



COMMONWEALTH of VIRGINIA

Marine Resources Commission

Building 96

380 Fenwick Road

Fort Monroe, VA 23651

Matthew J. Strickler
Secretary of Natural Resources

Steven G. Bowman
Commissioner

November 4, 2019

Shirley Contracting Company, LLC
Attn: Mr. Jeff Austin
c/o Dewberry Engineering LLC
8401 Arlington Boulevard
Fairfax, VA 22031

Re: VMRC #2019-0554

Dear Mr. Austin:

Enclosed is the Marine Resources Commission permit to replace the Route 7 bridge crossing of Difficult Run, to install by the directional bore method, 28 conduits beneath a 50-foot wide section of Difficult Run and to relocate and stabilize with articulated concrete blocks, approximately 1,500 linear of Colvin Run. This work is associated with the Route 7 Improvements Project between Colvin Run Road and Jarrett Valley Drive, in Fairfax County.

A yellow placard is also enclosed. This placard reflects the authorized activities for inspection purposes and must be conspicuously displayed at the work site throughout the construction phase. Failure to properly post the placard in a prominent location will be considered a violation of your permit conditions.

YOU ARE REMINDED THAT ANY DEVIATION FROM THE PERMIT OR ATTACHED DRAWINGS REQUIRES PRIOR AUTHORIZATION FROM THE MARINE RESOURCES COMMISSION. FAILURE TO OBTAIN THE NECESSARY MODIFICATION WILL BE CONSIDERED A VIOLATION AND COULD SUBJECT YOU TO CIVIL CHARGES IN AMOUNTS NOT TO EXCEED \$10,000 PER VIOLATION.

The work authorized by this permit is to be completed by September 30, 2022. Please note that in conformance with Special Condition 17 of your permit you are to notify the Commission 15 days prior to commencement of your permitted project. The enclosed self-addressed, stamped, postcard is to be used for this purpose. All other conditions of the permit will remain in effect.

An Agency of the Natural Resources Secretariat

www.mrc.virginia.gov

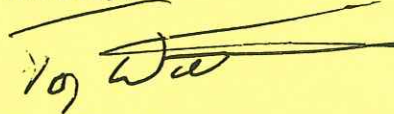
Telephone (757) 247-2200 (757) 247-2292 V/TDD Information and Emergency Hotline 1-800-541-4646 V/TDD

Shirley Contracting Company, LLC
Page Two

November 4, 2019
VMRC #2019-0554

Please be advised that you may also require issuance of a U. S. Army Corps of Engineers permit before you begin work on this project. You may wish to contact them directly to verify any permitting requirements.

Sincerely,

A handwritten signature in black ink, appearing to read "Tony Watkinson", is written over a horizontal line. The signature is stylized and somewhat cursive.

Tony Watkinson
Chief, Habitat Management

TW/mce:lra
HM
Enclosure
cc: Applicant

**COMMONWEALTH OF VIRGINIA
MARINE RESOURCES COMMISSION
PERMIT**

The Commonwealth of Virginia, Marine Resources Commission, hereinafter referred to as the Commission, on this 24th day of September 2019 hereby grants unto:

**Shirley Contracting Company, LLC
45240 Business Court, Suite 100
Dulles, VA 22079**

hereinafter referred to as the Permittee, permission to:

- X Encroach in, on, or over State-owned subaqueous bottoms pursuant to Chapter 12, Subtitle III, of Title 28.2 of the Code of Virginia.
- Use or develop tidal wetlands pursuant to Chapter 13, Subtitle III, of Title 28.2 of the Code of Virginia.

Permittee is hereby authorized to replace the Route 7 bridge crossing of Difficult Run, to install by the directional bore method, 28 conduits beneath a 50-foot wide section of Difficult Run, and to relocate and stabilize with articulated concrete blocks, approximately 1,500 linear of Colvin Run. This work is associated with the Route 7 Improvements Project between Colvin Run Road and Jarrett Valley Drive, in Fairfax County. All activities authorized herein shall be accomplished in conformance with the revised drawings dated received May 16, 2019, and July 24, 2019, which are attached and made a part of this permit.

This permit is granted subject to the following conditions:

- (1) The work authorized by this permit is to be completed by **September 30th, 2022**. The Permittee shall notify the Commission when the project is completed. The completion date may be extended by the Commission in its discretion. Any such application for extension of time shall be in writing prior to the above completion date and shall specify the reason for such extension and the expected date of completion of construction. All other conditions remain in effect until revoked by the Commission or the General Assembly.
- (2) This permit grants no authority to the Permittee to encroach upon the property rights, including riparian rights, of others.
- (3) The duly authorized agents of the Commission shall have the right to enter upon the premises at reasonable times, for the purpose of inspecting the work being done pursuant to this permit.
- (4) The Permittee shall comply with the water quality standards as established by the Department of Environmental Quality, Water Division, and all other applicable laws, ordinances, rules and regulations affecting the conduct of the project. The granting of this permit shall not relieve the Permittee of the responsibility of obtaining any and all other permits or authority for the projects.
- (5) This permit shall not be transferred without written consent of the Commissioner.
- (6) This permit shall not affect or interfere with the right vouchsafed to the people of Virginia concerning fishing, fowling and the catching of and taking of oysters and other shellfish in and from the bottom of acres and waters not included within the terms of this permit.
- (7) The Permittee shall, to the greatest extent practicable, minimize the adverse effects of the project upon adjacent properties and wetlands and upon the natural resources of the Commonwealth.
- (8) This permit may be revoked at any time by the Commission upon the failure of the Permittee to comply with any of the terms and conditions hereof or at the will of the General Assembly of Virginia.
- (9) There is expressly excluded from the permit any portion of the waters within the boundaries of the Baylor Survey.
- (10) This permit is subject to any lease of oyster planting ground in effect on the date of this permit. Nothing in this permit shall be construed as allowing the Permittee to encroach on any lease without the consent of the leaseholder. The Permittee shall be liable for any damages to such lease.
- (11) The issuance of this permit does not confer upon the Permittee any interest or title to the beds of the waters.
- (12) All structures authorized by this permit, which are not maintained in good repair, shall be completely removed from State-owned bottom within three (3) months after notification by the Commission.
- (13) The Permittee agrees to comply with all of the terms and conditions as set forth in this permit and that the project will be accomplished within the boundaries as outlined in the plans attached hereto. Any encroachment beyond the limits of this permit shall constitute a Class 1 misdemeanor.
- (14) This permit authorizes no claim to archaeological artifacts that may be encountered during the course of construction. If, however, archaeological remains are encountered, the Permittee agrees to notify the Commission, who will, in turn notify the Department of Historic Resources. The Permittee further agrees to cooperate with agencies of the Commonwealth in the recovery of archaeological remains if deemed necessary.
- (15) The Permittee agrees to indemnify and save harmless the Commonwealth of Virginia from any liability arising from the establishment, operation or maintenance of said project.

The following special conditions are imposed on this permit:

- (16) The yellow placard accompanying this permit document must be conspicuously displayed at the work site.
- (17) Permittee agrees to notify the Commission a minimum of 15 days prior to the start of the activities authorized by this permit.
- (18) Should the State threatened Wood Turtle be encountered during any of the work authorized by this permit, it should immediately be removed from danger and moved to suitable habitat in or near the closest perennial stream.
- (19) The instream construction activities shall be accomplished during low flow periods and within cofferdams constructed of non-erodible materials in such a manner that no more than half the width of the waterway is obstructed at any point in time.
- (20) All area of State-owned bottom and adjacent lands disturbed by this activity shall be restored to their original contours and natural conditions within thirty (30) days from the date of completion of the authorized work. All excess materials shall be removed to an upland site and contained in such a manner to prevent its reentry into State waters.
- (21) Erosion and sediment control measures shall be in conformance with the 1992 Third Edition of the Virginia Erosion and Sediment Control Handbook and shall be employed throughout construction.
- (22) The Permittee agrees to develop a contingency / clean-up plan to address potential frac-outs or related spills associated with any directional drilling activities.
- (23) Permittee shall execute a transfer of this permit to the Virginia Department of Transportation upon their acceptance of the structures authorized herein.

| Description of Fees | Amount | Unit of Measure | Rate | Total | Frequency | After-The-Fact |
|--------------------------|---------|-----------------|-------|-------------------|-----------|----------------|
| Encroachment Royalty | 1400.00 | Linear Feet | 3.000 | \$4200.00 | One-Time | |
| Permit Fee | | | | \$100.00 | One-Time | |
| Total Permit Fees | | | | \$4,300.00 | | |

This permit consists of 22 Pages

PERMITTEE

Permittee's signature is affixed hereto as evidence of acceptance of all of the terms and conditions herein.

In cases where the Permittee is a corporation, agency or political jurisdiction, please assure that the individual who signs for the Permittee has proper authorization to bind the organization to the financial and performance obligations which result from activity authorized by this permit.

PERMITTEE

Accepted for

23rd day of OCTOBER, 20 19

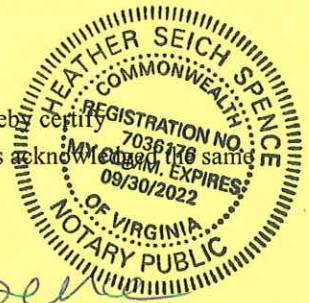
By Jeffrey S. Austin VICE PRESIDENT
(Name) (Title)

State of Virginia
City (or County) of Fairfax, to-wit:

I, Heather Seich Spence a Notary Public in and for said City (or County) and State hereby certify that Jeffrey S. Austin, Permittee, whose name is signed to the foregoing, has acknowledged the same before me in my City (or County) and State aforesaid.

Given under my hand this 23rd day of October, 2019
My Commission Expires: 9/30/2022

Notary Public Heather Seich Spence



COMMISSION

IN WITNESS WHEREOF, the Commonwealth of Virginia, Marine Resources Commission has caused these presents to be executed in its behalf by Tony Watkinson, Chief, Habitat Management
(Name) (Title) Marine Resources Commission

4th day of November, 20 19

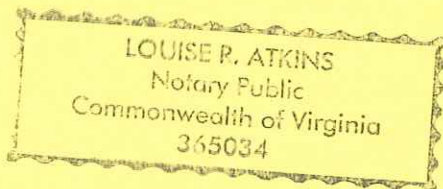
By Tony Watkinson

State of Virginia
City of Hampton, to-wit:

I, Louise R. Atkins, a Notary Public within and for said City, State of Virginia, hereby certify that Tony Watkinson, whose name is signed to the foregoing, bearing the 24th day of September 2019, has acknowledged the same before me in City aforesaid.

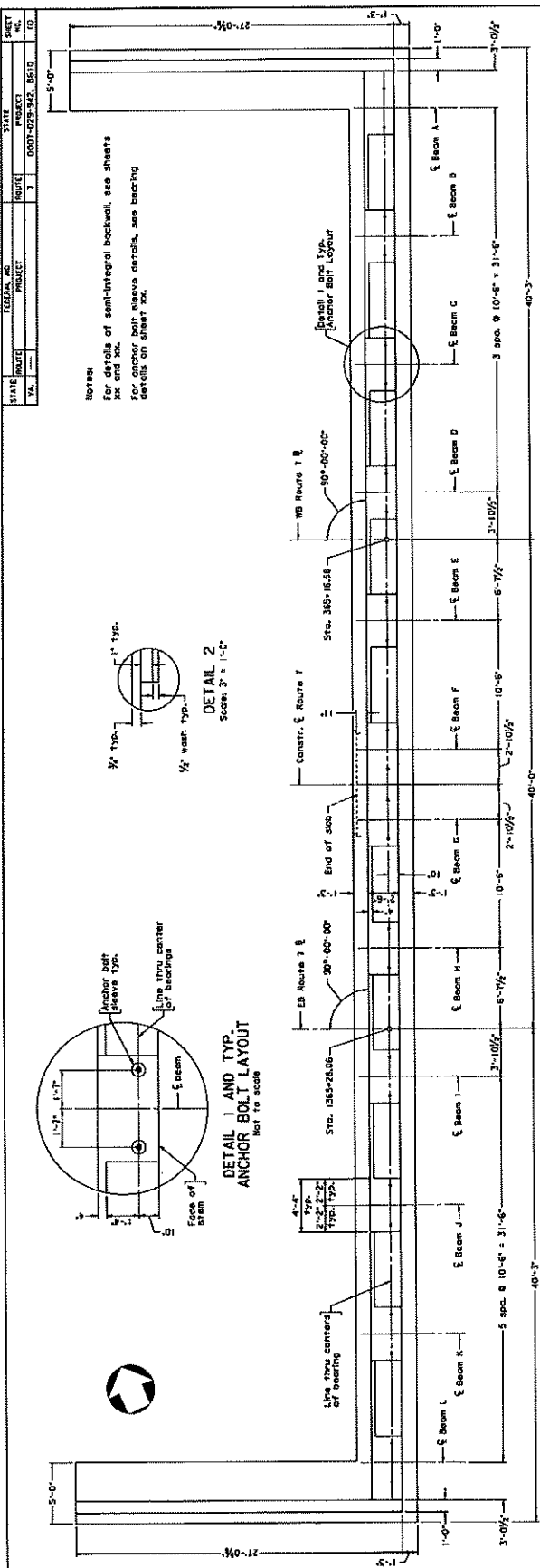
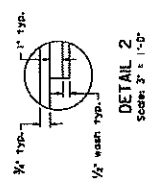
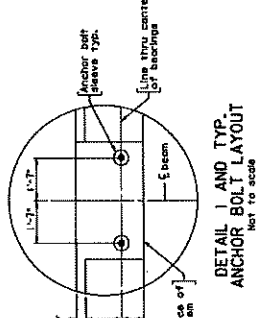
Given under my hand this 4th day of November, 20 19
My Commission Expires: January 31, 2021

Notary Public Louise R. Atkins

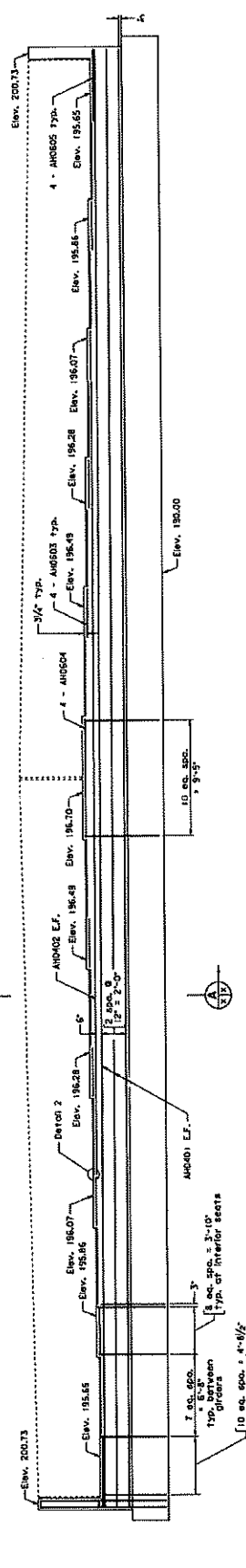


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|-------|---------------------|-------|-------------------|
| STATE | FEDERAL AID PROJECT | STATE | PROJECT |
| VA. | | VA. | 000-429-342, B51D |
| DATE | NO. | DATE | NO. |
| | 7 | | |

NOTES:
 For details of semi-integral deck, see sheets 10 of 33
 For anchor bolt sleeve details, see bearing details on sheet 10A.



PLAN



ELEVATION

Second Plus not shown

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| PRELIMINARY PLANS THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION | | COMMUNICATIONS OF VIRGINIA DEPARTMENT OF TRANSPORTATION STRUCTURE AND BRIDGE DIVISION | |
| No. | Description | Design No. | DATE |
| | Revisions | 2019 | Mar 2019 |
| SHEET NO. 10 of 33 | | PROJECT NO. 299-93 | |

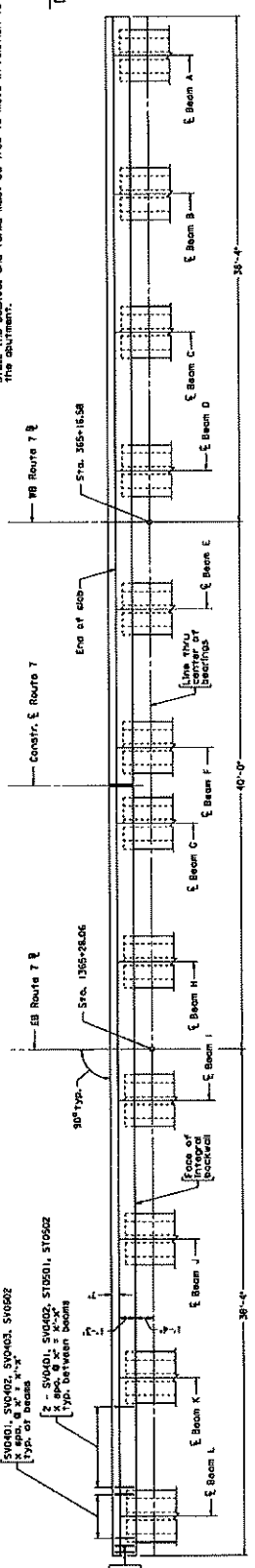
Scale: 1/4" = 1'-0" unless otherwise shown. © 2018 Commonwealth of Virginia

ADDITIONAL INFORMATION/REVISIONS Received by VMRC on May 16, 2019 /blh

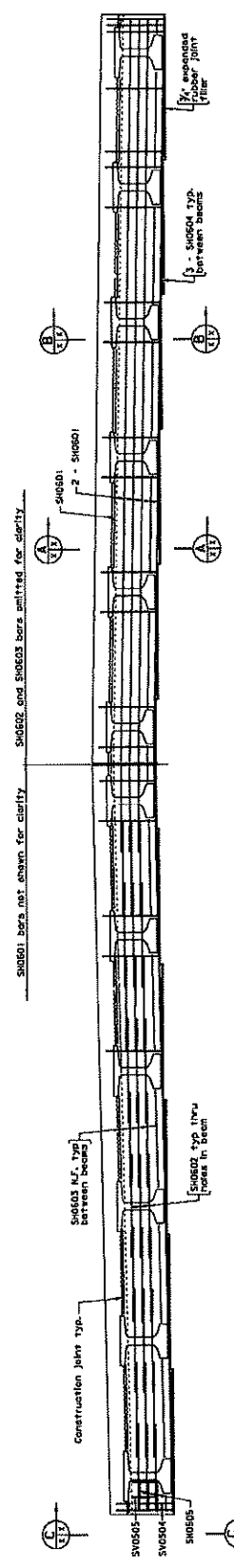
PREPARED BY: JAMES M. WOODS
 CHECKED BY: JAMES M. WOODS
 DATE: 05/16/2019

| | | | | |
|-------|-------|--------------------|---------------|-----------|
| STATE | ROUTE | FEDERAL RD PROJECT | STATE PROJECT | SHEET NO. |
| WI. | 7 | DDP-C2P-2E2, BE1D | | 11 |

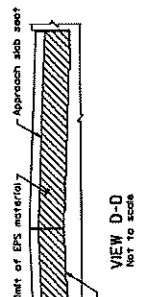
Notes:
 Integral backwall concrete shall be placed and cured to a minimum strength of 3000 psi prior to placement of deck concrete.
 Backfill operations above seat level shall not be started until deck concrete has reached a minimum strength of 3000 psi. Backfill shall be placed such that the differential in fill height between both abutments does not exceed 6" after compaction.
 For details of walls attached to the web and location and number of BC series bars, see sheet 22.
 The integral backwall shall be cast when the least thermal movement of the superstructure can be expected during the period of initial curing. The backwall shall be cast on a uniform, compacted uniformly sandy soil.
 Forms for the backwall shall be attached to the beams only; the forms shall not be attached to or blocked against the abutment. The forms shall be braced and forms must be free to retract to the abutment.



PLAN



ELEVATION



VIEW D-D
NOT TO SCALE

PRELIMINARY PLANS
 THESE PLANS NOT TO BE USED
 FOR CONSTRUCTION

| | | | |
|---|--|----------|---------------|
| COMMISSIONER OF TRANSPORTATION STRUCTURE AND BRIDGE DIVISION | | DATE | NO. OF SHEETS |
| DESIGNED BY | CHECKED BY | DATE | NO. OF SHEETS |
| PROJECT NO. | PROJECT NAME | DATE | NO. OF SHEETS |
| 299-93 | ABUTMENT A SEMI-INTEGRAL BACKWALL PLAN AND ELEVATION | Mar 2013 | 11 of 11 |

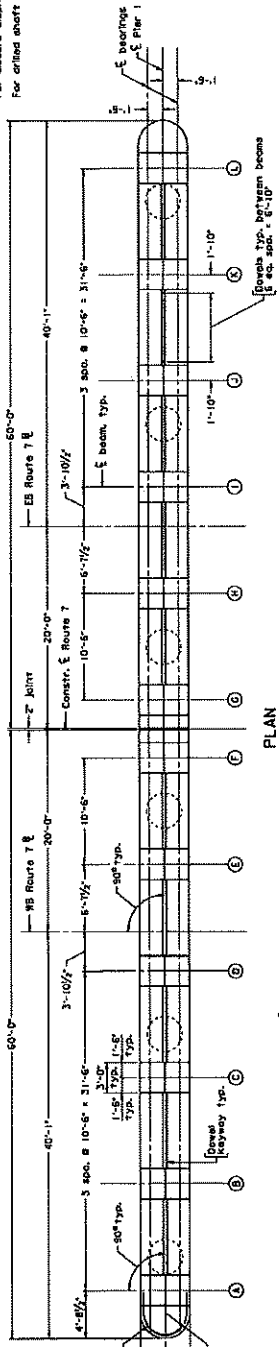
Scale: 1/4" = 1'-0" unless otherwise shown
 © 2013 Commonwealth of Virginia

ADDITIONAL INFORMATION/REVISIONS Received by VMRC on May 16, 2019 7/bh

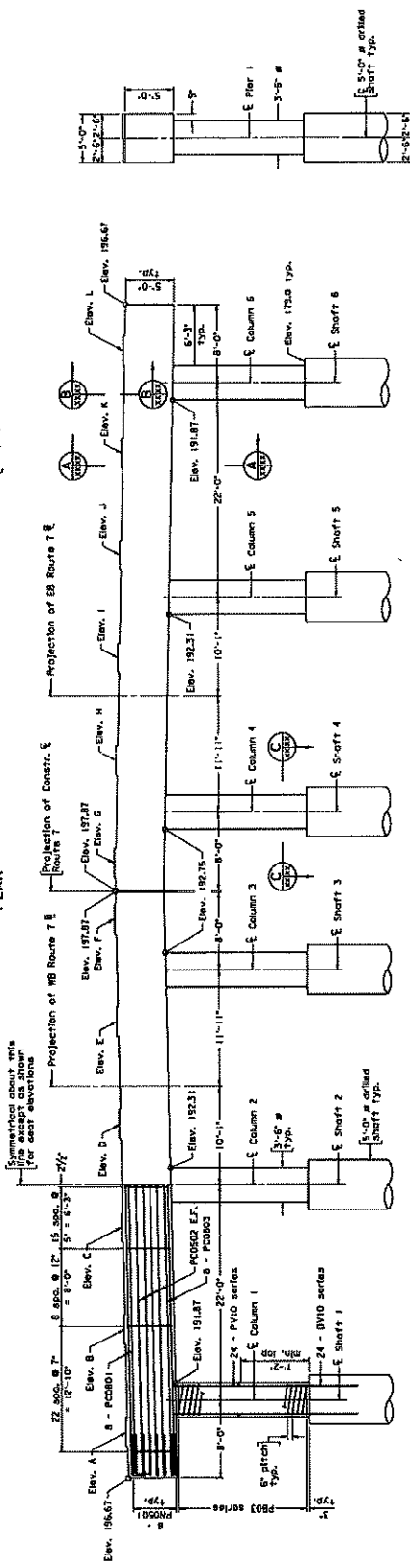
REINFORCING BARS
 STRUCTURAL STEEL

| | | | | | | |
|-------|-------------|-------|--------------------|-------|---------|-------|
| STATE | FEDERAL AID | ROUTE | PROJECT | STATE | PROJECT | SHEET |
| VA | | 7 | DDDD-243-142L B51D | | | X |

NOTE:
 When finishing concrete between and beyond posts, floor surfaces to draft from pier to edges of esp.
 At reinforcement in the pier shall be back steel.
 For reinforcement in the beam seat, see sheet no.
 For column diagram details, see sheet no.
 For cribbed shaft details, see sheet no.



PLAN



ELEVATION

END VIEW

| Elev. A | Elev. B | Elev. C | Elev. D | Elev. E | Elev. F | Elev. G | Elev. H | Elev. I | Elev. J | Elev. K | Elev. L |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 196.50 | 197.11 | 197.32 | 197.53 | 197.74 | 197.95 | 198.16 | 198.37 | 198.58 | 198.79 | 199.00 | 199.21 |
| 197.11 | 197.15 | 197.36 | 197.57 | 197.78 | 197.99 | 198.20 | 198.41 | 198.62 | 198.83 | 199.04 | 199.25 |

PRELIMINARY PLANS
 THESE PLANS MUST NOT BE USED
 FOR CONSTRUCTION

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| COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION STRUCTURE AND BRIDGE DIVISION | |
| NO. | DESCRIPTION |
| 1 | Revisions |
| DATE | BY |
| Mar 2018 | 299-93 |
| SCALE | X OF XX |

| | | |
|----------|--------|---------|
| DATE | BY | SCALE |
| Mar 2018 | 299-93 | X OF XX |

Scale: 3/8" = 1'-0"
 D.S.L. Commonwealth of Virginia

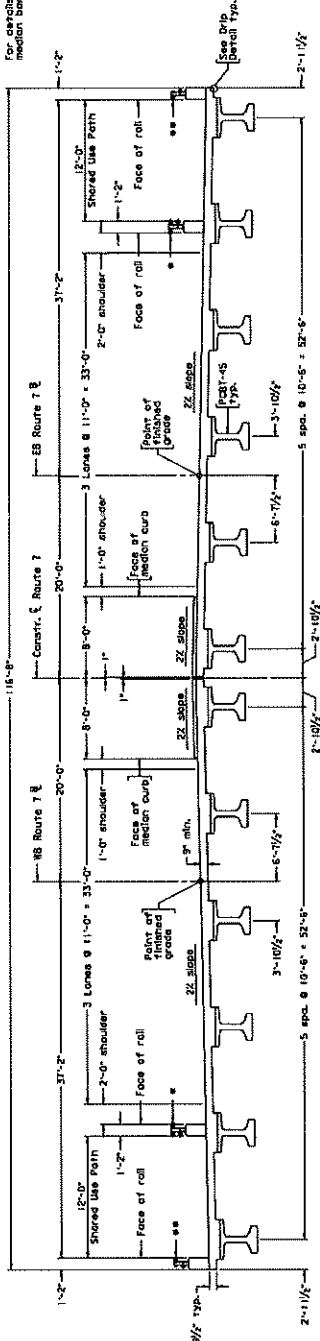
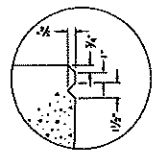
ADDITIONAL INFORMATION/REVISIONS Received by VMRC on May 16, 2019 /616

DESIGNED BY: JAMES W. HARRIS, INC.
 STRUCTURAL ENGINEER

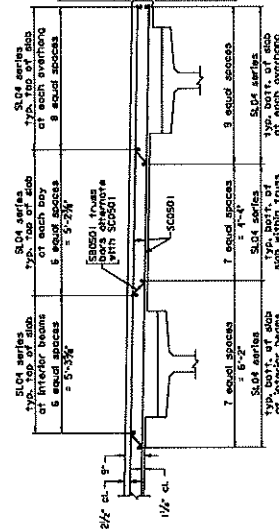
| | | | | | | | | |
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| STATE | ROUTE | FEDERAL AID PROJECT | STATE PROJECT | ROUTE | PROJECT | STATE PROJECT | ROUTE | PROJECT |
| VA. | 7 | | 0697-229-241 | BL10 | | | | |

| | | | |
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| REVISION | DATE | BY | REASON |
| | | | |

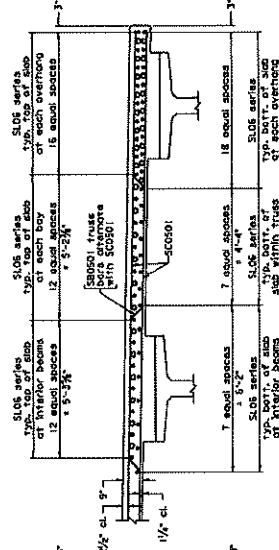
Notes:
 1. For additional reinforcing steel details, see back plan on sheet xx.
 2. For details of rolling, see sheets xx and xx. For details of median barrier, see sheet xx.



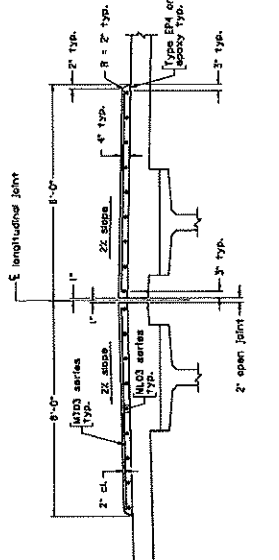
TRANSVERSE SECTION
 Scale: 3/8" = 1'-0"



TYPICAL REINFORCEMENT DETAIL



TYPICAL REINFORCEMENT DETAIL OVER PIER



DETAIL I

PRELIMINARY PLANS
 THESE PLANS MAY NOT BE USED
 FOR CONSTRUCTION

| | |
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| COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION STRUCTURE AND BRIDGE DIVISION | |
| TRANSVERSE SECTION AND DETAILS | |
| No. | Description |
| 1 | Revisions |
| DATE | BY |
| 03/16/19 | JK |
| APPROVED | DATE |
| 299-33 | Mar 2019 |
| SHEET NO. | X OF XX |

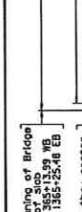
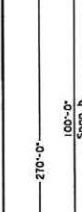
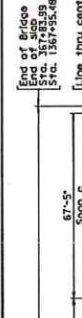
Scale: 1/2" = 1'-0" unless otherwise shown

ADDITIONAL INFORMATION/REVISIONS Received by VMRC on May 16, 2019 /blh

| | | | | | |
|-----------------------------|---------------|--------------------|---------------|--------------------|---------------|
| STATE | FEDERAL AID | PROJECT | ROUTE | PROJECT | SHEET NO. |
| VA | 7 | 0007-029-942, B610 | 7 | 0007-029-942, B610 | 1 |
| NBS Number: 0000000030028 | UPE No. 38418 | UPE No. 38418 | UPE No. 38418 | UPE No. 38418 | UPE No. 38418 |
| Federal Overweight Code: FO | FO | FO | FO | FO | FO |

DESIGN EXCEPTIONS:
None

GENERAL NOTES:
 1. 12'-0" shored use path, 1'-2" roll, 35'-0" roadway, 16'-0" median, 11'-4" roadway, 1'-2" roll, 12'-0" shored use path, overall width 114'-4" between face of rolls.
 2. 10'-0" shored use path, 1'-2" roll, 35'-0" roadway, 16'-0" median, 11'-4" roadway, 1'-2" roll, 12'-0" shored use path, overall width 114'-4" between face of rolls.
 3. 67'-5" span, prestressed concrete 45' deep bottom spans constructed per the book.
 Capacity: N-33 loading
 Drainage Area: 44.6 sq. mi.
 Specifications: Virginia Department of Transportation Road and Bridge Specifications, 2016.
 Design: AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014; and VDOT Memoranda.
 Standards: Virginia Department of Transportation Road and Bridge Specifications, 2016, including current editions.
 These plans are inseparable units accompanied by the Subcontract Specifications and Special Provisions included in the contract documents.
 Design loading includes 20 psf allowance for construction tolerances and construction methods.
 Design loading includes 15 psf allowance for future wearing surfaces.
 Concrete in deck, rolls, terminal walls, medians, integral backwalls, approach slabs and abutment structures shall be in accordance with Section 217.02Bb in plans and abutment plans and footings, Class A1.
 ■ Normal to abutment.
 Utilities not shown for clarity.



RECOMMENDED FOR APPROVAL FOR CONSTRUCTION

VDOT PROJECT MANAGER

DISTRICT CONSTRUCTION MANAGER

Approved: _____ Date: _____
 Chief Engineer

Approved: _____ Date: _____
 299-93
 Sheet 1 of 99

RECOMMENDED FOR APPROVAL _____ Date _____
 Designer / Designer

RECOMMENDED FOR APPROVAL _____ Date _____
 Designer / Designer

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RECOMMENDED FOR APPROVAL _____ Date _____
 Designer / Designer

RECOMMENDED FOR APPROVAL _____ Date _____
 Designer / Designer

| No. | Description | REVISION | DATE |
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| | | | |

PRELIMINARY PLANS
 THESE PLANS NOT TO BE USED
 FOR CONSTRUCTION

For Title Block, see Sheet 2.

Scale: 1" = 20'

DEVELOPED SECTION ALONG EB ROUTE 7

WB Route 7 & Sillier

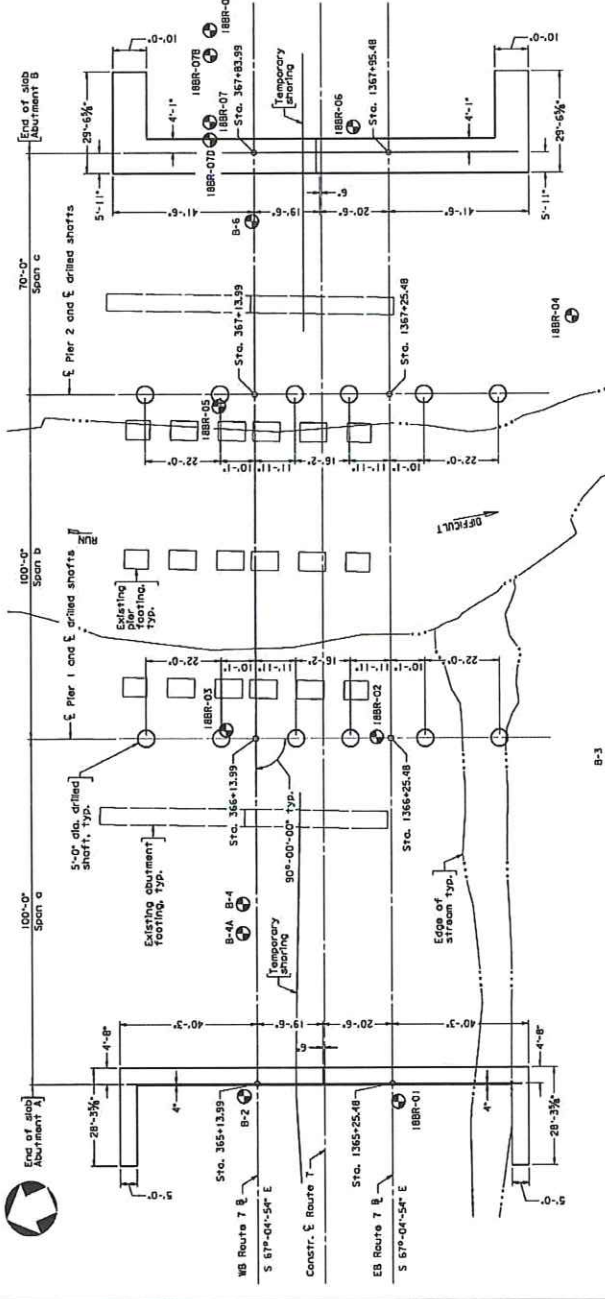
Tab 11 Revised 5/8/2019

ADDITIONAL INFORMATION/REVISIONS Inserted by VTRC on May 16, 2019. 300

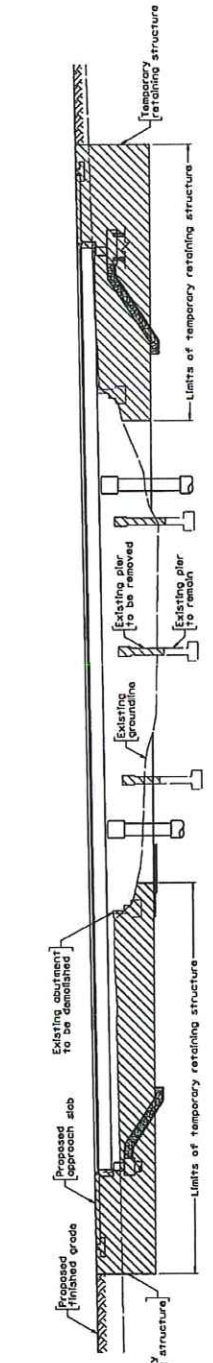
ADDITIONAL INFORMATION/REVISIONS Inserted by VTRC on May 16, 2019. 300

| | | | |
|-------------|---------------------|--------------------|-----------|
| STATE ROUTE | FEDERAL AID PROJECT | STATE PROJECT | SHEET NO. |
| 7 | 7 | 0007-029-942, BS10 | 4 |

Notes:
 The substructure layout is to be used only for the purpose of locating footings of abutments and piers.
 For abutment plans, sections and details, see sheets 9 thru 25.
 For pier plans, sections and details, see sheets 26 thru 72.
 For bridge engineering geology sheets, see sheets 54 thru 72.
 Temporary shoring utilized by the Contractor shall be shown on the drawing. A separate shoring plan shall be prepared by a registered professional engineer and submitted to the District Engineer for review and approval.
 18BR-07A The Contractor and his Engineer shall determine the methods and means of support required for the loads imposed by the roadway, traffic, the structure and any loads imposed by the working drawings and calculations shall be submitted to the Engineer for review and approval.
 Approximate limits of temporary shoring shown on the plans are responsible for determining the actual limits and quantities of temporary shoring. The contractor shall be responsible for maintaining minimum temporary slopes in accordance with OSHA Section 105.16 of the VDOT Road and Bridge Specifications.
 Ⓞ indicates boring location.



SUBSTRUCTURE LAYOUT



TEMPORARY SHORING LIMITS

PRELIMINARY PLANS
 THESE PLANS NOT TO BE USED
 FOR CONSTRUCTION

Tab 11 Revised 5/8/2019

Scale: 1/8" = 1'-0"

| | | | | | | | |
|-----|-------------|------|-------------|---------|----------|----------|-----------|
| No. | Description | Date | Designed By | Checked | Date | Drawn By | Sheet No. |
| | Revisions | | | | Apr 2019 | | 4 of 99 |

| | |
|---|--|
| COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION STRUCTURE AND BRIDGE DIVISION | |
| SUBSTRUCTURE LAYOUT AND TEMPORARY SHORING DETAILS | |

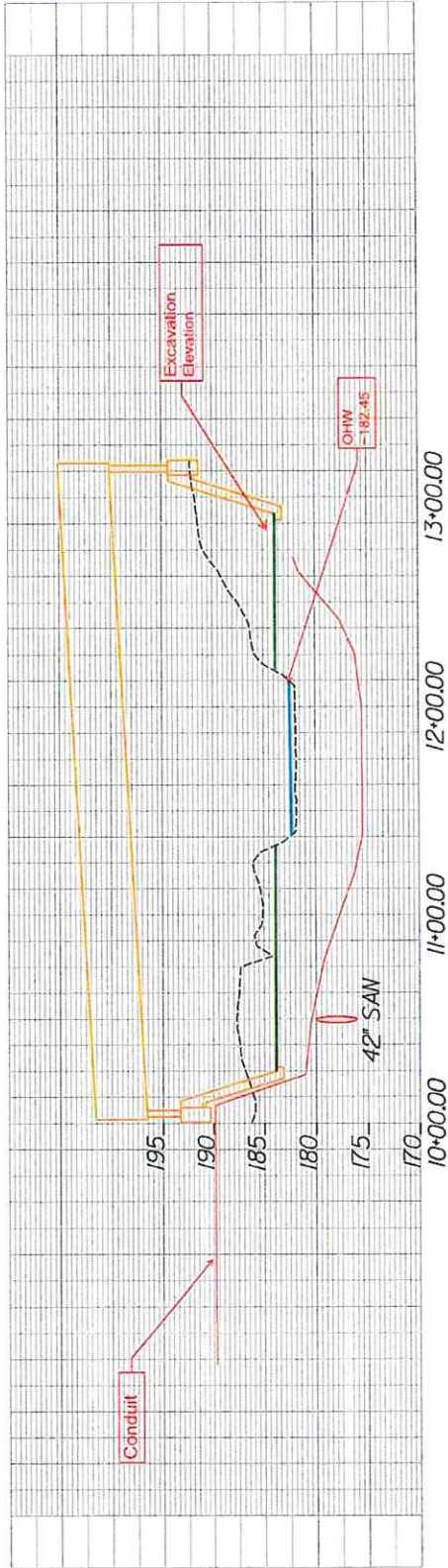
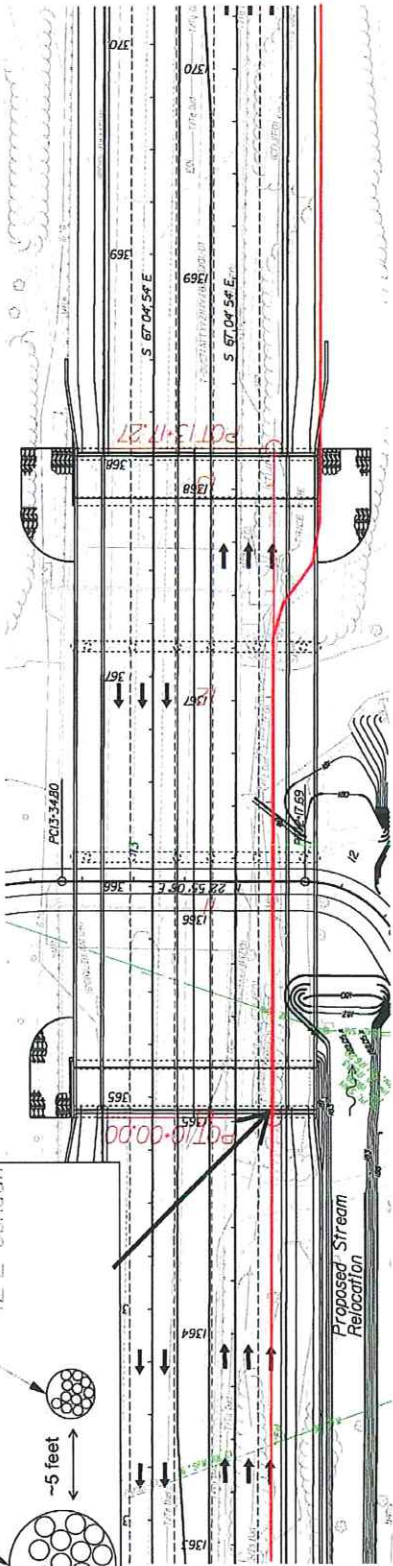
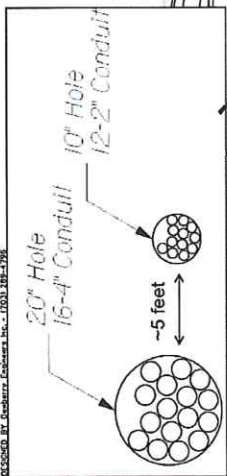
5/14/2018
2:00:57 PM

PROJECT MANAGER: ARI BARNUM, P.E., 0007 NOVA DRIVE - (703)225-9143
 ASSOCIATE ENGINEER: JAMES W. BARNUM, P.E., 12033 388-2786

0007-029-225
 Final Agreement

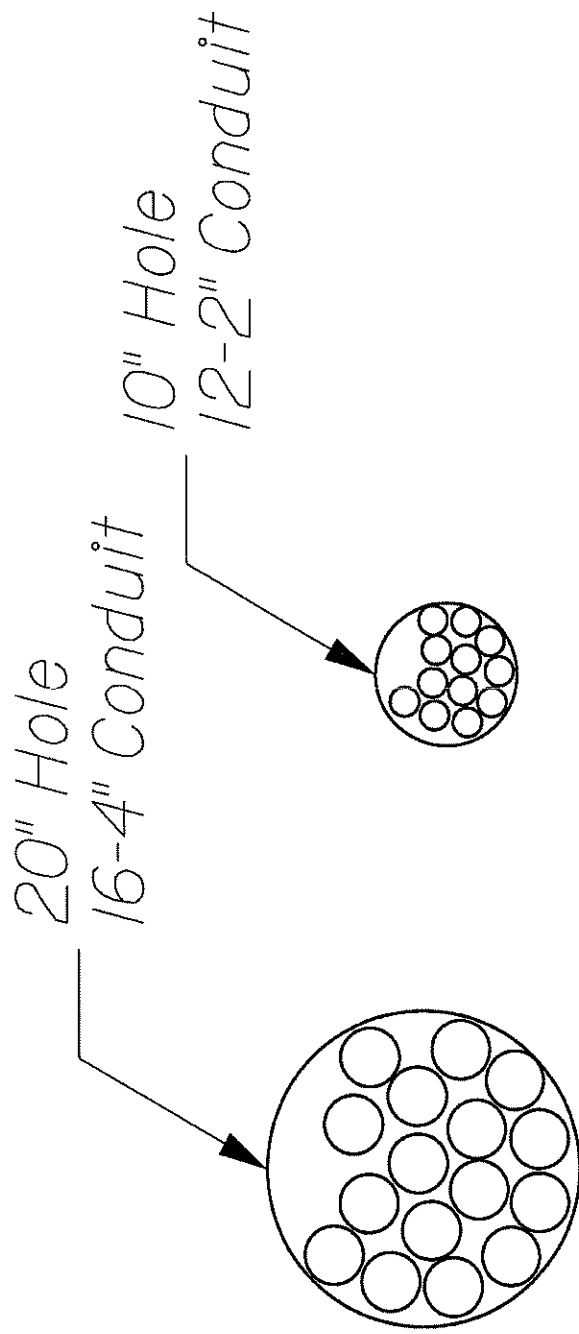
| REVISION | DATE | BY | DESCRIPTION |
|----------|------|----|-------------|
| VA | 7 | | |

DESIGN FEATURES RELATING TO CONSTRUCTION
 MAY BE SUBJECT TO CHANGE AS DEEMED
 NECESSARY BY THE DEPARTMENT



Revised 5/14/2018

0007-029-225
 0007-029-242





- NOTES:**
1. THE PROPOSED ROUTE 7 CORRIDOR EAST PROJECT (UPC 99478) EXTENDS APPROXIMATELY 3.5 MILES FROM COLVIN RUN ROAD TO JARRET VALLEY DRIVE.
 2. THE WATERS OF THE U.S. (WOUS), INCLUDING WETLANDS, BOUNDARIES WERE DELINEATED AND WERE CONFIRMED JURISDICTIONAL BY THE USACE PJD (NAO-2014-01572) ON 2017 MARCH 23.
 3. THE PROPOSED PLANS SHOWN ON THESE IMPACT SHEETS ARE FOR PERMITTING PURPOSES ONLY.

| | |
|---|-------------------|
| ROUTE 7 CORRIDOR IMPROVEMENTS EAST VDOT UPC 99478 WOUS/WETLAND IMPACT MAP FAIRFAX COUNTY, VIRGINIA | |
| | Date : APRIL 2019 |
| | Scale : 1"=1,000' |
| | Sheet : 1 OF 7 |



ADDITIONAL INFORMATION/REVISIONS Received by VMRC on May 16, 2019 /blh

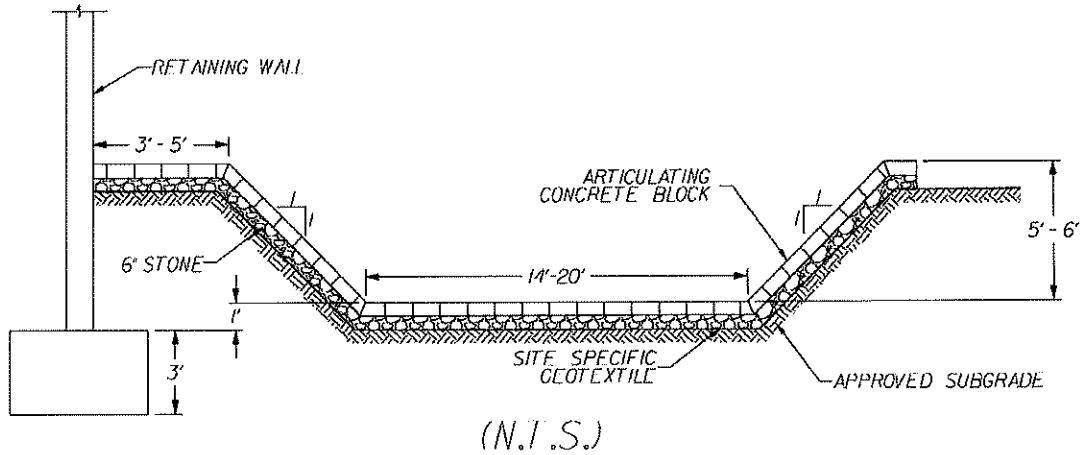


Figure 1. Typical detail of the proposed retaining wall adjacent to Colvin Run channel.

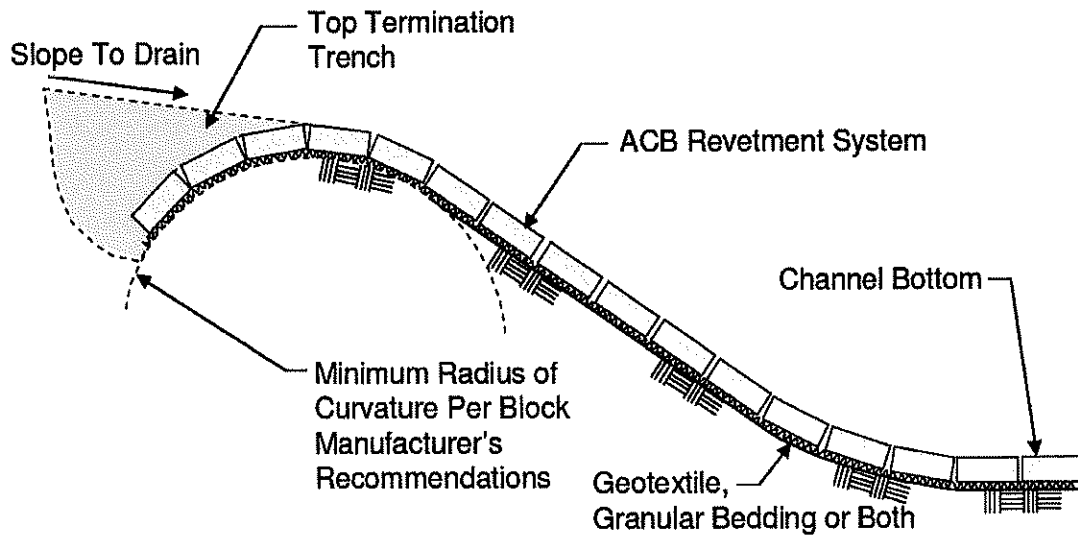
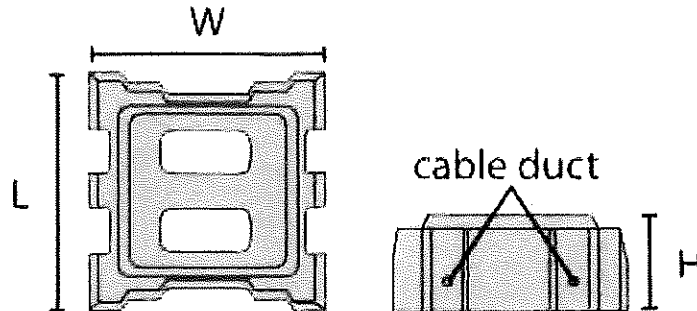


Figure 2. ACB typical layout detail for bank and bed armor (HEC-23 Third Edition, Vol. 2).

In order to design the ACB system, a hydraulic analysis of Colvin Run was performed using HEC-RAS v. 5.0.1. Preliminary hydraulic results for the 500-year storm event

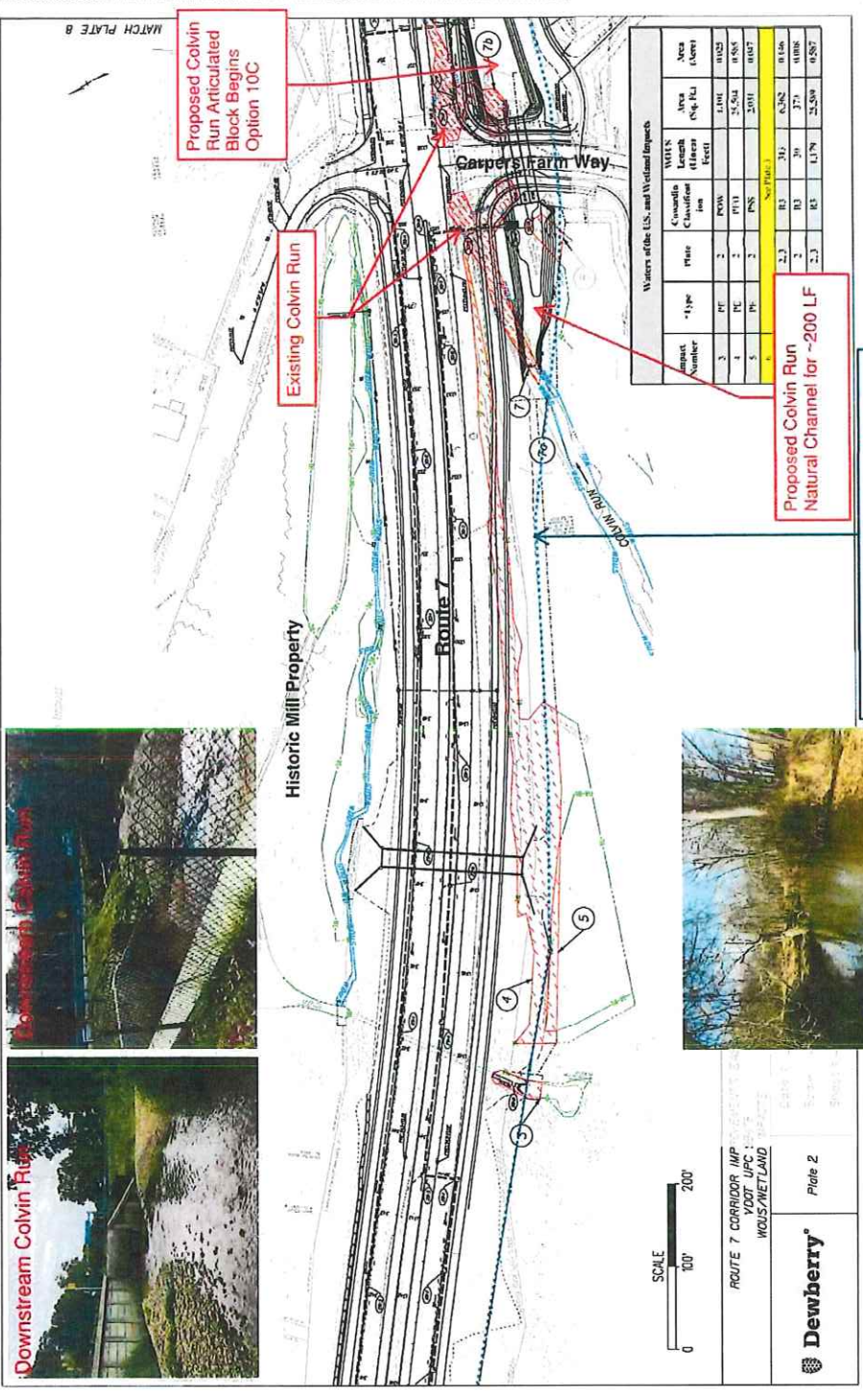


SHOREBLOCK[®] SD units are manufactured in accordance with ASTM C90, C140 and D6684-04.

Figure 3. Shoreblock SD unit (Manufactured by SHORTEC, distributed by ACF).

The ACB system is designed to protect against the 100- and 500-year scour. As the system will run from the proposed retaining wall out five (5) feet and down into the channel (and up to the opposite bank of the channel) there will be no opportunity for the material adjacent to the wall foundation to be subject to hydraulic forces that will result in scour. When installed, the ACB system will effectively resist the forces resulting in the 100- and 500-year velocities within Colvin Run.

Attached at the back are the design calculations provided by ACF Environmental. The calculations show the **Shoreblock** unit system would be sufficient to protect against the predicted scour along the proposed retaining wall, for the calculated hydraulic forces, with a factor of safety greater than 1.7. Therefore, the proposed ACB system is more than adequate to allow for the proposed base of the retaining wall to be placed at one (1) foot below the proposed bottom of the relocated Colvin Run channel.



SCALE
0 100' 200'

ROUTE 7 CORRIDOR IMP
VDOT UPC
W/US/WETLAND



Plate 2

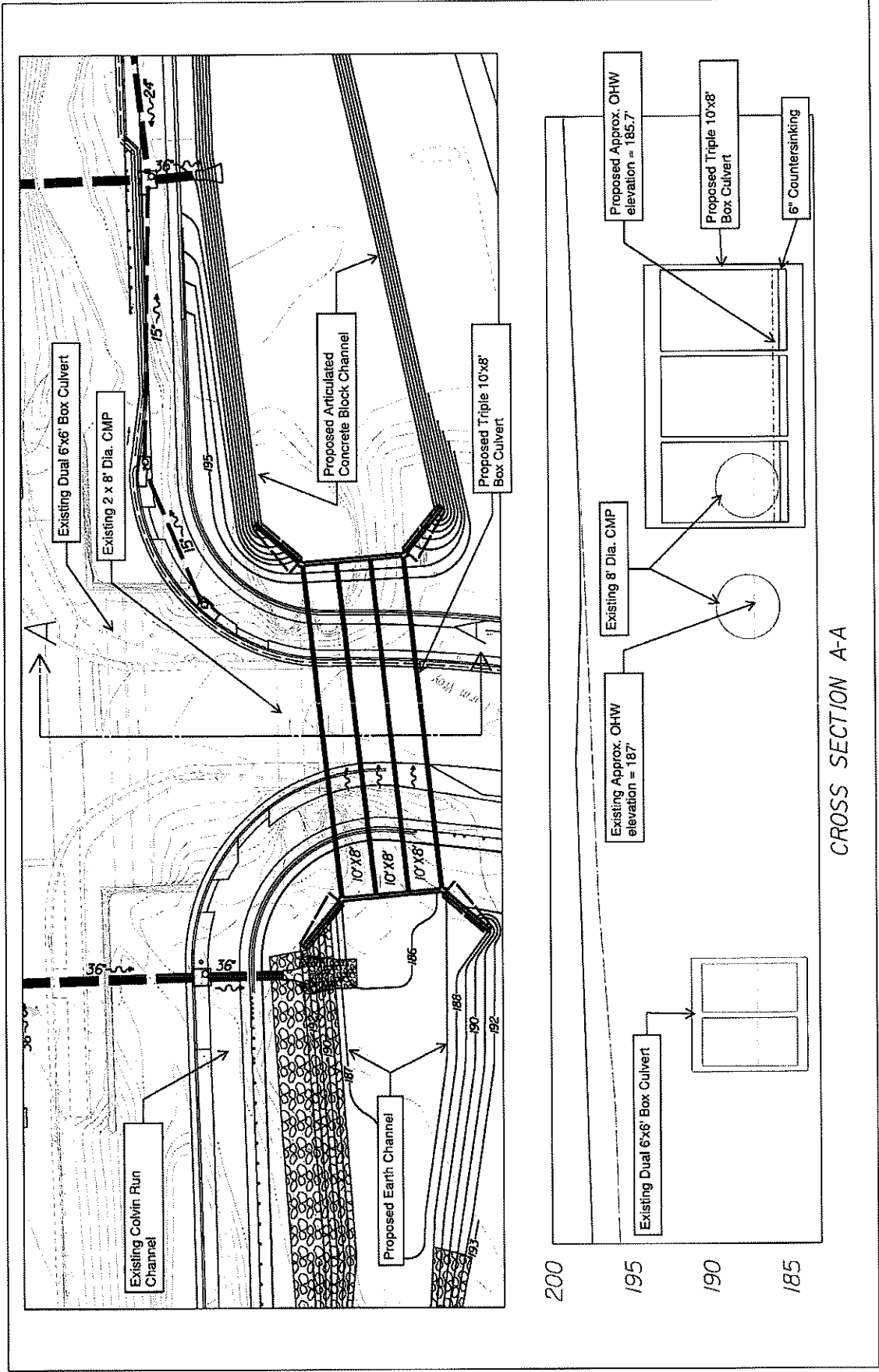
Upstream Colvin Run

Approx location of existing 54 inch water line

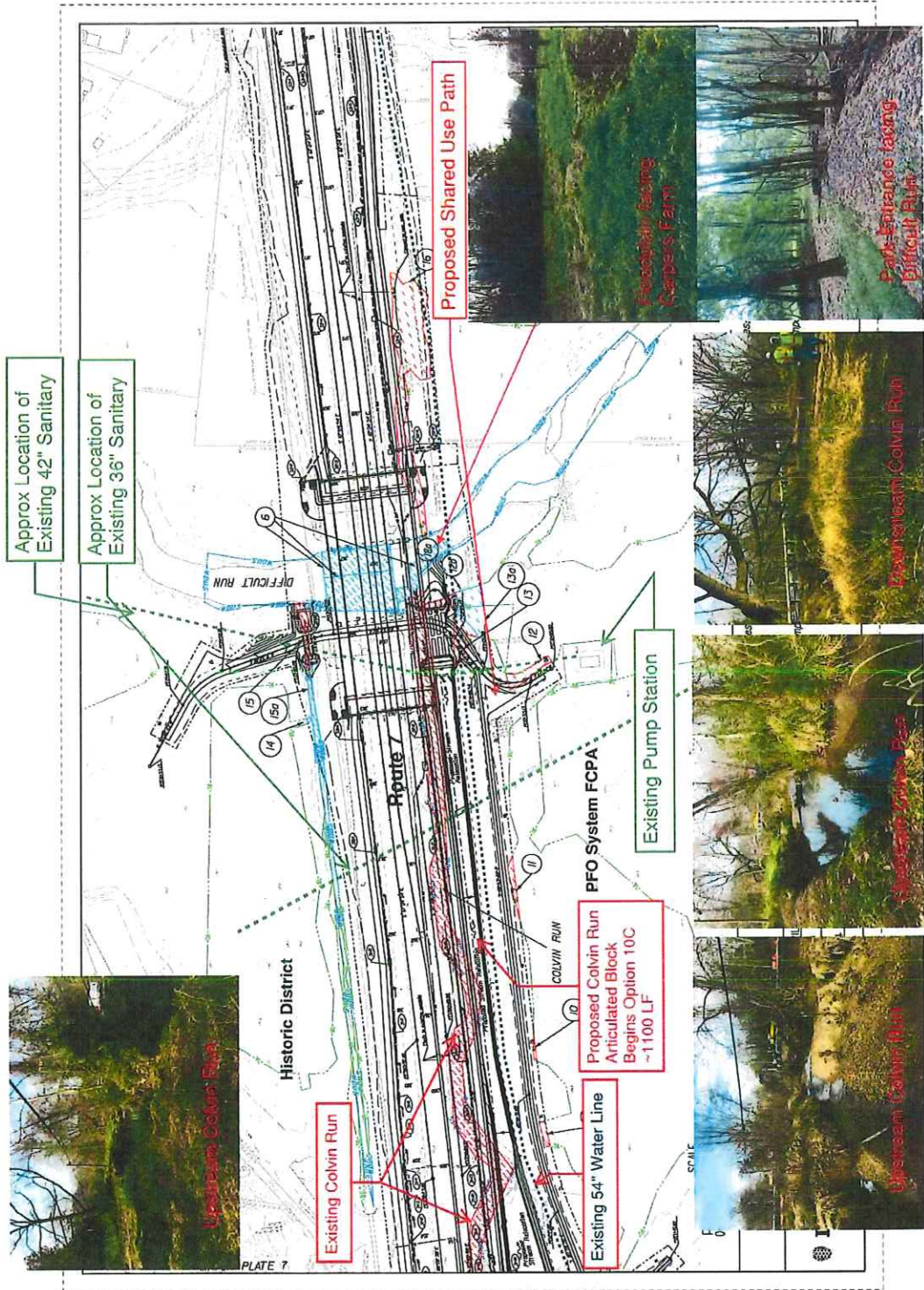
Proposed Colvin Run
Natural Channel for ~200 LF

Proposed Colvin Run Articulated Block Begins Option 10C

Existing Colvin Run



Additional Info/Revision
 Received by VMRC July 24, 2019 /lra



Approx Location of Existing 42" Sanitary

Approx Location of Existing 36" Sanitary

Proposed Shared Use Path

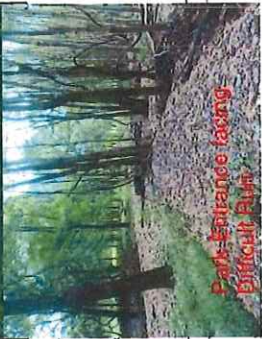
Existing Pump Station



Upstream Colvin Run



Park Entrance facing Campers Farm



Park Entrance facing Difficult Run



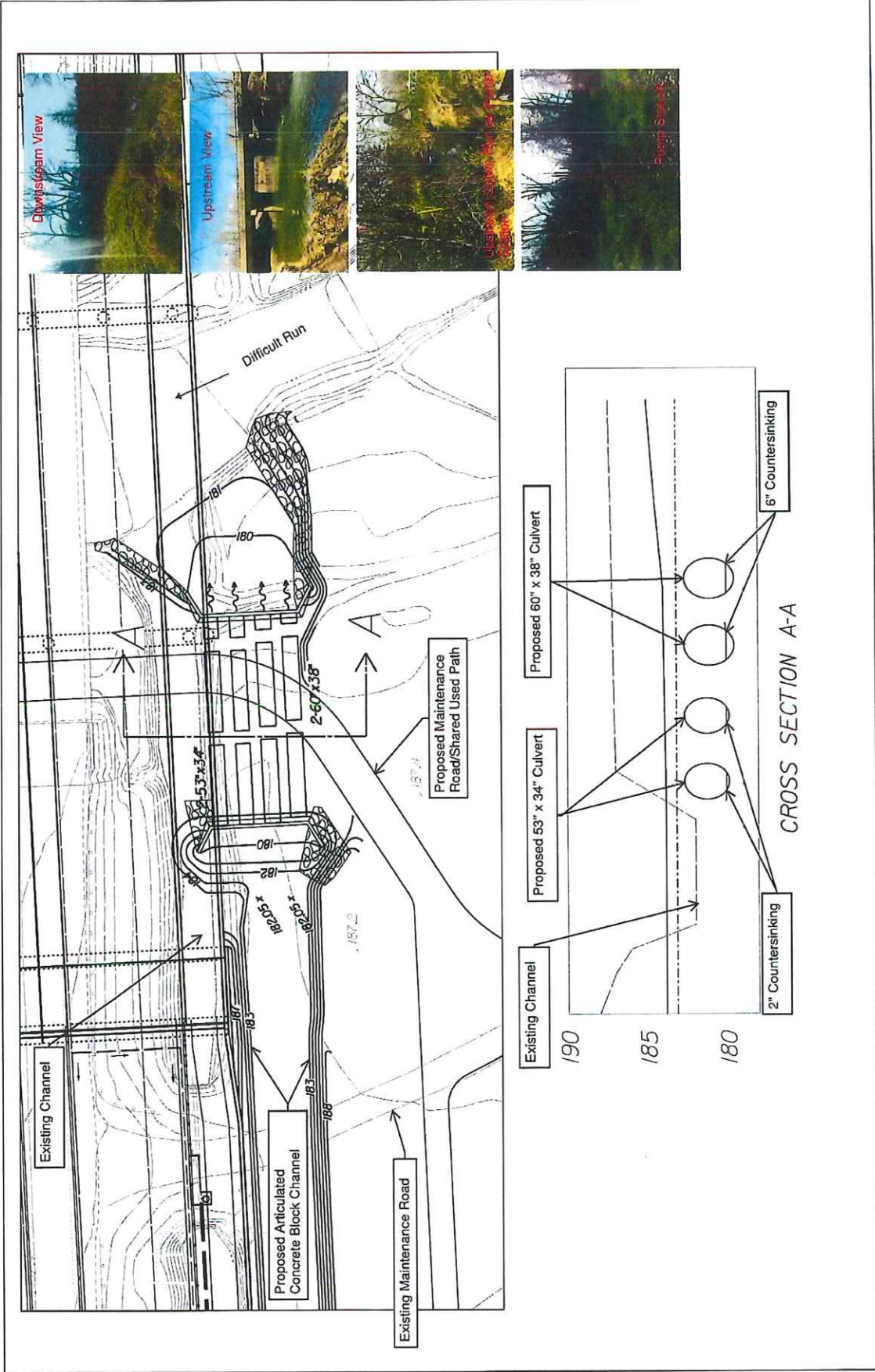
Downstream Colvin Run



Downstream Colvin Run

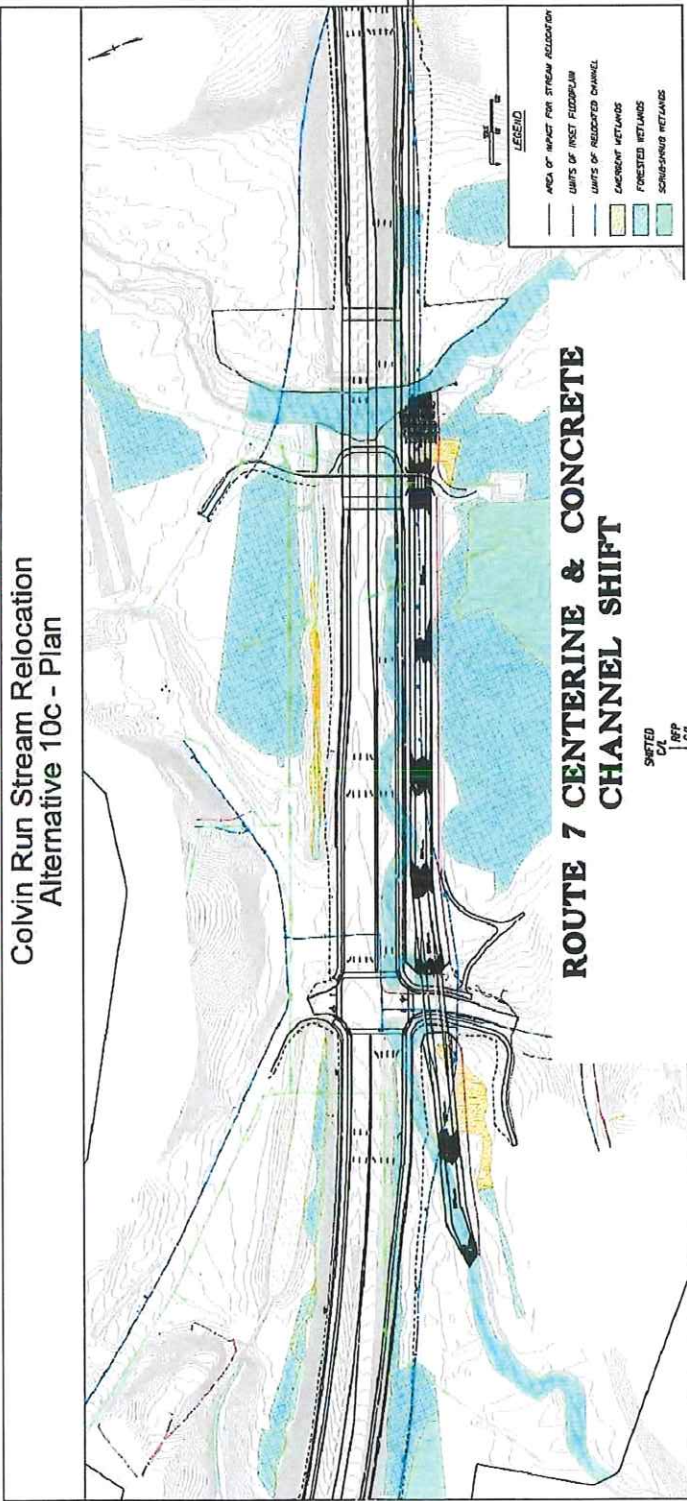


Upstream Colvin Run

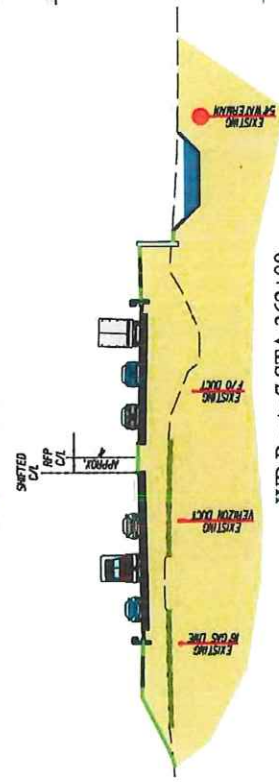


Additional Info/Revision
 Received by VMRC July 24, 2019 /ira

Figure 2-4: Colvin Run Options – Stream Relocation Option 10c



ROUTE 7 CENTERLINE & CONCRETE CHANNEL SHIFT



WB Route 7 STA 362+00

Route 7 Corridor Improvements

November 2017

SHEET #

PROJECT MANAGER AND REGISTERED PROFESSIONAL ENGINEER
REGISTERED PROFESSIONAL ENGINEER
SPECIALTY: CIVIL ENGINEERING
SUSAN RAE UTILITY, INC., ACCOMMODATION, VA
17033289-1196

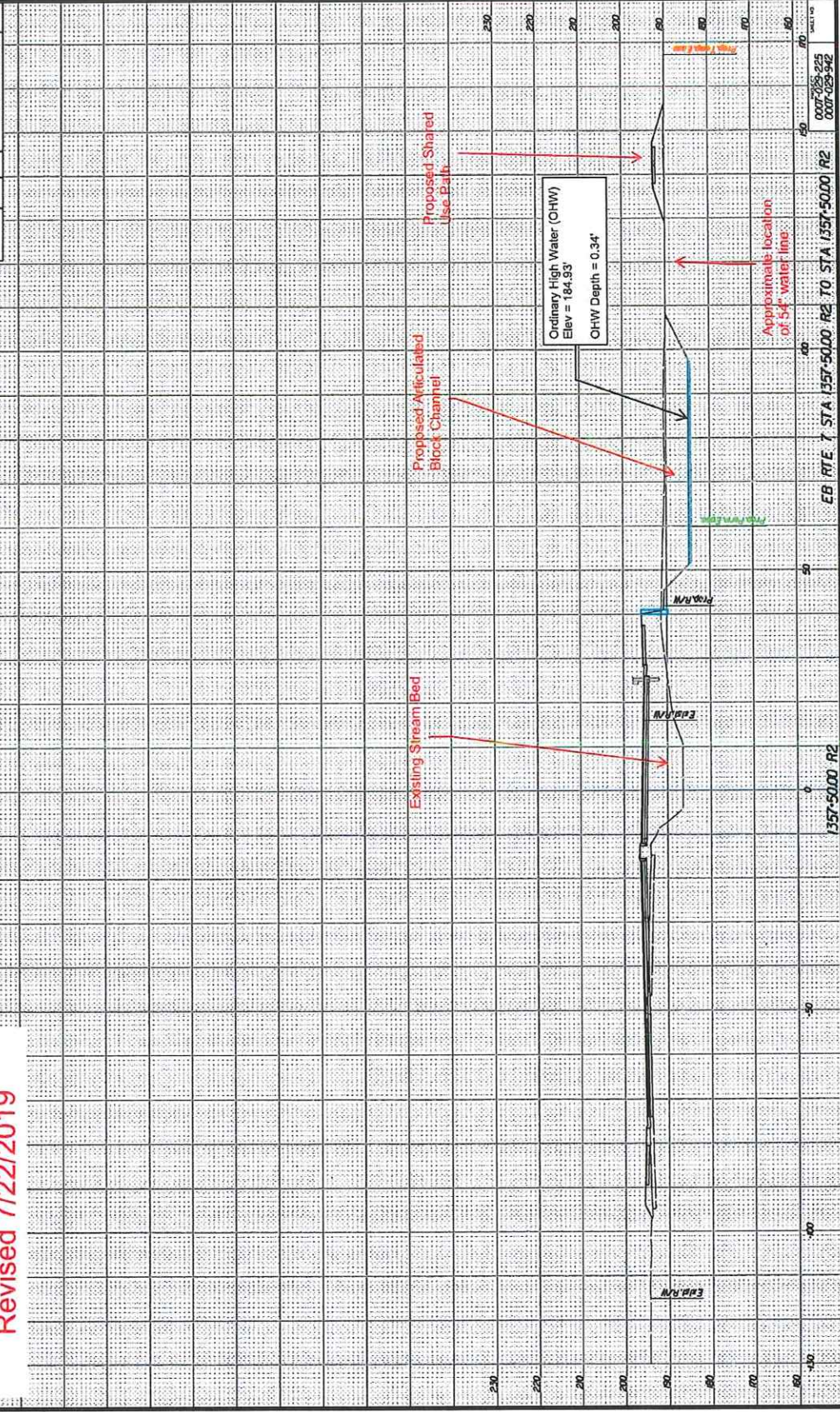
CROSS SECTIONS

SCALE: 1" IN. = 20' FT

BELOW FEATURES RELATING TO CONSTRUCTION
MAY BE SUBJECT TO CHANGE AS DEEMED
NECESSARY BY THE DEPARTMENT

| | | |
|------|---------|---|
| DATE | PROJECT | SHEET NO. |
| VA | 07 | 0007-029-225 R-201C-501 0007-029-942 B-601P-201C-501 |

Revised 7/22/2019



Additional Info/Revision
Received by VMRC July 24, 2019 /lra

0007 #

PROJECT MANAGER: P.J. BARNETT, P.E., INC. 1001 NORTH DIXIE HWY. SUITE 100
SUITE 100
DENVER, COLORADO 80202
TELEPHONE: (303) 733-4788
FAX: (303) 733-4789
WWW.PJBARNETT.COM

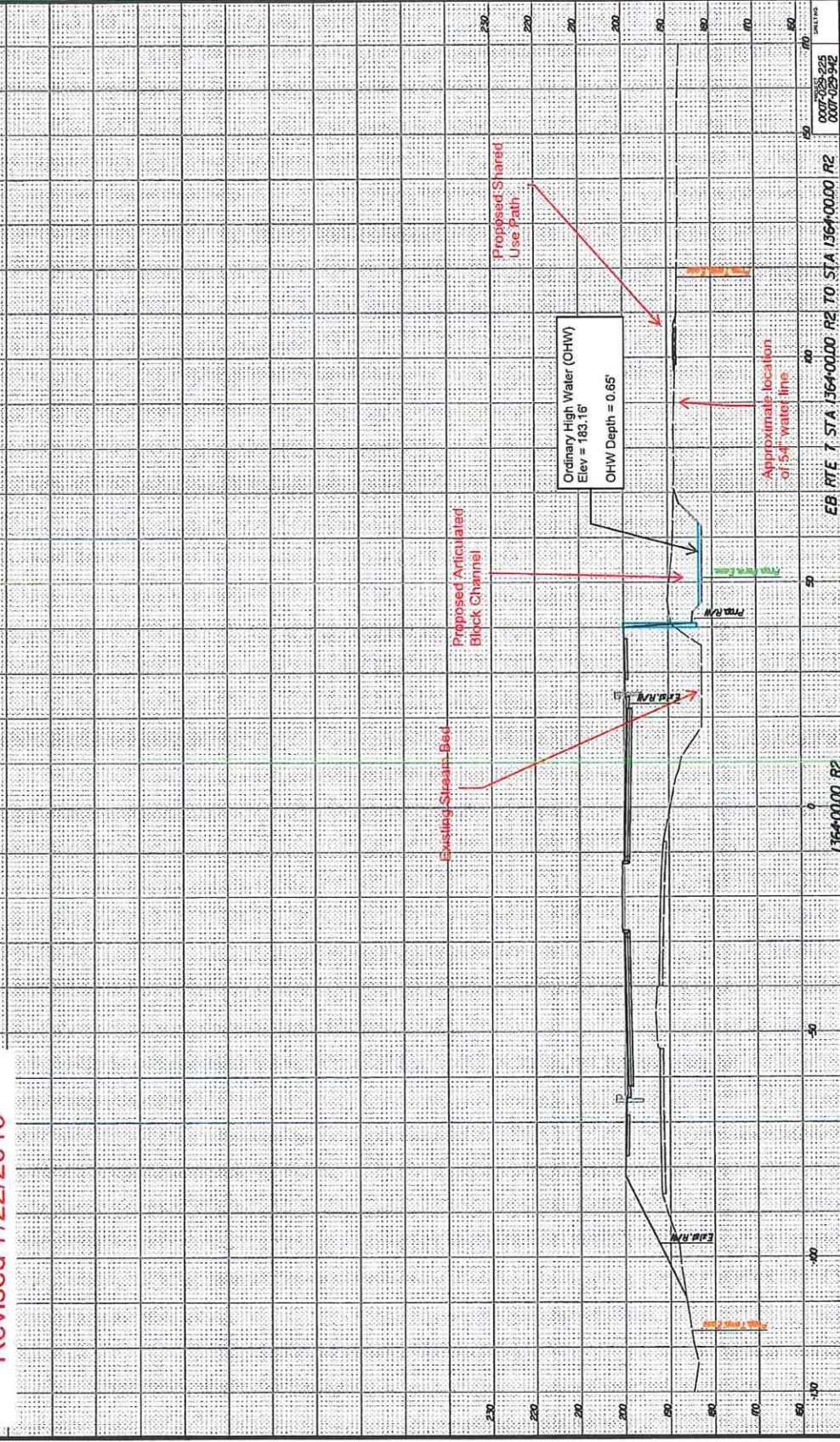
CROSS SECTIONS

SCALE: 1 IN. = 10 FT

DESIGN FEATURES RELATED TO THE CONSTRUCTION OF THIS PROJECT MAY BE SUBJECT TO CHANGE AS REQUIRED BY THE DEPARTMENT OF TRANSPORTATION

| | | | |
|------------|----|--------------|-----------------|
| DATE | BY | PROJECT | DESCRIPTION |
| 07/22/2019 | VA | 0007-029-025 | R-201C-501 |
| | | 0007-029-042 | B-201P-201C-501 |

Revised 7/22/2019



Additional Info/Revision
Received by VMRC July 24, 2019 /lra