STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

April 7, 2020

Brad Shaver
NCDOT Coordinator
Wilmington Regulatory Field Office
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, North Carolina 28403

ATTN: Brad Shaver, NCDOT Coordinator

Dear Sir:

Subject: **Request for Modification to Individual Section 404 and Section 401 Water Quality Certification** for the proposed Hampstead Bypass in Pender County. State Project No. 40237.1.2, TIP No. R-3300B. Debit $570.00 from WBS No. 40237.1.1

References: Section 404 Individual Permit signed August 10, 2017 (SAW-2007-1386) for U-4751 & R-3300
Section 401 Water Quality Certification issued June 5, 2017 (20161268) for U-4751 & R-3300

The purpose of this letter is to submit the final design and revised impact calculations for modification of the Clean Water Act (CWA) Section 404 Individual Permit (IP) and Section 401 Water Quality Certification for R-3300B. Included in this application package are the following: revised permit drawings, revised roadway plans and utility drawings. A revised NC Division of Mitigation Services Acceptance Letter will be forthcoming.

Permit History

In addition to R-3300B, there are two other sections associated with this project. A phased permit was issued in August 2017 where U-4751 Military Cutoff Extension was permitted with final design and Hampstead Bypass Section A & B were permitted with only preliminary design. This modification request only updates the final impacts to the R-3300B section of this project. R-3300A will be permitted at a later date.

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
5501 BARBADOS BOULEVARD
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Location:
5501 BARBADOS BOULEVARD
CASTLE HAYNE, NC 28429-5647

The revised design does not compromise NCDOT's compliance with the existing permit conditions. The revision has been evaluated for compliance with the avoidance/minimization criteria and complies with all previous issues, including the following:

- Aquatic life passage
- Protected species
- FEMA compliance
- Cultural Resources
- Indirect and Cumulative Effects

Table 1. Project Schedule for R-3300A & B

Section	Letting Type	Let Date
R-3300B	Traditional	September 2020
R-3300A	Traditional	2022

Impacts to Jurisdictional Resources

For the purposes of comparison, the detailed impacts outlined in the 2017 CP4A meeting are used here as estimated impacts since they were developed at approximately the same time as the original permit. Final wetland impact amounts decreased in the B section from the 4A and 4C projected impact numbers. The decrease in wetland impacts are associated with avoidance and minimization measures as well as modifications to the interchange north of Topsail Primary, Middle, and High Schools that resulted in fewer wetland impacts. The final stream impacts increased compared to what was projected at 4C. One of the reasons for the changes in the stream impacts was from an updated wetland and stream delineation for portions of the project, notably a jurisdictional stream was added within Wetland IWC (Site 3). Final design for section B has been updated. Utility impacts have also been added. Impacts to jurisdictional wetlands and surface waters for R-3300B are summarized below in Tables 2 - 4.

Table 2. R-3300B Wetland Impacts

Permit Drawing Site Number (2012)	Map Label in FEIS (2014)	Type	Permanent Impacts (ac.)	Temporary Impacts (ac.)	Mitigation Required [a]	HUC[e]
1	IWD	Non-Riparian	8.568	0	Yes	CPF-07
		Riparian	0.007	0	Yes	CPF-07
2	IWE	Non-Riparian	0.163	0	Yes	CPF-07
3	LWB	Riparian	4.707	0.410	Yes	CPF-07
4	MWM(2)	Non-Riparian	1.839	0	Yes	CPF-07
		Riparian	0.109	0	Yes	CPF-07
5	LWD1	Riparian	0.065	0	Yes	CPF-07
7	LWD	Riparian	5.756	0.13	Yes	CPF-07
8	LWF	Non-Riparian	0.083	0	Yes	CPF-07
9	LWE	Non-Riparian	0.128	0	Yes	CPF-07
11	LWG	Non-Riparian	0.001	0	Yes	CPF-07
13	LWI	Riparian	2.344	0	Yes	CPF-07
15	LWJ	Non-Riparian	6.464	0	Yes	CPF-07
16	LWL	Riparian	0.075	0.106	Yes	CPF-07
17	LWK	Riparian	0.251	0	Yes	CPF-07
18	NWO	Non-Riparian	0.849	0	Yes	CPF-07
19[d]	NWP, PD-29, -	Non-Riparian	27.823	0	Yes	CPF-07

Permit Drawing Site Number (2012)	Map Label in FEIS (2014)	Type	Permanent Impacts (ac.)	Temporary Impacts (ac.)	Mitigation Required [a]	HUC[e]
	15, -16, -31, -11, -32, -33, -35	Non-Riparian	9.079	0	Yes	WOK-02
		Riparian	2.756	0	Yes	WOK-02
21	NWQ	Riparian	0.448	0	Yes	WOK-02
22	IWC	Riparian	0.22	0	Yes	WOK-02
24	IWA	Riparian	0	0.025	Yes	WOK-02
25	LWI	Riparian	0	0.001	Yes	WOK-02
26	NWL	Riparian	0.005	0	Yes	WOK-02
28	NWM	Non-Riparian	0.392	0	Yes	WOK-02
29	NWE	Non-Riparian	0.019	0	Yes	WOK-02
30	NWB	Non-Riparian	0.006	0	Yes	WOK-02
32	NWN	Non-Riparian	0.014	0	Yes	WOK-02
		Total: [c]	**72.171 [b]**	**0.672**		

[a] For permanent impacts
[b] A decrease of 0.879 from 4C.
[c] Rounded totals are sum of actual impacts.
[d] Site 19 and 20 were merged into Site 19.
[e] CPF-07 = Cape Fear 8-digit HUC 03030007; WOK -02 = White Oak 8-digit HUC 03020302.

Table 3. R-3300B Surface Water Impacts

Permit Drawing Site Number	Waterbody	Permanent (ft)	Temporary (ft)	Permanent (ac.)	Temporary (ac.)	Mitigation Required [a]	HUC[e]
3	stream	1,411	302	0.718	0.046	Yes	CPF-07
5	stream	364	0	0.085	0	Yes	CPF-07
6	stream	355	31	0.121	0.01	Yes	CPF-07
7	stream	2,060	62	0.731	0.015	Yes	CPF-07
10	pond	0	0	0.633	0	No	CPF-07
12	pond	0	0	0.416	0	No	CPF-07
13	stream	348	26	0.085	0.007	Yes	CPF-07
14	tributary	0	0	0.15	0.013	No	CPF-07
19[f]	stream	773	0	0.254	0	Yes	WOK-02
21	stream/pond	97	33	0.014	0.009	Yes	WOK-02
22	stream	163	0	0.007	0	Yes	WOK-02
23	pond	0	0	0.279	0	No	WOK-02
26	stream	87	0	0.028	0	Yes	WOK-02
27	pond	0	0	0.117	0.046	No	WOK-02
31	stream	122	35	0.033	0.008	Yes	WOK-02
Total: [b]		**5,780 [cd]**	**489**	**3.671**	**0.154**		

[a] For permanent impacts
[b] An increase of 646 lf. from 4C.
[c] Includes 132 lf of bank stabilization at Site 3 and 34 lf of bank stabilization at Site 7.
[d] Includes 87 lf. of channel realignment at Site 26 and 37 lf of channel realignment at Site 31.
[e] CPF-07 = Cape Fear 8-digit HUC 03030007; WOK -02 = White Oak 8-digit HUC 03020302.
[f] Site 19 and 20 were merged into Site 19.

Permanent Impacts: Proposed permanent impacts for R-3300B include fill, excavation, and mechanized clearing in wetlands. This includes impacts to *16.743* acres of riparian wetlands and *55.428* acres of non-riparian wetlands. Proposed permanent impacts to streams are *5,780* linear feet.

Temporary Impacts: There is *0.354* acre of temporary impacts to riparian wetlands for R-3300B. Proposed temporary impacts to surface waters is *489* linear feet.

Utility Impacts: Within R-3300B there will be power, telecommunications, natural gas, sanitary sewer and water relocations. Impacts from underground utilities have been minimized by using bore pits and directional drilling. Beyond impacts already accounted for as part of the road construction only temporary impacts are required for utility relocations (Hand Clearing 1.669 acres) as shown in the utility permit drawing package. Furthermore, 1.510 acres of this hand clearing for utilities results in permanent conversion of mature forested wetlands.

Hand Clearing: The hand clearing totals associated with the roadway construction is 0.318 acres. None of the 0.318 acres of hand clearing for roadway construction will result in permanent conversion of a mature forested wetland.

Table 4. Summary of Wetland and Stream Impacts for R-3300B

Section	Permanent Wetland (ac.)		Temporary Wetland (ac.)		Permanent Stream (lf.)	Temporary Stream (lf.)
	Riparian	Non-riparian	Riparian	Non-riparian		
B	16.743	55.428	0.354	0	5,780	489

Avoidance and Minimization

All jurisdictional features were delineated, field verified, and surveyed within the corridor for R-3300B. Using these surveyed features, final designs were adjusted to avoid and/or minimize impacts to jurisdictional areas. NCDOT employs many strategies to avoid and minimize impacts to jurisdictional areas in all its designs. Many of these strategies have been incorporated into BMP documents that have been reviewed and approved by the resource agencies and which will be followed throughout construction. All wetland areas not affected by the project will be protected from unnecessary encroachment. Individual avoidance and minimization items are as follows:

- No staging of construction equipment or storage of construction supplies will be allowed in wetlands or near surface waters.
- To ensure that all borrow and waste activities occur on high ground, except as authorized by permit, the NCDOT shall require its contractors to identify all areas to be used to borrow material, or to dispose of dredged, fill or waste material. Documentation of the location and characteristics of all borrow and disposal sites associated with the project will be available to the USACE on request.
- A wet detention basin and dry detention basin have been designed at the northern most interchange to provide stormwater quality and quantity control.
- Offsite and roadway drainage has been separated to the maximum extent practical. Roadway drainage systems were extended so outfalls discharge outside of wetland areas and into uplands, wherever possible.
- Toe protection was added to the toe of fill slopes, in lieu of lateral ditches, in wetland areas to minimize impacts to wetlands, where possible.
- Culverts in jurisdictional streams will be buried to promote fish passage. RCBC's will be backfilled with native material excavated from the stream channel to provide natural

substrate. Where multiple barrel culverts are proposed, sills and floodplain benches will be constructed to natural stream dimensions and profiles.

- Perpendicular stream crossings have been used where possible.
- 3:1 side slopes were designed throughout the project within jurisdictional areas with the exception of two locations of 4:1 slopes within an interchange (as a driver safety measure) and a 2:1 slope on the edge of a pond and at a culvert extension near Sloop Point Road.
- Equalizer pipes have been added to wetland crossings to maintain hydraulic connectivity to the maximum extent practicable.
- Temporary fill for detours within jurisdictional areas will be placed on geotextile fabric so natural ground elevation can be restored to preexisting conditions.
- Other Avoidance and Minimization measures incorporated into this project can be found in the 4A meeting minutes dated July 12, 2017.

Summary of Mitigation

The proposed construction of R-3300B will impact *16.743* acres of riparian and *55.428* acres of non-riparian wetlands that will require mitigation. The riparian impacts from the R-3300B will be offset by compensatory mitigation provided by the DMS. The non-riparian impacts for R-3300B will be partially offset with the remaining mitigation credits (78.43 acres) that were purchased from the Northeast Cape Fear Umbrella Mitigation Bank in conjunction with U-4751. The remaining balance will be offset by compensatory mitigation provided by DMS. See Table 5 for a breakdown by HUC.

Mitigable permanent stream impacts (loss of waters) for the R-3300B total 5,492 linear feet (5,780 linear feet of permanent impact minus 166 linear feet of bank stabilization and 122 linear feet of channel realignment). The new channels are being constructed to offset impacts and will match the existing dimension and profile of the existing channel. The bank stabilization is occurring within the Cape Fear River Basin and the channel realignments are taking place within the White Oak river basin. The 5,492 linear feet of permanent stream impacts (loss) will be offset by compensatory mitigation provided by the DMS.

Table 5. Summary of Mitigation Required for R-3300B

HUC[a]	Permanent Wetland (ac.)		Temporary Wetland (ac.)		Permanent Stream (lf.)	Temporary Stream (lf.)
	Riparian	Non-riparian	Riparian	Non-riparian		
CPF-07	13.314	45.918	0.646	0	4,372[b]	421
WOK-02	3.429	9.510	0.026	0	1,120[c]	68
Total	16.743[d]	55.428[d]	0.672	0	5,492	489

[a] CPF-07 = Cape Fear 8-digit HUC 03030007; WOK -02 = White Oak 8-digit HUC 03020302.
[b] Permanent stream impacts in CPF-07 are 4,538 linear feet minus 166 linear feet bank stabilization.
[c] Permanent stream impacts in WOK-02 are 1,242 linear feet minus 122 linear feet of channel realignment.
[d] An additional 0.814 acres of riparian wetlands (0.757 CPF-07 and 0.057 WOK-2) and 0.696 acres of non-riparian wetlands (0.014 CPF-07 and 0.682 WOK-2) will be permanently converted from mature forested wetlands to maintained corridors by hand clearing for utilities.

Protected Species

The United States Fish and Wildlife Service (USFWS) list 16 federally protected species for Pender as of the June 27, 2018 listing (Table 6).

Table 6. Federally Protected Species in Pender County (R-3300B)

Scientific Name	Common Name	Federal Status	Habitat	Biological Conclusion
Alligator mississippiensis	American alligator	T(S/A)	Yes	N/A
Chelonia mydas	Green sea turtle	T	No	No Effect
Eretmochelys imbricata	Hawksbill sea turtle	E	No*	No Effect
Lepidochelys kempii	Kemp's Ridley sea turtle	E	No	No Effect
Dermochelys coriacea	Leatherback sea turtle	E	No	No Effect
Caretta caretta	Loggerhead sea turtle	T	No	No Effect
Myotis septentrionalis	Northern long-eared bat	T	Yes	MALAA
Trichechus manatus	West Indian manatee	T	No	No Effect
Charadrius melodus	Piping plover	T	No	No Effect
Calidris canutus rufa	Red knot	T	No	No Effect
Picoides borealis	Red-cockaded woodpecker	E	Yes	MALAA
Schwalbea americana	America chaffseed	E	Yes*	No Effect
Thalictrum cooleyi	Cooley's meadowrue	E	Yes	No Effect
Carex lutea	Golden sedge	E	Yes	No Effect
Lysimachia asperulaefolia	Rough-leaved loosestrife	E	Yes	MANLAA
Amaranthus pumilus	Seabeach amaranth	T	No	No Effect

Key: T(S/A) = Threatened (Similarity of Appearance), T = Threatened, E = Endangered, MALAA = May Affect, Likely to Adversely Affect, MANLAA = May Affect, Not Likely to Adversely Affect
* Historic record (the species was last observed in the county more than 50 years ago)

Northern Long-eared Bat
The US Fish and Wildlife Service has developed a programmatic biological opinion (PBO) in conjunction with the Federal Highway Administration (FHWA), the US Army Corps of Engineers (USACE), and NCDOT for the northern long-eared bat (NLEB) (*Myotis septentrionalis*) in eastern North Carolina. The PBO covers the entire NCDOT program in Divisions 1-8, including all NCDOT projects and activities. The programmatic determination for NLEB for the NCDOT program is **May Affect, Likely to Adversely Affect**. The PBO provides incidental take coverage for NLEB and will ensure compliance with Section 7 of the Endangered Species Act for five years for all NCDOT projects with a federal nexus in Divisions 1-8, which includes Pender County where R-3300B is located. This level of incidental take is authorized from the effective date of a final listing determination through April 30, 2020.

Red-Cockaded Woodpecker
As per the 2014 Final Environmental Impact Statement (FEIS) project commitments, if red-cockaded woodpecker (RCW) foraging habitat ceases to exist at the northern interchange at the time NCDOT applies for authorization from the USACE to construct the project, NCDOT would revisit the original interchange design. A Biological Opinion for the project was completed by USFWS in 2016 with a conclusion that the project is not likely to jeopardize the continued existence of the RCW but there may be an incidental take of one RCW group due to foraging habitat removal. Conservation measures are currently being undertaken through the purchase and donation of 81.6 acres of land by NCDOT to Holly Shelter Game Land. Updated cavity tree and habitat surveys were completed for the known RCW clusters in March-May 2018. Surveys confirmed that RCWs remain to be active in the existing clusters and foraging habitat within the Northern Interchange still exist therefore the Least Environmentally Damaging Practicable Alternative (LEDPA) is still valid. USFWS has reviewed and approved the updated survey results.

Cooley's Meadowrue & Golden Sedge
One population of Cooley's meadowrue was found off Sidbury Road in New Hanover County near the overall project study area in 2008. In 2009, biologists found species of *Carex* near the Sidbury Road site with the meadowrue individuals that could not be ruled out as golden sedge. These sightings were not within the R-3300B Section of the project. Additionally, an updated survey was completed of R-3300B in 2018 and no individuals of Cooley's meadowrue or golden sedge were found.

Rough-leaved loosestrife
As part of the 2016 RCW Biological Opinion, USFWS stated that rough-leaved loosestrife would be considered May Affect, Not Likely to Adversely Affect. Additionally, no individuals were found during updated plant surveys during the 2018 survey window.

Bald and Golden Eagle Protection Act (BGPA)
In the July 9, 2007 Federal Register (72:37346-37372), the bald eagle was declared recovered, and removed (de-listed) from the Federal List of Threatened and Endangered wildlife. This delisting took effect August 8, 2007. After delisting, the Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. 668-668d) became the primary law protecting bald eagles. The 2014 FEIS outlines potential foraging habitat near the R-3300A section but none within the B section. Habitat for the bald eagle is not present within R-3300B due to the lack of large water bodies in the study area.

Regulatory Approvals

Section 404: We are, therefore, requesting the modification of the USACE Individual 404 Permit signed August 10, 2017 (SAW-2007-1386), for the above-described activities. NCDOT will apply for a permit modification when designs are finalized and before construction commences on Section A.

Section 401: We are hereby requesting a modification to the 401 Water Quality Certification from the NCDWQ issued June 5, 2017 (20161268). In compliance with Section 143-215.3D(e) of the NCAC, we will provide $570.00 to act as payment for processing the Section 401 permit modification.

CAMA: Under separate cover, NCDOT is submitting a request for a CAMA Federal Consistency Review from the N.C. Division of Coastal Management for R-3300B.

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Mason Herndon at 910-341-2036 or tmherndon@ncdot.gov.

Sincerely,

For Chad Kimes, PE, Division 3 Engineer
North Carolina Department of Transportation

ec:

Kristi Lynn Carpenter, Division of Water Resources
Joanne Steenhuis, Division of Water Resources

Enclosures

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 40237.1.1 **TIP No.:** R-3300B **County(ies):** Pender

General Project Information

WBS Element:	40237.1.1	**TIP Number:**	R-3300B	**Project Type:**	New Location	**Date:**	3/29/2019
NCDOT Contact:	Mason Herndon			**Contractor / Designer:**	Joshua G. Dalton		
Address:	Div 3 Environmental Program Supervisor 5501 Barbados Blvd. Castle Hayne, NC 28429			**Address:**	Sungate Design Group, PA 905 Jones Franklin Rd Raleigh, NC 27606		
Phone:	910-341-2036			**Phone:**	919-859-2243		
Email:	tmherndon@ncdot.gov			**Email:**	jdalton@sungatedesign.com		
City/Town:	Hampsted			**County(ies):**	Pender		
River Basin(s):	Cape Fear	White Oak		**CAMA County?**	Yes		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	6.916 miles	**Surrounding Land Use:**	Rural, Residentail, Commercial		
	Proposed Project			**Existing Site**	
Project Built-Upon Area (ac.)	89.6	ac.		12.6	ac.
Typical Cross Section Description:	Two 12' travel lanes in each direction (4 total) with 10' paved shoulders and 34' wide grass median.			N/A, new location roadway.	
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 55400	Year: 2040		Existing: N/A	Year: 2016

General Project Narrative: (Description of Minimization of Water Quality Impacts)

R-3300B is a new location roadway project for future NC 417 (Hampstead Bypass) from south of NC 210 to east of SR 1563 (Sloop Point Loop Road). Work will include grading, drainage, paving, structures, signals, and culverts. Wetland and stream impacts have been minimized using maximum 3:1 side slopes across jurisdictional streams and through wetland areas. Off-site and roadway drainage have been seperated to the maximum extent practical and roadway drainage discharged outside of wetlands areas, where possible. Toe protection at toe of fill slopes, in lieu of lateral ditches, have been propsoed in wetland areas to minmize impacts to wetlands, where possible. Culverts in jurisdication streams will be buried to promote fish passage. A stormwater wet detention basin and dry detention basin have been designed at the northern most interchange to provide stormwater quality and quantity control.

Waterbody Information

Surface Water Body (1):	UT to Old Topsail Creek	**NCDWR Stream Index No.:**	18-87-12		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class SA		
		Supplemental Classification:	High Quality Waters (HQW)		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?		Comments:			
NRTR Stream ID:	NSF		**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

WBS Element:	40237.1.1	TIP No.:	R-3300B	County(ies):	Pender	Page	2	of	5

Additional Waterbody Information

Surface Water Body (2):	Winding Branch (Trib to Harrisons Creek)	**NCDWR Stream Index No.:**	18-74-49		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	Swamp Waters (Sw)		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	Comments:				
NRTR Stream ID:	LSB			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (3):	Harrisons Creek	**NCDWR Stream Index No.:**	18-74-49		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	Swamp Waters (Sw)		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	Comments:				
NRTR Stream ID:	LSC			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (4):	Godfrey Creek	**NCDWR Stream Index No.:**	18-74-49-1		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	Swamp Waters (Sw)		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	Comments:				
NRTR Stream ID:	LSD			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: **TIP No.:** R-3300B **County(ies):** Pender

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)	BMP Associated w/ Buffer Rules?
5	-Y30- 46+88 LT	(2)Winding Branch (Trib	Riprap Energy Dissipator Basin	Class I	48.0	Pipe	54	95.0	2.1	N/A
10	-L1- 677+37 RT	(3)Harrisons Creek	Riprap Energy Dissipator Basin	Class I	33.0	Pipe	54	65.0	1.9	N/A

Additional Comments

* Refer to the NCDOT Best Management Practices Toolbox (2014), NCDOT Standards, the Federal Highway Administration (FHWA) Hydraulic Engineering Circular No. 14 (HEC-14), Third Edition, Hydraulic Design of Energy Dissipators for Culverts and Channels (July 2006), as applicable, for design guidance and criteria.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 40237.1.1 **TIP No.:** R-3300B **County(ies):** Pender

Level Spreaders, Hazardous Spill Basins, and Forebays

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Level Spreader, Hazardous Spill Basin, or Forebay?	Drainage Area (ac)	New Built-Upon Area (ac)	Required / Minimum Treatment			Treatment Achieved		BMP Associated w/ Buffer Rules?
23	-L1_N- 866+50 LT	(1)UT to Old Topsail Creek	Forebay	1.41	0.88	0.1 inches of runoff from NBUA	303.6	cf	1116.0	cf	No
23	-Y32- 39+75 RT	(1)UT to Old Topsail Creek	Forebay	2.89	0.23	0.1 inches of runoff from NBUA	79.4	cf	1300.2	cf	No

*Hazardous spill basins are pollution prevention measures designed for spill containment rather than stormwater treatment. Under Required / Minimum Treatment and Treatment Achieved, provide the minimum required volume and the actual HSB volume, respectively. Refer to the NCDOT Stormwater Best Management Practices Toolbox (2014) for design guidance.

Additional Comments

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 40237.1.1 **TIP No.:** R-3300B **County(ies):** Pender

Other Best Management Practices

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	BMP Type	Drainage Area (ac)	New Built-Upon Area (ac)	Volume Treated (ac-ft)	Precipitation Depth Treated over NBUA (in)	BMP Associated w/ Buffer Rules?
23	-L1_N- 868+00 LT	(1)UT to Old Topsail Creek	Wet Detention Basin	12.1	2.9	0.378	1.65	No
23	-Y32- 29+23 RT	(1)UT to Old Topsail Creek	Dry Detention Basin	10.3	2.6	2.08	9.99	No

Additional Comments

Note: Volume treated (WQv) based on storage up to elevation of first opening above tee pipe.

TIP PROJECT: R-3300B

CONTRACT:

See Sheet 1A For Index of Sheets
See Sheet 1B for Conventional Symbols

FDFI PLANS SUBMITTAL

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PENDER COUNTY

LOCATION: NC 417 (HAMPSTEAD BYPASS) FROM SOUTH OF NC 210 TO NORTH OF SR 1563 (SLOOP POINT LOOP ROAD).

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, SIGNALS, AND CULVERTS

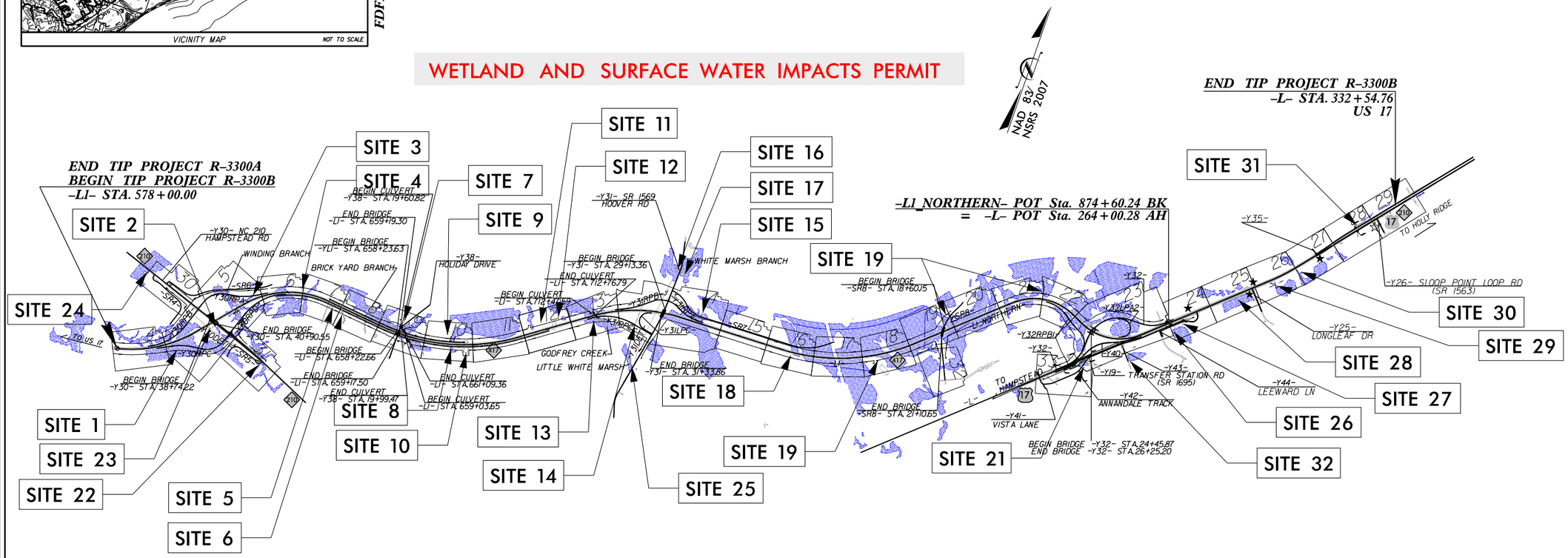
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-3300B	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
40237.1.1	N/A	PE
40237.2.1	N/A	R/W
40237.2.2	N/A	UTIL

PERMIT DRAWING
SHEET 1 OF 165

DATE: 04-01-2020

WETLAND AND SURFACE WATER IMPACTS PERMIT



SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

☆ UPDATE EXISTING SIGNAL
★ PROPOSED SIGNAL

-THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.
-CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY MODIFIED METHOD III.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2016 = N/A
ADT 2040 = 55,400
DHV = 8 %
D = 60 %
T = 6 % *
V = 70 MPH
*(TTST 2% + DUALS 4%)
FUNC CLASS = FREEWAY
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-3300B	=	6.893 MILES
LENGTH STRUCTURE TIP PROJECT R-3300B	=	0.023 MILES
TOTAL LENGTH TIP PROJECT R-3300B	=	6.916 MILES

PREPARED IN THE OFFICE OF:
STANTEC CONSULTING
801 Jones Franklin Road |Suite 300| Raleigh, NC 27606
Tel. (919) 851-6866 | Fax. (919) 851-7024 | www.stantec.com
License No. F-0672
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 16, 2018

LETTING DATE:
JULY 21, 2020

MICHAEL D. LINDGREN, P.E.
PROJECT ENGINEER

TRACE HOWELL, P.E.
NCDOT DIVISION 3 CONTACT

HYDRAULICS ENGINEERS

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

REVISIONS

–Y30DET–

Stantec

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www.stantec.com
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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2B-2
S/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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GRAPHIC SCALE
50 25 0 50 100
PLANS

PERMIT DRAWING
SHEET 2 OF 165

DATE: 04–01–2020

ENLARGEMENT VIEW
SEE SHEET 4 OF 165

SITE 24

BEGIN CONSTRUCTION
–Y30DET– PC Sta. 15+72.60
–Y30– PC Sta. 15+72.60

–Y30DET– PRC Sta. 19+96.79

–Y30DET– PT Sta. 22+26.96

–Y30DET– PC Sta. 26+31.98

–Y30DET– PRC Sta. 27+62.06

–Y30DET– PT Sta. 28+73.64

–Y30DET– PC Sta. 39+51.4

FOR –Y30DET– PROFILE SEE SHEETS 2B–3 & 2B–4

MATCHLINE –Y30DET– STA 40+00.00

NAD 83/NSRS 2007

DETAIL 2B-7
TEMPORARY SPECIAL LATERAL 'V' DITCH
(Not to Scale)

DETAIL 2B-3
TEMPORARY SPECIAL LATERAL 'V' DITCH
(Not to Scale)

DETAIL 2B-3
TEMPORARY SPECIAL SILT BASE DITCH
(Not to Scale)

DETAIL 2B-6
TOE PROTECTION
(Not to Scale)

–Y30– PC Sta. 46+86.72

–Y30– PT Sta. 59+12.58

–Y30DET– PT Sta. 50+55.31

–Y30DET– PC Sta. 49+52.44

–Y30DET– PC Sta. 57+96.57

–Y30DET– PRC Sta. 59+79.23

END CONSTRUCTION
–Y30DET– PT Sta. 62+57.50
–Y30– PT Sta. 62+35.77

–Y30DET– PT Sta. 41+18.81

SITE 2

SITE 1

ENLARGEMENT VIEW
SEE SHEET 5 OF 164

ENLARGEMENT VIEW
SEE SHEET 6 OF 165

SITE 3

PERMANENT IMPACTS SHOWN
ON SHEET 149 OF 165

PERMANENT IMPACTS SHOWN
ON SHEET 27 OF 165

HC	DENOTES HAND CLEARING
T	DENOTES TEMPORARY FILL IN WETLAND
TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
F	DENOTES FILL IN WETLAND

REVISIONS

–Y30DET–

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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2B-2
S/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALE
50 25 0 50 100
PLANS

PERMIT DRAWING
SHEET 3 OF 165

DATE: 04–01–2020

ENLARGEMENT VIEW
SEE SHEET 4 OF 165

SITE 24

BEGIN CONSTRUCTION
-Y30DET- PC Sta. 15+72.58
-Y30- PC Sta. 15+72.60

-Y30DET- PRC Sta. 19+96.79

-Y30DET- PT Sta. 22+26.96

-Y30DET- PC Sta. 26+31.98

-Y30DET- PRC Sta. 27+62.06

-Y30DET- PT Sta. 28+73.64

-Y30DET- PC Sta. 39+51.14

MATCHLINE -Y30DET- STA 40+00.00

FOR –Y30DET– PROFILE SEE SHEETS 2B–3 & 2B–4

NAD 83/NSRS 2007

DETAIL 2B-7
TEMPORARY SPECIAL LATERAL 'V' DITCH
(Not to Scale)

DETAIL 2B-3
TEMPORARY SPECIAL LATERAL 'V' DITCH
(Not to Scale)

DETAIL 2B-3
TEMPORARY SPECIAL CUT BASE DITCH
(Not to Scale)

DETAIL 2B-6
TOE PROTECTION
(Not to Scale)

-Y30- PT Sta. 59+12.58

-Y30- PC Sta. 46+86.72

-Y30DET- PT Sta. 50+55.31

-Y30DET- PC Sta. 49+52.44

-Y30DET- PC Sta. 57+96.57

-Y30DET- PRC Sta. 59+79.23

ENLARGEMENT VIEW
SEE SHEET 6 OF 165

SITE 3

END CONSTRUCTION
-Y30DET- PT Sta. 62+57.50
-Y30- PT Sta. 62+35.77

SITE 2

SITE 1

ENLARGEMENT VIEW
SEE SHEET 5 OF 165

-Y30DET- PT Sta. 41+18.81

MATCHLINE -Y30DET- STA 40+00.00

PERMANENT IMPACTS SHOWN
ON SHEET 149 OF 165

PERMANENT IMPACTS SHOWN
ON SHEET 27 OF 165

NAD 83/NSRS 2007

US MIT

HC HC	DENOTES HAND CLEARING
T T	DENOTES TEMPORARY FILL IN WETLAND
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
F F	DENOTES FILL IN WETLAND

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

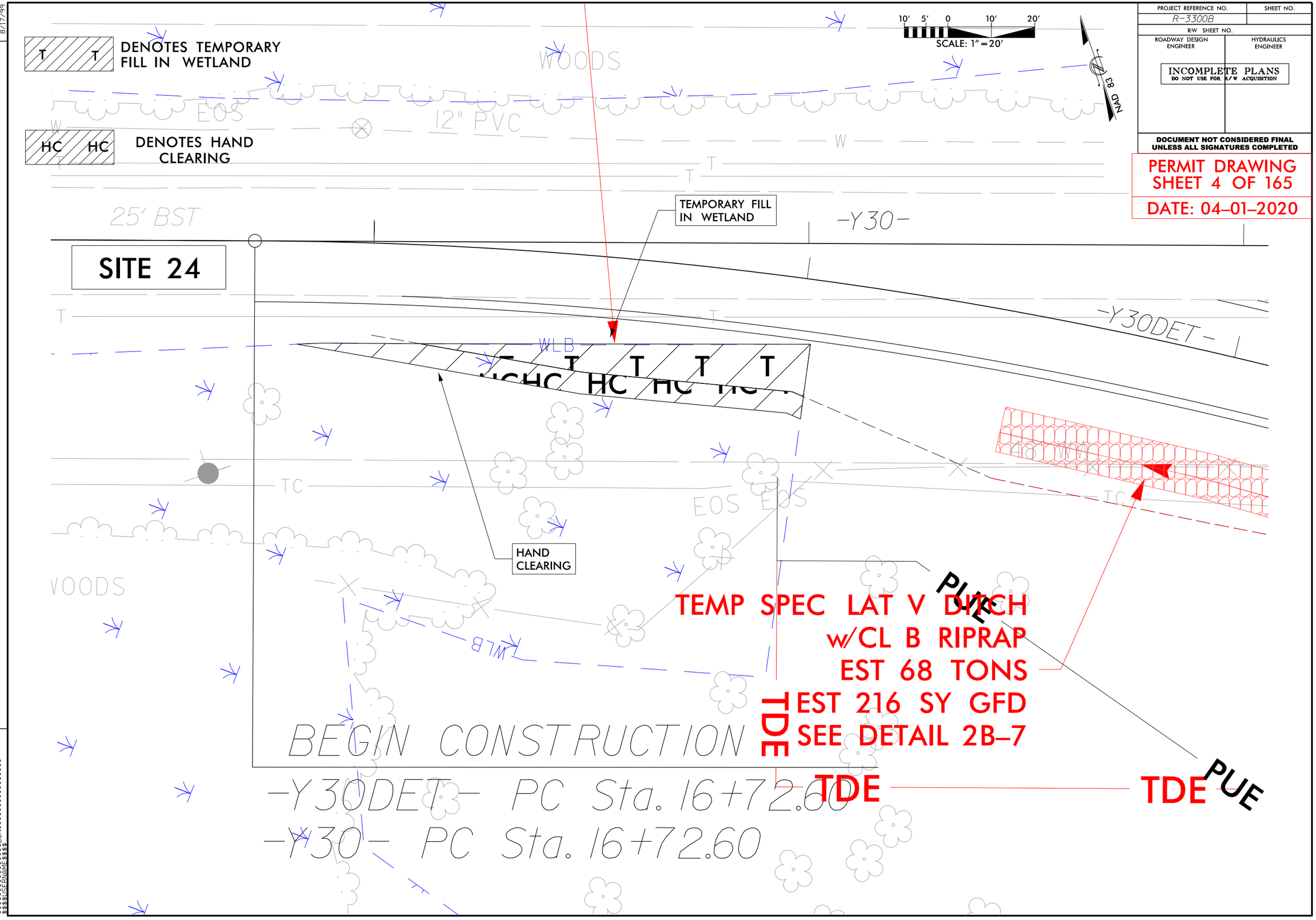
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 4 OF 165

DATE: 04-01-2020

REVISIONS

8/17/99



8/17/99

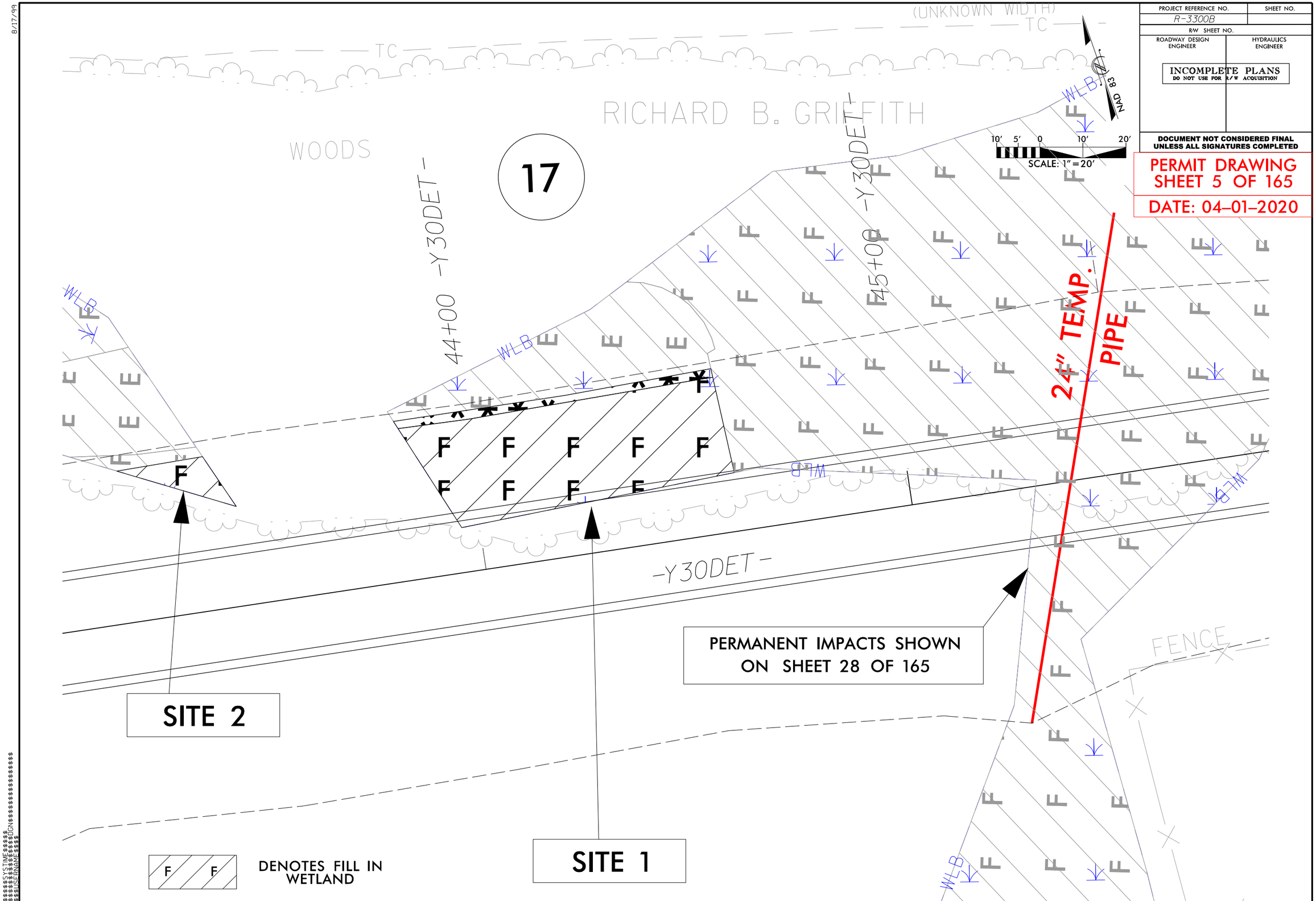
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 5 OF 165

DATE: 04-01-2020



8/17/99

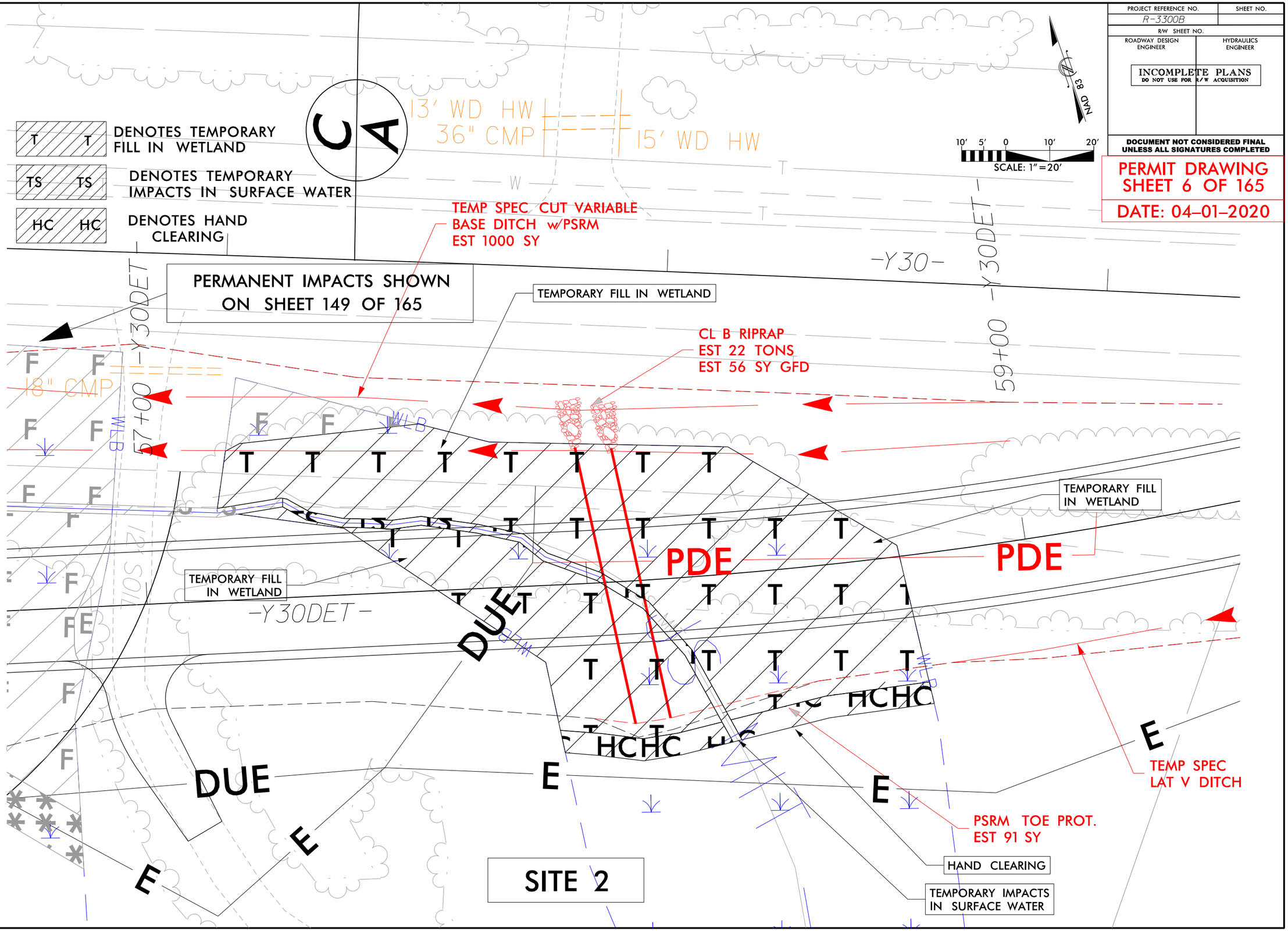
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 6 OF 165

DATE: 04-01-2020



6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-248

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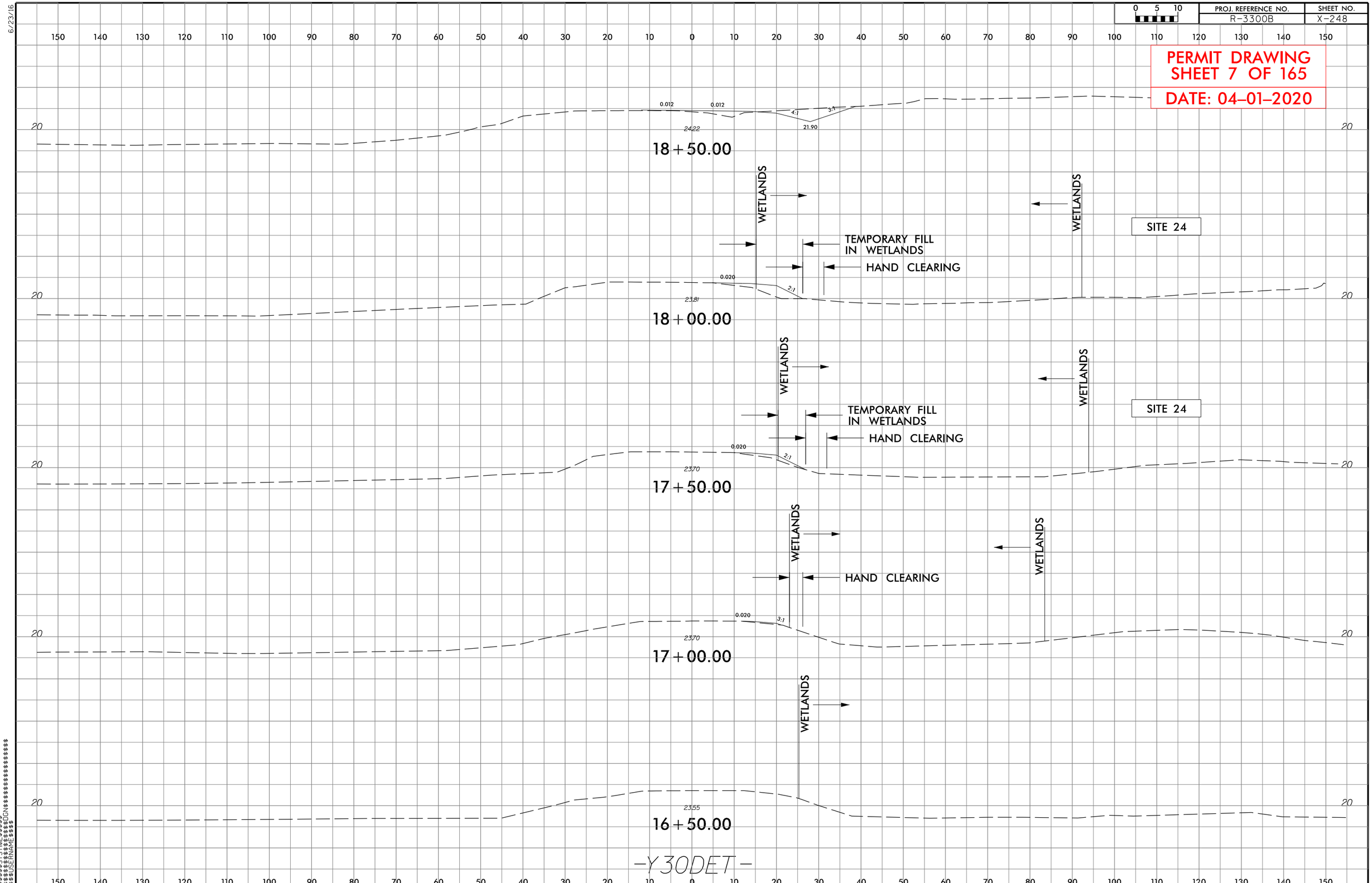
PERMIT DRAWING
SHEET 7 OF 165

DATE: 04-01-2020



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6/23/16

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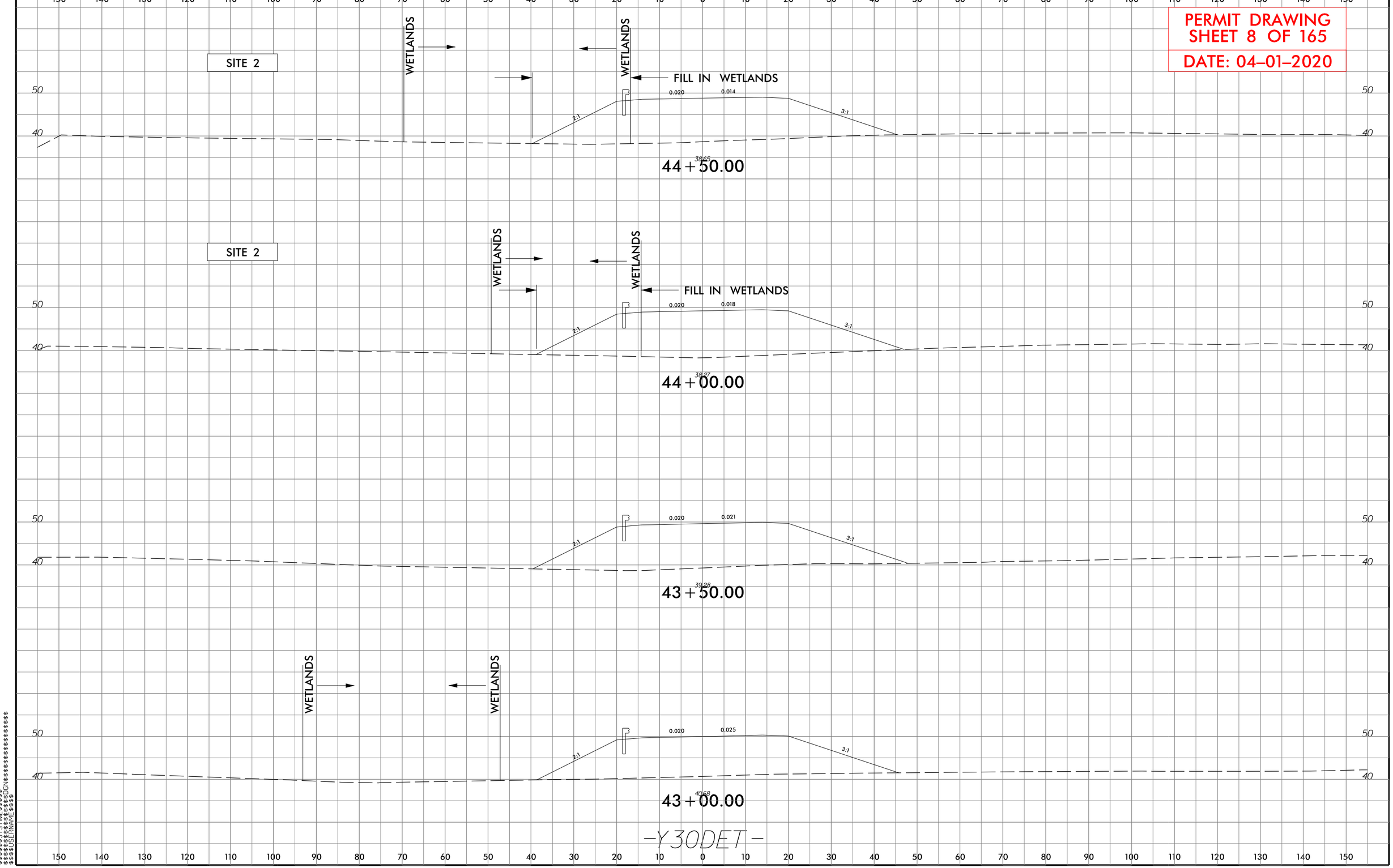
	R-3300B	X-261

PERMIT DRAWING
SHEET 8 OF 165

DATE: 04-01-2020



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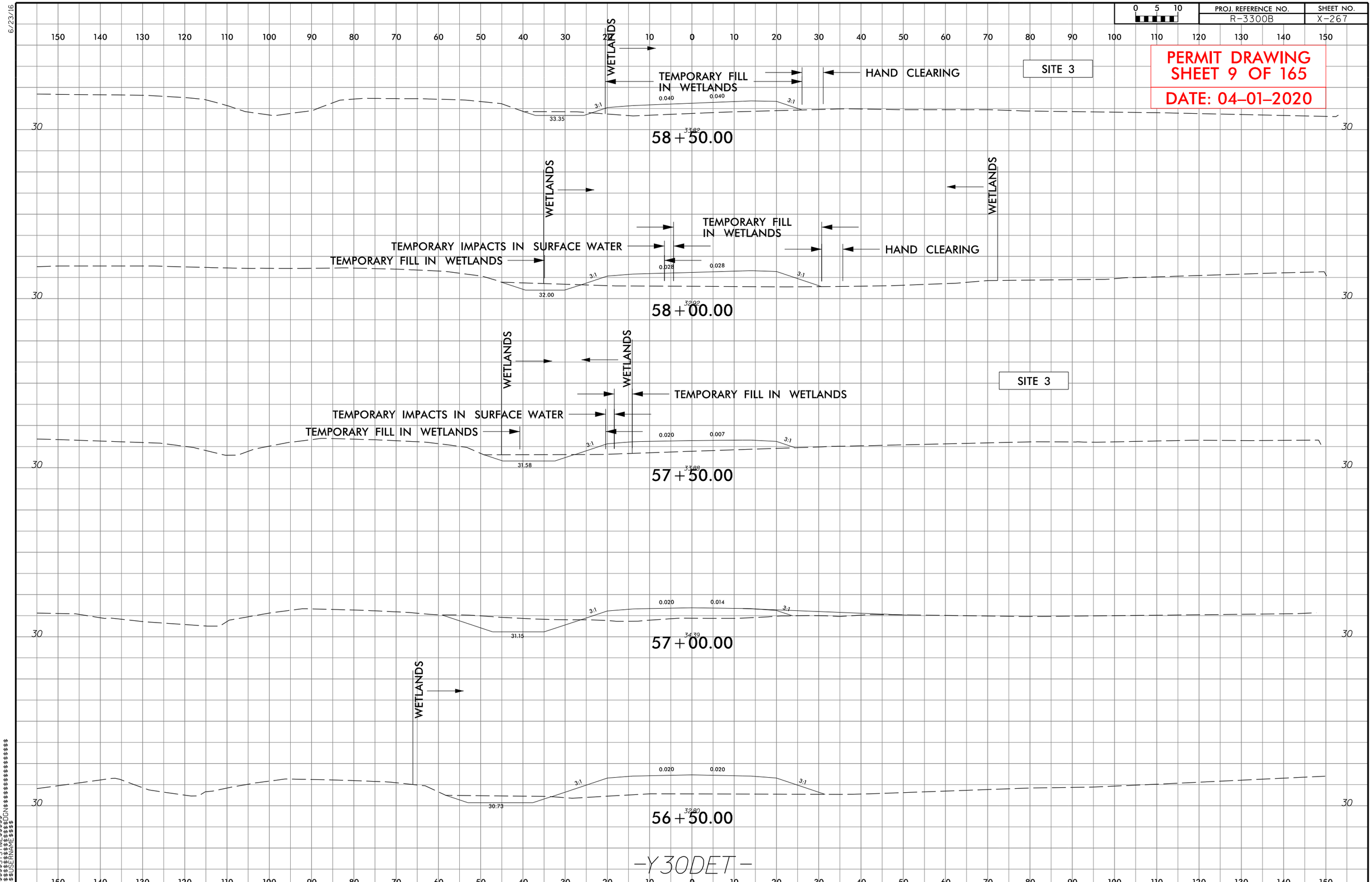
6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-267

0 5 10

PERMIT DRAWING
SHEET 9 OF 165

DATE: 04-01-2020



-Y30DET-

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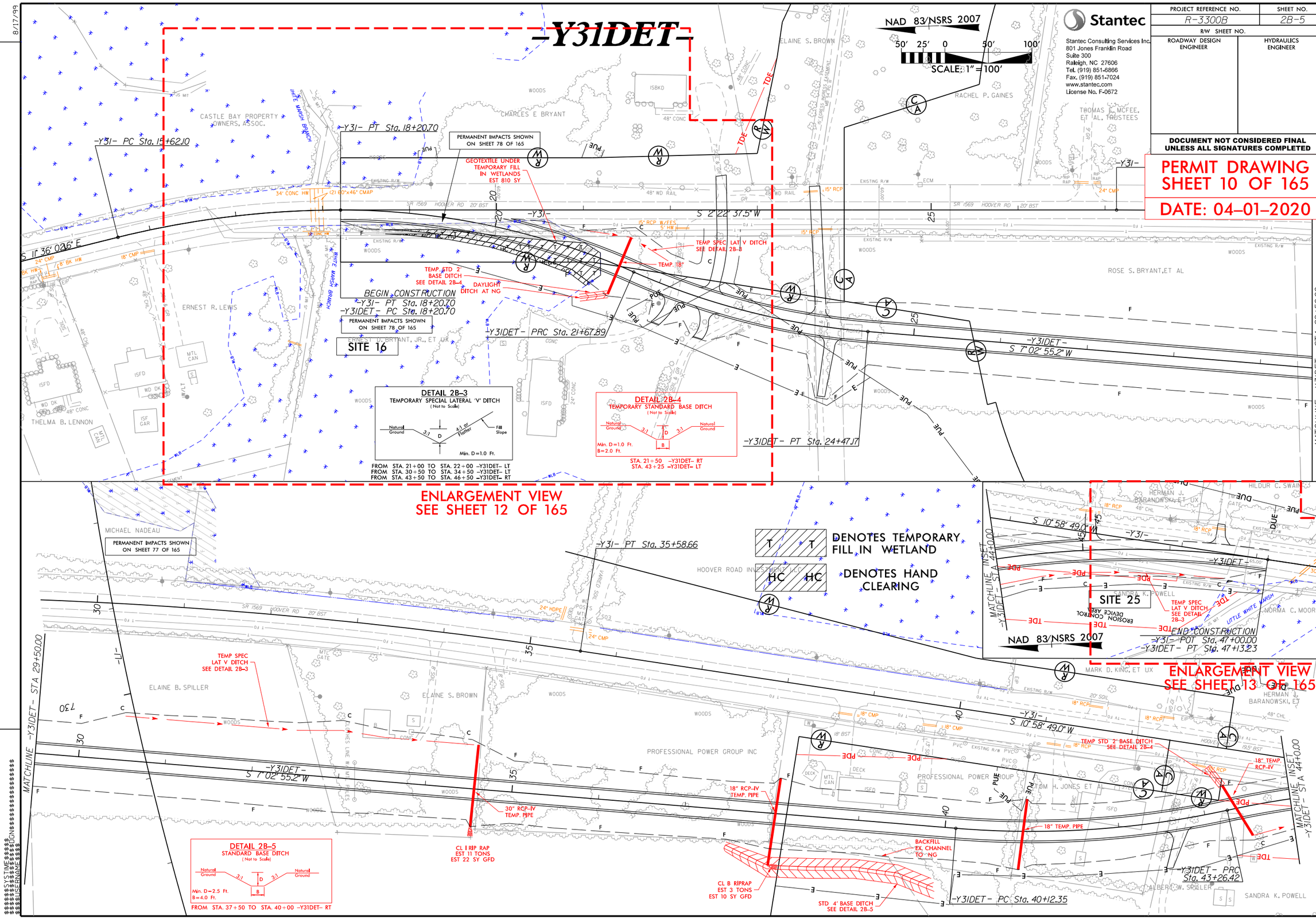
$$$$DGN$$$$
$$$$USERNAME$$$$


-Y31DET-
NAD 83/NSRS 2007
SCALE: 1" = 100'
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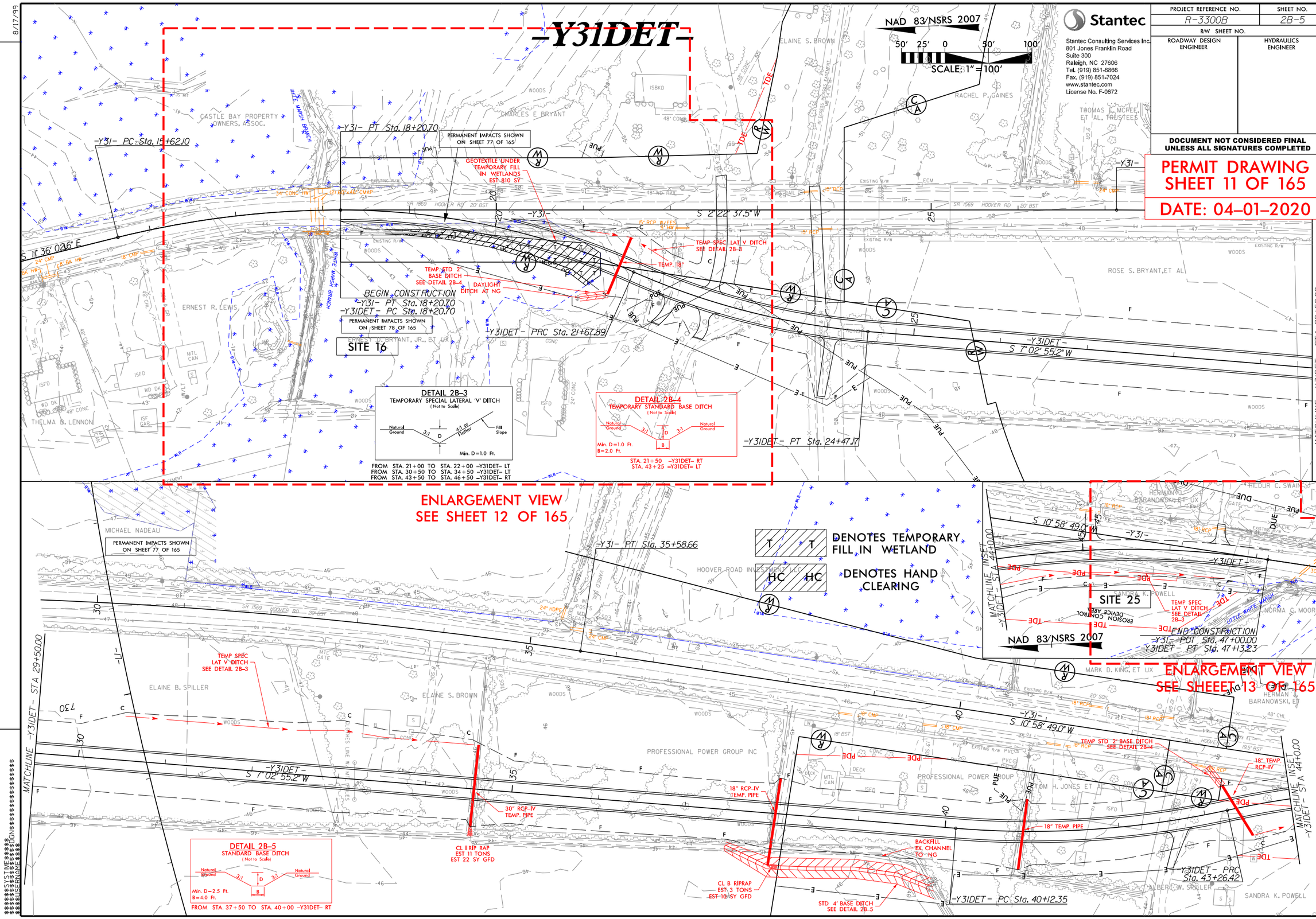
PROJECT REFERENCE NO.
R-3300B
SHEET NO.
2B-5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
PERMIT DRAWING
SHEET 10 OF 165
DATE: 04-01-2020
8/17/99
REVISIONS
-Y31- PC Sta. 15+62.10
-Y31- PT Sta. 18+20.70
PERMANENT IMPACTS SHOWN ON SHEET 78 OF 165
GEOTEXTILE UNDER TEMPORARY FILL IN WETLANDS EST 810 SY
TEMP SPEC LAT V DITCH SEE DETAIL 2B-8
TEMP. 18"
TEMP STD 2' BASE DITCH SEE DETAIL 2B-4
DAYLIGHT DITCH AT NG
BEGIN CONSTRUCTION
-Y31- PT Sta. 18+20.70
-Y31DET- PC Sta. 18+20.70
PERMANENT IMPACTS SHOWN ON SHEET 78 OF 165
SITE 16
-Y31DET- PRC Sta. 21+67.89
-Y31DET- PT Sta. 24+47.17
-Y31DET- S 7°02' 55.2" W
S 2°22' 37.5" W
S 11°36' 02.6" E
CASTLE BAY PROPERTY OWNERS, ASSOC.
CHARLES E BRYANT
ELAINE S. BROWN
RACHEL P. GAINES
THOMAS E. MCFEE, ET AL, TRUSTEES
ROSE S. BRYANT, ET AL
ERNEST R. LEWIS
ERNEST D. BRYANT, JR., ET UX
THELMA B. LENNON
MICHAEL NADEAU
PERMANENT IMPACTS SHOWN ON SHEET 77 OF 165
-Y31- PT Sta. 35+58.66
HOOVER ROAD INVESTMENT, LLC
DENOTES TEMPORARY FILL IN WETLAND
DENOTES HAND CLEARING
ENLARGEMENT VIEW SEE SHEET 12 OF 165
ENLARGEMENT VIEW SEE SHEET 13 OF 165
SITE 25
TEMP SPEC LAT V DITCH SEE DETAIL 2B-3
EROSION CONTROL DEVICE AREA
END CONSTRUCTION
-Y31- POT Sta. 47+00.00
-Y31DET- PT Sta. 47+13.23
SANDRA K. POWELL
MARK D. KING, ET UX
HERMAN J. BARANOWSKI, ET UX
HILDUR C. SWAIN
NORMA C. MOORE
-Y31- S 10°58' 49.0" W
TEMP STD 2' BASE DITCH SEE DETAIL 2B-4
18" TEMP. RCP-IV
18" TEMP. PIPE
BACKFILL EX. CHANNEL TO NG
-Y31DET- PRC Sta. 43+26.42
-Y31DET- PC Sta. 40+12.35
STD 4' BASE DITCH SEE DETAIL 2B-5
CL B RIPRAP EST 3 TONS EST 10 SY GFD
CL I RIP RAP EST 11 TONS EST 22 SY GFD
30" RCP-IV TEMP. PIPE
18" RCP-IV TEMP. PIPE
ELAINE B. SPILLER
PROFESSIONAL POWER GROUP INC
MATCHLINE -Y31DET- STA 29+50.00
MATCHLINE -Y31DET- STA 44+00.00
DETAIL 2B-3
TEMPORARY SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
Fill Slope
Min. D=1.0 Ft.
FROM STA. 21+00 TO STA. 22+00 -Y31DET- LT
FROM STA. 30+50 TO STA. 34+50 -Y31DET- LT
FROM STA. 43+50 TO STA. 46+50 -Y31DET- RT
DETAIL 2B-4
TEMPORARY STANDARD BASE DITCH
(Not to Scale)
Min. D=1.0 Ft.
B=2.0 Ft.
STA. 21+50 -Y31DET- RT
STA. 43+25 -Y31DET- LT
DETAIL 2B-5
STANDARD BASE DITCH
(Not to Scale)
Min. D=2.5 Ft.
B=4.0 Ft.
FROM STA. 37+50 TO STA. 40+00 -Y31DET- RT


-Y31DET-
NAD 83/NSRS 2007
SCALE: 1" = 100'
Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672
PROJECT REFERENCE NO.
R-3300B
SHEET NO.
2B-5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
PERMIT DRAWING
SHEET 11 OF 165
DATE: 04-01-2020
-Y31- PC Sta. 15+62.10
-Y31- PT Sta. 18+20.70
PERMANENT IMPACTS SHOWN ON SHEET 77 OF 165
GEOTEXTILE UNDER TEMPORARY FILL IN WETLANDS EST 810 SY
TEMP SPEC LAT V DITCH SEE DETAIL 2B-3
TEMP. 18"
TEMP STD 2' BASE DITCH SEE DETAIL 2B-4
DAYLIGHT DITCH AT NG
BEGIN CONSTRUCTION
-Y31- PT Sta. 18+20.70
-Y31DET- PC Sta. 18+20.70
PERMANENT IMPACTS SHOWN ON SHEET 78 OF 165
-Y31DET- PRC Sta. 21+67.89
SITE 16
-Y31DET- PT Sta. 24+47.37
-Y31DET- S 7°02'55.2"W
S 1°36'026" E
S 2°22'37.5"W
DETAIL 2B-3
TEMPORARY SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
3:1
D
4:1 or Flatter
Fill Slope
Min. D=1.0 Ft.
FROM STA. 21+00 TO STA. 22+00 -Y31DET- LT
FROM STA. 30+50 TO STA. 34+50 -Y31DET- LT
FROM STA. 43+50 TO STA. 46+50 -Y31DET- RT
DETAIL 2B-4
TEMPORARY STANDARD BASE DITCH
(Not to Scale)
Min. D=1.0 Ft.
B=2.0 Ft.
STA. 21+50 -Y31DET- RT
STA. 43+25 -Y31DET- LT
ENLARGEMENT VIEW
SEE SHEET 12 OF 165
DENOTES TEMPORARY FILL IN WETLAND
DENOTES HAND CLEARING
-Y31- PT Sta. 35+58.66
MATCHLINE -Y31DET- STA 29+50.00
MATCHLINE -Y31DET- STA 44+00.00
S 10°58'49.0"W
SITE 25
TEMP SPEC LAT V DITCH SEE DETAIL 2B-3
END CONSTRUCTION
-Y31- POT Sta. 47+00.00
-Y31DET- PT Sta. 47+13.23
ENLARGEMENT VIEW
SEE SHEEET 13 OF 165
TEMP STD 2' BASE DITCH SEE DETAIL 2B-4
18" TEMP. RCP-IV
18" RCP-IV TEMP. PIPE
30" RCP-IV TEMP. PIPE
18" TEMP. PIPE
BACKFILL EX. CHANNEL TO NG
CL I RIP RAP EST 11 TONS EST 22 SY GFD
CL B RIPRAP EST 3 TONS EST 10 SY GFD
STD 4' BASE DITCH SEE DETAIL 2B-5
-Y31DET- PRC Sta. 43+26.42
-Y31DET- PC Sta. 40+12.35
DETAIL 2B-5
STANDARD BASE DITCH
(Not to Scale)
Min. D=2.5 Ft.
B=4.0 Ft.
FROM STA. 37+50 TO STA. 40+00 -Y31DET- RT
CASTLE BAY PROPERTY OWNERS, ASSOC.
CHARLES E. BRYANT
ELAINE S. BROWN
RACHEL P. GAINES
THOMAS E. MCHEE, ET AL, TRUSTEES
ROSE S. BRYANT, ET AL
ERNEST R. LEWIS
ERNEST D. BRYANT, JR., ET UX
THELMA B. LENNON
MICHAEL NADEAU
ELAINE B. SPILLER
PROFESSIONAL POWER GROUP INC
HOOVER ROAD INVESTMENT, LLC
SANDRA K. POWELL
NORMA C. MOORE
MARK D. KING, ET UX
HERMAN L. BARANOWSKI, ET UX
TOM H. JONES ET AL
ALBERT W. SPILLER
HIDUR C. SWAIN
SR 1569 HOOVER RD
REVISIONS
8/17/99

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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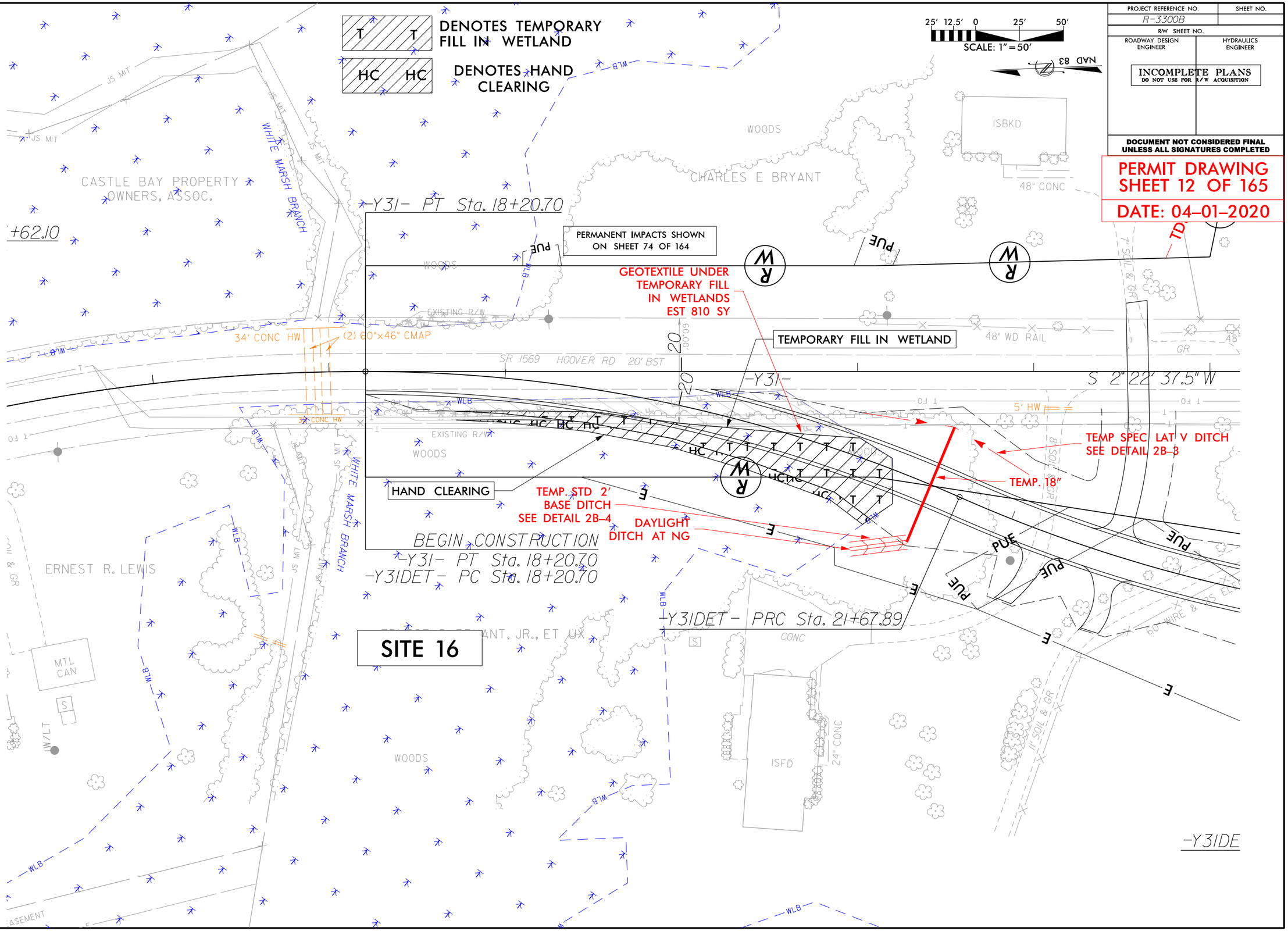
PERMIT DRAWING
SHEET 12 OF 165

DATE: 04-01-2020



8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 13 OF 165

DATE: 04–01–2020

10' 5' 0 10' 20'
SCALE: 1" = 20'

NAD 83

68

HERMAN J. BARANOWSKI, ET UX

48" CHL

105

HILDUR C. SWAIN

GATE

EXISTING R/W

48" CHL

DUE

PUE

DUE

45

-Y31-

46+00
-Y31DET-

-Y31DET-

HAND CLEARING

30" CMP

WLB

RDE

EXISTING R/W

E

E

E

67

SANDRA K. POWELL

TEMP SPEC
LAT V DITCH
SEE DETAIL
2B–3

TDE

TDE

TDE

LITTLE WHITE MARSH

NORMA C. MOORE

EX

WLB

END CONSTRUCTION
-Y31- POT Sta. 47+00.00
-Y31DET- PT Sta. 47+13.23

SITE 25

HC HC DENOTES HAND CLEARING

$$$$SYSTIME$$$$
$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$

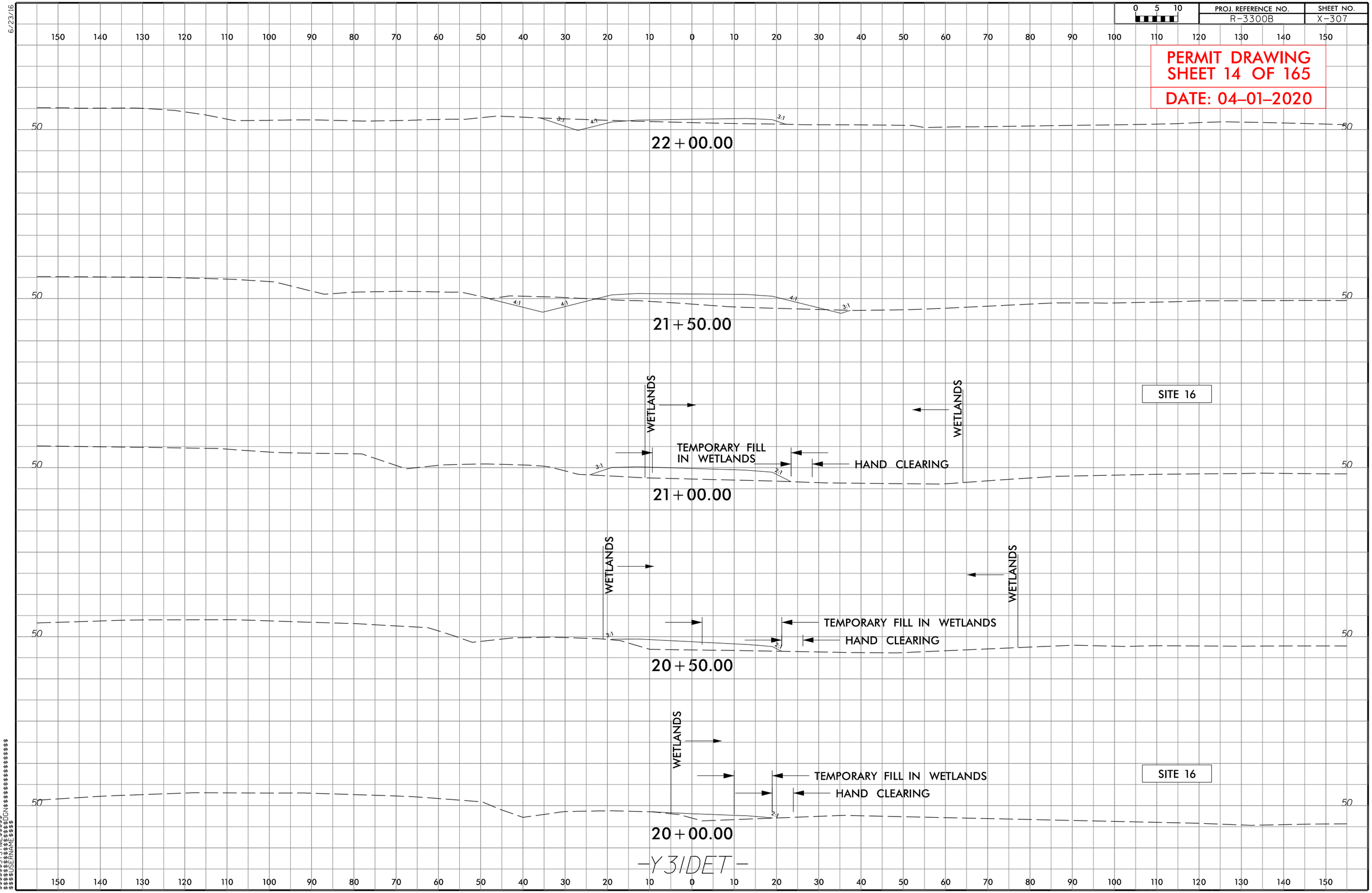
6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-307

0 5 10

PERMIT DRAWING
SHEET 14 OF 165

DATE: 04-01-2020



-Y31DET-

$$$$$$$SYSTIME$$$$
$$$$$$$SYSNAME$$$$
$$
$$
$$
$$$$USERNAME$$$$

8/17/99

-Y38DET-

PERMIT DRAWING
SHEET 15 OF 165

DATE: 04-01-2020

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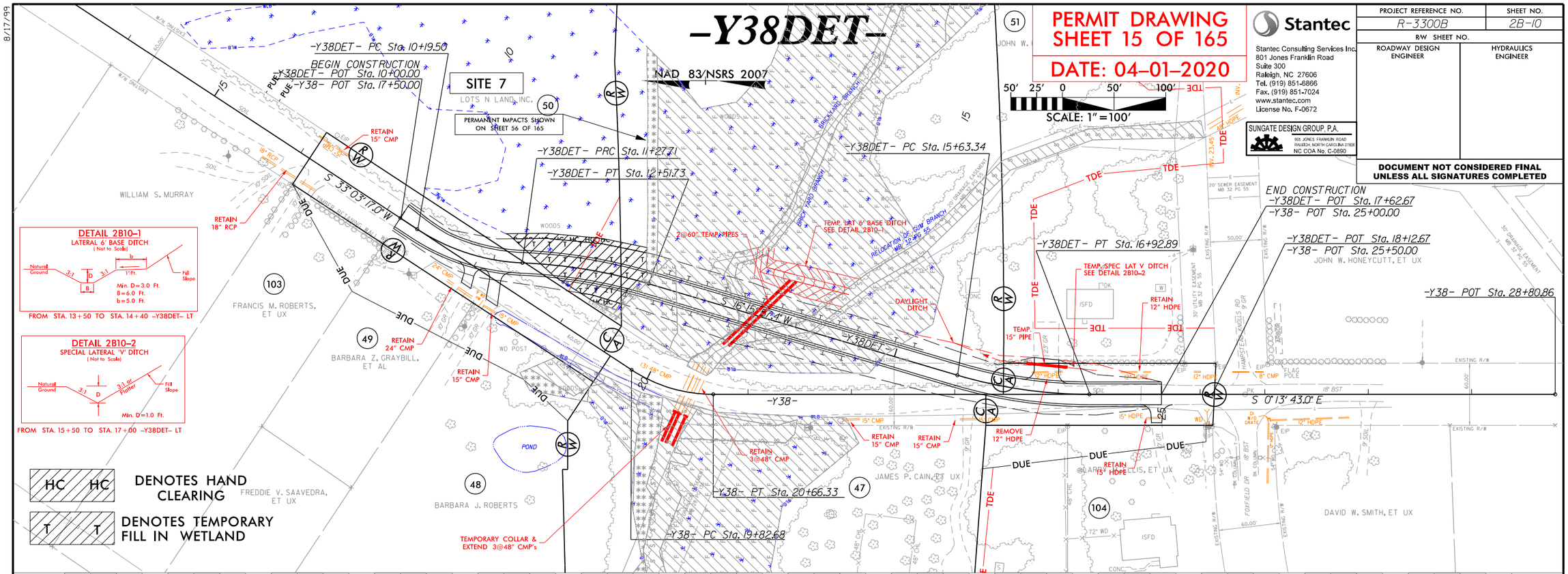
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2B-10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



8/17/99

PERMIT DRAWING SHEET 16 OF 165

DATE: 04-01-2020

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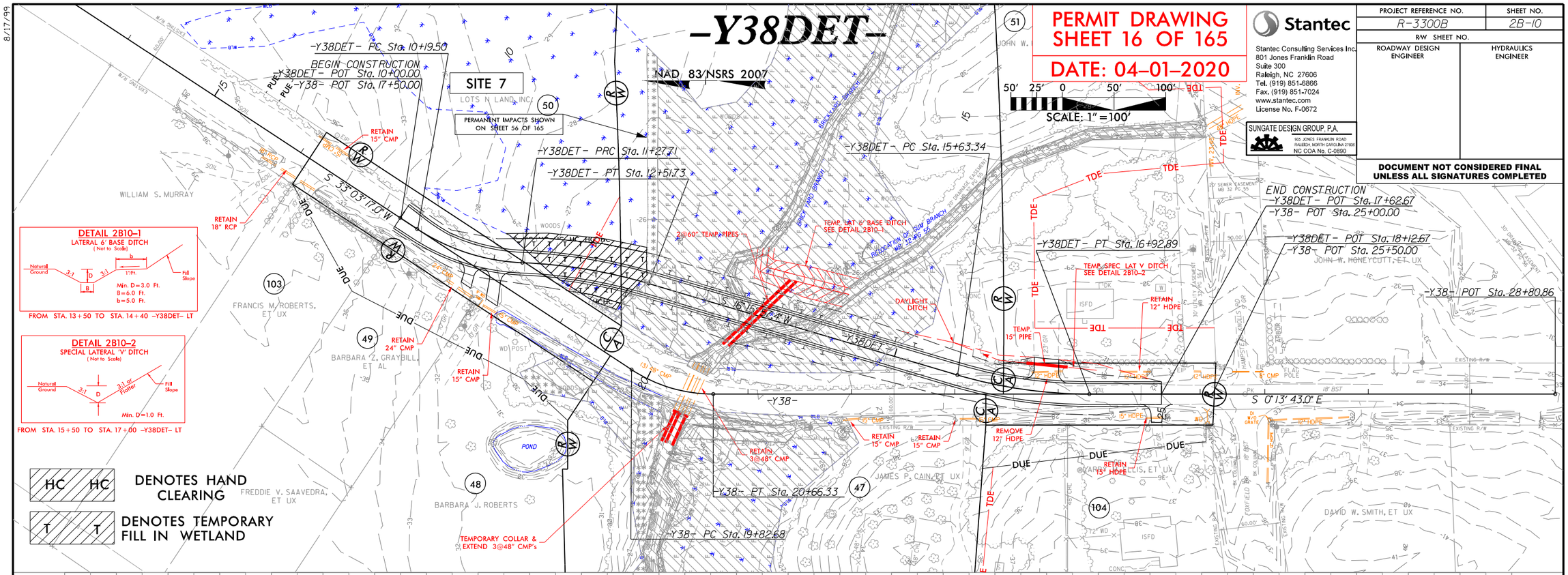
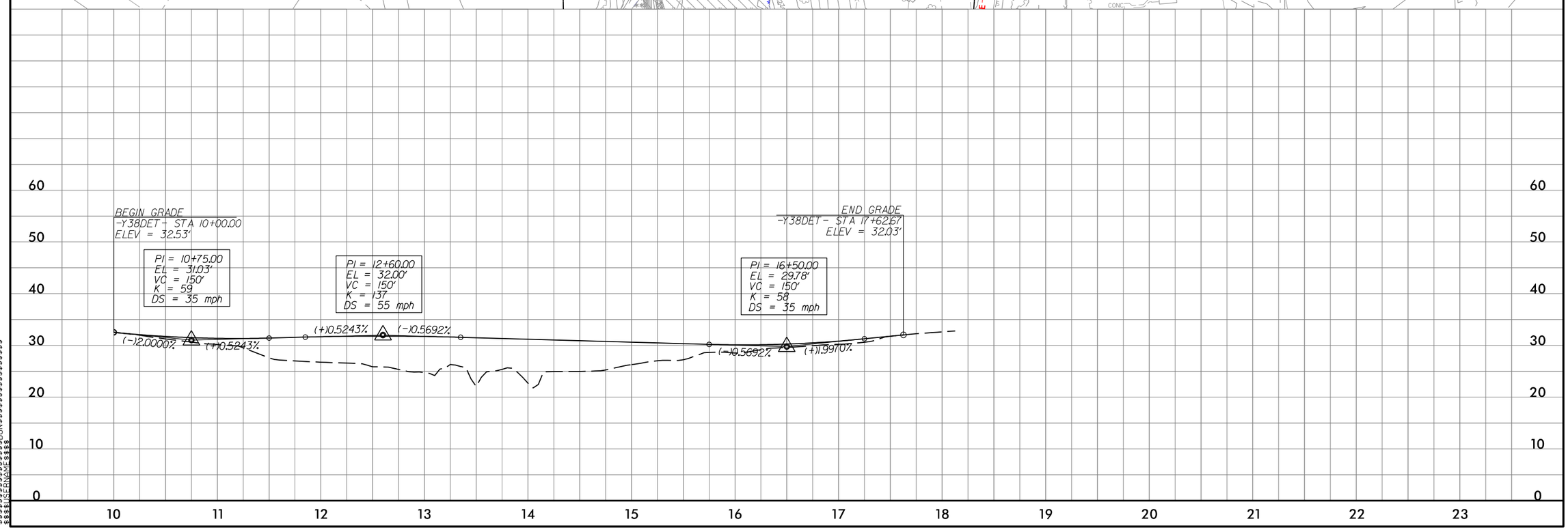




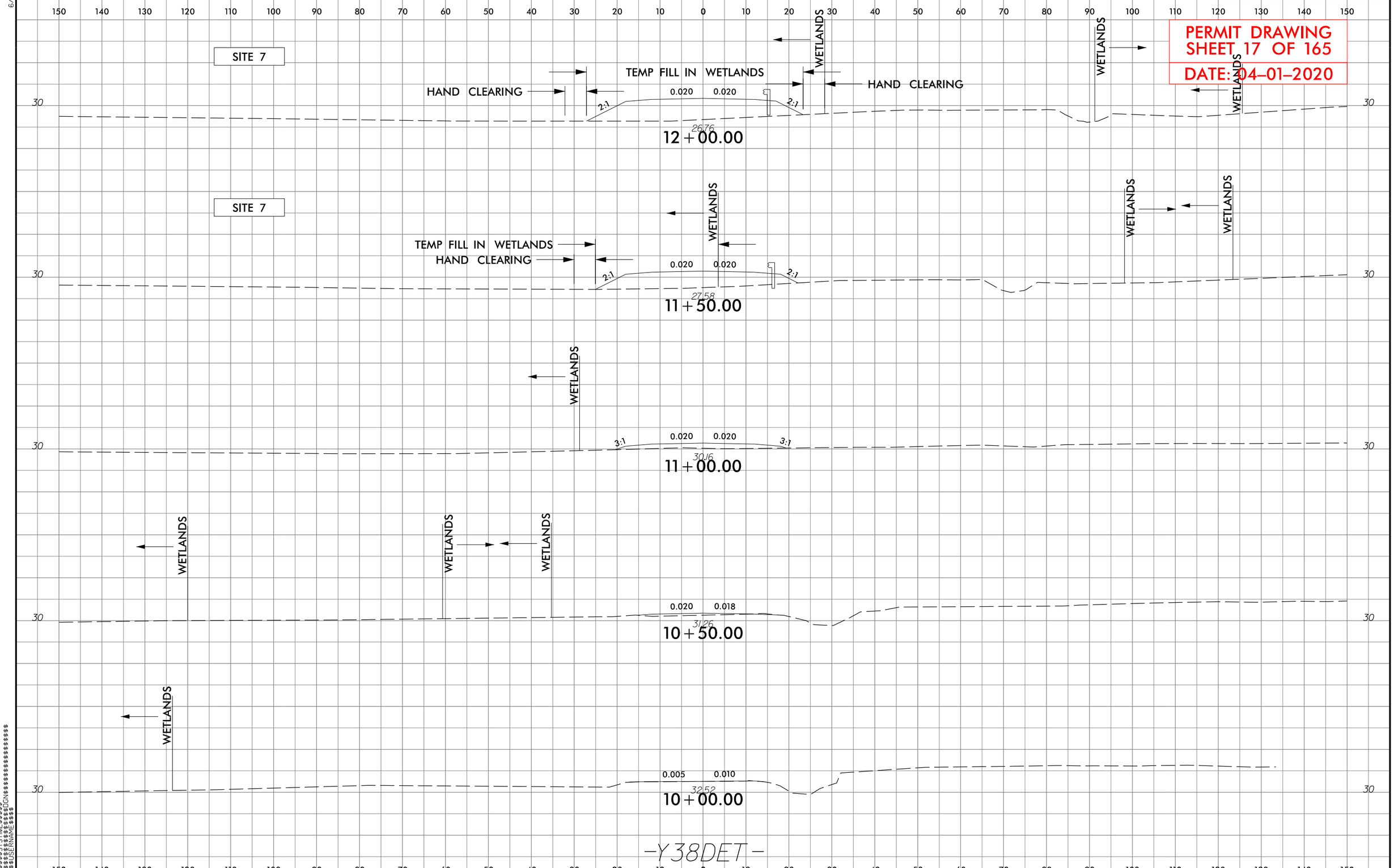
6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-451

0 5 10

PERMIT DRAWING
SHEET 17 OF 165

DATE: 04-01-2020



-Y38DET-

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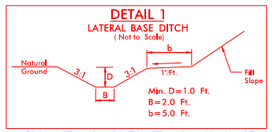
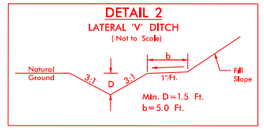
$$$$$$$$SAVE$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

5/14/99



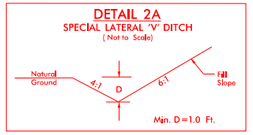
DETAIL 1
LATERAL BASE DITCH
(Not to Scale)

FROM STA. 581+86 TO STA. 584+00 –L1– RT
FROM STA. 656+50 TO STA. 658+40 –L1– RT
FROM STA. 694+65 TO STA. 695+50 –L1– LT
FROM STA. 713+50 TO STA. 718+00 –L1– LT
FROM STA. 28+50 TO STA. 31+00 –SR6– LT
FROM STA. 48+00 TO STA. 50+00 –Y30– RT
FROM STA. 14+50 TO STA. 16+00 –Y30RPA– RT
FROM STA. 22+00 TO STA. 24+00 –Y30RPA– RT
FROM STA. 23+00 TO STA. 25+00 –Y30RPC– RT
FROM STA. 24+50 TO STA. 25+50 –Y31– LT



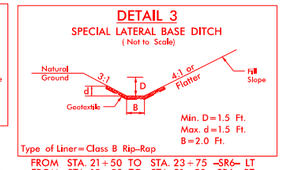
DETAIL 2
LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 726+00 TO STA. 728+70 –L1– LT
FROM STA. 17+60 TO STA. 20+15 –Y30RPC– RT



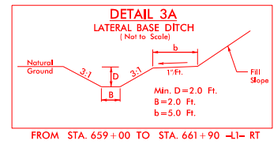
DETAIL 2A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 695+50 TO STA. 700+50 –L1– LT



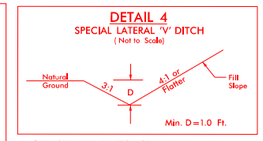
DETAIL 3
SPECIAL LATERAL BASE DITCH
(Not to Scale)

FROM STA. 21+50 TO STA. 23+75 –SR6– LT
FROM STA. 19+50 TO STA. 21+50 –SR6– RT



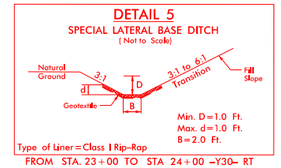
DETAIL 3A
LATERAL BASE DITCH
(Not to Scale)

FROM STA. 659+00 TO STA. 661+90 –L1– RT



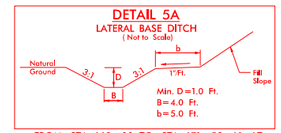
DETAIL 4
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 10+50 TO STA. 13+50 –SR4– RT
FROM STA. 10+30 TO STA. 12+50 –SR4– LT
FROM STA. 23+50 TO STA. 24+75 –SR4– RT
FROM STA. 23+50 TO STA. 24+75 –SR4– LT
FROM STA. 25+00 TO STA. 27+65 –SR4– RT
FROM STA. 25+00 TO STA. 27+65 –SR4– LT
FROM STA. 19+50 TO STA. 21+25 –SR5– LT
FROM STA. 17+80 TO STA. 19+75 –Y38– RT
FROM STA. 23+15 TO STA. 24+50 –Y38– RT
FROM STA. 23+18 TO STA. 25+00 –Y38– LT
FROM STA. 20+00 TO STA. 22+00 –Y31– LT
FROM STA. 10+50 TO STA. 11+40 –Y42– LT
FROM STA. 10+50 TO STA. 11+40 –Y42– RT



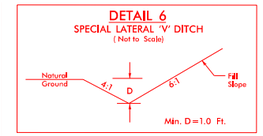
DETAIL 5
SPECIAL LATERAL BASE DITCH
(Not to Scale)

FROM STA. 23+00 TO STA. 24+00 –Y30– RT



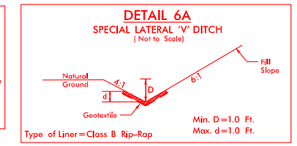
DETAIL 5A
LATERAL BASE DITCH
(Not to Scale)

FROM STA. 663+00 TO STA. 671+50 –L1– LT
FROM STA. 25+00 TO STA. 31+00 –SR7– LT
FROM STA. 13+10 TO STA. 15+00 –Y31RPA– RT



DETAIL 6
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 700+50 TO STA. 703+50 –L1– RT
FROM STA. 704+00 TO STA. 705+70 –L1– RT
FROM STA. 9+00 TO STA. 11+00 –Y31LPC– LT



DETAIL 6A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 24+00 TO STA. 25+00 –Y30– LT

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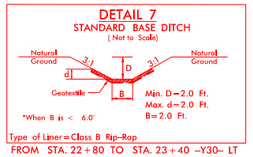
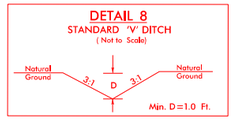
PERMIT DRAWING SHEET 18 OF 165

DATE: 04–01–2020



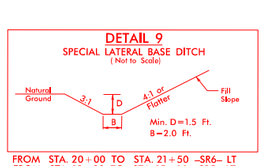
DETAIL 7
STANDARD BASE DITCH
(Not to Scale)

FROM STA. 22+80 TO STA. 23+40 –Y30– LT



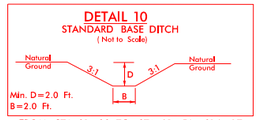
DETAIL 8
STANDARD 'V' DITCH
(Not to Scale)

STA. 27+65 –SR4– LT & RT



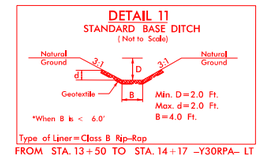
DETAIL 9
SPECIAL LATERAL BASE DITCH
(Not to Scale)

FROM STA. 20+00 TO STA. 21+50 –SR6– LT
FROM STA. 13+00 TO STA. 15+00 –SR5– LT
FROM STA. 16+00 TO STA. 19+00 –SR5– LT
FROM STA. 40+50 TO STA. 47+00 –Y31– LT
FROM STA. 17+00 TO STA. 19+50 –SR6– RT
FROM STA. 22+00 TO STA. 23+50 –SR6– RT



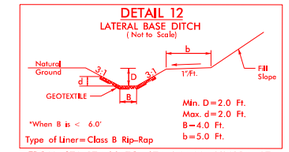
DETAIL 10
STANDARD BASE DITCH
(Not to Scale)

FROM STA. 21+03 TO STA. 21+50 –SR6– RT
FROM STA. 59+00 TO STA. 60+25 –Y30– RT
FROM STA. 11+40 TO STA. 13+00 –Y42– LT
FROM STA. 13+50 TO STA. 14+30 –Y42– LT
STA. 16+00 –SR7– RT
STA. 16+00 –SR5– RT
STA. 54+00 –Y30– LT
STA. 680+00 –L1– LT



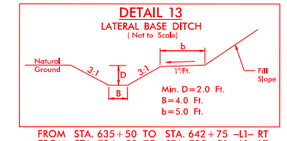
DETAIL 11
STANDARD BASE DITCH
(Not to Scale)

FROM STA. 13+50 TO STA. 14+17 –Y30RPA– LT



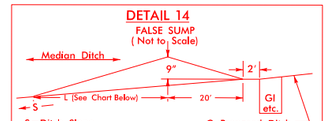
DETAIL 12
LATERAL BASE DITCH
(Not to Scale)

FROM STA. 17+00 TO STA. 24+00 –Y30RPA– LT



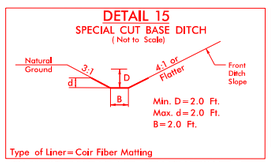
DETAIL 13
LATERAL BASE DITCH
(Not to Scale)

FROM STA. 635+50 TO STA. 642+75 –L1– RT
FROM STA. 724+00 TO STA. 725+50 –L1– LT
FROM STA. 12+79 TO STA. 18+50 –Y31RPB– LT
FROM STA. 12+00 TO STA. 13+50 –Y30RPA– LT
FROM STA. 601+40 TO STA. 604+00 –L1– RT



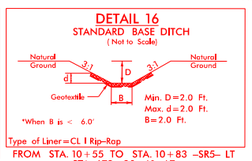
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

DETAIL 14
FALSE SUMP
(Not to Scale)



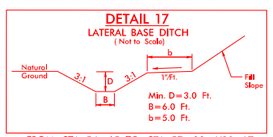
DETAIL 15
SPECIAL CUT BASE DITCH
(Not to Scale)

FROM STA. 24+00 TO STA. 28+50 –Y30– RT



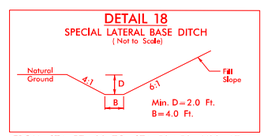
DETAIL 16
STANDARD BASE DITCH
(Not to Scale)

FROM STA. 10+55 TO STA. 10+83 –SR5– LT
STA. 672+20 –L1– LT



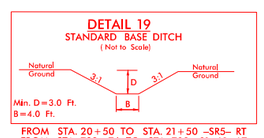
DETAIL 17
LATERAL BASE DITCH
(Not to Scale)

FROM STA. 54+65 TO STA. 57+00 –Y30– LT



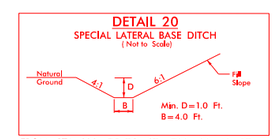
DETAIL 18
SPECIAL LATERAL BASE DITCH
(Not to Scale)

FROM STA. 57+00 TO STA. 59+50 –Y30– LT



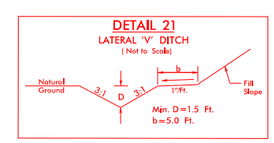
DETAIL 19
STANDARD BASE DITCH
(Not to Scale)

FROM STA. 20+50 TO STA. 21+50 –SR5– RT
FROM STA. 732+76 TO STA. 733+91 –L1– LT
STA. 28+75 –Y31– RT
FROM STA. 24+87 TO STA. 25+37 –Y30RPC– RT



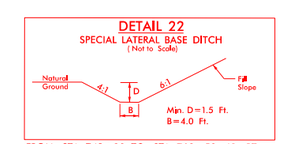
DETAIL 20
SPECIAL LATERAL BASE DITCH
(Not to Scale)

FROM STA. 693+75 TO STA. 700+00 –L1– RT



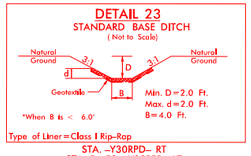
DETAIL 21
LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 726+00 TO STA. 728+70 –L1– LT
FROM STA. 10+50 TO STA. 16+50 –SR7– LT
FROM STA. 28+20 TO STA. 28+80 –Y31– LT
FROM STA. 733+00 TO STA. 735+50 –L1– LT



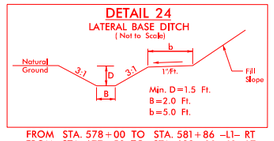
DETAIL 22
SPECIAL LATERAL BASE DITCH
(Not to Scale)

FROM STA. 748+00 TO STA. 760+50 –L1– RT



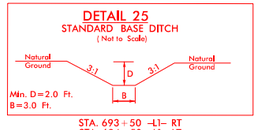
DETAIL 23
STANDARD BASE DITCH
(Not to Scale)

STA. –Y30RPD– RT
STA. 5+50 –Y30RPB– LT



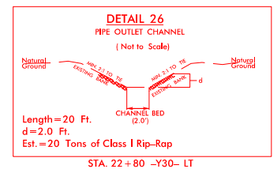
DETAIL 24
LATERAL BASE DITCH
(Not to Scale)

FROM STA. 578+00 TO STA. 581+86 –L1– RT
FROM STA. 677+50 TO STA. 683+00 –L1– LT
FROM STA. 28+50 TO STA. 33+00 –Y30– RT
FROM STA. 50+00 TO STA. 54+00 –Y30– RT
FROM STA. 11+00 TO STA. 12+40 –Y31LPC– LT
FROM STA. 07+00 TO STA. 14+00 –Y30RPA– RT



DETAIL 25
STANDARD BASE DITCH
(Not to Scale)

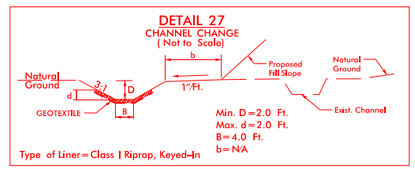
STA. 693+50 –L1– RT
STA. 694+50 –L1– LT



DETAIL 26
PIPE OUTLET CHANNEL
(Not to Scale)

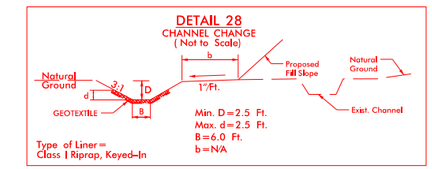
Length=20 Ft.
d=2.0 Ft.
Est.=20 Tons of Class I Rip-Rap

STA. 22+80 –Y30– LT



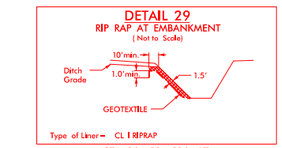
DETAIL 27
CHANNEL CHANGE
(Not to Scale)

STA. 649+20 –L1– LT



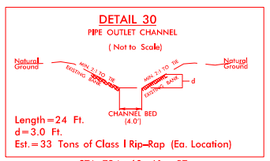
DETAIL 28
CHANNEL CHANGE
(Not to Scale)

642+45 –L1– LT



DETAIL 29
RIP RAP AT EMBANKMENT
(Not to Scale)

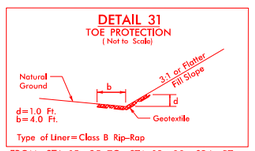
STA. 26+50 –SR6– LT
STA. 642+75 –L1– RT



DETAIL 30
PIPE OUTLET CHANNEL
(Not to Scale)

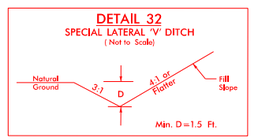
Length=24 Ft.
d=3.0 Ft.
Est.=33 Tons of Class I Rip-Rap (Ea. Location)

STA. 724+60 –L1– RT
STA. 17+75 –Y31RPC– RT



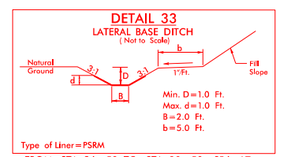
DETAIL 31
TOE PROTECTION
(Not to Scale)

FROM STA. 15+25 TO STA. 18+00 –SR4– RT
FROM STA. 11+00 TO STA. 12+50 –SR5– LT
FROM STA. 31+00 TO STA. 37+50 –SR6– RT
FROM STA. 31+00 TO STA. 39+00 –SR7– RT
FROM STA. 607+60 TO STA. 611+70 –L1– RT
FROM STA. 612+10 TO STA. 614+00 –L1– RT
FROM STA. 612+60 TO STA. 617+00 –L1– LT
FROM STA. 623+00 TO STA. 626+50 –L1– LT
FROM STA. 623+50 TO STA. 628+00 –L1– RT
FROM STA. 631+50 TO STA. 632+80 –L1– LT
FROM STA. 659+90 TO STA. 663+50 –L1– LT
FROM STA. 672+50 TO STA. 674+50 –L1– LT
FROM STA. 683+00 TO STA. 689+00 –L1– LT
FROM STA. 709+36 TO STA. 711+90 –L1– LT
FROM STA. 709+40 TO STA. 713+20 –L1– RT
FROM STA. 712+30 TO STA. 714+00 –L1– LT
FROM STA. 718+50 TO STA. 722+50 –L1– LT
FROM STA. 756+00 TO STA. 759+50 –L1– LT
FROM STA. 789+00 TO STA. 796+00 –L1– RT
FROM STA. 801+50 TO STA. 806+50 –L1– RT
FROM STA. 803+50 TO STA. 807+20 –L1– LT
FROM STA. 809+50 TO STA. 814+00 –L1– RT
FROM STA. 822+50 TO STA. 824+00 –L1– RT
FROM STA. 826+00 TO STA. 830+50 –L1– RT
FROM STA. 832+00 TO STA. 836+00 –L1– RT
FROM STA. 823+00 TO STA. 825+00 –L1– LT
FROM STA. 826+50 TO STA. 829+50 –L1– LT
FROM STA. 841+00 TO STA. 851+00 –L1– LT
FROM STA. 15+50 TO STA. 20+00 –SR8– RT
FROM STA. 20+20 TO STA. 23+00 –SR8– LT
FROM STA. 15+75 TO STA. 17+50 –Y30RPA– LT
FROM STA. 08+85 TO STA. 19+70 –Y30RPD– LT
FROM STA. 18+50 TO STA. 19+50 –Y31– LT
FROM STA. 30+75 TO STA. 34+00 –Y31– LT
FROM STA. 08+12 TO STA. 10+00 –Y31RPC– RT
FROM STA. 19+45 TO STA. 20+50 –Y30RPD– RT
FROM STA. 07+00 TO STA. 20+50 –Y32RPB1– RT
FROM STA. 23+50 TO STA. 24+82 –Y19– RT
FROM STA. 37+50 TO STA. 40+00 –Y32– LT



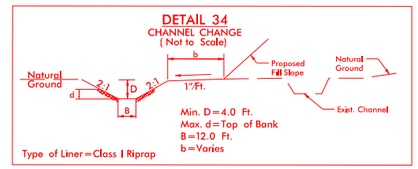
DETAIL 32
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 38+50 TO STA. 46+50 –Y31– RT
FROM STA. 11+50 TO STA. 14+50 –Y19– LT
FROM STA. 18+30 TO STA. 21+00 –Y30– RT



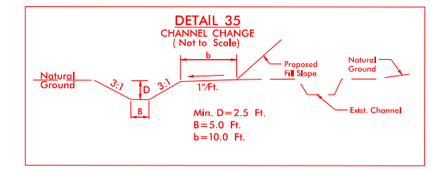
DETAIL 33
LATERAL BASE DITCH
(Not to Scale)

FROM STA. 26+50 TO STA. 28+50 –SR6– LT



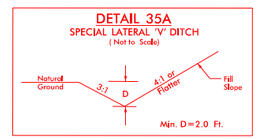
DETAIL 34
CHANNEL CHANGE
(Not to Scale)

FROM STA. 656+05 TO STA. 658+60 –L1– LT
FROM STA. 659+10 TO STA. 659+55 –L1– LT



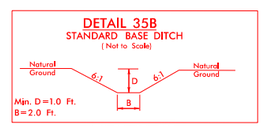
DETAIL 35
CHANNEL CHANGE
(Not to Scale)

FROM STA. 661+85 TO STA. 664+00 –L1– RT



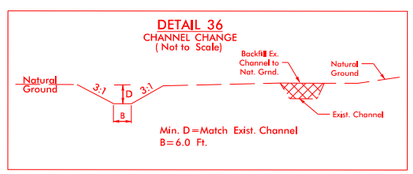
DETAIL 35A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 27+50 TO STA. 34+00 –Y19– LT



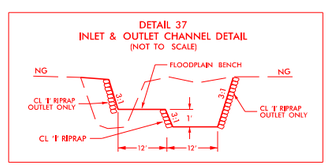
DETAIL 35B
STANDARD BASE DITCH
(Not to Scale)

STA. 32+63 –SR8–



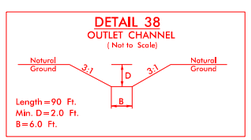
DETAIL 36
CHANNEL CHANGE
(Not to Scale)

FROM STA. 23+20 TO STA. 25+40 –Y38– LT



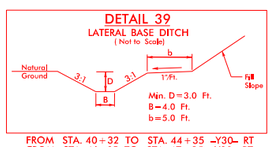
DETAIL 37
INLET & OUTLET CHANNEL DETAIL
(NOT TO SCALE)

STA. 712+00 –L1– LT
STA. 713+00 –L1– RT



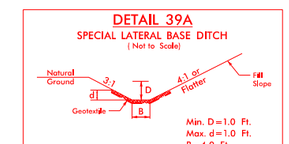
DETAIL 38
OUTLET CHANNEL
(Not to Scale)

STA. 612+50 –L1– LT



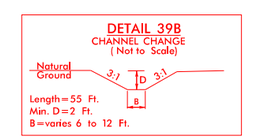
DETAIL 39
LATERAL BASE DITCH
(Not to Scale)

FROM STA. 40+32 TO STA. 44+35 –Y30– RT
FROM STA. 46+15 TO STA. 47+25 –Y30– RT
FROM STA. 17+00 TO STA. 18+00 –Y32RPB1– RT



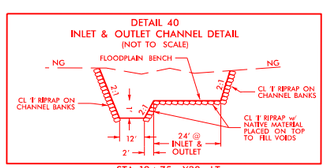
DETAIL 39A
SPECIAL LATERAL BASE DITCH
(Not to Scale)

FROM STA. 19+20 TO STA. 20+00 –Y31– LT



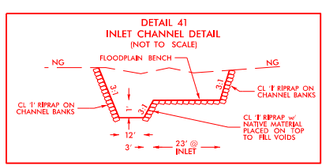
DETAIL 39B
CHANNEL CHANGE
(Not to Scale)

STA. 15+40 –Y30RPA– LT



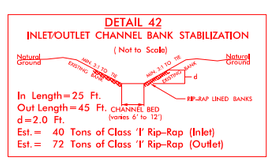
DETAIL 40
INLET & OUTLET CHANNEL DETAIL
(NOT TO SCALE)

STA. 19+75 –Y38– LT
STA. 19+85 –Y38– RT



DETAIL 41
INLET CHANNEL DETAIL
(NOT TO SCALE)

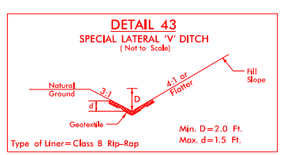
STA. 662+00 –L1– RT



DETAIL 42
INLET/OUTLET CHANNEL BANK STABILIZATION
(Not to Scale)

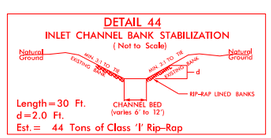
In Length=25 Ft.
Out Length=45 Ft.
d=2.0 Ft.
Est.= 40 Tons of Class 'I' Rip-Rap (Inlet)
Est.= 72 Tons of Class 'I' Rip-Rap (Outlet)

STA. 19+10 –Y30RPD– RT
STA. 19+85 –Y30RPD– LT



DETAIL 43
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 16+50 TO STA. 17+80 –Y38– RT



DETAIL 44
INLET CHANNEL BANK STABILIZATION
(Not to Scale)

Length=30 Ft.
d=2.0 Ft.
Est.= 44 Tons of Class 'I' Rip-Rap

STA. 611+85 –L1– RT

$$$$SYSTIME$$$$
$$$$USERNAME$$$$

5/14/99

Stantec	PROJECT REFERENCE NO.	SHEET NO.
Stantec Consulting Services Inc. 801 Jones Franklin Road Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672	R-3300B	2D-2
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SUNGATE DESIGN GROUP, P.A. 801 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27606 NC COA No. C-0890		

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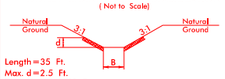
DETAIL 45
OUTLET CHANNEL BANK STABILIZATION
(Not to Scale)



Length = 35 Ft.
Max. d = 2.5 Ft.
B = varies 6 to 12 Ft.
Est. = 66 Tons of Class 'I' Rip-Rap

STA. 612 + 40 –L1– LT

DETAIL 46
OUTLET CHANNEL BANK STABILIZATION
(Not to Scale)

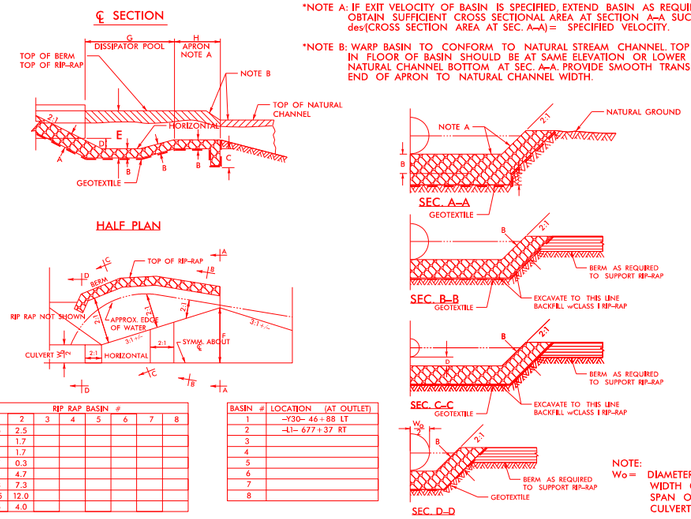
Length = 30 Ft.
d = 2.0 Ft.
Est. = 34 Tons of Class 'I' Rip-Rap

STA. 26 + 40 –SR6– LT

DETAIL 47
RIP-RAPPED ENERGY DISSIPATOR BASIN

*NOTE A: IF EXIT VELOCITY OF BASIN IS SPECIFIED, EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS SECTIONAL AREA AT SECTION A–A SUCH THAT Q des/(CROSS SECTION AREA AT SEC. A–A) = SPECIFIED VELOCITY.

*NOTE B: WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL. TOP OF RIP-RAP IN FLOOR OF BASIN SHOULD BE AT SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A–A. PROVIDE SMOOTH TRANSITION FROM END OF APRON TO NATURAL CHANNEL WIDTH.



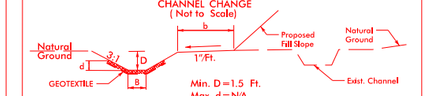
DIM.	RIP RAP BASIN # 1	2	3	4	5	6	7	8
A	2.5	2.5						
B	1.7	1.7						
C	1.7	1.7						
D	0.7	0.3						
E	6.1	4.7						
F	8.3	7.3						
G	13.5	12.0						
H	4.5	4.0						

*ALL DIMENSIONS APPROXIMATE IN FEET (FT)

BASIN #	LOCATION (AT OUTLET)
1	–Y30– 46 + 88 LT
2	–L1– 677 + 37 RT
3	
4	
5	
6	
7	
8	

5/05

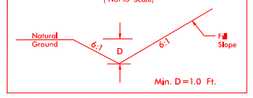
DETAIL 48
CHANNEL CHANGE
(Not to Scale)



Min. D = 1.5 Ft.
Max. d = N/A
B = 4.0 Ft.
b = 10 Ft.
Type of Liner = Vegetation

FROM STA. 787 + 50 TO STA. 788 + 50 –L1– RT

DETAIL 49
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D = 1.0 Ft.

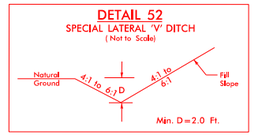
FROM STA. 231 + 00 TO STA. 232 + 00 –Y40– RT

DETAIL 50
SPECIAL LATERAL BASE DITCH
(Not to Scale)

Min. D = 2.0 Ft.
B = 2.0 Ft.

FROM STA. 235 + 00 TO STA. 237 + 20 –Y40– RT

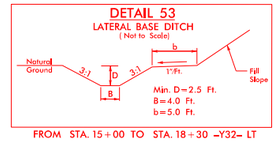
DETAIL 52
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D = 2.0 Ft.

FROM STA. 12 + 00 TO STA. 15 + 00 –Y32– LT

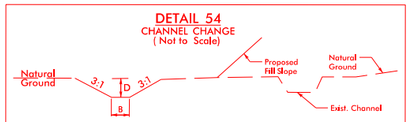
DETAIL 53
LATERAL BASE DITCH
(Not to Scale)



Min. D = 2.5 Ft.
B = 4.0 Ft.
b = 5.0 Ft.

FROM STA. 15 + 00 TO STA. 18 + 30 –Y32– LT

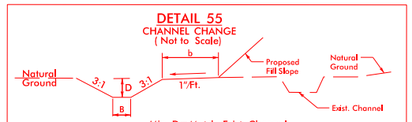
DETAIL 54
CHANNEL CHANGE
(Not to Scale)



Min. D = Match Existing Channel
B = 6.0 Ft.

FROM STA. 18 + 30 TO STA. 21 + 90 –Y32– LT

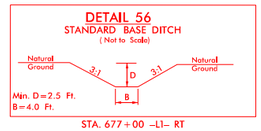
DETAIL 55
CHANNEL CHANGE
(Not to Scale)



Min. D = Match Exist. Channel
B = 6.0 Ft.
b = 10.0 Ft.

FROM STA. 26 + 00 TO STA. 31 + 65 –Y32– LT

DETAIL 56
STANDARD BASE DITCH
(Not to Scale)



Min. D = 2.5 Ft.
B = 4.0 Ft.

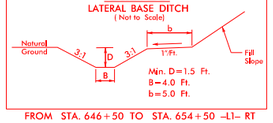
STA. 677 + 00 –L1– RT

DETAIL 57
STANDARD BASE DITCH
(Not to Scale)

Min. D = 2.0 Ft.
B = 4.0 Ft.

FROM STA. 21 + 00 TO STA. 21 + 75 –Y32RPB1– RT

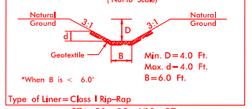
DETAIL 58
LATERAL BASE DITCH
(Not to Scale)



Min. D = 1.5 Ft.
B = 4.0 Ft.
b = 5.0 Ft.

FROM STA. 646 + 50 TO STA. 654 + 50 –L1– RT

DETAIL 59
STANDARD BASE DITCH
(Not to Scale)



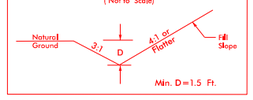
Min. D = 4.0 Ft.
Max. d = 4.0 Ft.
B = 6.0 Ft.

*When B is < 6.0'

Type of Liner = Class I Rip-Rap

STA. 50 + 35 –Y19– RT

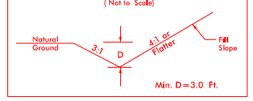
DETAIL 60
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D = 1.5 Ft.

FROM STA. 17 + 00 TO STA. 23 + 50 –Y19– LT

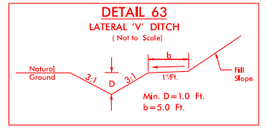
DETAIL 62
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D = 3.0 Ft.

FROM STA. 41 + 00 TO STA. 48 + 12 –Y32– LT

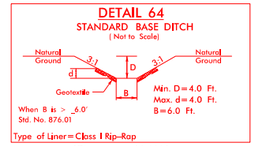
DETAIL 63
LATERAL 'V' DITCH
(Not to Scale)



Min. D = 1.0 Ft.
b = 5.0 Ft.

FROM STA. 655 + 00 TO STA. 656 + 00 –L1– RT

DETAIL 64
STANDARD BASE DITCH
(Not to Scale)



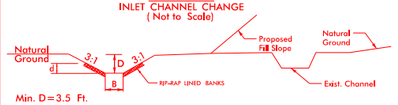
Min. D = 4.0 Ft.
Max. d = 4.0 Ft.
B = 6.0 Ft.

When B is > 6.0'
Std. No. 876.01

Type of Liner = Class I Rip-Rap

STA. 18 + 10 –Y32RPB1–

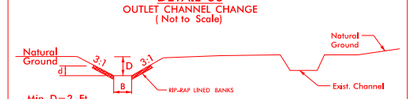
DETAIL 65
INLET CHANNEL CHANGE
(Not to Scale)



Min. D = 3.5 Ft.
Max. d = 3.5 Ft.
B = 8.0 Ft.
Est. = 202 Tons of Class 'I' Rip-Rap

STA. 18 + 40 –Y32– LT

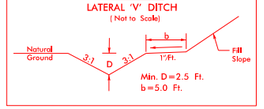
DETAIL 66
OUTLET CHANNEL CHANGE
(Not to Scale)



Min. D = 2 Ft.
Max. d = 2 Ft.
B = 8.0 Ft.
Est. = 105 Tons of Class 'I' Rip-Rap

STA. 25 + 00 –Y19– RT

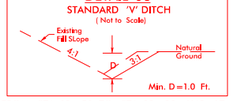
DETAIL 67
LATERAL 'V' DITCH
(Not to Scale)



Min. D = 2.5 Ft.
b = 5.0 Ft.

FROM STA. 52 + 15 TO STA. 56 + 40 –SR7– RT

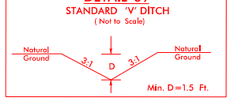
DETAIL 68
STANDARD 'V' DITCH
(Not to Scale)



Min. D = 1.0 Ft.

FROM STA. 12 + 50 TO STA. 13 + 00 –Y43– LT

DETAIL 69
STANDARD 'V' DITCH
(Not to Scale)



Min. D = 1.5 Ft.

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SHEET 19 OF 165

DATE: 04–01–2020

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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2D-3
R/W SHEET NO.	
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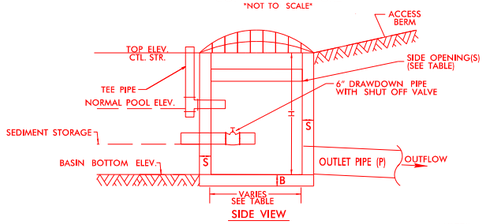
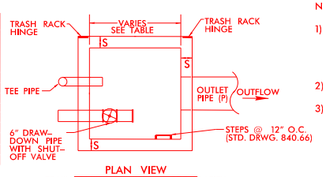
DATE: 04–01–2020

DETAIL P–1
WET DETENTION OUTLET CONTROL STRUCTURE
NOT TO SCALE



SIDE VIEW

SIDE OPENING DIMENSIONS				
STRUCTURE NUMBER	# OF SIDES w/ OPENING	INVERT ELEV. (FEET)	OPENING WIDTH (INCHES)	OPENING HEIGHT (INCHES)
2356	2	42.5'	60"	6"



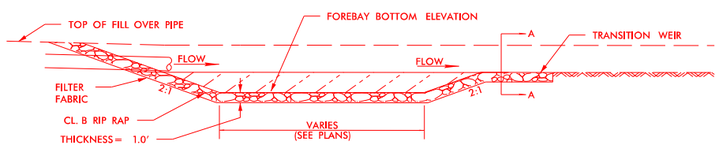
PLAN VIEW
TRASH RACK NOT SHOWN FOR CLARITY

NOTES

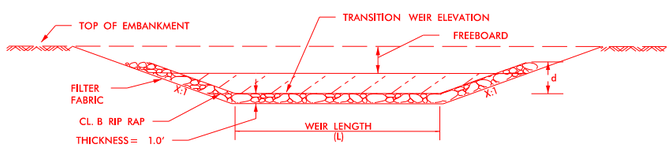
1) NO BEDDING MATERIAL TO BE USED. THERFORE, DO NOT FOLLOW STANDARD DRAWINGS FOR METHOD OF PIPE INSTALLATION FOR OUTLET PIPE THROUGH EMBANKMENT.
2) ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE.
3) SHUT OFF VALVE MAY BE A GATE VALVE, BALL VALVE, SHEAR GATE, ETC. SHUT OFF VALVE IS TO REMAIN CLOSED DURING NORMAL OPERATON.

MINIMUM DIMENSIONS FOR WET DETENTION BASIN DRAWDOWN STRUCTURE														
STATION	STRUCTURE NUMBER	SIDE WALLS (INCHES)	BASE B (INCHES)	CTL. STR. DIMENSIONS			TOP ELEVATION CONTROL STRUCTURE	BASIN BOTTOM ELEV.	TEE PIPE DIAMETER INCHES	TEE PIPE INV. ELEV. (NORMAL POOL)	DRAWDOWN PIPE INVERT	OUTLET PIPE INVERT	OUTLET PIPE DIAMETER(P) INCHES	OUTLET PIPE MATERIAL
				W	L	H								
L1_N 869+04 LT	2356	6"	18"	5.0'	5.0'	4.0'	43.5'	38.5'	3.0"	41.5'	39.5'	39.5'	42"	RCP–IV

DETAIL P–2
FOREBAY
(Not to Scale)



PROFILE VIEW



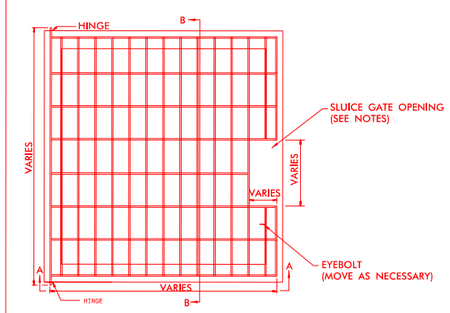
SECTION A–A
"TRANSITION BERM CROSS-SECTION"

MINIMUM DIMENSIONS FOR FOREBAY

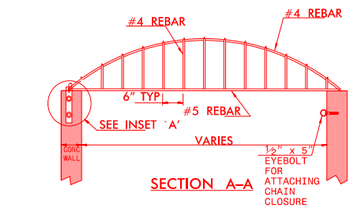
LOCATION	FOREBAY BOTTOM ELEV.	TRANSITION WEIR ELEV.	TRANSITION WEIR LENGTH (L)	WEIR SIDE SLOPES (X:1)	d
L1_N 866+50 LT	39.0'	42.0'	38'	3	1.0'
Y32 39+75 RT	39.0'	42.0'	56'	3	1.0'
?	?	?	?	?	?
?	?	?	?	?	?
?	?	?	?	?	?
?	?	?	?	?	?
?	?	?	?	?	?

DETAIL P–3
REBAR & ORIFICE TRASH RACKS
(N.T.S.)

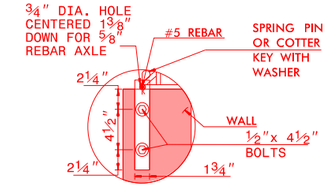
RISER TRASH RACK NOTES:
1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A "" BEAD.
2. IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3. EYEBOLT FOR CHAIN CLOSURE SHALL BE INSTALLED BY THE SAME METHOD AS THE HINGE PLATE BOLTS.
4. RACK AND HARDWARE SHALL BE ALUMINUM OR REBAR AND GALVANIZED IN ACCORDANCE WITH ASTM A–153.
5. PROVIDE OPENING IN TRASH RACK TO ACCOMODATE SLUICE GATE, IF APPLICABLE, ON THE OUTLET PIPE. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATES.



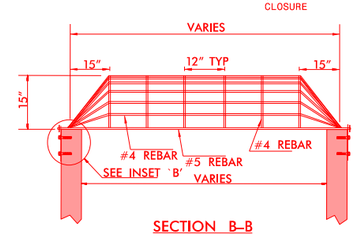
PLAN



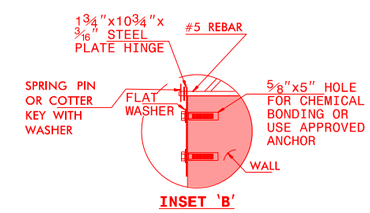
SECTION A–A



INSET 'A'

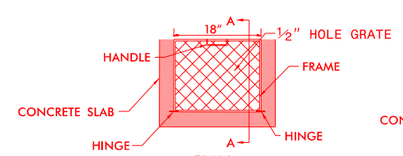


SECTION B–B

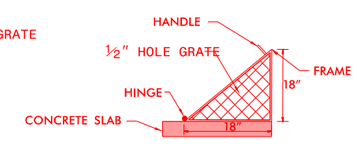


INSET 'B'

REBAR TRASH RACK
NOT TO SCALE



PLAN



SECTION A–A

ORIFICE TRASH RACK
NOT TO SCALE

ORIFICE TRASH RACK NOTES:
1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A "" BEAD.
2. IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3. REMOVEABLE ORIFICE TRASH RACK SHALL BE ATTACHED TO CONCRETE BOX BY HINGE OR SLIDE RAIL SYSTEM.
4. RACK AND HARDWARE SHALL BE ALUMINUM OR GALVANIZED IN ACCORDANCE WITH ASTM A–153.

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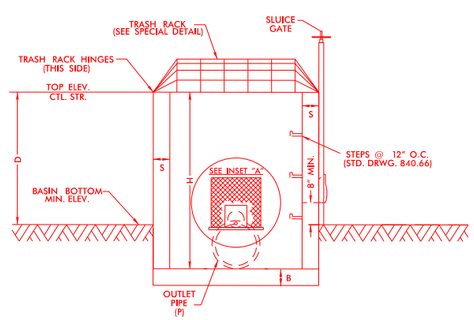
SHEET 21 OF 165

DATE: 04-01-2020

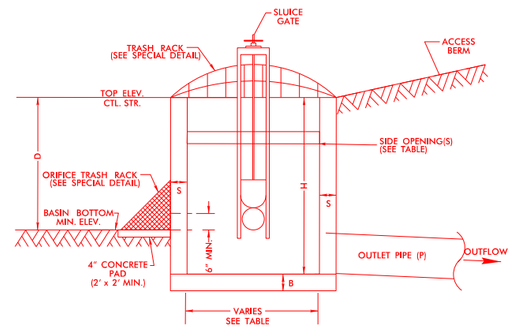
DETAIL P-4

DRY DETENTION DRAWDOWN STRUCTURE w/SLUICE GATE

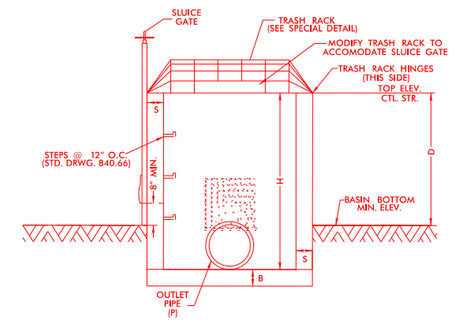
NOT TO SCALE



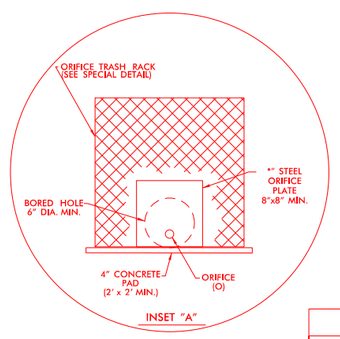
SIDE 1



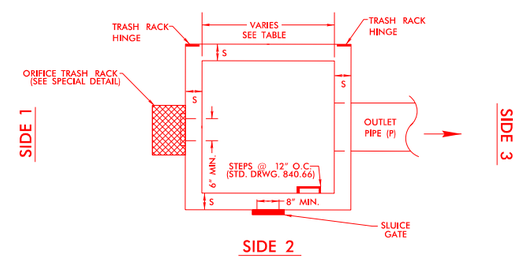
SIDE 2



SIDE 3



INSET "A"



SIDE 2

PLAN VIEW
TRASH RACK NOT SHOWN FOR CLARITY

NOTES:
1. 15" MINIMUM DIAMETER FOR OUTLET PIPE.
2. 2" MINIMUM DIAMETER ORIFICE. IF ORIFICE IS GREATER THAN 6", A STEEL PLATE IS NOT REQUIRED.
3. NO BEDDING MATERIAL TO BE USED. THEREFORE, DO NOT FOLLOW STANDARD DRAWINGS FOR METHOD OF PIPE INSTALLATION FOR OUTLET PIPE THROUGH EMBANKMENT.
4. 8" MIN. SLUICE GATE IS FOR MAINTENANCE AND SHOULD REMAIN CLOSED DURING NORMAL OPERATION. A GATE VALVE MAY BE USED IN LIEU OF THE 8" SLUICE GATE.
5. SLUICE GATE SHALL PROVIDE WATERTIGHT SEAL. PROVIDE ADEQUATE CLEARANCE FOR GATE OPERATION.
6. SELECT BOX STANDARD AS REQUIRED TO ACCOMMODATE SLUICE GATE AND ORIFICE TRASH RACK WIDTH.
7. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATE.
8. ADJUST FOOTER DIMENSIONS AS NEEDED FOR ANTI-FLOTATION.

SIDE OPENING DIMENSIONS

STRUCTURE NUMBER	# OF SIDES w/ OPENING	INVERT ELEV. (FEET)	OPENING WIDTH (INCHES)	OPENING HEIGHT (INCHES)
2333	1	43.5'	60"	6"

MINIMUM DIMENSIONS FOR DRY DETENTION/HAZARDOUS SPILL BASIN DRAWDOWN STRUCTURE

STATION	STRUCTURE NUMBER	S (INCHES) 6" MIN.	B (INCHES) 6" MIN.	BASIN BOTTOM MINIMUM ELEV.	TOP ELEVATION CONTROL STRUCTURE	MAX. STORAGE DEPTH(D) FEET	INV. ELEV. CTL. STR.	CTL. STR. DIMENSIONS (W x L x H)	ORIFICE DIAMETER (O) INCHES	ORIFICE INV. ELEV.	OUTLET PIPE DIAMETER(P) INCHES
-Y32- 29+23 RT	2333	6.0	18.0	43.0	45.0	2.0	40.0	5' x 5' x 5'	4.0	43.0	48"

WET DET. BASIN DETAILS

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	2D-5
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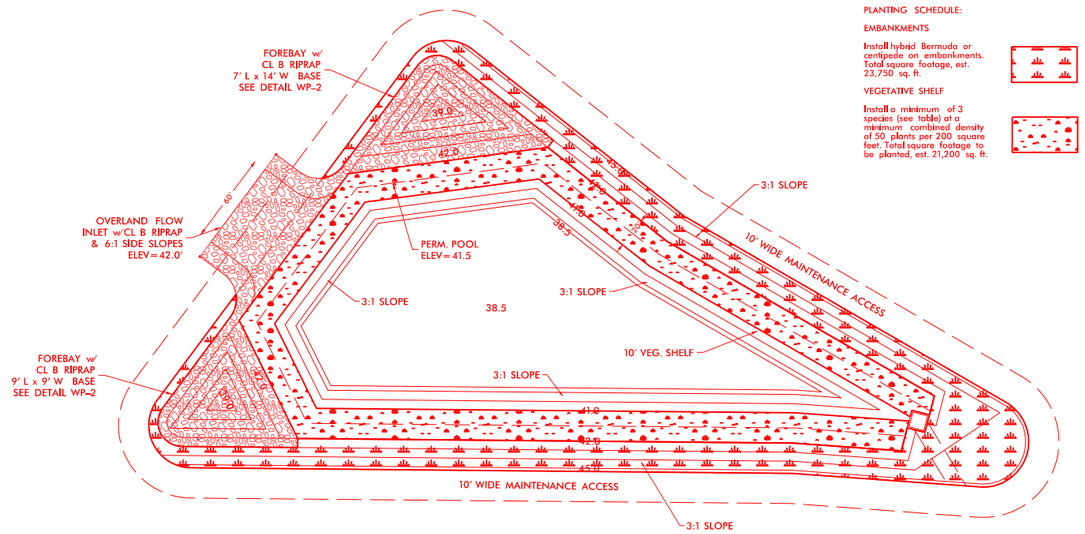
SHEET 22 OF 165

DATE: 04–01–2020

OPERATION AND MAINTENANCE PROVISIONS

BMP element:	Potential problems:	How to remediate the problem:
The entire BMP	Trash/debris is present.	Remove the trash/debris.
The perimeter of the wet pond	Areas of bare soil and/or erosive gullies have formed.	Regrade the soil if necessary to remove the gully, and then plant a ground cover and water until it is established. Provide lime and a one-time fertilizer application.
	Vegetation is too short or too long.	Maintain vegetation at a height of approximately six inches.
The inlet device: pipe or swale	The pipe is clogged.	Unclog the pipe. Dispose of the sediment off-site.
	The pipe is cracked or otherwise damaged.	Replace the pipe.
	Erosion is occurring in the swale.	Regrade the swale if necessary to smooth it over and provide erosion control devices such as reinforced turf matting or riprap to avoid future problems with erosion.
The forebay	Sediment has accumulated to a depth greater than the original design depth for sediment storage.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.
	Erosion has occurred.	Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems.
	Weeds are present.	Remove the weeds, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.
The vegetated shelf	Best professional practices show that pruning is needed to maintain optimal plant health.	Prune according to best professional practices
	Plants are dead, diseased or dying.	Determine the source of the problem: soils, hydrology, disease, etc. Remedy the problem and replace plants. Provide a one-time fertilizer application to establish the ground cover if a soil test indicates it is necessary.
	Weeds are present.	Remove the weeds, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.
The main treatment area	Sediment has accumulated to a depth greater than the original design sediment storage depth.	Search for the source of the sediment and remedy the problem if possible. Remove
		the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.
	Algal growth covers over 50% of the area.	Consult a professional to remove and control the algal growth.
	Cattails, phragmites or other invasive plants cover 50% of the basin surface.	Remove the plants by wiping them with pesticide (do not spray).
The embankment	Shrubs have started to grow on the embankment.	Remove shrubs immediately.
	Evidence of muskrat or beaver activity is present.	Use traps to remove muskrats and consult a professional to remove beavers.
	A tree has started to grow on the embankment.	Consult a dam safety specialist to remove the tree.
	An annual inspection by an appropriate professional shows that the embankment needs repair.	Make all needed repairs.
The outlet device / The receiving water	Clogging has occurred.	Clean out the outlet device. Dispose of the sediment off-site.
	The outlet device is damaged	Repair or replace the outlet device.
	Erosion or other signs of damage have occurred at the outlet.	Contact the local NC Division of Water Quality Regional Office, or the 401 Oversight Unit at 919-733-1786.
Floating wetland island (if applicable)	Weeds or volunteer trees are growing on the mat.	Remove the weeds or trees.
	The anchor cable is damaged, disconnected or missing.	Restore the anchor cable to its design state.

WET DET. BASIN –L1_NORTH– 868+00 LT – PLANTING PLAN



PLANTING SCHEDULE:

EMBANKMENTS

Install hybrid Bermuda or centipede on embankments. Total square footage, est. 23,750 sq. ft.

VEGETATIVE SHELF

Install a minimum of 3 species (see table) at a minimum combined density of 50 plants per 200 square feet. Total square footage to be planted, est. 21,200 sq. ft.

Landscape Plan:

1. Embankment slopes of the pond shall be vegetated with non–dumping turf grass, perennial grasses such as hybrid Bermuda or centipede are recommended; trees and woody shrubs shall not be allowed; and

2. The vegetated shelf shall be planted with a minimum of three diverse species of herbaceous, native vegetation at a minimum density of 50 plants per 200 square feet of shelf area. Species shall be selected from the table of Plants for Submerged and Partially Submerged Vegetative Shelves, shown below. Wetland seed mixes shall not be used.

3. Trees and woody shrubs shall not be planted on the embankment slopes and any volunteers should be removed as part of regular maintenance actives.

PLANTS FOR SUBMERGED AND PARTIALLY SUBMERGED VEGETATIVE SHELVES

Botanical Name	Common Name
Asclepias incarnata	Swamp Milkweed
Carex spp.	Sedges
Carex tenera	Quill sedge
Eupatoriadelphus dubius	Dwarf Joe Pye Weed
Eupatoriadelphus fistulosus	Joe Pye Weed
Eupatoriadelphus maculatus	Spotted trumpetweed
Hibiscus coccineus	Scarlet rose mallow
Hibiscus laevis	Halberdleaf rosemallow
Juncus effuses	Rush
Kosteletzkya virginica	Seashore Mallow
Lobelia cardinalis	Cardinal flower
Pontederia cordata	Pickerelweed
Rhynchospora spp.	Beakrush
Saccharum baldwinii	Narrow plumegrass
Sagittaria latifolia	Duck Potato
Saururus cernuus	Lizardtail
Scirpus cyperinus	Woolgrass
Scirpus spp.	Bulrush

Maintenance Plan:

1. Immediately after the wet pond is established, the plants on the vegetated shelf and perimeter of the basin should be watered twice weekly if needed, until the plants become established (commonly six weeks).

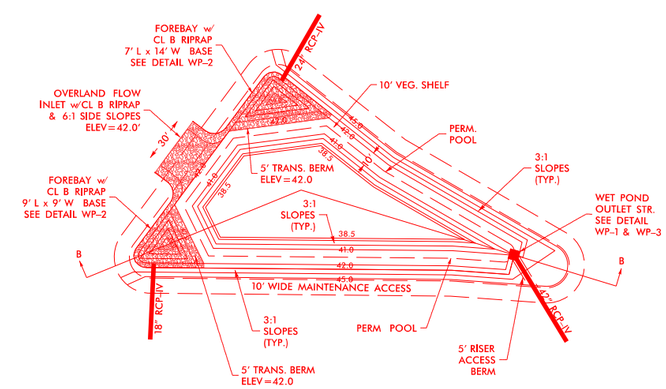
2. No portion of the wet pond should be fertilized after the first initial fertilization that is required to establish the plants on the vegetated shelf.

3. Stable groundcover should be maintained in the drainage area to reduce the sediment load to the wet pond.

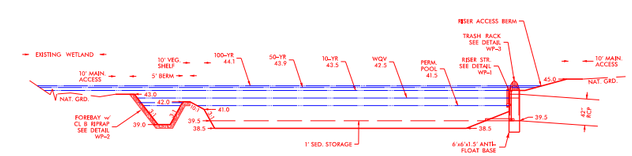
4. If the pond must be drained for an emergency or to perform maintenance, the flushing of sediment through the emergency drain should be minimized as much as possible.

WET DET. BASIN –L1_NORTH– 868+00 LT – PLAN & PROFILE

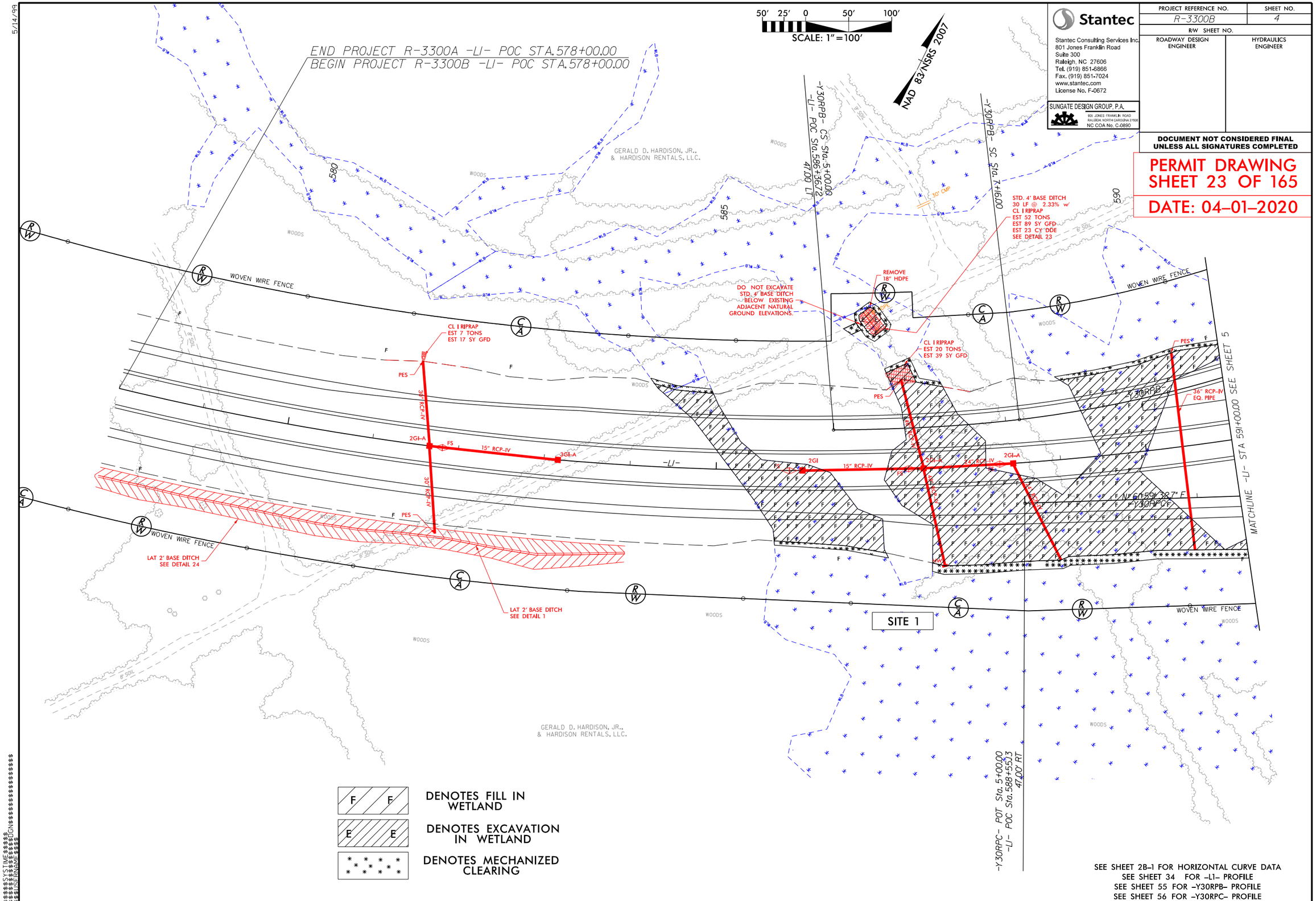
PLAN VIEW



SECTION B–B



5/14/99



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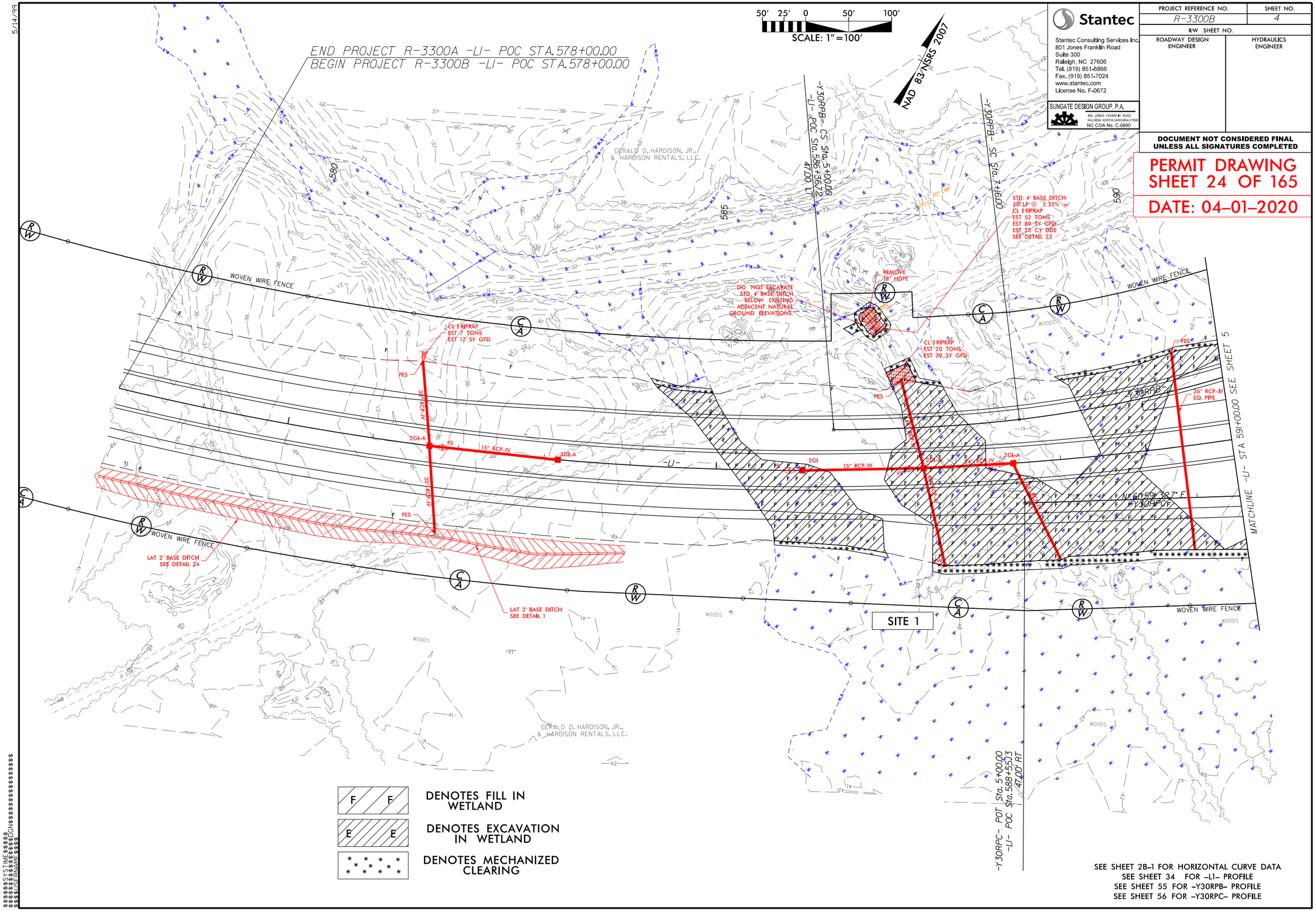
DATE: 04-01-2020

SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEET 34 FOR -L1- PROFILE
SEE SHEET 55 FOR -Y30RPB- PROFILE
SEE SHEET 56 FOR -Y30RPC- PROFILE

$$$$$$SYTIME$$$$$
$$$$$$SYSDATE$$$$$
$$$$$$USERNAME$$$$$

5/14/99



F F DENOTES FILL IN WETLAND

E E DENOTES EXCAVATION IN WETLAND

DENOTES MECHANIZED CLEARING

SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEET 34 FOR -L1- PROFILE
SEE SHEET 55 FOR -Y30RPB- PROFILE
SEE SHEET 56 FOR -Y30RPC- PROFILE

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801 JONES FRANKLIN ROAD
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NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 24 OF 165

DATE: 04-01-2020

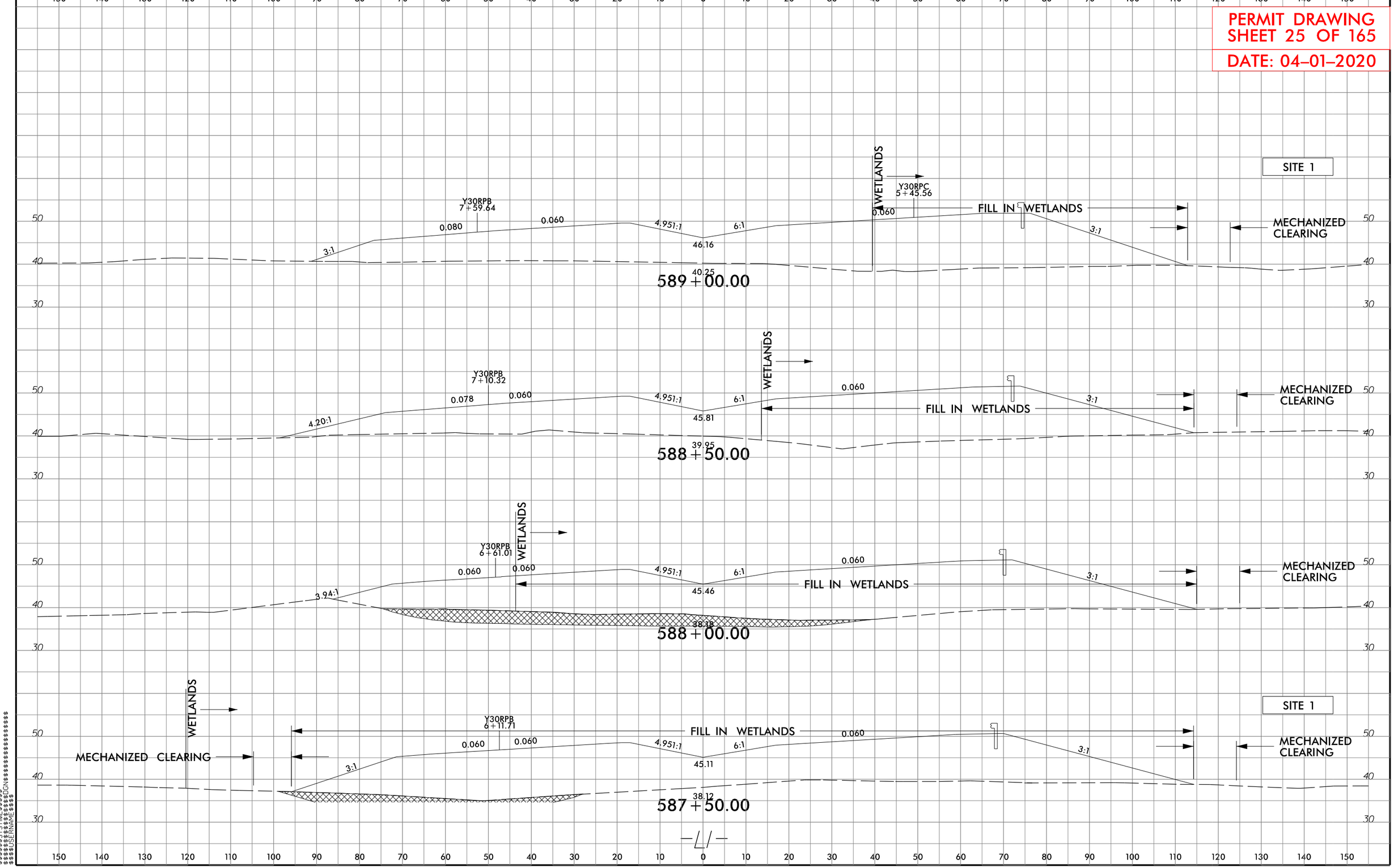
6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-5

0 5 10

PERMIT DRAWING
SHEET 25 OF 165

DATE: 04-01-2020



$$$$SYSTIME$$$$
$$$$SYSNME$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

6/23/16

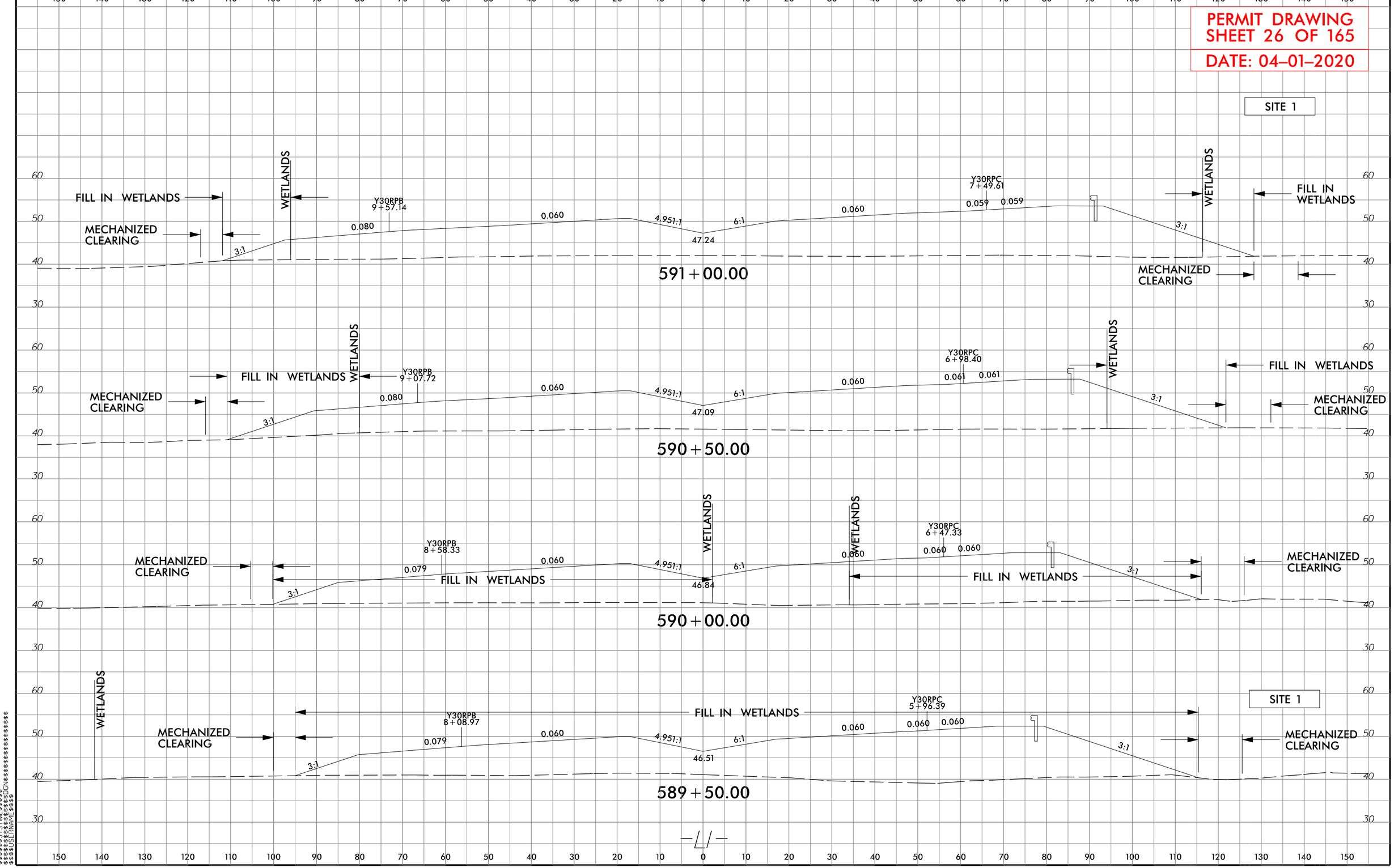
PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-6

0 5 10

PERMIT DRAWING
SHEET 26 OF 165

DATE: 04-01-2020

SITE 1



—L/—

$$$$SYSTIME$$$$
$$$$DGNFILENAME$$$$
$$$$USERNAME$$$$

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905 JONES FRANKLIN ROAD
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NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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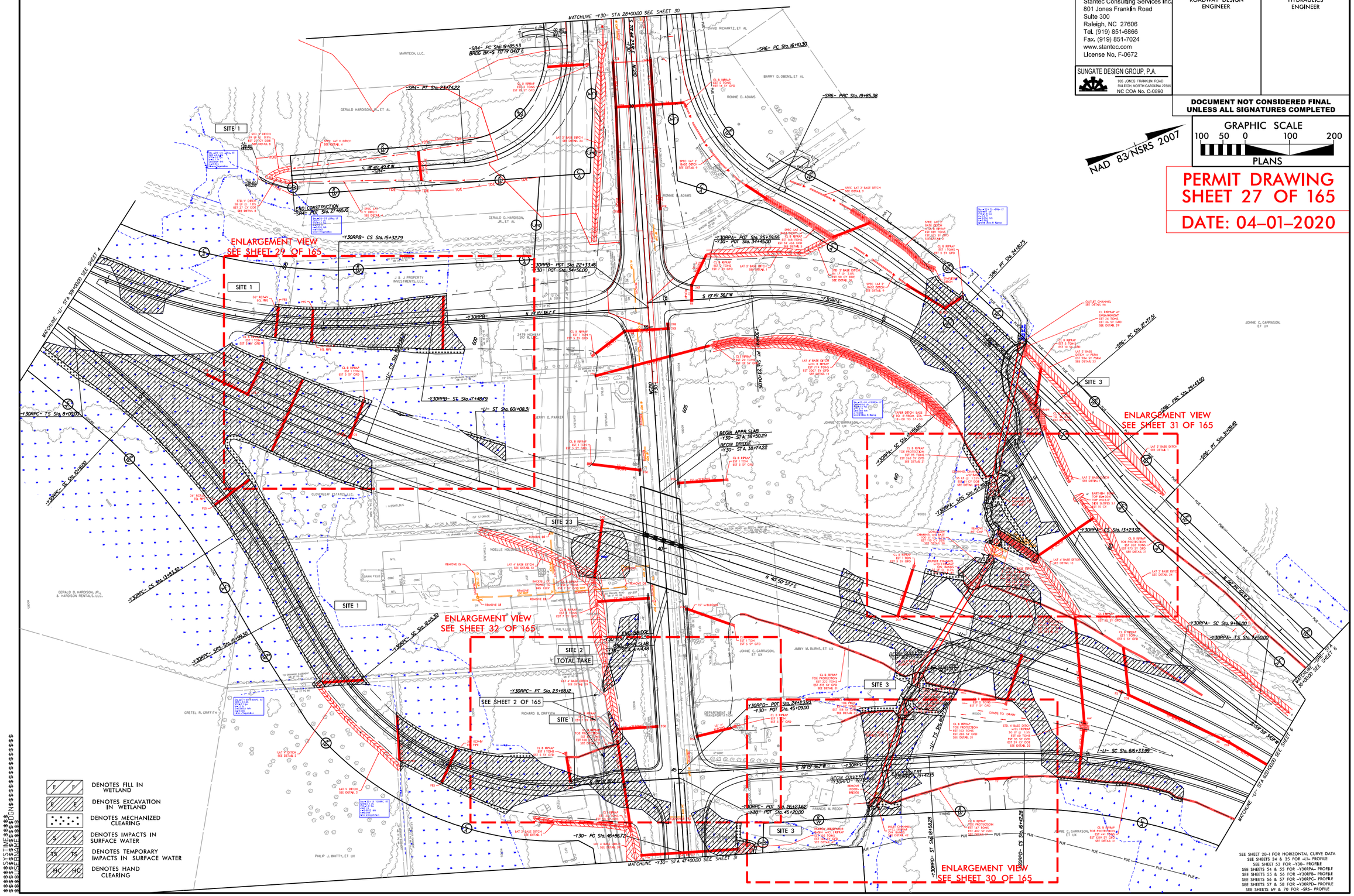
NAD 83/NSRS 2007

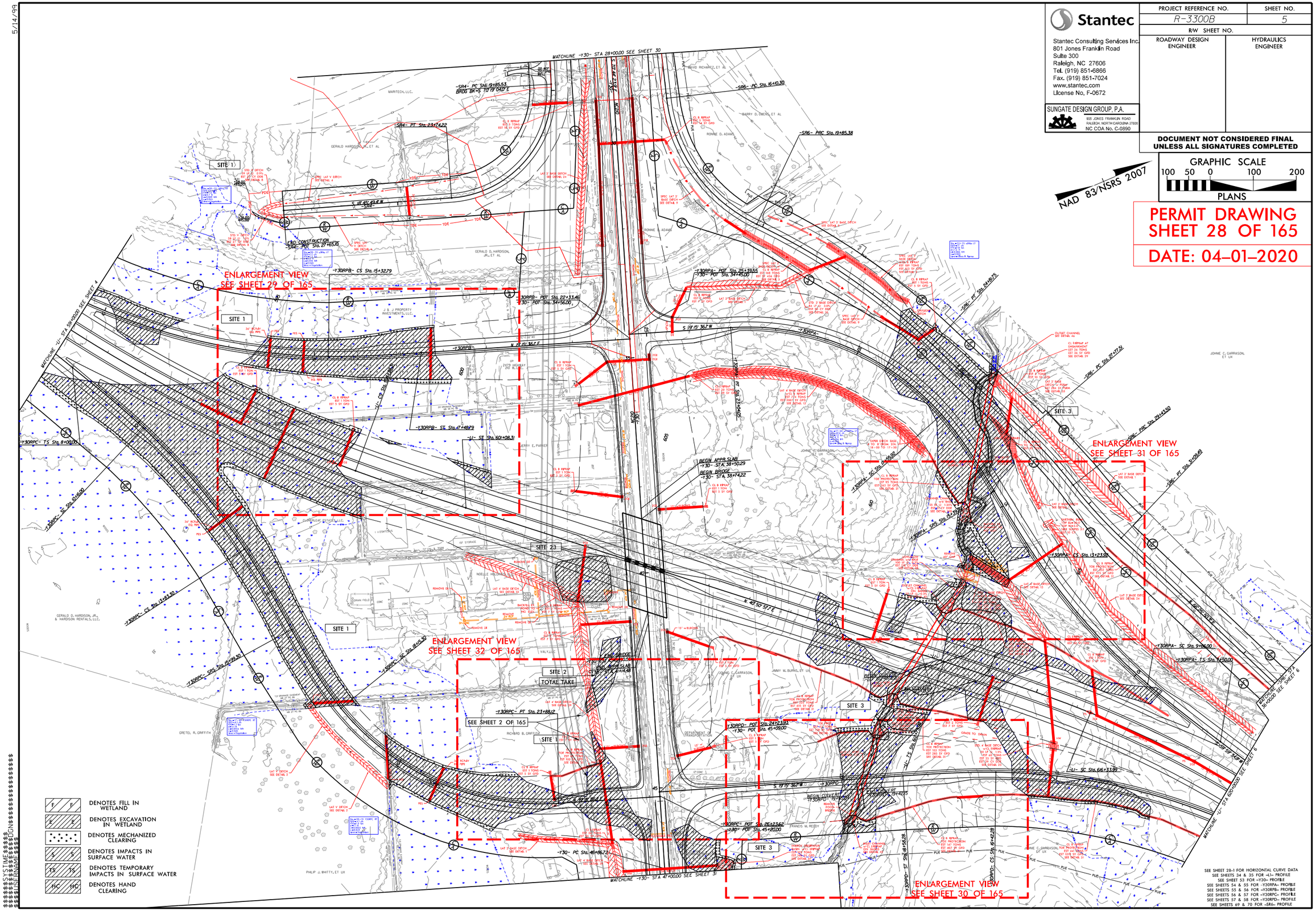
GRAPHIC SCALE
100 50 0 100 200
PLANS

PERMIT DRAWING SHEET 27 OF 165

DATE: 04-01-2020



5/14/99



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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NAD 83/NSRS 2007

GRAPHIC SCALE
100 50 0 100 200
PLANS

PERMIT DRAWING SHEET 28 OF 165

DATE: 04–01–2020

8/17/99

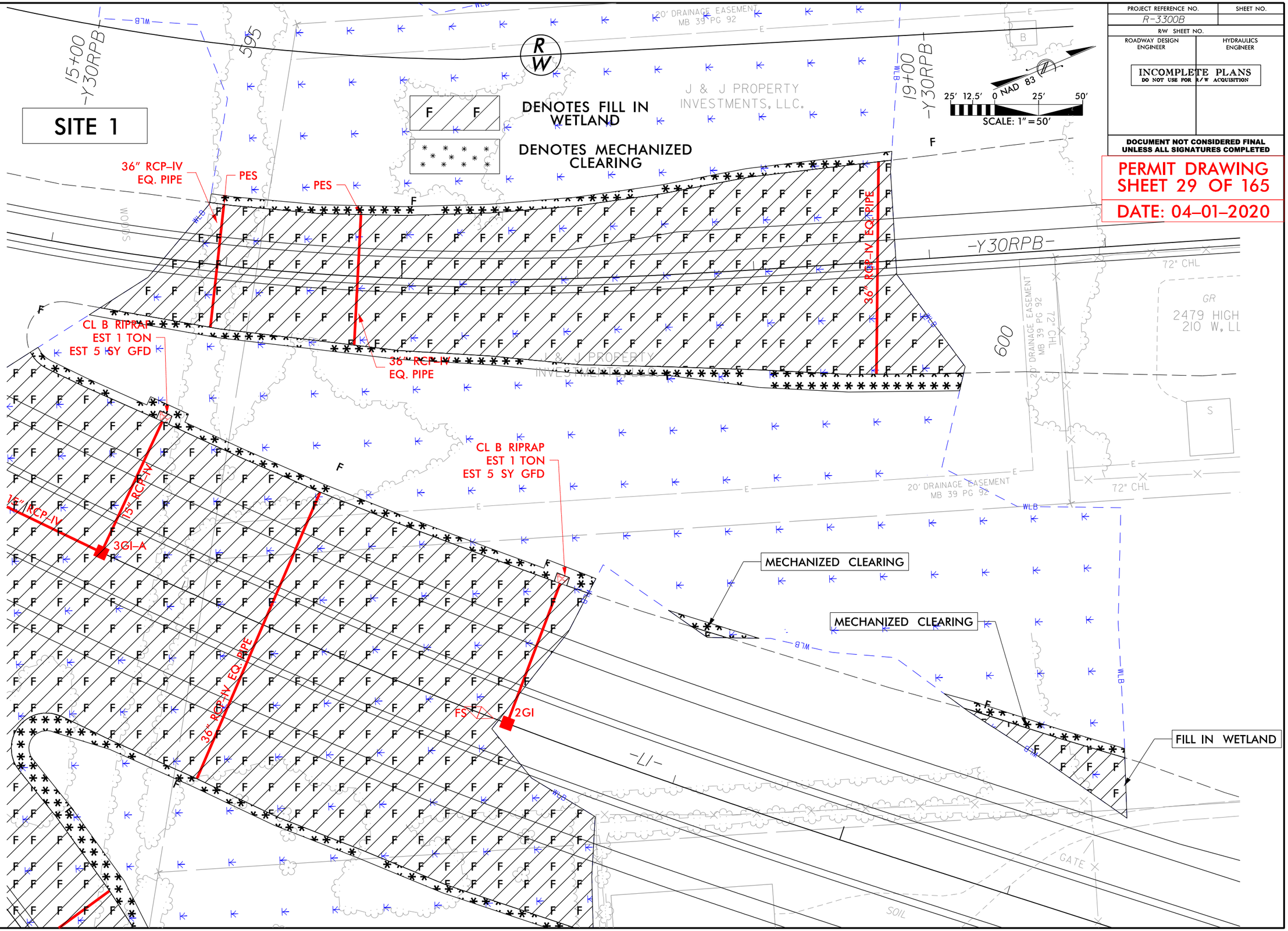
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 29 OF 165

DATE: 04-01-2020



8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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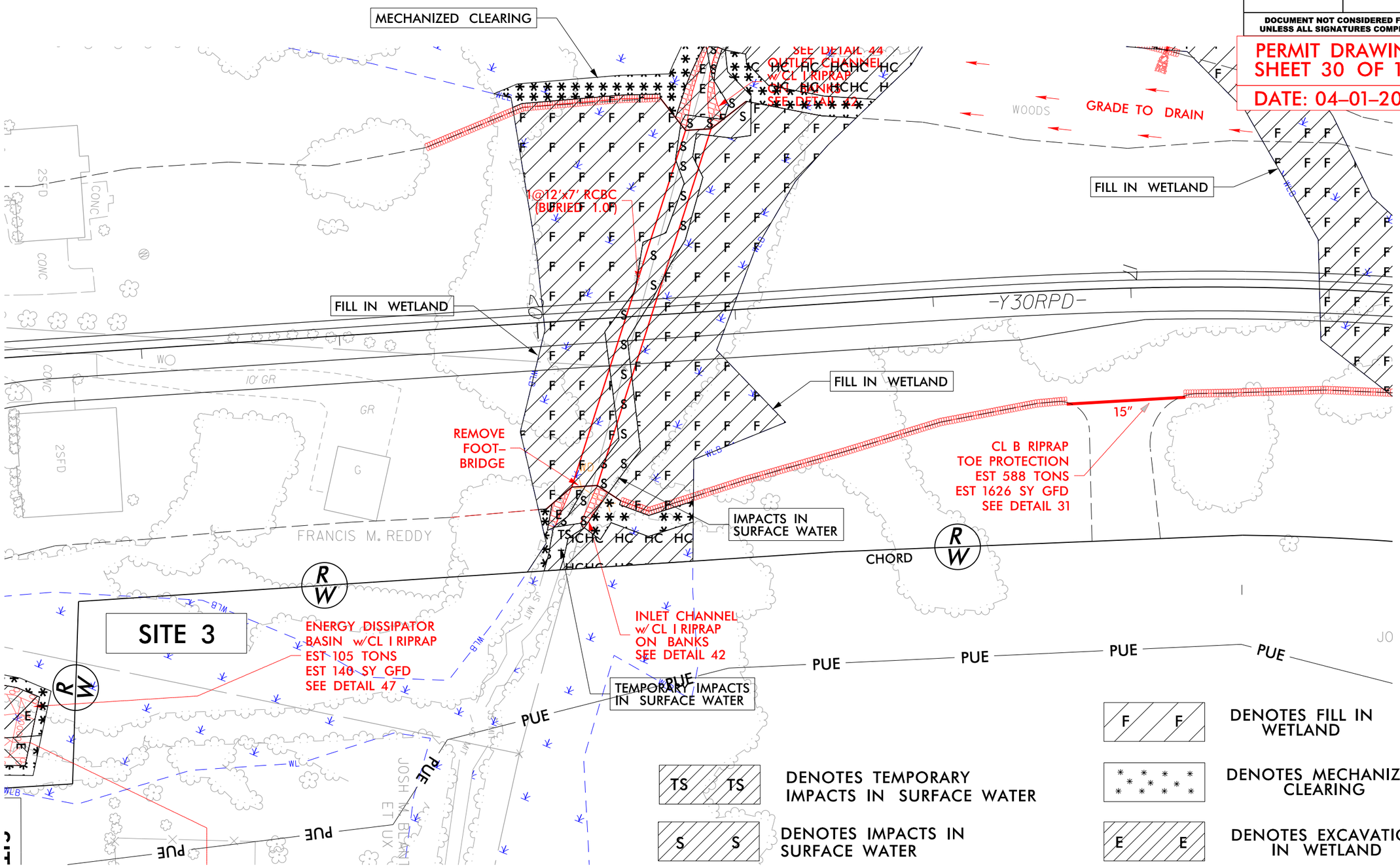
PERMIT DRAWING
SHEET 30 OF 165

DATE: 04-01-2020

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83



8/17/99

F F — DENOTES FILL IN WETLAND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

S S — DENOTES IMPACTS IN SURFACE WATER

E E — DENOTES EXCAVATION IN WETLAND

HC HC — DENOTES HAND CLEARING

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

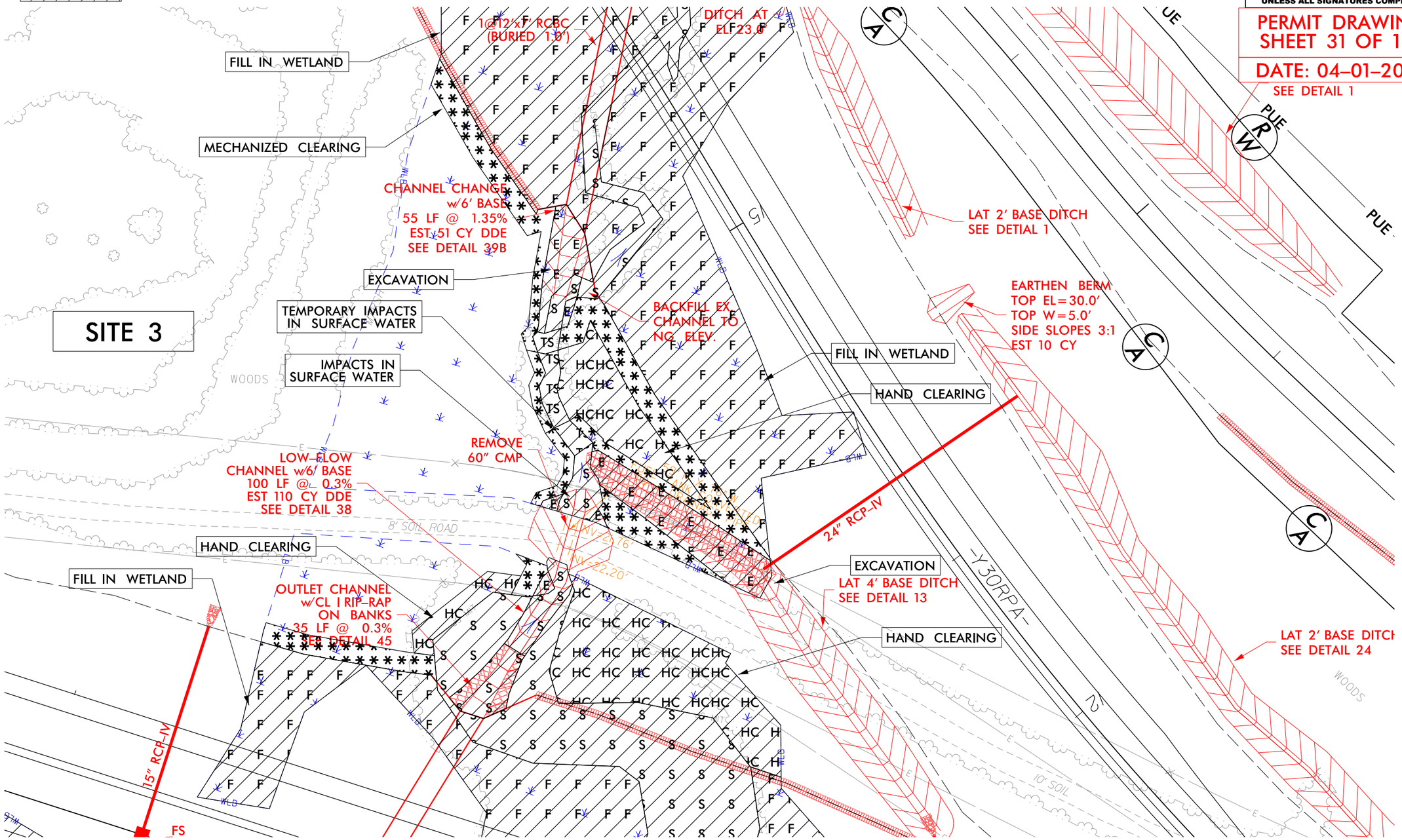
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 31 OF 165

DATE: 04-01-2020



8/17/99

F F — DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

E E — DENOTES EXCAVATION IN WETLAND

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

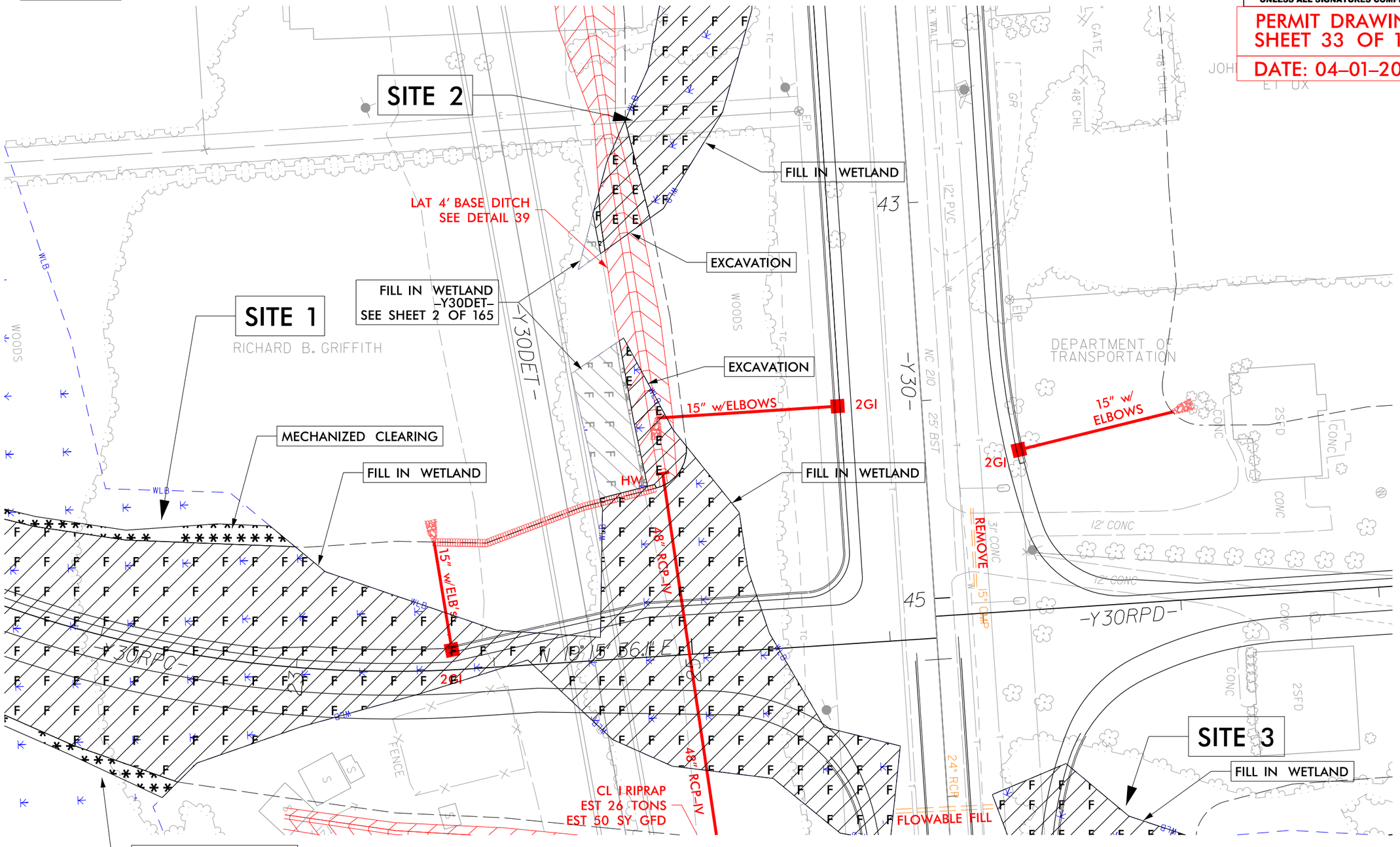
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 33 OF 165

DATE: 04-01-2020

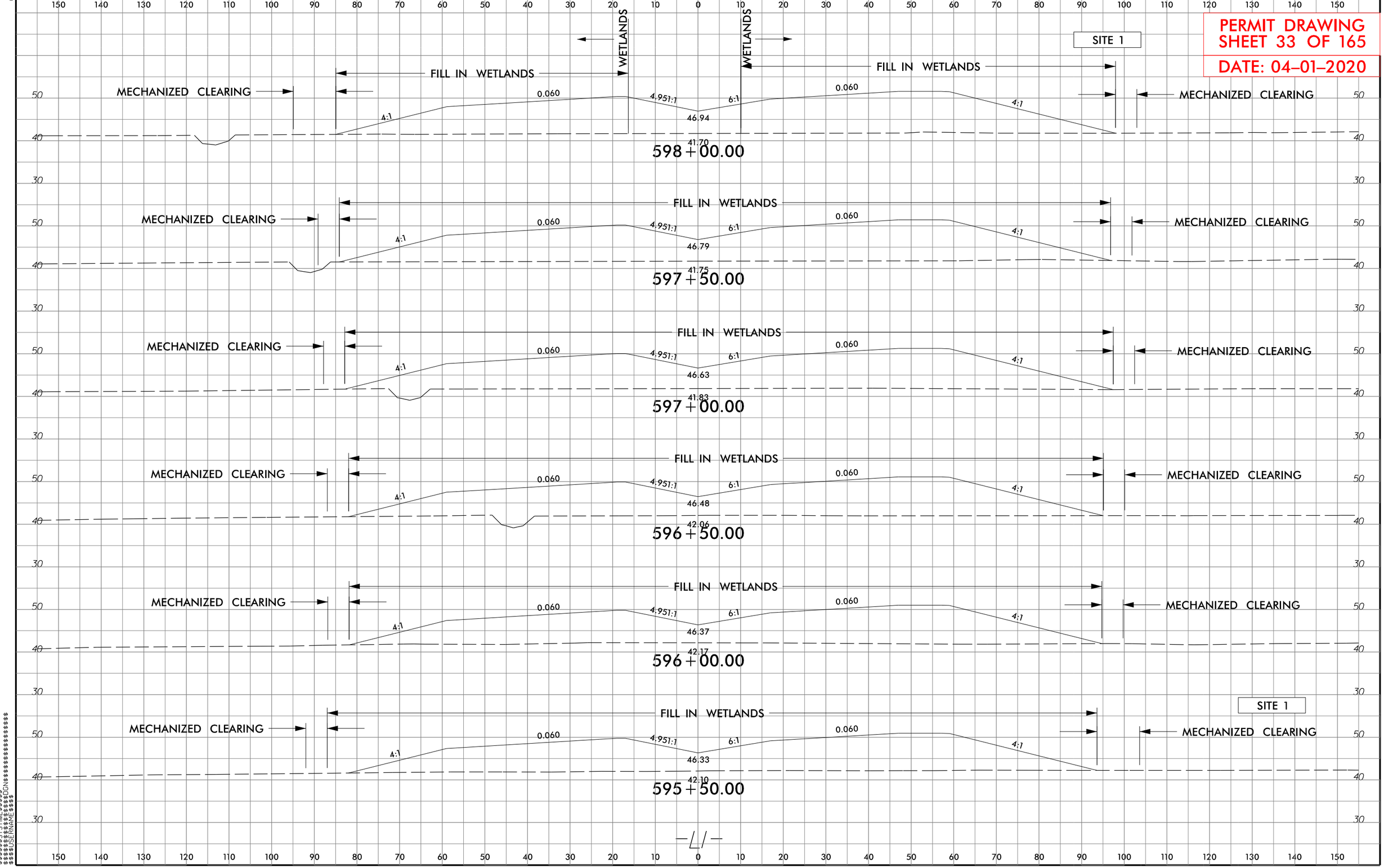


6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-11

0 5 10

PERMIT DRAWING
SHEET 33 OF 165
DATE: 04-01-2020



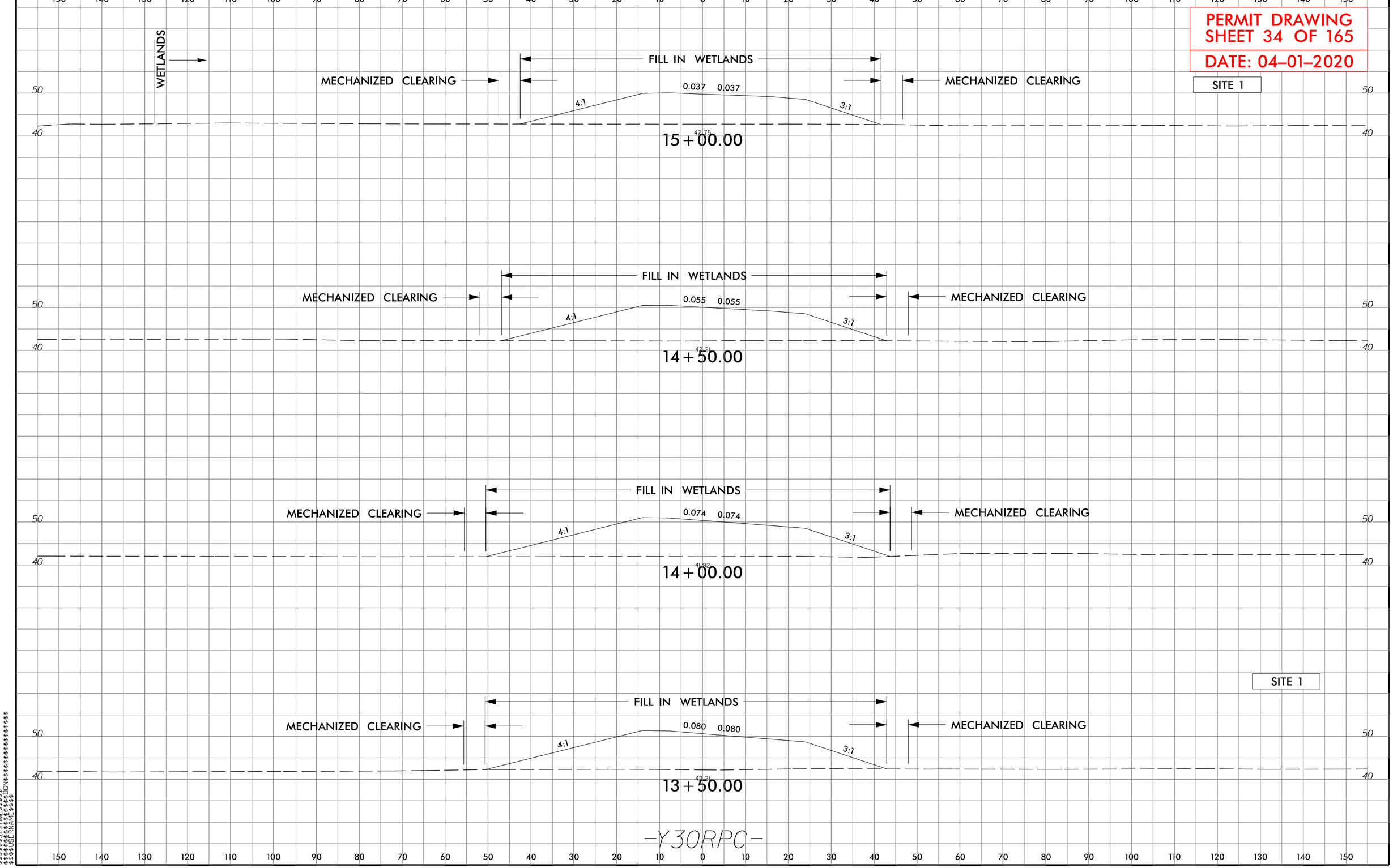
$$$$SYSTIME$$$$
$$$$SAVEDON$$$$
$$$$USERNAME$$$$

PROJ. REFERENCE NO. R-3300B

SHEET NO. X-234

PERMIT DRAWING
SHEET 34 OF 165

DATE: 04-01-2020



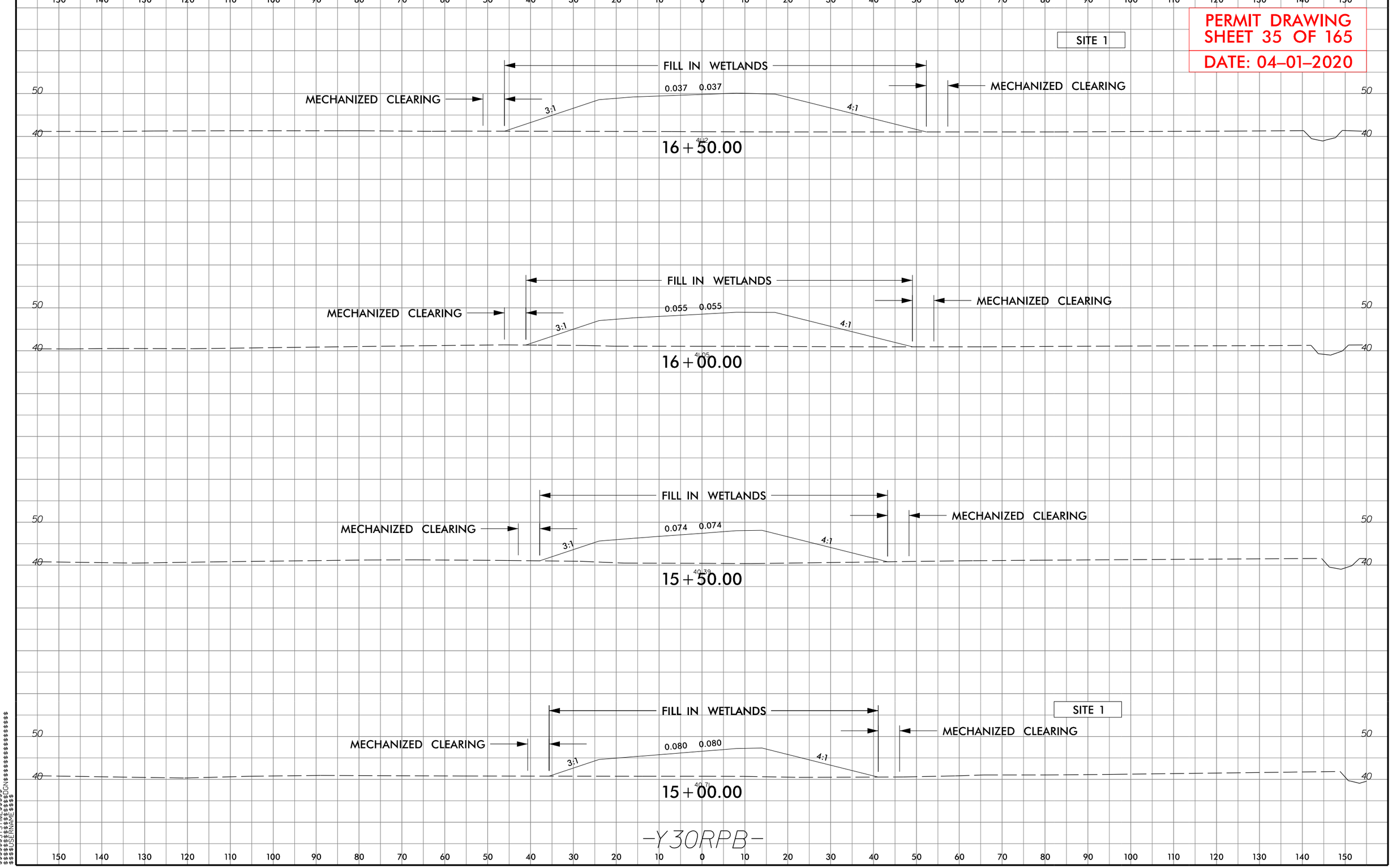
6/23/16

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$USERNAME$$$$

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-228

PERMIT DRAWING
SHEET 35 OF 165

DATE: 04-01-2020



6/23/16

$$$$$$SYSTIME$$$$
$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

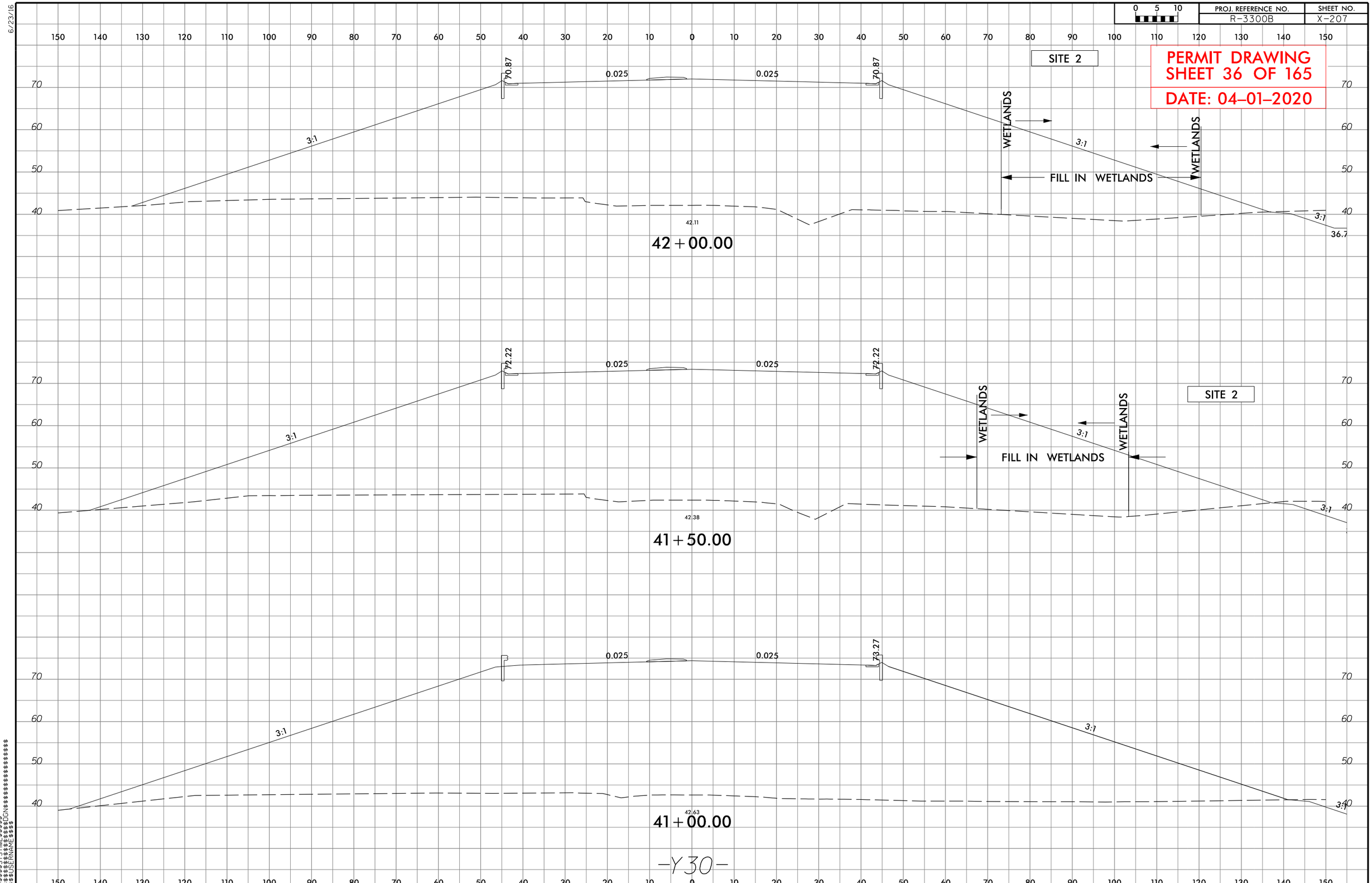
6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-207

0 5 10

PERMIT DRAWING
SHEET 36 OF 165

DATE: 04-01-2020



-Y30-

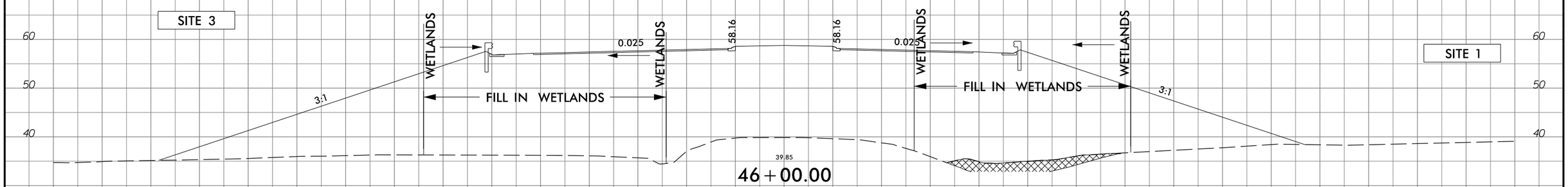
$$$$$$$$SYSTIME$$$$
$$$$$$$$SAVEDON$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

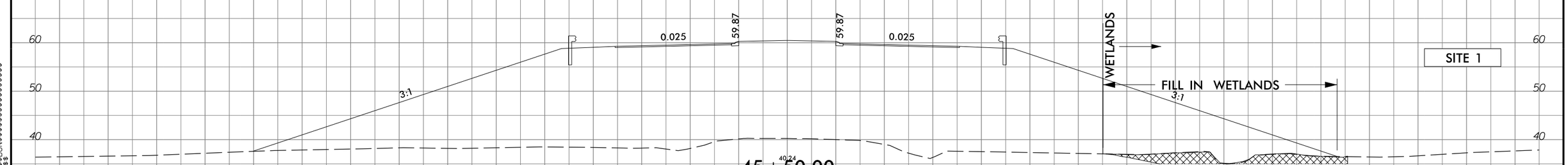
6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3300B	X-210

PERMIT DRAWING
SHEET 37 OF 165

DATE: 04-01-2020





-Y30-

$$$$SYSTIME$$$$
$$$$SSMEN$$$$
$$$$USERNAME$$$$

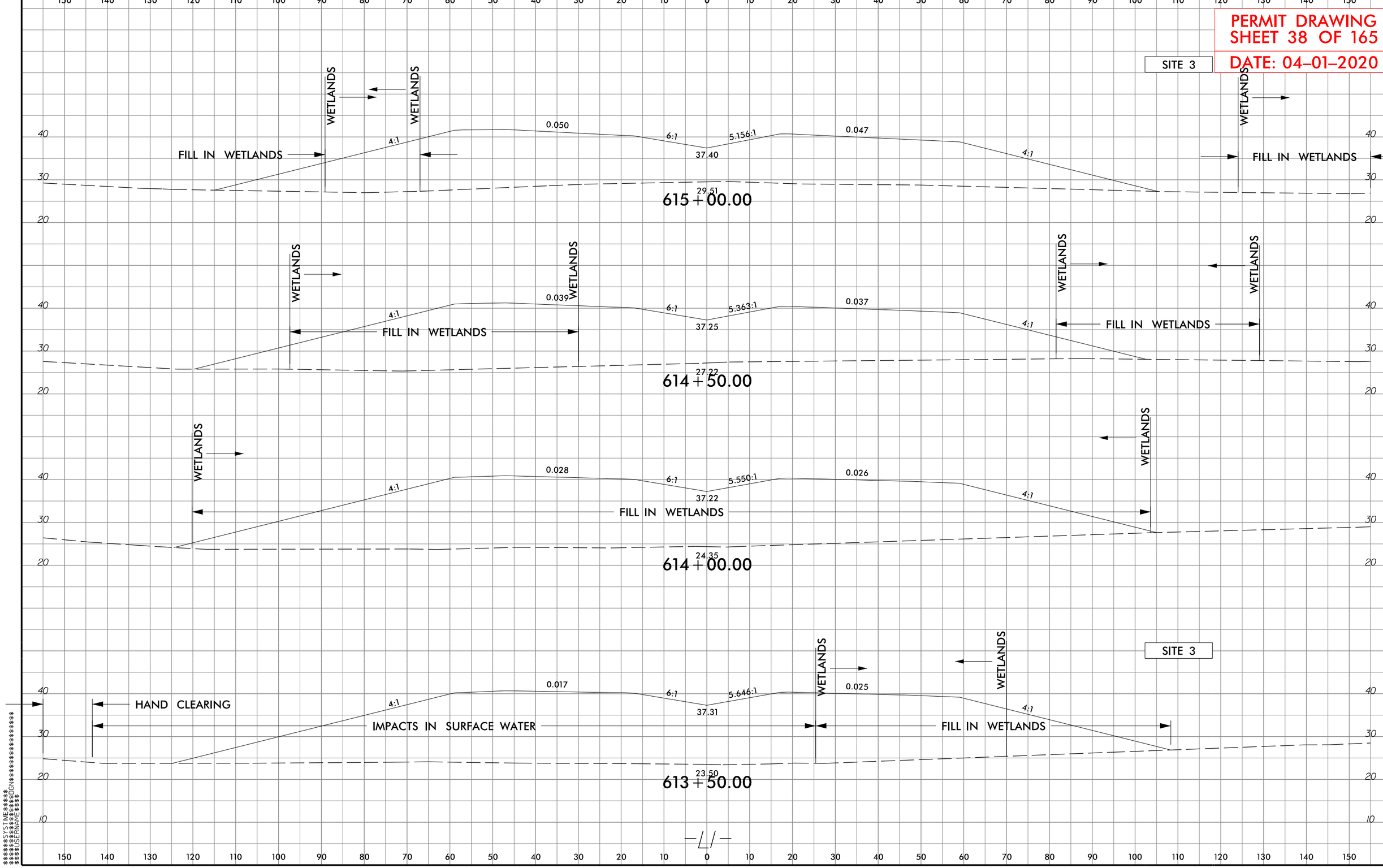
6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-18

PERMIT DRAWING
SHEET 38 OF 165

DATE: 04-01-2020

SITE 3



$$$$SYSTIME$$$$
$$$$SYSNAME$$$$
$$$$DGNS$$$$
$$$$USERNAME$$$$

6/23/16

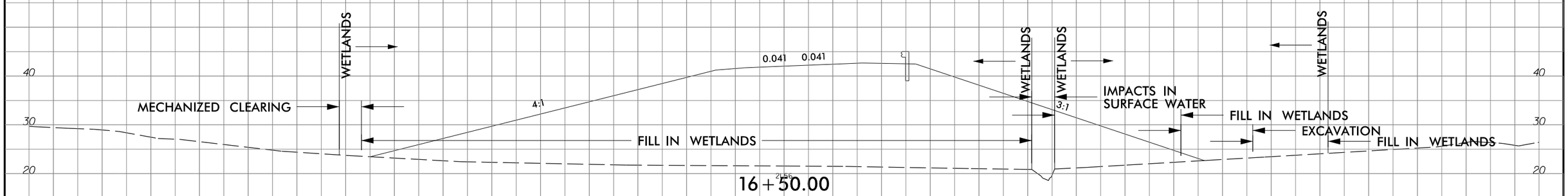
PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-220

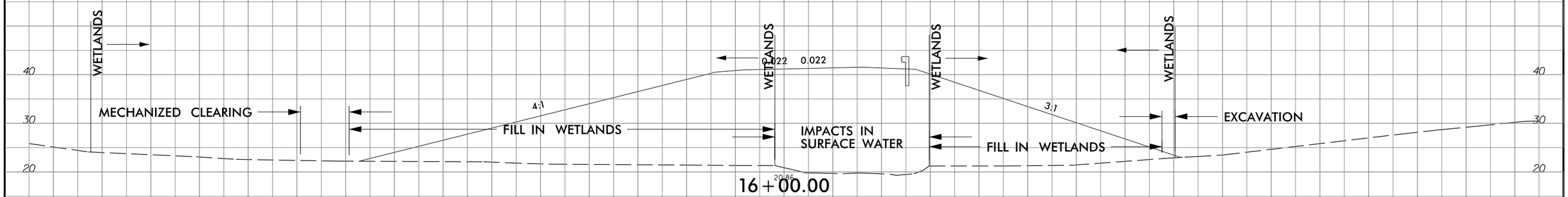
0 5 10

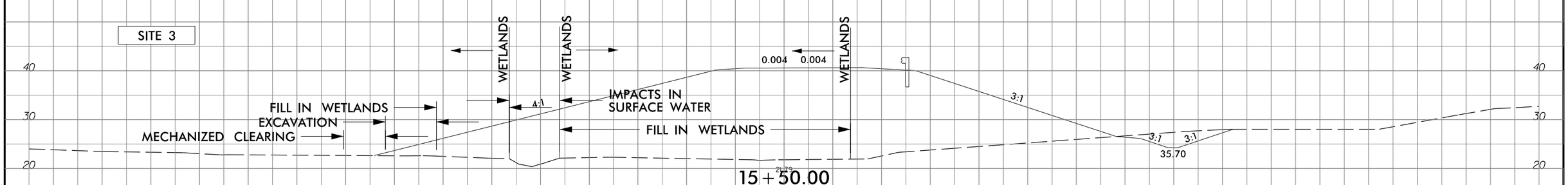
PERMIT DRAWING
SHEET 39 OF 165

DATE: 04-01-2020

SITE 3







-Y30RPA-

$$$$$$$$SYSTIME$$$$
$$$$$$$$SYSNAME$$$$
$$$$$$$$DGNS$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

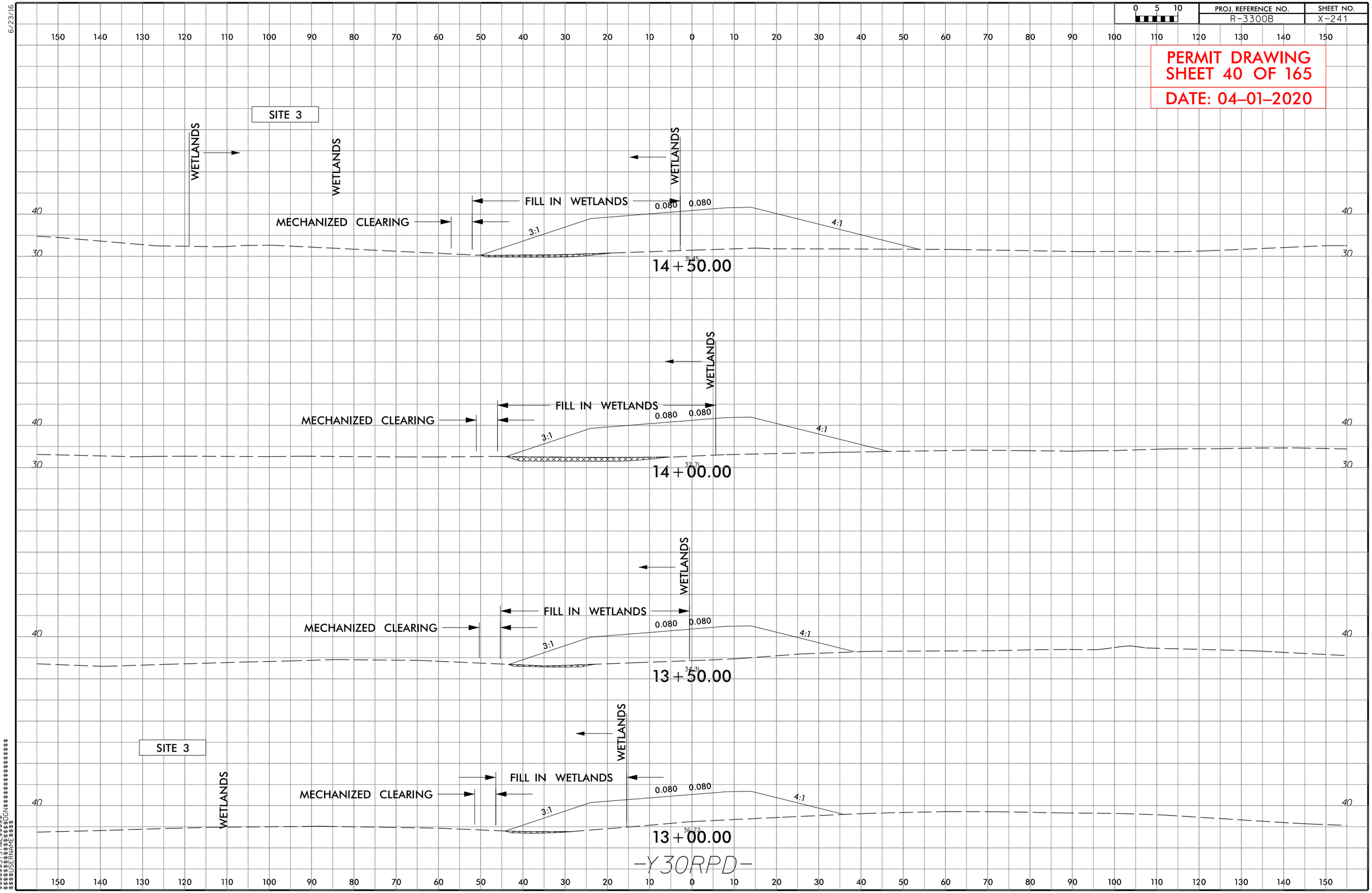
6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-241

0 5 10

PERMIT DRAWING
SHEET 40 OF 165

DATE: 04-01-2020



-Y30RPD-

$$$$USERNAME$$$$ $$$$SYSTIME$$$$ $$$$DGN$$$$$$$$$$$$$$$$$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

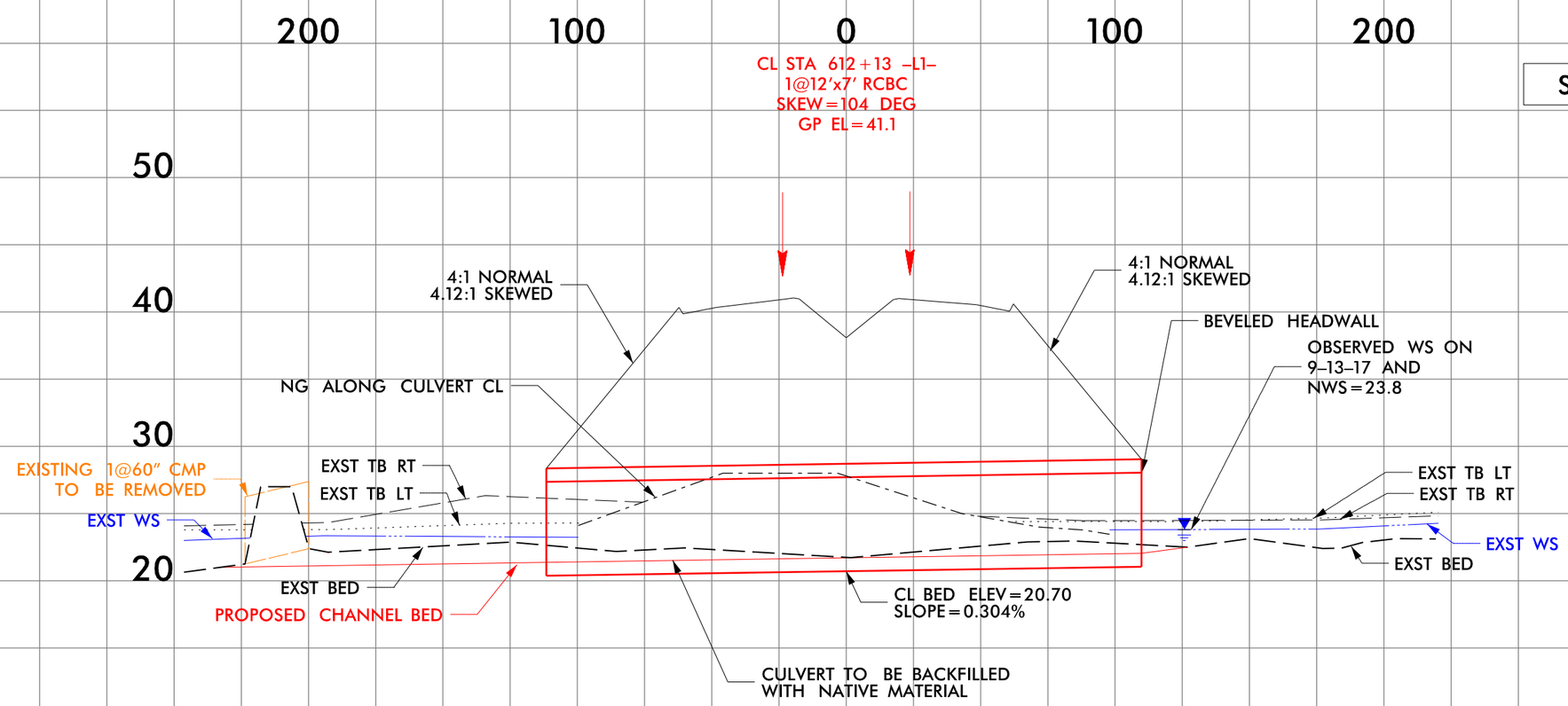
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

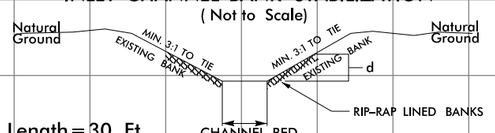
PERMIT DRAWING
SHEET 41 OF 165

DATE: 04-01-2020

SITE 3

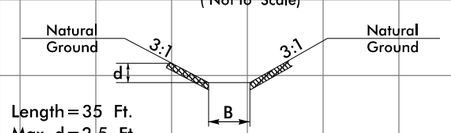


DETAIL
INLET CHANNEL BANK STABILIZATION
(Not to Scale)



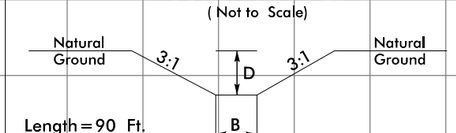
Length=30 Ft.
d=2.0 Ft.
Est.= 44 Tons of Class 'I' Rip-Rap

DETAIL
OUTLET CHANNEL BANK STABILIZATION
(Not to Scale)



Length=35 Ft.
Max. d=2.5 Ft.
B=varies 6 to 12 Ft.
Est.= 66 Tons of Class 'I' Rip-Rap

DETAIL
OUTLET CHANNEL
(Not to Scale)



Length=90 Ft.
Min. D=2.0 Ft.
B=6.0 Ft.

$$$$SYSTIME$$$$
$$$$LOGIN$$$$
$$$$USERNAME$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

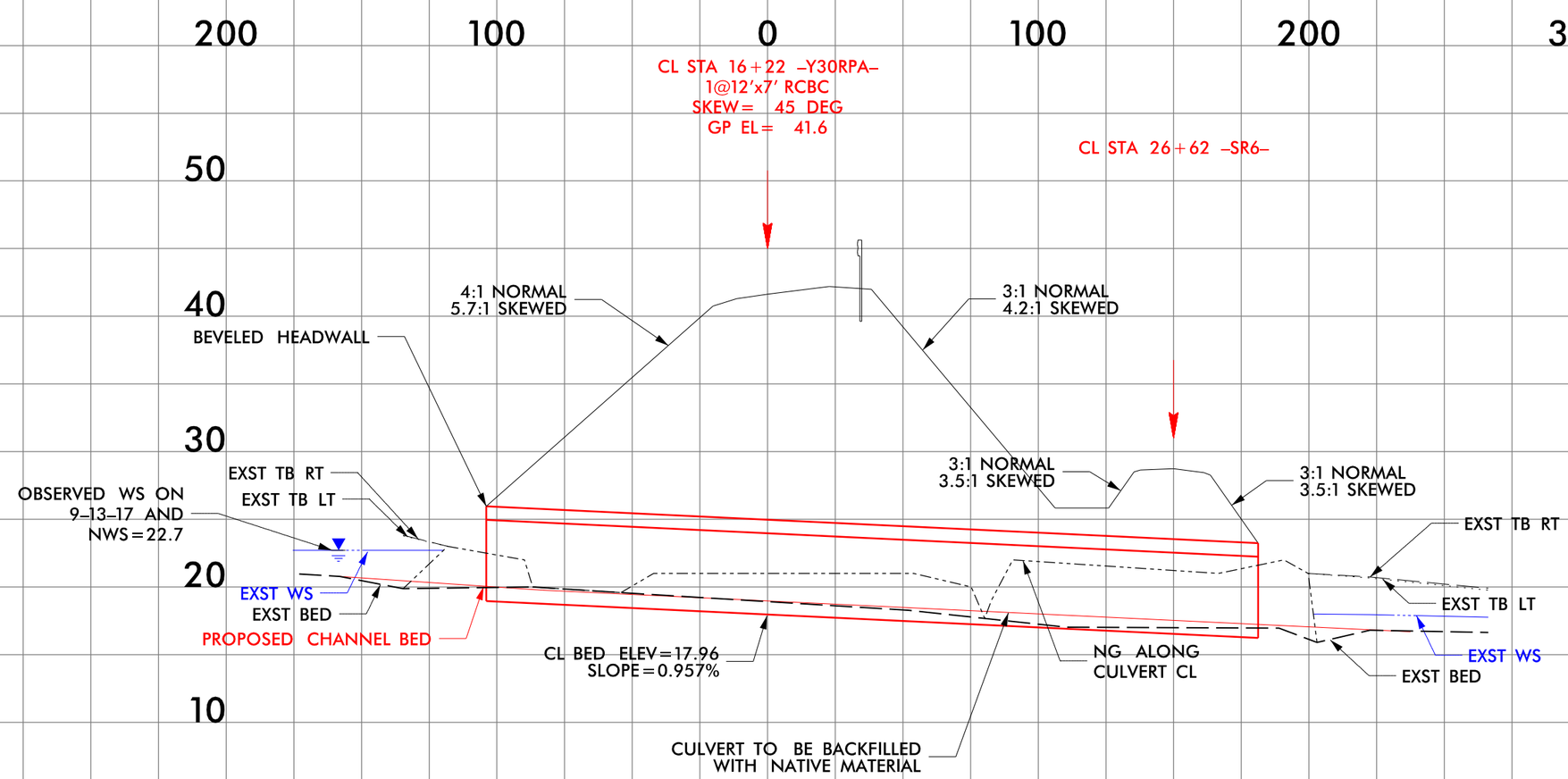
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

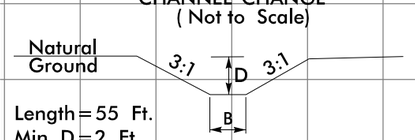
PERMIT DRAWING
SHEET 42 OF 165

DATE: 04-01-2020

SITE 3

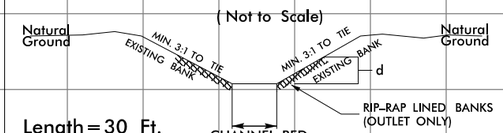


DETAIL
CHANNEL CHANGE
(Not to Scale)



Length=55 Ft.
Min. D=2 Ft.
B=varies 6 to 12 Ft.

DETAIL
OUTLET CHANNEL BANK STABILIZATION
(Not to Scale)



Length=30 Ft.
d=2.0 Ft.
Est.= 34 Tons of Class 'I' Rip-Rap

$$$$SYSTIME$$$$
$$$$LINE$$$$
$$$$LONG$$$$
$$$$FILENAME$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

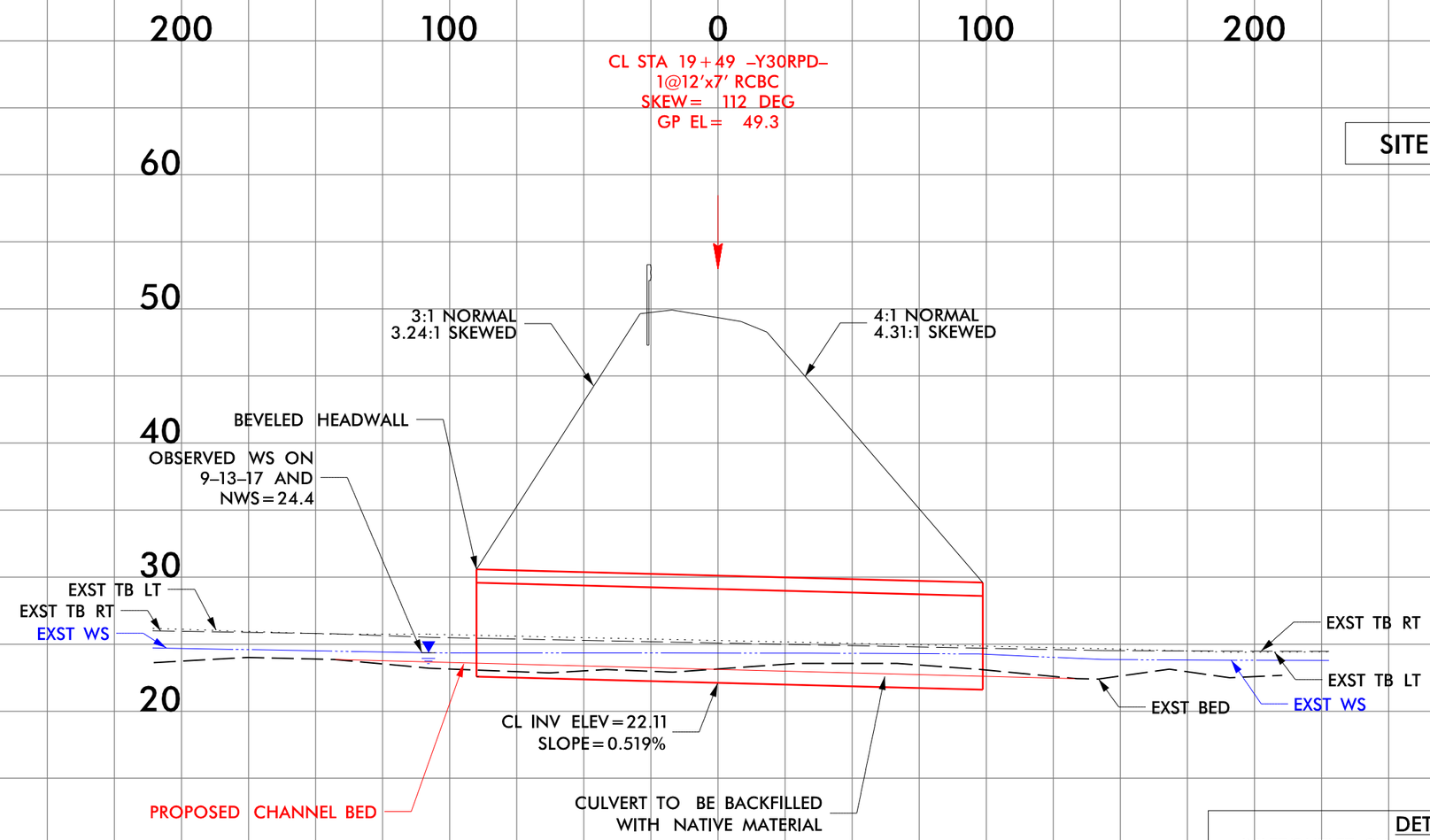
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 43 OF 165

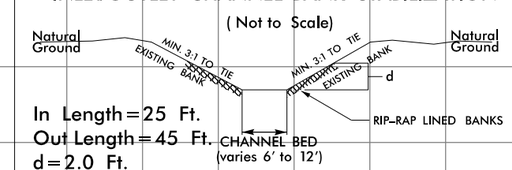
DATE: 04-01-2020

SITE 3



DETAIL
INLET/OUTLET CHANNEL BANK STABILIZATION

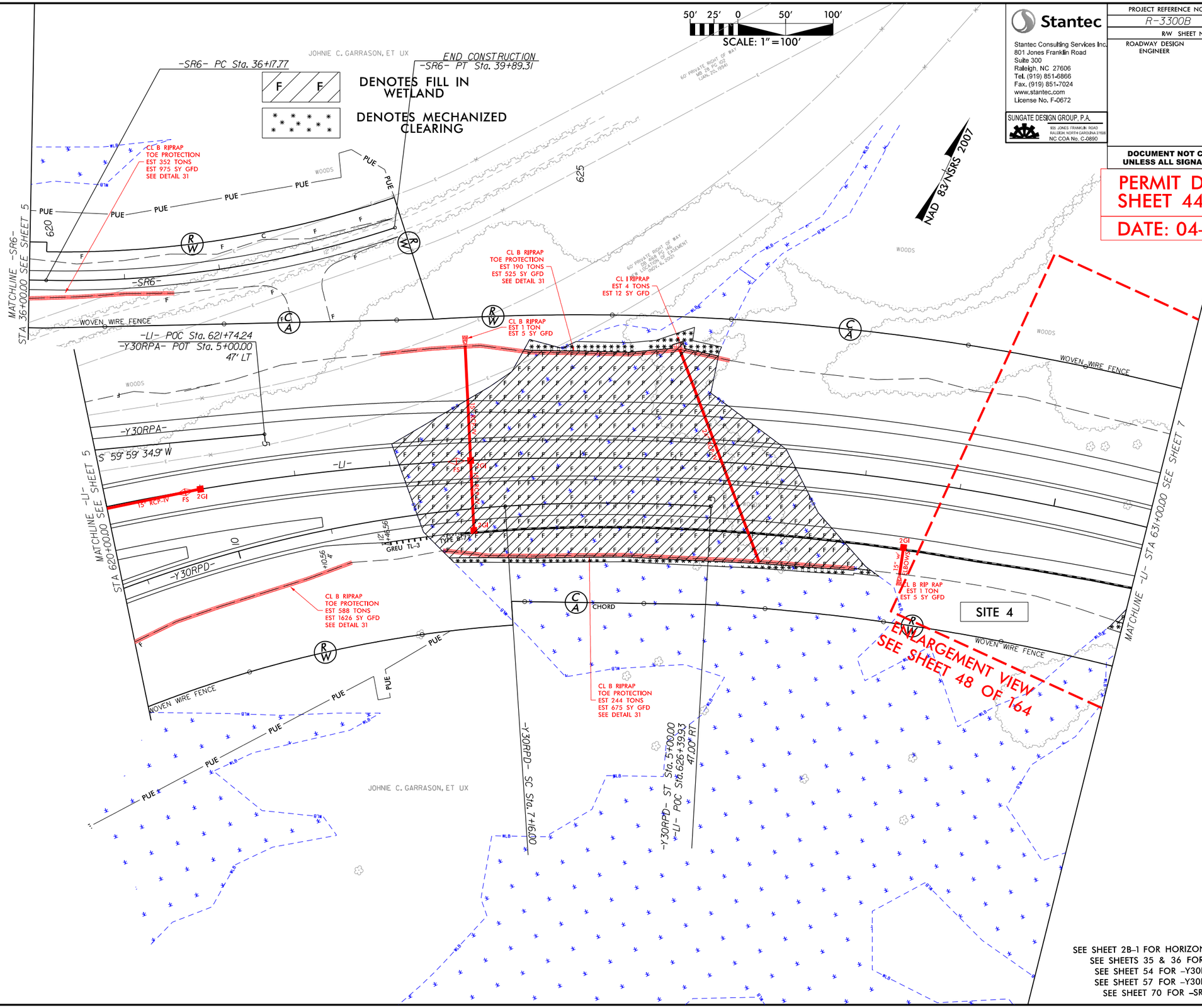
(Not to Scale)



In Length=25 Ft.
Out Length=45 Ft.
d=2.0 Ft.
Est.= 40 Tons of Class 'I' Rip-Rap (Inlet)
Est.= 72 Tons of Class 'I' Rip-Rap (Outlet)

$$$$SYSTIME$$$$
$$$$LONG$$$$
$$$$USERNAME$$$$

5/14/99



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RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

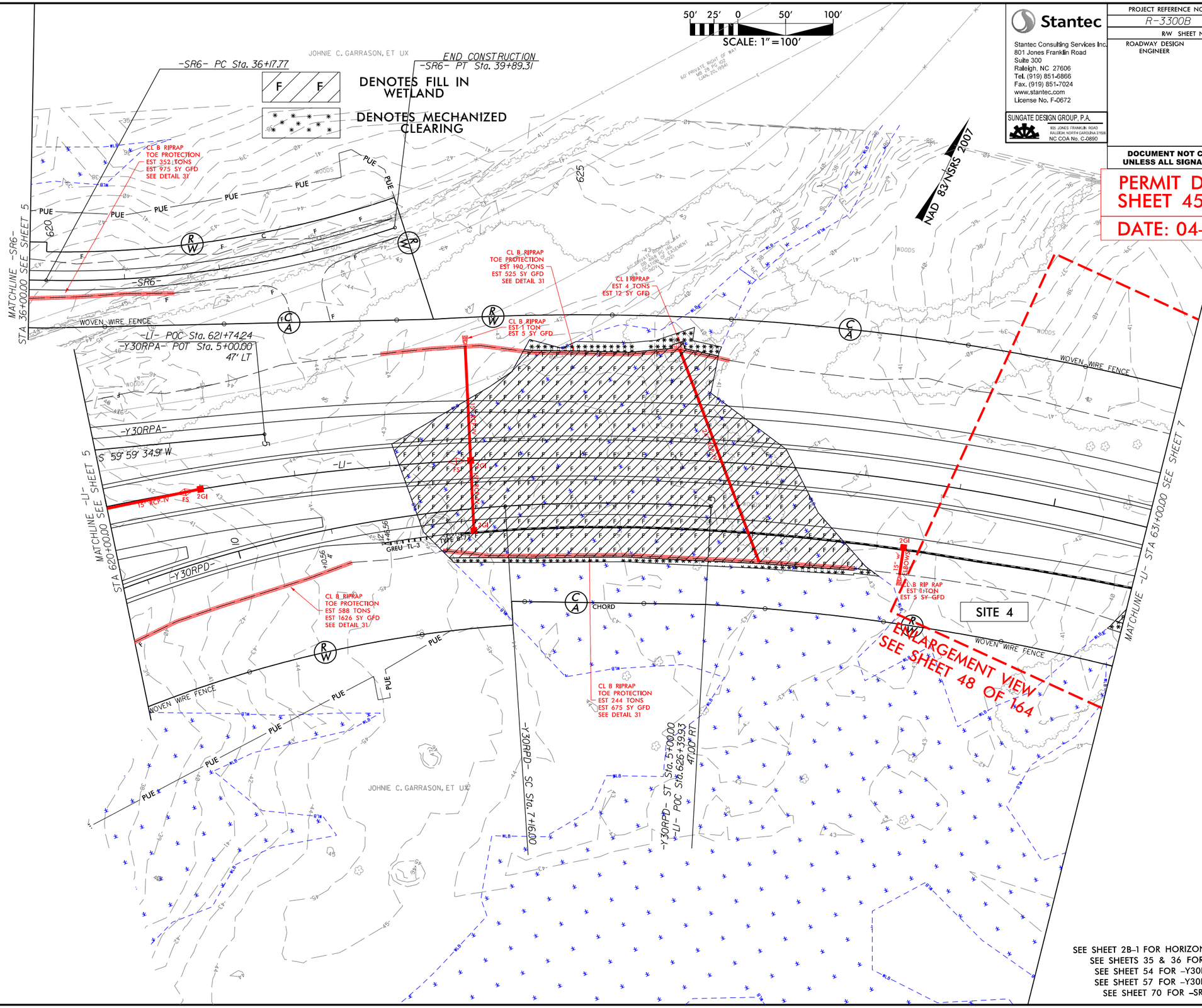
PERMIT DRAWING SHEET 44 OF 165

DATE: 04-01-2020

SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS 35 & 36 FOR -L1- PROFILE
SEE SHEET 54 FOR -Y30RPA- PROFILE
SEE SHEET 57 FOR -Y30RPD- PROFILE
SEE SHEET 70 FOR -SR6- PROFILE

$$$$SYSTIME$$$$
$$$$SYSDATE$$$$
$$$$USERNAME$$$$

5/14/99



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NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 45 OF 165

DATE: 04-01-2020

SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS 35 & 36 FOR -L1- PROFILE
SEE SHEET 54 FOR -Y30RPA- PROFILE
SEE SHEET 57 FOR -Y30RPD- PROFILE
SEE SHEET 70 FOR -SR6- PROFILE

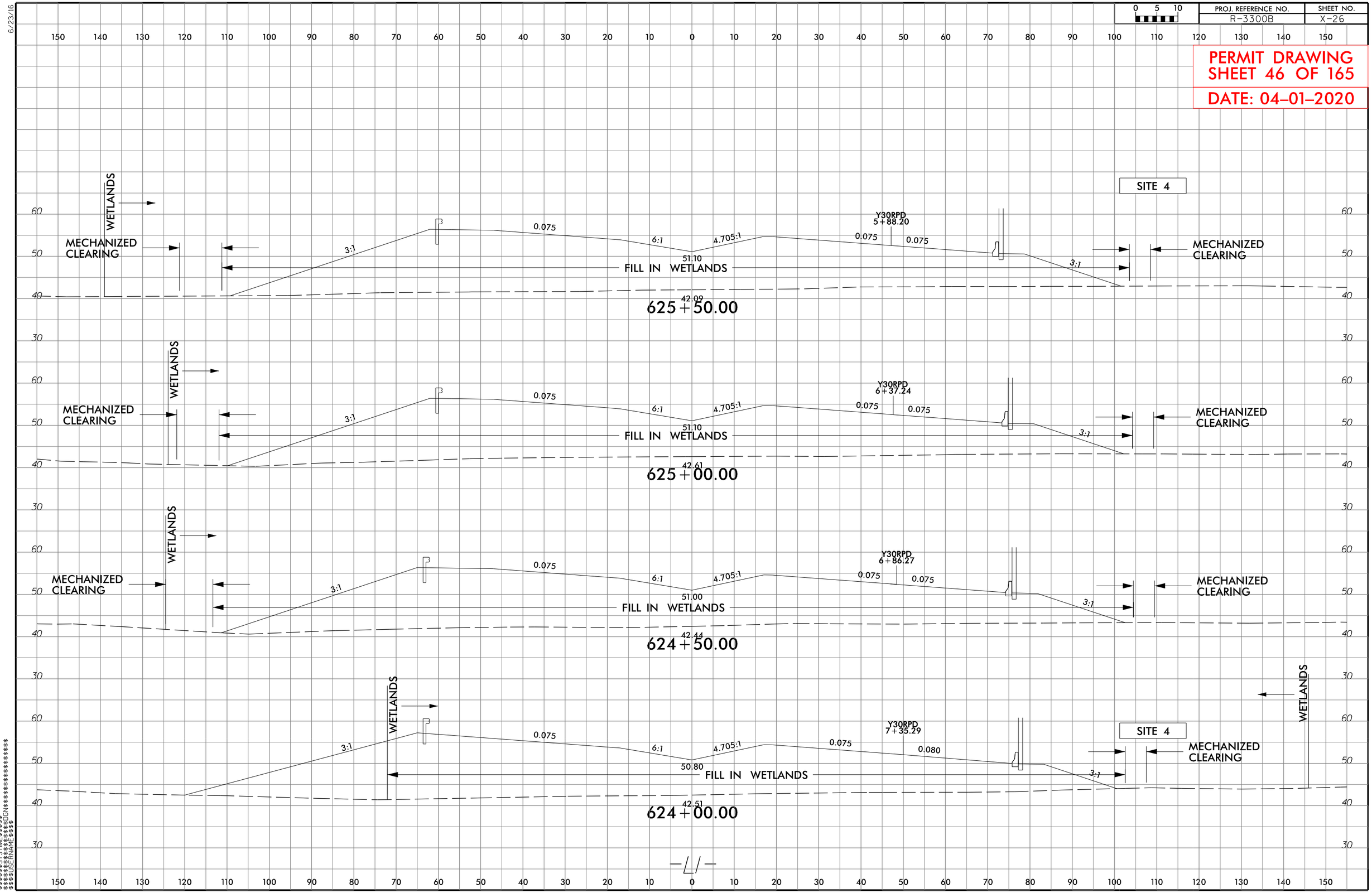
$$$$SYSTIME$$$$
$$$$SYSDATE$$$$
$$$$PROJECTNAME$$$$

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-26

PERMIT DRAWING
SHEET 46 OF 165

DATE: 04-01-2020



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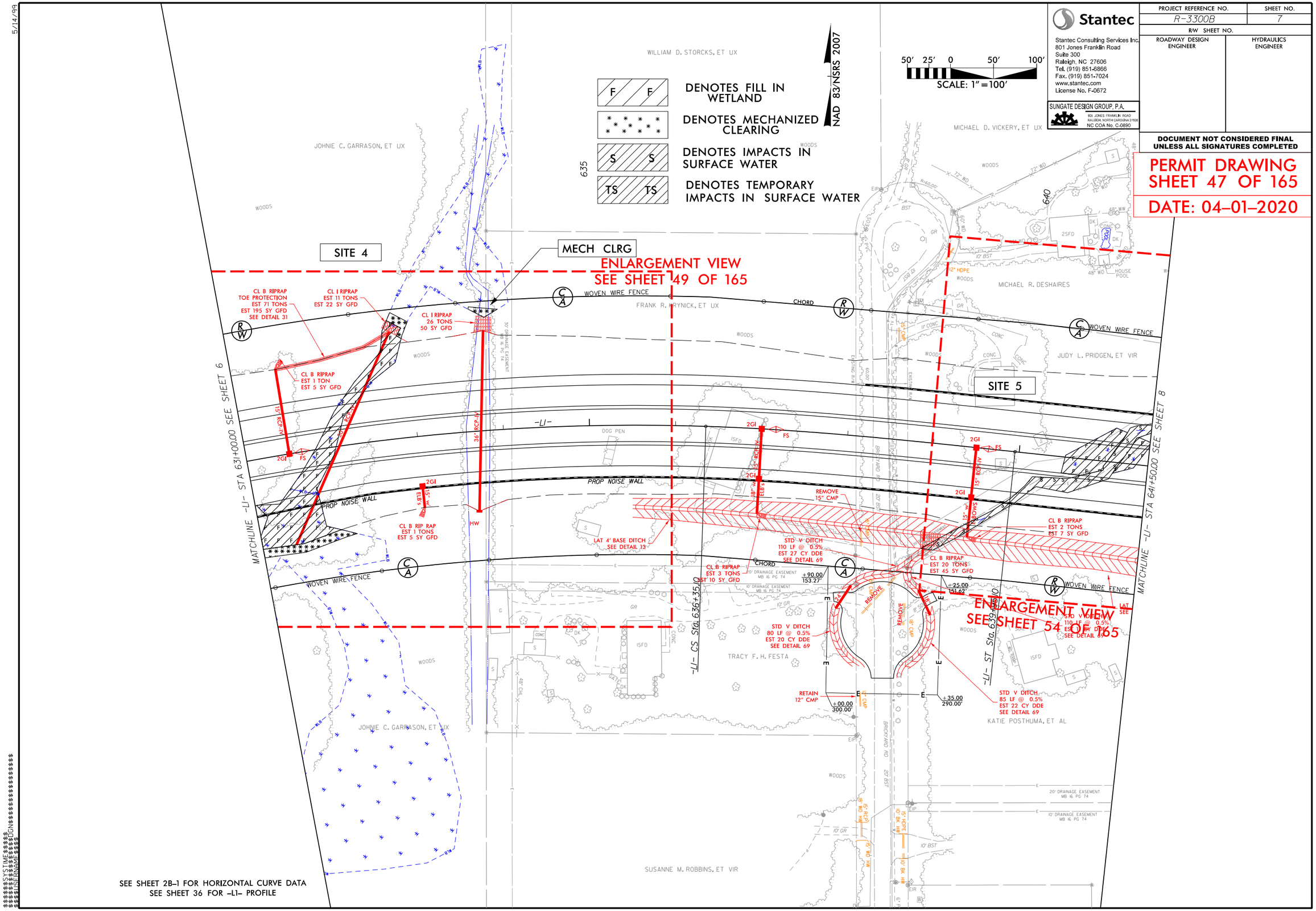
$$$$USERNAME$$$$

5/14/99



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NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

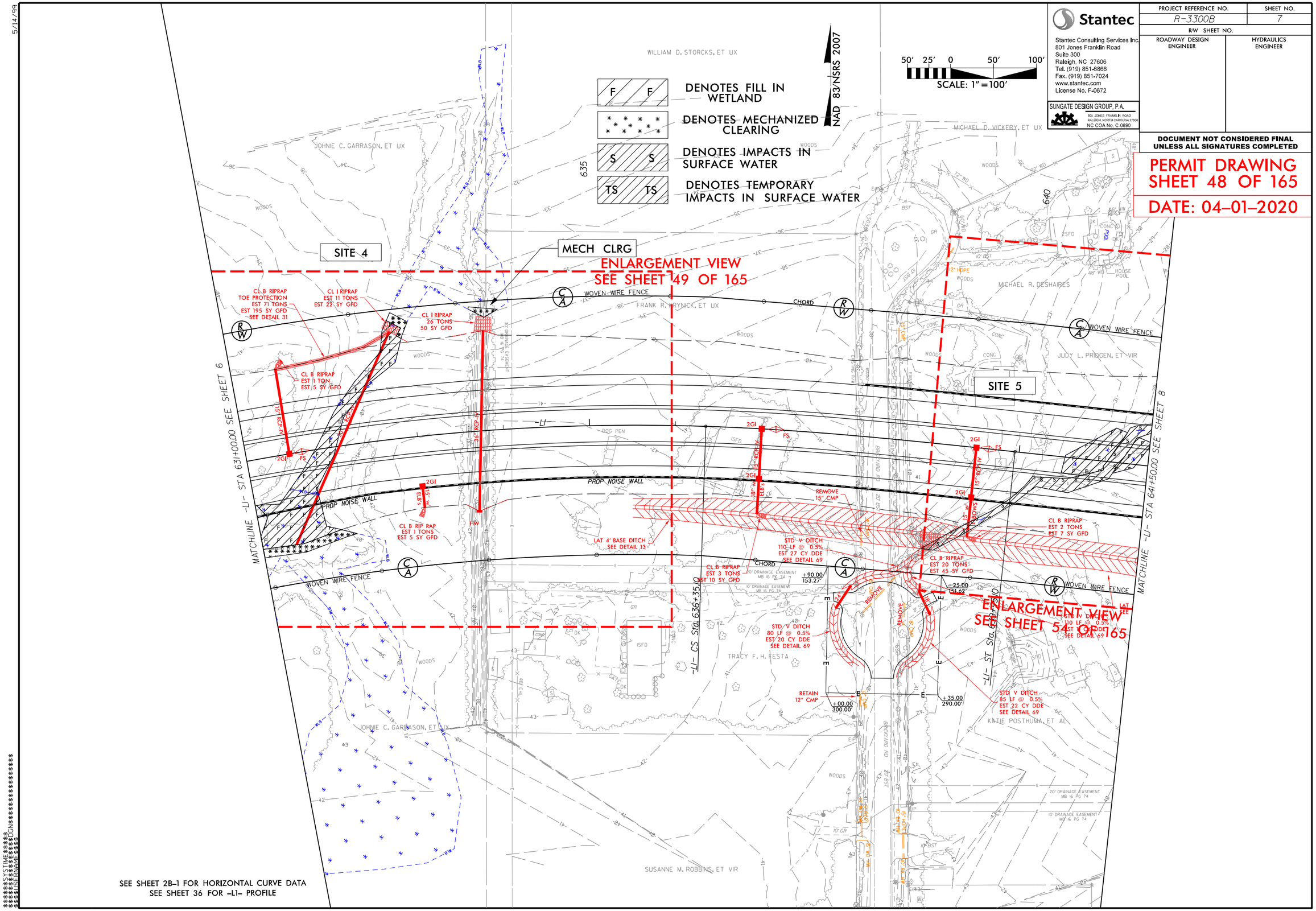
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 47 OF 165

DATE: 04-01-2020

$$$$SYSTIME$$$$
$$$$SYSDATE$$$$
$$$$USERNAME$$$$

5/14/99



SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEET 36 FOR -L1- PROFILE

$$$$$$$SYSTIME$$$$$
$$$$$$$SYSDATE$$$$$
$$$$$$$USERNAME$$$$$

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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING SHEET 48 OF 165

DATE: 04-01-2020

8/17/99

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

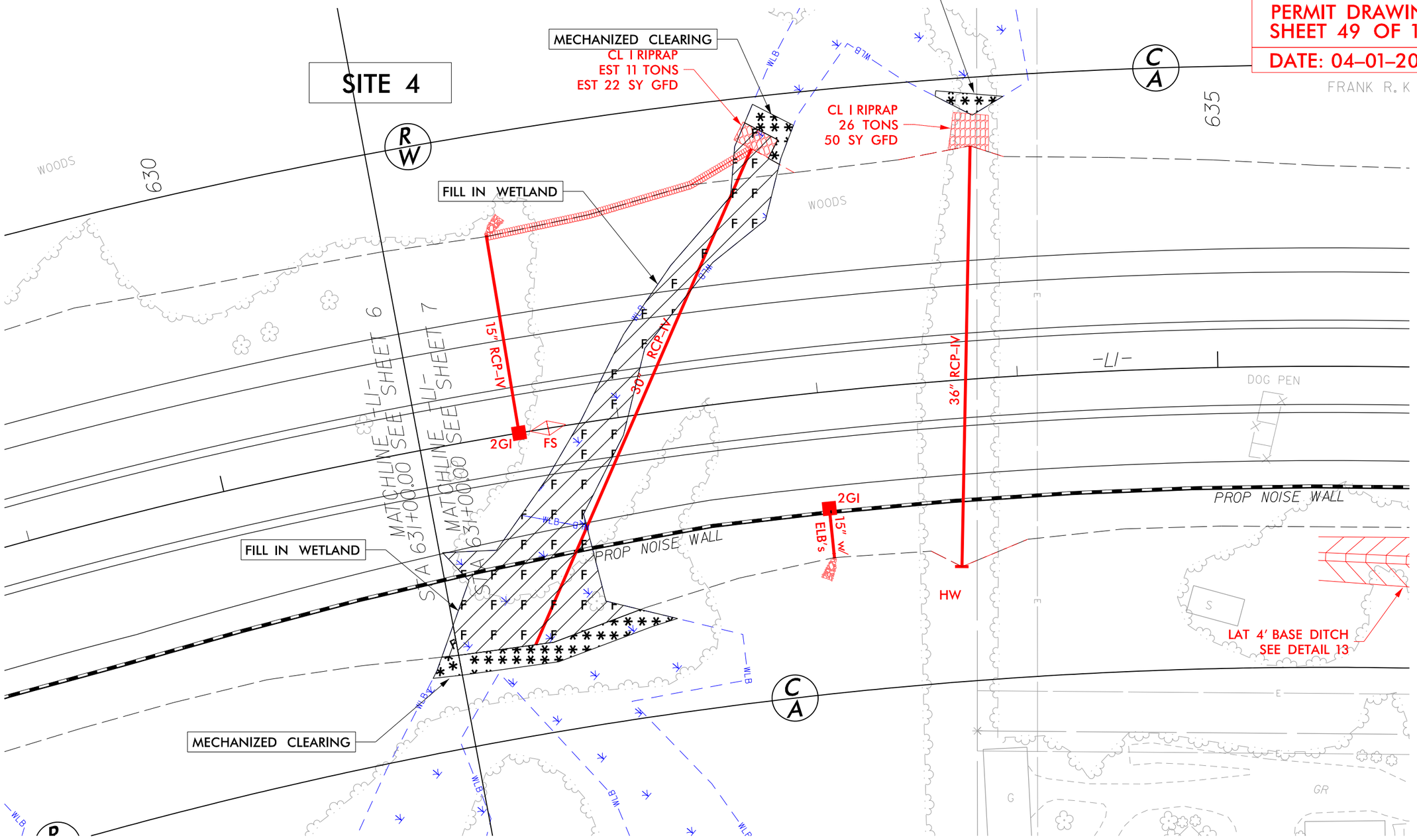
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 49 OF 165

DATE: 04-01-2020

FRANK R. K

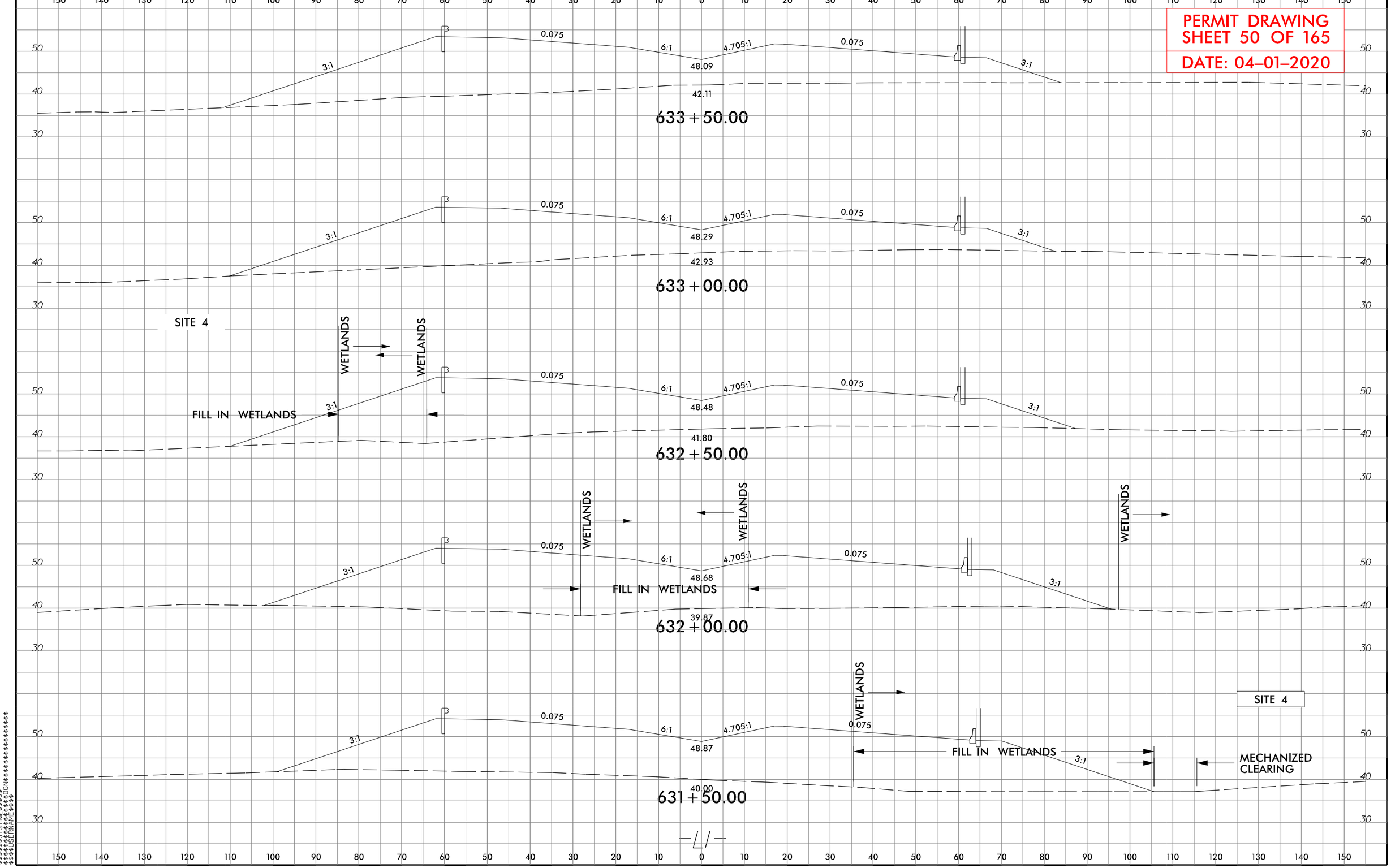


PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-29

0 5 10

PERMIT DRAWING
SHEET 50 OF 165

DATE: 04-01-2020



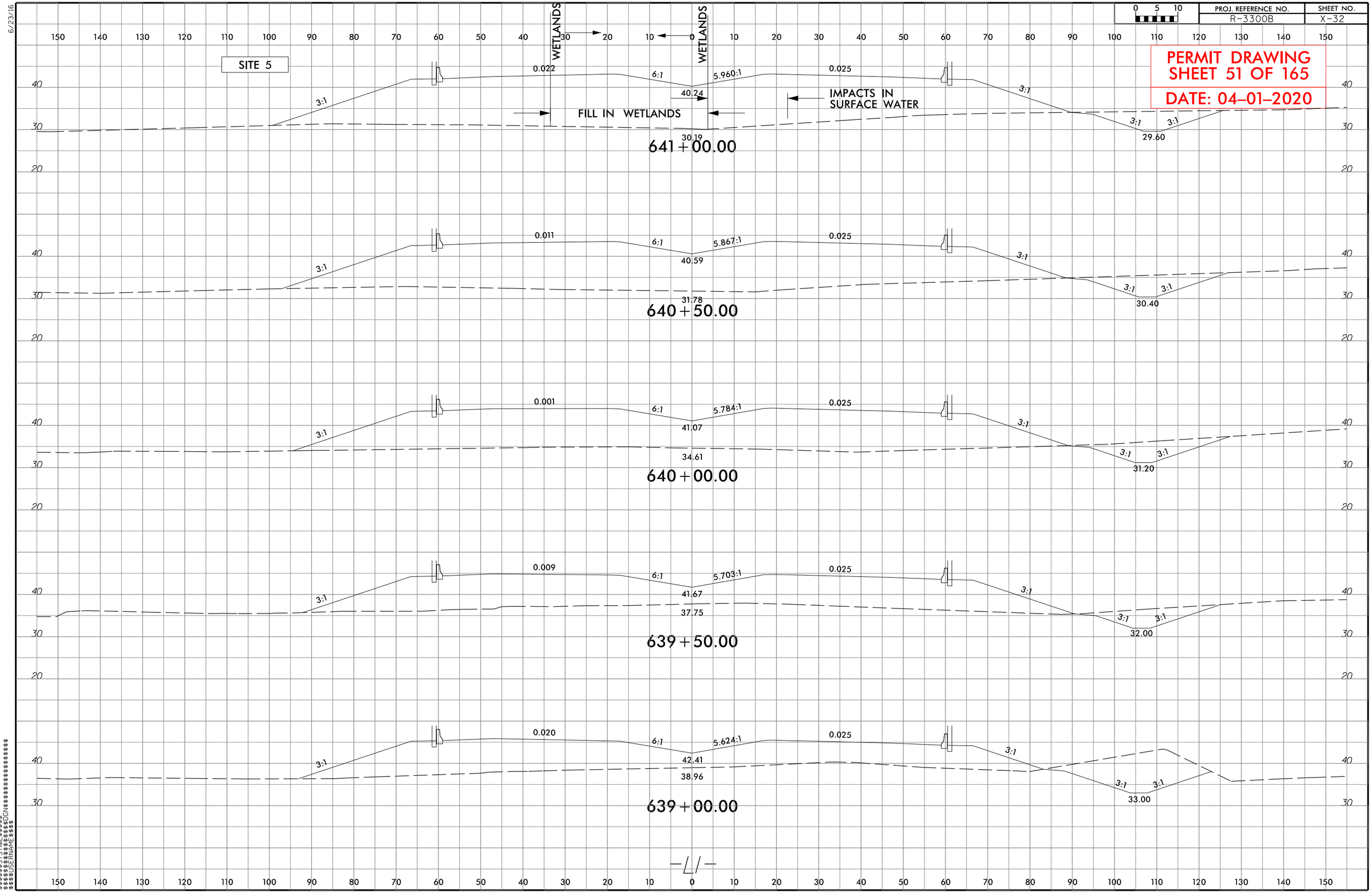
6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-32

0 5 10

PERMIT DRAWING
SHEET 51 OF 165

DATE: 04-01-2020



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$$$$$$SYSTIME$$$$$$
$$$$$$DGNS$$$$$$$$$$$$$$$$$$$$$$
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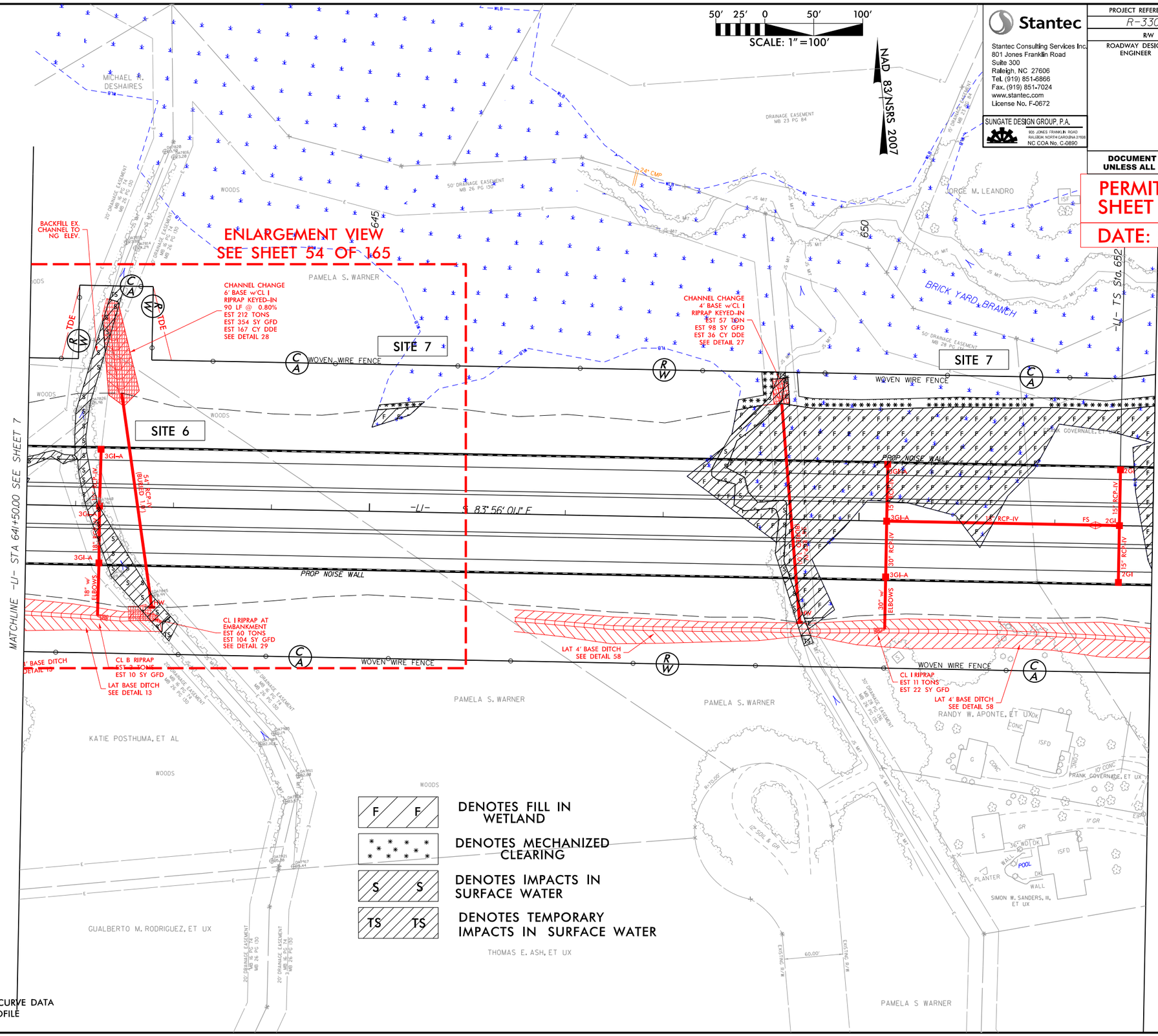
5/14/99



SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEET 36 FOR -L1- PROFILE

$$$$$$SYSTIME$$$$$$
$$$$$$SYSLOCATION$$$$$$$$$$$$$$$$$$$$
$$$$$$SYSFRAME$$$$$$

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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 52 OF 165

DATE: 04-01-2020

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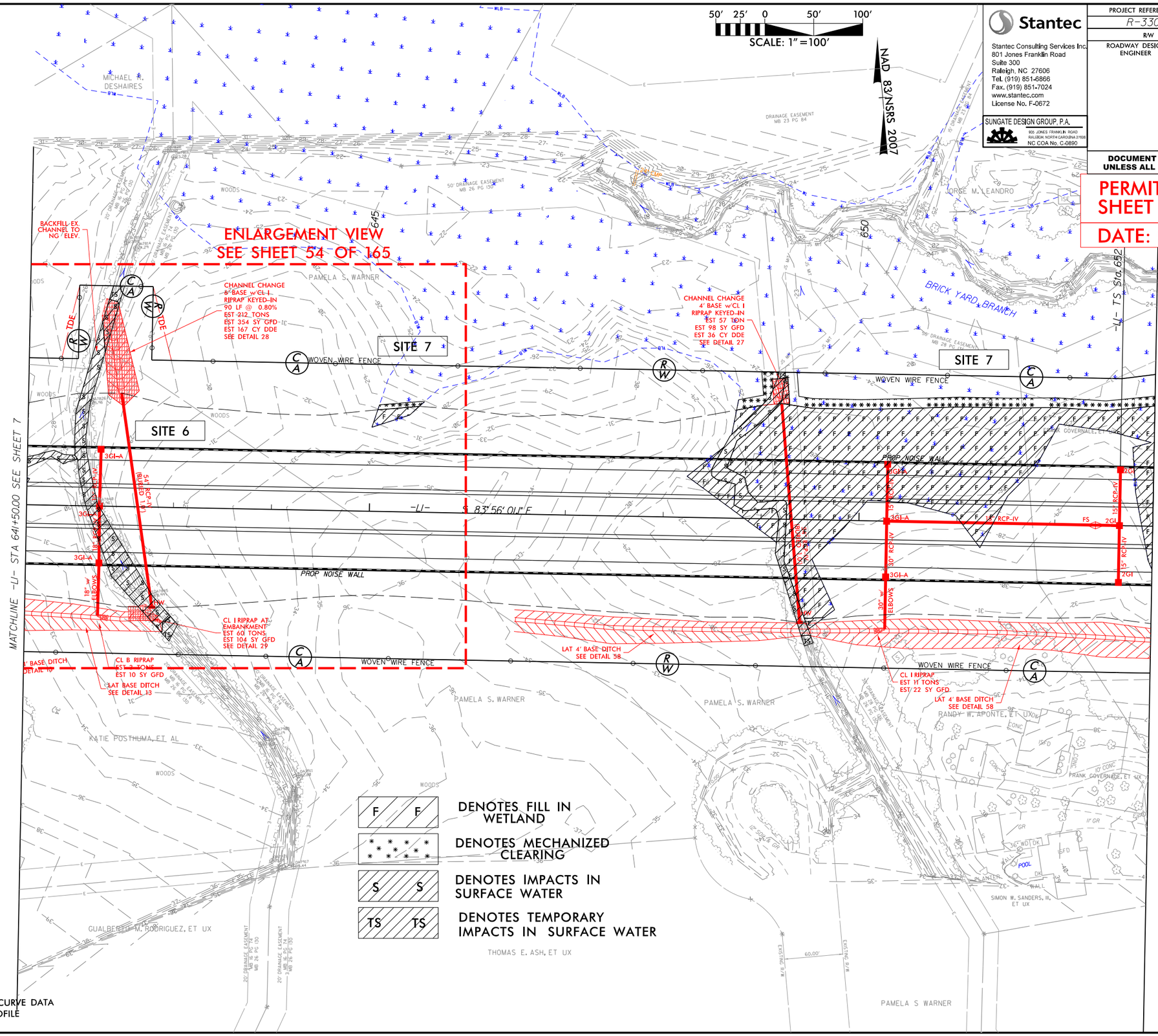

SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEET 36 FOR -L1- PROFILE

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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING SHEET 53 OF 165

DATE: 04-01-2020

8/17/99

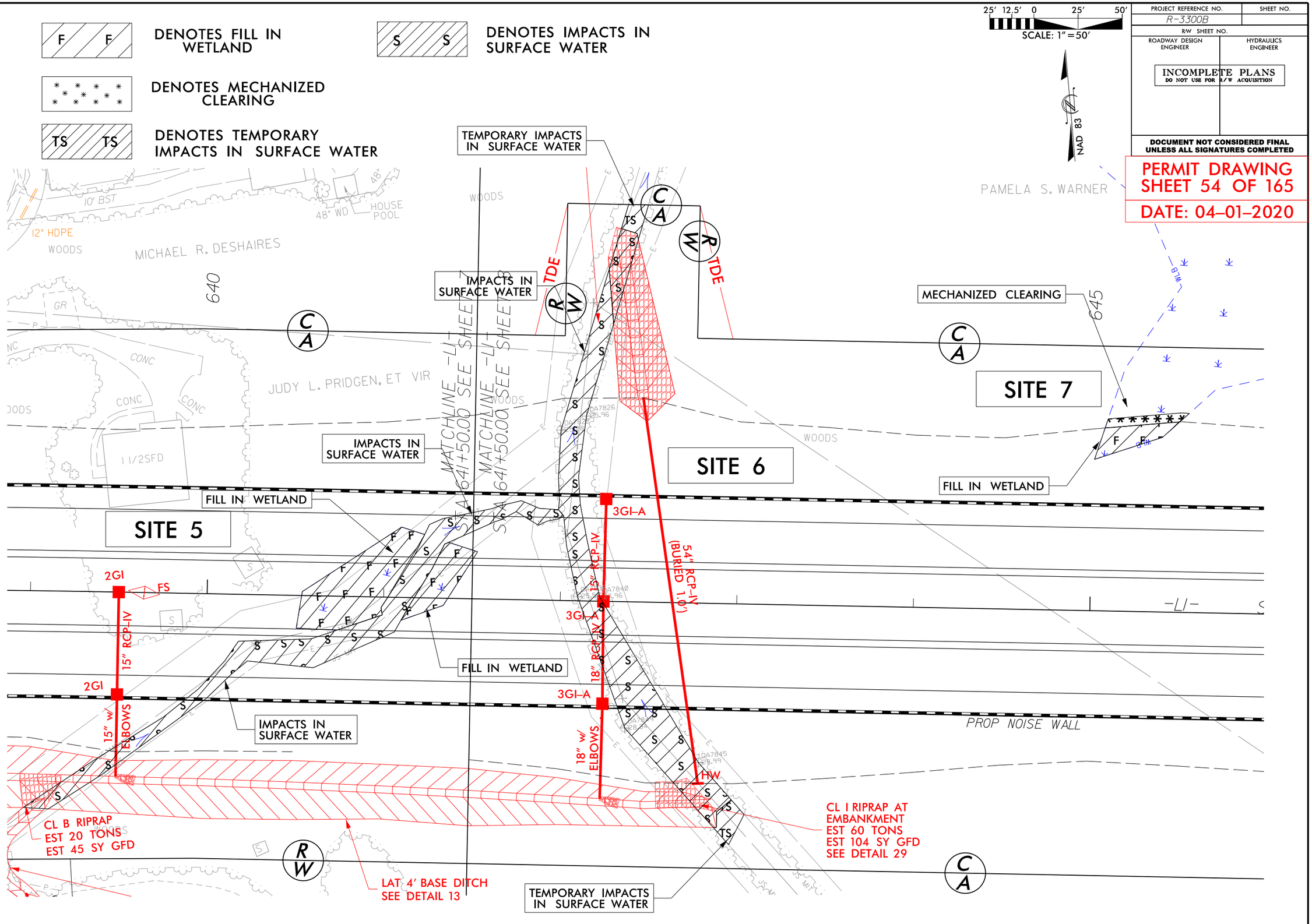
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 54 OF 165

DATE: 04-01-2020

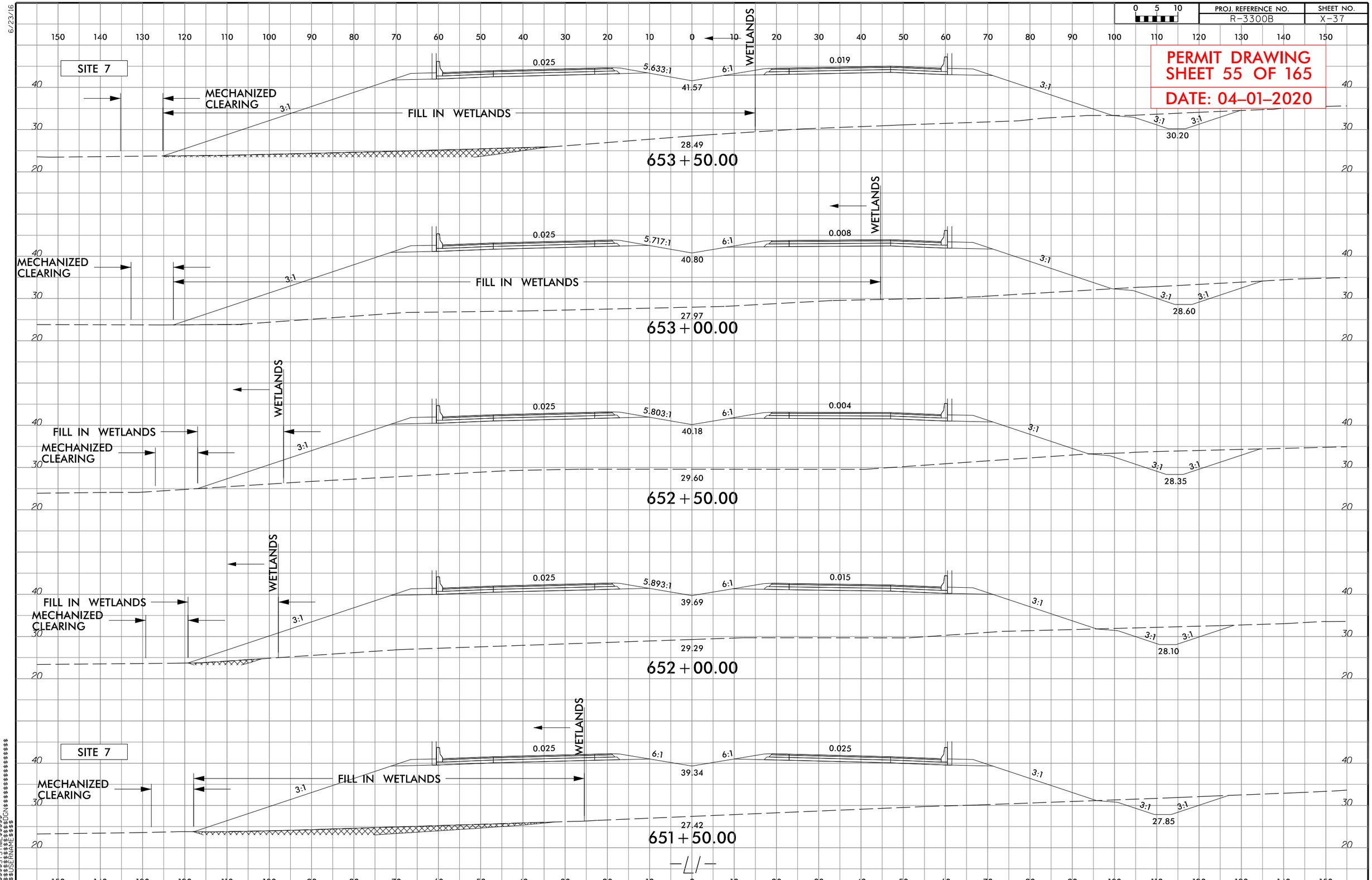


6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-37

0 5 10

PERMIT DRAWING
SHEET 55 OF 165
DATE: 04-01-2020



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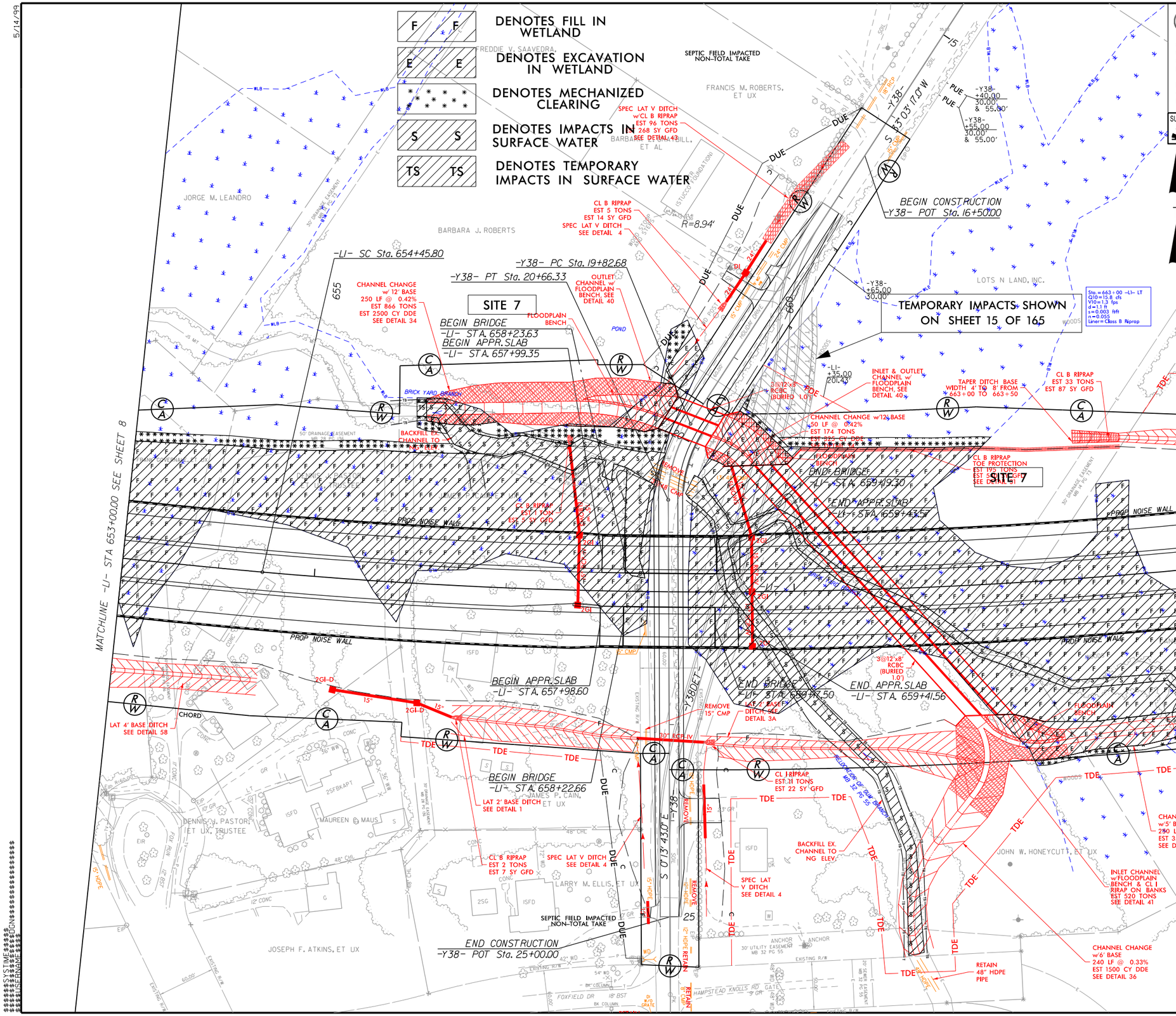
5/14/99



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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

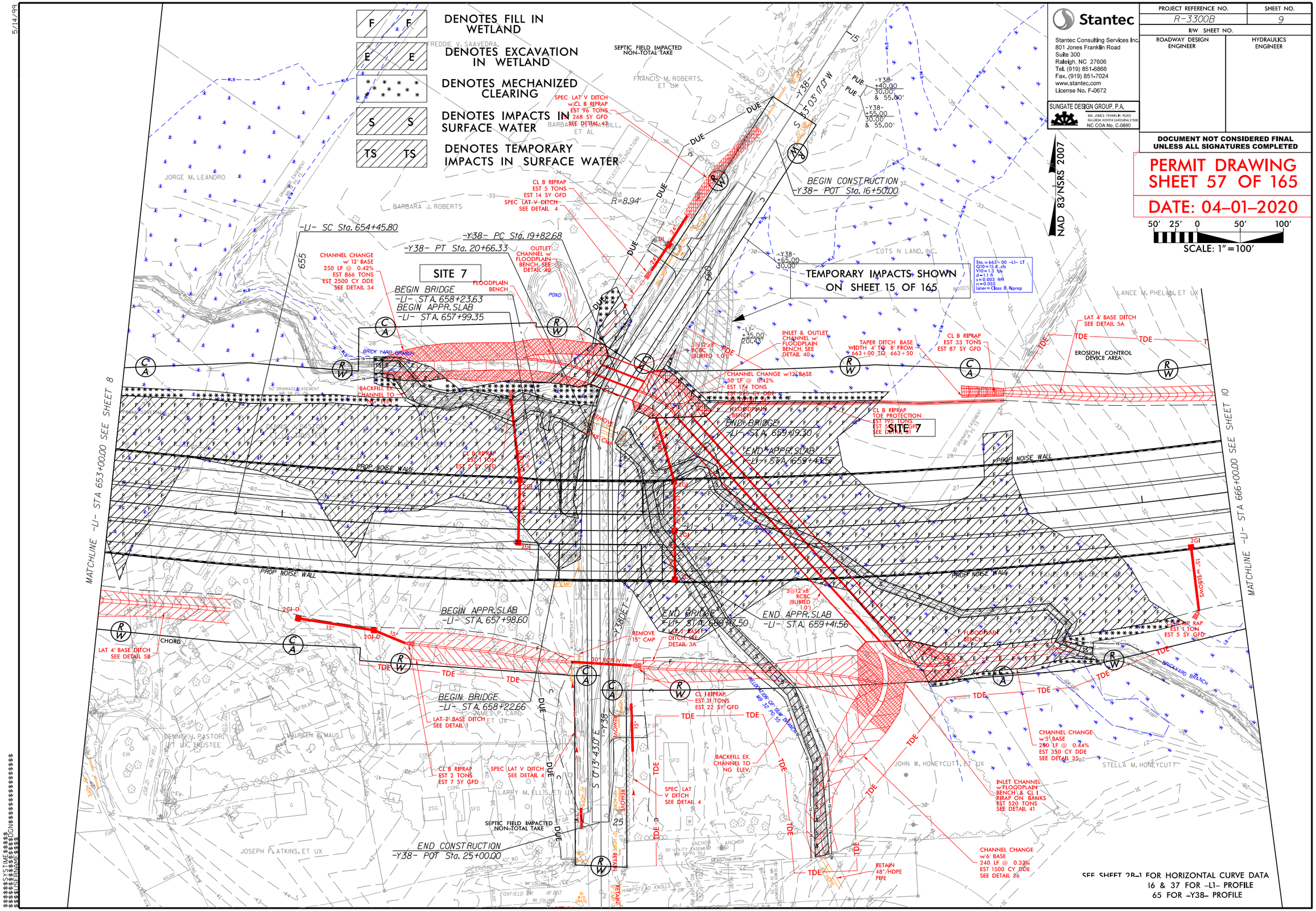
PERMIT DRAWING SHEET 56 OF 165

DATE: 04-01-2020

50' 25' 0 50' 100'
SCALE: 1" = 100'

SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
36 & 37 FOR -L1- PROFILE
65 FOR -Y38- PROFILE

5/14/99



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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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DATE: 04-01-2020

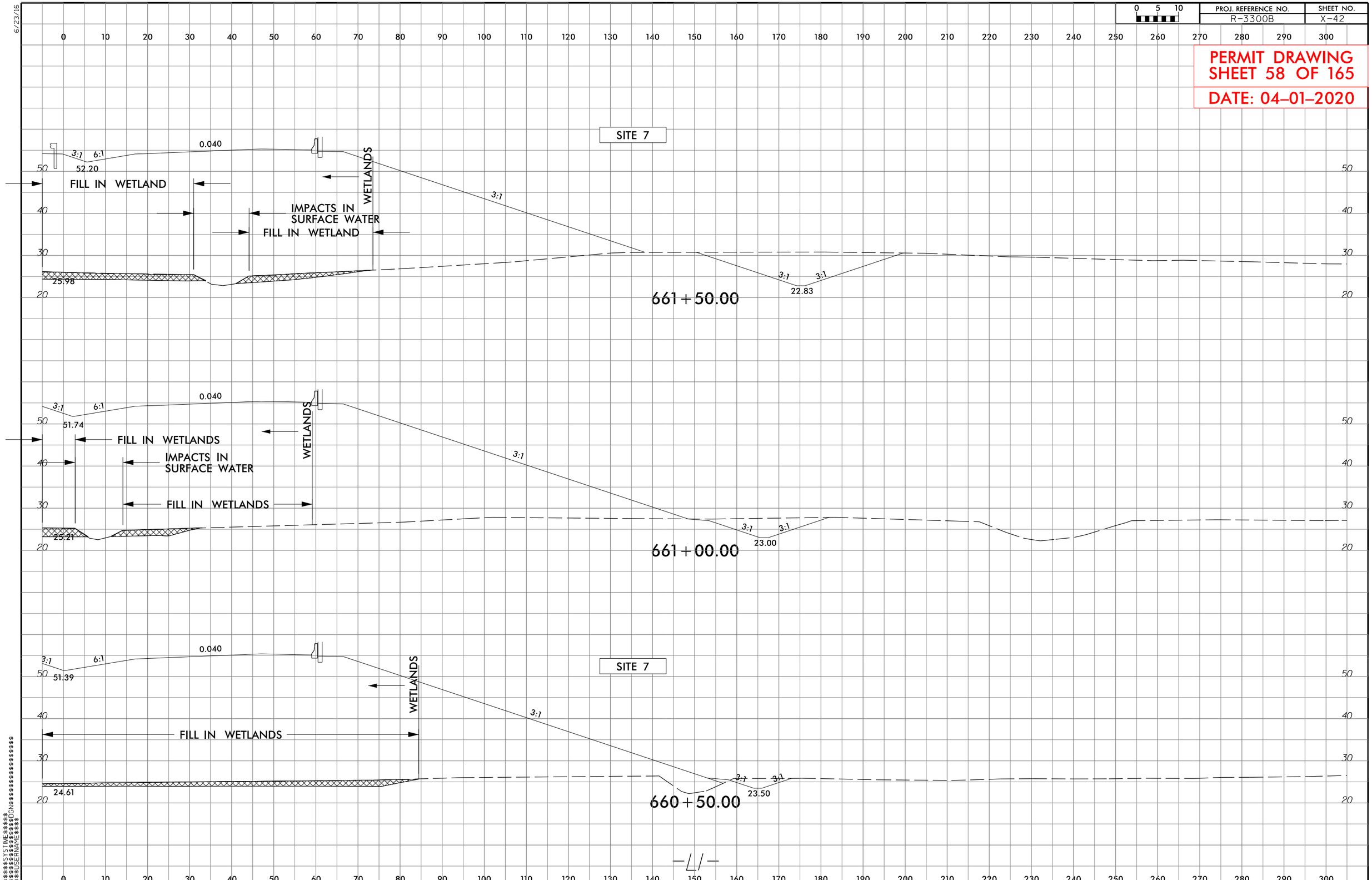
SEE SHEET 2R-1 FOR HORIZONTAL CURVE DATA
16 & 37 FOR -L1- PROFILE
65 FOR -Y38- PROFILE

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-42

PERMIT DRAWING
SHEET 58 OF 165

DATE: 04-01-2020



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$$$$$$$$SAVEDON$$$$$$$$$$$$$$$$$$$$
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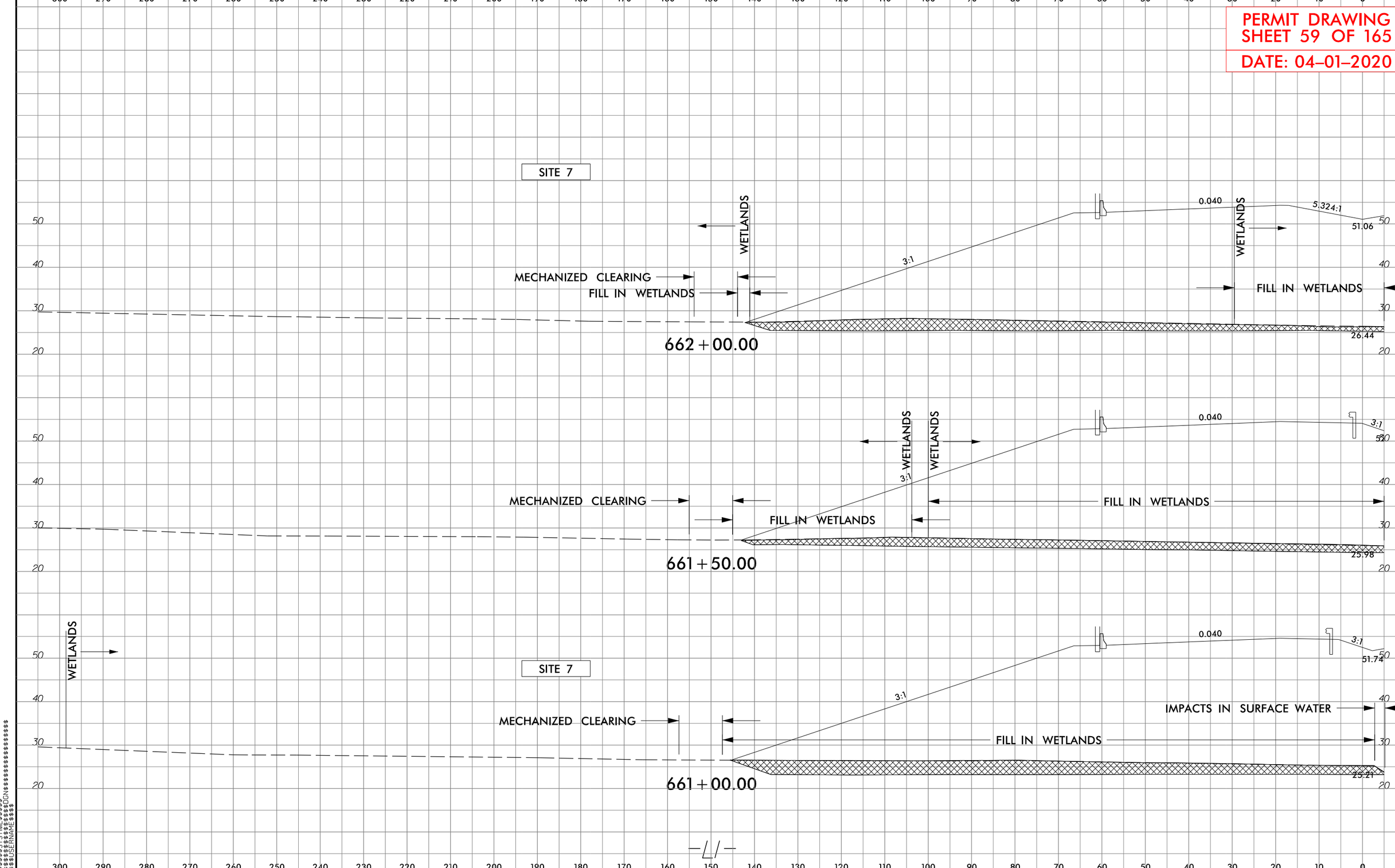
6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-48

0 5 10

PERMIT DRAWING
SHEET 59 OF 165

DATE: 04-01-2020



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$$$$SYSNAME$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

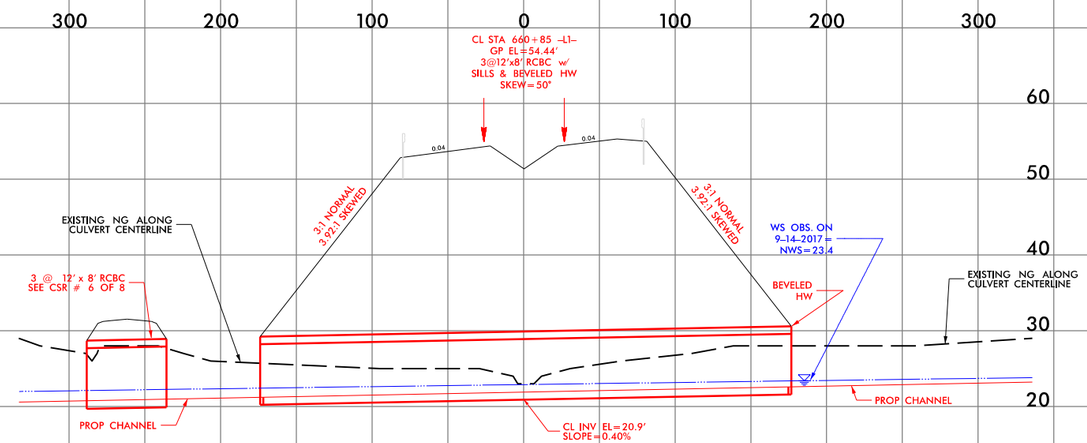
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

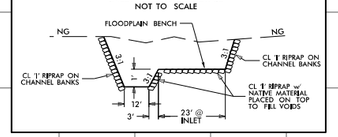
PERMIT DRAWING
SHEET 60 OF 165

DATE: 04-01-2020

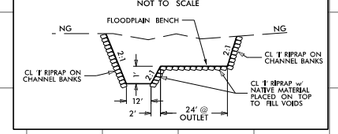
SITE 7



INLET CHANNEL DETAIL
NOT TO SCALE



OUTLET CHANNEL DETAIL
NOT TO SCALE



SKEWED MULTI-BARREL CULVERT LOW FLOW CHANNEL, SILLS AND FLOODPLAIN BENCH

(NOT TO SCALE)

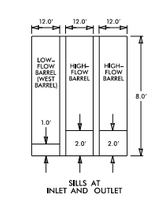
*NOTES:

1) NATIVE MATERIAL BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE THE STREAM DURING CONSTRUCTION, ONE PORTION OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP-RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARRELS). IF RIP-RAP IS USED TO LINE THE HIGH FLOW CULVERT BARRELS), NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

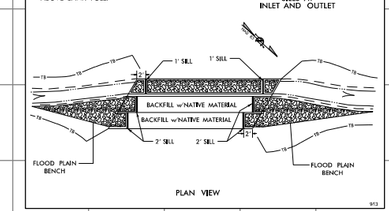
2) SILLS ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

3) TOP OF LOW FLOW SILLS SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) DO NOT SET ELEVATION OF HIGH SILLS ABOVE BANK FULL.



SILLS AT INLET AND OUTLET



PLAN VIEW

9/12

SYSTEM NAME
CONTROL SYSTEM

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

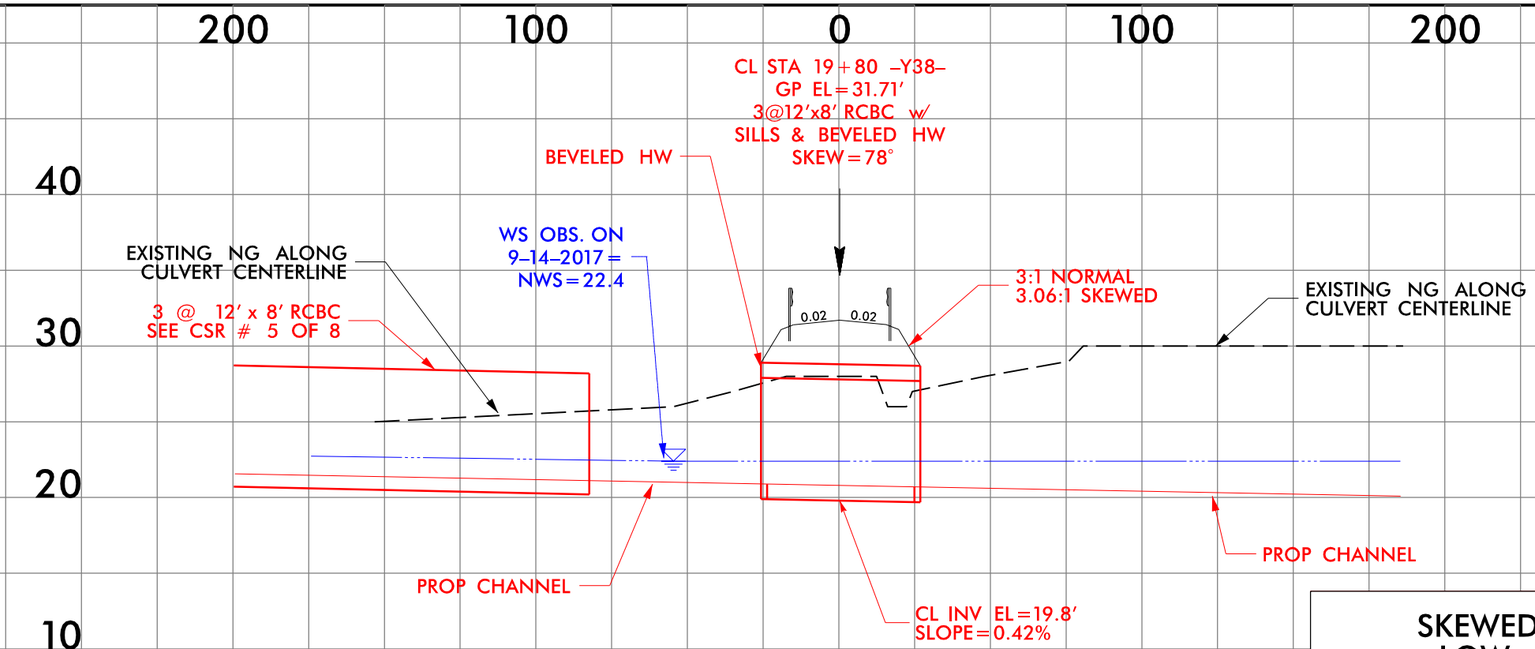
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 61 OF 165

DATE: 04-01-2020

SITE 7



SKEWED MULTI-BARREL CULVERT LOW FLOW CHANNEL, SILLS AND FLOODPLAIN BENCH

(NOT TO SCALE)

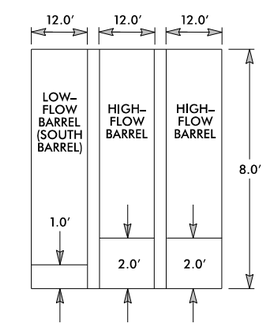
*NOTES:

1) NATIVE MATERIAL BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP-RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL(S). IF RIP-RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL(S), NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

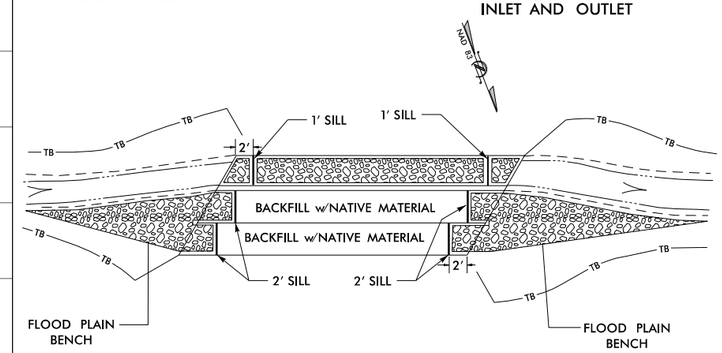
2) SILLS ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

3) TOP OF LOW FLOW SILLS SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) DO NOT SET ELEVATION OF HIGH SILLS ABOVE BANK FULL.



SILLS AT INLET AND OUTLET

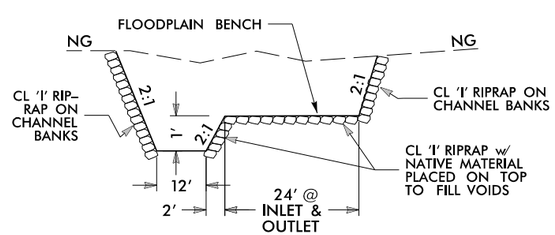


PLAN VIEW

9/13

INLET & OUTLET CHANNEL DETAIL

NOT TO SCALE



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$$$$$SYSTIME$$$$
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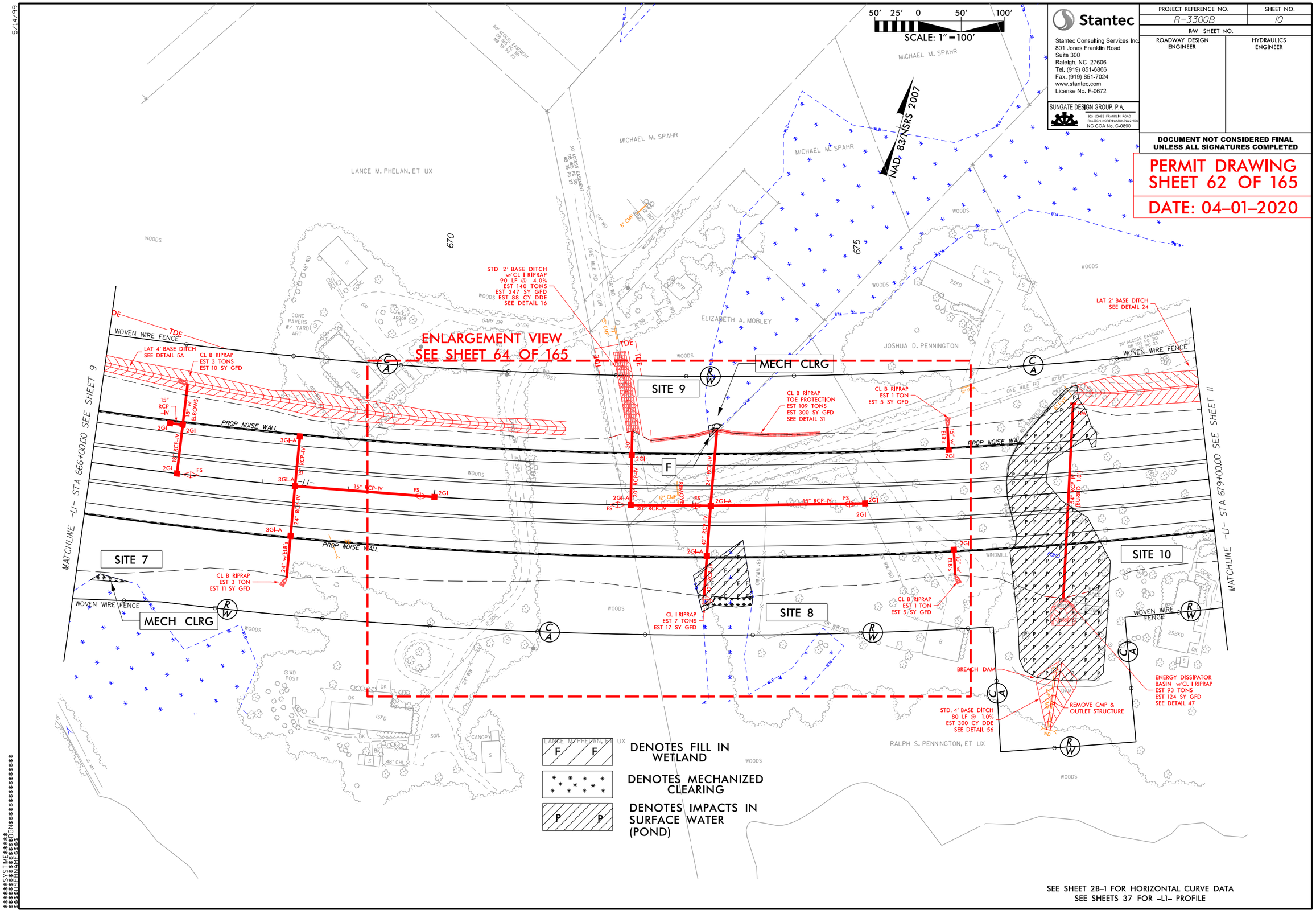
5/14/99



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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 62 OF 165

DATE: 04-01-2020

SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS 37 FOR -L1- PROFILE

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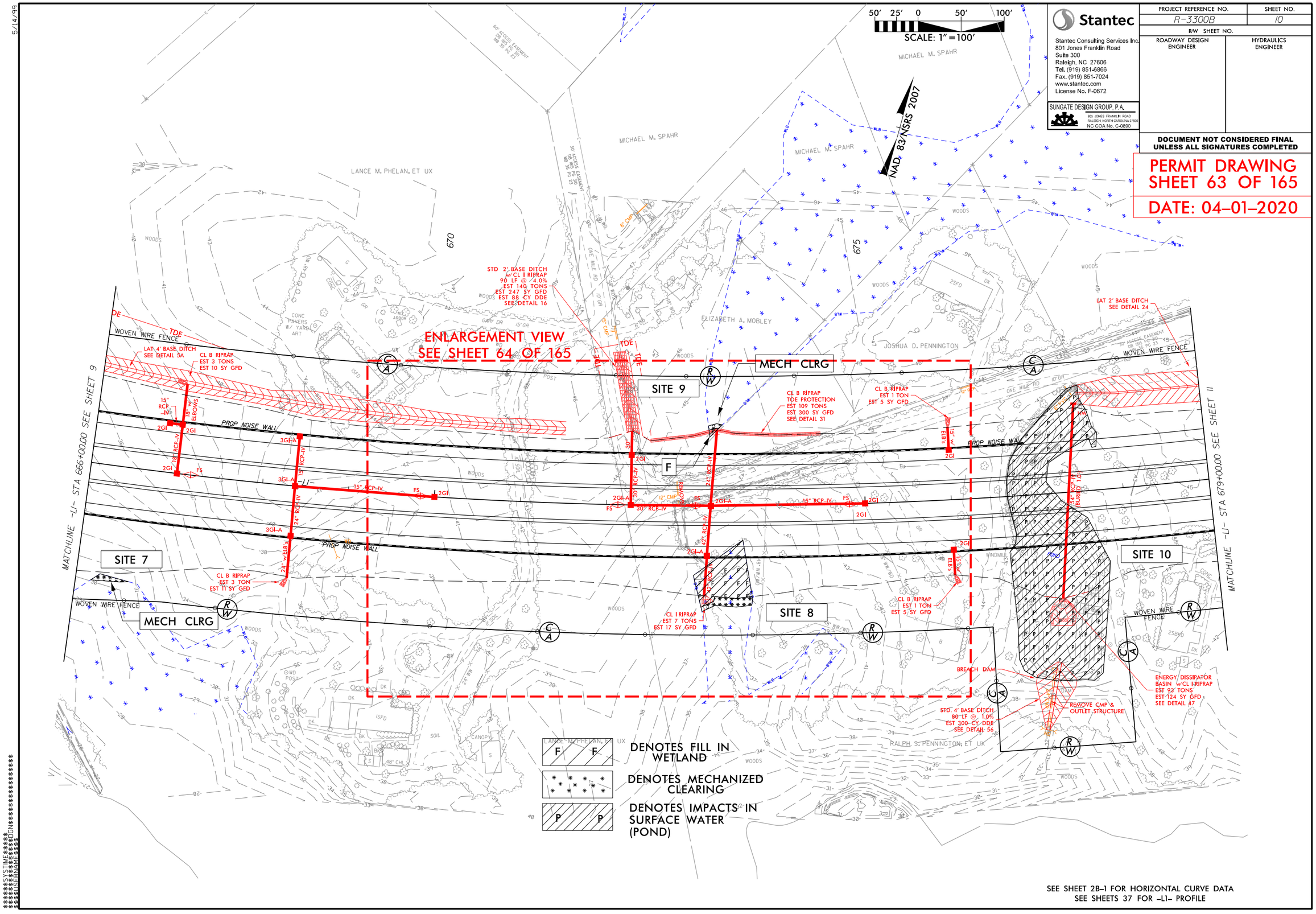
$$$$$SYSDATE$$$$
$$$$$USERNAME$$$$

5/14/99



SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS 37 FOR -L1- PROFILE

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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 63 OF 165

DATE: 04-01-2020

$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$

8/17/99

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

25′ 12.5′ 0 25′ 50′
SCALE: 1″=50′

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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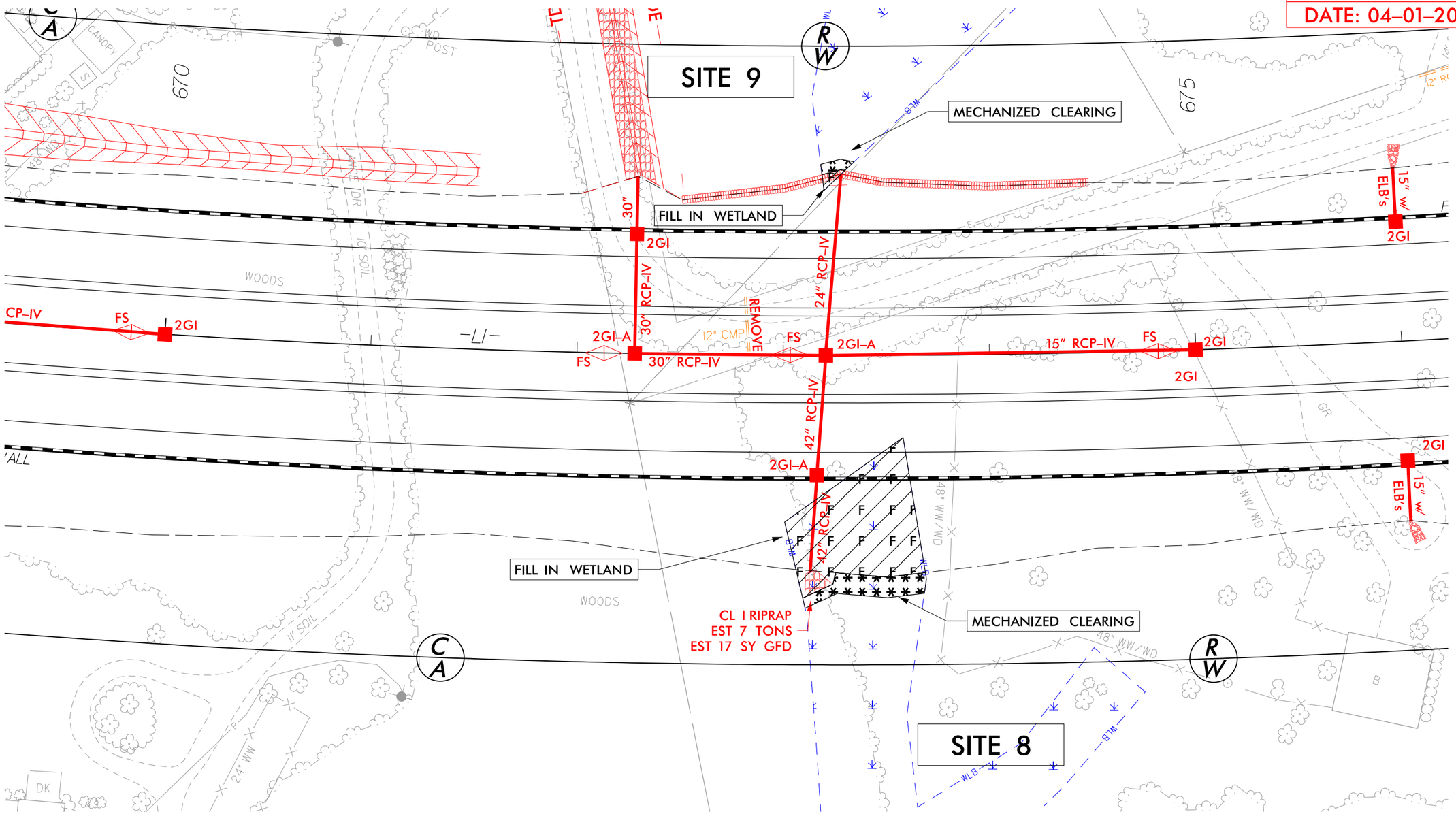
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 64 OF 165

DATE: 04–01–2020



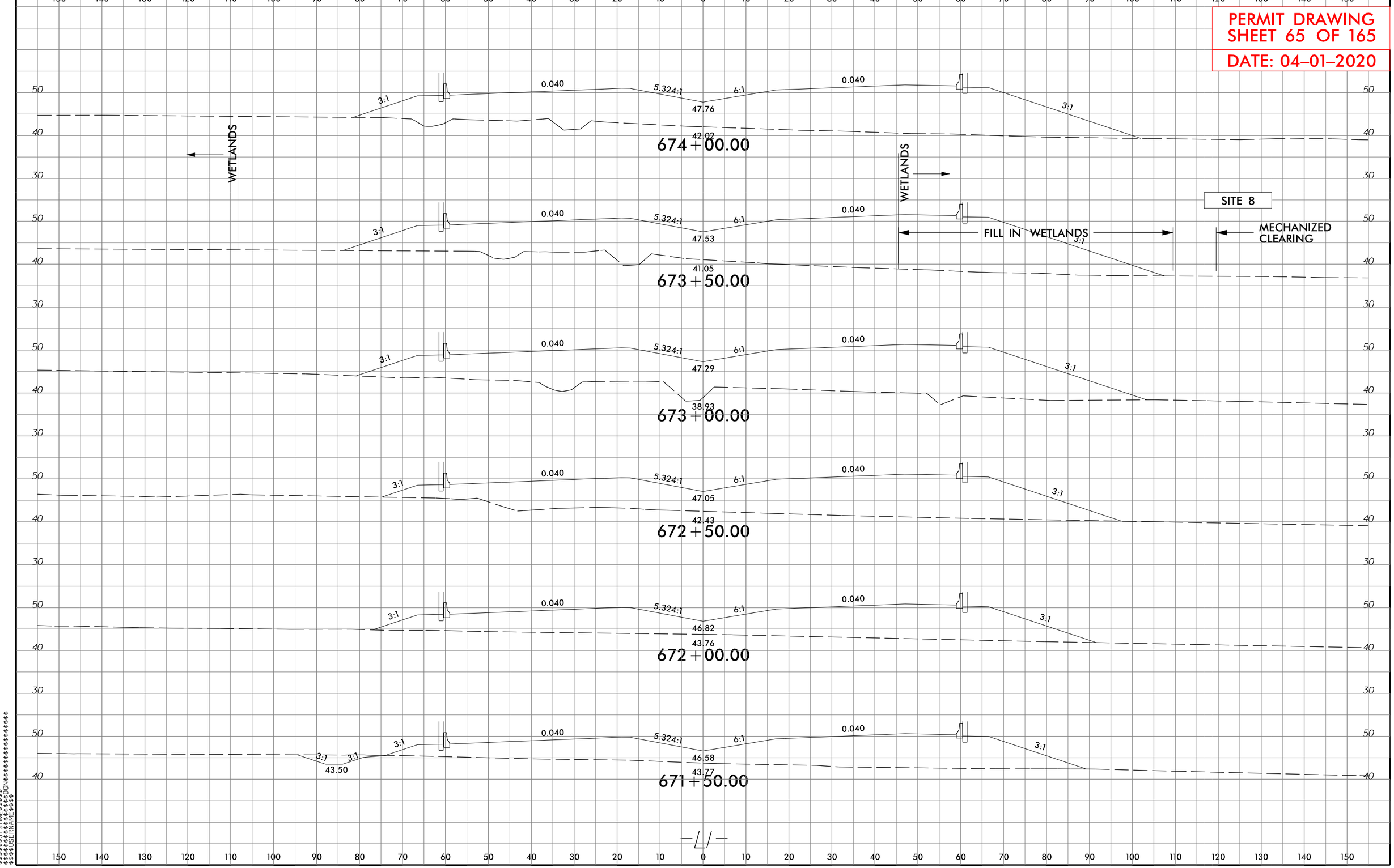
6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-53

0 5 10

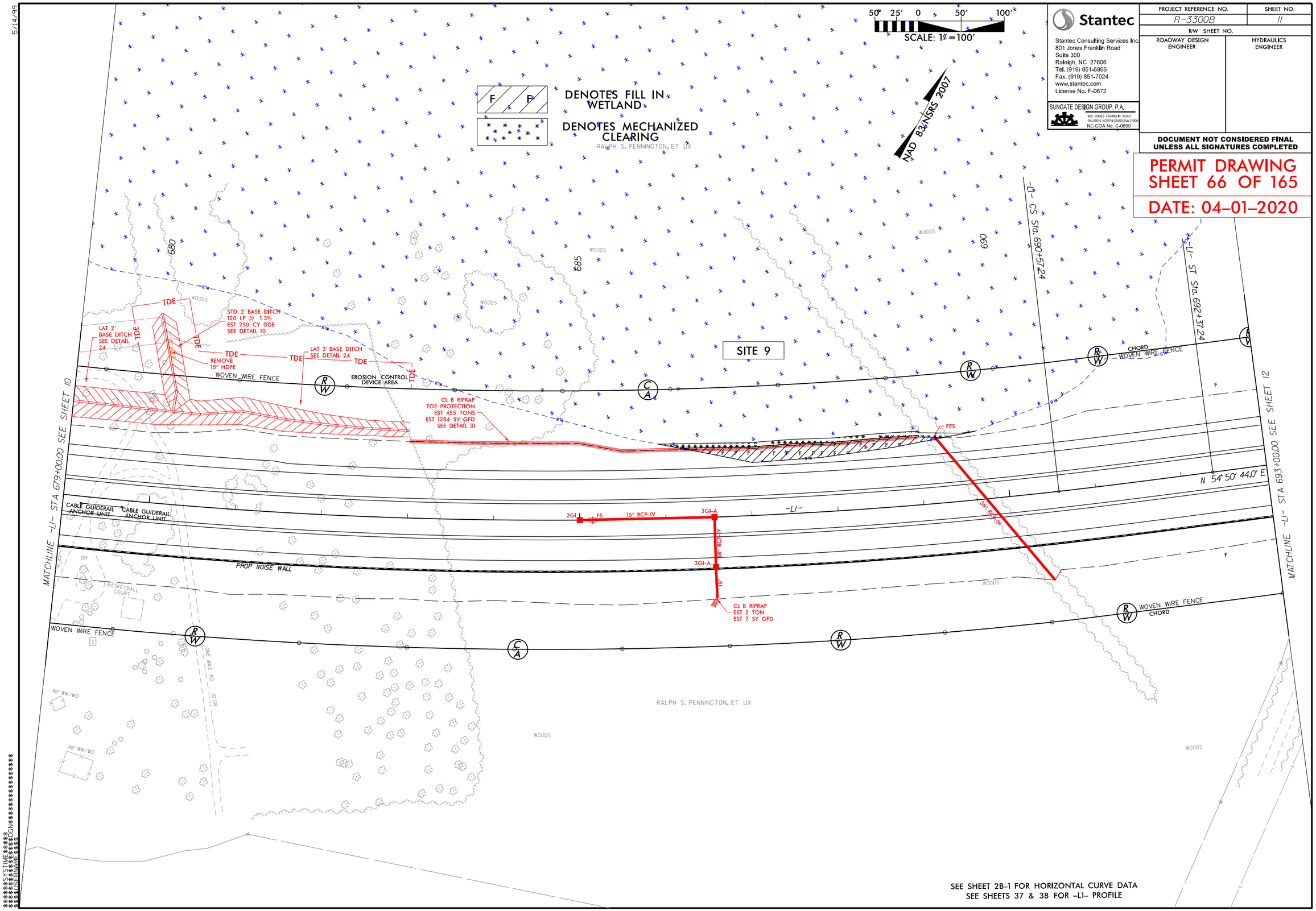
PERMIT DRAWING
SHEET 65 OF 165

DATE: 04-01-2020



$$$$$$$$SYSTIME$$$$
$$$$$$$$SAVEDON$$$$
$$$$USERNAME$$$$

5/14/99



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NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

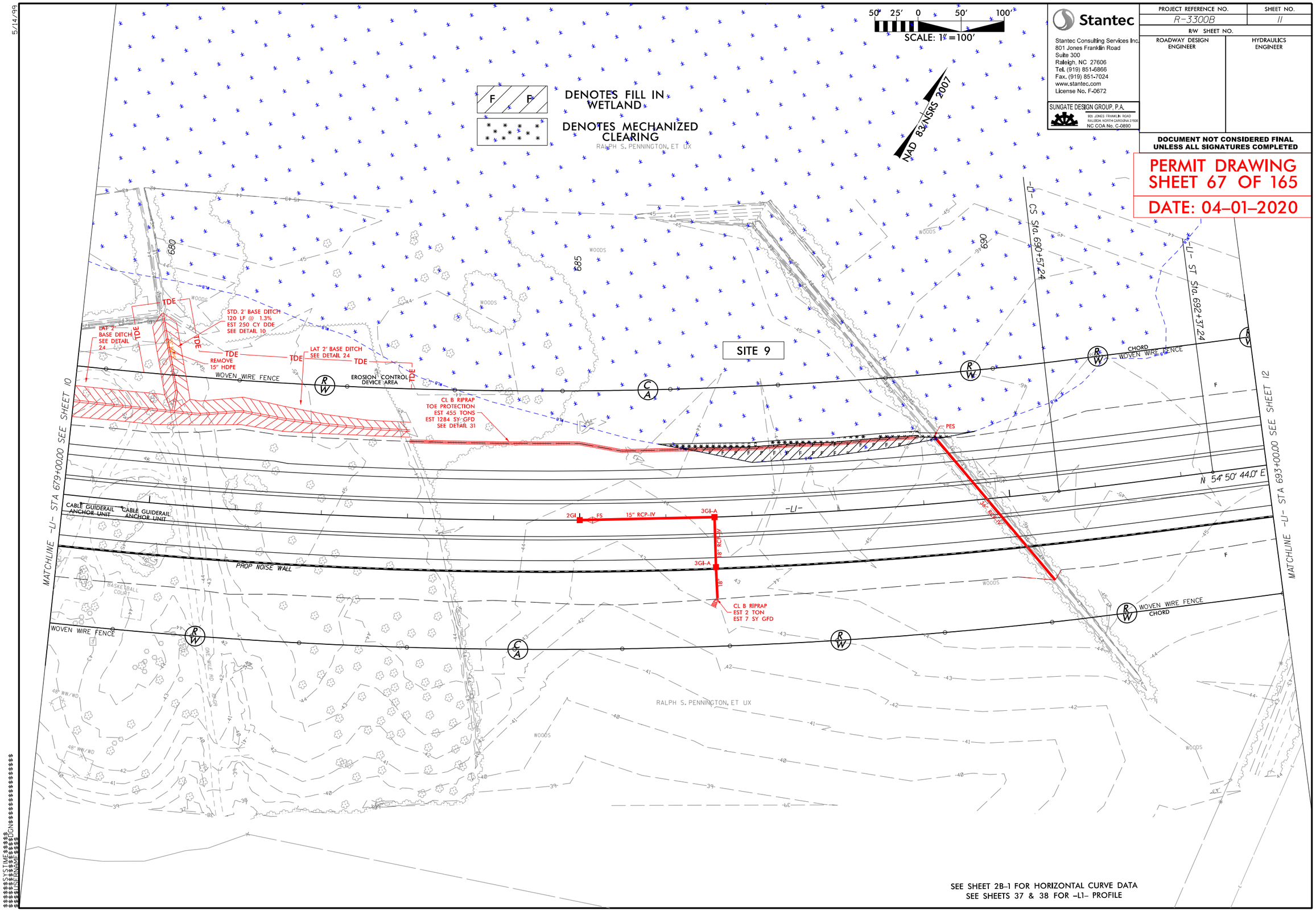
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 66 OF 165

DATE: 04-01-2020

SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS 37 & 38 FOR -L1- PROFILE

5/14/99



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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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SHEET 67 OF 165

DATE: 04-01-2020

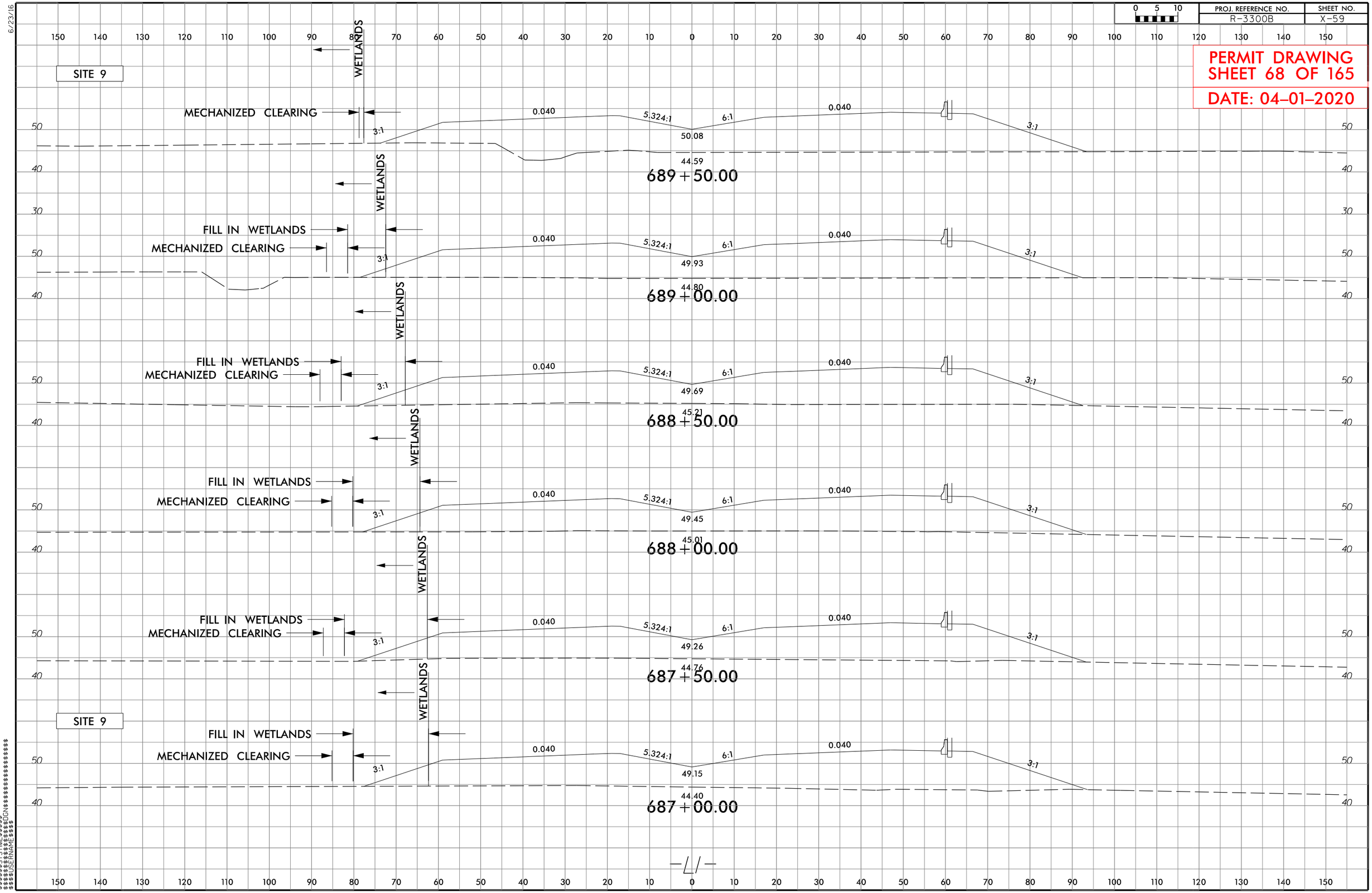
SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS 37 & 38 FOR -L1- PROFILE

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-59

PERMIT DRAWING
SHEET 68 OF 165

DATE: 04-01-2020



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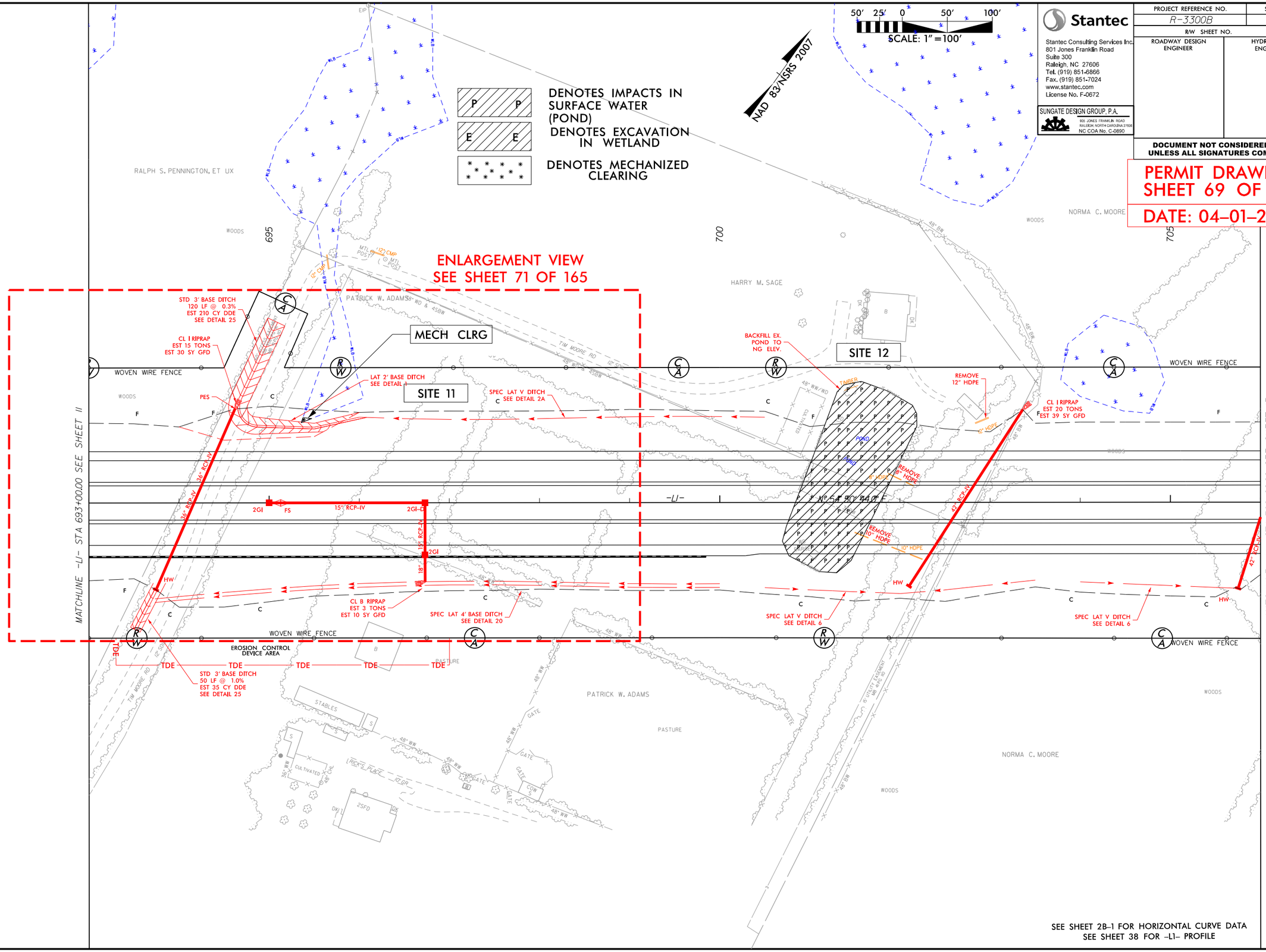
5/14/99



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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 69 OF 165

DATE: 04-01-2020

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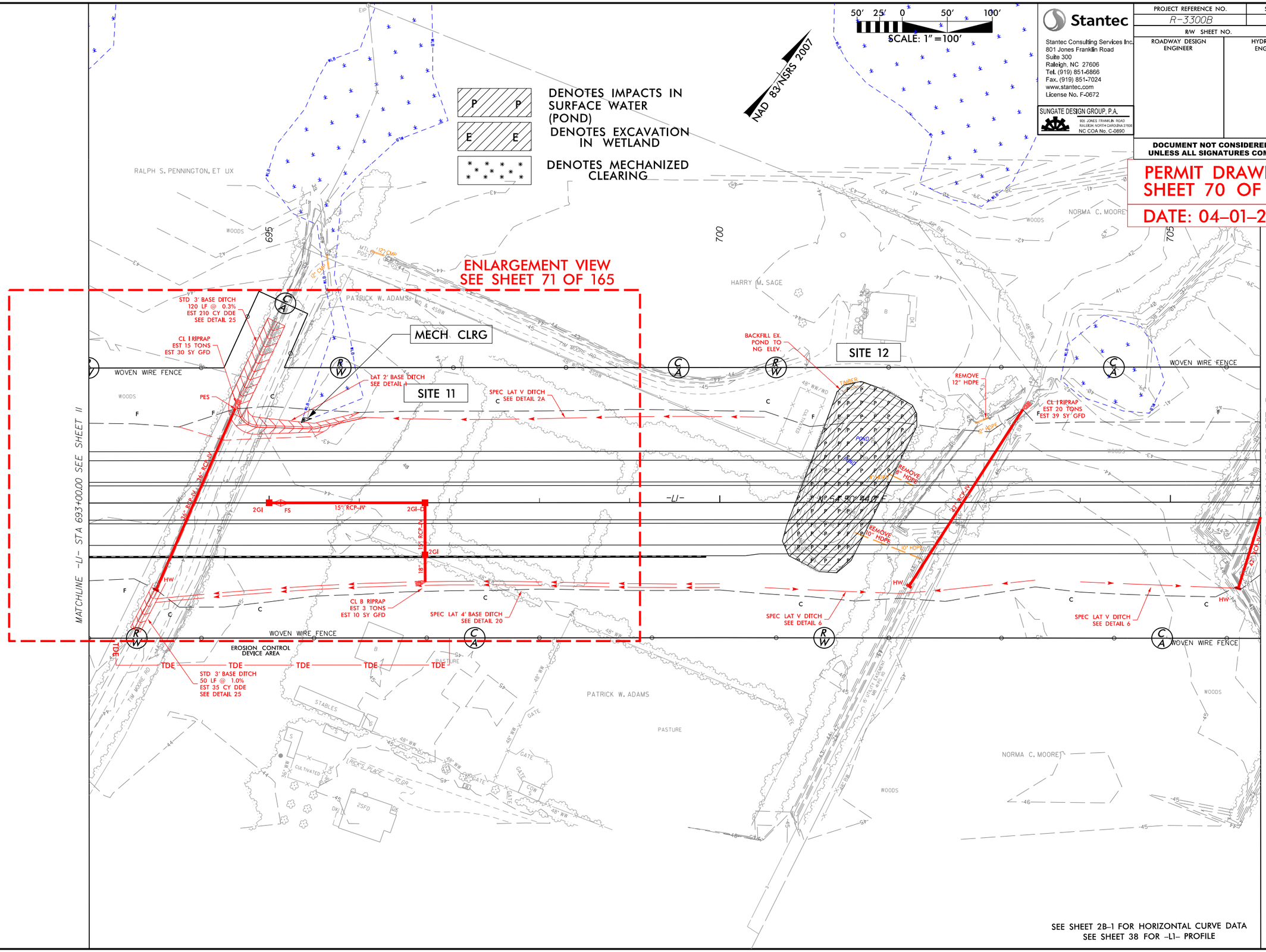
$$$$SZNAME$$$$
$$$$SZFRAME$$$$

5/14/99



SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEET 38 FOR -L1- PROFILE

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R-3300B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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SHEET 70 OF 165

DATE: 04-01-2020

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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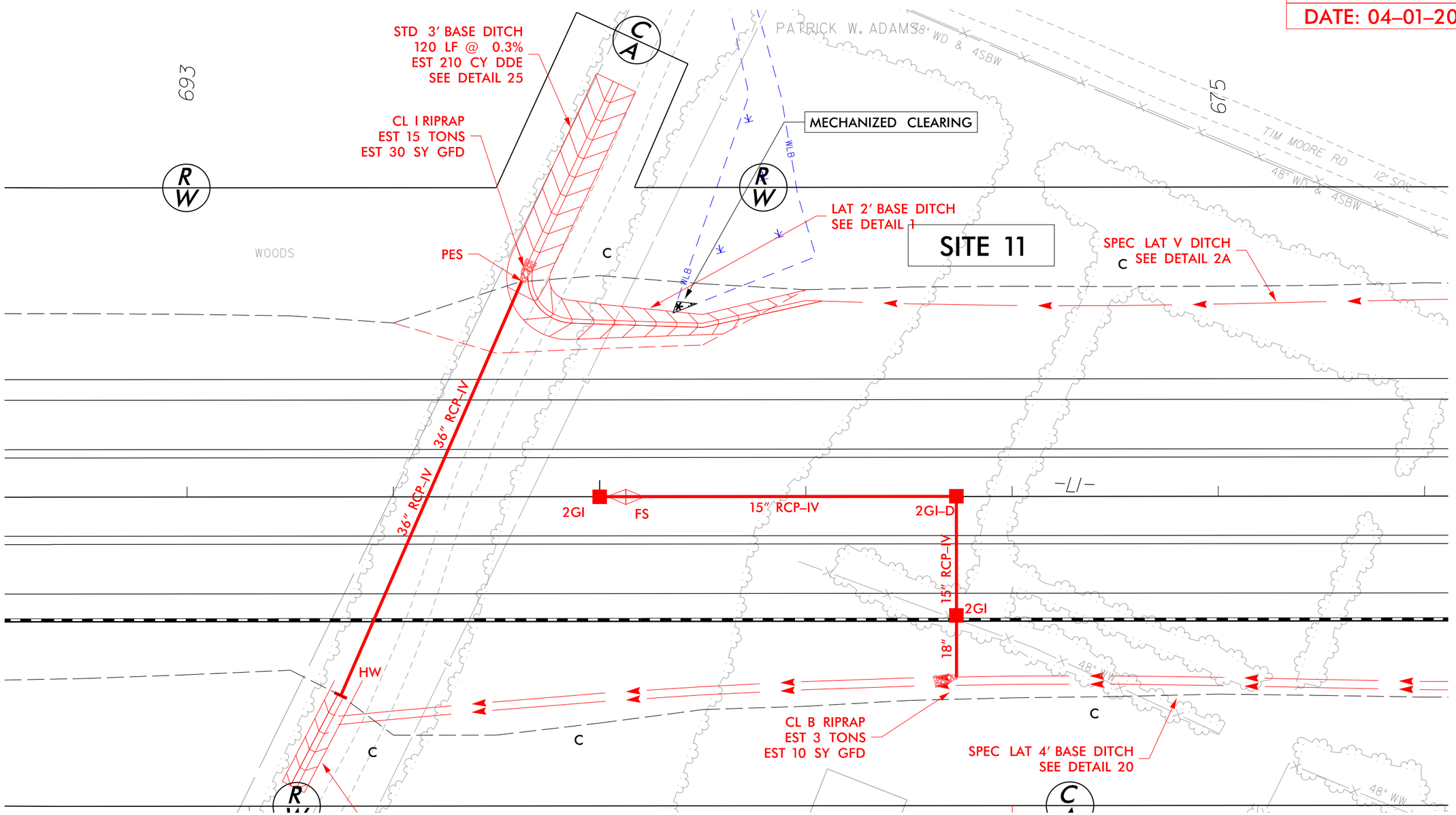
PERMIT DRAWING
SHEET 71 OF 165

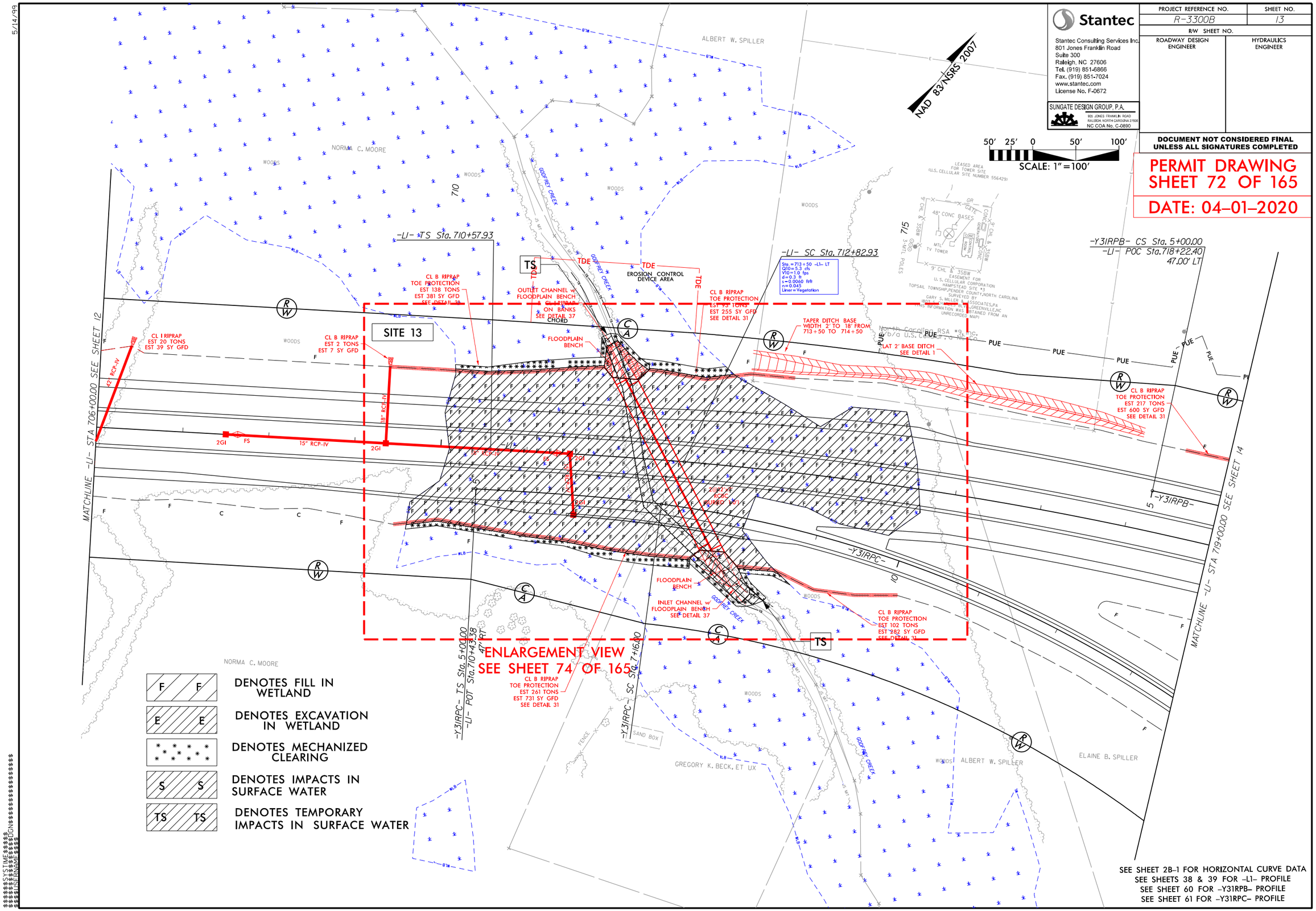
DATE: 04-01-2020

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83



5/14/99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PROJECT REFERENCE NO.
R-3300B
SHEET NO.
13
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
PERMIT DRAWING
SHEET 72 OF 165
DATE: 04-01-2020
NAD 83/NSRS 2007
50' 25' 0 50' 100'
SCALE: 1" = 100'
ALBERT W. SPILLER
NORMA C. MOORE
WOODS
GODFREY CREEK
-LI- TS Sta. 710+57.93
TS
TDE
EROSION CONTROL DEVICE AREA
CL B RIPRAP TOE PROTECTION EST 138 TONS EST 381 SY GFD SEE DETAIL 31
OUTLET CHANNEL w/ FLOODPLAIN BENCH & CL I RIPRAP ON BANKS SEE DETAIL 37
CHORD
FLOODPLAIN BENCH
CL B RIPRAP TOE PROTECTION EST 93 TONS EST 255 SY GFD SEE DETAIL 31
-LI- SC Sta. 712+82.93
Sta.=713+50 -LI- LT
Q10=5.3 cfs
V10=1.0 fps
d=0.3 ft
s=0.0060 ft/ft
n=0.045
Liner=Vegetation
TAPER DITCH BASE WIDTH 2' TO 18' FROM 713+50 TO 714+50
LAT 2' BASE DITCH SEE DETAIL 1
-Y31RPB- CS Sta. 5+00.00
-LI- POC Sta.718+22.40
47.00' LT
LEASED AREA FOR TOWER SITE (U.S. CELLULAR SITE NUMBER 556429)
48' CONC BASES
MTL TV TOWER
9' CHL & 35BW
EASEMENT FOR U.S. CELLULAR CORPORATION
HAMPSTEAD SITE #3
TOPSAIL TOWNSHIP, PENDER COUNTY, NORTH CAROLINA
SURVEYED BY GARY S. MILLER & ASSOCIATES, PA GREENVILLE, NC
INFORMATION WAS OBTAINED FROM AN UNRECORDED MAP)
North Carolina RSA #9, Inc. d/b/a U.S. Cellular
PUE
CL B RIPRAP TOE PROTECTION EST 217 TONS EST 600 SY GFD SEE DETAIL 31
SITE 13
CL I RIPRAP EST 20 TONS EST 39 SY GFD
CL B RIPRAP EST 2 TONS EST 7 SY GFD
12" RCP-IV
18" RCP-IV
15" RCP-IV
2G1
FS
FLOODPLAIN BENCH
INLET CHANNEL w/ FLOODPLAIN BENCH SEE DETAIL 37
CL B RIPRAP TOE PROTECTION EST 102 TONS EST 282 SY GFD SEE DETAIL 31
CL B RIPRAP TOE PROTECTION EST 261 TONS EST 731 SY GFD SEE DETAIL 31
-Y31RPC- TS Sta. 5+00.00
-LI- POT Sta.710+43.38
47.00' RT
-Y31RPC- SC Sta. 7+16.00
ENLARGEMENT VIEW
SEE SHEET 74 OF 165
MATCHLINE -LI- STA 706+00.00 SEE SHEET 12
MATCHLINE -LI- STA 719+00.00 SEE SHEET 14
-Y31RPB-
-Y31RPC-
SAND BOX
FENCE
GREGORY K. BECK, ET UX
ELAINE B. SPILLER
F DENOTES FILL IN WETLAND
E DENOTES EXCAVATION IN WETLAND
DENOTES MECHANIZED CLEARING
S DENOTES IMPACTS IN SURFACE WATER
TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS 38 & 39 FOR -L1- PROFILE
SEE SHEET 60 FOR -Y31RPB- PROFILE
SEE SHEET 61 FOR -Y31RPC- PROFILE

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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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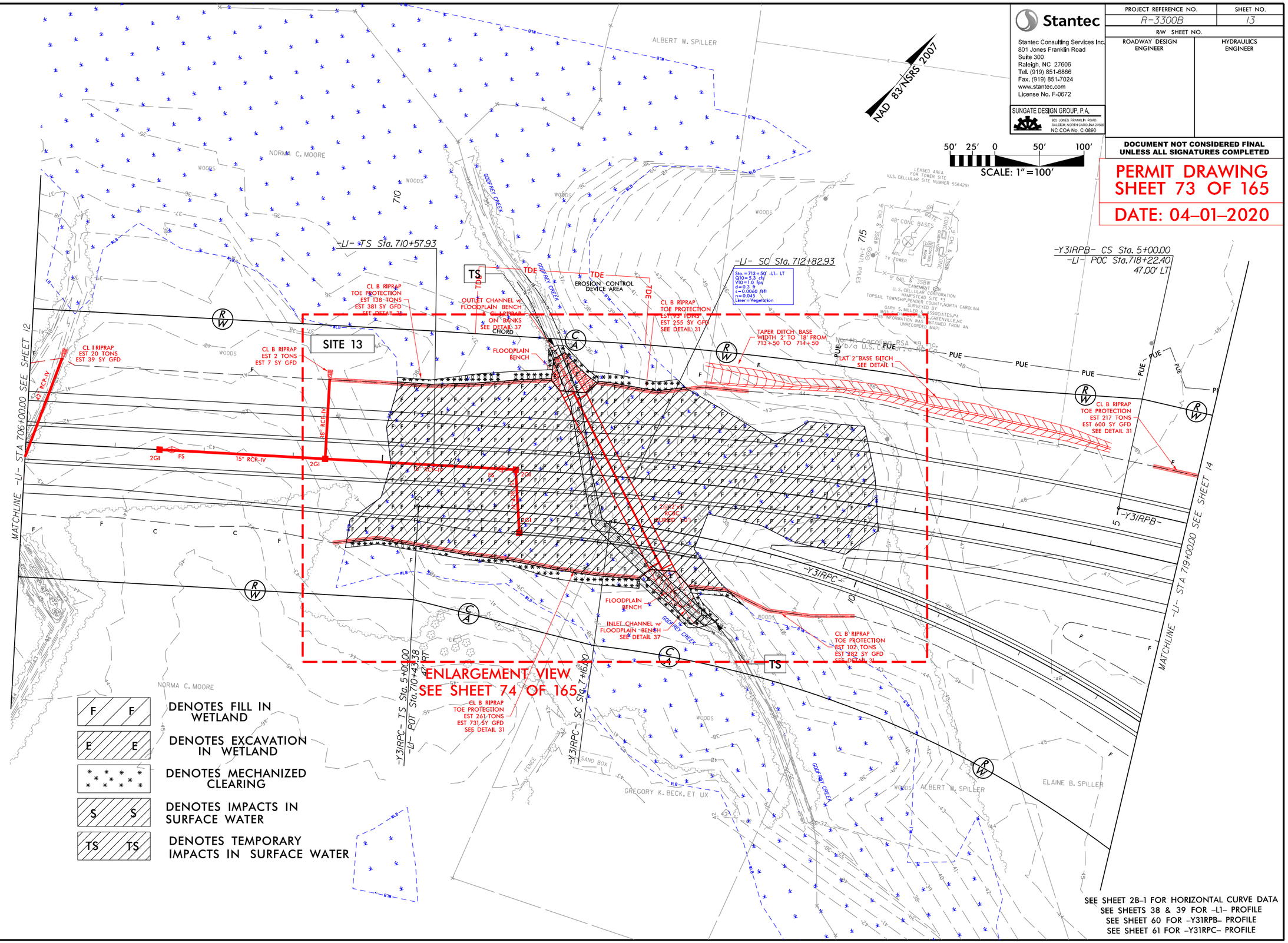
PERMIT DRAWING SHEET 73 OF 165

DATE: 04-01-2020



SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS 38 & 39 FOR -L1- PROFILE
SEE SHEET 60 FOR -Y31RPB- PROFILE
SEE SHEET 61 FOR -Y31RPC- PROFILE

5/14/99

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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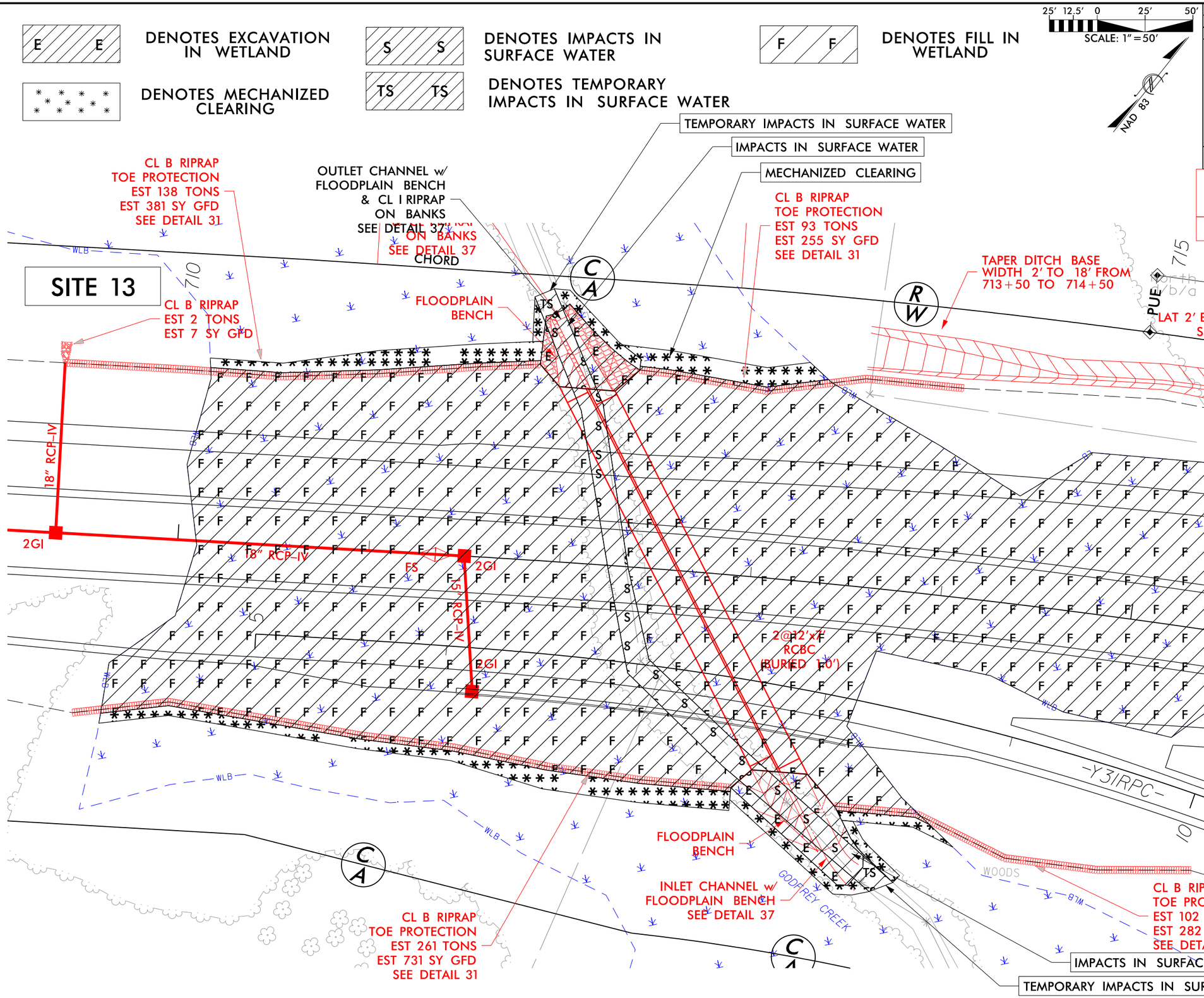
PERMIT DRAWING
SHEET 74 OF 165

DATE: 04–01–2020



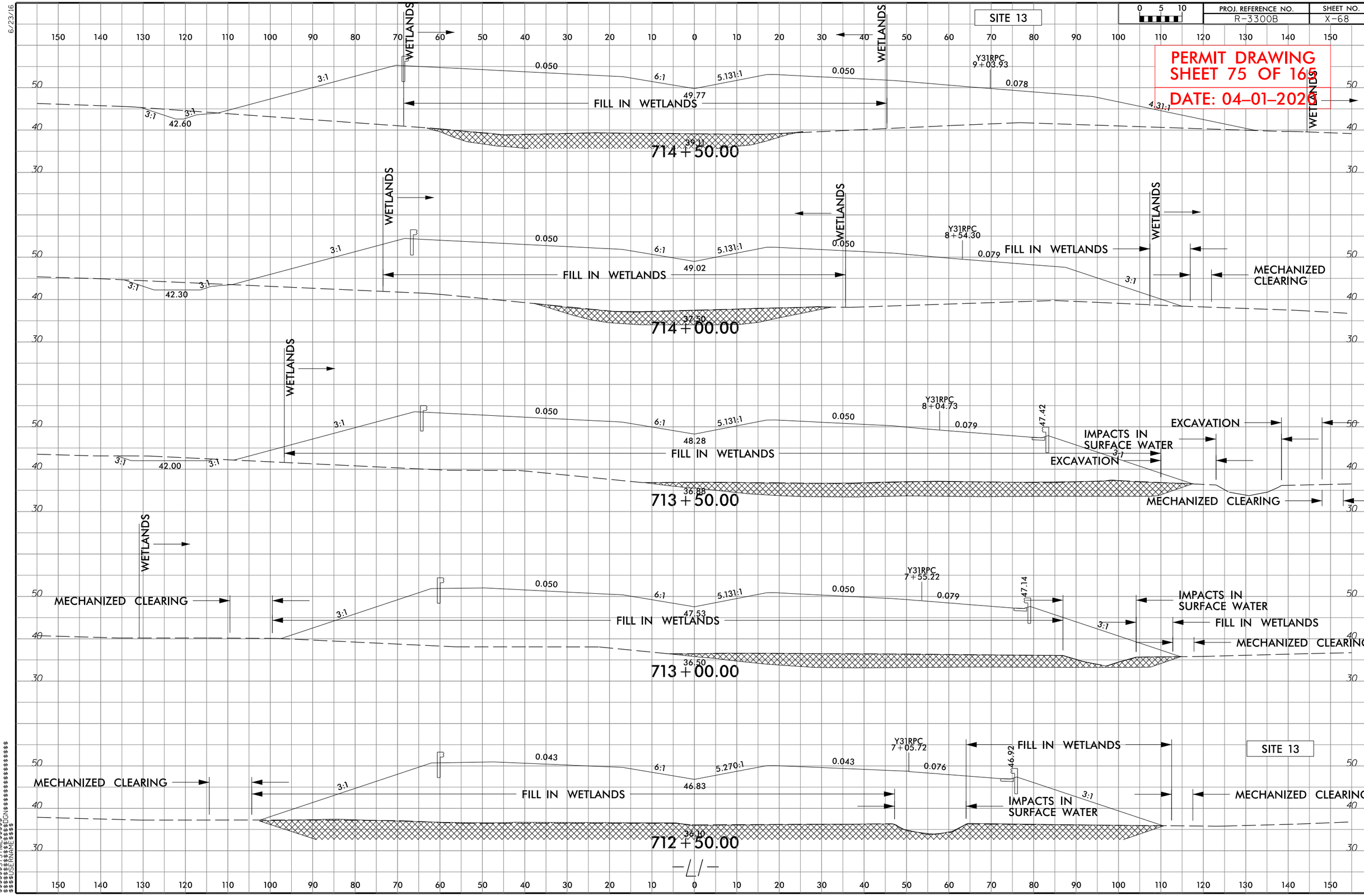
6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-68

0 5 10

SITE 13

PERMIT DRAWING
SHEET 75 OF 165
DATE: 04-01-2023



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$$$$USERNAME$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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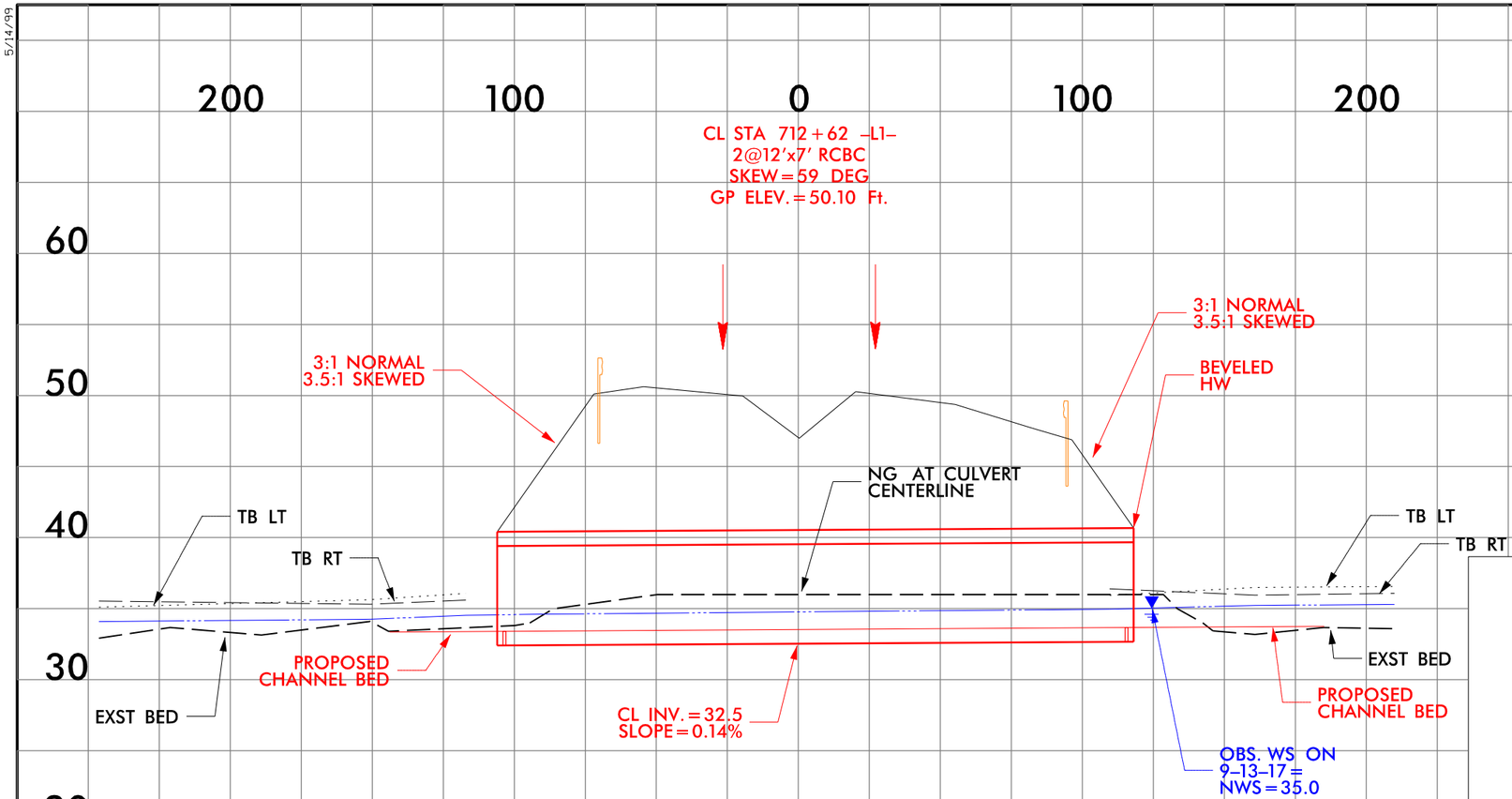
PERMIT DRAWING
SHEET 76 OF 165

DATE: 04-01-2020

SITE 13



MULTI-BARREL CULVERT LOW FLOW CHANNEL, SILLS AND FLOODPLAIN BENCH

(NOT TO SCALE)

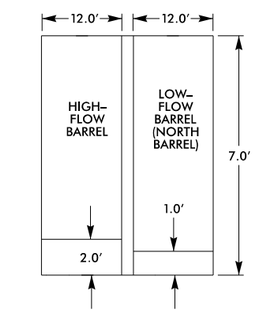
*NOTES:

1) NATIVE MATERIAL BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP-RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL(S). IF RIP-RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL(S), NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

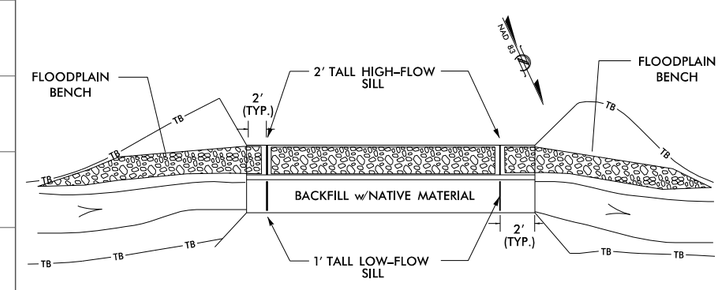
2) SILLS ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

3) TOP OF LOW FLOW SILLS SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) DO NOT SET ELEVATION OF HIGH SILLS ABOVE BANK FULL.



SILLS AT INLET AND OUTLET

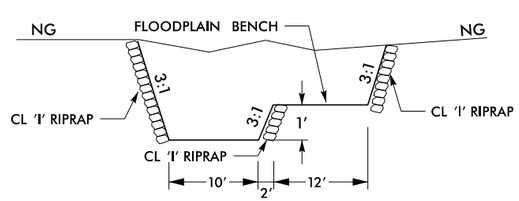


PLAN VIEW

9/13

INLET & OUTLET CHANNEL DETAIL

(NOT TO SCALE)



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R-3300B	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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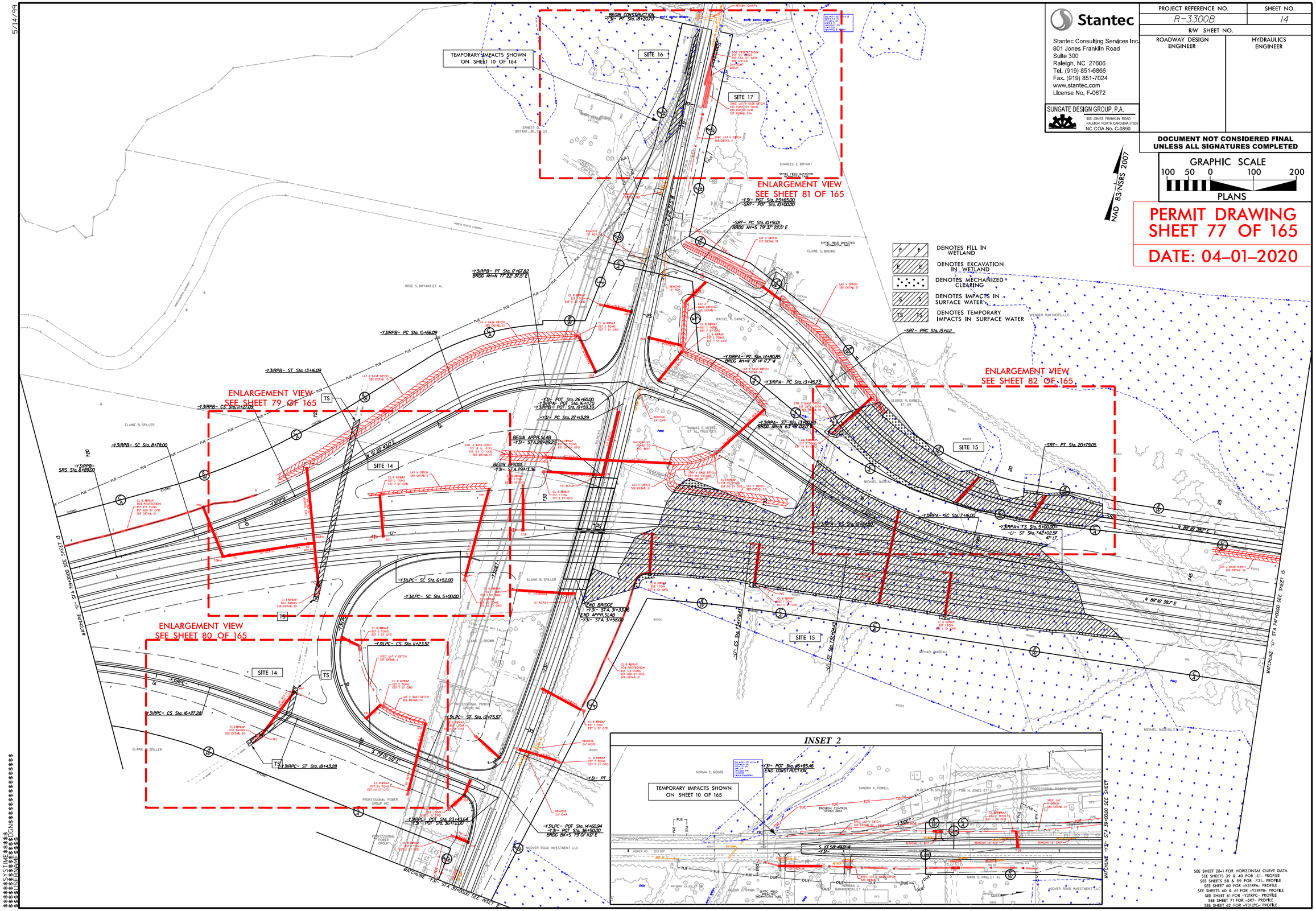
GRAPHIC SCALE
100 50 0 100 200
PLANS

NAD 83/NSRS 2007

PERMIT DRAWING SHEET 77 OF 165

DATE: 04–01–2020

F F DENOTES FILL IN WETLAND
F E DENOTES EXCAVATION IN WETLAND
DENOTES MECHANIZED CLEARING
S S DENOTES IMPACTS IN SURFACE WATER
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER



SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS 39 & 40 FOR -L1- PROFILE
SEE SHEETS 58 & 59 FOR -Y3I- PROFILE
SEE SHEET 60 FOR -Y3IRPA- PROFILE
SEE SHEETS 60 & 61 FOR -Y3IRPB- PROFILE
SEE SHEET 61 FOR -Y3IRPC- PROFILE
SEE SHEET 71 FOR -SR7- PROFILE
SEE SHEET 62 FOR -Y3ILPC- PROFILE

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NC COA No. C-0890

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R-3300B	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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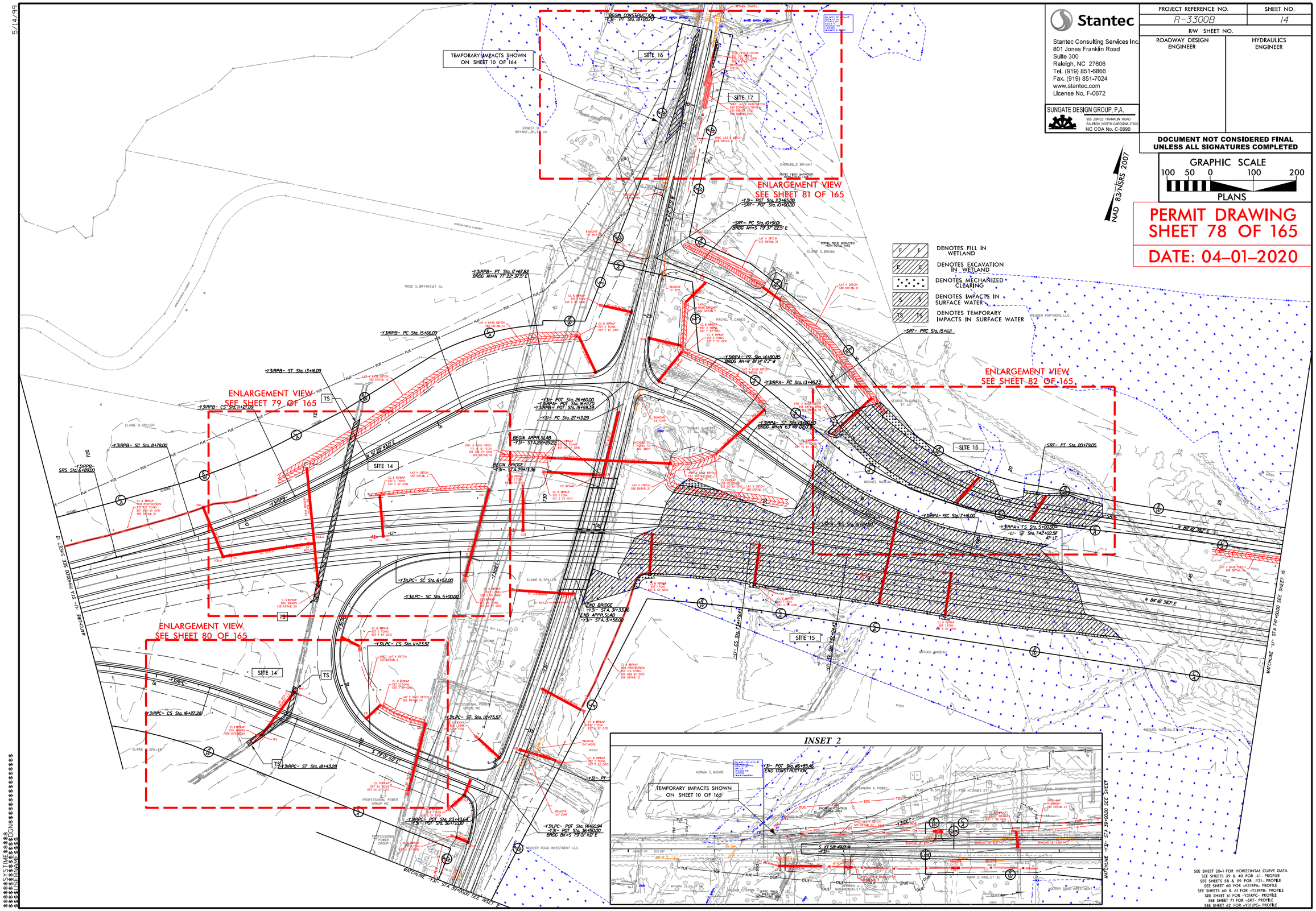
GRAPHIC SCALE
100 50 0 100 200
PLANS

PERMIT DRAWING SHEET 78 OF 165

DATE: 04-01-2020

NAD 83/NSRS 2007

F F	DENOTES FILL IN WETLAND
E E	DENOTES EXCAVATION IN WETLAND
✱ ✱ ✱	DENOTES MECHANIZED CLEARING
S S	DENOTES IMPACTS IN SURFACE WATER
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER



SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS 39 & 40 FOR -L1- PROFILE
SEE SHEETS 58 & 59 FOR -Y31- PROFILE
SEE SHEET 60 FOR -Y31RPA- PROFILE
SEE SHEETS 60 & 61 FOR -Y31RPB- PROFILE
SEE SHEET 61 FOR -Y31RPC- PROFILE
SEE SHEET 71 FOR -SR7- PROFILE
SEE SHEET 62 FOR -Y31LPC- PROFILE

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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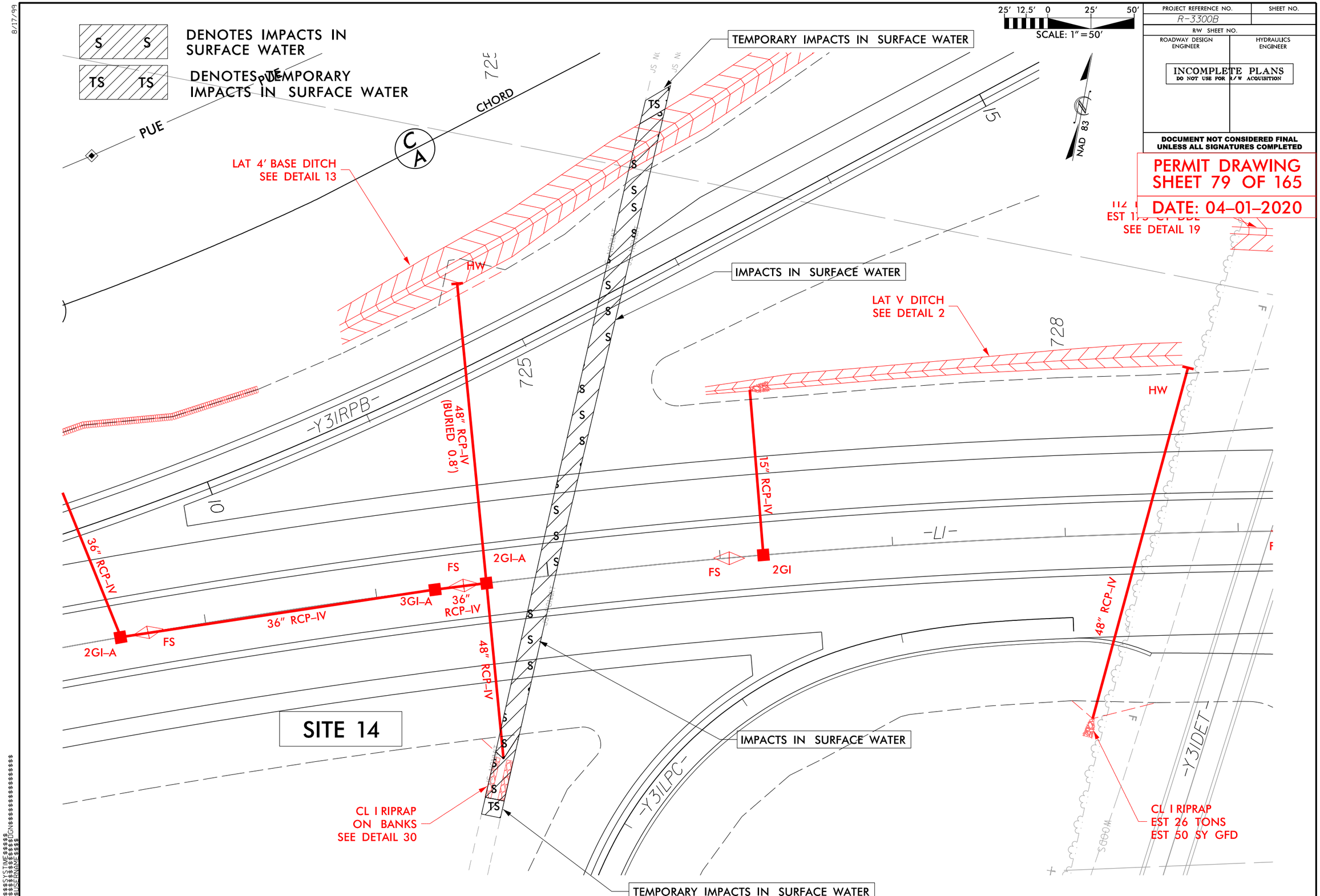
PERMIT DRAWING
SHEET 79 OF 165

DATE: 04-01-2020



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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING
SHEET 80 OF 165

DATE: 04-01-2020

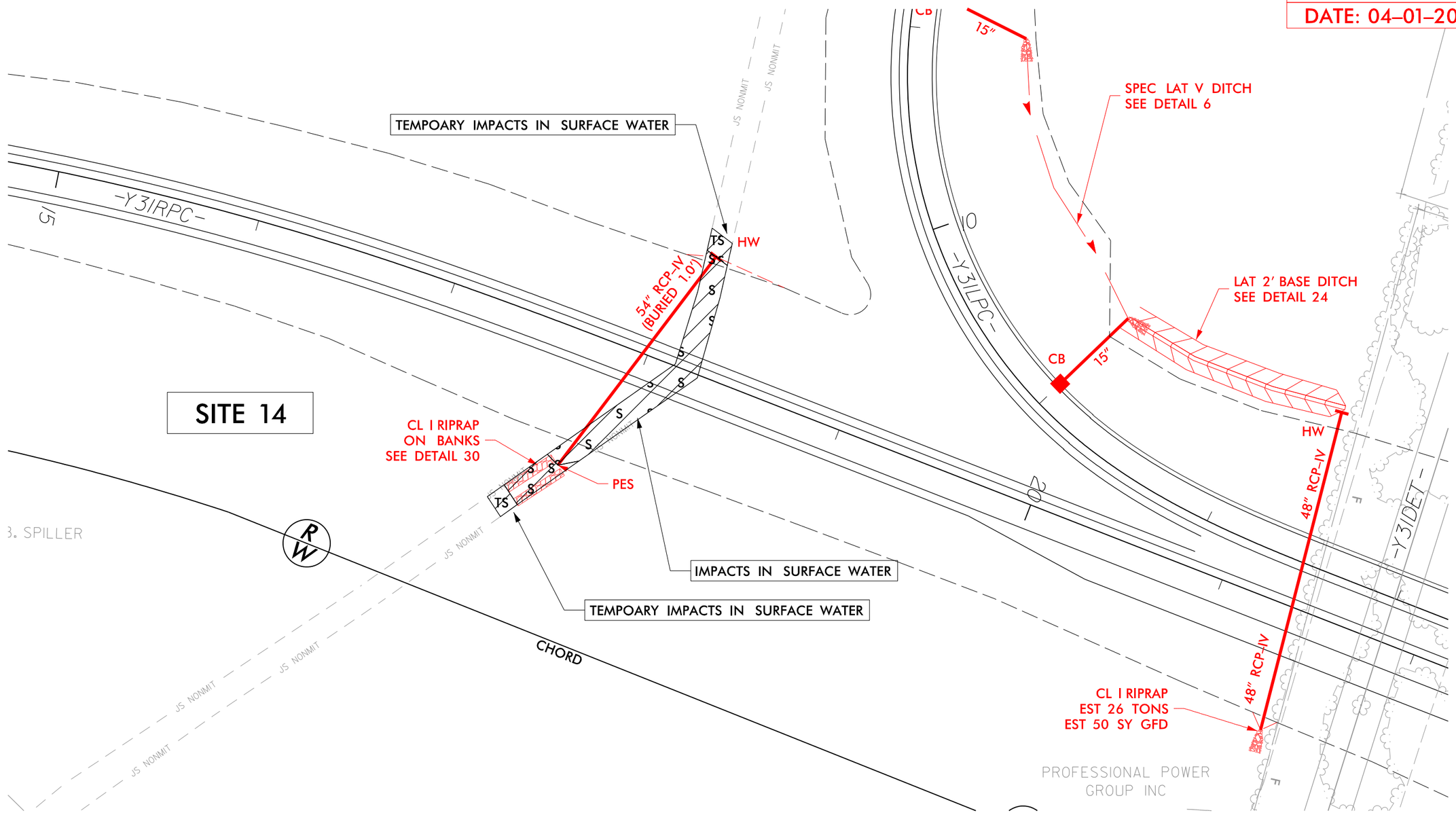
SCALE: 1" = 50'

25' 12.5' 0 25' 50'

NAD 83

S DENOTES IMPACTS IN SURFACE WATER

TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER



8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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PERMIT DRAWING
SHEET 81 OF 165

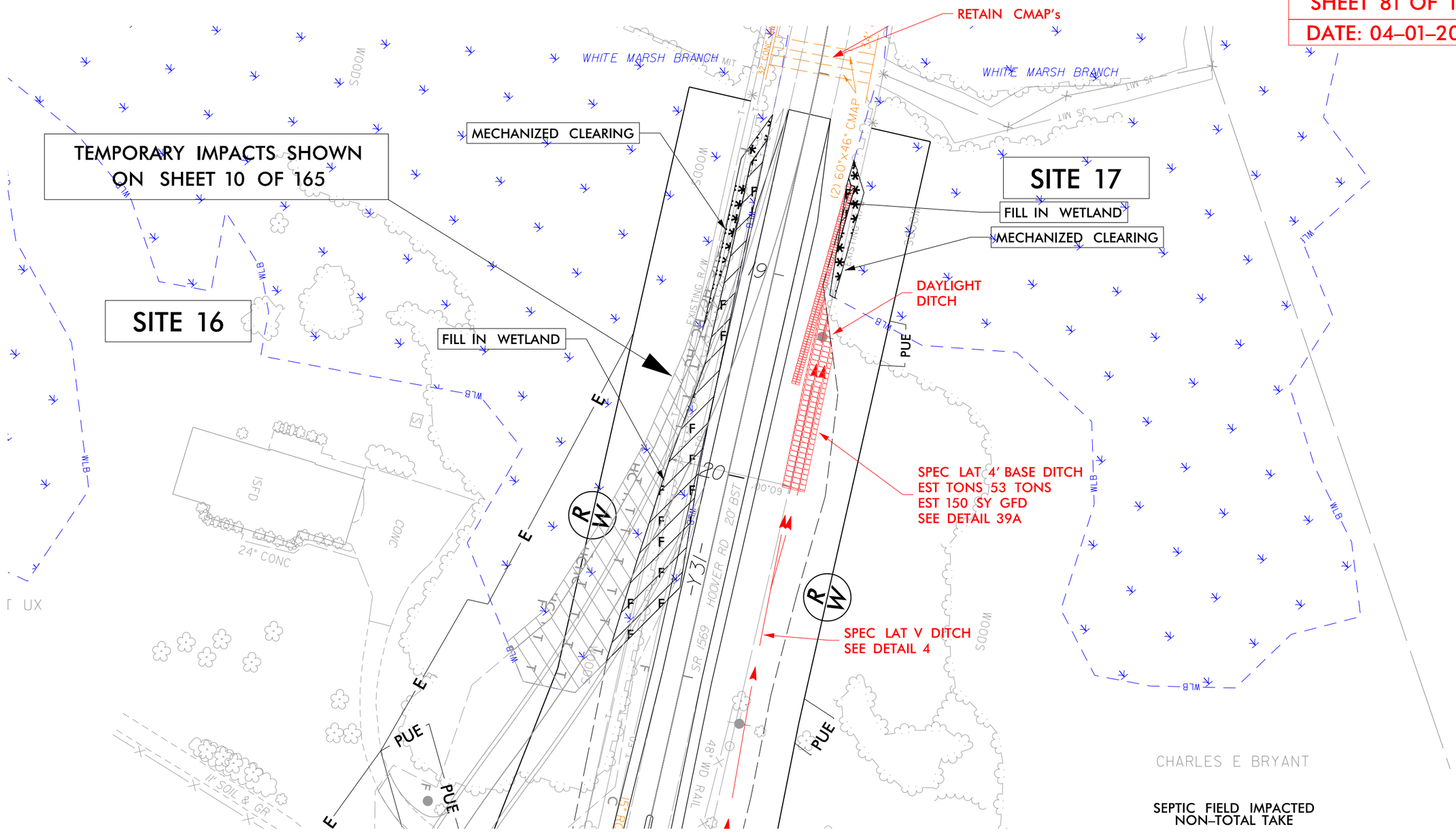
DATE: 04-01-2020

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83



8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 82 OF 165

DATE: 04-01-2020

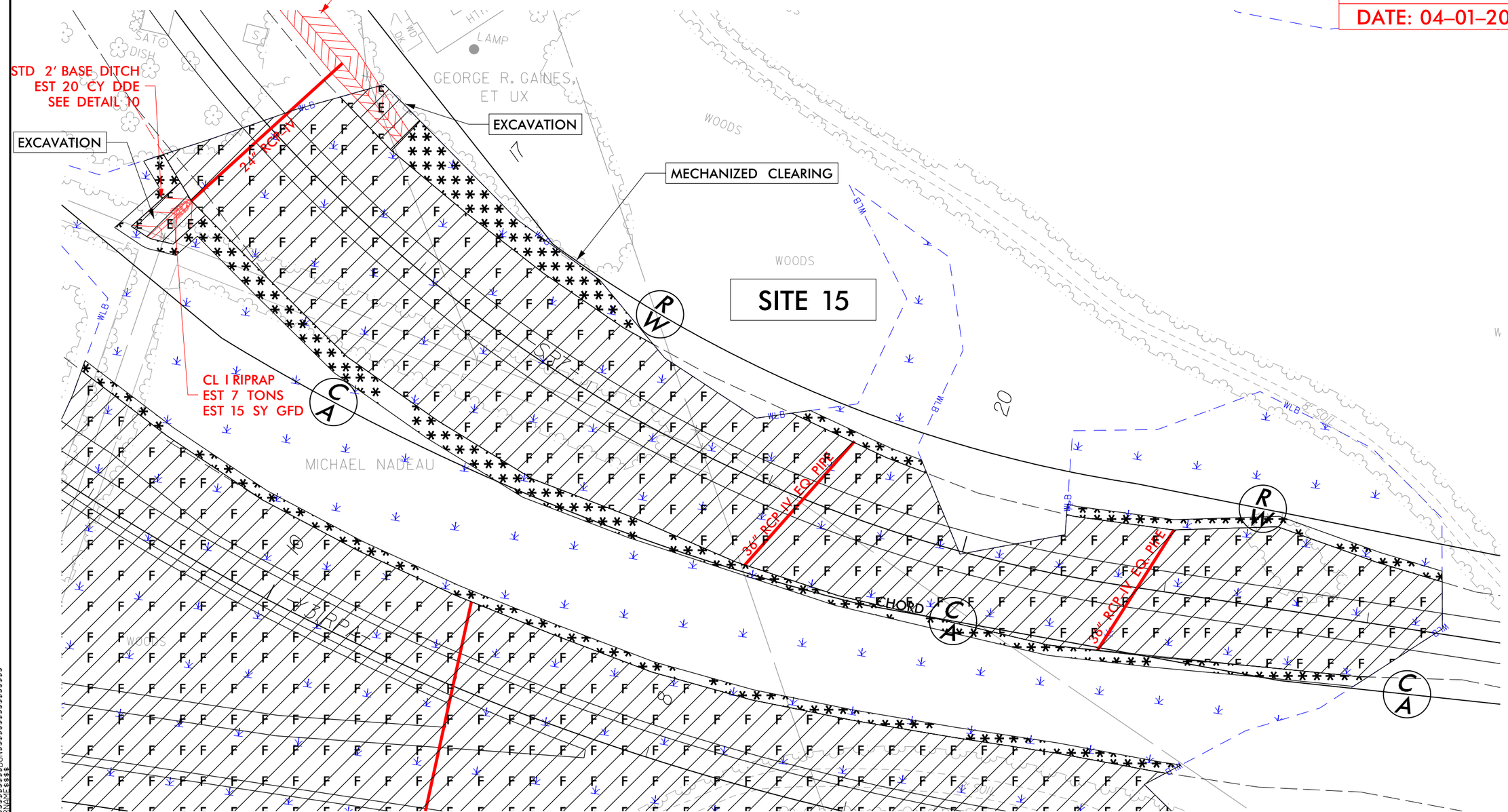
25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

F F — DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

E E — DENOTES EXCAVATION IN WETLAND

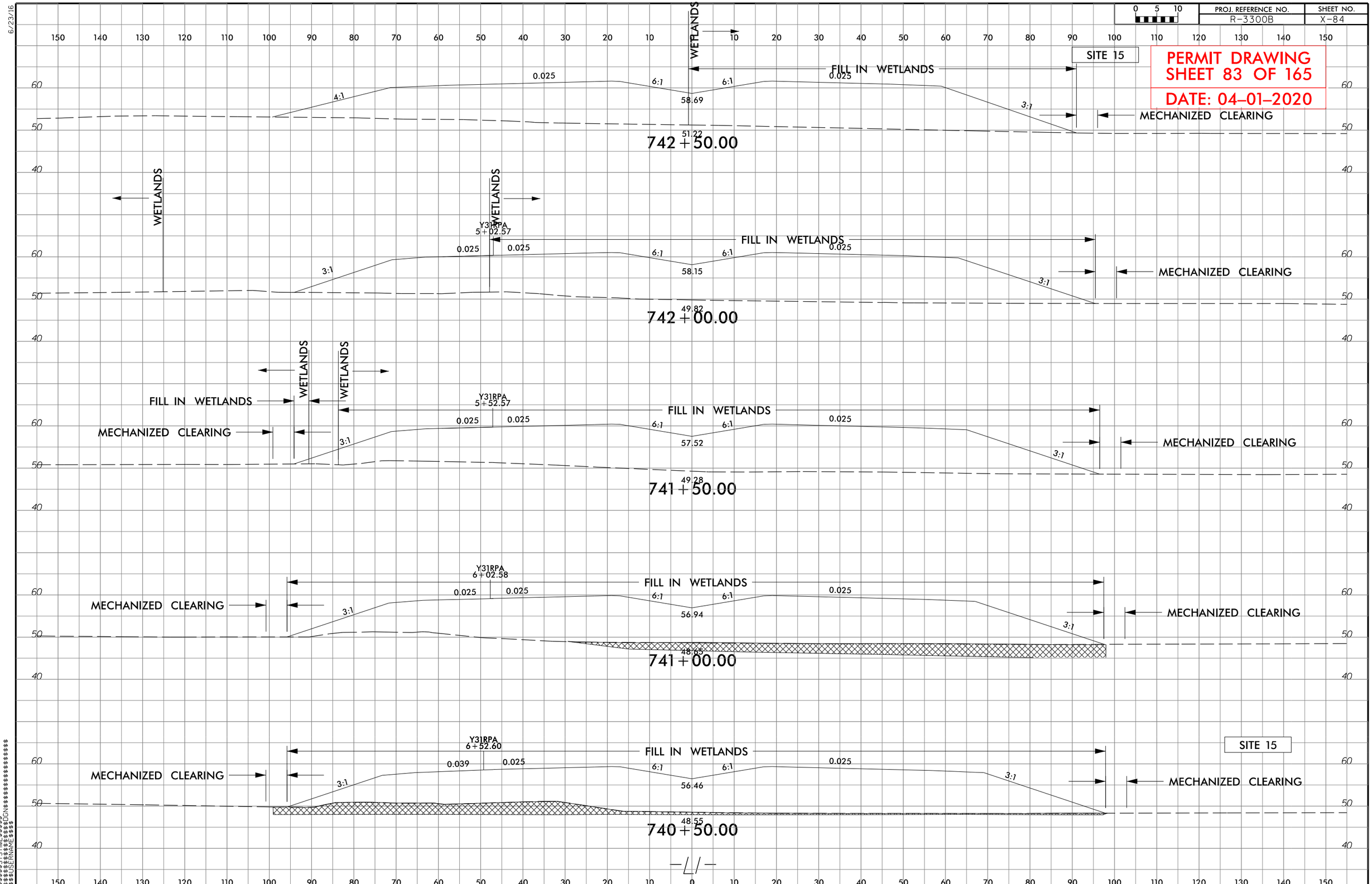


6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-84

0 5 10

PERMIT DRAWING
SHEET 83 OF 165
DATE: 04-01-2020

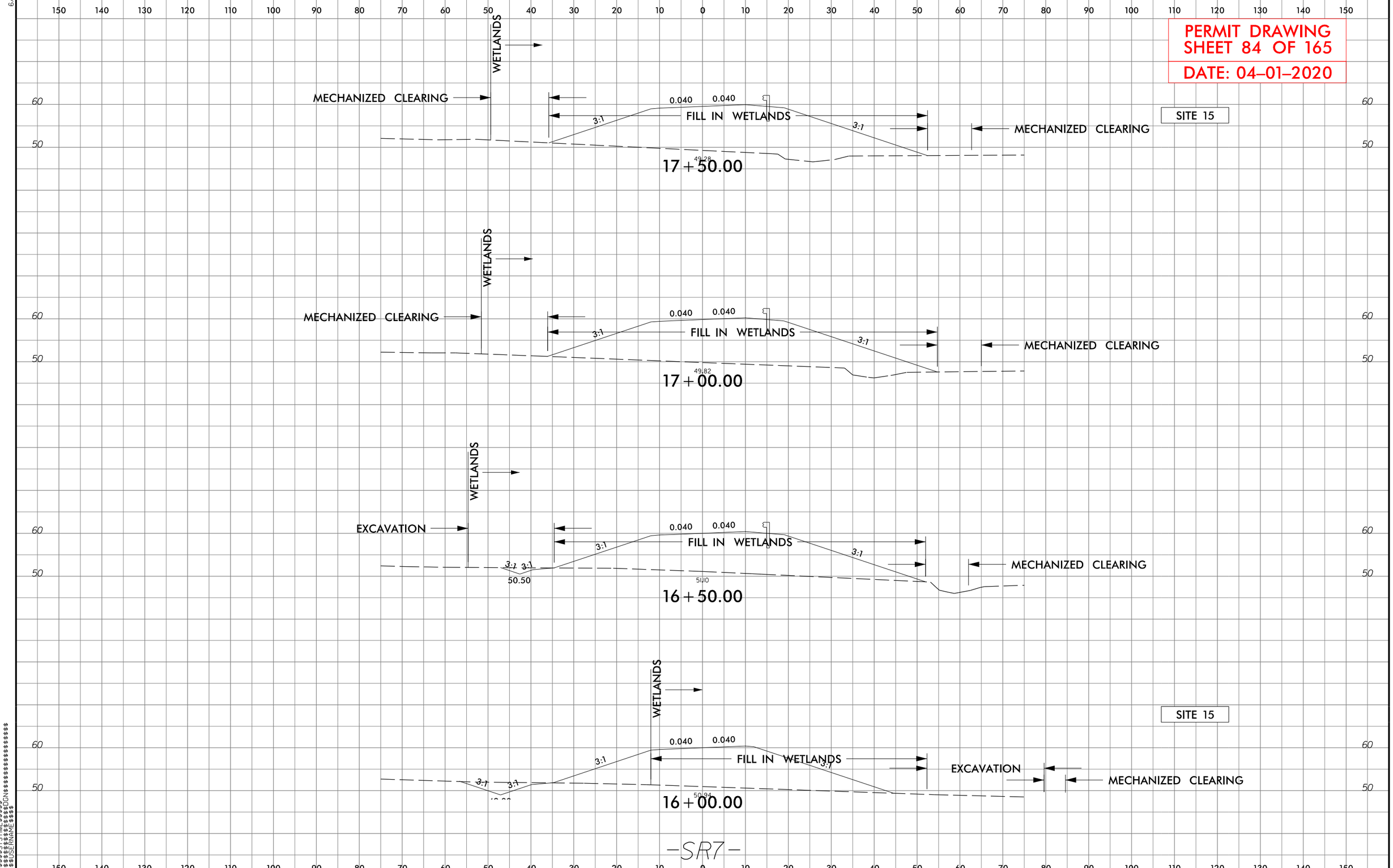


$$$$$$SYSTIME$$$$
$$$$$$$$NAME$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$$$USERNAME$$$$

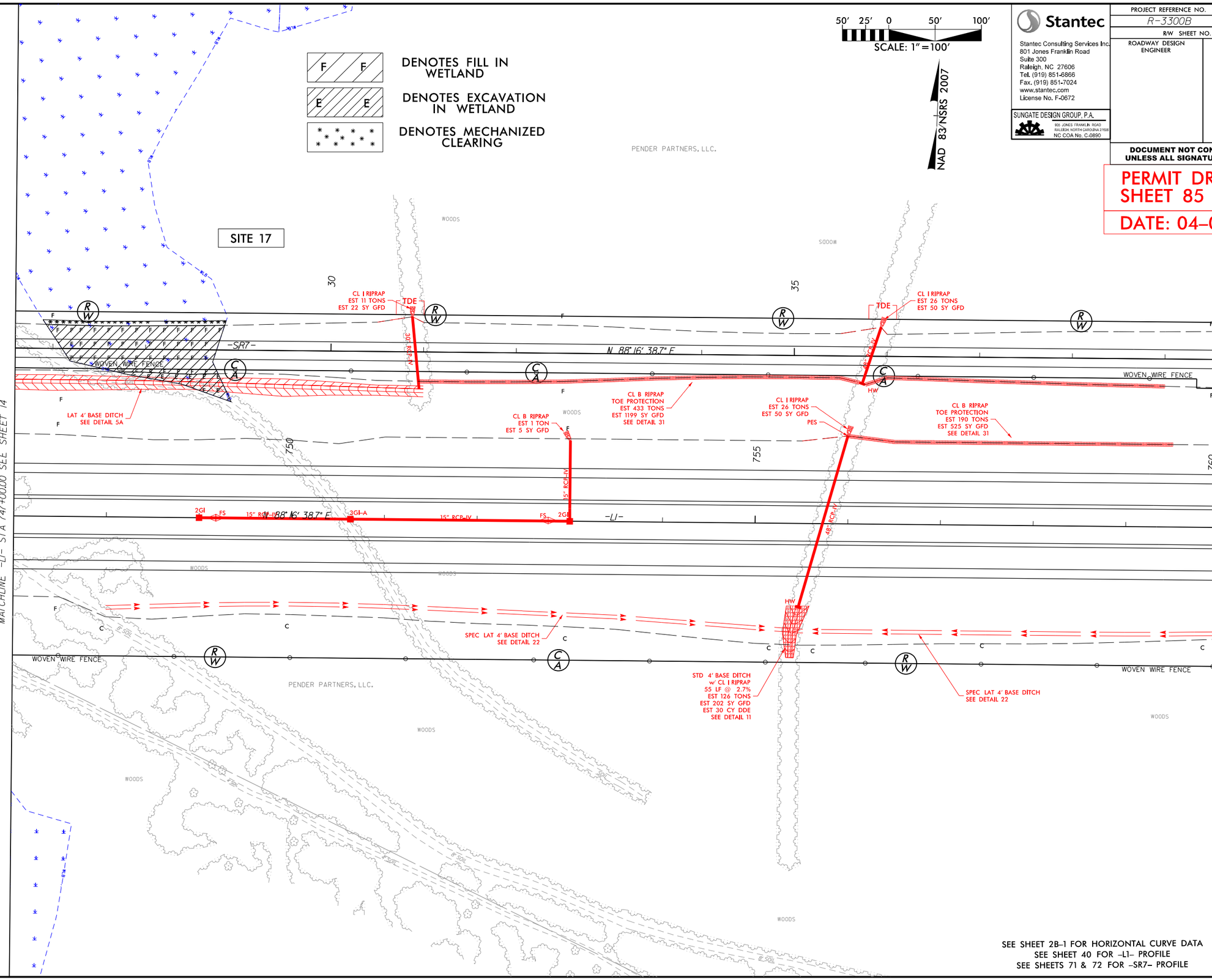
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3300B	X-410

PERMIT DRAWING
SHEET 84 OF 165

DATE: 04-01-2020



5/14/99



SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEET 40 FOR -L1- PROFILE
SEE SHEETS 71 & 72 FOR -SR7- PROFILE

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801 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

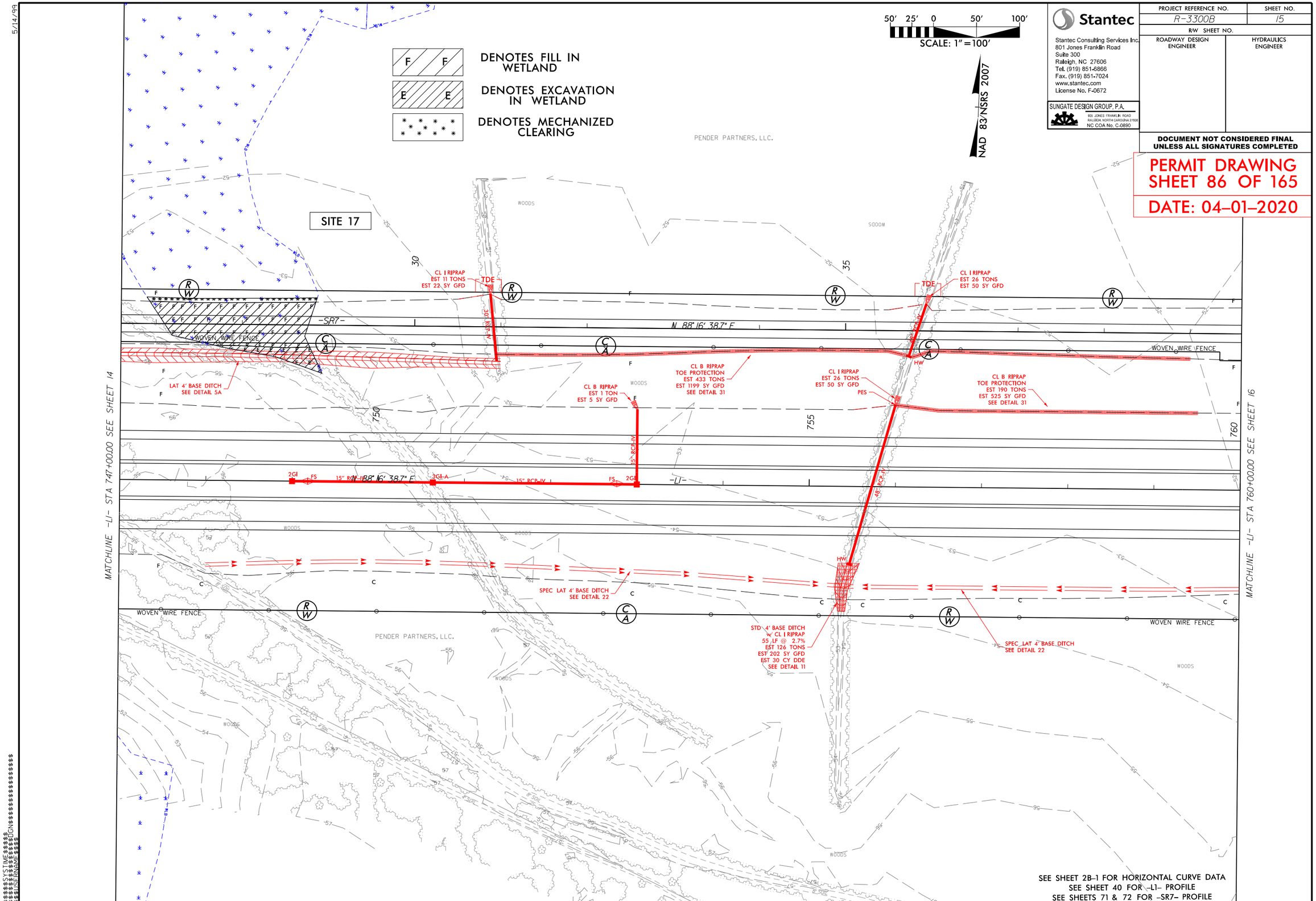
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 85 OF 165

DATE: 04-01-2020

$$$$SYSTIME$$$$
$$$$USERNAME$$$$
$$$$DGN$$$$

5/14/99



SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEET 40 FOR -L1- PROFILE
SEE SHEETS 71 & 72 FOR -SR7- PROFILE

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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 86 OF 165

DATE: 04-01-2020

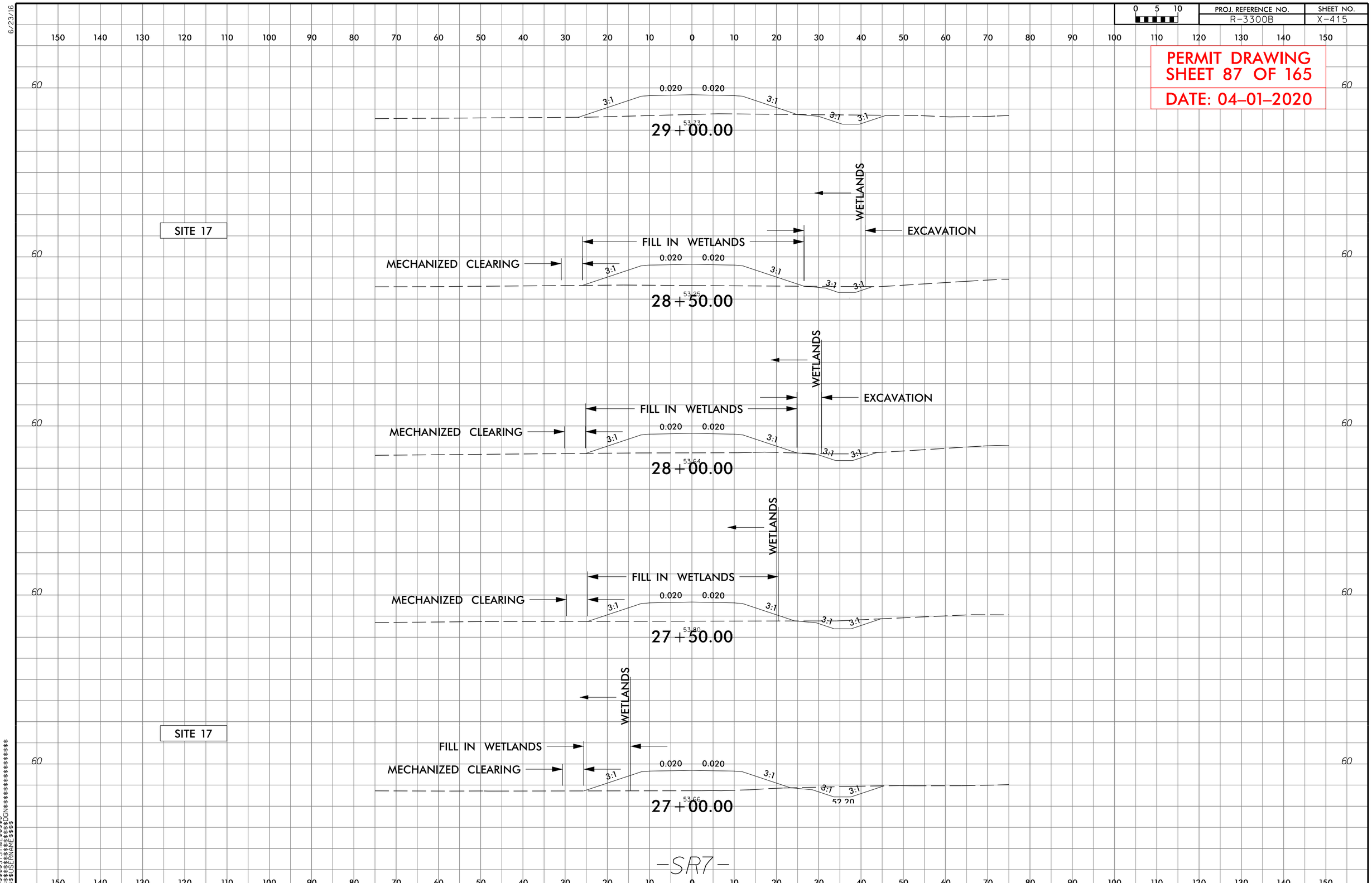
$$$$SYSTIME$$$$
$$$$USERNAME$$$$
$$$$DGN$$$$

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3300B	X-415

PERMIT DRAWING
SHEET 87 OF 165

DATE: 04-01-2020



$$$$SYSTIME$$$$
$$$$SAVEDON$$$$
$$$$USERNAME$$$$

5/14/99

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RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

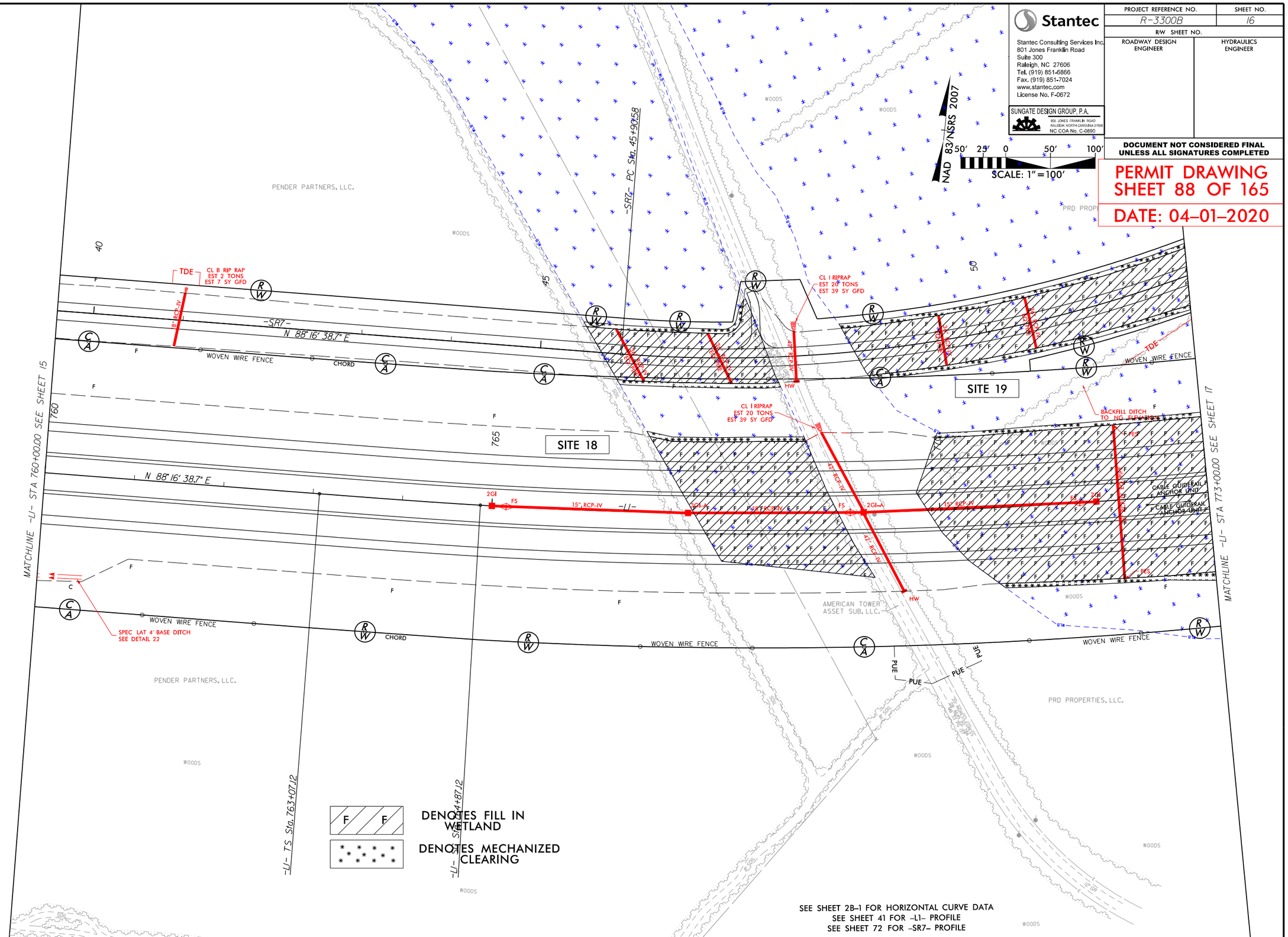
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 88 OF 165

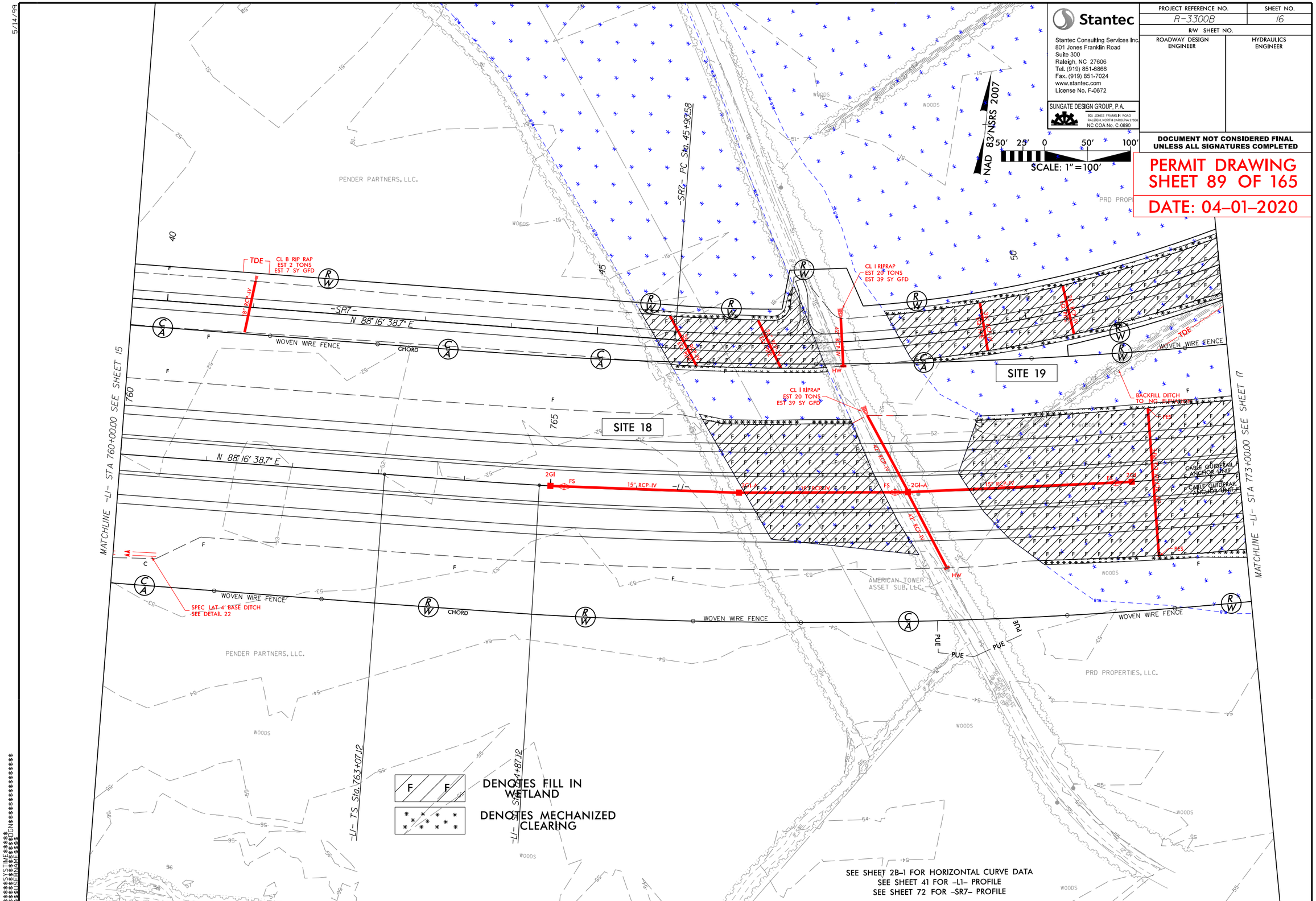
DATE: 04-01-2020

NAD 83/NSRS 2007

50' 25' 0 50' 100'
SCALE: 1" = 100'



5/14/99



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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 89 OF 165

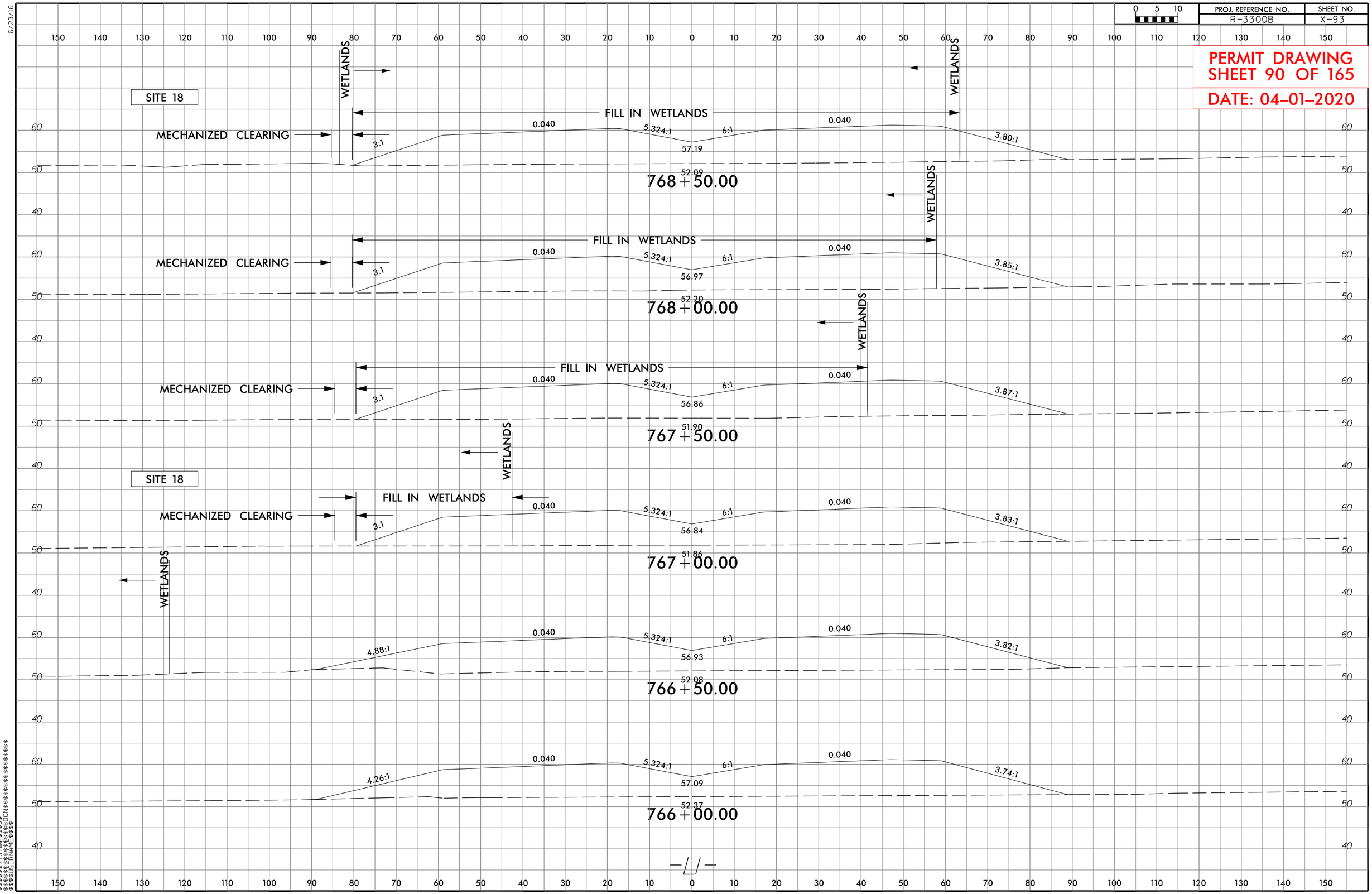
DATE: 04-01-2020

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-93

PERMIT DRAWING
SHEET 90 OF 165

DATE: 04-01-2020



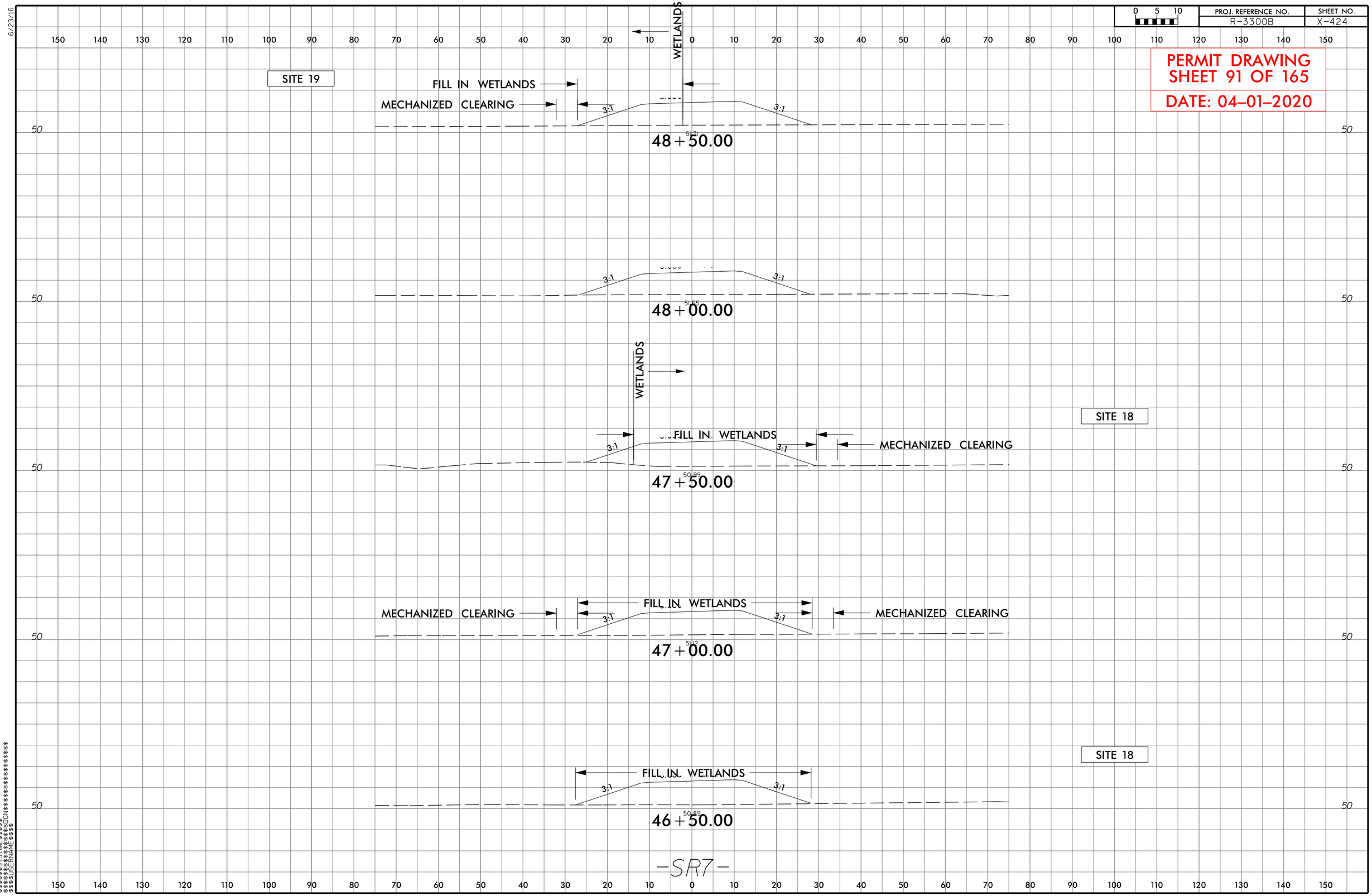
$$$$SYSTIME$$$$
$$$$SYSNAME$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-424

PERMIT DRAWING
SHEET 91 OF 165

DATE: 04-01-2020



$$$$$$SYSTIME$$$$$$
$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3300B	X-94

PERMIT DRAWING
SHEET 92 OF 165

DATE: 04-01-2020

SITE 19

MECHANIZED CLEARING

FILL IN WETLANDS

0.040 5.324:1 6:1 0.040 3:1

58.88

52.78

771+50.00

WETLANDS

MECHANIZED CLEARING

FILL IN WETLANDS

0.040 5.324:1 6:1 0.040 3:1

58.60

52.80

771+00.00

WETLANDS

MECHANIZED CLEARING

FILL IN WETLANDS

0.040 5.324:1 6:1 0.040 3:1

58.32

52.81

770+50.00

WETLANDS

WETLANDS

SITE 19

MECHANIZED CLEARING

FILL IN WETLANDS

0.040 5.324:1 6:1 0.040 3:1 3.62:1

58.04

52.06

770+00.00

WETLANDS

0.040 5.324:1 6:1 0.040 4.24:1 3.57:1

57.75

52.44

769+50.00

WETLANDS

WETLANDS

SITE 18

FILL IN WETLANDS

0.040 5.324:1 6:1 0.040 4.49:1 3.56:1

57.47

52.61

769+00.00

$$$$$$$$SYSTIME$$$$
$$$$$$$$SAVEDON$$$$$$$$$$$$$$$$$$$$
$$$$$$$$USERNAME$$$$

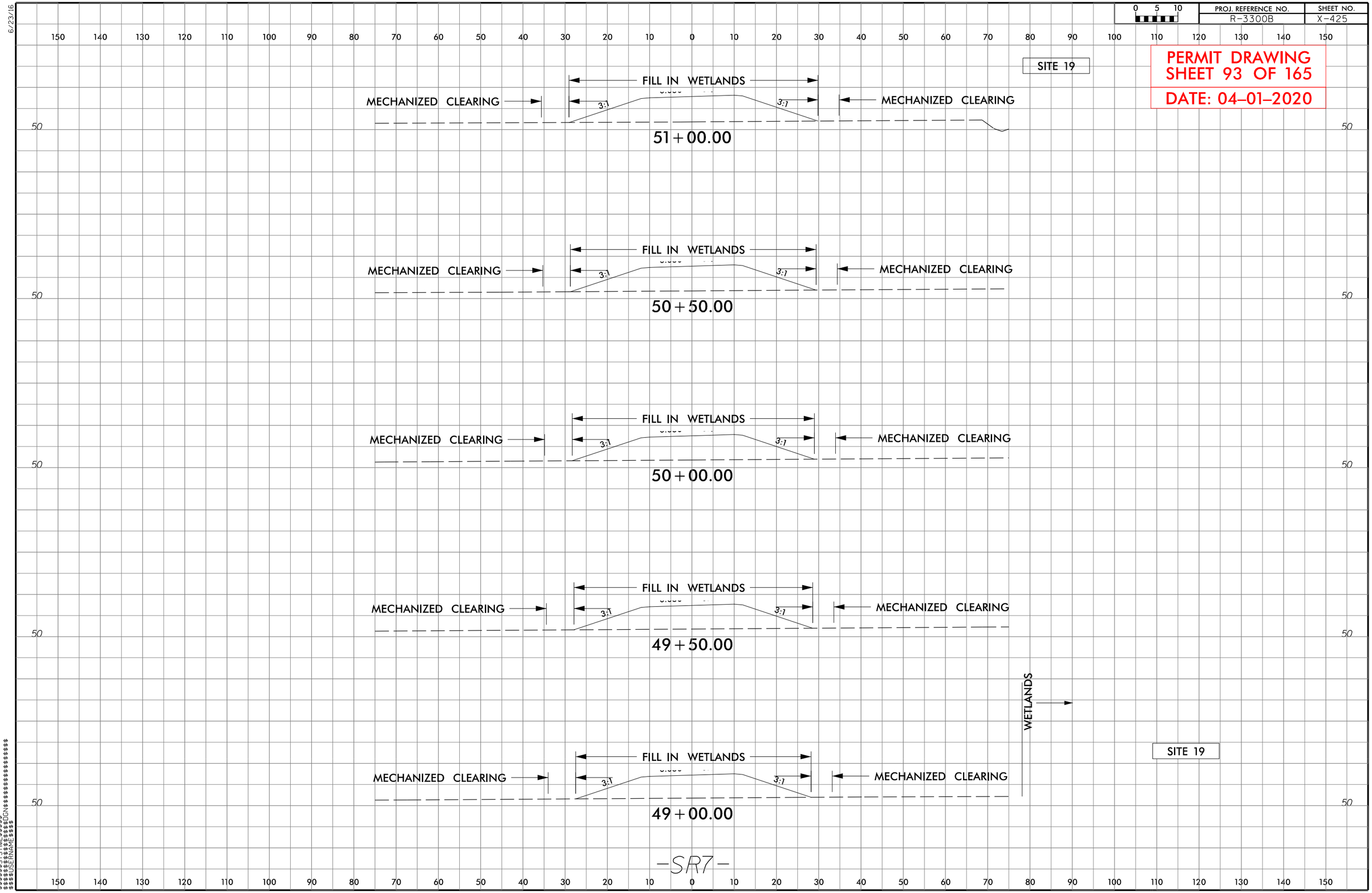
6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3300B	X-425

PERMIT DRAWING
SHEET 93 OF 165

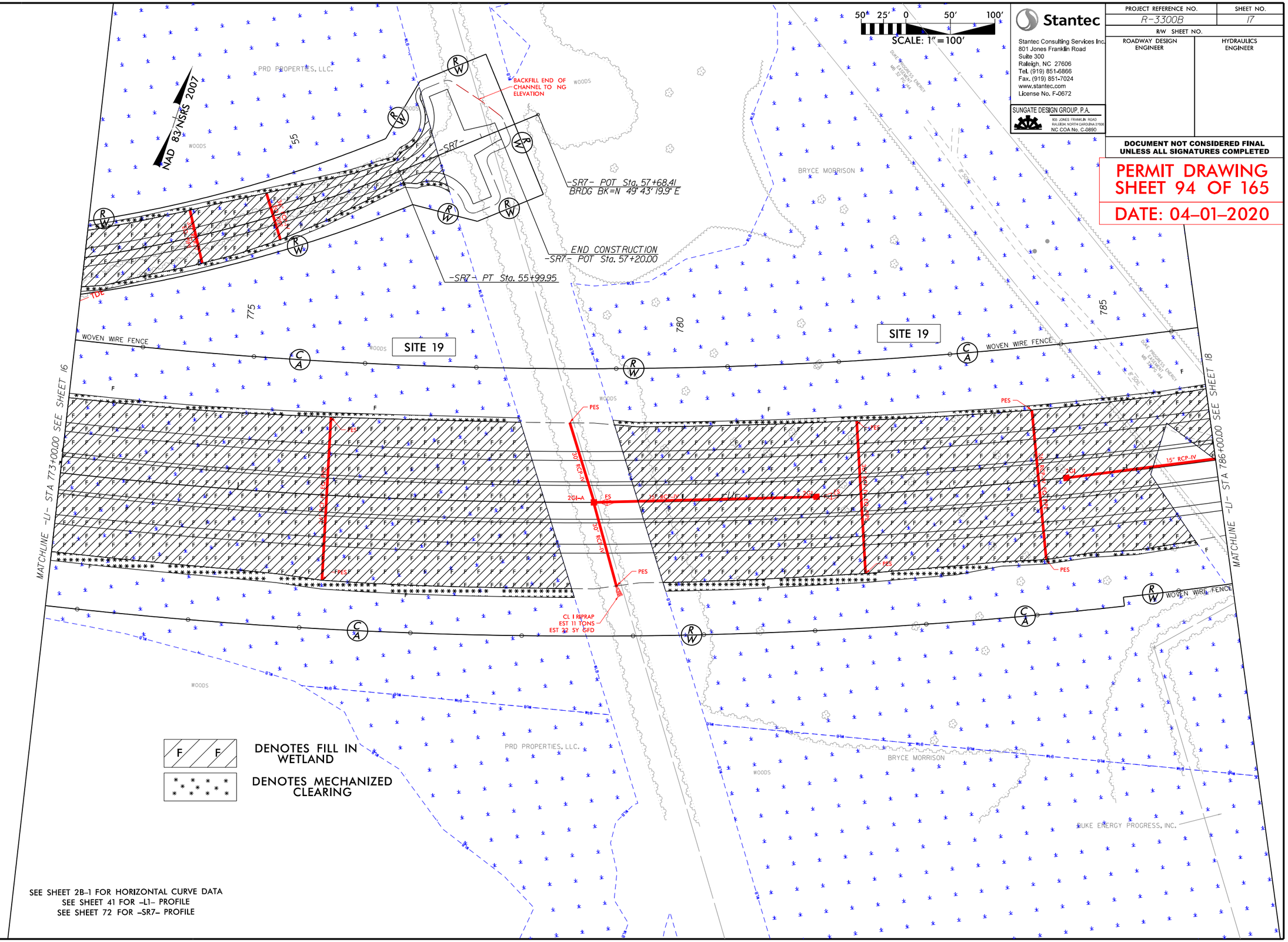
DATE: 04-01-2020

SITE 19



$$$$$$$$SYSTIME$$$$
$$$$$$$$SNAME$$$$
$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

5/14/99



SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEET 41 FOR -L1- PROFILE
SEE SHEET 72 FOR -SR7- PROFILE

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NC COA No. C-0890

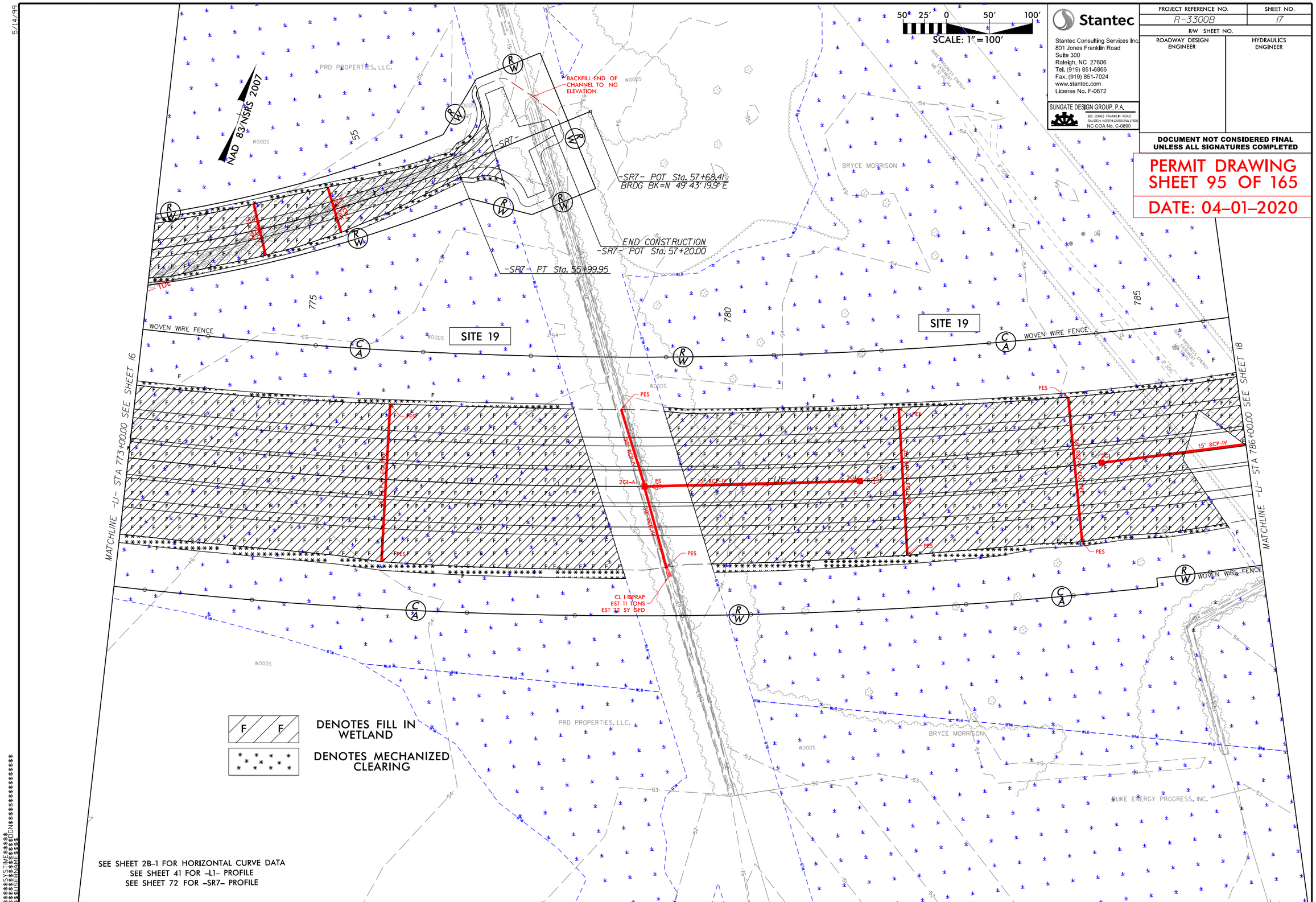
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 94 OF 165

DATE: 04-01-2020

5/14/99



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R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 95 OF 165

DATE: 04-01-2020

$$$$SYMBOLS$$$$
$$$$LINE$$$$
$$$$CONDITIONS$$$$
$$$$LINE$$$$
$$$$PROFILE$$$$

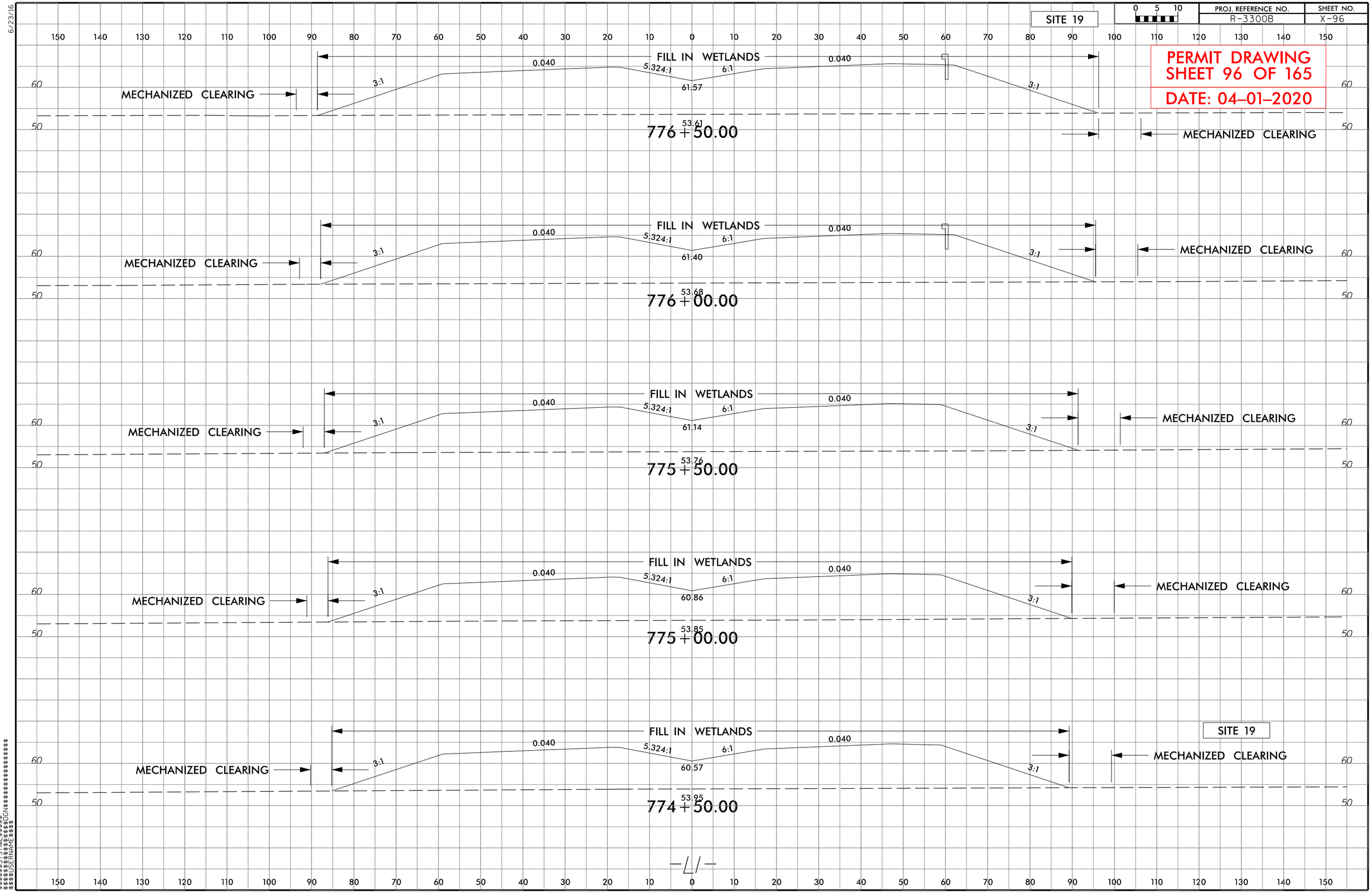
6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-96

0 5 10

SITE 19

PERMIT DRAWING
SHEET 96 OF 165
DATE: 04-01-2020



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$$$$DCN$$$$
$$$$USERNAME$$$$

6/23/16

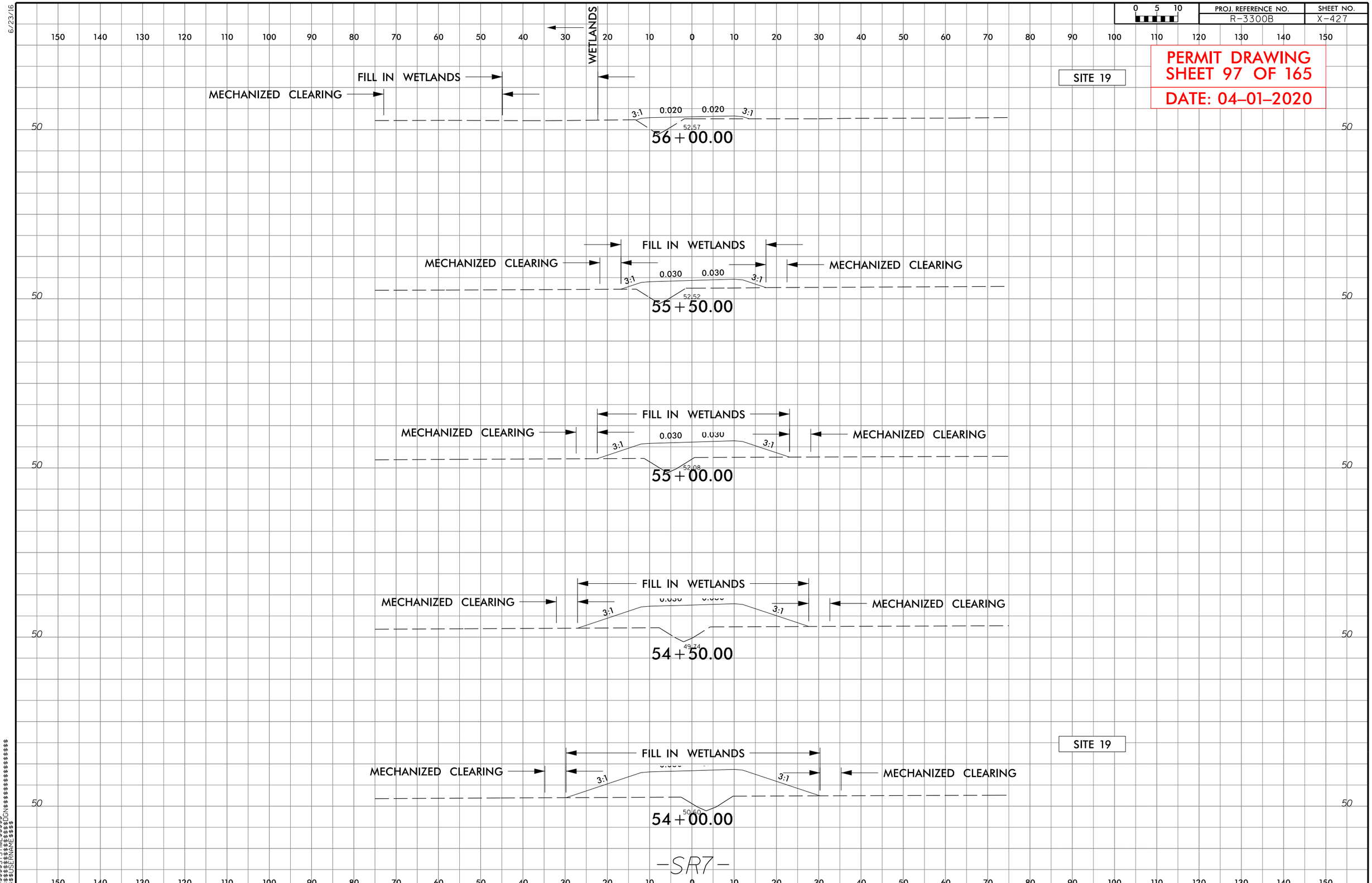
PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-427

0 5 10

PERMIT DRAWING
SHEET 97 OF 165

DATE: 04-01-2020

SITE 19



$$$$SYSTIME$$$$
$$$$SSNAME$$$$DGN$$$$$$$$$$$$$$$$$$$$
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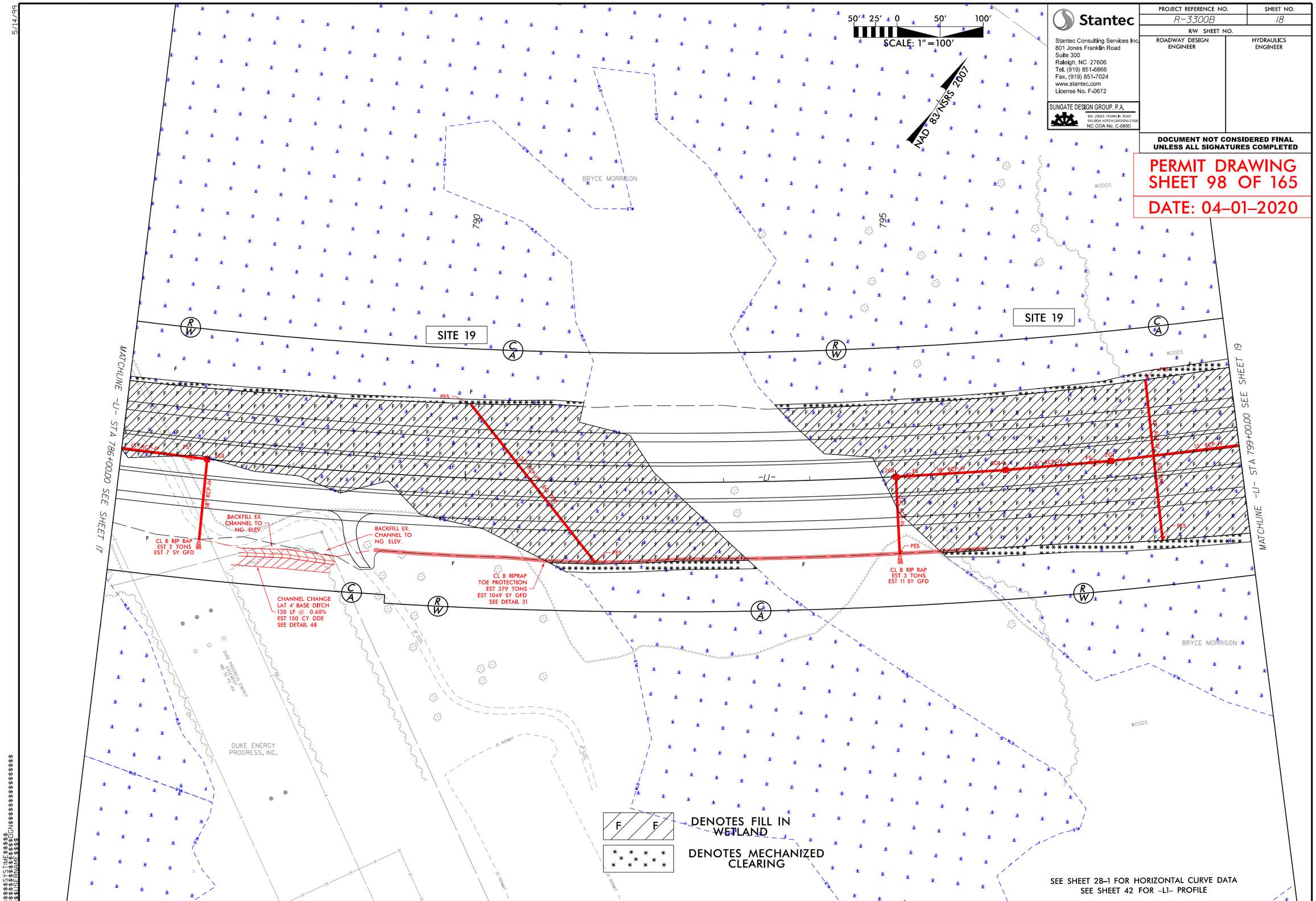
5/14/99



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NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

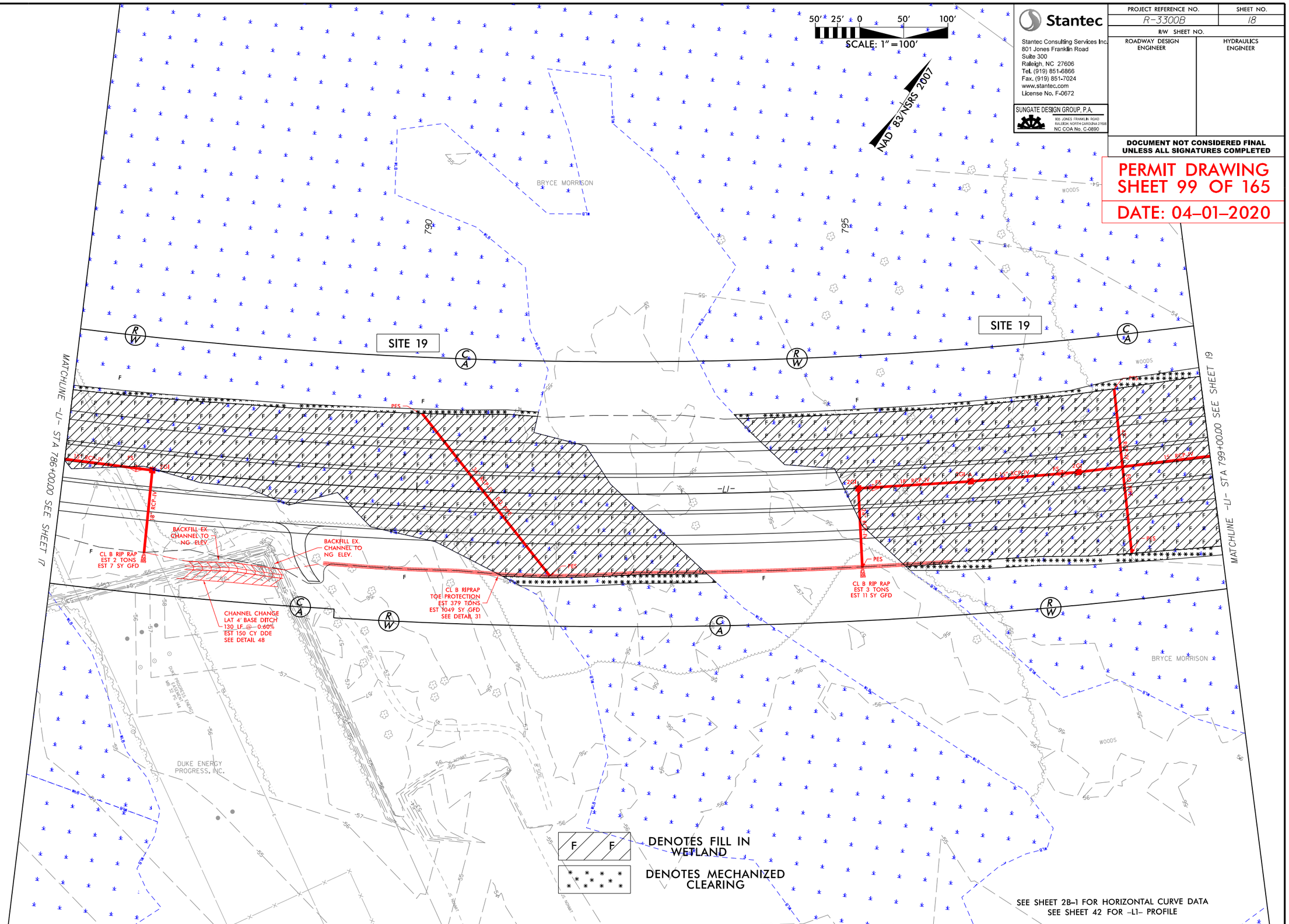
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 98 OF 165

DATE: 04-01-2020

$$$$$$SETLINE$$$$$$
$$$$$$SHEETDIMENSIONS$$$$$$
$$$$$$USERNAME$$$$$$

5/14/99



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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 99 OF 165

DATE: 04-01-2020

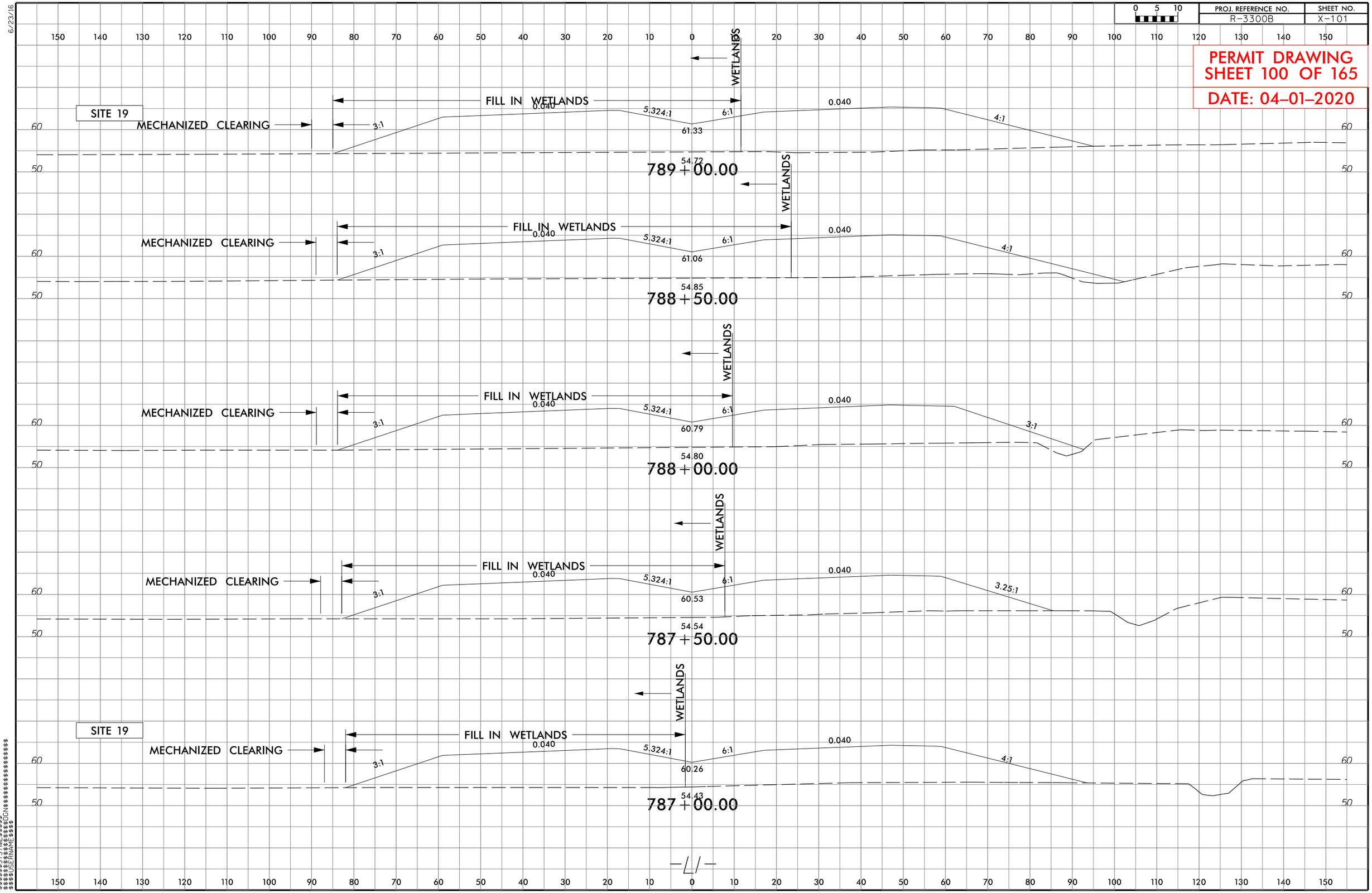
6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-101

0 5 10

PERMIT DRAWING
SHEET 100 OF 165

DATE: 04-01-2020



$$$$SYSTIME$$$$
$$$$SNAME$$$$
$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

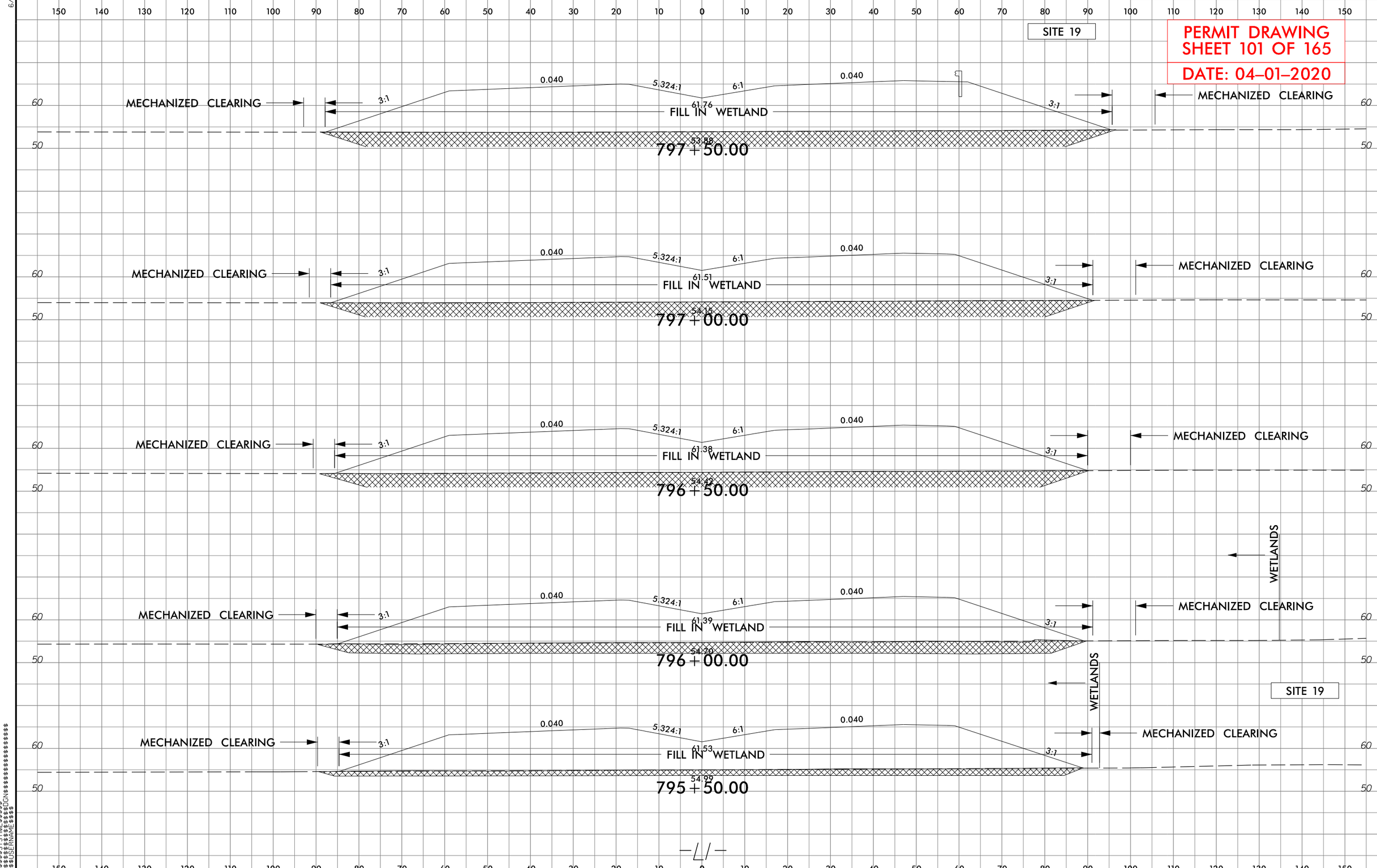
6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3300B	X-104

PERMIT DRAWING
SHEET 101 OF 165

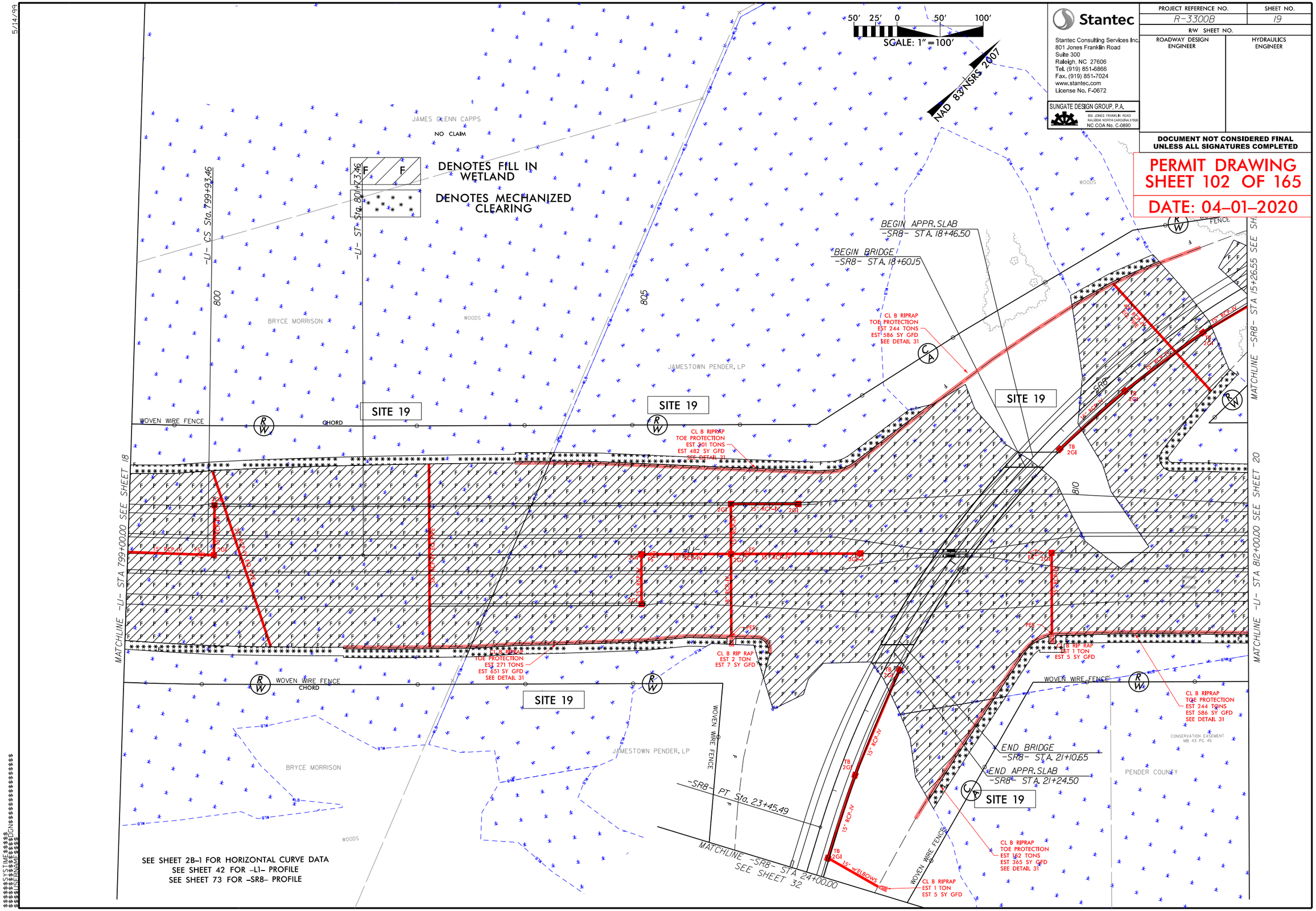
DATE: 04-01-2020

SITE 19



$$$$SYSTIME$$$$
$$$$SAVEDON$$$$
$$$$USERNAME$$$$

5/14/99



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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 102 OF 165

DATE: 04-01-2020

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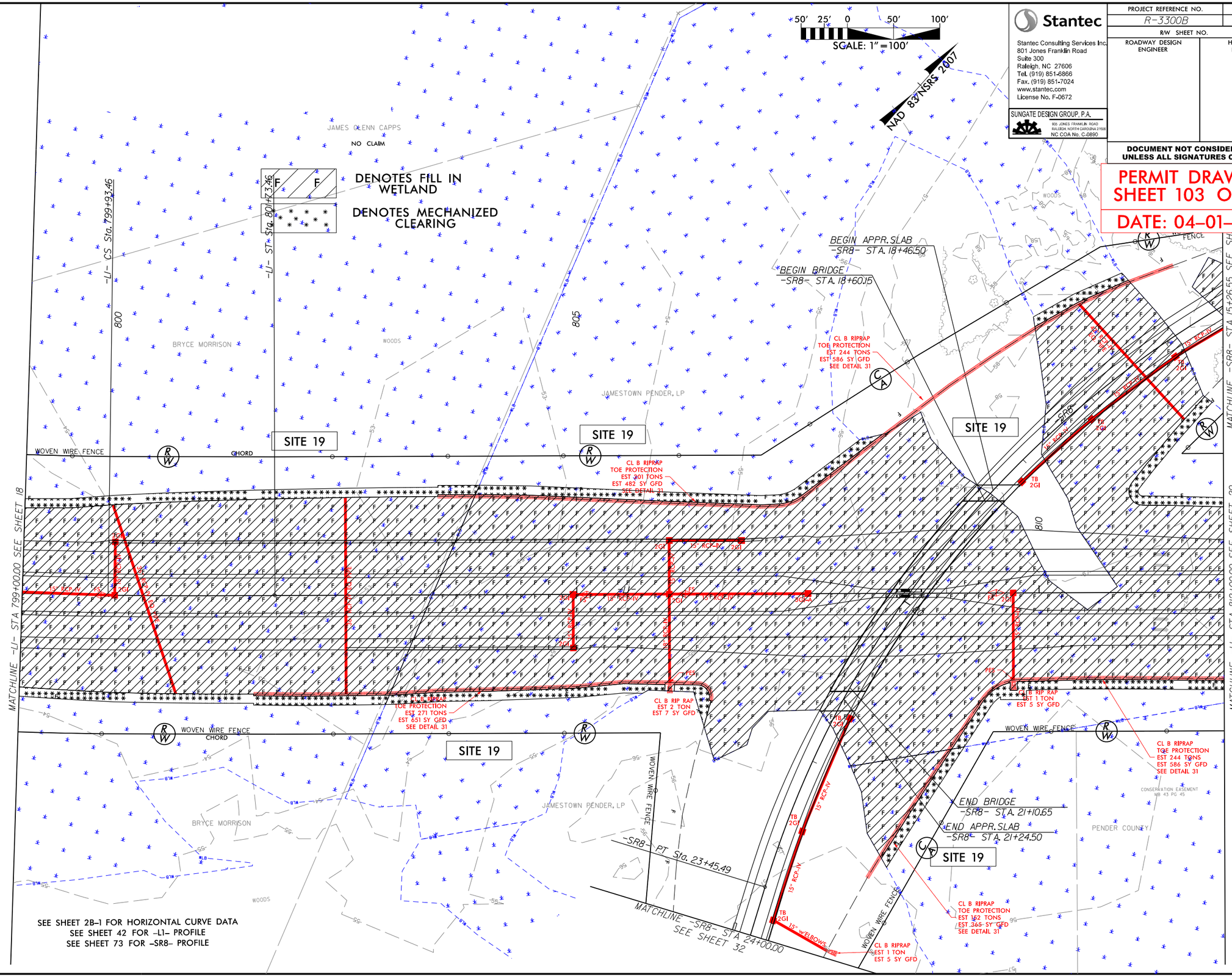

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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 103 OF 165

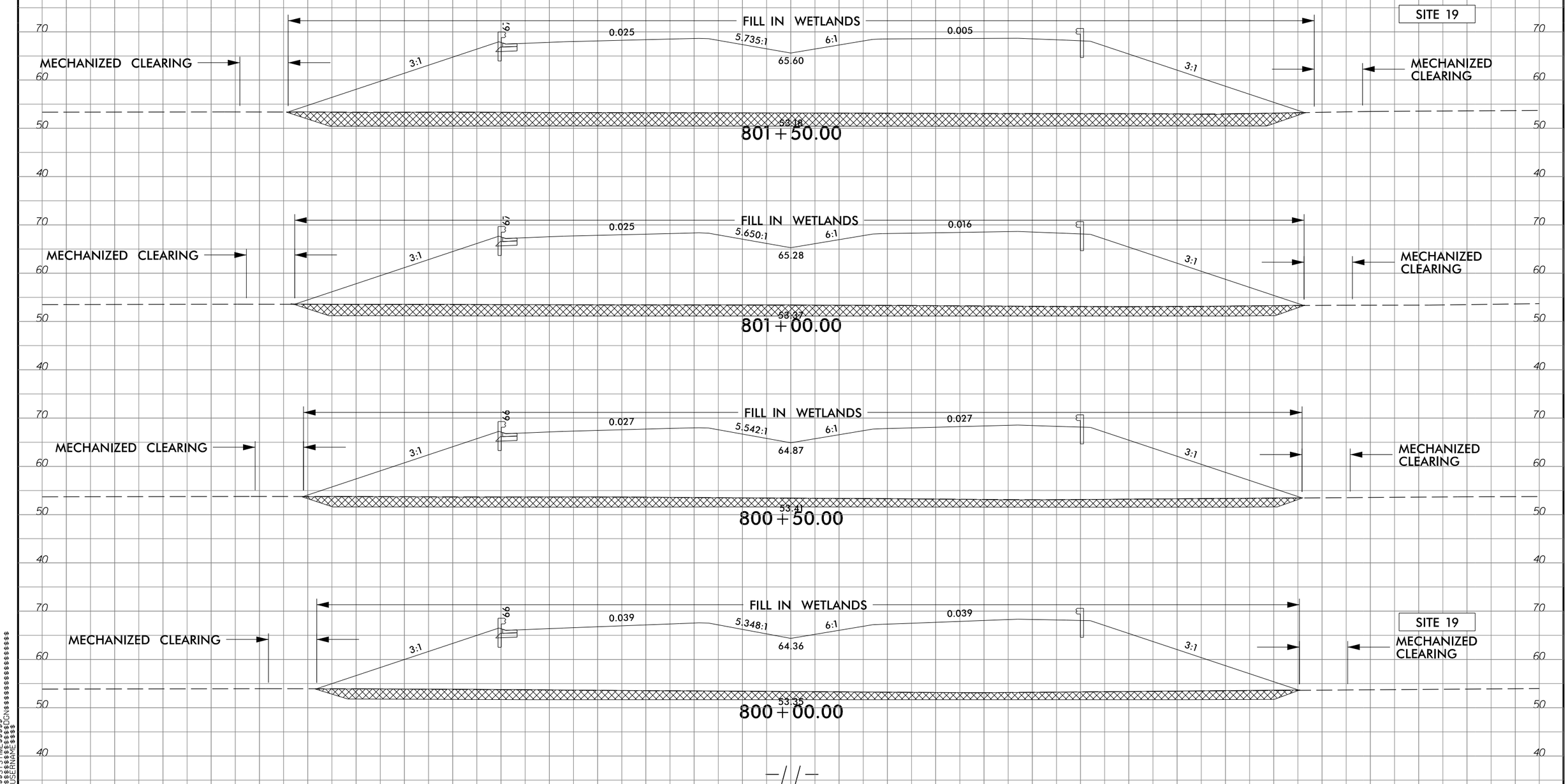
DATE: 04-01-2020

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3300B	X-106

PERMIT DRAWING
SHEET 104 OF 165

DATE: 04-01-2020



$$$$$SYSTIME$$$$
$$$$$SAVEDON$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

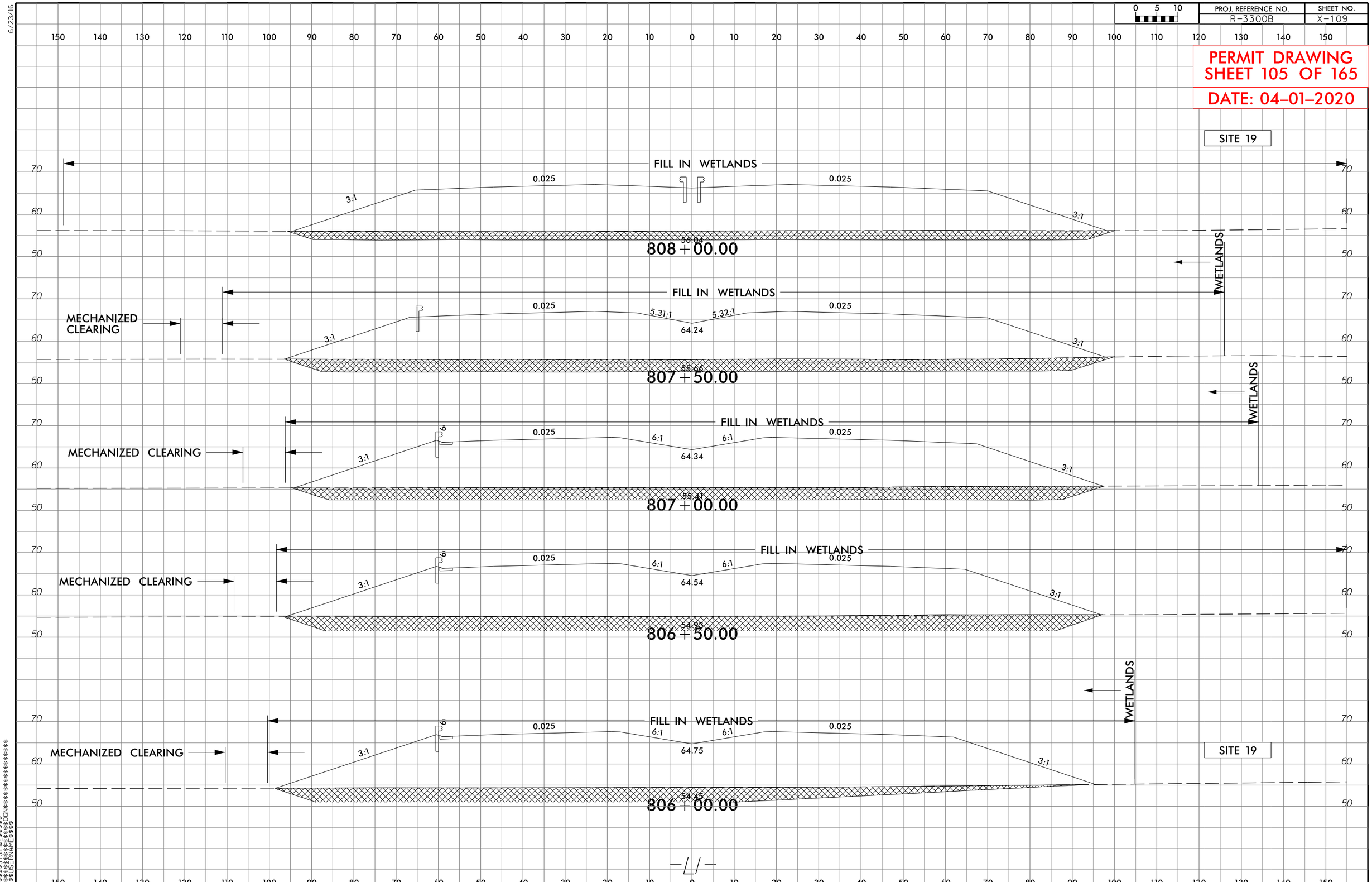
6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-109

PERMIT DRAWING
SHEET 105 OF 165

DATE: 04-01-2020

SITE 19



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$$$$$$SYSNAME$$$$$DGN$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

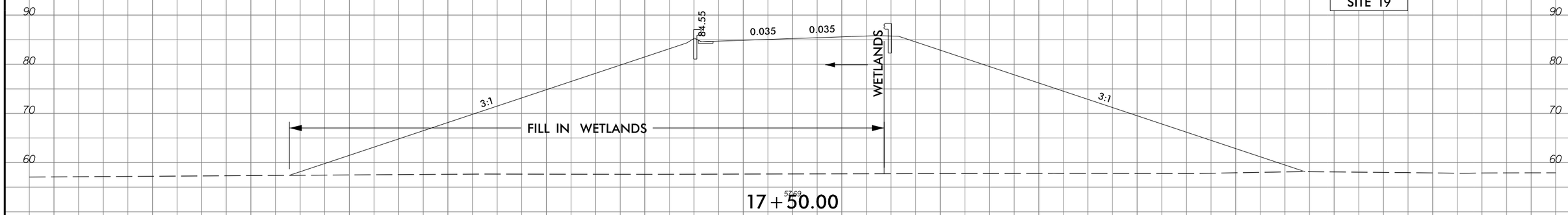
6/23/16

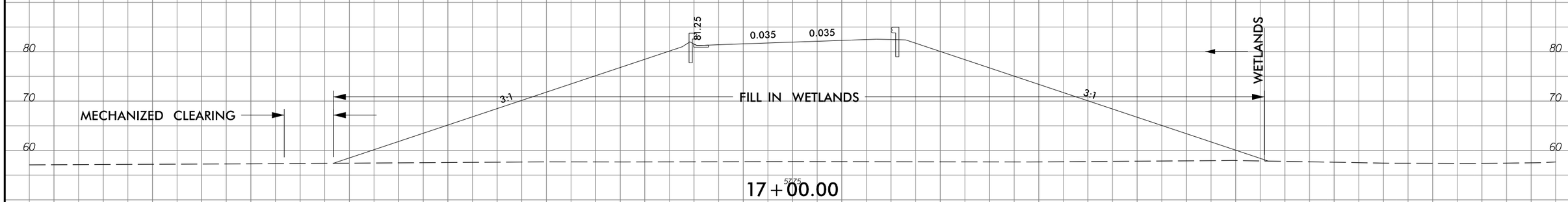
PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-431

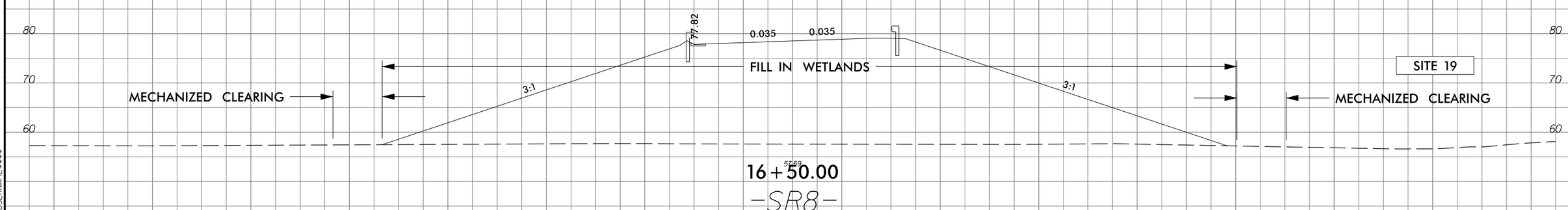
0 5 10

PERMIT DRAWING
SHEET 106 OF 165
DATE: 04-01-2020

SITE 19







SITE 19

-SR8-

$$$$SYSTIME$$$$
$$$$SAVEDON$$$$
$$$$USERNAME$$$$

5/14/99

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

50' 25' 0 50' 100'
SCALE: 1" = 100'

NAD 83/NSRS 2007

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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 107 OF 165

DATE: 04-01-2020

MATCHLINE -SR8- STA 15+26.55 SEE SHEET 19

MATCHLINE -L1- STA 812+00.00 SEE SHEET 19

MATCHLINE -L1_NORTHERN- STA 825+00.00 SEE SHEET 21

WOODS

END FENCE

BEGIN CONSTRUCTION
-SR8- POT Sta.12+55.00

S 18°29' 32.4" W

S 27° 03' 33.3" W

-SR8- POT Sta.10+00.00

-SR8- PI Sta.11+00.00

-SR8- PC Sta.13+52.11

-SR8-

10" SOIL PIPE

CL B RIP RAP
EST 1 TON
EST 5 SY GFD

BEGIN FENCE

WOVEN WIRE FENCE

815

820

-L1- POT Sta. 820+00.00 BK =
-L1_NORTHERN- POT Sta. 820+00.00 AH

JAMESTOWN PENDER, LP

SITE 19

CL B RIPRAP
TOE PROTECTION
EST 109 TONS
EST 300 SY GFD
SEE DETAIL 31

CL B RIP RAP
EST 1 TON
EST 5 SY GFD

PES

N 48° 11' 57.44" E

N 48° 11' 57.44" E -L1_NORTHERN-

36" RCP-IV
EQ PIPE

15" RCP-IV

24" RCP-IV
EQ PIPE

2GI

ES

CL B RIPRAP
TOE PROTECTION
EST 244 TONS
EST 586 SY GFD
SEE DETAIL 31

CL B RIP RAP
EST 1 TON
EST 5 SY GFD

8" SOIL

CL B RIPRAP
TOE PROTECTION
EST 82 TONS
EST 225 SY GFD
SEE DETAIL 31

PENDER COUNTY

CONSERVATION EASEMENT
MB 43 PG 45

60" CHL

PENDER CO BOARD OF EDUCATION

CONC

SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEET 43 FOR -L1- & L1_NORTHERN- PROFILES
SEE SHEET 73 FOR -SR8- PROFILE

5/14/99

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

50' 25' 0 50' 100'
SCALE: 1" = 100'

NAD 83/NSRS 2007

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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 108 OF 165

DATE: 04-01-2020

MATCHLINE -SR8- STA 15+26.55 SEE SHEET 19

MATCHLINE -L1- STA 812+00.00 SEE SHEET 19

MATCHLINE -L1_NORTHERN- STA 825+00.00 SEE SHEET 21

S 18°29'32.4" W

S 27°03'33.3" W

BEGIN CONSTRUCTION
-SR8- POT Sta.12+55.00

-SR8- PI Sta.11+00.00

-SR8- POT Sta.10+00.00

-SR8- PC Sta.13+52.11

END FENCE

BEGIN FENCE

WOVEN WIRE FENCE

CL B RIP RAP
EST 1 TON
EST 5 SY GFD

-L1- POT Sta.820+00.00 BK =
-L1_NORTHERN- POT Sta.820+00.00 AH

SITE 19

JAMESTOWN PENDER, LP

CL B RIPRAP
TOE PROTECTION
EST 109 TONS
EST 300 SY GFD
SEE DETAIL 31

CL B RIP RAP
EST 1 TON
EST 5 SY GFD

N 48°11'57.44" E

N 48°11'57.44" E -L1_NORTHERN-

N 36°11'57.34" E -L1_NORTHERN-

36" RCP-IV
EQ PIPE

18" RCP-IV

24" RCP-IV
EQ PIPE

15" RCP-IV

CL B RIPRAP
TOE PROTECTION
EST 244 TONS
EST 586 SY GFD
SEE DETAIL 31

CL B RIP RAP
EST 1 TON
EST 5 SY GFD

CL B RIPRAP
TOE PROTECTION
EST 82 TONS
EST 225 SY GFD
SEE DETAIL 31

PENDER COUNTY

CONSERVATION EASEMENT
MB 43 PG 45

PENDER CO BOARD OF EDUCATION

WOODS

815

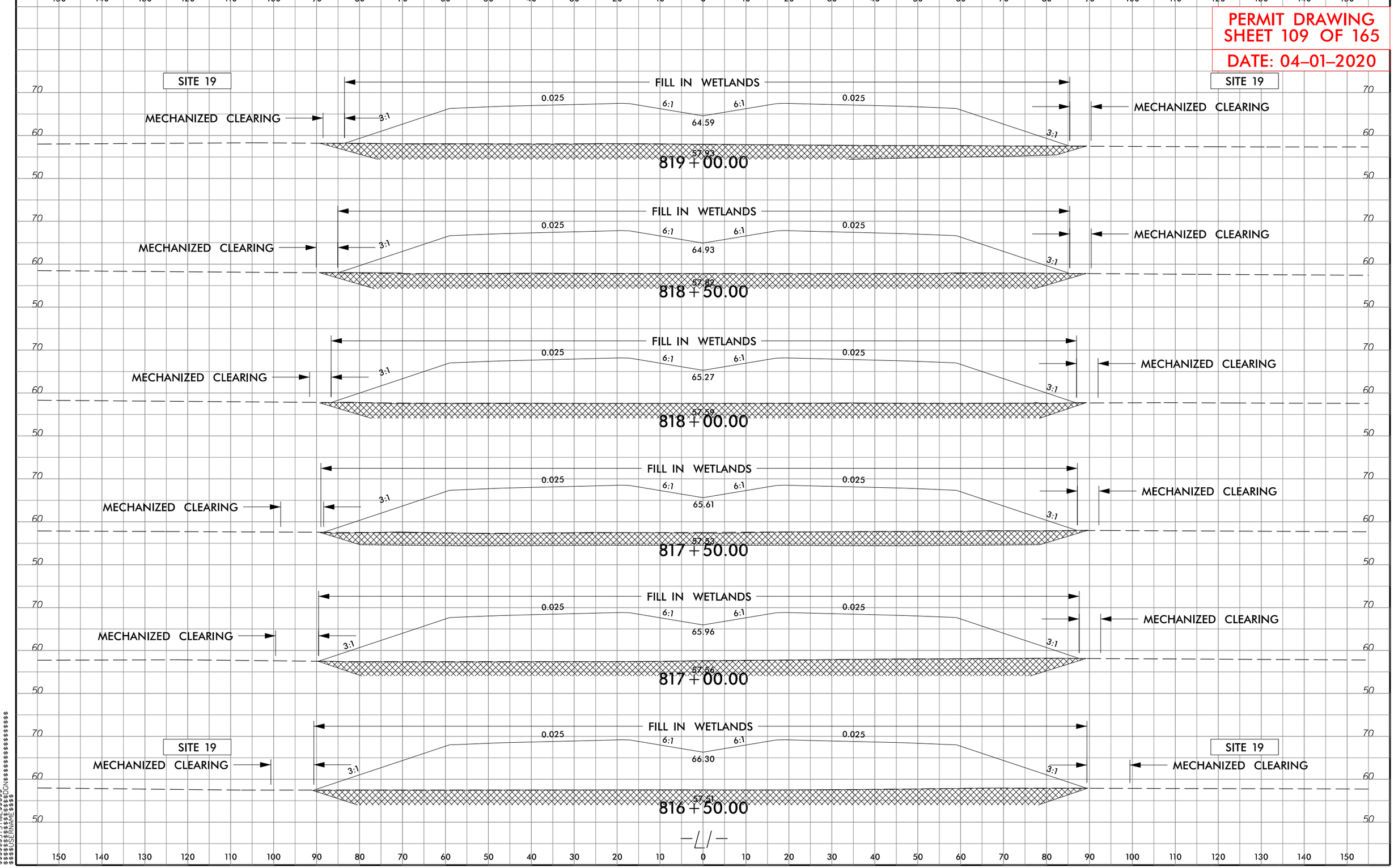
820

825

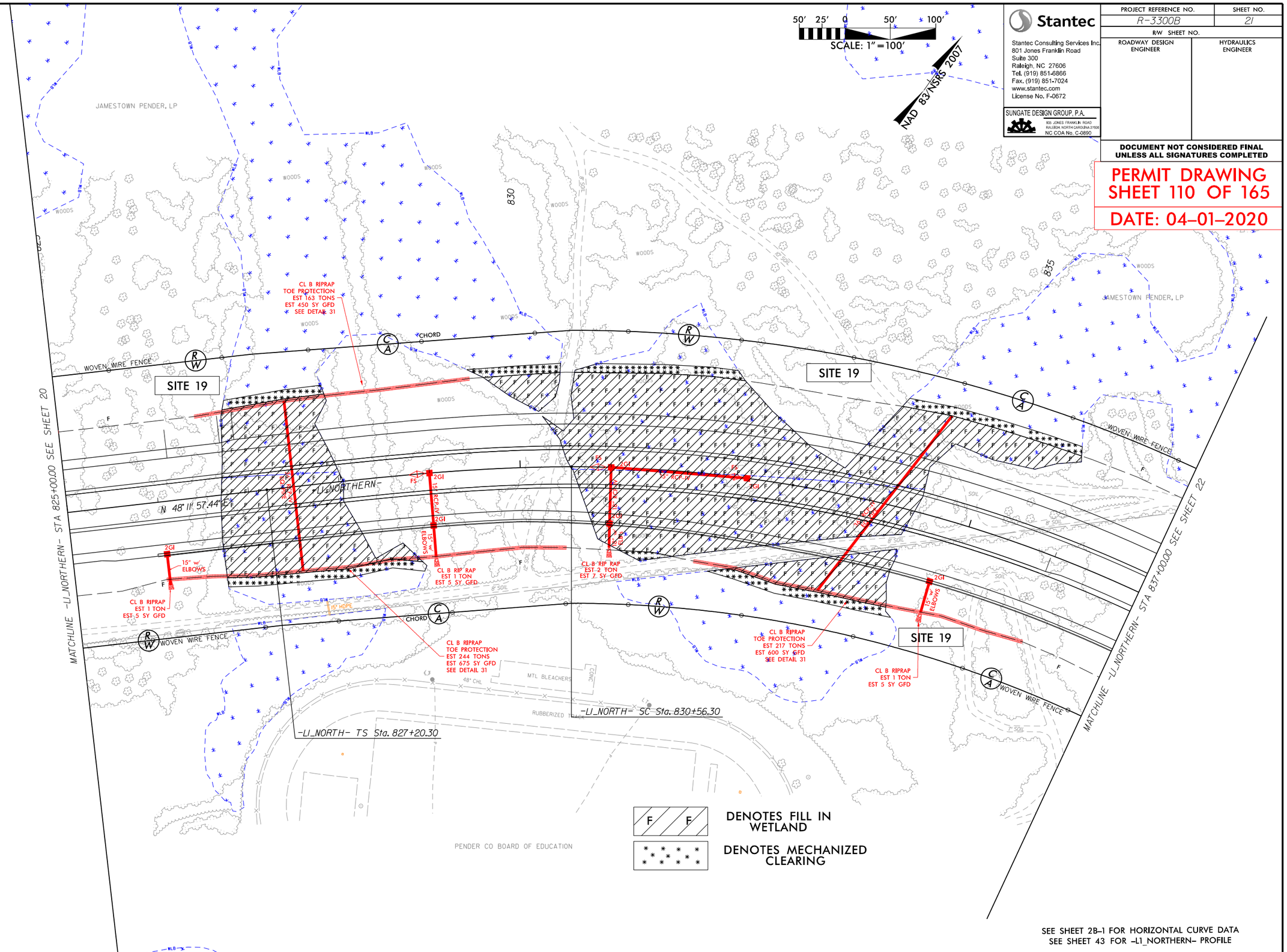
SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEET 43 FOR -L1- & L1_NORTHERN- PROFILES
SEE SHEET 73 FOR -SR8- PROFILE

PERMIT DRAWING
SHEET 109 OF 165

DATE: 04-01-2020



5/14/99



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SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

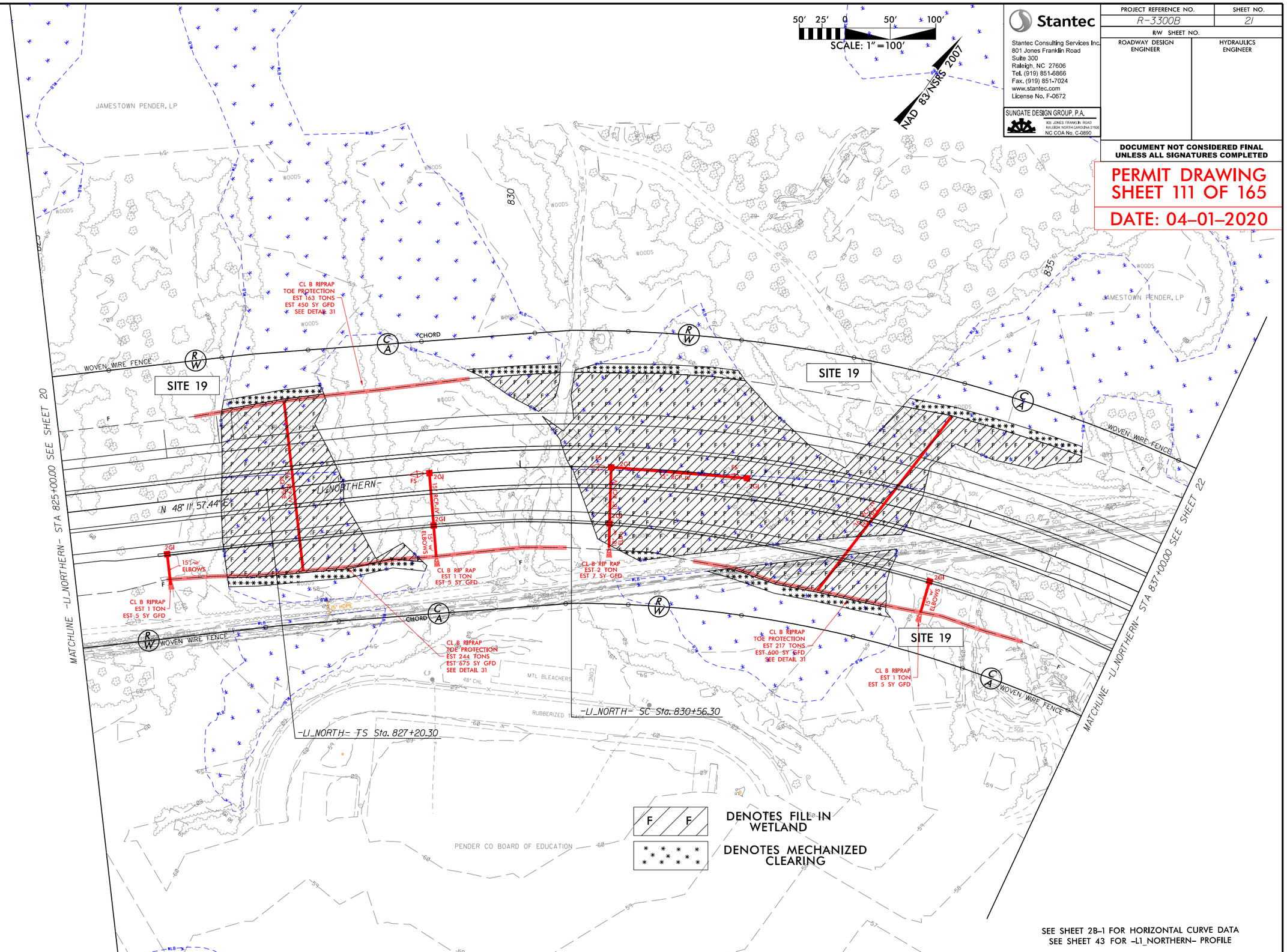
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 110 OF 165

DATE: 04-01-2020

SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEET 43 FOR -L1_NORTHERN- PROFILE

5/14/99



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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 111 OF 165

DATE: 04-01-2020

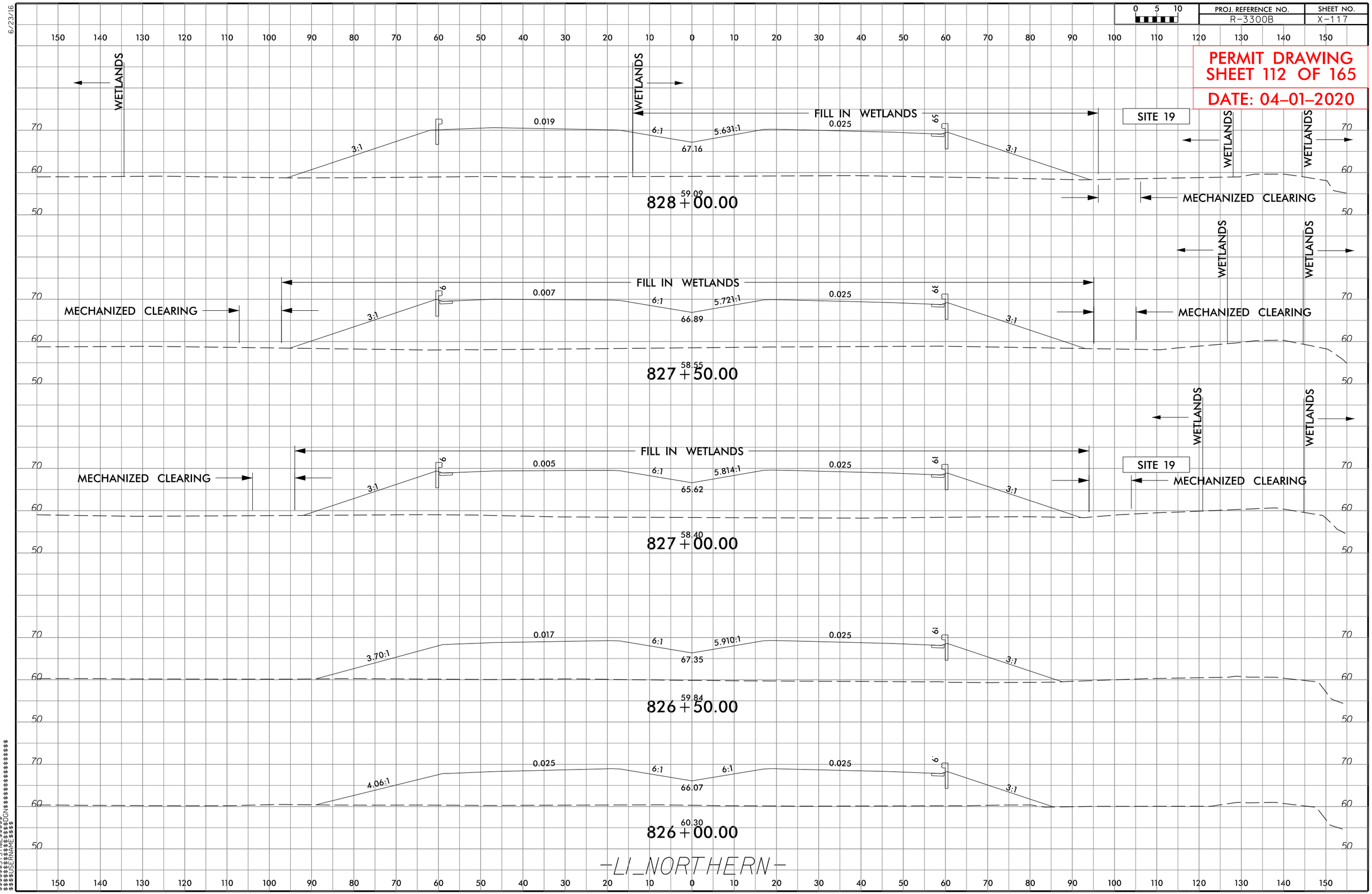
SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEET 43 FOR -L1_NORTHERN- PROFILE

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-117

PERMIT DRAWING
SHEET 112 OF 165

DATE: 04-01-2020



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$$$$USERNAME$$$$

6/23/16

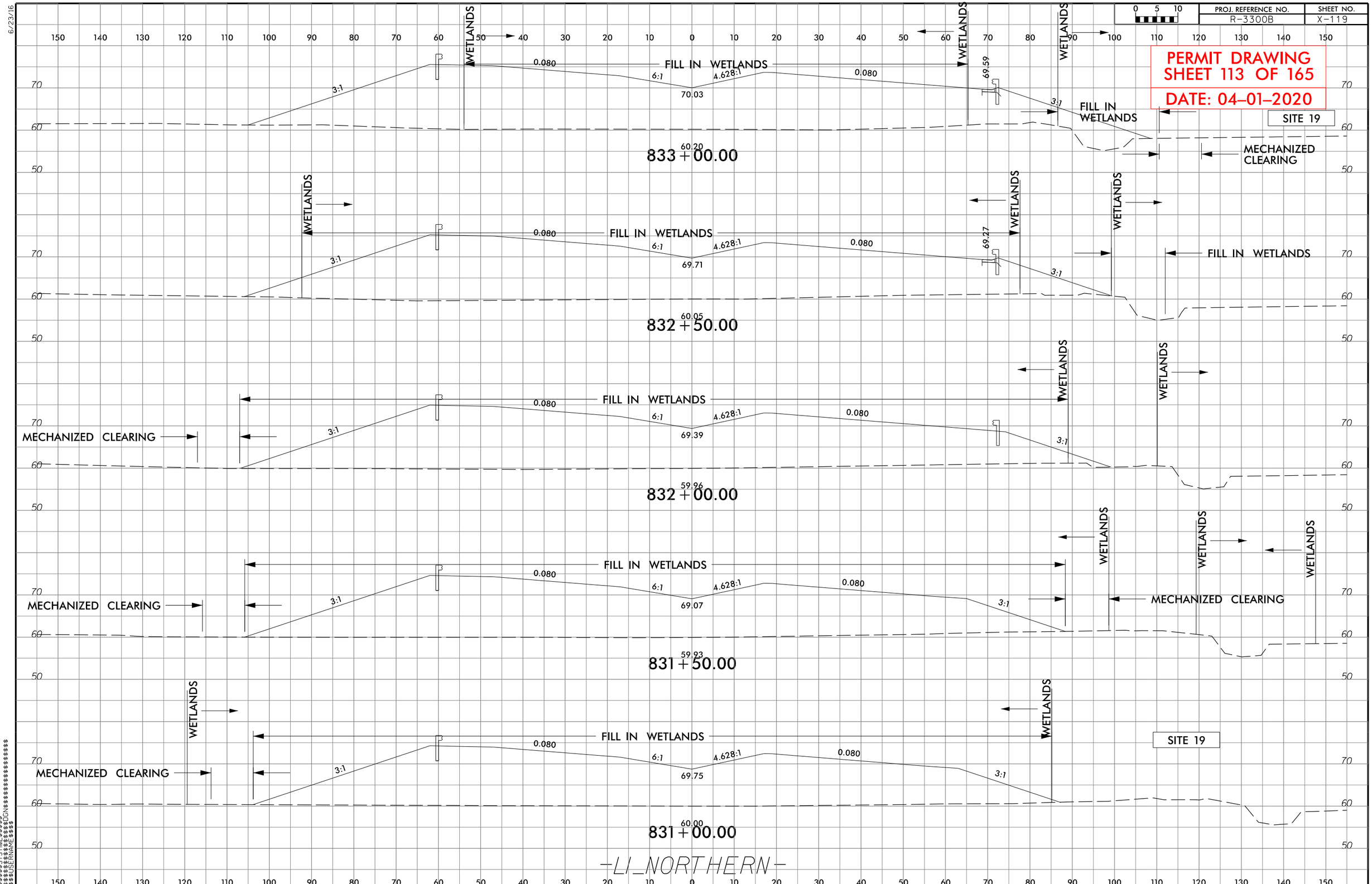
PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-119

0 5 10

PERMIT DRAWING
SHEET 113 OF 165

DATE: 04-01-2020

SITE 19



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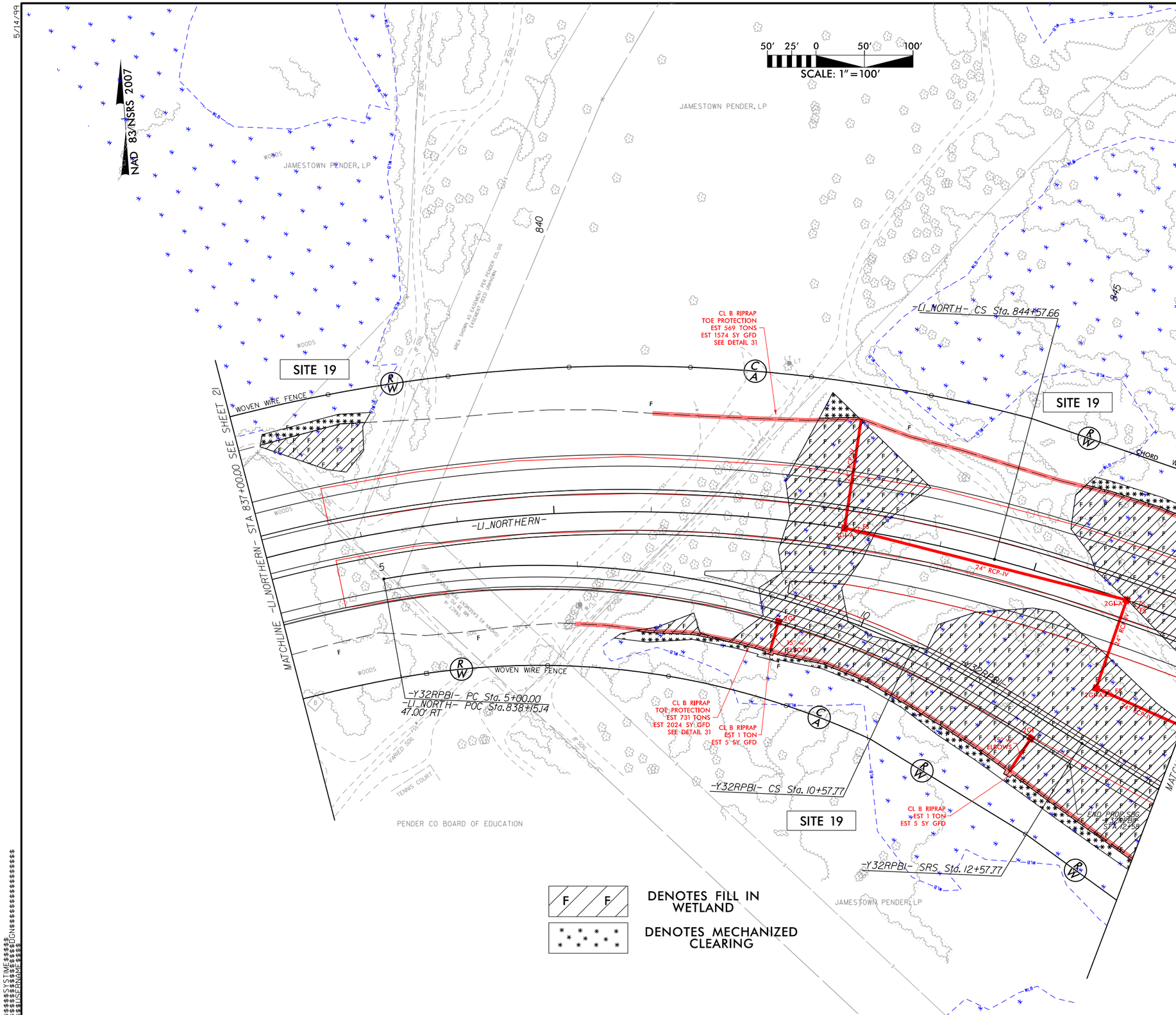
5/14/99



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NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 114 OF 165

DATE: 04-01-2020

SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS 43 & 44 FOR -L1_NORTHERN- PROFILE
SEE SHEET 64 FOR -Y32RPB1- PROFILE

$$$$SYSTIME$$$$
$$$$DATE$$$$
$$$$USERNAME$$$$

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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	22

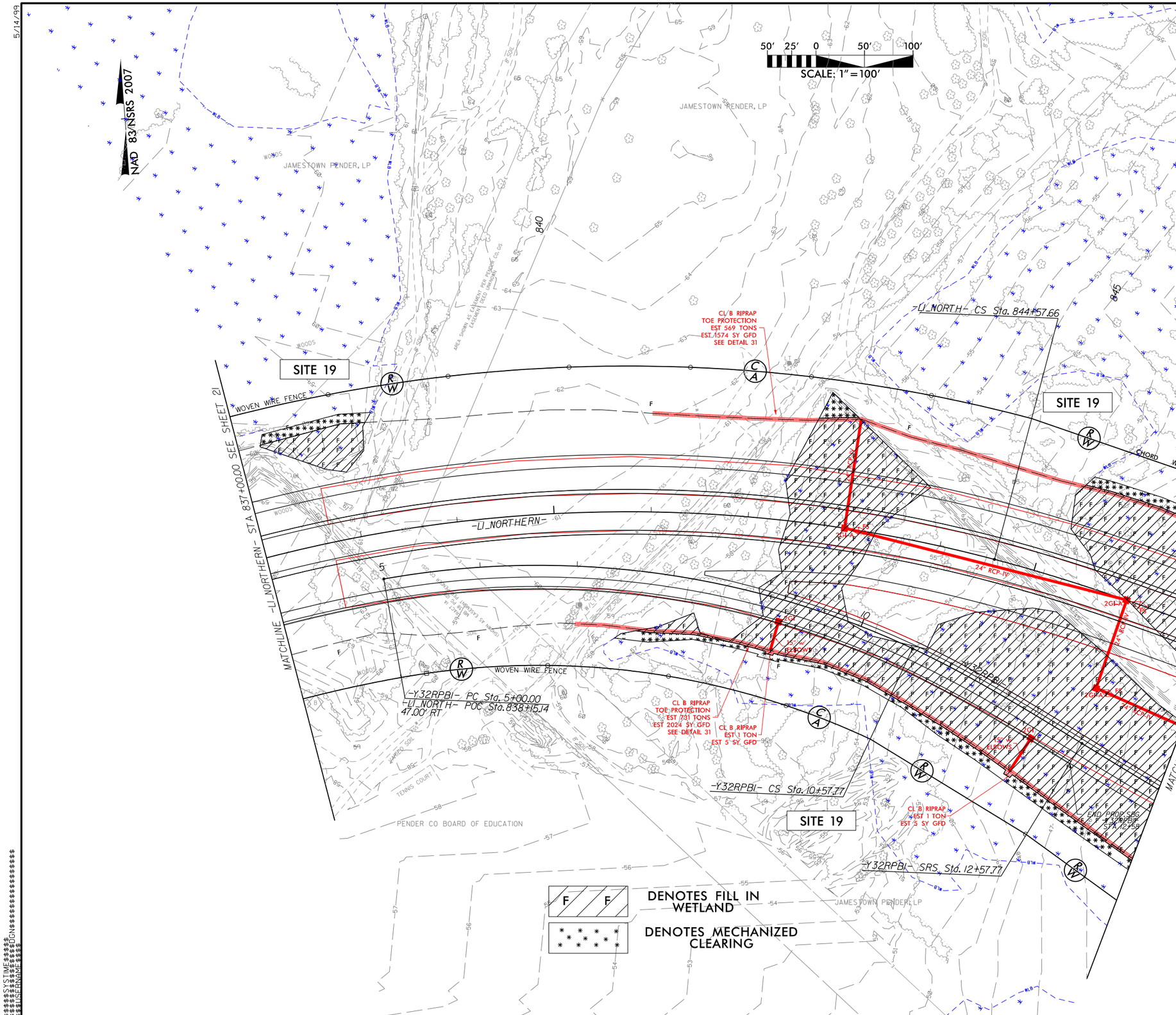
R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 115 OF 165

DATE: 04–01–2020



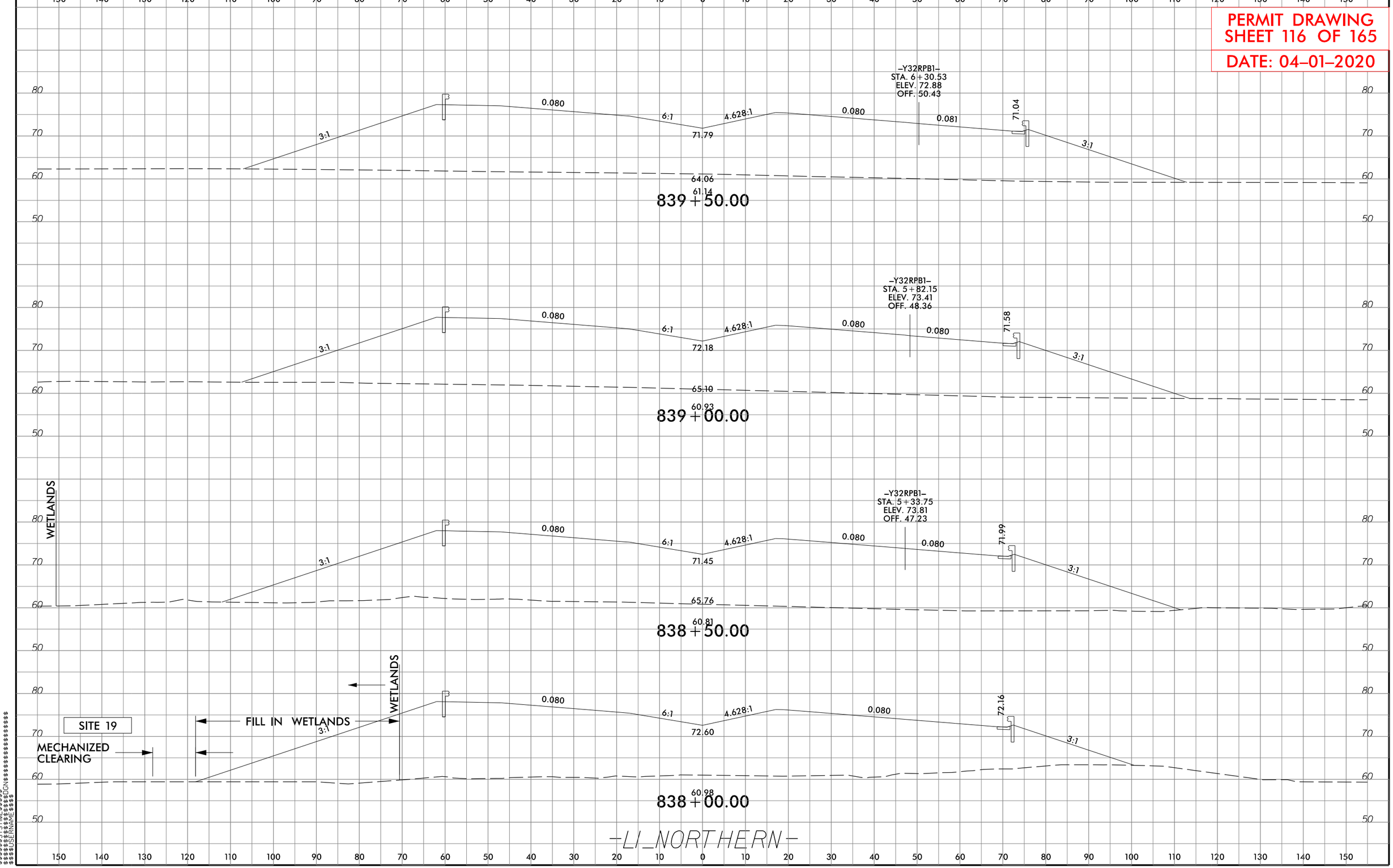
▨ F	DENOTES FILL IN WETLAND
*	DENOTES MECHANIZED CLEARING

SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS 43 & 44 FOR -L1_NORTHERN- PROFILE
SEE SHEET 64 FOR -Y32RPB1- PROFILE

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3300B	X-122

PERMIT DRAWING
SHEET 116 OF 165
DATE: 04-01-2020



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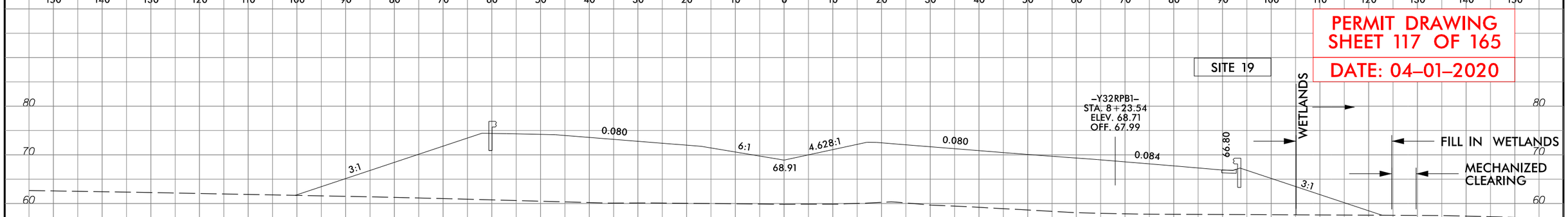
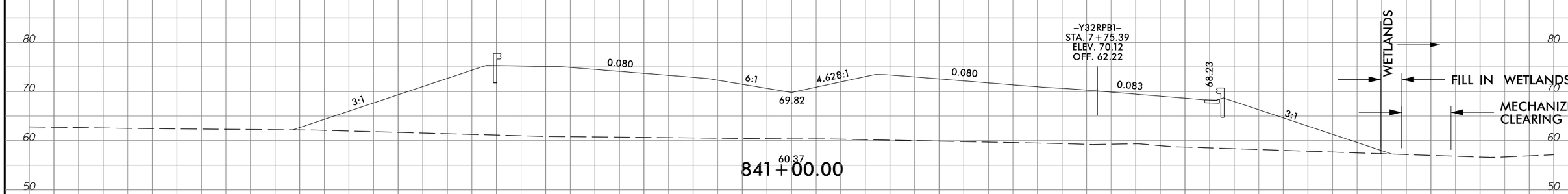
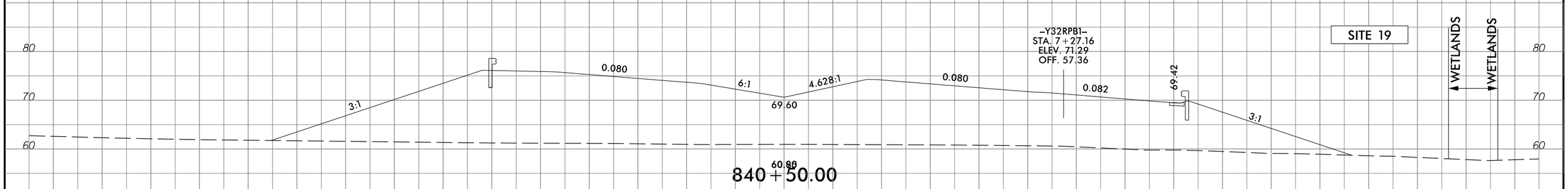
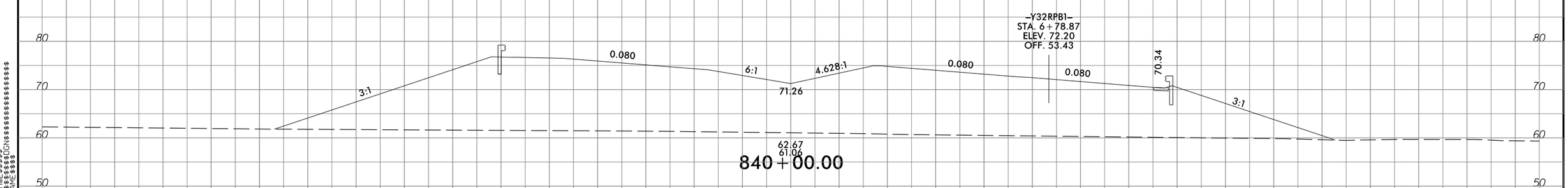








PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-123

PERMIT DRAWING
SHEET 117 OF 165

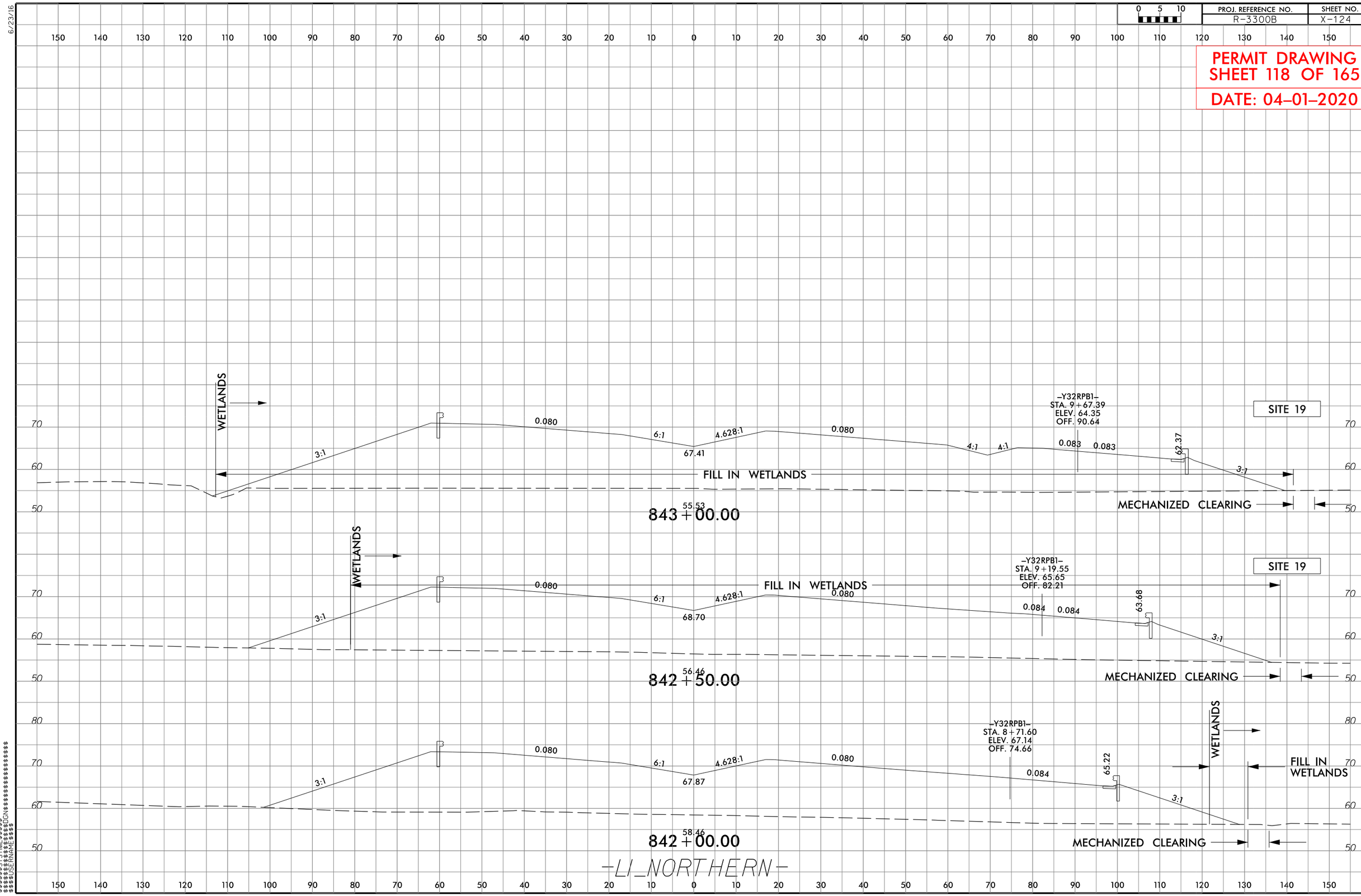
DATE: 04-01-2020

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-124

PERMIT DRAWING
SHEET 118 OF 165

DATE: 04-01-2020



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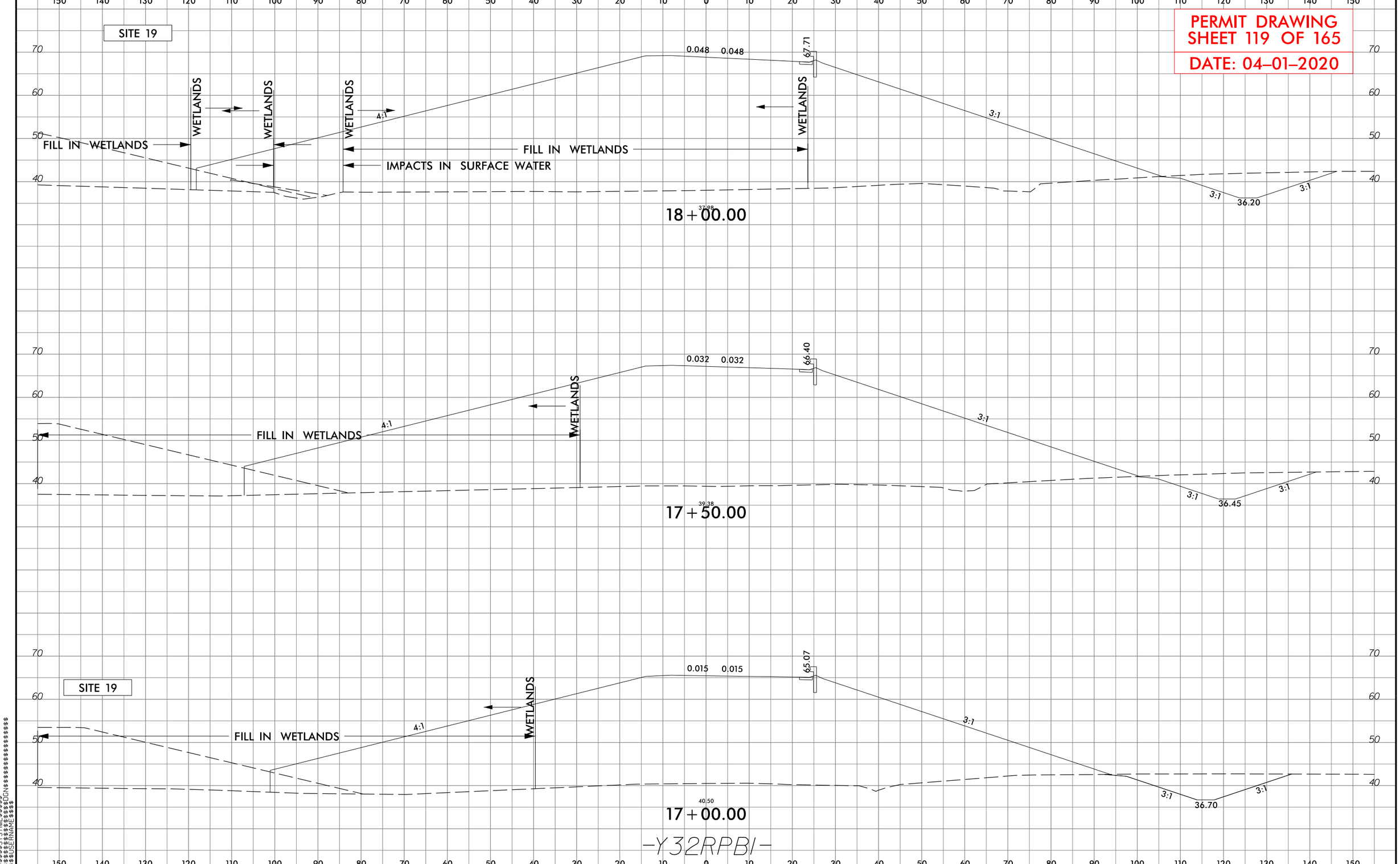
6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3300B	X-352

PERMIT DRAWING
SHEET 119 OF 165

DATE: 04-01-2020



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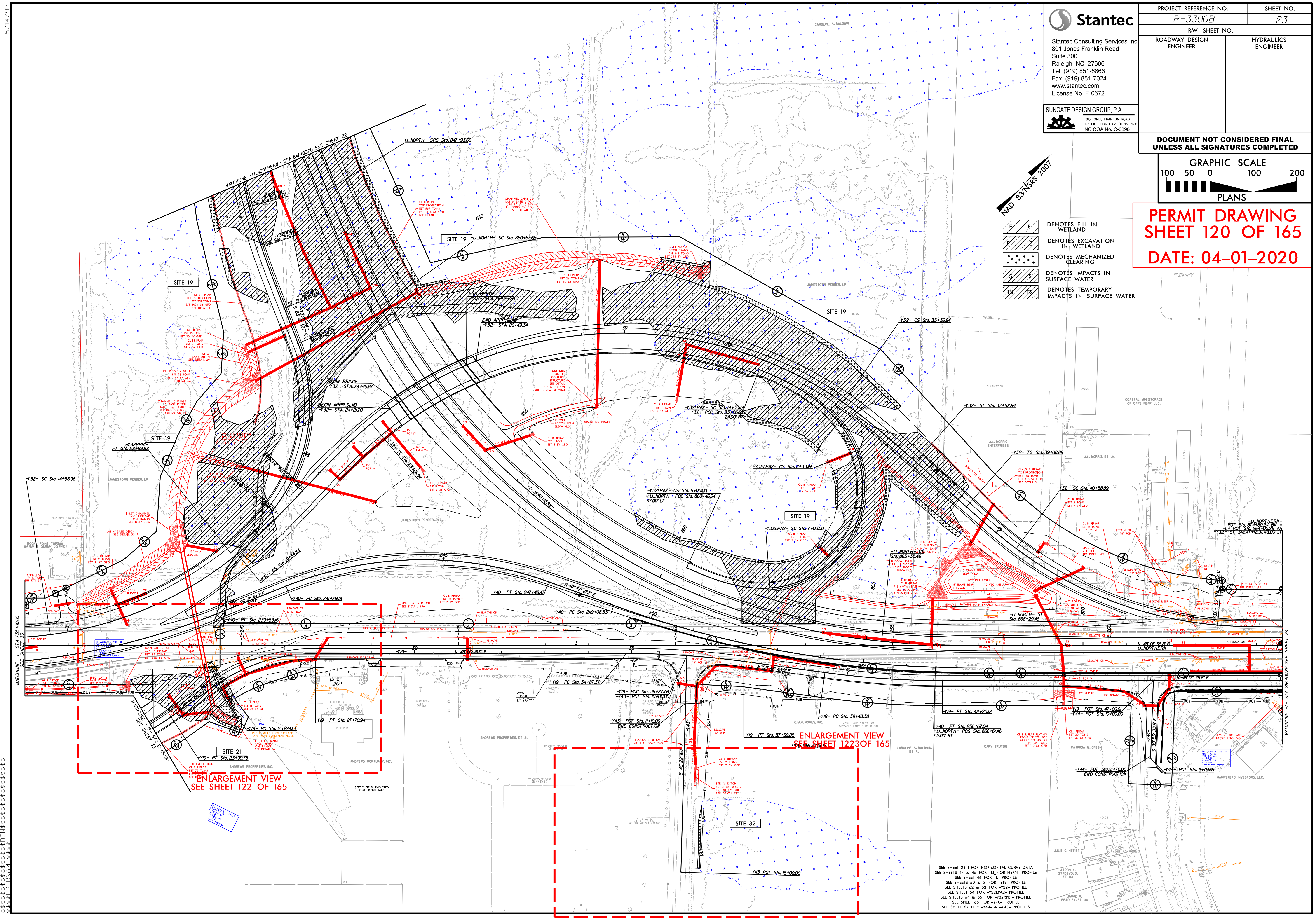

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NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	23

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALE
100 50 0 100 200
PLANS

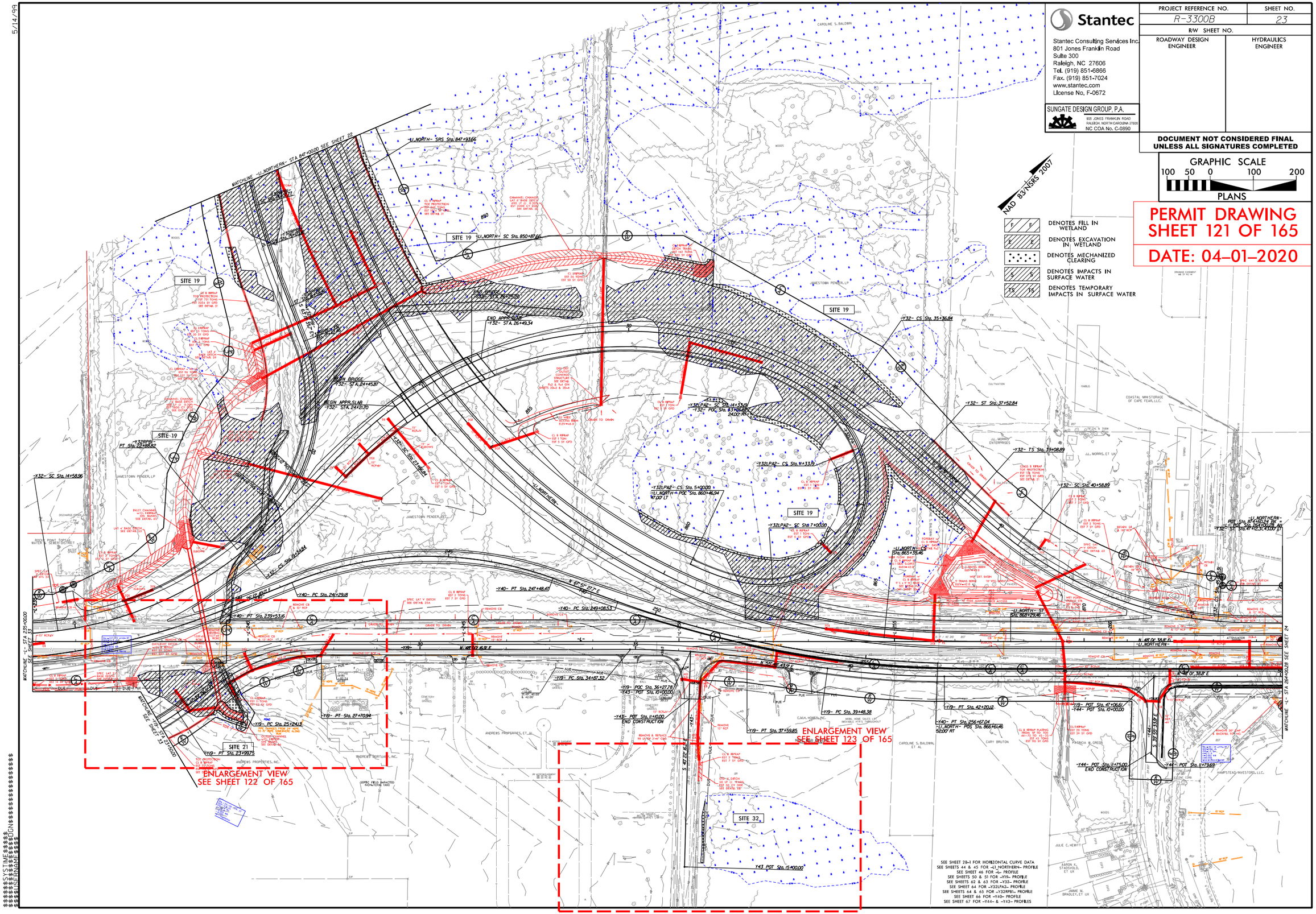
PERMIT DRAWING
SHEET 120 OF 165

DATE: 04-01-2020

F	DENOTES FILL IN WETLAND
E	DENOTES EXCAVATION IN WETLAND
⁘	DENOTES MECHANIZED CLEARING
S	DENOTES IMPACTS IN SURFACE WATER
TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS 44 & 45 FOR -L1_NORTHERN- PROFILE
SEE SHEET 46 FOR -L- PROFILE
SEE SHEETS 50 & 51 FOR -Y19- PROFILE
SEE SHEETS 62 & 63 FOR -Y32- PROFILE
SEE SHEET 64 FOR -Y32LPA2- PROFILE
SEE SHEETS 64 & 65 FOR -Y32RPB1- PROFILE
SEE SHEET 66 FOR -Y40- PROFILE
SEE SHEET 67 FOR -Y44- & -Y43- PROFILES

5/14/99



SEE SHEET 28-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS 44 & 45 FOR -L1_NORTHERN- PROFILE
SEE SHEET 46 FOR -L- PROFILE
SEE SHEETS 50 & 51 FOR -Y19- PROFILE
SEE SHEETS 62 & 63 FOR -Y32- PROFILE
SEE SHEET 64 FOR -Y32LPA2- PROFILE
SEE SHEETS 64 & 65 FOR -Y32RPB1- PROFILE
SEE SHEET 66 FOR -Y40- PROFILE
SEE SHEET 67 FOR -Y44- & -Y43- PROFILES

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SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27605
NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALE
100 50 0 100 200
PLANS

F F	DENOTES FILL IN WETLAND
E E	DENOTES EXCAVATION IN WETLAND
	DENOTES MECHANIZED CLEARING
S S	DENOTES IMPACTS IN SURFACE WATER
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 121 OF 165

DATE: 04-01-2020

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 122 OF 165

DATE: 04-01-2020

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

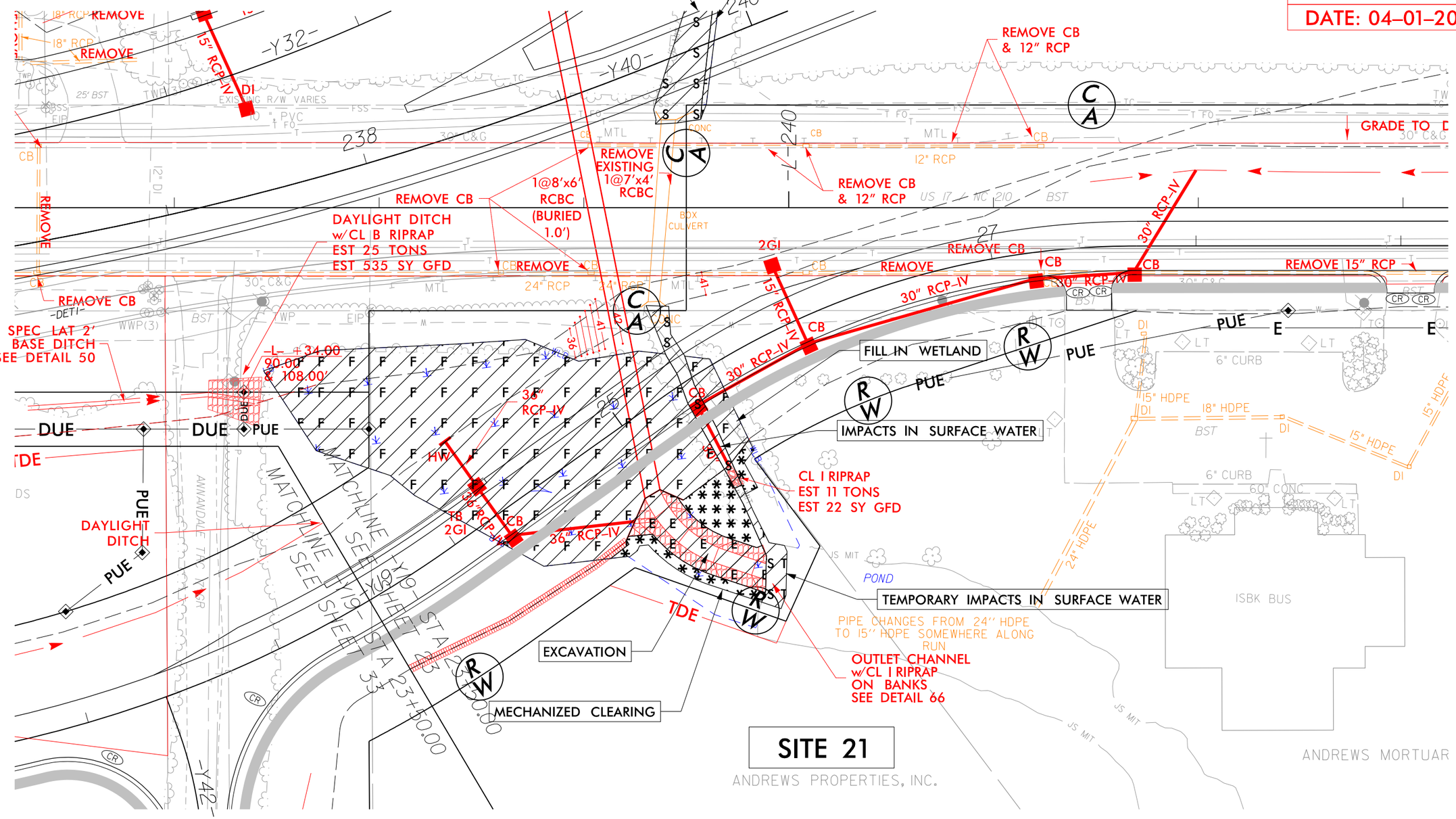
F F — DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

E E — DENOTES EXCAVATION IN WETLAND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER



8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

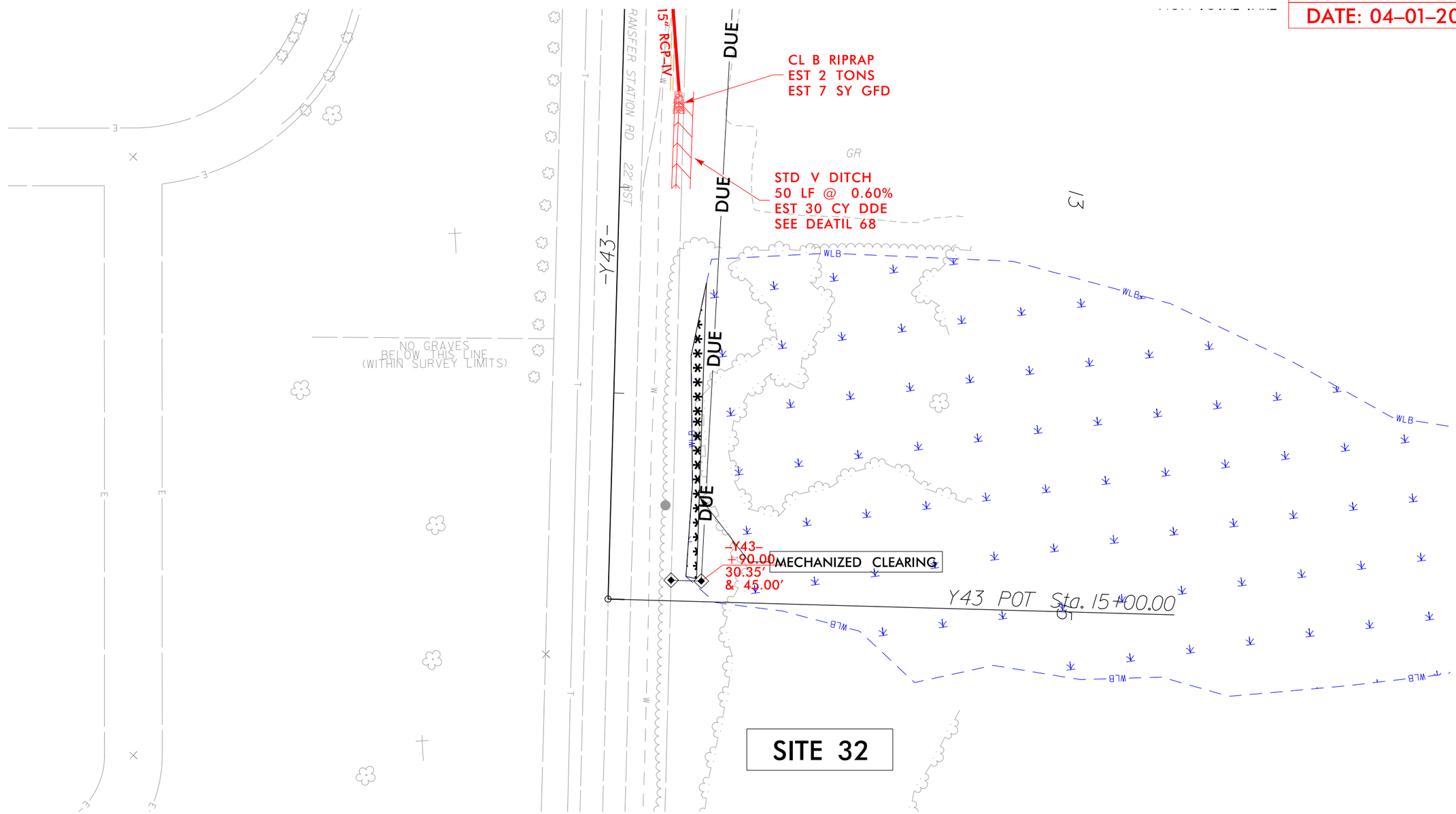
PERMIT DRAWING
SHEET 123 OF 165

DATE: 04-01-2020

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

DENOTES MECHANIZED CLEARING

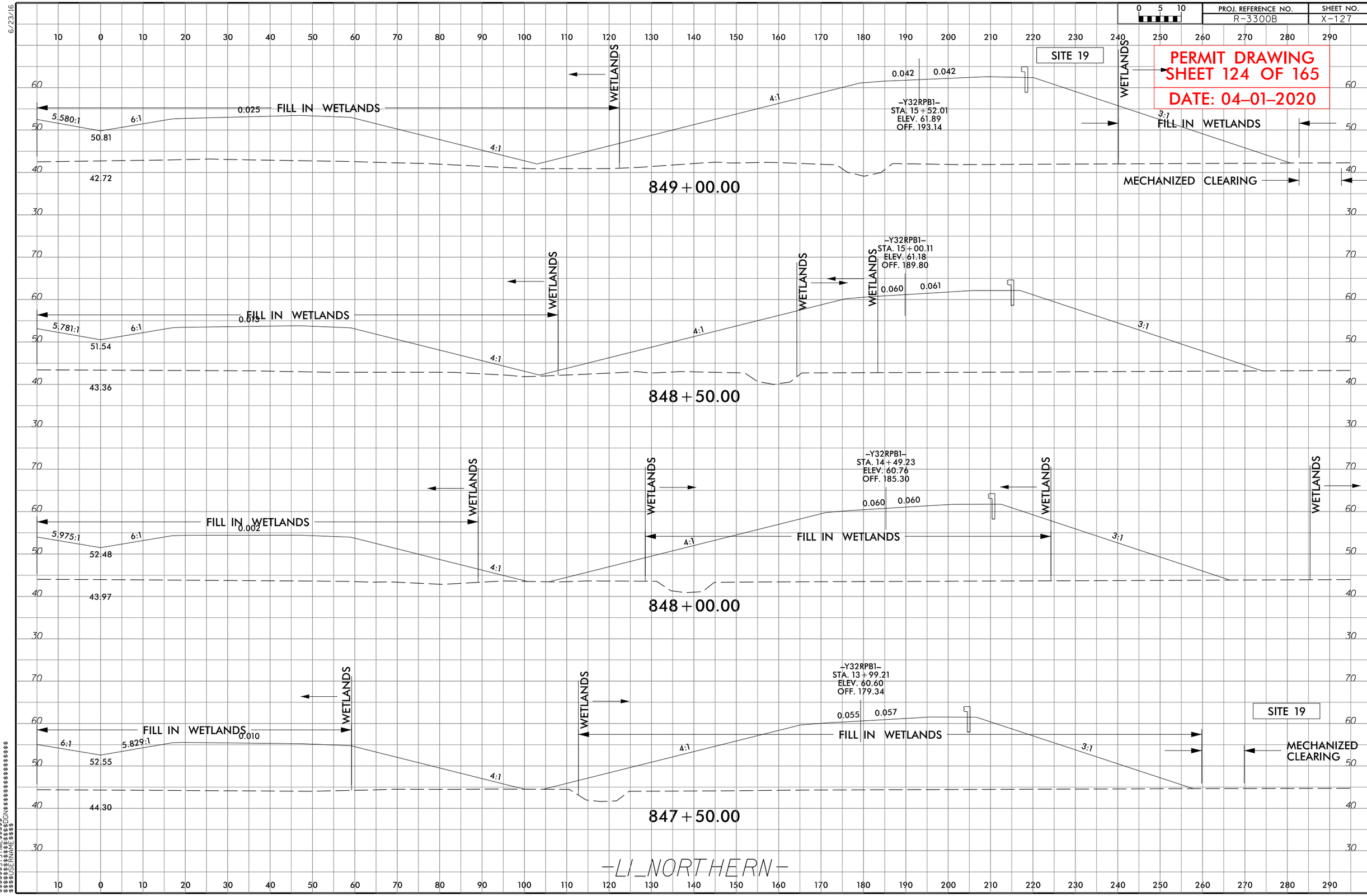


6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-127

0 5 10

PERMIT DRAWING
SHEET 124 OF 165
DATE: 04-01-2020



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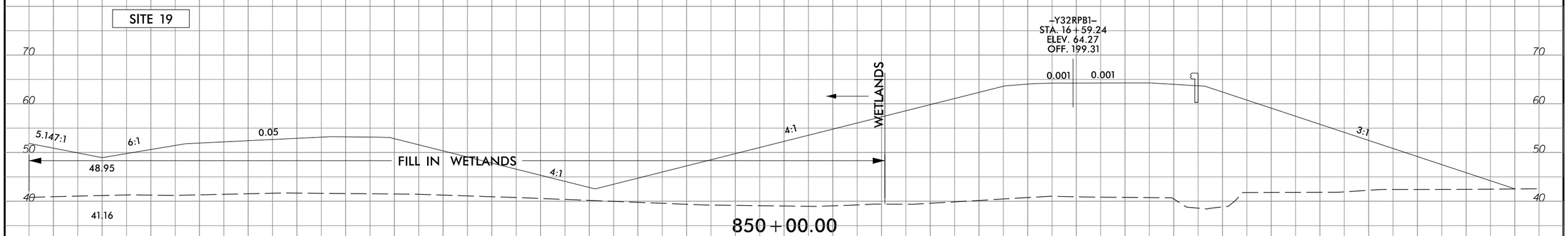
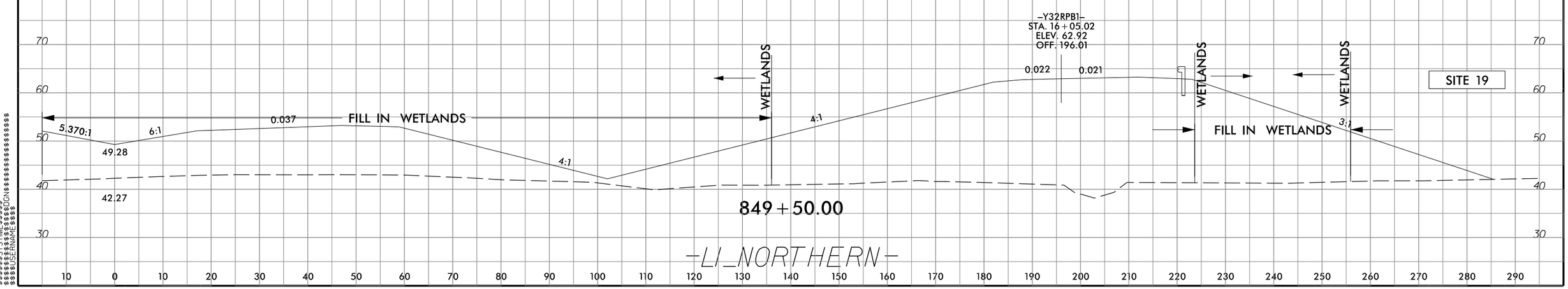
$$$$DGNS$$$$
$$$$USERNAME$$$$

PERMIT DRAWING
SHEET 125 OF 165

DATE: 04-01-2020



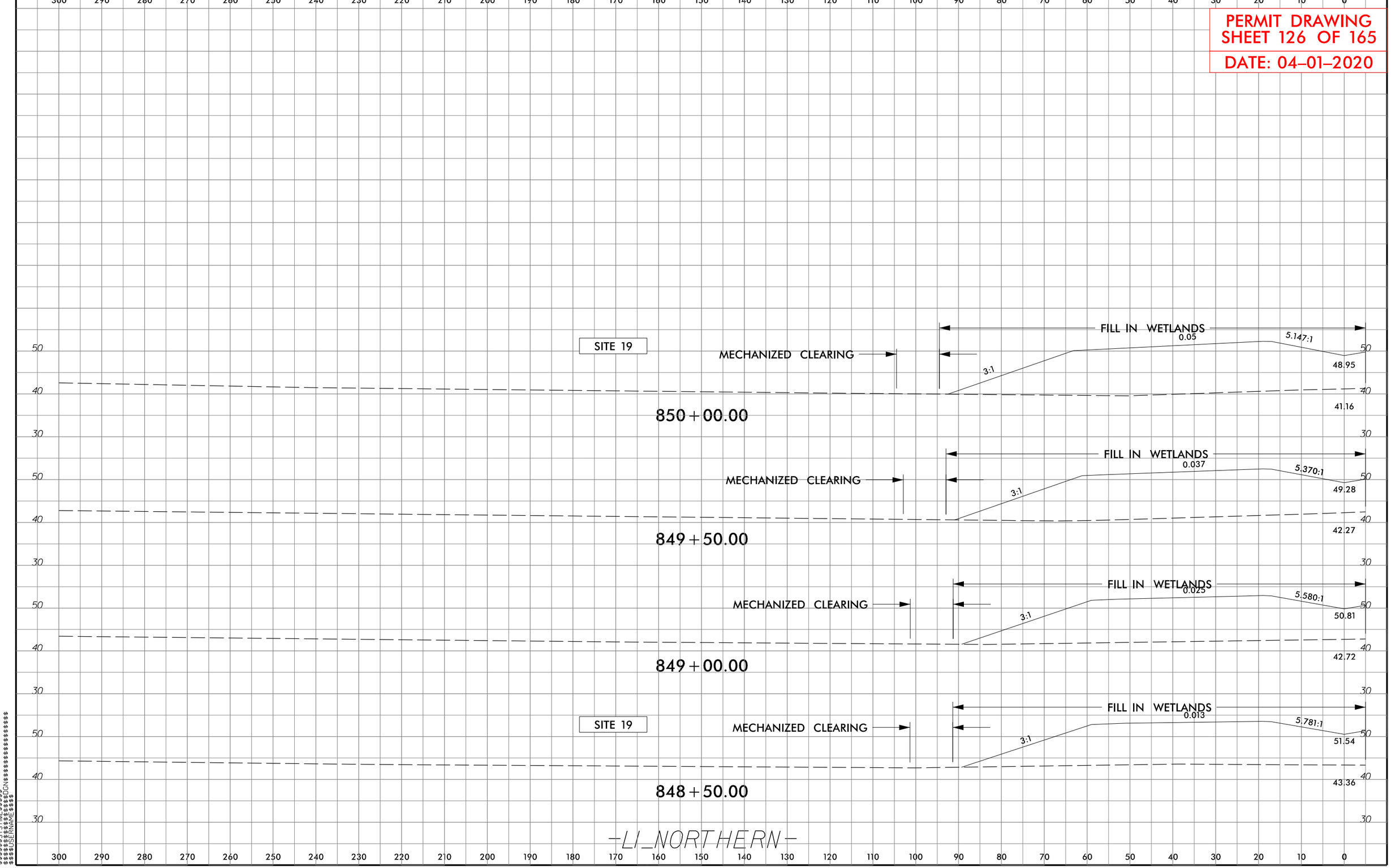


6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-131

PERMIT DRAWING
SHEET 126 OF 165

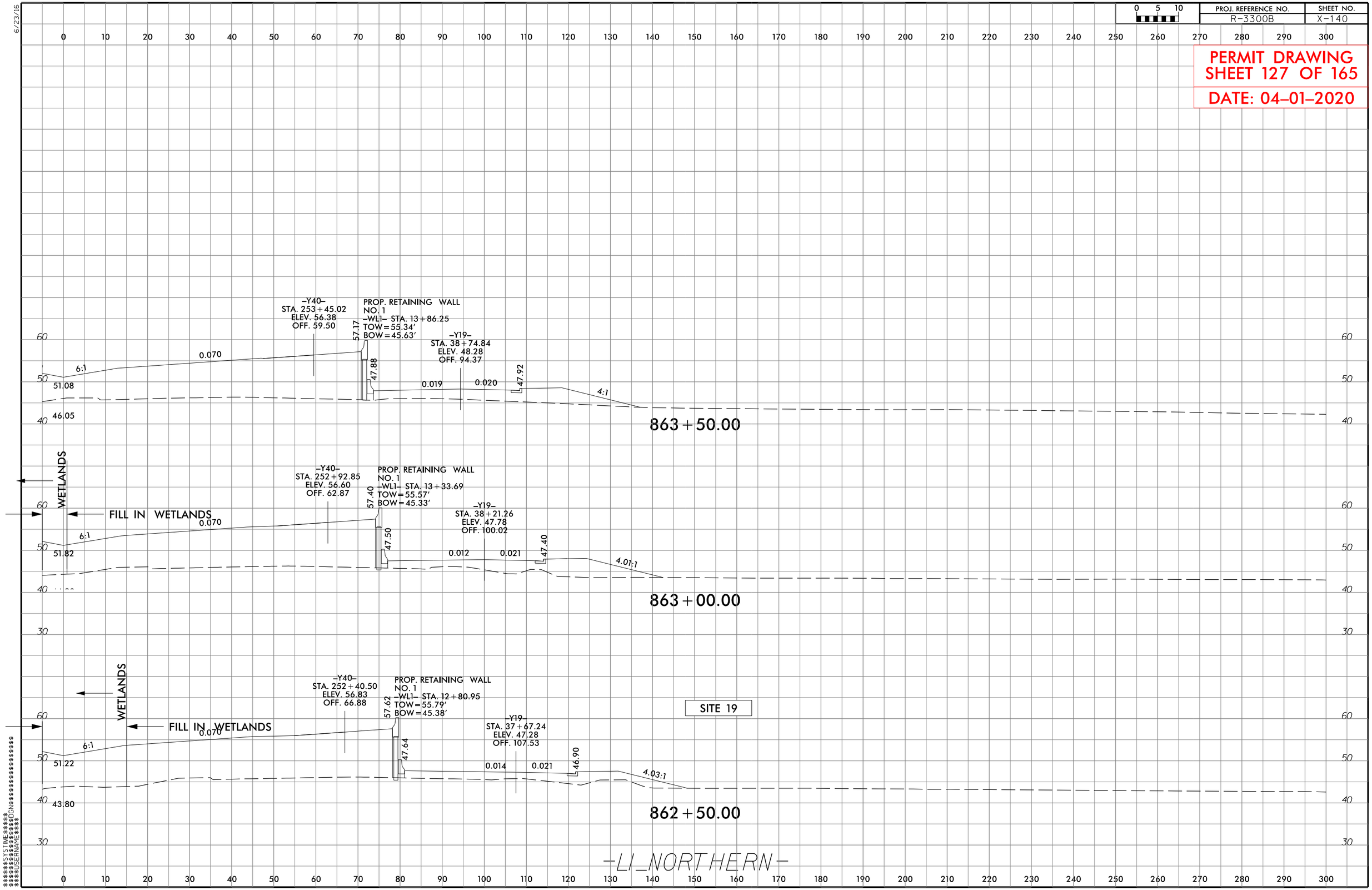
DATE: 04-01-2020



$$$$$$$SYSTIME$$$$$$$$$
$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

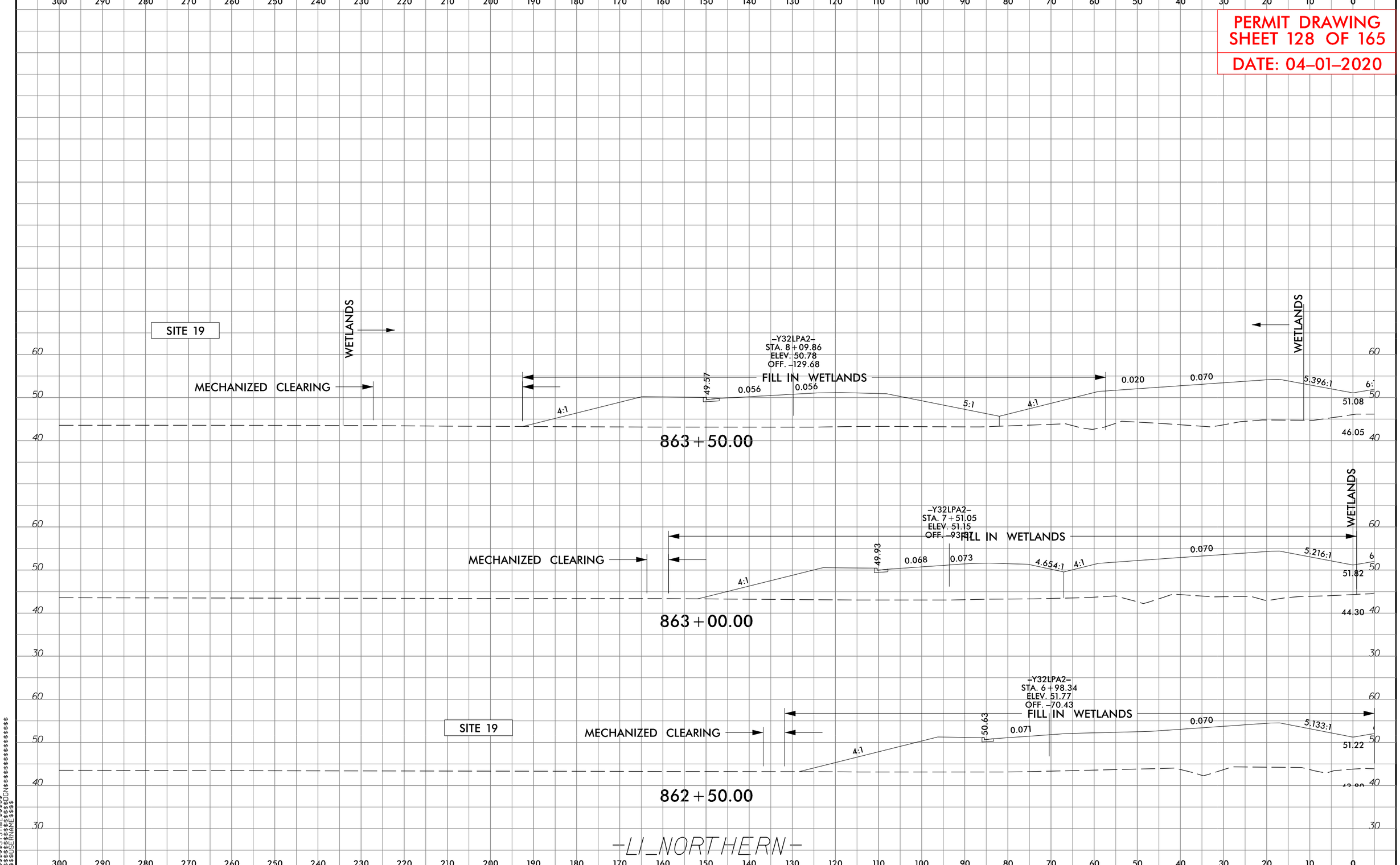
PERMIT DRAWING
SHEET 127 OF 165

DATE: 04-01-2020



PERMIT DRAWING
SHEET 128 OF 165

DATE: 04-01-2020



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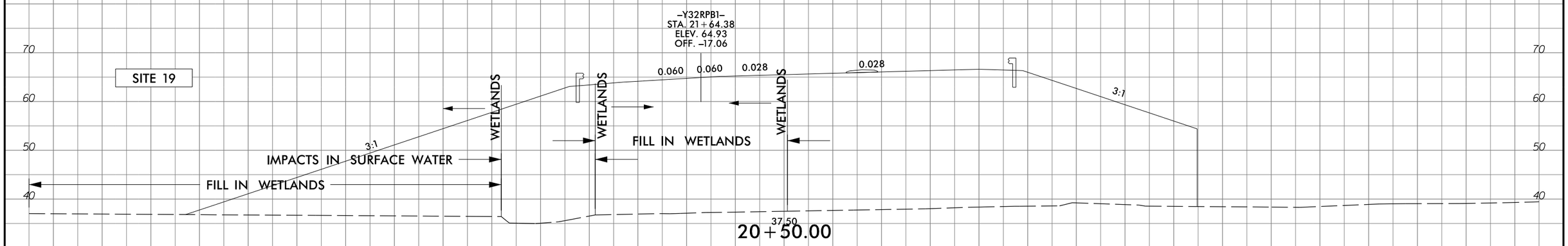
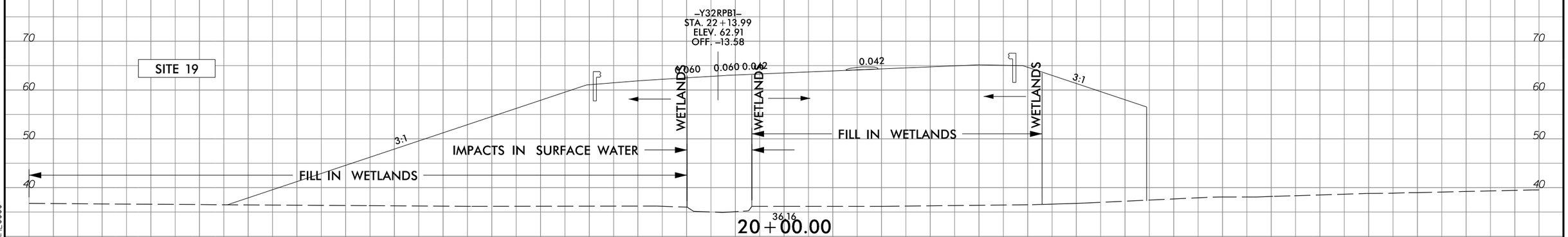
6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3300B	X-325

PERMIT DRAWING
SHEET 129 OF 165

DATE: 04-01-2020





-Y32-

$$$$$$$$SYSTIME$$$$
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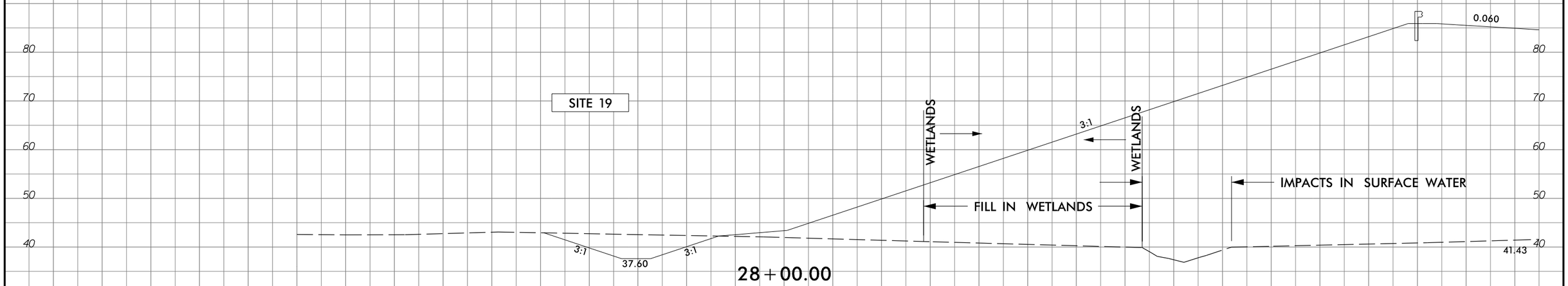
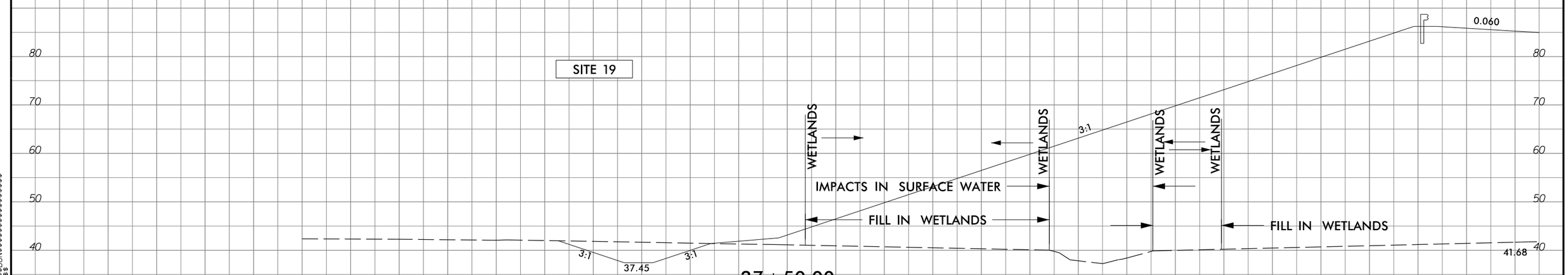
6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3300B	X-338

PERMIT DRAWING
SHEET 130 OF 165

DATE: 04-01-2020





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$$$$SYSTIME$$$$
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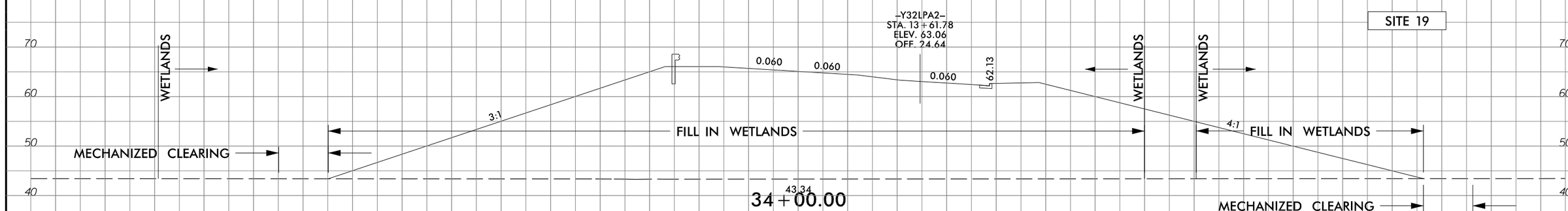
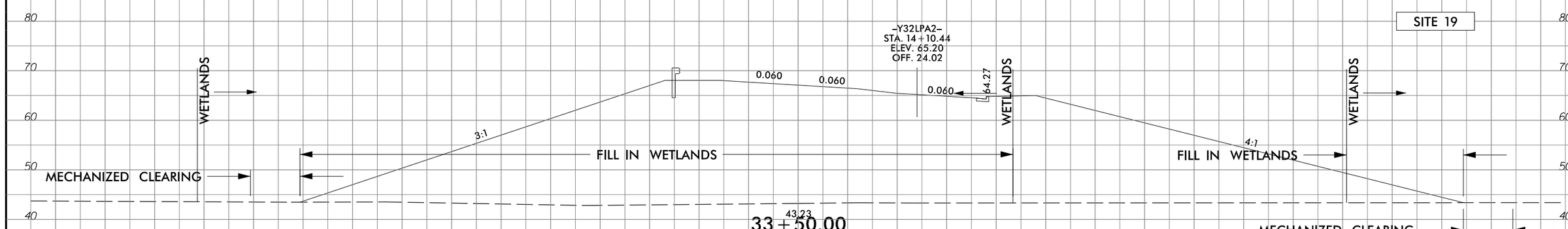
$$$$USERNAME$$$$

PERMIT DRAWING
SHEET 131 OF 165

DATE: 04-01-2020





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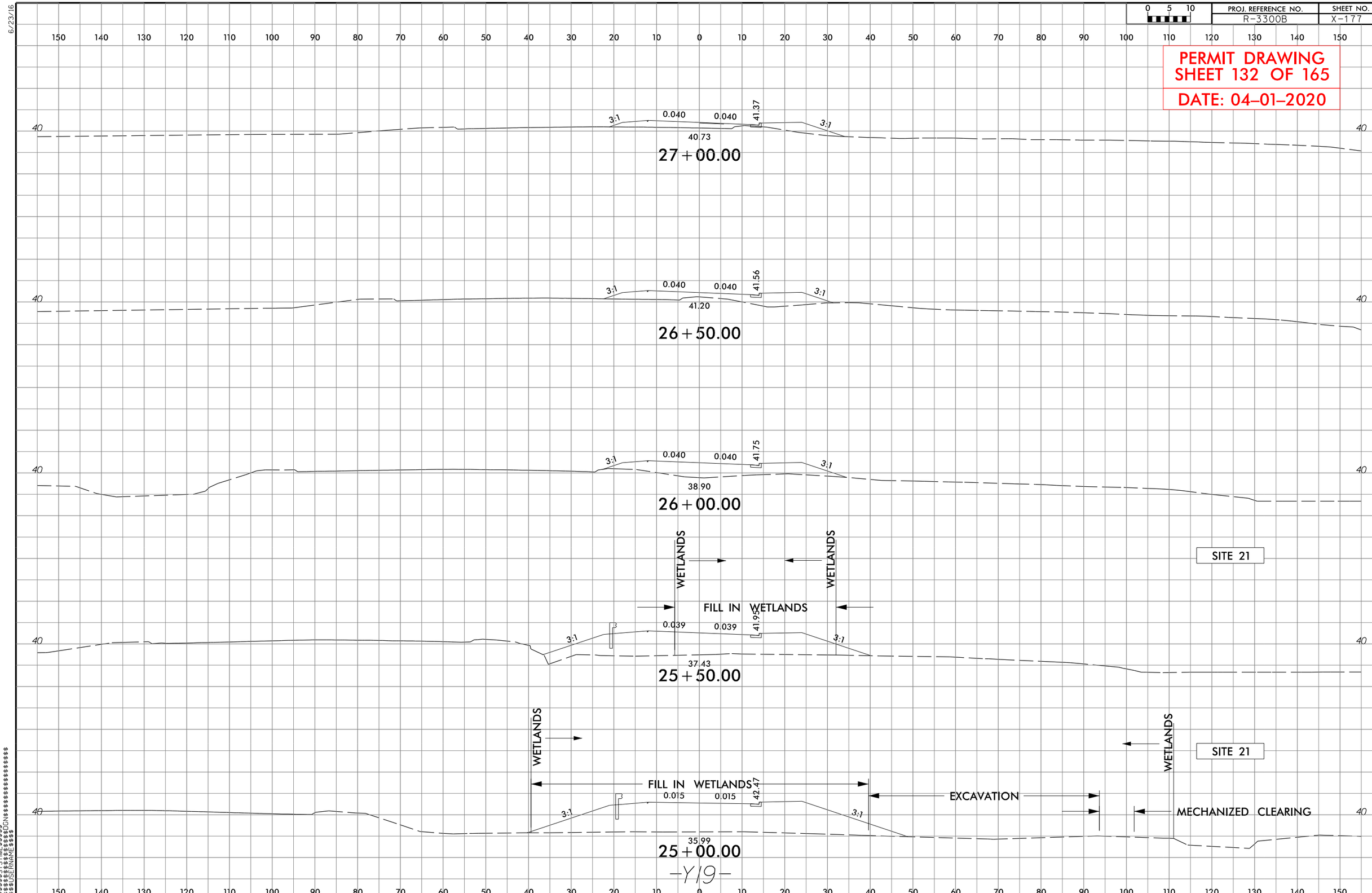
6/23/16

PROJ. REFERENCE NO.	SHEET NO.
R-3300B	X-177

0 5 10

PERMIT DRAWING
SHEET 132 OF 165

DATE: 04-01-2020



$$$$SYSTIME$$$$
$$$$SAVEDON$$$$
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

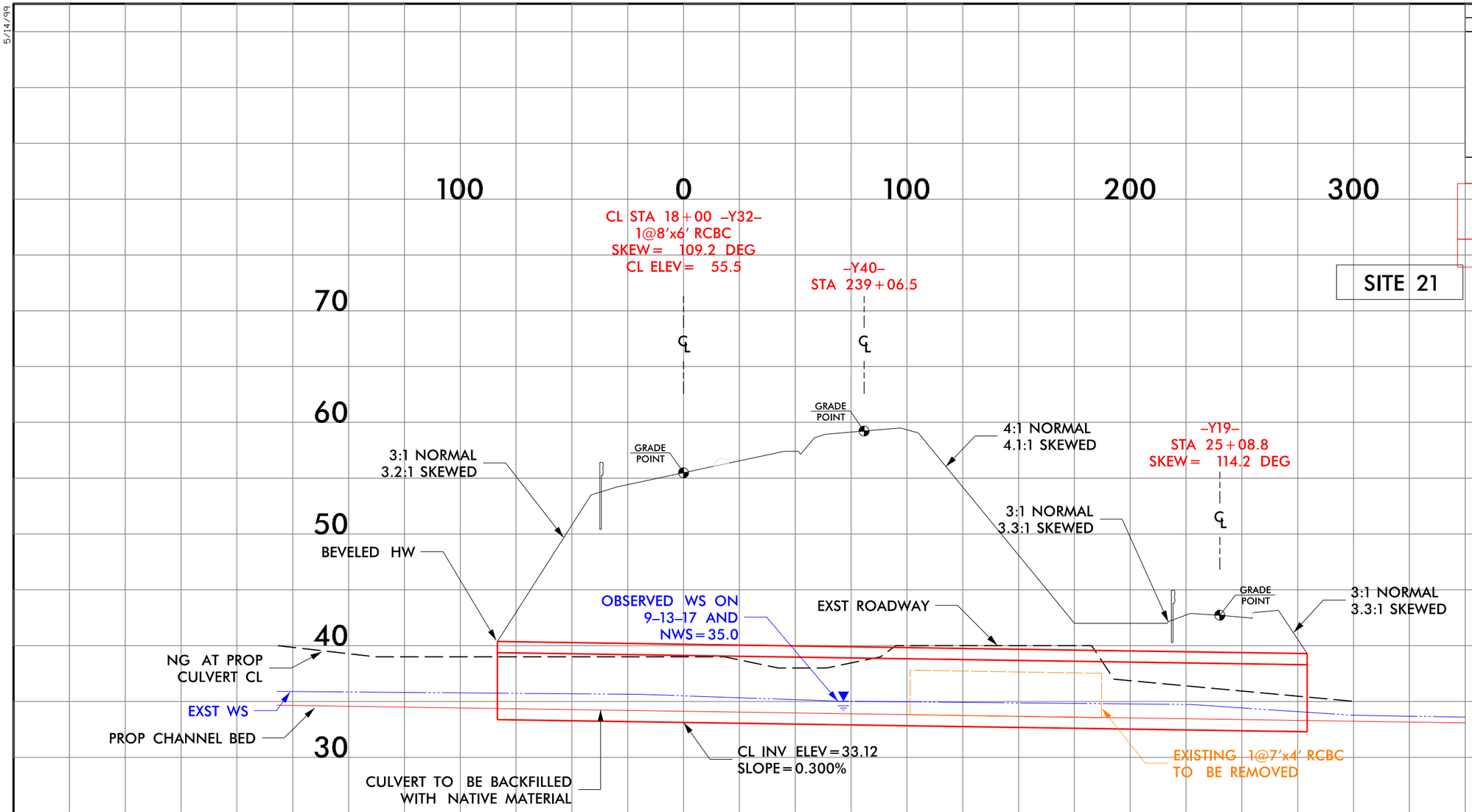
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

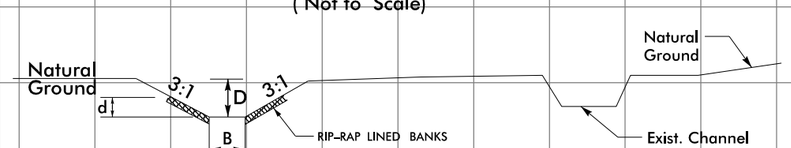
PERMIT DRAWING
SHEET 133 OF 165

DATE: 04-01-2020

SITE 21

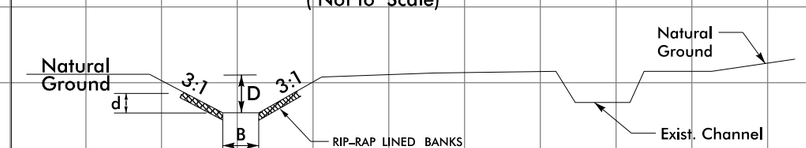


DETAIL
INLET CHANNEL CHANGE
(Not to Scale)



Min. D = 3.5 Ft.
Max. d = 3.5 Ft.
B = 8.0 Ft.
Est. = 202 Tons of Class 'I' Rip-Rap

DETAIL
OUTLET CHANNEL CHANGE
(Not to Scale)



Min. D = 2 Ft.
Max. d = 2 Ft.
B = 8.0 Ft.
Est. = 105 Tons of Class 'I' Rip-Rap

PERMIT DRAWING
SHEET 134 OF 165

DATE: 04-01-2020

Dewberry
2 TWOMYRCLIFF ROAD
S. 185410
RALEIGH, NC 27607
PHONE: 919 881.9929
NC COA No. F-0829

Stantec
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Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	24
FOR R/W SEE U-5732 SHEET NO.	24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

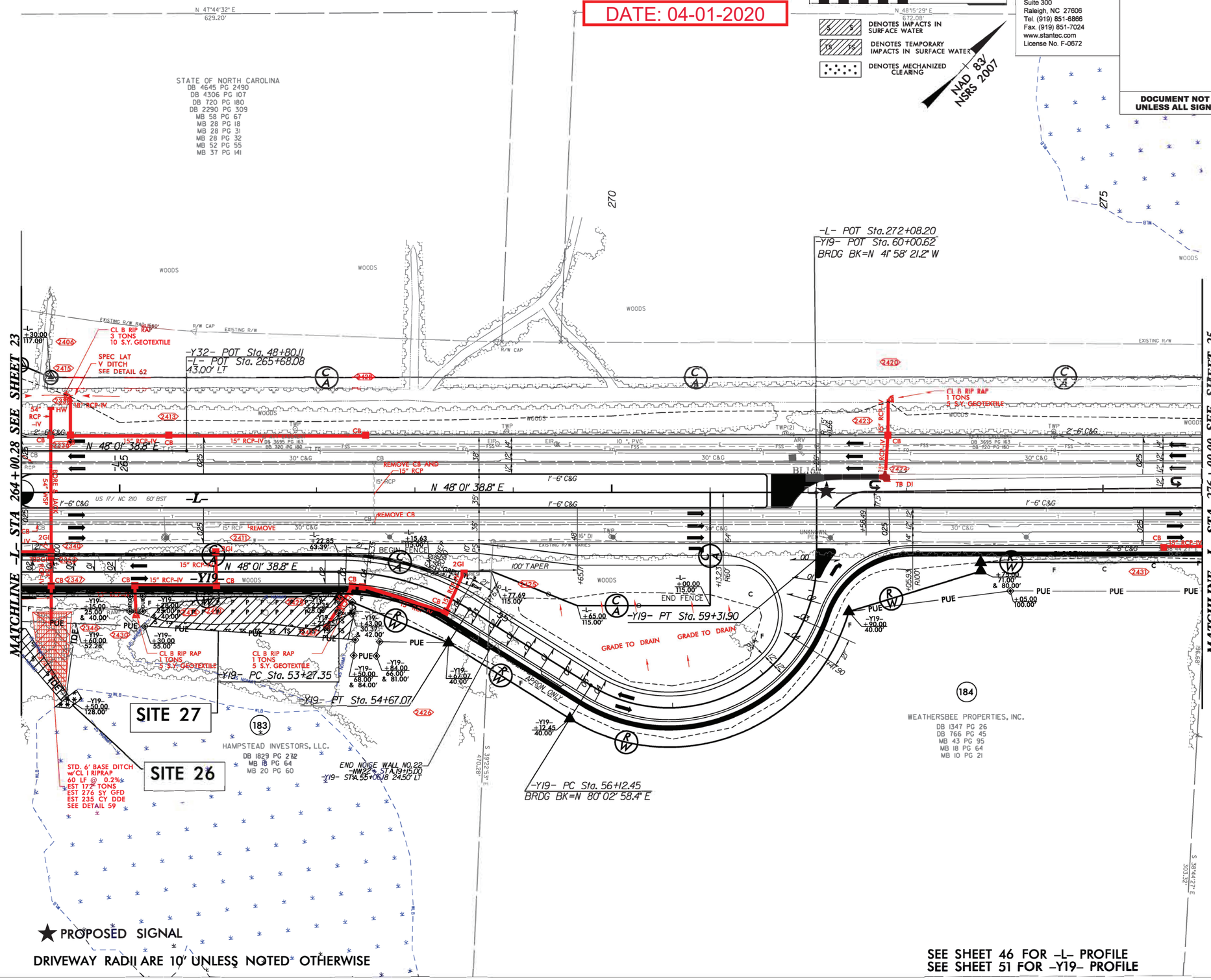
100' 0' 100'

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

NAD 83/ NSRS 2007



SEE SHEET 46 FOR -L- PROFILE
SEE SHEET 51 FOR -Y19- PROFILE

REVISIONS
03/15/2019 - R/W REVISION; ADDED ROW, DUE, PUE & TDE ON PARCEL 183; ADDED ROW & PUE ON PARCEL 184. - STANTEC

5/14/99

11/18/2019
DEWBERRY
R3300B_Permit Drawings_20191118.pdf

PERMIT DRAWING
SHEET 135 OF 165

DATE: 04-01-2020

Dewberry
2 6 10 WEST JEFFERSON S.U.STREET
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PHONE: 919 881.9939
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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	24
FOR R/W SEE U-5732 SHEET NO.	24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

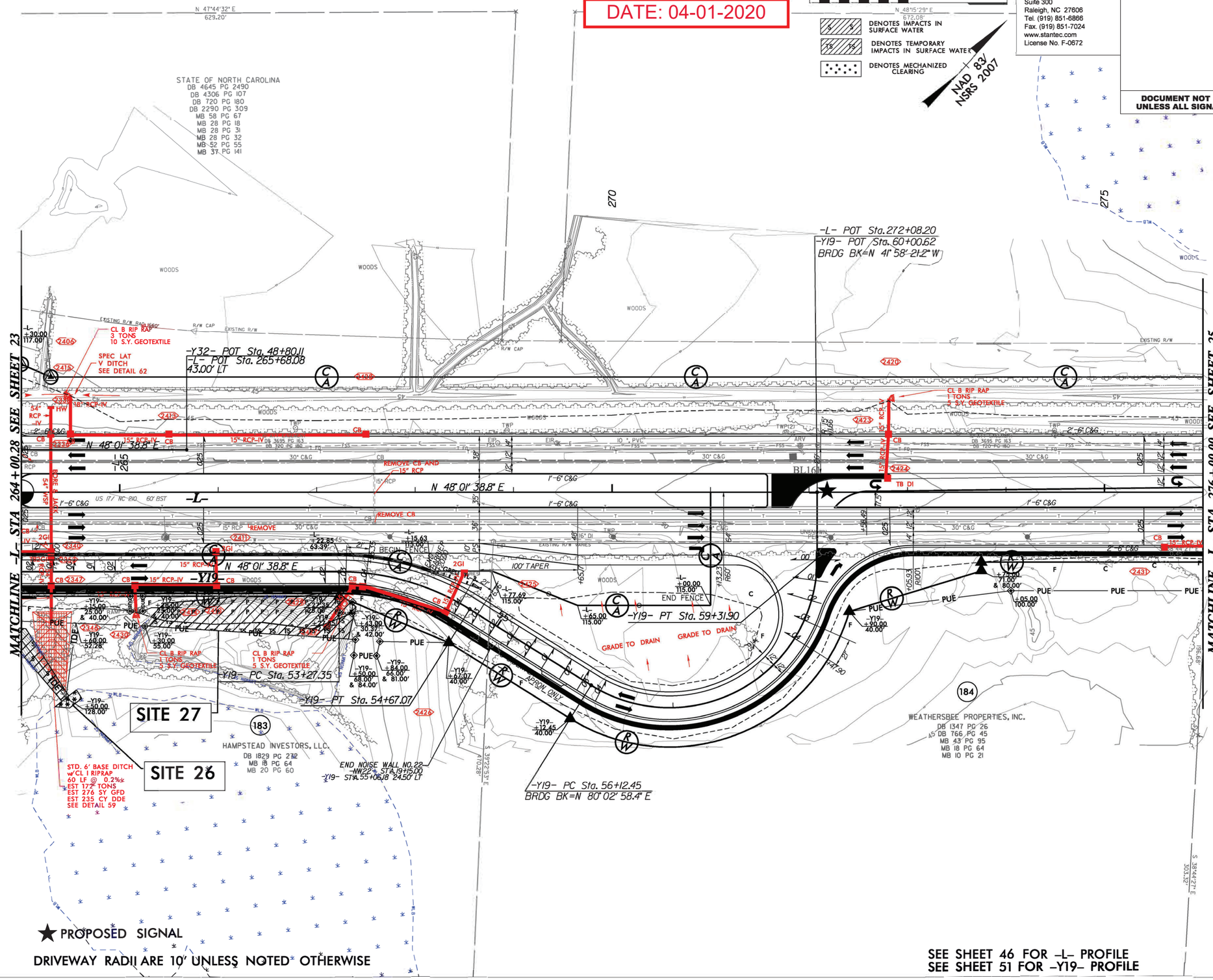
100' 0' 100'

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

NAD 83/ NSRS 2007



★ PROPOSED SIGNAL

DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 46 FOR -L- PROFILE
SEE SHEET 51 FOR -Y19- PROFILE

REVISIONS

03/15/2019 - R/W REVISION; ADDED ROW, DUE, PUE & TDE ON PARCEL 183; ADDED ROW & PUE ON PARCEL 184. - STANTEC

5/14/99

11/18/2019
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PERMIT DRAWING
SHEET 136 OF 165

DATE: 04-01-2020

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PHONE: 919.881.9939
NC COA No. F-0929

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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	25
FOR R/W SEE U-5732 SHEET NO.	25
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

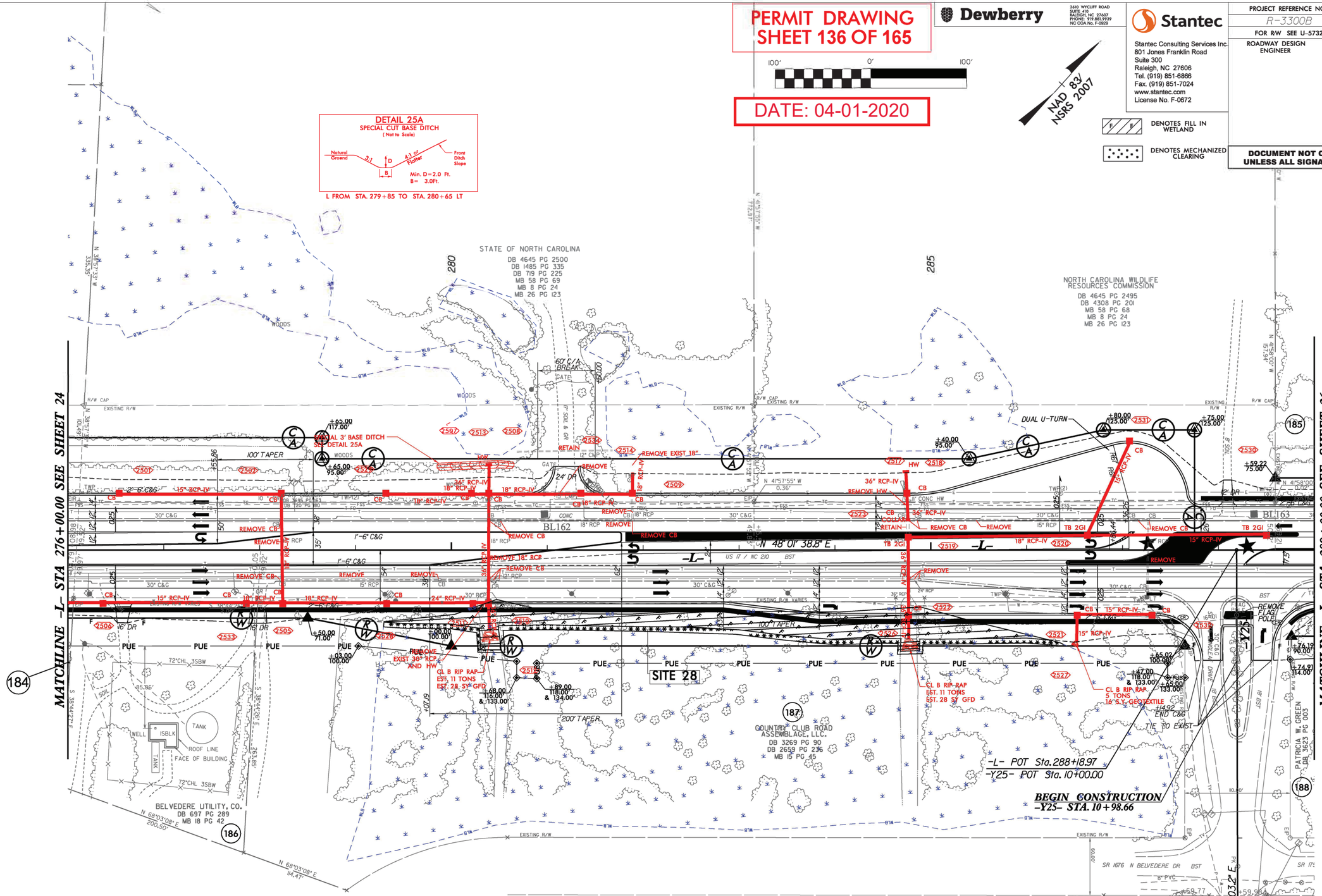
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83/ NSRS 2007

100' 0' 100'



★ PROPOSED SIGNAL
DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE
SEE SHEET 46 FOR -L- PROFILES

11/18/2019
DEWBERRY
R3300B_Permit Drawings_20191118.pdf

PERMIT DRAWING
SHEET 137 OF 165

DATE: 04-01-2020

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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	25
FOR R/W SEE U-5732 SHEET NO.	25
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

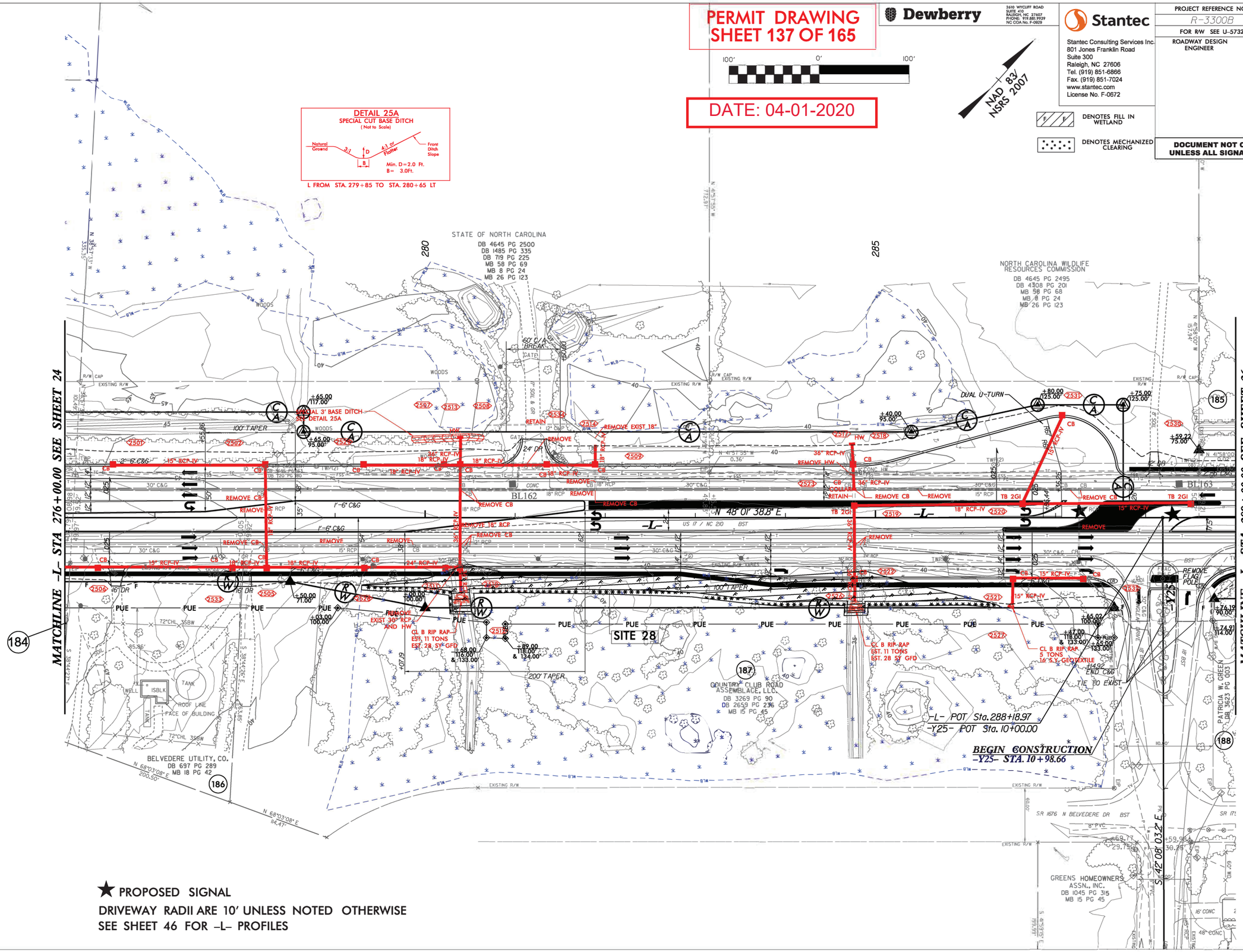
DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83/ NSRS 2007

100' 0' 100'

DETAIL 25A
SPECIAL CUT BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, B, 4:1 or Flatter, Front Ditch Slope
Min. D = 2.0 Ft.
B = 3.0Ft.
L FROM STA. 279+85 TO STA. 280+65 LT



★ PROPOSED SIGNAL

DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 46 FOR -L- PROFILES

11/8/2019
DEWBERRY
R3300B_Permit Drawings_20191118.pdf

5/14/99

PERMIT DRAWING
SHEET 138 OF 165

DATE: 04-01-2020

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2 60 WYC LIFF CIR D
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RALEIGH, NC 27607
PHONE: 919 851.9929
NC COA No. F-0829

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www.stantec.com
License No. F-0672

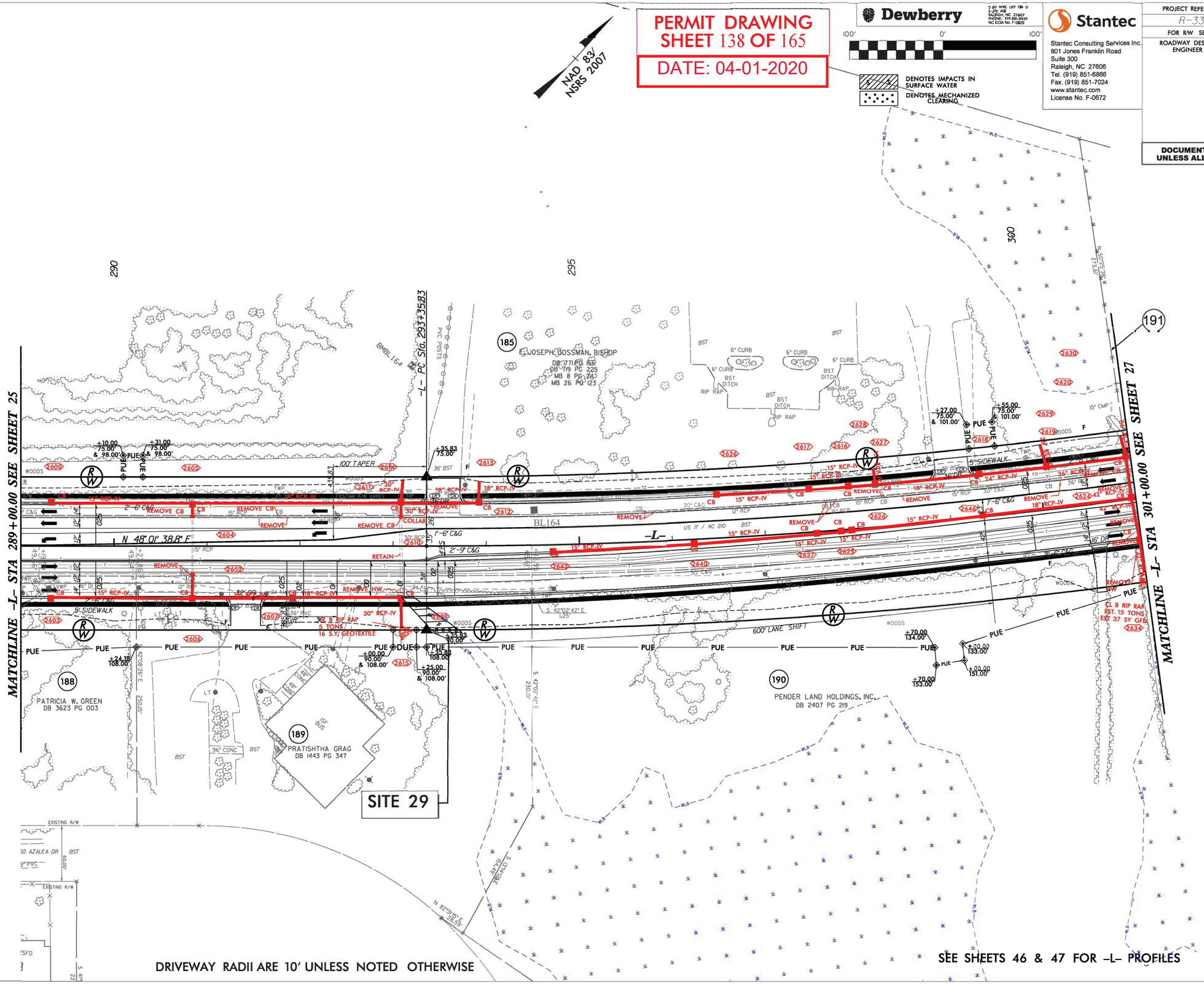
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	26
FOR R/W SEE U-5732 SHEET NO.	26
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

100' 0' 100'

DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING



DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEETS 46 & 47 FOR -L- PROFILES

11/18/2019
DEWBERRY
R3300B_Permit Drawings_20191118.pdf

5/14/99

PERMIT DRAWING
SHEET 139 OF 165
DATE: 04-01-2020

Dewberry
3610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919 881.9929
NC COA No. F-0928

100' 0' 100'

DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

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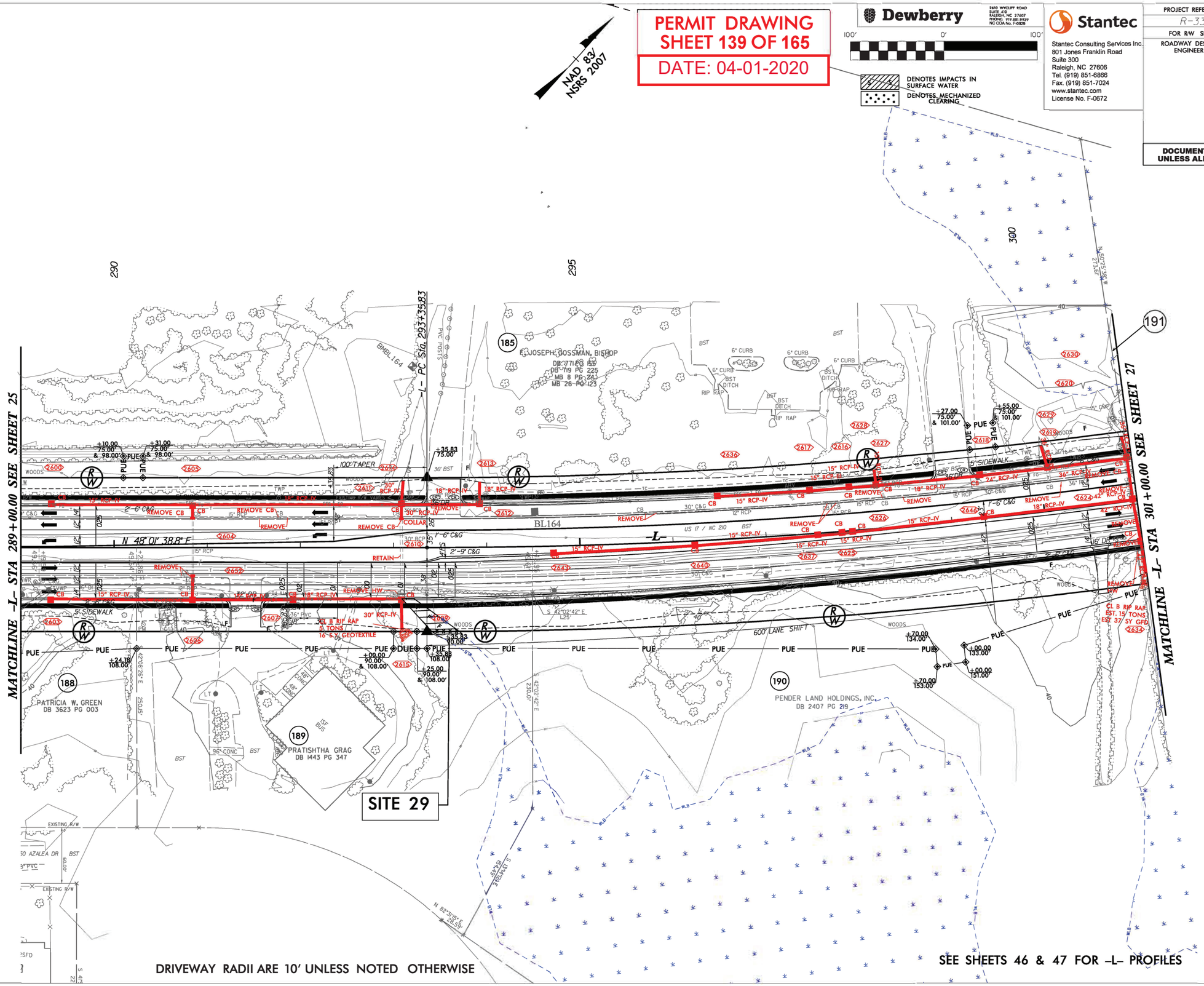
www.stantec.com
License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	26
FOR R/W SEE U-5732 SHEET NO.	26
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



11/18/2019
DEWBERRY
R3300B_Permit Drawings_20191118.pdf

PERMIT DRAWING
SHEET 140 OF 165

DATE: 04-01-2020

Dewberry
3: 6110 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919 881.9939
NC COA No. F-0929

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

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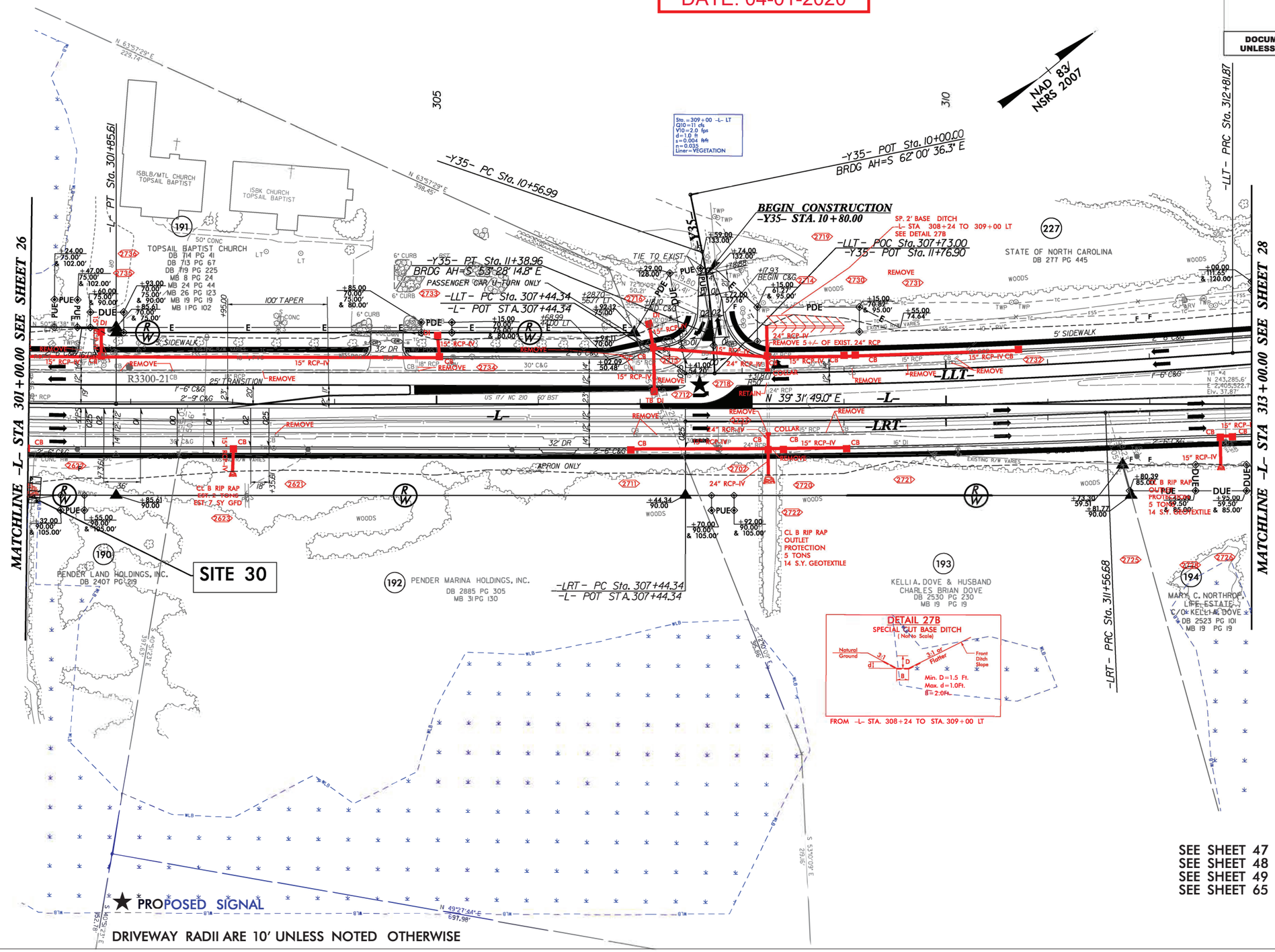
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	27
FOR R/W SEE U-5732 SHEET NO.	27
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SEE SHEET 47 FOR -L- PROFILES
SEE SHEET 48 FOR -LLT- PROFILE
SEE SHEET 49 FOR -LRT- PROFILE
SEE SHEET 65 FOR -Y35- PROFILE

REVISIONS

11/28/2018 - R/W REVISION: ADDED PARCEL NUMBER 227. - STANTEC

5/14/99

11/18/2019
DEWBERRY
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PERMIT DRAWING
SHEET 141 OF 165

DATE: 04-01-2020

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RALEIGH, NC 27607
PHONE: 919 881.9939
NC COA No. F-0929

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

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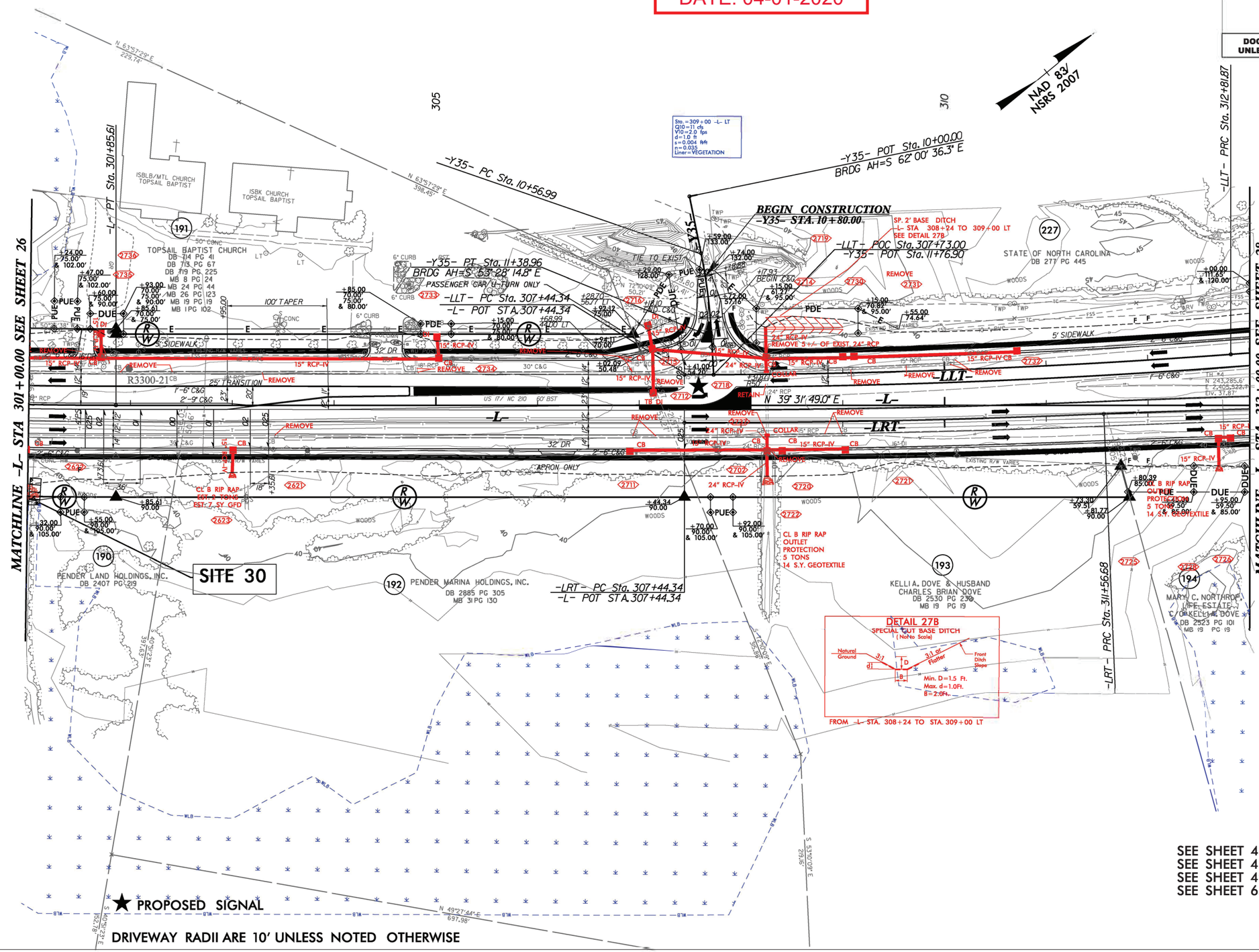
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	27
FOR R/W SEE U-5732 SHEET NO.	27
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SEE SHEET 47 FOR -L- PROFILES
SEE SHEET 48 FOR -LLT- PROFILE
SEE SHEET 49 FOR -LRT- PROFILE
SEE SHEET 65 FOR -Y35- PROFILE

REVISIONS
11/28/2018 - R/W REVISION: ADDED PARCEL NUMBER 227. - STANTEC

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11/18/2019
DEWBERRY
R3300B_Permit Drawings_20191118.pdf

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SHEET 142 OF 165

DATE: 04-01-2020

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.859.9939
NC CGA No. F-0829

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License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	28
OR R/W SEE U-5732	SHEET NO. 28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

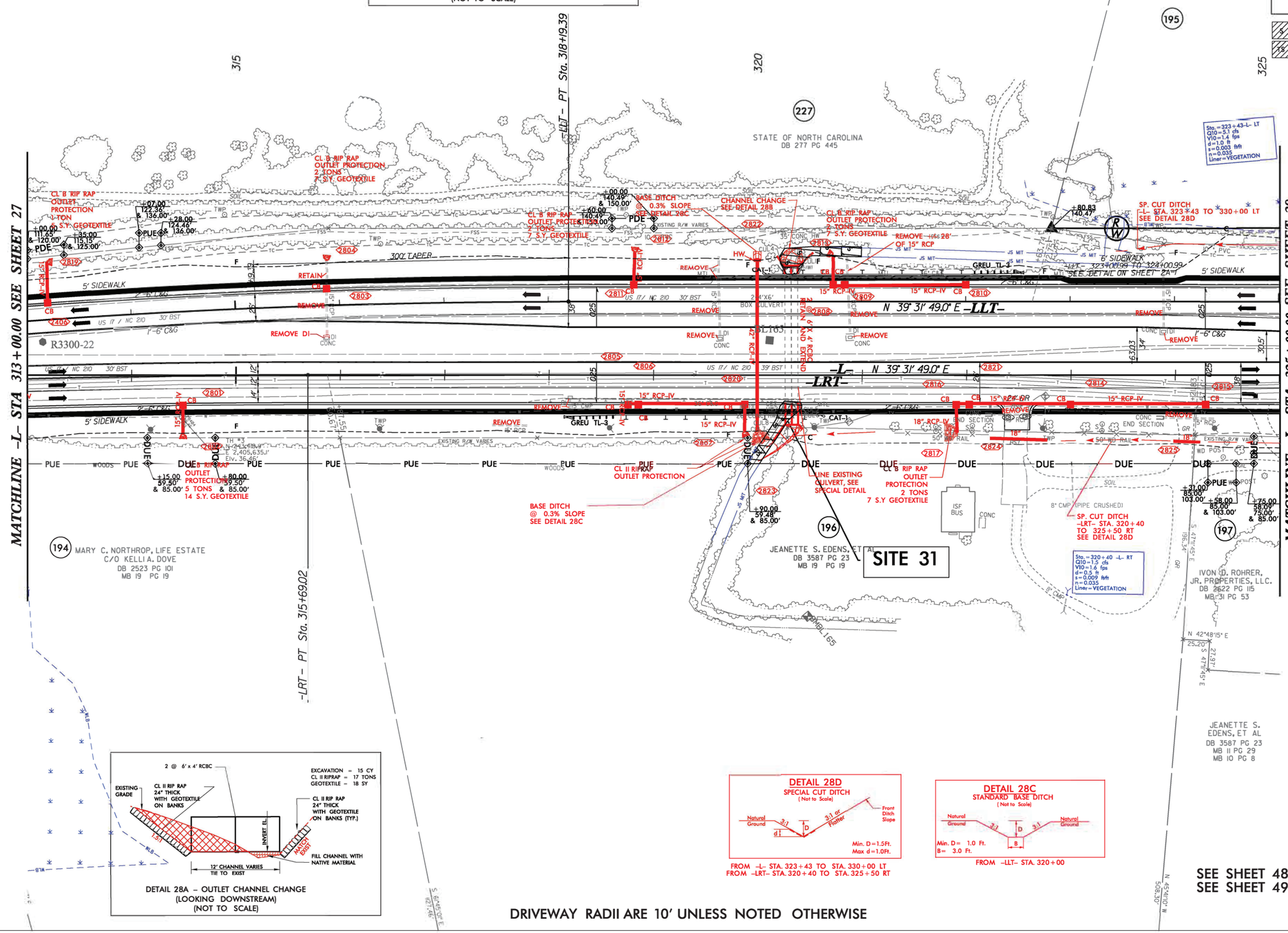
DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

REVISIONS

11/28/2018 – R/W REVISION; ADDED PARCEL NUMBER 227. – STANTEC

5/14/99



DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 48 FOR -LLT- PROFILE
SEE SHEET 49 FOR -LRT- PROFILE

11/18/2019
DEWBERRY
R3300B_Permit Drwwings_20191118.pdf

PERMIT DRAWING
SHEET 143 OF 165

DATE: 04-01-2020

Dewberry
2610 WYCOFF ROAD
SUITE 410
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PHONE: 919.859.9939
NC COA No. F-0829

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www.stantec.com
License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	28
FOR R/W SEE U-5732 SHEET NO.	28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

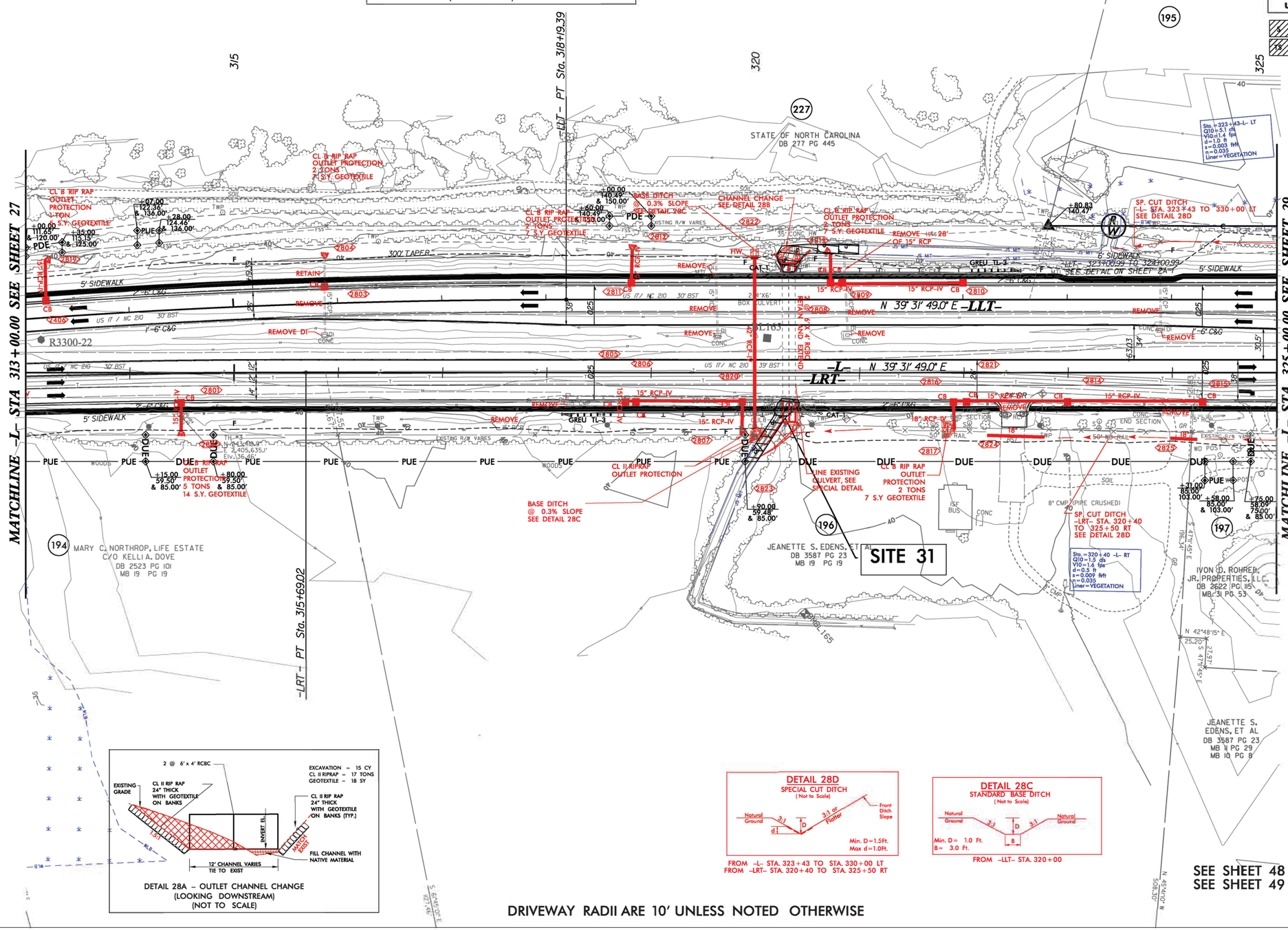
NAD 83/ NSRS 2007

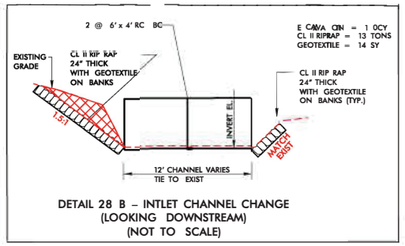
100' 0' 100'

REVISIONS

11/28/2018 – R/W REVISION: ADDED PARCEL NUMBER 227. – STANTEC

5/14/99





DETAIL 28 B – INTLET CHANNEL CHANGE
(LOOKING DOWNSTREAM)
(NOT TO SCALE)

DETAIL 28A – OUTLET CHANNEL CHANGE
(LOOKING DOWNSTREAM)
(NOT TO SCALE)

FROM -L- STA. 323+43 TO STA. 330+00 LT
FROM -LRT- STA. 320+40 TO STA. 325+50 RT

FROM -LLT- STA. 320+00

DRIVEWAY RADII ARE 10' UNLESS NOTED OTHERWISE

SEE SHEET 48 FOR -LLT- PROFILE
SEE SHEET 49 FOR -LRT- PROFILE

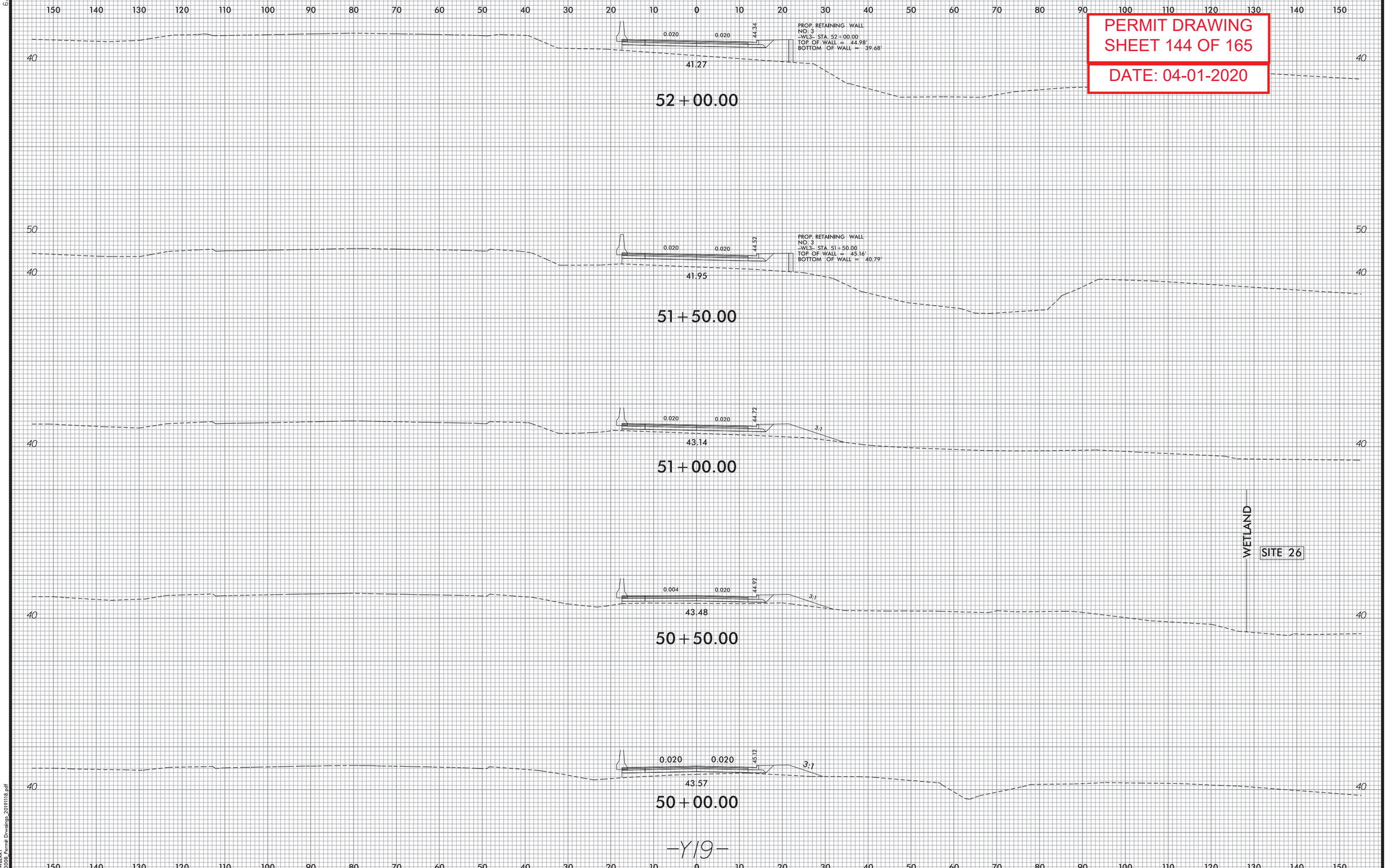
11/8/2019
DEWBERRY
R3300B_Permit Drawings_20191118.pdf

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3300B	X-188

PERMIT DRAWING
SHEET 144 OF 165

DATE: 04-01-2020



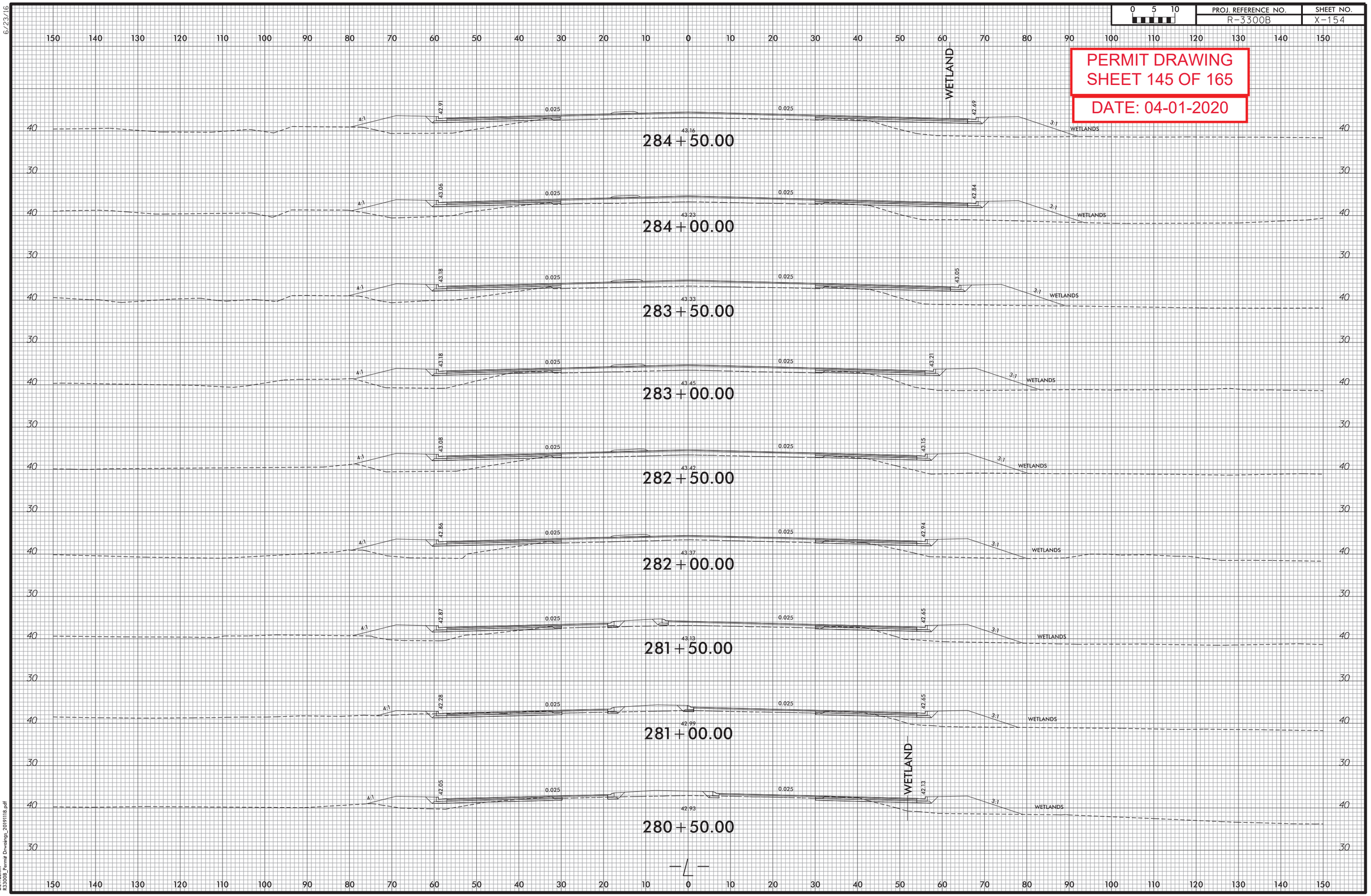
-Y19-

1118-0019
DEWBERRY
R3300B_Permit Drawings_20191118.pdf

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3300B	X-154

PERMIT DRAWING
SHEET 145 OF 165

DATE: 04-01-2020



6/23/16

11/8/2019
DEWBERRY
R3300B_Permit Drawings_20191118.pdf

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3300B	X-157

PERMIT DRAWING
SHEET 146 OF 165

DATE: 04-01-2020

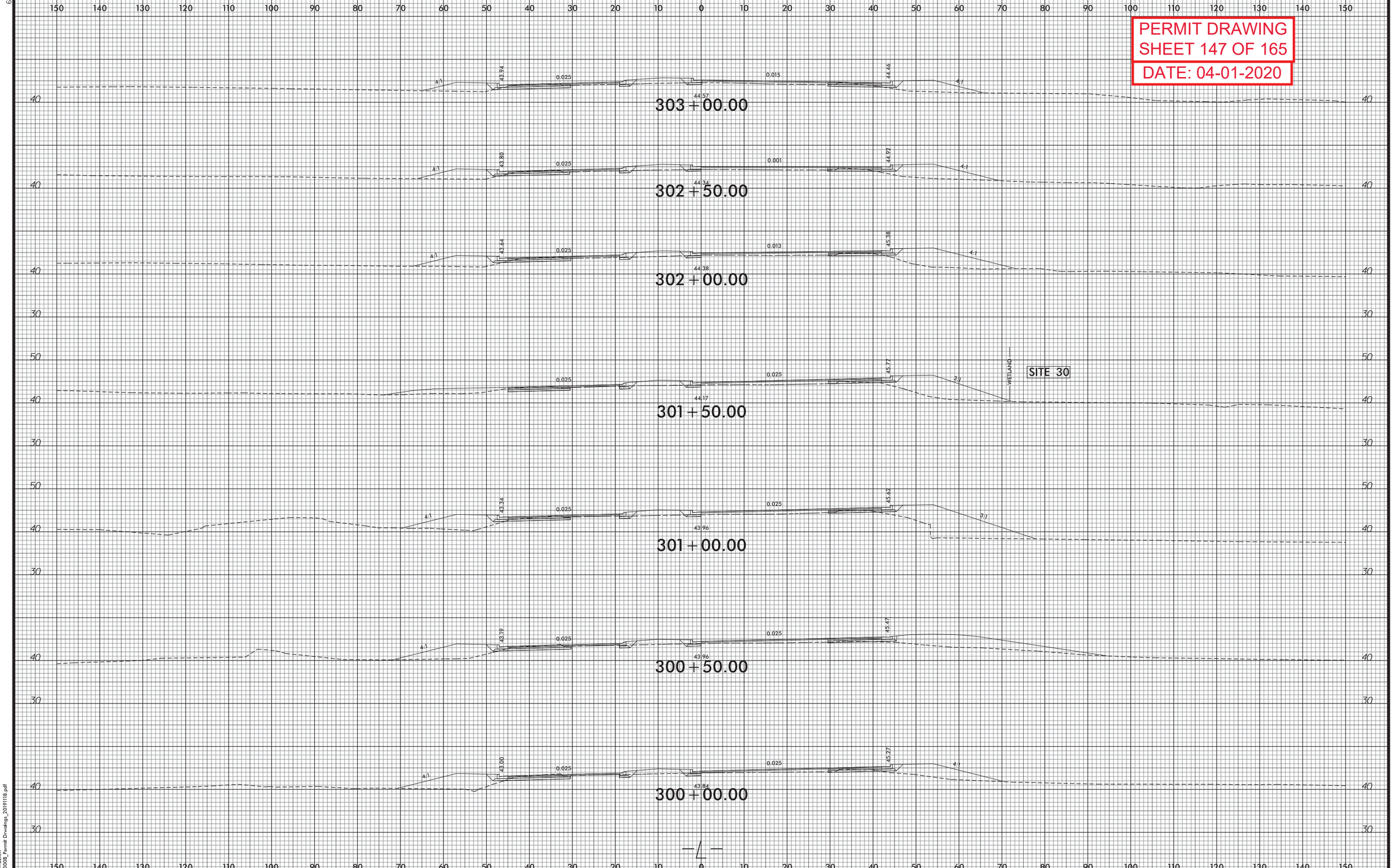
6/23/16

11/18/2019
DEWBBRY
R3300B_Permit Drawings_20191118.pdf

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3300B	X-159

PERMIT DRAWING
SHEET 147 OF 165
DATE: 04-01-2020



11/18/2019
DEWBERRY
R3300B_Permit Drawings_20191118.pdf

PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

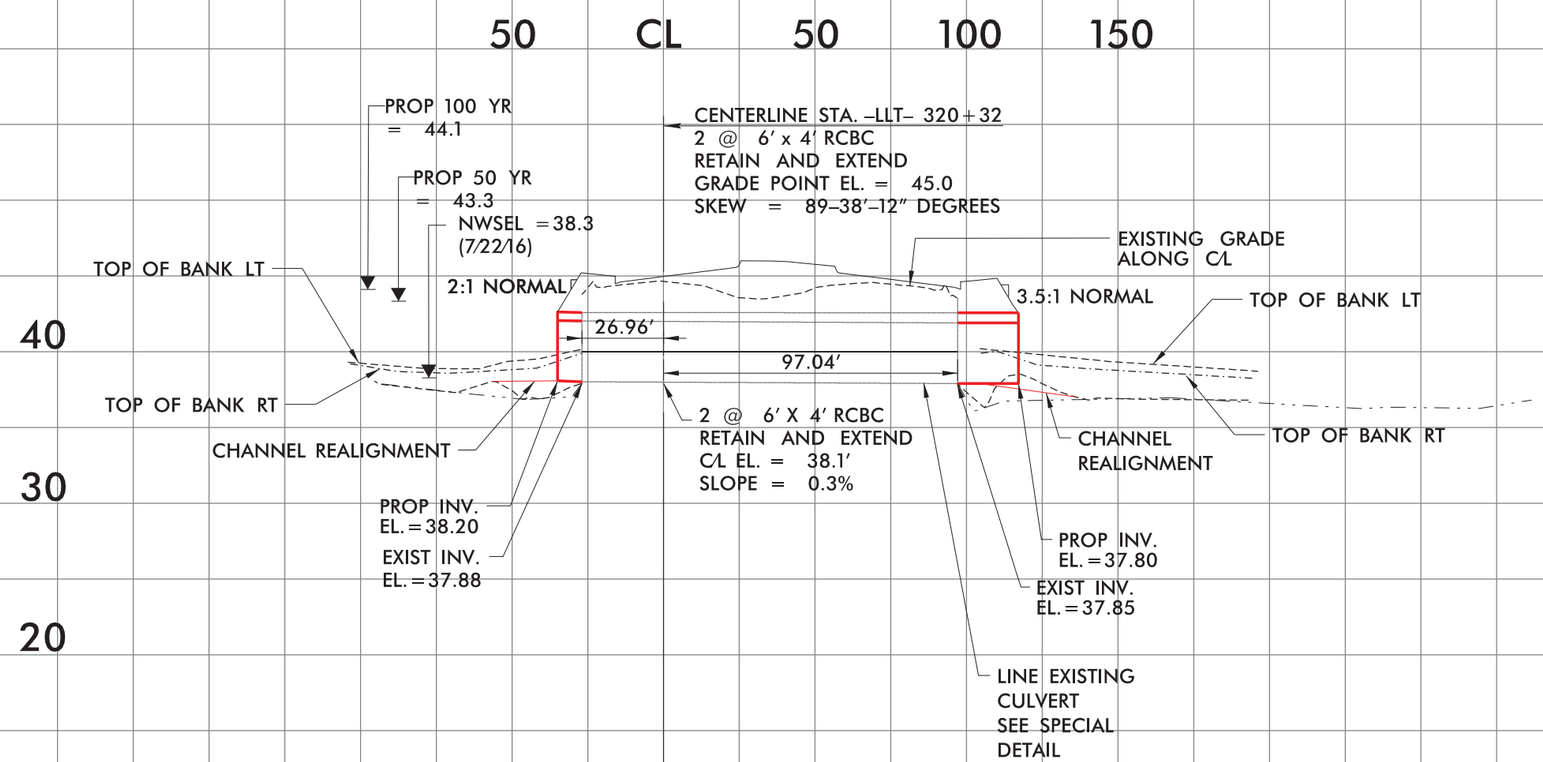
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 148 OF 165

DATE: 04-01-2020

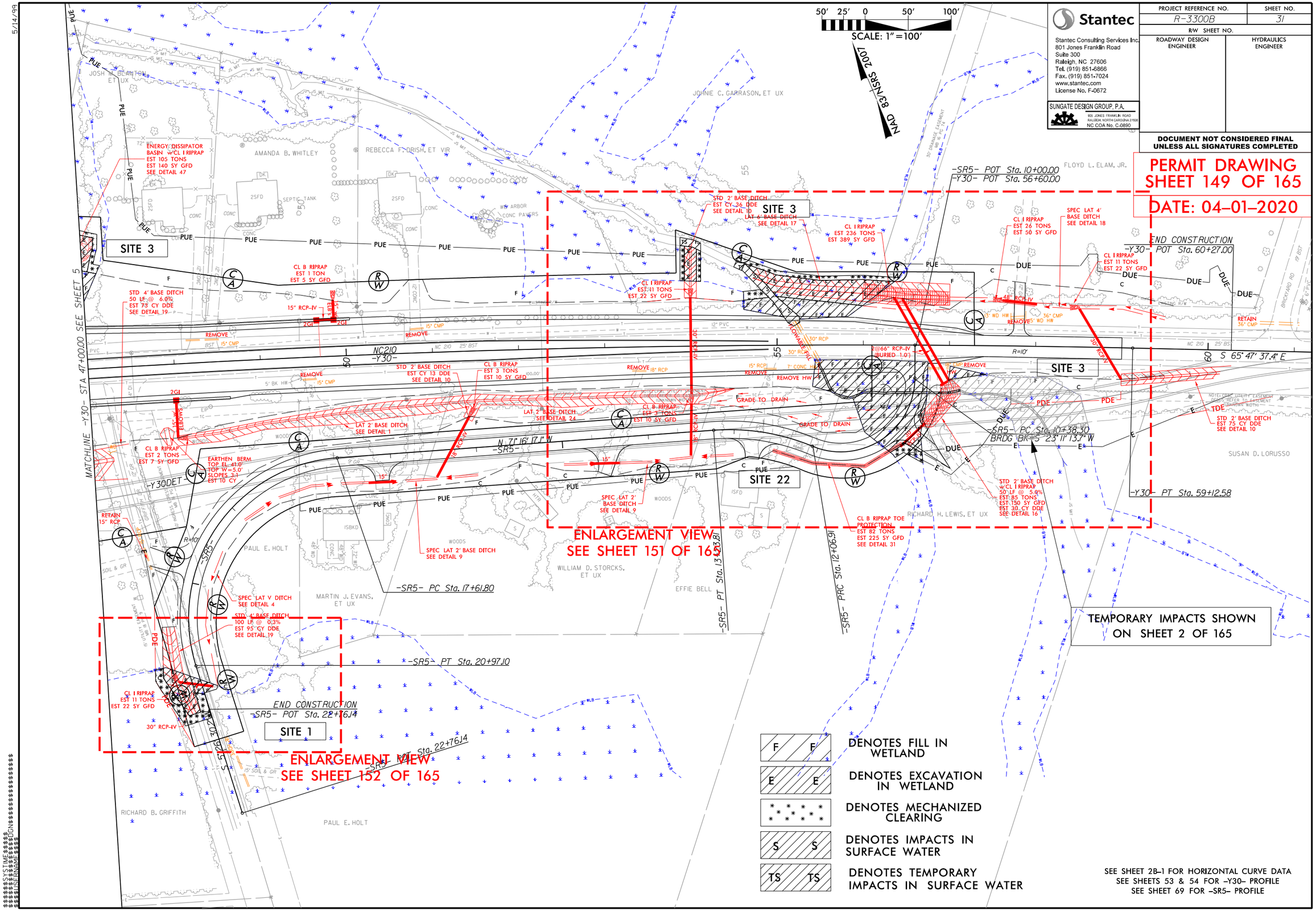
SITE 31



5/14/99

12/2/2019
DESIGNER
R-3100B Permit Drawings 20191202.pdf

5/14/99



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SUNGATE DESIGN GROUP, P.A.
105 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

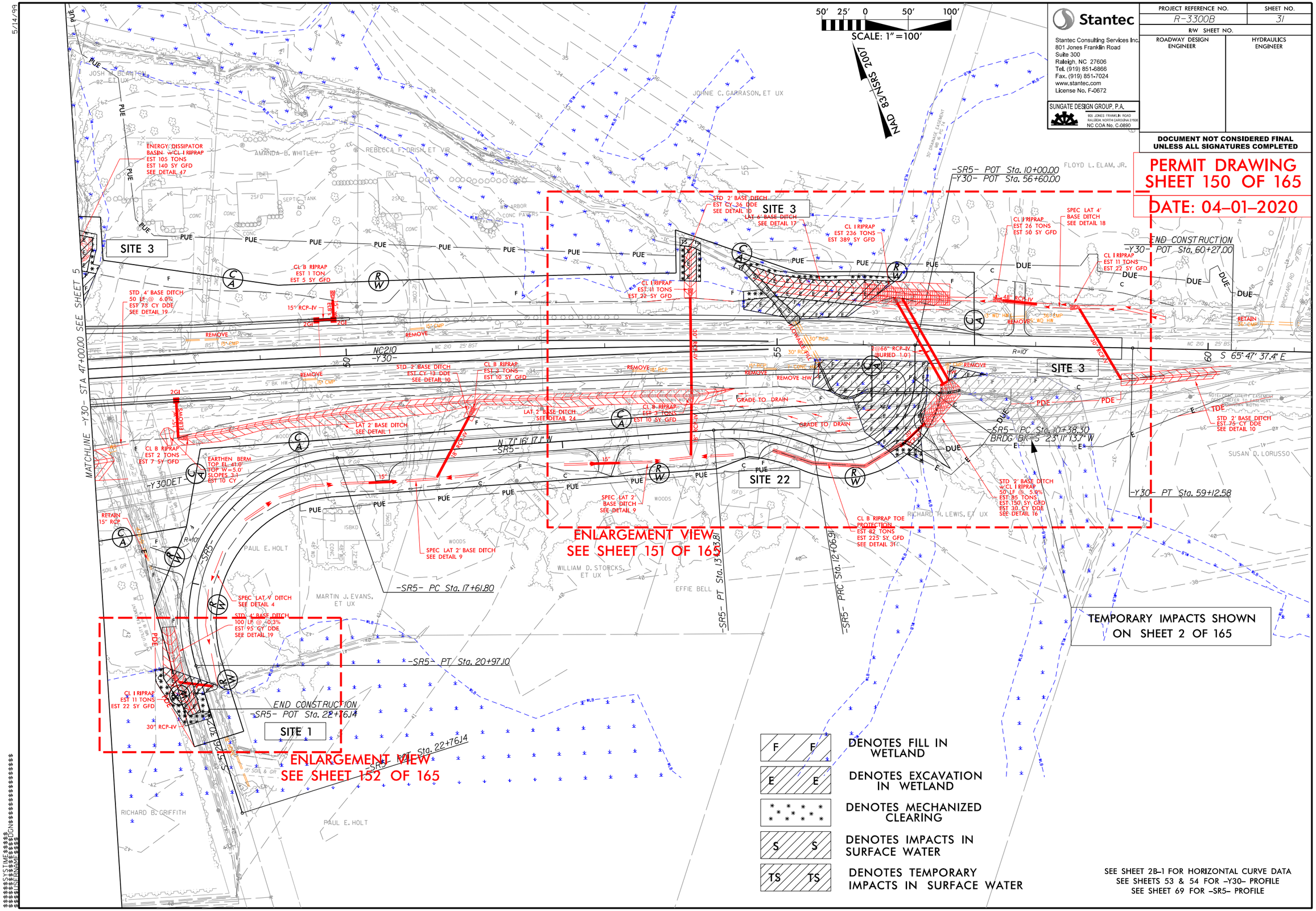
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 149 OF 165

DATE: 04-01-2020

SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS 53 & 54 FOR -Y30- PROFILE
SEE SHEET 69 FOR -SR5- PROFILE

5/14/99



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www.stantec.com
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SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 150 OF 165

DATE: 04-01-2020

SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS 53 & 54 FOR -Y30- PROFILE
SEE SHEET 69 FOR -SR5- PROFILE

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 151 OF 165

DATE: 04-01-2020

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

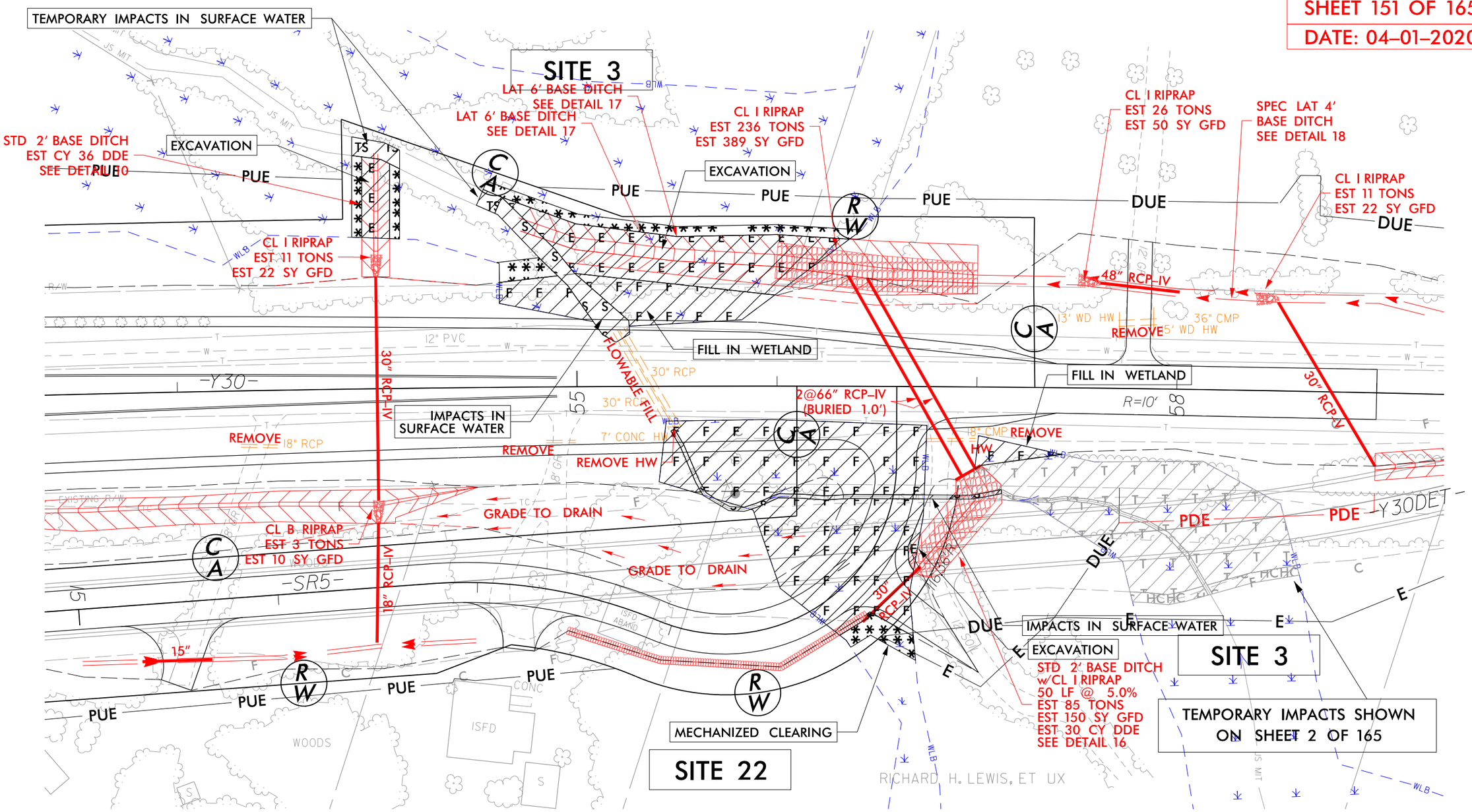
F F — DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

E E — DENOTES EXCAVATION IN WETLAND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER



8/17/99

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

E E DENOTES EXCAVATION IN WETLAND

10′ 5′ 0 10′ 20′
SCALE: 1″=20′

NAD 83

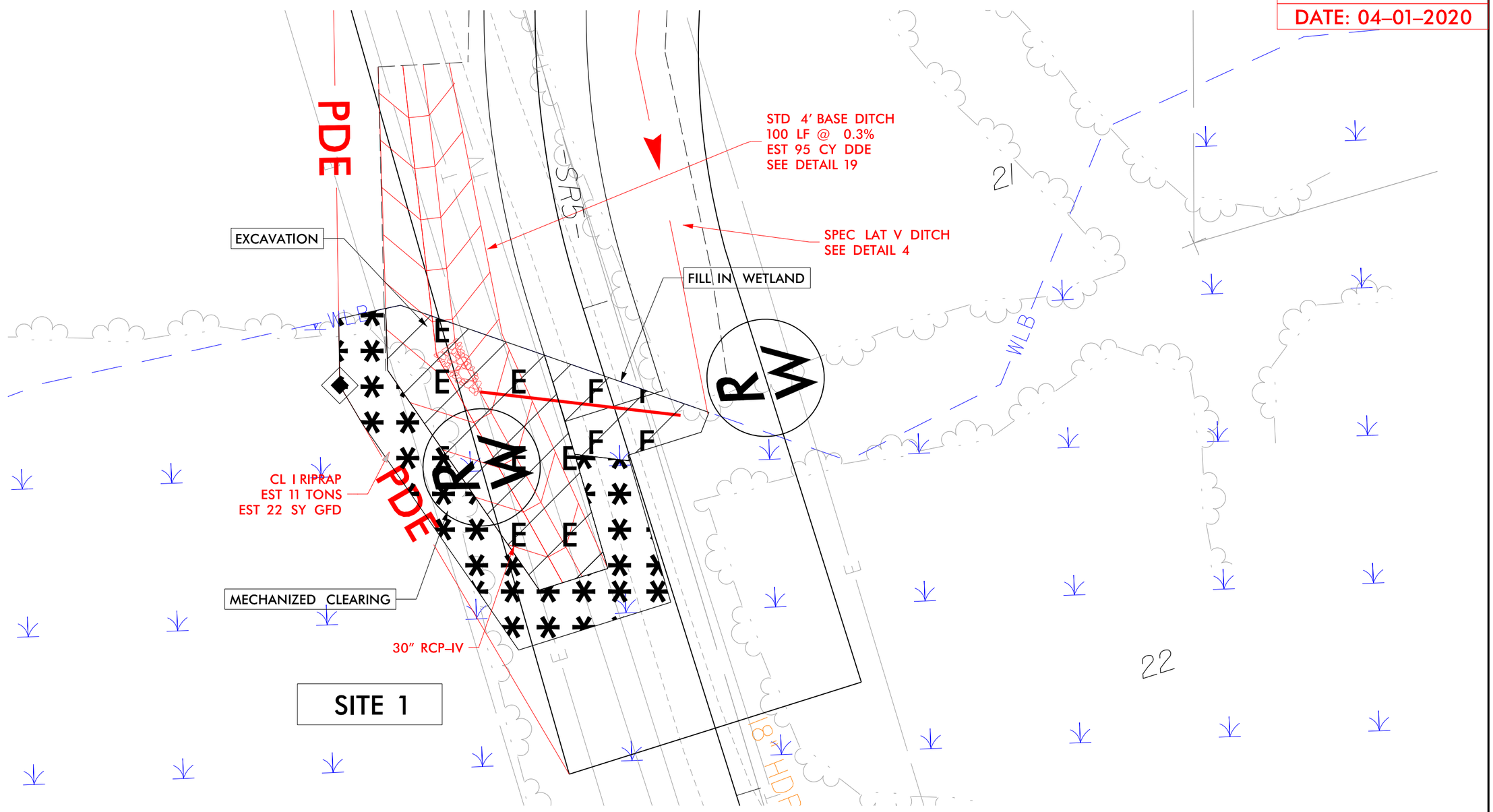
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 152 OF 165

DATE: 04–01–2020



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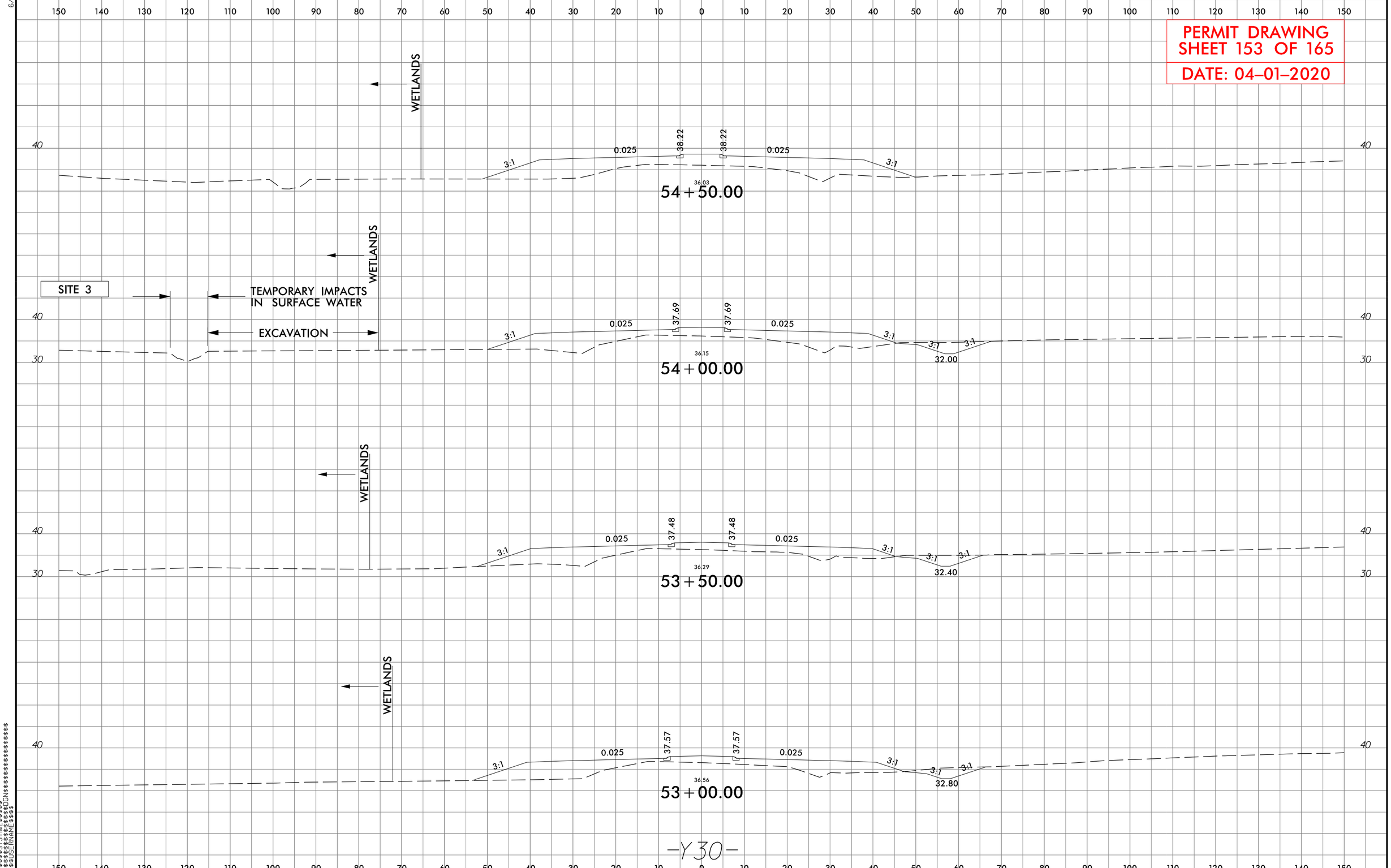
6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3300B	X-214

PERMIT DRAWING
SHEET 153 OF 165
DATE: 04-01-2020



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6/23/16

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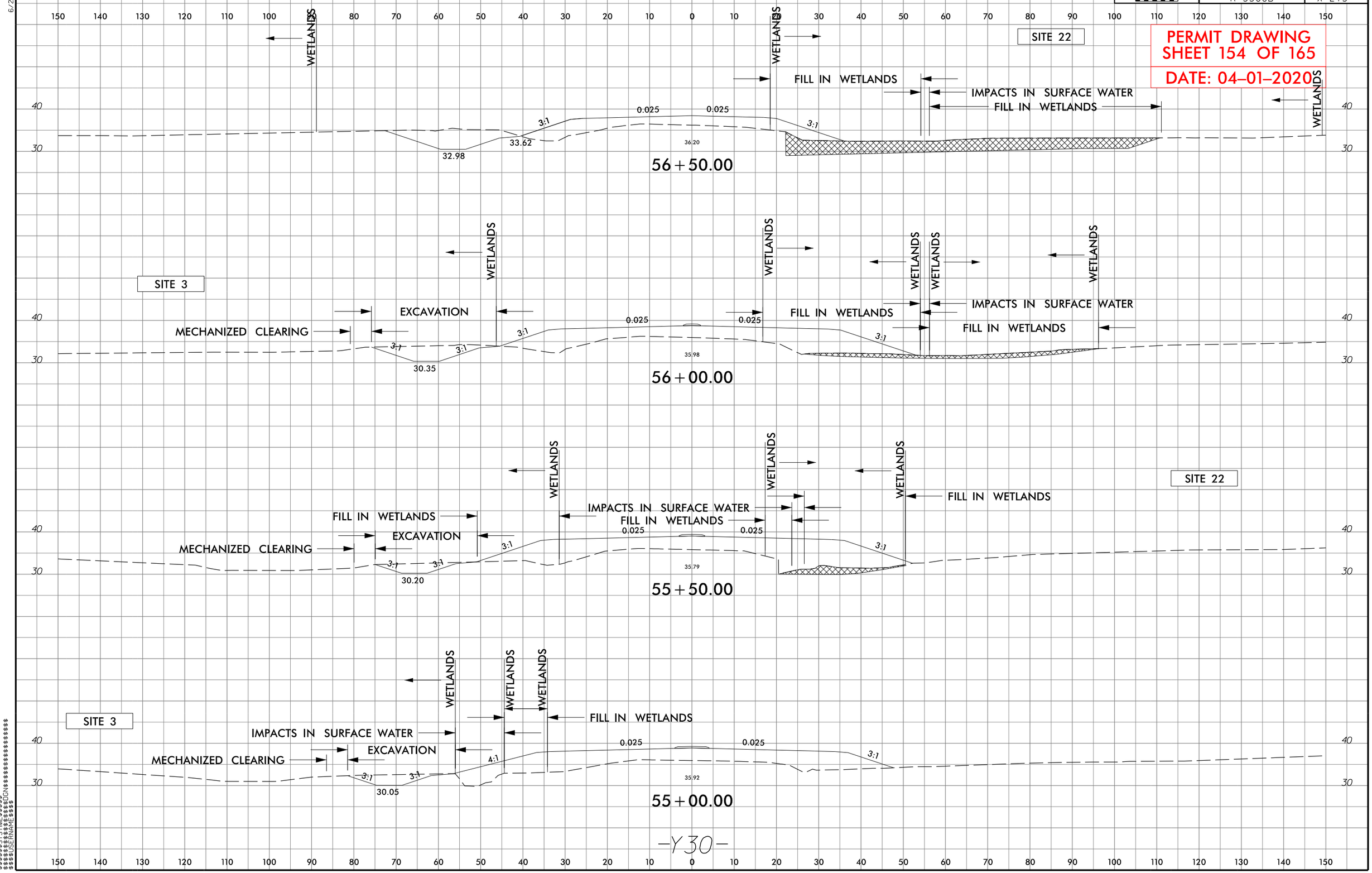
	R-3300B	X-215

PERMIT DRAWING
SHEET 154 OF 165
DATE: 04-01-2020



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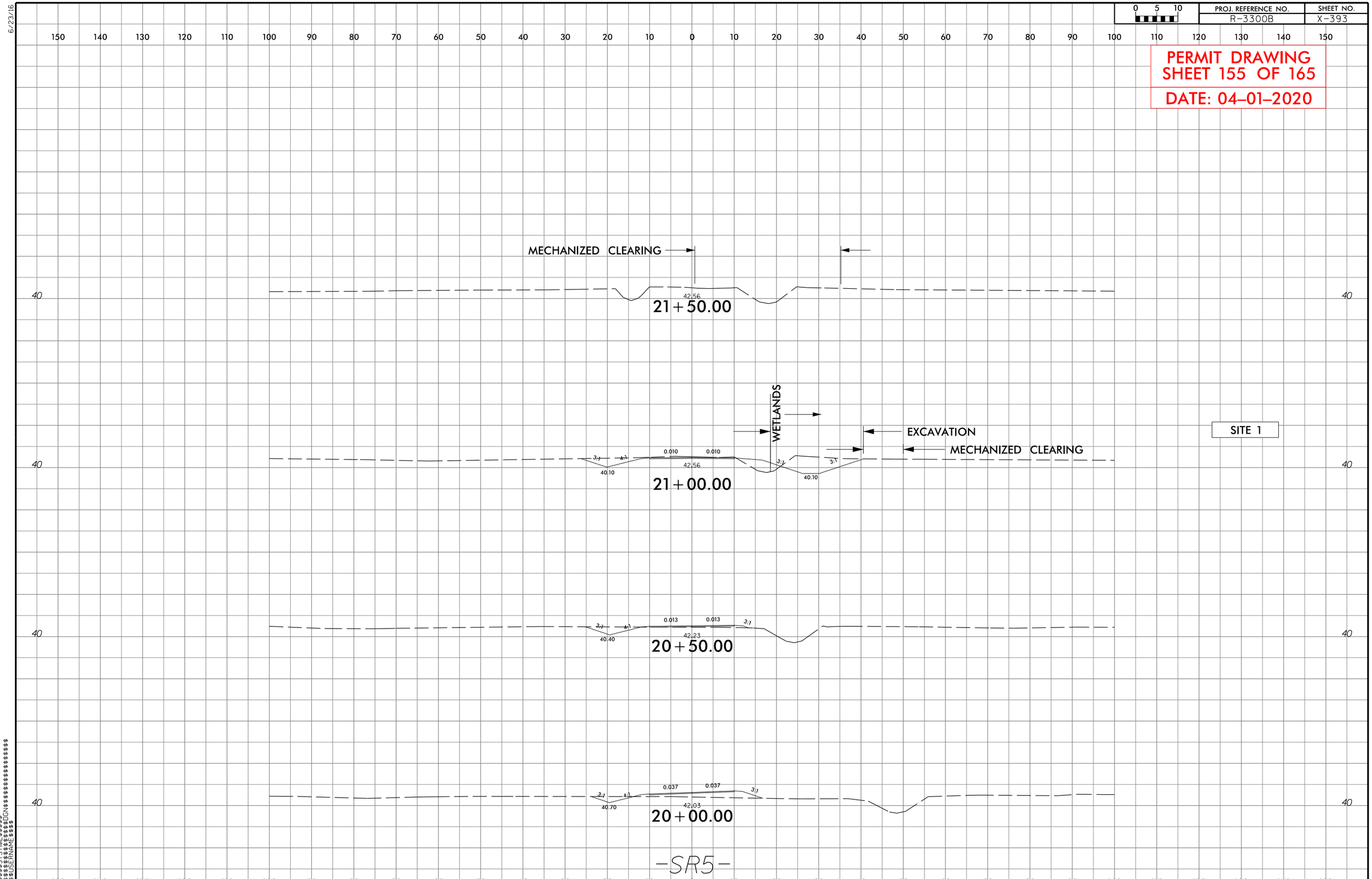
6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3300B	X-393

PERMIT DRAWING
SHEET 155 OF 165

DATE: 04-01-2020



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$$$$USERNAME$$$$

5/14/99

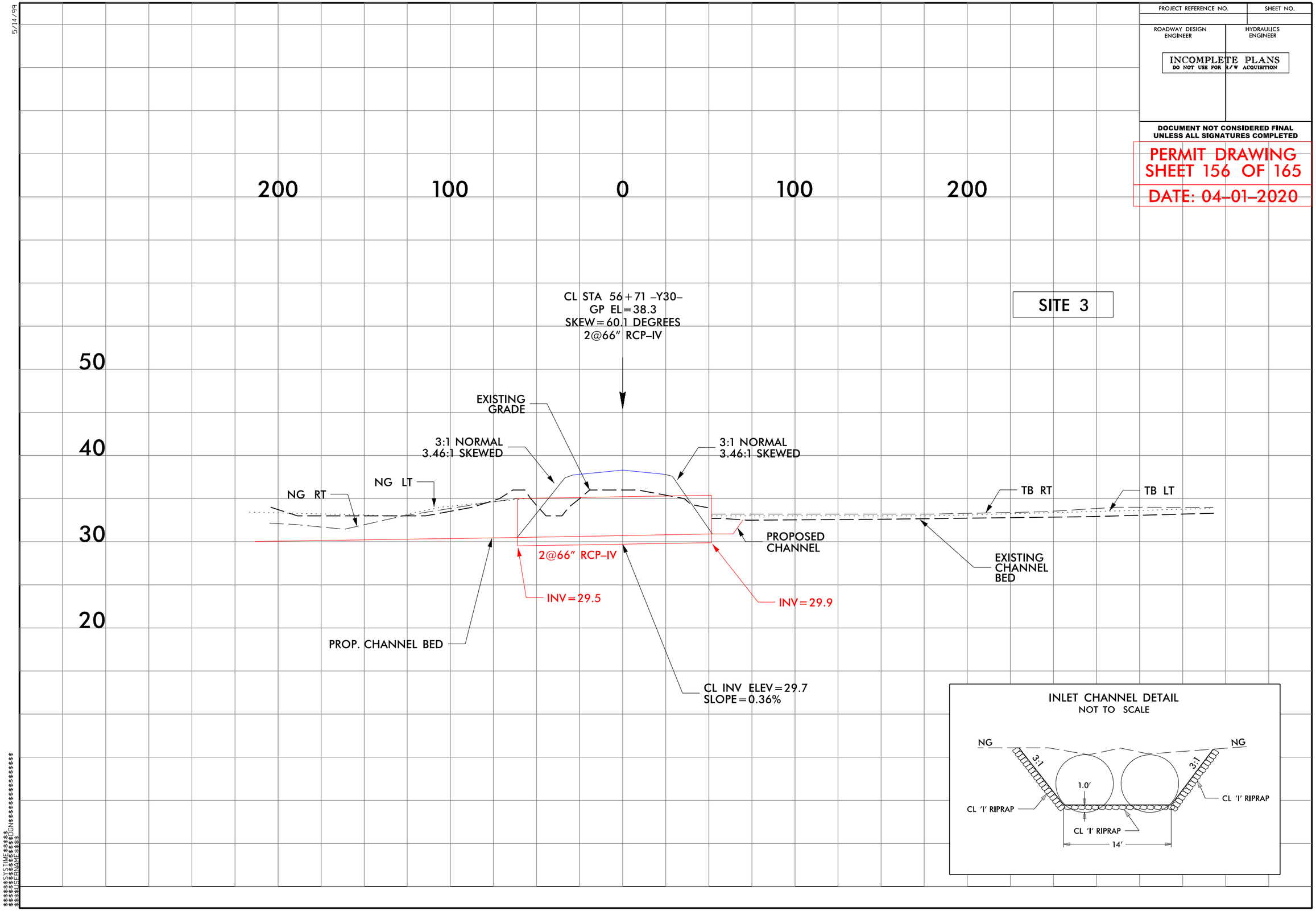
PROJECT REFERENCE NO.	SHEET NO.
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 156 OF 165

DATE: 04-01-2020



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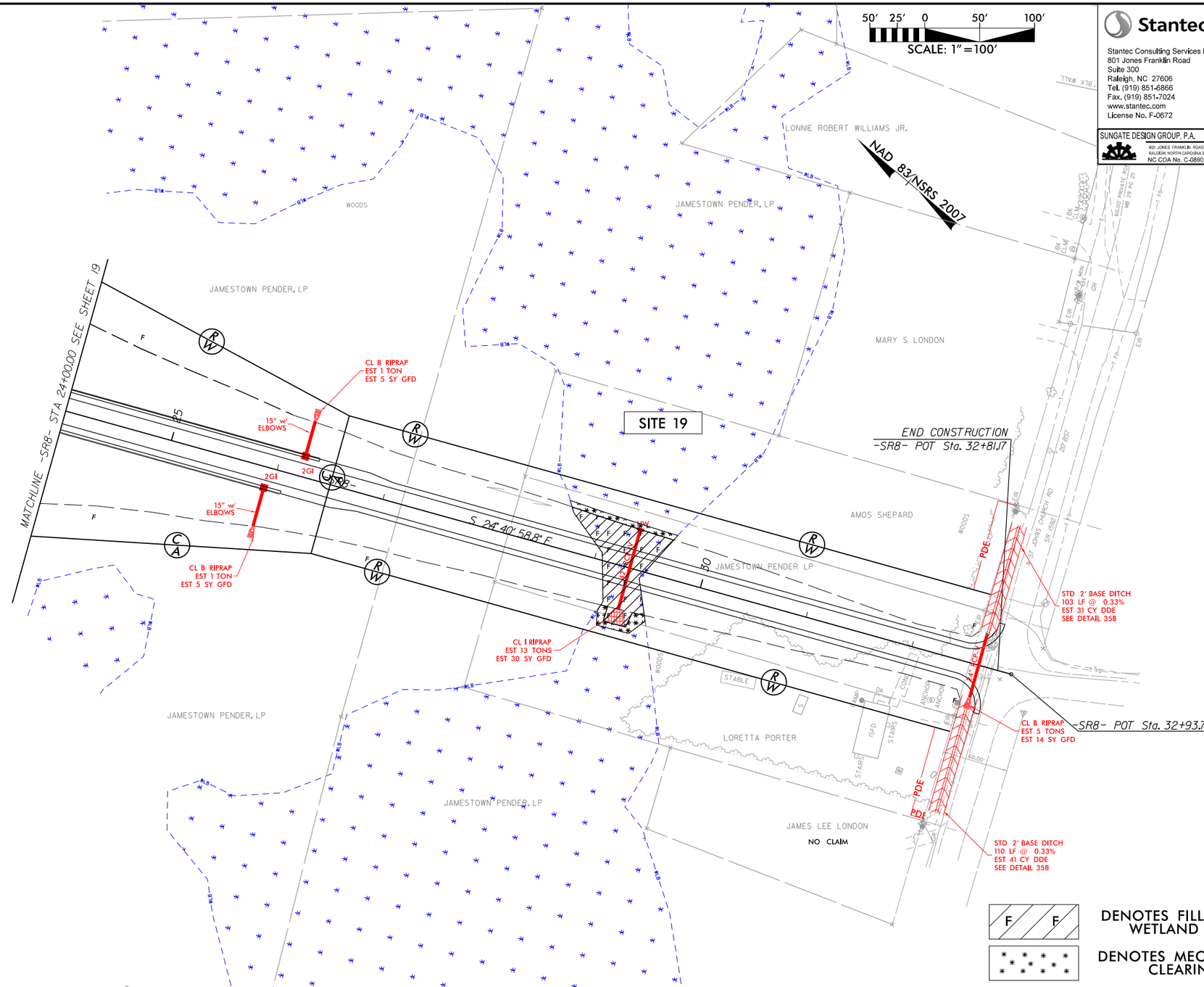
$$$$$$USERNAME$$$$

5/14/99



SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEET 73 FOR -SR8- PROFILE

Stantec
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www.stantec.com
License No. F-0672

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	32
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

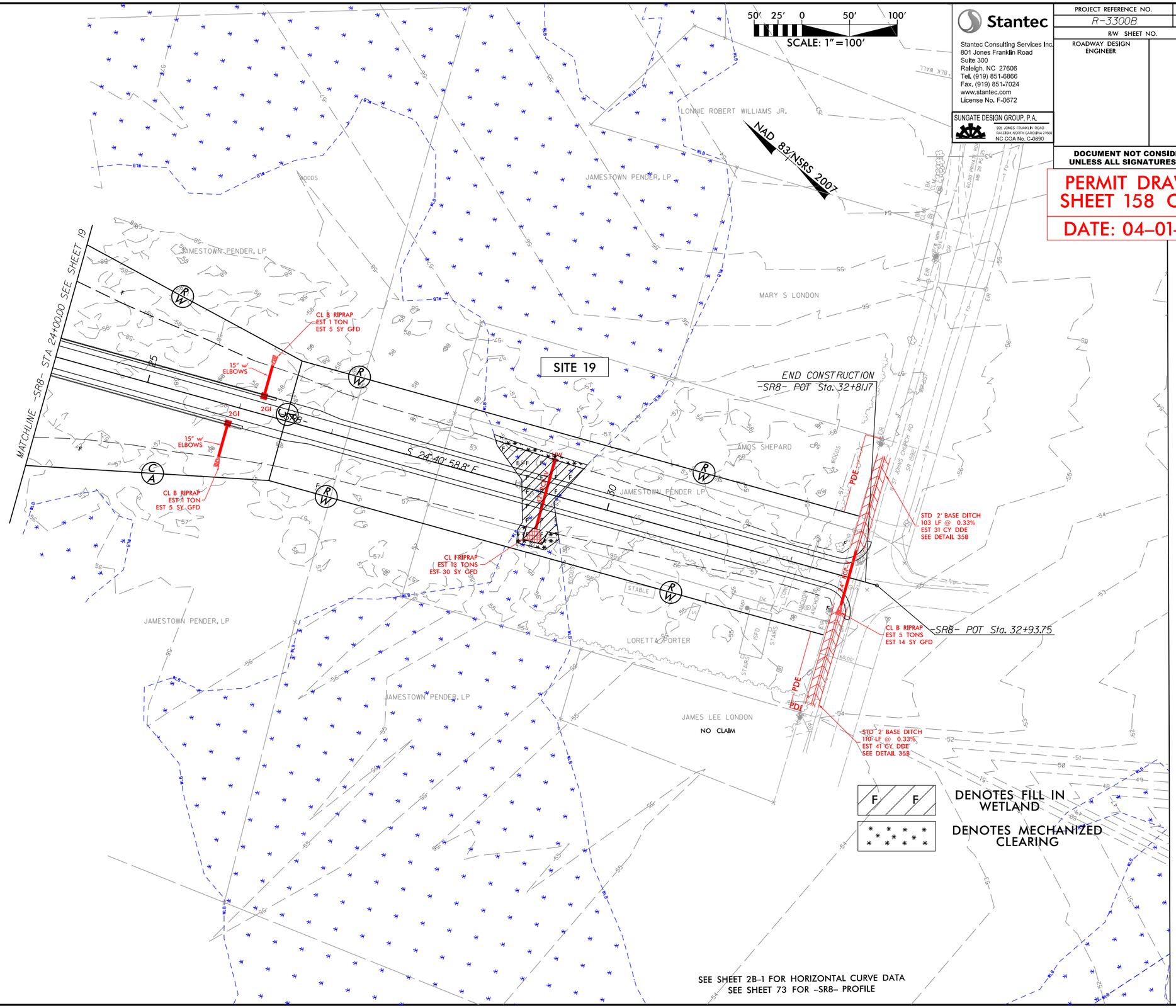
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 157 OF 165

DATE: 04-01-2020

$$$$SYSTIME$$$$
$$$$USERNAME$$$$

5/14/99



SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
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805 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	32
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 158 OF 165

DATE: 04-01-2020

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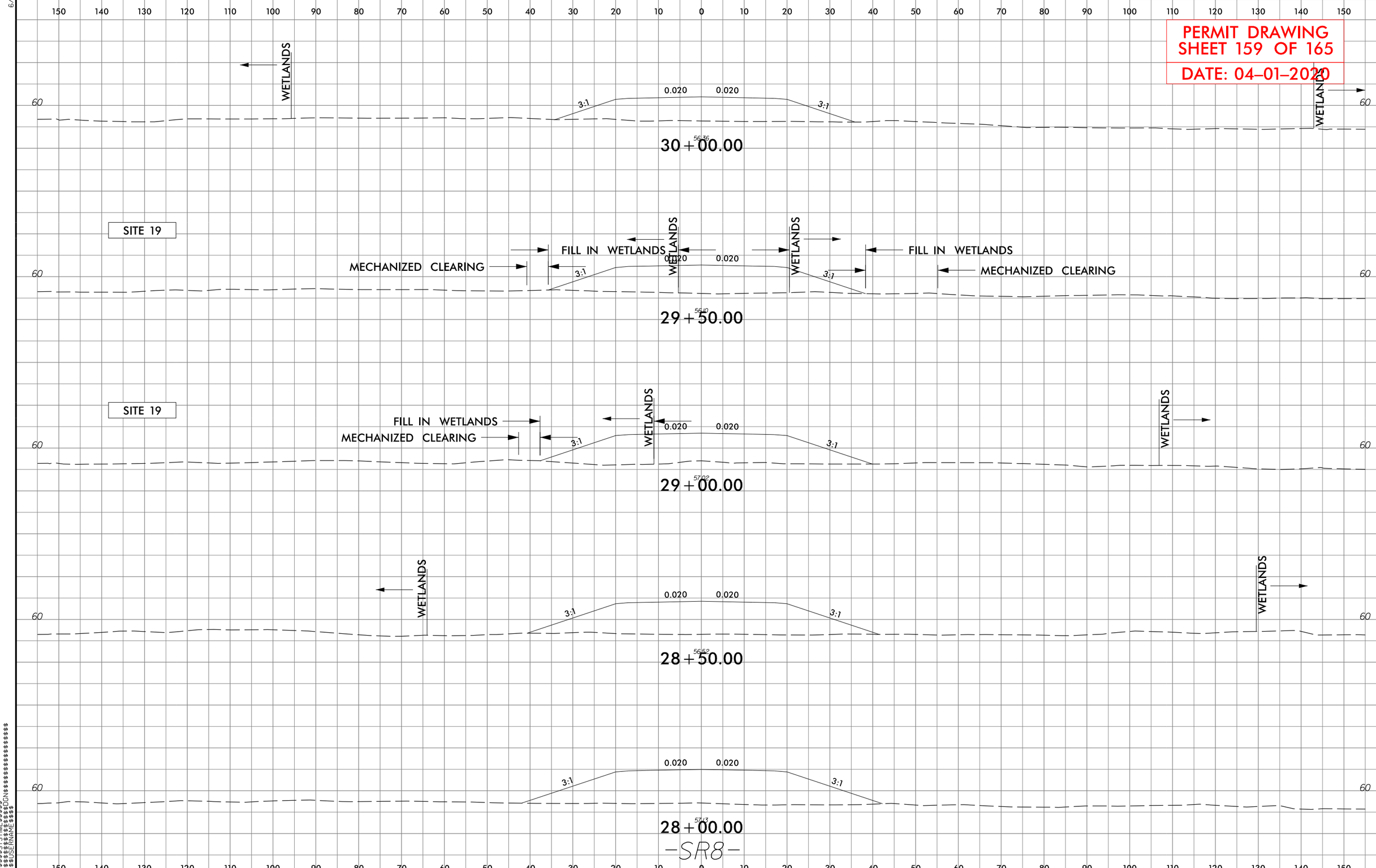
6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3300B	X-439

PERMIT DRAWING
SHEET 159 OF 165

DATE: 04-01-2020



$$$$SYSTIME$$$$
$$$$SAVEDON$$$$
$$$$USERNAME$$$$

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	584+18 to 601+51-L1-	ROADWAY FILL	5.436		0.005	0.699						
	5+13 to 5+71-Y30RPB-LT				0.015	0.016						
	13+27 to 18+16-Y30RPB-		0.883			0.118						
	19+30 to 26+02-Y30RPC-		1.190		0.025	0.080						
	27+65-SR4-					0.004						
	20+90 to 21+60-SR5-		0.008		0.028	0.027						
	43+83 to 44+59-Y30DET-LT		0.038			0.003						
2	41+43 to 43+15-Y30-RT	ROADWAY FILL	0.141		0.022							
	43+21 to 44+49-Y30DET-LT											
3	609+50 to 618+70-L1-	ROADWAY FILL	1.754		0.002	0.089	0.210	0.526	0.010	419	36	
	611+72 to 611+91-L1-RT	1 at 12'x7' RCBC										
		INLET CHANNEL			0.004							
		INLET BANK STABILIZATION								33		
	611+98 to 612+68-L1-LT	OUTLET CHANNEL				0.005	0.015	0.014		56		
		OUTLET BANK STABILIZATION								38		
	45+87 to 47+20-Y30-LT	ROADWAY FILL	0.180		0.035	0.024						
	53+88 to 54+12-Y30-LT	30" RCP OUTLET DITCH			0.013	0.009			0.005		25	
	54+51 to 56+42-Y30-LT	2 at 66" RCP OUTLET DITCH			0.082			0.019	0.002	91	10	
	56+99 to 57+43-Y30-RT	ROADWAY FILL	0.008									
	57+15 to 58+74-Y30DET-			0.149			0.010		0.006		125	
	13+40 to 19+59-Y30RPA-		1.694		0.045	0.188		0.094	0.011	441	55	
TOTALS*:			**11.332**	**0.149**	**0.276**	**1.262**	**0.235**	**0.653**	**0.034**	**1078**	**251**	**0**

*Rounded totals are sum of actual impacts

NOTES:

Site 2: Total Take

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
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PENDER COUNTY
R-3300B
40237.2.1

Revised 2018 Feb

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
3	15+01 to 15+56-Y30RPA-LT	1 at 12'x7' RCBC INLET CHANNEL			0.020			0.005	0.003	29	12	
	26+15 to 26+49-SR6-LT	OUTLET CHANNEL			0.005				0.004		14	
		OUTLET BANK STABILIZATION								14		
	18+22 to 20+14-Y30RPD-	ROADWAY FILL	0.470			0.064	0.026	0.060		243		
	19+69 to 20+05-Y30RPD-LT	1 at 12'x7' RCBC INLET CHANNEL			0.004				0.005		25	
		INLET BANK STABILIZATION								25		
	18+99 to 19+24-Y30RPD-RT	OUTLET CHANNEL			0.012							
		OUTLET BANK STABILIZATION								22		
4	623+04 to 632+02-L1-	ROADWAY FILL	1.812			0.131						
	633+70 to 634+01-L1-LT	30" RCP PIPE OUTLET				0.005						
5	638+99 to 642+01-L1-	ROADWAY FILL	0.065					0.085		364		
6	641+99 to 643+06-L1-	ROADWAY FILL						0.121	0.010	355	31	
7	645+01 to 666+60-L1-	ROADWAY FILL	4.805		0.249	0.380		0.606	0.012	1768	52	
		OUTLET CHANNEL			0.062							
		OUTLET BANK STABILIZATION								34		
	18+94 to 20+52-Y38-	ROADWAY FILL	0.072		0.033	0.018		0.112		226		
	19+83-Y38-RT	3 AT 12'x8' RCBC			0.009							
	19+38 to 20+09-Y38-LT	INLET CHANNEL				0.007						
	19+57 to 20+40Y38-RT	OUTLET CHANNEL			0.062	0.008		0.013	0.003	32	10	
			7.224	**0.000**	**0.456**	**0.613**	**0.026**	**1.002**	**0.037**	**3112**	**144**	**0**

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
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R-3300B
40237.2.1

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WETLAND AND SURACE WATER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
7	18+94 to 19+38-Y38-	ROADWAY FILL			0.033	0.018						
	11+08 to 12+48-Y38DET-			0.110			0.020					
8	673+01 to 673+68-L1-RT	ROADWAY FILL	0.071			0.012						
9	673+18 to 689+67-L1-LT	ROADWAY FILL	0.087			0.041						
10	676+64 to 679+37-L1-	DRAIN POND						0.633				
11	695+36 to 695+47-L1-LT	ROADWAY FILL				0.001						
12	700+69 to 702+88-L1-	DRAIN POND						0.416				
13	709+67 to 715+63-L1-	ROADWAY FILL	2.160			0.114		0.063		228		
	712+83 to 713+95-L1-RT	2 at 12'x7' RCBC INLET CHANNEL			0.024	0.015		0.022	0.004	78	14	
	711+78 to 712+35-L1-LT	OUTLET CHANNEL			0.021	0.010			0.003		12	
		OUTLET STABILIZATION								42		
14	724+44 to 725+96-L1-	ROADWAY FILL						0.100	0.007			
	724+48 to 724+73-L1-RT	48" RCP OUTLET STABILIZATION						0.007				
	17+51 to 18+26-Y31RPC-	ROADWAY FILL						0.035	0.006			
	17+57 to 17+87-Y31RPC-	54" RCP OUTLET STABILIZATION						0.008				
TOTALS*:			**2.318**	**0.110**	**0.078**	**0.211**	**0.020**	**1.284**	**0.020**	**348**	**26**	**0**

*Rounded totals are sum of actual impacts

NOTES:

Site 14: JS Non-Mitiable

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WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
15	730+72 to 743+68-L1-	ROADWAY FILL	4.898		0.060	0.228						
	15+72 to 22+37-SR7-		1.059		0.014	0.193						
	15+91 to 16+09-SR7-RT	24" RCP OUTLET CHANNEL			0.012							
16	18+25 to 21+01 -Y31-RT	ROADWAY FILL	0.066			0.009						
	18+74 to 21+34-Y31DET-			0.082			0.024					
17	18+38 to 19+05-Y31-LT	ROADWAY FILL	0.002			0.007						
	26+86 to 28+87-SR7-		0.190		0.030	0.022						
18	45+47 to 47+66-SR7-	ROADWAY FILL	0.252			0.043						
	766+70 to 769+26-L1-		0.534			0.020						
19	769+74 to 854+07-L1-	ROADWAY FILL	26.807		0.073	3.036		0.254		773		
	48+38 to 56+57-SR7-		1.002			0.188						
	14+42 to 29+70-SR8-		0.359			0.055						
	7+45 to 16+31-Y32RPB1-		2.075			0.156						
	18+01 to 39+40-Y32-		5.549		0.018	0.340						
TOTALS*:			**42.793**	**0.082**	**0.207**	**4.297**	**0.024**	**0.254**	**0.000**	**773**	**0**	**0**

*Rounded totals are sum of actual impacts

NOTES:

Site 20 Combined with Site 19.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
04-01-2020
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R-3300B
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WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
21	23+66 to 25+54-Y19-	ROADWAY FILL	0.372			0.020		0.014		97		
	25+09-Y19-	1 AT 8'x6' RCBC			0.013							
	24+82 to 25+32-Y19-	OUTLET CHANNEL			0.033	0.010			0.009		33	
22	10+17 to 12+28-SR5-	ROADWAY FILL	0.209		0.002	0.009		0.007		163		
23	603+49 to 604+94-L1-RT	POND						0.279				
24	16+83 to 18+03-Y30DET-RT	ROADWAY FILL		0.013			0.012					
25	46+69 to 46+76-Y31DET-RT	ROADWAY FILL					0.001					
26	Y19 50+00 RT	Channel Realignment				0.005		0.028		87		
27	Y19 51+27 to 53+44	Roadway Fill						0.117	0.046			
28	L 279+29 to 286+56 RT	Roadway Fill	0.307			0.085						
29	L 283+08 to 283+80 RT	Roadway Fill	0.016			0.003						
30	L 301+00 RT	Roadway Fill	0.005			0.001						
			0.909	**0.013**	**0.048**	**0.133**	**0.013**	**0.445**	**0.055**	**347**	**33**	**0**

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
04-01-2020
PENDER COUNTY
R-3300B
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WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
31	LLT 320+33 LT	6' X 4' RCBC Extension						0.009		26		
	LLT 320+33 LT	Channel Realignment (LT)						0.012	0.004	39	19	
	LLT 320+33 RT	CL. B Rip Rap Pad						0.004		20		
	LLT 320+33 RT	Channel Realignment (RT)						0.008	0.004	37	16	
32	13+45 to 14+89-Y43-LT	DITCH				0.014						
	TOTALS THIS SHEET		**0.000**	**0.000**	**0.000**	**0.014**	**0.000**	**0.033**	**0.008**	**122**	**35**	**0**
	TOTAL SHEET 160		11.332	0.149	0.276	1.262	0.235	0.653	0.034	1078	251	0
	TOTAL SHEET 161		7.224	0.000	0.456	0.613	0.026	1.002	0.037	3112	144	0
	TOTAL SHEET 162		2.318	0.110	0.078	0.211	0.020	1.284	0.020	348	26	0
	TOTAL SHEET 163		42.793	0.082	0.207	4.297	0.024	0.254	0.000	773	0	0
	TOTAL SHEET 164		0.909	0.013	0.048	0.133	0.013	0.445	0.055	347	33	0
TOTALS*:			**64.576**	**0.354**	**1.065**	**6.530**	**0.318**	**3.671**	**0.154**	**5780**	**489**	**0**

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
04-01-2020
PENDER COUNTY
R-3300B
40237.2.1

Revised 2018 Feb

TIP PROJECT: R-3300B

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

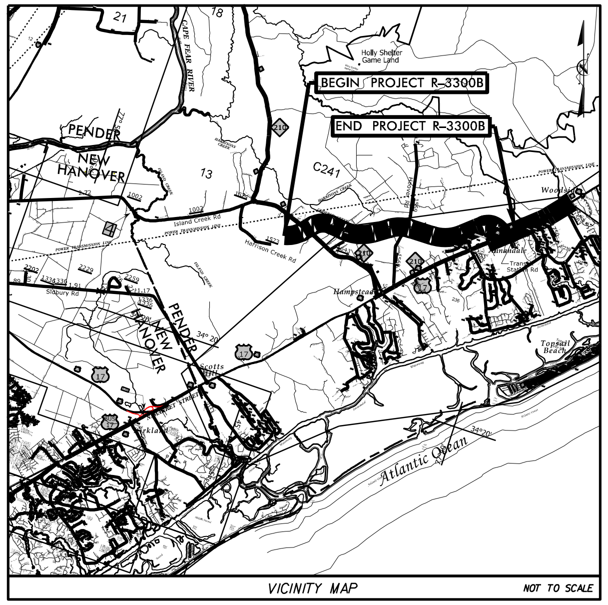
PENDER COUNTY

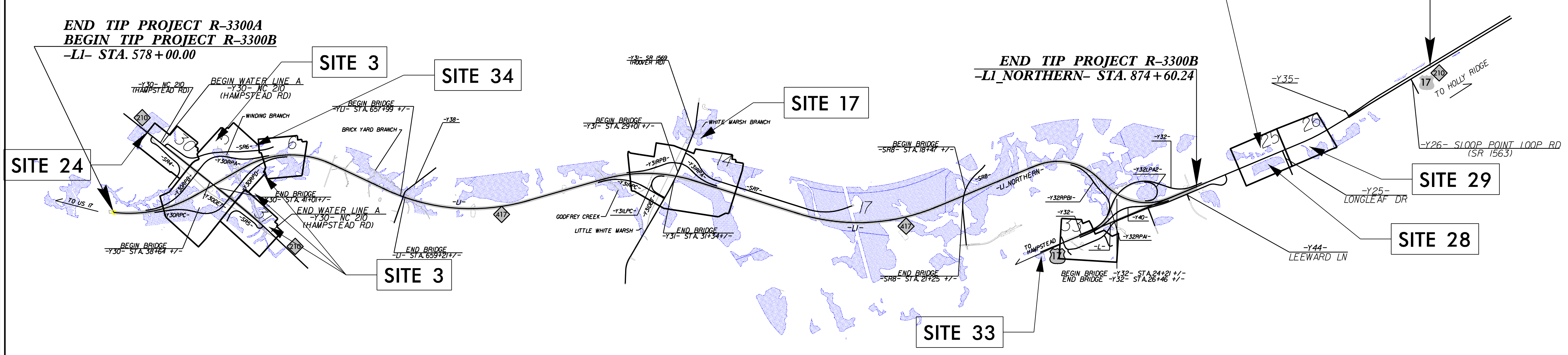
T.I.P. NO.	SHEET NO.
R-3300B	UC-01

PERMIT DRAWING
SHEET 1 OF 23
DATE: 04-01-2020

LOCATION: NC 417 (HAMPSTEAD BYPASS) FROM SOUTH OF NC 210 TO US-17 NORTH OF HAMPSTEAD

TYPE OF WORK: UTILITY RELOCATES

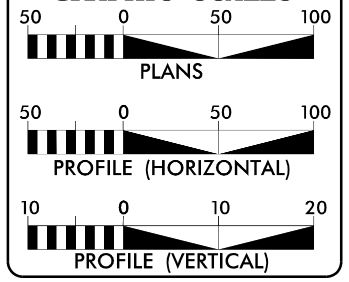

VICINITY MAP
NOT TO SCALE



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNTIL ALL SIGNATURES ARE COMPLETED

GRAPHIC SCALES



PREPARED IN THE OFFICE OF

Stantec

STANTEC CONSULTING SERVICES INC.
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LINDA PASS, PE — CONSULTANT CONTACT #2
ROBIN ROCK — CONSULTANT CONTACT #3

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UTILITIES REGIONAL ENGINEER
UTILITIES ENGINEER
UTILITIES AREA COORDINATOR
UTILITIES COORDINATOR

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PERMIT DRAWING
SHEET 2 OF 23

DATE: 04-01-2020

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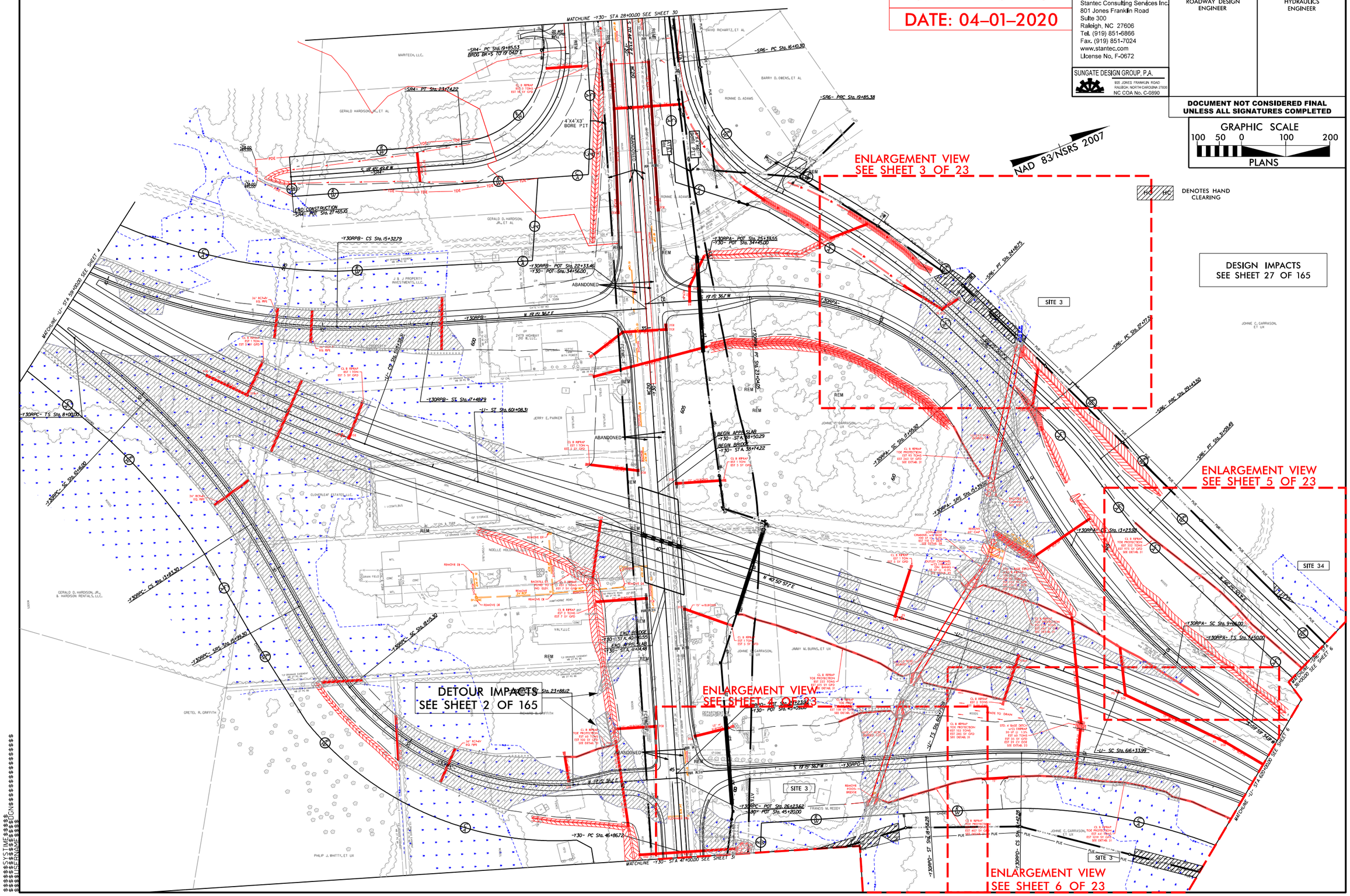
NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	NEU-5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALE
100 50 0 100 200
PLANS

NAD 83/NSRS 2007



PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

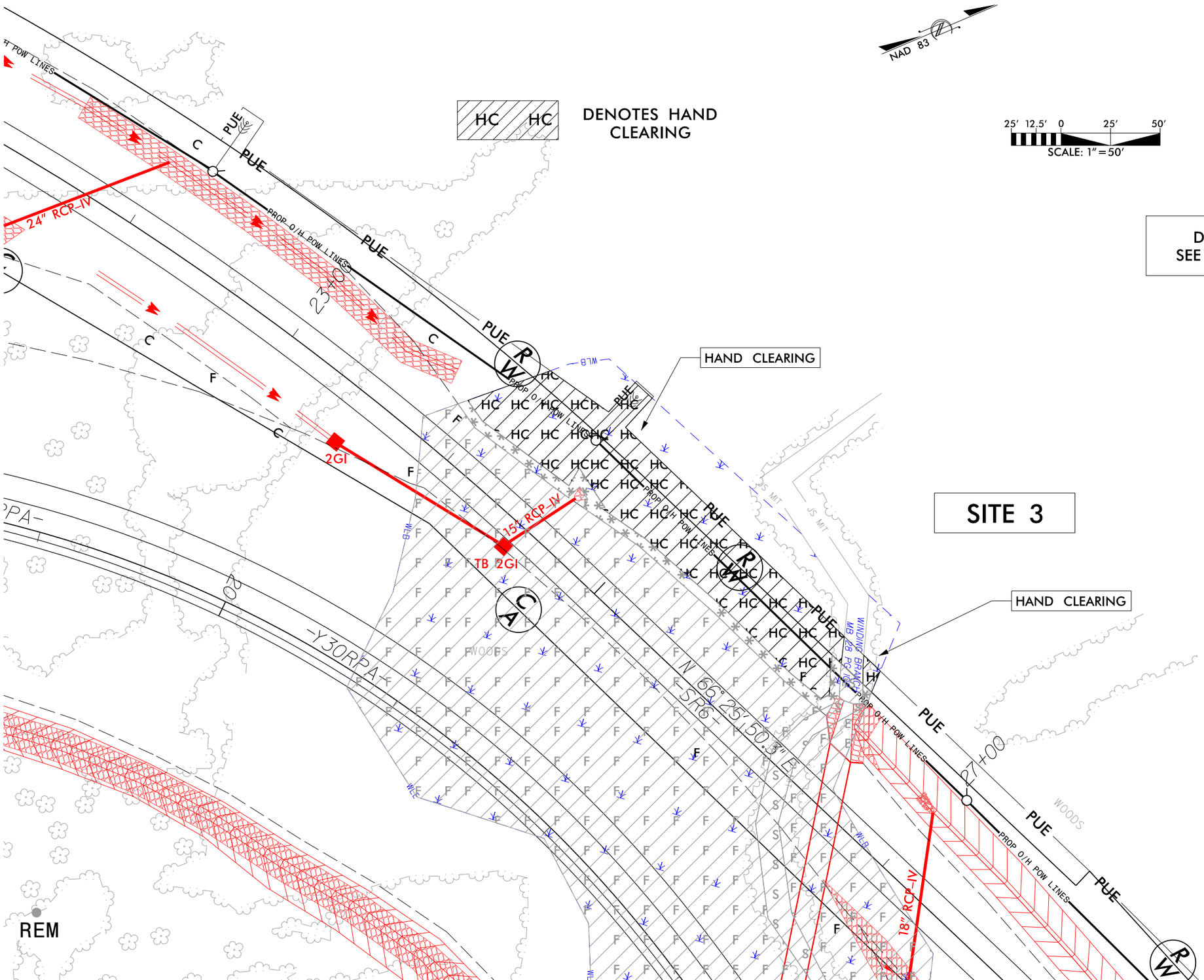
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 3 OF 23

DATE: 04-01-2020

DESIGN IMPACTS
SEE SHEET 27 OF 165



PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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PERMIT DRAWING
SHEET 4 OF 23

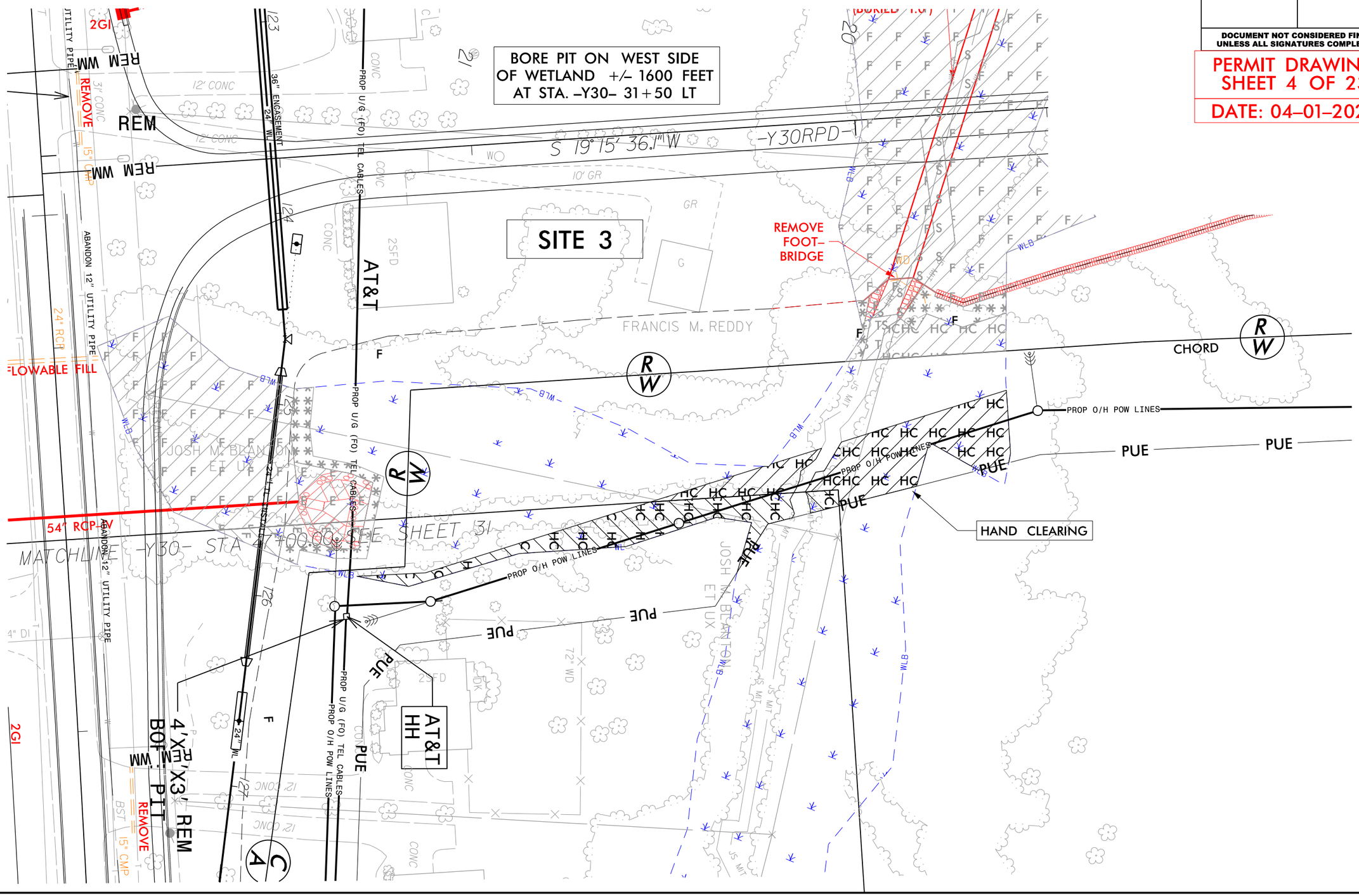
DATE: 04-01-2020

HC HC DENOTES HAND CLEARING

DESIGN IMPACTS
SEE SHEET 27 OF 165

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83



8/17/99

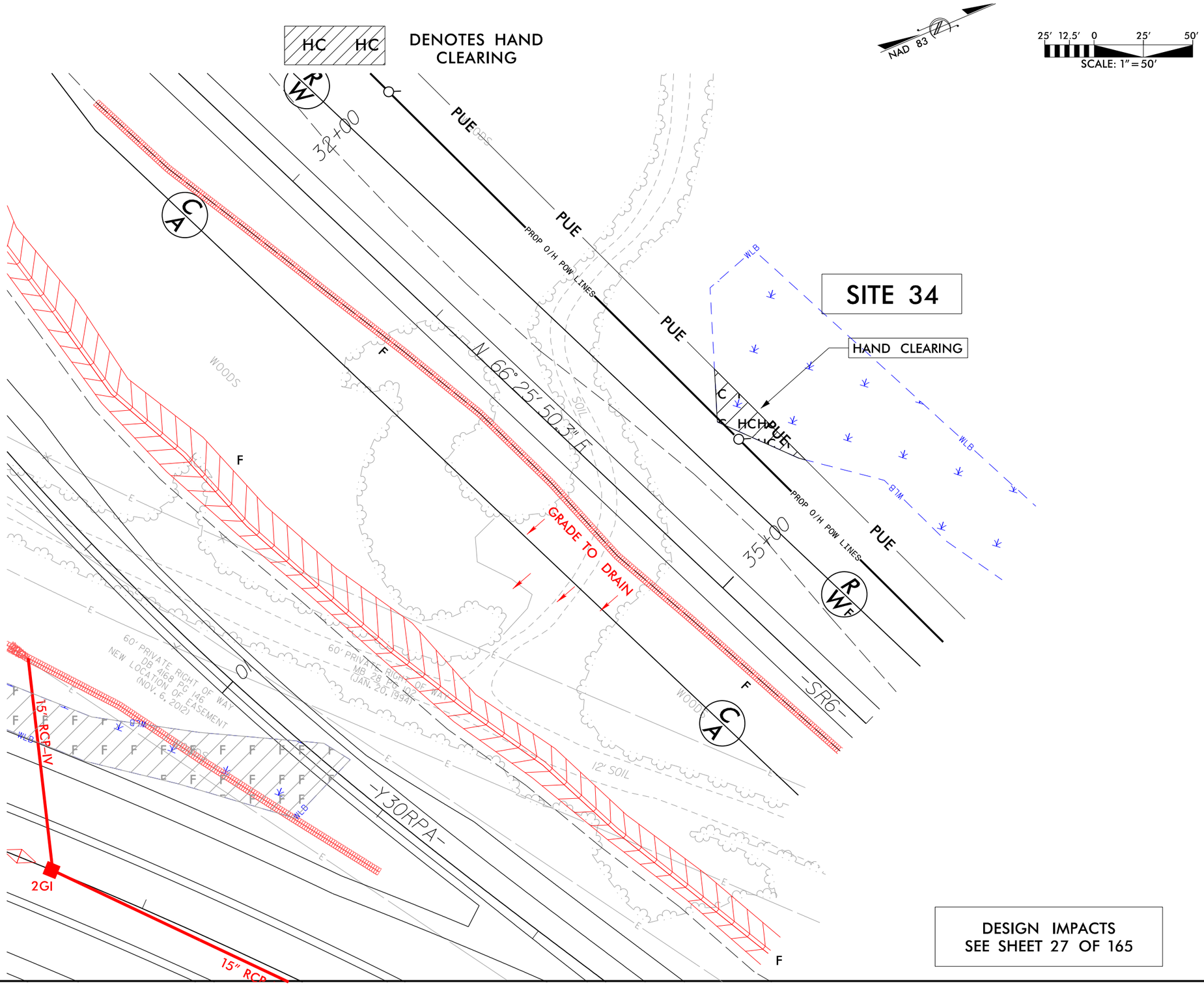
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 5 OF 23

DATE: 04–01–2020



DESIGN IMPACTS
SEE SHEET 27 OF 165

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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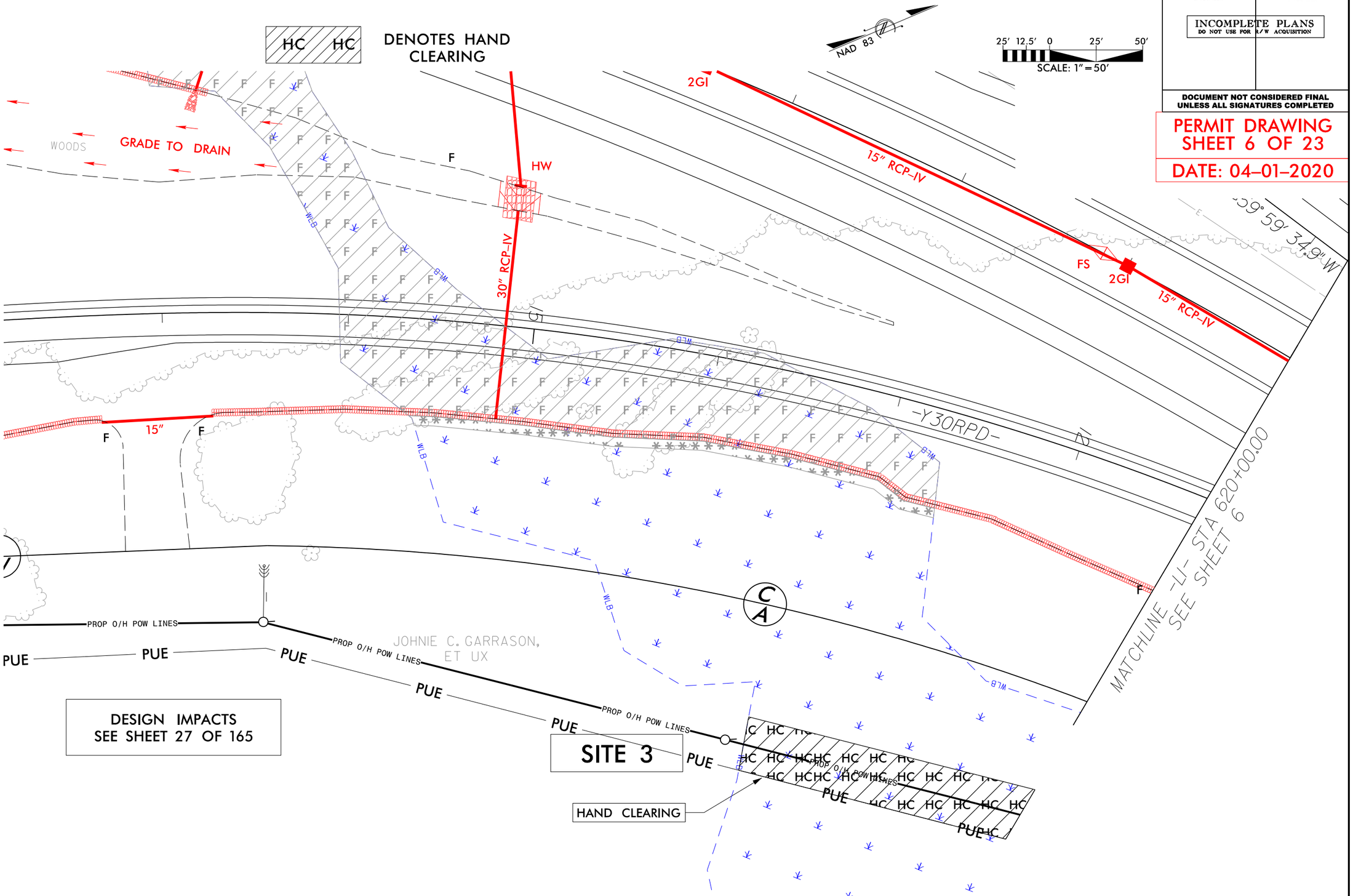
PERMIT DRAWING
SHEET 6 OF 23

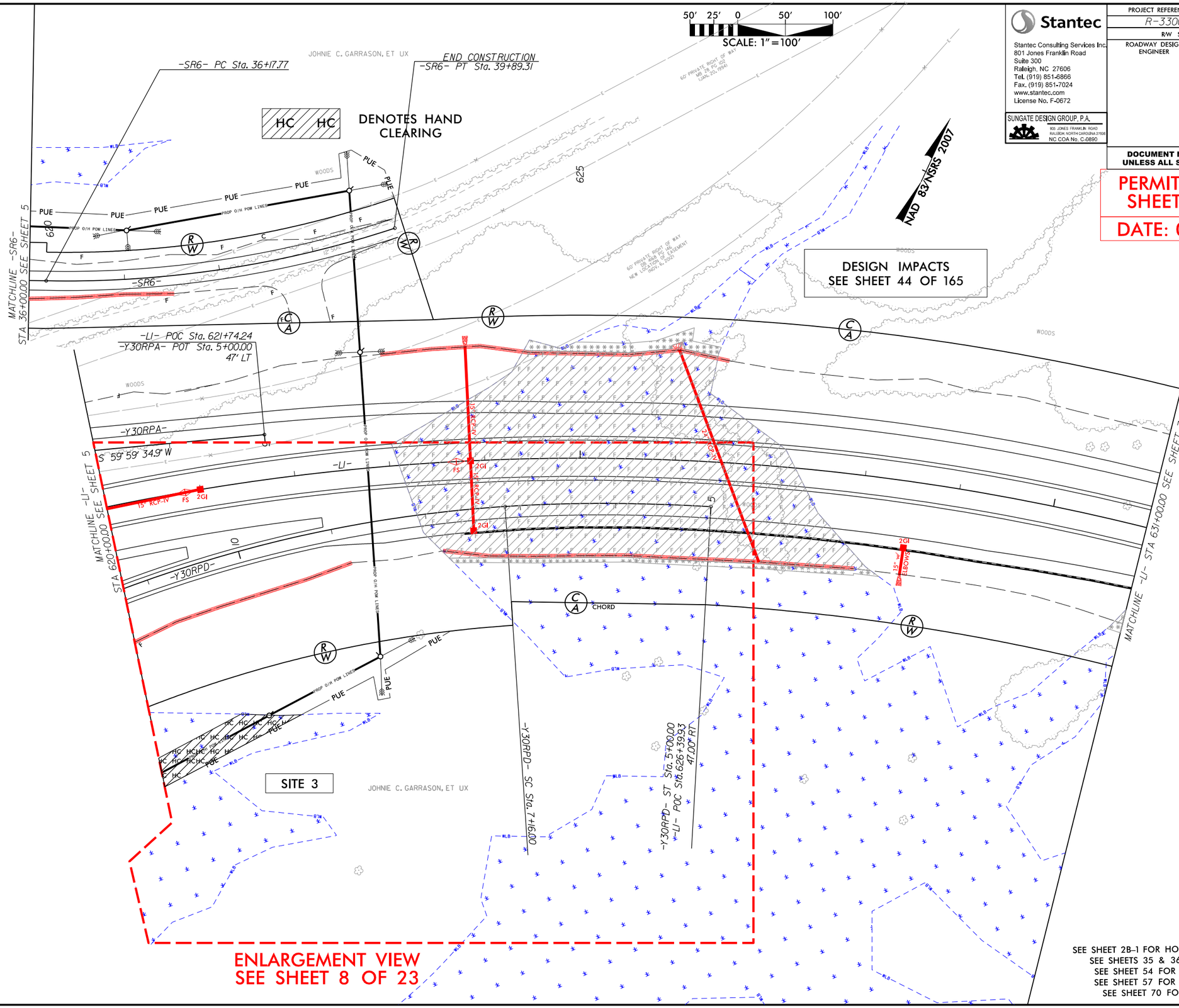
DATE: 04-01-2020



8/17/99

$$$$CYTIME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$

5/14/99



ENLARGEMENT VIEW
SEE SHEET 8 OF 23

SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS 35 & 36 FOR -L1- PROFILE
SEE SHEET 54 FOR -Y30RPA- PROFILE
SEE SHEET 57 FOR -Y30RPD- PROFILE
SEE SHEET 70 FOR -SR6- PROFILE

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RALEIGH, NORTH CAROLINA 27606
NC COA No. C-0890

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 7 OF 23

DATE: 04-01-2020

$$$$SYSTIME$$$$
$$$$SYSDATE$$$$
$$$$USERNAME$$$$

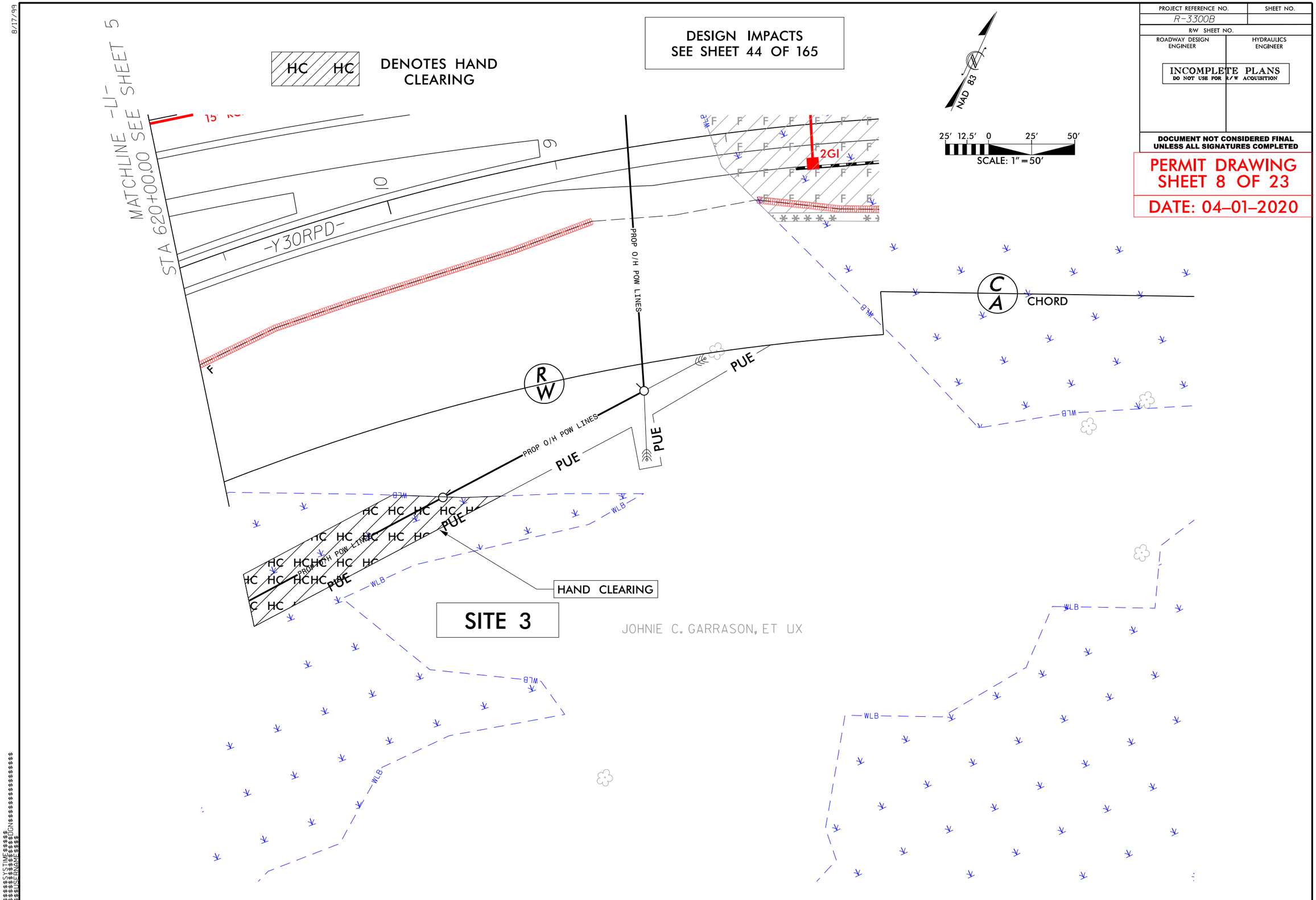
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

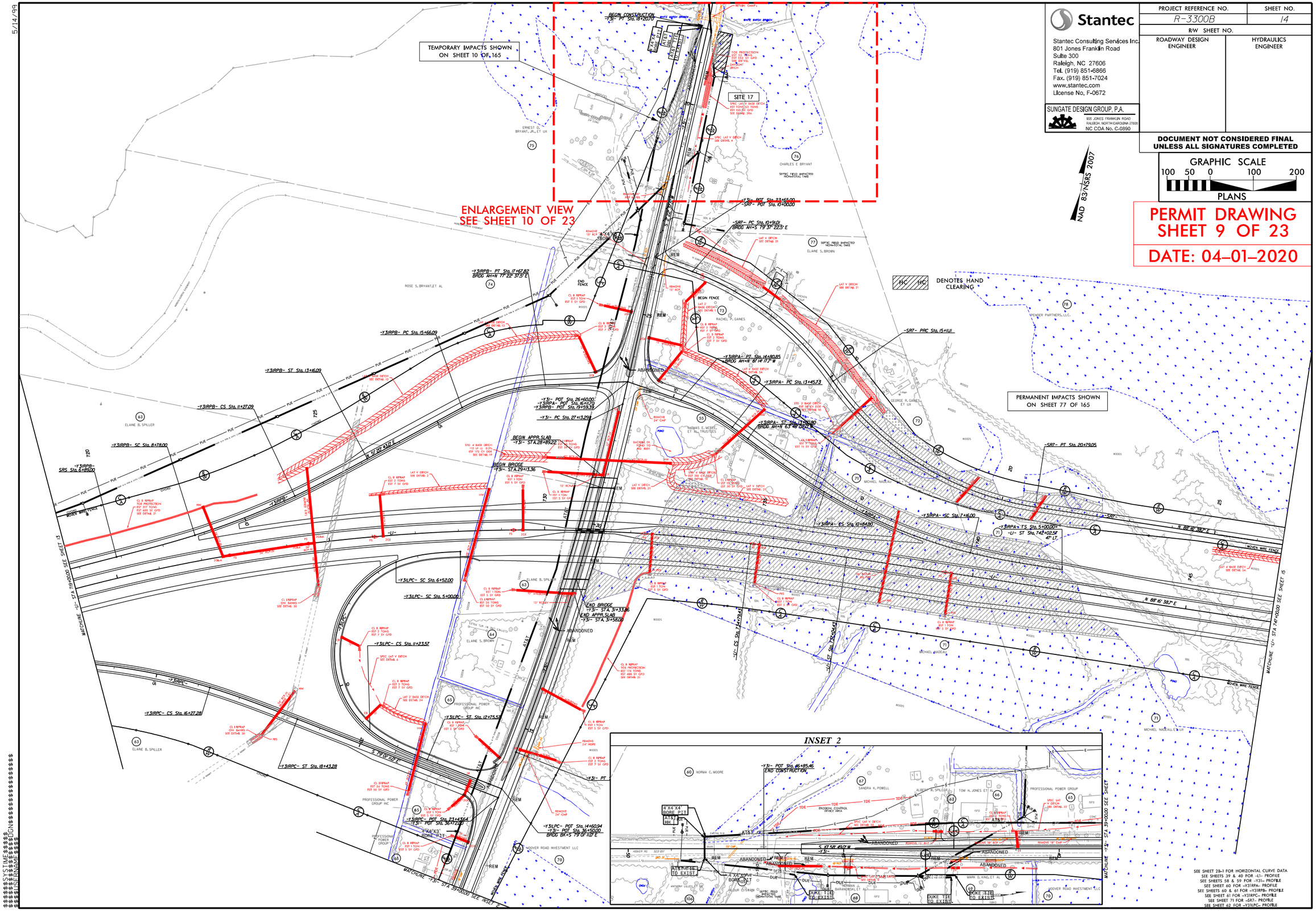
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 8 OF 23

DATE: 04-01-2020



8/17/99



SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS 39 & 40 FOR -L1- PROFILE
SEE SHEETS 58 & 59 FOR -Y31- PROFILE
SEE SHEET 60 FOR -Y31RPA- PROFILE
SEE SHEETS 60 & 61 FOR -Y31RPB- PROFILE
SEE SHEET 61 FOR -Y31RPC- PROFILE
SEE SHEET 71 FOR -SR7- PROFILE
SEE SHEET 62 FOR -Y31LPC- PROFILE

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NAD 83/NSRS 2007

GRAPHIC SCALE
100 50 0 100 200
PLANS

PERMIT DRAWING SHEET 9 OF 23

DATE: 04-01-2020

5/14/99

8/17/99

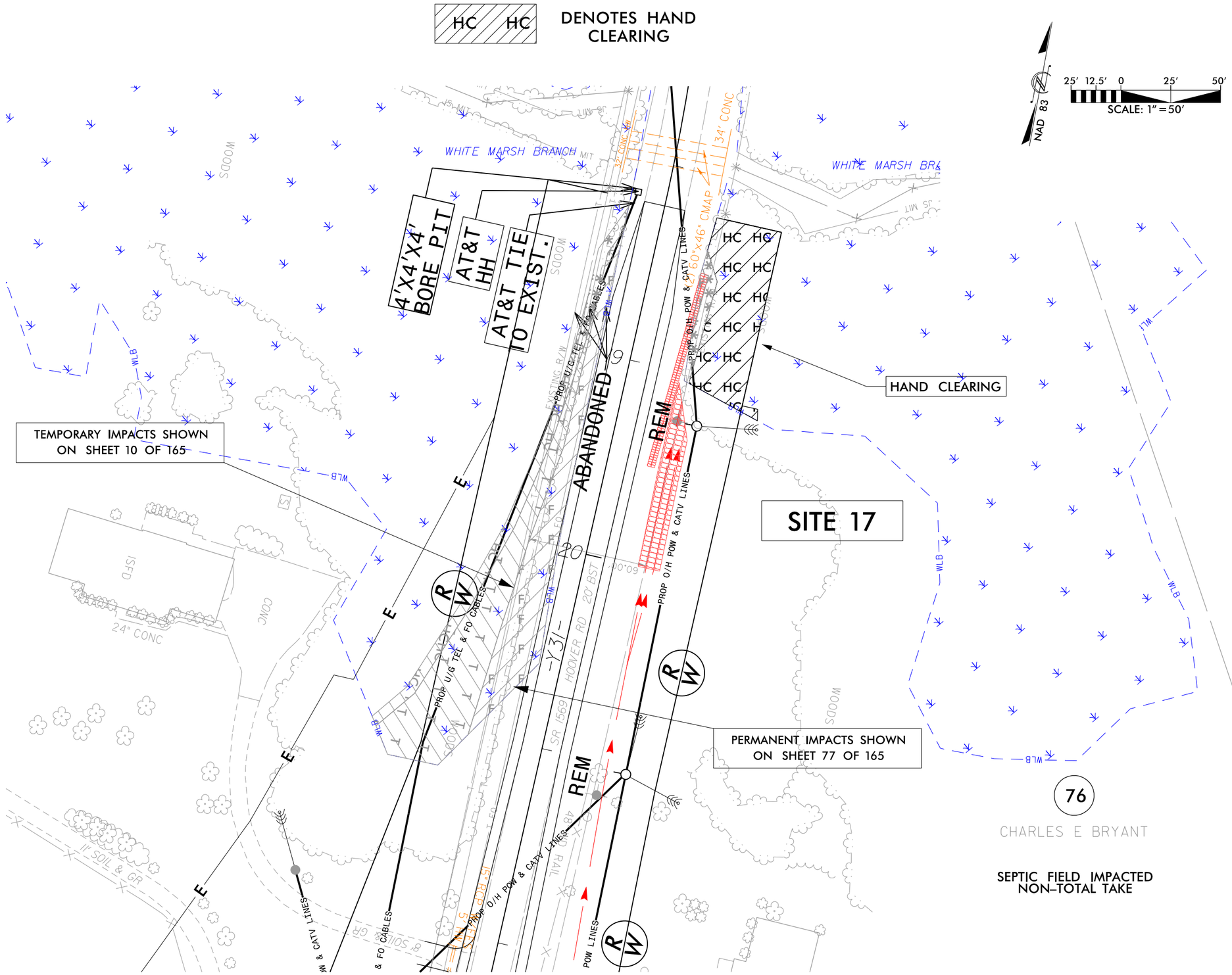
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 10 OF 23

DATE: 04-01-2020



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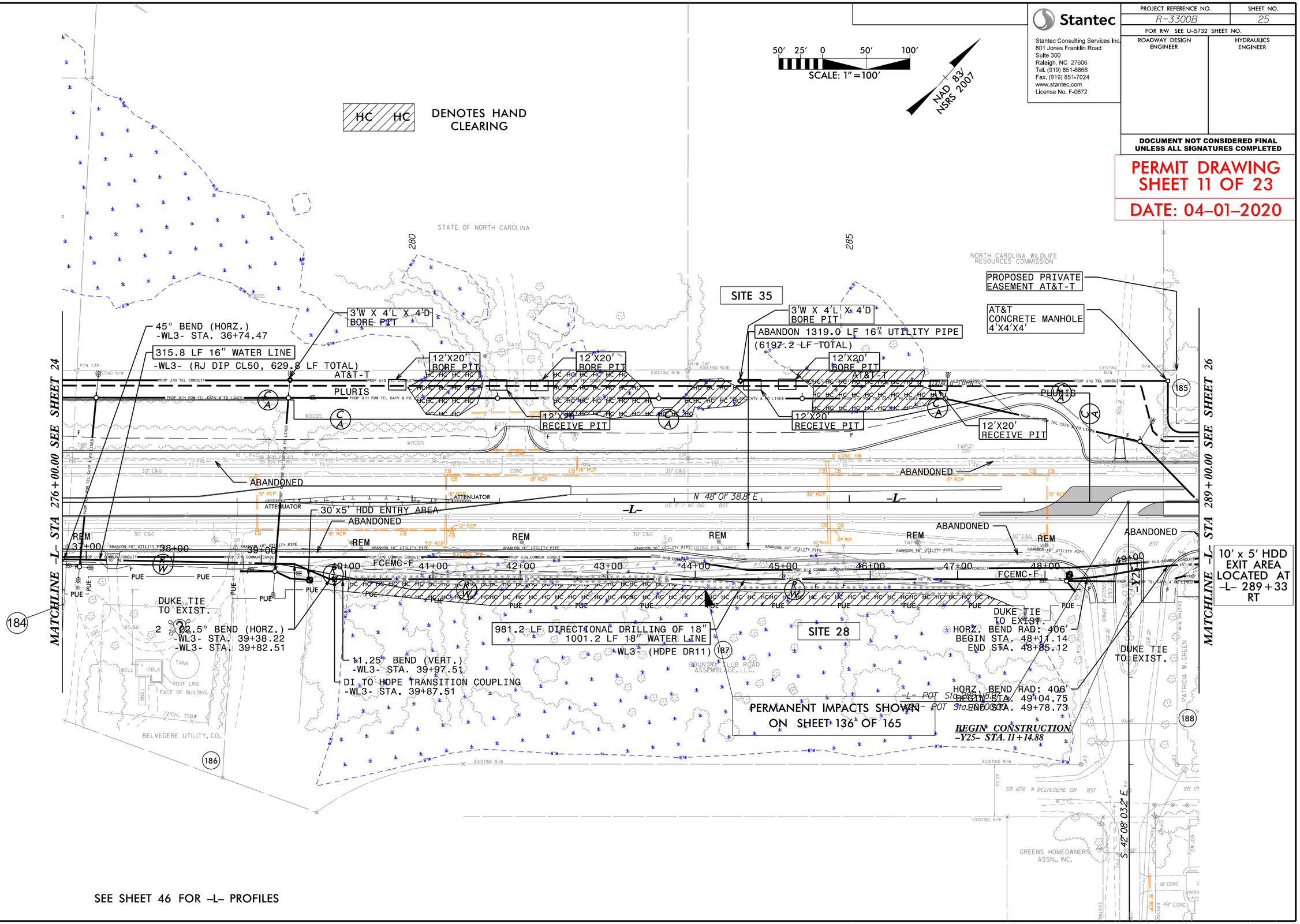
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	25
FOR R/W SEE U-5732 SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 11 OF 23

DATE: 04-01-2020



SEE SHEET 46 FOR -L- PROFILES

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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	26
FOR R/W SEE U-5732 SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 12 OF 23

DATE: 04-01-2020

50' 25' 0 50' 100'
SCALE: 1" = 100'

NAD 83/ NSRS 2007

HC HC DENOTES HAND CLEARING

ENLARGEMENT VIEW
SEE SHEET 13 OF 23

PERMANENT IMPACTS SHOWN ON SHEET 138 OF 165

ABANDON 1207.5 LF 16" UTILITY PIPE (6197.2 LF TOTAL)

3'W X 4'L X 4'D BORE PIT

PROPOSED PRIVATE EASEMENT AT&T-T

PRIVATE EASEMENT AT&T-T

30'x5' HDD ENTRY AREA

3'W X 4'L X 4'D BORE PIT

-L- PC Sta. 293+35.83

N 48°01' 38.8" E

MATCHLINE -L- STA 289+00.00 SEE SHEET 25

MATCHLINE -L- STA 301+00.00 SEE SHEET 27

10'x5' HDD EXIT AREA

RELOCATE FIRE HYDRANT
7.5 LF FIRE HYDRANT LEG

16"X16"X6" TEE
-WL3- STA. 49+98.73

DI TO HDPE TRANSITION COUPLING
-WL3- STA. 49+88.73

11.25° BEND (VERT.)
-WL3- STA. 49+78.73

1111.6 LF 16" WATER LINE
-WL3- (RJ DIP CL50)

HORZ. BEND RAD: 4000'
BEGIN STA. 55+07.10
END STA. 61+00.32

DI TO HDPE TRANSITION COUPLING
-WL3- STA. 61+00.32

11.25° BEND (VERT.)
-WL3- STA. 61+05.32

81.6 LF DIRECTIONAL DRILLING OF 18"
86.6 LF 18" WATER LINE
-WL3- (HDPE DR11, 195.4 LF TOTAL)

SITE 29

PATRICIA W. GREEN

PRATISHTHA GRAG

PENDER LAND HOLDINGS, INC.

SEE SHEETS 46 & 47 FOR -L- PROFILES

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

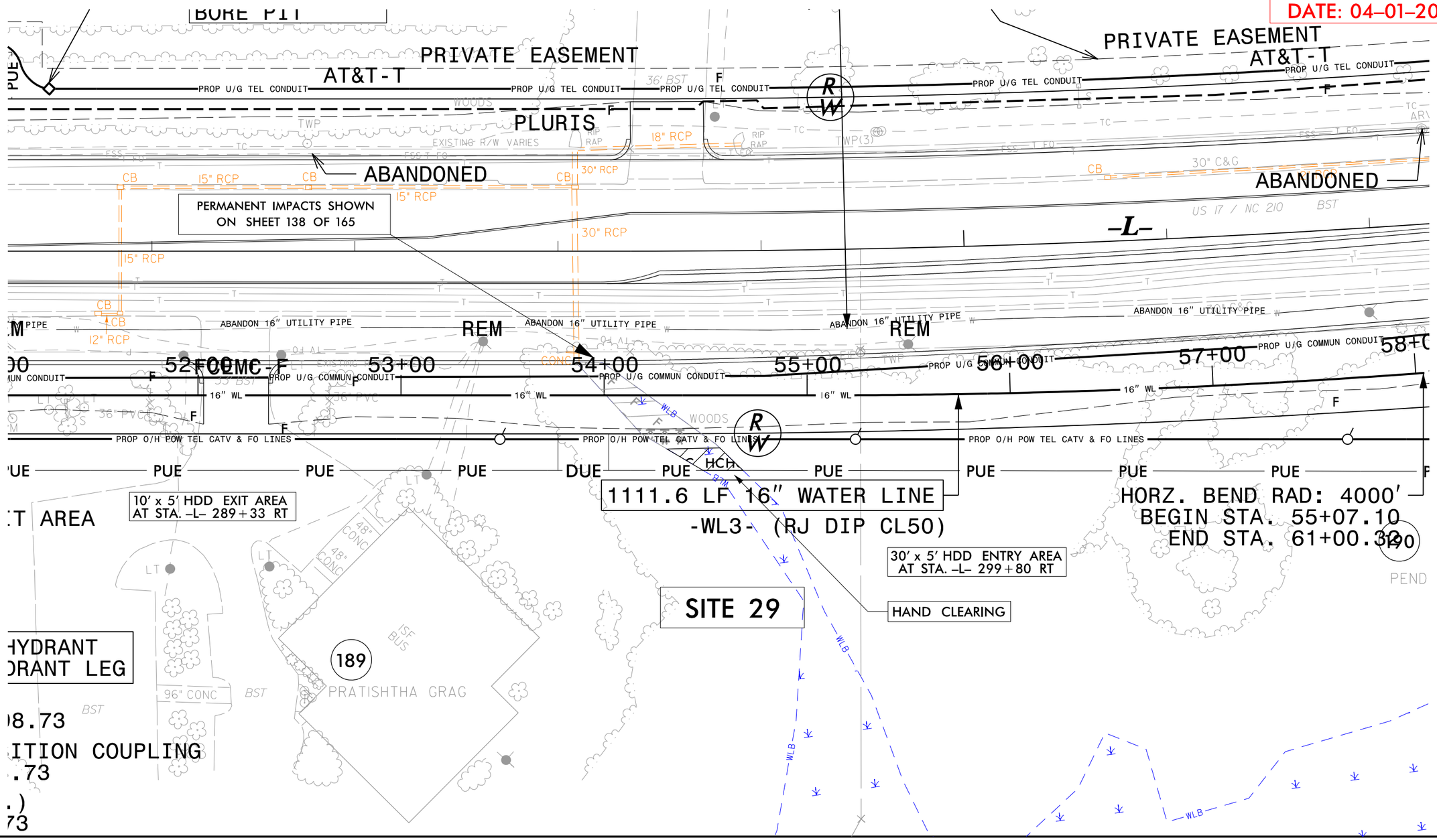
PERMIT DRAWING
SHEET 13 OF 23

DATE: 04-01-2020

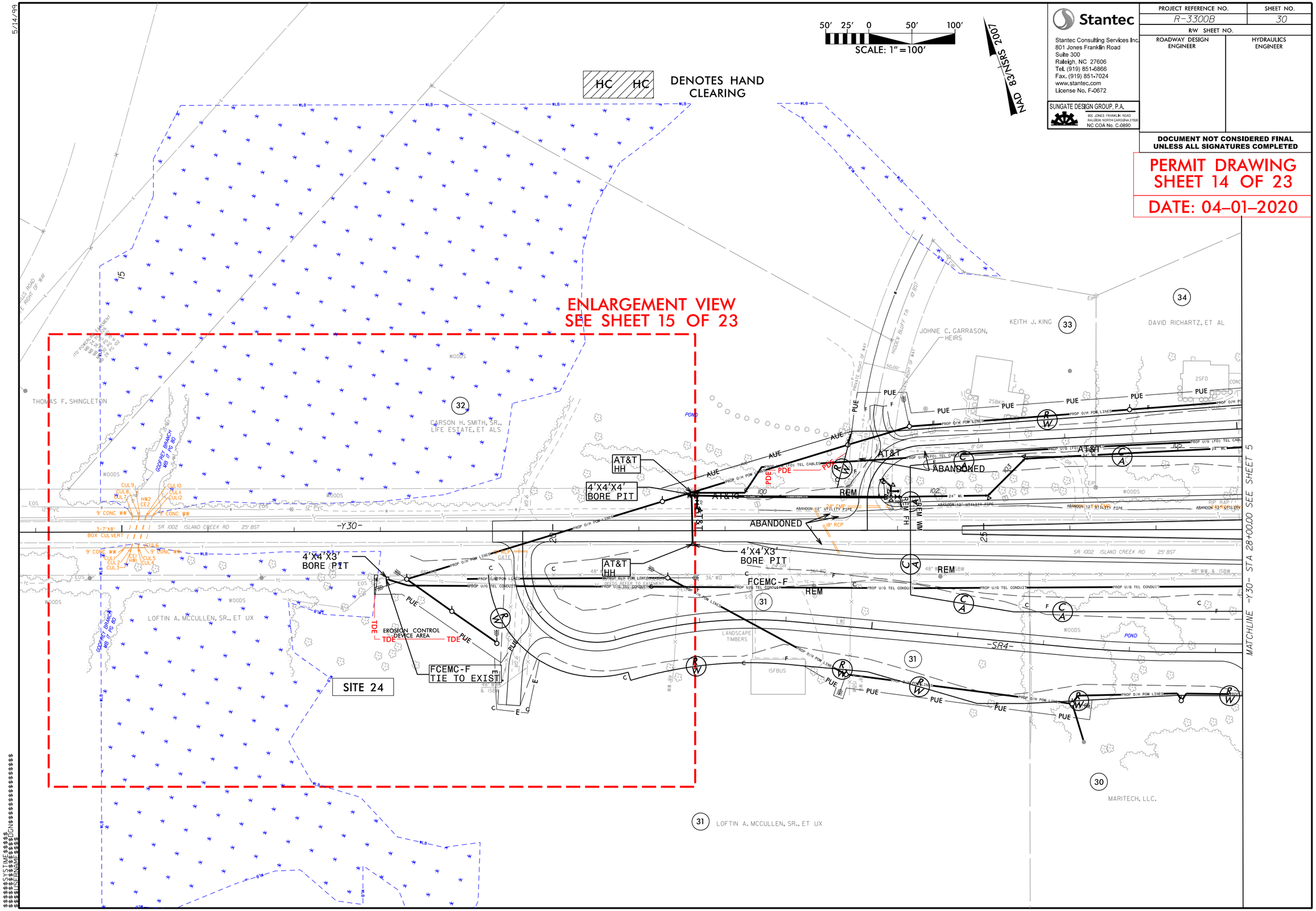
HC HC DENOTES HAND CLEARING

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83



5/14/99



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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	30
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 14 OF 23

DATE: 04-01-2020

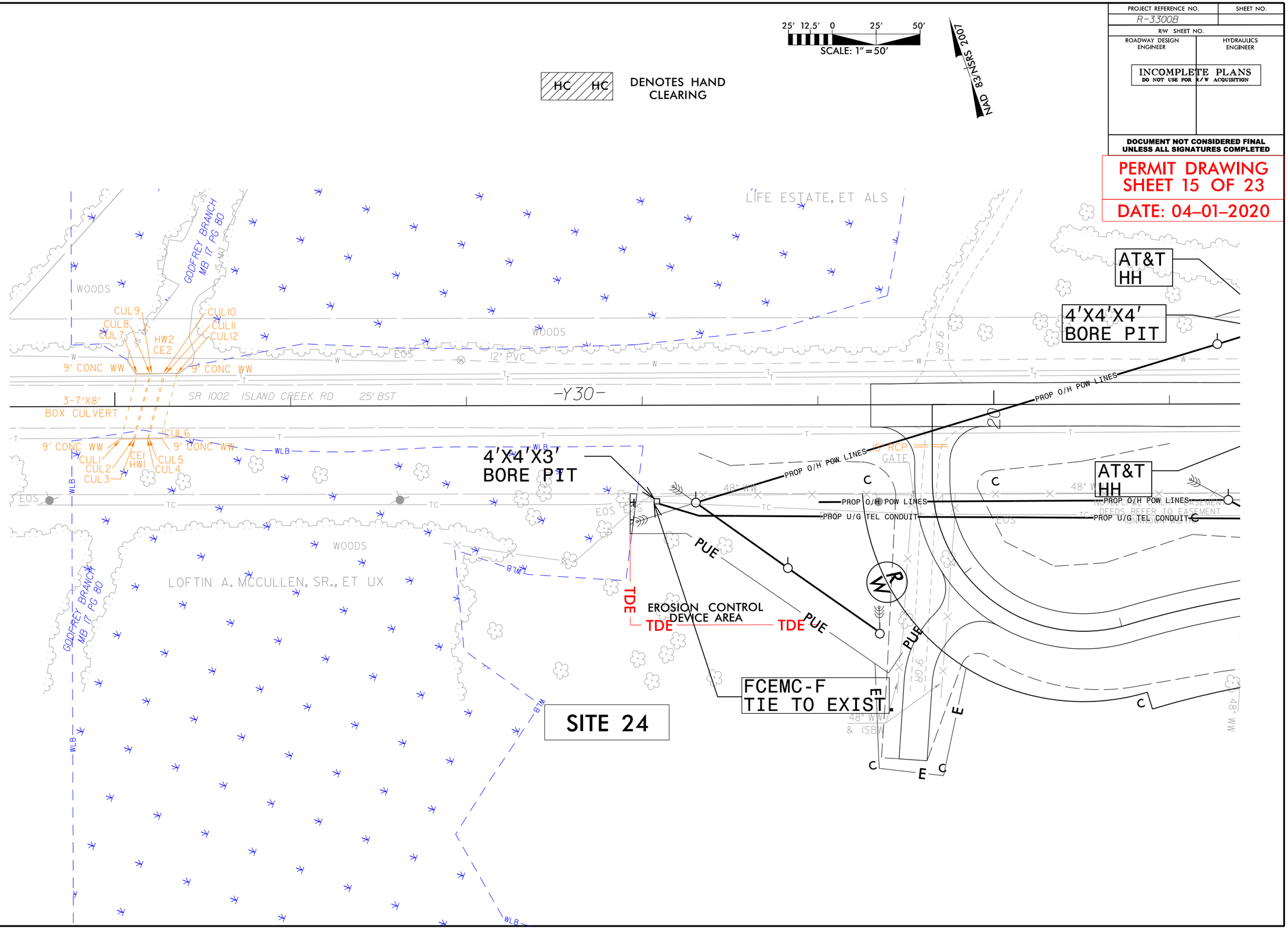
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 15 OF 23

DATE: 04-01-2020



5/14/99

ENLARGEMENT VIEW
SEE SHEET 4 OF 23

SCALE: 1" = 100'

NAD 83/NSRS 2007

MATCHLINE -Y30- STA 47+00.00 SEE SHEET 5

SITE 3

AT&T HH

4'X4'X3' BORE PIT

ABANDONED

NC210 -Y30-

N 71° 16' 17.1" W -SR5-

-SR5- PC Sta. 17+61.80

-SR5- PT Sta. 20+97.10

END CONSTRUCTION -SR5- POT Sta. 22+76.14

-SR5- POT Sta. 10+00.00
-Y30- POT Sta. 56+60.00

END CONSTRUCTION -Y30- POT Sta. 60+27.00

-SR5- PC Sta. 10+38.30
BRDG BK -S 23° 11' 13.7" W

S 65° 47' 37.4" E

FCEMC-F TIE TO EXIST.

-Y30- PT Sta. 62+12.58

-SR5- PT Sta. 13+23.81

-SR5- PRC Sta. 12+06.91

-SR5- POT Sta. 22+76.14

PERMANENT IMPACTS SHOWN ON SHEET 149 OF 165

TEMPORARY IMPACTS SHOWN ON SHEET 2 OF 165

HC HC DENOTES HAND CLEARING

JOSH W. BLANTON, ET UX
AMANDA B. WHITLEY
REBECCA F. DRISH, ET VIR
JOHNIE C. GARRASON, ET UX
FLOYD L. ELAM, JR.
PAUL E. HOLT
MARTIN J. EVANS, ET UX
WILLIAM D. STORCKS, ET UX
EFFIE BELL
RICHARD H. LEWIS, ET UX
SUSAN D. LORUSSO
RICHARD B. GRIFFITH

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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 16 OF 23

DATE: 04-01-2020

PERMIT DRAWING
SHEET 17 OF 23

DATE: 04-01-2020

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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	53
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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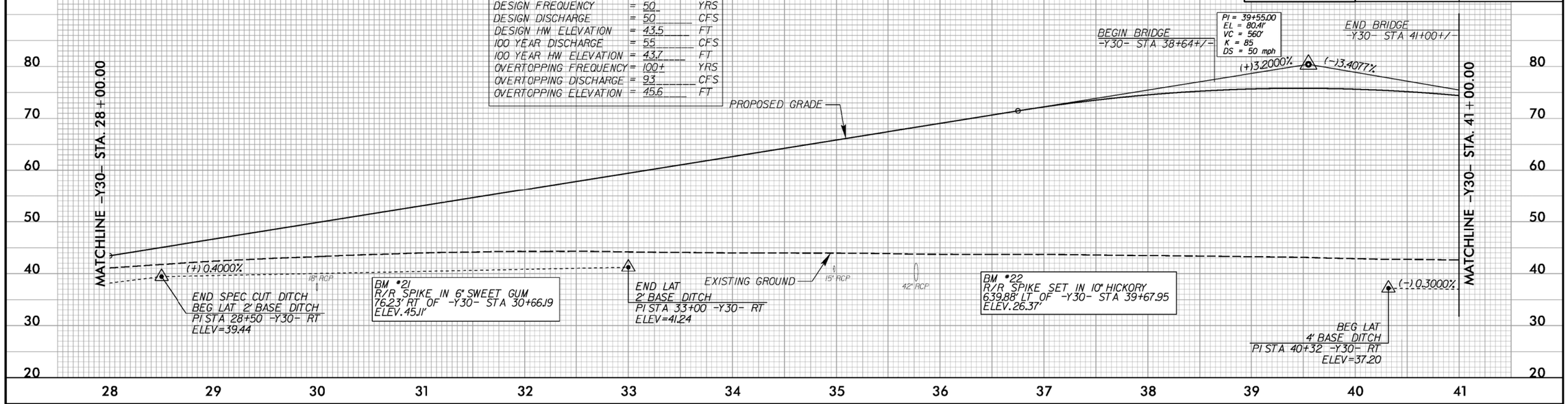
-Y30-

PIPE HYDRAULIC DATA
42" RCP Sta. 35+77 -Y30-

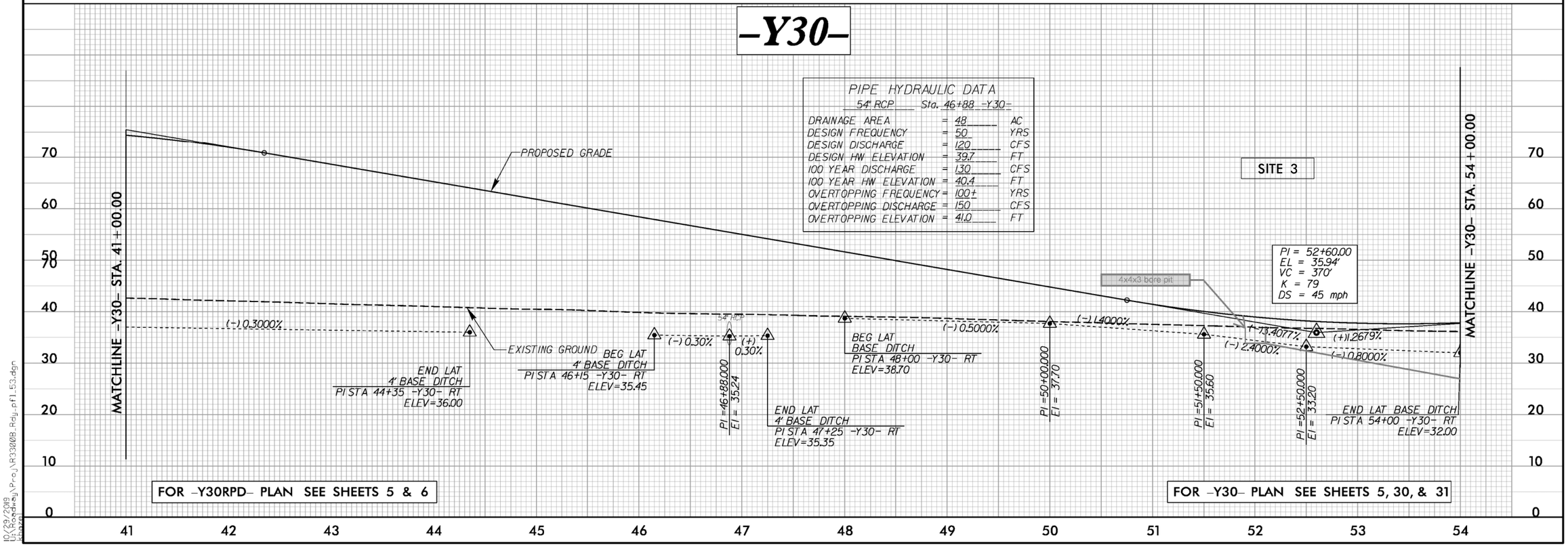
DRAINAGE AREA	=	11	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	50	CFS
DESIGN HW ELEVATION	=	43.5	FT
100 YEAR DISCHARGE	=	55	CFS
100 YEAR HW ELEVATION	=	43.7	FT
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING DISCHARGE	=	93	CFS
OVERTOPPING ELEVATION	=	45.6	FT



-Y30-

PIPE HYDRAULIC DATA
54" RCP Sta. 46+88 -Y30-

DRAINAGE AREA	=	48	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	120	CFS
DESIGN HW ELEVATION	=	39.7	FT
100 YEAR DISCHARGE	=	130	CFS
100 YEAR HW ELEVATION	=	40.4	FT
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING DISCHARGE	=	150	CFS
OVERTOPPING ELEVATION	=	41.0	FT



FOR -Y30RPD- PLAN SEE SHEETS 5 & 6

FOR -Y30- PLAN SEE SHEETS 5, 30, & 31

PERMIT DRAWING
SHEET 18 OF 23

DATE: 04-01-2020

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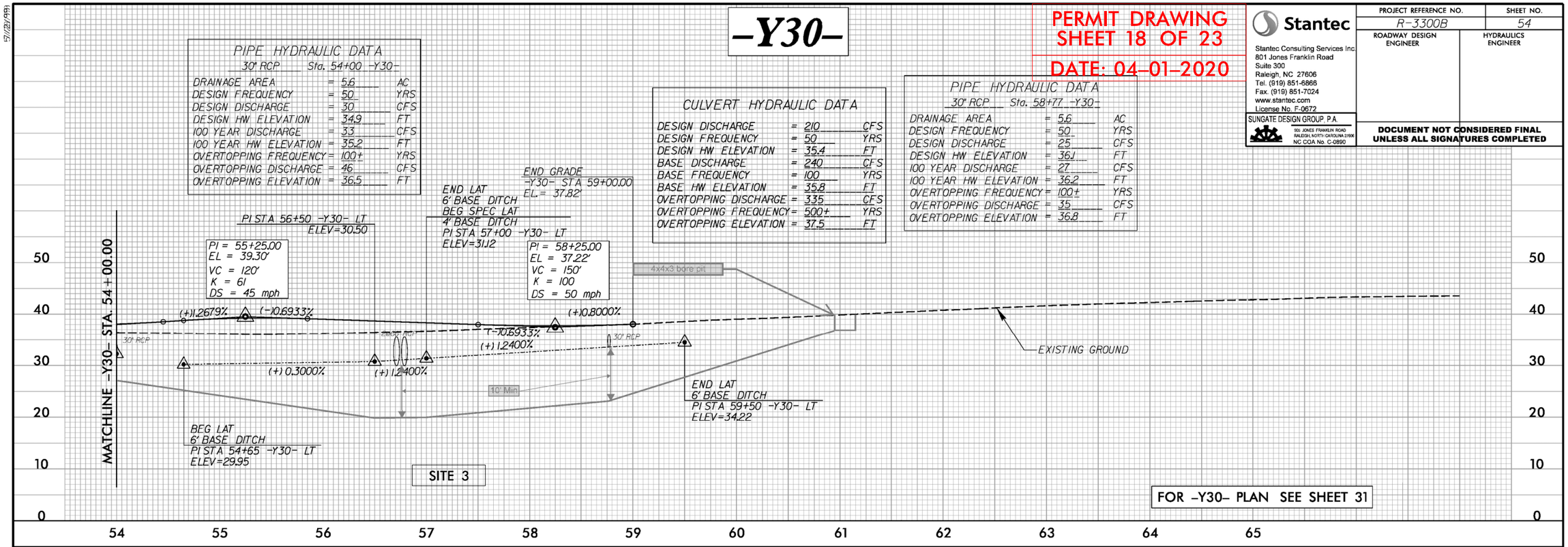
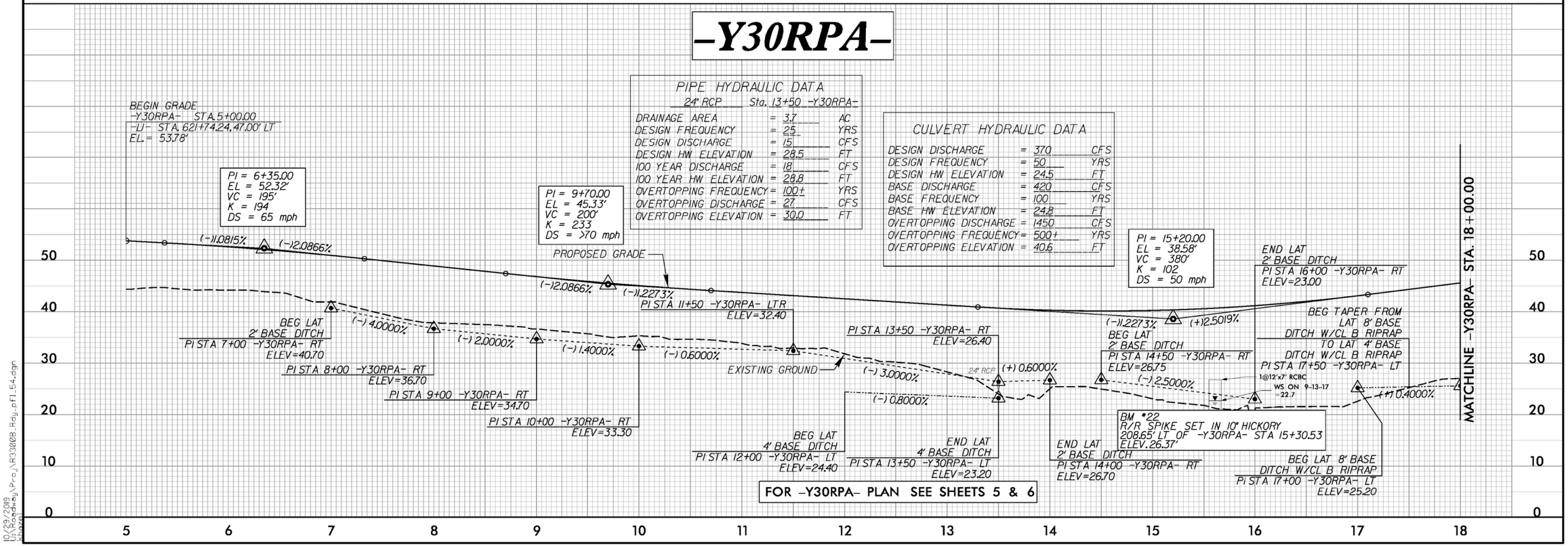
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	54
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-Y30-



-Y30RPA-



5/14/99

SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEET 50 FOR -Y19- PROFILE
SEE SHEET 52 FOR -Y20- PROFILE
SEE SHEET 62 FOR -Y32- PROFILE
SEE SHEET 66 FOR -Y40- PROFILE
SEE SHEET 67 FOR -Y41- PROFILE
SEE SHEET 67 FOR -Y42- PROFILE

HC HC DENOTES HAND CLEARING

50' 25' 0 50' 100'
SCALE: 1" = 100'

NAD 83/NSRS 2007

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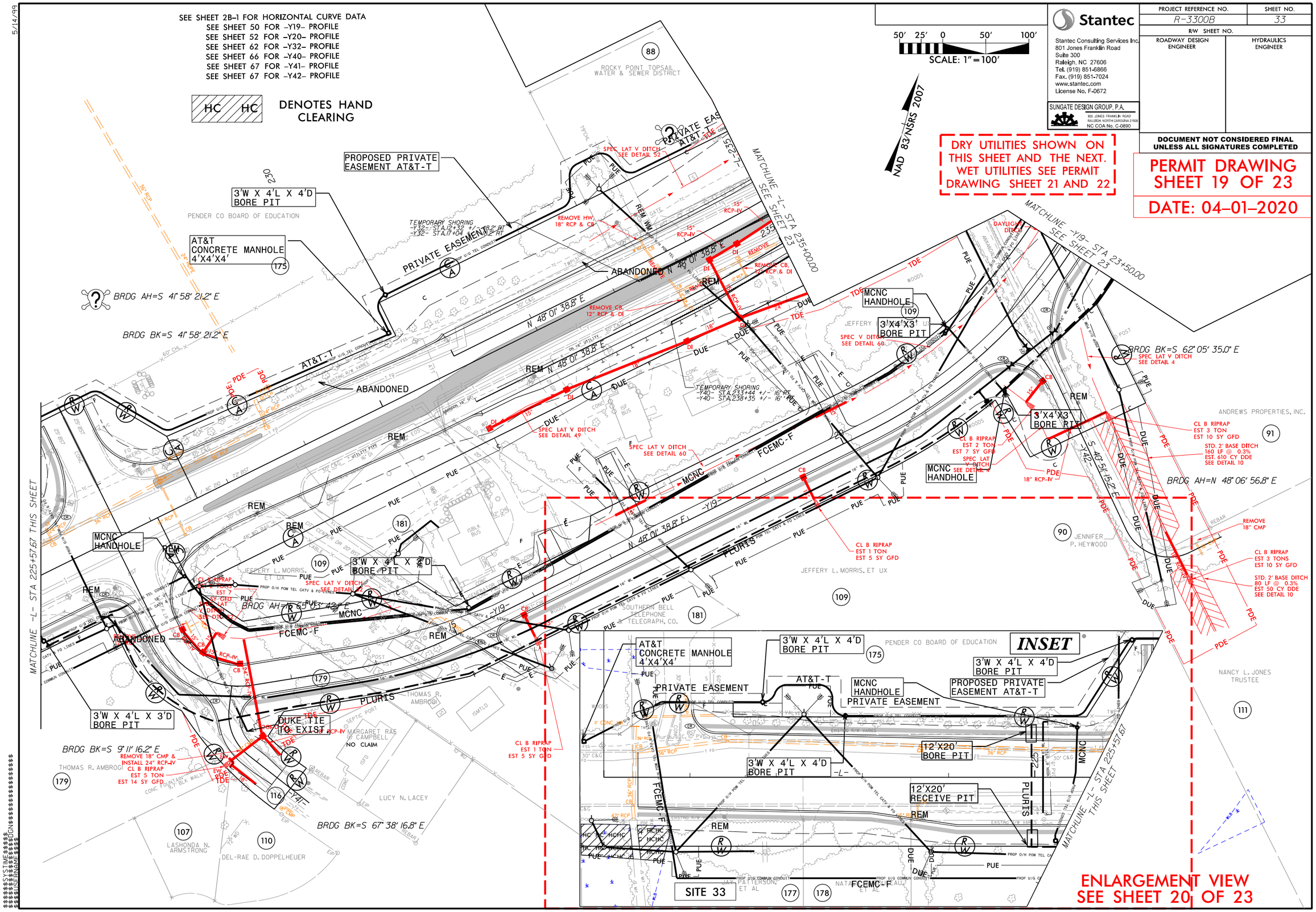
PROJECT REFERENCE NO.	SHEET NO.
R-3300B	33
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 19 OF 23

DATE: 04-01-2020

DRY UTILITIES SHOWN ON THIS SHEET AND THE NEXT. WET UTILITIES SEE PERMIT DRAWING SHEET 21 AND 22



ENLARGEMENT VIEW SEE SHEET 20 OF 23

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 20 OF 23

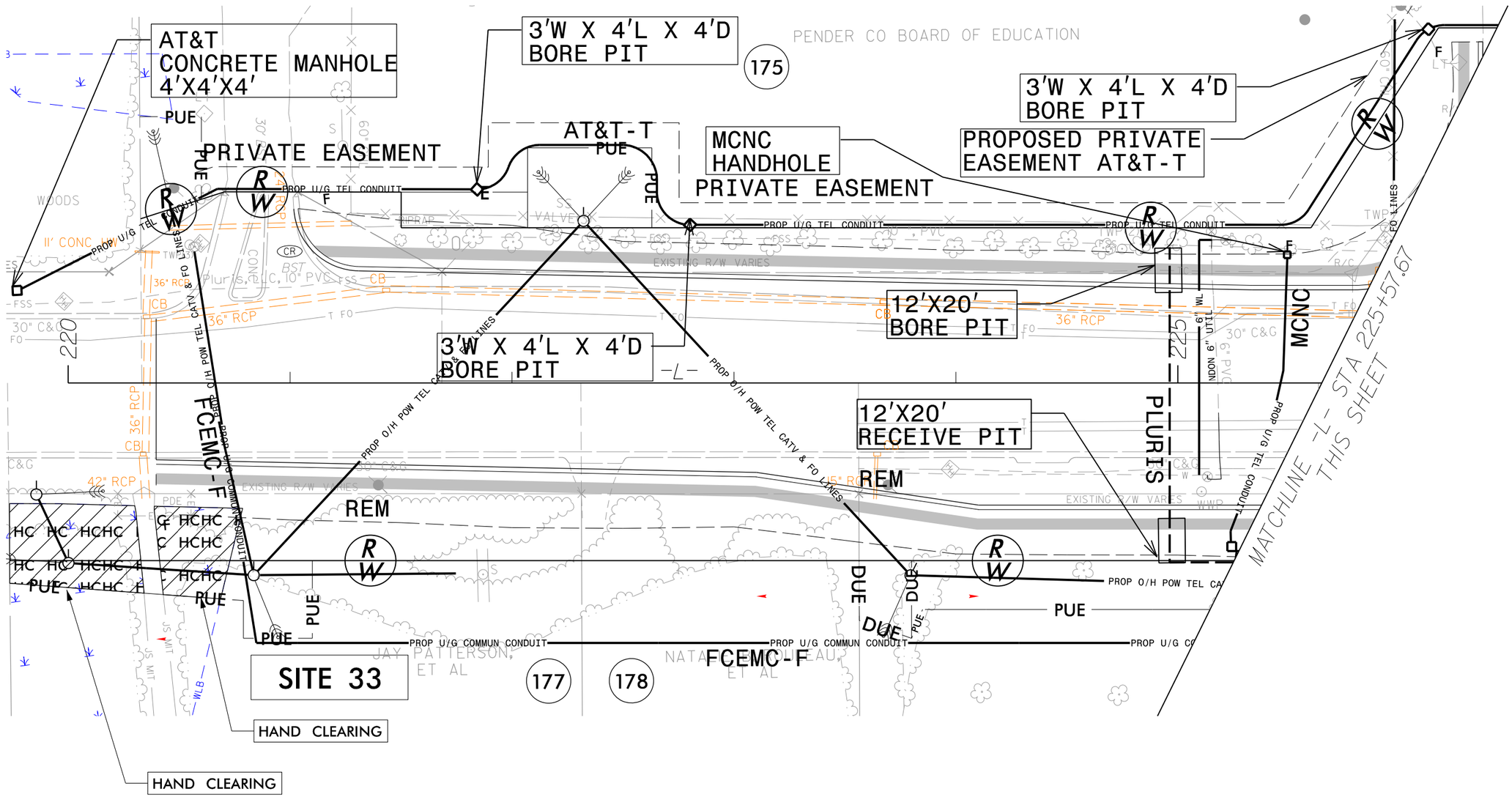
DATE: 04-01-2020

HC HC DENOTES HAND CLEARING

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

DRY UTILITIES SHOWN ON THIS SHEET AND THE PREVIOUS. WET UTILITIES SEE PERMIT DRAWING SHEET 21 AND 22



5/14/99

SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEET 50 FOR -Y19- PROFILE
SEE SHEET 52 FOR -Y20- PROFILE
SEE SHEET 62 FOR -Y32- PROFILE
SEE SHEET 66 FOR -Y40- PROFILE
SEE SHEET 67 FOR -Y41- PROFILE
SEE SHEET 67 FOR -Y42- PROFILE

HC HC DENOTES HAND CLEARING

50' 25' 0 50' 100'
SCALE: 1" = 100'

NAD 83/NSRS 2007

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PROJECT REFERENCE NO.	SHEET NO.
R-3300B	33
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

WET UTILITIES SHOWN ON THIS SHEET AND THE NEXT. DRY UTILITIES SEE PERMIT DRAWING SHEET 19 AND 20

PERMIT DRAWING SHEET 21 OF 23

DATE: 04-01-2020

REMOVE WATER METER

ABANDON 938.0 LF 16" UTILITY PIPE (1559.3 LF TOTAL)
TEMPORARY SHORING
-Y32- STA.12+32 +/- 18.2' RT
-Y32- STA.17+04 +/- 18.2' RT

-WL1- STA. 10+00.00
11.25° BEND (HORZ.)
INSTALL 16" TO EXIST. 16" WATER LINE W/ LONG PATTERN SLEEVE & CONCRETE THRUST BLOCK
-L- STA. 225+97.45 RT 72.90'
BRDG BK=S 41° 58' 21.2" E
45° BEND (HORZ.)
-WL1- STA. 10+10.00

158.1 LF 12" WATER LINE
-WL2- (RJ DIP CL50, 597.1 LF TOTAL)
11.25° BEND (ROTATED)
-WL2- STA. 10+20.00

12" VALVE
-WL2- STA. 10+05.00

16" VALVE
-WL1- STA. 22+52.68
11.25° BEND (VERT.)
-WL1- STA. 22+21.99

22.5° BEND (HORZ.)
-WL1- STA. 22+56.68
BRDG BK=S 62° 05' 35.0" E

16"X16"X12" TEE
-WL1- STA. 22+06.99
-WL2- STA. 10+00.00
11.25° BEND (VERT.)
-WL1- STA. 22+11.99

16" VALVE
-WL1- STA. 21+88.99

11.25° BEND (HORZ.)
-WL1- STA. 20+56.68

342.1 LF 16" WATER LINE
-WL1- (RJ DIP CL50, 1410.7 LF TOTAL)

HORZ. BEND RAD. 764'
BEGIN STA. 13+38.96
END STA. 15+66.10

DUKE TIE TO EXIST.

45° BEND (HORZ.)
-WL1- STA. 11+31.92
BRDG BK=S 9° 11' 16.2" E

45° BEND (ROTATED)
-WL1- STA. 12+35.56

3 - 45° BEND (VERT.)
-WL1- STA. 12+07.09
-WL1- STA. 12+09.98
-WL1- STA. 12+29.98
BRDG BK=S 67° 38' 16.8" E

MATCHLINE -L- STA 225+57.67 THIS SHEET

MATCHLINE -L- STA 235+00.00 SEE SHEET 23

MATCHLINE -Y19- STA 23+50.00 SEE SHEET 23

INSET

TIE-IN TO EXIST. 6" WATER LINE
-L- STA. 225+15.28 LT 64.48'

RECONNECT FIRE HYDRANT
RECONNECT WATER METER

90° BEND (ROTATED)
3 - 45° BENDS (VERT.)

111.6 LF 6" WATER LINE

ABANDON 124.9 LF 6" UTILITY PIPE

16" TAPPING SLEEVE AND VALVE

TIE IN TO EXIST. 16" WATER LINE
-L- STA. 225+09.61 RT 41.45'

SITE 33

MATCHLINE -L- STA 225+57.67 THIS SHEET

ENLARGEMENT VIEW SEE SHEET 22 OF 23

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3300B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 22 OF 23

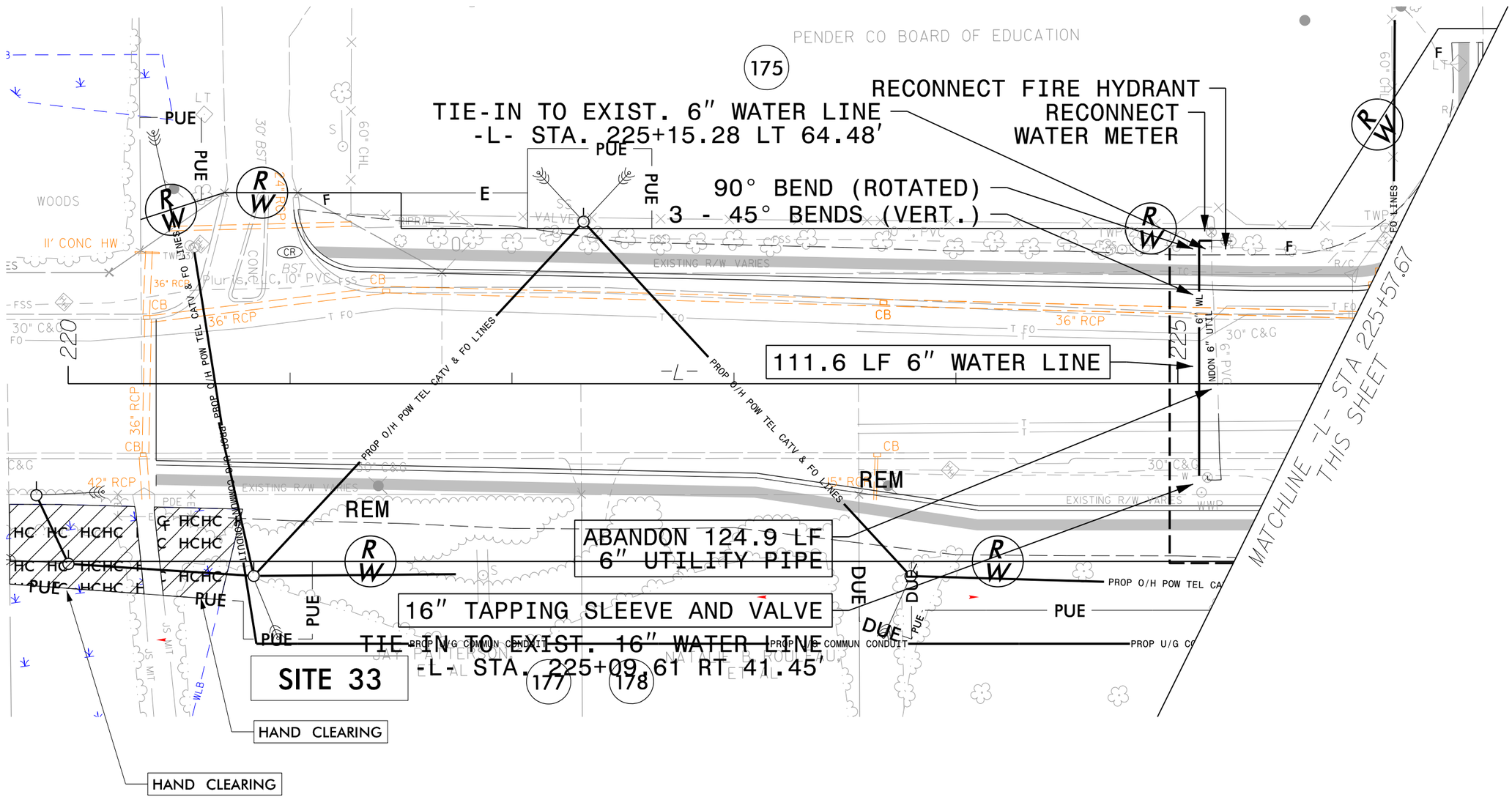
DATE: 04–01–2020

HC HC DENOTES HAND CLEARING

25′ 12.5′ 0 25′ 50′
SCALE: 1″ = 50′

NAD 83

WET UTILITIES SHOWN ON THIS SHEET AND THE PERVIOUS. DRY UTILITIES SEE PERMIT DRAWING SHEET 19 AND 20



WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
3	23+91 to 26+36-SR6-LT	UTILITY					0.171					
	19+29 to 22+74-Y30RPD-LT						0.143					
	10+57 to 13+41-Y30RPD-LT						0.192					
	52+05 to 56+54-Y30-LT						0.257					
17	19+10 to 19+16-Y31-LT	UTILITY					0.060					
24	16+77 to 16+97-Y30-RT	UTILITY					0.019					
28	289+27 to 286+83-L-RT	UTILITY					0.322					
29	293+53 to 293+90-L-RT	UTILITY					0.006					
33	219+74 to 220+73-L-RT	UTILITY					0.081					
34	34+21 to 34+86-SR6-LT	UTILITY					0.014					
35	279+95 to 280+81-L-LT	UTILITY					0.080					
	281+62 to 283+85-L-LT						0.178					
	284+33 to 286+01-L-LT						0.147					
TOTALS*:			**0.000**	**0.000**	**0.000**	**0.000**	**1.669**	**0.000**	**0.000**	**0**	**0**	**0**

*Rounded totals are sum of actual impacts

NOTES:

Converting a mature forested area to a maintained corridor= 1.51 AC

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
04-01-2020
PENDER COUNTY
R-3300B
40237.2.1

Revised 2018 Feb