STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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February 23, 2011

U. S. Army Corps of Engineers
Regulatory Field Office
3331 Heritage Trade Drive Suite 105
Wake Forest, NC 27587

ATTN: Mr. Monte Matthews
NCDOT Coordinator

Subject: **REVISION to Application for Individual Section 404 Permit and 401 Certification** for the widening of US 321 from SR 1500 (Blackberry Road) to US 221 at Blowing Rock; Watauga and Caldwell Counties; State Project No. 6.739001T; NCDOT Division 11; TIP No. R-2237C, WBS Element No. 34402.2.6

Reference:
- Application for Individual 404 Permit and 401 Certification (dated September 3, 2010)
- DWQ Letter dated December 3, 2010
- USACE Letter dated December 2, 2010

Dear Mr. Matthews:

This Application Revision is being submitted to augment the previously submitted application referenced above. This Revision includes responses to comments received in letters from the DWQ and from the USACE, as referenced above, and corrections/clarifications to the original application. This Revision application package consists of the cover letter, attachments for the responses to the USACE comments, a revised EEP acceptance letter, and Revised Permit Drawing Sheets (including revised Wetland Permit Impact Summary sheets) along with the applicable corresponding revised roadway plan sheets.

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Responses to DWQ Comments (Letter dated December 3, 2010)

Response to DWQ 1st bulleted item:
NCDOT has revised the culvert at Site VII. The revision includes the placement of a riprap bench to a height of one foot above the southern sill of the culvert. See Revised Permit Drawing Sheets 24-26 of 45, and 40 of 45, and the applicable corresponding revised roadway plan sheet number 16. There is no change in impacts.

Response to DWQ 2nd bulleted item (and NCWRC comment from October 15, 2010 email):
The permit drawings for Site IV have been revised to depict the existing stream connecting directly to the relocated portion of the stream. On the original drawings, there was a disconnect between the two sections of stream. See Revised Permit Drawing Sheets 12-14 of 45 and the applicable corresponding revised roadway plan sheet number 11. There is no change in impacts.

Response to DWQ 3rd bulleted item (and NCWRC comment from October 15, 2010 email):
A four-foot base ditch has been included at Site IX to create a direct connection to Middle Fork Creek. The permit drawings for Site IX have been revised accordingly. See Permit Drawings Sheets 31-33 of 45. The connection should be able to be constructed with no additional impacts to the streams.

Response to DWQ 4th bulleted item:
At Site X in the original application submittal, UT3 to Middle Fork Creek was proposed to be piped to the stormwater system. The impacts at this site did not include impacts that would have occurred to the downgradient segment of UT3 to Middle Fork Creek located between US 321 Business and Middle Fork Creek (this segment of UT3 to Middle Fork Creek was not included on the design plans). Due to the grade at the pipe outlet on the west side of US 321 Business, riprap is proposed to be placed in the stream channel to reduce erosion, resulting in a net increase of 10 lf of permanent stream impacts to UT3 Middle Fork Creek (Note: 98 lf of stream impacts were avoided). See Revised Permit Drawing Sheets 34-36 of 45, and the applicable corresponding revised roadway plan sheet number 19. The revisions at Site X are summarized below (and presented in revised Table 4 of this application):

Site X Permanent Stream Impacts:
- UT3 to Middle Fork: 59 lf (revised from 49 lf)
- UT4 to Middle Fork: 25 lf (unchanged)

Total for Site X = 84 lf (revised from 74 lf)

Site X Temporary Stream Impacts: <0.1 ac (unchanged)
NOTE: the temporary stream impacts increased 5 lf (from 14 lf to 19 lf); however, this had no effect on the acreage of temporary impacts, which remain unchanged.

Responses to USACE Comments (Letter dated December 2, 2010)

Response to USACE Item #1:
The Preferred Alternative's current jurisdictional impacts are presented in Revised Table 2 (page 7 of 11of this Cover Letter). The impact table from the FEIS (Table S-1) is included in the Attachment. The most current impact quantities for relocations on the Preferred Alternative are 14 residences and 12 businesses. The updated construction cost estimate is $50.4 million. All other impact estimates remain unchanged since the 2006 FEIS/2007 ROD.

Response to USACE Item #2:
Prior to the Merger Team's concurrence on CP 2, NCDOT spent four years (1995-1999) developing a Bypass Alternatives Study. During this time, there was much public involvement, so that interested citizens could have a voice in the alternatives to be carried forward for detailed study. The first Merger Team meeting was held November 4, 1999 for the purpose of concurring on CP 1 and CP 2. Concurrence was not reached for either concurrence point because additional information (a functional assessment) was requested. This information was sent to the team in February 2000. The letter from March 15, 2000 transmitted to the team a comparison of alternatives that included the findings from the functional assessment. This letter was amended on November 11, 2000 (see attached) to explain how the preliminary designs, completed for the project alternatives in 2000 for use in the Draft EIS, reduced the impacts for the alternatives. While the table attached to the November 11, 2000 amendment does not reflect these reduced impacts, the impact table included in the Draft EIS does. The Merger Team's discussion and concurrence on the LEDPA was based on the impacts in the Draft EIS, not those in the March 15, 2000 memo or the November 11, 2000 memo.

At a January 18, 2001 Merger Team meeting, the Team agreed to CP 2. The Team agreed to carry forward the Widening Alternative and Bypass 1 for detailed study. The Team did not agree to carrying forward Bypass Alternative 4 because it was not feasible from the perspective of the natural resource agency representatives. Nevertheless, NCDOT explained to the Team that it had an obligation to study Bypass Alternative 4 in detail in the Draft EIS because it was the only acceptable option to the Concerned Citizens of Blowing Rock. The NCDOT carried forward this alternative in full recognition of the fact that many agencies said they could not endorse it as LEDPA.

On January 15, 2003, the Team reached concurrence on the Widening Alternative as the LEDPA (CP 3). In making the LEDPA decision, the Team was looking at the impacts as reported in the Draft EIS (as opposed to the cited 2000 table). The LEDPA selection was based on the following, as excerpted from the May 21, 2003 minutes:

- *If the Green Park Historic District were not affected, the Widening Alternative would clearly be the least environmentally damaging alternative.*

- *The magnitude of the impact to the Green Park Inn Historic District by the Widening Alternative is not enough to outweigh the resulting negative community and environmental impacts of either Bypass Alternative 1 design.*

- *Mitigation opportunities exist with the Widening Alternative. Landscaping, revegetation, replacement and installation of new rock walls, and burying utilities are*

examples of initiatives to compensate for impacts to the Town of Blowing Rock. However, it would be extremely difficult to mitigate the damage to the natural environment, the surrounding hillside, and the local neighborhoods by a bypass alternative.

Note: Bypass Alternative 4 was not addressed in the above comparison nor at the meeting because of two factors: 1) the inclusion of Bypass Alternative 4 in the DEIS was at the initiative of the NCDOT and the FHWA but was not approved as a Detailed Study Alternative by the Merger Team at Concurrence Point 2; and 2) the NCDOT did not plan to pursue Bypass Alternative 4 as its preferred corridor because of its impacts to the natural environment, its impacts to the Blue Ridge Parkway, its cost, and the objection of the resource and regulatory agencies.

The Team agreed to an alternative with more jurisdictional impacts because of home/business relocations and community impacts associated with other alternatives. Also, the Team was highly opposed to Alternative 4 from early on (they would not agree to carry it forward as a Detailed Study Alternative) because of the way it would introduce a road into a rural, road-free area, bisect undeveloped, natural habitat and scar the mountainside. This was in spite of the fact that one design option for Alternative 4 had 0.1 ac of wetland impact. Clearly, the Team was considering factors other than jurisdictional impact quantities in the decision-making.

The above reasoning is not affected by the changes to the stream and wetland impact estimates that have occurred since the LEDPA selection.

Response to USACE Item #3:
NCDOT's Congestion Management section has reviewed the new traffic projections, and the need for the project remains unchanged. Even with the lower volumes, the roadway is expected to continue to operate at an unacceptable level of service in the future if the project is not built. The higher volumes in the Town limits, the steep grades south of the Town limits, and the heavy truck volumes all contribute to the ongoing need for the widening. Congestion Management conducted a new, detailed level of service to identify any design detail modifications. No changes are being made to the design based on the outcome of the new analysis, so the impact quantities remained unchanged.

Response to USACE Item #4:
The first site was the culvert replacement near the new fire station. At this location NCDOT received an MOA (2a) on 8/25/09 (NC Floodplain Mapping [NCFMP] Invoice Reference # 20090825-8). The Invoice was paid 8/27/09 $2000.00 with a payment reference # 2001162792. NCDOT lowered the Q100 Water Surface Elevation (WSEL), submitted a revised FEMA flood model to NCFPM and received a FEMA approval through the MOA process. NCFPM manages the program for FEMA in NC.

There is also a lateral encroachment around the Shoppes of the Parkway. NCFMP indicated that since this was a lateral encroachment nothing will be required by FEMA. Kevin Rothrock (Planning Director for the Town of Blowing Rock) was contacted about the need for a Community Development Permit. Mr. Rothrock indicated that the town would not require anything from DOT, as long as DOT is in compliance with FEMA Regulations.

Responses to Chetola Resort Comments (Letter dated November 11, 2010)
(referenced in USACE Letter dated December 2, 2010)

Chetola Resort Comment #1:
During discussions, Mr. Terry Bradshaw, Right Of Way Agent with NCDOT, pointed out an area located in Site X at the border of Site XI that is right at the dam holding back Chetola Lake (one of the four bodies of water that begin the New River). The engineers back in Raleigh had not noticed that the dam also serves as a road and is an emergency access to the resort and they (having never had the advantage of visiting the site) had closed off the entrance with the grading and a guard rail. This entrance is also used to bring big equipment out on the dam when repairs are necessary. Looking at the plans you have sent, I cannot tell for sure with my lack of expertise, but it appears that this has not yet been corrected.

NCDOT Response:
Due to the widening of US 321, it was necessary to relocate the US 321 Bus/US 221 intersection. As a result, proposed US 321 in the vicinity of the US 321 Bus/US 221 intersection is approximately 16 feet higher than the road across the dam. Maintaining the access, as it currently exist, was not feasible. The Department is investigating the feasibility of providing access to the road across the dam by utilizing the existing US 321 Bus/US 221 roadway. [Greg Brew, PE - Roadway Design Unit can be contacted to address questions/comments regarding this NCDOT response].

Chetola Resort Comment #2:
In Site X and XI, we have reviewed the drainage plans and have some concern as to how the storm water will be released at the base of our dam area and its potential long term erosion effects on both the island and shoreline at the base of the dam as well as the trout waters above and below this dam.

NCDOT Response:
At both Sites X and XI the existing drainage patterns are being maintained to the maximum extent practicable. At Site X the existing stream and roadway runoff are being discharged through a 36" Corrugated Steel Pipe (CSP) onto a rip rap dissipater pad and into the existing jurisdictional stream. There is no increase in discharge at this site from the existing to the proposed condition; therefore no increase in erosion is anticipated. At Site XI the 18" CSP is being discharged onto a rip rap dissipater pad in a flat area near the creek in order to reduce the outlet velocity from the pipe. No adverse impacts due to erosion are anticipated.

No adverse impacts to trout waters are anticipated, and Best Management Practices, including Design Standards in Sensitive Watersheds (DSSW), will be used throughout construction. [Marc Shown, PE - Hydraulic Design Unit can be contacted to address questions/comments regarding this NCDOT response].

Chetola Resort Comment #3:
In the North East area of Site X at the curve in the road the proposed plan will move the road over several feet making it necessary to build an expensive, large retaining wall within a couple feet of Chetola Lake. When we physically reviewed the site with Mr. Bradshaw that day, we all noted that this plan would make it necessary to cut down the timber that acts as a buffer to the Lake and Resort and its construction so very close to the shoreline would potentially disturb this trout stocked lake. In looking at the proposed plan further we all noted that if the road was

moved over affecting the opposite side instead of this lake site, it appeared that the land necessary was available without having to deal with the huge granite outcropping along the roadside (though this may have not been evident if aerial photos were used).

NCDOT Response:
Several factors went into determining the location of the US 321 Bus/US 221 intersection. These factors included the number of lanes, access to property on both sides of US 321, the location of the median crossover, impacts to property on both sides of US 321, traffic maintenance, and the existing alignment of US 321 and US 321 Bus/US 221. In addition, there is enough of an elevation difference between US 321 Bus/US 221 and the lake that we would not be able to shift the alignment enough to eliminate the retaining wall. Taking into consideration all of the constraints and the current stage of the design, we feel that it is best to proceed with the proposed design. [Greg Brew, PE - Roadway Design Unit can be contacted to address questions/comments regarding this NCDOT response].

Responses to Rosemyr Corporation Comment (Letter dated November 16, 2010) (referenced in USACE Letter dated December 2, 20101)

Rosemyr Corporation Comment:
H.H.C. Co., Inc. (d/b/a Rosemyr Corporation) is unconditionally opposed to the NCDOT's condemnation plans for the realignment of Main Street at 8684 Valley Blvd., Blowing Rock, NC as being proposed as part of the widening of US 321 in Blowing Rock, NC. The NCDOT's condemnation plan proposes a taking that is excessive and will result in the loss of our Tenant's (Broyhill furniture) front lawn which has several historic trees; some measuring over 6 feet in diameter. In addition a retaining wall is proposed that will obscure the visibility of the building and will create concerns with the drainage and the potential to now flood our building and property. Last, but not least, is the loss of the signature sign for this Tenant's building. Due to the new right of way proposed for the front and the side of the building, relocation of this signature sign is extremely limited. The frustrating part is that it is unnecessary.

In conversations with local NCDOT personnel, HHC believes that the proposed realignment of US 321 Business (Main Street) and Trillium Lane could be shifted southward to lessen the impact on our building and property. We note that this shift southward would not have a negative impact on any other property owner. Further, safety will not be jeopardized as the intersection is to be signalized. HHC has continually requested NCDOT to reconsider its planned configuration. We would welcome the opportunity to sit down with the NCDOT designers and work toward an agreeable solution; however at this time we have no other recourse than to oppose the plan.

NCDOT Response:
It should be noted that the proposed design was presented at the public hearing well before H.H.C. Co., Inc. purchased and developed the property. As a result of the development, the Department is investigating the feasibility of shifting the US 321 Business alignment to minimize impacts to the development. It appears that impacts to the property can be reduced from what is currently proposed. We will continue to coordinate with H.H.C. Co., Inc. representatives to work towards a solution that is acceptable for both parties. It should be noted that a traffic signal is not proposed at the US 321 and US 321 Business intersection.
[Greg Brew, PE - Roadway Design Unit can be contacted to address questions/comments regarding this NCDOT response].

Summary of Jurisdictional Impacts

Table 2 has been revised below. The permanent stream impact value for the Yadkin – Pee Dee River Basin (975 lf) has been corrected from the 1,002 lf erroneously listed in the original application, and the permanent stream impact value for the New River Basin has been revised to reflect the net increase of 10 lf of permanent stream impact at Site X. Table 2 has also been revised to exclude the pond impacts presented in the original application, as they are non-jurisdictional surface waters. The Wetland Permit Impact Summary Sheets (Revised Permit Drawing Sheets 44-45 of 45) have also been corrected to note these as non-jurisdictional impacts.

Revised Table 2 - Summary of Impacts

River Basin	Permanent Wetland (ac)	Permanent Stream (lf)	Temporary Stream (ac) [1/]
Yadkin-Pee Dee	0.13	975	0.03
New	0.06	671	0.02
Totals	**0.19**	**1,646**	**0.05**

[1/] Values are based on rounding, due to some of the individual impacts being <0.01 acre.

Summary of Mitigation:

As noted in the original application, all mitigation will be provided by the Ecosystem Enhancement Program (EEP). A revised EEP acceptance letter, corresponding to the revised mitigation requirement, is attached (see Tables 3 & 4 for stream mitigation determinations).

IMPACTS TO WATERS OF THE U.S.

Revisions to the Impacts to Waters of the U.S. section are described below.

Surface Waters

Based on the net increase of 10 linear feet of stream impact at Site X, permanent impacts are proposed on 1,646 (revised from 1,636) linear feet of jurisdictional streams: 975 linear feet within the Yadkin Pee-Dee River Basin and 671 (revised from 661) linear feet within the New River Basin. Temporary impacts are proposed on 0.05 acre (283 lf) of jurisdictional streams. This revised linear footage does not change the area (0.05 acre) of temporary impacts presented in the original application.

Table 4 has been revised to reflect the change in the permanent stream impact to UT3 to Middle Fork Creek at Site X. There have been no revisions to the impacts presented in Table 3. Additional revisions have been made to Tables 3 and 4 to include the linear footage of temporary stream impacts, and to present the mitigation requirements more concisely.

As noted in the original application, permanent impacts are proposed on 0.02 acre of a non-jurisdictional pond (Impact Site VIII in the original application). The Wetland Permit Impact Summary Sheet (Permit Sheet 44 of 45) has been corrected to note that this is a non-jurisdictional impact.

Revised Table 3. Impacts to jurisdictional streams in Yadkin-Pee Dee River Basin (HUC 03040101)

Site No.	Station No.	Stream Name	Stream Type / Classification	Impact Type	Impact Length	Impact Acreage	Mitigation Requirement
I	385+70 to 389+45-L-	UT1 to Bailey Camp Creek	Perennial / C; Tr	Perm. fill	294 lf	--	USACE & DWQ
				Temp. fill	36 lf	<0.01 ac.	--
II	403+30-L-	Bailey Camp Creek	Perennial / C; Tr	Perm. fill	119 lf	--	USACE & DWQ
				Temp. fill	33 lf	<0.01 ac.	--
III	442+00 to 444+00-L-	UT1 to Yadkin River	Perennial / C; Tr	Perm. fill	53 lf	--	USACE & DWQ
		UT2 to Yadkin River	Perennial / C; Tr	Perm. fill	150 lf	--	USACE & DWQ
				Bank stabilization	10 lf [a/]	--	DWQ
				Temp. fill	43 lf	0.01 ac.	--
IV	444+65 to 449+50-L-	UT2 to Yadkin River	Perennial / C; Tr	Perm. fill	317 lf	--	USACE & DWQ
				Temp. fill	46 lf	0.01 ac.	--
V	451+40-L-	UT2 to Yadkin River	Perennial / C; Tr	Perm. fill	22 lf	--	USACE & DWQ
				Bank stabilization	10 lf [a/]	--	DWQ
				Temp. fill	6 lf	<0.01 ac.	--
Total Temporary Impacts:					164 lf	0.03 [b/]	--
Total Permanent Impacts:					975 lf		
Permanent Impacts Requiring DWQ Mitigation (1:1):					975 lf		975 lf
Permanent Impacts Requiring USACE Mitigation (2:1):					955 lf		**1,910 lf** [+]

[a/] Mitigation for bank stabilization impact required by DWQ – not required by USACE.
[b/] Value based on rounding, due to some of the individual impacts being <0.01 acre.
[+] Mitigation proposed by NCDOT (based on mitigation required by the USACE exceeding the amount required by DWQ).

Revised Table 4. Impacts to jurisdictional streams in New River Basin (HUC 05050001)

Site No.	Station No.	Stream Name	Stream Type / Classification	Impact Type	Impact Length	Impact Acreage	Mitigation Requirement
VI	495+20 to 498+15-L-	UT1 to Middle Fork [a/]	Perennial / WS-IV: +	Perm. fill	294 lf	--	USACE & DWQ
VII	523+33.5-L-	Middle Fork	Perennial / WS-IV: +	Perm. fill	128 lf	--	USACE & DWQ
				Bank stabilization	32 lf [b/]	--	DWQ
				Temp. fill	26 lf	0.01 ac.	--
IX	540+20-L-	UT2 to Middle Fork	Perennial / WS-IV: +	Perm. fill	119 lf	--	USACE & DWQ
					14 lf	--	N/A [c/]
				Temp. fill	10 lf	<0.01 ac.	--
X	553+50-L-	UT3 to Middle Fork	Perennial / WS-IV: +	Perm. fill	**59 lf ***	--	USACE & DWQ
				Temp. fill	19 lf	<0.01 ac.	--
		UT4 to Middle Fork	Perennial / WS-IV: +	Perm. fill	25 lf	--	USACE & DWQ
				Temp. fill	19 lf	<0.01 ac.	--
XII	561+56-L-	UT5 to Middle Fork	Perennial / WS-IV: +	Temp. fill	45 lf	0.01 ac.	--
Total Temporary Impacts:					119 lf	0.02 [d/]	--
Total Permanent Impacts:					671 lf		
Permanent Impacts Requiring No Mitigation:					14 lf		0 lf
Permanent Impacts Requiring DWQ Mitigation (1:1):					657 lf		657 lf
Permanent Impacts Requiring USACE Mitigation (2:1):					625 lf		**1,250 lf** [+]

[a/] Middle Fork = Middle Fork of the South Fork of the New River.
[b/] Mitigation for bank stabilization impact required by DWQ – not required by USACE.
[c/] area determined to have been already impacted – no mitigation required by USACE or DWQ.
[d/] value based on rounding, due to some of the individual impacts being <0.01 acre.
[+] Mitigation proposed by NCDOT (based on mitigation required by the USACE exceeding the amount required by DWQ).
[*] Revised impact. Note: this is the only revision to the impacts presented in the table in the original application.

Wetlands

There are no changes to wetland impacts in this revised application. Permanent impacts are proposed on 0.19 acre of riparian wetlands, comprised of the placement of 0.13 acre of permanent fill, the excavation of 0.03 acre, and the mechanized clearing of 0.03 acre. Of the 0.19 acre of impact to riparian wetlands, 0.13 acre occurs in the Yadkin Pee-Dee River Basin (HUC 03040101) and 0.06 acre occurs in the New River Basin (HUC 05050001). There will be no temporary impacts to any wetlands.

MITIGATION OPTIONS

Avoidance and Minimization:

Design revisions were incorporated to minimize impacts to UT3 to Middle Fork Creek. The revisions included allowing UT3 Middle Fork Creek to flow to its existing channel downgradient of US 321 Business, rather than piping the stream to the stormwater system. The redesign results in an additional 10 lf of permanent stream impact but avoids approximately 98 lf of permanent impact to the downgradient section of UT3 to Middle Fork Creek located between US 321 Business and Middle Fork Creek.

Compensatory Mitigation

All mitigation for the project will be provided by EEP. The offsetting mitigation will derive from an inventory of assets already in existence within the same 8-digit cataloguing unit. The Department has avoided and minimized impacts to jurisdictional resources to the greatest extent possible. Compensatory mitigation for this project consists of the following:

Compensatory Stream Mitigation:

Unavoidable impacts to jurisdictional streams on the project total 1,646 (revised from 1,636 in original application) linear feet. The DWQ requires mitigation for 1,632 linear feet of stream impact (975 lf in the Yadkin Pee-Dee River Basin and 657 lf in the New River Basin) at a 1:1 ratio (totaling 1,632 lf of stream mitigation). The USACE requires mitigation for 1,580 linear feet of stream impact (955 lf in the Yadkin Pee-Dee River Basin and 625 lf in the New River Basin) at a 2:1 ratio (totaling 3,160 lf of stream mitigation). As the USACE mitigation requirement exceeds that of the DWQ, NCDOT requested mitigation from EEP to meet the USACE mitigation requirement.

Compensatory Wetland Mitigation:

There are no changes to the compensatory wetland mitigation in this revised application. To have all mitigation information presented, the wetland mitigation information from the original application is included below.

Compensatory mitigation has been acquired through EEP for the 0.19 acre of wetland impacts. Of the 0.19 acre of wetland impacts for which mitigation will be provided, 0.13 acre of wetland impact is within the Yadkin-Pee Dee River Basin (HUC 03040101), and 0.06 acre of wetland impact is within the New River Basin (HUC 05050001).

REGULATORY APPROVALS

This Revision to the original Application is hereby submitted for a Department of the Army Individual 404 Permit as required for the above-described activities. We are also hereby requesting a 401 Water Quality Certification from the NCDWQ. We are providing five (5) copies of this application modification to the NCDWQ for their review and approval.

A copy of this permit application and its distribution list will be posted on the NCDOT website at http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html

If you have any questions or need additional information please contact Mr. Bill Barrett by telephone at (919) 707-6103 or by e.mail at wabarrett@ncdot.gov.

Sincerely,

E. L. Luck

for Gregory J. Thorpe, Ph.D., Manager
Project Development and Environmental Analysis Branch

cc: NCDOT Permit Application Standard Distribution List

Attachments for Responses to USACE Comments

Table S-1. Summary Comparison of Alternatives

Evaluation Category	No-Build Alternative	Build Alternatives				
		Preferred (Widening) Alternative	Bypass Alternative 1		Bypass Alternative 4	
			A	B	A	B
Design Criteria						
Number of Lanes	2	4	4	4	4	4
Design Speed	Existing	40 mph (64 km/h)(50 mph [80 km/h] south of Blowing Rock)	50 mph (80 km/h)	50 mph (80 km/h)	50 mph (80 km/h)	50 mph (80 km/h)
Posted Speed	Existing	35 mph (56 km/h) (45 mph (72 km/h) south of Blowing Rock)	45 mph (72 km/h)	45 mph (72 km/h)	45 mph (72 km/h)	45 mph (72 km/h)
Design Criteria Exceptions	Existing	Steep grade and sharp curves between Blackberry Road and Green Hill Road	Steep grade when following existing US 321; tight curves in Blackberry Condominium area (particularly undesirable since only curve exceptions on entire alternative)	Steep grade when following existing US 321	None	None
Median Width	No median	4' (flush/painted) south of Blowing Rock); none south of US 321 Business; 16' (landscaped) north of US 321 Business	4' (flush/painted)	4' (flush/painted)	4' (flush/painted)	4' (flush/painted)
Cost (2001 dollars)						
Right-of-Way	$0	$23,400,000	$24,500,000	$25,200,000	$9,400,000	$8,900,000
Construction	$0	$22,500,000	$50,600,000	$67,000,000	$161,100,000	$241,400,000
TOTAL	$0	$45,900,000	$75,100,000	$92,200,000	$170,500,000	$250,300,000
Traffic Service						
2025 Average Annual Daily Traffic on Existing US 321	14,100 to 27,450	14,100 to 27,450	3,100 to 26,150	3,100 to 26,150	4,300 to 16,400	4,300 to 16,400
Number of Road Segments (Blackberry Road to Possum Hollow Road) With Less Than Desirable 2025 Design Hour Level Of Service (D, E, or F)						
• Existing US 321	8 of 8	1 of 8	3 of 8	3 of 8	4 of 8	4 of 8
• Bypass	N/A	N/A	0 of 3	0 of 3	0 of 4	0 of 4

Table S-1. Summary Comparison of Alternatives

Evaluation Category	No-Build Alternative	Build Alternatives				
		Preferred (Widening) Alternative	Bypass Alternative 1		Bypass Alternative 4	
			A	B	A	B
Worst Performing Segments in 2025 Design Hour						
• Up to US 321 Business (LOS)	All (F)	Green Hill Road to US 321 Business (C)	Bypass to Green Hill Road (D)	Bypass to Green Hill Road (D)	Bypass to Green Hill Rd. (D); Goforth Rd. to US 321 Bus. (D)	Bypass to Green Hill Rd. (D); Goforth Rd. to US 321 Bus. (D)
• US 321 Business to Possum Hollow Road (LOS)	US 321 Bus. to US 221 (F); US 221 to Possum Hollow Rd. (E)	US 221 to Possum Hollow Road (D)	Sunset Dr. to Food Lion (D); Food Lion to US 221 (E)	Sunset Dr. to Food Lion (D); Food Lion to US 221 (E)	Food Lion to US 221 (E); US 221 to Possum Hollow Road (E)	Food Lion to US 221 (E); US 221 to Possum Hollow Road (E)
Number of Intersections Along Existing US 321 With Less Than Desirable 2025 Design Hour Level of Service (D, E, or F)						
• Signalized	3 of 3	1 of 6	1 of 3	1 of 3	2 of 3	2 of 3
• Unsignalized (US 321traffic)	3 of 4	0 of 1	0 of 4	0 of 4	0 of 4	0 of 4
• Unsignalized (side street traffic)	4 of 4	0 of 1	1 of 4	1 of 4	2 of 4	2 of 4
Community Impacts						
Relocation						
• Homes	0	12	24	24	8	6
• Businesses	0	5	1	1	1	1
Economics	Increasing congestion at businesses	Business loss during construction; landscaped median would affect businesses in a minor way	Loss of sales for some businesses as a result of bypassed traffic; greatest potential to lower property values; travel benefits do not offset construction costs	Loss of sales for some businesses as a result of bypassed traffic; greatest potential to lower property values; travel benefits do not offset construction costs	Loss of sales for some businesses as a result of bypassed traffic; travel benefits do not offset construction costs	Loss of sales for some businesses as a result of bypassed traffic; travel benefits do not offset construction costs
Land Use Plan Compatibility						
• Caldwell County	Yes	Yes	Yes	Yes	Yes with extended zoning coverage	Yes with extended zoning coverage
• Watauga County	Would not improve transportation	Yes	Yes	Yes	Does not protect and maintain rural atmosphere	Does not protect and maintain rural atmosphere
• Blowing Rock	Yes	Alters topography, removes vegetation, affects historic resources	Bisects developing residential area	Bisects developing residential area	Yes	Yes
Farmlands	None	None	None	None	None	None

Table S-1. Summary Comparison of Alternatives

Evaluation Category	No-Build Alternative	Build Alternatives				
		Preferred (Widening) Alternative	Bypass Alternative 1		Bypass Alternative 4	
			A	B	A	B
Neighborhoods and Community Disturbances	None	Reduced community character	Divides several neighborhoods; reduced community character	Divides several neighborhoods; reduced community character (more than 1A with cut in Gideon Ridge)	Reduced isolation of rural homes	Reduced isolation of rural homes
Community Facilities and Resources	No benefits	Modest travel time savings for school buses, transit, and emergency vehicles	Modest travel time savings for school buses, transit, and emergency vehicles	Modest travel time savings for school buses, transit, and emergency vehicles	Modest travel time savings for school buses, transit, and emergency vehicles	Modest travel time savings for school buses, transit, and emergency vehicles
Visual Impacts	None	Reduced intimacy, unity, and intactness of the setting of Green Park Historic District and the mostly residential area between the Green Park Historic District and US 321 Business	Breaks rolling landscape; four residential areas would have substantial visual impacts	Breaks rolling landscape; four residential areas would have substantial visual impacts; additional impact of the cut in Gideon Ridge	Views affected in two rural residential areas and the Green Hill and Blackberry Condominium areas; substantial impact on views from the Thunderhill overlook area (two views of high value)	Views affected in two rural residential areas and the Green Hill and Blackberry Condominium areas; impact on views from the Thunderhill overlook area (two views of high value) but less impact than 4A
Air Quality	No impact	No impact	No impact	No impact	No impact	No impact
Noise						
# of Sensitive Receptors With Noise Levels Exceeding FHWA Noise Abatement Criteria	19	28	6	4	4	4
# With Substantial Increase in Noise	0	0	21	32	20	19
# With Both Impacts	0	0	42	25	1	1
TOTAL	19	28	69	61	25	24
Historic Resources						
Adverse Effect	None	Green Park Historic District and Green Park Inn	None	None	Blue Ridge Parkway	Blue Ridge Parkway
No Adverse Effect	None	Bollinger-Hartley House; Blue Ridge Parkway	Blue Ridge Parkway	Blue Ridge Parkway	None	None

Table S-1. Summary Comparison of Alternatives

Evaluation Category	No-Build Alternative	Build Alternatives				
		Preferred (Widening) Alternative	Bypass Alternative 1		Bypass Alternative 4	
			A	B	A	B
Parklands						
Blowing Rock Assembly Grounds (private)	None	None	2 structures removed; entrance changed	2 structures removed; entrance changed	None	None
Blowing Rock Country Club (private)	None	Changed views from golf course; retaining wall	None	None	None	None
Blue Ridge Parkway (public)	None	Some visual change	Some visual change	Some visual change	Substantial visual impact (large cuts and fills visible from Parkway)	Visual impact (bridges and some cuts and fills visible from Parkway)
Ecological Resources						
Terrestrial						
• Acres of Natural Plant Community Used	None	27	39	36	93	47
• Habitat Fragmentation	None	Least	Moderate	Moderate	Greatest	Moderate
Jurisdictional Areas						
• # of Stream Crossings by culvert	Existing	4	2	2	13	5
• # of Stream Crossings by bridge	Existing	0	2	3	6	14
• Parallel Fill in Stream -linear feet (acres)	None	1,070 (0.24)	190 (0.05)	590 (0.14)	0 (0.00)	125 (0.03)
• Wetland Impacts(acres)	None	0.07	0.00	0.00	0.09	0.01
Threatened or Endangered Species	None	Heller's blazing star and dwarf-flowered heartleaf not found in suveys	Heller's blazing star (survey needed)	Heller's blazing star (survey needed)	Heller's blazing star (survey needed)	Heller's blazing star (survey needed)
Floodplains Affected	None	840 feet crossed	None	None	<0.1 acre of fill in floodplain	<0.1 acre of fill in floodplain
Underground Storage Tanks Affected	N/A	4	1	1	1	1

Table S-1. Summary Comparison of Alternatives

Evaluation Category	No-Build Alternative	Build Alternatives				
		Preferred (Widening) Alternative	Bypass Alternative 1		Bypass Alternative 4	
			A	B	A	B
Utilities Affected	None	Affected throughout; placed underground within Blowing Rock	Generally affected at local road crossings and along where follows existing US 321	Generally affected at local road crossings and along where follows existing US 321	Relocates power substation	Relocates power substation
Cumulative Impacts	From current reasonably foreseeable development	From current reasonably foreseeable development plus Preferred Alternative	From current reasonably foreseeable development, potential shifts in future development from eastern Blowing Rock to other locations, and bypass	From current reasonably foreseeable development, potential shifts in future development from eastern Blowing Rock to other locations, and bypass	From current reasonably foreseeable development, potential induced development at southern and northern ends of bypass, and bypass	From current reasonably foreseeable development, potential induced development at southern and northern ends of bypass, and bypass
Construction Impacts						
Construction Period	None	3 to 4 construction seasons (with utilities placed underground)	2 to 3 construction seasons	3 to 4 construction seasons	4 construction seasons	4 to 6 construction seasons
Construction in Close Proximity to Homes	None	Yes	Yes	Yes	Yes but limited to rural areas except construction equipment supplies taken through eastern Blowing Rock during mobilization	Yes but limited to rural areas except construction equipment supplies taken through eastern Blowing Rock during mobilization
Affect of on Construction Business Access	None	Greatest	Only in US 221/Shoppes on the Parkway area	Only in US 221/ Shoppes on the Parkway area	None	None
Potential to Disrupt Traffic Movements	None	Greatest	Moderate	Moderate	Least	Least except substantially greater use of US 321 to transport prefabricated bridge components than 4A
Excavation (yd^3)	0	769,440	1,464,952	2,104,705	3,039,840	975,778
Fill (yd^3)	0	796,837	1,240,012	707,652 (plus 1.4 million yd^3 of waste that would be extremely difficult to dispose)	2,946,946	1,100,924

Table S-1. Summary Comparison of Alternatives

Evaluation Category	No-Build Alternative	Build Alternatives				
		Preferred (Widening) Alternative	Bypass Alternative 1		Bypass Alternative 4	
			A	B	A	B
Potential for Sedimentation Impacts to Streams	None	5 stream crossings	4 stream crossings	5 stream crossings	20 stream crossings	20 stream crossings (more streams bridged but streams affected by haul roads)

Memorandum

To: DISTRIBUTION

From: John Page

Date: March 15, 2000 *(amended November 11, 2000)*

Subject: Comparison of Alternatives

DISTRIBUTION:

David AndersonBlue Ridge Parkway	
Felix Davila	FHWA
Leigh Lane	NCDOT -- PDEA
Greg Brew	NCDOT - Roadway Design
Ed Davis	NCDOT -- PDEA
Jeff Lackey	NCDOT -- REU
John Hennessy	NC Division of Water Quality
Renee Gledhill-Earley	SHPO
April Alperin	SHPO
Lee Tippett	NCDOT
Tom Kendig	NCDOT - Roadway Design
Steve Lund	Corps of Engineers
Ted Bisterfeld	US EPA
Jay Tomlinson	NCSU

At the November 4, 1999 NEPA/404 Merger Meeting, John Hennessy, the representative from the North Carolina Division of Water Quality, requested that the comparison of the widening alternative and four bypass alternatives be augmented by a comparison of water resource impacts. It was agreed by merger meeting participants that such a comparison was essential to the completion of consensus on alternatives. Attached is a Functional Assessment of water resource involvement for the five alternatives.

The assessment notes 24 jurisdictional systems, including 34 streams and seven vegetated wetlands and ponds along the five alternatives. The Division of Water Quality stream classification and evaluation procedure was used to assess stream function. The streams are defined as high gradient step-pool; low gradient riffle-pool; and headwater seep. None of the three are more important than the other in terms of ecological functional attributes. Thus, linear distance is appropriate for use in making both quantitative and qualitative comparisons. Two methods were used to assess wetland functions, the General Wetland Functional Procedure and the NC Division of Environmental Management (DEM) Wetland Rating System. The General Assessment Procedure focuses on the ecological value of jurisdictional systems, while the DEM procedure focuses on water quality.

The findings of the functional assessment in relation to the 1994 design for the widening alternative and the 1998 designs for the bypass alternatives were used to compare the five alternatives from a water resource impact perspective. Water resource findings in combination with cost, earthwork, community impact, historic resource impact, and visual impact findings from alternatives studies conducted

from 1995 to 1998 are presented as a comparison of alternatives in the paragraphs below and in the attached table. This comparison is presented at a level of detail appropriate for the selection of alternatives to be evaluated in full in a Draft Environmental Impact Statement.

In summary, the water resource data in combination with the other comparison factors re-affirms the NCDOT's recommendation at the November 4, 1999 meeting that the widening alternative, Bypass Alternative 1, and Bypass Alternative 4 should be evaluated in detail in the DEIS.

The widening would have the least impact on water resources. It is also the alternative currently preferred by the NCDOT because is meets the purpose and need at the lowest cost. It will, however, pass through the Green Park Historic District. The potential exists for substantial short-term (during construction) and long-term adverse social, economic, and visual impacts.

Bypass Alternative 1 would have the least impact on water resources of all the bypass alternatives, although the wetland affected *by the 1998 design* is one of the highest quality in the project area, scoring 87 of 100 under the General Functional Analysis and 62 of 100 under the DEM rating system. *The preliminary design completed in 2000 for evaluating this alternative in the DEIS avoids this wetland impact by moving the alignment to an area with fewer wetlands and bridging them and the associated stream. The 2000 design also reduces stream impacts by moving the alignment away from the tributary that parallels Possom Hollow Road, eliminating most of the assocated 1,825 feet of stream impact.* A Bypass Alternative 1 also would avoid impacts to section 4(f) resources and the Federal Highway Administration wants to include this alternative on those grounds. It is also the lowest cost bypass alternative, involving the least earthwork. The public is universally concerned about the associated community and visual impacts.

Bypass Alternative 2 also would avoid section 4(f) resources. It would have a stream impact similar to Bypass Alternative 1, but the greatest wetland impact. The wetland affected is also of high quality, scoring 81 of 100 under the General Functional Analysis and 64 of 100 under the DEM rating system. Bypass Alternative 2 would involve substantially more earthwork and adversely affect the Blowing Rock Assembly Grounds, a church camp. Much of the camp's woods and trail system would be lost. One aspect of the camp's programs is environmental awareness retreats. This function would be lost with Bypass Alternative 2. Also, the road would be readily viewed from the camp's buildings. The public is universally concerned about the associated community and visual impacts. Thus, the NCDOT does not recommend that it be carried forward into the DEIS.

Bypass Alternatives 3 and 4 would have substantially greater impacts on steams than the other alternatives, with 4 affecting the greatest length of stream. Alternative 3 would not affect any jurisdictional wetlands. The quality of the wetlands affected by alternative 4 would be less than those along the other bypass

alternatives. These alternatives would involve far more substantial cost and earthwork, with associated habitat disturbance, than the other alternatives. Bol alternatives would be within the viewshed of the Blue Ridge Parkway, including Thunder Hill overlook. Parkway officials are very concerned about the potentia visual impact of these alternatives. *The Federal Highway Administration plans make a determination of whether the visual impacts are substantial enough to b considered a constructive use. The Section 4(f) resource originally affected by these alternatives has been altered by its owner and is no longer eligible for the Nation Register of Historic Places.* The public is universally concerned about tl community impacts associated with Bypass Alternative 3. Bypass 3 would hav same church camp related impacts as Bypass 2. Thus, the NCDOT does not recommend that Bypass Alternative 3 be carried forward into the DEIS. With Bypass Alternative 4, the combination of cost, earthwork, and rural community visual impacts are also of concern to the NCDOT. The alternative, however, ha support of a substantial segment of Blowing Rock stakeholders. Thus, the NCI plans to evaluate it in detail in the DEIS. *Two preliminary designs were develop in 2000 for Bypass Alternative 4. Both include additional bridges along the Blu Ridge flank. One alternative is almost all bridge. These revisions were made t help balance the earthwork in the first case and to address visual impacts in th second. Both also will have the affect of bridging additional jurisdicational stre and reducing stream impacts from that of the 1998 design.*

e-mail: page|@pbworld.com
direct line: 919-468-2130

Enclosure
c: Reggie Scales
task no.: 3145-01.01.04
file no.: 3145-2.7.1

J:\PLANNING\US 321EIS Part II\Administration\Misc Mailing Lists\Alternatives Comparison 2-002

Issues	Widening Alternative	Bypass Alternatives[1]			
		1	2	3	4
Total Cost (millions of dollars)	$29.5	$44.4	$55.2	$77.1	$107.0
Earthwork (millions of cubic yards)	0.8 (including 0.1 in Blowing Rock	3.3	6.4	12.6	9.8
Water Resource Impacts					
• No. of streams crossed	5	8	10	18	19
• Length of streams crossed (in feet)	1,975	3,525	3,350	7,250	9,200
• Vegetated wetlands filled (number/total acres)	1 / 0.1 acres	1 / 1.2 acres	1 / 3.3 acres	0 / 0 acres	1 / 0.3 acres
• Ponds filled (number/total acres	0 / 0 acres	1 / 0.3 acres	0 / 0 acres	0 / 0 acres	2 / 0.3 acres
Community Impacts	Highway traffic remains in Blowing Rock and is greater than today. Important concerns include the economic impact of construction, traffic noise, and the continued presence of through traffic in Blowing Rock	Highway traffic lessened along the existing road in Blowing Rock, but is introduced to the more rural eastern part of Blowing Rock.	Highway traffic lessened along the existing road in Blowing Rock, but is introduced to the more rural eastern part of Blowing Rock. Church camp bisected	Highway traffic lessened along the existing road in Blowing Rock, but is introduced to rural areas. Church camp bisected	Highway traffic lessened along the existing road in Blowing Rock, but is introduced to rural areas.

Issues	Widening Alternative	Bypass Alternatives[1]			
		1	2	3	4
Historic resource impacts	Passes through the Green Park Historic District and is adjacent to another resource	Avoids historic resources, but passes near parts of the Green Park Historic District and another structure.	Avoids historic resources, but passes near parts of the Green Park Historic District and another structure.	*Avoids the use of lands associated with historic resources, but would visually affect the Blue Ridge Parkway.*	*Avoids the use of lands associated with historic resources, but would visually affect the Blue Ridge Parkway.*
Visual impacts	Four lane road with loss of vegetation and straighter curves in Blowing Rock. The visual change is of particular concern between the southern town limits and US 321 Business.	Four-lane road introduced to neighborhoods near Blowing Rock Country Club; road seen in distance from Blue Ridge Parkway	Four-lane road introduced to neighborhoods near Blowing Rock Country Club; road seen in distance from Blue Ridge Parkway; and views of their wooded property lost by Church camp	Four-lane road introduced to rural area with large cuts and fills; road viewed from Green Hill Road area and Blue Ridge Parkway	Four-lane road introduced to rural area with large cuts and fills; road viewed from Green Hill Road area and Blue Ridge Parkway (two locations)

[1] *The numbers and descriptions of impact reflect the designs prepared for the analysis of bypass alternatives in 1998 and the 1994 widening design. The recent loss of National Register-eligibility status of the Five Points-Shuford House is taken into account under historic resource impacts.*

Ecosystem Enhancement PROGRAM

November 23, 2010

Mr. Greg Thorpe, Ph.D.
Environmental Management Director
Project Development and Environmental Analysis Branch
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Mr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

R-2237C, US 321 from SR 1500 (Blackberry Road) to US 221 at Blowing Rock, Watauga and Caldwell Counties; New and Yadkin River Basins

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream and riparian wetland mitigation for the unavoidable impact associated with the above referenced project. Based on the information supplied by you on November 4, 2010, the impacts are located in CU 05050001 of the New River Basin and 03040101 of the Yadkin River Basin in the Northern Mountains (NM) Eco-Region, and are as follows:

IMPACTS / MITIGATION UNITS	Stream			Wetlands			Buffer	
	Cold	Cool	Warm	RW	NRW	CM	Zone 1	Zone 2
Impacts – New 05050001 (NM)	657			0.06				
Mitigation Units – New 05050001 (up to 2:1)	1,250			0.12				
Impacts – Yadkin 03040101 (NM)	975			0.13				
Mitigation Units – Yadkin 03040101 (up to 2:1)	1,910			0.26				
Impacts – Total Project	1,632			0.19				
Mitigation Units – Total Project (up to 2:1)	3,160			0.38				

This mitigation acceptance letter replaces the mitigation acceptance letter issued on August 2 and 30, 2010. EEP commits to implementing sufficient compensatory stream and riparian wetland mitigation credits to offset the final permitted impacts associated with this project in accordance with the N.C. Department of Environment and Natural Resources' Ecosystem Enhancement Program In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-715-1929.

Sincerely,

William D. Gilmore, P.E.
EEP Director

cc: Mr. Monte Matthews, USACE – Raleigh Regulatory Field Office
Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
File: R-2237C Revised 2

5/14/99

REVISIONS

THE REVISION CONSISTS OF CHANGING THE RIGHT OF WAY ON PARCEL 69.

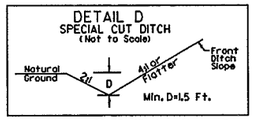
PROJECT REFERENCE NO.	SHEET NO.
R-2237C	11
R/W SHEET NO.	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

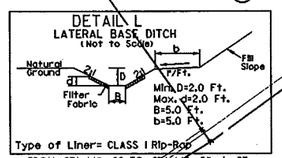
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

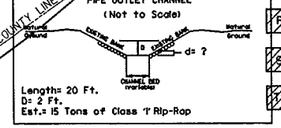
REVISED 10-5-10
Permit Drawing
Sheet 12 of ~~45~~

NOTE: SEE SHEET 25 FOR -L- & -U- PROFILES
SEE SHEET 30 FOR -Y3- & -Y4- PROFILES
SEE SHEET 2-G FOR -Y3- & -Y4-/-L- INTERSECTION DETAILS

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







PROJECT REFERENCE NO.	SHEET NO.
R-2237C	11
R/W SHEET NO.	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

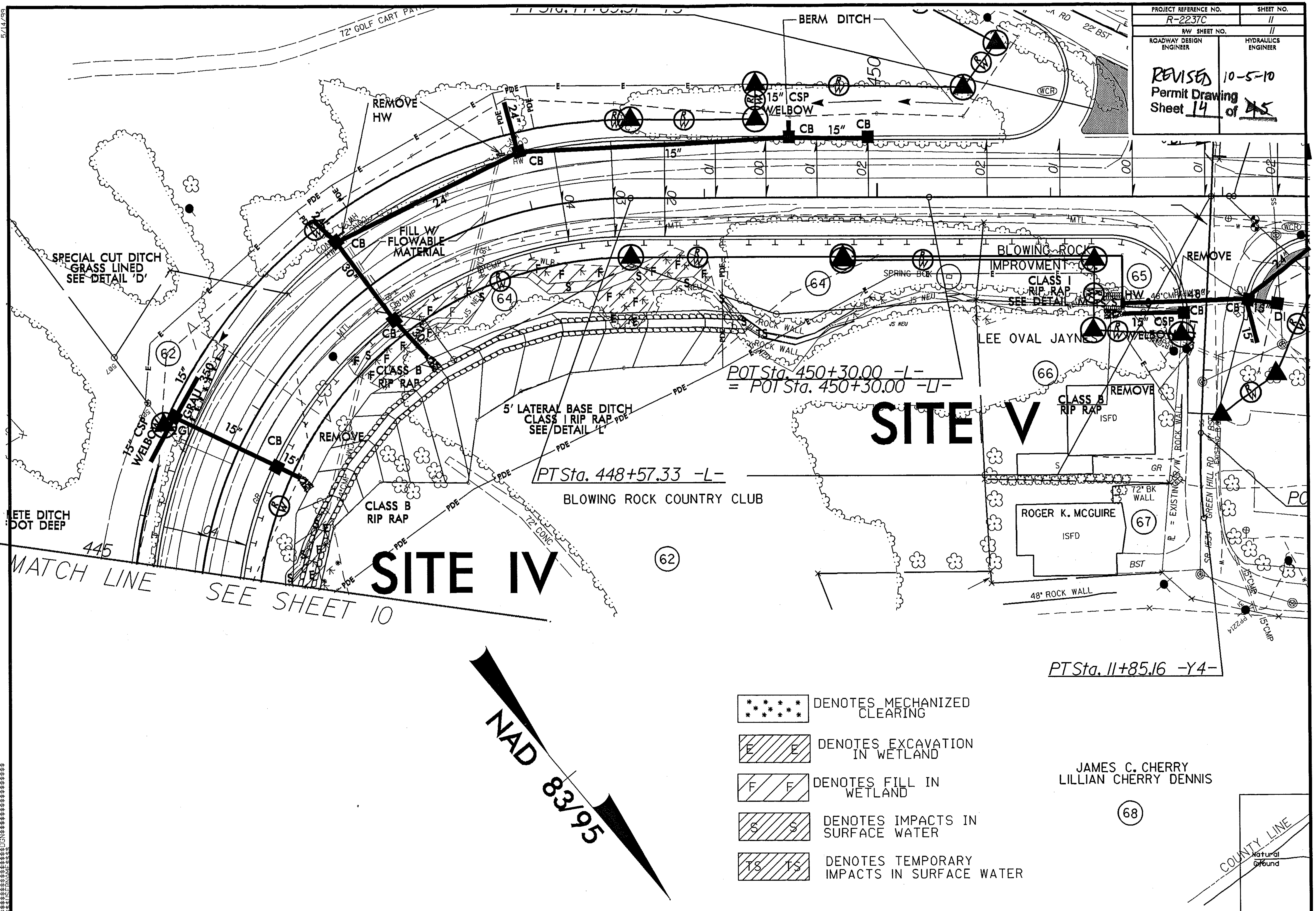
REVISED 10-5-10
Permit Drawing
Sheet 13 of 45

NOTE: SEE SHEET 25 FOR -L- & -LI- PROFILES
SEE SHEET 30 FOR -Y3- & -Y4- PROFILES
SEE SHEET 2-G FOR -Y3- & -Y4-/-L- INTERSECTION DETAILS

5/14/99

REVISIONS
THE REVISION CONSISTS OF CHANGING THE RIGHT OF WAY ON PARCEL 69.

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



PROJECT REFERENCE NO. R-2237C
SHEET NO. 11
R/W SHEET NO. 11
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
REVISED 10-5-10
Permit Drawing
Sheet 14 of 45
BERM DITCH
15" CSP W/ELBOW
CB 15" CB
REMOVE HW
SPECIAL CUT DITCH GRASS LINED SEE DETAIL 'D'
FILL W/ FLOWABLE MATERIAL
CLASS B RIP RAP
5' LATERAL BASE DITCH CLASS I RIP RAP SEE DETAIL 'L'
PT Sta. 448+57.33 -L-
BLOWING ROCK COUNTRY CLUB
POT Sta. 450+30.00 -L- = POT Sta. 450+30.00 -LI-
BLOWING ROCK IMPROVMENT CO.
CLASS I RIP RAP SEE DETAIL 'M'
LEE OVAL JAYNES
SITE IV
SITE V
ROGER K. MCGUIRE
MATCH LINE SEE SHEET 10
PT Sta. 11+85.16 -Y4-
NAD 83/95
DENOTES MECHANIZED CLEARING
DENOTES EXCAVATION IN WETLAND
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
JAMES C. CHERRY
LILLIAN CHERRY DENNIS
COUNTY LINE

5/14/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	16
RW SHEET NO.	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISED 10-5-10
Permit Drawing
Sheet 24 of 45

NAD 83/95

NOTE: SEE SHEETS 27 & 28 FOR -L- PROFILE
SEE SHEET 32 FOR -Y12- & -Y12A- PROFILE
SEE SHEET 2-H FOR -Y12-/-L- INTERSECTION DETAIL

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

Type of Liner= PSRM

FROM STA.516+50 TO STA.517+00 -L- RT.

▨ S	DENOTES IMPACTS IN SURFACE WATER
▨ TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

GRAPHIC SCALE

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

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	16
R/W SHEET NO.	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

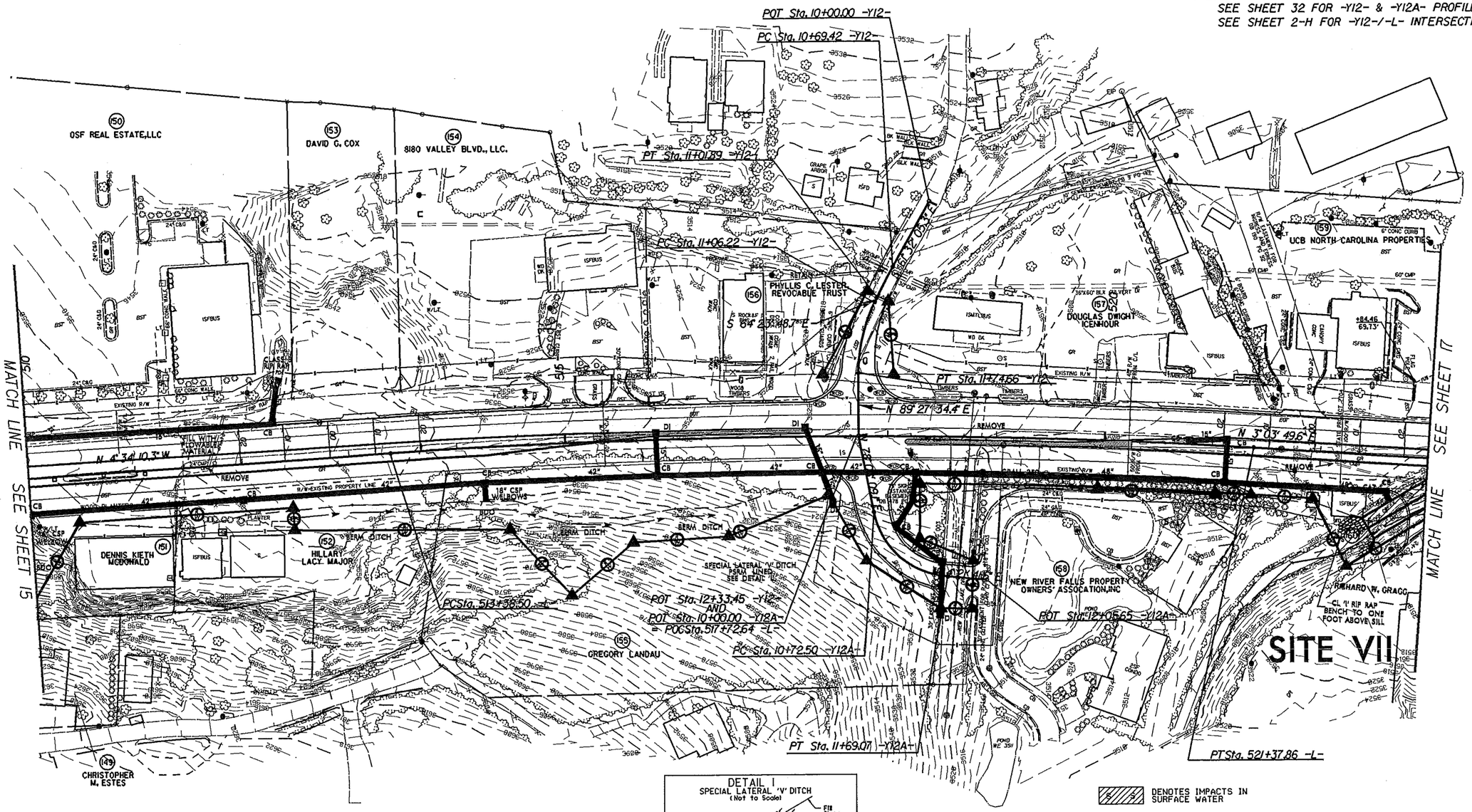
REVISED 10-5-10
Permit Drawing
Sheet 25 of 45

5/14/99

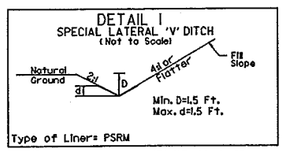
REVISIONS

NAD 83/95

NOTE: SEE SHEETS 27 & 28 FOR -L- PROFILE
SEE SHEET 32 FOR -Y12- & -Y12A- PROFILE
SEE SHEET 2-H FOR -Y12-/-L- INTERSECTION DETAIL



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



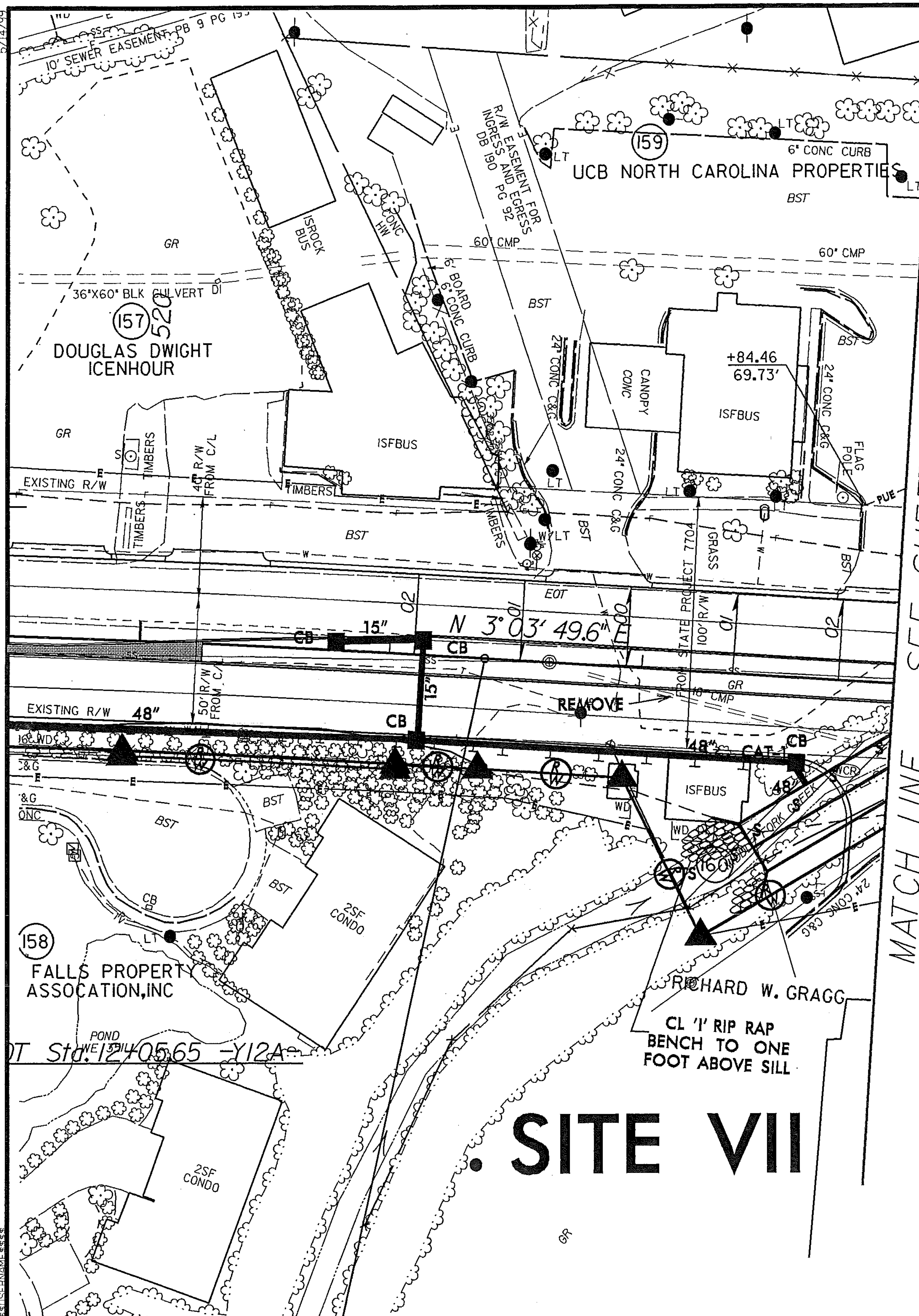
Min. D=1.5 Ft.
Max. d=1.5 Ft.
Type of Liner= PSRM
FROM STA.516+50 TO STA.517+00 -L- RT.

DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

100' 0' 100'
GRAPHIC SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	16
R/W SHEET NO.	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISED 10-5-10
Permit Drawing
Sheet 26 of 45



10' SEWER EASEMENT PB 9 PG 193
R/W EASEMENT FOR INGRESS AND EGRESS DB 190 PG 92
159
UCB NORTH CAROLINA PROPERTIES
6" CONC CURB
BST
GR
ISROCK BUS
60" CMP
6' BOARD
6" CONC CURB
36"X60" BLK CULVERT
157
520
DOUGLAS DWIGHT ICENHOUR
+84.46
69.73'
ISFBUS
CANOPY CONC
24" CONC C&G
FLAG POLE
EXISTING R/W
TIMBERS
40' R/W FROM C/L
STATE PROJECT 7704
100' R/W
GRASS
EOT
N 3° 03' 49.6" E
CB
15"
REMOVE
10" CMP
50' R/W FROM C/L
48"
CAT-1
WD
FORK CREEK
160
2SF CONDO
158
FALLS PROPERTY ASSOCATION,INC
POND
Sta. 12+05.65 -Y12A-
RICHARD W. GRAGG
CL 'I' RIP RAP BENCH TO ONE FOOT ABOVE SILL
MATCH LINE SEE SHEET 17
SITE VII

NAD 83/95

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

100' 0' 100'

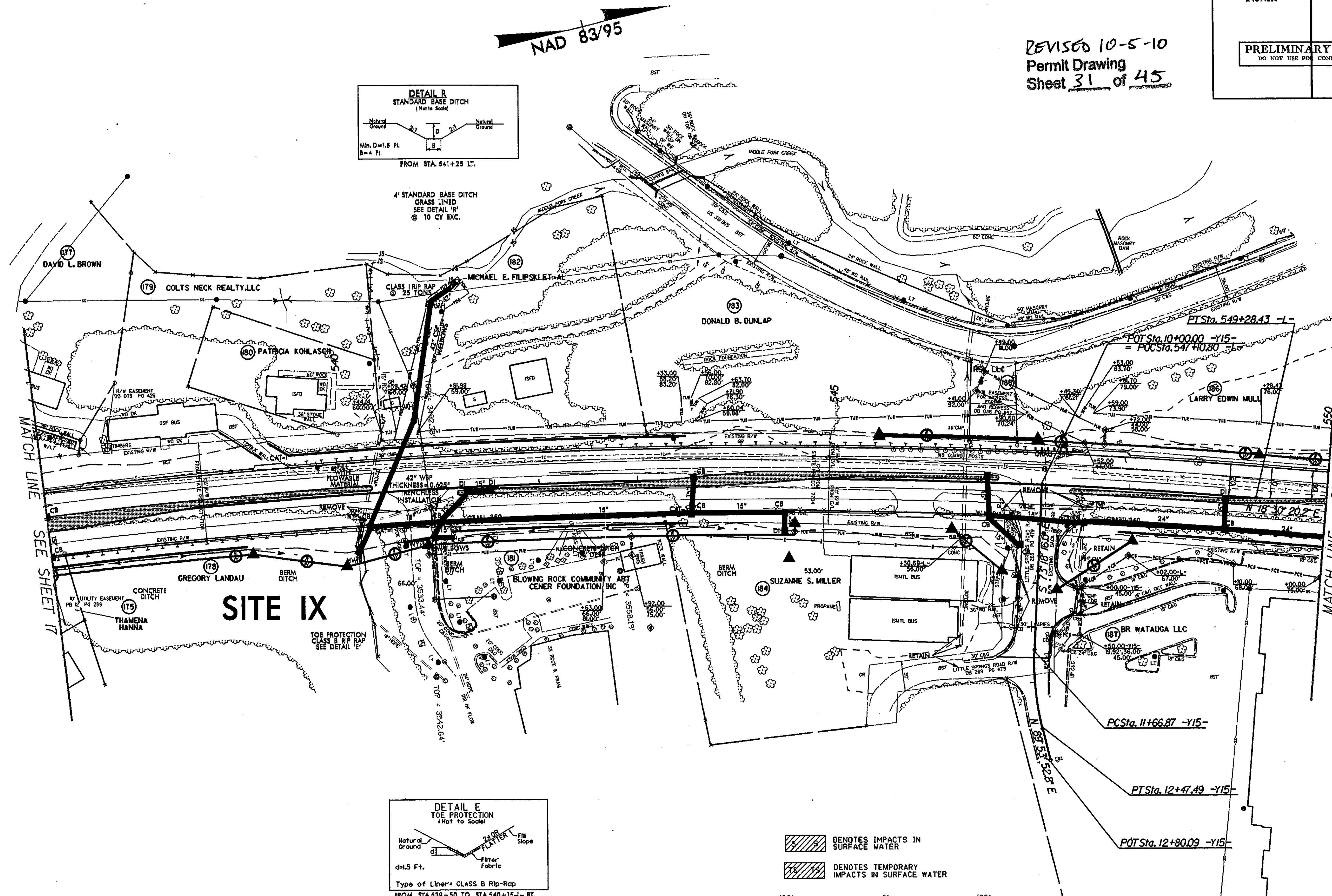
GRAPHIC SCALE

NOTE: SEE SHEETS 28 & 29 FOR -L- PROFILE
SEE SHEET 32 FOR -Y15- PROFILE
SEE SHEET 2-I FOR -Y15-/-L- INTERSECTION DETAIL

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	18
R/W SHEET NO.	18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISED 10-5-10
Permit Drawing
Sheet 31 of 45



NAD 83/95
DETAIL R
STANDARD BASE DITCH
(Not to Scale)
FROM STA. 541+25 LT.
4' STANDARD BASE DITCH
GRASS LINED
SEE DETAIL 'R'
@ 10 CY EXC.
DAVID L. BROWN
COLTS NECK REALTY, LLC
PATRICIA KOHLASCH
MICHAEL E. FILIPSKI ET AL
DONALD B. DUNLAP
LARRY EDWIN MULL
GREGORY LANDAU
THAMENA HANNA
BLOWING ROCK COMMUNITY ART CENER FOUNDATION, INC
SUZANNE S. MILLER
BR WATAUGA LLC
SITE IX
MATCH LINE SEE SHEET 17
MATCH LINE SEE SHEET 19
TOE PROTECTION
CLASS B RIP RAP
SEE DETAIL 'E'
42" WSP
THICKNESS=0.625"
TRENCHLESS INSTALLATION
PTSta. 549+28.43 -L-
POTSta. 10+00.00 -Y15- = POCSta. 547+10.80 -L-
PCSta. 11+66.87 -Y15-
PTSta. 12+47.49 -Y15-
POTSta. 12+80.09 -Y15-
N 18°30' 20.2" E
N 89°53' 52.8" E
DETAIL E
TOE PROTECTION
(Not to Scale)
d=1.5 Ft.
Type of Liner= CLASS B Rip-Rap
FROM STA.539+50 TO STA.540+15-L- RT.

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

100' 0' 100'
GRAPHIC SCALE

REVISIONS

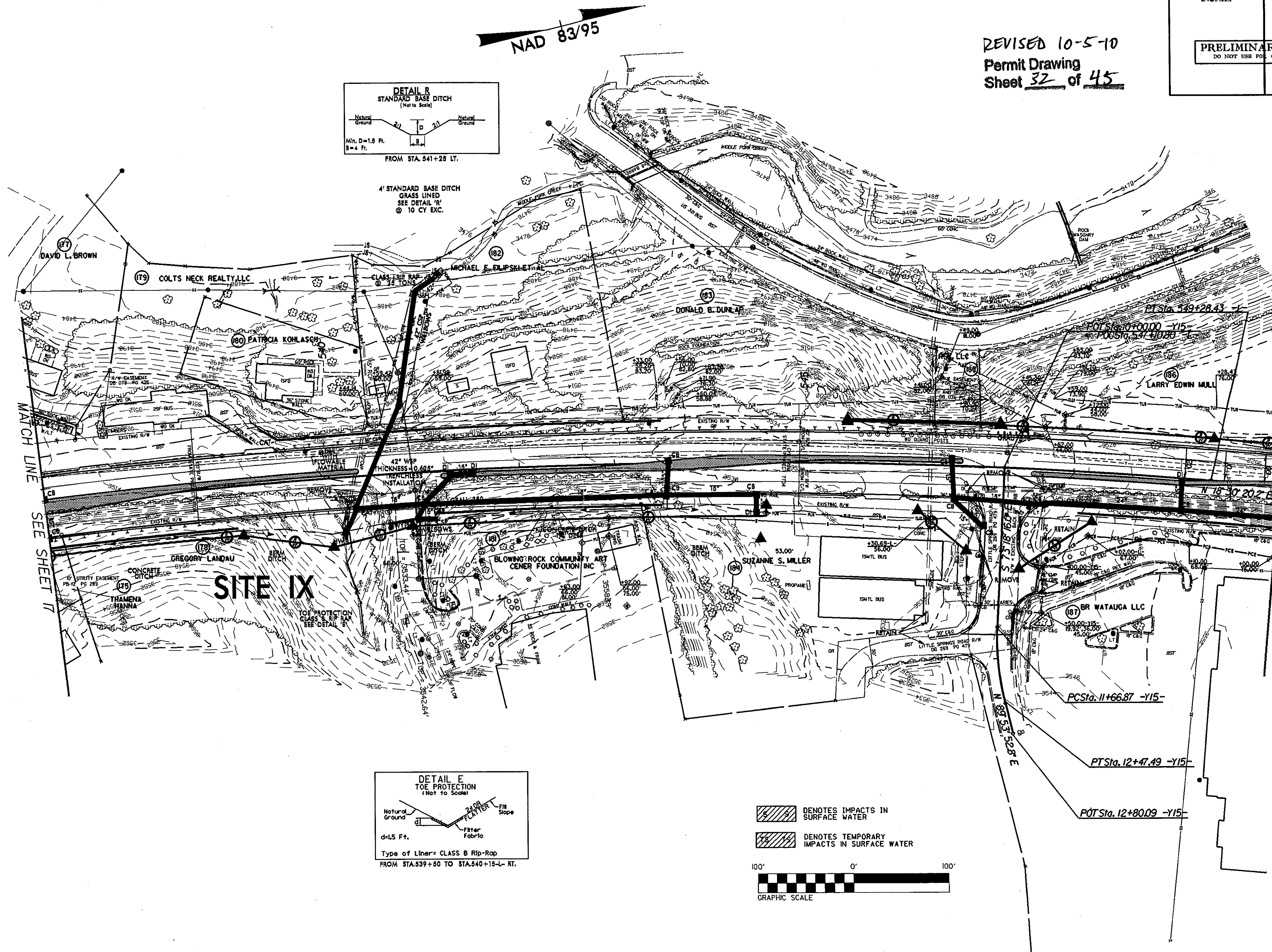
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	18
R/W SHEET NO.	18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NOTE: SEE SHEETS 28 & 29 FOR -L- PROFILE
SEE SHEET 32 FOR -Y15- PROFILE
SEE SHEET 2-I FOR -Y15-/-L- INTERSECTION DETAIL

REVISED 10-5-10
Permit Drawing
Sheet 32 of 45



NAD 83/95
DETAIL R
STANDARD BASE DITCH
(Not to Scale)
FROM STA. 541+25 LT.
4' STANDARD BASE DITCH
GRASS LINED
SEE DETAIL 'R'
@ 10 CY EXC.
DAVID L. BROWN
COLTS NECK REALTY,LLC
PATRICIA KOHLASCH
MICHAEL E. FILIPSKI ET AL
DONALD B. DUNLAP
LARRY EDWIN MULL
GREGORY LANDAU
THAMENA HANNA
SITE IX
TOE PROTECTION
CLASS B RIP RAP
SEE DETAIL 'E'
BLOWING ROCK COMMUNITY ART CENER FOUNDATION INC
SUZANNE S. MILLER
BR WATAUGA LLC
MATCH LINE SEE SHEET 17
MATCH LINE SEE SHEET 19
PT Sta. 549+28.43 -L-
POT Sta. 10+00.00 -Y15-
PC Sta. 11+66.87 -Y15-
PT Sta. 12+47.49 -Y15-
POT Sta. 12+80.09 -Y15-
DETAIL E
TOE PROTECTION
(Not to Scale)
Type of Liner= CLASS B Rip-Rap
FROM STA.539+50 TO STA.540+15-L- RT.
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
GRAPHIC SCALE

REVISIONS

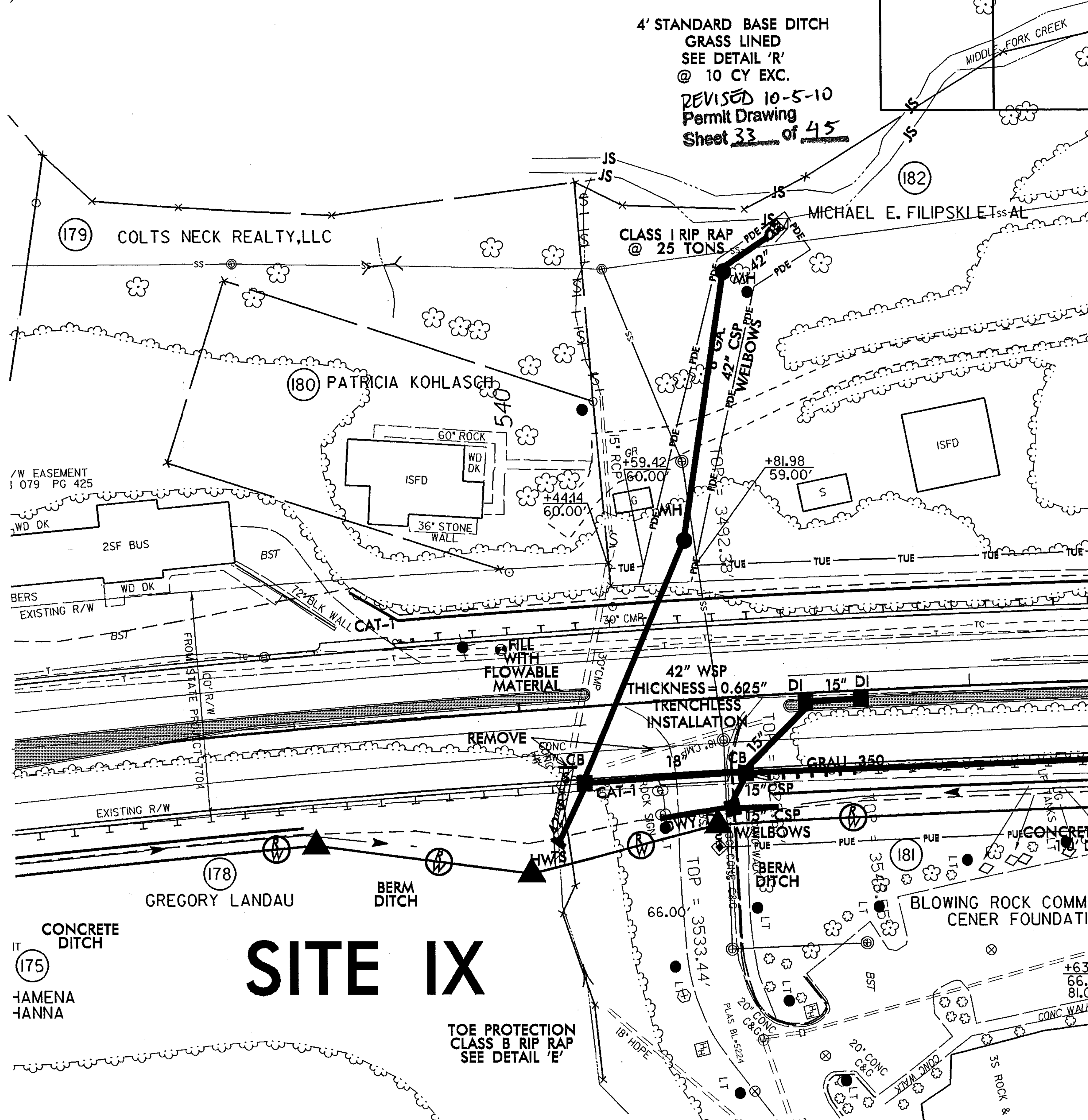
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	18
R/W SHEET NO.	18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FROM STA. 541+25 LT.

4' STANDARD BASE DITCH
GRASS LINED
SEE DETAIL 'R'
@ 10 CY EXC.

REVISED 10-5-10
Permit Drawing
Sheet 33 of 45



MIDDLE FORK CREEK
JS
(182)
MICHAEL E. FILIPSKI ET AL
(179) COLTS NECK REALTY,LLC
CLASS I RIP RAP
@ 25 TONS
42"
MH
42" CSP
W/ELBOWS
(180) PATRICIA KOHLASCH
540
60' ROCK
ISFD
WD DK
36' STONE WALL
15" RCP
GR
+59.42
60.00'
+44.14
60.00'
MH
+81.98
59.00'
S
ISFD
R/W EASEMENT
079 PG 425
WD DK
2SF BUS
BST
WD DK
72" BLK WALL
EXISTING R/W
CAT-1
30' CMP
FILL WITH FLOWABLE MATERIAL
FROM STATE PROJECT 1704
100' R/W
42" WSP
THICKNESS = 0.625"
TRENCHLESS
INSTALLATION
DI
15"
DI
REMOVE
CONC
CB
18"
CB
15"
GRAU 350
CAT-1
15" CSP
15" CSP
W/ELBOWS
EXISTING R/W
HW'S
(178)
GREGORY LANDAU
BERM DITCH
BERM DITCH
TOP = 3533.44'
66.00'
(181)
BLOWING ROCK COMMUN
CENER FOUNDATION
+63.0
66.00
81.00'
CONC WALK
CONCRETE DITCH
(175)
HAMENA
HANNA
SITE IX
TOE PROTECTION
CLASS B RIP RAP
SEE DETAIL 'E'
18" HDPE
20' CONC C&G
TUE
PUE
PDE

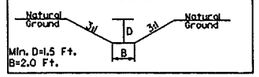
NAD 83/95

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

100' 0' 100'

GRAPHIC SCALE



5/14/99

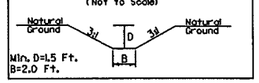
PROJECT REFERENCE NO.	SHEET NO.
R-2237C	19
R/W SHEET NO.	19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NOTE: SEE SHEET 29 FOR -L- PROFILE
SEE SHEET 33 FOR -Y17- PROFILE
SEE SHEET 2-1 FOR -Y17-/-L- INTERSECTION DETAIL

REVISED 10-5-10
Permit Drawing
Sheet 34 of ~~45~~

DETAIL Q
STANDARD BASE DITCH
(Not to Scale)



PROJECT REFERENCE NO.	SHEET NO.
R-2237C	19
R/W SHEET NO.	19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NOTE: SEE SHEET 29 FOR -L- PROFILE
SEE SHEET 33 FOR -Y17- PROFILE
SEE SHEET 2-1 FOR -Y17-/-L- INTERSECTION DETAIL

REVISED 10-5-10
Permit Drawing
Sheet 35 of 45

F F DENOTES FILL IN WETLAND

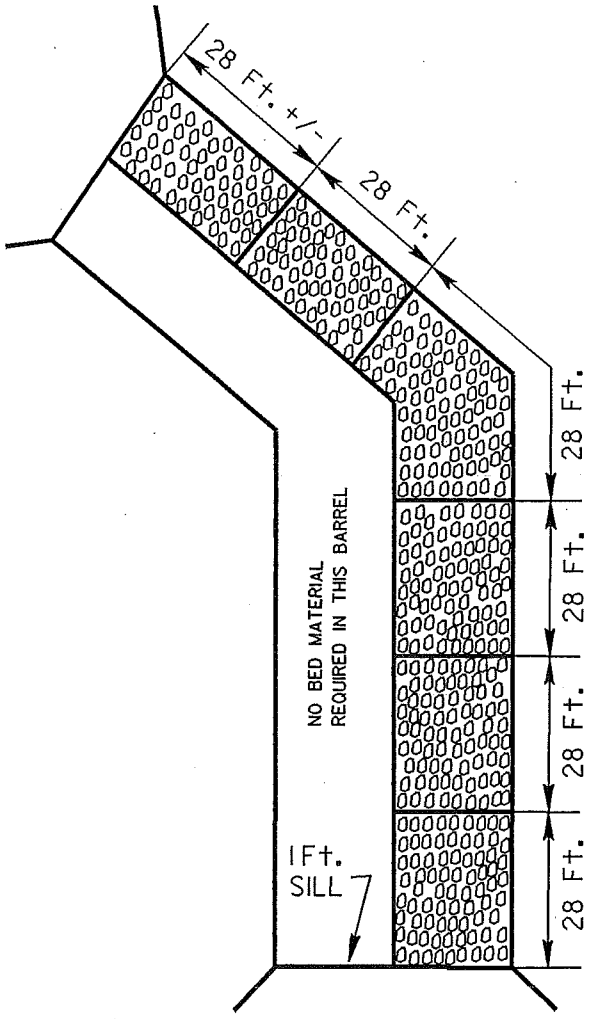
S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

100' 0' 100'
GRAPHIC SCALE

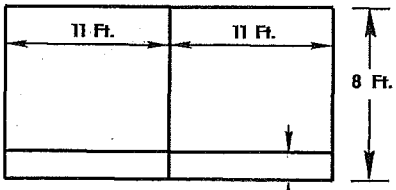
PROJECT REFERENCE NO.	SHEET NO.
R-2237C	19
R/W SHEET NO.	19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISED 10-5-10
Permit Drawing
Sheet 36 of 45



NOTES:

1. Bed material placed in the culvert shall be natural stone with a gradation size similar to that of Class 'B' riprap. Bed material is subject to approval by the Engineer.
2. Sills are to be 1.0 Ft. wide and cast seperately and attached by dowels.
3. Top of sill should match stream bed elevation in stream.



DETAIL OF SILLS AT INLET
AND OUTLET
(not to scale)

DETAIL OF SILLS

-L- STA. 523 +33.51
2 @ 11Ft. X 8 Ft. RCBC
MIDDLE FORK
(not to scale)

NCDOT
DIVISION OF HIGHWAYS
WATAUGA COUNTY
PROJECT: 34402.1.1 (R-2237C)
US 321 FROM SR 1500
TO US 221 AT
BLOWING ROCK
SHEET OF 9/30/09

REVISED 10-5-10
Permit Drawing
Sheet 40 of 45

WETLAND PERMIT IMPACT 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)
I	385+70 TO	24" CSP						0.02	<0.01	294	36	
	389+45 -L-											
II	403+30 -L-	36" CSP						0.01	<0.01	119	33	
III	442+00 TO	54" RCP	0.01			0.02		0.01	0.01	150	43	
	444+00 -L-	BANK STABILIZATION								10		
		FILL IN STREAM						<.01		53		
IV	444+65 TO		0.07		0.02	0.01		0.03	0.01	317	46	
	449+50 -L-											
V	451+40 -L-							<0.01	<0.01	22	6	
		BANK STABILIZATION								10		
VI	495+20 TO		0.01					0.03		294		
	498+15 -L-											
VII	523+33.5 -L-	2 @ 11'X8' RCBC			0.01			0.04	0.01	128	26	
		BANK STABILIZATION								32		
VIII	528+40 TO	30" RCP	NON-JURISDICTIONAL									
	530+50 -L-	15" CSP										
TOTALS:			0.09		0.03	0.03		0.15	0.04	1429	190	

REVISED 10-5-10
Permit Drawing
Sheet 44 of 45

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CALDWELL/WATAUGA COUNTIES
WBS - 34402.1.1 (R-2237C)

SHEET 10/5/2010

ATN Revised 3/31/05

WETLAND PERMIT IMPACT 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)
IX	540+20 -l-	42" WELDED						0.01	<0.01	133	10	
		STEEL PIPE										
X	553+50 -L-	30" RCP						0.01	<0.01	59	19	
								<0.01	<0.01	25	19	
XI	555+50 -L-	15" RCP	0.04									
XII	561+56 -L-	84" WELDED							0.01		45	
		STEEL PIPE										
TOTALS:			0.04					0.02	0.02	217	93	
GRAND TOTALS			0.13		0.03	0.03		0.17	0.05	1646	283	

REVISED 10-5-10
Permit Drawing
Sheet 45 of 45

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CALDWELL/WATAUGA COUNTIES
WBS - 34402.1.1 (R-2237C)

SHEET 10/5/2010

ATN Revised 3/31/05

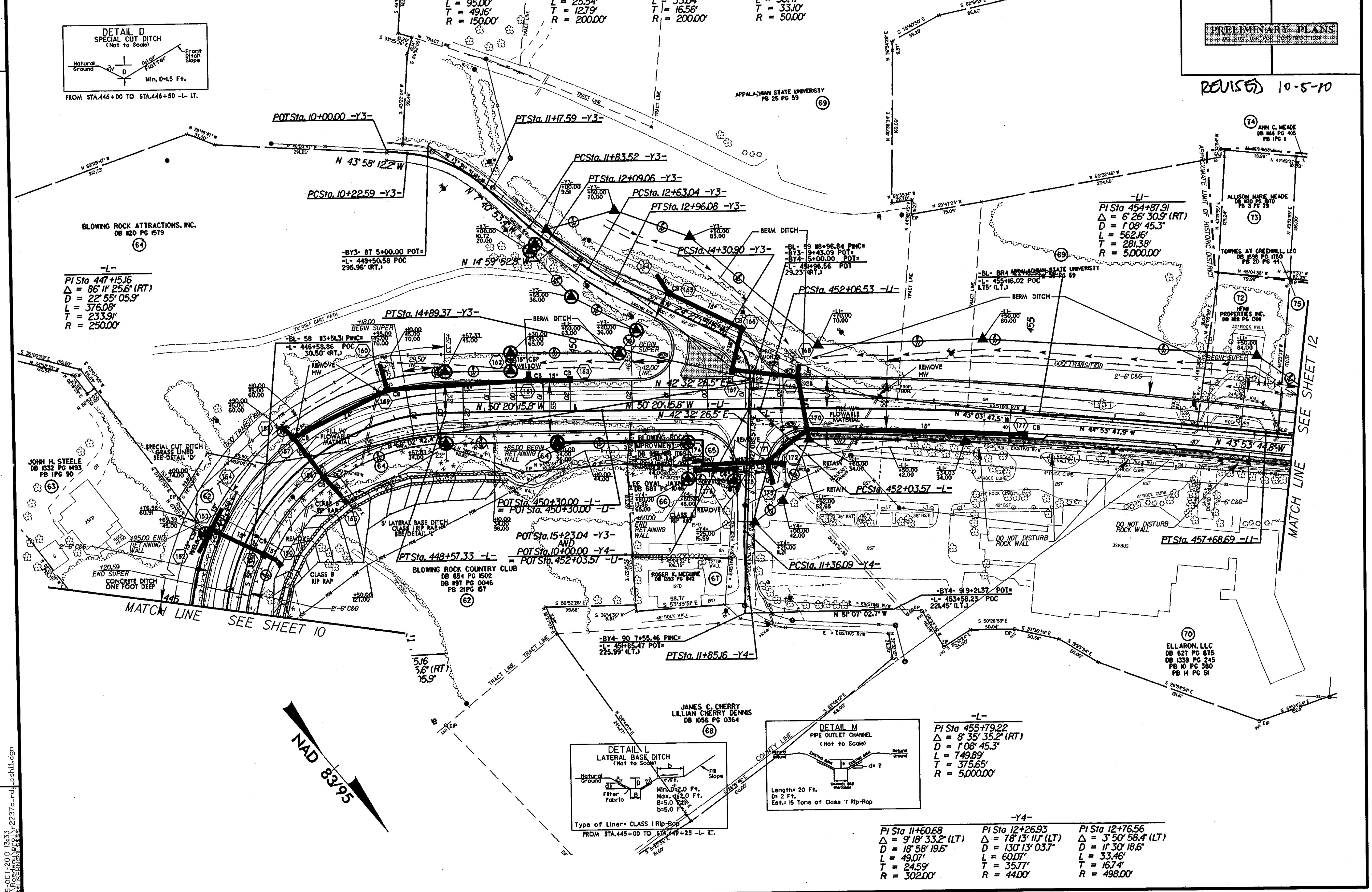
PROJECT REFERENCE NO.	SHEET NO.
R-2237C	11
R/W SHEET NO.	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISED 10-5-10

5/14/99

NOTE: SEE SHEET 25 FOR -L- & -U- PROFILES
SEE SHEET 30 FOR -Y3- & -Y4- PROFILES
SEE SHEET 2-G FOR -Y3- & -Y4-/-L- INTERSECTION DETAILS



DETAIL D
SPECIAL CUT DITCH
(Not to Scale)
FROM STA.446+00 TO STA.446+50 -L- LT.
POT Sta. 10+00.00 -Y3-
PC Sta. 10+22.59 -Y3-
PT Sta. 11+17.59 -Y3-
PC Sta. 11+83.52 -Y3-
PT Sta. 12+09.06 -Y3-
PC Sta. 12+63.04 -Y3-
PT Sta. 12+96.08 -Y3-
PC Sta. 14+30.90 -Y3-
PT Sta. 14+89.37 -Y3-
PC Sta. 452+06.53 -U-
PC Sta. 452+03.57 -L-
PT Sta. 457+68.69 -U-
PT Sta. 448+57.33 -L-
POT Sta. 450+30.00 -L- = POT Sta. 450+30.00 -U-
POT Sta. 15+23.04 -Y3- AND POT Sta. 10+00.00 -Y4- = POT Sta. 452+03.57 -U-
PC Sta. 11+36.09 -Y4-
PT Sta. 11+85.16 -Y4-
N 43° 58' 12.2" W
N 14° 59' 52.8" W
N 50° 20' 15.8" W
N 42° 32' 26.5" E
N 43° 53' 44.8" W
N 51° 07' 02.7" W
APPALACHIAN STATE UNIVERSITY PB 25 PG 59
BLOWING ROCK ATTRACTIONS, INC. DB 1120 PG 1579
BLOWING ROCK COUNTRY CLUB DB 654 PG 1502 DB 1197 PG 0046 PB 21 PG 157
JOHN H. STEELE DB 1332 PG 1493 PB 1 PG 90
ROGER K. MCGUIRE
ANN C. MEADE DB 1166 PG 405 PB 1 PG 1
ALLISON MARIE MEADE
TOWNES AT GREENHILL, LLC DB 1598 PG 1750 PB 20 PG 44
ELLARON, LLC DB 627 PG 675 DB 1339 PG 245 PB 10 PG 380 PB 14 PG 51
JAMES C. CHERRY LILLIAN CHERRY DENNIS DB 1056 PG 0364
APPROXIMATE LIMIT OF HISTORIC DISTRICT
BERM DITCH
REMOVE HW
DO NOT DISTURB ROCK WALL
60' TRANSITION
TRACT LINE
COUNTY LINE
MATCH LINE SEE SHEET 10
MATCH LINE SEE SHEET 12
NAD 83/95
DETAIL L
LATERAL BASE DITCH
(Not to Scale)
Min. D=2.0 Ft.
Max. D=3.0 Ft.
B=5.0 Ft.
b=5.0 Ft.
Type of Liner= CLASS I Rip-Rap
FROM STA.445+00 TO STA.449+25 -L- RT.
DETAIL M
PIPE OUTLET CHANNEL
(Not to Scale)
Length= 20 Ft.
D= 2 Ft.
Est.= 15 Tons of Class 'I' Rip-Rap

-Y3-

PI Sta 10+71.75	PI Sta 11+96.30	PI Sta 12+79.60	PI Sta 14+64.00
Δ = 36° 17' 18.8" (RT)	Δ = 7° 18' 59.4" (LT)	Δ = 9° 27' 58.8" (LT)	Δ = 67° 00' 18.1" (RT)
D = 38° 11' 49.9"	D = 28° 38' 52.4"	D = 28° 38' 52.4"	D = 114° 35' 29.6"
L = 95.00'	L = 25.54'	L = 33.04'	L = 58.47'
T = 49.16'	T = 12.79'	T = 16.56'	T = 33.10'
R = 150.00'	R = 200.00'	R = 200.00'	R = 50.00'

-L-

PI Sta 447+15.16
Δ = 86° 11' 25.6" (RT)
D = 22° 55' 05.9"
L = 376.08'
T = 233.91'
R = 250.00'

-U-

PI Sta 454+87.91
Δ = 6° 26' 30.9" (RT)
D = 1° 08' 45.3"
L = 562.16'
T = 281.38'
R = 5,000.00'

-L-

PI Sta 455+79.22
Δ = 8° 35' 35.2" (RT)
D = 1° 08' 45.3"
L = 749.89'
T = 375.65'
R = 5,000.00'

-Y4-

PI Sta 11+60.68	PI Sta 12+26.93	PI Sta 12+76.56
Δ = 9° 18' 33.2" (LT)	Δ = 78° 13' 11.1" (LT)	Δ = 3° 50' 58.4" (LT)
D = 18° 58' 19.6"	D = 130° 13' 03.7"	D = 11° 30' 18.6"
L = 49.07'	L = 60.07'	L = 33.46'
T = 24.59'	T = 35.77'	T = 16.74'
R = 302.00'	R = 44.00'	R = 498.00'

REVISIONS

RW REVISION: THE REVISIONS CONSIST OF REVISING EXISTING R/W AND REMOVING PROPOSED R/W ON PARCEL 63, ADDING PROPERTY OWNERS NAME AND PARCEL NUMBER 64, ELIMINATED PARCEL 71 TO COMBINE IT WITH PARCEL 69, AND CHANGED PARCEL NUMBER 69 PROPERTY OWNERS NAME. WTB 3/15/2010

05-OCT-2010 13:33
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PROJECT REFERENCE NO.	SHEET NO.
R-2237C	16
R/W SHEET NO.	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

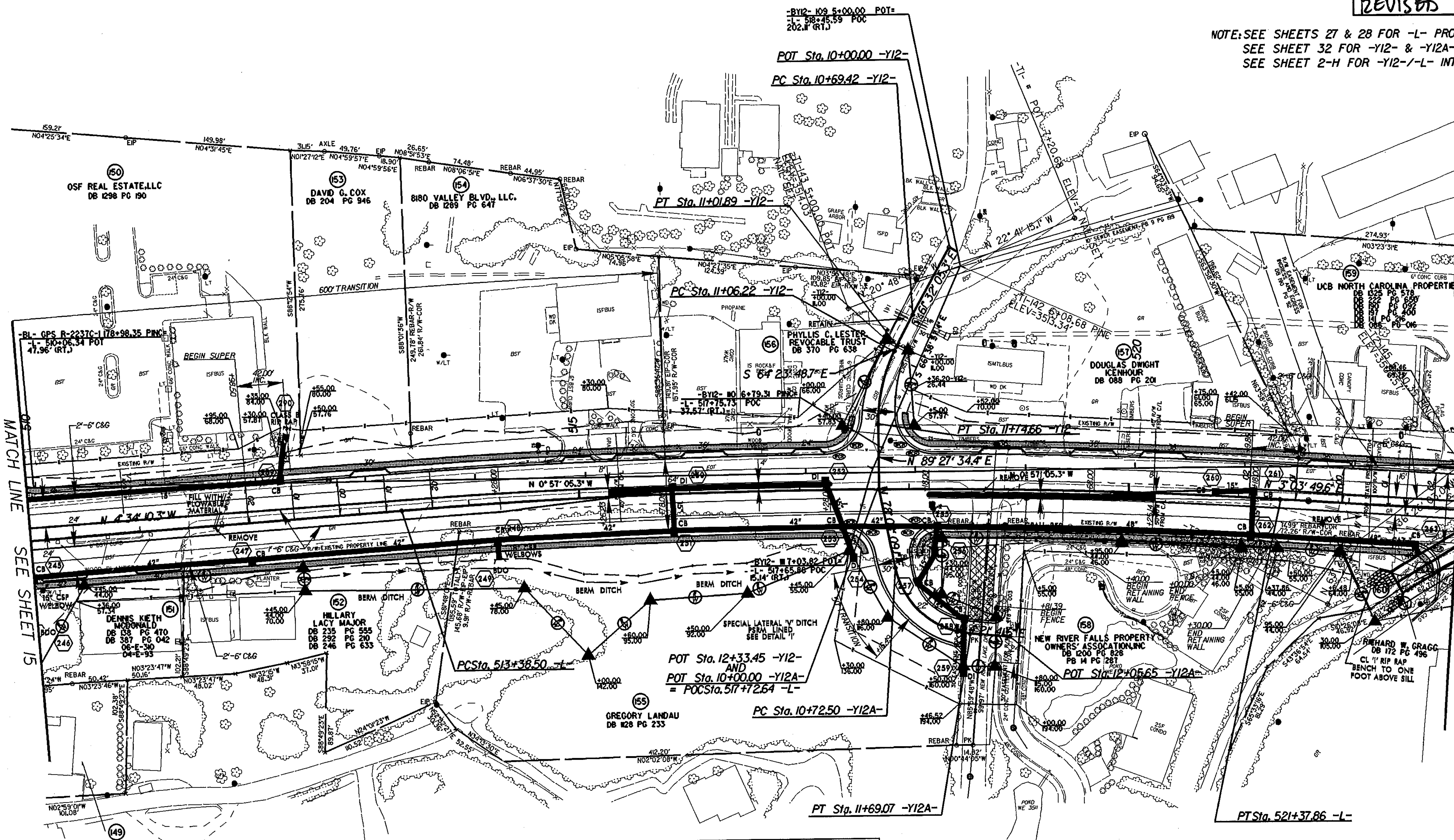
REVISED 10-5-10

-Y12-

PI Sta 10+85.66	PI Sta 11+41.05
Δ = 2° 51' 43.3" (LT)	Δ = 26° 08' 36.9" (LT)
D = 8° 48' 53.0"	D = 38° 11' 49.9"
L = 32.47'	L = 68.44'
T = 16.24'	T = 34.83'
R = 650.00'	R = 150.00'

NAD 83/95

NOTE: SEE SHEETS 27 & 28 FOR -L- PROFILE
SEE SHEET 32 FOR -Y12- & -Y12A- PROFILE
SEE SHEET 2-H FOR -Y12-/-L- INTERSECTION DETAIL



OSF REAL ESTATE, LLC
DB 1298 PG 190
DAVID G. COX
DB 204 PG 946
8180 VALLEY BLVD., LLC.
DB 1289 PG 647
PHYLLIS C. LESTER REVOCABLE TRUST
DB 370 PG 638
DOUGLAS DWIGHT ICENHOUR
DB 088 PG 201
UCB NORTH CAROLINA PROPERTIES
DENNIS KEITH MCDONALD
HILLARY LACY MAJOR
DB 235 PG 555
DB 292 PG 210
DB 246 PG 633
GREGORY LANDAU
DB 1128 PG 233
NEW RIVER FALLS PROPERTY OWNERS' ASSOCIATION, INC
DB 1200 PG 828
PB 14 PG 287
RICHARD W. GRAGG
DB 172 PG 496
CHRISTOPHER M. ESTES
MATCH LINE SEE SHEET 15
MATCH LINE SEE SHEET 17
POT Sta. 10+00.00 -Y12-
PC Sta. 10+69.42 -Y12-
PT Sta. 11+01.89 -Y12-
PC Sta. 11+06.22 -Y12-
PT Sta. 11+74.66 -Y12-
POT Sta. 12+33.45 -Y12-
AND
POT Sta. 10+00.00 -Y12A-
= POC Sta. 517+72.64 -L-
PC Sta. 10+72.50 -Y12A-
PT Sta. 11+69.07 -Y12A-
POT Sta. 12+05.65 -Y12A-
PC Sta. 513+38.50 -L-
PT Sta. 521+37.86 -L-
N 89° 27' 34.4" E
BERM DITCH
SPECIAL LATERAL 'V' DITCH PSRM LINED SEE DETAIL 'I'
600' TRANSITION
BEGIN SUPER
CL 'I' RIP RAP BENCH TO ONE FOOT ABOVE SILL

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

Natural Ground — Fill Slope — 4:1 or Flatter
Min. D=1.5 Ft.
Max. d=1.5 Ft.
Type of Liner= PSRM
FROM STA.516+50 TO STA.517+00 -L- RT.

PAVEMENT REMOVAL

-L-	-Y12A-
PI Sta 517+38.77	PI Sta 11+28.78
Δ = 7° 37' 59.8" (RT)	Δ = 73° 46' 27.5" (LT)
D = 0° 57' 17.7"	D = 76° 23' 39.7"
L = 799.36'	L = 96.57'
T = 400.27'	T = 56.29'
R = 6,000.00'	R = 75.00'

REVISIONS

R/W Revision: The revision consists of adding PUE and revising TCE on Parcel 159 (Degollado Inc.), wtb 4/20/10

5/14/99

05-OCT-2010 13:34
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PROJECT REFERENCE NO.	SHEET NO.
R-2237C	17
R/W SHEET NO.	17

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
REVISED	10-5-10

NOTE: SEE SHEET 28 FOR -L- PROFILE
SEE SHEET 32 FOR -Y13- & -Y14- PROFILE
SEE SHEET 2-I FOR -Y13- & -Y14-/-L- INTERSECTION DETAILS
SEE SHEET 38 FOR -DRIVE4- PROFILE

5/14/99

REVISIONS

R/W Revision: This revision consists of revising the Prop. R/W on Parcel 174. wtb 7/8/10

-DRIVE4-
PI Sta 10+41.51
Δ = 50° 30' 20.0" (LT)
D = 65° 06' 31.8"
L = 77.57'
T = 41.51'
R = 88.00'

-Y14-
PI Sta 10+42.11
Δ = 7° 48' 42.8" (LT)
D = 19° 05' 54.9"
L = 40.90'
T = 20.48'
R = 300.00'

PI Sta 12+01.54
Δ = 33° 34' 19.0" (LT)
D = 114° 35' 29.6"
L = 29.30'
T = 15.08'
R = 50.00'

-L-
PI Sta 541+24.83
Δ = 15° 26' 30.6" (RT)
D = 0° 57' 17.7"
L = 1,617.07'
T = 813.46'
R = 6,000.00'

-Y13-
PI Sta 13+49.85
Δ = 2° 46' 29.6" (RT)
D = 7° 09' 43.1"
L = 38.74'
T = 19.38'
R = 800.00'

PI Sta 14+39.41
Δ = 8° 41' 22.5" (RT)
D = 31° 49' 51.6"
L = 27.30'
T = 13.68'
R = 180.00'

05-OCT-2010 13:34
R:\Roadway\proj\r2237c_rdy_psh17.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	19
R/W SHEET NO.	19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISED 10-5-10

NOTE: SEE SHEET 29 FOR -L- PROFILE
SEE SHEET 33 FOR -Y17- PROFILE
SEE SHEET 2-1 FOR -Y17-/-L- INTERSECTION DETAIL

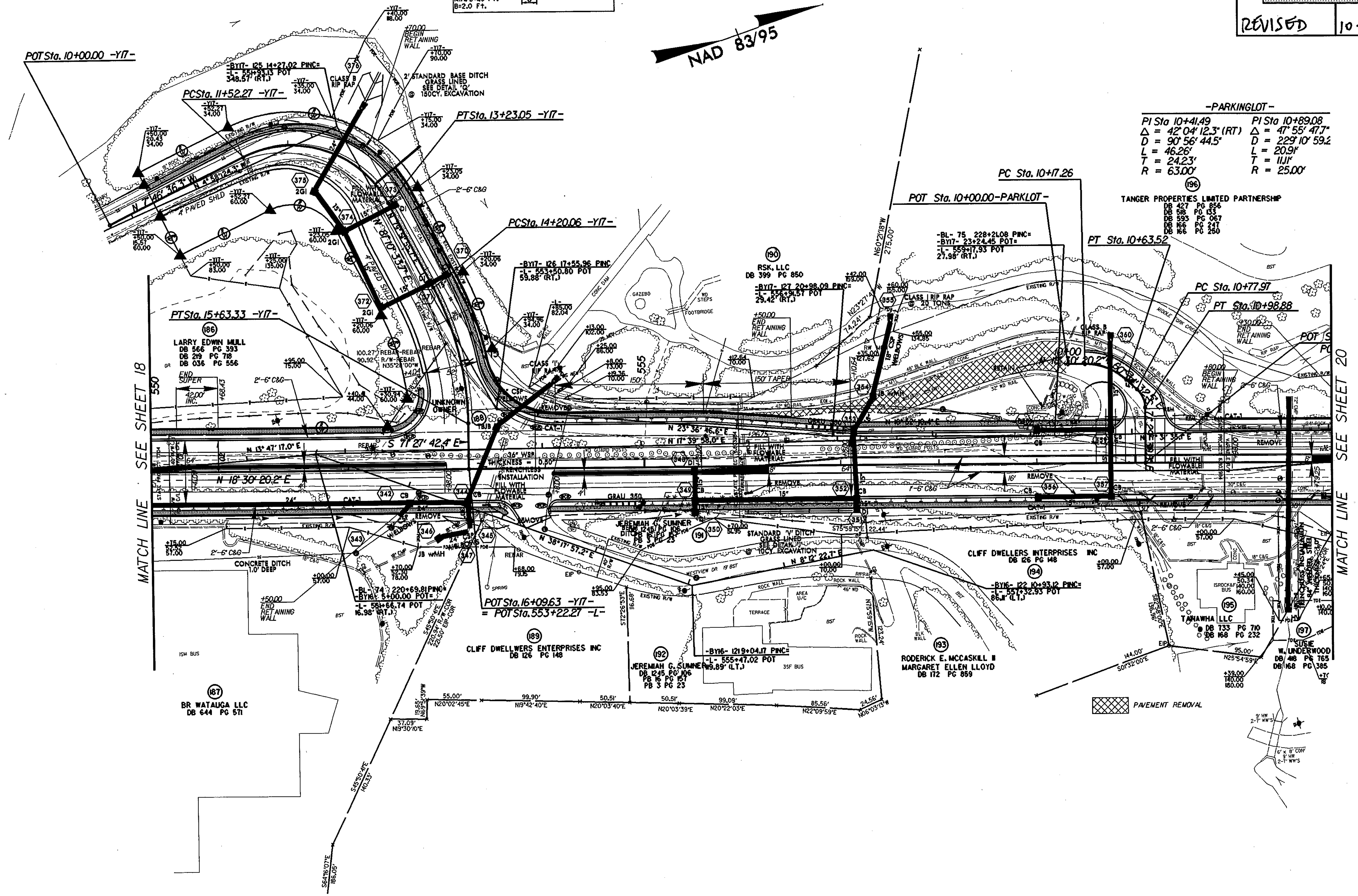
-Y17-

PI Sta 12+60.28	PI Sta 14+93.08
Δ = 88° 57' 09.9" (RT)	Δ = 27° 21' 43.9" (RT)
D = 52° 05' 13.5"	D = 19° 05' 54.9"
L = 170.78'	L = 143.27'
T = 108.01'	T = 73.03'
R = 110.00'	R = 300.00'

DETAIL Q
STANDARD BASE DITCH
(Not to Scale)
Natural Ground 3:1 D 3:1 Natural Ground B
Min. D=1.5 Ft.
B=2.0 Ft.

-PARKINGLOT-

PI Sta 10+41.49	PI Sta 10+89.08
Δ = 42° 04' 12.3" (RT)	Δ = 47° 55' 47.7"
D = 90° 56' 44.5"	D = 229° 10' 59.2
L = 46.26'	L = 20.91'
T = 24.23'	T = 11.11'
R = 63.00'	R = 25.00'



REVISIONS

Right of Way: This revision consists of adding right of way on Parcel 190. 8/26/10

5/14/99

05-OCT-2010 13:34
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