



**VTTrans Fall 2023 Transportation Alternatives (TAP)
and
Municipal Highway and Stormwater Mitigation Program Grant (MHSMP)
Combined Application**

Thoroughly read the TAP and MHSMP application guidebooks before you begin your application. It includes important program information and step-by-step instructions. Pay particular attention to the application process requirements. **Applications are due by e-mail by December 8, 2023.** Please e-mail the completed application to: Ross.gouin@vermont.gov and Scott.robertson@vermont.gov.

Butler Farms Culvert Upgrade Phase II
(Project Name/Title)

802-658-7961 ext. 6111
(Phone)

David Wheeler
(Municipality contact person responsible for the management of this project)

dwheeler@southburlingtonvt.gov
(e-mail address)

South Burlington
(Town)

\$ 871,680
Amount of **Federal Funds requested** (no more than 80% of the project cost estimate).

05403
(Zip Code)

\$ 217,920
Amount of Local Match. Example:
Federal Award = \$600,000 (80% of total)
Local Match = \$150,000 (20% of total)
Total Project Cost = \$750,000 (100% of the total)

104 Landfill Rd
(Mailing Address)

County: Chittenden

Town/Village/City: South Burlington

Specific location, street, or road: Butler Drive

Regional Planning Commission: Chittenden County Regional Planning Commission

If a linear project, what is the length in feet? Click here to enter text.

Is the project on or intersecting to a State maintained highway? Yes No

- *Note: If yes, be sure to include documentation that you have notified the VTTrans District Transportation Administrator of the intent to apply for TA funding and have provided them with a brief (one paragraph) description of the proposed project.*

Project type being applied for: **Scoping** **Design/Construction**

The municipality understands that a typical construction project utilizing TAP or MHSMP Program funds will take roughly three years (min.) in the Design and ROW phases prior to going to construction (as pointed out in the TAP and MHSMP Application Guides)? Yes No

Does this project have a previously completed scoping or feasibility study? Yes No

Note:

Attach a map(s) of the project area and clearly show the limits of the project as well as surrounding benefits from the proposed improvement. If the project is within or adjacent to a designated downtown, village or growth center, clearly indicate the relationship of the proposed project to the boundary of the designated area. Color photos of the area are also recommended.

Fiscal Information:

Accounting System Automated Manual Combination

SAM Unique Identifier # QLSMM3HYJP1

Fiscal Year End Month June

Property Ownership:

If the proposed project is on private property that will need to be acquired by the Municipality through purchase, easement, or eminent domain (includes temporary construction rights) in accordance with the "Uniform Act", then the municipality is committed to exercising its right of **eminent domain** to acquire the rights to construct the project if necessary. Yes No

Funding:

Does this project already have existing funding? If so, please describe. Yes No

Please note that existing projects will not be considered for additional funding without a current NEPA clearance and ROW clearance. Please provide date of clearances below:

Will you accept an award less than you applied for? Yes No

- If yes, please indicate whether local funds will be used to make up the shortfall, or if the project scope will be reduced. If the project scope is to be reduced, describe what part of the project (please be specific) you would accept partial funding for.

Funds from the City's Stormwater Utility will be used to match the remaining \$217,920 of project costs. We will attempt to use these same funds to make up any shortfall if only partial funding is awarded.

A support letter from the governing body of the applicant municipality or organization and an acknowledgement and source of the local match and commitment to future maintenance responsibility for construction projects is required (must be dated within 1 year of the application). Is a letter of support attached?

Yes No

Regional Planning Commission Letter of Support:

In order to apply, the project must have a letter of support from the regional planning commission. Is a letter of support attached?

Yes No

PLEASE NOTE: If this application is for salt or sand shed funding, the applicant must read and understand the ***Municipal Assistance Section Salt Shed Application Guide***. All of the following scoring questions below must thoroughly convey an understanding of the salt and sand guidance provided.

Application Scoring Criteria:

- 1. Please give a brief description of the project (be sure to indicate the primary facility type being applied for and be concise). (10 points max.)**

The Butler Farms and Oak Creek Village neighborhood experiences numerous issues related to stormwater runoff. The neighborhood was previously retrofit as part of a US EPA Demonstration Grant project to provide treatment of stormwater runoff, but the grant had restraints on what work could be done and additional work remains necessary to alleviate the frequent flooding that occurs during large storm events. Tributary 7 of Potash Brook flows through the neighborhood and crosses beneath City streets in four locations before flowing into the Wheeler Nature Park. In the time since the culverts were designed, permitted, and installed, design standards have changed resulting in the culverts being undersized relative to current standards. Under existing City standards, new culverts must have sufficient capacity to pass flow during a 25-year storm event. Through hydrologic modeling, it was determined that two of the four culverts have enough capacity so that they can almost pass a 10-year storm event before overtopping. The remaining two culverts did not have enough capacity to pass a 2-year storm event without overtopping. The City developed a 60% engineering design to replace all four of these culverts. In order to make this project more manageable from a cost standpoint, the City decided to advance to final design and replace these culverts two at a time, starting with the two culverts located most downstream (in Oak Creek Village), which were replaced in 2017 using a grant obtained through the Vermont Transportation Alternatives Program. This project proposes to replace the second two culverts, located in Butler Farms, with new properly sized box culverts to provide adequate passage of the 25-year storm.

- 2. What is the feasibility of this project? Feasibility (or Scoping) study applications will not be scored on this criterion. Also, please describe the extent of project development to date. (10 points max.)**

Culvert replacement projects are common, feasible projects. The two new box culverts will replace the previously undersized culverts within proximity of their existing footprint at two locations in Butler Farms. Due to the increase in cross-sectional area of the box culverts, electrical utility relocation and potable water main relocation will be required as part of the project. This type of work is typical in association with a culvert replacement project. Additionally, all the proposed work is within the City's right-of-way, preventing the need to obtain additional easements. The City has previously worked with an engineering consultant to develop a set of plans for the construction of the new culverts. These plans have not yet been advanced to final design. The 2015 progress plans are included in the attachments of this application.

3. Does this project address a need identified in a local or regional planning document? If so, please describe. (5 points max.)

This project addresses the need for River Hazard Protection as outlined in the CCRPC's 2018 Chittenden County ECOS Plan. The ECOS plan is the combined Chittenden County Regional Plan, Metropolitan Transportation Plan and Comprehensive Economic Development Strategy and is used to provide goals and strategies for managing growth in Chittenden County. Strategy 3 of this plan is to "Improve the Safety, Water Quality, and Habitat of Our Rivers, Streams, Wetlands, and Lakes in Each Watershed". This includes river hazard protection, under which the plan states that this can be achieved by identifying problem locations and revising culvert designs. The Butler Farms neighborhood has historically experienced issues with flooding during large storms and there is evidence that the culverts are failing. This project would allow for the culverts to be upsized and replaced, which would then resolve this issue and help to meet the goals set in the CCRPC's ECOS Plan.

4. Does this project:

- A. Benefit a State Designated Center per the link below (i.e., downtowns, villages, or neighborhood growth centers recognized by the Vermont Department of Economic, Housing and Community Development?

Not applicable for Environmental Mitigation Categories (5 points max.)

<http://maps.vermont.gov/ACCD/PlanningAtlas/index.html?viewer=PlanningAtlas>

- B. Benefit mobility for disadvantaged populations to include elderly, disabled, minorities, and low-income residents. Please describe this impact (if applicable) in detail. Supporting documentation, including recent data must be included.

Not applicable for Environmental Mitigation Categories (10 points max.)

5. Provide a project cost estimate below (project costs below include both federal dollars and local dollars). Projects will be scored based on whether the cost appears realistic for the size and scope of the project. For scoping studies, use PE and Local Project Management lines only.

Note: If you are applying for additional funds for an existing project, show the amount being requested for this grant in the PE, ROW, Construction, Construction Engineering, and Municipal Project Management rows below. Also, be clear regarding total project cost and other funding amounts and sources in the additional funding comments box below.

(10 points max.)

Preliminary Engineering (PE)
(Engineering, Surveying, Permitting)

\$ 85,000

Right-of-way / Acquisition (ROW)

| | |
|---|---------------------|
| <i>(appraisals, land acquisition and legal fees)</i> | \$ <u>1,000</u> |
| Construction <i>(construction costs with reasonable contingency)</i> | \$ <u>850,000</u> |
| Construction Engineering <i>(cost to provide inspection during construction)</i> | \$ <u>60,000</u> |
| Municipal Project Management Costs <i>(minimum of 10% of total PE, ROW and Construction Phases).</i> | \$ <u>93,600</u> |
| Total Project Cost | \$ <u>1,089,600</u> |

Addition Funding Comments: (ex. Total and additional funding for existing projects)

6. Select the eligibility category below (A, B, C or D) that best fits your project and answer the corresponding questions for that category (choose only one category). 10 bonus points will be awarded to projects that are primarily Bicycle or Pedestrian facilities.

A. Bicycle and Pedestrian Facilities (includes Safe Routes for Non-Drivers and Conversion of abandoned railroad corridors.

(i) Will the project contribute to a system of pedestrian and/or bicycle facilities? **(10 points max.)**

[Click here to enter text.](#)

(ii) Will the project provide access to likely generators of pedestrian and/or bicyclist activity? **(10 points max.)**

[Click here to enter text.](#)

(iii) Will the project address a known, documented safety concern? **(10 points max.)**

[Click here to enter text.](#)

B. Community Improvement Activities:

- i. Explain how the project improves the economic wellbeing of the community and/or provide a benefit to state tourism? **(10 points max.)**

[Click here to enter text.](#)

- ii. Describe the anticipated impact to the public; degree of visibility, public exposure and/or public use. **(10 points max.)**

[Click here to enter text.](#)

- iii. Answer only one of the following based on the type of project:

- a) Construction of turnouts, overlooks, and viewing areas as related to scenic or historic sites. *To what extent will the project provide a view of a highly unique and scenic area?*

- b) **(10 points max.)**

[Click here to enter text.](#)

- c) Preservation or rehabilitation of historic transportation facilities. *Describe the historic significance of the historic transportation facility and the importance of the facility to the state.* **(10 points max.)**

[Click here to enter text.](#)

- d) Archeological planning and research related to impacts from a transportation project. *Describe the associated transportation project and benefit of the proposed activities.*

- (10 points max.)**

[Click here to enter text.](#)

- e) Vegetation management in transportation rights of way to improve roadway safety, prevent invasive species, and provide erosion control. *Describe the extent of the current problem and the impact on the site and surrounding area.* **(10 points max.)**

[Click here to enter text.](#)

**C. Environmental Mitigation Activity Related to Stormwater and Highways
(Including Salt and Sand Sheds)**

- i. Please describe how this application provides environmental mitigation relating to stormwater and highways. **(10 points max.)**

The two existing Butler Farms culverts are undersized when compared to what is required under current South Burlington regulations. The current regulations require infrastructure to have capacity to pass the 25-year storm. In these larger storms, the lack of capacity causes water to build up and flood Butler Drive, which then causes damage to the road infrastructure. As seen in the attached photos, there is existing damage to the Butler Drive roadway due to the culverts failing.

- ii. What information or data is provided to substantiate the current stormwater problem and associated environmental impacts? **(10 points max.)**

Under normal antecedent moisture conditions, the hydraulic modeling (attached) shows that existing Culverts #3 and #4 are unable to pass the 10-year storm without backing up water upstream of the culvert. Inadequate drainage of stormwater in the Butler Farms neighborhood has caused frequent flooding in a highly residential area. Tailwater conditions imposed on stormwater outlets has prevented proper road drainage and flooded basements. The road has also been damaged by the culverts beginning to fail. In the photos attached, there are significant potholes in Butler Dr, as well as a large portion of curb beginning to fall toward the Potash Brook tributary.

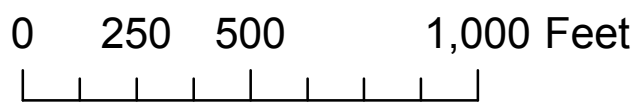
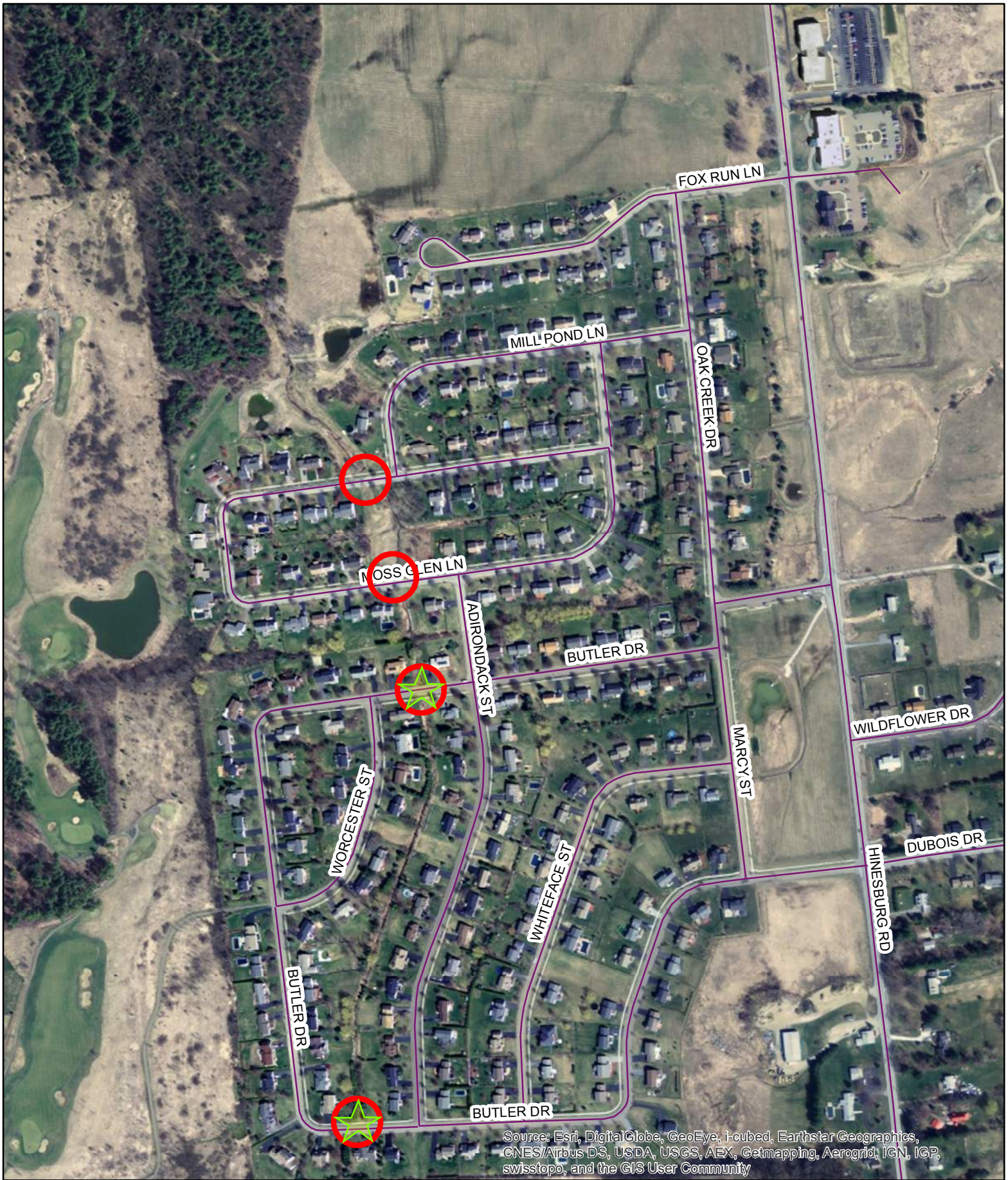
- iii. What substantiating data or information is provided to show that the proposed application is an effective and maintainable solution to the problem? **(10 points max.)**



Revised modeling shows that the replacement of the existing pipe culverts with properly sized box culverts would adequately pass the 25-year storm for Culverts #3 and #4 without overtopping the road or backing up water upstream of the culvert. See the attached hydraulic modeling. Utilization of properly sized box culverts is an effective and manageable solution to the common problem of an undersized pipe culvert. In addition to providing proper drainage in the neighborhood, the box culverts will also act to improve aquatic organism passage in the Butler Farms neighborhood.

D. Environmental Mitigation Activity Related to Wildlife

- i. Please describe how this application will reduce vehicle-caused wildlife mortality or will restore and maintain connectivity among terrestrial or aquatic habitats. **(10 points max.)**
[Click here to enter text.](#)
- ii. What information or data is provided to substantiate the current problem and associated environmental impacts? **(10 points max.)**
[Click here to enter text.](#)
- iii. What substantiating data or information is provided to show that the proposed application is an effective and manageable solution to the problem? **(10 points max.)**
[Click here to enter text.](#)

APPENDIX A – PROJECT LOCATION MAP AND PHOTOS



-  Culvert Crossing
-  Project Location



Culvert 3 Inlet



Culvert 3 Outlet

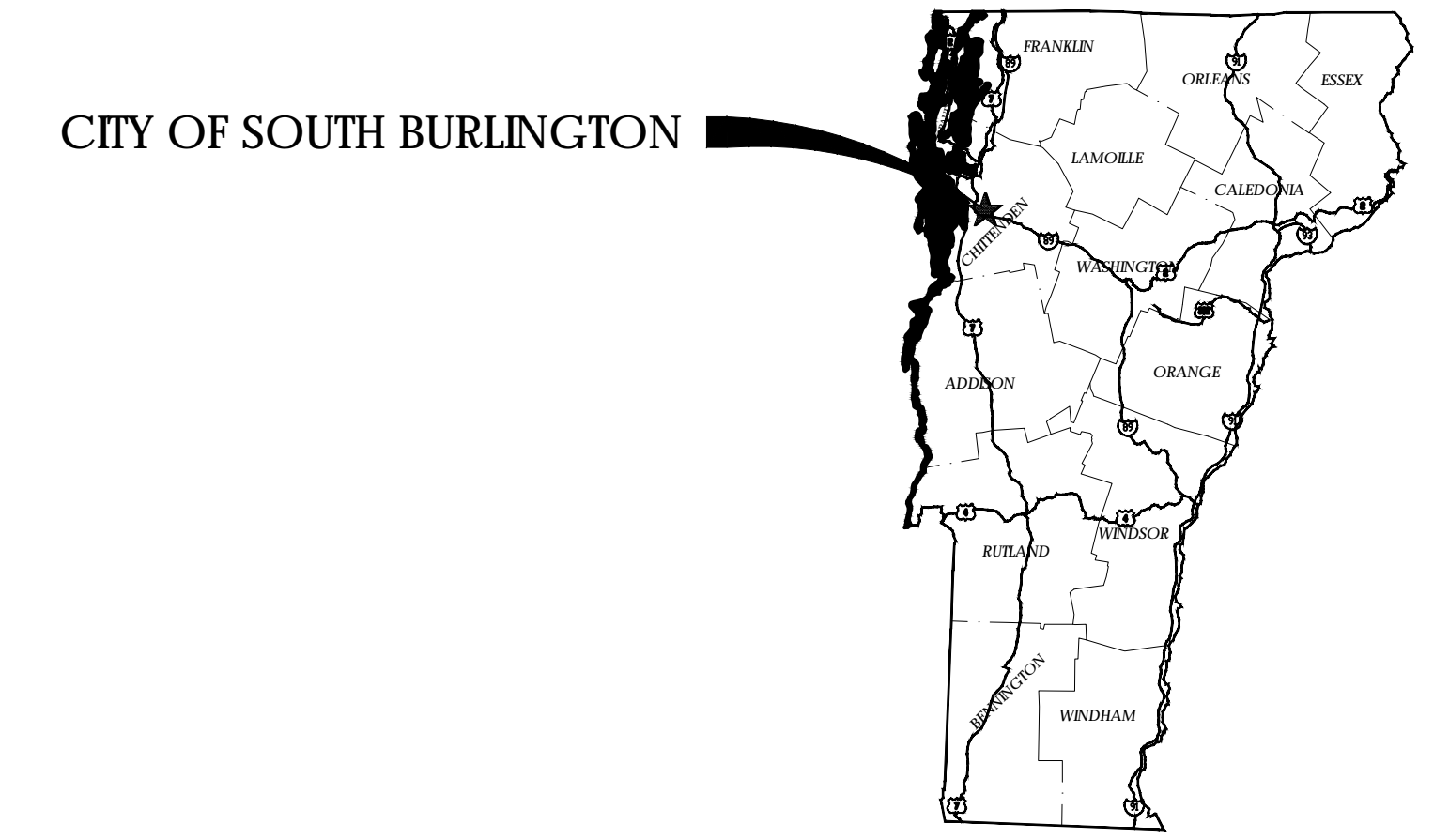


Culvert 4 Inlet



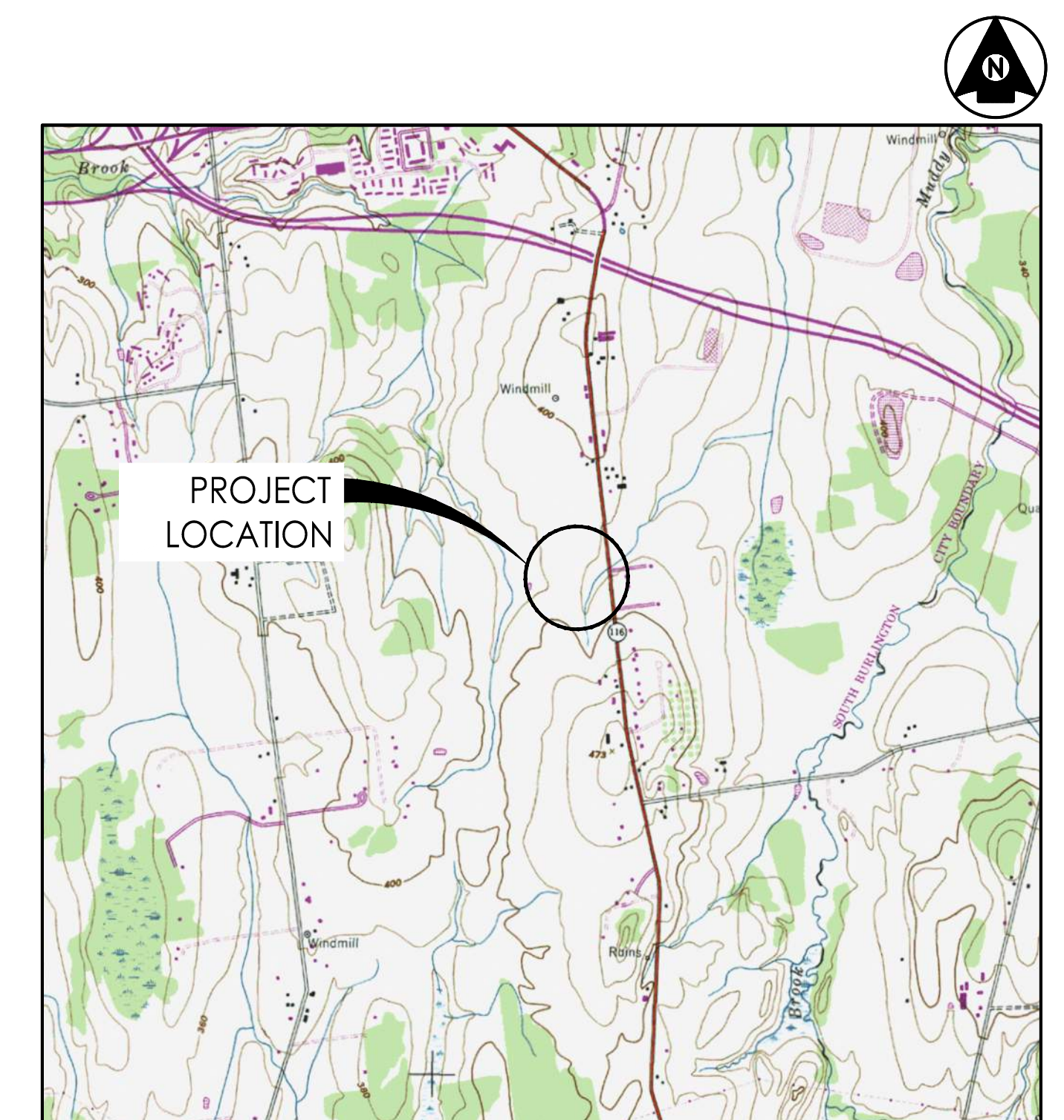
Culvert 4 Outlet

APPENDIX B – PROGRESS PROJECT PLANSET



LOCATION MAP

CITY OF SOUTH BURLINGTON, VERMONT OAK CREEK VILLAGE / BUTLER FARMS CULVERT REPLACEMENT PROJECT



VICINITY MAP
1" = 2000'

INDEX OF SHEETS

| <u>SHEET NO.</u> | <u>TITLE</u> |
|------------------|------------------------|
| | COVER SHEET |
| G-101 | OVERALL PLAN |
| C-101 | CULVERT #1 REPLACEMENT |
| C-102 | CULVERT #2 REPLACEMENT |
| C-103 | CULVERT #3 REPLACEMENT |
| C-104 | CULVERT #4 REPLACEMENT |
| C-501 | DETAILS |

AUGUST 2015

Project Number: 195311039

PUBLIC WORKS DIRECTOR
JUSTIN RABIDOUX, P.E.

DEPUTY PUBLIC WORK DIRECTOR
THOMAS DIPIETRO, JR.

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CONSTRUCTION
AUGUST 2015

Set No. ____

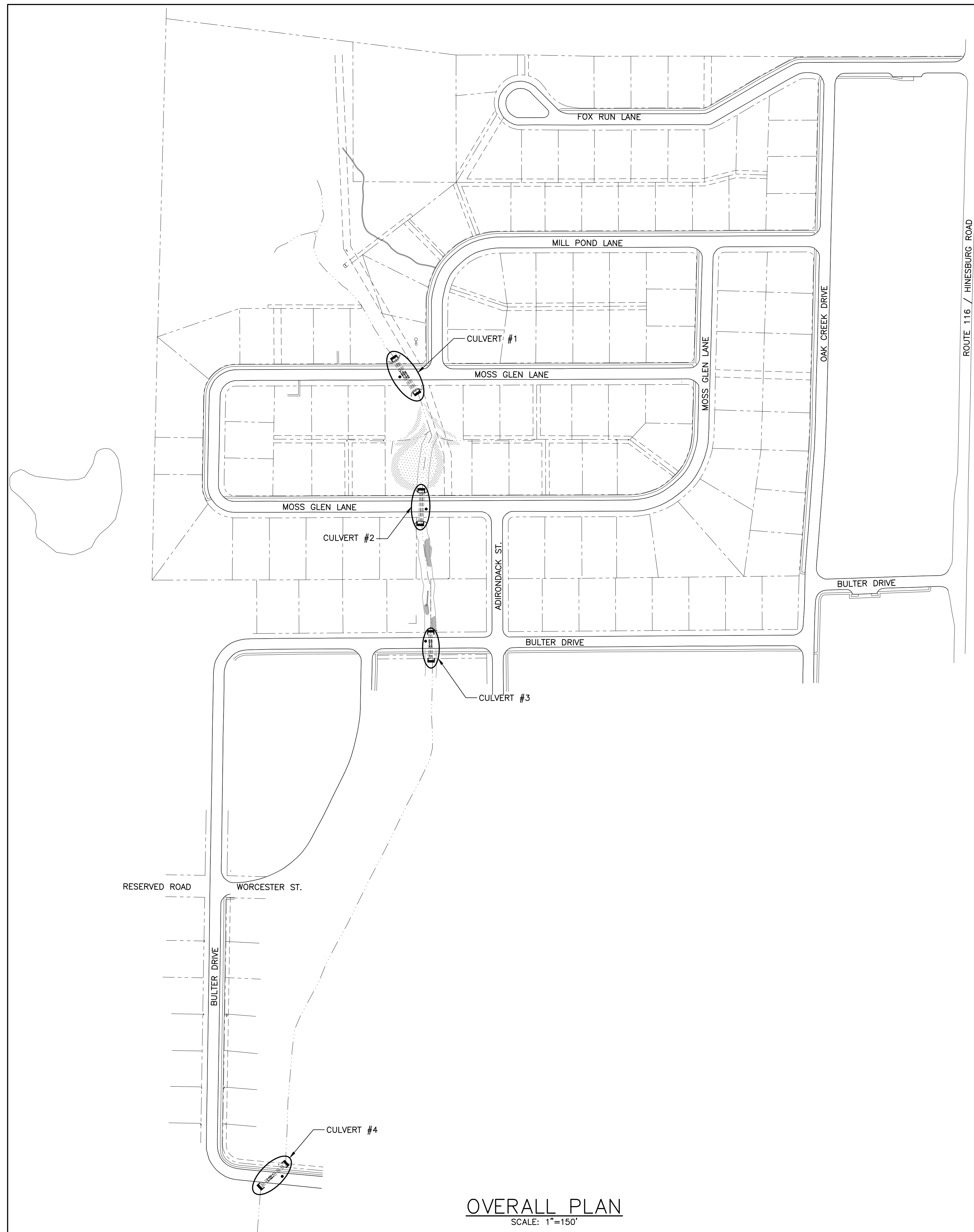
CIVIL LEGENDS

PROPOSED LEGEND

- PROPOSED BOUND
- ⊕ PROPOSED BENCHMARK
- PROPOSED CATCH BASIN (SQUARE)
- ⊙ PROPOSED CATCH BASIN (ROUND)
- ⊕ PROPOSED COMMUNICATION MANHOLE
- PROPOSED CURB INLET
- ⊙ PROPOSED DRAIN MANHOLE (DMH)
- ⊙ PROPOSED DRILL HOLE
- ⊙ PROPOSED ELECTRICAL MANHOLE
- ⊙ PROPOSED GUY POLE
- △ PROPOSED SURVEY POINT
- ⊙ PROPOSED IRON PIN
- ⊙ PROPOSED NATURAL GAS MANHOLE
- ⊕ PROPOSED HYDRANT
- ⊙ PROPOSED SANITARY SEWER MANHOLE (SMH)
- ⊕ PROPOSED SINGLE POLE SIGN
- ⊕ PROPOSED DOUBLE POLE SIGN
- ⊙ PROPOSED TELEPHONE MANHOLE
- TP1 PROPOSED TEST PIT
- B1 PROPOSED BORING
- ⊙ PROPOSED UTILITY POLE
- ⊕ PROPOSED WATER SHUTOFF
- ⊕ PROPOSED GATE VALVE
- ⊙ PROPOSED WELL
- ▲ PROPOSED FLOOD LIGHT
- ☆ PROPOSED LIGHT POST
- PROPOSED DRAINAGE FLOW
- ★ PROPOSED CONIFEROUS TREE
- ⊙ PROPOSED DECIDUOUS TREE
- PROPOSED TYPE II STONE
- PROPOSED CRUSHED STONE
- 100— PROPOSED MAJOR CONTOUR
- 98— PROPOSED MINOR CONTOUR
- X 95.5 PROPOSED SPOT ELEVATION
- — — — — PROPOSED RAILROAD TRACKS
- - - - - PROPOSED DITCH/SWALE
- - - - - PROPOSED EDGE OF RIVER
- - - - - PROPOSED EDGE OF POND
- - - - - PROPOSED EDGE OF WETLAND
- - - - - PROPOSED DEMOLITION WORK
- - - - - PROPOSED EASEMENT
- - - - - PROPOSED LIMITS OF CONSTRUCTION
- - - - - PROPOSED RIGHT OF WAY
- - - - - PROPOSED PROPERTY LINE
- G— PROPOSED FUEL GAS
- GAS— PROPOSED NATURAL GAS
- OHE— PROPOSED OVERHEAD POWER
- UG— PROPOSED UNDERGROUND POWER
- CATV— PROPOSED CABLE TV
- T— PROPOSED OVERHEAD TELEPHONE
- UGT— PROPOSED UNDERGROUND TELEPHONE
- S— PROPOSED SANITARY SEWER
- SS— PROPOSED SANITARY SEWER (FORCE MAIN)
- W— PROPOSED WATER MAIN
- PS— PROPOSED PRESSURE STEAM
- SD— PROPOSED STORM DRAIN
- UD— PROPOSED FOOTING UNDERDRAIN
- RD— PROPOSED ROOF DRAIN
- ▲▲▲▲ PROPOSED FIRE PROTECTION
- — — — — PROPOSED GUARD RAIL
- — — — — PROPOSED FENCE (BARBED WIRE)
- — — — — PROPOSED FENCE (CHAIN LINK)
- — — — — PROPOSED FENCE (WOODEN)
- — — — — PROPOSED RETAINING WALL
- — — — — PROPOSED STONE WALL
- — — — — PROPOSED SILT FENCE
- — — — — PROPOSED HAYBALES
- — — — — PROPOSED TREE LINE

EXISTING LEGEND

- EXISTING BOUND
- ⊕ EXISTING BENCHMARK
- △ EXISTING SURVEY POINT
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- — — — — EXISTING GUARD RAIL
- — — — — EXISTING FENCE
- — — — — EXISTING CHAINLINK FENCE
- — — — — EXISTING WOODEN FENCE
- — — — — EXISTING RETAINING WALL
- — — — — EXISTING HAYBALES
- — — — — EXISTING STONE WALL
- — — — — EXISTING TREE/SHRUB LINE



OVERALL PLAN
SCALE: 1"=150'
0 150' 300'

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AUGUST 2015

Consultants

Legend

Notes

1. CONTRACTOR IS RESPONSIBLE FOR COORDINATING, SCHEDULING AND CARRYING COSTS FOR ALL TEMPORARY AND PERMANENT UTILITY RELOCATIONS, INCLUDING BUT NOT LIMITED TO: VT GAS SYSTEMS, GREEN MOUNTAIN POWER, FAIR POINT COMMUNICATIONS, AND COMCAST.
2. CONTRACTOR SHALL COORDINATE THE WATERLINE RELOCATION WITH THE SOUTH BURLINGTON WATER DEPARTMENT.
3. THE CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING AND PROVIDING TIMELY NOTIFICATIONS TO ALL HOMEOWNERS IMPACTED BY THE UTILITY RELOCATIONS.

Revision

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Client/Project

SOUTH BURLINGTON
 CULVERT REPLACEMENT
 South Burlington, Vermont

Title

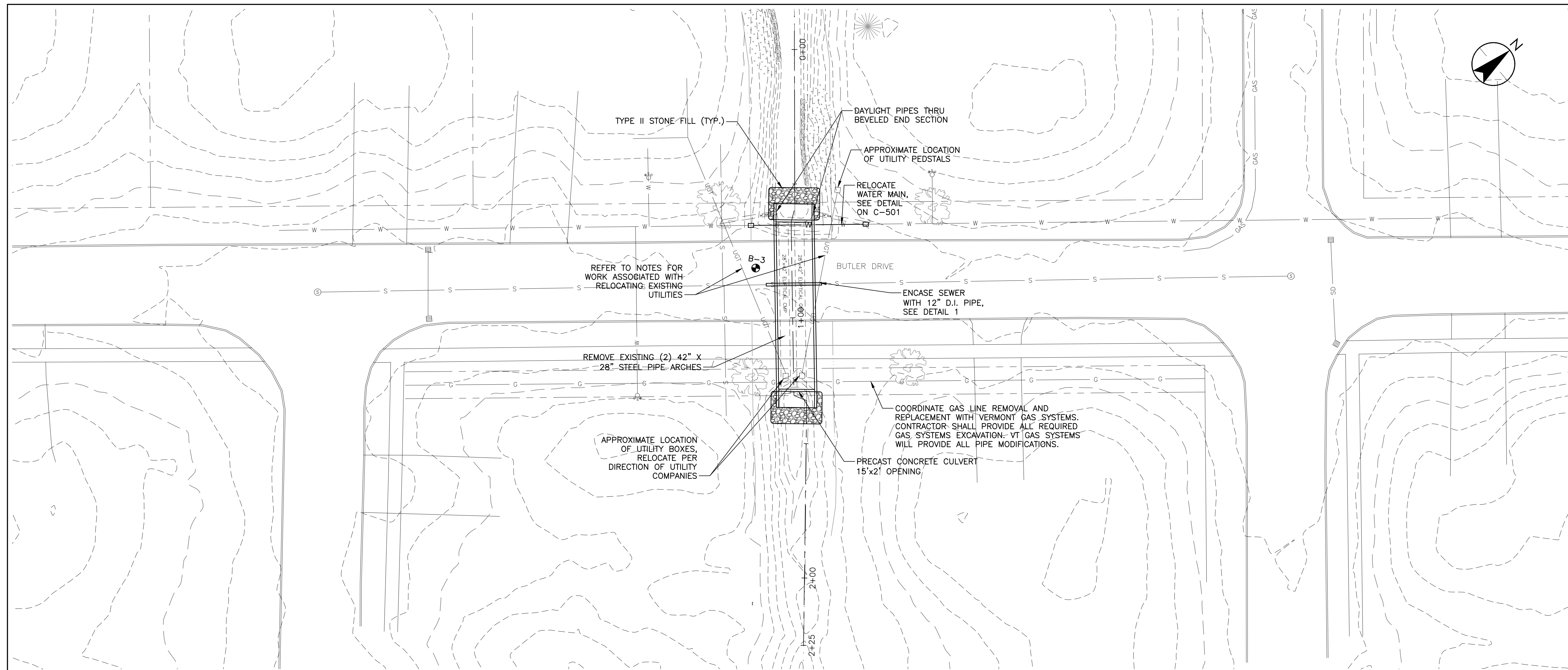
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 REPLACEMENT

Project No. Scale

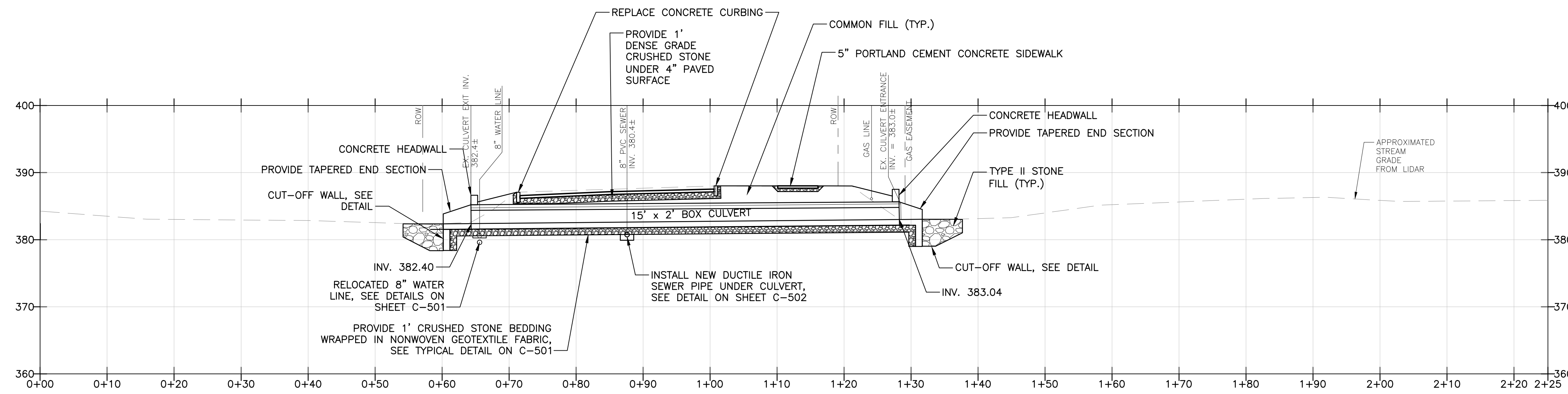
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Drawing No. Sheet Revision

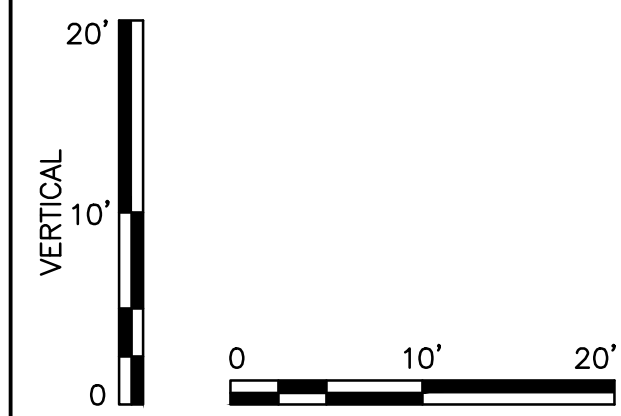
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PLAN
 SCALE: 1"=20'
 0 20' 40'



PROFILE
 SCALE: 1"=10'



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Consultants

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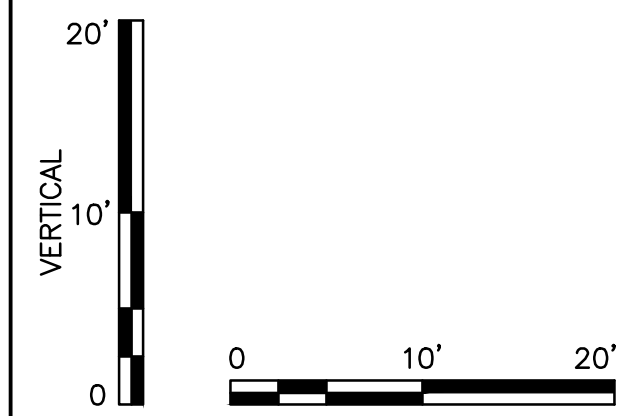
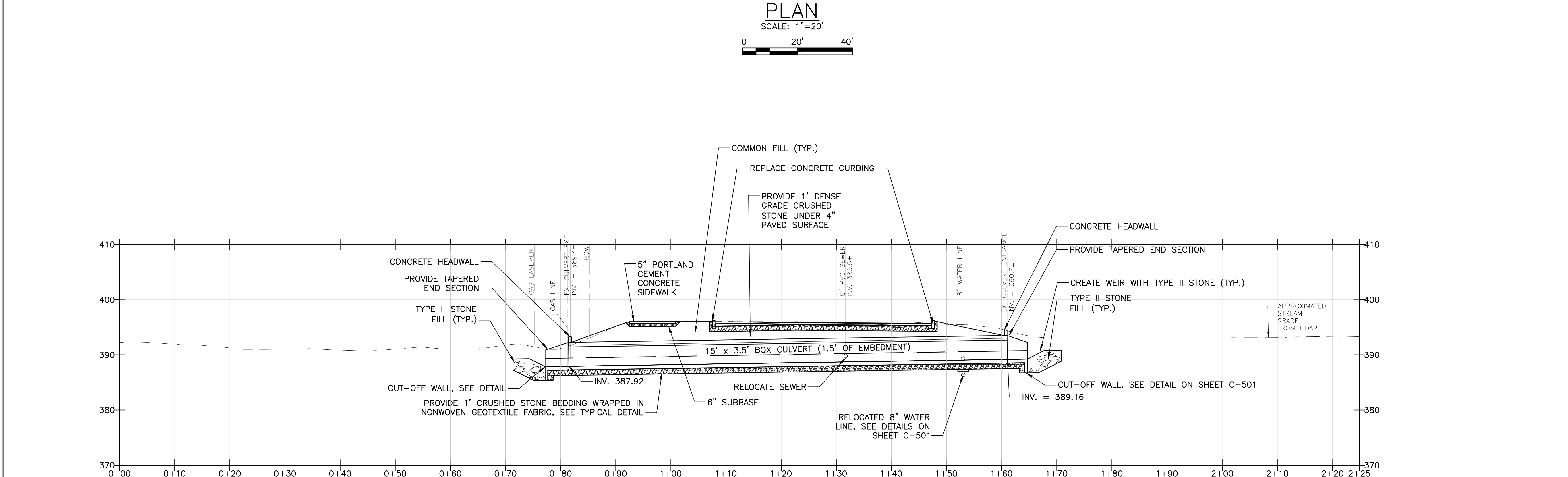
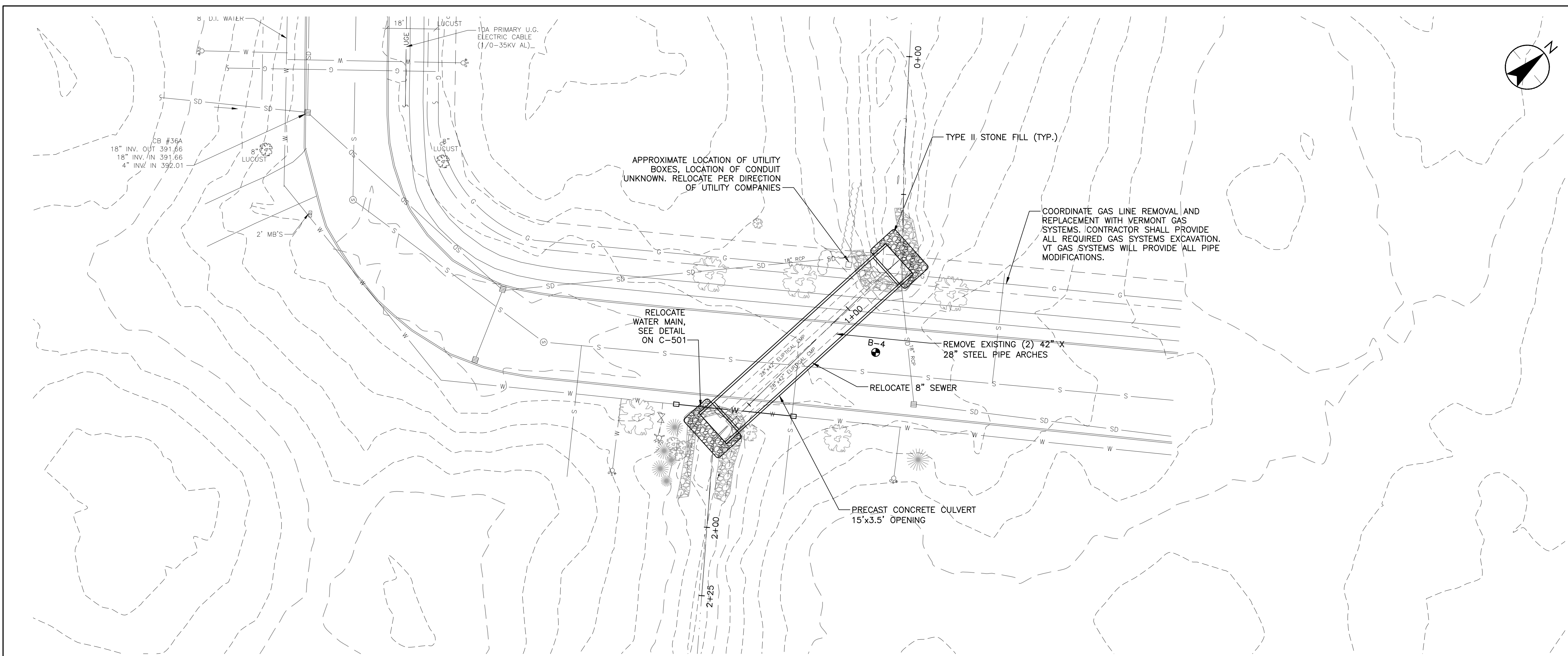
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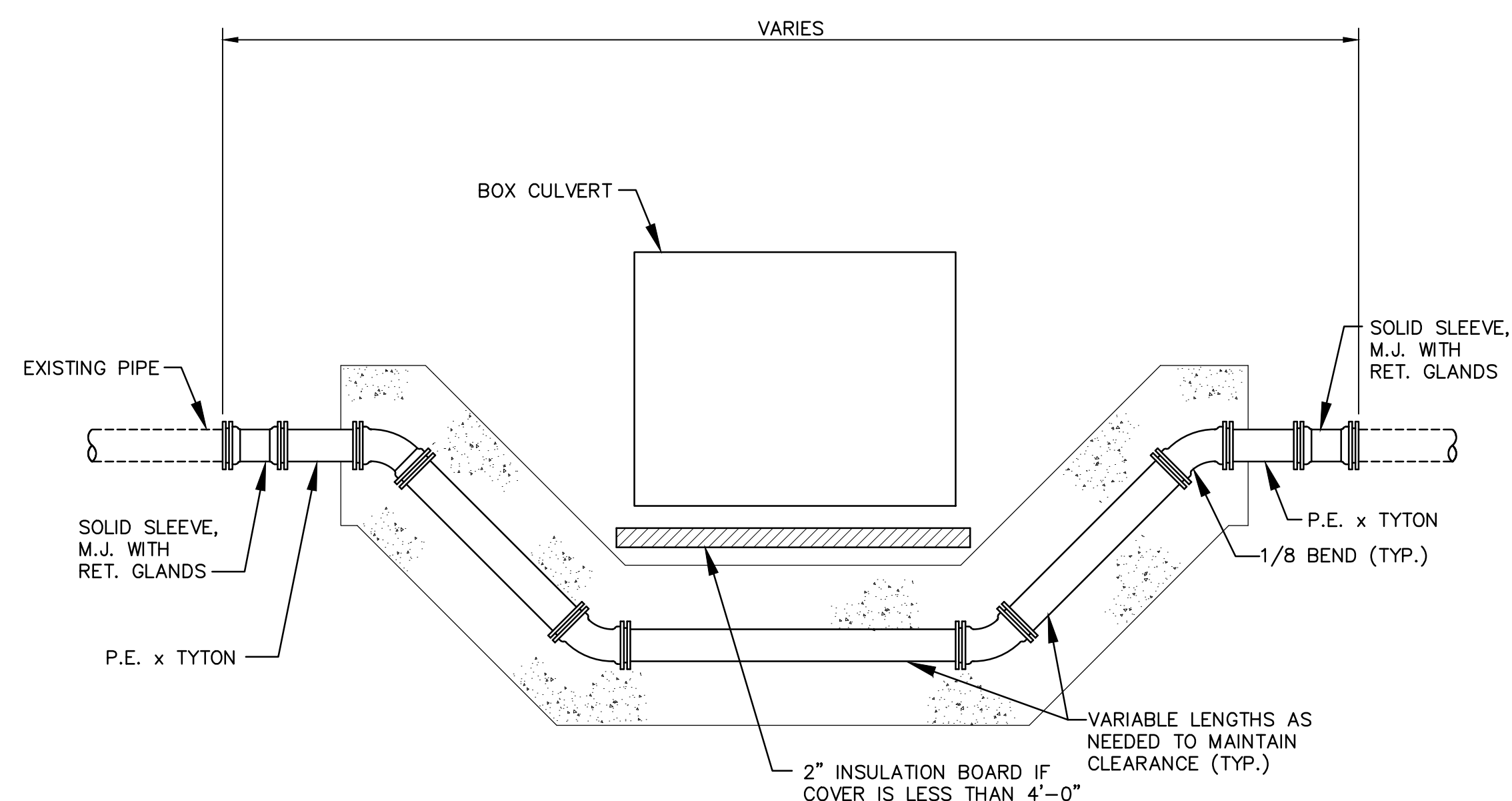
Client/Project
 SOUTH BURLINGTON
 CULVERT REPLACEMENT
 South Burlington, Vermont

Title
 CULVERT #4
 REPLACEMENT

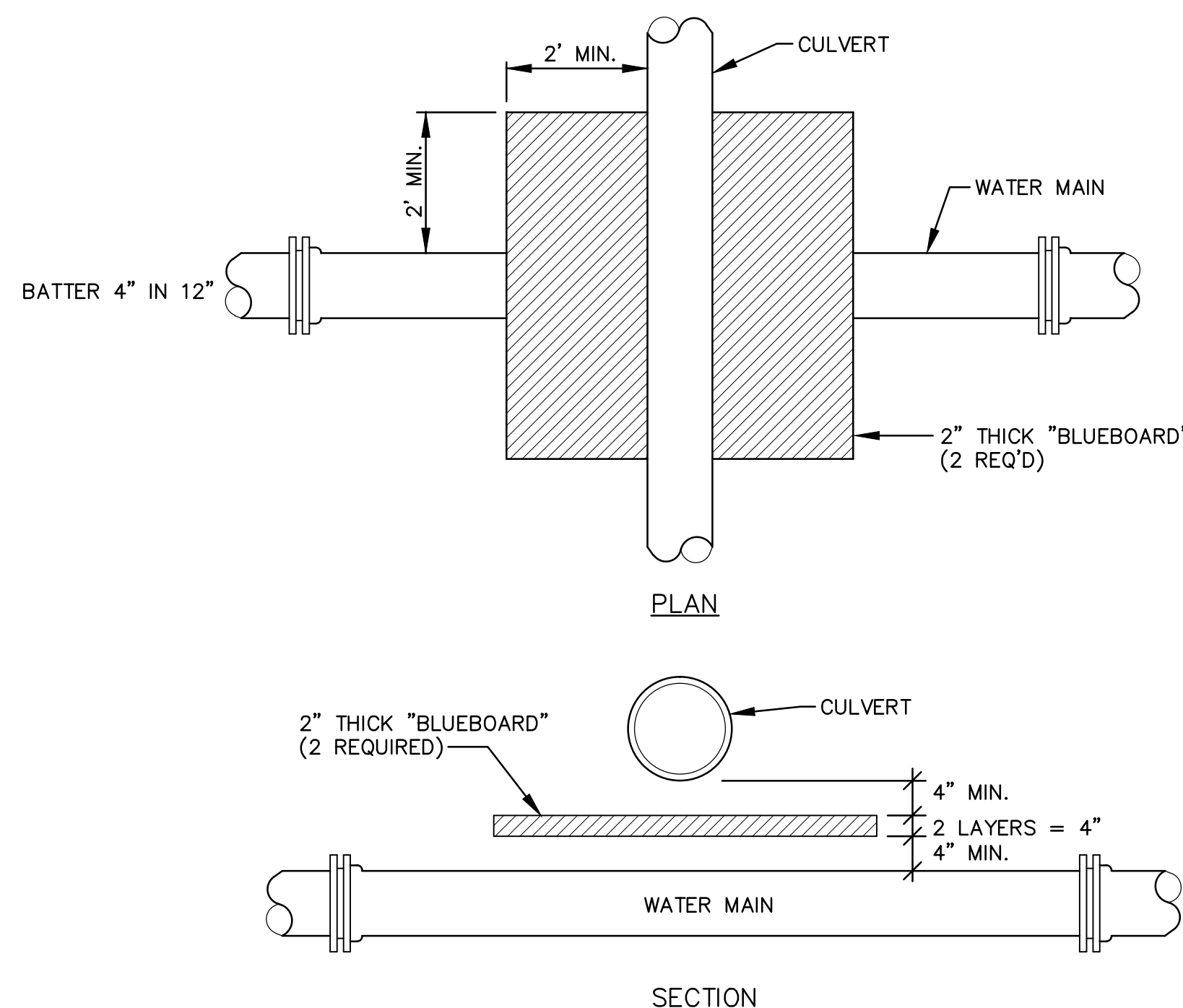
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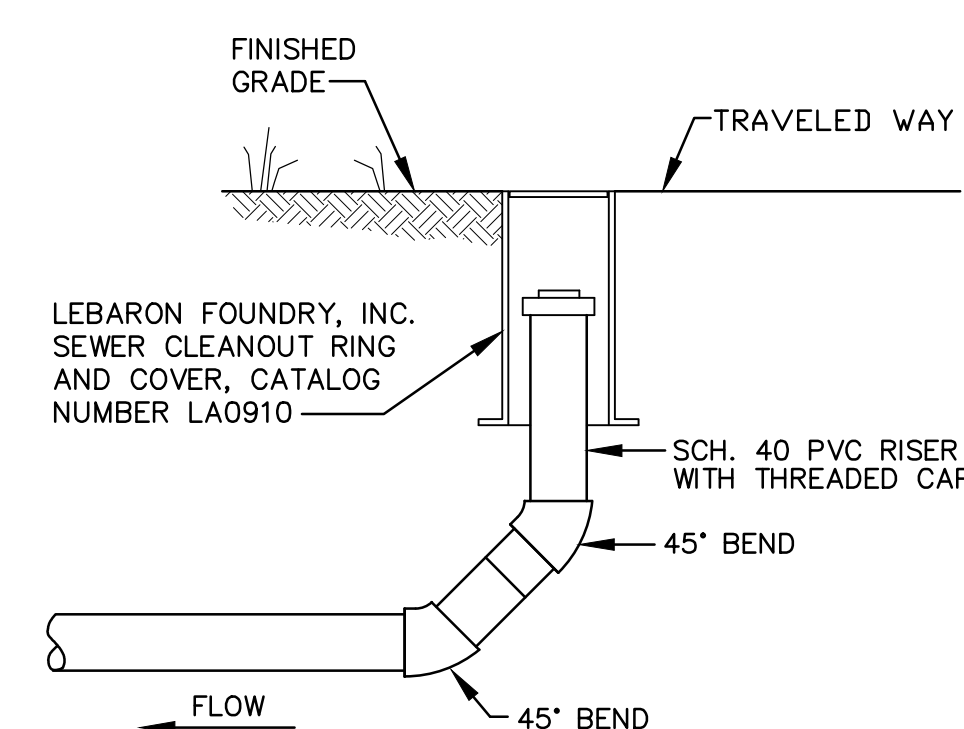




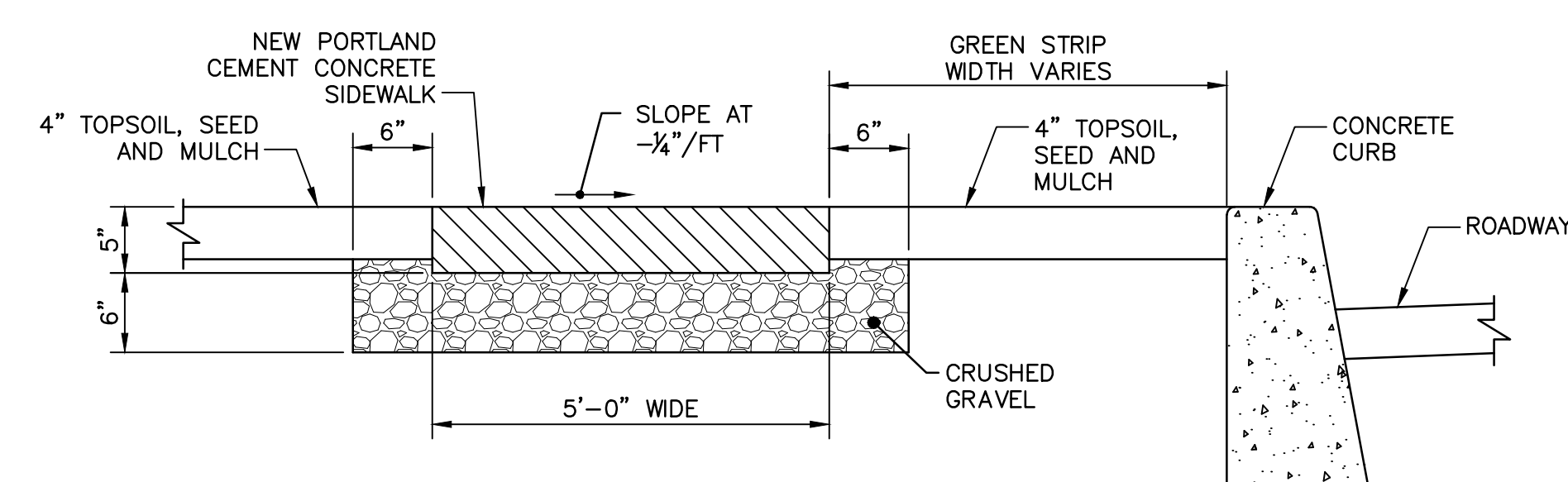
WATER MAIN RELOCATION DETAIL
NOT TO SCALE



WATER MAIN INSULATION DETAIL
NOT TO SCALE

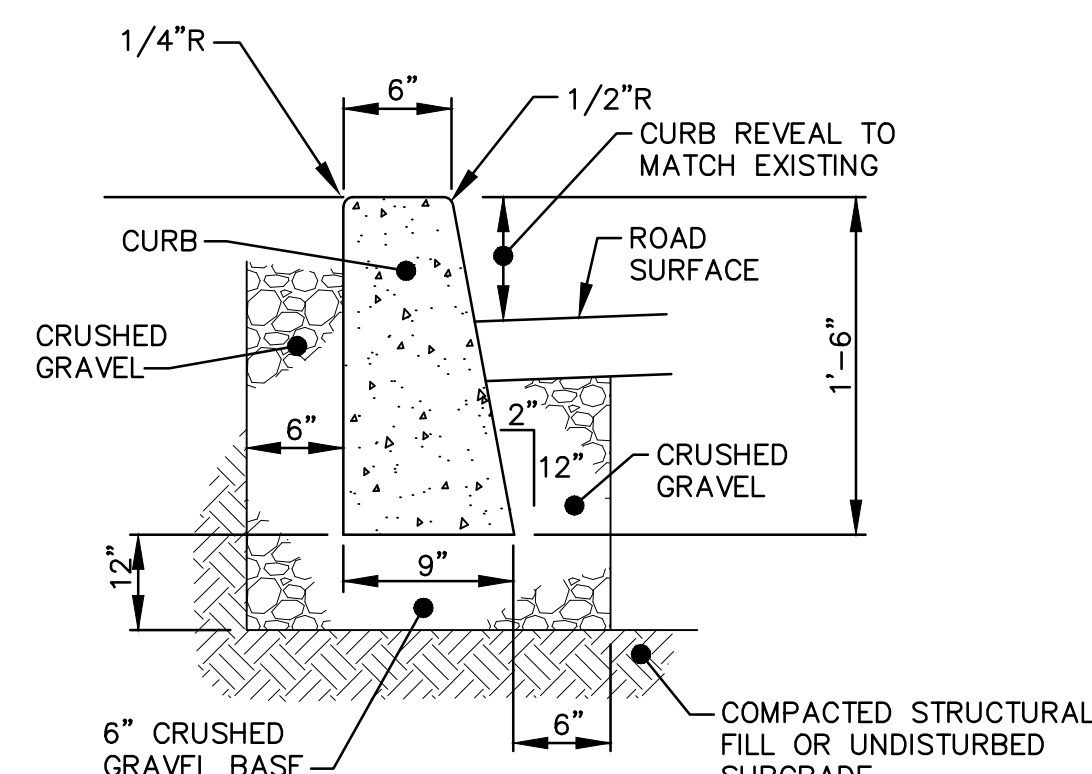


CLEAN OUT DETAIL
NOT TO SCALE

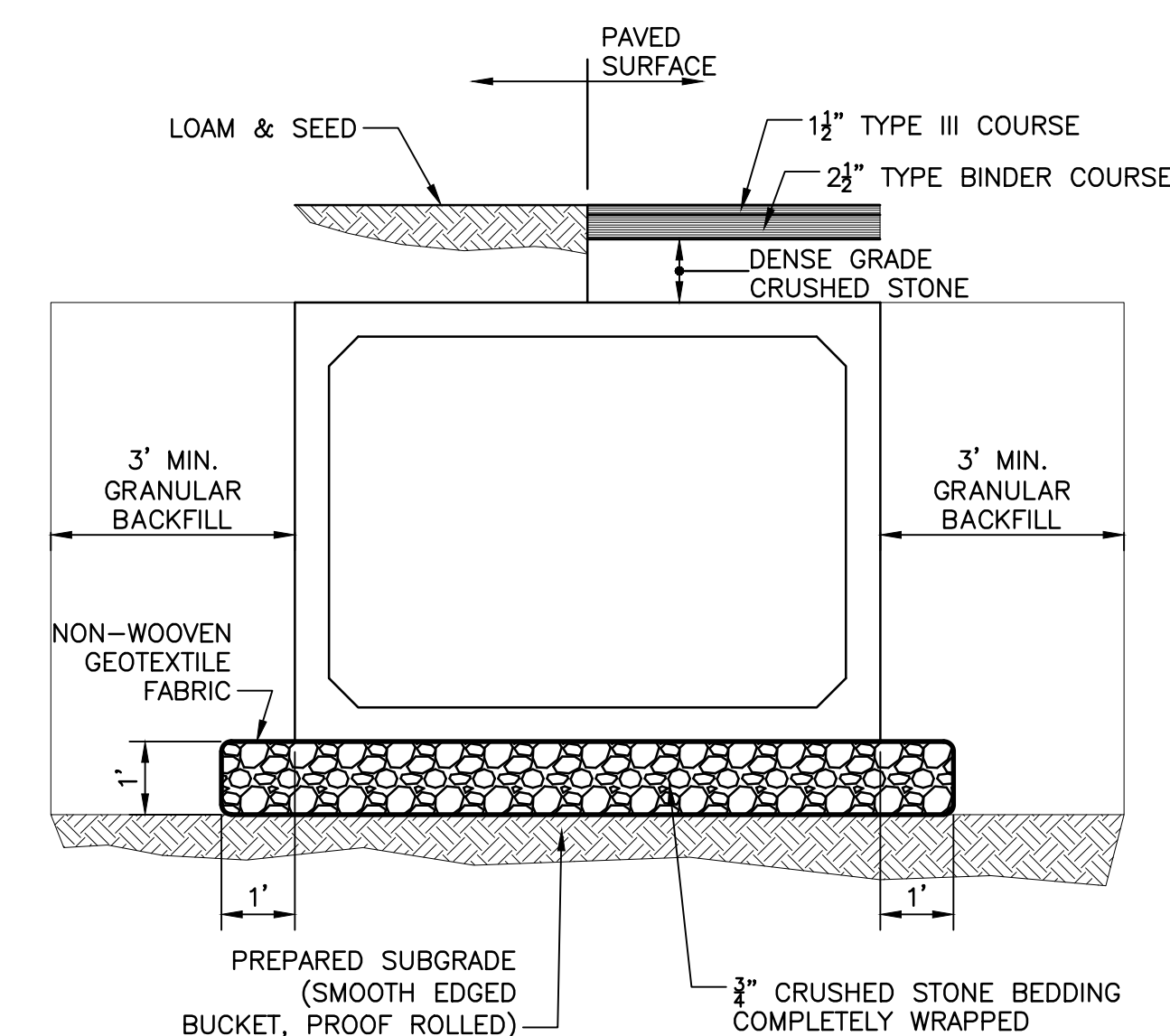


TYPICAL CONCRETE SIDEWALK DETAIL
NOT TO SCALE

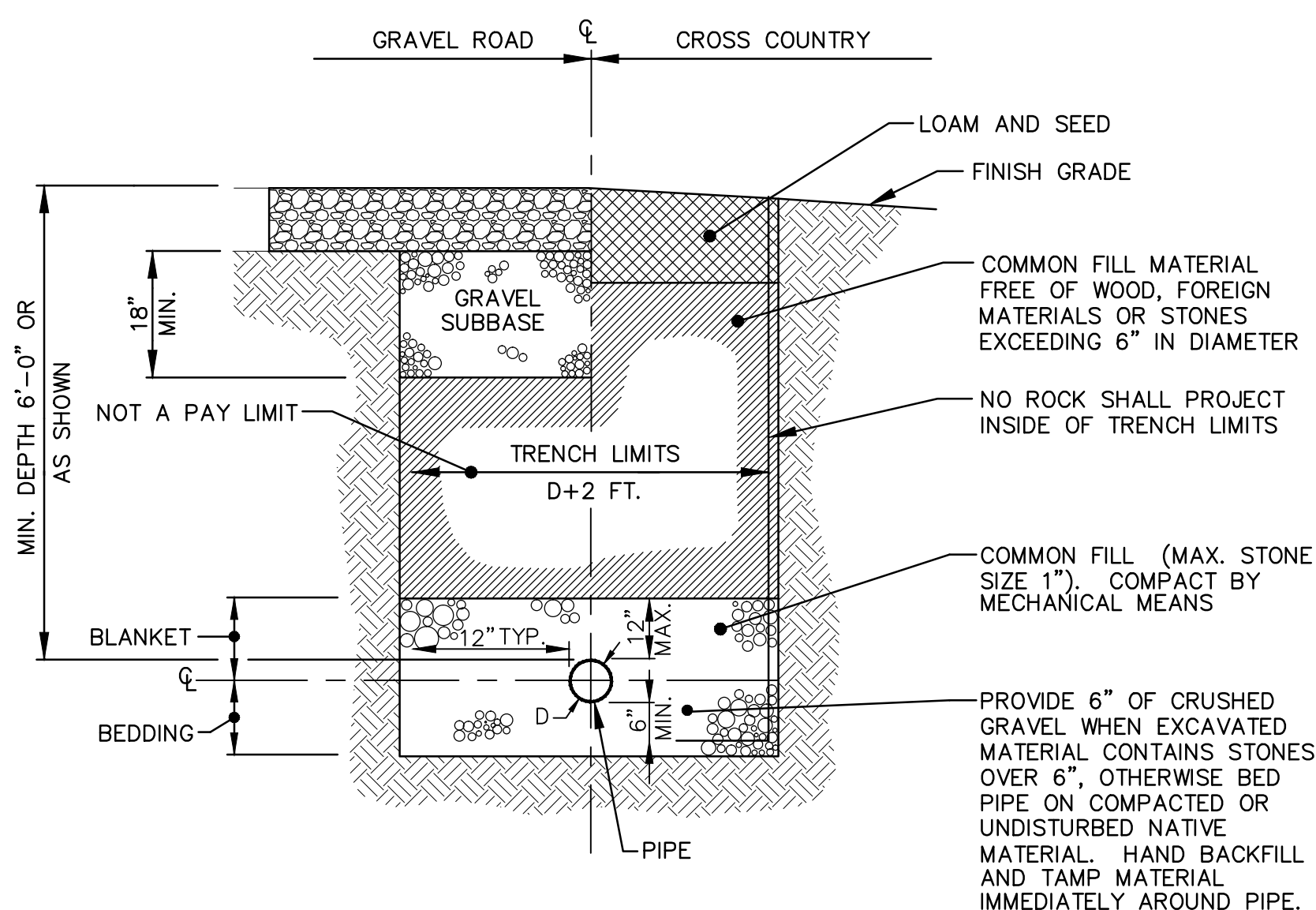
NOTE:
NEW PORTLAND CEMENT CONCRETE SIDEWALK SHALL BE 5" THICK THRU RESIDENTIAL DRIVEWAYS AND 8" THICK THRU COMMERCIAL DRIVEWAYS.



VERTICAL CONCRETE CURB DETAIL
NOT TO SCALE

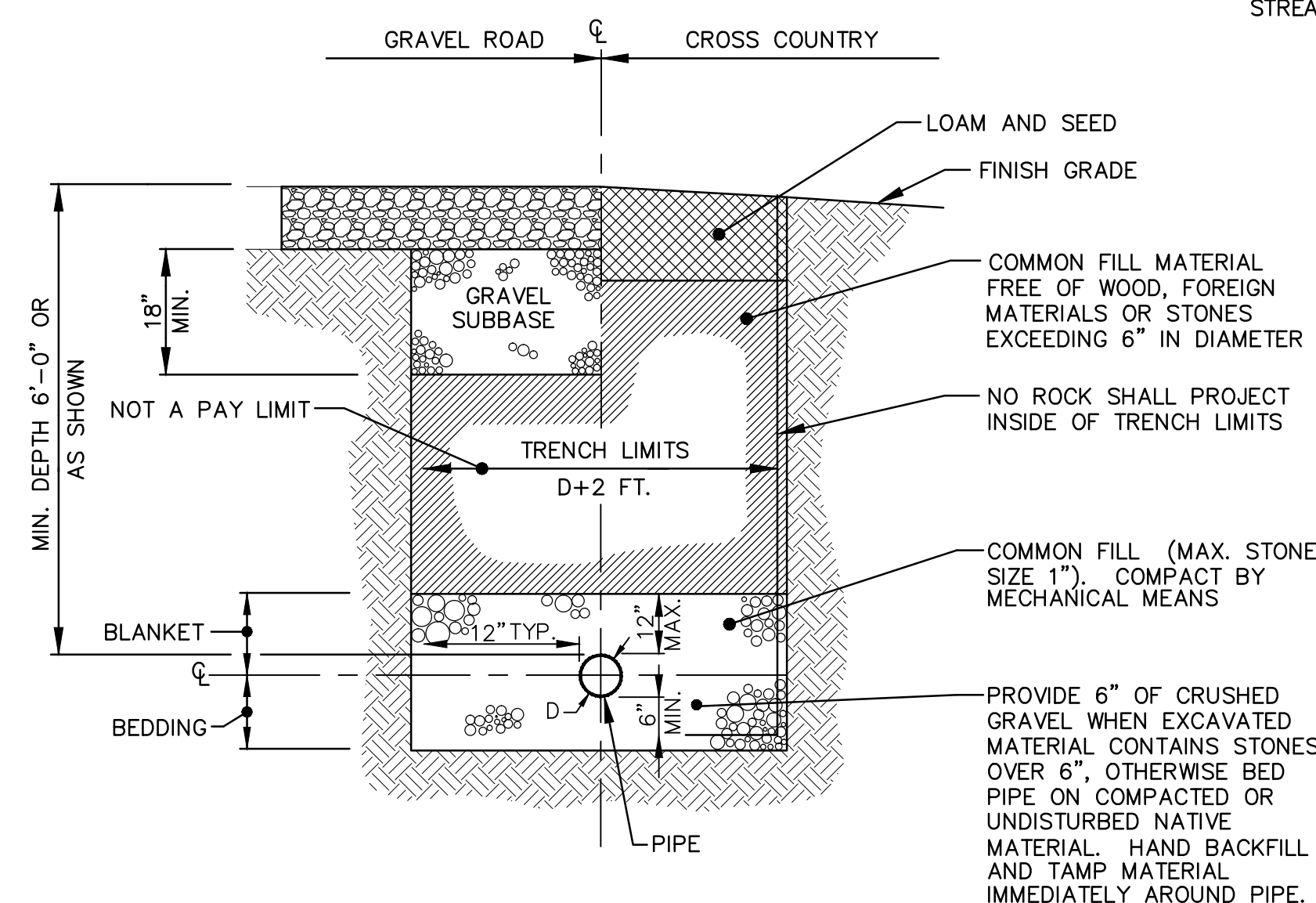


BOX CULVERT - TYPICAL SECTION
NOT TO SCALE



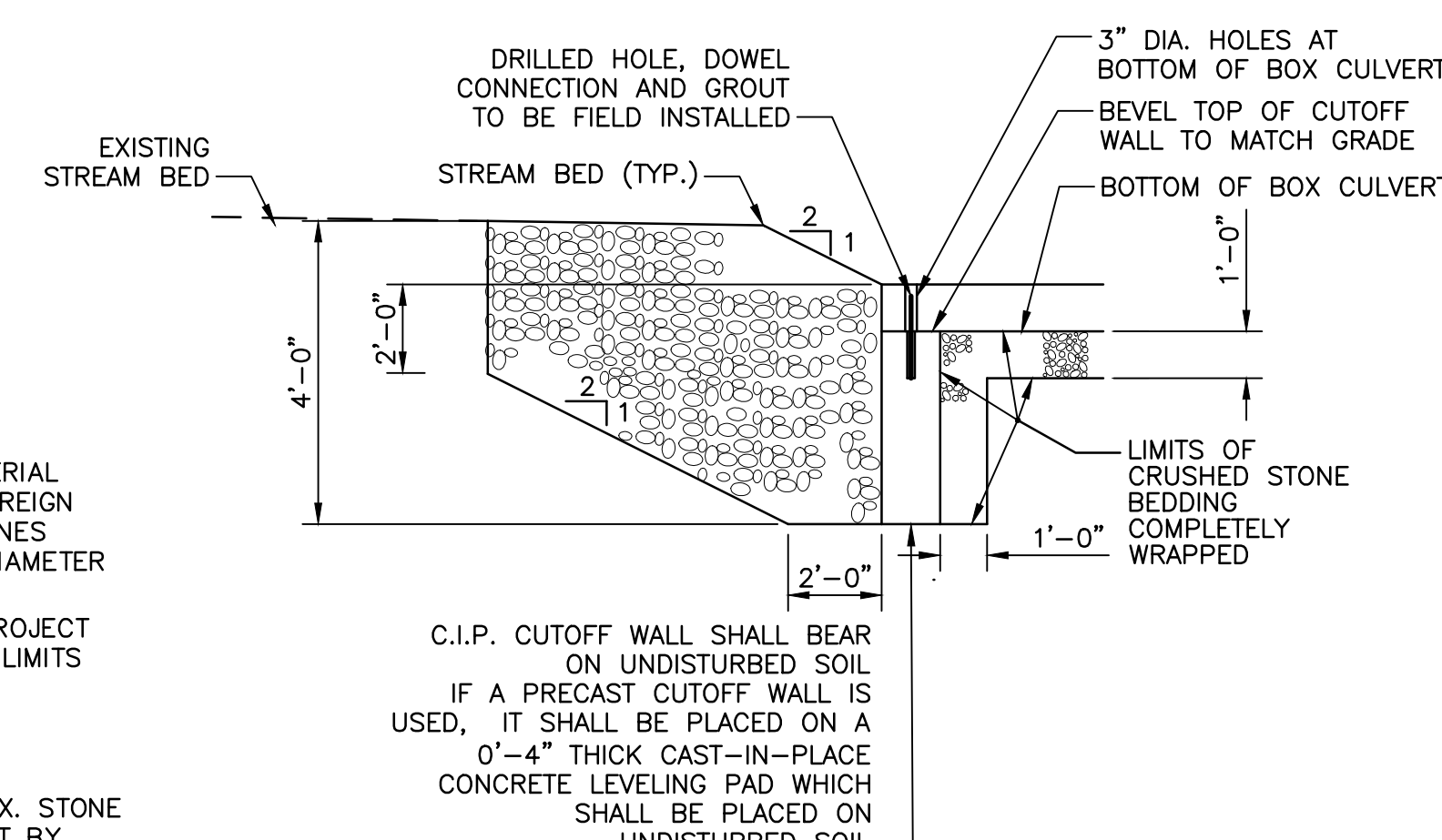
DUCTILE IRON PIPE TRENCH DETAIL
NOT TO SCALE

NOTE:
COMPACTION TO BE IN ACCORDANCE WITH SPECIFICATION SECTION 312000



PVC PIPE TRENCH DETAIL
NOT TO SCALE

NOTE:
COMPACTION TO BE IN ACCORDANCE WITH SPECIFICATION SECTION 312000



CUTOFF WALL DETAIL
NOT TO SCALE

C.I.P. CUTOFF WALL SHALL BEAR ON UNDISTURBED SOIL. IF A PRECAST CUTOFF WALL IS USED, IT SHALL BE PLACED ON A 0'-4" THICK CAST-IN-PLACE CONCRETE LEVELING PAD WHICH SHALL BE PLACED ON UNDISTURBED SOIL.

PROGRESS PRINT
NOT FOR
CONSTRUCTION
AUGUST 2015

Consultants

Legend

Notes

ADDITIONAL DETAILS TO BE SHOWN LATER:

TAPERED END SECTION DETAIL
 NOT TO SCALE

DUCTILE IRON SEWER PIPE DETAIL
 NOT TO SCALE

HEADWALL DETAIL
 NOT TO SCALE

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| File Name: 1103Pc-802.dwg | GDM | JTM | JTM | 15.04.03 |
| | Dwn. | Chkd. | Dsgn. | YY.MM.DD |

Permit-Seal

Client/Project
 SOUTH BURLINGTON

CULVERT REPLACEMENT

South Burlington, Vermont

Title
 DETAILS

**PROGRESS PRINT
 NOT FOR
 CONSTRUCTION**
 AUGUST 2015

| | |
|--------------------------|-------------------|
| Project No. 195311039 | Scale AS NOTED |
| Drawing No. C-502 | Sheet 8 of 8 |
| | Revision 0 |

APPENDIX C – LETTERS OF SUPPORT




To Whom it May Concern,

The City of South Burlington Stormwater Utility has been working to continue improvements to the stormwater treatment and drainage in the Butler Farms neighborhood for several years. A component of this work is to replace the four undersized culverts that drain Tributary 7 of Potash Brook through the neighborhood. In previous years, two of these culverts have been upgraded to appropriately sized boxed culverts. On 12/14, 2023 the South Burlington City Council voted to support the Stormwater Utility's plan to replace the two remaining undersized culverts. In addition, City Council supports the Stormwater Utility's grant application to the VTrans Municipal Highway and Stormwater Mitigation Program. We authorize our Stormwater Superintendent, Marisa Rorabaugh, to act as the City's authorized representative when dealing with matters related to this project and the associated applications. Marisa can be reached at (802) 658-7961x6111 or MRorabaugh@southburlingtonvt.gov.


Sincerely,

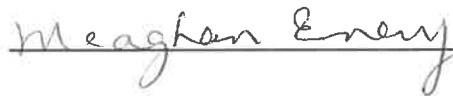
South Burlington City Council











Date: December 1, 2023

To: David P. Wheeler, Deputy Director of Water Resources– City of South Burlington Public Works.
(dwheeler@southburlingtonvt.gov)

Re: Town application VAOT Municipal Highway & Stormwater Mitigation Grant for the replacement of two culverts in the Butler Farms and Oak Creek Village neighborhoods in South Burlington, Vermont.

Dear Mr. Wheeler,

The Chittenden County Regional Planning Commission is pleased to support your proposal for a Vermont AOT Municipal Highway & Stormwater Mitigation Grant for the construction/replacement of two culverts in the Bulter Farms and Oak Creek Village neighborhoods. These more appropriately sized culverts will be more resilient in larger rain events and will limit potential erosion from them. South Burlington intends to stay proactive and integrate new stormwater solutions in needed areas. Correctly functioning stormwater designs are critical to addressing stormwater management and water pollution prevention. Executing this project as planned will mitigate the stormwater impact of our public roadway system on this waterway.

Further, this project helps implement the following specific sections of the *Chittenden County ECOS Plan*, the combined Regional Plan, Metropolitan Transportation Plan and Comprehensive Economic Development Strategy for the County:

- Transportation Goal (Section 2.5.3): Provide accessible, safe, efficient, interconnected, secure, equitable, and sustainable mobility choices for our region’s businesses, residents and visitors
- Water Quality Strategy (Section 3.2.3): Improve the safety, water quality, and habitat of our rivers, streams, wetlands and lakes in each watershed; and
- Improves and maintains infrastructure to help support the Sustainable Growth Strategy (3.2.2): Strive for 80% of new development in areas planned for growth, which amounts to 15% of our land area.

The City of South Burlington has been a leader in the region in systematically identifying and fixing water quality concerns. This project will add to the City’s achievements and improve water quality and prevent future damage to public and private infrastructure. Thank you for the opportunity to support this project and we look forward to working with you in the future!

Sincerely,



Chris Dubin – Senior Transportation Planner, Chittenden County RPC

APPENDIX D – CULVERT MODELING CALCULATIONS

Culvert #3

| Description | Design Parameter | Culvert Capacity (cfs) | Headwater (ft) | Invert | Flood Level |
|------------------------------|------------------|------------------------|----------------|--------|-------------|
| Existing - two 28"x42" pipes | 1.5D | 92 | 3.50 | 383.70 | 388 |
| Proposed - 2'x15' Box | 1.5D | 185 | 3.00 | 383.70 | 388 |

| Storm Event | AMC 2 | AMC 3 | |
|-------------|------------|------------|--|
| | Flow (cfs) | Flow (cfs) | |
| 1 year | 64 | 103 | |
| 2 year | 75 | 115 | Maximum Storm Capacity - Existing Conditions |
| 10 year | 126 | 169 | |
| 25 year | 180 | 222 | Maximum Storm Capacity - Proposed Conditions |

Culvert #4

| Description | Design Parameter | Culvert Capacity (cfs) | Headwater (ft) | Invert | Flood Level |
|------------------------------|------------------|------------------------|----------------|--------|-------------|
| Existing - two 28"x42" pipes | 1.5D | 92 | 3.50 | 391.10 | 395 |
| Proposed - 2'x15' Box | 1.5D | 185 | 3.00 | 391.10 | 395 |

| Storm Event | AMC 2 | AMC 3 | |
|-------------|------------|------------|--|
| | Flow (cfs) | Flow (cfs) | |
| 1 year | 62 | 100 | |
| 2 year | 73 | 112 | Maximum Storm Capacity - Existing Conditions |
| 10 year | 123 | 164 | |
| 25 year | 175 | 216 | Maximum Storm Capacity - Proposed Conditions |