

**Pittsfield Municipal Airport
2011-2015 Wild Acres Brook
Channel Relocation and
Wetland Restoration Report**

**USACE Permit NAE-2007-02868
MaDEP Variance 263-901
Pittsfield Municipal Airport
Pittsfield, Massachusetts**

Current status of the Wild Acres Brook channel relocation and associated wetland restoration. Channel section between South Mountain Road and Barker Road in Pittsfield, Massachusetts.



Prepared for:
City of Pittsfield Municipal Airport
Commission and Massachusetts
Dept. of Env. Protection

Prepared by:
Stantec Consulting Services, Inc.

April 19, 2016

PITTSFIELD MUNICIPAL AIRPORT
2011-2015 WILD ACRES BROOK
CHANNEL RELOCATION AND
WETLAND RESTORATION REPORT

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Introduction
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1.0 INTRODUCTION

The following section provides some background on the permitting and construction of the Wild Acres Brook channel relocation and associated wetland restoration adjacent to the channel. These wetland resource area improvements were required mitigation to offset direct wetland impacts associated with the Pittsfield Municipal Airport Improvements Project. This mitigation partially fulfilled requirements pursuant to the Massachusetts Wetlands Protection Act and Sections 401 and 404 of the Federal Clean Water Act.

1.1 PERMIT INFORMATION

Corps Permit No.: CENAE-2007-02868 (issued August 26, 2010)
DEP File No.: Variance 263-901 (MWPA Variance issued October 9, 2009)

Mitigation Site Name: Wild Acres Brook Channel Relocation and Wetland Restoration
410 Linear Feet Channel Construction (net 100' of new channel)
28,158 Square Feet of Vegetated Wetland Restoration
143,097 square feet of Wetland Enhancement (plantings)

Monitoring Report ID: 2 of 5 – Second Post-Construction Report

Permittee: Pittsfield Municipal Airport Commission
832 Tamarack Road
Pittsfield, MA 01201
Attention: Mr. Robert Snuck (Airport Manager)
Telephone: 413-448-9790

Party Responsible for Monitoring: Stantec Consulting Services Inc.
136 West Street, Suite 203
Northampton, MA 01060-3711
Telephone: 413-584-4776

Inspection Dates: Spring and Fall – 2012 through 2015

1.2 BACKGROUND

A channelized section of Wild Acres Brook was located within a former pasture area on the north side of South Mountain Road (see Figure 1). The brook was historically dredged and straightened, prior to acquisition by the airport in 2006-2009. Additionally, perpendicular



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drainage channels were excavated to drain the adjacent vegetated wetlands; presumably for use as pasture. The results of these actions include a loss of vegetated wetland area along the brook (dominant upland plant community), and poor habitat and flow characteristics within the existing channel. The straight-flush channel did not provide any pocket water for fisheries habitat, thus restricting the cover habitat available for fish populations in the channel.

A series of improvements were proposed to enhance the dredged section of the brook and to repair agriculture-related groundwater drainage features in the adjacent wetlands along the brook. The effort resulted in the restoration of 28,158 square feet of drained wetland, repaired 330 feet of existing perennial stream, provided for the addition of 100 linear feet of new perennial stream and 400 square feet of new open water and the revegetation of over 143,097 square feet of denuded wetland area associated with the brook. These improvements were mitigation for stream impacts associated with the installation of a 7' x 7' culvert along an upstream section of the brook to construct a runway safety area.

A careful construction sequence was followed to protect the existing channel during construction, and to ensure that the new channel would not erode when the full flow was introduced. The channel relocation was completed over two phases of construction. A year of vegetative growth and channel stability was provided for in the construction plans prior to the return of flow into the constructed channel. This sequencing had significant measureable success on the present (good) condition of the new Wild Acres Brook channel.

1.3 CONSTRUCTION DATES

Construction photos of the channel creation and wetland restoration process are provided in Appendix A of this report. The record drawings from both phases of construction are provided in Appendix D. The construction photographs are dated and are provided in the correct sequence. The following narrative provides narrative description of the major construction efforts. The discussion follows the sequence of photographs in Appendix A.

The Wild Acres Brook channel relocation site preparation started in October 2010 with the clearing of the work area and installation of the erosion control barriers. Wetland shrub transplants were installed outside of the channel relocation work area from October through December 2010. Phase 1 channel excavation was completed in January 2011 which preserved the initial 50' of the channel to function as a temporary blockage to water flow during the stabilization period; the flow remained in the "old" channel section which bypassed the work area. The channel grading included the grading of the adjacent impacted wetland areas and the removal of agricultural drainage features (small culverts and drainage tiles). The grading scheme included the use of approved topsoil for the establishment of final grade adjacent to the channel. The channel bottom was constructed of compacted gravel.



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Bio-engineering materials and plantings were installed in April 2011 including the coconut-fiber logs (bank protection), bio-degradable erosion control blanket, shrub stakes and wetland seeding. Final seeding of the disturbed areas of this mitigation site was completed on June 15, 2011 after the temporary construction access road was removed.

The seed, shrub stakes, transplants and nursery stock were allowed to establish through August 2012 at which time the remaining channel section was excavated. This operation required a temporary flow bypass around the work area while the final 50' of channel was constructed. The final channel section of was fully built by August 24, 2012. The flow bypass was removed and brook flow was fully introduced to the new channel. A channel block was concurrently constructed in the old Wild Acres channel to permanently re-direct flow. The channel block was planted with wetland shrubs, seeded, and covered with erosion control netting.

The introduction of flow into the new channel and the construction and planting of the channel block were the final construction activities associated with this mitigation site. 2013 represented the first full year of growth at this mitigation site for all of the sections of the work. Additional activities at this site since the completion of construction have included the annual introduction of additional shrub live stakes and the control of invasive shrub species (through hand cutting).

The construction photos provided in Appendix A provide a clear view of all major construction activities and also reveal the rapid stabilization of the banks and excellent growth of the planted shrubs. To date, the willow and dogwood shrubs have completely covered sections of the new channel, and the formed banks remain in excellent condition. The coconut fiber logs that were used to form the new banks have become integrated into the root network of the planted shrubs, and remain a part of the structure. The channel has experienced several flood events since August 2012 and has reacted well to these severe storms. A key component of the success of the bank stabilization was the use of the erosion control fabric and coconut fiber logs in tandem to form a complete, but temporary barrier between the flow and the soils. The seed and shrub stakes then had time to stabilize the soils before direct flow contact with the soil occurred. The one year lag time between planting and flow introduction to the channel was instrumental in the success of the work.

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2.0 MONITORING METHODS

Photographic monitoring and annual inspection of the constructed channel has occurred since 2012. Additionally, vegetation monitoring plots were established in the adjacent wetland restoration area to determine the success of the restored wetland areas. Monitoring plots WR-1 through WR-4 were installed in separate sections of the wetland restoration area to gauge the success of the plantings and to determine the overall dominance of native wetland vegetation. The monitoring plot locations are shown in Figure 2. Each plot was monitored for shrubs (15' radius plot) and groundcover (5' radius plot). The 2012 reporting included only the shrub assessment resulting from the transplants and nursery stock. Full groundcover was not present within the plots until the 2013 monitoring period.

The monitoring plots were located sufficiently far from the constructed stream channel so that the 15' shrub radius would not include the lower topography of the channel. The plots were to monitor conditions in the level areas adjacent to the channel only. Topographically, the plot areas are all nearly level and approximately 2-2.5' higher than the bottom of the Wild Acres Brook channel.

Monitoring was initiated in late-2012. Two monitoring events per year were completed from 2013 through 2015; one each in late-spring and early-fall. Photographic documentation of the monitoring plots and general site conditions was also collected as a part of the monitoring. The plot photographs are located in Appendix B while the vegetation data sheets are located in Appendix C.

3.0 MONITORING PLOT RESULTS

Monitoring of plots WR-1 through WR-4 was conducted to determine if the slight lowering of the grade and removal of drainage features would restore wetland conditions within the areas adjacent to Wild Acres Brook. The subject area (the limits of the intended restoration are shown in Figure 2) had been drained and filled as a part of past agricultural activities creating upland soil and vegetation conditions as documented in pre-construction data plots. These conditions were confirmed through on-site inspection with Massachusetts Department of Environmental Protection staff in 2009. Direct inspection of several small culverts, drainage tiles and minor ditching all combined to reduce groundwater levels. The monitoring was to evaluate the return of a dominance of native wetland plant species as an indicator of the return of suitable groundwater conditions. Additionally, the monitoring was to evaluate whether sufficient woody stems were introduced through transplants and nursery stock to form scrub-shrub and forested wetland cover types.



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Monitoring Plot Results
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The collected data included estimates of herbaceous species percent cover of each plot and a direct count of woody stems (shrub and tree species). Table 1 provides the results of the woody stem counts through the end of 2015 while Table 2 provides the present native wetland species percent cover of each plot, along with an assessment of invasive species coverage.

Table 1: Estimate of native woody stem density in the Wetland Restoration Area.

Monitoring Plot ID	Native Woody Stems w/in 15' Radius - 2012	2013	2014	2015	Estimated Woody Stem Density for 2015
WR-1	6	16	15	14	862/acre
WR-2	17	10	13	10	616/acre
WR-3	16	19	11	23	1417/acre
WR-4	37	22	16	20	1232/acre
Average	19	17	14	17	1032/acre

Table 1 reveals good progress towards the conversion of the wetland restoration area from an old-field upland area dominated by goldenrod to a scrub-shrub and forested wetland cover type. Woody stem densities within the monitoring plots suggest an average number of woody stems far above the pre-restoration condition of the site and above the typical standard of 500 stems/acre. The shrub transplants dominate the monitoring plot areas while the nursery stock tree and shrub plantings occurred primarily within the wetland enhancement areas located beyond the grading limits. Additional shrub stakes have been added to the site during the monitoring years, which are primarily responsible for the increases noted in the data from 2014 to 2015 for WR-3 and WR-4. Additionally, natural colonization is occurring but limited to mainly shrub species (willow and dogwood). Natural tree colonization has been mainly limited to cottonwood; in relatively low numbers.

Spreading of the dogwood shrubs through additional shoots has been noted on many of the transplants. Several of the transplants died-back to the root system after the initial planting, only to re-sprout with multi-stemmed clumps that have now grown to heights of 3' or more since the 2011 plantings. These transplants were taken from the project impact sites prior to the filling of each wetland. They were limited to various willow and dogwood species, with some arrow-wood and alder mixed in.



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Table 2: Fall Data - Wetland Species Cover of the Monitoring Plots in the Wetland Restoration Area.

FALL DATA									
Monitoring Plot ID	Total %Groundcover			% Cover of Invasive Species			% Cover of Native Hydrophytes		
	2013	2014	2015	2013	2014	2015	2013	2014	2015
WR-1	129	125	108	27	19	25	102	106	77
WR-2	110	102	69	15	21	8	60	66	81
WR-3	97	65	68	9	7	10	67	50	78
WR-4	103	99	64	11	10	7	73	79	81
Average	110	98	77	16	14	13	76	75	79

Table 3: Spring Data - Wetland Species Cover of the Monitoring Plots in the Wetland Restoration Area.

SPRING DATA									
Monitoring Plot ID	Total %Groundcover			% Cover of Invasive Species			% Cover of Native Hydrophytes		
	2013	2014	2015	2013	2014	2015	2013	2014	2015
WR-1	103	97	109	20	15	25	81	85	84
WR-2	74	93	63	10	20	5	61	70	89
WR-3	77	65	59	10	10	3	71	77	85
WR-4	86	88	55	10	12	5	76	80	82
Average	85	86	72	13	14	10	72	78	85

The groundcover data suggests that the wetland restoration area has achieved a dominance of native hydrophytes through a combination of the wetland seed mix and natural colonization. The average native hydrophyte cover is at or above the 80% standard established in the mitigation plan. The seed mix species have greatly diminished in their plot composition since the 2013 data set, and now comprise a minority of the native hydrophytes (the wetland seed mix was composed entirely of native wetland grasses). Conversely, opportunistic native hydrophytes have colonized the wetland restoration area dominated by a number of rush, sedge and aster species. Wetland goldenrods dominate much of the Fall data sets. Overall, the percent cover of the plots suggests soil stability, and the diversity of the native species seems acceptable.



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The invasive species data shows between 10% and 15% cover of invasives in the wetland restoration area; dominated by a single plant (purple loosestrife). This coverage is slightly above the 10% level that was set as a standard for the project, but well below the cover in the adjacent wetland areas. Loosestrife has a dominant presence in the adjacent wetlands and will continue to exist at the site. A high percent coverage of the soils with a diversity of native species is the best method for controlling further introductions of this species to the restoration area.

3.1 CHANNEL STABILITY

The relocated Wild Acres Brook channel has been completely stabilized as can be seen in the post-construction photographs contained in Appendix A. The initial 50' of the channel was the final section to be constructed in August 2012. The remaining channel was constructed in 2011 and given a year to vegetate prior to experiencing full flow conditions. Flows were introduced to the brook in August 2012, and the constructed channel has experienced several severe storm events since that time. Observation of flood flow conditions suggests that the channel is fully capable of withstanding erosive forces and is fully stabilized. Furthermore, the channel is nearly 80% covered by native wetland shrubs with dense root systems supplying structure to the bank. The shrub stems extend into the water which buffers the bank from direct contact by the more intense flow forces. Much of the coconut fiber logs that were used to develop the bank remain in a functional condition. The logs have been colonized by the introduced wetland shrubs and continue to provide some measure of erosion control.

The channel bends have naturally scoured deeper pockets in the gravel substrate along the outside of the bends, with a depositional environment on the inside of the bends. This channel bottom variability combined with the high degree of channel coverage by over-hanging shrubs provides a degree of fisheries habitat that was absent from the original channel. Fish are plentiful throughout the created channel and are protected from bird predators by the vegetation. Fisheries food and cover habitat has been created through the construction of the channel, mitigating much of the habitat lost in the impact area.

4.0 REMEDIAL MEASURES

Remedial measures for the wetland restoration area include the maintenance and enhancement of the shrub and tree presence within the restoration area limits. The more dense shrub and tree presence will provide the best control of the spread of loosestrife through the restoration area. Shading of the soils by a tall shrub and sapling layer will exclude further colonization while increasing light competition for existing loosestrife. Enhancing the woody stems will also increase the rate at which the intended cover types are realized. In particular, the number of tree specimens needs to be greater than present conditions to attain a suitable ratio with the shrub stems. Box elder, ash, maple and cottonwood could all be increased through natural colonization and protection of the seedlings. Plantings could be considered if natural colonization does not appear suitable from the annual monitoring data. A focus on



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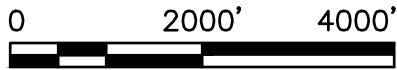
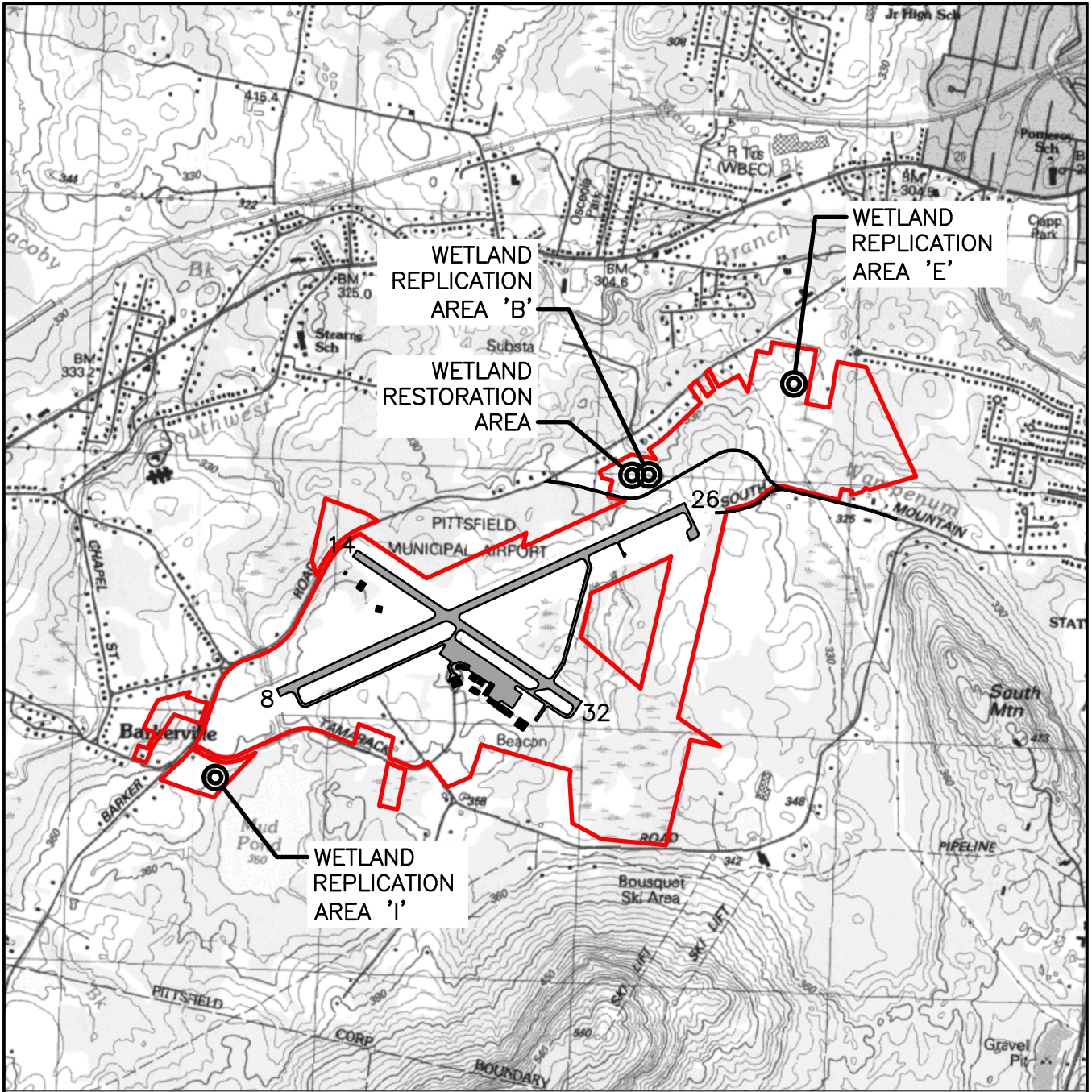
Remedial Measures

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canopy establishment should continue through the monitoring period. In particular, the areas represented by WR-1 and WR-2 should be further planted with shrub stakes/stickers during late-season monitoring events. These areas exhibit the lower woody stem densities on the site and would benefit from some additional live stake installation. These plots also have the higher invasives density which would also be controlled through an improved shrub layer. Fall 2016 should see 100-200 live stake installations in the southern section of the wetland restoration area.

While loosestrife has been the primary invasive species of concern in the wetland restoration area, some buckthorn has been noted in the data. Annual hand picking of buckthorn has been practiced during monitoring events at the site. No mature, seed producing specimens occur within the limits of the restoration and enhancement areas, but they do occur off the property to the north of the site. Continued observations and physical control of buckthorn needs to occur through the monitoring period, until the native shrubs/trees reach a density that precludes the easy colonization of the site by buckthorn.





AIRPORT PROPERTY LINE

ORIGINAL SHEET - ANSI A

MARCH 2016
195210537

Client/Project

PITTSFIELD MUNICIPAL AIRPORT



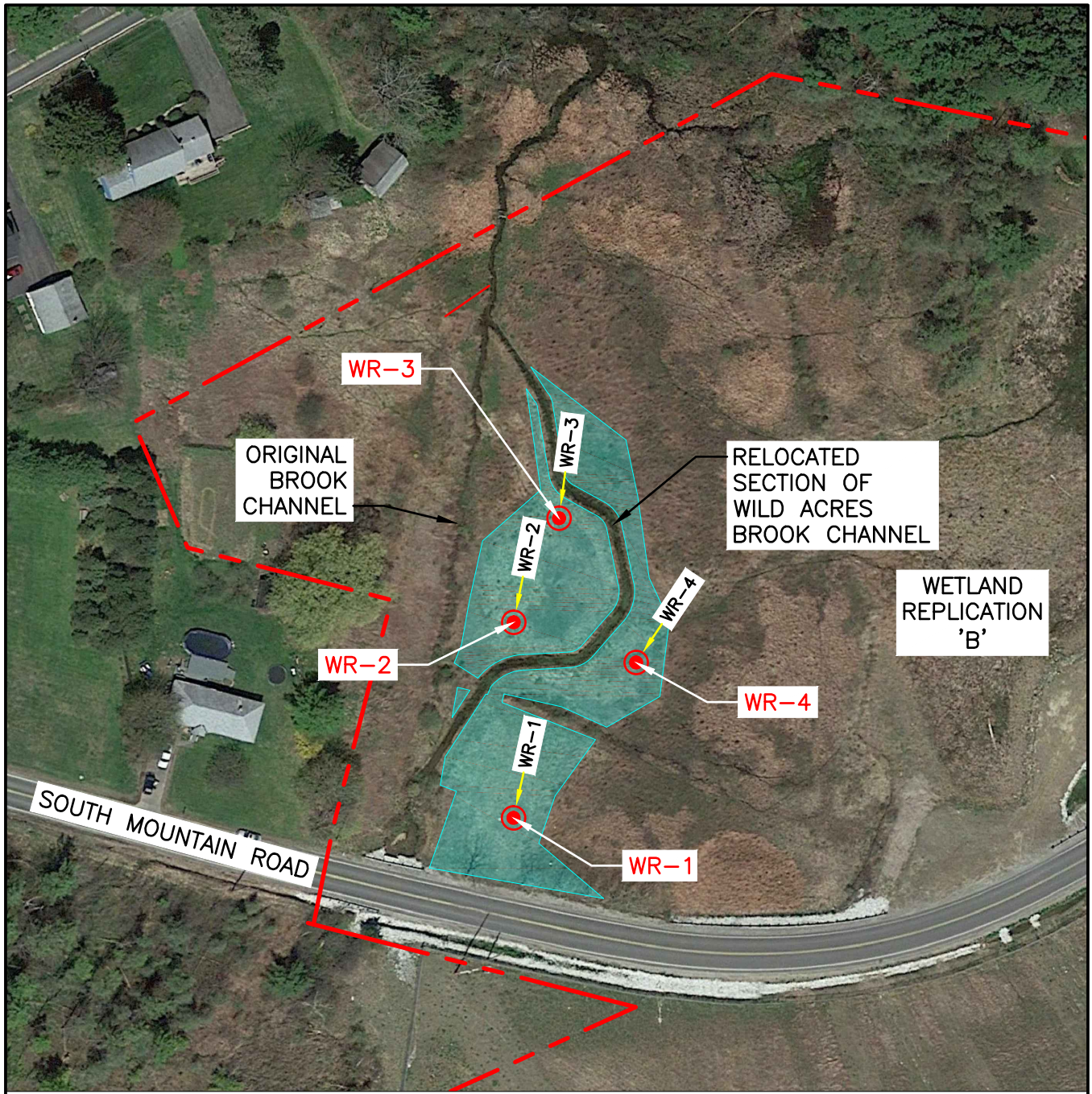
Stantec Consulting Services Inc.
482 Payne Road
Scarborough ME 04074 U.S.A.
Tel. 207.883.3355
Fax. 207.883.3376
www.stantec.com

Figure No.

1.0

Title

SITE PLAN



	AIRPORT PROPERTY LINE
	VEGETATION MONITORING PLOTS & ID
	PHOTOGRAPH ID & LOCATION
	LIMIT OF WETLAND RESTORATION AREA = 28,162 SF

ORIGINAL SHEET - ANSI A MARCH 2016
195210537

Client/Project
PITTSFIELD MUNICIPAL AIRPORT



Stantec Consulting Services Inc.
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Scarborough ME 04074 U.S.A.
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Figure No. 2
Title
**WETLAND RESOTRATION AREA
MONITORING PLOT LOCATIONS**

APPENDICES

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Appendix A Construction Photos
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Appendix A CONSTRUCTION PHOTOS

Photographs from both Phase 1 and Phase 2 of the airport improvements project pertaining to the relocation of the Wild Acres Brook channel and the restoration of adjacent wetlands areas that were previously disturbed by agricultural activities.

PITTSFIELD MUNICIPAL AIRPORT – WILD ACRES BROOK RESTORATION - CONSTRUCTION



Wetland Restoration: Pre-Construction June 2009



Wetland Restoration: Pre-Construction (Brook pre-construction) June 2009



Wetland Restoration: Pre-Construction June 2009



Wetland Restoration: Pre-Construction June 2009

PITTSFIELD MUNICIPAL AIRPORT – WILD ACRES BROOK RESTORATION - CONSTRUCTION



Wetland Replication: Site Preparation October 2010



Wetland Restoration: Site Preparation November 2010



Wetland Restoration: Site Preparation October 2010



Wetland Restoration: Site Preparation November 2010

PITTSFIELD MUNICIPAL AIRPORT – WILD ACRES BROOK RESTORATION - CONSTRUCTION



Wetland Restoration: New Channel Excavation January 2011



Wetland Restoration: Gravel Substrate Installation January 2011



Wetland Restoration: New Channel Outlet January 2011



Wetland Restoration: Channel construction January 2011

PITTSFIELD MUNICIPAL AIRPORT – WILD ACRES BROOK RESTORATION - CONSTRUCTION



Wetland Restoration: Channel Construction January 2011



Wetland Restoration: Channel Construction January 2011



Wetland Restoration: Channel Construction January 2011



Wetland Restoration: Channel Construction March 2011

PITTSFIELD MUNICIPAL AIRPORT – WILD ACRES BROOK RESTORATION - CONSTRUCTION



Wetland Restoration: Channel Construction April 2011



Wetland Restoration: Channel Construction/Stabilization April 2011



Wetland Restoration: Channel Construction/Stabilization April 2011



Wetland Restoration: Channel Construction/Stabilization April 2011

PITTSFIELD MUNICIPAL AIRPORT – WILD ACRES BROOK RESTORATION - CONSTRUCTION



Wetland Restoration: Nursery Stock Planting June 2011



Wetland Restoration: Nursery Stock Planting June 2011



Wetland Restoration: Planting (willow stakes along channel) June 2011



Wetland Restoration: Final Hydro-Seeding June 2011

PITTSFIELD MUNICIPAL AIRPORT – WILD ACRES BROOK RESTORATION - CONSTRUCTION



Wetland Restoration: July 2011



Wetland Restoration: Shrub Stake Growth July 2011



Wetland Restoration: Shrub Stake Growth July 2011



Wetland Restoration: Nursery Stock and Transplants July 2011

PITTSFIELD MUNICIPAL AIRPORT – WILD ACRES BROOK RESTORATION - CONSTRUCTION



Wetland Restoration: October 2011



Wetland Restoration: October 2011



Wetland Restoration: October 2011



Wetland Restoration: October 2011

PITTSFIELD MUNICIPAL AIRPORT – WILD ACRES BROOK RESTORATION - CONSTRUCTION



Wetland Restoration: April 2012



Wetland Restoration: April 2012



Wetland Restoration: June 2012



Wetland Restoration: June 2012

PITTSFIELD MUNICIPAL AIRPORT – WILD ACRES BROOK RESTORATION - CONSTRUCTION



Wetland Restoration: Creating Channel Connection August 2012



Wetland Restoration: Creating Channel Connection August 2012



Wetland Restoration: Channel Stabilization August 2012



Wetland Restoration: Channel Stabilization August 2012

PITTSFIELD MUNICIPAL AIRPORT – WILD ACRES BROOK RESTORATION - CONSTRUCTION



Wetland Restoration: Channel Connection August 2012



Wetland Restoration: Channel Connection August 2012



Wetland Restoration: Channel Connection August 2012



Wetland Restoration: Channel Connection and Water Release August 2012

PITTSFIELD MUNICIPAL AIRPORT – WILD ACRES BROOK RESTORATION - CONSTRUCTION



Wetland Restoration: Flow Release August 2012



Wetland Restoration: August 2012



Wetland Restoration: August 2012



Wetland Restoration: September 2012

PITTSFIELD MUNICIPAL AIRPORT – WILD ACRES BROOK RESTORATION - CONSTRUCTION



Wetland Restoration: September 2012



Wetland Restoration: September 2012

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Appendix B Monitoring Plot Photos
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Appendix B MONITORING PLOT PHOTOS

Photographs of the four vegetation monitoring plots within the wetland restoration area adjacent to Wild Acres Brook. The photos provide a close-up and distant view of each of the four monitoring plots (WR-1 through WR-4) from 2012 through 2015.

PITTSFIELD MUNICIPAL AIRPORT – WETLAND RESTORATION PLOTS 2012-2015



Wetland Restoration: WR-1 Close July 2012



Wetland Restoration: WR-1 Close October 2012



Wetland Restoration: WR-1 Close June 2013



Wetland Restoration: WR-1 Close September 2013

PITTSFIELD MUNICIPAL AIRPORT – WETLAND RESTORATION PLOTS 2012-2015



Wetland Restoration: WR-1 Close July 2014



Wetland Restoration: WR-1 Close September 2014



Wetland Restoration: WR-1 Close June 2015



Wetland Restoration: WR-1 Close September 2015

PITTSFIELD MUNICIPAL AIRPORT – WETLAND RESTORATION PLOTS 2012-2015



Wetland Restoration: WR-1 Far July 2012



Wetland Restoration: WR-1 Far October 2012



Wetland Restoration: WR-1 Far June 2013



Wetland Restoration: WR-1 Far September 2013

PITTSFIELD MUNICIPAL AIRPORT – WETLAND RESTORATION PLOTS 2012-2015



Wetland Restoration: WR-1 Far July 2014



Wetland Restoration: WR-1 Far September 2014



Wetland Restoration: WR-1 Far June 2015



Wetland Restoration: WR-1 Far September 2015

PITTSFIELD MUNICIPAL AIRPORT – WETLAND RESTORATION PLOTS 2012-2015



Wetland Restoration: WR-2 Close July 2012



Wetland Restoration: WR-2 Close October 2012



Wetland Restoration: WR-2 Close June 2013



Wetland Restoration: WR-2 Close September 2013

PITTSFIELD MUNICIPAL AIRPORT – WETLAND RESTORATION PLOTS 2012-2015



Wetland Restoration: WR-2 Close June 2014



Wetland Restoration: WR-2 Close September 2014



Wetland Restoration: WR-2 Close June 2015



Wetland Restoration: WR-2 Close September 2015

PITTSFIELD MUNICIPAL AIRPORT – WETLAND RESTORATION PLOTS 2012-2015



Wetland Restoration: WR-2 Far July 2012



Wetland Restoration: WR-2 Far October 2012



Wetland Restoration: WR-2 Far June 2013



Wetland Restoration: WR-2 Far September 2013

PITTSFIELD MUNICIPAL AIRPORT – WETLAND RESTORATION PLOTS 2012-2015



Wetland Restoration: WR-2 Far June 2014



Wetland Restoration: WR-2 Far September 2014



Wetland Restoration: WR-2 Far June 2015



Wetland Restoration: WR-2 Far September 2015

PITTSFIELD MUNICIPAL AIRPORT – WETLAND RESTORATION PLOTS 2012-2015



Wetland Restoration: WR-3 Close July 2012



Wetland Restoration: WR-3 Close October 2012



Wetland Restoration: WR-3 Close June 2013



Wetland Restoration: WR-3 Close September 2013

PITTSFIELD MUNICIPAL AIRPORT – WETLAND RESTORATION PLOTS 2012-2015



Wetland Restoration: WR-3 Close June 2014



Wetland Restoration: WR-3 Close September 2014



Wetland Restoration: WR-3 Close June 2015



Wetland Restoration: WR-3 Close September 2015

PITTSFIELD MUNICIPAL AIRPORT – WETLAND RESTORATION PLOTS 2012-2015



Wetland Restoration: WR-3 Far July 2012



Wetland Restoration: WR-3 Far October 2012



Wetland Restoration: WR-3 Far June 2013



Wetland Restoration: WR-3 Far September 2013

PITTSFIELD MUNICIPAL AIRPORT – WETLAND RESTORATION PLOTS 2012-2015



Wetland Restoration: WR-3 Far June 2014



Wetland Restoration: WR-3 Far September 2014



Wetland Restoration: WR-3 Far June 2015



Wetland Restoration: WR-3 Far September 2015

PITTSFIELD MUNICIPAL AIRPORT – WETLAND RESTORATION 2012-2015



Wetland Restoration: WR-4 Close July 2012



Wetland Restoration: WR-4 Close October 2012



Wetland Restoration: WR-4 Close June 2013



Wetland Restoration: WR-4 Close September 2013

PITTSFIELD MUNICIPAL AIRPORT – WETLAND RESTORATION 2012-2015



Wetland Restoration: WR-4 Close June 2014



Wetland Restoration: WR-4 Close September 2014



Wetland Restoration: WR-4 Close June 2015



Wetland Restoration: WR-4 Close September 2015

PITTSFIELD MUNICIPAL AIRPORT – WETLAND RESTORATION 2012-2015



Wetland Restoration: WR-4 Far July 2012



Wetland Restoration: WR-4 Far October 2012



Wetland Restoration: WR-4 Far June 2013



Wetland Restoration: WR-4 September 2013

PITTSFIELD MUNICIPAL AIRPORT – WETLAND RESTORATION 2012-2015



Wetland Restoration: WR-4 Far June 2014



Wetland Restoration: WR-4 Far June 2015



Wetland Restoration: WR-4 Far September 2015

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Appendix C Monitoring Plot Data Forms
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Appendix C MONITORING PLOT DATA FORMS

Vegetation data collected from the four vegetation monitoring plots (WR-1 through WR-4) associated with the wetland restoration area adjacent to Wild Acres Brook.

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 1</u>
Date: <u>10-22-12</u>
Staff: <u>Kate Foley</u>
Weather Conditions: <u>Partly Cloudy mid 50's</u>

Photograph Taken? <u>Y</u>
Herbivory Noted? <u>N</u>
Other Disturbance? <u>N</u>

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover	Invasive?	Hydric Indicator
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
Green Ash	<i>Fraxinus pennsylvanica</i>	S	4 Stems		FACW
Arrowwood	<i>Viburnum dentatum</i>	S	2 Stems		FAC
	GC % Cover		%		
	GC Invasives % Cover		%		
	GC Hydrophyte % Cover (non invasives only)				
	Native Shrub Stem Count		6		
	Invasive Shrub Stem Count		0		

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 2</u>
Date: <u>10-22-12</u>
Staff: <u>Kate Foley</u>
Weather Conditions: <u>Partly Cloudy mid 50's</u>

Photograph Taken? <u>Y</u>
Herbivory Noted? <u>N</u>
Other Disturbance? <u>N</u>

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover	Invasive?	Hydric Indicator
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
Arrowwood	<i>Viburnum dentatum</i>	S	2 Stems		FAC
Green Ash	<i>Fraxinus pennsylvanica</i>	S	1 Stems		FACW
Willow Sp.	<i>Salix sp.</i>	S	1 Stems		
Red Osier Dogwood	<i>Cornus sericea</i>	S	13 Stem		FACW+
	GC % Cover	%			
	GC Invasives % Cover	%			
	GC Hydrophyte % Cover (non invasives only)	%			
	Native Shrub Stem Count	17			
	Invasive Shrub Stem Count	0			

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 3</u>
Date: <u>10-22-12</u>
Staff: <u>Kate Foley</u>
Weather Conditions: <u>Partly Cloudy mid 50's</u>

Photograph Taken? <u>Y</u>
Herbivory Noted? <u>N</u>
Other Disturbance? <u>N</u>

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover	Invasive?	Hydric Indicator
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
Pussy Willow	<i>Salix discolor</i>	S	1 Stems		FACW
Green Ash	<i>Fraxinus pennsylvanica</i>	S	1 Stems		FACW
Willow Sp.	<i>Salix sp.</i>	S	2 Stems		
Red Osier Dogwood	<i>Cornus sericea</i>	S	12 Stem		FACW+
	GC % Cover	%			
	GC Invasives % Cover	%			
	GC Hydrophyte % Cover (non invasives only)	%			
	Native Shrub Stem Count	16			
	Invasive Shrub Stem Count	0			

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 4</u>
Date: <u>10-22-12</u>
Staff: <u>Kate Foley</u>
Weather Conditions: <u>Partly Cloudy mid 50's</u>

Photograph Taken? <u>Y</u>
Herbivory Noted? <u>N</u>
Other Disturbance? <u>N</u>

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover	Invasive?	Hydric Indicator
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
		GC	%		
Arrowwood	<i>Viburnum dentatum</i>	S	1 Stems		FAC
Green Ash	<i>Fraxinus pennsylvanica</i>	S	2 Stems		FACW
Willow Sp.	<i>Salix sp.</i>	S	2 Stems		
Red Osier Dogwood	<i>Cornus sericea</i>	S	32 Stem		FACW+
	GC % Cover	%			
	GC Invasives % Cover	%			
	GC Hydrophyte % Cover (non invasives only)	%			
	Native Shrub Stem Count	37			
	Invasive Shrub Stem Count	0			

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 1</u>
Date: <u>10-11-13</u>
Staff: <u>Randy Christensen & Kate Foley</u>
Weather Conditions: <u>Partly Cloudy mid 60's</u>

Photograph Taken? <u>Y</u>
Herbivory Noted? <u>N</u>
Other Disturbance? <u>N</u>

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover		Invasive?	Hydric Indicator
				Dominant		
Purple loosestrife	<i>Lythrum salicaria</i>	GC	27 %	Y	YES	OBL
Soft rush	<i>Juncus effusus</i>	GC	22 %	Y		OBL
Joint leaved rush	<i>Juncus articulatus</i>	GC	20 %	Y		OBL
Purple stem aster	<i>Symphylotrichum puniceum</i>	GC	15 %			OBL
Blue flag iris	<i>Iris versicolor</i>	GC	12 %			OBL
Grass-leaved goldenrod	<i>Euthamia graminifolia</i>	GC	10 %			FAC
Boneset	<i>Eupatorium perfoliatum</i>	GC	7 %			FACW
Dark green bulrush	<i>Scirpus atrovirens</i>	GC	7 %			OBL
Panic grass	<i>Panicum sp.</i>	GC	4 %			OBL
Blue vervain	<i>Verbena hastata</i>	GC	2 %			FACW
Fox sedge	<i>Carex vulpinoidea</i>	GC	2 %			OBL
Northern bedstraw	<i>Galium boreale</i>	GC	1 %			FAC
Bebb Willow	<i>Salix bebbiana</i>	S	5 Stems			FACW
Boxelder	<i>Acer negundo</i>	S	5 Stems			FAC
Red Osier Dogwood	<i>Cornus sericea</i>	S	3 Stems			NI
Arrowwood	<i>Viburnum dentatum</i>	S	3 Stems			FAC
European Buckthorn	<i>Frangula alnus</i>	S	1 Stem		YES	FAC
	GC % Cover		129 %			
	GC Invasives % Cover		27 %			
	GC Hydrophyte % Cover (non invasives only)			102 %		
	Native Shrub Stem Count		16			
	Invasive Shrub Stem Count		1			

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 2</u>
Date: <u>10-11-13</u>
Staff: <u>Randy Christensen & Kate Foley</u>
Weather Conditions: <u>Partly Cloudy mid 60's</u>

Photograph Taken? Y
Herbivory Noted? N
Other Disturbance? N

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover		Invasive?	Hydric Indicator
				Dominant		
Joint Leaved rush	<i>Juncus articulatus</i>	GC	25 %	Y		OBL
Blue Stem Goldenrod	<i>Solidago caesia</i>	GC	16 %	Y		FACU
Purple Loosestrife	<i>Lythrum salicaria</i>	GC	15 %	Y	YES	OBL
Gracefull Sedge	<i>Carex gracillima</i>	GC	12 %			FACU
Purple Stem Aster	<i>Symphylotrichum puniceum</i>	GC	11 %			OBL
Soft Rush	<i>Juncus effusus</i>	GC	7 %			OBL
Red Top Grass	<i>Agrostis gigantea</i>	GC	6 %			FACW
Purple Willow Herb	<i>Epilobium coloatum</i>	GC	5 %			OBL
Sphagnum Moss	<i>Sphagnum sp.</i>	GC	5 %			NI
Gark Green Bulrush	<i>Scirpus atrovirens</i>	GC	4 %			OBL
Fox Sedge	<i>Carex vulpinoidea</i>	GC	2 %			OBL
Field Thistle	<i>Cirsium discolor</i>	GC	2 %			UPL
Arrowwood	<i>Viburnum dentatum</i>	S	1 Stem			FAC
Green Ash	<i>Fraxinus pennsylvanica</i>	S	1 Stem			FACW
Bebb Willow	<i>Salix bebbiana</i>	S	2 Stems			FACW
Red osier dogwood	<i>Cornus sericea</i>	S	4 Stems			FACW+
Hoary Willow	<i>Salix candida</i>	S	2 Stems			OBL
	GC % Cover		110 %			
	GC Invasives % Cover		15 %			
	GC Hydrophyte % Cover (non invasives only)		60 %			
	Native Shrub Stem Count		10			
	Invasive Shrub Stem Count		0			

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 3</u>
Date: <u>10-11-13</u>
Staff: <u>Randy Christensen & Kate Foley</u>
Weather Conditions: <u>Partly Cloudy mid 60's</u>

Photograph Taken? <u>Y</u>
Herbivory Noted? <u>N</u>
Other Disturbance? <u>N</u>

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover		Invasive?	Hydric Indicator
				Dominant		
Purple stem aster	<i>Symphylotrichum puniceum</i>	GC	30 %	Y		OBL
Graceful sedge	<i>Carex gracillima</i>	GC	21 %	Y		FACU
Soft rush	<i>Juncus effusus</i>	GC	17 %			OBL
Purple loosestrife	<i>Lythrum salicaria</i>	GC	9 %		YES	OBL
Purple leaved willow herb	<i>Epilobium coloratum</i>	GC	6 %			OBL
Lurid sedge	<i>Carex lurida</i>	GC	6 %			OBL
Military rush	<i>Juncus militaris</i>	GC	6 %			OBL
Dark green bulrush	<i>Scirpus atrovirens</i>	GC	2 %			OBL
Hoary Willow	<i>Salix candida</i>	S	1 Stem			OBL
Boxelder	<i>Acer negundo</i>	S	1 Stem			FAC
Bebb Willow	<i>Salix bebbiana</i>	S	5 Stems			FACW
Red Osier Dogwood	<i>Cornus sericea</i>	S	12 Stem			NI
	GC % Cover		97 %			
	GC Invasives % Cover		9 %			
	GC Hydrophyte % Cover (non invasives only)		67 %			
	Native Shrub Stem Count		19			
	Invasive Shrub Stem Count		0			

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 4</u>
Date: <u>10-11-13</u>
Staff: <u>Randy Christensen & Kate Foley</u>
Weather Conditions: <u>Partly Cloudy mid 60's</u>

Photograph Taken? <u>Y</u>
Herbivory Noted? <u>N</u>
Other Disturbance? <u>N</u>

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover		Invasive?	Hydric Indicator
				Dominant		
Joint leaved rush	<i>Juncus articulatus</i>	GC	28 %	Y		OBL
Grassleaf goldenrod	<i>Euthamia graminifolia</i>	GC	15 %	Y		FAC
Graceful sedge	<i>Carex gracillima</i>	GC	11 %	Y		FACU
Purple loosestrife	<i>Lythrum salicaria</i>	GC	11 %	Y	YES	OBL
Soft rush	<i>Juncus effusus</i>	GC	10 %			OBL
Blue stem goldenrod	<i>Solidago caesia</i>	GC	8 %			FACU
New York aster	<i>Symphotrichum novi-belgii</i>	GC	7 %			FACW
Purple stem aster	<i>Symphotrichum puniceum</i>	GC	4 %			OBL
Redtop	<i>Agrostis gigantea</i>	GC	4 %			FACW
Boneset	<i>Eupatorium perfoliatum</i>	GC	2 %			FACW
Dark green bulrush	<i>Scirpus atrovirens</i>	GC	2 %			OBL
Water hemlock	<i>Circuta maculata</i>	GC	1 %			OBL
Arrowwood	<i>Viburnum dentatum</i>	S	1 Stem			FAC
Boxelder	<i>Acer negundo</i>	S	3 Stems			FAC
Bebb Willow	<i>Salix bebbiana</i>	S	3 Stems			FACW
Cottonwood	<i>Populus deltoides</i>	S	1 Stem			FAC
Hoary Willow	<i>Salix candida</i>	S	5 Stems			OBL
Red osier dogwood	<i>Cornus sericea</i>	S	9 Stems			FACW
	GC % Cover		103 %			
	GC Invasives % Cover		11 %			
	GC Hydrophyte % Cover (non invasives only)		73 %			
	Native Shrub Stem Count		22			
	Invasive Shrub Stem Count		0			

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 1</u>
Date: <u>9-17-14</u>
Staff: <u>Randy Christensen & Ally Sullivan</u>
Weather Conditions: <u>Calm, Cool, Clear, 70s</u>

Photograph Taken? Y
Herbivory Noted? N
Other Disturbance? N

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover		Invasive?	Hydric Indicator
				Dominant		
Purple loosestrife 32 Stems	<i>Lythrum salicaria</i>	GC	19 %	Y	YES	OBL
Soft rush	<i>Juncus effusus</i>	GC	22 %	Y		OBL
Joint leaved rush	<i>Juncus articulatus</i>	GC	16 %			OBL
Purple stem aster	<i>Symphylotrichum puniceum</i>	GC	21 %	Y		OBL
Blue flag iris	<i>Iris versicolor</i>	GC	8 %			OBL
Grass-leaved goldenrod	<i>Euthamia graminifolia</i>	GC	9 %			FAC
Boneset	<i>Eupatorium perfoliatum</i>	GC	4 %			FACW
Dark green bulrush	<i>Scirpus atrovirens</i>	GC	7 %			OBL
Panic grass	<i>Panicum sp.</i>	GC	5 %			FACW
Blue vervain	<i>Verbena hastata</i>	GC	1 %			FACW
Fox sedge	<i>Carex vulpinoidea</i>	GC	5 %			OBL
Northern bedstraw	<i>Galium boreale</i>	GC	1 %			FAC
Lurid Sedge	<i>Carex lurida</i>	GC	3 %			FACW+
Rough Leaved Goldenrod	<i>Solidago patula</i>	GC	3 %			FAC
New York Aster	<i>Symphylotrichum novi-belgi</i>	GC	1 %			FACW
Bebb Willow	<i>Salix bebbiana</i>	S	7 Stems			FACW
Boxelder	<i>Acer negundo</i>	S	5 Stems			FAC
Red Osier Dogwood	<i>Cornus sericea</i>	S	1 Stems			FACW
Arrowwood	<i>Viburnum dentatum</i>	S	2 Stems			FAC
European Buckthorn	<i>Frangula alnus</i>	S	1 Stem		YES	FAC
Notes	GC % Cover		125 %			
Groundwater at surface	GC Invasives % Cover		19 %			
	GC Hydrophyte % Cover (non invasives only)			106 %		
	Native Shrub Stem Count		15			
	Invasive Shrub Stem Count		1			

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 2</u>
Date: <u>09-17-14</u>
Staff: <u>Randy Christensen & Ally Sullivan</u>
Weather Conditions: <u>Calm, Cool, Clear, 70s</u>

Photograph Taken? Y
Herbivory Noted? N
Other Disturbance? N

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover		Invasive?	Hydric Indicator
				Dominant		
Joint Leaved rush	<i>Juncus articulatus</i>	GC	42 %	Y		OBL
Blue Stem Goldenrod	<i>Solidago caesia</i>	GC	5 %			FACU
Purple Loosestrife 24 Stems	<i>Lythrum salicaria</i>	GC	21 %	Y	YES	OBL
Gracefull Sedge	<i>Carex gracillima</i>	GC	9 %			FACU
Purple Stem Aster	<i>Symphylotrichum puniceum</i>	GC	9 %			OBL
Soft Rush	<i>Juncus effusus</i>	GC	7 %			OBL
Red Top Grass	<i>Agrostis gigantea</i>	GC	3 %			FACW
Sphagnum Moss	<i>Sphagnum sp.</i>	GC	1 %			NI
Gark Green Bulrush	<i>Scirpus atrovirens</i>	GC	2 %			OBL
Fox Sedge	<i>Carex vulpinoidea</i>	GC	2 %			OBL
Boneset	<i>Eupatorium perfoliatum</i>		1 %			FACW+
Arrowwood	<i>Viburnum dentatum</i>	S	2 Stem			FAC
Green Ash	<i>Fraxinus pennsylvanica</i>	S	1 Stem			FACW
Bebb Willow	<i>Salix bebbiana</i>	S	3 Stems			FACW
Red Osier Dogwood	<i>Cornus sericea</i>	S	5 Stems			FACW+
Hoary Willow	<i>Salix candida</i>	S	2 Stems			OBL
Notes	GC % Cover 102 %					
Groundwater at surface	GC Invasives % Cover 21 %					
	GC Hydrophyte % Cover (non invasives only)	66 %				
	Native Shrub Stem Count 13					
	Invasive Shrub Stem Count 0					

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 3</u>
Date: <u>09-17-14</u>
Staff: <u>Randy Christensen & Ally Sullivan</u>
Weather Conditions: <u>Calm, Cool, Clear, 70s</u>

Photograph Taken? Y
Herbivory Noted? N
Other Disturbance? N

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover		Invasive?	Hydric Indicator
				Dominant		
Purple stem aster	<i>Symphylotrichum puniceum</i>	GC	14 %	Y		OBL
Graceful sedge	<i>Carex gracillima</i>	GC	8 %	Y		FACU
Soft rush	<i>Juncus effusus</i>	GC	18 %	Y		OBL
Purple loosestrife 11 Stems	<i>Lythrum salicaria</i>	GC	7 %	Y	YES	OBL
Lurid sedge	<i>Carex lurida</i>	GC	5 %			OBL
Military rush	<i>Juncus militaris</i>	GC	8 %	Y		OBL
Dark green bulrush	<i>Scirpus atrovirens</i>	GC	2 %			OBL
Arrowhead	<i>Sagittaria latifolia</i>	GC	3 %			OBL
Boxelder	<i>Acer negundo</i>	S	1 Stem			FAC
Bebb Willow	<i>Salix bebbiana</i>	S	3 Stems			FACW
Red Osier Dogwood	<i>Cornus sericea</i>	S	7 Stem			FACW
Notes	GC % Cover 65 %					
Groundwater at surface	GC Invasives % Cover 7 %					
High beaver activity area	GC Hydrophyte % Cover (non invasives only)	50 %				
Loss of shrubs to beaver forage	Native Shrub Stem Count 11					
	Invasive Shrub Stem Count 0					

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 4</u>
Date: <u>09-17-14</u>
Staff: <u>Randy Christensen & Ally Sullivan</u>
Weather Conditions: <u>Calm, Cool, Clear, 70s</u>

Photograph Taken? <u>Y</u>
Herbivory Noted? <u>N</u>
Other Disturbance? <u>N</u>

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover		Invasive?	Hydric Indicator
				Dominant		
Joint leaved rush	<i>Juncus articulatus</i>	GC	32 %	Y		OBL
Grassleaf goldenrod	<i>Euthamia graminifolia</i>	GC	11 %	Y		FAC
Graceful sedge	<i>Carex gracillima</i>	GC	5 %			FACU
Purple loosestrife 16 Stems	<i>Lythrum salicaria</i>	GC	10 %	Y	YES	OBL
Soft rush	<i>Juncus effusus</i>	GC	10 %	Y		OBL
Blue stem goldenrod	<i>Solidago caesia</i>	GC	5 %			FACU
New York aster	<i>Symphotrichum novi-belgii</i>	GC	6 %			FACW
Purple stem aster	<i>Symphotrichum puniceum</i>	GC	3 %			OBL
Redtop	<i>Agrostis gigantea</i>	GC	1 %			FACW
Boneset	<i>Eupatorium perfoliatum</i>	GC	6 %			FACW
Dark green bulrush	<i>Scirpus atrovirens</i>	GC	8 %			OBL
Soft Stem Bulrush	<i>Scirpus validus</i>	GC	2 %			OBL
Arrowwood	<i>Viburnum dentatum</i>	S	2 Stem			FAC
Boxelder	<i>Acer negundo</i>	S	3 Stems			FAC
Bebb Willow	<i>Salix bebbiana</i>	S	4 Stems			FACW
Hoary Willow	<i>Salix candida</i>	S	1 Stems			OBL
Red osier dogwood	<i>Cornus sericea</i>	S	6 Stems			FACW
Notes	GC % Cover 99 %					
Groundwater at surface	GC Invasives % Cover 10 %					
	GC Hydrophyte % Cover (non invasives only)	79 %				
	Native Shrub Stem Count 16					
	Invasive Shrub Stem Count 0					

Plant Monitoring Form

Monitoring Plot Identifier: WR-1
Date: 9/24/15
Staff: Randy Christensen
Weather Conditions: partly cloudy, mid 60's

Photograph Taken? Yes
Herbivory Noted?
Other Disturbance?

Vegetation List

<u>Common Name</u>	<u>Species Name</u>	<u>Layer</u> (C,L,S,GC)	<u>Stem Count</u>	<u>Percent Cover</u>	<u>Dominant</u>	<u>Invasive?</u>	<u>Hydric Indicator</u>
Purple loosestrife	<i>Lythrum salicaria</i>	GC	30	25 %	Y	YES	OBL
Late goldenrod	<i>Solidago gigantea</i>	GC		25 %	Y		FACW
Soft rush	<i>Juncus effusus</i>	GC		15 %	Y		OBL
New York aster	<i>Symphotrichum novi-belgii</i>	GC		12 %	N		FACW
Blue flag iris	<i>Iris versicolor</i>	GC		6 %	N		OBL
Boneset	<i>Eupatorium perfoliatum</i>	GC		6 %	N		OBL
Path rush	<i>Juncus tenuis</i>	GC		5 %	N		FAC
Water horsetail	<i>Equisetum fluviatile</i>	GC		5 %	N		OBL
Lurid sedge	<i>Carex lurida</i>	GC		3 %	N		OBL
Fowl bluegrass	<i>Poa palustris</i>	GC		3 %	N		OBL
Ironweed	<i>Vernonia noveboracensis</i>	GC		3 %	N		FACW
Willow	<i>Salix sp.</i>	S	8	10 %	Y		FACW
Green ash	<i>Fraxinus pennsylvanica</i>	S	3	10 %	Y		FACW
Arrowwood	<i>Viburnum dentatum</i>	S	2	6 %	Y		FAC
Box elder	<i>Acer negundo</i>	S	1	2 %	N		FAC
	GC % Cover	108 %					
	GC Invasives % Cover	25 %					
	GC Hydrophyte % Cover (non invasives only)	77%					
	S % Cover	28 %					
	Native Shrub Stem Count	14					
	Invasive Shrub Stem Count	0					

Notes

Plant Monitoring Form

Monitoring Plot Identifier: WR-2
Date: 9/24/15
Staff: Randy Christensen
Weather Conditions: Partly cloudy, mid 60's

Photograph Taken? Yes
Herbivory Noted?
Other Disturbance?

Vegetation List

<u>Common Name</u>	<u>Species Name</u>	<u>Layer</u> (C,L,S,GC)	<u>Stem Count</u>	<u>Percent Cover</u>	<u>Dominant</u>	<u>Invasive?</u>	<u>Hydric Indicator</u>
New York aster	<i>Symphotrichum novi-belgii</i>	GC		22 %	Y		FACW
Lurid sedge	<i>Carex lurida</i>	GC		15 %	Y		OBL
Soft rush	<i>Juncus effusus</i>	GC		10 %	N		OBL
Purple loosestrife	<i>Lythrum salicaria</i>	GC	15	8 %	N	YES	OBL
Path rush	<i>Juncus tenuis</i>	GC		6 %	N		FAC
Bedstraw	<i>Galium mollugo</i>	GC		5 %	N		FACU
Redtop grass	<i>Agrostis gigantea</i>	GC		3 %	N		FACW
Red osier dogwood	<i>Cornus sericea</i>	S	4	7 %	Y		FACW
Willow	<i>Salix sp.</i>	S	3	7 %	Y		FACW
Arrowwood	<i>Viburnum dentatum</i>	S	2	5 %	Y		FAC
Green ash	<i>Fraxinus pennsylvanica</i>	S	1	3 %	N		FACW
	GC % Cover		69 %				
	GC Invasives % Cover		8 %				
	GC Hydrophyte % Cover (non invasives only)		81%				
	S % Cover		22 %				
	Native Shrub Stem Count		10				
	Invasive Shrub Stem Count		0				

Notes

Plant Monitoring Form

Monitoring Plot Identifier: WR-3
Date: 9/24/15
Staff: Randy Christensen
Weather Conditions: Partly cloudy, mid 60's

Photograph Taken? Yes
Herbivory Noted?
Other Disturbance?

Vegetation List

<u>Common Name</u>	<u>Species Name</u>	<u>Layer</u> (C,L,S,GC)	<u>Stem Count</u>	<u>Percent Cover</u>	<u>Dominant</u>	<u>Invasive?</u>	<u>Hydric Indicator</u>
Soft rush	<i>Juncus effusus</i>	GC		25 %	Y		OBL
Lurid sedge	<i>Carex lurida</i>	GC		15 %	Y		OBL
New York aster	<i>Symphotrichum novi-belgii</i>	GC		10 %	N		FACW
Purple loosestrife	<i>Lythrum salicaria</i>	GC	8	10 %	N	YES	OBL
Bedstraw	<i>Galium mollugo</i>	GC		5 %	N		FACU
Path rush	<i>Juncus tenuis</i>	GC		3 %	N		FAC
Willow	<i>Salix sp.</i>	S	13	25 %	Y		FACW
Red osier dogwood	<i>Cornus sericea</i>	S	8	11 %	Y		FACW
Green ash	<i>Fraxinus pennsylvanica</i>	S	2	3 %	N		FACW
	GC % Cover	68 %					
	GC Invasives % Cover	10 %					
	GC Hydrophyte % Cover (non invasives only)	78%					
	S % Cover	39 %					
	<i>Native Shrub Stem Count</i>	23					
	<i>Invasive Shrub Stem Count</i>	0					

Notes

Plant Monitoring Form

Monitoring Plot Identifier: WR-4
Date: 9/24/15
Staff: Randy Christensen
Weather Conditions: Partly cloudy, mid 60's

Photograph Taken? Yes
Herbivory Noted?
Other Disturbance?

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count	Percent Cover		Dominant	Invasive?	Hydric Indicator
Path rush	<i>Juncus tenuis</i>	GC		30	%	Y		FAC
Purple loosestrife	<i>Lythrum salicaria</i>	GC	6	7	%	Y	YES	OBL
Soft rush	<i>Juncus effusus</i>	GC		6	%	N		OBL
Lurid sedge	<i>Carex lurida</i>	GC		5	%	N		OBL
Boneset	<i>Eupatorium perfoliatum</i>	GC		5	%	N		FACW
Soft stem bulrush	<i>Scirpus validus</i>	GC		3	%	N		OBL
Graceful Sedge	<i>Carex gracillima</i>	GC		3	%	N		FACU
New York aster	<i>Symphyotrichum novi-belgii</i>	GC		3	%	N		FACW
Bedstraw	<i>Galium mollugo</i>	GC		2	%	N		FACU
Willow	<i>Salix sp.</i>	S	12	25	%	Y		FACW
Red osier dogwood	<i>Cornus sericea</i>	S	6	10	%	N		FACW
Arrowwood	<i>Viburnum dentatum</i>	S	2	2	%	N		FAC
	GC % Cover		64 %					
	GC Invasives % Cover		7 %					
	GC Hydrophyte % Cover (non invasives only)		81%					
	S % Cover		37 %					
	Native Shrub Stem Count		20					
	Invasive Shrub Stem Count		0					

Notes

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 1</u>
Date: <u>06-20-13</u>
Staff: <u>Randy Christensen</u>
Weather Conditions: <u>mid 60's</u>

Photograph Taken? Y
Herbivory Noted? N
Other Disturbance? N

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover		Invasive?	Hydric Indicator
				Dominant		
Soft rush	<i>Juncus effusus</i>	GC	25 %	Y		OBL
Purple loosestrife	<i>Lythrum salicaria</i>	GC	20 %	Y	YES	OBL
Joint leaved rush	<i>Juncus articulatus</i>	GC	12 %	Y		OBL
Purple stem aster	<i>Symphylotrichum puniceum</i>	GC	12 %	Y		OBL
Blue flag iris	<i>Iris versicolor</i>	GC	8 %	N		OBL
Grass-leaved goldenrod	<i>Euthamia graminifolia</i>	GC	8 %	N		FAC
Boneset	<i>Eupatorium perfoliatum</i>	GC	5 %	N		FACW
Dark green bulrush	<i>Scirpus atrovirens</i>	GC	5 %	N		OBL
Redtop grass	<i>Agrostis gigantea</i>	GC	3 %	N		OBL
Northern bedstraw	<i>Galium boreale</i>	GC	3 %	N		FAC
Fox sedge	<i>Carex vulpinoidea</i>	GC	2 %	N		OBL
Bebb Willow	<i>Salix bebbiana</i>	S	5 Stems			FACW
Boxelder	<i>Acer negundo</i>	S	5 Stems			FAC
Red Osier Dogwood	<i>Cornus sericea</i>	S	3 Stems			FACW
Arrowwood	<i>Viburnum dentatum</i>	S	3 Stems			FAC
European Buckthorn	<i>Rhamnus cathartica</i>	S	1 Stem		YES	FAC
	GC % Cover		103 %			
	GC Invasives % Cover		20 %			
	GC Hydrophyte % Cover (non invasives only)	81%				
	Native Shrub Stem Count		17			
	Invasive Shrub Stem Count		1			

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 2</u>
Date: <u>06-20-13</u>
Staff: <u>Randy Christensen</u>
Weather Conditions: <u>mid 60's</u>

Photograph Taken? <u>Y</u>
Herbivory Noted? <u>N</u>
Other Disturbance? <u>N</u>

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover		Invasive?	Hydric Indicator
				Dominant		
Joint Leaved Rush	<i>Juncus articulatus</i>	GC	12 %	Y		OBL
Purple Stem Aster	<i>Symphylotrichum puniceum</i>	GC	12 %	Y		OBL
Blue Stem Goldenrod	<i>Solidago caesia</i>	GC	10 %	Y		FACU
Purple Loosestrife	<i>Lythrum salicaria</i>	GC	10 %	Y	YES	OBL
Soft Rush	<i>Juncus effusus</i>	GC	10 %	Y		OBL
Graceful Sedge	<i>Carex gracillima</i>	GC	8 %	N		FACU
Red Top Grass	<i>Agrostis gigantea</i>	GC	5 %	N		FACW
Gark Green Bulrush	<i>Scirpus atrovirens</i>	GC	3 %	N		OBL
Purple Willow Herb	<i>Epilobium coloratum</i>	GC	1 %	N		OBL
Sphagnum Moss	<i>Sphagnum sp.</i>	GC	1 %	N		OBL
Fox Sedge	<i>Carex vulpinoidea</i>	GC	1 %	N		OBL
Field Thistle	<i>Cirsium discolor</i>	GC	1 %	N		UPL
Red Osier Dogwood	<i>Cornus sericea</i>	S	4 Stems			FACW
Bebb Willow	<i>Salix bebbiana</i>	S	2 Stems			FACW
Hoary Willow	<i>Salix candida</i>	S	2 Stems			OBL
Arrowwood	<i>Viburnum dentatum</i>	S	1 Stem			FAC
Green Ash	<i>Fraxinus pennsylvanica</i>	S	1 Stem			FACW
	GC % Cover		74 %			
	GC Invasives % Cover		10 %			
	GC Hydrophyte % Cover (non invasives only)	61%				
	Native Shrub Stem Count		10			
	Invasive Shrub Stem Count		0			

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 3</u>
Date: <u>06-20-13</u>
Staff: <u>Randy Christensen</u>
Weather Conditions: <u>mid 60's</u>

Photograph Taken? <u>Y</u>
Herbivory Noted? <u>N</u>
Other Disturbance? <u>N</u>

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover		Invasive?	Hydric Indicator
				Dominant		
Soft rush	<i>Juncus effusus</i>	GC	20 %	Y		OBL
Purple stem aster	<i>Symphylotrichum puniceum</i>	GC	18 %	Y		OBL
Graceful sedge	<i>Carex gracillima</i>	GC	12 %	Y		FACU
Purple loosestrife	<i>Lythrum salicaria</i>	GC	10 %	N	YES	OBL
Lurid sedge	<i>Carex lurida</i>	GC	7 %	N		OBL
Military rush	<i>Juncus militaris</i>	GC	5 %	N		OBL
Purple leaved willow herb	<i>Epilobium coloratum</i>	GC	3 %	N		OBL
Dark green bulrush	<i>Scirpus atrovirens</i>	GC	1 %	N		OBL
Rough goldenrod	<i>Solidago rugosa</i>	GC	1 %	N		FAC
Red Osier Dogwood	<i>Cornus sericea</i>	S	12 Stems			FACW
Bebb Willow	<i>Salix bebbiana</i>	S	5 Stems			FACW
Hoary Willow	<i>Salix candida</i>	S	1 Stem			OBL
Boxelder	<i>Acer negundo</i>	S	1 Stem			FAC
	GC % Cover		77 %			
	GC Invasives % Cover		10 %			
	GC Hydrophyte % Cover (non invasives only)		71%			
	Native Shrub Stem Count		19			
	Invasive Shrub Stem Count		0			

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 4</u>
Date: <u>06-20-13</u>
Staff: <u>Randy Christensen</u>
Weather Conditions: <u>mid 60's</u>

Photograph Taken? Y
Herbivory Noted? N
Other Disturbance? N

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover		Invasive?	Hydric Indicator
				Dominant		
Joint leaved rush	<i>Juncus articulatus</i>	GC	22 %	Y		OBL
Grassleaf goldenrod	<i>Euthamia graminifolia</i>	GC	12 %	Y		FAC
Soft rush	<i>Juncus effusus</i>	GC	12 %	Y		OBL
Purple loosestrife	<i>Lythrum salicaria</i>	GC	10 %	N	YES	OBL
Graceful sedge	<i>Carex gracillima</i>	GC	8 %	N		FACU
Redtop	<i>Agrostis gigantea</i>	GC	5 %	N		FACW
Boneset	<i>Eupatorium perfoliatum</i>	GC	5 %	N		FACW
Blue stem goldenrod	<i>Solidago caesia</i>	GC	3 %	N		FACU
New York aster	<i>Symphotrichum novi-belgii</i>	GC	3 %	N		FACW
Purple stem aster	<i>Symphotrichum puniceum</i>	GC	3 %	N		OBL
Dark green bulrush	<i>Scirpus atrovirens</i>	GC	1 %	N		OBL
Water hemlock	<i>Circuta maculata</i>	GC	1 %	N		OBL
Soft stem bulrush	<i>Schoenoplectus tabernaemontani</i>	GC	1 %	N		OBL
Red Osier Dogwood	<i>Cornus sericea</i>	S	9 Stems			FACW
Hoary Willow	<i>Salix candida</i>	S	5 Stems			OBL
Boxelder	<i>Acer negundo</i>	S	3 Stems			FAC
Bebb Willow	<i>Salix bebbiana</i>	S	3 Stems			FACW
Arrowwood	<i>Viburnum dentatum</i>	S	1 Stem			FAC
Cottonwood	<i>Populus deltoides</i>	S	1 Stem			FAC
	GC % Cover		86 %			
	GC Invasives % Cover		10 %			
	GC Hydrophyte % Cover (non invasives only)		76%			
	Native Shrub Stem Count		22			
	Invasive Shrub Stem Count		0			

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 1</u>
Date: <u>07-01-14</u>
Staff: <u>Randy Christensen</u>
Weather Conditions: <u>Sunny, high 80's</u>

Photograph Taken? <u>Y</u>
Herbivory Noted? <u>N</u>
Other Disturbance? <u>N</u>

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover		Invasive?	Hydric Indicator
				Dominant		
Soft rush	<i>Juncus effusus</i>	GC	20 %	Y		OBL
Purple stem aster	<i>Symphylotrichum puniceum</i>	GC	15 %	Y		OBL
Purple loosestrife	<i>Lythrum salicaria</i>	GC	15 %	Y	YES	OBL
Joint leaved rush	<i>Juncus articulatus</i>	GC	12 %	N		OBL
Dark green bulrush	<i>Scirpus atrovirens</i>	GC	7 %	N		OBL
Grass-leaved goldenrod	<i>Euthamia graminifolia</i>	GC	6 %	N		FAC
Blue flag iris	<i>Iris versicolor</i>	GC	5 %	N		OBL
Redtop grass	<i>Agrostis panicum</i>	GC	3 %	N		FACW
Fox sedge	<i>Carex vulpinoidea</i>	GC	3 %	N		OBL
Boneset	<i>Eupatorium perfoliatum</i>	GC	3 %	N		FACW
Lurid Sedge	<i>Carex lurida</i>	GC	3 %	N		FACW
Ironweed	<i>Vernonia noveboracensis</i>	GC	3 %	N		FACW
Rough Leaved Goldenrod	<i>Solidago patula</i>	GC	1 %	N		FAC
Northern bedstraw	<i>Galium boreale</i>	GC	1 %	N		FAC
Bebb Willow	<i>Salix bebbiana</i>	S	7 Stems			FACW
Boxelder	<i>Acer negundo</i>	S	5 Stems			FAC
Arrowwood	<i>Viburnum dentatum</i>	S	2 Stems			FAC
Red Osier Dogwood	<i>Cornus sericea</i>	S	1 Stems			FACW
European Buckthorn	<i>Rhamnus cathartica</i>	S	1 Stem		YES	FAC
Notes	GC % Cover		97 %			
	GC Invasives % Cover		15 %			
	GC Hydrophyte % Cover (non invasives only)			85%		
	Native Shrub Stem Count		16			
	Invasive Shrub Stem Count		1			

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 2</u>
Date: <u>07-01-14</u>
Staff: <u>Randy Christensen</u>
Weather Conditions: <u>Sunny, high 80's</u>

Photograph Taken? <u>Y</u>
Herbivory Noted? <u>N</u>
Other Disturbance? <u>N</u>

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover		Invasive?	Hydric Indicator
				Dominant		
Joint Leaved rush	<i>Juncus articulatus</i>	GC	28 %	Y		OBL
Purple Loosestrife	<i>Lythrum salicaria</i>	GC	20 %	Y	YES	OBL
Purple Stem Aster	<i>Symphylotrichum puniceum</i>	GC	10 %	N		OBL
Soft Rush	<i>Juncus effusus</i>	GC	10 %	N		OBL
Red Top Grass	<i>Agrostis gigantea</i>	GC	7 %	N		FACW
Graceful Sedge	<i>Carex gracillima</i>	GC	5 %	N		FACU
Blue Stem Goldenrod	<i>Solidago caesia</i>	GC	3 %	N		FACU
Dark Green Bulrush	<i>Scirpus atrovirens</i>	GC	3 %	N		OBL
Fox Sedge	<i>Carex vulpinoidea</i>	GC	3 %	N		OBL
Small White Aster	<i>Symphylotrichum racemosum</i>	GC	3 %	N		FACW
Boneset	<i>Eupatorium perfoliatum</i>	GC	1 %	N		FACW
Red Osier Dogwood	<i>Cornus sericea</i>	S	5 Stems			FACW
Bebb Willow	<i>Salix bebbiana</i>	S	3 Stems			FACW
Arrowwood	<i>Viburnum dentatum</i>	S	2 Stem			FAC
Hoary Willow	<i>Salix candida</i>	S	2 Stems			OBL
Green Ash	<i>Fraxinus pennsylvanica</i>	S	1 Stem			FACW
Notes	GC % Cover		93 %			
Groundwater at surface	GC Invasives % Cover		20 %			
	GC Hydrophyte % Cover (non invasives only)	70%				
	Native Shrub Stem Count		13			
	Invasive Shrub Stem Count		0			

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 3</u>
Date: <u>07-01-14</u>
Staff: <u>Randy Christensen</u>
Weather Conditions: <u>Sunny, high 80's</u>

Photograph Taken? <u>Y</u>
Herbivory Noted? <u>N</u>
Other Disturbance? <u>N</u>

Vegetation List

Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover		Invasive?	Hydric Indicator
				Dominant		
Soft rush	<i>Juncus effusus</i>	GC	20 %	Y		OBL
Purple stem aster	<i>Symphylotrichum puniceum</i>	GC	15 %	Y		OBL
Purple loosestrife	<i>Lythrum salicaria</i>	GC	10 %	N	YES	OBL
Military rush	<i>Juncus militaris</i>	GC	8 %	N		OBL
Graceful sedge	<i>Carex gracillima</i>	GC	5 %	N		FACU
Lurid sedge	<i>Carex lurida</i>	GC	5 %	N		OBL
Arrowhead	<i>Sagittaria latifolia</i>	GC	1 %	N		OBL
Dark green bulrush	<i>Scirpus atrovirens</i>	GC	1 %	N		OBL
Red Osier Dogwood	<i>Cornus sericea</i>	S	7 Stems			FACW
Bebb Willow	<i>Salix bebbiana</i>	S	3 Stems			FACW
Boxelder	<i>Acer negundo</i>	S	1 Stem			FAC
Notes	GC % Cover		65 %			
	GC Invasives % Cover		10 %			
	GC Hydrophyte % Cover (non invasives only)			77%		
	Native Shrub Stem Count		11			
	Invasive Shrub Stem Count		0			

Plant Monitoring Form

Monitoring Plot Identifier: <u>WR-Plot 4</u>
Date: <u>07-01-14</u>
Staff: <u>Randy Christensen</u>
Weather Conditions: <u>Sunny, high 80's</u>

Photograph Taken? <u>Y</u>
Herbivory Noted? <u>N</u>
Other Disturbance? <u>N</u>

Vegetation List

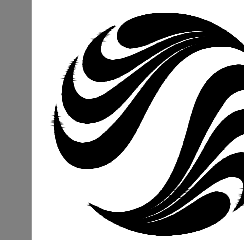
Common Name	Species Name	Layer (C,L,S,GC)	Stem Count or % Cover		Invasive?	Hydric Indicator
				Dominant		
Joint leaved rush	<i>Juncus articulatus</i>	GC	25 %	Y		OBL
Grassleaf goldenrod	<i>Euthamia graminifolia</i>	GC	15 %	Y		FAC
Purple loosestrife	<i>Lythrum salicaria</i>	GC	12 %	Y	YES	OBL
Soft rush	<i>Juncus effusus</i>	GC	12 %	Y		OBL
Purple stem aster	<i>Symphylotrichum puniceum</i>	GC	7 %	N		OBL
Dark green bulrush	<i>Scirpus atrovirens</i>	GC	3 %	N		OBL
Boneset	<i>Eupatorium perfoliatum</i>	GC	3 %	N		FACW
Graceful sedge	<i>Carex gracillima</i>	GC	3 %	N		FACU
Blue stem goldenrod	<i>Solidago caesia</i>	GC	3 %	N		FACU
Redtop grass	<i>Agrostis gigantea</i>	GC	3 %	N		FACW
New York aster	<i>Symphylotrichum novi-belgii</i>	GC	1 %	N		FACW
Soft stem bulrush	<i>Scirpus validus</i>	GC	1 %	N		OBL
Red osier dogwood	<i>Cornus sericea</i>	S	6 Stems			FACW
Bebb Willow	<i>Salix bebbiana</i>	S	4 Stems			FACW
Boxelder	<i>Acer negundo</i>	S	3 Stems			FAC
Arrowwood	<i>Viburnum dentatum</i>	S	2 Stems			FAC
Hoary Willow	<i>Salix candida</i>	S	1 Stem			OBL
Notes	GC % Cover		88 %			
	GC Invasives % Cover		12 %			
	GC Hydrophyte % Cover (non invasives only)	80%				
	Native Shrub Stem Count		16			
	Invasive Shrub Stem Count		0			

**PITTSFIELD MUNICIPAL AIRPORT
2011-2015 WILD ACRES BROOK
CHANNEL RELOCATION AND
WETLAND RESTORATION REPORT**

Appendix D Wild Acres Brook Construction Plans
April 19, 2016

Appendix D WILD ACRES BROOK CONSTRUCTION PLANS

Plan sheets from Phase 1 and Phase 2 of the construction of the airport improvements project pertaining to the creation of a new channel for a section of Wild Acres Brook (Phase 1) and the eventual connection of the new channel to the original Wild Acres Brook (Phase 2).



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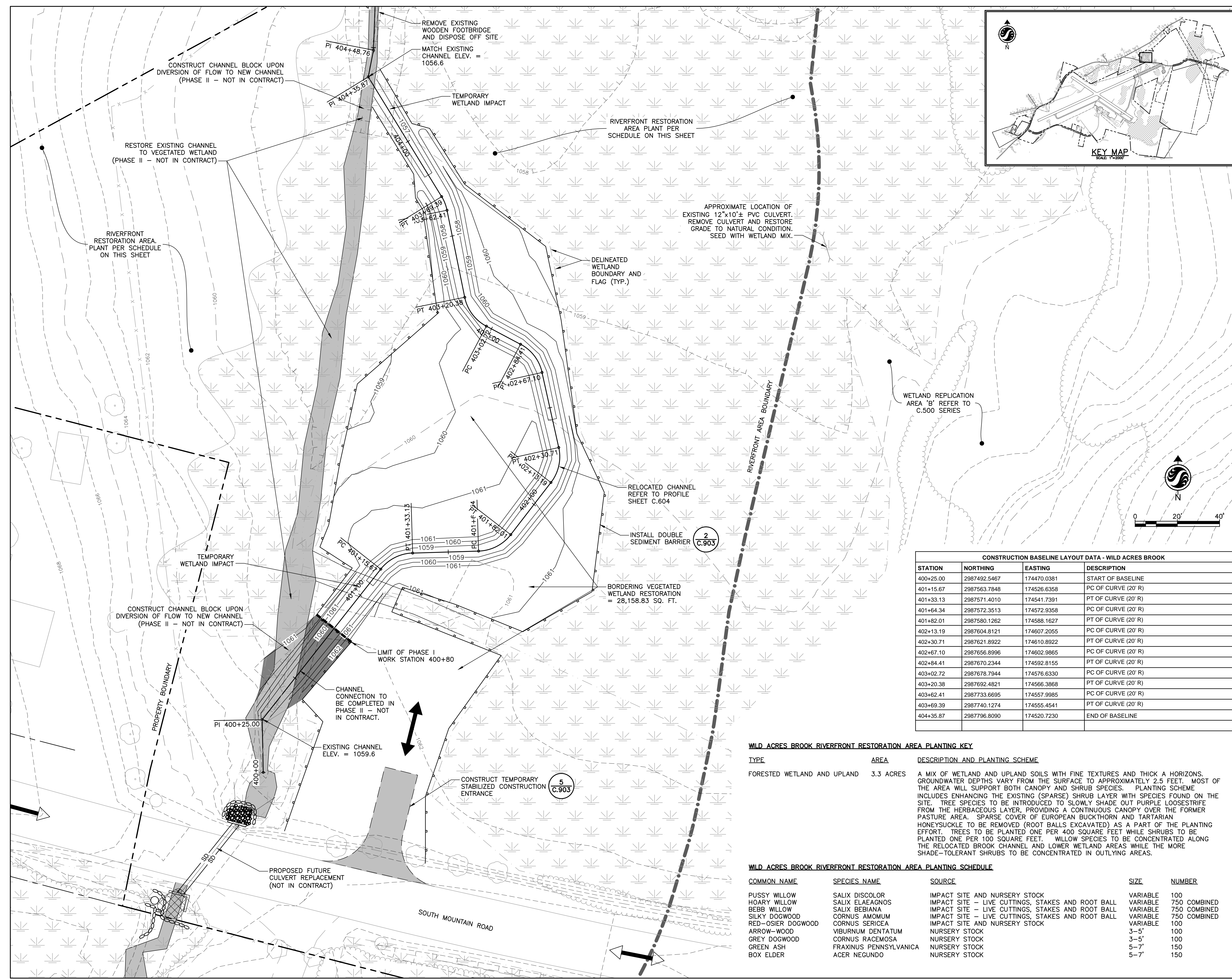
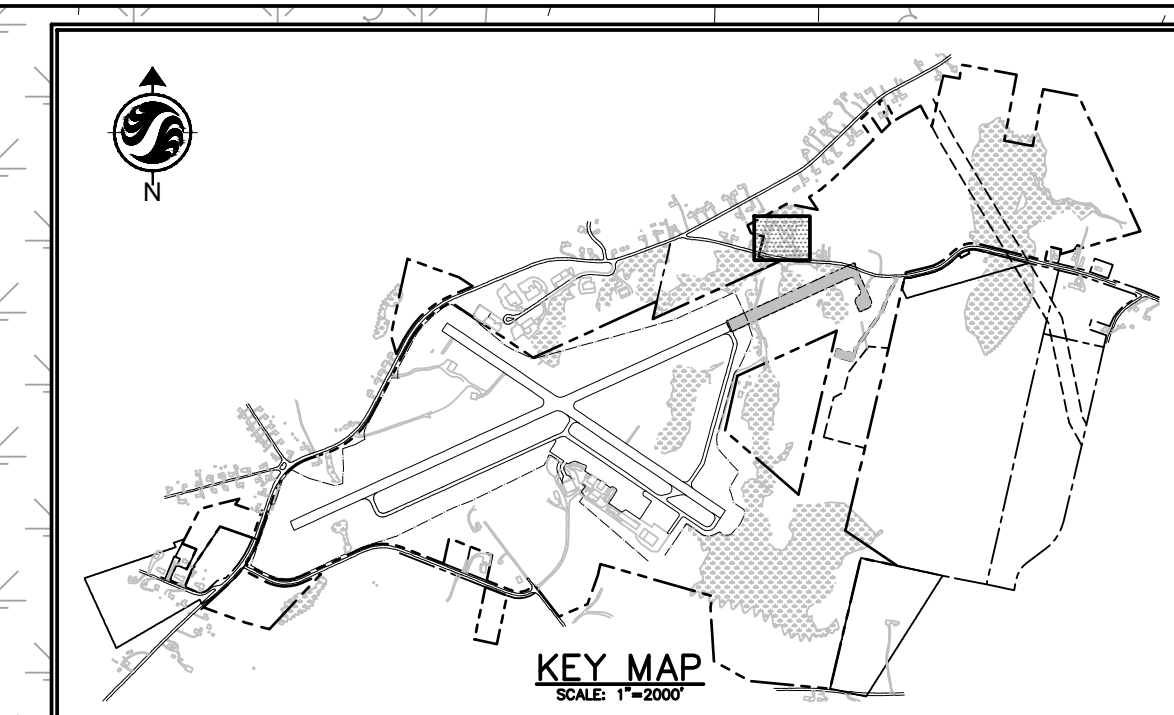
Legend

- AIRPORT PROPERTY LINE
- - - EXISTING CONTOURS
- PROPOSED CONTOURS
- DOUBLE SEDIMENT BARRIER
- ↔ TEMPORARY ACCESS/HAUL ROUTE
- ↔ ROAD ACCESS/HAUL ROUTE
- ⊙ PROPOSED MONITORING WELL
- ⊙ BORING
- ⊙ SURVEY CONTROL POINT
- ⊙ TEST PIT LOCATION
- DELINEATED WETLAND

Notes

Notes section containing project-specific instructions and clarifications.

RECORD DRAWING
 Stantec Consulting Services, Inc.



CONSTRUCTION BASELINE LAYOUT DATA - WILD ACRES BROOK

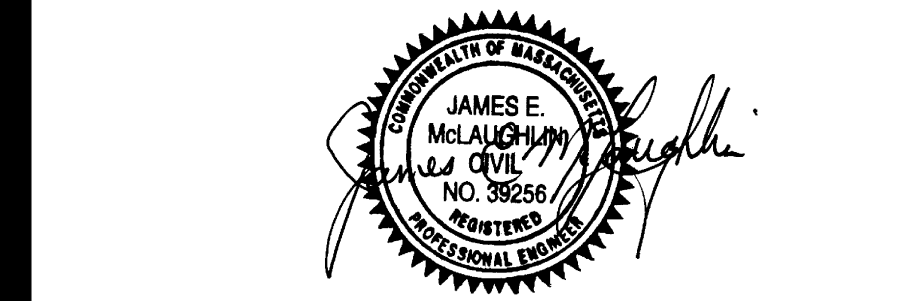
STATION	NORTHING	EASTING	DESCRIPTION
400+25.00	2987492.5467	174470.0381	START OF BASELINE
401+15.67	2987563.7848	174526.6358	PC OF CURVE (20' R)
401+33.13	2987571.4010	174541.7391	PT OF CURVE (20' R)
401+64.34	2987572.3513	174572.9358	PC OF CURVE (20' R)
401+82.01	2987580.1262	174588.1627	PT OF CURVE (20' R)
402+13.19	2987604.8121	174607.2055	PC OF CURVE (20' R)
402+30.71	2987621.8922	174610.8922	PT OF CURVE (20' R)
402+67.10	2987656.8996	174602.9865	PC OF CURVE (20' R)
402+84.41	2987670.2344	174592.8155	PT OF CURVE (20' R)
403+02.72	2987678.7944	174576.6330	PC OF CURVE (20' R)
403+20.38	2987692.4821	174566.3868	PT OF CURVE (20' R)
403+62.41	2987733.6695	174557.9985	PC OF CURVE (20' R)
403+69.39	2987740.1274	174555.4541	PT OF CURVE (20' R)
404+35.87	2987796.8090	174520.7230	END OF BASELINE

WILD ACRES BROOK RIVERFRONT RESTORATION AREA PLANTING KEY

TYPE	AREA	DESCRIPTION AND PLANTING SCHEME
FORESTED WETLAND AND UPLAND	3.3 ACRES	A MIX OF WETLAND AND UPLAND SOILS WITH FINE TEXTURES AND THICK A HORIZONS. GROUNDWATER DEPTHS VARY FROM THE SURFACE TO APPROXIMATELY 2.5 FEET. MOST OF THE AREA WILL SUPPORT BOTH CANOPY AND SHRUB SPECIES. PLANTING SCHEME INCLUDES ENHANCING THE EXISTING (SPARSE) SHRUB LAYER WITH SPECIES FOUND ON THE SITE. TREE SPECIES TO BE INTRODUCED TO SLOWLY SHADE OUT PURPLE LOOSESTRIFE FROM THE HERBACEOUS LAYER, PROVIDING A CONTINUOUS CANOPY OVER THE FORMER PASTURE AREA. SPARSE COVER OF EUROPEAN BUCKTHORN AND TARTARIAN HONEYSUCKLE TO BE REMOVED (ROOT BALLS EXCAVATED) AS A PART OF THE PLANTING EFFORT. TREES TO BE PLANTED ONE PER 400 SQUARE FEET WHILE SHRUBS TO BE PLANTED ONE PER 100 SQUARE FEET. WILLOW SPECIES TO BE CONCENTRATED ALONG THE RELOCATED BROOK CHANNEL AND LOWER WETLAND AREAS WHILE THE MORE SHADE-TOLERANT SHRUBS TO BE CONCENTRATED IN OUTLYING AREAS.

WILD ACRES BROOK RIVERFRONT RESTORATION AREA PLANTING SCHEDULE

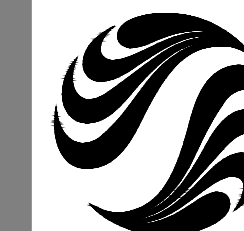
COMMON NAME	SPECIES NAME	SOURCE	SIZE	NUMBER
PUSSY WILLOW	SALIX DISCOLOR	IMPACT SITE AND NURSERY STOCK	VARIABLE	100
HOARY WILLOW	SALIX ELAEAGNOS	IMPACT SITE - LIVE CUTTINGS, STAKES AND ROOT BALL	VARIABLE	750 COMBINED
BEBB WILLOW	SALIX BEBIANA	IMPACT SITE - LIVE CUTTINGS, STAKES AND ROOT BALL	VARIABLE	750 COMBINED
SILKY DOGWOOD	CORNUS AMOMUM	IMPACT SITE - LIVE CUTTINGS, STAKES AND ROOT BALL	VARIABLE	750 COMBINED
RED-OSIER DOGWOOD	CORNUS SERICEA	IMPACT SITE AND NURSERY STOCK	VARIABLE	100
ARROW-WOOD	VIBURNUM DENTATUM	NURSERY STOCK	3-5'	100
GREY DOGWOOD	CORNUS DENTATA	NURSERY STOCK	3-5'	100
GREEN ASH	FRAXINUS PENNSYLVANICA	NURSERY STOCK	5-7'	150
BOX ELDER	ACER NEGUNDO	NURSERY STOCK	5-7'	150



Client/Project
 PITTSFIELD MUNICIPAL AIRPORT
 PITTSFIELD AIRPORT COMMISSION
 CONSTRUCT RUNWAY 8-26 EXTENSION -
 PHASE I (EARTH FILL & MITIGATION SITES)
 Pittsfield, Massachusetts

Title
 WILD ACRES BROOK CHANNEL
 CHANNEL IMPROVEMENTS
 GRADING AND DRAINAGE PLAN

Project No. 195210271 Scale 1" = 20'
 Drawing No. Sheet 66 of 82 Revision 0



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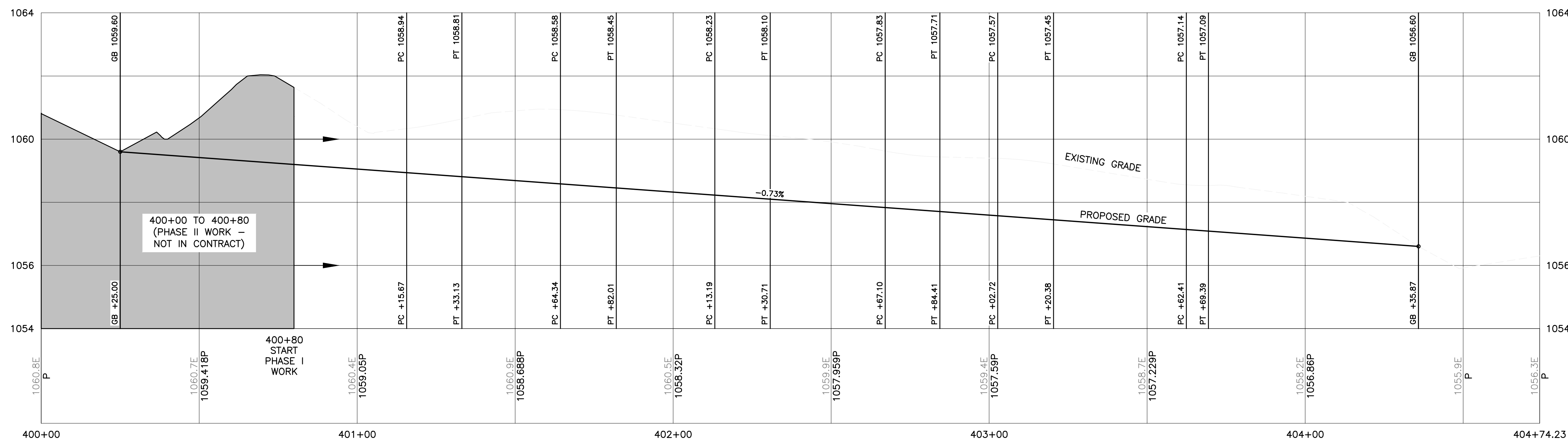
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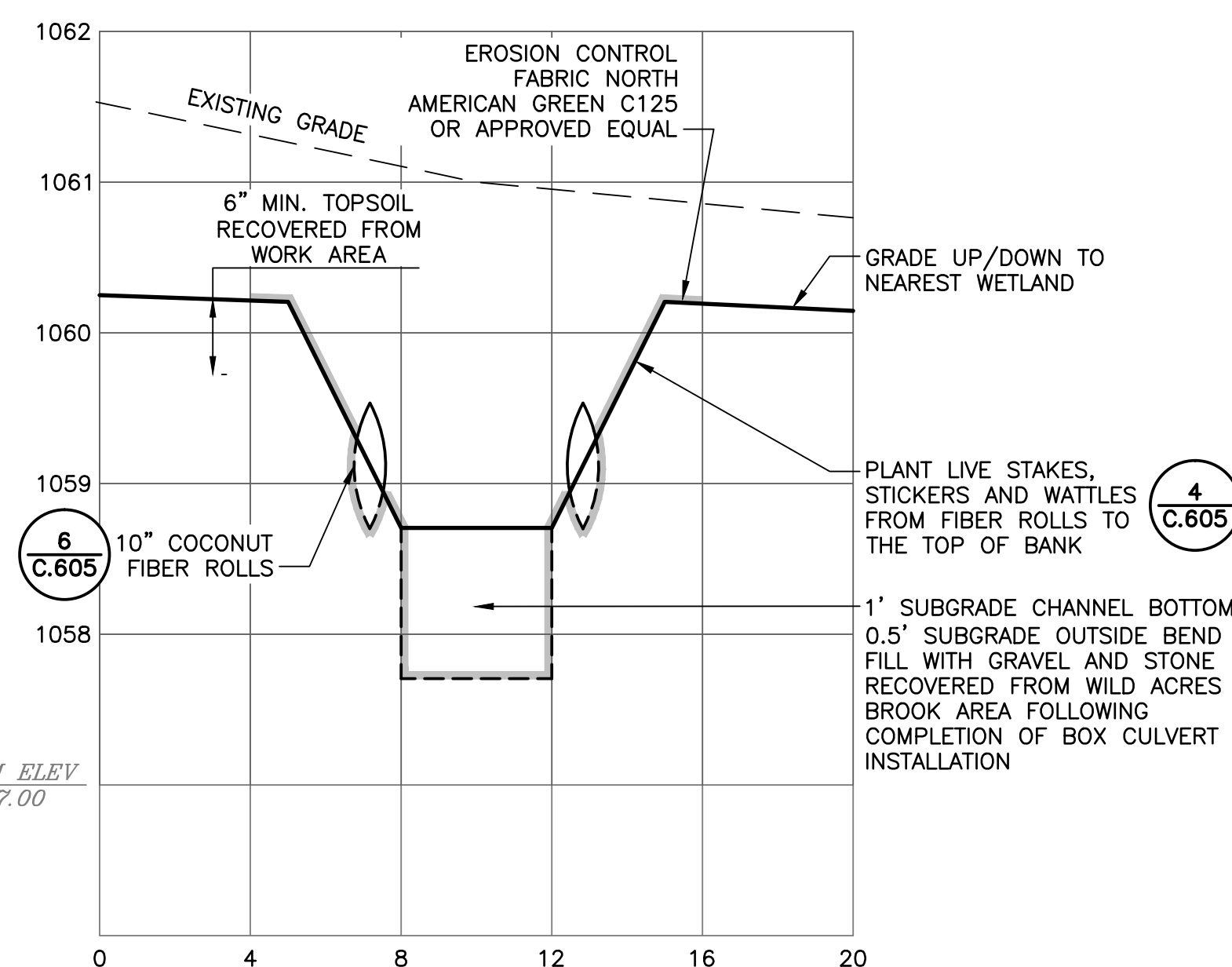
Legend

Notes



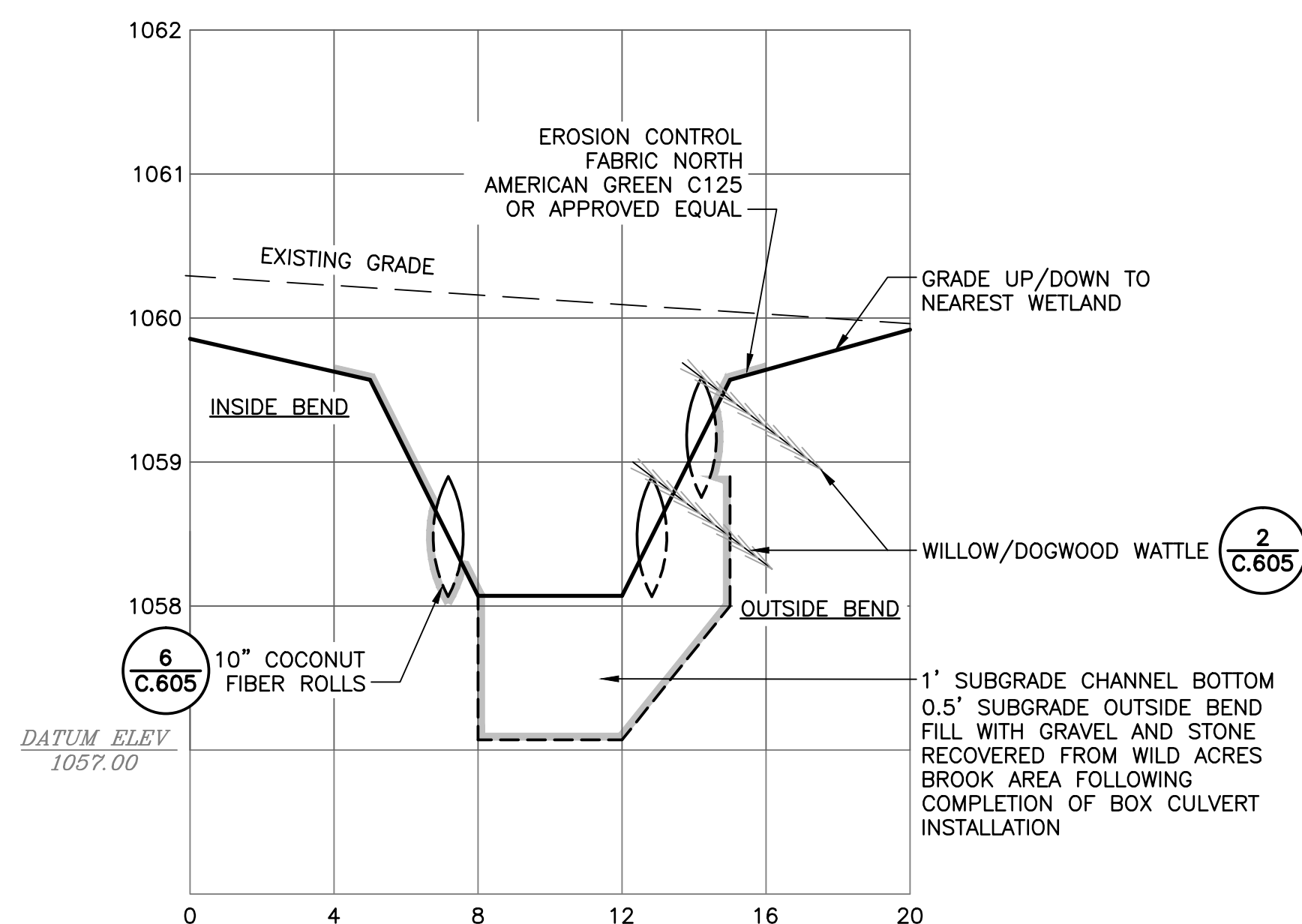
RELOCATED WILD ACRES BROOK PROFILE

HORIZONTAL SCALE: 1"=20'
 VERTICAL SCALE: 1"=2'



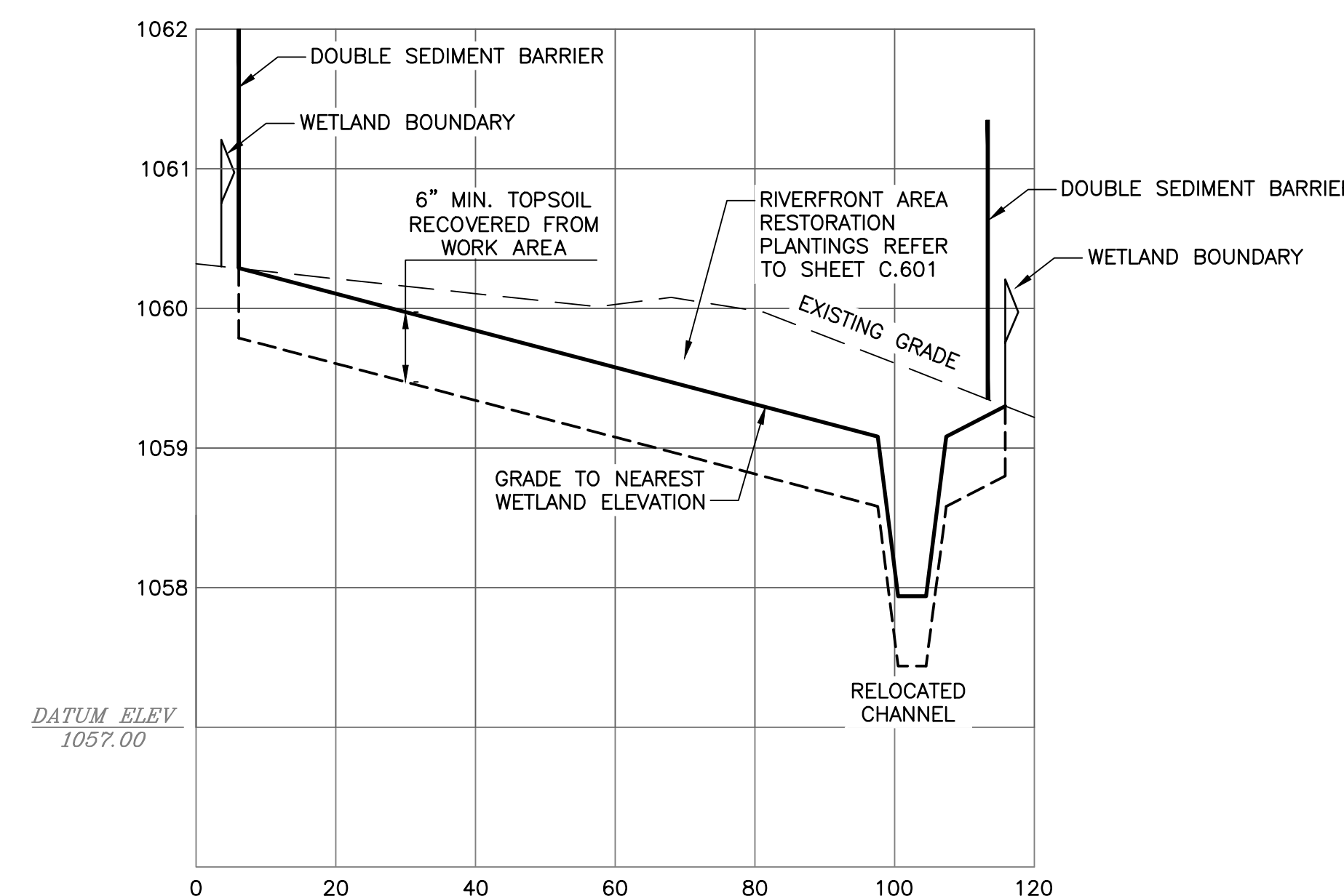
TYPICAL SECTION - TANGENTS

HORIZONTAL SCALE: 1"=20'
 VERTICAL SCALE: 1"=2'



TYPICAL SECTION - CURVES

HORIZONTAL SCALE: 1"=20'
 VERTICAL SCALE: 1"=2'



TYPICAL SECTION

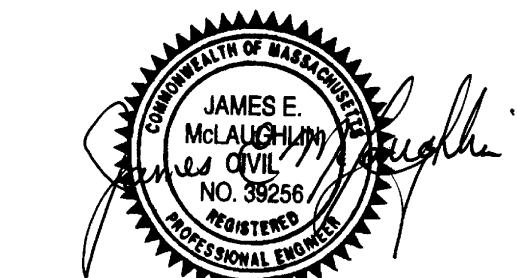
HORIZONTAL SCALE: 1"=20'
 VERTICAL SCALE: 1"=2'

RECORD DRAWING
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Revision	By	Appd.	YY.MM.DD
3	JEM	JEM	13.05.17
2	JEM	JEM	10.09.22
1	JEM	JEM	10.03.24
Issued	By	Appd.	YY.MM.DD

File Name: Sheet_69_Wild_Acres_Brk_Chrrl..._01.dwg DPN 10.01.15
 Dwn. Chkd. Dsgn. YY.MM.DD

Permit-Seal

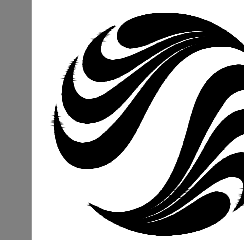


Client/Project
 PITTSFIELD MUNICIPAL AIRPORT
 PITTSFIELD AIRPORT COMMISSION
 CONSTRUCT RUNWAY 8-26 EXTENSION -
 PHASE I (EARTH FILL & MITIGATION SITES)
 Pittsfield, Massachusetts

Title
 WILD ACRES BROOK
 CHANNEL IMPROVEMENTS
 PROFILE AND TYPICAL SECTIONS

Project No. 195210271 Scale AS NOTED

Drawing No. Sheet Revision



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Legend

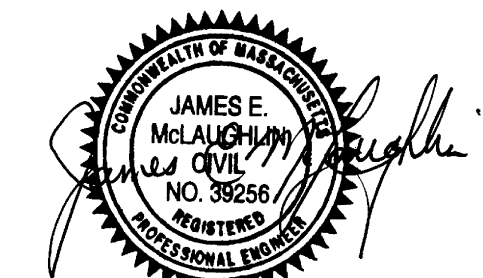
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Stantec Consulting Services, Inc.

Revision	By	Appd.	YY.MM.DD
3			13.05.17
2	JEM	JEM	10.09.22
1	JEM	JEM	10.03.24
Issued			YY.MM.DD

File Name: Sheet_70_Wild_Acres_Brk_Chnnl_Dpmts_06.dwg DPN 10.01.15
Dwn. Chkd. Dsgn. YY.MM.DD

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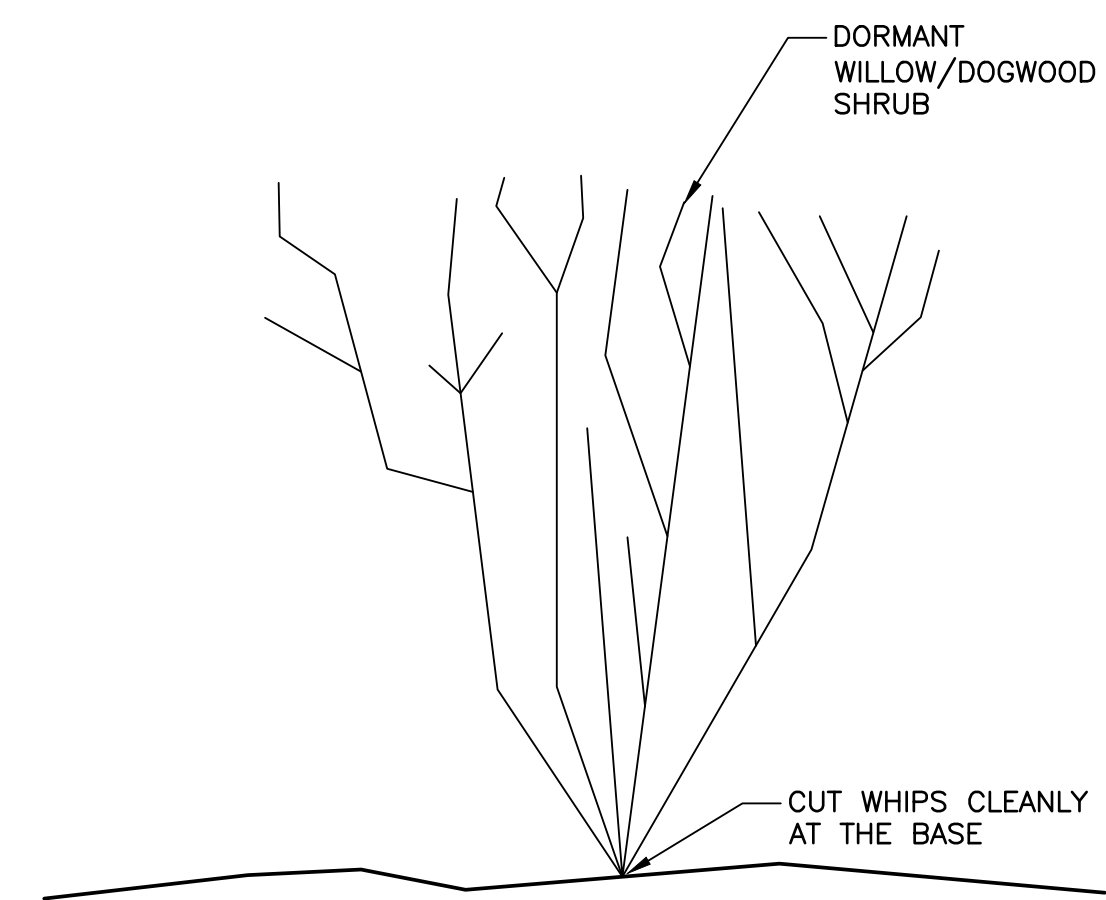
Client/Project
PITTSFIELD MUNICIPAL AIRPORT
PITTSFIELD AIRPORT COMMISSION
CONSTRUCT RUNWAY 8-26 EXTENSION -
PHASE I (EARTH FILL & MITIGATION SITES)
Pittsfield, Massachusetts

Title
WILD ACRES BROOK
CHANNEL IMPROVEMENTS
PLANTING DETAILS

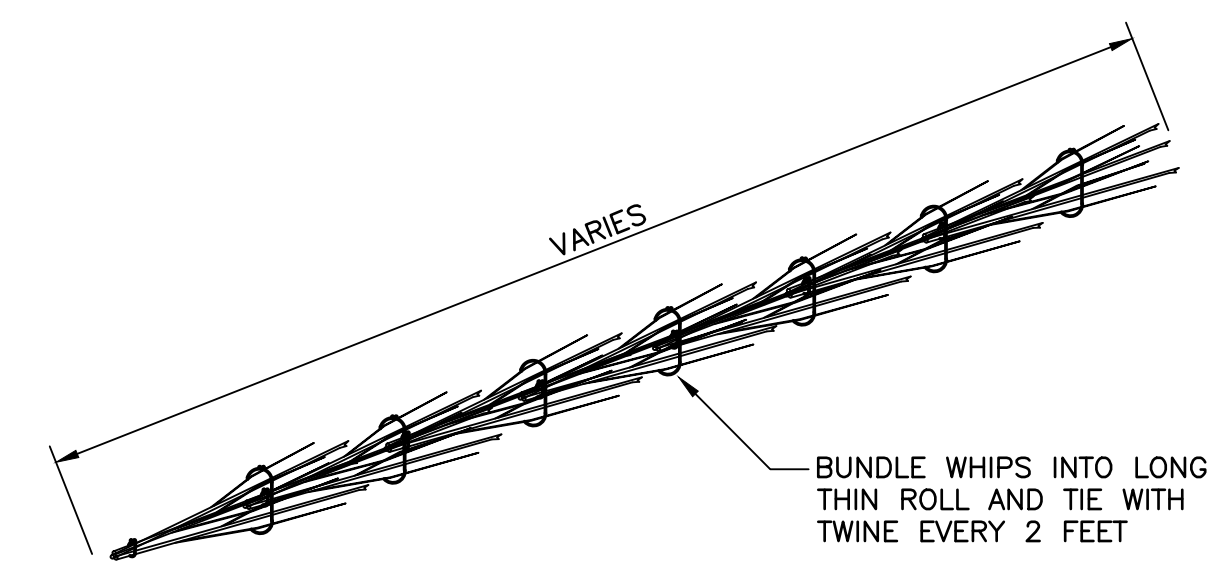
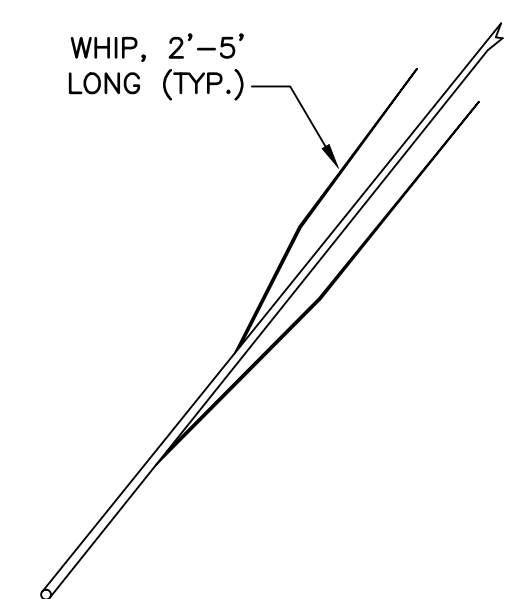
Project No. 195210271 Scale AS NOTED

Drawing No. Sheet Revision

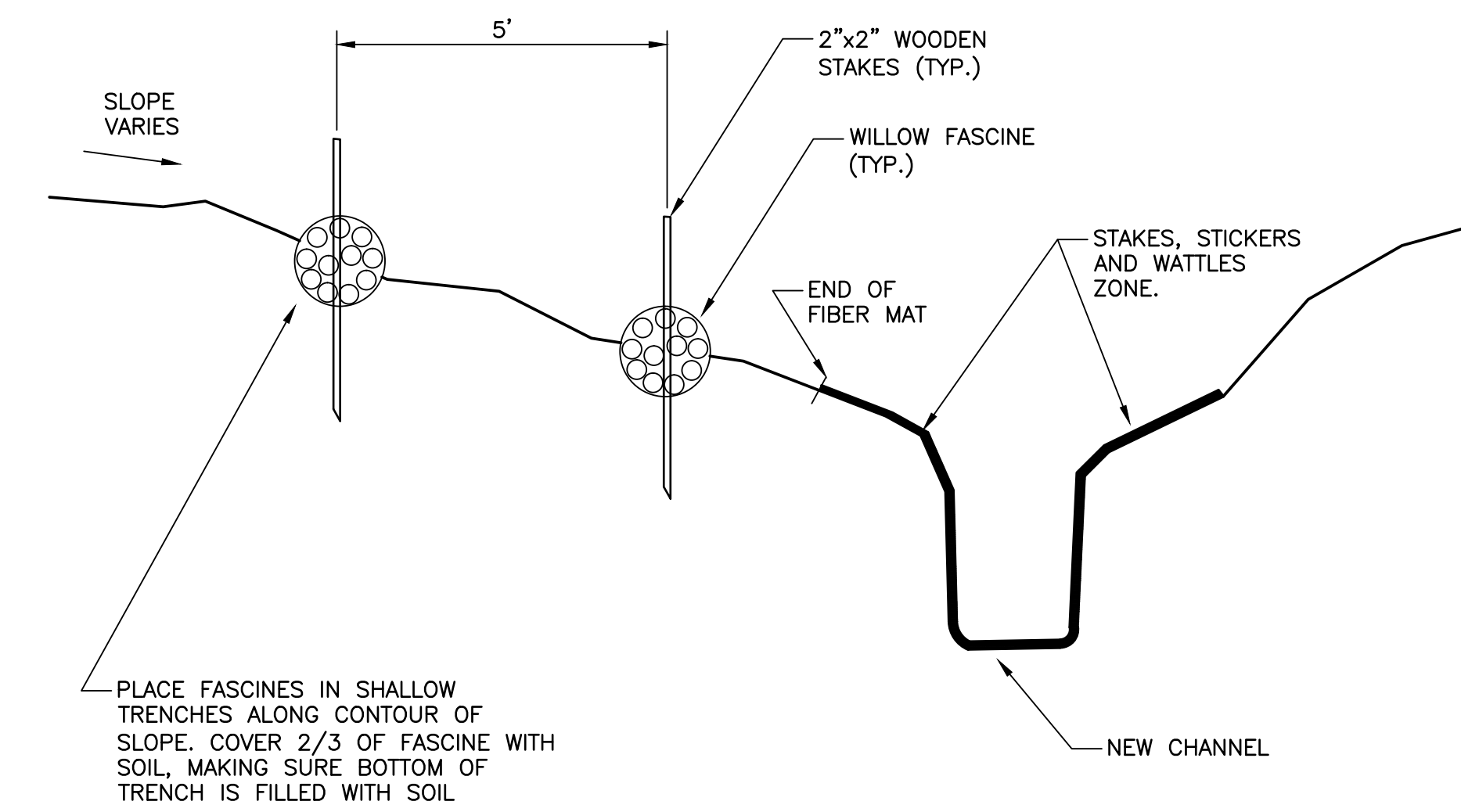
C.605 70 of 82 0



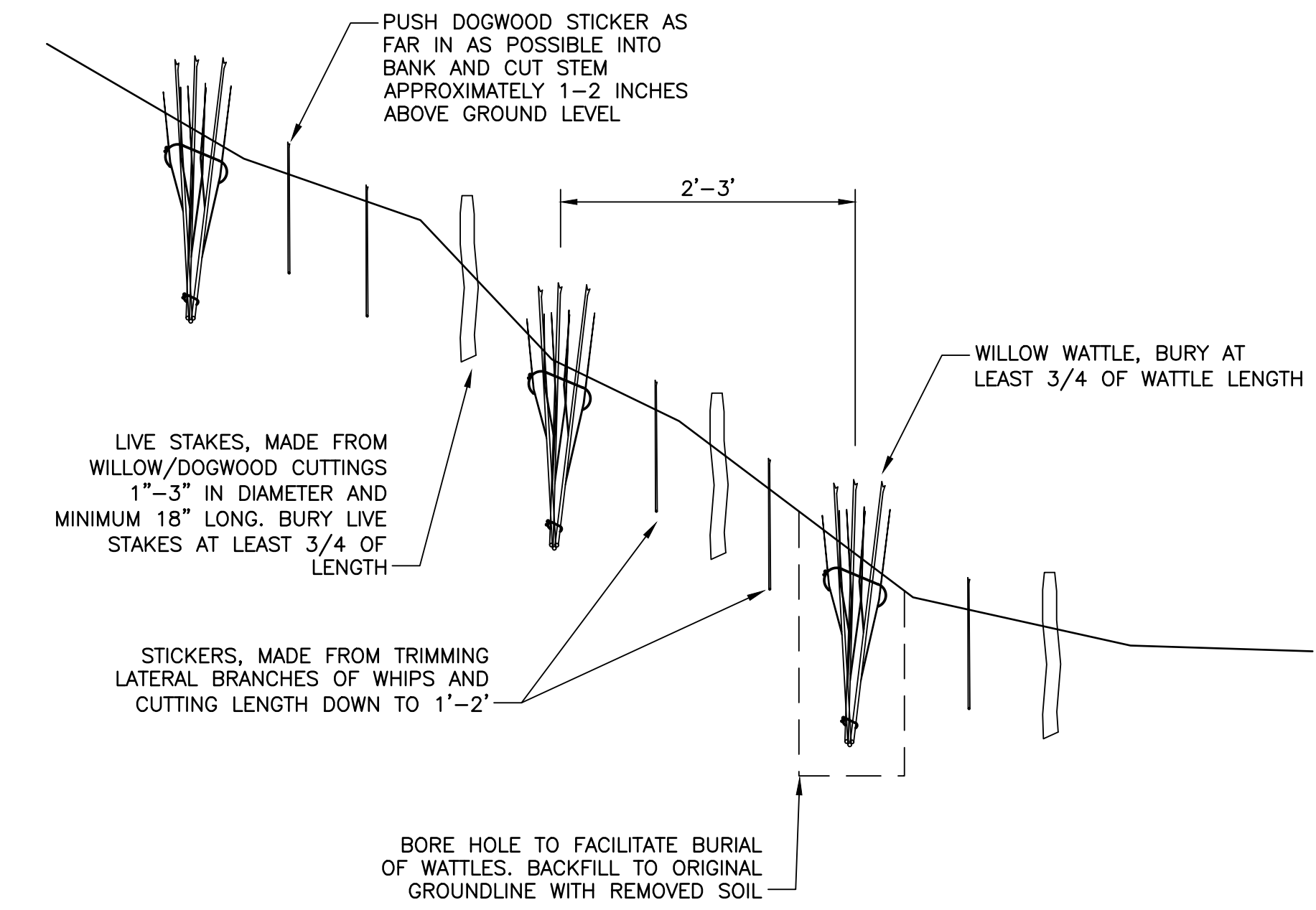
1 WHIP
NOT TO SCALE



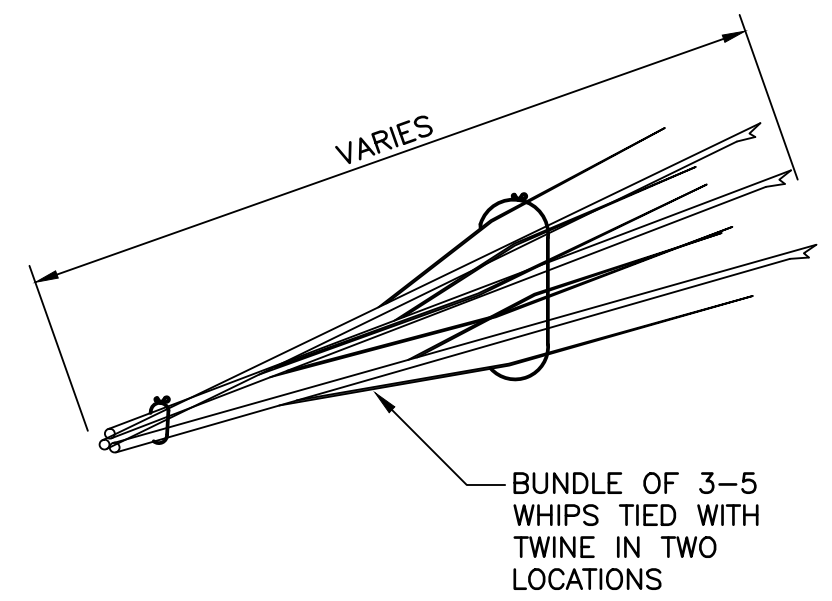
2 WILLOW FASCINE
NOT TO SCALE



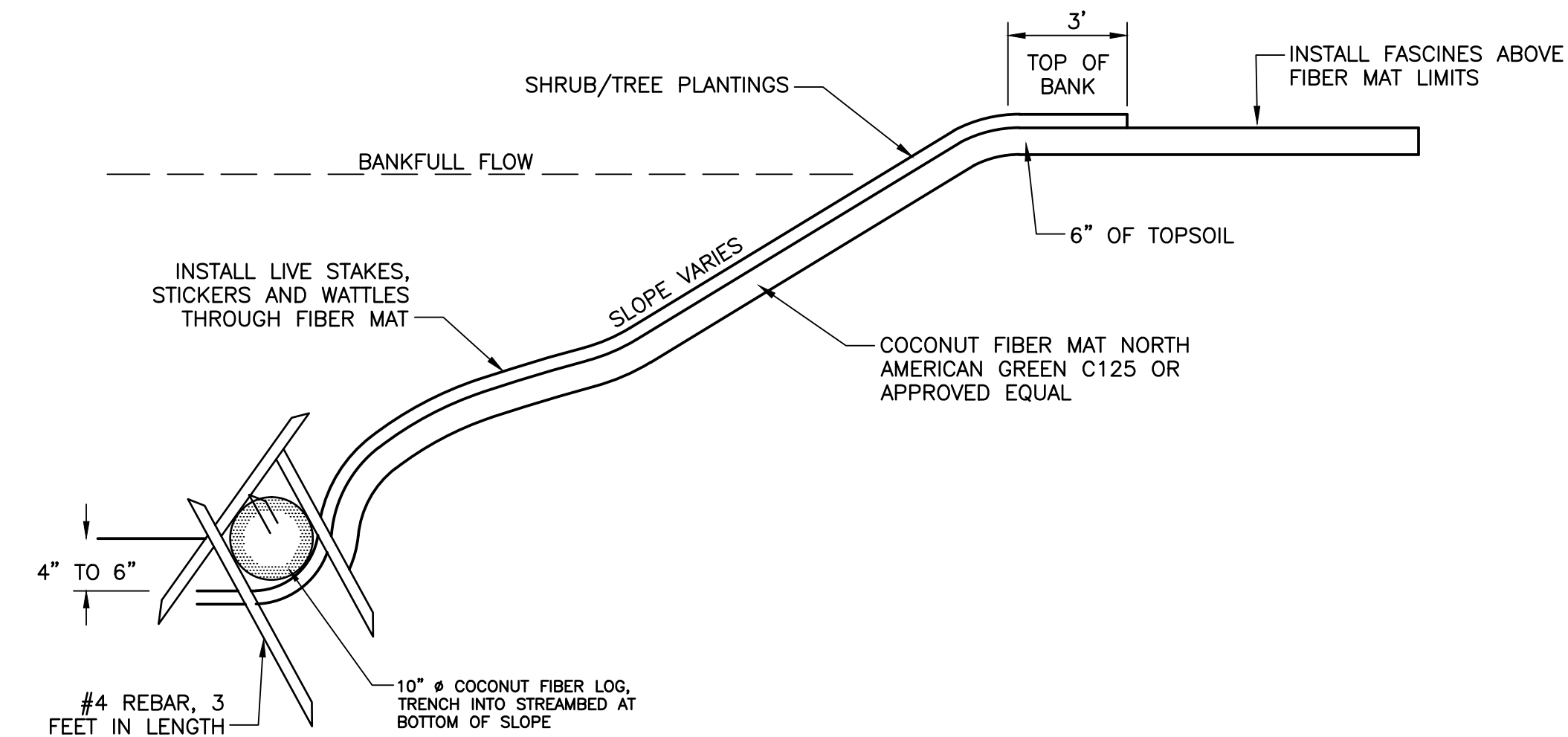
3 WILLOW FASCINE AND WATTLE INSTALLATION
NOT TO SCALE



4 LIVE STAKES, STICKERS AND WATTLES
NOT TO SCALE



5 SHRUB WATTLE
NOT TO SCALE



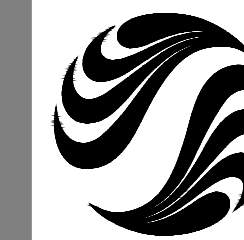
6 COIR BANK STABILIZER - STRAIGHT STREAM SECTION
NOT TO SCALE

NOTES:

- THE WILD ACRES BROOK CHANNEL RELOCATION EFFORT SHALL OCCUR OVER TWO GROWING SEASONS TO PROVIDE FOR ADEQUATE STABILIZATION OF THE "NEW" CHANNEL PRIOR TO THE PERMANENT DIVERSION OF FLOW FROM THE "EXISTING" CHANNEL. IT IS INTENDED WITH THESE PLANS TO UTILIZE EXISTING NATIVE SHRUBS FROM THE IMPACT SITES TO PLANT AND STABILIZE THE NEW CHANNEL PRIOR TO THE DIVERSION. SUPPLEMENTAL NURSERY STOCK MAY BE USED AS DIRECTED BY THE ENVIRONMENTAL MONITOR. THE WILD ACRES BROOK RIVERFRONT AREA RESTORATION EFFORT SHALL OCCUR AFTER COMPLETION OF THE WILD ACRES BROOK CHANNEL RELOCATION IN ORDER TO PROTECT/PRESERVE THE PLANTINGS ASSOCIATED WITH THE RIVERFRONT AREA RESTORATION.
- STREAM STONE RECLAIMED FROM THE WILD ACRES BROOK BOX CULVERT INSTALLATION SHALL BE USED ON THE NEW CHANNEL BOTTOM AS SHOWN ON THE DETAILS ON THIS PLAN. THE NEW CHANNEL CONSTRUCTION WILL NEED TO OCCUR DURING/AFTER THE WILD ACRES BROOK BOX CULVERT INSTALLATION FOR THE PROPER STONE TO BE USED IN THE NEW CHANNEL. IF QUANTITIES OF RECLAIMED STONE ARE FOUND TO BE INSUFFICIENT (AS DETERMINED BY THE ENVIRONMENTAL MONITOR) TO PROPERLY SUPPLY THE NEW CHANNEL CONSTRUCTION, THE RECLAIMED STONE SHALL BE SAVED FOR THE SURFACE PORTION OF THE STONE FILL TRENCH, USING PROCESSED STONE FOR THE BOTTOM PORTION OF THE TRENCH. IT IS AN OBJECTIVE OF THIS SPECIFICATION FOR NATURALLY OCCURRING STREAM STONE TO COVER THE BOTTOM SURFACE OF THE NEW CHANNEL.
- PRIOR TO CLEARING THE IMPACT SITES, THE CONTRACTOR SHALL CONSTRUCT AND GRADE THE NEW CHANNEL AND ADJACENT UPLANDS FROM STATION 400+80 TO STATION 404+35.87 ONLY, ALLOWING THE BASE FLOW TO REMAIN IN THE EXISTING CHANNEL FOR THE DURATION OF THE WORK. THIS WORK SHALL BE COMPLETED BETWEEN MAY 1ST AND AUGUST 1ST OF THE FIRST GROWING SEASON. COMPLETE THE NEW CHANNEL GRADING, TOPSOIL PLACEMENT, RECLAIMED STONE PLACEMENT, FIBER ROLL PLACEMENT (WITH LIVE STAKES, STICKERS AND WATTLES), EROSION CONTROL FABRIC INSTALLATION AND PLANTINGS WITHIN THE NOTED STATION RANGE. MAINTAIN AND ENHANCE AS NEEDED THE SEPARATION BETWEEN THE EXISTING AND NEW CHANNELS. CONSTRUCT CHANNEL BLOCKS IN THE TWO EXISTING DRAINAGE DITCHES. ACCESS TO THE WORK AREA IS AS SHOWN ON THE PLAN.
- SEED ALL DISTURBED AREAS USING THE SPECIFIED WETLAND SEED MIX. ALLOW THE SITE TO STABILIZE THROUGH JUNE OF THE SECOND GROWING SEASON OR AS DETERMINED BY THE ENVIRONMENTAL MONITOR. CONNECTION OF THE EXISTING CHANNEL TO THE RELOCATED CHANNEL SHALL OCCUR UNDER A DIFFERENT CONTRACT (PHASE II).
- PLANT THE WILD ACRES BROOK RIVERFRONT AREA RESTORATION SITE PER THE PLAN.

EXISTING CHANNEL STATION RANGE	STABILIZATION MEASURES	LF 10" FIBER ROLL	# OF SHRUB WATTLES	# OF SHRUB STAKES	# OF SHRUB STICKERS	LF OF SHRUB FASCINES
400+70 TO 401+15	STRAIGHT SECTION	90	30	16	32	20
401+15 TO 401+33	BEND SECTION	54	12	6	12	30
401+33 TO 401+64	STRAIGHT SECTION	62	20	6	12	20
401+64 TO 401+82	BEND SECTION	36	12	3	6	30
401+82 TO 402+13	STRAIGHT SECTION	62	20	7	14	10
402+13 TO 402+30	BEND SECTION	51	12	3	6	20
402+30 TO 402+67	STRAIGHT SECTION	74	25	8	16	10
402+67 TO 403+20	BEND SECTION	159	34	3	6	30
403+20 TO 403+62	STRAIGHT SECTION	84	28	4	8	10
403+62 TO 403+80	BEND SECTION	54	12	4	8	20
403+80 TO 404+35	STRAIGHT SECTION	110	34	7	14	20
TOTALS		836	239	82	164	220

STREAM CHANNEL RELOCATION
STABILIZATION MEASURES SCHEDULE



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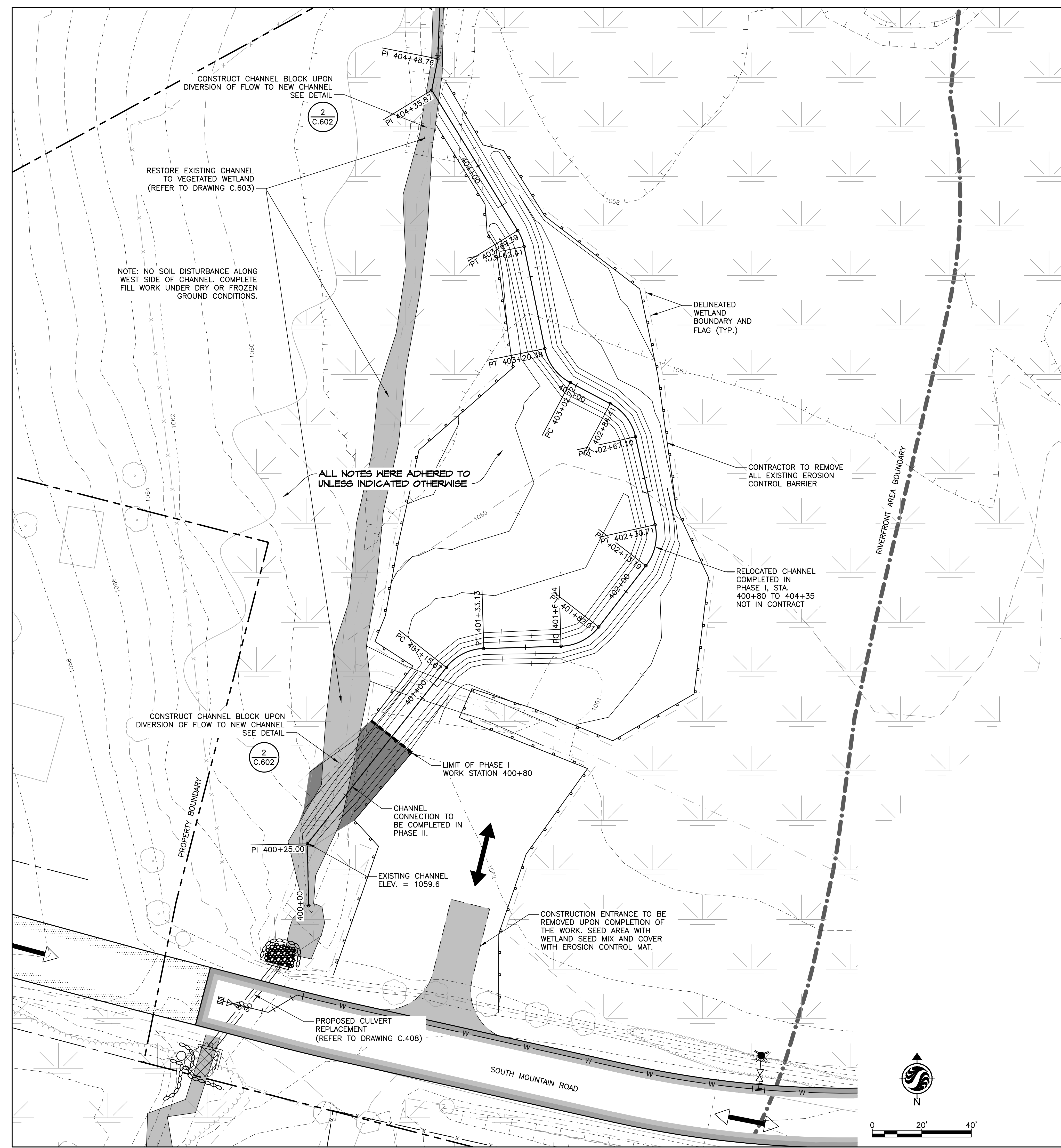
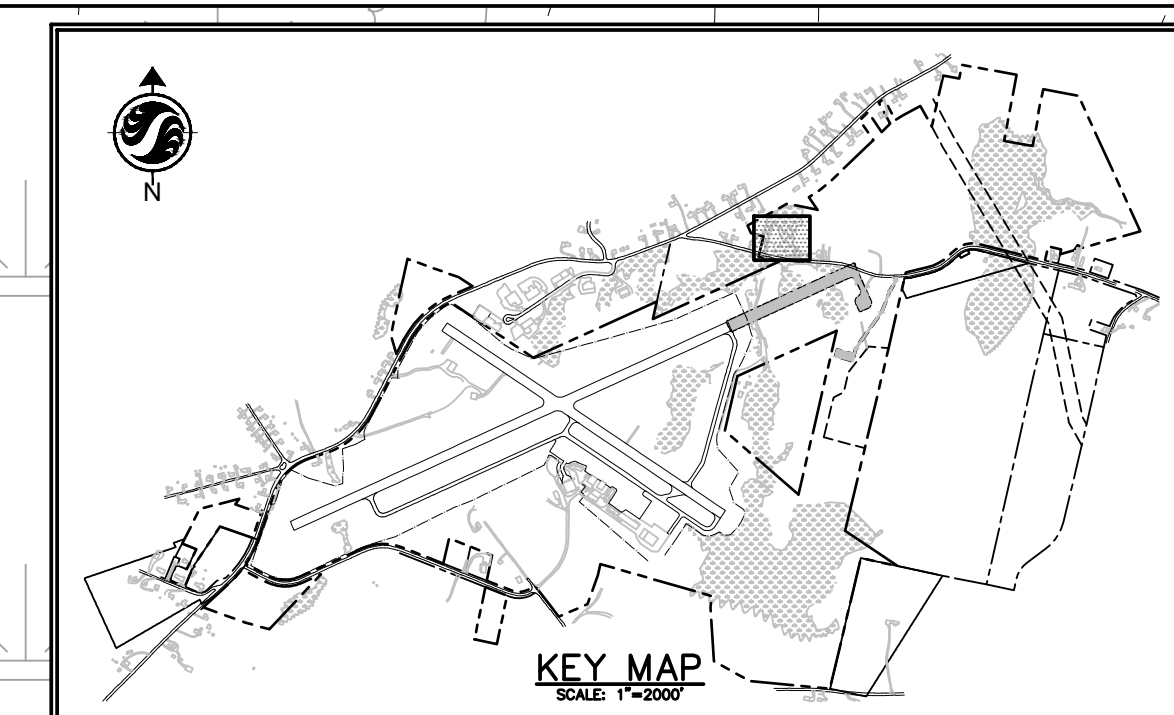
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Legend

- AIRPORT PROPERTY LINE
- EXISTING CONTOURS
- PROPOSED CONTOURS
- DOUBLE SEDIMENT BARRIER
- TEMPORARY ACCESS/HAUL ROUTE
- ROAD ACCESS/HAUL ROUTE
- PROPOSED MONITORING WELL
- BORING
- SURVEY CONTROL POINT
- TEST PIT LOCATION
- DELINEATED WETLAND

RECORD DRAWING
 Stantec Consulting Services, Inc.



CONSTRUCTION BASELINE LAYOUT DATA - WILD ACRES BROOK			
STATION	NORTHING	EASTING	DESCRIPTION
400+25.00	2987492.5467	174470.0381	START OF BASELINE
401+15.67	2987563.7848	174526.6358	PC OF CURVE (20' R)
401+33.13	2987571.4010	174541.7391	PT OF CURVE (20' R)
401+64.34	2987572.3513	174572.9358	PC OF CURVE (20' R)
401+82.01	2987580.1262	174588.1627	PT OF CURVE (20' R)
402+13.19	2987604.8121	174607.2055	PC OF CURVE (20' R)
402+30.71	2987621.8922	174610.8922	PT OF CURVE (20' R)
402+67.10	2987656.8996	174602.9865	PC OF CURVE (20' R)
402+84.41	2987670.2344	174592.8155	PT OF CURVE (20' R)
403+02.72	2987678.7944	174576.6330	PC OF CURVE (20' R)
403+20.38	2987692.4821	174566.3868	PT OF CURVE (20' R)
403+62.41	2987733.6695	174557.9985	PC OF CURVE (20' R)
403+69.39	2987740.1274	174555.4541	PT OF CURVE (20' R)
404+35.87	2987796.8090	174520.7230	END OF BASELINE

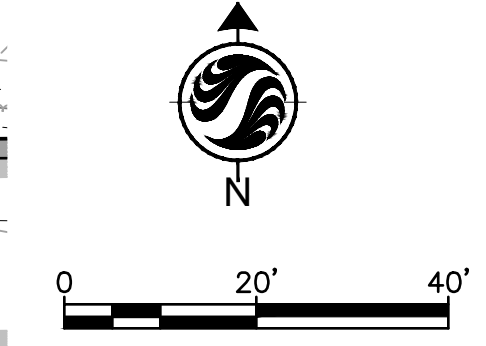
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5	JEM	JEM	11.08.30
4	JEM	JEM	11.04.12
3	JEM	JEM	11.04.12
2	JEM	JEM	11.04.04
1	JEM	JEM	11.03.18

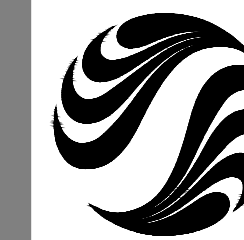
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Client/Project
 PITTSFIELD MUNICIPAL AIRPORT
 PITTSFIELD AIRPORT COMMISSION
 CONSTRUCT RUNWAY 8-26 EXTENSION
 AND SAFETY AREAS - PHASE 2
 Pittsfield, Massachusetts

Title
 WILD ACRES BROOK CHANNEL
 CHANNEL IMPROVEMENTS
 GRADING PLAN AND NOTES

Project No. 195210537 Scale 1" = 20'
 Drawing No. C.601 Sheet 117 of 176 Revision 0

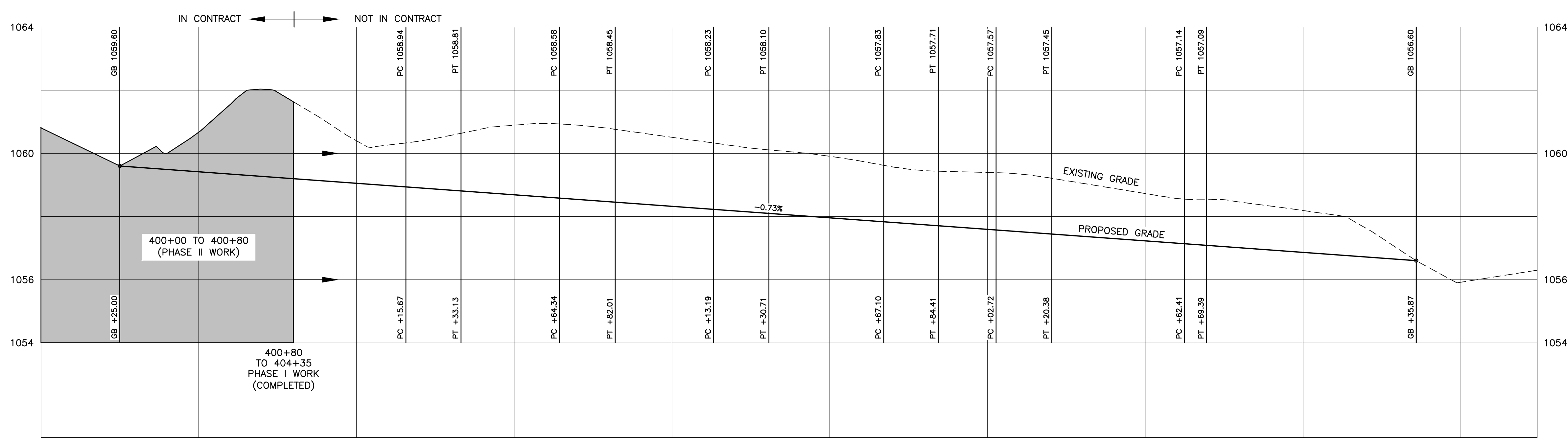




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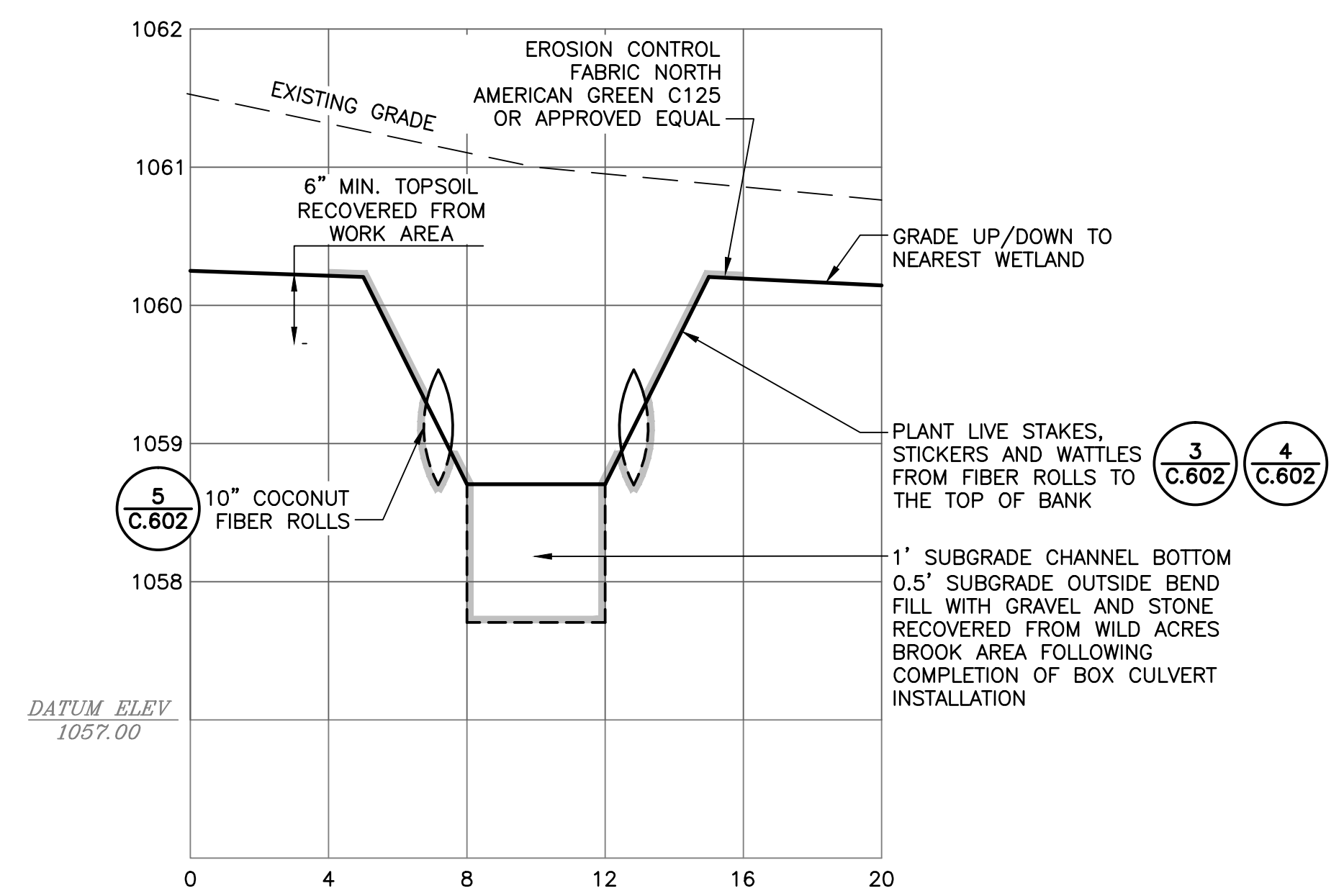
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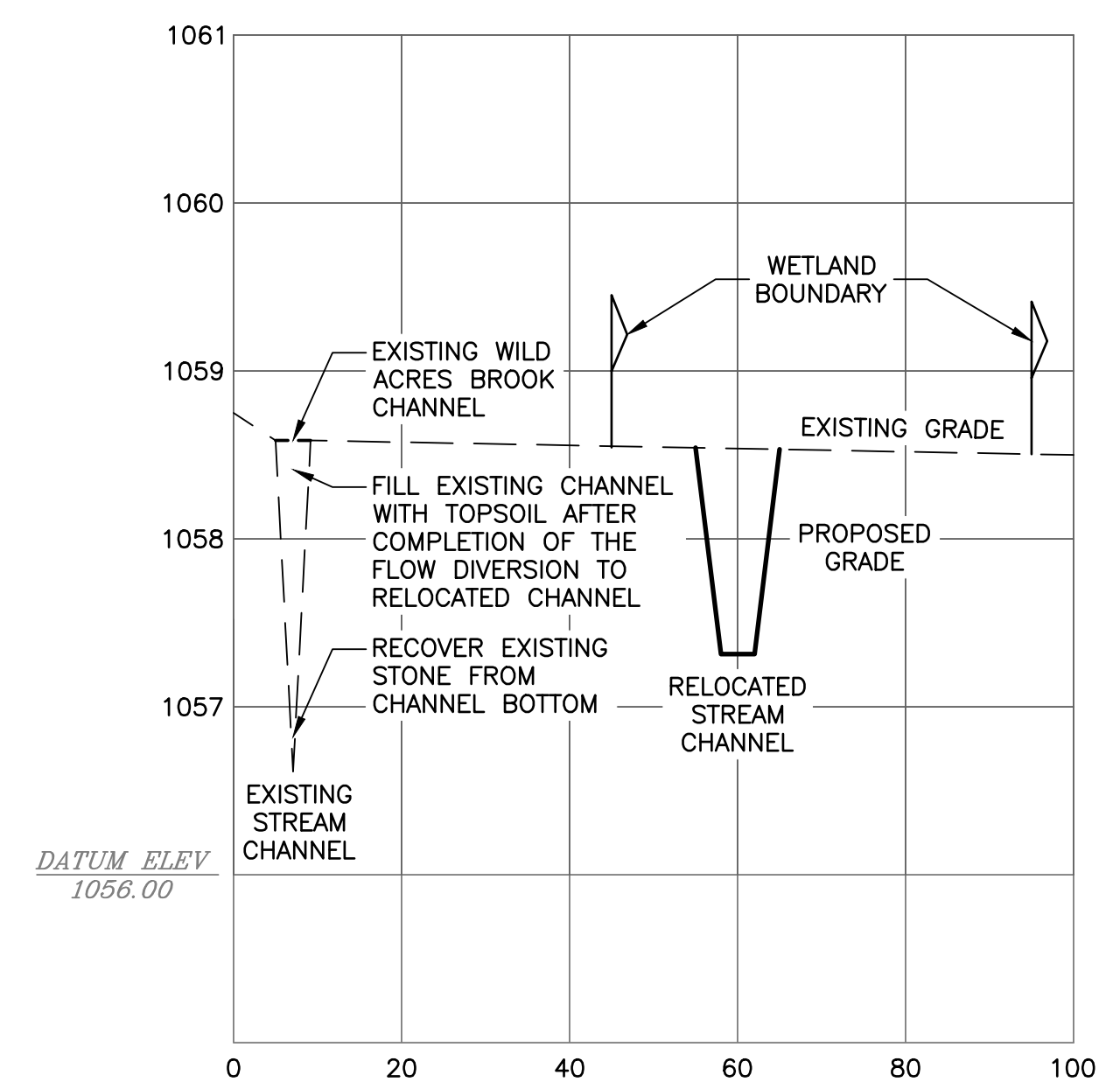


RELOCATED WILD ACRES BROOK PROFILE
 HORIZONTAL SCALE: 1"=20'
 VERTICAL SCALE: 1"=2'

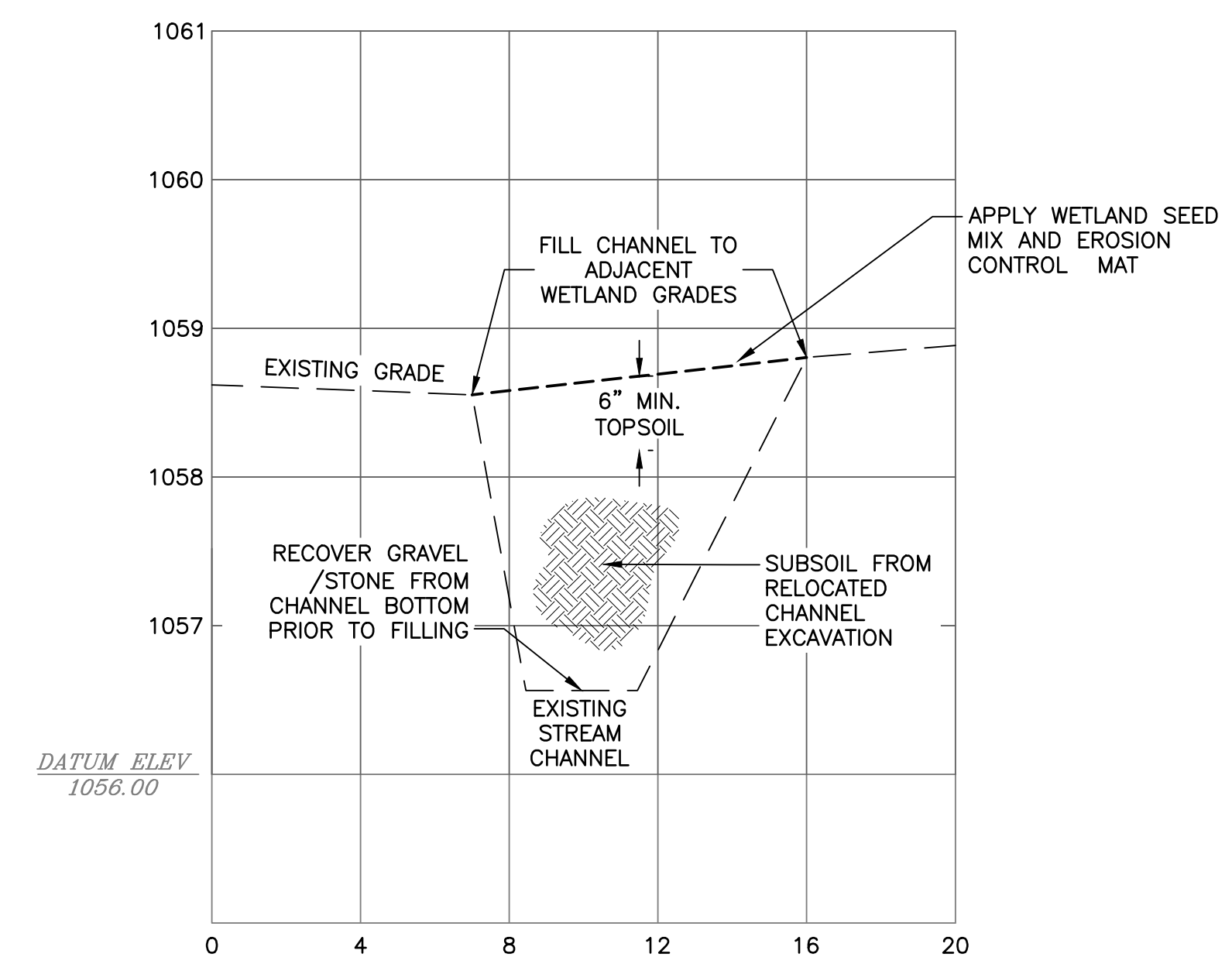
ALL NOTES WERE ADHERED TO UNLESS INDICATED OTHERWISE



TYPICAL SECTION - CHANNEL CONNECTION
 HORIZONTAL SCALE: 1"=20'
 VERTICAL SCALE: 1"=2'



TYPICAL SECTION - CHANNEL FILL
 HORIZONTAL SCALE: 1"=20'
 VERTICAL SCALE: 1"=2'

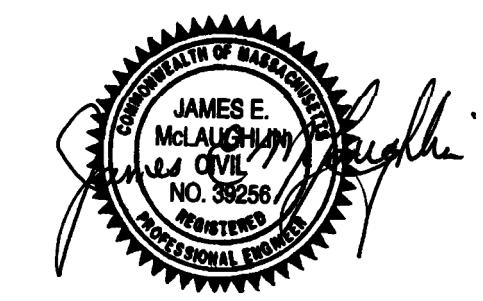


TYPICAL SECTION - CHANNEL FILL
 HORIZONTAL SCALE: 1"=20'
 VERTICAL SCALE: 1"=2'

RECORD DRAWING
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Revision	By	Appd.	YY.MM.DD
5	JEM	JEM	11.08.30
4	JEM	JEM	11.04.12
3	JEM	JEM	11.04.12
2	JEM	JEM	11.04.04
1	JEM	JEM	11.03.18

File Name: SH_119_Wild_Acres_Brk_Channel_Improvements_Dwg DPN 10.01.15
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Client/Project
 PITTSFIELD MUNICIPAL AIRPORT
 PITTSFIELD AIRPORT COMMISSION
 CONSTRUCT RUNWAY 8-26 EXTENSION
 AND SAFETY AREAS - PHASE 2
 Pittsfield, Massachusetts

Title
 WILD ACRES BROOK
 CHANNEL IMPROVEMENTS
 PROFILE AND TYPICAL SECTIONS

Project No. 195210537 Scale AS NOTED
 Drawing No. Sheet Revision