Exh. Petitioner JR-3

Natural Resource Assessment Report

Florence Substation Condition Assessment Project

Pittsford, VT

Prepared for:

Vermont Electric Power Company, Inc.
&
VT Transco LLC

Prepared by:

TRC Environmental Corporation
6 Ashley Drive
Scarborough Maine 04074

August 2021

TABLE OF CONTENTS

LIST OF ACRONYMS

BMP	Best Management Practice
DBH	Diameter at breast height
DWA	Deer Wintering Area
EI	Erodibility Index
EO	Element Occurrence
EPSC Plan	Erosion Prevention and Sediment Control Plan
FEH	Fluvial Erosion Hazard
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
GIS	geographic information system
GPS	global positioning system
HEL	Highly Erodible Land
NHI	Natural Heritage Inventory
NRCS	Natural Resources Conservation Service
OHW	Ordinary High Water
PAS	Prime Agricultural Soils
PEM	Palustrine Emergent
PFO	Palustrine Forested
PSS	Palustrine Scrub Shrub
RINA	Rare and Irreplaceable Natural Areas
ROW	right-of-way
RTE	Rare, Threatened, and Endangered Species
SCAP	Substation Condition Assessment Project
SOF	successional old field
SPA	Source Water Protection Area
SPCC Plan	VELCO Spill Prevention, Control, and Countermeasure Plan
TMDL	Total Maximum Daily Load
U.S.	United States
USACE	U.S. Army Corps of Engineers
USFWS	US Fish and Wildlife Service
VEGM	VELCO Environmental Guidance Manual
V.S. A	Vermont Statutes Annotated
VSWI	Vermont Significant Wetlands Inventory
VCGI	Vermont Center for Geographic Information
VELCO	VT Transco LLC and Vermont Electric Power Company
VT ANR	Vermont Agency of Natural Resources
VT DEC	Vermont Department of Environmental Conservation
VT FWD	Vermont Fish and Wildlife Department

1.0 Introduction

TRC has prepared this Natural Resource Assessment Report on behalf of VT Transco LLC and Vermont Electric Power Company (referred collectively herein as "VELCO") as part of its Florence Substation Condition Assessment Project (Project) in Pittsford, Vermont. This report summarizes the results of TRC's natural resource investigation at the Florence Substation, hereafter referred to as the "Substation Assessment area" or "Assessment area", which is approximately 5.09 acres (Figure 1, Attachment A). TRC's investigation evaluates the potential effect of the Project on water quality and the natural environment in accordance with Section 248(b)(5) of Title 30, Vermont Statutes Annotated (V.S.A), which provides that a generation or transmission facility should not have an undue adverse effect on air and water purity, the natural environment, the use of natural resources, and the public health and safety, with due consideration having been given to, but not limited to, the following environmental criteria:

- Outstanding Resource Waters (10 V.S.A. § 1424a(d)),
- Air Pollution (10 V.S.A. § 6086(a)(1)),
- Headwaters (10 V.S.A. § 6086(a)(1)(A)),
- Waste Disposal (10 V.S.A. § 6086(a)(1)(B)),
- Water Conservation (10 V.S.A. § 6086(a)(1)(C)),
- Floodways (10 V.S.A. § 6086(a)(1)(D)),
- Streams (10 V.S.A. § 6086(a)(1)(E))
- Shorelines (10 V.S.A. § 6086 (a)(1)(F)),
- Wetlands (10 V.S.A. § 6086(a)(1)(G)),
- Water Supply (10 V.S.A. § 6086(a)(2) and (3)),
- Soils (10 V.S.A. § 6086 (a)(4)),
- Rare and Irreplaceable Natural Areas (10 V.S.A. § 6086(a)(8)), and Necessary WildlifeHabitat and Endangered Species (§ 6086 (a)(8)(A)),
- Primary Agricultural Soils (30 V.S.A. § 248 (a)(9)(B)).
- Greenhouse Gas Impacts (30 V.S.A. § 248 (a)(9)(F)),

TRC reviewed applicable Vermont environmental standards, records, and data relating to natural resources in the Assessment area, including a review of applicable geographic information system (GIS) data available online from the Vermont Center for Geographic Information (VCGI) and Vermont Natural Resources Atlas. Additionally, TRC environmental scientists performed natural resource field surveys and wetland delineations throughout the Assessment area in October 22, 2020. Additional surveys for rare plant species and potentialbat roosting habitat were conducted in July 2021. The following sections describe the natural resources identified in the Substation Assessment area and address potential effects of the Project upon those environmental-related criteria specified in 10 V.S.A. §1424a(d) and 6086(a)(1) through (8) and greenhouse gas impacts, pursuant to Section 248(b)(5) of Title 30.

The Assessment area contains a mix of herbaceous wetland areas along a transmission right of way, pockets of scrub-shrub and forested wetlands, and forested uplands as well as several natural resources that will in most instances not be impacted or affected in any way by the proposed Project activities, because they are well outside the Assessment Area itself.

1.1 Background

VELCO proposes to construct a new substation to the north and adjacent to the existing substation. After VELCO has successfully commissioned the new substation and placed it into service, VELCO will retire and remove the existing substation. At a highlevel, the Project consists of the following primary components:

- Construct a new 115/46 kV ring bus substation with all new components adjacent to the existing substation, including installing:
  - A new 115/46 kV, 33.6/44.8/56 MVA transformer.
  - Four (4) 46 kV vacuum circuit breakers
  - One (1) 115 kV, SF6 circuit breaker
  - Ten (10) MVar capacitor bank, and associated reactor/resister filter bank components, and SF6 Breaker
  - A protection and control system
  - A control building that can accommodate the new protection and controls system, redundant AC and DC services, communication equipment, and security systems.
  - One (1) set of 115 kV, and four (4) sets of 46 kV instrument voltage transformers in support of the new protection and controls system.
  - Passive secondary oil containment system for the new 115/46 kV transformer.
  - A new fence to accommodate the new substation. The substation fence will enclose a 39,500 square foot area to the north of the existing substation fence. For comparison, the existing substation fence encloses an area of 24,900 square feet. Inaddition, VELCO will install a fence at the top of the hillside for safety purposes.
  - Two (2), three pole structures to connect the existing 115 kV transmission line to the new substation.
- Perform tree clearing to accommodate new substation and pole structures
- Remove existing substation, including all above and below grade components and restore the area to fit in with the surrounding property

1.2 Natural Setting

The Florence Substation is in the Town of Pittsford in northcentral Rutland County, between the Taconic Mountain biophysical region to the west and Vermont Valley biophysical region to the east. The Taconic Mountain region is described by Elizabeth Thompson and Eric Sorenson(2005) as a contrasting landscape with places that are high or low, dry or wet, have hills that aregently sloping or "noticeably knobby", lime-rich bedrock or lime-poor slate, and moderate or harsh, cold climates. The rocky landscape is derived from metamorphosed mudstones translocated on top of limestone. Postglacial deposits of kame gravel, lake deposits and alluvial sediments occur in the valleys of this region. Springs are prevalent as a result of the soft limestone bedrock beneath the relatively harder mudstone.

The Vermont Valley region is flanked by the Taconic Mountains to the west and the Green Mountains to the east (Thompson and Sorenson 2005). The Vermont Valley is narrow, ranging in width from approximately five miles to less than one mile. Soils include glacial deposits, mostly kame terraces and some eskers. The Vermont Valley, even though flanked on both sidesby mountains, is of itself a drainage divide for Otter Creek and the Batten Kill, each flowing in directions opposite of one another. Additionally, surface water can easily become subterranean as result of the easily erodible soft bedrock that underlies the region, or the presence of permeable gravel deposits along the valley walls.

Vegetation in the Taconic Mountains biophysical region is highly variable. Northern hardwood forests are dominant along mid-elevations with mesic soil moisture regimes and are comprised of sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), ash (*Fraxinus spp.)*, and yellow birch (*Betula alleghaniensis*). Lower elevations and south-facing slopes are characterized by oaks (*Quercus spp.*) and hickories (*Carya spp*.).

The natural forests of the Vermont Valley have been lost through generations of development. However, white pine (*Pinus strobus*) and eastern hemlock (*Tsuga canadensis*) are common on gravel terraces typical to the region, much as they probably were prior to the development of the valley. For example, the substation proper is nestled up against a gravel terrace where white pine and hemlock are the dominant tree species.

The forests of the Taconic Mountains provide habitat to a number of large mammals including black bear (*Ursus americana*), white-tailed deer (*Odocoileus virginianus*), and bobcat (*Lynxrufus*). Additionally, the forests provide habitat for a diversity of songbirds, and the springs and seeps provide amphibian habitat (Thompson and Sorenson, 2005). The Vermont Valley region serves as a corridor between the Taconic and Green mountains, along which wildlife exploit the abundance of food and water.

Within the Substation Assessment area, natural communities have been altered by development and maintenance of the existing substation, access road, and K-30 Line and two other unnamed transmission line right-of-ways (ROWs), which intersect the site. The majorityof the site is low and flat, except to the east and southeast of the substation, which is comprised of a forested hillside, part of which was cut into for the original construction of the substation. The forested hillside has steep slopes with a northwesterly aspect. The slopes are dominated by eastern hemlock, eastern white pine, and sugar maple, with red cedar (*Juniperus virginiana*) on rock outcrops. A stand of northern white cedar (*Thuja occidentalis*) is present on top of the rock outcrop, between the existing Florence substation and an active mineral processing company (OMYA) to the east.

The Assessment area includes portions of a larger, contiguous wetland, west of the substation proper, dominated by common reed (*Phragmites australis*), silky dogwood (*Cornus amomum*), and sedges (*Carex spp*.) The wetland community is discussed in more detail in Section 12.

1.3 Accessibility of the Assessment area

Access to the Assessment area can be achieved from the existing substation access road located directly off Whipple Hollow Road. Pending construction plans, additional access roads and equipment staging areas may be identified within the assessment area. To the extent possible, these will be restored after construction.

2.0 Outstanding Resource Waters (10 V.S.A. § 1424a(d))

The 10 VSA § 1424a(d) states that "after consideration of all relevant information, the Secretary shall adopt rules designating the waters as outstanding resource waters if it finds that they have exceptional natural, recreational, cultural, or scenic values". The Vermont Water Quality Standards (page 13) similarly states "the Secretary may under 10 V.S.A. §1424a designate certain waters as Outstanding Resource Waters. Where the Secretary so designates such watersbecause of their water quality values, their existing quality shall, at a minimum, be protected and maintained". The following four waterways have been classified by the ANR as Outstanding Resource Waters (ORWs; ANR 2012):

1. Batten Kill River, Towns of East Dorset and Arlington
2. Pike's Falls/Ball Mountain, Town of Jamaica
3. Poultney River, Towns of Poultney and Fair Haven
4. Great Falls, Ompompanoosuc River, Town of Thetford

TRC completed a review to assess proximity of these ORWs to the Assessment area and determined that none are in the vicinity of the Assessment area and thus, the Project will have no undue, adverse effect on Outstanding Resource Waters.

3.0 Air Pollution (§ 6086(a)(1))

For the incorporated Act 250 criteria relating to air pollution to be met, the Applicant must demonstrate that the Project will not result in adverse undue air pollution. The Project is not proposing any facilities that will generate air pollution, and therefore will not be subject to an air pollutioncontrol permit under the Agency of Natural Resources (VT ANR) Air Pollution Control Regulations (10 V.S.A. Section 556). There will be temporary dust sources associated with removal and crushing of rock ledge during the construction phase of the Project, but this disturbance will be temporary in nature and does not represent an ongoing source of air pollution. With respect to dust, any temporary dust resulting from construction activities associated with the Project will be managed in accordance with VELCO's Environmental Guidance Manual ("VEGM"), and the Vermont Standards & Specifications for Erosion Prevention & Sediment Control, and any associated permits.

4.0 Headwaters (10 V.S.A. § 6086(a)(1)(A))

Vermont Act 250 Criterion 1(A) (Headwaters) provides that a permit will be granted when an applicant demonstrates that the Project would meet any applicable Vermont Health and Environmental Conservation Department regulations regarding reduction of the quality of the ground or surface waters flowing through or upon lands which are not devoted to intensive development, and which lands are:

- (i) headwaters or watersheds characterized by steep slopes and shallow soils; or
- (ii) drainage areas of 20 square miles or less; or
- (iii) above 1,500 feet elevations; or
- (iv) watersheds of public water supplies designated by the VT ANR; or
- (v) areas supplying significant amounts of recharge waters to aquifers.

To assess whether the Assessment area is located within headwaters as defined above, TRC conducted a database review of soils data from the NRCS and the ANR Atlas, and of topographic maps, watershed maps, and public water supply protection area information from the ANR Atlas. Based on this information, it was determined that the Assessment area is: (a) not characterized by steep slopes and shallow soils, (b) not positioned above 1,500 feet, (c) not a watershed designated by ANR as a public water supply, and (d) not an area supplying significant amounts of recharge water to aquifers. The Assessment area is within the subwatershed (Hydraulic Unit 12 (HU12) - Subbasin) headwaters of Bresee Mill Brook-Otter Creek, which has a total subwatershed area of 34.99 square miles (greater than 20 square miles). It is also located within the Greater Lake Champlain Drainage Basin (Otter Creek Basin, Water Quality Management Plan, May 31, 2012).

Therefore, the Assessmentrea is not located within headwaters as defined above, and with the implementation of the practices and standards outlined in VELCO's Environmental Guidance Manual (VEGM), its Transmission Vegetation Management Plan, and site-specific Spill Prevention, Control, and Countermeasure Plans, the Project will have minimal potential to adversely affect the natural flow regime or groundwater recharge, the condition or waterquality of streams, groundwater, wetlands, or affect public health. Therefore, the proposed Project will have no undue, adverse effect on headwaters.

5.0 Waste Disposal (§ 6086(a)(1)(b))

The Act 250 criterion relating to waste disposal states that "A permit will be granted whenever it is demonstrated by the applicant that, in addition to all other applicable criteria, the development or subdivision will meet any applicable Health and Environmental Conservation Department regulations regarding the disposal of wastes, and will not involve the injection of waste materials or any harmful or toxic substances into ground water or wells".

The existing Florence Substation facility is included in the VELCO Spill Prevention, Control, and Countermeasure (SPCC) plan, which includes spill control and response measures in the event of a release of oil and/or hazardous material at the site and specifies the secondary containment systems that are currently installed at the site. High groundwater at the site precludes the use of a conventional in-ground wastewater treatment so wastewater from the existing control building sink and toilet is handled by an onsite holding tank, which is located west and outside of the substation fence line. The system is inspected annually in accordance with the Wastewater and Potable Supply Permit for the site, with the inspection report submitted to the VT ANR Regional Engineer. VELCO is still in the siting and design phase of its proposed onsite water supply and wastewater system. As part of this effort, VELCO will evaluate the viability of utilizing the existing well and septic system for the new control building. VELCO will obtain the necessary Wastewater and Potable Water Supply Permit from the VT DEC Drinking Water and Groundwater Protection Division for the Project.

The Project will follow VELCO's Decommissioning Plan for the removal of the existing Florence substation facility. Any waste generated during construction of the Project will be managed and disposed of in accordance with the above-mentioned state and federal regulations. As such, the Project will not have any undue adverse impacts relating to waste disposal.

6.0 Water Conservation (§ 6086(a)(1)(C))

The Act 250 criterion relating to water conservation states that "a permit will be granted whenever it is demonstrated by the applicant that, in addition to all other applicable criteria, the design has considered water conservation, incorporates multiple use or recycling where technically and economically practical, utilizes the best available technology for such applications, and provides for continued efficient operation of these systems". There is anexisting bathroom facility located in the VELCO Florence Substation control building, which is served by an onsite drilled well located east of the control building and along the fence line of the existing substation yard. VELCO is evaluating the viability of reusing the existing well. If a new well is warranted, the existing well will be decommissioned as part of the Project in accordance with VT ANR guidelines.

VELCO plans to construct a new control building as part of this Project, which will replace the existing control building. The existing control building and associated bathroom will be removed as part of the proposed Project. VELCO does not plan to install any additional bathrooms on the premises or to otherwise increase water use or demand as a result of the Project. However, water may be used onsite during the Project for several activities, which may include dust control, secondary containment testing, and certain aspects of restoration. Water use for these Project elements is expected to be limited and temporary in nature. Water use upon completion of the Project is expected to be minimal as the substation is not regularly staffed, and thus, there will be no undue adverse effect to water conservation.

7.0 Floodways (10 V.S.A. § 6086(a)(1)(D))

Under Act 250 Criterion 1(D) (Floodways), a permit will be granted whenever it is demonstrated by the applicant that development within a floodway will not restrict or divert the flow of flood waters, and endanger the health, safety and welfare of the public or riparian owners during flooding, and the development within a floodway fringe will not significantly increase the peak discharge of the river or stream within or downstream from the area of development and endanger the health, safety, or welfare of the public or riparian owners. The term "floodway" is defined at Section 6001(6) of Act 250 to mean "the channel of a watercourse which is expected to flood on an average of at least once every 100 years and the adjacent land areas which are required to carry and discharge the flood of the watercourse …." Floodway fringe is defined at Section 6001(7) as "an area which is outside a floodway and is flooded with an average frequency of once or more in each 100 years." TRC reviewed Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) to identify possible floodways or floodway fringes.

In addition, the Vermont Flood Hazard and River Corridor Rule went into effect on March 1, 2015, which requires the VT ANR to regulate activities exempt from municipal regulation in flood hazard areas and river corridors. These activities include power generating and transmission facilities regulated under 30 V.S.A. § 248, such as the Florence Substation Condition Assessment Project.

Fitzgerald Environmental Associates (FEA) was retained by VELCO to assist with the evaluation of hydrology and hydraulics for the substation South of Whipple Hollow Road on the unnamed tributary to Otter Creek. The resulting hydraulic analysis and flood zone mapping is included in Attachment C. The site is located between 420 and 500 feet in elevation above mean sea level, and FEA's results indicated at the substation, the modeled 100-year flood discharge elevation was 419.5 feet and the modeled 500-year flood discharge elevation was 419.7 feet.

According to the FEMA FIRM (Map Number 50007C0039D, dated July 18, 2011), much of the Assessment area is located outside floodways or floodway fringe. However, the area west of the substation is located within the 1% annual chance flood, or 100-year flood zone (Figure 2, Attachment A). This area approximately corresponds to the area mapped as wetland PI-6d.

TRC viewed data layers for floodable soils (VT ANR, 2017). Most of the Assessment area soils meet the flood frequency category "none". In addition, TRC reviewed VT ANR's river corridor mapping tool, the "Flood Ready Atlas" (VT ANR, 2021). The closest mapped river corridor is for an unnamed stream north of Whipple Hollow Road, directly across from the substation access road.

TRC additionally performed stream/waterbody delineation and desktop fluvial erosion hazard (FEH) assessments. Given the relatively small FEH in this area and lack of any streams or waterbodies, the Project has minimal potential to affect floodways or floodway fringes.

Based on these findings, we conclude the Project will have no undue, adverse effects on floodways or floodway fringes nor will it endanger the health, safety and welfare of the public or riparian owners as it relates to flood events or fluvial erosion.

8.0 Streams (10 V.S.A. § 6086(a)(1)(E))

Section 248 and the incorporated Act 250 Criterion 1(E) requires that an applicant demonstrate that the development of lands on or adjacent to the banks of a stream will, whenever feasible, maintain natural condition of the stream, and will not endanger the health, safety, or welfare of the public or of adjoining landowners.

TRC surveyed for perennial and intermittent streams to characterize their physical and natural conditions during wetland delineation field surveys in October 2020, but no streams were found within the Assessment area.

8.1 Impaired Waters Status

According to the U.S. Environmental Protection Agency-approved 303(d) list of impaired surface waters, there are no impaired waters in the Assessment area. Therefore, it is presumed that the Project will have no undue, adverse effects on impaired waterbodies.

9.0 Shorelines (10 V.S.A. § 6086 (a)(1)(F))

Shoreline boundaries include the land between the mean high water and the mean low water mark of ponds, lakes, reservoirs and rivers (10 V.S.A §6001(17)). Shoreline is also defined in Act 250 as "the land adjacent to the waters of lakes, ponds, reservoirs and rivers." Previous Act 250 findings are that "the word 'adjacent' is a relative term that must be considered in the scale of a project." Act 250 criterion (1)(F) seeks to, insofar as possible and reasonable considering the purpose of the proposed Project,

- (i) retain the shoreline and the waters in their natural condition,
- (ii) allow continued access to the waters and the recreational opportunities provided by the waters,
- (iii) retain or provide vegetation which will screen the development or subdivisionfrom the waters, and
- (iv) stabilize the bank from erosion, as necessary with vegetation cover.

The Assessment area is not located near or within a shoreline, nor would any of the Project activities have any effect on the above-mentioned shoreline criteria so, the Project will have no undue, adverse effects on shoreline resources.

10.0 Wetlands (10 V.S.A. § 6086(a)(1)(G))

Section 248 and the incorporated Act 250 Criterion 1(G) requires that an applicant must demonstrate that a project will not violate the rules of the Secretary of Natural Resources relating to "significant" wetlands (i.e., the Vermont Wetland Rules). As enumerated in the Wetland Rules, there are three classes of wetlands. "Class One" and "Class Two" wetlands are considered "significant" and are protected by the Vermont Wetland Rules. Class One Wetlands are exceptional or irreplaceable in their contribution to Vermont's natural heritage and therefore merit the highest level of protection for the wetland and a 100-foot buffer zone.Class Two Wetlands are wetlands identified on the Vermont Significant Wetlands Inventory (VSWI) maps, or those the Secretary of the ANR determines merit protection, based on an evaluation of the functions and values set forth in 10 V.S.A. § 6025(d)(5)(A)-(K) and Sections 5of the Vermont Wetland Rules, as well as the presumptions of significance identified in Section 4.6 of the Vermont Wetland Rules. A 50-foot buffer zone is designated adjacent to all Class Two wetlands. Class Three wetlands are not protected by the Vermont Wetland Rules, although they are subject to jurisdiction under the federal Clean Water Act administered by the USACE.In accordance with recent revisions to the Vermont Wetland Rules, the Secretary of the ANR may on his or her own motion or upon petition, pursuant to 10 V.S.A. §914, determine whether a wetland is a Class Two or Class Three Wetland.

10.1 Wetland Delineation and Classification Methodology

TRC conducted field surveys and delineations of wetlands in the entire Assessment area consistent with the criteria in the Vermont Wetland Rules, and based on the following definition: "those areas of the state that are inundated by surface or groundwater with a frequency sufficient to support significant vegetation or aquatic life that depend on saturated or seasonally saturated soil conditions for growth or reproduction." TRC delineated wetlands using the delineation methodology prescribed in the Vermont Wetland Rules, which is enumerated in the U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual (1987), and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0) (2012).

The USACE wetland delineation methodology includes the assessment and documentation of three technical criteria (vegetation, soils, and hydrology) in identifying wetlands. TRC also recommended the classification of wetlands as Class Two or Class Three by using VSWI GIS data available on the VCGI website, an evaluation of the wetland functions and values by completing the Vermont Wetland Evaluation Forms, and consideration of the presumptions of significance identified in Section 4.6 of the Vermont Wetland Rules.

TRC wetland scientists completed wetland delineations that included flagging wetland boundaries, GPS location data, and characterizing vegetation communities within the Assessment area. Field surveys were conducted in October 2020. As part of the wetland delineation efforts, field flags were numbered sequentially to assist with the GPS field location inventories conducted at each wetland to produce geo-referenced boundaries. TRC processed the wetland and stream GPS boundaries and tentative state-regulated wetland buffer zones (for Class Two wetlands) onto a geo-referenced, aerial basemap (Figure 1, Attachment A).

Documentation of wetland boundaries consisted of completing wetland and upland plots forms (USACE Wetland Determination Forms) for each wetland to record hydrology, soils, and vegetation indicators observed in the field and characterize adjacent uplands. Table 1 of Attachment B summarizes the wetland resources delineated in the Assessment area, provides the Cowardin classification, the functions and values for each wetland, and lists TRC's recommended wetland classification.

10.2 Wetland Function and Values Evaluation for Vermont

TRC used two methods to evaluate the functions and values provided by each wetland delineated in the Assessment area. Under the Vermont Wetland Rules, Sections 5.1 through 5.10, there are 10 recognized functions and values of wetlands. TRC characterized wetlands using the State of Vermont functional criteria and completed a Vermont Wetland Evaluation Form for each wetland. TRC also evaluated wetlands for the 13 functions and values enumerated in *The Highway Methodology Workbook: Supplement* prepared by the USACE New England District (1999), which are considered by the Regulatory Branch for any Section 404 wetland permit. TRC characterized wetlands using these federal functional criteria and completed a USACE Wetland Function-Value Evaluation Form for each wetland. Wetland function and values are included on Table 1 in Attachment B.

10.3 Wetland Resources

One wetland (comprised of two sections, PI-6d and PI-6e) was identified, as depicted on Figure 1 of Attachment A, summarized in Table 1 of Attachment B, and described below.

Wetlands PI-6d and PI-6e

Wetland PI-6d is a depressional wetland in the southeastern portion of the Assessment area to the west of the existing substation. It is in the eastern segment of a large VSWI Class Two wetland. PI-6d is classified as a palustrine emergent/palustrine scrub-shrub (PEM/PSS) wetland and is approximately 6.88 acres. The eastern boundary is gently sloped to the west and dominated primarily by shrubs such as eastern cottonwood (*Populus deltoides*), red maple (*Acerrubrum*) and silky dogwood, with herbaceous species such as sedges, northern bugleweed (*Lycopus uniflorus*) and sensitive fern (*Onoclea sensibilis*). Beginning at the toe of this slope, andextending west, the remainder of the mapped wetland contains standing water and is dominated by common reed. PI-6d receives surface runoff from the hillslopes to the east and groundwater recharge. It is presumed that it drains to the linear irrigation ditch to the west, which separates the wetland from agriculture fields.

PI-6d provides high levels of water storage and surface and groundwater protection and mid-levels of wildlife habitat. Based on its location within a mapped VSWI wetland, PI-6d is a Class

Two wetland.

PI-6e is a very small (0.02 acres), depressional PEM wetland on the eastern side of the substation access road, seemingly isolated from the wetland complex on the west side of the access road. It is located at the foot of a vertical rock cut, receives surface runoff and precipitation, and retains hydrologic connection to wetland PI-6d via a culvert. Based on its connection to PI-6d, TRC recommends PI-6e as a Class Two wetland.

Temporary and/or permanent impacts to Class Two wetlands will be required for the construction of the Project. An analysis of the Project demonstrated that upgrading the VELCO Florence Substation is the most efficient way to address the condition-related concerns. In the upgrade design process, VELCO engineers have evaluated the existing configuration of the Florence Substation, safety and reliability standards, and the proposed Project components relative to wetland locations to determine a design to avoid and minimize wetland impacts to the extent practicable. The selected design for the Florence Substation Project greatly reduces the amount of wetland impacts associated with the Project, however, some unavoidable temporary and permanent impacts will be required. Construction of the new facility will require temporary and permanent impacts to wetland PI6D (class 2) and permanent impacts to wetland PI6E (class 2).

Potential temporary effects upon the wetlands during construction of the Project will be mitigated by employing appropriate construction practices, which could include working under frozen or dry conditions, the use of construction matting, utilizing appropriate erosion controls, and the restoration of wetland soil and vegetation. Permanent wetland impacts (e.g., placement of fill for the Project) will be required but is not considered to be significant. Significant permanent impacts would be mitigated as warranted based on consultation with the USACE.

VELCO will seek authorization from the USACE under the authority of Section 404 of the Clean WaterAct for any unavoidable impacts to wetlands. In addition, for any proposed impacts to Class Two wetlands, VELCO will obtain a VT State Wetlands Permit from the VT ANR under the authority of the Vermont Wetland Rules and 10 V.S.A § 6025.

As with other recent VELCO projects, appropriate mitigation measures will be developed during the wetland permitting process as necessary, and significant adverse impacts to wetland functions and values will be avoided or mitigated. In addition, erosion prevention and sediment control practices as described in the VEGM (and/or a Project-specific EPSC Plan to be developed under General Permit 3-9020 or an Individual Construction Stormwater Discharge Permit) will ensure the protection of wetlands and water quality from unintended runoff and sedimentation during construction. Therefore, no undue, adverse effects to wetland functions and values will occur.

11.0 Water Supply (10 V.S.A. § 6086(a)(2) and (3))

According to the criteria in Act 250 pertaining to water supply, it should be demonstrated that there is, "sufficient water available for the reasonably foreseeable needs of the subdivision or development" and that it will "not cause an unreasonable burden on an existing water supply, if one is to be utilized". Water is likely to be used during construction of the Project for dust control, secondary containment testing, and certain aspects of restoration, as necessary. Waterfor these uses will be limited and temporary in nature. VELCO will obtain a wastewater system and potable water supply permit amendment from the VT ANR for the control building relocation component of the proposed Project.

The current onsite water supply is expected to meet the limited water supply demand associated with the operation of the Project, as the proposed Project upgrades will not increasewater demand at the substation following completion of the project and, as such, the Project will not cause a burden on existing water supplies.

According to the Natural Resources Atlas, there is one private well near the northwestern boundary of the Assessment area [Well Tag: 544-A] (VT ANR, 2021b). VELCO will take precautions during construction to ensure this well will not be adversely affected. In addition, there are two mapped "inactive" public water sources roughly three quarters of a mile northeast of the substation. The area surrounding these sources make up the "Pittsford Florence Water" groundwater Source Water Protection Area (SPA), which is inactive.

12.0 Soil Erosion (10 V.S.A. § 6086(a)(4))

Section 248 and the incorporated Vermont Act 250 criterion (a)(4) states that a permit shall not be granted unless it is demonstrated that the development will, "not cause unreasonable soil erosion or reduction in the capacity of the land to hold water so that a dangerous or unhealthy condition may result". TRC evaluated soil types and slope gradients within the Substation Assessment area to assess the potential for proposed construction activity to reduce permeable area (capacity of land to infiltrate and hold water) or cause an unreasonable risk for drainage or runoff problems that lead to soil erosion.

12.1 Soil Series within the Substation Assessment area

To evaluate the potential for soil erosion and the capacity of the land to hold water within the Substation Assessment area, TRC obtained soil series data from VCGI and soil series descriptions from the Natural Resources Conservation Service (NRCS) Web Soil Survey for Rutland County. These series were then plotted within the Assessment area as shown on Figure 2 in Attachment A. Soils found in the Assessment area are summarized in Table 2 of Attachment B.

The elevation on-site ranges from approximately 410 feet to 500 feet above sea level. Numerous soil types are found in the Assessment area. Farmington-Galway-Galoo complex,very rocky

(5.77 acres); Eldridge fine sandy loam (0.41 acres), Scarboro muck (5.26 acres), and Linwood Muck (1.79 acres). These soil types have percent slope categories that range from 0 to 50 percent. With the exception of the Scarboro muck, which is the only hydric soil type, the site is classified as highly erodible or potentially highly erodible land.

12.2 Soil Erosion

The NRCS classifies highly erodible land (HEL) according to an erodibility index (EI) as defined in the National Food Security Act Manual. The HEL value is a calculation that considers the soil erodibility factor (K-value), soil loss tolerance, slope gradient factor, and slope length factor. Highly erodible soils have reduced capacities to hold water and an increased potential for detachment either from steepness or poor soil structure. These soils are subject to runoff and increased erosion risk.

Over two-thirds of the soil series within the Assessment area are classified as either highly erodible or potentially highly erodible and require special attention and management during construction. Applicable erosion prevention, sediment control and restoration practices will be implemented in accordance with the VEGM. The Project will obtain and comply with a Construction Stormwater Discharge Permit and additional measures will be outlined in a Project-specific EPSC Plan. Although Project plans are not finalized, they will be developed to ensure construction activities do not cause undue, adverse effects to soil, effects from soil erosion, effects on the water quality of stream and wetland resources, deviations from the VT Water Quality Standardsor cause a reduction in the capacity of the land to hold water from the Project.

13.0 Rare and Irreplaceable Natural Areas (§ 6086(a)(8)), Necessary Wildlife Habitat and Endangered Species (§ 6086(a)(8)(A))

Section 248 and the incorporated criterion 8(A) of Act 250 provides that a permit will not be granted if it is demonstrated that the project will “destroy or significantly imperil necessary wildlife habitat or any endangered species.” Furthermore, Act 250 criterion 8 provides that before granting a permit, the applicant must determine that the project will not have an undue adverse effect on rare and irreplaceable natural areas (RINA) among other resources.

13.1 Natural Heritage Inventory Review

TRC conducted a desktop review prior to field surveys to obtain documentation of state natural areas, wildlife habitat, significant natural communities, and rare, threatened, and endangered species (RTE) within the Assessment area. As part of that review, TRC obtained Natural Heritage Inventory (NHI) Element Occurrence (EO) records from the VT ANR Natural Resource Atlas for RTE and significant natural communities that occur in proximity to the Substation Assessment area. In addition, the U.S. Fish and Wildlife Service (USFWS, 2021) list of federally listed species in Vermont was obtained, which lists species by town and county. TRC also consulted USFWS online Information for Planning and Consultation (IPaC) system (https://ecos.fws.gov/ipac/), which generates an official species list for the Assessment area. The VT ANR has also reviewed VELCO's 45-day notice of intent to file a petition requesting a Certificate of Public Good for the project, providing preliminary comments for RTE species on July 02, 2021.

13.2 RTE Species

13.2.1 Indiana Bat

One federally endangered species, the Indiana bat (*Myotis sodalis*) (USFWS, 2021), was identified by the USFWS as occurring in Rutland County, and VT ANR's July 2, 2021 comments submitted for this Project indicated that the Project was located within the known summer range for this species. Indiana bat has been documented in forests and woodlots in the towns of Benson, Brandon, Sudbury, Fair Haven, Pittsford and West Haven, and hibernacula were known to exist in caves and mines in the towns of Brandon and Chittenden, which are adjacent to Pittsford.

TRC conducted desktop and field-based Phase 1 habitat assessment within the Assessment area for Indiana bat summer maternity roosting habitat, as well as for any potential wintering hibernacula. Suitable summer habitat for Indiana bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats, such as emergent wetlands and adjacentedges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥5 inches dbh) that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. (USFWS 2020). Unsuitable habitat is generally considered to be individual trees that are greater than 1,000 feet from forested/wooded areas, Trees found in highly-developed urban areas (e.g., street trees, downtown areas), and a pure stand of less than 3-inch dbh trees that are not mixed with larger trees (USFWS 2020).

Within the Assessment area two types of forested habitat exist: patches of forested wetland dominated by red maple, cottonwood, elm, spruce, and willows in the western portion of the Assessment area, and an upland forest located atop a cliff in the eastern segment of the Assessment area. Both areas were surveyed on July 19, 2021 for appropriate roosting structure. The forested wetlands contained younger growth, and a thick understory of shrubs and saplings. The tree species present did not have exfoliating bark, and no appropriately sized trees or dead snags with cracks/crevices were located within the forested wetlands. The forested uplands to the east of the substation are a dense coniferous stand of cedar, hemlock, white pine, and occasional white oaks. This stand contained generally larger trees than the forested wetlands and had an open understory. The tree species present did not display exfoliating bark, but therewere dead snags and other features present which indicated potential habitat. In this area eight potential roost trees were identified. These were all between 12 inches and 22 inches indiameter (DBH), and consisted of either dead snags with loose bark, or living trees with large broken horizontal limbs and/or visible cavities. Their locations are shown in Attachment A, Figure 1.

The landscape within 5 miles of the Project consists principally of forested, agricultural, and residential land. The adjacent property to the east is currently being utilized for industrial purposes and contains a rock quarry, a calcium carbonate production facility, and a railroad spur servicing the facility. This industrial property is roughly 400 feet from the existing Florence substation, and all the potential roost trees identified are located within the upland forested area between the existing substation and the industrial lot. The general noise from machinery, rock crushing, train and vehicular travel may degrade the quality of the forested habitat for usage by Indiana bats. During the field surveys no caves, mines or other appropriate winter hibernacula were identified within the Project area. The presence of open palustrine emergent wetlands within the Assessment area may provide foraging opportunities for Indiana bats, but the industrial land use directly west may negatively affect the quality of Assessment area's potential roosting habitat.

As per VT FWD recommendation, in order to avoid taking Indiana bats, VELCO intends to implement the seasonal restriction and clear potential roost trees > 5" dbh within the Assessment Area between November 1 to March 31. These trees were identified in the field during an Indiana Bat Phase 1 Project Screening & Habitat Assessment in July 19, 2021, and their locations are shown on Figure 1 in Attachment A. If circumstances prevent tree clearing within this window, then VELCO will work closely with VT FWD and USFWS to conduct suitable targeted surveys/studies and implement appropriate mitigation measures to remove/reduce potential impacts to Indiana bats and clear the potential roost trees. As the trees will be removed prior to the Indiana bat maternity season, or removed with agency consultation, the Project will have no undue, adverse effect on Indiana bats.

13.2.2 Northern Long Eared Bat

The Assessment area is not located within 1 mile of a known occupied hibernacula or a known active maternity colony, placing it outside potential federally threatened, northern long-eared bat (*Myotis septentrionalis*) hibernacula or summer roosting habitat for both the USFWS 4(d) rule (USFW 2019) and the VTANR Regulatory Review Guidance for Protecting Northern Long-eared Bats and their Habitats (VT FWD 2019b). The Assessment area is not located within any federally regulated northern long-eared bat habitat buffers, but as per the VTANR guidelines, the Assessment area is within habitat that VTANR recognizes as potential summer habitat. The VTANR guidelines for potential summer habitat state that "Land use activities impacting less than 1% of the existing forested acreage within a 1.0-mile radius of the land use activity (i.e., 20acres in a completely forested landscape) will be allowed without any conservation measures necessary". Therefore, the Project does not require any conservation measures to be implemented before tree removal. For these reasons, the Project will have no undue, adverse effect on northern long-eared bats.

13.2.3 Rare Plants and Significant Natural Communities

According to the Vermont's Natural Resource Atlas one endangered, protected plant species, and one uncommon, but not protected species, are mapped by within 1 mile of the Project. VTANR's

July 2 comments submitted for this Project indicated the potential of RTE plants or significant natural habitats which occur on calcareous bedrock systems to be potentially present. In response, TRC retainedGilman and Briggs Environmental to conduct a survey for rare plants and rare natural communities within the Assessment area. Surveys were conducted on July 19, 2021, and the survey results are summarized here and provided in Attachment C.

Hills Pondweed (*Potamogeton hillii* EO ID 9121) was last documented in 1983 near the northern boundary of the Assessment area, along Whipple Hollow Road. Hill's pondweed is an uncommon aquatic plant in the state of Vermont (state rarity rank S3) (VT FWD, 2021), but it is not federally-protected. Hill's pondweed is a perennial, submersed aquatic plant; its stems and leaves remain below the surface of the water. Typical habitat includes shallow, still to slow-moving streams, rivers, lakes and ponds. This population was last documented in 1983. During field surveys, no habitat was observed within the Assessment area that would be considered ideal Hill's pondweed habitat. The site does not contain the type of aquatic habitat, i.e., pools, ponds, or streams that might provide habitat for Hill's pondweed, and no Hill's pondweed was observed. The second plant species, Drummond's rock cress (*Boechera stricta*) is considered an endangered species in Vermont. The Assessment area contains ledge and outcrop habitat suitable for Drummond's rock cress, but no Drummond's rock cress nor any other rock cress species were found during the plant surveys.

No rare natural communities were identified within the Assessment area during the rare plant and natural community surveys.

Based on the current Project designs, the absence of any rare plants or significant natural communities within the Assessment area, and implementation of winter tree clearing guidelines regarding Indiana bat, the proposed Project will not result in an undue adverseeffect on RTE species or significant natural communities at the site.

13.3 Rare or Irreplaceable Natural Areas (RINA) (§ 6086(a)(8))

An assessment for Rare and Irreplaceable Natural Areas (RINA), Necessary Wildlife Habitat, and Rare Threatened and Endangered (RTE) Species was performed by TRC in 2014 and again in 2021. No occurrences of RINA were documented in or adjacent to the Assessment area.

Roughly two to three miles to the northwest of the Assessment area, in the Taconic Mountains, there is a network of mapped occurrences of natural communities. These include widespread (state rank S4) natural communities consisting of *Hemlock Forest*, *Rich Northern Hardwood Forest*, *Mesic Red Oak-Northern Hardwood Forest*, and *Hemlock-Northern Hardwood Forest*; uncommon (state rank S3) natural communities consisting of *Dry Oak Forest*, *Hemlock-Balsam Fir-Black Ash Seepage Swamp* and *Dry Oak-Hickory-Hophornbeam Forest*; and one rare natural community (state rank S2), a *Hemlock-Sphagnum Acidic Basin Swamp*.

The remaining vegetative communities are not currently considered by the Natural Heritage

Program to be sufficiently rare, high in quality, or occurring in sufficiently rare assemblages to qualify as state-significant natural communities. Thus, the Project will not have an undue, adverse effect upon RINA, or destroy or significantly imperil rare, threatened, or endangered species.

13.4 Wildlife Habitat

The Act 250 criterion for wildlife habitat defines "necessary wildlife habitat" as "concentrated habitat which is identifiable and is demonstrated as being decisive to the survival of a species of wildlife at any period in its life, including breeding and migratory periods" (10 V.S.A. Section 6001(12)). TRC evaluated "necessary wildlife habitat" by reviewing the significant habitat maps available from the VT FWD website, characterizing vegetation communities and recording observations of wildlife sightings during field surveys, and reviewing reports and scientific literature concerning cleared ROWs and early-successional habitats associated with natural and human disturbance areas in New England.

13.4.1 Deer Habitat

There are no mapped Deer Wintering Areas (DWA) documented by the VT FWD within the Substation Assessment area. During field surveys in the coniferous forest with southern and southeasterly aspects east of the Florence substation and Assessment Area, TRC noted evidence of transitory deer activity; however, the habitat was determined not to be DWA because it lacked the necessary combination of a shrubby understory composed of browse species preferred by white-tail deer. Outside of winters with deep snow cover and throughout the rest of the year, deer use the habitat in the Assessment area as part of their home range. Given that no DWA is mapped within the Assessment area, no DWA was determined to be present, the Project will not have undue adverse effects on any "deer wintering areas" or significant deer habitat areas.

13.4.2 Bear Habitat

According to the VT FWD, beech stands representing "necessary black bear habitat" exhibitbear scarring made within the past 10 years and include at least 15 to 25 scarred beech trees within a stand. Similarly, oak stands serving as "necessary black bear habitat" have bear scarring and include at least 15 to 25 scarred oak trees within a stand (VT FWD, 2019a).

TRC also considered the bear habitat classes defined by the VT FWD as follows:

Class 0 – are areas generally not known to be bear production or seasonal habitat areas, although bears sightings may be possible.

Class 1 – are potential bear production habitat in that there may be den sites and feeding sites in these areas.

Class 2 – are potential seasonal bear habitat, that is, summer feeding areas but not typical den site habitat.

Class 3 – are known bear habitat sites or sites with important primary bear habitat characteristics such as large stands of beech trees or suitable or known den sites. Some of these sites are mapped within the Green Mountain Range and in the Northeast Kingdom.

The Assessment area is surrounded by fragmentation and development. According to this dataset, there is an area of Class I habitat identified within the Town of Pittsford approximately 2.2 miles northeast of the Assessment area. In addition, Class I bear habitat is identified in the neighboring towns of Brandon, Chittenden and Rutland. No observations of bear use (bear scarring, bear dens, scat) were made during the field surveys and the site does not represent ideal bear habitat, so the area may potentially constitute Class 0 or Class 2 (seasonal) bear habitat. The site is not characteristic of bear production habitat; therefore, the Project will not cause undue, adverse effects to black bear habitat.

13.5 Wildlife Effects

The Substation Assessment area does not contain DWA, potential bear habitat, is located within and surrounding an industrial use substation facility and is adjacent to an active marble quarry and processing facility. Thus, the proposed Florence Substation Project is not expected to destroy or significantly imperil necessary wildlife habitat, or negatively affect the survival of anyanimal species. Therefore, the Project will not cause undue, adverse effects to wildlife or necessary wildlife habitat.

14.0 Primary Agricultural Soils [30 V.S.A. § 248(b)(5)]

The Section 248 criterion cites that the Project activities shall not have an undue adverse impact on primary agricultural soils as defined in 10 V.S.A. § 6001.
From 10 V.S.A. § 6001(15), Primary Agricultural Soils ("PAS") are defined as:

(A) An important farmland soils map unit that the Natural Resources Conservation Service of the U.S. Department of Agriculture ("NRCS") has identified and determinedto have a rating of prime, statewide, or local importance, unless the District Commission determines that the soils within the unit have lost their agricultural potential. In determining that soils within an important farmland soils map unit have lost their agricultural potential, the Commission shall consider:

(i) impacts to the soils relevant to the agricultural potential of the soil from previously constructed improvements;
(ii) the presence on the soils of a Class I or Class II wetland under chapter 37 of this title;
(iii) the existence of topographic or physical barriers that reduce the accessibility of the rated soils so as to cause their isolation and that cannot reasonably be overcome; and;
(iv) other factors relevant to the agricultural potential of the soils, on a site-specific basis, as found by the Commission after considering the recommendation, if any,

ofthe Secretary of Agriculture, Food and Markets.

(v) Soils on the project tract that the District Commission finds to be of agricultural importance, due to their present or recent use for agricultural activities and that havenot been identified by the NRCS as important farmland soil map units.

TRC's review is limited to the NRCS soil map unit designations, where PAS soils are defined as those soils with a prime agricultural soil rating of 1 (most desirable) through 7 (least desirable) with some soils with a rating of 8 included. Soils of statewide importance have an agricultural value of 7 or less, and soils of local importance consist of selected soil types with an agricultural value of 8 or less. TRC conducted a review of the NRCS soil map data to determine if PAS were present within the Assessment area. NRCS soil map units, including PAS designations, are included in Attachment A, Figure 2.

One of the five mapped soil units within the Assessment area, Eldridge fine sandy loam, 3-8 percent slopes, (soil series are shown on Attachment B: Table 2) is ranked as being soils of statewide importance, therefore meeting the Section 248 definition of Prime Agricultural Soils. The current conditions onsite place the potential PAS soil types within the northernmost segment of the Assessment area, for a total of 0.41 acres. This land is currently not used for agricultural purposes and exists as a grassy residential yard and gravel access road leading to the existing substation. The small amount of PAS (0.41 acres) within the Assessment area and its position under a permanent road and residential yard make viable agriculture unfeasible, and it's too small to support an economically viable agricultural operation and thus not viable PAS. Based on this information, the 0.41 acres of Eldridge fine sandy loam within the Assessment area should not be considered Prime Agricultural Soils and as such there is no undue adverse effect to farming, farming potential, or PAS as a result of the Project.

15.0 Greenhouse Gas Impacts (30 V.S.A. § 248(b)(5))

Beyond the limited, temporary emissions associated with construction-related gasoline- and diesel-powered vehicles and equipment, the Project is not anticipated to have any impact on greenhouse gas emissions. In addition, the new sulfur hexafluoride (SF6) circuit breakers to be installed at the substation are sealed units that are not anticipated to result in the emission of SF6 gas. In addition, VELCO has worked collaboratively with the VT DEC's Air Quality andClimate Division to specifically address VELCO's SF6 gas handling practices and the implementation of leak monitoring best practices, which VT DEC has obtained and reviewed in VELCO's SF6 Gas Policy. An on-site emergency generator capable of carrying the AC station service load would result in minor emissions of carbon monoxide (CO); however, its use is not a function of normal operation of the facility, and any minor emissions from its use would be infrequent and associated with emergency situations post construction. As such, there will be no undue, adverse effect associated with greenhouse gas emissions associated with the proposed Project.

16.0 Summary

This Natural Resource Assessment Report and the enclosed attachments describe the results of TRC's natural resource investigation on behalf of VELCO for its proposed SCAP at the Florence Substation in Pittsford, Vermont. This investigation supports VELCO's application to the Public Utility Commission for a Certificate of Public Good for construction activates related to a regulated electric transmission Project. Title 30 of the Vermont Statutes Annotated, Section 248 (b)(5), requires that a regulated electric generation or transmission Project, have no undue adverse effect on the natural environment with due consideration to specific criteria including 10 V.S.A. §§ 1424a(d) and 6086(a)(1) through (8) and (9)(K) and greenhouse gas impacts.

This report addresses each of the criteria specified in 10 V.S.A. §1424a(d) and 6086(a)(1)through (8) and greenhouse gas impacts and identifies resource areas to identify any which mayrequire special attention during project design and construction. With implementation of the avoidance and minimization measures described or referenced herein, and application of VELCO's Environmental Best Management Practices and the VermontStandards for Erosion Prevention and Sediment Control, TRC concludes the Project has no undue adverse impact on the reviewed §248 criteria in light of the Project's design and construction practices.

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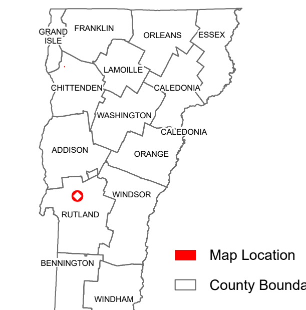
ATTACHMENT A – FIGURES



BAT TREE LOCATIONS
PRIVATE WELL
VELCO STRUCTURE
GMP AND/OR VELCO TRANSMISSION LINE
ASSESSMENT AREA
PROPERTY BOUNDARY
VERMONT STREAMS
WETLAND EXTENDS
TENTATIVE 50-FOOT WETLAND BUFFER
DELINEATED WETLAND
RARE, THREATENED, & ENDANGERED SPECIES & SIGNIFICANT COMMUNITY

150 300 Feet

Source Data: FEMA, Vermont Center for Geographic Information, Vermont Natural Resources Atlas, 2019. Vermont Electric Power Company, 2014.

Service Layer Credits: Esri, HERE, iPC, VCGI, Maxar, Microsoft

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VELCO
336 Pinnacle Ridge Rd.
Rutland, VT 05701
(802) 773-9161

TRC
6 Ashley Drive
1st Floor
Scarborough, ME 04074

VELCO SUBSTATION CONDITION ASSESSMENT PROJECT

FIGURE 1
NATURAL RESOURCE MAP

DATE: 8/26/2021

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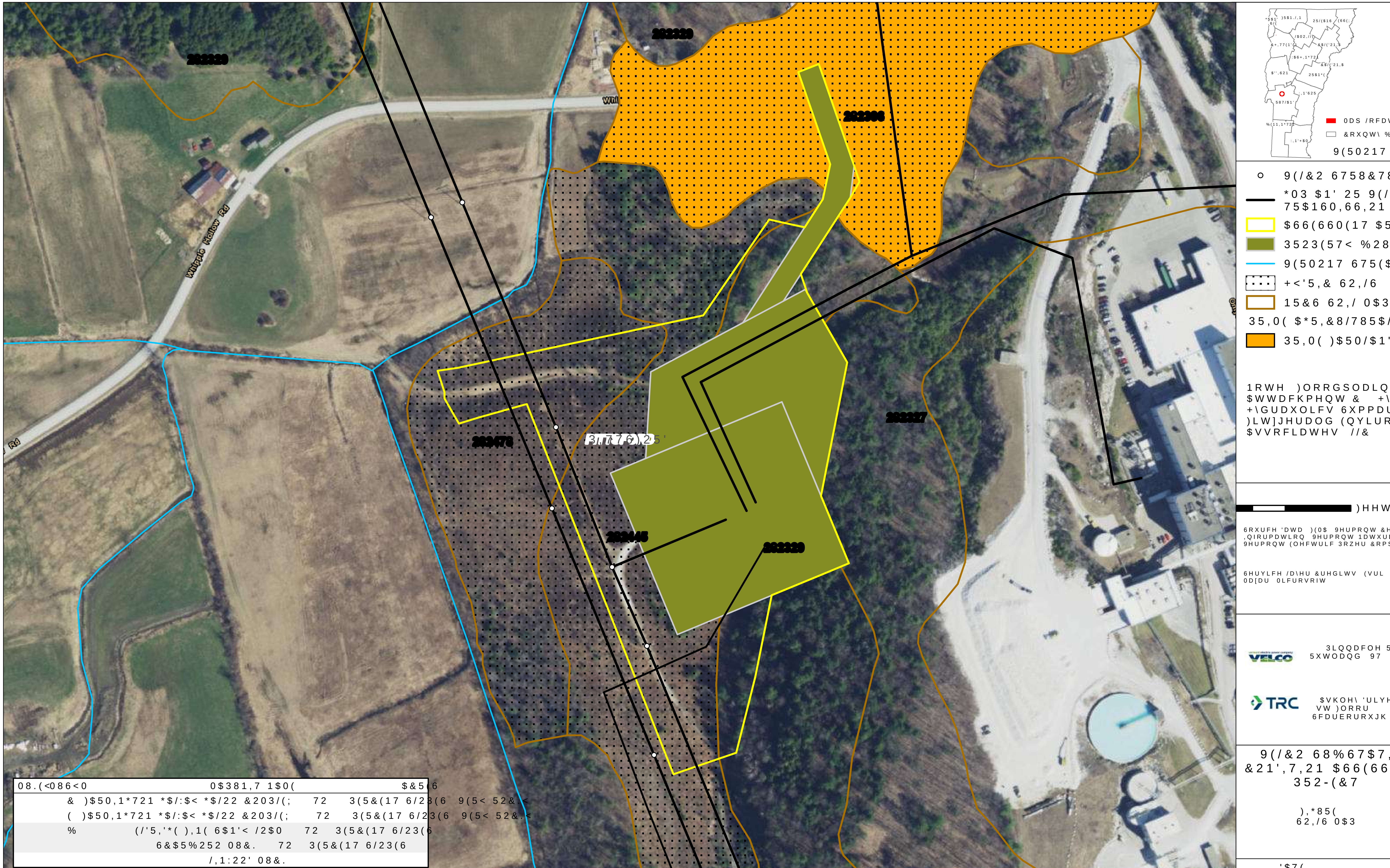

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ATTACHMENT B – TABLES

TABLE 1
Wetlands Resources Within the Florence Substation Assessment Area

Wetland I.D.	Town/City	Cowardin Classification a/	Functions and Values b/	Overlaps VSWI? (Y/N)	VWR Presumptions of Significance	Recommended Wetland Classfiication[1]	Associated Streams	Size of Wetland Within Assessment Area (acres)	Comments (significant impacts, approximate size of entire wetland, etc)
PI6D	Pittsford	PEM /PSS	1H, 2H, 4P	Y	a, c, h	Class Two	NA	6.88	Irrigation canals adjacent to and within wetland. Dominated by Phragmites.
PI6E	Pittsford	PEM/PSS	1H, 2H, 4P	Y	none	Class Two	NA	0.02	Small, depressional wetland bordered by access road, substation pad, and to the east by steep rock outcrops. Hydrologic connection to PI6d via approx. 20' culvert. Class II recommendation based on PI6D connectivity

[1]Wetland classifications are pending confirmation by VT ANR.

a/ Cowardin Classifications: PEM - Palustrine emergent wetland, PSS - Palustrine scrub shrub wetland, PFO – Palustrine forested wetland

b/ Functions and Values numbers refer to the Vermont Wetland Functions and Values, per the Vermont Wetland Rules under 10 V.S.A. § 905(7). The following describes how the Vermont Functions and Values as contained in this table relate to the Federal Functions and Values, designated in the Highway Methodology Workbook Supplement (1993) published by the Army Corps of Engineers New England District Regulatory Branch.

Vermont Wetland Functions and Values	Equivalent or Similar Federal Functions and Values
1 - Water storage for flood water and storm runoff	Floodflow Alteration (Storage and Desynchronization)
2 - Surface and ground water protection	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal/Retention/Transformation
3 - Fisheries habitat	Fish and Shellfish Habitat
4 - Wildlife and migratory bird habitat	Wildlife Habitat, Production Export (Nutrient)
5 - Hydrophytic vegetation habitat	Endangered Species, Uniqueness/Heritage
6 - Threatened and endangered species habitat	Endangered Species
7 - Education and Research in natural sciences	Educational/Scientific Value, Uniqueness/Heritage
8 - Recreational value and economic benefit	Recreation (Consumptive & Non-consumptive), Production Export (Nutrient)
9 - Open space and aesthetics	Visual Quality/Aesthetics, Uniqueness/Heritage
10 - Erosion control through binding and stabilizing the soil	Sediment/Shoreline Stabilization

TABLE 2 Soil Series & Prime Agricultural Soils Within the Florence Substation Assessment Area						
Soil Symbol	**Map Unit Key**	**Soil Name and Slope**	**Prime Farmland Status**	**Hydric Status**	**K Value**	**Acres in Assessment Area**
Substation Assessment Area						
41C	282327	Farmington-Galway-Galoo complex, 5 to 25 percent slopes, very rocky	NPSL	No	Potentially Highly Erodible	0.72
41E	282329	Farmington-Galway-Galoo complex, 25 to 50 percent slopes, very rocky	NPSL	No	Highly Erodible	5.05
61B	282396	Eldridge fine sandy loam, 3 to 8 percent slopes	Prime	No	Potentially Highly Erodible	0.41
73	282445	Scarboro muck	NPSL	Yes	Not Rated	5.26
86	282478	Linwood muck	NPSL	Yes	Not Rated	1.79
Assessment Area Total						***13.23***

ATTACHMENT C – SUPPORTING DOCUMENTATION

Fitzgerald Environmental Associates, LLC.

Applied Watershed Science & Ecology

MEMORANDUM

To: Andy McMillan, VELCO
From: Evelyn Boardman and Evan Fitzgerald, CPESC/CFM
Re: Hydrology & Hydraulics Summary for VELCO Florence Substation
Date: December 14, 2020

1.0 Introduction

Fitzgerald Environmental Associates (FEA) was retained by VELCO to assist with the evaluation of hydrology and hydraulics for the substation South of Whipple Hollow Road on an unnamed tributary to the Otter Creek in Florence, Vermont.

FEA was tasked with: 1) recommending defensible estimates of flood discharges for the stream; 2) determination of Base Flood Elevation (BFE) and flood extents for the 100- and 500-year floods in relation to VELCO's infrastructure and proposed improvements; and 3) summarizing findings from the model. Below is a summary of our analysis pertinent to the VELCO infrastructure. Supporting information is provided in the Attachments.

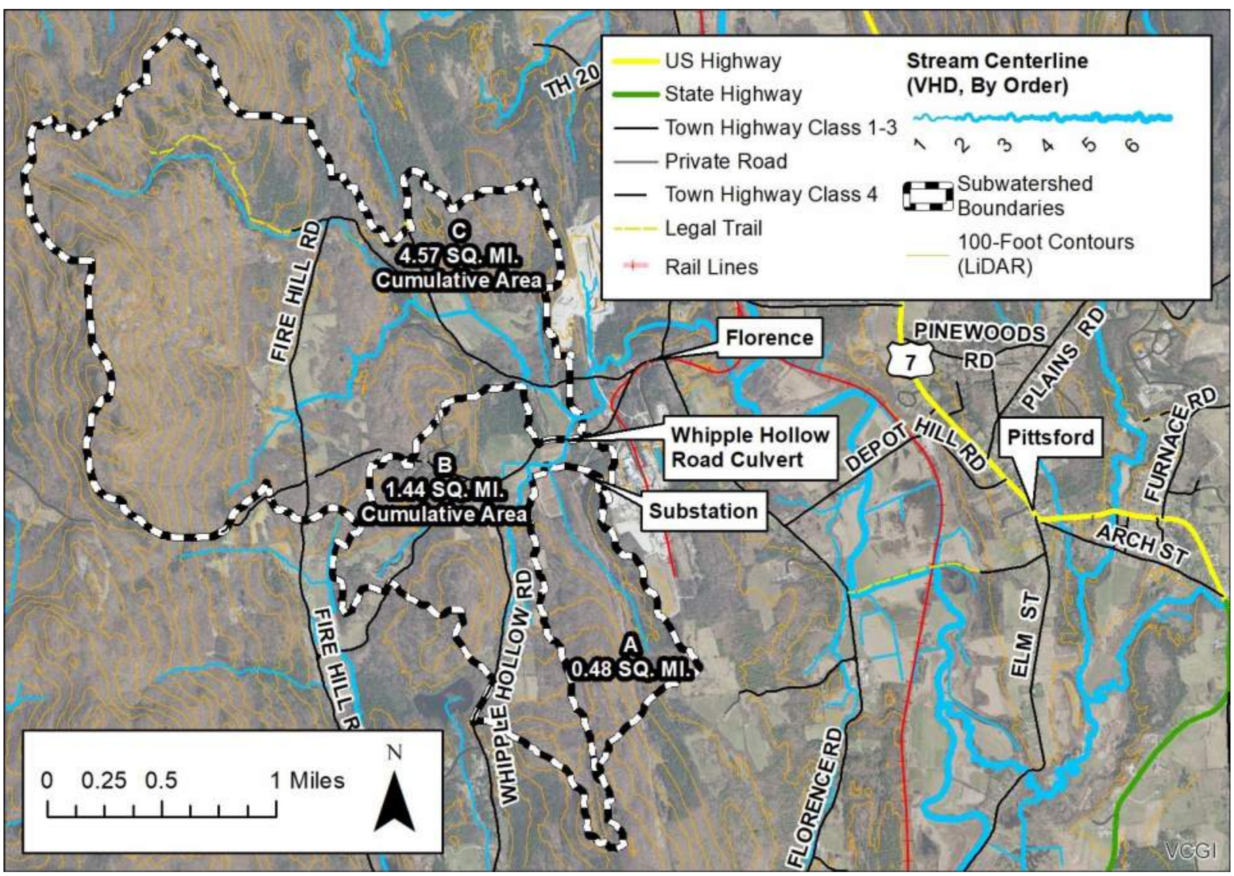

Figure 1: Study area location and watersheds (A, B, and C) considered in the hydrologic analysis.

2.0 Methods

2.1 Watershed Hydrology

We evaluated the 2, 5, 10, 25, 50, 100, and 500-year recurrence interval flows using the regional regression equations for Vermont (Olson, 2002 and Olson, 2014). The drainage area of the stream near the substation before the tributary confluence near the VAST bridge is 0.48 square miles (Watershed A). After the confluence with the western tributary near the VAST bridge, the combined drainage is 1.44 square miles (Watershed B) at Whipple Hollow Road. The combined drainage area at the larger tributary confluence downstream of Whipple Hollow Road is 4.57 square miles (Watershed C). The peak flow data from the 2002 and 2014 regional regressions are presented in Tables 1 and 2.

We also examined the FEMA Flood Insurance Study for Rutland County. No flows are listed for the Otter Creek tributary. The study states that countywide discharges were calculated using the 2002 regional regression equations. We used the updated regional regressions (Olson 2014) to estimate base flood elevations (BFE) using the most recent and best available statewide flow data.

Table 1: 2-year, 10-year, 50-year, 100-year, and 500-year flood discharge estimates from Olson 2002 regressions in cubic feet per second (cfs) and normalized for drainage area as cubic feet per square mile (csm).

Watershed	Cumulative Drainage Area (square miles)	2-year flood		10-year flood		50-year flood		100-year flood		500-year flood	
		cfs	csm	cfs	csm	cfs	csm	cfs	csm	cfs	csm
A	0.48	17	34.7	32	66.4	48	101.3	56	117.4	75	157.9
B	1.44	42	29.4	79	55.1	117	81.6	134	93.3	176	122.4
C	4.57	153	33.5	281	61.5	405	88.6	459	100.4	589	128.8

Table 1: 2-year, 10-year, 50-year, 100-year, and 500-year flood discharge estimates from Olson 2014 regressions in cubic feet per second (cfs) and normalized for drainage area as cubic feet per square mile (csm). Flows used for BFE determination are **underlined**.

Watershed	Cumulative Drainage Area (square miles)	2-year flood		10-year flood		50-year flood		100-year flood		500-year flood	
		cfs	csm	cfs	csm	cfs	csm	cfs	csm	cfs	csm
A	0.48	14	29.2	30	61.9	48	101.3	**58**	121.2	84	175.6
B	1.44	36	24.9	74	51.4	119	82.6	**141**	98.0	202	140.1
C	4.57	112	24.4	225	49.2	357	78.1	**421**	92.2	598	130.9

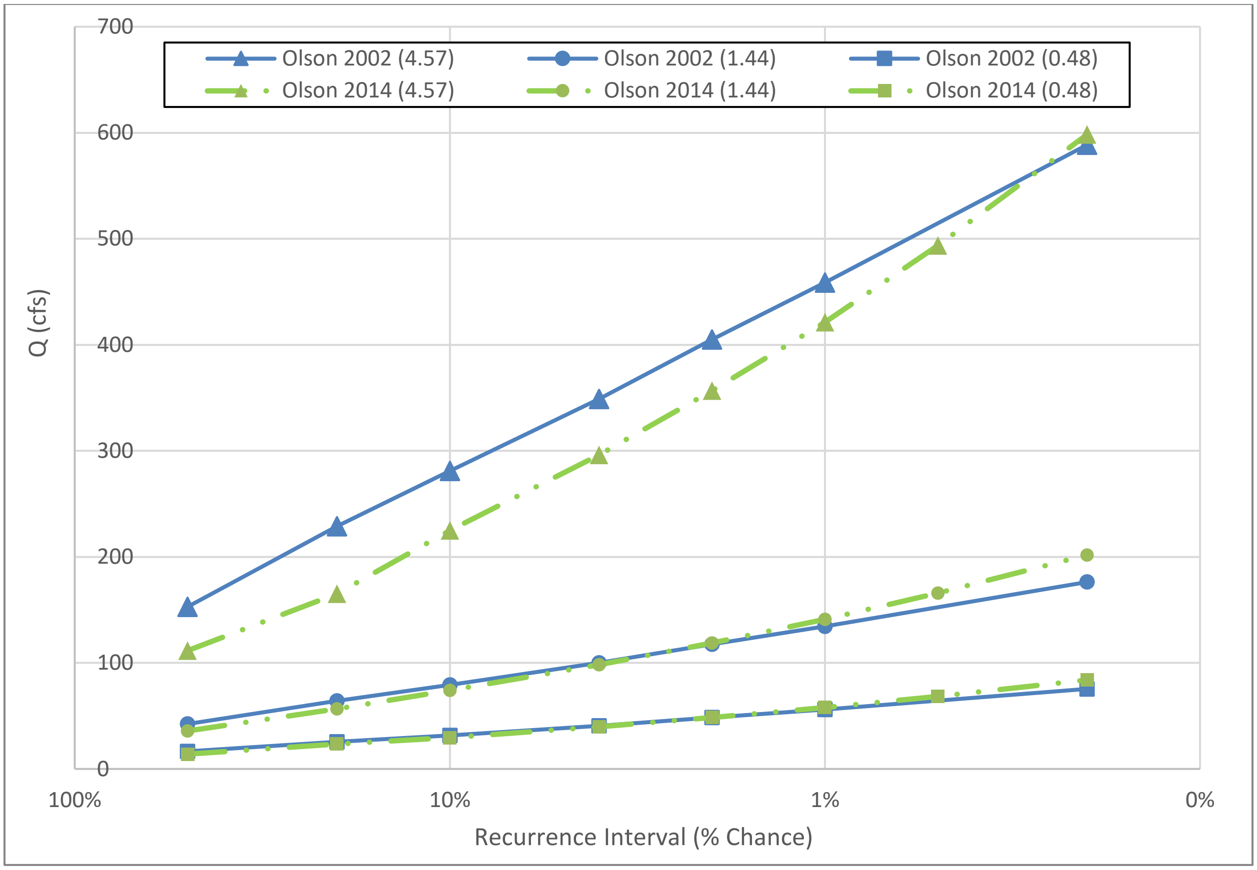

Figure 2: Comparison of regression-based flow estimates and cumulative drainage area.

2.2 Structure and Channel Observations

We surveyed the tributary channel in November 2020. Three beaver dams were observed in the channel (Figure 3). The most downstream dam was at the VAST bridge and completely obstructed the bridge opening. The second dam was approximately 700 feet upstream at the confluence between the main channel and a side channel. The third dam was upstream at the southernmost extent of the survey area. These dams caused ponding in most of the channel and in some cases the floodplain from the VAST bridge upstream to the southernmost extent of the study area.

Rose Surveying provided dimensions for the Whipple Hollow Road culvert and elevations on and around the road embankment. After flowing through the 54" HDPE Whipple Hollow culvert, the stream passes through a natural valley constriction, followed by an abandoned railroad bridge approximately 100" wide, double 48" diameter corrugated metal pipe culverts under Fire Hill Road, and an approximately 14' wide and 8' tall, corrugated metal pipe arch on an OMYA quarry road. VELCO provided the dimensions of the structures downstream of Whipple Hollow Road. We fit the structures downstream of the Whipple Hollow Road culvert into the model using the LiDAR DEM and photographs in the absence of field surveyed elevation data.

According to the Pittsford Road Foreman (Chad Eugair), the Fire Hill Road culverts were scheduled for replacement in 2020. The replacement has been rescheduled for 2021. The culvert is anticipated to be a concrete box sized for the bankfull channel, with dimensions approximately 20' wide and 10' tall.

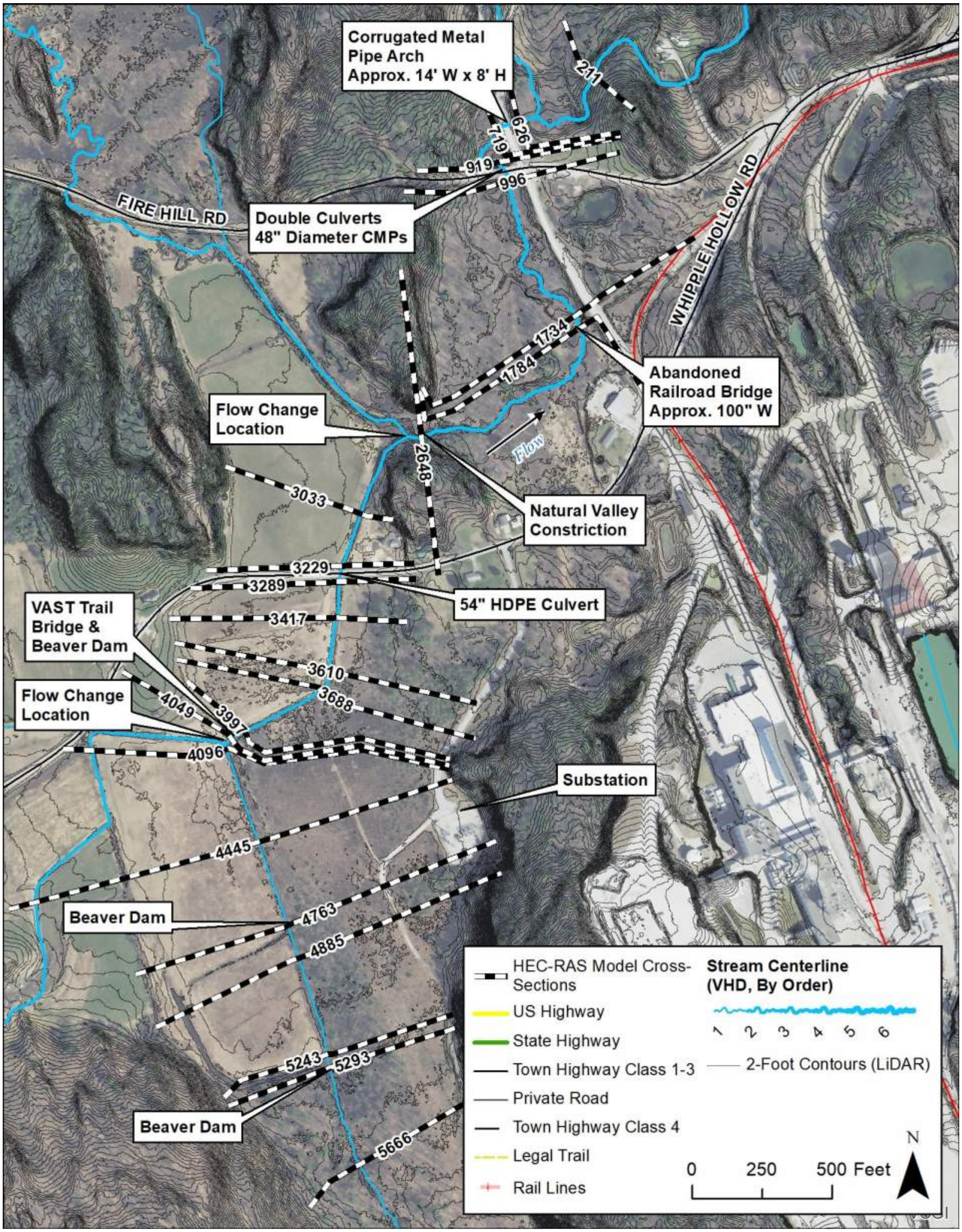

Figure 3: Site map with 2018 VCGI aerial imagery and 2013 Rutland County LiDAR contours showing the study area, structures on the channel, and flow change locations.

2.3 Hydraulic Modeling Methods

HEC-RAS 5.0.7 software (USACE, 2019) was used to create a one-dimensional, steady flow river and floodplain hydraulics model for approximately 5,400 feet of the channel from upstream of the substation to downstream of the Fire Hill and OMYA road crossings (Figure 3). We created a floodplain digital elevation model (DEM) for the study area using high-resolution (0.7 m) LiDAR elevation surfaces from a 2013 dataset covering Rutland County. We converted the DEM vertical elevation units from meters to feet. We loaded the DEM into RAS Mapper as the base terrain for setting up the HEC-RAS model. We updated cross-section geometry derived from the LiDAR DEM with the August 2020 surveyed channel bottom data.

Modeling Details

To set up the HEC-RAS model in RAS Mapper, we digitized the stream centerline and the top of each bank using survey data, a Google Satellite imagery service, and the terrain model of the LiDAR DEM to emphasize topographic relief. We constructed the hydraulic model as a single reach. Next, we drew a total of 23 cross-sections perpendicular to channel and floodplain flow stretching across the valley to contain all areas of overbank flow at the cross-section (Figure 3). An accurate 3D lateral profile of the floodplain and channel was generated in RAS-Mapper by sampling the DEM and was updated with the field survey data. This verification effort is very important when constructing a detailed hydraulic model from LiDAR derived DEMs which are typically less accurate at road crossings and along steep road embankments where the DEM may be adjusted to reflect the “bare earth” condition. The survey data were used to improve the accuracy of the channel bottom and bank elevations.

The LiDAR data were verified and adjusted as follows:

- To correct for LiDAR scatter at the water surface, channel bottom elevations were adjusted based on comparison to the 2020 channel survey data collected by FEA. Channel bottom adjustments ranged from 0.7 in the shallow channel downstream of the beaver dam to 2.8 feet based on surveyed elevations in the deep impounded channel upstream of the beaver dam at the VAST bridge.
- We applied a channel bottom adjustment to areas without survey data consistent with bottom adjustments in the surveyed areas. Where we extended the model downstream to capture tailwater conditions we adjusted the channel bottom down by 1.8 feet in low slope areas and down by 1 foot in higher slope areas.
- We plotted the channel longitudinal profile and checked for any unnatural slope changes.
- VELCO provided existing conditions 2-foot contours for the study area based on LiDAR data and updated with survey data around the substation. We generated an elevation surface from the contours and integrated the surveyed channel elevations with the cross-sectional floodplain and substation elevations upstream of Whipple Hollow Road with the surface. This surface was used for flood extent mapping (Attachments 1-4).

Further parameterization of the HEC-RAS model included the following:

- We assigned floodplain and channel roughness values (Manning's N values) based on land cover from aerial imagery and field observations. Roughness values ranged from 0.03 (muck bottom channel with minimal aquatic vegetation) to 0.1 (dense bushy floodplain vegetation with depth of flow reaching branches) following Chow (1959) and Arcement et al. (1989).
- Due to the impermanence of beaver dams, these features are not included in the hydraulic model used for BFE determination. We ran a model iteration with impounded water upstream of the beaver dams modeled as ineffective flow up to the dam elevations recorded in the channel survey. This had little to no effect on modeled flood extents for large (100- to 500-year) events in the study area because most of the flood conveyance is via the floodplain.
- To account for areas where roads prevent the conveyance of floodplain flows, flow was considered ineffective up to the downstream road elevation. Flow is no longer considered ineffective once it overtops the road.
- Levees were placed on high points along roads as appropriate to prevent the model from flooding the area outside until it was overtopped.
- Two flow change locations were included in the model at tributary confluences along the study reach. The first location was at section 4049 as the cumulative drainage area increased from 0.48 square miles (Watershed A) to 1.44 square miles (Watershed B). The second location was at section 2648 as the cumulative drainage area increased to 4.57 square miles (Watershed C).

The steady flow model was run using a subcritical flow regime consistent with standard FEMA methods.

3.0 Hydraulic Modeling Results

3.1 Existing Conditions

Under existing conditions, the 50-year flood and larger floods overtop the Whipple Hollow Road culvert. At the substation (section 4763), the modeled 100-year flood discharge elevation was 419.5' and the modeled 500-year flood discharge elevation was 419.7'. In conversations with the Pittsford Road Foreman and the farmer who owns the left bank field upstream of Whipple Hollow Road, the road has not been known to overtop. However, the modeled flood extent is consistent with observations that the fields upstream of Whipple Hollow Road fill with water in large floods.

The low channel slope and series of natural and manmade constrictions downstream of Whipple Hollow Road cause tailwater control of floodwater conveyance through the Whipple Hollow Road culvert, which in turn controls the BFEs upstream near the substation. These include a natural valley constriction at section 2648, the abandoned railroad bridge, and the Fire Hill Road culverts.

Although we do not have field survey data for the structures downstream of Whipple Hollow Road, we tested the sensitivity of upstream flood elevations to the invert elevations and structure size. We found that the invert elevations did not affect upstream flood elevations and that the existing constriction at Fire Hill Road is the hydraulic control due to the relatively low conveyance capacity of the existing double 48" diameter corrugated metal culverts.

We compared the modeled flood depths between the geometry with VCGI LiDAR floodplain and substation elevations and the geometry with VELCO LiDAR and survey floodplain and substation elevations. There was no difference in the modeled flood elevations for existing conditions and the two culvert replacement scenarios discussed below. We used the elevation surface generated from the VELCO data for mapping flood extents (Attachments 1-4).

We expect the modeled flood elevation and extents are conservative because the regional hydrology regressions do not account for timing of peak flows. Due to different watershed sizes and times of concentration, the peak flows of the individual tributaries are likely to pass through the watershed at different times, resulting in lower peak flows than predicted by the regressions. The regional regressions also do not account for attenuation of flood flows due to floodplain storage. The northwestern tributary that joins the study reach at section 2648 (Watershed C) appears to pass through a large wetland complex just before flowing under Fire Hill Road before the confluence. In reality, the dampened peak flow condition from this tributary likely results in a lower tailwater control at Whipple Hollow Road than predicted in our modeling. This may explain why the observed flood conditions are lower than those predicted in our modeling.

3.2 Culvert Replacement Alternatives

We tested replacing the Fire Hill Road culvert with the 20' wide and 10' tall concrete box culvert the Pittsford Road Foreman indicated is scheduled for 2021 installation. In this scenario with reduced tailwater control, the modeled 100-year flood discharge elevation at the substation (section 4763) was 419.2' and the modeled 500-year flood discharge elevation was 419.6'. The 100-year flood filled the area upstream of Whipple Hollow Road but did not overtop the road. The flood extent around the substation was similar to the existing conditions model.

We also tested replacing the Whipple Hollow Road with a 14' wide and 8' tall arch similar to the structure on the OMYA quarry road downstream of Fire Hill Road in addition to the Fire Hill Road culvert replacement. In this scenario, the modeled 100-year flood discharge elevation at the substation (section 4763) was 417.3' and the modeled 500-year flood discharge elevation was 418.4'. The low point on the access road west of the substation is 417.6', so in this scenario the 100-year flood extent around the substation is substantially reduced.

We tested both of these alternatives in combination with removing the abandoned railway bridge and embankment. Removing the railway bridge had a negligible effect on flood elevations near the substation. With both the Whipple Hollow and Fire Hill culverts upsized, the tailwater control appears to be most substantially affected by the low channel slope immediately downstream of Whipple Hollow Road and the natural valley constriction at section 1784.

List of Attachments

Attachment 1: **HEC-RAS Model Flood Extent Maps**

Sheet 1: Existing Conditions HEC-RAS Model Flood Extent Overview

Sheet 2: Existing Conditions HEC-RAS Model Flood Extent Near Substation

Sheet 3: Fire Hill Road Culvert Replacement HEC-RAS Model Flood Extent Near Substation

Sheet 4: Fire Hill and Whipple Hollow Road Culvert Replacements HEC-RAS Model Flood Extent Near Substation

Attachment 2: HEC-RAS Model Existing Conditions Profile and Cross-Section Plots

References

Arcement, George J., and V.R. Schneider, 1989. Guide for Selecting Manning's Roughness Coefficients for Natural Channels and Flood Plains. USGS Paper 2339.

Chow, V.T., 1959. Open Channel Hydraulics. New York, NY: McGraw-Hill Book Co.

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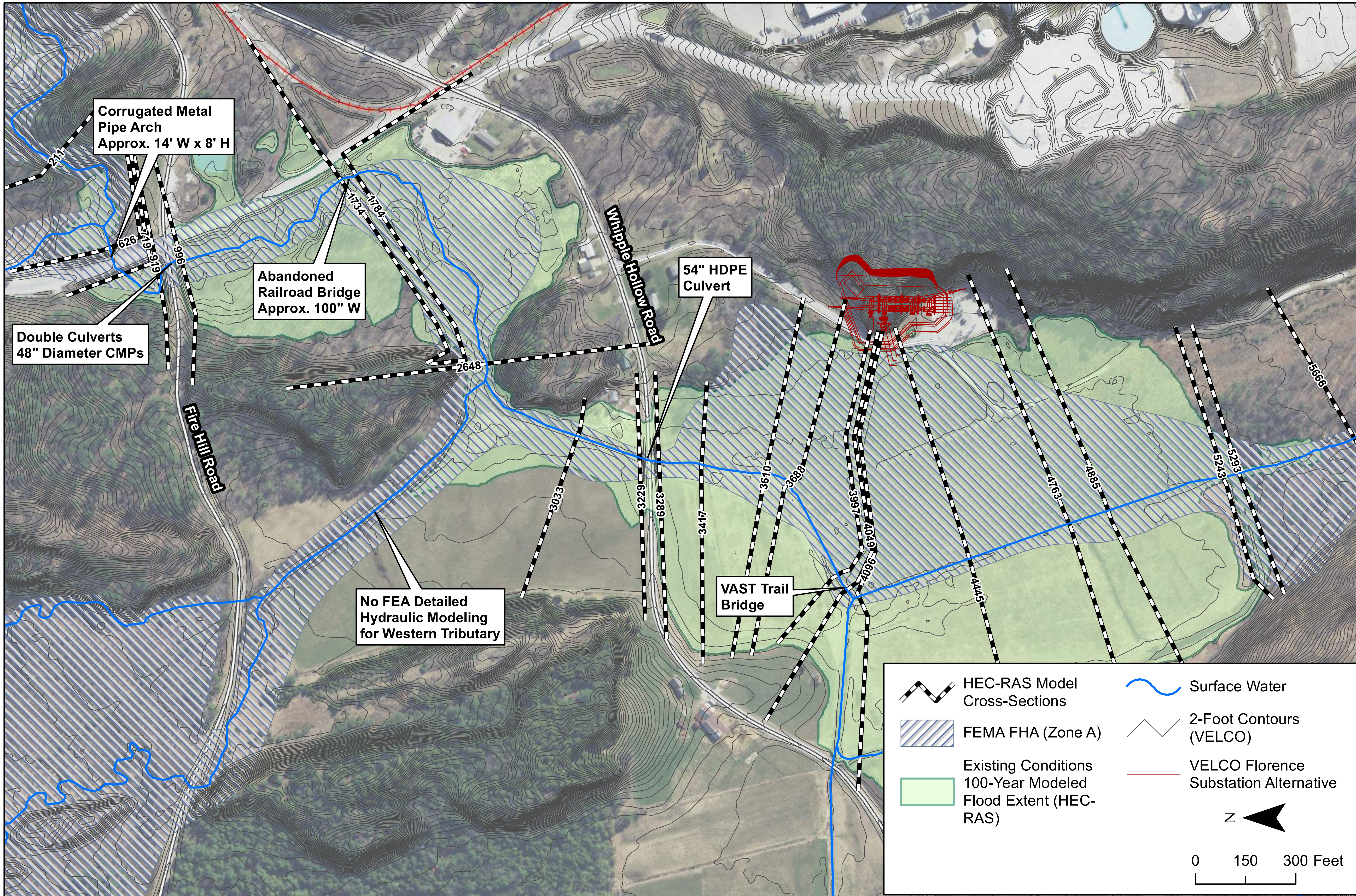
Olson, S. A., 2014, Estimation of Flood Discharges at Selected Annual Exceedance Probabilities for Unregulated, Rural Streams in Vermont, United States Geologic Survey, USGS Scientific Investigations Report 2014-5078.

USACE (US Army Corps of Engineers), 2019. HEC-RAS River Analysis System, Version 5.0.7. Available at: http://www.hec.usace.army.mil/software/hec-ras/documentation.aspx



Fitzgerald Environmental Associates, LLC.
18 Severance Green, Suite 203
Colchester, VT 05446
Tel: 802.876.7778
www.fitzgeraldenvironmental.com

Notes

- Field survey data collected November 2020 by FEA (centimeter-grade Trimble Geo7X GPS) and Rose Land Surveying.
- VCGI Imagery from 2016
- LiDAR contours from Rutland County LiDAR 0.7-m DEM (VCGI 2013)

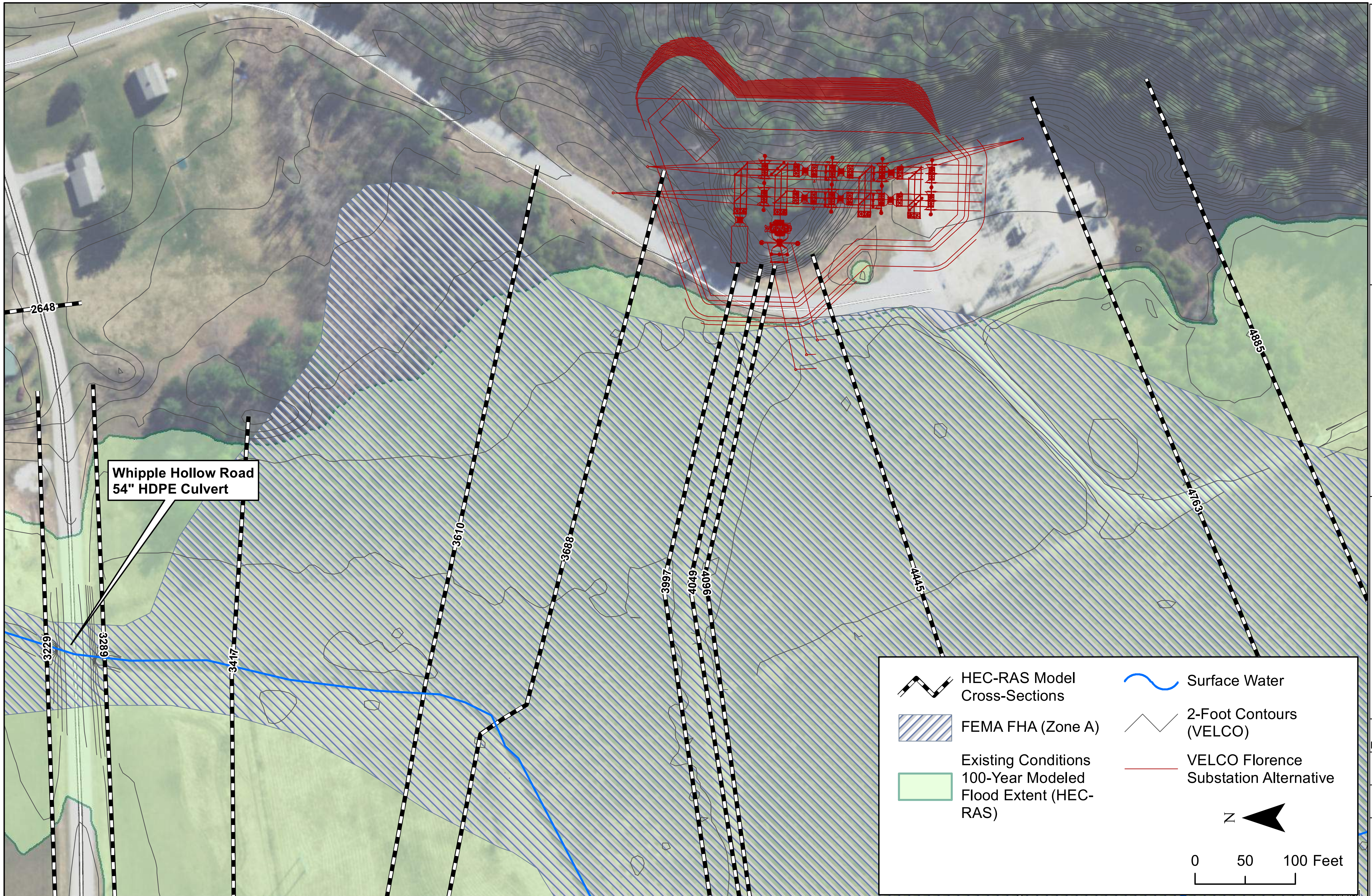
HEC-RAS Modeled Flood Extents Map
VELCO
Florence Substation
Florence, Vermont

EHB Map By	EPF Checked By

1 inch = 300 feet
Scale

April 23, 2021
Date

Sheet 1 of 4
SHEET NO.



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HEC-RAS Modeled Flood Extents Map
VELCO
Florence Substation
Florence, Vermont

EHB	EPF
Map By	Checked By

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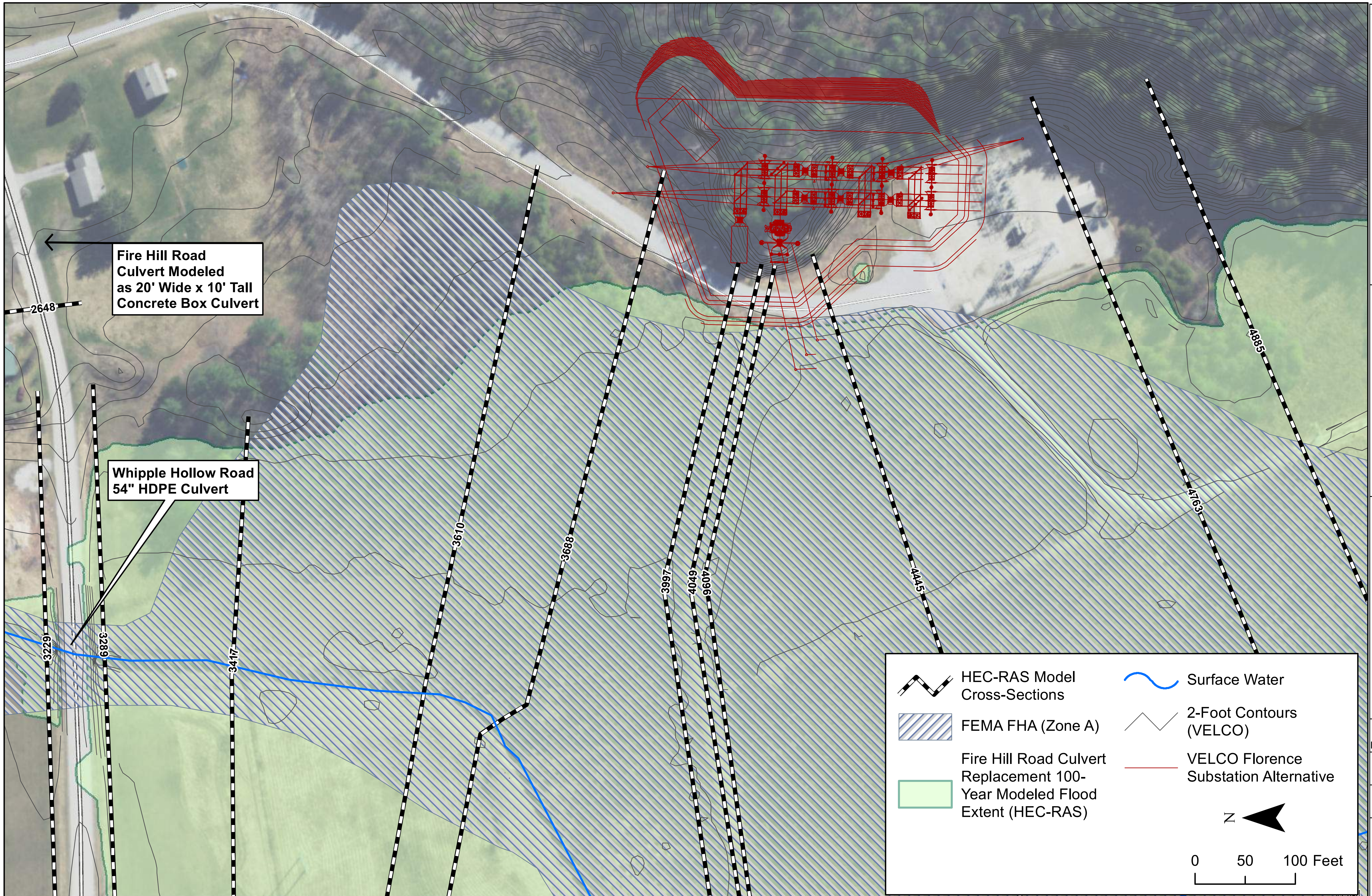
Scale

April 23, 2021
Date

Sheet 2 of 4
SHEET NO.



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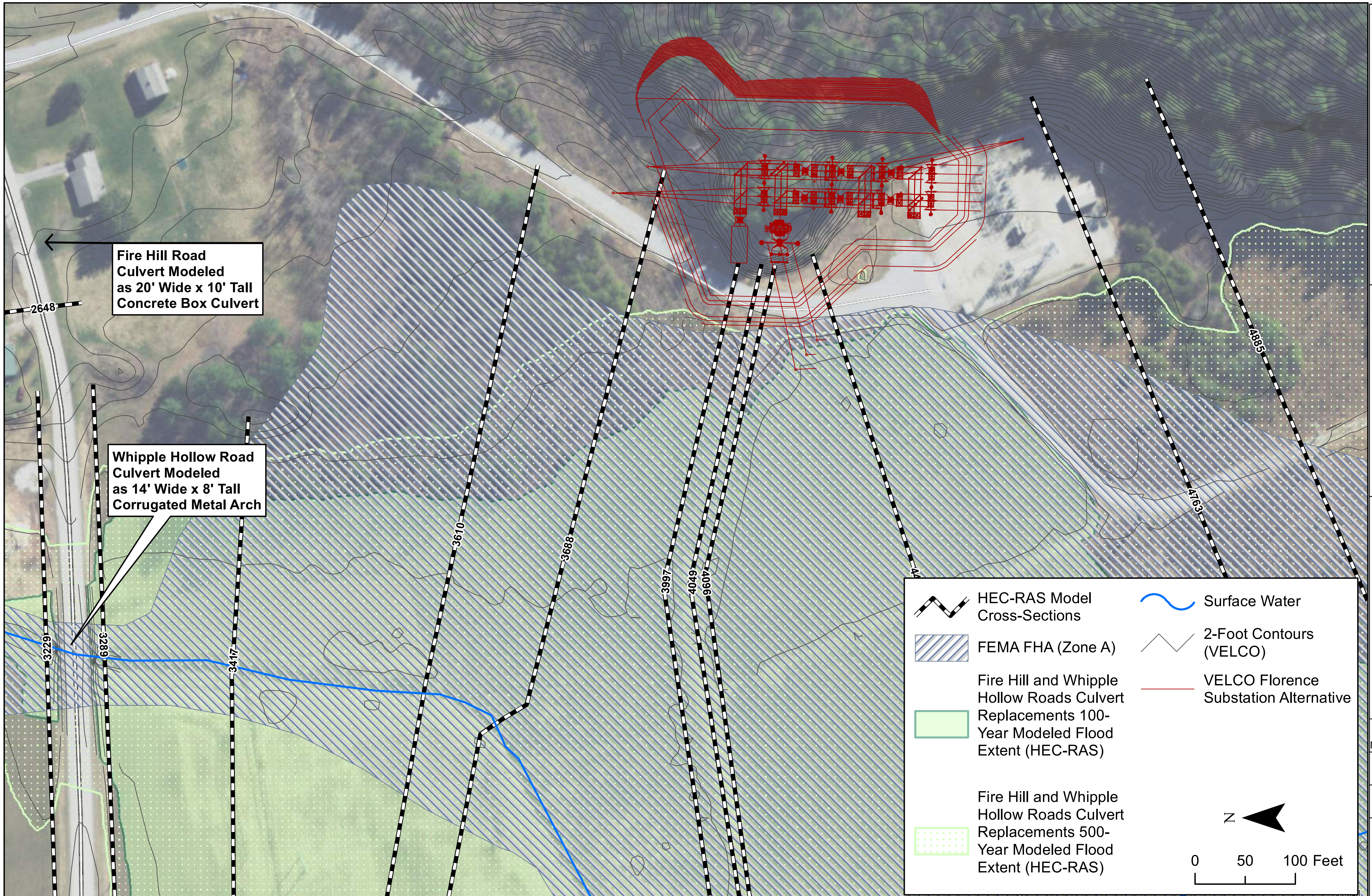
HEC-RAS Modeled Flood Extents Map
VELCO
Florence Substation
Florence, Vermont

Map By	Checked By
EHB	EPF

Scale: 1 inch = 100 feet

Date: April 23, 2021

SHEET NO. Sheet 3 of 4



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- LiDAR contours from Rutland County LiDAR 0.7-m DEM (VCGI 2013)

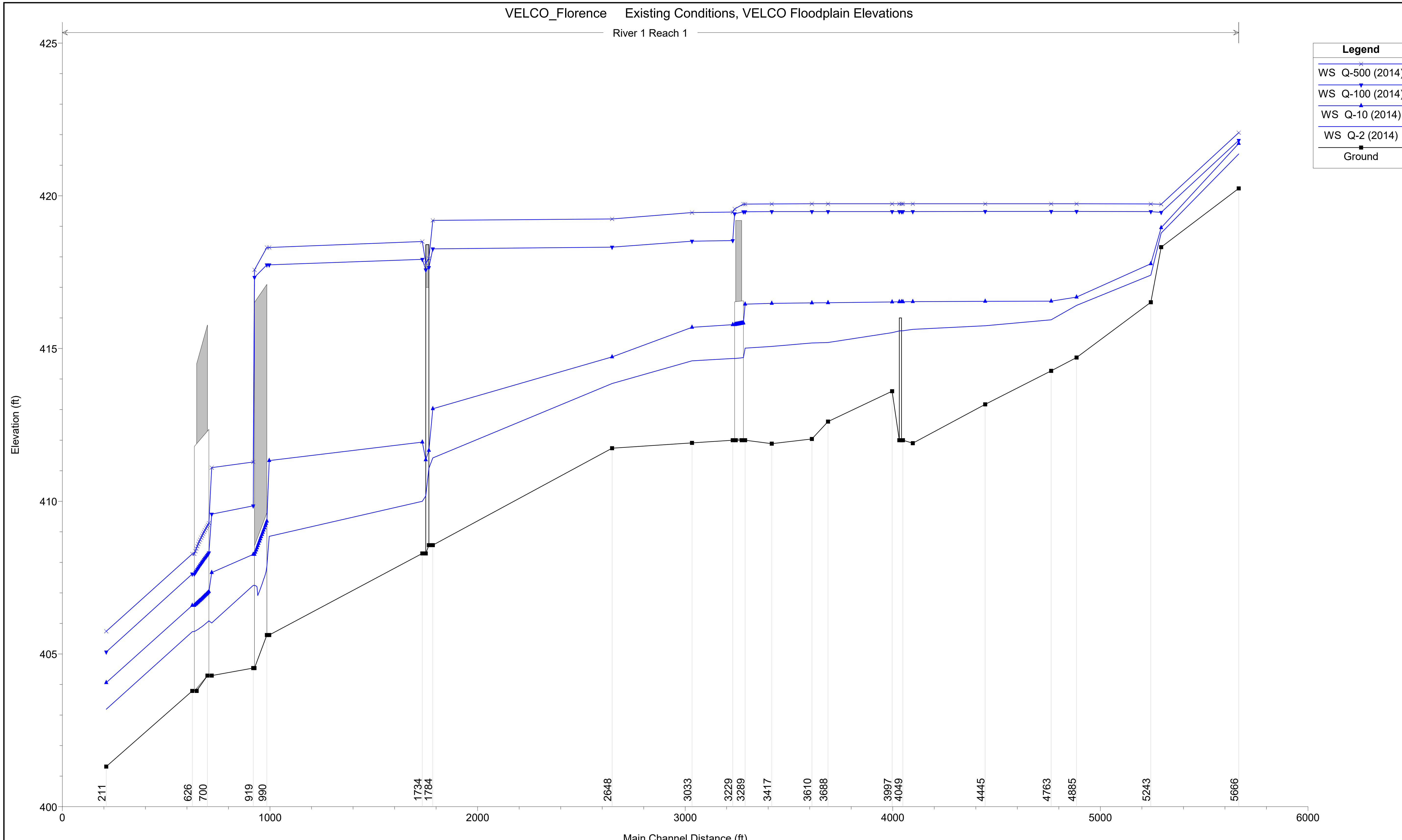
HEC-RAS Modeled Flood Extents Map VELCO Florence Substation Florence, Vermont

EHB	EPF
Map By	Checked By

1 inch = 100 feet
Scale

April 23, 2021
Date

Sheet 4 of 4
SHEET NO.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WS Q-10 (2014)
WS Q-2 (2014)
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405
400
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1784
2648
3033
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3289
3417
3610
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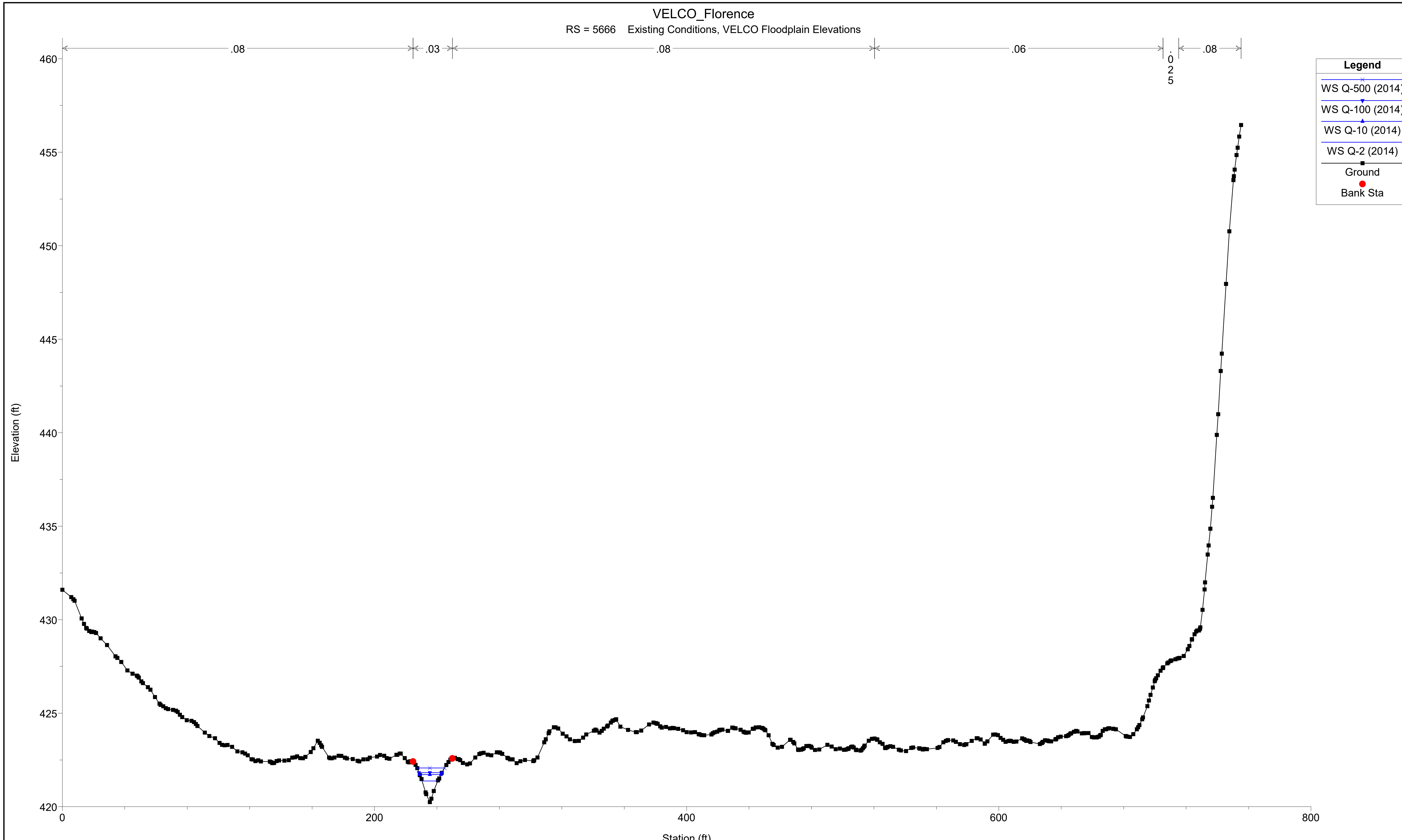
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WS Q-10 (2014)
WS Q-2 (2014)
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Bank Sta
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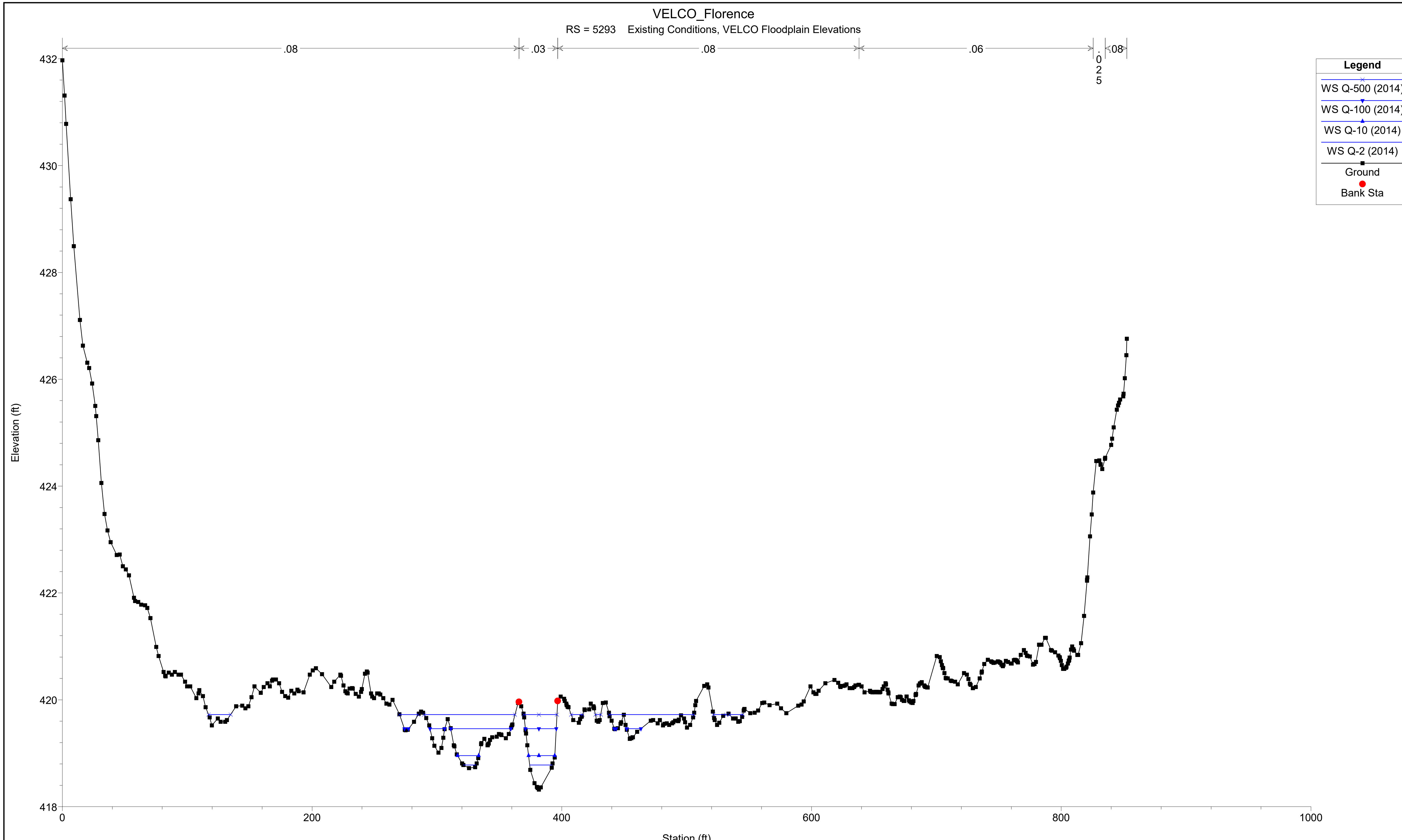
600
800
Station (ft)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WS Q-100 (2014)
WS Q-10 (2014)
WS Q-2 (2014)
Ground
Bank Sta
Elevation (ft)
Station (ft)
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428
426
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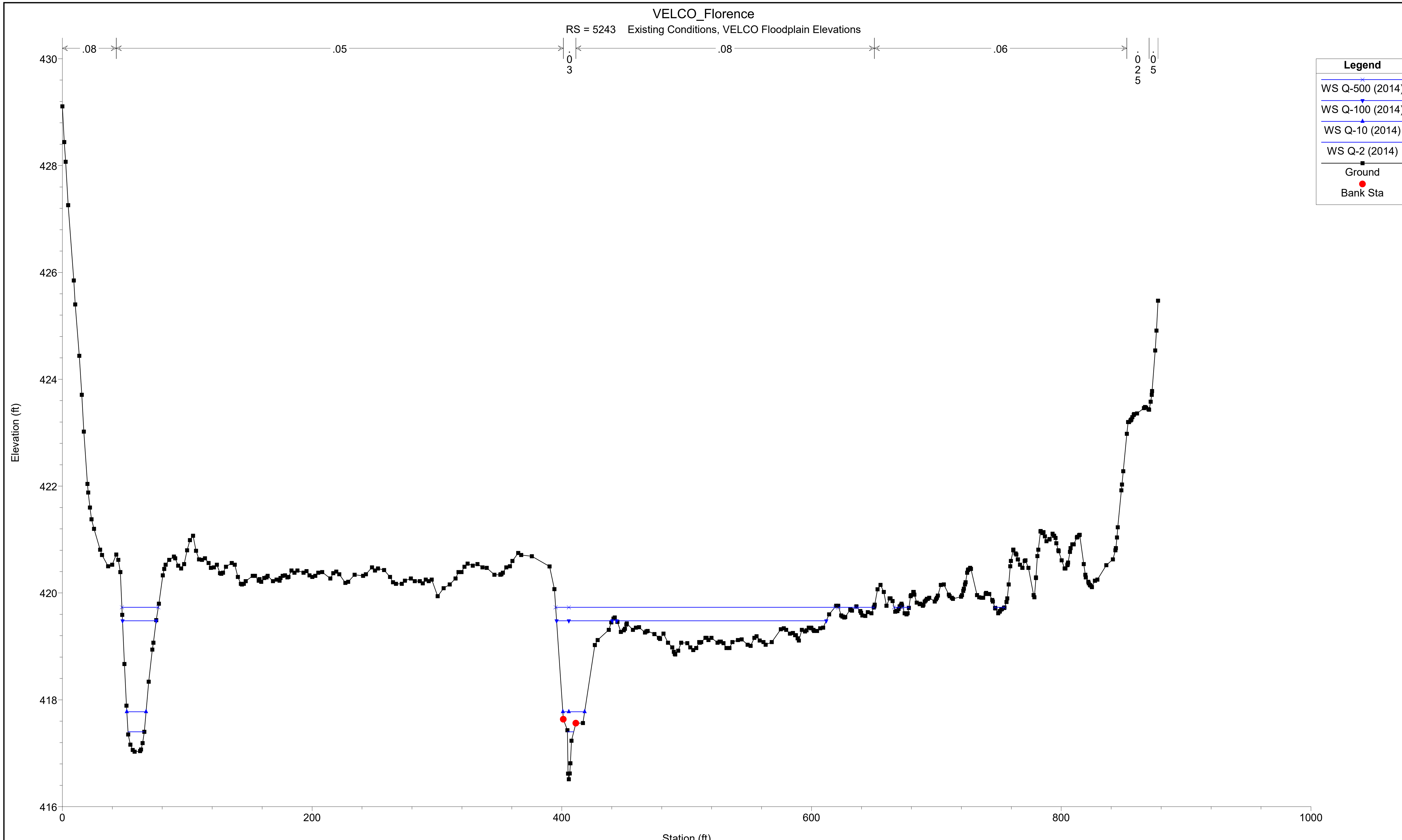
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WS Q-10 (2014)
WS Q-2 (2014)
Ground
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Elevation (ft)
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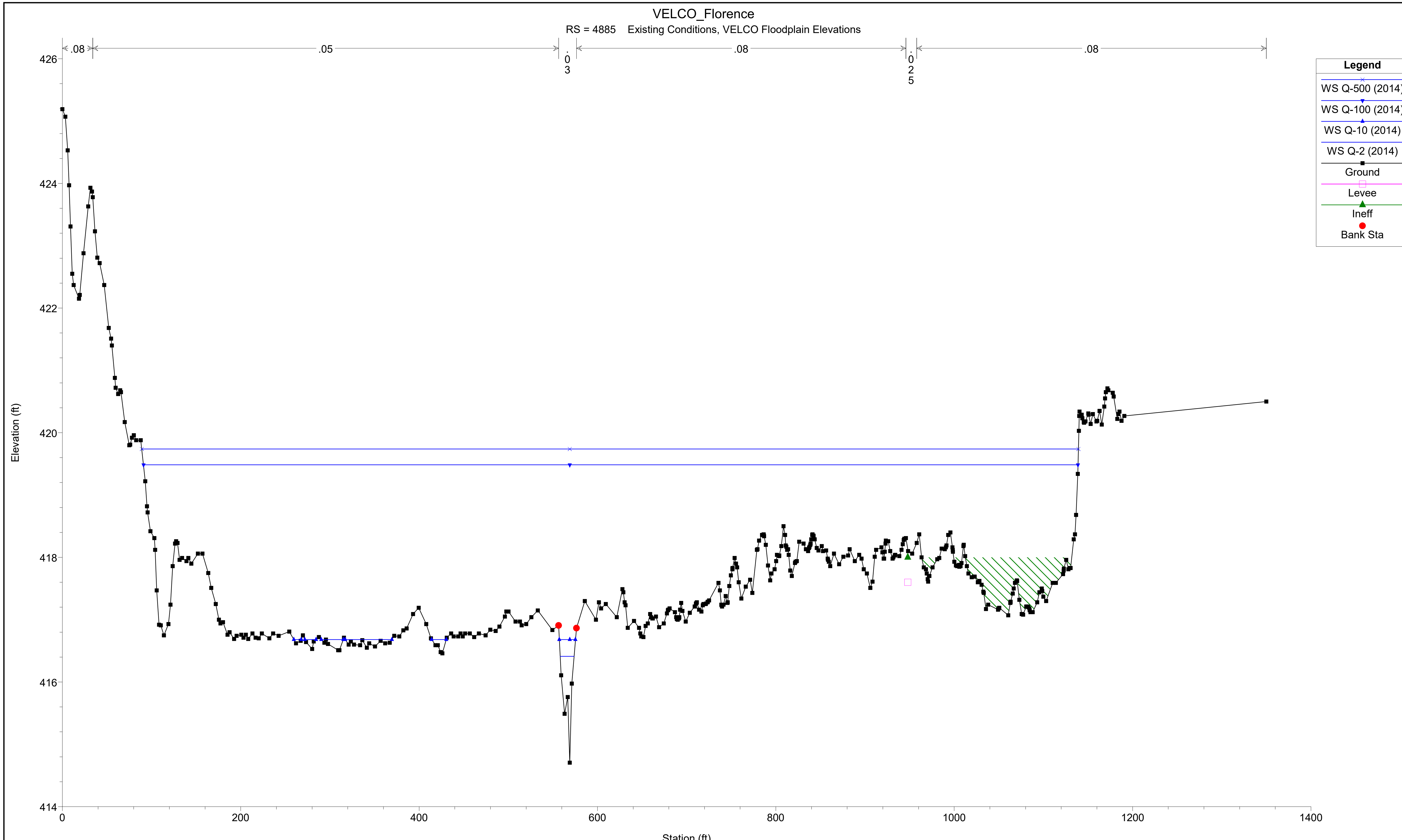
Station (ft)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WS Q-2 (2014)
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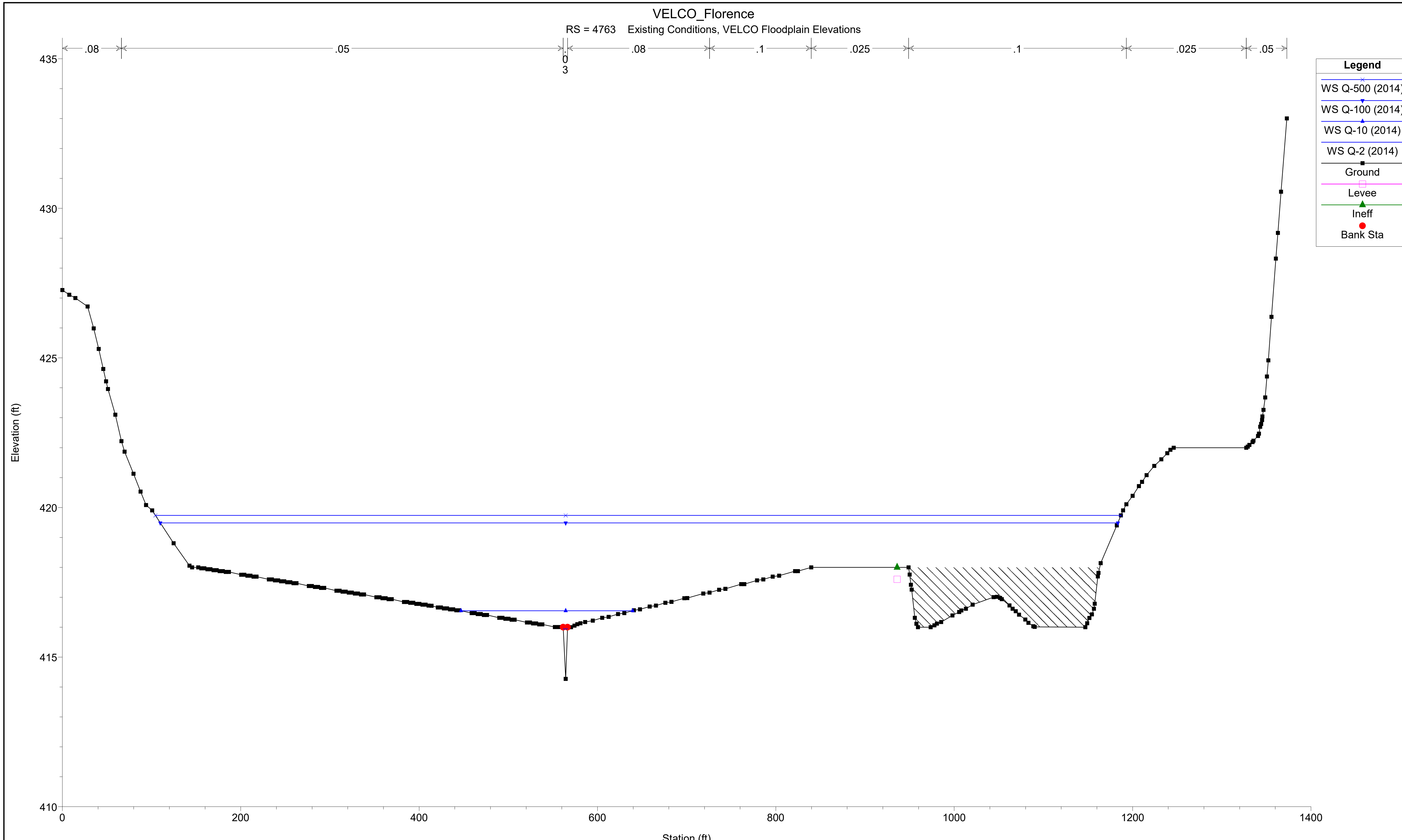
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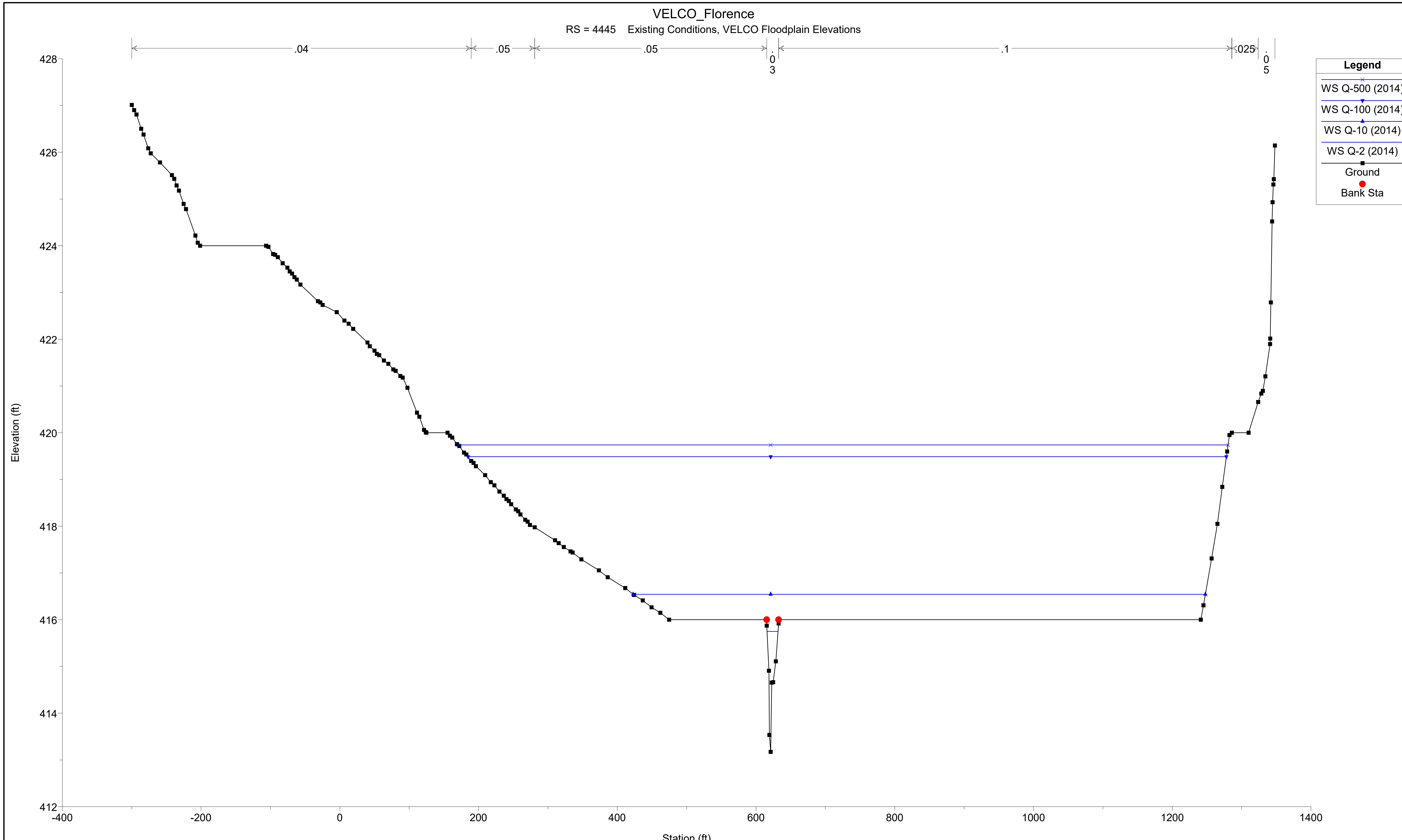
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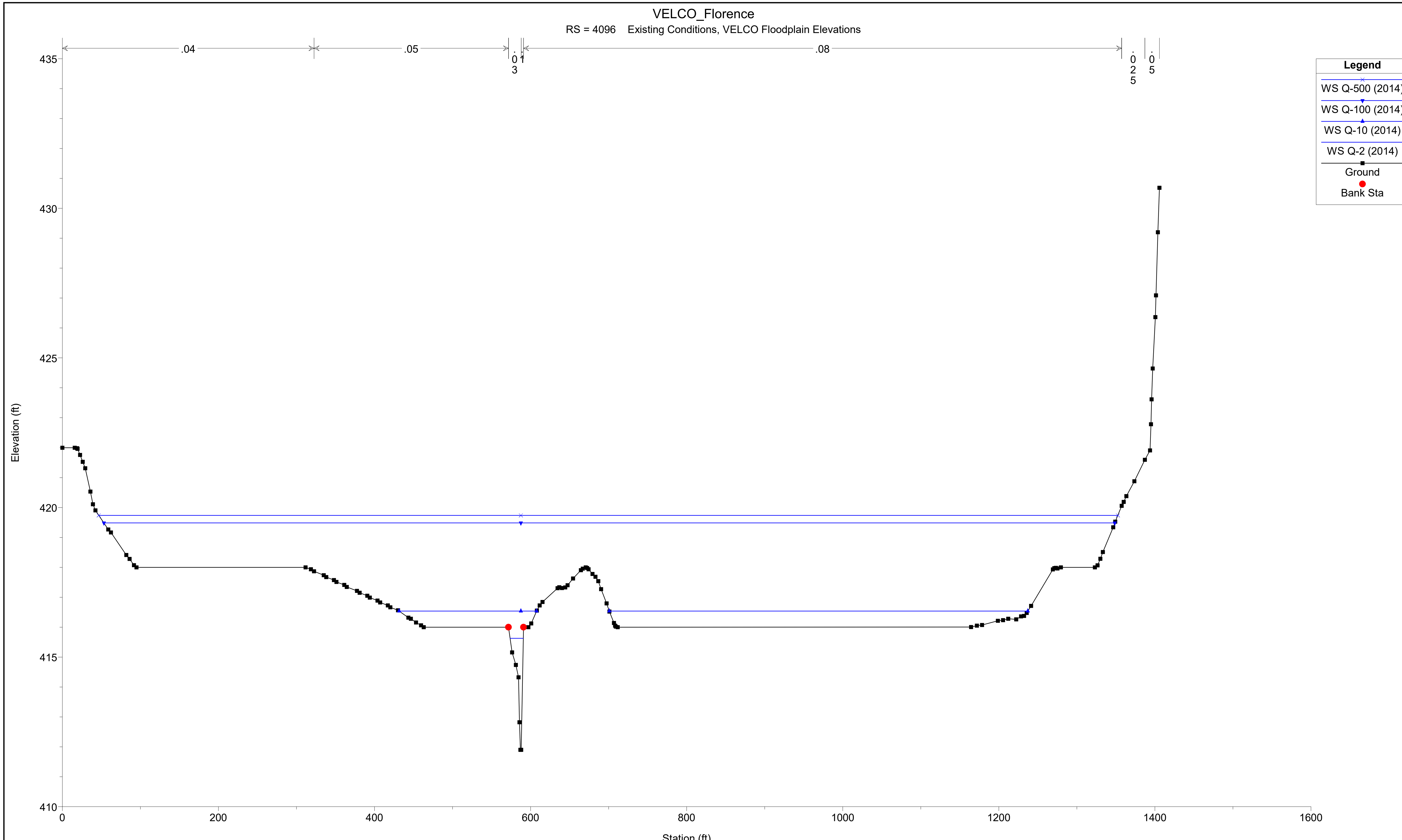
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Bank Sta
Elevation (ft)
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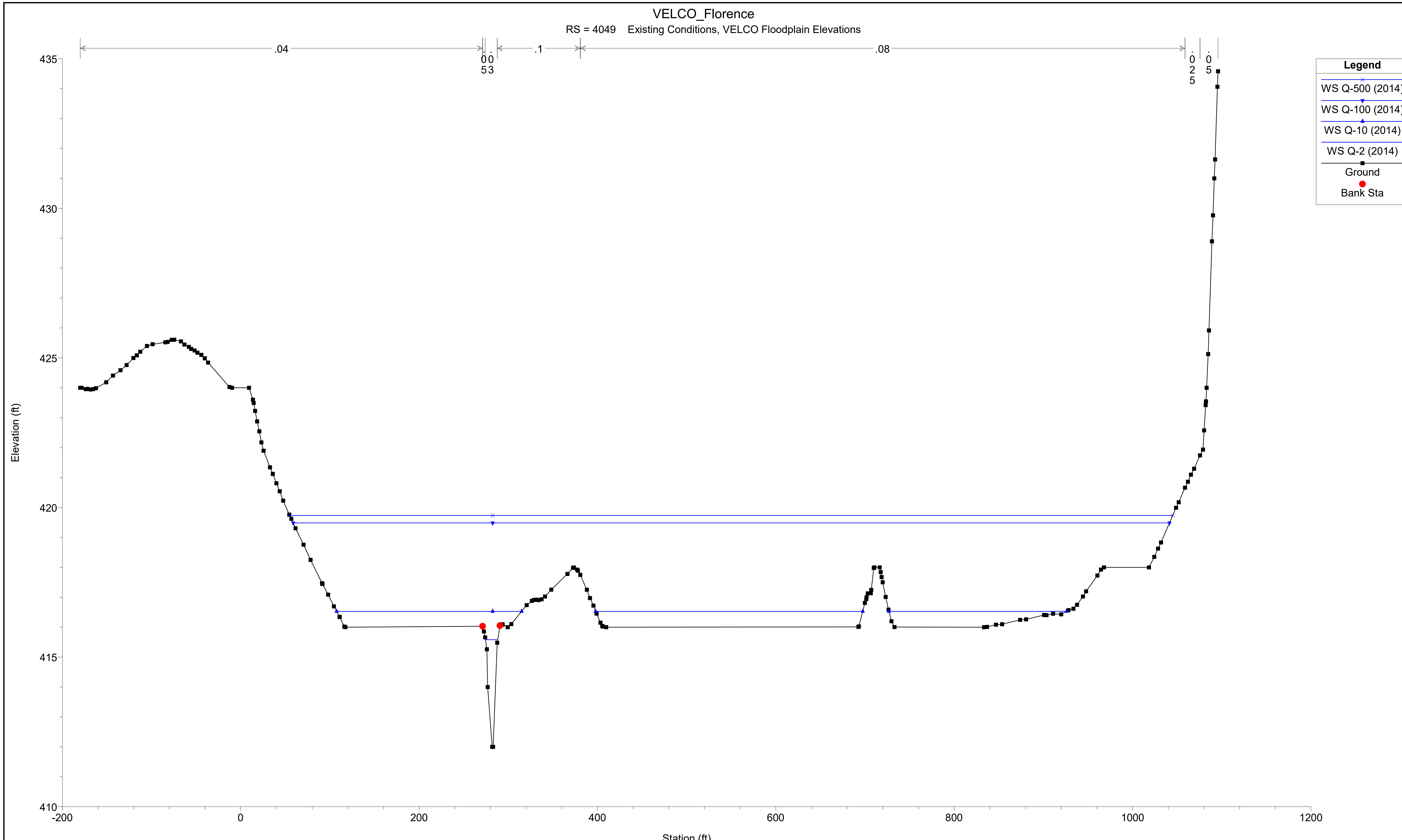
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Bank Sta
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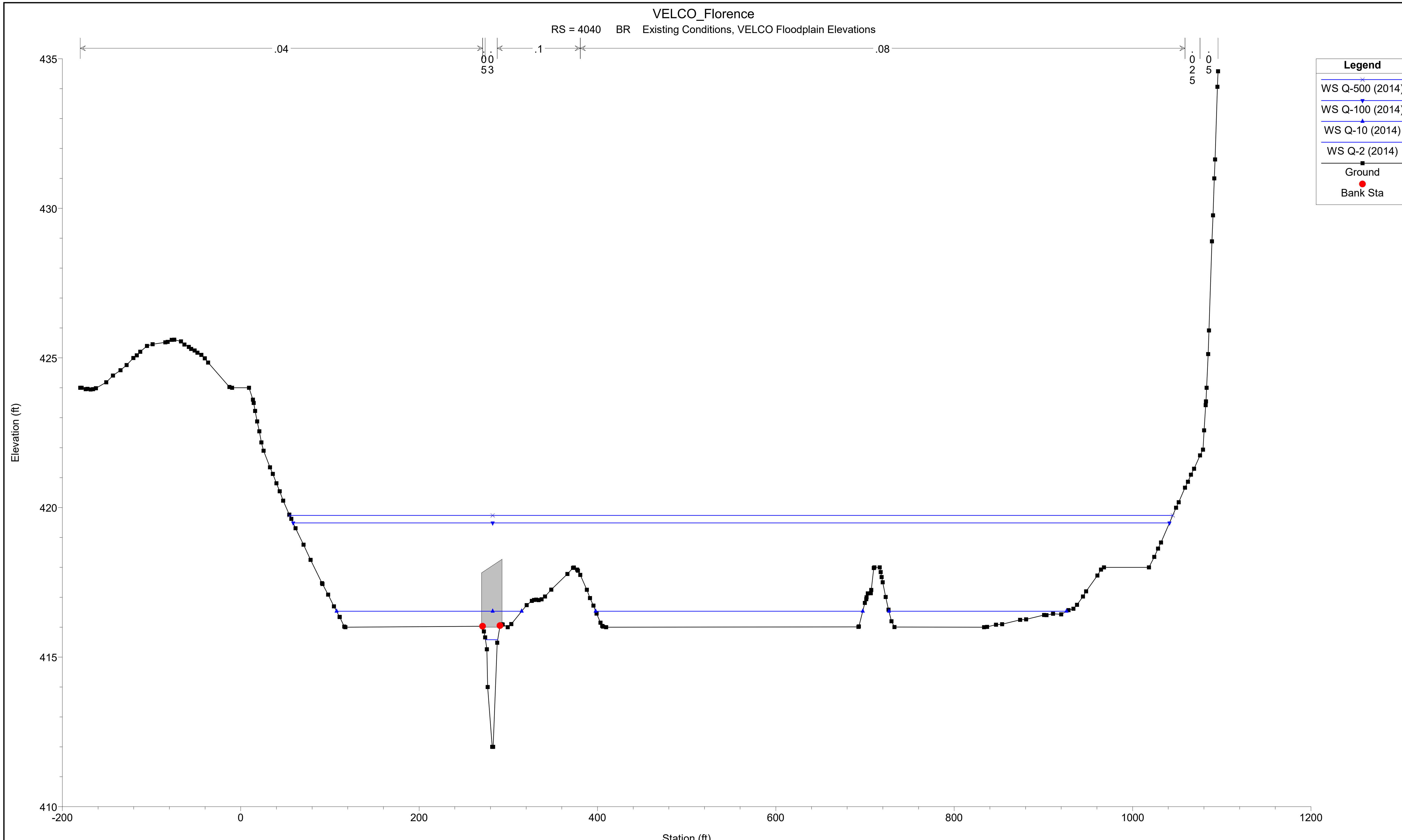
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Bank Sta
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420
415
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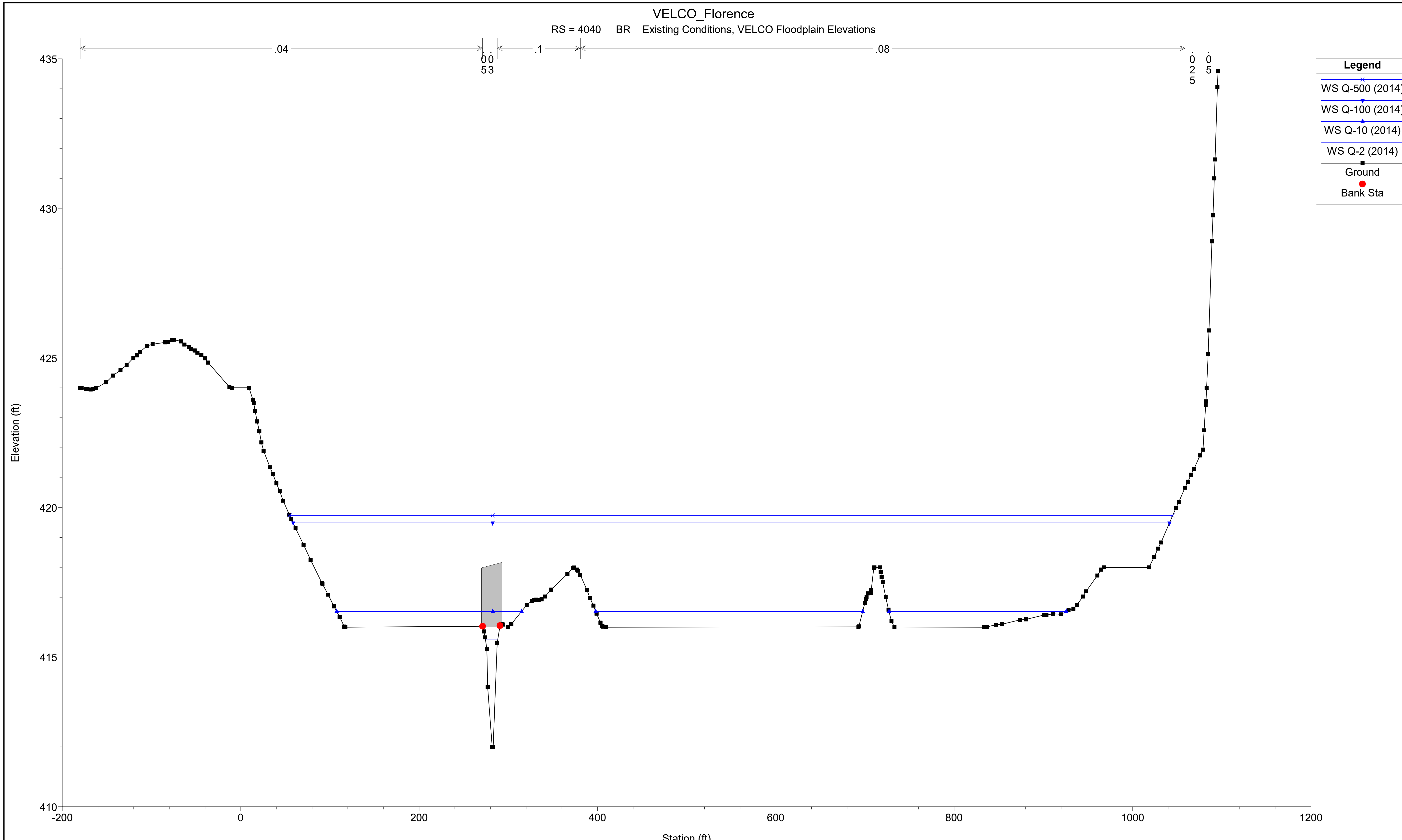
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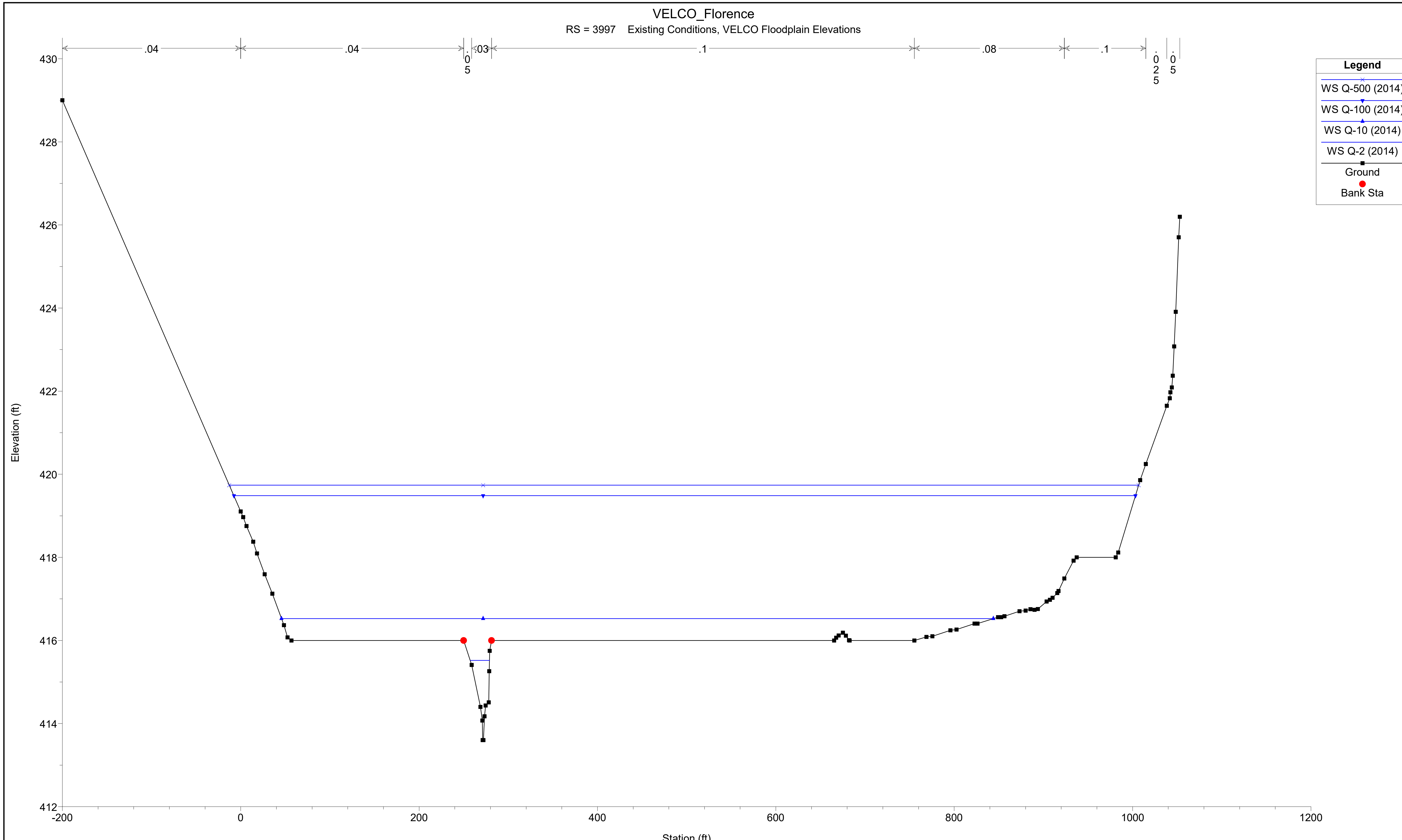
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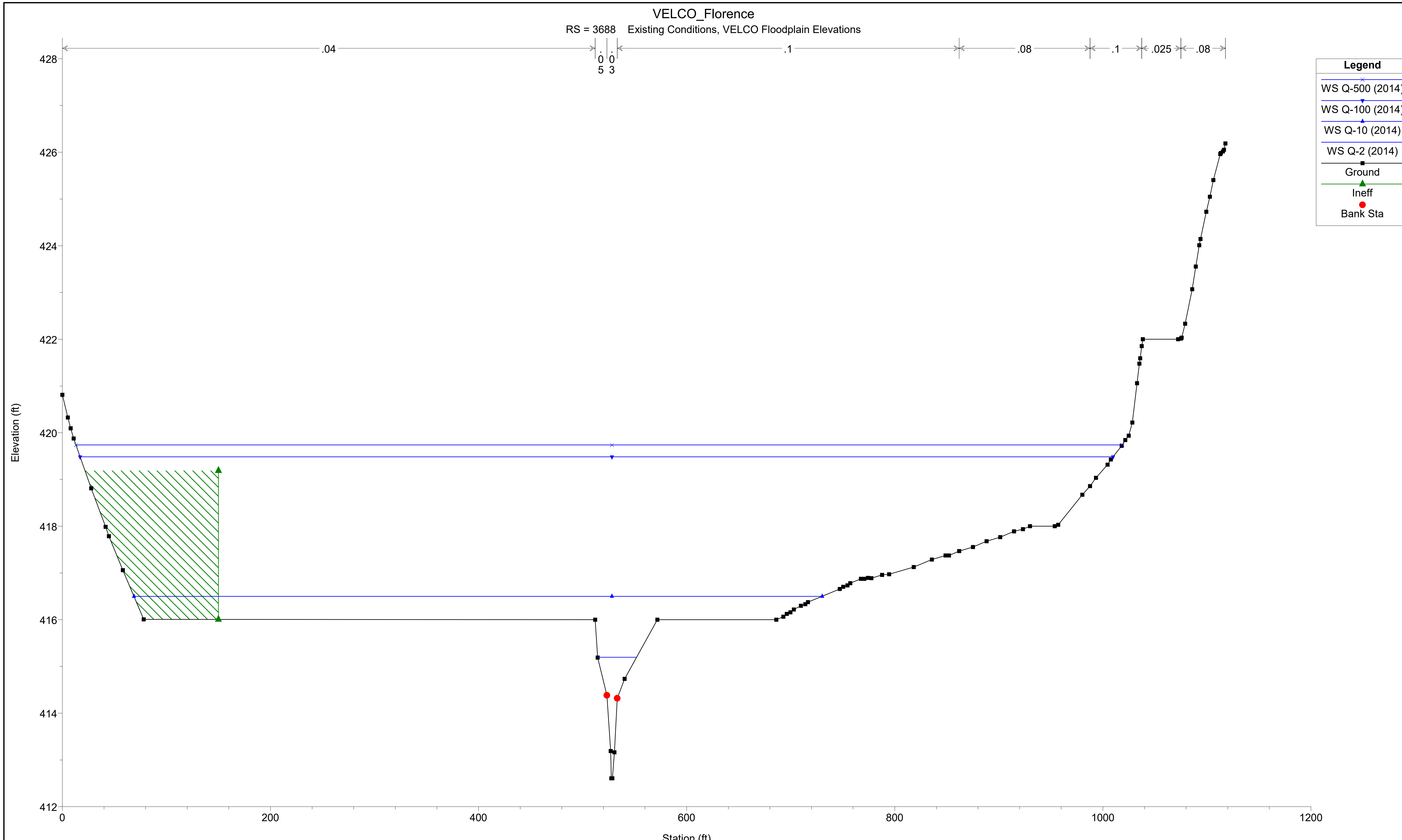
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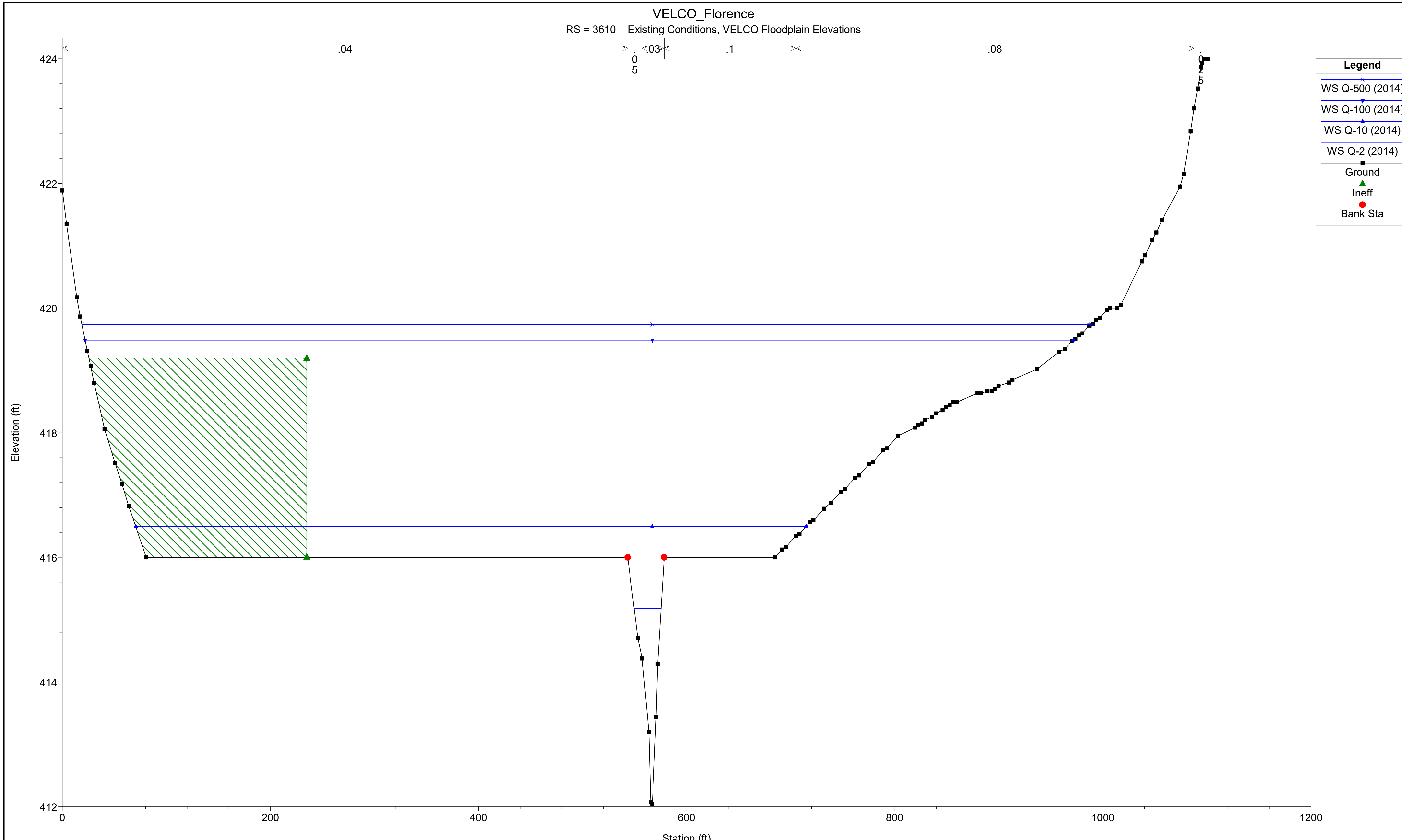
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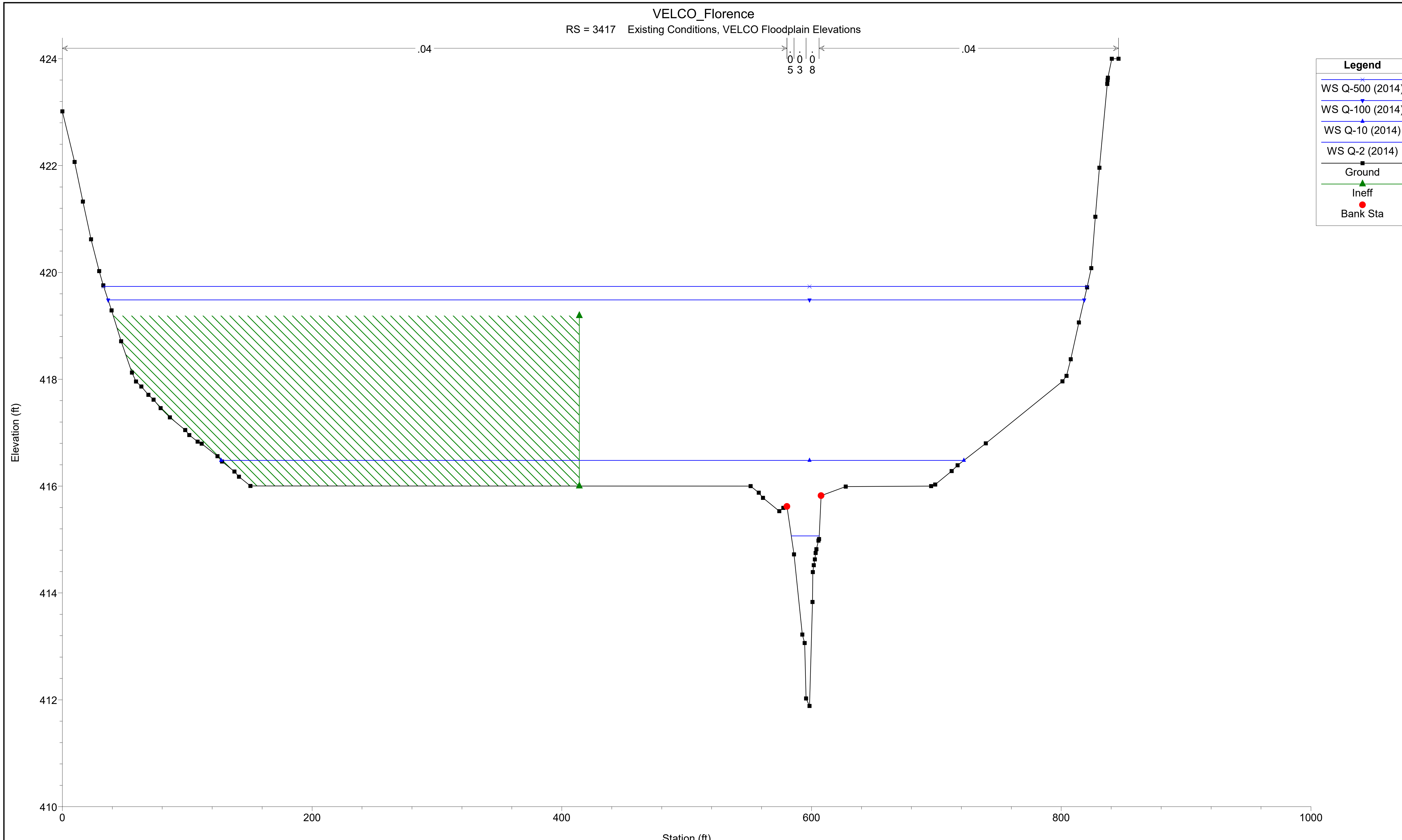
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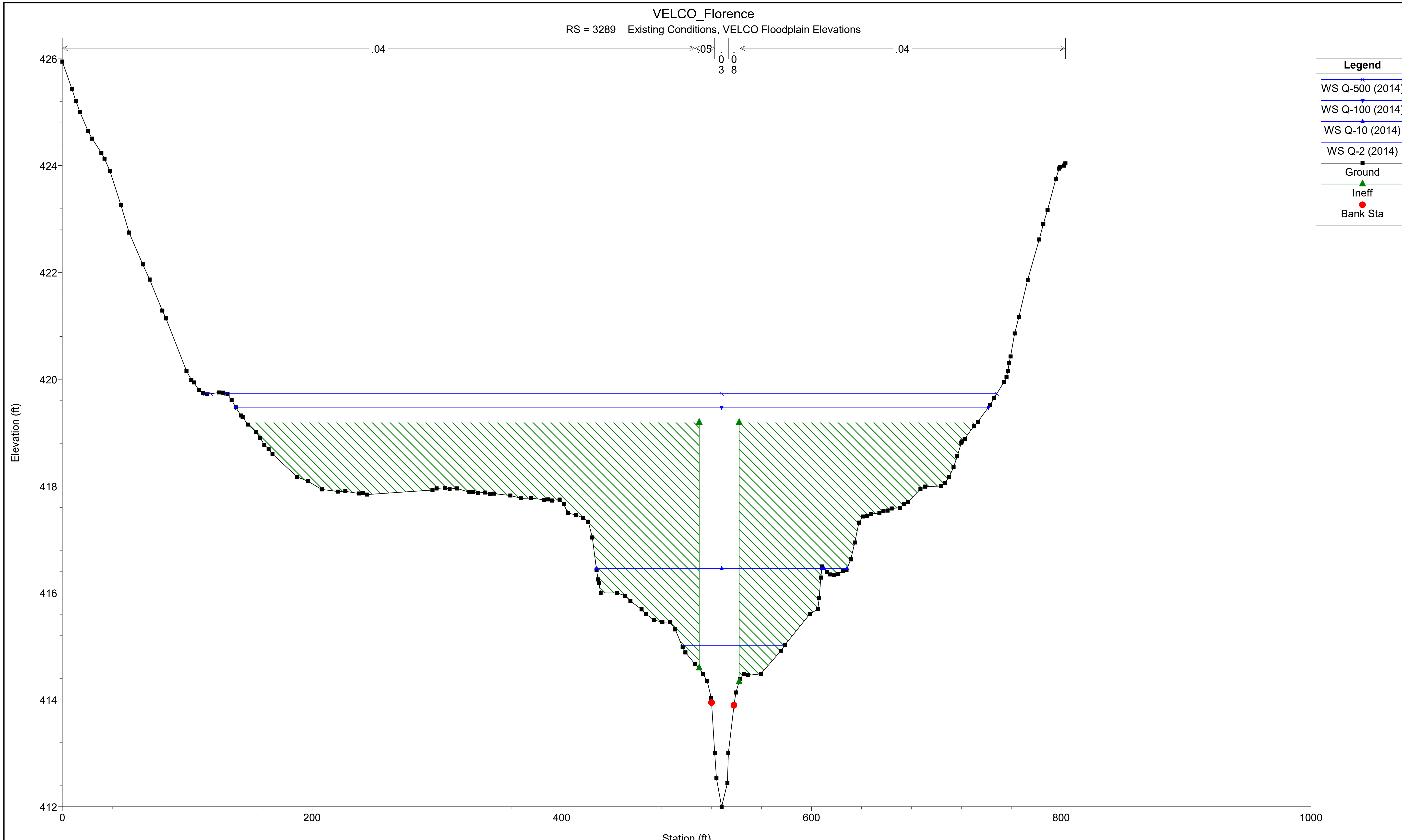
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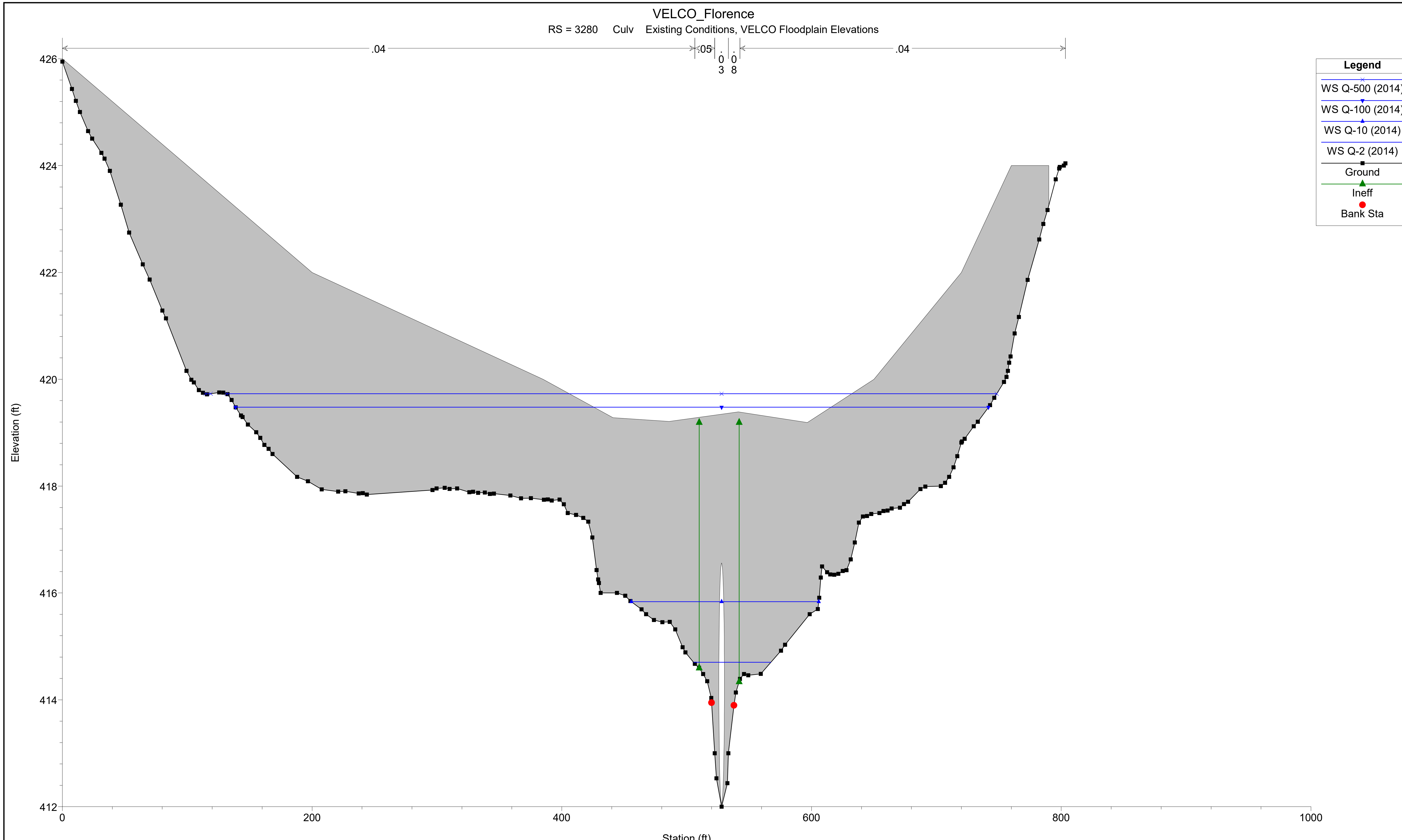
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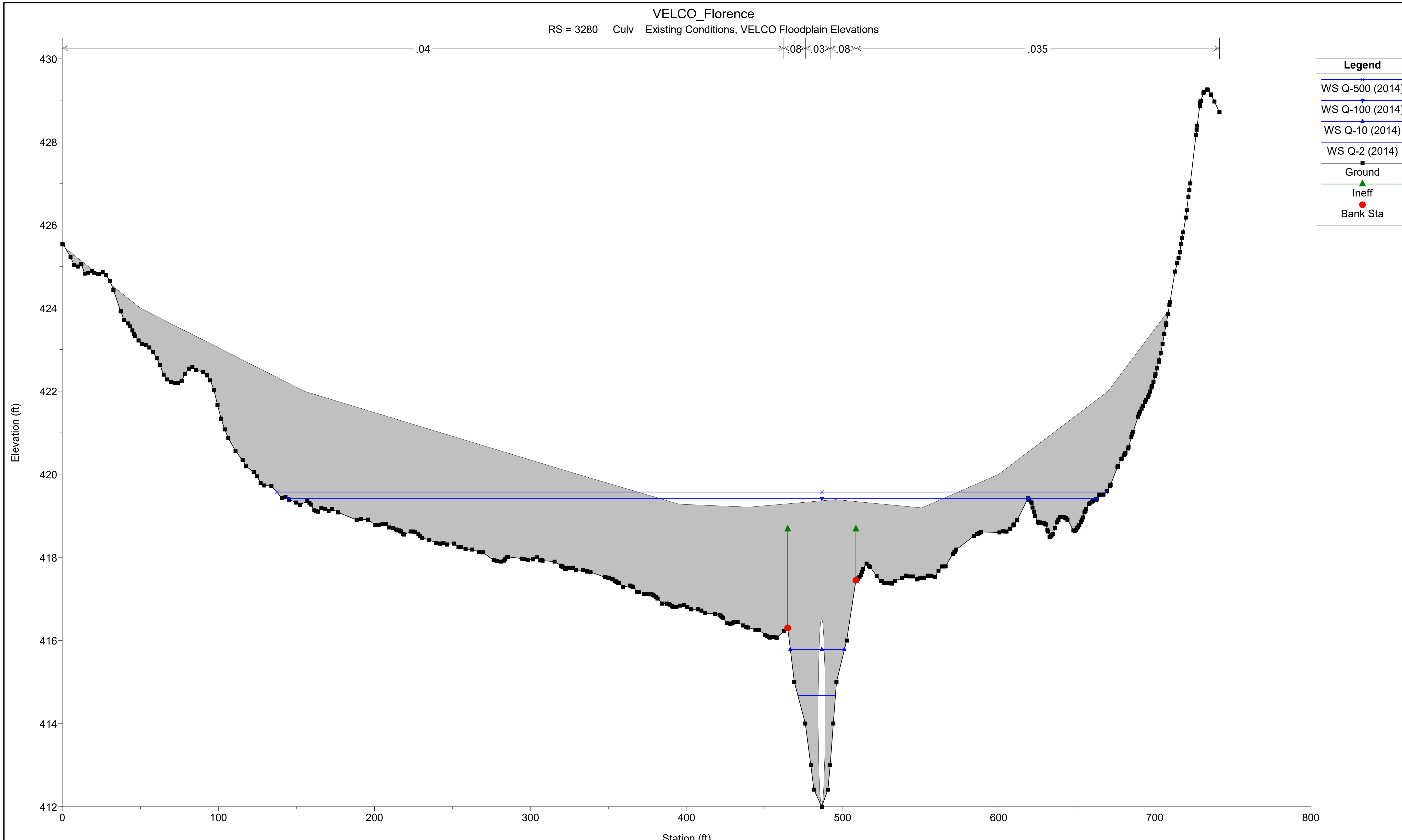
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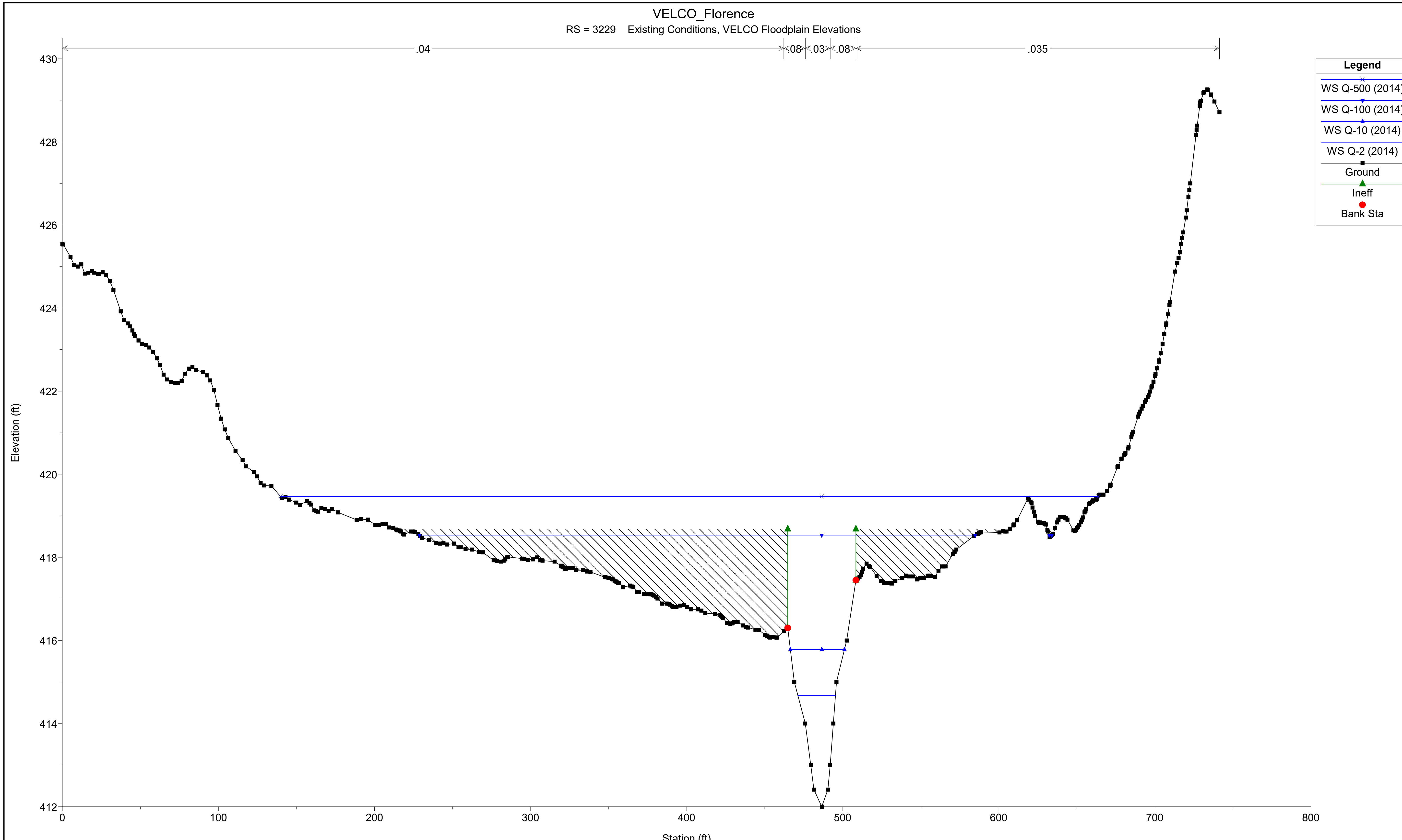
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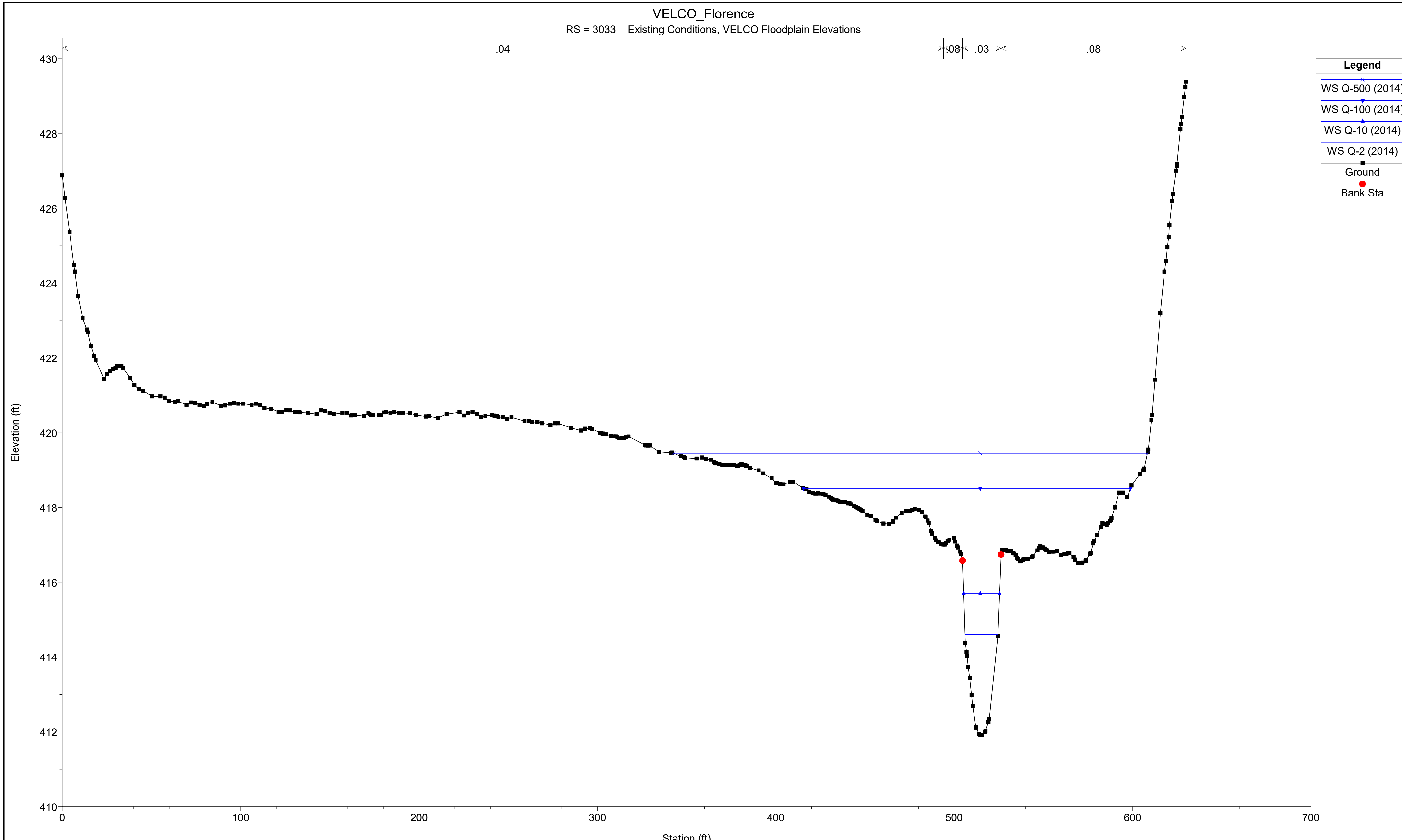
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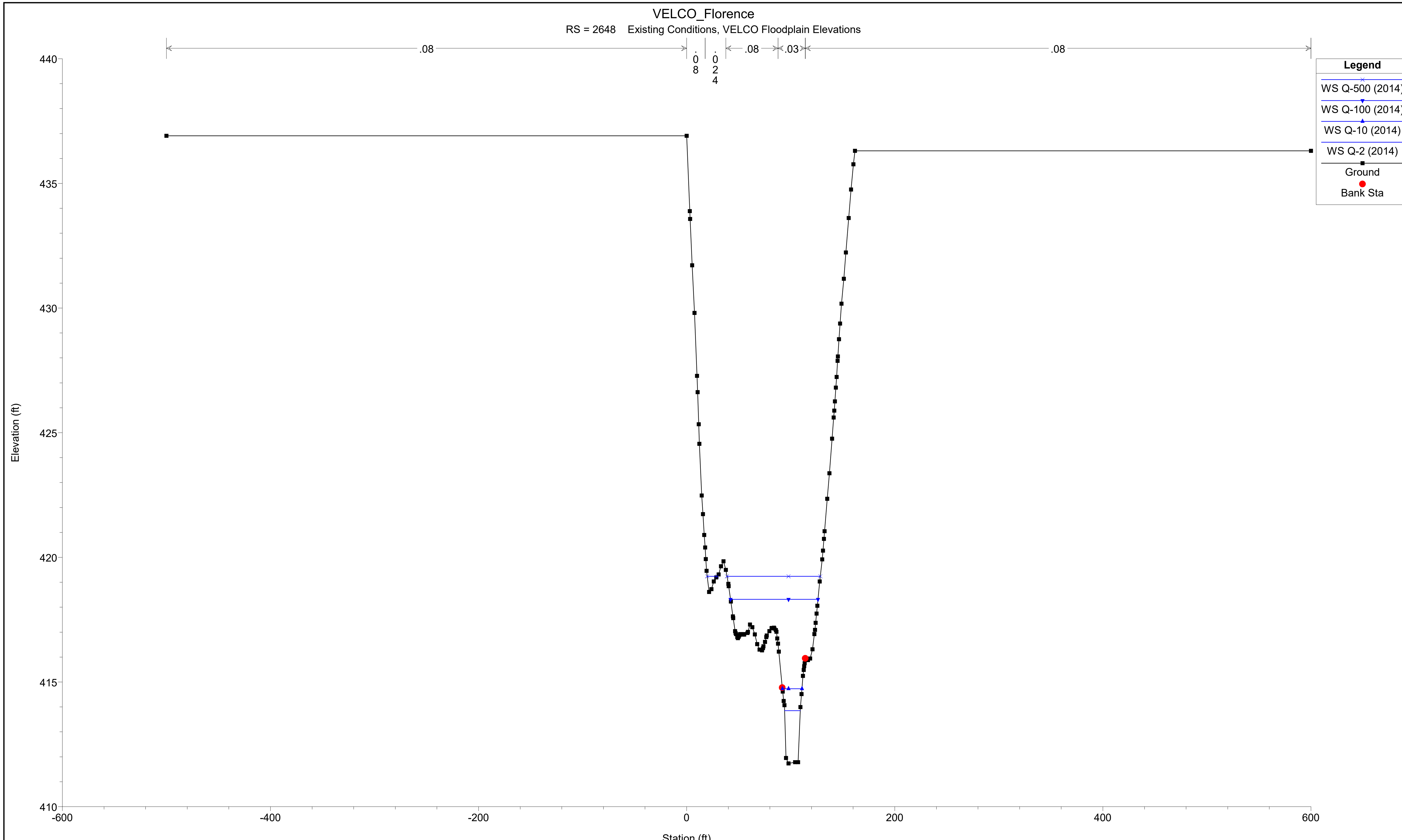
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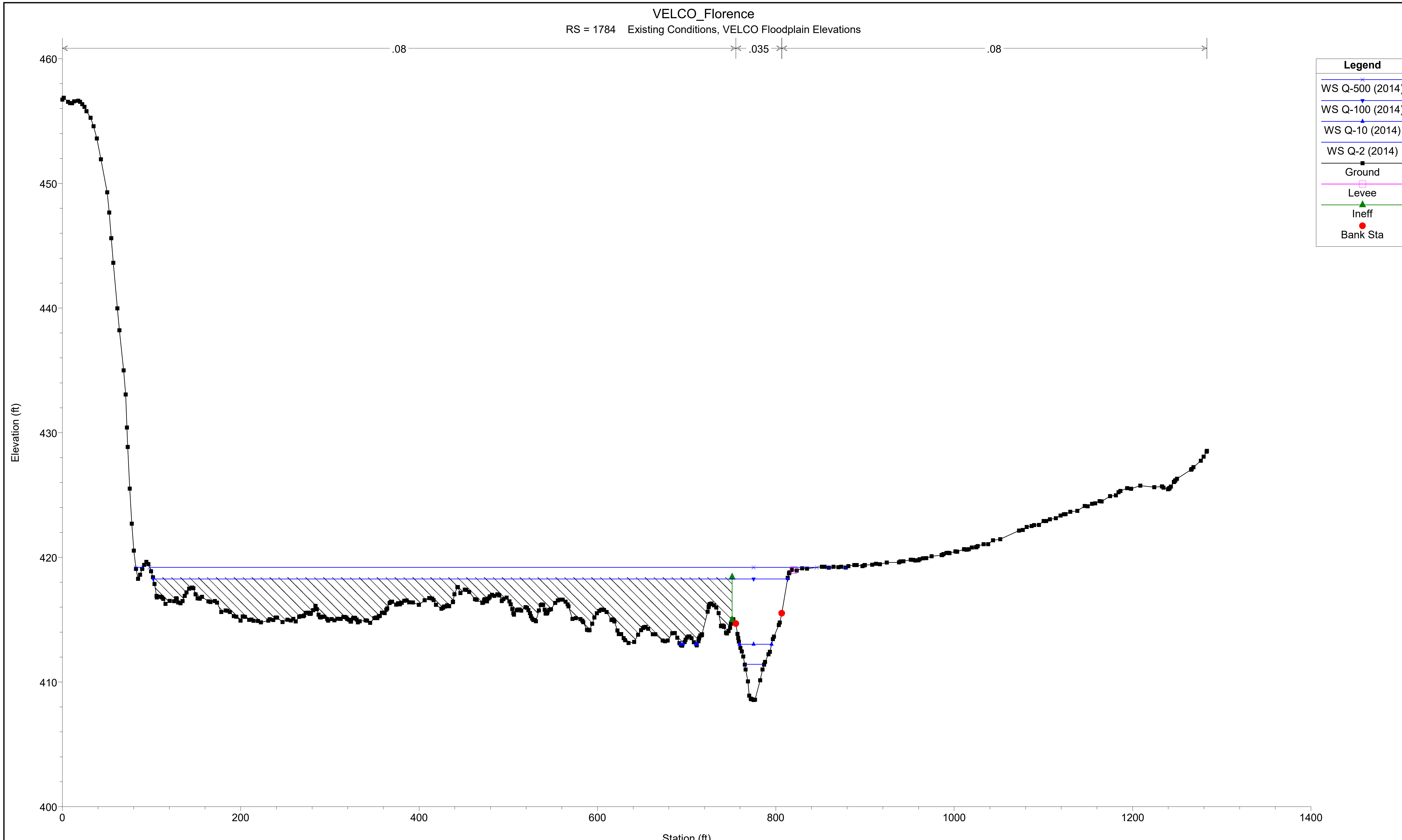
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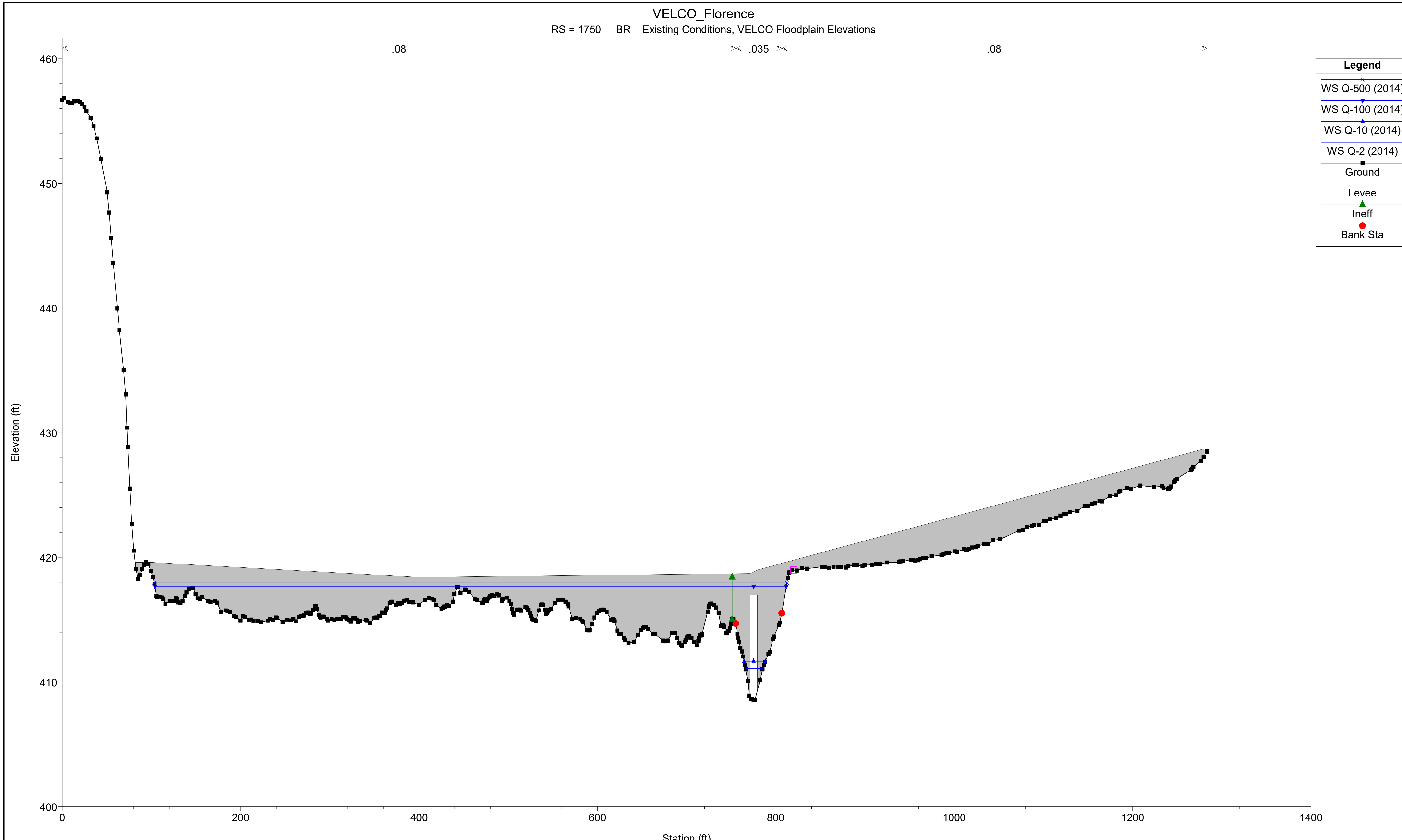
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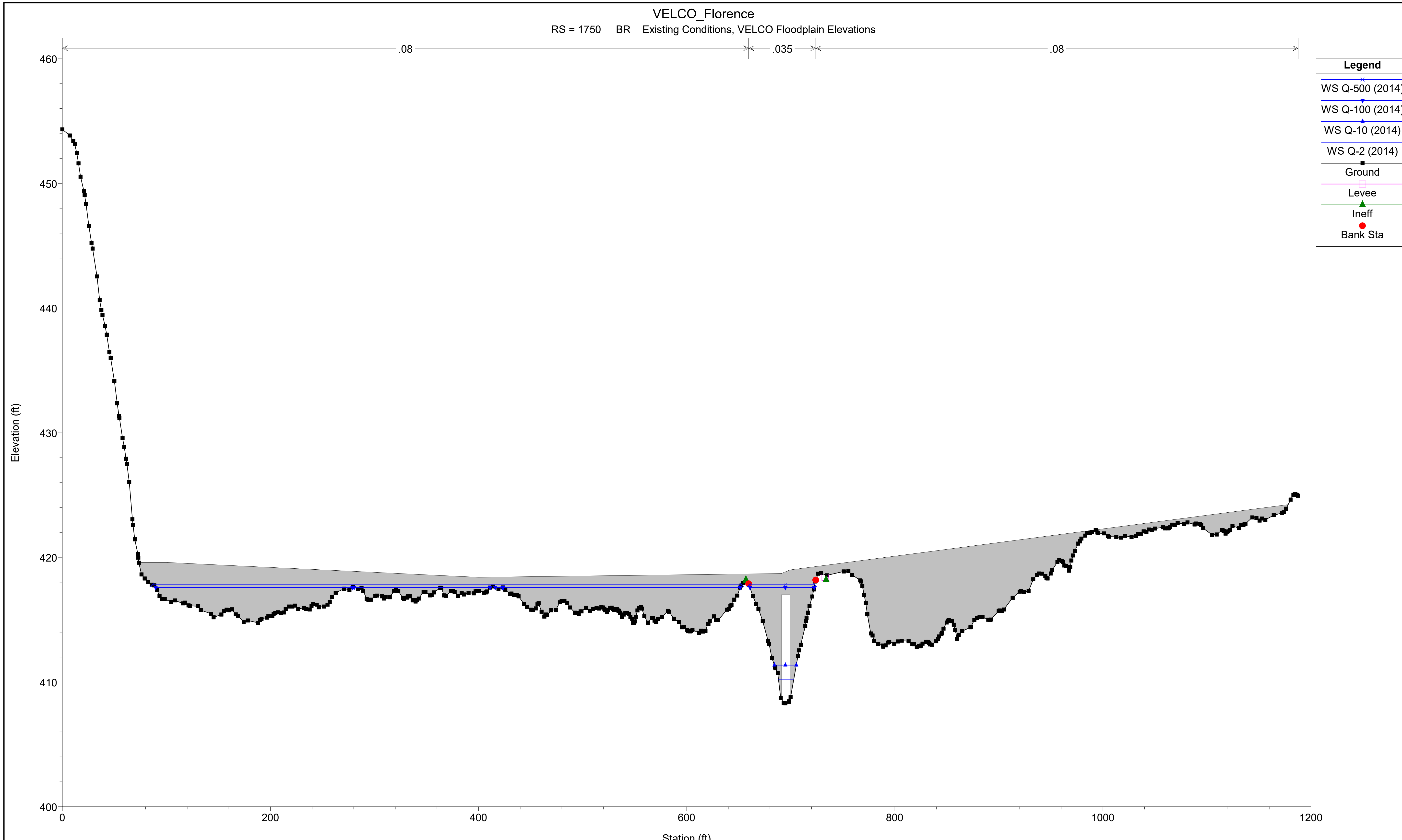
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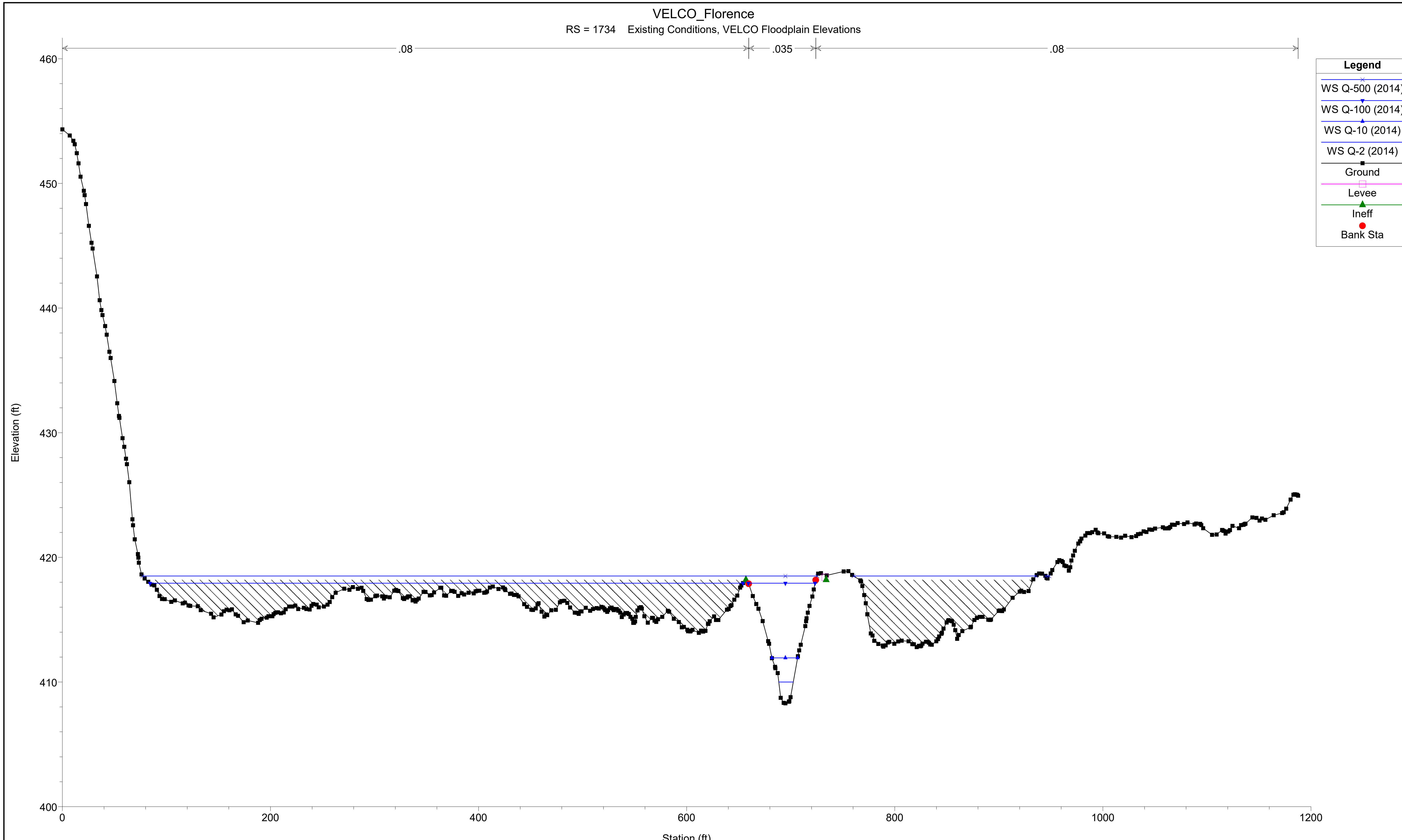
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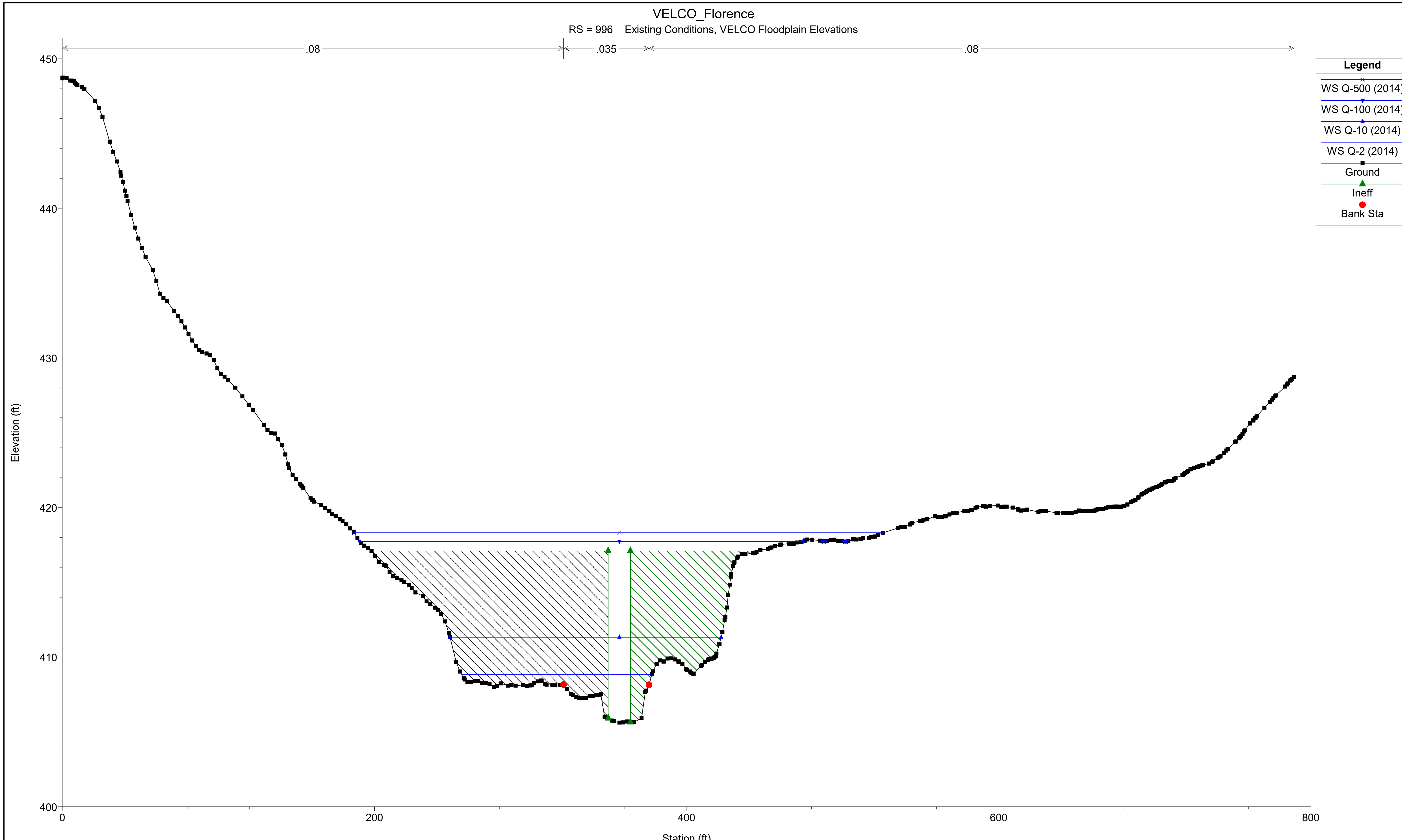
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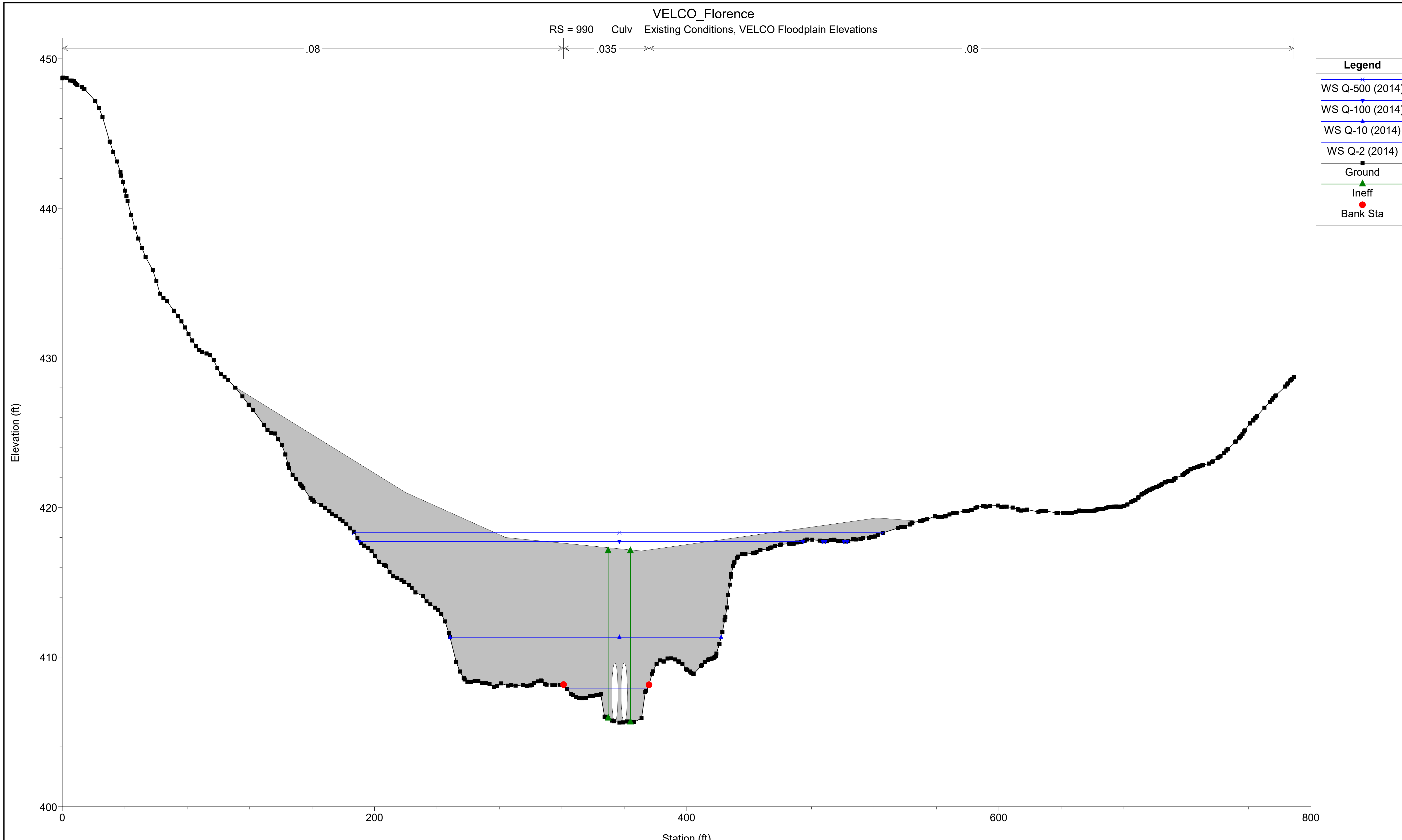
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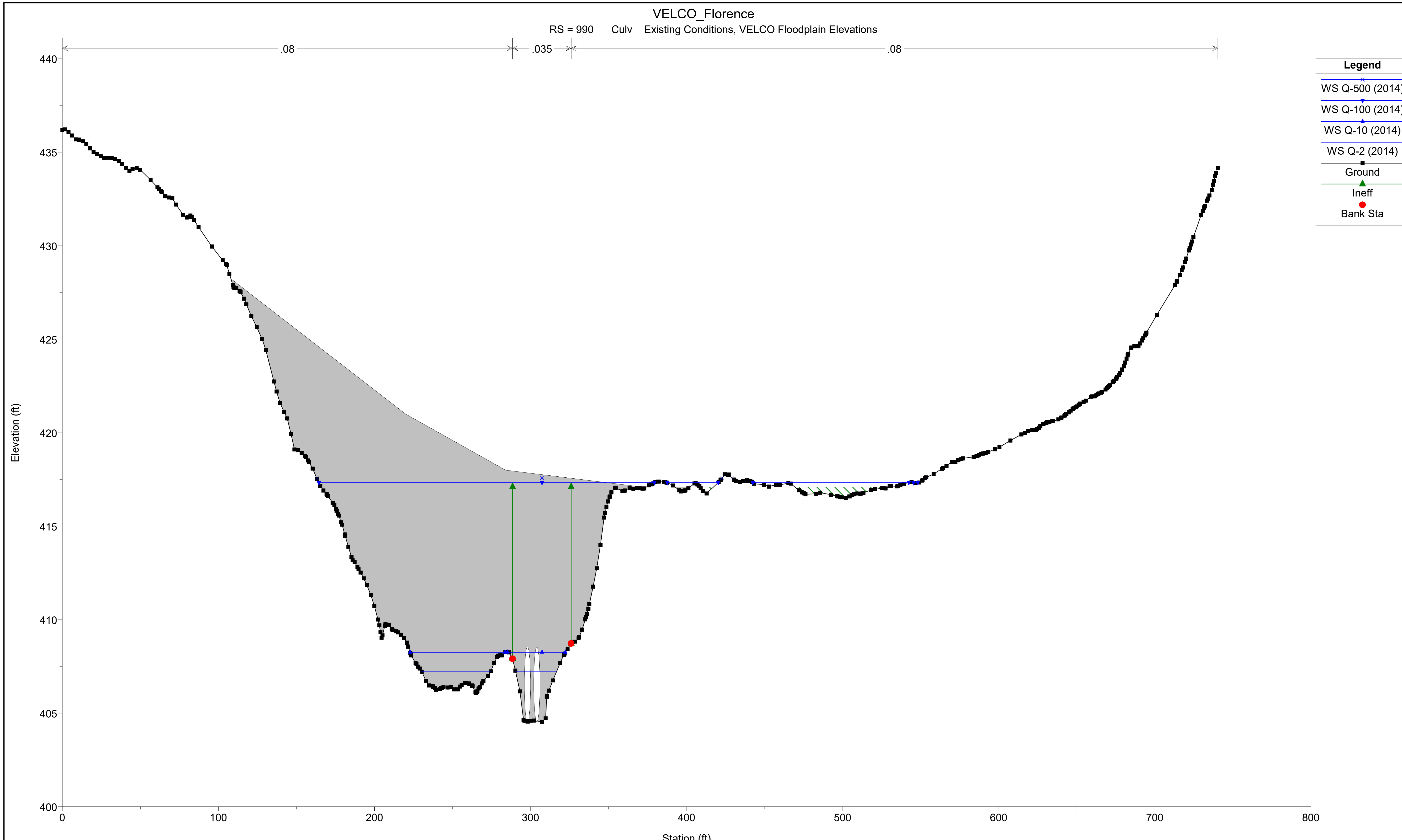
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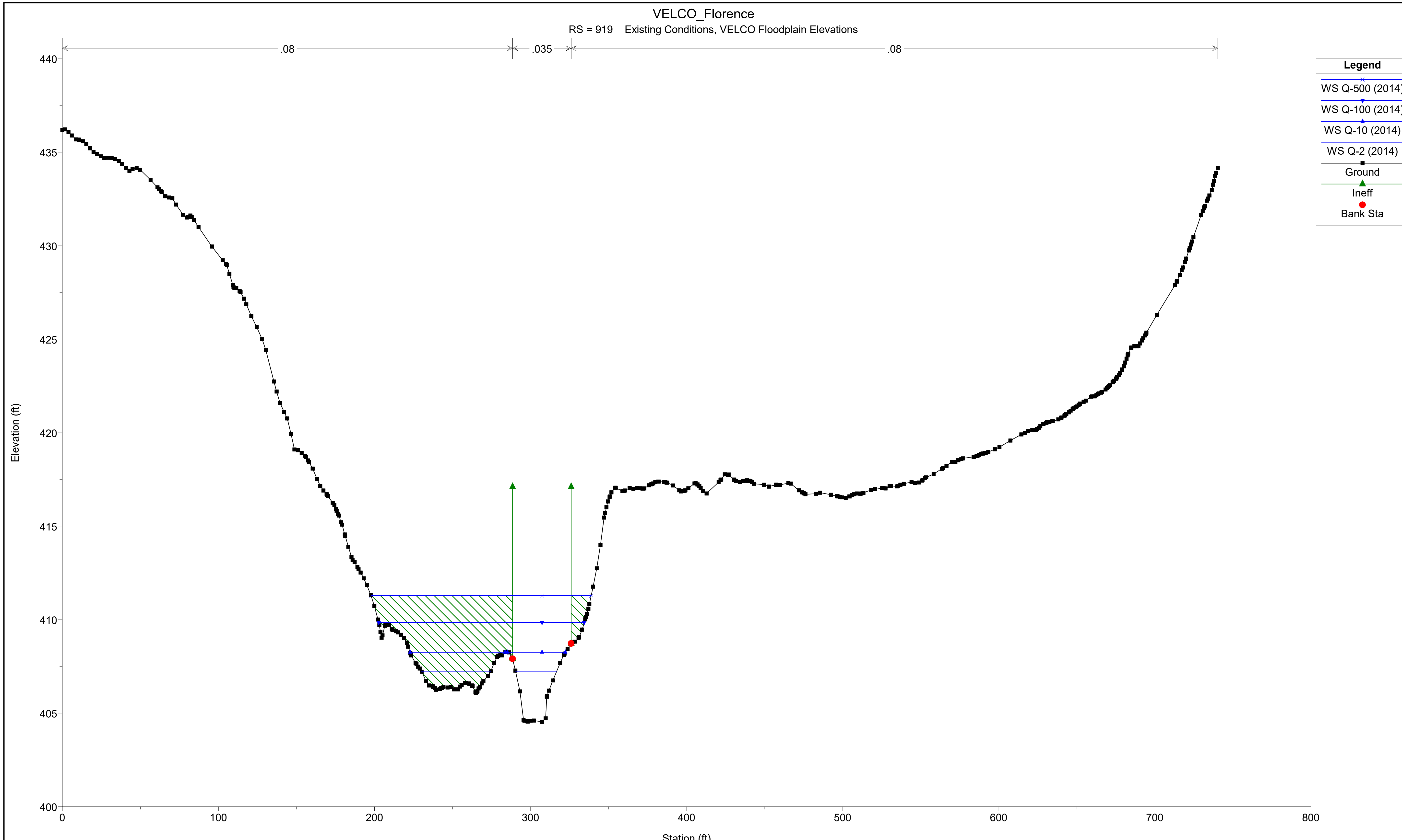
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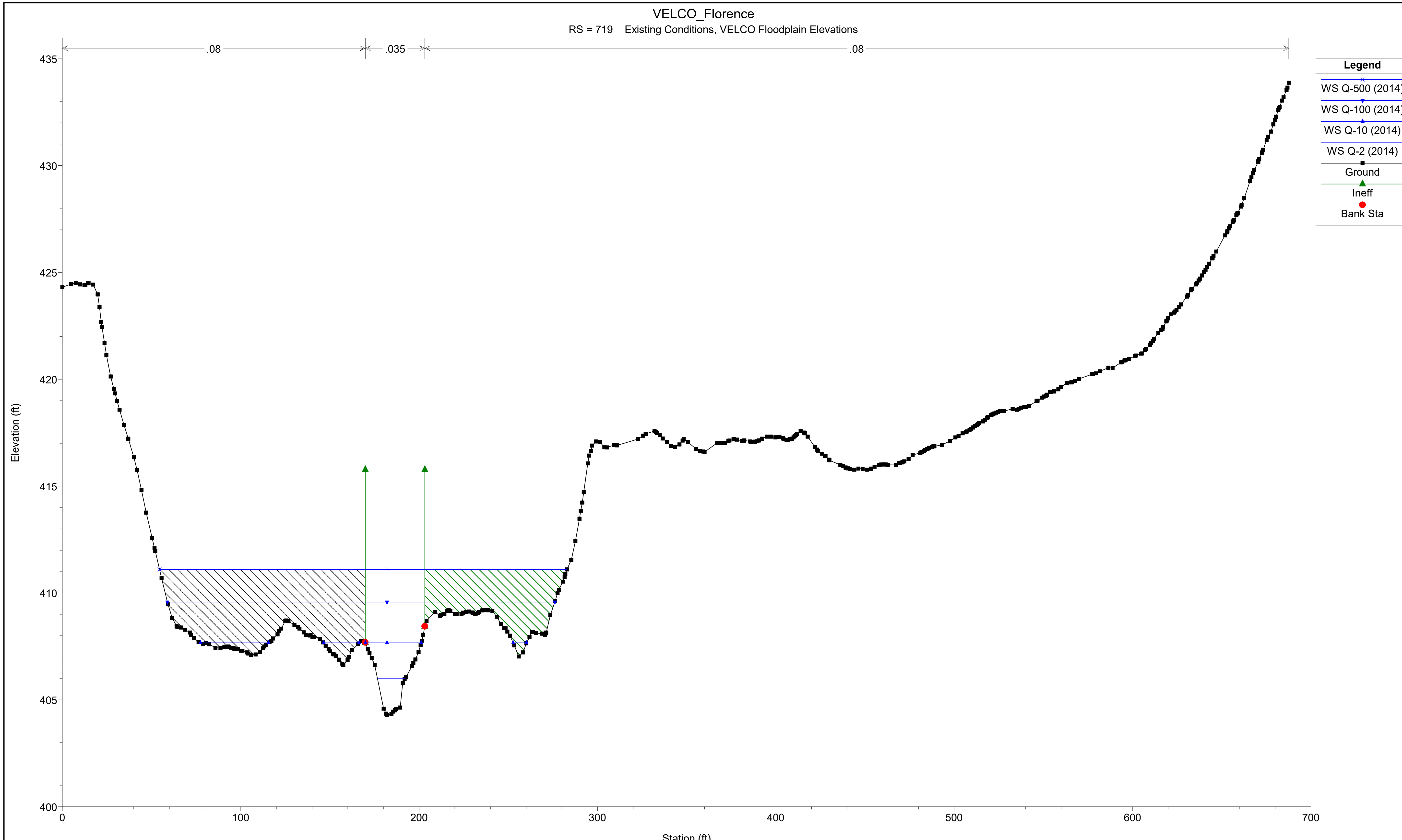
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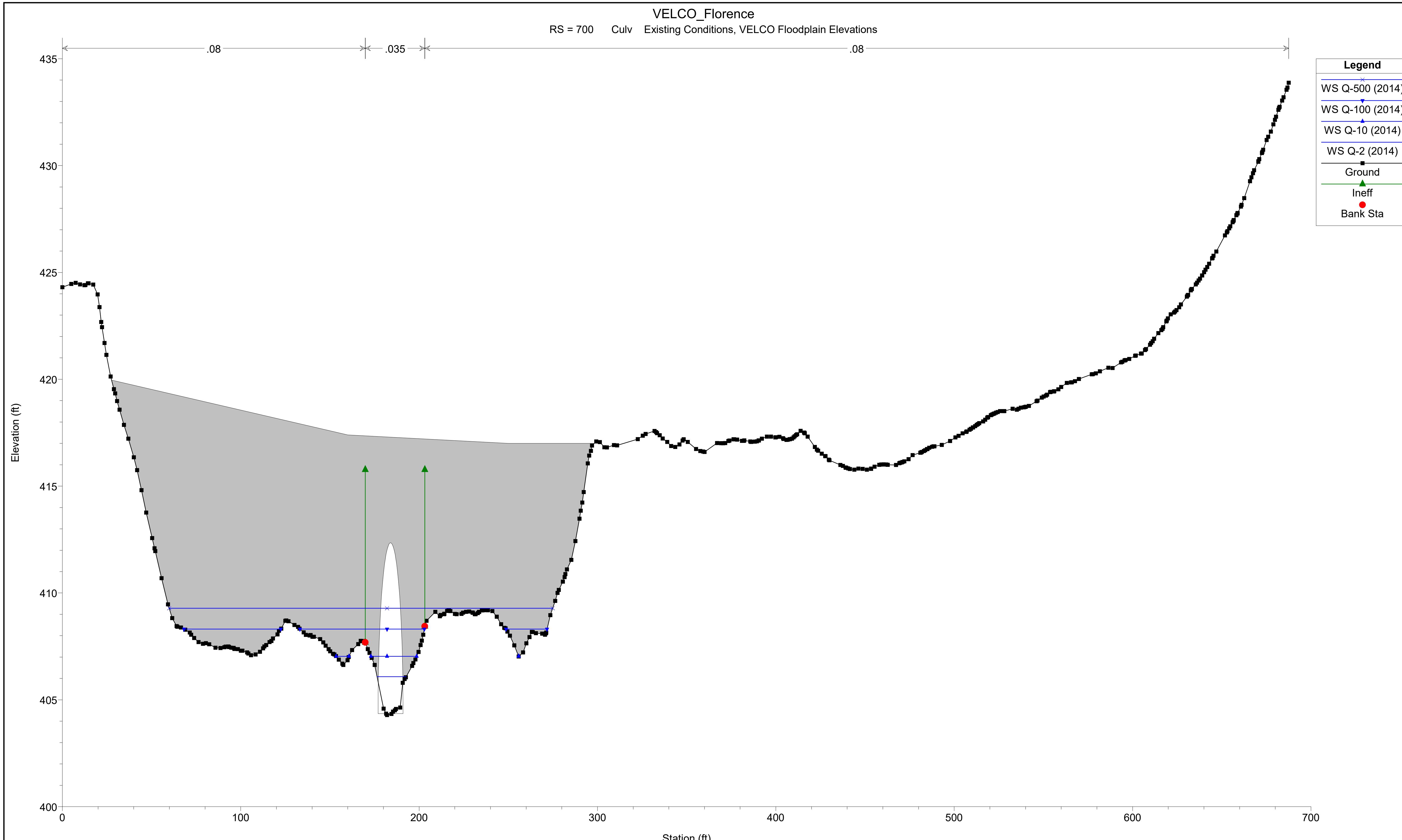
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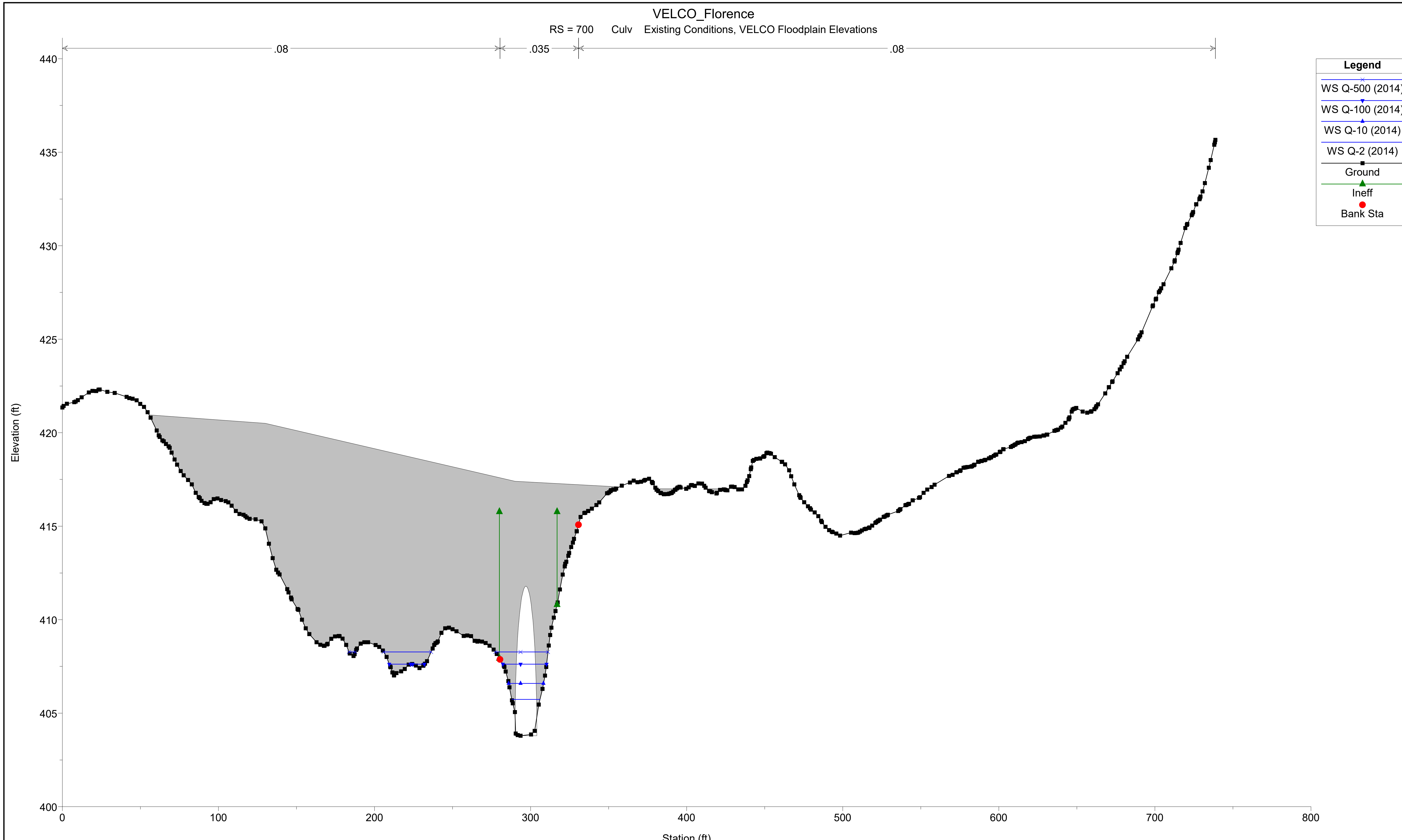
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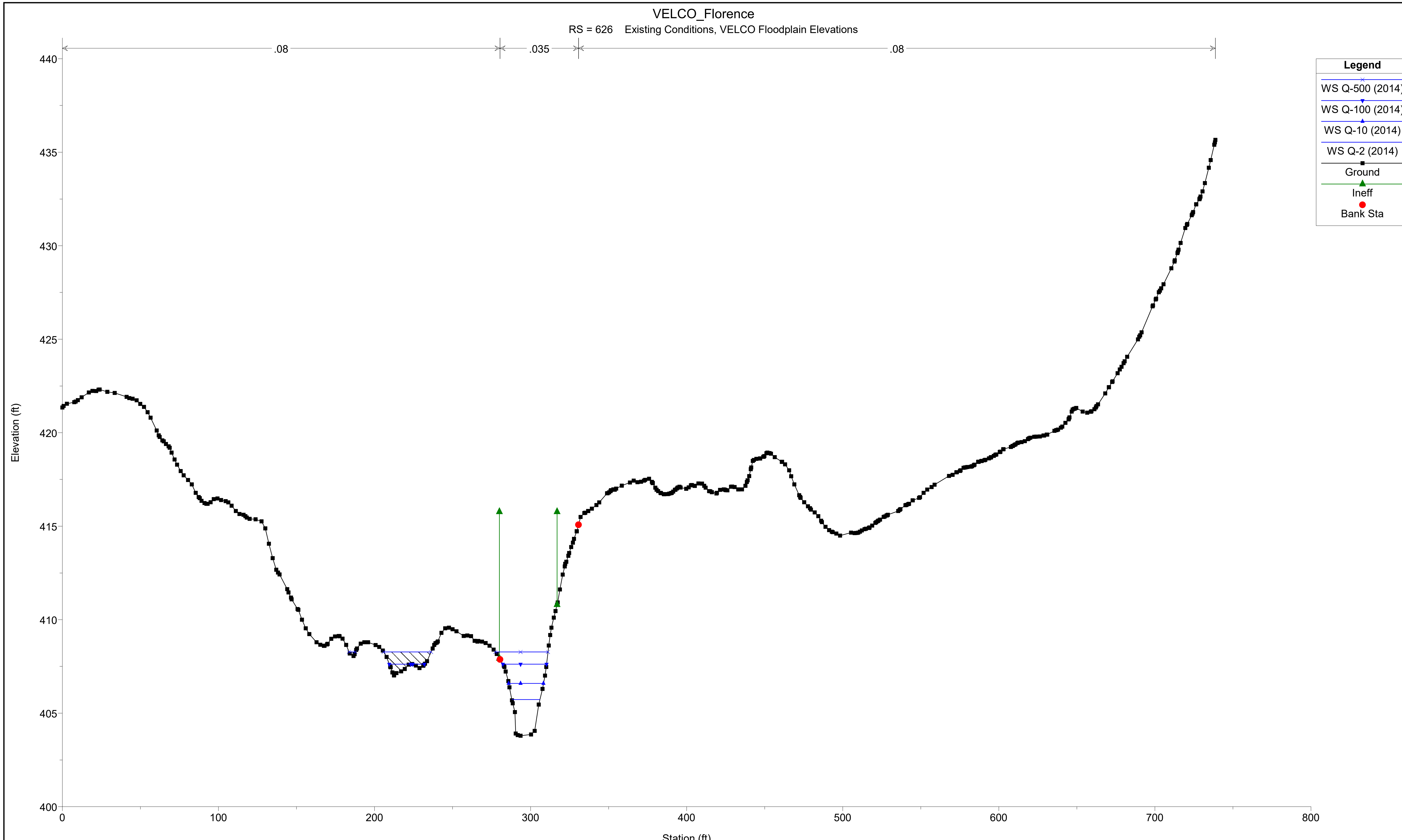
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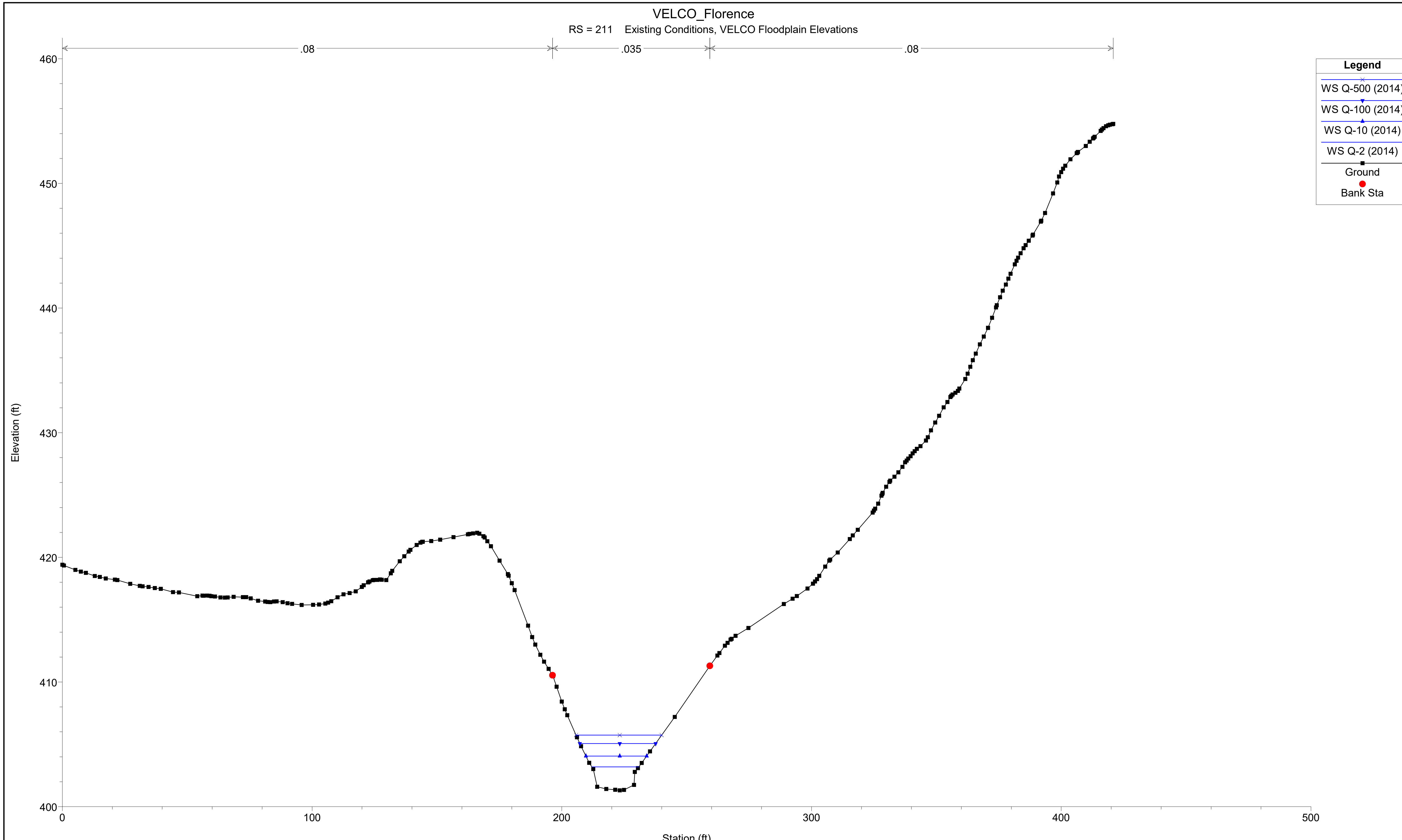
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Gilman & Briggs Environmental

1 Conti Circle #5, Barre, VT 05641
Ph: 802-479-7480; team@gbevt.com

MEMORANDUM

To: Duane Choquette
From: Art Gilman
Date: 27 July 2021
Re: Search for Rare, Threatened, or Endangered plant species at the site of the proposed Florence Substation project, Pittsford, Vermont

I visited the site of the proposed new Florence Substation in Pittsford, Vermont, with you and Jake Reed on 19 July to search for any plants listed as threatened or endangered under federal or Vermont law, or listed as rare by the Vermont Natural Heritage Inventory program. We inspected the areas where trees will be removed, where earth will be disturbed, and/or where vegetation will be cut, These areas include the footprint of the new substation and its environs north to and including the 46kV powerline corridor that runs east to the OMYA facility to the height of land, and lands west of the drive where a new powerline corridor will be established from the large tap structure at the edge of the wetland.

Weather was warm and dry under midsummer growing conditions. The region had received significant rains during the preceding week, following a prolonged moderate drought, but this did not affect the plants so that they could not be identified.

One endangered, protected plant species, and one uncommon, but not protected species, are mapped by the Vermont Natural Resources Atlas as occurring within one mile of this project location. The endangered species is Drummond's rock-cress (*Boechera stricta*), ranked rare to very rare (S1S2), which is known from a location ca. 0.7 mi south of the project area. The uncommon species, ranked S3, is Hill's pondweed (*Potamogeton hillii*), known from aquatic habitats in Smith Pond, ca. 0.8 mi northeast of the substation and in a tributary to Smith's Pond that passes under Whipple Hollow Road about 0.7 mi north of the substation.

The search area includes four habitat types:

1) a mixed forest on limestone bedrock on the hill east and north of the substation, including white pine, hemlock, red maple, red oak, and birch;

2) exposed bedrock ledges and maintained powerline corridor along the northern edge of the property and along the driveway; this area is very shrubby and has a mix of introduced and native species;

3) disturbed areas along the existing driveway and substation itself; primarily vegetated with goldenrods and various weedy species; and

4) wetland west of the driveway, which consists of tall emergent graminoids (cat-tails and

Phragmites) as well as shrubs (mostly willows) and a few trees (willow, poplars and northern white cedar).

I observed no rare, threatened, or endangered species on the property. Specifically, although the site contains habitat suitable for Drummond's rock cress, i.e., bedrock rock outcrops either forested or exposed, I observed no Drumond's rock cress nor any other rock cress species. Also, the site does not contain the type of aquatic habitat, i.e., pools, ponds, or streams that might provide habitat for Hill's pondweed.

A full list of plant species observed is given in Tables 1 and 2. Table 1 contains plants observed in the forest and on ledge outcrops, and on disturbed lands east of the access drive. Table 2 those in disturbed areas and wetland west of the drive. Note, several non-native invasive species were observed. The forested area has few invasives and these are present in low numbers. The exposed ledges under powerlines on the north side, disturbed areas along the road, and the wetland areas are more heavily burdened, especially with purple loosestrife and *Phragmites.*

Table 1. Plants observed in forest and on rock outcrops at the site of the proposed Florence Substation expansion, Pittsford, Vt.

Scientific Name	Common Name	Notes
TREES, SHRUBS AND WOODY VINES		Non-native (NNIS) species
Acer pennsylvanicum	Striped maple	
Acer rubrum	Red maple	
Acer saccharum	Sugar maple	
Berberis vulgaris	European barberry	NNIS
Betula alleghaniensis	Yellow birch	
Betula papyrifera	Paper birch	
Carpinus caroliniana	Blue beech	
Carya cordifolia	Bitternut hickory	
Celastrus americana	Bittersweet	
Cornus alternifolia	Alternate-leaved dogwood	
Cornus rugosa	Round-leaved dogwood	
Cornus scandens	Racemed dogwood	
Corylus cornuta	Beaked hazel	
Dasiphora fruticosa	Shrubby cinquefoil	
Diervilla lonicera	Bush honeysuckle	
Frangula alnus	Glossy buckthorn	NNIS
Fraxinus americana	White ash	
Fraxinus nigra	Black ash	
Juniperus communis	Pasture juniper	
Lonicera dioica	Glaucous honeysuckle	
Lonicera morrowii	Morrow's honeysuckle	NNIS
Ostrya virginiana	Hop hornbeam	
Parthenocissus quinquefolia	Virginia creeper	
Pinus strobus	White pine	
Populus balsamifera	Balsam-poplar	
Populus tremuloides	Quaking aspen	
Prunus serotina	Black cherry	
Prunus virginiana	Choke cherry	
Quercus rubra	Red oak	
Rhamnus alnifolia	Alder-leaved buckthorn	
Rhamnus catharticus	Common buckthorn	NNIS
Rhus typhina	Staghorn sumac	
Rubus alleghaniensis	Tall blackberry	
Rubus idaeus	Red raspberry	
Rubus occidentalis	Black-cap raspberry	
Rubus odoratus	Flowering raspberry	
Sambucus racemosa	Red-berried elder	
Sorbus americana	Mountain ash	
Tilia americana	Basswood	
Toxicodendron rydbergii	Creeping poison-ivy	
Thuja occidentalis	Northern white cedar	
Tsuga canadensis	Eastern hemlock	

Viburnum acerifolium	Maple-leaved viburnum	
Vitis riparia	Riverbank grape	
FERNS AND FERN-ALLIES		
Adiantum pedatum	Maidenhair fern	
Asplenium platyneuron	Ebony spleenwort	
Athyrium filix-femina	Lady fern	
Cystopteris bulbifera	Bulblet bladder-fern	
Dryopteris intermedia	Intermediate woodfern	
Dryopteris marginalis	Marginal woodfern	
Equisetum arvense	Field horsetail	
Onoclea sensibilis	Sensitive fern	
Polypodium virginianum	Rock polypody	
Polystichum acrostichoides	Christmas fern	
Pteridium aquilinum	Bracken	
Thelypteris palustris	Marsh fern	
GRASSES, SEDGES, AND RUSHES		
Calamagrostis canadensis	Canada bluejoint grass	
Carex appalachica	Appalachian sedge	
Carex communis	Common sedge	
Carex eburnea	Ebony sedge	
Carex pedunculata	Pedunculate sedge	
Carex pensylvanica	Pennsylvania sedge	
Carex platyphylla	Wide-leaved sedge	
Dichanthelium acuminatum var. *fasciculatum*	Panic-grass	
Oryzopsis asperifolia	Mountain rice grass	
Patis racemosa	Black-seeded mountain rice grass	
Phalaris arundinacea	Reed canary-grass	
Schizachne purpurascens	Purple-oat	
Sphenopholis intermedia	Wedge-grass	
HERBS		
Actaea rubra	Red baneberry	
Ageratina altissima	White snakeroot	
Amphicarpaea bracteata	Hog-peanut	
Anemone acutiloba	Sharp-lobed hepatica	
Anemone quinquefolia	Wood anemone	
Anemone virginiana	Thimbleweed	
Apocynum androsaemifolium	Spreading dogbane	
Aquilegia canadensis	Wild columbine	
Aralia nudicaulis	False sarsaparilla	
Asarum canadense	Wild ginger	
Asclepias syriaca	Common milkweed	

Centaurea stoebe	Spotted knapweed	
Circaea alpina	Dwarf enchanter's nightshade	
Circaea canadensis	Enchanter's nightshade	
Cirsium vulgare	Bull thistle	
Clematis virginiana	White clematis	
Echium vulgare	Viper's bugloss	
Epipactis helleborine	Helleborine	
Erechtites hieraciifolia	Fireweed	
Erigeron pulchellus	Robin's-plantain	
Euphorbia cyparissias	Cemetery spurge	
Eurybia divaricata	White wood-aster	
Eurybia macrophylla	Large-leaved aster	
Eutrochium maculatum	Joe Pye weed	
Galium circaezans	Wild-licorice	
Lactuca cf. canadensis	Wild lettuce	
Leucanthemum vulgare	Oxeye daisy	
Lithospermum officinale	Gromwell	
Lysimachia ciliata	Fringed loosestrife	
Lythrum salicaria	Purple loosestrife	NNIS
Maianthemum canadense	False lily-of-the-valley	
Maianthemum racemosum	False Solomon's-seal	
Mitchella repens	Partridge-berry	
Monarda fistulosa	Bee-balm	
Origanum vulgare	Oregano	
Packera schweinitziana	Robbins's ragwort	
Pilosella cespitosa	Yellow king-devil	
Pilosella piloselloides	Glaucous king-devil	
Polygaloides paucifolia	Fringed polygala	
Polygonatum pubescens	Solomon's-seal	
Pycnanthemum virginianum	Virginia mountain mint	
Securigera varia	Crown vetch	
Solanum dulcamara	Bittersweet nightshade	
Solidago caesia	Blue-stemmed goldenrod	
Solidago altissima	Tall goldenrod	
Solidago flexicaulis	Zig-zag goldenrod	
Solidago juncea	Early goldenrod	
Solidago nemoralis	Ashy goldenrod	
Solidago rugosa	Wrinkle-leaved goldenrod	
Symphyotrichum novae-angliae	New England aster	
Symphyotrichum cordifolium	Heart-leaved aster	
Symphyotrichum lateriflorum	Calico aster	
Tiarella cordifolia	Foamflower	
Tussilago farfara	Colt's-foot	
Verbascum thapsus	Common mullein	

Viola labradorica	Dog violet	

Table 2. Plants observed along driveway, disturbed lands at substation, on in wetland W of the driveway at the site of the proposed Florence Substation expansion, Pittsford, VT

TREES, SHRUBS AND WOODY VINES		
Acer rubrum	Red maple	
Alnus incana	Speckled alder	
Cornus amomum	Silky dogwood	
Fraxinus americana	White ash	
Lonicera morrowii	Morrow's honeysuckle	NNIS
Populus deltoides	Cottonwood	
Populus tremuloides	Quaking aspen	
Salix bebbiana	Bebb's willow	
Salix discolor	Pussy-willow	
Salix eriocephala	Wand willow	
Salix fragilis	Crack willow	
Salix sericea	Silky willow	
Spiraea alba var. *latifolia*	Meadowsweet	
Thuja occidentalis	Northern white cedar	
Ulmus americana	American elm	
Viburnum dentatum	Arrowwood	
Vitis riparia	Riverbank grape	
FERNS AND FERN-ALLIES		
Equisetum arvense	Field horsetail	
Thelypteris palustris	Marsh fern	
GRASSES, SEDGES, AND RUSHES		
Agrostis gigantea	Red-top grass	
Bromus inermis	Hungarian brome	
Carex lacustris	Lake sedge	
Elymus repens	Witch grass	
Juncus effusus	Soft rush	
Phleum pratense	Timothy	
Phragmites australis	Common reed	NNIS
Scirpus pendulus	Pendulous bulrush	
HERBS		
Achillea millefolium	Yarrow	
Agalinis tenuifolia	Slender agalinis	
Amphicarpaea bracteata	Hog-peanut	
Anemone canadensis	Canada anemone	
Arctium lappa	Great burdock	
Artemisia vulgaris	Mugwort	
Calystegia sepium	Hedge bindweed	

var. *angulata*		
Erigeron strigosus	Daisy fleabane	
Eutrochium maculatum	Joe-Pye weed	
Galium mollugo	Bedstraw	
Lathyrus perennis	Perennial pea	
Lotus corniculatus	Bird's-foot trefoil	
Lythrum salicaria	Purple loosestrife	NNIS
Medicago lupulina	Black medick	
Melilotus albus	White sweet-clover	
Pastinaca sativa	Wild parsnip	
Potentilla norvegica	Rough cinquefoil	
Prunella vulgaris	Self-heal	
Rubus pubescens	Dwarf raspberry	
Rudbeckia hirta var. *pulcherrima*	Black-eyed Susan	
Solidago altissima	Tall goldenrod	
Taraxacum officinale	Dandelion	
Zizia aurea	Golden Alexanders	