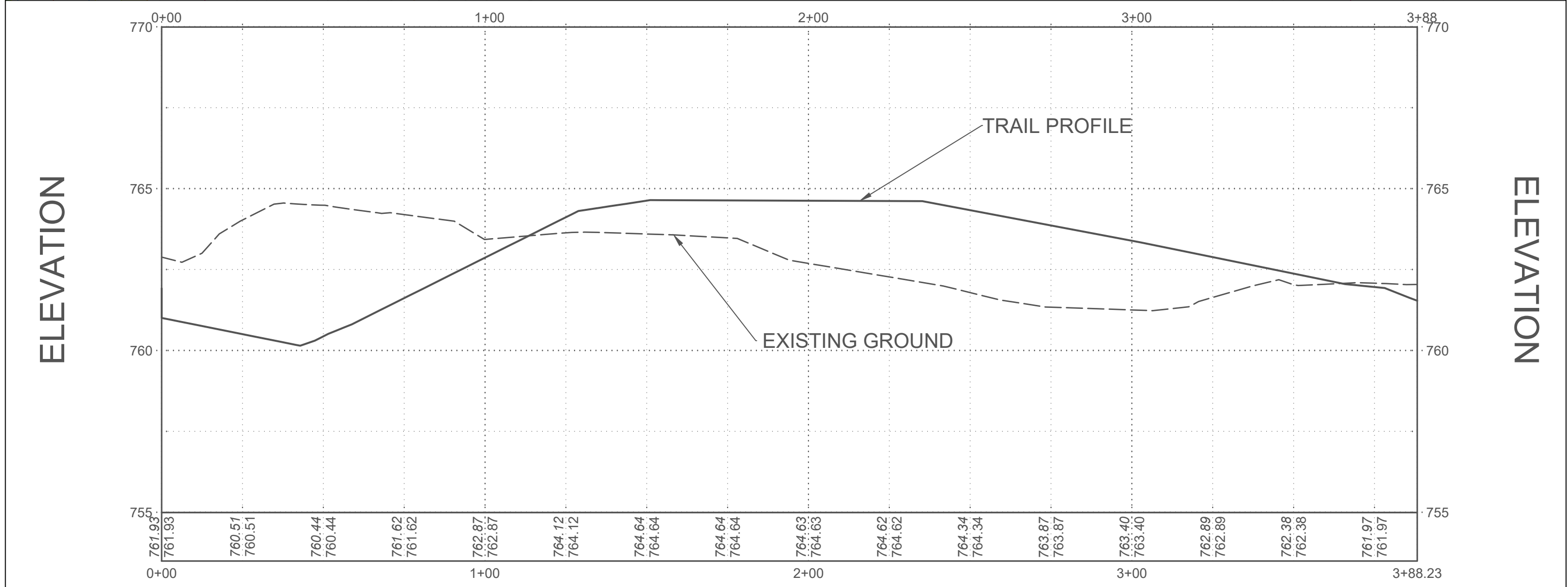
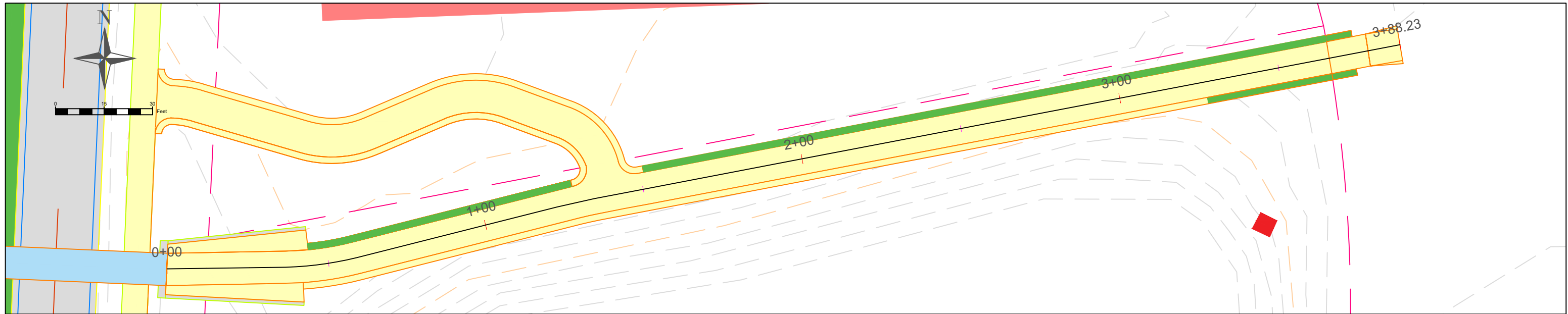
- 6" PCC TRAIL
- TURF SHOULDER/MEDIAN
- 10" PCC ROADWAY
- UNDERPASS
- PROPERTY LINE




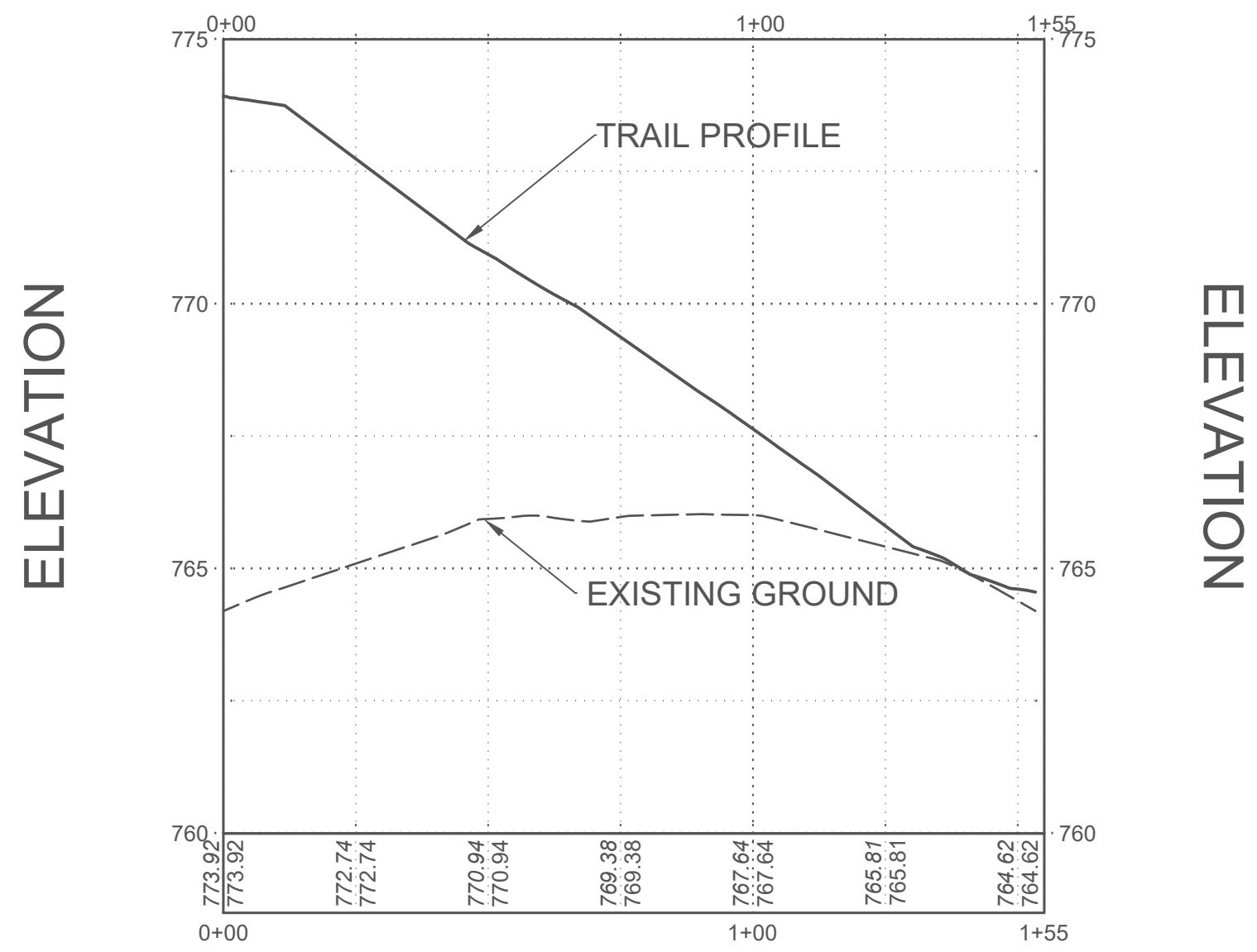
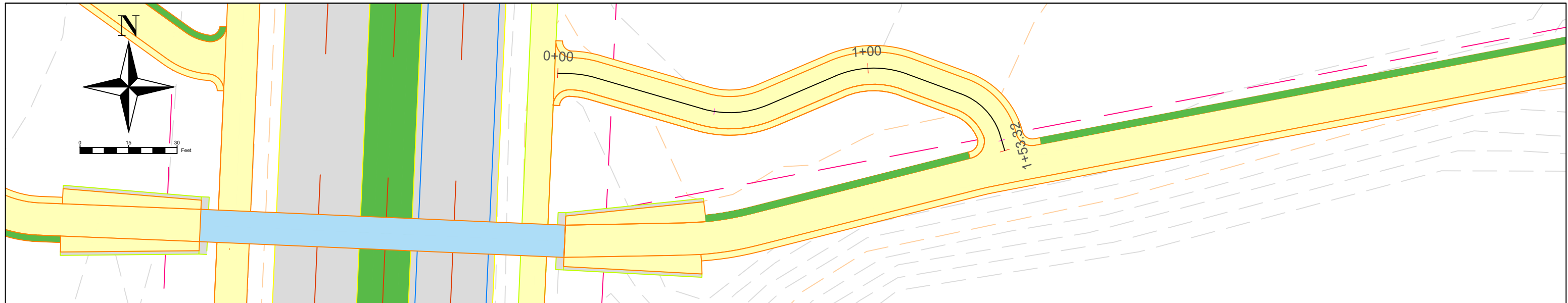
Grading Plan
Ranshaw Way Trail
Underpass


| NO. | BY | DATE | REVISION |
|------------------------|---------------------------------------|------|----------|
| | | | |
| | | | |
| | | | |
| 03 | North Liberty, IA Designed By: MJR | | |
| DWG: 03 - Grading Plan | | | |

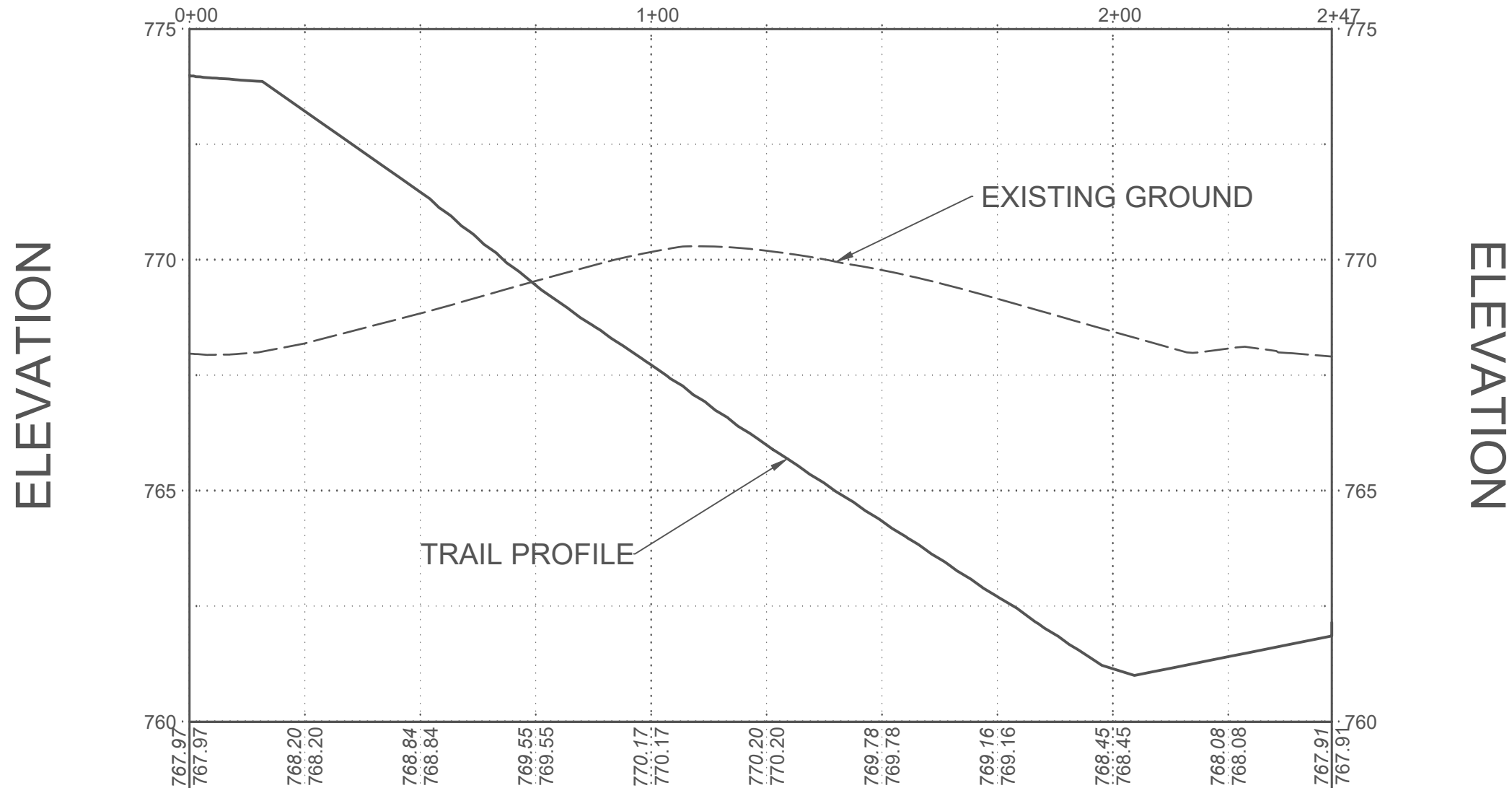
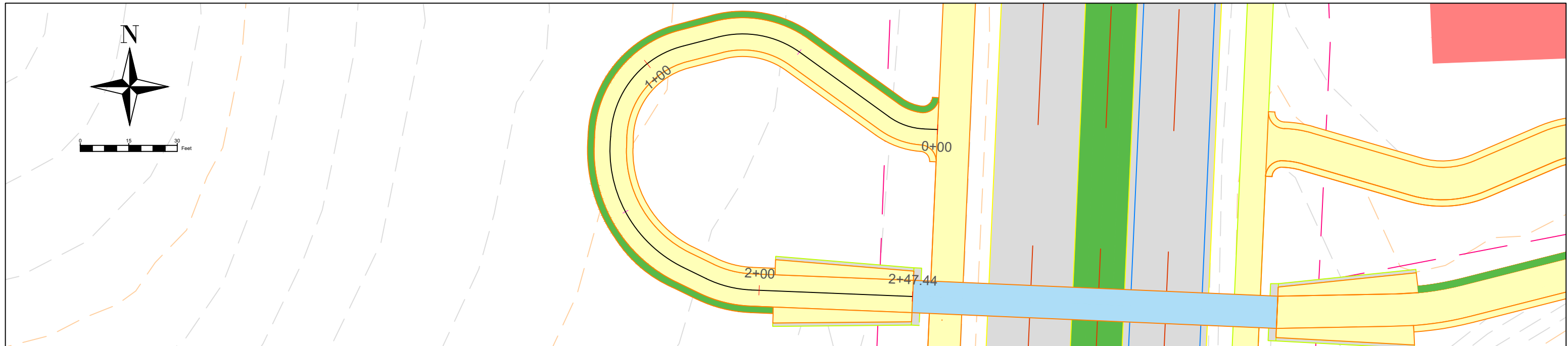
Scale: 1" = 40'




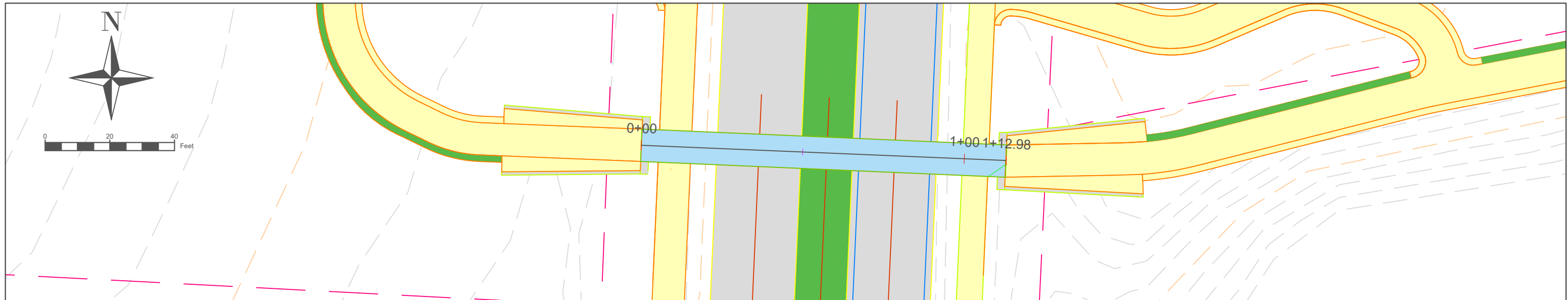
| | | | | | | | | | |
|--|-----------------------------|-----|--|----------------------|--|------|--|---|--|
| | Trail Plan - Main Trail | NO. | | BY | | DATE | | REVISION | |
| | | | | | | | | | |
| | Ranshaw Way Trail Underpass | 04 | | North Liberty, IA | | | |  | |
| | | | | Designed By: MJR | | | | | |
| | | | | DWG: 04 - Trail Plan | | | | | |
| | | | | | | | | Scale: 1" = 30' | |



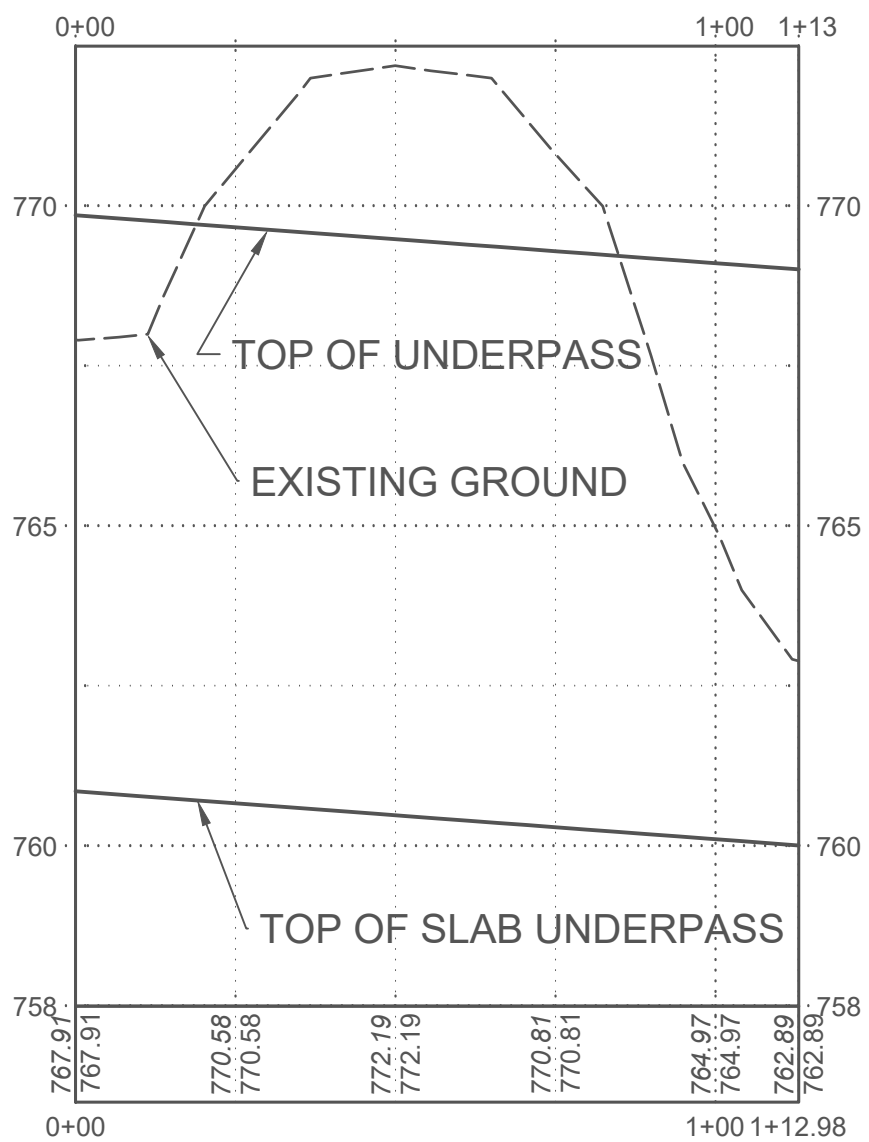
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|--|------------------------------|-----|----------------------|------|---|
| | Trail Plan - East Connection | NO. | BY | DATE | REVISION |
| | | | | | |
| | Ranshaw Way Trail Underpass | 05 | North Liberty, IA | |  |
| | | | Designed By: MJR | | |
| | | | DWG: 04 - Trail Plan | | Scale: 1" = 30' |



| | | | | | |
|--|------------------------------|-----|----------------------|------|---|
| | Trail Plan - West Connection | NO. | BY | DATE | REVISION |
| | | | | | |
| | | | | | |
| | Ranshaw Way Trail Underpass | 06 | North Liberty, IA | |  |
| | | | Designed By: MJR | | |
| | | | DWG: 04 - Trail Plan | | |
| | | | | | Scale: 1" = 30' |



ELEVATION



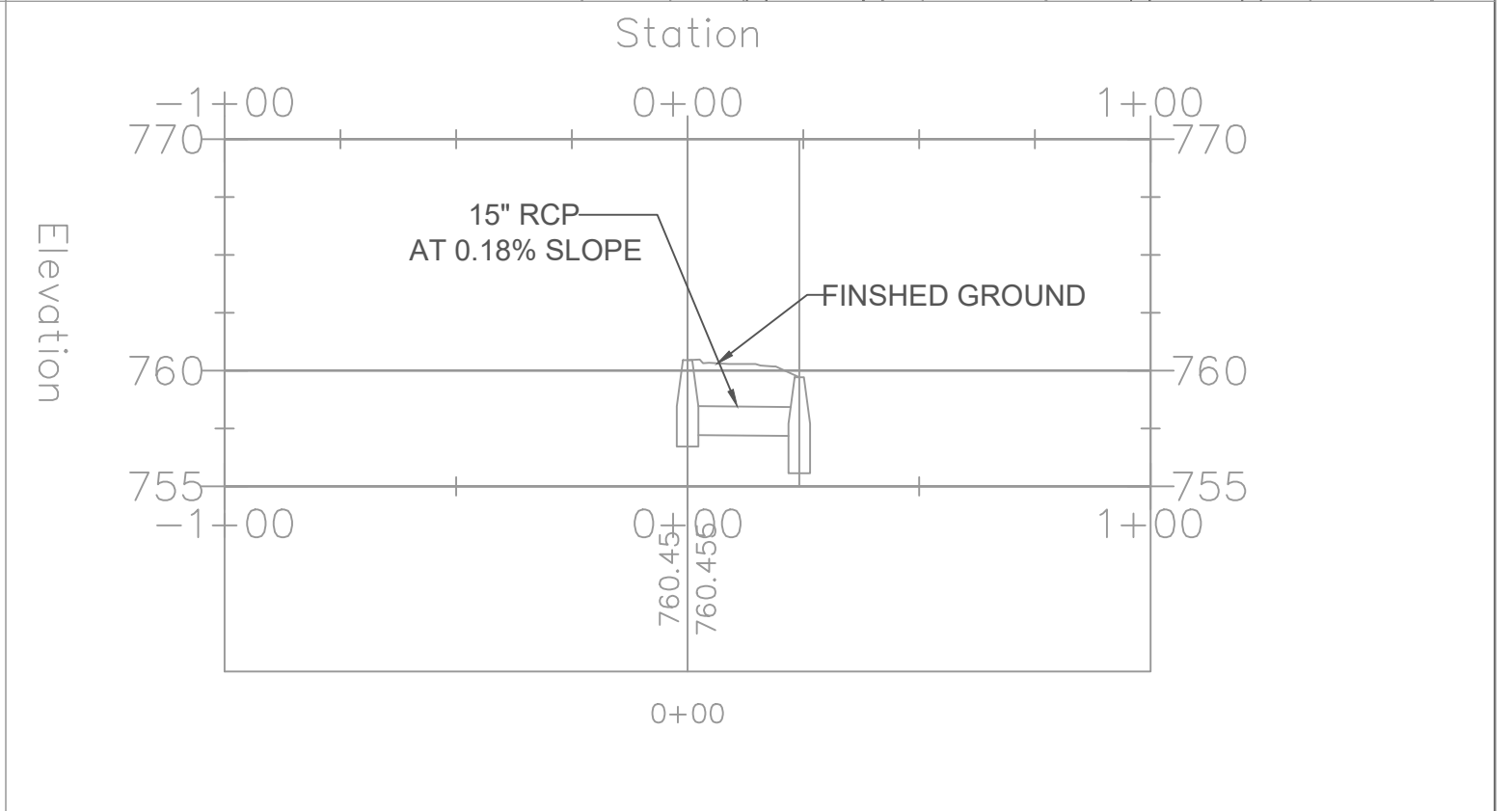
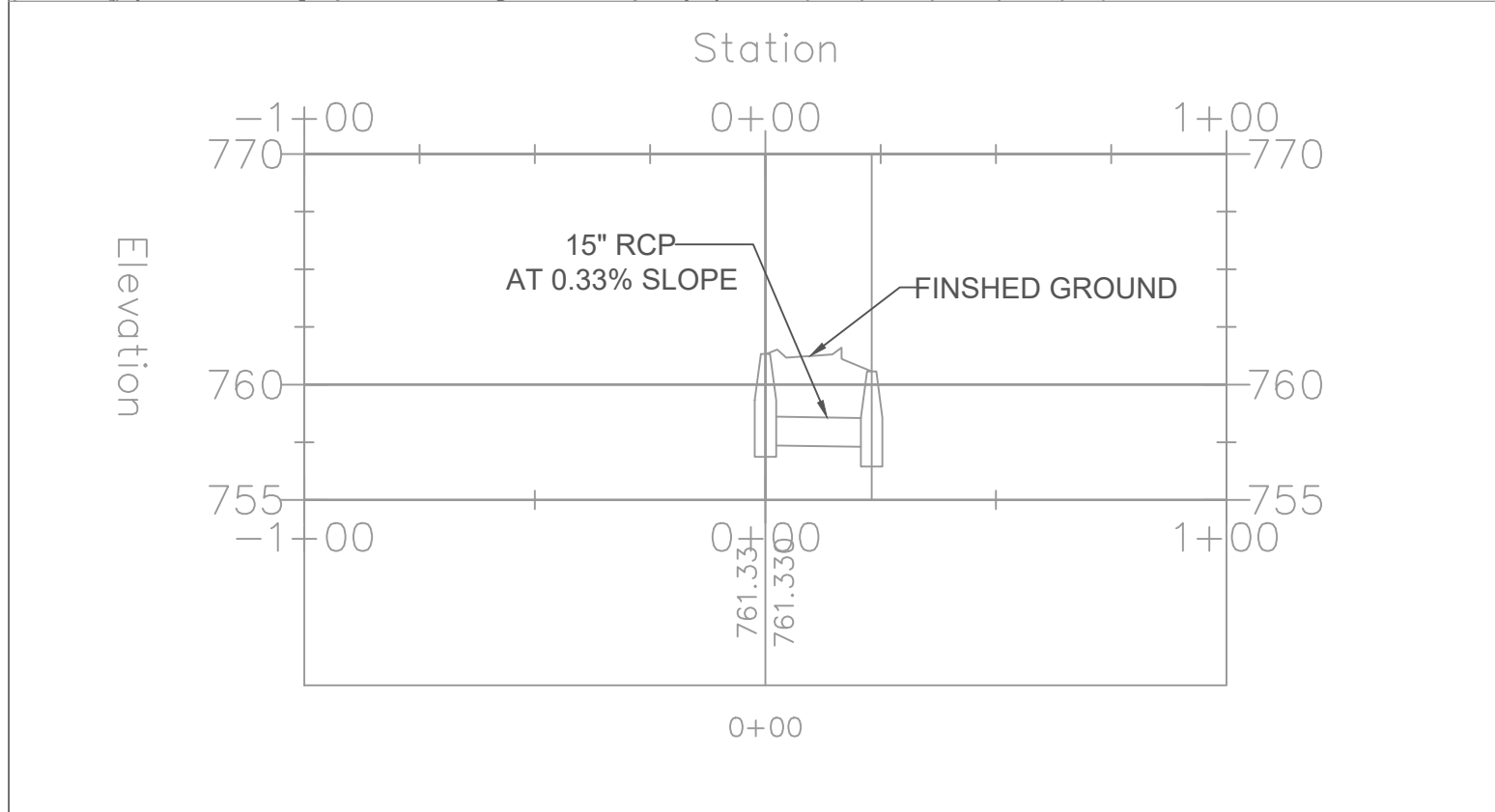
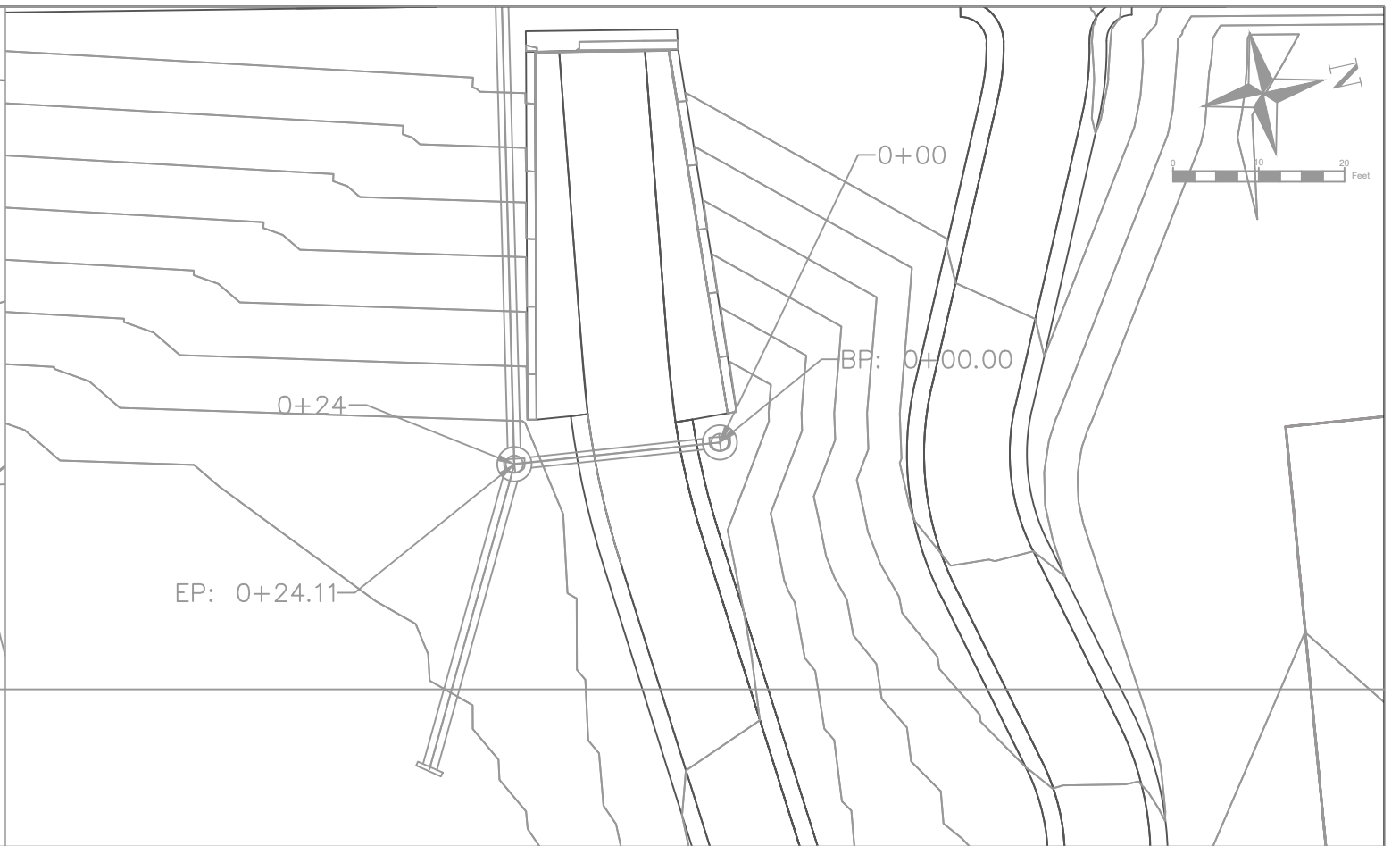
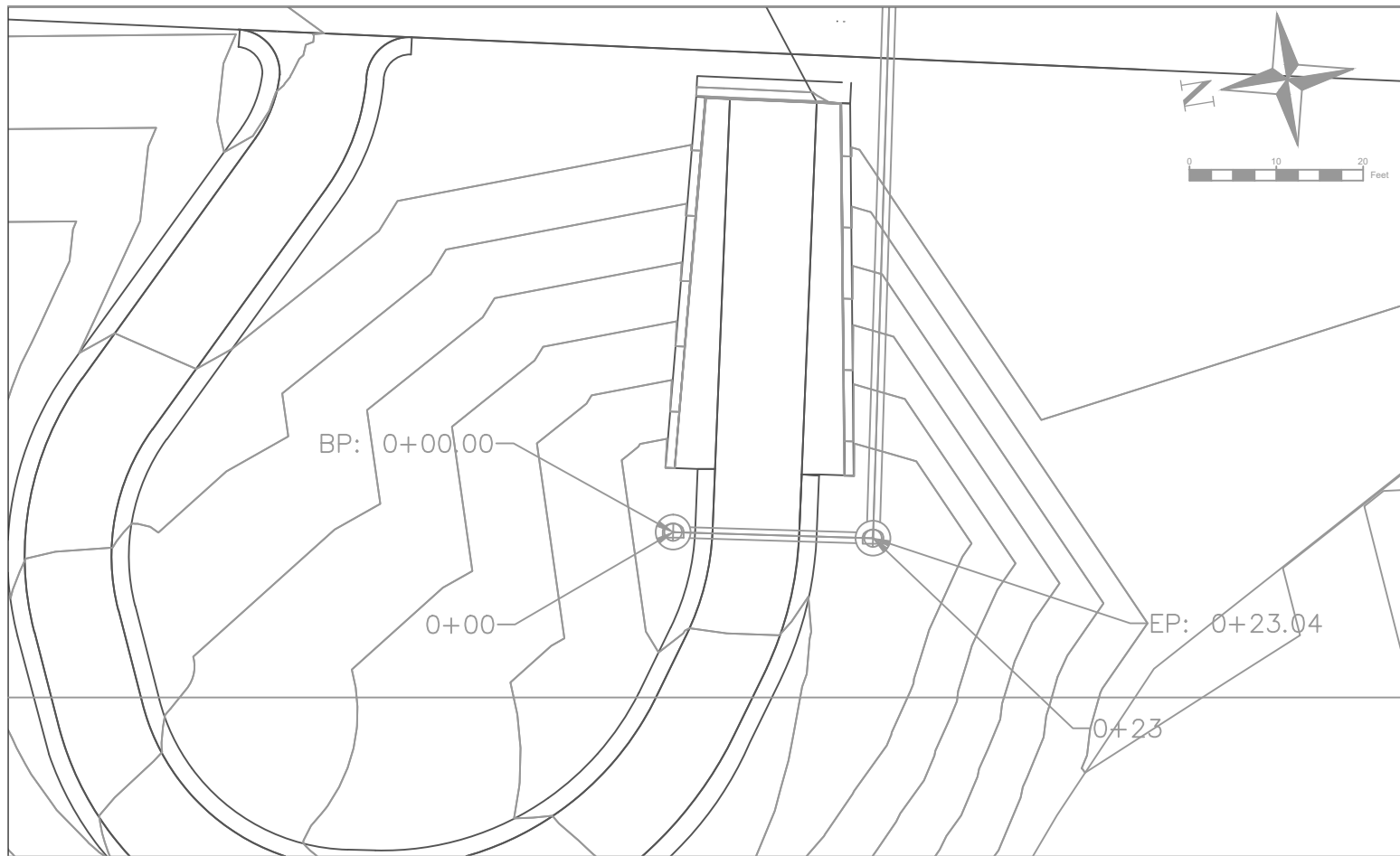
ELEVATION

Trail Plan - Underpass
Ranshaw Way Trail
Underpass

| NO. | BY | DATE | REVISION |
|-----|---------------------------------------|------|----------|
| 07 | North Liberty, IA Designed By: MJR | | |
| | DWG: 04 - Trail Plan | | |




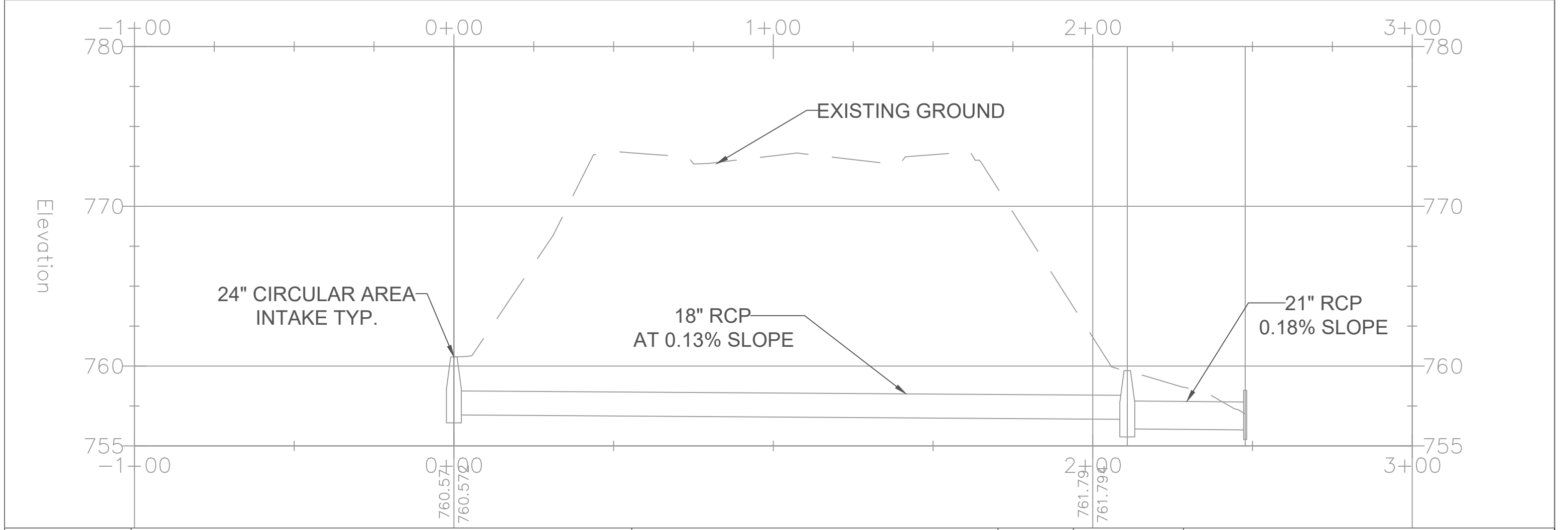
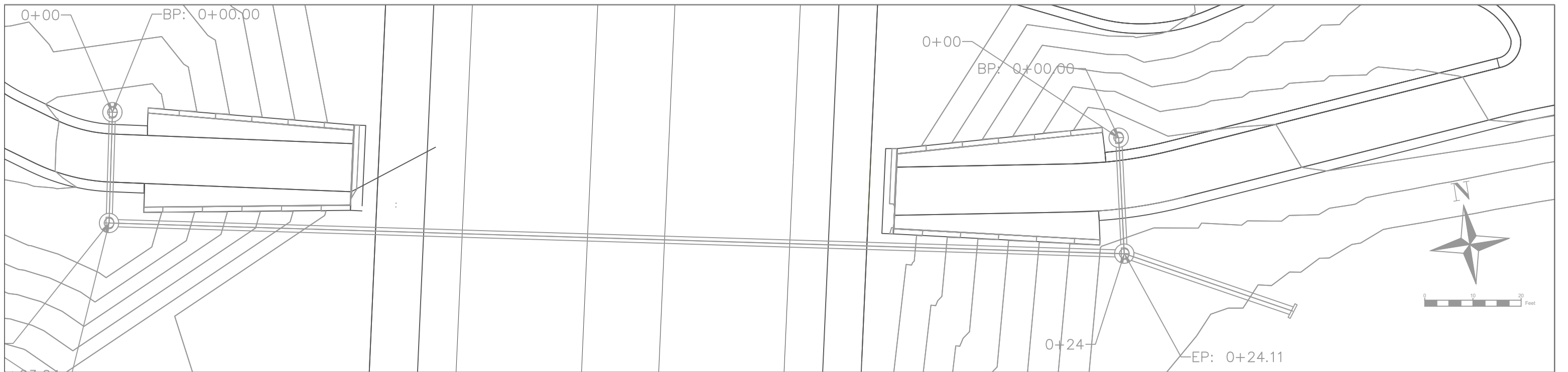
Scale: 1" = 40'




Storm Sewer Plan - E & W
Ranshaw Way Trail
Underpass




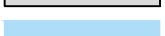


| NO. | BY | DATE | REVISION |
|-----|----------------------------|------|----------|
| 08 | North Liberty, IA | | |
| | Designed By: MJR | | |
| | DWG: 08 - Storm Sewer Plan | | |

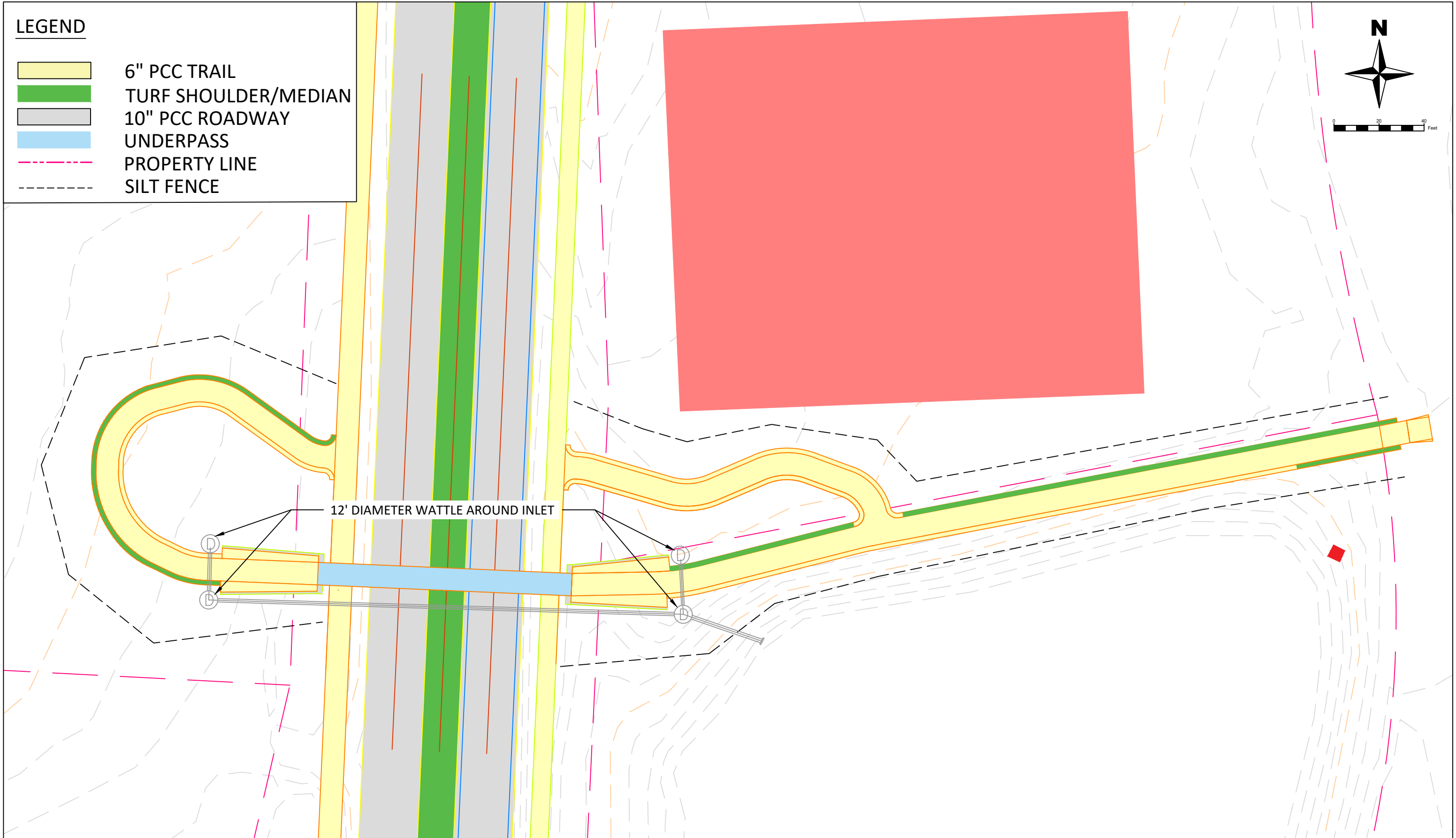
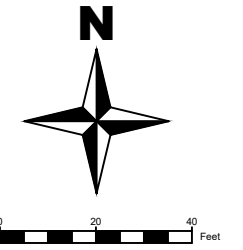

Scale: 1" = 40'



| | | | | | | |
|----|-------------------|--|---|-----------------|------|----------|
| | | Storm Sewer Plan - Main Ranshaw Way Trail Underpass | NO. | BY | DATE | REVISION |
| | | | | | | |
| 09 | North Liberty, IA | |  | | | |
| | Designed By: MJR | | | | | |
| | | DWG: 08 - Storm Sewer Plan | | Scale: 1" = 30' | | |

LEGEND

-  6" PCC TRAIL
-  TURF SHOULDER/MEDIAN
-  10" PCC ROADWAY
-  UNDERPASS
-  PROPERTY LINE
-  SILT FENCE



12' DIAMETER WATTLE AROUND INLET

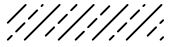
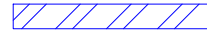

Erosion Control Plan
Ranshaw Way Trail
Underpass

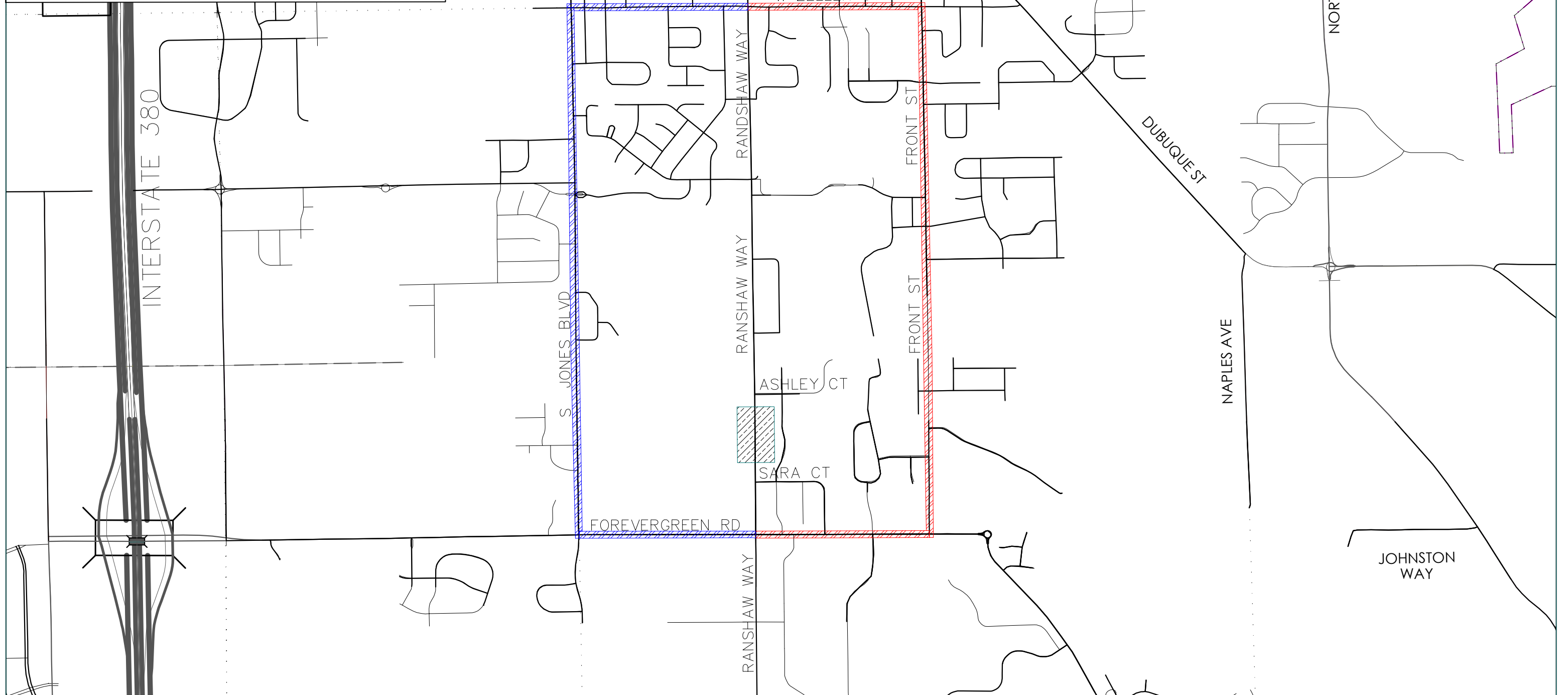
| NO. | BY | DATE | REVISION |
|-----|--------------------------------|------|----------|
| 10 | North Liberty, IA | | |
| | Designed By: MJR | | |
| | DWG: 10 - Erosion Control Plan | | |



Scale: 1" = 40'


LEGEND

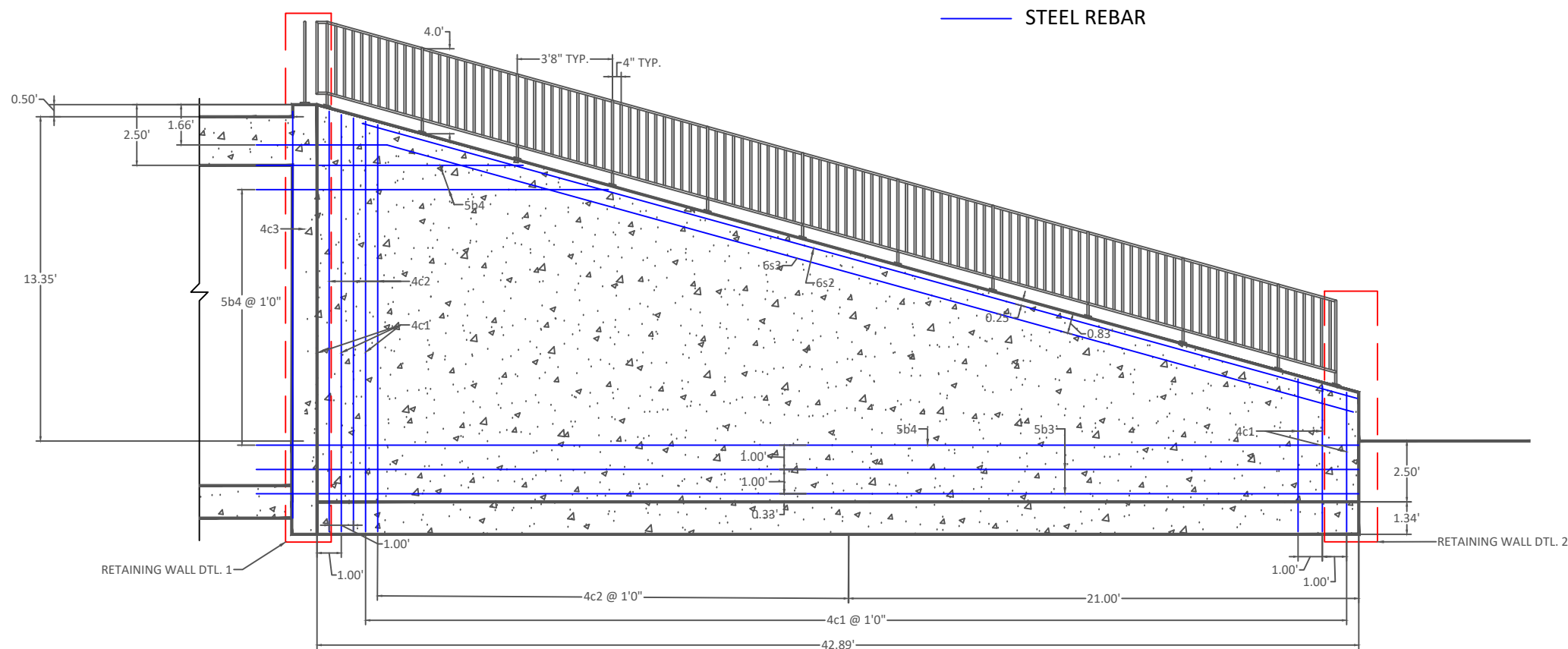
-  AREA OF CONSTRUCTION
-  SOUTH BOUND DETOUR ROUTE
-  NORTH BOUND DETOUR ROUTE



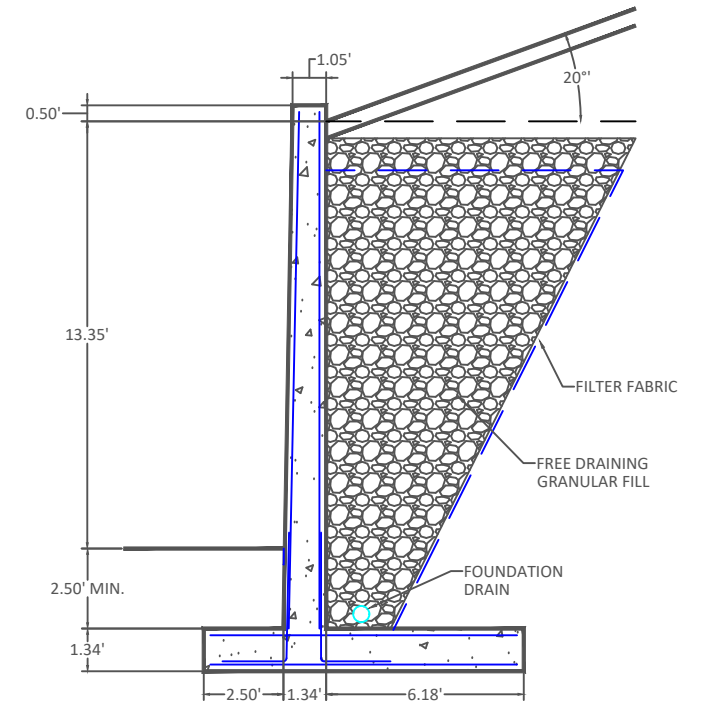
Traffic Control Plan
Ranshaw Way Trail
Underpass

| NO. | BY | DATE | REVISION |
|-----|----|------|----------|
| | | | |
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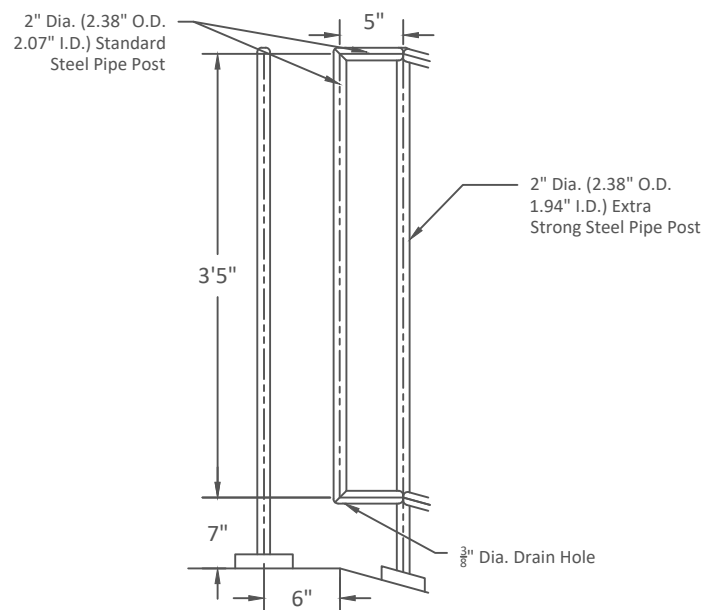
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| 11 | North Liberty, IA |  | Scale: |
| | Designed By: MJR | | |
| | DWG: 11 - Traffic Control Plan | | |



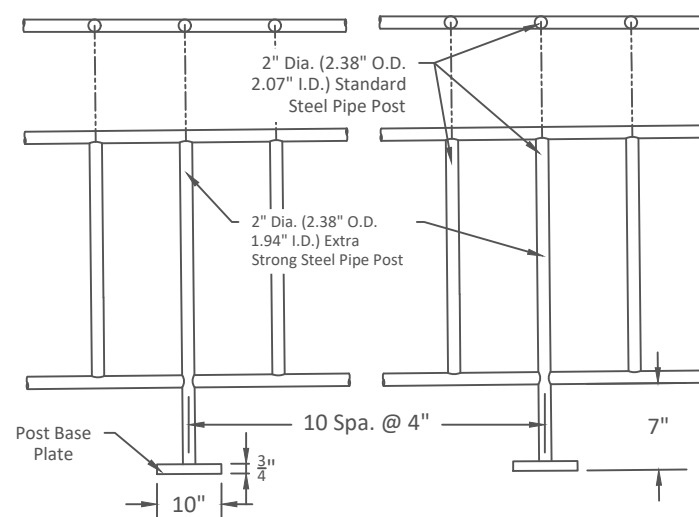
1 Elevation View of Wingwall



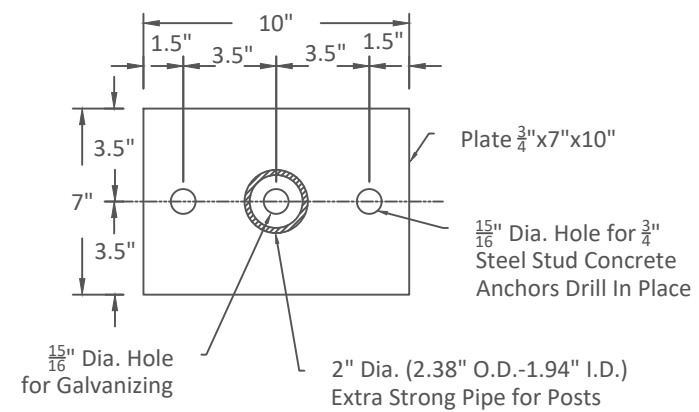
2 Retaining Wall Dtl. 1



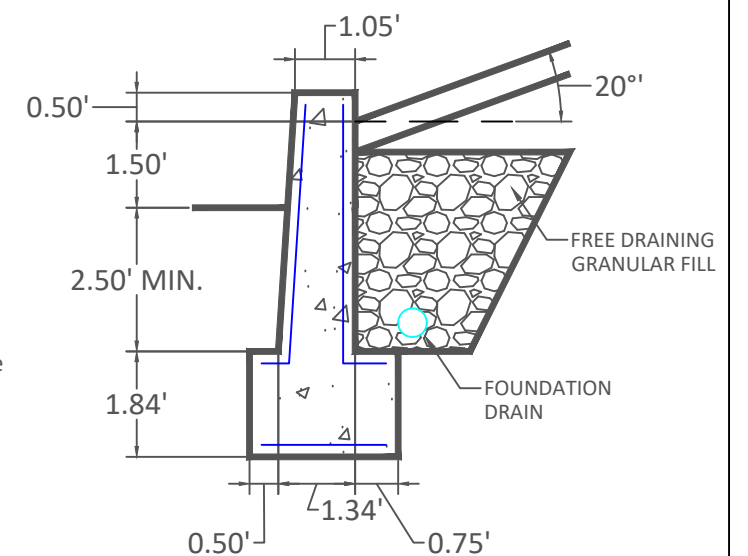
3 End Rail Details



4 Pipe Handrail Details



5 Post Base Plate



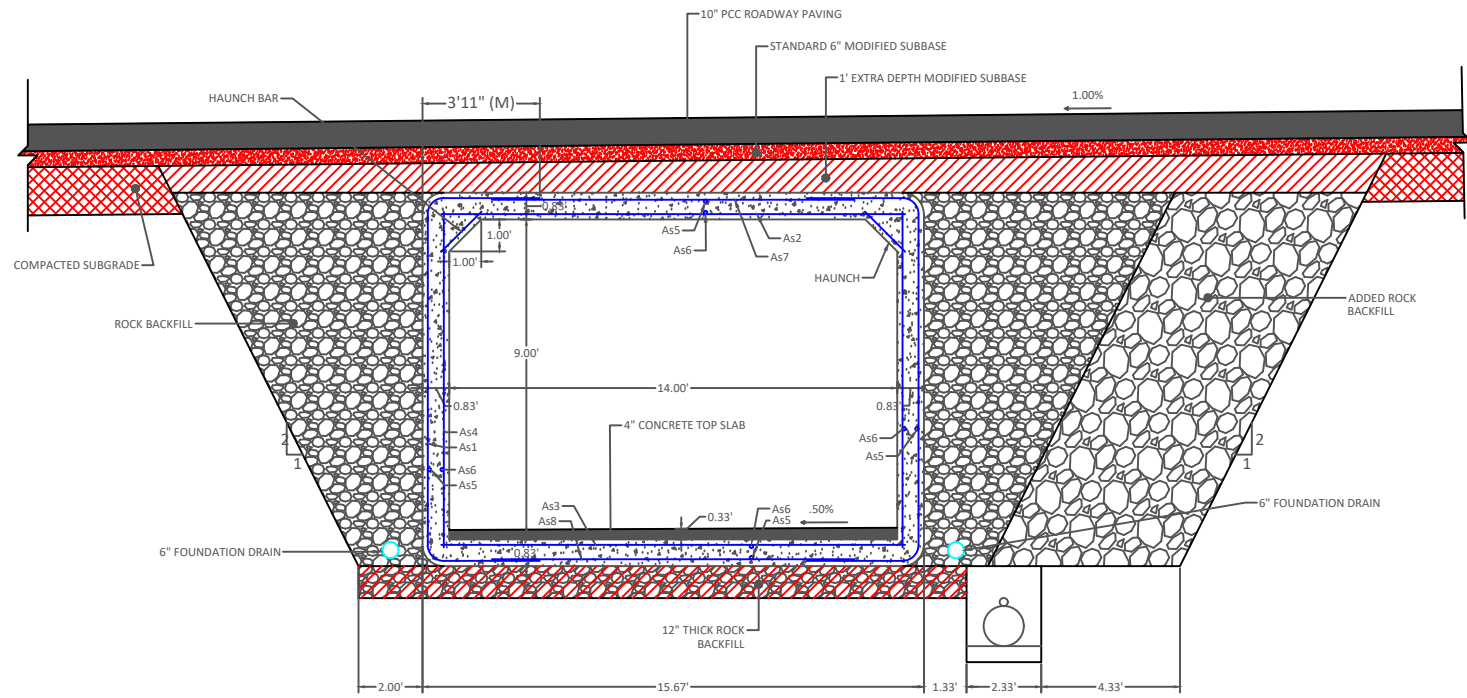
6 Retaining Wall Dtl. 2

Construction Details
Ranshaw Way Trail
Underpass

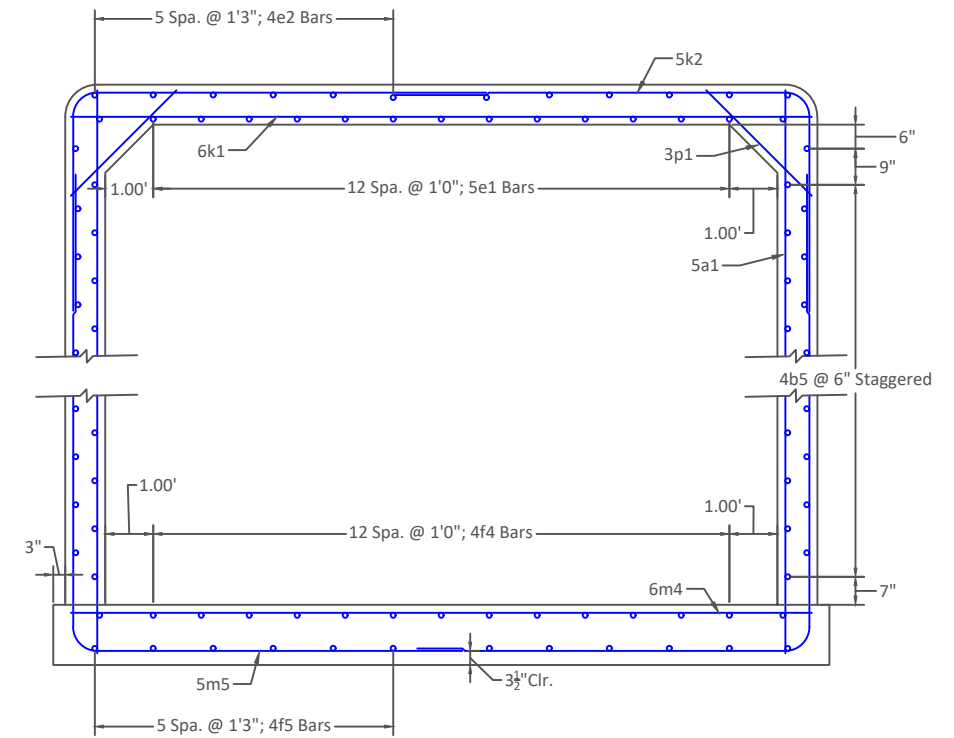
| NO. | BY | DATE | REVISION |
|-----|---------------------------------------|------|----------|
| | | | |
| | | | |
| | | | |
| 12 | North Liberty, IA Designed By: MJR | | |
| | DWG: 12 - Construction Details | | |



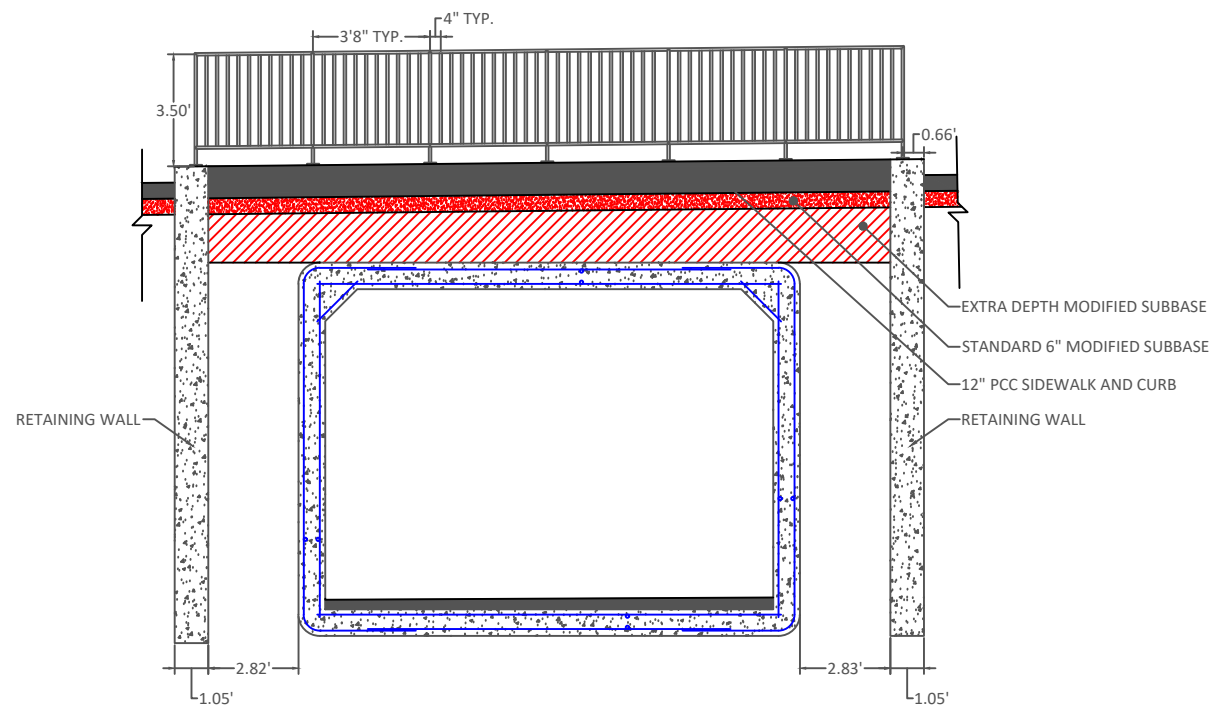
Scale: N/A



1 Tunnel Cross Section - Road CL



3 Tunnel Barrel End Section Rebar



2 Tunnel Cross Section - Opening

Tunnel Detail
Ranshaw Way Trail
Underpass

| NO. | BY | DATE | REVISION |
|-----|---------------------------------------|------|----------|
| | | | |
| | | | |
| | | | |
| 13 | North Liberty, IA Designed By: MJR | | |
| | DWG: 12 - Construction Details | | |



Scale: N/A

| Bar | Location | Shape | No. | Length | Wt. |
|-----|---|-------|-----|---------|-----|
| 5a1 | Barrel End Section Walls, F.F.V. | | 18 | 13'-8" | 257 |
| 4b5 | Barrel End Section Walls, F.F.H. & B.F.H. | | 46 | 4'-4" | 133 |
| 5e1 | Barrel End Section Slab, Bott. Longit. | | 13 | 4'-4" | 59 |
| 4e2 | Barrel End Section Slab, Top Longit. | | 12 | 4'-4" | 35 |
| 4f4 | Barrel End Section Floor, Top Longit. | | 15 | 4'-4" | 43 |
| 4f5 | Barrel End Section Floor, Bott. Longit. | | 12 | 4'-4" | 35 |
| 6k1 | Barrel End Section Slab, Bott. Transv. | | 9 | 15'-8" | 212 |
| 5k2 | Barrel End Section Slab, Top Corner | | 18 | 12'-10" | 241 |
| 6m4 | Barrel Haunch | | 9 | 16'-2" | 219 |
| 5m5 | Barrel End Section Floor, Bott. Corner | | 18 | 19'-10" | 372 |


1 Rebar Tunnel Barrel End Section

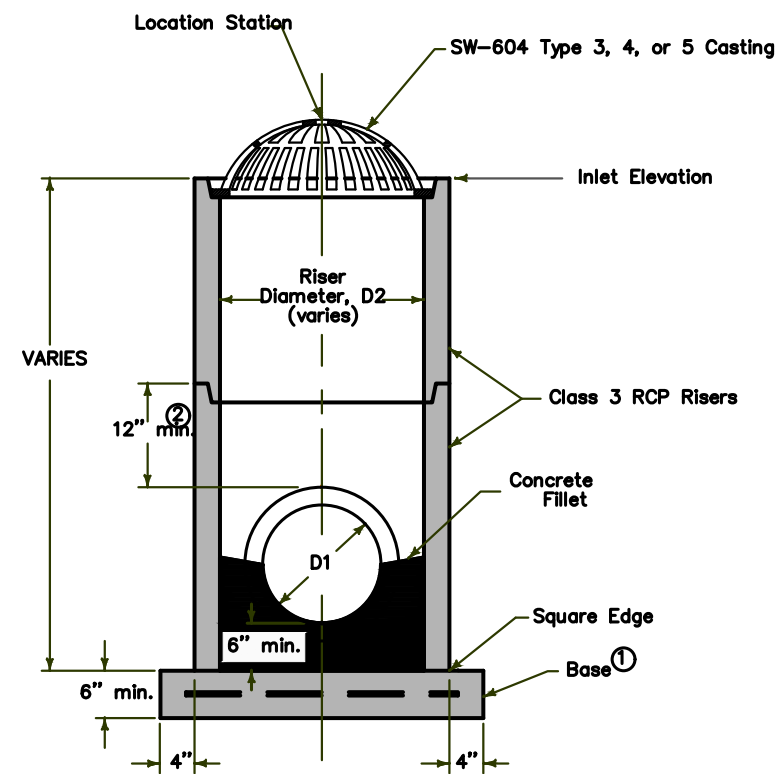
| Bar | Location | Shape | No. | Length | Wt. |
|-----|---------------------|-------|---------|-------------------------|-----|
| 5b3 | Wingwall, F.F.H. | | 4 | 39'-9" | 166 |
| 5b4 | Wingwall, F.F.V. | | 20 Var. | 2 Each 10'-6" to 38'-4" | 509 |
| 4c1 | Wingwall, F.F.V. | | 74 Var. | 2 Each 2'-10" to 14'-5" | 426 |
| 4c2 | Wingwall, F.F.V. | | 32 Var. | 2 Each 9'-6" to 14'-4" | 255 |
| 4c3 | Wingwall, F.F.V. | | 2 | 13'-7" | 18 |
| 6s2 | Wing Slope, Both F. | | 4 | 7'-8" | 46 |
| 6s3 | Wing Slope, Both F. | | 4 | 35'-11" | 216 |

2 Rebar Retaining Wall

| Bar | Area | Length |
|---------|------|---------|
| As1 | .8 | 20'-10" |
| As2 | 1.2 | 14'-6" |
| As3 | 1.29 | 14'-6" |
| As4 | .24 | 12'-6" |
| As7/As8 | .24 | 13'-8" |

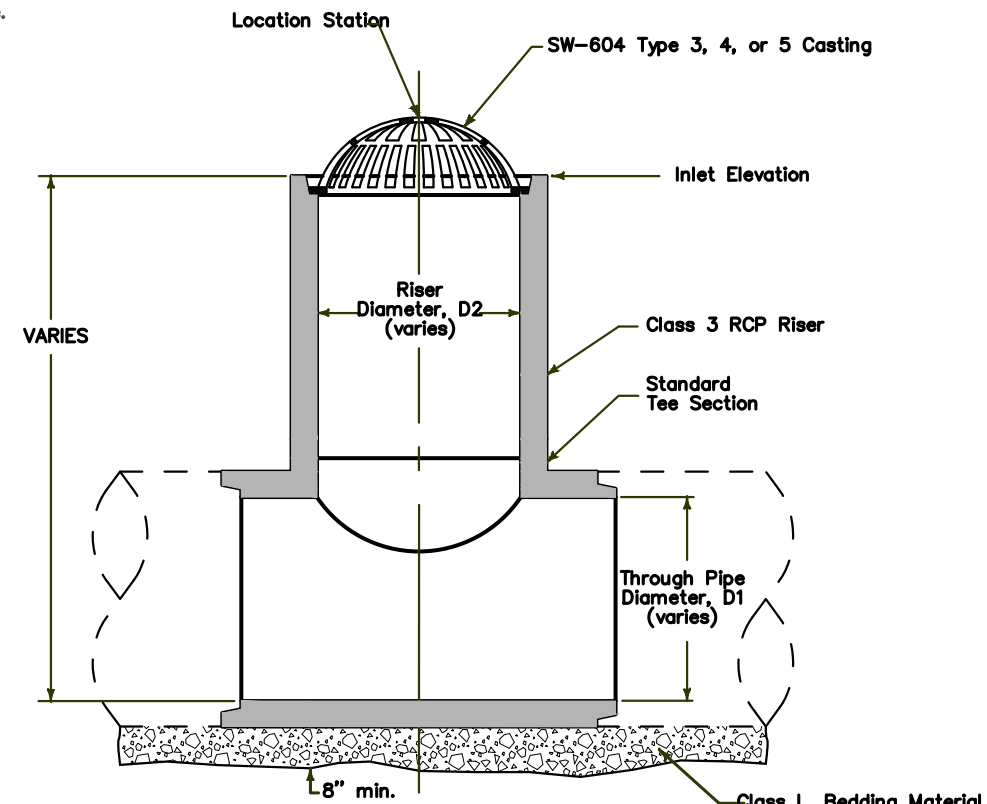
3 Rebar Typical Barrel Section

| | | | | | | |
|--|--|-----------------------------|--------------------------------|-------------------|------------|---|
| | | Rebar Detail | NO. | BY | DATE | REVISION |
| | | | | | | |
| | | Ranshaw Way Trail Underpass | 14 | North Liberty, IA | |  |
| | | | | Designed By: MJR | | |
| | | | DWG: 12 - Construction Details | | Scale: N/A | |



- ① Precast (shown) or cast-in-place base:
 Precast: 6 inch thick concrete with #6 welded wire mesh on 4 inch centers (WWF 4" x 4"). Center mesh vertically within base.
 Cast-in-place: 8 inch thick non-reinforced concrete.
- ② 12 inch minimum riser height above all pipes.

| INTAKE SIZE - CASE 1 | |
|--------------------------|----------------------------|
| Outlet Pipe Diameter, D1 | Minimum Riser Diameter, D2 |
| 12" | 18" |
| 15" | 24" |
| 18" | 24" |
| 21" | 30" |
| 24" | 30" |
| 27" | 36" |



- ③ Minimum riser diameter is 18 inches.

| INTAKE SIZE - CASE 2 | |
|---------------------------|----------------------------|
| Through Pipe Diameter, D1 | Maximum Riser Diameter, D2 |
| 18" | 18" |
| 21" | 18" |
| 24" | 24" |
| 27" | 24" |
| 30" | 30" |
| 36" or more | 36" |

| | |
|--|-------------------------|
| REVISION | |
| 4 | 04-21-20 |
| SW-512 | |
| SHEET 1 of 2 | |
| REVISIONS: Changed 1 to 1 on Bedding Material. | |
| SUBAS DIRECTOR | DESIGN METHODS ENGINEER |
| CIRCULAR AREA INTAKE | |

TYPICAL SECTION
CASE 1

| | |
|--|-------------------------|
| REVISION | |
| 4 | 04-21-20 |
| SW-512 | |
| SHEET 2 of 2 | |
| REVISIONS: Changed 1 to 1 on Bedding Material. | |
| SUBAS DIRECTOR | DESIGN METHODS ENGINEER |
| CIRCULAR AREA INTAKE | |

TYPICAL SECTION
CASE 2

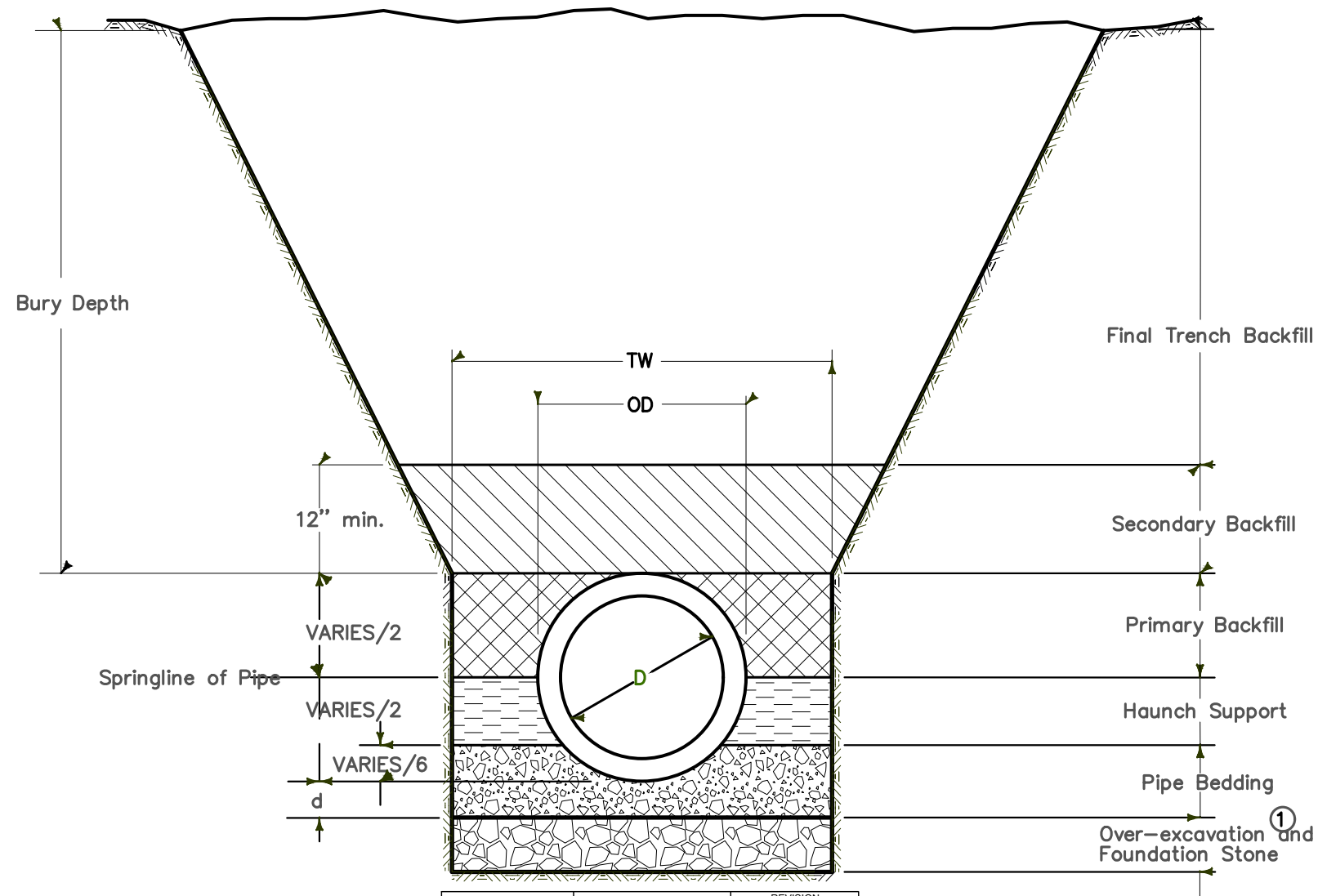
Stormwater Detail 1
Ranshaw Way Trail Underpass

| NO. | BY | DATE | REVISION |
|-----|--------------------------------|------|----------|
| 15 | North Liberty, IA | | |
| | Designed By: MJR | | |
| | DWG: 12 - Construction Details | | |

Scale: N/A

Refer to the contract documents for specific material and placement requirements.


① Required only when specified in the contract documents or when directed by the Engineer.

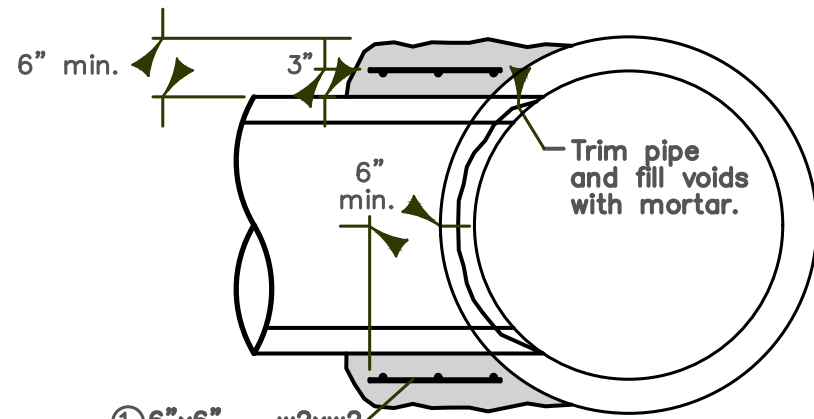


Key

- OD = Outside diameter of pipe
- D = Inside diameter of pipe
- TW = Trench width at top of pipe
- d = Depth of bedding material below pipe

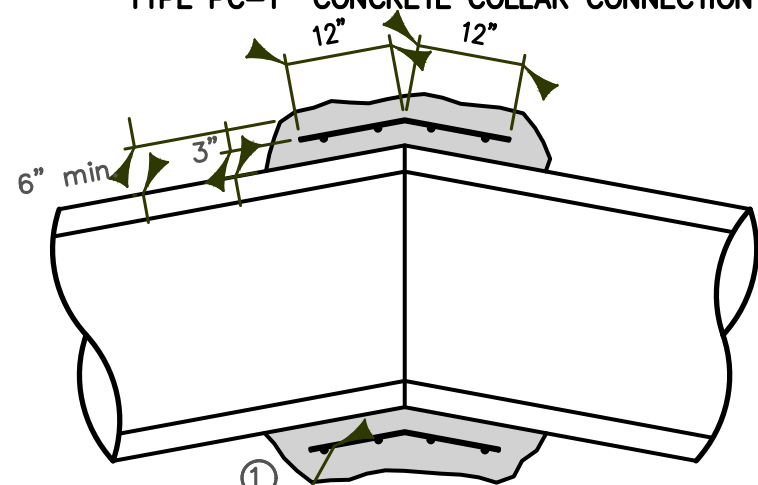
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|--|--|-------------------------|----------|
| | | REVISION | |
| | | 4 | 04-21-20 |
| FIGURE 6010.512 STANDARD ROAD PLAN | | SW-512 | |
| | | SHEET 1 of 2 | |
| REVISIONS: Changed 1 to 1 on Bedding Material. | | | |
| SUDAS DIRECTOR | | DESIGN METHODS ENGINEER | |
| CIRCULAR AREA INTAKE | | | |

| | | | | | |
|--|------------------------------------|-----------|---------------------------------------|------|---|
| | Stormwater Detail 2 | NO. | BY | DATE | REVISION |
| | Ranshaw Way Trail Underpass | | | | |
| | | 16 | North Liberty, IA Designed By: MJR | | Scale: N/A |
| | | | DWG: 12 - Construction Details | |  |



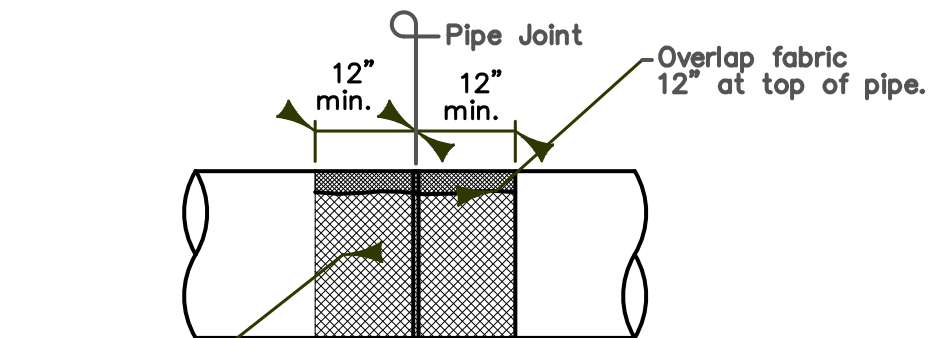
① 6"x6" - w2xw2 (8ga.) Wire Mesh

TYPE PC-1 CONCRETE COLLAR CONNECTION



① 6"x6" - w2xw2 (8ga.) Wire Mesh

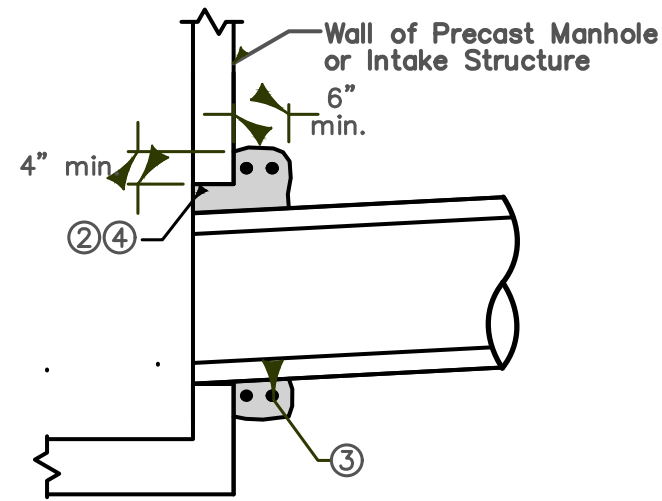
TYPE PC-2 CONCRETE COLLAR CONNECTION



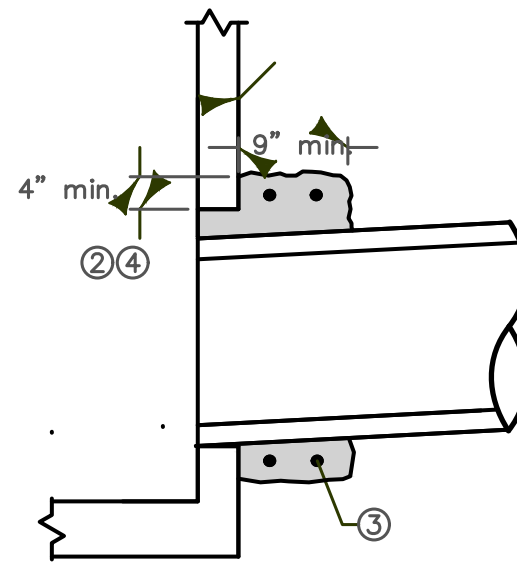
Engineering Fabric

PIPE JOINT WRAPPING

PIPE TO PIPE CONNECTION



CONCRETE COLLAR FOR PIPES 12" AND SMALLER



CONCRETE COLLAR FOR PIPES GREATER THAN 12"

PIPE TO STRUCTURE CONNECTION


- ① Lap ends of wire mesh a minimum of 6 inches.
- ② Concrete collar is required when annular space between the outside of the pipe and the wall of the structure is 2 inches or greater.
- ③ Provide two #4 hoop bars in concrete collar. Lap bars a minimum of 6 inches.
- ④ Trowel concrete flush with inside wall of structure.

| | | | |
|--|--------------------|-------------------------|----------|
| | | REVISION | |
| | | 4 | 04-21-20 |
| FIGURE 6010.512 | STANDARD ROAD PLAN | SW-512 | |
| | | SHEET 1 of 2 | |
| REVISIONS: Changed 1 to 1 on Bedding Material. | | | |
| SUDAS DIRECTOR | | DESIGN METHODS ENGINEER | |
| CIRCULAR AREA INTAKE | | | |

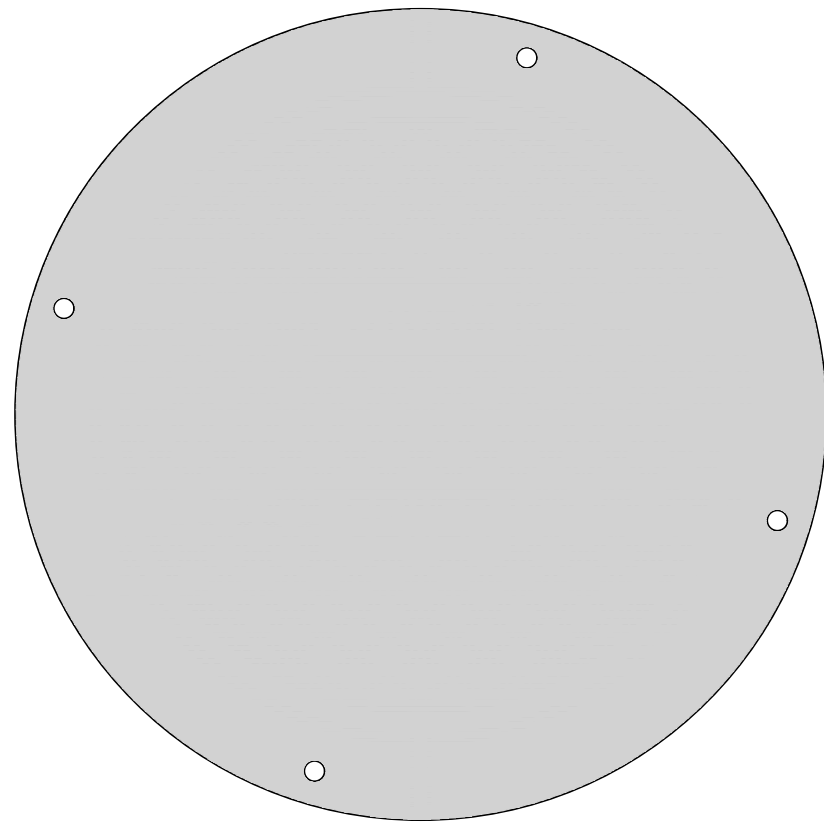
Stormwater Detail 3

Ranshaw Way Trail Underpass

| NO. | BY | DATE | REVISION |
|-----|----|------|----------|
| 17 | | | |

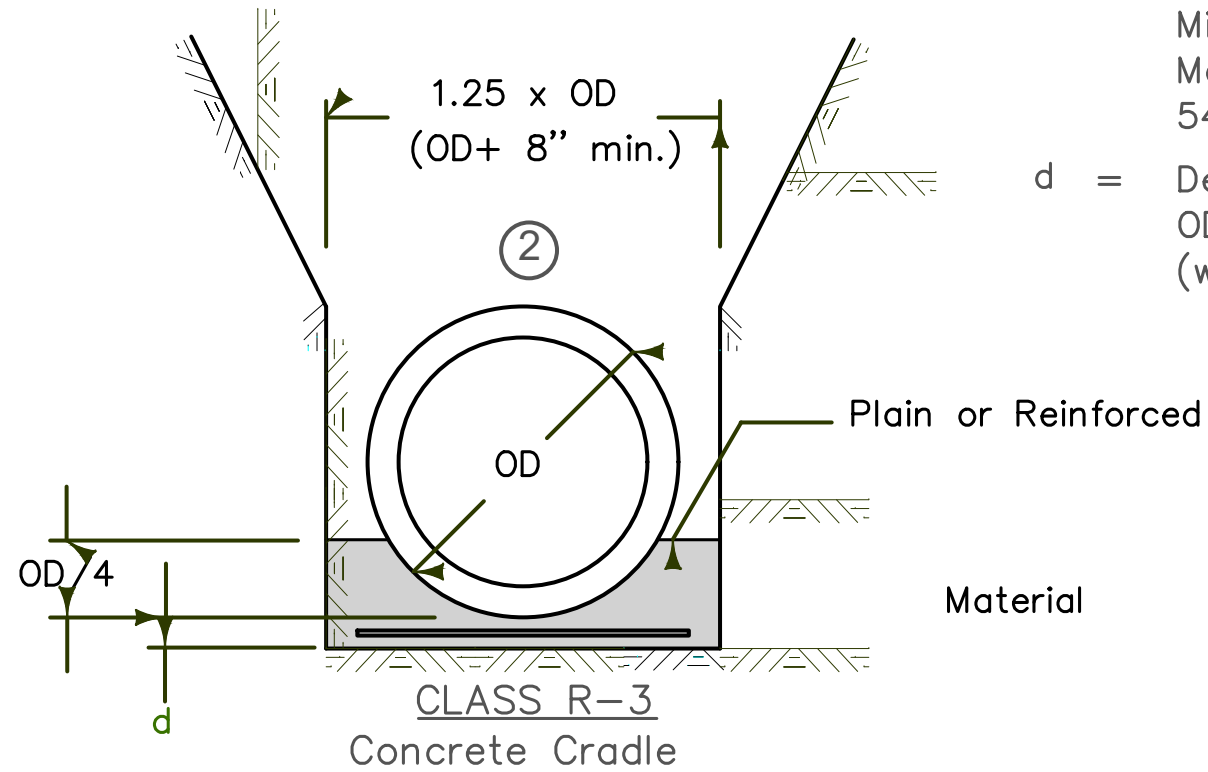
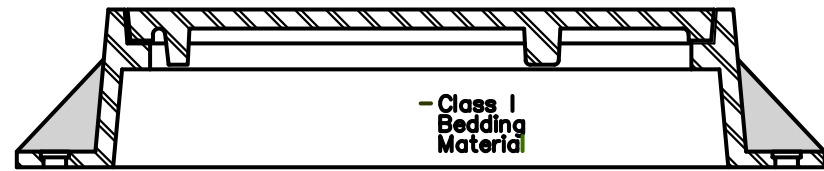
| | | |
|--------------------------------|---|------------|
| North Liberty, IA |  | Scale: N/A |
| Designed By: MJR | | |
| DWG: 12 - Construction Details | | |

TYPE E
Two-piece fixed casting



①

PLAN



Key

- OD = Outside diameter of pipe
- OS = Outside span of pipe
- TW = Trench width at top of pipe:
Min. = OD+18 inches
Max.= 1.25xOD+12 inches OR
54 inches (whichever is greater)
- d = Depth of bedding material below pipe:
OD/8 or OS/8, OR 4 inches
(whichever is greater)

| | | | |
|--|--|-------------------------|----------|
| | | REVISION | |
| | | 4 | 04-21-20 |
| FIGURE 6010.602 STANDARD ROAD PLAN | | SW-602 | |
| | | SHEET 3 of 3 | |
| REVISIONS: Add option for 3-piece HMA casting. | | | |
| SUDAS DIRECTOR | | DESIGN METHODS ENGINEER | |
| CASTINGS FOR STORM SEWER MANHOLES | | | |

Stormwater Detail 4

Ranshaw Way Trail
Underpass

| NO. | BY | DATE | REVISION |
|-----|----|------|----------|
| | | | |
| | | | |
| | | | |

18

North Liberty, IA
Designed By: MJR
DWG: 12 - Construction Details



Scale: N/A