Stony Brook Mitigation

Environmental Assessment

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New York Governor's Office of Storm Recovery

June 20, 2017

Stony Brook Mitigation
Environmental Assessment

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Project Name:	Stony Brook Mitigation
Project Location:	Stony Brook following Stony Brook Road for 2.6 miles from west of Frisbieville Road until west of Rack Road in the Town of Schoharie, Schoharie County, NY.
HTFC SHARS #:	N/A
Federal Agency:	U.S. Department of Housing and Urban Development
Responsible Entity:	New York State Homes and Community Renewal
Responsible Agency's Certifying Officer:	Lori A. Shirley, Certifying Officer, Governor's Office of Storm Recovery
Project Sponsor:	Schoharie County Soil & Water Conservation District
Primary Contact:	Peter Nichols, Stream Program Manager 173 South Grant Street, Suite 3, Cobleskill, NY 12043 district@schohariesoilandwater.org, 518-823-4535
Project NEPA Classification:	24 CFR 58.36 (Environmental Assessment)
Environmental Finding:	☒ Finding of No Significant Impact - The project will not result in a significant impact on the quality of the human environment. ☐ Finding of Significant Impact - The project may significantly affect the quality of the human environment.
Certification	The undersigned hereby certifies that New York State Homes and Community Renewal has conducted an environmental review of the project identified above and prepared the attached environmental review record in compliance with all applicable provisions of the National Environmental Policy Act of 1969, as amended (42 USC Sec. 4321 et seq.) and its implementing regulations at 24 CFR Part 58.
Signature	Lori A. Shirley, Certifying Officer, GOSR

Environmental Review Prepared By:

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CERTIFICATION OF NEPA CLASSIFICATION

It is the finding of the New York State Housing Trust Fund Corporation that the activity(ies) proposed in its 2017 NYS CDBG-DR project, Stony Brook Mitigation are:

Check the applicable classification.

☐ Exempt as defined in 24 CFR 58.34 (a).

☐ Categorically Excluded as defined in 24 CFR 58.35(b).

☐ Categorically Excluded as defined in 24 CFR 58.35(a) and no activities are affected by federal environmental statues and executive orders [i.e., exempt under 58.34(a)(12)].

☐ Categorically Excluded as defined in 24 CFR 58.35(a) and some activities are affected by federal environmental statues and executive orders.

☒ "Other" neither exempt (24 CFR 58.34(a)) nor categorically excluded (24 CFR 58.35).

☒ Part or all of the project is located in an area identified as a floodplain or wetland. For projects located in a floodplain or wetland, evidence of compliance with Executive Orders 11988 and/or 11990 is required.

For activities excluding those classified as "Other," attached is the appropriate Classification Checklist (Exhibit 2-4) that identifies each activity and the corresponding citation.

Lori A Shirley	June 20, 2017
Signature of Certifying Officer	**Date**
Lori A. Shirley	Environmental Certifying Officer
Print Name	**Title**

CERTIFICATION OF SEQRA CLASSIFICATION

It is the finding of the New York State Housing Trust Fund Corporation that the activity(ies) proposed in its 2017 NYS CDBG-DR project, Stony Brook Mitigation are:

Check the applicable classification:

- ☐ Type I Action (6NYCRR Section 617.4)
- ☐ Type II Action (6NYCRR Section 617.5)
- ☒ Unlisted Action (not Type I or Type II Action)

Check if applicable:

- ☐ Environmental Impact Statement (EIS) Prepared
  - ☐ Draft EIS
  - ☐ Final EIS

Lori A Shirley	June 20, 2017
Signature of Certifying Officer	**Date**
Lori A. Shirley	Environmental Certifying Officer
Print Name	**Title**

Description of the Proposed Project [24 CFR 50.12 & 58.32; 40 CFR 1508.25]**:**
The Schoharie County Soil & Water Conservation District ("SCSWCD") is pursuing a stream repair and restoration project along approximately 2.6 miles of Stony Brook (the "Proposed Project"). Stony Brook is a tributary to Schoharie Creek, which flows to the Mohawk River and then to the Hudson River. The project site is located in the town of Schoharie, in northeastern Schoharie County, New York (see **Figure 1, "Project Location"** and **Figure 2, "Project Site"**). The Proposed Project includes eight (8) proposed restoration areas and is anticipated to improve the health of the riverine system, prevent flooding and protect infrastructure and private residential properties during storm events. Below are the eight (8) proposed restoration areas (see **Appendix A, "Conceptual Design Plans"**).

Area 1
Channel Location (STA): 32+00 – 14+50
Latitude: 42.645601 / Longitude: -74.326106

Area 2
Channel Location (STA): 32+50 – 44+00
Latitude: 42.644488 / Longitude: -74.321308

Area 3A
Channel Location (STA): 48+50 – 67+00
Latitude: 42.642651 / Longitude: -74.316228

Area 3B
Channel Location (STA): 48+50 – 67+00
Latitude: 42.642989 / Longitude: -74.313465

Area 4
Channel Location (STA): 70+00 – 82+00
Latitude: 42.644698 / Longitude: -74.309846

Area 5
Channel Location (STA): 86+00 – 99+00
Latitude: 42.646348 / Longitude: -74.305249

Area 6
Channel Location (STA): 100+50 – 114+00
Latitude: 42.645921 / Longitude: -74.300552

Area 7
Channel Location (STA): 134+00 – 150+00
Latitude: 42.644092 / Longitude: -74.290176

The Proposed Project would include development of sediment management standards to guide removal of sediment and proper channel sizing at the above locations. In addition, based on the engineering study, the following improvement measures are also proposed for specific areas: installation of rock vane structures to improve sediment transport; removal of sidecast sediments; installation of grade control to arrest channel incision and prevent additional incision; repair and restacking of stacked rock revetment wall and installation of grade control; roughening of channel with random boulder placement; bank failure repair and relocation of channel away from toe of slope; replacement of undersized culvert at Frisbieville Road; and replacement of undersized culvert at Stony Brook Road.

Statement of Purpose and Need for the Proposal [40 CFR 1508.9(b)]:
Recent, severe flooding events, most significantly Tropical Storm Irene in 2011, and also a June 2013 flood event have resulted in severe bed and bank erosion within the Stony Brook channel as well as aggradation of bedload sediment. This aggradation of sediment has clogged culvert and bridge crossings, leading to the reduction of flood conveyance capacity in the channel. The sediment migration has caused the channel to become unstable, with bank erosion and excessive sedimentation in many areas.

During Tropical Storm Irene, Stony Brook overflowed, flooding houses along Frisbieville Road and undermined the shoulder of Stony Brook Road to the point of collapse. Stony Brook Road is a major evacuation route for residents of the northern part of the Town of Schoharie, isolating the upstream population and hindering access to emergency sheltering. In addition, emergency services were slowed down due to the reduced access capacity to the southern part of the Town.

The Proposed Project is anticipated to improve the health of the riverine system, prevent future flooding, and protect infrastructure and private residential properties during storm events.

Existing Conditions and Trends [24 CFR 58.40(a)]:

Stony Brook is prone to overflowing during severe storm evens, flooding houses along Frisbieville Road and undermining Stony Brook Road to the point of collapse. Stony Brook is classified as a New York State Department of Environmental Conservation Class C stream; it is not listed in the Wild, Scenic, and Recreational Rivers List (NYSDEC 2017) nor on the Nationwide Rivers Inventory (NPS 2011). Stony Brook is mapped as National Wetlands Inventory (NWI) riverine wetlands with a classification of R5UBH (unknown Perennial) (see **Figure 3**, **"NWI Wetlands"**). There are no NYSDEC wetlands within the project site (see **Figure 4**, **"NYSDEC Freshwater Wetlands"**).

The west end of the project site is located within the 500-year and 100-year floodplains (see **Figure 5, "FEMA Flood Zone"**) associated with Schoharie Creek. The project site boundary includes approximately 1.11 acres within the 500-year floodplain and 1.56 acres within the 100-year floodplain. However, the 500-year and 100-year floodplains are outside the limits of disturbance of the proposed project.

As mentioned above, recent flooding events have led to aggradation of sediment and clogging of culverts that are causing reduced conveyance capacity. Current conditions include aggradation of sediment (Areas 1, 2, and 3), evidence of sidecasting (Areas 1, 2, and 4), channel incision (Areas 4, 5, 6, and 7), high bank failure (Areas 5, 6, and 7), undercutting of stacked rock wall (Area 4), and undersized culverts (Areas 1 and 3) (see **Appendix B, "Engineering Report"**).

The Proposed Project will be conducted in accordance with NYSDEC and USACE permitting guidelines and with the 8-Step Floodplain Management & Wetland Protection Plan prepared in compliance with Executive Orders 11988 and 11990 (see **Appendix C, "Draft 8-Step Floodplain Management & Wetland Protection Plan"**). The Proposed Project culvert replacements will follow the NYSDOT Chapter 8 Drainage Standards.

Funding Information

Estimated Total HUD Funded Amount:	**$2,400,000**
Estimated Total Project Cost (HUD and non-HUD funds) [24 CFR 58.32(d)]**:**	**$2,400,000**

Compliance with 24 CFR 58.5 and 58.6 Laws and Authorities

Record below the compliance or conformance determinations for each statute, executive order, or regulation. Provide credible, traceable, and supportive source documentation for each authority. Where applicable, complete the necessary reviews or consultations and obtain or note applicable permits of approvals. Clearly note citations, dates/names/titles of contacts, and page references. Attach additional documentation as appropriate.

Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6	Are formal compliance steps or mitigation required?	Compliance determinations
STATUTES, EXECUTIVE ORDERS, AND REGULATIONS LISTED AT 24 CFR 50.4 and 58.6		
Airport Hazards 24 CFR Part 51 Subpart D	Yes ☐ No ☒	Not applicable. Based on guidance provided by HUD in Fact Sheet #D1, the National Plan of Integrated Airport Systems was reviewed for civilian, commercial service airports within the vicinity of the project site. No known civil airports are located within 2,500 feet and no known military airports are located within 15,000 feet of the project site. Therefore there are no anticipated adverse impacts.
Coastal Barrier Resources Coastal Barrier Resources Act, as amended by the Coastal Barrier Improvement Act of 1990 [16 USC 3501]	Yes ☐ No ☒	Not applicable. According to the Coastal Barrier Resource System maps, the proposed project is not located in a Coastal Barrier Resource System. Therefore, the proposed project would have no impact on any Coastal Barrier Resources. http://www.fws.gov/cbra/Maps/index.html
Flood Insurance Flood Disaster Protection Act of 1973 and National Flood Insurance Reform Act of 1994 [42 USC 4001-4128 and 42 USC 5154a]	Yes ☐ No ☒	Not applicable. Based on review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), portions of the project are located within the 100-year and 500-year floodplains (see Figure 5). However, this project contains only rehabilitation work within the stream and is exempt from the Flood Insurance requirement. https://msc.fema.gov/portal

STATUTES, EXECUTIVE ORDERS, AND REGULATIONS LISTED AT 24 CFR 50.4 & 58.5		
Clean Air Clean Air Act, as amended, particularly section 176(c) & (d); 40 CFR Parts 6, 51, 93	Yes ☐ No ☒	Schoharie County is not within the most recent Nonattainment Areas for Criteria Pollutants as defined by the EPA's Green Book for Nonattainment Areas for Criteria Pollutants. The proposed project involves the stream restoration of approximately 2.6 linear miles of Stony Brook north of Stony Brook Road. Construction activities associated with the Proposed Project may result in temporary increases in emissions from on-site equipment, construction-related vehicles and non-road engines, and fugitive dust. However, all activities under the Proposed Project would comply with applicable federal, state, and local laws and regulations regarding construction emissions. No significant adverse impacts are anticipated. http://www.epa.gov/airquality/greenbook/ http://www.epa.gov/airquality/greenbook/adden.html
Coastal Zone Management Coastal Zone Management Act, sections 307(c) & (d)	Yes ☐ No ☒	Not applicable. State agencies must complete a Coastal Assessment Form (CAF) as soon as the agency contemplates an action that may affect the policies for the coastal area or of an approved Local Waterfront Revitalization Program (LWRP). The project site is not located within the boundaries of the New York State Coastal Area Boundary. The Proposed Project site is located near Schoharie Creek, a NYS-designated inland waterway. However, there are currently no adopted LWRPs in the Town of Schoharie. Therefore, no adverse impacts are anticipated. http://www.dos.ny.gov/opd/atlas/ http://appext20.dos.ny.gov/coastal_map_public/map.aspx http://www.dos.ny.gov/opd/programs/pdfs/Waterways_List_08-14.pdf
Contamination and Toxic Substances 24 CFR Part 50.3(i) & 58.5(i)(2)	Yes ☐ No ☒	The Stony Brook Mitigation site is not listed on a U.S. Environmental Protection Agency (EPA) Superfund National Priorities or CERCLA List, or equivalent State list, located within 3,000 feet of a toxic or solid waste landfill site, does not have an underground storage tank, and is not known or suspected to be contaminated by toxic chemicals or radioactive materials. In addition, a review of the NYSDEC Spill Incident Database did not indicate any spills within the vicinity

		of the Project Site within the last year. The Proposed Project would not result in any significant adverse impacts related to toxic, hazardous, or radioactive materials. http://nepassisttool.epa.gov/nepassist/entry.aspx http://www.dec.ny.gov/cfmx/extapps/derexternal/index.cfm?pageid=2
Endangered Species Endangered Species Act of 1973, particularly section 7; 50 CFR Part 402	Yes ☐ No ☒	The Proposed Project was reviewed using the New York State Department of Environmental Conservation (NYSDEC) Environmental Resource Mapper. According to the information generated by the Mapper, rare threatened or endangered plant or animal species may be present within the vicinity of the Proposed Project (see **Appendix D, "NYSDEC Environmental Resources Map"**). A consultation letter was submitted to the NYSDEC New York Natural Heritage Program (NYNHP) on February 10, 2016 requesting review and consultation of the Proposed Project and location. This consultation letter requested advisement on whether or not the Proposed Project is Likely to adversely affect any rare, threatened, or endangered species. A concurrence letter was received on March 11, 2016 (see **Appendix E, "Consultations"**). The Proposed Project was reviewed in February 2016 and again in May 2017 using the U.S. Fish & Wildlife Services (USFWS) IPac website and the generated Trust Resource Report. According to the report, there is one species listed as a federally listed threatened or endangered that is potentially associated with the Proposed Project location (see **Appendix F, "USFWS IPaC Trust Resources Report"**). The species is the Northern long-eared bat (NLEB) (*Myotis septentrionalis*). There are currently no roost trees or hibernacula known to be occupied by the NLEB within the Proposed Project boundaries. The closest hibernaculum is within three miles of the Proposed Project location. The proposed project will include limited tree removal, which may take place during the active season (April-October). The Proposed Project location consists mainly of stream and riparian areas along Stony Brook Road. Forested areas within the project site are fragmented by farm fields and roads. The limited trees that may be removed would not likely be considered suitable habitat for the NLEB, as discussed in the consultation letter submitted to

		USFWS on June 22, 2016 (**Appendix E**). Nonetheless, due to the potential for active season tree removal, GOSR determines that this project may affect the NLEB, but that any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule. All activities associated with the proposed project will not: 1) disturb hibernating NLEBs in a known hibernaculum; 2) alter the entrance or interior environment of a known hibernaculum; 3) remove any trees within 0.25 miles of a known hibernaculum at any time of year; or 4) cut or destroy known occupied maternity roost trees, or any other trees within a 150-foot radius from the maternity roost tree, during the pup season (June 1 through July 31). Further, to avoid impacts to migratory birds GOSR may require the sub-recipient to avoid construction between April 1 and August 31 as feasible. USFWS requested additional information in an email dated June 28, 2016, to which GOSR responded on July 11, 2016 (see **Appendix E**). On July 15, 2016, USFWS requested that a copy of the determination and supporting materials be provided to any involved Federal agency for final ESA determination (see **Appendix E**). http://www.dec.ny.gov/animals/38801.html https://ecos.fws.gov/ipac/
Explosive and Flammable Hazards 24 CFR Part 51 Subpart C	Yes ☐ No ☒	This criterion is applicable to HUD-assisted projects that involve new residential construction, conversion of non-residential buildings to residential use, rehabilitation of residential properties that increase the number of units, or restoration of abandoned properties to habitable condition. The Proposed Project is limited to the restoration of a stream. Therefore, the criterion does not apply and no adverse impacts are anticipated.
Farmlands Protection Farmland Protection Policy Act of 1981, particularly sections 1504(b) and 1541; 7 CFR Part 658	Yes ☐ No ☒	A portion of the Proposed Project is located within Agricultural District 1 within Schoharie County. A portion of the Proposed Project location is mapped as Prime Farmland soils, with a small portion mapped as farmland of statewide importance (see **Figure 6**).

		The Proposed Project would involve approximately 2.05 acres of disturbance (including the stream restoration work, staging areas, and barn demolition). The majority of this area will be limited to the bed and banks of Stony Brook, and to the area of barn demolition (less than 0.25 acres). Therefore, the proposed project would not violate the Farmland Protection Policy Act (FPPA). The United Stated Department of Agriculture (USDA) National Resources Conservation Service) has been consulted in order to ensure compliance with the FPPA (see **Appendix E**). Therefore, no adverse impacts are anticipated. http://www.agriculture.ny.gov/ap/agservices/agricultural-districts.html http://websoilsurvey.sc.egov.usda.gov/app/WebSoilSurvey.aspx
Floodplain Management Executive Order 11988, particularly section 2(a); 24 CFR Part 55	Yes ☐ No ☒	The project site boundary includes approximately 1.11 acres within the 500-year floodplain and 1.56 acres within the 100-year floodplain (see **Figure 5**) associated with Schoharie Creek. However, the 500-year and 100-year floodplains are outside the limits of disturbance of the proposed project. A Draft 8-Step Floodplain Management & Wetland Protection Plan has been prepared in compliance with Executive Orders 11988 and 11990 and is attached to this EA as **Appendix C**. The Proposed Project will be providing stream and culvert improvements and is anticipated to reduce the risk of localized flooding during future storm events, while preventing isolation of residents and allowing uninterrupted emergency response. A preliminary HEC-RAS hydraulic modeling study has been conducted for the project. The preliminary HEC-RAS study confirmed that no impacts would occur (i.e., rise in water levels) to Schoharie Creek. Should further refinement of the model change this conclusion, the design would be modified to eliminate the impact. Therefore, no adverse impacts to the floodplain are anticipated. https://msc.fema.gov/portal
Historic Preservation National Historic Preservation Act of 1966, particularly sections 106 and 110; 36 CFR Part 800; Tribal notification for new ground disturbance.	Yes ☐ No ☒	The Proposed Project location was reviewed using the State Historic Preservation Office (SHPO) Cultural Resource information System (CRIS) database in June 2016. Three buildings appeared within the system's database. Two of them were listed as "Listed" and one as "Not Eligible". The Proposed Project was reviewed using the National Register of Historic Places. There are no properties

		located within the Proposed Project boundaries that are listed on the National Register. A consultation letter was prepared and sent to the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) on May 5, 2016. On May 18, 2016 SHPO issued a No Effect letter. Subsequent to this consultation, the project was changed to include the demolition of a barn. Therefore, an updated consultation was sent to OPRHP on April 24, 2017, with a follow-up letter submitted on May 9, 2017. On May 22, 2017 SHPO issued a No Effect letter (see **Appendix E**). A consultation letter was prepared for and sent to the Saint Regis Mohawk Tribe, Stockbridge-Munsee Community, Band of Mohicans, and Mohawk Nation Council of Chiefs Tribal Offices of Historic Preservation (THPO) on May 19, 2016. The Stockbridge-Munsee Community, Band of Mohicans issued a No Effect determination in an email dated June 10, 2016. The Saint Regis Mohawk Tribe issued a No Effect letter on June 22, 2016. No response has been received from the Mohawk Nation Council of Chiefs (see **Appendix E**). On April 27, 2017, an updated consultation letter was sent to the Saint Regis Mohawk Tribe, Stockbridge-Munsee Community, Band of Mohicans, and Mohawk Nation Council of Chiefs regarding the barn demolition (see **Appendix E**). http://www.nationalregisterofhistoricplaces.com/ny/schoharie/state.html http://parks.ny.gov/shpo/online-tools/ http://egis.hud.gov/tdat/Tribal.aspx
Noise Abatement and Control Noise Control Act of 1972, as amended by the Quiet Communities Act of 1978; 24 CFR Part 51 Subpart B	Yes ☐ No ☒	The Proposed Project involves stream restoration and mitigation measures. Therefore, the Proposed Project is not a noise sensitive use, and furthermore, the policies of 24 CFR 51.101(a)(3) do not apply to any action or emergency assistance under disaster assistance provisions or appropriations which are provided to save lives and protect public health and safety. The Proposed Project would temporarily increase noise levels at nearby residences. These increases would be mitigated by implementing the Construction Impacts Conditions for Approval (see below under Mitigation Measures and Conditions), including outfitting of equipment with mufflers, and compliance with local noise ordinances including time-of-day work

		limitations. Following these temporary construction activities, noise levels would be similar to pre-storm levels and would not result in any significant increase in ambient noise levels.
Sole Source Aquifers Safe Drinking Water Act of 1974, as amended, particularly section 1424(e); 40 CFR Part 149	Yes ☐ No ☒	There are no sole source aquifers in Schoharie County. Therefore, no adverse impacts to sole source aquifers are anticipated. http://www.epa.gov/region02/water/aquifer/
Wetlands Protection Executive Order 11990, particularly sections 2 and 5	Yes ☐ No ☒	Stony Brook is mapped as NWI riverine wetlands with a classification of R5UBH (unknown Perennial) (see **Figure 3**). The Proposed Project is not located within 100 feet of a NYSDEC freshwater wetland (see **Figure 4**). The Proposed Project will be providing stream improvements and is anticipated to improve the health of the riverine system and prevent flooding. The Proposed Project will be conducted in accordance with NYSDEC and USACE permitting guidelines. The Proposed Project would adhere to and be in compliance with the guidelines and regulations of Executive Order 11990, in order to minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. A Draft 8-Step Floodplain Management & Wetland Protection Plan has been prepared in compliance with Executive Orders 11988 and 11990 and is attached to this EA as **Appendix C**. Therefore, no adverse impacts to the wetland are anticipated. http://www.fws.gov/wetlands/Data/Mapper.html
Wild and Scenic Rivers Wild and Scenic Rivers Act of 1968, particularly section 7(b) and (c)	Yes ☐ No ☒	There are no Wild and Scenic Rivers within Schoharie County, as designated by the U.S. Department of the Interior. There are no National Wild and Scenic Rivers in Schoharie County as designated by the National Wild and Scenic Rivers System. The project is not located along a Wild, Scenic and Recreational Rivers as determined by NYSDEC. Therefore, the Proposed Project would not violate the Wild and Scenic Rivers Act. http://www.nps.gov/ncrc/programs/rtca/nri/states/ny.html http://www.rivers.gov/new-york.php http://www.dec.ny.gov/permits/32739.html
ENVIRONMENTAL JUSTICE		
Environmental Justice Executive Order 12898	Yes ☐ No ☒	The Proposed Project is not located in or adjacent to potential environmental justice areas as indicated by the New York State Department of Environmental Conservation. The Proposed Project would have no

		significant adverse environmental justice impacts on the surrounding community. http://www.dec.ny.gov/docs/permits_ej_operations_pdf/schoharieej.pdf

Environmental Assessment Factors [24 CFR 58.40; Ref. 40 CFR 1508.8 &1508.27] Recorded below is the qualitative and quantitative significance of the effects of the proposal on the character, features and resources of the project area. Each factor has been evaluated and documented, as appropriate and in proportion to its relevance to the proposed action. Verifiable source documentation has been provided and described in support of each determination, as appropriate. Credible, traceable and supportive source documentation for each authority has been provided. Where applicable, the necessary reviews or consultations have been completed and applicable permits of approvals have been obtained or noted. Citations, dates/names/titles of contacts, and page references are clear. Additional documentation is attached, as appropriate. **All conditions, attenuation or mitigation measures have been clearly identified.**

Impact Codes: Use an impact code from the following list to make the determination of impact for each factor.

- **(1)** Minor beneficial impact
- **(2)** No impact anticipated
- **(3)** Minor Adverse Impact – May require mitigation
- **(4)** Significant or potentially significant impact requiring avoidance or modification which may require an Environmental Impact Statement

Environmental Assessment Factor	Impact Code	Impact Evaluation
LAND DEVELOPMENT		
Conformance with Plans / Compatible Land Use and Zoning / Scale and Urban Design	2	The Proposed Project would be consistent with the objectives outlined in the March 2014 New York Rising Community Reconstruction Plan for the Towns and Villages of Esperance, Schoharie, and Middleburgh and the 1997 Joint Town and Village of Schoharie Comprehensive Plan. Specifically, the 1997 Joint Comprehensive Plan aims to minimize potential flooding of homes, while providing for the long-range protection of water resources for water quality and quantity, recreation, wildlife habitat and erosion stability. The Proposed Project would address flood issues, and significantly increase the safety of Stony Brook Road and Frisbieville Road to ensure uninterrupted emergency service. The Proposed Project, which would maintain current land uses and be consistent with local zoning, is not anticipated to result in any significant adverse impacts to land use or zoning, and would not have an urbanizing effect on the community.
Soil Suitability/ Slope/ Erosion/ Drainage/ Storm Water Runoff	1	The installation of stream bank improvements and erosion control installation aims to reduce the risk of flooding during storm events. This would result in minor beneficial impacts. During construction, best management practices would be utilized to avoid potential soil erosion. A preliminary HEC-RAS hydraulic modeling study has been conducted for the project. The preliminary HEC-RAS study confirmed that no impacts would occur (i.e., rise in water levels) to Schoharie Creek. Should further refinement of the

		model change this conclusion, the design would be modified to eliminate the impact. The Proposed Project would involve approximately 2.05 acres of disturbance (including the stream restoration work, staging areas, and barn demolition); as such a Stormwater Pollution Prevention Plan (SPPP) will be prepared.
Hazards and Nuisances including Site Safety and Noise	2	The Proposed Project would consist of the design, engineering, and construction of shoreline and stream improvements. The Proposed Project includes the demolition of one structure, an existing barn. Impacts such as fugitive dust would be addressed under existing regulations governing construction activity in New York State, Schoharie County, and the Town of Schoharie. The Proposed Project would only temporarily increase noise levels at nearby residences during construction. These increases would be mitigated by implementing the Construction Impacts Conditions for Approval, including outfitting of equipment with mufflers, and compliance with local noise ordinances including time of-day work limitations.
Energy Consumption	2	The Proposed Project would result in energy consumption including the use of fossil fuels, for use of construction equipment and the shipment of materials required for construction activities. However, the Proposed Project would not increase long-term energy consumption.
SOCIOECONOMIC		
Employment and Income Patterns	2	The Proposed Project would create temporary construction jobs. However, these jobs would not significantly increase employment opportunities or impact income patterns. The Proposed Project would not result in the creation of new permanent jobs and therefore would not impact employment and income patterns.
Demographic Character Changes, Displacement	2	The Proposed Project would not result in the creation of new jobs and therefore would not alter the demographic characteristics of the surrounding community. The Proposed Project would not directly or indirectly displace people, businesses, institutions, or community facilities as the project consists of shoreline and stream repairs within Stony Brook.

Environmental Assessment Factor	Impact Code	Impact Evaluation
COMMUNITY FACILITIES AND SERVICES		
Educational and Cultural Facilities	2	The Proposed Project would not result in the creation of new jobs and therefore would not increase demand on educational facilities. Additionally, the Proposed Project it is not located within or adjacent to a cultural facility and would not impact cultural facilities.
Commercial Facilities	2	The Proposed Project would not result in the creation of new jobs and therefore would not increase demand on commercial facilities.
Health Care and Social Services	2	The Proposed Project would not result in the creation of new jobs and therefore would not increase demand on health care or social services.
Solid Waste Disposal / Recycling	2	Construction of the Proposed Project would result in the generation of waste, primarily unusable soil and/or rock. The amount of solid waste generated from construction would not significantly increase long-term generation of municipal solid waste as the total acreage that is anticipated to be disturbed would not exceed one acre. All waste would be hauled off-site by the selected contractor and would be handled in accordance with the State's solid and hazardous waste rules.
Waste Water / Sanitary Sewers	2	The Proposed Project consists of the design, engineering, and construction of shoreline and stream improvements. Construction would not require the relocation or reconstruction of, or impact to, the existing wastewater or sanitary sewer infrastructure.
Water Supply	2	The Proposed Project would not require water supply and would not result in the creation of new jobs and therefore would not increase demand on the water supply.
Public Safety - Police, Fire and Emergency Medical	1	The Proposed Project would not result in the creation of new jobs and therefore would not increase demand for police protection, fire protection, or emergency medical services. It would, however, mitigate potential for interruption and closure of Stony Brook Road, which is a major evacuation route for residents of the northern part of the Town of Schoharie. Therefore, the proposed project would result in a minor beneficial impact for residents and emergency service providers.
Parks, Open Space and Recreation	2	The Proposed Project would not impact open space or recreation.
Transportation and Accessibility	1	It is anticipated that minor service interruptions and detours would be required during culvert replacements. In addition, a negligible increase in construction traffic would be expected to occur. However, following the completion of the stream repair and restoration, transportation and accessibility are anticipated to feel a minor beneficial impact due to reduced likelihood of

		flooding and undermining roads during future storms.
NATURAL FEATURES		
Unique Natural Features, Water Resources	2	There are no NYSDEC Unique Geologic Features or NYSDEC Critical Environmental Areas within the vicinity of the Proposed Project location. There are no Sole Source Aquifers in Schoharie County. The Proposed Project would adhere to and be in compliance with the guidelines and regulations of Executive Order 11990, in order to minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. A Draft 8-Step Floodplain Management & Wetland Protection Plan has been prepared in compliance with Executive Orders 11988 and 11990 and is attached to this EA as **Appendix C**. Stream repair and restoration components throughout Stony Brook would be conducted in accordance with in accordance with NYSDEC and USACE permitting guidelines. The Proposed Project would not pose a significant threat to water resources.
Vegetation, Wildlife	2	The Proposed Project was reviewed using the New York State Department of Environmental Conservation (NYSDEC) Environmental Resource Mapper. According to the information generated by the Mapper, rare threatened or endangered plant or animal species may be present within the vicinity of the Proposed Project (see **Appendix D**). A consultation letter was submitted to the NYSDEC New York Natural Heritage Program (NYNHP) on February 10, 2016 requesting review and consultation of the Proposed Project and location. This consultation letter requested advisement on whether or not the Proposed Project is Likely to adversely affect any rare, threatened, or endangered species. A concurrence letter was received on March 11, 2016 (see **Appendix E**). The Proposed Project was reviewed in February 2016 and again in May 2017 using the U.S. Fish & Wildlife Services (USFWS) IPac website and the generated Trust Resource Report. According to the report, there is one species listed as a federally listed threatened or endangered that is potentially associated with the Proposed Project location (see **Appendix F**). The species is the Northern long-eared bat (NLEB) (*Myotis septentrionalis*). There are currently no roost trees or hibernacula known to be occupied by the NLEB within the Proposed Project boundaries. The closest hibernaculum is within three miles of the Proposed Project location. The proposed project will include limited tree removal, which may take place during the active season (April-October). The Proposed Project location consists mainly of stream and riparian areas along Stony Brook. Forested areas within the project site are fragmented by farm fields and roads. The limited trees that may be removed would not likely be

		considered suitable habitat for the NLEB, as discussed in the consultation letter submitted to USFWS on June 22, 2016 (**Appendix E**). Nonetheless, due to the potential for active season tree removal, GOSR determines that this project may affect the NLEB, but that any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule. All activities associated with the proposed project will not: 1) disturb hibernating NLEBs in a known hibernaculum; 2) alter the entrance or interior environment of a known hibernaculum; 3) remove any trees within 0.25 miles of a known hibernaculum at any time of year; or 4) cut or destroy known occupied maternity roost trees, or any other trees within a 150-foot radius from the maternity roost tree, during the pup season (June 1 through July 31). Further, to avoid impacts to migratory birds GOSR may require the sub-recipient to avoid construction between April 1 and August 31 as feasible. USFWS requested additional information in an email dated June 28, 2016, to which GOSR responded on July 11, 2016 (see **Appendix E**). On July 15, 2016, USFWS requested that a copy of the determination and supporting materials be provided to any involved Federal agency for final ESA determination (see **Appendix E**). http://www.dec.ny.gov/animals/38801.html https://ecos.fws.gov/ipac/
Other Factors	2	There are no other factors applicable to the Proposed Project.

Additional Studies Performed:
Engineering Report, Stream Repair and Restoration, Stony Brook, Town of Schoharie. Prepared by Milone & MacBroom. January 19, 2016.

Stony Brook Stream Repair and Restoration Hydrologic, Hydraulic, and Engineering Design Report Town of Schoharie, Schoharie County, New York. Prepared by Milone & MacBroom. February 2017

Draft HEC-RAS Hydraulic Model, Stony Brook. Prepared by Milone & MacBroom, dated June 8, 2017.

Field Inspection (Date and completed by)**:**
Site visits were conducted by Milone & MacBroom on September 9 and October 13, 2015 in connection with the Engineering Report listed above.

List of Sources, Agencies and Persons Consulted [40 CFR 1508.9(b)]:

Sources:
Broders, H.G., G.J. Forbes, S. Woodley, and I.D. Thompson. 2006. Range extent and stand selection for forest-dwelling northern long-eared and little brown bats in New Brunswick. Journal of Wildlife Management 70: 1174-1184.

Carter, T.C., and G.A. Feldhamer. 2005. Roost tree use by maternity colonies of Indiana bats and northern long-eared bats in southern Illinois. Forest Ecology and Management 219:259-268.

Federal Aviation Administration (FAA).
http://www.faa.gov/airports/environmental/airport_noise/noise_exposure_maps/
http://www.faa.gov/airports/runway_safety/diagrams/

FAA Runway Protection Zones.
http://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5300-13A-chg1-interactive.pdf

FEMA Coastal Barrier Resource System – New York
https://www.fema.gov/national-floodinsurance-program/coastal-barrier-resource-system-new-york

FEMA Floodplain Map Service Center:
https://msc.fema.gov/portal

Ford, W.M., M.A. Menzel, J.L. Rodrigue, J.M. Menzel, and J.B. Johnson. 2005. Relating bat species presence to simple habitat measures in a central Appalachian forest. Biological Conservation 126: 528-539.

Foster, R.W. and A. Kurta, A. 1999. Roosting ecology of the northern bat (*Myotis septentrionalis*) and comparisons with the endangered Indiana bat (*Myotis sodalis*). Journal of Mammalogy 80: 659-672.

Henderson, L.E., L.J. Farrow, and H.G. Broders. 2008. Intra-specific effects of forest loss on the distribution of the forest-dependent northern long-eared bat (*Myotis septentrionalis*). Biological Conservation 141:1819-1828.

Menzel, M.A., S.F. Owen, W.M. Ford, J.W. Edwards, P.B. Wood, B.R. Chapman, and K.V. Miller. 2002. Roost tree selection by northern long-eared bat (*Myotis septentrionalis*) maternity colonies in an industrial forest of the central Appalachian mountains. Forest Ecology and Management 155:107-114.

Military and Civilian Airports:
https://www.michigan.gov/documents/mshda/mshda_cd_nsp2_air_accident_315724_7.pdf

National Park Service (NPS). 2011. Nationwide Rivers Inventory. Available at http://www.nps.gov/ncrc/programs/rtca/nri/index.html. Accessed August 19, 2016.

National Register of Historic Places – Schoharie County, NY.
http://www.nationalregisterofhistoricplaces.com/ny/schoharie/state.html

New York Rising Communities – NYRCR Towns and Villages of Esperance, Schoharie, and Middleburgh
http://www.schohariecounty-ny.gov/CountyWebSite/Planning/NYRCR%20Towns%20and%20Village%20of%20Esperance,%20Schoharie%20and%20Middleburgh.pdf

New York State Department of Agriculture and Markets:
http://www.agriculture.ny.gov/ap/agservices/agricultural-districts.html

New York State Department of Environmental Conservation (NYSDEC), Coastal Management:
http://www.dec.ny.gov/lands/86541.html

NYSDEC Environmental Remediation Databases.
http://www.dec.ny.gov/chemical/8437.html

NYSDEC Environmental Resource Mapper
http://www.dec.ny.gov/animals/38801.html

NYSDEC Potential Environmental Justice Areas in Schoharie County:
http://www.dec.ny.gov/docs/permits_ej_operations_pdf/schoharieej.pdf

NYSDEC. State Implementation Plan
http://www.dec.ny.gov/chemical/8403.html

NYSDEC. 2017. Wild, Scenic and Recreational Rivers
http://www.dec.ny.gov/permits/32739.html.

New York State Department of State (NYSDOS) – Coastal Boundary Map:
http://www.dos.ny.gov/opd/atlas/
http://appext20.dos.ny.gov/coastal_map_public/map.aspx

NYSDOS – Local Waterfront Revitalization Program – Coastal Waterbodies and Inland Waterways.
http://www.dos.ny.gov/opd/programs/pdfs/Waterways_List_08-14.pdf

Owen, S.F., M.A. Menzel, W.M. Ford, B.R. Chapman, K.V. Miller, J.W. Edwards, and P.B. Wood. 2003.

Home-range size and habitat used by the northern myotis (*Myotis septentrionalis*). American Midland Naturalist 150:352-359.

State Register of Historic Places – Cultural Resources Information Systems (CRIS):
http://parks.ny.gov/shpo/online-tools/

Town and Village of Schoharie 1997 Comprehensive Plan
http://www.schohariecounty-ny.gov/townsch/SchoharieCP.pdf

United States Department of Agriculture. Natural Resources Conservation Service. Web Soil Survey.
http://websoilsurvey.sc.egov.usda.gov/app/WebSoilSurvey.aspx

United States Department of Housing and Urban Development (HUD). Community Planning and Development. Tribal Directory Assessment Tool (TDAT) V2.0.
http://egis.hud.gov/tdat/Tribal.aspx

U.S. EPA, Greenbook
http://www.epa.gov/oaqps001/greenbk/index.html

U.S. EPA, Greenbook – Federal Register Notices
http://www.epa.gov/oaqps001/greenbk/adden.html

U.S. EPA NEPAssist
http://nepassisttool.epa.gov/nepassist/entry.aspx

U.S. EPA Region 2 Sole Source Aquifers
http://www.epa.gov/region02/water/aquifer/

United States Fish and Wildlife Service (USFWS) Coastal Barrier Resources Act
http://www.fws.gov/cbra/Maps/index.html

USFWS IPaC, accessed February 2016 and May 2017
http://ecos.fws.gov/ipac/

USFWS Wetlands Online Mapper – National Wetlands Inventory Map:
http://www.fws.gov/wetlands/Data/Mapper.html

Wild and Scenic Rivers Act – Sections 3 and 5 (16 USC 1274 and 1276):
http://www.rivers.gov/rivers/delaware-upper.php
http://www.rivers.gov/maps/conus.php

Agencies and Persons:

May O'Malley, New York State Department of Environmental Conservation, agency response dated June 20, 2016.

Nicholas Conrad, New York Natural Heritage Program, consultation letter transmitted via email on February 12, 2016.

Nicholas Conrad, New York Natural Heritage Program, agency response dated March 11, 2016.

Robyn A. Niver, Endangered Species Biologist, U.S. Fish & Wildlife Service, consultation letter dated June 22, 2016.

Tim Sullivan, U.S. Fish & Wildlife Service, email dated June 28, 2016 and response form dated July 15, 2016.

Larry K Moss, Historic Preservation Technical Specialist, New York State Office of Parks, Recreation and Historic Preservation, consultation letters dated May 5, 2016, April 24, 2017, and May 9, 2017.

Larry K Moss, Historic Preservation Technical Specialist, New York State Office of Parks, Recreation and Historic Preservation, agency responses dated May 18, 2016 and May 22, 2017.

Ron LaFrance, Jr., Paul Thompson, and Beverly Cook, Saint Regis Mohawk Tribe, consultation letters dated May 19, 2016 and April 27, 2017.

Arnold Printup, Tribal Historic Preservation Office, agency response dated June 22, 2016.

Shannon Holsey, Stockbridge-Munsee Community, Band of the Mohicans, consultation letters dated May 19, 2016 and April 27, 2017.

Bonney Hartley, Stockbridge-Munsee Community, Band of the Mohicans, agency response email dated June 10, 2016.

Mohawk Nation Council of Chiefs, Haudenosaunee Six Nations Confederacy, consultation letters dated May 19, 2016 and April 27, 2017.

United States Department of Agriculture, Natural Resources Conservation Service, consultation letter dated October 5, 2016.

Kathryn Duncan, United States Department of Agriculture, Natural Resources Conservation Service, agency response dated October 14, 2016.

List of Appendices:

Appendix A	Conceptual Design Plans
Appendix B	Engineering Reports
Appendix C	Draft 8-Step Floodplain Management & Wetland Protection Plan
Appendix D	NYSDEC Environmental Resources Map
Appendix E	Consultations
Appendix F	USFWS IPaC Trust Resources Report

List of Permits Obtained or Required:

The following permits are required for project implementation

- New York State Department of Transportation Highway Work Permit
- New York State Department of Environmental Conservation Article 15 Protection of Waters Permit and 401 Water Quality Certification
- New York State Department of Environmental Conservation State Pollutant Discharge Elimination System ("SPDES") General Permit for Stormwater Discharges from Construction Activities
- United States Army Corps of Engineers Section 404 Clean Water Act and Section 10 Rivers and Harbors Act permit

Public Outreach [24 CFR 50.23 & 58.43]:

An "Early Notice and Public Explanation of a Proposed Activity in a 100 and 500-Year Floodplain and Wetland" was published in The Daily Gazette of Schenectady, NY on May 24, 2017 and mailed to agencies on May 24, 2017. Any individual, group, or agency had the opportunity to submit written comments on the proposed action or a request for further information by June 9, 2017.

A "Final Notice and Public Explanation of a Proposed Activity in a 500- and 100-year Floodplain and Wetland" will be published in The Daily Gazette of Schenectady, NY and mailed to agencies on June 27, 2017. A draft Floodplain Management Plan was developed (Appendix C) and made available with this EA. Comments on the draft Floodplain Management Plan received by July 5, 2017 will be reviewed and incorporated, and a final FMP will be appended to this review.

On June 27, 2017 a combined Notice of Finding of No Significant Impact (FONSI) and Notice of Intent to Request Release of Funds (NOIRROF) will be published in The Daily Gazette of Schenectady. Any individual, group or agency may submit written comments on the Environmental Review Record. Comments should be submitted via email, in the proper format, on or before July 5, 2017 at NYSCDBG_DR_ER@nyshcr.org. Written comments may also be submitted at the following address, or by mail, in the proper format, to be received on or before July 5, 2017:

Lori A. Shirley, Certifying Officer
Governor's Office of Storm Recovery
99 Washington Avenue
Suite 1224
Albany, New York 12260

Comments may be received by telephone at (518) 474-0755. All comments must be received on or before 5pm on July 5, 2017 or they will not be considered.

Cumulative Impact Analysis [24 CFR 58.32]:

The following community reconstruction projects are planned to occur within the vicinity of the Proposed Project.

The South End Drainage Improvements project, located in the Village of Schoharie. The project includes relocating existing utilities, lowering culverts, providing a dentention pond to attenuate peak runoff, constructing an outfall to Schoharie Creek, re-establishing swales, providing additional drainage along

and across State Route 30 / Main Street and Bridge Street, providing backflow gates to prevent Schoharie Creek flood waters from feeding back into the project location and providing streambank stabilization at the Schoharie Creek outfall.

The Parrott House project and the Taylor Block project, both located in the Village of Schoharie, both include acquisition and repair of the Parrott House building and Taylor Block building, respectively.

The Town of Schoharie Highway Garage Replacement project, located in the Town of Schoharie, includes construction of a new Town garage in a location away from the creek.

The Hilgert Parkway Stormwater Pumping Station project, located in the Village of Schoharie, includes the construction of a pumping station to relieve flooding problems.

The Spring Brook Drainage Improvements project, located in the Village of Schoharie, includes improvements to enhance flow capacity into the stream channel and subsequently Schoharie Creek.

The Rebuilding Police Emergency Services project, located in the Village of Schoharie, includes construction of a new shared service facility outside of the floodplain on the Schoharie Central School District Property.

These projects, along with the Proposed Project, are intended to improve the community's emergency response capabilities. The Proposed Project is not anticipated to result in cumulative impacts, including adverse impacts to natural resources, socioeconomic resources, human health, recreation, community facilities, and cultural and historic resources. The scale of the Proposed Project and the other nearby projects are not large enough to contribute significantly to cumulative impacts. As such, no significant adverse cumulative impacts from these improvements are anticipated.

Alternatives [24 CFR 58.40(e); 40 CFR 1508.9]:

Alternative 1
Alternative 1 includes the components of relatively high priority in Area 3, Area 6, and Area 7. The Area 3 component would install rock vane structures and replace the undersized culvert at Stony Brook Road. The Area 6 component would relocate channel away from toe slope, stabilize the bank, install a grade control structure in the bed, and roughen the channel. Similarly, the Area 7 component would relocate the channel away from toe of slope, stabilize the bank, install grade control structure in the bed, and roughen the channel.

Alternative 2
Alternative 2 includes the components of relatively high priority in Areas 3, 6, and 7 as discussed above, with the addition of those components of medium priority in Area 1 and Area 4. The Area 1 component would install rock vane structures and replace the undersized culvert at Frisbieville Road. The Area 4 component would install a grade control structure, repair a rock revetment wall, and roughen the channel with random boulder placement.

Alternative 3 (the Proposed Project)
Alternative 3 (the Proposed Project) includes all components of relatively high and medium priority discussed in Alternatives 1 and 2 above, with the addition of other components. The proposed action

would include development of sediment management standards to guide removal of sediment and proper channel sizing throughout the project site. In addition, based on the engineering study, the following improvement measures are also proposed for specific areas: installation of rock vane structures to improve sediment transport; removal of sidecast sediments; installation of grade control to arrest channel incision and prevent additional incision; repair and restacking of stacked rock revetment wall and installation of grade control; roughening of channel with random boulder placement; bank failure repair and relocation of channel away from toe of slope; replacement of the undersized culvert at Frisbieville Road; and replacement of the undersized culvert at Stony Brook Road. This alternative was selected for the proposed project.

No Action Alternative
The No Action alternative would leave Stony Brook in its current, degraded condition with eroding banks and excessive sedimentation. The undersized culverts at Frisbieville Road and Stony Brook Road would remain in their current condition of reduced flood conveyance capacity. The high bank failure section of Stony Brook would remain in its current condition, which is in danger of undermining Stony Brook Road. Under the No Action alternative, future storm events would continue to cause flooding, put infrastructure and private residential properties at risk, and reduce access to emergency services.

Summary of Findings and Conclusions:

The Proposed Project involves the design, engineering, and construction of shoreline and stream improvements for Stony Brook, located north of Stony Brook Road. The construction of these mitigation improvements aim to reduce the risk of flooding and ponding, while contributing to safer and more accessible regional roadway conditions.

The Proposed Project will include limited tree removal; however, the trees would not likely be considered suitable habitat for the NLEB. Nonetheless, due to the potential for active season tree removal, GOSR determines that this project may affect the NLEB, but that any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule.

Although a portion of the Proposed Project location is comprised of Prime Farmland and Farmland of Statewide Importance soils, disturbance would be limited to approximately 2.05 acres of land primarily along the bed and banks of Stony Brook, with a small area of disturbance associated with the barn demolition (less than 0.25 acres) and staging areas (0.07 acres). The USDA National Resources Conservation Service has been consulted in order to ensure compliance with the Farmland Protection Policy Act.

The Proposed Project will be conducted in accordance with NYSDEC and USACE permitting guidelines and with the 8-Step Floodplain Management & Wetland Protection Plan prepared in compliance with Executive Orders 11988 and 11990. The Proposed Project culvert replacements will follow the NYSDOT Chapter 8 Drainage Standards.

The proposed project would not result in a significant impact on the quality of the human environment or result in other direct, indirect, or cumulative impacts. The Project would comply with all relevant regulations listed in 24 CFR Part 58.

Any change to the approved scope of work will require re-evaluation by the Certifying Officer for compliance with NEPA and other laws and Executive Orders.

This review does not address all federal, state and local requirements. Acceptance of federal funding requires recipient to comply with all federal state and local laws. Failure to obtain all appropriate federal, state and local environmental permits and clearances may jeopardize federal funding.

Mitigation Measures and Conditions [40 CFR 1505.2(c)]

Summarize below all mitigation measures adopted by the Responsible Entity to reduce, avoid, or eliminate adverse environmental impacts and to avoid non-compliance or non-conformance with the above-listed authorities and factors. These measures/conditions must be incorporated into project contracts, development agreements, and other relevant documents. The staff responsible for implementing and monitoring mitigation measures should be clearly identified in the mitigation plan.

Construction Impacts Conditions for Approval

- Construction equipment would be outfitted with mufflers.
- Construction would comply with local noise ordinances including time-of-day work limitations.
- All solid waste materials would be managed and transported in accordance with Federal, state, and local solid and hazardous waste rules.
- Best management practices would be used to avoid soil erosion.
- Mitigation measures would be implemented to ensure the proper handling of any solid waste generated during construction and demolition to address fugitive dust concerns.

Law, Authority, or Factor	Mitigation Measure
Floodplain Management Executive Order 11988, particularly section 2(a); 24 CFR Part 55	The project site boundary includes approximately 1.11 acres within the 500-year floodplain and 1.56 acres within the 100-year floodplain. However, the 500-year and 100-year floodplains are outside the limits of disturbance of the proposed project. A Draft 8-Step Floodplain Management & Wetland Protection Plan was prepared in compliance with Executive Order 11988 and Executive Order 11990 (see **Appendix C**).
Endangered Species Endangered Species Act of 1973, particularly section 7; 50 CFR Part 402	The USFWS Information, Planning and Conservation (IPaC) online planning tool Trust Resource List generated for the proposed project on May 17, 2017 (see **Appendix F**) lists the following Federally-listed species as having the potential to occur within the vicinity of the proposed project: northern long-eared bat (NLEB, *Myotis septentrionalis*) - threatened. As discussed in the consultation letter submitted to USFWS on June 22, 2016 (see **Appendix E**), due to the potential for active season tree removal, GOSR determines that this project may affect the NLEB, but that any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule. All activities associated with the proposed project will not: 1) disturb hibernating NLEBs in a known hibernaculum; 2) alter the entrance or interior environment of a known hibernaculum; 3) remove any trees within 0.25 miles of a known hibernaculum at any time of year; or 4) cut or destroy known occupied maternity roost trees, or any other trees within a 150-foot radius from the maternity roost tree, during the pup season (June 1 through July 31). (See **Appendix E**).

Soil Suitability/ Slope/ Erosion/ Drainage/ Storm Water Runoff	The Proposed Project will be conducted in accordance with NYSDEC and USACE permitting guidelines and with the 8-Step Floodplain Management & Wetland Protection Plan prepared in compliance with Executive Orders 11988 and 11990. The Proposed Project culvert replacements will follow the NYSDOT Chapter 8 Drainage Standards. State and local permitting requirements would incorporate BMPs to eliminate erosion impacts during construction.
Clean Air Clean Air Act, as amended, particularly section 176(c) & (d); 40 CFR Parts 6, 51, 93	All Project activities would comply with applicable federal, state, and local laws and regulations regarding construction emissions, including but not limited to NYCRR, NYSDEC Air Quality Management Plan, and the New York SIP. All necessary measures would be used to minimize fugitive dust emissions during activities, such as demolition of existing structures. The preferred method for dust suppression is water sprinkling. To demonstrate compliance, the following specifications will be incorporated into the contract documents: - *Idling Restriction*. In addition to adhering to the local law restricting unnecessary idling on roadways, on-site vehicle idle time will also be restricted to five minutes for all equipment and vehicles that are not using their engines to operate a loading, unloading, or processing device (e.g., concrete mixing trucks) or otherwise required for the proper operation of the engine. - *Utilization of Newer Equipment.* EPA's Tier 1 through 4 standards for non-road engines regulates the emission of criteria pollutants from new engines, including PM, CO, NOx, and hydrocarbons (HC). All non-road construction equipment with a power rating of 50 hp or greater would meet at least the Tier 2 emissions standard to the extent practicable. - *Best Available Tailpipe Reduction Technologies.* Non-road diesel engines with a power rating of 50 horsepower (hp) or greater and controlled truck fleets (i.e., truck fleets under long-term contract with the project) including but not limited to concrete mixing and pumping trucks would utilize the best available tailpipe (BAT) technology for reducing DPM emissions. Diesel particulate filters (DPFs) have been identified as being the tailpipe technology currently proven to have the highest reduction capability. Construction contracts would specify that all diesel non-road engines rated at 50 hp or greater would utilize DPFs, either installed by the original equipment manufacturer (OEM) or retrofitted. Retrofitted DPFs must be verified by EPA or the California Air Resources Board (CARB). Active DPFs or other technologies proven to achieve an equivalent reduction may also be used.
Permit Requirements	All permit conditions listed above or otherwise required for activities under the proposed project must be adhered to.

Determination:

☒ **Finding of No Significant Impact** [24 CFR 58.40(g)(1); 40 CFR 1508.27]
The project will not result in a significant impact on the quality of the human environment.

☐ **Finding of Significant Impact** [24 CFR 58.40(g)(2); 40 CFR 1508.27]
The project may significantly affect the quality of the human environment.

Preparer Signature: Gwen Sivirichi Date: June 20, 2017

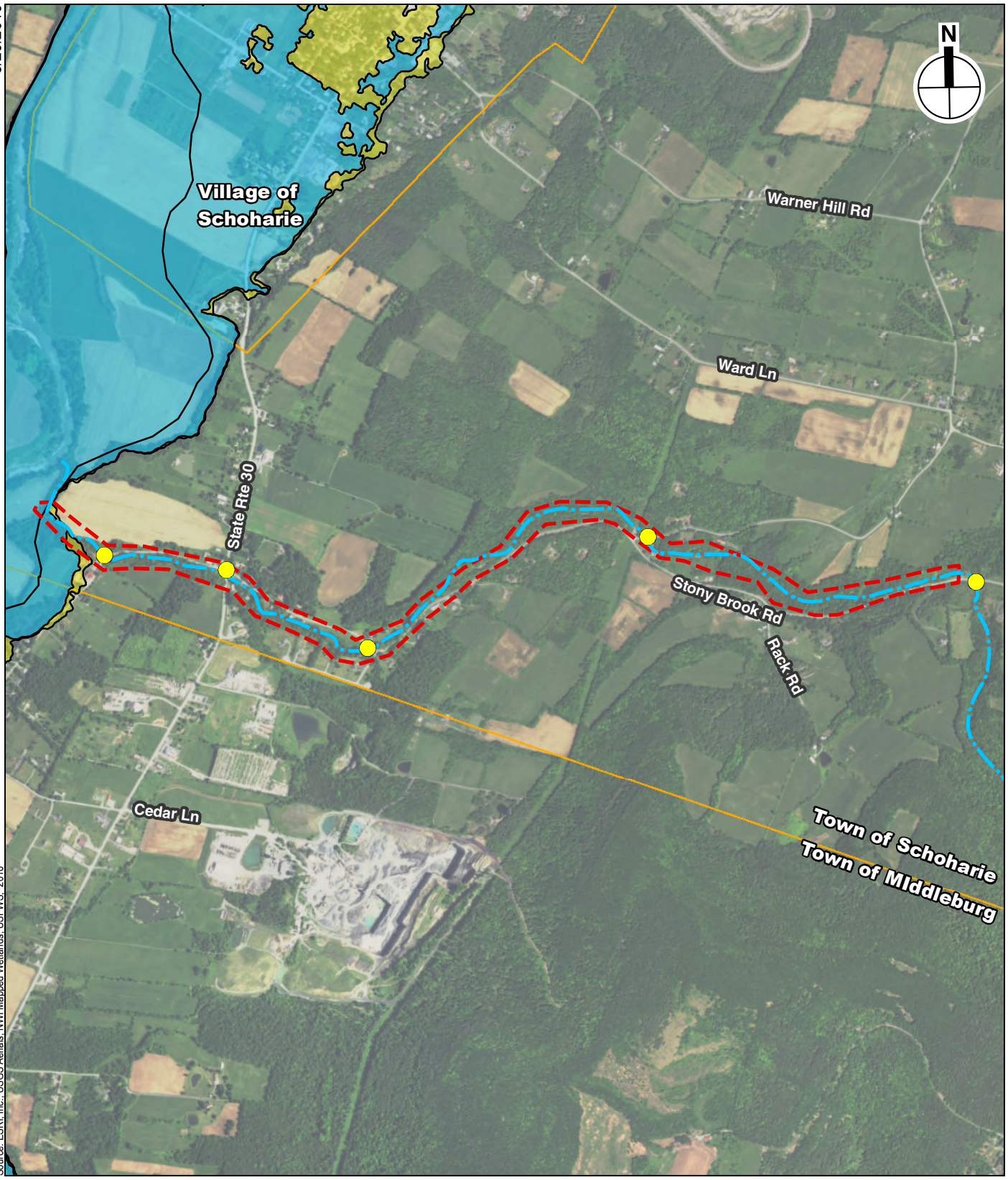
Name/Title/Organization: Gwen Sivirichi, Senior Environmental Scientist, AKRF, Inc.

Certifying Officer Signature: Lori A Shirley Date: June 20, 2017

Name/Title: Lori A. Shirley, Environmental - Certifying Officer

This original, signed document and related supporting material must be retained on file by the Responsible Entity in an Environmental Review Record (ERR) for the activity/project (ref: 24 CFR Part 58.38) and in accordance with recordkeeping requirements for the HUD program(s).

8/26/2016



Source: ESRI, Inc.; USGS Aerials; NWI Mapped Wetlands, USFWS, 2016

Stony Brook

Site Boundary

Culvert

Municipal Boundaries

1% Annual Chance Flood Hazard (100-year floodplain)

0.2% Annual Chance Flood Hazard (500-year floodplain)

Note: Stony Brook has not been evaluated by FEMA

0 1,000 FEET

FEMA Flood Zone

Stony Brook Mitigation, Town of Schoharie

Figure 1

8/26/2016

Source: ESRI, Inc.; USGS Aerials; NWI Mapped Wetlands, USFWS, 2016

Site Boundary

Freshwater Pond

Riverine

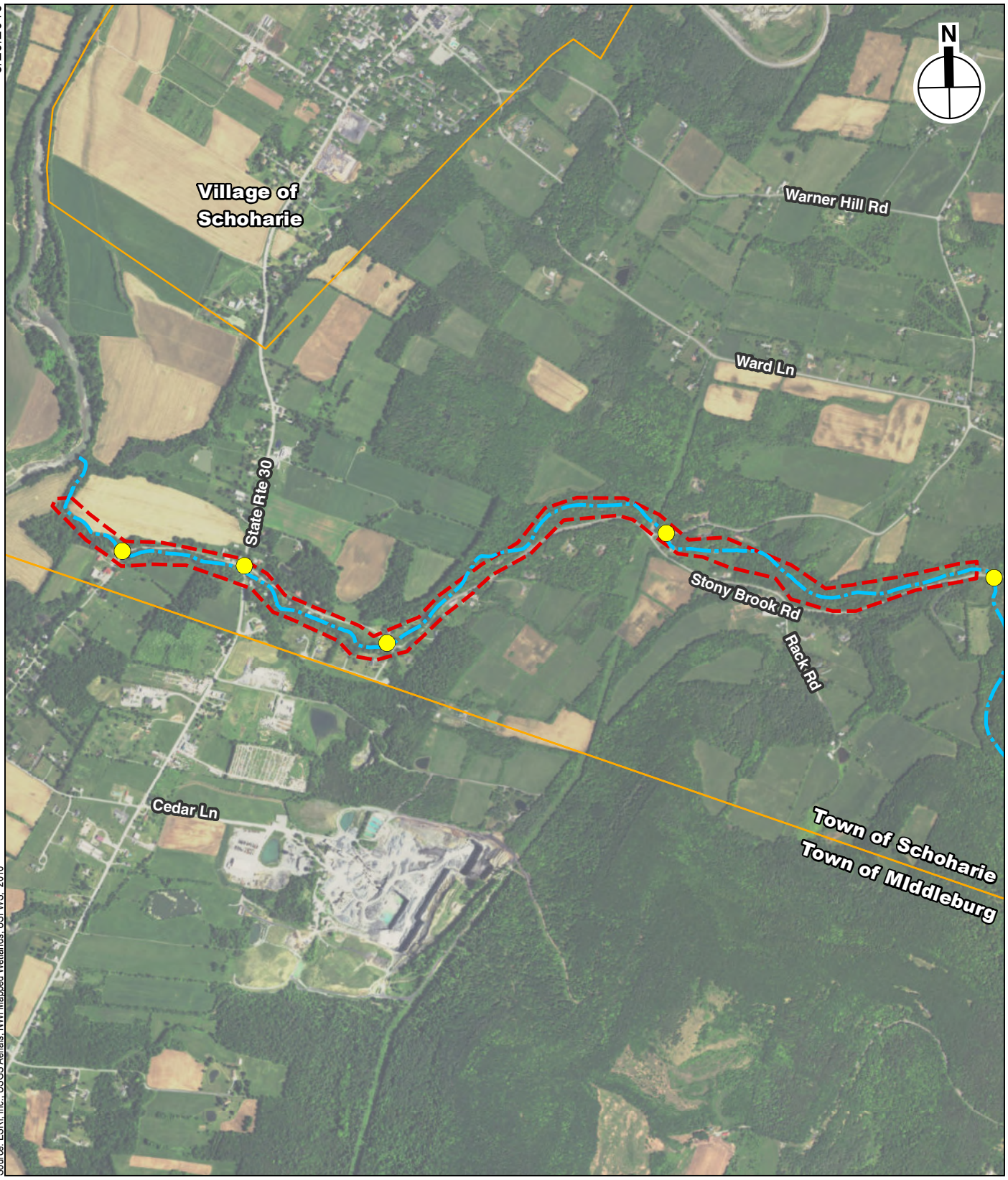
0 1,000 FEET

NWI Wetlands

Stony Brook Mitigation, Town of Schoharie

Figure 2

8/26/2016



Source: ESRI, Inc.; USGS Aerials; NWI Mapped Wetlands, USFWS, 2016

Stony Brook

Site Boundary

Culvert

Municipal Boundaries

NYSDEC Freshwater Wetlands

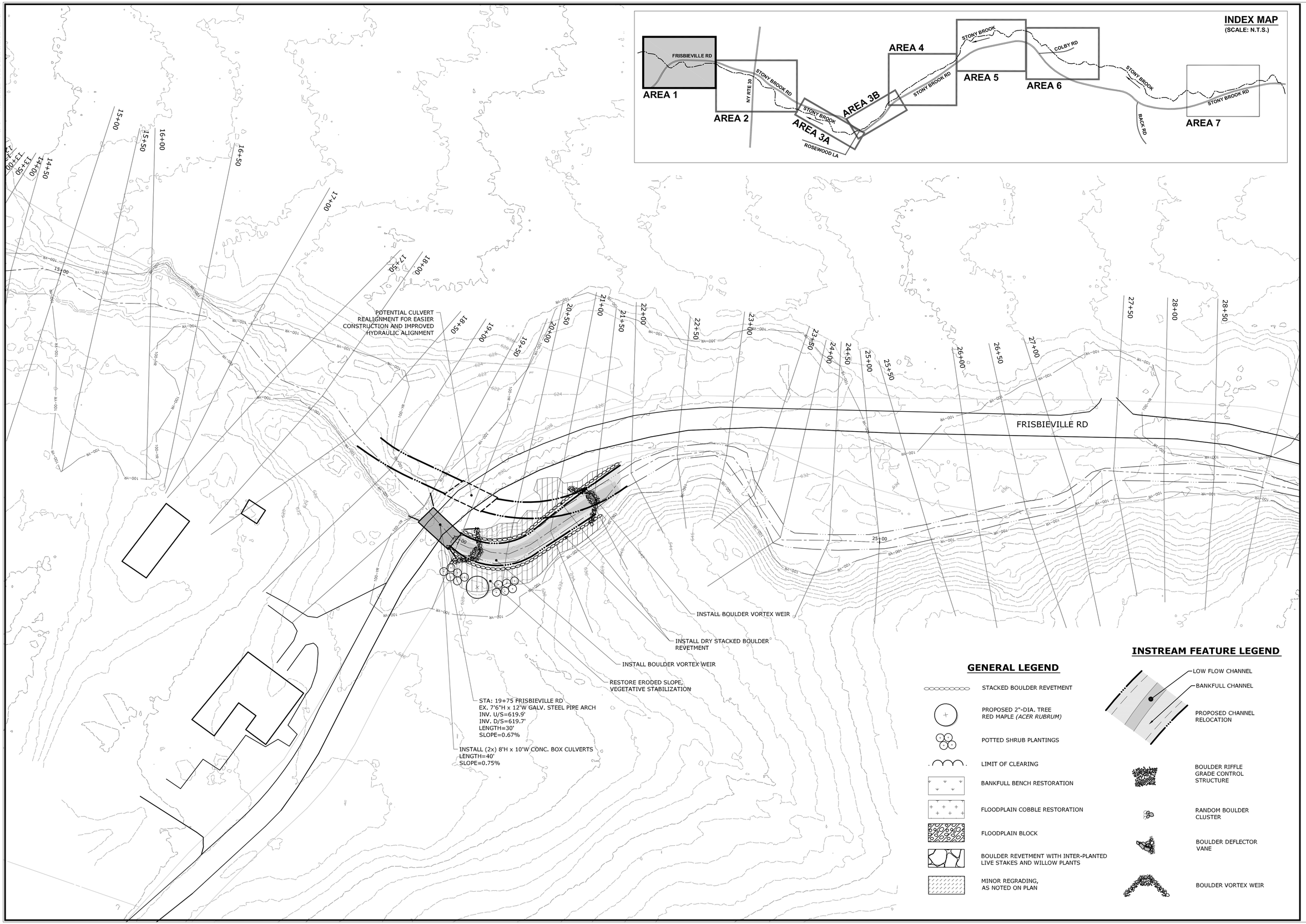
0 1,000 FEET

NYSDEC Freshwater Wetlands

Stony Brook Mitigation, Town of Schoharie

Figure 3

Appendix A: Conceptual Design Plans



MILONE & MACBROOM®

DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 1

STONY BROOK
STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 01 OF 07

SHEET NAME: AREA 1

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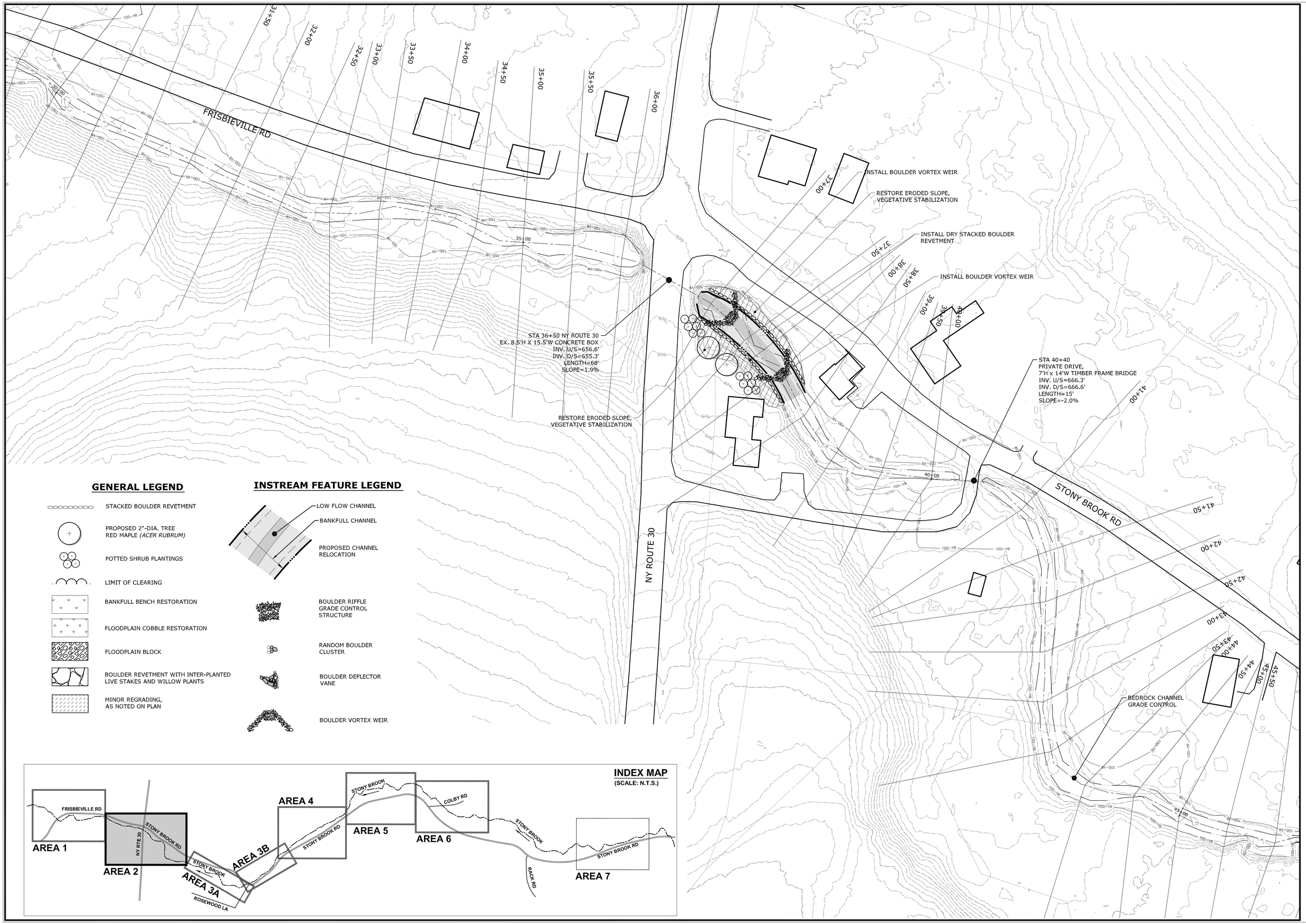

GENERAL LEGEND

- STACKED BOULDER REVETMENT
- PROPOSED 2"-DIA. TREE RED MAPLE *(ACER RUBRUM)*
- POTTED SHRUB PLANTINGS
- LIMIT OF CLEARING
- BANKFULL BENCH RESTORATION
- FLOODPLAIN COBBLE RESTORATION
- FLOODPLAIN BLOCK
- BOULDER REVETMENT WITH INTER-PLANTED LIVE STAKES AND WILLOW PLANTS
- MINOR REGRADING, AS NOTED ON PLAN

INSTREAM FEATURE LEGEND

- LOW FLOW CHANNEL
- BANKFULL CHANNEL
- PROPOSED CHANNEL RELOCATION
- BOULDER RIFFLE GRADE CONTROL STRUCTURE
- RANDOM BOULDER CLUSTER
- BOULDER DEFLECTOR VANE
- BOULDER VORTEX WEIR

INDEX MAP

(SCALE: N.T.S.)

MILONE & MACBROOM®

DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 2

STONY BROOK STREAM REPAIR AND RESTORATION

NY ROUTE 30, AND STONY BROOK ROAD AREA

SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 02 OF 07

SHEET NAME: **AREA 2**

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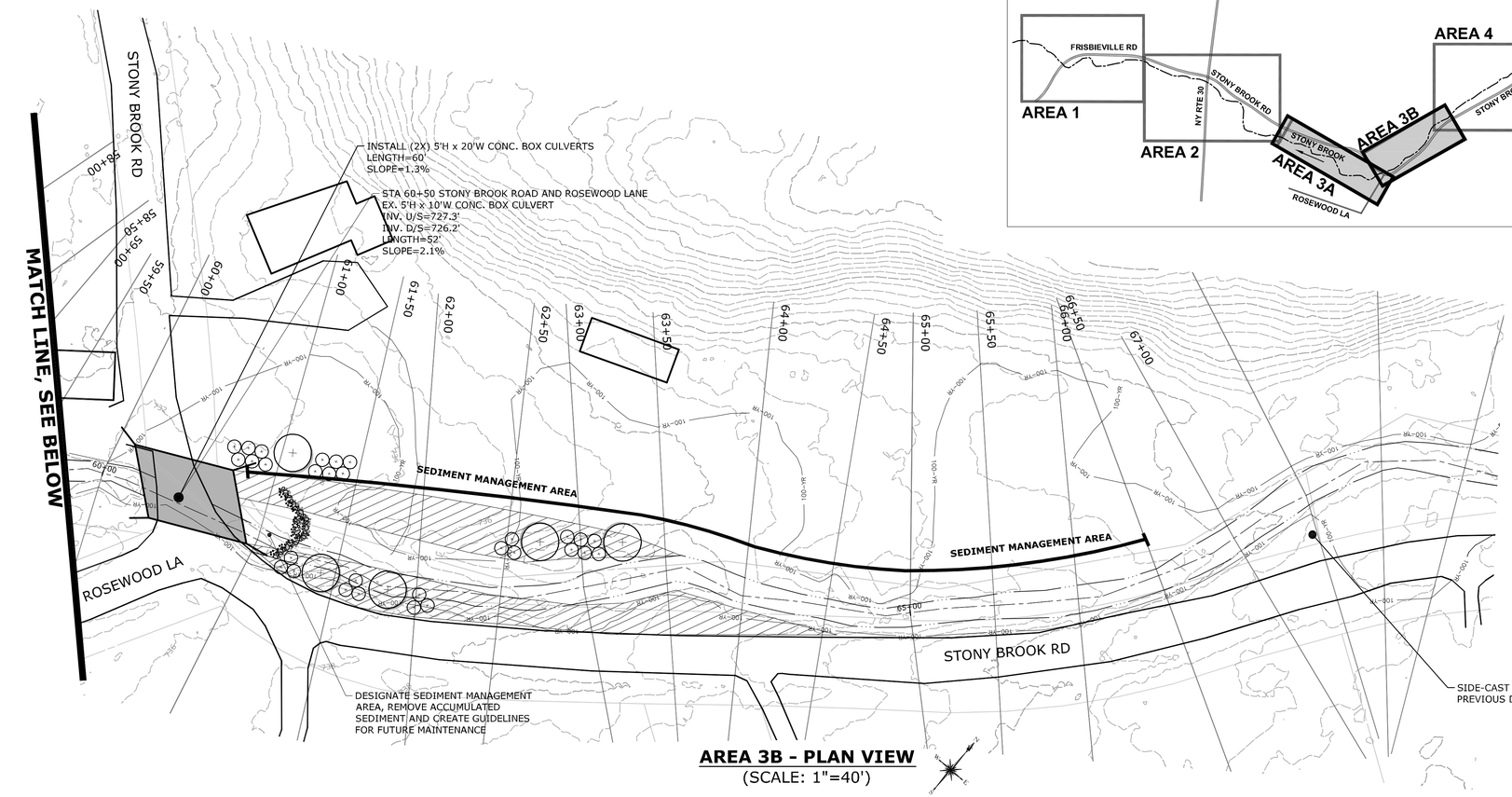

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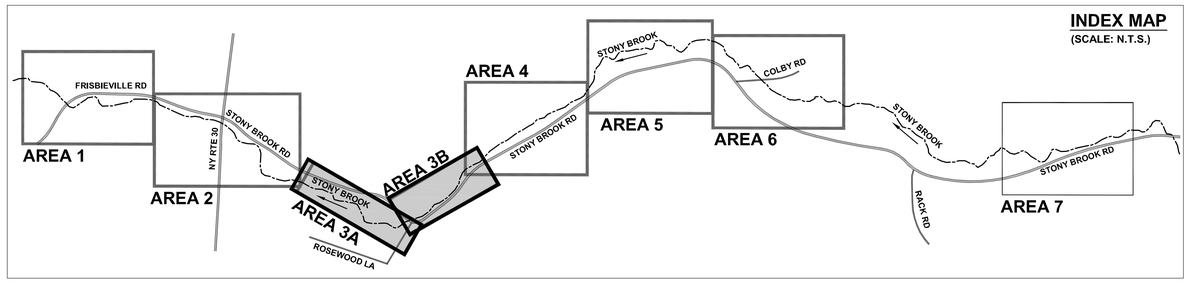
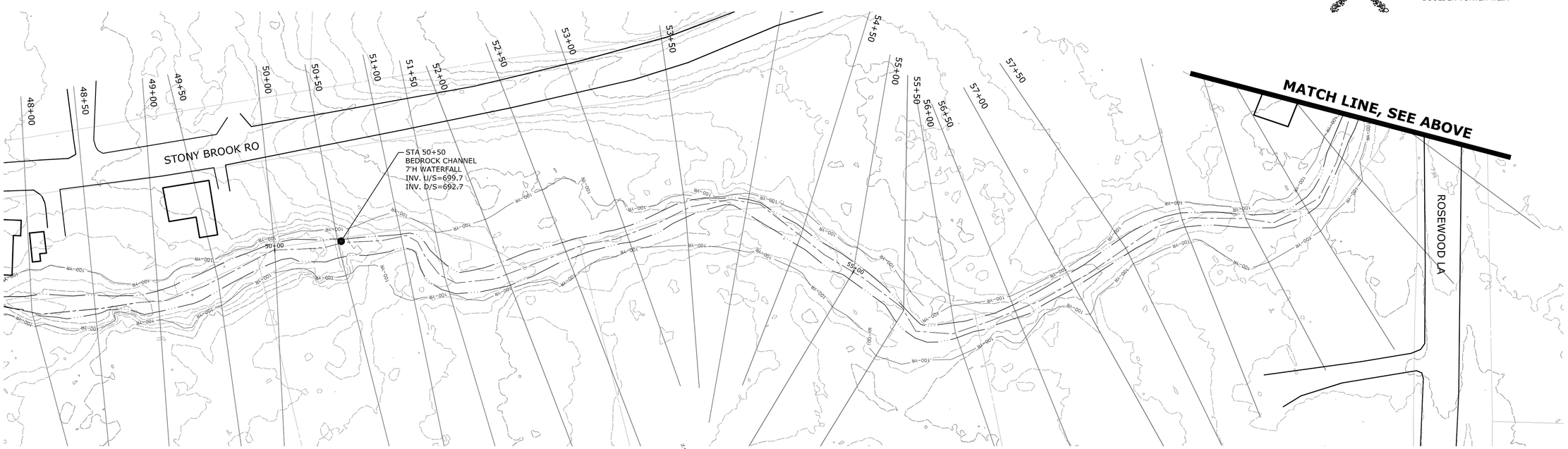


LEGEND

- STACKED BOULDER REVETMENT
- EXISTING 100-YEAR FLOODPLAIN (HYDRAULIC MODELING)
- EXISTING EDGE OF LOW-FLOW CHANNEL
- LOW FLOW CHANNEL
- BANKFULL CHANNEL
- PROPOSED CHANNEL RELOCATION
- BOULDER RIFFLE GRADE CONTROL STRUCTURE
- RANDOM BOULDER CLUSTER
- BOULDER DEFLECTOR VANE
- BOULDER VORTEX WEIR



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SCHOHARIE, NEW YORK

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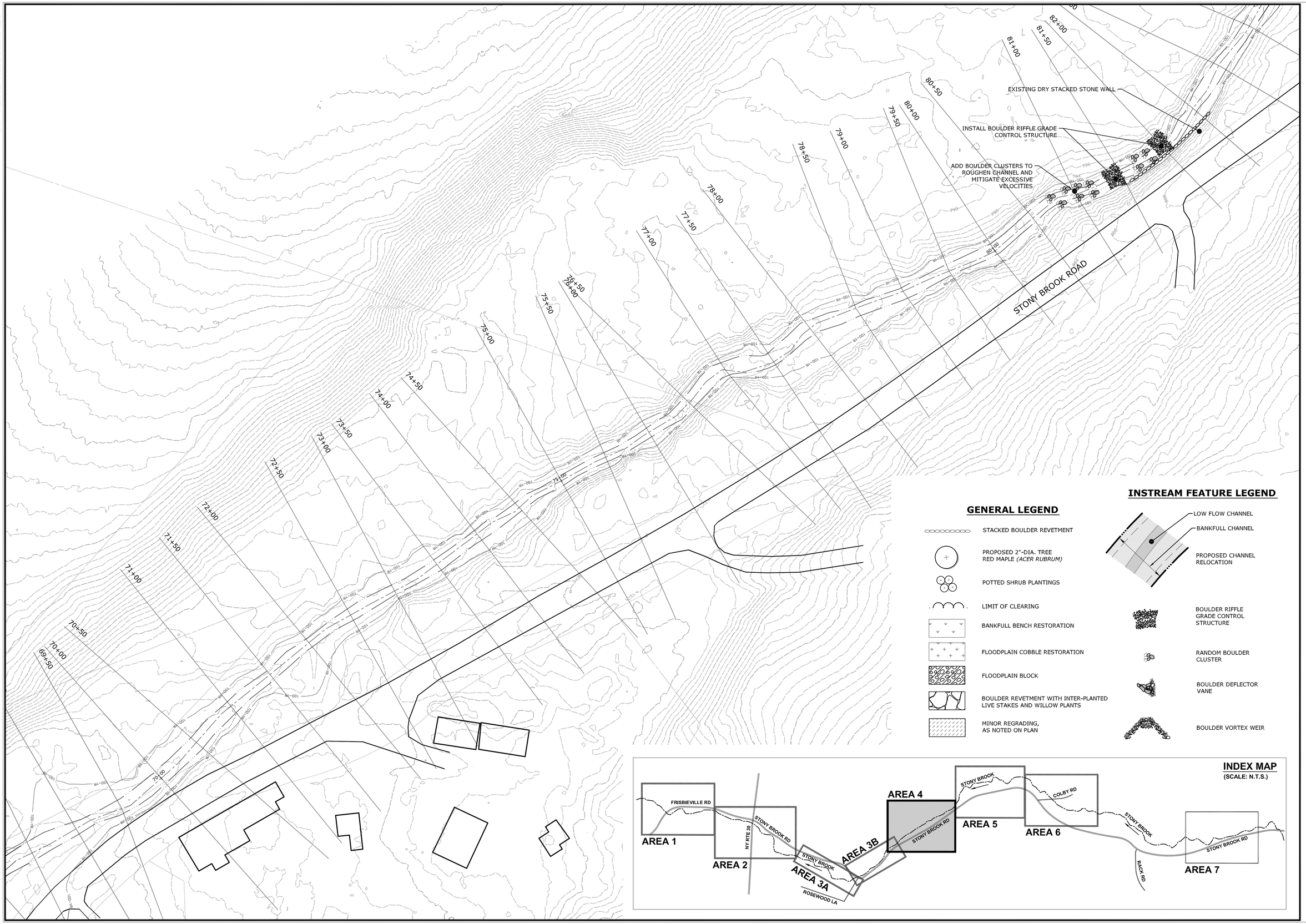

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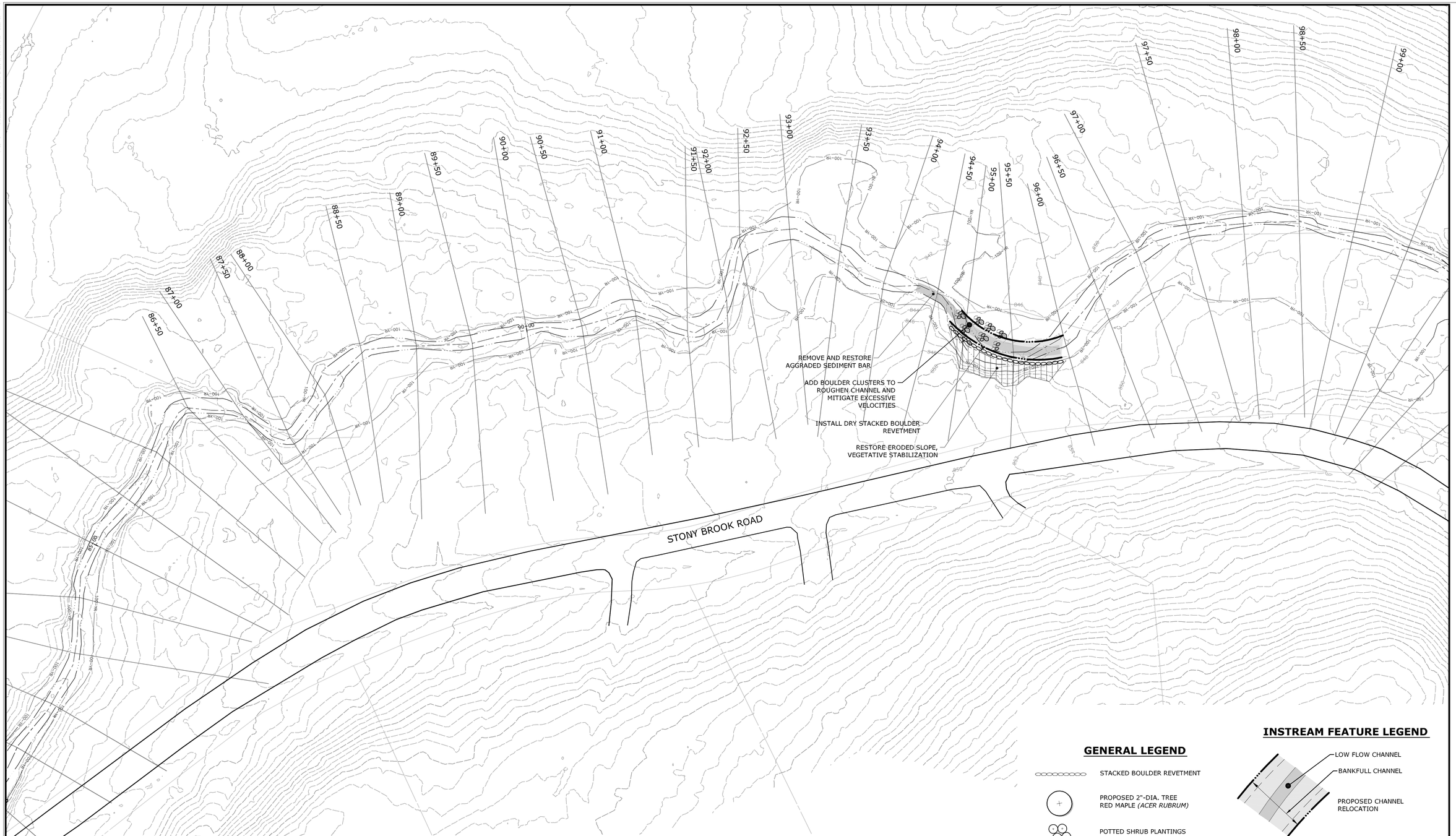

INDEX MAP
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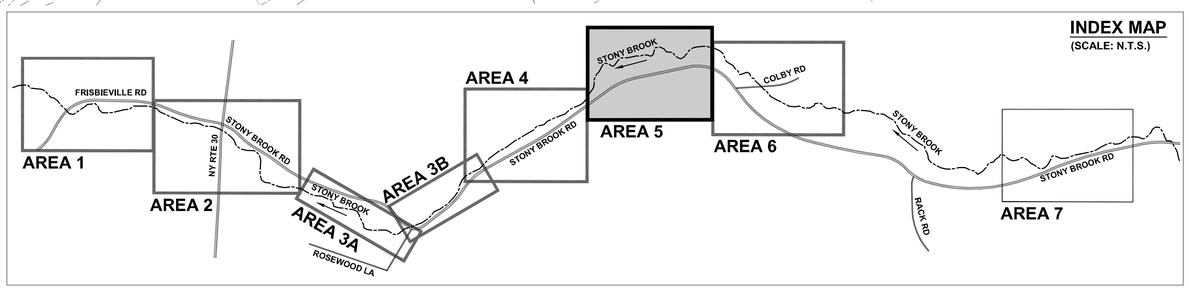

GENERAL LEGEND

- STACKED BOULDER REVETMENT
- PROPOSED 2"-DIA. TREE RED MAPLE *(ACER RUBRUM)*
- POTTED SHRUB PLANTINGS
- LIMIT OF CLEARING
- BANKFULL BENCH RESTORATION
- FLOODPLAIN COBBLE RESTORATION
- FLOODPLAIN BLOCK
- BOULDER REVETMENT WITH INTER-PLANTED LIVE STAKES AND WILLOW PLANTS
- MINOR REGRADING, AS NOTED ON PLAN

INSTREAM FEATURE LEGEND

- LOW FLOW CHANNEL
- BANKFULL CHANNEL
- PROPOSED CHANNEL RELOCATION
- BOULDER RIFFLE GRADE CONTROL STRUCTURE
- RANDOM BOULDER CLUSTER
- BOULDER DEFLECTOR VANE
- BOULDER VORTEX WEIR

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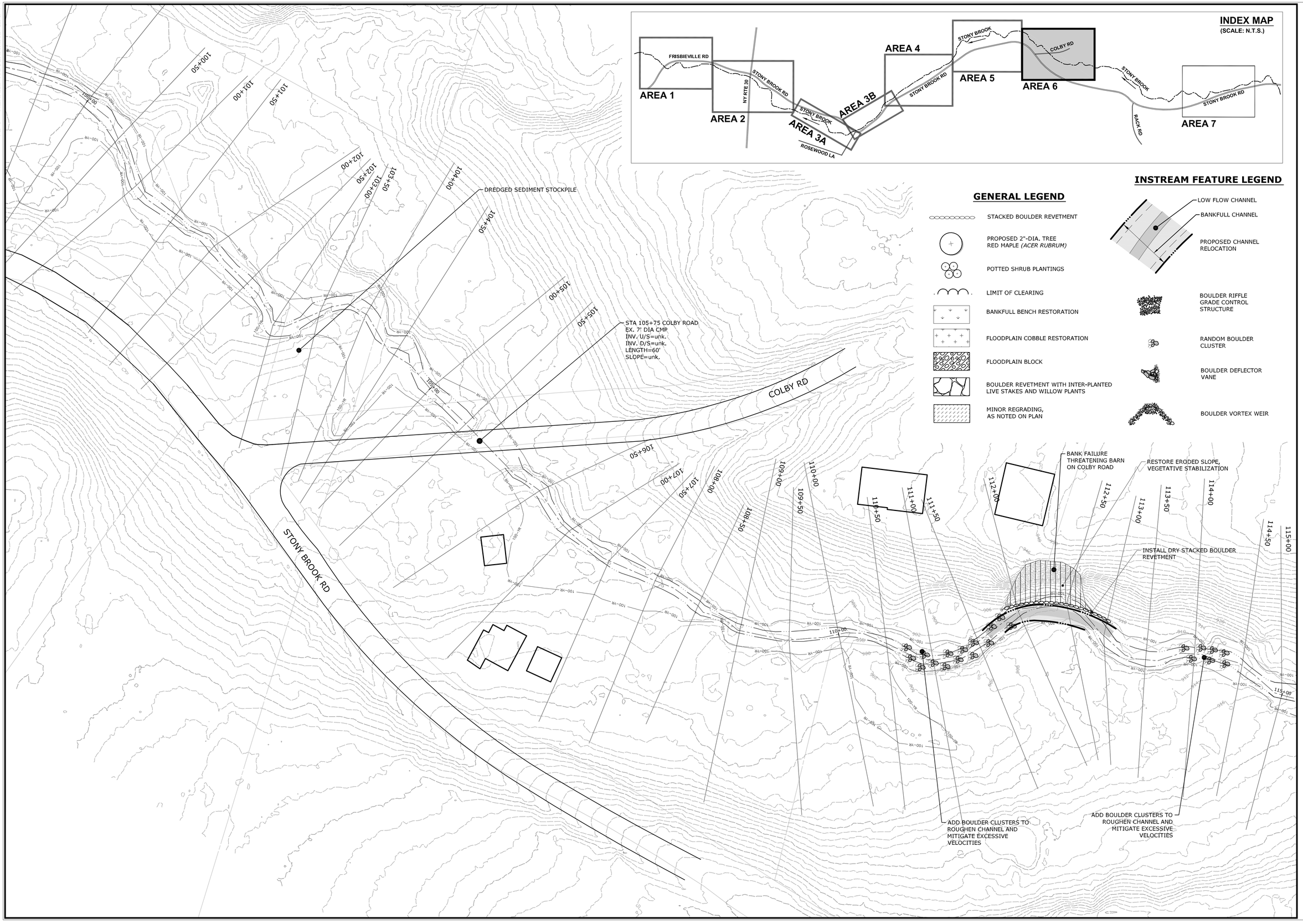

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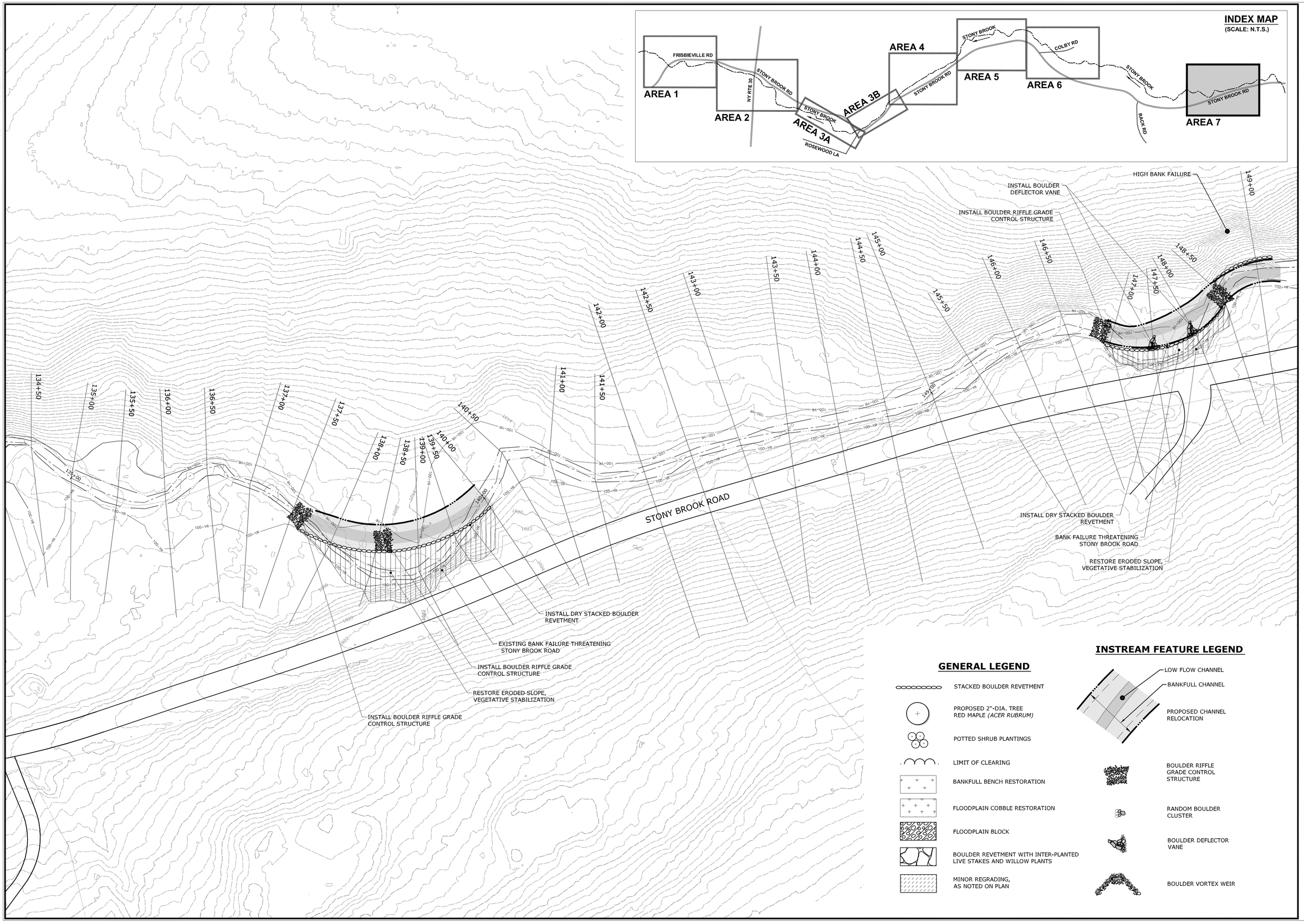

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DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 07 OF 07

SHEET NAME: AREA 7

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Appendix B: Engineering Report

Engineering Report

Stream Repair and Restoration
Stony Brook, Town of Schoharie
Schoharie County, New York
January 19, 2016

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Engineering Report

Stream Repair and Restoration
Stony Brook, Town of Schoharie
Schoharie County, New York
January 19, 2016

Prepared for:
Schoharie County Soil and Water
Conservation District
173 South Grand Street, Suite 3
Cobleskill, New York 12043

MMI #4805-04-1

Prepared by:
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1.0 INTRODUCTION

1.1 Project Description

The Schoharie County Soil & Water Conservation District (SCSWCD) is progressing with a stream repair and restoration project along Stony Brook. Stony Brook is a tributary to Schoharie Creek, which flows to the Mohawk River and then to the Hudson River. The project site is located in the town of Schoharie, in northeastern Schoharie County, New York. Established as a town in Albany County in 1788, Schoharie became part of the newly created Schoharie County in 1795. The 2000 census reports a population of 3,299 in the town of Schoharie.

Recent, severe flooding events, most significantly Tropical Storm Irene in 2011, and also a June 2013 flood event have resulted in severe bed and bank erosion within the Stony Brook channel as well as aggradation of bedload sediment. This aggradation of sediment has clogged culvert and bridge crossings, leading to the reduction of flood conveyance capacity in the channel. The sediment migration has caused the channel to become unstable, with bank erosion and excessive sedimentation in many areas.

Milone & MacBroom, Inc. (MMI) has been retained by SCSWCD to assess approximately 2.6 miles of the Stony Brook stream corridor, to provide recommendations for channel improvements along the banks and bed of the brook, and to provide recommendations regarding two culvert crossings and a bridge through which Stony Brook flows. This work is being conducted with federal funding through the United States Department of Housing and Urban Development's (HUD's) Community Development Block Grant – Disaster Recovery (CDBG-DR) funds appropriated by the Disaster Relief Appropriations Act, 2013 (Pub. L. 113-2). This funding is being administered by the Governor's Office of Storm Recovery (GOSR).

1.2 Field Assessment

In support of the analysis and design effort, MMI staff visited the site on September 9 and October 13, 2015 for the purpose of conducting an assessment of the streambed, banks, floodplain, revetment walls, and other stream features. The work included assessment of the channel dimensions, flow conditions, substrate and sediment, and a general assessment of the culverts and bridges. This engineering report summarizes the results of those findings.

The weather on September 9 was partly cloudy and hot with a high temperature of 90°F. The Stony Brook channel was nearly dry for its entire length, with no active flow. Small areas of ponded water were present at several locations along the length of the channel, and small fish such as black-nosed dace were observed. Severe thunderstorms moved into the area late in the day. The weather on October 13 was partly cloudy with light drizzle and temperatures in the mid 60s F. Flow in the Stony Brook channel was low.

1.3 Nomenclature

Stream stationing is used as an "address" to identify specific points along the Stony Brook watercourse. Stationing is measured in feet, beginning at the outlet of Stony Brook at Schoharie Creek at STA 0+00 and continuing upstream through the project reach. All references to right bank and left bank in this report refer to "river right" and "river left," meaning the orientation assumes that the reader is standing in the channel looking downstream.

2.0 EXISTING CONDITIONS

2.1 Stony Brook Watershed

Stony Brook flows in a generally westward direction toward its confluence with Schoharie Creek. The watershed of Stony Brook is 4.2 square miles in size and drains an area to the east of Schoharie Creek. The watershed is bound by high points reaching elevations of 1,800 to 1,900 feet above sea level, including unnamed hills to the north, Rundy Cup Mountain to the east, and Cotton Hill to the south. The watershed is approximately 70 percent forested, with a patchwork of agriculture and rural residential uses concentrated in the central part of the basin.

The Stony Brook watershed is underlain by unsorted glacial till ranging from clay to boulders, with some areas of proglacial and alluvial sediments along Schoharie Creek. The underlying bedrock consists of a mix of sandstone, limestone, and shale from the Lower to Middle Devonian period. Bedrock is visible at several locations in the Stony Brook channel.

2.2 Flooding Reports

Anecdotal reports indicate that substantial flooding, channel erosion, and sediment aggradation occurred along Stony Brook on August 28, 2011 when Tropical Storm Irene passed through the area. In late June 2013, a severe, localized rain event triggered flooding throughout Stony Brook's watershed. Large volumes of sediment were reported to have been transported from the upper reaches of the watershed, which accumulated in front of the culverts, reducing their capacity and causing them to overtop their associated roadways. Severe flooding was also reported to have occurred in January 1996.

Sediment that had accumulated in the channel was reportedly removed in the days following the June 2013 flood event. In some areas, it was hauled to a disposal site to the east on Stony Brook Road. Some of it was cast to the banks of the stream, lowering the streambed but leaving berms of deposited material on the banks and still within the floodprone area of the brook. Evidence of this sidecasting was noted during the MMI field walks. Evidence of historic dredging was noted as well, as indicated by berms located farther away from the channel containing woody vegetation ranging between 20 to 50 years old.

Several landowners with homes along Stony Brook have provided descriptions and photographs of the June 2013 flood event. The Schoharie Highway Supervisor and staff at the SCSWCD have also provided descriptions of the flooding as well as historical aerial photographs dating back to 1940. These were used to analyze historical changes to the Stony Brook watershed and stream corridor.

2.3 Stony Brook Channel

During the site visits, MMI staff walked the entire length of Stony Brook within the project area, from STA 156+00 (100 feet upstream of the culvert that passes under Stony Brook Road approximately one-half mile east of Rack Road) downstream to STA 14+00 (500 feet downstream of Frisbieville Road). The corridor was characterized by assessing the channel at multiple locations. A photo log is included as Appendix A.

Over the 2.6-mile reach assessed (between STA 156+00 and STA 14+00), Stony Brook drops 433 vertical feet, yielding an average slope of 3.2 percent. Some reaches of the channel are stable, with a well-armored cobble/gravel bed and mature woody vegetation on both banks. However, other reaches are unstable, either due to channel downcutting as a result of bed erosion (degradation/incision), which has steepened the banks and triggered severe bank erosion collapse, or due to excessive sediment deposition (aggradation), which has led to channel widening, instability, and bank erosion. These are discussed in more detail below.

The study area includes several reaches where deep channel incision has occurred, creating unstable banks that continue to erode, fail, and introduce excess sediment into Stony Brook. This has led to a pattern in which these incised reaches act as sources of sediment, followed by downstream reaches where sediment is transported, finally depositing in a reach of aggradation where the sediment settles in the channel. Table 2-1 provides a summary of these reaches and their locations noted in the field.

TABLE 2-1
Stony Brook Channel Characteristics

Channel Reach by Station (STA)	Channel Characteristics	Channel Slope (%)	Channel Substrate	Notes and Observations
156+00 – 152+50	Stable	4.0	Gravel/Cobble	Good condition, includes culvert under Stony Brook Road
152+50 – 139+00	Incised	3.8	Gravel/Cobble	Excessive bed and bank erosion through reach; high bank failure at STA 152+00 behind a home; high bank failures at STA 145+50; failure at STA 139+00 is in danger of undermining Stony Brook Road; drop culvert on tributary at STA 143+50 due to incision in main channel; bank failure at STA 148+00
139+00 – 132+50	Stable	3.9	Gravel/Cobble	Generally good condition; less incised; some connection to floodplain; eroding bank where channel contacts valley wall at STA 135+00
132+50 – 126+00	Incised	3.2	Gravel/Cobble	Severe channel incision of 4 to 5 feet in areas; woody debris jam; erosion up tributary at STA 132+00
126+00 – 119+50	Stable	4.1	Gravel/Cobble	Generally good condition; minor incision and bank erosion at debris jam at STA 118+00; some connection to floodplain; exposed bedrock along bank at STA 121+50
119+50 – 113+00	Bedrock Control	3.6	Bedrock Bed	Bedrock bed is acting as natural grade control to arrest incision and head cutting.

TABLE 2-1 (continued)
Stony Brook Channel Characteristics

Channel Reach by Station (STA)	Channel Characteristics	Channel Slope (%)	Channel Substrate	Notes and Observations
113+00 – 108+50	Incised	3.7	Gravel/Cobble	Severe channel incision; high bank failure on right bank at STA 112+50 threatens barn
108+50 – 102+00	Stable	3.8	Gravel/Cobble	Channel in generally good condition; includes culvert under Colby Road
102+00 – 73+50	Incised	3.4	Gravel/Cobble	Channel incision and raw banks increasingly severe moving downstream, especially along right bank near STA 100+50; drop culvert on tributary at STA 101+00 due to incision; high bank failure along left bank at STA 96+00; debris jam at STA 86+00 is arresting migration of head cut; stacked rock wall is being undercut at STA 83+00 to 81+50; drop culvert on tributary at STA 74+50 due to incision
73+50 – 70+50	Stable	2.6	Gravel/Cobble	Evidence of sidecasting of dredge material along banks
70+50 – 51+00	Aggrading	2.9	Gravel/Cobble	Aggradation of sediment; includes culvert under Stony Brook Road
51+00 – 48+00	Bedrock Control	2.7 including vertical falls	Bedrock Bed	Bedrock bed is acting as natural grade control to arrest incision and head cutting.
48+00 – 44+00	Incised	2.3	Gravel/Cobble	Channel incision and raw banks especially along left bank
44+00 - 42+00	Stable	3.2	Gravel/Cobble	Generally good condition; less incised
42+00 – 14+00	Aggrading	2.2	Gravel/Cobble	Aggradation of sediment; includes private bridge, NY Route 30 bridge and Frisbieville culvert; evidence of sidecasting at STA 23+00 and 20+50

Figure 2-1 is a longitudinal profile of Stony Brook showing its elevation above sea level versus the linear distance from its outlet at Schoharie Creek as well as the locations of all roadway crossings. Reaches that are stable, aggraded, incised, or under the influence of bedrock control are shown on the profile and correspond to the reaches identified in Table 2-1. Figures 2-2 and 2-3 are maps showing the downstream and upstream sections of the Stony Brook project area, respectively.

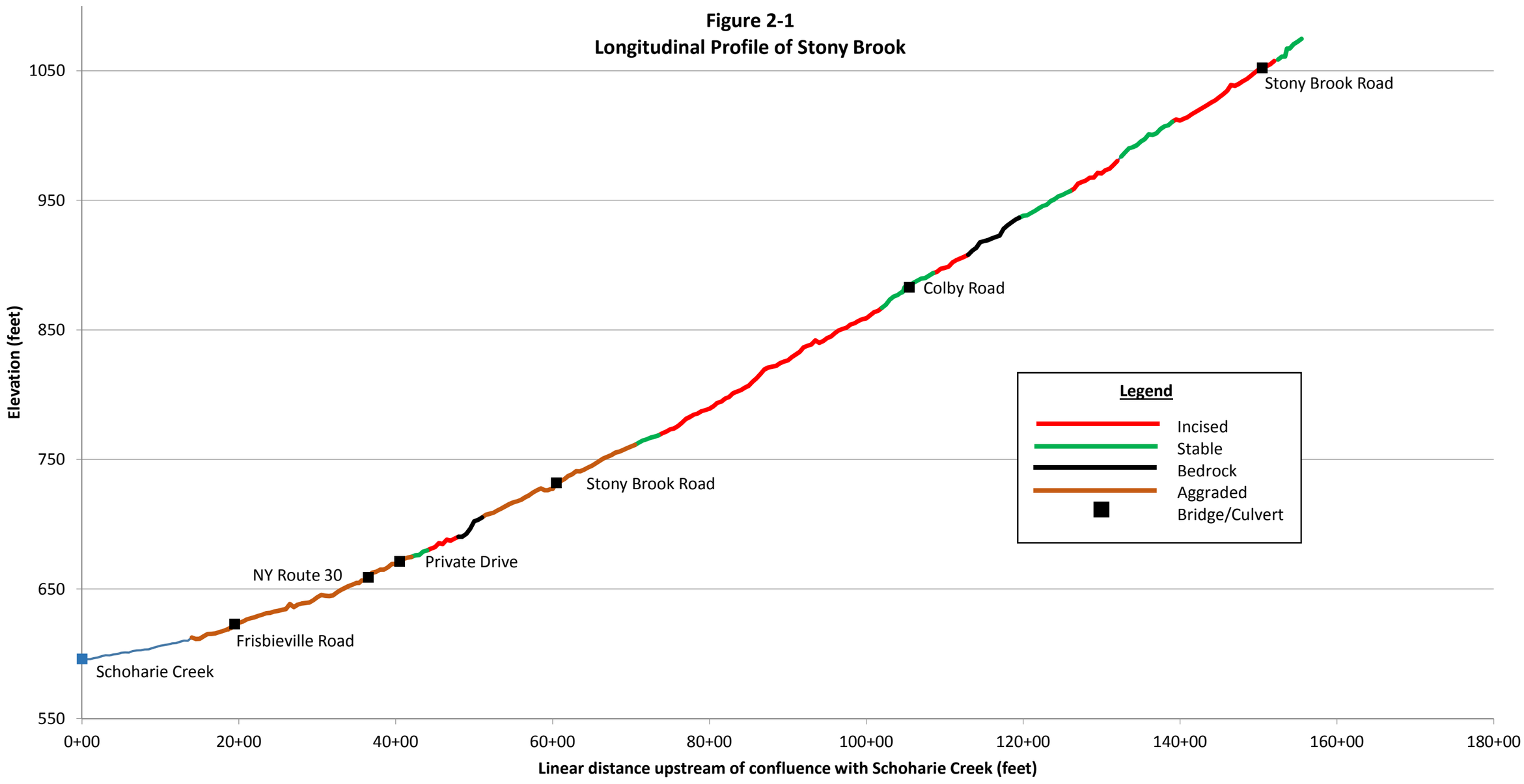
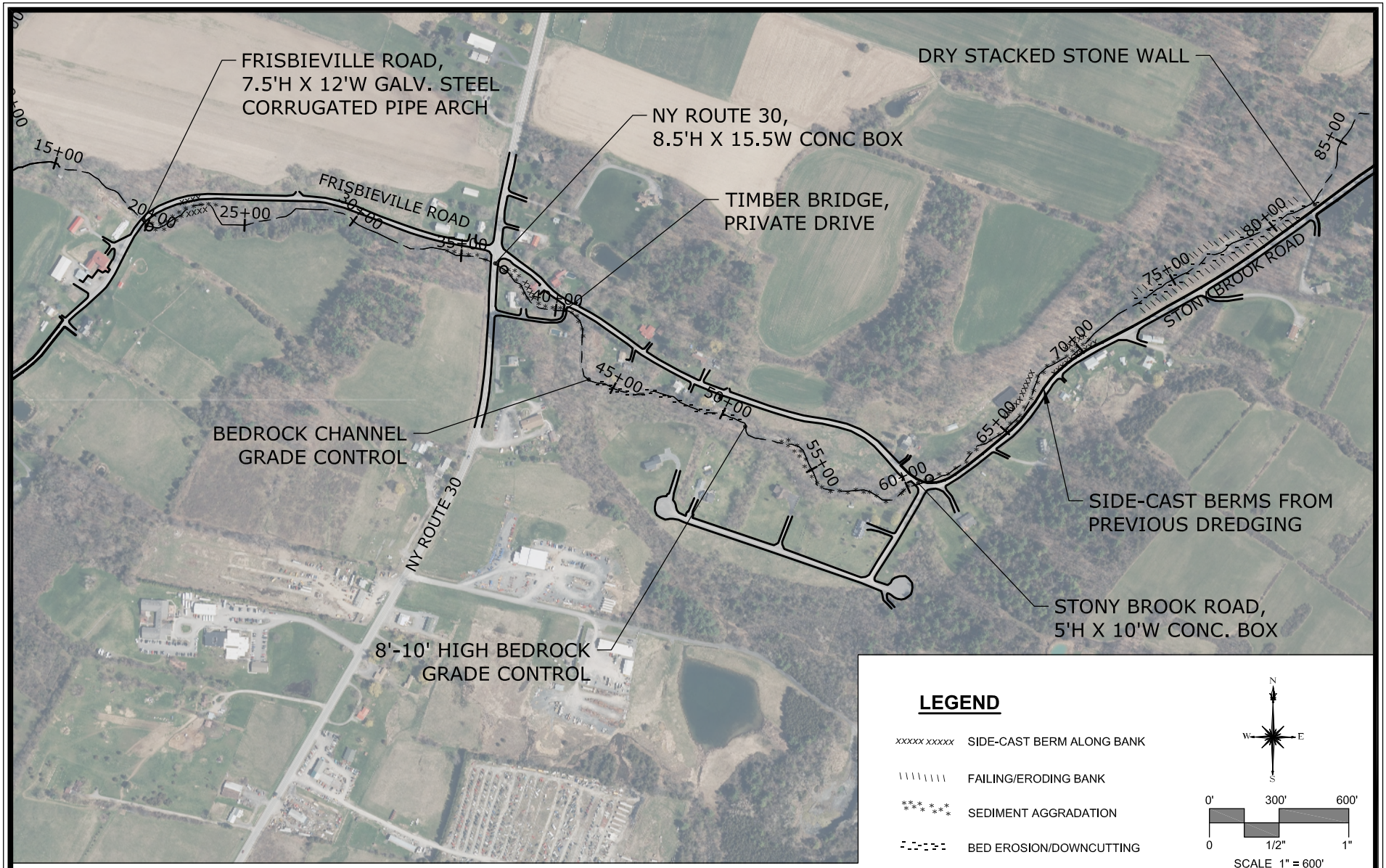


Figure 2-1
Longitudinal Profile of Stony Brook
Elevation (feet)
1050
950
850
750
650
550
0+00
20+00
40+00
60+00
80+00
100+00
120+00
140+00
160+00
180+00
Linear distance upstream of confluence with Schoharie Creek (feet)
Stony Brook Road
Colby Road
Stony Brook Road
Private Drive
NY Route 30
Frisbieville Road
Schoharie Creek
Legend
Incised
Stable
Bedrock
Aggraded
Bridge/Culvert



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LOCATION MAP

FIELD ASSESSMENT AND SEDIMENT CHARACTERIZATION
STONY BROOK MITIGATION FLOOD ASSESSMENT

NY ROUTE 30 AND STONY BROOK ROAD
SCHOHARIE, NEW YORK

REVISED: ---

DRAWING NAME:

FIG. 2-2

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Drawing: W:\DESIGN\4805-04-DE\CAD\FIGURES.DWG Layout Tab:FIG 2-2
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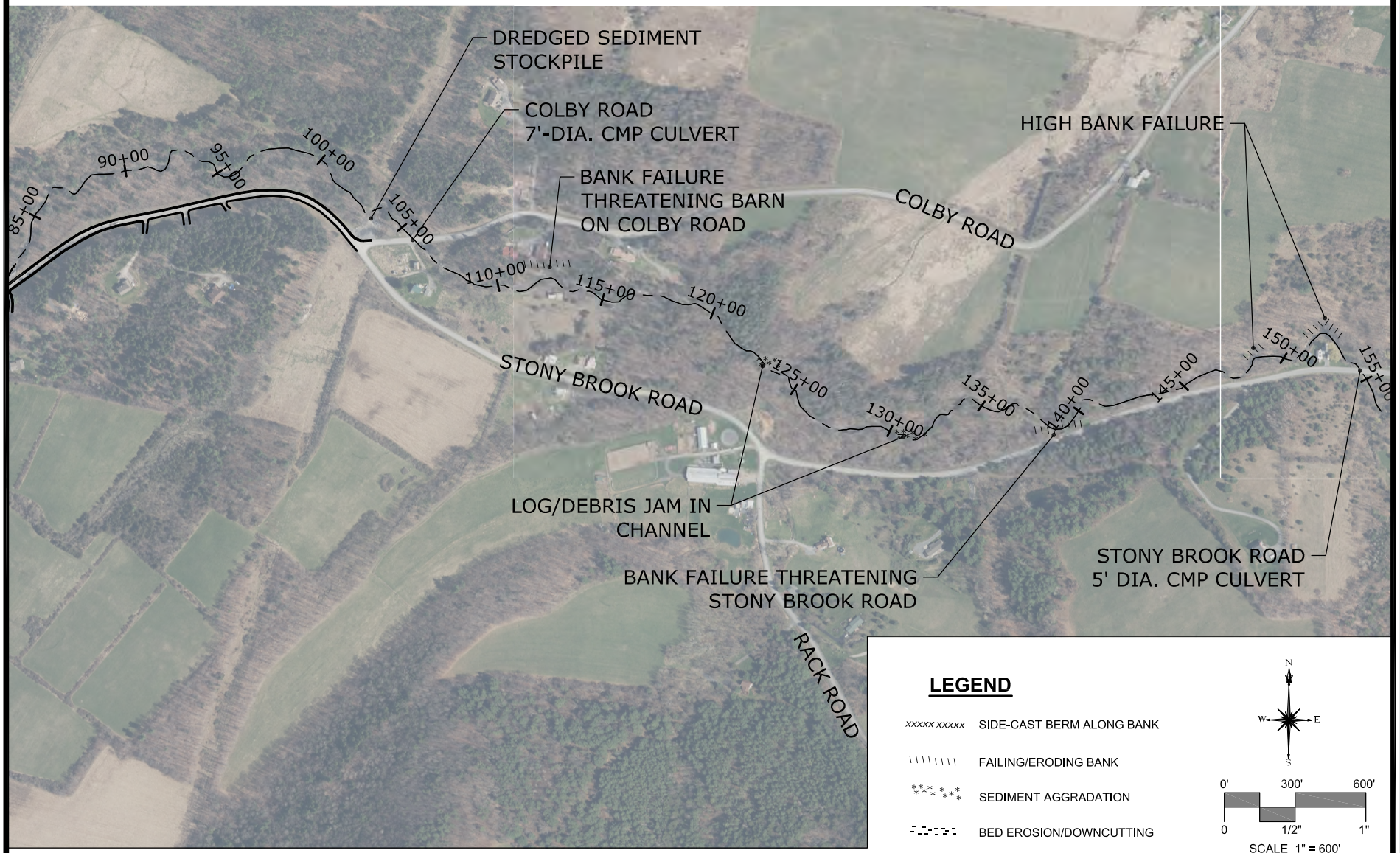

LEGEND

- xxxxx xxxxx SIDE-CAST BERM ALONG BANK
- FAILING/ERODING BANK
- SEDIMENT AGGRADATION
- BED EROSION/DOWNCUTTING

N W E S

0' 300' 600'
0 1/2" 1"
SCALE 1" = 600'

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LOCATION MAP

FIELD ASSESSMENT AND SEDIMENT CHARACTERIZATION
STONY BROOK MITIGATION FLOOD ASSESSMENT

NY ROUTE 30 AND STONY BROOK ROAD
SCHOHARIE, NEW YORK

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FIG. 2-3

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Drawing: W:\DESIGN\4805-04-DE\CAD\FIGURES.DWG Layout Tab:FIG 2-3
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The reaches identified as incised in Table 2-1 and Figure 2-1 are at some locations very severely incised, (as much as 5 vertical feet), leaving nearly vertical, actively eroding banks with no armoring or protection against further collapse. Many trees along the banks have fallen into the channel or are in danger of doing so. At STA 152+50, a high bank failure has occurred on a bend in the channel immediately behind a home. High bank failures have also occurred at STA 145+50, STA 139+00, STA 112+50, and STA 96+00. At some locations along Stony Brook, channel incision and associated high bank failures are threatening structures and infrastructure.

A high bank failure on the left bank at STA 139+00 is in danger of undermining Stony Brook Road. The high bank failure on the right bank at STA 112+50 would potentially threaten a garage or barn structure at 132 Colby Road if it were to continue to advance. A stacked rock wall along the right bank at STA 81+50 has been undermined along its entire length by channel incision. As a result of downcutting of the channel, small tributaries entering Stony Brook (e.g., at STA 143+50, STA 101+00, and STA 74+50) drop by as much as 5 vertical feet as they enter the main channel. The degrading bed and failing banks upstream of STA 73+50 are a source of the excessive sediments that are aggrading and clogging the channel further downstream.

From STA 70+50 downstream past the culvert under Stony Brook Road to STA 51+00, as well as STA 42+00 to STA 14+50, there is evidence of excess sedimentation in the channel. This has caused the channel to fill with gravel and cobble. This can lead to an unstable, meandering channel with a high propensity of avulsing into one of several floodplain "flood chutes" during a high flow event.

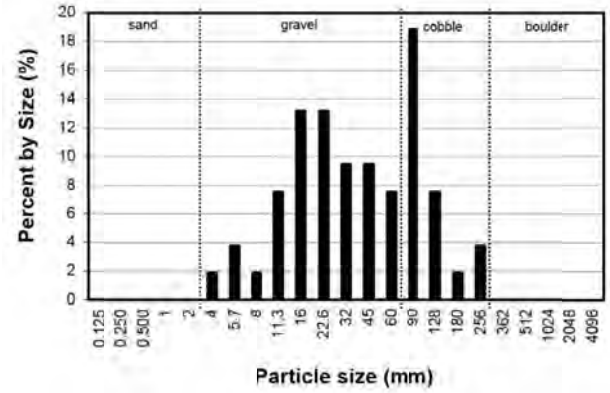
2.4 Characterization of Channel Sediments

To further characterize the size distribution of the bed armoring, three Wolman pebble counts (Wolman, 1954) were performed within the project extents. A pebble count seeks to characterize the armoring layer of bed substrate (sediment) that remains on a streambed by measuring independent particle sizes of a representative section of bed armoring and plotting the results. The resulting data can then be used in combination with hydraulic modeling to assess the bed armoring stability during a range of flow events.

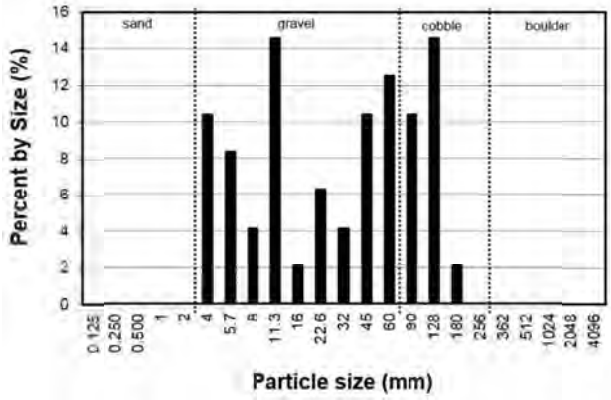
The pebble counts were conducted to determine the character of bed load sediment mobilizing in the system. They were located near the three culvert crossings described later in this report. Additional counts were not conducted partly because the substrate was uniform and in some parts was comprised entirely of bedrock. No fine-grained materials were present for which sieve analysis would have been appropriate. Results are presented below in Figure 2-4. The median particle size throughout the study area can be classified as cobble and gravel.

FIGURE 2-4
CHANNEL BED PARTICLE DISTRIBUTION

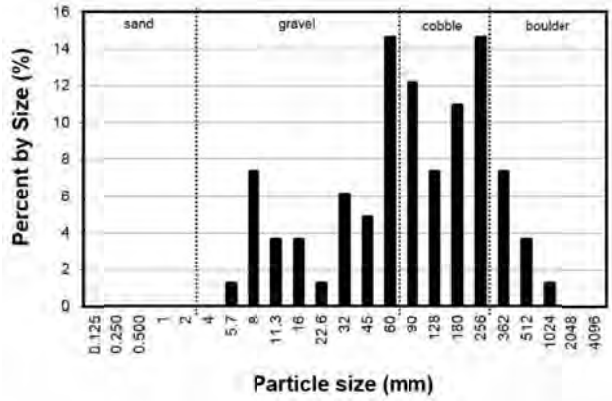
STA: 19+00 D/S OF FRISBIEVILLE ROAD



STA: 35+50 D/S OF NY ROUTE 30



STA: 61+50 U/S OF STONY BROOK ROAD



Between the Stony Brook Road culvert and the Frisbieville Road culvert, pebble counts show a larger bedload sediment size at locations that are farther upstream, starting as primarily cobble material near Stony Brook Road and transitioning to mostly gravel near Frisbieville Road. This indicates that the stream power (velocity, shear stresses, depth) and the ability of flood flows to transport sediment within this section of channel are greatest at the upstream end and decrease in the downstream direction. This could be due to a reduced slope of the channel, to less confined channel reaches, or to undersized culverts causing low velocity impoundments for the larger substrate to fall out.

2.5 Hydrology

Hydrologic peak-flow rates along Stony Brook for various frequency events were calculated by MMI using the United States Geological Survey (USGS) *StreamStats* program, which uses regional regression equations to estimate peak flows. Table 2-2 lists peak discharges along Stony Brook at several locations, as calculated using *StreamStats*.

TABLE 2-2
Peak Discharges Along Stony Brook

Channel Station (STA)	Description	Drainage Area (sq mi)	Flows (cfs)				
			2-yr	10-yr	50-yr	100-yr	500-yr
0+00	Confluence with Schoharie Creek	4.18	160	401	732	905	1,390
20+00	Upstream of Stony Brook Road	4.05	156	389	711	879	1,350
37+00	Upstream of NY Route 30	4.02	155	387	706	873	1,340
61+00	Upstream of Rosewood Lane	3.46	133	334	611	756	1,160
100+50	Confluence with unnamed tributary	3.01	116	292	535	663	1,020
106+50	Upstream of Colby Road	2.58	100	252	462	573	879
124+00	Confluence of tributary near Rack Road	2.46	95	240	441	546	840
154+00	Confluence of tributary below Stony Brook Road	1.85	73	182	336	417	641
155+00	Upstream of Stony Brook Road	1.06	43	107	198	245	378

sq mi = square miles cfs = cubic feet per second

Alluvial river channels adjust their width and depth around a long-term dynamic equilibrium condition that corresponds to "bankfull" conditions. Extensive data sets indicate the channel-forming or bankfull discharge in specific regions is primarily a function of watershed area and soil conditions. The bankfull width and depth of alluvial channels represent long-term equilibrium conditions and are important geophysical criteria that are used for design. Table 2-3 below lists estimated bankfull discharge, width, and depth at several points along Stony Brook, as derived from the USGS *StreamStats* program.

TABLE 2-3
Bankfull Characteristics Along Stony Brook

Channel Station (STA)	Description	Drainage Area (sq mi)	Bankfull Characteristics		
			Flow (cfs)	Width (feet)	Depth (feet)
0+00	Confluence with Schoharie Creek	4.18	358	33	1.7
20+00	Upstream of Stony Brook Road	4.05	349	33	1.7
37+00	Upstream of NY Route 30	4.02	347	32	1.7
61+00	Upstream of Rosewood Lane	3.46	309	30	1.6
100+50	Confluence with unnamed tributary	3.01	277	28	1.5
106+50	Upstream of Colby Road	2.58	245	26	1.4
124+00	Confluence of tributary near Rack Road	2.46	237	26	1.3
154+00	Confluence of tributary below Stony Brook Road	1.85	189	23	1.3
155+00	Upstream of Stony Brook Road	1.06	123	18	1.1

sq mi = square miles cfs = cubic feet per second

2.6 Channel History

The aerial photographs in Figures 2-5 and 2-6 below illustrate changes to the Stony Brook channel and watershed.

Image provided by SCSWCD

Figure 2-5: 1940 Channel Alignment

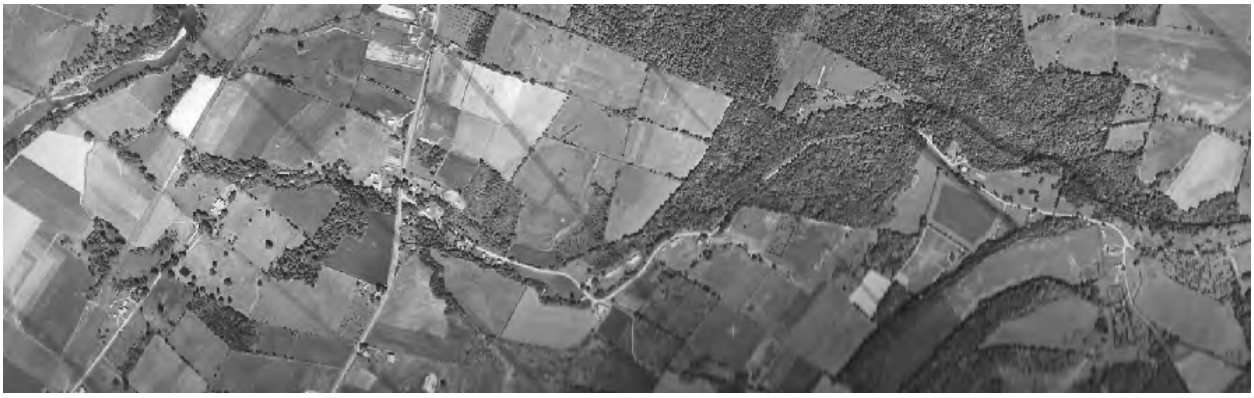


Image provided by SCSWCD

Figure 2-6: 1960 Channel Alignment

The aerial imagery between 1940 and 1960, and more recent aerial imagery, illustrates that while the watershed has undergone changes relative to the proportions of agricultural and forested land the course of the Stony Brook channel itself has been largely unchanged. Similar to today, the historical aerials show evidence of channel aggradation in the vicinity of the NY Route 30 bridge.

3.0 HYDRAULIC ANALYSIS

3.1 Introduction

The term "hydraulic analysis" refers to the computational prediction of a river's water surface elevations, depths, and velocities for specified water discharge rates. This analysis is used to evaluate flooding, scour, sediment transport, and stable channel dimensions and was used during the design of channel stabilization measures.

A hydraulic model was prepared to develop water surface profiles for the project reach using the U.S. Army Corps of Engineers' Hydrologic Engineering Center – *River Analysis System* (HEC-RAS) program (USACE, 2010). The HEC-RAS model is used to compute water surface profiles for one-dimensional, gradually varied flow for steady (i.e., flows constant over time) or unsteady (i.e., flows varying over time) flow scenarios. This system can accommodate a full network of channels, a dendritic system, or a single river reach. HEC-RAS is capable of modeling water surface profiles under subcritical (i.e., tranquil, smooth, and deep), supercritical (i.e., jetting, turbulent, and shallow), and mixed-flow conditions.

The basic computational procedure for HEC-RAS is based on the solution of the one-dimensional energy equation. Energy losses are evaluated by friction (Manning's Equation) and contraction/expansion (coefficient multiplied by the change in velocity head). The momentum equation is utilized in situations where the water surface profile is rapidly varying such as for a mixed-flow regime near dams, bridges, and confluences.

3.2 Existing Conditions

An existing conditions hydraulic model of Stony Brook was developed for the purpose of evaluating the watercourse and providing a relative benchmark with which to compare the effectiveness of proposed conditions. In developing the hydraulic model, channel cross-section data were used to define the channel dimensions at selected locations. Critical cross-section locations included areas where channel and floodplain dimensions vary moving downstream, approaching and departing structures, and at important design locations. At each location, the channel is defined by lateral station, elevation, and hydraulic roughness (i.e., sediment size and vegetative cover on the bed, banks, and overbanks).

The geometry input was obtained by compiling surveyed stream cross sections (performed by Prudent Engineering, 10/2/2015) with newly obtained LiDAR (Light Detection and Ranging) mapping (collected in June 2015 and collected/provided by the USGS). Because the LiDAR was obtained during the dry summer months and Stony Brook has been observed as almost entirely dry during low-flow periods, it is likely that the LiDAR provides a relatively accurate portrayal of the Stony Brook channel. The LiDAR mapping was compared with the ground survey and was found to be consistent with surveyed elevations throughout the channel reach. Therefore, the LiDAR was used as the primary basis for the geometry input to the hydraulic modeling, with cross sections being cut for every 50 feet of stream channel length with ground survey information used for bridge/culvert structure dimensions.

The Manning's roughness coefficient is used by the model to describe how much energy is lost as water flows over the ground due to friction. Manning's "n" values ranging from 0.03 to 0.35 were used to describe the roughness of the bankfull channel, and a coefficient of 0.1 was used to describe overbank

floodplain areas that were almost entirely forested. These values were chosen based upon guidance from USGS as well as from the United States Army Corps of Engineers (USACE) HEC-RAS documentation.

A normal slope of 0.049 feet per foot (ft/ft) was applied as the upstream boundary condition, and a normal slope of 0.008 ft/ft was applied as the downstream boundary condition. The model was run in a mixed-flow regime. Water surface elevations and velocities were developed for the bankfull, 2-, 10-, 50-, 100-, and 500-year storm events as described in the preceding section of this report.

As expected and described in preceding sections, some reach segments with entrenchment and a degraded channel show high velocity and stream power results. The following narrative describes these results.

3.3 Entrenchment Ratio and Stream Power

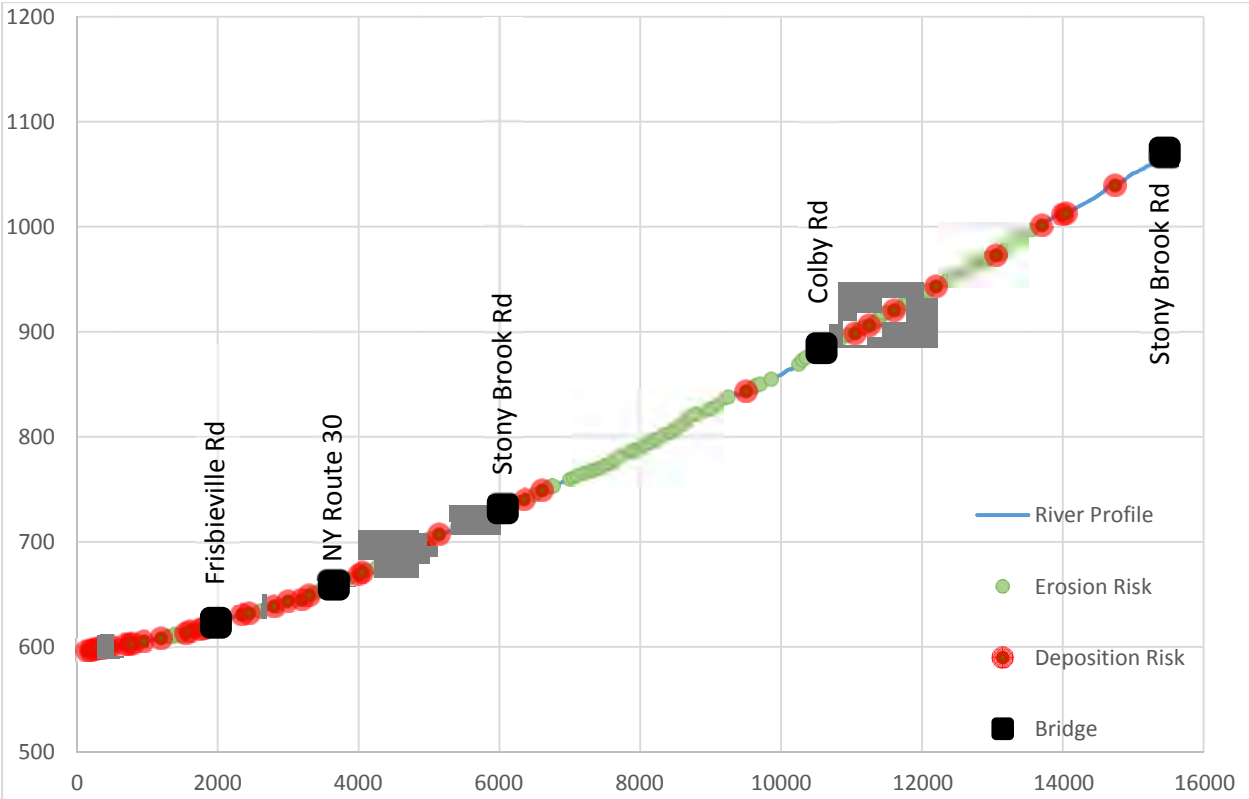
Entrenchment ratios and stream power are two metrics that can provide an understanding of the geomorphic processes that are occurring in the channel during flood flows. They can be especially helpful when attempting to understand the role of sediment in a riverine system and how that sediment is being eroded, transported, or deposited. Anecdotal evidence suggests that sediment deposition at key areas can limit the conveyance capacity of the channel and cause water to overtop the banks. Evidence of sediment aggradation and past attempts at sediment management were observed in the field during field investigations.

The entrenchment ratio is defined as the ratio between the floodplain width and the bankfull channel width of a stream. A value near one indicates that the floodplain is very narrow relative to the normal flow and indicates an incised or entrenched channel. Channels that are entrenched do not have adequate space to spread out flows and dissipate energy. They become "flumelike" in nature during a flood, with deep, fast, powerful flows being conveyed through a very narrow channel. These flows can have tremendous ability to erode and transport sediment. When a reach of channel that is highly incised sends sediment downstream to a reach where flows spread out and slow down, that sediment drops from suspension and tends to aggrade.

Stream power is another metric of the ability of flows to perform work and expend energy against the bed and banks of a stream during a flood. The equation for stream power includes variables for the volume of water flowing down the channel, the slope at which the water is flowing, and the weight of the water. This gives an indication of how much power the section of stream has. Comparing this total value to the width of the channel indicates how concentrated or confined this energy is.

Figure 3-1 was developed from HEC-RAS hydraulic modeling output. The entrenchment ratio and stream power were plotted for all segments of the stream. Cross sections where the entrenchment ratio was lower than 1.4 (indicating an entrenched channel) and the stream power value was greater than 10 pounds per foot second (lb/f s) were flagged as areas where erosion risk is high. Similarly, any area with a stream power less than 4 lb/f s was flagged as an area that would likely drop bed load sediment from transport and be subject to aggradation.

Figure 3-1
Computed Risk Areas for Sediment Erosion and Deposition
Based Upon Entrenchment and Stream Power, Bankfull Flow



The sections of channel predicted to be undergoing erosion and deposition in Figure 3-1 match well with conditions witnessed in the field. Deposition was noted upstream of the Frisbieville Road and Stony Brook Road culverts and upstream of the NY Route 30 bridge. At those locations, deposition is due in part to inadequate capacity of the culverts to convey the 100-year flood, thus creating an impoundment of slower-moving water upstream of the structure. The NY Route 30 crossing has adequate hydraulic capacity, but the channel slope and geometry leading up to the bridge cause velocities to slow.

Similarly, areas of severe entrenchment and bank erosion and instability were noted for a long reach upstream of the Stony Brook Road culvert, which is indicated. Upstream of Colby Road, many areas of unstable channel were noted as well.

3.4 Culverts and Bridges

Each bridge and culvert along Stony Brook was surveyed and inspected. As part of the assessment and development of design recommendations for Stony Brook, the bridges and culverts were evaluated to determine whether they have adequate hydraulic capacity to convey flows during large high-flow events without overtopping and whether they are contributing to flooding and channel aggradation. Table 3-1 presents a summary of limited, visual inspections at road crossings with culverts and bridges and provides the results of the assessment of hydraulic capacity.

TABLE 3-1
Stony Brook Culvert Characteristics

	Frisbieville Road STA: 19+75	NY Route 30 STA: 36+50	Private Drive STA: 40+40	Stony Brook Road at Rosewood Lane STA: 60+50	Colby Road STA: 105+75	Stony Brook Road STA 154+50
Size	7.5' h x 12' w	8.5' h x 15.5' w	Irregular	5' h x 10' w	7' diameter	5' diameter
Shape	Pipe-Arch	Four-Sided Box	Timber Bridge on Mortared Stone Abutments	Four-Sided Box	Round Pipe	Round Pipe
Material	Corrugated Galvanized Steel	Concrete	Timber/Stone	Concrete	Corrugated Metal Pipe	Corrugated Metal Pipe
Sedimentation	none	yes	none	yes	no	no
Condition	fair	good	fair	good	good	good
Approximate Capacity (cfs)	870	does not overtop	does not overtop	600	245	195
Return Interval of Overtop (years)	50-100	>500	100-500	10-50	2-5	10-50

cfs = cubic feet per second

Many of the stream crossings do not have adequate capacity to pass the 100-year flood flow without overtopping. Of specific note are the Colby Road crossing and the Stony Brook Road at Rosewood Lane crossing, both of which have very limited capacities relative to the predicted 100-year flows. These estimations are based upon current conditions with no sediment blockages; further reduction of the waterway opening from deposited sediment would further reduce their hydraulic capacity.

A Flood Evacuation Route has been designated between the population center of Middleburgh and the Rock Road Chapel shelter. This route passes through the project area, running north on NY Route 30 from Middleburgh, turning right on Stony Brook Road for 1.1 miles, and bearing left on Colby Road. This route passes over the NY Route 30 bridge, the Stony Brook Road culvert at Rosewood Lane, and the Colby Road culvert. An evacuation route map is included in Appendix E.

4.0 REPAIR AND RESTORATION DESIGN RECOMMENDATIONS

The field assessment and hydraulic analysis of the Stony Brook corridor as described above were used to identify areas along the brook that caused issues relative to flooding, excessive sediment accumulation, undersized roadway crossings, failing banks, or other maintenance concerns. These areas were designated Areas No. 1 through 7. Figure 4-1 presents these areas on a regional index plan. Once the issues affecting each area were identified, a conceptual design was developed in an attempt to mitigate those issues.

While individual concepts were developed for each area, some generalized strategies can be employed for the entire watershed, specifically relative to sediment management.

4.1 Sediment Management

Sediment accumulation can raise the elevation of the streambed and reduce flood conveyance. A natural reaction to this occurrence is typically to excavate as much sediment from the affected area as possible. Anecdotal reports indicate that overexcavation is likely to have occurred at varying points in Stony Brook, and based upon the sediment load identified during the field investigation, accumulation is likely to continue. A long-term management plan should be developed such that future accumulation of sediment can be dealt with appropriately and without causing further damage or instability to the stream corridor.

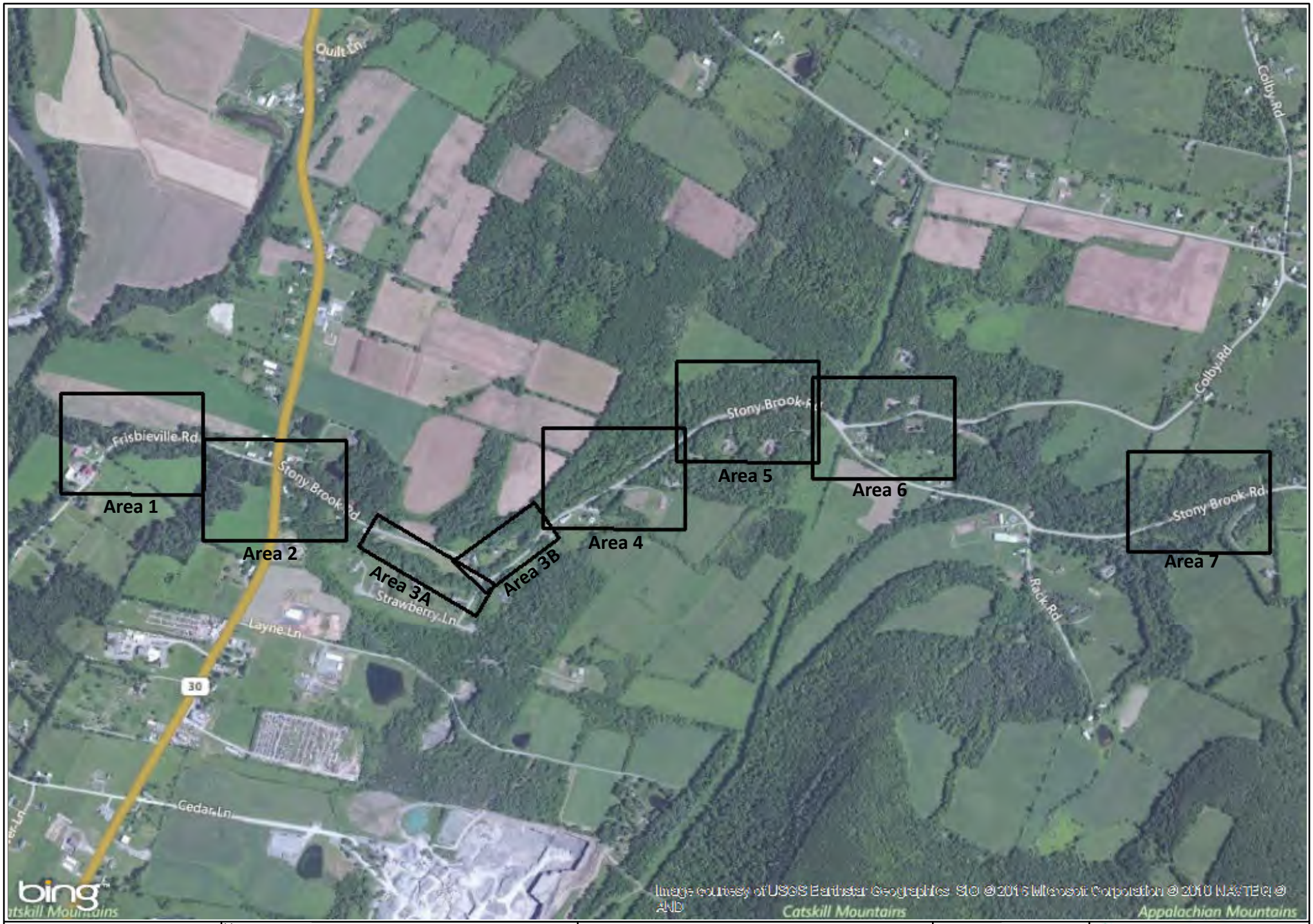
Overwidening or overdeepening of a channel through overly aggressive dredging has the potential to:

- isolate a stream from its natural floodplain
- initiate head cutting in the channel
- destabilize banks
- expose fine-grained silts and clays to erosion
- foster poor sediment transport
- result in low habitat quality
- promote additional downstream sediment deposition

A sediment maintenance program would involve the development of standards to delineate how, when, and to what dimensions sediment excavation should be performed. It will also require the proper regulatory approval as well as budgetary considerations to allow the work to be funded on an ongoing or as-needed basis as prescribed by the standards to be developed.

Conditions in which active sediment management should be considered include:

- Situations where the channel is confined without space in which to laterally migrate
- For the purpose of infrastructure protection
- At bridge openings where hydraulic capacity has been compromised
- In reaches with low habitat value



SOURCE(S): **BING Aerial Imagery with Labels**	N MXD: Y:\4805-04\Stony Brook Index Map.mxd	**Figure 4-1: Stony Brook Index Map**	**Stony Brook** **Stream Repair and Restoration** **LOCATION: Schoharie, NY**	**Map By:** CMP **MMI#:** 4805-04 **Original:** 1/8/2016 **Revision:** 1/8/2016 **Scale:** 1 in = 1,500 ft

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In cases where sediment management of the stream channel is necessary, a methodology should be developed that would allow for proper channel sizing and slope. The following guidelines are provided:

1. Maintain the original channel slope and do not overly deepen or widen the channel. Excavation should not extend beyond the channel's estimated bankfull width unless it is to match an even wider natural channel.

2. Sediment management should be limited in volume to either a single flood's deposition or to the watershed's annual sediment yield in order to preclude downstream bed degradation from lack of sediment.

3. Excavation of fine-grain sediment releases turbidity. Best available practices should be followed to control sedimentation and erosion.

4. Sediment excavation requires regulatory permits. Prior to initiation of any in-stream activities, New York State Department of Environmental Conservation should be contacted, and appropriate local, state, and federal permitting should be obtained.

5. Disposal of excavated sediments should always occur outside of the floodplain. If such materials are placed on the adjacent bank, they will be vulnerable to remobilization and redeposition during the next large storm event.

6. No sediment excavation should be undertaken in areas where rare or endangered species are located.

When excavation of depositional areas is necessary, it should be undertaken in a manner that maintains channel stability, avoiding overwidening and/or overdeepening the channel. Development of sediment management standards is recommended to provide guidance to contractors and local municipal and county public works departments on how to maintain proper channel sizing and slope as well as the application of best practices.

4.2 Localized Channel Repair, Stabilization, and Restoration Areas

A preliminary list of potential channel repairs and conceptual design alternatives for each designated area along Stony Brook is found in Table 4-1 below.

TABLE 4-1
Localized Channel Repair, Stabilization, and Restoration Areas

Area	Channel Location (STA)	Proposed Channel Repairs
	Entire watercourse	• Development of sediment management standards to guide removal of sediment and proper channel sizing
Area 1	32+00 – 14+50	• Installation of rock vane structures to improve sediment transport upstream of Frisbieville Road culvert • Develop guidelines for removal of sediments upstream of NY Route 30 bridge. • Replacement of undersized culvert at Frisbieville Road (STA 19+75)
Area 2	32+50 – 44+00	• Installation of rock vane structures to improve sediment transport upstream of NY Route 30 bridge • Removal of sidecast sediments
Area 3	48+50 – 67+00	• Develop guidelines for removal of sediments upstream of Stony Brook Road culvert. • Installation of rock vane structures to improve sediment transport upstream of Stony Brook Road culvert • Replacement of undersized culvert at Stony Brook Road (STA 60+50) • Removal of sidecast sediments
Area 4	70+00 – 82+00	• Installation of grade control to arrest channel incision and prevent additional incision between STA 102+00 and STA 73+50 • Repair and restacking of stacked rock revetment wall and installation of grade control at STA 81+50 • Roughening of channel with random boulder placement.
Area 5	86+00 – 99+00	• Bank failure repair and relocation of channel away from toe of slope between STA 94+50 and 96+00 • Roughening of channel with random boulder placement
Area 6	100+50 – 114+00	• Installation of grade control to arrest channel incision and prevent additional incision between STA 113+00 and STA 108+50 • Bank failure repair and relocation of channel away from toe of slope at STA 112+50, where bank failure potentially threatens a garage or barn at 132 Colby Road • Roughening of channel with random boulder placement
Area 7	134+00 – 150+00	• Installation of grade control to arrest channel incision and prevent additional incision between STA 152+00 and STA 139+00 • Bank failure repair and relocation of channel away from toe of slope at STA 139+00 and STA 148+00, where bank failures threaten Stony Brook Road • Roughening of channel with random boulder placement

The following table summarizes the two culverts that were recommended for replacement along Stony Brook and the size and type of proposed replacement structures. The replacements were designed to pass a 100-year flow.

TABLE 4-2
Proposed Culvert Replacements

Area	Roadway	Existing Culvert	Proposed Culvert
Area 1	Frisbieville Road	7'6"H x 12'W Galvanized Steel Pipe Arch	Twin 8'H x 10'W Concrete Box
Area 3	Stony Brook Road	5'H x 10'W Concrete Box	Twin 5'H x 20'W Concrete Box

The following table summarizes the concept design areas identified above relative to their estimated costs (for design and construction) and their relative priority (based upon the potential benefits to property, structures, and infrastructure). Estimated costs provided are a preliminary engineer's opinion of probable design and construction costs, which will require refinement as site investigations and borings are undertaken and design plans are advanced.

TABLE 4-3
Proposed Conceptual Alternatives, Cost, and Priority

Area	Description	Approximate Cost	Relative Priority
Area 1	Install rock vane structures and replace undersized culvert at Frisbieville Road.	$950,000	Medium
Area 2	Install rock vane structures.	$370,000	Low
Area 3	Install rock vane structures and replace undersized culvert at Stony Brook Road.	$970,000	High
Area 4	Install grade control structure, repair rock revetment wall, and roughen channel with random boulder placement.	$400,000	Medium
Area 5	Relocate channel away from toe of slope, stabilize bank, and roughen channel.	$280,000	Low
Area 6	Relocate channel away from toe of slope, stabilize bank, install grade control structure in bed, and roughen channel.	$310,000	High
Area 7	Relocate channel away from toe of slope, stabilize bank, install grade control structure in bed, and roughen channel.	$580,000	High

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APPENDIX A

PHOTO LOG

APPENDIX B

WOLMAN PEBBLE COUNT DATA SHEETS

APPENDIX C

HEC-RAS OUTPUT

APPENDIX D

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

APPENDIX E

FLOOD EVACUATION ROUTE MAP

APPENDIX A

PHOTO LOG

Field Assesment and Sediment Characterization
Stony Brook Flood Mitigation Assessment
Schoharie, New York
MMI #4805-04

PHOTOS TAKEN ON SEPTEMBER 9 AND OCTOBER 13, 2015

Photo 1: STA:154+50 – 5-foot CMP under Stony Brook Road

Photo 2: STA: 152+00 – High bank failure on right bank across channel from home on Stony Brook Road

Photo 3: STA: 145+50 – High bank failure along right bank, causing trees to fall into channel

Photo 4: STA: 139+00 along left bank threatens Stony Brook Road

Photo 5: STA: 131+00 – Woody debris jam

Photo 6: STA: 132+00 to 126+00 – Deeply incised channel

Photo 7: STA: 119+50 to 113+00 – bedrock acting as grade control in channel bed

Photo 8: STA: 112+50 – High bank failure potentially threatens barn on Colby Road

Photo 9: STA: 113+00 to 108+50 – Deeply incised channel through former pasture

Photo 10: STA: 105+75 – 7 foot diameter CMP under Colby Road

Photo 11: STA: 101+00 – Culvert on tributary, where incision on Stony Brook channel has run up the tributary, resulting in a drop culvert.

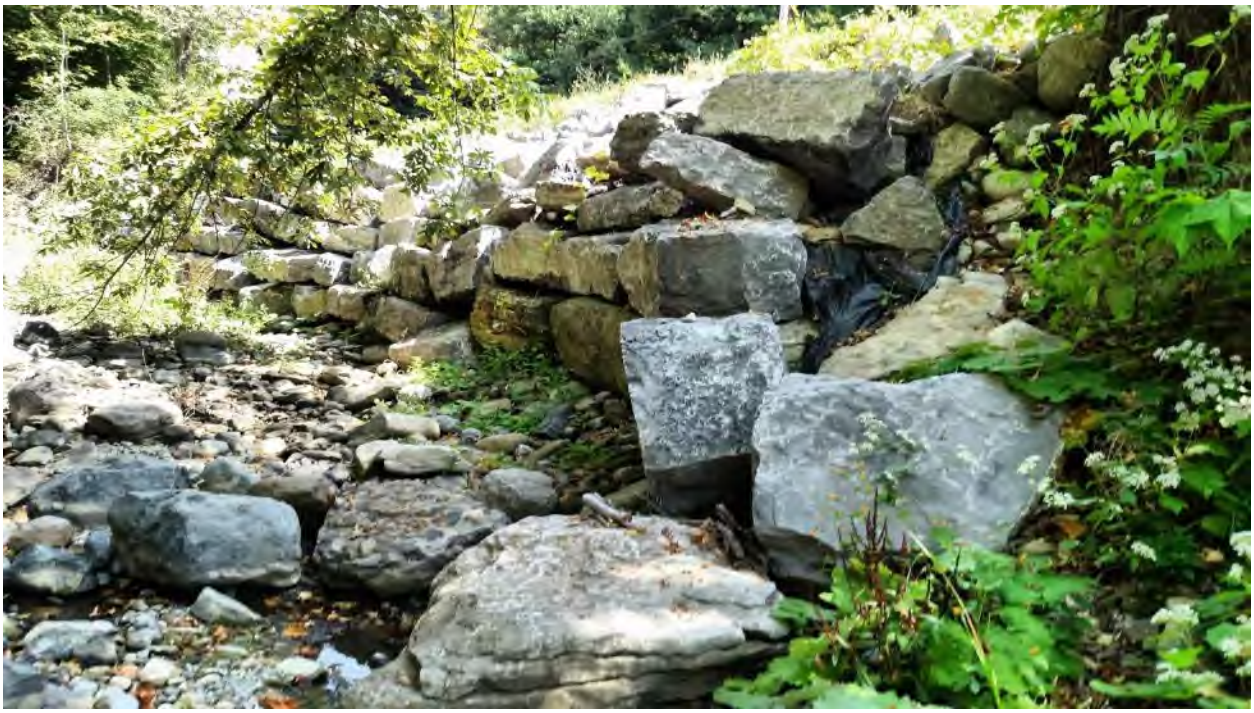


Photo 12: STA:83+00 to 81+50 – Dry-stacked rock wall supporting Stony Brook Road being undermined and damaged by floods

Photo 13: STA:102+00 to 73+50 – Deeply incised and downcutting channel, steep and unstable banks (sediment source)

Photo 14: STA:70+50 to 60+50 – Sediment deposition area. Historic dredging shows sidecast berms along banks from a recent dredge event, and a historic dredge event (based upon vegetation growth)

Photo 15: STA:62+00 – Sediment deposition area, no recent dredging seen. Bankfull channel full to top of banks.

Photo 16: STA: 60+50 – Upstream of Stony Brook Road culvert

Photo 17: STA:60+50 – Sediment deposition inside Stony Brook culvert

Photo 18: STA 60+00 – Post-dredged reach below Stony Brook culvert

Photo 19: STA: 51+00 to 48+00 – Bedrock channel bed and change in vertical grade

Photo 20: STA 48+00 – Looking upstream at bedrock waterfall/grade control

Photo 21: STA 48+00 – Looking downstream from bedrock grade control at highly incised and downcutting channel

Photo 22: STA 45+00 – Eroding and unstable banks caused by downcutting channel

Photo 23: STA: 40+00 to 41+00 – Bedrock channel bed and change in vertical grade

Photo 24: STA: 40+40 – Private driveway bridge

Photo 25: STA: 38+00 Bedrock in channel upstream of Route 30

Photo 26: STA: 37+00 – Vegetated sediment bar where aggrading sediment accumulates upstream of Route 30 bridge.

Photo 27: STA 36+50 – Route 30 bridge

Photo 28: STA: 36+00 – Downstream of Route 30 bridge

Photo 29: STA 36+00 – Channel looking downstream of Route 30 bridge.

Photo 30: STA 22+00 along Frisbieville Road

Photo 31: STA 20+00 – Sediment deposition area. Historic dredging shows sidecast berms along banks from a recent dredge event, and a historic dredge event (based upon vegetation growth)

Photo 32: STA: 19+75 – Frisbieville Road culvert, upstream end

Photo 33: STA: 19+00 – Frisbieville Road culvert, downstream end

Photo 34: Photo provided by landowner, taken during June 2013 flood event

Photo 35: Photo provided by landowner, taken during June 2013 flood event

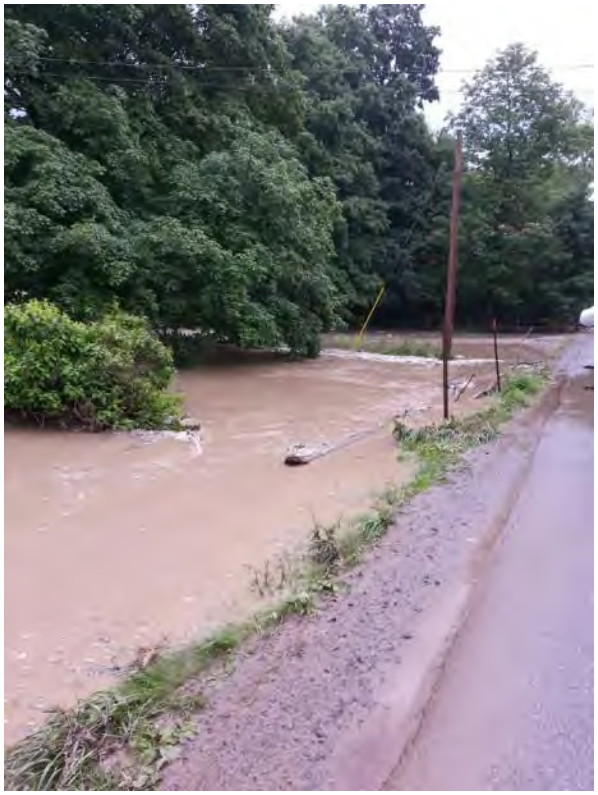


Photo 36: Photo provided by landowner, taken during June 2013 flood event

APPENDIX B

WOLMAN PEBBLE COUNT DATA SHEETS

Project Information

Project Name	Stony Brook
Project Number	4805-04
Stream / Station	Stony Brook 17+00
Town, State	Schoharie, NY
Sample Date	9/9/2015
Sampled By	MCB
Sample Method	Wolman Pebble Count

Particle Distribution (%)

silt/clay	0
sand	0
gravel	68
cobble	32
boulder	0
bedrock	0

Sample Site Descriptions by Observations

Channel type	
Misc. Notes	Downstream of Frisbieville Road
	Heavily armored bed, cobble sediment transported from upstream

Particle Sizes (mm)

D16	12
D35	19
D50	**31**
D84	85
D95	144

(Bunte and Abt, 2001)

Particle Name	Size Limits (mm) lower	upper	Tally	Count	Percent Passing	Cumulative % Finer
silt/clay	0	**0.063**			0.0	0.0
very fine sand	0.063	**0.125**			0.0	0.0
fine sand	0.125	**0.250**			0.0	0.0
medium sand	0.250	**0.500**			0.0	0.0
coarse sand	0.500	**1**			0.0	0.0
very coarse sand	1	**2**			0.0	0.0
very fine gravel	2	**4**	1	1	1.9	1.9
fine gravel	4	**5.7**	11	2	3.8	5.7
fine gravel	5.7	**8**	1	1	1.9	7.5
medium gravel	8	**11.3**	111	4	7.5	15.1
medium gravel	11.3	**16**	1111111	7	13.2	28.3
coarse gravel	16	**22.6**	1111111	7	13.2	41.5
coarse gravel	22.6	**32**	11111	5	9.4	50.9
very coarse gravel	32	**45**	11111	5	9.4	60.4
very coarse gravel	45	**60**	1111	4	7.5	67.9
small cobble	60	**90**	1111111111	10	18.9	86.8
medium cobble	90	**128**	1111	4	7.5	94.3
large cobble	128	**180**	1	1	1.9	96.2
very large cobble	180	**256**	11	2	3.8	100.0
small boulder	256	**362**			0.0	100.0
small boulder	362	**512**			0.0	100.0
medium boulder	512	**1024**			0.0	100.0
large boulder	1024	**2048**			0.0	100.0
very large boulder	2048	**4096**			0.0	100.0
bedrock	4096	**-**			0.0	100.0
			Total	53	100.0	-

(Wenthworth, 1922)

F-T Particle Sizes (mm)

F-T n-value	0.5
D16	3.2
D5	0.3

(Fuller and Thompson, 1907)

D (mm) of the largest mobile particles on bar

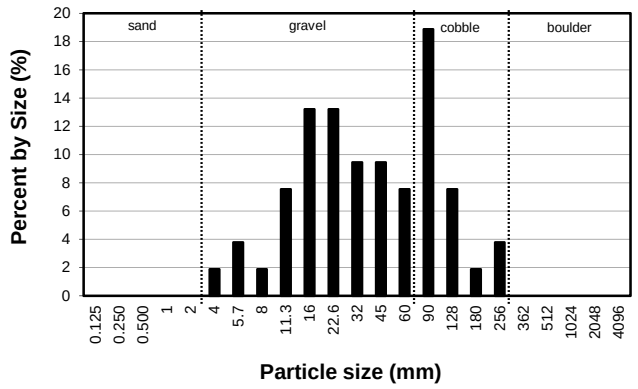
Mean	

Riffle Stability Index (%)

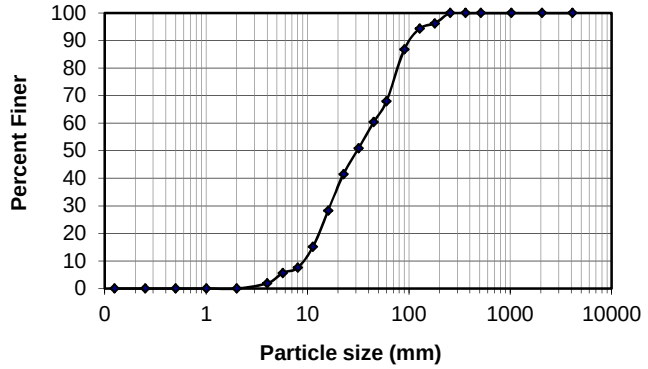
(Kappesser, 2002)

Notes

Particle Size Histogram



Gradation Curve



Project Information

Project Name	Stony Brook
Project Number	4805-04
Stream / Station	Stony Brook 32+50
Town, State	Schoharie, NY
Sample Date	9/9/2015
Sampled By	MCB
Sample Method	Wolman Pebble Count

Particle Distribution (%)

silt/clay	0
sand	0
gravel	73
cobble	27
boulder	0
bedrock	0

Sample Site Descriptions by Observations

Channel type	
Misc. Notes	Downstream of Route 30 Bridge
	Heavily armored bed, cobble sediment transported from upstream

Particle Sizes (mm)

D16	5
D35	11
D50	**32**
D84	91
D95	119

(Bunte and Abt, 2001)

Particle Name	Size Limits (mm) lower	upper	Tally	Count	Percent Passing	Cumulative % Finer
silt/clay	0	**0.063**			0.0	0.0
very fine sand	0.063	**0.125**			0.0	0.0
fine sand	0.125	**0.250**			0.0	0.0
medium sand	0.250	**0.500**			0.0	0.0
coarse sand	0.500	**1**			0.0	0.0
very coarse sand	1	**2**			0.0	0.0
very fine gravel	2	**4**	11111	5	10.4	10.4
fine gravel	4	**5.7**	1111	4	8.3	18.8
fine gravel	5.7	**8**	11	2	4.2	22.9
medium gravel	8	**11.3**	1111111	7	14.6	37.5
medium gravel	11.3	**16**	1	1	2.1	39.6
coarse gravel	16	**22.6**	111	3	6.3	45.8
coarse gravel	22.6	**32**	11	2	4.2	50.0
very coarse gravel	32	**45**	11111	5	10.4	60.4
very coarse gravel	45	**60**	111111	6	12.5	72.9
small cobble	60	**90**	11111	5	10.4	83.3
medium cobble	90	**128**	1111111	7	14.6	97.9
large cobble	128	**180**	1	1	2.1	100.0
very large cobble	180	**256**			0.0	100.0
small boulder	256	**362**			0.0	100.0
small boulder	362	**512**			0.0	100.0
medium boulder	512	**1024**			0.0	100.0
large boulder	1024	**2048**			0.0	100.0
very large boulder	2048	**4096**			0.0	100.0
bedrock	4096	**-**			0.0	100.0
			Total	48	100.0	-

(Wenthworth, 1922)

F-T Particle Sizes (mm)

F-T n-value	0.5
D16	3.3
D5	0.3

(Fuller and Thompson, 1907)

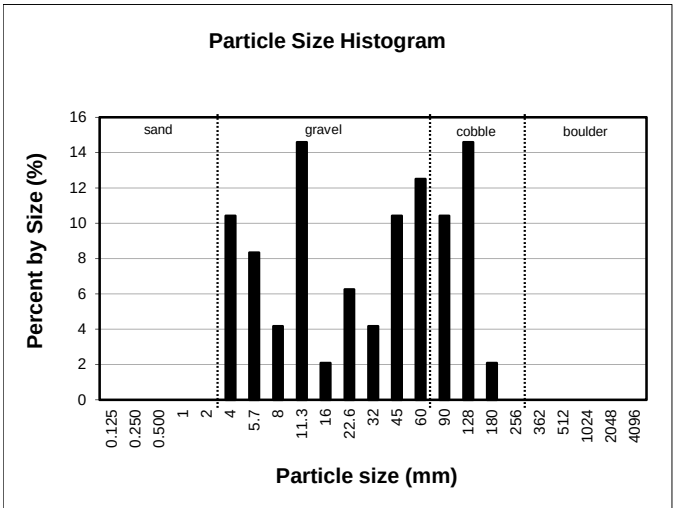
D (mm) of the largest mobile particles on bar

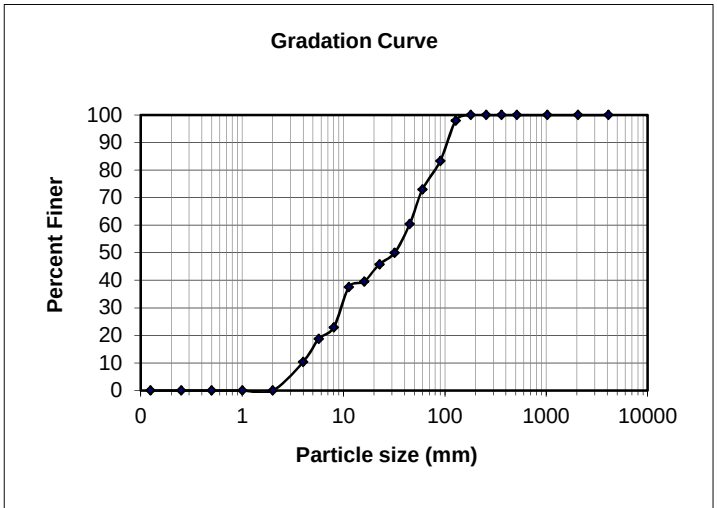
Mean	

Riffle Stability Index (%)

(Kappesser, 2002)

Notes





Project Information

Project Name	Stony Brook
Project Number	4805-04
Stream / Station	Stony Brook 58+00
Town, State	Schoharie, NY
Sample Date	9/9/2015
Sampled By	MCB
Sample Method	Wolman Pebble Count

Particle Distribution (%)

silt/clay	0
sand	0
gravel	43
cobble	45
boulder	12
bedrock	0

Sample Site Descriptions by Observations

Channel type	
Misc. Notes	Downstream of Route 30 Bridge
	Heavily armored bed, cobble sediment transported from upstream

Particle Sizes (mm)

D16	17
D35	52
D50	**77**
D84	234
D95	360

(Bunte and Abt, 2001)

Particle Name	Size Limits (mm) lower	upper	Tally	Count	Percent Passing	Cumulative % Finer
silt/clay	0	**0.063**			0.0	0.0
very fine sand	0.063	**0.125**			0.0	0.0
fine sand	0.125	**0.250**			0.0	0.0
medium sand	0.250	**0.500**			0.0	0.0
coarse sand	0.500	**1**			0.0	0.0
very coarse sand	1	**2**			0.0	0.0
very fine gravel	2	**4**			0.0	0.0
fine gravel	4	**5.7**	1	1	1.2	1.2
fine gravel	5.7	**8**	111111	6	7.3	8.5
medium gravel	8	**11.3**	111	3	3.7	12.2
medium gravel	11.3	**16**	111	3	3.7	15.9
coarse gravel	16	**22.6**	1	1	1.2	17.1
coarse gravel	22.6	**32**	11111	5	6.1	23.2
very coarse gravel	32	**45**	1111	4	4.9	28.0
very coarse gravel	45	**60**	111111111111	12	14.6	42.7
small cobble	60	**90**	1111111111	10	12.2	54.9
medium cobble	90	**128**	111111	6	7.3	62.2
large cobble	128	**180**	111111111	9	11.0	73.2
very large cobble	180	**256**	111111111111	12	14.6	87.8
small boulder	256	**362**	111111	6	7.3	95.1
small boulder	362	**512**	111	3	3.7	98.8
medium boulder	512	**1024**	1	1	1.2	100.0
large boulder	1024	**2048**			0.0	100.0
very large boulder	2048	**4096**			0.0	100.0
bedrock	4096	**-**			0.0	100.0
			Total	82	100.0	-

(Wenthworth, 1922)

F-T Particle Sizes (mm)

F-T n-value	0.5
D16	7.8
D5	0.8

(Fuller and Thompson, 1907)

D (mm) of the largest mobile particles on bar

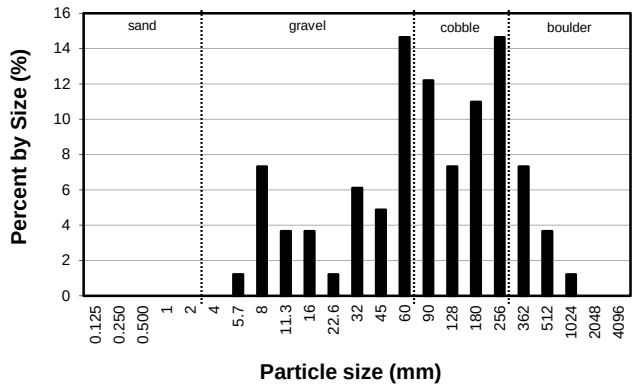
Mean	

Riffle Stability Index (%)

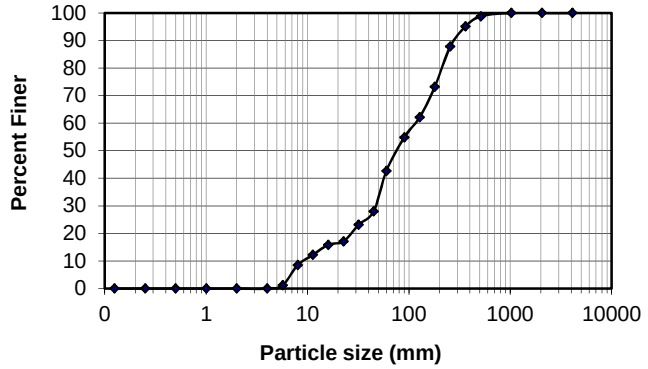
(Kappesser, 2002)

Notes

Particle Size Histogram



Gradation Curve



APPENDIX C

HEC-RAS OUTPUT

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X    X  XXXXXX   XXXX      XXXX     XX     XXXX
X    X  X      X   X     X  X    X X   X
X    X  X      X        X  X   X   X  X
XXXXXXX  XXXX   X     XXX  XXXX   XXXXXX   XXXX
X    X  X      X        X X    X   X     X
X    X  X      X   X     X  X   X   X     X
X    X  XXXXXX   XXXX      X   X  X   X  XXXXX
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PROJECT DATA
Project Title: Stony Brook
Project File : StonyBrook.prj
Run Date and Time: 11/12/2015 1:35:41 PM

Project in English units

PLAN DATA

Plan Title: ExCond Plan
Plan File : w:\Design\4805-04-DE\Comps\HEC-RAS\Current\StonyBrook.p01

Geometry Title: ExCond - 2015 LIDAR
Geometry File : w:\Design\4805-04-DE\Comps\HEC-RAS\Current\StonyBrook.g01

Flow Title : ExCond Streamstats
Flow File : w:\Design\4805-04-DE\Comps\HEC-RAS\Current\StonyBrook.f01

Plan Summary Information:
Number of: Cross Sections = 307 Multiple Openings = 0
Culverts = 6 Inline Structures = 0
Bridges = 0 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary

Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: ExCond Streamstats
Flow File : w:\Design\4805-04-DE\Comps\HEC-RAS\Current\StonyBrook.f01

Flow Data (cfs)

River	Reach	RS	Bankfull	2-yr	10-yr	50-yr	100-yr	500-yr
STONY BROOK CENT	STONY BROOK CENT	15650	123	43	107	198	245	378
STONY BROOK CENT	STONY BROOK CENT	15500	123	43	107	198	245	378
STONY BROOK CENT	STONY BROOK CENT	15400	189	73	182	336	417	641
STONY BROOK CENT	STONY BROOK CENT	12400	237	95	240	441	546	840
STONY BROOK CENT	STONY BROOK CENT	10650	245	100	252	462	573	879
STONY BROOK CENT	STONY BROOK CENT	10050	277	116	292	535	663	1020
STONY BROOK CENT	STONY BROOK CENT	6100	309	133	334	611	756	1160
STONY BROOK CENT	STONY BROOK CENT	3700	347	155	387	706	873	1340
STONY BROOK CENT	STONY BROOK CENT	2000	349	156	389	711	879	1350

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
STONY BROOK CENT	STONY BROOK CENT	Bankfull	Normal S = 0.049	Normal S = 0.008
STONY BROOK CENT	STONY BROOK CENT	2-yr	Normal S = 0.049	Normal S = 0.008
STONY BROOK CENT	STONY BROOK CENT	10-yr	Normal S = 0.049	Normal S = 0.008
STONY BROOK CENT	STONY BROOK CENT	50-yr	Normal S = 0.049	Normal S = 0.008
STONY BROOK CENT	STONY BROOK CENT	100-yr	Normal S = 0.049	Normal S = 0.008
STONY BROOK CENT	STONY BROOK CENT	500-yr	Normal S = 0.049	Normal S = 0.008

SUMMARY OF MANNING'S N VALUES

River:STONY BROOK CENT

Reach	River Sta.	n1	n2	n3

STONY BROOK CENT	15650	.1	.035	.1
STONY BROOK CENT	15600	.1	.035	.1
STONY BROOK CENT	15550	.1	.035	.1
STONY BROOK CENT	15500	.1	.035	.1
STONY BROOK CENT	15450	Culvert		
STONY BROOK CENT	15400	.1	.03	.1
STONY BROOK CENT	15350	.1	.03	.1
STONY BROOK CENT	15300	.1	.03	.1
STONY BROOK CENT	15250	.1	.03	.1
STONY BROOK CENT	15200	.1	.03	.1
STONY BROOK CENT	15150	.1	.035	.1
STONY BROOK CENT	15100	.1	.035	.1
STONY BROOK CENT	15050	.1	.035	.1
STONY BROOK CENT	15000	.1	.035	.1
STONY BROOK CENT	14950	.1	.035	.1
STONY BROOK CENT	14900	.1	.035	.1
STONY BROOK CENT	14850	.1	.035	.1
STONY BROOK CENT	14800	.1	.035	.1
STONY BROOK CENT	14750	.1	.035	.1
STONY BROOK CENT	14700	.1	.035	.1
STONY BROOK CENT	14650	.1	.035	.1
STONY BROOK CENT	14600	.1	.035	.1
STONY BROOK CENT	14550	.1	.035	.1
STONY BROOK CENT	14500	.1	.035	.1
STONY BROOK CENT	14450	.1	.035	.1
STONY BROOK CENT	14400	.1	.035	.1
STONY BROOK CENT	14350	.1	.035	.1
STONY BROOK CENT	14300	.1	.035	.1
STONY BROOK CENT	14250	.1	.035	.1
STONY BROOK CENT	14200	.1	.035	.1
STONY BROOK CENT	14150	.1	.035	.1
STONY BROOK CENT	14100	.1	.035	.1
STONY BROOK CENT	14050	.1	.035	.1
STONY BROOK CENT	14000	.1	.035	.1
STONY BROOK CENT	13950	.1	.035	.1
STONY BROOK CENT	13900	.1	.035	.1
STONY BROOK CENT	13850	.1	.035	.1
STONY BROOK CENT	13800	.1	.035	.1
STONY BROOK CENT	13750	.1	.035	.1
STONY BROOK CENT	13700	.1	.035	.1
STONY BROOK CENT	13650	.1	.035	.1
STONY BROOK CENT	13600	.1	.035	.1
STONY BROOK CENT	13550	.1	.035	.1
STONY BROOK CENT	13500	.1	.035	.1
STONY BROOK CENT	13450	.1	.035	.1
STONY BROOK CENT	13400	.1	.035	.1
STONY BROOK CENT	13350	.1	.035	.1
STONY BROOK CENT	13300	.1	.035	.1
STONY BROOK CENT	13250	.1	.035	.1
STONY BROOK CENT	13200	.1	.035	.1
STONY BROOK CENT	13150	.1	.035	.1
STONY BROOK CENT	13100	.1	.035	.1
STONY BROOK CENT	13050	.1	.035	.1

STONY BROOK CENT	13000	.1	.035	.1
STONY BROOK CENT	12950	.1	.035	.1
STONY BROOK CENT	12900	.1	.035	.1
STONY BROOK CENT	12850	.1	.035	.1
STONY BROOK CENT	12800	.1	.035	.1
STONY BROOK CENT	12750	.1	.035	.1
STONY BROOK CENT	12700	.1	.035	.1
STONY BROOK CENT	12650	.1	.035	.1
STONY BROOK CENT	12600	.1	.035	.1
STONY BROOK CENT	12550	.1	.035	.1
STONY BROOK CENT	12500	.1	.035	.1
STONY BROOK CENT	12450	.1	.035	.1
STONY BROOK CENT	12400	.1	.035	.1
STONY BROOK CENT	12350	.1	.035	.1
STONY BROOK CENT	12300	.1	.035	.1
STONY BROOK CENT	12250	.1	.035	.1
STONY BROOK CENT	12200	.1	.035	.1
STONY BROOK CENT	12150	.1	.035	.1
STONY BROOK CENT	12100	.1	.035	.1
STONY BROOK CENT	12050	.1	.035	.1
STONY BROOK CENT	12000	.1	.035	.1
STONY BROOK CENT	11950	.1	.035	.1
STONY BROOK CENT	11900	.1	.035	.1
STONY BROOK CENT	11850	.1	.035	.1
STONY BROOK CENT	11800	.1	.035	.1
STONY BROOK CENT	11750	.1	.035	.1
STONY BROOK CENT	11700	.1	.035	.1
STONY BROOK CENT	11650	.1	.035	.1
STONY BROOK CENT	11600	.1	.035	.1
STONY BROOK CENT	11550	.1	.035	.1
STONY BROOK CENT	11500	.1	.035	.1
STONY BROOK CENT	11450	.1	.035	.1
STONY BROOK CENT	11400	.1	.035	.1
STONY BROOK CENT	11350	.1	.035	.1
STONY BROOK CENT	11300	.1	.035	.1
STONY BROOK CENT	11250	.1	.035	.1
STONY BROOK CENT	11200	.1	.035	.1
STONY BROOK CENT	11150	.1	.035	.1
STONY BROOK CENT	11100	.1	.035	.1
STONY BROOK CENT	11050	.1	.035	.1
STONY BROOK CENT	11000	.1	.035	.1
STONY BROOK CENT	10950	.1	.035	.1
STONY BROOK CENT	10900	.1	.035	.1
STONY BROOK CENT	10850	.1	.035	.1
STONY BROOK CENT	10800	.1	.035	.1
STONY BROOK CENT	10750	.1	.035	.1
STONY BROOK CENT	10700	.1	.035	.1
STONY BROOK CENT	10650	.1	.035	.1
STONY BROOK CENT	10575	Culvert		
STONY BROOK CENT	10550	.1	.03	.1
STONY BROOK CENT	10500	.1	.03	.1
STONY BROOK CENT	10450	.1	.03	.1
STONY BROOK CENT	10400	.1	.03	.1
STONY BROOK CENT	10350	.1	.035	.1

STONY BROOK CENT	10300	.1	.035	.1
STONY BROOK CENT	10250	.1	.035	.1
STONY BROOK CENT	10200	.1	.035	.1
STONY BROOK CENT	10150	.1	.035	.1
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STONY BROOK CENT	9600	.1	.035	.1
STONY BROOK CENT	9550	.1	.035	.1
STONY BROOK CENT	9500	.1	.035	.1
STONY BROOK CENT	9450	.1	.035	.1
STONY BROOK CENT	9400	.1	.035	.1
STONY BROOK CENT	9350	.1	.035	.1
STONY BROOK CENT	9300	.1	.035	.1
STONY BROOK CENT	9250	.1	.035	.1
STONY BROOK CENT	9200	.1	.035	.1
STONY BROOK CENT	9150	.1	.035	.1
STONY BROOK CENT	9100	.1	.035	.1
STONY BROOK CENT	9050	.1	.035	.1
STONY BROOK CENT	9000	.1	.035	.1
STONY BROOK CENT	8950	.1	.035	.1
STONY BROOK CENT	8900	.1	.035	.1
STONY BROOK CENT	8850	.1	.035	.1
STONY BROOK CENT	8800	.1	.035	.1
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STONY BROOK CENT	8700	.1	.035	.1
STONY BROOK CENT	8650	.1	.035	.1
STONY BROOK CENT	8600	.1	.035	.1
STONY BROOK CENT	8550	.1	.035	.1
STONY BROOK CENT	8500	.1	.035	.1
STONY BROOK CENT	8450	.1	.035	.1
STONY BROOK CENT	8400	.1	.035	.1
STONY BROOK CENT	8350	.1	.035	.1
STONY BROOK CENT	8300	.1	.035	.1
STONY BROOK CENT	8250	.1	.035	.1
STONY BROOK CENT	8200	.1	.035	.1
STONY BROOK CENT	8150	.1	.035	.1
STONY BROOK CENT	8100	.1	.035	.1
STONY BROOK CENT	8050	.1	.035	.1
STONY BROOK CENT	8000	.1	.035	.1
STONY BROOK CENT	7950	.1	.035	.1
STONY BROOK CENT	7900	.1	.035	.1
STONY BROOK CENT	7850	.1	.035	.1
STONY BROOK CENT	7800	.1	.035	.1
STONY BROOK CENT	7750	.1	.035	.1
STONY BROOK CENT	7700	.1	.035	.1
STONY BROOK CENT	7650	.1	.035	.1

STONY BROOK CENT	7600	.1	.035	.1
STONY BROOK CENT	7550	.1	.035	.1
STONY BROOK CENT	7500	.1	.035	.1
STONY BROOK CENT	7450	.1	.035	.1
STONY BROOK CENT	7400	.1	.035	.1
STONY BROOK CENT	7350	.1	.035	.1
STONY BROOK CENT	7300	.1	.035	.1
STONY BROOK CENT	7250	.1	.035	.1
STONY BROOK CENT	7200	.1	.035	.1
STONY BROOK CENT	7150	.1	.035	.1
STONY BROOK CENT	7100	.1	.035	.1
STONY BROOK CENT	7050	.1	.035	.1
STONY BROOK CENT	7000	.1	.035	.1
STONY BROOK CENT	6950	.1	.035	.1
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STONY BROOK CENT	6750	.1	.035	.1
STONY BROOK CENT	6700	.1	.035	.1
STONY BROOK CENT	6650	.1	.035	.1
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STONY BROOK CENT	6550	.1	.035	.1
STONY BROOK CENT	6500	.1	.035	.1
STONY BROOK CENT	6450	.1	.035	.1
STONY BROOK CENT	6400	.1	.035	.1
STONY BROOK CENT	6350	.1	.035	.1
STONY BROOK CENT	6300	.1	.035	.1
STONY BROOK CENT	6250	.1	.035	.1
STONY BROOK CENT	6200	.1	.035	.1
STONY BROOK CENT	6150	.1	.035	.1
STONY BROOK CENT	6100	.1	.035	.1
STONY BROOK CENT	6050	Culvert		
STONY BROOK CENT	6000	.1	.03	.1
STONY BROOK CENT	5950	.1	.03	.1
STONY BROOK CENT	5900	.1	.03	.1
STONY BROOK CENT	5850	.1	.03	.1
STONY BROOK CENT	5800	.1	.035	.1
STONY BROOK CENT	5750	.1	.035	.1
STONY BROOK CENT	5700	.1	.035	.1
STONY BROOK CENT	5650	.1	.035	.1
STONY BROOK CENT	5600	.1	.035	.1
STONY BROOK CENT	5550	.1	.035	.1
STONY BROOK CENT	5500	.1	.035	.1
STONY BROOK CENT	5450	.1	.035	.1
STONY BROOK CENT	5400	.1	.035	.1
STONY BROOK CENT	5350	.1	.035	.1
STONY BROOK CENT	5300	.1	.035	.1
STONY BROOK CENT	5250	.1	.035	.1
STONY BROOK CENT	5200	.1	.035	.1
STONY BROOK CENT	5150	.1	.035	.1
STONY BROOK CENT	5100	.1	.035	.1
STONY BROOK CENT	5050	.1	.035	.1
STONY BROOK CENT	5000	.1	.035	.1
STONY BROOK CENT	4950	.1	.035	.1

STONY BROOK CENT	4900	.1	.035	.1
STONY BROOK CENT	4850	.1	.035	.1
STONY BROOK CENT	4800	.1	.035	.1
STONY BROOK CENT	4750	.1	.035	.1
STONY BROOK CENT	4700	.1	.035	.1
STONY BROOK CENT	4650	.1	.035	.1
STONY BROOK CENT	4600	.1	.035	.1
STONY BROOK CENT	4550	.1	.035	.1
STONY BROOK CENT	4500	.1	.035	.1
STONY BROOK CENT	4450	.1	.035	.1
STONY BROOK CENT	4400	.1	.035	.1
STONY BROOK CENT	4350	.1	.035	.1
STONY BROOK CENT	4300	.1	.035	.1
STONY BROOK CENT	4250	.1	.035	.1
STONY BROOK CENT	4200	.1	.035	.1
STONY BROOK CENT	4150	.1	.035	.1
STONY BROOK CENT	4100	.1	.035	.1
STONY BROOK CENT	4040	Culvert		
STONY BROOK CENT	4000	.1	.035	.1
STONY BROOK CENT	3950	.1	.035	.1
STONY BROOK CENT	3900	.1	.035	.1
STONY BROOK CENT	3850	.1	.035	.1
STONY BROOK CENT	3800	.1	.035	.1
STONY BROOK CENT	3750	.1	.035	.1
STONY BROOK CENT	3700	.1	.035	.1
STONY BROOK CENT	3650	Culvert		
STONY BROOK CENT	3600	.1	.03	.1
STONY BROOK CENT	3550	.1	.03	.1
STONY BROOK CENT	3500	.1	.03	.1
STONY BROOK CENT	3450	.1	.03	.1
STONY BROOK CENT	3400	.1	.035	.1
STONY BROOK CENT	3350	.1	.035	.1
STONY BROOK CENT	3300	.1	.035	.1
STONY BROOK CENT	3250	.1	.035	.1
STONY BROOK CENT	3200	.1	.035	.1
STONY BROOK CENT	3150	.1	.035	.1
STONY BROOK CENT	3100	.1	.035	.1
STONY BROOK CENT	3050	.1	.035	.1
STONY BROOK CENT	3000	.1	.035	.1
STONY BROOK CENT	2950	.1	.035	.1
STONY BROOK CENT	2900	.1	.035	.1
STONY BROOK CENT	2850	.1	.035	.1
STONY BROOK CENT	2800	.1	.035	.1
STONY BROOK CENT	2750	.1	.035	.1
STONY BROOK CENT	2700	.1	.035	.1
STONY BROOK CENT	2650	.1	.035	.1
STONY BROOK CENT	2600	.1	.035	.1
STONY BROOK CENT	2550	.1	.035	.1
STONY BROOK CENT	2500	.1	.035	.1
STONY BROOK CENT	2450	.1	.035	.1
STONY BROOK CENT	2400	.1	.035	.1
STONY BROOK CENT	2350	.1	.035	.1
STONY BROOK CENT	2300	.1	.035	.1
STONY BROOK CENT	2250	.1	.035	.1

STONY BROOK CENT	2200	.1	.035	.1
STONY BROOK CENT	2150	.1	.035	.1
STONY BROOK CENT	2100	.1	.035	.1
STONY BROOK CENT	2050	.1	.035	.1
STONY BROOK CENT	2000	.1	.035	.1
STONY BROOK CENT	1975	Culvert		
STONY BROOK CENT	1950	.1	.03	.1
STONY BROOK CENT	1900	.1	.03	.1
STONY BROOK CENT	1850	.1	.03	.1
STONY BROOK CENT	1800	.1	.03	.1
STONY BROOK CENT	1750	.1	.035	.1
STONY BROOK CENT	1700	.1	.035	.1
STONY BROOK CENT	1650	.1	.035	.1
STONY BROOK CENT	1600	.1	.035	.1
STONY BROOK CENT	1550	.1	.035	.1
STONY BROOK CENT	1500	.1	.035	.1
STONY BROOK CENT	1450	.1	.035	.1
STONY BROOK CENT	1400	.1	.035	.1
STONY BROOK CENT	1350	.1	.035	.1
STONY BROOK CENT	1300	.1	.035	.1
STONY BROOK CENT	1250	.1	.035	.1
STONY BROOK CENT	1200	.1	.035	.1
STONY BROOK CENT	1150	.1	.035	.1
STONY BROOK CENT	1100	.1	.035	.1
STONY BROOK CENT	1050	.1	.035	.1
STONY BROOK CENT	1000	.1	.035	.1
STONY BROOK CENT	950	.1	.035	.1
STONY BROOK CENT	900	.1	.035	.1
STONY BROOK CENT	850	.1	.035	.1
STONY BROOK CENT	800	.1	.035	.1
STONY BROOK CENT	750	.1	.035	.1
STONY BROOK CENT	700	.1	.035	.1
STONY BROOK CENT	650	.1	.035	.1
STONY BROOK CENT	600	.1	.035	.1
STONY BROOK CENT	550	.1	.035	.1
STONY BROOK CENT	500	.1	.035	.1
STONY BROOK CENT	450	.1	.035	.1
STONY BROOK CENT	400	.1	.035	.1
STONY BROOK CENT	350	.1	.035	.1
STONY BROOK CENT	300	.1	.035	.1
STONY BROOK CENT	250	.1	.035	.1
STONY BROOK CENT	200	.1	.035	.1
STONY BROOK CENT	150	.1	.035	.1
STONY BROOK CENT	100	.1	.035	.1

SUMMARY OF REACH LENGTHS

River: STONY BROOK CENT

Reach	River Sta.	Left	Channel	Right

STONY BROOK CENT	15650	50	50	50
STONY BROOK CENT	15600	50	50	50
STONY BROOK CENT	15550	50	50	50
STONY BROOK CENT	15500	100	100	100
STONY BROOK CENT	15450	Culvert		
STONY BROOK CENT	15400	50	50	50
STONY BROOK CENT	15350	50	50	50
STONY BROOK CENT	15300	50	50	50
STONY BROOK CENT	15250	50	50	50
STONY BROOK CENT	15200	50	50	50
STONY BROOK CENT	15150	50	50	50
STONY BROOK CENT	15100	50	50	50
STONY BROOK CENT	15050	50	50	50
STONY BROOK CENT	15000	50	50	50
STONY BROOK CENT	14950	50	50	50
STONY BROOK CENT	14900	50	50	50
STONY BROOK CENT	14850	50	50	50
STONY BROOK CENT	14800	50	50	50
STONY BROOK CENT	14750	50	50	50
STONY BROOK CENT	14700	50	50	50
STONY BROOK CENT	14650	50	50	50
STONY BROOK CENT	14600	50	50	50
STONY BROOK CENT	14550	50	50	50
STONY BROOK CENT	14500	50	50	50
STONY BROOK CENT	14450	50	50	50
STONY BROOK CENT	14400	50	50	50
STONY BROOK CENT	14350	50	50	50
STONY BROOK CENT	14300	50	50	50
STONY BROOK CENT	14250	50	50	50
STONY BROOK CENT	14200	50	50	50
STONY BROOK CENT	14150	50	50	50
STONY BROOK CENT	14100	50	50	50
STONY BROOK CENT	14050	50	50	50
STONY BROOK CENT	14000	50	50	50
STONY BROOK CENT	13950	50	50	50
STONY BROOK CENT	13900	50	50	50
STONY BROOK CENT	13850	50	50	50
STONY BROOK CENT	13800	50	50	50
STONY BROOK CENT	13750	50	50	50
STONY BROOK CENT	13700	50	50	50
STONY BROOK CENT	13650	50	50	50
STONY BROOK CENT	13600	50	50	50
STONY BROOK CENT	13550	50	50	50
STONY BROOK CENT	13500	50	50	50
STONY BROOK CENT	13450	50	50	50
STONY BROOK CENT	13400	50	50	50
STONY BROOK CENT	13350	50	50	50
STONY BROOK CENT	13300	50	50	50
STONY BROOK CENT	13250	50	50	50
STONY BROOK CENT	13200	50	50	50
STONY BROOK CENT	13150	50	50	50
STONY BROOK CENT	13100	50	50	50
STONY BROOK CENT	13050	50	50	50
STONY BROOK CENT	13000	50	50	50

STONY BROOK CENT	12950	50	50	50
STONY BROOK CENT	12900	50	50	50
STONY BROOK CENT	12850	50	50	50
STONY BROOK CENT	12800	50	50	50
STONY BROOK CENT	12750	50	50	50
STONY BROOK CENT	12700	50	50	50
STONY BROOK CENT	12650	50	50	50
STONY BROOK CENT	12600	50	50	50
STONY BROOK CENT	12550	50	50	50
STONY BROOK CENT	12500	50	50	50
STONY BROOK CENT	12450	50	50	50
STONY BROOK CENT	12400	50	50	50
STONY BROOK CENT	12350	50	50	50
STONY BROOK CENT	12300	50	50	50
STONY BROOK CENT	12250	50	50	50
STONY BROOK CENT	12200	50	50	50
STONY BROOK CENT	12150	50	50	50
STONY BROOK CENT	12100	50	50	50
STONY BROOK CENT	12050	50	50	50
STONY BROOK CENT	12000	50	50	50
STONY BROOK CENT	11950	50	50	50
STONY BROOK CENT	11900	50	50	50
STONY BROOK CENT	11850	50	50	50
STONY BROOK CENT	11800	50	50	50
STONY BROOK CENT	11750	50	50	50
STONY BROOK CENT	11700	50	50	50
STONY BROOK CENT	11650	50	50	50
STONY BROOK CENT	11600	50	50	50
STONY BROOK CENT	11550	50	50	50
STONY BROOK CENT	11500	50	50	50
STONY BROOK CENT	11450	50	50	50
STONY BROOK CENT	11400	50	50	50
STONY BROOK CENT	11350	50	50	50
STONY BROOK CENT	11300	50	50	50
STONY BROOK CENT	11250	50	50	50
STONY BROOK CENT	11200	50	50	50
STONY BROOK CENT	11150	50	50	50
STONY BROOK CENT	11100	50	50	50
STONY BROOK CENT	11050	50	50	50
STONY BROOK CENT	11000	50	50	50
STONY BROOK CENT	10950	50	50	50
STONY BROOK CENT	10900	50	50	50
STONY BROOK CENT	10850	50	50	50
STONY BROOK CENT	10800	50	50	50
STONY BROOK CENT	10750	50	50	50
STONY BROOK CENT	10700	50	50	50
STONY BROOK CENT	10650	100	100	100
STONY BROOK CENT	10575	Culvert		
STONY BROOK CENT	10550	50	50	50
STONY BROOK CENT	10500	50	50	50
STONY BROOK CENT	10450	50	50	50
STONY BROOK CENT	10400	50	50	50
STONY BROOK CENT	10350	50	50	50
STONY BROOK CENT	10300	50	50	50

STONY BROOK CENT	10250	50	50	50
STONY BROOK CENT	10200	50	50	50
STONY BROOK CENT	10150	50	50	50
STONY BROOK CENT	10100	50	50	50
STONY BROOK CENT	10050	50	50	50
STONY BROOK CENT	10000	50	50	50
STONY BROOK CENT	9950	50	50	50
STONY BROOK CENT	9900	50	50	50
STONY BROOK CENT	9850	50	50	50
STONY BROOK CENT	9800	50	50	50
STONY BROOK CENT	9750	50	50	50
STONY BROOK CENT	9700	50	50	50
STONY BROOK CENT	9650	50	50	50
STONY BROOK CENT	9600	50	50	50
STONY BROOK CENT	9550	50	50	50
STONY BROOK CENT	9500	50	50	50
STONY BROOK CENT	9450	50	50	50
STONY BROOK CENT	9400	50	50	50
STONY BROOK CENT	9350	50	50	50
STONY BROOK CENT	9300	50	50	50
STONY BROOK CENT	9250	50	50	50
STONY BROOK CENT	9200	50	50	50
STONY BROOK CENT	9150	50	50	50
STONY BROOK CENT	9100	50	50	50
STONY BROOK CENT	9050	50	50	50
STONY BROOK CENT	9000	50	50	50
STONY BROOK CENT	8950	50	50	50
STONY BROOK CENT	8900	50	50	50
STONY BROOK CENT	8850	50	50	50
STONY BROOK CENT	8800	50	50	50
STONY BROOK CENT	8750	50	50	50
STONY BROOK CENT	8700	50	50	50
STONY BROOK CENT	8650	50	50	50
STONY BROOK CENT	8600	50	50	50
STONY BROOK CENT	8550	50	50	50
STONY BROOK CENT	8500	50	50	50
STONY BROOK CENT	8450	50	50	50
STONY BROOK CENT	8400	50	50	50
STONY BROOK CENT	8350	50	50	50
STONY BROOK CENT	8300	50	50	50
STONY BROOK CENT	8250	50	50	50
STONY BROOK CENT	8200	50	50	50
STONY BROOK CENT	8150	50	50	50
STONY BROOK CENT	8100	50	50	50
STONY BROOK CENT	8050	50	50	50
STONY BROOK CENT	8000	50	50	50
STONY BROOK CENT	7950	50	50	50
STONY BROOK CENT	7900	50	50	50
STONY BROOK CENT	7850	50	50	50
STONY BROOK CENT	7800	50	50	50
STONY BROOK CENT	7750	50	50	50
STONY BROOK CENT	7700	50	50	50
STONY BROOK CENT	7650	50	50	50
STONY BROOK CENT	7600	50	50	50

STONY BROOK CENT	7550	50	50	50
STONY BROOK CENT	7500	50	50	50
STONY BROOK CENT	7450	50	50	50
STONY BROOK CENT	7400	50	50	50
STONY BROOK CENT	7350	50	50	50
STONY BROOK CENT	7300	50	50	50
STONY BROOK CENT	7250	50	50	50
STONY BROOK CENT	7200	50	50	50
STONY BROOK CENT	7150	50	50	50
STONY BROOK CENT	7100	50	50	50
STONY BROOK CENT	7050	50	50	50
STONY BROOK CENT	7000	50	50	50
STONY BROOK CENT	6950	50	50	50
STONY BROOK CENT	6900	50	50	50
STONY BROOK CENT	6850	50	50	50
STONY BROOK CENT	6800	50	50	50
STONY BROOK CENT	6750	50	50	50
STONY BROOK CENT	6700	50	50	50
STONY BROOK CENT	6650	50	50	50
STONY BROOK CENT	6600	50	50	50
STONY BROOK CENT	6550	50	50	50
STONY BROOK CENT	6500	50	50	50
STONY BROOK CENT	6450	50	50	50
STONY BROOK CENT	6400	50	50	50
STONY BROOK CENT	6350	50	50	50
STONY BROOK CENT	6300	50	50	50
STONY BROOK CENT	6250	50	50	50
STONY BROOK CENT	6200	50	50	50
STONY BROOK CENT	6150	50	50	50
STONY BROOK CENT	6100	100	100	100
STONY BROOK CENT	6050	Culvert		
STONY BROOK CENT	6000	50	50	50
STONY BROOK CENT	5950	50	50	50
STONY BROOK CENT	5900	50	50	50
STONY BROOK CENT	5850	50	50	50
STONY BROOK CENT	5800	50	50	50
STONY BROOK CENT	5750	50	50	50
STONY BROOK CENT	5700	50	50	50
STONY BROOK CENT	5650	50	50	50
STONY BROOK CENT	5600	50	50	50
STONY BROOK CENT	5550	50	50	50
STONY BROOK CENT	5500	50	50	50
STONY BROOK CENT	5450	50	50	50
STONY BROOK CENT	5400	50	50	50
STONY BROOK CENT	5350	50	50	50
STONY BROOK CENT	5300	50	50	50
STONY BROOK CENT	5250	50	50	50
STONY BROOK CENT	5200	50	50	50
STONY BROOK CENT	5150	50	50	50
STONY BROOK CENT	5100	50	50	50
STONY BROOK CENT	5050	50	50	50
STONY BROOK CENT	5000	50	50	50
STONY BROOK CENT	4950	50	50	50
STONY BROOK CENT	4900	50	50	50

STONY BROOK CENT	4850	50	50	50
STONY BROOK CENT	4800	50	50	50
STONY BROOK CENT	4750	50	50	50
STONY BROOK CENT	4700	50	50	50
STONY BROOK CENT	4650	50	50	50
STONY BROOK CENT	4600	50	50	50
STONY BROOK CENT	4550	50	50	50
STONY BROOK CENT	4500	50	50	50
STONY BROOK CENT	4450	50	50	50
STONY BROOK CENT	4400	50	50	50
STONY BROOK CENT	4350	50	50	50
STONY BROOK CENT	4300	50	50	50
STONY BROOK CENT	4250	50	50	50
STONY BROOK CENT	4200	50	50	50
STONY BROOK CENT	4150	50	50	50
STONY BROOK CENT	4100	100	100	100
STONY BROOK CENT	4040	Culvert		
STONY BROOK CENT	4000	50	50	50
STONY BROOK CENT	3950	50	50	50
STONY BROOK CENT	3900	50	50	50
STONY BROOK CENT	3850	50	50	50
STONY BROOK CENT	3800	50	50	50
STONY BROOK CENT	3750	50	50	50
STONY BROOK CENT	3700	100	100	100
STONY BROOK CENT	3650	Culvert		
STONY BROOK CENT	3600	50	50	50
STONY BROOK CENT	3550	50	50	50
STONY BROOK CENT	3500	50	50	50
STONY BROOK CENT	3450	50	50	50
STONY BROOK CENT	3400	50	50	50
STONY BROOK CENT	3350	50	50	50
STONY BROOK CENT	3300	50	50	50
STONY BROOK CENT	3250	50	50	50
STONY BROOK CENT	3200	50	50	50
STONY BROOK CENT	3150	50	50	50
STONY BROOK CENT	3100	50	50	50
STONY BROOK CENT	3050	50	50	50
STONY BROOK CENT	3000	50	50	50
STONY BROOK CENT	2950	50	50	50
STONY BROOK CENT	2900	50	50	50
STONY BROOK CENT	2850	50	50	50
STONY BROOK CENT	2800	50	50	50
STONY BROOK CENT	2750	50	50	50
STONY BROOK CENT	2700	50	50	50
STONY BROOK CENT	2650	50	50	50
STONY BROOK CENT	2600	50	50	50
STONY BROOK CENT	2550	50	50	50
STONY BROOK CENT	2500	50	50	50
STONY BROOK CENT	2450	50	50	50
STONY BROOK CENT	2400	50	50	50
STONY BROOK CENT	2350	50	50	50
STONY BROOK CENT	2300	50	50	50
STONY BROOK CENT	2250	50	50	50
STONY BROOK CENT	2200	50	50	50

STONY BROOK CENT	2150	50	50	50
STONY BROOK CENT	2100	50	50	50
STONY BROOK CENT	2050	50	50	50
STONY BROOK CENT	2000	50	50	50
STONY BROOK CENT	1975	Culvert		
STONY BROOK CENT	1950	50	50	50
STONY BROOK CENT	1900	50	50	50
STONY BROOK CENT	1850	50	50	50
STONY BROOK CENT	1800	50	50	50
STONY BROOK CENT	1750	50	50	50
STONY BROOK CENT	1700	50	50	50
STONY BROOK CENT	1650	50	50	50
STONY BROOK CENT	1600	50	50	50
STONY BROOK CENT	1550	50	50	50
STONY BROOK CENT	1500	50	50	50
STONY BROOK CENT	1450	50	50	50
STONY BROOK CENT	1400	50	50	50
STONY BROOK CENT	1350	50	50	50
STONY BROOK CENT	1300	50	50	50
STONY BROOK CENT	1250	50	50	50
STONY BROOK CENT	1200	50	50	50
STONY BROOK CENT	1150	50	50	50
STONY BROOK CENT	1100	50	50	50
STONY BROOK CENT	1050	50	50	50
STONY BROOK CENT	1000	50	50	50
STONY BROOK CENT	950	50	50	50
STONY BROOK CENT	900	50	50	50
STONY BROOK CENT	850	50	50	50
STONY BROOK CENT	800	50	50	50
STONY BROOK CENT	750	50	50	50
STONY BROOK CENT	700	50	50	50
STONY BROOK CENT	650	50	50	50
STONY BROOK CENT	600	50	50	50
STONY BROOK CENT	550	50	50	50
STONY BROOK CENT	500	50	50	50
STONY BROOK CENT	450	50	50	50
STONY BROOK CENT	400	50	50	50
STONY BROOK CENT	350	50	50	50
STONY BROOK CENT	300	50	50	50
STONY BROOK CENT	250	50	50	50
STONY BROOK CENT	200	50	50	50
STONY BROOK CENT	150	50	50	50
STONY BROOK CENT	100			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: STONY BROOK CENT

Reach	River Sta.	Contr.	Expan.
STONY BROOK CENT	15650	.1	.3

STONY BROOK CENT	15600	.1	.3
STONY BROOK CENT	15550	.1	.3
STONY BROOK CENT	15500	.1	.3
STONY BROOK CENT	15450	Culvert	
STONY BROOK CENT	15400	.1	.3
STONY BROOK CENT	15350	.1	.3
STONY BROOK CENT	15300	.1	.3
STONY BROOK CENT	15250	.1	.3
STONY BROOK CENT	15200	.1	.3
STONY BROOK CENT	15150	.1	.3
STONY BROOK CENT	15100	.1	.3
STONY BROOK CENT	15050	.1	.3
STONY BROOK CENT	15000	.1	.3
STONY BROOK CENT	14950	.1	.3
STONY BROOK CENT	14900	.1	.3
STONY BROOK CENT	14850	.1	.3
STONY BROOK CENT	14800	.1	.3
STONY BROOK CENT	14750	.1	.3
STONY BROOK CENT	14700	.1	.3
STONY BROOK CENT	14650	.1	.3
STONY BROOK CENT	14600	.1	.3
STONY BROOK CENT	14550	.1	.3
STONY BROOK CENT	14500	.1	.3
STONY BROOK CENT	14450	.1	.3
STONY BROOK CENT	14400	.1	.3
STONY BROOK CENT	14350	.1	.3
STONY BROOK CENT	14300	.1	.3
STONY BROOK CENT	14250	.1	.3
STONY BROOK CENT	14200	.1	.3
STONY BROOK CENT	14150	.1	.3
STONY BROOK CENT	14100	.1	.3
STONY BROOK CENT	14050	.1	.3
STONY BROOK CENT	14000	.1	.3
STONY BROOK CENT	13950	.1	.3
STONY BROOK CENT	13900	.1	.3
STONY BROOK CENT	13850	.1	.3
STONY BROOK CENT	13800	.1	.3
STONY BROOK CENT	13750	.1	.3
STONY BROOK CENT	13700	.1	.3
STONY BROOK CENT	13650	.1	.3
STONY BROOK CENT	13600	.1	.3
STONY BROOK CENT	13550	.1	.3
STONY BROOK CENT	13500	.1	.3
STONY BROOK CENT	13450	.1	.3
STONY BROOK CENT	13400	.1	.3
STONY BROOK CENT	13350	.1	.3
STONY BROOK CENT	13300	.1	.3
STONY BROOK CENT	13250	.1	.3
STONY BROOK CENT	13200	.1	.3
STONY BROOK CENT	13150	.1	.3
STONY BROOK CENT	13100	.1	.3
STONY BROOK CENT	13050	.1	.3
STONY BROOK CENT	13000	.1	.3
STONY BROOK CENT	12950	.1	.3

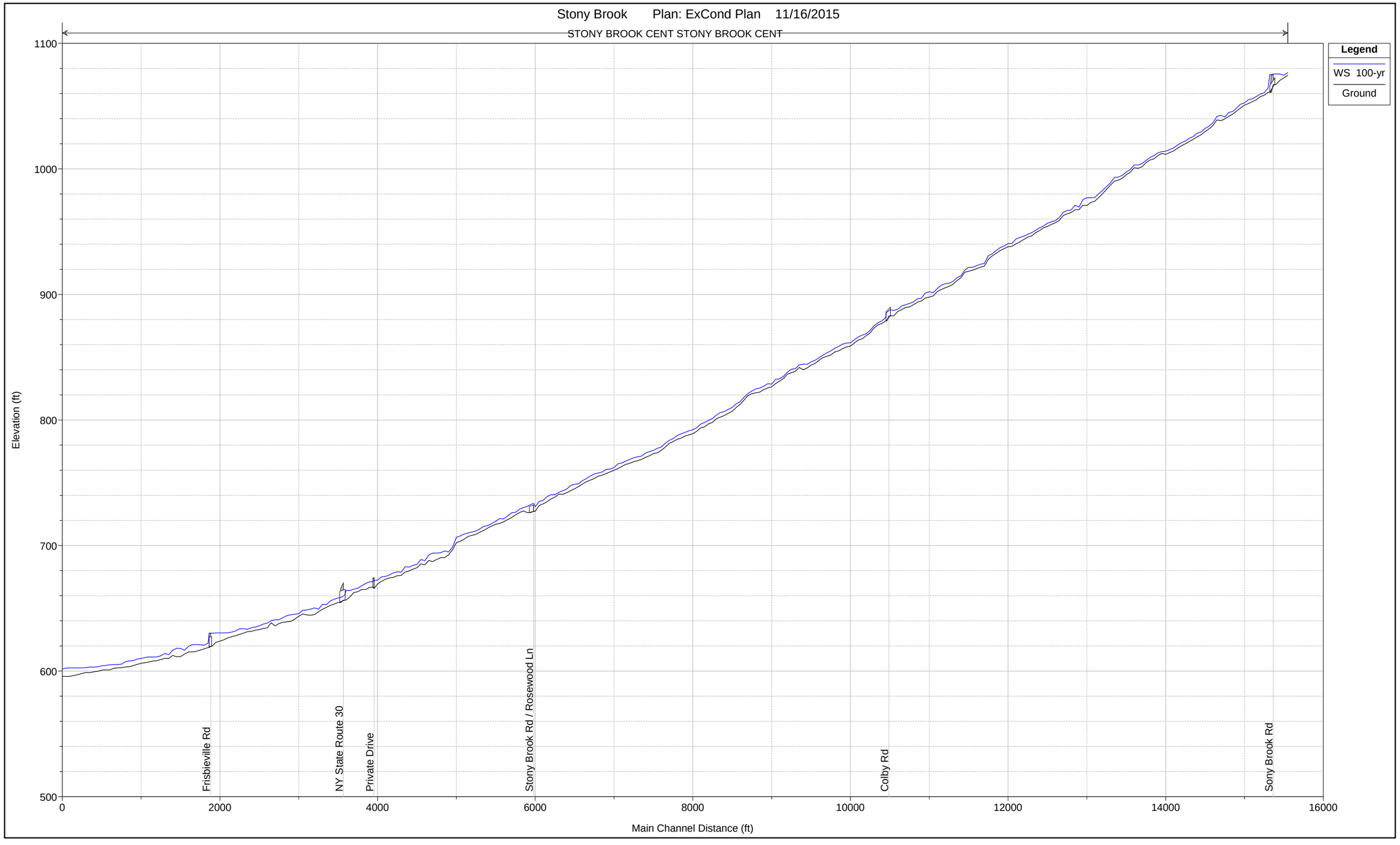
STONY BROOK CENT	12900	.1	.3
STONY BROOK CENT	12850	.1	.3
STONY BROOK CENT	12800	.1	.3
STONY BROOK CENT	12750	.1	.3
STONY BROOK CENT	12700	.1	.3
STONY BROOK CENT	12650	.1	.3
STONY BROOK CENT	12600	.1	.3
STONY BROOK CENT	12550	.1	.3
STONY BROOK CENT	12500	.1	.3
STONY BROOK CENT	12450	.1	.3
STONY BROOK CENT	12400	.1	.3
STONY BROOK CENT	12350	.1	.3
STONY BROOK CENT	12300	.1	.3
STONY BROOK CENT	12250	.1	.3
STONY BROOK CENT	12200	.1	.3
STONY BROOK CENT	12150	.1	.3
STONY BROOK CENT	12100	.1	.3
STONY BROOK CENT	12050	.1	.3
STONY BROOK CENT	12000	.1	.3
STONY BROOK CENT	11950	.1	.3
STONY BROOK CENT	11900	.1	.3
STONY BROOK CENT	11850	.1	.3
STONY BROOK CENT	11800	.1	.3
STONY BROOK CENT	11750	.1	.3
STONY BROOK CENT	11700	.1	.3
STONY BROOK CENT	11650	.1	.3
STONY BROOK CENT	11600	.1	.3
STONY BROOK CENT	11550	.1	.3
STONY BROOK CENT	11500	.1	.3
STONY BROOK CENT	11450	.1	.3
STONY BROOK CENT	11400	.1	.3
STONY BROOK CENT	11350	.1	.3
STONY BROOK CENT	11300	.1	.3
STONY BROOK CENT	11250	.1	.3
STONY BROOK CENT	11200	.1	.3
STONY BROOK CENT	11150	.1	.3
STONY BROOK CENT	11100	.1	.3
STONY BROOK CENT	11050	.1	.3
STONY BROOK CENT	11000	.1	.3
STONY BROOK CENT	10950	.1	.3
STONY BROOK CENT	10900	.1	.3
STONY BROOK CENT	10850	.1	.3
STONY BROOK CENT	10800	.1	.3
STONY BROOK CENT	10750	.1	.3
STONY BROOK CENT	10700	.1	.3
STONY BROOK CENT	10650	.1	.3
STONY BROOK CENT	10575	Culvert	
STONY BROOK CENT	10550	.1	.3
STONY BROOK CENT	10500	.1	.3
STONY BROOK CENT	10450	.1	.3
STONY BROOK CENT	10400	.1	.3
STONY BROOK CENT	10350	.1	.3
STONY BROOK CENT	10300	.1	.3
STONY BROOK CENT	10250	.1	.3

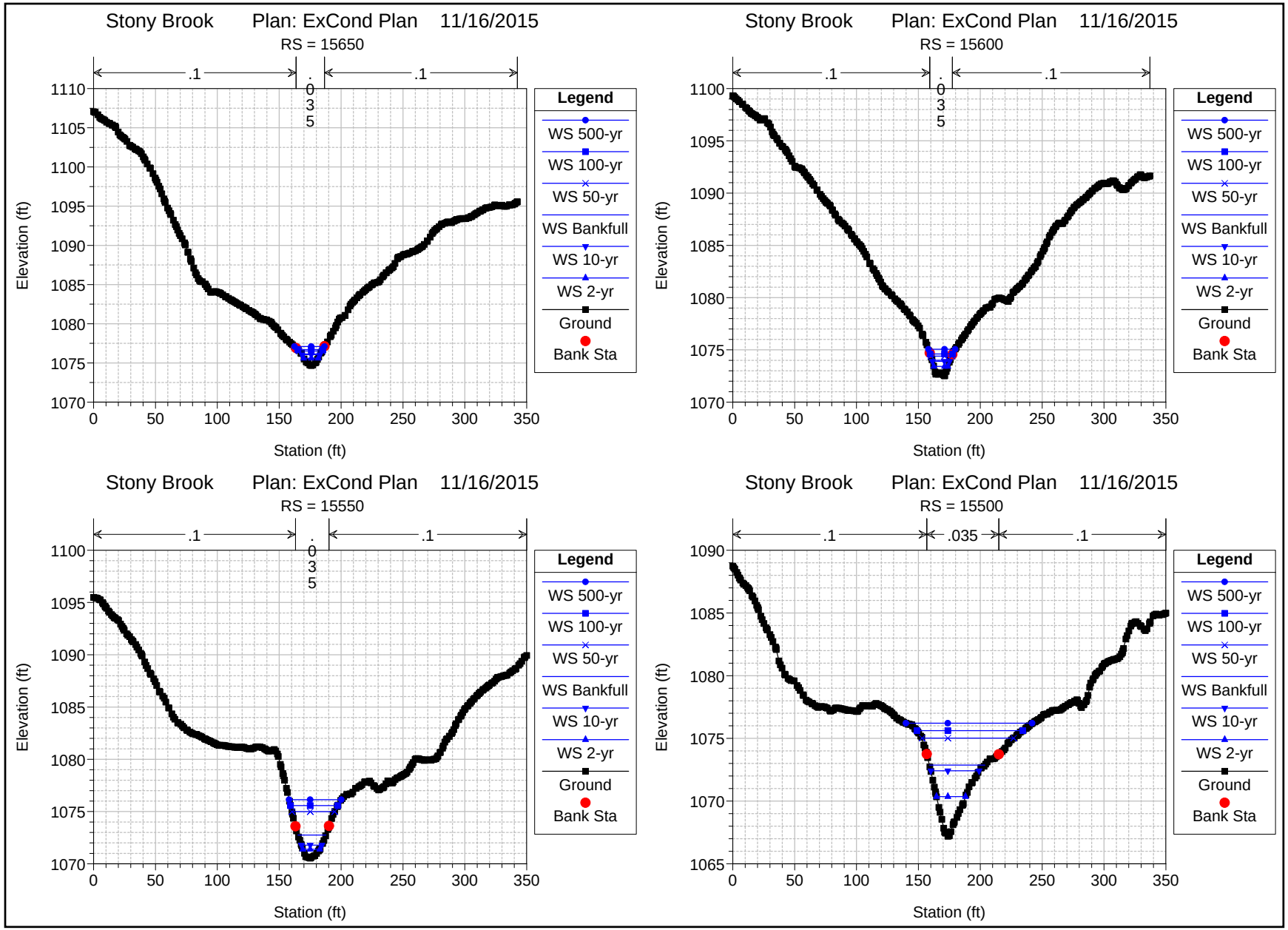
STONY BROOK CENT	10200	.1	.3
STONY BROOK CENT	10150	.1	.3
STONY BROOK CENT	10100	.1	.3
STONY BROOK CENT	10050	.1	.3
STONY BROOK CENT	10000	.1	.3
STONY BROOK CENT	9950	.1	.3
STONY BROOK CENT	9900	.1	.3
STONY BROOK CENT	9850	.1	.3
STONY BROOK CENT	9800	.1	.3
STONY BROOK CENT	9750	.1	.3
STONY BROOK CENT	9700	.1	.3
STONY BROOK CENT	9650	.1	.3
STONY BROOK CENT	9600	.1	.3
STONY BROOK CENT	9550	.1	.3
STONY BROOK CENT	9500	.1	.3
STONY BROOK CENT	9450	.1	.3
STONY BROOK CENT	9400	.1	.3
STONY BROOK CENT	9350	.1	.3
STONY BROOK CENT	9300	.1	.3
STONY BROOK CENT	9250	.1	.3
STONY BROOK CENT	9200	.1	.3
STONY BROOK CENT	9150	.1	.3
STONY BROOK CENT	9100	.1	.3
STONY BROOK CENT	9050	.1	.3
STONY BROOK CENT	9000	.1	.3
STONY BROOK CENT	8950	.1	.3
STONY BROOK CENT	8900	.1	.3
STONY BROOK CENT	8850	.1	.3
STONY BROOK CENT	8800	.1	.3
STONY BROOK CENT	8750	.1	.3
STONY BROOK CENT	8700	.1	.3
STONY BROOK CENT	8650	.1	.3
STONY BROOK CENT	8600	.1	.3
STONY BROOK CENT	8550	.1	.3
STONY BROOK CENT	8500	.1	.3
STONY BROOK CENT	8450	.1	.3
STONY BROOK CENT	8400	.1	.3
STONY BROOK CENT	8350	.1	.3
STONY BROOK CENT	8300	.1	.3
STONY BROOK CENT	8250	.1	.3
STONY BROOK CENT	8200	.1	.3
STONY BROOK CENT	8150	.1	.3
STONY BROOK CENT	8100	.1	.3
STONY BROOK CENT	8050	.1	.3
STONY BROOK CENT	8000	.1	.3
STONY BROOK CENT	7950	.1	.3
STONY BROOK CENT	7900	.1	.3
STONY BROOK CENT	7850	.1	.3
STONY BROOK CENT	7800	.1	.3
STONY BROOK CENT	7750	.1	.3
STONY BROOK CENT	7700	.1	.3
STONY BROOK CENT	7650	.1	.3
STONY BROOK CENT	7600	.1	.3
STONY BROOK CENT	7550	.1	.3

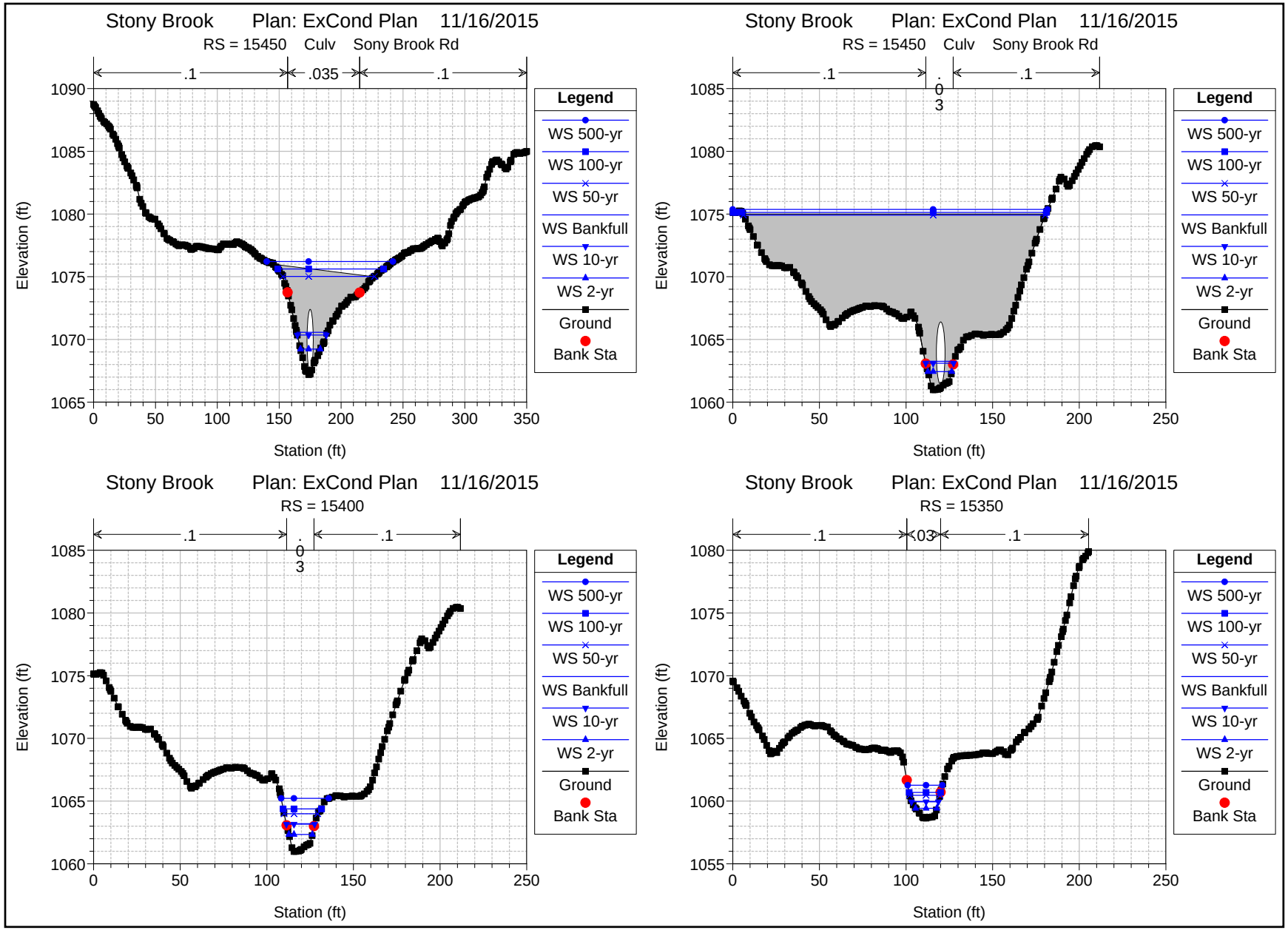
STONY BROOK CENT	7500	.1	.3
STONY BROOK CENT	7450	.1	.3
STONY BROOK CENT	7400	.1	.3
STONY BROOK CENT	7350	.1	.3
STONY BROOK CENT	7300	.1	.3
STONY BROOK CENT	7250	.1	.3
STONY BROOK CENT	7200	.1	.3
STONY BROOK CENT	7150	.1	.3
STONY BROOK CENT	7100	.1	.3
STONY BROOK CENT	7050	.1	.3
STONY BROOK CENT	7000	.1	.3
STONY BROOK CENT	6950	.1	.3
STONY BROOK CENT	6900	.1	.3
STONY BROOK CENT	6850	.1	.3
STONY BROOK CENT	6800	.1	.3
STONY BROOK CENT	6750	.1	.3
STONY BROOK CENT	6700	.1	.3
STONY BROOK CENT	6650	.1	.3
STONY BROOK CENT	6600	.1	.3
STONY BROOK CENT	6550	.1	.3
STONY BROOK CENT	6500	.1	.3
STONY BROOK CENT	6450	.1	.3
STONY BROOK CENT	6400	.1	.3
STONY BROOK CENT	6350	.1	.3
STONY BROOK CENT	6300	.1	.3
STONY BROOK CENT	6250	.1	.3
STONY BROOK CENT	6200	.1	.3
STONY BROOK CENT	6150	.1	.3
STONY BROOK CENT	6100	.1	.3
STONY BROOK CENT	6050	Culvert	
STONY BROOK CENT	6000	.1	.3
STONY BROOK CENT	5950	.1	.3
STONY BROOK CENT	5900	.1	.3
STONY BROOK CENT	5850	.1	.3
STONY BROOK CENT	5800	.1	.3
STONY BROOK CENT	5750	.1	.3
STONY BROOK CENT	5700	.1	.3
STONY BROOK CENT	5650	.1	.3
STONY BROOK CENT	5600	.1	.3
STONY BROOK CENT	5550	.1	.3
STONY BROOK CENT	5500	.1	.3
STONY BROOK CENT	5450	.1	.3
STONY BROOK CENT	5400	.1	.3
STONY BROOK CENT	5350	.1	.3
STONY BROOK CENT	5300	.1	.3
STONY BROOK CENT	5250	.1	.3
STONY BROOK CENT	5200	.1	.3
STONY BROOK CENT	5150	.1	.3
STONY BROOK CENT	5100	.1	.3
STONY BROOK CENT	5050	.1	.3
STONY BROOK CENT	5000	.1	.3
STONY BROOK CENT	4950	.1	.3
STONY BROOK CENT	4900	.1	.3
STONY BROOK CENT	4850	.1	.3

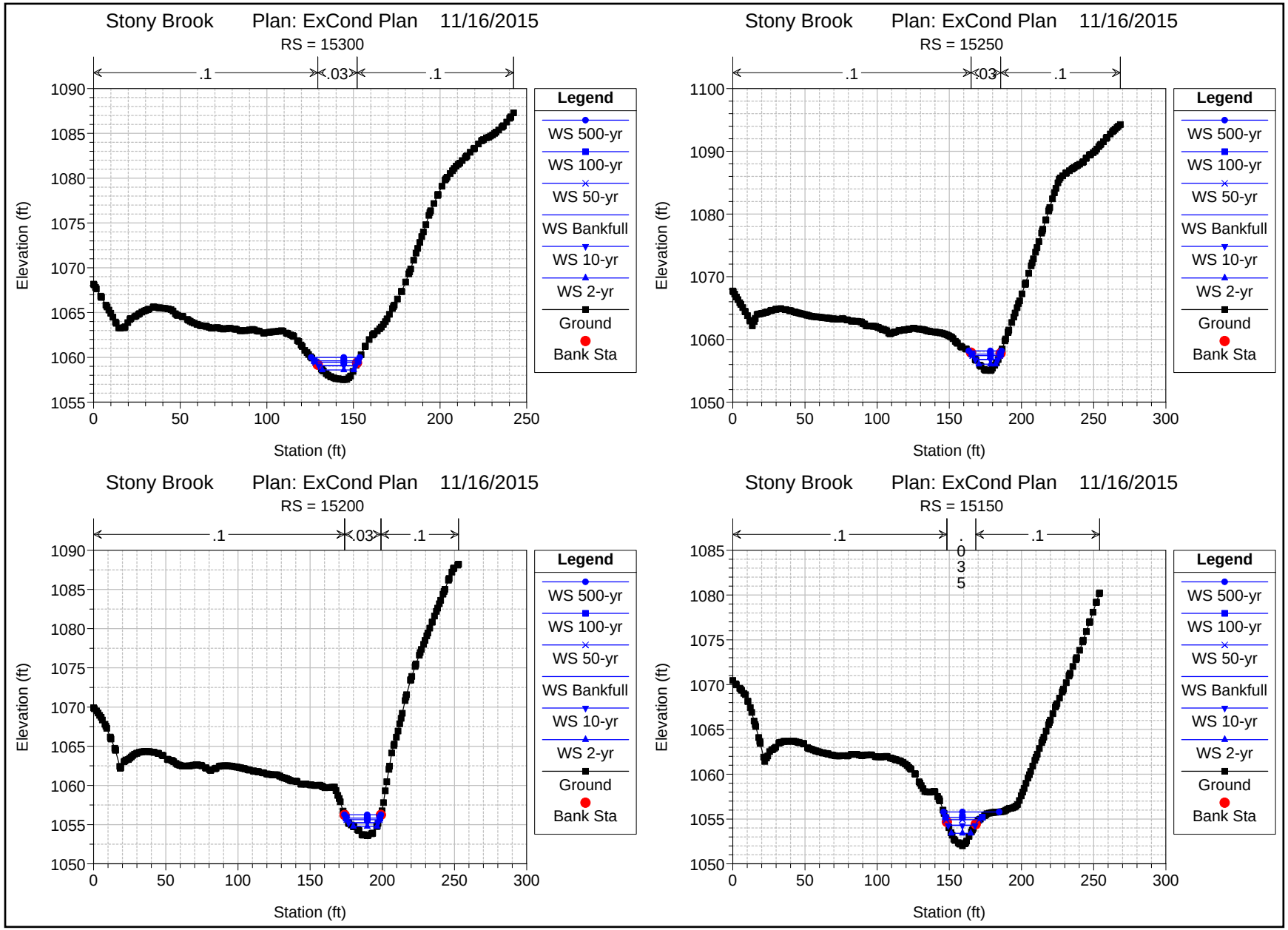
STONY BROOK CENT	4800	.1	.3
STONY BROOK CENT	4750	.1	.3
STONY BROOK CENT	4700	.1	.3
STONY BROOK CENT	4650	.1	.3
STONY BROOK CENT	4600	.1	.3
STONY BROOK CENT	4550	.1	.3
STONY BROOK CENT	4500	.1	.3
STONY BROOK CENT	4450	.1	.3
STONY BROOK CENT	4400	.1	.3
STONY BROOK CENT	4350	.1	.3
STONY BROOK CENT	4300	.1	.3
STONY BROOK CENT	4250	.1	.3
STONY BROOK CENT	4200	.1	.3
STONY BROOK CENT	4150	.1	.3
STONY BROOK CENT	4100	.1	.3
STONY BROOK CENT	4040	Culvert	
STONY BROOK CENT	4000	.1	.3
STONY BROOK CENT	3950	.1	.3
STONY BROOK CENT	3900	.1	.3
STONY BROOK CENT	3850	.1	.3
STONY BROOK CENT	3800	.1	.3
STONY BROOK CENT	3750	.1	.3
STONY BROOK CENT	3700	.1	.3
STONY BROOK CENT	3650	Culvert	
STONY BROOK CENT	3600	.1	.3
STONY BROOK CENT	3550	.1	.3
STONY BROOK CENT	3500	.1	.3
STONY BROOK CENT	3450	.1	.3
STONY BROOK CENT	3400	.1	.3
STONY BROOK CENT	3350	.1	.3
STONY BROOK CENT	3300	.1	.3
STONY BROOK CENT	3250	.1	.3
STONY BROOK CENT	3200	.1	.3
STONY BROOK CENT	3150	.1	.3
STONY BROOK CENT	3100	.1	.3
STONY BROOK CENT	3050	.1	.3
STONY BROOK CENT	3000	.1	.3
STONY BROOK CENT	2950	.1	.3
STONY BROOK CENT	2900	.1	.3
STONY BROOK CENT	2850	.1	.3
STONY BROOK CENT	2800	.1	.3
STONY BROOK CENT	2750	.1	.3
STONY BROOK CENT	2700	.1	.3
STONY BROOK CENT	2650	.1	.3
STONY BROOK CENT	2600	.1	.3
STONY BROOK CENT	2550	.1	.3
STONY BROOK CENT	2500	.1	.3
STONY BROOK CENT	2450	.1	.3
STONY BROOK CENT	2400	.1	.3
STONY BROOK CENT	2350	.1	.3
STONY BROOK CENT	2300	.1	.3
STONY BROOK CENT	2250	.1	.3
STONY BROOK CENT	2200	.1	.3
STONY BROOK CENT	2150	.1	.3

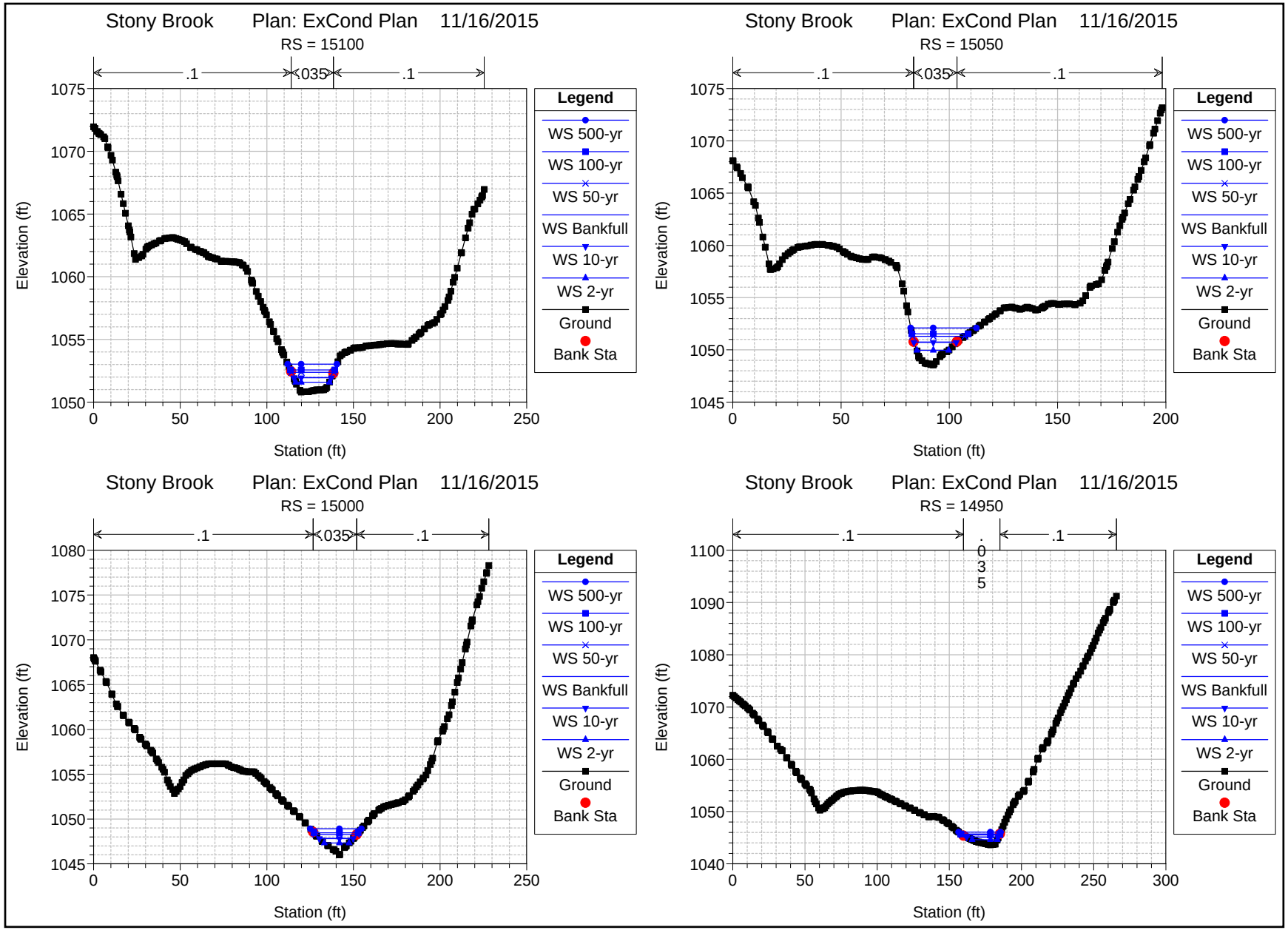
STONY BROOK CENT	2100	.1	.3
STONY BROOK CENT	2050	.1	.3
STONY BROOK CENT	2000	.1	.3
STONY BROOK CENT	1975	Culvert	
STONY BROOK CENT	1950	.1	.3
STONY BROOK CENT	1900	.1	.3
STONY BROOK CENT	1850	.1	.3
STONY BROOK CENT	1800	.1	.3
STONY BROOK CENT	1750	.1	.3
STONY BROOK CENT	1700	.1	.3
STONY BROOK CENT	1650	.1	.3
STONY BROOK CENT	1600	.1	.3
STONY BROOK CENT	1550	.1	.3
STONY BROOK CENT	1500	.1	.3
STONY BROOK CENT	1450	.1	.3
STONY BROOK CENT	1400	.1	.3
STONY BROOK CENT	1350	.1	.3
STONY BROOK CENT	1300	.1	.3
STONY BROOK CENT	1250	.1	.3
STONY BROOK CENT	1200	.1	.3
STONY BROOK CENT	1150	.1	.3
STONY BROOK CENT	1100	.1	.3
STONY BROOK CENT	1050	.1	.3
STONY BROOK CENT	1000	.1	.3
STONY BROOK CENT	950	.1	.3
STONY BROOK CENT	900	.1	.3
STONY BROOK CENT	850	.1	.3
STONY BROOK CENT	800	.1	.3
STONY BROOK CENT	750	.1	.3
STONY BROOK CENT	700	.1	.3
STONY BROOK CENT	650	.1	.3
STONY BROOK CENT	600	.1	.3
STONY BROOK CENT	550	.1	.3
STONY BROOK CENT	500	.1	.3
STONY BROOK CENT	450	.1	.3
STONY BROOK CENT	400	.1	.3
STONY BROOK CENT	350	.1	.3
STONY BROOK CENT	300	.1	.3
STONY BROOK CENT	250	.1	.3
STONY BROOK CENT	200	.1	.3
STONY BROOK CENT	150	.1	.3
STONY BROOK CENT	100	.1	.3

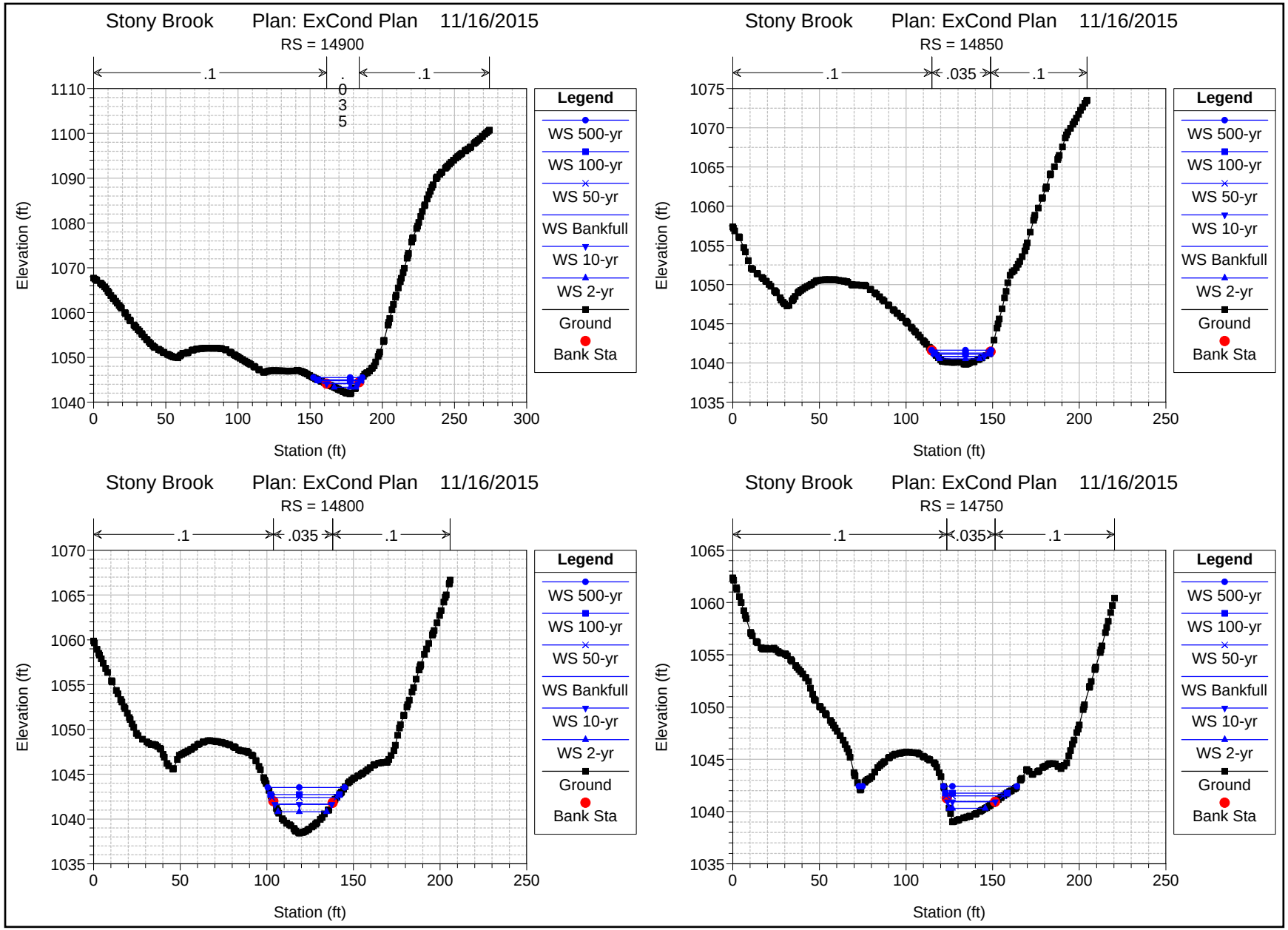

Stony Brook Plan: ExCond Plan 11/16/2015
STONY BROOK CENT STONY BROOK CENT
Legend
WS 100-yr
Ground
Elevation (ft)
1100
1000
900
800
700
600
500
0
2000
4000
6000
8000
10000
12000
14000
16000
Main Channel Distance (ft)
Frisbieville Rd
NY State Route 30
Private Drive
Stony Brook Rd / Rosewood Ln
Colby Rd
Sony Brook Rd


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 15650
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 15600
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 15550
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 15500
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 15450 Culv Sony Brook Rd
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 15450 Culv Sony Brook Rd
.1
.03
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 15400
.1
.03
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 15350
.1
.03
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 15300
.1
.03
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 15250
.1
.03
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 15200
.1
.03
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 15150
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 15100
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 15050
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 15000
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 14950
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta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Elevation (ft)
Station (ft)
Legend
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WS 2-yr
Ground
Bank Sta
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Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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Elevation (ft)
Station (ft)
Legend
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WS 100-yr
WS 50-yr
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WS 10-yr
WS 2-yr
Ground
Bank Sta
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Legend
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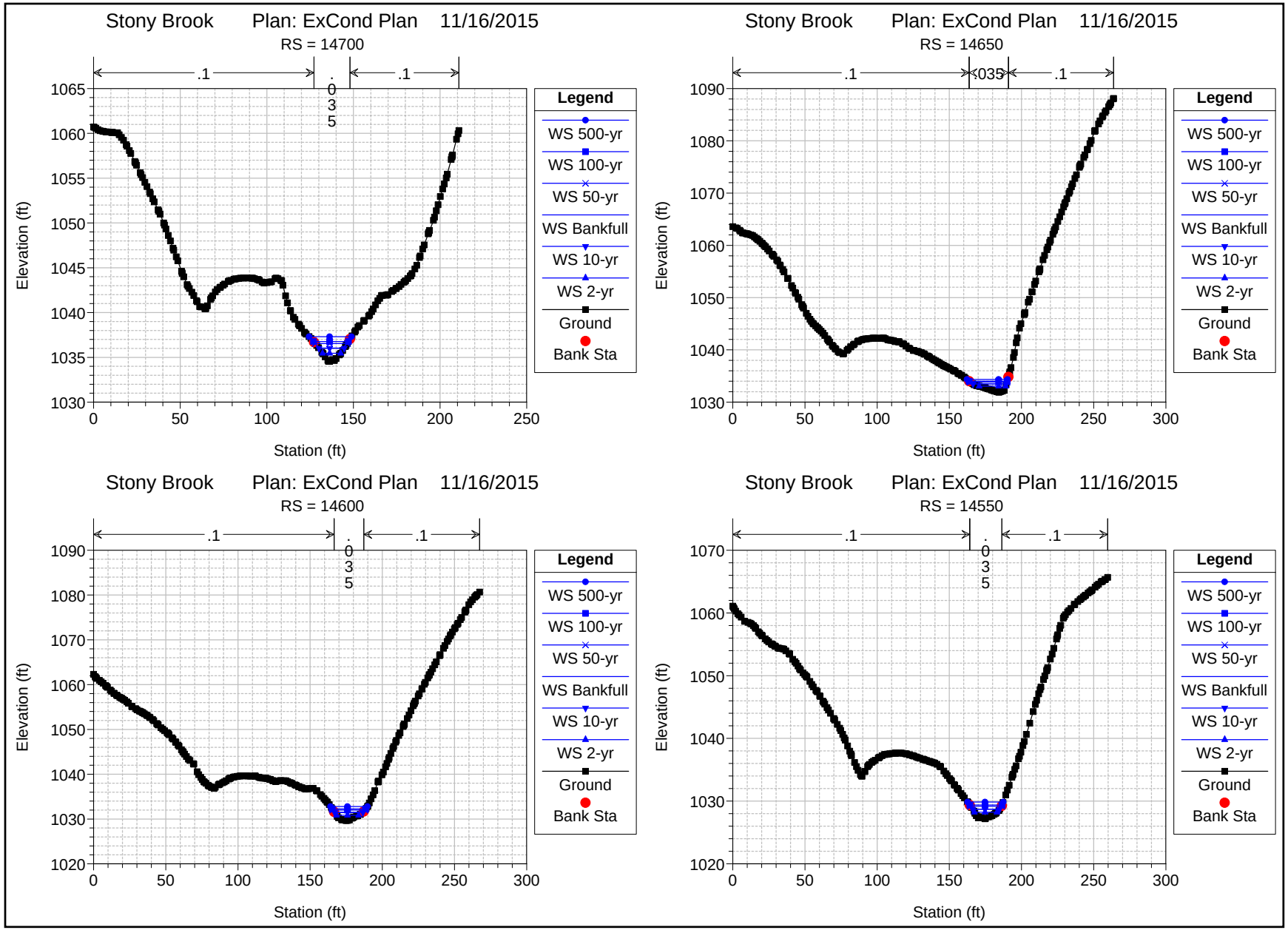
WS 10-yr
WS 2-yr
Ground
Bank Sta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Elevation (ft)
Station (ft)
Legend
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WS 2-yr
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Bank Sta
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Elevation (ft)
Station (ft)
Legend
WS 500-yr
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WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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Elevation (ft)
Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 14550
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Elevation (ft)
Station (ft)
Legend
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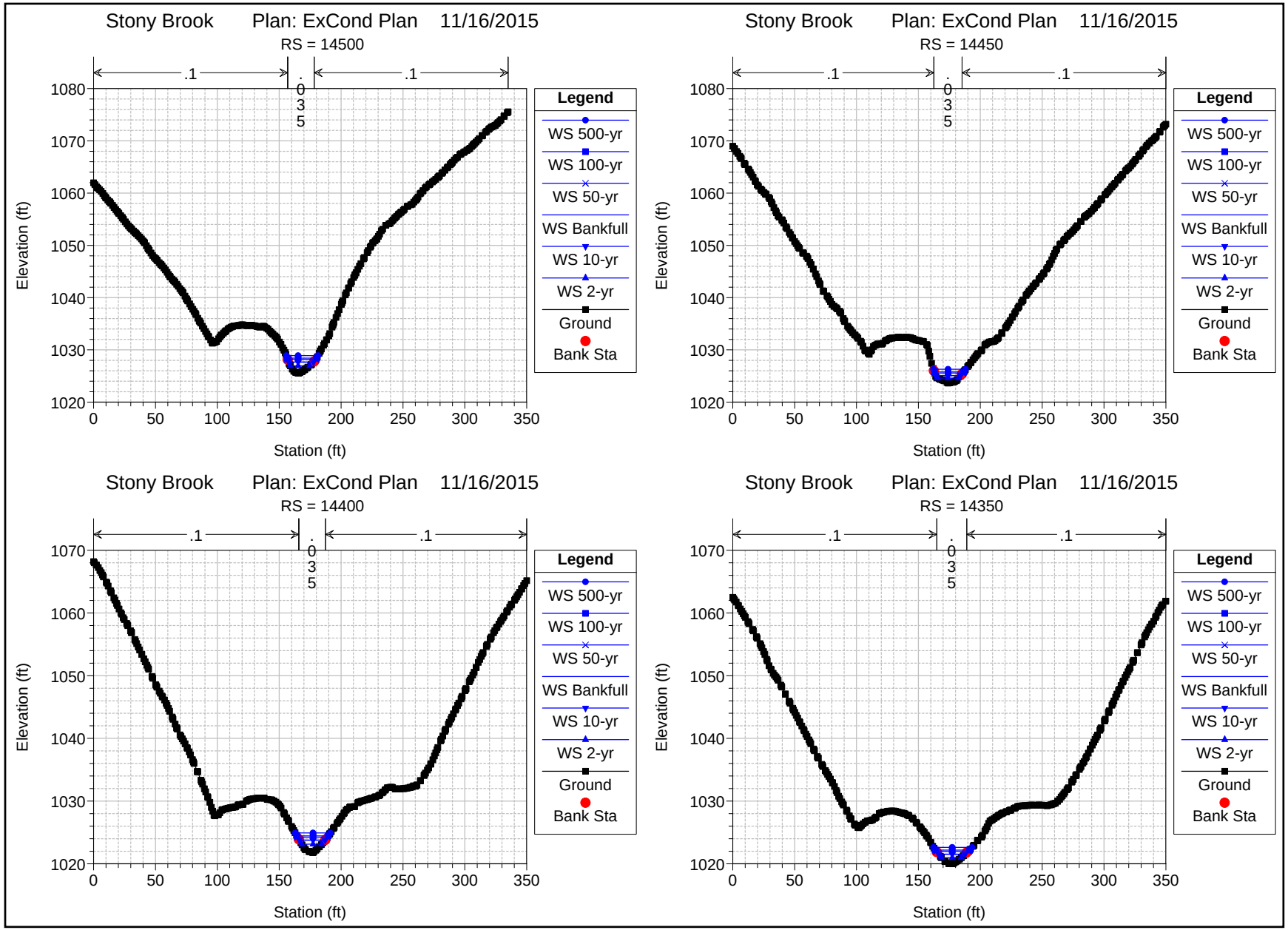
WS 10-yr
WS 2-yr
Ground
Bank Sta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Station (ft)
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Ground
Bank Sta
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Stony Brook Plan: ExCond Plan 11/16/2015
RS = 14400
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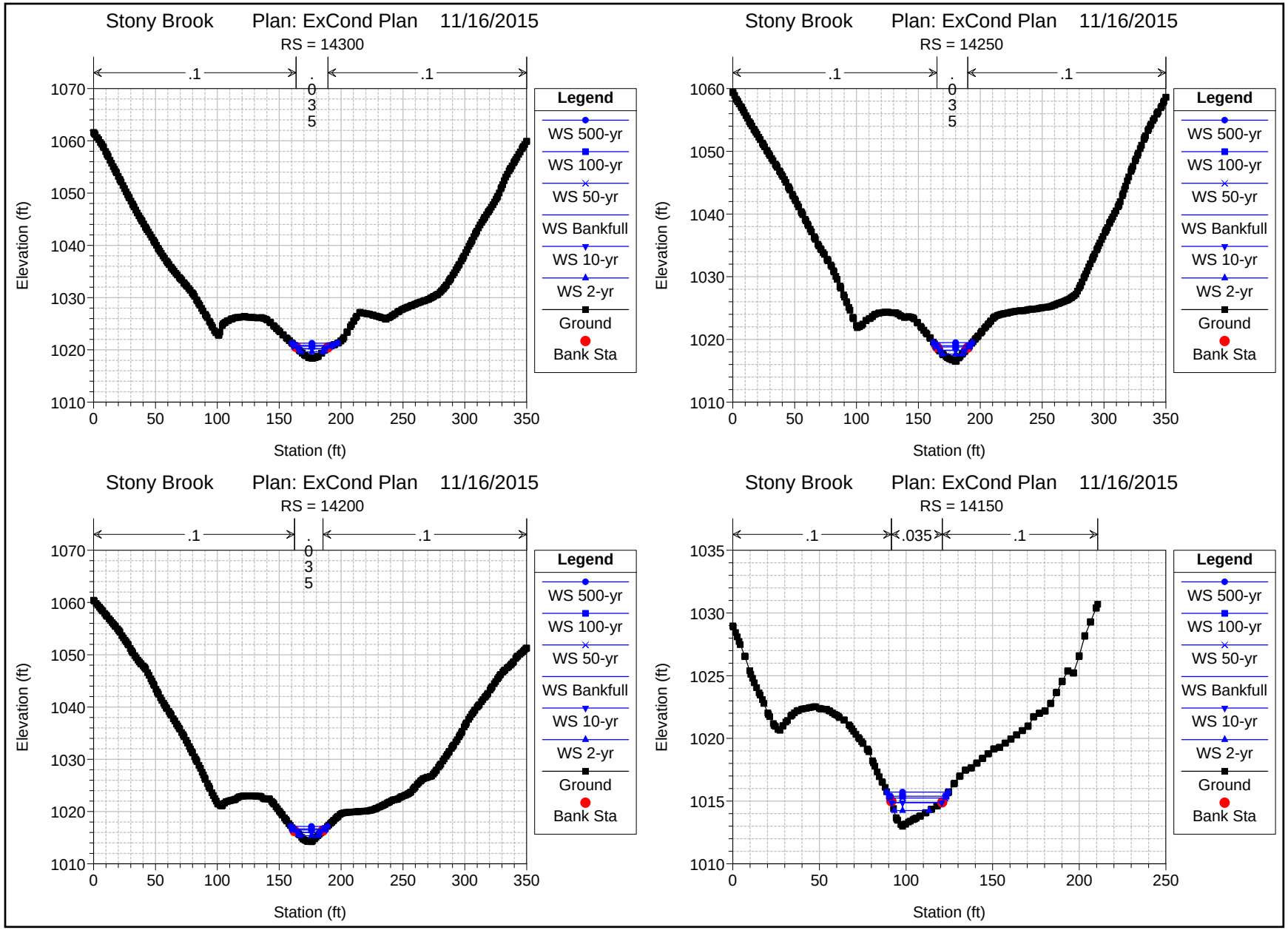
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WS 2-yr
Ground
Bank Sta
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RS = 14250
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Elevation (ft)
Station (ft)
Legend
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WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 14200
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.035
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Elevation (ft)
Station (ft)
Legend
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WS 100-yr
WS 50-yr
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WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 14150
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Station (ft)
Legend
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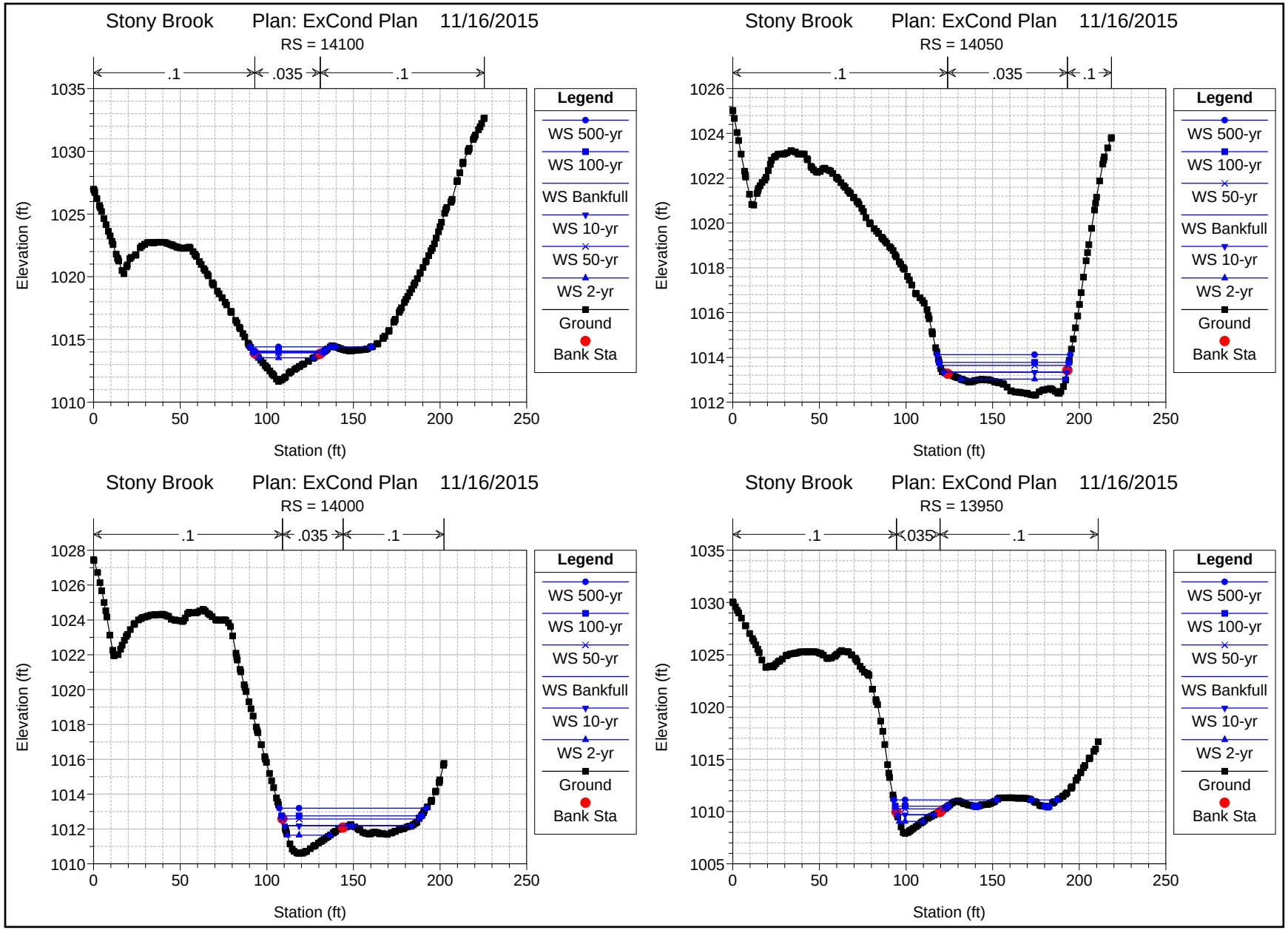
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta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Station (ft)
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Ground
Bank Sta
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RS = 14050
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Elevation (ft)
Station (ft)
Legend
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WS 2-yr
Ground
Bank Sta
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Station (ft)
Legend
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WS 100-yr
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WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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Station (ft)
Legend
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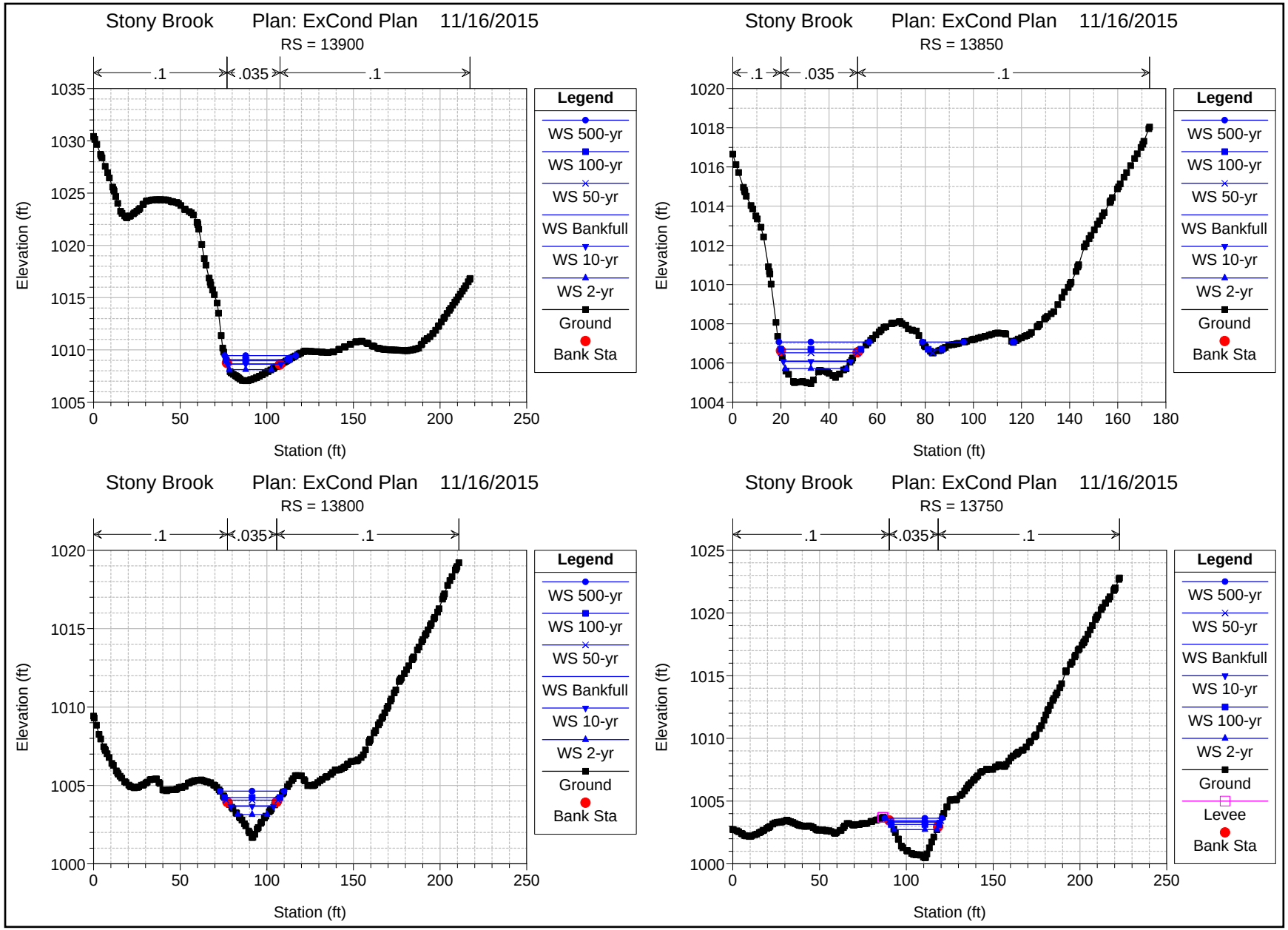
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta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WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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Elevation (ft)
Station (ft)
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WS 2-yr
Ground
Bank Sta
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Station (ft)
Legend
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WS 2-yr
Ground
Bank Sta
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Elevation (ft)
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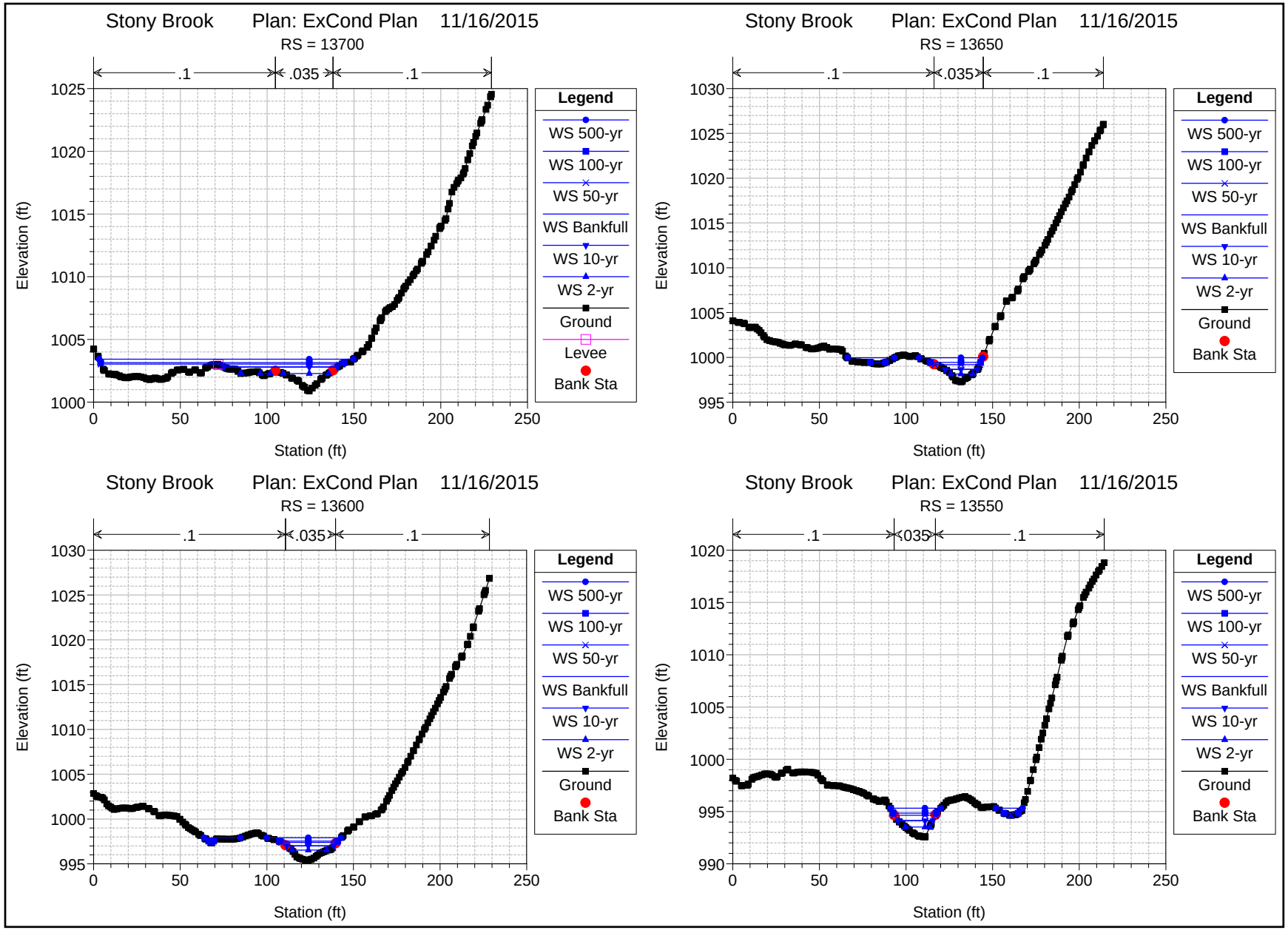
WS 2-yr
Ground
Levee
Bank Sta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Station (ft)
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WS 10-yr
WS 2-yr
Ground
Levee
Bank Sta
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Elevation (ft)
Station (ft)
Legend
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WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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035
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Elevation (ft)
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Legend
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WS 100-yr
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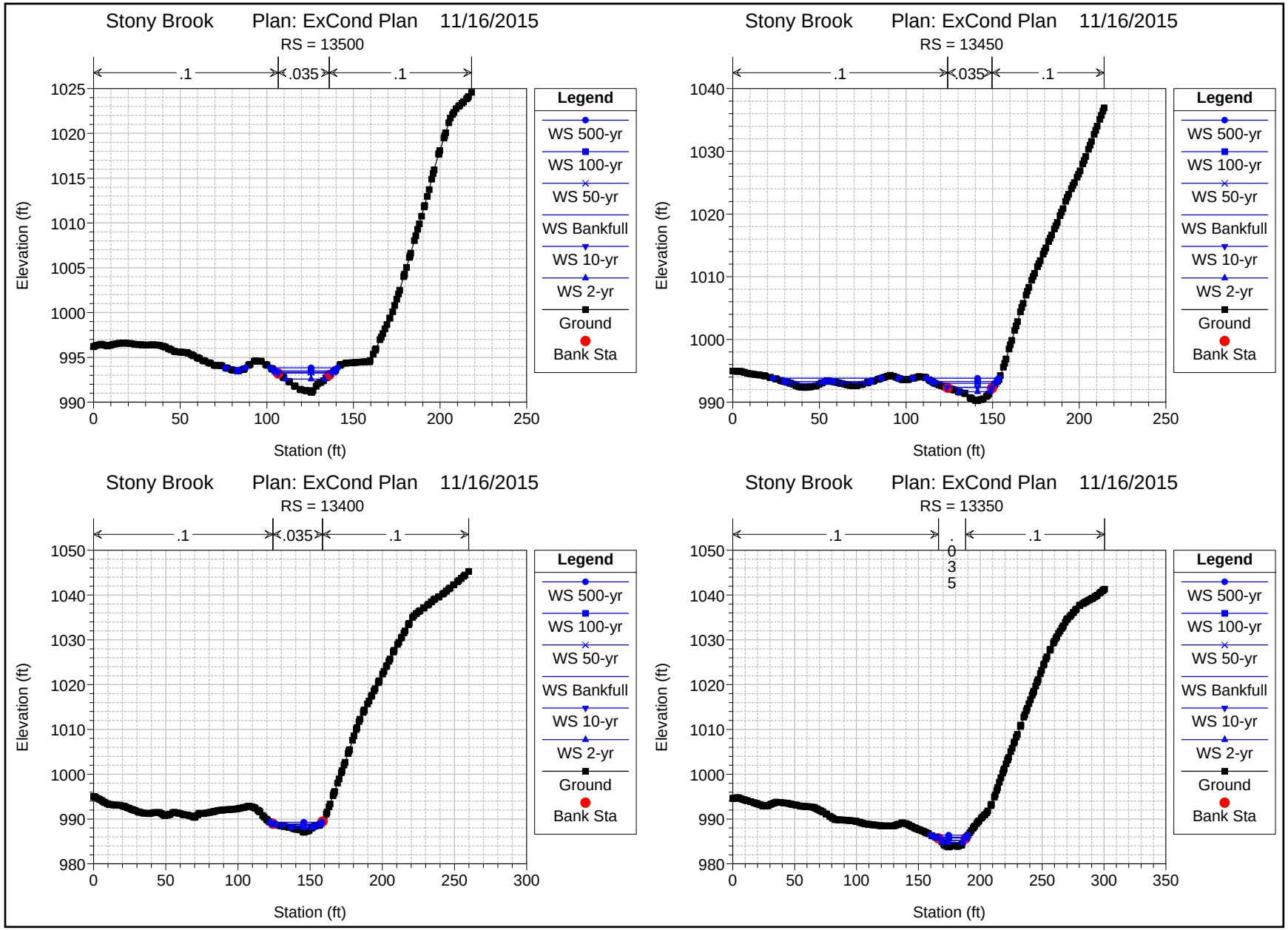
WS 10-yr
WS 2-yr
Ground
Bank Sta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WS 2-yr
Ground
Bank Sta
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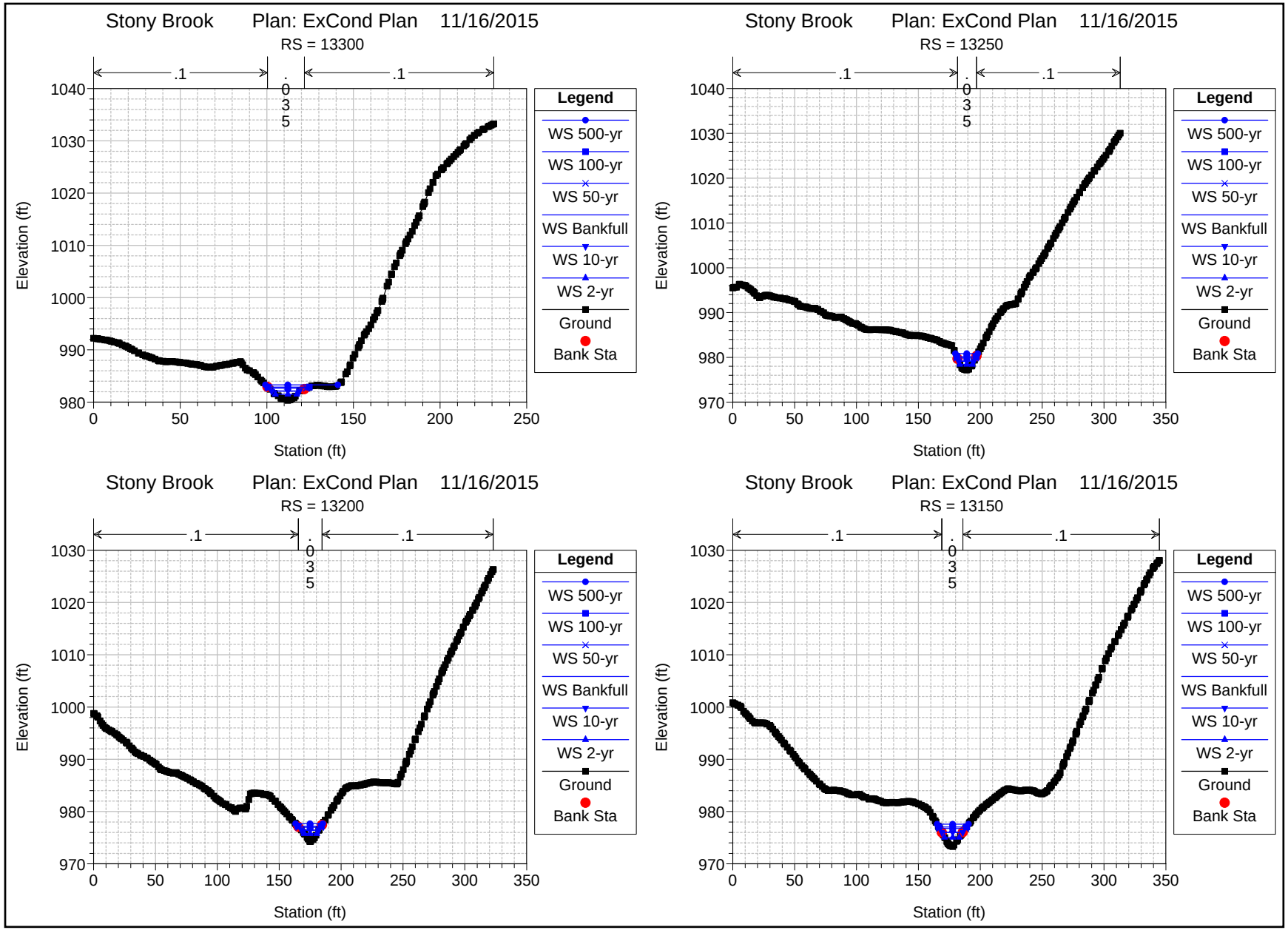
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Bank Sta
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Elevation (ft)
Station (ft)
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WS 2-yr
Ground
Bank Sta
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Elevation (ft)
Station (ft)
Legend
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WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 13150
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Legend
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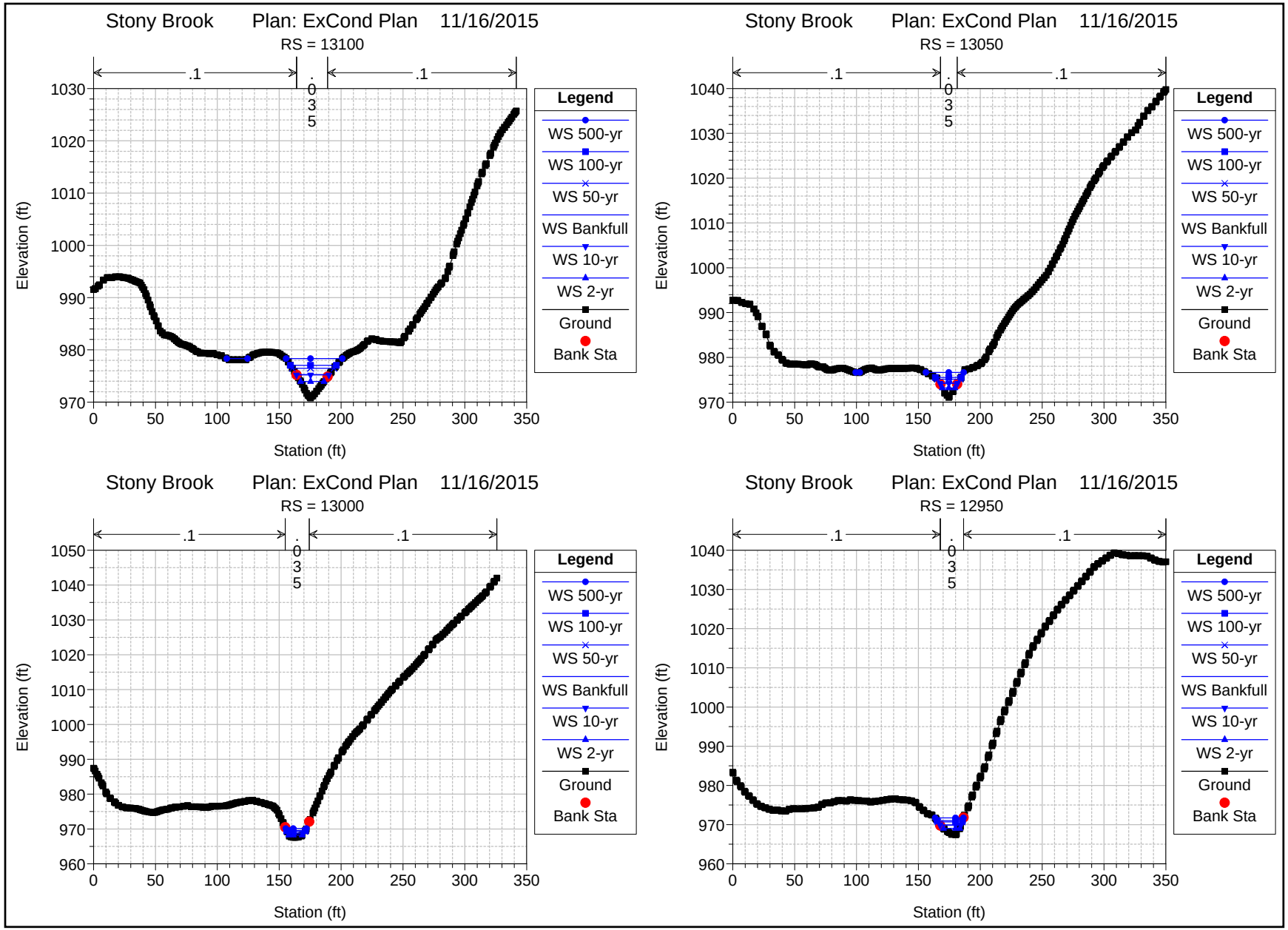
Ground
Bank Sta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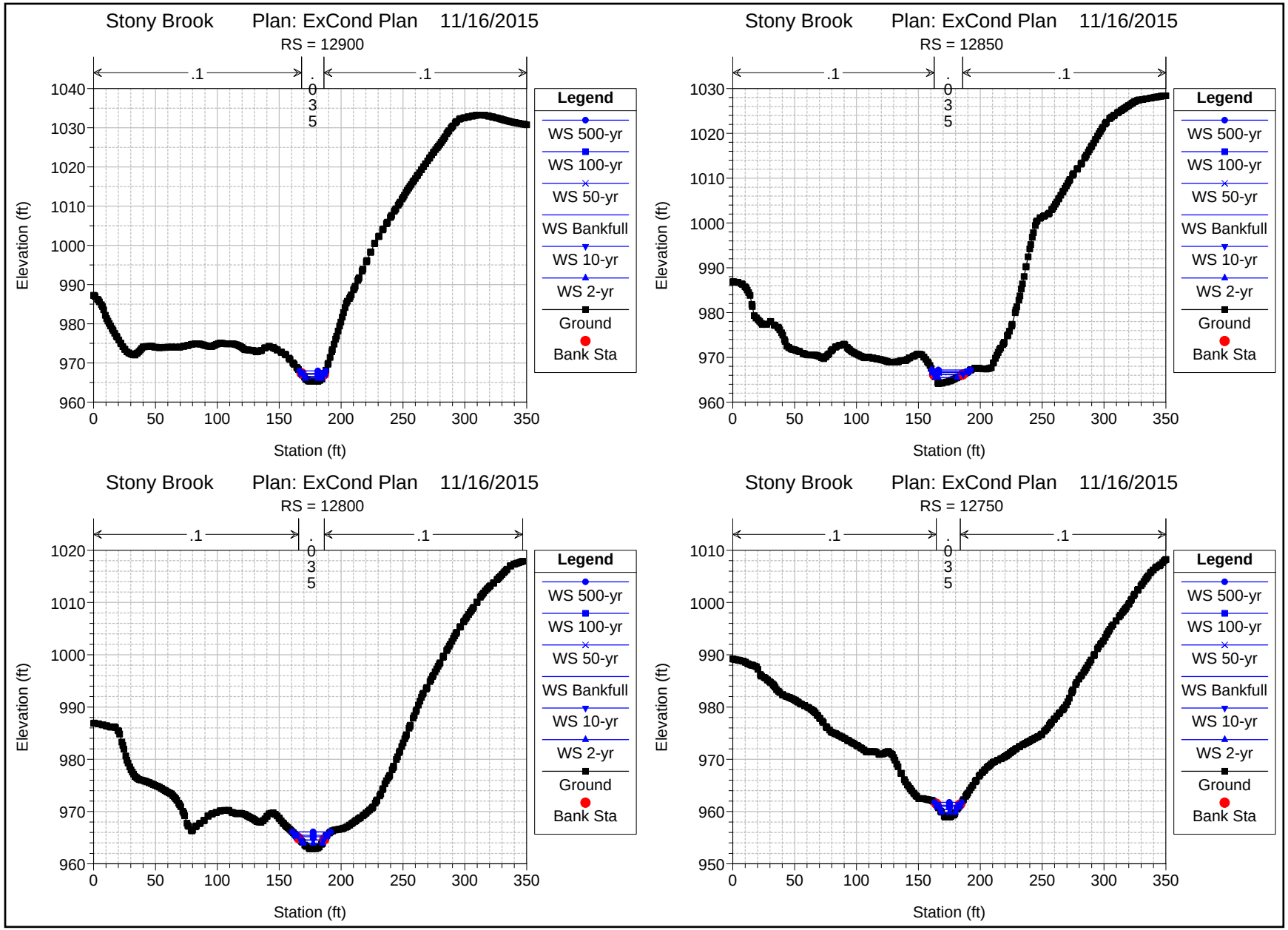
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WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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Station (ft)
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Ground
Bank Sta
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Station (ft)
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Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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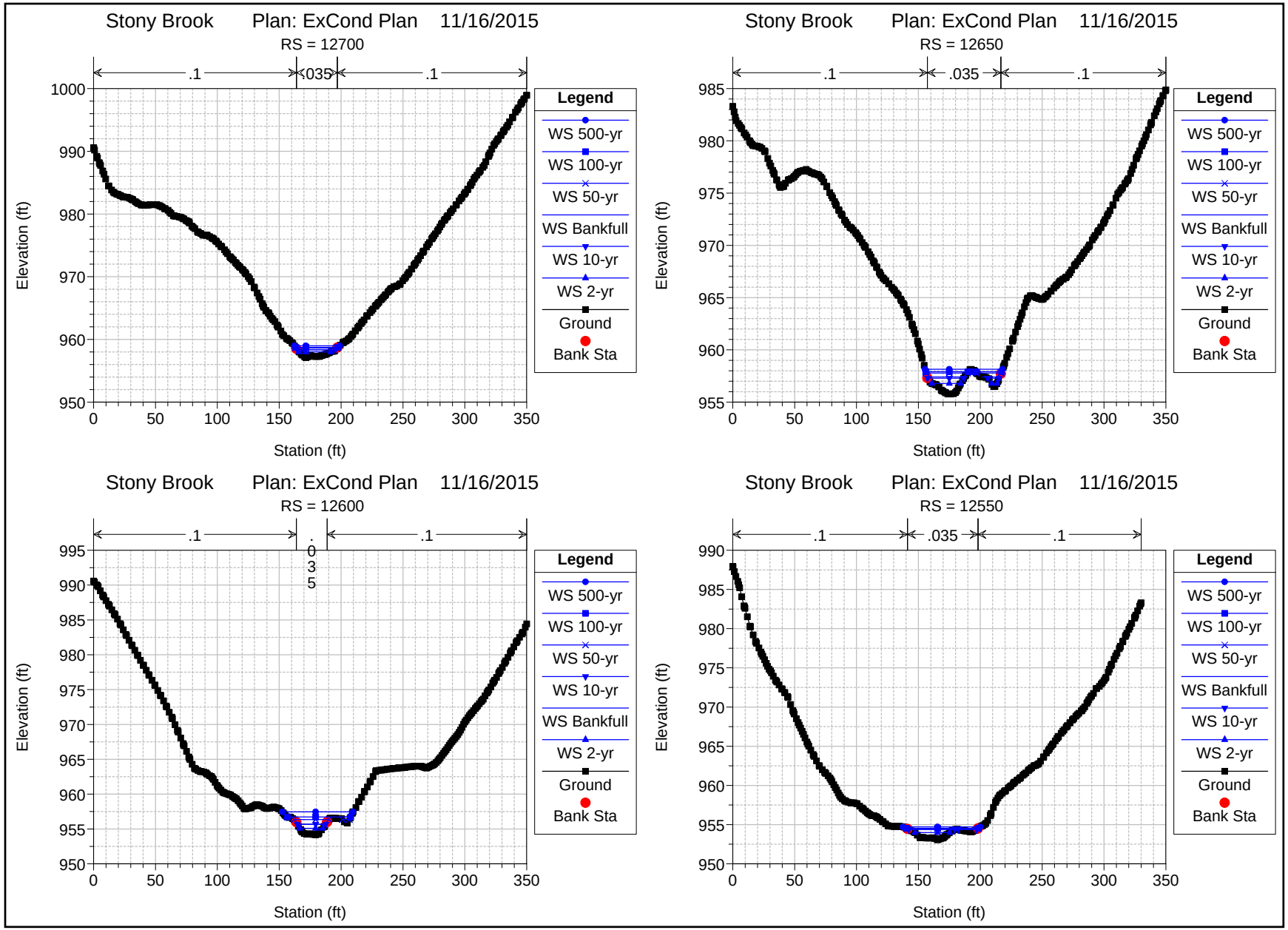
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Ground
Bank Sta
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Station (ft)
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WS 2-yr
Ground
Bank Sta
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Station (ft)
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Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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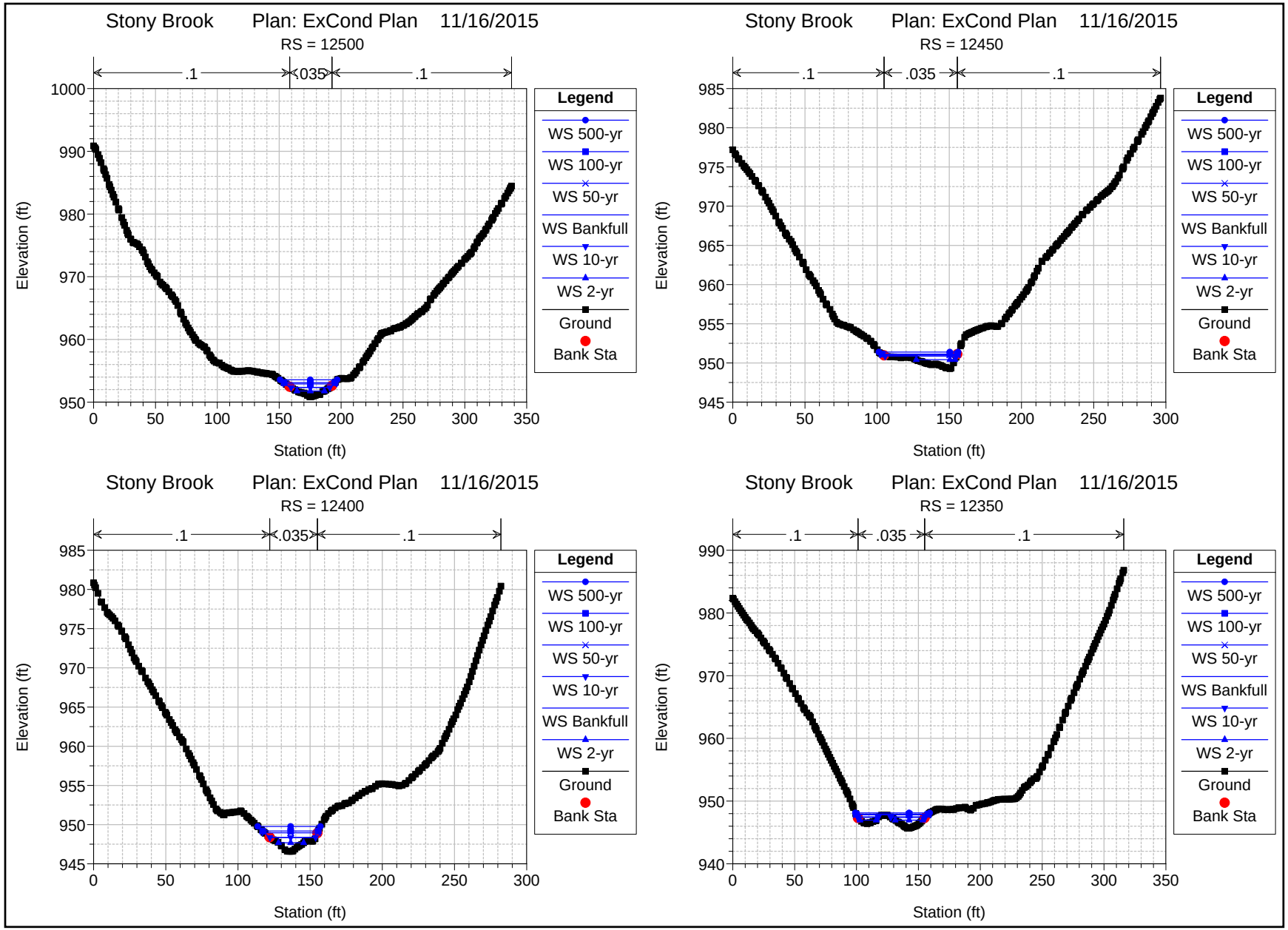
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WS 2-yr
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Bank Sta
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Bank Sta
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Station (ft)
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Bank Sta
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WS 2-yr
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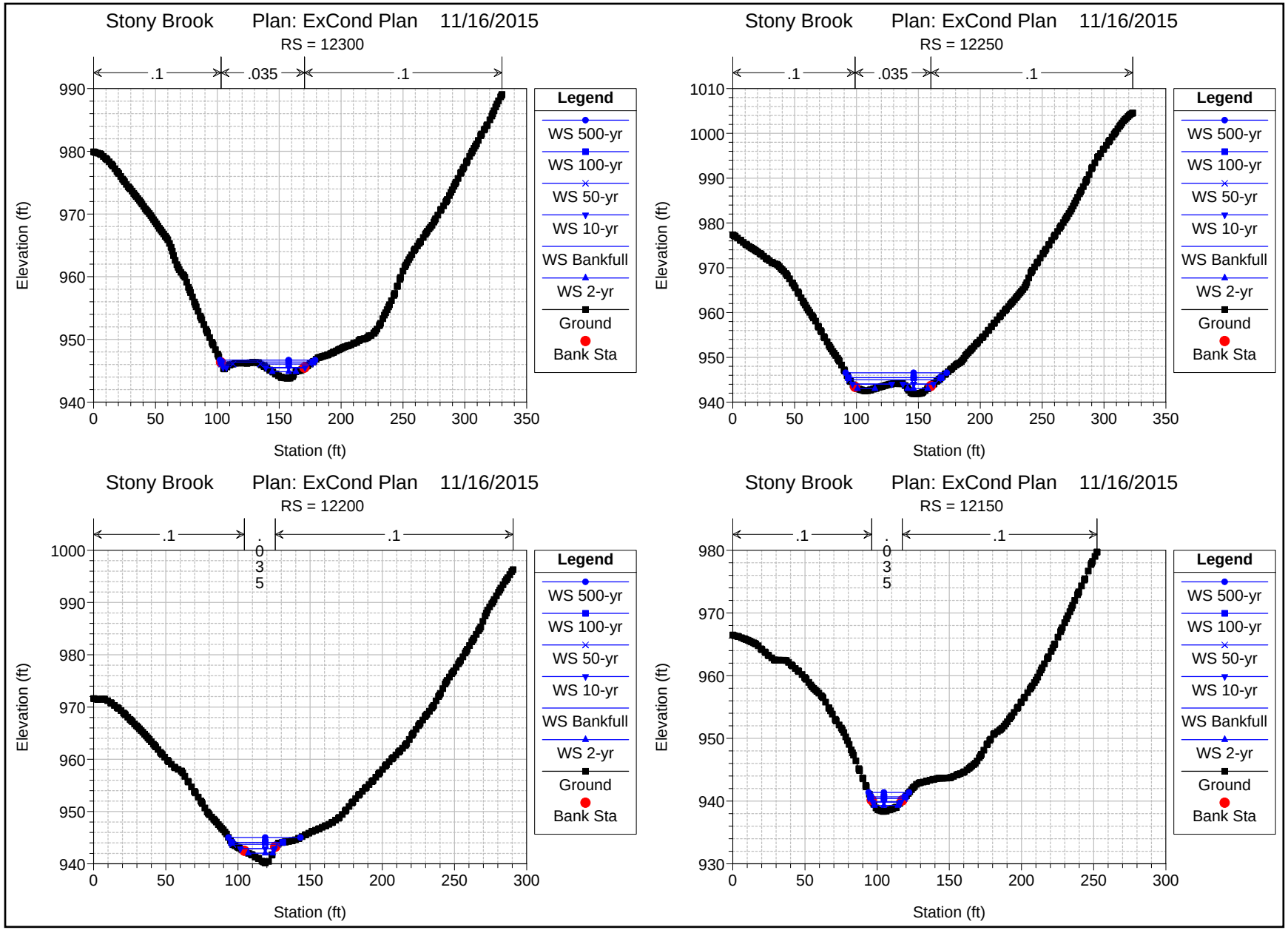
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Bank Sta
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Bank Sta
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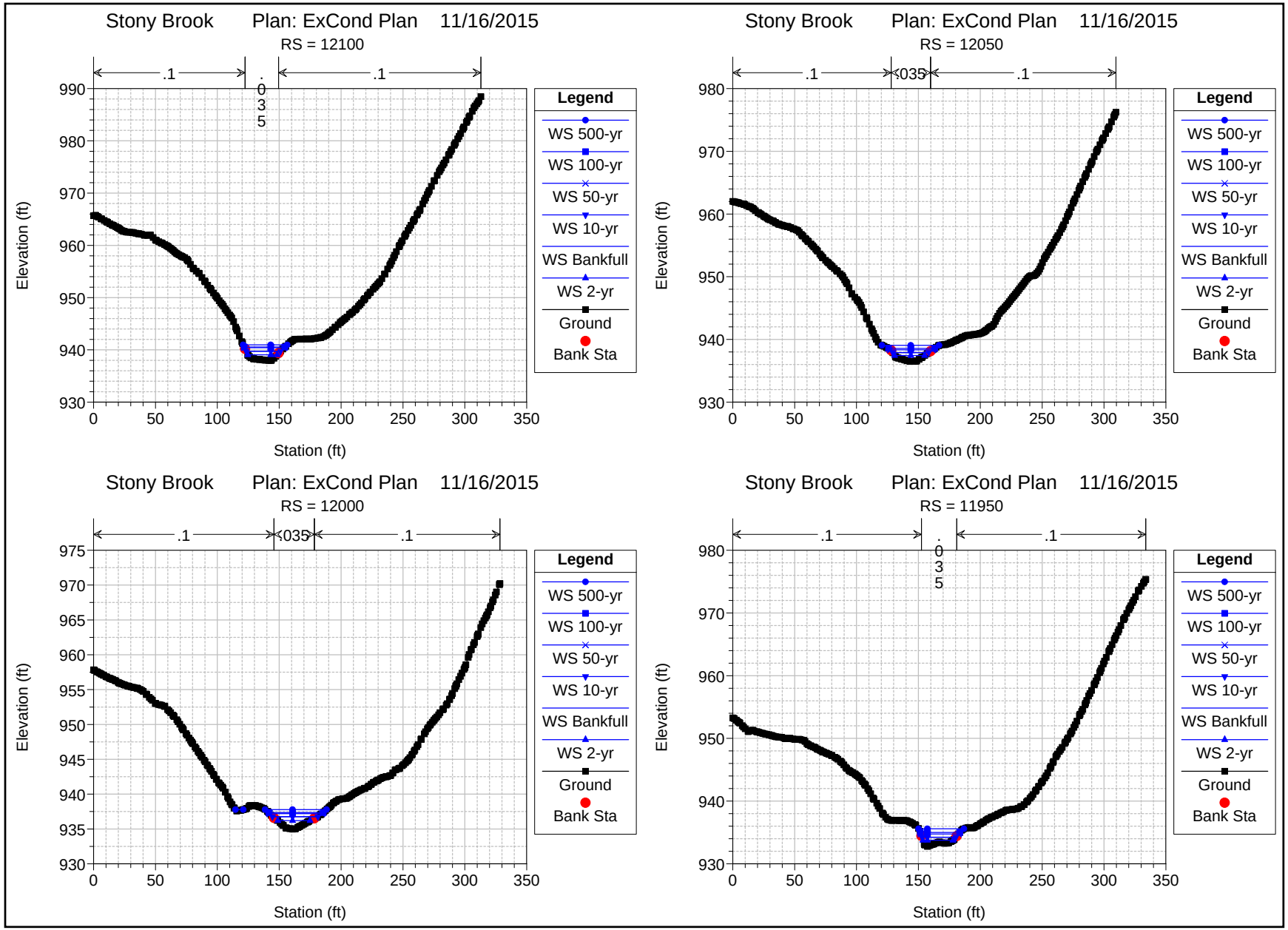
Bank Sta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Bank Sta
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Ground
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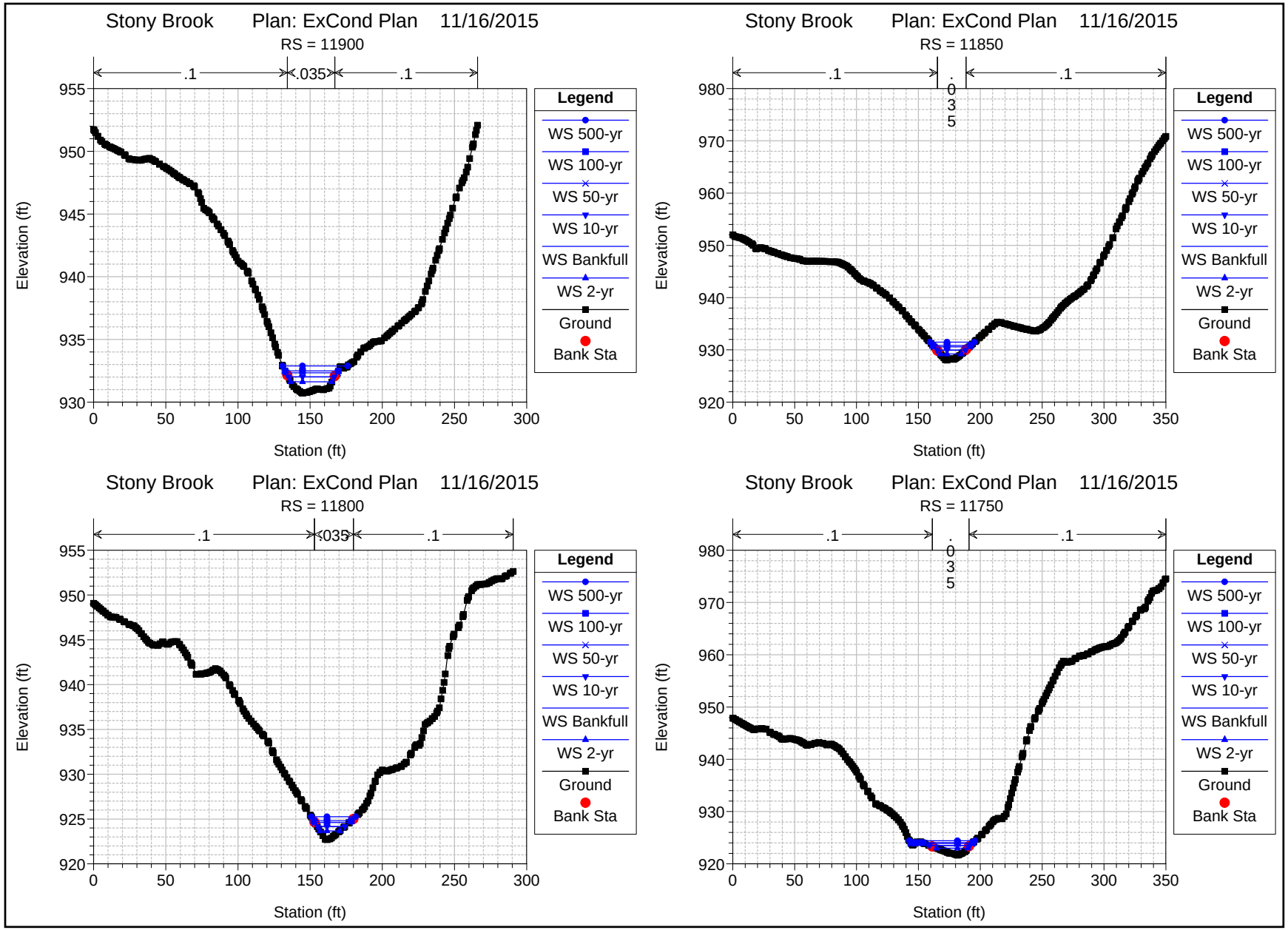
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Ground
Bank Sta
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Station (ft)
Legend
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Ground
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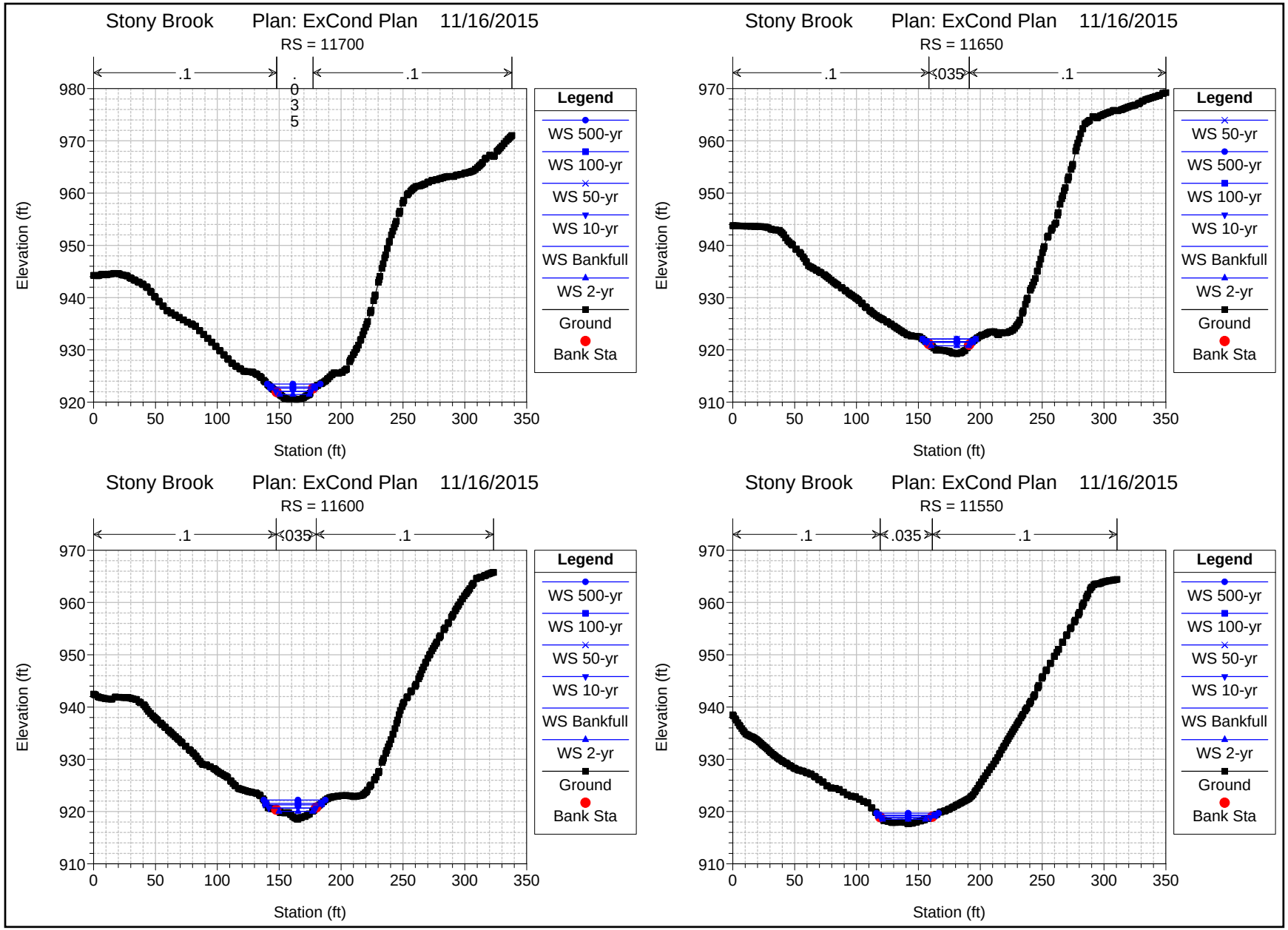
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Ground
Bank Sta
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Station (ft)
Legend
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WS 10-yr
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WS 2-yr
Ground
Bank Sta
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Elevation (ft)
Station (ft)
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
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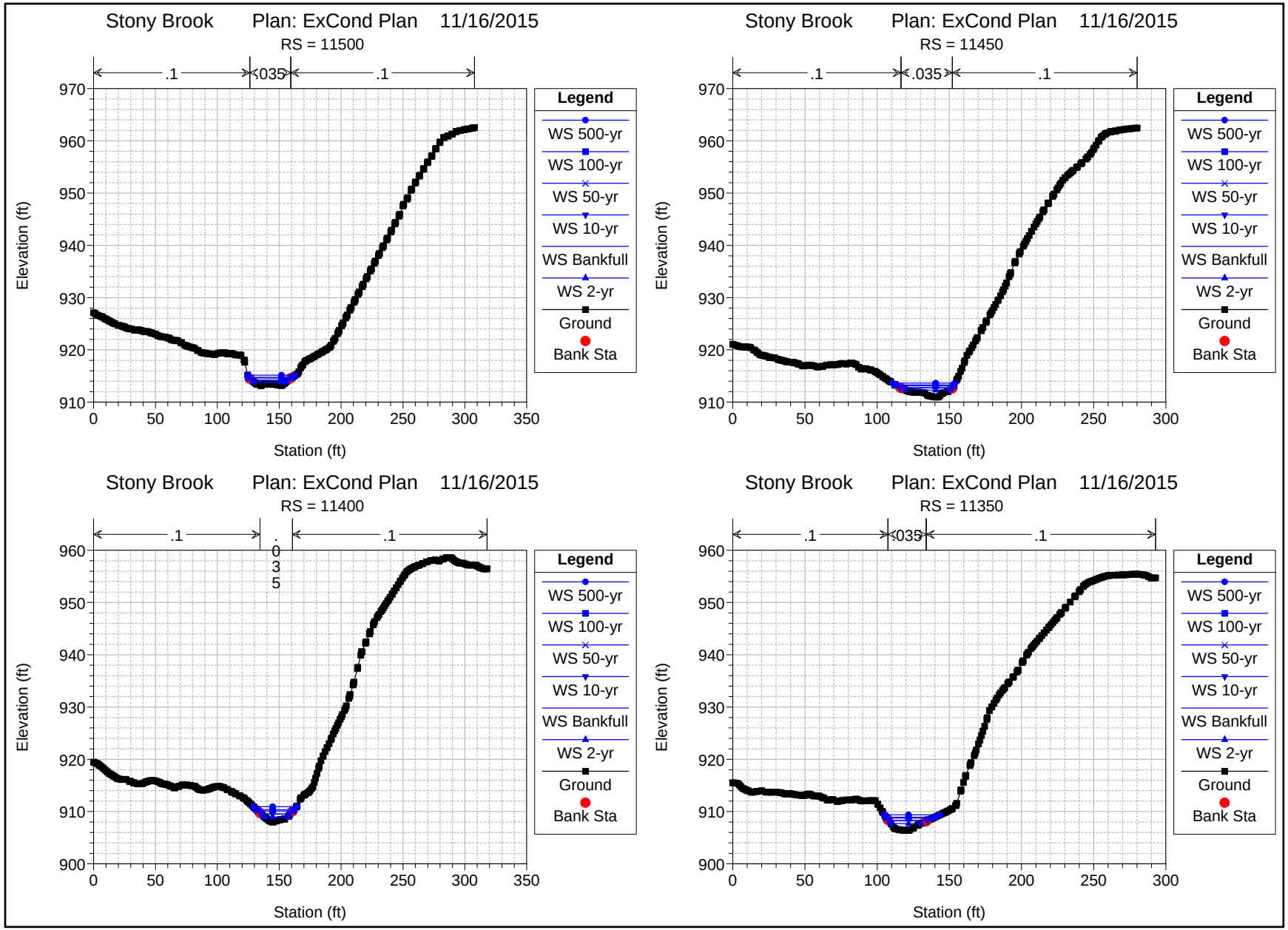
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Elevation (ft)
Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 11450
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Elevation (ft)
Station (ft)
Legend
WS 500-yr
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 11400
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Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 11350
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Elevation (ft)
Station (ft)
Legend
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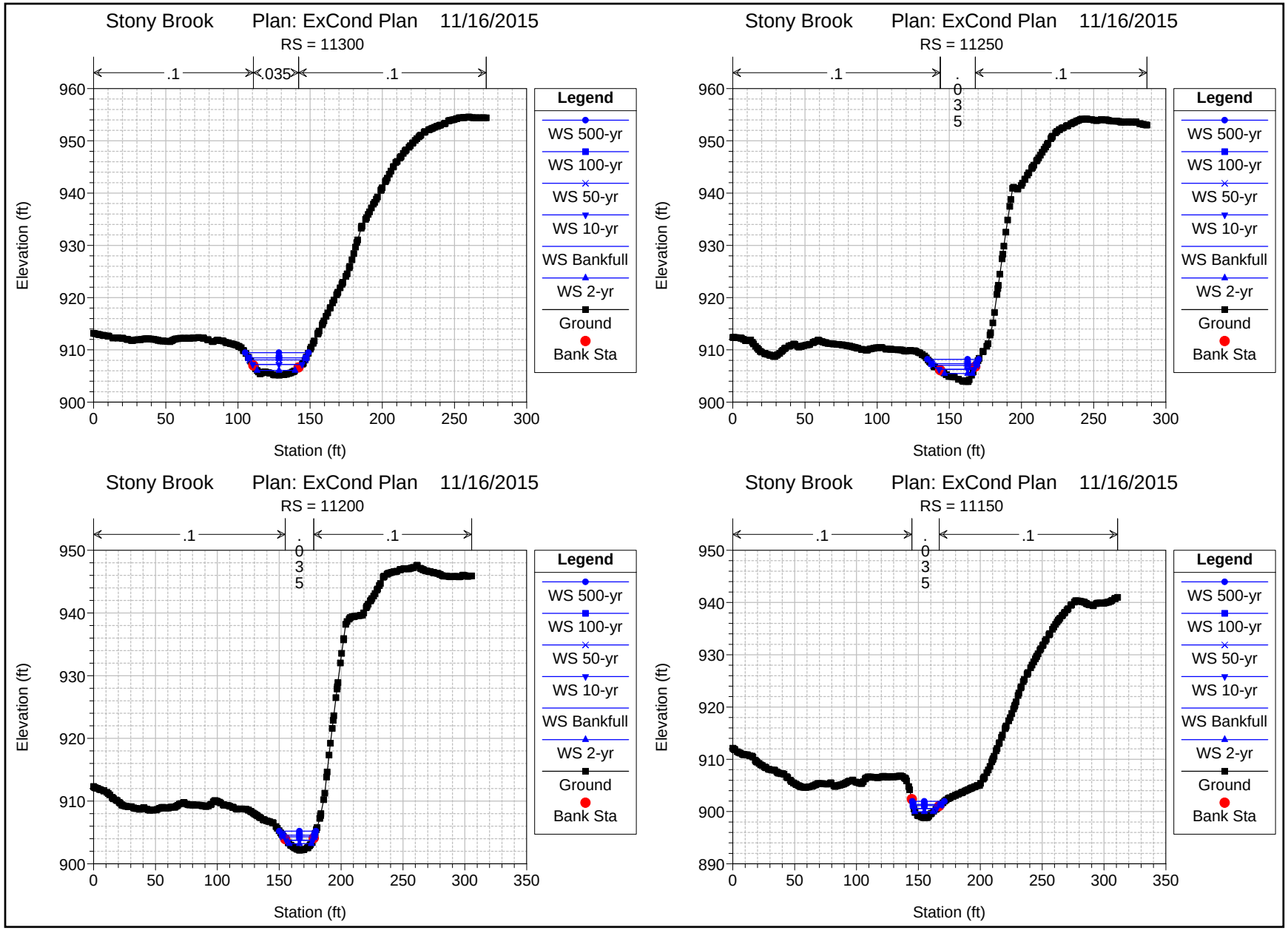
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta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Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 11250
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Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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Elevation (ft)
Station (ft)
Legend
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WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 11150
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Station (ft)
Legend
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WS 10-yr
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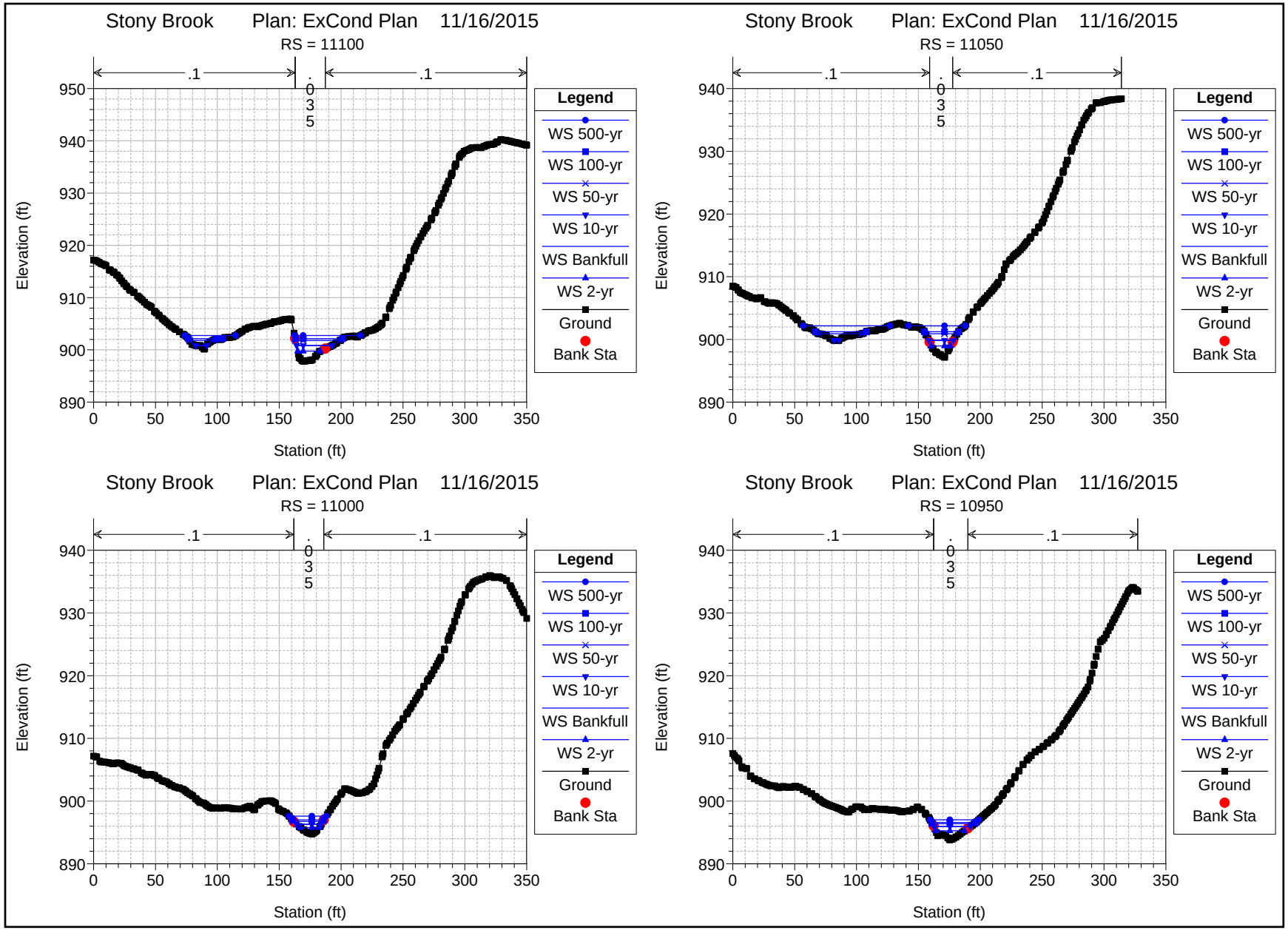
WS 2-yr
Ground
Bank Sta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Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
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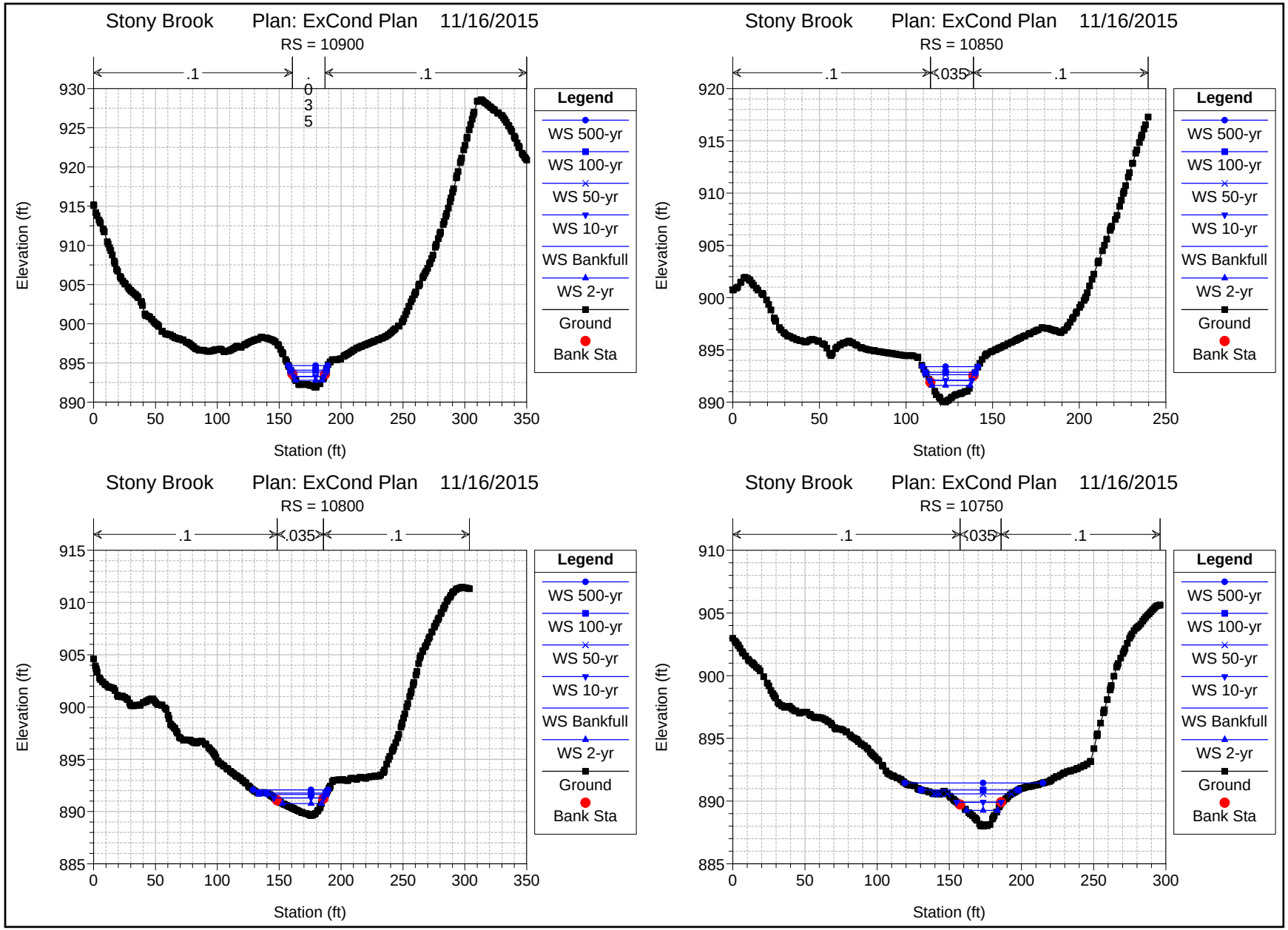
RS = 11050
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 11000
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 10950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Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 10850
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Elevation (ft)
Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 10800
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Elevation (ft)
Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 10750
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.035
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Elevation (ft)
Station (ft)
Legend
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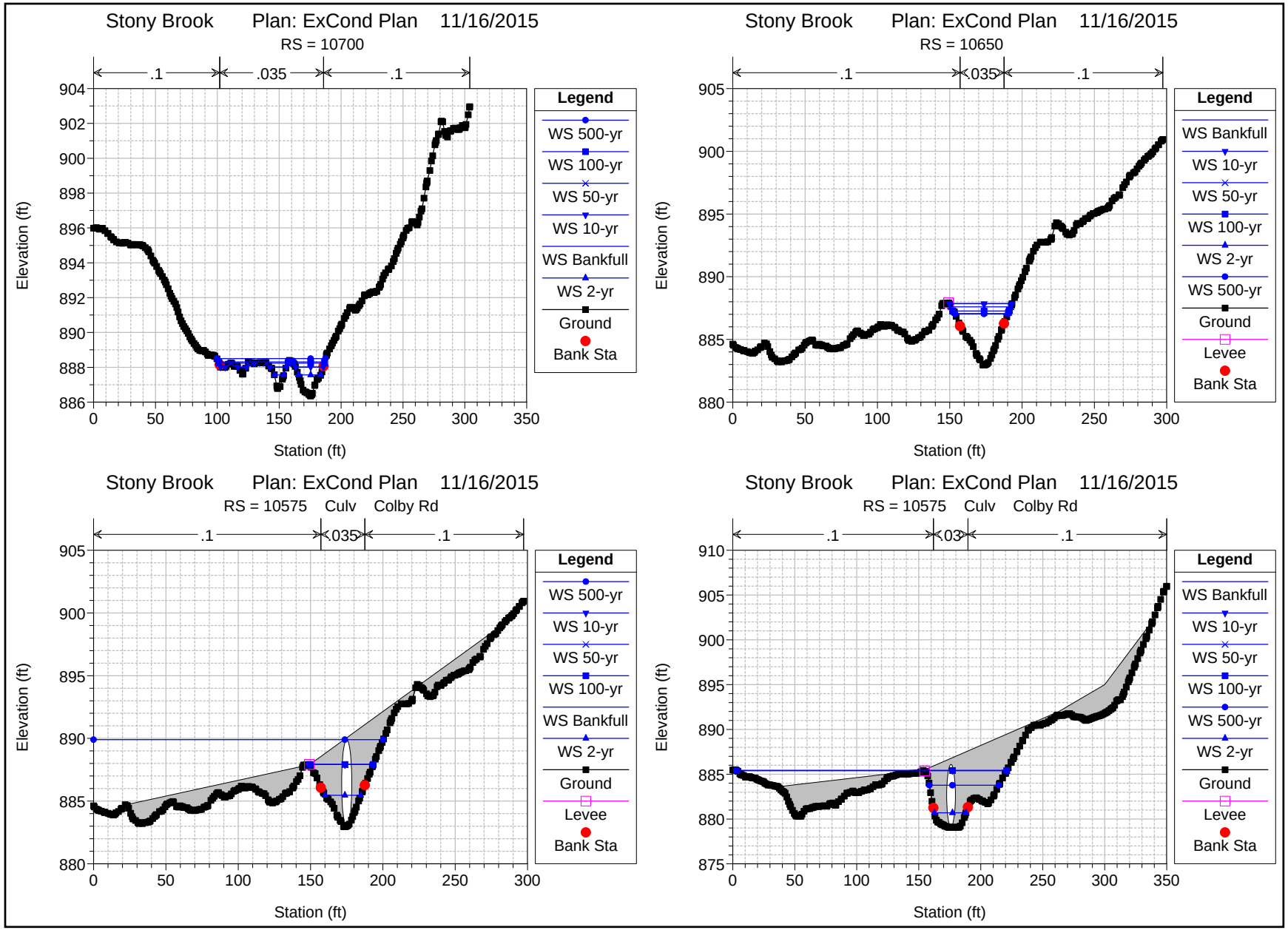
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta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Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 10650
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Elevation (ft)
Station (ft)
Legend
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WS 10-yr
WS 50-yr
WS 100-yr
WS 2-yr
WS 500-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 10575 Culv Colby Rd
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Elevation (ft)
Station (ft)
Legend
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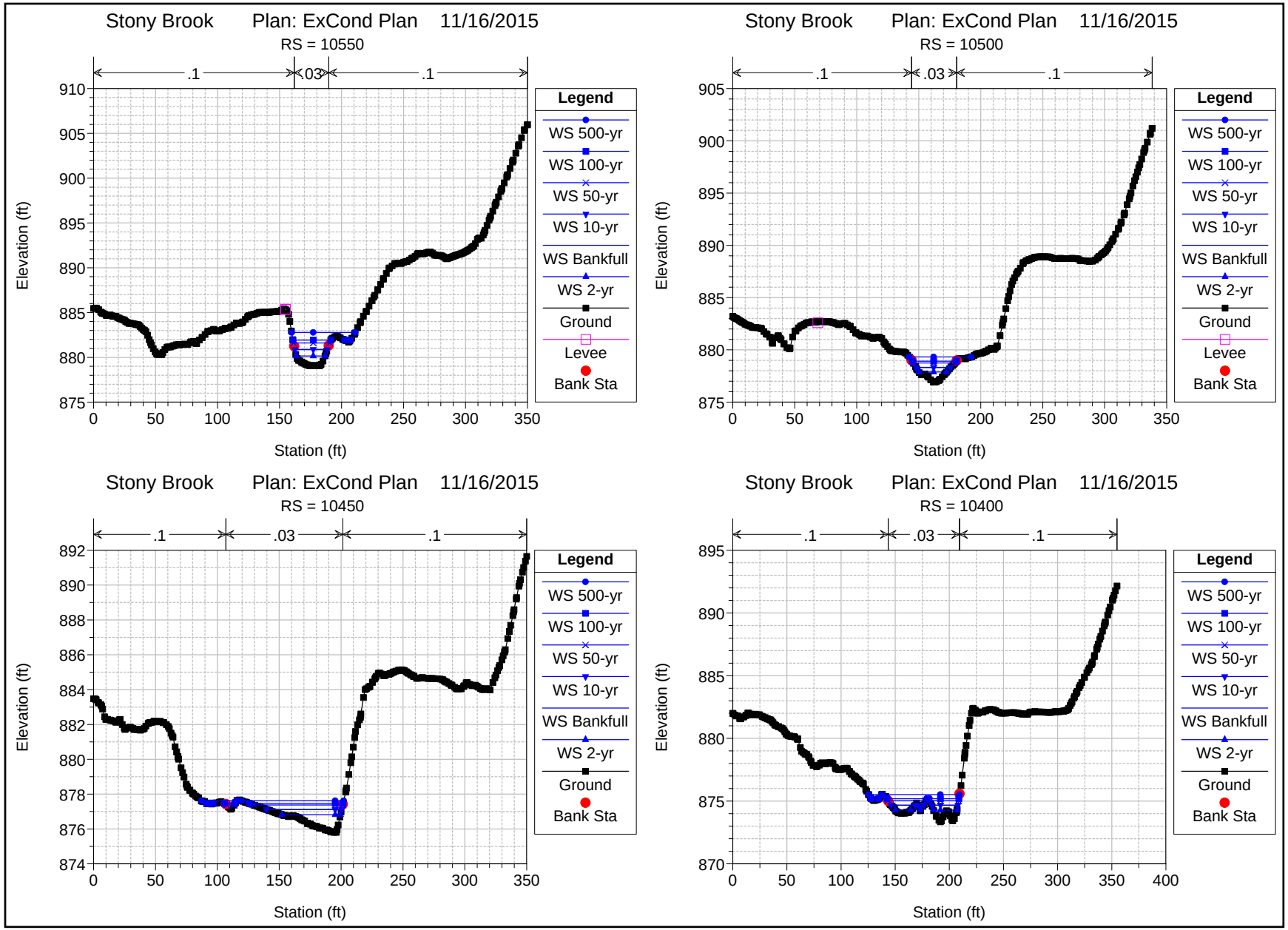
WS 10-yr
WS 50-yr
WS 100-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 10575 Culv Colby Rd
.1
.03
.1
Elevation (ft)
Station (ft)
Legend
WS Bankfull
WS 10-yr
WS 50-yr
WS 100-yr
WS 500-yr
WS 2-yr
Ground
Levee
Bank Sta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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 10500
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.03
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Elevation (ft)
Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 10450
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.03
.1
Elevation (ft)
Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 10400
.1
.03
.1
Elevation (ft)
Station (ft)
Legend
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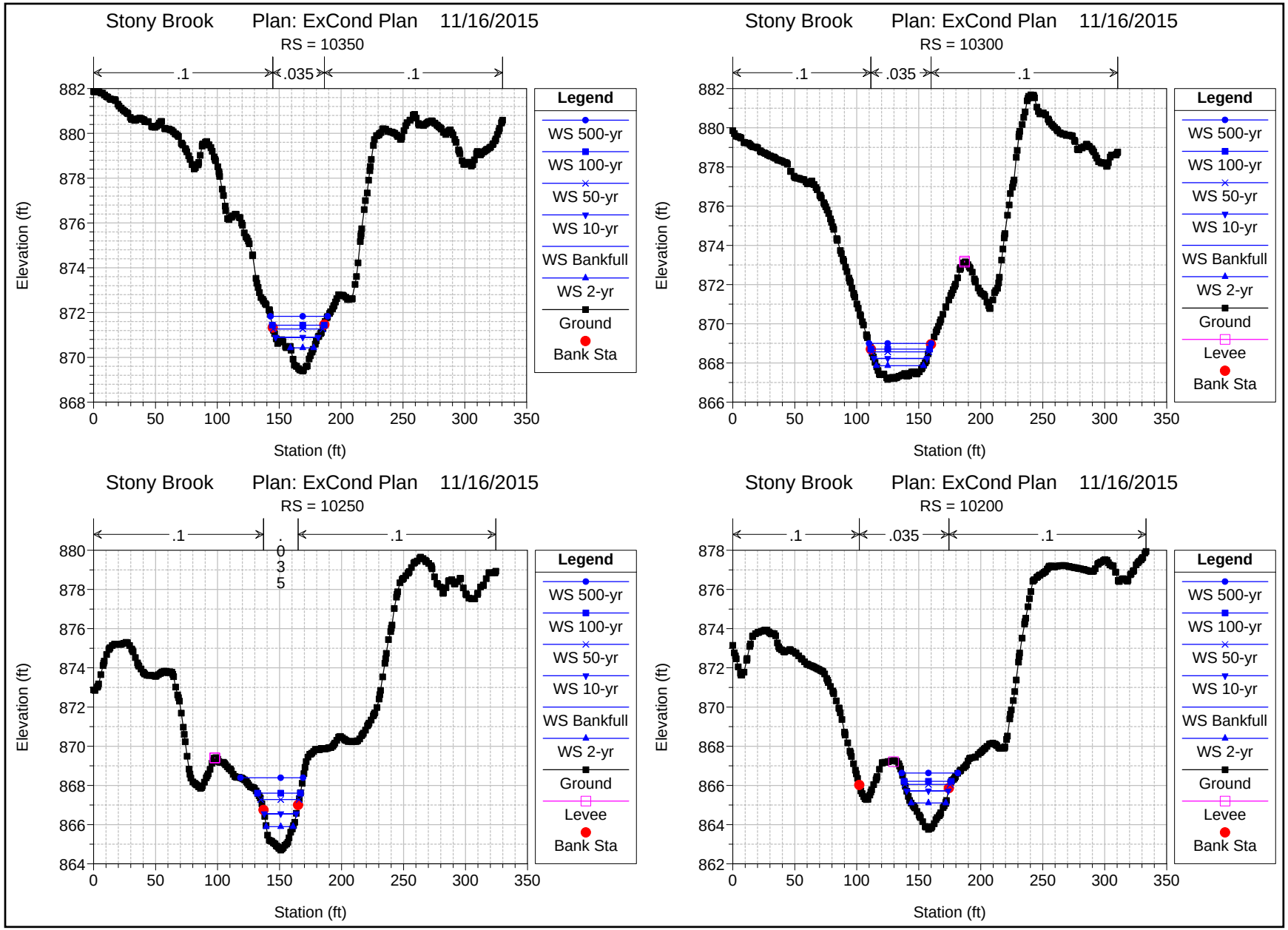
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta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Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 10300
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.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 10250
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Elevation (ft)
Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 10200
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
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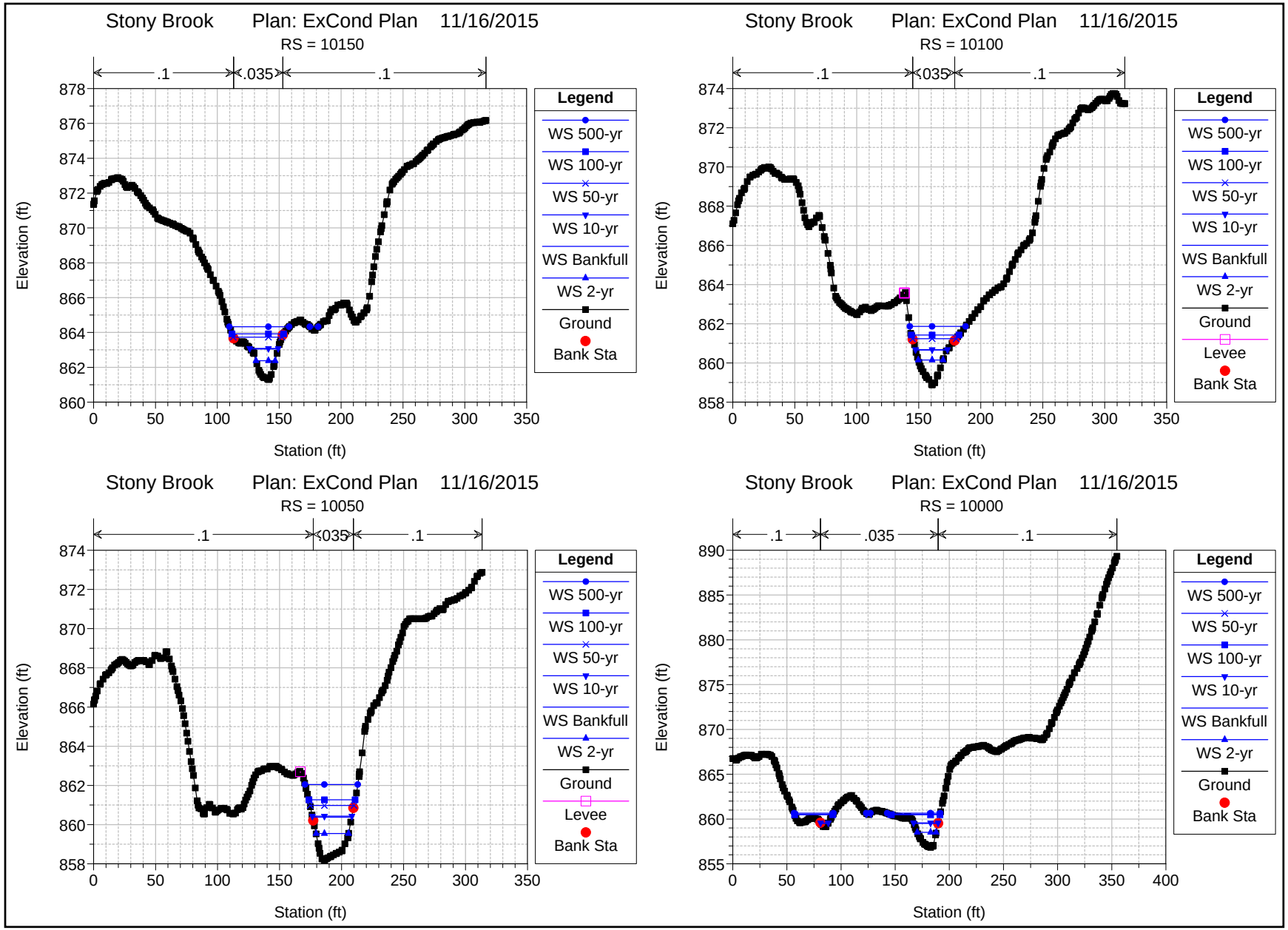
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 10100
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.035
.1
Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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Station (ft)
Legend
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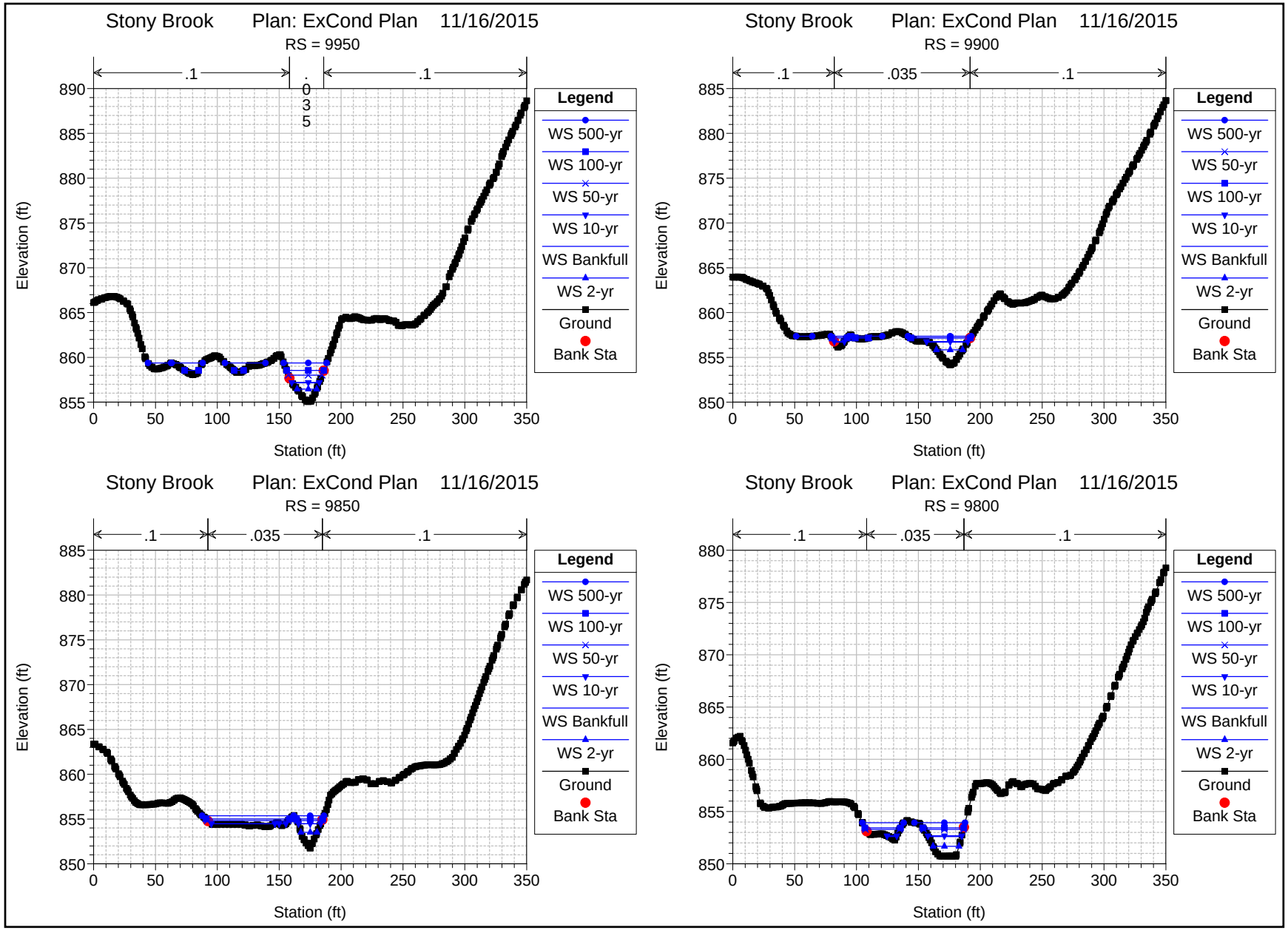
WS 2-yr
Ground
Bank Sta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Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 9900
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.035
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Elevation (ft)
Station (ft)
Legend
WS 500-yr
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WS 100-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 9850
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Elevation (ft)
Station (ft)
Legend
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WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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Elevation (ft)
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Legend
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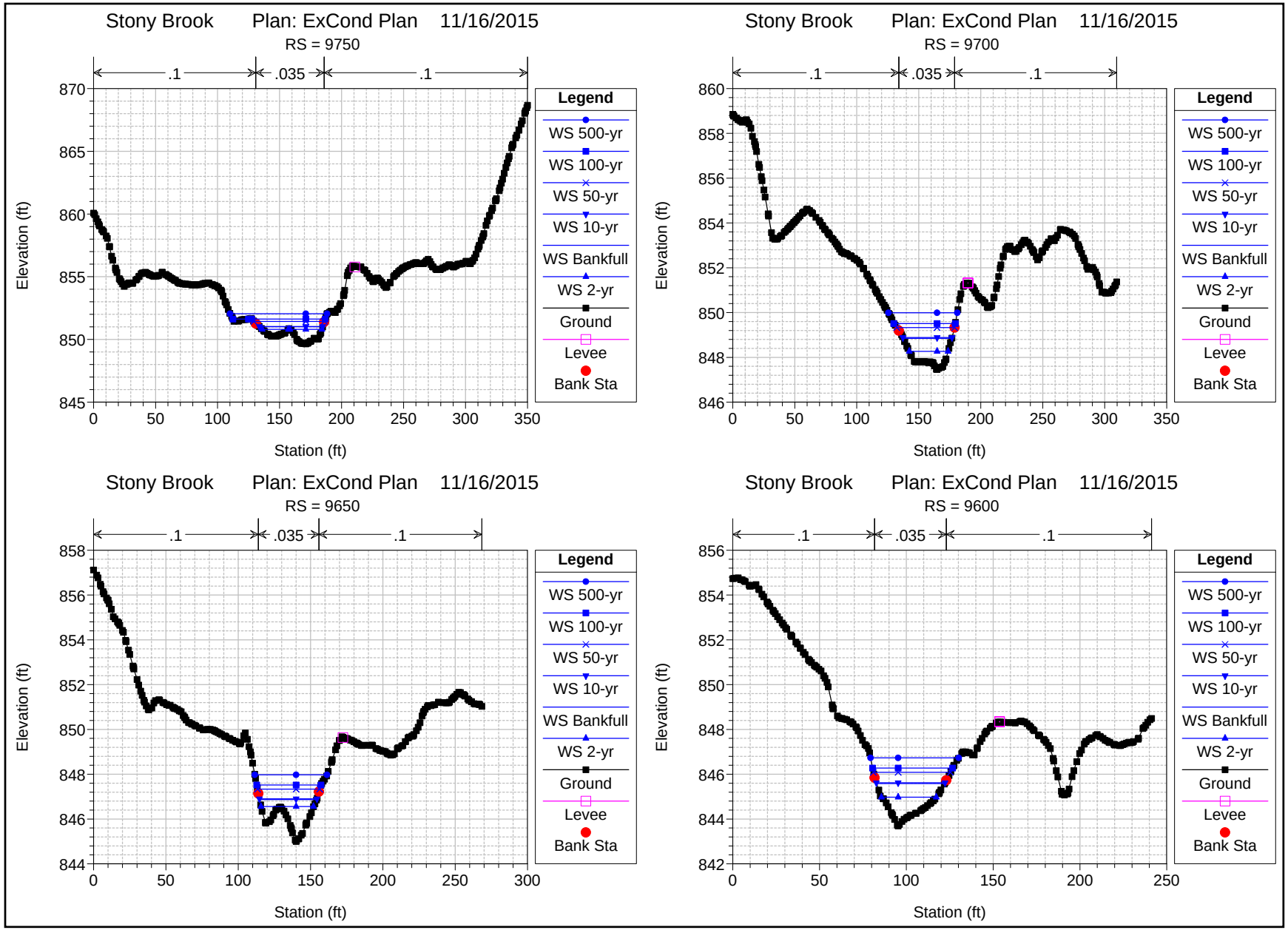
Ground
Bank Sta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Elevation (ft)
Station (ft)
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WS 100-yr
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WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 9700
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RS = 9650
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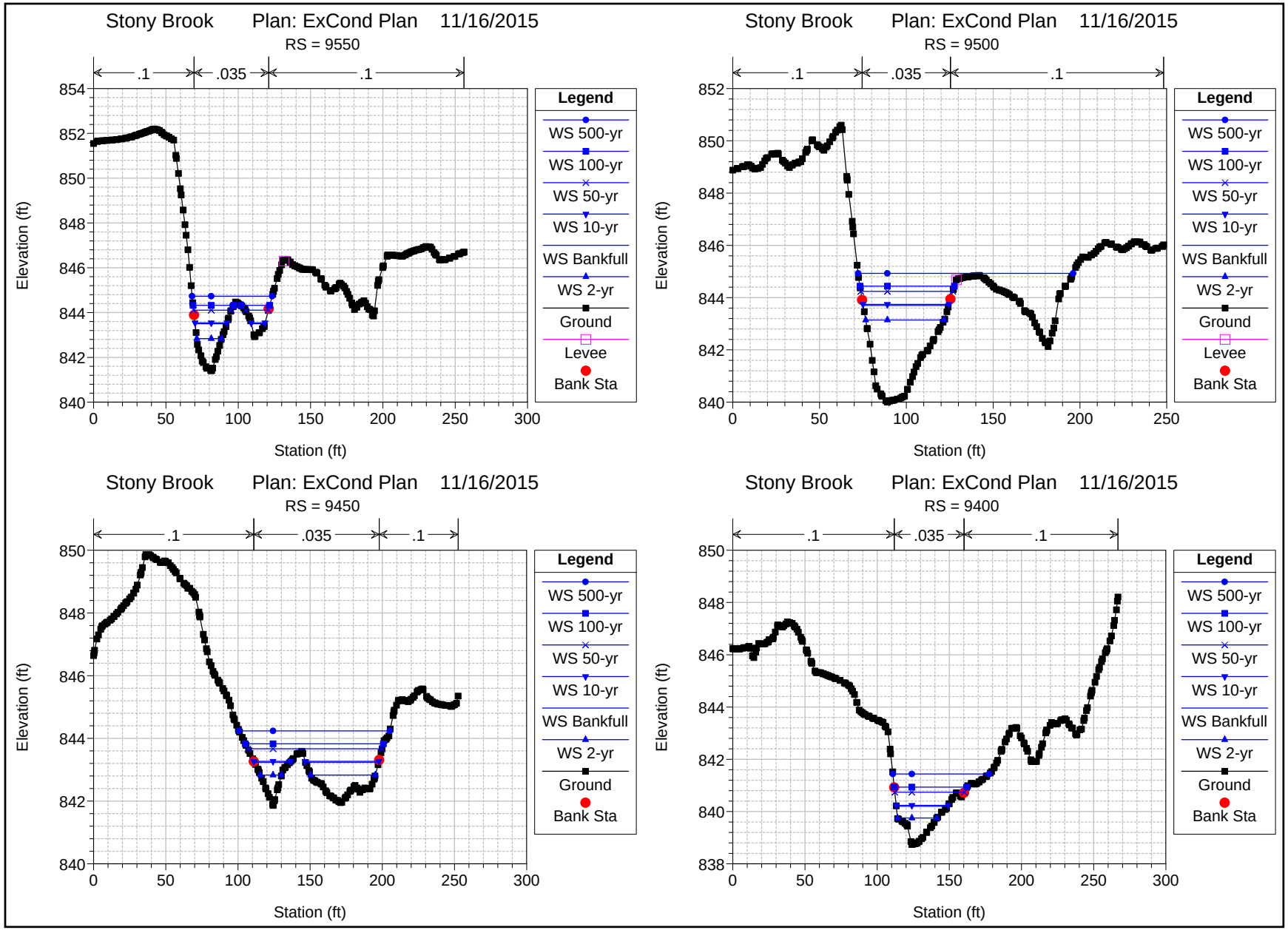
RS = 9600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Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
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RS = 9500
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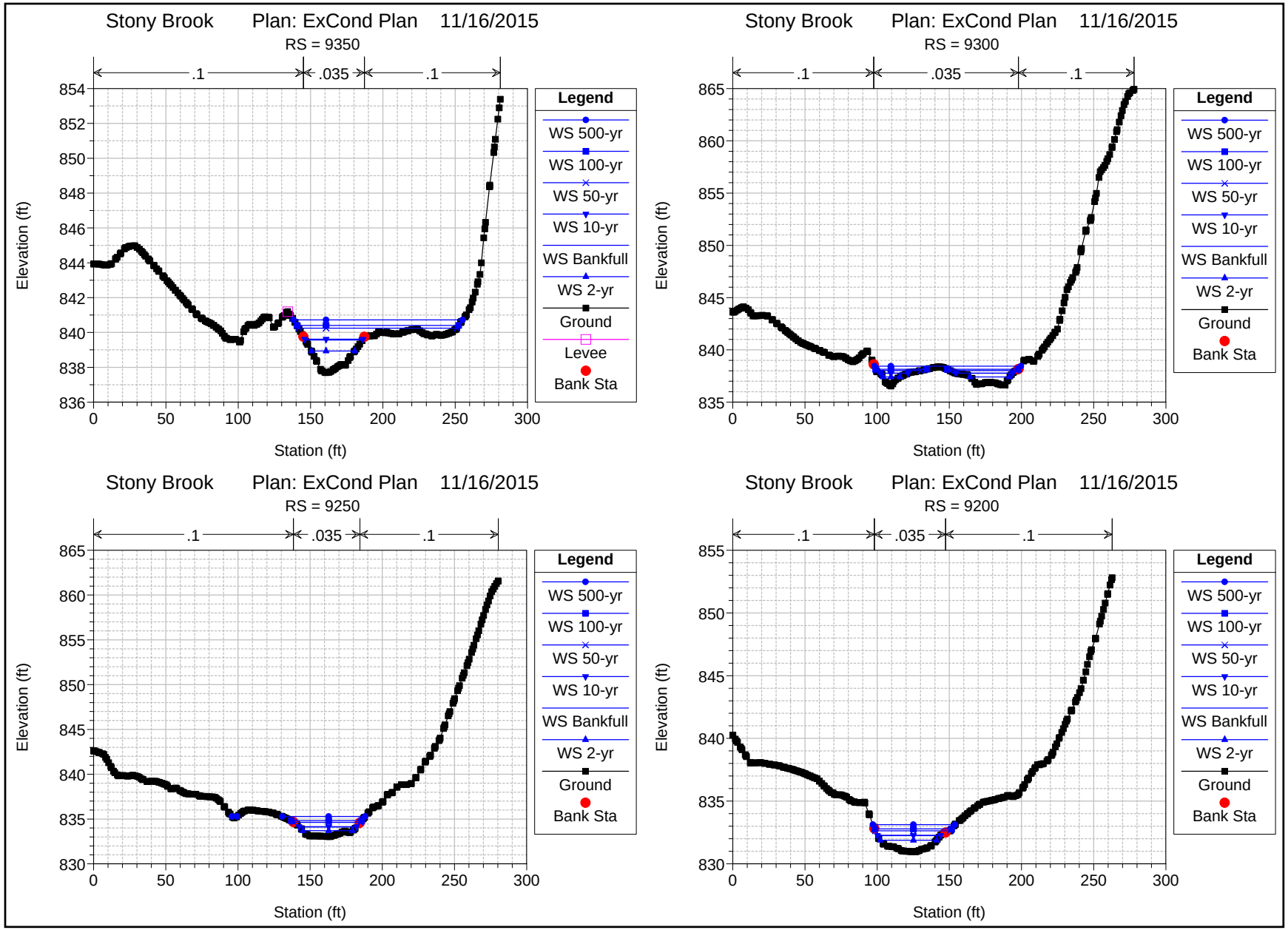
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Station (ft)
Legend
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WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
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RS = 9300
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RS = 9250
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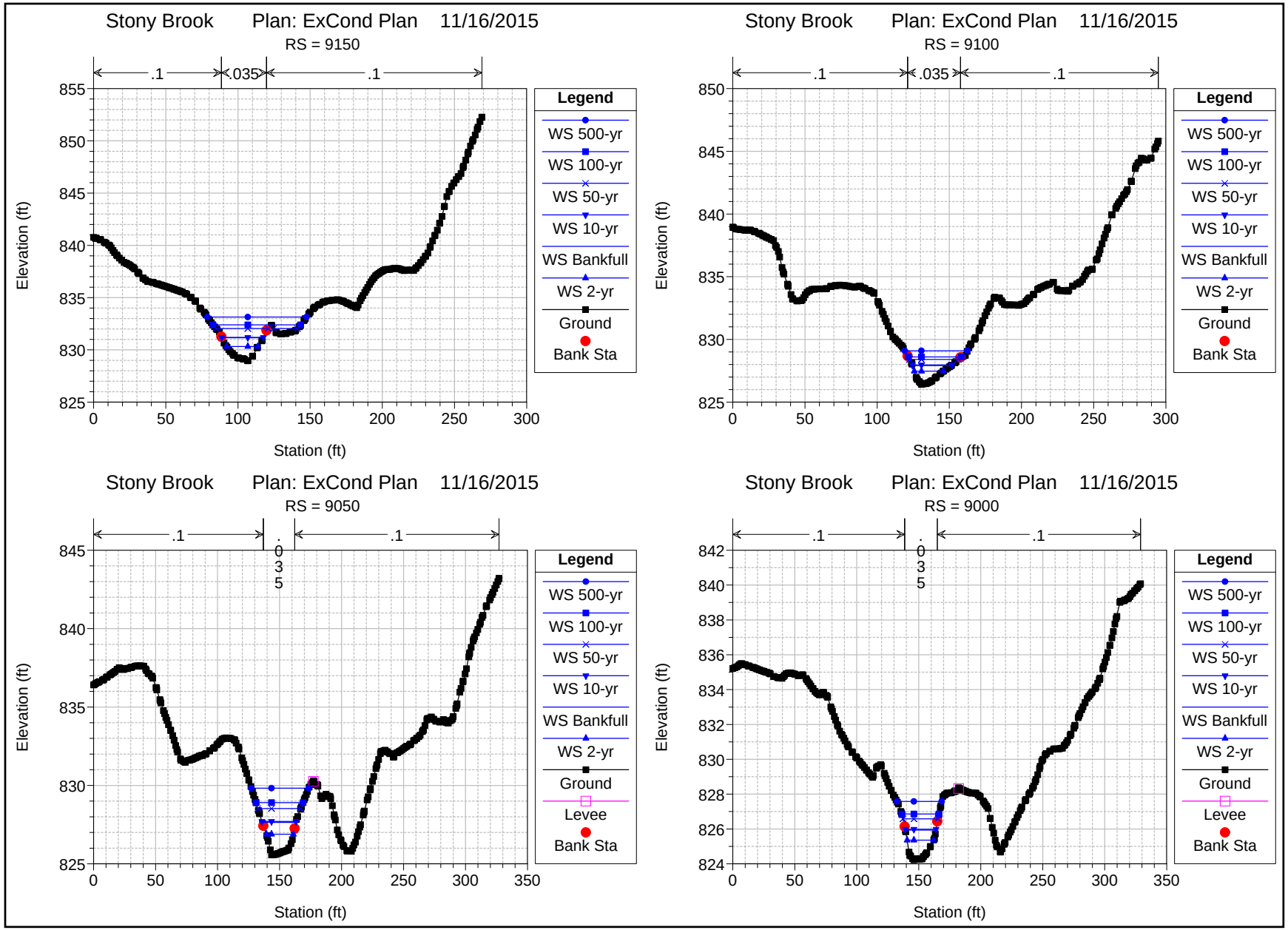
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 9050
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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
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WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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Elevation (ft)
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WS 50-yr
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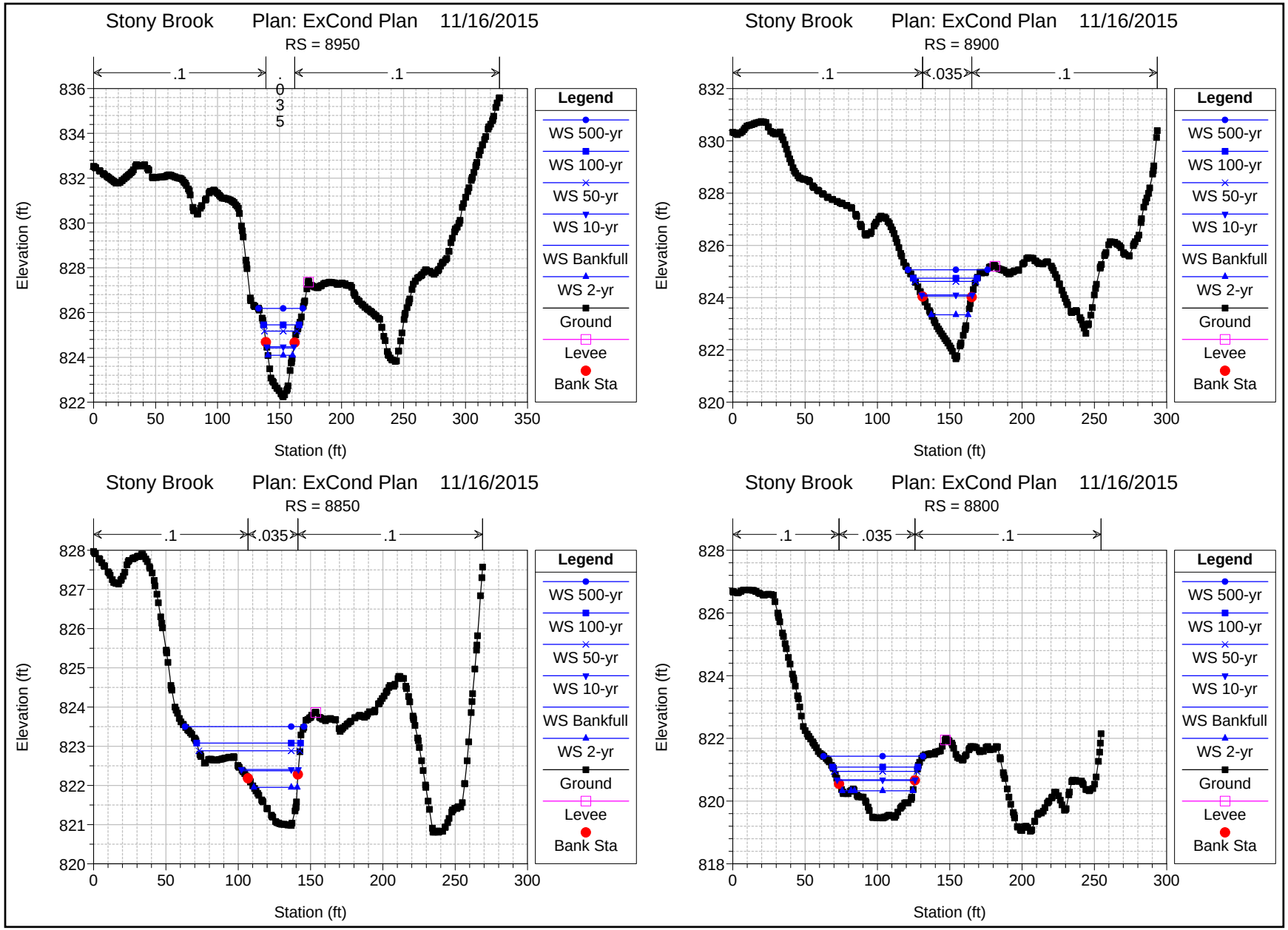
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta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Station (ft)
Legend
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WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 8900
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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 8850
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Elevation (ft)
Station (ft)
Legend
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WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 8800
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Elevation (ft)
Station (ft)
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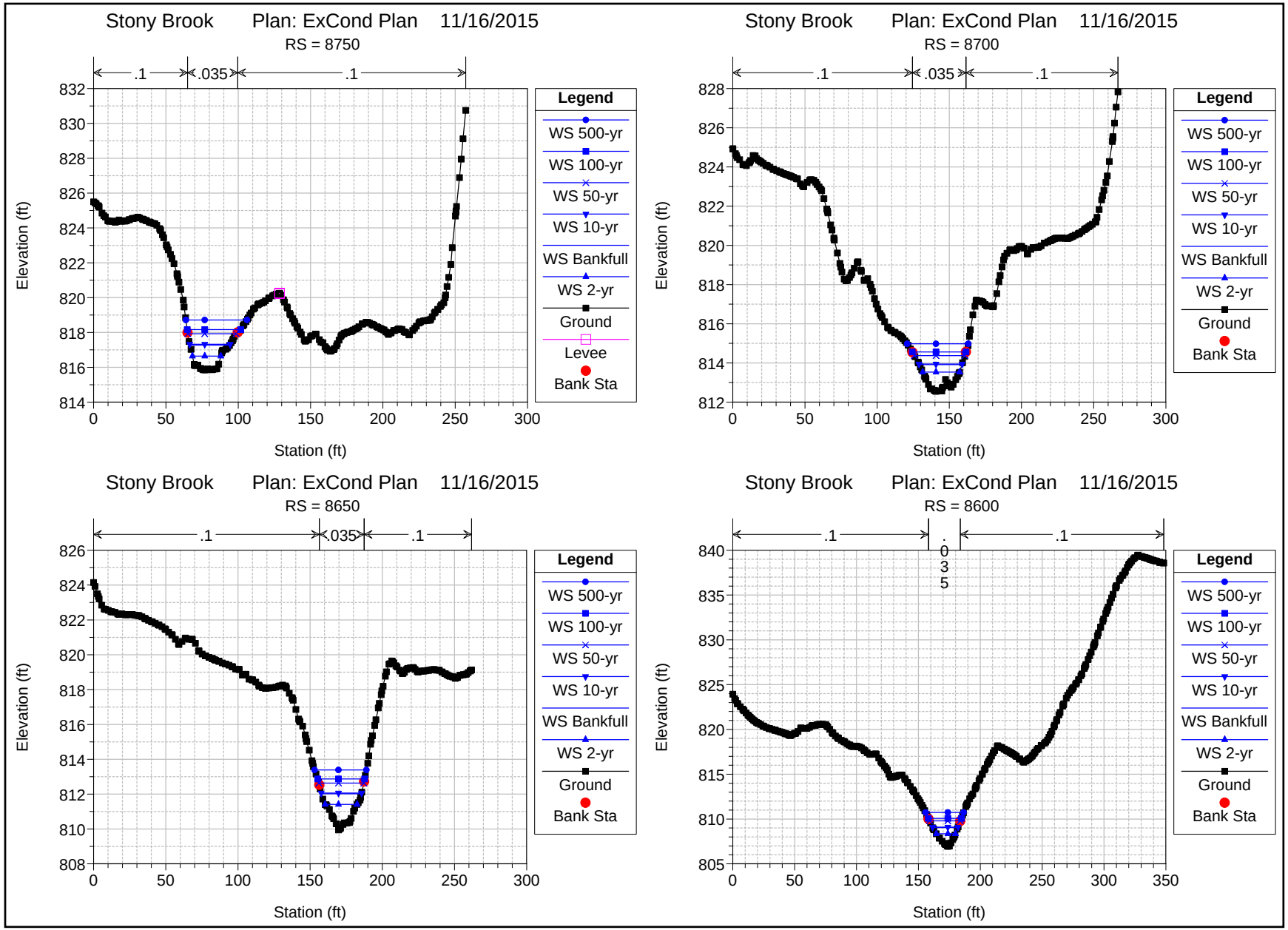
WS 2-yr
Ground
Levee
Bank Sta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Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 8700
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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 8650
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Elevation (ft)
Station (ft)
Legend
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WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 8600
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Station (ft)
Legend
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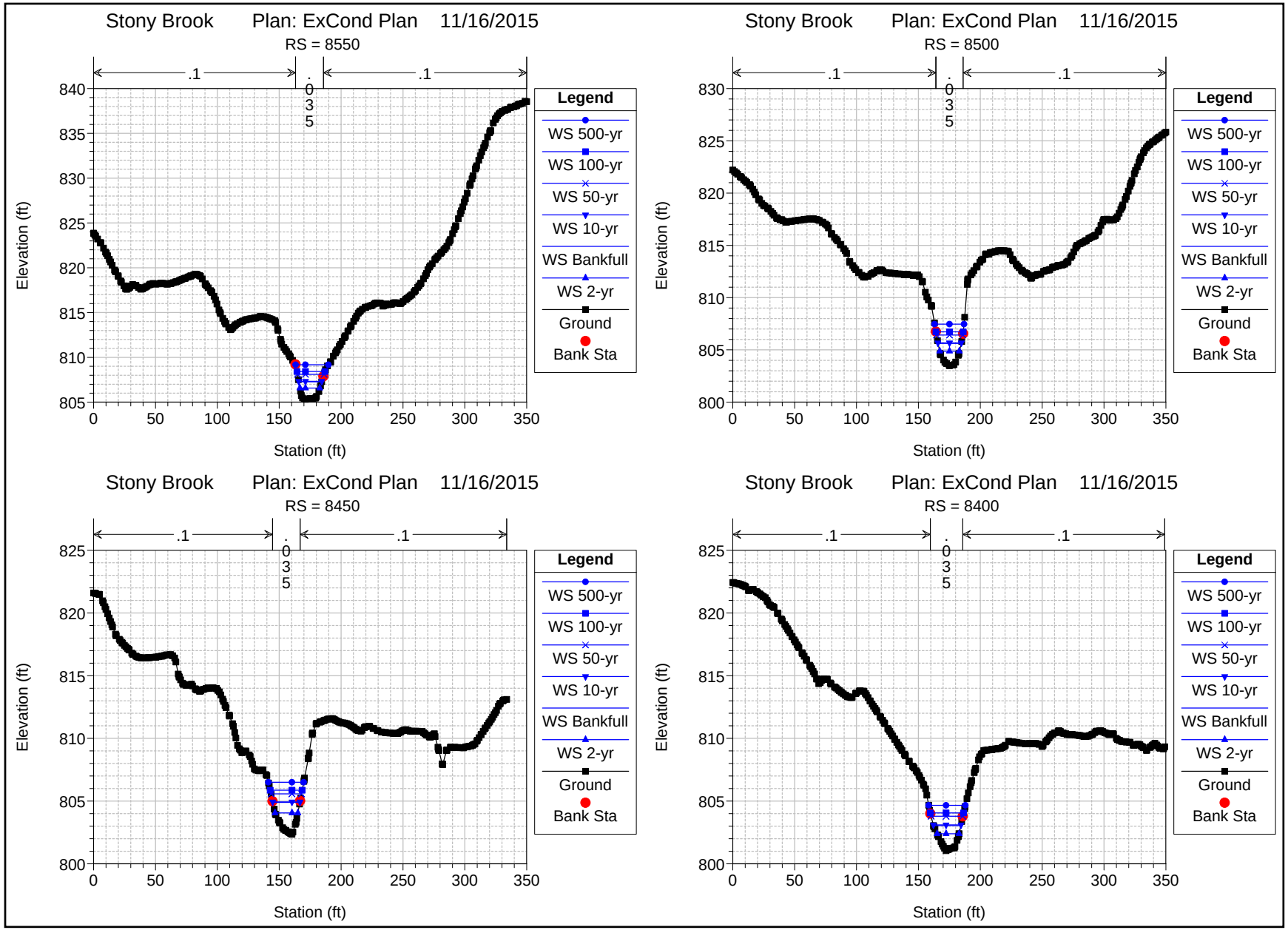
WS 2-yr
Ground
Bank Sta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Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 8500
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Elevation (ft)
Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 8450
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.035
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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 8400
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Station (ft)
Legend
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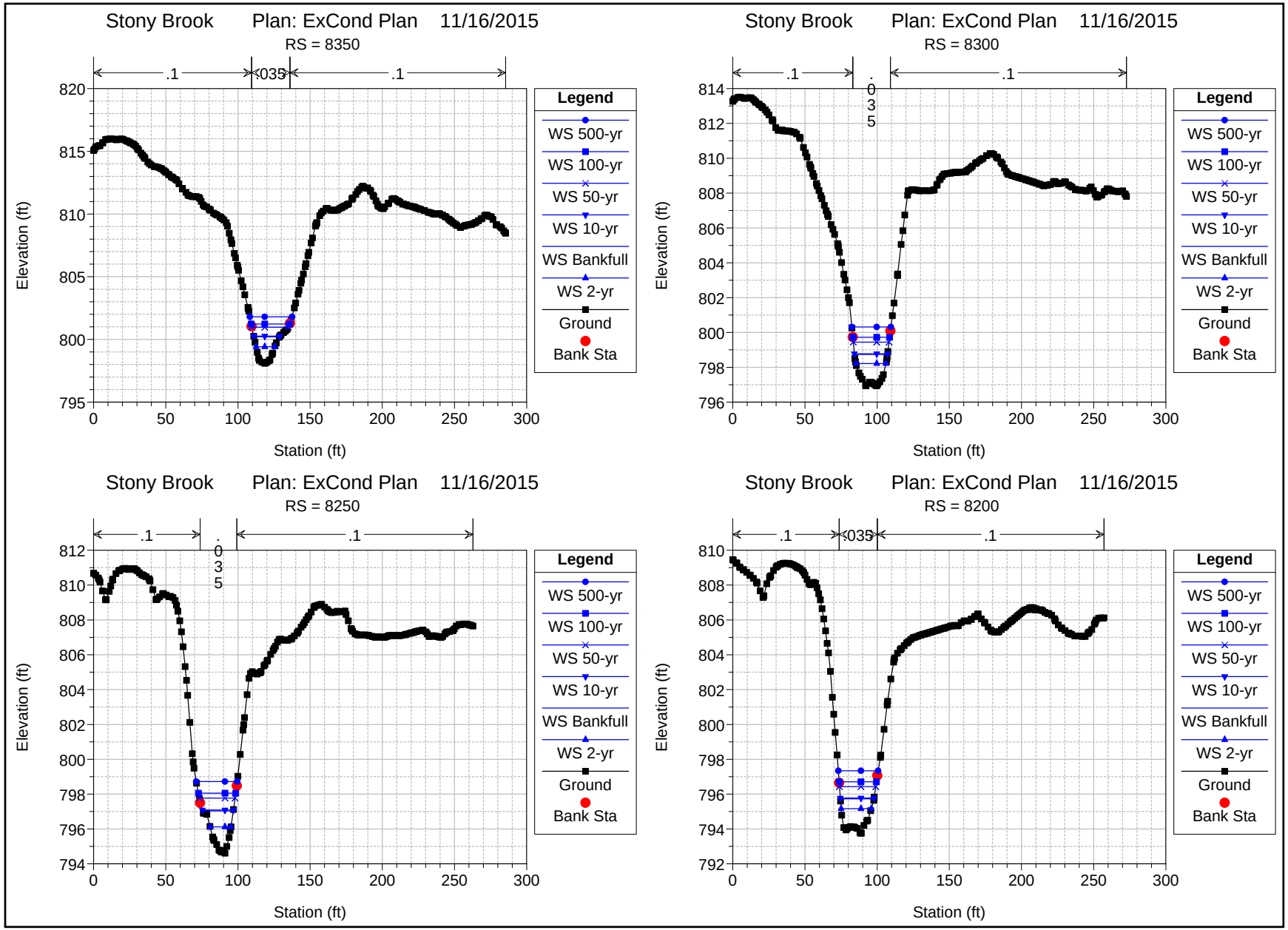
WS 2-yr
Ground
Bank Sta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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 8300
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Elevation (ft)
Station (ft)
Legend
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WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 8250
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Elevation (ft)
Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 8200
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.035
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Station (ft)
Legend
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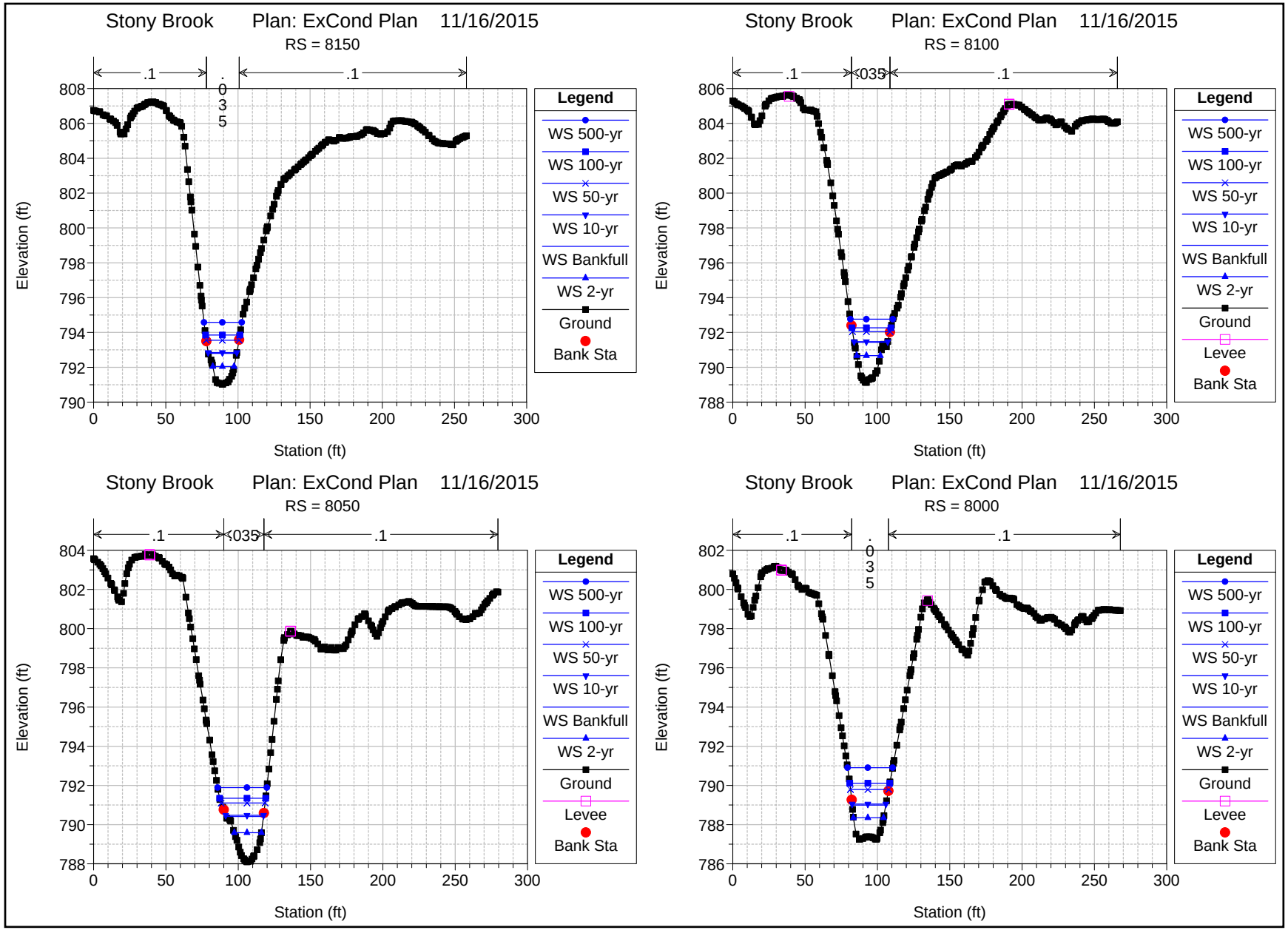
WS 2-yr
Ground
Bank Sta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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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Elevation (ft)
Station (ft)
Legend
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WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 8050
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Elevation (ft)
Station (ft)
Legend
WS 500-yr
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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Elevation (ft)
Station (ft)
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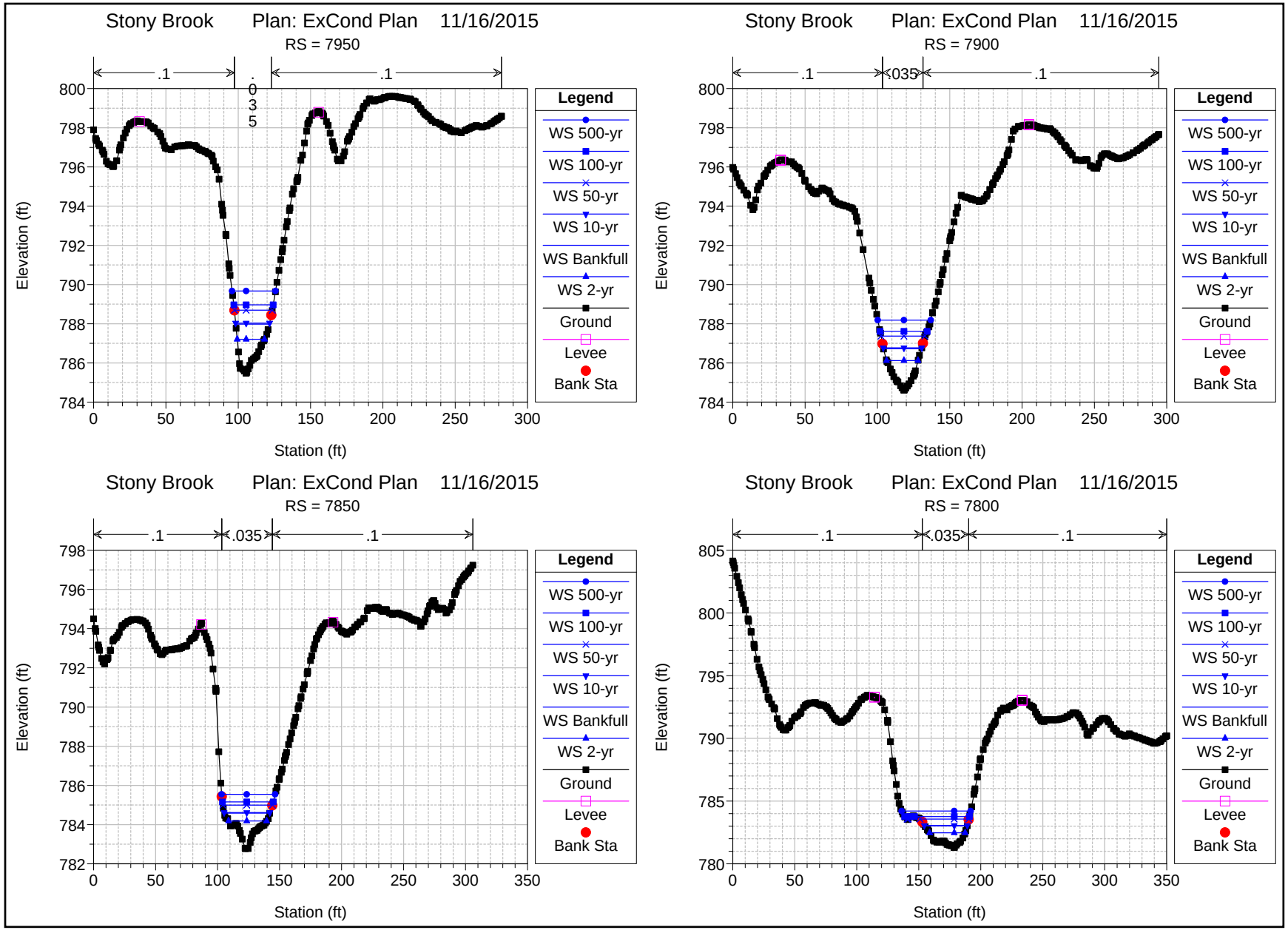
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta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Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 7900
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Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 7850
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Elevation (ft)
Station (ft)
Legend
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WS 10-yr
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WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 7800
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Elevation (ft)
Station (ft)
Legend
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WS 10-yr
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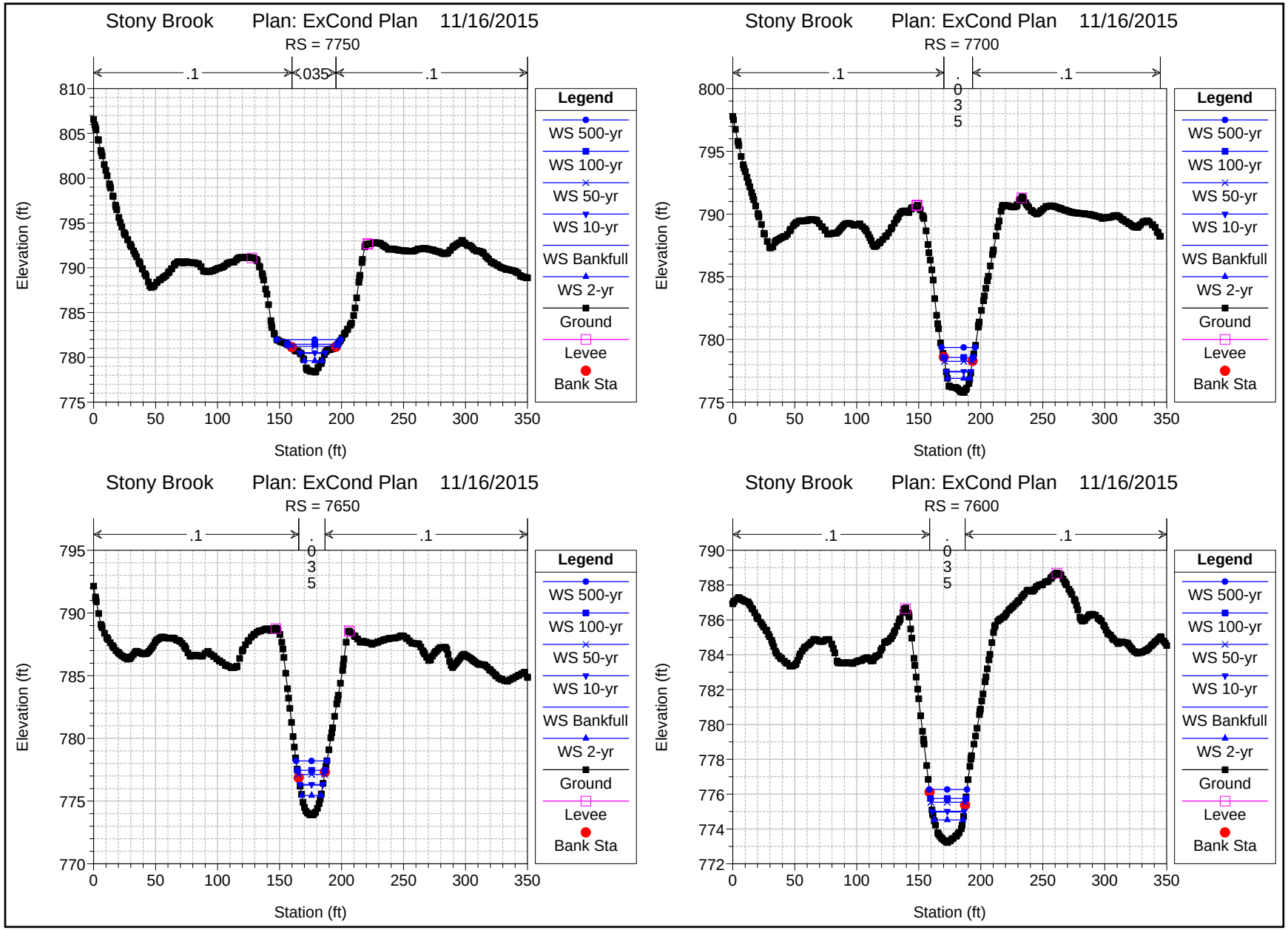
WS 2-yr
Ground
Levee
Bank Sta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Station (ft)
Legend
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WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 7700
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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 7650
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Elevation (ft)
Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 7600
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Elevation (ft)
Station (ft)
Legend
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WS 10-yr
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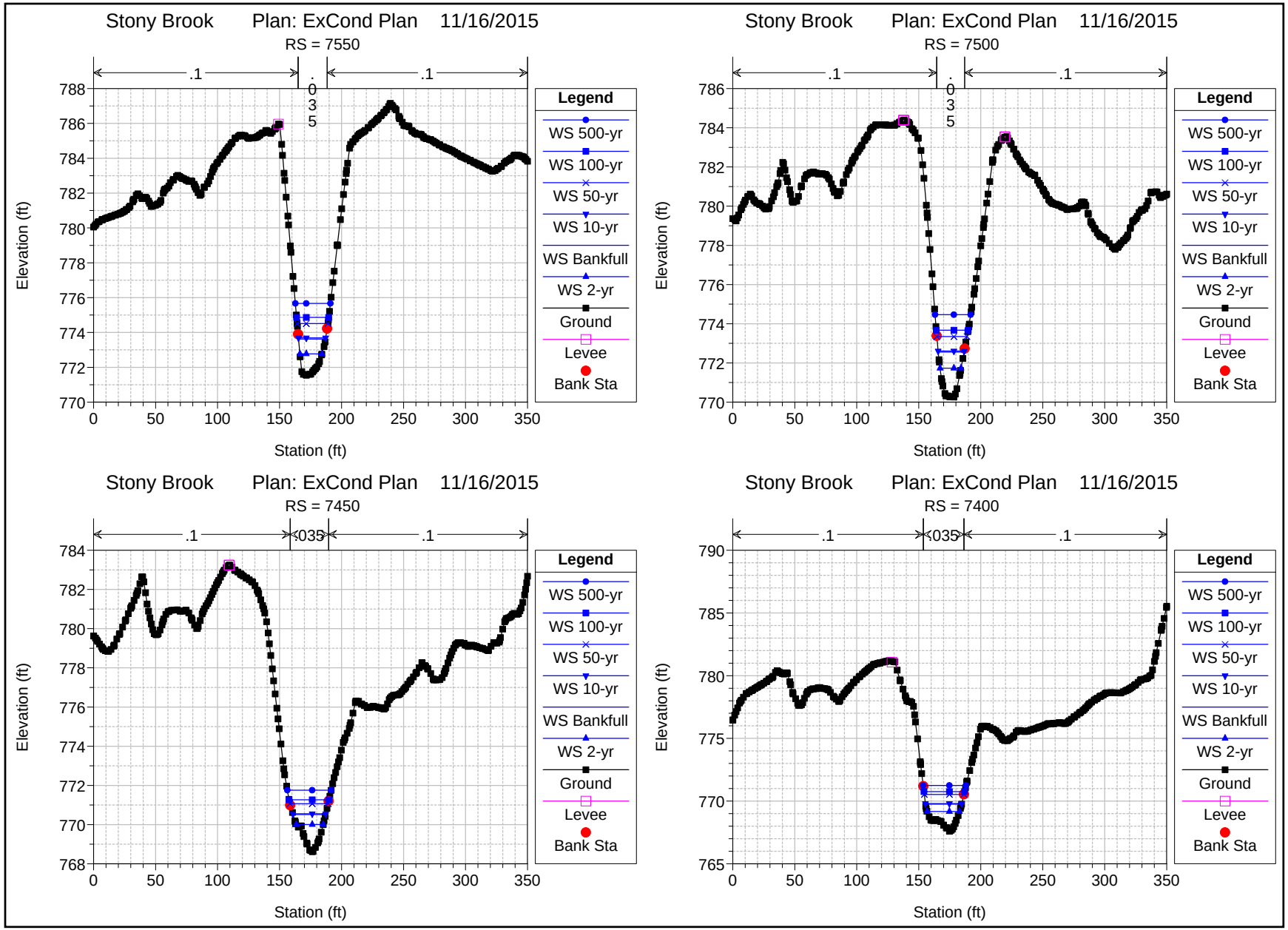
WS 2-yr
Ground
Levee
Bank Sta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Station (ft)
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WS 10-yr
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WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 7500
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Elevation (ft)
Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 7450
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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 7400
.1
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Elevation (ft)
Station (ft)
Legend
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WS 100-yr
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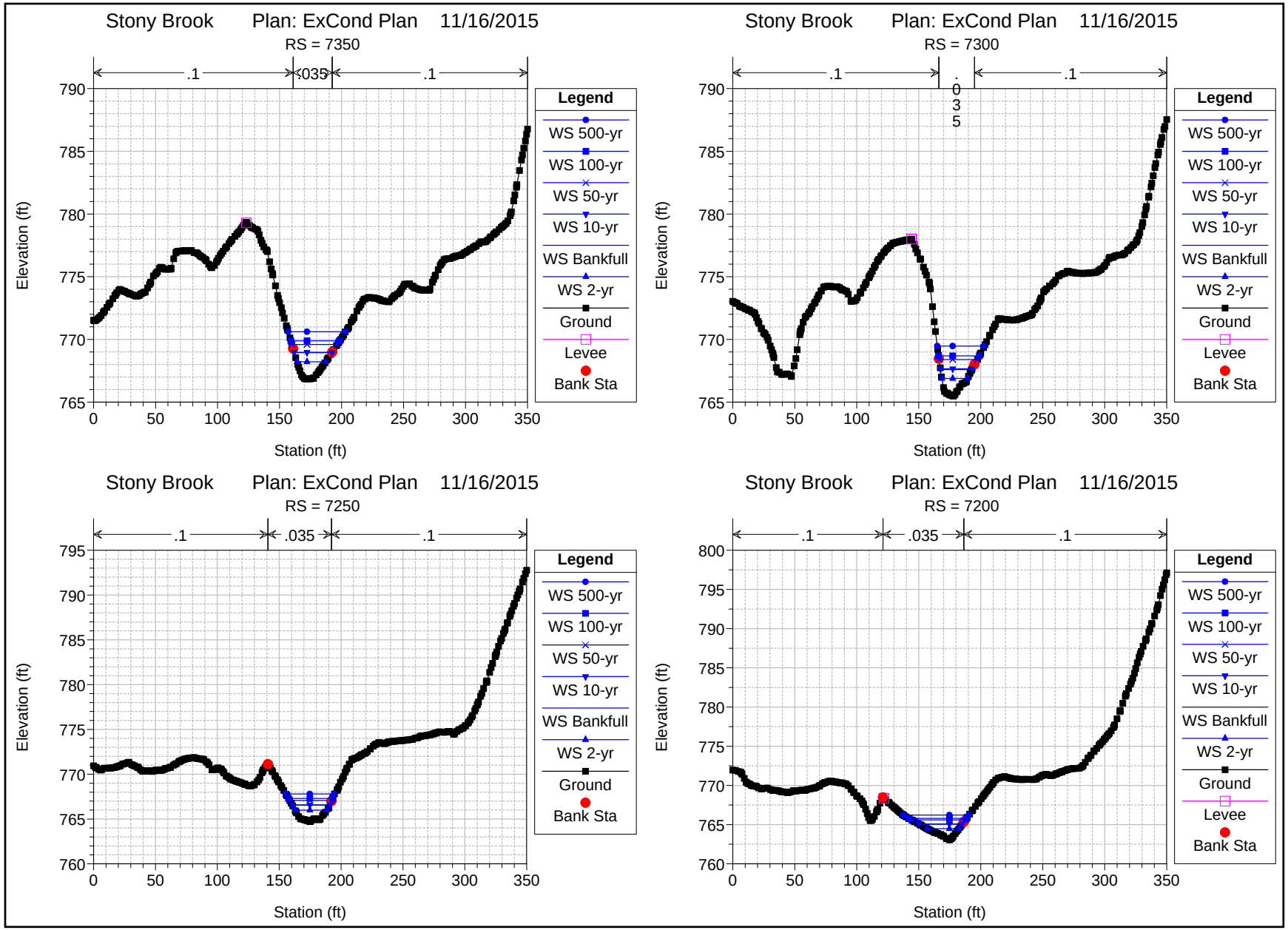
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 7300
.1
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Elevation (ft)
Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 7250
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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 7200
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.035
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Elevation (ft)
Station (ft)
Legend
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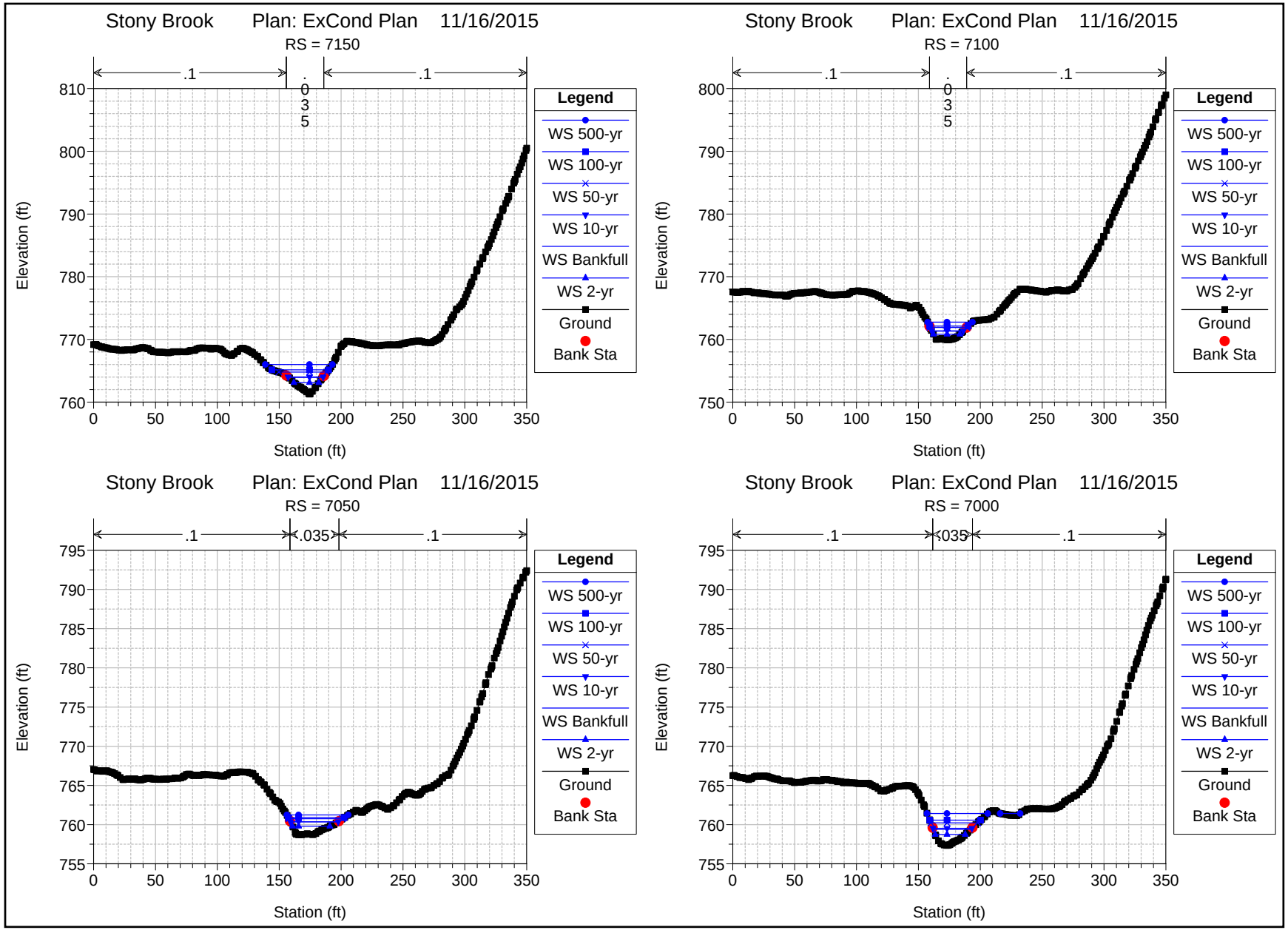
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta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Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 7100
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.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 7050
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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 7000
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.1
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Station (ft)
Legend
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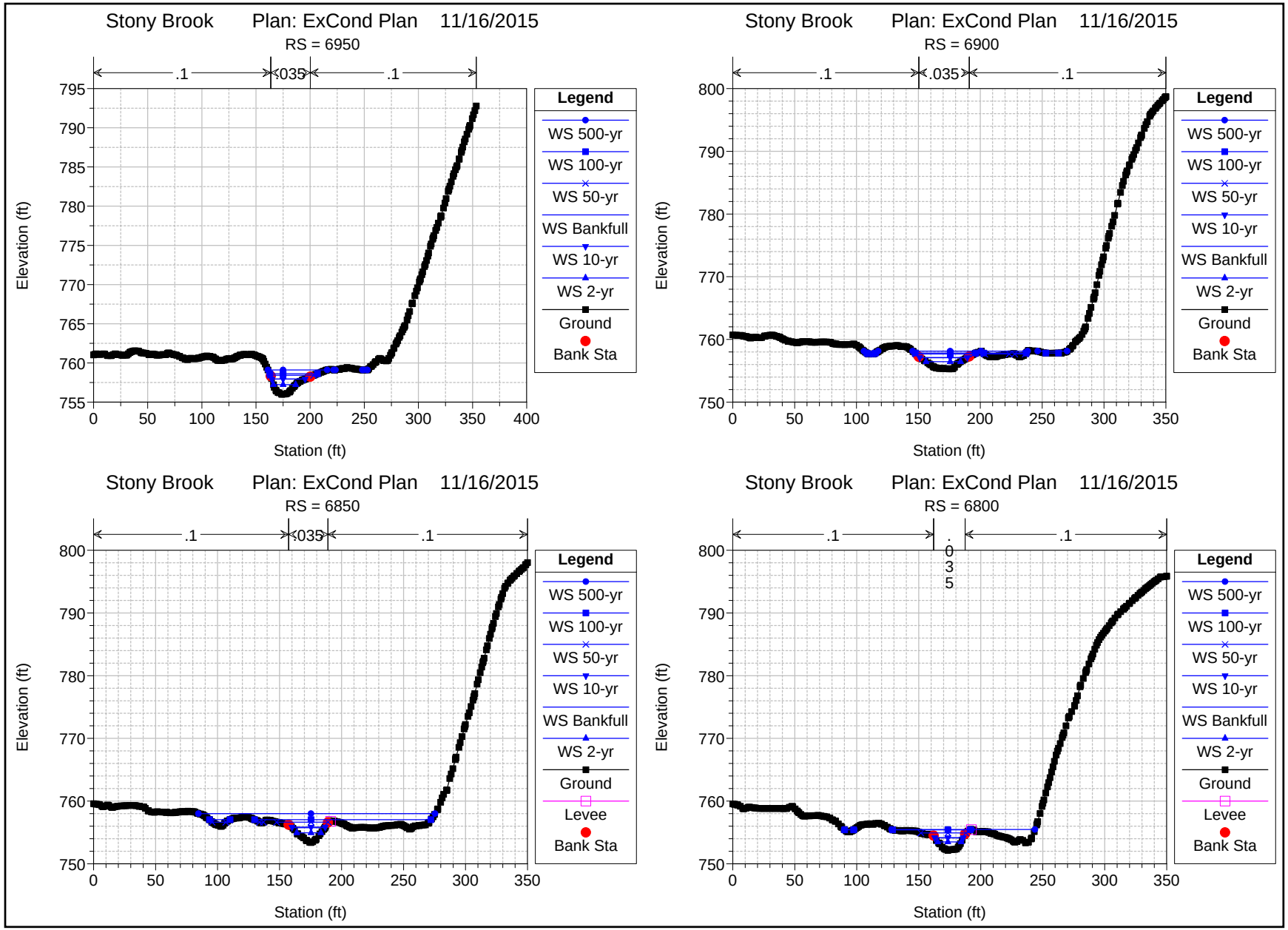
WS Bankfull
WS 2-yr
Ground
Bank Sta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WS 50-yr
WS Bankfull
WS 10-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 6900
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Elevation (ft)
Station (ft)
Legend
WS 500-yr
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 6850
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.035
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Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 6800
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Elevation (ft)
Station (ft)
Legend
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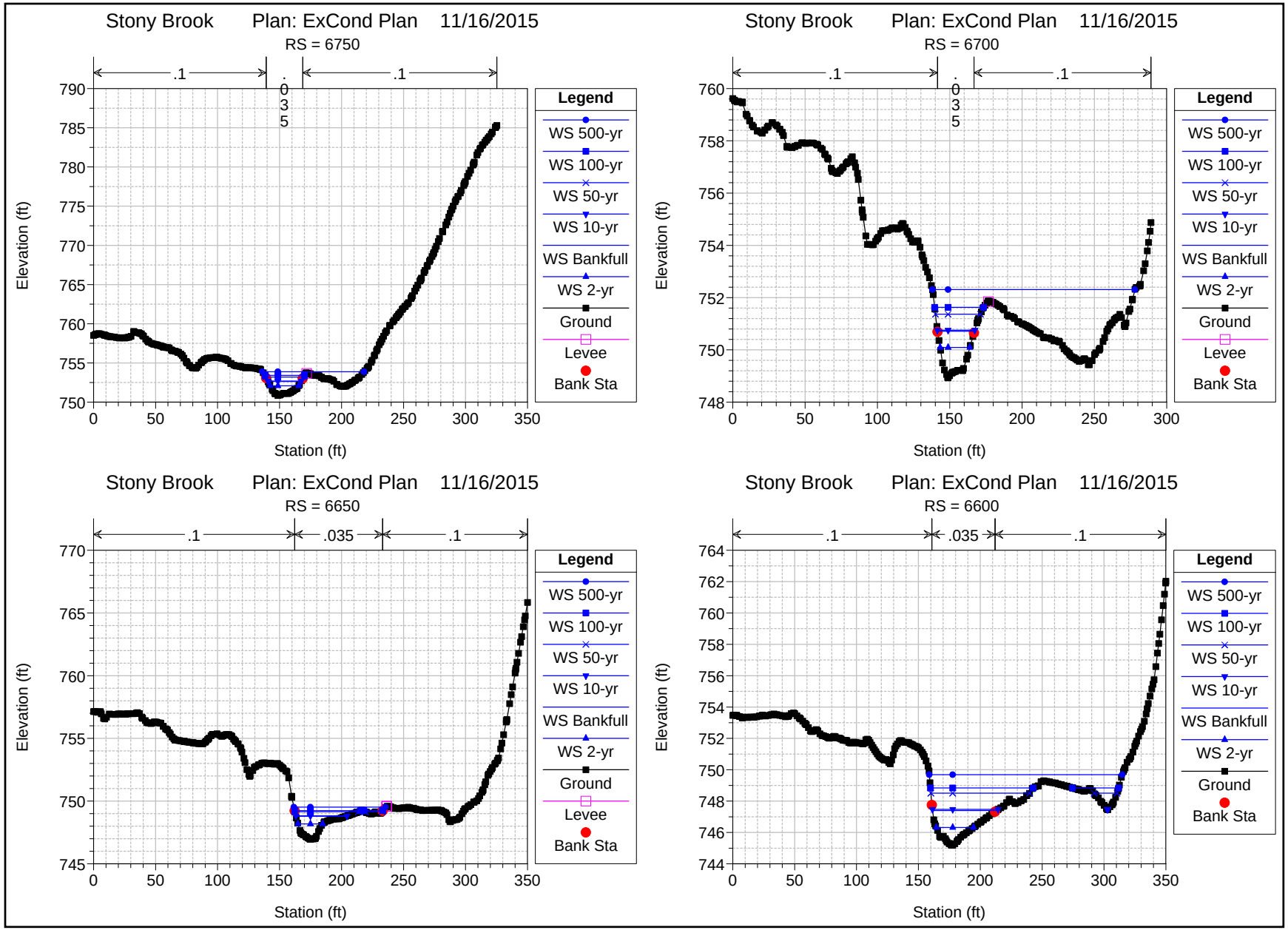
WS 2-yr
Ground
Levee
Bank Sta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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 6700
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Elevation (ft)
Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 6650
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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 6600
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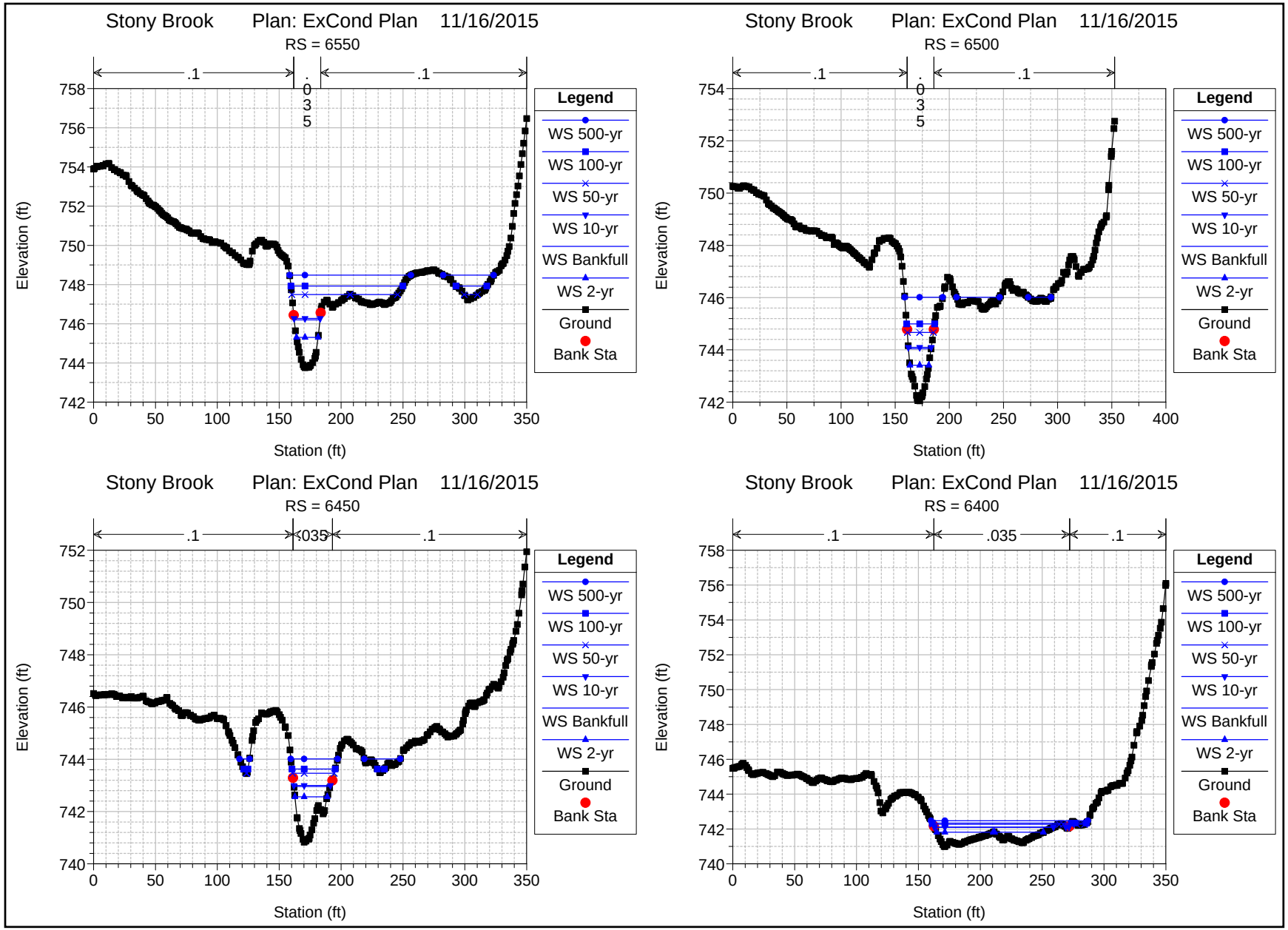
Ground
Bank Sta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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 6500
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Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 6450
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Elevation (ft)
Station (ft)
Legend
WS 500-yr
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 6400
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Elevation (ft)
Station (ft)
Legend
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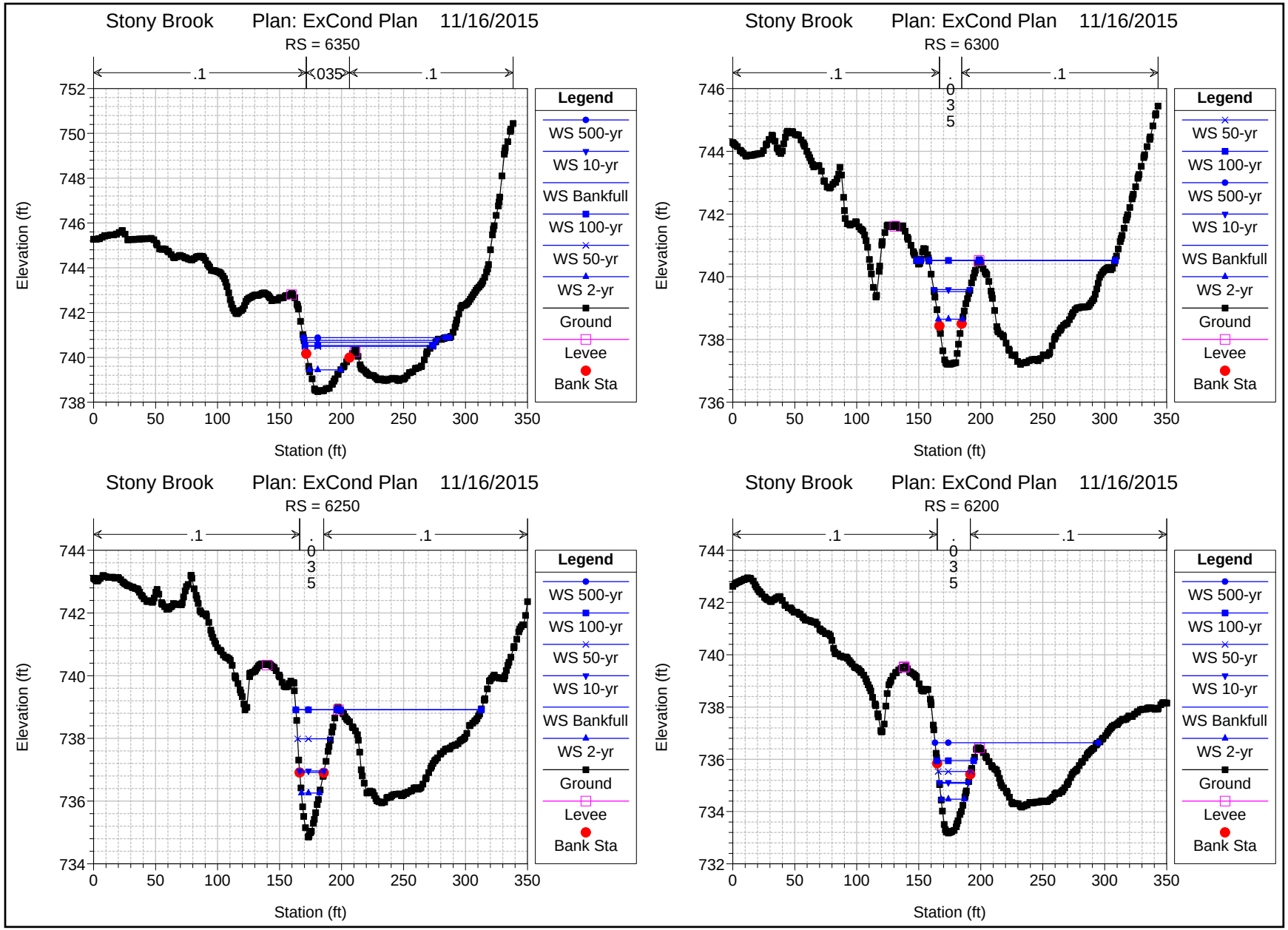
Ground
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
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Elevation (ft)
Station (ft)
Legend
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WS 10-yr
WS Bankfull
WS 100-yr
WS 50-yr
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 6300
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 50-yr
WS 100-yr
WS 500-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 6250
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.035
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Elevation (ft)
Station (ft)
Legend
WS 500-yr
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 6200
.1
.035
.1
Elevation (ft)
Station (ft)
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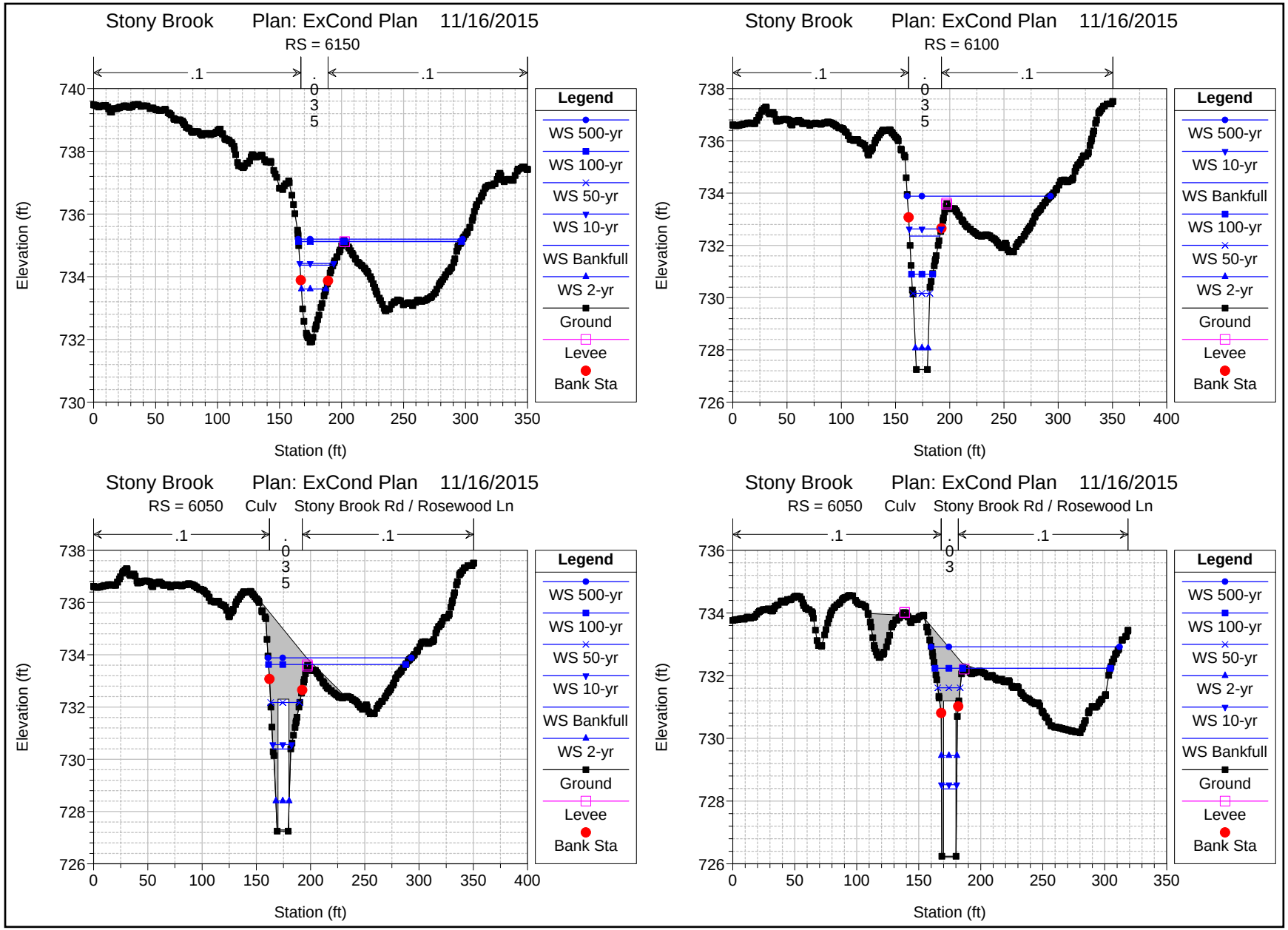
WS 2-yr
Ground
Levee
Bank Sta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RS = 6150
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Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 6100
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.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 10-yr
WS Bankfull
WS 100-yr
WS 50-yr
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 6050 Culv Stony Brook Rd / Rosewood Ln
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Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 6050 Culv Stony Brook Rd / Rosewood Ln
.1
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Elevation (ft)
Station (ft)
Legend
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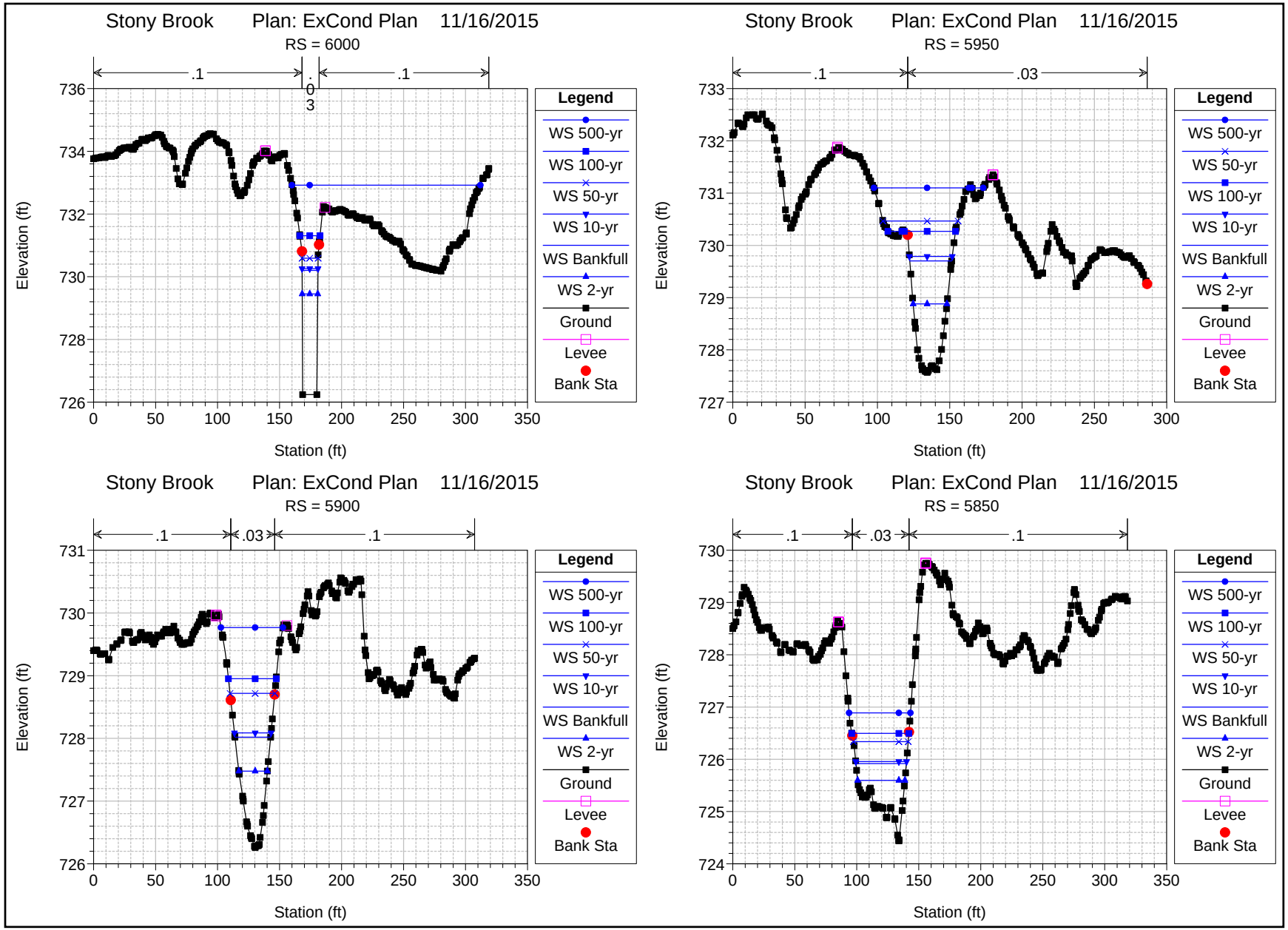
Ground
Levee
Bank Sta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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 5950
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Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 50-yr
WS 100-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 5900
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.03
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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 5850
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Elevation (ft)
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Levee
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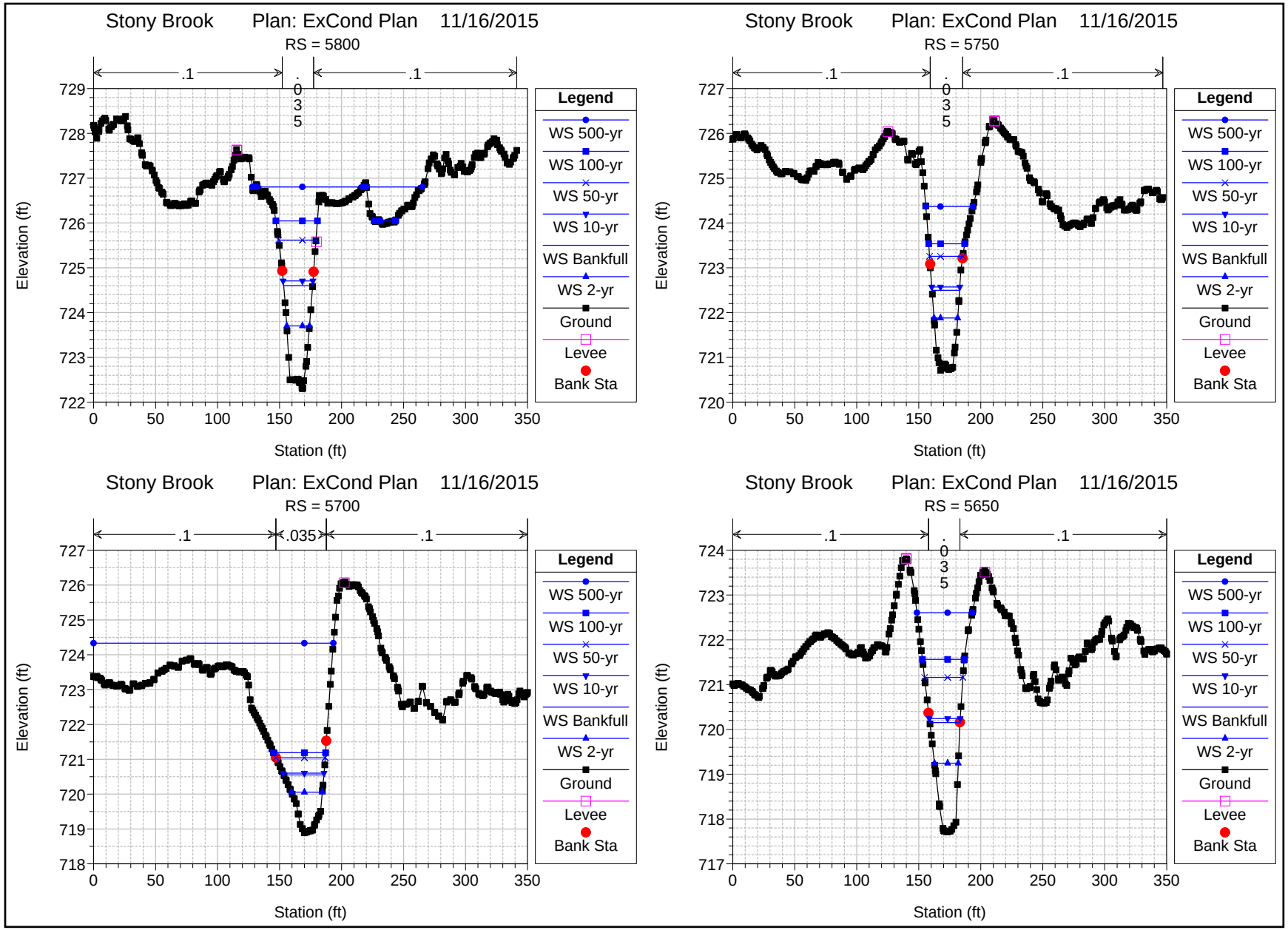
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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 5750
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Elevation (ft)
Station (ft)
Legend
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WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 5700
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Elevation (ft)
Station (ft)
Legend
WS 500-yr
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WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 5650
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Elevation (ft)
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Levee
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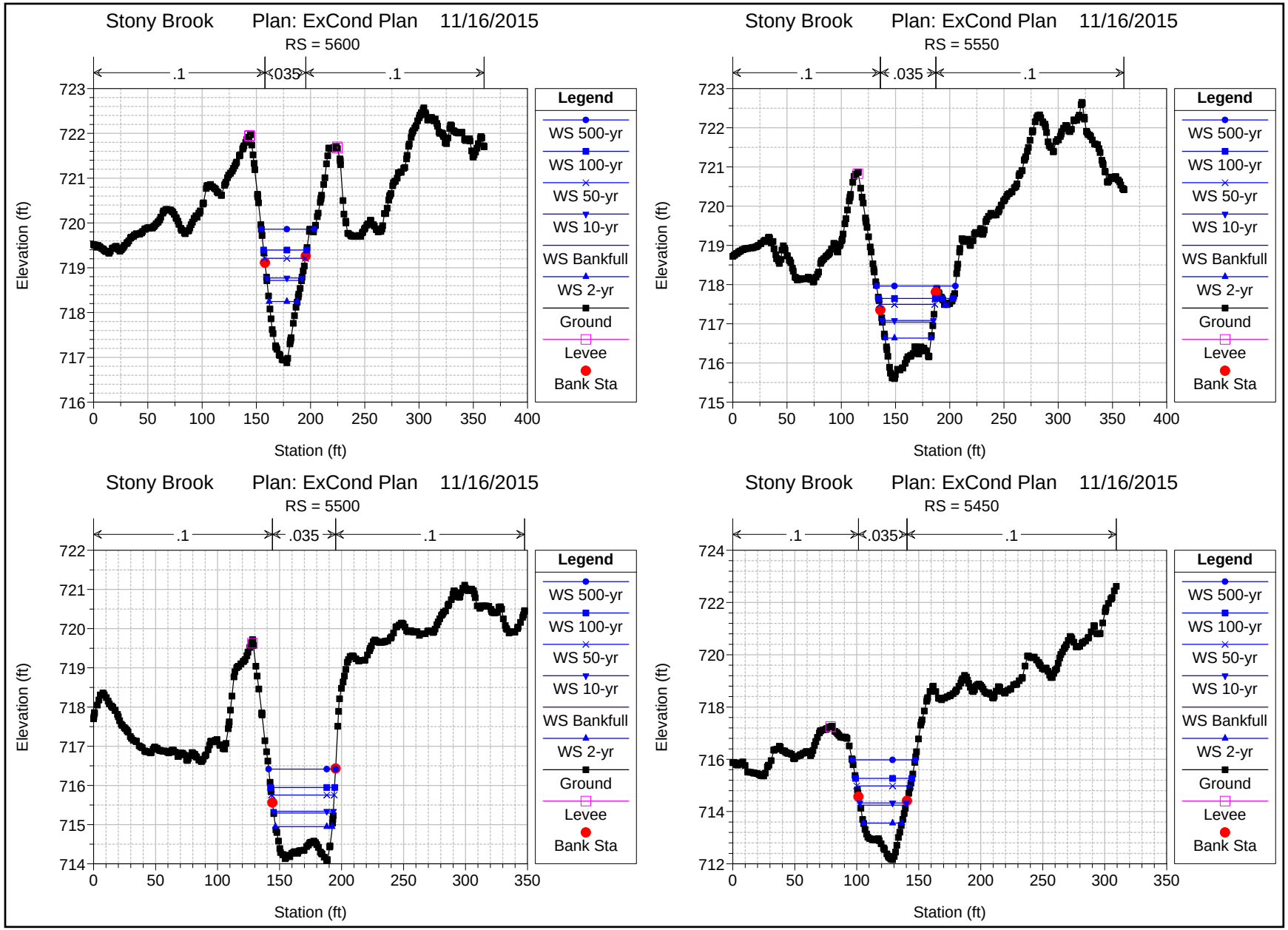
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Elevation (ft)
Station (ft)
Legend
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WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 5500
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Elevation (ft)
Station (ft)
Legend
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WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 5450
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Elevation (ft)
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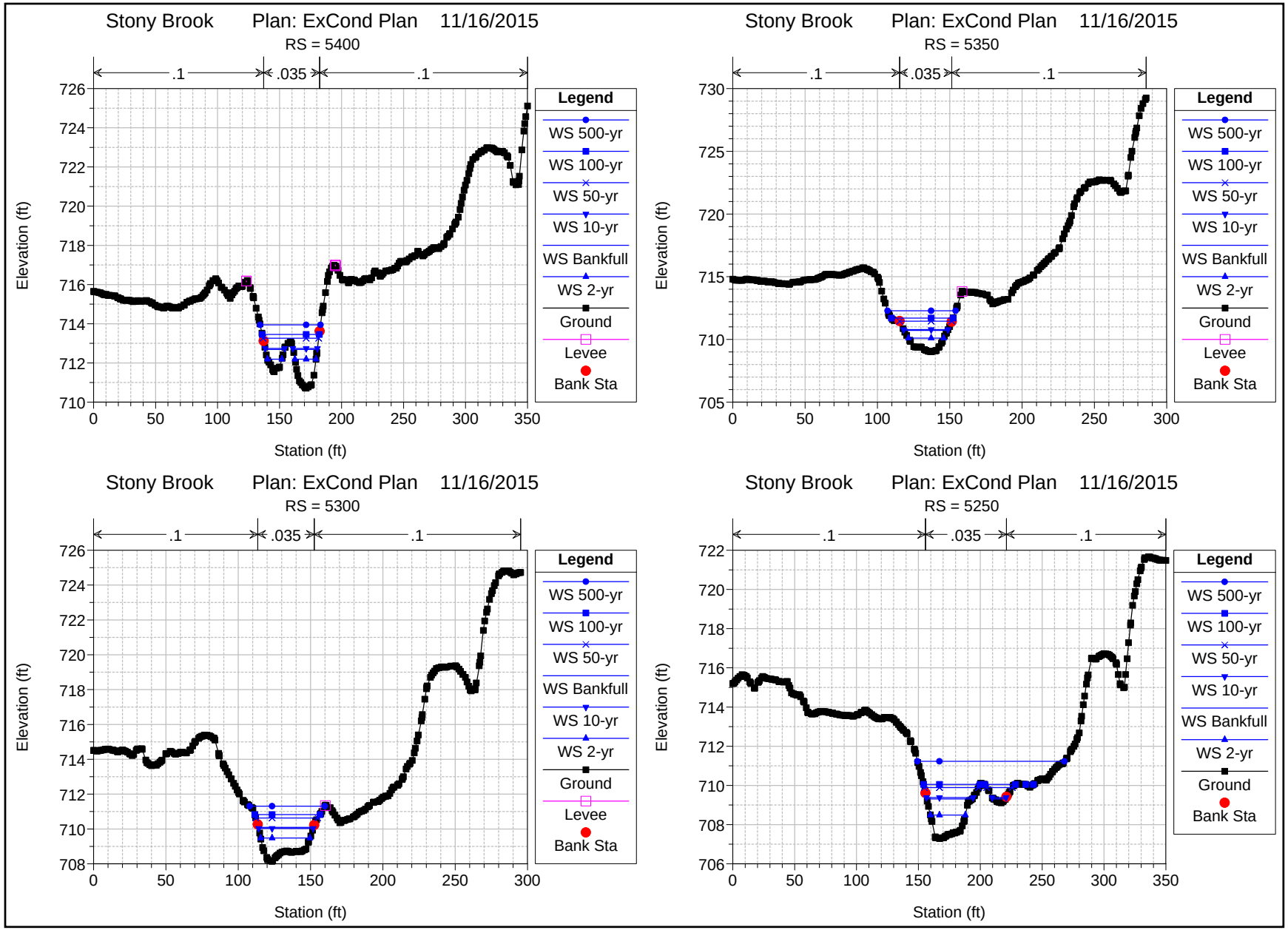
Levee
Bank Sta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WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
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RS = 5300
Stony Brook Plan: ExCond Plan 11/16/2015
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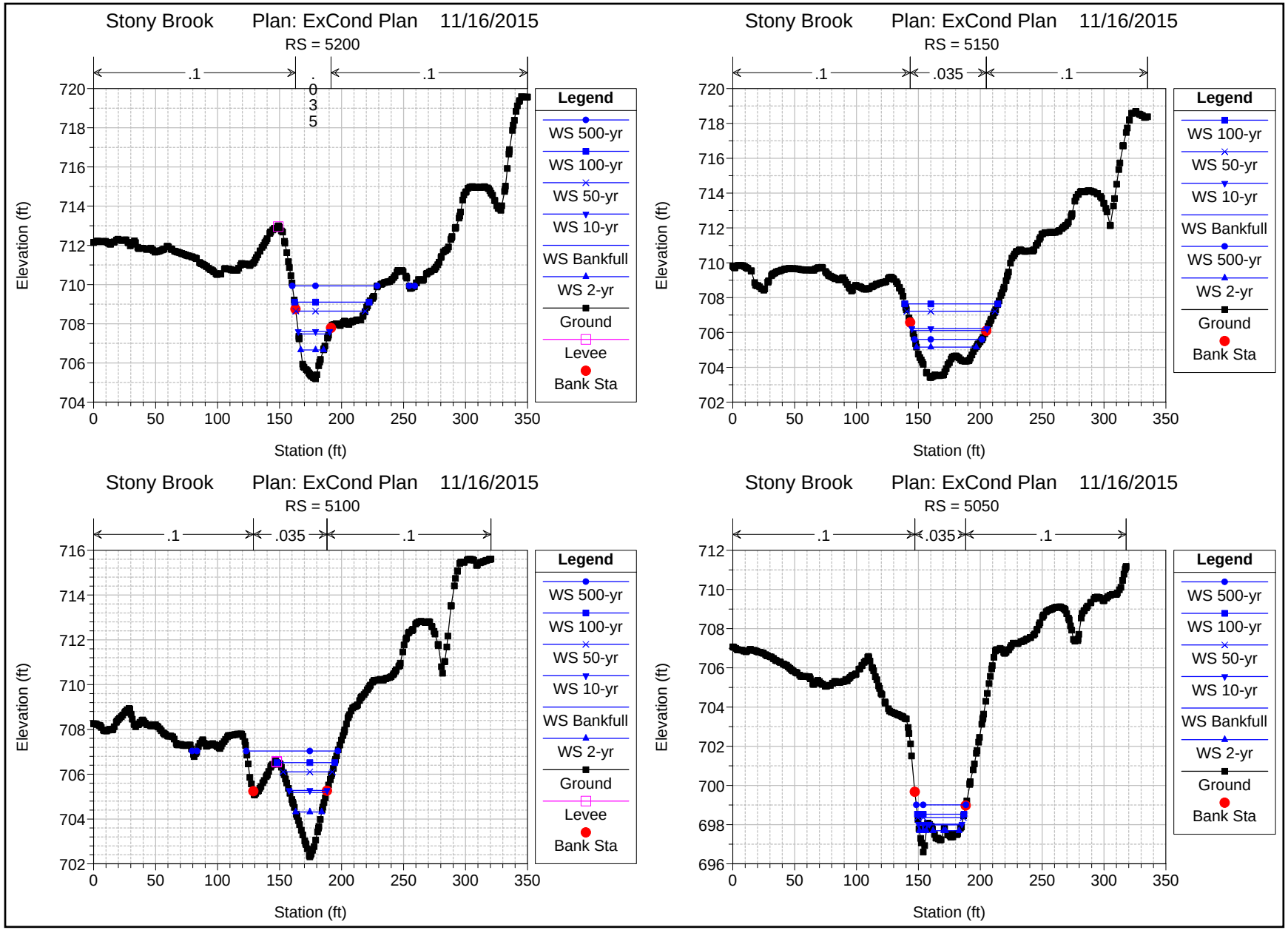
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Station (ft)
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WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 5150
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.035
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Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 500-yr
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 5100
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Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 5050
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Station (ft)
Legend
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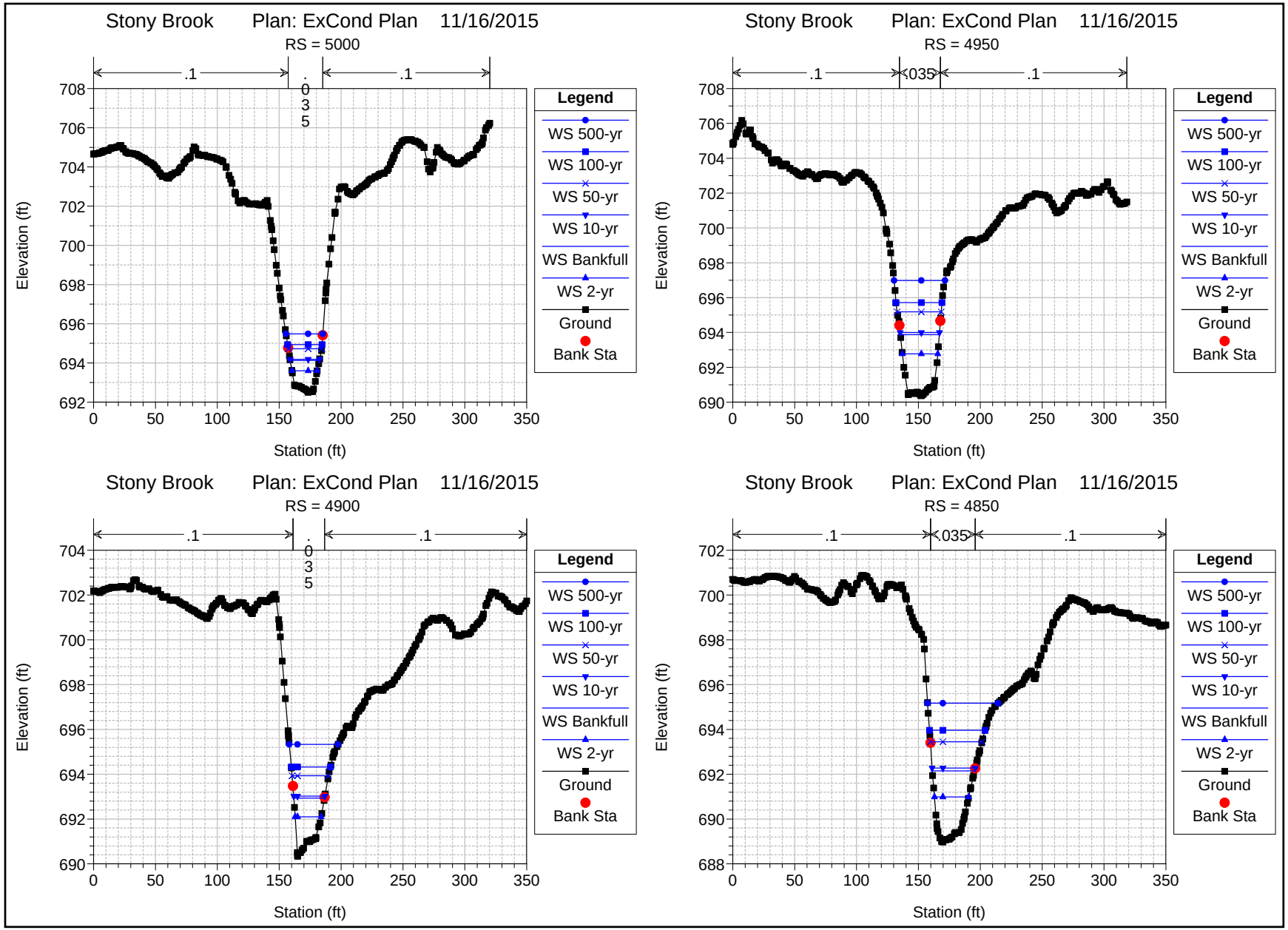
WS 2-yr
Ground
Bank Sta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Elevation (ft)
Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 4950
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Elevation (ft)
Station (ft)
Legend
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WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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Elevation (ft)
Station (ft)
Legend
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WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
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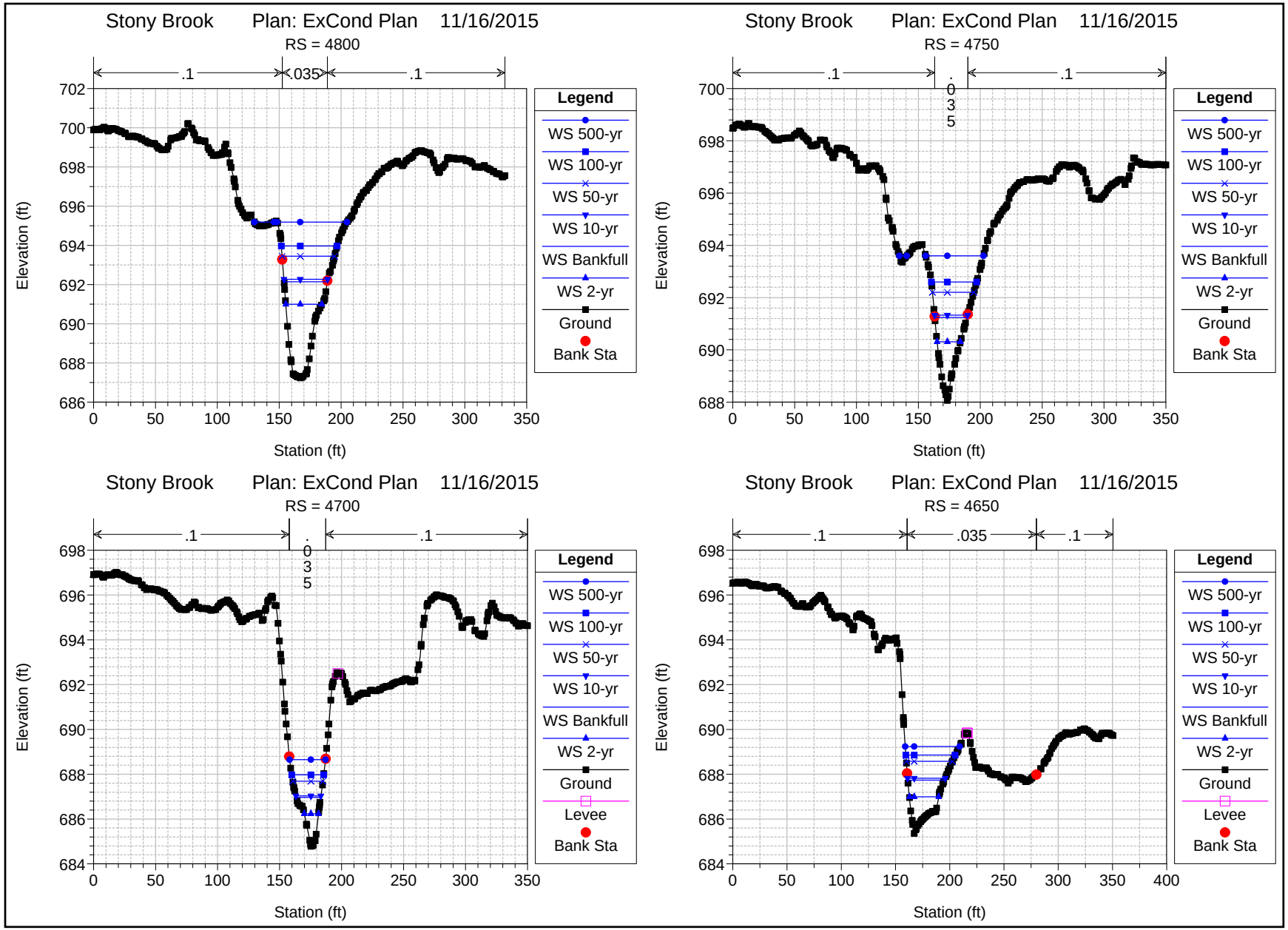
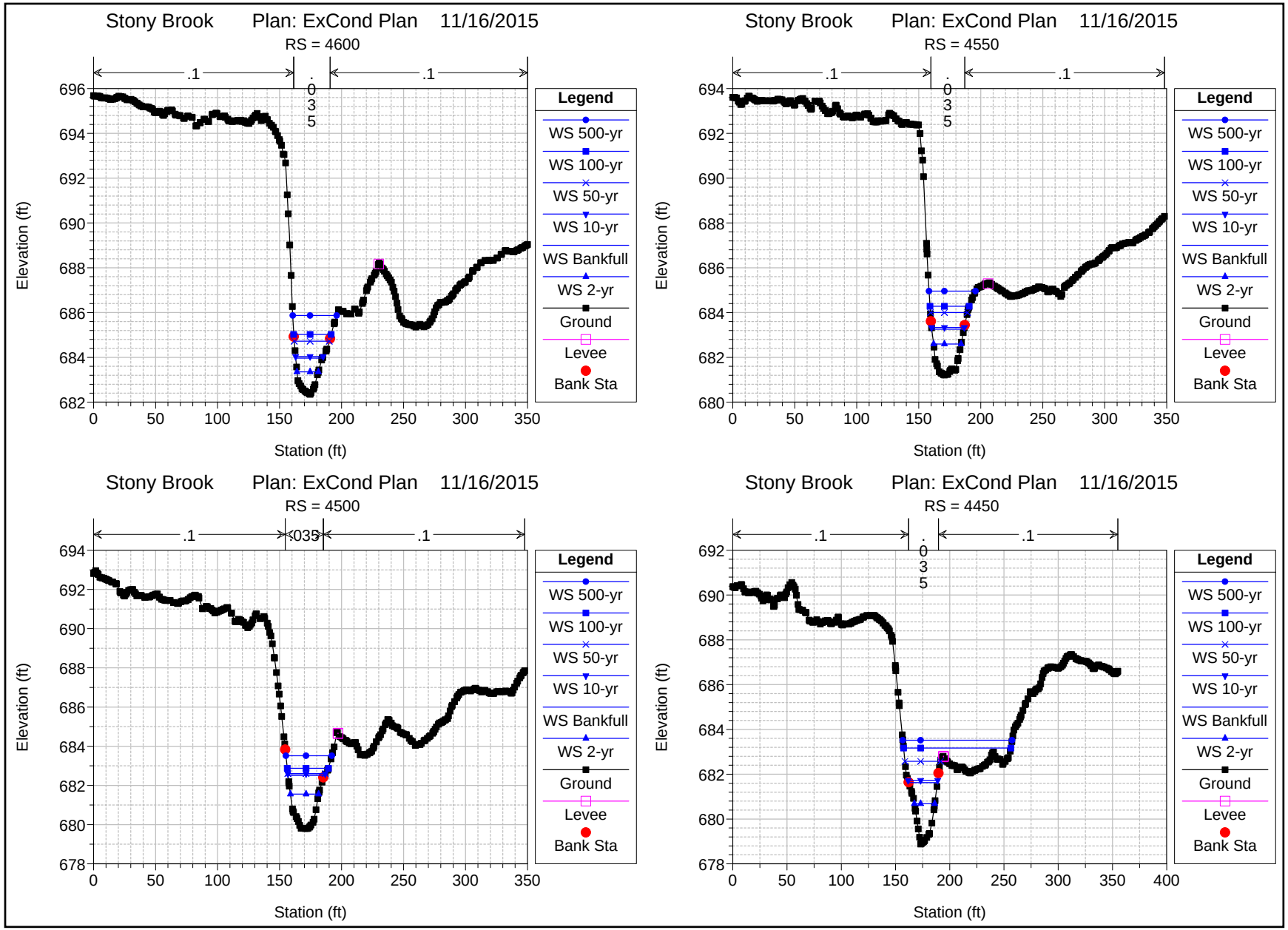
Ground
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 4800
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 4750
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 4700
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 4650
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 4600
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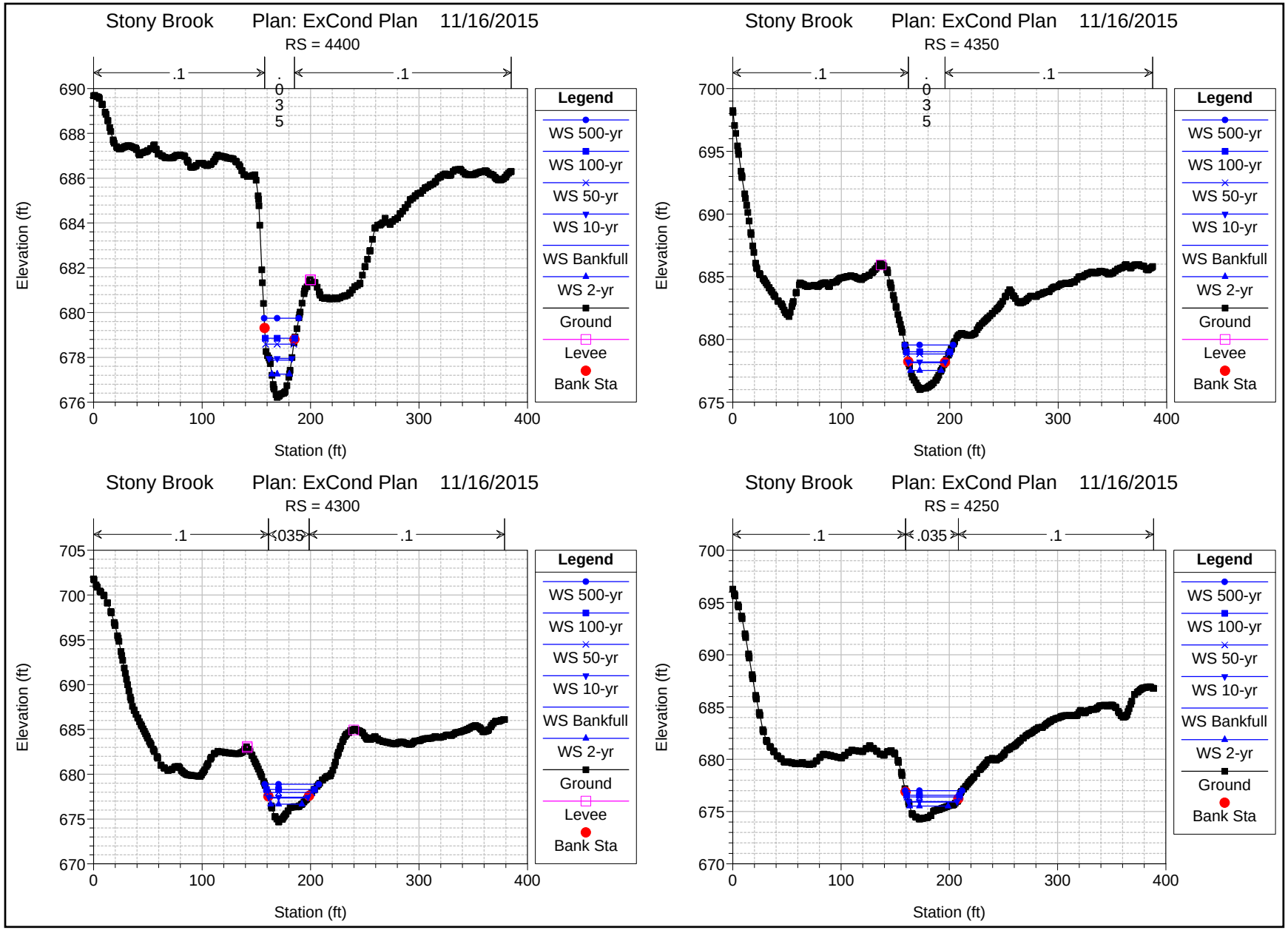
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 4550
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 4500
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 4450
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 4400
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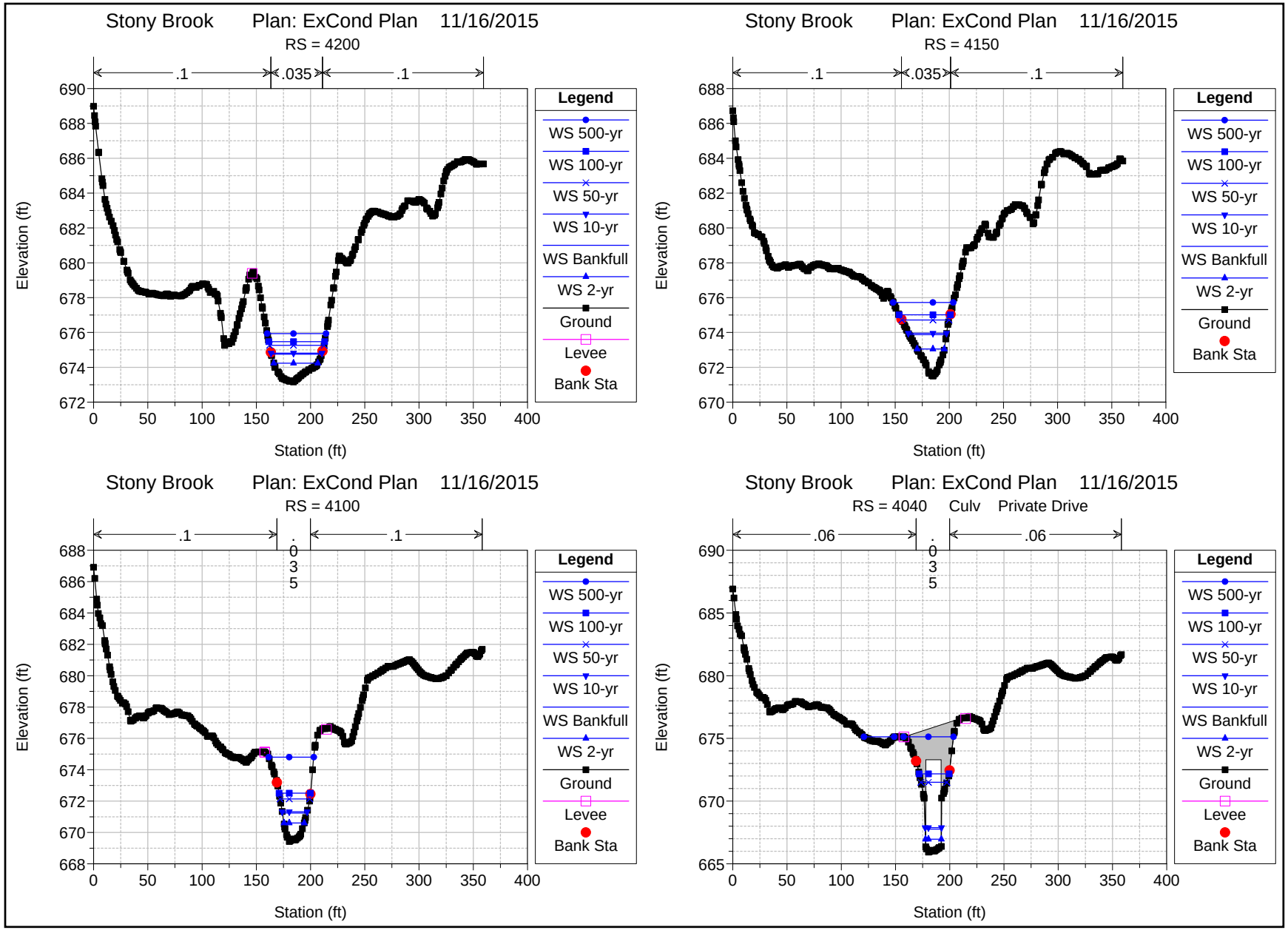
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 4350
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 4300
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 4250
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 4200
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.035
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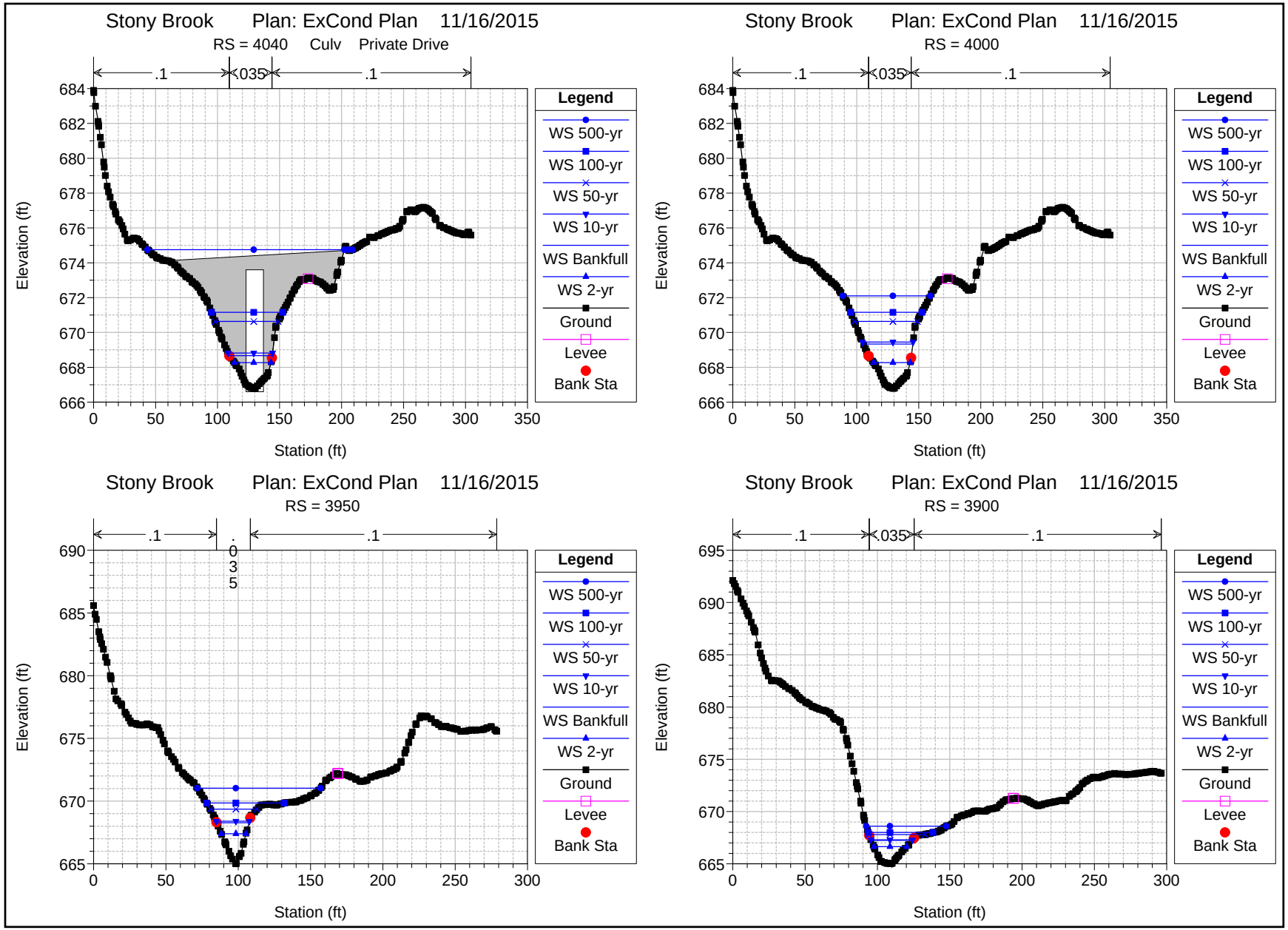
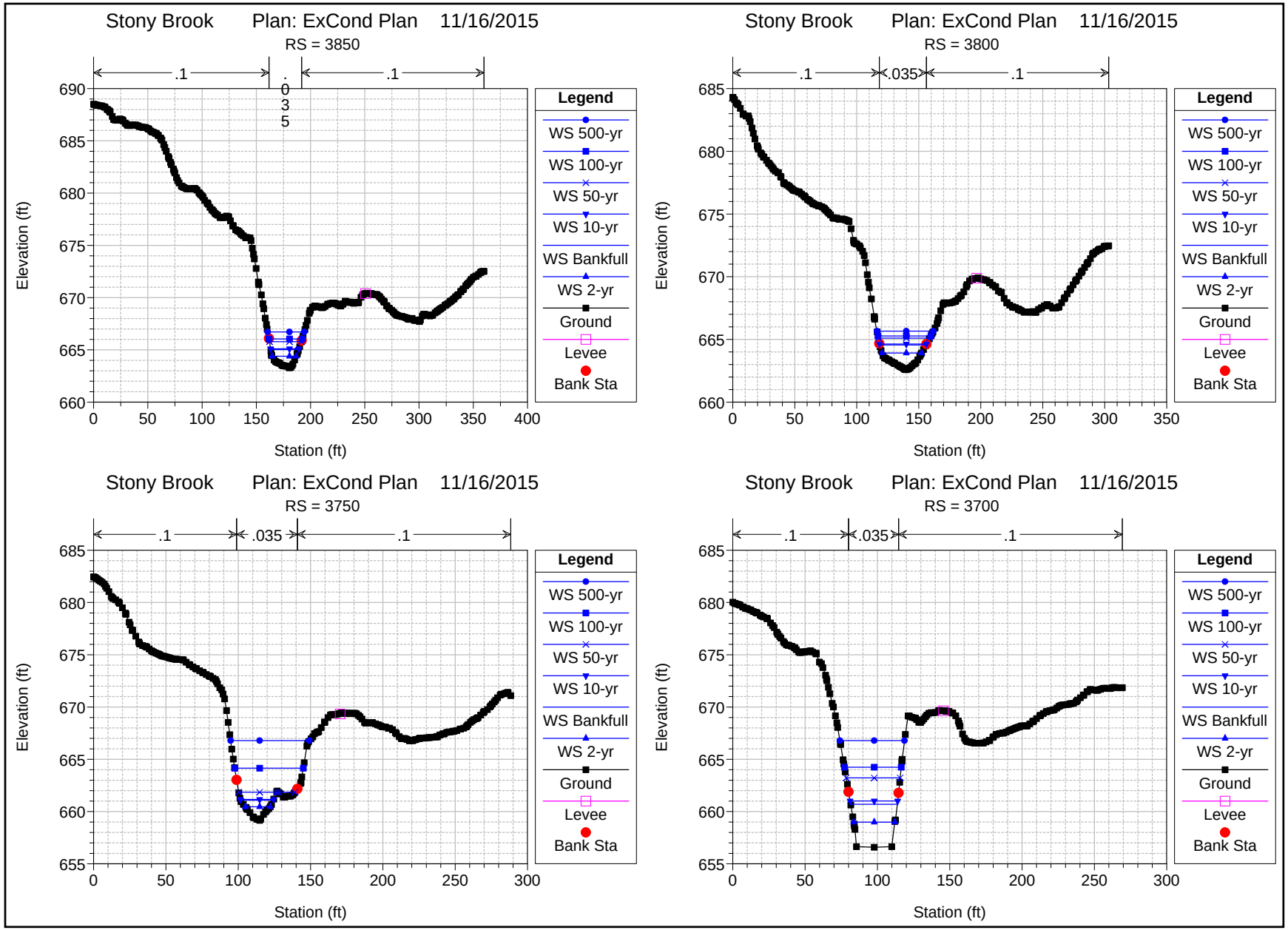
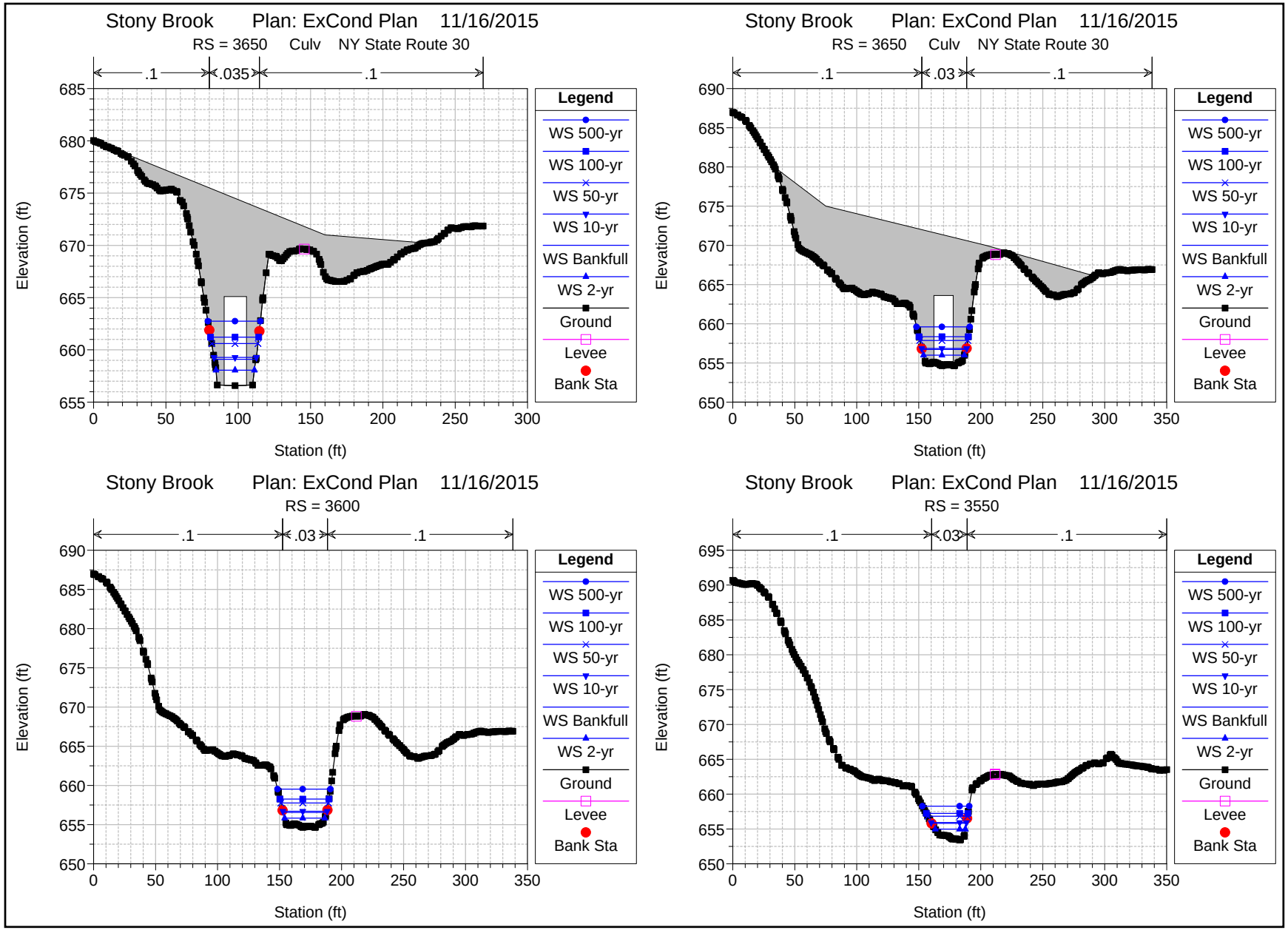
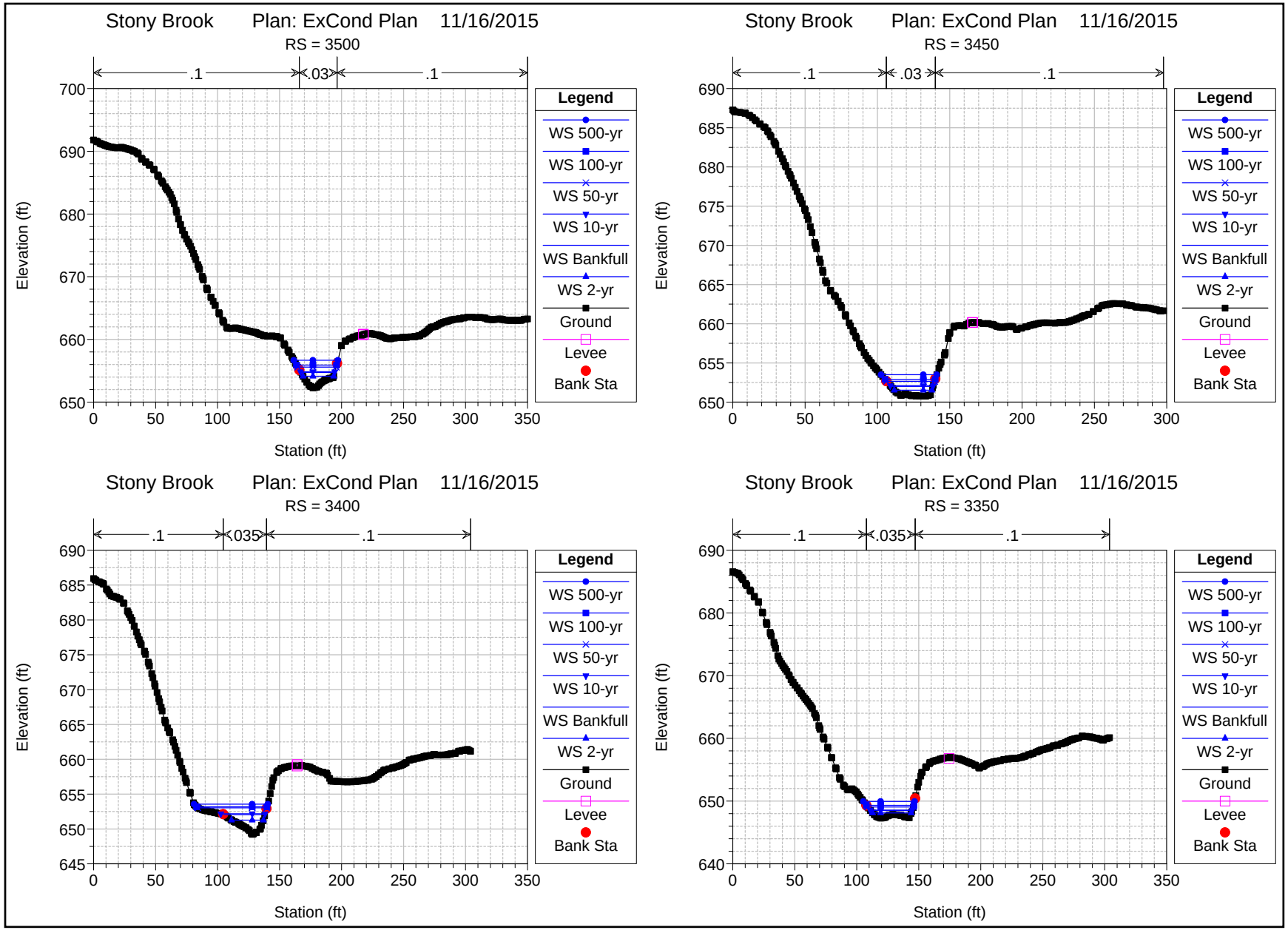
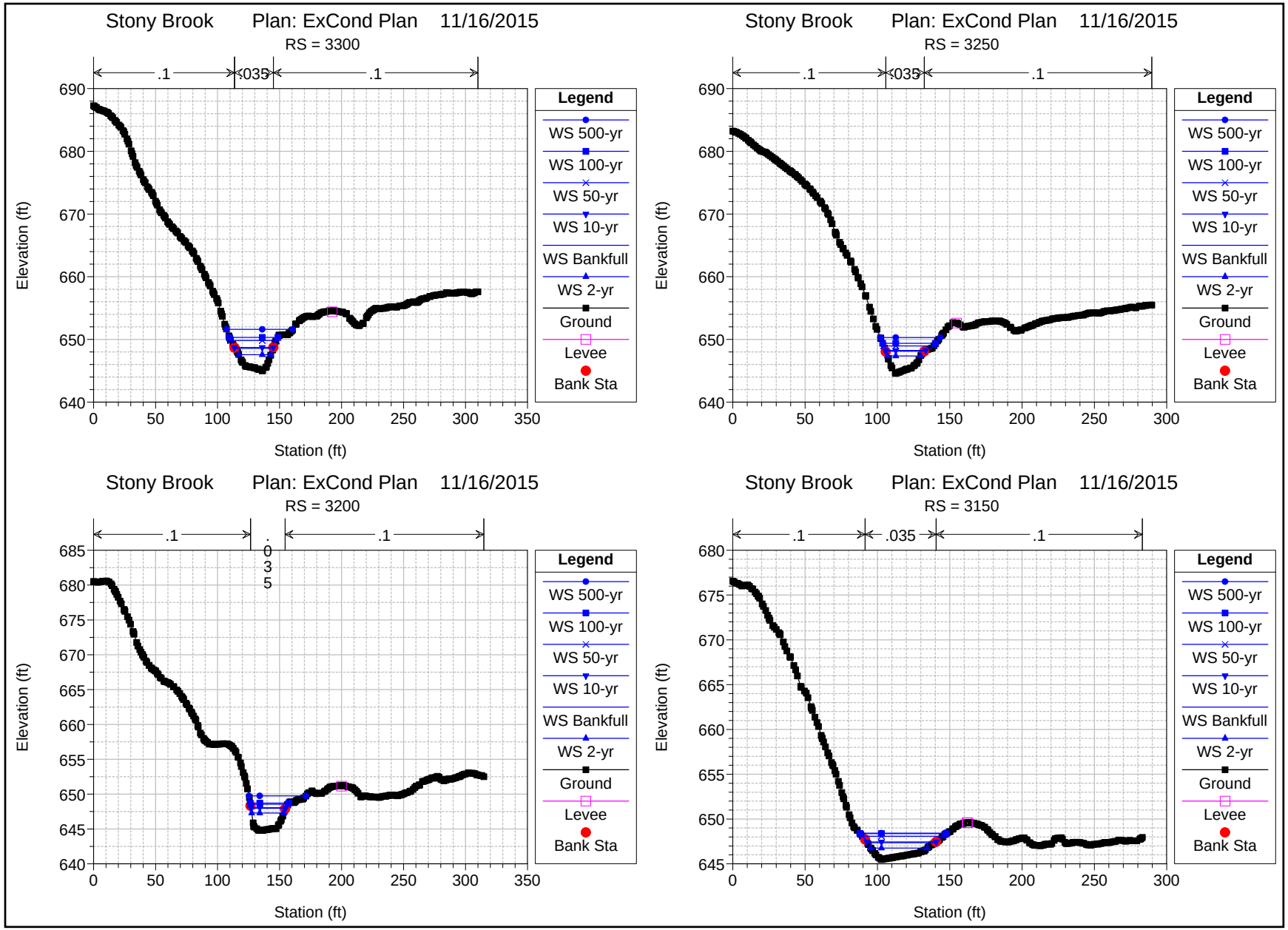
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 4150
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 4100
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 4040 Culv Private Drive
.06
.035
.06
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 4040 Culv Private Drive
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 4000
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3950
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3900
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3850
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3800
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3750
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3700
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3650 Culv NY State Route 30
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3650 Culv NY State Route 30
.1
.03
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3600
.1
.03
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3550
.1
.03
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3500
.1
.03
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3450
.1
.03
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3400
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3350
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3300
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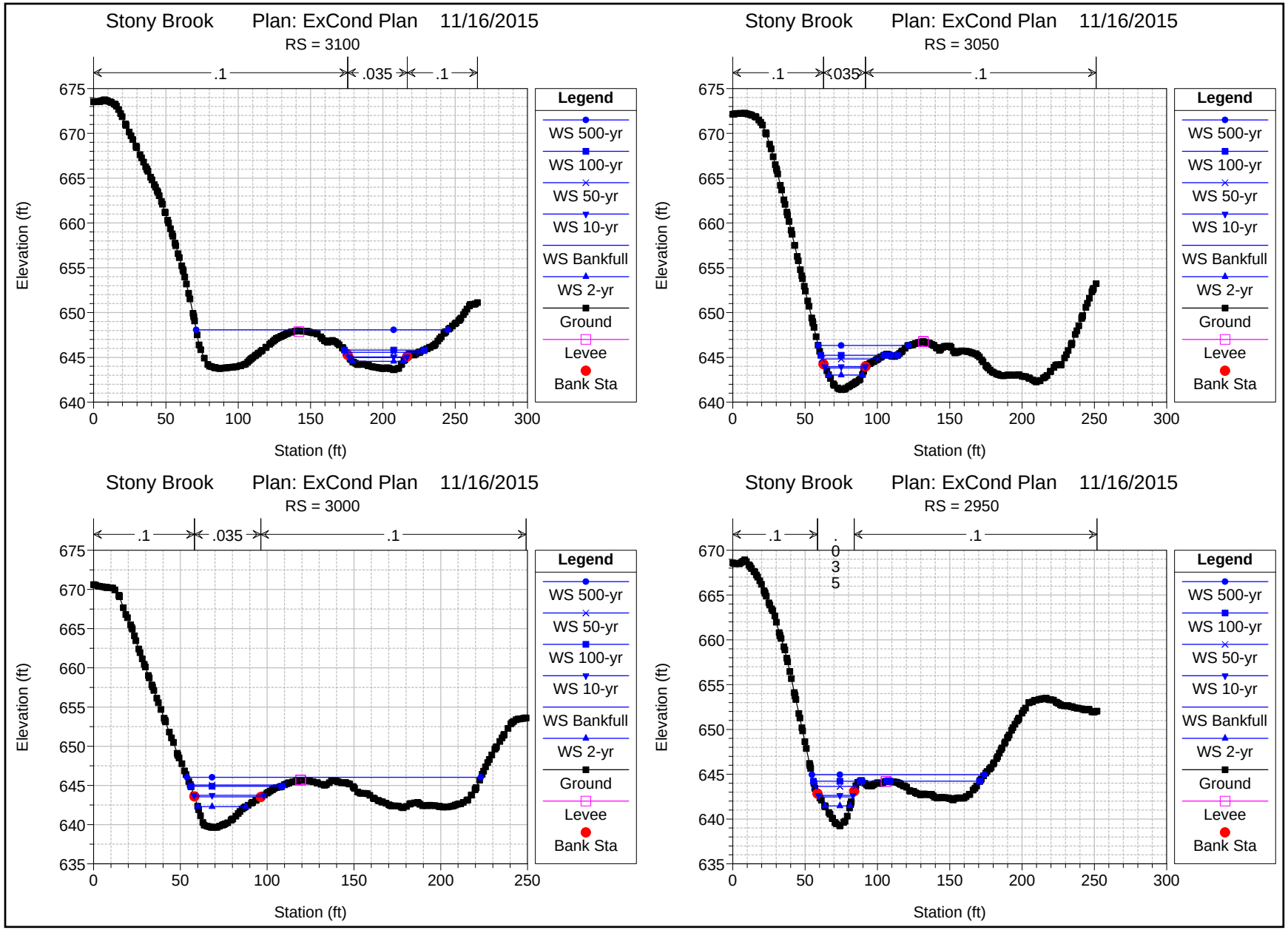
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3250
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3200
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3150
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3100
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3050
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 3000
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 50-yr
WS 100-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2950
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
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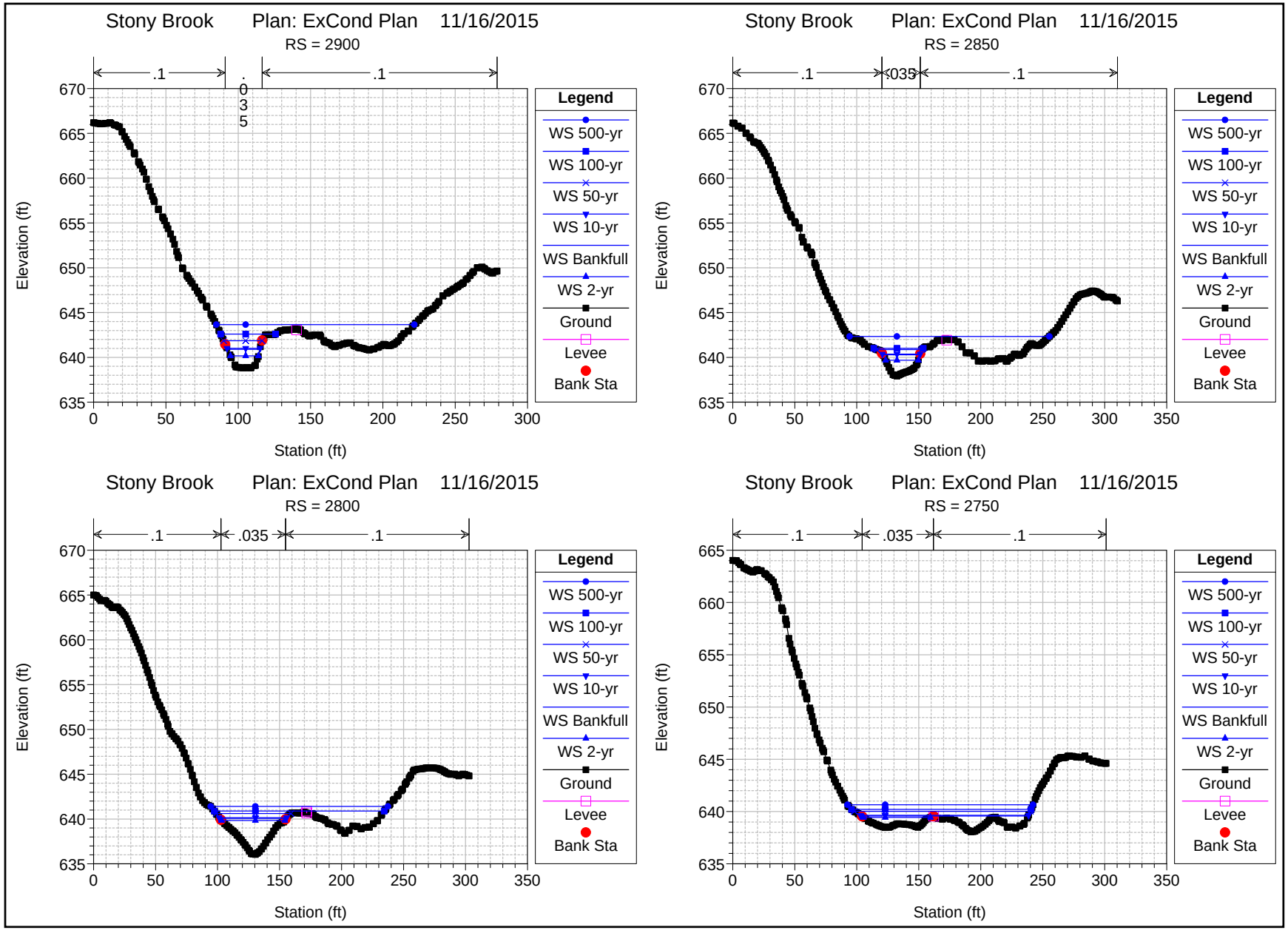
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2900
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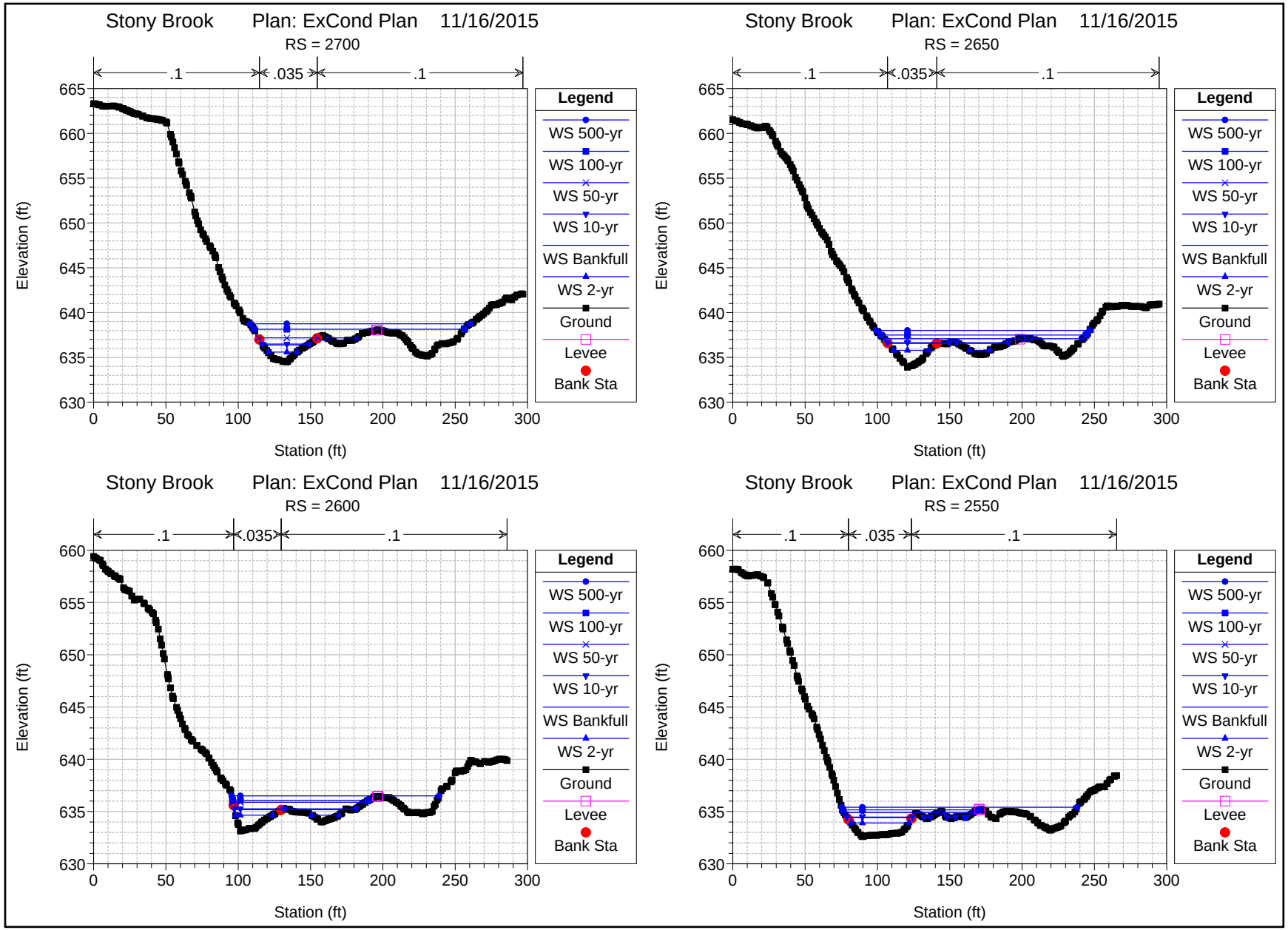
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2850
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2800
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2750
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2700
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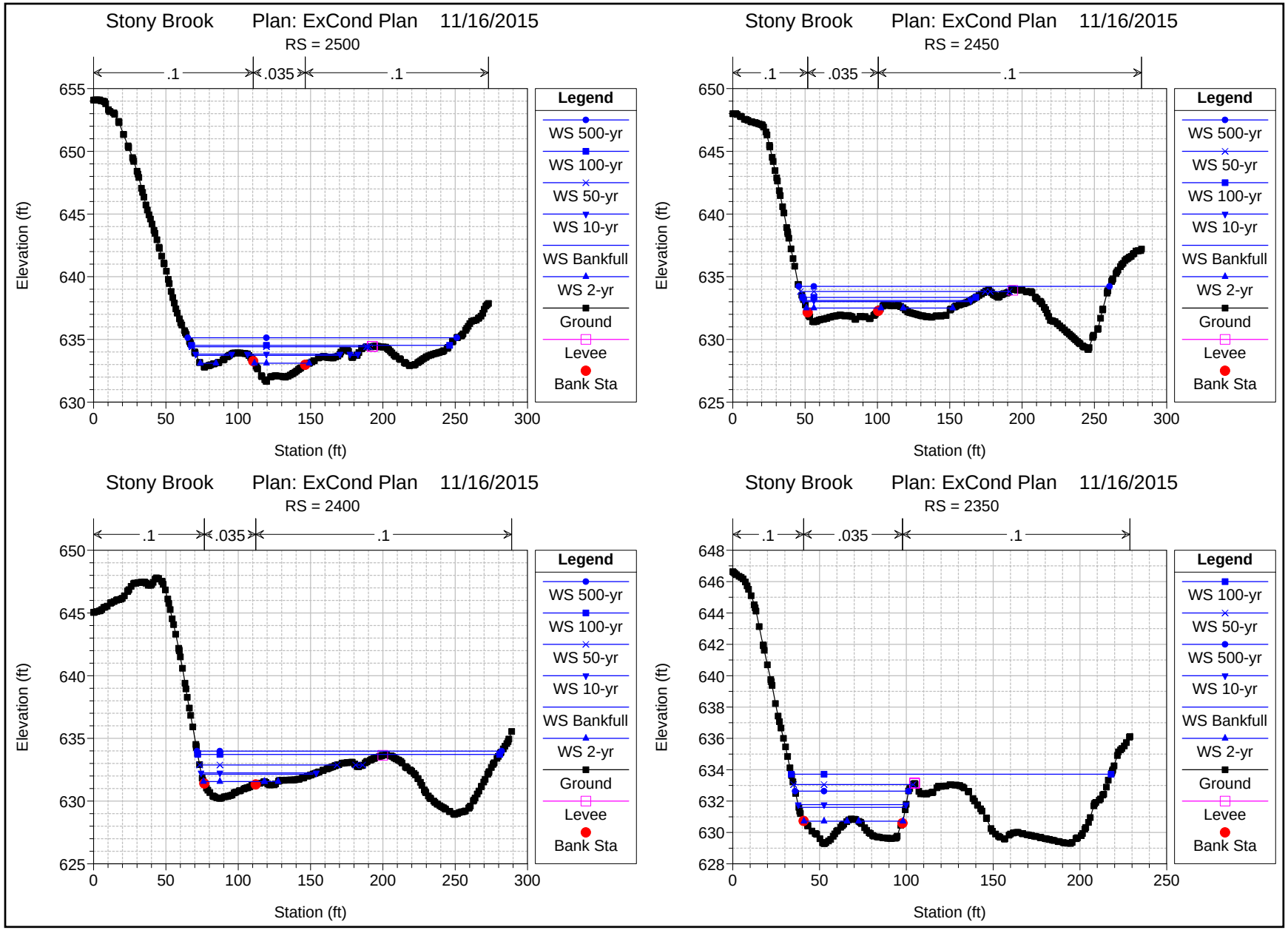
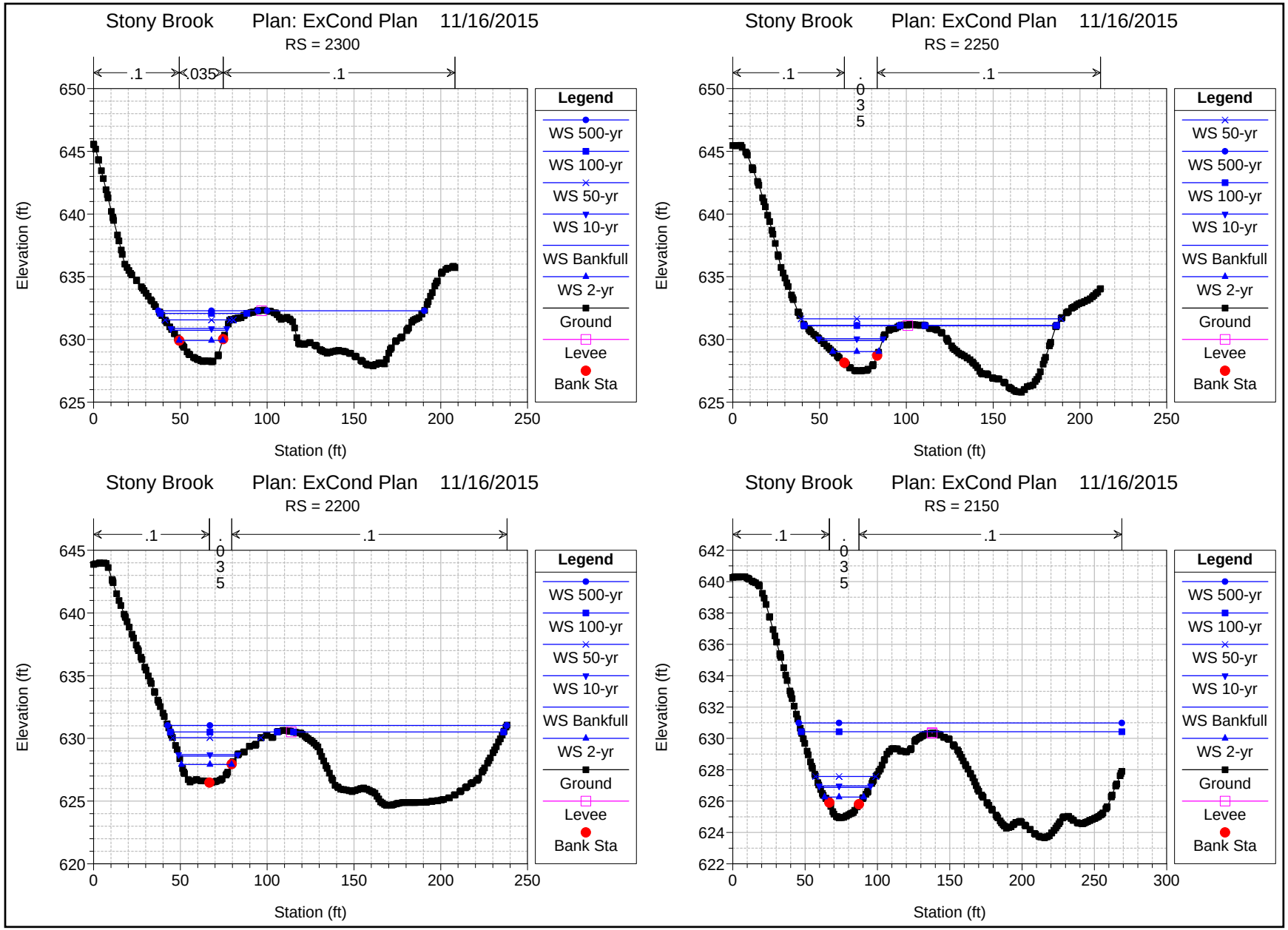
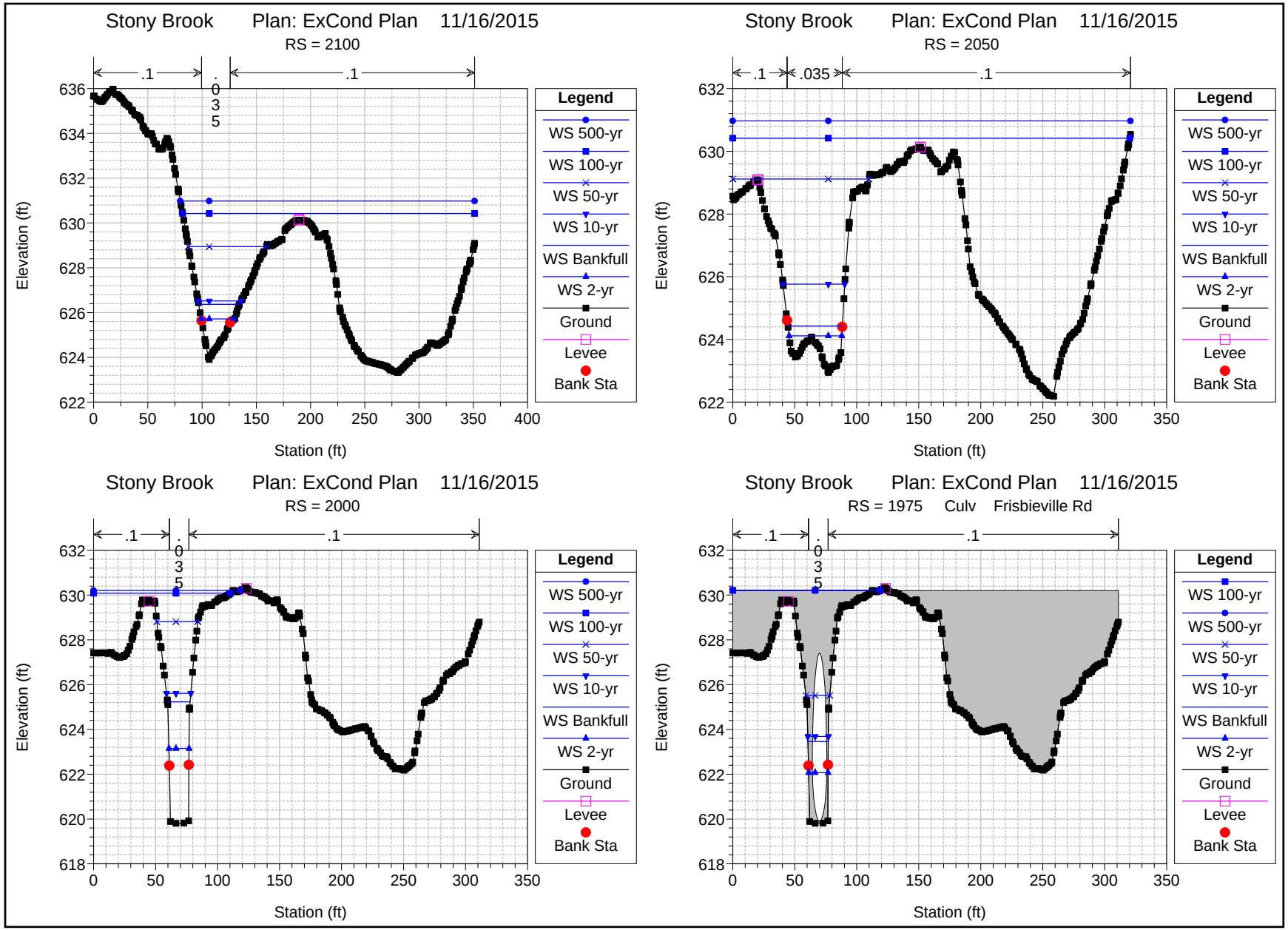
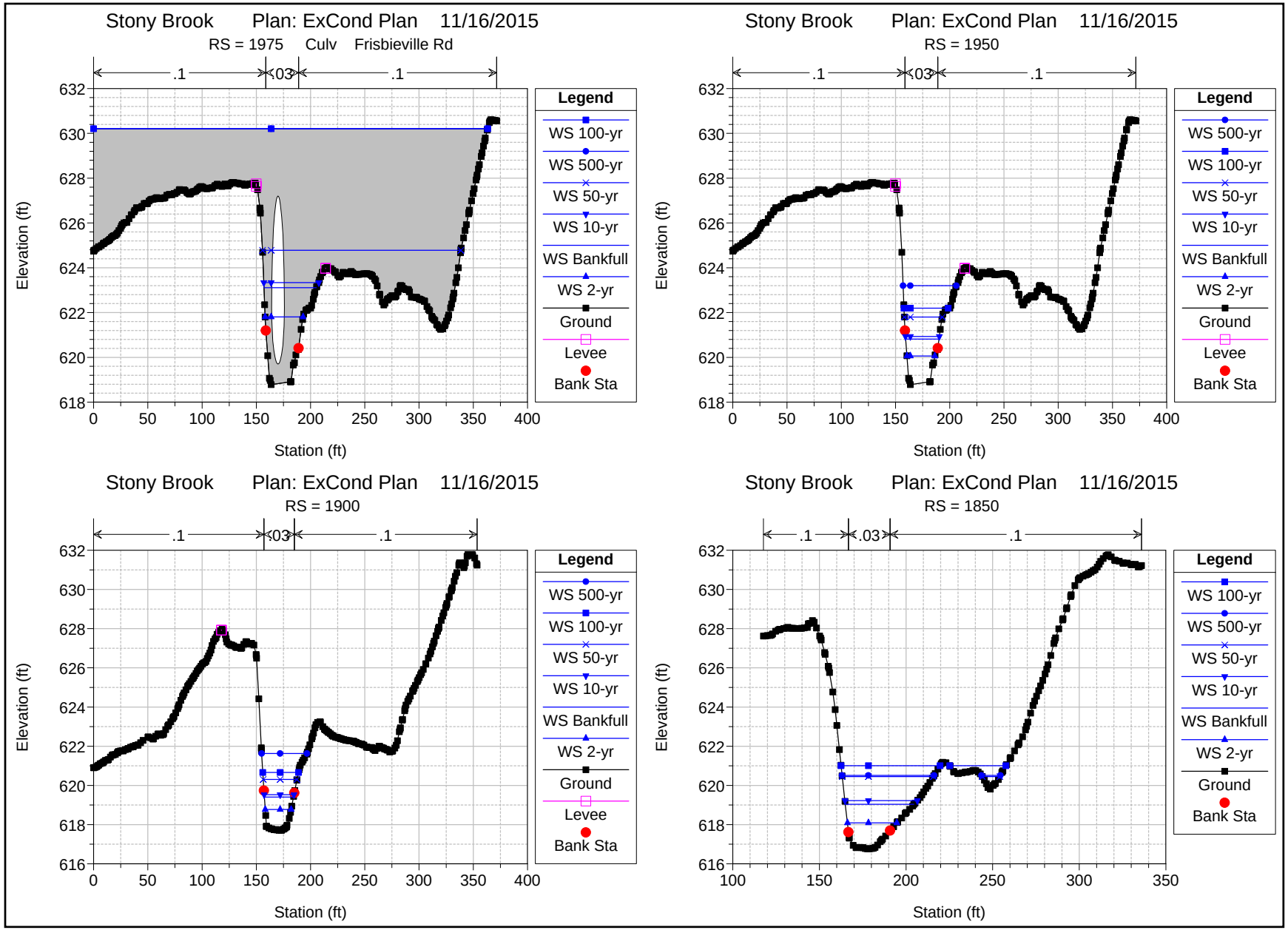
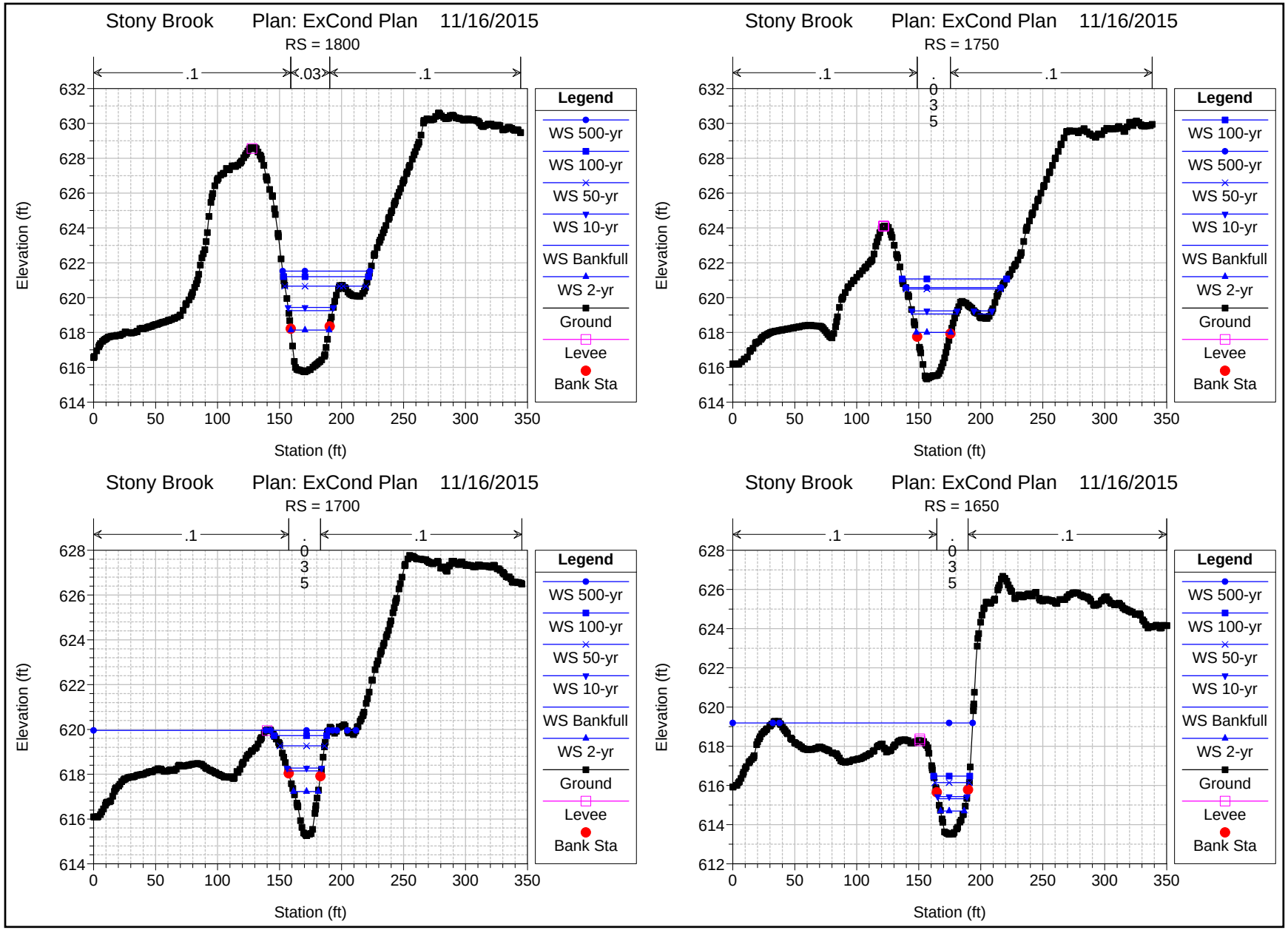
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2650
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2600
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2550
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta

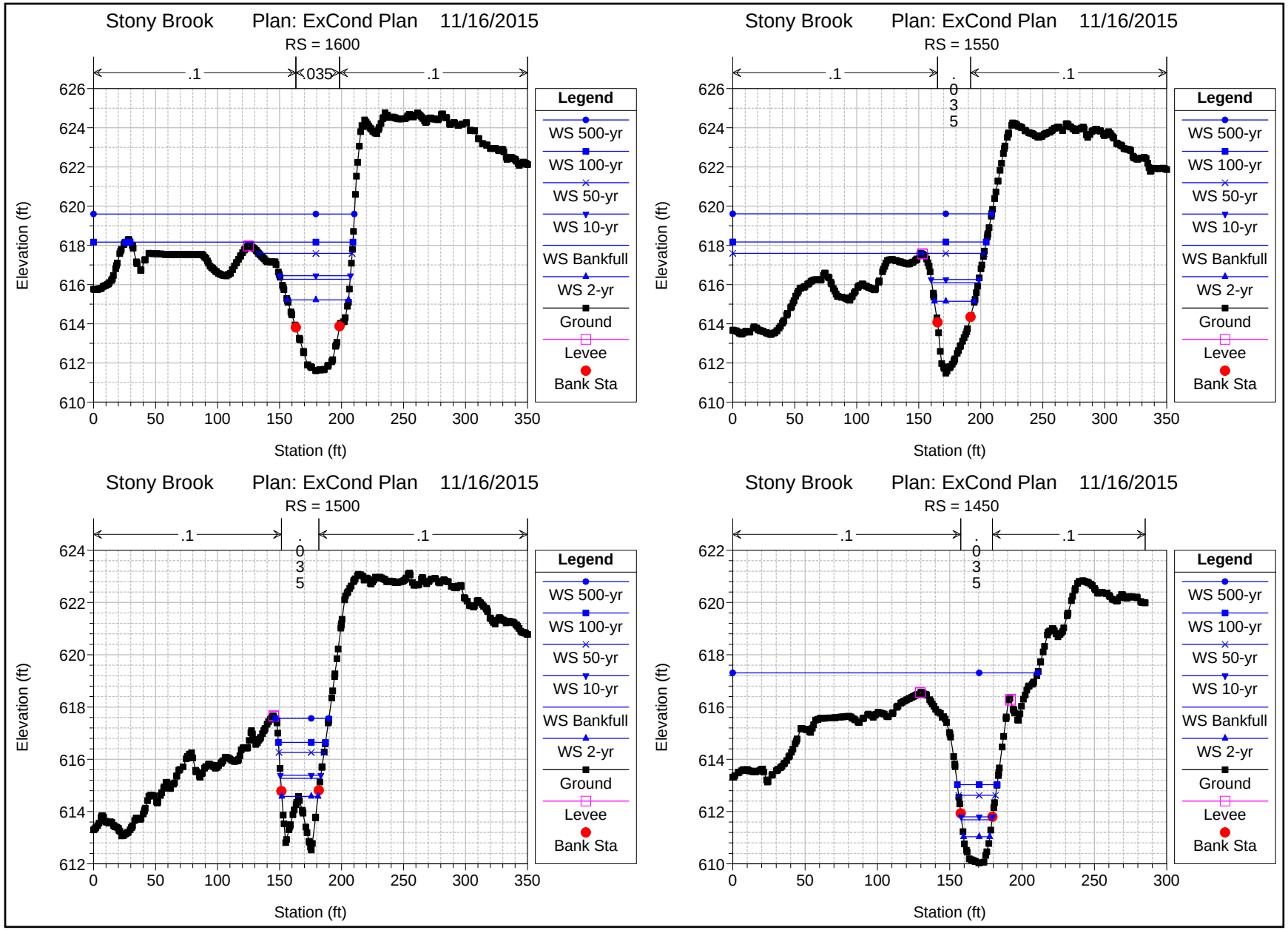

Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2500
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2450
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 50-yr
WS 100-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2400
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2350
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 50-yr
WS 500-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2300
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2250
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 50-yr
WS 500-yr
WS 100-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2200
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2150
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2100
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2050
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 2000
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1975 Culv Frisbieville Rd
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 500-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1975 Culv Frisbieville Rd
.1
.03
.1
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 500-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1950
.1
.03
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1900
.1
.03
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1850
.1
.03
.1
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 500-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1800
.1
.03
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1750
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 500-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1700
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1650
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1600
.1
.035
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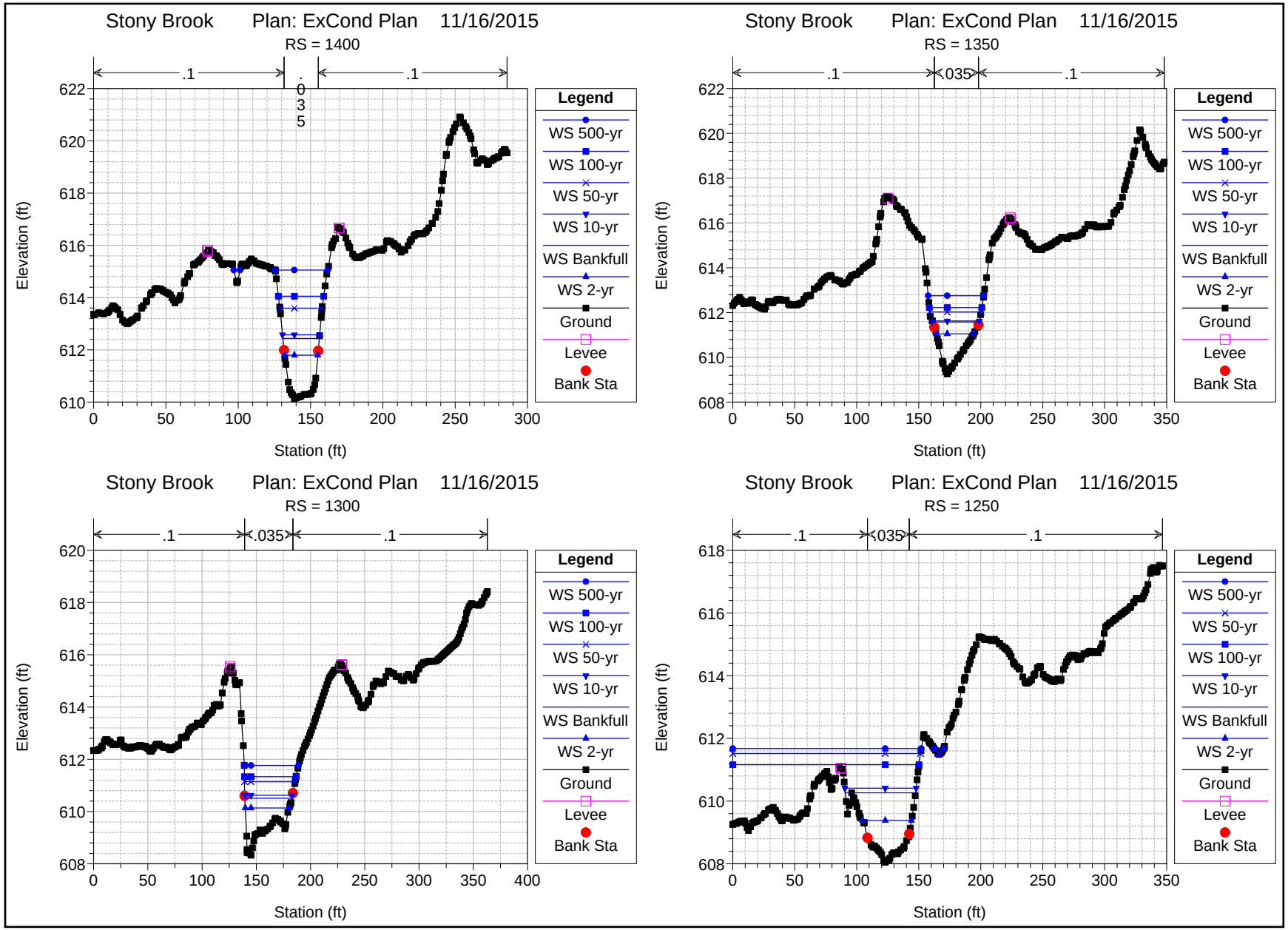
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1550
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1500
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1450
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1400
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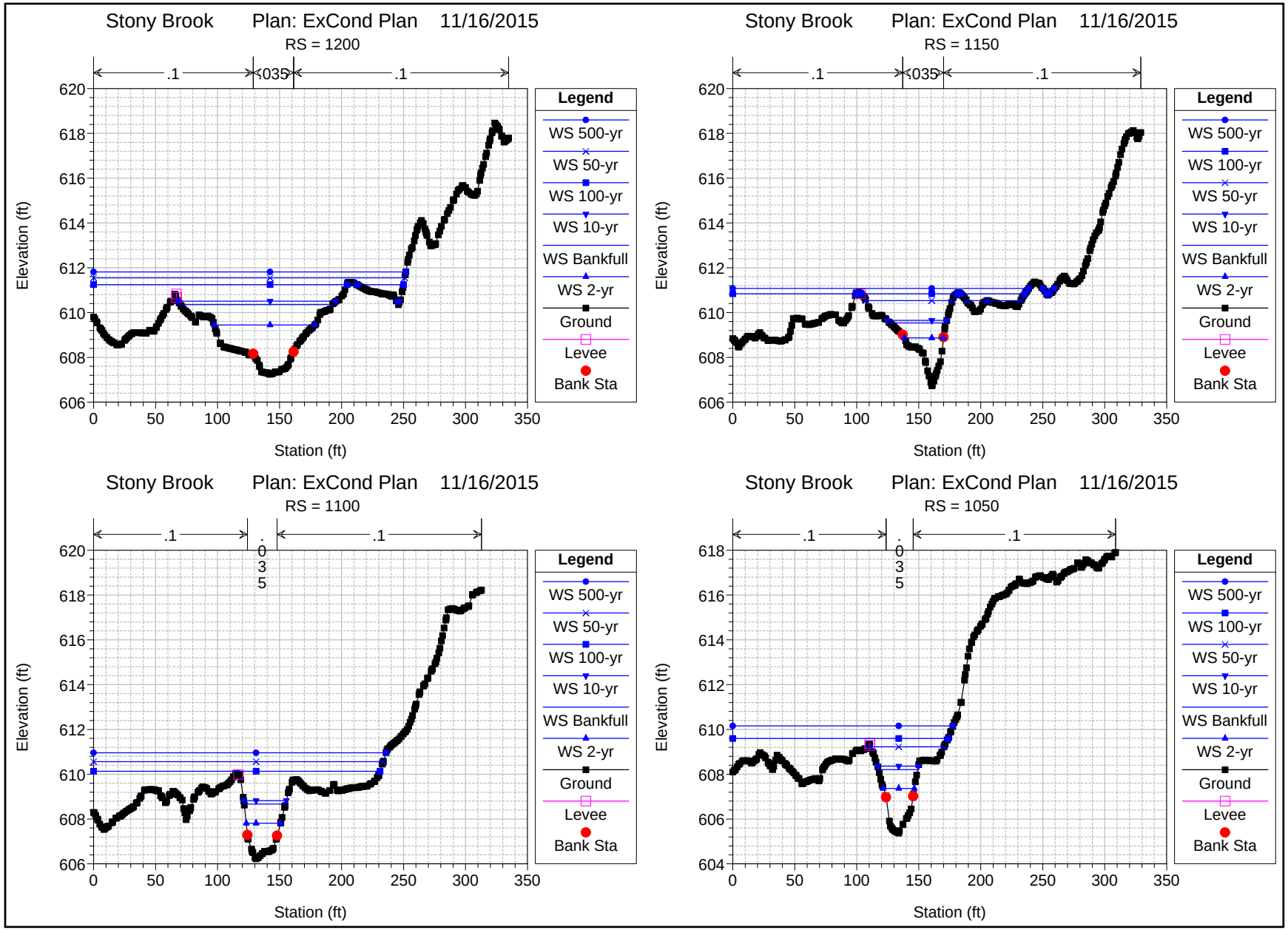
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1350
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1300
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1250
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 50-yr
WS 100-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1200
.1
.035
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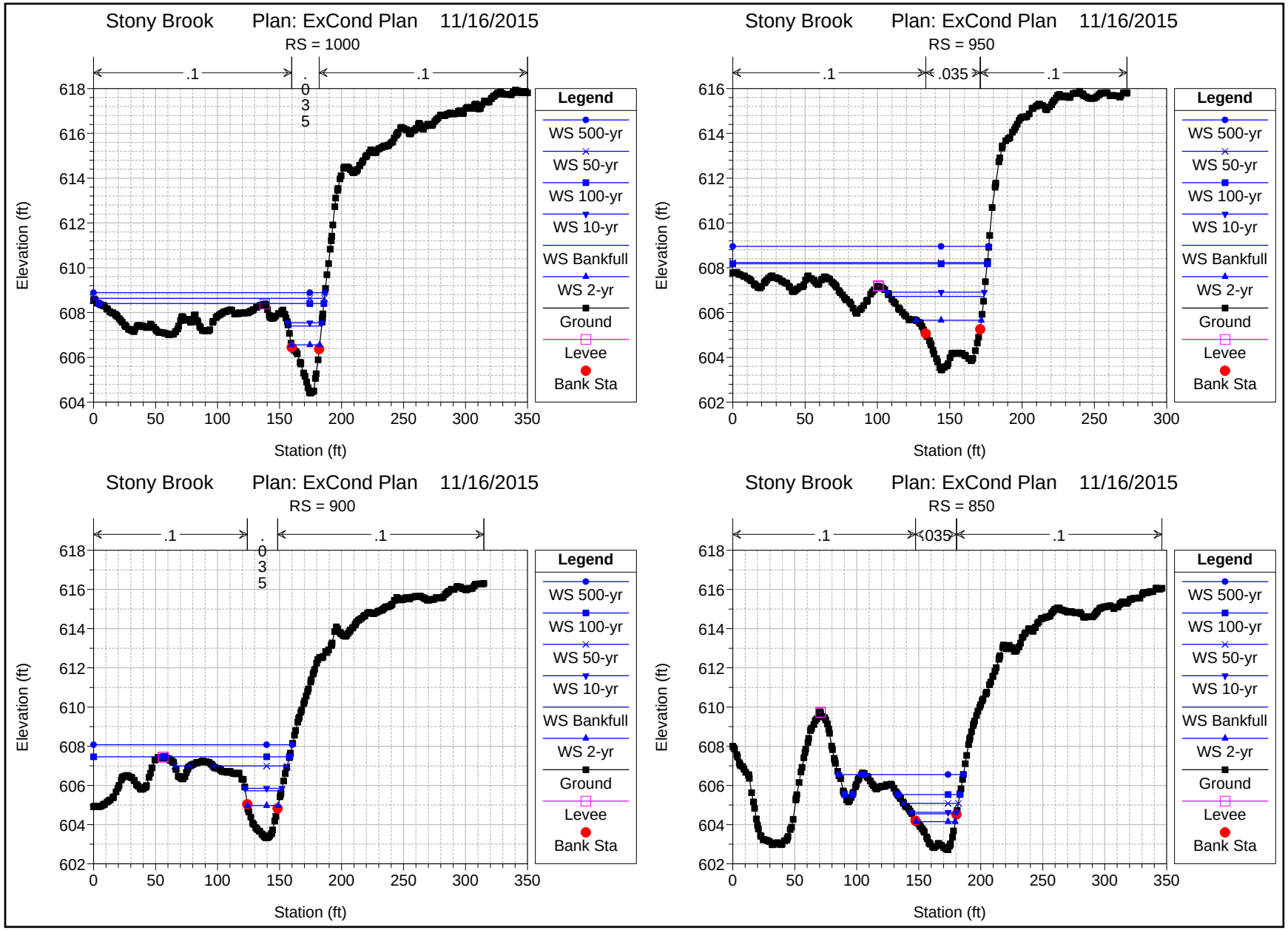
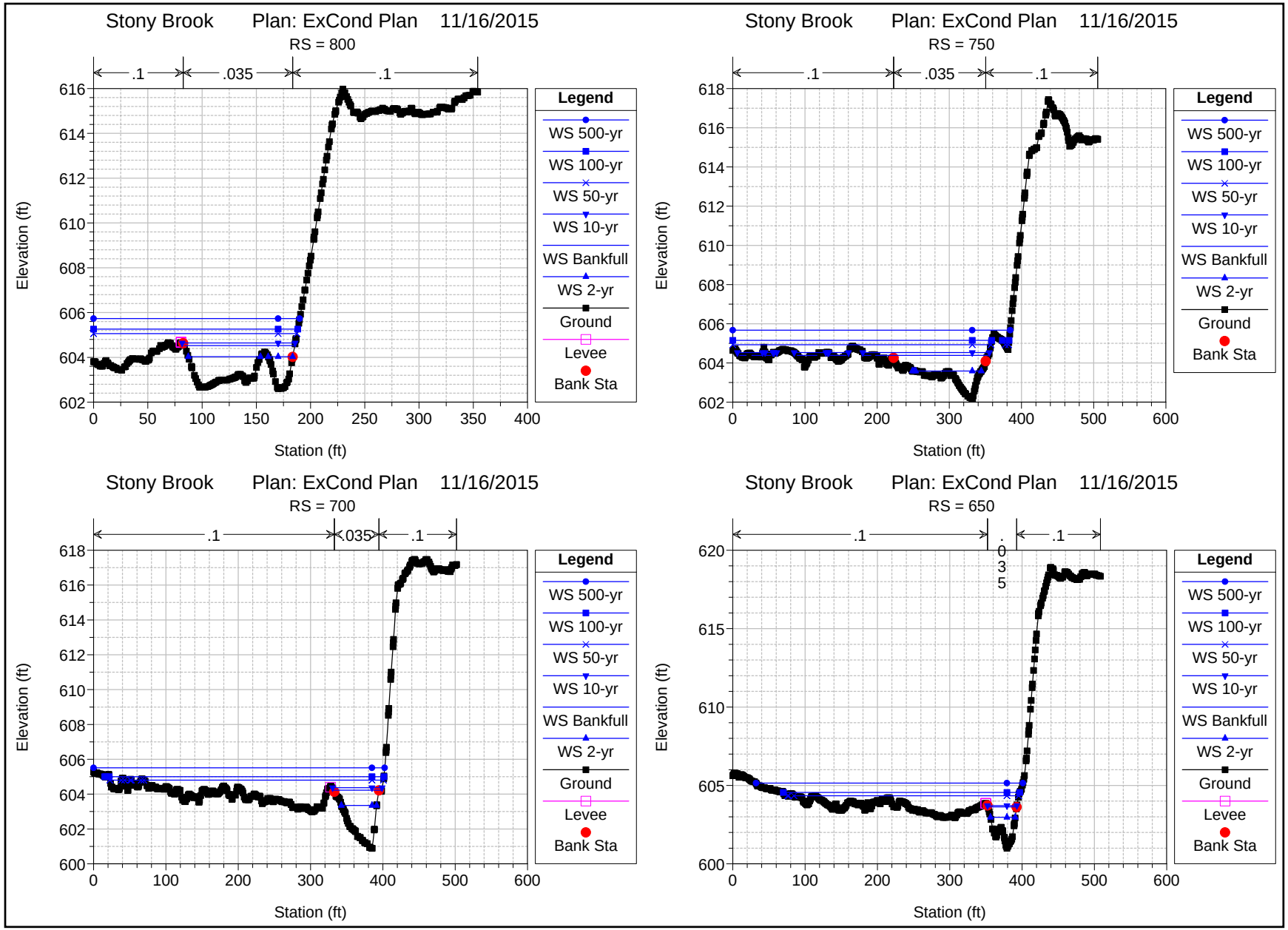
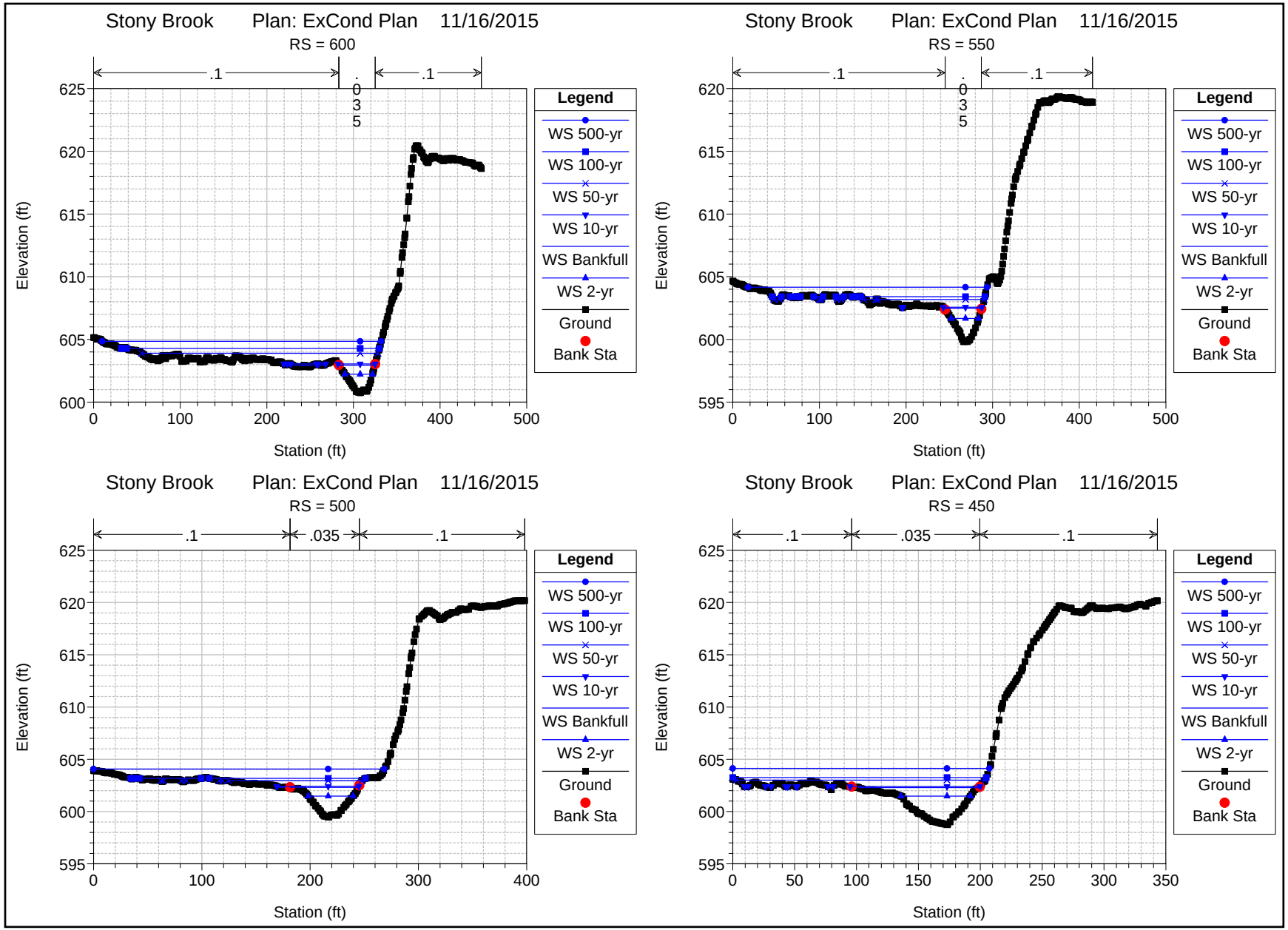
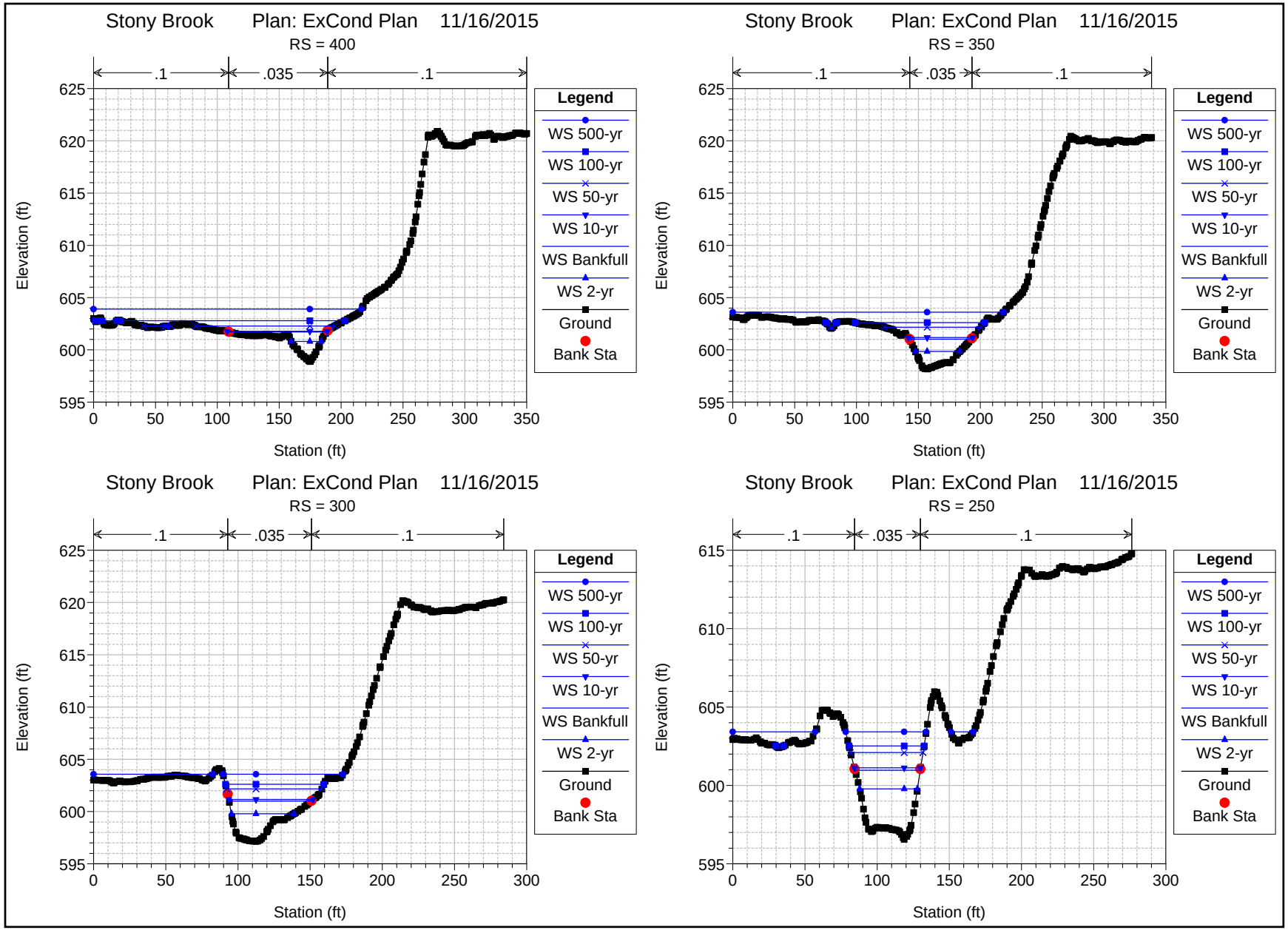
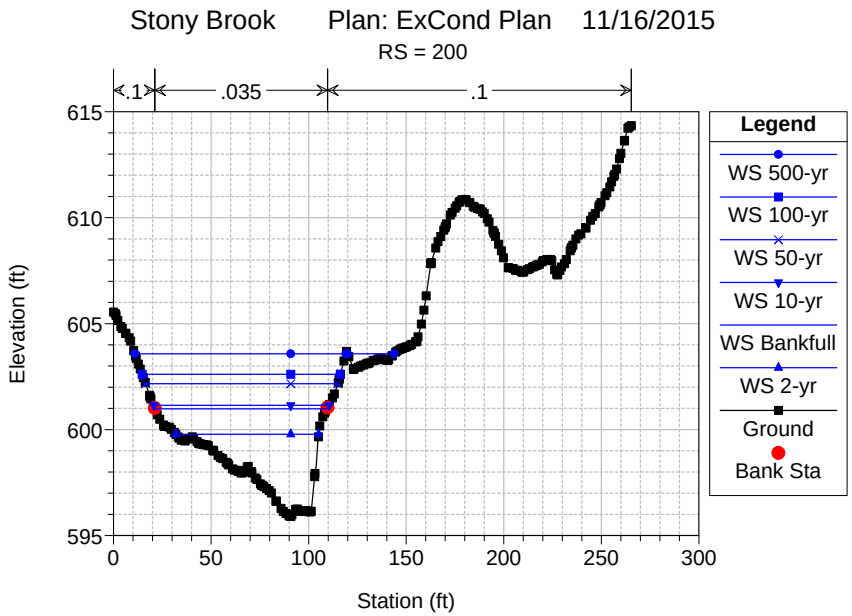
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 50-yr
WS 100-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1150
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1100
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 50-yr
WS 100-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1050
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta

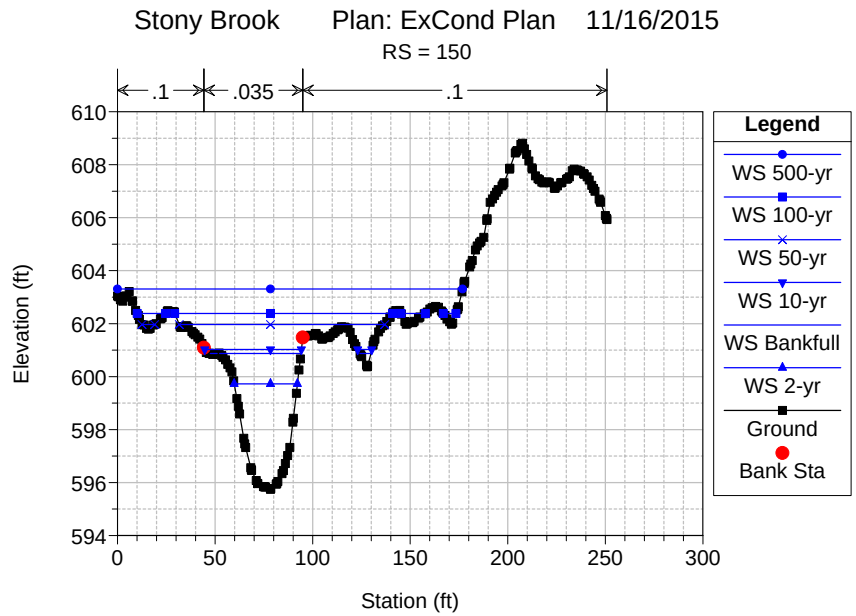

Stony Brook Plan: ExCond Plan 11/16/2015
RS = 1000
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 50-yr
WS 100-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 950
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 50-yr
WS 100-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 900
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 850
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta

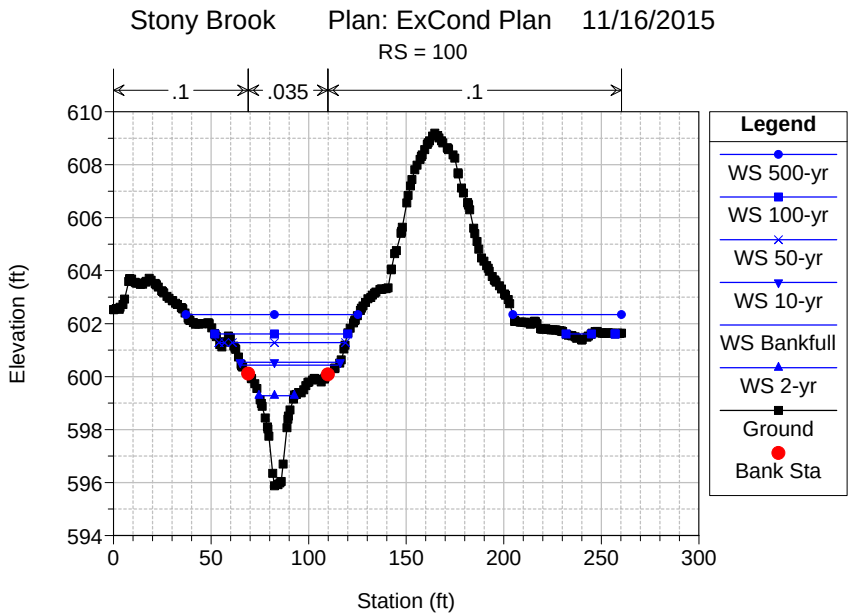

Stony Brook Plan: ExCond Plan 11/16/2015
RS = 800
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 750
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 700
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 650
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Levee
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 600
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 550
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 500
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 450
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 400
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 350
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 300
Stony Brook Plan: ExCond Plan 11/16/2015
RS = 250


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 200
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 150
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta


Stony Brook Plan: ExCond Plan 11/16/2015
RS = 100
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 500-yr
WS 100-yr
WS 50-yr
WS 10-yr
WS Bankfull
WS 2-yr
Ground
Bank Sta

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	15650	Bankfull	123.00	1074.66	1076.15	1076.53	1077.34	0.049007	8.77	14.03	15.22	1.61
STONY BROOK CENT	15650	2-yr	43.00	1074.66	1075.60	1075.79	1076.25	0.049012	6.43	6.68	11.62	1.49
STONY BROOK CENT	15650	10-yr	107.00	1074.66	1076.06	1076.41	1077.17	0.049017	8.43	12.70	14.63	1.59
STONY BROOK CENT	15650	50-yr	198.00	1074.66	1076.52	1076.99	1078.01	0.049080	9.81	20.18	18.51	1.66
STONY BROOK CENT	15650	100-yr	245.00	1074.66	1076.70	1077.22	1078.35	0.049061	10.31	23.76	20.22	1.68
STONY BROOK CENT	15650	500-yr	378.00	1074.66	1077.10	1077.75	1079.21	0.049021	11.67	32.51	24.26	1.73
STONY BROOK CENT	15600	Bankfull	123.00	1072.52	1074.01	1074.33	1075.10	0.040308	8.38	14.68	14.50	1.47
STONY BROOK CENT	15600	2-yr	43.00	1072.52	1073.42	1073.57	1073.99	0.040796	6.09	7.06	11.47	1.37
STONY BROOK CENT	15600	10-yr	107.00	1072.52	1073.91	1074.20	1074.91	0.040117	8.03	13.32	13.97	1.45
STONY BROOK CENT	15600	50-yr	198.00	1072.52	1074.41	1074.80	1075.79	0.038973	9.43	21.00	16.90	1.49
STONY BROOK CENT	15600	100-yr	245.00	1072.52	1074.61	1075.05	1076.16	0.038487	9.97	24.57	18.23	1.50
STONY BROOK CENT	15600	500-yr	378.00	1072.52	1075.07	1075.66	1077.12	0.035567	11.50	33.52	21.62	1.51
STONY BROOK CENT	15550	Bankfull	123.00	1070.56	1072.75	1072.19	1072.97	0.005140	3.80	32.37	22.63	0.56
STONY BROOK CENT	15550	2-yr	43.00	1070.56	1071.39	1071.53	1071.91	0.041999	5.76	7.47	13.71	1.37
STONY BROOK CENT	15550	10-yr	107.00	1070.56	1071.79	1072.08	1072.76	0.046101	7.89	13.56	16.57	1.54
STONY BROOK CENT	15550	50-yr	198.00	1070.56	1074.99	1072.63	1075.06	0.000534	2.15	96.18	34.47	0.21
STONY BROOK CENT	15550	100-yr	245.00	1070.56	1075.58	1072.86	1075.65	0.000472	2.26	117.50	38.20	0.20
STONY BROOK CENT	15550	500-yr	378.00	1070.56	1076.14	1073.41	1076.28	0.000712	3.03	139.95	42.17	0.25
STONY BROOK CENT	15500	Bankfull	123.00	1067.20	1072.87	1069.32	1072.89	0.000151	1.00	123.31	44.91	0.11
STONY BROOK CENT	15500	2-yr	43.00	1067.20	1070.36	1068.51	1070.38	0.000306	1.05	41.03	23.49	0.14
STONY BROOK CENT	15500	10-yr	107.00	1067.20	1072.41	1069.19	1072.43	0.000167	1.03	104.23	39.07	0.11
STONY BROOK CENT	15500	50-yr	198.00	1067.20	1075.03	1069.81	1075.04	0.000057	0.81	252.68	74.06	0.07
STONY BROOK CENT	15500	100-yr	245.00	1067.20	1075.62	1070.06	1075.63	0.000056	0.88	299.72	85.53	0.07
STONY BROOK CENT	15500	500-yr	378.00	1067.20	1076.21	1070.65	1076.23	0.000089	1.19	354.59	102.02	0.09
STONY BROOK CENT	15450		Culvert									
STONY BROOK CENT	15400	Bankfull	189.00	1060.98	1063.20	1063.20	1064.04	0.012248	7.32	25.88	16.42	1.01
STONY BROOK CENT	15400	2-yr	73.00	1060.98	1062.34	1062.34	1062.83	0.014262	5.62	13.00	13.50	1.01
STONY BROOK CENT	15400	10-yr	182.00	1060.98	1063.16	1063.16	1063.97	0.012380	7.23	25.20	16.27	1.01
STONY BROOK CENT	15400	50-yr	336.00	1060.98	1063.99	1063.99	1065.17	0.010363	8.75	39.93	19.46	0.99
STONY BROOK CENT	15400	100-yr	417.00	1060.98	1064.38	1064.38	1065.72	0.009659	9.32	47.93	22.08	0.98
STONY BROOK CENT	15400	500-yr	641.00	1060.98	1065.22	1065.22	1067.02	0.009237	10.87	68.32	27.52	1.00
STONY BROOK CENT	15350	Bankfull	189.00	1058.64	1059.97	1060.71	1062.60	0.078815	13.01	14.53	15.64	2.38
STONY BROOK CENT	15350	2-yr	73.00	1058.64	1059.43	1059.91	1061.18	0.102351	10.63	6.86	12.27	2.51
STONY BROOK CENT	15350	10-yr	182.00	1058.64	1059.95	1060.67	1062.52	0.079129	12.88	14.13	15.49	2.38
STONY BROOK CENT	15350	50-yr	336.00	1058.64	1060.46	1061.43	1063.88	0.066556	14.84	22.64	17.41	2.29
STONY BROOK CENT	15350	100-yr	417.00	1058.64	1060.69	1061.77	1064.47	0.062703	15.61	26.72	18.12	2.26
STONY BROOK CENT	15350	500-yr	641.00	1058.64	1061.27	1062.59	1065.83	0.051983	17.15	37.63	20.03	2.15
STONY BROOK CENT	15300	Bankfull	189.00	1057.52	1059.08	1059.34	1060.10	0.024516	8.09	23.35	21.52	1.37
STONY BROOK CENT	15300	2-yr	73.00	1057.52	1058.59	1058.64	1059.04	0.017515	5.36	13.61	18.18	1.09
STONY BROOK CENT	15300	10-yr	182.00	1057.52	1059.06	1059.31	1060.04	0.024161	7.96	22.86	21.37	1.36
STONY BROOK CENT	15300	50-yr	336.00	1057.52	1059.45	1059.96	1061.21	0.030544	10.66	31.69	24.08	1.59
STONY BROOK CENT	15300	100-yr	417.00	1057.52	1059.61	1060.26	1061.79	0.032696	11.85	35.64	25.22	1.68
STONY BROOK CENT	15300	500-yr	641.00	1057.52	1059.99	1060.99	1063.27	0.036794	14.56	45.82	27.98	1.85
STONY BROOK CENT	15250	Bankfull	189.00	1055.04	1056.82	1057.34	1058.50	0.038796	10.42	18.14	15.92	1.72
STONY BROOK CENT	15250	2-yr	73.00	1055.04	1056.06	1056.49	1057.44	0.062896	9.40	7.76	11.53	2.02
STONY BROOK CENT	15250	10-yr	182.00	1055.04	1056.78	1057.30	1058.45	0.039577	10.38	17.54	15.72	1.73
STONY BROOK CENT	15250	50-yr	336.00	1055.04	1057.42	1058.08	1059.57	0.033787	11.77	28.55	18.65	1.68
STONY BROOK CENT	15250	100-yr	417.00	1055.04	1057.67	1058.39	1060.10	0.033787	12.52	33.31	19.77	1.70
STONY BROOK CENT	15250	500-yr	641.00	1055.04	1058.18	1059.20	1061.50	0.033827	14.63	44.12	22.73	1.77
STONY BROOK CENT	15200	Bankfull	189.00	1053.60	1055.25	1055.63	1056.55	0.035057	9.15	20.65	20.66	1.61
STONY BROOK CENT	15200	2-yr	73.00	1053.60	1054.78	1054.92	1055.36	0.024028	6.14	11.89	16.37	1.27
STONY BROOK CENT	15200	10-yr	182.00	1053.60	1055.23	1055.60	1056.48	0.034533	8.99	20.25	20.57	1.60
STONY BROOK CENT	15200	50-yr	336.00	1053.60	1055.63	1056.27	1057.71	0.040047	11.57	29.04	22.45	1.79
STONY BROOK CENT	15200	100-yr	417.00	1053.60	1055.83	1056.56	1058.25	0.040854	12.48	33.40	23.32	1.84
STONY BROOK CENT	15200	500-yr	641.00	1053.60	1056.25	1057.24	1059.59	0.043938	14.67	43.70	25.26	1.96
STONY BROOK CENT	15150	Bankfull	189.00	1052.01	1054.32	1054.39	1055.13	0.019498	7.22	26.19	18.84	1.08
STONY BROOK CENT	15150	2-yr	73.00	1052.01	1053.41	1053.54	1054.04	0.029209	6.39	11.43	13.48	1.22
STONY BROOK CENT	15150	10-yr	182.00	1052.01	1054.28	1054.35	1055.07	0.019654	7.16	25.41	18.60	1.08
STONY BROOK CENT	15150	50-yr	336.00	1052.01	1054.93	1055.08	1056.12	0.018824	8.77	38.88	22.95	1.12
STONY BROOK CENT	15150	100-yr	417.00	1052.01	1055.19	1055.43	1056.61	0.018946	9.57	45.13	25.53	1.14
STONY BROOK CENT	15150	500-yr	641.00	1052.01	1055.79	1056.34	1057.79	0.019468	11.42	62.78	38.50	1.21
STONY BROOK CENT	15100	Bankfull	189.00	1050.80	1051.97	1052.42	1053.44	0.062982	9.74	19.40	21.91	1.82
STONY BROOK CENT	15100	2-yr	73.00	1050.80	1051.58	1051.76	1052.22	0.046761	6.39	11.42	19.48	1.47
STONY BROOK CENT	15100	10-yr	182.00	1050.80	1051.95	1052.39	1053.38	0.062957	9.62	18.92	21.78	1.82
STONY BROOK CENT	15100	50-yr	336.00	1050.80	1052.38	1053.00	1054.48	0.060743	11.64	28.88	24.43	1.88
STONY BROOK CENT	15100	100-yr	417.00	1050.80	1052.57	1053.28	1054.97	0.057802	12.46	33.59	25.57	1.87
STONY BROOK CENT	15100	500-yr	641.00	1050.80	1053.03	1053.97	1056.18	0.051485	14.27	46.09	28.40	1.86
STONY BROOK CENT	15050	Bankfull	189.00	1048.56	1050.76	1050.84	1051.57	0.020851	7.21	26.21	19.82	1.11
STONY BROOK CENT	15050	2-yr	73.00	1048.56	1049.96	1050.04	1050.50	0.025516	5.91	12.34	14.73	1.14
STONY BROOK CENT	15050	10-yr	182.00	1048.56	1050.72	1050.81	1051.51	0.020847	7.14	25.50	19.60	1.10
STONY BROOK CENT	15050	50-yr	336.00	1048.56	1051.30	1051.53	1052.57	0.021070	9.06	38.03	24.15	1.17
STONY BROOK CENT	15050	100-yr	417.00	1048.56	1051.54	1051.85	1053.05	0.021340	9.91	44.13	25.99	1.21

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	15050	500-yr	641.00	1048.56	1052.10	1052.65	1054.25	0.022453	11.89	59.84	30.37	1.29
STONY BROOK CENT	15000	Bankfull	189.00	1046.02	1047.84	1048.39	1049.65	0.078135	10.80	17.50	19.80	2.02
STONY BROOK CENT	15000	2-yr	73.00	1046.02	1047.33	1047.67	1048.40	0.075361	8.31	8.79	14.35	1.87
STONY BROOK CENT	15000	10-yr	182.00	1046.02	1047.81	1048.35	1049.59	0.078591	10.71	16.99	19.54	2.02
STONY BROOK CENT	15000	50-yr	336.00	1046.02	1048.28	1048.99	1050.66	0.074086	12.40	27.09	23.94	2.05
STONY BROOK CENT	15000	100-yr	417.00	1046.02	1048.46	1049.26	1051.16	0.071115	13.17	31.74	25.61	2.05
STONY BROOK CENT	15000	500-yr	641.00	1046.02	1048.90	1049.94	1052.37	0.062763	14.96	43.90	29.52	2.02
STONY BROOK CENT	14950	Bankfull	189.00	1043.63	1045.13	1045.51	1046.40	0.050128	9.02	20.94	22.17	1.64
STONY BROOK CENT	14950	2-yr	73.00	1043.63	1044.63	1044.83	1045.32	0.047843	6.70	10.90	17.51	1.50
STONY BROOK CENT	14950	10-yr	182.00	1043.63	1045.11	1045.48	1046.34	0.049872	8.91	20.42	21.96	1.63
STONY BROOK CENT	14950	50-yr	336.00	1043.63	1045.53	1046.08	1047.41	0.052638	10.99	30.64	25.94	1.75
STONY BROOK CENT	14950	100-yr	417.00	1043.63	1045.70	1046.37	1047.94	0.053904	12.01	35.02	27.08	1.80
STONY BROOK CENT	14950	500-yr	641.00	1043.63	1046.07	1047.04	1049.31	0.057121	14.47	45.50	29.10	1.93
STONY BROOK CENT	14900	Bankfull	189.00	1041.86	1044.20	1044.23	1044.89	0.018077	6.64	28.48	22.61	1.03
STONY BROOK CENT	14900	2-yr	73.00	1041.86	1043.34	1043.43	1043.89	0.026928	5.97	12.22	15.01	1.17
STONY BROOK CENT	14900	10-yr	182.00	1041.86	1044.12	1044.18	1044.84	0.020434	6.81	26.73	21.90	1.09
STONY BROOK CENT	14900	50-yr	336.00	1041.86	1044.78	1044.86	1045.79	0.016709	8.07	42.96	27.52	1.05
STONY BROOK CENT	14900	100-yr	417.00	1041.86	1045.01	1045.16	1046.23	0.017353	8.89	49.46	29.82	1.09
STONY BROOK CENT	14900	500-yr	641.00	1041.86	1045.49	1045.90	1047.32	0.019967	10.96	64.84	33.88	1.21
STONY BROOK CENT	14850	Bankfull	189.00	1039.83	1040.82	1041.35	1042.81	0.137073	11.33	16.68	27.13	2.55
STONY BROOK CENT	14850	2-yr	73.00	1039.83	1040.53	1040.81	1041.45	0.108814	7.69	9.49	23.21	2.12
STONY BROOK CENT	14850	10-yr	182.00	1039.83	1040.82	1041.32	1042.65	0.125561	10.86	16.75	27.16	2.44
STONY BROOK CENT	14850	50-yr	336.00	1039.83	1041.12	1041.83	1043.82	0.125502	13.20	25.46	30.80	2.56
STONY BROOK CENT	14850	100-yr	417.00	1039.83	1041.27	1042.05	1044.24	0.117025	13.84	30.14	32.19	2.52
STONY BROOK CENT	14850	500-yr	641.00	1039.83	1041.62	1042.61	1045.24	0.098440	15.27	42.00	34.23	2.42
STONY BROOK CENT	14800	Bankfull	189.00	1038.42	1041.67	1040.44	1041.79	0.001822	2.84	66.54	33.11	0.35
STONY BROOK CENT	14800	2-yr	73.00	1038.42	1040.81	1039.75	1040.86	0.001172	1.82	40.07	28.07	0.27
STONY BROOK CENT	14800	10-yr	182.00	1038.42	1041.63	1040.40	1041.75	0.001793	2.79	65.20	32.90	0.35
STONY BROOK CENT	14800	50-yr	336.00	1038.42	1042.40	1041.04	1042.61	0.002093	3.67	92.21	37.45	0.40
STONY BROOK CENT	14800	100-yr	417.00	1038.42	1042.73	1041.31	1042.99	0.002167	4.04	105.14	39.67	0.41
STONY BROOK CENT	14800	500-yr	641.00	1038.42	1043.52	1041.94	1043.89	0.002330	4.90	138.25	44.37	0.44
STONY BROOK CENT	14750	Bankfull	189.00	1039.02	1040.97	1040.97	1041.54	0.017875	6.07	31.15	27.82	1.00
STONY BROOK CENT	14750	2-yr	73.00	1039.02	1040.31	1040.31	1040.68	0.021032	4.87	14.99	20.88	1.01
STONY BROOK CENT	14750	10-yr	182.00	1039.02	1040.94	1040.94	1041.50	0.018129	6.01	30.29	27.55	1.01
STONY BROOK CENT	14750	50-yr	336.00	1039.02	1041.50	1041.50	1042.32	0.015648	7.28	47.40	32.97	1.00
STONY BROOK CENT	14750	100-yr	417.00	1039.02	1041.76	1041.76	1042.69	0.014612	7.76	56.42	35.66	0.99
STONY BROOK CENT	14750	500-yr	641.00	1039.02	1042.42	1042.42	1043.58	0.012526	8.75	82.62	44.50	0.96
STONY BROOK CENT	14700	Bankfull	189.00	1034.55	1036.03	1036.88	1039.31	0.143171	14.53	13.01	14.75	2.73
STONY BROOK CENT	14700	2-yr	73.00	1034.55	1035.45	1036.06	1038.02	0.214042	12.87	5.67	10.48	3.08
STONY BROOK CENT	14700	10-yr	182.00	1034.55	1036.01	1036.84	1039.24	0.144724	14.44	12.60	14.55	2.73
STONY BROOK CENT	14700	50-yr	336.00	1034.55	1036.54	1037.56	1040.35	0.115886	15.66	21.46	18.52	2.56
STONY BROOK CENT	14700	100-yr	417.00	1034.55	1036.77	1037.87	1040.83	0.106677	16.17	25.80	20.17	2.50
STONY BROOK CENT	14700	500-yr	641.00	1034.55	1037.31	1038.64	1041.95	0.080144	17.30	37.87	24.44	2.29
STONY BROOK CENT	14650	Bankfull	189.00	1031.91	1033.50	1033.87	1034.73	0.050562	8.88	21.28	23.16	1.63
STONY BROOK CENT	14650	2-yr	73.00	1031.91	1033.06	1033.22	1033.65	0.038288	6.13	11.90	18.41	1.34
STONY BROOK CENT	14650	10-yr	182.00	1031.91	1033.48	1033.84	1034.67	0.050029	8.74	20.83	23.05	1.62
STONY BROOK CENT	14650	50-yr	336.00	1031.91	1033.86	1034.44	1035.81	0.058085	11.21	29.97	25.41	1.82
STONY BROOK CENT	14650	100-yr	417.00	1031.91	1034.02	1034.71	1036.34	0.061275	12.23	34.11	26.40	1.89
STONY BROOK CENT	14650	500-yr	641.00	1031.91	1034.34	1035.38	1037.85	0.070643	15.05	42.81	28.14	2.10
STONY BROOK CENT	14600	Bankfull	189.00	1029.66	1031.48	1031.77	1032.60	0.035239	8.48	22.27	19.80	1.41
STONY BROOK CENT	14600	2-yr	73.00	1029.66	1030.82	1031.04	1031.57	0.044668	6.92	10.55	15.35	1.47
STONY BROOK CENT	14600	10-yr	182.00	1029.66	1031.45	1031.74	1032.55	0.035482	8.40	21.66	19.65	1.41
STONY BROOK CENT	14600	50-yr	336.00	1029.66	1032.01	1032.43	1033.61	0.031593	10.17	33.33	22.21	1.41
STONY BROOK CENT	14600	100-yr	417.00	1029.66	1032.25	1032.74	1034.11	0.030391	10.95	38.83	23.27	1.42
STONY BROOK CENT	14600	500-yr	641.00	1029.66	1032.79	1033.52	1035.37	0.030082	12.94	52.07	25.57	1.47
STONY BROOK CENT	14550	Bankfull	189.00	1027.20	1028.73	1029.22	1030.31	0.058958	10.10	18.72	18.90	1.79
STONY BROOK CENT	14550	2-yr	73.00	1027.20	1028.22	1028.48	1029.06	0.056231	7.36	9.92	15.64	1.63
STONY BROOK CENT	14550	10-yr	182.00	1027.20	1028.70	1029.19	1030.25	0.059060	9.98	18.23	18.75	1.78
STONY BROOK CENT	14550	50-yr	336.00	1027.20	1029.18	1029.85	1031.44	0.059152	12.05	27.87	21.53	1.87
STONY BROOK CENT	14550	100-yr	417.00	1027.20	1029.38	1030.15	1031.98	0.058644	12.94	32.24	22.47	1.89
STONY BROOK CENT	14550	500-yr	641.00	1027.20	1029.86	1030.91	1033.32	0.053393	14.94	43.52	24.66	1.89
STONY BROOK CENT	14500	Bankfull	189.00	1025.54	1027.68	1027.77	1028.47	0.020275	7.11	26.58	20.24	1.09
STONY BROOK CENT	14500	2-yr	73.00	1025.54	1026.96	1026.98	1027.42	0.020283	5.41	13.50	15.63	1.03
STONY BROOK CENT	14500	10-yr	182.00	1025.54	1027.65	1027.73	1028.41	0.020165	7.02	25.94	20.07	1.09
STONY BROOK CENT	14500	50-yr	336.00	1025.54	1028.20	1028.41	1029.44	0.021926	8.94	37.91	23.00	1.19
STONY BROOK CENT	14500	100-yr	417.00	1025.54	1028.42	1028.73	1029.93	0.022798	9.86	43.02	23.79	1.24
STONY BROOK CENT	14500	500-yr	641.00	1025.54	1028.91	1029.50	1031.17	0.025697	12.12	55.00	25.57	1.36
STONY BROOK CENT	14450	Bankfull	189.00	1023.65	1025.10	1025.57	1026.70	0.066544	10.16	18.61	20.52	1.88
STONY BROOK CENT	14450	2-yr	73.00	1023.65	1024.61	1024.90	1025.58	0.078530	7.91	9.23	16.86	1.88
STONY BROOK CENT	14450	10-yr	182.00	1023.65	1025.07	1025.54	1026.65	0.067398	10.07	18.08	20.39	1.88
STONY BROOK CENT	14450	50-yr	336.00	1023.65	1025.57	1026.20	1027.69	0.055445	11.70	28.76	22.71	1.81
STONY BROOK CENT	14450	100-yr	417.00	1023.65	1025.78	1026.50	1028.19	0.052114	12.44	33.73	23.69	1.79

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	14450	500-yr	641.00	1023.65	1026.29	1027.22	1029.40	0.046409	14.17	46.44	25.94	1.77
STONY BROOK CENT	14400	Bankfull	189.00	1021.80	1023.79	1023.93	1024.63	0.023467	7.33	25.78	21.08	1.17
STONY BROOK CENT	14400	2-yr	73.00	1021.80	1023.14	1023.16	1023.59	0.021092	5.39	13.55	16.33	1.04
STONY BROOK CENT	14400	10-yr	182.00	1021.80	1023.77	1023.89	1024.58	0.023287	7.23	25.16	20.87	1.16
STONY BROOK CENT	14400	50-yr	336.00	1021.80	1024.25	1024.58	1025.63	0.026238	9.46	35.98	24.02	1.30
STONY BROOK CENT	14400	100-yr	417.00	1021.80	1024.45	1024.88	1026.13	0.027329	10.43	40.99	25.32	1.35
STONY BROOK CENT	14400	500-yr	641.00	1021.80	1024.94	1025.63	1027.38	0.029315	12.62	54.05	28.46	1.45
STONY BROOK CENT	14350	Bankfull	189.00	1020.00	1021.54	1021.95	1022.89	0.052930	9.30	20.32	21.59	1.69
STONY BROOK CENT	14350	2-yr	73.00	1020.00	1020.97	1021.25	1021.86	0.062709	7.56	9.66	15.95	1.71
STONY BROOK CENT	14350	10-yr	182.00	1020.00	1021.52	1021.92	1022.84	0.053282	9.23	19.72	21.31	1.69
STONY BROOK CENT	14350	50-yr	336.00	1020.00	1021.99	1022.54	1023.84	0.048917	10.91	30.93	25.98	1.71
STONY BROOK CENT	14350	100-yr	417.00	1020.00	1022.18	1022.83	1024.32	0.047081	11.75	36.05	27.63	1.71
STONY BROOK CENT	14350	500-yr	641.00	1020.00	1022.63	1023.52	1025.54	0.045139	13.75	49.17	31.19	1.75
STONY BROOK CENT	14300	Bankfull	189.00	1018.39	1020.23	1020.37	1021.02	0.023800	7.10	26.63	23.26	1.17
STONY BROOK CENT	14300	2-yr	73.00	1018.39	1019.63	1019.64	1020.04	0.020941	5.18	14.09	17.99	1.03
STONY BROOK CENT	14300	10-yr	182.00	1018.39	1020.20	1020.34	1020.97	0.023694	7.01	25.95	22.99	1.16
STONY BROOK CENT	14300	50-yr	336.00	1018.39	1020.69	1020.97	1021.90	0.026245	8.83	38.22	27.56	1.28
STONY BROOK CENT	14300	100-yr	417.00	1018.39	1020.87	1021.26	1022.35	0.027790	9.79	43.27	30.68	1.34
STONY BROOK CENT	14300	500-yr	641.00	1018.39	1021.28	1021.93	1023.48	0.030726	11.95	57.29	36.77	1.46
STONY BROOK CENT	14250	Bankfull	189.00	1016.49	1018.28	1018.63	1019.44	0.041263	8.64	21.88	21.48	1.51
STONY BROOK CENT	14250	2-yr	73.00	1016.49	1017.67	1017.91	1018.44	0.050785	7.08	10.31	15.98	1.55
STONY BROOK CENT	14250	10-yr	182.00	1016.49	1018.25	1018.59	1019.39	0.041565	8.57	21.25	21.25	1.51
STONY BROOK CENT	14250	50-yr	336.00	1016.49	1018.79	1019.21	1020.32	0.037428	9.94	33.83	25.55	1.50
STONY BROOK CENT	14250	100-yr	417.00	1016.49	1019.00	1019.51	1020.76	0.035267	10.64	39.50	27.26	1.50
STONY BROOK CENT	14250	500-yr	641.00	1016.49	1019.50	1020.20	1021.87	0.033222	12.39	53.91	31.21	1.52
STONY BROOK CENT	14200	Bankfull	189.00	1014.24	1016.00	1016.39	1017.29	0.044367	9.11	20.74	19.78	1.57
STONY BROOK CENT	14200	2-yr	73.00	1014.24	1015.38	1015.60	1016.14	0.041461	6.99	10.45	14.12	1.43
STONY BROOK CENT	14200	10-yr	182.00	1014.24	1015.97	1016.36	1017.24	0.044261	9.03	20.16	19.45	1.56
STONY BROOK CENT	14200	50-yr	336.00	1014.24	1016.48	1017.01	1018.28	0.043777	10.77	31.31	24.16	1.63
STONY BROOK CENT	14200	100-yr	417.00	1014.24	1016.67	1017.30	1018.78	0.042818	11.65	36.23	25.68	1.65
STONY BROOK CENT	14200	500-yr	641.00	1014.24	1017.16	1018.02	1019.99	0.040107	13.54	49.77	29.44	1.67
STONY BROOK CENT	14150	Bankfull	189.00	1012.99	1014.90	1014.97	1015.54	0.023161	6.43	29.40	29.20	1.13
STONY BROOK CENT	14150	2-yr	73.00	1012.99	1014.25	1014.34	1014.72	0.030188	5.51	13.25	20.29	1.20
STONY BROOK CENT	14150	10-yr	182.00	1012.99	1014.87	1014.95	1015.50	0.022963	6.35	28.68	28.85	1.12
STONY BROOK CENT	14150	50-yr	336.00	1012.99	1015.24	1015.49	1016.36	0.027507	8.49	39.88	31.58	1.29
STONY BROOK CENT	14150	100-yr	417.00	1012.99	1015.39	1015.74	1016.79	0.030028	9.50	44.56	32.77	1.37
STONY BROOK CENT	14150	500-yr	641.00	1012.99	1015.72	1016.36	1017.90	0.035839	11.88	56.01	35.63	1.55
STONY BROOK CENT	14100	Bankfull	189.00	1011.65	1014.00	1013.67	1014.27	0.007601	4.16	45.55	40.07	0.67
STONY BROOK CENT	14100	2-yr	73.00	1011.65	1013.54	1013.04	1013.64	0.003986	2.51	29.08	31.83	0.46
STONY BROOK CENT	14100	10-yr	182.00	1011.65	1013.98	1013.64	1014.24	0.007409	4.07	44.84	39.76	0.66
STONY BROOK CENT	14100	50-yr	336.00	1011.65	1013.92	1014.14	1014.89	0.029709	7.89	42.63	38.78	1.31
STONY BROOK CENT	14100	100-yr	417.00	1011.65	1014.08	1014.38	1015.23	0.029758	8.60	48.84	41.28	1.34
STONY BROOK CENT	14100	500-yr	641.00	1011.65	1014.41	1014.91	1016.07	0.031791	10.38	67.86	67.17	1.44
STONY BROOK CENT	14050	Bankfull	189.00	1012.31	1013.35	1013.35	1013.66	0.021648	4.49	42.21	71.68	1.01
STONY BROOK CENT	14050	2-yr	73.00	1012.31	1013.03	1013.03	1013.21	0.026398	3.43	21.27	60.52	1.02
STONY BROOK CENT	14050	10-yr	182.00	1012.31	1013.33	1013.33	1013.64	0.021900	4.44	41.08	71.15	1.01
STONY BROOK CENT	14050	50-yr	336.00	1012.31	1013.64	1013.64	1014.09	0.018421	5.37	63.65	74.10	1.00
STONY BROOK CENT	14050	100-yr	417.00	1012.31	1013.78	1013.78	1014.29	0.017828	5.79	73.63	74.90	1.00
STONY BROOK CENT	14050	500-yr	641.00	1012.31	1014.12	1014.12	1014.80	0.016044	6.66	99.79	76.83	1.00
STONY BROOK CENT	14000	Bankfull	189.00	1010.60	1012.20	1012.25	1012.65	0.018414	5.54	43.51	72.12	1.00
STONY BROOK CENT	14000	2-yr	73.00	1010.60	1011.64	1011.65	1011.98	0.022539	4.67	15.63	24.76	1.04
STONY BROOK CENT	14000	10-yr	182.00	1010.60	1012.18	1012.21	1012.62	0.018569	5.49	41.92	70.94	1.00
STONY BROOK CENT	14000	50-yr	336.00	1010.60	1012.58	1012.64	1013.18	0.017418	6.60	72.12	78.62	1.02
STONY BROOK CENT	14000	100-yr	417.00	1010.60	1012.76	1012.80	1013.42	0.016579	7.02	86.40	80.56	1.02
STONY BROOK CENT	14000	500-yr	641.00	1010.60	1013.19	1013.21	1014.01	0.015047	7.95	122.48	84.76	1.02
STONY BROOK CENT	13950	Bankfull	189.00	1007.91	1009.71	1010.13	1011.08	0.055655	9.39	20.13	21.70	1.72
STONY BROOK CENT	13950	2-yr	73.00	1007.91	1009.07	1009.40	1010.10	0.068088	8.16	8.95	13.86	1.79
STONY BROOK CENT	13950	10-yr	182.00	1007.91	1009.68	1010.10	1011.04	0.056248	9.35	19.47	21.29	1.72
STONY BROOK CENT	13950	50-yr	336.00	1007.91	1010.25	1010.76	1011.83	0.039994	10.08	33.73	27.99	1.54
STONY BROOK CENT	13950	100-yr	417.00	1007.91	1010.51	1011.10	1012.19	0.033448	10.40	41.59	35.19	1.46
STONY BROOK CENT	13950	500-yr	641.00	1007.91	1011.12	1011.74	1012.95	0.024904	11.12	76.32	74.42	1.33
STONY BROOK CENT	13900	Bankfull	189.00	1007.05	1008.66	1008.70	1009.24	0.020847	6.14	30.79	31.08	1.08
STONY BROOK CENT	13900	2-yr	73.00	1007.05	1008.11	1008.11	1008.44	0.021194	4.62	15.79	24.25	1.01
STONY BROOK CENT	13900	10-yr	182.00	1007.05	1008.64	1008.67	1009.20	0.020636	6.04	30.17	30.82	1.07
STONY BROOK CENT	13900	50-yr	336.00	1007.05	1008.96	1009.21	1010.04	0.027371	8.36	40.89	34.90	1.29
STONY BROOK CENT	13900	100-yr	417.00	1007.05	1009.08	1009.46	1010.48	0.031448	9.50	45.13	36.32	1.40
STONY BROOK CENT	13900	500-yr	641.00	1007.05	1009.45	1010.19	1011.48	0.033780	11.49	59.60	41.05	1.51
STONY BROOK CENT	13850	Bankfull	189.00	1004.95	1006.10	1006.50	1007.41	0.071979	9.17	20.60	28.21	1.89
STONY BROOK CENT	13850	2-yr	73.00	1004.95	1005.72	1005.94	1006.48	0.090406	7.01	10.41	25.38	1.93
STONY BROOK CENT	13850	10-yr	182.00	1004.95	1006.08	1006.47	1007.37	0.073248	9.11	19.97	27.98	1.90
STONY BROOK CENT	13850	50-yr	336.00	1004.95	1006.52	1007.02	1008.12	0.054556	10.15	33.12	31.84	1.75
STONY BROOK CENT	13850	100-yr	417.00	1004.95	1006.70	1007.28	1008.48	0.049766	10.71	39.60	39.26	1.71

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	13850	500-yr	641.00	1004.95	1007.07	1007.88	1009.46	0.047486	12.48	56.74	55.10	1.74
STONY BROOK CENT	13800	Bankfull	189.00	1001.68	1003.70	1004.00	1004.70	0.039640	8.05	23.49	24.95	1.46
STONY BROOK CENT	13800	2-yr	73.00	1001.68	1003.14	1003.29	1003.74	0.035792	6.21	11.75	17.01	1.32
STONY BROOK CENT	13800	10-yr	182.00	1001.68	1003.67	1003.97	1004.65	0.039300	7.95	22.90	24.61	1.45
STONY BROOK CENT	13800	50-yr	336.00	1001.68	1004.06	1004.53	1005.62	0.045572	10.02	33.62	30.04	1.63
STONY BROOK CENT	13800	100-yr	417.00	1001.68	1004.22	1004.80	1006.08	0.045801	10.94	38.59	32.01	1.67
STONY BROOK CENT	13800	500-yr	641.00	1001.68	1004.63	1005.57	1007.16	0.044000	12.81	52.68	36.99	1.71
STONY BROOK CENT	13750	Bankfull	189.00	1000.48	1003.35	1002.45	1003.55	0.003176	3.60	52.76	29.00	0.46
STONY BROOK CENT	13750	2-yr	73.00	1000.48	1002.73	1001.73	1002.79	0.001430	2.03	35.99	24.74	0.30
STONY BROOK CENT	13750	10-yr	182.00	1000.48	1003.32	1002.42	1003.52	0.003078	3.52	51.97	28.81	0.45
STONY BROOK CENT	13750	50-yr	336.00	1000.48	1003.45	1003.10	1004.02	0.008593	6.07	55.70	29.68	0.76
STONY BROOK CENT	13750	100-yr	417.00	1000.48	1003.14	1003.38	1004.37	0.021851	8.91	46.87	27.57	1.19
STONY BROOK CENT	13750	500-yr	641.00	1000.48	1003.64	1003.93	1005.37	0.023187	10.58	61.47	32.84	1.27
STONY BROOK CENT	13700	Bankfull	189.00	1000.89	1002.82	1002.82	1003.23	0.015755	5.32	45.62	66.21	0.94
STONY BROOK CENT	13700	2-yr	73.00	1000.89	1002.29	1002.29	1002.59	0.020156	4.42	16.98	32.13	0.98
STONY BROOK CENT	13700	10-yr	182.00	1000.89	1002.79	1002.79	1003.20	0.015863	5.25	44.13	65.53	0.94
STONY BROOK CENT	13700	50-yr	336.00	1000.89	1003.04	1003.04	1003.42	0.014494	5.82	112.13	138.70	0.93
STONY BROOK CENT	13700	100-yr	417.00	1000.89	1003.15	1003.15	1003.60	0.015695	6.42	127.61	140.25	0.98
STONY BROOK CENT	13700	500-yr	641.00	1000.89	1003.43	1003.46	1004.04	0.017393	7.67	167.92	146.52	1.06
STONY BROOK CENT	13650	Bankfull	189.00	997.26	998.67	999.38	1001.26	0.134491	12.92	14.63	19.09	2.60
STONY BROOK CENT	13650	2-yr	73.00	997.26	998.15	998.67	1000.15	0.180276	11.35	6.43	12.71	2.81
STONY BROOK CENT	13650	10-yr	182.00	997.26	998.65	999.34	1001.22	0.136354	12.87	14.14	18.75	2.61
STONY BROOK CENT	13650	50-yr	336.00	997.26	999.19	999.98	1001.73	0.090336	12.77	26.32	25.90	2.23
STONY BROOK CENT	13650	100-yr	417.00	997.26	999.43	1000.17	1001.94	0.070772	12.72	33.96	37.90	2.03
STONY BROOK CENT	13650	500-yr	641.00	997.26	999.95	1000.75	1002.47	0.048802	13.04	62.45	63.74	1.78
STONY BROOK CENT	13600	Bankfull	189.00	995.36	997.02	997.22	997.84	0.032049	7.29	25.94	27.36	1.32
STONY BROOK CENT	13600	2-yr	73.00	995.36	996.53	996.60	996.96	0.025946	5.28	13.82	20.19	1.12
STONY BROOK CENT	13600	10-yr	182.00	995.36	997.00	997.19	997.80	0.031824	7.19	25.32	27.11	1.31
STONY BROOK CENT	13600	50-yr	336.00	995.36	997.39	997.76	998.70	0.034931	9.20	36.88	32.68	1.44
STONY BROOK CENT	13600	100-yr	417.00	995.36	997.53	998.08	999.16	0.037590	10.25	41.79	36.53	1.52
STONY BROOK CENT	13600	500-yr	641.00	995.36	997.90	998.68	1000.21	0.039475	12.29	59.79	64.02	1.62
STONY BROOK CENT	13550	Bankfull	189.00	992.57	994.15	994.61	995.65	0.059258	9.82	19.24	20.41	1.78
STONY BROOK CENT	13550	2-yr	73.00	992.57	993.52	993.89	994.71	0.087510	8.75	8.35	14.15	2.01
STONY BROOK CENT	13550	10-yr	182.00	992.57	994.12	994.58	995.60	0.059914	9.76	18.64	20.11	1.79
STONY BROOK CENT	13550	50-yr	336.00	992.57	994.65	995.27	996.55	0.050720	11.09	30.30	24.46	1.73
STONY BROOK CENT	13550	100-yr	417.00	992.57	994.85	995.58	997.01	0.047258	11.80	36.49	33.43	1.71
STONY BROOK CENT	13550	500-yr	641.00	992.57	995.32	996.24	998.09	0.043066	13.52	54.74	44.39	1.71
STONY BROOK CENT	13500	Bankfull	189.00	991.10	993.27	993.08	993.67	0.010644	5.08	37.41	31.62	0.80
STONY BROOK CENT	13500	2-yr	73.00	991.10	992.57	992.41	992.81	0.011541	3.96	18.45	22.57	0.77
STONY BROOK CENT	13500	10-yr	182.00	991.10	993.24	993.05	993.63	0.010640	5.00	36.53	31.25	0.79
STONY BROOK CENT	13500	50-yr	336.00	991.10	993.34	993.61	994.48	0.028133	8.56	39.64	32.56	1.31
STONY BROOK CENT	13500	100-yr	417.00	991.10	993.49	993.89	994.91	0.030631	9.57	44.51	34.92	1.39
STONY BROOK CENT	13500	500-yr	641.00	991.10	993.84	994.56	995.97	0.034977	11.78	59.74	50.22	1.54
STONY BROOK CENT	13450	Bankfull	189.00	990.23	992.37	992.37	992.98	0.017714	6.24	30.39	28.85	1.01
STONY BROOK CENT	13450	2-yr	73.00	990.23	991.66	991.66	992.06	0.019804	5.07	14.39	18.07	1.00
STONY BROOK CENT	13450	10-yr	182.00	990.23	992.34	992.34	992.93	0.018082	6.18	29.46	26.46	1.02
STONY BROOK CENT	13450	50-yr	336.00	990.23	993.01	993.01	993.73	0.012372	6.95	61.23	67.05	0.91
STONY BROOK CENT	13450	100-yr	417.00	990.23	993.28	993.28	994.05	0.011310	7.28	81.35	83.08	0.89
STONY BROOK CENT	13450	500-yr	641.00	990.23	993.82	993.89	994.72	0.010551	8.20	134.36	112.93	0.89
STONY BROOK CENT	13400	Bankfull	189.00	987.06	988.48	989.07	990.82	0.156118	12.27	15.40	24.35	2.72
STONY BROOK CENT	13400	2-yr	73.00	987.06	988.03	988.51	989.73	0.162153	10.45	6.99	14.45	2.65
STONY BROOK CENT	13400	10-yr	182.00	987.06	988.46	989.03	990.76	0.152636	12.16	14.97	23.59	2.69
STONY BROOK CENT	13400	50-yr	336.00	987.06	988.77	989.54	991.94	0.168619	14.30	23.49	31.32	2.91
STONY BROOK CENT	13400	100-yr	417.00	987.06	988.90	989.76	992.37	0.154873	14.94	27.92	32.70	2.85
STONY BROOK CENT	13400	500-yr	641.00	987.06	989.28	990.30	993.18	0.112633	15.85	40.71	35.84	2.56
STONY BROOK CENT	13350	Bankfull	189.00	983.77	985.25	985.68	986.62	0.046912	9.37	20.17	19.09	1.61
STONY BROOK CENT	13350	2-yr	73.00	983.77	984.72	984.92	985.44	0.047376	6.83	10.68	16.50	1.50
STONY BROOK CENT	13350	10-yr	182.00	983.77	985.22	985.64	986.56	0.047464	9.29	19.58	18.95	1.61
STONY BROOK CENT	13350	50-yr	336.00	983.77	985.75	986.32	987.64	0.045089	11.01	30.55	22.96	1.65
STONY BROOK CENT	13350	100-yr	417.00	983.77	985.94	986.63	988.18	0.045295	12.02	35.07	24.81	1.69
STONY BROOK CENT	13350	500-yr	641.00	983.77	986.39	987.37	989.53	0.045663	14.27	47.52	30.02	1.76
STONY BROOK CENT	13300	Bankfull	189.00	980.35	982.14	982.71	983.94	0.059831	10.75	17.58	16.16	1.82
STONY BROOK CENT	13300	2-yr	73.00	980.35	981.52	981.87	982.63	0.066131	8.44	8.65	12.42	1.78
STONY BROOK CENT	13300	10-yr	182.00	980.35	982.11	982.67	983.87	0.059832	10.63	17.12	16.01	1.81
STONY BROOK CENT	13300	50-yr	336.00	980.35	982.67	983.44	985.01	0.059623	12.29	27.41	21.63	1.88
STONY BROOK CENT	13300	100-yr	417.00	980.35	982.87	983.73	985.57	0.059002	13.19	32.05	23.92	1.90
STONY BROOK CENT	13300	500-yr	641.00	980.35	983.31	984.38	986.94	0.057237	15.39	46.92	41.83	1.95
STONY BROOK CENT	13250	Bankfull	189.00	977.20	979.16	979.77	981.13	0.052169	11.26	16.79	12.60	1.72
STONY BROOK CENT	13250	2-yr	73.00	977.20	978.42	978.78	979.59	0.055982	8.65	8.44	10.14	1.67
STONY BROOK CENT	13250	10-yr	182.00	977.20	979.12	979.72	981.05	0.052384	11.15	16.32	12.47	1.72
STONY BROOK CENT	13250	50-yr	336.00	977.20	979.85	980.62	982.39	0.045891	12.78	26.31	14.87	1.68
STONY BROOK CENT	13250	100-yr	417.00	977.20	980.15	980.99	983.01	0.044287	13.58	30.86	15.80	1.68

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	13250	500-yr	641.00	977.20	980.83	981.95	984.55	0.039880	15.51	42.42	18.08	1.67
STONY BROOK CENT	13200	Bankfull	189.00	974.28	976.46	977.08	978.38	0.057215	11.10	17.03	14.20	1.79
STONY BROOK CENT	13200	2-yr	73.00	974.28	975.77	976.12	976.88	0.051763	8.44	8.65	10.13	1.61
STONY BROOK CENT	13200	10-yr	182.00	974.28	976.43	977.04	978.30	0.056922	10.98	16.58	14.00	1.78
STONY BROOK CENT	13200	50-yr	336.00	974.28	976.99	977.80	979.70	0.063027	13.19	25.47	17.62	1.93
STONY BROOK CENT	13200	100-yr	417.00	974.28	977.21	978.15	980.33	0.064492	14.18	29.43	19.02	1.99
STONY BROOK CENT	13200	500-yr	641.00	974.28	977.68	978.98	981.99	0.065035	16.66	39.15	22.01	2.07
STONY BROOK CENT	13150	Bankfull	189.00	973.30	976.04	976.04	976.83	0.016817	7.13	26.49	17.11	1.01
STONY BROOK CENT	13150	2-yr	73.00	973.30	975.08	975.08	975.61	0.019224	5.85	12.49	12.03	1.01
STONY BROOK CENT	13150	10-yr	182.00	973.30	976.00	976.00	976.77	0.016902	7.06	25.78	16.89	1.01
STONY BROOK CENT	13150	50-yr	336.00	973.30	976.78	976.78	977.91	0.014430	8.56	40.59	21.02	1.00
STONY BROOK CENT	13150	100-yr	417.00	973.30	977.04	977.16	978.43	0.015377	9.50	46.30	22.43	1.05
STONY BROOK CENT	13150	500-yr	641.00	973.30	977.58	978.05	979.76	0.018867	11.96	59.16	25.38	1.20
STONY BROOK CENT	13100	Bankfull	189.00	970.79	975.27	973.64	975.42	0.001663	3.04	62.32	26.58	0.34
STONY BROOK CENT	13100	2-yr	73.00	970.79	973.93	972.67	974.01	0.001554	2.29	31.88	18.83	0.31
STONY BROOK CENT	13100	10-yr	182.00	970.79	975.21	973.58	975.35	0.001685	3.01	60.63	26.20	0.34
STONY BROOK CENT	13100	50-yr	336.00	970.79	976.47	974.45	976.67	0.001390	3.62	98.21	33.59	0.33
STONY BROOK CENT	13100	100-yr	417.00	970.79	977.04	974.79	977.27	0.001304	3.86	118.31	37.08	0.33
STONY BROOK CENT	13100	500-yr	641.00	970.79	978.34	975.53	978.63	0.001209	4.44	175.17	62.31	0.33
STONY BROOK CENT	13050	Bankfull	189.00	971.10	974.24	974.24	975.15	0.016364	7.67	24.76	14.45	1.00
STONY BROOK CENT	13050	2-yr	73.00	971.10	973.18	973.18	973.77	0.019349	6.17	11.83	10.21	1.01
STONY BROOK CENT	13050	10-yr	182.00	971.10	974.19	974.19	975.08	0.016555	7.58	24.08	14.24	1.00
STONY BROOK CENT	13050	50-yr	336.00	971.10	975.12	975.12	976.40	0.013659	9.11	39.30	18.34	0.97
STONY BROOK CENT	13050	100-yr	417.00	971.10	975.53	975.53	976.99	0.013072	9.78	47.17	20.90	0.97
STONY BROOK CENT	13050	500-yr	641.00	971.10	976.63	976.63	978.35	0.010655	10.79	75.41	33.75	0.92
STONY BROOK CENT	13000	Bankfull	189.00	967.58	968.79	969.78	972.91	0.174494	16.30	11.60	12.66	3.00
STONY BROOK CENT	13000	2-yr	73.00	967.58	968.26	968.88	971.15	0.272355	13.65	5.35	10.85	3.43
STONY BROOK CENT	13000	10-yr	182.00	967.58	968.76	969.74	972.82	0.176940	16.17	11.25	12.57	3.01
STONY BROOK CENT	13000	50-yr	336.00	967.58	969.30	970.59	974.43	0.141104	18.18	18.49	14.40	2.83
STONY BROOK CENT	13000	100-yr	417.00	967.58	969.54	970.95	975.08	0.130524	18.88	22.08	15.24	2.76
STONY BROOK CENT	13000	500-yr	641.00	967.58	970.12	971.85	976.63	0.111437	20.48	31.29	16.67	2.63
STONY BROOK CENT	12950	Bankfull	189.00	967.42	969.90	969.91	970.71	0.017031	7.19	26.32	17.14	1.01
STONY BROOK CENT	12950	2-yr	73.00	967.42	969.02	969.02	969.52	0.019495	5.68	12.85	13.13	1.01
STONY BROOK CENT	12950	10-yr	182.00	967.42	969.86	969.87	970.65	0.017163	7.10	25.63	17.00	1.01
STONY BROOK CENT	12950	50-yr	336.00	967.42	970.68	970.68	971.79	0.014764	8.44	40.54	19.49	0.99
STONY BROOK CENT	12950	100-yr	417.00	967.42	971.04	971.04	972.29	0.014310	9.01	47.68	20.61	0.99
STONY BROOK CENT	12950	500-yr	641.00	967.42	971.71	971.90	973.52	0.016151	10.86	62.27	22.89	1.08
STONY BROOK CENT	12900	Bankfull	189.00	965.27	966.58	967.26	968.91	0.088273	12.24	15.44	15.64	2.17
STONY BROOK CENT	12900	2-yr	73.00	965.27	966.04	966.46	967.47	0.113780	9.58	7.62	13.70	2.26
STONY BROOK CENT	12900	10-yr	182.00	965.27	966.55	967.22	968.84	0.089177	12.14	15.00	15.53	2.18
STONY BROOK CENT	12900	50-yr	336.00	965.27	967.09	967.98	970.16	0.076866	14.07	23.88	17.60	2.12
STONY BROOK CENT	12900	100-yr	417.00	965.27	967.33	968.32	970.73	0.070694	14.80	28.25	18.41	2.08
STONY BROOK CENT	12900	500-yr	641.00	965.27	967.97	969.17	971.96	0.053021	16.06	40.90	21.02	1.91
STONY BROOK CENT	12850	Bankfull	189.00	964.17	966.22	966.22	966.86	0.017574	6.46	29.27	23.87	1.01
STONY BROOK CENT	12850	2-yr	73.00	964.17	965.49	965.49	965.90	0.020097	5.13	14.23	17.68	1.01
STONY BROOK CENT	12850	10-yr	182.00	964.17	966.18	966.18	966.82	0.017733	6.38	28.52	23.61	1.01
STONY BROOK CENT	12850	50-yr	336.00	964.17	966.64	966.83	967.78	0.020873	8.56	40.23	27.27	1.16
STONY BROOK CENT	12850	100-yr	417.00	964.17	966.81	967.12	968.25	0.023479	9.66	44.84	28.54	1.25
STONY BROOK CENT	12850	500-yr	641.00	964.17	967.17	967.94	969.51	0.030122	12.33	55.75	31.26	1.46
STONY BROOK CENT	12800	Bankfull	189.00	962.89	964.57	964.85	965.65	0.032492	8.36	22.62	19.38	1.36
STONY BROOK CENT	12800	2-yr	73.00	962.89	963.92	964.08	964.57	0.035408	6.44	11.34	15.44	1.32
STONY BROOK CENT	12800	10-yr	182.00	962.89	964.54	964.81	965.60	0.032564	8.27	22.01	19.19	1.36
STONY BROOK CENT	12800	50-yr	336.00	962.89	965.18	965.51	966.60	0.026036	9.55	35.61	23.14	1.30
STONY BROOK CENT	12800	100-yr	417.00	962.89	965.46	965.83	967.05	0.023863	10.13	42.39	25.15	1.27
STONY BROOK CENT	12800	500-yr	641.00	962.89	966.11	966.65	968.17	0.021456	11.61	60.41	30.84	1.27
STONY BROOK CENT	12750	Bankfull	189.00	958.95	960.44	961.20	962.97	0.090413	12.75	14.82	14.36	2.21
STONY BROOK CENT	12750	2-yr	73.00	958.95	959.82	960.32	961.53	0.115098	10.48	6.97	10.98	2.32
STONY BROOK CENT	12750	10-yr	182.00	958.95	960.41	961.15	962.90	0.091438	12.66	14.37	14.20	2.22
STONY BROOK CENT	12750	50-yr	336.00	958.95	960.96	961.92	964.27	0.083116	14.60	23.02	16.99	2.21
STONY BROOK CENT	12750	100-yr	417.00	958.95	961.20	962.25	964.84	0.080727	15.31	27.23	18.27	2.21
STONY BROOK CENT	12750	500-yr	641.00	958.95	961.76	963.13	966.18	0.068551	16.86	38.35	21.78	2.13
STONY BROOK CENT	12700	Bankfull	189.00	957.09	958.36	958.64	959.31	0.047331	7.81	24.20	30.94	1.56
STONY BROOK CENT	12700	2-yr	73.00	957.09	958.02	958.11	958.42	0.031481	5.09	14.33	25.65	1.20
STONY BROOK CENT	12700	10-yr	182.00	957.09	958.35	958.61	959.26	0.046485	7.66	23.75	30.81	1.54
STONY BROOK CENT	12700	50-yr	336.00	957.09	958.63	959.11	960.27	0.059690	10.30	32.64	33.13	1.82
STONY BROOK CENT	12700	100-yr	417.00	957.09	958.74	959.35	960.77	0.064086	11.43	36.58	34.28	1.92
STONY BROOK CENT	12700	500-yr	641.00	957.09	958.99	959.92	962.18	0.077178	14.35	45.35	36.67	2.17
STONY BROOK CENT	12650	Bankfull	189.00	955.78	957.42	957.42	957.83	0.019252	5.16	36.64	44.56	1.00
STONY BROOK CENT	12650	2-yr	73.00	955.78	956.79	956.86	957.17	0.031748	4.94	14.76	27.74	1.19
STONY BROOK CENT	12650	10-yr	182.00	955.78	957.29	957.38	957.81	0.024876	5.79	31.43	38.68	1.13
STONY BROOK CENT	12650	50-yr	336.00	955.78	957.79	957.82	958.37	0.019610	6.12	55.19	53.38	1.05
STONY BROOK CENT	12650	100-yr	417.00	955.78	957.91	958.00	958.63	0.022067	6.81	61.61	55.79	1.13

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	12650	500-yr	641.00	955.78	958.15	958.43	959.28	0.030096	8.54	76.01	62.60	1.34
STONY BROOK CENT	12600	Bankfull	189.00	954.16	955.67	955.89	956.59	0.030212	7.67	24.64	22.91	1.30
STONY BROOK CENT	12600	2-yr	73.00	954.16	955.10	955.21	955.61	0.030300	5.72	12.77	18.57	1.21
STONY BROOK CENT	12600	10-yr	182.00	954.16	955.70	955.86	956.51	0.026167	7.22	25.22	23.06	1.22
STONY BROOK CENT	12600	50-yr	336.00	954.16	956.35	956.46	957.37	0.018929	8.09	43.48	33.81	1.11
STONY BROOK CENT	12600	100-yr	417.00	954.16	956.73	956.84	957.72	0.014328	8.07	59.60	51.20	1.00
STONY BROOK CENT	12600	500-yr	641.00	954.16	957.47	957.47	958.54	0.010877	8.63	99.59	57.21	0.91
STONY BROOK CENT	12550	Bankfull	189.00	953.08	954.43	954.51	954.89	0.032212	5.49	34.40	56.00	1.24
STONY BROOK CENT	12550	2-yr	73.00	953.08	953.99	953.99	954.29	0.021805	4.40	16.58	28.06	1.01
STONY BROOK CENT	12550	10-yr	182.00	953.08	954.37	954.49	954.89	0.036242	5.78	31.50	51.95	1.31
STONY BROOK CENT	12550	50-yr	336.00	953.08	954.50	954.86	955.69	0.072340	8.76	38.38	57.38	1.88
STONY BROOK CENT	12550	100-yr	417.00	953.08	954.53	955.01	956.18	0.093438	10.30	40.52	58.10	2.16
STONY BROOK CENT	12550	500-yr	641.00	953.08	954.72	955.40	957.17	0.102389	12.57	51.54	62.43	2.34
STONY BROOK CENT	12500	Bankfull	189.00	950.84	952.36	952.56	953.15	0.036085	7.16	26.40	31.38	1.38
STONY BROOK CENT	12500	2-yr	73.00	950.84	951.78	952.00	952.49	0.066923	6.76	10.80	22.25	1.71
STONY BROOK CENT	12500	10-yr	182.00	950.84	952.35	952.54	953.10	0.034379	6.96	26.15	31.27	1.34
STONY BROOK CENT	12500	50-yr	336.00	950.84	952.90	953.03	953.77	0.021880	7.49	45.70	38.80	1.15
STONY BROOK CENT	12500	100-yr	417.00	950.84	953.11	953.26	954.10	0.020336	7.98	54.18	41.27	1.14
STONY BROOK CENT	12500	500-yr	641.00	950.84	953.56	953.85	954.92	0.020112	9.42	73.57	46.05	1.18
STONY BROOK CENT	12450	Bankfull	189.00	949.28	950.90	950.99	951.40	0.030827	5.68	33.29	49.72	1.22
STONY BROOK CENT	12450	2-yr	73.00	949.28	950.42	950.43	950.73	0.022061	4.49	16.27	26.85	1.02
STONY BROOK CENT	12450	10-yr	182.00	949.28	950.87	950.97	951.37	0.032010	5.67	32.12	49.47	1.24
STONY BROOK CENT	12450	50-yr	336.00	949.28	951.03	951.34	952.13	0.053807	8.39	40.07	51.17	1.66
STONY BROOK CENT	12450	100-yr	417.00	949.28	951.13	951.51	952.47	0.056767	9.28	45.05	52.24	1.74
STONY BROOK CENT	12450	500-yr	641.00	949.28	951.39	951.95	953.27	0.057123	11.04	58.87	54.81	1.82
STONY BROOK CENT	12400	Bankfull	237.00	946.58	948.35	948.65	949.44	0.045434	8.37	28.30	31.49	1.56
STONY BROOK CENT	12400	2-yr	95.00	946.58	947.68	948.06	948.76	0.068044	8.30	11.44	17.43	1.81
STONY BROOK CENT	12400	10-yr	240.00	946.58	948.37	948.67	949.43	0.043040	8.26	29.07	31.73	1.52
STONY BROOK CENT	12400	50-yr	441.00	946.58	948.95	949.27	950.26	0.028889	9.18	48.98	36.67	1.34
STONY BROOK CENT	12400	100-yr	546.00	946.58	949.19	949.55	950.66	0.026761	9.76	57.81	38.59	1.32
STONY BROOK CENT	12400	500-yr	840.00	946.58	949.77	950.23	951.64	0.023137	11.06	81.74	43.53	1.29
STONY BROOK CENT	12350	Bankfull	237.00	945.68	947.49	947.49	947.98	0.018937	5.60	42.44	46.07	1.01
STONY BROOK CENT	12350	2-yr	95.00	945.68	946.97	946.97	947.28	0.022376	4.49	21.14	35.28	1.02
STONY BROOK CENT	12350	10-yr	240.00	945.68	947.40	947.50	948.00	0.025599	6.22	38.64	44.46	1.17
STONY BROOK CENT	12350	50-yr	441.00	945.68	947.82	948.00	948.70	0.028327	7.52	59.57	57.77	1.27
STONY BROOK CENT	12350	100-yr	546.00	945.68	947.91	948.19	949.06	0.033930	8.64	64.39	58.38	1.41
STONY BROOK CENT	12350	500-yr	840.00	945.68	948.12	948.65	950.06	0.045521	11.20	77.15	60.04	1.68
STONY BROOK CENT	12300	Bankfull	237.00	943.83	945.46	945.79	946.52	0.044940	8.24	28.75	32.50	1.54
STONY BROOK CENT	12300	2-yr	95.00	943.83	944.86	945.12	945.66	0.048073	7.20	13.19	19.21	1.53
STONY BROOK CENT	12300	10-yr	240.00	943.83	945.54	945.80	946.45	0.036814	7.67	31.31	34.31	1.41
STONY BROOK CENT	12300	50-yr	441.00	943.83	946.08	946.46	947.17	0.032106	8.38	53.77	49.29	1.37
STONY BROOK CENT	12300	100-yr	546.00	943.83	946.39	946.62	947.33	0.032875	7.80	72.42	74.26	1.35
STONY BROOK CENT	12300	500-yr	840.00	943.83	946.71	947.02	947.99	0.031632	9.15	96.27	76.81	1.39
STONY BROOK CENT	12250	Bankfull	237.00	941.88	944.02	943.68	944.27	0.007720	4.03	59.74	55.70	0.67
STONY BROOK CENT	12250	2-yr	95.00	941.88	943.02	943.13	943.49	0.036073	5.50	17.29	30.42	1.28
STONY BROOK CENT	12250	10-yr	240.00	941.88	944.04	943.69	944.29	0.007615	4.01	60.80	56.50	0.66
STONY BROOK CENT	12250	50-yr	441.00	941.88	945.00	944.24	945.21	0.003191	3.69	126.50	72.18	0.47
STONY BROOK CENT	12250	100-yr	546.00	941.88	945.46	944.43	945.66	0.002385	3.67	160.01	74.99	0.42
STONY BROOK CENT	12250	500-yr	840.00	941.88	946.55	944.86	946.77	0.001566	3.83	245.57	81.75	0.36
STONY BROOK CENT	12200	Bankfull	237.00	940.20	942.88	942.88	943.68	0.016259	7.16	33.60	23.54	1.00
STONY BROOK CENT	12200	2-yr	95.00	940.20	942.04	942.04	942.54	0.019301	5.71	16.63	16.88	1.01
STONY BROOK CENT	12200	10-yr	240.00	940.20	942.90	942.90	943.69	0.016197	7.18	33.94	23.64	1.00
STONY BROOK CENT	12200	50-yr	441.00	940.20	943.73	943.73	944.83	0.013381	8.50	56.51	30.95	0.97
STONY BROOK CENT	12200	100-yr	546.00	940.20	944.10	944.10	945.33	0.012428	9.02	68.52	35.53	0.96
STONY BROOK CENT	12200	500-yr	840.00	940.20	945.02	945.02	946.48	0.010363	10.00	109.41	49.85	0.92
STONY BROOK CENT	12150	Bankfull	237.00	938.36	939.85	940.49	942.03	0.077244	11.83	20.04	19.60	2.06
STONY BROOK CENT	12150	2-yr	95.00	938.36	939.31	939.71	940.65	0.090484	9.31	10.21	16.22	2.07
STONY BROOK CENT	12150	10-yr	240.00	938.36	939.86	940.50	942.05	0.077058	11.86	20.23	19.65	2.06
STONY BROOK CENT	12150	50-yr	441.00	938.36	940.42	941.31	943.39	0.063104	13.83	32.13	22.80	1.98
STONY BROOK CENT	12150	100-yr	546.00	938.36	940.69	941.67	943.97	0.056606	14.57	38.28	24.26	1.93
STONY BROOK CENT	12150	500-yr	840.00	938.36	941.38	942.57	945.30	0.043964	15.99	56.32	28.06	1.80
STONY BROOK CENT	12100	Bankfull	237.00	937.99	939.74	939.74	940.42	0.016567	6.65	35.91	27.66	1.00
STONY BROOK CENT	12100	2-yr	95.00	937.99	939.07	939.07	939.47	0.019947	5.09	18.67	23.68	1.01
STONY BROOK CENT	12100	10-yr	240.00	937.99	939.75	939.75	940.44	0.016501	6.67	36.26	27.74	1.00
STONY BROOK CENT	12100	50-yr	441.00	937.99	940.41	940.45	941.44	0.015235	8.17	55.97	31.90	1.02
STONY BROOK CENT	12100	100-yr	546.00	937.99	940.57	940.76	941.92	0.018173	9.37	60.92	32.88	1.13
STONY BROOK CENT	12100	500-yr	840.00	937.99	940.96	941.54	943.21	0.024160	12.10	74.45	35.52	1.34
STONY BROOK CENT	12050	Bankfull	237.00	936.49	937.90	938.24	939.07	0.046456	8.71	27.20	29.06	1.59
STONY BROOK CENT	12050	2-yr	95.00	936.49	937.44	937.61	938.06	0.041491	6.29	15.11	24.24	1.40
STONY BROOK CENT	12050	10-yr	240.00	936.49	937.90	938.25	939.09	0.046574	8.75	27.42	29.14	1.59
STONY BROOK CENT	12050	50-yr	441.00	936.49	938.34	938.88	940.14	0.046269	10.75	41.23	33.95	1.67
STONY BROOK CENT	12050	100-yr	546.00	936.49	938.57	939.16	940.55	0.041140	11.29	49.29	37.23	1.62

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	12050	500-yr	840.00	936.49	939.05	939.87	941.67	0.038035	13.06	69.39	46.20	1.63
STONY BROOK CENT	12000	Bankfull	237.00	934.98	936.76	936.83	937.42	0.020993	6.56	36.58	36.66	1.10
STONY BROOK CENT	12000	2-yr	95.00	934.98	936.20	936.21	936.58	0.020442	4.94	19.25	26.10	1.01
STONY BROOK CENT	12000	10-yr	240.00	934.98	936.77	936.84	937.44	0.021018	6.59	36.87	36.77	1.10
STONY BROOK CENT	12000	50-yr	441.00	934.98	937.20	937.43	938.35	0.023249	8.64	54.11	42.15	1.22
STONY BROOK CENT	12000	100-yr	546.00	934.98	937.36	937.72	938.79	0.025378	9.65	61.09	43.97	1.30
STONY BROOK CENT	12000	500-yr	840.00	934.98	937.78	938.48	939.88	0.028149	11.76	81.48	55.90	1.42
STONY BROOK CENT	11950	Bankfull	237.00	932.78	934.24	934.66	935.68	0.060978	9.64	24.59	27.46	1.79
STONY BROOK CENT	11950	2-yr	95.00	932.78	933.76	934.04	934.69	0.083422	7.73	12.29	24.29	1.92
STONY BROOK CENT	11950	10-yr	240.00	932.78	934.24	934.67	935.69	0.060671	9.66	24.83	27.51	1.79
STONY BROOK CENT	11950	50-yr	441.00	932.78	934.76	935.33	936.69	0.045572	11.14	39.90	30.45	1.67
STONY BROOK CENT	11950	100-yr	546.00	932.78	935.01	935.63	937.13	0.040620	11.71	47.49	31.88	1.62
STONY BROOK CENT	11950	500-yr	840.00	932.78	935.59	936.43	938.27	0.034230	13.19	67.25	36.58	1.56
STONY BROOK CENT	11900	Bankfull	237.00	930.73	932.01	932.30	933.04	0.042005	8.15	29.07	31.84	1.50
STONY BROOK CENT	11900	2-yr	95.00	930.73	931.62	931.71	932.09	0.032622	5.48	17.32	28.52	1.24
STONY BROOK CENT	11900	10-yr	240.00	930.73	932.02	932.31	933.06	0.042169	8.19	29.29	31.91	1.51
STONY BROOK CENT	11900	50-yr	441.00	930.73	932.34	932.91	934.23	0.052710	11.04	40.28	35.65	1.77
STONY BROOK CENT	11900	100-yr	546.00	930.73	932.49	933.20	934.78	0.054546	12.14	45.76	36.93	1.83
STONY BROOK CENT	11900	500-yr	840.00	930.73	932.89	933.85	936.08	0.054420	14.39	61.75	45.26	1.91
STONY BROOK CENT	11850	Bankfull	237.00	928.05	929.94	930.25	931.13	0.034488	8.76	27.05	22.98	1.41
STONY BROOK CENT	11850	2-yr	95.00	928.05	929.22	929.49	930.10	0.047369	7.51	12.65	17.02	1.53
STONY BROOK CENT	11850	10-yr	240.00	928.05	929.95	930.27	931.15	0.034364	8.79	27.32	23.08	1.41
STONY BROOK CENT	11850	50-yr	441.00	928.05	930.58	931.03	932.29	0.028602	10.50	43.42	28.33	1.38
STONY BROOK CENT	11850	100-yr	546.00	928.05	930.85	931.37	932.80	0.027454	11.28	51.27	30.58	1.38
STONY BROOK CENT	11850	500-yr	840.00	928.05	931.47	932.23	934.09	0.026085	13.12	72.17	35.87	1.41
STONY BROOK CENT	11800	Bankfull	237.00	922.71	924.15	925.01	927.66	0.164095	15.03	15.77	19.02	2.91
STONY BROOK CENT	11800	2-yr	95.00	922.71	923.67	924.25	925.90	0.169382	11.98	7.93	13.79	2.78
STONY BROOK CENT	11800	10-yr	240.00	922.71	924.16	925.02	927.69	0.163837	15.07	15.92	19.11	2.91
STONY BROOK CENT	11800	50-yr	441.00	922.71	924.61	925.71	929.20	0.153586	17.20	25.64	24.03	2.93
STONY BROOK CENT	11800	100-yr	546.00	922.71	924.80	926.04	929.83	0.145795	17.99	30.38	26.06	2.91
STONY BROOK CENT	11800	500-yr	840.00	922.71	925.25	926.80	931.31	0.121067	19.77	43.23	30.72	2.78
STONY BROOK CENT	11750	Bankfull	237.00	921.66	923.50	923.64	924.29	0.024606	7.13	33.46	32.35	1.19
STONY BROOK CENT	11750	2-yr	95.00	921.66	923.00	923.00	923.38	0.020274	4.99	19.05	25.24	1.01
STONY BROOK CENT	11750	10-yr	240.00	921.66	923.51	923.65	924.31	0.024719	7.18	33.68	32.46	1.19
STONY BROOK CENT	11750	50-yr	441.00	921.66	923.90	924.32	925.35	0.030465	9.72	48.06	41.32	1.39
STONY BROOK CENT	11750	100-yr	546.00	921.66	924.06	924.60	925.85	0.032646	10.79	55.26	45.13	1.47
STONY BROOK CENT	11750	500-yr	840.00	921.66	924.43	925.26	927.14	0.038884	13.42	73.56	53.01	1.65
STONY BROOK CENT	11700	Bankfull	237.00	920.55	922.06	922.25	922.96	0.028502	7.64	31.05	28.56	1.28
STONY BROOK CENT	11700	2-yr	95.00	920.55	921.47	921.60	922.04	0.036068	6.08	15.64	23.76	1.32
STONY BROOK CENT	11700	10-yr	240.00	920.55	922.07	922.27	922.98	0.028385	7.67	31.35	28.64	1.28
STONY BROOK CENT	11700	50-yr	441.00	920.55	922.65	922.93	923.94	0.024461	9.14	49.48	33.29	1.26
STONY BROOK CENT	11700	100-yr	546.00	920.55	922.89	923.23	924.38	0.023483	9.82	57.85	35.73	1.26
STONY BROOK CENT	11700	500-yr	840.00	920.55	923.46	923.97	925.48	0.022570	11.48	80.13	42.93	1.29
STONY BROOK CENT	11650	Bankfull	237.00	919.31	921.46	921.07	921.80	0.006831	4.67	51.38	36.40	0.66
STONY BROOK CENT	11650	2-yr	95.00	919.31	920.79	920.46	920.95	0.006194	3.25	29.24	30.22	0.58
STONY BROOK CENT	11650	10-yr	240.00	919.31	921.47	921.08	921.81	0.006847	4.70	51.77	36.51	0.66
STONY BROOK CENT	11650	50-yr	441.00	919.31	922.08	921.69	922.67	0.007516	6.14	76.23	43.05	0.73
STONY BROOK CENT	11650	100-yr	546.00	919.31	921.59	921.97	923.11	0.027501	9.90	56.32	37.75	1.34
STONY BROOK CENT	11650	500-yr	840.00	919.31	922.07	922.69	924.21	0.028090	11.81	75.42	42.84	1.42
STONY BROOK CENT	11600	Bankfull	237.00	918.53	920.66	920.66	921.26	0.017011	6.19	39.07	37.77	1.00
STONY BROOK CENT	11600	2-yr	95.00	918.53	920.04	920.04	920.41	0.020986	4.89	19.43	27.17	1.02
STONY BROOK CENT	11600	10-yr	240.00	918.53	920.68	920.68	921.27	0.016927	6.21	39.50	38.02	1.00
STONY BROOK CENT	11600	50-yr	441.00	918.53	921.28	921.28	922.13	0.014478	7.48	63.94	43.11	0.98
STONY BROOK CENT	11600	100-yr	546.00	918.53	921.56	921.56	922.51	0.013466	7.95	76.32	45.20	0.97
STONY BROOK CENT	11600	500-yr	840.00	918.53	922.21	922.21	923.46	0.012399	9.15	107.21	49.70	0.98
STONY BROOK CENT	11550	Bankfull	237.00	917.66	918.83	919.13	919.84	0.054038	8.03	29.52	40.12	1.65
STONY BROOK CENT	11550	2-yr	95.00	917.66	918.51	918.63	918.98	0.042562	5.49	17.29	34.73	1.37
STONY BROOK CENT	11550	10-yr	240.00	917.66	918.84	919.13	919.85	0.054302	8.07	29.73	40.19	1.65
STONY BROOK CENT	11550	50-yr	441.00	917.66	919.16	919.64	920.78	0.056087	10.20	43.40	44.16	1.78
STONY BROOK CENT	11550	100-yr	546.00	917.66	919.31	919.87	921.21	0.055487	11.07	49.86	45.86	1.80
STONY BROOK CENT	11550	500-yr	840.00	917.66	919.69	920.46	922.22	0.050944	12.80	68.10	50.15	1.81
STONY BROOK CENT	11500	Bankfull	237.00	913.18	914.21	914.74	916.09	0.104301	11.01	21.53	29.75	2.28
STONY BROOK CENT	11500	2-yr	95.00	913.18	913.79	914.16	915.15	0.164046	9.34	10.17	25.26	2.60
STONY BROOK CENT	11500	10-yr	240.00	913.18	914.21	914.75	916.10	0.103691	11.03	21.76	29.82	2.28
STONY BROOK CENT	11500	50-yr	441.00	913.18	914.61	915.34	917.19	0.089154	12.89	34.25	33.89	2.23
STONY BROOK CENT	11500	100-yr	546.00	913.18	914.77	915.61	917.73	0.084441	13.81	39.82	35.50	2.23
STONY BROOK CENT	11500	500-yr	840.00	913.18	915.17	916.27	919.03	0.074800	15.80	54.81	38.49	2.20
STONY BROOK CENT	11450	Bankfull	237.00	910.97	912.75	912.86	913.45	0.025438	6.71	35.38	36.37	1.19
STONY BROOK CENT	11450	2-yr	95.00	910.97	912.31	912.31	912.65	0.021576	4.67	20.33	31.11	1.02
STONY BROOK CENT	11450	10-yr	240.00	910.97	912.76	912.87	913.47	0.025527	6.75	35.61	36.43	1.19
STONY BROOK CENT	11450	50-yr	441.00	910.97	913.13	913.45	914.39	0.029964	9.02	49.71	39.44	1.36
STONY BROOK CENT	11450	100-yr	546.00	910.97	913.28	913.70	914.84	0.032274	10.04	55.78	40.66	1.43

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	11450	500-yr	840.00	910.97	913.64	914.34	916.03	0.037301	12.44	70.89	43.27	1.60
STONY BROOK CENT	11400	Bankfull	237.00	908.00	909.52	910.06	911.34	0.072121	10.82	21.91	23.44	1.97
STONY BROOK CENT	11400	2-yr	95.00	908.00	908.94	909.36	910.40	0.121316	9.69	9.80	18.35	2.34
STONY BROOK CENT	11400	10-yr	240.00	908.00	909.53	910.07	911.35	0.071632	10.84	22.15	23.52	1.97
STONY BROOK CENT	11400	50-yr	441.00	908.00	910.10	910.77	912.35	0.052341	12.04	36.91	28.03	1.79
STONY BROOK CENT	11400	100-yr	546.00	908.00	910.35	911.09	912.82	0.046434	12.64	44.10	30.06	1.74
STONY BROOK CENT	11400	500-yr	840.00	908.00	910.93	911.88	914.04	0.039198	14.22	63.14	34.96	1.68
STONY BROOK CENT	11350	Bankfull	237.00	906.42	908.26	908.41	909.12	0.023952	7.44	31.91	26.98	1.19
STONY BROOK CENT	11350	2-yr	95.00	906.42	907.68	907.68	908.11	0.019542	5.32	17.87	20.80	1.01
STONY BROOK CENT	11350	10-yr	240.00	906.42	908.27	908.42	909.14	0.024029	7.48	32.14	27.07	1.19
STONY BROOK CENT	11350	50-yr	441.00	906.42	908.73	909.13	910.26	0.028159	9.93	45.73	31.86	1.35
STONY BROOK CENT	11350	100-yr	546.00	906.42	908.92	909.44	910.79	0.029970	11.01	51.98	33.85	1.42
STONY BROOK CENT	11350	500-yr	840.00	906.42	909.39	910.22	912.14	0.033167	13.43	68.78	38.64	1.55
STONY BROOK CENT	11300	Bankfull	237.00	905.20	907.21	906.84	907.57	0.007144	4.80	50.00	34.22	0.68
STONY BROOK CENT	11300	2-yr	95.00	905.20	906.07	906.23	906.67	0.045057	6.22	15.26	26.38	1.44
STONY BROOK CENT	11300	10-yr	240.00	905.20	907.23	906.85	907.59	0.007106	4.82	50.49	34.31	0.67
STONY BROOK CENT	11300	50-yr	441.00	905.20	908.08	907.48	908.58	0.005618	5.71	81.54	38.20	0.64
STONY BROOK CENT	11300	100-yr	546.00	905.20	908.48	907.75	909.04	0.005168	6.05	96.96	39.79	0.63
STONY BROOK CENT	11300	500-yr	840.00	905.20	909.47	908.45	910.17	0.004375	6.81	138.59	43.91	0.61
STONY BROOK CENT	11250	Bankfull	237.00	903.93	906.26	906.26	907.01	0.016855	6.93	34.27	24.24	1.01
STONY BROOK CENT	11250	2-yr	95.00	903.93	905.49	905.49	905.95	0.019619	5.46	17.40	19.26	1.01
STONY BROOK CENT	11250	10-yr	240.00	903.93	906.28	906.28	907.03	0.016823	6.95	34.57	24.33	1.01
STONY BROOK CENT	11250	50-yr	441.00	903.93	907.04	907.04	908.10	0.014314	8.30	55.30	29.66	0.99
STONY BROOK CENT	11250	100-yr	546.00	903.93	907.37	907.37	908.58	0.013462	8.86	65.53	31.32	0.99
STONY BROOK CENT	11250	500-yr	840.00	903.93	908.20	908.20	909.75	0.011982	10.11	93.16	35.45	0.98
STONY BROOK CENT	11200	Bankfull	237.00	902.18	903.75	904.26	905.47	0.059896	10.53	22.50	21.70	1.82
STONY BROOK CENT	11200	2-yr	95.00	902.18	903.20	903.52	904.25	0.066674	8.21	11.58	17.72	1.79
STONY BROOK CENT	11200	10-yr	240.00	902.18	903.76	904.27	905.49	0.059816	10.57	22.70	21.76	1.82
STONY BROOK CENT	11200	50-yr	441.00	902.18	904.31	905.03	906.74	0.050789	12.51	35.48	24.71	1.79
STONY BROOK CENT	11200	100-yr	546.00	902.18	904.56	905.39	907.28	0.046262	13.25	41.99	26.06	1.75
STONY BROOK CENT	11200	500-yr	840.00	902.18	905.22	906.25	908.58	0.037983	14.79	60.20	29.53	1.67
STONY BROOK CENT	11150	Bankfull	237.00	898.82	900.57	901.16	902.49	0.058568	11.11	21.34	18.41	1.82
STONY BROOK CENT	11150	2-yr	95.00	898.82	899.96	900.31	901.08	0.059843	8.50	11.18	14.84	1.72
STONY BROOK CENT	11150	10-yr	240.00	898.82	900.58	901.17	902.51	0.058543	11.15	21.53	18.47	1.82
STONY BROOK CENT	11150	50-yr	441.00	898.82	901.14	902.01	903.97	0.058887	13.49	32.71	21.27	1.90
STONY BROOK CENT	11150	100-yr	546.00	898.82	901.37	902.37	904.65	0.057849	14.53	37.78	22.63	1.92
STONY BROOK CENT	11150	500-yr	840.00	898.82	901.97	903.28	906.24	0.054025	16.64	52.21	25.94	1.93
STONY BROOK CENT	11100	Bankfull	237.00	897.82	900.82	900.21	901.19	0.005538	4.92	51.20	33.70	0.60
STONY BROOK CENT	11100	2-yr	95.00	897.82	899.77	899.27	900.00	0.005720	3.83	24.82	18.19	0.58
STONY BROOK CENT	11100	10-yr	240.00	897.82	900.84	900.23	901.22	0.005544	4.95	51.79	37.43	0.61
STONY BROOK CENT	11100	50-yr	441.00	897.82	901.79	901.08	902.30	0.005066	5.91	96.09	54.42	0.61
STONY BROOK CENT	11100	100-yr	546.00	897.82	902.15	901.42	902.73	0.005190	6.38	117.12	65.62	0.62
STONY BROOK CENT	11100	500-yr	840.00	897.82	902.75	902.14	903.65	0.006549	8.02	164.81	94.27	0.72
STONY BROOK CENT	11050	Bankfull	237.00	897.16	899.85	899.85	900.71	0.015770	7.43	32.14	23.23	1.00
STONY BROOK CENT	11050	2-yr	95.00	897.16	898.96	898.96	899.49	0.018878	5.87	16.19	15.53	1.01
STONY BROOK CENT	11050	10-yr	240.00	897.16	899.87	899.87	900.73	0.015675	7.45	32.52	24.07	1.00
STONY BROOK CENT	11050	50-yr	441.00	897.16	900.90	900.90	901.90	0.010181	8.21	71.69	59.83	0.87
STONY BROOK CENT	11050	100-yr	546.00	897.16	901.24	901.24	902.33	0.009878	8.73	93.64	68.88	0.87
STONY BROOK CENT	11050	500-yr	840.00	897.16	902.18	902.18	903.28	0.007717	9.22	180.35	115.91	0.81
STONY BROOK CENT	11000	Bankfull	237.00	894.74	896.30	897.02	898.89	0.105786	12.91	18.35	20.01	2.38
STONY BROOK CENT	11000	2-yr	95.00	894.74	895.78	896.26	897.45	0.118488	10.38	9.16	15.14	2.35
STONY BROOK CENT	11000	10-yr	240.00	894.74	896.31	897.03	898.91	0.105807	12.96	18.52	20.08	2.38
STONY BROOK CENT	11000	50-yr	441.00	894.74	896.77	897.77	900.46	0.103957	15.42	28.60	23.70	2.46
STONY BROOK CENT	11000	100-yr	546.00	894.74	897.00	898.11	900.94	0.090589	15.93	34.44	25.41	2.36
STONY BROOK CENT	11000	500-yr	840.00	894.74	897.61	899.13	902.10	0.064364	17.04	51.33	30.02	2.11
STONY BROOK CENT	10950	Bankfull	237.00	893.82	895.92	895.95	896.62	0.018186	6.70	35.64	29.39	1.04
STONY BROOK CENT	10950	2-yr	95.00	893.82	895.27	895.27	895.68	0.020320	5.13	18.53	23.41	1.02
STONY BROOK CENT	10950	10-yr	240.00	893.82	895.94	895.96	896.63	0.017690	6.67	36.27	29.59	1.03
STONY BROOK CENT	10950	50-yr	441.00	893.82	896.40	896.64	897.66	0.022109	9.05	50.61	33.80	1.21
STONY BROOK CENT	10950	100-yr	546.00	893.82	896.59	896.96	898.15	0.023801	10.06	57.27	35.56	1.27
STONY BROOK CENT	10950	500-yr	840.00	893.82	897.02	897.70	899.42	0.028344	12.55	73.45	39.36	1.44
STONY BROOK CENT	10900	Bankfull	237.00	891.89	893.27	893.76	894.94	0.067697	10.38	22.83	24.76	1.90
STONY BROOK CENT	10900	2-yr	95.00	891.89	892.80	893.10	893.81	0.082889	8.08	11.76	21.76	1.94
STONY BROOK CENT	10900	10-yr	240.00	891.89	893.27	893.77	894.97	0.068623	10.47	22.92	24.78	1.92
STONY BROOK CENT	10900	50-yr	441.00	891.89	893.83	894.47	895.99	0.049528	11.80	37.51	27.57	1.75
STONY BROOK CENT	10900	100-yr	546.00	891.89	894.08	894.79	896.47	0.044235	12.42	44.51	28.81	1.70
STONY BROOK CENT	10900	500-yr	840.00	891.89	894.66	895.63	897.72	0.038176	14.09	62.16	31.77	1.66
STONY BROOK CENT	10850	Bankfull	237.00	890.02	892.09	892.20	892.94	0.021340	7.41	32.03	24.56	1.13
STONY BROOK CENT	10850	2-yr	95.00	890.02	891.60	891.48	891.93	0.013249	4.61	20.59	22.08	0.84
STONY BROOK CENT	10850	10-yr	240.00	890.02	892.10	892.21	892.96	0.021501	7.47	32.21	24.60	1.14
STONY BROOK CENT	10850	50-yr	441.00	890.02	892.63	892.95	894.10	0.024450	9.73	46.07	27.40	1.27
STONY BROOK CENT	10850	100-yr	546.00	890.02	892.85	893.29	894.64	0.025675	10.75	52.15	28.73	1.33

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	10850	500-yr	840.00	890.02	893.39	894.13	895.98	0.027291	12.98	68.68	32.06	1.42
STONY BROOK CENT	10800	Bankfull	237.00	889.63	891.30	891.32	891.86	0.018885	6.01	39.69	40.34	1.03
STONY BROOK CENT	10800	2-yr	95.00	889.63	890.77	890.77	891.10	0.021184	4.63	20.52	31.50	1.01
STONY BROOK CENT	10800	10-yr	240.00	889.63	891.31	891.33	891.87	0.018900	6.05	40.00	40.45	1.03
STONY BROOK CENT	10800	50-yr	441.00	889.63	891.63	891.90	892.74	0.025959	8.47	53.92	45.18	1.27
STONY BROOK CENT	10800	100-yr	546.00	889.63	891.77	892.16	893.16	0.028591	9.49	60.52	48.75	1.35
STONY BROOK CENT	10800	500-yr	840.00	889.63	892.07	892.75	894.30	0.036552	12.08	77.70	60.66	1.58
STONY BROOK CENT	10750	Bankfull	237.00	888.00	889.90	890.06	890.74	0.025701	7.35	32.46	30.69	1.22
STONY BROOK CENT	10750	2-yr	95.00	888.00	889.26	889.38	889.82	0.030589	6.01	15.82	21.52	1.23
STONY BROOK CENT	10750	10-yr	240.00	888.00	889.91	890.07	890.76	0.025557	7.37	32.79	30.87	1.21
STONY BROOK CENT	10750	50-yr	441.00	888.00	890.58	890.71	891.66	0.018034	8.41	58.21	46.98	1.10
STONY BROOK CENT	10750	100-yr	546.00	888.00	890.89	891.11	892.05	0.015876	8.77	76.29	67.25	1.06
STONY BROOK CENT	10750	500-yr	840.00	888.00	891.45	891.81	892.94	0.015649	10.17	121.24	95.66	1.09
STONY BROOK CENT	10700	Bankfull	237.00	886.35	888.00	888.35	888.93	0.053880	7.72	30.70	43.62	1.62
STONY BROOK CENT	10700	2-yr	95.00	886.35	887.56	887.72	888.11	0.037782	5.95	15.97	25.68	1.33
STONY BROOK CENT	10700	10-yr	240.00	886.35	888.02	888.35	888.93	0.056201	7.64	31.42	46.86	1.64
STONY BROOK CENT	10700	50-yr	441.00	886.35	888.24	888.68	889.82	0.101879	10.10	43.75	68.30	2.21
STONY BROOK CENT	10700	100-yr	546.00	886.35	888.31	888.81	890.22	0.133511	11.08	49.43	82.69	2.50
STONY BROOK CENT	10700	500-yr	840.00	886.35	888.50	889.20	891.10	0.132801	12.95	65.52	87.84	2.60
STONY BROOK CENT	10650	Bankfull	245.00	882.95	887.86	885.56	887.94	0.000587	2.31	115.41	43.54	0.22
STONY BROOK CENT	10650	2-yr	100.00	882.95	887.06	884.65	887.08	0.000241	1.24	83.20	36.62	0.13
STONY BROOK CENT	10650	10-yr	252.00	882.95	887.85	885.58	887.94	0.000624	2.38	115.18	43.50	0.23
STONY BROOK CENT	10650	50-yr	462.00	882.95	887.60	886.34	887.94	0.002735	4.73	104.33	41.40	0.47
STONY BROOK CENT	10650	100-yr	573.00	882.95	887.27	886.64	887.93	0.006084	6.56	91.21	38.97	0.68
STONY BROOK CENT	10650	500-yr	879.00	882.95	887.03	887.41	888.90	0.019235	11.00	82.26	36.44	1.20
STONY BROOK CENT	10575		Culvert									
STONY BROOK CENT	10550	Bankfull	245.00	879.06	880.85	880.85	881.55	0.012019	6.70	36.58	26.12	1.00
STONY BROOK CENT	10550	2-yr	100.00	879.06	880.15	880.15	880.57	0.014078	5.17	19.33	23.15	1.00
STONY BROOK CENT	10550	10-yr	252.00	879.06	880.88	880.88	881.59	0.012009	6.76	37.28	26.22	1.00
STONY BROOK CENT	10550	50-yr	462.00	879.06	881.60	881.60	882.62	0.010560	8.07	57.44	29.19	0.99
STONY BROOK CENT	10550	100-yr	573.00	879.06	881.92	881.92	883.09	0.010010	8.65	67.46	34.87	0.99
STONY BROOK CENT	10550	500-yr	879.00	879.06	882.79	882.79	884.18	0.008065	9.55	106.96	51.34	0.94
STONY BROOK CENT	10500	Bankfull	245.00	876.92	878.31	878.88	880.22	0.068909	11.09	22.08	27.83	2.19
STONY BROOK CENT	10500	2-yr	100.00	876.92	877.88	878.25	879.09	0.079556	8.82	11.34	22.48	2.19
STONY BROOK CENT	10500	10-yr	252.00	876.92	878.33	878.91	880.26	0.068455	11.17	22.56	28.01	2.19
STONY BROOK CENT	10500	50-yr	462.00	876.92	878.74	879.53	881.38	0.065134	13.02	35.47	33.66	2.24
STONY BROOK CENT	10500	100-yr	573.00	876.92	878.92	879.81	881.88	0.064002	13.80	41.51	35.60	2.25
STONY BROOK CENT	10500	500-yr	879.00	876.92	879.32	880.49	883.10	0.056176	15.60	58.11	50.08	2.21
STONY BROOK CENT	10450	Bankfull	245.00	875.81	877.11	877.29	877.72	0.028405	6.24	39.25	60.47	1.37
STONY BROOK CENT	10450	2-yr	100.00	875.81	876.82	876.84	877.10	0.018892	4.26	23.50	47.37	1.06
STONY BROOK CENT	10450	10-yr	252.00	875.81	877.12	877.30	877.74	0.028867	6.32	39.84	60.93	1.38
STONY BROOK CENT	10450	50-yr	462.00	875.81	877.37	877.70	878.38	0.039834	8.05	57.38	77.79	1.65
STONY BROOK CENT	10450	100-yr	573.00	875.81	877.46	877.83	878.69	0.045233	8.89	64.54	86.15	1.78
STONY BROOK CENT	10450	500-yr	879.00	875.81	877.62	878.18	879.57	0.063160	11.24	80.39	111.15	2.13
STONY BROOK CENT	10400	Bankfull	245.00	873.35	874.67	874.98	875.70	0.057633	8.18	29.96	51.92	1.90
STONY BROOK CENT	10400	2-yr	100.00	873.35	874.28	874.55	875.20	0.099307	7.71	12.97	37.02	2.29
STONY BROOK CENT	10400	10-yr	252.00	873.35	874.68	875.00	875.72	0.056841	8.20	30.74	52.53	1.89
STONY BROOK CENT	10400	50-yr	462.00	873.35	875.04	875.41	876.29	0.042732	8.96	51.55	62.30	1.73
STONY BROOK CENT	10400	100-yr	573.00	873.35	875.19	875.59	876.56	0.039849	9.39	61.63	73.09	1.71
STONY BROOK CENT	10400	500-yr	879.00	873.35	875.52	876.03	877.24	0.034114	10.55	87.54	83.11	1.66
STONY BROOK CENT	10350	Bankfull	245.00	869.39	870.89	871.33	872.34	0.077581	9.66	25.35	34.05	1.97
STONY BROOK CENT	10350	2-yr	100.00	869.39	870.42	870.77	871.40	0.060062	7.93	12.62	18.80	1.71
STONY BROOK CENT	10350	10-yr	252.00	869.39	870.90	871.35	872.38	0.077654	9.75	25.84	34.27	1.98
STONY BROOK CENT	10350	50-yr	462.00	869.39	871.27	871.88	873.38	0.077712	11.67	39.60	40.15	2.07
STONY BROOK CENT	10350	100-yr	573.00	869.39	871.43	872.13	873.80	0.073878	12.36	46.39	41.89	2.06
STONY BROOK CENT	10350	500-yr	879.00	869.39	871.83	872.73	874.85	0.062971	13.95	63.82	46.13	2.00
STONY BROOK CENT	10300	Bankfull	245.00	867.16	868.22	868.49	869.14	0.048866	7.69	31.85	42.77	1.57
STONY BROOK CENT	10300	2-yr	100.00	867.16	867.86	868.01	868.39	0.054871	5.84	17.13	38.02	1.53
STONY BROOK CENT	10300	10-yr	252.00	867.16	868.24	868.51	869.17	0.049005	7.78	32.40	42.89	1.58
STONY BROOK CENT	10300	50-yr	462.00	867.16	868.57	869.01	870.05	0.051549	9.78	47.25	46.02	1.70
STONY BROOK CENT	10300	100-yr	573.00	867.16	868.71	869.25	870.48	0.054145	10.69	53.59	47.37	1.77
STONY BROOK CENT	10300	500-yr	879.00	867.16	868.99	869.79	871.63	0.061221	13.03	67.64	50.15	1.95
STONY BROOK CENT	10250	Bankfull	245.00	864.70	866.54	866.72	867.45	0.024933	7.66	31.98	25.74	1.21
STONY BROOK CENT	10250	2-yr	100.00	864.70	865.90	866.01	866.45	0.028710	5.99	16.69	21.76	1.21
STONY BROOK CENT	10250	10-yr	252.00	864.70	866.56	866.75	867.49	0.024762	7.71	32.67	25.90	1.21
STONY BROOK CENT	10250	50-yr	462.00	864.70	867.28	867.46	868.49	0.019231	8.83	52.95	31.01	1.14
STONY BROOK CENT	10250	100-yr	573.00	864.70	867.61	867.79	868.94	0.017104	9.29	63.75	34.51	1.10
STONY BROOK CENT	10250	500-yr	879.00	864.70	868.39	868.67	870.03	0.014174	10.36	96.48	50.58	1.06
STONY BROOK CENT	10200	Bankfull	245.00	863.76	865.72	865.73	866.32	0.017551	6.22	39.40	33.60	1.01
STONY BROOK CENT	10200	2-yr	100.00	863.76	865.10	865.10	865.48	0.020731	4.92	20.32	28.00	1.02
STONY BROOK CENT	10200	10-yr	252.00	863.76	865.72	865.76	866.35	0.018226	6.36	39.65	33.66	1.03

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	10200	50-yr	462.00	863.76	866.05	866.39	867.32	0.028413	9.05	51.14	36.48	1.33
STONY BROOK CENT	10200	100-yr	573.00	863.76	866.21	866.66	867.79	0.031508	10.10	57.04	38.15	1.42
STONY BROOK CENT	10200	500-yr	879.00	863.76	866.63	867.22	868.90	0.035007	12.11	74.67	45.24	1.55
STONY BROOK CENT	10150	Bankfull	245.00	861.30	863.05	863.65	864.74	0.058603	10.44	23.48	22.57	1.80
STONY BROOK CENT	10150	2-yr	100.00	861.30	862.38	862.77	863.64	0.071644	9.01	11.10	15.53	1.88
STONY BROOK CENT	10150	10-yr	252.00	861.30	863.08	863.67	864.76	0.057011	10.38	24.29	23.08	1.78
STONY BROOK CENT	10150	50-yr	462.00	861.30	863.73	864.23	865.41	0.051335	10.40	44.44	39.46	1.72
STONY BROOK CENT	10150	100-yr	573.00	861.30	863.92	864.51	865.82	0.048591	11.06	51.97	41.73	1.71
STONY BROOK CENT	10150	500-yr	879.00	861.30	864.33	865.16	866.89	0.045566	12.86	71.21	55.09	1.73
STONY BROOK CENT	10100	Bankfull	245.00	858.89	860.66	861.12	862.02	0.047448	9.36	26.19	25.45	1.63
STONY BROOK CENT	10100	2-yr	100.00	858.89	860.15	860.36	860.87	0.039533	6.81	14.68	20.08	1.40
STONY BROOK CENT	10100	10-yr	252.00	858.89	860.68	861.14	862.07	0.048073	9.45	26.67	25.79	1.64
STONY BROOK CENT	10100	50-yr	462.00	858.89	861.24	861.77	862.99	0.045431	10.61	43.59	35.21	1.65
STONY BROOK CENT	10100	100-yr	573.00	858.89	861.42	862.04	863.47	0.044598	11.50	50.37	38.42	1.67
STONY BROOK CENT	10100	500-yr	879.00	858.89	861.87	862.72	864.65	0.042823	13.45	69.04	44.98	1.71
STONY BROOK CENT	10050	Bankfull	277.00	858.20	860.38	860.16	860.89	0.010333	5.74	48.31	31.55	0.81
STONY BROOK CENT	10050	2-yr	116.00	858.20	859.55	859.46	859.90	0.014194	4.77	24.30	26.22	0.87
STONY BROOK CENT	10050	10-yr	292.00	858.20	860.43	860.21	860.96	0.010314	5.85	50.03	31.91	0.81
STONY BROOK CENT	10050	50-yr	535.00	858.20	860.98	860.95	861.95	0.013496	7.93	68.34	35.39	0.97
STONY BROOK CENT	10050	100-yr	663.00	858.20	861.27	861.27	862.42	0.013411	8.62	78.78	37.25	0.99
STONY BROOK CENT	10050	500-yr	1020.00	858.20	862.04	862.04	863.55	0.012096	9.90	109.94	42.57	0.98
STONY BROOK CENT	10000	Bankfull	277.00	856.84	859.50	859.50	860.22	0.016911	6.79	40.80	28.92	1.01
STONY BROOK CENT	10000	2-yr	116.00	856.84	858.51	858.51	859.07	0.018341	6.01	19.30	17.54	1.01
STONY BROOK CENT	10000	10-yr	292.00	856.84	859.57	859.57	860.29	0.016889	6.84	42.66	29.92	1.01
STONY BROOK CENT	10000	50-yr	535.00	856.84	860.52	860.52	861.14	0.014850	6.46	95.35	81.55	0.95
STONY BROOK CENT	10000	100-yr	663.00	856.84	860.48	860.80	861.50	0.024086	8.23	92.50	80.01	1.21
STONY BROOK CENT	10000	500-yr	1020.00	856.84	860.65	861.22	862.47	0.044969	11.09	106.82	89.20	1.65
STONY BROOK CENT	9950	Bankfull	277.00	855.05	857.15	857.67	858.81	0.046542	10.34	26.80	21.86	1.64
STONY BROOK CENT	9950	2-yr	116.00	855.05	856.46	856.82	857.59	0.051213	8.55	13.57	15.86	1.63
STONY BROOK CENT	9950	10-yr	292.00	855.05	857.21	857.73	858.89	0.045555	10.41	28.05	22.26	1.63
STONY BROOK CENT	9950	50-yr	535.00	855.05	858.01	858.63	859.95	0.032577	11.20	47.93	27.26	1.47
STONY BROOK CENT	9950	100-yr	663.00	855.05	858.54	859.03	860.27	0.022057	10.60	67.52	48.92	1.25
STONY BROOK CENT	9950	500-yr	1020.00	855.05	859.38	859.93	861.21	0.016097	11.20	133.17	111.11	1.12
STONY BROOK CENT	9900	Bankfull	277.00	854.16	856.70	856.70	857.28	0.017698	6.16	44.99	38.97	1.01
STONY BROOK CENT	9900	2-yr	116.00	854.16	855.85	855.85	856.34	0.018814	5.64	20.55	21.24	1.01
STONY BROOK CENT	9900	10-yr	292.00	854.16	856.77	856.77	857.35	0.017407	6.10	47.85	41.51	1.00
STONY BROOK CENT	9900	50-yr	535.00	854.16	857.20	857.46	858.05	0.030359	7.42	72.46	73.19	1.30
STONY BROOK CENT	9900	100-yr	663.00	854.16	857.16	857.66	858.57	0.050389	9.53	69.87	70.71	1.67
STONY BROOK CENT	9900	500-yr	1020.00	854.16	857.36	858.02	859.61	0.083558	12.05	86.00	102.86	2.14
STONY BROOK CENT	9850	Bankfull	277.00	851.76	854.47	854.76	855.48	0.102477	8.06	34.35	74.26	2.09
STONY BROOK CENT	9850	2-yr	116.00	851.76	853.51	853.91	854.81	0.050747	9.14	12.69	13.09	1.64
STONY BROOK CENT	9850	10-yr	292.00	851.76	854.48	854.78	855.54	0.104684	8.26	35.37	74.99	2.12
STONY BROOK CENT	9850	50-yr	535.00	851.76	854.82	855.15	855.94	0.060780	8.50	62.98	85.36	1.74
STONY BROOK CENT	9850	100-yr	663.00	851.76	855.01	855.33	856.10	0.044901	8.37	79.44	89.14	1.55
STONY BROOK CENT	9850	500-yr	1020.00	851.76	855.37	855.72	856.67	0.036776	9.16	112.74	97.91	1.47
STONY BROOK CENT	9800	Bankfull	277.00	850.73	852.61	852.86	853.37	0.021785	6.97	39.72	33.19	1.12
STONY BROOK CENT	9800	2-yr	116.00	850.73	851.68	851.89	852.45	0.038541	7.05	16.46	20.90	1.40
STONY BROOK CENT	9800	10-yr	292.00	850.73	852.69	852.90	853.43	0.021246	6.90	42.32	35.28	1.11
STONY BROOK CENT	9800	50-yr	535.00	850.73	853.30	853.42	854.12	0.022361	7.29	73.45	59.54	1.15
STONY BROOK CENT	9800	100-yr	663.00	850.73	853.45	853.65	854.45	0.024481	8.06	82.54	62.07	1.22
STONY BROOK CENT	9800	500-yr	1020.00	850.73	853.93	854.23	855.19	0.024138	9.00	114.82	74.26	1.25
STONY BROOK CENT	9750	Bankfull	277.00	849.64	851.01	851.26	851.85	0.044684	7.33	37.82	50.99	1.50
STONY BROOK CENT	9750	2-yr	116.00	849.64	850.80	850.80	851.08	0.020629	4.24	27.39	47.08	0.98
STONY BROOK CENT	9750	10-yr	292.00	849.64	851.03	851.28	851.91	0.045668	7.51	38.86	51.27	1.52
STONY BROOK CENT	9750	50-yr	535.00	849.64	851.44	851.80	852.65	0.038448	8.82	60.76	56.89	1.48
STONY BROOK CENT	9750	100-yr	663.00	849.64	851.63	852.02	852.97	0.034853	9.33	72.71	71.90	1.45
STONY BROOK CENT	9750	500-yr	1020.00	849.64	852.05	852.56	853.78	0.030908	10.63	105.08	78.36	1.43
STONY BROOK CENT	9700	Bankfull	277.00	847.46	848.85	849.11	849.78	0.037981	7.75	35.72	39.18	1.43
STONY BROOK CENT	9700	2-yr	116.00	847.46	848.27	848.54	849.17	0.084129	7.61	15.24	31.27	1.92
STONY BROOK CENT	9700	10-yr	292.00	847.46	848.89	849.16	849.84	0.037443	7.85	37.22	39.67	1.43
STONY BROOK CENT	9700	50-yr	535.00	847.46	849.33	849.73	850.74	0.037530	9.51	56.36	46.70	1.50
STONY BROOK CENT	9700	100-yr	663.00	847.46	849.51	849.99	851.15	0.036698	10.29	65.06	49.64	1.52
STONY BROOK CENT	9700	500-yr	1020.00	847.46	849.99	850.62	852.14	0.032868	11.80	90.19	55.57	1.51
STONY BROOK CENT	9650	Bankfull	277.00	845.00	846.87	847.13	847.82	0.040045	7.84	35.34	39.47	1.46
STONY BROOK CENT	9650	2-yr	116.00	845.00	846.56	846.59	846.94	0.024609	4.94	23.47	36.38	1.08
STONY BROOK CENT	9650	10-yr	292.00	845.00	846.90	847.18	847.89	0.040218	7.99	36.54	39.74	1.47
STONY BROOK CENT	9650	50-yr	535.00	845.00	847.33	847.75	848.83	0.038295	9.82	54.58	43.01	1.52
STONY BROOK CENT	9650	100-yr	663.00	845.00	847.52	848.03	849.28	0.037730	10.65	62.65	44.41	1.54
STONY BROOK CENT	9650	500-yr	1020.00	845.00	847.98	848.69	850.39	0.036298	12.49	84.19	49.95	1.58
STONY BROOK CENT	9600	Bankfull	277.00	843.69	845.58	845.68	846.27	0.022723	6.65	41.68	39.15	1.13
STONY BROOK CENT	9600	2-yr	116.00	843.69	844.98	845.10	845.49	0.033708	5.76	20.13	31.55	1.27
STONY BROOK CENT	9600	10-yr	292.00	843.69	845.62	845.74	846.33	0.022802	6.76	43.18	39.61	1.14

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	9600	50-yr	535.00	843.69	846.08	846.32	847.23	0.024060	8.60	62.66	44.36	1.24
STONY BROOK CENT	9600	100-yr	663.00	843.69	846.28	846.60	847.66	0.024731	9.45	71.31	46.09	1.28
STONY BROOK CENT	9600	500-yr	1020.00	843.69	846.73	847.29	848.74	0.026162	11.40	93.40	50.81	1.37
STONY BROOK CENT	9550	Bankfull	277.00	841.41	843.50	843.88	844.69	0.043258	8.77	31.57	31.20	1.54
STONY BROOK CENT	9550	2-yr	116.00	841.41	842.84	843.15	843.71	0.036466	7.49	15.48	17.10	1.39
STONY BROOK CENT	9550	10-yr	292.00	841.41	843.54	843.94	844.76	0.042755	8.86	32.97	31.84	1.53
STONY BROOK CENT	9550	50-yr	535.00	841.41	844.11	844.61	845.65	0.040501	9.98	53.67	41.94	1.55
STONY BROOK CENT	9550	100-yr	663.00	841.41	844.32	844.84	846.03	0.042001	10.50	63.37	48.13	1.59
STONY BROOK CENT	9550	500-yr	1020.00	841.41	844.73	845.40	847.03	0.044363	12.18	84.90	55.39	1.69
STONY BROOK CENT	9500	Bankfull	277.00	840.01	843.70	842.02	843.80	0.001123	2.45	113.20	49.27	0.28
STONY BROOK CENT	9500	2-yr	116.00	840.01	843.14	841.27	843.17	0.000426	1.34	86.75	45.25	0.17
STONY BROOK CENT	9500	10-yr	292.00	840.01	843.74	842.07	843.84	0.001188	2.54	115.18	49.55	0.29
STONY BROOK CENT	9500	50-yr	535.00	840.01	844.24	842.80	844.47	0.002131	3.81	140.81	52.97	0.40
STONY BROOK CENT	9500	100-yr	663.00	840.01	844.44	843.10	844.74	0.002593	4.40	151.49	54.36	0.45
STONY BROOK CENT	9500	500-yr	1020.00	840.01	844.93	843.76	845.38	0.003316	5.51	242.02	123.94	0.52
STONY BROOK CENT	9450	Bankfull	277.00	841.86	843.24	843.24	843.62	0.020302	4.95	56.01	75.46	1.01
STONY BROOK CENT	9450	2-yr	116.00	841.86	842.83	842.83	843.08	0.023713	4.02	28.83	59.48	1.02
STONY BROOK CENT	9450	10-yr	292.00	841.86	843.27	843.27	843.66	0.020234	5.01	58.23	76.71	1.01
STONY BROOK CENT	9450	50-yr	535.00	841.86	843.67	843.67	844.20	0.017858	5.85	92.51	93.04	1.01
STONY BROOK CENT	9450	100-yr	663.00	841.86	843.83	843.83	844.44	0.017116	6.29	107.48	95.59	1.01
STONY BROOK CENT	9450	500-yr	1020.00	841.86	844.24	844.24	845.03	0.015119	7.18	148.74	104.54	0.99
STONY BROOK CENT	9400	Bankfull	277.00	838.74	840.20	840.71	841.74	0.076884	9.94	27.86	35.64	1.98
STONY BROOK CENT	9400	2-yr	116.00	838.74	839.75	840.10	840.86	0.098821	8.44	13.74	27.19	2.09
STONY BROOK CENT	9400	10-yr	292.00	838.74	840.24	840.74	841.79	0.074397	10.00	29.20	36.10	1.96
STONY BROOK CENT	9400	50-yr	535.00	838.74	840.74	841.29	842.55	0.062775	10.80	49.53	48.12	1.87
STONY BROOK CENT	9400	100-yr	663.00	838.74	840.94	841.54	842.90	0.054450	11.24	59.17	50.31	1.79
STONY BROOK CENT	9400	500-yr	1020.00	838.74	841.44	842.15	843.72	0.040387	12.17	88.91	66.69	1.64
STONY BROOK CENT	9350	Bankfull	277.00	837.69	839.57	839.57	840.14	0.017370	6.11	45.36	39.55	1.00
STONY BROOK CENT	9350	2-yr	116.00	837.69	838.93	838.93	839.32	0.019226	4.97	23.35	29.95	0.99
STONY BROOK CENT	9350	10-yr	292.00	837.69	839.62	839.62	840.21	0.017061	6.16	47.43	40.29	1.00
STONY BROOK CENT	9350	50-yr	535.00	837.69	840.25	840.32	841.00	0.013153	7.04	93.15	109.41	0.94
STONY BROOK CENT	9350	100-yr	663.00	837.69	840.40	840.55	841.32	0.014603	7.86	110.37	111.78	1.00
STONY BROOK CENT	9350	500-yr	1020.00	837.69	840.72	841.08	842.13	0.018961	9.93	146.98	116.95	1.17
STONY BROOK CENT	9300	Bankfull	277.00	836.54	837.76	838.06	838.65	0.059425	7.58	36.56	57.93	1.68
STONY BROOK CENT	9300	2-yr	116.00	836.54	837.41	837.55	837.92	0.043358	5.70	20.36	39.01	1.39
STONY BROOK CENT	9300	10-yr	292.00	836.54	837.78	838.09	838.71	0.061312	7.76	37.64	58.94	1.71
STONY BROOK CENT	9300	50-yr	535.00	836.54	838.02	838.48	839.54	0.088170	9.91	53.99	76.97	2.09
STONY BROOK CENT	9300	100-yr	663.00	836.54	838.15	838.62	839.79	0.084652	10.26	64.62	84.83	2.07
STONY BROOK CENT	9300	500-yr	1020.00	836.54	838.44	838.99	840.37	0.077865	11.14	91.82	101.45	2.05
STONY BROOK CENT	9250	Bankfull	277.00	833.04	834.11	834.52	835.43	0.068135	9.22	30.04	39.42	1.86
STONY BROOK CENT	9250	2-yr	116.00	833.04	833.70	833.98	834.65	0.105413	7.84	14.79	34.37	2.11
STONY BROOK CENT	9250	10-yr	292.00	833.04	834.14	834.56	835.49	0.066214	9.30	31.40	39.83	1.85
STONY BROOK CENT	9250	50-yr	535.00	833.04	834.62	835.11	836.27	0.050079	10.31	51.91	45.93	1.70
STONY BROOK CENT	9250	100-yr	663.00	833.04	834.81	835.38	836.68	0.046834	10.97	60.65	48.59	1.69
STONY BROOK CENT	9250	500-yr	1020.00	833.04	835.28	836.09	837.64	0.039302	12.34	86.06	60.91	1.63
STONY BROOK CENT	9200	Bankfull	277.00	830.96	832.25	832.44	833.02	0.031892	7.06	39.21	43.46	1.31
STONY BROOK CENT	9200	2-yr	116.00	830.96	831.88	831.91	832.24	0.024576	4.82	24.08	39.01	1.08
STONY BROOK CENT	9200	10-yr	292.00	830.96	832.27	832.48	833.08	0.032447	7.23	40.37	43.75	1.33
STONY BROOK CENT	9200	50-yr	535.00	830.96	832.64	833.01	833.98	0.038858	9.32	57.55	51.65	1.51
STONY BROOK CENT	9200	100-yr	663.00	830.96	832.78	833.25	834.42	0.040989	10.27	65.20	53.37	1.58
STONY BROOK CENT	9200	500-yr	1020.00	830.96	833.12	833.84	835.53	0.044710	12.49	83.99	56.82	1.71
STONY BROOK CENT	9150	Bankfull	277.00	828.96	831.17	831.18	831.90	0.017151	6.89	40.21	28.70	1.03
STONY BROOK CENT	9150	2-yr	116.00	828.96	830.32	830.44	830.93	0.027194	6.26	18.54	21.72	1.19
STONY BROOK CENT	9150	10-yr	292.00	828.96	831.20	831.24	831.98	0.017826	7.10	41.13	28.89	1.05
STONY BROOK CENT	9150	50-yr	535.00	828.96	832.04	832.04	833.01	0.012986	7.93	73.87	52.48	0.96
STONY BROOK CENT	9150	100-yr	663.00	828.96	832.39	832.39	833.44	0.011625	8.31	93.97	60.90	0.93
STONY BROOK CENT	9150	500-yr	1020.00	828.96	833.14	833.14	834.43	0.010514	9.42	142.66	68.75	0.92
STONY BROOK CENT	9100	Bankfull	277.00	826.42	827.91	828.57	830.07	0.093278	11.79	23.49	26.82	2.22
STONY BROOK CENT	9100	2-yr	116.00	826.42	827.47	827.86	828.70	0.079586	8.89	13.04	20.20	1.95
STONY BROOK CENT	9100	10-yr	292.00	826.42	827.96	828.62	830.13	0.090529	11.83	24.69	27.43	2.20
STONY BROOK CENT	9100	50-yr	535.00	826.42	828.40	829.25	831.43	0.092226	13.96	38.32	33.63	2.31
STONY BROOK CENT	9100	100-yr	663.00	826.42	828.60	829.53	831.95	0.090551	14.68	45.18	36.97	2.32
STONY BROOK CENT	9100	500-yr	1020.00	826.42	829.10	830.27	833.07	0.069683	16.02	65.57	43.47	2.15
STONY BROOK CENT	9050	Bankfull	277.00	825.57	827.64	827.64	828.42	0.015677	7.05	39.56	27.17	1.00
STONY BROOK CENT	9050	2-yr	116.00	825.57	826.89	826.89	827.36	0.018349	5.53	20.99	21.94	1.00
STONY BROOK CENT	9050	10-yr	292.00	825.57	827.70	827.70	828.50	0.015491	7.18	41.08	27.53	1.00
STONY BROOK CENT	9050	50-yr	535.00	825.57	828.53	828.53	829.67	0.012827	8.61	66.64	34.61	0.97
STONY BROOK CENT	9050	100-yr	663.00	825.57	828.90	828.90	830.19	0.012042	9.17	80.25	37.95	0.96
STONY BROOK CENT	9050	500-yr	1020.00	825.57	829.82	829.82	831.43	0.010578	10.38	119.05	46.25	0.95
STONY BROOK CENT	9000	Bankfull	277.00	824.23	825.94	826.30	827.23	0.035817	9.12	30.36	24.61	1.45
STONY BROOK CENT	9000	2-yr	116.00	824.23	825.36	825.55	826.09	0.036180	6.85	16.94	21.45	1.36
STONY BROOK CENT	9000	10-yr	292.00	824.23	825.98	826.35	827.32	0.035810	9.28	31.47	24.85	1.45

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	9000	50-yr	535.00	824.23	826.58	827.16	828.59	0.034272	11.38	47.34	28.22	1.50
STONY BROOK CENT	9000	100-yr	663.00	824.23	826.86	827.52	829.15	0.032262	12.17	55.48	29.97	1.49
STONY BROOK CENT	9000	500-yr	1020.00	824.23	827.58	828.33	830.50	0.027754	13.77	79.12	36.12	1.46
STONY BROOK CENT	8950	Bankfull	277.00	822.24	824.42	824.72	825.64	0.027678	8.86	31.28	21.64	1.30
STONY BROOK CENT	8950	2-yr	116.00	822.24	824.09	823.85	824.44	0.009743	4.73	24.51	19.90	0.75
STONY BROOK CENT	8950	10-yr	292.00	822.24	824.47	824.78	825.73	0.027782	9.00	32.43	21.94	1.30
STONY BROOK CENT	8950	50-yr	535.00	822.24	825.17	825.65	827.05	0.026235	11.02	49.18	26.30	1.34
STONY BROOK CENT	8950	100-yr	663.00	822.24	825.45	826.07	827.68	0.026281	12.00	56.95	28.65	1.37
STONY BROOK CENT	8950	500-yr	1020.00	822.24	826.18	827.08	829.17	0.024880	13.97	80.41	35.77	1.40
STONY BROOK CENT	8900	Bankfull	277.00	821.66	824.06	824.06	824.69	0.016645	6.39	43.34	34.29	1.00
STONY BROOK CENT	8900	2-yr	116.00	821.66	823.34	823.34	823.77	0.018896	5.27	22.01	25.39	1.00
STONY BROOK CENT	8900	10-yr	292.00	821.66	824.10	824.10	824.76	0.016411	6.50	44.95	34.87	1.00
STONY BROOK CENT	8900	50-yr	535.00	821.66	824.62	824.77	825.75	0.018168	8.53	64.78	42.04	1.11
STONY BROOK CENT	8900	100-yr	663.00	821.66	824.74	825.12	826.26	0.022437	9.89	70.05	44.13	1.24
STONY BROOK CENT	8900	500-yr	1020.00	821.66	825.07	825.79	827.66	0.031623	12.99	85.73	55.03	1.52
STONY BROOK CENT	8850	Bankfull	277.00	820.98	822.37	822.69	823.43	0.039731	8.25	33.91	38.52	1.48
STONY BROOK CENT	8850	2-yr	116.00	820.98	821.95	822.09	822.50	0.035441	5.96	19.46	30.01	1.30
STONY BROOK CENT	8850	10-yr	292.00	820.98	822.41	822.70	823.51	0.039680	8.42	35.13	39.36	1.48
STONY BROOK CENT	8850	50-yr	535.00	820.98	822.88	823.36	824.48	0.034814	10.23	61.03	69.82	1.48
STONY BROOK CENT	8850	100-yr	663.00	820.98	823.08	823.65	824.87	0.033847	10.97	74.99	71.76	1.49
STONY BROOK CENT	8850	500-yr	1020.00	820.98	823.50	823.87	825.94	0.035459	13.02	106.77	82.24	1.58
STONY BROOK CENT	8800	Bankfull	277.00	819.46	820.66	820.85	821.40	0.038032	6.91	40.15	53.53	1.39
STONY BROOK CENT	8800	2-yr	116.00	819.46	820.33	820.42	820.71	0.034129	4.95	23.42	46.56	1.23
STONY BROOK CENT	8800	10-yr	292.00	819.46	820.68	820.88	821.46	0.038587	7.09	41.29	53.80	1.41
STONY BROOK CENT	8800	50-yr	535.00	819.46	820.95	821.38	822.39	0.048358	9.65	56.22	57.13	1.66
STONY BROOK CENT	8800	100-yr	663.00	819.46	821.08	821.65	822.82	0.049547	10.59	64.06	58.99	1.71
STONY BROOK CENT	8800	500-yr	1020.00	819.46	821.43	821.95	823.85	0.049230	12.53	86.12	68.80	1.78
STONY BROOK CENT	8750	Bankfull	277.00	815.85	817.28	817.79	818.92	0.061736	10.29	26.93	27.58	1.83
STONY BROOK CENT	8750	2-yr	116.00	815.85	816.64	817.08	818.00	0.090239	9.34	12.42	19.60	2.07
STONY BROOK CENT	8750	10-yr	292.00	815.85	817.32	817.85	818.99	0.060201	10.36	28.19	28.02	1.82
STONY BROOK CENT	8750	50-yr	535.00	815.85	817.93	818.54	819.95	0.047036	11.41	46.91	33.44	1.70
STONY BROOK CENT	8750	100-yr	663.00	815.85	818.17	818.85	820.42	0.044481	12.05	55.24	37.01	1.68
STONY BROOK CENT	8750	500-yr	1020.00	815.85	818.71	819.60	821.62	0.038825	13.72	76.96	42.26	1.65
STONY BROOK CENT	8700	Bankfull	277.00	812.55	813.91	814.45	815.61	0.071090	10.45	26.51	29.59	1.95
STONY BROOK CENT	8700	2-yr	116.00	812.55	813.53	813.78	814.35	0.055495	7.26	15.99	25.64	1.62
STONY BROOK CENT	8700	10-yr	292.00	812.55	813.94	814.50	815.70	0.071582	10.65	27.42	29.90	1.96
STONY BROOK CENT	8700	50-yr	535.00	812.55	814.38	815.13	816.96	0.075017	12.91	41.44	35.03	2.09
STONY BROOK CENT	8700	100-yr	663.00	812.55	814.56	815.43	817.50	0.075339	13.77	48.17	37.29	2.13
STONY BROOK CENT	8700	500-yr	1020.00	812.55	814.98	816.16	818.96	0.070667	16.03	64.67	42.33	2.16
STONY BROOK CENT	8650	Bankfull	277.00	809.94	812.02	812.30	813.13	0.032296	8.44	32.80	27.75	1.37
STONY BROOK CENT	8650	2-yr	116.00	809.94	811.41	811.60	812.11	0.035606	6.73	17.24	22.13	1.34
STONY BROOK CENT	8650	10-yr	292.00	809.94	812.06	812.36	813.21	0.032304	8.59	33.98	28.00	1.37
STONY BROOK CENT	8650	50-yr	535.00	809.94	812.63	813.09	814.35	0.032257	10.51	50.90	31.14	1.44
STONY BROOK CENT	8650	100-yr	663.00	809.94	812.87	813.43	814.88	0.031947	11.39	58.43	32.57	1.47
STONY BROOK CENT	8650	500-yr	1020.00	809.94	813.39	814.24	816.29	0.033359	13.69	76.16	35.87	1.56
STONY BROOK CENT	8600	Bankfull	277.00	806.94	809.04	809.65	810.98	0.054724	11.18	24.78	20.24	1.78
STONY BROOK CENT	8600	2-yr	116.00	806.94	808.35	808.77	809.69	0.065515	9.29	12.49	15.51	1.82
STONY BROOK CENT	8600	10-yr	292.00	806.94	809.09	809.71	811.07	0.053980	11.30	25.85	20.57	1.78
STONY BROOK CENT	8600	50-yr	535.00	806.94	809.79	810.54	812.33	0.047169	12.79	41.82	24.91	1.74
STONY BROOK CENT	8600	100-yr	663.00	806.94	810.07	810.93	812.92	0.044677	13.55	49.07	26.64	1.73
STONY BROOK CENT	8600	500-yr	1020.00	806.94	810.74	811.87	814.42	0.038914	15.42	68.05	30.66	1.69
STONY BROOK CENT	8550	Bankfull	277.00	805.32	807.27	807.68	808.77	0.032398	9.82	28.21	18.47	1.40
STONY BROOK CENT	8550	2-yr	116.00	805.32	806.57	806.75	807.38	0.030330	7.24	16.03	16.06	1.28
STONY BROOK CENT	8550	10-yr	292.00	805.32	807.33	807.76	808.88	0.032481	9.99	29.23	18.67	1.41
STONY BROOK CENT	8550	50-yr	535.00	805.32	808.10	808.71	810.33	0.031551	11.98	44.72	21.51	1.45
STONY BROOK CENT	8550	100-yr	663.00	805.32	808.42	809.15	810.99	0.031162	12.88	51.79	22.65	1.46
STONY BROOK CENT	8550	500-yr	1020.00	805.32	809.18	810.21	812.62	0.030964	14.92	70.24	26.44	1.51
STONY BROOK CENT	8500	Bankfull	277.00	803.51	805.61	806.03	807.13	0.033255	9.88	28.03	18.70	1.42
STONY BROOK CENT	8500	2-yr	116.00	803.51	804.88	805.11	805.77	0.034226	7.55	15.36	15.90	1.35
STONY BROOK CENT	8500	10-yr	292.00	803.51	805.67	806.10	807.24	0.033254	10.04	29.08	18.91	1.43
STONY BROOK CENT	8500	50-yr	535.00	803.51	806.42	807.05	808.70	0.033270	12.13	44.09	21.28	1.49
STONY BROOK CENT	8500	100-yr	663.00	803.51	806.72	807.45	809.37	0.033467	13.06	50.79	22.09	1.51
STONY BROOK CENT	8500	500-yr	1020.00	803.51	807.46	808.48	811.05	0.031442	15.21	67.71	23.74	1.54
STONY BROOK CENT	8450	Bankfull	277.00	802.35	804.90	804.93	805.79	0.016977	7.59	36.50	21.85	1.03
STONY BROOK CENT	8450	2-yr	116.00	802.35	804.06	804.06	804.60	0.018536	5.92	19.60	18.44	1.01
STONY BROOK CENT	8450	10-yr	292.00	802.35	804.94	805.00	805.88	0.017518	7.80	37.44	22.03	1.05
STONY BROOK CENT	8450	50-yr	535.00	802.35	805.58	805.89	807.24	0.020282	10.33	52.42	24.61	1.19
STONY BROOK CENT	8450	100-yr	663.00	802.35	805.87	806.28	807.87	0.021007	11.37	59.71	25.83	1.24
STONY BROOK CENT	8450	500-yr	1020.00	802.35	806.51	807.30	809.52	0.023815	13.99	76.97	28.51	1.37
STONY BROOK CENT	8400	Bankfull	277.00	801.05	803.05	803.48	804.52	0.038249	9.72	28.50	21.98	1.50
STONY BROOK CENT	8400	2-yr	116.00	801.05	802.39	802.64	803.27	0.038669	7.51	15.44	17.77	1.42
STONY BROOK CENT	8400	10-yr	292.00	801.05	803.11	803.54	804.60	0.037377	9.80	29.78	22.26	1.49

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	8400	50-yr	535.00	801.05	803.80	804.38	805.87	0.035222	11.57	46.25	25.65	1.52
STONY BROOK CENT	8400	100-yr	663.00	801.05	804.06	804.75	806.48	0.035329	12.50	53.11	26.94	1.55
STONY BROOK CENT	8400	500-yr	1020.00	801.05	804.66	805.67	808.05	0.034837	14.78	70.23	29.59	1.61
STONY BROOK CENT	8350	Bankfull	277.00	798.10	800.21	800.90	802.26	0.050976	11.48	24.14	17.69	1.73
STONY BROOK CENT	8350	2-yr	116.00	798.10	799.42	799.88	800.85	0.058996	9.60	12.08	13.01	1.76
STONY BROOK CENT	8350	10-yr	292.00	798.10	800.27	800.96	802.37	0.050980	11.63	25.12	18.05	1.74
STONY BROOK CENT	8350	50-yr	535.00	798.10	800.97	801.77	803.66	0.053373	13.16	40.67	25.20	1.83
STONY BROOK CENT	8350	100-yr	663.00	798.10	801.23	802.15	804.28	0.052785	14.03	47.29	26.67	1.85
STONY BROOK CENT	8350	500-yr	1020.00	798.10	801.81	803.05	805.92	0.049449	16.28	63.46	29.27	1.87
STONY BROOK CENT	8300	Bankfull	277.00	796.94	798.74	799.07	800.02	0.032450	9.10	30.43	22.85	1.39
STONY BROOK CENT	8300	2-yr	116.00	796.94	798.22	798.30	798.80	0.024155	6.13	18.93	20.86	1.13
STONY BROOK CENT	8300	10-yr	292.00	796.94	798.78	799.13	800.12	0.032788	9.31	31.38	22.96	1.40
STONY BROOK CENT	8300	50-yr	535.00	796.94	799.44	799.99	801.44	0.031750	11.32	47.25	24.76	1.44
STONY BROOK CENT	8300	100-yr	663.00	796.94	799.73	800.36	802.04	0.032120	12.20	54.33	25.52	1.47
STONY BROOK CENT	8300	500-yr	1020.00	796.94	800.32	801.27	803.64	0.034315	14.64	69.90	27.11	1.58
STONY BROOK CENT	8250	Bankfull	277.00	794.61	797.04	797.41	798.39	0.032563	9.32	29.71	21.31	1.39
STONY BROOK CENT	8250	2-yr	116.00	794.61	796.12	796.43	797.19	0.042015	8.32	13.94	14.47	1.49
STONY BROOK CENT	8250	10-yr	292.00	794.61	797.09	797.48	798.49	0.032750	9.49	30.77	21.58	1.40
STONY BROOK CENT	8250	50-yr	535.00	794.61	797.77	798.33	799.82	0.032553	11.50	46.57	24.71	1.46
STONY BROOK CENT	8250	100-yr	663.00	794.61	798.06	798.73	800.43	0.032015	12.36	53.93	25.86	1.48
STONY BROOK CENT	8250	500-yr	1020.00	794.61	798.72	799.66	801.97	0.031894	14.47	71.93	28.41	1.53
STONY BROOK CENT	8200	Bankfull	277.00	793.76	795.73	795.97	796.85	0.026676	8.48	32.66	23.31	1.26
STONY BROOK CENT	8200	2-yr	116.00	793.76	795.16	795.19	795.69	0.020303	5.79	20.02	20.85	1.04
STONY BROOK CENT	8200	10-yr	292.00	793.76	795.78	796.03	796.94	0.026758	8.65	33.76	23.43	1.27
STONY BROOK CENT	8200	50-yr	535.00	793.76	796.43	796.88	798.24	0.027992	10.79	49.57	25.12	1.35
STONY BROOK CENT	8200	100-yr	663.00	793.76	796.71	797.26	798.83	0.028634	11.69	56.71	25.85	1.39
STONY BROOK CENT	8200	500-yr	1020.00	793.76	797.34	798.16	800.35	0.029858	13.92	73.54	27.59	1.47
STONY BROOK CENT	8150	Bankfull	277.00	791.03	792.80	793.44	794.86	0.058132	11.53	24.03	19.57	1.83
STONY BROOK CENT	8150	2-yr	116.00	791.03	792.04	792.55	793.71	0.088622	10.36	11.19	14.80	2.10
STONY BROOK CENT	8150	10-yr	292.00	791.03	792.85	793.51	794.96	0.057218	11.66	25.03	19.78	1.83
STONY BROOK CENT	8150	50-yr	535.00	791.03	793.55	794.38	796.33	0.048792	13.38	40.00	22.70	1.77
STONY BROOK CENT	8150	100-yr	663.00	791.03	793.85	794.78	796.97	0.044666	14.18	46.93	23.74	1.74
STONY BROOK CENT	8150	500-yr	1020.00	791.03	794.58	795.79	798.57	0.038234	16.06	65.17	26.18	1.69
STONY BROOK CENT	8100	Bankfull	277.00	789.13	791.44	791.73	792.61	0.028556	8.71	31.81	23.01	1.30
STONY BROOK CENT	8100	2-yr	116.00	789.13	790.67	790.78	791.36	0.023733	6.68	17.36	16.37	1.14
STONY BROOK CENT	8100	10-yr	292.00	789.13	791.47	791.78	792.71	0.029409	8.94	32.66	23.20	1.33
STONY BROOK CENT	8100	50-yr	535.00	789.13	792.05	792.62	794.07	0.034410	11.40	46.93	26.01	1.49
STONY BROOK CENT	8100	100-yr	663.00	789.13	792.27	793.00	794.74	0.037247	12.63	52.57	27.00	1.58
STONY BROOK CENT	8100	500-yr	1020.00	789.13	792.76	793.90	796.49	0.042086	15.49	66.64	29.30	1.74
STONY BROOK CENT	8050	Bankfull	277.00	788.11	790.42	790.54	791.31	0.020965	7.60	36.42	25.83	1.13
STONY BROOK CENT	8050	2-yr	116.00	788.11	789.59	789.67	790.19	0.022321	6.23	18.61	18.77	1.10
STONY BROOK CENT	8050	10-yr	292.00	788.11	790.47	790.60	791.39	0.020718	7.69	37.96	26.20	1.13
STONY BROOK CENT	8050	50-yr	535.00	788.11	791.10	791.40	792.56	0.021589	9.69	55.68	30.36	1.21
STONY BROOK CENT	8050	100-yr	663.00	788.11	791.35	791.73	793.11	0.022377	10.67	63.37	31.82	1.26
STONY BROOK CENT	8050	500-yr	1020.00	788.11	791.89	792.61	794.56	0.025506	13.16	81.15	34.03	1.39
STONY BROOK CENT	8000	Bankfull	277.00	787.25	789.00	789.25	790.12	0.026481	8.49	32.62	23.23	1.26
STONY BROOK CENT	8000	2-yr	116.00	787.25	788.35	788.46	788.97	0.026933	6.33	18.33	20.85	1.19
STONY BROOK CENT	8000	10-yr	292.00	787.25	789.05	789.31	790.20	0.026327	8.63	33.85	23.43	1.26
STONY BROOK CENT	8000	50-yr	535.00	787.25	789.79	790.14	791.43	0.023418	10.26	52.37	26.39	1.26
STONY BROOK CENT	8000	100-yr	663.00	787.25	790.11	790.52	791.99	0.022186	10.99	61.02	27.70	1.26
STONY BROOK CENT	8000	500-yr	1020.00	787.25	790.90	791.45	793.37	0.019998	12.63	84.22	31.16	1.25
STONY BROOK CENT	7950	Bankfull	277.00	785.48	787.98	788.10	788.92	0.020061	7.78	35.62	23.23	1.11
STONY BROOK CENT	7950	2-yr	116.00	785.48	787.21	787.25	787.78	0.020754	6.05	19.19	18.90	1.06
STONY BROOK CENT	7950	10-yr	292.00	785.48	788.03	788.16	789.01	0.020130	7.92	36.88	23.46	1.11
STONY BROOK CENT	7950	50-yr	535.00	785.48	788.69	789.00	790.26	0.022451	10.05	53.32	26.14	1.23
STONY BROOK CENT	7950	100-yr	663.00	785.48	788.97	789.37	790.85	0.022915	11.01	60.56	27.21	1.26
STONY BROOK CENT	7950	500-yr	1020.00	785.48	789.67	790.32	792.29	0.022474	12.99	80.81	30.01	1.31
STONY BROOK CENT	7900	Bankfull	277.00	784.61	786.72	786.97	787.76	0.026942	8.17	33.90	26.29	1.27
STONY BROOK CENT	7900	2-yr	116.00	784.61	786.12	786.20	786.67	0.023482	5.98	19.40	21.76	1.12
STONY BROOK CENT	7900	10-yr	292.00	784.61	786.77	787.02	787.84	0.026759	8.28	35.24	26.63	1.27
STONY BROOK CENT	7900	50-yr	535.00	784.61	787.37	787.78	789.03	0.026723	10.34	52.18	30.35	1.34
STONY BROOK CENT	7900	100-yr	663.00	784.61	787.61	788.14	789.59	0.027158	11.31	59.77	32.53	1.38
STONY BROOK CENT	7900	500-yr	1020.00	784.61	788.19	789.02	791.01	0.028153	13.55	79.85	36.68	1.46
STONY BROOK CENT	7850	Bankfull	277.00	782.78	784.59	784.97	785.84	0.057114	8.99	30.82	36.63	1.73
STONY BROOK CENT	7850	2-yr	116.00	782.78	784.18	784.41	784.91	0.057667	6.83	16.98	30.72	1.62
STONY BROOK CENT	7850	10-yr	292.00	782.78	784.62	785.02	785.92	0.057444	9.17	31.84	36.87	1.74
STONY BROOK CENT	7850	50-yr	535.00	782.78	785.00	785.61	787.05	0.060855	11.51	46.48	39.98	1.88
STONY BROOK CENT	7850	100-yr	663.00	782.78	785.16	785.89	787.59	0.061262	12.52	53.01	40.97	1.92
STONY BROOK CENT	7850	500-yr	1020.00	782.78	785.55	786.56	788.95	0.061628	14.81	69.47	43.14	2.01
STONY BROOK CENT	7800	Bankfull	277.00	781.30	783.02	783.20	783.85	0.026266	7.32	37.86	34.22	1.23
STONY BROOK CENT	7800	2-yr	116.00	781.30	782.48	782.55	782.96	0.026414	5.56	20.86	28.65	1.15
STONY BROOK CENT	7800	10-yr	292.00	781.30	783.06	783.24	783.92	0.026256	7.44	39.27	34.62	1.23

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	7800	50-yr	535.00	781.30	783.57	783.91	784.90	0.026905	9.24	58.09	40.46	1.31
STONY BROOK CENT	7800	100-yr	663.00	781.30	783.77	784.20	785.36	0.027647	10.15	66.88	49.20	1.35
STONY BROOK CENT	7800	500-yr	1020.00	781.30	784.21	784.89	786.53	0.030180	12.32	90.55	55.62	1.47
STONY BROOK CENT	7750	Bankfull	277.00	778.35	780.45	781.10	782.13	0.041659	10.40	26.64	19.63	1.57
STONY BROOK CENT	7750	2-yr	116.00	778.35	779.60	780.03	780.95	0.060639	9.32	12.45	14.43	1.77
STONY BROOK CENT	7750	10-yr	292.00	778.35	780.52	781.15	782.21	0.041268	10.44	27.98	20.35	1.57
STONY BROOK CENT	7750	50-yr	535.00	778.35	781.24	781.82	783.12	0.045311	11.00	48.69	36.53	1.66
STONY BROOK CENT	7750	100-yr	663.00	778.35	781.45	782.13	783.61	0.042790	11.77	56.97	40.53	1.65
STONY BROOK CENT	7750	500-yr	1020.00	778.35	781.98	782.84	784.78	0.038526	13.51	81.11	51.61	1.64
STONY BROOK CENT	7700	Bankfull	277.00	775.78	777.41	778.07	779.55	0.063110	11.73	23.61	19.86	1.90
STONY BROOK CENT	7700	2-yr	116.00	775.78	776.90	777.23	777.98	0.055623	8.33	13.92	18.00	1.67
STONY BROOK CENT	7700	10-yr	292.00	775.78	777.46	778.14	779.65	0.062201	11.89	24.56	20.02	1.89
STONY BROOK CENT	7700	50-yr	535.00	775.78	778.26	779.02	780.83	0.043499	12.87	41.56	22.63	1.67
STONY BROOK CENT	7700	100-yr	663.00	775.78	778.57	779.42	781.44	0.040761	13.60	48.81	23.68	1.65
STONY BROOK CENT	7700	500-yr	1020.00	775.78	779.36	780.40	782.92	0.033232	15.17	68.74	27.02	1.57
STONY BROOK CENT	7650	Bankfull	277.00	773.90	776.28	776.52	777.49	0.022953	8.85	31.29	18.45	1.20
STONY BROOK CENT	7650	2-yr	116.00	773.90	775.44	775.55	776.15	0.023208	6.77	17.12	15.49	1.14
STONY BROOK CENT	7650	10-yr	292.00	773.90	776.33	776.60	777.60	0.023095	9.02	32.39	18.65	1.21
STONY BROOK CENT	7650	50-yr	535.00	773.90	777.13	777.57	779.04	0.024315	11.10	48.24	21.33	1.29
STONY BROOK CENT	7650	100-yr	663.00	773.90	777.45	777.99	779.70	0.024471	12.04	55.37	22.46	1.32
STONY BROOK CENT	7650	500-yr	1020.00	773.90	778.20	779.04	781.38	0.024706	14.33	73.16	24.86	1.38
STONY BROOK CENT	7600	Bankfull	277.00	773.23	774.98	775.28	776.14	0.031550	8.63	32.08	25.77	1.36
STONY BROOK CENT	7600	2-yr	116.00	773.23	774.52	774.54	775.00	0.020320	5.57	20.81	23.31	1.04
STONY BROOK CENT	7600	10-yr	292.00	773.23	775.02	775.34	776.23	0.031963	8.83	33.08	25.94	1.38
STONY BROOK CENT	7600	50-yr	535.00	773.23	775.53	776.13	777.55	0.036638	11.40	46.96	27.88	1.54
STONY BROOK CENT	7600	100-yr	663.00	773.23	775.75	776.47	778.18	0.038189	12.49	53.19	28.64	1.60
STONY BROOK CENT	7600	500-yr	1020.00	773.23	776.27	777.32	779.78	0.041356	15.03	68.45	30.40	1.72
STONY BROOK CENT	7550	Bankfull	277.00	771.55	773.62	773.86	774.75	0.024424	8.50	32.59	21.65	1.22
STONY BROOK CENT	7550	2-yr	116.00	771.55	772.77	773.00	773.62	0.037108	7.41	15.66	17.76	1.39
STONY BROOK CENT	7550	10-yr	292.00	771.55	773.69	773.93	774.83	0.023960	8.59	33.99	21.87	1.21
STONY BROOK CENT	7550	50-yr	535.00	771.55	774.51	774.80	776.10	0.020189	10.10	53.27	24.82	1.18
STONY BROOK CENT	7550	100-yr	663.00	771.55	774.86	775.18	776.68	0.019176	10.84	62.14	25.90	1.18
STONY BROOK CENT	7550	500-yr	1020.00	771.55	775.66	776.17	778.15	0.018458	12.70	83.83	28.26	1.21
STONY BROOK CENT	7500	Bankfull	277.00	770.26	772.55	772.72	773.60	0.020687	8.22	33.72	20.81	1.14
STONY BROOK CENT	7500	2-yr	116.00	770.26	771.74	771.80	772.36	0.020954	6.36	18.24	16.88	1.08
STONY BROOK CENT	7500	10-yr	292.00	770.26	772.61	772.79	773.70	0.020993	8.39	34.81	21.05	1.15
STONY BROOK CENT	7500	50-yr	535.00	770.26	773.35	773.69	775.05	0.021731	10.47	51.57	24.32	1.23
STONY BROOK CENT	7500	100-yr	663.00	770.26	773.67	774.10	775.66	0.021331	11.33	59.72	25.76	1.24
STONY BROOK CENT	7500	500-yr	1020.00	770.26	774.47	775.10	777.17	0.020400	13.25	81.45	28.79	1.27
STONY BROOK CENT	7450	Bankfull	277.00	768.62	770.51	771.00	772.02	0.050026	9.86	28.10	26.20	1.68
STONY BROOK CENT	7450	2-yr	116.00	768.62	770.01	770.25	770.84	0.046214	7.32	15.84	21.79	1.51
STONY BROOK CENT	7450	10-yr	292.00	768.62	770.56	771.04	772.11	0.049800	10.00	29.20	26.55	1.68
STONY BROOK CENT	7450	50-yr	535.00	768.62	771.07	771.77	773.38	0.052020	12.19	43.90	30.87	1.79
STONY BROOK CENT	7450	100-yr	663.00	768.62	771.27	772.09	773.99	0.052772	13.25	50.16	32.27	1.84
STONY BROOK CENT	7450	500-yr	1020.00	768.62	771.76	772.91	775.52	0.051264	15.60	66.76	35.38	1.90
STONY BROOK CENT	7400	Bankfull	277.00	767.60	769.76	769.83	770.53	0.018933	7.05	39.32	29.13	1.07
STONY BROOK CENT	7400	2-yr	116.00	767.60	769.17	769.14	769.57	0.016964	5.04	23.01	26.13	0.95
STONY BROOK CENT	7400	10-yr	292.00	767.60	769.81	769.87	770.61	0.018929	7.18	40.69	29.30	1.07
STONY BROOK CENT	7400	50-yr	535.00	767.60	770.53	770.63	771.65	0.016985	8.51	62.84	31.94	1.07
STONY BROOK CENT	7400	100-yr	663.00	767.60	770.75	770.94	772.14	0.018433	9.46	70.11	32.74	1.13
STONY BROOK CENT	7400	500-yr	1020.00	767.60	771.25	771.74	773.42	0.022526	11.84	86.67	34.48	1.29
STONY BROOK CENT	7350	Bankfull	277.00	766.85	768.95	768.98	769.66	0.017546	6.79	40.79	30.30	1.03
STONY BROOK CENT	7350	2-yr	116.00	766.85	768.22	768.22	768.68	0.018506	5.44	21.34	23.12	1.00
STONY BROOK CENT	7350	10-yr	292.00	766.85	768.98	769.02	769.74	0.018348	7.00	41.70	30.60	1.06
STONY BROOK CENT	7350	50-yr	535.00	766.85	769.60	769.74	770.78	0.017881	8.74	62.50	36.61	1.11
STONY BROOK CENT	7350	100-yr	663.00	766.85	769.89	770.08	771.25	0.016998	9.36	73.74	39.33	1.10
STONY BROOK CENT	7350	500-yr	1020.00	766.85	770.61	770.88	772.38	0.015423	10.75	104.75	46.13	1.10
STONY BROOK CENT	7300	Bankfull	277.00	765.49	767.59	767.81	768.60	0.024684	8.07	34.34	25.18	1.22
STONY BROOK CENT	7300	2-yr	116.00	765.49	766.88	767.02	767.53	0.028709	6.44	18.00	20.88	1.22
STONY BROOK CENT	7300	10-yr	292.00	765.49	767.66	767.88	768.68	0.023824	8.08	36.12	25.68	1.20
STONY BROOK CENT	7300	50-yr	535.00	765.49	768.40	768.66	769.79	0.021076	9.48	56.91	30.96	1.19
STONY BROOK CENT	7300	100-yr	663.00	765.49	768.69	769.00	770.30	0.020251	10.18	66.42	32.94	1.19
STONY BROOK CENT	7300	500-yr	1020.00	765.49	769.47	769.87	771.53	0.017667	11.57	93.86	37.91	1.17
STONY BROOK CENT	7250	Bankfull	277.00	764.71	766.55	766.68	767.38	0.022339	7.31	37.88	30.25	1.15
STONY BROOK CENT	7250	2-yr	116.00	764.71	765.99	765.99	766.42	0.019463	5.29	21.93	25.77	1.01
STONY BROOK CENT	7250	10-yr	292.00	764.71	766.58	766.74	767.46	0.023228	7.54	38.75	30.45	1.18
STONY BROOK CENT	7250	50-yr	535.00	764.71	767.08	767.46	768.56	0.028336	9.77	54.80	34.05	1.35
STONY BROOK CENT	7250	100-yr	663.00	764.71	767.29	767.77	769.06	0.029868	10.69	62.12	35.56	1.41
STONY BROOK CENT	7250	500-yr	1020.00	764.71	767.80	768.55	770.30	0.032515	12.71	81.08	39.24	1.52
STONY BROOK CENT	7200	Bankfull	277.00	763.06	765.05	765.32	766.01	0.033585	7.85	35.29	34.54	1.37
STONY BROOK CENT	7200	2-yr	116.00	763.06	764.48	764.65	765.11	0.035497	6.35	18.26	25.58	1.33
STONY BROOK CENT	7200	10-yr	292.00	763.06	765.09	765.38	766.07	0.033379	7.94	36.78	35.22	1.37

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	7200	50-yr	535.00	763.06	765.60	766.01	766.99	0.034121	9.48	56.59	43.31	1.44
STONY BROOK CENT	7200	100-yr	663.00	763.06	765.80	766.29	767.40	0.034771	10.17	65.62	46.49	1.48
STONY BROOK CENT	7200	500-yr	1020.00	763.06	766.22	766.91	768.45	0.038720	11.99	86.58	53.03	1.61
STONY BROOK CENT	7150	Bankfull	277.00	761.28	763.95	764.01	764.74	0.018507	7.15	38.77	27.62	1.06
STONY BROOK CENT	7150	2-yr	116.00	761.28	763.12	763.18	763.69	0.022935	6.10	19.01	20.20	1.11
STONY BROOK CENT	7150	10-yr	292.00	761.28	764.01	764.07	764.82	0.018248	7.20	40.57	28.29	1.06
STONY BROOK CENT	7150	50-yr	535.00	761.28	764.79	764.82	765.87	0.014554	8.32	66.12	38.81	1.01
STONY BROOK CENT	7150	100-yr	663.00	761.28	765.15	765.19	766.34	0.013216	8.79	81.07	45.87	0.99
STONY BROOK CENT	7150	500-yr	1020.00	761.28	766.00	766.00	767.43	0.010949	9.76	124.36	54.23	0.94
STONY BROOK CENT	7100	Bankfull	277.00	759.95	761.33	761.88	763.09	0.061995	10.65	26.02	25.40	1.85
STONY BROOK CENT	7100	2-yr	116.00	759.95	760.83	761.15	761.85	0.063355	8.11	14.30	21.43	1.75
STONY BROOK CENT	7100	10-yr	292.00	759.95	761.37	761.93	763.18	0.061719	10.80	27.03	25.72	1.86
STONY BROOK CENT	7100	50-yr	535.00	759.95	761.91	762.66	764.43	0.057801	12.73	42.04	29.79	1.88
STONY BROOK CENT	7100	100-yr	663.00	759.95	762.14	762.98	764.99	0.054289	13.53	49.14	31.42	1.87
STONY BROOK CENT	7100	500-yr	1020.00	759.95	762.76	763.90	766.26	0.043600	15.03	70.03	36.15	1.77
STONY BROOK CENT	7050	Bankfull	277.00	758.70	760.34	760.44	761.03	0.022219	6.65	41.64	38.29	1.12
STONY BROOK CENT	7050	2-yr	116.00	758.70	759.81	759.81	760.20	0.020180	5.02	23.10	30.16	1.01
STONY BROOK CENT	7050	10-yr	292.00	758.70	760.38	760.48	761.10	0.022705	6.81	42.90	38.73	1.14
STONY BROOK CENT	7050	50-yr	535.00	758.70	760.75	761.08	762.08	0.028977	9.25	58.36	43.29	1.35
STONY BROOK CENT	7050	100-yr	663.00	758.70	760.90	761.36	762.58	0.032131	10.39	64.95	45.19	1.44
STONY BROOK CENT	7050	500-yr	1020.00	758.70	761.24	762.10	763.92	0.040183	13.18	80.83	49.69	1.67
STONY BROOK CENT	7000	Bankfull	277.00	757.35	759.39	759.48	760.17	0.020253	7.10	39.01	30.20	1.10
STONY BROOK CENT	7000	2-yr	116.00	757.35	758.74	758.75	759.20	0.019694	5.44	21.33	24.22	1.02
STONY BROOK CENT	7000	10-yr	292.00	757.35	759.53	759.53	760.23	0.016542	6.71	43.54	31.52	1.01
STONY BROOK CENT	7000	50-yr	535.00	757.35	760.23	760.23	761.24	0.014253	8.09	67.72	37.92	1.00
STONY BROOK CENT	7000	100-yr	663.00	757.35	760.56	760.56	761.70	0.013124	8.59	80.90	41.04	0.98
STONY BROOK CENT	7000	500-yr	1020.00	757.35	761.41	761.41	762.81	0.010918	9.60	121.62	65.25	0.94
STONY BROOK CENT	6950	Bankfull	277.00	756.02	757.95	758.21	758.93	0.030504	7.95	34.86	30.99	1.32
STONY BROOK CENT	6950	2-yr	116.00	756.02	757.24	757.41	757.94	0.032056	6.73	17.24	20.46	1.29
STONY BROOK CENT	6950	10-yr	292.00	756.02	757.94	758.26	759.04	0.034232	8.41	34.70	30.87	1.40
STONY BROOK CENT	6950	50-yr	535.00	756.02	758.43	758.92	760.09	0.037744	10.32	52.14	39.92	1.53
STONY BROOK CENT	6950	100-yr	663.00	756.02	758.63	759.21	760.58	0.037463	11.21	60.39	44.06	1.55
STONY BROOK CENT	6950	500-yr	1020.00	756.02	759.11	760.01	761.77	0.036486	13.16	84.15	58.33	1.60
STONY BROOK CENT	6900	Bankfull	277.00	755.31	757.09	757.13	757.72	0.019390	6.40	43.31	38.25	1.06
STONY BROOK CENT	6900	2-yr	116.00	755.31	756.46	756.46	756.87	0.019623	5.14	22.57	27.92	1.01
STONY BROOK CENT	6900	10-yr	292.00	755.31	757.11	757.18	757.79	0.020425	6.61	44.16	38.58	1.09
STONY BROOK CENT	6900	50-yr	535.00	755.31	757.68	757.87	758.63	0.017883	7.88	75.56	77.49	1.08
STONY BROOK CENT	6900	100-yr	663.00	755.31	757.83	758.11	759.01	0.019858	8.82	89.22	100.86	1.16
STONY BROOK CENT	6900	500-yr	1020.00	755.31	758.13	758.75	759.99	0.026437	11.26	123.74	128.16	1.37
STONY BROOK CENT	6850	Bankfull	277.00	753.40	755.76	755.92	756.68	0.021766	7.67	36.13	26.18	1.15
STONY BROOK CENT	6850	2-yr	116.00	753.40	754.94	755.10	755.64	0.030172	6.72	17.25	19.53	1.26
STONY BROOK CENT	6850	10-yr	292.00	753.40	755.85	755.98	756.75	0.020199	7.58	38.54	26.88	1.11
STONY BROOK CENT	6850	50-yr	535.00	753.40	756.65	756.78	757.75	0.016565	8.47	69.13	55.83	1.06
STONY BROOK CENT	6850	100-yr	663.00	753.40	757.03	757.03	757.69	0.009473	7.20	172.33	158.79	0.83
STONY BROOK CENT	6850	500-yr	1020.00	753.40	758.01	757.55	758.46	0.004790	6.46	346.60	190.82	0.62
STONY BROOK CENT	6800	Bankfull	277.00	752.14	754.14	754.47	755.37	0.030183	8.91	31.10	22.91	1.35
STONY BROOK CENT	6800	2-yr	116.00	752.14	753.49	753.64	754.18	0.028165	6.66	17.43	18.99	1.22
STONY BROOK CENT	6800	10-yr	292.00	752.14	754.18	754.52	755.47	0.030863	9.12	32.00	23.11	1.37
STONY BROOK CENT	6800	50-yr	535.00	752.14	754.92	755.46	756.66	0.026078	10.61	52.47	36.30	1.33
STONY BROOK CENT	6800	100-yr	663.00	752.14	755.42	755.47	757.04	0.018211	10.32	76.85	69.87	1.15
STONY BROOK CENT	6800	500-yr	1020.00	752.14	755.47	755.47	757.78	0.029455	13.29	135.18	123.11	1.47
STONY BROOK CENT	6750	Bankfull	277.00	750.85	752.65	752.96	753.78	0.032283	8.55	32.39	26.90	1.37
STONY BROOK CENT	6750	2-yr	116.00	750.85	752.09	752.23	752.71	0.029930	6.29	18.43	23.01	1.24
STONY BROOK CENT	6750	10-yr	292.00	750.85	752.69	753.01	753.86	0.032079	8.68	33.64	27.19	1.38
STONY BROOK CENT	6750	50-yr	535.00	750.85	753.20	753.69	755.11	0.036085	11.08	48.36	30.48	1.53
STONY BROOK CENT	6750	100-yr	663.00	750.85	753.42	754.00	755.71	0.036969	12.16	54.93	31.83	1.58
STONY BROOK CENT	6750	500-yr	1020.00	750.85	753.88	754.68	756.24	0.031876	13.12	117.00	82.07	1.52
STONY BROOK CENT	6700	Bankfull	277.00	748.93	750.71	751.08	752.03	0.037786	9.20	30.11	25.57	1.48
STONY BROOK CENT	6700	2-yr	116.00	748.93	750.09	750.34	750.92	0.042219	7.30	15.89	20.53	1.46
STONY BROOK CENT	6700	10-yr	292.00	748.93	750.76	751.13	752.11	0.037165	9.35	31.26	25.91	1.48
STONY BROOK CENT	6700	50-yr	535.00	748.93	751.37	751.85	753.39	0.032601	11.43	48.53	31.07	1.48
STONY BROOK CENT	6700	100-yr	663.00	748.93	751.63	751.85	753.98	0.031999	12.37	56.97	33.76	1.50
STONY BROOK CENT	6700	500-yr	1020.00	748.93	752.31	752.31	753.14	0.011947	9.11	246.11	139.95	0.96
STONY BROOK CENT	6650	Bankfull	277.00	746.96	748.79	749.19	749.83	0.047441	8.18	33.88	40.37	1.57
STONY BROOK CENT	6650	2-yr	116.00	746.96	748.18	748.42	748.95	0.036422	7.04	16.47	20.09	1.37
STONY BROOK CENT	6650	10-yr	292.00	746.96	748.82	749.23	749.90	0.048832	8.35	34.97	41.27	1.60
STONY BROOK CENT	6650	50-yr	535.00	746.96	749.15	749.66	750.83	0.081732	10.40	51.46	64.45	2.05
STONY BROOK CENT	6650	100-yr	663.00	746.96	749.23	749.82	751.33	0.096089	11.62	57.06	68.40	2.24
STONY BROOK CENT	6650	500-yr	1020.00	746.96	749.52	750.20	752.23	0.087898	13.23	77.46	73.89	2.24
STONY BROOK CENT	6600	Bankfull	277.00	745.18	747.40	747.09	747.70	0.008110	4.40	62.93	51.74	0.70
STONY BROOK CENT	6600	2-yr	116.00	745.18	746.32	746.49	746.94	0.042740	6.31	18.38	30.02	1.42
STONY BROOK CENT	6600	10-yr	292.00	745.18	747.47	747.13	747.77	0.007485	4.39	66.75	53.66	0.67

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	6600	50-yr	535.00	745.18	748.51	747.68	748.79	0.003425	4.35	146.90	98.35	0.50
STONY BROOK CENT	6600	100-yr	663.00	745.18	748.84	747.93	749.16	0.003266	4.64	182.51	120.28	0.50
STONY BROOK CENT	6600	500-yr	1020.00	745.18	749.68	748.55	750.04	0.002723	5.08	304.48	155.91	0.48
STONY BROOK CENT	6550	Bankfull	277.00	743.76	746.20	746.20	747.09	0.015895	7.58	36.56	20.81	1.01
STONY BROOK CENT	6550	2-yr	116.00	743.76	745.30	745.30	745.86	0.018212	6.02	19.28	17.48	1.01
STONY BROOK CENT	6550	10-yr	292.00	743.76	746.27	746.27	747.19	0.015789	7.68	38.00	21.04	1.01
STONY BROOK CENT	6550	50-yr	535.00	743.76	747.49	747.49	748.46	0.008954	8.02	88.91	96.02	0.82
STONY BROOK CENT	6550	100-yr	663.00	743.76	747.92	747.92	748.86	0.007678	8.14	134.69	115.55	0.78
STONY BROOK CENT	6550	500-yr	1020.00	743.76	748.48	748.48	749.72	0.009131	9.82	204.47	138.81	0.87
STONY BROOK CENT	6500	Bankfull	277.00	742.05	744.05	744.57	745.75	0.045802	10.47	26.45	20.88	1.64
STONY BROOK CENT	6500	2-yr	116.00	742.05	743.41	743.72	744.43	0.047705	8.09	14.33	17.31	1.57
STONY BROOK CENT	6500	10-yr	292.00	742.05	744.10	744.64	745.85	0.045658	10.63	27.47	21.15	1.64
STONY BROOK CENT	6500	50-yr	535.00	742.05	744.67	745.47	747.39	0.050926	13.25	40.38	24.08	1.80
STONY BROOK CENT	6500	100-yr	663.00	742.05	745.00	746.15	747.90	0.043990	13.68	48.59	25.76	1.72
STONY BROOK CENT	6500	500-yr	1020.00	742.05	746.01	747.09	748.85	0.025041	13.63	90.11	96.02	1.39
STONY BROOK CENT	6450	Bankfull	277.00	740.83	742.96	743.14	743.87	0.024876	7.64	36.25	29.16	1.21
STONY BROOK CENT	6450	2-yr	116.00	740.83	742.56	742.42	742.89	0.012327	4.57	25.37	26.12	0.82
STONY BROOK CENT	6450	10-yr	292.00	740.83	743.00	743.20	743.94	0.025365	7.80	37.42	29.58	1.22
STONY BROOK CENT	6450	50-yr	535.00	740.83	743.46	744.00	745.11	0.031400	10.29	52.23	34.21	1.42
STONY BROOK CENT	6450	100-yr	663.00	740.83	743.63	744.31	745.70	0.034797	11.55	58.74	44.20	1.52
STONY BROOK CENT	6450	500-yr	1020.00	740.83	744.01	745.10	747.22	0.042272	14.48	80.98	75.03	1.73
STONY BROOK CENT	6400	Bankfull	277.00	740.99	742.09	742.13	742.44	0.025393	4.77	58.02	97.72	1.09
STONY BROOK CENT	6400	2-yr	116.00	740.99	741.81	741.81	742.01	0.024588	3.53	32.87	85.03	1.00
STONY BROOK CENT	6400	10-yr	292.00	740.99	742.10	742.15	742.48	0.026475	4.92	59.38	98.71	1.12
STONY BROOK CENT	6400	50-yr	535.00	740.99	742.27	742.48	743.03	0.042353	6.99	76.82	114.77	1.46
STONY BROOK CENT	6400	100-yr	663.00	740.99	742.34	742.61	743.31	0.049732	7.90	84.82	121.89	1.59
STONY BROOK CENT	6400	500-yr	1020.00	740.99	742.47	742.95	744.11	0.067602	10.28	101.89	126.75	1.91
STONY BROOK CENT	6350	Bankfull	277.00	738.47	740.67	740.26	740.80	0.003525	3.46	139.44	105.75	0.48
STONY BROOK CENT	6350	2-yr	116.00	738.47	739.44	739.69	740.22	0.049471	7.05	16.45	25.37	1.54
STONY BROOK CENT	6350	10-yr	292.00	738.47	740.75	740.26	740.89	0.003270	3.45	148.45	107.34	0.47
STONY BROOK CENT	6350	50-yr	535.00	738.47	740.49	740.32	741.15	0.019898	7.61	120.91	102.60	1.12
STONY BROOK CENT	6350	100-yr	663.00	738.47	740.53	740.71	741.49	0.027820	9.16	124.94	103.55	1.33
STONY BROOK CENT	6350	500-yr	1020.00	738.47	740.88	740.88	742.30	0.031458	11.22	162.77	114.72	1.46
STONY BROOK CENT	6300	Bankfull	277.00	737.21	739.52	739.52	740.42	0.013451	7.66	40.62	28.44	0.96
STONY BROOK CENT	6300	2-yr	116.00	737.21	738.65	738.65	739.19	0.017416	5.89	19.81	19.44	0.99
STONY BROOK CENT	6300	10-yr	292.00	737.21	739.59	739.59	740.51	0.013333	7.80	42.52	29.21	0.96
STONY BROOK CENT	6300	50-yr	535.00	737.21	740.52	740.52	740.70	0.002969	4.73	287.04	153.03	0.48
STONY BROOK CENT	6300	100-yr	663.00	737.21	740.52	740.52	740.79	0.004560	5.86	287.03	153.03	0.60
STONY BROOK CENT	6300	500-yr	1020.00	737.21	740.52	740.52	741.16	0.010793	9.01	287.03	153.03	0.92
STONY BROOK CENT	6250	Bankfull	277.00	734.86	736.91	737.56	739.05	0.060817	11.72	23.63	19.48	1.87
STONY BROOK CENT	6250	2-yr	116.00	734.86	736.26	736.69	737.61	0.062365	9.34	12.42	14.68	1.79
STONY BROOK CENT	6250	10-yr	292.00	734.86	736.96	737.64	739.16	0.059299	11.88	24.58	19.81	1.86
STONY BROOK CENT	6250	50-yr	535.00	734.86	737.98	738.59	740.16	0.027054	11.91	48.32	26.54	1.39
STONY BROOK CENT	6250	100-yr	663.00	734.86	738.91	738.91	739.24	0.004383	6.01	271.43	147.00	0.59
STONY BROOK CENT	6250	500-yr	1020.00	734.86	738.92	738.92	739.69	0.010276	9.22	272.52	147.32	0.91
STONY BROOK CENT	6200	Bankfull	277.00	733.18	735.08	735.50	736.47	0.037346	9.44	29.33	23.26	1.48
STONY BROOK CENT	6200	2-yr	116.00	733.18	734.47	734.66	735.23	0.032647	6.99	16.58	18.74	1.31
STONY BROOK CENT	6200	10-yr	292.00	733.18	735.12	735.54	736.57	0.038261	9.67	30.20	23.53	1.50
STONY BROOK CENT	6200	50-yr	535.00	733.18	735.53	736.36	738.24	0.055119	13.20	40.56	26.55	1.86
STONY BROOK CENT	6200	100-yr	663.00	733.18	735.95	736.43	738.52	0.039625	12.87	52.15	29.58	1.63
STONY BROOK CENT	6200	500-yr	1020.00	733.18	736.64	736.64	737.61	0.014743	9.63	220.69	131.80	1.05
STONY BROOK CENT	6150	Bankfull	277.00	731.92	734.37	734.43	735.25	0.016681	7.58	37.55	26.71	1.04
STONY BROOK CENT	6150	2-yr	116.00	731.92	733.61	733.61	734.12	0.018319	5.75	20.18	19.73	1.00
STONY BROOK CENT	6150	10-yr	292.00	731.92	734.42	734.49	735.34	0.016557	7.72	39.08	27.36	1.04
STONY BROOK CENT	6150	50-yr	535.00	731.92	735.12	735.12	735.51	0.006940	6.27	190.09	130.62	0.71
STONY BROOK CENT	6150	100-yr	663.00	731.92	735.13	735.13	735.72	0.010531	7.74	191.06	131.05	0.88
STONY BROOK CENT	6150	500-yr	1020.00	731.92	735.20	735.54	736.52	0.022519	11.53	200.17	132.54	1.29
STONY BROOK CENT	6100	Bankfull	309.00	727.25	732.35	730.05	732.56	0.001994	3.66	84.52	27.89	0.37
STONY BROOK CENT	6100	2-yr	133.00	727.25	728.07	728.92	731.53	0.191438	14.93	8.91	11.64	3.01
STONY BROOK CENT	6100	10-yr	334.00	727.25	732.63	730.20	732.83	0.001861	3.61	92.41	29.55	0.36
STONY BROOK CENT	6100	50-yr	611.00	727.25	730.16	731.58	734.32	0.056777	16.36	37.34	15.57	1.86
STONY BROOK CENT	6100	100-yr	756.00	727.25	730.90	732.11	734.44	0.043403	15.11	50.05	19.45	1.66
STONY BROOK CENT	6100	500-yr	1160.00	727.25	733.88	733.17	734.69	0.005588	7.74	251.93	132.07	0.66
STONY BROOK CENT	6050		Culvert									
STONY BROOK CENT	6000	Bankfull	309.00	726.24	730.20	729.02	730.84	0.005042	6.42	48.14	12.84	0.58
STONY BROOK CENT	6000	2-yr	133.00	726.24	729.45	727.83	729.63	0.001750	3.45	38.59	12.58	0.35
STONY BROOK CENT	6000	10-yr	334.00	726.24	730.26	729.18	730.98	0.005649	6.84	48.86	12.86	0.62
STONY BROOK CENT	6000	50-yr	611.00	726.24	730.59	730.59	732.64	0.014926	11.49	53.17	12.98	1.00
STONY BROOK CENT	6000	100-yr	756.00	726.24	731.31	731.31	733.55	0.014051	12.03	63.37	16.29	0.99
STONY BROOK CENT	6000	500-yr	1160.00	726.24	732.92	732.92	733.97	0.006140	9.72	298.97	152.00	0.69
STONY BROOK CENT	5950	Bankfull	309.00	727.57	729.70	729.70	730.46	0.011627	7.00	44.17	28.93	1.00

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	5950	2-yr	133.00	727.57	728.88	728.91	729.41	0.014842	5.87	22.66	23.34	1.05
STONY BROOK CENT	5950	10-yr	334.00	727.57	729.79	729.79	730.58	0.011644	7.16	46.67	29.57	1.00
STONY BROOK CENT	5950	50-yr	611.00	727.57	730.47	730.71	731.69	0.013453	8.90	72.11	51.99	1.12
STONY BROOK CENT	5950	100-yr	756.00	727.57	730.27	731.20	732.59	0.027210	12.24	62.42	45.10	1.58
STONY BROOK CENT	5950	500-yr	1160.00	727.57	731.10	731.35	733.31	0.026354	12.08	109.94	73.46	1.56
STONY BROOK CENT	5900	Bankfull	309.00	726.26	728.02	728.48	729.47	0.033575	9.67	31.96	28.78	1.62
STONY BROOK CENT	5900	2-yr	133.00	726.26	727.48	727.74	728.33	0.031876	7.43	17.90	23.07	1.49
STONY BROOK CENT	5900	10-yr	334.00	726.26	728.09	728.56	729.59	0.033266	9.85	33.91	29.51	1.62
STONY BROOK CENT	5900	50-yr	611.00	726.26	728.72	729.30	730.66	0.029093	11.20	54.61	36.09	1.59
STONY BROOK CENT	5900	100-yr	756.00	726.26	728.95	729.61	731.20	0.027767	12.02	63.36	38.54	1.59
STONY BROOK CENT	5900	500-yr	1160.00	726.26	729.77	730.32	732.20	0.018321	12.56	98.77	49.99	1.37
STONY BROOK CENT	5850	Bankfull	309.00	724.44	725.92	726.36	727.38	0.053774	9.71	31.83	40.66	1.93
STONY BROOK CENT	5850	2-yr	133.00	724.44	725.60	725.82	726.34	0.049336	6.94	19.18	38.08	1.72
STONY BROOK CENT	5850	10-yr	334.00	724.44	725.96	726.44	727.51	0.053953	9.99	33.42	40.96	1.95
STONY BROOK CENT	5850	50-yr	611.00	724.44	726.34	727.03	728.69	0.053721	12.32	49.59	44.19	2.05
STONY BROOK CENT	5850	100-yr	756.00	724.44	726.50	727.31	729.25	0.054657	13.32	56.77	46.04	2.10
STONY BROOK CENT	5850	500-yr	1160.00	724.44	726.89	727.98	730.63	0.051682	15.52	75.55	49.48	2.14
STONY BROOK CENT	5800	Bankfull	309.00	722.30	724.60	724.79	725.66	0.021215	8.26	37.43	23.50	1.15
STONY BROOK CENT	5800	2-yr	133.00	722.30	723.70	723.88	724.49	0.028672	7.14	18.64	18.39	1.25
STONY BROOK CENT	5800	10-yr	334.00	722.30	724.71	724.88	725.79	0.020664	8.36	39.94	24.10	1.14
STONY BROOK CENT	5800	50-yr	611.00	722.30	725.62	725.78	727.07	0.016223	9.69	64.50	30.17	1.08
STONY BROOK CENT	5800	100-yr	756.00	722.30	726.05	726.30	727.65	0.014469	10.18	78.63	47.79	1.05
STONY BROOK CENT	5800	500-yr	1160.00	722.30	726.80	727.52	728.90	0.014534	11.90	142.25	132.44	1.10
STONY BROOK CENT	5750	Bankfull	309.00	720.71	722.50	723.00	724.15	0.041068	10.33	29.92	22.18	1.57
STONY BROOK CENT	5750	2-yr	133.00	720.71	721.88	722.15	722.81	0.039444	7.75	17.15	19.13	1.44
STONY BROOK CENT	5750	10-yr	334.00	720.71	722.57	723.12	724.31	0.041135	10.59	31.55	22.55	1.58
STONY BROOK CENT	5750	50-yr	611.00	720.71	723.25	724.00	725.75	0.041066	12.67	48.27	26.84	1.65
STONY BROOK CENT	5750	100-yr	756.00	720.71	723.54	724.41	726.40	0.039105	13.59	56.11	29.00	1.64
STONY BROOK CENT	5750	500-yr	1160.00	720.71	724.36	725.41	727.76	0.030105	14.86	83.85	38.10	1.52
STONY BROOK CENT	5700	Bankfull	309.00	718.89	720.55	720.97	721.88	0.046277	9.26	33.38	32.40	1.61
STONY BROOK CENT	5700	2-yr	133.00	718.89	720.05	720.27	720.81	0.038509	6.95	19.13	24.88	1.40
STONY BROOK CENT	5700	10-yr	334.00	718.89	720.60	721.06	722.01	0.047473	9.54	35.02	33.11	1.63
STONY BROOK CENT	5700	50-yr	611.00	718.89	721.05	721.73	723.26	0.057107	11.93	51.22	39.71	1.85
STONY BROOK CENT	5700	100-yr	756.00	718.89	721.19	722.02	723.92	0.062061	13.27	57.09	42.00	1.96
STONY BROOK CENT	5700	500-yr	1160.00	718.89	724.33	722.77	724.76	0.002322	5.56	357.44	193.41	0.46
STONY BROOK CENT	5650	Bankfull	309.00	717.71	720.15	720.15	721.00	0.015660	7.41	41.70	24.36	1.00
STONY BROOK CENT	5650	2-yr	133.00	717.71	719.25	719.25	719.82	0.017717	6.06	21.96	19.23	1.00
STONY BROOK CENT	5650	10-yr	334.00	717.71	720.24	720.24	721.14	0.015740	7.61	43.91	24.95	1.01
STONY BROOK CENT	5650	50-yr	611.00	717.71	721.16	721.16	722.43	0.013032	9.06	69.68	30.99	0.98
STONY BROOK CENT	5650	100-yr	756.00	717.71	721.56	721.56	723.01	0.012363	9.69	82.66	33.67	0.98
STONY BROOK CENT	5650	500-yr	1160.00	717.71	722.60	722.60	724.41	0.010592	10.91	122.96	44.52	0.95
STONY BROOK CENT	5600	Bankfull	309.00	716.88	718.72	719.05	719.85	0.034957	8.56	36.11	31.98	1.42
STONY BROOK CENT	5600	2-yr	133.00	716.88	718.25	718.33	718.79	0.023717	5.91	22.49	25.95	1.12
STONY BROOK CENT	5600	10-yr	334.00	716.88	718.77	719.13	719.98	0.035586	8.81	37.91	32.57	1.44
STONY BROOK CENT	5600	50-yr	611.00	716.88	719.21	719.82	721.25	0.045845	11.45	53.39	37.86	1.69
STONY BROOK CENT	5600	100-yr	756.00	716.88	719.40	720.15	721.83	0.047085	12.52	60.60	39.79	1.74
STONY BROOK CENT	5600	500-yr	1160.00	716.88	719.86	720.93	723.28	0.047128	14.85	80.32	48.84	1.82
STONY BROOK CENT	5550	Bankfull	309.00	715.60	717.04	717.28	717.94	0.038895	7.59	40.73	46.94	1.44
STONY BROOK CENT	5550	2-yr	133.00	715.60	716.63	716.79	717.18	0.046125	5.93	22.42	42.54	1.44
STONY BROOK CENT	5550	10-yr	334.00	715.60	717.08	717.35	718.03	0.039108	7.81	42.75	47.34	1.45
STONY BROOK CENT	5550	50-yr	611.00	715.60	717.49	717.94	718.96	0.039212	9.72	62.93	51.67	1.53
STONY BROOK CENT	5550	100-yr	756.00	715.60	717.64	718.20	719.43	0.041470	10.71	71.76	62.52	1.60
STONY BROOK CENT	5550	500-yr	1160.00	715.60	717.96	718.79	720.67	0.048715	13.25	93.65	72.81	1.79
STONY BROOK CENT	5500	Bankfull	309.00	714.08	715.30	715.49	716.10	0.033698	7.20	42.92	48.04	1.34
STONY BROOK CENT	5500	2-yr	133.00	714.08	714.95	715.01	715.34	0.028761	5.00	26.59	45.72	1.16
STONY BROOK CENT	5500	10-yr	334.00	714.08	715.34	715.55	716.19	0.033612	7.41	45.10	48.29	1.35
STONY BROOK CENT	5500	50-yr	611.00	714.08	715.75	716.12	717.11	0.034037	9.34	65.50	50.56	1.44
STONY BROOK CENT	5500	100-yr	756.00	714.08	715.95	716.38	717.52	0.033098	10.05	75.49	51.64	1.45
STONY BROOK CENT	5500	500-yr	1160.00	714.08	716.42	717.02	718.54	0.031994	11.71	100.20	54.03	1.48
STONY BROOK CENT	5450	Bankfull	309.00	712.16	714.25	714.26	714.90	0.017022	6.50	47.52	36.98	1.01
STONY BROOK CENT	5450	2-yr	133.00	712.16	713.56	713.61	714.03	0.023689	5.52	24.10	30.84	1.10
STONY BROOK CENT	5450	10-yr	334.00	712.16	714.33	714.33	715.00	0.016483	6.59	50.68	37.73	1.00
STONY BROOK CENT	5450	50-yr	611.00	712.16	714.98	715.02	715.98	0.014922	8.02	77.14	43.21	1.01
STONY BROOK CENT	5450	100-yr	756.00	712.16	715.27	715.31	716.42	0.014402	8.64	89.83	45.45	1.02
STONY BROOK CENT	5450	500-yr	1160.00	712.16	715.98	716.07	717.51	0.013333	9.98	123.88	50.74	1.03
STONY BROOK CENT	5400	Bankfull	309.00	710.71	712.69	712.99	713.70	0.033531	8.10	38.14	35.00	1.37
STONY BROOK CENT	5400	2-yr	133.00	710.71	712.19	712.29	712.74	0.027848	5.94	22.40	28.66	1.18
STONY BROOK CENT	5400	10-yr	334.00	710.71	712.74	713.07	713.82	0.034009	8.32	40.13	35.71	1.38
STONY BROOK CENT	5400	50-yr	611.00	710.71	713.26	713.70	714.80	0.037138	9.97	61.33	44.94	1.50
STONY BROOK CENT	5400	100-yr	756.00	710.71	713.45	713.97	715.27	0.037103	10.81	70.13	46.01	1.53
STONY BROOK CENT	5400	500-yr	1160.00	710.71	713.95	714.65	716.39	0.035094	12.56	93.46	48.72	1.55
STONY BROOK CENT	5350	Bankfull	309.00	709.02	710.72	711.07	711.94	0.036495	8.87	34.85	30.17	1.45

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	5350	2-yr	133.00	709.02	710.10	710.35	710.95	0.045924	7.39	18.00	24.41	1.52
STONY BROOK CENT	5350	10-yr	334.00	709.02	710.79	711.16	712.06	0.035907	9.03	36.98	30.76	1.45
STONY BROOK CENT	5350	50-yr	611.00	709.02	711.45	711.91	713.11	0.030976	10.32	59.20	36.09	1.42
STONY BROOK CENT	5350	100-yr	756.00	709.02	711.70	712.23	713.60	0.029613	11.08	69.27	42.73	1.42
STONY BROOK CENT	5350	500-yr	1160.00	709.02	712.29	713.01	714.83	0.027741	12.85	95.93	47.06	1.44
STONY BROOK CENT	5300	Bankfull	309.00	708.15	710.09	710.04	710.68	0.014758	6.15	50.24	38.10	0.94
STONY BROOK CENT	5300	2-yr	133.00	708.15	709.48	709.42	709.83	0.016205	4.73	28.14	34.14	0.92
STONY BROOK CENT	5300	10-yr	334.00	708.15	710.03	710.11	710.79	0.020001	6.98	47.82	37.67	1.09
STONY BROOK CENT	5300	50-yr	611.00	708.15	710.63	710.79	711.77	0.018750	8.59	71.74	42.84	1.12
STONY BROOK CENT	5300	100-yr	756.00	708.15	710.83	711.09	712.24	0.020171	9.55	80.61	45.16	1.18
STONY BROOK CENT	5300	500-yr	1160.00	708.15	711.31	711.95	713.45	0.023145	11.79	103.55	51.85	1.31
STONY BROOK CENT	5250	Bankfull	309.00	707.29	709.31	709.31	709.87	0.017549	5.99	51.58	46.45	1.00
STONY BROOK CENT	5250	2-yr	133.00	707.29	708.49	708.49	708.94	0.019240	5.36	24.81	28.32	1.01
STONY BROOK CENT	5250	10-yr	334.00	707.29	709.38	709.38	709.95	0.017835	6.07	55.02	49.17	1.01
STONY BROOK CENT	5250	50-yr	611.00	707.29	709.89	709.99	710.73	0.019576	7.38	83.90	64.62	1.10
STONY BROOK CENT	5250	100-yr	756.00	707.29	710.05	710.25	711.08	0.021889	8.16	95.13	76.67	1.18
STONY BROOK CENT	5250	500-yr	1160.00	707.29	711.23	710.79	711.86	0.006691	6.51	218.82	118.81	0.71
STONY BROOK CENT	5200	Bankfull	309.00	705.19	707.48	707.80	708.71	0.028525	8.90	34.72	24.47	1.32
STONY BROOK CENT	5200	2-yr	133.00	705.19	706.66	706.93	707.59	0.037123	7.71	17.24	18.46	1.41
STONY BROOK CENT	5200	10-yr	334.00	705.19	707.60	707.90	708.81	0.026286	8.82	37.86	25.42	1.27
STONY BROOK CENT	5200	50-yr	611.00	705.19	708.64	708.82	709.85	0.014979	8.94	81.40	56.08	1.03
STONY BROOK CENT	5200	100-yr	756.00	705.19	709.10	709.15	710.28	0.011949	8.96	108.07	60.15	0.95
STONY BROOK CENT	5200	500-yr	1160.00	705.19	709.93	709.93	711.36	0.010735	10.10	162.06	73.04	0.94
STONY BROOK CENT	5150	Bankfull	309.00	703.41	706.11	705.26	706.26	0.002760	3.11	99.31	59.90	0.43
STONY BROOK CENT	5150	2-yr	133.00	703.41	705.16	704.74	705.28	0.004449	2.79	47.61	48.30	0.50
STONY BROOK CENT	5150	10-yr	334.00	703.41	706.22	705.32	706.37	0.002641	3.16	105.77	60.85	0.42
STONY BROOK CENT	5150	50-yr	611.00	703.41	707.22	705.90	707.42	0.001971	3.65	171.69	71.29	0.39
STONY BROOK CENT	5150	100-yr	756.00	703.41	707.64	706.15	707.87	0.001855	3.90	202.52	75.23	0.39
STONY BROOK CENT	5150	500-yr	1160.00	703.41	705.60	706.72	709.84	0.108716	16.51	70.26	54.47	2.56
STONY BROOK CENT	5100	Bankfull	309.00	702.31	705.18	705.18	705.93	0.015866	6.92	44.65	29.76	1.00
STONY BROOK CENT	5100	2-yr	133.00	702.31	704.31	704.31	704.85	0.017744	5.87	22.65	21.01	1.00
STONY BROOK CENT	5100	10-yr	334.00	702.31	705.28	705.28	706.05	0.015748	7.05	47.41	30.66	1.00
STONY BROOK CENT	5100	50-yr	611.00	702.31	706.10	706.10	707.13	0.013959	8.15	76.53	39.72	0.99
STONY BROOK CENT	5100	100-yr	756.00	702.31	706.52	706.52	707.59	0.013500	8.34	94.08	46.50	0.98
STONY BROOK CENT	5100	500-yr	1160.00	702.31	707.04	707.04	708.13	0.013731	8.48	148.37	77.81	0.99
STONY BROOK CENT	5050	Bankfull	309.00	696.60	697.99	698.84	703.22	0.465681	18.36	16.83	32.60	4.50
STONY BROOK CENT	5050	2-yr	133.00	696.60	697.69	698.26	701.85	0.689062	16.37	8.12	25.08	5.07
STONY BROOK CENT	5050	10-yr	334.00	696.60	698.02	698.91	703.36	0.448563	18.54	18.02	33.43	4.45
STONY BROOK CENT	5050	50-yr	611.00	696.60	698.36	699.57	704.72	0.304676	20.23	30.21	36.73	3.93
STONY BROOK CENT	5050	100-yr	756.00	696.60	698.53	699.87	705.25	0.259766	20.80	36.35	37.56	3.73
STONY BROOK CENT	5050	500-yr	1160.00	696.60	699.01	700.60	705.90	0.166680	21.06	55.09	40.09	3.16
STONY BROOK CENT	5000	Bankfull	309.00	692.50	694.13	694.72	696.03	0.056126	11.08	27.88	23.64	1.80
STONY BROOK CENT	5000	2-yr	133.00	692.50	693.60	693.91	694.63	0.050747	8.16	16.29	20.37	1.61
STONY BROOK CENT	5000	10-yr	334.00	692.50	694.19	694.81	696.20	0.056531	11.39	29.33	24.00	1.82
STONY BROOK CENT	5000	50-yr	611.00	692.50	694.72	695.66	697.85	0.062152	14.19	43.05	27.05	1.98
STONY BROOK CENT	5000	100-yr	756.00	692.50	694.94	696.02	698.65	0.063674	15.47	48.91	27.81	2.04
STONY BROOK CENT	5000	500-yr	1160.00	692.50	695.49	696.98	700.54	0.062389	18.05	64.82	29.76	2.10
STONY BROOK CENT	4950	Bankfull	309.00	690.37	693.87	692.37	694.06	0.001915	3.54	87.41	31.39	0.37
STONY BROOK CENT	4950	2-yr	133.00	690.37	692.77	691.63	692.87	0.001484	2.44	54.44	28.70	0.31
STONY BROOK CENT	4950	10-yr	334.00	690.37	694.00	692.46	694.21	0.001958	3.65	91.42	31.72	0.38
STONY BROOK CENT	4950	50-yr	611.00	690.37	695.19	693.30	695.53	0.002145	4.69	131.19	35.55	0.42
STONY BROOK CENT	4950	100-yr	756.00	690.37	695.72	693.68	696.12	0.002152	5.11	150.50	37.29	0.43
STONY BROOK CENT	4950	500-yr	1160.00	690.37	696.99	694.59	697.56	0.002180	6.07	199.97	41.15	0.45
STONY BROOK CENT	4900	Bankfull	309.00	690.34	692.93	692.93	693.79	0.016240	7.41	41.70	24.77	1.01
STONY BROOK CENT	4900	2-yr	133.00	690.34	692.10	692.10	692.64	0.018829	5.92	22.46	21.13	1.01
STONY BROOK CENT	4900	10-yr	334.00	690.34	693.02	693.02	693.92	0.016117	7.60	43.97	25.20	1.01
STONY BROOK CENT	4900	50-yr	611.00	690.34	693.93	693.93	695.21	0.013646	9.10	68.64	29.35	0.99
STONY BROOK CENT	4900	100-yr	756.00	690.34	694.33	694.33	695.80	0.013025	9.76	80.63	31.60	0.99
STONY BROOK CENT	4900	500-yr	1160.00	690.34	695.33	695.33	697.21	0.011467	11.10	115.97	39.50	0.97
STONY BROOK CENT	4850	Bankfull	309.00	688.97	692.15	691.10	692.40	0.003262	4.05	76.26	34.14	0.48
STONY BROOK CENT	4850	2-yr	133.00	688.97	690.98	690.33	691.15	0.003765	3.30	40.33	27.65	0.48
STONY BROOK CENT	4850	10-yr	334.00	688.97	692.27	691.19	692.54	0.003249	4.14	80.62	34.83	0.48
STONY BROOK CENT	4850	50-yr	611.00	688.97	693.45	692.04	693.83	0.002875	4.99	125.39	41.58	0.48
STONY BROOK CENT	4850	100-yr	756.00	688.97	693.96	692.39	694.40	0.002733	5.34	147.58	44.85	0.48
STONY BROOK CENT	4850	500-yr	1160.00	688.97	695.17	693.23	695.76	0.002561	6.19	207.77	57.03	0.48
STONY BROOK CENT	4800	Bankfull	309.00	687.24	692.14		692.27	0.001143	2.90	106.65	34.91	0.29
STONY BROOK CENT	4800	2-yr	133.00	687.24	690.99		691.05	0.000702	1.93	69.03	29.14	0.22
STONY BROOK CENT	4800	10-yr	334.00	687.24	692.27		692.41	0.001180	3.01	111.08	35.47	0.30
STONY BROOK CENT	4800	50-yr	611.00	687.24	693.45		693.69	0.001419	3.98	157.10	42.38	0.34
STONY BROOK CENT	4800	100-yr	756.00	687.24	693.96		694.26	0.001468	4.37	179.70	44.97	0.35
STONY BROOK CENT	4800	500-yr	1160.00	687.24	695.19		695.61	0.001577	5.28	242.40	72.28	0.38
STONY BROOK CENT	4750	Bankfull	309.00	688.07	691.24	691.24	692.06	0.016080	7.29	42.38	26.01	1.01

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	4750	2-yr	133.00	688.07	690.31	690.31	690.90	0.018200	6.15	21.62	18.84	1.01
STONY BROOK CENT	4750	10-yr	334.00	688.07	691.33	691.33	692.19	0.016116	7.46	44.79	26.72	1.01
STONY BROOK CENT	4750	50-yr	611.00	688.07	692.20	692.20	693.43	0.013236	8.91	71.19	33.50	0.98
STONY BROOK CENT	4750	100-yr	756.00	688.07	692.60	692.60	693.99	0.012448	9.51	84.91	36.57	0.98
STONY BROOK CENT	4750	500-yr	1160.00	688.07	693.60	693.60	695.32	0.010629	10.68	127.07	52.61	0.95
STONY BROOK CENT	4700	Bankfull	309.00	684.78	686.96	687.86	690.16	0.106010	14.35	21.54	19.68	2.42
STONY BROOK CENT	4700	2-yr	133.00	684.78	686.24	687.00	688.84	0.114538	12.95	10.27	11.54	2.42
STONY BROOK CENT	4700	10-yr	334.00	684.78	687.03	687.97	690.32	0.103642	14.56	22.95	20.17	2.40
STONY BROOK CENT	4700	50-yr	611.00	684.78	687.69	688.87	691.78	0.085901	16.23	37.65	24.35	2.30
STONY BROOK CENT	4700	100-yr	756.00	684.78	687.97	689.23	692.40	0.079823	16.89	44.76	25.76	2.26
STONY BROOK CENT	4700	500-yr	1160.00	684.78	688.65	690.17	693.87	0.069736	18.33	63.29	28.96	2.19
STONY BROOK CENT	4650	Bankfull	309.00	685.36	687.73	687.73	688.42	0.016380	6.64	46.56	33.84	1.00
STONY BROOK CENT	4650	2-yr	133.00	685.36	686.99	686.99	687.46	0.019827	5.50	24.20	27.01	1.02
STONY BROOK CENT	4650	10-yr	334.00	685.36	687.82	687.82	688.53	0.016135	6.74	49.53	34.74	1.00
STONY BROOK CENT	4650	50-yr	611.00	685.36	688.58	688.58	689.52	0.014781	7.77	78.82	42.52	1.00
STONY BROOK CENT	4650	100-yr	756.00	685.36	688.86	688.91	689.94	0.015132	8.33	91.14	45.34	1.03
STONY BROOK CENT	4650	500-yr	1160.00	685.36	689.24	689.66	691.01	0.022307	10.71	109.21	50.19	1.26
STONY BROOK CENT	4600	Bankfull	309.00	682.35	683.96	684.77	686.63	0.085623	13.11	23.57	21.29	2.20
STONY BROOK CENT	4600	2-yr	133.00	682.35	683.35	683.93	685.32	0.117540	11.24	11.83	17.21	2.39
STONY BROOK CENT	4600	10-yr	334.00	682.35	684.04	684.86	686.76	0.084749	13.24	25.23	22.29	2.19
STONY BROOK CENT	4600	50-yr	611.00	682.35	684.72	685.67	687.92	0.068209	14.34	42.60	28.24	2.06
STONY BROOK CENT	4600	100-yr	756.00	682.35	685.02	686.06	688.38	0.058531	14.70	51.51	30.24	1.95
STONY BROOK CENT	4600	500-yr	1160.00	682.35	685.87	687.03	689.42	0.036867	15.16	79.26	35.48	1.66
STONY BROOK CENT	4550	Bankfull	309.00	681.21	683.26	683.41	684.24	0.021243	7.96	38.81	25.97	1.15
STONY BROOK CENT	4550	2-yr	133.00	681.21	682.60	682.60	683.12	0.018300	5.80	22.92	22.17	1.01
STONY BROOK CENT	4550	10-yr	334.00	681.21	683.34	683.50	684.37	0.021288	8.16	40.94	26.43	1.16
STONY BROOK CENT	4550	50-yr	611.00	681.21	684.00	684.35	685.66	0.022130	10.36	59.61	29.90	1.24
STONY BROOK CENT	4550	100-yr	756.00	681.21	684.28	684.74	686.26	0.022343	11.31	68.34	31.57	1.27
STONY BROOK CENT	4550	500-yr	1160.00	681.21	684.96	685.98	687.77	0.023058	13.51	91.51	37.47	1.35
STONY BROOK CENT	4500	Bankfull	309.00	679.80	682.51	682.11	683.02	0.008168	5.75	53.76	29.24	0.74
STONY BROOK CENT	4500	2-yr	133.00	679.80	681.56	681.26	681.88	0.008479	4.56	29.19	22.72	0.71
STONY BROOK CENT	4500	10-yr	334.00	679.80	682.60	682.20	683.14	0.008206	5.93	56.49	30.17	0.74
STONY BROOK CENT	4500	50-yr	611.00	679.80	682.60	683.09	684.42	0.027362	10.83	56.56	30.20	1.36
STONY BROOK CENT	4500	100-yr	756.00	679.80	682.87	683.47	685.01	0.027689	11.74	65.24	33.13	1.39
STONY BROOK CENT	4500	500-yr	1160.00	679.80	683.51	684.37	686.46	0.028783	13.84	87.69	37.01	1.47
STONY BROOK CENT	4450	Bankfull	309.00	678.88	681.62	681.62	682.44	0.015814	7.23	42.73	26.36	1.00
STONY BROOK CENT	4450	2-yr	133.00	678.88	680.69	680.69	681.26	0.017525	6.11	21.78	18.76	1.00
STONY BROOK CENT	4450	10-yr	334.00	678.88	681.72	681.72	682.57	0.015384	7.36	45.40	27.27	0.99
STONY BROOK CENT	4450	50-yr	611.00	678.88	682.58	682.58	683.79	0.013366	8.86	71.19	32.78	0.99
STONY BROOK CENT	4450	100-yr	756.00	678.88	683.17	683.17	684.14	0.008640	8.21	137.03	98.86	0.82
STONY BROOK CENT	4450	500-yr	1160.00	678.88	683.52	683.88	685.14	0.013044	10.84	171.89	100.80	1.03
STONY BROOK CENT	4400	Bankfull	309.00	676.21	677.88	678.70	680.68	0.086605	13.44	22.99	20.18	2.22
STONY BROOK CENT	4400	2-yr	133.00	676.21	677.25	677.84	679.30	0.116292	11.48	11.59	16.20	2.39
STONY BROOK CENT	4400	10-yr	334.00	676.21	677.95	678.80	680.84	0.086586	13.63	24.50	21.05	2.23
STONY BROOK CENT	4400	50-yr	611.00	676.21	678.59	679.66	682.23	0.075461	15.30	39.93	25.89	2.17
STONY BROOK CENT	4400	100-yr	756.00	676.21	678.85	680.04	682.88	0.071494	16.11	46.94	27.24	2.15
STONY BROOK CENT	4400	500-yr	1160.00	676.21	679.75	680.98	683.81	0.042764	16.19	73.53	31.98	1.77
STONY BROOK CENT	4350	Bankfull	309.00	676.00	678.15	678.12	678.81	0.015335	6.56	47.13	33.44	0.97
STONY BROOK CENT	4350	2-yr	133.00	676.00	677.53	677.41	677.88	0.012633	4.73	28.13	28.27	0.84
STONY BROOK CENT	4350	10-yr	334.00	676.00	678.21	678.20	678.92	0.015524	6.76	49.38	33.96	0.99
STONY BROOK CENT	4350	50-yr	611.00	676.00	678.84	678.93	680.00	0.015870	8.65	72.06	38.82	1.06
STONY BROOK CENT	4350	100-yr	756.00	676.00	679.02	679.26	680.51	0.018273	9.83	79.33	40.25	1.15
STONY BROOK CENT	4350	500-yr	1160.00	676.00	679.55	680.10	681.81	0.021006	12.13	101.92	44.43	1.28
STONY BROOK CENT	4300	Bankfull	309.00	674.68	677.35	677.35	678.02	0.016620	6.55	47.17	35.40	1.00
STONY BROOK CENT	4300	2-yr	133.00	674.68	676.66	676.66	677.10	0.019137	5.30	25.07	28.78	1.00
STONY BROOK CENT	4300	10-yr	334.00	674.68	677.43	677.43	678.12	0.016312	6.66	50.14	36.17	1.00
STONY BROOK CENT	4300	50-yr	611.00	674.68	677.97	678.12	679.14	0.018713	8.71	70.84	41.27	1.12
STONY BROOK CENT	4300	100-yr	756.00	674.68	678.30	678.44	679.59	0.016633	9.15	84.89	44.34	1.09
STONY BROOK CENT	4300	500-yr	1160.00	674.68	678.88	679.23	680.74	0.017607	11.01	112.37	49.85	1.16
STONY BROOK CENT	4250	Bankfull	309.00	674.28	675.92	676.15	676.81	0.036123	7.58	40.76	44.48	1.40
STONY BROOK CENT	4250	2-yr	133.00	674.28	675.52	675.61	675.98	0.026711	5.41	24.58	35.51	1.15
STONY BROOK CENT	4250	10-yr	334.00	674.28	675.96	676.21	676.91	0.036801	7.82	42.70	45.07	1.42
STONY BROOK CENT	4250	50-yr	611.00	674.28	676.40	676.79	677.85	0.035921	9.68	63.17	48.04	1.48
STONY BROOK CENT	4250	100-yr	756.00	674.28	676.56	677.06	678.33	0.038274	10.70	70.82	49.01	1.55
STONY BROOK CENT	4250	500-yr	1160.00	674.28	677.00	677.73	679.45	0.037845	12.56	93.40	52.54	1.61
STONY BROOK CENT	4200	Bankfull	309.00	673.16	674.75	674.82	675.38	0.021155	6.35	48.64	46.42	1.09
STONY BROOK CENT	4200	2-yr	133.00	673.16	674.24	674.29	674.64	0.026157	5.10	26.06	40.59	1.12
STONY BROOK CENT	4200	10-yr	334.00	673.16	674.81	674.89	675.47	0.020879	6.50	51.37	46.87	1.09
STONY BROOK CENT	4200	50-yr	611.00	673.16	675.26	675.46	676.35	0.022172	8.38	73.42	50.34	1.19
STONY BROOK CENT	4200	100-yr	756.00	673.16	675.47	675.73	676.76	0.022224	9.12	83.94	51.53	1.22
STONY BROOK CENT	4200	500-yr	1160.00	673.16	675.93	676.38	677.81	0.023653	11.02	108.45	54.25	1.31
STONY BROOK CENT	4150	Bankfull	309.00	671.50	673.87	673.87	674.56	0.016845	6.66	46.39	34.45	1.01

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	4150	2-yr	133.00	671.50	673.05	673.13	673.62	0.024396	6.04	22.04	25.14	1.14
STONY BROOK CENT	4150	10-yr	334.00	671.50	673.95	673.95	674.67	0.016665	6.78	49.28	35.37	1.01
STONY BROOK CENT	4150	50-yr	611.00	671.50	674.71	674.71	675.64	0.015266	7.72	79.10	43.61	1.01
STONY BROOK CENT	4150	100-yr	756.00	671.50	675.01	675.01	676.05	0.014618	8.18	92.72	47.48	1.01
STONY BROOK CENT	4150	500-yr	1160.00	671.50	675.72	675.72	677.05	0.012671	9.27	129.22	55.51	0.99
STONY BROOK CENT	4100	Bankfull	309.00	669.43	671.24	671.82	673.09	0.050215	10.94	28.25	22.45	1.72
STONY BROOK CENT	4100	2-yr	133.00	669.43	670.60	670.97	671.78	0.056282	8.72	15.25	18.68	1.70
STONY BROOK CENT	4100	10-yr	334.00	669.43	671.32	671.93	673.22	0.048589	11.06	30.19	22.98	1.70
STONY BROOK CENT	4100	50-yr	611.00	669.43	672.14	672.81	674.38	0.036737	12.02	50.84	27.53	1.56
STONY BROOK CENT	4100	100-yr	756.00	669.43	672.50	673.20	674.87	0.032434	12.34	61.26	28.98	1.49
STONY BROOK CENT	4100	500-yr	1160.00	669.43	674.80	674.09	675.98	0.006457	8.76	140.74	41.48	0.75
STONY BROOK CENT	4040		Culvert									
STONY BROOK CENT	4000	Bankfull	309.00	666.79	669.34	668.86	669.70	0.005878	4.86	65.29	39.95	0.63
STONY BROOK CENT	4000	2-yr	133.00	666.79	668.27	668.18	668.63	0.014476	4.85	27.43	29.45	0.89
STONY BROOK CENT	4000	10-yr	334.00	666.79	669.45	668.93	669.83	0.005616	4.95	69.86	40.82	0.62
STONY BROOK CENT	4000	50-yr	611.00	666.79	670.63	669.65	671.10	0.003753	5.54	123.38	50.80	0.55
STONY BROOK CENT	4000	100-yr	756.00	666.79	671.16	669.98	671.67	0.003358	5.81	151.81	57.43	0.54
STONY BROOK CENT	4000	500-yr	1160.00	666.79	672.10	670.80	672.81	0.003529	6.94	211.83	70.67	0.57
STONY BROOK CENT	3950	Bankfull	309.00	665.00	668.28	668.28	669.19	0.015843	7.68	40.25	22.35	1.01
STONY BROOK CENT	3950	2-yr	133.00	665.00	667.40	667.27	667.92	0.013295	5.81	22.90	16.99	0.88
STONY BROOK CENT	3950	10-yr	334.00	665.00	668.40	668.40	669.34	0.015248	7.77	42.98	23.05	1.00
STONY BROOK CENT	3950	50-yr	611.00	665.00	669.36	669.38	670.70	0.012922	9.30	68.95	32.34	0.98
STONY BROOK CENT	3950	100-yr	756.00	665.00	669.85	669.88	671.30	0.011406	9.72	88.06	53.60	0.94
STONY BROOK CENT	3950	500-yr	1160.00	665.00	671.04	671.04	672.48	0.008169	10.10	175.91	85.22	0.84
STONY BROOK CENT	3900	Bankfull	309.00	665.01	667.24	667.44	668.23	0.023905	8.00	38.64	28.25	1.21
STONY BROOK CENT	3900	2-yr	133.00	665.01	666.64	666.64	667.15	0.017932	5.71	23.29	22.80	1.00
STONY BROOK CENT	3900	10-yr	334.00	665.01	667.29	667.52	668.36	0.024978	8.30	40.24	28.76	1.24
STONY BROOK CENT	3900	50-yr	611.00	665.01	667.80	668.38	669.68	0.031713	11.01	56.15	38.77	1.45
STONY BROOK CENT	3900	100-yr	756.00	665.01	668.00	668.70	670.30	0.033624	12.19	64.72	44.75	1.52
STONY BROOK CENT	3900	500-yr	1160.00	665.01	668.60	669.46	671.60	0.031494	14.06	95.59	55.34	1.54
STONY BROOK CENT	3850	Bankfull	309.00	663.28	665.02	665.50	666.57	0.044578	9.99	30.93	25.84	1.61
STONY BROOK CENT	3850	2-yr	133.00	663.28	664.39	664.74	665.53	0.066099	8.56	15.55	22.22	1.80
STONY BROOK CENT	3850	10-yr	334.00	663.28	665.10	665.59	666.70	0.042946	10.13	32.98	26.23	1.59
STONY BROOK CENT	3850	50-yr	611.00	663.28	665.78	666.41	667.93	0.037299	11.77	51.92	29.40	1.56
STONY BROOK CENT	3850	100-yr	756.00	663.28	666.05	666.76	668.52	0.036582	12.61	60.00	30.63	1.57
STONY BROOK CENT	3850	500-yr	1160.00	663.28	666.72	667.67	669.96	0.032854	14.47	81.42	33.65	1.56
STONY BROOK CENT	3800	Bankfull	309.00	662.59	664.56	664.56	665.20	0.016544	6.43	48.09	37.35	1.00
STONY BROOK CENT	3800	2-yr	133.00	662.59	663.92	663.92	664.33	0.019458	5.13	25.91	31.96	1.00
STONY BROOK CENT	3800	10-yr	334.00	662.59	664.63	664.63	665.30	0.016272	6.56	50.92	37.93	1.00
STONY BROOK CENT	3800	50-yr	611.00	662.59	665.11	665.29	666.32	0.019928	8.86	69.69	41.40	1.16
STONY BROOK CENT	3800	100-yr	756.00	662.59	665.28	665.61	666.83	0.022452	10.00	76.99	42.71	1.25
STONY BROOK CENT	3800	500-yr	1160.00	662.59	665.66	666.39	668.20	0.029151	12.82	93.93	45.50	1.47
STONY BROOK CENT	3750	Bankfull	309.00	659.16	661.09	661.89	663.48	0.076912	12.41	24.89	22.62	2.08
STONY BROOK CENT	3750	2-yr	133.00	659.16	660.46	661.00	662.29	0.104181	10.84	12.27	17.21	2.26
STONY BROOK CENT	3750	10-yr	334.00	659.16	661.16	661.97	663.61	0.073829	12.56	26.60	23.01	2.06
STONY BROOK CENT	3750	50-yr	611.00	659.16	661.85	662.63	664.48	0.071407	13.00	47.00	37.54	2.05
STONY BROOK CENT	3750	100-yr	756.00	659.16	664.15	662.92	664.57	0.003163	5.28	148.26	47.45	0.51
STONY BROOK CENT	3750	500-yr	1160.00	659.16	666.79	663.62	667.09	0.001063	4.49	281.75	54.49	0.32
STONY BROOK CENT	3700	Bankfull	347.00	656.59	660.70	658.42	660.84	0.001083	3.03	114.45	32.22	0.28
STONY BROOK CENT	3700	2-yr	155.00	656.59	658.98	657.68	659.08	0.001344	2.49	62.14	28.43	0.30
STONY BROOK CENT	3700	10-yr	387.00	656.59	661.01	658.56	661.16	0.001048	3.10	124.64	32.87	0.28
STONY BROOK CENT	3700	50-yr	706.00	656.59	663.22	659.50	663.41	0.000780	3.52	202.12	37.28	0.26
STONY BROOK CENT	3700	100-yr	873.00	656.59	664.24	659.91	664.45	0.000693	3.70	241.06	39.30	0.25
STONY BROOK CENT	3700	500-yr	1340.00	656.59	666.78	660.94	667.04	0.000558	4.10	347.98	44.67	0.24
STONY BROOK CENT	3650		Culvert									
STONY BROOK CENT	3600	Bankfull	347.00	654.65	656.55	656.48	657.21	0.010182	6.50	53.36	35.19	0.93
STONY BROOK CENT	3600	2-yr	155.00	654.65	655.83	655.83	656.27	0.013643	5.33	29.06	32.42	0.99
STONY BROOK CENT	3600	10-yr	387.00	654.65	656.70	656.59	657.38	0.009410	6.59	58.75	35.76	0.91
STONY BROOK CENT	3600	50-yr	706.00	654.65	657.76	657.36	658.58	0.005960	7.26	98.23	38.48	0.78
STONY BROOK CENT	3600	100-yr	873.00	654.65	658.26	657.71	659.15	0.005140	7.56	117.78	39.64	0.75
STONY BROOK CENT	3600	500-yr	1340.00	654.65	659.52	658.59	660.58	0.003958	8.28	169.50	42.70	0.69
STONY BROOK CENT	3550	Bankfull	347.00	653.41	655.80	655.80	656.64	0.011623	7.36	47.13	28.03	1.00
STONY BROOK CENT	3550	2-yr	155.00	653.41	654.97	655.01	655.55	0.014828	6.11	25.38	24.30	1.05
STONY BROOK CENT	3550	10-yr	387.00	653.41	655.93	655.93	656.83	0.011444	7.64	50.70	28.52	1.00
STONY BROOK CENT	3550	50-yr	706.00	653.41	656.84	656.84	658.15	0.009949	9.20	78.17	32.05	0.99
STONY BROOK CENT	3550	100-yr	873.00	653.41	657.24	657.24	658.75	0.009424	9.85	91.58	33.63	0.99
STONY BROOK CENT	3550	500-yr	1340.00	653.41	658.27	658.27	660.22	0.008380	11.25	128.24	37.76	0.98
STONY BROOK CENT	3500	Bankfull	347.00	652.28	654.74	654.99	655.89	0.018659	8.61	40.28	27.32	1.25
STONY BROOK CENT	3500	2-yr	155.00	652.28	654.13	654.22	654.75	0.017059	6.35	24.42	24.70	1.13
STONY BROOK CENT	3500	10-yr	387.00	652.28	654.85	655.13	656.09	0.018765	8.95	43.25	27.79	1.26
STONY BROOK CENT	3500	50-yr	706.00	652.28	655.58	656.02	657.44	0.018166	10.94	64.78	30.93	1.31

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	3500	100-yr	873.00	652.28	655.90	656.42	658.04	0.017779	11.75	75.08	32.36	1.32
STONY BROOK CENT	3500	500-yr	1340.00	652.28	656.69	657.39	659.55	0.016758	13.60	101.77	35.65	1.34
STONY BROOK CENT	3450	Bankfull	347.00	650.77	652.01	652.69	654.24	0.060305	11.99	28.94	29.15	2.12
STONY BROOK CENT	3450	2-yr	155.00	650.77	651.53	651.97	653.06	0.080890	9.94	15.60	26.10	2.26
STONY BROOK CENT	3450	10-yr	387.00	650.77	652.09	652.80	654.44	0.058252	12.30	31.46	29.68	2.11
STONY BROOK CENT	3450	50-yr	706.00	650.77	652.65	653.60	655.87	0.051469	14.39	49.06	33.17	2.09
STONY BROOK CENT	3450	100-yr	873.00	650.77	652.90	653.96	656.52	0.048416	15.27	57.27	34.65	2.07
STONY BROOK CENT	3450	500-yr	1340.00	650.77	653.50	654.89	658.12	0.041553	17.27	79.18	38.49	2.01
STONY BROOK CENT	3400	Bankfull	347.00	649.23	652.05	652.05	652.81	0.016093	6.97	49.77	33.00	1.00
STONY BROOK CENT	3400	2-yr	155.00	649.23	651.28	651.28	651.79	0.017908	5.77	26.86	25.74	1.00
STONY BROOK CENT	3400	10-yr	387.00	649.23	652.18	652.18	652.98	0.015836	7.18	53.95	35.64	1.00
STONY BROOK CENT	3400	50-yr	706.00	649.23	653.03	653.03	654.09	0.012653	8.35	93.91	55.47	0.95
STONY BROOK CENT	3400	100-yr	873.00	649.23	653.19	653.38	654.59	0.015302	9.60	103.13	56.86	1.06
STONY BROOK CENT	3400	500-yr	1340.00	649.23	653.56	654.21	655.97	0.022368	12.70	124.51	59.47	1.31
STONY BROOK CENT	3350	Bankfull	347.00	647.29	648.50	649.18	650.94	0.114436	12.53	27.69	33.57	2.43
STONY BROOK CENT	3350	2-yr	155.00	647.29	648.11	648.55	649.71	0.148354	10.13	15.31	31.13	2.54
STONY BROOK CENT	3350	10-yr	387.00	647.29	648.57	649.29	651.13	0.109924	12.86	30.10	34.06	2.41
STONY BROOK CENT	3350	50-yr	706.00	647.29	649.05	650.03	652.51	0.090853	14.92	47.32	36.98	2.32
STONY BROOK CENT	3350	100-yr	873.00	647.29	649.32	650.36	652.91	0.076259	15.19	57.46	38.30	2.18
STONY BROOK CENT	3350	500-yr	1340.00	647.29	649.95	651.19	654.11	0.057124	16.38	82.56	41.36	1.99
STONY BROOK CENT	3300	Bankfull	347.00	645.02	648.56	647.58	648.91	0.004083	4.73	73.42	30.60	0.54
STONY BROOK CENT	3300	2-yr	155.00	645.02	647.57	646.74	647.75	0.003164	3.40	45.59	25.95	0.45
STONY BROOK CENT	3300	10-yr	387.00	645.02	648.72	647.74	649.10	0.004217	4.94	78.35	31.40	0.55
STONY BROOK CENT	3300	50-yr	706.00	645.02	649.82	648.73	650.42	0.004169	6.25	115.40	36.51	0.58
STONY BROOK CENT	3300	100-yr	873.00	645.02	650.33	649.11	651.03	0.004064	6.75	134.80	39.11	0.59
STONY BROOK CENT	3300	500-yr	1340.00	645.02	651.60	650.10	652.53	0.003785	7.79	194.97	53.45	0.59
STONY BROOK CENT	3250	Bankfull	347.00	644.59	648.14	647.49	648.64	0.006310	5.68	61.08	27.02	0.66
STONY BROOK CENT	3250	2-yr	155.00	644.59	647.37	646.58	647.58	0.003644	3.70	41.85	23.07	0.48
STONY BROOK CENT	3250	10-yr	387.00	644.59	648.25	647.64	648.82	0.006691	6.04	64.17	27.94	0.69
STONY BROOK CENT	3250	50-yr	706.00	644.59	648.97	648.67	650.07	0.009271	8.46	86.98	34.67	0.84
STONY BROOK CENT	3250	100-yr	873.00	644.59	649.39	649.11	650.68	0.009212	9.17	101.95	36.68	0.86
STONY BROOK CENT	3250	500-yr	1340.00	644.59	650.31	650.17	652.15	0.009765	11.01	137.90	41.37	0.92
STONY BROOK CENT	3200	Bankfull	347.00	644.79	647.96	647.06	648.35	0.004369	4.99	69.58	27.84	0.55
STONY BROOK CENT	3200	2-yr	155.00	644.79	647.28	646.23	647.42	0.002170	3.02	51.31	25.84	0.38
STONY BROOK CENT	3200	10-yr	387.00	644.79	648.05	647.20	648.50	0.004841	5.36	72.19	28.22	0.59
STONY BROOK CENT	3200	50-yr	706.00	644.79	648.55	648.18	649.60	0.009107	8.21	86.74	30.30	0.82
STONY BROOK CENT	3200	100-yr	873.00	644.79	648.72	648.60	650.16	0.011653	9.62	91.92	31.21	0.94
STONY BROOK CENT	3200	500-yr	1340.00	644.79	649.74	649.74	651.63	0.010795	11.11	132.72	45.94	0.95
STONY BROOK CENT	3150	Bankfull	347.00	645.49	647.35	647.35	647.94	0.016892	6.20	55.95	46.69	1.00
STONY BROOK CENT	3150	2-yr	155.00	645.49	646.76	646.76	647.15	0.019552	5.04	30.78	39.23	1.00
STONY BROOK CENT	3150	10-yr	387.00	645.49	647.45	647.45	648.08	0.016414	6.35	60.95	48.04	0.99
STONY BROOK CENT	3150	50-yr	706.00	645.49	648.08	648.08	648.99	0.014263	7.67	93.91	55.93	0.99
STONY BROOK CENT	3150	100-yr	873.00	645.49	648.37	648.37	649.41	0.013534	8.21	110.31	59.41	0.99
STONY BROOK CENT	3150	500-yr	1340.00	645.49	648.43	649.10	650.75	0.029142	12.26	113.79	60.27	1.45
STONY BROOK CENT	3100	Bankfull	347.00	643.62	644.98	645.42	646.42	0.058956	9.65	35.98	39.52	1.78
STONY BROOK CENT	3100	2-yr	155.00	643.62	644.56	644.84	645.46	0.066937	7.59	20.41	35.36	1.76
STONY BROOK CENT	3100	10-yr	387.00	643.62	645.05	645.53	646.59	0.057695	9.95	38.91	40.16	1.78
STONY BROOK CENT	3100	50-yr	706.00	643.62	645.57	646.22	647.70	0.046540	11.72	62.07	50.73	1.71
STONY BROOK CENT	3100	100-yr	873.00	643.62	645.81	646.55	648.17	0.042329	12.38	74.79	55.10	1.67
STONY BROOK CENT	3100	500-yr	1340.00	643.62	648.07	647.32	648.48	0.003207	5.99	433.75	173.98	0.53
STONY BROOK CENT	3050	Bankfull	347.00	641.40	643.82	643.92	644.77	0.018199	7.81	44.44	27.27	1.08
STONY BROOK CENT	3050	2-yr	155.00	641.40	643.03	643.09	643.65	0.021007	6.33	24.49	23.13	1.08
STONY BROOK CENT	3050	10-yr	387.00	641.40	643.97	644.06	644.96	0.017710	7.99	48.41	28.08	1.07
STONY BROOK CENT	3050	50-yr	706.00	641.40	644.83	644.99	646.25	0.015339	9.60	76.97	38.78	1.06
STONY BROOK CENT	3050	100-yr	873.00	641.40	645.24	645.47	646.81	0.013987	10.14	94.38	48.95	1.04
STONY BROOK CENT	3050	500-yr	1340.00	641.40	646.33	646.33	648.08	0.010607	10.90	157.06	62.52	0.96
STONY BROOK CENT	3000	Bankfull	347.00	639.64	643.55	642.21	643.78	0.002706	3.83	90.58	38.49	0.44
STONY BROOK CENT	3000	2-yr	155.00	639.64	642.30	641.32	642.45	0.002688	3.15	49.17	27.73	0.42
STONY BROOK CENT	3000	10-yr	387.00	639.64	643.74	642.36	643.98	0.002603	3.95	98.10	40.13	0.44
STONY BROOK CENT	3000	50-yr	706.00	639.64	645.06	643.35	645.41	0.002123	4.71	159.46	53.98	0.42
STONY BROOK CENT	3000	100-yr	873.00	639.64	644.90	643.71	645.47	0.003771	6.10	150.62	52.38	0.56
STONY BROOK CENT	3000	500-yr	1340.00	639.64	646.04	644.57	646.41	0.002144	5.50	464.64	169.21	0.44
STONY BROOK CENT	2950	Bankfull	347.00	639.26	642.46	642.46	643.43	0.015583	7.91	43.87	22.95	1.01
STONY BROOK CENT	2950	2-yr	155.00	639.26	641.46	641.46	642.13	0.016840	6.57	23.59	17.40	0.99
STONY BROOK CENT	2950	10-yr	387.00	639.26	642.64	642.64	643.65	0.015030	8.04	48.13	23.89	1.00
STONY BROOK CENT	2950	50-yr	706.00	639.26	643.64	643.64	645.08	0.013360	9.62	74.50	28.47	1.00
STONY BROOK CENT	2950	100-yr	873.00	639.26	644.22	644.22	645.17	0.008106	8.46	175.53	111.41	0.80
STONY BROOK CENT	2950	500-yr	1340.00	639.26	644.95	644.95	646.13	0.008519	9.85	260.75	119.28	0.85
STONY BROOK CENT	2900	Bankfull	347.00	638.83	640.89	641.28	642.35	0.029002	9.67	35.89	22.36	1.34
STONY BROOK CENT	2900	2-yr	155.00	638.83	640.17	640.37	641.03	0.028964	7.45	20.81	19.40	1.27
STONY BROOK CENT	2900	10-yr	387.00	638.83	641.02	641.42	642.57	0.029047	10.01	38.67	22.86	1.36
STONY BROOK CENT	2900	50-yr	706.00	638.83	641.85	642.44	644.07	0.027383	11.94	59.36	26.59	1.38

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	2900	100-yr	873.00	638.83	642.60	642.94	644.52	0.016504	11.14	81.40	37.95	1.12
STONY BROOK CENT	2900	500-yr	1340.00	638.83	643.66	643.66	644.75	0.008265	9.61	283.48	136.92	0.83
STONY BROOK CENT	2850	Bankfull	347.00	637.91	640.28	640.30	641.10	0.016147	7.27	47.75	29.92	1.01
STONY BROOK CENT	2850	2-yr	155.00	637.91	639.68	639.52	640.07	0.011500	5.01	30.92	26.36	0.82
STONY BROOK CENT	2850	10-yr	387.00	637.91	640.37	640.42	641.28	0.017195	7.68	50.39	30.46	1.05
STONY BROOK CENT	2850	50-yr	706.00	637.91	640.86	641.34	642.65	0.024170	10.75	66.35	36.09	1.30
STONY BROOK CENT	2850	100-yr	873.00	637.91	641.01	641.75	643.39	0.029208	12.38	72.18	39.94	1.45
STONY BROOK CENT	2850	500-yr	1340.00	637.91	642.34	642.34	643.34	0.008710	9.17	292.91	161.18	0.85
STONY BROOK CENT	2800	Bankfull	347.00	636.04	640.08	638.75	640.24	0.002191	3.21	108.34	53.73	0.39
STONY BROOK CENT	2800	2-yr	155.00	636.04	639.84	637.92	639.88	0.000635	1.62	95.91	51.03	0.21
STONY BROOK CENT	2800	10-yr	387.00	636.04	640.15	638.88	640.34	0.002419	3.45	112.42	54.52	0.41
STONY BROOK CENT	2800	50-yr	706.00	636.04	640.62	639.77	641.03	0.004157	5.16	139.27	60.42	0.56
STONY BROOK CENT	2800	100-yr	873.00	636.04	640.89	640.06	641.27	0.003693	5.19	244.30	137.05	0.54
STONY BROOK CENT	2800	500-yr	1340.00	636.04	641.40	640.71	641.97	0.004660	6.50	315.75	142.97	0.62
STONY BROOK CENT	2750	Bankfull	347.00	638.46	639.58	639.58	639.95	0.027916	5.73	96.04	134.15	1.18
STONY BROOK CENT	2750	2-yr	155.00	638.46	639.44	639.44	639.76	0.021192	4.55	34.09	53.94	1.01
STONY BROOK CENT	2750	10-yr	387.00	638.46	639.64	639.64	640.03	0.026229	5.88	104.75	135.65	1.16
STONY BROOK CENT	2750	50-yr	706.00	638.46	640.03	640.03	640.61	0.023092	7.18	158.16	141.96	1.17
STONY BROOK CENT	2750	100-yr	873.00	638.46	640.21	640.21	640.87	0.021681	7.66	184.45	144.88	1.16
STONY BROOK CENT	2750	500-yr	1340.00	638.46	640.66	640.66	641.52	0.019594	8.80	250.12	149.68	1.15
STONY BROOK CENT	2700	Bankfull	347.00	634.50	636.38	636.93	637.98	0.051317	10.12	34.27	31.44	1.71
STONY BROOK CENT	2700	2-yr	155.00	634.50	635.59	636.16	637.52	0.114842	11.17	13.87	20.11	2.37
STONY BROOK CENT	2700	10-yr	387.00	634.50	636.48	637.05	638.14	0.049918	10.33	37.46	32.64	1.70
STONY BROOK CENT	2700	50-yr	706.00	634.50	637.17	637.72	639.04	0.037371	11.04	70.63	62.01	1.55
STONY BROOK CENT	2700	100-yr	873.00	634.50	638.14	638.06	638.71	0.007466	6.79	227.96	145.36	0.75
STONY BROOK CENT	2700	500-yr	1340.00	634.50	638.75	638.46	639.46	0.007487	7.84	317.73	152.38	0.78
STONY BROOK CENT	2650	Bankfull	347.00	633.92	636.55	636.55	637.15	0.014598	6.48	71.54	74.89	0.95
STONY BROOK CENT	2650	2-yr	155.00	633.92	635.79	635.79	636.27	0.016168	5.67	31.12	38.29	0.96
STONY BROOK CENT	2650	10-yr	387.00	633.92	636.64	636.64	637.28	0.014710	6.74	78.58	78.90	0.96
STONY BROOK CENT	2650	50-yr	706.00	633.92	637.09	637.09	637.96	0.016176	8.37	150.75	131.39	1.05
STONY BROOK CENT	2650	100-yr	873.00	633.92	637.50	637.50	638.24	0.011399	7.98	208.09	142.15	0.91
STONY BROOK CENT	2650	500-yr	1340.00	633.92	638.01	638.01	638.97	0.011979	9.33	283.02	147.55	0.97
STONY BROOK CENT	2600	Bankfull	347.00	633.14	635.17	635.46	636.10	0.030223	8.14	59.16	72.68	1.32
STONY BROOK CENT	2600	2-yr	155.00	633.14	634.66	634.80	635.25	0.026068	6.34	29.77	44.64	1.18
STONY BROOK CENT	2600	10-yr	387.00	633.14	635.27	635.55	636.25	0.028968	8.38	66.71	82.99	1.31
STONY BROOK CENT	2600	50-yr	706.00	633.14	635.88	636.13	637.01	0.021751	9.36	120.69	91.48	1.21
STONY BROOK CENT	2600	100-yr	873.00	633.14	636.08	636.38	637.40	0.022879	10.26	138.85	94.03	1.26
STONY BROOK CENT	2600	500-yr	1340.00	633.14	636.51	636.94	638.09	0.023490	11.78	222.45	143.41	1.32
STONY BROOK CENT	2550	Bankfull	347.00	632.61	634.42	634.30	634.94	0.012386	5.81	60.18	51.97	0.87
STONY BROOK CENT	2550	2-yr	155.00	632.61	633.91	633.72	634.16	0.009830	4.06	38.22	40.22	0.73
STONY BROOK CENT	2550	10-yr	387.00	632.61	634.47	634.40	635.07	0.013431	6.22	63.31	58.27	0.92
STONY BROOK CENT	2550	50-yr	706.00	632.61	634.90	635.12	636.02	0.018100	8.58	95.18	86.24	1.11
STONY BROOK CENT	2550	100-yr	873.00	632.61	635.17	635.35	636.40	0.016899	9.08	119.64	94.68	1.10
STONY BROOK CENT	2550	500-yr	1340.00	632.61	635.41	635.86	636.97	0.021053	10.90	210.95	162.84	1.25
STONY BROOK CENT	2500	Bankfull	347.00	631.65	633.72	633.72	634.30	0.013191	6.25	72.36	88.77	0.91
STONY BROOK CENT	2500	2-yr	155.00	631.65	633.10	633.10	633.51	0.017707	5.09	32.05	48.61	0.97
STONY BROOK CENT	2500	10-yr	387.00	631.65	633.83	633.83	634.42	0.012489	6.38	82.52	94.26	0.90
STONY BROOK CENT	2500	50-yr	706.00	631.65	634.42	634.45	635.23	0.012290	7.81	147.26	122.16	0.94
STONY BROOK CENT	2500	100-yr	873.00	631.65	634.53	634.70	635.40	0.013385	8.43	202.11	178.51	0.99
STONY BROOK CENT	2500	500-yr	1340.00	631.65	635.13	635.15	636.03	0.011152	9.02	312.52	186.03	0.94
STONY BROOK CENT	2450	Bankfull	347.00	631.40	633.01	632.86	633.33	0.010068	4.90	104.55	113.73	0.78
STONY BROOK CENT	2450	2-yr	155.00	631.40	632.50	632.39	632.71	0.012399	3.84	53.20	85.80	0.79
STONY BROOK CENT	2450	10-yr	387.00	631.40	633.10	632.93	633.44	0.009537	5.01	115.51	115.50	0.77
STONY BROOK CENT	2450	50-yr	706.00	631.40	633.83	633.41	634.21	0.006518	5.54	206.95	141.03	0.68
STONY BROOK CENT	2450	100-yr	873.00	631.40	633.35	633.63	634.47	0.026259	9.31	144.26	119.72	1.31
STONY BROOK CENT	2450	500-yr	1340.00	631.40	634.23	633.92	634.61	0.006909	6.41	427.47	214.77	0.72
STONY BROOK CENT	2400	Bankfull	347.00	630.23	632.15	632.15	632.72	0.013539	6.30	72.68	77.10	0.92
STONY BROOK CENT	2400	2-yr	155.00	630.23	631.56	631.56	631.95	0.017646	5.06	32.81	51.57	0.97
STONY BROOK CENT	2400	10-yr	387.00	630.23	632.25	632.25	632.85	0.013128	6.49	80.63	79.60	0.92
STONY BROOK CENT	2400	50-yr	706.00	630.23	632.88	632.88	633.72	0.012409	7.92	135.78	99.89	0.95
STONY BROOK CENT	2400	100-yr	873.00	630.23	633.72	633.03	633.91	0.002650	4.55	436.25	208.70	0.46
STONY BROOK CENT	2400	500-yr	1340.00	630.23	633.98	633.65	634.33	0.004441	6.23	491.13	210.62	0.61
STONY BROOK CENT	2350	Bankfull	347.00	629.29	631.60	631.11	631.84	0.004848	3.93	90.23	61.54	0.56
STONY BROOK CENT	2350	2-yr	155.00	629.29	630.72	630.60	630.97	0.013193	4.05	38.30	50.46	0.82
STONY BROOK CENT	2350	10-yr	387.00	629.29	631.77	631.18	632.01	0.004220	3.94	100.94	62.15	0.53
STONY BROOK CENT	2350	50-yr	706.00	629.29	633.06	631.74	633.31	0.002140	4.07	184.38	68.92	0.41
STONY BROOK CENT	2350	100-yr	873.00	629.29	633.72	632.00	633.81	0.000860	2.94	530.97	184.26	0.27
STONY BROOK CENT	2350	500-yr	1340.00	629.29	632.63	632.63	633.88	0.012883	9.02	155.90	65.35	0.99
STONY BROOK CENT	2300	Bankfull	347.00	628.22	630.73	630.55	631.45	0.010463	6.81	52.97	31.19	0.85
STONY BROOK CENT	2300	2-yr	155.00	628.22	629.92	629.76	630.33	0.011900	5.16	30.03	25.13	0.83
STONY BROOK CENT	2300	10-yr	387.00	628.22	630.87	630.68	631.64	0.010293	7.08	57.51	32.26	0.85
STONY BROOK CENT	2300	50-yr	706.00	628.22	631.56	631.56	632.98	0.013275	9.66	81.29	37.82	1.01

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	2300	100-yr	873.00	628.22	632.08	632.08	633.57	0.011216	9.95	104.94	49.82	0.96
STONY BROOK CENT	2300	500-yr	1340.00	628.22	632.29	632.29	632.99	0.007770	8.62	339.95	147.92	0.81
STONY BROOK CENT	2250	Bankfull	347.00	627.48	629.91	629.91	630.84	0.012834	7.99	54.72	35.42	0.96
STONY BROOK CENT	2250	2-yr	155.00	627.48	629.03	629.03	629.63	0.015813	6.26	27.43	26.63	0.97
STONY BROOK CENT	2250	10-yr	387.00	627.48	630.06	630.06	631.06	0.012551	8.26	60.22	37.06	0.96
STONY BROOK CENT	2250	50-yr	706.00	627.48	631.64	631.11	631.78	0.001701	4.30	411.25	149.69	0.38
STONY BROOK CENT	2250	100-yr	873.00	627.48	631.11	631.11	631.39	0.004073	6.04	333.52	131.13	0.58
STONY BROOK CENT	2250	500-yr	1340.00	627.48	631.12	631.12	631.77	0.009528	9.25	334.50	131.43	0.89
STONY BROOK CENT	2200	Bankfull	347.00	626.47	628.58	628.81	629.85	0.031517	10.69	52.82	33.35	1.44
STONY BROOK CENT	2200	2-yr	155.00	626.47	627.92	627.95	628.55	0.030594	7.62	32.09	28.87	1.31
STONY BROOK CENT	2200	10-yr	387.00	626.47	628.71	629.00	630.08	0.031191	11.14	56.97	34.19	1.45
STONY BROOK CENT	2200	50-yr	706.00	626.47	630.06	630.06	631.46	0.015704	11.43	115.74	50.98	1.13
STONY BROOK CENT	2200	100-yr	873.00	626.47	630.51	630.51	630.56	0.001221	3.48	623.65	182.72	0.32
STONY BROOK CENT	2200	500-yr	1340.00	626.47	631.03	630.52	631.14	0.002085	4.97	723.72	195.35	0.43
STONY BROOK CENT	2150	Bankfull	347.00	624.93	626.87	627.27	628.34	0.028351	9.91	41.47	34.59	1.36
STONY BROOK CENT	2150	2-yr	155.00	624.93	626.26	626.46	627.07	0.027952	7.24	22.50	27.01	1.25
STONY BROOK CENT	2150	10-yr	387.00	624.93	626.97	627.42	628.57	0.028731	10.37	44.92	35.53	1.38
STONY BROOK CENT	2150	50-yr	706.00	624.93	627.57	628.40	630.24	0.033250	13.60	68.13	41.64	1.57
STONY BROOK CENT	2150	100-yr	873.00	624.93	630.43	628.83	630.48	0.000509	2.86	832.94	221.65	0.22
STONY BROOK CENT	2150	500-yr	1340.00	624.93	630.98	629.94	631.07	0.000786	3.81	956.55	223.35	0.28
STONY BROOK CENT	2100	Bankfull	347.00	623.90	626.37	626.45	627.27	0.016576	7.67	49.66	37.53	1.04
STONY BROOK CENT	2100	2-yr	155.00	623.90	625.71	625.71	626.22	0.017599	5.70	27.42	30.43	0.99
STONY BROOK CENT	2100	10-yr	387.00	623.90	626.52	626.58	627.45	0.015217	7.80	55.66	39.76	1.01
STONY BROOK CENT	2100	50-yr	706.00	623.90	628.95	627.48	629.37	0.002495	5.53	191.04	71.96	0.47
STONY BROOK CENT	2100	100-yr	873.00	623.90	630.43	627.88	630.46	0.000258	2.17	1083.12	269.21	0.16
STONY BROOK CENT	2100	500-yr	1340.00	623.90	630.98	628.84	631.03	0.000411	2.91	1233.07	271.32	0.20
STONY BROOK CENT	2050	Bankfull	347.00	622.95	624.43	624.84	625.78	0.061338	9.34	37.16	43.95	1.79
STONY BROOK CENT	2050	2-yr	155.00	622.95	624.12	624.30	624.78	0.052744	6.56	23.64	42.53	1.55
STONY BROOK CENT	2050	10-yr	387.00	622.95	625.76	624.92	626.01	0.003200	3.99	99.71	49.65	0.48
STONY BROOK CENT	2050	50-yr	706.00	622.95	629.12	625.59	629.23	0.000443	2.77	319.55	109.61	0.21
STONY BROOK CENT	2050	100-yr	873.00	622.95	630.42	625.88	630.45	0.000127	1.71	1239.86	320.18	0.12
STONY BROOK CENT	2050	500-yr	1340.00	622.95	630.97	626.64	631.02	0.000210	2.31	1416.50	320.79	0.15
STONY BROOK CENT	2000	Bankfull	349.00	619.81	625.23	622.41	625.50	0.001410	4.16	86.33	18.14	0.32
STONY BROOK CENT	2000	2-yr	156.00	619.81	623.15	621.34	623.29	0.001496	3.07	51.01	16.23	0.30
STONY BROOK CENT	2000	10-yr	389.00	619.81	625.61	622.58	625.90	0.001390	4.32	93.46	19.59	0.32
STONY BROOK CENT	2000	50-yr	711.00	619.81	628.81	623.91	629.18	0.000988	4.91	176.53	33.11	0.29
STONY BROOK CENT	2000	100-yr	879.00	619.81	630.08	624.52	630.40	0.000807	4.84	327.92	110.40	0.27
STONY BROOK CENT	2000	500-yr	1350.00	619.81	630.20	626.08	630.93	0.001801	7.29	341.50	118.43	0.40
STONY BROOK CENT	1975		Culvert									
STONY BROOK CENT	1950	Bankfull	349.00	618.78	620.82	620.82	621.62	0.011294	7.18	48.78	30.81	0.99
STONY BROOK CENT	1950	2-yr	156.00	618.78	620.06	620.06	620.58	0.013146	5.78	27.00	25.81	1.00
STONY BROOK CENT	1950	10-yr	389.00	618.78	620.93	620.93	621.80	0.011257	7.47	52.38	31.30	1.00
STONY BROOK CENT	1950	50-yr	711.00	618.78	621.80	621.80	623.07	0.009778	9.05	81.11	35.01	0.99
STONY BROOK CENT	1950	100-yr	879.00	618.78	622.20	622.20	623.64	0.009239	9.68	95.85	40.76	0.99
STONY BROOK CENT	1950	500-yr	1350.00	618.78	623.20	623.20	625.02	0.008029	10.95	141.61	49.18	0.97
STONY BROOK CENT	1900	Bankfull	349.00	617.71	619.41	619.77	620.78	0.024093	9.38	37.21	26.90	1.41
STONY BROOK CENT	1900	2-yr	156.00	617.71	618.77	619.01	619.63	0.027334	7.43	20.99	23.87	1.40
STONY BROOK CENT	1900	10-yr	389.00	617.71	619.53	619.91	620.97	0.023434	9.63	40.40	27.47	1.40
STONY BROOK CENT	1900	50-yr	711.00	617.71	620.31	620.82	622.32	0.019090	11.41	63.26	31.14	1.35
STONY BROOK CENT	1900	100-yr	879.00	617.71	620.67	621.21	622.94	0.017625	12.11	74.76	32.90	1.33
STONY BROOK CENT	1900	500-yr	1350.00	617.71	621.63	622.55	624.40	0.014204	13.44	110.07	41.86	1.26
STONY BROOK CENT	1850	Bankfull	349.00	616.77	619.04	618.89	619.77	0.007832	6.97	59.04	39.55	0.86
STONY BROOK CENT	1850	2-yr	156.00	616.77	618.09	618.11	618.65	0.013532	6.02	26.76	28.51	1.02
STONY BROOK CENT	1850	10-yr	389.00	616.77	619.22	619.02	619.97	0.007165	7.07	66.59	41.75	0.84
STONY BROOK CENT	1850	50-yr	711.00	616.77	620.45	619.98	621.35	0.004964	7.91	128.49	62.75	0.75
STONY BROOK CENT	1850	100-yr	879.00	616.77	621.01	620.42	621.94	0.004350	8.18	171.53	89.57	0.72
STONY BROOK CENT	1850	500-yr	1350.00	616.77	620.51	621.64	623.60	0.016780	14.71	132.37	64.07	1.39
STONY BROOK CENT	1800	Bankfull	349.00	615.74	619.25	617.86	619.47	0.001474	3.80	93.64	35.66	0.39
STONY BROOK CENT	1800	2-yr	156.00	615.74	618.14	617.12	618.26	0.001423	2.75	56.74	30.87	0.36
STONY BROOK CENT	1800	10-yr	389.00	615.74	619.44	617.98	619.68	0.001488	3.98	100.34	36.54	0.40
STONY BROOK CENT	1800	50-yr	711.00	615.74	620.66	618.85	621.07	0.001599	5.15	156.74	62.62	0.44
STONY BROOK CENT	1800	100-yr	879.00	615.74	621.21	619.25	621.67	0.001599	5.57	193.23	68.64	0.45
STONY BROOK CENT	1800	500-yr	1350.00	615.74	621.52	620.23	622.47	0.002998	7.96	215.27	70.41	0.62
STONY BROOK CENT	1750	Bankfull	349.00	615.33	619.06	617.90	619.37	0.002762	4.45	84.36	45.17	0.46
STONY BROOK CENT	1750	2-yr	156.00	615.33	618.00	617.03	618.16	0.002559	3.17	49.37	27.80	0.41
STONY BROOK CENT	1750	10-yr	389.00	615.33	619.24	618.05	619.57	0.002785	4.66	93.01	51.25	0.47
STONY BROOK CENT	1750	50-yr	711.00	615.33	620.50	619.03	620.96	0.002623	5.68	176.30	75.91	0.48
STONY BROOK CENT	1750	100-yr	879.00	615.33	621.07	619.50	621.57	0.002474	5.99	222.64	84.28	0.48
STONY BROOK CENT	1750	500-yr	1350.00	615.33	620.57	620.57	622.17	0.008817	10.53	182.39	76.98	0.88
STONY BROOK CENT	1700	Bankfull	349.00	615.26	618.15	618.15	619.04	0.015110	7.57	46.18	26.82	0.99
STONY BROOK CENT	1700	2-yr	156.00	615.26	617.23	617.23	617.85	0.017022	6.29	24.79	19.93	0.99

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	1700	10-yr	389.00	615.26	618.28	618.28	619.24	0.014874	7.87	49.73	27.88	1.00
STONY BROOK CENT	1700	50-yr	711.00	615.26	619.27	619.27	620.63	0.012180	9.40	81.44	36.01	0.97
STONY BROOK CENT	1700	100-yr	879.00	615.26	619.72	619.72	621.24	0.011321	9.98	99.16	42.47	0.96
STONY BROOK CENT	1700	500-yr	1350.00	615.26	619.96	619.96	620.68	0.007855	8.69	375.78	196.22	0.81
STONY BROOK CENT	1650	Bankfull	349.00	613.51	615.32	616.01	617.56	0.060526	12.00	29.09	23.18	1.89
STONY BROOK CENT	1650	2-yr	156.00	613.51	614.69	615.17	616.22	0.071560	9.90	15.75	19.08	1.92
STONY BROOK CENT	1650	10-yr	389.00	613.51	615.43	616.14	617.78	0.058969	12.30	31.62	23.77	1.88
STONY BROOK CENT	1650	50-yr	711.00	613.51	616.14	617.11	619.35	0.048482	14.38	49.96	27.86	1.81
STONY BROOK CENT	1650	100-yr	879.00	613.51	616.47	617.56	620.04	0.043734	15.17	59.43	29.18	1.77
STONY BROOK CENT	1650	500-yr	1350.00	613.51	619.19	618.88	620.06	0.004715	8.39	356.39	188.15	0.66
STONY BROOK CENT	1600	Bankfull	349.00	611.61	616.27	613.69	616.35	0.000499	2.38	171.57	56.02	0.21
STONY BROOK CENT	1600	2-yr	156.00	611.61	615.22	612.96	615.25	0.000284	1.47	116.20	49.52	0.15
STONY BROOK CENT	1600	10-yr	389.00	611.61	616.45	613.81	616.55	0.000531	2.52	181.92	57.16	0.22
STONY BROOK CENT	1600	50-yr	711.00	611.61	617.59	614.61	617.78	0.000769	3.57	255.08	75.43	0.27
STONY BROOK CENT	1600	100-yr	879.00	611.61	618.17	614.96	618.35	0.000722	3.70	426.82	205.47	0.27
STONY BROOK CENT	1600	500-yr	1350.00	611.61	619.60	615.84	619.78	0.000618	3.95	726.61	210.37	0.26
STONY BROOK CENT	1550	Bankfull	349.00	611.48	616.09	614.35	616.30	0.001483	3.68	103.77	37.62	0.35
STONY BROOK CENT	1550	2-yr	156.00	611.48	615.14	613.49	615.23	0.000875	2.29	70.46	32.33	0.25
STONY BROOK CENT	1550	10-yr	389.00	611.48	616.26	614.48	616.49	0.001574	3.91	110.00	38.51	0.36
STONY BROOK CENT	1550	50-yr	711.00	611.48	617.59	615.42	617.72	0.000835	3.51	490.64	202.47	0.28
STONY BROOK CENT	1550	100-yr	879.00	611.48	618.17	615.86	618.30	0.000753	3.58	608.66	204.43	0.27
STONY BROOK CENT	1550	500-yr	1350.00	611.48	619.61	616.90	619.73	0.000613	3.77	905.74	208.87	0.25
STONY BROOK CENT	1500	Bankfull	349.00	612.53	615.27	615.27	616.07	0.016028	7.18	49.02	32.06	1.00
STONY BROOK CENT	1500	2-yr	156.00	612.53	614.58	614.58	615.07	0.019360	5.58	27.97	29.28	1.01
STONY BROOK CENT	1500	10-yr	389.00	612.53	615.39	615.39	616.25	0.015616	7.44	52.94	32.58	1.00
STONY BROOK CENT	1500	50-yr	711.00	612.53	616.26	616.26	617.50	0.013249	8.99	82.91	36.35	0.98
STONY BROOK CENT	1500	100-yr	879.00	612.53	616.65	616.65	618.07	0.012673	9.64	97.25	38.02	0.98
STONY BROOK CENT	1500	500-yr	1350.00	612.53	617.56	617.56	619.47	0.011985	11.21	134.06	42.92	1.00
STONY BROOK CENT	1450	Bankfull	349.00	610.03	611.69	612.49	614.39	0.073790	13.19	26.46	21.13	2.08
STONY BROOK CENT	1450	2-yr	156.00	610.03	611.04	611.61	613.03	0.103835	11.31	13.79	18.12	2.28
STONY BROOK CENT	1450	10-yr	389.00	610.03	611.80	612.62	614.61	0.070555	13.45	28.93	21.67	2.05
STONY BROOK CENT	1450	50-yr	711.00	610.03	612.62	613.70	616.14	0.047321	15.08	48.39	25.58	1.82
STONY BROOK CENT	1450	100-yr	879.00	610.03	613.03	614.18	616.79	0.040313	15.62	59.12	27.53	1.73
STONY BROOK CENT	1450	500-yr	1350.00	610.03	617.30	615.37	617.72	0.001719	6.22	561.06	210.80	0.42
STONY BROOK CENT	1400	Bankfull	349.00	610.14	612.44	612.44	613.37	0.014763	7.77	45.28	25.22	0.99
STONY BROOK CENT	1400	2-yr	156.00	610.14	611.80	611.62	612.22	0.011029	5.22	29.89	23.03	0.81
STONY BROOK CENT	1400	10-yr	389.00	610.14	612.58	612.58	613.58	0.014427	8.05	48.87	25.70	0.99
STONY BROOK CENT	1400	50-yr	711.00	610.14	613.60	613.60	615.06	0.012328	9.75	76.78	29.23	0.98
STONY BROOK CENT	1400	100-yr	879.00	610.14	614.05	614.05	615.73	0.011731	10.44	90.65	31.32	0.98
STONY BROOK CENT	1400	500-yr	1350.00	610.14	615.06	615.06	617.36	0.011691	12.32	125.57	40.73	1.02
STONY BROOK CENT	1350	Bankfull	349.00	609.26	611.58	611.73	612.46	0.022496	7.54	46.48	37.48	1.17
STONY BROOK CENT	1350	2-yr	156.00	609.26	611.05	611.05	611.52	0.018361	5.48	28.45	30.31	1.00
STONY BROOK CENT	1350	10-yr	389.00	609.26	611.63	611.83	612.65	0.024913	8.12	48.20	37.92	1.23
STONY BROOK CENT	1350	50-yr	711.00	609.26	612.03	612.60	614.03	0.034602	11.38	64.28	41.43	1.52
STONY BROOK CENT	1350	100-yr	879.00	609.26	612.22	612.96	614.68	0.036905	12.62	72.49	42.34	1.60
STONY BROOK CENT	1350	500-yr	1350.00	609.26	612.75	613.80	616.26	0.038550	15.14	95.44	44.75	1.70
STONY BROOK CENT	1300	Bankfull	349.00	608.33	610.51	610.64	611.28	0.023693	7.03	49.64	43.39	1.16
STONY BROOK CENT	1300	2-yr	156.00	608.33	610.14	610.07	610.46	0.015131	4.58	34.05	40.52	0.88
STONY BROOK CENT	1300	10-yr	389.00	608.33	610.62	610.73	611.41	0.021839	7.12	54.62	44.03	1.13
STONY BROOK CENT	1300	50-yr	711.00	608.33	611.14	611.40	612.44	0.022764	9.14	78.20	46.61	1.22
STONY BROOK CENT	1300	100-yr	879.00	608.33	611.34	611.70	612.94	0.024570	10.18	87.23	47.61	1.29
STONY BROOK CENT	1300	500-yr	1350.00	608.33	611.76	612.48	614.29	0.029645	12.78	108.19	50.05	1.46
STONY BROOK CENT	1250	Bankfull	349.00	608.05	610.27	609.91	610.71	0.007256	5.42	75.88	56.59	0.70
STONY BROOK CENT	1250	2-yr	156.00	608.05	609.38	609.31	609.74	0.013799	4.83	33.45	39.56	0.87
STONY BROOK CENT	1250	10-yr	389.00	608.05	610.41	610.02	610.87	0.006861	5.55	84.27	57.44	0.69
STONY BROOK CENT	1250	50-yr	711.00	608.05	611.52	610.80	611.77	0.002814	4.77	300.12	153.07	0.48
STONY BROOK CENT	1250	100-yr	879.00	608.05	611.16	611.05	611.74	0.007210	7.04	246.03	150.20	0.75
STONY BROOK CENT	1250	500-yr	1350.00	608.05	611.68	611.47	612.46	0.008237	8.45	325.13	159.99	0.83
STONY BROOK CENT	1200	Bankfull	349.00	607.24	610.35	609.06	610.48	0.001369	3.12	195.39	122.81	0.33
STONY BROOK CENT	1200	2-yr	156.00	607.24	609.45	608.46	609.51	0.001152	2.21	102.76	81.30	0.28
STONY BROOK CENT	1200	10-yr	389.00	607.24	610.51	609.15	610.64	0.001369	3.24	215.18	129.85	0.33
STONY BROOK CENT	1200	50-yr	711.00	607.24	611.55	609.75	611.65	0.000926	3.25	534.21	250.93	0.29
STONY BROOK CENT	1200	100-yr	879.00	607.24	611.25	610.24	611.45	0.001991	4.53	459.10	242.06	0.41
STONY BROOK CENT	1200	500-yr	1350.00	607.24	611.81	610.83	612.10	0.002480	5.56	600.53	251.86	0.47
STONY BROOK CENT	1150	Bankfull	349.00	606.73	609.54	609.54	610.26	0.014932	6.84	53.94	45.29	0.97
STONY BROOK CENT	1150	2-yr	156.00	606.73	608.87	608.87	609.33	0.018969	5.42	28.76	31.69	1.00
STONY BROOK CENT	1150	10-yr	389.00	606.73	609.65	609.65	610.42	0.014394	7.06	59.47	48.25	0.97
STONY BROOK CENT	1150	50-yr	711.00	606.73	610.53	610.53	611.46	0.010412	7.97	122.48	112.89	0.88
STONY BROOK CENT	1150	100-yr	879.00	606.73	610.84	610.84	611.27	0.005662	6.35	311.80	231.01	0.66
STONY BROOK CENT	1150	500-yr	1350.00	606.73	611.08	611.08	611.84	0.009309	8.58	369.57	247.93	0.86
STONY BROOK CENT	1100	Bankfull	349.00	606.22	608.67	608.48	609.39	0.009995	6.88	56.30	33.29	0.84
STONY BROOK CENT	1100	2-yr	156.00	606.22	607.81	607.69	608.25	0.012125	5.32	30.22	27.67	0.85

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	1100	10-yr	389.00	606.22	608.82	608.61	609.59	0.009695	7.11	61.55	34.37	0.84
STONY BROOK CENT	1100	50-yr	711.00	606.22	610.56	609.70	610.77	0.001909	4.63	412.50	233.55	0.41
STONY BROOK CENT	1100	100-yr	879.00	606.22	610.13	610.00	610.70	0.005383	7.21	313.46	231.07	0.67
STONY BROOK CENT	1100	500-yr	1350.00	606.22	610.96	610.52	611.44	0.004188	7.31	505.68	235.85	0.62
STONY BROOK CENT	1050	Bankfull	349.00	605.38	608.21	607.92	608.92	0.008702	6.82	56.39	31.64	0.79
STONY BROOK CENT	1050	2-yr	156.00	605.38	607.36	607.08	607.73	0.008200	4.89	32.45	25.05	0.71
STONY BROOK CENT	1050	10-yr	389.00	605.38	608.36	608.07	609.13	0.008692	7.11	61.25	33.01	0.80
STONY BROOK CENT	1050	50-yr	711.00	605.38	609.23	609.23	610.48	0.009811	9.25	103.46	59.38	0.89
STONY BROOK CENT	1050	100-yr	879.00	605.38	609.59	609.59	610.38	0.006654	8.17	251.03	173.64	0.75
STONY BROOK CENT	1050	500-yr	1350.00	605.38	610.16	610.16	611.12	0.007586	9.59	349.93	177.58	0.82
STONY BROOK CENT	1000	Bankfull	349.00	604.41	607.40	607.40	608.35	0.014104	7.86	46.49	26.95	0.98
STONY BROOK CENT	1000	2-yr	156.00	604.41	606.56	606.56	607.14	0.017515	6.09	25.66	22.84	1.00
STONY BROOK CENT	1000	10-yr	389.00	604.41	607.54	607.54	608.56	0.013764	8.14	50.51	27.68	0.98
STONY BROOK CENT	1000	50-yr	711.00	604.41	608.64	608.64	609.29	0.006671	7.46	225.16	186.18	0.73
STONY BROOK CENT	1000	100-yr	879.00	604.41	608.40	608.87	609.83	0.015060	10.66	182.51	181.40	1.08
STONY BROOK CENT	1000	500-yr	1350.00	604.41	608.89	609.38	610.52	0.016133	12.19	272.16	186.66	1.15
STONY BROOK CENT	950	Bankfull	349.00	603.44	606.72	605.51	606.90	0.001860	3.44	120.69	64.97	0.38
STONY BROOK CENT	950	2-yr	156.00	603.44	605.66	604.92	605.77	0.002303	2.69	59.54	45.22	0.38
STONY BROOK CENT	950	10-yr	389.00	603.44	606.91	605.62	607.10	0.001793	3.54	133.44	67.36	0.37
STONY BROOK CENT	950	50-yr	711.00	603.44	608.24	606.39	608.43	0.001253	3.84	339.38	176.15	0.33
STONY BROOK CENT	950	100-yr	879.00	603.44	608.18	606.72	608.49	0.002044	4.85	328.88	176.04	0.42
STONY BROOK CENT	950	500-yr	1350.00	603.44	608.95	607.83	609.34	0.002223	5.68	465.71	177.00	0.46
STONY BROOK CENT	900	Bankfull	349.00	603.32	605.73	605.73	606.62	0.014305	7.62	47.46	29.10	0.98
STONY BROOK CENT	900	2-yr	156.00	603.32	604.97	604.94	605.49	0.016168	5.75	27.16	24.84	0.96
STONY BROOK CENT	900	10-yr	389.00	603.32	605.86	605.86	606.82	0.014129	7.92	51.31	29.88	0.99
STONY BROOK CENT	900	50-yr	711.00	603.32	607.00	607.00	608.19	0.009852	8.94	101.38	72.26	0.89
STONY BROOK CENT	900	100-yr	879.00	603.32	607.46	607.46	608.27	0.006618	8.03	222.34	157.05	0.75
STONY BROOK CENT	900	500-yr	1350.00	603.32	608.08	608.08	609.09	0.007425	9.46	320.99	160.30	0.81
STONY BROOK CENT	850	Bankfull	349.00	602.72	604.55	604.80	605.63	0.028630	8.34	42.35	36.09	1.31
STONY BROOK CENT	850	2-yr	156.00	602.72	604.15	604.15	604.61	0.018395	5.41	28.84	31.40	0.99
STONY BROOK CENT	850	10-yr	389.00	602.72	604.63	604.93	605.82	0.029294	8.77	45.11	37.04	1.34
STONY BROOK CENT	850	50-yr	711.00	602.72	605.08	605.76	607.25	0.036082	11.85	63.76	44.23	1.56
STONY BROOK CENT	850	100-yr	879.00	602.72	605.54	606.06	607.56	0.025467	11.56	86.43	56.53	1.36
STONY BROOK CENT	850	500-yr	1350.00	602.72	606.56	607.06	608.49	0.015523	11.58	165.59	97.70	1.13
STONY BROOK CENT	800	Bankfull	349.00	602.60	604.53	603.83	604.63	0.002617	2.62	133.51	101.65	0.40
STONY BROOK CENT	800	2-yr	156.00	602.60	604.03	603.46	604.08	0.002004	1.83	85.03	89.20	0.33
STONY BROOK CENT	800	10-yr	389.00	602.60	604.64	603.89	604.76	0.002492	2.69	145.48	104.20	0.40
STONY BROOK CENT	800	50-yr	711.00	602.60	605.06	604.36	605.22	0.002871	3.42	276.44	187.43	0.44
STONY BROOK CENT	800	100-yr	879.00	602.60	605.26	604.54	605.46	0.003035	3.76	314.14	188.18	0.46
STONY BROOK CENT	800	500-yr	1350.00	602.60	605.73	604.92	606.02	0.003425	4.59	403.46	189.98	0.51
STONY BROOK CENT	750	Bankfull	349.00	602.19	604.38		604.48	0.003358	2.55	153.43	246.23	0.44
STONY BROOK CENT	750	2-yr	156.00	602.19	603.59	603.59	603.82	0.024844	3.84	40.66	93.47	1.03
STONY BROOK CENT	750	10-yr	389.00	602.19	604.53		604.62	0.002624	2.46	192.73	296.41	0.39
STONY BROOK CENT	750	50-yr	711.00	602.19	604.93		605.07	0.002939	3.15	329.15	362.16	0.44
STONY BROOK CENT	750	100-yr	879.00	602.19	605.15		605.30	0.002704	3.29	409.55	368.16	0.43
STONY BROOK CENT	750	500-yr	1350.00	602.19	605.67		605.84	0.002386	3.66	607.00	384.31	0.42
STONY BROOK CENT	700	Bankfull	349.00	600.89	604.23	602.96	604.36	0.001890	2.88	121.49	65.67	0.36
STONY BROOK CENT	700	2-yr	156.00	600.89	603.35	602.35	603.42	0.001527	2.15	72.71	48.89	0.31
STONY BROOK CENT	700	10-yr	389.00	600.89	604.37	603.07	604.51	0.001870	2.99	130.84	68.52	0.36
STONY BROOK CENT	700	50-yr	711.00	600.89	604.80	603.78	604.95	0.002002	3.51	417.93	368.92	0.39
STONY BROOK CENT	700	100-yr	879.00	600.89	605.00	604.11	605.18	0.002171	3.85	494.40	382.12	0.41
STONY BROOK CENT	700	500-yr	1350.00	600.89	605.51	604.71	605.72	0.002332	4.46	695.71	402.50	0.44
STONY BROOK CENT	650	Bankfull	349.00	600.99	603.63	603.40	604.13	0.010345	5.70	61.22	39.72	0.81
STONY BROOK CENT	650	2-yr	156.00	600.99	602.96	602.73	603.25	0.009293	4.25	36.73	34.23	0.72
STONY BROOK CENT	650	10-yr	389.00	600.99	603.71	603.51	604.28	0.010924	6.02	64.65	40.58	0.84
STONY BROOK CENT	650	50-yr	711.00	600.99	604.34	604.20	604.76	0.006820	5.92	276.13	312.09	0.70
STONY BROOK CENT	650	100-yr	879.00	600.99	604.55	604.45	604.98	0.006646	6.21	343.59	326.96	0.70
STONY BROOK CENT	650	500-yr	1350.00	600.99	605.15	604.78	605.53	0.005363	6.45	552.61	369.01	0.65
STONY BROOK CENT	600	Bankfull	349.00	600.75	602.95	602.88	603.53	0.013926	6.14	58.79	68.11	0.92
STONY BROOK CENT	600	2-yr	156.00	600.75	602.23	602.16	602.64	0.015658	5.13	30.39	31.77	0.92
STONY BROOK CENT	600	10-yr	389.00	600.75	603.05	603.02	603.67	0.013556	6.32	66.89	85.67	0.92
STONY BROOK CENT	600	50-yr	711.00	600.75	603.89	603.86	604.39	0.007082	6.19	228.62	272.92	0.72
STONY BROOK CENT	600	100-yr	879.00	600.75	604.28		604.68	0.005081	5.82	337.99	292.00	0.63
STONY BROOK CENT	600	500-yr	1350.00	600.75	604.86		605.28	0.004750	6.40	515.57	322.14	0.62
STONY BROOK CENT	550	Bankfull	349.00	599.82	602.49		602.93	0.009040	5.37	65.01	43.24	0.76
STONY BROOK CENT	550	2-yr	156.00	599.82	601.67		601.99	0.010072	4.48	34.78	31.93	0.76
STONY BROOK CENT	550	10-yr	389.00	599.82	602.57	602.30	603.07	0.009447	5.69	68.66	46.13	0.78
STONY BROOK CENT	550	50-yr	711.00	599.82	603.18	603.18	603.95	0.009965	7.22	134.15	150.67	0.85
STONY BROOK CENT	550	100-yr	879.00	599.82	603.41	603.41	604.28	0.010217	7.80	172.50	189.77	0.87
STONY BROOK CENT	550	500-yr	1350.00	599.82	604.16	604.16	604.94	0.007444	7.94	358.48	275.86	0.78
STONY BROOK CENT	500	Bankfull	349.00	599.46	602.32		602.54	0.004834	3.79	92.23	68.45	0.55
STONY BROOK CENT	500	2-yr	156.00	599.46	601.48		601.63	0.004132	3.10	50.40	41.47	0.49

HEC-RAS Plan: excond River: STONY BROOK CENT Reach: STONY BROOK CENT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STONY BROOK CENT	500	10-yr	389.00	599.46	602.42		602.66	0.004877	3.95	99.49	76.02	0.56
STONY BROOK CENT	500	50-yr	711.00	599.46	602.96	602.46	603.38	0.005872	5.27	153.98	133.32	0.64
STONY BROOK CENT	500	100-yr	879.00	599.46	603.18	602.74	603.68	0.006172	5.79	192.31	204.15	0.67
STONY BROOK CENT	500	500-yr	1350.00	599.46	604.07	603.49	604.50	0.003841	5.67	412.21	268.54	0.56
STONY BROOK CENT	450	Bankfull	349.00	598.75	602.30		602.38	0.001500	2.24	155.92	100.59	0.31
STONY BROOK CENT	450	2-yr	156.00	598.75	601.48		601.52	0.000792	1.67	93.48	56.26	0.23
STONY BROOK CENT	450	10-yr	389.00	598.75	602.40		602.48	0.001645	2.35	166.70	120.35	0.33
STONY BROOK CENT	450	50-yr	711.00	598.75	603.00		603.15	0.001803	3.05	270.62	200.98	0.36
STONY BROOK CENT	450	100-yr	879.00	598.75	603.26		603.43	0.001846	3.32	322.93	204.84	0.37
STONY BROOK CENT	450	500-yr	1350.00	598.75	604.13		604.31	0.001439	3.58	501.57	207.37	0.35
STONY BROOK CENT	400	Bankfull	349.00	598.89	601.71	601.71	602.15	0.020389	5.34	65.36	78.50	1.03
STONY BROOK CENT	400	2-yr	156.00	598.89	600.81	600.81	601.36	0.018252	5.97	26.14	24.28	1.01
STONY BROOK CENT	400	10-yr	389.00	598.89	601.79	601.79	602.25	0.019378	5.46	71.29	80.79	1.02
STONY BROOK CENT	400	50-yr	711.00	598.89	602.28	602.27	602.90	0.014654	6.35	121.53	133.49	0.95
STONY BROOK CENT	400	100-yr	879.00	598.89	602.79	602.50	603.23	0.007278	5.51	207.62	195.02	0.71
STONY BROOK CENT	400	500-yr	1350.00	598.89	603.90		604.20	0.002895	4.73	442.43	216.49	0.48
STONY BROOK CENT	350	Bankfull	349.00	598.17	601.03	600.23	601.26	0.003931	3.91	89.37	49.77	0.51
STONY BROOK CENT	350	2-yr	156.00	598.17	599.84	599.56	600.10	0.008299	4.04	38.58	35.79	0.69
STONY BROOK CENT	350	10-yr	389.00	598.17	601.19	600.34	601.43	0.003744	4.00	97.38	52.15	0.51
STONY BROOK CENT	350	50-yr	711.00	598.17	602.17		602.52	0.003102	4.79	160.88	80.07	0.49
STONY BROOK CENT	350	100-yr	879.00	598.17	602.60		603.00	0.002916	5.10	202.68	113.22	0.49
STONY BROOK CENT	350	500-yr	1350.00	598.17	603.61		604.05	0.002485	5.60	385.82	218.74	0.47
STONY BROOK CENT	300	Bankfull	349.00	597.15	601.00		601.12	0.001473	2.75	127.08	56.83	0.32
STONY BROOK CENT	300	2-yr	156.00	597.15	599.80		599.88	0.001785	2.35	66.29	43.33	0.34
STONY BROOK CENT	300	10-yr	389.00	597.15	601.16		601.29	0.001469	2.85	136.35	58.41	0.33
STONY BROOK CENT	300	50-yr	711.00	597.15	602.17		602.37	0.001517	3.64	199.68	66.04	0.35
STONY BROOK CENT	300	100-yr	879.00	597.15	602.61		602.85	0.001528	3.97	229.25	68.06	0.36
STONY BROOK CENT	300	500-yr	1350.00	597.15	603.57		603.92	0.001647	4.79	337.30	165.91	0.39
STONY BROOK CENT	250	Bankfull	349.00	596.56	600.96		601.06	0.000754	2.45	142.71	45.13	0.24
STONY BROOK CENT	250	2-yr	156.00	596.56	599.78		599.82	0.000542	1.69	92.28	39.97	0.20
STONY BROOK CENT	250	10-yr	389.00	596.56	601.12		601.23	0.000806	2.60	149.87	45.86	0.25
STONY BROOK CENT	250	50-yr	711.00	596.56	602.10		602.31	0.001128	3.65	196.87	50.21	0.31
STONY BROOK CENT	250	100-yr	879.00	596.56	602.52		602.78	0.001259	4.11	218.64	57.33	0.33
STONY BROOK CENT	250	500-yr	1350.00	596.56	603.42		603.83	0.001598	5.20	310.32	128.48	0.39
STONY BROOK CENT	200	Bankfull	349.00	595.90	600.98		601.02	0.000337	1.48	235.75	87.99	0.16
STONY BROOK CENT	200	2-yr	156.00	595.90	599.78		599.80	0.000315	1.13	137.83	73.19	0.15
STONY BROOK CENT	200	10-yr	389.00	595.90	601.14		601.18	0.000347	1.56	250.15	89.81	0.16
STONY BROOK CENT	200	50-yr	711.00	595.90	602.17		602.23	0.000412	2.08	346.78	98.58	0.19
STONY BROOK CENT	200	100-yr	879.00	595.90	602.61		602.69	0.000436	2.31	391.24	101.65	0.20
STONY BROOK CENT	200	500-yr	1350.00	595.90	603.58		603.70	0.000517	2.87	501.60	132.04	0.22
STONY BROOK CENT	150	Bankfull	349.00	595.76	600.87		600.98	0.000986	2.65	133.23	50.77	0.27
STONY BROOK CENT	150	2-yr	156.00	595.76	599.73		599.77	0.000441	1.72	90.71	32.40	0.18
STONY BROOK CENT	150	10-yr	389.00	595.76	601.02		601.14	0.001150	2.79	141.51	56.78	0.29
STONY BROOK CENT	150	50-yr	711.00	595.76	601.97		602.18	0.001453	3.76	213.51	111.78	0.34
STONY BROOK CENT	150	100-yr	879.00	595.76	602.39		602.64	0.001492	4.09	267.82	145.03	0.36
STONY BROOK CENT	150	500-yr	1350.00	595.76	603.31		603.64	0.001584	4.83	422.56	176.88	0.38
STONY BROOK CENT	100	Bankfull	349.00	595.88	600.43	600.08	600.84	0.008016	5.16	68.99	49.47	0.71
STONY BROOK CENT	100	2-yr	156.00	595.88	599.28	598.71	599.68	0.008012	5.09	30.68	18.16	0.69
STONY BROOK CENT	100	10-yr	389.00	595.88	600.54	600.18	600.99	0.008011	5.39	74.52	51.21	0.72
STONY BROOK CENT	100	50-yr	711.00	595.88	601.28	600.90	601.99	0.008002	6.81	115.38	60.95	0.76
STONY BROOK CENT	100	100-yr	879.00	595.88	601.61	601.22	602.44	0.008006	7.39	137.97	81.15	0.77
STONY BROOK CENT	100	500-yr	1350.00	595.88	602.34	602.22	603.41	0.008013	8.62	226.67	143.80	0.80

APPENDIX D

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

MILONE & MACBROOM®
231 Main Street, Suite 102
New Paltz, New York 12561
(845) 633-8153

Stream Repair Restoration
Stony Brook, Schoharie, New York

December 28, 2015
MMI# 4805-04
BY: AJL

AREA 1 - FRISBIEVILLE ROAD
PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COSTS

Based upon 30% Conceptual Design Alternatives
Dated January 2016

Notes and Assumptions:

1) Bedrock channel - cannot excavate bypass channel to dewater work site, requires cofferdam and piping.
2) Footing of boulder revetment may require pinning to bedrock for stability/scour protection.
3) Vegetative restoration is limited to typical species of grasses, shrubs, and trees.
4) Assume 375 linear feet of stacked boulder revetment, approx. 5' high
5) Assume no unsuitable or contaminated material management necessary, all fill generated on site suitable for reuse.
6) Assume construction inspection services at 15% of project cost.

Engineer's Opinion of Cost Based Upon Conceptual Analysis:

Item	Unit	Quantity	Unit Cost	Cost
Design and Permitting	L.S.	1	$60,000	$60,000
Construction Mobilization	L.S.	1	$30,000	$30,000
Sedimentation and Erosion Control	L.S.	1	$15,000	$15,000
Water Control	L.S.	1	$90,000	$90,000
Site Access Easement	L.S.	1	$10,000	$10,000
Clearing and Grubbing	L.S.	1	$10,000	$10,000
Site Access Haul Road	L.F.	200	$35	$7,000
Culvert (2x) 10'x8' Conc. Box	L.S.	1	$225,000	$225,000
Bedrock Pinning	L.F.	375	$50	$18,750
Stacked Boulder Revetment	TON	825	$150	$123,750
Excavation (Earthwork)	C.Y.	400	$15	$6,000
Stream Channel Bed Armoring (Re-Use)	L.S.	1	$15,000	$15,000
Random Boulder Clusters	Ton	100	$75	$7,500
Bank Stabilization	L.F.	375	$80	$30,000
Geotextile Matting	S.F.	6700	$2	$13,400
Seeding and Vegetative Restoration	S.F.	6700	$3	$20,100
Shrubs, Trees, and Plantings	Ea.	335	$30	$10,050
Construction Inspection	L.S.	1	$104,000	$104,000
			Subtotal =	$795,550
			+20% Contingency	$159,110
			Rounded Total	$950,000

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Stream Repair Restoration
Stony Brook, Schoharie, New York

December 24, 2015
MMI# 4805-04
BY: AJL

AREA 2 - NY ROUTE 30
PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COSTS

Based upon 30% Conceptual Design Alternatives
Dated January 2016

Notes and Assumptions:

1) Bedrock channel - cannot excavate bypass channel to dewater work site, requires cofferdam and piping.
2) Footing of boulder revetment will require pinning to bedrock for stability/scour protection.
3) Vegetative restoration is limited to typical species of grasses, shrubs, and trees.
4) Assume no unsuitable or contaminated material management necessary, all fill generated on site suitable for reuse.
5) Assume construction inspection services at 15% of project cost.

Engineer's Opinion of Cost Based Upon Conceptual Analysis:

Item	Unit	Quantity	Unit Cost	Cost
Design and Permitting	L.S.	1	$25,000	$25,000
Construction Mobilization	L.S.	1	$12,500	$12,500
Sedimentation and Erosion Control	L.S.	1	$6,250	$6,250
Water Control	L.S.	1	$37,500	$37,500
Site Access Easement	L.S.	1	$10,000	$10,000
Site Access Haul Road	L.F.	130	$35	$4,550
Excavation (Earthwork)	C.Y.	340	$15	$5,100
Stacked Boulder Revetment	TON	500	$150	$75,000
Boulder Vortex Weir	C.Y.	300	$200	$60,000
Stream Channel Bed Armoring (Import)	TON	150	$75	$11,250
Geotextile Matting	S.F.	3000	$2	$6,000
Seeding and Vegetative Restoration	S.F.	3000	$3	$9,000
Shrubs, Trees, and Plantings	Ea.	150	$30	$4,500
Construction Inspection	L.S.	1	$40,000	$40,000
			Subtotal =	$306,650
			+20% Contingency	$61,330
			Total	$370,000

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December 24, 2015
MMI# 4805-04
BY: AJL

AREA 3 - ROSEWOOD LANE
PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COSTS

Based upon 30% Conceptual Design Alternatives
Dated January 2016

Notes and Assumptions:
1) Bedrock channel - cannot excavate bypass channel to dewater work site, requires cofferdam and piping.
2) Footing of boulder revetment will require pinning to bedrock for stability/scour protection.
3) Vegetative restoration is limited to typical species of grasses, shrubs, and trees.
4) Assume no unsuitable or contaminated material management necessary, all fill generated on site suitable for reuse.
5) Assume construction inspection services at 15% of project cost.

Engineer's Opinion of Cost Based Upon Conceptual Analysis:

Item	Unit	Quantity	Unit Cost	Cost
Design and Permitting	L.S.	1	$60,000	$60,000
Construction Mobilization	L.S.	1	$30,000	$30,000
Sedimentation and Erosion Control	L.S.	1	$15,000	$15,000
Water Control	L.S.	1	$90,000	$90,000
Site Access Easement	L.S.	1	$10,000	$10,000
Site Access Haul Road	L.F.	130	$35	$4,550
Culvert (2x 10'x8' Conc. Box)	L.S.	1	$325,000	$325,000
Excavation (Earthwork)	C.Y.	340	$15	$5,100
Stacked Boulder Revetment	TON	500	$150	$75,000
Boulder Vortex Weir	C.Y.	300	$200	$60,000
Stream Channel Bed Armoring (Import)	TON	150	$75	$11,250
Geotextile Matting	S.F.	3000	$2	$6,000
Seeding and Vegetative Restoration	S.F.	3000	$3	$9,000
Shrubs, Trees, and Plantings	Ea.	150	$30	$4,500
Construction Inspection	L.S.	1	$106,000	$106,000
			Subtotal =	$811,400
			+20% Contingency	$162,280
			Total	$970,000

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Stream Repair Restoration
Stony Brook, Schoharie, New York

December 24, 2015
MMI# 4805-04
BY: AJL

AREA 4 - UPSTREAM OF ROSEWOOD LA
PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COSTS

Based upon 30% Conceptual Design Alternatives
Dated January 2016

Notes and Assumptions:

1) Bedrock channel - cannot excavate bypass channel to dewater work site, requires cofferdam and piping.
2) Footing of boulder revetment will require pinning to bedrock for stability/scour protection.
3) Vegetative restoration is limited to typical species of grasses, shrubs, and trees.
4) Assume 110 linear feet of stacked boulder revetment, approx. 5' high
5) Assume no unsuitable or contaminated material management necessary, all fill generated on site suitable for reuse.
6) Assume construction inspection services at 15% of project cost.

Engineer's Opinion of Cost Based Upon Conceptual Analysis:

Item	Unit	Quantity	Unit Cost	Cost
Design and Permitting	L.S.	1	$25,000	$25,000
Construction Mobilization	L.S.	1	$12,500	$12,500
Sedimentation and Erosion Control	L.S.	1	$6,250	$6,250
Water Control	L.S.	1	$37,500	$37,500
Site Access Easement	L.S.	1	$10,000	$10,000
Clearing and Grubbing	L.S.	1	$10,000	$10,000
Site Access Haul Road	L.F.	250	$35	$8,750
Stream Crossing	L.S.	1	$10,000	$10,000
Bedrock Pinning	L.F.	110	$50	$5,500
Stacked Boulder Revetment	TON	500	$150	$75,000
Excavation (Earthwork)	C.Y.	200	$10	$2,000
Random Boulder Cluster	Ton	100	$75	$7,500
Riffle Grade Control Structure	Ton	400	$150	$60,000
Stream Channel Bed Armoring (Import)	Ton	100	$75	$7,500
Bank Stabilization	L.F.	110	$80	$8,800
Geotextile Matting	S.F.	1000	$2	$2,000
Seeding and Vegetative Restoration	S.F.	1000	$3	$3,000
Shrubs, Trees, and Plantings	Ea.	20	$30	$600
Construction Inspection	L.S.	1	$44,000	$44,000
			Subtotal =	$335,900
			+20% Contingency	$67,180
			Total	$400,000

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Stream Repair Restoration
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December 24, 2015
MMI# 4805-04
BY: AJL

AREA 5 - UPSTREAM OF ROSEWOOD LA
PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COSTS

Based upon 30% Conceptual Design Alternatives
Dated January 2016

Notes and Assumptions:

1) Bedrock channel - cannot excavate bypass channel to dewater work site, requires cofferdam and piping.
2) Footing of boulder revetment will require pinning to bedrock for stability/scour protection.
3) Vegetative restoration is limited to typical species of grasses, shrubs, and trees.
4) Assume 115 linear feet of stacked boulder revetment, approx. 5' high
5) Assume no unsuitable or contaminated material management necessary, all fill generated on site suitable for reuse.
6) Assume construction inspection services at 15% of project cost.

Engineer's Opinion of Cost Based Upon Conceptual Analysis:

Item	Unit	Quantity	Unit Cost	Cost
Design and Permitting	L.S.	1	$25,000	$25,000
Construction Mobilization	L.S.	1	$10,000	$10,000
Sedimentation and Erosion Control	L.S.	1	$5,000	$5,000
Water Control	L.S.	1	$30,000	$30,000
Clearing and Grubbing	L.S.	1	$10,000	$10,000
Site Access Easement	L.S.	1	$10,000	$10,000
Site Access Haul Road	L.F.	200	$35	$7,000
Stream Crossing	L.S.	1	$10,000	$10,000
Bedrock Pinning	L.F.	115	$50	$5,750
Stacked Boulder Revetment	TON	300	$150	$45,000
Excavation (Earthwork)	C.Y.	800	$10	$8,000
Stream Channel Bed Armoring (Import)	TON	100	$75	$7,500
Bank Stabilization	L.F.	115	$80	$9,200
Geotextile Matting	S.F.	2700	$2	$5,400
Seeding and Vegetative Restoration	S.F.	2700	$3	$8,100
Shrubs, Trees, and Plantings	Ea.	135	$30	$4,050
Construction Inspection	L.S.	1	$30,000	$30,000
			Subtotal =	$230,000
			+20% Contingency	$46,000
			Total	$280,000

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Stream Repair Restoration
Stony Brook, Schoharie, New York

December 24, 2015
MMI# 4805-04
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AREA 6 - COLBY ROAD
PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COSTS

Based upon 30% Conceptual Design Alternatives
Dated January 2016

Notes and Assumptions:

1) Bedrock channel - cannot excavate bypass channel to dewater work site, requires cofferdam and piping.
2) Footing of boulder revetment will require pinning to bedrock for stability/scour protection.
3) Vegetative restoration is limited to typical species of grasses, shrubs, and trees.
4) Assume 115 linear feet of stacked boulder revetment, approx. 5' high
5) Assume no unsuitable or contaminated material management necessary, all fill generated on site suitable for reuse.
6) Assume construction inspection services at 15% of project cost.

Engineer's Opinion of Cost Based Upon Conceptual Analysis:

Item	Unit	Quantity	Unit Cost	Cost
Design and Permitting	L.S.	1	$25,000	$25,000
Construction Mobilization	L.S.	1	$12,500	$12,500
Sedimentation and Erosion Control	L.S.	1	$6,250	$6,250
Water Control	L.S.	1	$37,500	$37,500
Site Access Easement	L.S.	1	$10,000	$10,000
Clearing and Grubbing	L.S.	1	$20,000	$20,000
Site Access Haul Road	L.F.	800	$35	$28,000
Bedrock Pinning	L.F.	115	$50	$5,750
Stacked Boulder Revetment	TON	300	$150	$45,000
Excavation (Earthwork)	C.Y.	220	$10	$2,200
Stream Channel Bed Armoring (Import)	TON	100	$75	$7,500
Bank Stabilization	L.F.	115	$80	$9,200
Geotextile Matting	S.F.	3000	$2	$6,000
Seeding and Vegetative Restoration	S.F.	3000	$3	$9,000
Shrubs, Trees, and Plantings	Ea.	150	$30	$4,500
Construction Inspection	L.S.	1	$34,000	$34,000
			Subtotal =	$262,400
			+20% Contingency	$52,480
			Total	$310,000

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Stream Repair Restoration
Stony Brook, Schoharie, New York

December 24, 2015
MMI# 4805-04
BY: AJL

AREA 7 - UPSTREAM OF COLBY RD
PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COSTS

Based upon 30% Conceptual Design Alternatives
Dated January 2016

Notes and Assumptions:

1) Bedrock channel - cannot excavate bypass channel to dewater work site, requires cofferdam and piping.
2) Footing of boulder revetment will require pinning to bedrock for stability/scour protection.
3) Vegetative restoration is limited to typical species of grasses, shrubs, and trees.
4) Assume 415 linear feet of stacked boulder revetment, approx. 5' high
5) Assume no unsuitable or contaminated material management necessary, all fill generated on site suitable for reuse.
6) Assume construction inspection services at 15% of project cost.

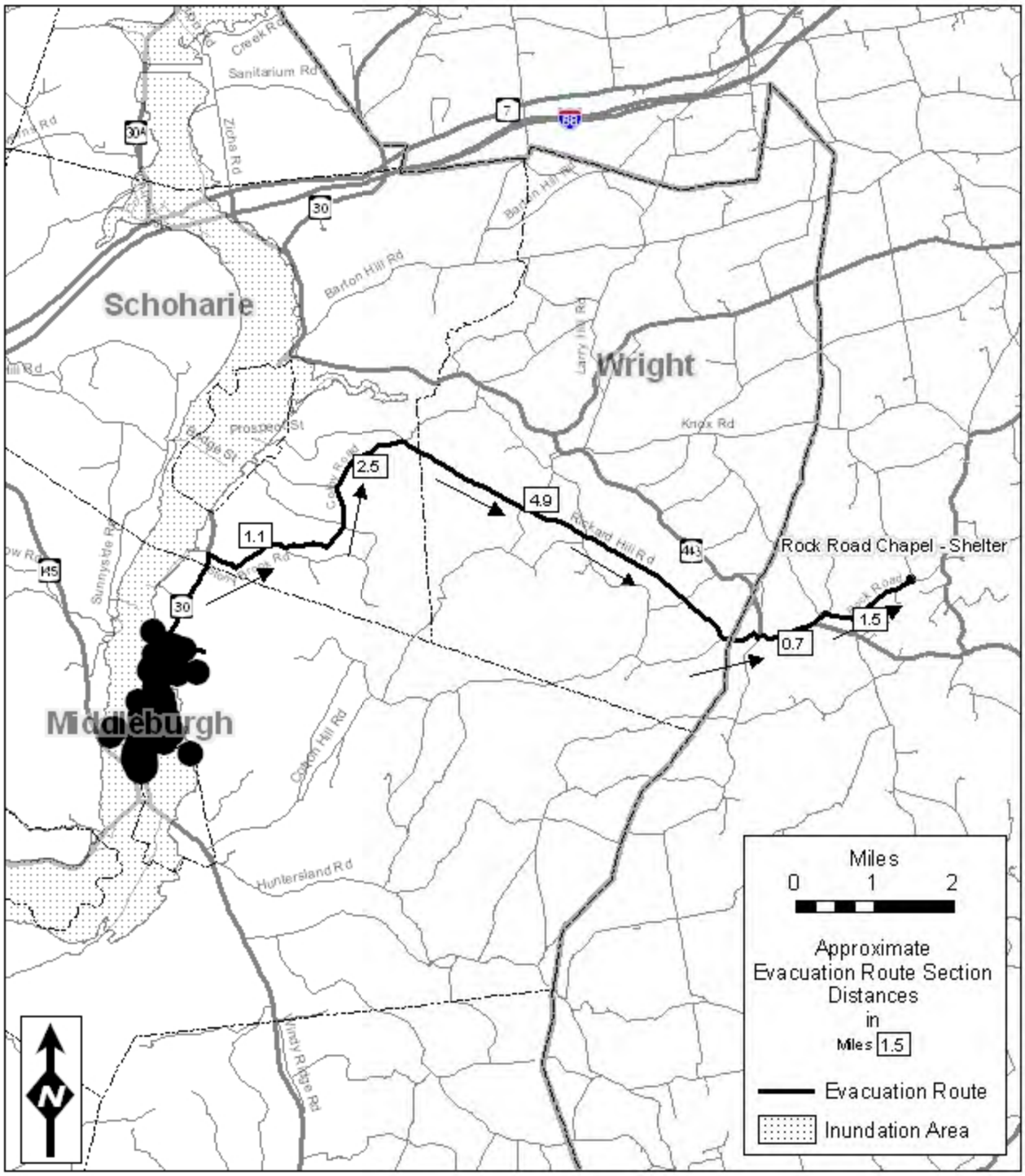
Engineer's Opinion of Cost Based Upon Conceptual Analysis:

Item	Unit	Quantity	Unit Cost	Cost
Design and Permitting	L.S.	1	$40,000	$40,000
Construction Mobilization	L.S.	1	$20,000	$20,000
Sedimentation and Erosion Control	L.S.	1	$10,000	$10,000
Water Control	L.S.	1	$60,000	$60,000
Site Access Easement	L.S.	1	$10,000	$10,000
Clearing and Grubbing	L.S,	1	$30,000	$30,000
Site Access Haul Road	L.F.	180	$35	$6,300
Stream Crossing	L.S.	2	$10,000	$20,000
Bedrock Pinning	L.F.	415	$50	$20,750
Stacked Boulder Revetment	TON	280	$150	$42,000
Excavation (Earthwork)	C.Y.	800	$10	$8,000
Stream Channel Bed Armoring (Import)	TON	200	$75	$15,000
Bank Stabilization	L.F.	415	$80	$33,200
Geotextile Matting	S.F.	16000	$2	$32,000
Seeding and Vegetative Restoration	S.F.	16000	$3	$48,000
Shrubs, Trees, and Plantings	Ea.	800	$30	$24,000
Construction Inspection	L.S.	1	$63,000	$63,000
			Subtotal =	$482,250
			+20% Contingency	$96,450
			Total	$580,000

APPENDIX E

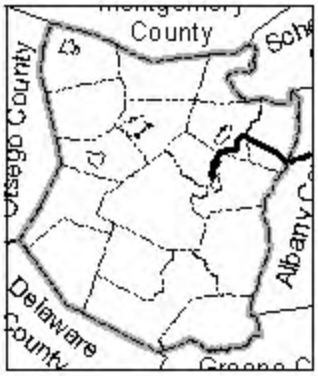
FLOOD EVACUATION ROUTE MAP

Region 13 Evacuation Route



SHELTER - Rock Road Chapel

- Route 30 North - 2.8 Miles
- Right onto Stony Brook Road - 1.1 Miles
- Straight on to Colby Road - 2.5 Miles
- Right onto Rickard Hill Road to end - 4.9 Miles
- Left then right onto 443 - 0.7 Miles
- Left onto Rock Road - 1.5 Miles
- To Rock Road Chapel



Stony Brook
Stream Repair and Restoration
Hydrologic, Hydraulic,
and Engineering Design Report

Town of Schoharie, Schoharie County, New York

February 2017

MILONE & MACBROOM

Engineering | Planning | Landscape Architecture | Environmental Science

Stony Brook
Stream Repair and Restoration
Hydrologic, Hydraulic, and Engineering Design Report

Town of Schoharie, Schoharie County, New York
February 2017

Prepared for:
Schoharie County Soil and Water
Conservation District
173 South Grand Street, Suite 3
Cobleskill, NY 12043

MMI #4805-04-6

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To be inserted

1.0 INTRODUCTION

The Schoharie County Soil and Water Conservation District (SCSWCD) retained Milone & MacBroom, Inc. (MMI) to assess approximately 2.6 miles of Stony Brook in the town of Schoharie, New York. The Stony Brook project has been divided into two phases. During Phase I, which was undertaken in 2015, an assessment of the stream, culverts, and bridges was completed, and conceptual design recommendations for stream repair were provided. Channel and infrastructure improvements were recommended and prioritized in consultation with SCSWCD and with input from the Town of Schoharie. Recommendations are summarized in an engineering report and accompanying conceptual design plans entitled *Stream Repair and Restoration, Stony Brook, Town of Schoharie,* produced by MMI and dated January 19, 2016.

Phase II of the Stony Brook project entails a more detailed hydraulic analysis, survey, geotechnical investigations, alternatives analysis, final design, permitting, and construction phase services. The stream repair components being advanced to Phase II are listed below. Areas and stream stationing are as referenced in the engineering report and on the conceptual design plans.

- Replacement of undersized culvert at Frisbieville Road (Area 1, Station [STA] 19+75) with a larger structure. The existing culvert is a corrugated metal pipe arch or multiplate structure with a rise of 7.5 feet and maximum span of 12 feet. The culvert is prone to overtopping during floods and has a drop on the downstream end.

- Replacement of undersized culvert at Stony Brook Road (Area 3, STA 60+50) with a larger structure. The existing culvert is precast concrete with a span of 10 feet and a rise of 5 feet and frequently overtops during floods.

- Repair and restacking of stacked rock revetment wall, installation of grade control, and roughening of channel with random boulder placement (Area 4, STA 81+50). The existing stacked rock wall has been eroded and undercut at this location and is in danger of failure.

- Bank failure repair, grade control, and relocation of channel away from toe of slope (Area 7, STA 139+00). The bank failure at this location is in danger of undermining Stony Brook Road.

- Bank failure repair, grade control, and relocation of channel away from toe of slope where bank failure threatens Stony Brook Road (Area 7, STA 148+00).

This work is funded through the United States Department of Housing and Urban Development's (HUD's) Community Development Block Grant – Disaster Recovery (CDBG-DR) appropriated by the Disaster Relief Appropriations Act, 2013 (Pub. L. 113-2). The CDBG-DR funding is administered by the Governor's Office of Storm Recovery (GOSR).

This report documents the hydrologic, hydraulic, and structural analyses performed to support the design of the replacement structures and channel.

1.1 Site Description

Stony Brook is located in the town of Schoharie in Schoharie County, New York. The stream is a total of 5.6 miles in length from its headwaters to the confluence with Schoharie Creek (Figure 1-1). The creek originates in the range of hills on the east side of the Schoharie Creek Valley. After leaving its headwaters, Stony Brook passes under Stony Brook Road. It parallels Stony Brook Road for most of its course before passing under State Highway 30. The creek subsequently flows along the south side of Frisbieville Road for 0.4 miles before passing through a culvert and traveling approximately 0.5 miles where it discharges to Schoharie Creek.

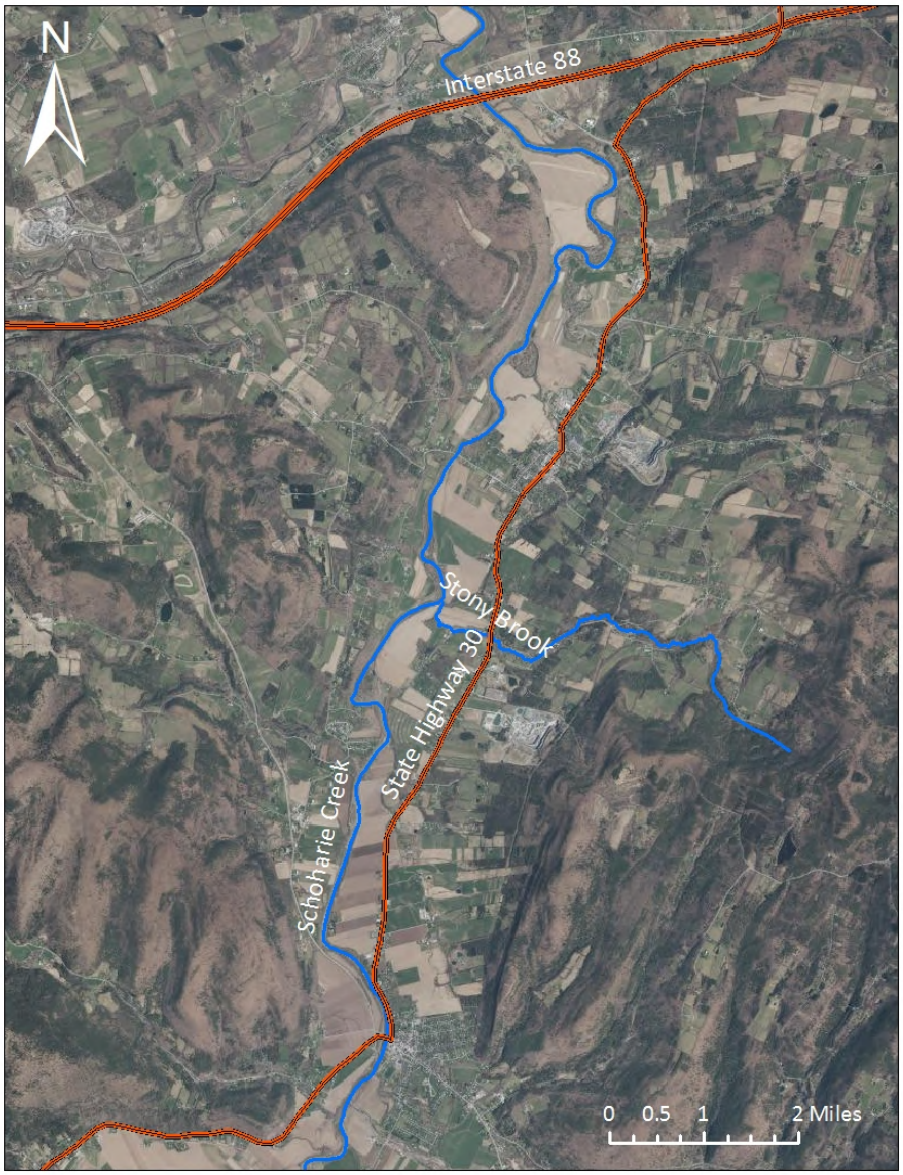

Figure 1-1
Project Area Map

For ease of reference, stream stationing is used as an "address" to identify specific points along the Stony Brook watercourse. Stationing is measured in feet, beginning at the confluence with Schoharie Creek (STA 0+00) and continuing upstream to Stony Brook's headwaters. All references to right bank and left bank in this memo refer to "river right" and "river left," meaning the orientation assumes that the reader is standing in the channel looking downstream.

Channel improvements will take place at five locations along the Stony Brook channel as listed in Table 1-1 and located on Figure 1-2. In order to maintain consistency, the same site numbering that was used in the initial report is used here.

TABLE 1-1
Channel Improvements

Site Number	Stream Station	Repair
1	19+75	Replacement of undersized culvert at Frisbieville Road
3	60+50	Replacement of undersized culvert at Stony Brook Road
4	81+50	Repair and restacking of stacked rock revetment wall, installation of grade control, and roughening of channel with random boulder placement
7a	139+00	Bank failure repair, grade control, and relocation of channel away from toe of slope
7b	148+00	Bank failure repair, grade control, and relocation of channel away from toe of slope

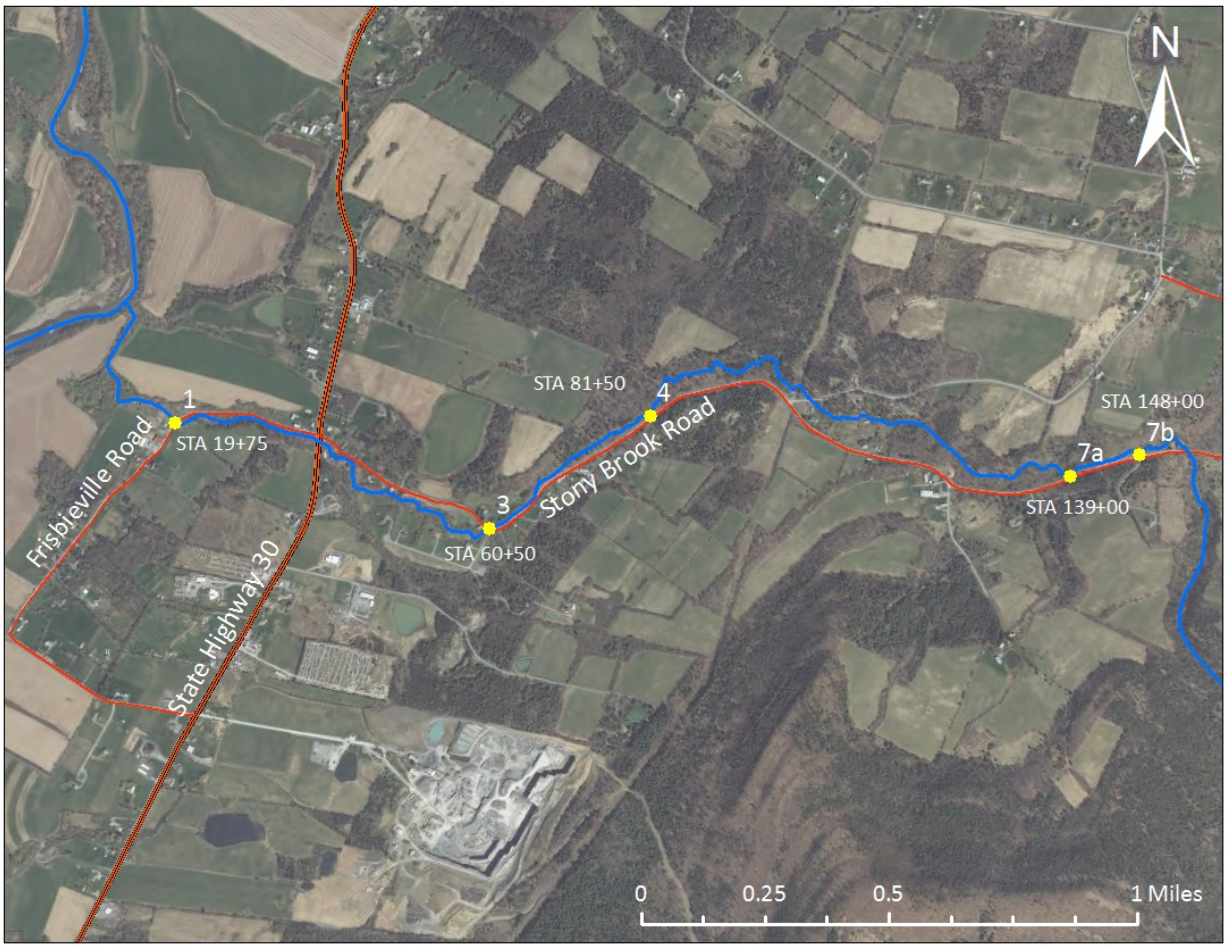

Figure 1-2
Site Locations along Stony Brook

1.2 Utilities

Utilities to be determined.

Utility poles that carry electrical, telephone, and cable cross over the Stony Brook Road Culvert (Site 3).

Utility poles that carry electrical, telephone, and cable run parallel to Stony Brook Road opposite Site 4.

Utility poles that carry overhead electrical, telephone, and cable run parallel to Stony Brook Road opposite the bank failure at Site 7a. Overhead electrical crosses the road and the creek just downstream of the project area.

Utility poles that carry overhead electrical, telephone, and cable run parallel to Stony Brook Road on the same side of the road as the bank failure at Site 7b, then cross to the opposite side of the road adjacent to the site.

1.3 Subsurface Investigations

The subsurface investigation of the Stony Brook site was conducted by Atlantic Testing Laboratories (ATL). The intent of this investigation was to determine the type and nature of the soils at the project site and develop foundation recommendations.

One boring was taken at each end of the existing Frisbieville Road culvert along the north side. Boring B-1 was advanced to a depth of 23 feet before encountering refusal. A 5-foot rock core was obtained, for a total boring depth of 28 feet. Boring B-2 was advanced to a depth of 22.5 feet before encountering refusal on a boulder or possible bedrock.

Groundwater was encountered 8 to 10 feet below grade at the time the borings were taken. Actual levels may vary seasonally or following storm events. Dewatering may be necessary depending on the structure type selected and the amount of excavation required.

The soils at the Frisbieville Road culvert consisted of medium compact (N values 10 to 30) to very compact (N values greater than 50) gravelly sand and sandy gravel that extended to depths ranging from 10 to 14 feet below the surface. The sandy gravel and gravelly sand were underlain by stiff (N values 8 to 15) to very stiff (N values 15 to 30) silty clay and clayey silt that extended to refusal on sandstone bedrock at depths ranging from 22.5 to 23 feet. Sandstone bedrock was cored in boring B-1 utilizing an NX-size, double-tube core barrel to termination. Based on the rock core RQD value, the bedrock recovered is considered good quality sandstone (see Geotechnical Report by ATL under separate cover).

One boring was taken at each end of the existing Stony Brook Road culvert along the north side. Boring B-4 was advanced to a depth of 16 feet before encountering refusal and a 5-foot rock core was obtained, for a total boring depth of 21 feet. Boring B-3 was advanced to a depth of 15 feet before encountering refusal on a boulder or possible bedrock.

Boring B-3 encountered 2 inches of topsoil and organic material at the surface that was underlain by very stiff (N values 15 to 30) sandy silt that extended to a depth of 2 feet. Underlying the sandy silt in boring B-3 and at the surface in boring B-4 was medium compact (N values 10 to 30) to very compact (N values greater than 50) sandy gravel and gravelly sand that extended auger refusal at depths ranging from 15 to 16 feet. Sandstone bedrock was cored in boring B-4 utilizing an NX-size, double-tube core barrel to termination. Based on the rock core rock quality designation (RQD) value, the bedrock recovered is considered good quality sandstone (see Geotechnical Report by ATL under separate cover).

2.0 HYDROLOGY

2.1 Design Flood Frequency

The flood frequency used for design of replacement structures is based upon review of the recommendations provided by GOSR and criteria provided in the New York State Department of Transportation (NYSDOT) *Highway Design Manual* and *Bridge Design Manual*.

GOSR recommendations were provided in a document entitled, "Environmental Review for Community Development Block Grant-Disaster Recovery (CDBG-DR) Funded Projects in the NY Rising Community Reconstruction Program." The Culvert Sizing/Replacement section recommends that capacity and size of a culvert should be based upon the predicted 100-year storm event. Criteria derived from the NYSDOT manuals indicate that culverts and bridges should be designed to accommodate the predicted 50-year storm event.

Based on review of the documents cited above, it is recommended that hydraulic design of the replacement structures be based on the GOSR recommendation to size the structure to pass a 100-year event. Should the resulting structure size be judged as impractical (based on the required physical extent of the project, the extent of environmental impacts, aesthetics, and cost), the design frequency will default to the 50-year storm event.

2.2 Basin Descriptions

Stony Brook flows in a generally westward direction toward its confluence with Schoharie Creek. The watershed of Stony Brook is 4.2 square miles in size and drains an area to the east of Schoharie Creek. The watershed is bound by high points reaching elevations of 1,800 to 1,900 feet above sea level, including unnamed hills to the north, Rundy Cup Mountain to the east, and Cotton Hill to the south. The watershed is approximately 70 percent forested with a patchwork of agriculture and rural residential uses concentrated in the central part of the basin. Size and land use for the contributing watersheds at Sites 1, 3, 4, and 7a, and 7b are given in the table below (Table 2-1).

The Stony Brook basin is underlain by unsorted glacial till ranging from clay to boulders, with some areas of proglacial and alluvial sediments along Schoharie Creek. The underlying bedrock consists of a mix of sandstone, limestone, and shale from the Lower to Middle Devonian period. Bedrock is visible at several locations in the Stony Brook channel.

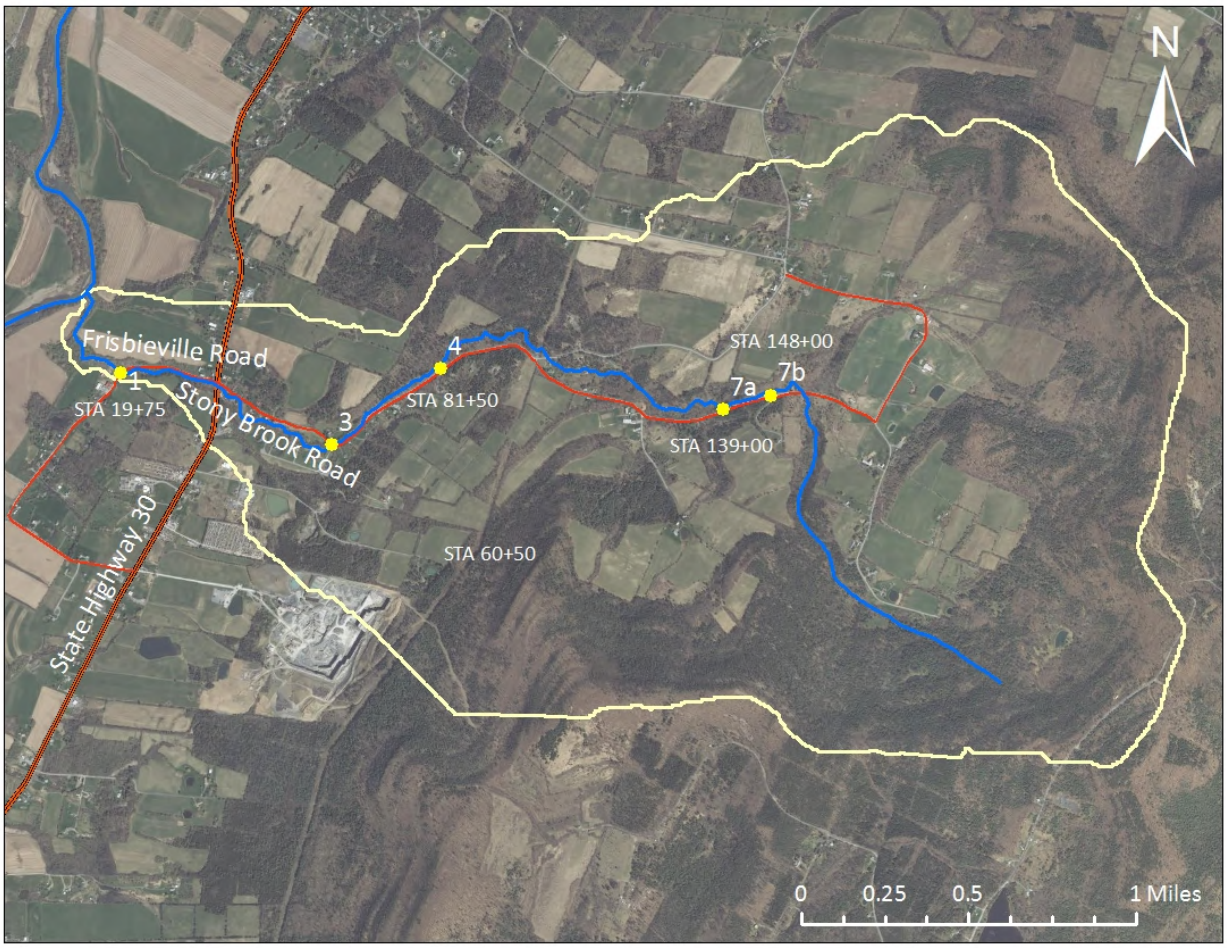

Figure 2-1
Stony Brook Watershed

TABLE 2-1
Watershed Characteristics at Site Locations

Area	Watershed Area (mi^2)	Forested Cover (%)	Urban Area (%)	Area above 1,200 feet (%)
1	4.1	74	4.1	60.6
3	3.5	74	4.0	67.4
4	3.1	75	4.2	74.9
7a and 7b	1.9	82	2.3	92.1

2.3 Flood History

Recent, severe flooding events, most significantly Tropical Storm Irene in 2011 and a June 2013 flood event, have significantly impacted Stony Brook. These events resulted in severe bed and bank erosion within some areas of the Stony Brook channel as well as aggradation of excessive amounts of bedload sediment in

other areas. This aggradation of sediment has clogged culvert and bridge crossings and led to the reduction of flood conveyance capacity in the channel. The sediment migration has caused the channel to become unstable, with bank erosion and excessive sedimentation in many areas.

Anecdotal reports indicate that substantial flooding, channel erosion, and sediment aggradation occurred along Stony Brook on August 28, 2011, when Tropical Storm Irene passed through the area. In late June 2013, a severe, localized rain event triggered flooding throughout Stony Brook's watershed. Large volumes of sediment were transported from the upper reaches of the watershed, which accumulated in front of the culverts reducing their capacity and causing them to overtop. Severe flooding also occurred in January 1996.

Sediment that had accumulated in the channel was reportedly removed in the days following the June 2013 flood event. In some areas, it was hauled to a disposal site to the east on Stony Brook Road. In other areas, excess sediment was cast along the banks of the stream, lowering the streambed but leaving berms on each bank. These berms, formed by dredging spoil, are evident along Stony Brook, particularly near Site 3. Historic dredging of the channel was indicated by berms located farther away from the channel that contain woody vegetation ranging between 20 to 50 years old.

Several landowners with homes along Stony Brook have provided descriptions and photographs of the June 2013 flood event. The Schoharie Highway Supervisor and staff at SCSWCD have also provided descriptions of the flooding. SCSWCD staff provided historical aerial photographs dating back to 1940. These were used to analyze historical changes to the Stony Brook watershed and stream corridor.

Figure 2-2
Photo of Flooding along Stony Brook Taken by a Landowner during June 2013 Flood

2.4 Published Data

There are no known published discharge data for the project area.

2.5 Peak Discharges

Regression equations, developed by the United States Geological Survey (USGS) (Lumia, Freehafer, Smith, 2006) and applied through the USGS web-based *StreamStats* program, were used to estimate peak discharges at the project sites. The regression equations employed for these sites are specific to New York State Hydrologic Region 3 and include the parameters of drainage area, basin lag, mean annual runoff, and the seasonal maximum snow depth to estimate peak flows. Tables 2-2 through 2-5 summarize the peak discharges predicted by *StreamStats* at the project sites. The tables also show the range of discharges defined by the standard error of estimate (SEE) associated with the regression equations. Printed results from *StreamStats* are provided in Appendix B.

TABLE 2-2
USGS Regression Equation Discharges – Site 1 (USGS *StreamStats*)[1]

Recurrence Interval	Discharge	Discharge at Minimum SEE	Discharge at Maximum SEE
5-Year	280	223	337
10-Year	389	316	462
25-Year	557	465	649
50-Year	711	602	820
100-Year	879	751	1,007
500-Year	1,350	1,160	1,540

[1] Discharges are in cubic feet per second (cfs).

TABLE 2-3
USGS Regression Equation Discharges – Site 3 (USGS *StreamStats*)[1]

Recurrence Interval	Discharge	Discharge at Minimum SEE	Discharge at Maximum SEE
5-Year	240	191	289
10-Year	334	272	396
25-Year	478	399	557
50-Year	611	517	705
100-Year	756	646	866
500-Year	1,160	996	1,324

[1] Discharges are in cubic feet per second (cfs).

TABLE 2-4
USGS Regression Equation Discharges – Site 4 (USGS *StreamStats*)[1]

Recurrence Interval	Discharge	Discharge at Minimum SEE	Discharge at Maximum SEE
5-Year	213	170	256
10-Year	297	241	353
25-Year	425	354	496
50-Year	544	460	628
100-Year	673	575	771
500-Year	1,030	885	1,175

[1] Discharges are in cubic feet per second (cfs).

TABLE 2-5
USGS Regression Equation Discharges – Sites 7a/7b (USGS *StreamStats*)[1]

Recurrence Interval	Discharge	Discharge at Minimum SEE	Discharge at Maximum SEE
5-Year	134	107	161
10-Year	187	152	222
25-Year	269	224	314
50-Year	345	207	283
100-Year	428	366	490
500-Year	658	565	751

[1] Discharges are in cubic feet per second (cfs).

While *StreamStats* provides a good regional average for stream behavior, the regression equations were developed from stream flow gauging station data extending only to September 1999 and do not include more recent flood events including Tropical Storm Irene. Therefore, a comparative analysis was conducted of two gauged streams with similarly sized watersheds. Biscuit Brook is a gauged stream in the same New York State hydrologic region as Stony Brook. Its watershed area is 3.72 square miles, which is similar to Sites 1, 3, and 4 on Stony Brook, which have respective basin sizes of 4.1, 3.5, and 3.1 square miles. The second gauged stream identified was Hollow Tree Brook. The effective watershed area at this gauge is 1.95 square miles. This was by far the closest gauged stream with a similar watershed area to Sites 7a and 7b, which have an effective catchment area of 1.9 square miles.

At both Biscuit Brook and Hollow Tree Brook, peak discharges were derived from the gauges using the Hydrologic Engineering Center – *Statistical Software Package* (HEC-SSP). The USGS peak discharges were then compared with peak stream flow estimates derived from *StreamStats*. These USGS peak discharges were divided by the peak discharges estimated by *StreamStats* to arrive at a dimensionless ratio. A ratio close to 1.0 signifies close agreement between peak discharges derived from analysis of gauge data and peak discharges estimated from regression equations. This ratio was then applied to the 100-year discharge at the four Stony Brook project sites to arrive at an adjusted peak discharge. This analysis found that the adjusted 100-year discharge typically fell within the SEE for the USGS

StreamStats discharge. Therefore, the discharges determined using *StreamStats* were used as the design discharges without applying the adjustments using the dimensionless ratios.

2.6 Bankfull Discharge

Natural rivers convey a wide range of discharges on an annual basis. A widely accepted theory is that alluvial streams adjust their channel form in response to a natural range of flows that can be represented by a single, equivalent "channel forming discharge" (Doyle et al. 2007, Richard and Anderson 2007). Statistical analysis has determined that the frequency of channel-forming discharges typically varies from 1 to 5 years. This frequency can be higher or lower at specific sites. However, the value generally used to represent the channel-forming discharge is 1.5 years. Several surrogates are available to estimate the channel-forming discharge including the bankfull discharge, effective sediment transport discharge, and frequency analysis. The most commonly used of these methods is bankfull discharge.

Bankfull flows were estimated by first examining peak discharges derived from USGS *StreamStat*s. Peak flows were then run in the Stony Brook Hydrologic Engineering Center – *River Analysis System* (HEC-RAS) model. Simulated water surface elevations were compared to cross section geometry to determine which discharge best approximated bankfull flow. A review of discharges and cross sections determined that the 2-year event best approximated bankfull flow (Table 2-6).

TABLE 2-6
Bankfull Estimates for Stony Brook Based on *StreamStats* 2-Year Discharge[1]

Site	Station	Flow (cfs)
1 – Frisbieville Road Culvert	19+75	156
3 – Stony Brook Road Culvert	60+50	133
4 – Stony Brook Road Repair	81+50	116
7a – Stony Brook Road Repair	139+00	73
7b – Stony Brook Road Repair	148+00	73

[1] Discharges are in cubic feet per second (cfs), and velocities are in feet per second (ft/sec).

Channel dimensions from surveyed cross sections at STA 131+00 and STA 31+00 were used to calculate bankfull flow using Manning's equation. These bankfull flows were found to be comparable to the flows estimated using *StreamStats* and HEC-RAS.

2.7 Recommended Discharges

Design discharges for Stony Brook were developed from USGS *StreamStats* regression equations. As discussed above, these discharges were used without applying the adjustments using the dimensionless ratios. The discharges for bankfull and peak flows are given in Table 2-7. Flood frequency curves based on the design discharges are illustrated in Figures 2-3 through 2-6.

TABLE 2-7
Recommended Design Discharges[1]

Site	Design Discharges				
	Bankfull	10-Year	50-Year	100-Year	500-Year
1	156	389	711	879	1,350
3	133	334	611	756	1,160
4	116	297	544	673	1,030
7a/7b	73	187	345	428	658

[1] Discharges are in cubic feet per second (cfs).

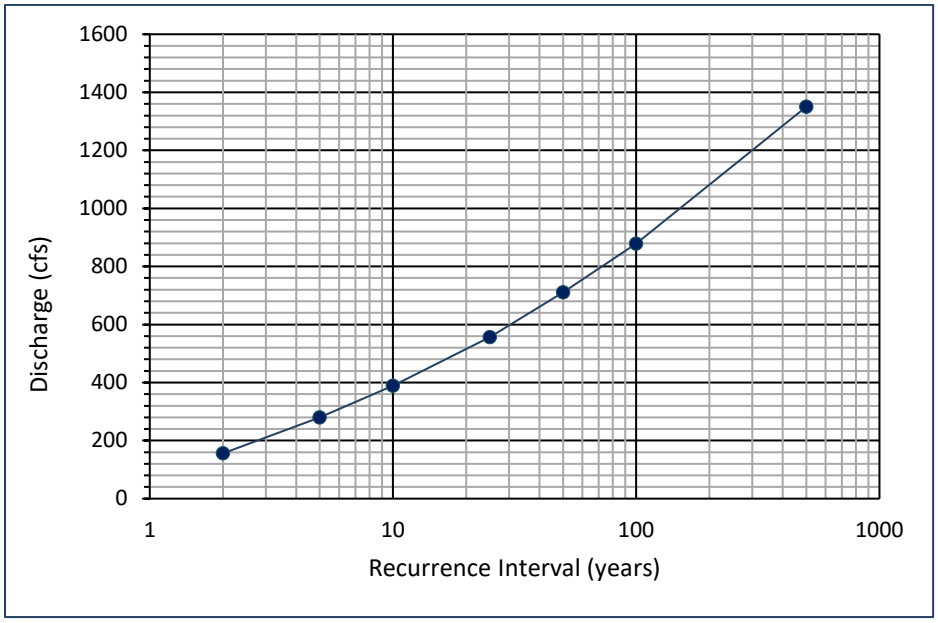

Figure 2-3
Flood Frequency Curve for Stony Brook – Site 1

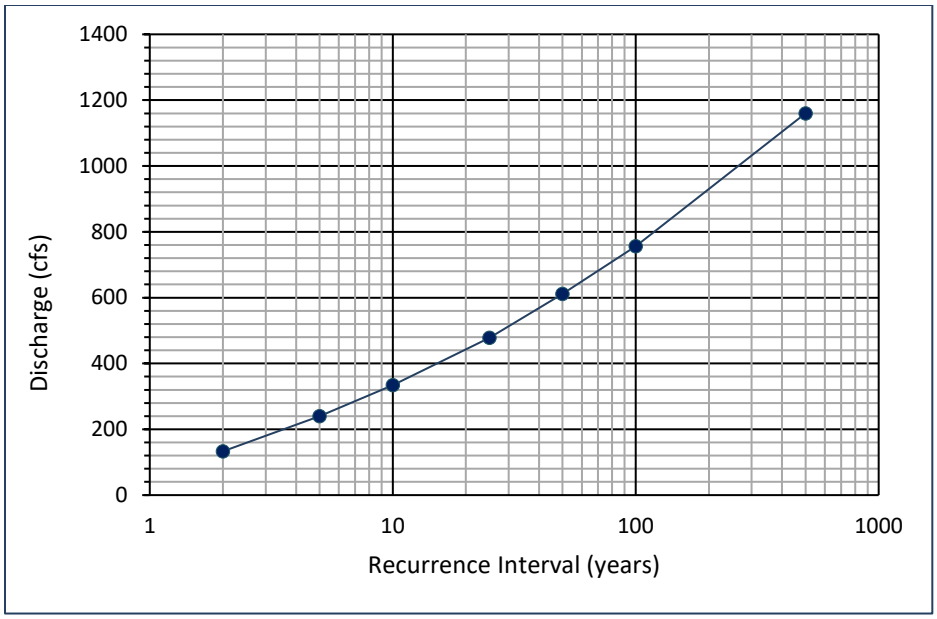

Figure 2-4
Flood Frequency Curve for Stony Brook – Site 3

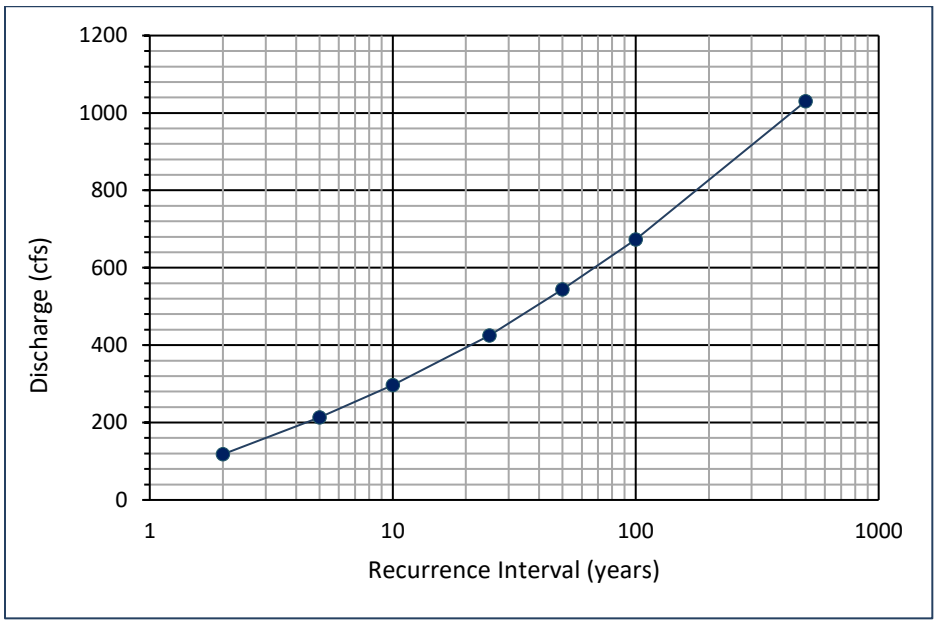

Figure 2-5
Flood Frequency Curve for Stony Brook – Site 4

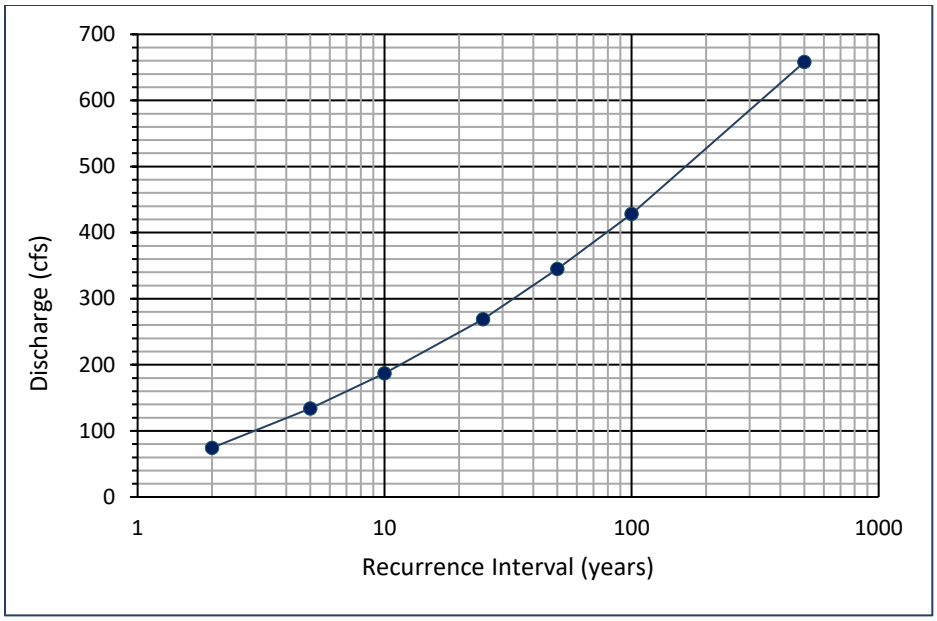

Figure 2-6
Flood Frequency Curve for Stony Brook – Sites 7a/7b

3.0 CHANNEL CHARACTERISTICS

Fieldwork to evaluate channel characteristics was carried out to support design of culvert replacements and in-stream channel work including grade control and bank stabilization. This consisted of pebble counts to characterize streambed composition and channel measurements to determine bankfull characteristics. Figure 3-1 indicates the location along Stony Brook where the field measurements were taken.

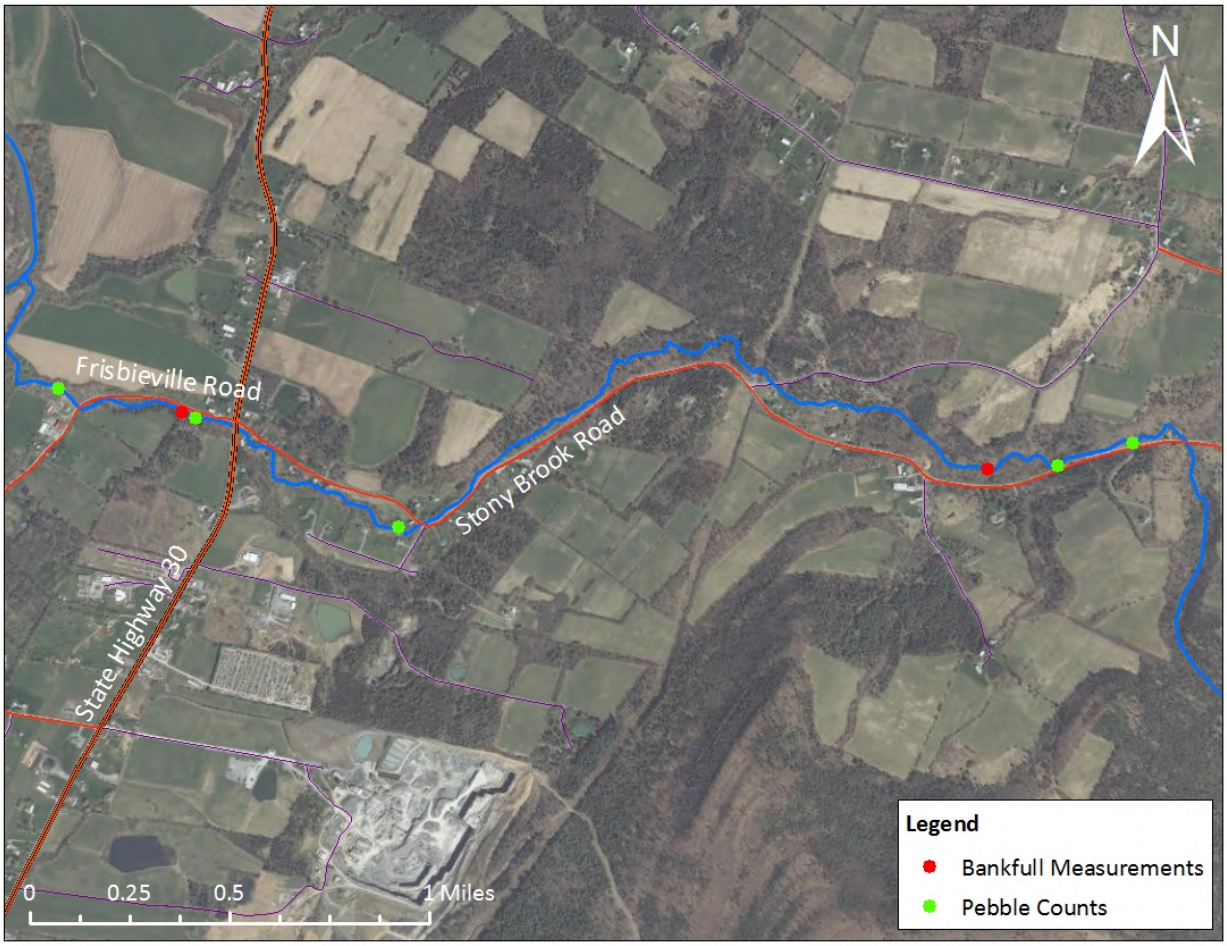

Figure 3-1
Location of Bankfull and Pebble Count Field Sites along Stony Brook

3.1 Sediment Size Distribution

Wolman pebble counts (Wolman, 1954) were performed at stream stations 17+00 (downstream of Site 1), 32+50 and 58+00 (downstream of Site 3), and 139+32 and 147+50 (Sites 7a and 7b, respectively). A pebble count seeks to characterize the streambed substrate (sediment) by measuring independent particle sizes of a representative section of bed. Pebble counts are performed by dividing a

representative stream reach into equally spaced transects/cross sections. Individual sediment particles are randomly selected and measured at equal intervals along all transects until a minimum of 100 individual particles have been sampled. Particle size data is usually given in the form D# (i.e., D16 or D50). As an example, if the D50 of a pebble count is given as 30 millimeters (mm), this means that 50 percent of the particles sampled had a median diameter smaller than 30 mm.

After the data were collected, individual particle sizes were plotted on a histogram to illustrate the dominant particle size classes. Additionally, particle size classes including the D16, D35, D50, D84, and D95 were calculated. The resulting data can then be used in combination with hydraulic modeling to assess the bed armoring stability during a range of flow events. The sediment size distribution data for the pebble count sites are given in Table 3-1 and Figures 3-2 through 3-6.

TABLE 3-1
Representative Particle Size Classes at Pebble Count Locations

Particle Size Class	Particle Diameter (mm)				
	17+00	32+50	58+00	139+32	147+50
D16	12	5	17	4	7
D35	19	11	52	8	19
D50	31	32	77	13	32
D84	85	91	234	93	126
D95	144	119	360	338	303

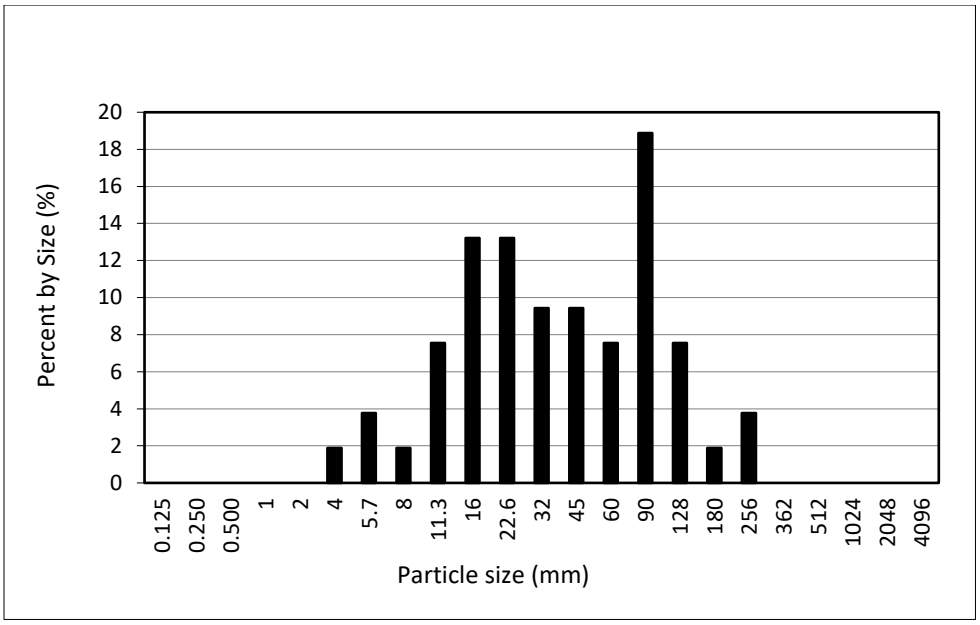

Figure 3-2
Particle Size Histogram at Stream Station 17+00

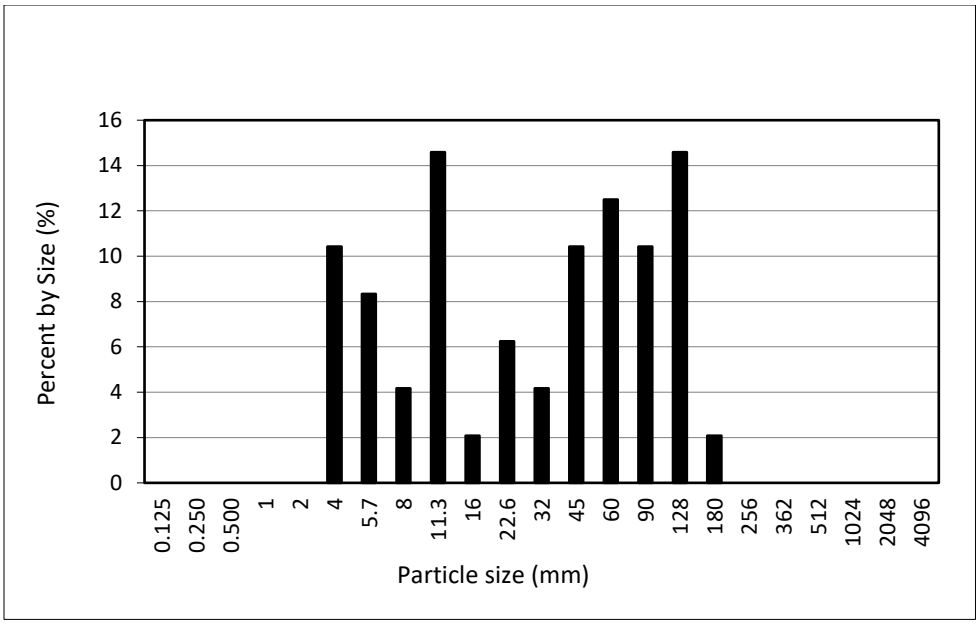

Figure 3-3
Particle Size Histogram at Stream Station 32+50

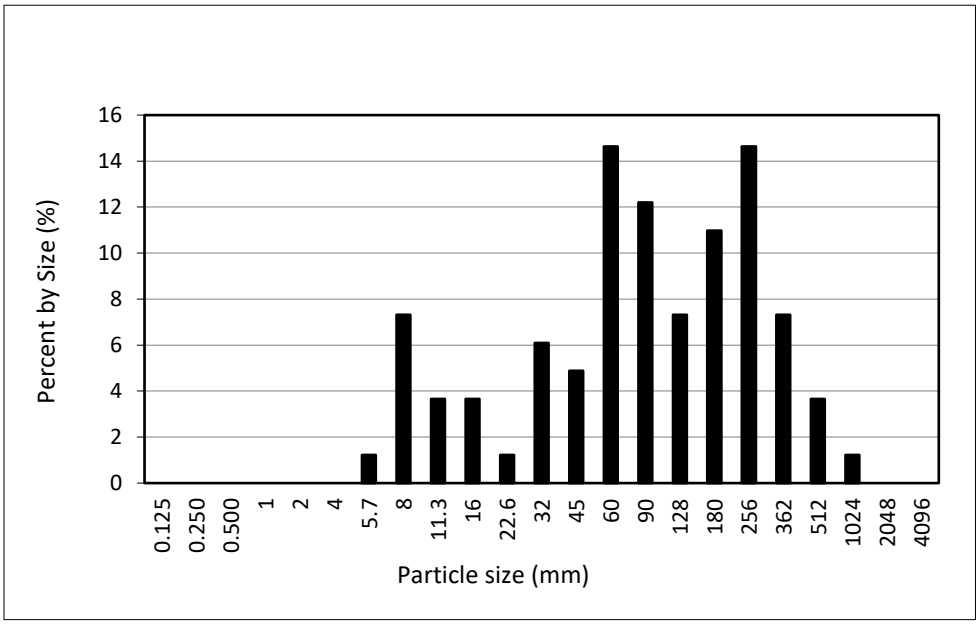

Figure 3-4
Particle Size Histogram at Stream Station 58+00

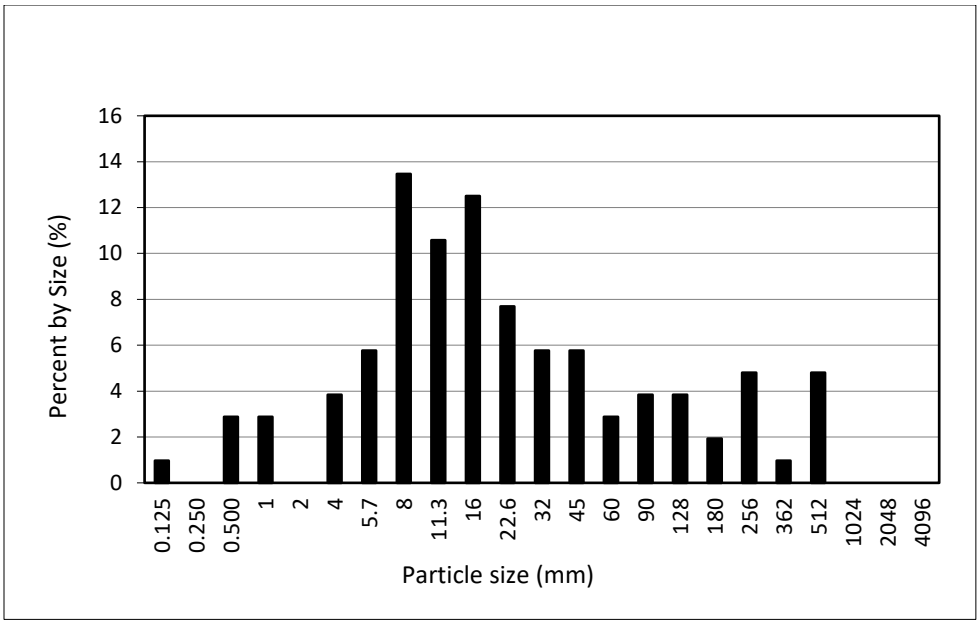

Figure 3-5
Particle Size Histogram at Stream Station 139+32

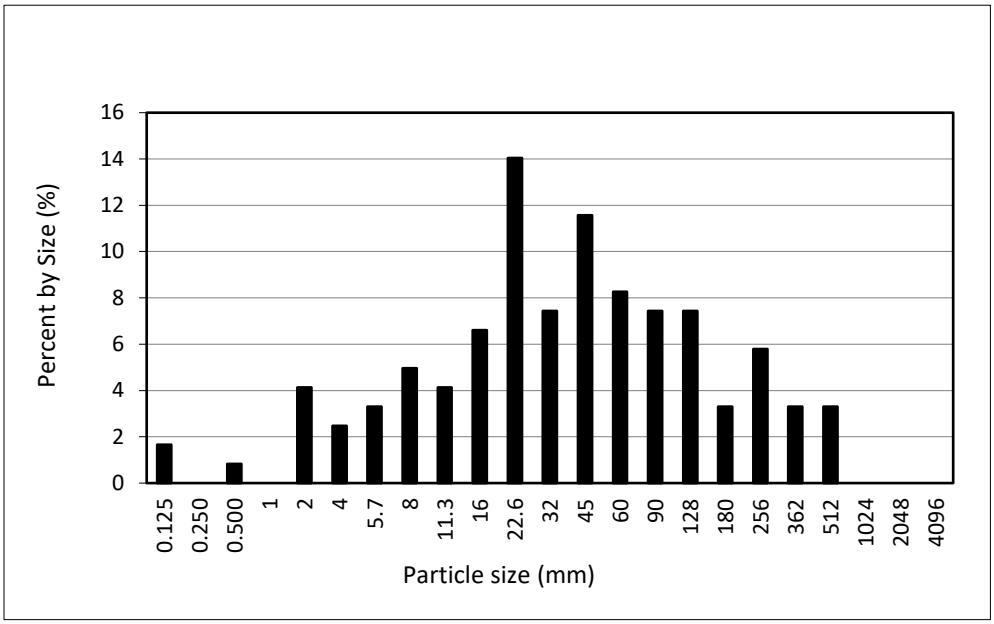

Figure 3-6
Particle Size Histogram at Stream Station 147+50

The table and figures above indicate that Stony Brook is predominately a gravel bed river with the predominant sediment size ranging from 2 mm to 60 mm. Based on the data collected, the only exception is at stream station 58+00 (located just downstream of Site 3, the Stony Brook Road culvert). This site was characterized by larger particle diameters across all size classes, and the bed is best described as gravel/cobble.

3.2 Channel Characterization

As discussed previously, alluvial channels adjust their width, depth, and slope in response to a natural range of flows that can be represented by a single, equivalent "channel forming discharge" (Doyle et al. 2007, Richard and Anderson 2007). The most common surrogate for "channel forming discharge" is bankfull flow. Along with characterization of the streambed material, measurements associated with the bankfull discharge such as width and depth are useful parameters in the design of channel and bank restorations.

The basic bankfull parameters of width and depth are typically used to generate secondary bankfull characteristics such as width-to-depth ratio and incision ratio. The width-to-depth ratio is defined as the ratio of the bankfull width to the mean bankfull channel depth. This ratio is an indicator of potential channel instability. As the channel becomes wider and shallower, the width-to-depth ratio increases. In practical terms, this indicates that hydraulic stress against the banks increases resulting in accelerated erosion.

Another important secondary bankfull characteristic is the incision ratio, which is defined as the height of the floodplain divided by the maximum bankfull depth. This ratio is an indication of the vertical connection between a channel and its floodplain. An incision ration of 1.0 to 1.2 indicates that the bankfull flow will access the floodplain. A larger value indicates that only larger floods will leave the channel and spread into the floodplain.

Channel cross sections were measured at two locations where bankfull indicators could be identified to determine bankfull characteristics on Stony Brook. The first location was in the upper project area. It is located along Stony Brook Road approximately 866 feet upstream of the intersection of Stony Brook Road and Rack Road at STA 131+00. The second cross section was located along Frisbieville Road 728 feet downstream of the intersection of State Highway 30 and Frisbieville Road at STA 31+00. These cross sections are illustrated in Figures 3-7 and 3-8.

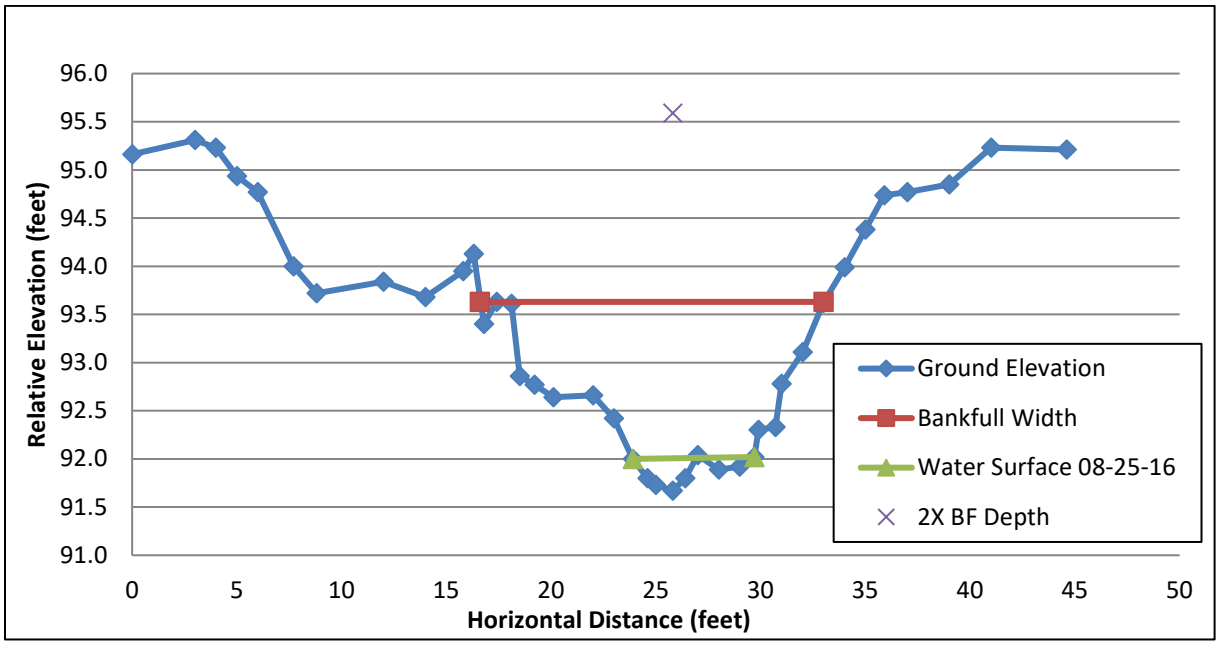

Figure 3-7
Cross Section Located at the Upper End of Stony Brook

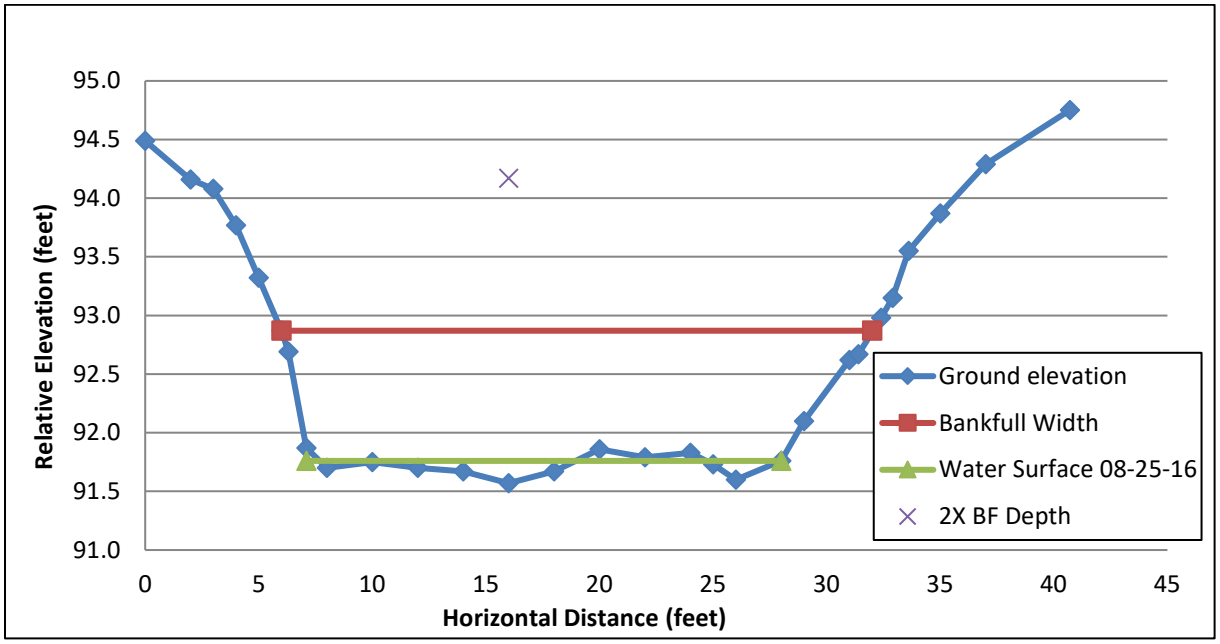

Figure 3-8
Cross Section Located at the Lower End of Stony Brook

Bankfull characteristics were determined based on field observation and cross-section measurements. The bankfull characteristics of cross-sectional area, width, and depth were used to calculate width-to-depth ration and incision ratio (Table 3-2). These bankfull characteristics are important parameters for designing channel size and form particularly at Sites 4 and 7 where there are no hydraulic structures. It should be noted that the Stony Brook channel was severely damaged due to erosion during recent flood events, and as a result, the channel is overly wide, and bankfull features have not had a chance to reform. Bankfull features were difficult to distinguish in the field.

TABLE 3-2
Bankfull Dimensions Based on Field Measurements

Site	Cross Sectional Area (feet^2)	Width (feet)	Mean Depth (feet)	Max Depth (feet)	Width/Depth Ratio	Incision Ratio
Upper/Stony Brook Road	18.7	16.4	1.14	2.0	14.4	1.3
Lower/Frisbieville Lane	26.6	26.0	1.02	1.3	25.4	1.5

A longitudinal survey was conducted at both culvert locations (Frisbieville Road – Site 1 and Stony Brook Road – Site 3) to determine the channel slope. At Frisbieville Road, the longitudinal profile began 253 feet upstream of the culvert and extended 174 feet downstream of the culvert. Including the culvert, the total length of reach is 458.3 feet. It is important to note that the culvert outlet is perched approximately 3.3 feet above the channel bed. Large blocks of stone have been placed below the culvert outlet to alleviate scouring. The total slope of the reach is 2.61 percent. Upstream of the culvert, the slope is 2.52 percent, and downstream of the culvert, the slope is 2.04 percent. Within the culvert itself, the slope is 1.63 percent (Figure 3-9).

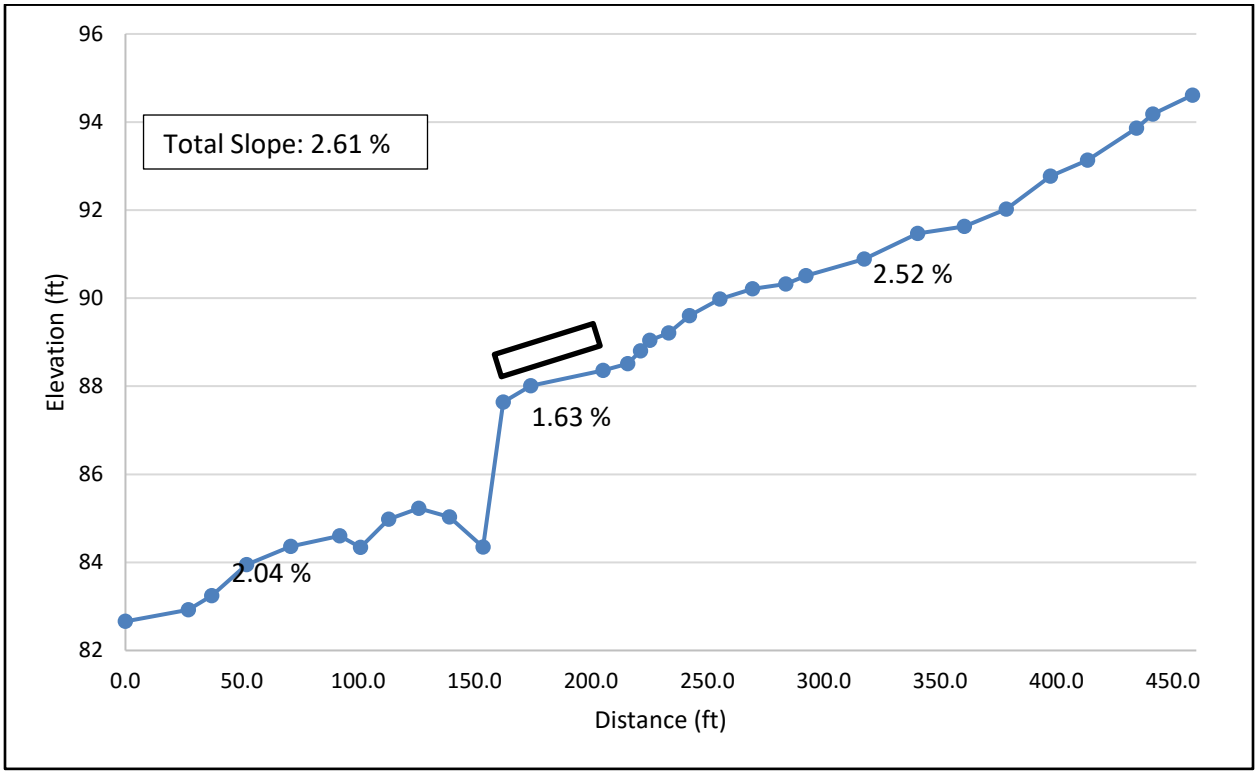

Figure 3-9
Longitudinal Profile at Frisbieville Lane Culvert (Site 1)

The longitudinal profile through the Stony Brook Road culvert began 233 feet above the culvert entrance and ended 257 feet below the culvert outlet. The total length of the longitudinal profile including the culvert was 540 feet. Just below the culvert outlet, the channel slope decreases, and aggradation of fine-grained sediment is evident. At the lower end of the reach, the channel makes a sharp bend that is accompanied by a noticeable decrease in channel slope (Figure 3-10).

The slope of this entire reach is 2.90 percent. Above the culvert, the slope is 3.94 percent, and below the culvert the slope is 2.38 percent while the slope of the culvert itself is 0.74 percent. If the downstream end of the reach (where the channel makes a sharp bend and flattens) is ignored, the total slope of the reach is 2.65 percent, and the slope below the culvert is 1.37 percent.

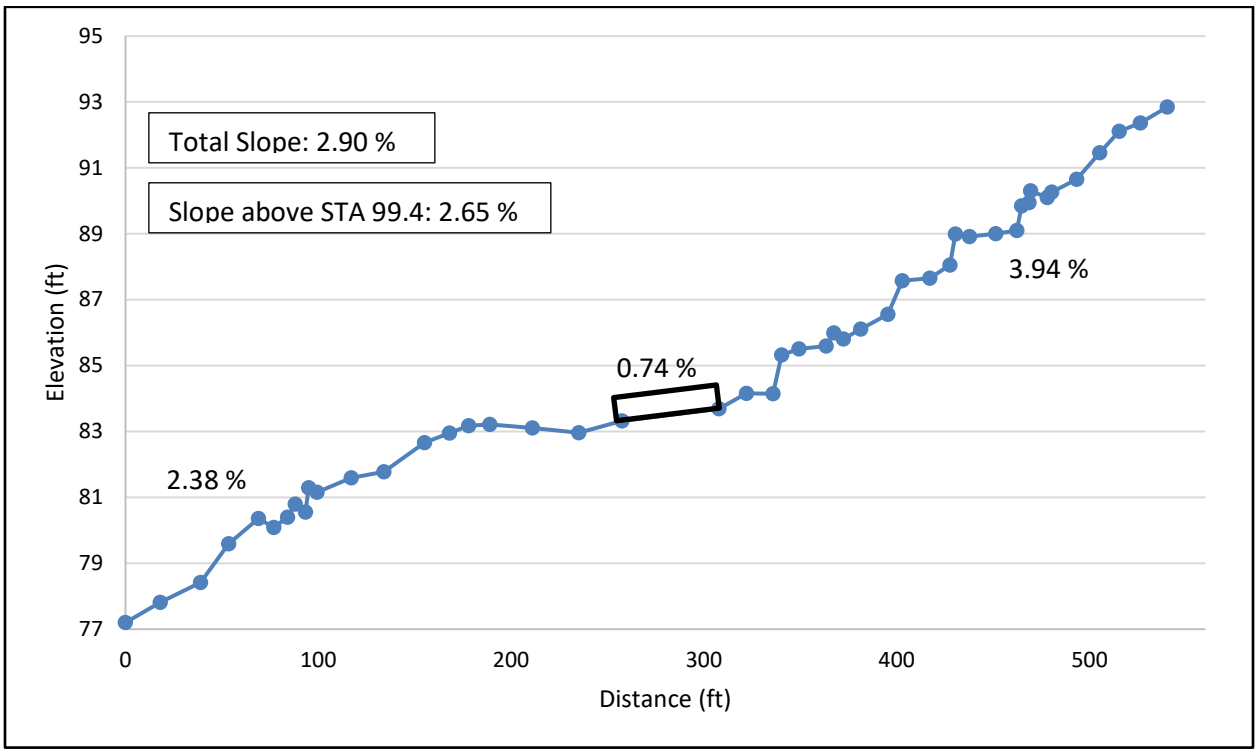

Figure 3-10
Longitudinal Profile at Stony Brook Road Culvert (Site 3)

4.0 HYDRAULIC ANALYSIS

4.1 Hydraulic Design Criteria

The criteria used for the hydraulic design of the replacement structures is based upon review of the recommendations provided by the GOSR) and review of criteria provided in the NYSDOT *Highway Design Manual* and *Bridge Design Manual*.

Criteria derived from the NYSDOT manual indicate that culverts and bridges should be designed to accommodate the predicted 50-year storm event.

However, funding for the proposed culvert replacements is being provided by the GOSR program, which offers more conservative design guidance. GOSR recommendations were provided in a document entitled *Environmental Review for Community Development Block Grant-Disaster Recovery (CDBG-DR) Funded Projects in the NY Rising Community Reconstruction Program,* not dated. The Culvert Sizing/Replacement section recommends that new and replacement culverts be designed to pass the predicted 100-year storm event.

Hydraulic design of the replacement structures will be based on the GOSR recommendation to size structures to pass a 100-year event. The GOSR document does not contain specific guidance or recommendation for maximum headwater upstream of culverts. Therefore, criteria for hydraulic design of both culverts will be as follows:

- All structures, to the extent practical relative to site constraints and project budget, will be designed to pass the predicted 100-year storm event.

- Headwater at culverts will be limited to an elevation as follows:

    - Would not result in damage to upland property;
    - Would not increase the water surface elevation allowed by floodplain regulation; or
    - Would result in a headwater depth-to-culvert-height ratio not greater than 1.0 for culverts with a height (diameter) greater than 5 feet and not greater than 1.5 for culverts with a height (diameter) of 5 feet or less.

Furthermore, the designs will, to the extent practical relative to site constraints and project budget, incorporate the following best management guidelines promoted by the GOSR program:

- Provide a minimum opening width of 1.25 times the bankfull width of the waterway in the vicinity of the culvert.
- Use open-bottom culverts, or closed-bottom culverts that have the bottom slabs placed below the streambed elevation, allowing for installation of natural streambed material through the length of the culvert.
- Match natural channel slope upstream and downstream of the culvert to channel slope through the culvert.

- Install culverts perpendicularly to the direction of flow of the stream.
- Install new or replacement structures so that no inlet or outlet drop would restrict aquatic organism passage.

Should application of these guidelines result in a structure size judged to be impractical (based on the required physical extent of the project, the extent of environmental impacts, aesthetics, and cost), the design frequency will default to the 50-year storm event.

4.2 Approach and Methodology

4.2.1 Culverts at Site 1 (Frisbieville Road) and Site 3 (Stony Brook Road)

A hydraulic model called *Hydraflow Express* by Autodesk Inc. was used to analyze both culvert crossings under existing and proposed conditions. The software uses the procedures outlined in the Federal Highway Administration (FHWA) HDS-5, which provides protocols to determine inlet control by assessing the entrance geometry of the culvert, outlet control by using the standard step method based on Bernoulli's energy equation, and Manning's equation to evaluate friction losses through the pipe.

Individual models for each culvert crossing were developed to represent existing conditions. The models include analysis of the 2-, 10-, 50-, 100-, and 500-year storm events. Upon evaluation of existing conditions, the models were then copied and modified iteratively to assess various changes to the geometry that would allow for the safe passage of the design storm within the confines of the existing roadway and channel elevations.

Geometric data required to describe the waterways and the two culverts for the existing condition was obtained from field survey conducted by Prudent Engineering. The survey was used as input to the hydraulic model. The survey data was referenced to the North American Datum of 1983 (NAD83) horizontally and the North American Vertical Datum of 1988 (NAVD88) vertically.

Data from field observations and the aerial photographs were used to ascertain the general plan form of the waterway upstream and downstream of the survey, aid in determination of roughness coefficients, and aid in defining the location of the stream banks.

4.2.2 Stream Channels at Sites 4 and 7a/7b

Stream channel designs at Sites 4, 7a, and 7b were based on bankfull channel measurements taken at STA 131+00. The dimensions are given below as well as in Table 4-2:

- Cross Sectional Area – 18.7 square feet
- Width – 16.4 feet
- Mean Depth – 1.14 feet
- Width/Depth Ratio – 14.4

4.3 Hydraulic Analysis Results

4.3.1 Culvert Capacity

The results of the hydraulic analyses indicate that the existing culverts are significantly undersized for the design flows.

- The Site 1 Frisbieville Road culvert reaches capacity just above the 10-year flow and overtops the road at the 100-year flow.
- The Site 3 Stony Brook Road culvert reaches capacity and overtops the roadway below the 10-year flow.

The following table summarizes the minimum sizes required to pass the design flows with a minimum of 1 foot of freeboard.

TABLE 4-1
Comparison of Existing and Proposed Culvert Sizing for Design Discharge

Culvert	Design Discharge	Culvert Type and Size	
	100-Year	Existing	Min. Proposed[1]
Site 1 – Frisbieville Road	879 cfs	7'-6'' high x 12' wide Galvanized Steel Pipe Arch	Single 7' high x 18'wide x 50' long Concrete Box Culvert with natural channel bottom
Site 3 – Stony Brook Road	756 cfs	5' high x 10' wide Concrete Box Culvert	Single 6' high x 18' wide x 60' long Concrete Box Culvert with natural channel bottom

[1] Proposed culvert evaluated for 100-year flood event

4.3.2 Channel Dimensions at Sites 4 and 7a/7b

The Stony Brook channel in the vicinity of Site 4 is essentially straight with no sharp bends containing point bars and pools. Therefore, the general design at this location is a compound channel based on a riffle morphology. The channel is symmetrical and roughly trapezoidal in shape with a low-flow area in the center and a secondary bench on both banks to accommodate bankfull flow (Figure 4-1).

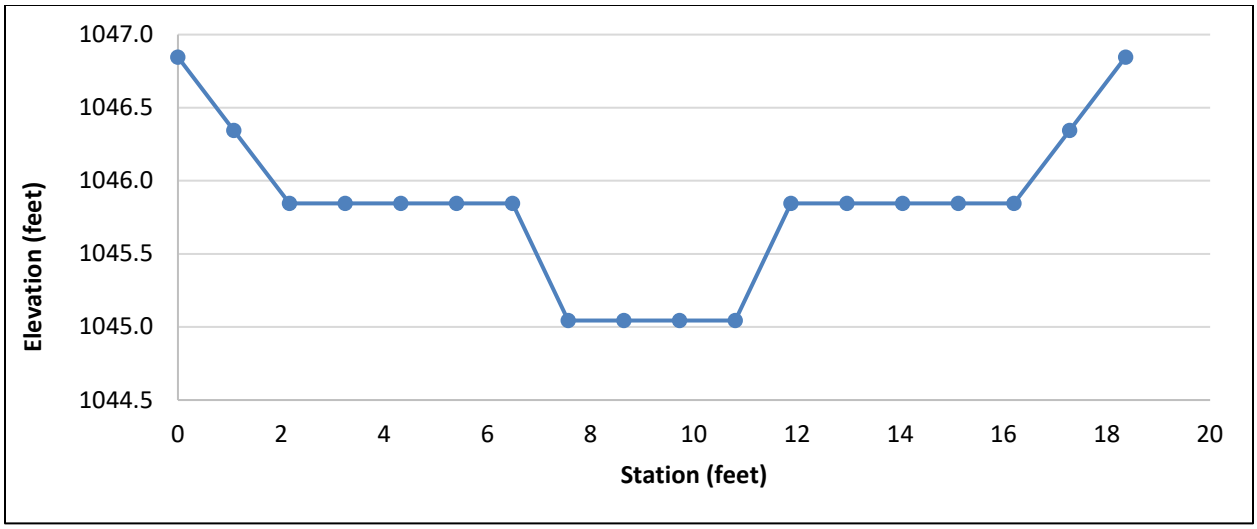

Figure 4-1
General Stream Channel Cross Section for Site 4

Sites 7a and 7b are both located on bends where the stream channel encroaches on Stony Brook Road. As a result, general channel designs were completed for both pool and riffle morphologies. These are illustrated in Figures 4-2 and 4-3.

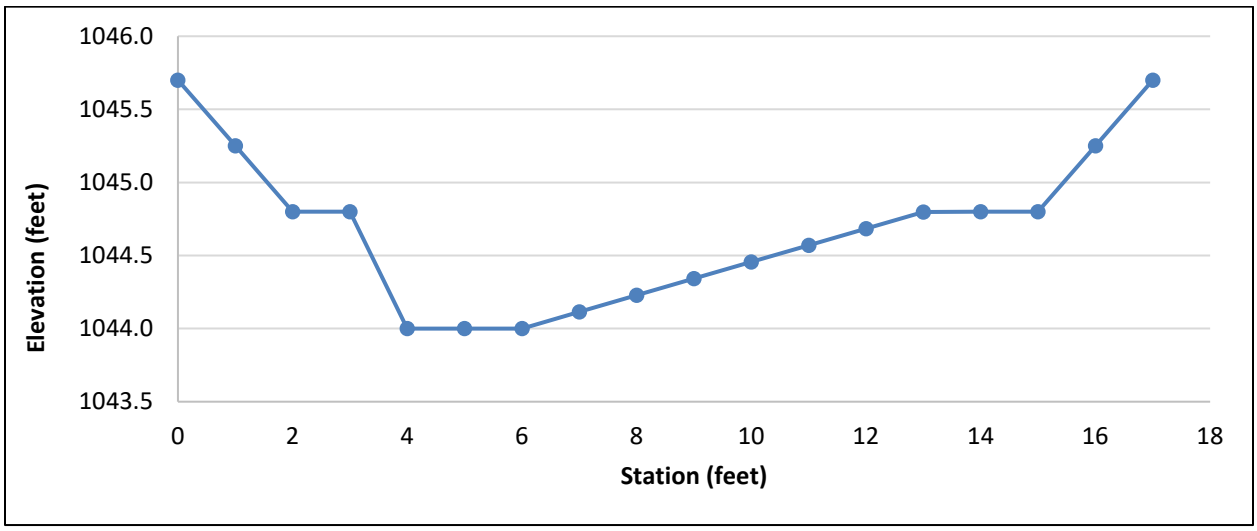

Figure 4-2
General Stream Channel Cross Section for Sites 7a and 7b – Pool

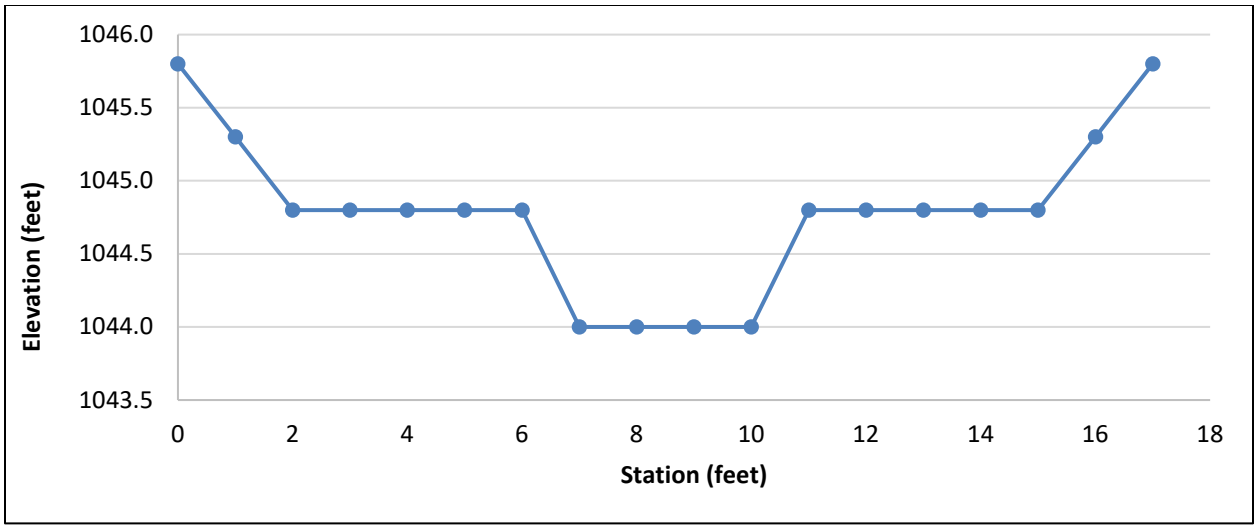

Figure 4-3
General Stream Channel Cross Section for Sites 7a and 7b – Riffle

The dimensions for the stream channels at Sites 4 and 7 as well as the measured bankfull dimensions at STA 131+00 are given in the table below (Table 4-2).

TABLE 4-2
Bankfull Dimensions of Measured Channel at STA 131+00 and Designed Channels at Sites 4 and 7

Dimensions	STA 131+00	Area 4 - Riffle	Area 7 - Riffle	Area 7 - Pool
Area (feet^2)	18.7	19.8	18.2	18.3
Width (feet)	16.4	18.4	17	17
Mean Depth (feet)	1.14	1.08	1.07	1.08
Width/Depth Ratio	14.4	17.0	15.9	15.7

4.3.3 Channel Bed Stability

To be completed

5.0 STRUCTURE ALTERNATIVES

SCSWCD retained MMI to assess approximately 2.6 miles of Stony Brook in the town of Schoharie, New York. There are two existing culverts at this location that are in need of replacement.

5.1 Proposed Replacement Structures

The following summarizes the differences between the existing and proposed conditions at each culvert crossing.

Site 1 - Frisbieville Road Culvert

Existing Conditions (7 feet 6 inches high x 12 feet wide Galvanized Steel Pipe Arch):

- Flow will overtop the roadway in the 100-year event.
- Capacity of culvert is exceeded just above the 10-year event.
- The culvert has a poor, skewed alignment with the channel, with the channel making a hard bend just upstream of the culvert.
- The channel bed through the culverts does not match the natural channel bed substrate upstream and downstream of the culvert.
- Channel slope through the existing culverts does not match the natural channel slope upstream and downstream of the culvert.
- Width of the culvert is 12 feet at its widest point, or approximately 0.45 times the measured bankfull width of the channel (it should be noted that the channel was overly widened as a result of recent flood events, and as a result, bankfull features could not be accurately measured).
- Culvert has a vertical drop at its outlet that likely restricts passage of aquatic organisms.

Proposed Conditions (embedded Concrete Box Culvert with hydraulic opening size of 7 feet tall by 18 feet wide):

- The proposed box culvert will pass the 100-year storm event within the culvert and without roadway overflow.
- The headwater-to-culvert height ratio for the 100-year event will be 0.97.
- The channel will be realigned so that the replacement culvert will have a perpendicular alignment with the roadway.
- The proposed culvert would be embedded so that the channel bed substrate through the culvert matches the natural channel substrate upstream and downstream of the culvert.
- Channel slope through the proposed culvert will more closely match the natural channel slope upstream and downstream of the culvert.
- The proposed 18-foot width is 0.68 times the estimated bankfull width of the channel (it should be noted that the channel was overly widened as a result of recent flood events, and as a result, bankfull features could not be accurately measured).
- Culvert will have no vertical drop at its outlet and will pass aquatic organisms.

Site 3 – Stony Brook Road Culvert

Existing Conditions (5 feet high x 10 feet wide Concrete Box Culvert):

- Flow will overtop the roadway in the 10-year event.
- Capacity of culvert is exceeded in the 10-year event.
- The channel bed through the culverts does not match the natural channel bed substrate upstream and downstream of the culvert.
- Channel slope through the existing culverts does not match the natural channel slope upstream and downstream of the culvert.
- Width of the culvert is 5 feet, or approximately 0.27 times the measured bankfull width of the channel.

Proposed Conditions (embedded Concrete Box Culvert with hydraulic opening size of 6 feet tall by 18 feet wide):

- The proposed box culvert will pass the 100-year storm event within the culvert and without roadway overflow.
- The headwater-to-culvert height ratio for the 100-year event will be 1.02.
- The channel will be realigned so that the replacement culvert will have a perpendicular alignment with the roadway.
- The proposed culvert would be embedded so that the channel bed substrate through the culvert matches the natural channel substrate upstream and downstream of the culvert.
- Channel slope through the proposed culvert more closely matches the natural channel slope upstream and downstream of the culvert.
- The proposed 18-foot width is 0.96 times the estimated bankfull width of the channel.
- Culvert will have no vertical drop at its outlet and will pass aquatic organisms.

The following alternates were considered for analysis prior to selecting the four-sided concrete box culvert at each site.

• Alternate 1 – Three-Sided Precast Concrete Box Culvert
• Alternate 2 – Four-Sided Precast Concrete Box Culvert

All options considered will have an 18-foot span, and as a result, some regrading and minor realignment of the channel will be necessary to accommodate the increase in the structure span. Channel armoring or other bank stabilization measures may be required. The exact nature of these improvements has not been determined at this time; however, they will be generally the same for both alternates considered.

The first alternate is a three-sided precast concrete box culvert with an 18-foot clear span. The box culvert will be supported by concrete strip footings. The bridge railing will be mounted to cast-in-place concrete curbs. Once the culvert has been backfilled, the roadway may be paved. The embankments will be retained with cast-in-place concrete wingwalls. The depth of the foundations is dependent on the potential for scour.

While cast-in-place concrete wingwalls and culvert footings are proposed in the alternatives study, precast should be considered during design to accelerate construction. Modular block walls or precast cantilever wall sections may be possible alternatives for cast-in-place wingwalls.

Pros

- Provides a permanent natural channel bottom
- Concrete structures require less future maintenance.

Because the channel is to be relocated in order to improve brook/culvert alignment with the roadway, the existing culvert can be used for water control while the new culvert and channel are being constructed.

Cons

- Cast-in-place foundations (if required in lieu of precast) will extend the construction duration. The use of precast foundations will reduce construction time somewhat, but the three-sided box involves more components, and the culvert must be grouted to the foundations giving it a still slightly longer construction schedule than a four-sided box.
- Requires more excavation for the installation of the footings, which will be installed below scour depth. Excavation will need to be coordinated with the temporary bypass pipes or cofferdam.
- Cost will be greater than the four-sided box culvert.

The second alternative is a four-sided 18-foot-wide by 9-foot-high precast concrete box culvert at the Frisbieville Road culvert and an 18-foot-wide by 7'-6"-high precast concrete box culvert at the Stony Brook Road culvert. The 9-foot and 7'-6" heights allow for the required minimum 7-foot and 6-foot clear openings respectively and sufficient embedment to accommodate New York State Department of Conservation (NYSDEC) minimum embedment of 20 percent. The bridge railing will be mounted to cast-in-place concrete curbs. Once the culvert has been backfilled, the roadway may be paved. The embankments will be retained with cast-in-place concrete wingwalls.

Similarly to Alternate 1, the precast concrete box culvert will also need to address the potential for scour. The nature of scour affecting a box culvert differs from that of a bridge or a three-sided box. Scour through the structure is prevented by the bottom slab of the box culvert, and scour countermeasures are only required at the inlet and outlet. A concrete cutoff wall and a minimum embedment of 4 feet on the wingwall foundations would serve to protect the structure against scour.

Pros

- Shorter construction duration as no foundations are required to place the box culvert
- Eliminates the issue of scour through the structure by providing the protection of a bottom slab
- Box culverts are designed for overtopping and pressure flow.
- The wingwalls can be incorporated with end units as precast members.

Because the channel is to be relocated in order to improve brook/culvert alignment with the roadway, the existing culvert can be used for water control while the new culvert and channel are being constructed.

Cons

- Natural channel substrate is subject to periodic displacement.

5.2 Maintenance and Protection of Traffic

Frisbieville Road is approximately 1.3 miles long beginning at the intersection of State Highway 30 and looping back to State Highway 30. Frisbieville Road is primarily residential and farm land. The culvert is located approximately 0.3 miles from the State Highway 30 and Stony Brook Road intersection. A detour is available via State Highway 30, which would allow for full road closure during construction.

Stony Brook Road is approximately 3 miles long beginning at the intersection of State Highway 30 and ending at the intersection of Colby Road. Stony Brook Road is primarily residential and farm land. The culvert is located approximately 0.4 miles from the State Highway 30 and Frisbieville Road intersection. A detour is available that would allow for full road closure during construction, but the county may want to consider that vehicle access during construction be maintained via one-way alternate traffic with stop signs.

5.3 Proposed Roadway

The existing road width of Frisbieville Road and Stony Brook Road is approximately 20 feet. The proposed structure will provide two 11-foot lanes. Shoulder widths and slopes will match existing conditions. Minimal changes to the vertical and horizontal alignment of either road are proposed.

The proposed pavement section at the Frisbieville Road and Stony Brook Road culvert replacement sites will be comprised of 8 inches of Item 4 Subbase with a 2-inch asphalt base course and 2-inch top course.

5.4 Right-of-Way Impacts

To be completed

5.5 Utilities

Utility poles that carry electrical, telephone, and cable run parallel on the south side of the roadway. Adjacent to the existing Culvert 1, a telephone box is mounted at the utility pole 102 25, which may require protection during construction.

5.6 Cost Opinion

Our preliminary opinion of the construction cost for the Frisbieville Road culvert is estimated in the range of $450,000 to $550,000. Our preliminary opinion of the construction cost for the Stony Brook Road culvert is estimated in the range of $525,000 to $625,000. This reflects structural and roadway items only and does not include any property easements, utility relocations, etc. The cost assumes a detour plan will be implemented during construction.

6.0 REFERENCES

Federal Emergency Management Agency, May 16, 2008, *Flood Insurance Rate Map, Greene County, New York,* Panel 216 of 531.

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Mulvihill, C.I., Baldigo, B.P., Miller, S.J., and DeKoskie, Douglas, 2009, Bankfull Discharge and Channel Characteristics of Streams in New York State: U.S. Geological Survey Scientific Investigations Report 2009-5144, 51 p. (http://pubs.usgs.gov/sir/2009/5144/)

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APPENDIX

Appendix C: Draft 8-Step Floodplain Management & Wetland Protection Plan

DRAFT

Floodplain Management & Wetland Protection Plan

Governor's Office of Storm Recovery

U.S. Department of Housing and Urban Development

Community Development Block Grant – Disaster Recovery

Stony Brook Mitigation

Town of Schoharie, New York

Schoharie County, New York

Effective Date: _____, 2017

Executive Order 11988 – Floodplain Management
Executive Order 11990 – Protection of Wetlands

Governor's Office of Storm Recovery

Community Development Block Grant – Disaster Recovery

Stony Brook Mitigation
Town of Schoharie, New York

Schoharie County, New York
Effective Date: _____, 2017

This Floodplain Management Plan Compliance Document meets the requirements of 24 CFR Part 55.20 and Executive Order 11988—Floodplain Management— and 11990—Protection of Wetlands— for the Stony Brook Mitigation ("Proposed Project") located along Stony Brook in the Town of Schoharie, Schoharie County, New York. The Town of Schoharie is participating in the U.S. Department of Urban Development (HUD) Community Development Block Grant Program as administered by the State of New York Action Plan for Community Development Block Grant Program – Disaster Recovery (CDBG-DR).

The Schoharie County Soil & Water Conservation District (SCSWCD) is pursuing a stream repair and restoration project along approximately 2.6 miles of Stony Brook. Stony Brook is a tributary to Schoharie Creek, which flows to the Mohawk River and then to the Hudson River. The project site is located in the town of Schoharie, in northeastern Schoharie County, New York. Recent, severe flooding events, most significantly Tropical Storm Irene in 2011, and also a June 2013 flood event have resulted in severe bed and bank erosion within the Stony Brook channel as well as aggradation of bedload sediment. This aggradation of sediment has clogged culvert and bridge crossings, leading to the reduction of flood conveyance capacity in the channel. The sediment migration has caused the channel to become unstable, with bank erosion and excessive sedimentation in many areas.

This Plan documents the eight-step decision making process for the Proposed Project and pertains to activities within the Special Flood Hazard Area (SFHA) as defined by the Federal Emergency Management Agency (FEMA), or its successors, pursuant to the National Flood Insurance Program (NFIP), or a successor program, whether advisory, preliminary, or final and wetland as defined by 24 CFR 55.2(b)(11).

Description of Proposed Project Activities in the SFHA

The New York State (NYS) Governor's Office of Storm Recovery (GOSR), an office of the New York State Housing Trust Fund Corporation, is the "responsible entity" in charge of administering New York State's share of the U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant – Disaster Recovery (CDBG-DR) program pursuant to the Disaster Relief Appropriations Act of 2013. The CDBG-DR program is designed to address the needs of New York State (NYS) communities devastated by Superstorm Sandy. To date, this funding has been disbursed in three allocations. On March 5, 2013, HUD published Federal Register Notice 78 Fed. Reg. 14329, which established the requirements and processes for the first $1.71 billion in federal CDBG-DR aid appropriated by the United States Congress and allocated to NYS for disaster relief. On November 18, 2013, HUD issued a second allocation of $2.097 billion to NYS under Federal Register Notice 78 Fed.

Reg. 69104. On October 16, 2014, HUD issued the third and final allocation of $600 million to NYS under Federal Register Notice 79 Fed. Reg. 62194.

The Governor's Office of Storm Recovery (GOSR) is conducting an evaluation as required by Executive Order 11988 and Executive Order 11990 in accordance with HUD regulations under 24 CFR Part 55 - Procedures for Making Determinations on Floodplain Management and Protection of Wetlands, to determine the potential effects that Project activity in the floodplain and wetlands would have on the human environment.

The Proposed Project will include development of sediment management standards to guide removal of sediment and proper channel sizing. In addition, based on the engineering study, the following improvement measures are also proposed for specific areas: installation of rock vane structures to improve sediment transport; removal of sidecast sediments; installation of grade control to arrest channel incision and prevent additional incision; repair and restacking of stacked rock revetment wall and installation of grade control; roughening of channel with random boulder placement; bank failure repair and relocation of channel away from toe of slope; replacement of undersized culvert at Frisbieville Road; and replacement of undersized culvert at Stony Brook Road. The Proposed Project includes the following eight (8) restoration areas, and is anticipated to improve the health of the riverine system, prevent flooding and protect infrastructure and private residential properties during storm events.

Area 1
Channel Location (STA): 32+00 – 14+50
Latitude: 42.645601 / Longitude: -74.326106

Area 2
Channel Location (STA): 32+50 – 44+00
Latitude: 42.644488 / Longitude: -74.321308

Area 3A
Channel Location (STA): 48+50 – 67+00
Latitude: 42.642651 / Longitude: -74.316228

Area 3B
Channel Location (STA): 48+50 – 67+00
Latitude: 42.642989 / Longitude: -74.313465

Area 4
Channel Location (STA): 70+00 – 82+00
Latitude: 42.644698 / Longitude: -74.309846

Area 5
Channel Location (STA): 86+00 – 99+00
Latitude: 42.646348 / Longitude: -74.305249

Area 6
Channel Location (STA): 100+50 – 114+00
Latitude: 42.645921 / Longitude: -74.300552

Area 7
Channel Location (STA): 134+00 – 150+00
Latitude: 42.644092 / Longitude: -74.290176

According to the application for funding, dated July 2015, no land acquisition is anticipated as a result of the improvements and the project will not result in a change in land use.

Executive Order 11988 & 24 CFR Part 55

Pursuant to 24 CFR §55.20, an 8-step process for floodplain management must be completed for proposed actions taking place in a floodplain or wetland. 24 CFR §55.20 implements Executive Order (EO) 11988 (Floodplain Management) and Executive Order 11990 (Protection of Wetlands). EO 11988 requires federal agencies (or a state agency implementing a federal funding program) to reduce the loss of life and property caused by floods, minimize impacts of floods on human safety, health, and welfare, and preserve the natural and beneficial functions of floodplains. EO 11990 requires federal agencies (or a state agency implementing a federal funding program) to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

In addition, federal agencies are required to demonstrate that consideration of all practicable alternatives has resulted in the reduction or elimination of long- and short-term adverse impacts associated with occupancy and modifications of the floodplain or wetlands. This 8-step process includes assessing all practicable alternatives and incorporating public review.

Projects located within a Special Flood Hazard Area (SFHA) are subject to Executive Order 11988. Information on where SFHAs are located is available on Flood Insurance Rate Maps (FIRMs) published by FEMA. FEMA uses engineering studies to determine the delineation of these areas or zones subject to flooding. The relevant data source for the SFHA is the latest issued FEMA data or guidance, which includes advisory data, such as Advisory Base Flood Elevations (ABFEs) or preliminary and final FIRMs.

24 CFR Part 55.20 Eight-Step Process

Step One: Determine whether the proposed action is located in a 100-year floodplain

Projects located within a Special Flood Hazard Area (SFHA) as defined by FEMA are subject to EO 11988. The project site boundary includes approximately 1.11 acres within the 500-year floodplain and 1.56 acres within the 100-year floodplain (see **Figure 1**). However, the 500-year and 100-year floodplains are outside the limits of disturbance of the proposed project.

Stony Brook is mapped as NWI riverine wetlands. The total acreage of disturbance within the project site is approximately 2.05 acres. Therefore, no more than 2.05 acres of NWI riverine wetlands would be disturbed (see **Figure 2**). The project site does not contain any NYSDEC wetlands (see **Figure 3**). The Proposed Project would adhere to and be in compliance with the guidelines and regulations of Executive Order 11990 and in accordance with permitting guidelines from the U.S. Army Corps of Engineers and the New York State Department of Environmental Conservation (NYSDEC), in order to minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

Step Two: Notify the public at the earliest possible time of a proposal to consider an action in a floodplain, and involve the affected and interested public in the decision making process.

Stony Brook Mitigation will involve work within the 100 year floodplain and 500 year floodplain. As a result, GOSR must publish an early notice that allows the public an opportunity to provide input into the decision to provide funding for the proposed project activities in the area.

Once the early public notice and comment period is complete, GOSR will assess, consider, and respond to the comments received individually and collectively for the project file, then proceed to Step Three.

A 15-day "Early Notice and Public Explanation of a Proposed Activity in a 500- and 100- Year Floodplain and Wetland" was published in the Daily Gazette on May 24, 2017. The 15-day period expired on June 9, 2017. The notice was sent to the following federal, state, and local agencies on May 24, 2017: U.S. Environmental Protection Agency (EPA), U.S. Department of Homeland Security Federal Emergency Management Agency (FEMA), U.S. Department of Housing and Urban Development (HUD), U.S. Army Corps of Engineers, NYS Department Environmental Conservation, NYS Department of Transportation Region 9, NYS Office of Parks, Recreation and Historic Preservation, NYS Division of Homeland Security & Emergency Services, Schoharie County Soil and Water Conservation District, Schoharie County Planning and Development, Schoharie County Board of Supervisors, Schoharie County Clerk, Schoharie County Department of Public Works, Town of Schoharie Planning Board, Town of Schoharie Town Supervisor, Town of Schoharie Town Clerk/Collector, and the Town of Middleburgh (see **Appendix A** for the notice).

GOSR received no public comments on this notice. See **Appendix B**.

Step Three: Identify and evaluate practicable alternatives to locating the proposed action in a floodplain.

After consideration of the following alternatives, it has been determined that the best practicable alternative is the Proposed Project. The restoration components considered in the eight areas were assigned a relative priority level as high, medium, or low.

Alternative 1 includes the components of relatively high priority in Area 3, Area 6, and Area 7. The Area 3 component would install rock vane structures and replace the undersized culvert at Stony Brook Road. The Area 6 component would relocate channel away from toe slope, stabilize the bank, install a grade control structure in the bed, and roughen the channel. Similarly, the Area 7 component would relocate the channel away from toe of slope, stabilize the bank, install grade control structure in the bed, and roughen the channel.

Alternative 2 includes the components of relatively high priority in Areas 3, 6, and 7 as discussed above, with the addition of those components of medium priority in Area 1 and Area 4. The Area 1 component would install rock vane structures and replace the undersized culvert at Frisbieville Road. The Area 4 component would install a grade control structure, repair a rock revetment wall, and roughen the channel with random boulder placement.

Alternative 3 (the proposed action) includes all components of relatively high and medium priority discussed in Alternatives 1 and 2 above, with the addition of other components. The proposed action would include development of sediment management standards to guide removal of sediment and proper channel sizing throughout the project site. In addition, based on the engineering study, the following improvement measures are also proposed for specific areas: installation of rock vane structures to improve sediment transport; removal of sidecast sediments; installation of grade control to arrest channel incision and prevent additional incision; repair and restacking of stacked rock revetment wall and installation of grade control; roughening of channel with random boulder placement; bank failure repair and relocation of channel away from toe of slope; replacement of the undersized culvert at Frisbieville

Road; and replacement of the undersized culvert at Stony Brook Road. This alternative was selected for the proposed project.

The No Action alternative would leave Stony Brook in its current, degraded condition with eroding banks and excessive sedimentation. The undersized culverts at Frisbieville Road and Stony Brook Road would remain in their current condition of reduced flood conveyance capacity. The high bank failure section of Stony Brook would remain in its current condition, which is in danger of undermining Stony Brook Road. Under the No Action alternative, future storm events would continue to cause flooding, put infrastructure and private residential properties at risk, and reduce access to emergency services.

Step Four: Identify the potential direct and indirect impacts associated with the occupancy or modification of the floodplain.

Approximately 2.6 miles of Stony Brook will be repaired and restored to improve the overall function of the floodplain and the health of the riverine system, prevent future flooding, and protect infrastructure and private residential properties during storm events.

In many cases bank erosion has been severe, resulting in mass wasting and failure of bank hardening features. It has also resulted in bed incision along much of the stream. This incision, along with removal of material from the bed, has resulted in a disconnection of the channel from the floodplain. Therefore, the installation of rock vane structures associated with the Proposed Project would improve sediment transport upstream of Frisbieville Road culvert, the NY Route 30 Bridge, and the Stony Brook Road culverts.

A preliminary HEC-RAS hydraulic modeling study has been conducted for the project. The preliminary HEC-RAS study confirmed that no impacts would occur (i.e., rise in water levels). Should further refinement of the model change this conclusion, the design would be modified to eliminate the impact.

Therefore, no additional adverse impacts to the floodplain are anticipated.

Step Five: Where practicable, design or modify the proposed action to minimize the potential adverse impacts within the floodplain and to restore and preserve its natural and beneficial values.

The current state of unstable areas and undersized or damaged bridges and culverts in Stony Brook is prone to flooding during storm events. The proposed project will minimize potential adverse impacts of future flooding by improving the health of the riverine system, prevent flooding and protect infrastructure and private residential properties during storm events.

As noted above, a preliminary HEC-RAS hydraulic modeling study has been conducted for the project. The preliminary HEC-RAS study confirmed that no impacts would occur (i.e., rise in water levels). Should further refinement of the model change this conclusion, the design would be modified to eliminate the impact.

The Proposed Project will be conducted in accordance with NYSDEC and USACE permitting guidelines. The Proposed Project culvert replacements will follow the NYSDOT Chapter 8 Drainage Standards.

The Project will implement and maintain erosion and sedimentation control measures to prevent deposition of sediment and eroded soil in off-site wetlands and waters. Soil compaction will be controlled by minimizing activities in vegetated areas, including lawns. Best management practices (BMPs), such as silt fence and erosion prevention, may be implemented if required by permits or agency discretion. Work in areas of soils with high wind erosion potential may have to occur only during calm weather conditions

or include additional watering and other dust suppression mitigation measures. Thorough planning, engineering review, and design, through the local permitting process, will minimize soil erosion and damage to the floodplain that could result from Project activities on sites with marginal soil properties.

Step Six: Reevaluate the proposed action to determine: (1) Whether it is still practicable in light of its exposure to flood hazards in the floodplain, the extent to which it will aggravate the current hazards to other floodplains, and its potential to disrupt floodplain values; and (2) Whether alternatives preliminarily rejected at Step Three are practicable in light of the information gained in Steps Four and Five.

GOSR has reevaluated the proposed action and determined that the Stony Brook Mitigation is still practicable in light of its exposure to flood hazards in the floodplain. As the Project activity consists of stream repairs and restorations, the Project would not aggravate current hazards to the floodplain, nor will the Project disrupt floodplain values. In fact, the Proposed Project would prevent flooding and protect infrastructure and private residential properties during storm events.

Site-specific hazard mitigation measures will be taken to mitigate the effects of the Project on the floodplain and to preserve natural and beneficial properties of the floodplain, including BMPs to reduce erosion and sedimentation, and proper disposal of debris.

There are no practicable alternatives to the Proposed Project.

Step Seven: If the reevaluation results in a determination that there is no practicable alternative to locating the proposal in the floodplain, publish a final notice.

There is no practicable alternative to stream repair and restoration in the floodplain. Implementation of the Proposed Project will prevent flooding and protect infrastructure during future storms and will lessen the risk of local residents being separated from food, shelter, and medical facilities during a severe storm. The Proposed Project will also increase the Town's ability to recover quickly from storm events. The determination by GOSR is that the Stony Brook Mitigation is the preferred alternative.

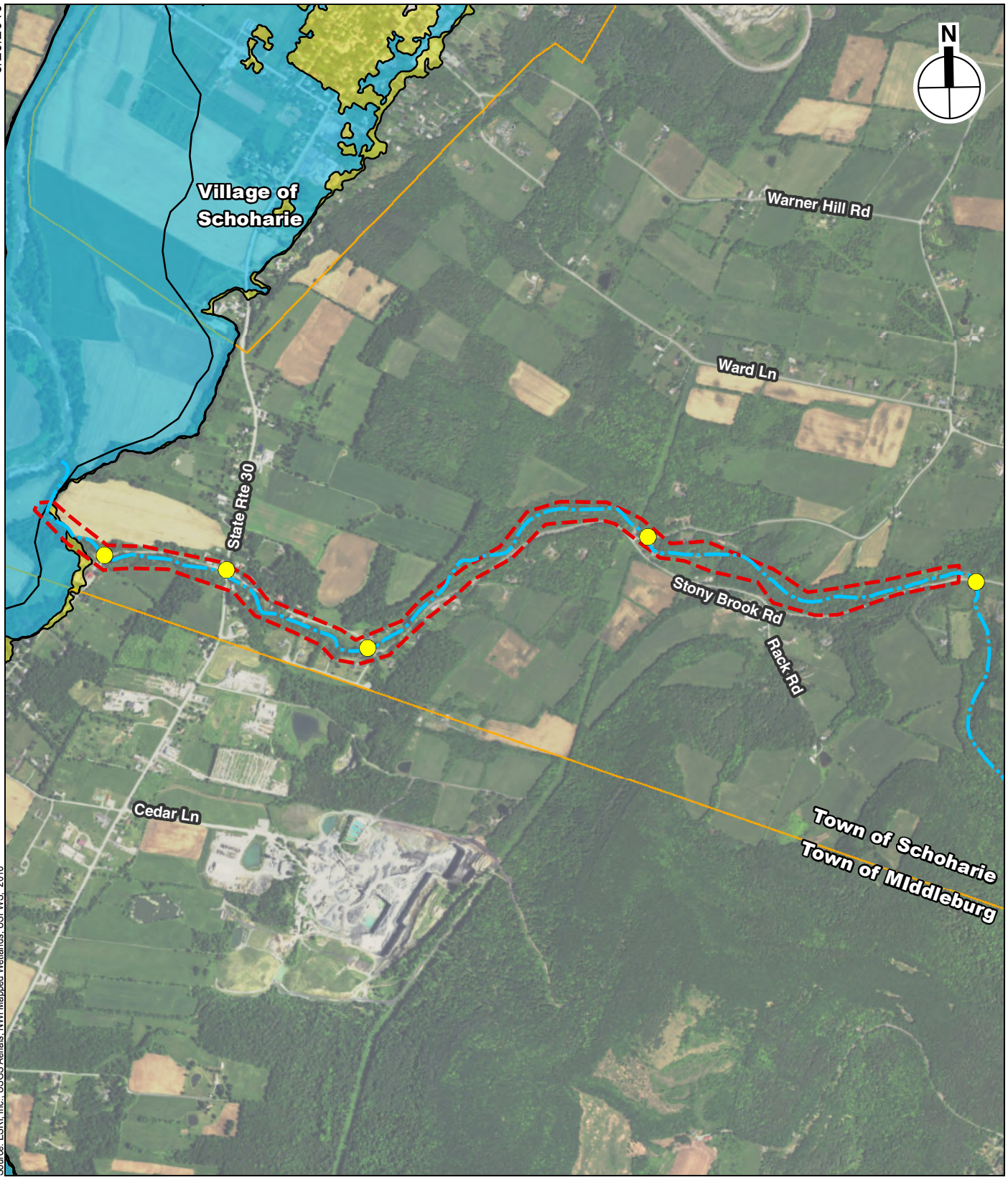
A 7-day "Final Notice and Public Explanation of a Proposed Activity in a 500- and 100-Year Floodplain and Wetland" will be published in the Daily Gazette on June 27, 2017. The 7-day period will expire on July 5, 2017. The notice was sent to the following federal, state, and local agencies on June 27, 2017:
U.S. Environmental Protection Agency (EPA), U.S. Department of Homeland Security Federal Emergency Management Agency (FEMA), U.S. Department of Housing and Urban Development (HUD), U.S. Army Corps of Engineers, NYS Department Environmental Conservation, NYS Department of Transportation Region 9, NYS Office of Parks, Recreation and Historic Preservation, NYS Division of Homeland Security & Emergency Services, Schoharie County Soil and Water Conservation District, Schoharie County Planning and Development, Schoharie County Board of Supervisors, Schoharie County Clerk, Schoharie County Department of Public Works, Town of Schoharie Planning Board, Town of Schoharie Town Supervisor, Town of Schoharie Town Clerk/Collector, and the Town of Middleburgh (see **Appendix C** for the notice).

All comments received by July 5, 2017 will be considered.

Step Eight: Implement the Action

Step eight is implementation of the proposed action. GOSR has determined that the Proposed Project will have no direct or indirect adverse impacts to the floodplain or wetland. GOSR will ensure that all mitigation measures prescribed in the steps above will be adhered to. Furthermore, GOSR has conducted a NEPA review in accordance with 24 CFR Part 58 and a NY State Environmental Quality Review Act (SEQR) review in accordance with 6 NYCRR Part 617.

8/26/2016



Source: ESRI, Inc.; USGS Aerials; NWI Mapped Wetlands, USFWS, 2016

Stony Brook

Site Boundary

Culvert

Municipal Boundaries

1% Annual Chance Flood Hazard (100-year floodplain)

0.2% Annual Chance Flood Hazard (500-year floodplain)

Note: Stony Brook has not been evaluated by FEMA

0 1,000 FEET

FEMA Flood Zone

Stony Brook Mitigation, Town of Schoharie

Figure 1

8/26/2016

Source: ESRI, Inc.; USGS Aerials; NWI Mapped Wetlands, USFWS, 2016

Site Boundary

Freshwater Pond

Riverine

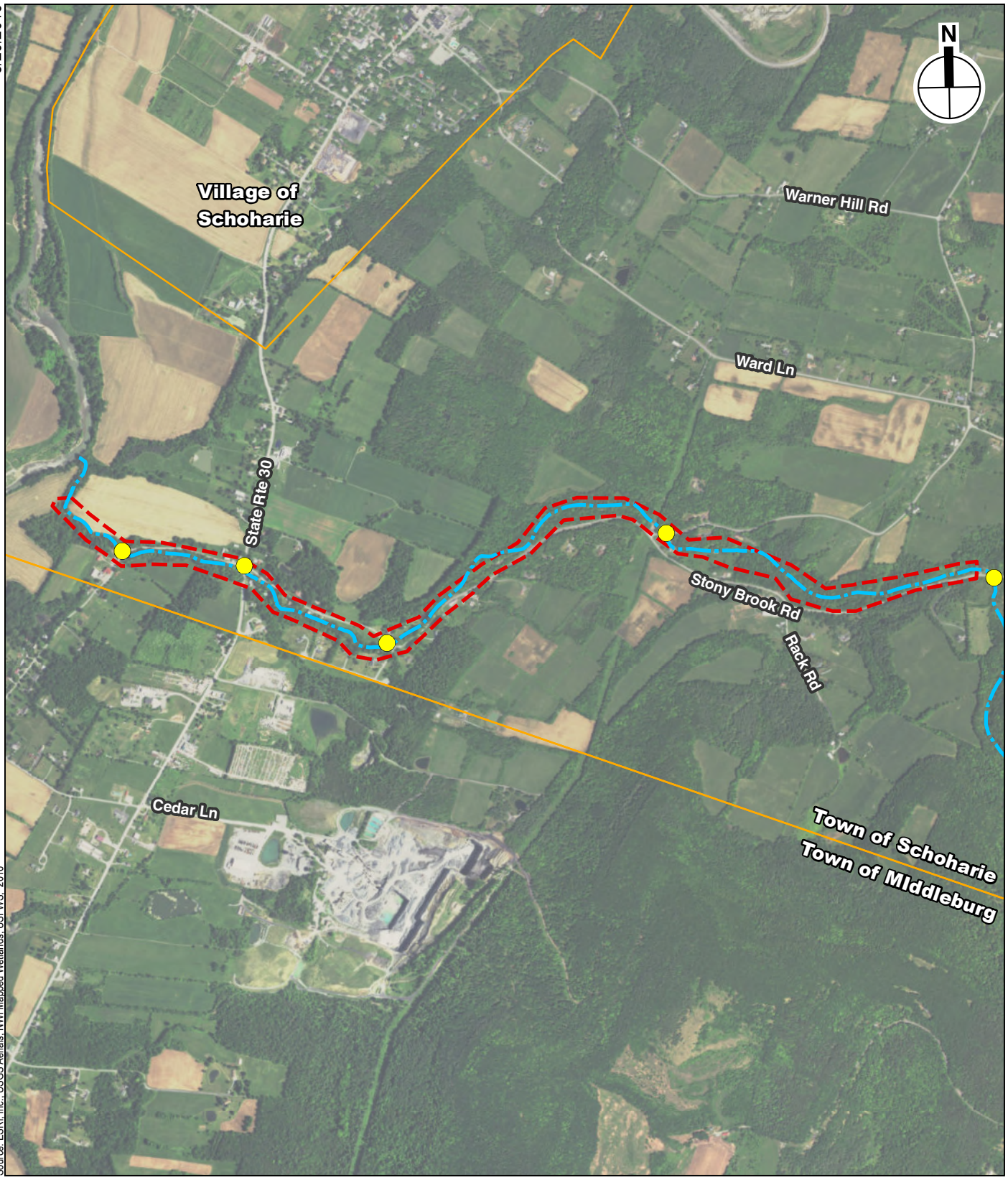
0 1,000 FEET

NWI Wetlands

Stony Brook Mitigation, Town of Schoharie

Figure 2

8/26/2016



Source: ESRI, Inc.; USGS Aerials; NWI Mapped Wetlands, USFWS, 2016

Stony Brook

Site Boundary

Culvert

Municipal Boundaries

NYSDEC Freshwater Wetlands

0 1,000 FEET

NYSDEC Freshwater Wetlands

Stony Brook Mitigation, Town of Schoharie

Figure 3

Appendix A:
Early Floodplain Notice

Governor's Office of
Storm Recovery

ANDREW M. CUOMO
Governor

LISA BOVA-HIATT
Executive Director

EARLY NOTICE OF A PROPOSED ACTIVITY
IN A 500- AND 100-YEAR FLOODPLAIN AND WETLAND

STONY BROOK MITIGATION
TOWN OF SCHOHARIE, SCHOHARIE COUNTY, NEW YORK
May 24, 2017

To: All Interested Agencies, Groups, and Individuals

This is to give notice that the Governor's Office of Storm Recovery (GOSR), an office of the New York State Housing Trust Fund Corporation (HTFC), has received an application from Schoharie County Soil & Water Conservation District to fund Stony Brook Mitigation (hereinafter, the "Proposed Activity") and is conducting an evaluation as required by Executive Order 11988 and Executive Order 11990 in accordance with U.S. Department of Housing and Urban Renewal (HUD) regulations (24 CFR Part 55). There are three primary purposes for this notice. First, to provide the public an opportunity to express their concerns and share information about the Proposed Activity. Second, adequate public notice is an important public education tool. The dissemination of information about floodplains and wetlands facilitates and enhances governmental efforts to reduce the risks associated with the occupancy and modification of these special areas. Third, as a matter of fairness, when the government determines it will participate in actions taking place in floodplains or wetlands, it must inform those who may be put at greater or continued risk. Funding for the Proposed Activity will be provided by the HUD Community Development Block Grant – Disaster Recovery (CDBG-DR) program for storm recovery activities in New York State.

The Proposed Activity is needed to address severe bed and bank erosion within the Stony Brook channel as well as aggradation of bedload sediment from recent, severe flooding events, most significantly Tropical Storm Irene in 2011, and also a June 2013 flood event. This aggradation of sediment has clogged culvert and bridge crossings, leading to the reduction of flood conveyance capacity in the channel. The sediment migration has caused the channel to become unstable, with bank erosion and excessive sedimentation in many areas.

The Proposed Activity entails stream repair and restoration along approximately 2.6 miles of Stony Brook. Stony Brook is a tributary to Schoharie Creek, which flows to the Mohawk River and then to the Hudson River. The project site is located in the town of Schoharie, in northeastern Schoharie County, New York. The Proposed Activity includes eight restoration areas, and is anticipated to improve the health of the riverine system, prevent flooding and protect infrastructure and private residential properties during storm events. The Proposed Activity involves development of sediment management standards to guide removal of sediment and proper channel sizing. In addition, based on the engineering study, the following improvement measures are also proposed for specific areas: installation of rock vane structures to improve sediment transport; removal of sidecast sediments; installation of grade control to arrest channel incision and prevent additional incision; repair and restacking of stacked rock revetment wall and installation of grade control; roughening of channel with random boulder placement; bank failure repair and relocation of channel away from toe of slope; replacement of undersized culvert at Frisbieville Road; and replacement of undersized culvert at Stony Brook Road.

The Proposed Activity will not result in any impacts to the 500-year or 100-year floodplain. Although approximately 1.11 acres within the 500-year floodplain and 1.56 acres within the 100-year floodplain are located within the project site boundary, the 500-year and 100-year floodplains are outside the limits of disturbance of the Proposed Activity. Stony Brook is mapped as NWI riverine wetlands. The total acreage of disturbance within the project site is approximately 0.85 acres. Therefore, no more than 0.85 acres of NWI riverine wetlands would be disturbed. However, the impacts would be conducted as described above to improve the health of the riverine system, prevent flooding and protect infrastructure and private residential properties during storm events. The project site does not contain any NYSDEC wetlands.

A Floodplain map based on the FEMA Base Flood Elevation Maps and wetlands maps based on the National Wetland Inventory and New York State Department of Environmental Conservation (NYSDEC) data have been prepared and are available for review with additional information at http://www.stormrecovery.ny.gov/environmental-docs.

Any individual, group, or agency may submit written comments on the Proposed Activity or request further information by contacting Lori A. Shirley, Certifying Officer, Governor's Office of Storm Recovery, 99 Washington Avenue, Suite 1224, Albany, NY 12260; email: NYSCDBG_DR_ER@nyshcr.org. Standard office hours are 9:00 AM to 5:00 PM Monday through Friday. For more information call 518-474-0755. All comments received by 5:00 PM on June 9, 2017 will be considered.

Lori A. Shirley, Certifying Officer

May 24, 2017

Affidavit of Mailing

STATE OF NEW YORK)

:SS.:

COUNTY OF NEW YORK)

0

Nancy L. Green, being duly sworn, deposes and says:

1. I am over the age of eighteen years.
2. On May 24, 2017 I mailed true and correct copies of the annexed letter And attachment Dated May 24, 2017, by placing the same in first class post-paid Envelopes addressed: SEE ATTACHED LIST.
3. On said day, I deposited said envelopes in a mailbox at 34 South Broadway, White Plains, New York 10601.

Nancy L. Green

Nancy L. Green

Sworn to before me this

22 day of May, 2017

NANCY LORRAINE GREEN
Notary Public, State of New York
No. 01GR6314973
Qualified in Westchester County
Term Expires November 17, 2018

Notary Public

Governor's Office of
Storm Recovery

ANDREW M. CUOMO
Governor

LISA BOVA-HIATT
Executive Director

EARLY NOTICE OF A PROPOSED ACTIVITY
IN A 500- AND 100-YEAR FLOODPLAIN AND WETLAND

STONY BROOK MITIGATION
TOWN OF SCHOHARIE, SCHOHARIE COUNTY, NEW YORK
May 24, 2017

To: All Interested Agencies, Groups, and Individuals

This is to give notice that the Governor's Office of Storm Recovery (GOSR), an office of the New York State Housing Trust Fund Corporation (HTFC), has received an application from Schoharie County Soil & Water Conservation District to fund Stony Brook Mitigation (hereinafter, the "Proposed Activity") and is conducting an evaluation as required by Executive Order 11988 and Executive Order 11990 in accordance with U.S. Department of Housing and Urban Renewal (HUD) regulations (24 CFR Part 55). There are three primary purposes for this notice. First, to provide the public an opportunity to express their concerns and share information about the Proposed Activity. Second, adequate public notice is an important public education tool. The dissemination of information about floodplains and wetlands facilitates and enhances governmental efforts to reduce the risks associated with the occupancy and modification of these special areas. Third, as a matter of fairness, when the government determines it will participate in actions taking place in floodplains or wetlands, it must inform those who may be put at greater or continued risk. Funding for the Proposed Activity will be provided by the HUD Community Development Block Grant – Disaster Recovery (CDBG-DR) program for storm recovery activities in New York State.

The Proposed Activity is needed to address severe bed and bank erosion within the Stony Brook channel as well as aggradation of bedload sediment from recent, severe flooding events, most significantly Tropical Storm Irene in 2011, and also a June 2013 flood event. This aggradation of sediment has clogged culvert and bridge crossings, leading to the reduction of flood conveyance capacity in the channel. The sediment migration has caused the channel to become unstable, with bank erosion and excessive sedimentation in many areas.

The Proposed Activity entails stream repair and restoration along approximately 2.6 miles of Stony Brook. Stony Brook is a tributary to Schoharie Creek, which flows to the Mohawk River and then to the Hudson River. The project site is located in the town of Schoharie, in northeastern Schoharie County, New York. The Proposed Activity includes eight restoration areas, and is anticipated to improve the health of the riverine system, prevent flooding and protect infrastructure and private residential properties during storm events. The Proposed Activity involves development of sediment management standards to guide removal of sediment and proper channel sizing. In addition, based on the engineering study, the following improvement measures are also proposed for specific areas: installation of rock vane structures to improve sediment transport; removal of sidecast sediments; installation of grade control to arrest channel incision and prevent additional incision; repair and restacking of stacked rock revetment wall and installation of grade control; roughening of channel with random boulder placement; bank failure repair and relocation of channel away from toe of slope; replacement of undersized culvert at Frisbieville Road; and replacement of undersized culvert at Stony Brook Road.

The Proposed Activity will not result in any impacts to the 500-year or 100-year floodplain. Although approximately 1.11 acres within the 500-year floodplain and 1.56 acres within the 100-year floodplain are located within the project site boundary, the 500-year and 100-year floodplains are outside the limits of disturbance of the Proposed Activity. Stony Brook is mapped as NWI riverine wetlands. The total acreage of disturbance within the project site is approximately 0.85 acres. Therefore, no more than 0.85 acres of NWI riverine wetlands would be disturbed. However, the impacts would be conducted as described above to improve the health of the riverine system, prevent flooding and protect infrastructure and private residential properties during storm events. The project site does not contain any NYSDEC wetlands.

A Floodplain map based on the FEMA Base Flood Elevation Maps and wetlands maps based on the National Wetland Inventory and New York State Department of Environmental Conservation (NYSDEC) data have been prepared and are available for review with additional information at http://www.stormrecovery.ny.gov/environmental-docs.

Any individual, group, or agency may submit written comments on the Proposed Activity or request further information by contacting Lori A. Shirley, Certifying Officer, Governor's Office of Storm Recovery, 99 Washington Avenue, Suite 1224, Albany, NY 12260; email: NYSCDBG_DR_ER@nyshcr.org. Standard office hours are 9:00 AM to 5:00 PM Monday through Friday. For more information call 518-474-0755. All comments received by 5:00 PM on June 9, 2017 will be considered.

Lori A. Shirley, Certifying Officer

May 24, 2017

tony Brook Early Floodplain Notice Distribution List

Tennille Smith Parker, Director
U.S. Dept. of Housing and Urban Development
Disaster Recovery & Special Issues Division
451 7th Street SW, Rm 7272
Washington, DC 20410

Grace Musumeci
Environmental Protection Agency
Region 2 (NJ, NY, PR, VI)
290 Broadway
New York, NY 10007-1866

Mr. Ron Rausch, Director
Environmental Management Bureau
Office of Parks, Recreation and Historic Preservation
625 Broadway, 2nd Floor
Albany, New York 12238

Rick Lord, Chief of Mitigation Programs & Agency Preservation Officer
NYS Division of Homeland Security & Emergency Services
1220 Washington Avenue, Bldg 7A – Floor 4,
Albany, NY 12242

Therese Fretwell
Regional Environmental Officer, Region II
Housing and Urban Development
26 Federal Plaza
New York, NY 10278-0002

Andrew Dangler, ATTN: CENAN-OP-RU
Biologist/Senior Project Manager, Upstate New York Section Department Of The Army US Army Corps of Engineers
1 Buffington St., Bldg. 10, 3rd Fl. North
Watervliet, NY 12189

Shane Nickle, Senior Planner
Schoharie County Planning and Development Agency Office
276 Main Street- Suite 2, PO Box 396
Schoharie, NY 12157

William J. Clarke, Permit Administrator
NYSDEC Region 4
1130 North Westcott Rd
Schenectady, NY 12306-2014

Jack Williams, P.E., Regional Director
New York State Department of Transportation
Region 9
44 Hawley Street
Binghamton, NY 13901

Katheryn M. Saddlemire, Chairwoman
Town of Schoharie Planning Board
167 Westfall Road
Schoharie, NY 12157

Jerome Hatfield, Regional Administrator
U.S. Dep. of Homeland Security
Federal Emergency Management Agency, R II
26 Federal Plaza
New York, NY 10278-0002

Christopher W. Tague, Town Supervisor
Town of Schoharie
P.O. Box 544
Schoharie, NY 12157

James Tierney
Assistant Commissioner of Water Resources
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233-0001

William Nechamen
NYS Dept. of Environmental Conservation
Floodplain Management
Division of Water
625 Broadway
Albany, NY 12233-0001

M. Indica Jaycox, Schoharie County Clerk
P.O. Box 549
Schoharie, New York 12157

Brenda Weaver, Office Manager
Schoharie County Soil and Water Conservation District
173 Grant Street, Suite 3
Cobleskill, NY 12043

Earl VanWormer III, Chairman
Schoharie County Board of Supervisors
County Office Building, Room 365
284 Main Street
Schoharie, New York 12157

Pamela Foland, Town Clerk/Collector
Town of Schoharie
P.O. Box 544
Schoharie, NY 12157

Ben Cooper, Public Works Administrator
Schoharie County Department of Public Works
P.O. Box 249
Schoharie, NY 12157

Gerald Pete Coppolo Sr., Town Supervisor
Town of Middleburgh
P.O. Box 946
Middleburgh, NY 12122

E-MAIL:
Disaster_recovery@hud.gov

State of New York, ss.:
City and County of Schenectady

EARLY NOTICE OF A PROPOSED ACTIVITY IN A 500- AND 100-YEAR FLOODPLAIN AND WETLAND STONY BROOK MITIGATION TOWN OF SCHOHARIE, SCHOHARIE COUNTY, NEW YORK
May 24, 2017

To: All Interested Agencies, Groups, and Individuals

This is to give notice that the Governor's Office of Storm Recovery (GOSR), an office of the New York State Housing Trust Fund Corporation (HTFC), has received an application from Schoharie County Soil & Water Conservation District to fund Stony Brook Mitigation (hereinafter, the "Proposed Activity") and is conducting an evaluation as required by Executive Order 11988 and Executive Order 11990 in accordance with U.S. Department of Housing and Urban Renewal (HUD) regulations (24 CFR Part 55). There are three primary purposes for this notice. First, to provide the public an opportunity to express their concerns and share information about the Proposed Activity. Second, adequate public notice is an important public education tool. The dissemination of information about floodplains and wetlands facilitates and enhances governmental efforts to reduce the risks associated with the occupancy and modification of these special areas. Third, as a matter of fairness, when the government determines it will participate in actions taking place in floodplains or wetlands, it must inform those who may be put at greater or continued risk. Funding for the Proposed Activity will be provided by the HUD Community Development Block Grant – Disaster Recovery (CDBG-DR) program for storm recovery activities in New York State.

The Proposed Activity is needed to address severe bed and bank erosion within the Stony Brook channel as well as aggradation of bedload sediment from recent, severe flooding events, most significantly Tropical Storm Irene in 2011, and also a June 2013 flood event. This aggradation of sediment has clogged culvert and bridge crossings, leading to the reduction of flood conveyance capacity in the channel. The sediment migration has caused the channel to become unstable, with bank erosion and excessive sedimentation in many areas.

The Proposed Activity entails stream repair and restoration along approximately 2.6 miles of Stony Brook. Stony Brook

Lindsey Harrison of the City of Schenectady, being duly sworn, says that he/she is Principal Clerk in the office of the Daily Gazette Co., published in the City of Schenectady and that the notice/advertisement, of which the annexed is a printed copy, has been regularly published in the Daily Gazette and/or Sunday Gazette as follows:

1 insertion on May 24, 2017

Lindsey Harrison

Sworn to me on this 24th day of May, 2017

NOTARY PUBLIC

LISA J. BALDWIN
COMMISSION OF DEEDS
MY COMMISSION EXPIRES
12-22-17

Lisa Baldwin

is a tributary to Schoharie Creek, which flows to the Mohawk River and then to the Hudson River. The project site is located in the town of Schoharie, in northeastern Schoharie County, New York. The Proposed Activity includes eight restoration areas, and is anticipated to improve the health of the riverine system, prevent flooding and protect infrastructure and private residential properties during storm events. The Proposed Activity involves development of sediment management standards to guide removal of sediment and proper channel sizing. In addition, based on the engineering study, the following improvement measures are also proposed for specific areas: installation of rock vane structures to improve sediment transport; removal of sidecast sediments; installation of grade control to arrest channel incision and prevent additional incision; repair and restacking of stacked rock revetment wall and installation of grade control; roughening of channel with random boulder placement; bank failure repair and relocation of channel away from toe of slope; replacement of undersized culvert at Frisbieville Road; and replacement of undersized culvert at Stony Brook Road.

The Proposed Activity will not result in any impacts to the 500-year or 100-year floodplain. Although approximately 1.11 acres within the 500-year floodplain and 1.56 acres within the 100-year floodplain are located within the project boundary, the 500-year and 100-year floodplains are outside the limits of distu[illegible]ance of the [illegible]ivity. Stony [illegible]ped as NWI [illegible]nds. The total [illegible] of disturbance [illegible]roject site is [illegible]ly 0.85 acres. [illegible] no more than [illegible] of NWI riverine [illegible] would be dis[illegible]owever, the im[illegible]ld be conducted [illegible]ribed above to [illegible] the health of the [illegible] system, prevent [illegible] and protect infra[illegible]re and private resi[illegible] properties during [illegible] events. The project [illegible]oes not contain any [illegible]EC wetlands.

[illegible]oodplain map based [illegible]he FEMA Base Flood [illegible]ation Maps and wet[illegible]ds maps based on the [illegible]tional Wetland Inventory and New York State Department of Environmental Conservation (NYSDEC) [illegible]ata have been prepared and are available for review with additional information at http://www.stormrecovery.ny.gov/environmental-docs.

Any individual, group, or agency may submit written comments on the Proposed Activity or request further information by contacting Lori A. Shirley, Certifying Officer, Governor's Office of Storm Recovery, 99 Washington Avenue, Suite 1224, Albany, NY 12260; email: NYSCDBG_DR_ER@nyshcr.org. Standard office hours are 9:00 AM to 5:00 PM Monday through Friday. For more information call 518-474-0755. All comments received by 5:00 PM on June 9, 2017 will be considered.

Lori A. Shirley, Certifying Officer

May 24, 2017

5/24 2303601

Appendix B:
Public Comments

No comments have been received

Appendix C:
Final Floodplain Notice

PUBLIC NOTICE
COMBINED FINAL NOTICE AND PUBLIC REVIEW OF A PROPOSED ACTIVITY IN A 500- AND 100-YEAR FLOODPLAIN AND WETLAND, NOTICE OF FINDING OF NO SIGNIFICANT IMPACT (FONSI), AND NOTICE OF INTENT TO REQUEST RELEASE OF FUNDS (NOI-RROF)

STONY BROOK MITIGATION
TOWN OF SCHOHARIE, NY

June 27, 2017

Name of Responsible Entity and Recipient: New York State Homes and Community Renewal (HCR), 38-40 State Street, Hampton Plaza, Albany, NY 12207, in cooperation with the New York State Housing Trust Fund Corporation (HTFC), of the same address. Contact: Lori A. Shirley (518) 474-0755.

Pursuant to 24 CFR Section 58.43 and 24 CFR part 55, this combined Notice of Finding of No Significant Impact, Notice of Intent to Request Release of Funds (FONSI/NOIRROF), and Final Notice and Public Explanation of a Proposed Activity in a 500- and 100-year floodplain and wetland satisfies three separate procedural requirements for project activities proposed to be undertaken by HCR.

Project Description: The Governor's Office of Storm Recovery (GOSR), an office of HCR's HTFC, is responsible for the direct administration of the United States Department of Housing and Urban Development (HUD) Community Development Block Grant – Disaster Recovery (CDBG-DR) program in New York State. GOSR proposes to provide $2,400,000 in CDBG-DR funding to address severe bed and bank erosion within the Stony Brook channel as well as aggradation of bedload sediment from severe flooding events, most significantly Tropical Storm Irene in 2011, and also a June 2013 flood event (the "Proposed Activity"). This aggradation of sediment has clogged culvert and bridge crossings, leading to the reduction of flood conveyance capacity in the channel. The sediment migration has caused the channel to become unstable, with bank erosion and excessive sedimentation in many areas. The Proposed Activity entails stream repair and restoration along approximately 2.6 miles of Stony Brook. Stony Brook is a tributary to Schoharie Creek, which flows to the Mohawk River and then to the Hudson River.

PUBLIC EXPLANATION OF A PROPOSED ACTIVITY IN A 500- AND 100-YEAR FLOODPLAIN AND WETLAND

The Proposed Activity will not result in any impacts to the 500-year or 100-year floodplain. Although approximately 1.11 acres within the 500-year floodplain and 1.56 acres within the 100-year floodplain are located within the project site boundary, the 500-year and 100-year floodplains are outside the limits of disturbance of the Proposed Activity.

Stony Brook is mapped as NWI riverine wetlands. The total acreage of disturbance within the project site is approximately 2.05 acres. Therefore, no more than 2.05 acres of NWI riverine wetlands would be disturbed. However, the impacts would be conducted as described above to improve the health of the riverine system, prevent flooding and protect infrastructure and private residential properties during storm events. The project site does not contain any NYSDEC wetlands. Applicable permits from the New York State Department of Environmental Conservation and the United States Army Corps of Engineers will be acquired before work is commenced. The Applicant will be bound by any permit stipulations or mitigation measures listed in permits acquired for this project.

There are three primary purposes for this notice. First, people who may be affected by activities in floodplains or wetlands and those who have an interest in the protection of the natural environment should be given an opportunity to express their concerns and provide information about these areas. Second, adequate public notice is an important public education tool. The dissemination of information about floodplains and wetlands facilitates and enhances Federal efforts to reduce the risks associated with the occupancy and modification of these special areas. Third, as a matter of fairness, when the Federal government determines it will participate in actions taking place in floodplains or wetlands, it must inform those who may be put at greater or continued risk.

FINDING OF NO SIGNIFICANT IMPACT

An Environmental Assessment (EA) for the Proposed Project has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and HUD environmental review regulations at 24 CFR Part 58. The EA is incorporated by reference into this FONSI. Subject to public comments, no further review of the Proposed Project is anticipated. HCR has determined that the EA for the project identified herein complies with the requirements of HUD environmental review regulations at 24 CFR Part 58. HCR has determined that the Proposed Project will have no significant impact on the human environment and therefore does not require the preparation of an environmental impact statement under NEPA.

Public Review: Public viewing of the EA and Floodplain Management Documents are available online at http://stormrecovery.ny.gov/environmental-docs and are also available in person Monday – Friday, 9:00 AM – 5:00 PM at the following address: Governor's Office of Storm Recovery, 99 Washington Avenue, Suite 1224, Albany, New York 12260. Contact: Lori A. Shirley (518) 474-0755.

Further information may be requested by writing to the above address, emailing NYSCDBG_DR_ER@nyshcr.org or by calling (518) 474-0755. This combined notice is being sent to individuals and groups known to be interested in these activities, local news media, appropriate local, state and federal agencies, the regional office of the U.S. Environmental

Protection Agency having jurisdiction, and to the HUD Field Office, and is being published in a newspaper of general circulation in the affected community.

Public Comments on the Proposed Activity within Floodplain and Wetland, FONSI and/or NOIRROF: Any individual, group or agency may submit written comments on the Project. The public is hereby advised to specify in their comments which "notice" their comments address. Comments should be submitted via email, in the proper format, on or before July 5, 2017 at NYSCDBG_DR_ER@nyshcr.org. Written comments may also be submitted at the following address, or by mail, in the proper format, to be received on or before July 5, 2017: Governor's Office of Storm Recovery, 99 Washington Avenue, Suite 1224, Albany, New York 12260. Comments may be received by telephone by contacting Lori A. Shirley at (518) 474-0755. All comments must be received on or before 5 pm on July 5, 2017 or they will not be considered. If modifications result from public comment, these will be made prior to proceeding with the expenditure of funds.

REQUEST FOR RELEASE OF FUNDS AND CERTIFICATION

On or about July 13, 2017, the HCR certifying officer will submit a request and certification to HUD for the release of CDBG-DR funds as authorized by related laws and policies for the purpose of implementing this part of the New York CDBG-DR program.

HCR certifies to HUD that Lori A. Shirley, in her capacity as Certifying Officer, consents to accept the jurisdiction of the U.S. federal courts if an action is brought to enforce responsibilities in relation to the environmental review process and that these responsibilities have been satisfied. HUD's approval of the certification satisfies its responsibilities under NEPA and related laws and authorities, and allows GOSR to use CDBG-DR program funds.

Objection to Release of Funds: HUD will accept objections to its release of funds and GOSR's certification for a period of fifteen days following the anticipated submission date or its actual receipt of the request (whichever is later). Potential objectors may contact HUD or the GOSR Certifying Officer to verify the actual last day of the objection period.

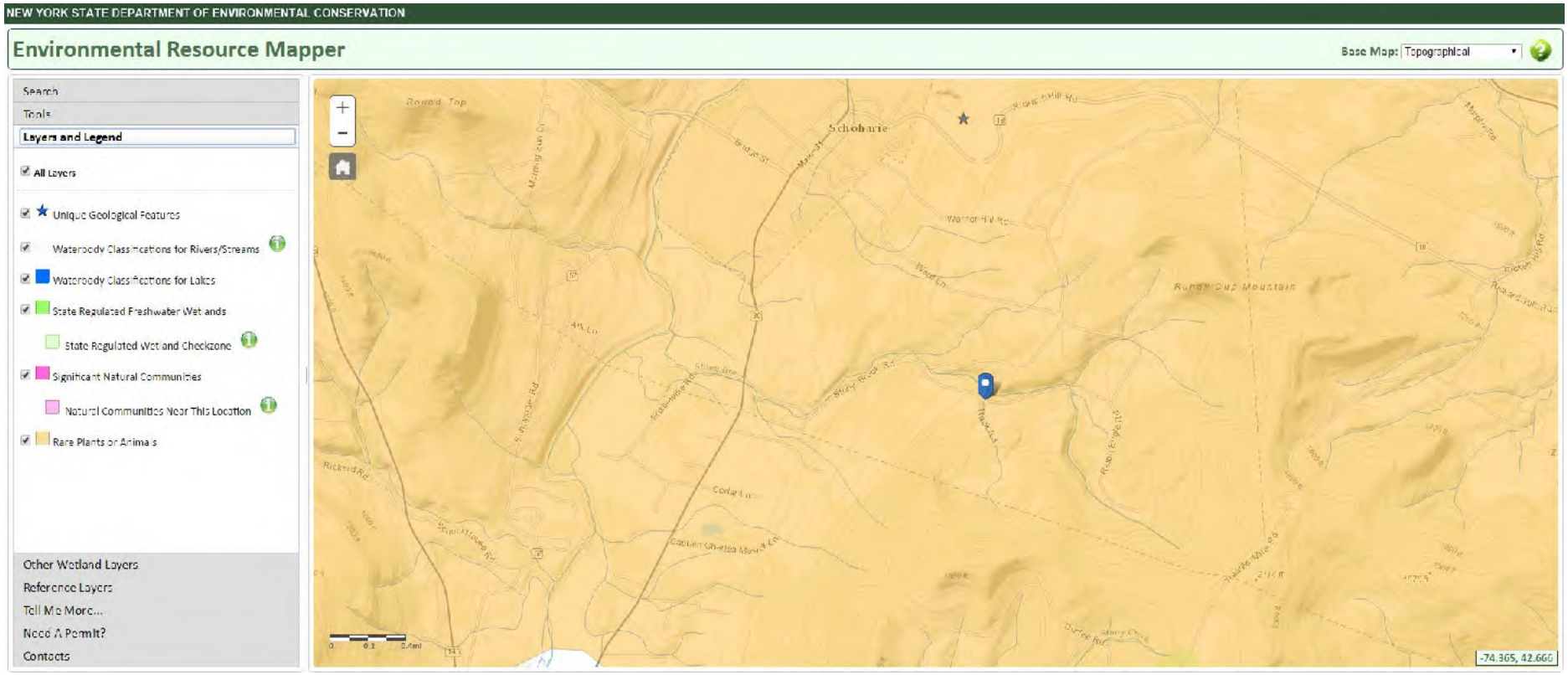
The only permissible grounds for objections claiming a responsible entity's non-compliance with 24 CFR Part 58 are: (a) Certification was not executed by HCR's Certifying Officer; (b) the responsible entity has omitted a step or failed to make a decision or finding required by HUD regulations at 24 CFR Part 58; (c) the responsible entity or has committed funds or incurred costs not authorized by 24 CFR Part 58 before release of funds and approval of environmental certification; or (d) another Federal agency acting pursuant to 40 CFR Part 1504 has submitted a written finding that the project is unsatisfactory from the standpoint of environmental quality.

Objections must be prepared and submitted in accordance with the required procedures (24 CFR Part 58) and shall be addressed to Tennille Smith Parker, Director, Disaster Recovery and Special Issues Division, Office of Block Grant Assistance, U.S. Department of Housing & Urban Development, 451 7th Street SW, Washington, DC 20410, Phone: (202) 402-4649.

Lori A. Shirley
Certifying Officer
June 27, 2017

Appendix D: NYSDEC Environmental Resources Map

Appendix D
Stony Brook Mitigation



Appendix E: Consultations

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Permits & Pollution Prevention
625 Broadway, 4th Floor, Albany, New York 12233-1750
P: (518) 402-9167 | F: (518) 402-9168 | deppermitting@dec.ny.gov
www.dec.ny.gov

June 20, 2016

Mr. Thomas J. King
Governor's Office of Storm Recovery
99 Washington Avenue
Suite 1224
Albany, NY 12260

RE: Stony Brook Stream Mitigation for area 1, 3, 4 and 7
Town of Schoharie, Schoharie County

Dear Mr. King:

We received your jurisdictional inquiry request for Stony Brook Stream Mitigation located near Hwy 30 in the Town of Schoharie, Schoharie County. It is our understanding that the project is stream mitigation of Stony Brook. The project will include some excavation but will use the natural channel and slope using best practices for control of sedimentation and erosion. Area 1 installation of rock vane structures and replacement of undersized culvert to twin 8'H x 10'W concrete box at Frisbieville Rd. Area 3A and B Installation of rock vane structures, replacement of undersized culvert to twin 5'H x 20'W concrete box at Stony Brook Rd, and removal of sidecast sediments. Area 4 installation of grade control to arrest channel incision, repair and restacking of stacked rock revetment wall and installation of grade control and roughening of channel with random boulder placement. Area 7 installation of grade control, bank failure repair and relocation of channel away from toe of slope and roughening of channel with random boulder placement. Based on our understanding of the project and review of the Engineering Report dated January 2016, we have the following comments on the project:

WATER

Protection of Waters: A *stream/pond* is located within your project/site. The following provides a summary of the *stream(s)/pond(s)* within the project/site:

Name	Class	Waters Index Number
Stony Brook	C	H-240-82-74

An Article 15, Protection of Waters Permit is not required to physically disturb the bed or

banks of *this/these stream(s)/pond(s)* or to dredge or fill within the waterway.

Please note that **any project undertaken shall not result in the degradation or contravening of water quality standards of the stream**. Activities resulting in sedimentation and/or turbid waters may constitute a violation of water quality standards and the Environmental Conservation Law (ECL). Care needs to be taken to stabilize the disturbed areas promptly after construction, and all necessary precautions be taken to prevent contamination of the stream by silt, sediment, fuels, solvents, lubricants, or any other pollutant associated with the project.

Stormwater Permit: If your project will disturb more than one acre of land, you must comply with the State Pollutant Discharge Elimination System (SPDES) Phase II regulations for Stormwater Discharges Associated with Construction Activities. Information regarding the SPDES General Permit for Stormwater Discharges can be found on the Department's website at: http://www.dec.ny.gov/chemical/8468.html.

STATE-LISTED SPECIES

DEC has reviewed the State's Natural Heritage records. This site is in close proximity to known occurrences of the following state-protected species:

Common Name	Scientific Name	State Status	Federal Status
Northern Long-eared Bat	Myotis septentrionalis	Threatened	Threatened

Your project is in the Northern Long-eared Bat hibernaculum. If tree cutting is proposed, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

All threatened or endangered species are subject to regulation under Article 11, Title 5 of the Environmental Conservation Law and a permit is required for a taking of that species pursuant to 6 NYCRR Part 182. Besides death of individuals, taking includes harassment, interference with essential behaviors, and adverse modification of habitat. Additional information on the proposal will be required for a determination on the need for a permit.

The absence of data does not necessarily mean that any other rare or state-listed species, natural communities or other significant habitats do not exist on or adjacent to the proposed site. Rather, our files currently do not contain information which indicates their presence. For most sites, comprehensive field surveys have not been conducted. We cannot provide a definitive statement on the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

CULTURAL RESOURCES

Your project/site appears to be located within an area of potential historical or archeological significance. If approvals/permits are needed from this Department, we may require consultation with the Office of Parks, Recreation and Historic Preservation (OPRHP) in order to better evaluate this project's impact to these resources.

For more information, please visit the New York State Office of Historic Preservation website at http://www.nysparks.com/shpo/.

OTHER

Work in certain wetlands and other waters of the United States may require a permit from the U.S. Army Corps of Engineers (USACOE). If a USACOE permit is required, the Department may need to make a determination that discharges from the proposed activities will comply with the applicable effluent limitations, water quality standards, and any other applicable conditions of the State Law. A Water Quality Certification, pursuant to Section 401 of the Federal Clean Water Act, may be required from this Department for impacts to federally regulated wetlands. Please contact the Department for further details. It is recommended that you contact the Corps at (518) 266-6350 to discuss their permitting requirements.

Please note that this letter only addresses the requirements for the following permits from the Department:

Water Quality 401 State-listed Species

Other permits from this Department or other agencies may be required for projects conducted on this property now or in the future. Also, regulations applicable to the location subject to this determination occasionally are revised and you should, therefore, verify the need for permits if your project is delayed or postponed. This determination regarding the need for permits will remain effective for a maximum of one year unless you are otherwise notified. Applications may be downloaded from our website at www.dec.ny.gov under "Programs" then "Division of Environmental Permits."

Please contact this office if you have questions regarding the above information.

Sincerely,

May O'Malley

May O'Malley
Division of Environmental Permits
may.omalley@dec.ny.gov
518-402-9154

Cc: NYSDEC Region 4 Environmental Permits

From: King, Thomas J (STORMRECOVERY)
Sent: Friday, February 12, 2016 2:04 PM
To: dec.sm.NaturalHeritage; Conrad, Nick (DEC)
Cc: Shultz, Alicia (NYSHCR); Barthelme, Mary (STORMRECOVERY); npeek@akrf.com; O'Malley, May H (DEC)
Subject: NHP Request for Information
Attachments: Stony_Brook_NYNHP_Consultation_Package_2016-02-10.pdf

Dear Mr. Conrad,

Please see the attached request for information related to the Stony Brook project.

Tom

Director – Bureau of Environmental Review and Assessment
Assistant General Counsel
Governor's Office of Storm Recovery
99 Washington Avenue Suite 1224
Albany, New York 12260
Office: (518) 473-0015
Mobile: (646) 417-4660
Thomas.King@StormRecovery.NY.Gov

February 10, 2015

Nicholas Conrad
NYS Department of Environmental Conservation
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program – Information Services
625 Broadway, 5th Floor
Albany, New York 12233-4757

RE: Natural Heritage Compliance Process Request for the Schoharie County Soil and Water Conservation District Stony Brook Mitigation Project – Town of Schoharie, Schoharie County, NY

Dear Mr. Conrad:

The Governor's Office of Storm Recovery (GOSR), acting under the auspices of New York State Homes and Community Renewal's (HCR) Housing Trust Fund Corporation (HTFC), on behalf of the Department of Housing & Urban Development (HUD) is currently preparing an environmental review for the Stony Brook Mitigation project, located in Schoharie, NY, (the "Proposed Action") (see **Attachment 1** and **Attachment 2**).

The purpose of this letter is to provide the New York State Department of Environmental Conservation (DEC) Natural Heritage Program (NYNHP) notice of the Proposed Action and determine whether the Proposed Action has the potential to impact any state or federal endangered, threatened, or rare species or significant natural communities.

Area of Effect: The Stony Brook Mitigation project includes the design, engineering and construction of drainage improvements along an approximately 2.6 mile section of Stony Brook Creek located in the Town of Schoharie, Schoharie County, NY.

The Town of Schoharie was particularly impacted by Hurricane Irene. Houses along Frisbieville Lane experienced considerable flooding and floodwaters undermined the shoulder of Stony Brook Road, an important evacuation route for residents of the northern part of the Town of Schoharie, to the point of collapse. This created a condition of isolation for those stranded upstream, and a condition requiring emergency sheltering for those suffering from the storm's affect downstream. Additionally, the Town's emergency response system was hindered by a reduced capacity to access those residents needing assistance in the affected areas.

Proposed Project Description: Implementation of the Proposed Action will reduce the flood risk and propensity for flood damage of a primary evacuation route, three culverts, and over a dozen private properties along Stony Brook and Frisbieville Lane. The project is anticipated to include, but not limited to floodplain reconnections, culvert modification or replacement, bank repair, channel stabilization, and grade control. Construction activities anticipated to complete scope of work include, but are not limited to earthwork, digging, grading stone revetment and construction of retaining walls. The Proposed Action is anticipated to improve the health of the riverine system, prevent flooding, protect infrastructure and private residential properties and increase the Town's ability to recover quickly from storm events.

According to the application for funding, dated July 2015, no land acquisition is anticipated as a result of the improvements and the project will not result in a change in land use. The location of the Proposed Action is wholly within the Mohawk River Watershed which is under the jurisdiction of NYSDEC.

Compliance: According to information reviewed from the New York State Environmental Resource (ERM) Mapper, no designated natural communities are known to exist within the property's vicinity. According to information reviewed from the New York State Environmental Resource (ERM) Mapper, rare, threatened or endangered plant or animal species are known to exist in the property's vicinity (see **Attachment 3**). GOSR has concluded that the Proposed Action will have no effect on or is not likely to adversely affect rare, threatened or endangered plant or animal species. GOSR respectfully requests NYNHP review the Proposed Action and location and concur with our determination, if appropriate.

If you have questions or require additional information regarding this request, please contact me at (518) 473-0015 or Thomas.King@stormrecovery.ny.gov. Thank you for your time and consideration.

Sincerely,

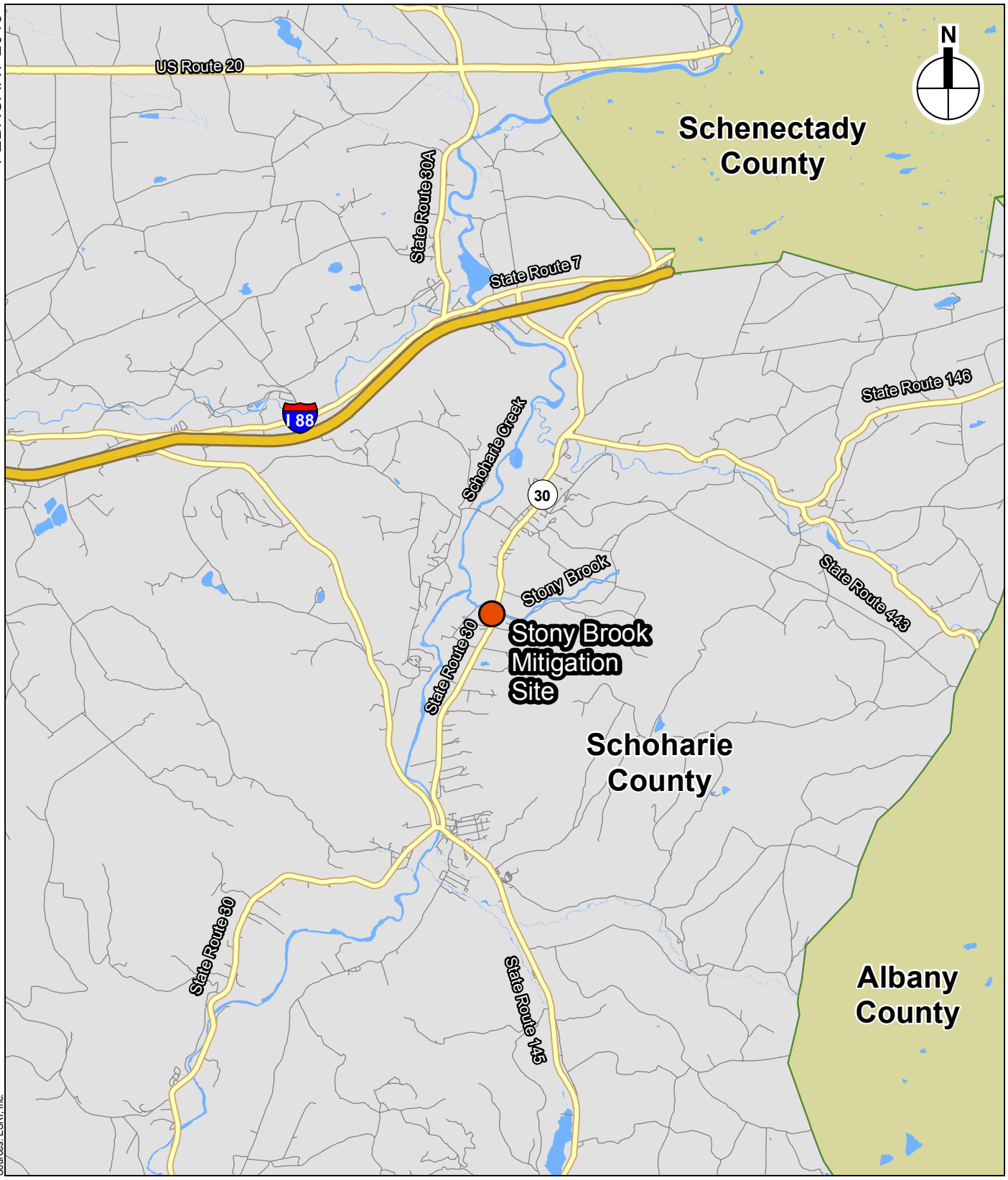
Thomas J. King
Assistant General Counsel and Certifying Officer

Enclosures:
Attachment 1: Project Location Map
Attachment 2: Project Site Maps
Attachment 3: ERM Mapper Findings

Attachment 1

Project Location Map

FEBRUARY 2016



Sources: ESRI, Inc.

Site Location

0 3 Miles

Project Location Map

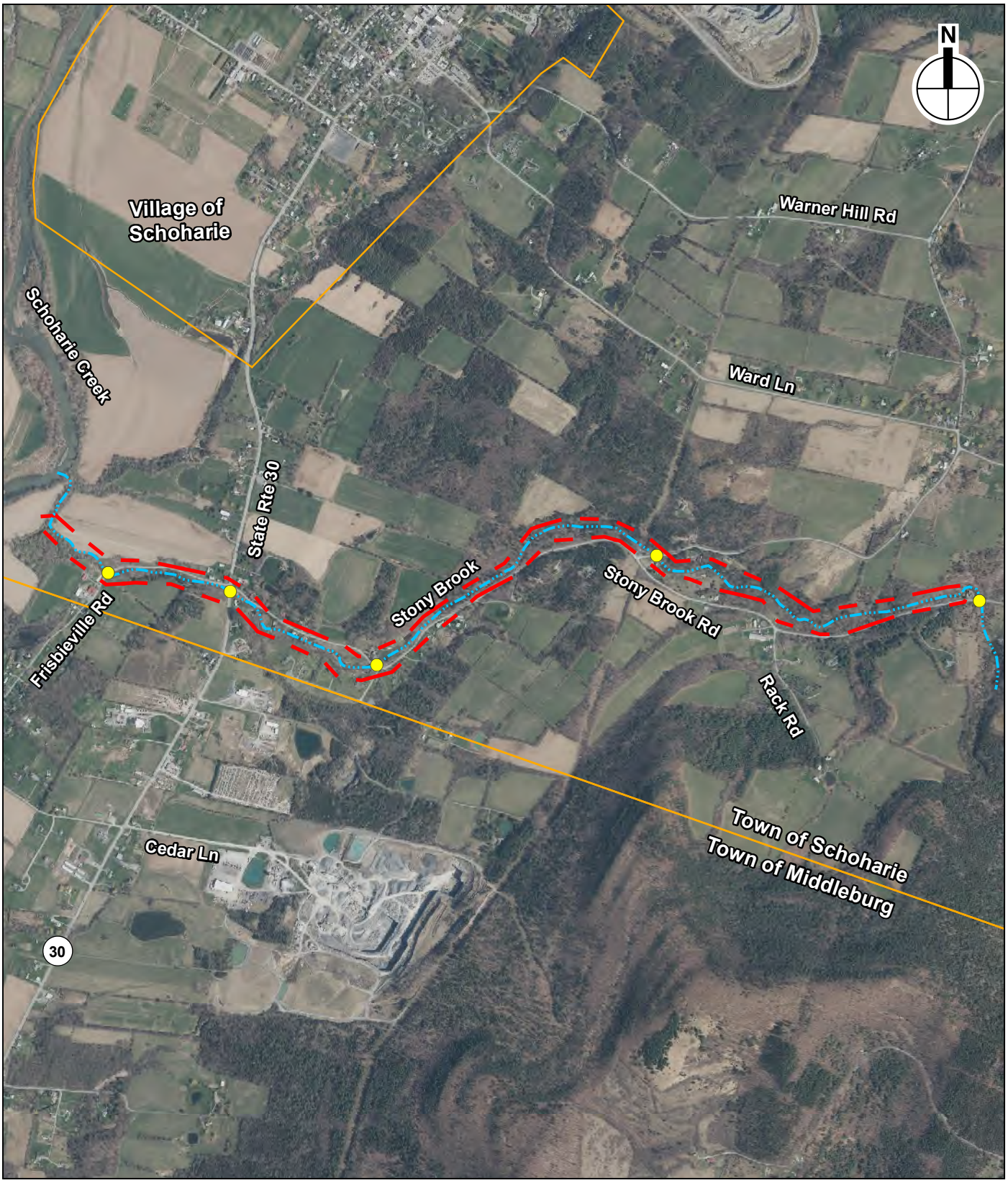
Stony Brook Mitigation, Town of Schoharie

Figure 1

Attachment 2

Project Site Map

FEBRUARY 2016



Sources: NYSDOP 2014

0 0.5 Mile

Culvert

Stony Brook

Site Boundary

Municipal Boundaries

Project Site Map

Stony Brook Mitigation, Town of Schoharie

Figure 2

Attachment 3

NYS DEC ERM Mapper Findings

NEW YORK STATE - DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

Environmental Resource Mapper

Search | Layers & Legend | Tell Me More...
Need a Permit? | Contacts | Help

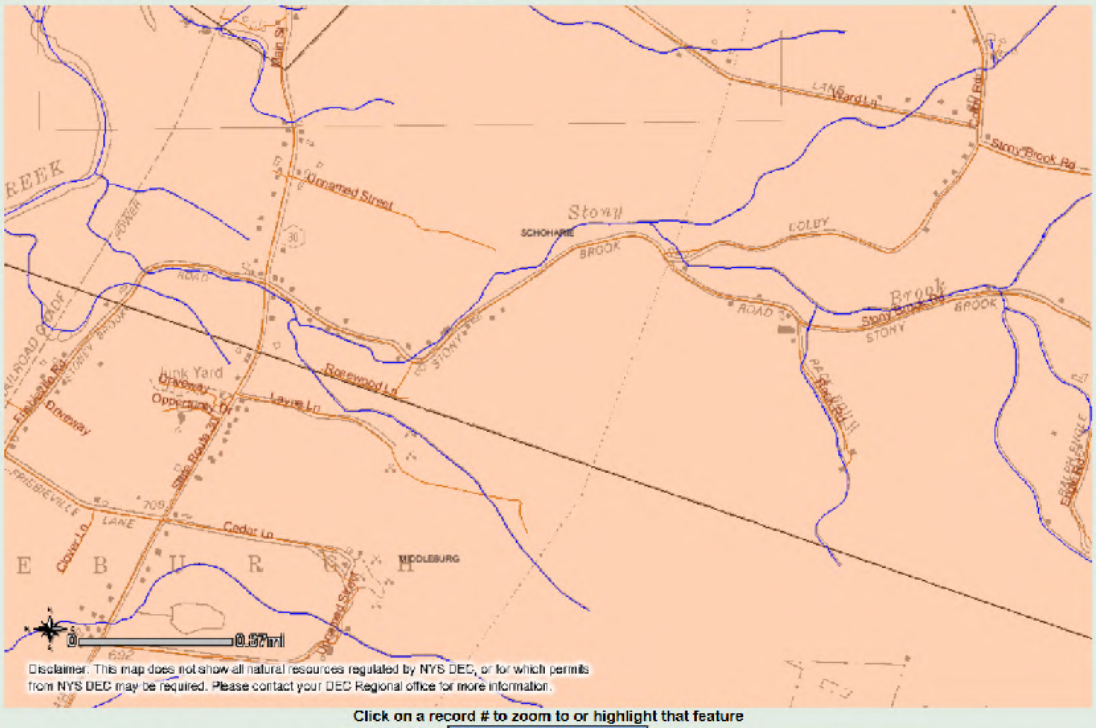
Map Layers & Legend

More layers appear as you zoom in

- [x] Classified Water Bodies
- [x] Unique Geological Features
- [x] Classified Water Bodies
- [x] State Regulated Freshwater Wetlands
  - Wetland Checkzone ?
- [x] Rare Plants and Rare Animals
- [x] Significant Natural Communities
  - Natural Communities Vicinity ?
- [x] Background Map
- [x] Adirondack Park Boundary
- [x] Counties

Click "Refresh Layers" to activate and deactivate layers

Refresh Layers



Click on a record # to zoom to or highlight that feature

Counties		
Record #	County	Area (Mile²)
1	SCHOHARIE	825.77

The Coordinates of the point you clicked on are:

NYTM	E : 555680		Longitude/Latitude	W : 74.320
	N : 4721611			N : 42.644

Classified Streams

Regulation	Standard	Classification
879-87	C	C

Rare Plants and Rare Animals

This location is in the vicinity of one or more :
Rare Animals and/or Rare Plants

USGS Quadrangle

USGS Quadrangle Name
SCHOHARIE

If your project or action is within or near an area with a rare animal, a permit may be required if the species is listed as endangered or threatened and the department determines the action may be harmful to the species or its habitat.

If your project or action is within or near an area with rare plants and/or significant natural communities, the environmental impacts may need to be addressed.

The presence of a unique geological feature or landform near a project, unto itself, does not trigger a requirement for a NYS DEC permit. Readers are advised, however, that there is the chance that a unique feature may also show in another data layer (ie. a wetland) and thus be subject to permit jurisdiction.

Please refer to the "Need a Permit?" tab for permit information or other authorizations regarding these natural resources.

Disclaimer:If you are considering a project or action in, or near, a wetland or a stream, a NYS DEC permit may be required. The Environmental Resources Mapper does not show all natural resources which are regulated by NYS DEC, and for which permits from NYS DEC are required. For example, Regulated Tidal Wetlands, and Wild, Scenic, and Recreational Rivers, are currently not included on the maps.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th Floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **Fax:** (518) 402-8925
Website: www.dec.ny.gov

March 11, 2016

Thomas J. King, Esq.
Governor's Office of Storm Recovery
25 Beaver Street
New York, NY 10004

Re: Stony Brook Mitigation Project, drainage and culvert improvements
Town/City: Schoharie. County: Schoharie.

Dear Thomas J. King, Esq.:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.

We have no records of rare or state-listed animals or plants, or significant natural communities directly on the project site.

Within five miles of the project site are several documented hibernacula (winter locations) for **Northern long-eared bat** (*Myotis septentrionalis*, state and federally listed as Threatened), with the closest being within three miles of the project site. The bats may travel five miles or more from documented locations. The main impact of concern for bats is the cutting or removal of potential roost trees; if no large trees will be cut as part of this project, we do not expect any significant impacts to rare bat species.

However, New York Natural Heritage is not authorized to make official determinations regarding projects or the level of impacts on listed species from proposed actions. For official determinations of NYSDEC and for information about any permit considerations for your project, please contact the Permits staff at the NYSDEC Region 4 Office at dep.r4@dec.ny.gov, 518-357-2456. For information about potential impacts of your project on these species, and how to avoid, minimize, or mitigate any impacts, contact the Region 4 Wildlife staff at 518-357-2355.

For most sites, comprehensive field surveys have not been conducted. We cannot provide a definitive statement on the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other resources may be required to fully assess impacts on biological resources.

This response applies only to known occurrences of rare or state-listed animals and plants, significant natural communities, and other significant habitats maintained in the Natural Heritage Database. Your project may require additional review or permits; for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the NYSDEC Region 4 Office, Division of Environmental Permits, as listed above.

Sincerely,

Nicholas Conrad
Information Resources Coordinator
New York Natural Heritage Program

93C

June 22, 2016

Robyn A. Niver
Endangered Species Biologist USFWS
New York Field Office
Cortland, NY 13045
VIA EMAIL: robyn_niver@fws.gov

RE: Early Coordination for the Section 7 Review for the Schoharie County Soil and Water Conservation District Stony Brook Mitigation Project – Town of Schoharie, Schoharie County, NY

Dear Ms. Niver:

The Governor's Office of Storm Recovery (GOSR), acting under the auspices of New York State Homes and Community Renewal's (HCR) Housing Trust Fund Corporation (HTFC), on behalf of the Department of Housing & Urban Development (HUD), is currently preparing an Environmental Assessment (EA) for the design, engineering, and construction of drainage improvements to mitigate flooding of the Stony Brook Creek within the Town of Schoharie in Schoharie County, New York. The affected area includes approximately 2.6 miles of Stony Brook Creek in the Town of Schoharie (see **Figure 1** and **Figure 2**).

GOSR is initiating informal consultation with your office concerning the proposed action in accordance with the following laws: Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), Migratory Bird Treaty Act of 1918 (MBTA) (40 Stat. 755, as amended; 16 U.S.C. 703-712) and the Bald and Golden Eagle Protection Act of 1940 (BGEPA) (54 Stat. 240, as amended; 16 U.S.C. 668-668c).

Proposed Action

The Proposed Action is a stream repair and restoration project along approximately 2.6 miles of Stony Brook. Stony Brook is a tributary to Schoharie Creek, which flows to the Mohawk River and then to the Hudson River. The project site is located in the town of Schoharie, in northeastern Schoharie County, New York. Recent, severe flooding events, most significantly Tropical Storm Irene in 2011, and also a June 2013 flood event have resulted in severe bed and bank erosion within the Stony Brook channel as well as aggradation of bedload sediment. This aggradation of sediment has clogged culvert and bridge crossings, leading to the reduction of flood conveyance capacity in the channel. The sediment migration has caused the channel to become unstable, with bank erosion and excessive sedimentation in many areas. The Proposed Action includes the following eight (8) restoration areas, and is anticipated to improve the health of the riverine system, prevent flooding and protect infrastructure and private residential properties during storm events.

Area 1
Channel Location (STA): 32+00 – 14+50
Latitude: 42.645601 / Longitude: -74.326106

Area 2
Channel Location (STA): 32+50 – 44+00
Latitude: 42.644488 / Longitude: -74.321308

Area 3A
Channel Location (STA): 48+50 – 67+00
Latitude: 42.642651 / Longitude: -74.316228

Area 3B
Channel Location (STA): 48+50 – 67+00
Latitude: 42.642989 / Longitude: -74.313465

Area 4
Channel Location (STA): 70+00 – 82+00
Latitude: 42.644698 / Longitude: -74.309846

Area 5
Channel Location (STA): 86+00 – 99+00
Latitude: 42.646348 / Longitude: -74.305249

Area 6
Channel Location (STA): 100+50 – 114+00
Latitude: 42.645921 / Longitude: -74.300552

Area 7
Channel Location (STA): 134+00 – 150+00
Latitude: 42.644092 / Longitude: -74.290176

The Proposed Project would include development of sediment management standards to guide removal of sediment and proper channel sizing at the above locations. In addition, based on the engineering study, the following improvement measures are also proposed for specific areas: installation of rock vane structures to improve sediment transport; removal of sidecast sediments; installation of grade control to arrest channel incision and prevent additional incision; repair and restacking of stacked rock revetment wall and installation of grade control; roughening of channel with random boulder placement; bank failure repair and relocation of channel away from toe of slope; replacement of undersized culvert at Frisbieville Road; and replacement of undersized culvert at Stony Brook Road.

According to the application for funding, dated July 2015, no land acquisition is anticipated as a result of the improvements and the project will not result in a change in land use.

Compliance

Endangered Species Act – According to the USFWS Information, Planning and Conservation (IPaC) online planning tool and Trust Resource Report, accessed February 9, 2016, there is one threatened species that is potentially associated with the project site – the Northern Long-Eared Bat (NLEB) (**Attachment 1**). GOSR has completed the Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form (**Attachment 2**). The official species list for the proposed project indicated that there is no critical habitat in the project area. However, the consultation response from the New York Natural Heritage Program dated March 11, 2016 (**Attachment 3**) indicated the presence of several documented hibernacula for the NLEB within five miles of

the project site, with the closest being within three miles of the project site. There are currently no maternity roost trees or hibernacula known to be occupied by the NLEB within the proposed project boundaries. The proposed project will include limited tree removal, which may take place during the active season (April-October).

The Northern long-eared bat (NLEB), listed as federally threatened, is a temperate, insectivorous bat whose life cycle can be coarsely divided into two primary phases - reproduction and hibernation. NLEB hibernate in caves or mines during winter and then emerge in early spring, with males dispersing and remaining solitary until mating season at the end of the summer, and pregnant females forming maternity colonies in which to rear young. No caves or mines occur near the project site. Summer habitat of the NLEB generally includes upland and riparian forest within heavily forested landscapes (Ford et al. 2005, Henderson et al. 2008). The NLEB is sensitive to fragmentation and urbanization, and requires interior forest for both foraging and breeding (Foster and Kurta 1999, Broders et al. 2006, Henderson et al. 2008). Roost trees are usually in intact forest, close to the core and away from large clearings, roads, or other sharp edges (Menzel et al. 2002, Owen et al. 2003, Carter and Feldhammer 2005). The project site consists of stream and riparian areas along Stony Brook Road. There are forested areas interspersed with farm fields in the vicinity of the project site. The forested areas within the project site would not be considered heavily forested or interior forest and are fragmented by roads and open fields. The limited trees that may be removed would not likely be considered suitable habitat.

As indicated on **Attachment 2**, GOSR determines that this project may affect the NLEB, but that any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule. If the USFWS does not respond within 30 days from submittal of this form, GOSR may presume that its determination is informed by the best available information and that its project responsibilities under 7(a)(2) with respect to the NLEB are fulfilled through the USFWS January 5, 2016, "Programmatic Biological Opinion (BO) on the Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions." GOSR will update this determination annually for multi-year activities.

MBTA – According to the USFWS IPaC Trust Resource Report, accessed February 9, 2016, there are several migratory birds of concern that could potentially be affected by the proposed project. The project takes place within the Atlantic Flyway. GOSR determined that the project would have no significant adverse impact on migratory birds or their habitat. It is anticipated that passerine birds would temporarily leave the area during construction due to noise and disturbance.

BGEPA – Bald Eagle (*Haliaeetus leucocephalus*) habitat and breeding sites can be found throughout Schoharie County; however, the response from the New York Natural Heritage Program dated March 11, 2016 (**Attachment 3**) indicated no known Bald Eagle nests within the vicinity of the project site. GOSR has determined that the proposed action would have no impact on the Bald Eagle.

If you have questions or require additional information regarding this request, please contact me at Alicia.Shultz@nyshcr.org or call (518) 474-0647. Thank you for your time and consideration.

Sincerely,

Alicia Shultz
Community Developer - Environmental Services
New York State Homes & Community Renewal
38-40 State St., 408N
Hampton Plaza, Albany, NY 12207

Enclosures:
Figure 1: Project Location Map
Figure 2: Project Site Map
Attachment 1: IPaC Trust Resource Report
Attachment 2: Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form
Attachment 3: NYNHP Response

Literature Cited

Broders, H.G., G.J. Forbes, S. Woodley, and I.D. Thompson. 2006. Range extent and stand selection for forest-dwelling northern long-eared and little brown bats in New Brunswick. Journal of Wildlife Management 70: 1174-1184.

Carter, T.C., and G.A. Feldhamer. 2005. Roost tree use by maternity colonies of Indiana bats and northern long-eared bats in southern Illinois. Forest Ecology and Management 219:259-268.

Ford, W.M., M.A. Menzel, J.L. Rodrigue, J.M. Menzel, and J.B. Johnson. 2005. Relating bat species presence to simple habitat measures in a central Appalachian forest. Biological Conservation 126: 528-539.

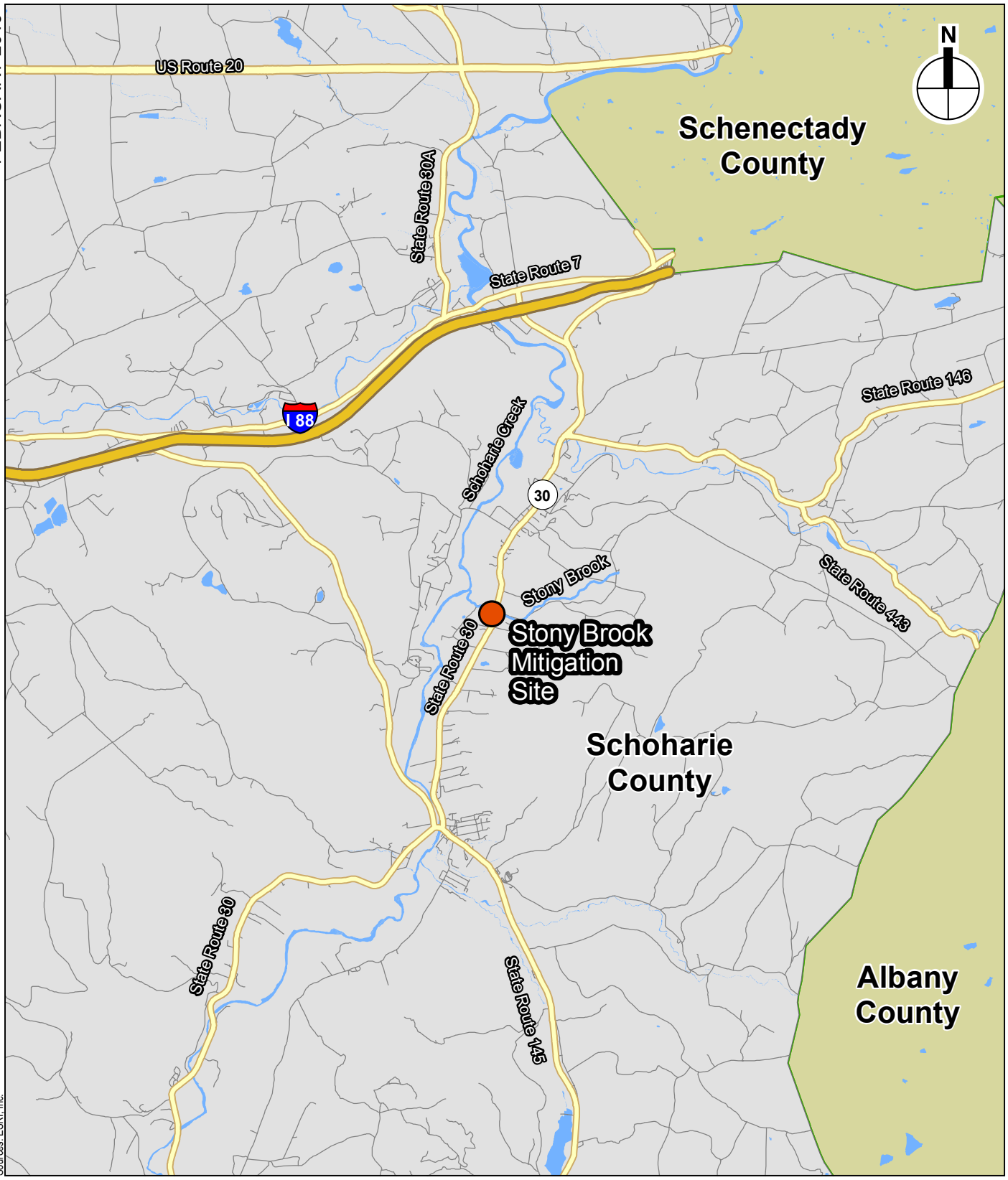
Foster, R.W. and A. Kurta, A. 1999. Roosting ecology of the northern bat (Myotis septentrionalis) and comparisons with the endangered Indiana bat (Myotis sodalis). Journal of Mammalogy 80: 659-672.

Henderson, L.E., L.J. Farrow, and H.G. Broders. 2008. Intra-specific effects of forest loss on the distribution of the forest-dependent northern long-eared bat (Myotis septentrionalis). Biological Conservation 141:1819-1828.

Menzel, M.A., S.F. Owen, W.M. Ford, J.W. Edwards, P.B. Wood, B.R. Chapman, and K.V. Miller. 2002. Roost tree selection by northern long-eared bat (Myotis septentrionalis) maternity colonies in an industrial forest of the central Appalachian mountains. Forest Ecology and Management 155:107-114.

Owen, S.F., M.A. Menzel, W.M. Ford, B.R. Chapman, K.V. Miller, J.W. Edwards, and P.B. Wood. 2003. Home-range size and habitat used by the northern myotis (Myotis septentrionalis). American Midland Naturalist 150:352-359.

FEBRUARY 2016



Sources: ESRI, Inc.

Site Location

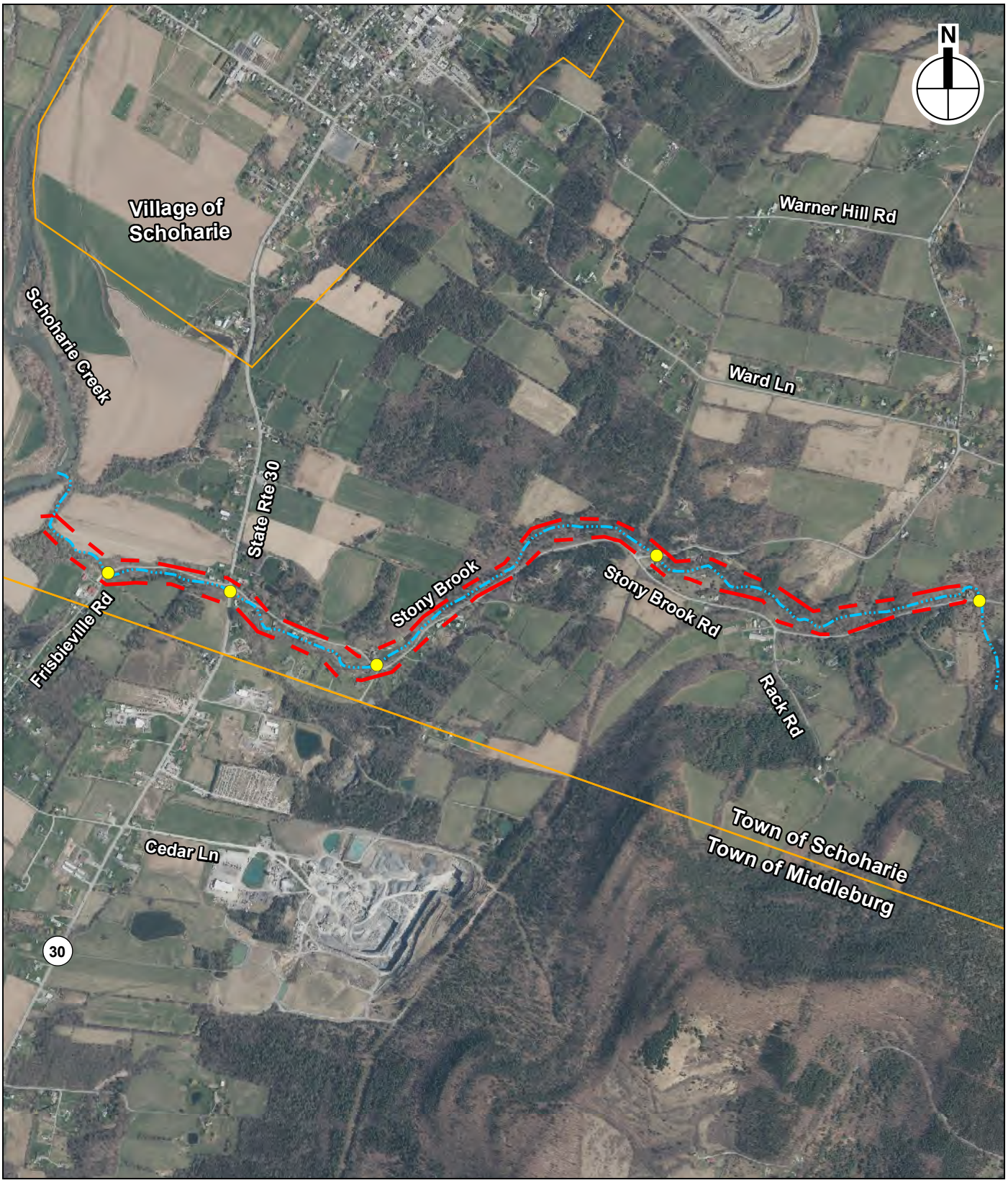
0 3 Miles

Project Location Map

Stony Brook Mitigation, Town of Schoharie

Figure 1

FEBRUARY 2016



Sources: NYSDOP 2014

0 0.5 Mile

Culvert

Stony Brook

Site Boundary

Municipal Boundaries

Project Site Map

Stony Brook Mitigation, Town of Schoharie

Figure 2

Attachment 1

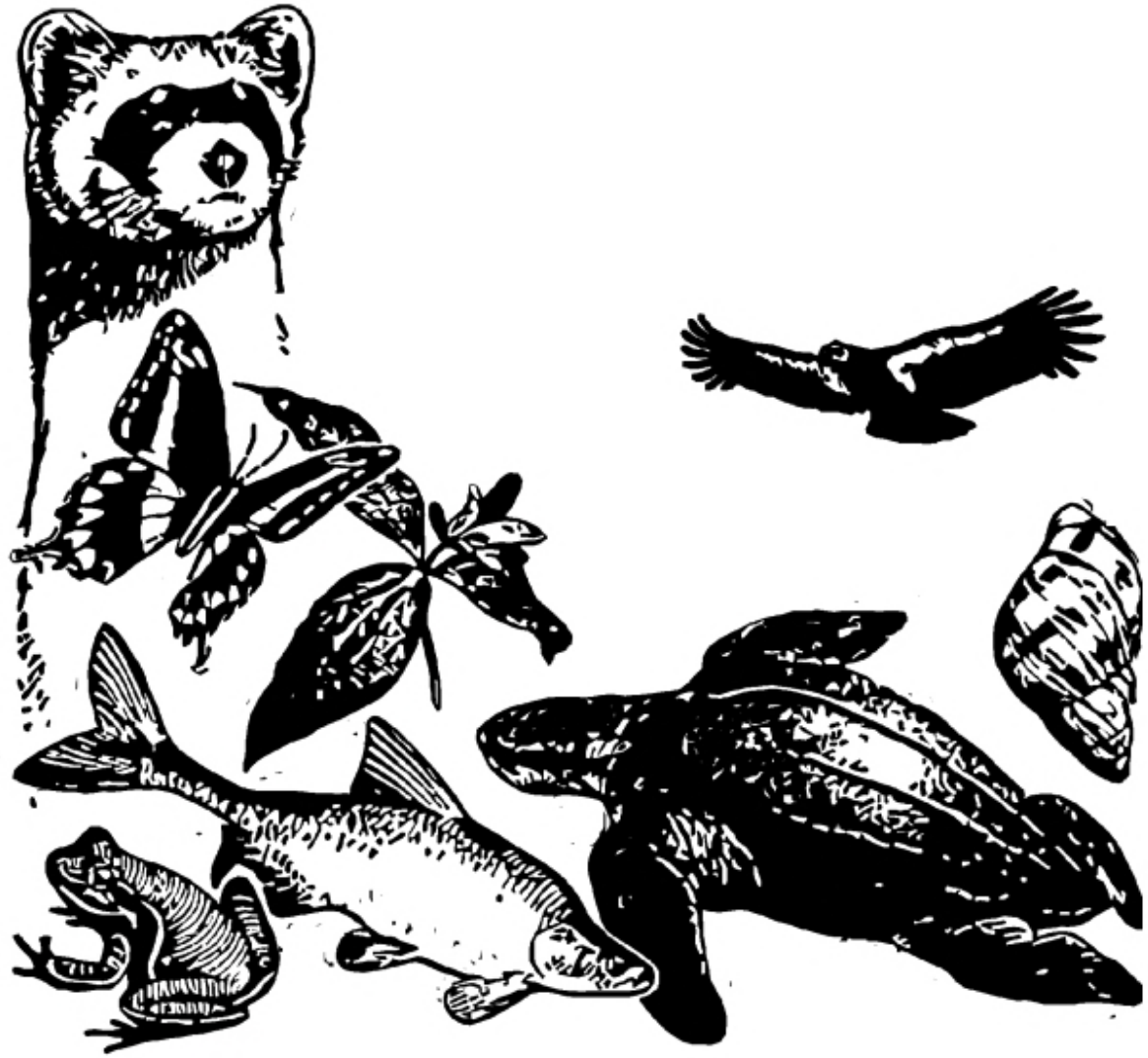
IPaC Trust Resource Report

U.S. Fish & Wildlife Service

IPaC Trust Resource Report

Generated February 09, 2016 01:47 PM MST, IPaC v2.3.2

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.



IPaC - Information for Planning and Conservation (https://ecos.fws.gov/ipac/): A project planning tool to help streamline the U.S. Fish & Wildlife Service environmental review process.

US Fish & Wildlife Service

IPaC Trust Resource Report

LOCATION

Schoharie County, New York

IPAC LINK

https://ecos.fws.gov/ipac/project/7XUF4-YO2AZ-CORKG-KWUMU-4G3DZ4

U.S. Fish & Wildlife Contact Information

Trust resources in this location are managed by:

New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9349
(607) 753-9334

Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the Endangered Species Program of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require FWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list from the Regulatory Documents section in IPaC.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Mammals

Northern Long-eared Bat Myotis septentrionalis — Threatened

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A0JE

Critical Habitats

There are no critical habitats in this location

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity which results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service (1). There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

Additional information can be found using the following links:

- Birds of Conservation Concern
  http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Conservation measures for birds
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/akn-histogram-tools.php

The following species of migratory birds could potentially be affected by activities in this location:

American Bittern Botaurus lentiginosus — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0F3

Bald Eagle Haliaeetus leucocephalus — Bird of conservation concern
Year-round
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B008

Black-billed Cuckoo Coccyzus erythropthalmus — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HI

Blue-winged Warbler Vermivora pinus — Bird of conservation concern
Season: Breeding

Canada Warbler Wilsonia canadensis — Bird of conservation concern
Season: Breeding

Golden-winged Warbler Vermivora chrysoptera — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0G4

Louisiana Waterthrush Parkesia motacilla — Bird of conservation concern
Season: Breeding

Olive-sided Flycatcher Contopus cooperi — Bird of conservation concern

Season: Breeding

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0AN

Peregrine Falcon Falco peregrinus — Bird of conservation concern

Season: Breeding

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FU

Pied-billed Grebe Podilymbus podiceps — Bird of conservation concern

Season: Breeding

Prairie Warbler Dendroica discolor — Bird of conservation concern

Season: Breeding

Red-headed Woodpecker Melanerpes erythrocephalus — Bird of conservation concern

Season: Breeding

Short-eared Owl Asio flammeus — Bird of conservation concern

Season: Wintering

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HD

Willow Flycatcher Empidonax traillii — Bird of conservation concern

Season: Breeding

https://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0F6

Wood Thrush Hylocichla mustelina — Bird of conservation concern

Season: Breeding

Refuges

Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

Refuge data is unavailable at this time.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

There are no wetlands in this location

Attachment 2

Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form

Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form

Federal agencies should use this form for the optional streamlined consultation framework for the northern long-eared bat (NLEB). This framework allows federal agencies to rely upon the U.S. Fish and Wildlife Service's (USFWS) January 5, 2016, intra-Service Programmatic Biological Opinion (BO) on the final 4(d) rule for the NLEB for section 7(a)(2) compliance by: (1) notifying the USFWS that an action agency will use the streamlined framework; (2) describing the project with sufficient detail to support the required determination; and (3) enabling the USFWS to track effects and determine if reinitiation of consultation is required per 50 CFR 402.16.

This form is not necessary if an agency determines that a proposed action will have no effect to the NLEB or if the USFWS has concurred in writing with an agency's determination that a proposed action may affect, but is not likely to adversely affect the NLEB (i.e., the standard informal consultation process). Actions that may cause prohibited incidental take require separate formal consultation. Providing this information does not address section 7(a)(2) compliance for any other listed species.

Information to Determine 4(d) Rule Compliance:	**YES**	**NO**
1. Does the project occur wholly outside of the WNS Zone[1]?	☐	☒
2. Have you contacted the appropriate agency[2] to determine if your project is near known hibernacula or maternity roost trees?	☒	☐
3. Could the project disturb hibernating NLEBs in a known hibernaculum?	☐	☒
4. Could the project alter the entrance or interior environment of a known hibernaculum?	☐	☒
5. Does the project remove any trees within 0.25 miles of a known hibernaculum at any time of year?	☐	☒
6. Would the project cut or destroy known occupied maternity roost trees, or any other trees within a 150-foot radius from the maternity roost tree from June 1 through July 31.	☐	☒

You are eligible to use this form if you have answered yes to question #1 **or** yes to question #2 **and** no to questions 3, 4, 5 and 6. The remainder of the form will be used by the USFWS to track our assumptions in the BO.

Agency and Applicant[3] (Name, Email, Phone No.): Dept of Housing and Urban Development

Applicant: Schoharie County Soil & Water Conservation District, (Stephen Hoerz), district@schohariesoilandwater.org, (518) 823-4535

Project Name: Stony Brook Mitigation

Project Location (include coordinates if known): Town of Schoharie, Schoharie County, NY (ranging from Lat. 42.645601, Long. -74.326106 to Lat. 42.644092, Long. -74.290176)

Basic Project Description (provide narrative below or attach additional information): Project description included with enclosed letter.

[1] http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf
[2] See http://www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html
[3] If applicable - only needed for federal actions with applicants (e.g., for a permit, etc.) who are party to the consultation.

General Project Information	YES	NO
Does the project occur within 0.25 miles of a known hibernaculum?	☐	☒
Does the project occur within 150 feet of a known maternity roost tree?	☐	☒
Does the project include forest conversion[4]? (if yes, report acreage below)	☐	☒
Estimated total acres of forest conversion		
If known, estimated acres[5] of forest conversion from April 1 to October 31		
If known, estimated acres of forest conversion from June 1 to July 31[6]		
Does the project include timber harvest? (if yes, report acreage below)	☐	☒
Estimated total acres of timber harvest		
If known, estimated acres of timber harvest from April 1 to October 31		
If known, estimated acres of timber harvest from June 1 to July 31		
Does the project include prescribed fire? (if yes, report acreage below)	☐	☒
Estimated total acres of prescribed fire		
If known, estimated acres of prescribed fire from April 1 to October 31		
If known, estimated acres of prescribed fire from June 1 to July 31		
Does the project install new wind turbines? (if yes, report capacity in MW below)	☐	☒
Estimated wind capacity (MW)		

Agency Determination:

By signing this form, the action agency determines that this project may affect the NLEB, but that any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule.

If the USFWS does not respond within 30 days from submittal of this form, the action agency may presume that its determination is informed by the best available information and that its project responsibilities under 7(a)(2) with respect to the NLEB are fulfilled through the USFWS January 5, 2016, Programmatic BO. The action agency will update this determination annually for multi-year activities.

The action agency understands that the USFWS presumes that all activities are implemented as described herein. The action agency will promptly report any departures from the described activities to the appropriate USFWS Field Office. The action agency will provide the appropriate USFWS Field Office with the results of any surveys conducted for the NLEB. Involved parties will promptly notify the appropriate USFWS Field Office upon finding a dead, injured, or sick NLEB.

Signature: _____ Date Submitted: _____

[4] Any activity that temporarily or permanently removes suitable forested habitat, including, but not limited to, tree removal from development, energy production and transmission, mining, agriculture, etc. (see page 48 of the BO).
[5] If the project removes less than 10 trees and the acreage is unknown, report the acreage as less than 0.1 acre.
[6] If the activity includes tree clearing in June and July, also include those acreage in April to October.

Attachment 3

NYNHP Response

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th Floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **Fax:** (518) 402-8925
Website: www.dec.ny.gov

March 11, 2016

Thomas J. King, Esq.
Governor's Office of Storm Recovery
25 Beaver Street
New York, NY 10004

Re: Stony Brook Mitigation Project, drainage and culvert improvements
Town/City: Schoharie. County: Schoharie.

Dear Thomas J. King, Esq.:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.

We have no records of rare or state-listed animals or plants, or significant natural communities directly on the project site.

Within five miles of the project site are several documented hibernacula (winter locations) for **Northern long-eared bat** (*Myotis septentrionalis*, state and federally listed as Threatened), with the closest being within three miles of the project site. The bats may travel five miles or more from documented locations. The main impact of concern for bats is the cutting or removal of potential roost trees; if no large trees will be cut as part of this project, we do not expect any significant impacts to rare bat species.

However, New York Natural Heritage is not authorized to make official determinations regarding projects or the level of impacts on listed species from proposed actions. For official determinations of NYSDEC and for information about any permit considerations for your project, please contact the Permits staff at the NYSDEC Region 4 Office at dep.r4@dec.ny.gov, 518-357-2456. For information about potential impacts of your project on these species, and how to avoid, minimize, or mitigate any impacts, contact the Region 4 Wildlife staff at 518-357-2355.

For most sites, comprehensive field surveys have not been conducted. We cannot provide a definitive statement on the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other resources may be required to fully assess impacts on biological resources.

This response applies only to known occurrences of rare or state-listed animals and plants, significant natural communities, and other significant habitats maintained in the Natural Heritage Database. Your project may require additional review or permits; for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the NYSDEC Region 4 Office, Division of Environmental Permits, as listed above.

Sincerely,

Nicholas Conrad
Information Resources Coordinator
New York Natural Heritage Program

93C

From: Shultz, Alicia (NYSHCR)
Sent: Monday, July 11, 2016 3:26 PM
To: 'Tim Sullivan'
Cc: aley@akrf.com
Subject: Stony Brook Creek drainage improvements, Town of Schoharie, Schoharie County
Attachments: 2016-01-15 Concept Design Plans.pdf

Hello Tim,

The Stony Brook Creek drainage improvements project in the Town of Schoharie, Schoharie County, NY is seeking federal CDBG-DR funding through the Governor's Office of Storm Recovery (GOSR). In addition, a USACE may be required for the in water work, but a Jurisdictional Determination has not yet been sought.

The full extent of the tree removal has not yet been determined, as a tree survey has not been prepared. The area of disturbance is estimated at 0.6 acres, and would include development of sediment management standards to guide removal of sediment and proper channel sizing at eight locations over a 2.6 mile stretch of Stony Brook. In addition, the following improvement measures are also proposed for specific areas: installation of rock vane structures to improve sediment transport; removal of sidecast sediments; installation of grade control to arrest channel incision and prevent additional incision; repair and restacking of stacked rock revetment wall and installation of grade control; roughening of channel with random boulder placement; bank failure repair and relocation of channel away from toe of slope; replacement of undersized culvert at Frisbieville Road; and replacement of undersized culvert at Stony Brook Road. It is anticipated that some tree removal would be required to complete this work. A copy of the conceptual engineering study is attached for your reference.

As this project is still in the engineering design development stages, we do not have specific construction dates at this time. However, to avoid impacts to the northern long-eared bat, GOSR can commit to requiring the sub-recipient to limit tree removal to October 31 to March 31. Further, to avoid impacts to migratory birds GOSR may require the sub-recipient to avoid construction between April 1 and August 31 as feasible. We will provide you with a copy of the EA once complete.

Please let me know if this addresses your concerns, or if more information is required at this time.

Thank you,

Alicia Shultz
Community Developer - Environmental Services

New York State Homes & Community Renewal
38-40 State St.,408N, Hampton Plaza, Albany, NY 12207
(518) 474-0647 | Alicia.Shultz@nyshcr.org |

From: Tim Sullivan [mailto:tim_r_sullivan@fws.gov]
Sent: Tuesday, June 28, 2016 4:04 PM
To: Shultz, Alicia (NYSHCR)
Subject: Stony Brook Creek drainage improvements, Town of Schoharie, Schoharie County

ATTENTION: This email came from an external source. Do not open attachments or click on links from unknown senders or unexpected emails.

Hello Alicia,
We received your submittal of information, dated June 23, 2016, for the above-referenced project.??
??
It is not clear if federal funding or approval is required for the project.?? Please confirm if a Corps of Engineers permit or FEMA funding will be required.?? It appears highly likely that a Corps of Engineers permit will be needed for working in the stream and therefore they will have to consult with our office under section 7 of the Endangered Species Act regarding federally-listed species.??
??
Please note that tree removal is proposed in an area that is approximately 3 miles from a northern long-eared bat hibernaculum.?? As you may be aware, this species is listed as threatened under the ESA.?? The project information does not specify the number of trees to be removed only stating that ???limited trees may be removed???.?? We request clarification on this issue.?? Please indicate when the trees will be removed.
??
Further, the project information indicates that construction may occur between April and October but no dates are provided.?? Yet, the text indicates that there will be no significant adverse impacts to migratory birds.?? If construction takes place during the breeding season then adverse impacts will occur.?? This should be clarified in the project description. We generally recommend no work occur between April 1 and August 31 to protect migratory birds, if feasible.
??
Finally, we would be interested in obtaining a copy of the Environmental Assessment report when it is completed.
??
Please contact me if there are any questions.
Thank you,
??
Tim Sullivan
US Fish and Wildlife Service
3817 Luker Road
Cortland, NY 13045
(607)753-9334
??

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New York Field Office
3817 Luker Road
Cortland, NY 13045
Phone: (607) 753-9334 Fax: (607) 753-9699
http://www.fws.gov/northeast/nyfo

To: Alicia Shultz Date: Jul 15, 2016

USFWS File No: 16I1931

Regarding your: ___Letter ___Fax _x_ Email Dated: Jun 23, 2016

For project: Stony Brook Creek drainage improvements

Located: Stony Brook Creek

In Town/County: Town of Schoharie, Schoharie County

Pursuant to the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*), the U.S. Fish and Wildlife Service:

___ Acknowledges receipt of your "no effect" and/or no impact determination. No further ESA coordination or consultation is required.

_x_ Acknowledges receipt of your determination. Please provide a copy of your determination and supporting materials to any involved Federal agency for their final ESA determination.

___ Is taking no action pursuant to ESA or any legislation at this time, but would like to be kept informed of project developments.

As a reminder, until the proposed project is complete, we recommend that you check our website (http://www.fws.gov/northeast/nyfo/es/section7.htm) every 90 days from the date of this letter to ensure that listed species presence/absence information for the proposed project is current. Should project plans change or if additional information on listed or proposed species or critical habitat becomes available, this determination may be reconsidered.

USFWS Contact(s):

Supervisor: Date: 7/15/16

May 5, 2016

Mr. Larry Moss
Historic Preservation Technical Specialist
New York State Office of Parks, Recreation and Historic Preservation
Division of Historic Preservation
Peebles Island
P.O. Box 189
Waterford, New York 12188-0189

Re: Section 106 Compliance for Stony Brook Flood Mitigation Project (Schoharie County, NY)

Dear Mr. Moss:

Pursuant to the Disaster Relief Appropriations Act, 2013 (Public Law 113-2) and the Housing and Community Development Act (42 U.S.C. § 5301 et seq.), the Governor's Office of Storm Recovery (GOSR), an office of New York State Homes and Community Renewal's Housing Trust Fund Corporation as a recipient of Community Development Block Grant – Disaster Recovery ("CDBG-DR") funds from the United States Department of Housing and Urban Development ("HUD"), is serving as the entity responsible for compliance with the HUD environmental review procedures set forth in 24 CFR Part 58. GOSR is acting on behalf of HUD in providing the enclosed project information and request for consultation.

GOSR processes environmental reviews for projects funded with HUD CDBG-DR on a case-by-case basis. A consultation request for the project described herein will also be sent to the Mohawk Nation and the St. Regis Mohawk Tribe. In accordance with Section 101(d)(6)(B) of the National Historic Preservation Act (NHPA) of 1966, as amended (16 U.S.C. 470f), and its implementing regulations, 36 Code of Federal Regulations (CFR) Part 800, this letter serves as notification of the proposed action.

Area of Potential Effect: The Schoharie County Soil & Water Conservation District ("SCSWCD") is pursuing a stream repair and restoration project along approximately 2.6 miles of Stony Brook (the "Proposed Project"). Stony Brook is a tributary to Schoharie Creek, which flows to the Mohawk River and then to the Hudson River. The project site is located in the town of Schoharie, in northeastern Schoharie County, New York (see Attachment 1). Recent, severe flooding events, most significantly Tropical Storm Irene in 2011, and also a June 2013 flood event have resulted in severe bed and bank erosion within the Stony Brook channel as well as aggradation of bedload sediment. This aggradation of sediment has clogged culvert and bridge crossings, leading to the reduction of flood conveyance capacity in the channel. The sediment migration has caused the channel to become unstable, with bank erosion and excessive sedimentation in many areas. The Area of Potential Effect (APE) is shown in Attachment 2.

Proposed Project Description: The Proposed Project involves the stream repair and restoration of approximately 2.6 miles of Stony Brook. The Proposed Project includes eight (8) proposed restoration

areas and is anticipated to improve the health of the riverine system, prevent flooding and protect infrastructure and private residential properties during storm events. Below are the eight (8) proposed restoration areas (see Attachment 3).

Area 1
Channel Location (STA): 32+00 – 14+50
Latitude: 42.645601 / Longitude: -74.326106

Area 2
Channel Location (STA): 32+50 – 44+00
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Area 3A
Channel Location (STA): 48+50 – 67+00
Latitude: 42.642651 / Longitude: -74.316228

Area 3B
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Area 5
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Area 6
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Latitude: 42.645921 / Longitude: -74.300552

Area 7
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The purpose of this letter is to initiate consultation pursuant to Section 106 of the NHPA per the implementing regulations at 36 Code of Federal Regulations (CFR) Part 800. GOSR respectfully requests your review of the proposed project described herein. If you have any questions or require

additional information regarding this request, please feel free to contact me at (646) 417-4660 or via email at Thomas.King@stormrecovery.ny.gov. Thank you for your time and consideration.

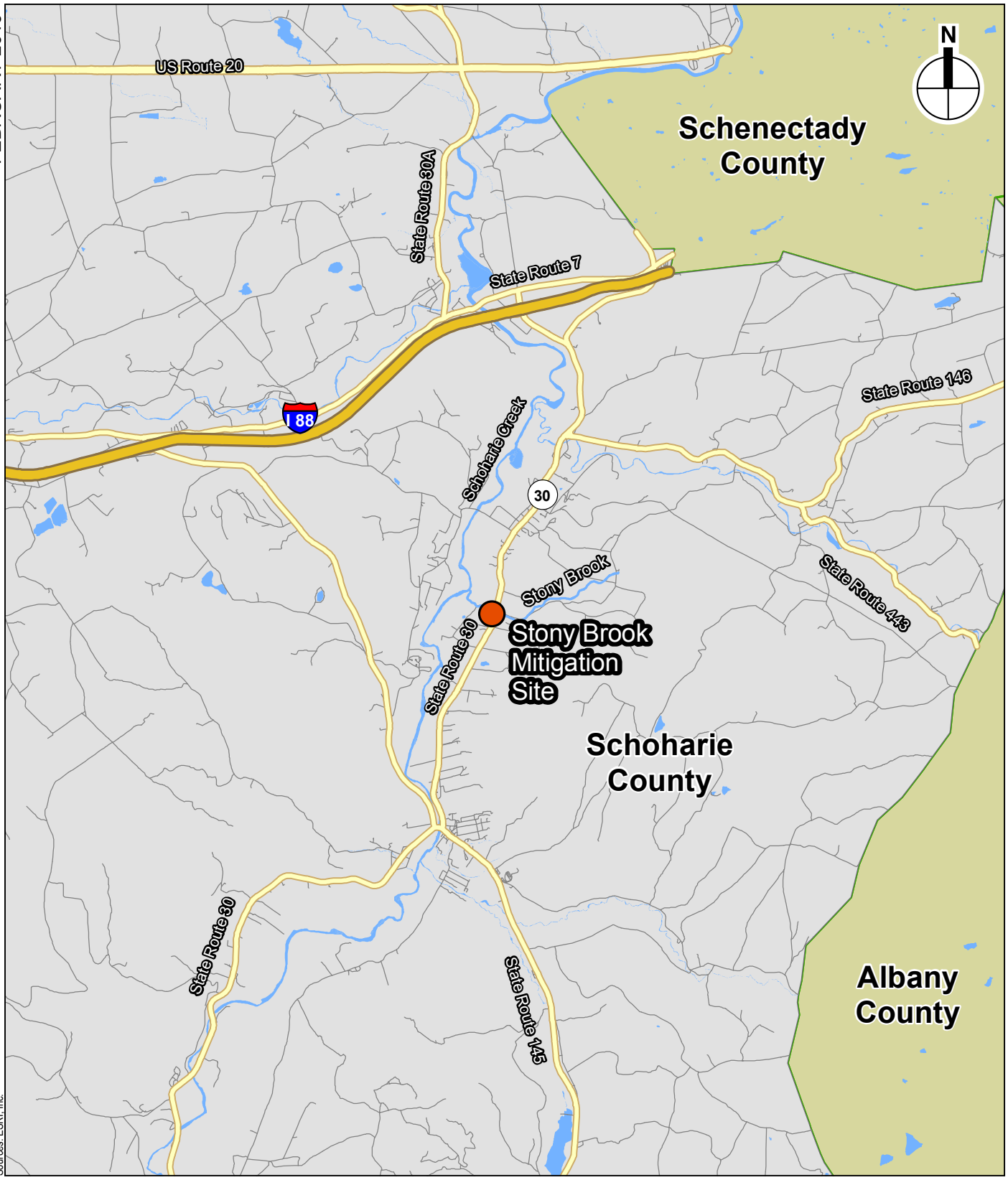
Sincerely,

Thomas J. King
Assistant General Counsel and Certifying Officer

Enclosures:
Attachment 1: Project Location Map
Attachment 2: Project Site Map
Attachment 3: Conceptual Design Plans

Attachment 1:
Project Location Map

FEBRUARY 2016



Sources: ESRI, Inc.

Site Location

0 3 Miles

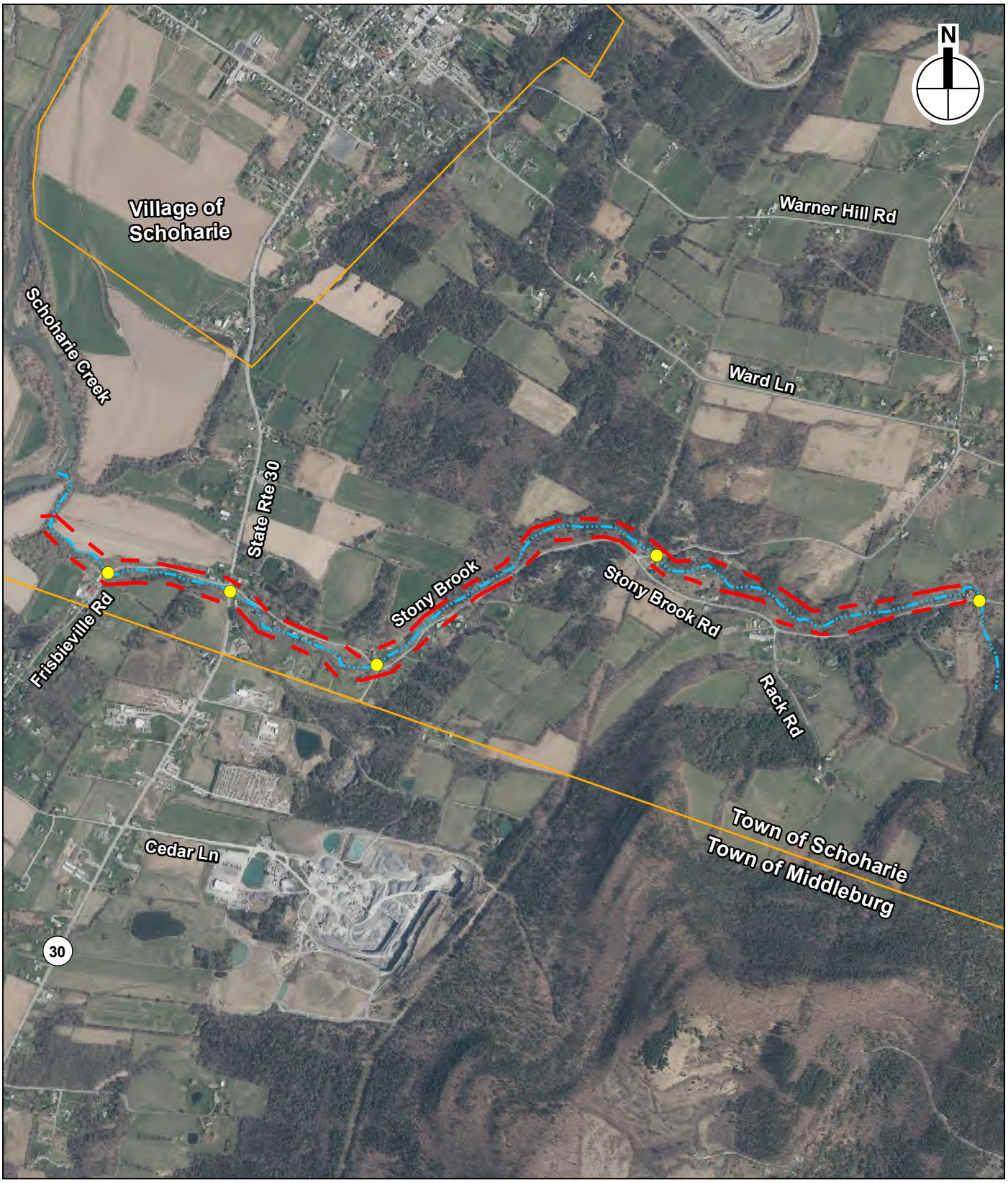
Project Location Map

Stony Brook Mitigation, Town of Schoharie

Figure 1

Attachment 2:
Project Site Map

FEBRUARY 2016



Sources: NYSDOP 2014

0 0.5 Mile

Culvert

Stony Brook

Area of Potential Effect

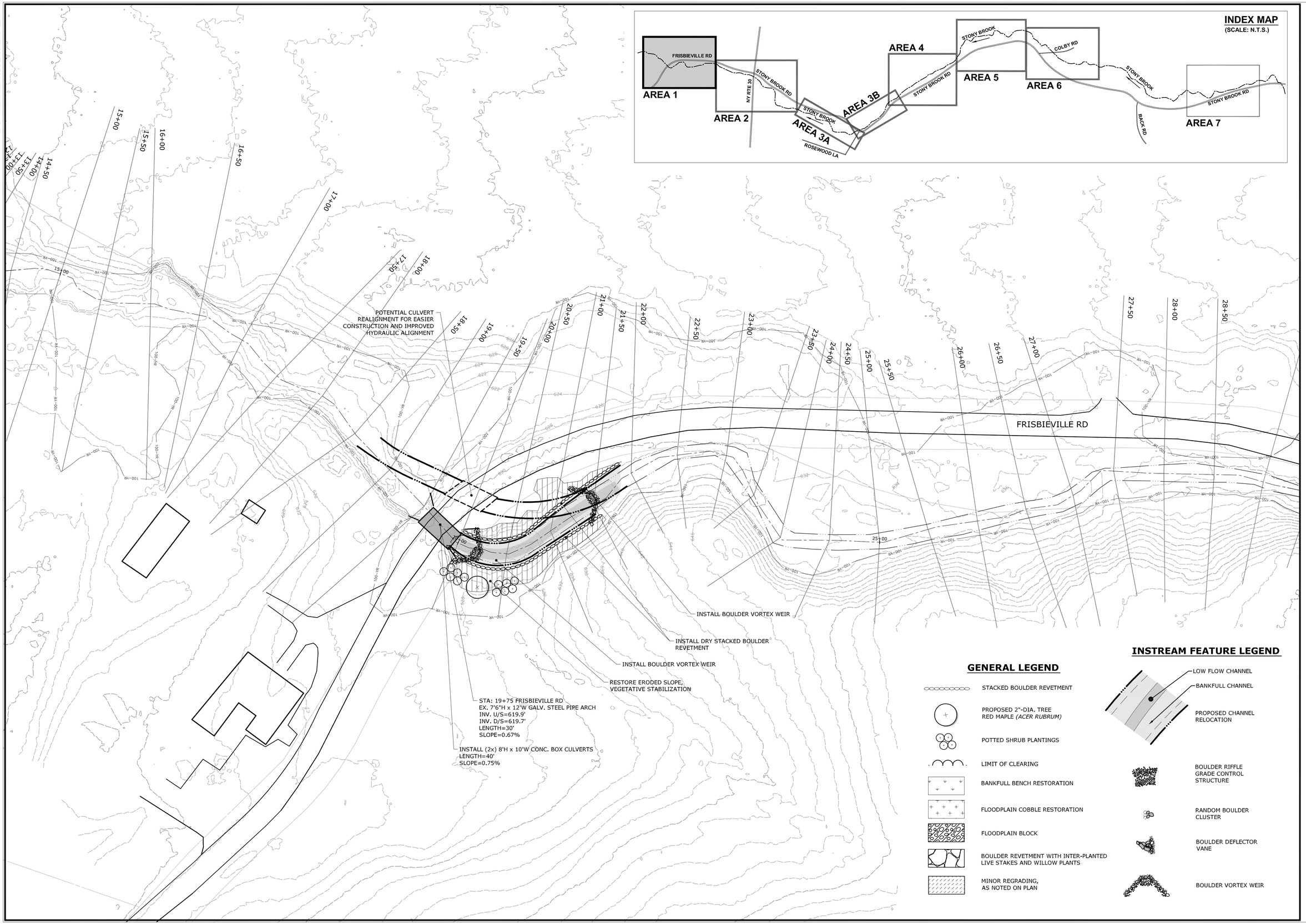
Municipal Boundaries

Project Site Map

Stony Brook Mitigation, Town of Schoharie

Figure 2

Attachment 3:
Conceptual Design Plans



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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 1

STONY BROOK
STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 01 OF 07

SHEET NAME: AREA 1

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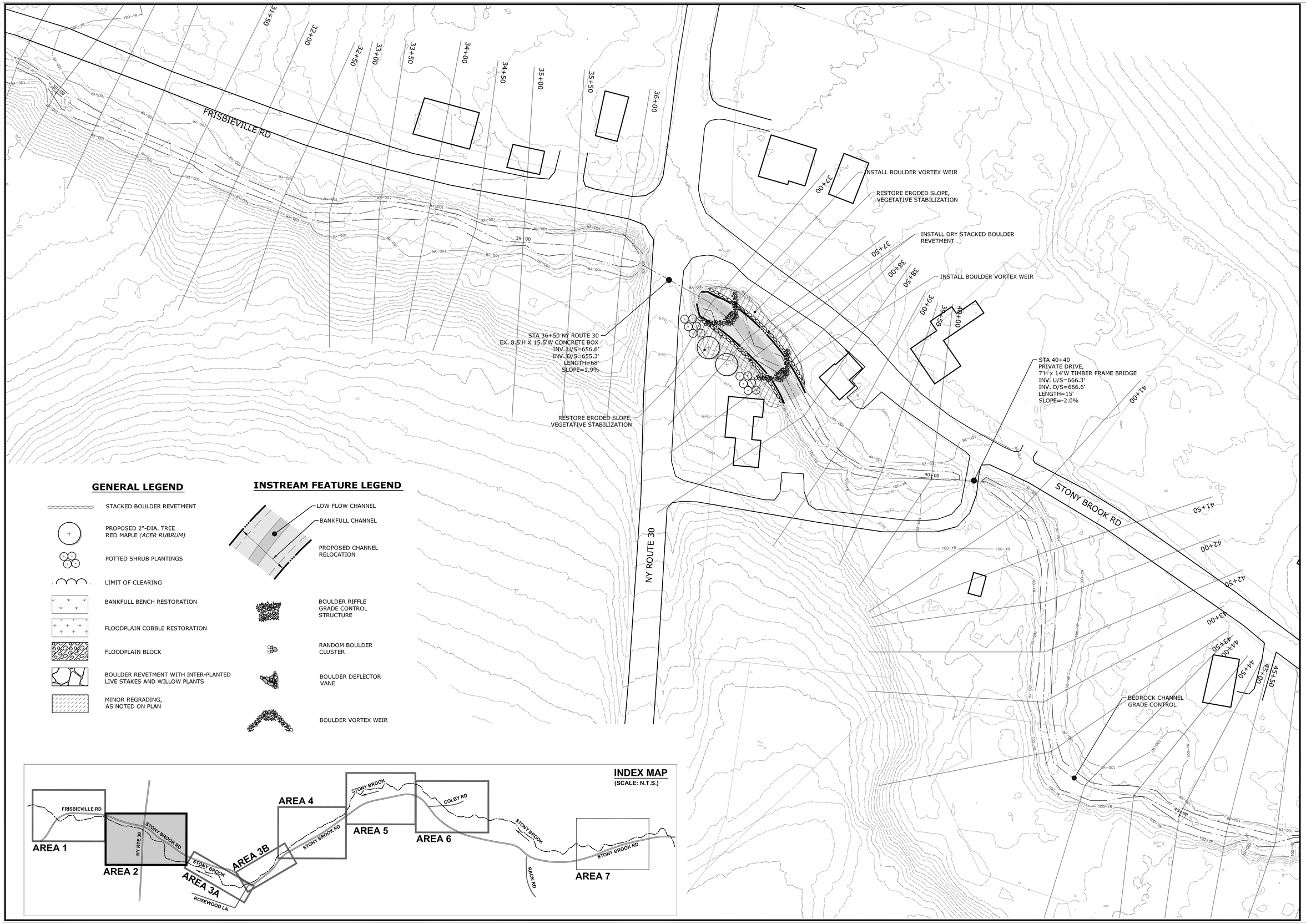

GENERAL LEGEND

- STACKED BOULDER REVETMENT
- PROPOSED 2"-DIA. TREE RED MAPLE *(ACER RUBRUM)*
- POTTED SHRUB PLANTINGS
- LIMIT OF CLEARING
- BANKFULL BENCH RESTORATION
- FLOODPLAIN COBBLE RESTORATION
- FLOODPLAIN BLOCK
- BOULDER REVETMENT WITH INTER-PLANTED LIVE STAKES AND WILLOW PLANTS
- MINOR REGRADING, AS NOTED ON PLAN

INSTREAM FEATURE LEGEND

- LOW FLOW CHANNEL
- BANKFULL CHANNEL
- PROPOSED CHANNEL RELOCATION
- BOULDER RIFFLE GRADE CONTROL STRUCTURE
- RANDOM BOULDER CLUSTER
- BOULDER DEFLECTOR VANE
- BOULDER VORTEX WEIR

INDEX MAP

(SCALE: N.T.S.)

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 2

STONY BROOK STREAM REPAIR AND RESTORATION

NY ROUTE 30, AND STONY BROOK ROAD AREA

SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 02 OF 07

SHEET NAME: **AREA 2**

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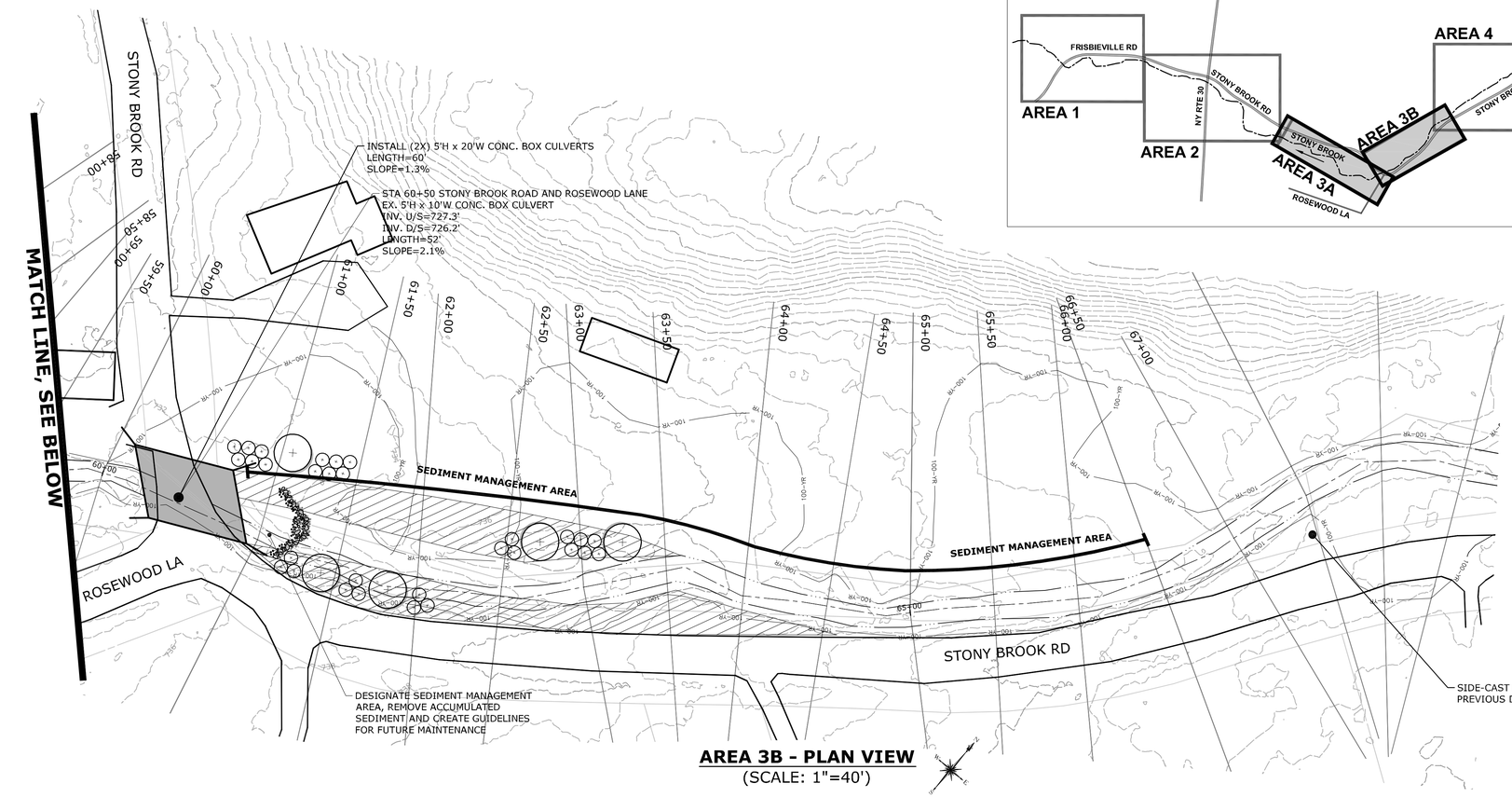
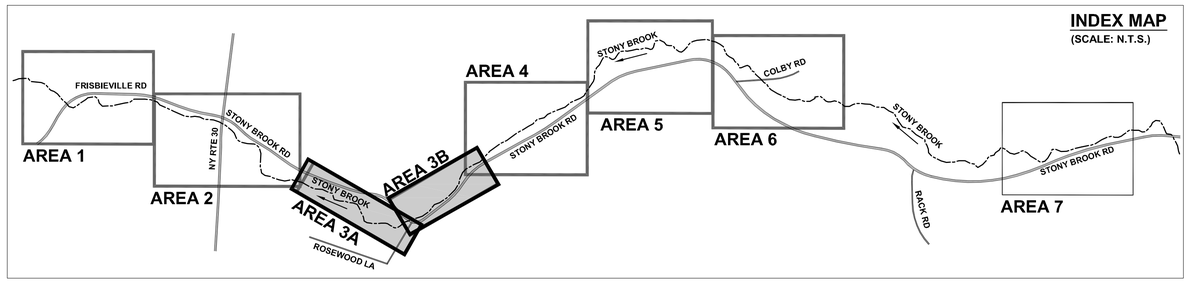
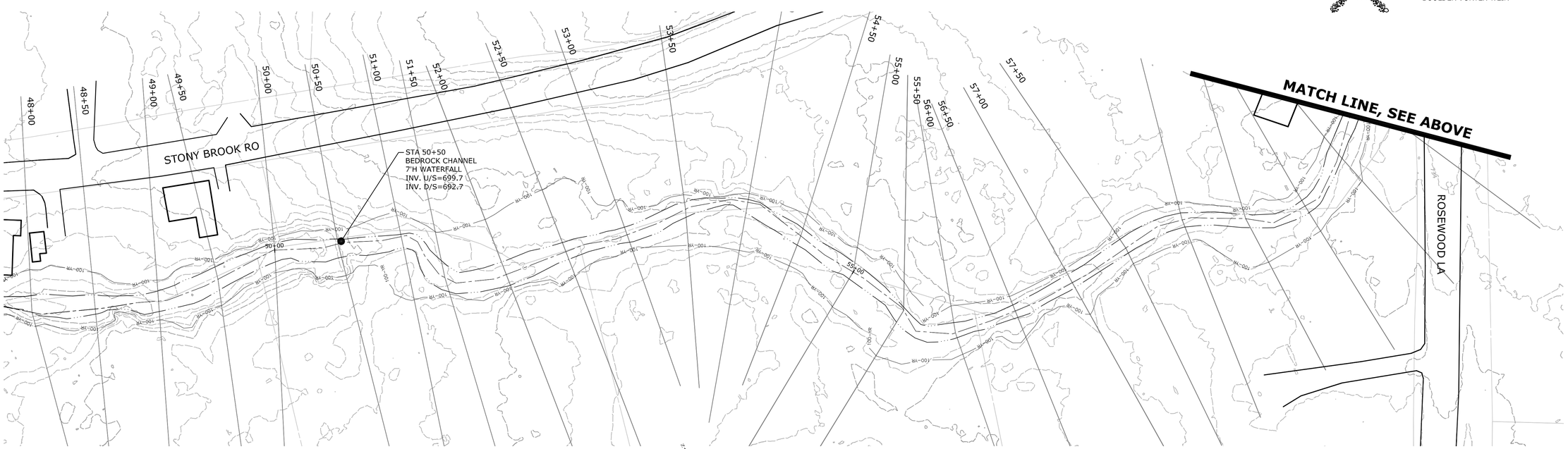


AREA 3B - PLAN VIEW
(SCALE: 1"=40')



LEGEND

- STACKED BOULDER REVETMENT
- EXISTING 100-YEAR FLOODPLAIN (HYDRAULIC MODELING)
- EXISTING EDGE OF LOW-FLOW CHANNEL
- LOW FLOW CHANNEL
- BANKFULL CHANNEL
- PROPOSED CHANNEL RELOCATION
- BOULDER RIFFLE GRADE CONTROL STRUCTURE
- RANDOM BOULDER CLUSTER
- BOULDER DEFLECTOR VANE
- BOULDER VORTEX WEIR



AREA 3A - PLAN VIEW
(SCALE: 1"=40')

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 3

STONY BROOK STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'
DATE: JAN. 2016
PROJECT NO.: 4805-04
SHEET NO.: 03 OF 07

SHEET NAME: **AREA 3**

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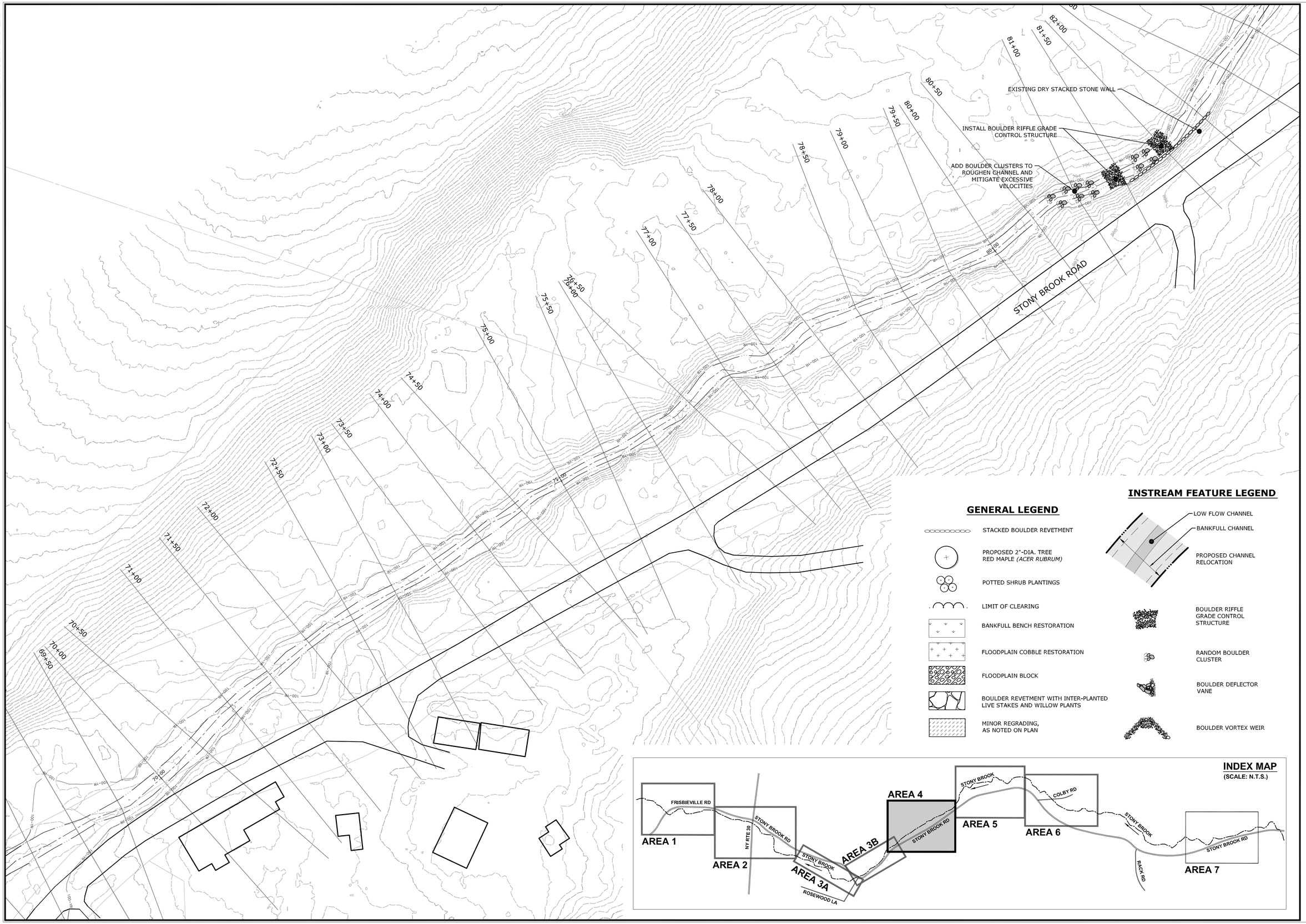

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 4

STONY BROOK
STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 04 OF 07

SHEET NAME: AREA 4

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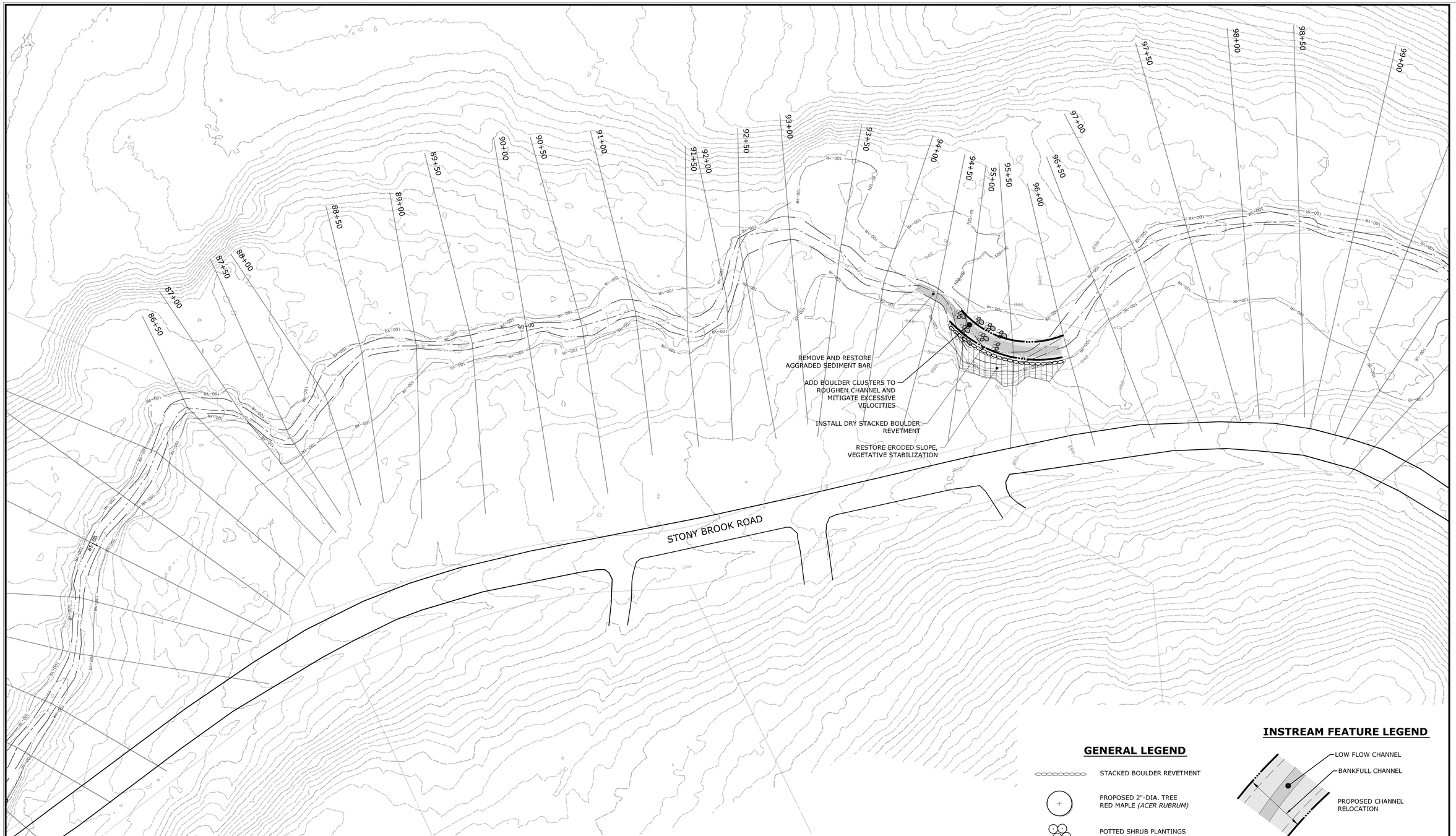
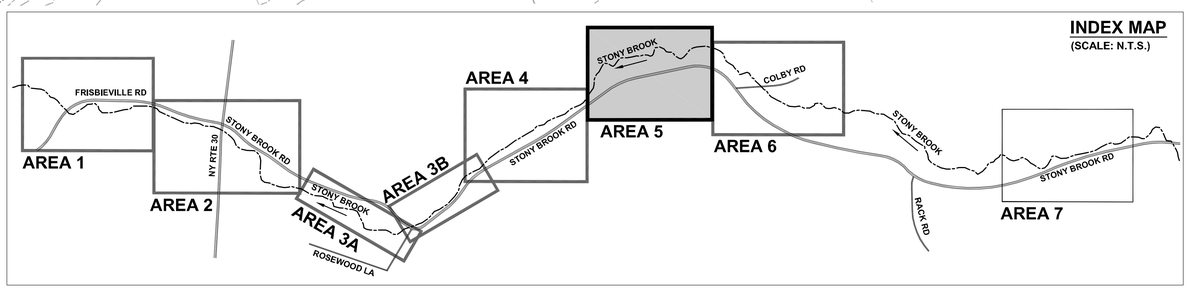


INDEX MAP
(SCALE: N.T.S.)



GENERAL LEGEND

- STACKED BOULDER REVETMENT
- PROPOSED 2"-DIA. TREE RED MAPLE *(ACER RUBRUM)*
- POTTED SHRUB PLANTINGS
- LIMIT OF CLEARING
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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 5

STONY BROOK
STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 05 OF 07

SHEET NAME: AREA 5

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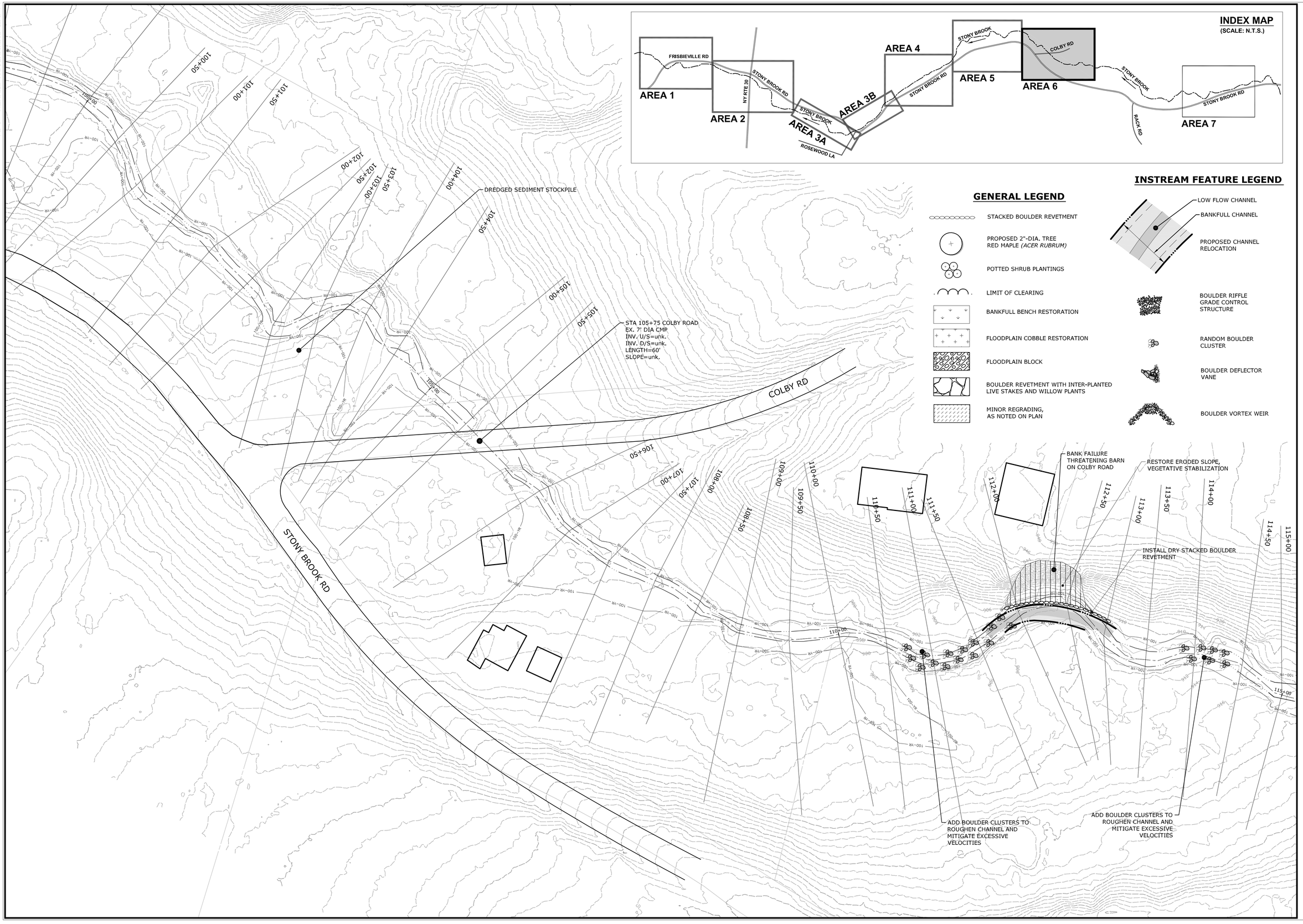

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 6

STONY BROOK STREAM REPAIR AND RESTORATION

NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 06 OF 07

SHEET NAME: **AREA 6**

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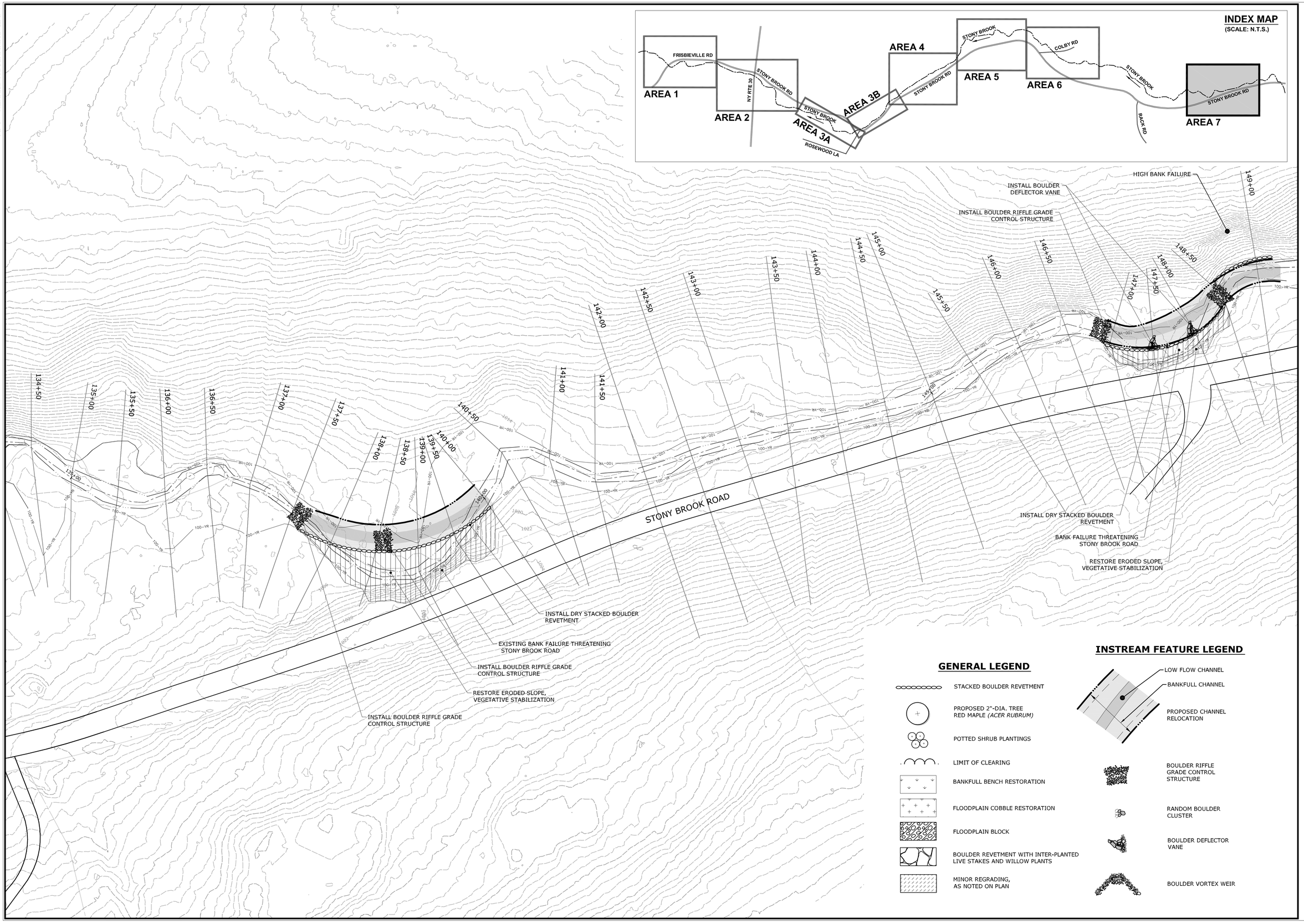

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 7

STONY BROOK
STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 07 OF 07

SHEET NAME: AREA 7

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NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

May 18, 2016

Thomas King
Governor's Office of Storm Recovery
99 Washington Ave, Suite 1224
Albany, NY 12231

Re: HTF/ GOSR/ HUD CDBG-DR
Stony Brook Flood Mitigation Project
Schoharie/ Schoharie County
16PR3037

Dear Mr. King:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Title 54, Section 306108 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/ Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

Based on this review, the opinion of the SHPO is that there will be No Historic Properties Affected by the proposed undertaking.

If I can be of further assistance, please contact me at (518) 268-2187 or Larry.moss@parks.ny.gov

Sincerely,

L Moss

Larry K Moss, Historic Preservation Technical Specialist
CC: Mary Barthelme
Alicia Shultz, NYSHCR
Ashley Ley, AKRF

Governor's Office of
Storm Recovery

ANDREW M. CUOMO
Governor

LISA BOVA-HIATT
Executive Director

April 24 2017

Mr. Larry Moss
Historic Preservation Technical Specialist
New York State Office of Parks, Recreation and Historic Preservation
Division of Historic Preservation
Peebles Island
P.O. Box 189
Waterford, New York 12188-0189

Re: 16PR3037
Section 106 Compliance for Stony Brook Flood Mitigation Project, Schoharie County, New York

Dear Mr. Moss:

Pursuant to the Disaster Relief Appropriations Act, 2013 (Public Law 113-2) and the Housing and Community Development Act (42 U.S.C. § 5301 et seq.), the Governor's Office of Storm Recovery (GOSR), an office of New York State Homes and Community Renewal's Housing Trust Fund Corporation as a recipient of Community Development Block Grant – Disaster Recovery ("CDBG-DR") funds from the United States Department of Housing and Urban Development ("HUD"), is serving as the entity responsible for compliance with the HUD environmental review procedures set forth in 24 CFR Part 58. GOSR is acting on behalf of HUD in providing the enclosed project information and request for consultation.

GOSR processes environmental reviews for projects funded with HUD CDBG-DR on a case by-case basis. A consultation request for the project described herein will also be sent to the Saint Regis Mohawk Tribe and the Mohawk Nation. In accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 U.S.C. §306108), and its implementing regulations, 36 Code of Federal Regulations (CFR) Part 800, this letter serves as notification of the proposed action.

GOSR submitted a consultation for the Stony Brook Flood Mitigation Project on May 5, 2016 (Attachment 1). On May 18, 2016 SHPO responded that no historic properties were affected (Attachment 2). Since that date the project has changed to include the demolition of a barn. The barn must be demolished to make way for the Stony Brook flood improvements. The design plans and complete project description are provided in Attachment 2. Photographs of the barn and the surrounding area are provided in Attachment 3.

Request for Comment: The purpose of this letter is to initiate consultation pursuant to Section 106 of the NHPA per the implementing regulations at 36 Code of Federal Regulations (CFR)

Part 800. GOSR respectfully requests your review of the proposed project described herein. If you have any questions or require additional information regarding this request, please feel free to contact me at (518) 474-0647 or via email at alicia.shultz@nyshcr.org. Thank you for your time and consideration.

Sincerely,

Alicia Shultz
Senior Environmental Scientist
Bureau of Environmental Review and Assessment
Governor's Office of Storm Recovery

Enclosures:
Attachment 1: Initial consultation to SHPO
Attachment 2: SHPO Response
Attachment 3: Photographs

Attachment 1

May 5, 2016

Mr. Larry Moss
Historic Preservation Technical Specialist
New York State Office of Parks, Recreation and Historic Preservation
Division of Historic Preservation
Peebles Island
P.O. Box 189
Waterford, New York 12188-0189

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Area 3A
Channel Location (STA): 48+50 – 67+00
Latitude: 42.642651 / Longitude: -74.316228

Area 3B
Channel Location (STA): 48+50 – 67+00
Latitude: 42.642989 / Longitude: -74.313465

Area 4
Channel Location (STA): 70+00 – 82+00
Latitude: 42.644698 / Longitude: -74.309846

Area 5
Channel Location (STA): 86+00 – 99+00
Latitude: 42.646348 / Longitude: -74.305249

Area 6
Channel Location (STA): 100+50 – 114+00
Latitude: 42.645921 / Longitude: -74.300552

Area 7
Channel Location (STA): 134+00 – 150+00
Latitude: 42.644092 / Longitude: -74.290176

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Sincerely,

Thomas J. King
Assistant General Counsel and Certifying Officer

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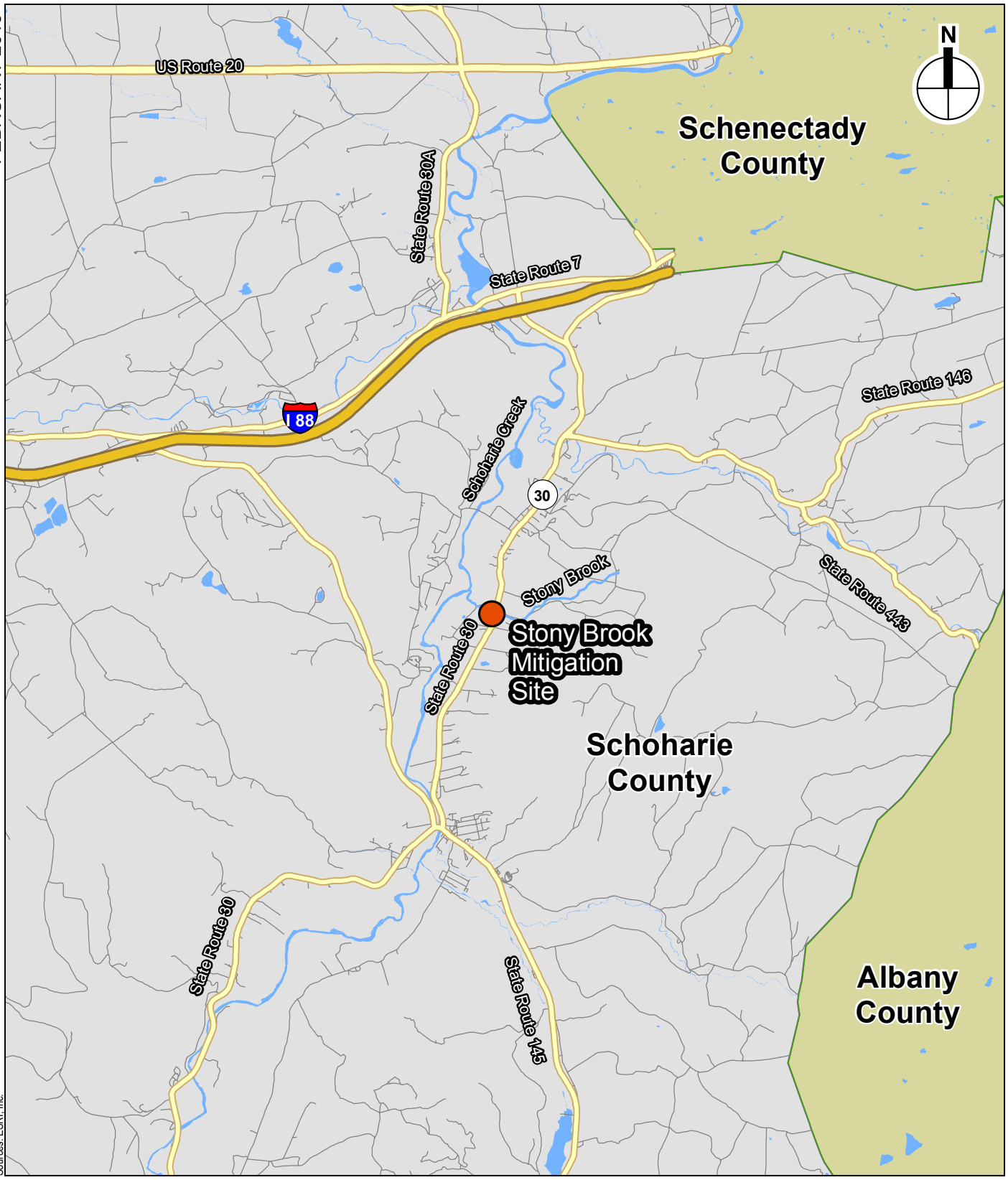
Attachment 2: Project Site Map
Attachment 3: Conceptual Design Plans

Attachment 1:
Project Location Map

FEBRUARY 2016



Sources: ESRI, Inc.

Site Location

0 3 Miles

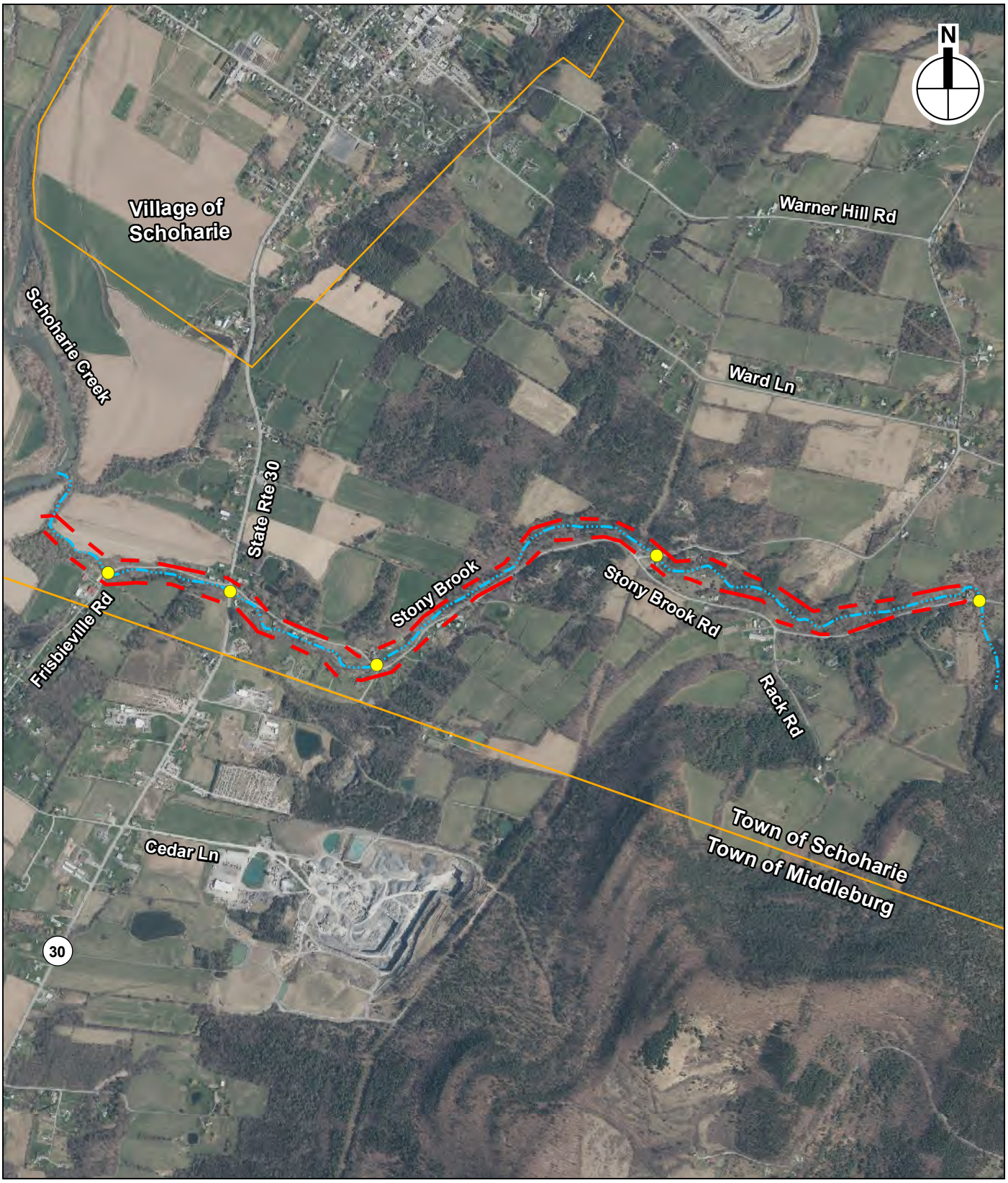
Project Location Map

Stony Brook Mitigation, Town of Schoharie

Figure 1

Attachment 2:
Project Site Map

FEBRUARY 2016



Sources: NYSDOP 2014

0 0.5 Mile

Culvert

Stony Brook

Area of Potential Effect

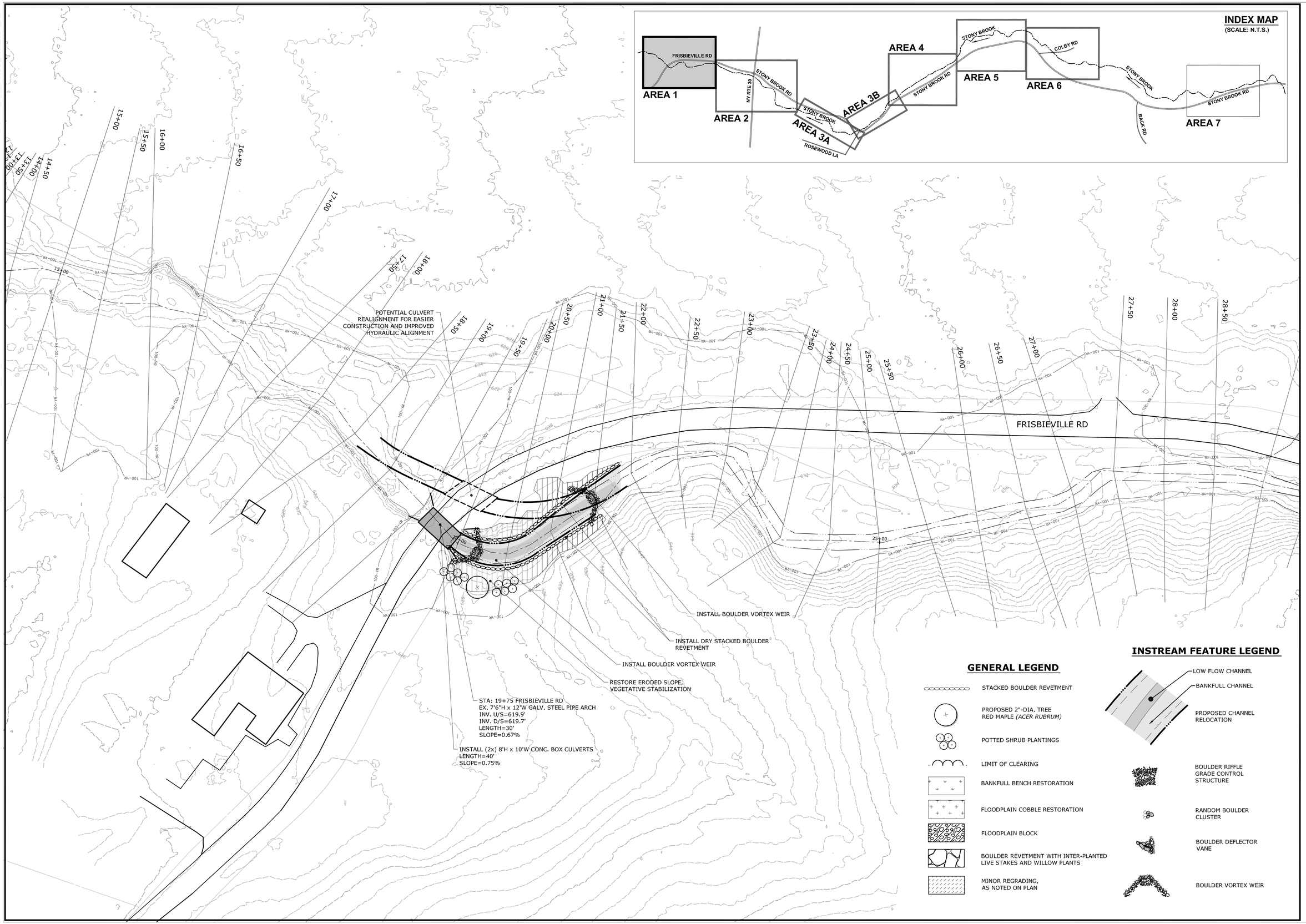
Municipal Boundaries

Project Site Map

Stony Brook Mitigation, Town of Schoharie

Figure 2

Attachment 3:
Conceptual Design Plans



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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 1

STONY BROOK
STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 01 OF 07

SHEET NAME: AREA 1

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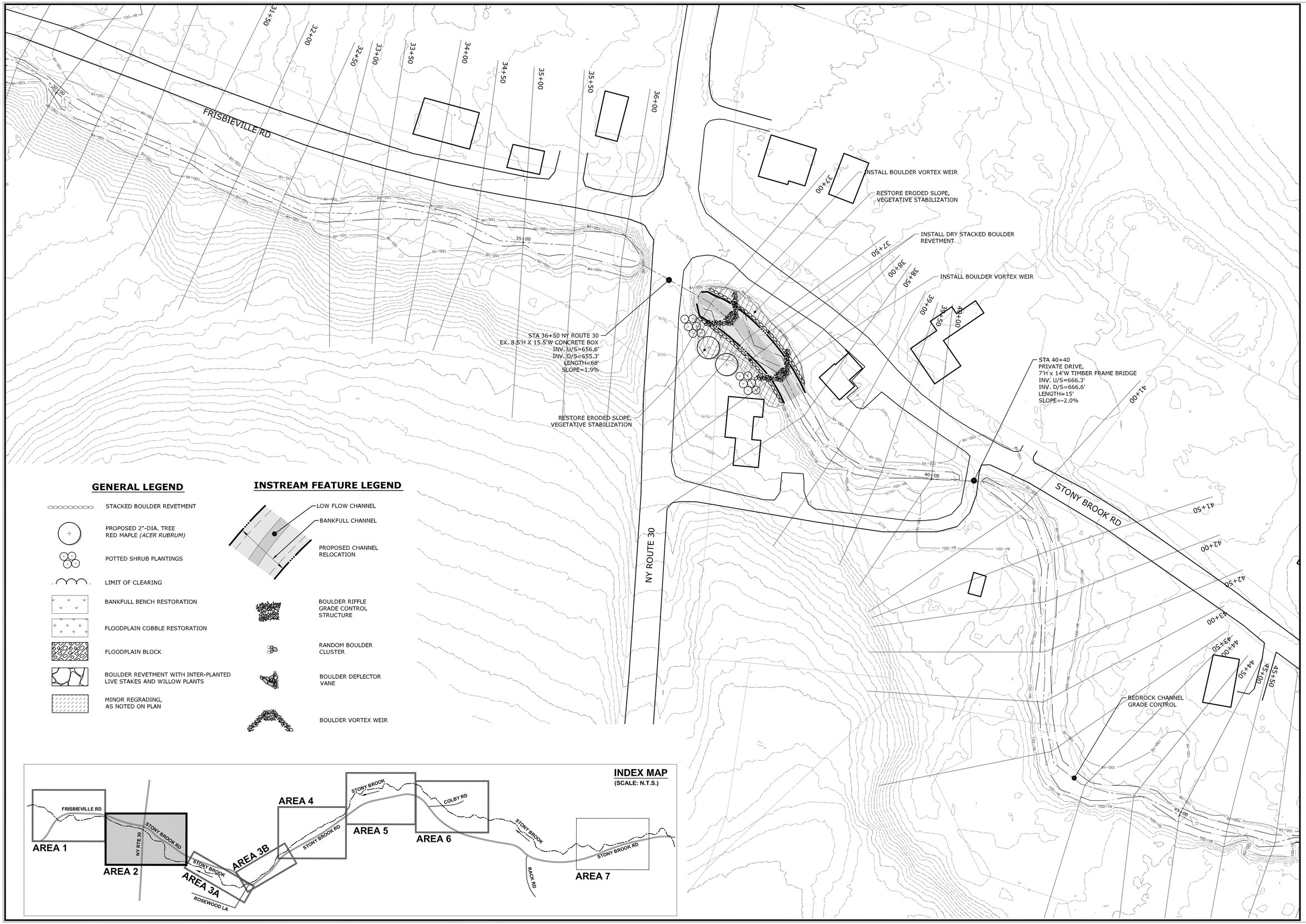

GENERAL LEGEND

- STACKED BOULDER REVETMENT
- PROPOSED 2"-DIA. TREE RED MAPLE *(ACER RUBRUM)*
- POTTED SHRUB PLANTINGS
- LIMIT OF CLEARING
- BANKFULL BENCH RESTORATION
- FLOODPLAIN COBBLE RESTORATION
- FLOODPLAIN BLOCK
- BOULDER REVETMENT WITH INTER-PLANTED LIVE STAKES AND WILLOW PLANTS
- MINOR REGRADING, AS NOTED ON PLAN

INSTREAM FEATURE LEGEND

- LOW FLOW CHANNEL
- BANKFULL CHANNEL
- PROPOSED CHANNEL RELOCATION
- BOULDER RIFFLE GRADE CONTROL STRUCTURE
- RANDOM BOULDER CLUSTER
- BOULDER DEFLECTOR VANE
- BOULDER VORTEX WEIR

INDEX MAP

(SCALE: N.T.S.)

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 2

STONY BROOK STREAM REPAIR AND RESTORATION

NY ROUTE 30, AND STONY BROOK ROAD AREA

SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 02 OF 07

SHEET NAME: **AREA 2**

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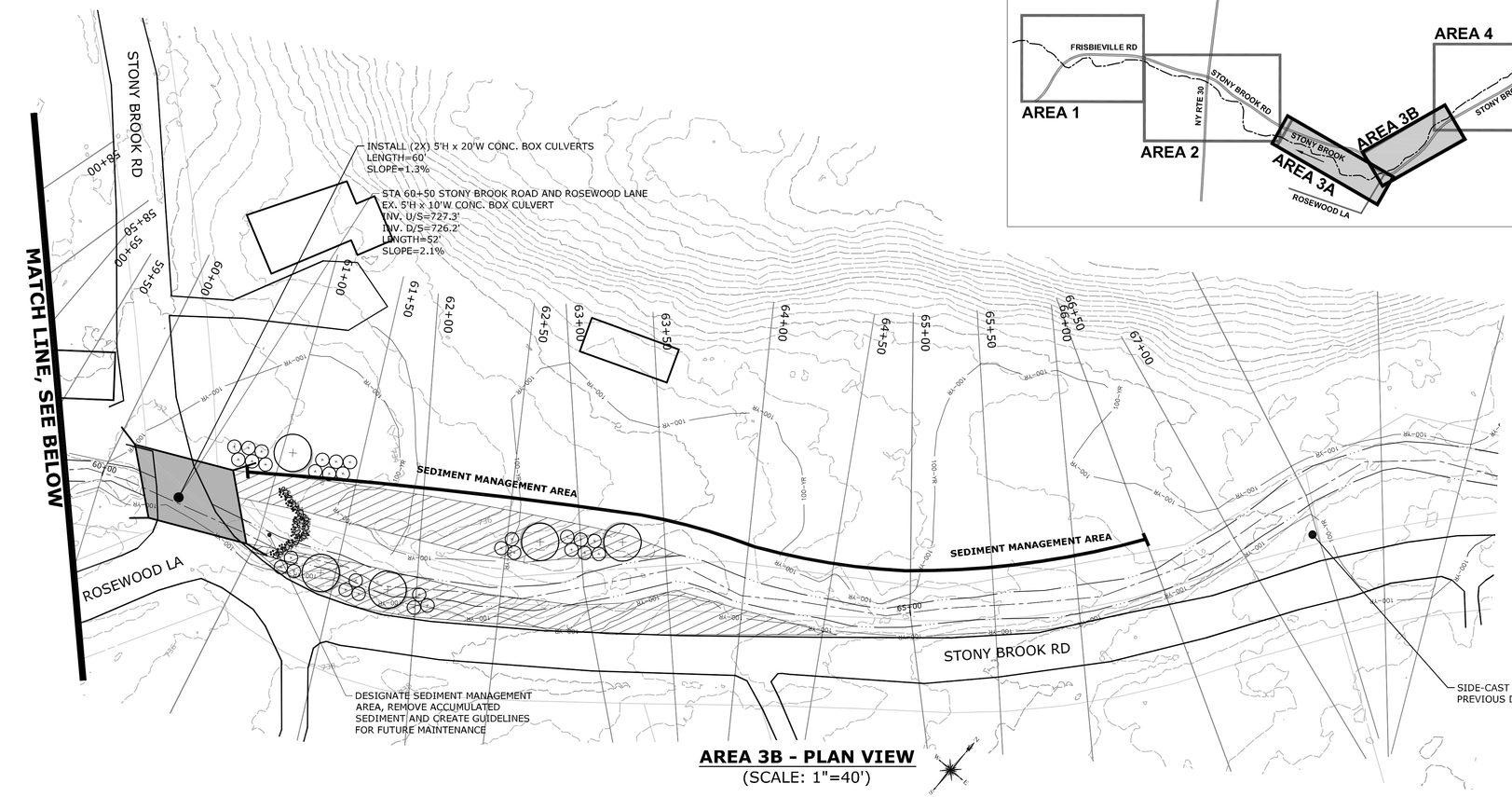
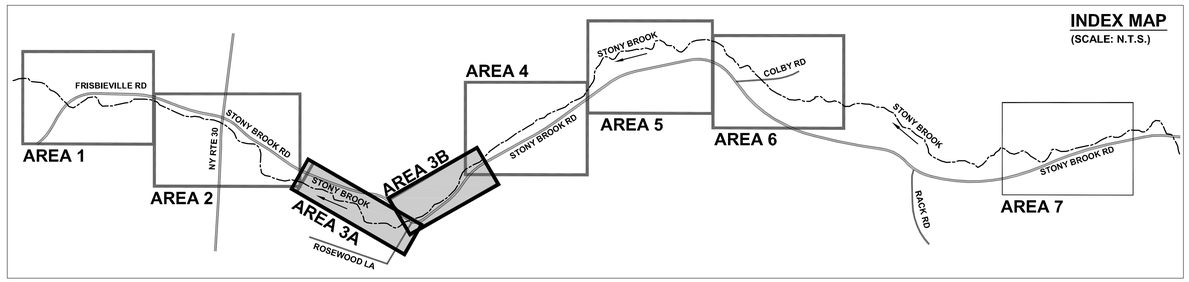
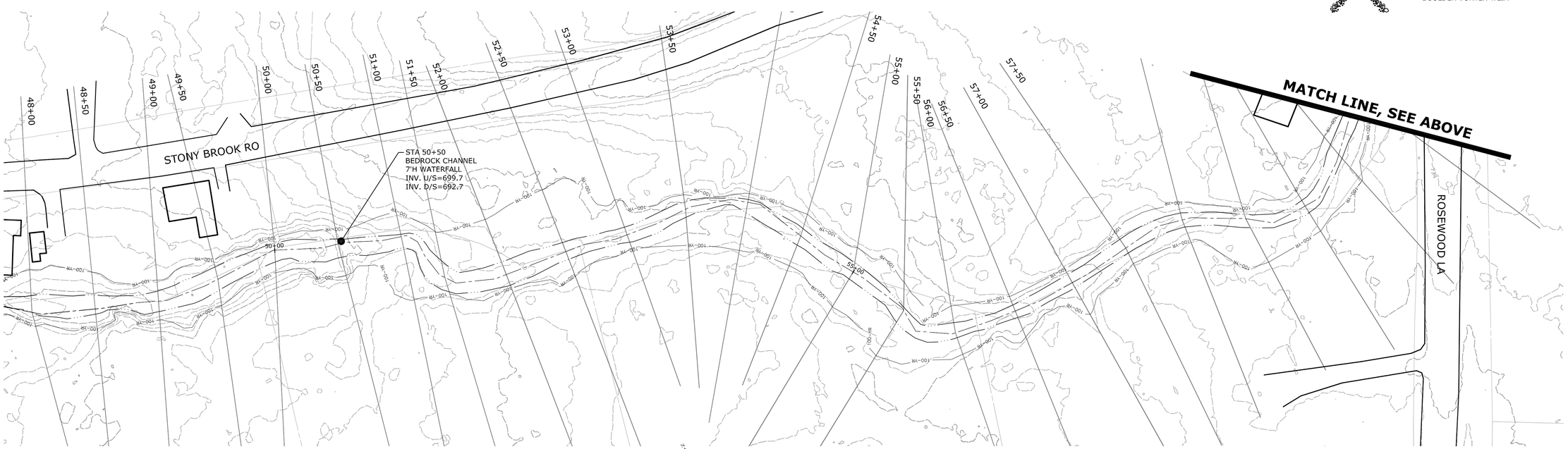


AREA 3B - PLAN VIEW
(SCALE: 1"=40')



LEGEND

- STACKED BOULDER REVETMENT
- EXISTING 100-YEAR FLOODPLAIN (HYDRAULIC MODELING)
- EXISTING EDGE OF LOW-FLOW CHANNEL
- LOW FLOW CHANNEL
- BANKFULL CHANNEL
- PROPOSED CHANNEL RELOCATION
- BOULDER RIFFLE GRADE CONTROL STRUCTURE
- RANDOM BOULDER CLUSTER
- BOULDER DEFLECTOR VANE
- BOULDER VORTEX WEIR



AREA 3A - PLAN VIEW
(SCALE: 1"=40')

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 3

STONY BROOK STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'
DATE: JAN. 2016
PROJECT NO.: 4805-04
SHEET NO.: 03 OF 07

SHEET NAME: **AREA 3**

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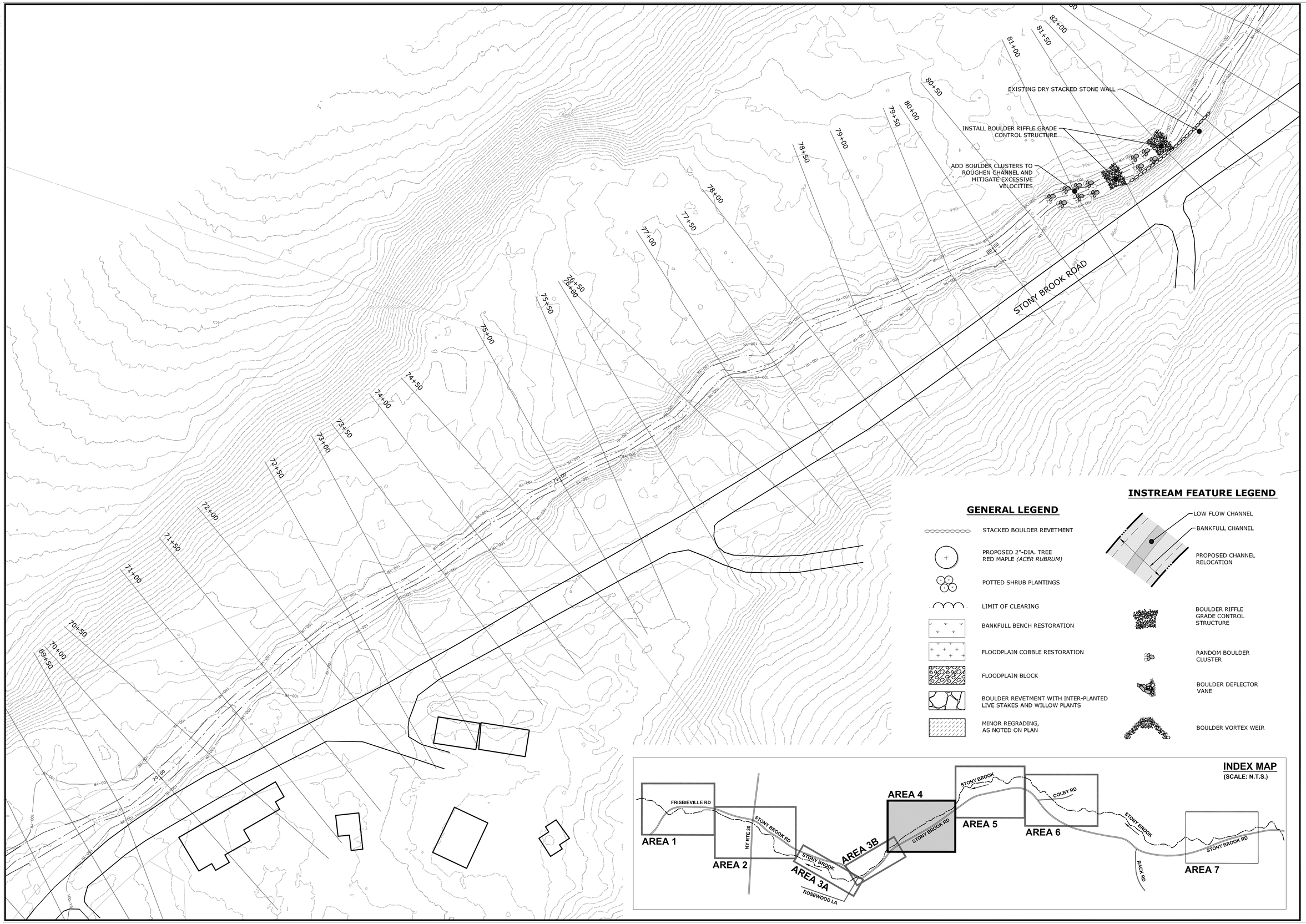

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 4

STONY BROOK
STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 04 OF 07

SHEET NAME: AREA 4

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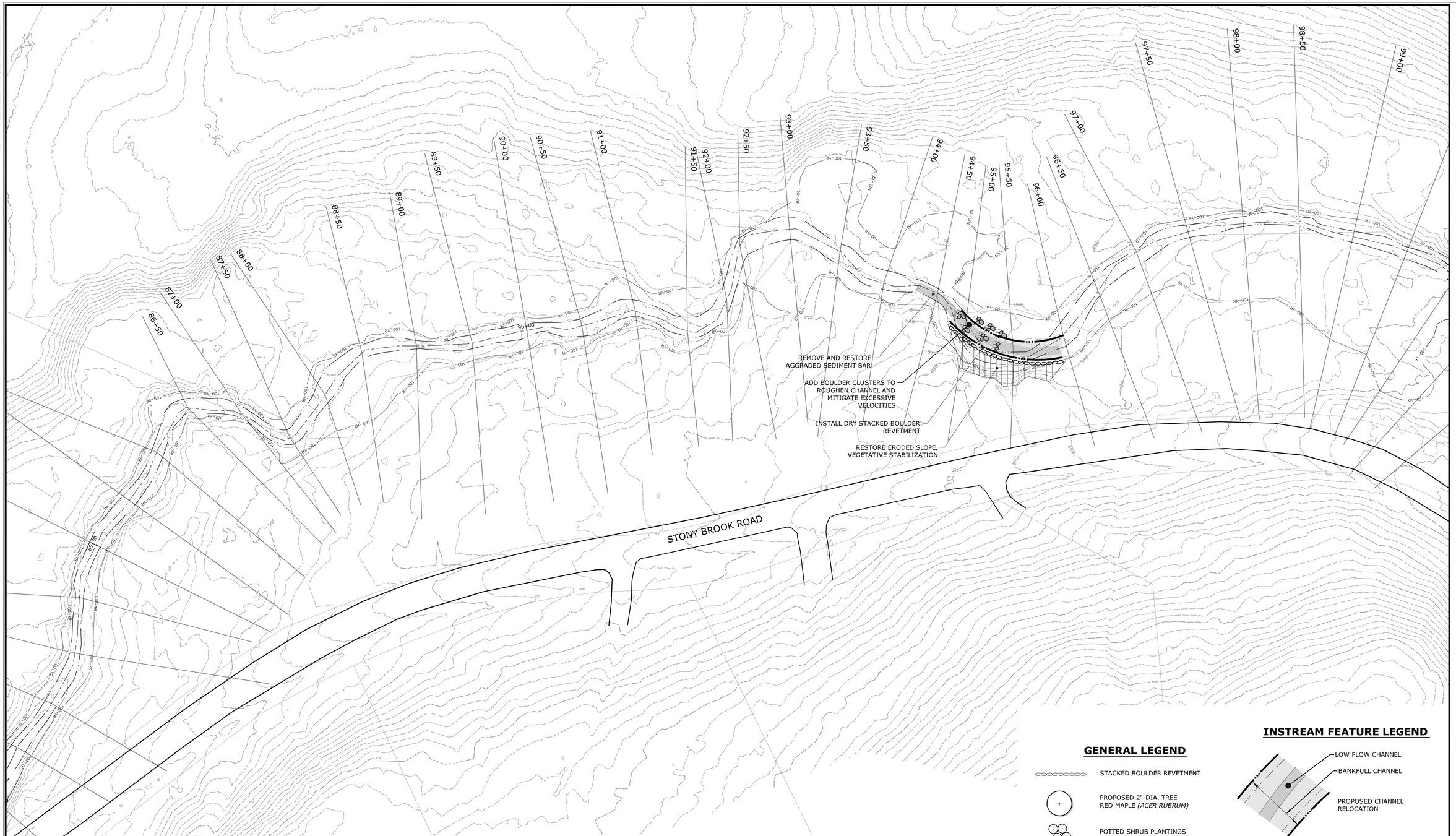
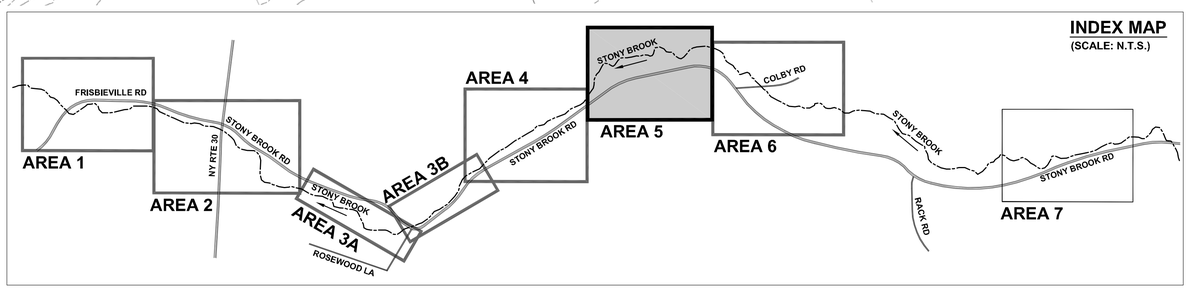


INDEX MAP
(SCALE: N.T.S.)



GENERAL LEGEND

- STACKED BOULDER REVETMENT
- PROPOSED 2"-DIA. TREE RED MAPLE *(ACER RUBRUM)*
- POTTED SHRUB PLANTINGS
- LIMIT OF CLEARING
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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 5

STONY BROOK
STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 05 OF 07

SHEET NAME: AREA 5

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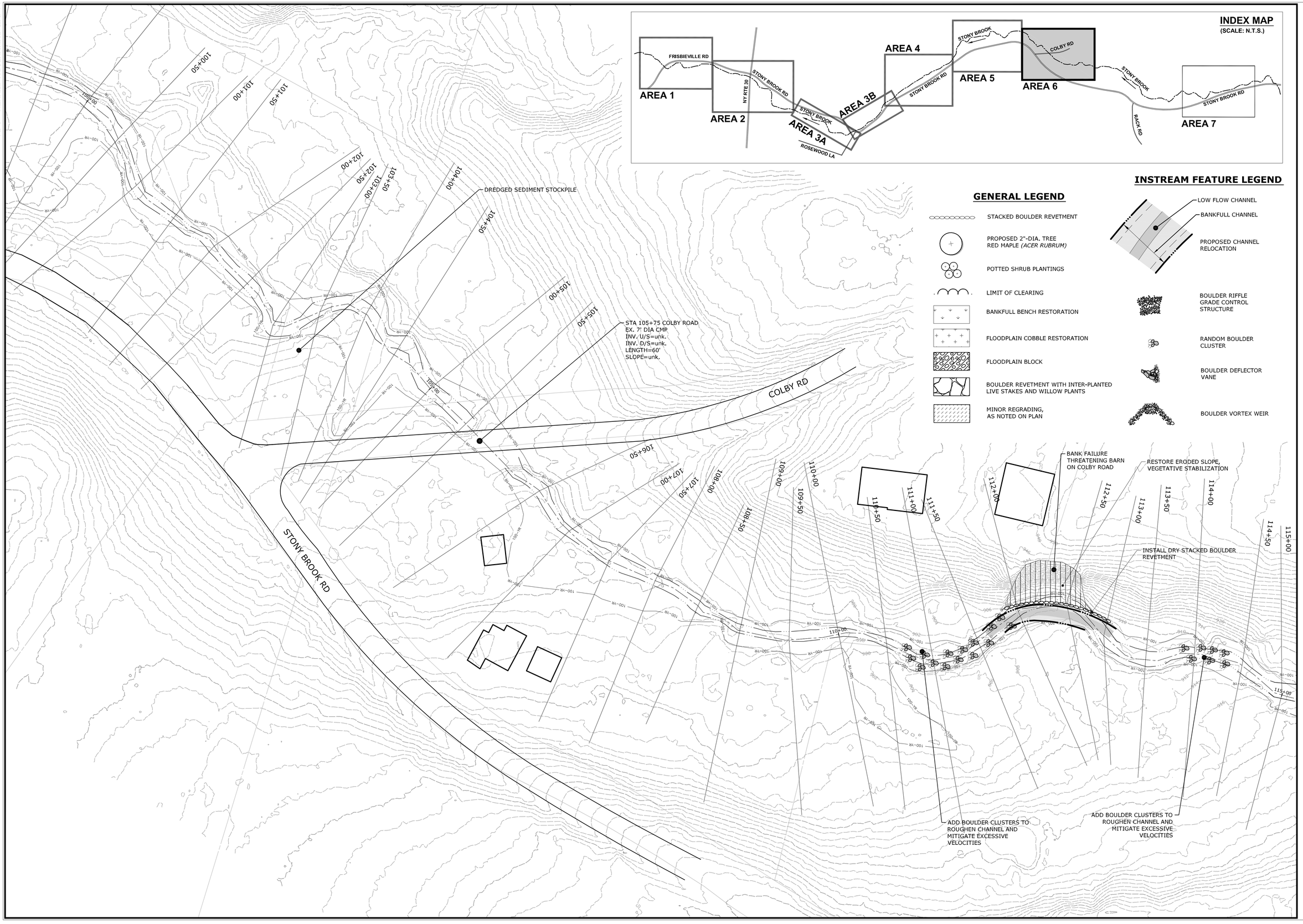

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 6

STONY BROOK STREAM REPAIR AND RESTORATION

NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 06 OF 07

SHEET NAME: **AREA 6**

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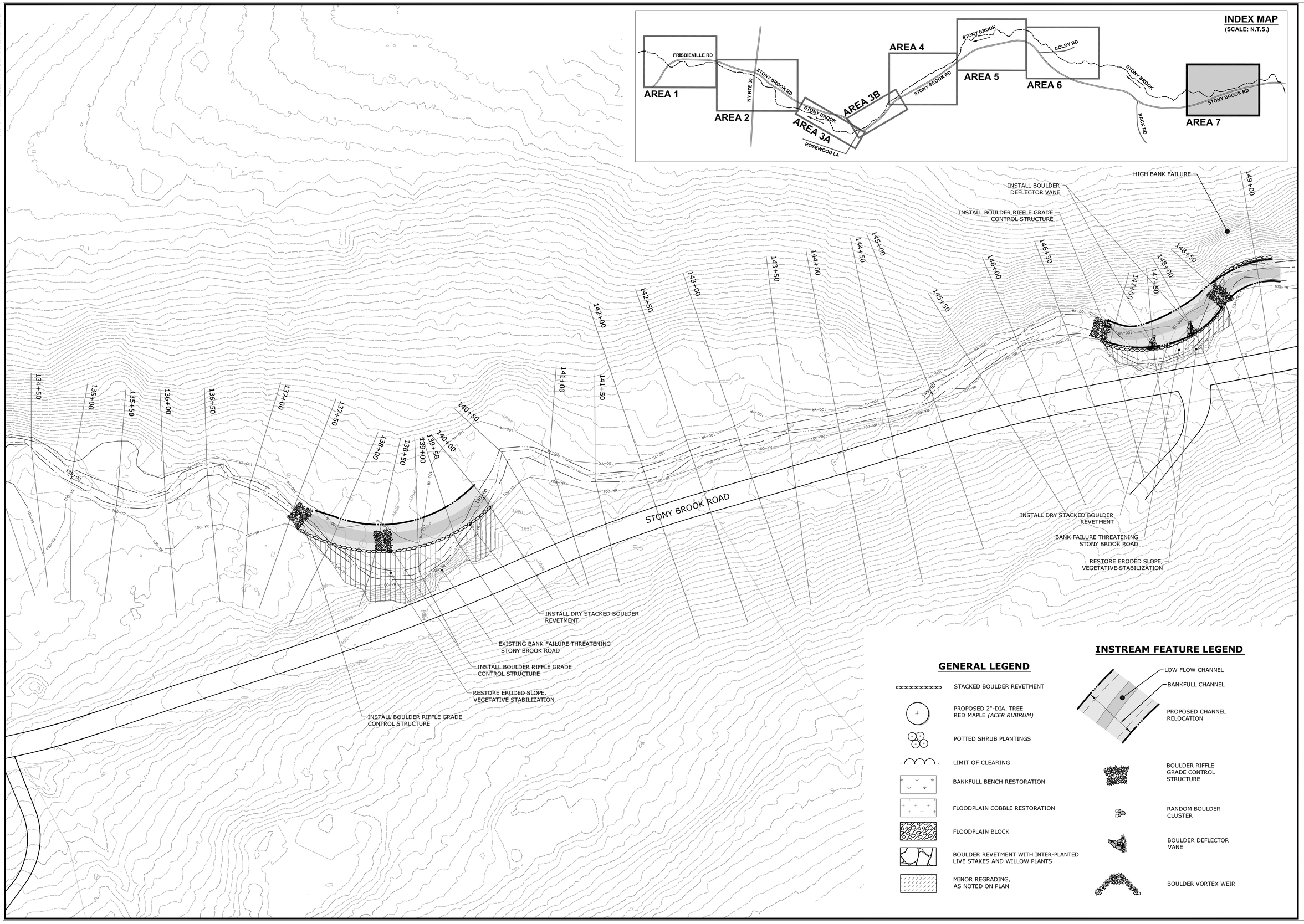

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 7

STONY BROOK
STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 07 OF 07

SHEET NAME: AREA 7

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Attachment 2

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

May 18, 2016

Thomas King
Governor's Office of Storm Recovery
99 Washington Ave, Suite 1224
Albany, NY 12231

Re: HTF/ GOSR/ HUD CDBG-DR
Stony Brook Flood Mitigation Project
Schoharie/ Schoharie County
16PR3037

Dear Mr. King:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Title 54, Section 306108 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/ Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

Based on this review, the opinion of the SHPO is that there will be No Historic Properties Affected by the proposed undertaking.

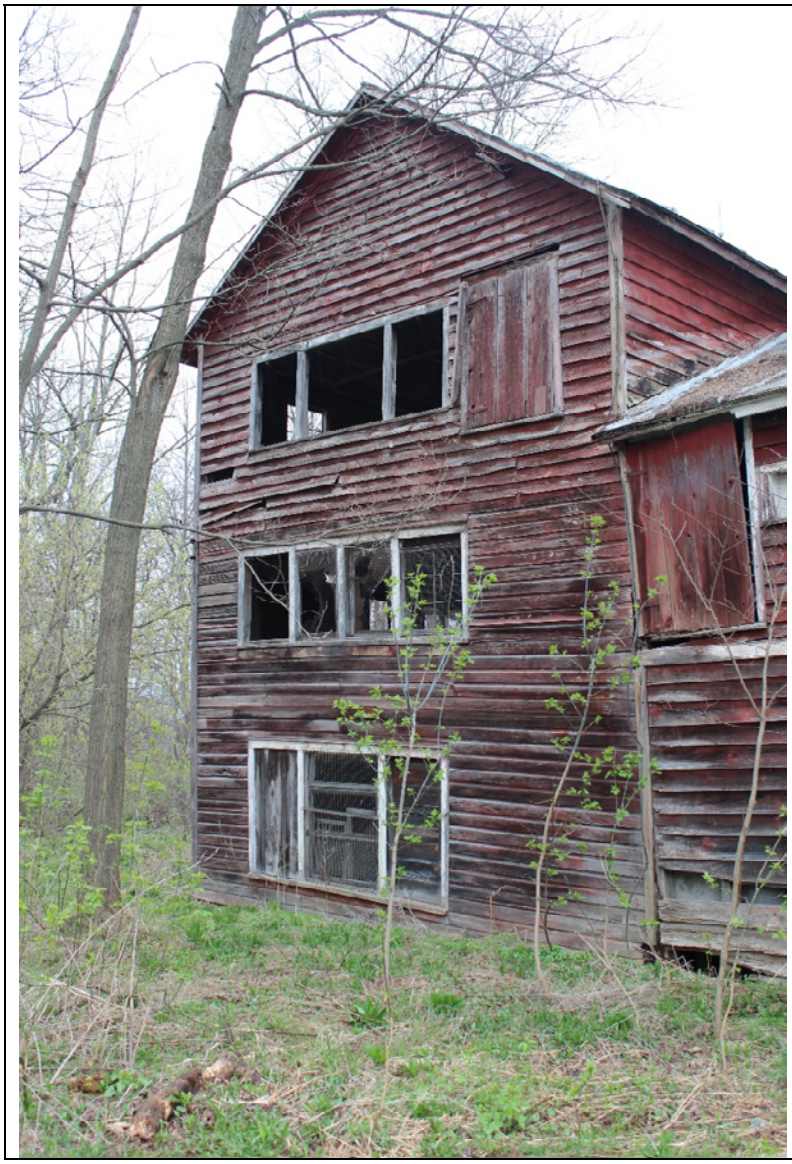
If I can be of further assistance, please contact me at (518) 268-2187 or Larry.moss@parks.ny.gov

Sincerely,

L Moss

Larry K Moss, Historic Preservation Technical Specialist
CC: Mary Barthelme
Alicia Shultz, NYSHCR
Ashley Ley, AKRF

Attachment 3



ROSEWOOD LN

FOR SALE
G.P.&DEW
REALTY
LOTS

Governor's Office of
Storm Recovery

ANDREW M. CUOMO
Governor

LISA BOVA-HIATT
Executive Director

May 9, 2017

Mr. Larry Moss
Historic Preservation Technical Specialist
New York State Office of Parks, Recreation and Historic Preservation
Division of Historic Preservation
Peebles Island
P.O. Box 189
Waterford, New York 12188-0189

Re: 16PR3037
Section 106 Compliance for Stony Brook Flood Mitigation Project, Schoharie County, New York

Dear Mr. Moss:

Pursuant to the Disaster Relief Appropriations Act, 2013 (Public Law 113-2) and the Housing and Community Development Act (42 U.S.C. § 5301 et seq.), the Governor's Office of Storm Recovery (GOSR), an office of New York State Homes and Community Renewal's Housing Trust Fund Corporation as a recipient of Community Development Block Grant – Disaster Recovery ("CDBG-DR") funds from the United States Department of Housing and Urban Development ("HUD"), is serving as the entity responsible for compliance with the HUD environmental review procedures set forth in 24 CFR Part 58. GOSR is acting on behalf of HUD in providing the enclosed project information and request for consultation.

GOSR submitted a consultation for the Stony Brook Flood Mitigation Project on April 24, 2017 (Attachment 1). On May 9, 2017 SHPO requested photographs of the dwelling associated with barn to be demolished and the location of the barn and house on map as well as their addresses (Attachment 2). Photographs of the barn and the associated dwelling and a map are provided in Attachment 3. Both the barn and associated dwelling are located at **175 Stony Brook Road**, Town of Schoharie, NY per the attached tax map report (Attachment 4).

Request for Comment: The purpose of this letter is to initiate consultation pursuant to Section 106 of the NHPA per the implementing regulations at 36 Code of Federal Regulations (CFR) Part 800. GOSR respectfully requests your review of the proposed project described herein. If you have any questions or require additional information regarding this request, please feel free to contact me at (518) 474-0647 or via email at alicia.shultz@nyshcr.org. Thank you for your time and consideration.

Sincerely,

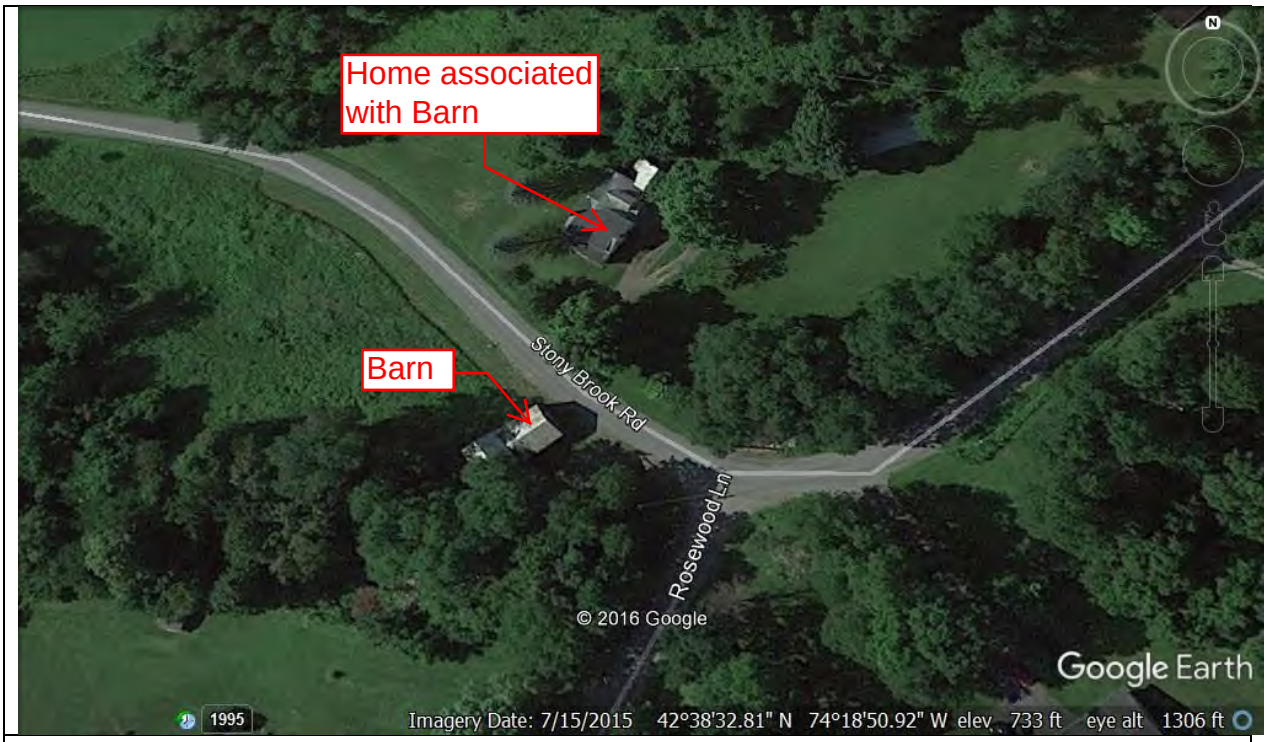
Alicia Shultz
Senior Environmental Scientist
Bureau of Environmental Review and Assessment
Governor's Office of Storm Recovery

Enclosures:
Attachment 1: Initial consultation to SHPO
Attachment 2: SHPO Response
Attachment 3: Photographs

Attachment 1

Attachment 2

Attachment 3


Home associated with Barn
Barn
Stony Brook Rd
Rosewood Ln
© 2016 Google
Google Earth
1995
Imagery Date: 7/15/2015 42°38'32.81" N 74°18'50.92" W elev 733 ft eye alt 1306 ft

Stony Brook

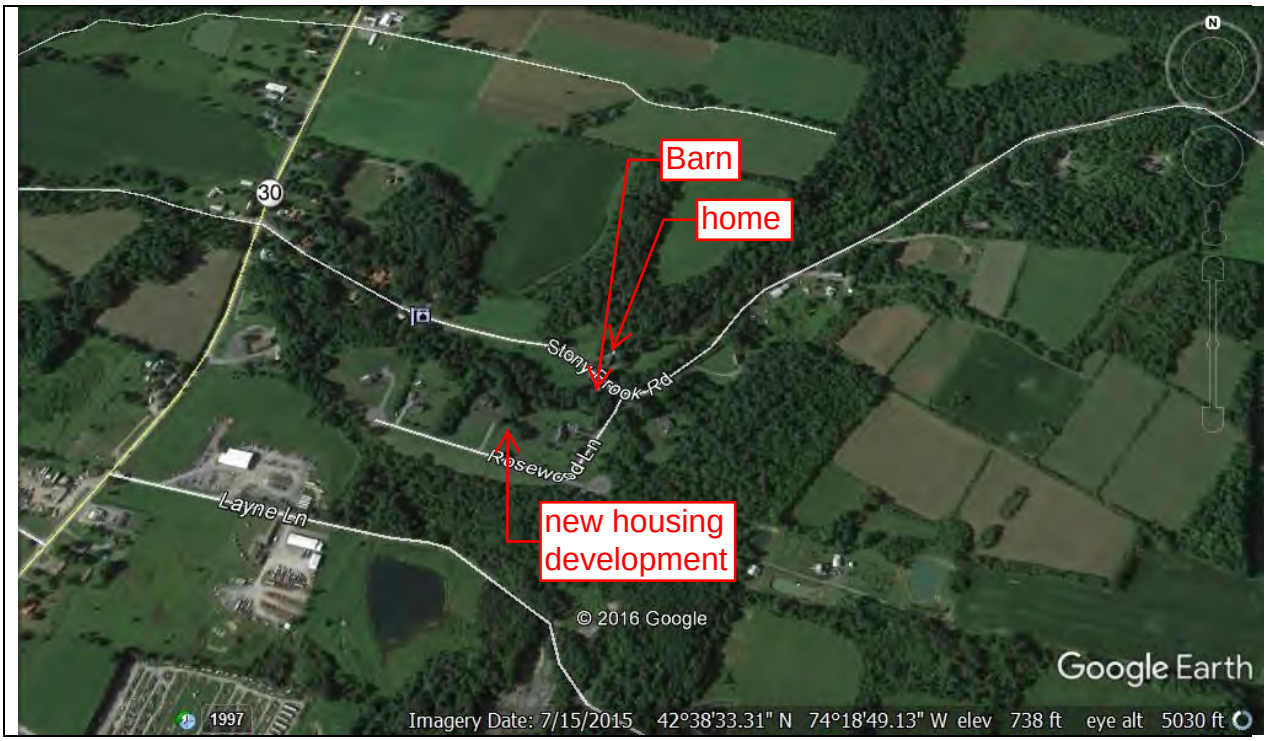
New construction

New construction

New construction

new construction

Stony Brook


Barn
home
new housing development
30
Stony Brook Rd
Rosewood Ln
Layne Ln
© 2016 Google
Google Earth
1997
Imagery Date: 7/15/2015 42°38'33.31" N 74°18'49.13" W elev 738 ft eye alt 5030 ft

Home associated with barn

Home associated with barn.

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

May 22, 2017

Mary Barthelme
Governor's Office of Storm Recovery
99 Washington Ave, Suite 1224
Albany, NY 12231

Re: HTF/ GOSR/ HUD CDBG-DR
Stony Brook Flood Mitigation Project
Schoharie/ Schoharie County
16PR3037

Dear Ms. Barthelme:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the materials submitted May 10, 2017 in accordance with Title 54, Section 306108 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/ Cultural resources.

Based on this review, the opinion of the SHPO is that there will be No Historic Properties Affected by the proposed undertaking.

If I can be of further assistance, contact me at (518) 268-2187 or Larry.moss@parks.ny.gov

Sincerely,

Larry K Moss, Historic Preservation Technical Specialist

CC: Alicia Shultz, NYSHCR
Ashley Ley, AKRF

Affidavit of Mailing

STATE OF NEW YORK)
: SS. :
COUNTY OF ALBANY)

MARY BARTHELME, being duly sworn, deposes and says:

1. I am over the age of eighteen years.
2. On May 19, 2016, I mailed true and correct copies of the annexed Stony Brook Mitigation Tribal Consultations dated May 19, 2016, by placing the same in first class post-paid envelopes addressed: SEE ATTACHED LIST.
3. On said day, I deposited said envelopes in a mailbox at 99 Washington Avenue, Albany, New York 12210.

Mary Barthelme

Sworn to before me this
23rd day of May, 2016

Notary Public

Stephanie Maier
Notary Public, State of New York
Qualified in Rensselaer County
No. 01MA6337406
Commission Expires February 22, 2020

Ron LaFrance, Jr; Paul Thompson;
and Beverly Cook, Chiefs
St. Regis Mohawk Tribe
412 State Route 37
Akwesasne, NY 13655

Mohawk Nation Council of Chiefs
of Haudenosaunee Six Nations
Confederacy
Akwesasane Territory Box 336
Via Rooseveltown, NY 13683-0366

Shannon Holsey, President
Stockbridge-Munsee Community, Band of the
Mohicans
N8476 Moh He Con Nuck Road
Bowler, WI 54416

Community Planning and Development

Tribal Directory Assessment Information

Contact Information for Tribes with Interests in Schoharie County, New York

1

	Tribal Name	County Name
+	Saint Regis Mohawk Tribe	Schoharie
+	Stockbridge Munsee Community, Wisconsin	Schoharie

1

Print Current Page | Export to Excel

Return to the Main Tribal page. Return to the Query Request page for New York.

U.S. Department of Housing and Urban Development
451 7th Street S.W., Washington, DC 20410
Telephone: (202) 708-1112 TTY: (202) 708-1455
Find the address of the HUD office near you

May 19, 2016

Mohawk Nation Council of Chiefs
of Haudenosaunee Six Nations Confederacy
Akwesasane Territory Box 336
Via Rooseveltown, NY 13683-0366

Re: Section 106 Compliance for the Stony Brook Creek Mitigation Project, Town of Schoharie, Schoharie County, New York.

Dear Chiefs of the Mohawk Nation:

Pursuant to the Disaster Relief Appropriations Act, 2013 (Public Law 113-2) and the Housing and Community Development Act (42 U.S.C. § 5301 et seq.), the Governor's Office of Storm Recovery (GOSR) is acting under the auspices of New York State Homes and Community Renewal's Housing Trust Fund Corporation as a recipient of Community Development Block Grant – Disaster Recovery ("CDBG-DR") funds from the United States Department of Housing and Urban Development ("HUD"). GOSR is the entity responsible for compliance with the HUD environmental review procedures set forth in 24 CFR Part 58. GOSR is acting on behalf of HUD in providing the enclosed project information and inviting this discussion with your Nation to respond with any concerns or comments.

GOSR processes environmental reviews for projects funded with HUD CDBG-DR on a case-by-case basis. GOSR proposes to provide funding for a stream repair and restoration project along approximately 2.6 miles of Stony Brook in the Town of Schoharie, Schoharie County. New York. In accordance with Section 101(d)(6)(B) of the National Historic Preservation Act of 1966, as amended (54 U.S.C. 302706(b)), and its implementing regulations, 36 Code of Federal Regulations (CFR) Part 800, this letter serves as notification of the proposed action. This consultation is being sent to the Mohawk Nation, the St. Regis Mohawk Tribe, and the Stockbridge-Munsee Community Band of the Mohicans.

Area of Potential Effect: The Schoharie County Soil & Water Conservation District ("SCSWCD") is pursuing a stream repair and restoration project along approximately 2.6 miles of Stony Brook (the "Proposed Project"). Stony Brook is a tributary to Schoharie Creek, which flows to the Mohawk River and then to the Hudson River. The project site is located in the town of Schoharie, in northeastern Schoharie County, New York (see Attachment 1). Recent, severe flooding events, most significantly Tropical Storm Irene in 2011, and also a June 2013 flood event have resulted in severe bed and bank erosion within the Stony Brook channel as well as aggradation of bedload sediment. This aggradation of sediment has clogged culvert and bridge crossings, leading to the reduction of flood conveyance capacity in the channel. The sediment migration has caused the channel to become unstable, with bank erosion and excessive sedimentation in many areas. The Area of Potential Effect (APE) is shown in Attachment 2.

Proposed Project Description: The Proposed Project involves the stream repair and restoration of approximately 2.6 miles of Stony Brook. The Proposed Project includes eight (8) proposed restoration areas and is anticipated to improve the health of the riverine system, prevent flooding and protect infrastructure and private residential properties during storm events. Below are the eight (8) proposed restoration areas (see Attachment 3).

Area 1
Channel Location (STA): 32+00 – 14+50
Latitude: 42.645601 / Longitude: -74.326106

Area 2
Channel Location (STA): 32+50 – 44+00
Latitude: 42.644488 / Longitude: -74.321308

Area 3A
Channel Location (STA): 48+50 – 67+00
Latitude: 42.642651 / Longitude: -74.316228

Area 3B
Channel Location (STA): 48+50 – 67+00
Latitude: 42.642989 / Longitude: -74.313465

Area 4
Channel Location (STA): 70+00 – 82+00
Latitude: 42.644698 / Longitude: -74.309846

Area 5
Channel Location (STA): 86+00 – 99+00
Latitude: 42.646348 / Longitude: -74.305249

Area 6
Channel Location (STA): 100+50 – 114+00
Latitude: 42.645921 / Longitude: -74.300552

Area 7
Channel Location (STA): 134+00 – 150+00
Latitude: 42.644092 / Longitude: -74.290176

The Proposed Project would include development of sediment management standards to guide removal of sediment and proper channel sizing at the above locations. In addition, based on the engineering study, the following improvement measures are also proposed for specific areas: installation of rock vane structures to improve sediment transport; removal of sidecast sediments; installation of grade control to arrest channel incision and prevent additional incision; repair and restacking of stacked rock revetment wall and installation of grade control; roughening of channel with random boulder placement; bank failure repair and relocation of channel away from toe of slope; replacement of undersized culvert at Frisbieville Road; and replacement of undersized culvert at Stony Brook Road.

Pursuant to NHPA Section 106, GOSR has initiated consultation with the State Historic Preservation Office (SHPO) concerning this Project and its potential to affect historic resources that are listed on or eligible for listing on the NRHP. The SHPO's finding for this project is no Historic Properties Affected. GOSR is completing an environmental review for this project pursuant to HUD NEPA regulations. If the Area of Potential Effect encompasses historic properties of religious or cultural significance to your Nation, please respond within 30 days or sooner. Additionally, please indicate if there are other sources of information or other parties, Nations, Tribes, or members of the public you believe should be included in the consultation process. Please respond by email or in writing to the address listed below.

Mr. Thomas King
Certifying Environmental Officer
Governor's Office of Storm Recovery
99 Washington Avenue
Suite 1224
Albany, New York 12260

I am available to answer any questions that you may have regarding this action. If you have any questions, please feel free to contact me at (518) 473-0015 or via email at Thomas.King@stormrecovery.ny.gov.

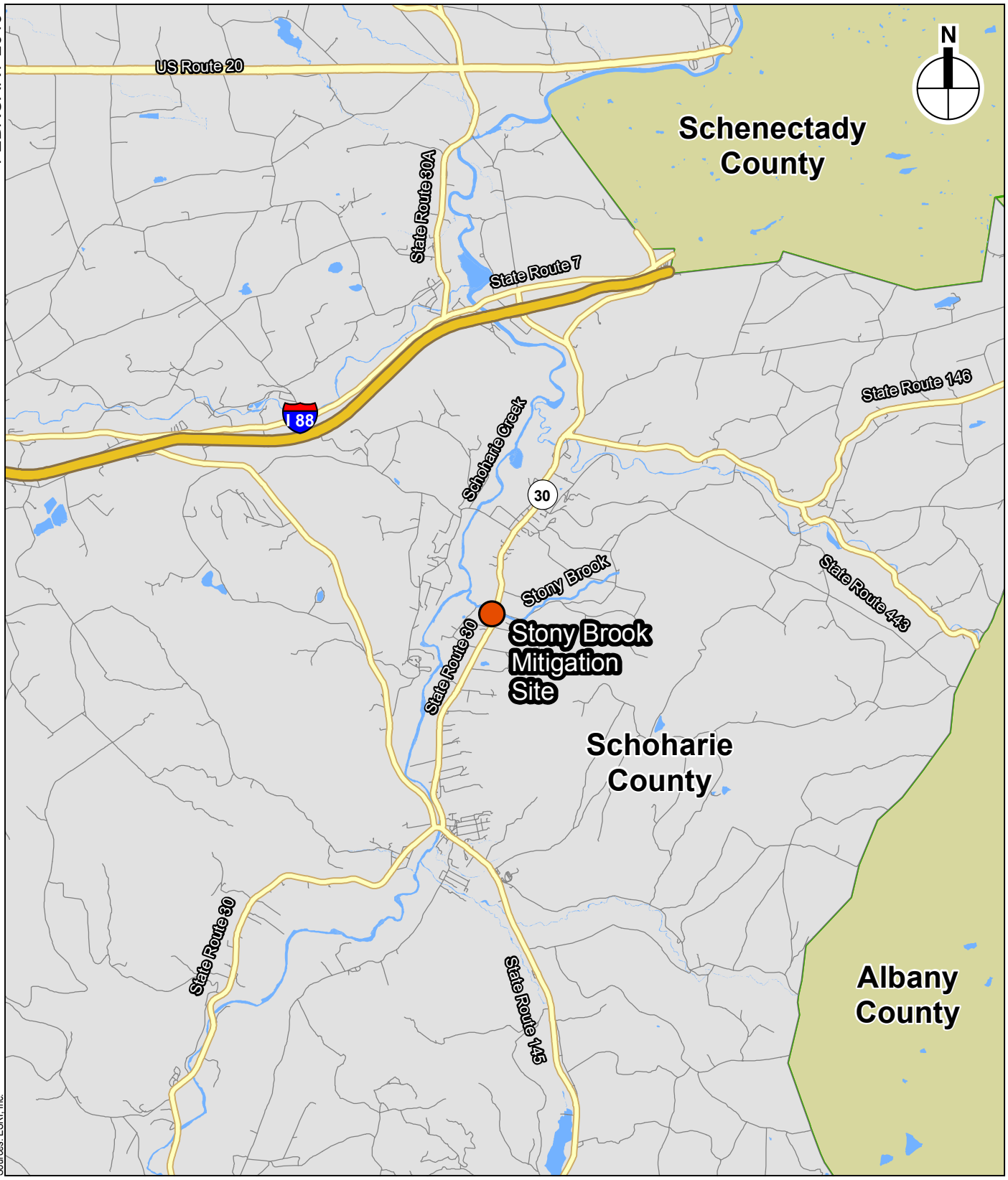
Sincerely,

Thomas J. King
Assistant General Counsel and Certifying Officer
Governor's Office of Storm Recovery

Enclosures:
Project Location Map
Design Plans

Attachment 1:
Project Location Map

FEBRUARY 2016



Sources: ESRI, Inc.

Site Location

0 3 Miles

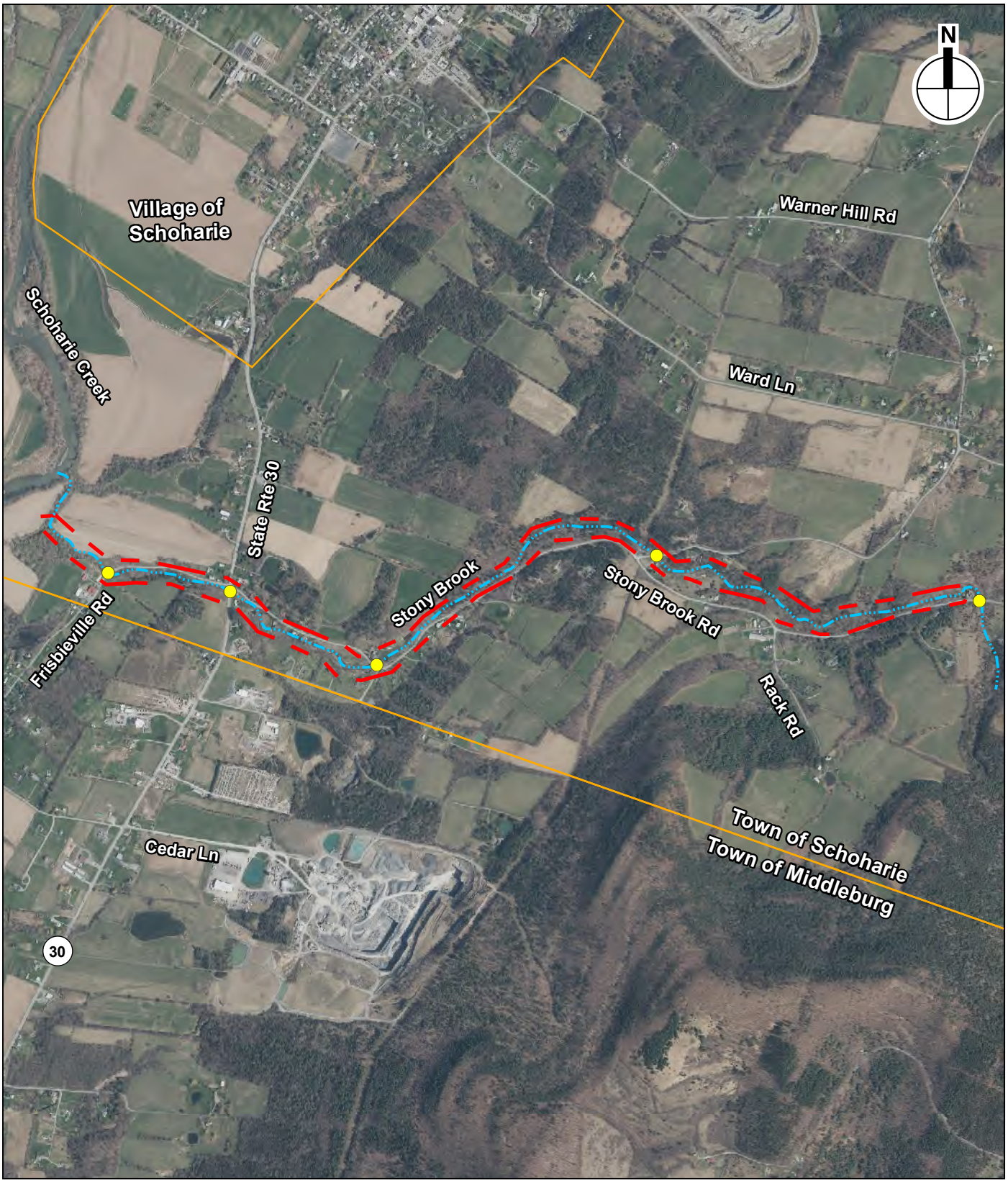
Project Location Map

Stony Brook Mitigation, Town of Schoharie

Figure 1

Attachment 2:
Project Site Map

FEBRUARY 2016



Sources: NYSDOP 2014

0 0.5 Mile

Culvert

Stony Brook

Area of Potential Effect

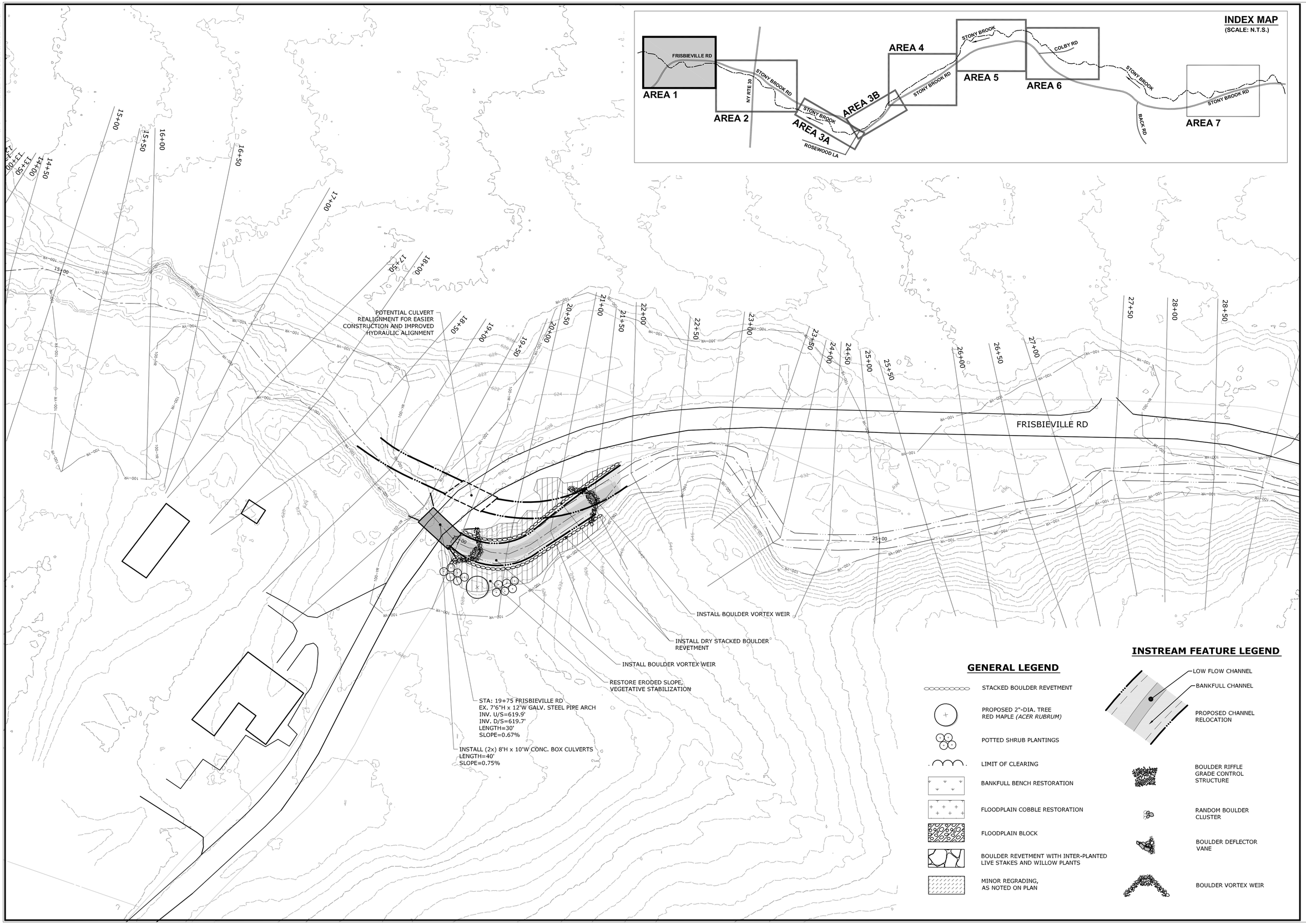
Municipal Boundaries

Project Site Map

Stony Brook Mitigation, Town of Schoharie

Figure 2

Attachment 3:
Conceptual Design Plans



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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 1

STONY BROOK
STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 01 OF 07

SHEET NAME: AREA 1

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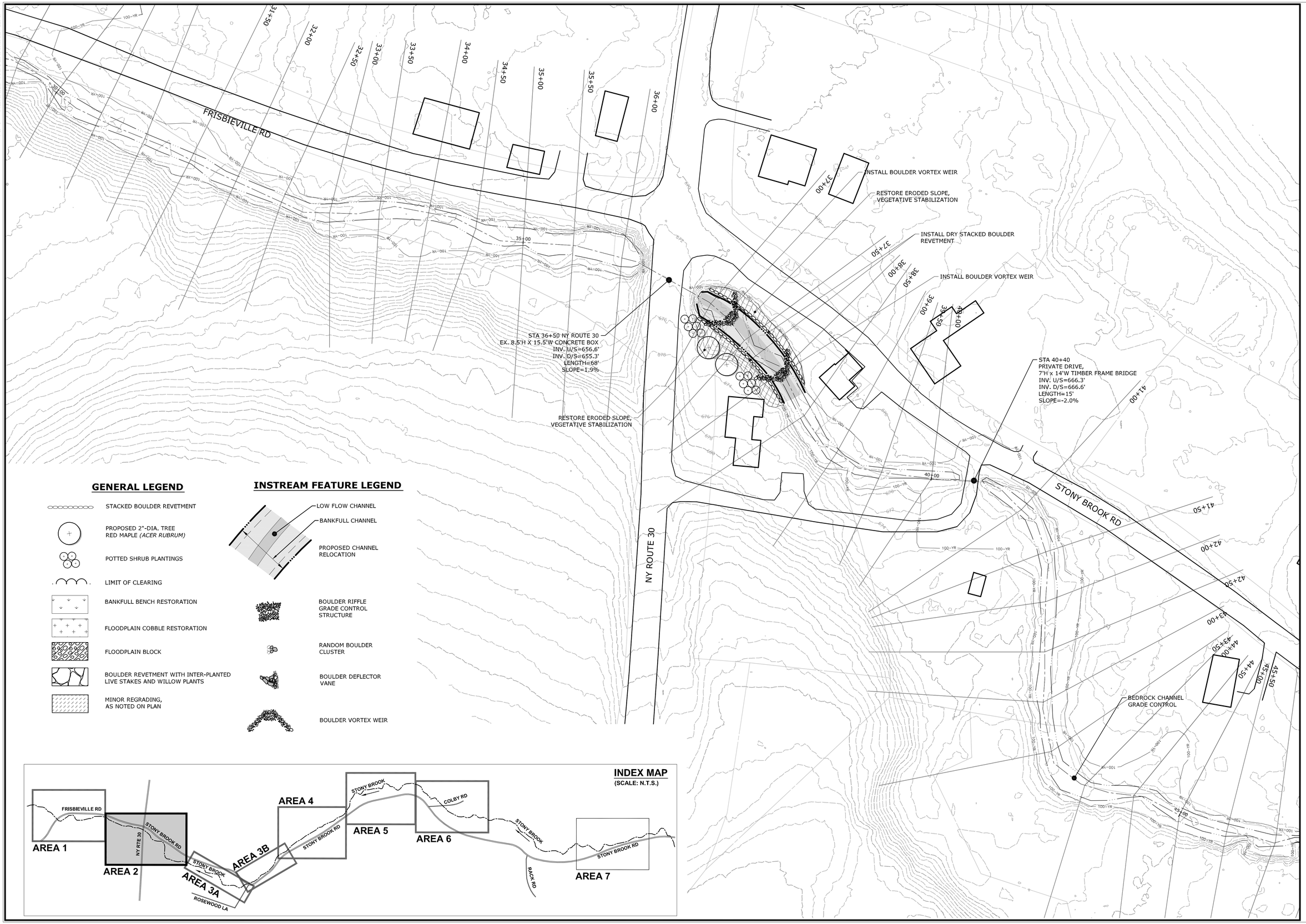

GENERAL LEGEND

- STACKED BOULDER REVETMENT
- PROPOSED 2"-DIA. TREE RED MAPLE *(ACER RUBRUM)*
- POTTED SHRUB PLANTINGS
- LIMIT OF CLEARING
- BANKFULL BENCH RESTORATION
- FLOODPLAIN COBBLE RESTORATION
- FLOODPLAIN BLOCK
- BOULDER REVETMENT WITH INTER-PLANTED LIVE STAKES AND WILLOW PLANTS
- MINOR REGRADING, AS NOTED ON PLAN

INSTREAM FEATURE LEGEND

- LOW FLOW CHANNEL
- BANKFULL CHANNEL
- PROPOSED CHANNEL RELOCATION
- BOULDER RIFFLE GRADE CONTROL STRUCTURE
- RANDOM BOULDER CLUSTER
- BOULDER DEFLECTOR VANE
- BOULDER VORTEX WEIR

INDEX MAP

(SCALE: N.T.S.)

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 2

STONY BROOK STREAM REPAIR AND RESTORATION

NY ROUTE 30, AND STONY BROOK ROAD AREA

SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 02 OF 07

SHEET NAME: **AREA 2**

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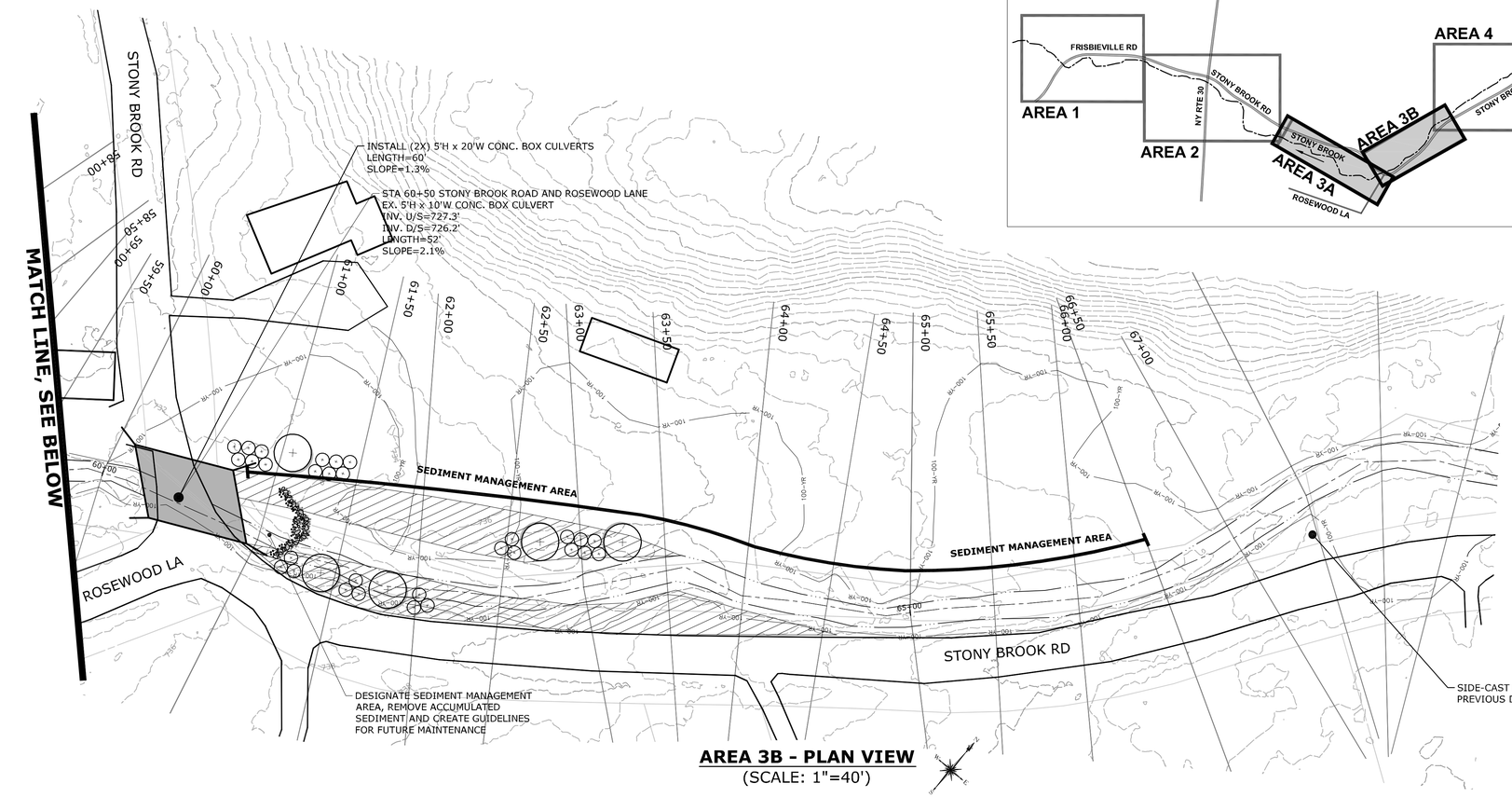
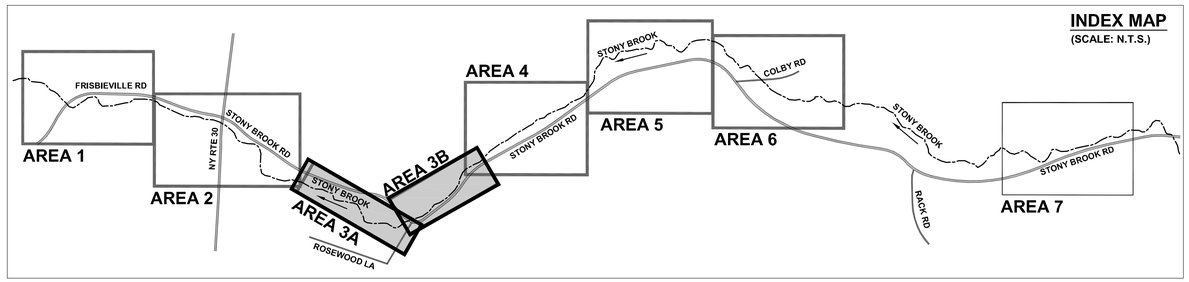
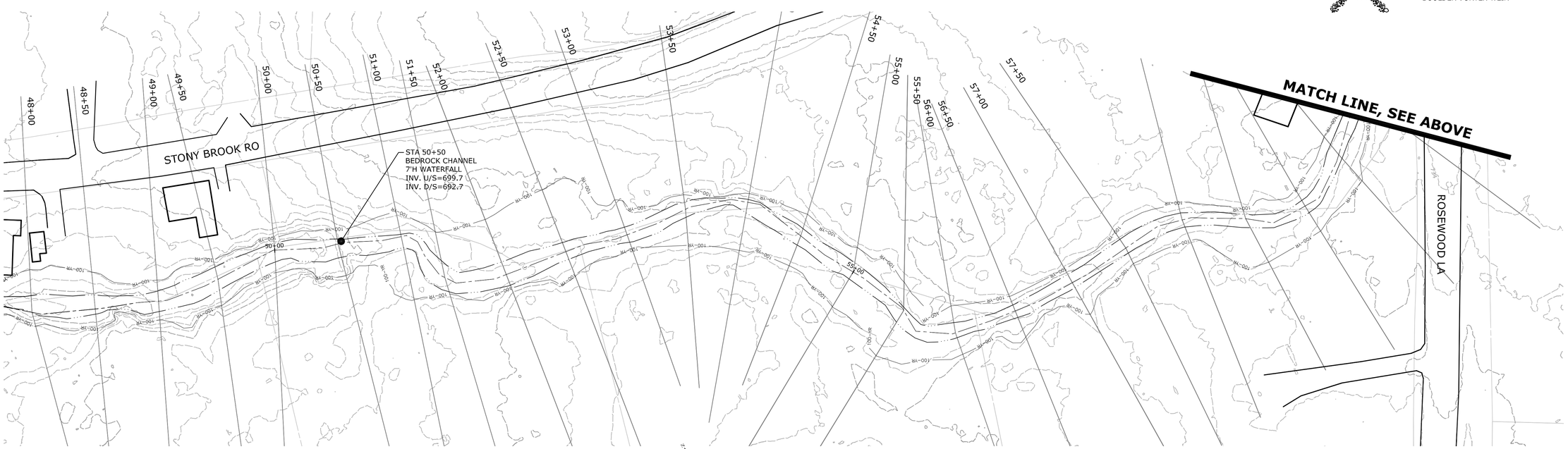


AREA 3B - PLAN VIEW
(SCALE: 1"=40')



LEGEND

- STACKED BOULDER REVETMENT
- EXISTING 100-YEAR FLOODPLAIN (HYDRAULIC MODELING)
- EXISTING EDGE OF LOW-FLOW CHANNEL
- LOW FLOW CHANNEL
- BANKFULL CHANNEL
- PROPOSED CHANNEL RELOCATION
- BOULDER RIFFLE GRADE CONTROL STRUCTURE
- RANDOM BOULDER CLUSTER
- BOULDER DEFLECTOR VANE
- BOULDER VORTEX WEIR



AREA 3A - PLAN VIEW
(SCALE: 1"=40')

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PROPOSED CONCEPT DESIGN - AREA 3

STONY BROOK STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'
DATE: JAN. 2016
PROJECT NO.: 4805-04
SHEET NO.: 03 OF 07

SHEET NAME: **AREA 3**

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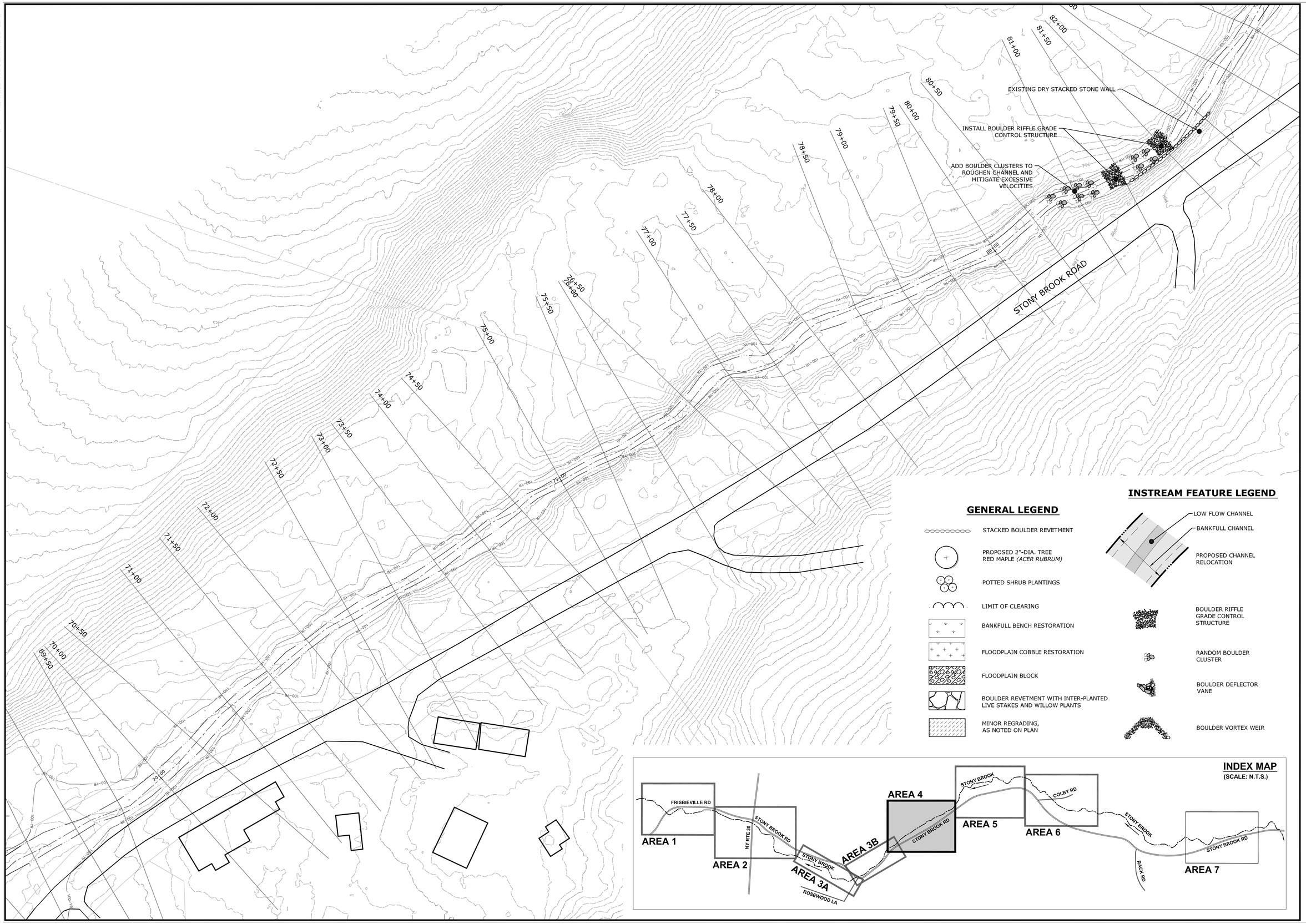

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PROPOSED CONCEPT DESIGN - AREA 4

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NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 04 OF 07

SHEET NAME: AREA 4

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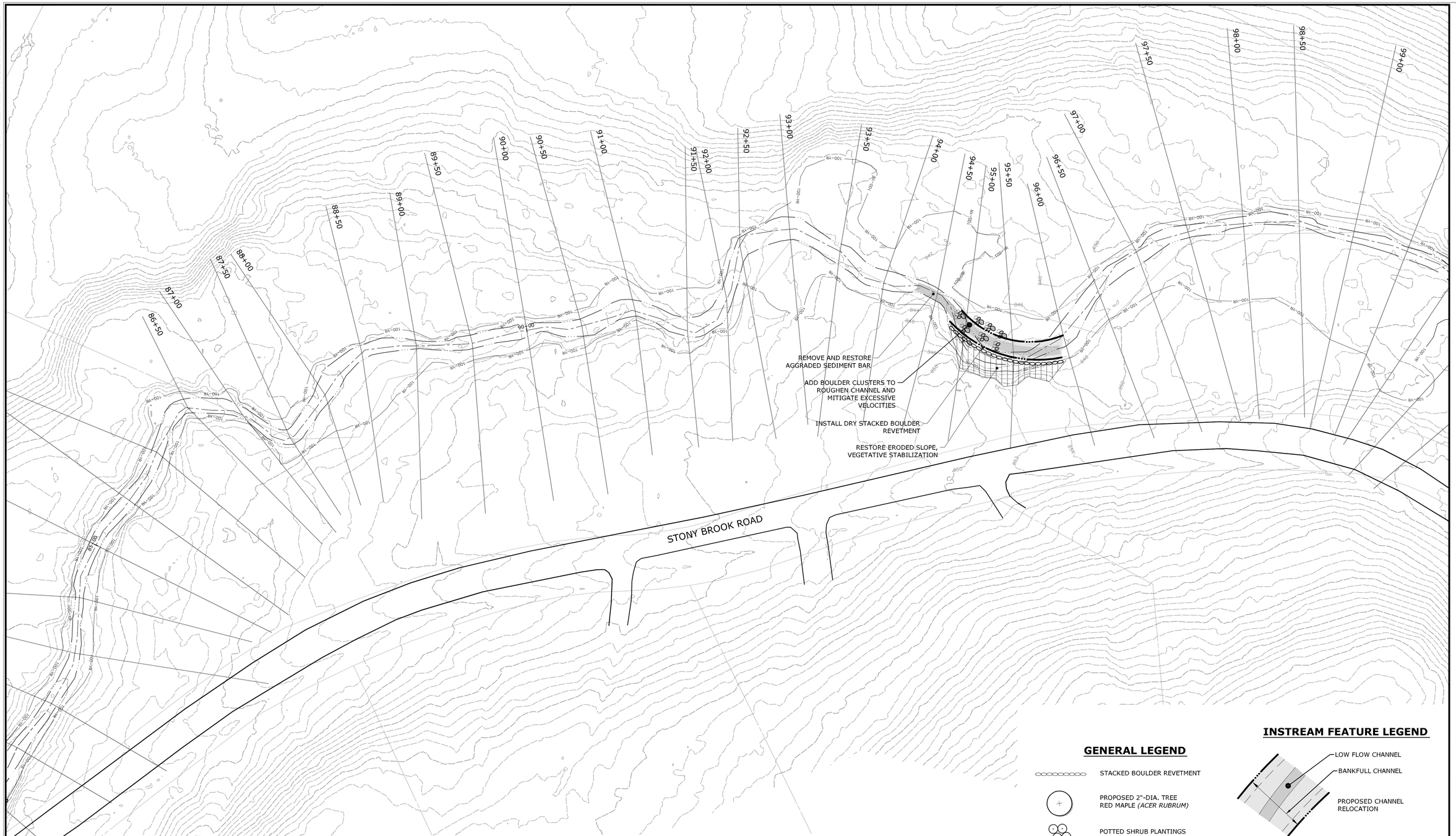
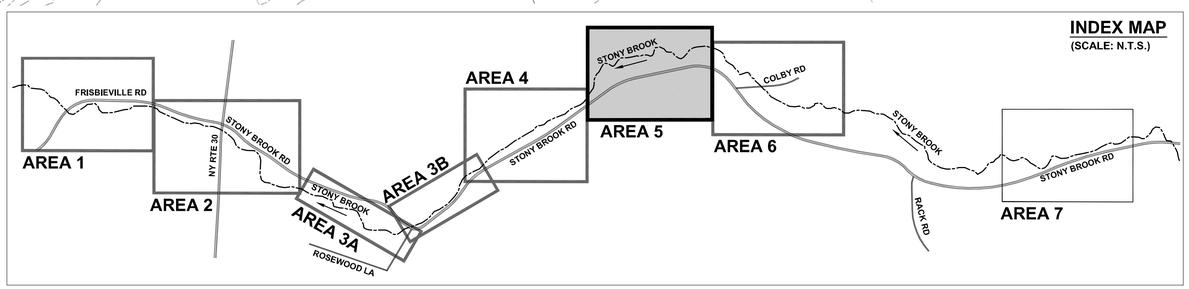


INDEX MAP
(SCALE: N.T.S.)



GENERAL LEGEND

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 5

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STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 05 OF 07

SHEET NAME: AREA 5

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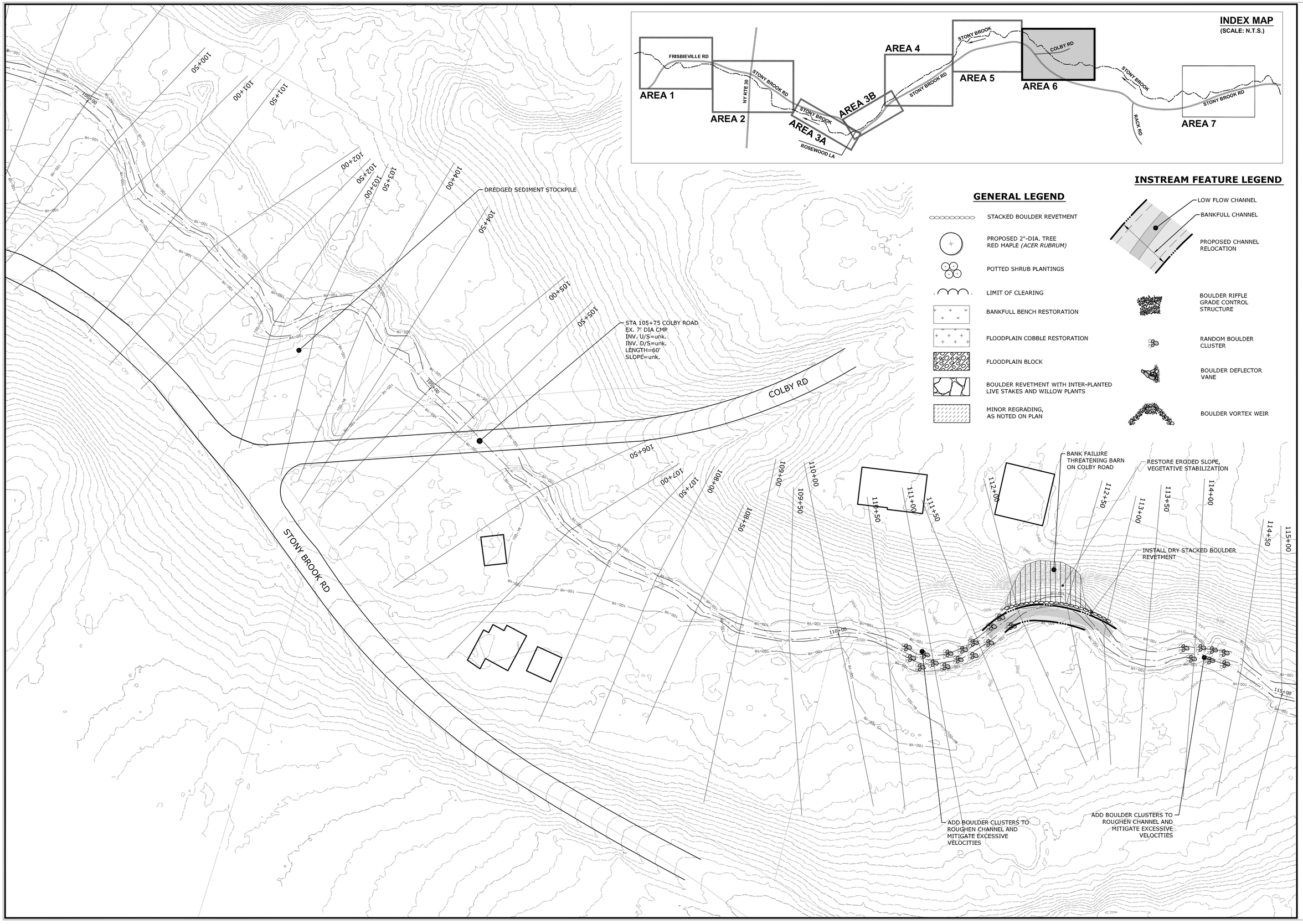

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PROPOSED CONCEPT DESIGN - AREA 6

STONY BROOK STREAM REPAIR AND RESTORATION

NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 06 OF 07

SHEET NAME: **AREA 6**

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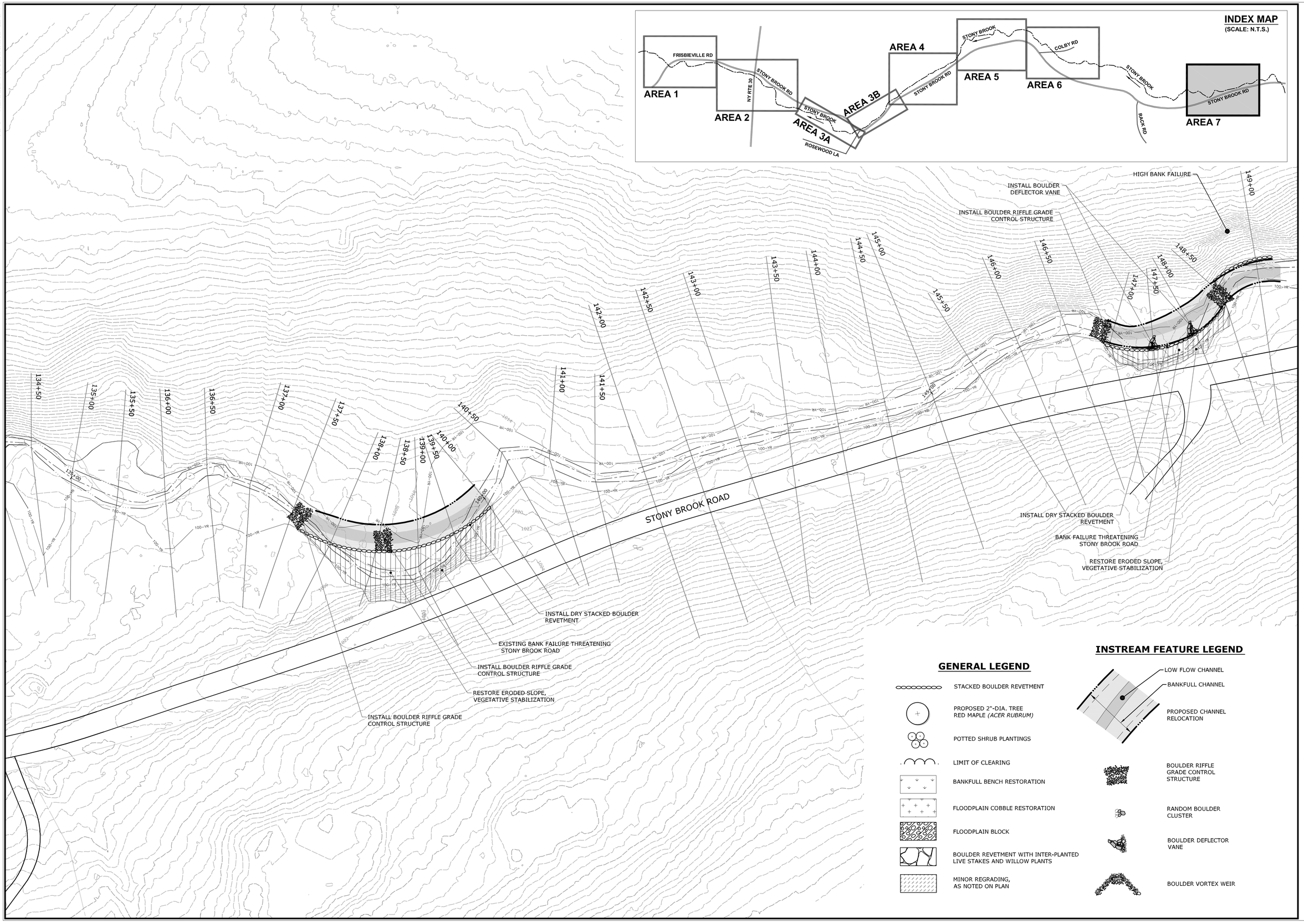

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PROPOSED CONCEPT DESIGN - AREA 7

STONY BROOK
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SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 07 OF 07

SHEET NAME: AREA 7

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NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

May 18, 2016

Thomas King
Governor's Office of Storm Recovery
99 Washington Ave, Suite 1224
Albany, NY 12231

Re: HTF/ GOSR/ HUD CDBG-DR
Stony Brook Flood Mitigation Project
Schoharie/ Schoharie County
16PR3037

Dear Mr. King:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Title 54, Section 306108 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/ Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

Based on this review, the opinion of the SHPO is that there will be No Historic Properties Affected by the proposed undertaking.

If I can be of further assistance, please contact me at (518) 268-2187 or Larry.moss@parks.ny.gov

Sincerely,

L Moss

Larry K Moss, Historic Preservation Technical Specialist
CC: Mary Barthelme
Alicia Shultz, NYSHCR
Ashley Ley, AKRF

May 19, 2016

Shannon Holsey, President
Stockbridge-Munsee Community, Band of the Mohicans
N8476 Moh He Con Nuck Road
Bowler, WI 54416

Re: Section 106 Compliance for the Stony Brook Creek Mitigation Project, Town of Schoharie, Schoharie County, New York.

Dear Shannon Holsey:

Pursuant to the Disaster Relief Appropriations Act, 2013 (Public Law 113-2) and the Housing and Community Development Act (42 U.S.C. § 5301 et seq.), the Governor's Office of Storm Recovery (GOSR) is acting under the auspices of New York State Homes and Community Renewal's Housing Trust Fund Corporation as a recipient of Community Development Block Grant – Disaster Recovery ("CDBG-DR") funds from the United States Department of Housing and Urban Development ("HUD"). GOSR is the entity responsible for compliance with the HUD environmental review procedures set forth in 24 CFR Part 58. GOSR is acting on behalf of HUD in providing the enclosed project information and inviting this discussion with your Community to respond with any concerns or comments.

GOSR processes environmental reviews for projects funded with HUD CDBG-DR on a case-by-case basis. GOSR proposes to provide funding for a stream repair and restoration project along approximately 2.6 miles of Stony Brook in the Town of Schoharie, Schoharie County. New York. In accordance with Section 101(d)(6)(B) of the National Historic Preservation Act of 1966, as amended (54 U.S.C. 302706(b)), and its implementing regulations, 36 Code of Federal Regulations (CFR) Part 800, this letter serves as notification of the proposed action. This consultation is being sent to the Mohawk Nation, the St. Regis Mohawk Tribe, and the Stockbridge-Munsee Community Band of the Mohicans.

Area of Potential Effect: The Schoharie County Soil & Water Conservation District ("SCSWCD") is pursuing a stream repair and restoration project along approximately 2.6 miles of Stony Brook (the "Proposed Project"). Stony Brook is a tributary to Schoharie Creek, which flows to the Mohawk River and then to the Hudson River. The project site is located in the town of Schoharie, in northeastern Schoharie County, New York (see Attachment 1). Recent, severe flooding events, most significantly Tropical Storm Irene in 2011, and also a June 2013 flood event have resulted in severe bed and bank erosion within the Stony Brook channel as well as aggradation of bedload sediment. This aggradation of sediment has clogged culvert and bridge crossings, leading to the reduction of flood conveyance capacity in the channel. The sediment migration has caused the channel to become unstable, with bank erosion and excessive sedimentation in many areas. The Area of Potential Effect (APE) is shown in Attachment 2.

Proposed Project Description: The Proposed Project involves the stream repair and restoration of approximately 2.6 miles of Stony Brook. The Proposed Project includes eight (8) proposed restoration areas and is anticipated to improve the health of the riverine system, prevent flooding and protect infrastructure and private residential properties during storm events. Below are the eight (8) proposed restoration areas (see Attachment 3).

Area 1
Channel Location (STA): 32+00 – 14+50
Latitude: 42.645601 / Longitude: -74.326106

Area 2
Channel Location (STA): 32+50 – 44+00
Latitude: 42.644488 / Longitude: -74.321308

Area 3A
Channel Location (STA): 48+50 – 67+00
Latitude: 42.642651 / Longitude: -74.316228

Area 3B
Channel Location (STA): 48+50 – 67+00
Latitude: 42.642989 / Longitude: -74.313465

Area 4
Channel Location (STA): 70+00 – 82+00
Latitude: 42.644698 / Longitude: -74.309846

Area 5
Channel Location (STA): 86+00 – 99+00
Latitude: 42.646348 / Longitude: -74.305249

Area 6
Channel Location (STA): 100+50 – 114+00
Latitude: 42.645921 / Longitude: -74.300552

Area 7
Channel Location (STA): 134+00 – 150+00
Latitude: 42.644092 / Longitude: -74.290176

The Proposed Project would include development of sediment management standards to guide removal of sediment and proper channel sizing at the above locations. In addition, based on the engineering study, the following improvement measures are also proposed for specific areas: installation of rock vane structures to improve sediment transport; removal of sidecast sediments; installation of grade control to arrest channel incision and prevent additional incision; repair and restacking of stacked rock revetment wall and installation of grade control; roughening of channel with random boulder placement; bank failure repair and relocation of channel away from toe of slope; replacement of undersized culvert at Frisbieville Road; and replacement of undersized culvert at Stony Brook Road.

Pursuant to NHPA Section 106, GOSR has initiated consultation with the State Historic Preservation Office (SHPO) concerning this Project and its potential to affect historic resources that are listed on or eligible for listing on the NRHP. The SHPO's finding for this project is no Historic Properties Affected. GOSR is completing an environmental review for this project pursuant to HUD NEPA regulations. If the Area of Potential Effect encompasses historic properties of religious or cultural significance to your Community, please respond within 30 days or sooner. Additionally, please indicate if there are other sources of information or other parties, Nations, Tribes, or members of the public you believe should be included in the consultation process. Please respond by email or in writing to the address listed below.

Mr. Thomas King
Certifying Environmental Officer
Governor's Office of Storm Recovery
99 Washington Avenue
Suite 1224
Albany, New York 12260

I am available to answer any questions that you may have regarding this action. If you have any questions, please feel free to contact me at (518) 473-0015 or via email at Thomas.King@stormrecovery.ny.gov.

Sincerely,

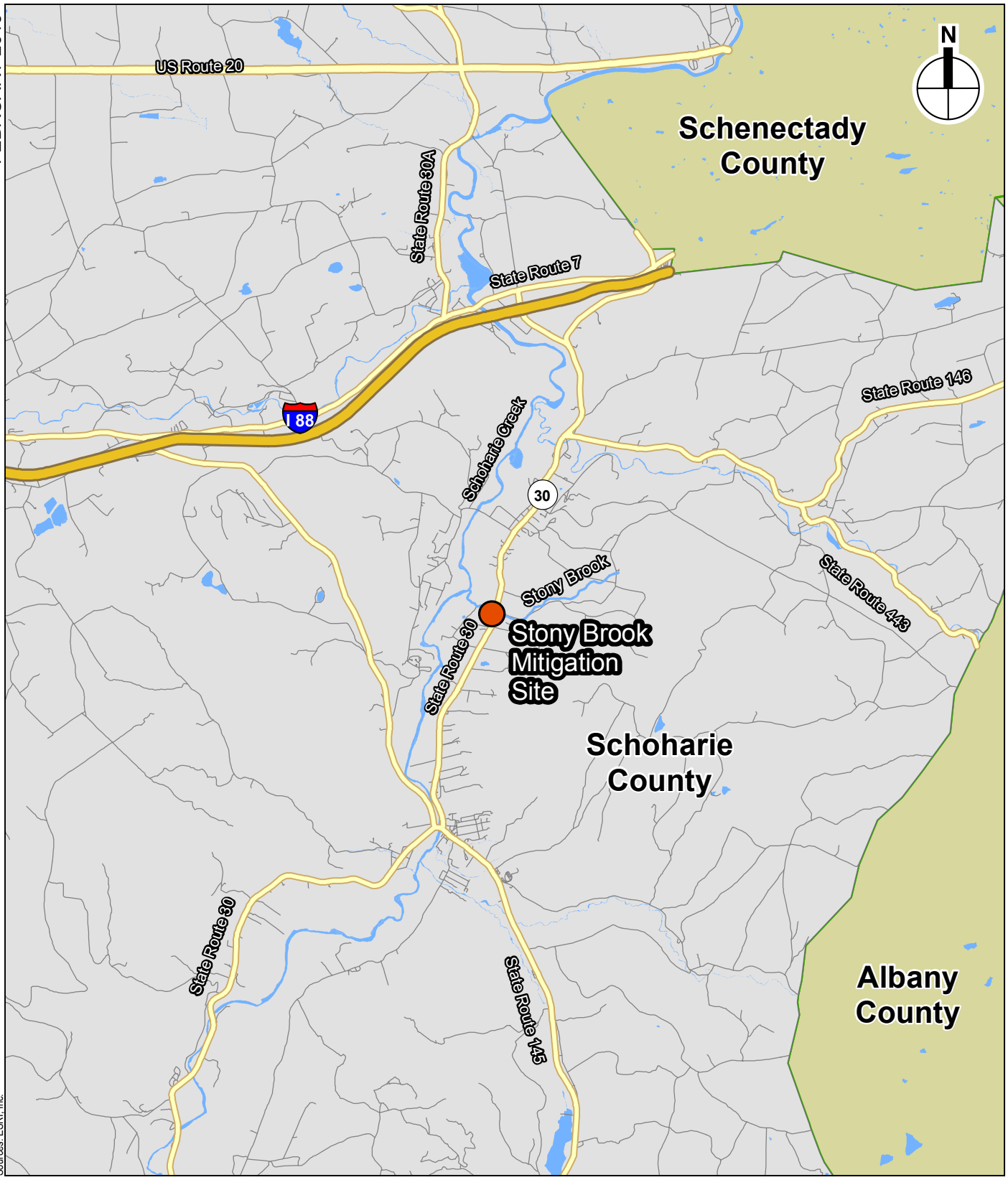
Thomas J. King
Assistant General Counsel and Certifying Officer
Governor's Office of Storm Recovery

Enclosures:
Project Location Map
Design Plans

Electronic letter sent to:
Bonney Hartley
THPO, New York Office
Stockbridge-Munsee Community, Band of the Mohicans
65 1st Street
Troy, NY 12180

Attachment 1:
Project Location Map

FEBRUARY 2016



Sources: ESRI, Inc.

Site Location

0 3 Miles

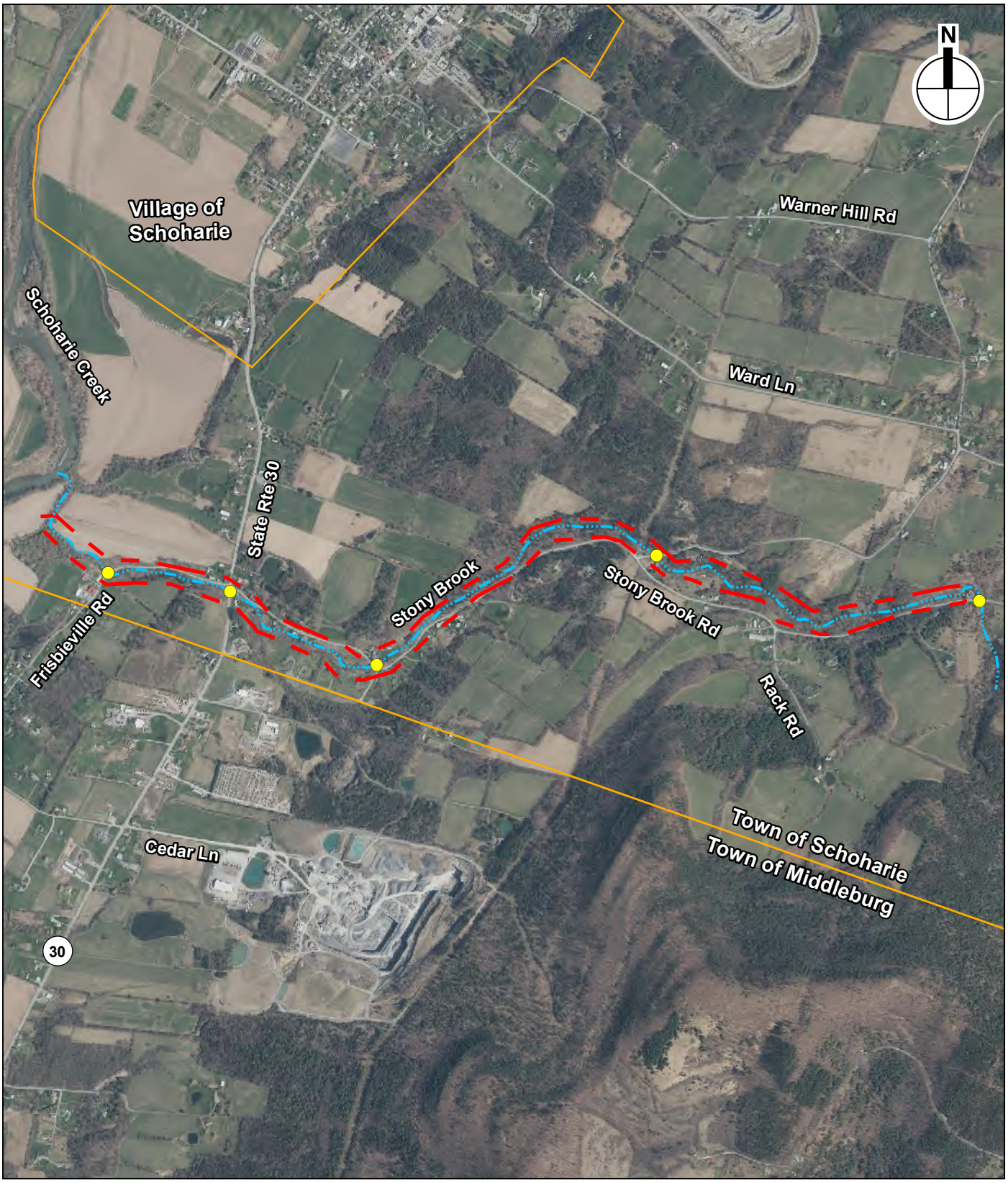
Project Location Map

Stony Brook Mitigation, Town of Schoharie

Figure 1

Attachment 2:
Project Site Map

FEBRUARY 2016



Sources: NYSDOP 2014

0 0.5 Mile

Culvert

Stony Brook

Area of Potential Effect

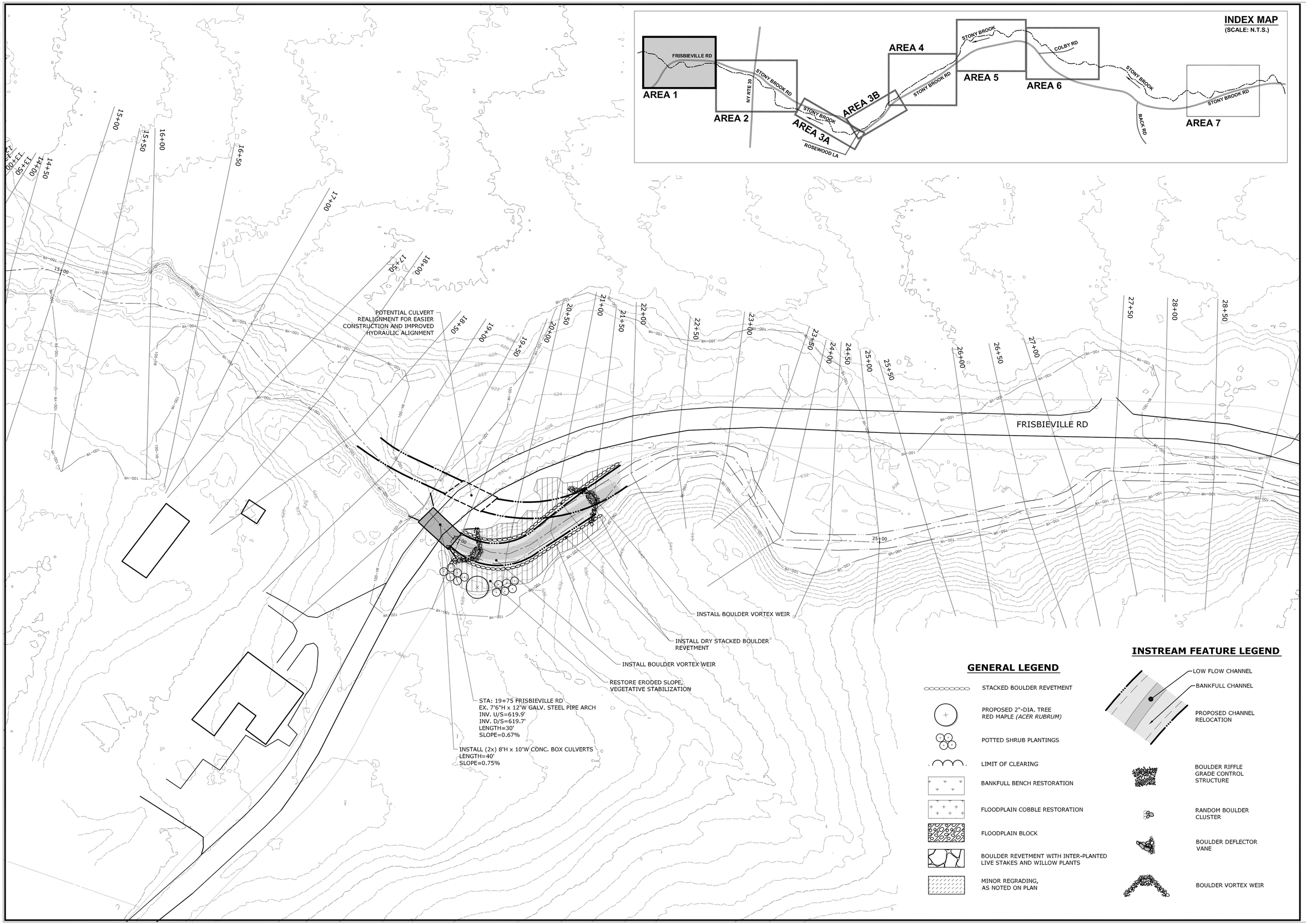
Municipal Boundaries

Project Site Map

Stony Brook Mitigation, Town of Schoharie

Figure 2

Attachment 3:
Conceptual Design Plans



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SCHOHARIE, NEW YORK

JCM	JCM	MBC
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SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 01 OF 07

SHEET NAME: AREA 1

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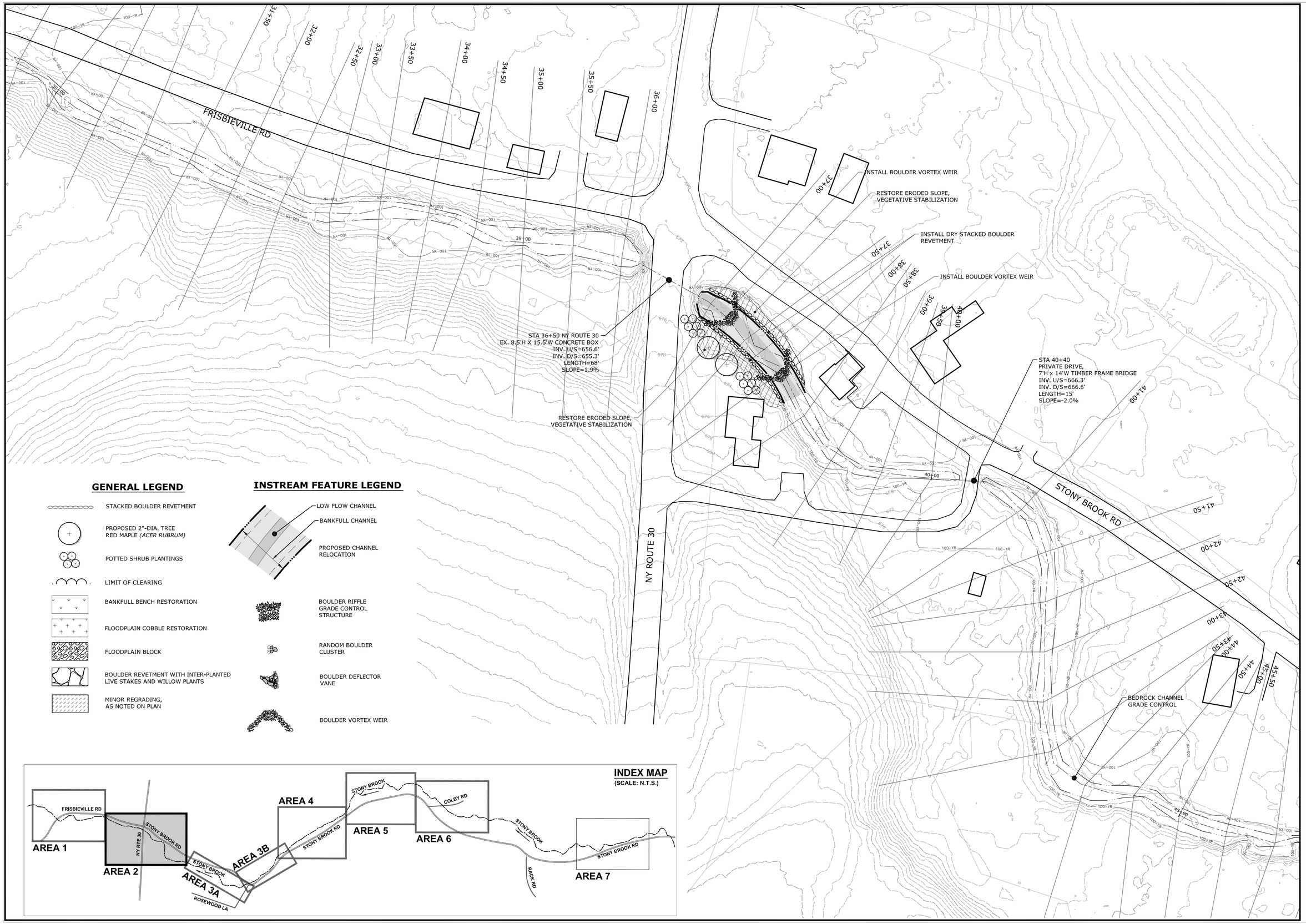

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INDEX MAP

(SCALE: N.T.S.)

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NY ROUTE 30, AND STONY BROOK ROAD AREA

SCHOHARIE, NEW YORK

JCM	JCM	MBC
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DATE: JAN. 2016

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SHEET NAME: **AREA 2**

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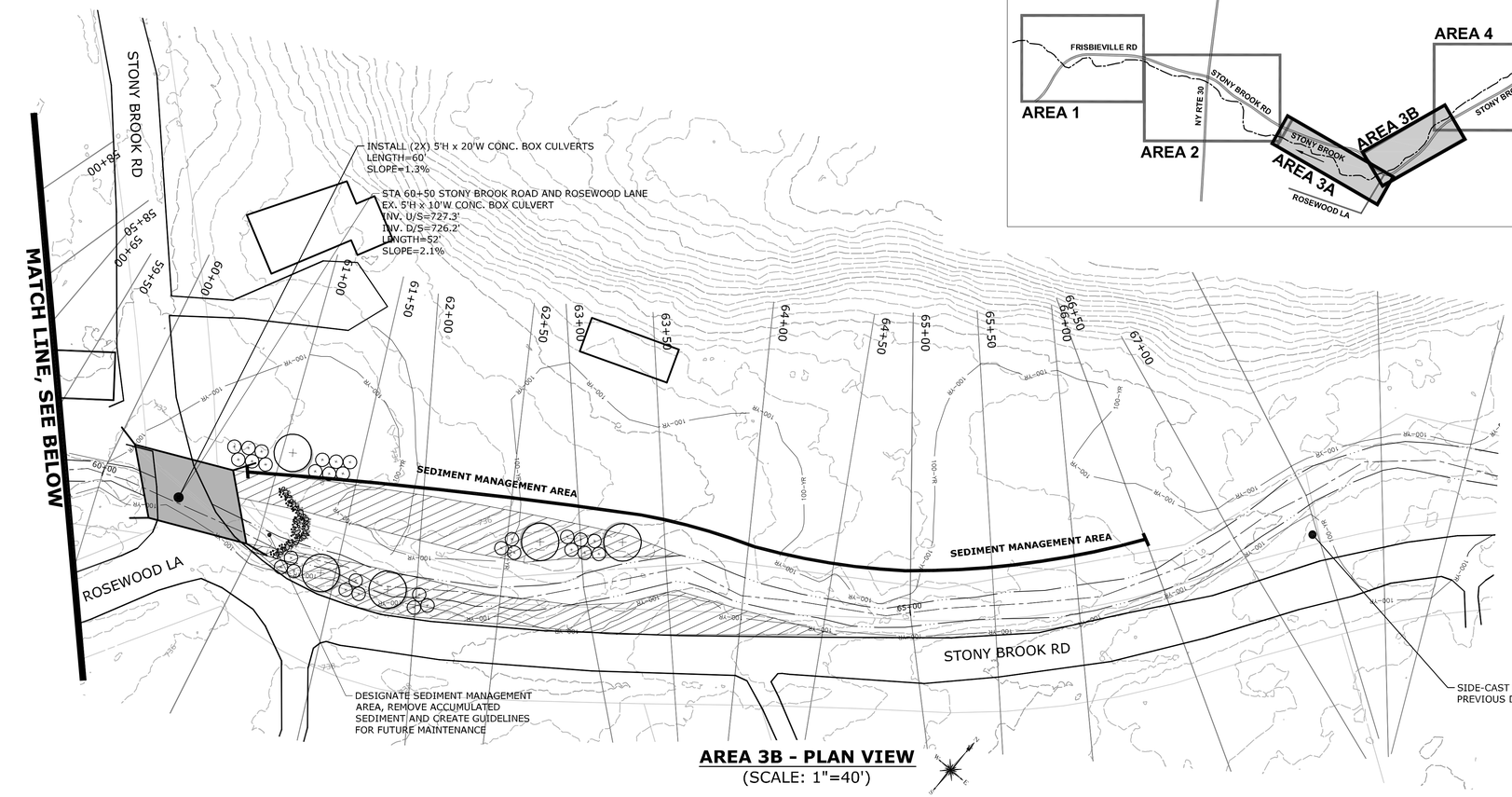
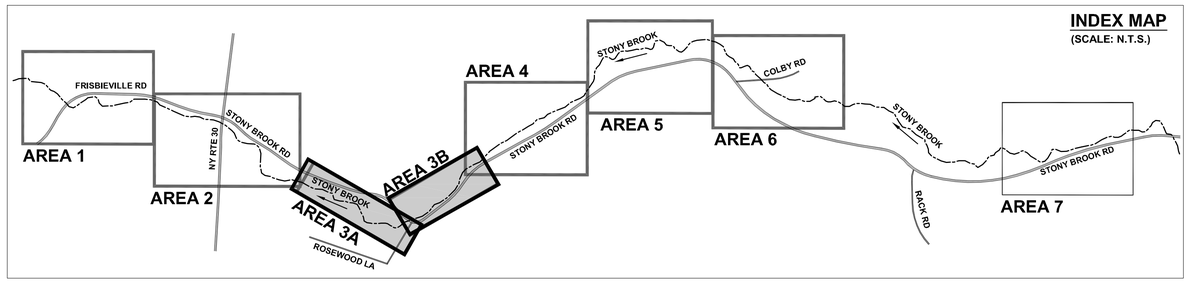


AREA 3B - PLAN VIEW
(SCALE: 1"=40')



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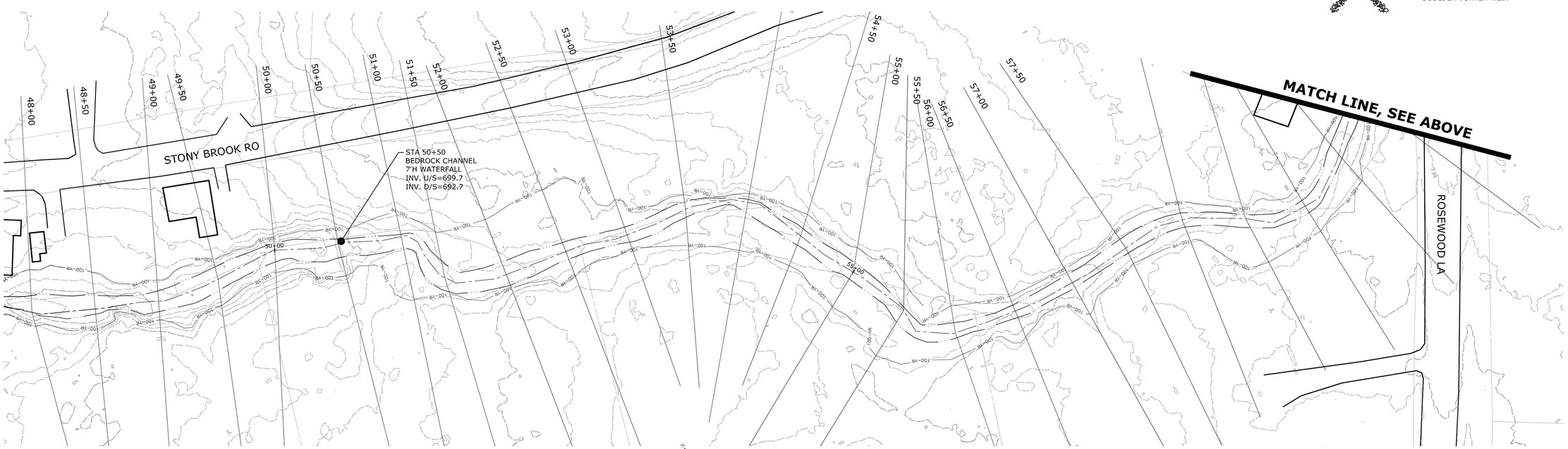

AREA 3A - PLAN VIEW
(SCALE: 1"=40')

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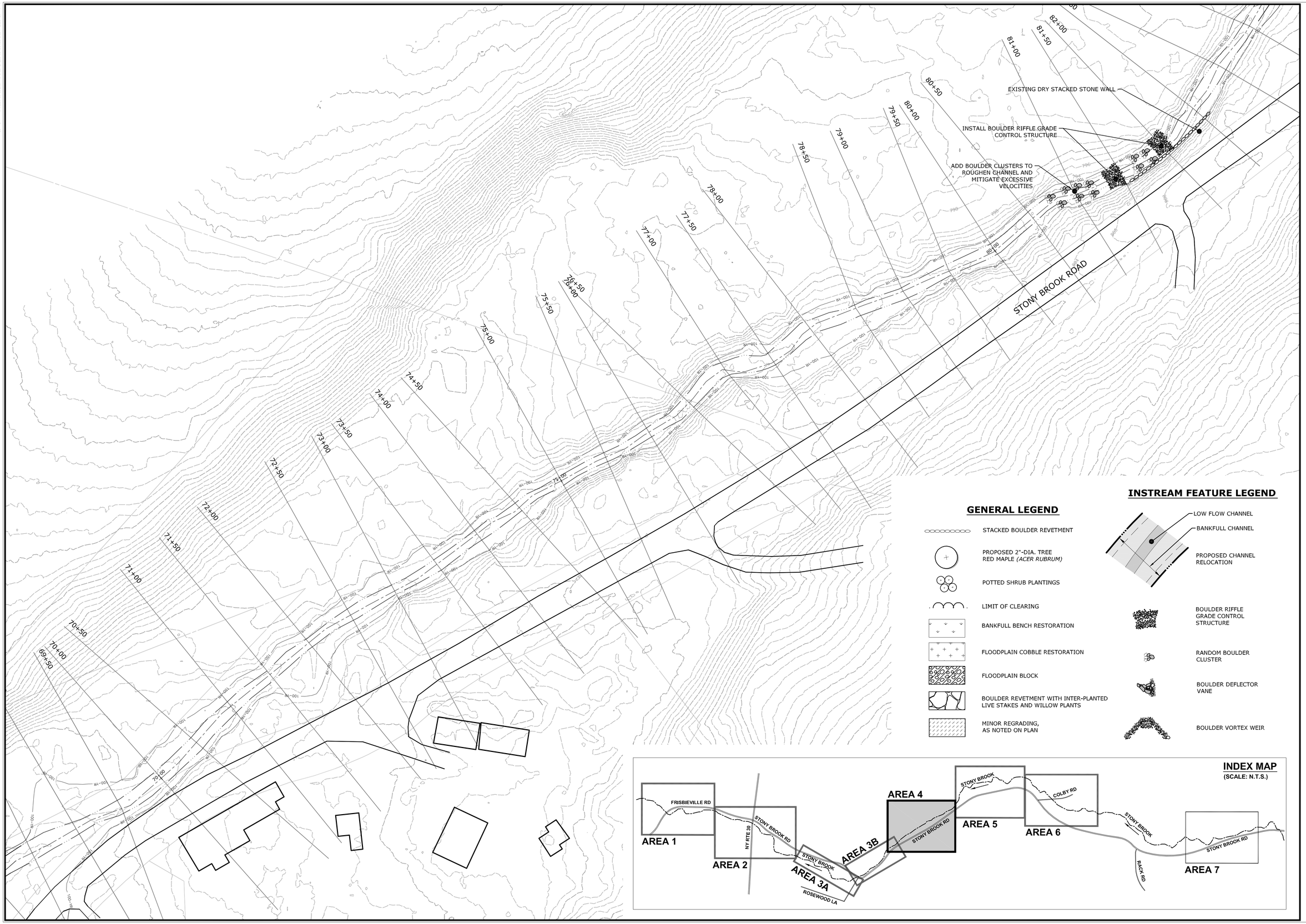

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PROJECT NO.: 4805-04

SHEET NO.: 04 OF 07

SHEET NAME: AREA 4

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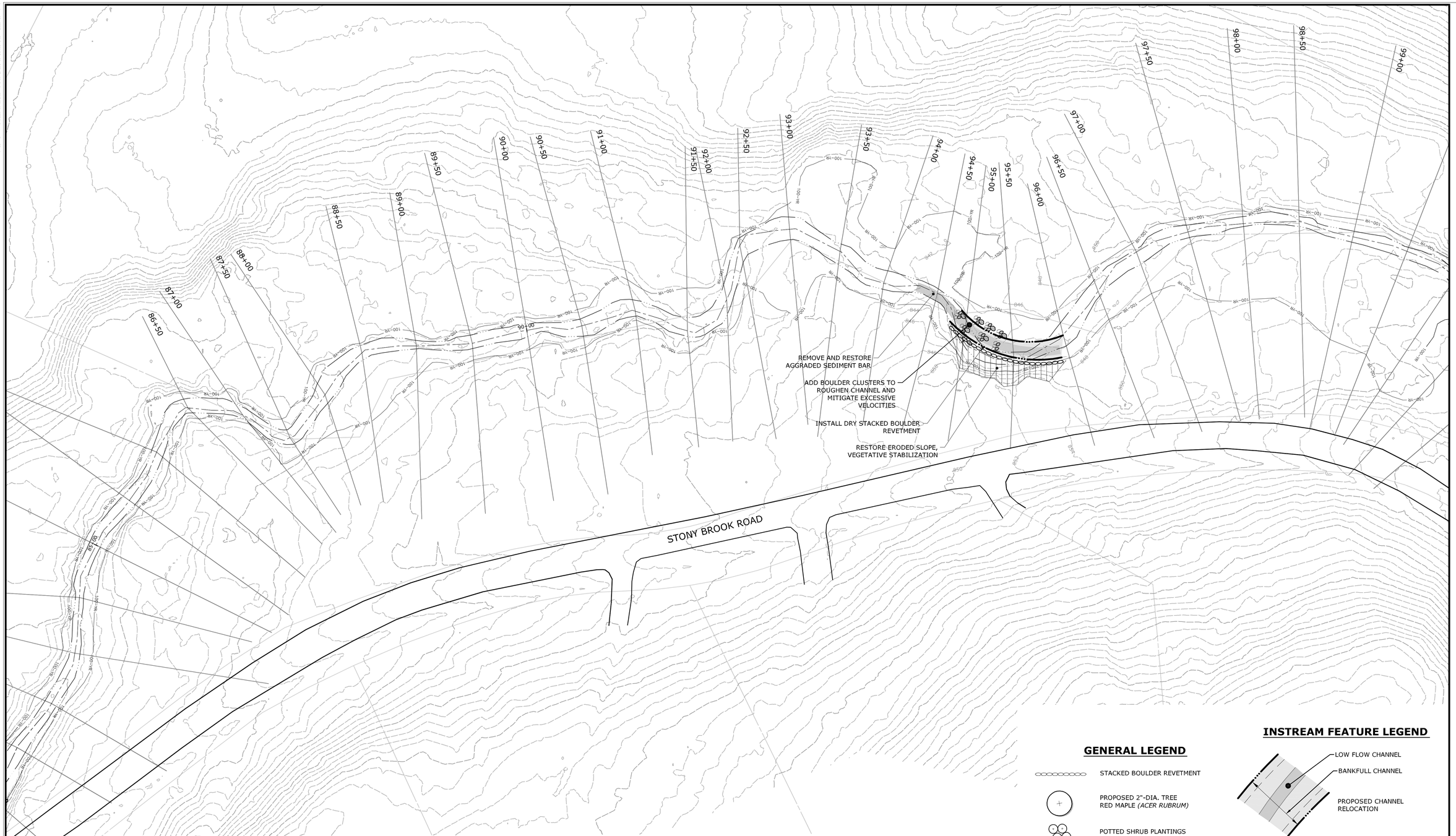
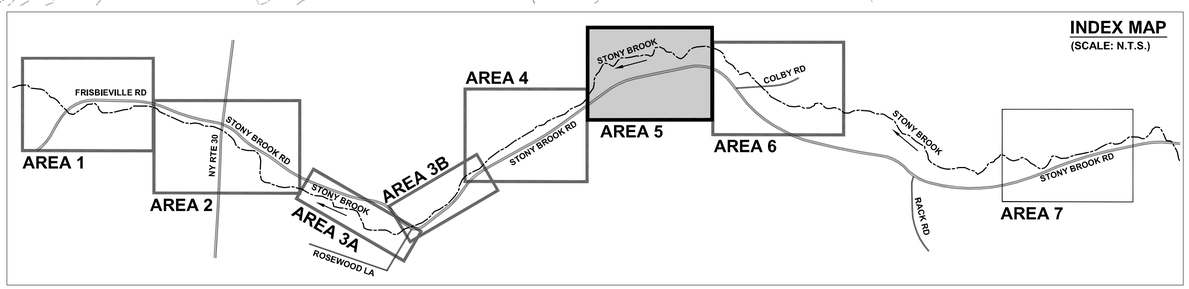


INDEX MAP
(SCALE: N.T.S.)



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JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 05 OF 07

SHEET NAME: AREA 5

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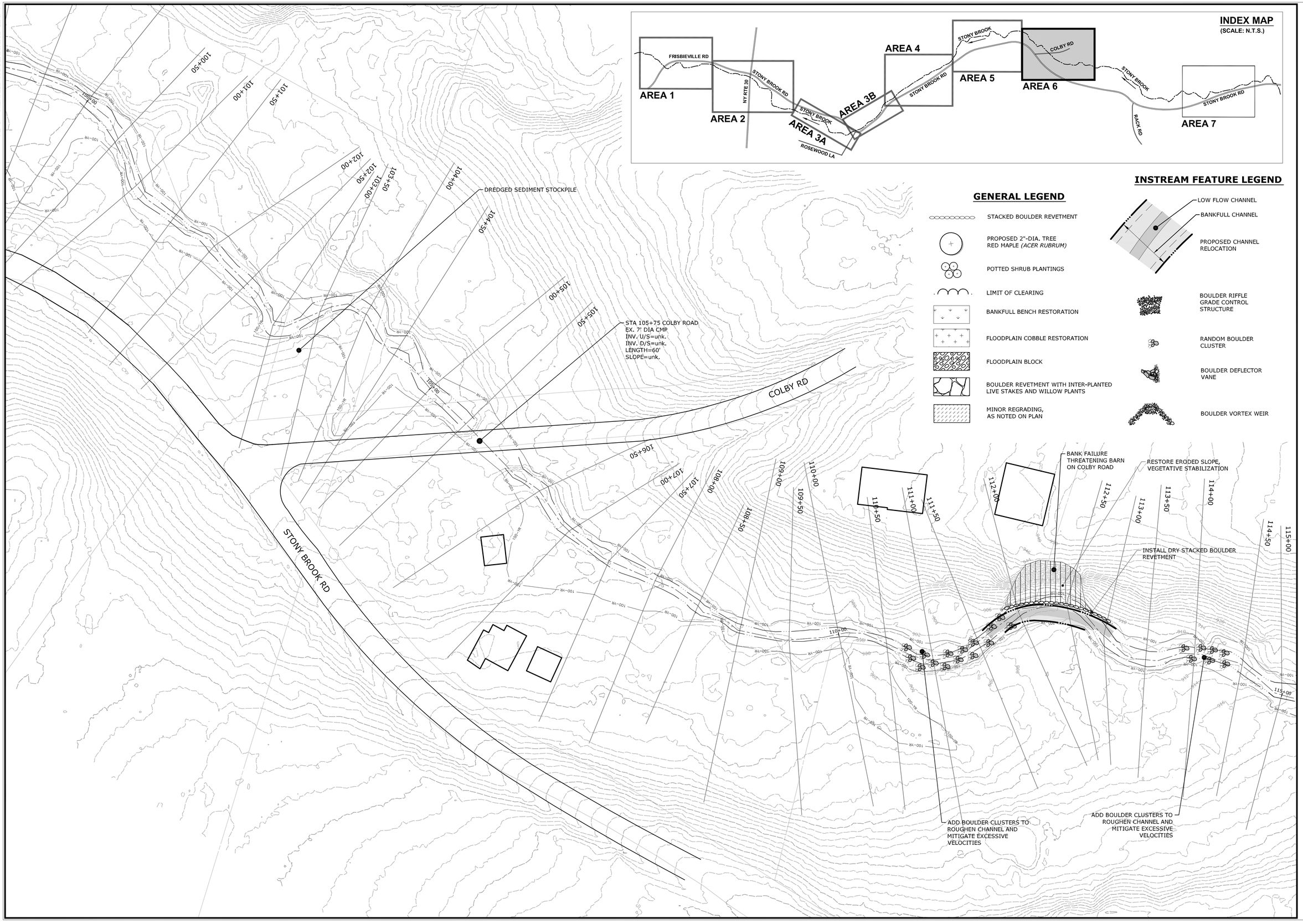

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 6

STONY BROOK STREAM REPAIR AND RESTORATION

NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 06 OF 07

SHEET NAME: **AREA 6**

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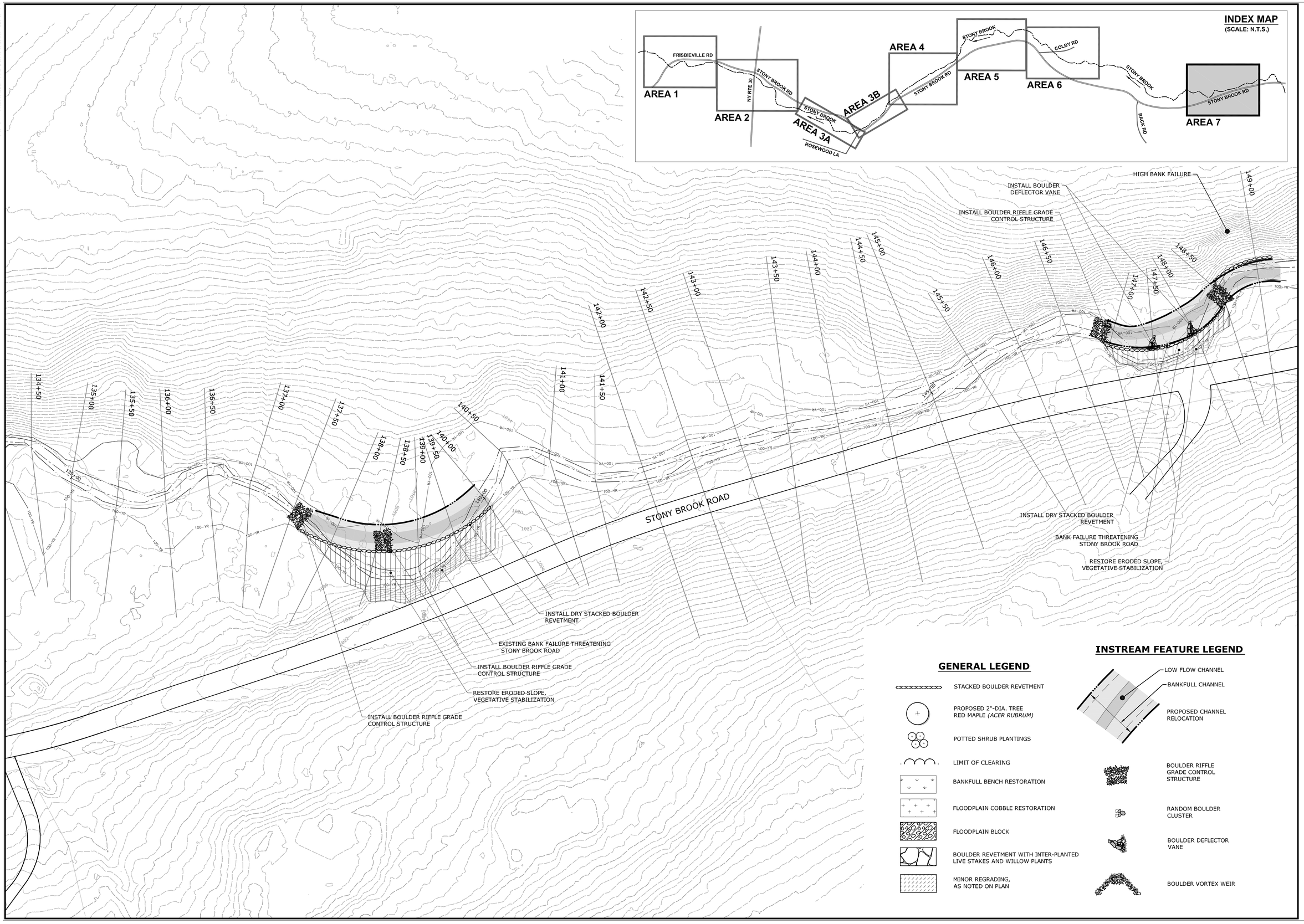

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 7

STONY BROOK
STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 07 OF 07

SHEET NAME: AREA 7

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ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

May 18, 2016

Thomas King
Governor's Office of Storm Recovery
99 Washington Ave, Suite 1224
Albany, NY 12231

Re: HTF/ GOSR/ HUD CDBG-DR
Stony Brook Flood Mitigation Project
Schoharie/ Schoharie County
16PR3037

Dear Mr. King:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Title 54, Section 306108 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/ Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

Based on this review, the opinion of the SHPO is that there will be No Historic Properties Affected by the proposed undertaking.

If I can be of further assistance, please contact me at (518) 268-2187 or Larry.moss@parks.ny.gov

Sincerely,

L Moss

Larry K Moss, Historic Preservation Technical Specialist
CC: Mary Barthelme
Alicia Shultz, NYSHCR
Ashley Ley, AKRF

May 19, 2016

Ron LaFrance, Jr; Paul Thompson; and Beverly Cook, Chiefs
St. Regis Mohawk Tribe
412 State Route 37
Akwesasne, NY 13655

Re: Section 106 Compliance for the Stony Brook Creek Mitigation Project, Town of Schoharie, Schoharie County, New York.

Dear Chiefs of the St. Regis Mohawk Tribe:

Pursuant to the Disaster Relief Appropriations Act, 2013 (Public Law 113-2) and the Housing and Community Development Act (42 U.S.C. § 5301 et seq.), the Governor's Office of Storm Recovery (GOSR) is acting under the auspices of New York State Homes and Community Renewal's Housing Trust Fund Corporation as a recipient of Community Development Block Grant – Disaster Recovery ("CDBG-DR") funds from the United States Department of Housing and Urban Development ("HUD"). GOSR is the entity responsible for compliance with the HUD environmental review procedures set forth in 24 CFR Part 58. GOSR is acting on behalf of HUD in providing the enclosed project information and inviting this discussion with your Tribe to respond with any concerns or comments.

GOSR processes environmental reviews for projects funded with HUD CDBG-DR on a case-by-case basis. GOSR proposes to provide funding for a stream repair and restoration project along approximately 2.6 miles of Stony Brook in the Town of Schoharie, Schoharie County. New York. In accordance with Section 101(d)(6)(B) of the National Historic Preservation Act of 1966, as amended (54 U.S.C. 302706(b)), and its implementing regulations, 36 Code of Federal Regulations (CFR) Part 800, this letter serves as notification of the proposed action. This consultation is being sent to the Mohawk Nation, the St. Regis Mohawk Tribe, and the Stockbridge-Munsee Community Band of the Mohicans.

Area of Potential Effect: The Schoharie County Soil & Water Conservation District ("SCSWCD") is pursuing a stream repair and restoration project along approximately 2.6 miles of Stony Brook (the "Proposed Project"). Stony Brook is a tributary to Schoharie Creek, which flows to the Mohawk River and then to the Hudson River. The project site is located in the town of Schoharie, in northeastern Schoharie County, New York (see Attachment 1). Recent, severe flooding events, most significantly Tropical Storm Irene in 2011, and also a June 2013 flood event have resulted in severe bed and bank erosion within the Stony Brook channel as well as aggradation of bedload sediment. This aggradation of sediment has clogged culvert and bridge crossings, leading to the reduction of flood conveyance capacity in the channel. The sediment migration has caused the channel to become unstable, with bank erosion and excessive sedimentation in many areas. The Area of Potential Effect (APE) is shown in Attachment 2.

Proposed Project Description: The Proposed Project involves the stream repair and restoration of approximately 2.6 miles of Stony Brook. The Proposed Project includes eight (8) proposed restoration areas and is anticipated to improve the health of the riverine system, prevent flooding and protect infrastructure and private residential properties during storm events. Below are the eight (8) proposed restoration areas (see Attachment 3).

Area 1
Channel Location (STA): 32+00 – 14+50
Latitude: 42.645601 / Longitude: -74.326106

Area 2
Channel Location (STA): 32+50 – 44+00
Latitude: 42.644488 / Longitude: -74.321308

Area 3A
Channel Location (STA): 48+50 – 67+00
Latitude: 42.642651 / Longitude: -74.316228

Area 3B
Channel Location (STA): 48+50 – 67+00
Latitude: 42.642989 / Longitude: -74.313465

Area 4
Channel Location (STA): 70+00 – 82+00
Latitude: 42.644698 / Longitude: -74.309846

Area 5
Channel Location (STA): 86+00 – 99+00
Latitude: 42.646348 / Longitude: -74.305249

Area 6
Channel Location (STA): 100+50 – 114+00
Latitude: 42.645921 / Longitude: -74.300552

Area 7
Channel Location (STA): 134+00 – 150+00
Latitude: 42.644092 / Longitude: -74.290176

The Proposed Project would include development of sediment management standards to guide removal of sediment and proper channel sizing at the above locations. In addition, based on the engineering study, the following improvement measures are also proposed for specific areas: installation of rock vane structures to improve sediment transport; removal of sidecast sediments; installation of grade control to arrest channel incision and prevent additional incision; repair and restacking of stacked rock revetment wall and installation of grade control; roughening of channel with random boulder placement; bank failure repair and relocation of channel away from toe of slope; replacement of undersized culvert at Frisbieville Road; and replacement of undersized culvert at Stony Brook Road.

Pursuant to NHPA Section 106, GOSR has initiated consultation with the State Historic Preservation Office (SHPO) concerning this Project and its potential to affect historic resources that are listed on or eligible for listing on the NRHP. The SHPO's finding for this project is no Historic Properties Affected. GOSR is completing an environmental review for this project pursuant to HUD NEPA regulations. If the Area of Potential Effect encompasses historic properties of religious or cultural significance to your Tribe, please respond within 30 days or sooner. Additionally, please indicate if there are other sources of information or other parties, Nations, Tribes, or members of the public you believe should be included in the consultation process. Please respond by email or in writing to the address listed below.

Mr. Thomas King
Certifying Environmental Officer
Governor's Office of Storm Recovery
99 Washington Avenue
Suite 1224
Albany, New York 12260

I am available to answer any questions that you may have regarding this action. If you have any questions, please feel free to contact me at (518) 473-0015 or via email at Thomas.King@stormrecovery.ny.gov.

Sincerely,

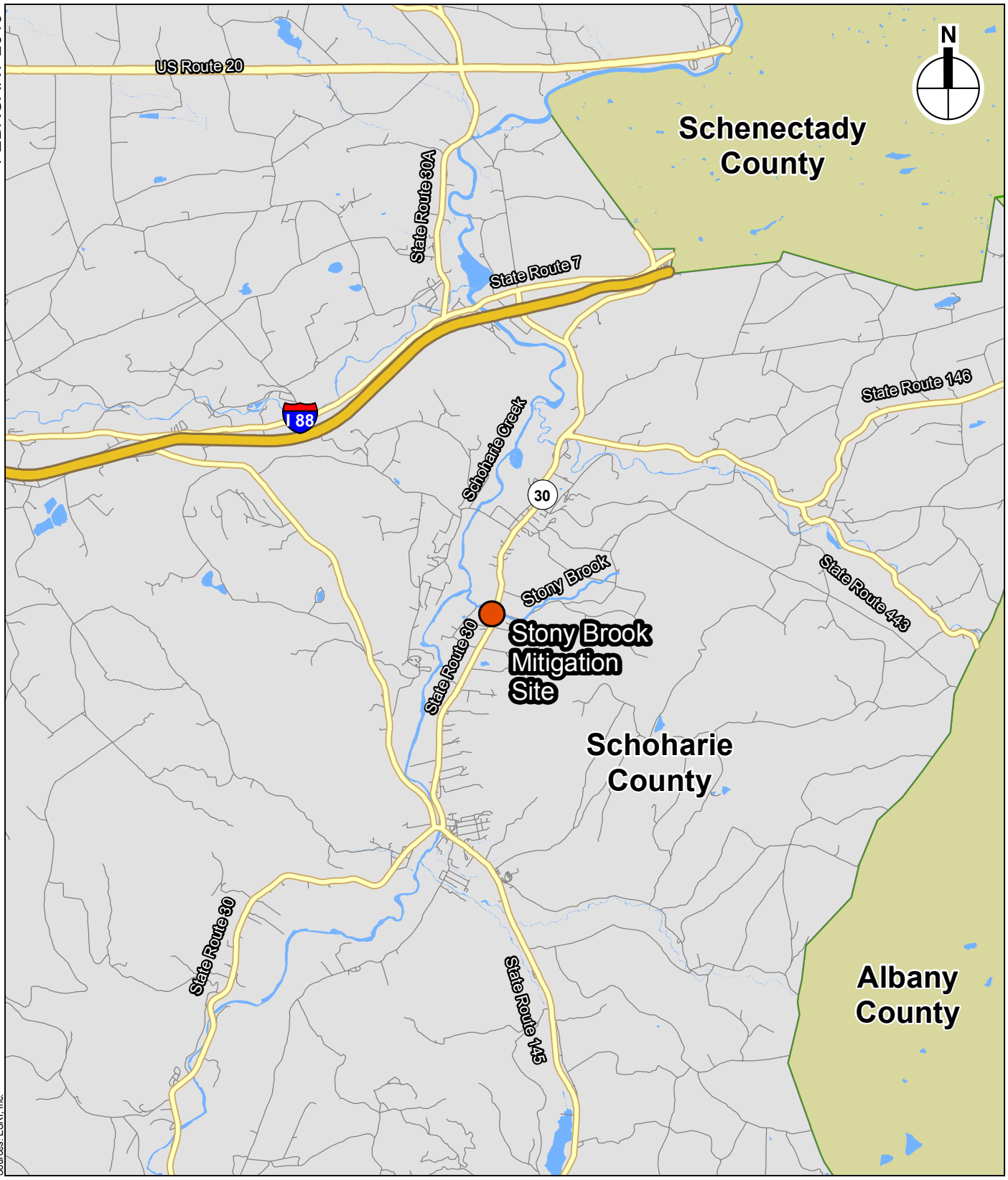
Thomas J. King
Assistant General Counsel and Certifying Officer
Governor's Office of Storm Recovery

Enclosures:
Project Location Map
Design Plans

Electronic letter sent to:
Arnold Printup
Saint Regis Mohawk Tribe, THPO
412 State Route 37
Akwesasne, NY 13655

Attachment 1:
Project Location Map

FEBRUARY 2016



Sources: ESRI, Inc.

Site Location

0 3 Miles

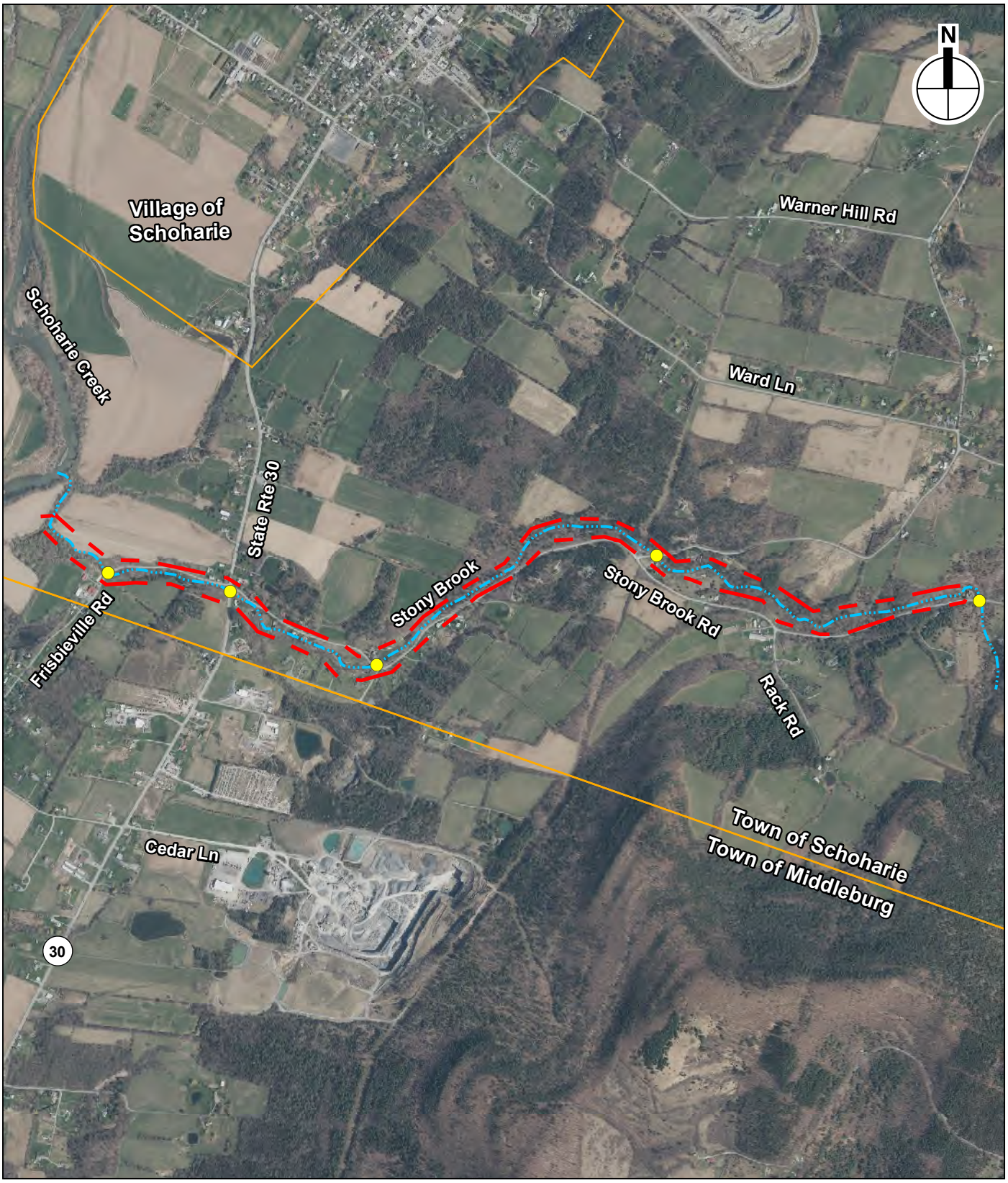
Project Location Map

Stony Brook Mitigation, Town of Schoharie

Figure 1

Attachment 2:
Project Site Map

FEBRUARY 2016



Sources: NYSDOP 2014

0 0.5 Mile

Culvert

Stony Brook

Area of Potential Effect

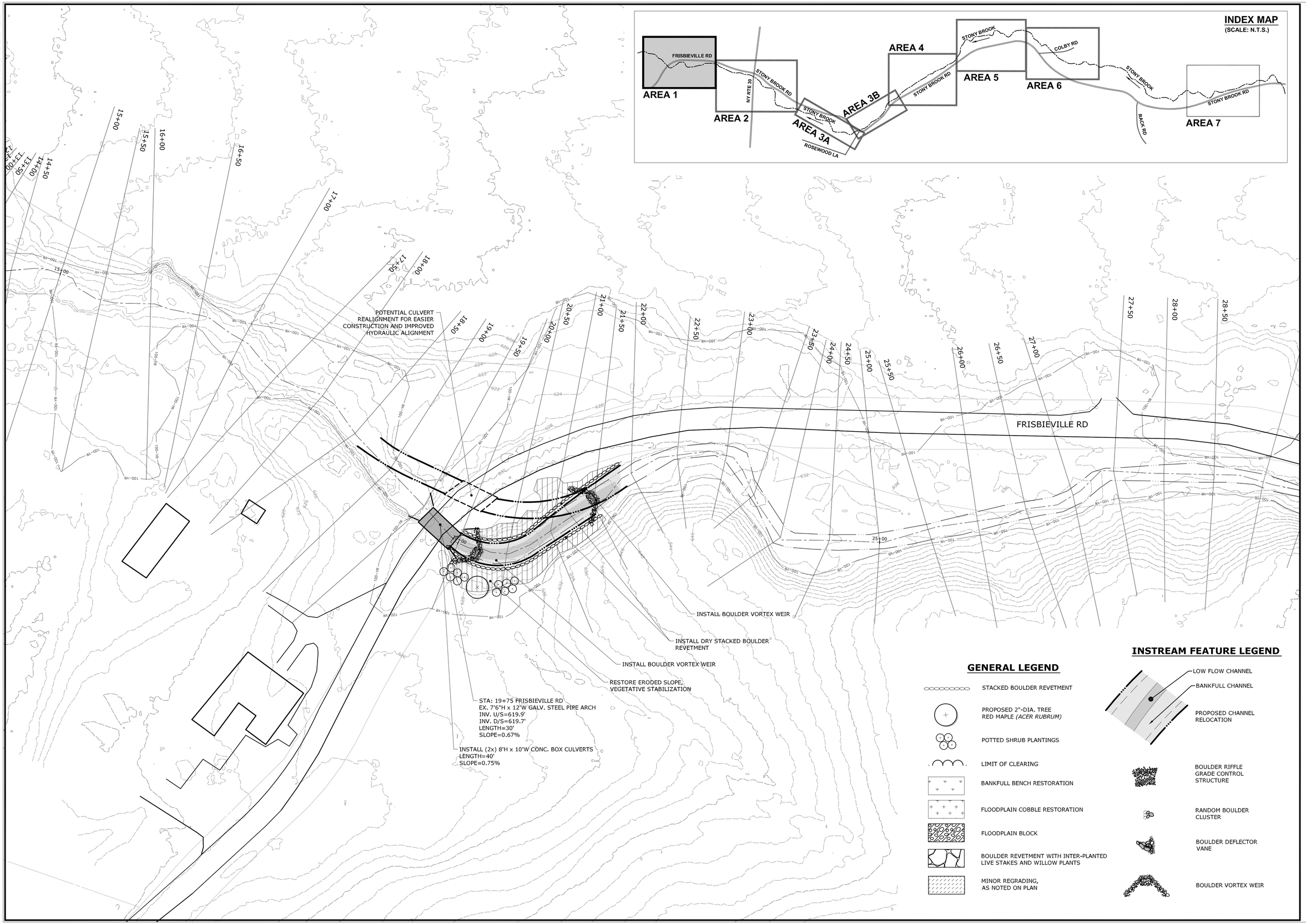
Municipal Boundaries

Project Site Map

Stony Brook Mitigation, Town of Schoharie

Figure 2

Attachment 3:
Conceptual Design Plans



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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 1

STONY BROOK
STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 01 OF 07

SHEET NAME: AREA 1

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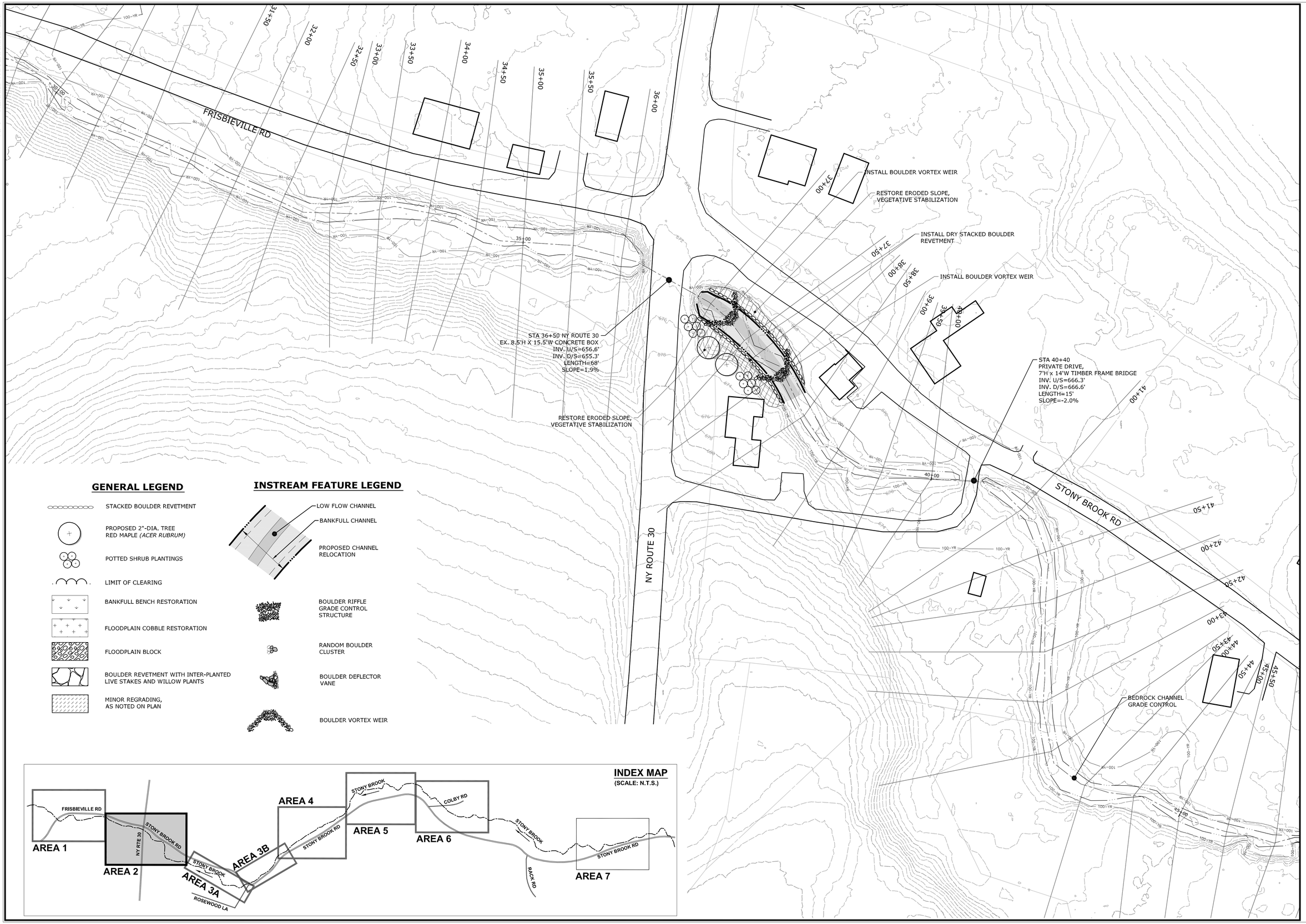

GENERAL LEGEND

- STACKED BOULDER REVETMENT
- PROPOSED 2"-DIA. TREE RED MAPLE *(ACER RUBRUM)*
- POTTED SHRUB PLANTINGS
- LIMIT OF CLEARING
- BANKFULL BENCH RESTORATION
- FLOODPLAIN COBBLE RESTORATION
- FLOODPLAIN BLOCK
- BOULDER REVETMENT WITH INTER-PLANTED LIVE STAKES AND WILLOW PLANTS
- MINOR REGRADING, AS NOTED ON PLAN

INSTREAM FEATURE LEGEND

- LOW FLOW CHANNEL
- BANKFULL CHANNEL
- PROPOSED CHANNEL RELOCATION
- BOULDER RIFFLE GRADE CONTROL STRUCTURE
- RANDOM BOULDER CLUSTER
- BOULDER DEFLECTOR VANE
- BOULDER VORTEX WEIR

INDEX MAP

(SCALE: N.T.S.)

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 2

STONY BROOK STREAM REPAIR AND RESTORATION

NY ROUTE 30, AND STONY BROOK ROAD AREA

SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 02 OF 07

SHEET NAME: **AREA 2**

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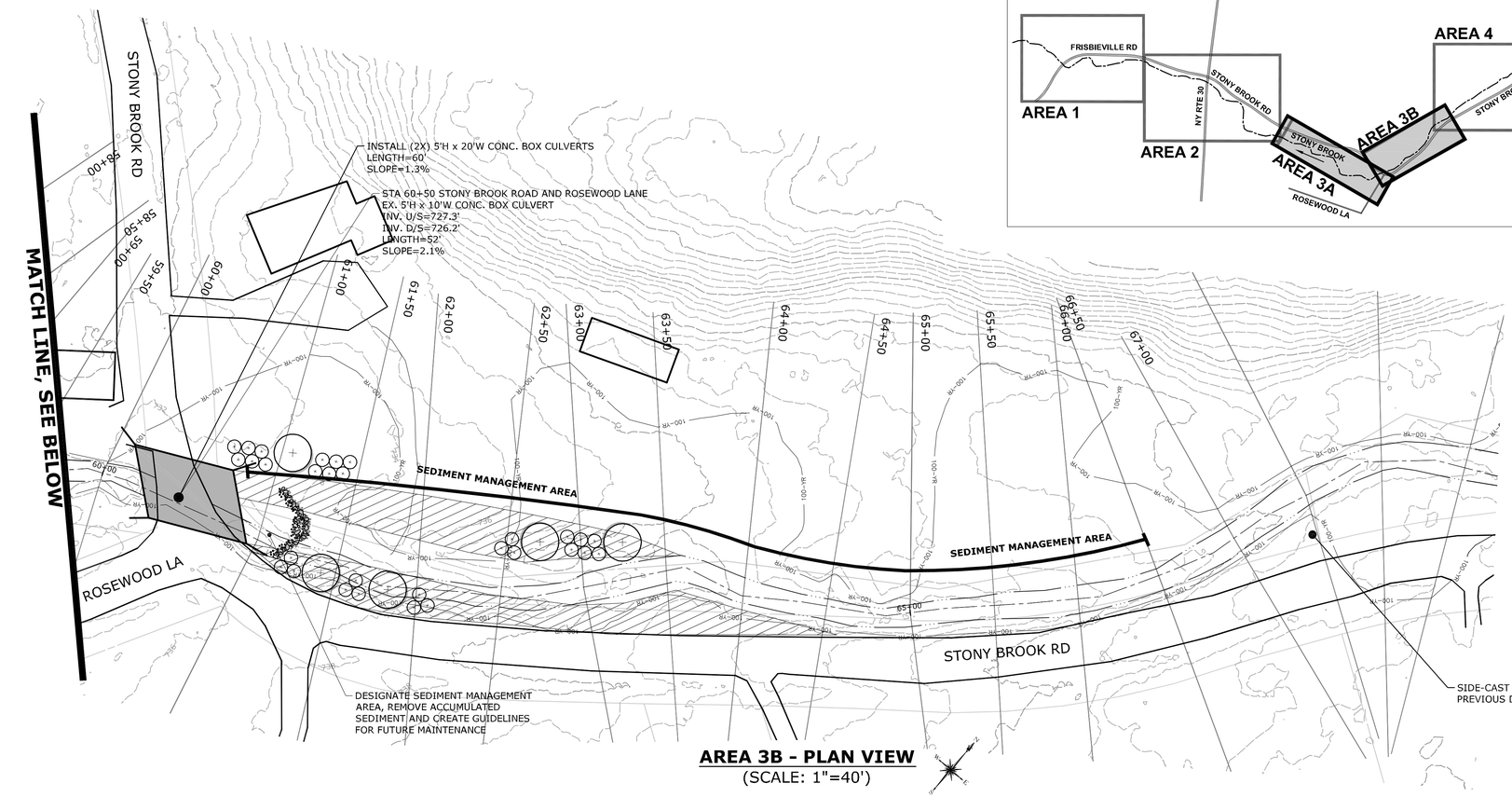
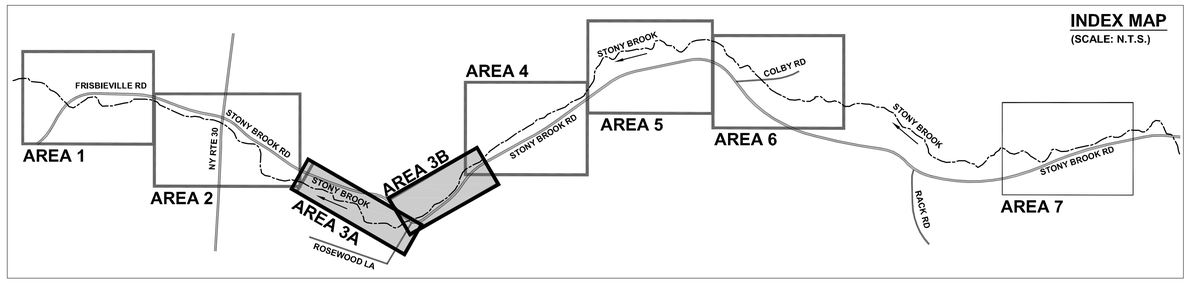
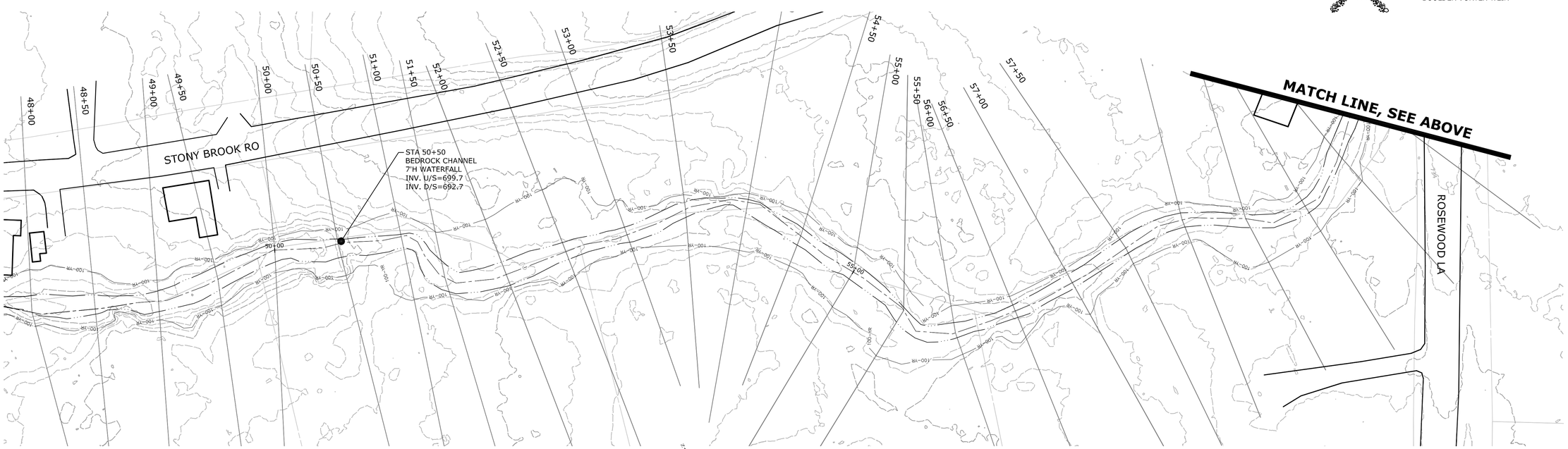


AREA 3B - PLAN VIEW
(SCALE: 1"=40')



LEGEND

- STACKED BOULDER REVETMENT
- EXISTING 100-YEAR FLOODPLAIN (HYDRAULIC MODELING)
- EXISTING EDGE OF LOW-FLOW CHANNEL
- LOW FLOW CHANNEL
- BANKFULL CHANNEL
- PROPOSED CHANNEL RELOCATION
- BOULDER RIFFLE GRADE CONTROL STRUCTURE
- RANDOM BOULDER CLUSTER
- BOULDER DEFLECTOR VANE
- BOULDER VORTEX WEIR



AREA 3A - PLAN VIEW
(SCALE: 1"=40')

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PROPOSED CONCEPT DESIGN - AREA 3

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SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'
DATE: JAN. 2016
PROJECT NO.: 4805-04
SHEET NO.: 03 OF 07

SHEET NAME: **AREA 3**

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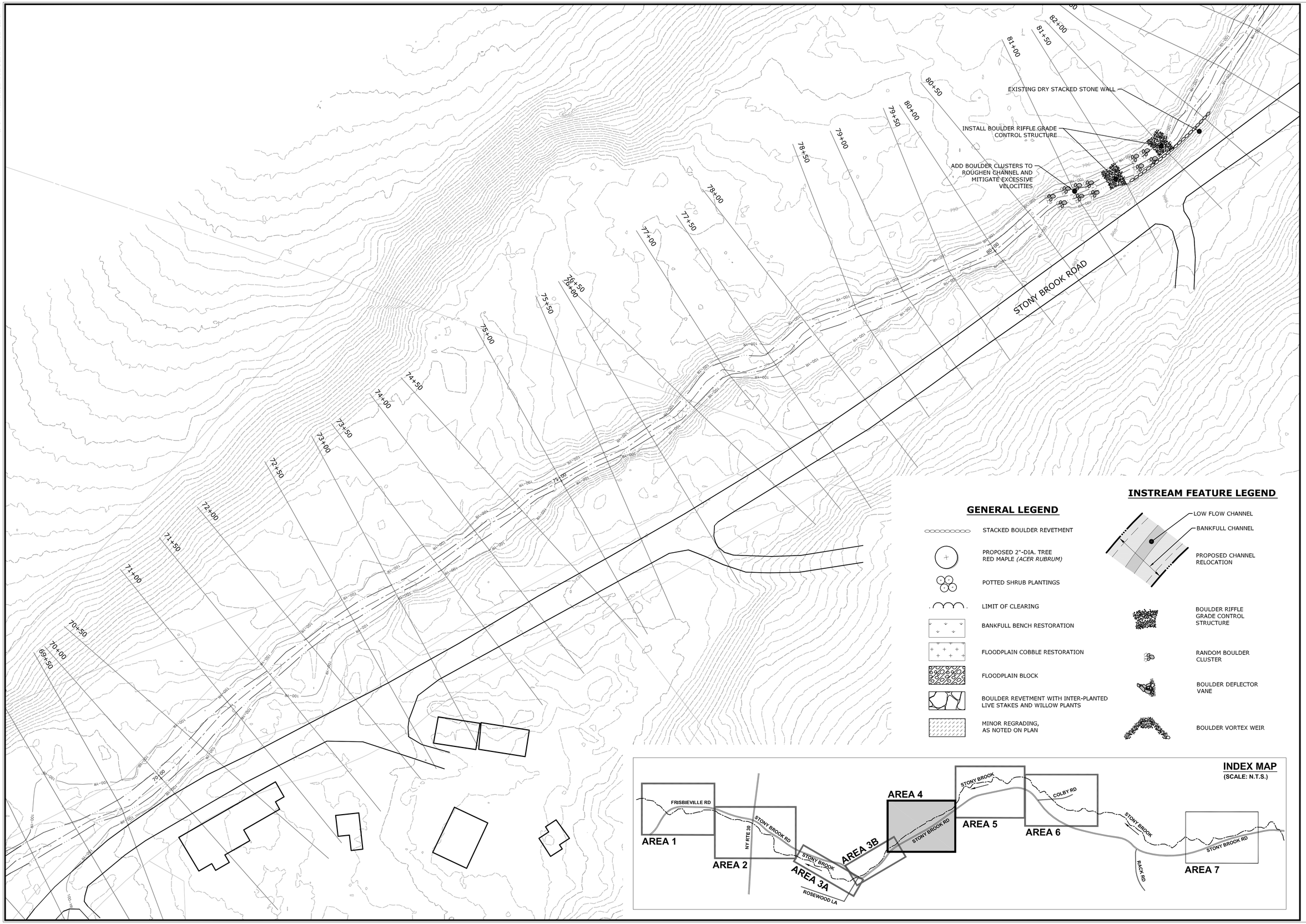

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PROPOSED CONCEPT DESIGN - AREA 4

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STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 04 OF 07

SHEET NAME: AREA 4

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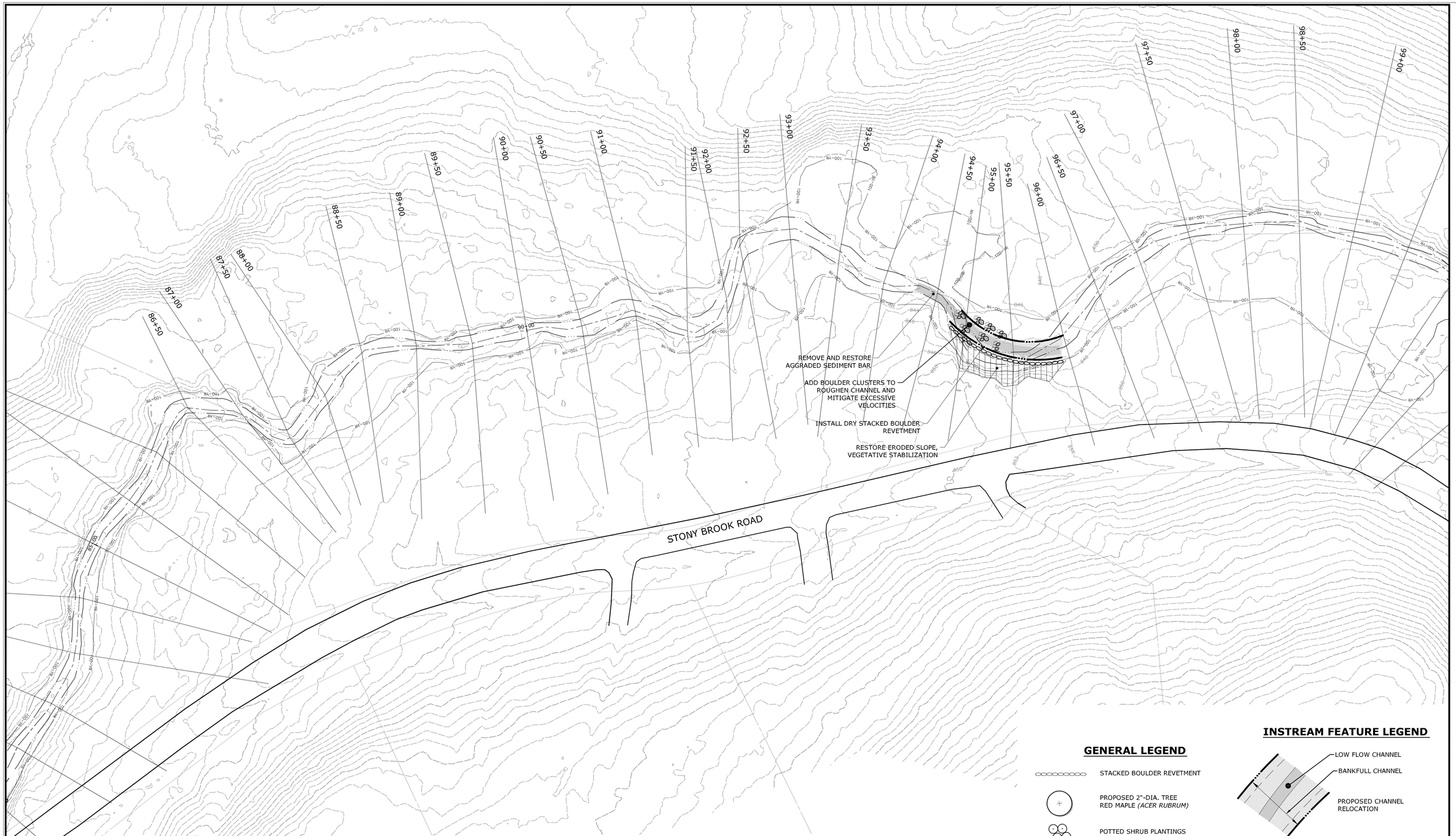
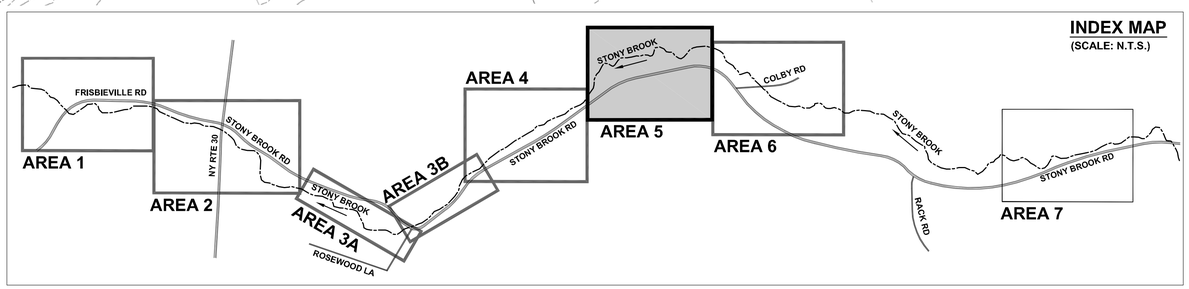


INDEX MAP
(SCALE: N.T.S.)



GENERAL LEGEND

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SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 05 OF 07

SHEET NAME: AREA 5

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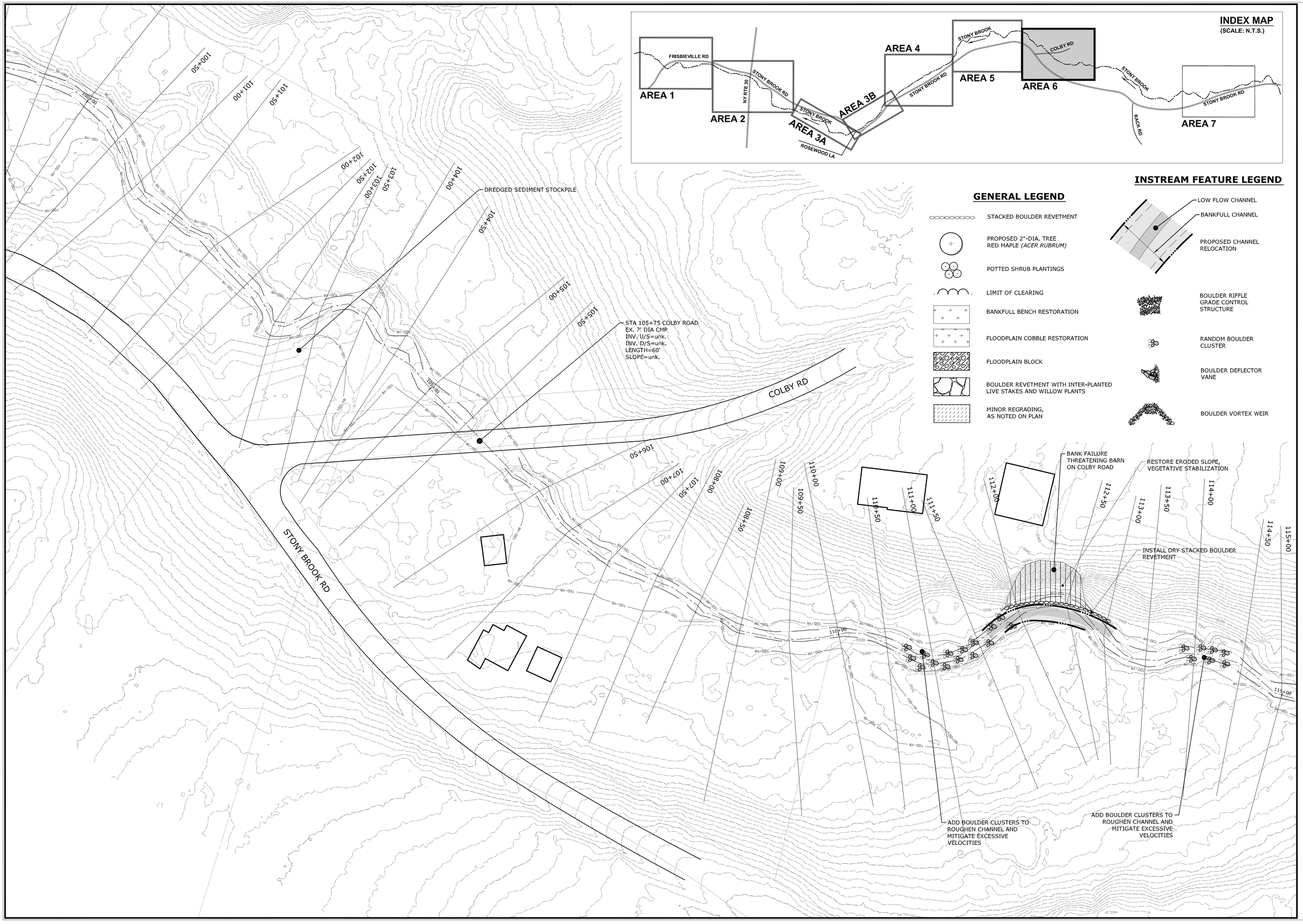

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 6

STONY BROOK STREAM REPAIR AND RESTORATION

NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 06 OF 07

SHEET NAME: **AREA 6**

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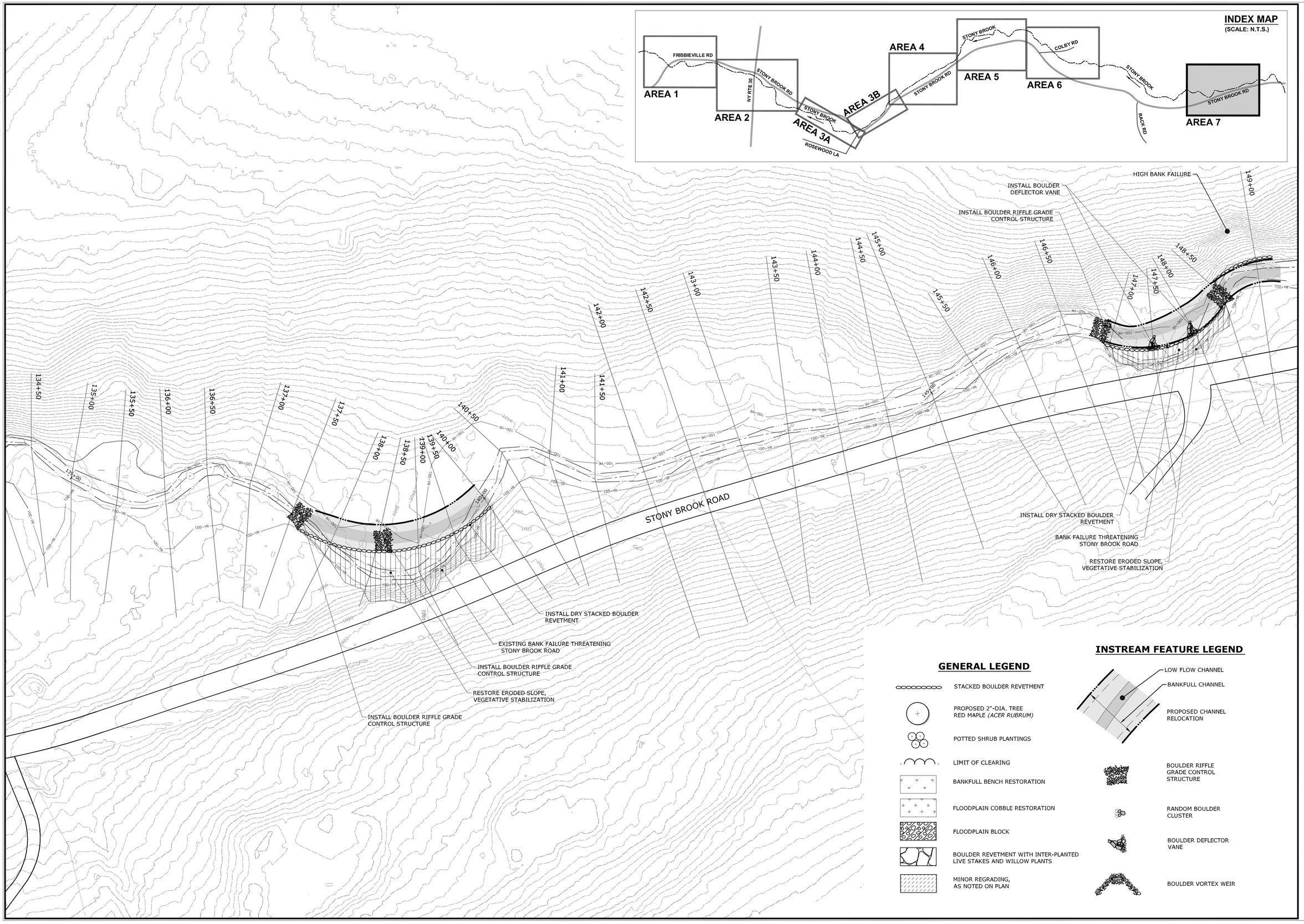

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PROPOSED CONCEPT DESIGN - AREA 7

STONY BROOK
STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 07 OF 07

SHEET NAME: AREA 7

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ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

May 18, 2016

Thomas King
Governor's Office of Storm Recovery
99 Washington Ave, Suite 1224
Albany, NY 12231

Re: HTF/ GOSR/ HUD CDBG-DR
Stony Brook Flood Mitigation Project
Schoharie/ Schoharie County
16PR3037

Dear Mr. King:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Title 54, Section 306108 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/ Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

Based on this review, the opinion of the SHPO is that there will be No Historic Properties Affected by the proposed undertaking.

If I can be of further assistance, please contact me at (518) 268-2187 or Larry.moss@parks.ny.gov

Sincerely,

L Moss

Larry K Moss, Historic Preservation Technical Specialist
CC: Mary Barthelme
Alicia Shultz, NYSHCR
Ashley Ley, AKRF

From: Bonney Hartley
To: Barthelme, Mary (STORMRECOVERY)
Subject: RE: Section 106 Compliance for the Stony Brook Creek Mitigation Project, Town of Schoharie, Schoharie County, New York.
Date: Friday, June 10, 2016 10:26:59 AM

ATTENTION: This email came from an external source. Do not open attachments or click on links from unknown senders or unexpected emails.

Hi Mary,
I have completed review and confirm on behalf of Stockbridge-Munsee Mohican Tribe that we do not have significant cultural resource concerns. We do not have known cultural sites in this location of Stony Brook Creek, Schoharie, Schoharie County.
However, as always, should any cultural resources inadvertently be discovered during project activities we request immediate notice.
Thank you,
Bonney

Bonney Hartley
Tribal Historic Preservation Officer
Stockbridge-Munsee Mohican Tribal Historic Preservation
New York Office
65 1st Street
Troy, NY 12180
(518) 244-3164
Bonney.Hartley@mohican-nsn.gov
www.mohican-nsn.gov
Physical Address: 37 1st Street

From: Barthelme, Mary (STORMRECOVERY) [mailto:Mary.Barthelme@stormrecovery.ny.gov]
Sent: Friday, May 20, 2016 12:03 PM
To: Bonney Hartley
Subject: RE: Section 106 Compliance for the Stony Brook Creek Mitigation Project, Town of Schoharie, Schoharie County, New York.

Hello Bonney,

I attempted to send the following consult to you yesterday but it looks like it got bounced back to me because it was too large.

Attached is 1 of 2 documents for the project referenced above.

Thank you,

Mary

From: Barthelme, Mary (STORMRECOVERY)
Sent: Thursday, May 19, 2016 3:33 PM
To: 'Bonney Hartley' <Bonney.Hartley@mohican-nsn.gov>
Subject: Section 106 Compliance for the Stony Brook Creek Mitigation Project, Town of Schoharie, Schoharie County, New York.

Dear Bonney,

Please see the attached consultation for the above-mentioned project.

A hard copy is being sent today by mail. Please let me know if you have any questions.

Thank you,

Mary Barthelme

Mary Barthelme
Environmental and Historic Preservation Specialist
Bureau of Environmental Review and Assessment
Governor's Office of Storm Recovery
99 Washington Avenue Suite 1224
Albany, New York 12260
Office: (518) 473-0154
Cell: (646) 706-6748
Mary.Barthelme@stormrecovery.ny.gov

Saint Regis Mohawk Tribe

June 22, 2016

Mr. Thomas King
Govenor's Office on Storm Recovery
25 Beaver Street
New York NY 10004

Re: Stony Brook Creek Mitigation Project

She:kon Mr.King,

This letter is in response to a request for a Section 106 consultation between your agency and the Saint Regis Mohawk Tribe. The following project(s) that you requested my office to consult on is considered to have "No Effect" in regards to cultural properties of concern to the Saint Regis Mohawk Tribe.

Stony Brook Creek Mitigation Project, Town of Schoharie, Schoharie County NY

The St. Regis Mohawk Tribe requests to be immediately contacted in the event any inadvertent discoveries of human remains, funerary objects, sacred objects and objects of cultural patrimony are made during the scope of this project.

Should you or your office have any further questions in regards to these comments please feel free to contact my office at your earliest convenience.

Nia:wen,

Arnold L Printup
Saint Regis Mohawk Tribe
Tribal Historic Preservation Office
1(518)358-2272 Ext. 2163

412 State Route 37
Akwesasne, New York 13655
www.srmt-nsn.gov
Phone: 518-358-2272

Affidavit of Mailing

STATE OF NEW YORK)
: SS. :
COUNTY OF ALBANY)

MARY BARTHELME, being duly sworn, deposes and says:

1. I am over the age of eighteen years.
2. On April 27, 2017, I mailed true and correct copies of the annexed Updated Stony Brook Mitigation Project Tribal Consultations dated April 27, 2017 by placing the same in first class post-paid envelopes addressed: SEE ATTACHED LIST.
3. On said day, I deposited said envelopes in a mailbox at 99 Washington Avenue, Albany, New York 12210.

Mary Barthelme

Sworn to before me this
1st day of May, 2017

Notary Public

Stephanie Maier
Notary Public, State of New York
Qualified in Rensselaer County
No. 01MA6337406
Commission Expires February 22, 2020

Ron LaFrance, Jr; Paul Thompson;
and Beverly Cook, Chiefs
St. Regis Mohawk Tribe
412 State Route 37
Akwesasne, NY 13655

Mohawk Nation Council of Chiefs
of Haudenosaunee Six Nations
Confederacy
Akwesasane Territory Box 336
Via Rooseveltown, NY 13683-0366

Shannon Holsey, President
Stockbridge-Munsee Community,
Band of the Mohicans
N8476 Moh He Con Nuck Road
Bowler, WI 54416

Governor's Office of
Storm Recovery

ANDREW M. CUOMO
Governor

LISA BOVA-HIATT
Executive Director

April 27, 2017

Mohawk Nation Council of Chiefs
of Haudenosaunee Six Nations Confederacy
Akwesasane Territory Box 336
Via Rooseveltown, NY 13683-0366

Re: Updated Section 106 Compliance for the Stony Brook Creek Mitigation Project, Town of Schoharie, Schoharie County, New York

Dear Chiefs of the Mohawk Nation:

Pursuant to the Disaster Relief Appropriations Act, 2013 (Public Law 113-2) and the Housing and Community Development Act (42 U.S.C. § 5301 et seq.), the Governor's Office of Storm Recovery (GOSR), an office of New York State Homes and Community Renewal's Housing Trust Fund Corporation as a recipient of Community Development Block Grant – Disaster Recovery ("CDBG-DR") funds from the United States Department of Housing and Urban Development ("HUD"), is serving as the entity responsible for compliance with the HUD environmental review procedures set forth in 24 CFR Part 58. GOSR is acting on behalf of HUD in providing the enclosed project information and inviting this discussion with your Nation to respond with any concerns or comments.

GOSR processes environmental reviews for projects funded with HUD CDBG-DR on a case-by-case basis. In accordance with Section 101(d)(6)(B) of the National Historic Preservation Act (NHPA) of 1966, as amended (16 U.S.C. 470a), and its implementing regulations, 36 Code of Federal Regulations (CFR) Part 800, this letter serves as notification of the proposed action. This updated consultation is being sent to the Mohawk Nation, the Saint Regis Mohawk Tribe, and the Stockbridge-Munsee Community Band of the Mohicans.

Proposed Project Description and Area of Potential Effects: GOSR submitted a consultation for the Stony Brook Flood Mitigation Project to you on May 19, 2016 (Attachment 1). Since that date the project has changed to include the demolition of a barn located within the APE. The barn must be demolished to make way for the Stony Brook flood improvements to take place in the APE. The design plans and complete project description are provided in Attachment 2. Photographs of the barn and the surrounding area are provided in Attachment 3.

With this letter, GOSR respectfully submits for your review the attached documentation for the proposed project described herein. GOSR initiated an updated consultation with the New York State Historic Preservation Office and no comments have been received to date. If the Area of Potential Effect encompasses historic properties of religious or cultural significance to your Nation, please respond within 30 days or sooner. Additionally, please indicate if there are other

sources of information or other parties, Nations, Tribes, or members of the public you believe should be included in the consultation process. Please respond by email or in writing to the address listed below.

Alicia Shultz
Bureau of Environmental Review and Assessment
Governor's Office of Storm Recovery
New York State Homes & Community Renewal
38-40 State St.,408N, Hampton Plaza
Albany, NY 12207

I am available to answer any questions that you may have regarding this action. If you have any questions, please feel free to contact me at (518) 474-0647 or via email at Alicia.Shultz@nyshcr.org.

Sincerely,

Alicia Shultz
Senior Environmental Scientist
Bureau of Environmental Review and Assessment
Governor's Office of Storm Recovery

Enclosures:
Previous Consultation Request
Project Site Maps
Project Engineering Design Plans
Site Photographs

Attachment 1

May 19, 2016

Mohawk Nation Council of Chiefs
of Haudenosaunee Six Nations Confederacy
Akwesasane Territory Box 336
Via Rooseveltown, NY 13683-0366

Re: Section 106 Compliance for the Stony Brook Creek Mitigation Project, Town of Schoharie, Schoharie County, New York.

Dear Chiefs of the Mohawk Nation:

Pursuant to the Disaster Relief Appropriations Act, 2013 (Public Law 113-2) and the Housing and Community Development Act (42 U.S.C. § 5301 et seq.), the Governor's Office of Storm Recovery (GOSR) is acting under the auspices of New York State Homes and Community Renewal's Housing Trust Fund Corporation as a recipient of Community Development Block Grant – Disaster Recovery ("CDBG-DR") funds from the United States Department of Housing and Urban Development ("HUD"). GOSR is the entity responsible for compliance with the HUD environmental review procedures set forth in 24 CFR Part 58. GOSR is acting on behalf of HUD in providing the enclosed project information and inviting this discussion with your Nation to respond with any concerns or comments.

GOSR processes environmental reviews for projects funded with HUD CDBG-DR on a case-by-case basis. GOSR proposes to provide funding for a stream repair and restoration project along approximately 2.6 miles of Stony Brook in the Town of Schoharie, Schoharie County. New York. In accordance with Section 101(d)(6)(B) of the National Historic Preservation Act of 1966, as amended (54 U.S.C. 302706(b)), and its implementing regulations, 36 Code of Federal Regulations (CFR) Part 800, this letter serves as notification of the proposed action. This consultation is being sent to the Mohawk Nation, the St. Regis Mohawk Tribe, and the Stockbridge-Munsee Community Band of the Mohicans.

Area of Potential Effect: The Schoharie County Soil & Water Conservation District ("SCSWCD") is pursuing a stream repair and restoration project along approximately 2.6 miles of Stony Brook (the "Proposed Project"). Stony Brook is a tributary to Schoharie Creek, which flows to the Mohawk River and then to the Hudson River. The project site is located in the town of Schoharie, in northeastern Schoharie County, New York (see Attachment 1). Recent, severe flooding events, most significantly Tropical Storm Irene in 2011, and also a June 2013 flood event have resulted in severe bed and bank erosion within the Stony Brook channel as well as aggradation of bedload sediment. This aggradation of sediment has clogged culvert and bridge crossings, leading to the reduction of flood conveyance capacity in the channel. The sediment migration has caused the channel to become unstable, with bank erosion and excessive sedimentation in many areas. The Area of Potential Effect (APE) is shown in Attachment 2.

Proposed Project Description: The Proposed Project involves the stream repair and restoration of approximately 2.6 miles of Stony Brook. The Proposed Project includes eight (8) proposed restoration areas and is anticipated to improve the health of the riverine system, prevent flooding and protect infrastructure and private residential properties during storm events. Below are the eight (8) proposed restoration areas (see Attachment 3).

Area 1
Channel Location (STA): 32+00 – 14+50
Latitude: 42.645601 / Longitude: -74.326106

Area 2
Channel Location (STA): 32+50 – 44+00
Latitude: 42.644488 / Longitude: -74.321308

Area 3A
Channel Location (STA): 48+50 – 67+00
Latitude: 42.642651 / Longitude: -74.316228

Area 3B
Channel Location (STA): 48+50 – 67+00
Latitude: 42.642989 / Longitude: -74.313465

Area 4
Channel Location (STA): 70+00 – 82+00
Latitude: 42.644698 / Longitude: -74.309846

Area 5
Channel Location (STA): 86+00 – 99+00
Latitude: 42.646348 / Longitude: -74.305249

Area 6
Channel Location (STA): 100+50 – 114+00
Latitude: 42.645921 / Longitude: -74.300552

Area 7
Channel Location (STA): 134+00 – 150+00
Latitude: 42.644092 / Longitude: -74.290176

The Proposed Project would include development of sediment management standards to guide removal of sediment and proper channel sizing at the above locations. In addition, based on the engineering study, the following improvement measures are also proposed for specific areas: installation of rock vane structures to improve sediment transport; removal of sidecast sediments; installation of grade control to arrest channel incision and prevent additional incision; repair and restacking of stacked rock revetment wall and installation of grade control; roughening of channel with random boulder placement; bank failure repair and relocation of channel away from toe of slope; replacement of undersized culvert at Frisbieville Road; and replacement of undersized culvert at Stony Brook Road.

Pursuant to NHPA Section 106, GOSR has initiated consultation with the State Historic Preservation Office (SHPO) concerning this Project and its potential to affect historic resources that are listed on or eligible for listing on the NRHP. The SHPO's finding for this project is no Historic Properties Affected. GOSR is completing an environmental review for this project pursuant to HUD NEPA regulations. If the Area of Potential Effect encompasses historic properties of religious or cultural significance to your Nation, please respond within 30 days or sooner. Additionally, please indicate if there are other sources of information or other parties, Nations, Tribes, or members of the public you believe should be included in the consultation process. Please respond by email or in writing to the address listed below.

Mr. Thomas King
Certifying Environmental Officer
Governor's Office of Storm Recovery
99 Washington Avenue
Suite 1224
Albany, New York 12260

I am available to answer any questions that you may have regarding this action. If you have any questions, please feel free to contact me at (518) 473-0015 or via email at Thomas.King@stormrecovery.ny.gov.

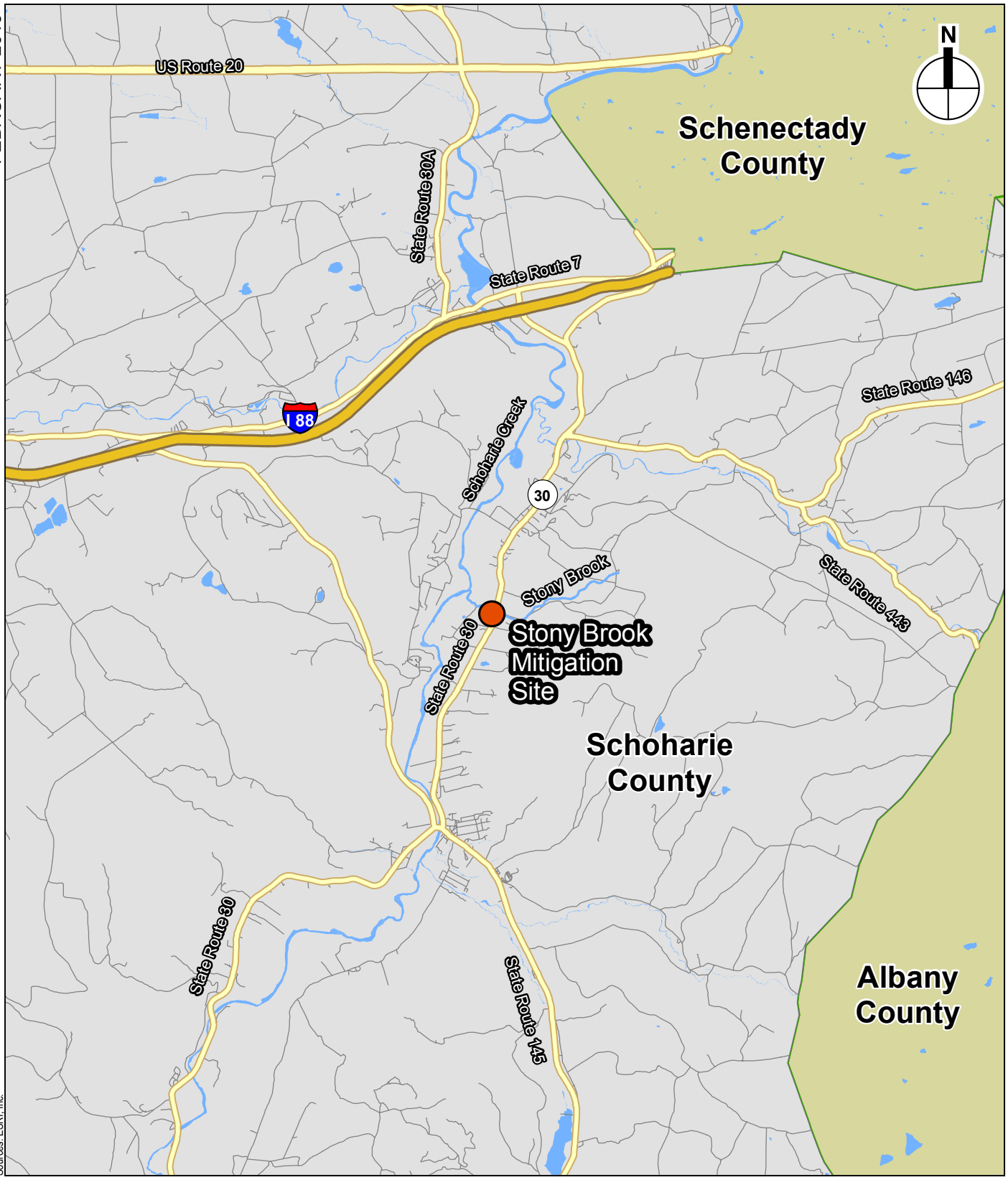
Sincerely,

Thomas J. King
Assistant General Counsel and Certifying Officer
Governor's Office of Storm Recovery

Enclosures:
Project Location Map
Design Plans

Attachment 1:
Project Location Map

FEBRUARY 2016



Sources: ESRI, Inc.

Site Location

0 3 Miles

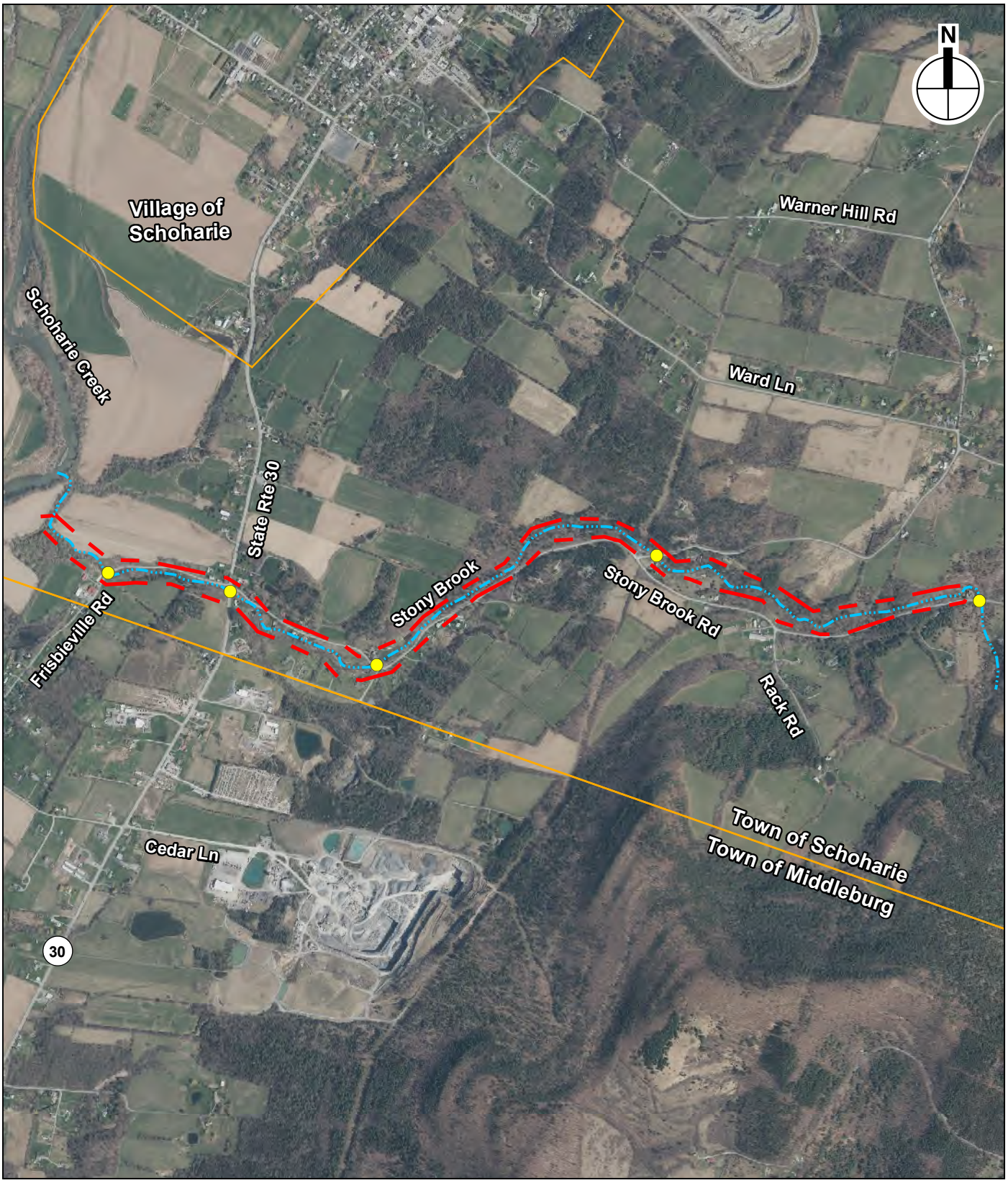
Project Location Map

Stony Brook Mitigation, Town of Schoharie

Figure 1

Attachment 2:
Project Site Map

FEBRUARY 2016



Sources: NYSDOP 2014

0 0.5 Mile

Culvert

Stony Brook

Area of Potential Effect

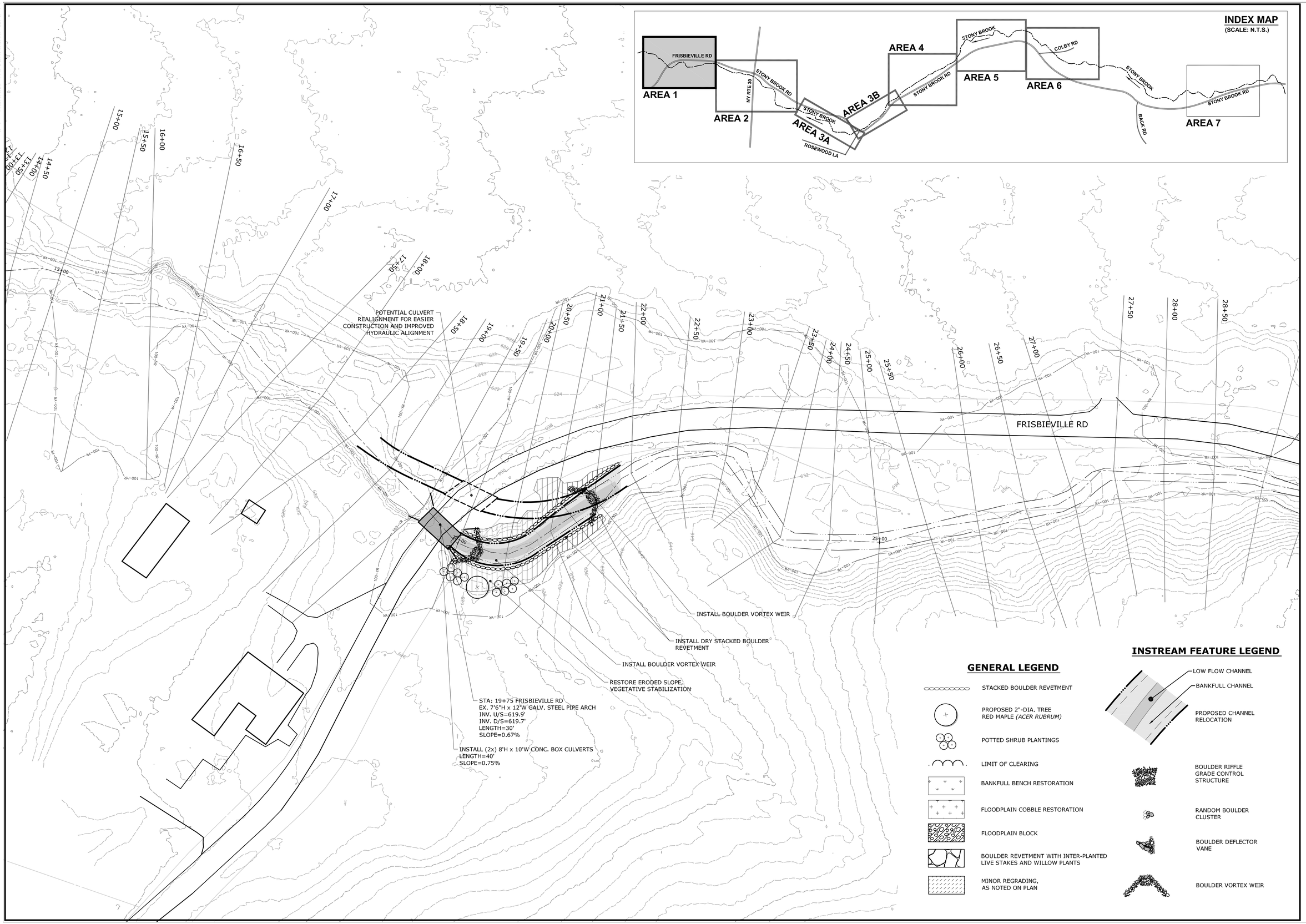
Municipal Boundaries

Project Site Map

Stony Brook Mitigation, Town of Schoharie

Figure 2

Attachment 3:
Conceptual Design Plans



MILONE & MACBROOM®

DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 1

STONY BROOK
STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 01 OF 07

SHEET NAME: AREA 1

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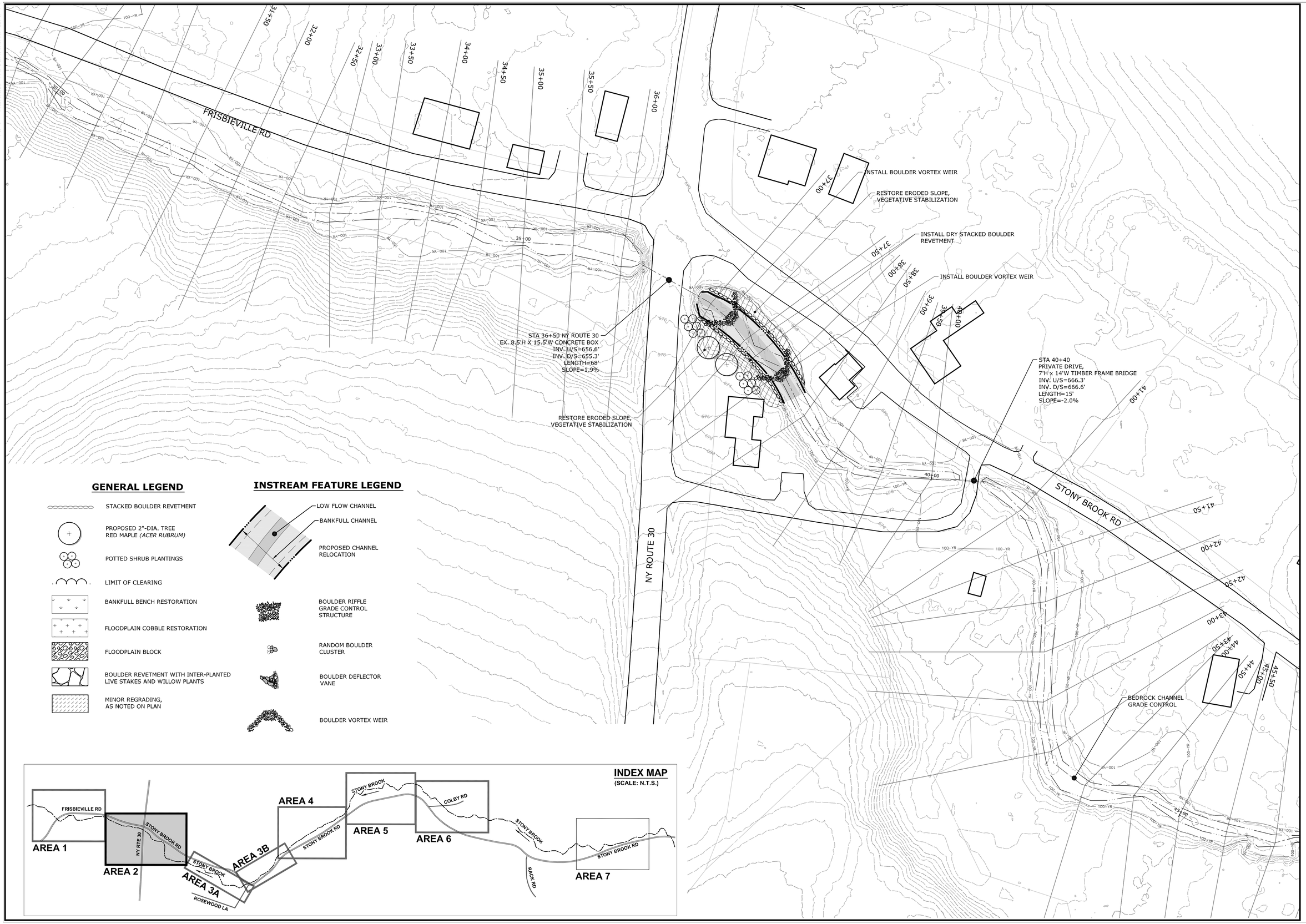

GENERAL LEGEND

- STACKED BOULDER REVETMENT
- PROPOSED 2"-DIA. TREE RED MAPLE *(ACER RUBRUM)*
- POTTED SHRUB PLANTINGS
- LIMIT OF CLEARING
- BANKFULL BENCH RESTORATION
- FLOODPLAIN COBBLE RESTORATION
- FLOODPLAIN BLOCK
- BOULDER REVETMENT WITH INTER-PLANTED LIVE STAKES AND WILLOW PLANTS
- MINOR REGRADING, AS NOTED ON PLAN

INSTREAM FEATURE LEGEND

- LOW FLOW CHANNEL
- BANKFULL CHANNEL
- PROPOSED CHANNEL RELOCATION
- BOULDER RIFFLE GRADE CONTROL STRUCTURE
- RANDOM BOULDER CLUSTER
- BOULDER DEFLECTOR VANE
- BOULDER VORTEX WEIR

INDEX MAP

(SCALE: N.T.S.)

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 2

STONY BROOK STREAM REPAIR AND RESTORATION

NY ROUTE 30, AND STONY BROOK ROAD AREA

SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 02 OF 07

SHEET NAME: **AREA 2**

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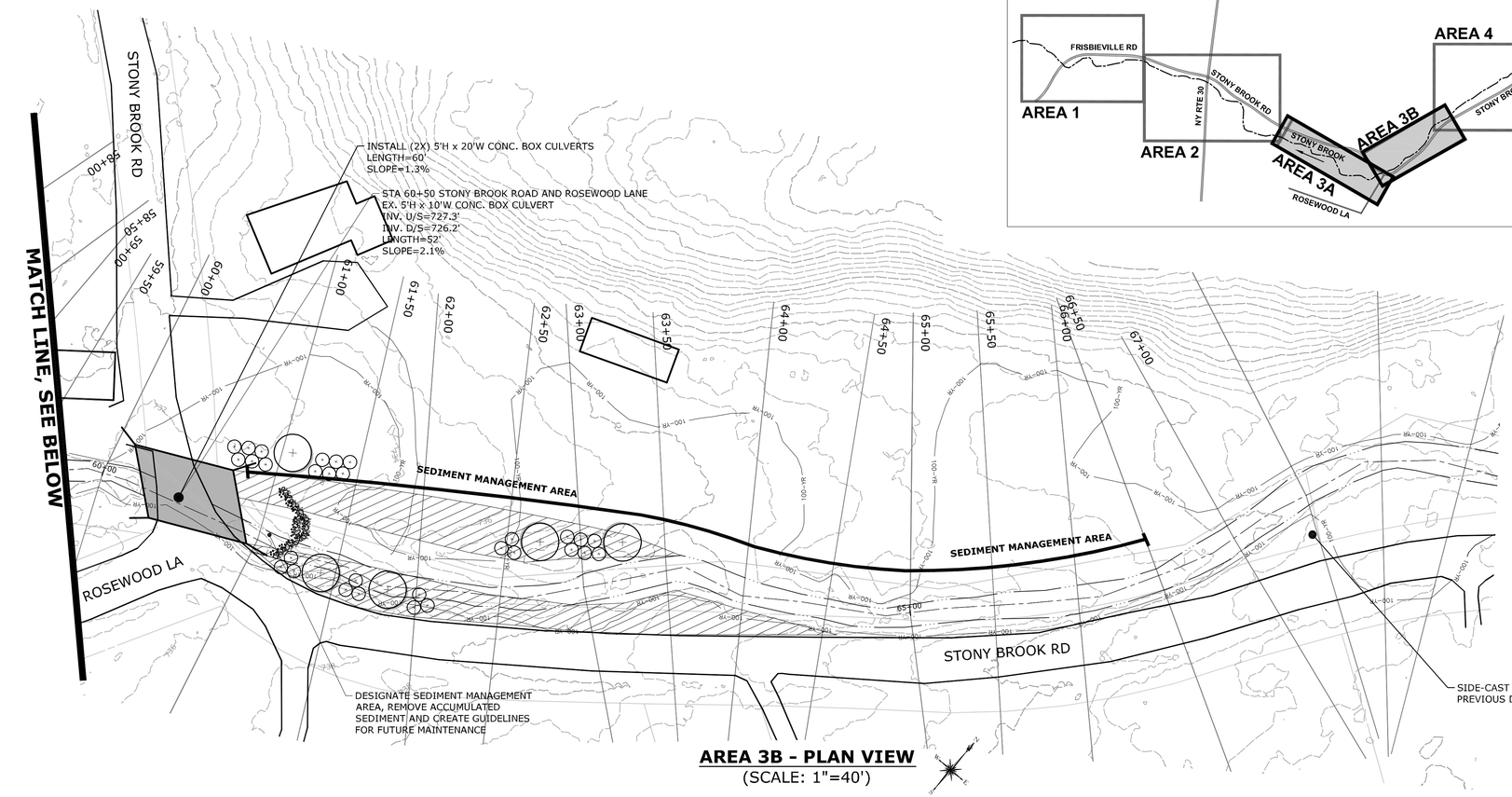
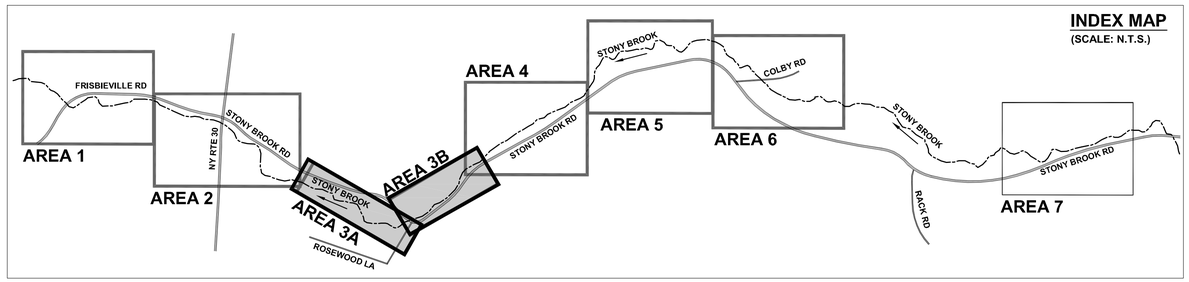
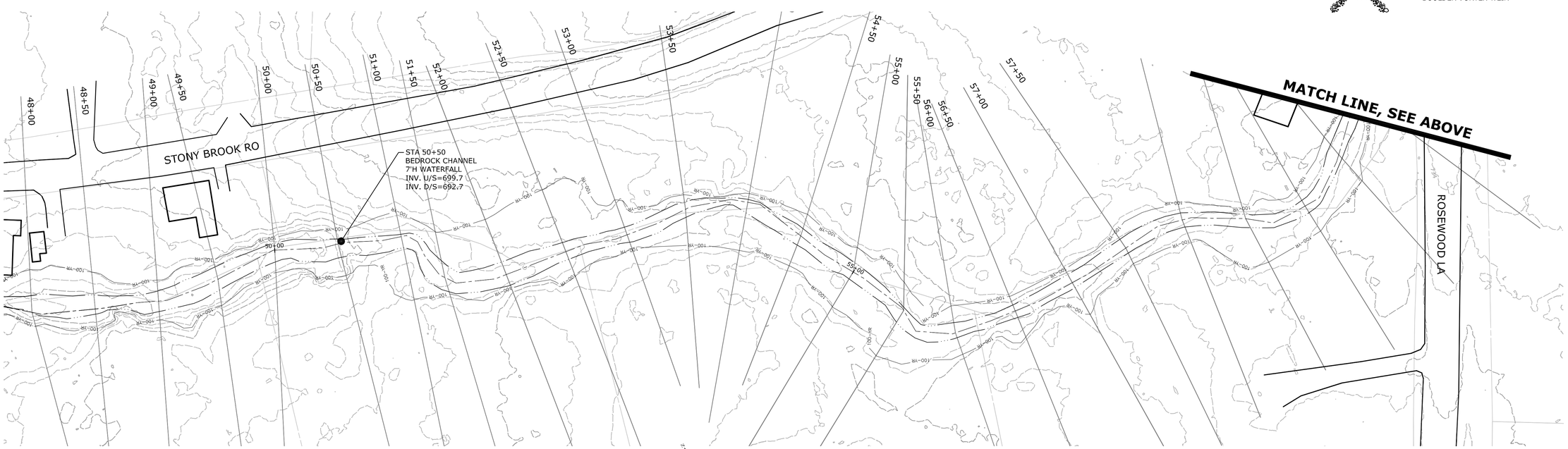


AREA 3B - PLAN VIEW
(SCALE: 1"=40')



LEGEND

- STACKED BOULDER REVETMENT
- EXISTING 100-YEAR FLOODPLAIN (HYDRAULIC MODELING)
- EXISTING EDGE OF LOW-FLOW CHANNEL
- LOW FLOW CHANNEL
- BANKFULL CHANNEL
- PROPOSED CHANNEL RELOCATION
- BOULDER RIFFLE GRADE CONTROL STRUCTURE
- RANDOM BOULDER CLUSTER
- BOULDER DEFLECTOR VANE
- BOULDER VORTEX WEIR



AREA 3A - PLAN VIEW
(SCALE: 1"=40')

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 3

STONY BROOK STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'
DATE: JAN. 2016
PROJECT NO.: 4805-04
SHEET NO.: 03 OF 07

SHEET NAME: **AREA 3**

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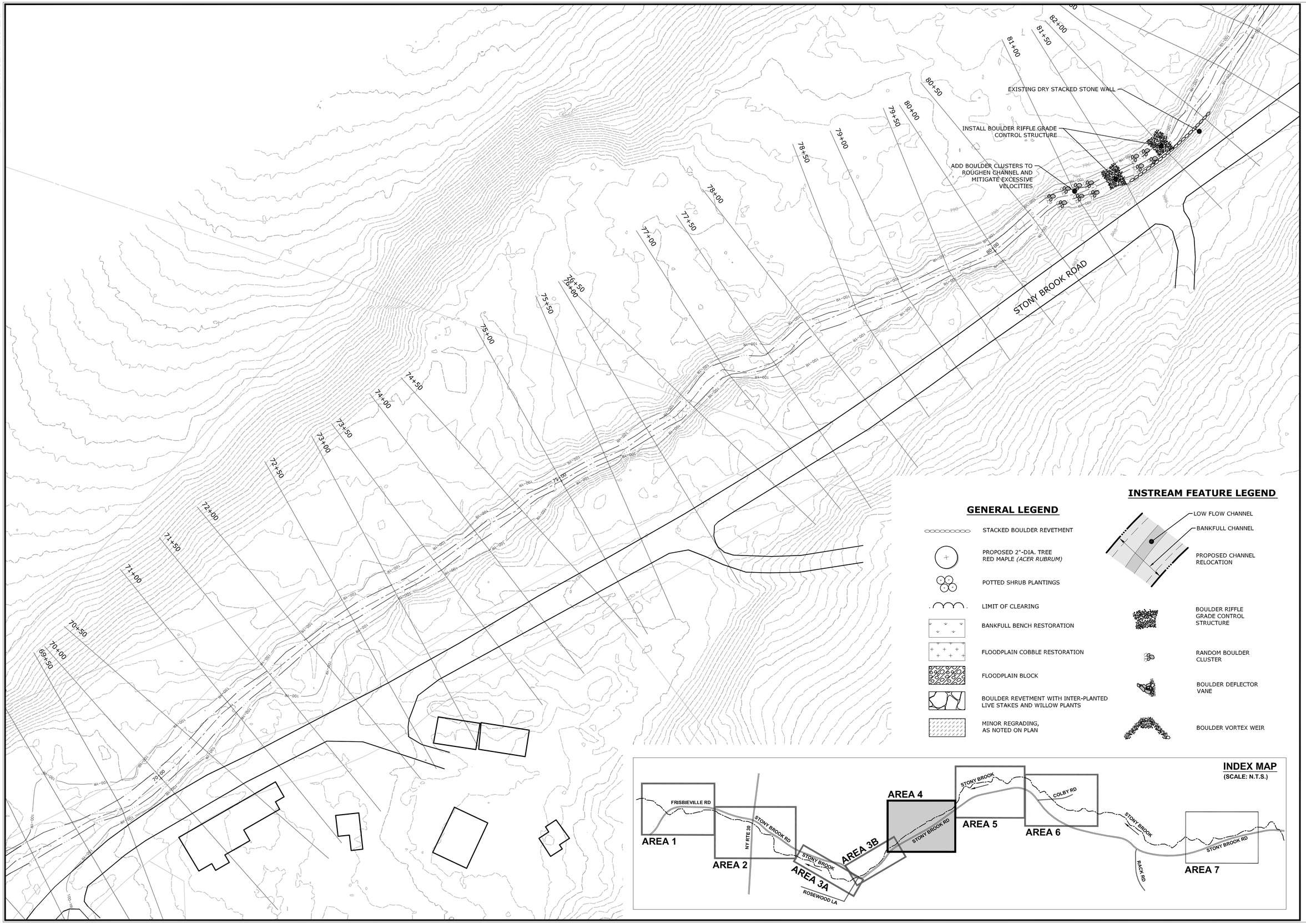

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 4

STONY BROOK
STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 04 OF 07

SHEET NAME: AREA 4

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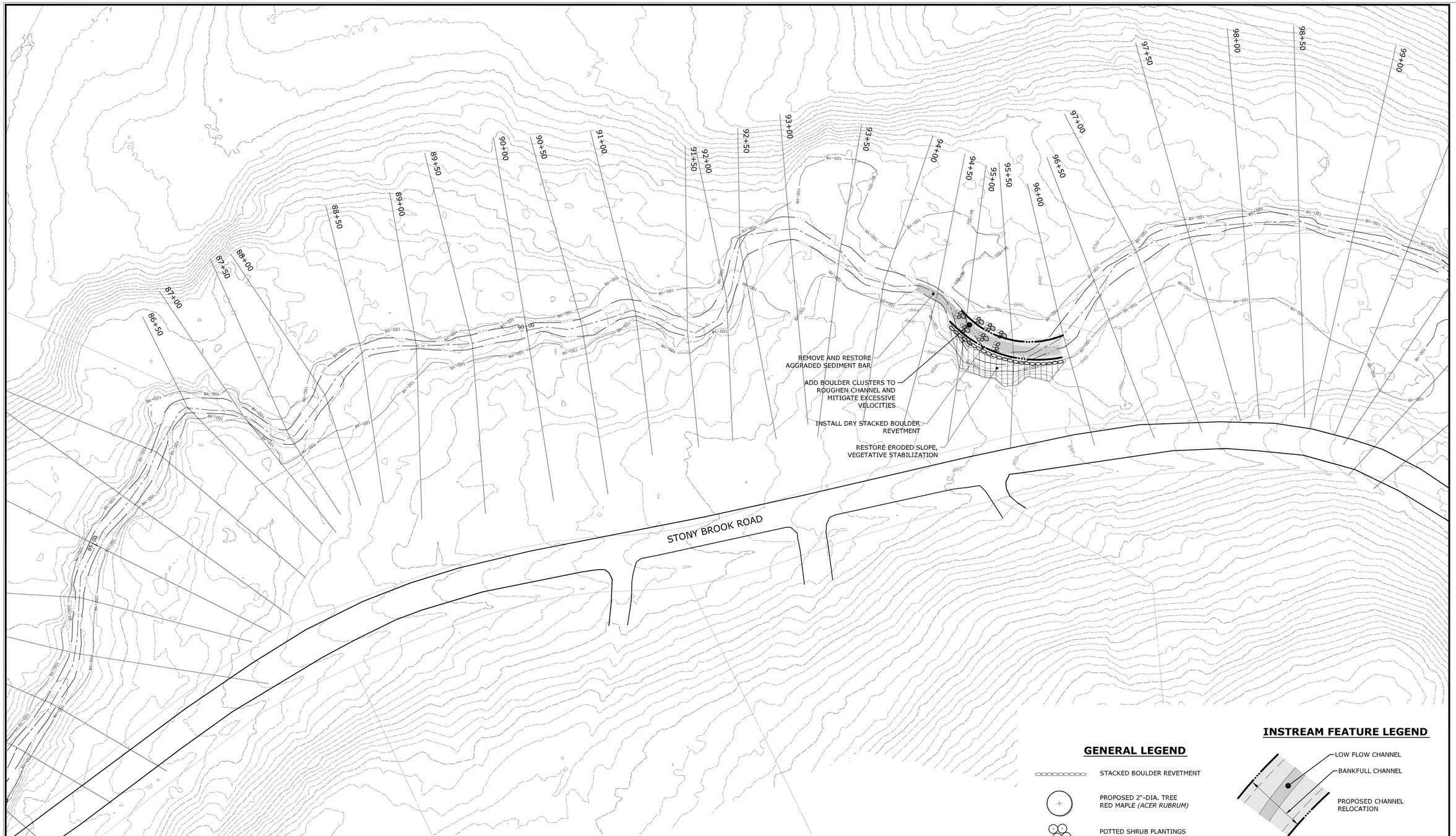
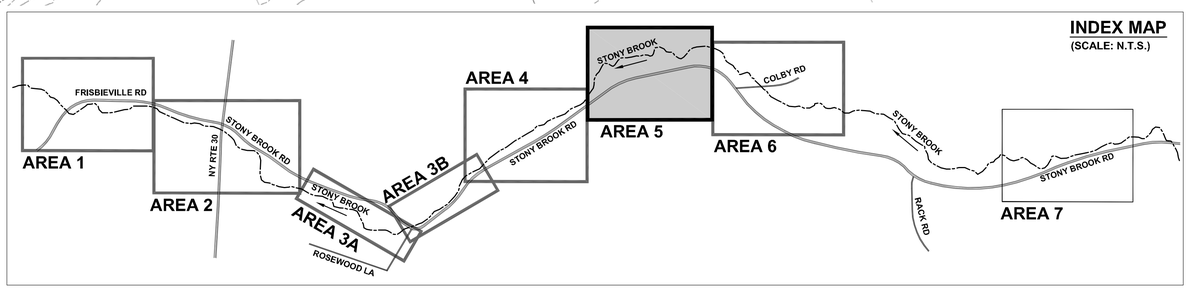


INDEX MAP
(SCALE: N.T.S.)



GENERAL LEGEND

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- BOULDER DEFLECTOR VANE
- BOULDER VORTEX WEIR

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 5

STONY BROOK
STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 05 OF 07

SHEET NAME: AREA 5

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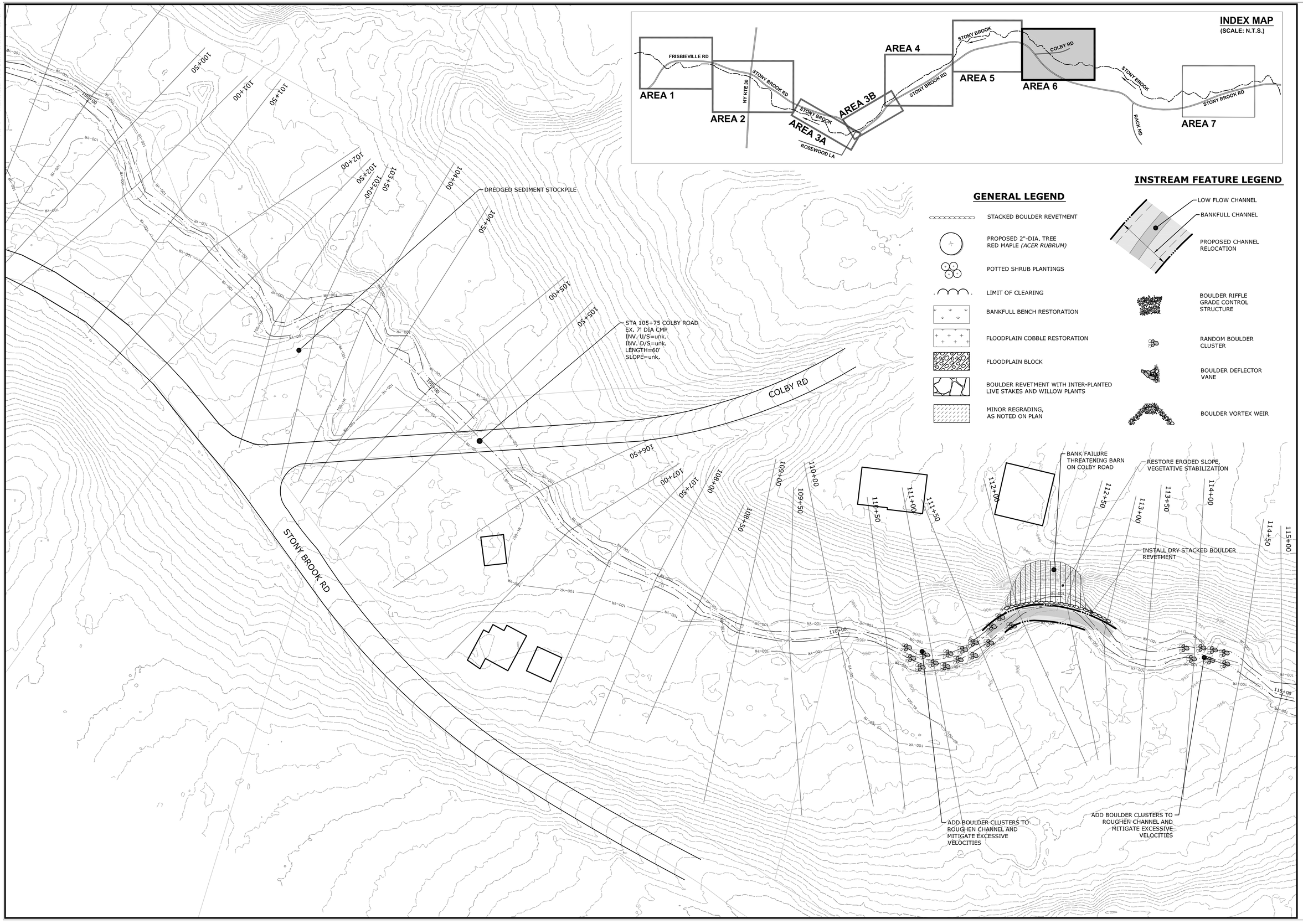

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 6

STONY BROOK STREAM REPAIR AND RESTORATION

NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 06 OF 07

SHEET NAME: **AREA 6**

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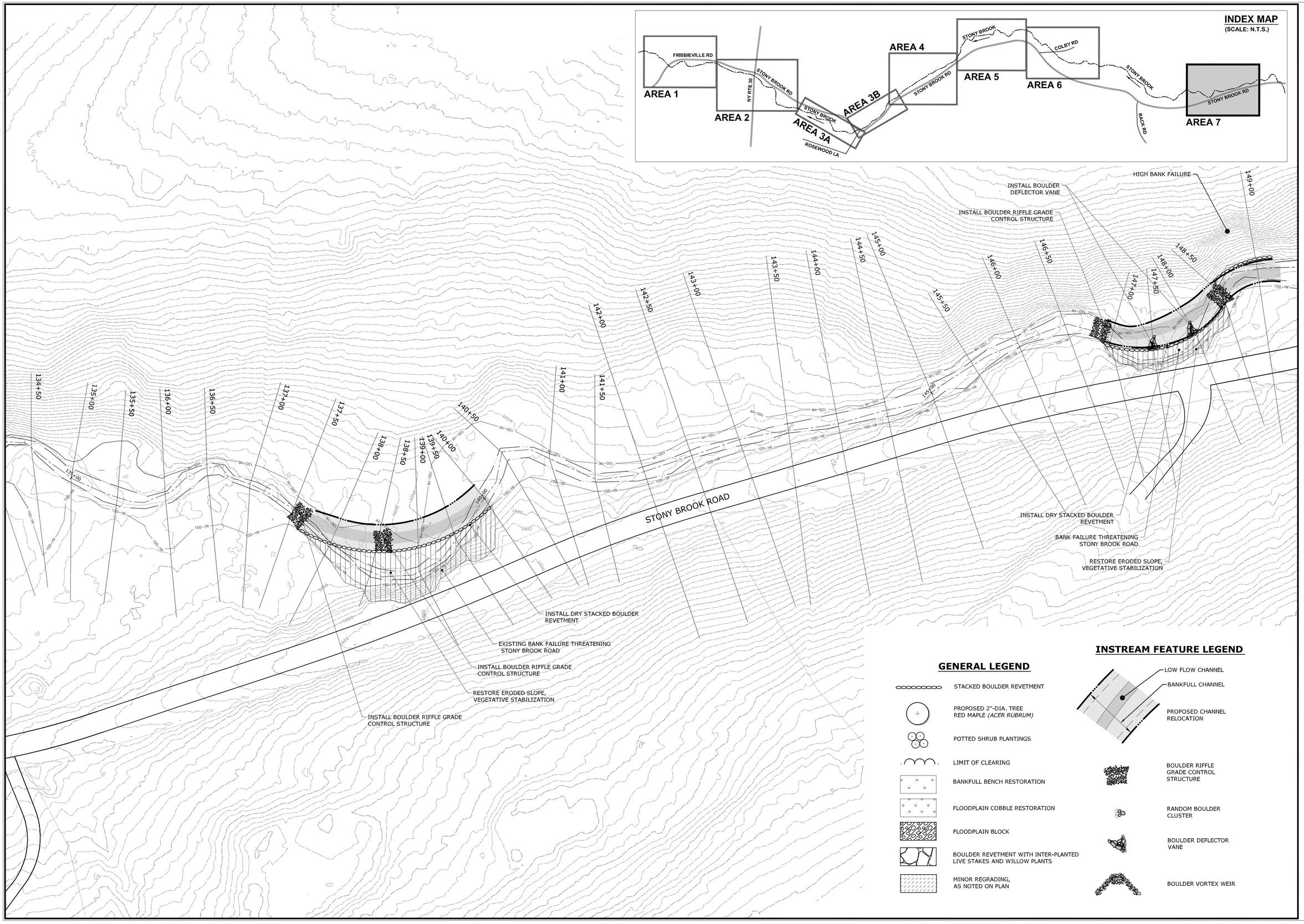

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 7

STONY BROOK
STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 07 OF 07

SHEET NAME: AREA 7

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Attachment 2

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

May 18, 2016

Thomas King
Governor's Office of Storm Recovery
99 Washington Ave, Suite 1224
Albany, NY 12231

Re: HTF/ GOSR/ HUD CDBG-DR
Stony Brook Flood Mitigation Project
Schoharie/ Schoharie County
16PR3037

Dear Mr. King:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Title 54, Section 306108 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/ Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

Based on this review, the opinion of the SHPO is that there will be No Historic Properties Affected by the proposed undertaking.

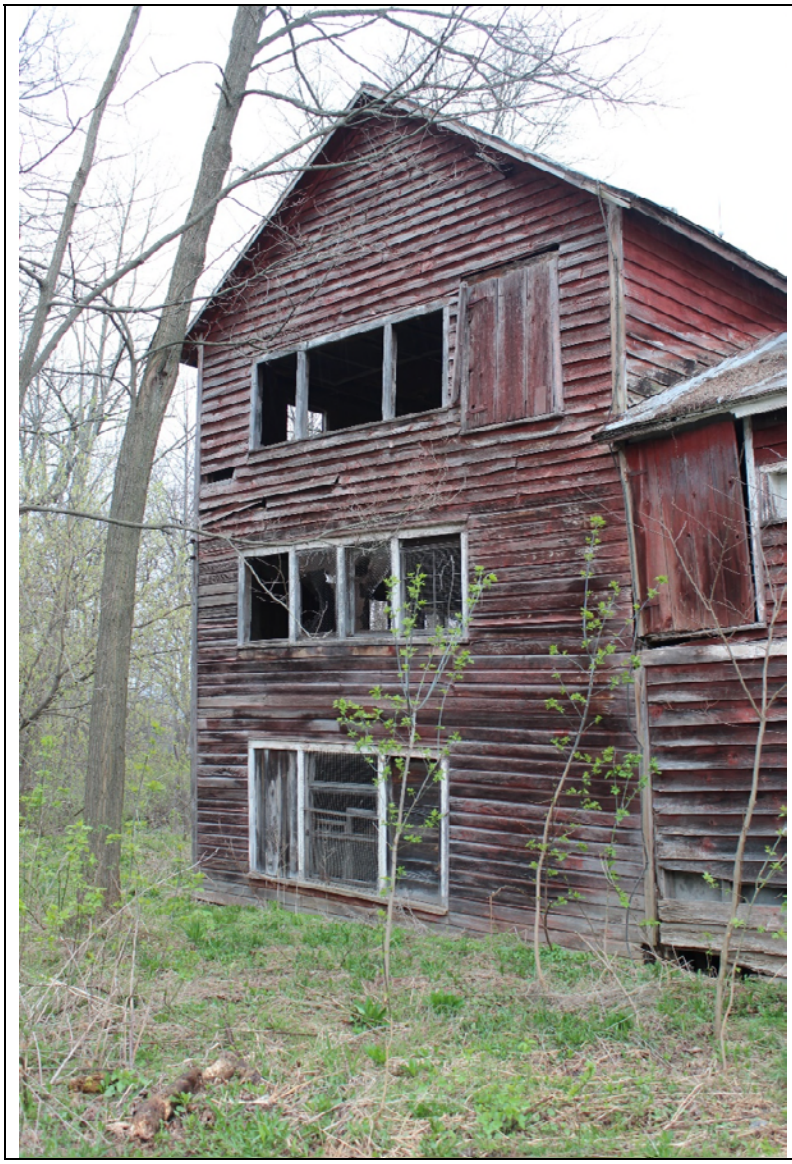
If I can be of further assistance, please contact me at (518) 268-2187 or Larry.moss@parks.ny.gov

Sincerely,

L Moss

Larry K Moss, Historic Preservation Technical Specialist
CC: Mary Barthelme
Alicia Shultz, NYSHCR
Ashley Ley, AKRF

Attachment 3



ROSEWOOD LN

FOR SALE
G.P.&DEW
REALTY
LOTS

Governor's Office of
Storm Recovery

ANDREW M. CUOMO
Governor

LISA BOVA-HIATT
Executive Director

April 27, 2017

Ron LaFrance, Jr.; Paul Thompson; and Beverly Cook, Chiefs
St. Regis Mohawk Tribe
412 State Route 37
Akwesasne, NY 13655

Re: Updated Section 106 Compliance for the Stony Brook Creek Mitigation Project, Town of Schoharie, Schoharie County, New York

Dear Chiefs of the St. Regis Mohawk Tribe:

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Alicia Shultz
Bureau of Environmental Review and Assessment
Governor's Office of Storm Recovery
New York State Homes & Community Renewal
38-40 State St.,408N, Hampton Plaza
Albany, NY 12207

I am available to answer any questions that you may have regarding this action. If you have any questions, please feel free to contact me at (518) 474-0647 or via email at Alicia.Shultz@nyshcr.org.

Sincerely,

Alicia Shultz
Senior Environmental Scientist
Bureau of Environmental Review and Assessment
Governor's Office of Storm Recovery

Enclosures:
Previous Consultation Request
Project Site Maps
Project Engineering Design Plans
Site Photographs

Electronic letter sent to:
Arnold Printup
Saint Regis Mohawk Tribe, THPO
412 State Route 37
Akwesasne, NY 13655

Governor's Office of
Storm Recovery

ANDREW M. CUOMO
Governor

LISA BOVA-HIATT
Executive Director

April 27, 2017

Shannon Holsey, President
Stockbridge-Munsee Community, Band of the Mohicans
N8476 Moh He Con Nuck Road
Bowler, WI 54416

Re: Updated Section 106 Compliance for the Stony Brook Creek Mitigation Project, Town of Schoharie, Schoharie County, New York

Dear President Shannon Holsey:

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38-40 State St.,408N, Hampton Plaza
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Sincerely,

Alicia Shultz
Senior Environmental Scientist
Bureau of Environmental Review and Assessment
Governor's Office of Storm Recovery

Enclosures:
Previous Consultation Request
Project Site Maps
Project Engineering Design Plans
Site Photographs

Electronic letter sent to:
Bonney Hartley
THPO, New York Office
Stockbridge-Munsee Community, Band of the Mohicans
65 1st Street
Troy, NY 12180

Governor's Office of Storm Recovery

Andrew M. Cuomo
Governor

Lisa Bova-Hiatt
Executive Director

New York State Office
USDA Natural Resources Conservation Service
The Galleries of Syracuse
441 South Salina Street, Suite 354
Syracuse, New York 13202-2450

October 5, 2016

RE: Stony Brook Mitigation – Town of Schoharie, Schoharie County, NY

To Whom It May Concern:

The Governor's Office of Storm Recovery (GOSR), an office of New York State Homes and Community Renewal's (HCR) Housing Trust Fund Corporation (HTFC), on behalf of the Department of Housing & Urban Development (HUD), is currently preparing an Environmental Assessment (EA) for the Stony Brook Mitigation in the Town of Schoharie in Schoharie County, NY (see Figures 1 and 2). GOSR is acting as HUD's non-federal representative for the purposes of conducting consultation pursuant to the Farmland Protection Policy Act (FPPA). The proposed project involves the stream restoration along approximately 2.6 linear miles of Stony Brook north of Stony Brook Road. The project would disturb up to 0.6 acres on an approximately 75-acre corridor. However, the 0.6 acres of disturbance would be limited to the bed and banks of Stony Brook and are not expected to result in conversion of any farmland.

The purpose of this letter is to provide the Natural Resources Conservation Service (NRCS) notice of the proposed project and to document FPPA compliance. The soils on the parcel are shown as prime farmland and farmland of statewide importance (See Figure 3). Please find attached the Form CPA-106 for your review and use. Conceptual Design Plans are also included as Attachment 1.

If you have questions or require additional information regarding this request, please contact me at Alicia.Shultz@nyshcr.org or call (518) 474-0647. Thank you for your time and consideration.

Sincerely,

Alicia Shultz
Community Developer - Environmental Services
New York State Homes & Community Renewal
38-40 State St., 408N
Hampton Plaza, Albany, NY 12207

Enclosures:
Form CPA-106
Figure 1: Project Location Map
Figure 2: Project Site Map
Figure 3: Farmland Map
Attachment 1 - Conceptual Design Plans

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request **9/1/16**	4. Sheet 1 of **1**
1. Name of Project **Stony Brook Mitigation**	5. Federal Agency Involved **U.S. Dept. of Housing and Urban Development**	
2. Type of Project **Stream Improvements**	6. County and State **Schoharie County, New York**	

PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS	2. Person Completing Form
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☐ NO ☐		4. Acres Irrigated | Average Farm Size
5. Major Crop(s)	6. Farmable Land in Government Jurisdiction **Acres:** **%**	7. Amount of Farmland As Defined in FPPA **Acres:** **%**
8. Name Of Land Evaluation System Used	9. Name of Local Site Assessment System	10. Date Land Evaluation Returned by NRCS

PART III *(To be completed by Federal Agency)*		Alternative Corridor For Segment _____			
		Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres To Be Converted Directly		0.6			
B. Total Acres To Be Converted Indirectly, Or To Receive Services		N/A			
C. Total Acres In Corridor		75			
PART IV *(To be completed by NRCS) Land Evaluation Information*					
A. Total Acres Prime And Unique Farmland					
B. Total Acres Statewide And Local Important Farmland					
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted					
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value					
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*					
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))*	Maximum Points				
1. Area in Nonurban Use	15				
2. Perimeter in Nonurban Use	10				
3. Percent Of Corridor Being Farmed	20				
4. Protection Provided By State And Local Government	20				
5. Size of Present Farm Unit Compared To Average	10				
6. Creation Of Nonfarmable Farmland	25				
7. Availablility Of Farm Support Services	5				
8. On-Farm Investments	20				
9. Effects Of Conversion On Farm Support Services	25				
10. Compatibility With Existing Agricultural Use	10				
TOTAL CORRIDOR ASSESSMENT POINTS	160	0	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland (From Part V)	100	0	0	0	0
Total Corridor Assessment (From Part VI above or a local site assessment)	160	0	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	0	0	0	0

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES ☐ NO ☐

5. Reason For Selection:

Signature of Person Completing this Part: | DATE

NOTE: Complete a form for each segment with more than one Alternate Corridor

Clear Form

CORRIDOR - TYPE SITE ASSESSMENT CRITERIA

The following criteria are to be used for projects that have a linear or corridor - type site configuration connecting two distant points, and crossing several different tracts of land. These include utility lines, highways, railroads, stream improvements, and flood control systems. Federal agencies are to assess the suitability of each corridor - type site or design alternative for protection as farmland along with the land evaluation information.

(1) How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?
More than 90 percent - 15 points
90 to 20 percent - 14 to 1 point(s)
Less than 20 percent - 0 points

(2) How much of the perimeter of the site borders on land in nonurban use?
More than 90 percent - 10 points
90 to 20 percent - 9 to 1 point(s)
Less than 20 percent - 0 points

(3) How much of the site has been farmed (managed for a scheduled harvest or timber activity) more than five of the last 10 years?
More than 90 percent - 20 points
90 to 20 percent - 19 to 1 point(s)
Less than 20 percent - 0 points

(4) Is the site subject to state or unit of local government policies or programs to protect farmland or covered by private programs to protect farmland?
Site is protected - 20 points
Site is not protected - 0 points

(5) Is the farm unit(s) containing the site (before the project) as large as the average - size farming unit in the County ? (Average farm sizes in each county are available from the NRCS field offices in each state. Data are from the latest available Census of Agriculture, Acreage or Farm Units in Operation with $1,000 or more in sales.)
As large or larger - 10 points
Below average - deduct 1 point for each 5 percent below the average, down to 0 points if 50 percent or more below average - 9 to 0 points

(6) If the site is chosen for the project, how much of the remaining land on the farm will become non-farmable because of interference with land patterns?
Acreage equal to more than 25 percent of acres directly converted by the project - 25 points
Acreage equal to between 25 and 5 percent of the acres directly converted by the project - 1 to 24 point(s)
Acreage equal to less than 5 percent of the acres directly converted by the project - 0 points

(7) Does the site have available adequate supply of farm support services and markets, i.e., farm suppliers, equipment dealers, processing and storage facilities and farmer's markets?
All required services are available - 5 points
Some required services are available - 4 to 1 point(s)
No required services are available - 0 points

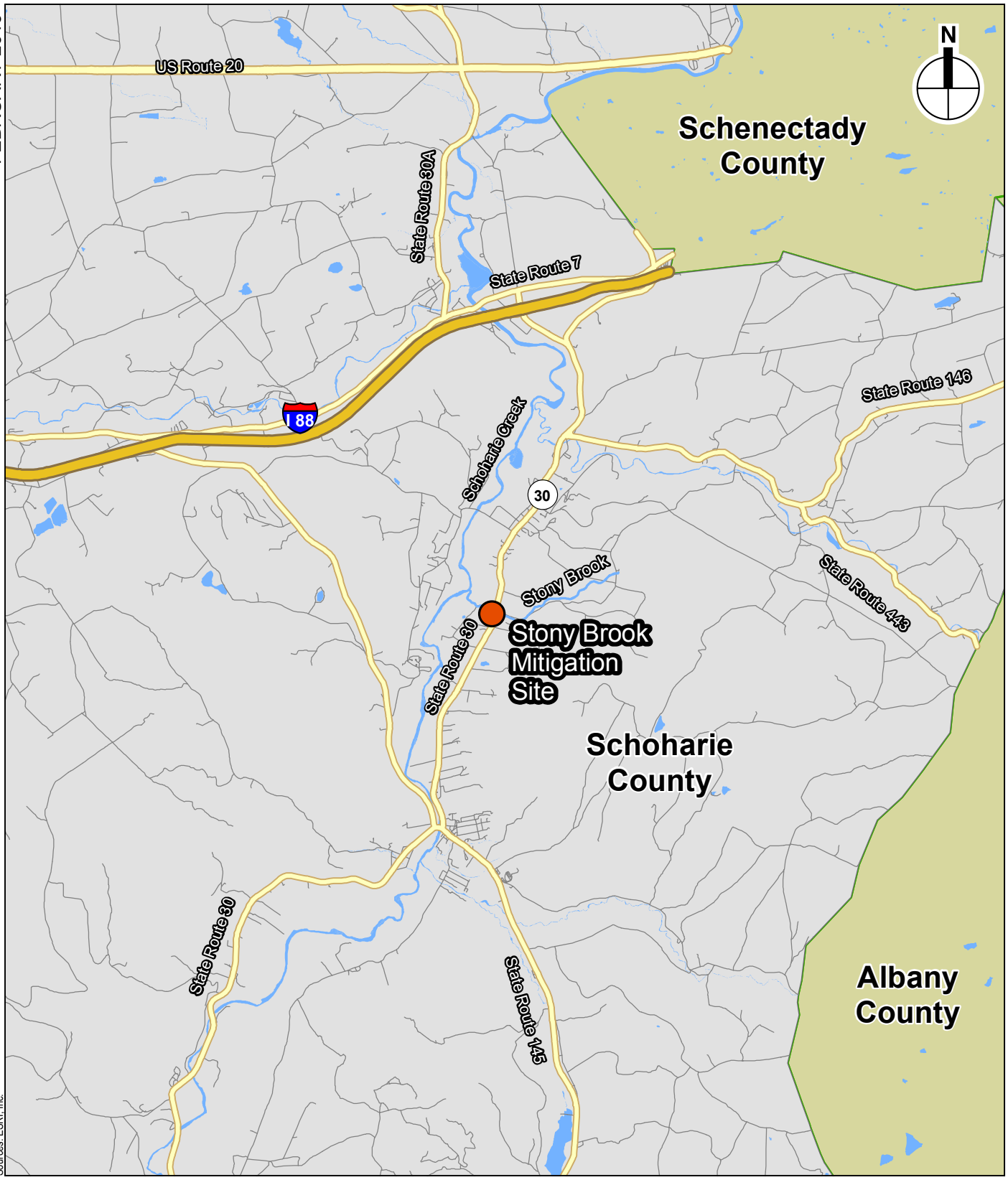
(8) Does the site have substantial and well-maintained on-farm investments such as barns, other storage building, fruit trees and vines, field terraces, drainage, irrigation, waterways, or other soil and water conservation measures?
High amount of on-farm investment - 20 points
Moderate amount of on-farm investment - 19 to 1 point(s)
No on-farm investment - 0 points

(9) Would the project at this site, by converting farmland to nonagricultural use, reduce the demand for farm support services so as to jeopardize the continued existence of these support services and thus, the viability of the farms remaining in the area?
Substantial reduction in demand for support services if the site is converted - 25 points
Some reduction in demand for support services if the site is converted - 1 to 24 point(s)
No significant reduction in demand for support services if the site is converted - 0 points

(10) Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of surrounding farmland to nonagricultural use?
Proposed project is incompatible to existing agricultural use of surrounding farmland - 10 points
Proposed project is tolerable to existing agricultural use of surrounding farmland - 9 to 1 point(s)
Proposed project is fully compatible with existing agricultural use of surrounding farmland - 0 points

Figures

FEBRUARY 2016



Sources: ESRI, Inc.

Site Location

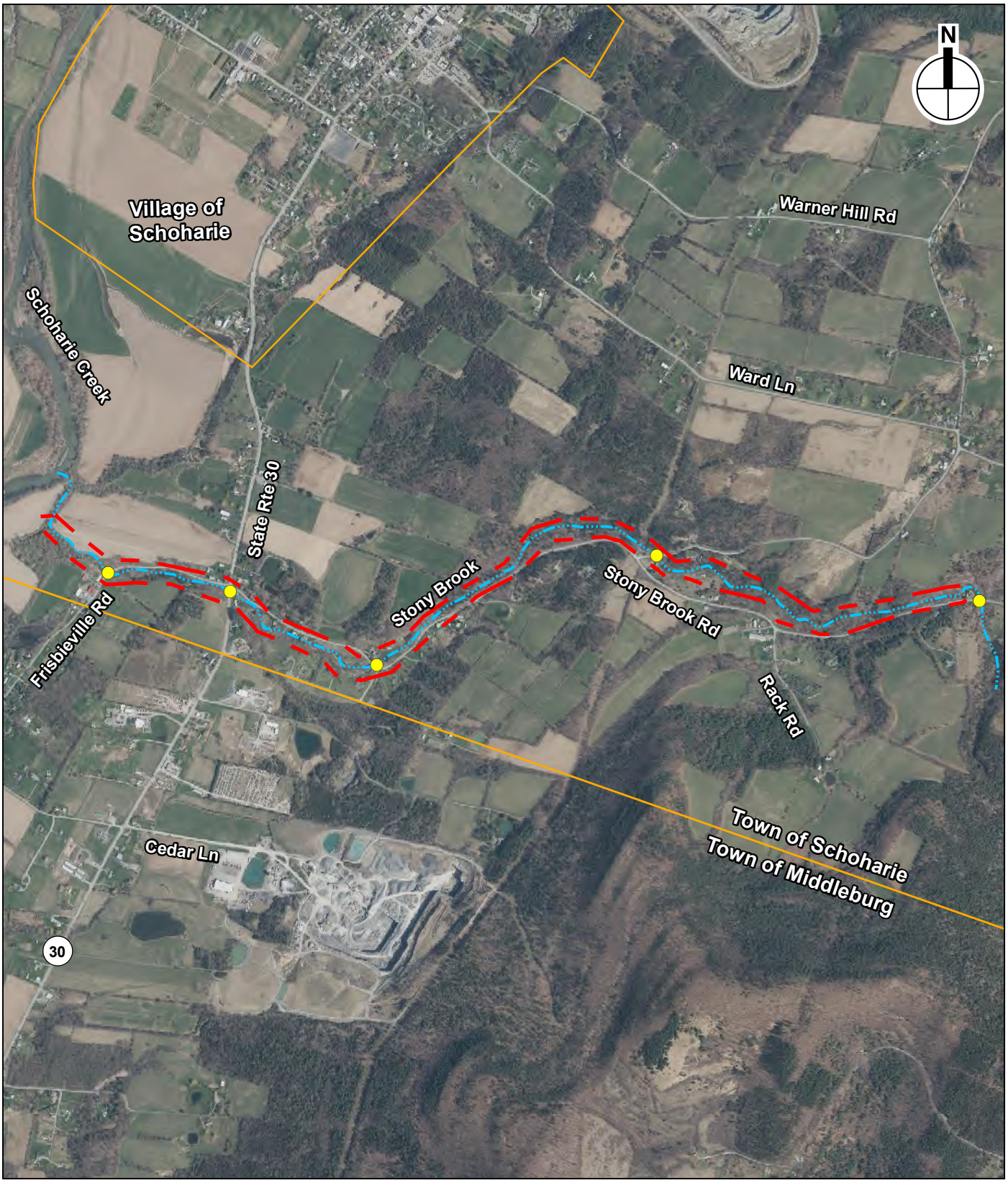
0 3 Miles

Project Location Map

Stony Brook Mitigation, Town of Schoharie

Figure 1

FEBRUARY 2016



Sources: NYSDOP 2014

0 0.5 Mile

Culvert

Stony Brook

Site Boundary

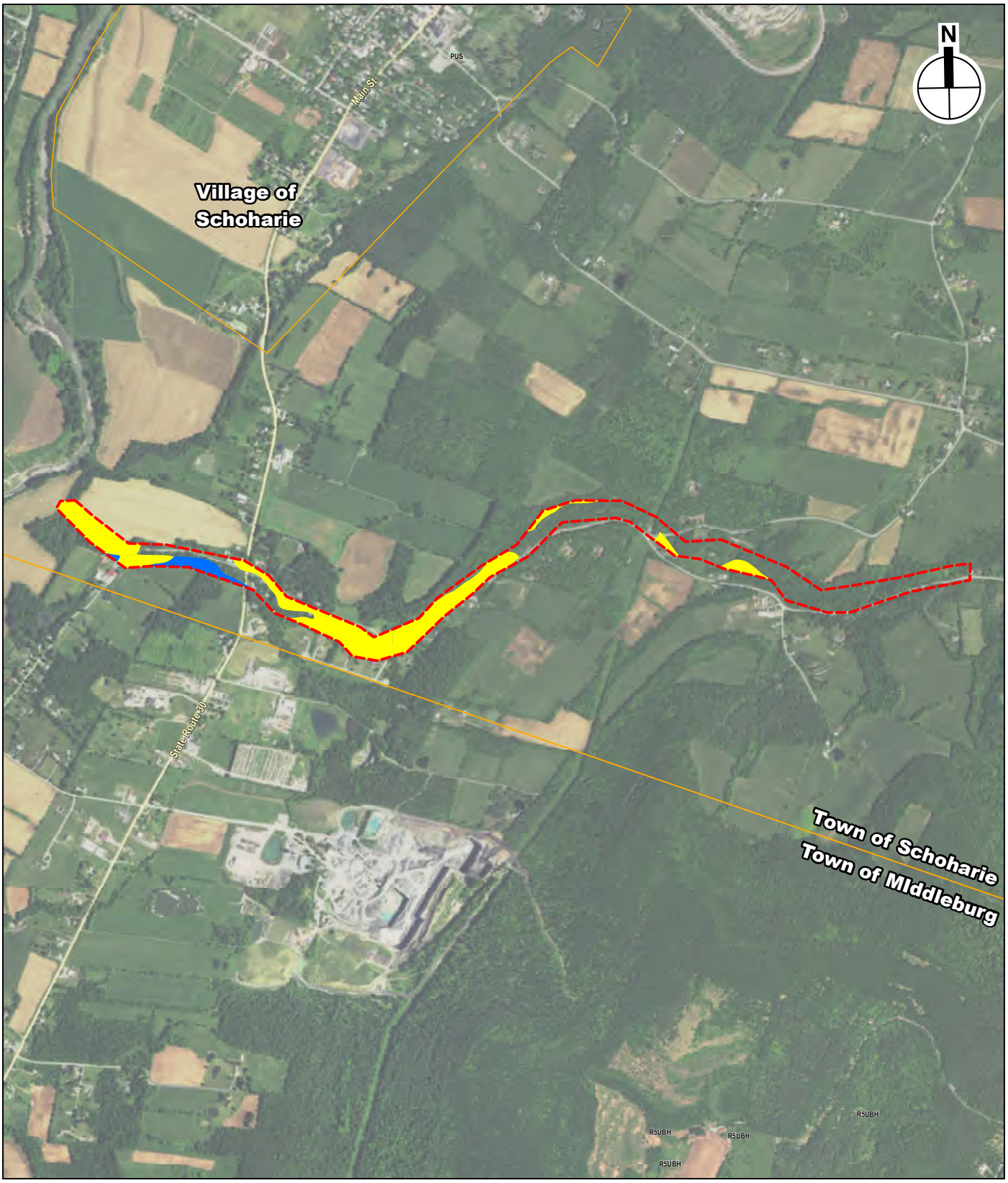
Municipal Boundaries

Project Site Map

Stony Brook Mitigation, Town of Schoharie

Figure 2

8/29/2016



Site Boundary

All areas are prime farmland

Farmland of statewide importance

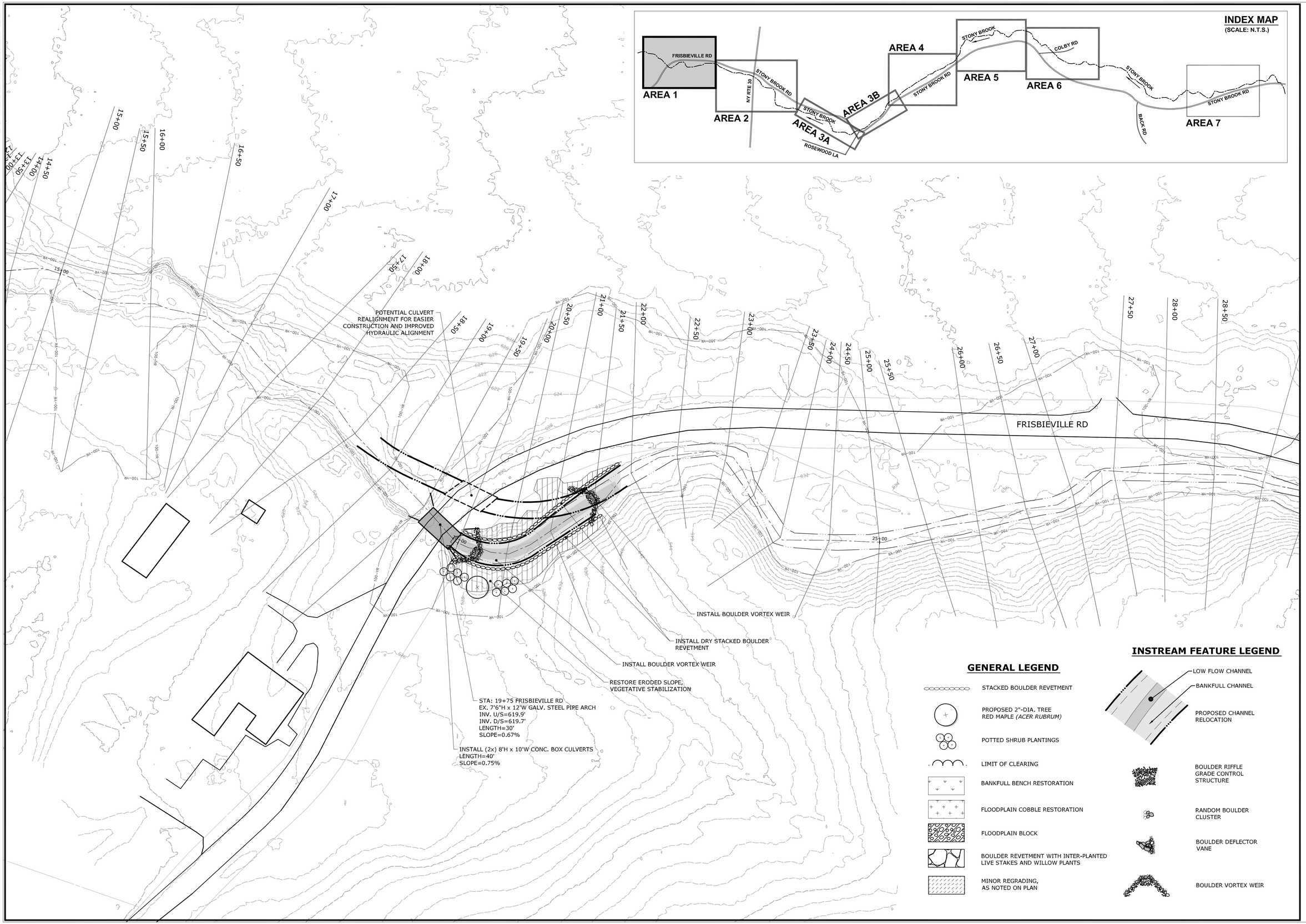
0 1,000 FEET

Stony Brook Mitigation, Town of Schoharie

Soil Survey - Prime Farmland

Figure 3

Attachment 1: Conceptual Design Plans



MILONE & MACBROOM®

DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 1

STONY BROOK
STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 01 OF 07

SHEET NAME: AREA 1

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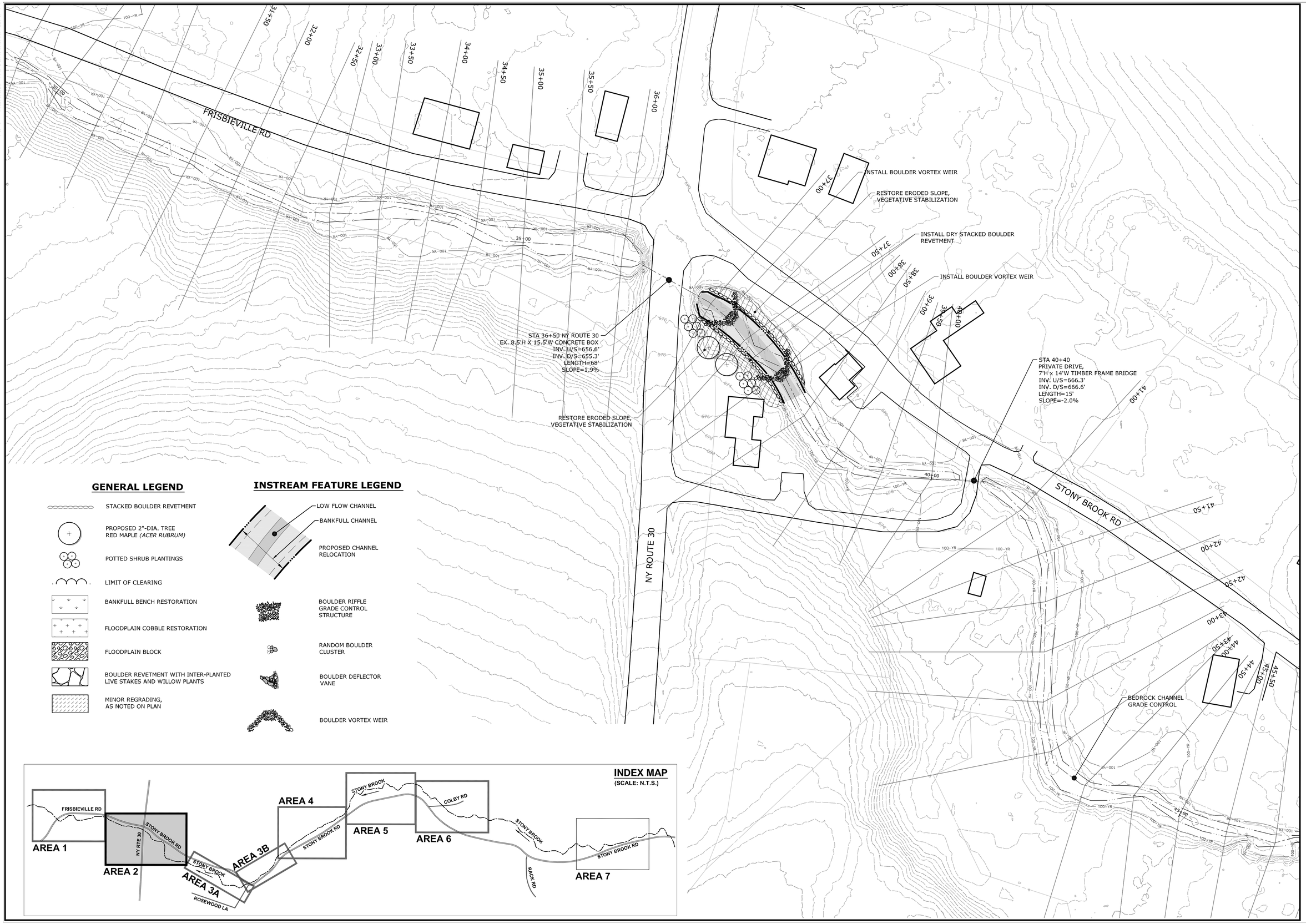

GENERAL LEGEND

- STACKED BOULDER REVETMENT
- PROPOSED 2"-DIA. TREE RED MAPLE *(ACER RUBRUM)*
- POTTED SHRUB PLANTINGS
- LIMIT OF CLEARING
- BANKFULL BENCH RESTORATION
- FLOODPLAIN COBBLE RESTORATION
- FLOODPLAIN BLOCK
- BOULDER REVETMENT WITH INTER-PLANTED LIVE STAKES AND WILLOW PLANTS
- MINOR REGRADING, AS NOTED ON PLAN

INSTREAM FEATURE LEGEND

- LOW FLOW CHANNEL
- BANKFULL CHANNEL
- PROPOSED CHANNEL RELOCATION
- BOULDER RIFFLE GRADE CONTROL STRUCTURE
- RANDOM BOULDER CLUSTER
- BOULDER DEFLECTOR VANE
- BOULDER VORTEX WEIR

INDEX MAP

(SCALE: N.T.S.)

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 2

STONY BROOK STREAM REPAIR AND RESTORATION

NY ROUTE 30, AND STONY BROOK ROAD AREA

SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 02 OF 07

SHEET NAME: **AREA 2**

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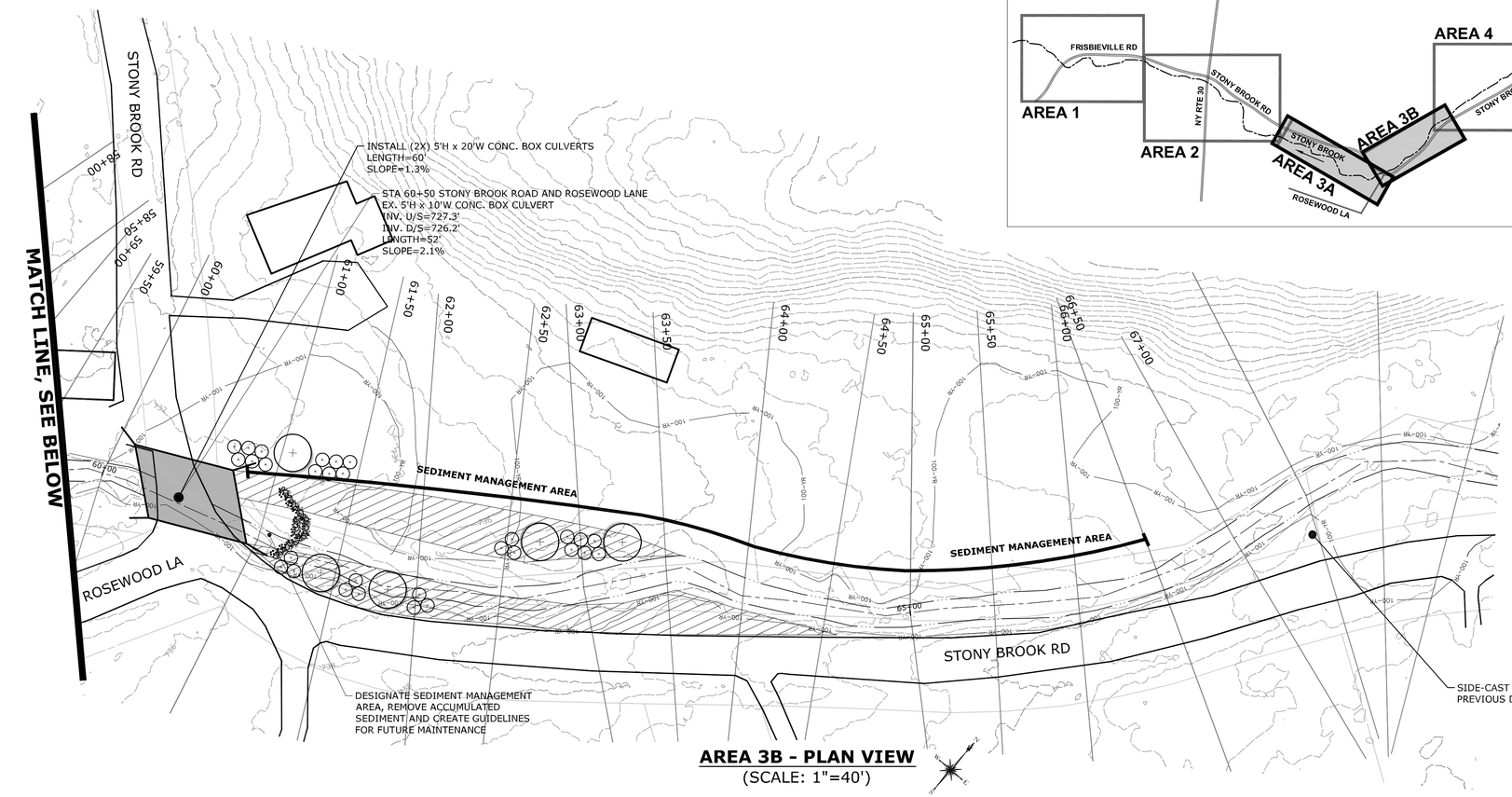
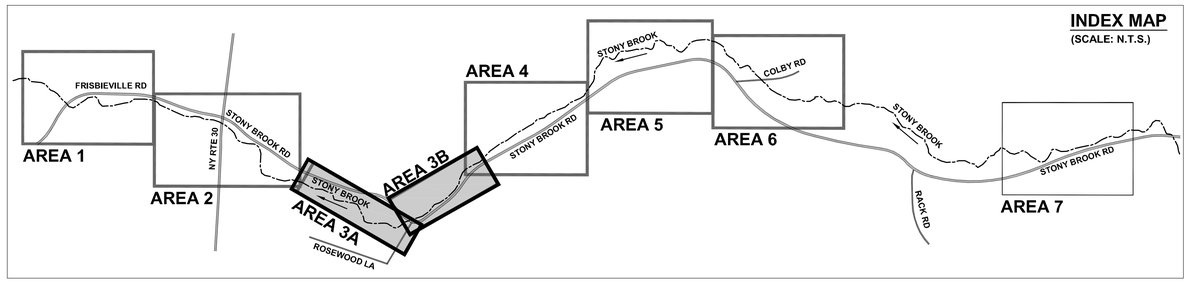
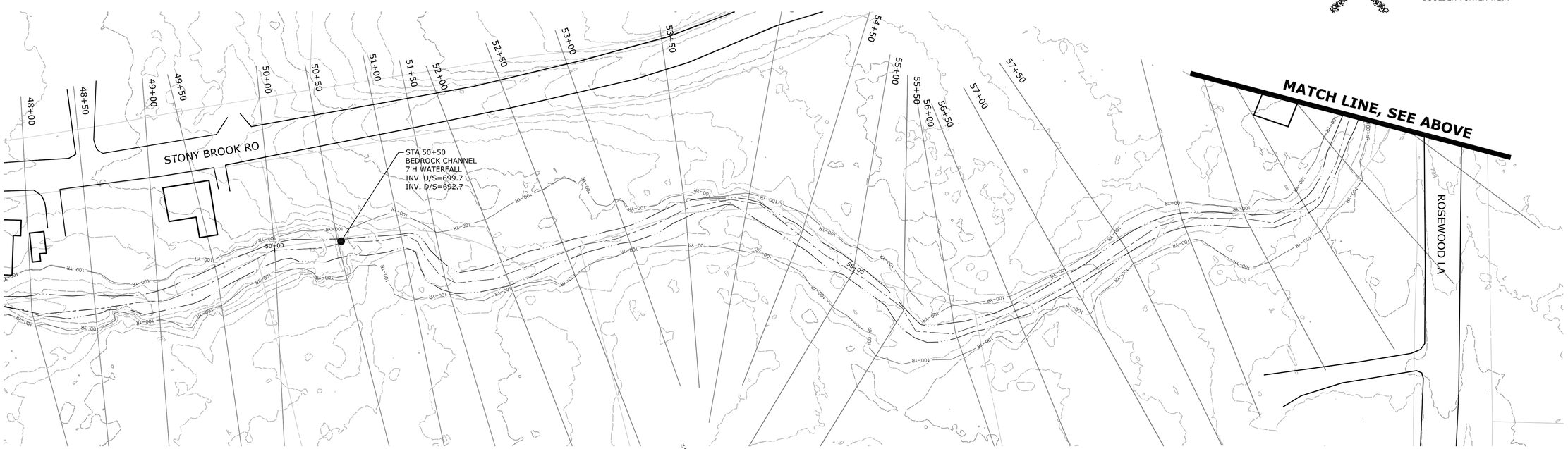


AREA 3B - PLAN VIEW
(SCALE: 1"=40')



LEGEND

- STACKED BOULDER REVETMENT
- EXISTING 100-YEAR FLOODPLAIN (HYDRAULIC MODELING)
- EXISTING EDGE OF LOW-FLOW CHANNEL
- LOW FLOW CHANNEL
- BANKFULL CHANNEL
- PROPOSED CHANNEL RELOCATION
- BOULDER RIFFLE GRADE CONTROL STRUCTURE
- RANDOM BOULDER CLUSTER
- BOULDER DEFLECTOR VANE
- BOULDER VORTEX WEIR



AREA 3A - PLAN VIEW
(SCALE: 1"=40')

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 3

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NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'
DATE: JAN. 2016
PROJECT NO.: 4805-04
SHEET NO.: 03 OF 07

SHEET NAME: **AREA 3**

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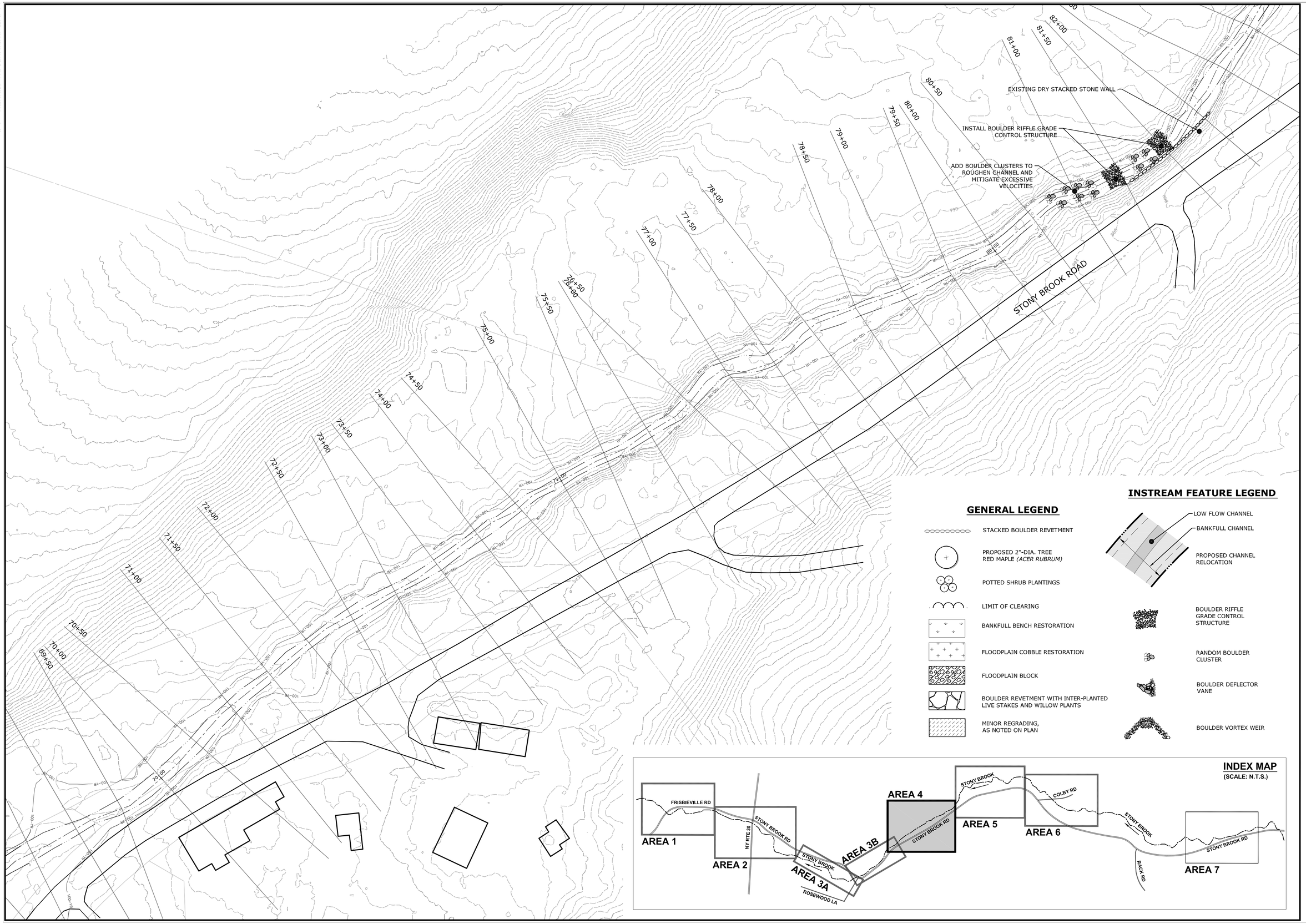

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 4

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STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 04 OF 07

SHEET NAME: AREA 4

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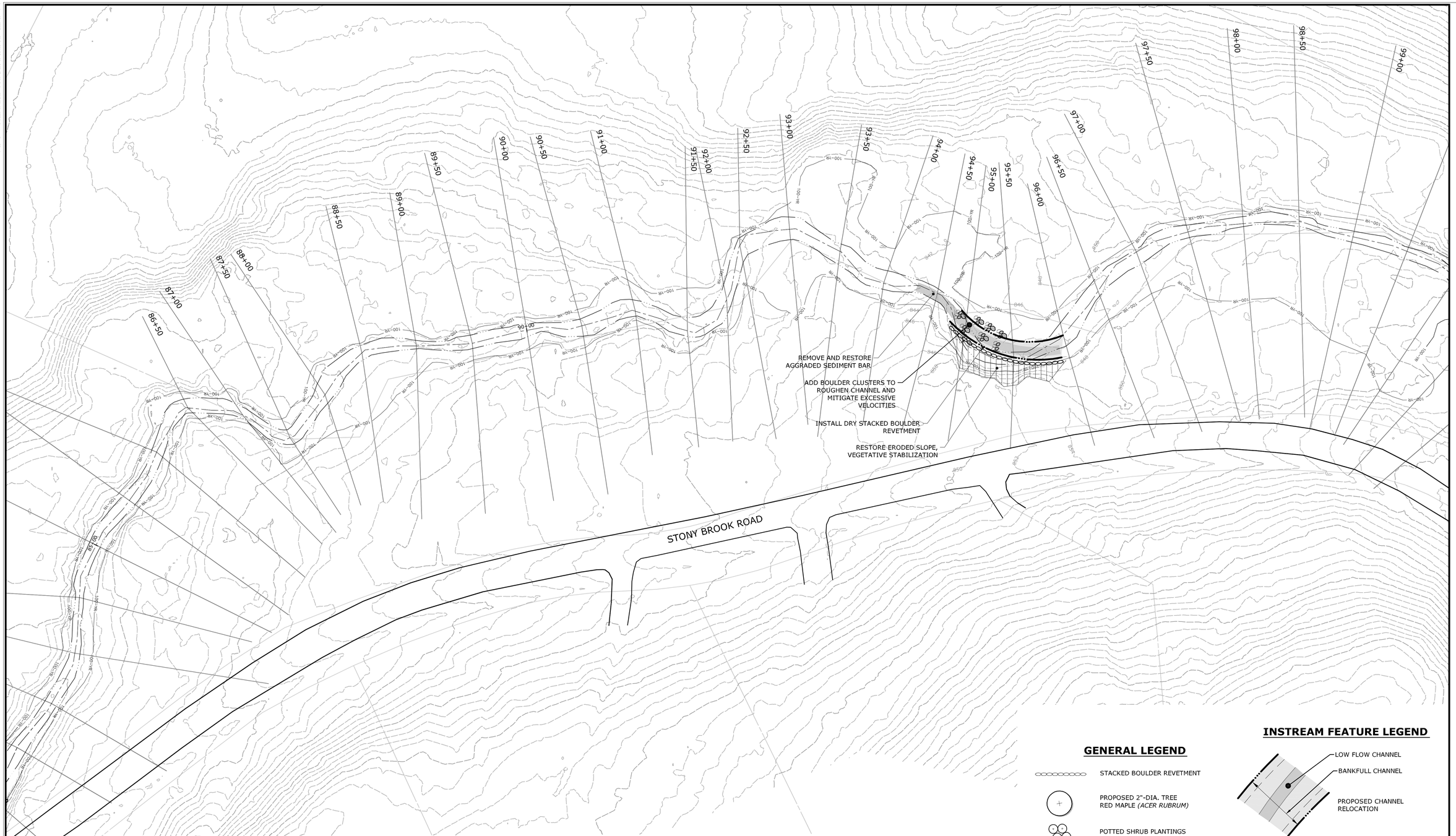
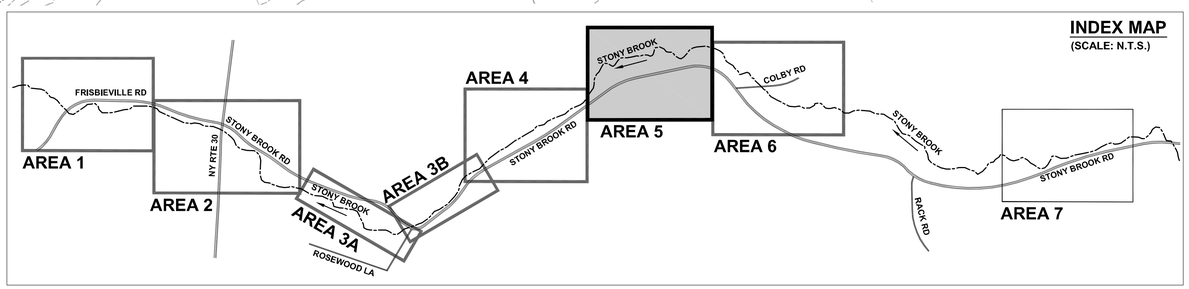


INDEX MAP
(SCALE: N.T.S.)



GENERAL LEGEND

- STACKED BOULDER REVETMENT
- PROPOSED 2"-DIA. TREE RED MAPLE *(ACER RUBRUM)*
- POTTED SHRUB PLANTINGS
- LIMIT OF CLEARING
- BANKFULL BENCH RESTORATION
- FLOODPLAIN COBBLE RESTORATION
- FLOODPLAIN BLOCK
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- RANDOM BOULDER CLUSTER
- BOULDER DEFLECTOR VANE
- BOULDER VORTEX WEIR

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 5

STONY BROOK
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NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 05 OF 07

SHEET NAME: AREA 5

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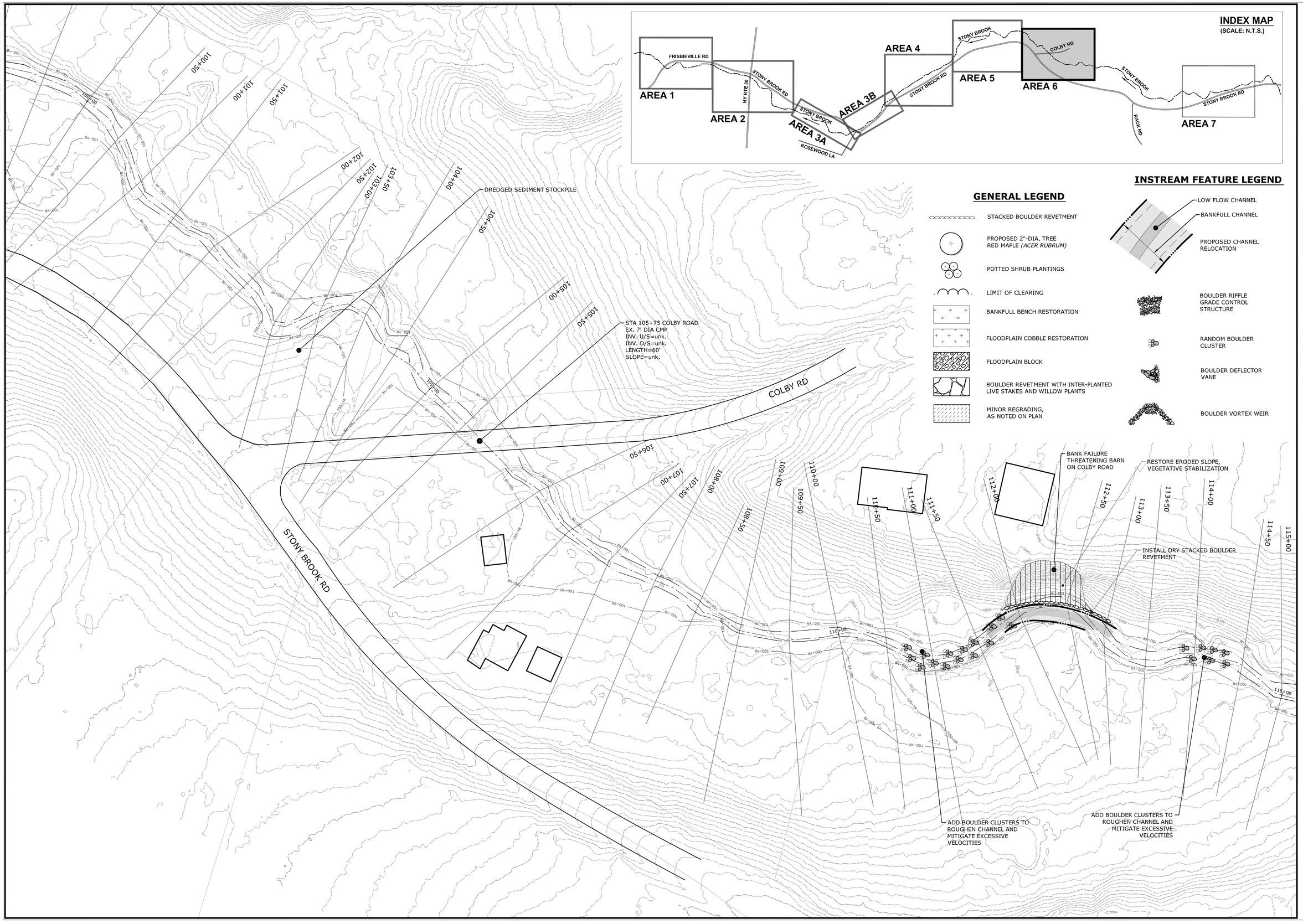

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 6

STONY BROOK STREAM REPAIR AND RESTORATION

NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 06 OF 07

SHEET NAME: **AREA 6**

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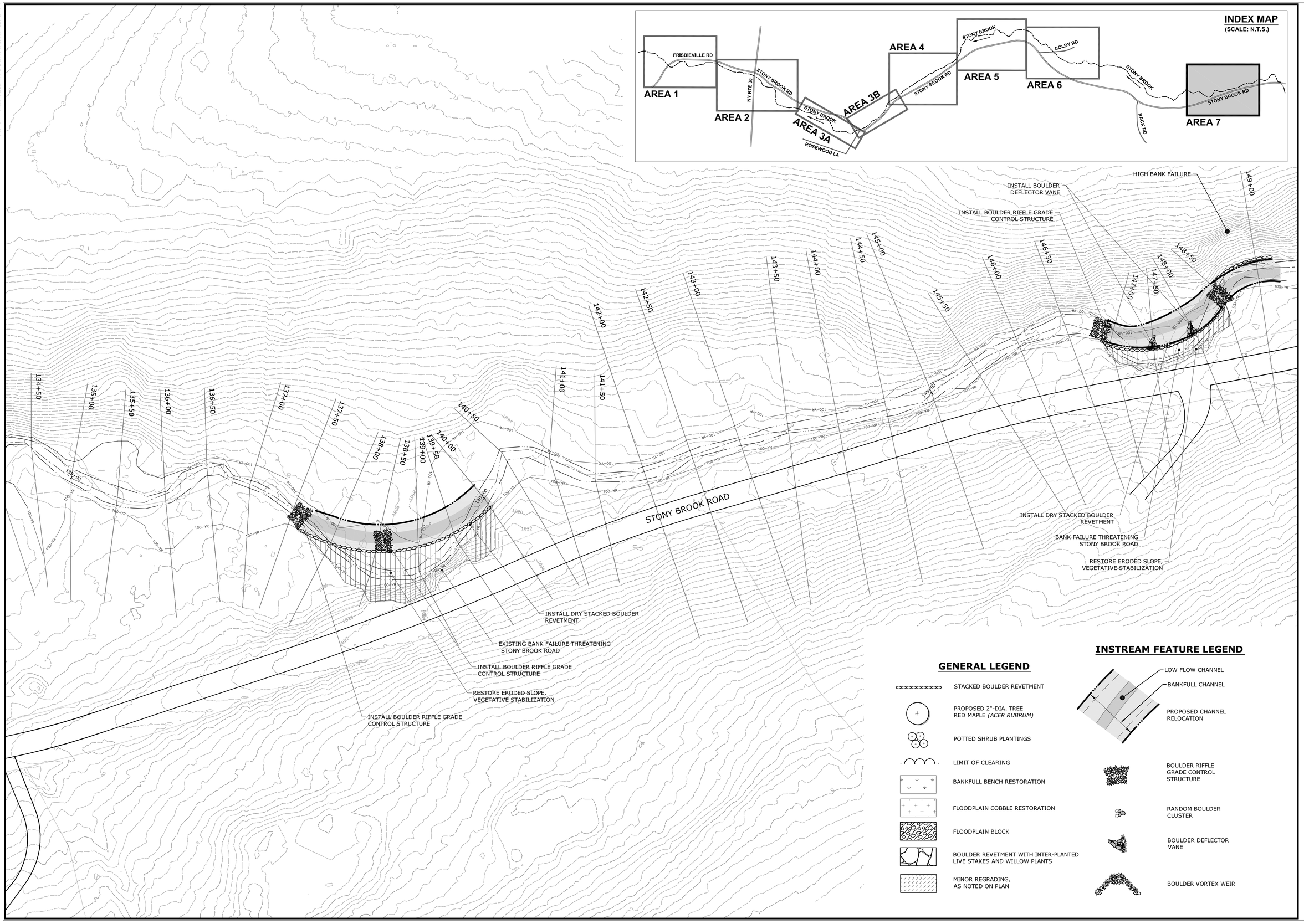

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DESCRIPTION	DATE	BY

PROPOSED CONCEPT DESIGN - AREA 7

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STREAM REPAIR AND RESTORATION
NY ROUTE 30, AND STONY BROOK ROAD AREA
SCHOHARIE, NEW YORK

JCM	JCM	MBC
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JAN. 2016

PROJECT NO.: 4805-04

SHEET NO.: 07 OF 07

SHEET NAME: AREA 7

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USDA

United States Department of Agriculture

Natural Resources
Conservation Service

441 South Salina St.
Suite 354
Syracuse, NY 13212
315-477-6506
kathryn.duncan@ny.usda.gov

October 14, 2016

Alicia Shultz
Community Developer - Environmental Services
New York State Homes & Community Renewal
38-40 State St., 408N Hampton Plaza
Albany, NY 12207

Re: Stony Brook Mitigation – Town of Schoharie, Schoharie County, NY
NRCS FPPA review

Ms. Schultz,

I have received the materials with the information needed to complete a Farmland Conversion Impact Rating for the project cited above which is required by the Department of Housing and Urban Development. Although the site is located on soils rated farmland of statewide importance we will be exempting the project from the Farmland Protection Policy Act (FPPA) provision.

The project is exempt because the amount of disturbance is of minimal size. According to the Farmland Protection Policy Act Manual projects less than 3 acres do not need further consideration. Therefore a NRCS-AD-1006 is not required for this project. Please submit this letter to the federal agency providing funding for the project as proof of exemption from the Farmland Protection Policy Act.

If you have any questions about this determination please feel free to contact me.

Kathryn Duncan

Kathryn Duncan
Cartographer

An Equal Opportunity Provider and Employer

Appendix F: USFWS IPaC Trust Resources Report

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Schoharie County, New York

Not for consultation

Local office

New York Ecological Services Field Office

(607) 753-9334
(607) 753-9699

3817 Luker Road
Cortland, NY 13045-9349

http://www.fws.gov/northeast/nyfo/es/section7.htm

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.

5. Click REQUEST SPECIES LIST.

Listed species[1] are managed by the Endangered Species Program of the U.S. Fish and Wildlife Service.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Not for consultation

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any activity that results in the take (to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct) of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service[3]. There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Conservation measures for birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data http://www.birdscanada.org/birdmon/default/datasummaries.jsp

The migratory birds species listed below are species of particular conservation concern (e.g. Birds of Conservation Concern) that may be potentially affected by activities in this location. It is not a list of every bird species you may find in this location, nor a guarantee that all of the bird species on this list will be found on or near this location. Although it is important to try to avoid and minimize impacts to all birds, special attention should be made to avoid and minimize impacts to birds of priority concern. To view available data on other bird species that may occur in your project area, please visit the AKN Histogram Tools and Other Bird Data Resources. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

NAME	SEASON(S)
American Bittern Botaurus lentiginosus https://ecos.fws.gov/ecp/species/6582	Breeding
Bald Eagle Haliaeetus leucocephalus https://ecos.fws.gov/ecp/species/1626	Year-round
Black-billed Cuckoo Coccyzus erythropthalmus https://ecos.fws.gov/ecp/species/9399	Breeding
Blue-winged Warbler Vermivora pinus	Breeding
Canada Warbler Wilsonia canadensis	Breeding

Golden-winged Warbler Vermivora chrysoptera https://ecos.fws.gov/ecp/species/8745	Breeding
Louisiana Waterthrush Parkesia motacilla	Breeding
Olive-sided Flycatcher Contopus cooperi https://ecos.fws.gov/ecp/species/3914	Breeding
Peregrine Falcon Falco peregrinus https://ecos.fws.gov/ecp/species/8831	Breeding
Pied-billed Grebe Podilymbus podiceps	Breeding
Prairie Warbler Dendroica discolor	Breeding
Red-headed Woodpecker Melanerpes erythrocephalus	Breeding
Short-eared Owl Asio flammeus https://ecos.fws.gov/ecp/species/9295	Wintering
Willow Flycatcher Empidonax traillii https://ecos.fws.gov/ecp/species/3482	Breeding
Wood Thrush Hylocichla mustelina	Breeding

Not for consultation

What does IPaC use to generate the list of migratory bird species potentially occurring in my specified location?

Landbirds:

Migratory birds that are displayed on the IPaC species list are based on ranges in the latest edition of the National Geographic Guide, Birds of North America (6th Edition, 2011 by Jon L. Dunn, and Jonathan Alderfer). Although these ranges are coarse in nature, a number of U.S. Fish and Wildlife Service migratory bird biologists agree that these maps are some of the best range maps to date. These ranges were clipped to a specific Bird Conservation Region (BCR) or USFWS Region/Regions, if it was indicated in the 2008 list of Birds of Conservation Concern (BCC) that a species was a BCC species only in a particular Region/Regions. Additional modifications have been made to some ranges based on more local or refined range information and/or information provided by U.S. Fish and Wildlife Service biologists with species expertise. All migratory birds that show in areas on land in IPaC are those that appear in the 2008 Birds of Conservation Concern report.

Atlantic Seabirds:

Ranges in IPaC for birds off the Atlantic coast are derived from species distribution models developed by the National Oceanic and Atmospheric Association (NOAA) National Centers for Coastal Ocean Science (NCCOS) using the best available seabird survey data for the offshore Atlantic Coastal region to date. NOAANCCOS assisted USFWS in developing seasonal species ranges from their models for specific use in IPaC. Some of these birds are not BCC species but were of interest for inclusion because they may occur in high abundance off the coast at different times throughout the year, which potentially makes them more susceptible to certain types of development and activities taking place in that area. For more refined details about the abundance and richness of bird species within your project area off the Atlantic Coast, see the Northeast Ocean Data Portal. The Portal also offers data and information about other types of taxa that may be helpful in your project review.

About the NOAANCCOS models: the models were developed as part of the NOAANCCOS project: Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf. The models resulting from this project are being used in a number of decision-support/mapping products in order to help guide decision-making on activities off the Atlantic Coast with the goal of reducing impacts to migratory birds. One such product is the Northeast Ocean Data Portal, which can be used to explore details about the relative occurrence and abundance of bird species in a particular area off the Atlantic Coast.

All migratory bird range maps within IPaC are continuously being updated as new and better information becomes available.

Can I get additional information about the levels of occurrence in my project area of specific birds or groups of birds listed in IPaC?

Landbirds:

The Avian Knowledge Network (AKN) provides a tool currently called the "Histogram Tool", which draws from the data within the AKN (latest,survey, point count, citizen science datasets) to create a view of relative abundance of species within a particular location over the course of the year. The results of the tool depict the frequency of detection of a species in survey events, averaged between multiple datasets within AKN in a particular week of the year. You may access the histogram tools through the Migratory Bird Programs AKN Histogram Tools webpage.

The tool is currently available for 4 regions (California, Northeast U.S., Southeast U.S. and Midwest), which encompasses the following 32 states: Alabama, Arkansas, California, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, New York, North, Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, West Virginia, and Wisconsin.

In the near future, there are plans to expand this tool nationwide within the AKN, and allow the graphs produced to appear with the list of trust resources generated by IPaC, providing you with an additional level of detail about the level of occurrence of the species of particular concern potentially occurring in your project area throughout the course of the year.

Atlantic Seabirds:

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAANCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Facilities

Wildlife refuges

Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGES AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Not for consultation

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

THERE ARE NO KNOWN WETLANDS AT THIS LOCATION.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.