APPENDIX I
JURISDICTIONAL RESOURCE IMPACT DETAILS

APPENDIX I-1

SELECT ENGINEERING DETAILS

APPENDIX I-2

UNITED STREAM METHODOLOGY AND FUNCTIONS AND VALUES ASSESSMENTS

- **APPENDIX I-2-1**

  UNITED STREAM METHODOLOGY FORMS

- **APPENDIX I-2-2**

  FUNCTIONS AND VALUES ASSESSMENTS

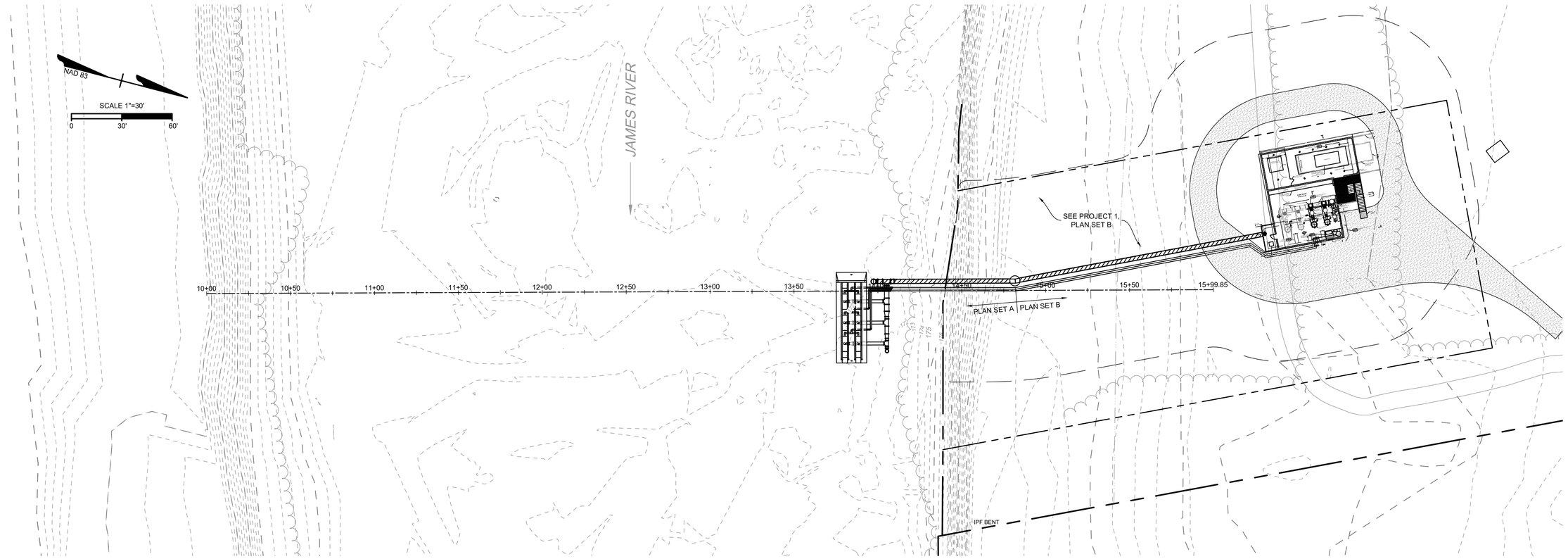
APPENDIX I-3

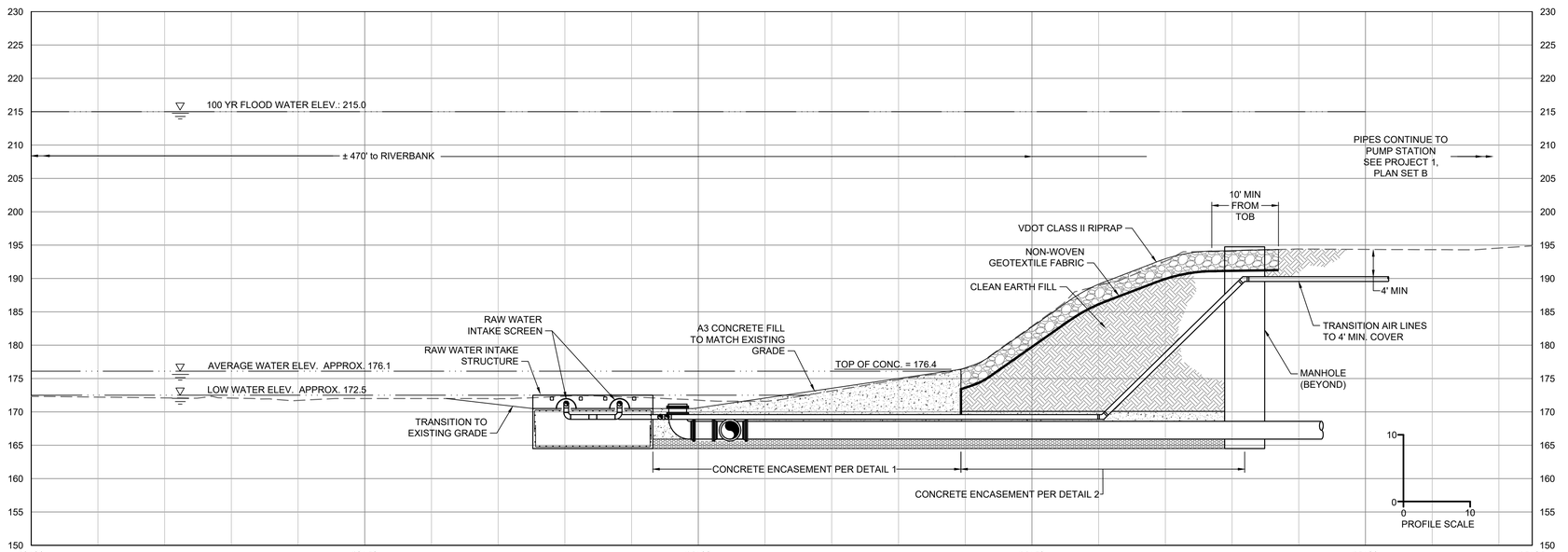
LETTER OF CREDIT AVAILABILITY

APPENDIX I-4

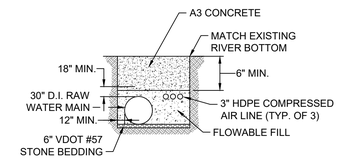
PRELIMINARY JURISDICTIONAL WATERS OF THE U.S. IMPACTS MAP

APPENDIX I-1
SELECT ENGINEERING DETAILS



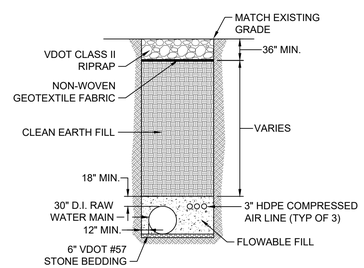


RAW WATER INTAKE PROFILE



CONCRETE ENCASEMENT DETAIL 1

NOT TO SCALE



CONCRETE ENCASEMENT DETAIL 2

NOT TO SCALE

NOT FOR CONSTRUCTION

THIS DRAWING PREPARED AT THE
CORPORATE OFFICE
1001 Boulders Parkway, Suite 300 | Richmond, VA 23225
TEL. 804.200.6500 FAX 804.560.1016 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION

DATE

DATE
MARCH 2020

DRAWN BY

DESIGNED BY

CHECKED BY

SCALE
AS SHOWN

TIMMONS GROUP

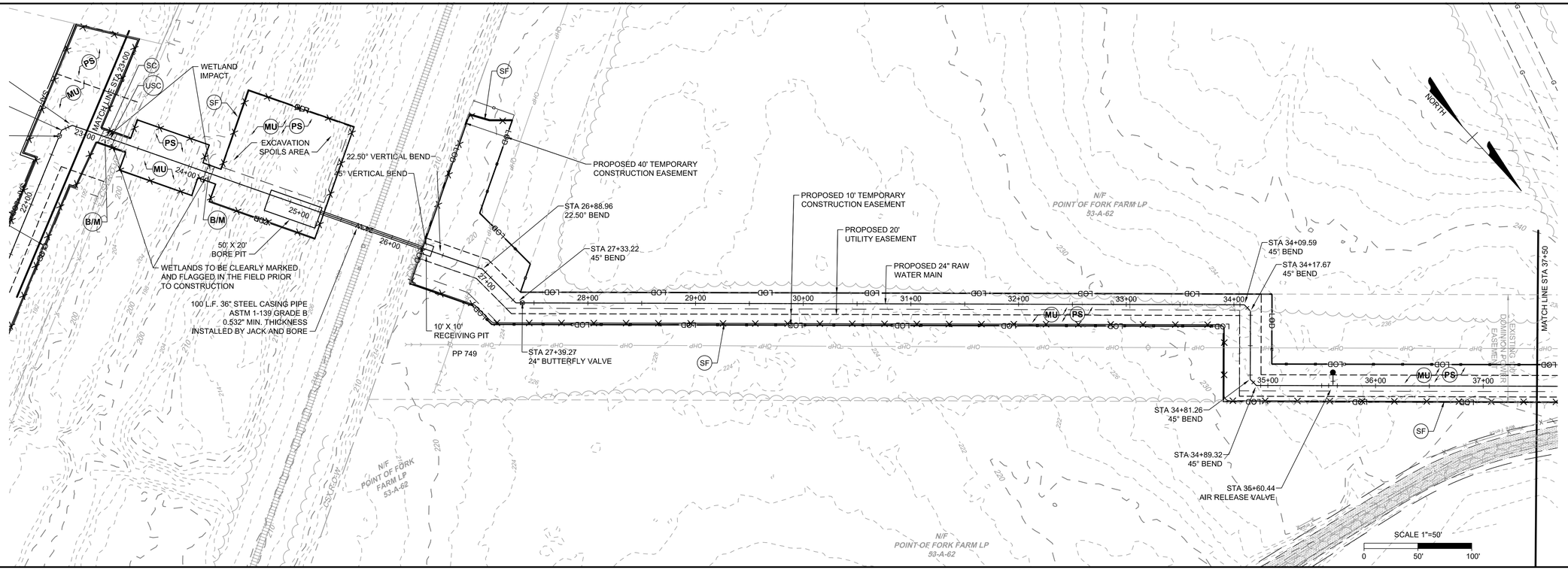
JAMES RIVER WATER PROJECT

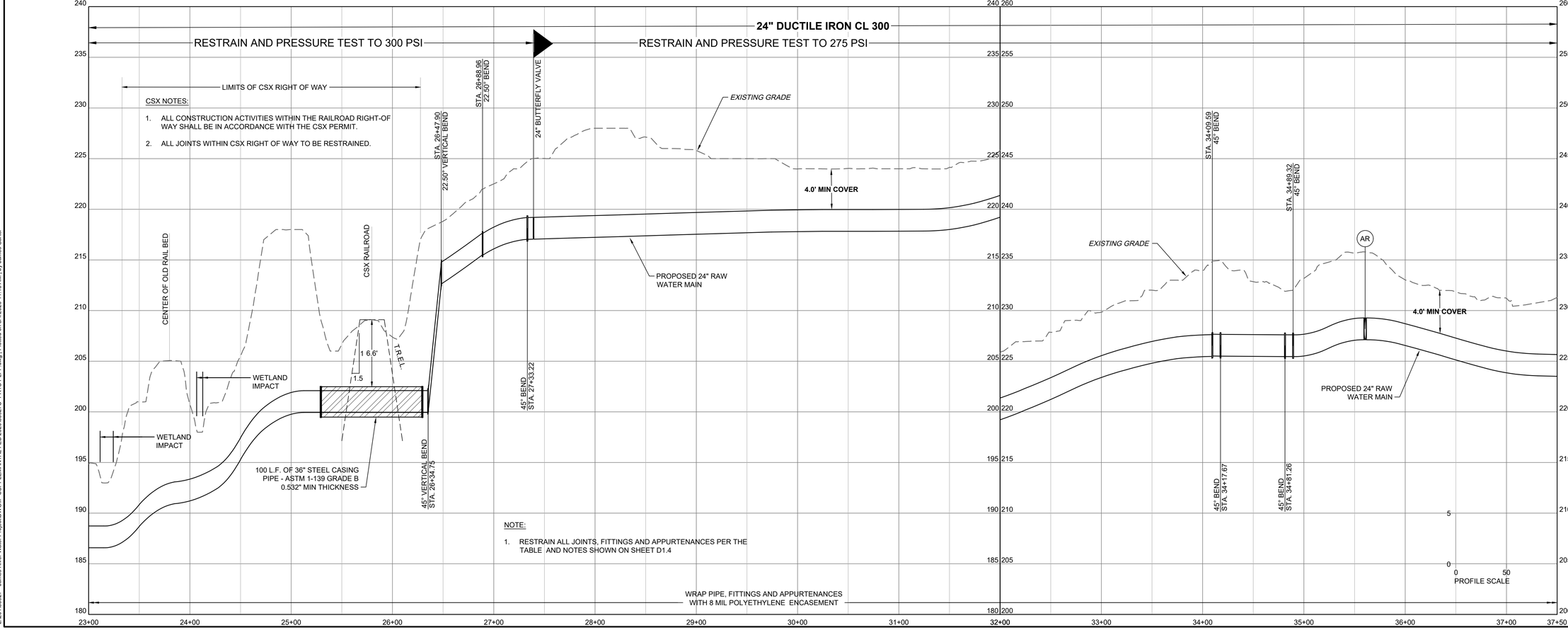
JAMES RIVER WATER AUTHORITY - FLUVANNA COUNTY, VIRGINIA

SELECT ENGINEERING DETAILS - IMPACTS 1 AND 2

JOB NO.
33927

SHEET NO.
1





NOT FOR CONSTRUCTION

THIS DRAWING PREPARED AT THE
CORPORATE OFFICE
1001 Boulders Parkway, Suite 300 | Richmond, VA 23225
TEL 804.200.6500 FAX 804.560.1016 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

TIMMONS GROUP

REVISION DESCRIPTION	DATE

DATE: MARCH 2020
DRAWN BY:
DESIGNED BY:
CHECKED BY:
SCALE: AS SHOWN

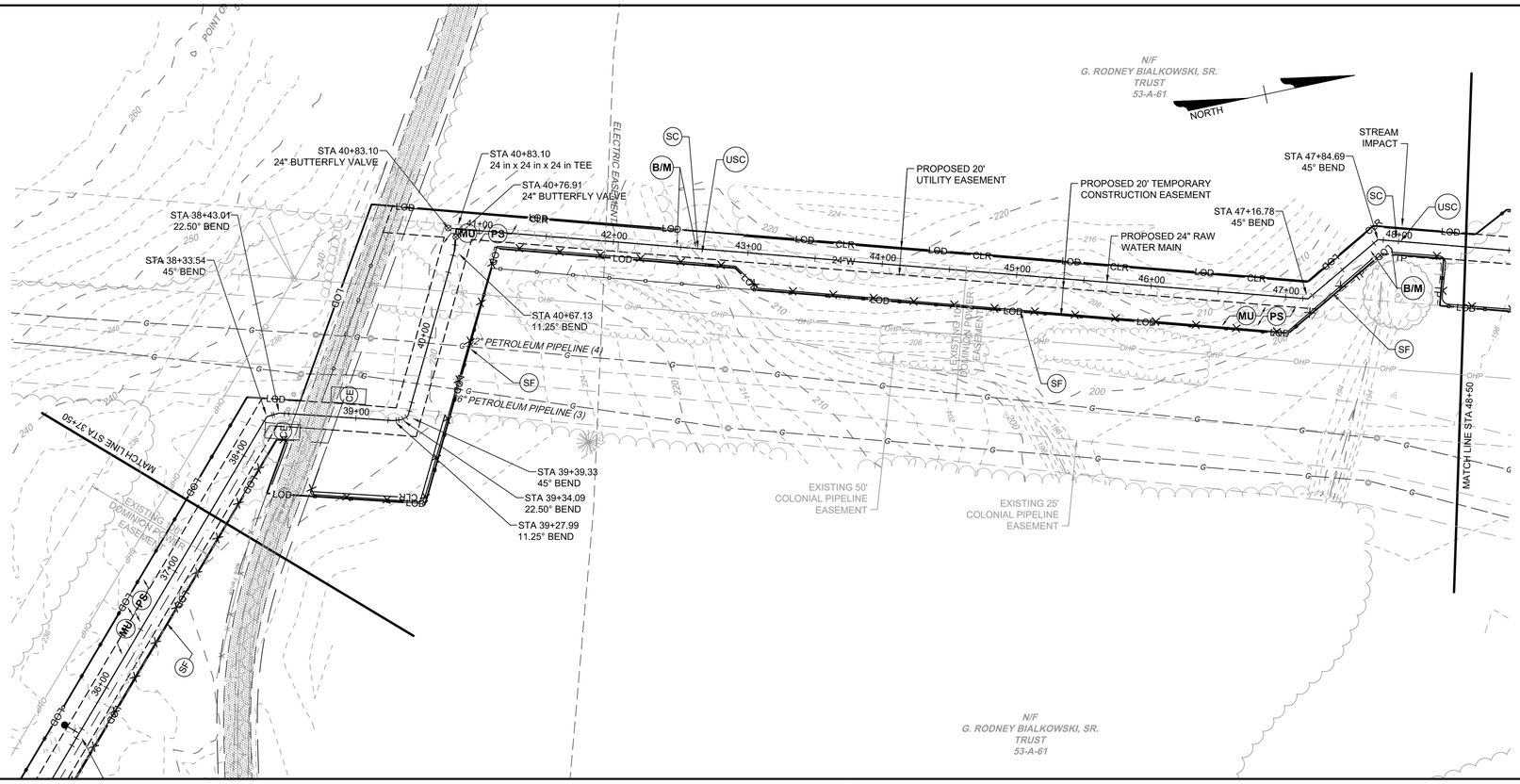
JAMES RIVER WATER PROJECT

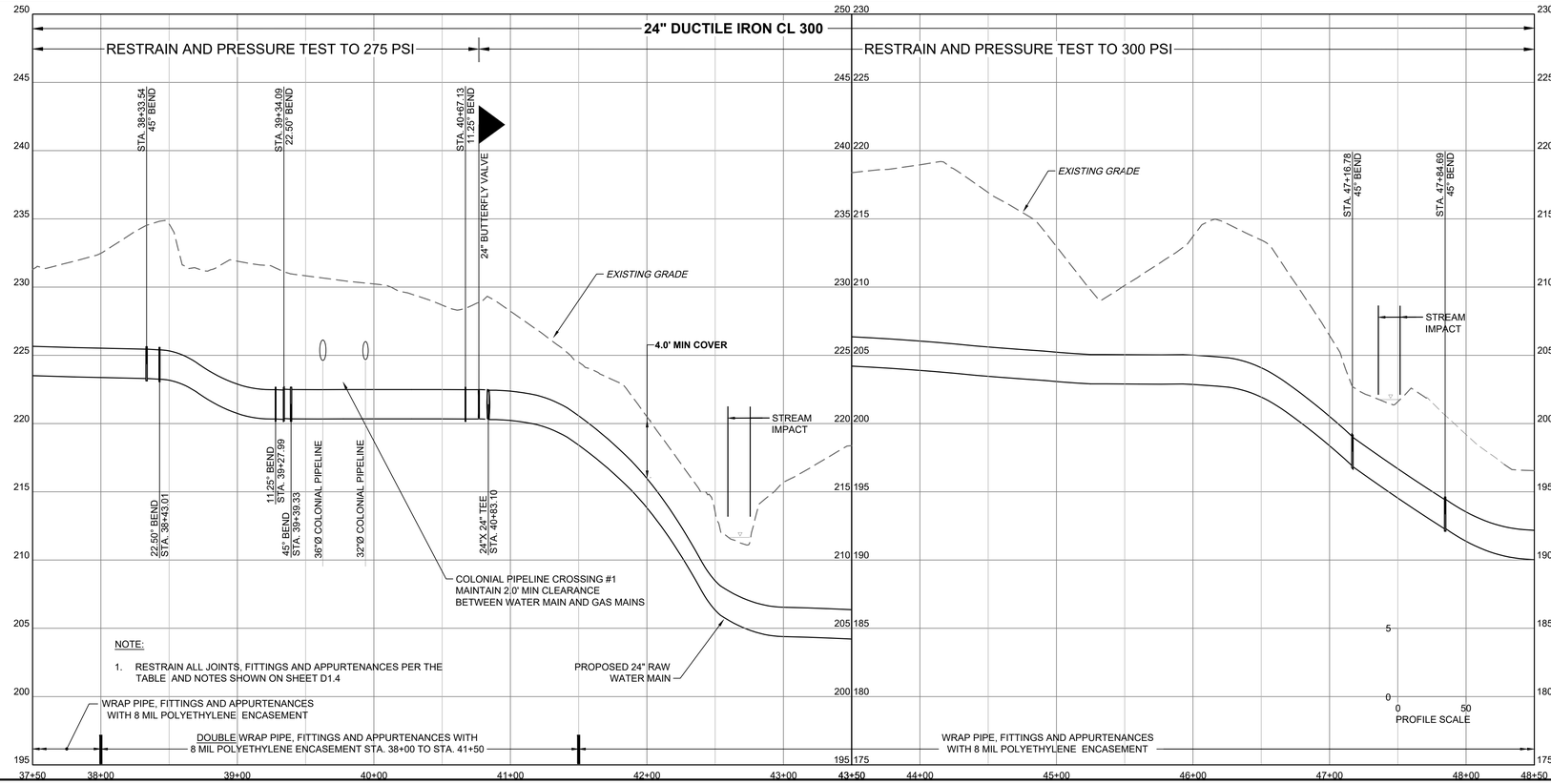
JAMES RIVER WATER AUTHORITY - FLUVANNA COUNTY, VIRGINIA

SELECT ENGINEERING DETAILS - IMPACTS 3 AND 4

JOB NO. 33927
SHEET NO. 2

L:\26\133927 - James River Water Project\DWG\P SUP\LEMANTAL FEB 2020\33927C- PR1C-PLPF.dwg | Plotted on 3/4/2020 11:16 AM | by James Carter





NOT FOR CONSTRUCTION

THIS DRAWING PREPARED AT THE
CORPORATE OFFICE
1001 Boulders Parkway, Suite 300 | Richmond, VA 23225
TEL 804.200.6500 FAX 804.560.1016 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE
MARCH 2020
DRAWN BY
DESIGNED BY
CHECKED BY
SCALE
AS SHOWN

TIMMONS GROUP

JAMES RIVER WATER PROJECT

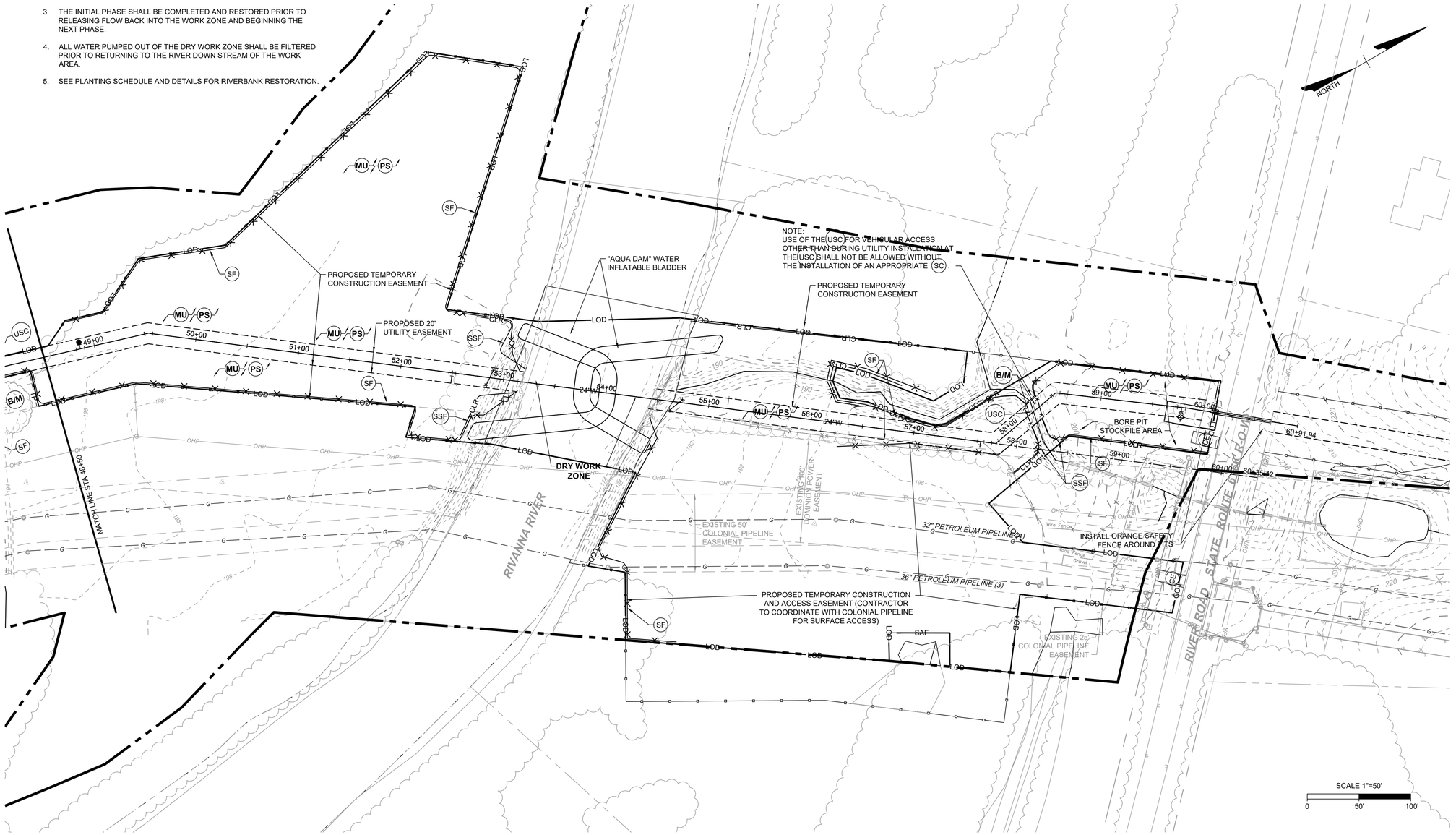
JAMES RIVER WATER AUTHORITY - FLUVANNA COUNTY, VIRGINIA

SELECT ENGINEERING DETAILS - IMPACTS 5, 6, AND 7

JOB NO. *33927*
SHEET NO. *3*

RIVER CROSSING NOTES:

1. CONTRACTOR SHALL INSTALL BLADDER AND PUMP OUT THE WORK AREA PRIOR TO ANY EXCAVATION WITHIN THE RIVER BANK OR RIVER BOTTOM.
2. RIVER CROSSING TO BE COMPLETED IN 2 (TWO) PHASES.
3. THE INITIAL PHASE SHALL BE COMPLETED AND RESTORED PRIOR TO RELEASING FLOW BACK INTO THE WORK ZONE AND BEGINNING THE NEXT PHASE.
4. ALL WATER PUMPED OUT OF THE DRY WORK ZONE SHALL BE FILTERED PRIOR TO RETURNING TO THE RIVER DOWN STREAM OF THE WORK AREA.
5. SEE PLANTING SCHEDULE AND DETAILS FOR RIVERBANK RESTORATION.



SEE SHEET 5 FOR PROFILE VIEW

NOT FOR CONSTRUCTION

THIS DRAWING PREPARED AT THE
CORPORATE OFFICE
1001 Boulders Parkway, Suite 300 | Richmond, VA 23225
TEL. 804.200.6500 FAX. 804.560.1016 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

TIMMONS GROUP

REVISION DESCRIPTION	DATE

DATE: *MARCH 2020*
DRAWN BY:
DESIGNED BY:
CHECKED BY:
SCALE: *AS SHOWN*

JAMES RIVER WATER PROJECT

JAMES RIVER WATER AUTHORITY - FLUVANNA COUNTY, VIRGINIA

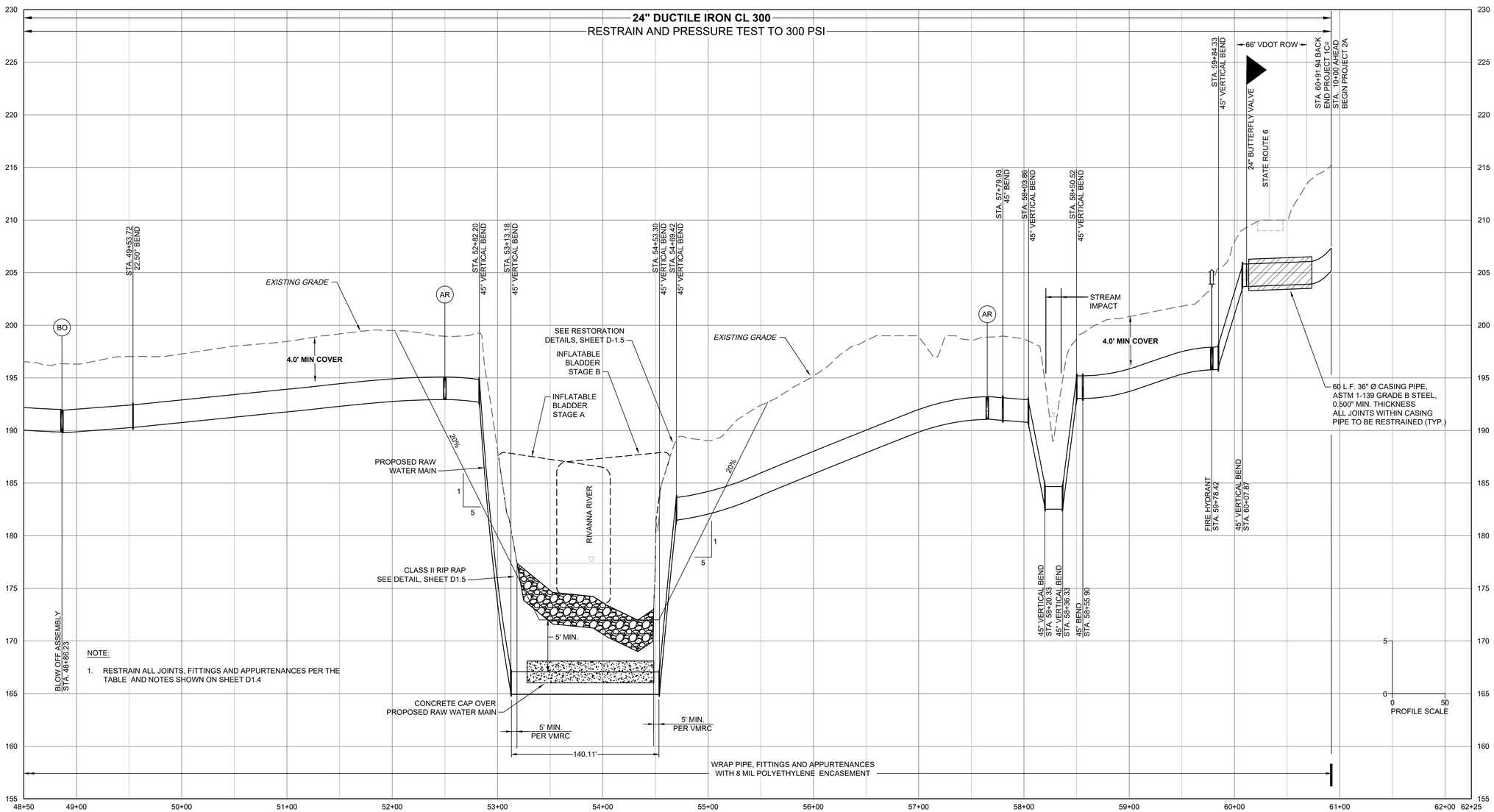
SELECT ENGINEERING DETAILS - IMPACTS 8, 9, AND 11

JOB NO. *33927*
SHEET NO. *4*

L:\20\133927 - James River Water Project\DWG\IP SUP\ELEMANTAL FEB 2020\33927C- PR1C-PLPF.dwg | Plotted on 3/13/2020 2:46 PM | by James Carter

RIVER CROSSING NOTES:

1. CONTRACTOR SHALL INSTALL BLADDER AND PUMP OUT THE WORK AREA PRIOR TO ANY EXCAVATION WITHIN THE RIVER BANK OR RIVER BOTTOM.
2. RIVER CROSSING TO BE COMPLETED IN 2 (TWO) PHASES.
3. THE INITIAL PHASE SHALL BE COMPLETED AND RESTORED PRIOR TO RELEASING FLOW BACK INTO THE WORK ZONE AND BEGINNING THE NEXT PHASE.
4. ALL WATER PUMPED OUT OF THE DRY WORK ZONE SHALL BE FILTERED PRIOR TO RETURNING TO THE RIVER DOWN STREAM OF THE WORK AREA.
5. SEE PLANTING SCHEDULE AND DETAILS FOR RIVERBANK RESTORATION.



NOTE:

1. RESTRAIN ALL JOINTS, FITTINGS AND APPURTENANCES PER THE TABLE AND NOTES SHOWN ON SHEET D1.4

NOT FOR CONSTRUCTION

THIS DRAWING PREPARED AT THE
CORPORATE OFFICE
1001 Boulders Parkway, Suite 300 | Richmond, VA 23225
TEL 804.200.6500 FAX 804.560.1016 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

TIMMONS GROUP

REVISION DESCRIPTION

DATE

DATE: MARCH 2020
DRAWN BY:
DESIGNED BY:
CHECKED BY:
SCALE: AS SHOWN

JAMES RIVER WATER PROJECT

JAMES RIVER WATER AUTHORITY - FLUVANNA COUNTY, VIRGINIA

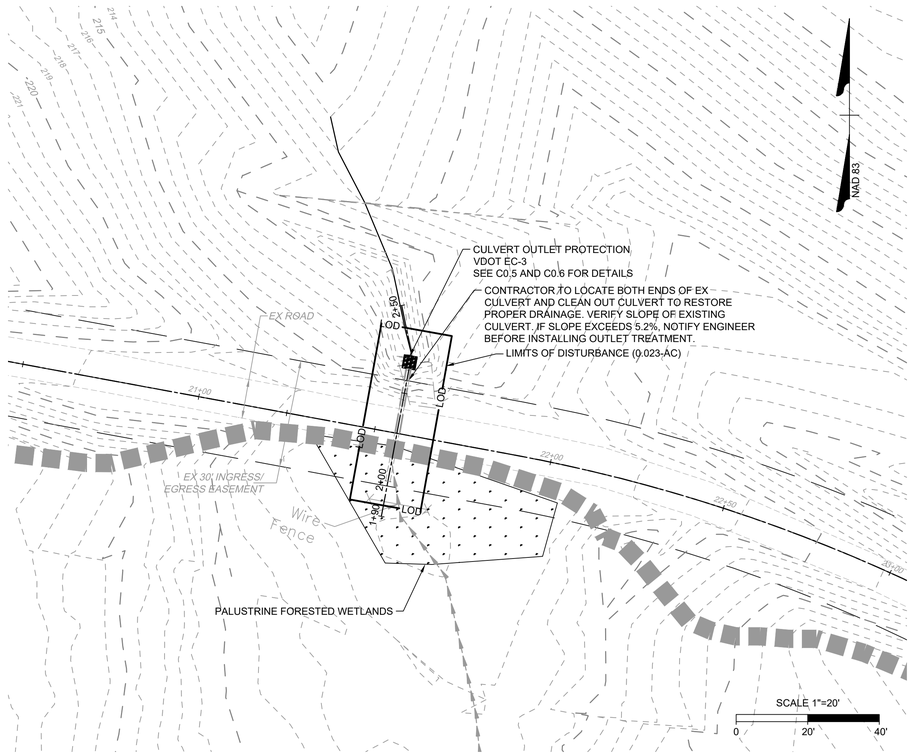
SELECT ENGINEERING DETAILS - IMPACTS 8, 9, AND 11

JOB NO. 33927

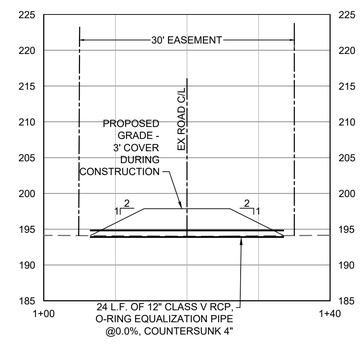
SHEET NO. 5

**NOTE:
CONTRACTOR TO LOCATE BOTH ENDS OF EXISTING CULVERT AND CLEAN OUT CULVERT TO RESTORE PROPER DRAINAGE. VERIFY SLOPE OF EXISTING CULVERT - IF SLOPE EXCEEDS 5.2%, NOTIFY ENGINEER BEFORE INSTALLING OUTLET TREATMENT.

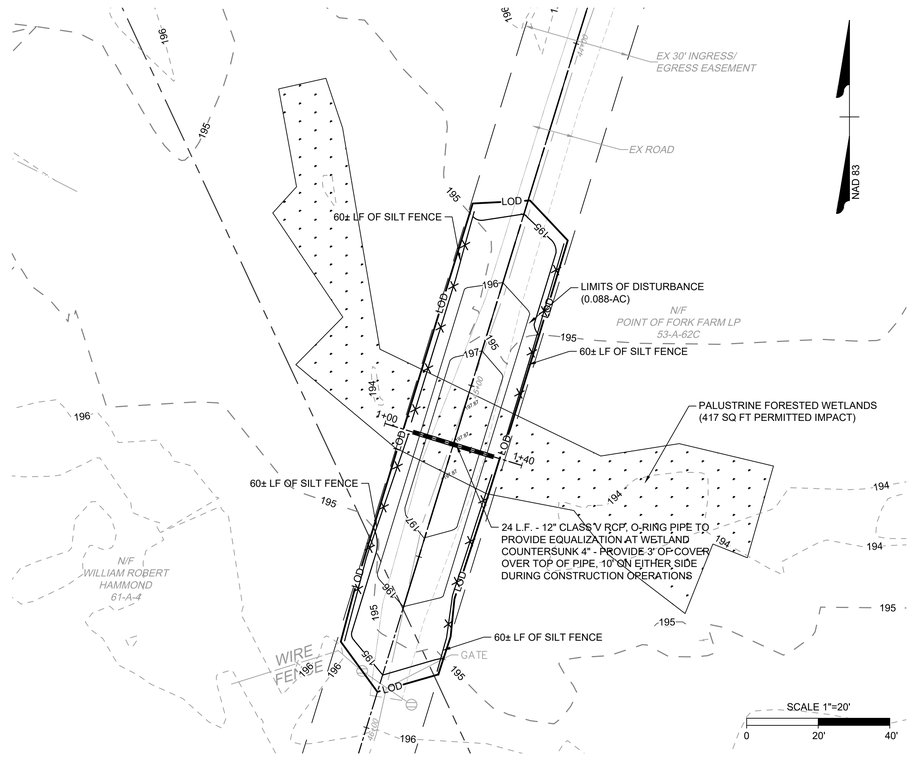
SCALE: 1"=10'



IMPACT # 200
SCALE: 1"-20'



SCALE: 1"=10'



IMPACT # 202
SCALE: 1"-20'

NOT FOR CONSTRUCTION

THIS DRAWING PREPARED AT THE
CORPORATE OFFICE
1001 Boulders Parkway, Suite 300 | Richmond, VA 23225
TEL 804.200.6500 FAX 804.560.1016 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

TIMMONS GROUP

REVISION DESCRIPTION

DATE

DATE
2/18/2020
MARCH 2020

DRAWN BY
J.M. / J.C.

DESIGNED BY
D. SAUNDERS

CHECKED BY
D. SAUNDERS

SCALE
AS SHOWN

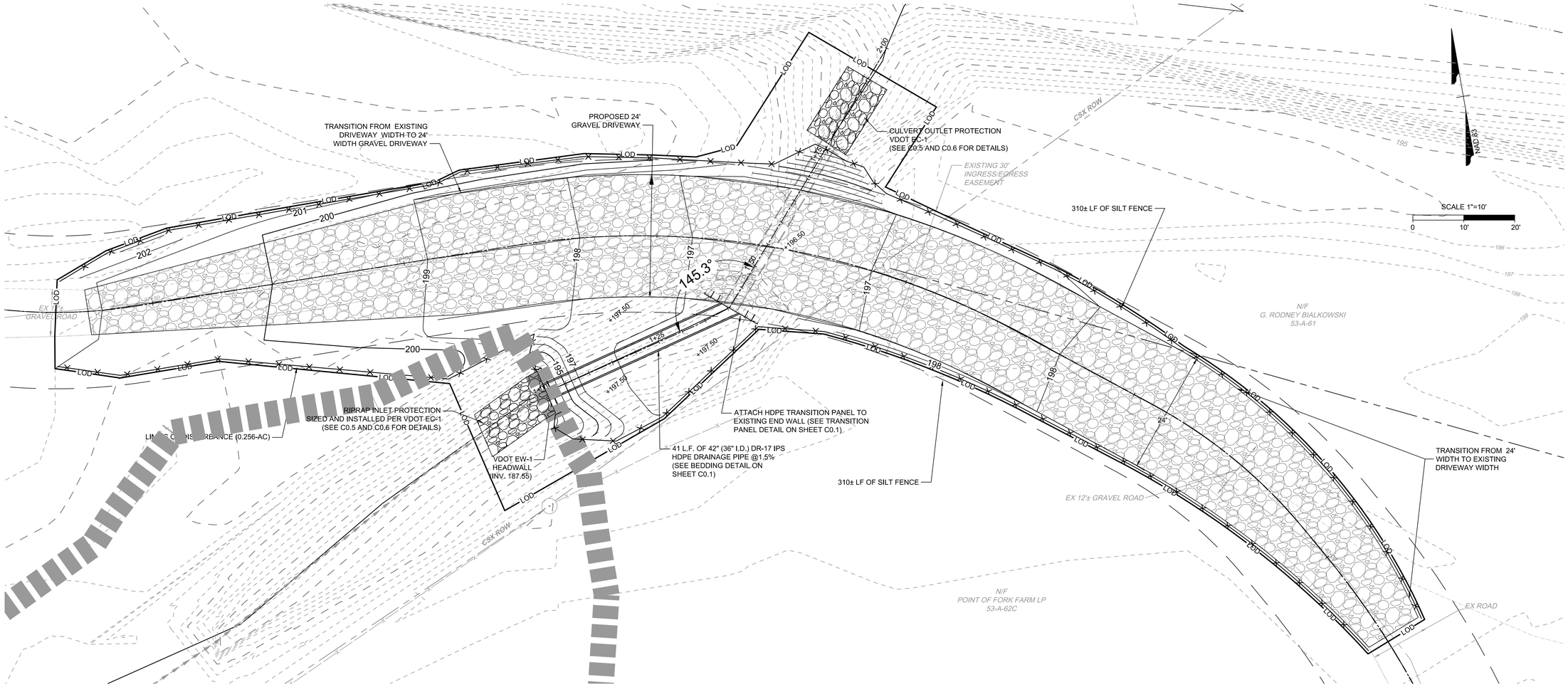
JAMES RIVER WATER PROJECT

JAMES RIVER WATER AUTHORITY - FLUVANNA COUNTY, VIRGINIA

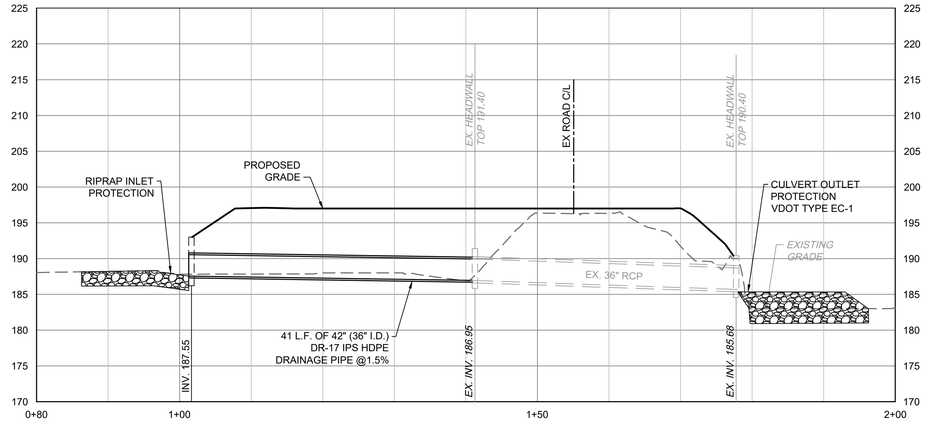
SELECT ENGINEERING DETAILS - IMPACTS 200 AND 202

JOB NO.
33927

SHEET NO.
6



SCALE: 1"=10'



SCALE: 1"=10'

NOT FOR CONSTRUCTION

THIS DRAWING PREPARED AT THE
CORPORATE OFFICE
1001 Boulders Parkway, Suite 300 | Richmond, VA 23225
TEL 804.200.6500 FAX 804.560.1016 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

TIMMONS GROUP

REVISION DESCRIPTION

DATE

DATE: MARCH 2020

DRAWN BY

DESIGNED BY

CHECKED BY

SCALE: AS SHOWN

JAMES RIVER WATER PROJECT

JAMES RIVER WATER AUTHORITY - FLUVANNA COUNTY, VIRGINIA

SELECT ENGINEERING DETAILS - IMPACT 201

JOB NO. 33927

SHEET NO. 7

APPENDIX I-2
UNITED STREAM METHODOLOGY AND FUNCTIONS AND VALUES ASSESSMENTS

APPENDIX I-2-1
UNITED STREAM METHODOLOGY FORMS

JRWA

Stream Assessment Summary Form (Form 2)

Unified Stream Methodology
for use in Virginia

Project #	Applicant	Date
33927	JRWA	01/29/2018, 02/12/2020
Evaluators	**HUC**	**Locality**
Todd Preuninger, Eli Wright	02080204	Louisa

Stream Name	Reach ID	Length of Impact (L_I) (feet)	Reach Condition Index (RCI)	Impact Factor (IF)	Compensation Requirement (CR) ($L_I \times RCI \times IF$)
UNT to Rivanna	Impact 200	12	0.90	1.00	11
UNT to Rivanna	Impact 201	72	0.90	1	65
	Total L_I	**84**		**Total CR**	**76**

Note: Round all feet & CR's to the nearest whole number.

Stream Assessment Form (Form 1)

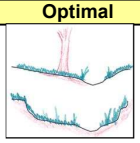
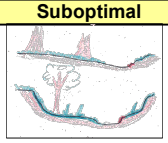
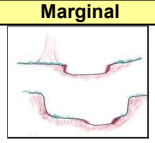
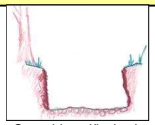
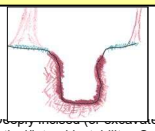
Unified Stream Methodology for use in Virginia

For use in wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
33927	JRWA	Louisa	R3	02080204	02/12/2020	Impact 200	12	1

Name(s) of Evaluator(s)	Stream Name and Information
Eli Wright	UNT to Rivanna

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

	Conditional Category					
	Optimal	Suboptimal	Marginal	Poor	Severe	
Channel Condition	 Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	 Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	 Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute instability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which	 Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	 Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.	CI
Score	3	2.4	2	1.6	1	1.6
NOTES>>						

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

	Conditional Category							
	Optimal	Suboptimal		Marginal		Poor		NOTES>> North of Robious Road stream is located in an actively grazed pasture. On the south side, the impact area is located in an existing maintained (grassed) DOT right-of-way.
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	**High Suboptimal:** Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**Low Suboptimal:** Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	**High Marginal:** Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	**Low Marginal:** Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	**High Poor:** Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	**Low Poor:** Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
		High	Low	High	Low	High	Low	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	

1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.
2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.
3. Enter the % Riparian Area and Score for each riparian category in the blocks below.

Ensure the sums of % Riparian Blocks equal 100

Right Bank	% Riparian Area>	100%						100%			
	Score >	1.2									
									CI= (Sum % RA * Scores*0.01)/2		
Left Bank	% Riparian Area>	100%						100%	Rt Bank CI >	1.20	CI
	Score >	1.2							Lt Bank CI >	1.20	1.20

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle poole complexes, stable features.

NOTES>>

	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	
Instream Habitat/ Available Cover	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	CI
Score	1.5	1.2	0.9	0.5	1.20

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
33927	JRWA	Louisa	R3	02080204	02/12/2020	Impact 200	12	1

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock

NOTES>> channel has been straightned - existing culvert present at crossing

	Conditional Category						
	Negligible	Minor		Moderate		Severe	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.	
SCORE	1.5	1.3	1.1	0.9	0.7	0.5	0.50

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: **The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.**

THE REACH CONDITION INDEX (RCI) >>	0.90
RCI= (Sum of all CI's)/5	
COMPENSATION REQUIREMENT (CR) >>	11
CR = RCI X LF X IF	

INSERT PHOTOS:

DESCRIBE PROPOSED IMPACT:


2/12/2020

Stream Assessment Form (Form 1)

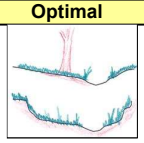
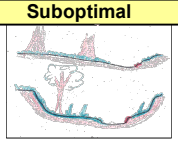
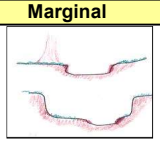
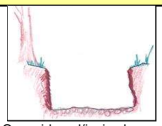
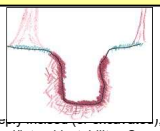
Unified Stream Methodology for use in Virginia

For use in wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
33927	JRWA	Louisa	R3	02080204	01/29/2018	Impact 201	72	1

Name(s) of Evaluator(s)	Stream Name and Information
Todd Preuninger	UNT to Rivanna

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

	Conditional Category					
	Optimal	Suboptimal	Marginal	Poor	Severe	
Channel Condition	 Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	 Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	 Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute instability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which	 Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	 Deeply incised (or shallow), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.	CI
Score	3	2.4	2	1.6	1	1.6
NOTES>>						

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

	Conditional Category							
	Optimal	Suboptimal		Marginal		Poor		NOTES>> North of Robious Road stream is located in an actively grazed pasture. On the south side, the impact area is located in an existing maintained (grassed) DOT right-of-way.
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	**High Suboptimal:** Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**Low Suboptimal:** Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	**High Marginal:** Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	**Low Marginal:** Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	**High Poor:** Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	**Low Poor:** Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
		High	Low	High	Low	High	Low	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	

1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.
2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.
3. Enter the % Riparian Area and Score for each riparian category in the blocks below.

Ensure the sums of % Riparian Blocks equal 100

Right Bank	% Riparian Area>	100%							100%		
	Score >	1.2									
									CI= (Sum % RA * Scores*0.01)/2		
Left Bank	% Riparian Area>	100%						100%	Rt Bank CI >	1.20	CI
	Score >	1.2							Lt Bank CI >	1.20	1.20

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle poole complexes, stable features.

NOTES>>

	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	
Instream Habitat/ Available Cover	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	CI
Score	1.5	1.2	0.9	0.5	1.20

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
33927	JRWA	Louisa	R3	02080204	01/29/2018	Impact 201	72	1

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock

NOTES>> channel has been straightned - existing culvert present at crossing

	Conditional Category						
	Negligible	Minor		Moderate		Severe	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.	
SCORE	1.5	1.3	1.1	0.9	0.7	0.5	0.50

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: **The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.**

THE REACH CONDITION INDEX (RCI) >>	**0.90**
RCI= (Sum of all CI's)/5	
COMPENSATION REQUIREMENT (CR) >>	**65**
CR = RCI X LF X IF	

INSERT PHOTOS:

DESCRIBE PROPOSED IMPACT:

APPENDIX I-2-2
FUNCTIONS AND VALUES ASSESSMENTS

Wetland Function-Value Evaluation Form

Total area of wetland 0.04566 Human made? No Is wetland part of a wildlife corridor? Yes or a "habitat island"? No

Adjacent land use Forest/Young tree stand Distance to nearest roadway or other development 0'

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present Yes

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Low

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 200

Latitude _____ Longitude _____

Prepared by: E.W. Date 11/19/2019

Wetland Impact:
Type Fill Area 0.008

Evaluation based on:
Office X Field _____

Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N	2, 5,10, 11, 15		
Floodflow Alteration	Y	3, 5, 7, 9, 11, 13, 15	X	
Fish and Shellfish Habitat	N	1, 2		
Sediment/Toxicant Retention	Y	3, 4, 5, 6, 9, 10, 14	X	
Nutrient Removal	N	7, 9, 10, 12		
Production Export	N	1, 2, 4, 12		Birds observed
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	3, 4, 5, 7, 8, 9, 21	X	Road fragmentation (gravel), song birds present
Recreation	N	8		Private site
Educational/Scientific Value	N	11, 13		
Uniqueness/Heritage	N	10, 14, 16, 19, 22, 29		
Visual Quality/Aesthetics	Y	5, 6, 9, 10, 11, 12		Road/ Invasive species
ES Endangered Species Habitat	N	N/A		
Other				

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 0.086524 Human made? No Is wetland part of a wildlife corridor? Yes or a "habitat island"? No

Adjacent land use Forest/Young tree stand Distance to nearest roadway or other development 0'

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present Yes

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Low

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 202

Latitude _____ Longitude _____

Prepared by: E.W. Date 11/19/2019

Wetland Impact:
Type Fill Area 0.015

Evaluation based on:
Office X Field _____

Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N	2, 5, 11, 15		
Floodflow Alteration	Y	3, 5, 6, 7, 8, 9, 11	X	
Fish and Shellfish Habitat	N	1, 2		
Sediment/Toxicant Retention	Y	3, 4, 5, 6, 9		
Nutrient Removal	N	7, 9, 10		
Production Export	Y	1, 2, 4, 8, 12		Birds observed at wetland, invasive herb
Sediment/Shoreline Stabilization	N			Not associated with watercourse
Wildlife Habitat	Y	3, 4, 5, 7, 8, 9, 10, 21	X	Road fragmentation (gravel), song birds present
Recreation	N	8		Private site
Educational/Scientific Value	N	11, 13		
Uniqueness/Heritage	Y	10, 12, 14, 16, 19, 22, 29	X	Wetland itself is not unique although surrounded by multiple possible unique resources
Visual Quality/Aesthetics	Y	1, 5, 6, 9, 10, 11, 12		Road/ Invasive species
ES Endangered Species Habitat	N	N/A		
Other				

Notes:

* Refer to backup list of numbered considerations.

APPENDIX I-3
LETTER OF CREDIT AVAILABILITY

LONE OAK STREAM MITIGATION BANK

March 16, 2020

Greg Kouri
Environmental Scientist
1001 Boulders Parkway
Richmond, VA 23225

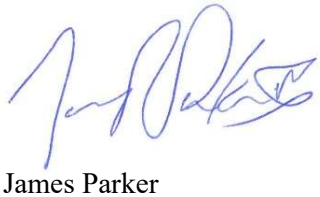
RE: Stream Credit Availability for the James River Water Supply project located in the Rivanna and Middle James-Buffalo Watersheds HUCs 02080203 & 02080204

Dear Greg:

Clearwater Mitigation I LLC owns and operates the Lone Oak Stream Mitigation Bank ("Lone Oak") which has approval from the U.S. Army Corps of Engineers ("USACE") and the Virginia Department of Environmental Quality ("DEQ") to provide stream mitigation credits for offset of authorized impacts within the James River Watershed including HUCs 02080203, 02080204, 02080205, and 02080207. Currently, Lone Oak has 14,869 Stream Credits available to offset impacts in these regions. It is my understanding that your project, referenced above, requires 76 Stream Credits to satisfy the permit requirements.

On behalf of Clearwater Ventures LLC, I truly appreciate the opportunity to work with you and your client on this project.

Very truly yours,



James Parker
Managing Member
Clearwater Mitigation I LLC
804-819-0474
jparker@clearwaterventuresllc.com

The Nature Conservancy in Virginia
652 Peter Jefferson Pkwy, Suite 190
Charlottesville, VA 22911

Tel: (434) 295-6106

nature.org/virginia

March 17, 2020

Mr. Eli Wright
Timmons Group
1001 Boulders Parkway, Suite 300
Richmond, VA 23225

Subject: Virginia Aquatic Resources Trust Fund Credit Availability for James River Water Authority (the Applicant)

The Nature Conservancy (TNC) of Virginia has mitigation credits available for sale to the Applicant in the hydraulic unit code (HUC) 02080204.

This letter confirms that 0.05 advance non-tidal wetland credits are available for the Applicant to purchase for impacts in HUC 02080204 for a period of 60 days. These credits will be used as compensatory mitigation for impacts to 0.03 acres of non-tidal wetlands in 02080204.

TNC acknowledges that the above-mentioned credits will be available for purchase by the Applicant until 5/16/2020 for the price of $55,000/non-tidal wetland credit. The total purchase price for 0.05 advance non-tidal wetland credits is therefore $2,750. **There is no guarantee of availability beyond this date. If purchase of credits is not made prior to the date listed, the Applicant must contact TNC to determine credit availability status.**

This letter does not document payment for impacts. TNC does not assume liability for the above-mentioned impacts through this correspondence. Please be advised that a purchase of mitigation credits from The Nature Conservancy's Virginia Aquatic Resources Trust Fund is a payment for service and therefore is not, and shall not be acknowledged as, a charitable contribution.

Instructions for submitting payment: When the applicant is ready to submit payment for the above-mentioned credits, please submit a completed Conflict Disclosure Form and Credit Payment Voucher along with the payment written out to "**The Virginia Aquatic Resources Trust Fund".** Mail the voucher and check to Avery Stone at the address shown in the above letterhead. TNC reserves the right to refuse to accept payment until any conflict (whether disclosed by the form or not) is reviewed and approved by TNC.

Sincerely,

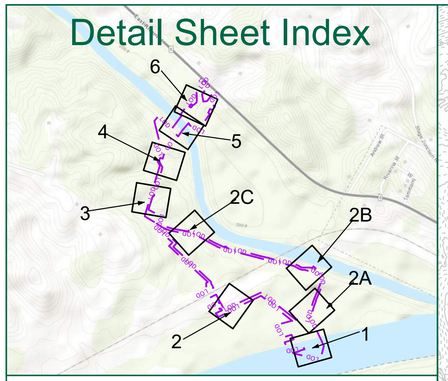
Karen K Johnson

Karen K. Johnson
Director of Wetland and Stream Mitigation

CC: Steven VanderPloeg, USACE
Brian McGurk, VADEQ
Alissa Bellios, Timmons Group

APPENDIX I-4
PRELIMINARY JURISDICTIONAL WATERS OF THE U.S. IMPACTS MAP

Detail Sheet Index

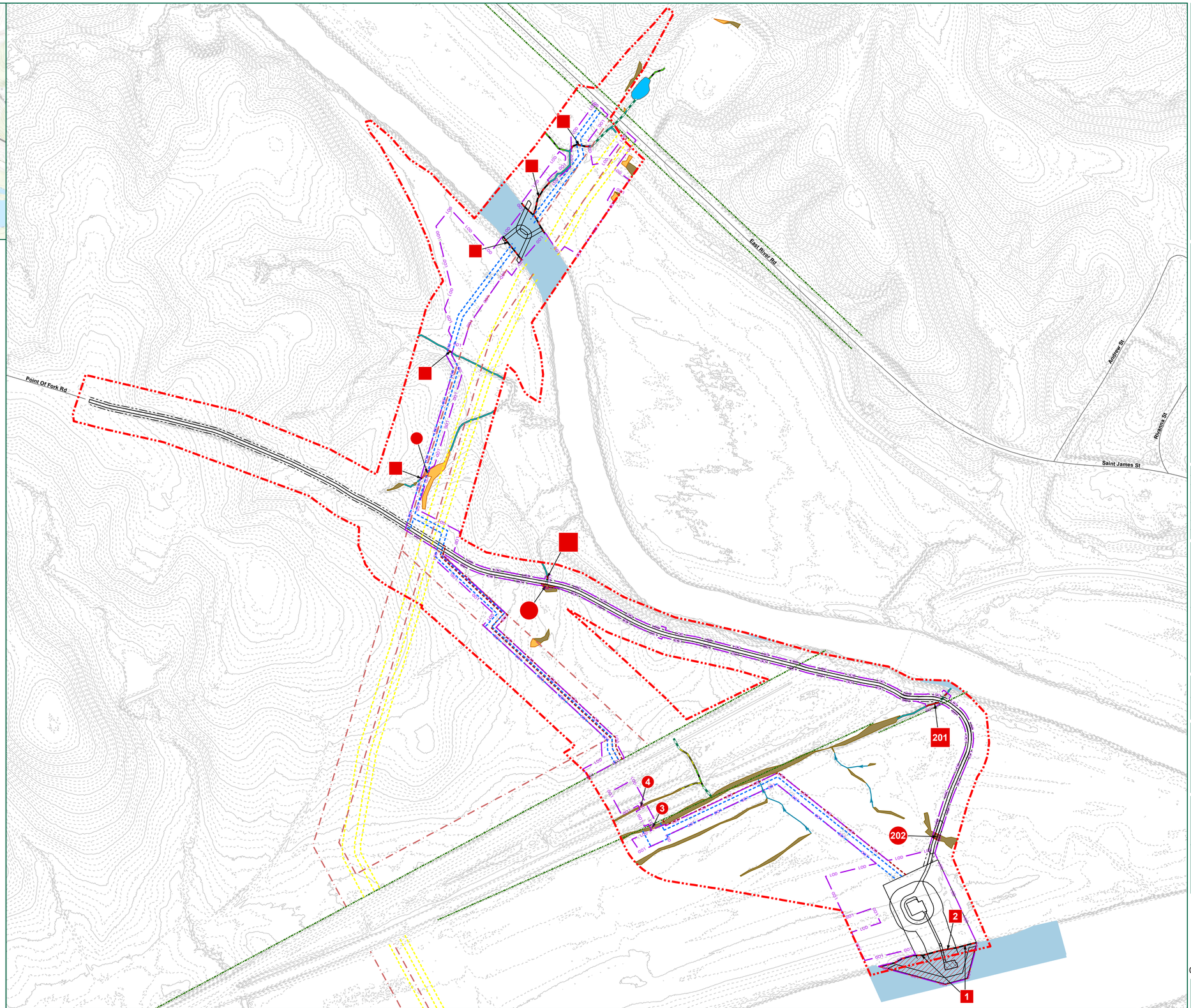


Legend

- Project Study Limits (2016 Delineation)
- Proposed Limits of Disturbance
- Stream Impact
- Wetland Impact
- Permanent Stream Impact
- Temporary Stream Impact
- Existing Culvert
- Perennial Stream (R3)
- Intermittent Stream (R4)
- Ephemeral Stream (R6)
- Ditch
- Excavation/Fill Impact
- Construction Easement Impact
- Maintained Easement Impact
- Temporary Wetland Impact
- Permanent Conversion Wetland Impact
- Permanent Wetland Impact
- Perennial Stream (R3)
- Palustrine Emergent (PEM) Wetlands
- Palustrine Forested (PFO) Wetlands
- Palustrine Open Water (POW)
- Project Water Easement
- Project Utility Easement
- Existing Power Easement
- Existing Utility Easement
- Road Easement
- Existing Right of Way

Topographic Contours

- 10 Foot
- 2 Foot



TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.
1001 Boulders Parkway, Suite 300
Richmond, VA 23225
TEL 804.200.6500
www.timmons.com

PROJECT NAME & LOCATION

JAMES RIVER WATER SUPPLY PROJECT

FLUVANNA COUNTY, VIRGINIA

DATE	03/06/2020
PROJECT NUMBER	33927
PROJECT NAME	JAMES RIVER WATER SUPPLY PROJECT
DESIGNED BY / DRAWN BY	A. MEHFOUD

1. Waters of the U.S. within the project study limits have been located using submeter, Bluetooth GPS antennas by Timmons Group.
2.Waters of the U.S. have been confirmed by the U.S. Army Corps of Engineers within all project areas.
3. Project study limits are approximate.
4. Topography based on VGIN LIDAR.
5. Cowardin Stream Classifications are based solely on field observations. No formal Stream assessment methodology was completed to determine these Cowardin Classifications.

REVISIONS

#	MM/DD/YY	DESCRIPTION

DRAWING DESCRIPTION

PRELIMINARY JURISDICTIONAL WATERS OF THE U.S. IMPACTS MAP - OVERALL

SCALE (FEET)

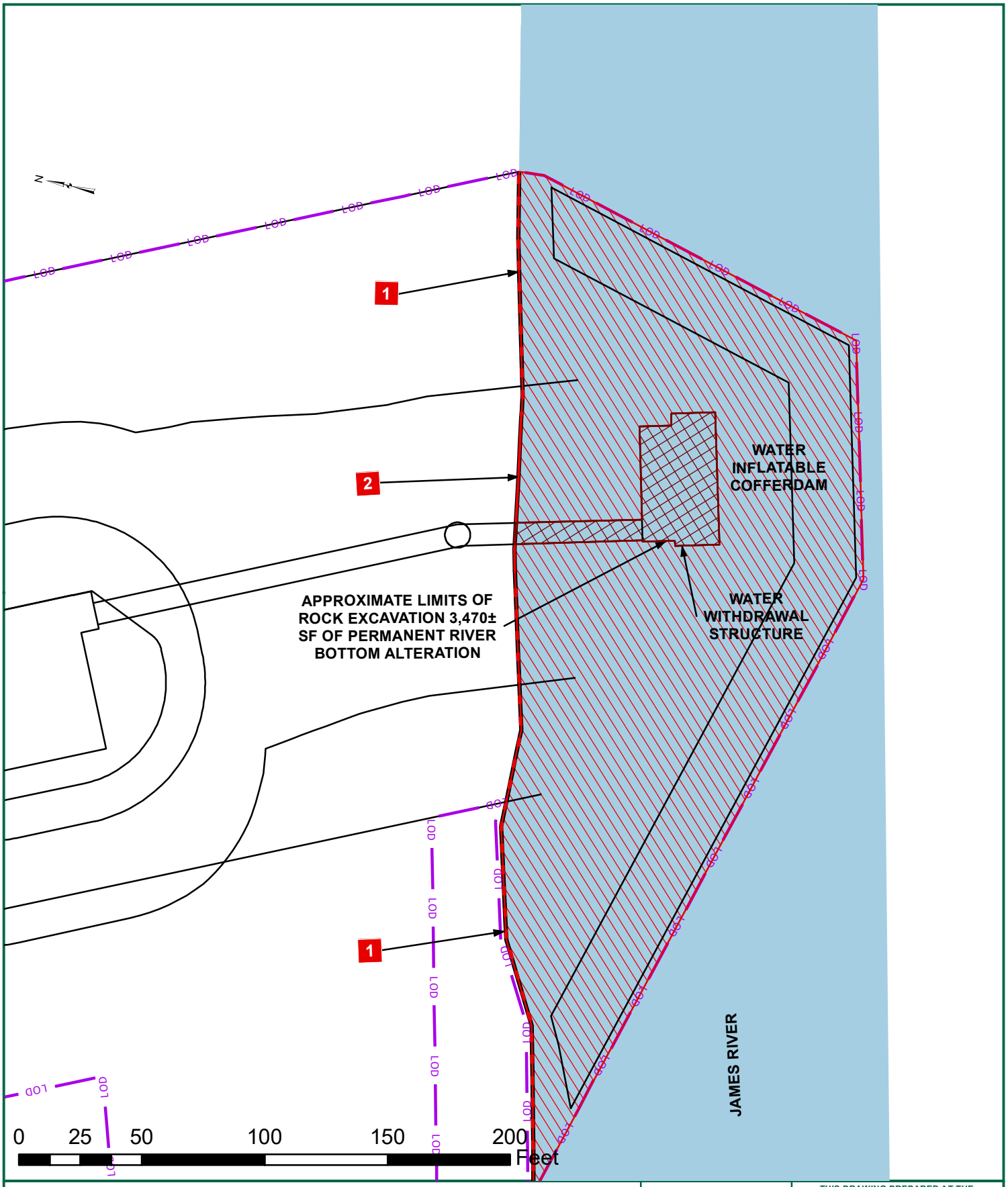
0 200 400

PLANS PRINTED AS 11X17 ARE HALF SCALE

SCALE	SHEET NUMBER
H:1 " = 200 '	1 of 1

Y:\804\33927-jrwa-pipeline\GIS\Pipeline - Wetland Impacts\WTIM-RW-Overall.mxd

Path: Y:\804\33927-jrwa-pipeline\GIS\Pipeline - Wetland Impacts\WTIM-RW-Detail.mxd



TIMMONS GROUP

YOUR VISION ACHIEVED THROUGH OURS

THIS DRAWING PREPARED AT THE CORPORATE OFFICE
1001 Boulders Parkway, Suite 300 | Richmond, VA 23225
TEL 804.200.6500 FAX 804.560.1648 www.timmons.com

Site Development | Residential | Infrastructure | Technology | Environmental

JAMES RIVER WATER SUPPLY PROJECT

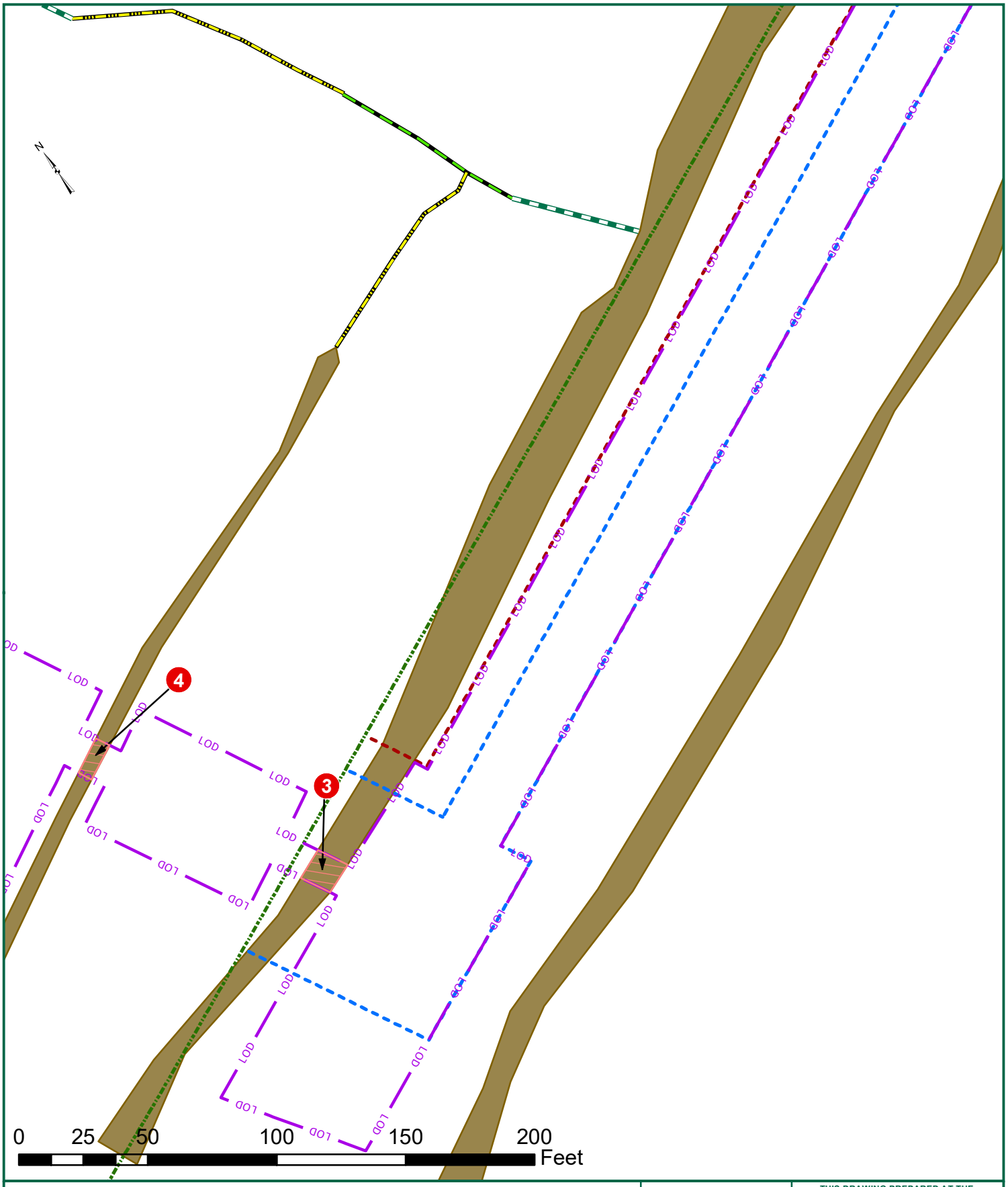
LOUISA & FLUVANNA COUNTY, VIRGINIA

PRELIMINARY JURISDICTIONAL WATERS OF THE U.S. IMPACTS MAP - DETAIL

SHEET NO.	1 OF 6
JOB NUMBER	33927
SCALE	1" = 50'
CHECKED BY	E. WRIGHT
DESIGNED BY	A. MEHFOUD
DRAWN BY	A. MEHFOUD
DATE	03/06/2020

DATE	REVISION DESCRIPTION

Path: Y:\804\33927-jrwa-pipeline\GIS\Pipeline - Wetland Impacts\WTIM-RW-Detail.mxd



TIMMONS GROUP

YOUR VISION ACHIEVED THROUGH OURS

THIS DRAWING PREPARED AT THE CORPORATE OFFICE
1001 Boulders Parkway, Suite 300 | Richmond, VA 23225
TEL 804.200.6500 FAX 804.560.1648 www.timmons.com

Site Development | Residential | Infrastructure | Technology | Environmental

JAMES RIVER WATER SUPPLY PROJECT

LOUISA & FLUVANNA COUNTY, VIRGINIA

PRELIMINARY JURISDICTIONAL WATERS OF THE U.S. IMPACTS MAP - DETAIL

SHEET NO. 2 OF 6

JOB NUMBER 33927

SCALE 1" = 50'

CHECKED BY E. WRIGHT

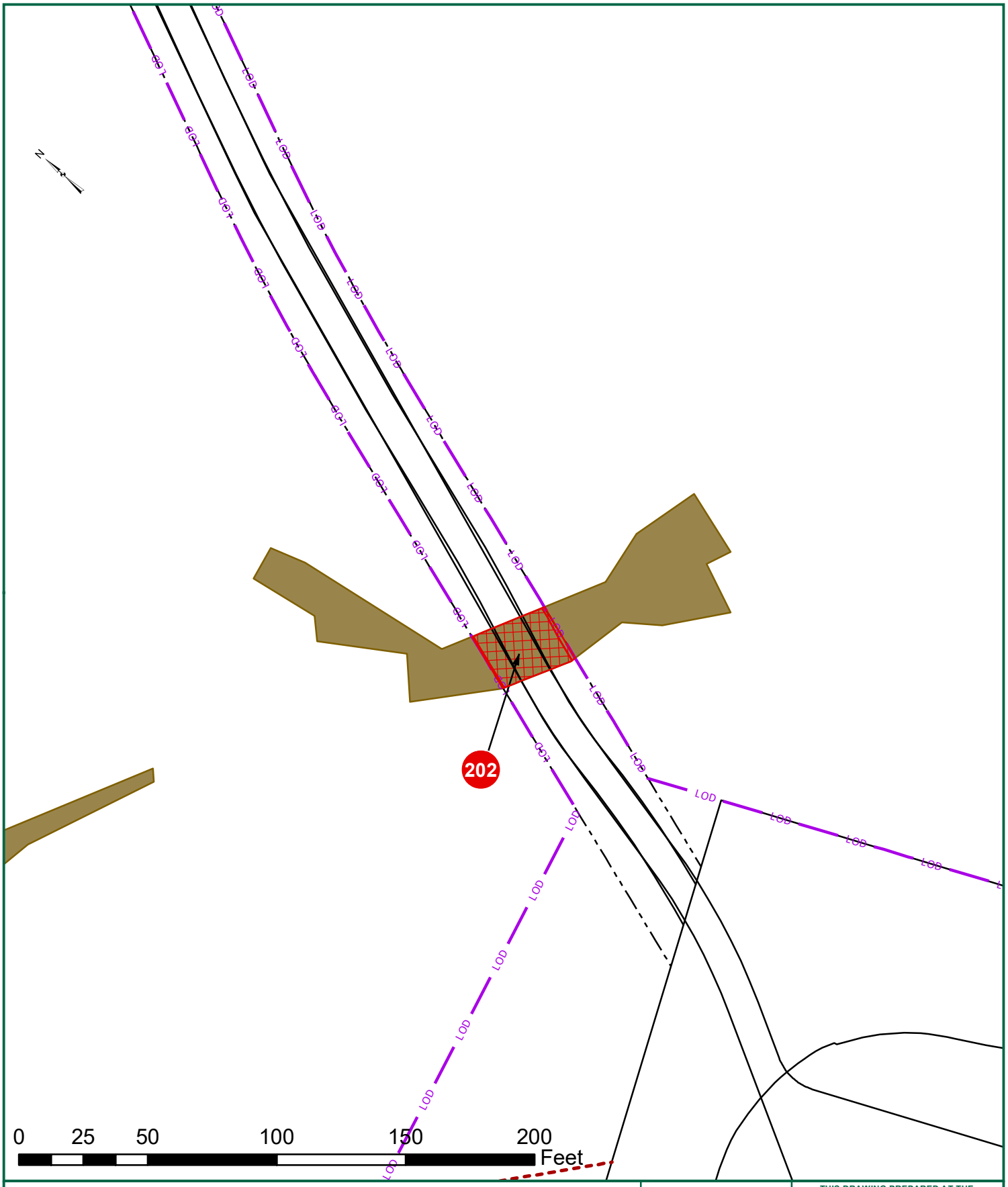
DESIGNED BY A. MEHFOUD

DRAWN BY A. MEHFOUD

DATE 03/06/2020

DATE	REVISION DESCRIPTION

Path: Y:\804\33927-jrwa-pipeline\GIS\Pipeline - Wetland Impacts\WTIM-RW-Detail.mxd



TIMMONS GROUP

YOUR VISION ACHIEVED THROUGH OURS

THIS DRAWING PREPARED AT THE CORPORATE OFFICE
1001 Boulders Parkway, Suite 300 | Richmond, VA 23225
TEL 804.200.6500 FAX 804.560.1648 www.timmons.com

Site Development | Residential | Infrastructure | Technology | Environmental

JAMES RIVER WATER SUPPLY PROJECT

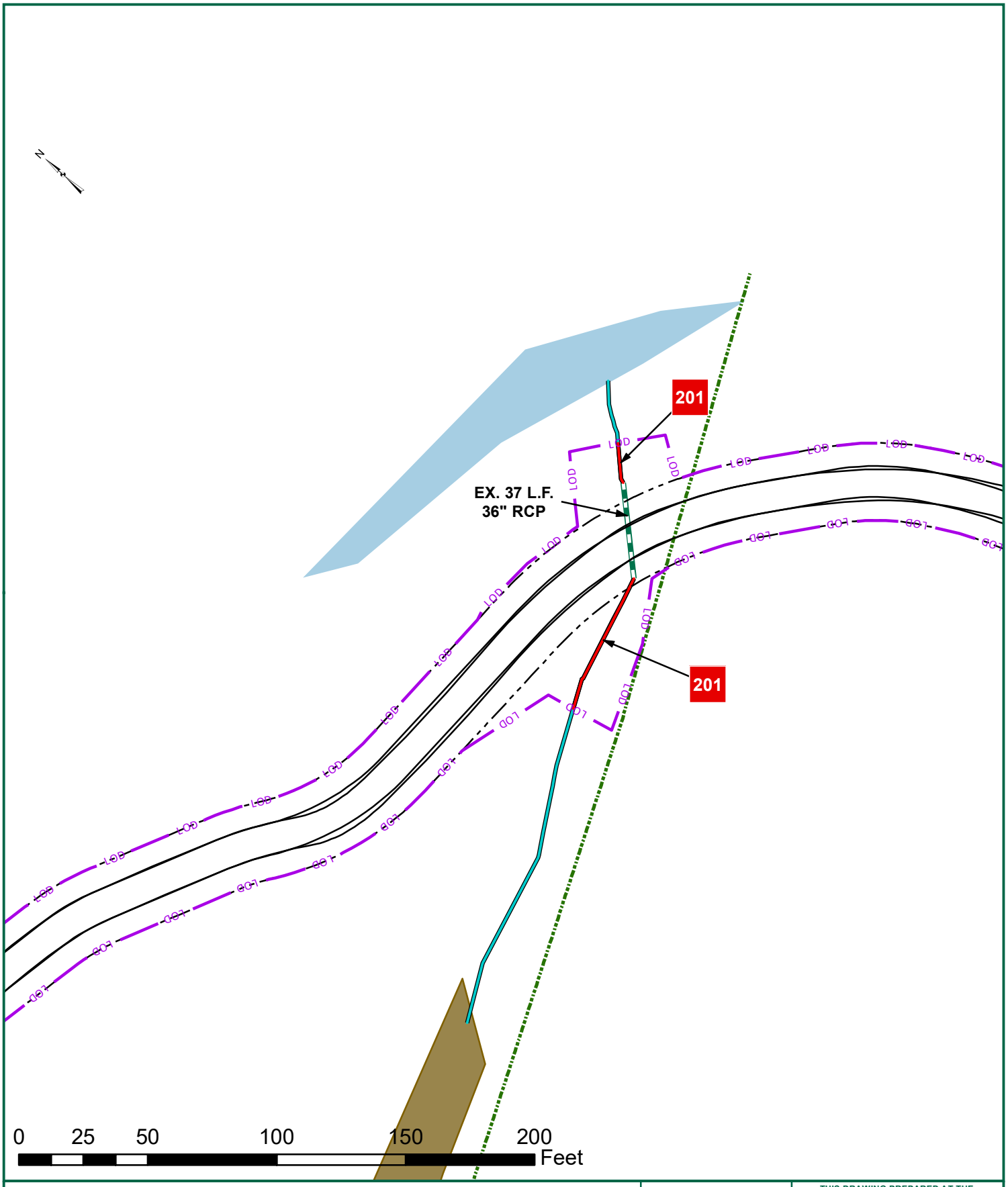
LOUISA & FLUVANNA COUNTY, VIRGINIA

PRELIMINARY JURISDICTIONAL WATERS OF THE U.S. IMPACTS MAP - DETAIL

SHEET NO. 24 OF 26
JOB NUMBER 33927
SCALE 1" = 50'
CHECKED BY E. WRIGHT
DESIGNED BY A. MEHFOUD
DRAWN BY A. MEHFOUD
DATE 03/06/2020

DATE	REVISION DESCRIPTION

Path: Y:\804\33927-jrwa-pipeline\GIS\Pipeline - Wetland Impacts\WTIM-RW-Detail.mxd



TIMMONS GROUP

YOUR VISION ACHIEVED THROUGH OURS

THIS DRAWING PREPARED AT THE CORPORATE OFFICE
1001 Boulders Parkway, Suite 300 | Richmond, VA 23225
TEL 804.200.6500 FAX 804.560.1648 www.timmons.com

Site Development | Residential | Infrastructure | Technology | Environmental

JAMES RIVER WATER SUPPLY PROJECT

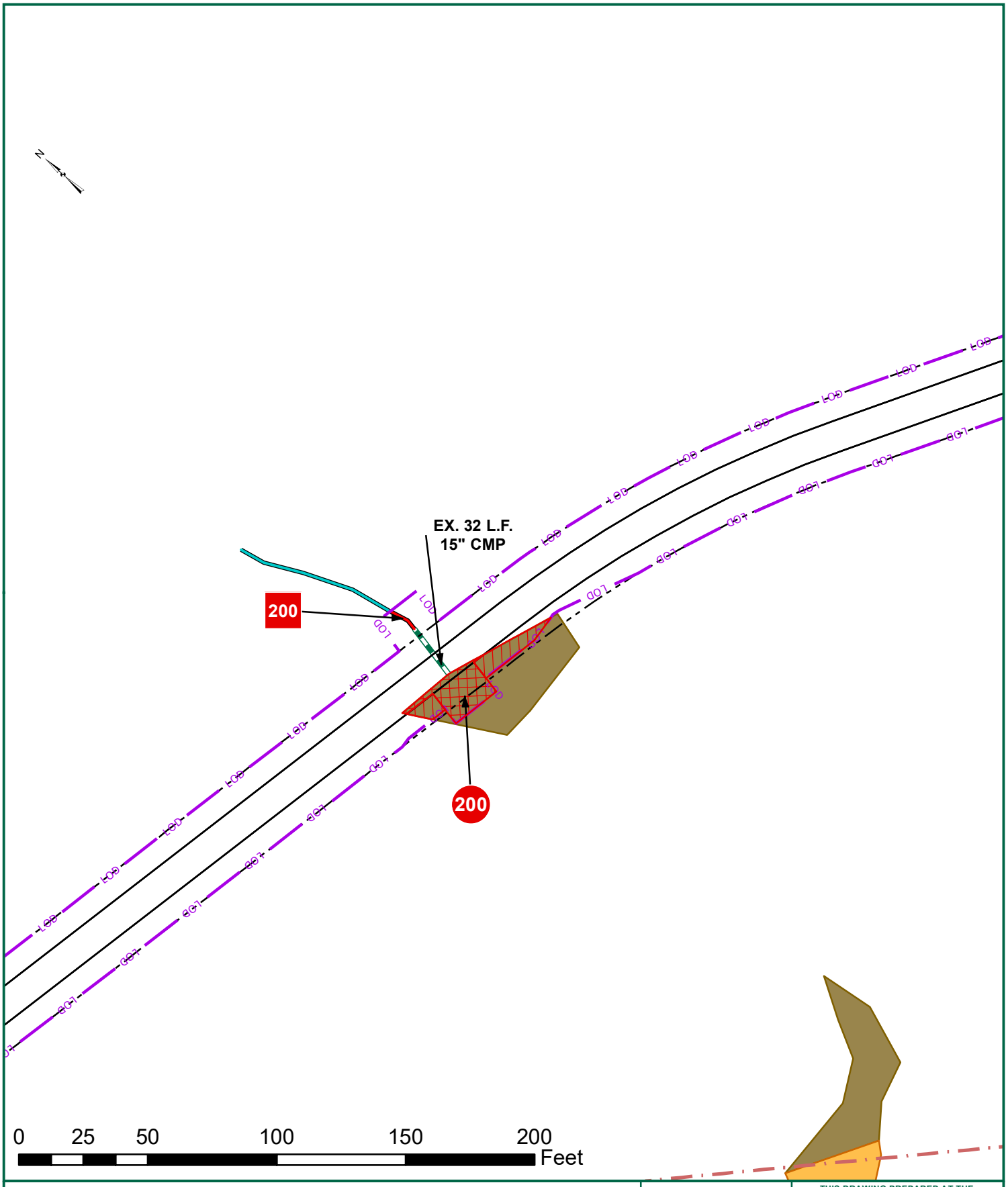
LOUISA & FLUVANNA COUNTY, VIRGINIA

PRELIMINARY JURISDICTIONAL WATERS OF THE U.S. IMPACTS MAP - DETAIL

SHEET NO. 25 OF 96
JOB NUMBER 33927
SCALE 1" = 50'
CHECKED BY E. WRIGHT
DESIGNED BY A. MEHFOUD
DRAWN BY A. MEHFOUD
DATE 03/06/2020

DATE	REVISION DESCRIPTION

Path: Y:\804\33927-jrwa-pipeline\GIS\Pipeline - Wetland Impacts\WTIM-RW-Detail.mxd



TIMMONS GROUP

YOUR VISION ACHIEVED THROUGH OURS

THIS DRAWING PREPARED AT THE CORPORATE OFFICE
1001 Boulders Parkway, Suite 300 | Richmond, VA 23225
TEL 804.200.6500 FAX 804.560.1648 www.timmons.com

Site Development | Residential | Infrastructure | Technology | Environmental

SHEET NO. 2C OF 6

JOB NUMBER 33927

JAMES RIVER WATER SUPPLY PROJECT

LOUISA & FLUVANNA COUNTY, VIRGINIA

PRELIMINARY JURISDICTIONAL WATERS OF THE U.S. IMPACTS MAP - DETAIL

SCALE 1" = 50'

CHECKED BY E. WRIGHT

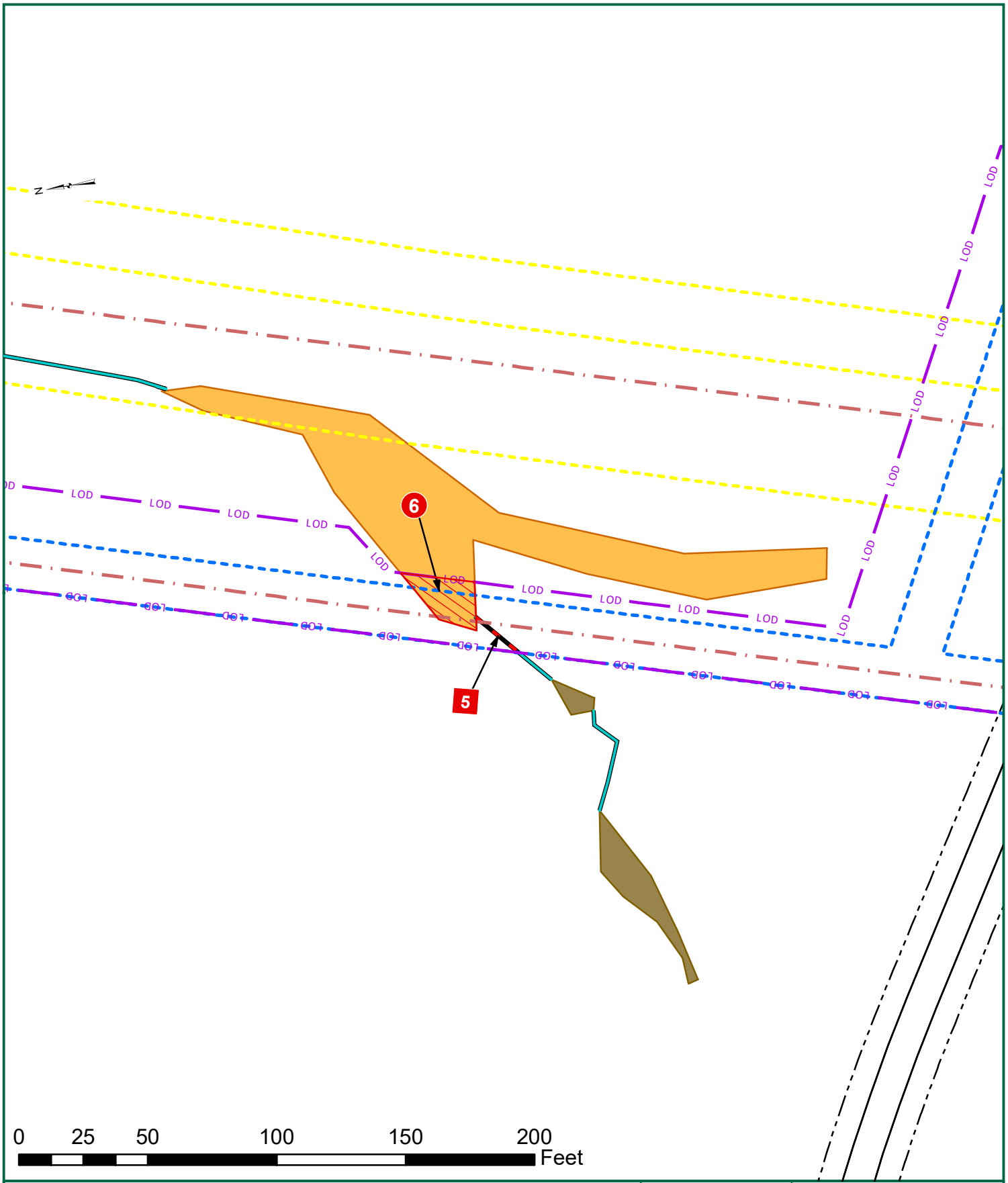
DESIGNED BY A. MEHFOUD

DRAWN BY A. MEHFOUD

DATE 03/06/2020

DATE	REVISION DESCRIPTION

Path: Y:\804\33927-jrwa-pipeline\GIS\Pipeline - Wetland Impacts\WTIM-RW-Detail.mxd



TIMMONS GROUP

YOUR VISION ACHIEVED THROUGH OURS

THIS DRAWING PREPARED AT THE CORPORATE OFFICE
1001 Boulders Parkway, Suite 300 | Richmond, VA 23225
TEL 804.200.6500 FAX 804.560.1648 www.timmons.com

Site Development | Residential | Infrastructure | Technology | Environmental

JAMES RIVER WATER SUPPLY PROJECT

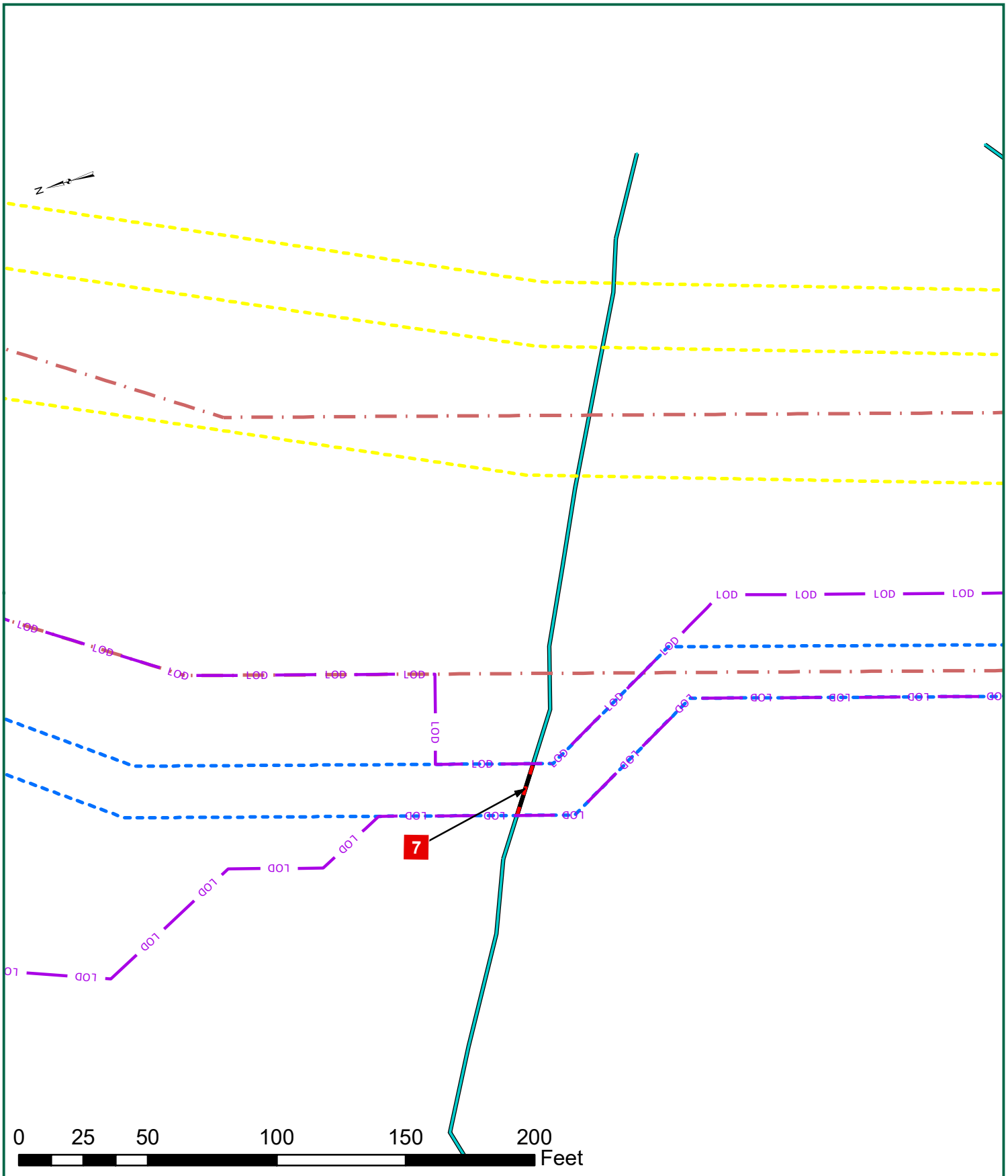
LOUISA & FLUVANNA COUNTY, VIRGINIA

PRELIMINARY JURISDICTIONAL WATERS OF THE U.S. IMPACTS MAP - DETAIL

SHEET NO. 3 OF 6
JOB NUMBER 33927
SCALE 1" = 50'
CHECKED BY E. WRIGHT
DESIGNED BY A. MEHFOUD
DRAWN BY A. MEHFOUD
DATE 03/06/2020

DATE	REVISION DESCRIPTION

Path: Y:\804\33927-jrwa-pipeline\GIS\Pipeline - Wetland Impacts\WTIM-RW-Detail.mxd



TIMMONS GROUP

YOUR VISION ACHIEVED THROUGH OURS

THIS DRAWING PREPARED AT THE CORPORATE OFFICE
1001 Boulders Parkway, Suite 300 | Richmond, VA 23225
TEL 804.200.6500 FAX 804.560.1648 www.timmons.com

Site Development | Residential | Infrastructure | Technology | Environmental

JAMES RIVER WATER SUPPLY PROJECT

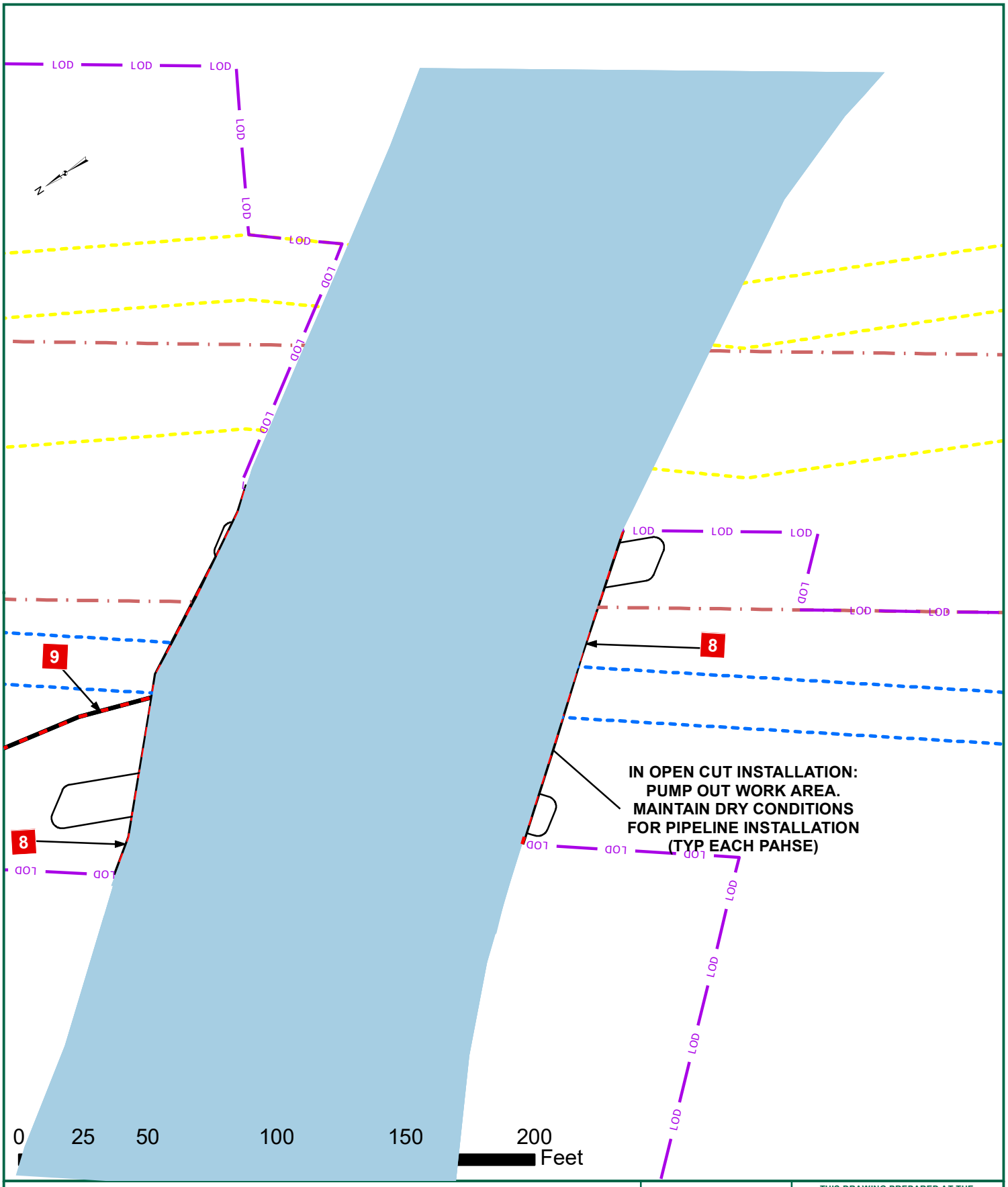
LOUISA & FLUVANNA COUNTY, VIRGINIA

PRELIMINARY JURISDICTIONAL WATERS OF THE U.S. IMPACTS MAP - DETAIL

SHEET NO. 4 OF 6
JOB NUMBER 33927
SCALE 1" = 50'
CHECKED BY E. WRIGHT
DESIGNED BY A. MEHFOUD
DRAWN BY A. MEHFOUD
DATE 03/06/2020

DATE	REVISION DESCRIPTION

Path: Y:\804\33927-jrwa-pipeline\GIS\Pipeline - Wetland Impacts\WTIM-RW-Detail.mxd



TIMMONS GROUP

YOUR VISION ACHIEVED THROUGH OURS

THIS DRAWING PREPARED AT THE CORPORATE OFFICE
1001 Boulders Parkway, Suite 300 | Richmond, VA 23225
TEL 804.200.6500 FAX 804.560.1648 www.timmons.com

Site Development | Residential | Infrastructure | Technology | Environmental

JAMES RIVER WATER SUPPLY PROJECT

LOUISA & FLUVANNA COUNTY, VIRGINIA

PRELIMINARY JURISDICTIONAL WATERS OF THE U.S. IMPACTS MAP - DETAIL

SHEET NO. 5 OF 6

JOB NUMBER 33927

SCALE 1" = 50'

CHECKED BY E. WRIGHT

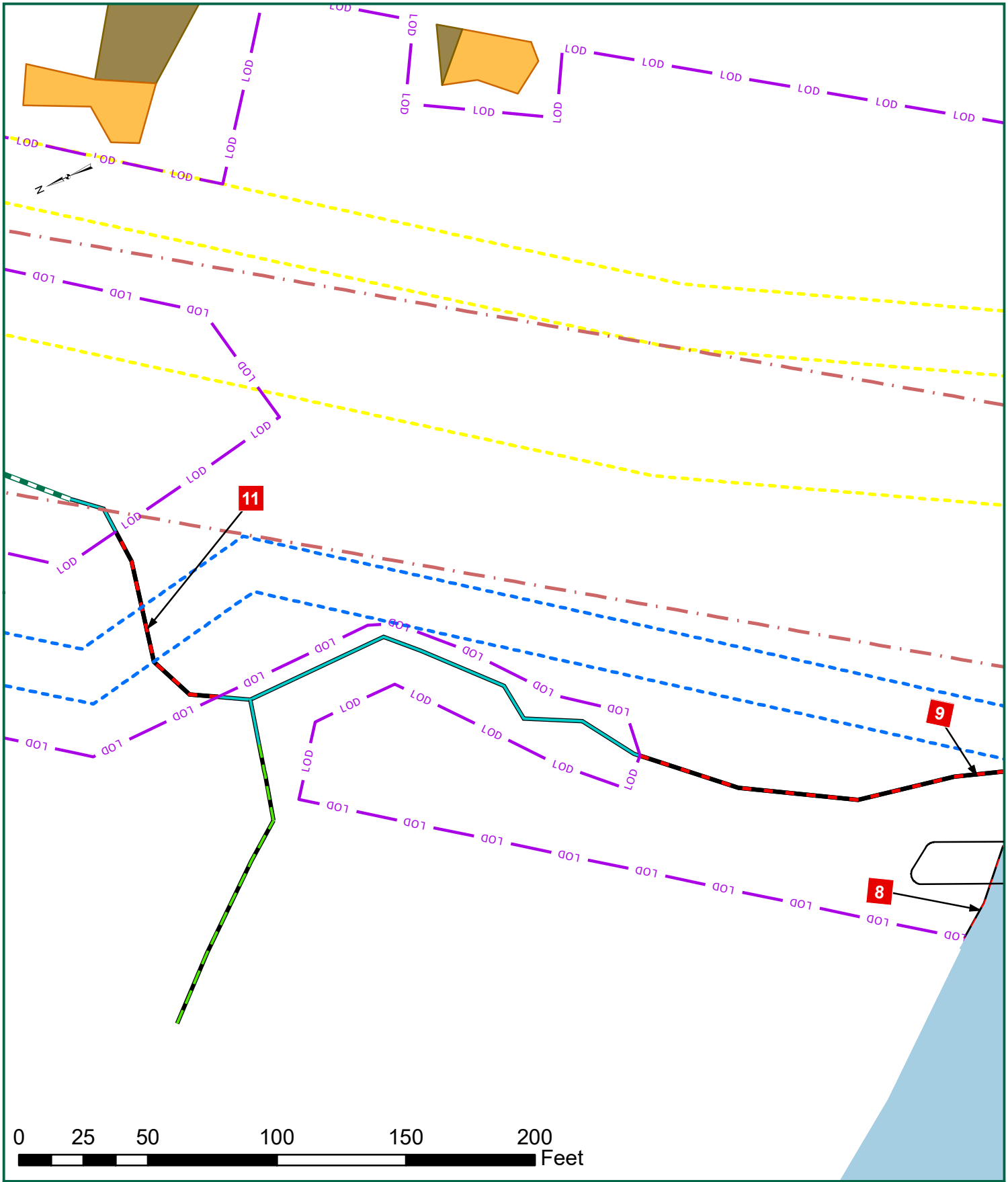
DESIGNED BY A. MEHFOUD

DRAWN BY A. MEHFOUD

DATE 03/06/2020

DATE	REVISION DESCRIPTION

Path: Y:\804\33927-jrwa-pipeline\GIS\Pipeline - Wetland Impacts\WTIM-RW-Detail.mxd



TIMMONS GROUP

YOUR VISION ACHIEVED THROUGH OURS

THIS DRAWING PREPARED AT THE CORPORATE OFFICE
1001 Boulders Parkway, Suite 300 | Richmond, VA 23225
TEL 804.200.6500 FAX 804.560.1648 www.timmons.com

Site Development | Residential | Infrastructure | Technology | Environmental

SHEET NO. 6 OF 6

JOB NUMBER 33927

JAMES RIVER WATER SUPPLY PROJECT

LOUISA & FLUVANNA COUNTY, VIRGINIA

PRELIMINARY JURISDICTIONAL WATERS OF THE U.S. IMPACTS MAP - DETAIL

SCALE 1" = 50'

CHECKED BY E. WRIGHT

DESIGNED BY A. MEHFOUD

DRAWN BY A. MEHFOUD

DATE 03/06/2020

DATE	REVISION DESCRIPTION