APPROVED

DIVISION OF WASTE MANAGEMENT

SOLID WASTE SECTION

Date 12/03/2013 **By** Patricia M. Backus

DIN **20101**

Attachment 1 **Part** VI **Document** 1

Permit 5305-TRANSFER-2013 **Permit DIN** 20102

Permit Application Package

Sanford Transfer Station
Sanford, North Carolina

Prepared for:

Waste Industries

Raleigh, North Carolina

WASTE INDUSTRIES

August, 2013

Revised November 10, 2013

BARNARD ENGINEERING, P.C.

Civil • Environmental • Geotechnical

BARNARD ENGINEERING, P.C.
Civil • Environmental • Geotechnical

August 27, 2013
Revised: November 6, 2013

Mr. Ed Mussler, P.E.
Permitting Branch Head
North Carolina Department of Environment and Natural Resources
Solid Waste Division
217 West Jones St.
Raleigh, NC 27603

Re: Proposed Waste Industries Sanford Transfer Station
Sanford, Lee County, NC

Dear Mr. Mussler,

We are forwarding this letter and associated attachments as application for a new Transfer Station to be located in Sanford, North Carolina. Waste Industries was awarded the collection contract for the City of Sanford earlier this year, and as part of that contract, committed to building a new transfer station. The Transfer Station facility will include a 6,000 square foot transfer station, a scale house / office, a scale, parking areas for employees, route collection trucks, transfer trailers and additional areas for maneuvering. The facility will be owned and operated by Waste Industries. The City of Sanford issued the Special Use Permit on October 21, 2013. A copy of the Special Use Permit is attached. A copy of the deed will be attached when Waste Industries closes on the property, which we anticipate before the end of November.

The proposed Transfer Station is to be located at 3290 McDonald Drive, Sanford, North Carolina. The property is identified by tax parcel id number 9651-96-5089-00 and consists of 5.44 Acres with a light industrial zoning classification. A second parcel is also included and will be recombined with the above parcel to create a single parcel. The second parcel is identified by parcel id number 9661-05-0902-00 and consists of 2.96 acres. The first Parcel is within the City Limits of Sanford and the second is currently in the City's Extraterritorial Jurisdiction. The parcel is being voluntarily annexed into the City.

Currently, the property houses an unfinished 60,000 square foot pre-engineered metal building that was constructed as a speculative investment venture and never completed. This building will be removed prior to construction of the new Transfer Station. The property does not appear to have been developed prior to the construction of the building and was used for agricultural purposes.

1534 Saratoga Blvd. *(704) 421-3067*
Indian Trail, NC 28079
www.barnardengineeringpc.com

A Phase 1 ESA was completed on the property. The ESA indicated no environmental concerns on the property.

The facility will accept MSW from Lee, Moore, Chatham, Wake, Harnett, Randolph, Montgomery, Hoke, Cumberland, Scotland and Richmond counties. The waste will be taken to the Sampson County Landfill in Roseboro, North Carolina, Permit number 82-02. Daily tonnages may range from 100 to 500 tons per day with an average of 150 tons per day.

Access to the site will be from McDonald Drive, a City of Sanford maintained street. McDonald Drive is a cul-de-sac street that connects to Wilson Road, a NCDOT maintained highway. Incoming waste will arrive at the site from either direction on Wilson Road. Outbound waste will use Wilson Road to Access either US Highway 421 or N.C. Highway 87.

We contacted NCDOT's local office regarding the need for a traffic study. Based upon the traffic count we supplied to NCDOT, no improvements to the local streets are warranted. A copy of the letter from NCDOT is attached.

A paved driveway will connect from McDonald Drive to a new scale house / office. A single 70-ft x 10-ft above ground scale will be installed adjacent to the scale house to weigh trucks for financial transactions and tracking waste tonnages. Once beyond the scale house, the access drive will be paved with either asphalt or gravel, depending upon the outcome of the SUP and Variance process with The City of Sanford. Parking areas for collection trucks and transfer trailers will be asphalt paved. Concrete paved approach slabs will be provided in front of the transfer station, both at the tipping floor and the loading tunnel.

Site access will be controlled by a chain link fence surrounding the property with a gate at the entrance to the facility. Landscaping buffers will be provided in certain areas to provide visual screening.

Signage will be provided at the gate to inform customers of acceptable wastes, hours of operation, contact information and other required information.

The scale house will be a modular structure with a small office, a break room and restrooms for employees. The building will be ADA accessible. The building will be equipped with telephone and internet access for business and safety purposes.

The Transfer Station will be a 6,000 square foot partial grade separation style facility. The tipping floor is 8-feet higher than the loading pit floor. A lift-over wall located along the loading pit provides protection for the transfer trailers and safety for facility employees. The remainder of the tipping floor is surrounded by 10-foot tall push walls to allow for waste storage and building protection. All of the walls are plated with steel plates to provide long-term wear protection. The lift-over wall is plated with steel on the top as well to provide additional wear protection. Additional steel plates will be attached to the top of each push wall and the building frame to keep waste from falling between the push wall and the building skin. A deflector plate will be installed in the loading pit above the transfer trailers to assist in loading the trailers.

The floor of the transfer station consists of two separate floors. The first, lower floor, is a structural floor designed to accept the loads from the collection trucks and the wheel loader. The second floor is a sacrificial floor installed above the structural floor. This floor is intended as a wear surface to protect the structural floor from damage. As the facility ages, the sacrificial floor can be replaced wholly or in sections without compromising the structural integrity of the building. This two floor system will also be installed in the loading pit.

A liquid management system will be incorporated into the building design through several design features. First, the tipping floor is sloped from the outside towards the center of the lift-over wall. Scupper holes located in the base of the wall allow liquids to drain into the loading tunnel. The floor of the loading tunnel is sloped to two trench drains which collect the liquids and direct them to the sanitary sewer system. Second, a two foot by 6-inch high mountable "speed bump" will be poured at the entrance to the tipping floor and the loading tunnel. This "speed bump" will prevent leachate from draining out of the building.

The trench drains in the loading tunnel drain by gravity through 8-inch diameter piping to a 1500 gallon oil/water separator then on to the City of Sanford Sanitary Sewer System for treatment and disposal.

The site will be connected to the public water system to provide potable water for site usage. Water will be available in the break room for employee use, and at the Transfer Station for wash down.

We have attached a USGS quad sheet with the site delineated, a copy of the FEMA Firm Map for the area, a full set of Civil Site Drawings, a copy of the proposed Operations Plan and a copy of the letter from NCDOT regarding the Traffic Study. Please contact us if you need further information or clarification.

Sincerely,
Barnard Engineering, P.C.

John D. Barnard, P.E.
Principal

Attachments:
- Special Use Permit
- USGS Quadrangle
- FEMA FIRM
- NCDENR Land Quality Section Sedimentation and Erosion Control Approval
- Site Civil Drawings
- Operation Plan
- NCDOT Letter

BK:01340 PG:0235

FILED
LEE COUNTY
MOLLIE A. MCINNIS
REGISTER OF DEEDS

FILED	Oct 30, 2013
AT	01:16:17 pm
BOOK	01340
START PAGE	0235
END PAGE	0241
INSTRUMENT #	07358

SPECIAL USE PERMIT

Mail after recording to:
David Pepper
3301 Benson Drive
Suite 601
Raleigh, NC 27609

This instrument prepared under the supervision of Susan C. Patterson, City of Sanford Attorney

Brief Description: 3290 McDonald Drive and 0 McDonald Drive
Waste Transfer Station
Jonesboro Township

Recording: Time, Book and Page

STATE OF NORTH CAROLINA)
)
COUNTY OF LEE)

SPECIAL USE PERMIT
(Not Valid Until Executed and Recorded)

The City of Sanford Board of Adjustment hereby grants to Waste Industries as applicant and owner of the land described in Schedule A, Schedule B, and Schedule C attached hereto, and by this reference made a part hereof, a Special Use Permit to construct and operate a Waste Transfer Station upon said lands in conformity with an application on file with the Sanford/Lee County Planning and Development Department and subject to all applicable provisions of the Sanford/Lee County/Town of Broadway Unified Development Ordinance and the following conditions:

1. The applicant shall complete the development strictly in accordance with the plans submitted to and approved by this Board. A copy of which is on file under the application herein before set out.
2. Nothing authorized by this permit may be done until the property owner properly executes and returns to the City of Sanford the attached acknowledgment of the issuance of this permit herein after set out and records this permit and acknowledgment in the Office of the Register of Deeds in Lee County, North Carolina.

IN WITNESS WHEREOF, City of Sanford Board of Adjustment, has caused this permit to be issued in its name and the undersigned being the applicant/agent of the property described in Schedule A and Schedule B to this permit, do hereby accept this Special Use Permit, as binding on them and their successors in interest.

By: Bill Jones
Bill Jones, Chairman
City of Sanford Board of Adjustment

ATTEST:
Angela Baker
Angela Baker, Clerk to the Board

STATE OF NORTH CAROLINA
COUNTY OF LEE

This 21st day of OCTOBER, 2013 personally came before me WILLIAM E. MORGAN, Notary Public of said county and state, Angela Baker, who being by me duly sworn, says that she is acquainted with Bill Jones who is Chairman of the City of Sanford Board of Adjustment; and that she the said Angela Baker is the duly appointed Secretary of said Board, and saw the said Chairman sign the foregoing instrument, and that she the said Secretary as aforesaid, signed her name in attestation of the execution of said instrument in the presence of said Chairman of the City of Sanford Board of Adjustment.

Witness my hand and official seal, this 21st day of OCTOBER, 2013.

William E. Morgan
Notary Public

My Commission Expires: MAY 24 2016

(SEAL)

WILLIAM E. MORGAN
Notary Public
Lee County N.C.

David Pepper, Director of Capital Projects of Waste Industries does hereby acknowledge receipt of this Special Use Permit. The undersigned do further acknowledges that no work may be done pursuant to this permit except in accordance with all its conditions and requirements and after its recordation in the Office of the Register of Deeds for Lee County, North Carolina, and that these restrictions shall be binding on them and their successors in interest.

This the 23rd day of October, 2013

David W. Pepper

David Pepper,
Director of Capital Projects of
Waste Industries

STATE OF NORTH CAROLINA
COUNTY OF LEE

I Althea T. Thompson, a Notary Public of the County and State aforesaid, do herby certify that David Pepper, Director of Capital Projects of Waste Industries personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official stamps, or seals, this the 23 day of October, 2013.

Althea T. Thompson
Notary Public

My Commission Expires: January 18, 2017

(SEAL)

ALTHEA T. THOMPSON NOTARY PUBLIC LEE COUNTY, N.C.

Christine E. Carney, representative of Solus Industrial Innovations, LLC, owners of the identified property, do hereby acknowledge receipt of this Special Use Permit. The undersigned do further acknowledges that no work may be done pursuant to this permit except in accordance with all its conditions and requirements and after its recordation in the Office of the Register of Deeds for Lee County, North Carolina, and that these restrictions shall be binding on them and their successors in interest.

This the 29th day of October, 2013

Christine E Carney
Owner- Authorized Signatory

STATE OF ~~NORTH CAROLINA~~ Missouri
COUNTY OF ~~LEE~~ St. Louis

I Sharon L. Hyde, a Notary Public of the County and State aforesaid, do hereby certify that Christine E. Carney personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official stamps, or seals, this the 29th day of October, 2013.

Sharon L. Hyde
Notary Public

My Commission Expires: 11/21/2015

(SEAL)

SHARON L. HYDE
Notary Public - Notary Seal
State of Missouri, St Louis County
Commission # 11535019
My Commission Expires Nov 21, 2015

SCHEDULE A

SPECIAL USE PERMIT
ISSUED TO: WASTE INDUSTRIES

Property Data

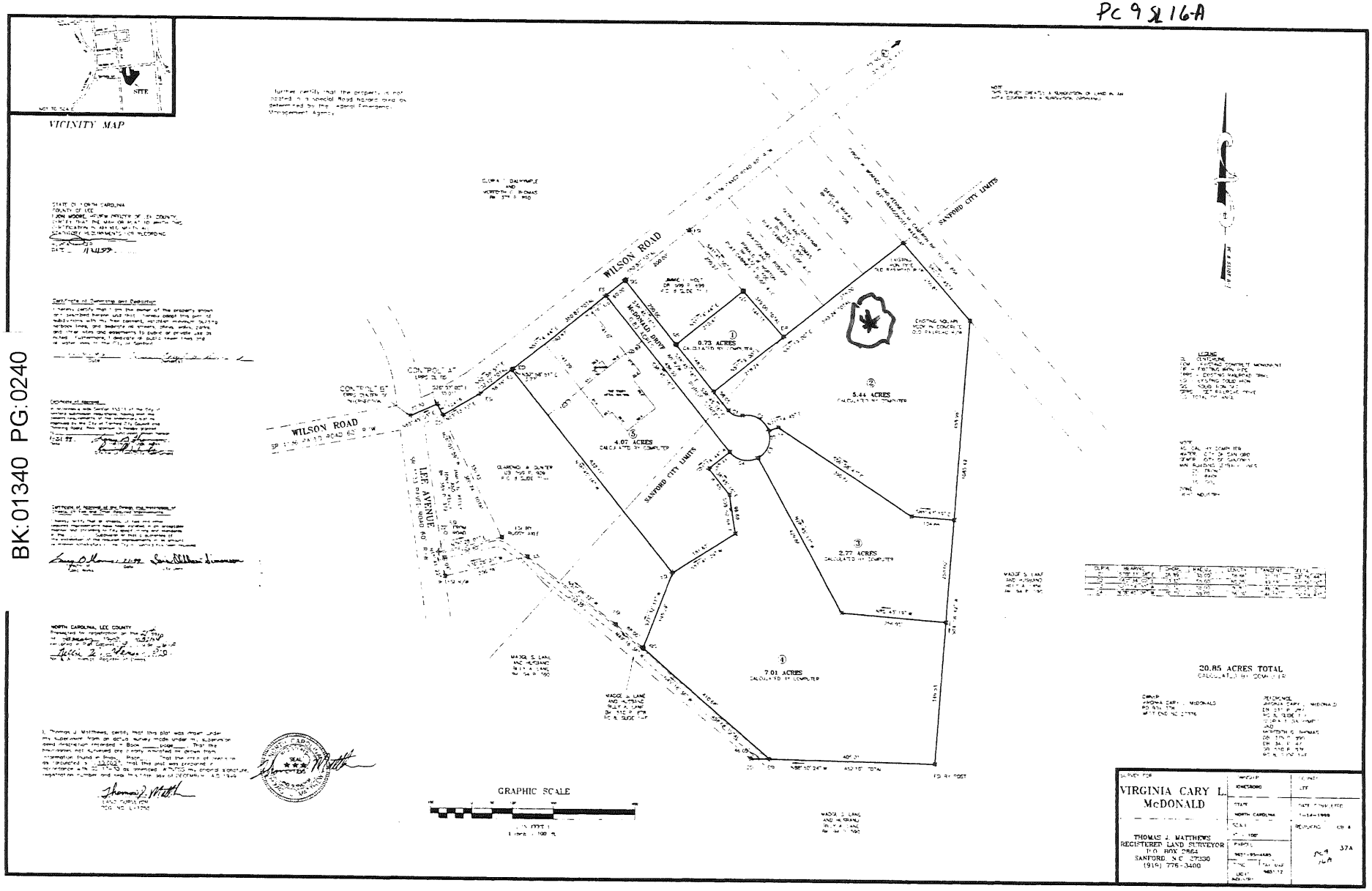
Address:	3290 McDonald Drive and 0 McDonald Drive Sanford, NC 27330
PIN:	Parcels 9661-05-0902-00 and 9651-96-5089-00
Tax Map:	9661.01 and 9651.12
Deed Reference:	Being all the property described in Deed Book 1041, Page 234 and Deed Book 1066, Page 83. Plat Cabinet 9, Slide 16A and Plat Cabinet 2006, Slide 217 Lee County Register of Deeds Office.
Lot Size:	8.40 +/- acres as shown on Schedule B and Schedule C
Township:	Jonesboro

SCHEDULE B

THIS MAP IS NOT A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS.

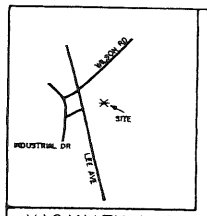
PC 9 SL 16A

BK:01340 PG:0240



SCHEDULE C

PLAT 2006 SL 217



VICINITY MAP

NORTH BY
D.B. 94, PG. 590

THIS MAP IS NOT A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS.

NORTH CAROLINA PROFESSIONAL SEAL L-3471 LAND SURVEYOR MELVIN A. GRAHAM

I, MELVIN A. GRAHAM, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION (DEED DESCRIPTION RECORDED IN BOOK 94, PAGE 590); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION FOUND IN BOOK , PAGE ; THAT THE RATIO OF PRECISION AS CALCULATED IS 1: 7500 , THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL

THIS 10 DAY OF NOVEMBER A.D. 2006

Melvin A. Graham

SURVEYOR REGISTRATION NUMBER L-3471

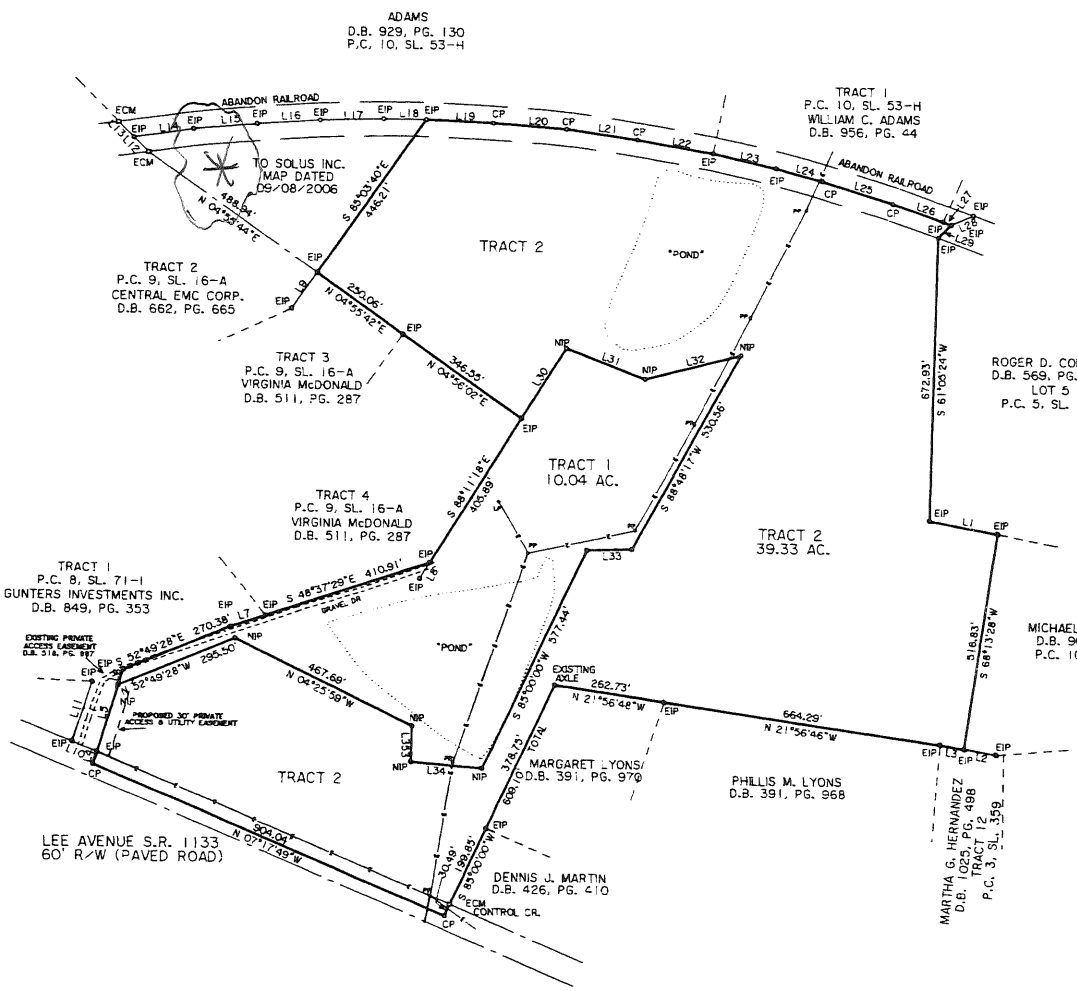
STATE OF NORTH CAROLINA
COUNTY OF LEE

I, Renée C. Scott REVIEW OFFICER OF LEE COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

11/13/06 Renée C. Scott

DATE REVIEW OFFICER

COURSE	BEARING	DISTANCE
1	S 19°37'14"E	164.48'
2	N 20°34'26"W	76.71'
3	N 20°36'20"W	58.16'
4	N 77°07'06"E	30.31'
5	N 77°07'06"E	167.65'
6	N 77°07'06"E	39.13'
7	S 48°36'45"E	87.65'
8	S 88°05'10"E	46.04'
9	S 85°07'03"E	104.65'
10	N 07°12'14"W	62.31'
11	N 77°54'27"E	150.27'
12	N 15°21'32"E	49.13'
13	N 15°20'33"E	50.82'
14	S 38°37'27"E	141.95'
15	S 35°26'39"E	149.98'
16	S 34°09'44"E	148.97'
17	S 31°50'44"E	150.03'
18	S 29°48'03"E	101.76'
19	S 27°40'59"E	160.23'
20	S 25°57'14"E	174.27'
21	S 22°06'45"E	168.76'
22	S 20°18'34"E	184.07'
23	S 17°32'03"E	154.76'
24	S 15°13'52"E	114.32'
25	S 13°05'36"E	175.01'
26	S 10°58'13"E	126.11'
27	S 08°11'41"E	20.06'
28	N 53°55'25"W	57.65'
29	N 75°38'05"W	42.48'
30	S 88°11'18"E	200.00'
31	S 08°48'47"E	200.00'
32	S 44°42'16"E	236.70'
33	N 31°44'29"W	106.57'
34	N 25°31'52"W	170.37'
35	N 61°31'19"E	86.87'



NOTES:
PROPERTY CONSIST OF ALL OF THE BILLY A. LANE and MADGE S. LANE PROPERTIES AS RECORDED IN D.B. 94, PG. 590 D.B. 510, PG. 878 and D.B. 742 PG. 434 LEE COUNTY REGISTRY.

ALL AREAS BY COORDINATE METHOD

PROPERTY ZONED RA

PIN #'s 9651-94-6622-00
9661-05-3536-00
9651-95-0338-00

TOTAL AREA = 49.37 AC.

AREA IN R/W = 0.63 AC.+/-

IMPROVEMENTS NOT LOCATED

MINIMUM BUILDING SETBACKS
FRONT - 30'
SIDELINES - 15'
REAR - 30'

NOTE:
THIS SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXCEPTION TO THE DEFINITION OF SUBDIVISION.

LEGEND:
EIP-EXISTING IRON PIPE OR IRON ROD
NIP-NEW IRON PIPE OR IRON ROD
NRRS-NEW RAILROAD SPIKE
ERRS-EXISTING RAILROAD SPIKE
NPK-NEW P.K. NAIL
EPK EXISTING P.K. NAIL
ECM-EXISTING CONCRETE MONUMENT
C/L-CENTER LINE
PP-POWER POLE
LP-LIGHT POLE
R/W-RIGHT OF WAY
CP-CALCULATED POINT
-E- -ELECTRICITY
+ - GROUND ELEVATION
-X-X-X- FENCE

200 0 200 400 600
GRAPHIC SCALE - FEET

NORTH CAROLINA, LEE COUNTY
PRESENTED FOR REGISTRATION ON THE 13TH DAY OF NOV 2006 AT 10:53AM
RECORDED IN PLAT CABINET 2006 SLIDE 217
Mollie A. McInnis
MOLLIE A. MCINNIS, REGISTER OF DEEDS.
By: Amanda S. Hart
Deputy

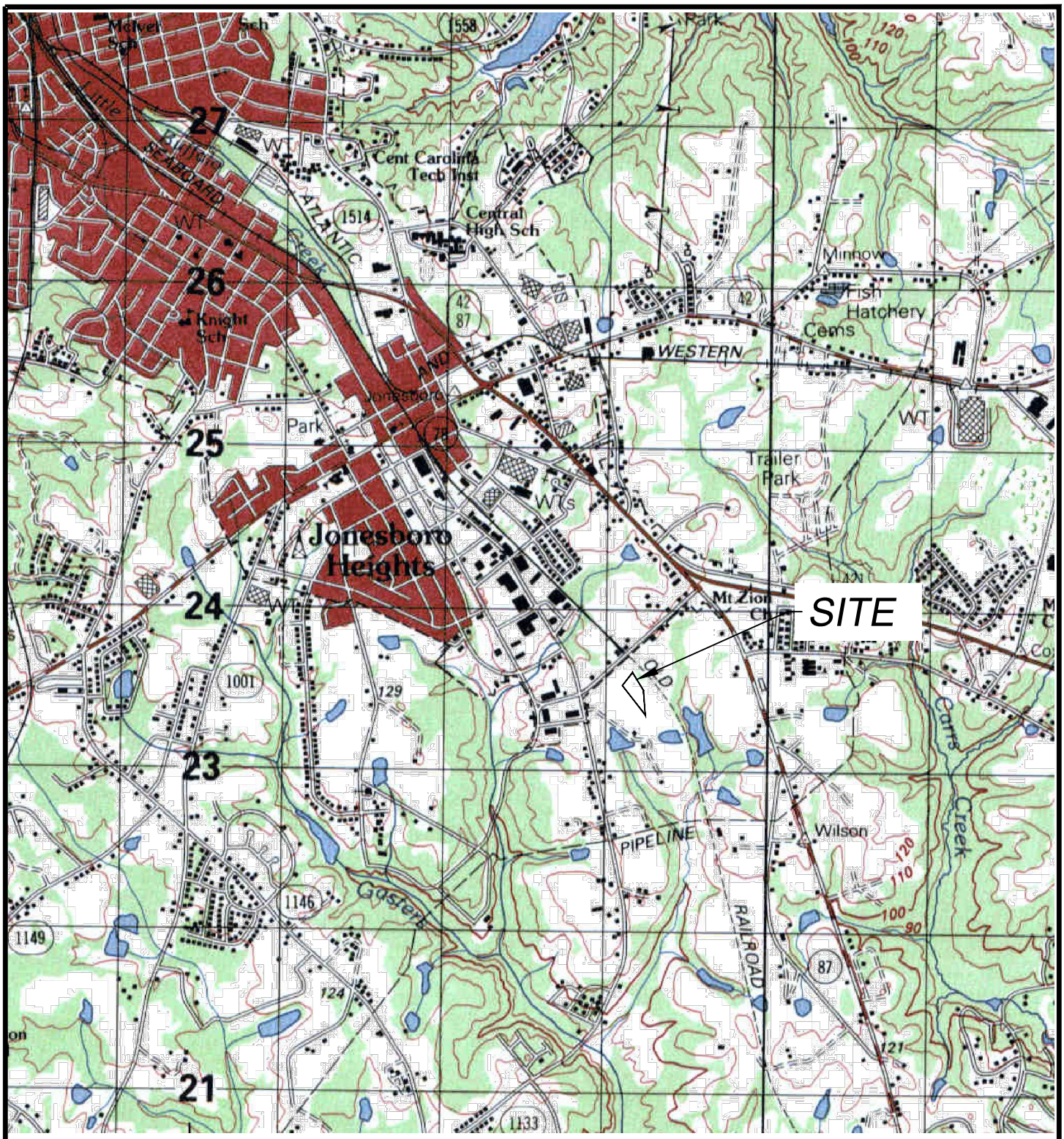
TOWNSHIP	COUNTY	STATE
JONESBORO	LEE	NC

(OWNER) SURVEY FOR
BILLY A. LANE
MADGE S. LANE
3311 LEE AVE.
SANFORD, NC 27330

DATE: 11/09/2006
SCALE: 1" = 200'
PROJECT: 10806
REVISION:

MELVIN A. GRAHAM, PLS.
3679 NICHOLSON ROAD
CAMERON, NC 28326
PHONE(919)499-6174

BK:01340 PG:0241



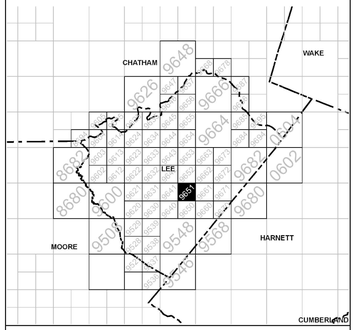
USGS QUADRANGLE:
"SANFORD"
15 MIN SERIES, DATE 1982

SANFORD TRANSFER STATION
SANFORD, NC

WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH, NC 27609

BARNARD ENGINEERING, P.C.
1534 Saratoga Blvd. Indian Trail, NC 28079
(704) 421-3067
www.barnardengineeringpc.com
N.C. License No. C-3679

STATE OF NORTH CAROLINA FIRM PANEL LOCATOR DIAGRAM



DATUM INFORMATION

The **projection** used in the preparation of this map was the North Carolina State Plane (FIPSZONE 3200). The **horizontal datum** was the North American Datum of 1983, GRS80 ellipsoid. Differences in datum, ellipsoid, projection, or Universal Transverse Mercator zones used in the production of FIRMS for adjacent jurisdictions may result in slight positional differences in map features across jurisdictional boundaries. These differences do not affect the accuracy of this FIRM. All coordinates on this map are in U.S. Survey Feet, where
1 U.S. Survey Foot = 1200/3937 Meters.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988 (NAVD 88). These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. An average offset between NAVD 88 and the National Geodetic Vertical Datum of 1929 (NGVD 29) has been computed for each North Carolina county. This offset was then applied to the NGVD 29 flood elevations that were not revised during the creation of this statewide format FIRM. The offsets for each county shown on this FIRM panel are shown in the vertical datum offset table below. Where a county boundary and a flooding source with unrevised NGVD 29 flood elevations are coincident, an individual offset has been calculated and applied during the creation of this statewide format FIRM. See Section 6.1 of the accompanying Flood Insurance Study report to obtain further information on the conversion of elevations between NAVD 88 and NGVD 29. To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the North Carolina Geodetic Survey at the address shown below. You may also contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

North Carolina Geodetic Survey
121 West Jones Street
Raleigh, NC 27601
(919) 733-3836
http://www.ncgs.state.nc.us

County Average Vertical Datum Offset Table

County	Vertical Datum Offset (ft)
LEE	-0.76

Example: NAVD 88 = NGVD 29 + (-0.76)

All streams listed in the **Flood Hazard Data Table** below were studied by detailed methods using field survey. Other flood hazard data shown on this map may have been derived using either a coastal analysis or limited detailed Riverine analysis. More information on the flooding sources studied by these analyses is contained in the Flood Insurance Study report.

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevation determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Areas to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

23 — 23	Cross section line
23 - - - - - 23	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4275000 M	1000-meter Universal Transverse Mercator grid ticks, zone 17
1 477 500 FEET	2500-foot grid values: North Carolina State Plane coordinate system (FIPSZONE 3200, State Plane NAD 83 feet)
BM5510	North Carolina Geodetic Survey bench mark (see explanation in the Datum Information section of this FIRM panel)
BM5510	National Geodetic Survey bench mark (see explanation in the Datum Information section of this FIRM panel)
● M1.5	River Mile

GRID NORTH
MAP SCALE 1" = 500' (1 : 6,000)
250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

BARNARD ENGINEERING, P.C.
1534 Saratoga Blvd. Indian Trail, NC 28079
(704) 421-3067
www.barnardengineeringpc.com
N.C. License No. C-3679

NO.	DATE	BY	REVISION

SANFORD TRANSFER STATION
SANFORD, NC

WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH, NC 27609

FEMA FLOOD INSURANCE RATE MAP

DESIGNED	DRAWN	CHECKED	PROJECT NO.
----	----	----	2013-6
SCALE	DATE		
AS SHOWN	11-6-13		

SHEET:
F.I.R.M.

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 9651J

FIRM
FLOOD INSURANCE RATE MAP
NORTH CAROLINA

PANEL 9651
(SEE LOCATOR DIAGRAM OR MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	CID No.	PANEL	SUFFIX
LEE COUNTY	370331	9651	J
SANFORD, CITY OF	370143	9651	J

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

EFFECTIVE DATE MAP NUMBER
SEPTEMBER 6, 2006 3710965100J

State of North Carolina
Federal Emergency Management Agency

NORTH CAROLINA Cooperating Technical State
FEMA'S COOPERATING TECHNICAL PARTNER

This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of North Carolina and the Federal Emergency Management Agency (FEMA). The State of North Carolina has implemented a long term approach of floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map floodplain areas at the local level. As a part of this effort, the state of North Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

www.ncfloodmaps.com

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles, Floodway Data, Limited Detailed Flood Hazard Data, and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of **regulatory floodways** shown on the FIRM for flooding sources studied by detailed methods were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data for flooding sources studied by detailed methods as well as **non-encroachment widths** for flooding sources studied by limited detailed methods are provided in the Flood Insurance Study (FIS) report for this jurisdiction. The FIS report also provides instructions for determining a floodway using non-encroachment widths for flooding sources studied by limited detailed methods.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 4.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

Base map information and geospatial data used to develop this FIRM were obtained from various organizations, including the participating local community(ies), state and federal agencies, and/or other sources. The primary base for this FIRM is aerial imagery acquired by Lee County. The time period of collection for the imagery is 2002. Information and geospatial data supplied by the local community(ies) that met FEMA base map specifications were considered the preferred source for development of the base map. See geospatial metadata for the associated digital FIRM for additional information about base map preparation.

Base map features shown on this map, such as **corporate limits**, are based on the most up-to-date data available at the time of publication. **Changes in the corporate limits may have occurred since this map was published**. Map users should consult the appropriate community official or website to verify current conditions of jurisdictional boundaries and base map features. This map may contain roads that were not considered in the hydraulic analysis of streams where no new hydraulic model was created during the production of this statewide format FIRM.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels, community map repository addresses, and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

If you have **questions about this map**, or questions concerning the National Flood Insurance Program in general, please call **1 – 877 – FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.

An accompanying Flood Insurance Study report, Letter of Map Revision (LOMR) or Letter of Map Amendment (LOMA) revising portions of this panel, and digital versions of this FIRM may be available. Visit the **North Carolina Floodplain Mapping Program** website at http://www.ncfloodmaps.com, or contact the **FEMA Map Service Center** at 1-800-358-9616 for information on all related products associated with this FIRM. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov.

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index or visit http://www.ncfloodmaps.com

EFFECTIVE DATE OF FLOOD INSURANCE RATE MAP PANEL

SEPTEMBER 6, 2006

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to statewide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent, the North Carolina Division of Emergency Management or the National Flood Insurance Program at the following phone numbers or websites:

NC Division of Emergency Management
(919) 715-8000 http://www.nccrimecontrol.org/nfip

National Flood Insurance Program
1-800-638-6620 http://www.fema.gov/nfip

NCDENR

North Carolina Department of Environment and Natural Resources

Division of Energy, Mineral and Land Resources
Land Quality Section

Tracy E. Davis, PE, CPM
Director

Pat McCrory, Governor
John E. Skvarla, III, Secretary

August 16, 2013

LETTER OF APPROVAL WITH MODIFICATIONS

Waste Industries
ATTN :- David Pepper, Director of Capital Projects
3301 Benson Drive, Suite 601
Raleigh, NC 27609

RE: Project Name: Sanford Transfer Station
Project ID: LEE-2014-001 Acres Approved: 4.96
County: Lee, 3290 McDonald Drive, Sanford
River Basin: Cape Fear Stream Classification: Other
Submitted By: John D Barnard, Barnard Engineering, PC
Date Received by LQS: July 17, 2013 and August 2, 2013
Plan Type: New

Dear Sir or Madam:

This office has reviewed the subject erosion and sedimentation control plan. We find the plan to be acceptable with modifications and hereby issue this letter of Approval with Modifications. The Modifications Required for Approval are listed on the attached page. This plan approval shall expire three (3) years following the date of approval, if no land-disturbing activity has been undertaken, as is required by Title 15A NCAC 4B .0129.

Please be aware that your project will be covered by the enclosed NPDES Construction Stormwater General Permit NCG010000. Please become familiar with all the requirements and conditions of this permit in order to achieve compliance.

Please be advised that Title 15A NCAC 4B .0118(a) requires that a copy of the approved erosion control plan be on file at the job site. Also, you should consider this letter to give the Notice required by G.S. 113A-61.1(a) of our right of periodic inspection to insure compliance with the approved plan.

North Carolina's Sedimentation Pollution Control Program is performance-oriented, requiring

protection of existing natural resources and adjoining properties. If, following the commencement of this project, it is determined that the erosion and sedimentation control plan is inadequate to meet the requirements of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statute 113A-51 through 66), this office may require revisions to the plan and implementation of the revisions to insure compliance with the Act.

Acceptance and approval of this plan is conditioned upon your compliance with Federal and State water quality laws, regulations, and rules. In addition, local city or county ordinances or rules may also apply to this land-disturbing activity. This approval does not supersede any other permit or approval.

Please note that this approval is based in part on the accuracy of the information provided in the Financial Responsibility Form, which you have provided. You are requested to file an amended form if there is any change in the information included on the form. In addition, it would be helpful if you notify this office of the proposed starting date for this project. Please notify us if you plan to have a preconstruction conference.

Your cooperation is appreciated.

Sincerely,

John L. Holley, Jr., PE, CPESC
Regional Engineer
Land Quality Section

Enclosures: Certificate of Approval
Modifications Required for Approval
NPDES Permit

cc: John D Barnard, Barnard Engineering, PC, 1534 Saratoga Blvd., Indian Trail, NC 28079
DWQ Regional Supervisor

MODIFICATIONS REQUIRED FOR APPROVAL

Project Name: Sanford Transfer Station

Project ID: LEE-2014-001

County: Lee

(1) Additional silt fence outlets must be added in the field at low points along the perimeter installation sufficient to prevent overloading of the fence due to concentration of runoff.
(2) Please add the bottom dimensions for the proposed skimmer basin to the final plans to ensure adequate sizing.

Thank you for your cooperation.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

August 14, 2013

LEE COUNTY

Mr. John D. Barnard, P.E
Barnard Engineering, P.C.

Re: Sanford Transfer Station – McDonald Drive Sanford

Dear Mr. Barnard,

The North Carolina Department of Transportation has reviewed your request for access to Wilson Road (SR 1136) in Lee County and found that no improvements would be required on Wilson Road based on the trip information you provided.

Employee Trips: 12
Route Hauling Vehicle Trips: 8
Transfer Station Trips Inbound: 66
Tractor Trailer Loads Outbound: 14

It would be recommended that you improve the radius on McDonald Drive to help accommodate the truck traffic into your site.

Final approval for your site is dependent upon an approved driveway permit.

If you have any further questions, please feel free to contact me at (910) 944-7621.

Sincerely,

Marty C. Tillman
District Engineer

Cc: File

APPROVED

DIVISION OF WASTE MANAGEMENT

SOLID WASTE SECTION

Date 12/03/2013 **By** Patricia M. Backus

DIN **20101**

Attachment 1 **Part** VI **Document** 1

Permit 5305-TRANSFER-2013 **Permit DIN** 20102

Operations Manual

Sanford Transfer Station
Sanford, North Carolina

Prepared for:

Waste Industries

Raleigh, North Carolina

August, 2013

BARNARD ENGINEERING, P.C.

Civil • Environmental • Geotechnical

SANFORD TRANSFER STATION

OPERATIONS MANUAL

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Set of Construction Plans: Sanford Transfer Station

SECTION 1.0

GENERAL FACILITIES OPERATIONS

1.1 OVERVIEW

This Operations Manual was prepared for operations of the Sanford Transfer Station located at 3290 McDonald Drive, Sanford N.C. as shown in Figure 1. The facility will be is authorized under a North Carolina Department of Environment and Natural Resources (NCDENR) Permit which, at the time of this plan preparation is being applied for and reviewed. The facility is owned and will be operated by Waste Industries.

The proposed site layout is depicted on Figure 2 and in more detail on the attached civil site plans titled "Sanford Transfer Station", prepared by Barnard Engineering, P.C., dated August 2013. A schematic layout of the building is included as Figure 3. Pertinent cross sections of the building are included as Figure 3A.

The information contained herein was prepared to provide personnel with an understanding of how the Design Engineer envisioned that the completed facility would be operated. While deviations from the operations outlined here may be acceptable, they should be reviewed and approved by the Design Engineer.

All personnel involved with the management or supervision of the facility shall review the documents and update them as needed. A copy of this Operations Manual will be kept at the facility and will be available for use at all times.

1.2 CONTACT INFORMATION

All correspondence and questions concerning the operation of the Sanford Transfer Station should be directed to the appropriate company and regulatory personnel listed below. For fire or police emergencies dial 911.

1.2.1 **Waste Industries** (Owner/Operator)

Waste Industries
4621 Marracco Drive
Hope Mills, NC 28348
(910) 423-4122 Office
(910) 423-4125 Fax

Contact: Mr. Ted Habets
Ted.habets@wasteindustries.com

Mr. Habets will be the contact for all correspondence regarding the facility, including invoices for permit and annual fees.

1.2.3 **Barnard Engineering, P.C.** (Design Engineer)

1534 Saratoga Blvd.
Indian Trail, NC 28079
Phone: 704-421-3067

Contact: John D. Barnard, P.E.
jbarnard@barnardengineeringpc.com

1.2.4 North Carolina Department of Environment and Natural Resources

North Carolina DENR- Raleigh Central Office
217 W. Jones St.
Raleigh, NC 27603
Phone: (919) 707-8200
Mail to (Overnight Also): 1626 Mail Service Center
Raleigh, NC 27699-1646
Division of Waste Management (DWM)- Solid Waste Section

1.3 ACCESS CONTROL

Limiting access to the facility is important for the following reasons:

- Unauthorized and illegal dumping of waste materials is prevented.
- Trespassing, and potential injury is discouraged.
- The risk of vandalism is greatly reduced.

The facility entrance is gated and all customers must check in at the Scale house.

1.3.1 Physical Restraints

The site is accessed through the McDonald Drive cul-de-sac, as shown **on the attached plans**. Scales and a (modular) scale house are provided near the entrance. All waste will be weighed prior to being processed on the site. The entrance has a gate which will be securely locked during non-operating hours.

1.3.2 Security

Frequent inspections of gates and fences will be performed by facility personnel. Evidence of trespassing, vandalism, or illegal operation will be reported to the Operator and/or Owner.

1.4 SIGNAGE

A prominent sign(s) containing the information required by the Division of Waste Management (DWM) will be placed at the main facility entrance. This sign(s) will provide information on operating hours, operating procedures, and acceptable wastes. Additional signage will be provided as necessary within the facility to distinctly distinguish the roadway to the transfer station. Service and maintenance roads for use by operations personnel will be clearly marked and barriers (e.g., traffic cones, barrels, etc.) will be provided as required. This is a private facility, not open to the public; however, contractual arrangements with other solid waste collection companies may allow them access to the facility.

1.5 COMMUNICATIONS

The scale house/office is equipped with telephones in case of emergency and for the conduct of day-to-day business. Emergency telephone numbers are displayed in the scale house and district office.

1.6 FIRE AND SAFETY

1.6.1 Fire Control

The facility is located within the City of Sanford fire district. The primary policy for fire control will be to evacuate the facility, notify the City of Sanford fire department and await their response. In case of minimal fire, 10 ABC fire extinguishers are mounted on both levels of the transfer station facility. All Waste Industries vehicles carry (2) 10 ABC fire extinguishers. A local fire extinguisher company periodically inspects and services the fire extinguishers and conducts training for all Waste Industries personnel.

1.6.2 Safety

All aspects of the operation of the facility were developed with the health and safety of operations staff, customers, and neighbors in mind. Prior to commencement of operations, a member of the operating staff will be designated site safety officer. This individual, together with the facility's management will modify the site safety and emergency response program to remain consistent with National Solid Waste Management Association and Occupational Safety and Health Administration (OSHA) guidance.

Safety equipment provided includes equipment rollover protective cabs, seat belts, audible reverse warning devices, hard hats, safety shoes, and first aid kits. All personnel will be encouraged to complete the American Red Cross Basic First Aid Course. Other safety requirements as designated by the Owner will also be implemented.

1.7 SEVERE WEATHER CONDITIONS

Unusual weather conditions can directly affect the operation of the facility. Some of these weather conditions and recommended operational procedures are as follows.

1.7.1 Ice Storms

An ice storm can make access to the facility dangerous, prevent movement and, thus, may require closure of the facility until the ice is removed or has melted.

1.7.2 Heavy Rains

Exposed soil surfaces can create a muddy situation in some portions of the facility during rainy periods. The control of drainage and use of crushed stone on unpaved roads should provide all-weather access for the site and promote drainage away from critical areas. In areas where the aggregate surface is washed away or otherwise damaged, new aggregate should be used for repair.

1.7.3 Electrical Storms

The open areas of the facility are susceptible to the hazards of an electrical storm. If necessary, operations will be temporarily suspended during such an event. To guarantee the safety of all field personnel, refuge will be taken in the on-site buildings or in rubber-tired vehicles.

1.7.4 Windy Conditions

The tipping area is covered and contained. However, excessively windy conditions may cause some wind-blown waste issues. Facility operations during a particularly windy period may include temporary employees to police wind-blown waste.

1.7.5 Severe Storms

In the event of hurricane, tornado, or severe winter storm warning issued by the National Weather Service, facility operations may be temporarily suspended until the warning is lifted.

1.8 EQUIPMENT REQUIREMENTS

The Owner will maintain on-site equipment required to perform the necessary transfer activities. Periodic maintenance of all equipment, and minor and major repair work, will be performed at designated maintenance zones. Off-site preventative maintenance and repairs is also possible, depending on the specific situation.

1.9 PERSONNEL REQUIREMENTS

At least one member of the supervisory staff will be experienced in the management of transfer station operations. Each facility employee will go through an annual training course (led by supervisory staff). As part of this training, personnel learn to recognize loads which may contain prohibited wastes.

1.10 HEALTH AND SAFETY

All aspects of the transfer station operations were developed with the health and safety of the operating staff, customers, and neighbors in mind. Prior to commencement of operations of the facility, a member of the operating staff will be designated as site safety officer. This individual, together with the facility's management, will modify the site safely and emergency response program to remain consistent with applicable Occupational Safety and Health Administration (OSHA) guidance.

Safety equipment provided includes equipment rollover protective cabs, seat belts, audible reverse warning devices, hard hats, safety shoes, and first aid kits. Facility personnel will be encouraged to complete the American Red Cross Basic First Aid Course. Other safety requirements as designated by the Owner will also be implemented.

Each facility employee will go through annual training course in health and safety (led by supervisory staff). All training shall be documented and attested to by signatures of the trainer and trainee. The following are some general recommendations for the health and safety of workers at the Sanford Transfer Station.

1.10.1 <u>Personal Hygiene</u>

The following items are recommended as a minimum of practice:

- Wash hands before eating, drinking, or smoking.
- Wear personal protective equipment as described in **Section 1.10.2**.
- Wash, disinfect, and bandage ANY cut, no matter how small it is. Any break in the skin can become a source of infection.
- Keep fingernails closely trimmed and clean (dirty nails can harbor pathogens).

1.10.2 Personal Protective Equipment

Personal Protective Equipment (PPE) must be evaluated as to the level of protection necessary for particular operating conditions and then made available to facility employees. The list below includes the PPE typically used and/or required in a solid waste management facility workplace.

- Safety shoes with steel toes.
- Reflective Vests.
- Hard Hats, when not in a piece of equipment or truck.
- Noise reduction protection should be used in areas where extended exposure to continuous high decibel levels is expected.
- Disposable rubber latex or chemical resistant gloves for handling and/or sampling of waste materials.
- Dust filter masks

Following use, PPE's should be disposed of or adequately cleaned, dried, or readied for reuse.

1.10.3 Mechanical Equipment Hazard Prevention

The loaders and other equipment should be operated with care and caution. All safety equipment such as horns, backup alarms, and lights should be functional. A Lockout-Tagout program shall be used to identify equipment in need or under repair and insure that operation is “off-limits” prior to maintenance or repair. All operators shall be trained in the proper operation of equipment.

1.10.4 Employee Health and Safety

Some general safety rules are:

- Consider safety first when planning and conducting activities.
- Review the equipment Operation & Maintenance Manual prior to attempting repairs/changes.
- Remember the buddy system in case of repair of mechanical equipment.
- Clearly post emergency contact phone numbers.
- Provide easy and visible access to the Right To Know materials.
- Provide easy and visible access to the first aid kit and fire extinguishers.

1.10.5 Physical Exposure

Facility personnel may come in contact with the fluids, solids, and airborne constituents found at the transfer. Routine training should be conducted regarding the individual and collective materials used in the facility and their associated hazards. Training concerning safe work practices around these potential exposures should use equipment and proper disposal procedures.

1.10.6 Material Safety Data Sheets

Material Safety Data Sheets (MSDS) shall be collected on every waste (if available) that enters the facility. Information shall also be made available for all chemicals stored on site. MSDS sheets shall be stored in a location with all other Right-To-Know information for the site.

1.11 UTILITIES

Electrical power, water, and telephone will be provided at the scale house. Water and electrical power will be available at the Transfer Station Building. Restrooms for site employees will be provided at the site in the scale house.

1.12 RECORD KEEPING PROGRAM

The Owner will maintain the following records in an operating record at the landfill:

A. Waste inspection records (see **Section 2.4**);
B. Daily tonnage records – including source of generation, scale certifications;
C. Waste determination records;
D. List of generators and haulers that have attempted to dispose of restricted wastes;
E. Employee training procedures and records of training completed;
F. Leachate management records (see **Section 3.3.3**);
G. Annual facility reports;
H. Cost estimates for financial assurance documentation.

The operating record will be kept up to date by the Owner or his designee. It will be presented upon request to the Division of Waste Management for inspection. A copy of this **Operations Manual** will be kept at the facility and will be available for use at all times.

SECTION 2.0
WASTE HANDLING OPERATIONS

2.1 OVERVIEW

This section describes the required waste handling operations for the Sanford Transfer Station facility. The solid waste processed through the Transfer Station could be a portion of the waste stream generated in Lee, Moore, Chatham, Wake, Harnett, Randolph, Montgomery, Hoke, Cumberland, Scotland and Richmond counties. The waste stream will consist of Municipal Solid Waste (MSW).

2.2 ACCEPTABLE WASTES

2.2.1 MSW Transfer Station

Only the waste as defined by 15A NCAC 13A .0101(36) may be received at the Transfer Station. Employees are trained to recognize unacceptable and hazardous materials and to properly segregate and dispose of them.

2.3 PROHIBITED WASTES

2.3.1 MSW Transfer Station

Only wastes as defined in **Section 2.2.1** above may be accepted in the MSW transfer station. Industrial wastewater sludges, asbestos and commercial animal waste (i.e. animal shelter waste) will not be transferred through this facility. No other wastes may be accepted including the following wastes:

- Whole Scrap Tires
- Used Oil
- White Goods
- Lead Acid Batteries
- Yard Waste
- Discarded computer equipment
- Oyster shells
- Rigid plastic containers
- Aluminum cans

In addition, operating criteria prohibit other materials from receipt by the MSW transfer station. These materials are:

- Hazardous waste as defined by 15A NCAC 13A .0101(11), including hazardous waste from conditionally exempt small quantity generators.
- Polychlorinated biphenyls (PCB) wastes as defined in 40 CFR 761 with the exception of trace amounts found in materials such as consumer electronics.
- Bulk or non-containerized liquid wastes unless the waste is household waste other than septic waste and waste oil; or the waste is leachate or gas condensate derived from the MSW landfill unit. A liquid determination will be performed by the standard Paint Filter test.
- Containers holding liquid wastes unless the waste is household waste.

2.4 WASTE SCREENING PROGRAMS

To assure that prohibited wastes are not entering the facility, screening programs will be implemented. Waste received at both the scale house entrance and waste taken to the tipping area will be screened by trained personnel. These individuals have been trained to spot indications of suspicious wastes, including: hazardous placarding or markings, liquids, powders or dusts, sludges, bright or unusual colors, drums or commercial size containers, and chemical" odors. Screening programs for visual and olfactory characteristics of prohibited wastes are an ongoing part of the facility operation.

2.4.1 Waste Receiving and Inspection

All vehicles must stop at the scale house located in proximity to the entrance of the facility, and visitors are required to sign-in. All waste transportation vehicles are weighed and the content of the load assessed. The scale attendant(s) requests from the driver of the vehicle a description of the waste it is carrying to ensure that unacceptable waste is not allowed into the facility. The attendant(s) then visually check the vehicle as it crosses the scale. Signs informing users of the acceptable and unacceptable types of waste are posted at the scale house. Once passing the scales, the vehicles are routed to the appropriate area of the Transfer Station.

Vehicles will be randomly selected for screening on a regular basis, depending on personnel available. At least one vehicle per week will be randomly selected by inspection personnel. A random truck number and time will be selected (e.g., the tenth load after 10:00 a.m.) on the day of inspections. However, in the event that suspicious materials are spotted in any waste load, that load will be inspected further.

Vehicles selected for inspection are to be directed to an area on the tipping floor where the vehicle will be unloaded. Waste is carefully spread using suitable equipment. An attendant trained to identify wastes that are unacceptable inspects the waste discharged at the screening area. If unacceptable waste is found, the entire load will be isolated, reloaded, and the generator/hauler will be logged and escorted out of the facility.

For unacceptable wastes that are non-hazardous, the Owner will then notify officials of the Division of Waste Management (see **Section 1.2.2**) within 24 hours of attempted

disposal of unacceptable waste to determine the proper course of action. The hauler is responsible for removing unacceptable waste from the facility property.

If no unacceptable waste is found, the load will be loaded into the transfer trailer. All random waste inspections will be documented by operations staff.

In addition to random waste screening described above, waste unloaded on the tipping floor face will be inspected by the equipment operators, trained to spot unacceptable wastes, before and during loading into the transfer trailer, Any suspicious looking waste will be reported immediately to the designated primary inspector for further evaluation.

2.5 FACILITY OPERATIONS

2.5.1 Operating Capacity

The Operating capacity for the transfer area is estimated to be up to approximately 500 tons per day of MSW.

2.5.2 Service Area

The solid waste processed through the Transfer Station will be a portion of the waste stream generated in Lee, Moore, Chatham, Wake, Harnett, Randolph, Montgomery, Hoke, Cumberland, Scotland and Richmond counties

2.5.3 Disposal Facility

The Sampson County Landfill, located in Roseboro, North Carolina and operated under Permit Number 82-02 will be the primary disposal site. Waste prohibited or requiring special handling at the receiving landfills will not be allowed into the Transfer Station.

2.5.4 Personnel Requirements

The anticipated personnel requirements for operation and maintenance of the Transfer Station are listed in the following table.

Description	Primary Function (Allocation)
1) Site Manager/Scale house Attendant	Overall management of the facility. Receiving and weight for incoming loads
3) Operators (1 or 2)	Management of tipping floor
4) Commercial Drivers (Varies)*	Transfer of MSW Waste
5) Labor (1 to 2)	General labor and operational staff around the site

* Commercial drivers subject to change in response to actual volume of waste received.

2.5.5 Equipment Requirements

The anticipated equipment requirements for operation and maintenance of the site are listed in the following:

(1) Wheel loader
(2) Various sizes of sealed transfer trailers
(3) 100,000 lb. certified truck scale at facility entrance

2.5.5 Building Features

The anticipated building features of the Transfer Station are listed in the following table.

Description	MSW
1) Roof	Yes
2) Sides (3)	Yes
3) Concrete Floor	Yes
4) Leachate Collection	Yes
5) Ventilation	Yes
6) Water Supply	Yes
7) Lighting	Yes
8) Interior Office & Bathrooms	No
9) Explosive Gas Monitoring	Yes
10) Communications (Telephone, Radios, Cell Phones)	Yes
11) Fire Suppression/Sprinkler System	No

2.6 TRANSFER OPERATIONS

2.6.1 Access

Traffic will be clearly directed to the appropriate area of the Transfer Station. Traffic speed on the site should be less than 10 MPH. Rutting of gravel roadway surfaces must be repaired by placement of additional gravel on the roadway and not solely by grading the rut. This will maintain the separator geotextile placed below all gravel roadway surfaces.

2.6.2 General Procedures

The transfer operations will be conducted in accordance with the approved Operation Plan and conditions of the Solid Waste Permit issued by the NC DENR DWM.

Facility operations are anticipated as follows:

1. Collection vehicles delivering waste to the facility will enter through the main entrance;
2. Pass through the scales and scale house for weight;
3. Continue along the access road until reaching the transfer station tipping area;
4. The attendant will direct vehicles, waiting to unload, to back into the facility through the entrance. Adequate area is available in front of the transfer area for drivers to queue their vehicles into a backing maneuver. Station operating personnel will be on the station floor to direct and guide the vehicles.
5. The vehicles will back onto the tipping floor to an area designated by the attendant.
6. Once the vehicle is in position, the waste load will be discharged directly onto the tipping floor. The Facility is equipped with 10-ft tall steel clad "push walls" as well as 4-ft tall "lift-over walls. These walls line the interior of the building and create temporary storage areas for the waste and a loading area for the transfer trailers.
7. A spotter will inspect the discharged waste before it is mixed with other waste on the tipping floor and pushed into the temporary storage area by a wheel loader.
8. When appropriate, the waste will be picked up by the wheel loader and loaded into open top transfer trailers, specifically designed for hauling MSW waste, located in the lower level of the Transfer Station.
9. Once loaded, the transfer trailers will be removed from the Transfer Station and tarped. It will then either be placed in a parking spot to wait for a road tractor, or if a road tractor is available, the loaded trailer will be hauled from the site immediately.

A site plan is shown on Figure 2.

SECTION 3.0

ENVIRONMENTAL MANAGEMENT

3.1 OVERVIEW

This section reviews the overall environmental management tasks required for the successful operation of the facility.

3.2 SURFACE WATER CONTROL

Proper control of surface water at the transfer area will accomplish the following goals:

- Prevent the run-on of surface water into waste handling area(s);
- Prevent the run-off of surface water that has come into contact with the waste (i.e. leachate);
- Limit the erosion caused by surface waters; and
- Limit sediments carried off-site by surface waters.

The design of the building and site protects surface and ground water from contamination through contact with waste. The tipping of the transfer station is isolated from the site by building walls, push walls, a rollover curb at the front of the building and the fact the site is graded to drain away from the building. Liquid from the waste and from washing down the building interior/ tipping floor is directed to collections sumps and then to the sanitary sewer system. The tipping floor is sloped to drain towards the lift over wall. Scupper holes in the wall allow water to flow to two floor drains. The loading pit floor is also sloped to the floor drains. A schematic of the building with floor slopes is included on Figure 2.

Erosion and sedimentation control plans for the site have been approved by NC DENR, Raleigh Regional Office. These plans describe engineered features and practices for preventing erosion and controlling sedimentation during construction of the site. The City of Sanford does not have a Phase 2 post construction storm water requirement at this time.

3.2.1 <u>Erosion and Sedimentation Control</u>

The facility design includes a temporary skimmer sedimentation basin located on the western property line. Surface water flows at the site generally convey site runoff to the pond. All site features should be inspected regularly for erosion damage and promptly repaired. Upon final site stabilization, this basin will be removed and stabilized.

3.3 LEACHATE MANAGEMENT

The leachate management system for the proposed Transfer Station consists of concrete tipping floor, collection drains, an oil/water separator and a direct connection to a sanitary sewer system.

3.3.1 Leachate Collection

As described above, leachate drains from the tipping floor through scupper holes in the lift over wall to drains in the load-out pit floor. Removable screens in the floor drains keep gross contaminants out of the piping and oil water separator. Piping directs the flow by gravity to an oil/water separator. The leachate then flows through gravity piping to the City of Sanford sanitary sewer

3.3.2 Inspections and Maintenance

The facility staff should inspect the drain pit screens on a regular basis and should remove gross contaminants as required. The oil/water separator should be inspected regularly and must be cleaned as required.

3.3.3 Record Keeping

Accurate records will be maintained at the facility in accordance with **Section 1.12**.

3.4 VECTOR CONTROL

Vector control at the site will be handled primarily by proper housekeeping. Under normal operating conditions, all waste will be removed from the floor during the current operation shift. Except in an emergency, solid waste will not remain on-site for more than 48 hours. A local pest control contractor will be used to further control insects and rodents, if necessary. If vector control becomes a problem, additional measures will be taken to ensure the protection of human health.

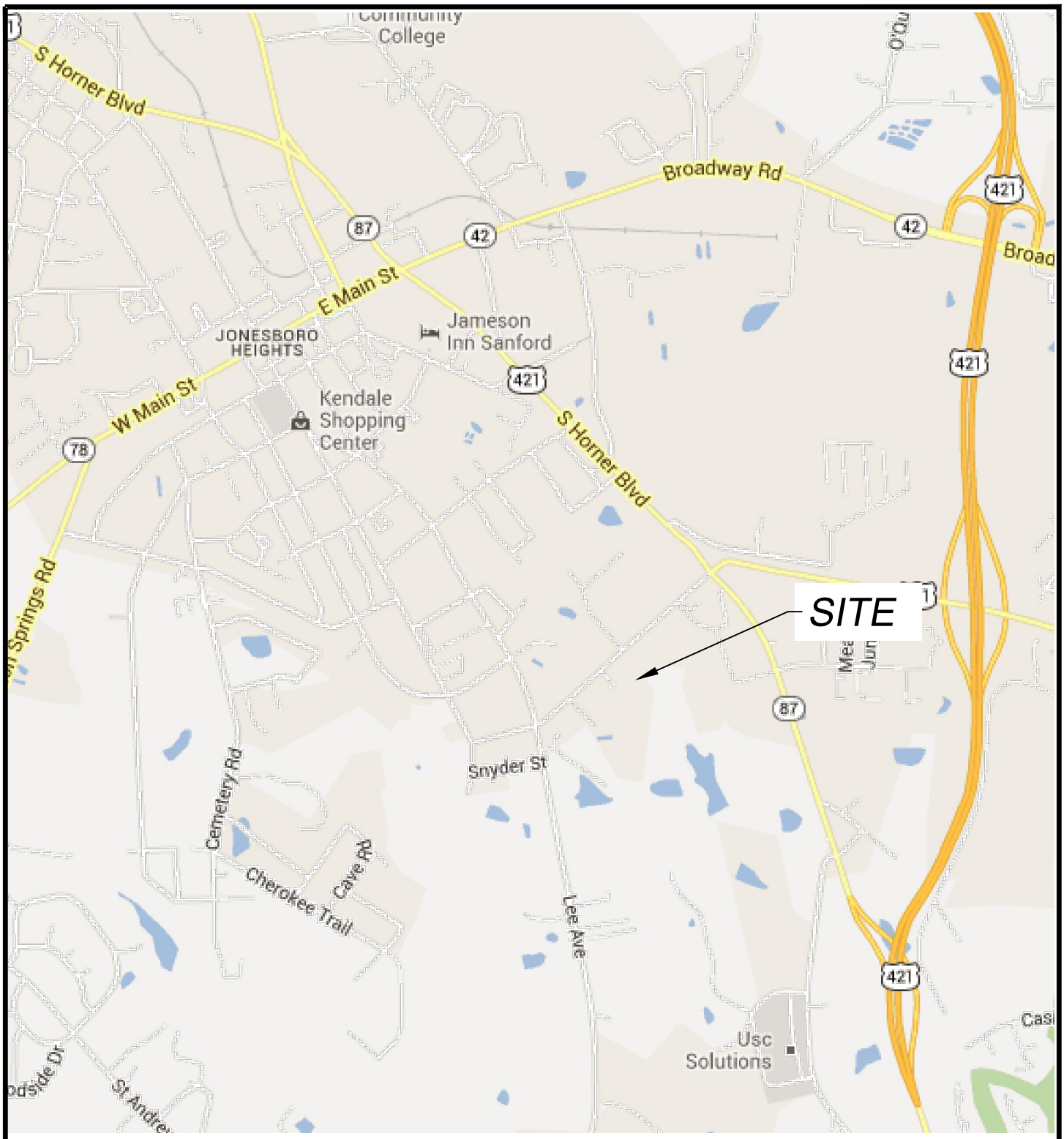
3.5 ODOR CONTROL

Odorous or potentially odorous materials will be pushed into the transfer truck covered as soon as possible to avoid odor problems. Additionally, the transfer areas will be cleaned and swept daily and washed down weekly, at a minimum. If odor control becomes a problem, additional measures will be taken to ensure odor control.

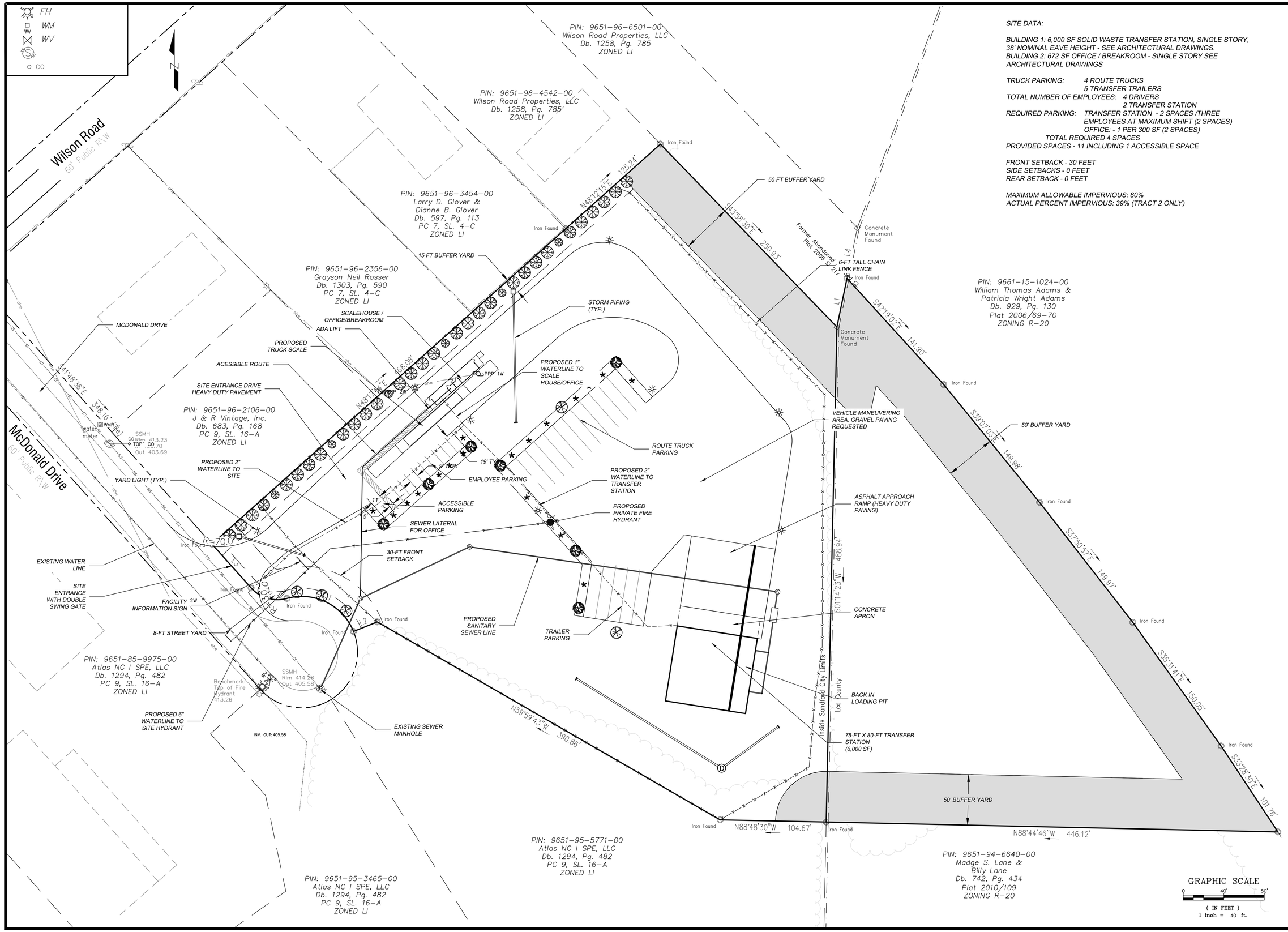
3.6 DUST CONTROL

Dust related to waste hauler traffic on the access roads will be minimized by using a water truck or a sprinkler system to limit dust on the gravel portion of the road.

FIGURES



VICINITY MAP	SANFORD TRANSFER STATION SANFORD, NC	BARNARD ENGINEERING, P.C. 1534 Saratoga Blvd. (704) 628-0344 Indian Trail, NC 28079 (678) 232-8967 www.barnardengineeringpc.com N.C. License No. C-3679
FIGURE-1	WASTE INDUSTRIES 3301 BENSON DRIVE RALEIGH, NC 27609	



SITE DATA:

BUILDING 1: 6,000 SF SOLID WASTE TRANSFER STATION, SINGLE STORY, 38' NOMINAL EAVE HEIGHT - SEE ARCHITECTURAL DRAWINGS.
BUILDING 2: 672 SF OFFICE / BREAKROOM - SINGLE STORY SEE ARCHITECTURAL DRAWINGS

TRUCK PARKING: 4 ROUTE TRUCKS
5 TRANSFER TRAILERS
TOTAL NUMBER OF EMPLOYEES: 4 DRIVERS
2 TRANSFER STATION
REQUIRED PARKING: TRANSFER STATION - 2 SPACES /THREE EMPLOYEES AT MAXIMUM SHIFT (2 SPACES)
OFFICE: - 1 PER 300 SF (2 SPACES)
TOTAL REQUIRED 4 SPACES
PROVIDED SPACES - 11 INCLUDING 1 ACCESSIBLE SPACE

FRONT SETBACK - 30 FEET
SIDE SETBACKS - 0 FEET
REAR SETBACK - 0 FEET

MAXIMUM ALLOWABLE IMPERVIOUS: 80%
ACTUAL PERCENT IMPERVIOUS: 39% (TRACT 2 ONLY)

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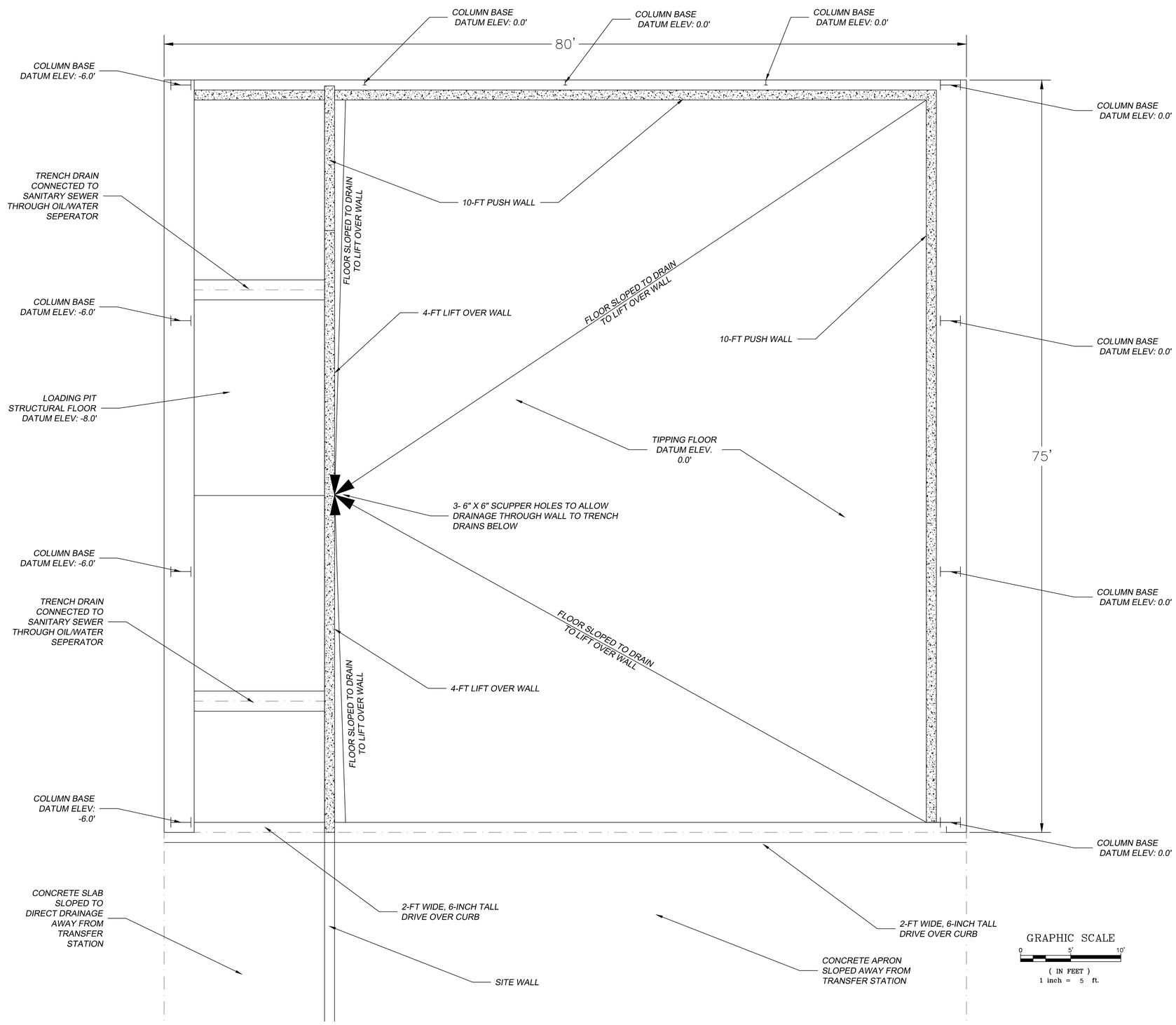
NO.	DATE	BY	REVISION

SANFORD TRANSFER STATION
SANFORD NC
WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

SITE PLAN

DESIGNED	JDB	CHECKED	JDB
DRAWN	JDB	PROJECT NO.	2013-5
SCALE	AS SHOWN	DATE	6/8/2013

SHEET:
FIGURE 2



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SANFORD TRANSFER STATION

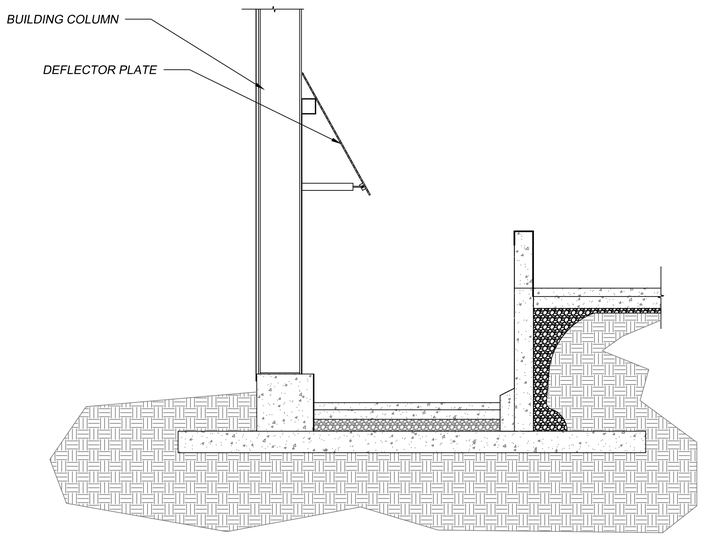
WASTE INDUSTRIES

TRANSFER STATION SCHEMATIC FLOOR PLAN

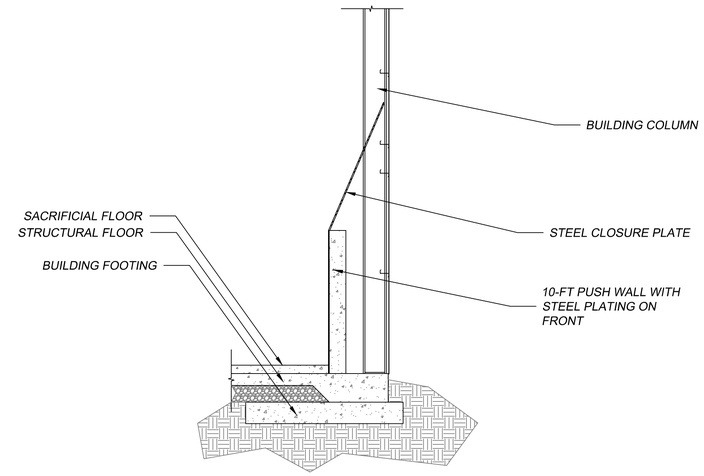
DESIGNED	JDB	CHECKED	JDB
DRAWN	JDB	PROJECT NO.	2013-5
SCALE	AS SHOWN	DATE	8/2013

SHEET:

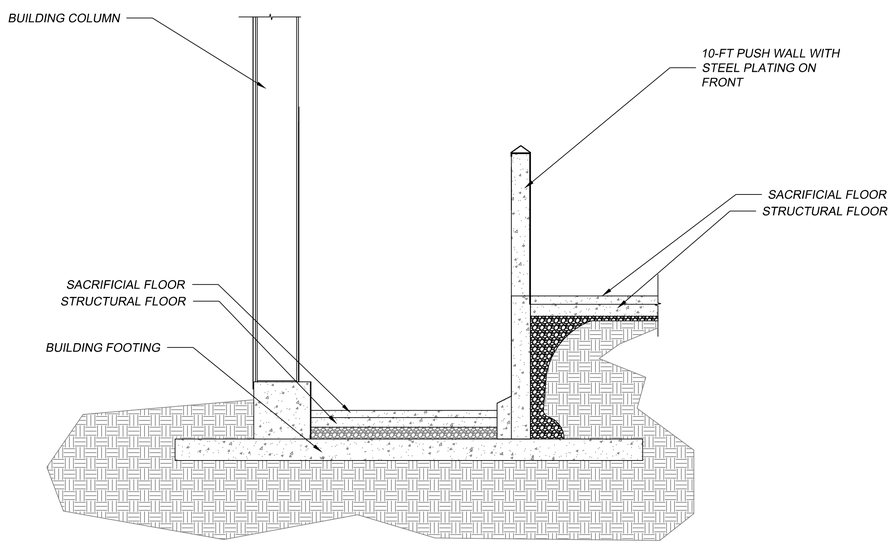
FIGURE 3



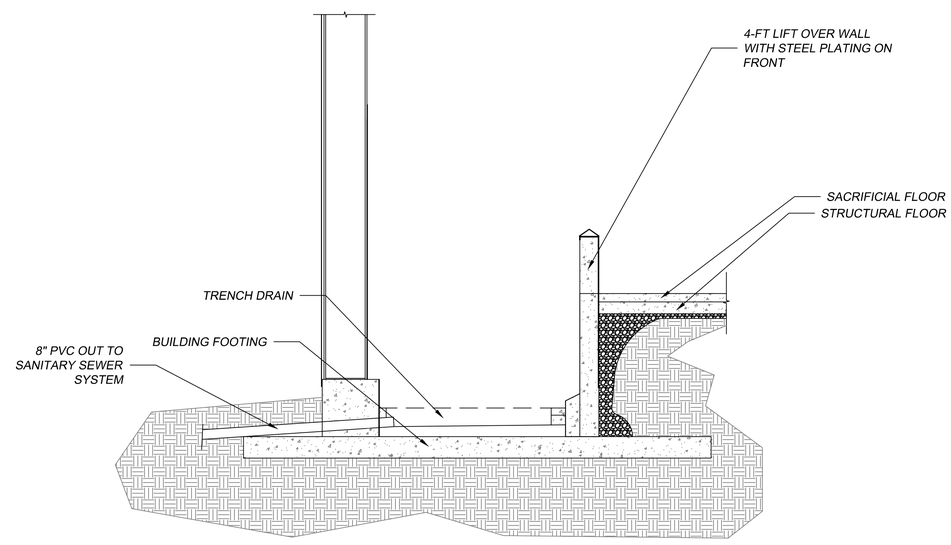
SECTION THROUGH LOADING PIT
AT 4-FT LIFT OVER WALL



SECTION THROUGH TIPPING
FLOOR AT 10-FT PUSH WALL



SECTION THROUGH LOADING PIT
AT 10-FT PUSH WALL



SECTION THROUGH LOADING PIT
AT 4-FT LIFT OVER WALL
SHOWING DRAIN

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NO.	DATE	BY	REVISION

SANFORD TRANSFER STATION

WASTE INDUSTRIES

TRANSFER STATION SCHEMATIC
TYPICAL SECTIONS

DESIGNED	JDB	CHECKED	JDB
DRAWN	JDB	PROJECT NO:	2013-5
DATE	8/2013		
SCALE	NTS		

SHEET:
FIGURE
3A

SANFORD TRANSFER STATION

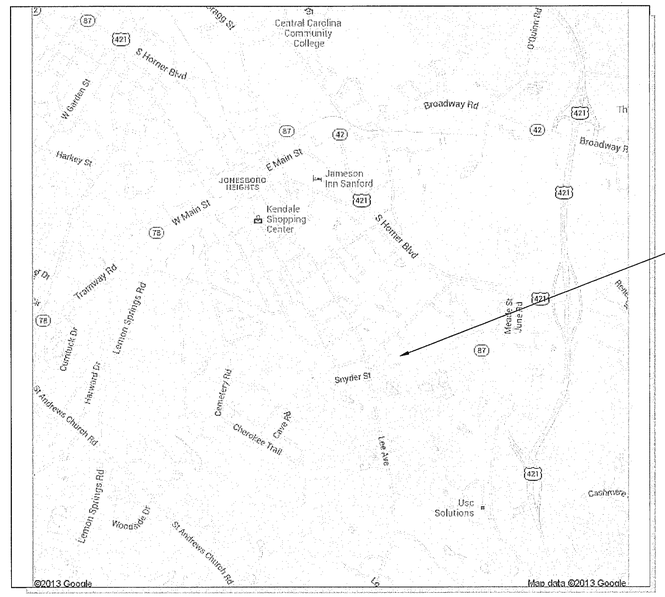
SANFORD NC

Project Number: 2013-5

SITE AND DEVELOPMENT DATA	
JURISDICTION	SANFORD NC
TAX PARCEL(S):	TRACT 1 – 9661-05-0902-00
	TRACT 2 – 9651-96-5089-00
SITE ADDRESS:	3290 McDONALD DRIVE, SANFORD NC 27332
ZONING	TRACT 1: LI
	TRACT 2: LI
PROPOSED ZONING	LI
USE CLASSIFICATION	LIGHT INDUSTRIAL
TOTAL AREA	8.40 ACRES
AREA IN LOTS.	N/A
COMMON AREA	N/A
RIGHT-OF-WAY	N/A
MINIMUM FRONT SETBACK	30 FT
MINIMUM CORNER/SIDE SETBACK	0/0
MINIMUM REAR SETBACK	0
MINIMUM LOT SIZE	N/A
MINIMUM LOT WIDTH	80'
MAXIMUM IMPERVIOUS PERCENTAGE	80

APPROVED
DIVISION OF WASTE MANAGEMENT
SOLID WASTE SECTION
Date 12/03/2013 By Patricia A. Beckwith
DIN 20101
Attachment 1 Part VI Document 1
Permit 5305-TRANSFER-2013 Permit DIN 20102

OWNER: WASTE INDUSTRIES
STREET ADDRESS: 3301 BENSON DRIVE
CITY, STATE , ZIP: RALEIGH, NC 27609
PHONE: (919) 325-3000
FAX: (919) 872-1471
CONTACT: DAVID PEPPER



PROJECT LOCATION MAP

NOT TO SCALE

Sheet List Table	
Sheet Number	Sheet Title
C-0	COVER
C-1	Existing Conditions
C-2	DEMOLITION PLAN
C-3	SITE PLAN
C-4	OVERALL GRADING
C-4A	DETAIL GRADING
C-4B	PAVING SCHEDULE
C-5	LANDSCAPING AND LIGHTING PLAN
C-6	EROSION AND SEDIMENTATION CONTROL PLAN PHASE 1
C-7	EROSION AND SEDIMENTATION CONTROL PLAN PHASE 2
C-8	STORM DETAILS 1 OF 2
C-9	Storm Details 2 OF 2
C-10	TEMPORARY SEEDING
C-11	PERMANENT SEEDING
C-12	EROSION CONTROL DETAILS 1 OF 3
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C-14	EROSION CONTROL DETAILS 3 OF 3
C-15	GENERAL NOTES
U-1	OVERALL UTILITIES
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U-3	SCALEHOUSE LATERAL PLAN AND PROFILE
U-4	FIRELINE PROFILE
U-5	WATER DETAILS
U-6	SEWER DETAILS

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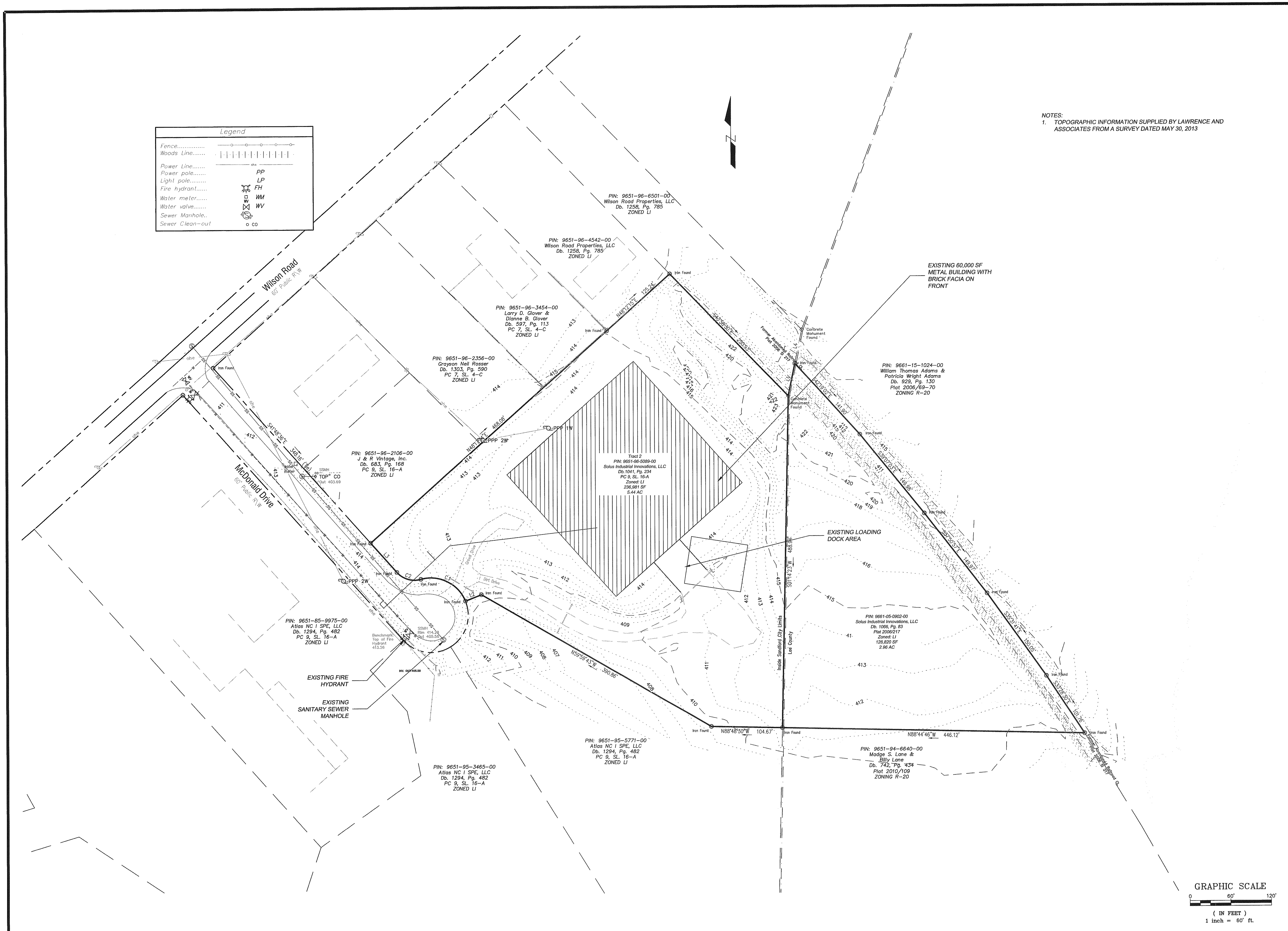
CALL 1-800-632-4949
N.C. ONE-CALL CENTER
IT'S THE LAW!

NO.	DATE	BY	REVISION
1	7-26-13	JDB	TRC REVIEW
2	7-30-13	JDB	NCDENR LAND QUALITY REVIEW



NOTES:
1. TOPOGRAPHIC INFORMATION SUPPLIED BY LAWRENCE AND ASSOCIATES FROM A SURVEY DATED MAY 30, 2013

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NO.	DATE	BY	REVISION

SANFORD TRANSFER STATION
SANFORD NC

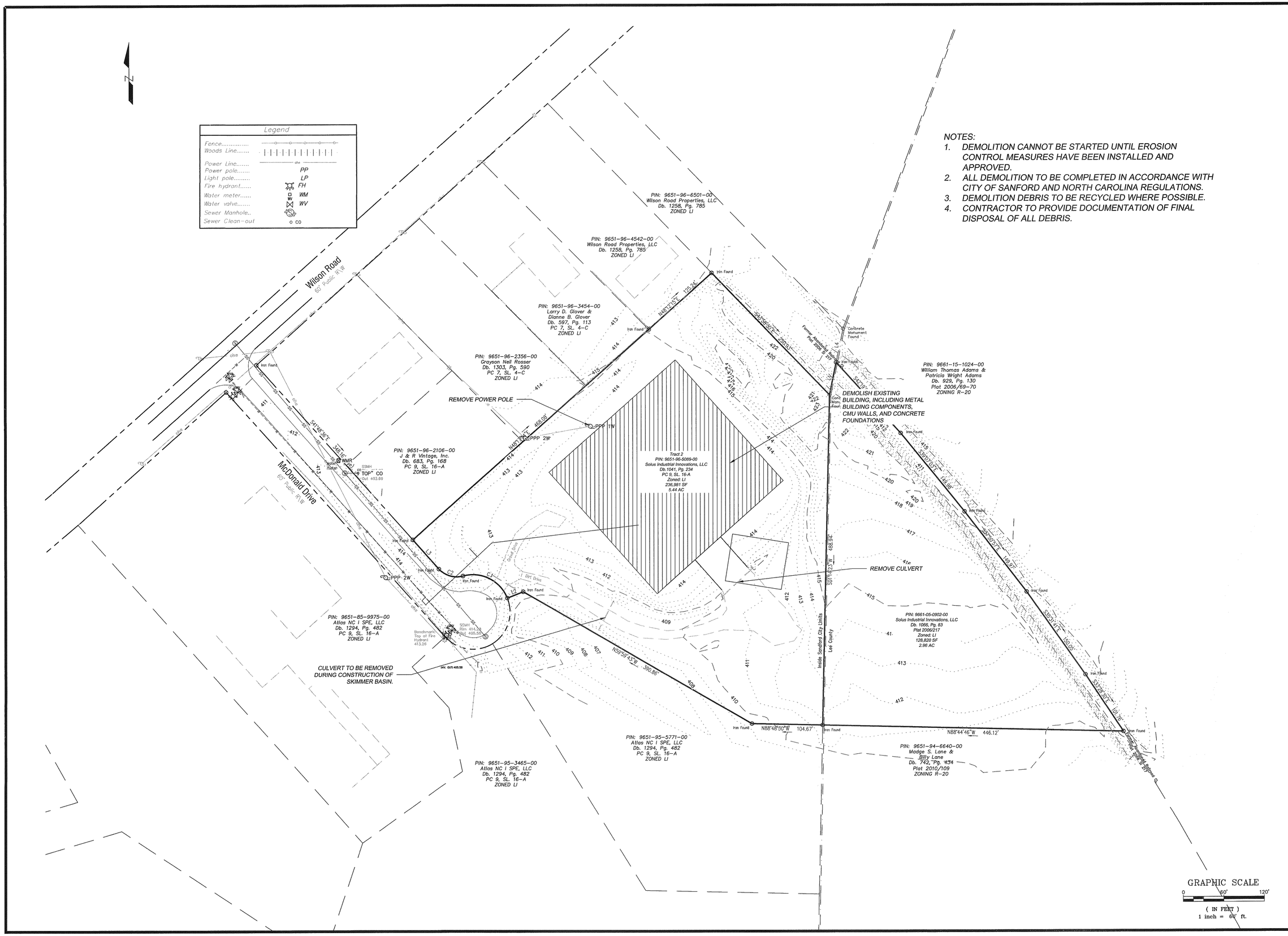
WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

EXISTING CONDITIONS

DESIGNED	JDB	DRAWN	JDB	CHECKED	JDB
SCALE	AS SHOWN	DATE	6/8/2013	PROJECT NO.:	2013-5

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19665 JOHN D. BARNARD

SHEET:
C-1



NOTES:

1. DEMOLITION CANNOT BE STARTED UNTIL EROSION CONTROL MEASURES HAVE BEEN INSTALLED AND APPROVED.
2. ALL DEMOLITION TO BE COMPLETED IN ACCORDANCE WITH CITY OF SANFORD AND NORTH CAROLINA REGULATIONS.
3. DEMOLITION DEBRIS TO BE RECYCLED WHERE POSSIBLE.
4. CONTRACTOR TO PROVIDE DOCUMENTATION OF FINAL DISPOSAL OF ALL DEBRIS.

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NO.	DATE	BY	REVISION

SANFORD TRANSFER STATION
SANFORD NC

WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

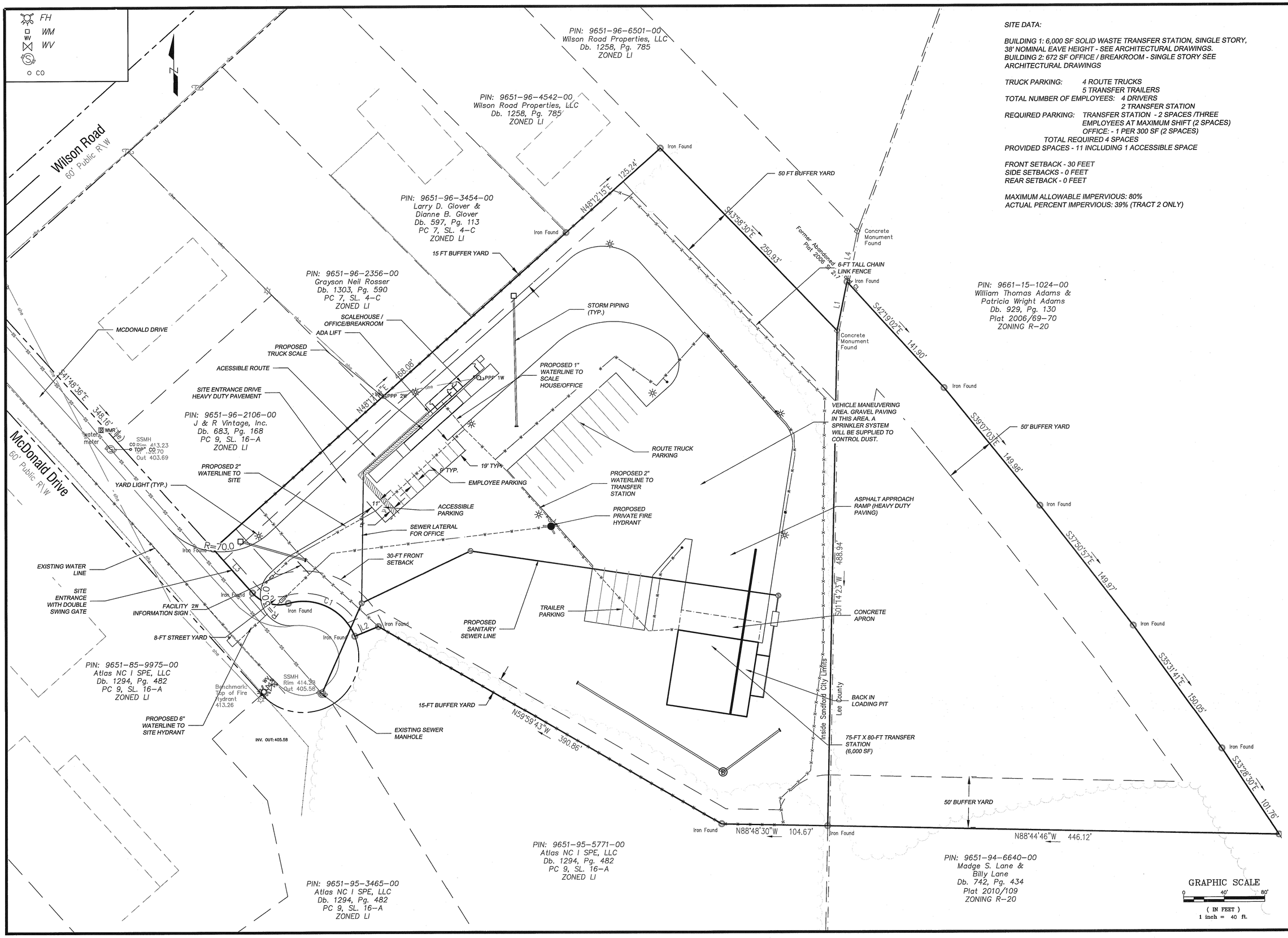
DEMOLITION PLAN

DESIGNED	JDB	CHECKED	JDB
DRAWN	JDB	PROJECT NO.	2013-5
SCALE	AS SHOWN	DATE	6/8/2013

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19665 JOHN D. BARNARD

SHEET:

C-2



SITE DATA:

BUILDING 1: 6,000 SF SOLID WASTE TRANSFER STATION, SINGLE STORY, 38' NOMINAL EAVE HEIGHT - SEE ARCHITECTURAL DRAWINGS.
BUILDING 2: 672 SF OFFICE / BREAKROOM - SINGLE STORY SEE ARCHITECTURAL DRAWINGS

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REQUIRED PARKING: TRANSFER STATION - 2 SPACES /THREE EMPLOYEES AT MAXIMUM SHIFT (2 SPACES)
OFFICE: - 1 PER 300 SF (2 SPACES)
TOTAL REQUIRED 4 SPACES
PROVIDED SPACES - 11 INCLUDING 1 ACCESSIBLE SPACE

FRONT SETBACK - 30 FEET
SIDE SETBACKS - 0 FEET
REAR SETBACK - 0 FEET

MAXIMUM ALLOWABLE IMPERVIOUS: 80%
ACTUAL PERCENT IMPERVIOUS: 39% (TRACT 2 ONLY)

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NO.	DATE	BY	REVISION
1	7-26-13	JDB	TRC REVIEW - ACCESSIBLE SPACE CHANGED TO VAN ACCESSIBLE
2	9-16-13	JDB	ADD 15-FT BUFFER YARD TO SOUTH WEST

SANFORD TRANSFER STATION

SANFORD NC

WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

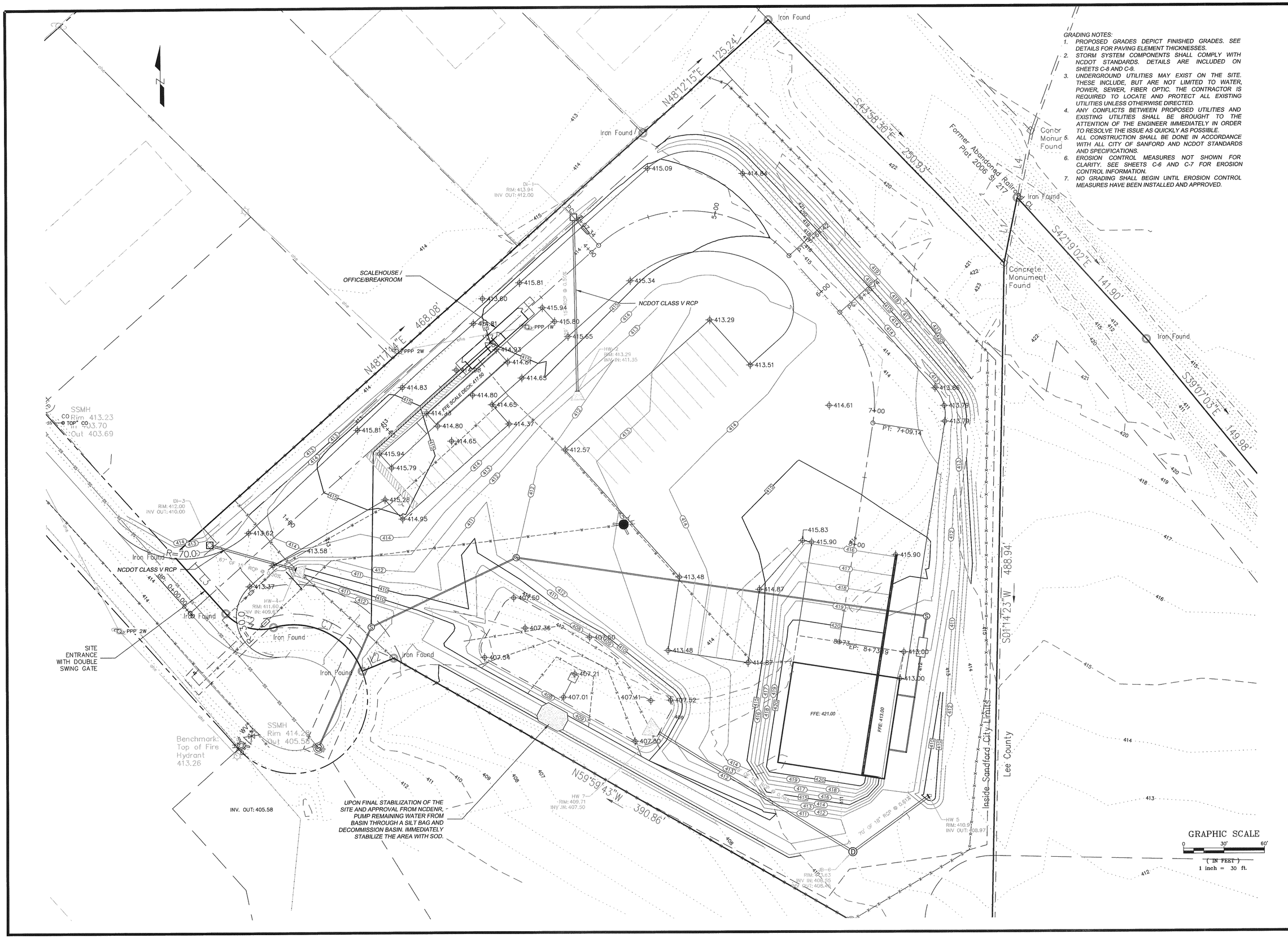
SITE PLAN

DESIGNED	DRAWN	CHECKED
JDB	JDB	JDB
SCALE	DATE	PROJECT NO.
AS SHOWN	6/8/2013	2013-5

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19865 JOHN D. BARNARD, JR.
9/26/13

SHEET:

C-3



GRADING NOTES:

1. PROPOSED GRADES DEPICT FINISHED GRADES. SEE DETAILS FOR PAVING ELEMENT THICKNESSES.
2. STORM SYSTEM COMPONENTS SHALL COMPLY WITH NCDOT STANDARDS. DETAILS ARE INCLUDED ON SHEETS C-8 AND C-9.
3. UNDERGROUND UTILITIES MAY EXIST ON THE SITE. THESE INCLUDE, BUT ARE NOT LIMITED TO WATER, POWER, SEWER, FIBER OPTIC. THE CONTRACTOR IS REQUIRED TO LOCATE AND PROTECT ALL EXISTING UTILITIES UNLESS OTHERWISE DIRECTED.
4. ANY CONFLICTS BETWEEN PROPOSED UTILITIES AND EXISTING UTILITIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY IN ORDER TO RESOLVE THE ISSUE AS QUICKLY AS POSSIBLE.
5. ALL CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH ALL CITY OF SANFORD AND NCDOT STANDARDS AND SPECIFICATIONS.
6. EROSION CONTROL MEASURES NOT SHOWN FOR CLARITY. SEE SHEETS C-6 AND C-7 FOR EROSION CONTROL INFORMATION.
7. NO GRADING SHALL BEGIN UNTIL EROSION CONTROL MEASURES HAVE BEEN INSTALLED AND APPROVED.

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NO.	DATE	BY	REVISION
1	7-26-13	JDB	TRC REVIEW - ACCESSIBLE SPACE CHANGED TO VAN ACCESSIBLE
2	7-30-13	JDB	NCDENR LAND QUALITY REVIEW

SANFORD TRANSFER STATION

SANFORD NC

WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

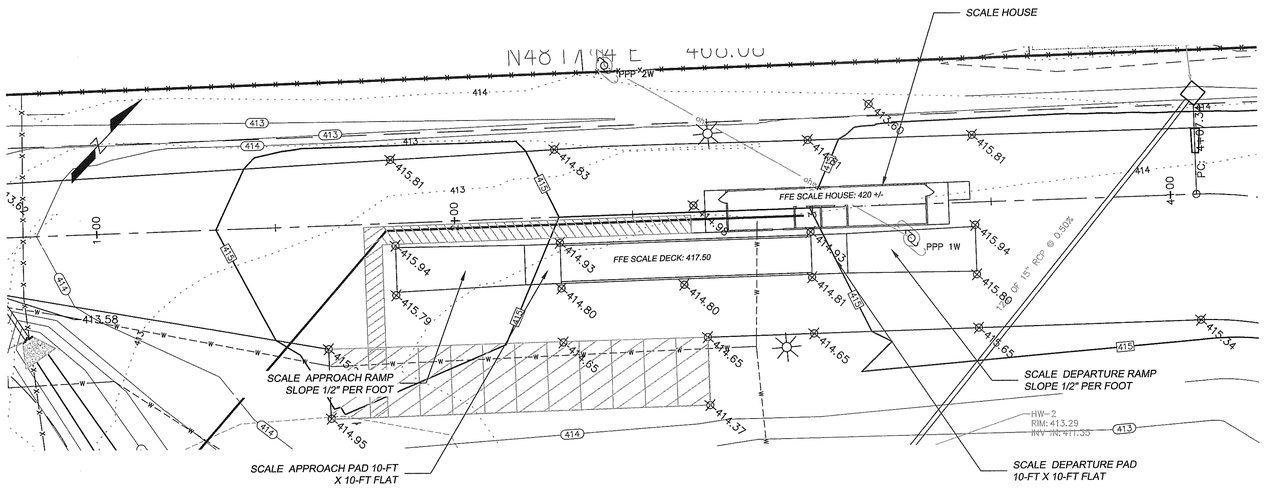
OVERALL GRADING

DESIGNED	DRAWN	CHECKED
JDB	JDB	JDB
SCALE	DATE	PROJECT NO.
AS SHOWN	6/8/2013	2013-5

NORTH CAROLINA PROFESSIONAL SEAL 19665 ENGINEER JOHN D. BARNARD 7/7/13

SHEET:

C-4



GRAPHIC SCALE

0 20' 40'

(IN FEET)
1 inch = 20 ft.

GRADING NOTES:

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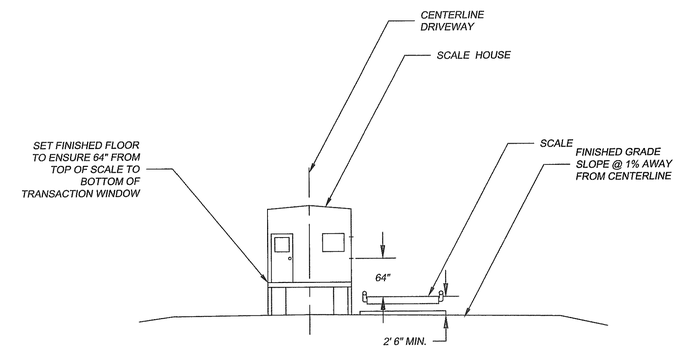
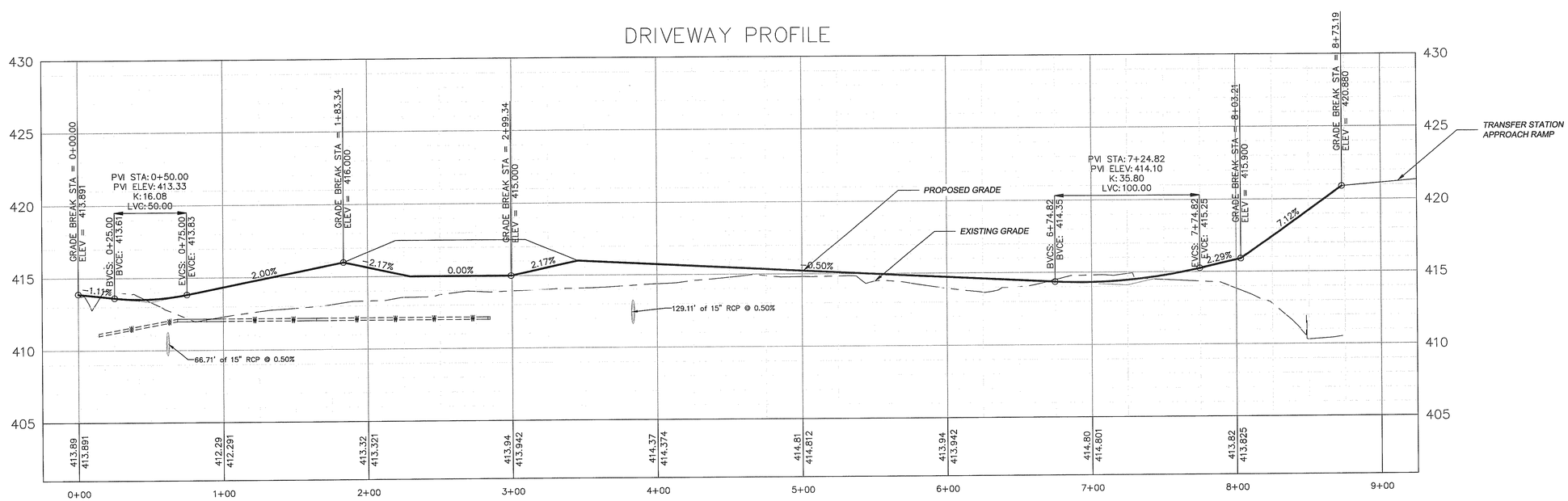


SCHEMATIC SCALE HOUSE SECTION



GRAPHIC SCALE

0 40' 80'

(IN FEET)
1 inch = 40 ft.

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NO.	DATE	BY	REVISION
1	7-26-13	JDB	TRC REVIEW - ACCESSIBLE SPACE CHANGED TO VAN ACCESSIBLE

SANFORD TRANSFER STATION
SANFORD NC

WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

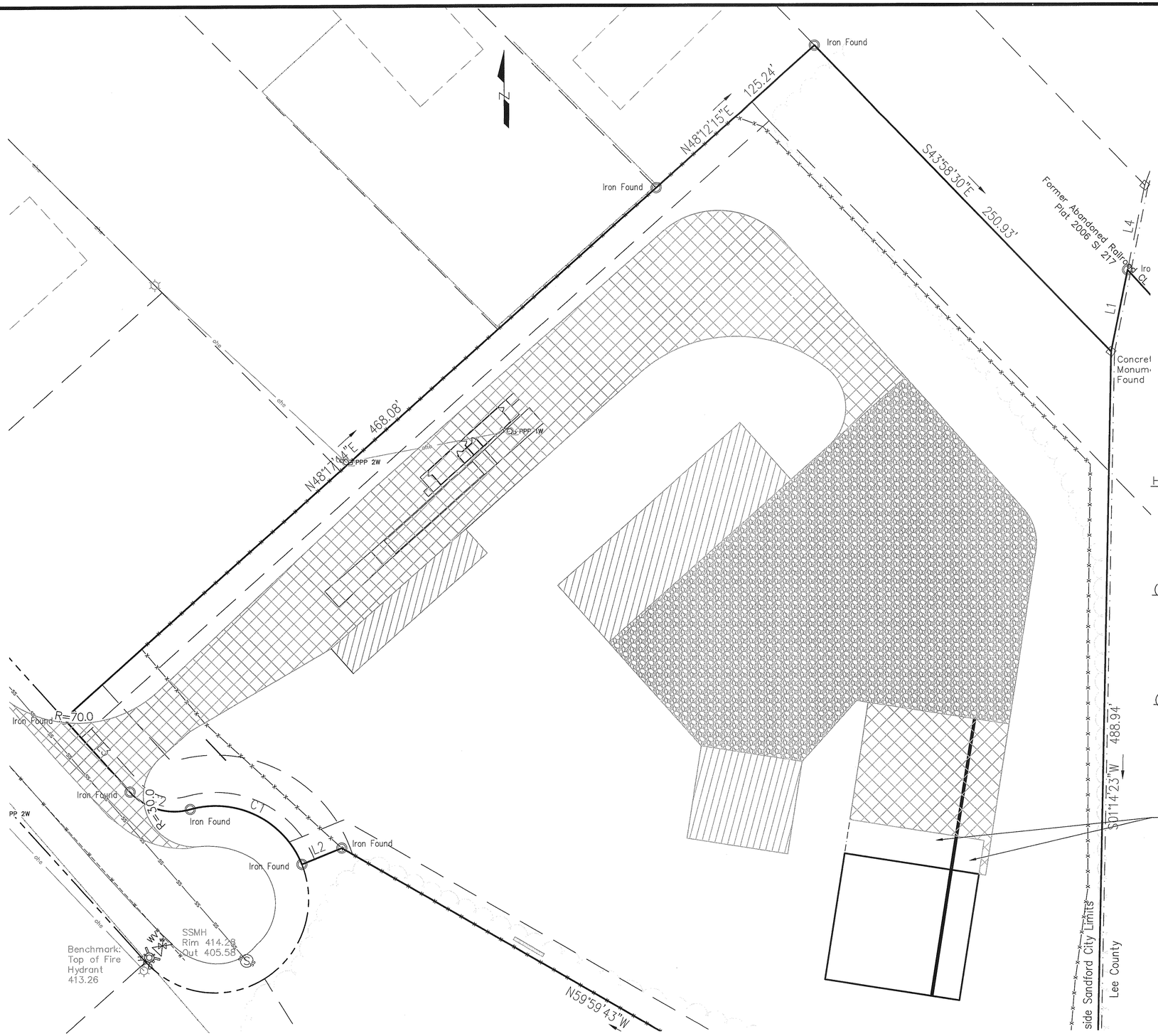
DETAIL GRADING

DESIGNED	DRAWN	CHECKED	PROJECT NO.
JDB	JDB	JDB	2013-5
SCALE	DATE		
AS SHOWN	6/8/2013		

NORTH CAROLINA PROFESSIONAL SEAL 19665 ENGINEER JOHN D. BARNARD

SHEET:

C-4A



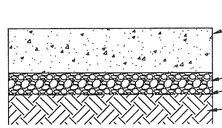
HEAVY DUTY CONCRETE APRON

PAVING SCHEDULE

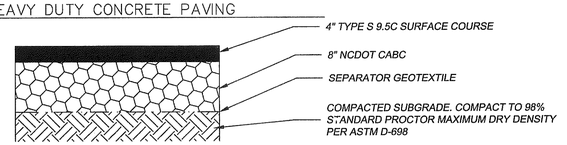
LIGHT DUTY ASPHALT PAVEMENT

HEAVY DUTY ASPHALT PAVEMENT

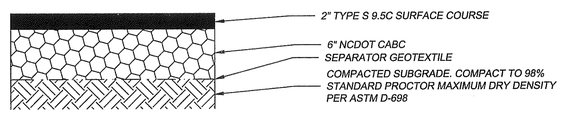
GRAVEL PAVEMENT IF APPROVED



HEAVY DUTY CONCRETE PAVING



(TYPE I) HEAVY DUTY ASPHALT PAVING



(TYPE II) ASPHALT PAVING (LIGHT DUTY)

NOTE: ABC SHALL BE PROOF-ROLLED BEFORE THE FINAL LIFT IS PLACED, AND AS REQUIRED BY THE SPECIFICATIONS.

GRAPHIC SCALE

0 30' 60'

(IN FEET)
1 inch = 30 ft.

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NO.	DATE	BY	REVISION
1	7-26-13	JDB	TRC REVIEW - ACCESSIBLE SPACE CHANGED TO VAN ACCESSIBLE
1	9-24-13	JDB	POST VARIANCE APPROVAL

SANFORD TRANSFER STATION
SANFORD NC

WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

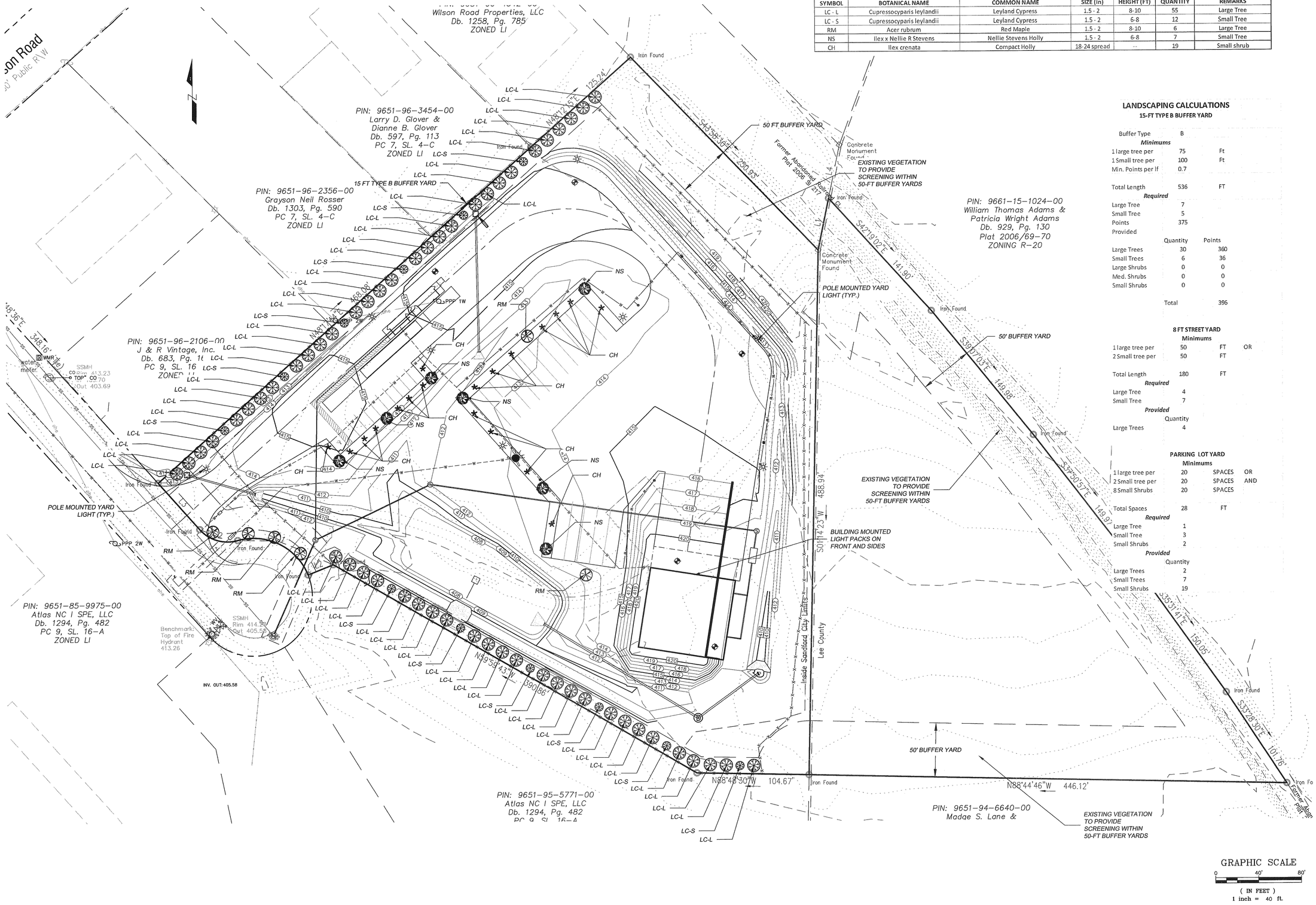
PAVING SCHEDULE

DESIGNED	DRAWN	CHECKED
JDB	JDB	JDB
SCALE	DATE	PROJECT NO.
AS SHOWN	6/8/2013	2013-5

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19665 9/24/2013 JOHN D. BARNARD

SHEET:

C-4B



PLANT LIST

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE (in)	HEIGHT (FT)	QUANTITY	REMARKS
LC - L	Cupressocyparis leylandii	Leyland Cypress	1.5 - 2	8-10	55	Large Tree
LC - S	Cupressocyparis leylandii	Leyland Cypress	1.5 - 2	6-8	12	Small Tree
RM	Acer rubrum	Red Maple	1.5 - 2	8-10	6	Large Tree
NS	Ilex x Nellie R Stevens	Nellie Stevens Holly	1.5 - 2	6-8	7	Small Tree
CH	Ilex crenata	Compact Holly	18-24 spread	--	19	Small shrub

LANDSCAPING CALCULATIONS

15-FT TYPE B BUFFER YARD

Buffer Type	B	
Minimums		
1 large tree per	75	Ft
1 Small tree per	100	Ft
Min. Points per lf	0.7	
Total Length	536	FT
Required		
Large Tree	7	
Small Tree	5	
Points	375	
Provided		
	Quantity	Points
Large Trees	30	360
Small Trees	6	36
Large Shrubs	0	0
Med. Shrubs	0	0
Small Shrubs	0	0
Total		396

8 FT STREET YARD

Minimums			
1 large tree per	50	FT	OR
2 Small tree per	50	FT	
Total Length	180	FT	
Required			
Large Tree	4		
Small Tree	7		
Provided			
	Quantity		
Large Trees	4		

PARKING LOT YARD

Minimums			
1 large tree per	20	SPACES	OR
2 Small tree per	20	SPACES	AND
8 Small Shrubs	20	SPACES	
Total Spaces	28	FT	
Required			
Large Tree	1		
Small Tree	3		
Small Shrubs	2		
Provided			
	Quantity		
Large Trees	2		
Small Trees	7		
Small Shrubs	19		

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NO.	DATE	BY	REVISION
1	7-26-13	JDB	TRC REVIEW - ACCESSIBLE SPACE CHANGED TO VAN ACCESSIBLE
2	9-18-13	JDB	ADD 15-FT BUFFER YARD TO SOUTH WEST

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WASTE INDUSTRIES
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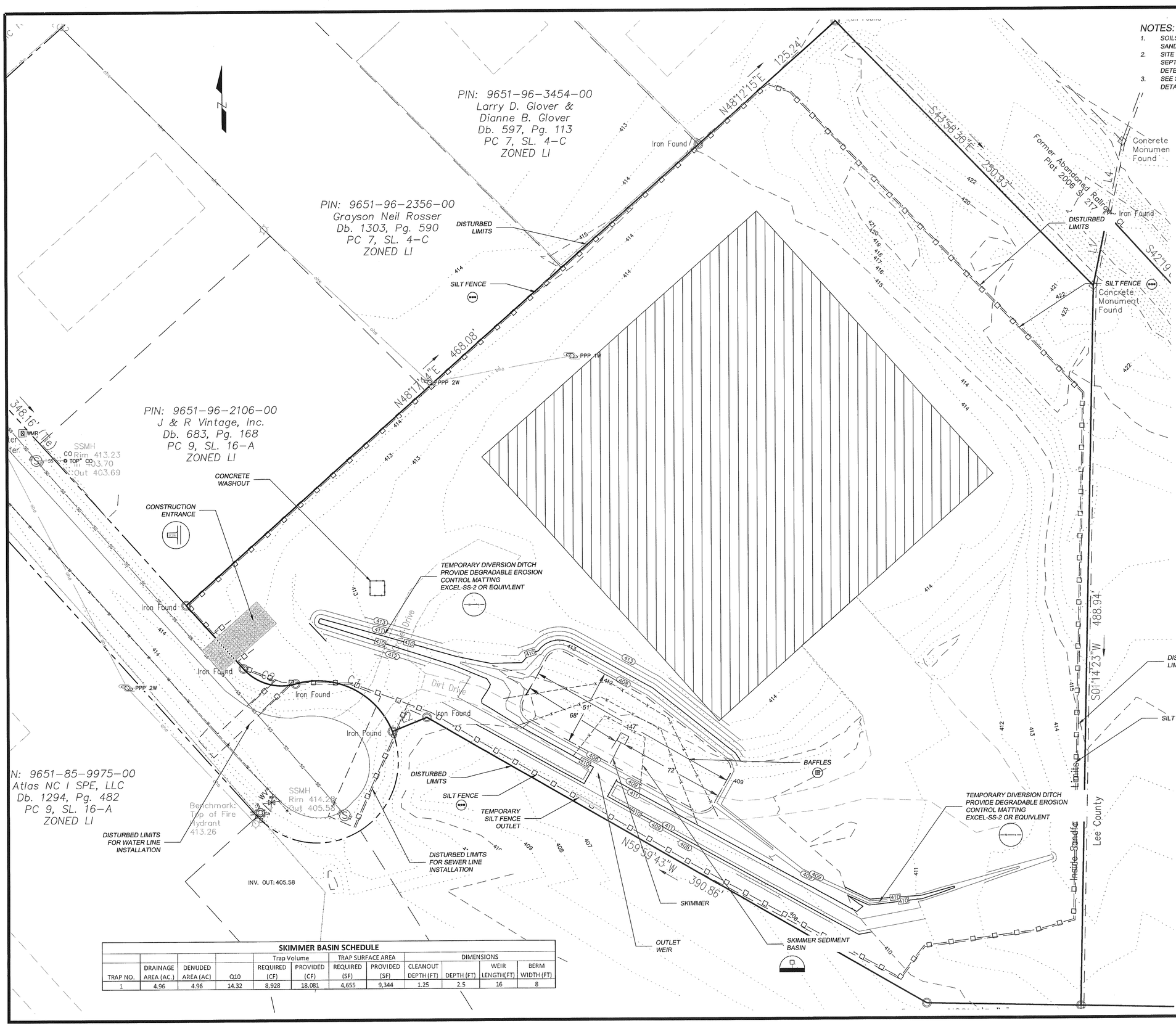
RALEIGH NC

LANDSCAPING AND LIGHTING PLAN

DESIGNED	DRAWN	CHECKED	PROJECT NO.
JDB	JDB	JDB	2013-5
SCALE	DATE		
AS SHOWN	6/8/2013		

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19665 JOHN D. BARNARD 9-24-2013

SHEET:
C-5



NOTES:

1. SOILS ON THIS SITE ARE COMPRISED PRIMARILY OF DOTHAN LOAMY SAND WHICH IS A HYDROLOGIC GROUP B SOIL.
2. SITE IS LOCATED ON FEMA FIRM PANEL 3710965100J, EFFECTIVE DATE SEPTEMBER 6, 2006. THE SITE IS LOCATED IN ZONE X, THE AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.
3. SEE SUBSEQUENT SHEETS FOR ADDITIONAL EROSION CONTROL DETAILS

CONSTRUCTION SEQUENCE:

1. CONTRACTOR SHALL CONTACT LAND QUALITY PRIOR TO BEGINNING CONSTRUCTION TO SCHEDULE PRECONSTRUCTION MEETING.
2. CONDUCT PRE-CONSTRUCTION CONFERENCE WITH NCDENR, THE OWNER, DESIGN ENGINEER AND THE CONTRACTOR.
3. INSTALL CONSTRUCTION ENTRANCE.
4. CLEAR ENOUGH AREA TO INSTALL PERIMETER EROSION CONTROL DEVICES FOR PHASE 1
5. INSTALL PERIMETER SILT FENCE FOR PHASE 1
6. CLEAR ENOUGH AREA TO INSTALL SKIMMER BASIN 1.
7. DEMOLISH EXISTING BUILDING
8. COMPLETE CLEARING AREA AND BEGIN GRADING BUILDING PAD AND SURROUNDING AREA.
9. DISTURB AREAS FOR SEWER AND WATER LINE INSTALLATION AS REQUIRED.
10. STABILIZE SEWER AND WATER LINE EXCAVATIONS IN THE RIGHT OF WAY IMMEDIATELY UPON BACKFILL OF EXCAVATIONS.
11. MAINTAIN THE TEMPORARY DIVERSION DITCHES TO THE BASIN THROUGHOUT GRADING OPERATIONS.
12. INSTALL INLET PROTECTION DEVICES AS DETAILED ON THE PLAN AS INLETS ARE INSTALLED.
13. INSPECT EROSION AND SEDIMENTATION CONTROL DEVICES AS REQUIRED THROUGHOUT THE DURATION OF THE PROJECT.
14. MAINTAIN EROSION AND SEDIMENTATION CONTROL DEVICES AS REQUIRED THROUGHOUT THE DURATION OF THE PROJECT.
15. DISTURBED AREAS SHALL BE STABILIZED IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:
    - 15.1. PERIMETER AREAS AND SLOPES STEEPER THAN 3:1 SHALL BE STABILIZED IN 7 DAYS.
    - 15.2. ALL OTHER AREAS SHALL BE STABILIZED WITHIN 14 DAYS.
16. UPON FINAL STABILIZATION OF THE SITE AND COMPLIANCE WITH PERMIT CONDITIONS, THE EROSION CONTROL DEVICES CAN BE REMOVED AND THE AREAS STABILIZED.

EROSION CONTROL LEGEND

- SKIMMER BASIN — PRACTICE 6.64
- SEDIMENT FENCE — PRACTICE 6.62
- POROUS BAFFLES — PRACTICE 6.65
- HARDWARE CLOTH AND GRAVEL INLET PROTECTION — PRACTICE 6.51.1
- TEMPORARY DIVERSIONS — PRACTICE 6.21.1
- ROCK PIPE INLET PROTECTION — PRACTICE 6.55
- ROCK CHECK DAM — PRACTICE 6.83
- TEMPORARY CONSTRUCTION ENTRANCE — PRACTICE 6.06

TOTAL DISTURBED AREA = 216,037 SQ. FT. OR 4.96 AC.

SKIMMER BASIN SCHEDULE

TRAP NO.	DRAINAGE AREA (AC.)	DENUDED AREA (AC)	Q10	Trap Volume REQUIRED (CF)	Trap Volume PROVIDED (CF)	TRAP SURFACE AREA REQUIRED (SF)	TRAP SURFACE AREA PROVIDED (SF)	DIMENSIONS CLEANOUT DEPTH (FT)	DIMENSIONS DEPTH (FT)	DIMENSIONS WEIR LENGTH(FT)	DIMENSIONS BERM WIDTH (FT)
1	4.96	4.96	14.32	8,928	18,081	4,655	9,344	1.25	2.5	16	8

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NO.	DATE	BY	REVISION
1	7-30-13	JDB	NCDENR LAND QUALITY REVIEW

SANFORD TRANSFER STATION
SANFORD NC

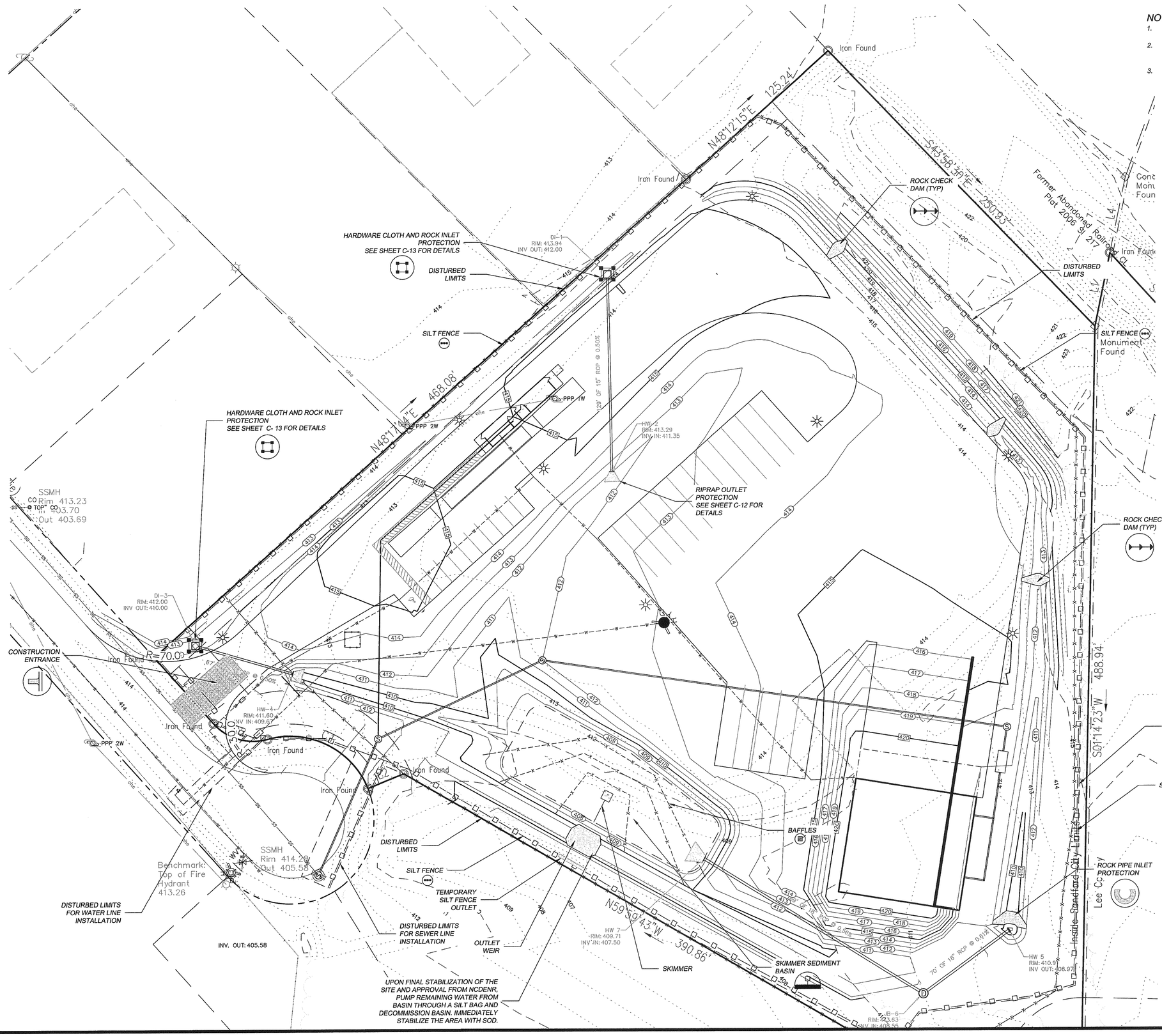
WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

EROSION AND SEDIMENTATION CONTROL PLAN PHASE 1

DESIGNED	DRAWN	CHECKED	PROJECT NO.
JDB	JDB	JDB	2013-5
SCALE	DATE		
AS SHOWN	6/8/2013		

NORTH CAROLINA PROFESSIONAL SEAL 19665 ENGINEER JOHN D. BARNARD

SHEET: C-6



NOTES:

1. SOILS ON THIS SITE ARE COMPRISED PRIMARILY OF DOTHAN LOAMY SAND WHICH IS A HYDROLOGIC GROUP B SOIL.
2. SITE IS LOCATED ON FEMA FIRM PANEL 3710965100J, EFFECTIVE DATE SEPTEMBER 6, 2006. THE SITE IS LOCATED IN ZONE X, THE AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.
3. SEE SUBSEQUENT SHEETS FOR ADDITIONAL EROSION CONTROL DETAILS

CONSTRUCTION SEQUENCE:

1. CONTRACTOR SHALL CONTACT LAND QUALITY PRIOR TO BEGINNING CONSTRUCTION TO SCHEDULE PRECONSTRUCTION MEETING.
2. CONDUCT PRE-CONSTRUCTION CONFERENCE WITH NCDENR, THE OWNER, DESIGN ENGINEER AND THE CONTRACTOR.
3. INSTALL CONSTRUCTION ENTRANCE.
4. CLEAR ENOUGH AREA TO INSTALL PERIMETER EROSION CONTROL DEVICES FOR PHASE 1.
5. INSTALL PERIMETER SILT FENCE FOR PHASE 1
6. CLEAR ENOUGH AREA TO INSTALL SKIMMER BASIN 1.
7. DEMOLISH EXISTING BUILDING
8. COMPLETE CLEARING AREA AND BEGIN GRADING BUILDING PAD AND SURROUNDING AREA.
9. DISTURB AREAS FOR SEWER AND WATER LINE INSTALLATION AS REQUIRED.
10. STABILIZE SEWER AND WATER LINE EXCAVATIONS IN THE RIGHT OF WAY IMMEDIATELY UPON BACKFILL OF EXCAVATIONS.
11. MAINTAIN THE TEMPORARY DIVERSION DITCHES TO THE BASIN THROUGHOUT GRADING OPERATIONS.
12. INSTALL INLET PROTECTION DEVICES AS DETAILED ON THE PLAN AS INLETS ARE INSTALLED.
13. INSPECT EROSION AND SEDIMENTATION CONTROL DEVICES AS REQUIRED THROUGHOUT THE DURATION OF THE PROJECT.
14. MAINTAIN EROSION AND SEDIMENTATION CONTROL DEVICES AS REQUIRED THROUGHOUT THE DURATION OF THE PROJECT.
15. DISTURBED AREAS SHALL BE STABILIZED IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:
    - 15.1. PERIMETER AREAS AND SLOPES STEEPER THAN 3:1 SHALL BE STABILIZED IN 7 DAYS.
    - 15.2. ALL OTHER AREAS SHALL BE STABILIZED WITHIN 14 DAYS.
16. UPON FINAL STABILIZATION OF THE SITE AND COMPLIANCE WITH PERMIT CONDITIONS, THE EROSION CONTROL DEVICES CAN BE REMOVED AND THE AREAS STABILIZED.

EROSION CONTROL LEGEND

- SKIMMER BASIN — PRACTICE 6.64
- SEDIMENT FENCE — PRACTICE 6.62
- POROUS BAFFLES — PRACTICE 6.65
- HARDWARE CLOTH AND GRAVEL INLET PROTECTION — PRACTICE 6.51.1
- TEMPORARY DIVERSIONS — PRACTICE 6.21.1
- ROCK PIPE INLET PROTECTION — PRACTICE 6.55
- ROCK CHECK DAM — PRACTICE 6.83
- TEMPORARY CONSTRUCTION ENTRANCE — PRACTICE 6.06

TOTAL DISTURBED AREA = 216,037 SQ. FT. OR 4.96 AC.

GRAPHIC SCALE
0 30' 60'
(IN FEET)
1 inch = 30 ft.

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NO.	DATE	BY	REVISION
1	7-30-13	JDB	NCDENR LAND QUALITY REVIEW

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3301 BENSON DRIVE
RALEIGH NC

EROSION AND SEDIMENTATION CONTROL PLAN PHASE 2

DESIGNED	JDB	DRAWN	JDB	CHECKED	JDB
SCALE	AS SHOWN	DATE	6/8/2013	PROJECT NO:	2013-5

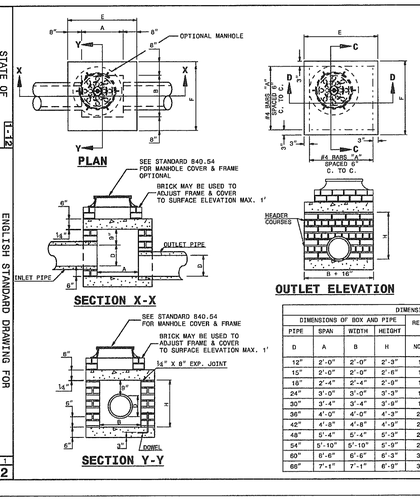
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19665 JOHN D. BARNARD

SHEET: C-7

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-12

ENGLISH STANDARD DRAWING FOR
BRICK JUNCTION BOX
(WITH OPTIONAL MANHOLE)
12" THRU 66" PIPE



GENERAL NOTES:
CHAMFER ALL EXPOSED CORNERS 1".
USE CLASS "B" CONCRETE THROUGHOUT.
USE #4 BAR DOWELS AT 12" CENTERS.
MORTAR JOINTS ½" ± ⅛" THICK.
CONCAVE TOO ALL EXPOSED JOINTS.
USE FORMS TO CONSTRUCT THE BOTTOM SLAB.
JUMBO BRICK WILL BE PERMITTED. CONCRETE BRICK OR 4" SOLID CONCRETE BLOCKS MAY BE USED IN LIEU OF CLAY BRICK.
FOR 8'-0" IN HEIGHT OR LESS, USE 8" WALL. OVER 8'-0" IN HEIGHT, USE 12" WALL TO 6'-0" FROM TOP OF WALL, AND 8" WALL FOR THE REMAINING 6'-0". ADJUST DIMENSIONS AND QUANTITIES ACCORDINGLY.
IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STANDARD NO. 840.00.
PROVIDE ALL JUNCTION BOXES OVER 3'-0" IN DEPTH WITH STEPS 12" ON CENTERS IN ACCORDANCE WITH STD. NO. 840.66.
ADJUST THE STEEL, CONCRETE AND BRICK MASONRY QUANTITIES TO INCLUDE THE ADDITION OF THE MANHOLE (I.E. DIAGONAL BARS SHORTENED AROUND OPENING IN TOP SLAB, ADDITIONAL VARIABLE HEIGHT BRICK MASONRY, OPENING IN TOP SLAB.)
MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEVATION IS 12 FEET.

DIMENSIONS AND QUANTITIES FOR BRICK JUNCTION BOXES

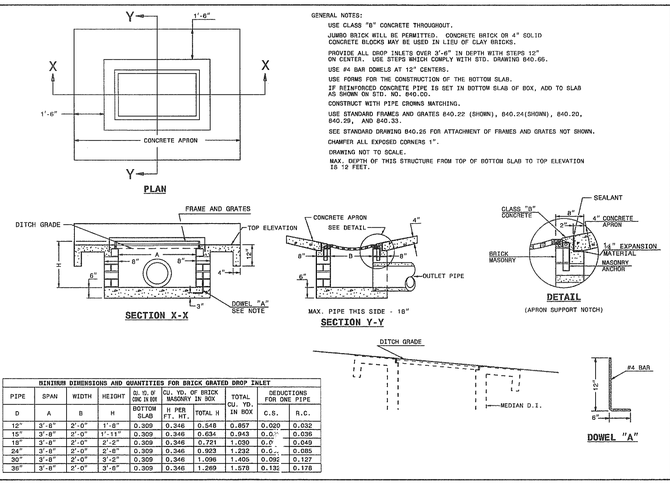
DIMENSIONS OF BOX AND PIPE				REINFORCEMENT BARS		TOP SLAB DIMENSIONS		CUBIC YARDS			DEDUCTIONS FOR ONE PIPE	
PIPE	SPAN	WIDTH	HEIGHT					CONC.	BRICK MASONRY			
D	A	B	H	NO.	LENGTH	E	F	TOP & BOTTOM SLAB CU. YD.	VAR. HEIGHT CU. YD.	WALL PER FT. HT. CU. YD.	C.S.	R.C.
12"	2'-0"	2'-0"	2'-3"	12	3'-1"	3'-4"	3'-4"	0.412	0.591	0.263	0.020	0.032
15"	2'-0"	2'-0"	2'-6"	12	3'-1"	3'-4"	3'-4"	0.412	0.657	0.263	0.031	0.047
18"	2'-4"	2'-4"	2'-9"	14	3'-5"	3'-8"	3'-8"	0.498	0.814	0.296	0.044	0.065
24"	3'-0"	3'-0"	3'-3"	16	4'-1"	4'-4"	4'-4"	0.695	1.176	0.362	0.078	0.113
30"	3'-4"	3'-4"	3'-9"	16	4'-5"	4'-8"	4'-8"	0.807	1.461	0.395	0.122	0.170
36"	4'-0"	4'-0"	4'-3"	20	5'-1"	5'-4"	5'-4"	1.053	1.959	0.461	0.176	0.238
42"	4'-8"	4'-8"	4'-9"	22	5'-9"	6'-0"	6'-0"	1.339	2.503	0.527	0.240	0.323
48"	5'-4"	5'-4"	5'-3"	26	6'-5"	6'-8"	6'-8"	1.648	2.940	0.565	0.313	0.422
54"	5'-10"	5'-10"	5'-9"	28	6'-11"	7'-2"	7'-2"	1.902	3.502	0.609	0.396	0.535
60"	6'-6"	6'-6"	6'-3"	30	7'-7"	7'-10"	7'-10"	2.222	4.113	0.656	0.489	0.660
66"	7'-1"	7'-1"	6'-9"	32	8'-2"	8'-5"	8'-5"	2.624	4.778	0.708	0.591	0.798

SHEET 1 OF 1
840.32

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-12

ENGLISH STANDARD DRAWING FOR
BRICK GRATED DROP INLET TYPE 'D'
12" THRU 36" PIPE



GENERAL NOTES:
USE CLASS "B" CONCRETE THROUGHOUT.
JUMBO BRICK WILL BE PERMITTED. CONCRETE BRICK OR 4" SOLID CONCRETE BLOCKS MAY BE USED IN LIEU OF CLAY BRICKS.
PROVIDE ALL DROP INLETS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.
USE #4 BAR DOWELS AT 12" CENTERS.
USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.
CONSTRUCT WITH PIPE CROWNS MATCHING.
USE STANDARD FRAMES AND GRATES 840.22 (SHOWN), 840.24(SHOWN), 840.20, 840.29, AND 840.33.
SEE STANDARD DRAWING 840.25 FOR ATTACHMENT OF FRAMES AND GRATES NOT SHOWN.
CHAMFER ALL EXPOSED CORNERS 1".
DRAWING NOT TO SCALE.
MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEVATION IS 12 FEET.

MINIMUM DIMENSIONS AND QUANTITIES FOR BRICK GRATED DROP INLET

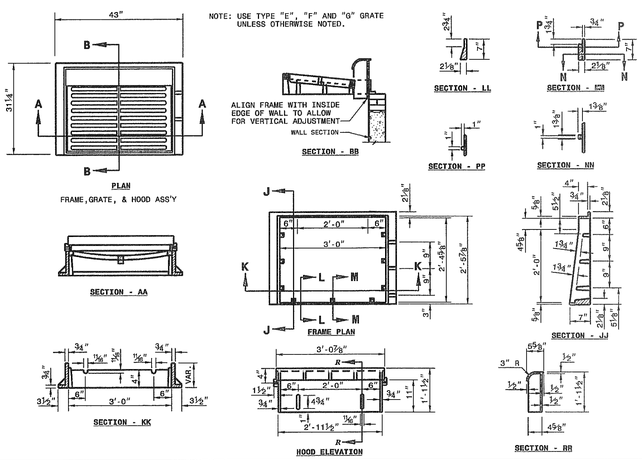
PIPE	SPAN	WIDTH	HEIGHT	CU. YD. OF CONC IN BOX	CU. YD. OF BRICK MASONRY IN BOX		TOTAL CU. YD. IN BOX	DEDUCTIONS FOR ONE PIPE	
D	A	B	H	BOTTOM SLAB	H PER FT. HT.	TOTAL H		C.S.	R.C.
12"	3'-8"	2'-0"	1'-8"	0.309	0.346	0.548	0.857	0.020	0.032
15"	3'-8"	2'-0"	1'-11"	0.309	0.346	0.634	0.943	0.0..	0.036
18"	3'-8"	2'-0"	2'-2"	0.309	0.346	0.721	1.030	0.0.	0.049
24"	3'-8"	2'-0"	2'-8"	0.309	0.346	0.923	1.232	0.0..	0.085
30"	3'-8"	2'-0"	3'-2"	0.309	0.346	1.098	1.40.	0.09.	0.127
36"	3'-8"	2'-0"	3'-8"	0.309	0.346	1.269	1.578	0.13.	0.178

SHEET 1 OF 1
840.28

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-12

ENGLISH STANDARD DRAWING FOR
FRAME, GRATES, AND HOOD
FOR USE ON STANDARD CATCH BASIN

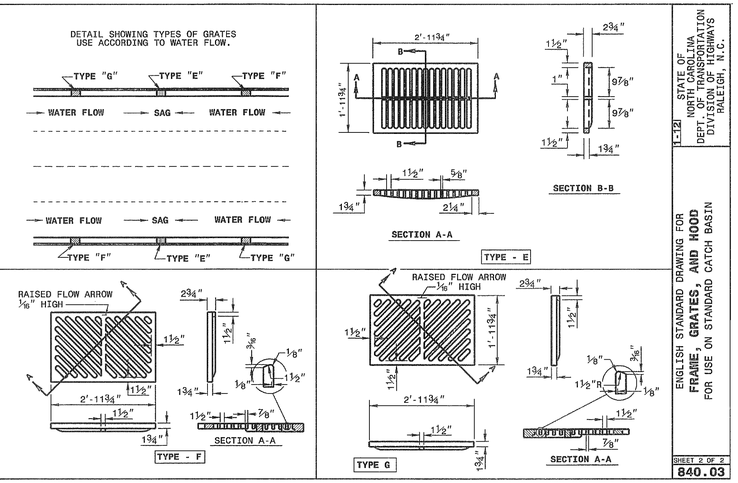


SHEET 1 OF 2
840.03

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-12

ENGLISH STANDARD DRAWING FOR
FRAME, GRATES, AND HOOD
FOR USE ON STANDARD CATCH BASIN



SHEET 2 OF 2
840.03

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NO.	DATE	BY	REVISION

SANFORD TRANSFER STATION
SANFORD NC

WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

STORM DETAILS 1 OF 2

DESIGNED	DRAWN	CHECKED
JDB	JDB	JDB
SCALE	DATE	PROJECT NO.
AS SHOWN	6/6/2013	2013-5

NORTH CAROLINA PROFESSIONAL SEAL 19865 ENGINEER JOHN D. BARNARD

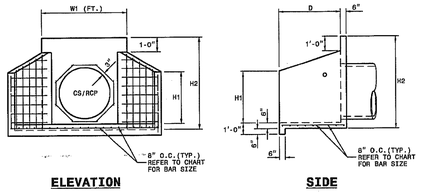
SHEET:
C-8

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-12

ENGLISH STANDARD DRAWING FOR
PRECAST CONCRETE ENDWALL
FOR SINGLE 12" THRU 72" PIPE - 90° SKEW

SHEET 1 OF 1
838.80



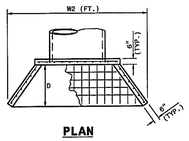
ELEVATION

SIDE

NOTES:

- THIS PRECAST ENDWALL MAY BE USED FOR THE FOLLOWING STANDARDS: 838.01, 838.11, 838.21, 838.27, 838.33, 838.39, 838.51, 838.57, 838.63 AND 838.69.
- INSTALL PRECAST ENDWALLS WITH WINGS AND PAY FOR IN ACCORDANCE WITH SPECIFICATION SECTION 838.
- USE 4000 PSI CONCRETE.
- PROVIDE ALL REINFORCING STEEL WHICH MEETS ASTM A615 FOR GRADE 60 AND WELDED WIRE FABRIC CONFORMING TO ASTM A185 WITH 2" MIN. CLEARANCE.
- PLACE LIFT HOLES OR PINS IN ACCORDANCE WITH OSHA STANDARD 1926.704.
- PIPE TO BE GROUTED INTO HEADWALL AT JOB SITE BY CONTRACTOR
- ALL ELEMENTS PRECAST TO MEET ASTM C913.
- WELDED WIRE FABRIC MAY BE SUBSTITUTED FOR REBAR AS LONG AS THE SAME AREA OF STEEL IS PROVIDED.
- CHAMFER ALL CORNERS 1" OR HAVE A RADIUS OF 1".

NOTE: THE MINIMUM BAR SIZE SHALL BE #5 BARS AT 8" CTS.THE CONTRACTOR WILL HAVE THE OPTION TO INCREASE THIS BAR SIZE AS NEEDED.



PLAN

ENDWALL DIMENSIONS

FT.	MINIMUM	MIN./MAX.	MIN./MAX.	MIN./MAX.	MIN./MAX.	MIN./MAX.
PIPE DIA.	BAR SIZE	H1(FT.)	H2(FT.)	D (FT.)	W1	W2
1.0	#5 @ 8"	1.25/2.00	2.00/3.75	1.25/1.75	3.00/3.75	5.50/6.00
1.25	#5 @ 8"	1.25/2.00	3.00/3.75	1.25/2.00	3.50/3.75	6.50/6.75
1.50	#5 @ 8"	1.25/2.00	3.00/4.25	1.50/2.50	3.50/3.75	6.50/6.75
2.0	#5 @ 8"	1.50/2.50	4.00/4.75	1.75/2.50	4.00/4.25	7.50/8.25
2.5	#5 @ 8"	2.50/3.50	4.00/6.00	2.00/3.00	4.50/5.50	10.00/11.50
3.0	#5 @ 8"	3.00/3.50	5.00/6.00	2.75/3.50	5.25/5.75	11.50/11.75
3.5	#5 @ 8"	3.25/4.50	6.00/6.75	3.25/3.50	6.00/6.75	12.00/13.25
4.0	#5 @ 8"	3.50/4.50	6.50/7.00	3.25/3.50	6.50/6.75	13.00/13.25
4.5	#6 @ 8"	4.00/5.00	6.50/8.50	3.25/4.00	7.00/9.25	13.50/15.75
5.0	#6 @ 8"	4.50/5.00	7.00/8.50	3.25/4.00	7.25/9.25	13.75/15.75
5.5	#6 @ 8"	4.50/5.00	7.50/8.50	3.25/4.00	7.25/9.25	14.00/15.75
6.0	#6 @ 8"	4.50/5.00	7.50/8.50	3.25/4.00	7.75/9.25	14.75/16.75

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1-12

ENGLISH STANDARD DRAWING FOR
PRECAST CONCRETE ENDWALL
FOR SINGLE 12" THRU 72" PIPE - 90° SKEW

SHEET 1 OF 1
838.80

STATE OF
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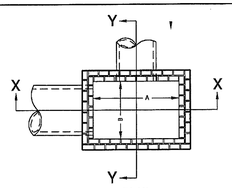
RALEIGH, N.C.

1-12

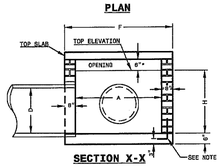
ENGLISH STANDARD DRAWING FOR
BRICK OPEN THROAT CATCH BASIN
12" THRU 48" PIPE

SHEET 1 OF 2
840.05

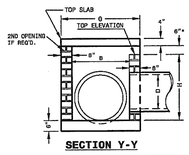


PLAN

NOTES: MORTAR JOINTS ½" +/- ⅛" THICK.
USE CLASS "B" CONCRETE THROUGHOUT.
USE FORMS FOR CONSTRUCTION OF THE BOTTOM SLAB.
USE #4 BAR DOWELS AT 12" CENTERS.
DEDUCT FOR PIPE(S) FROM TOTAL CU. YDS. OF BRICK MASONRY.
PROVIDE ALL CATCH BASINS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.
CONCAVE TOOL ALL EXPOSED MORTAR JOINTS.
USE BRICK OR CONCRETE BLOCK WHICH COMPLIES WITH THE REQUIREMENTS OF SECTION 840 OF THE STANDARD SPECIFICATIONS.
IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.
FOR 8'-0" IN HEIGHT OR LESS USE 6" WALLS AND BOTTOM SLAB. OVER 8'-0" TO 16'-0" IN HEIGHT USE 8" WALLS AND BOTTOM SLAB. ADJUST QUANTITIES ACCORDINGLY.
CONSTRUCT WITH PIPE CROWNS MATCHING.
CHAMFER ALL EXPOSED CORNERS 1".
DRAWING NOT TO SCALE.
* INCREASE THE SIZE OF THE 6" OPENING TO 8" MAX., AS DIRECTED BY THE ENGINEER BY ADDING 2" TO THE WALL HEIGHT ABOVE THE TOP ELEVATION. ADJUST QUANTITIES ACCORDINGLY.



SECTION X-X



SECTION Y-Y

MIN. DIMENSIONS AND QUANTITIES FOR CATCH BASIN (BASED ON MIN. HEIGHT, H)

DIM'S OF BOX & PIPE				REINFORCING					SLAB DIMENSIONS		CU. YDS. CONC. IN BOX			TOTAL BRICK MASONRY		DEDUCTION ONE PIPE		DED. ONE K. THROAT OPENING
PIPE	SPAN	WIDTH	HEIGHT	BARS - X		BARS - Y		TOTAL	F	G	TOP SLAB	WRT. SLAB	TOTAL	FOR FT. H	FOR IST. FOR H	C.S.	R.C.	CU.YDS.
D	A	B	H	NO.	LENGTH	NO.	LENGTH	LBS										
12"	3'-6"	2'-3"	1'-10"	5	3'-4"	7	4'-7"	28	4'-10"	3'-7"	0.214	0.321	0.535	0.350	0.656	0.020	0.037	0.043
15"	3'-6"	2'-3"	2'-1"	5	3'-4"	7	4'-7"	28	4'-10"	3'-7"	0.214	0.321	0.535	0.350	0.744	0.031	0.059	0.043
18"	4'-0"	2'-8"	2'-4"	6	3'-9"	8	5'-1"	36	5'-4"	4'-0"	0.263	0.395	0.658	0.385	0.938	0.044	0.081	0.049
24"	4'-0"	2'-8"	2'-10"	6	3'-9"	8	5'-1"	36	5'-4"	4'-0"	0.263	0.395	0.658	0.385	1.136	0.078	0.134	0.049
30"	4'-0"	3'-8"	3'-4"	6	4'-7"	10	5'-1"	44	5'-4"	4'-10"	0.318	0.477	0.795	0.436	1.472	0.122	0.199	0.049
36"	4'-6"	4'-0"	3'-10"	6	5'-1"	11	5'-7"	52	5'-10"	5'-4"	0.384	0.576	0.960	0.485	1.879	0.176	0.278	0.056
42"	5'-0"	4'-6"	4'-4"	6	5'-7"	13	6'-1"	65	6'-4"	5'-10"	0.456	0.684	1.140	0.535	2.340	0.240	0.371	0.062
48"	5'-0"	5'-0"	4'-10"	6	6'-1"	14	6'-1"	71	6'-4"	6'-4"	0.495	0.743	1.238	0.559	2.725	0.313	0.476	0.062

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1-12

ENGLISH STANDARD DRAWING FOR
BRICK OPEN THROAT CATCH BASIN
12" THRU 48" PIPE

SHEET 1 OF 2
840.05

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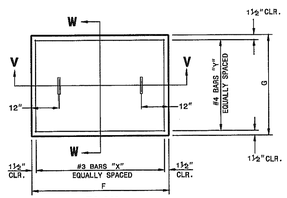
1-12

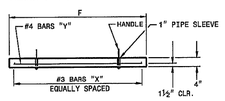
ENGLISH STANDARD DRAWING FOR
BRICK CATCH BASIN WITH
SINGLE AND MULTIPLE PIPES
12" THRU 48" PIPE

SHEET 2 OF 2
840.05

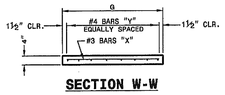


PLAN

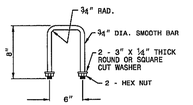
PRECAST OR CAST IN PLACE TOP SLAB



SECTION V-V



SECTION W-W



DETAIL OF HANDLE

PART SECTION

THRU COVER SHOWING HANDLE

DOWEL

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1-12

ENGLISH STANDARD DRAWING FOR
BRICK CATCH BASIN WITH
SINGLE AND MULTIPLE PIPES
12" THRU 48" PIPE

SHEET 2 OF 2
840.05

Pipe Segment							
From Structure	To Structure	Length (ft)	Pipe Diameter (in.)	Slope (ft/ft)	Rim Elev.	Up Inv. Out	Dwn. Inv. In
DI-1	HW-2	129.00	15	0.50%	413.94	412.00	411.35
D1-3	HW-4	67.00	15	0.49%	412.00	410.00	409.67
HW 5	JB 6	70.00	24	0.60%	410.91	408.97	408.55
JB 6	FES 7	167.00	24	0.57%	413.09	408.45	407.50

STORM SCHEDULE

BARNARD ENGINEERING, P.C.
1534 Saratoga Blvd. (704) 628-0344
Indian Trail, NC 28079 (678) 232-8967
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NO.	DATE	BY	REVISION

SANFORD TRANSFER STATION
SANFORD NC

WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

STORM DETAILS 2 OF 2

DESIGNED	DRAWN	CHECKED
JDB	JDB	JDB
SCALE	DATE	PROJECT NO.
AS SHOWN	6/6/2013	2013-5

NORTH CAROLINA PROFESSIONAL SEAL 19665 ENGINEER JOHN D. BARNARD 7/12/13

SHEET:
C-9

6.10 **TEMPORARY SEEDING**

TS

Definition Planting rapid-growing annual grasses, small grains, or legumes to provide initial, temporary cover for erosion control on disturbed areas.

Purpose [redacted]

Temporary seeding controls runoff and erosion until permanent vegetation or other erosion control measures can be established. In addition, it provides residue for soil protection and seedbed preparation, and reduces problems of mud and dust production from bare soil surfaces during construction.

Conditions Where Practice Applies On any cleared, unvegetated, or sparsely vegetated soil surface where vegetative cover is needed for less than 1 year. Applications of this practice include diversions, dams, temporary sediment basins, temporary road banks, and topsoil stockpiles.

Planning Considerations Annual plants, which sprout and grow rapidly and survive for only one season, are suitable for establishing initial or temporary vegetative cover. Temporary seeding preserves the integrity of earthen sediment control structures such as dikes, diversions, and the banks of dams and sediment basins. It can also reduce the amount of maintenance associated with these devices. For example, the frequency of sediment basin cleanouts will be reduced if watershed areas, outside the active construction zone, are stabilized.

Proper seedbed preparation, selection of appropriate species, and use of quality seed are as important in this Practice as in Practice 6.11, *Permanent Seeding*. Failure to follow established guidelines and recommendations carefully may result in an inadequate or short-lived stand of vegetation that will not control erosion.

Temporary seeding provides protection for no more than 1 year, during which time permanent stabilization should be initiated.

Specifications Complete grading before preparing seedbeds, and install all necessary erosion control practices such as, dikes, waterways, and basins. Minimize steep slopes because they make seedbed preparation difficult and increase the erosion hazard. If soils become compacted during grading, loosen them to a depth of 6-8 inches using a ripper, harrow, or chisel plow.

SEEDBED PREPARATION
Good seedbed preparation is essential to successful plant establishment. A good seedbed is well-pulverized, loose, and uniform. Where hydroseeding methods are used, the surface may be left with a more irregular surface of large clods and stones.

Liming—Apply lime according to soil test recommendations. If the pH (acidity) of the soil is not known, an application of ground agricultural limestone at the

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rate of 1 to 1 1/2 tons/acre on coarse-textured soils and 2-3 tons/acre on fine-textured soils is usually sufficient. Apply limestone uniformly and incorporate into the top 4-6 inches of soil. Soils with a pH of 6 or higher need not be limed.

Fertilizer—Base application rates on soil tests. When these are not possible, apply a 10-10-10 grade fertilizer at 700-1,000 lb/acre. Both fertilizer and lime should be incorporated into the top 4-6 inches of soil. If a hydraulic seeder is used, do not mix seed and fertilizer more than 30 minutes before application.

Surface roughening—If recent tillage operations have resulted in a loose surface, additional roughening may not be required, except to break up large clods. If rainfall causes the surface to become sealed or crusted, loosen it just prior to seeding by disking, raking, harrowing, or other suitable methods. Groove or furrow slopes steeper than 3:1 on the contour before seeding (Practice 6.03, *Surface Roughening*).

PLANT SELECTION
Select an appropriate species or species mixture from Table 6.10a for seeding in late winter and early spring, Table 6.10b for summer, and Table 6.10c for fall.

In the Mountains, December and January seedings have poor chances of success. When it is necessary to plant at these times, use recommendations for fall and a securely tacked mulch.

SEEDING
Evenly apply seed using a cyclone seeder (broadcast), drill, cultipacker seeder, or hydroseeder. Use seeding rates given in Tables 6.10a-6.10c. Broadcast seeding and hydroseeding are appropriate for steep slopes where equipment cannot be driven. Hand broadcasting is not recommended because of the difficulty in achieving a uniform distribution.

Small grains should be planted no more than 1 inch deep, and grasses and legumes no more than 1/2 inch. Broadcast seed must be covered by raking or chain dragging, and then lightly firmed with a roller or cultipacker. Hydroseeded mixtures should include a wood fiber (cellulose) mulch.

MULCHING
The use of an appropriate mulch will help ensure establishment under normal conditions, and is essential to seeding success under harsh site conditions (Practice 6.14, *Mulching*). Harsh site conditions include:

- seeding in fall for winter cover (wood fiber mulches are not considered adequate for this use),
- slopes steeper than 3:1,
- excessively hot or dry weather,
- adverse soils (shallow, rocky, or high in clay or sand), and
- areas receiving concentrated flow.

If the area to be mulched is subject to concentrated waterflow, as in channels, anchor mulch with netting (Practice 6.14, *Mulching*).

Maintenance Reseed and mulch areas where seedling emergence is poor, or where erosion occurs, as soon as possible. Do not mow. Protect from traffic as much as possible.

References *Site Preparation*
6.03, Surface Roughening
6.04, Topsoiling

Surface Stabilization
6.11, Permanent Seeding
6.14, Mulching

Appendix
8.02, Vegetation Tables

6

Table 6.10a Temporary Seeding Recommendations for Late Winter and Early Spring

Seeding mixture

Species	Rate (lb/acre)
Rye (grain)	120
Annual lespedeza (Kobe in Piedmont and Coastal Plain, Korean in Mountains)	50

Omit annual lespedeza when duration of temporary cover is not to extend beyond June.

Seeding dates
Mountains—Above 2500 feet: Feb. 15 - May 15
Below 2500 feet: Feb. 1- May 1
Piedmont—Jan. 1 - May 1
Coastal Plain—Dec. 1 - Apr. 15

Soil amendments
Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.

Mulch
Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance
Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

Table 6.10b Temporary Seeding Recommendations for Summer

Seeding mixture

Species	Rate (lb/acre)
German millet	40

In the Piedmont and Mountains, a small-stemmed Sudangrass may be substituted at a rate of 50 lb/acre.

Seeding dates
Mountains—May 15 - Aug. 15
Piedmont—May 1 - Aug. 15
Coastal Plain—Apr. 15 - Aug. 15

Soil amendments
Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.

Mulch
Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance
Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

6

Table 6.10c Temporary Seeding Recommendations for Fall

Seeding mixture

Species	Rate (lb/acre)
Rye (grain)	120

Seeding dates
Mountains—Aug. 15 - Dec. 15
Coastal Plain and Piedmont—Aug. 15 - Dec. 30

Soil amendments
Follow soil tests or apply 2,000 lb/acre ground agricultural limestone and 1,000 lb/acre 10-10-10 fertilizer.

Mulch
Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance
Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extent temporary cover beyond June 15, overseed with 50 lb/acre Kobe (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

NOTE: CONTRACTOR MUST STABILIZE SITE IN ACCORDANCE WITH THE FOLLOWING:

1. *STABILIZE DISTURBED AREAS ON THE PERIMETER AND ON SLOPES STEEPER THAN 3:1 IN 7 DAYS*
2. *STABILIZE ALL OTHER AREAS IN 14 DAYS.*

GRAPHIC SCALE
0 40' 80'
(IN FEET)
1 inch = 40 ft.

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NO.	DATE	BY	REVISION

SANFORD TRANSFER STATION
SANFORD NC

WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

TEMPORARY SEEDING

DESIGNED	JDB	DRAWN	JDB	CHECKED	JDB
SCALE	AS SHOWN	DATE	6/6/2013	PROJECT NO.	2013-5

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19665 JOHN D. BARNARD 6/6/13

SHEET:
C-10

PERMANENT SEEDING

NOTE: CONTRACTOR MUST STABILIZE SITE IN ACCORDANCE WITH THE FOLLOWING:

1. **STABILIZE DISTURBED AREAS ON THE PERIMETER AND ON SLOPES STEEPER THAN 3:1 IN 7 DAYS**
2. **STABILIZE ALL OTHER AREAS IN 14 DAYS.**

MAINTENANCE

GENERALLY, A STAND OF VEGETATON CANNOT BE DETERMINED TO BE FULLY ESTABLISHED UNTIL SOIL COVER HAS BEEN MAINTAINED FOR ONE FULL YEAR FROM PLANTING. INSPECT SEEDED AREAS FOR FAILURE AND MAKE NECESSARY REPAIRS AND RESEEDINGS WITHIN THE SAME SEASON, IF POSSIBLE.

RESEEDING–IF A STAND HAS INADEQUATE COVER, RE–EVALUATE CHOICE OF PLANT MATERIALS AND QUANTITIES OF LIME AND FERTILIZER. RE–ESTABLISH THE STAND AFTER SEEDBED PREPARATION OR OVER–SEED THE STAND. CONSIDER SEEDING TEMPORARY, ANNUAL SPECIES IF THE TIME OF YEAR IS NOT APPROPRIATE FOR PERMANENT SEEDING (PRAC– TICE 6.10, TEMPORARY SEEDING).

IF VEGETATION FAILS TO GROW, SOIL MUST BE TESTED TO DETERMINE IF ACIDITY OR NUTRIENT IMBALANCE IS RES– PONSIBLE. FERTILIZATION–ON THE TYPICAL DISTURBED SITE, FULL ESTABLISHMENT USUALLY REQUIRES REFERTILIZATION IN THE SECOND GROWING SEASON. FINE TURF REQUIRES ANNUAL MAINTENANCE FERTILIZATION (TABLE 6.12b). USE SOIL TESTS IF POSSIBLE OR FOLLOW THE GUIDELINES GIVEN FOR THE SPECIFIC SEEDING MIXTURE (TABLES 6.11c THROUGH 6.11v).

SPECIFICATION

ESTABLISHMENT OF VEGETATION SHOULD NOT BE ATTEMPTED ON SITES THAT ARE UNSUITABLE DUE TO INAPPROPRIATE SOIL TEXTURE (TABLE 6.11a), POOR DRAINAGE, CONCENTRATED OVERLAND FLOW, OR STEEPNESS OF SLOPE UNTIL MEASURES HAVE BEEN TAKEN TO CORRECT THESE PROBLEMS.

TO MAINTAIN A GOOD STAND OF VEGETATION, THE SOIL MUST MEET CERTAIN MINIMUM REQUIREMENTS AS A GROWTH MEDIUM. THE EXISTING SOIL SHOULD HAVE THESE CRITERIA:

* ENOUGH FINE–GRAINED (SILT AND CLAY) MATERIAL TO MAINTAIN ADEQUATE MOISTURE AND NUTRIENT SUPPLY (AVAILABLE WATER CAPACITY OF AT LEAST .05 INCHES WATER TO 1 INCH OF SOIL).
*SUFFICIENT PORE SPACE TO PERMIT ROOT PENETRATION.
* SUFFICIENT DEPTH OF SOIL TO PROVIDE AN ADEQUATE ROOT ZONE. THE DEPTH TO ROCK OR IMPERMEABLE LAYERS SUCH AS HARDPANS SHOULD BE 12 INCHES OR MORE, EXCEPT ON SLOPES STEEPER THAN 2:1 WHERE THE ADDITION OF SOIL NOT FEASIBLE.
* A FAVORABLE pH RANGE FOR PLANT GROWTH, USUALLY 6.0–6.5.
* FREEDOM FROM LARGE ROOTS, BRANCHES, STONES, LARGE CLODS OF EARTH, OR TRASH OF ANY KIND. CLODS AND STONES MAY BE LEFT ON SLOPES STEEPER THAN 3:1 IF THEY ARE TO BE HYDROSEEDED.

IF ANY OF THE ABOVE CRITERIA ARE NOT MET–i.e., IF THE EXISTING SOIL IS TOO COARSE, DENSE, SHALLOW OR ACIDIC TO FOS– TER VEGETATION–SPECIAL AMENDMENTS ARE REQUIRED. THE SOIL CONDITIONERS DESCRIBED BELOW MAY BE BENEFICIAL OR, PRE– FERABLY, TOPSOIL MAY BE APPLIED IN ACCORDANCE WITH PRACTICE 6.04, TOPSOILING.

SEEDBED REQUIREMENTS

TABLE 6.11L
SEEDING NO. 2P FOR: GENTLE SLOPES, AVERAGE SOIL; LOW MAINTENANCE

SEEDING MIXTURE

SPECIES[1]	RATE (LB/ACRE)
TALL FESCUE	80
SERICEA LESPEDEZA	20
KOBE LESPEDEZA	10

SEEDING NOTES
1. AFTER AUG. 15 USE UNSCARIFIED SERICEA SEED.
2. WHERE PERIODIC MOWING IS PLANNED OR A NEAT APPEARANCE IS DESIRED, OMIT SERICEA AND INCREASE KOBE LESPEDEZA TO 40 LB/ACRE.
3. TO EXTEND SPRING SEEDING DATES INTO JUNE, ADD 15 LB/ACRE HULLED BER– MUDAGRASS. HOWEVER, AFTER MID–APR. IT IS PREFERABLE TO SEED TEMPORARY COVER.

NURSE PLANTS
BETWEEN MAY 1 AND AUG. 15, ADD 10 LB/ACRE GERMAN MILLET OR 15 LB/ACRE SUDAN– GRASS. PRIOR TO MAY 1 OR AFTER AUG. 15 ADD 40 LB/ACRE RYE (GRAIN).

SEEDING DATES	BEST	POSSIBLE
FALL:	AUG. 25 – SEPT. 15	AUG. 20 – OCT. 25
LATE WINTER:	FEB. 15 – MAR. 21	FEB. 1 – APR. 15

FALL IS BEST FOR TALL FESCUE AND LATE WINTER FOR LESPEDEZAS. OVERSEEDING OF KOBE LESPEDEZA OVER FALL–SEEDED TALL FESCUE IS VERY EFFECTIVE.

SOIL AMENDMENTS
APPLY LIME AND FERTILIZER ACCORDING TO SOIL TESTS, OR APPLY 4,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 1,000 LB/ACRE 10–10–10 FERTILIZER.

MULCH
APPLY 4,000 LB/ACRE GRAIN STRAW OR EQUIVALENT COVER OF ANOTHER SUITABLE MULCH. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR ROVING OR BY CRIMPING WITH A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE
REFERTILIZE IN THE SECOND YEAR UNLESS GROWTH IS FULLY ADEQUATE. MAY BE MOWED ONCE OR TWICE A YEAR, BUT MOWING IS NOT NECESSARY. RESEED, FERTILIZE, AND MULCH DAMAGED AREAS IMMEDIATELY.

1 REFER TO APPENDIX 8.02 FOR BOTANICAL NAMES.

SOIL CONDITIONERS

IN ORDER TO IMPROVE THE STRUCTURE OR DRAINAGE CHARACTERISTICS OF A SOIL, THE FOLLOWING MATERIALS MAY BE ADDED. THESE AMENDMENTS SHOULD ONLY BE NECESSARY WHERE SOILS HAVE LIMITATIONS THAT MAKE THEM POOR FOR PLANT GROWTH OR FOR FINE TURF ESTABLISHMENT (SEE CHAPTER 3, VEGETATIVE CONSIDERATIONS).

PEAT–APPROPRIATE TYPES ARE SPHAGNUM MOSS PEAT, HYPNUM MOSS PEAT, REEDSEDGE PEAT, OR PEAT HUMUS, ALL FROM FRESH–WATER SOURCES. PEAT SHOULD BE SHREDDED AND CONDITIONED IN STORAGE PILES FOR AT LEAST 6 MONTHS AFTER EXCAVATION.

SAND–CLEAN AND FREE OF TOXIC MATERIALS.

VERMICULITE–HORTICULTURAL GRADE AND FREE OF TOXIC SUBSTANCES.

ROTTED MANURE–STABLE OR CATTLE MANURE NOT CONTAINING UNDUE AMOUNTS OF STRAW OR OTHER BEDDING MATERIALS.

THOROUGHLY ROTTED SAWDUST–FREE OF STONES AND DEBRIS. ADD 6 lb OF NITROGEN TO EACH CUBIC YARD.

SLUDGE–TREATED SEWAGE AND INDUSTRIAL SLUDGES ARE AVAILABLE IN VARIOUS FORMS; THESE SHOULD BE USED ONLY IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

SPECIES SELECTION

USE THE KEY TO PERMANENT SEEDING MIXTURES (TABLE 6.11b) IN THE NCDENR EROSION CONTROL MANUAL TO SELECT THE MOST APPROPRIATE SEEDING MIXTURE BASED ON THE GENERAL SITE AND MAINTENANCE FACTORS. A LISTING OF SPECIES, INCLUDING SCIENTIFIC NAMES AND CHARACTERISTICS, IS GIVEN IN APPENDIX 8.02.

SEEDBED PREPARATION

INSTALL NECESSARY MECHANICAL EROSION AND SEDIMENTATION CONTROL PRACTICES BEFORE SEEDING, AND COMPLETE GRADING ACCORDING TO THE APPROVED PLAN.

LIME AND FERTILIZER NEEDS SHOULD BE DETERMINED BY SOIL TESTS. SOIL TESTING IS PERFORMED FREE OF CHARGE BY THE NORTH CAROLINA DEP– ARTMENT OF AGRICULTURE SOIL TESTING LABORATORY. DIRECTIONS, SAMPLE CARTONS, AND INFORMATION SHEETS ARE AVAILABLE THROUGH COUNTY AGRICULTURAL EXTENSION OFFICES OR FROM NCDA. BECAUSE THE NCDA SOIL TESTING LAB REQUIRES 1–6 WEEKS FOR SAMPLE TURN–AROUND, SAMP– LING MUST BE PLANNED WELL IN ADVANCE OF FINAL GRADING. TESTING IS ALSO DONE BY COMMERCIAL LABORATORIES.

WHEN SOIL TEST ARE NOT AVAILABLE, FOLLOW RATES SUGGESTED ON THE INDIVIDUAL SPECIFICATION SHEET FOR THE SEEDING MIX CHOSEN (TABLES 6.11c THROUGH 6.11v). APPLICATION RATES USUALLY FALL INTO THE FOLLOWING RANGES:

GROUND AGRICULTURAL LIMESTONE:
LIGHT–TEXTURED, SANDY SOILS: 1–1 1/2 TONS/ACRE
HEAVY–TEXTURED, CLAYEY SOILS: 2–3 TONS/ACRE

FERTILIZER:
GRASSES: 800–1200 LB/ACRE OF 10–10–10 (OR THE EQUIVALENT)
GRASS–LEGUME MIXTURES: 800–1200 LB/ACRE OF 5–10–10 (OR THE EQUIVALENT)

APPLY LIME AND FERTILIZER EVENLY AND INCORPORATE INTO THE TOP 4–6 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS. OPERATE MACHINERY ON THE CONTOUR. WHEN USING A HYDROSEEDER, APPLY LIME AND FERTILIZER TO A ROUGH, LOOSE SURFACE.

ROUGHEN SURFACES ACCORDING TO PRACTICE 6.03, SURFACE ROUGHENING.

COMPLETE SEEDBED PREPARATION BY BREAKING UP LARGE CLODS AND RAKING INTO A SMOOTH, UNIFORM SURFACE (SLOPES LESS THAN 3:1). FILL IN OR LEVEL DEPRESSIONS THAT CAN COLLECT WATER. BROADCAST SEED INTO A FRESHLY LOOSENED SEEDBED THAT HAS NOT BEEN SEALED BY RAINFALL.

SEEDING NO. 5P FOR: GRASS LINED CHANNELS

SEEDING MIXTURE

SPECIES	RATE (LB/ACRE)
TALL FESCUE	200 (4–5 lb/ 1,000 FT)

SEEDING DATES
BEST: AUG. 25 – OCT. POSSIBLE: FEB. – APR. 15 AVOID SEEDING FROM NOV. TO JAN.
IF SEEDING MUST BE DONE AT THIS TIME, ADD 40 lb/acre RYE GRAIN AND USE A CHANNEL LINING THAT OFFERS MAXIMUM PROTECTION.

NURSE PLANTS
BETWEEN MAY 1 AND AUG. 15, ADD 10 LB/ACRE GERMAN MILLET OR 15 LB/ACRE SUDAN–GRASS. PRIOR TO MAY 1 OR AFTER AUG. 15 ADD 40 LB/ACRE RYE (GRAIN).

SOIL AMENDMENTS
APPLY LIME AND FERTILIZER ACCORDING TO SOIL TESTS, OR APPLY 4,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 1,000 LB/ACRE 10–10–10 FERTILIZER. OPERATE TILLAGE EQUIPMENT ACROSS THE WATERWAY.

USE JUTE, EXCELSIOR MATTING, OR OTHER EFFECTIVE CHANNEL LINING MATERIAL TO COVER THE BOTTOM OF CHANNELS AND DITCHES, AND STAPLE SECURELY. THE LINING SHOULD EXTEND ABOVE THE HIGHEST CALCULATED DEPTH OF FLOW. ON CHANNEL SIDE SLOPES ABOVE THIS HEIGHT, AND IN DRAINAGES NOT REQUIRING TEMPORARY LININGS, APPLY 4,000 lb/acre GRAIN STRAW AND ANCHOR STRAW BY STAPLING NETTING OVER THE TOP.

MULCH
MULCH AND ANCHORING MATERIALS MUST NOT BE ALLOWED TO WASH DOWN SLOPES WHERE THEY CAN CLOG DRAINAGE DEVICES.

MAINTENANCE
INSPECT AND REPAIR MULCH FREQUENTLY. REFERTILISE IN LATE WINTER OF THE FOLLOWING YEAR; USE SOIL TESTS OR APPLY 150 lb/acre 10–10–10. MOW REGULARLY TO A HEIGHT OF 2 – 4 INCHES.

REFER TO APPENDIX 8.02 FOR BOTANICAL NAMES.

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NO.	DATE	BY	REVISION

SANFORD TRANSFER STATION
SANFORD NC

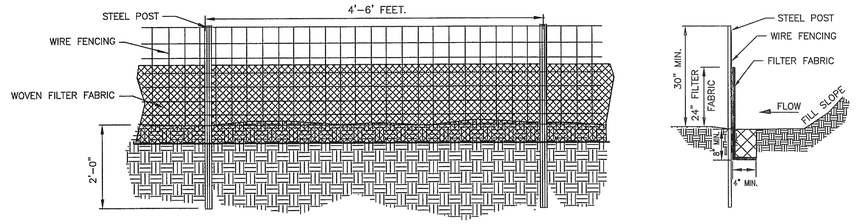
WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

PERMANENT SEEDING

DESIGNED	DRAWN	CHECKED
JDB	JDB	JDB
SCALE	DATE	PROJECT NO.
AS SHOWN	6/8/2013	2013-5

NORTH CAROLINA PROFESSIONAL SEAL 19665 ENGINEER JOHN D. BARNARD 7/9/2014

SHEET:
C-11



GENERAL NOTES:

1. USE A SYNTHETIC FILTER FABRIC OF AT LEAST 95 % BY WEIGHT POLYOLEFINS OR POLYESTER WHICH IS CERTIFIED BY THE MANUFACTURER OR SUPPLIER AS CONFORMING TO ASTM D 6461.
2. SYNTHETIC FILTER FABRIC SHOULD CONTAIN ULTRAVIOLET RAY INHIBITORS AND STABILIZERS TO PROVIDE A MINIMUM OF 6 MONTHS EXPECTED USABLE CONSTRUCTION LIFE AT A TEMPERATURE RANGE OF 0 TO 120 DEGREES FARENHEIT.
3. STEEL POSTS SHALL BE 5'-0" IN HEIGHT AND BE OF THE SELF-FASTENER ANGLE STEEL TYPE WITH A MINIMUM WEIGHT OF 1.33 LBS/FT.
4. WIRE FENCING SHALL BE AT LEAST #14 GAGE WITH A MAXIMUM MESH SPACING OF 6-INCHES. MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
5. TURN SILT FENCE UP SLOPE AT ENDS.

INSTALLATION NOTES:

1. THE BASE OF BOTH END POSTS SHOPULD BE AT LEAST A FOOT HIGER THAN THE MIDDLE OF THE FENCE.
2. INSTALL POSTS 4 FEET APART IN CRITICAL AREAS AND 6-FEET APART ON STANDARD APPLICATIONS.
3. INSTALL POSTS 2 FEET DEEP ONT EH DOWNSTREAM SIDE OF THE SILT FENCE, AND AS CLOSE AS POSSIBLE TO THE FABRIC, ENABLING POSTS TO SUPPORT THE FABRIC FROM UPSTREAM WATER PRESSURE
4. INSTALL POSTS WITH THE NIPPLES FACING AWAY FROM THE SILT FABRIC.
5. ATTACH FABRIC TO EACH POST WITH THREE TIES, ALL SPACED WITHIN THE TOP EIGHT INCHES OF THE FABRIC. ATTACH EACH TIE DIAGONALLY 45 DEGREES THROUGH THE FABRIC, WITH EACH PUNCTURE AT LEAST 1 INCH VERTICALLY APART. EACH TIE SHOULD BE POSITIONED TO HANG ON A POST NIPPLE WHEN TIGHTENED TO PREVENT SAGGING.
6. WRAP APPROXIMATELY 6 INCHES OF FABRIC AROUND THE END POSTS AND SECURE WITH 3 TIES.
7. NO MORE THAN 24-INCHES OF A 36 INCH FABRIC IS ALLOWED ABOVE GROUND LEVEL.
8. THE INSTALLATION SHOULD BE CHECKED AND CORRECTED FOR ANY DEVIATIONS BEFORE COMPACTION.
9. COMPACT THE SOIL IMMEDIATELY NEXT TO THE SILT FENCE FABRIC WITH THE FRONT WHEEL OF THE TRACTOR, SKID STEER, OR ROLLER EXERTING 60 POUNDS PER SQUARE INCH. COMPACT THE UPSTREAM SIDE FIRST, THEN EACH SIDE TWICE FOR A TOTAL OF 4 TRIPS.

MAINTENANCE NOTES:

1. FILTER BARRIERS SHALL BE INSPECTED BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT AT LEST ONCE A WEEK AND IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS NEEDED SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN DEPOSITS REACH ONE THIRD THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS REMOVED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.

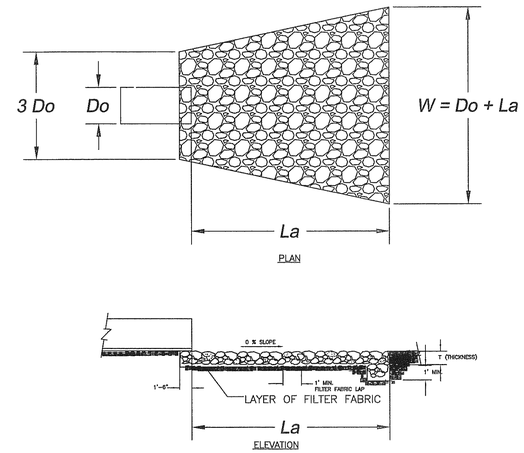
SPECIFICATIONS FOR SEDIMENT FENCE FABRIC

		TEST MATERIAL	UNITS	SUPPORTED[1] SILT FENCE	UN- SUPPORTED[1] SILT FENCE	TYPE OF VALUE
GRAB STRENGTH		ASTM D 4632	N(lbs)			
	MACHINE DIRECTION			400	550	MARV
				(90)	(90)	
	X-MACHINE DIRECTION			400	450	MARV
				(90)	(90)	
PERMITTIVITY[2]		ASTM D 4491	sec^{-1}	0.05	0.05	MARV
APPARENTY OPENING SIZE[2]		ASTM D 4751	mm	0.60	0.60	Max ARV[3]
			US Sieve #	(30)	(30)	
ULTRAVIOLET STABILITY		ASTM D 4355	% Retained Strength	70% After 500 h of exposure	70% After 500 h of exposure	Typical

1 - Silt Fence support shall consist of 14 gage steel wire with a mesh spacing of 6-inches or prefabricted polymer mesh of equivalent strength.
2 - These default valuees are based on empirical evidences with a variety of sediment. For environmentally sensitive areas, a review of previous experience an/or site or regionally specific geotextile tests in accordance with Test Method D 5141 should be performed by the agency to cinfirm suitability of these rquirements.
3 - As measured in accordance with Test Method D 4632.

SILT FENCE

NTS



RIP RAP PAD SUMMARY

PAD LOCATION	OUTLET PIPE DIAMETER (Do) (IN)	PAD LENGTH L_a (FT)	PAD WIDTH 3Do (FT)	PAD WIDTH W (FT)	PAD THICKNESS (IN)	RIP RAP d_{50} (IN)
HW 2	15	6	3.75	9.75	9	6
HW 3	15	6	3.75	9.75	9	6
HW 7	24	10	4.5	14.5	9	6

CONSTRUCTION SPECIFICATIONS:

1. ENSURE THE SUBGRADE FOR THE FILTER AND RIP RAP FOLLOWS THE REQUIRED LINES AND GRADES SHOWN IN THE PLAN. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO THE DENSITY OF THE SURROUNDING UNDISTURBED MATERIAL. LOW AREAS IN THE SUBGRADE ON UNDISTURBED SOIL MAY BE FILLED BY INCREASING THE RIP RAP THICKNESS.
2. THE RIP-RAP AND GRAVEL FILTER MUST CONFORM TO THE SPECIFIED GRADING LIMITS SHOWN ON THE PLANS.
3. FILTER CLOTH, WHEN USED, MUST MEET DESIGN REQUIREMENTS AND BE PROPERLY PROTECTED FROM PUNCHING OR TEARING DURING INSTALLATION. REPAIR ANY DAMAGE BY REMOVING THE RIP RAP AND PLACING ANOTHER PIECE OF FILTER CLOTH OVER THE DAMAGED AREA. ALL CONNECTING JOINTS SHOULD OVERLAP SO THE TOP LAYER IS ABOVE THE DOWNSTREAM LAYER A MINIMUM OF 1 FOOT. IF THE DAMAGE IS EXTENSIVE, REPLACE THE ENTIRE FILTER CLOTH.
4. RIPRAP MAY BE PLACED BY EQUIPMENT, BUT TAKE CARE `O AVOID DAMAGING THE FILTER.
5. THE MINIMUM THICKNESS OF THE RIPRAP SHOULL BE 1.5 TIMES THE MAXIMUM STONE DIAMETER.
6. RIPRAP MAY BE FIELD STONE OR ROUGH QUARRY STONE. IT SHOULD BE HARD, ANGULAR, HIGHLY WEATHER RESISTANT ANDS WELL GRADED.
7. CONSTRUCT THE APRON ON ZERO GRADE WITH NO OVERFILL AT THE END. MAKE THE TOP OF THE RIPRAP AT THE DOWNSTREAM END LEVEL WITH THE RECEIVING AREA OR SLIGHTLY BELOW IT.
8. ENSURE THE APRON IS PROPERLY ALIGNED WITH THE RECEIVING STREAM AND PREFERABLY STRAIGHT THROUGHOUT ITS LENGTH. IF A CURVE IS NEEDED TO FIT SITE CONDITIONS PLACE IT IN THE UPPER SECTION OF THE APRON.
9. IMMEDIATELY AFTER CONSTRUCTION, STABILIZE ALL DISTURBED AREAS WITH VEGETATION.

MAINTENANCE NOTES:

1. INSPECT RIPRAP OUTLET STRUCTURES WEEKLY AND AFTER SIGNIFICANT (1/2 INCH OR GREATER) RAINFALL EVENTS TO SEE IF ANY EROSION AROUND OR BELOW THE RIPRAP HAS TAKEN PLACE, OR IF STONES HAVE BEEN DISLODGED. IMMEDIATELY MAKE ALL NEEDED REPAIRS TO PREVENT FURTHER DAMAGE.

RIP RAP OUTLET PROTECTION

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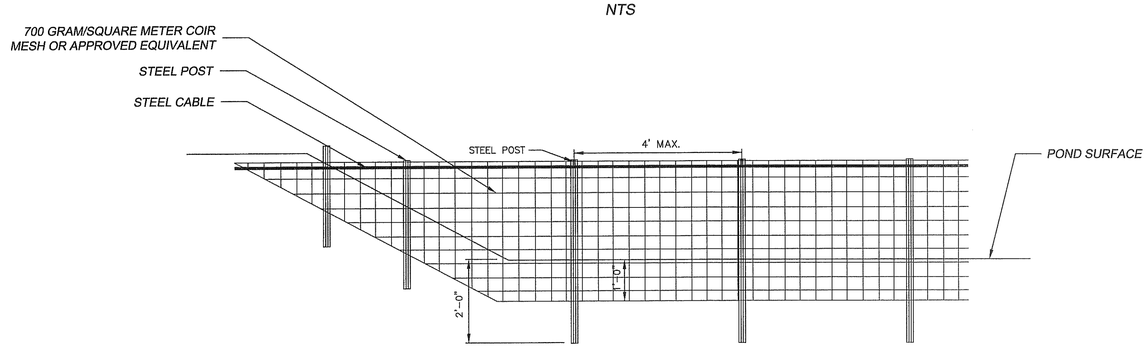


GENERAL NOTES:

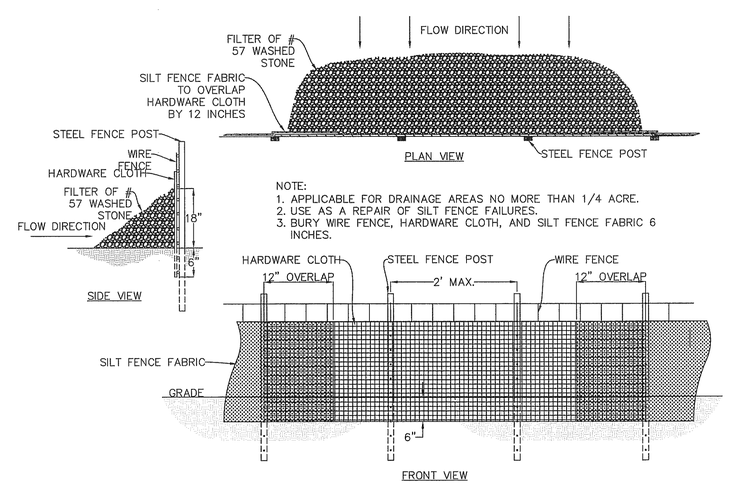
1. INSTALL AS SHOWN ON THE CONSTRUCTION DRAWINGS
2. STEEL POSTS SHALL BE DRIVEN A MINIMUM OF 24" ON A 4-FT MAXIMUM SPACING.
3. THE TOP OF THE FABRIC SHALL BE 6-INCHES HIGHER THAN THE INVERT OF THE SPILLWAY
4. THE TOP OF THE BAFFLES SHOULD BE 2-INCHES BELOW THE TOP OF THE DAM.
5. ADD A SUPPORT WIRE AS SHOWN TO MINIMIZE SAGS
6. ADD CABLE STAYS AT CORNERS TO PROVIDE ADDITIONAL SUPPORT
7. THE BOTTOM OF THE FABRIC SHALL BE TRENCHED IN A MINIMUM OF 12-INCHES.
8. DO NOT SPLICE FABRIC, USE A CONTINUOUS PIECE.

MAINTENANCE NOTES:

1. FILTER BARRIERS SHALL BE INSPECTED BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS NEEDED SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN DEPOSITS REACH ONE THIRD THE HEIGHT OF THE BARRIER.
4. AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED, REMOVE ALL BAFFLE MATERIALS AND UNSTABLE SEDIMENT DEPOSITS, BRING AREA TO GRADE AND STABILIZE.

POROUS BAFFLES

NTS



TEMPORARY SILT FENCE OUTLET

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NO.	DATE	BY	REVISION

SANFORD TRANSFER STATION
SANFORD NC

WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

EROSION CONTROL DETAILS
1 OF 3

DESIGNED	DRAWN	CHECKED
JDB	JDB	JDB
SCALE	DATE	PROJECT NO.
AS SHOWN	6/8/2013	2013-5

NORTH CAROLINA PROFESSIONAL SEAL 19665 ENGINEER JOHN D. BARNARD

SHEET:
C-12

Practice Standards and Specifications

6.51 **HARDWARE CLOTH & GRAVEL INLET PROTECTION**

Definition A temporary measure of wire-mesh hardware cloth around steel posts supporting washed stone placed around the opening of a drop inlet.

Purpose To prevent sediment from entering yard inlets, grated storm drains or drop inlets during construction. This practice allows early use of the storm drain system.

Conditions Where Practice Applies To be placed around a catch basin or a drop inlet and where the flow is light to moderate. If heavy flow is anticipated, use the rock doughnut inlet protection method (Practice 6.54, *Rock Doughnut Inlet Protection*). It is also used where storm drain inlets are to be made operational before permanent stabilization of the disturbed drainage area. This method of inlet protection is effective where the inlet is expected to drain shallow sheet flow. The immediate land area around the inlet should be relatively flat (less than 1 percent) and located so that accumulated sediment can be easily removed.

This practice must not be used near the edge of fill material and must not divert water over cut or fill slopes.

Design Criteria Ensure that drainage areas do not exceed 1 acre per inlet.

For securing the wire mesh hardware cloth barriers, use steel T posts. The posts need to be 1.25 lb/linear ft steel with a minimum length of 5 feet. Make sure the posts have projections to facilitate fastening the hardware cloth. Securely drive each stake into the ground to a minimum depth of 2 feet. The maximum spacing for the posts is 4 feet.

The wire mesh should be at least a 19-gauge hardware cloth with a ½ inch mesh opening. The total height should be a minimum of 2 feet. Providing a flap of hardware cloth on the ground projecting away from the inlet can aid in removal of the stone at the project's completion. The sediment control stone, with a height of 16 inches, should have a outside slope of 2:1.

The top elevation of the structure must be at least 12 inches lower than the ground elevation downslope from the inlet. It is important that all storm flows pass over the structure into the storm drain and not bypass the structure. Temporary dikes below the structure may be necessary to prevent bypass flow. Soil excavated when constructing the sediment pool may be used for this purpose (Figure 6.51a).

Rev. 6/96 6.51.1

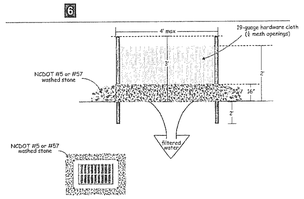


Figure 6.51a Hardware cloth and gravel inlet protection

Construction Specifications
1. Uniformly grade a shallow depression approaching the inlet.
2. Drive 5-foot steel posts 2 feet into the ground surrounding the inlet. Space posts evenly around the perimeter of the inlet, a minimum of 4 feet apart.
3. Surround the posts with wire mesh hardware cloth. Secure the wire mesh to the steel posts at the top, middle, and bottom. Placing a 2-foot flap of the wire mesh under the gravel for anchoring is recommended.
4. Place clean gravel (NC DOT #5 or #57 stone) on a 2:1 slope with a height of 16 inches around the wire, and smooth to an even grade.
5. Once the contributing drainage area has been stabilized, remove accumulated sediment, and establish final grading elevations.
6. Compact the area properly and stabilized it with groundcover.

Maintenance Inspect inlets at least weekly and after each significant (½ inch or greater) rainfall event. Clear the mesh wire of any debris or other objects to provide adequate flow for subsequent rains. Take care not to damage or embrace the wire mesh during sediment removal. Replace stone as needed.

References *Inlet Protection*
6.52, Block and Gravel Inlet Protection
6.54, Rock Doughnut Inlet Protection

North Carolina Department of Transportation
Standard Specifications for Roads and Structures

6.51.2 Rev. 6/96

HARDWARE CLOTH AND GRAVEL INLET PROTECTION

NOT TO SCALE

Practice Standards and Specifications

6.83 **CHECK DAM**

Definition A small temporary stone dam constructed across a drainage way.

Purpose To reduce erosion in a drainage channel by reducing the velocity of flow.

Conditions Where Practice Applies This practice may be used as a temporary measure to limit erosion by reducing velocity in small open channels. When needed, they can be used in channels, roadside ditches, and temporary diversions.

Check dams may be used to:
- reduce velocity in small temporary channels that are degrading, but whose permanent stabilization is impractical due to their short period of usefulness;
- reduce velocity in small eroding channels where construction delays or weather conditions prevent timely installation of nonerosive liners.

Do not use check dams in intermittent or perennial streams.

Planning Considerations Check dams are an expedient way to reduce gullying in the bottom of channels that will be filled or stabilized at a later date. The dams should only be used while permanent stabilization measures are being put into place.

Check dams installed in grass-lined channels may kill the vegetative lining if submergence after it rains is too long and/or silting is excessive. All stone and riprap must be removed if mowing is planned as part of vegetative maintenance.

Design Criteria The following criteria should be used when designing a check dam:
- The drainage area is limited to one half acre.
- Keep a maximum height of 2 feet at the center of the dam.
- Keep the center of the check dam at least 9 inches lower than the outer edges to natural ground elevation.
- Keep the side slopes of the dam at 2:1 or flatter.
- Ensure that the maximum spacing between dams places the toe of the upstream dam at the same elevation as the top of the downstream dam (Figure 6.83a).
- Stabilize outflow areas along the channel to resist erosion.
- Use NC DOT Class B stone and line the upstream side of the dam with NC DOT #5 or #57 stone.
- Key the stone into the ditch banks and extend it beyond the abutments a minimum of 1.5 feet to avoid washout from overflow around the dam.

Rev. 6/96 6.83.1

Construction Specifications
1. Place stone to the lines and dimensions shown in the plan on a filter fabric foundation.
2. Keep the center stone section at least 9 inches below natural ground level where the dam abuts the channel banks.
3. Extend dams at least 1.5 feet beyond the ditch bank (Figure 6.83b) to keep water from cutting around the ends of the check dam.
4. Set spacing between dams to assure that the elevation at the top of the lower dam is the same as the toe elevation of the upper dam.
5. Protect the channel other than the lowest check dam from heavy flow that could cause erosion.
6. Make sure that the channel reach above the most upstream dam is stable.
7. Ensure that other areas of the channel, such as culvert entrances below the check dams, are not subject to damage or blockage from displaced stones.

Figure 6.83a Space check dams in a channel so that the crest of downstream dam is at elevation of the toe of upstream dam.

6.83.2 Rev. 6/96

Practice Standards and Specifications

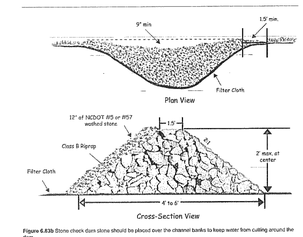


Figure 6.83b Stone check dam stone should be placed over the channel banks to keep water from cutting around the dam.

Maintenance Inspect check dams and channels at least weekly and after each significant (1/2 inch or greater) rainfall event and repair immediately. Clean out sediment, straw, limbs, or other debris that could clog the channel when needed.

Anticipate sediment and deposition above the check dam and erosion from high flows around the edges of the dam. Correct all damage immediately. If significant erosion occurs between dams, additional measures can be taken such as, installing a protective riprap liner in that portion of the channel (Practice 6.31, *Riprap-line and Paved Channels*).

Remove sediment accumulated behind the dams as needed to prevent damage to channel vegetation, allow the channel to drain through the stone check dam, and prevent large flows from carrying sediment over the dam. Add stones to dams as needed to maintain design height and cross section.

References *Runoff Conveyance Measures*
6.30, Grass-lined Channels
6.31, Riprap-lined and Paved Channels.

North Carolina Department of Transportation
Standard Specifications for Roads and Structures

Rev. 6/96 6.83.3

ROCK CHECK DAM

NOT TO SCALE

Practice Standards and Specifications

6.55 **ROCK PIPE INLET PROTECTION**

Definition A horseshoe shaped rock dam structure at a pipe inlet with a sediment storage area around the outside perimeter of the structure.

Purpose To prevent sediment from entering, accumulating in and being transferred by a culvert or storm drainage system prior to stabilization of the disturbed drainage area. This practice allows early use of the storm drainage system.

Conditions Where Practice Applies Rock pipe inlet protection may be used at pipes with a maximum diameter of 36 inches. This inlet protection may be used to supplement additional sediment traps or basins at the pipe outlet, or used in combination with an excavated sediment storage area to serve as a temporary sediment trap. Pipe inlet protection should be provided to protect the storm drainage system and downstream areas from sedimentation until permanent stabilization of the disturbed drainage area.

Do not install this measure in an intermittent or perennial stream.

Planning Considerations When construction on a project reaches a stage where culverts and other storm drainage structures are installed and many areas are brought to the desired grade, there is need to protect the points where runoff can leave the site through culverts or storm drains. Similar to drop and curb inlets, culverts receiving runoff from disturbed areas can convey large amounts of sediment to lakes or streams. Even if the pipe discharges into a sediment trap or basin, the pipe or pipe system itself may clog with sediment.

Design Criteria When used in combination with an excavated sediment storage area to serve as a temporary sediment trap, the design criteria for temporary sediment traps must be satisfied. The maximum drainage area should be 5 acres, and 3600 cubic feet of sediment storage per acre of disturbed drainage area should be provided.

The minimum stone height should be 2 feet, with side slopes no steeper than 2:1. The stone "horseshoe" around the pipe inlet should be constructed of Class B or Class I riprap, with a minimum crest width of 3 feet. The outside face of the riprap should be coved with a 12-inch thick layer of #5 or #57 washed stone.

In preparing plans for rock pipe inlet protection, it is important to protect the embankment over the pipe from overtopping. The top of the stone should be a minimum of 1 foot below the top of the fill over the pipe. The stone should tie into the fill on both sides of the pipe. The inside toe of the stone should be no closer than 2 feet from the culvert opening to allow passage of high flows.

The sediment storage area should be excavated upstream of the rock pipe inlet protection, with a minimum depth of 18 inches below grade.

Rev. 6/96 6.55.1

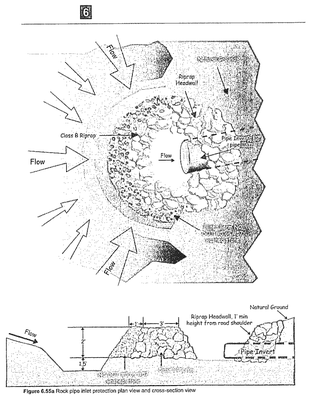


Figure 6.55a Rock pipe inlet protection plan view and cross-section view

6.55.2 Rev. 6/96

Practice Standards and Specifications

Construction Specifications
1. Clear the area of all debris that might hinder excavation and disposal of spoil.
2. Install the Class B or Class I riprap in a semi-circle around the pipe inlet. The stone should be built up higher on each end where it ties into the embankment. The minimum crest width of the riprap should be 3 feet, with a minimum bottom width of 18 feet. The minimum height should be 2 feet, but also 1 foot lower than the shoulder of the embankment or diversions.
3. A 1 foot thick layer of NC DOT #5 or #57 stone should be placed on the outside slope of the riprap.
4. The sediment storage area should be excavated around the outside of the stone horseshoe 18 inches below natural grade.
5. When the contributing drainage area has been stabilized, fill depressions and establish final grading elevations, compact area properly, and stabilize with ground cover.

Maintenance Inspect rock pipe inlet protection at least weekly and after each significant (½ inch or greater) rainfall event and repair immediately. Remove sediment and restore the sediment storage area to its original dimensions when the sediment has accumulated to one-half the design depth of the trap. Place the sediment that is removed in the designated disposal area and replace the contaminated part of the gravel facing.

Check the structure for damage. Any riprap displaced from the stone horseshoe area be replaced immediately.

After all the sediment-producing areas have been permanently stabilized, remove the structure and all the unstable sediment. Smooth the area to blend with the adjoining areas and provide permanent ground cover (*Surface Stabilization*).

References *Inlet protection*
6.52, Block and Gravel Inlet Protection (Temporary)

Sediment Trap and Barriers
6.60, Temporary Sediment Trap

Surface Stabilization
6.15, Riprap

North Carolina Department of Transportation
Erosion & Sedimentation Guidelines for Division Maintenance Operation, 1993.

Virginia Erosion and Sediment Control Handbook, 1992. STD & SPEC 3.08, Culvert Inlet Protection, pages III-46 - III-51 (Culvert Inlets. Sediment Traps).

6.55.3 Rev. 6/96

ROCK PIPE INLET PROTECTION

NOT TO SCALE

Practice Standards and Specifications

6.06 **TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT**

Definition A graveled area or pad located at points where vehicles enter and leave a construction site.

Purpose To provide a buffer area where vehicles can shop their mud and sediment to avoid transporting it onto public roads, to control erosion from surface runoff, and to help control dust.

Conditions Where Practice Applies Wherever traffic will be leaving a construction site and traveling directly onto a public road or other paved off-site area. Construction plans should limit traffic to properly constructed entrances.

Design Criteria **Aggregate Size**—Use 2-3 inch washed stone.

Dimensions of gravel pad—
Thickness: 6 inches minimum
Width: 12-foot minimum or full width at all points of the vehicular entrance and exit area, whichever is greater
Length: 50-foot minimum

Location—Locate construction entrances and exits to limit sediment from leaving the site and to provide for maximum utility by all construction vehicles (Figure 6.06a). Avoid steep grades, and entrances at curves in public roads.

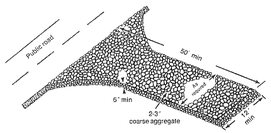


Figure 6.06a Ground entrance/exit keeps sediment from leaving the construction site (modified from Va DWCC).

6.06.1

Washing—If conditions at the site are such that most of the mud and sediment are not removed by vehicles traveling over the gravel, the tires should be washed. Washing should be done on an area stabilized with crushed stone that drains into a sediment trap or other suitable disposal area. A wash rack may also be used to make washing more convenient and effective.

Construction Specifications
1. Clear the entrance and exit area of all vegetation, roots, and other objectionable material and properly grade it.
2. Place the gravel to the specific grade and dimensions shown on the plans, and smooth it.
3. Provide drainage to carry water to a sediment trap or other suitable outlet.
4. Use geotextile fabrics because they improve stability of the foundation in locations subject to seepage or high water table.

Maintenance Maintain the gravel pad in a condition to prevent mud or sediment from leaving the construction site. This may require periodic topdressing with 2-inch stone. After each rainfall, inspect any structure used to trap sediment and clean it out as necessary. Immediately remove all objectionable materials spilled, washed, or tracked onto public roadways.

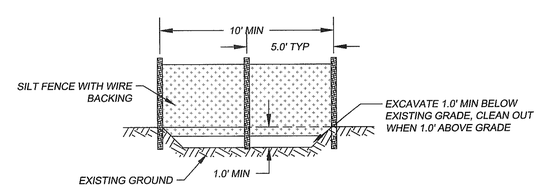
References *Runoff Conveyance Measures*
6.30, Grass-lined Channels

Sediment Traps and Barriers
6.60, Temporary Sediment Trap

6.06.2

CONSTRUCTION ENTRANCE

NOT TO SCALE



CONCRETE WASHOUT

NOT TO SCALE

GRAPHIC SCALE
0 40' 80'
(IN FEET)
1 inch = 40 ft.

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1534 Saratoga Blvd. Indian Trail, NC 28079
(704) 421-3067
www.barnardengineeringpc.com
N.C. License No. C-3679

NO.	DATE	BY	REVISION
1	7-30-13	JDB	NCDENR LAND QUALITY REVIEW

SANFORD TRANSFER STATION
SANFORD NC

WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

EROSION CONTROL DETAILS
2 OF 3

DESIGNED	DRAWN	CHECKED
JDB	JDB	JDB
SCALE	DATE	PROJECT NO.
AS SHOWN	6/6/2013	2013-5

NORTH CAROLINA PROFESSIONAL SEAL 19565 ENGINEER JOHN D. BARNARD

SHEET:
C-13

- Dewatering—Allow the maximum reasonable detention period before the basin is completely dewatered (at least 24 hours).
- Inflow rate—Reduce the inflow velocity and divert all sediment-free runoff.

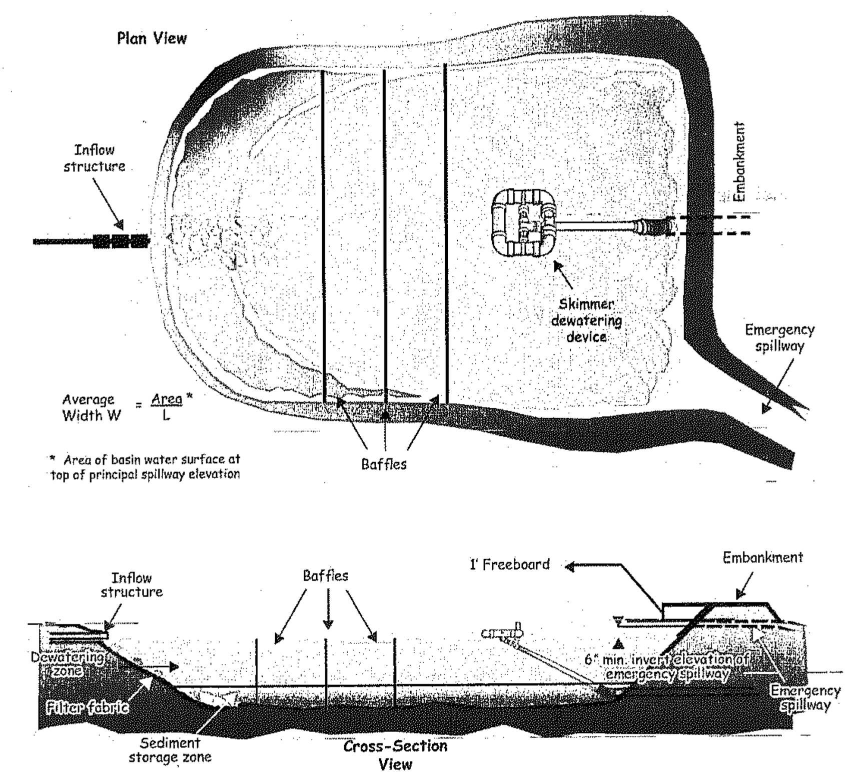


Figure 6.64c Example of a sediment basin with a skimmer outlet and emergency spillway. From Pennsylvania Erosion and Sediment Pollution Control Manual, March, 2000.

6

Construction Specifications

1. Clear, grub, and strip the area under the embankment of all vegetation and root mat. Remove all surface soil containing high amounts of organic matter and stockpile or dispose of it properly. Haul all objectionable material to the designated disposal area. Place temporary sediment control measures below basin as needed

2. Ensure that fill material for the embankment is free of roots, woody vegetation, organic matter, and other objectionable material. Place the fill in lifts not to exceed 9 inches, and machine compact it. Over fill the embankment 6 inches to allow for settlement.

3. Shape the basin to the specified dimensions. Prevent the skimming device from settling into the mud by excavating a shallow pit under the skimmer or providing a low support under the skimmer of stone or timber.

4. Place the barrel (typically 4-inch Schedule 40 PVC pipe) on a firm, smooth foundation of impervious soil. Do not use pervious material such as sand, gravel, or crushed stone as backfill around the pipe. Place the fill material around the pipe spillway in 4-inch layers and compact it under and around the pipe to at least the same density as the adjacent embankment. Care must be taken not to raise the pipe from the firm contact with its foundation when compacting under the pipe haunches.

Place a minimum depth of 2 feet of compacted backfill over the pipe spillway before crossing it with construction equipment. In no case should the pipe conduit be installed by cutting a trench through the dam after the embankment is complete.

5. Assemble the skimmer following the manufacturers instructions, or as designed.

6. Lay the assembled skimmer on the bottom of the basin with the flexible joint at the inlet of the barrel pipe. Attach the flexible joint to the barrel pipe and position the skimmer over the excavated pit or support. Be sure to attach a rope to the skimmer and anchor it to the side of the basin. This will be used to pull the skimmer to the side for maintenance.

7. Earthen spillways—Install the spillway in undisturbed soil to the greatest extent possible. The achievement of planned elevations, grade, design width, and entrance and exit channel slopes are critical to the successful operation of the spillway. The spillway should be lined with laminated plastic or impermeable geotextile fabric. The fabric must be wide and long enough to cover the bottom and sides and extend onto the top of the dam for anchoring in a trench. The edges may be secured with 8-inch staples or pins. The fabric must be long enough to extend down the slope and exit onto stable ground. The width of the fabric must be one piece, not joined or spliced; otherwise water can get under the fabric. If the length of the fabric is insufficient for the entire length of the spillway, multiple sections, spanning the complete width, may be used. The upper section(s) should overlap the lower section(s) so that water cannot flow under the fabric. Secure the upper edge and sides of the fabric in a trench with staples or pins. (Adapted from "A Manual for Designing, Installing and Maintaining Skimmer Sediment Basins." February, 1999. J. W. Faircloth & Son.).

8. Inlets—Discharge water into the basin in a manner to prevent erosion. Use temporary slope drains or diversions with outlet protection to divert sediment-laden water to the upper end of the pool area to improve basin trap efficiency (References: *Runoff Control Measures and Outlet Protection*).

9. Erosion control—Construct the structure so that the disturbed area is minimized. Divert surface water away from bare areas. Complete the embankment before the area is cleared. Stabilize the emergency spillway embankment and all other disturbed areas above the crest of the principal spillway immediately after construction (References: *Surface Stabilization*).

10. Install porous baffles as specified in Practice 6.65, *Porous Baffles*.

11. After all the sediment-producing areas have been permanently stabilized, remove the structure and all the unstable sediment. Smooth the area to blend with the adjoining areas and stabilize properly (References: *Surface Stabilization*).

Maintenance

Inspect skimmer sediment basins at least weekly and after each significant (one-half inch or greater) rainfall event and repair immediately. Remove sediment and restore the basin to its original dimensions when sediment accumulates to one-half the height of the first baffle. Pull the skimmer to one side so that the sediment underneath it can be excavated. Excavate the sediment from the entire basin, not just around the skimmer or the first cell. Make sure vegetation growing in the bottom of the basin does not hold down the skimmer.

Repair the baffles if they are damaged. Re-anchor the baffles if water is flowing underneath or around them.

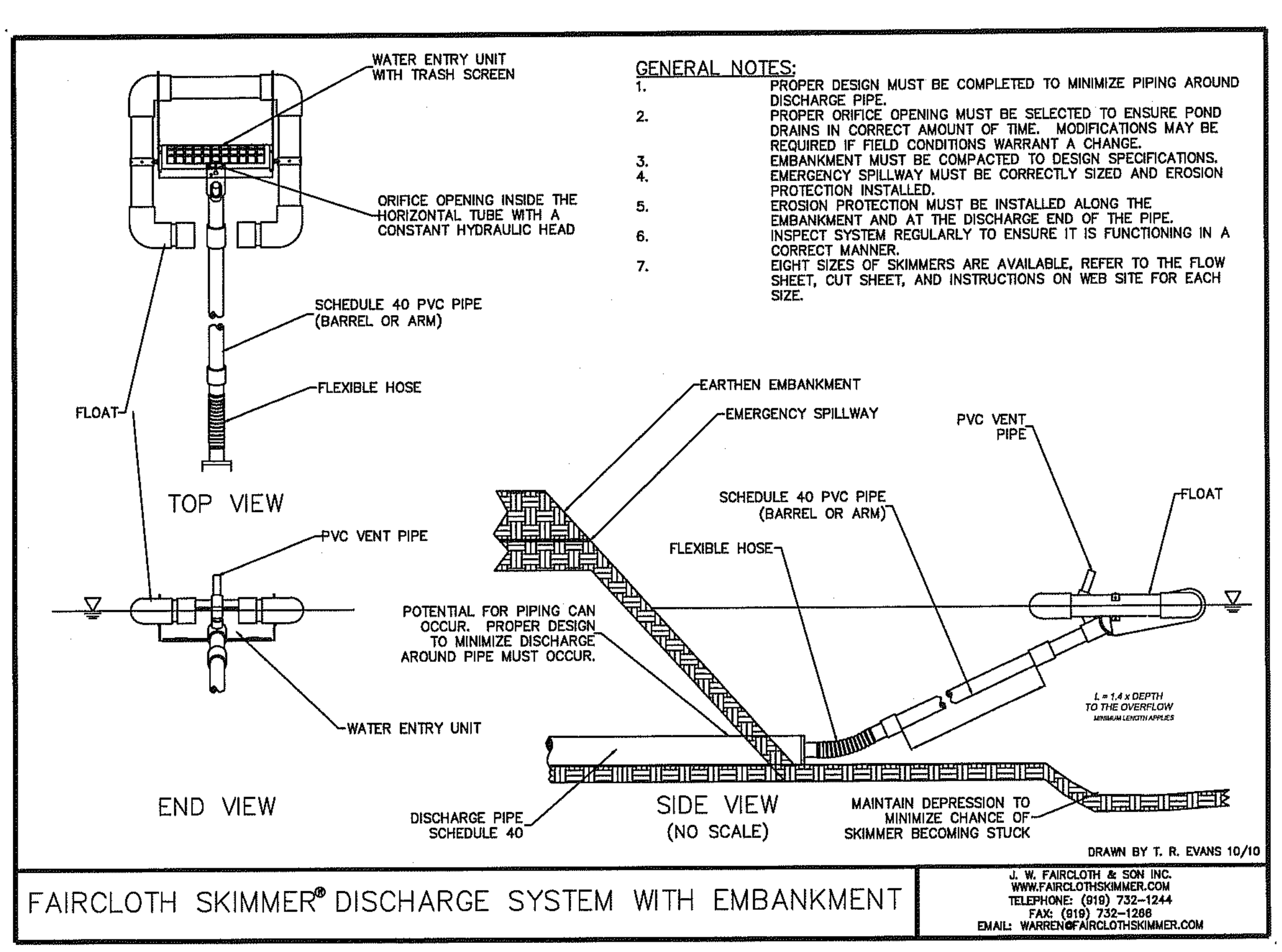
If the skimmer is clogged with trash and there is water in the basin, usually jerking on the rope will make the skimmer bob up and down and dislodge the debris and restore flow. If this does not work, pull the skimmer over to the side of the basin and remove the debris. Also check the orifice inside the skimmer to see if it is clogged; if so remove the debris.

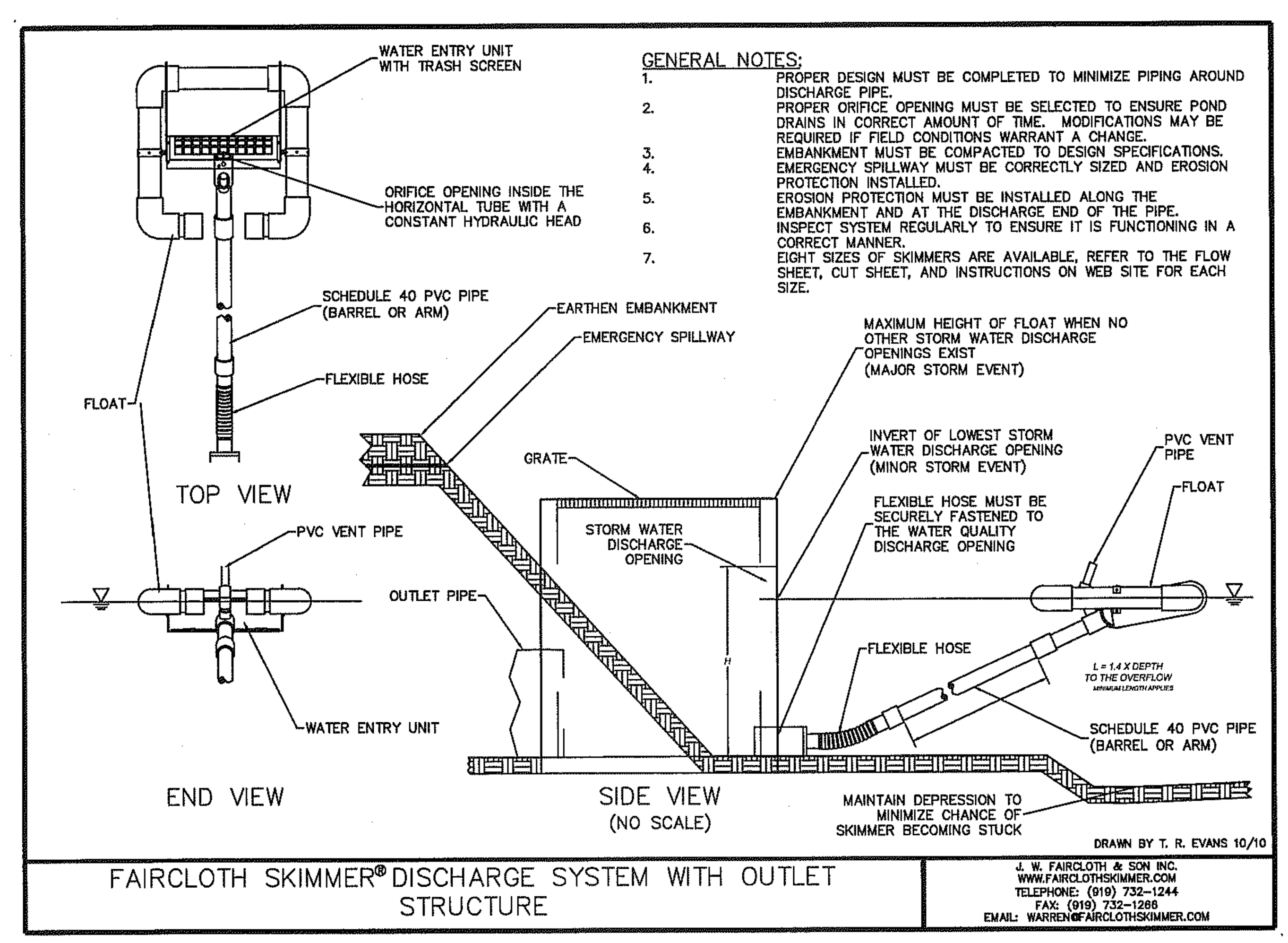
If the skimmer arm or barrel pipe is clogged, the orifice can be removed and the obstruction cleared with a plumber's snake or by flushing with water. Be sure and replace the orifice before repositioning the skimmer.

Check the fabric lined spillway for damage and make any required repairs with fabric that spans the full width of the spillway. Check the embankment, spillways, and outlet for erosion damage, and inspect the embankment for piping and settlement. Make all necessary repairs immediately. Remove all trash and other debris from the skimmer and pool areas.

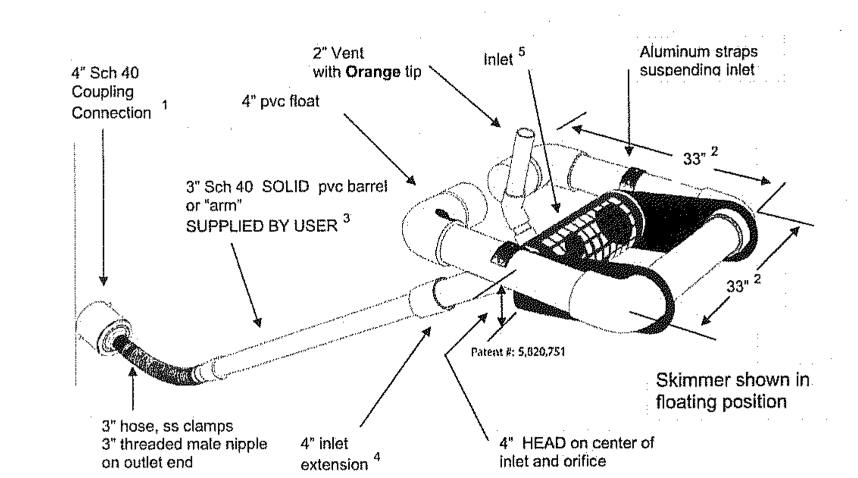
Freezing weather can result in ice forming in the basin. Some special precautions should be taken in the winter to prevent the skimmer from plugging with ice.

SKIMMER BASIN DETAILS





4" *Faircloth Skimmer®* Surface Drain Cut Sheet
J. W. Faircloth & Son, Inc.
www.FairclothSkimmer.com



1. Coupling can be removed and hose attached to outlet using the threaded 3" nipple. Typical methods used: on a metal structure a steel stubout welded on the side at the bottom with a 3" threaded coupling or reducers; on a concrete structure with a hole or orifice at the bottom, use a steel plate with a hole cut in it and coupling welded to it that will fit over the hole in the concrete and bolted to the structure with sealant. It is possible to grout a 4" pvc pipe in a hole in the concrete to connect the skimmer but this is less secure than other methods.
2. Dimensions are approximate, not intended as plans for construction.
3. Barrel (solid, not foam core pipe) should be 1.4 times the depth of water with a minimum length of 8' so the inlet can be pulled to the side for maintenance. If more than 10' long weight may have to be added to inlet to counter the increased buoyancy.
4. Inlet tapers down from 4" maximum inlet to a 3" barrel and hose. Barrel is smaller to reduce buoyancy and tendency to lift inlet but is sufficient for flow through inlet because of slope. The inlet orifice can be reduced using the plug and cutter provided to control the outflow rate.
5. Inlet is 8" pipe between the straps with slots cut in the inlet and aluminum screen door (smaller than shown in illustration) for access to the 4" inlet and orifice inside.
6. **Capacity** 20,109 cubic feet per day maximum with 4" inlet and 4" head. Inlet can be reduced by installing a smaller orifice using the plug and cutter provided to adjust flow rate for the particular basin volume and drawdown time required.
7. Shipped assembled. User glues inlet extension and barrel, installs vent, cuts orifice in plug and attaches to outlet pipe or structure. Includes flexible hose, rope, orifice cutter, etc.

4inchCut TM 11-07 November 14, 2007

Project	Sanford Transfer Station			
Date	6/25/2013	Rev 7/30/13		
By	JDB			
Project Number	2013-5			
		SEDIMENT TRAP SIZING		
TRAP NO.:	1			
DRAINAGE AREA	4.96	AC.		
CALCULATE FLOW				
	C:	0.4	Rational Runoff Coefficient	
	i	7.22	Rainfall Intensity (in/hr)	
	A	4.96	Drainage area (Ac)	
	Q_{10}	14.32	Flow (cfs)	
Required Surfacea Area		325	Sf per cfs Q_{10}	
		4,655	Sf	
Required Storage		1,800	CF / Disturbed Acre	
		8,928	CF	
Weir Length	Must Pass Q_{10} with no more than 6" depth over weir			
Weir Equation	$Q = C_wLH^{3/2}$		where	
Weir Coefficient	C_w	3	dimensionless	
Weir Length	L	***Solve***	Ft	
Head over weir	H	0.5	Ft (max)	
Flow	Q	14.32	CFS From Above	
	L	13.51	Ft	
	Use L = 16'			
		Storage		
Top Elevation	411			
Weir Elevation	409.5			
Bottom Elevation	407			
Storage Depth	2.5			
	Elevation	Area (SF)	Inc. Volume(CF)	Cumulative Volume
	407	0		
	407.5	6656	1664	1664
	408	7745	3600.25	5264.25
	409.5	9344	12816.75	18081
Skimmer Orifice Sizing				
Volume to Drain	18,081	Ft^3		
Time to Drain	5	Days		
Q_d (Flow Rate)	3616.2	Ft^3/ Day		
Try 4" Skimmer				
h (head) =	0.33			
Orifice Dia.				
$D = (Qd/(2310^*(h)^{\wedge}.5)^{\wedge 0.5}$				
	1.65	Inches		
Use 1 5/8" Orifice				

NOTE: USE A 4" SKIMMER WITH A 1 5/8" ORIFICE

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NO.	DATE	BY	REVISION
1	7-30-13	JDB	NCDENR LAND QUALITY REVIEW

SANFORD TRANSFER STATION
SANFORD NC

WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

EROSION CONTROL DETAILS
3 OF 3

DESIGNED	JDB	DRAWN	JDB	CHECKED	JDB
SCALE	AS SHOWN	DATE	6/8/2013	PROJECT NO.:	2013-5

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19665 JOHN D. BARNARD 7/31/13

SHEET:
C-14

1. MISCELLANEOUS

A. CURRENT EDITIONS OF THE NCDOT ROADWAY STANDARD DRAWINGS AND SPECIFICATIONS MANUAL SHALL BE CONSIDERED PART OF THESE PLANS.

B. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE PERMIT AND INSPECTION REQUIREMENTS SPECIFIED BY THE VARIOUS GOVERNMENTAL AGENCIES, THE ENGINEER, AND THE ARCHITECT. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO CONSTRUCTION, AND SHALL SCHEDULE ANY NECESSARY INSPECTIONS ACCORDING TO AGENCY INSTRUCTIONS.

C. ALL SPECIFICATIONS AND DOCUMENTS REFERRED TO IN THESE PLANS SHALL BE OF THE LATEST REVISION.

D. ALL WORK PERFORMED SHALL COMPLY WITH THE REGULATIONS AND ORDINANCES OF THE VARIOUS GOVERNMENTAL AGENCIES HAVING JURISDICTION OVER THE WORK.

2. PROTECTION OF EXISTING UTILITIES

THE CONTRACTOR SHALL CONTACT THE APPROPRIATE AGENCY FOR THE EXACT FIELD LOCATIONS OF ALL WATER, SEWER, ELECTRIC, TELEPHONE, TELEVISION AND ANY OTHER UNDERGROUND AND OVERHEAD UTILITY BEFORE STARTING CONSTRUCTION.
THE OMISSION FROM OR THE INCLUSION OF UTILITY LOCATION ON THE CONTRACT DRAWINGS IS NOT TO BE CONSIDERED AS THE NON-EXISTANCE OF OR A DEFINITE LOCATION OF EXISTING UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES ALONG THE ROUTE OF WORK.

THE FOLLOWING LISTING OF UTILITY COMPANIES (WHICH MAY OR MAY NOT BE COMPLETE) MAY HAVE EXISTING UNDERGROUND OR OVERHEAD UTILITIES IN THE CONTRACT VICINITY.

ONE CALL.....(800) 632-4949

3. SAFETY

A. DURING THE CONSTRUCTION AND MAINTENANCE OF THIS PROJECT, ALL SAFETY REGULATIONS SHALL BE ENFORCED. THE CONTRACTOR OR HIS REPRESENTATIVE SHALL BE RESPONSIBLE FOR THE CONTROL AND SAFETY OF THE TRAVELING PUBLIC AND THE SAFETY OF HIS PERSONNEL.

B. LABOR SAFETY REGULATIONS SHALL CONFORM TO THE PROVISIONS SET FORTH BY OSHA IN THE FEDERAL REGISTER OF THE DEPARTMENT OF TRANSPORTATION.

C. CONTRACTOR SHALL PROVIDE AND MAINTAIN HIS OWN SAFETY EQUIPMENT IN ACCORDANCE WITH HIS HEALTH & SAFETY PROGRAM AND ALL OTHER APPLICABLE LEGAL AND HEALTH AND SAFETY REQUIREMENTS. THE CONTRACTOR IS ALSO RESPONSIBLE FOR PROVIDING ITS EMPLOYEES AND SUB CONTRACTORS WITH ADEQUATE INFORMATION AND TRAINING TO ENSURE THAT ALL EMPLOYEES AND SUB CONTRACTORS AND SUB CONTRACTOR'S EMPLOYEES COMPLY WITH ALL APPLICABLE REQUIREMENTS. CONTRACTOR SHALL REMAIN IN COMPLIANCE WITH ALL OCCUPATION SAFETY AND HEALTH REGULATIONS AS WELL AS THE ENVIRONMENTAL PROTECTION LAWS. THE FOLLOWING IS NOT TO BE PERCEIVED AS THE ENTIRE SAFETY PROGRAM BUT JUST BASIC REQUIREMENTS.

D. ALL EXCAVATIONS BY THE CONTRACTOR SHALL CONFORM TO THE REQUIREMENTS OF THE DEPARTMENT OF LABOR'S OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION RULES AND REGULATIONS. PARTICULAR ATTENTION MUST BE PAID TO THE CONSTRUCTION STANDARDS FOR EXCAVATIONS, 29 CFR PART 1926, SUBPART P.

E. THE MINIMUM STANDARDS AS SET FORTH IN THE CURRENT EDITION OF "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (U.S. DOT) SHALL BE FOLLOWED IN THE DESIGN APPLICATION, INSTALLATION, MAINTENANCE AND REMOVAL OF ALL TRAFFIC CONTROL DEVICES, WARNING DEVICES AND BARRIERS NECESSARY TO PROTECT THE PUBLIC AND WORKMEN FROM HAZARDS WITHIN THE PROJECT LIMITS.

F. ALL TRAFFIC CONTROL MARKINGS AND DEVICES SHALL CONFORM TO THE PROVISIONS SET FORTH IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES PREPARED BY THE U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION.

G. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO COMPLY AND ENFORCE ALL APPLICABLE SAFETY REGULATIONS. THE ABOVE INFORMATION HAS BEEN PROVIDED FOR THE CONTRACTOR'S INFORMATION ONLY AND DOES NOT IMPLY THAT THE OWNER OR ENGINEER WILL INSPECT AND/OR ENFORCE SAFETY REGULATIONS.

H. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION IN AREAS OF BURIED UTILITIES AND SHALL PROVIDE AT LEAST 48 HOURS NOTICE TO THE UTILITY COMPANIES PRIOR TO CONSTRUCTION TO OBTAIN FIELD LOCATIONS OF EXISTING UNDERGROUND UTILITIES.

I. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO EXISTING FACILITIES, ABOVE OR BELOW GROUND, THAT MAY OCCUR AS A RESULT OF THE WORK PERFORMED BY THE CONTRACTOR CALLED FOR IN THIS CONTRACT.

J. ALL UNDERGROUND UTILITIES MUST BE IN PLACE AND TESTED OR INSPECTED PRIOR TO BASE AND PAVEMENT CONSTRUCTION.

IV. SITE PLAN AND COORDINATE GEOMETRY

A. DESIGN DATA PREPARED BY BARNARD ENGINEERING AND LAWRENCE ASSOCIATES SURVEYING.

B. ALL POINTS AND MONUMENTS SHALL BE SURVEYED UPON MOBILIZATION TO VERIFY THEIR ACCURACY. ANY DISCREPENCIES DISCOVERED MUST BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN WRITING.

C. MONUMENTS AND OTHER SURVEY CONTROL POINTS SHALL BE PROTECTED FROM DAMAGE AND DISTURBANCE. IF ANY CONTROL POINTS ARE DAMAGED OR DISTURBED, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE ENGINEER AND REPLACE THE CONTROL POINTS TO THEIR ORIGINAL CONDITION AT HIS OWN EXPENSE.

D. ALL ELEVATIONS REFER TO THE NATIONAL GEODETIC VERTICAL DATUM.

E. LOCATIONS, ELEVATIONS, AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES AND OTHER FEATURES ARE SHOWN ACCORDING TO THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF THESE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS, ELEVATIONS AND DIMENSIONS OF ALL EXISTING UTILITIES, STRUCTURES AND OTHER FEATURES AFFECTING THIS WORK PRIOR TO CONSTRUCTION.

F. UPON COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL FURNISH OWNER'S ENGINEER WITH COMPLETE "AS-BUILT" INFORMATION CERTIFIED BY A REGISTERED LAND SURVEYOR. THIS "AS-BUILT INFORMATION SHALL BE PRODUCED ON AUTOCAD VERSION 12, OR LATER, AND UPON COMPLETION, THE CONTRACTOR SHALL FURNISH BARNARD ENGINEERING WITH DISKS OF ALL DRAWINGS, ONE SET OF REPRODUCIBLE MYLARS, AND TWO SETS OF BLUEPRINTS. THE "AS-BUILT" INFORMATION SHALL CLEARLY AND ACCURATELY REPRESENT ALL CONSTRUCTED ITEMS INCLUDING, BUT NOT LIMITED TO:

1. ELEVATIONS OF ALL STORM SEWER AND SANITARY SEWER STRUCTURE BOTTOMS, TOPS, AND INVERTS.

2. FIELD MEASURED LENGTHS OF PIPES FOR ALL INSTALLED UTILITIES, CONDUITS, SLEEVES, ETC.

3. LOCATIONS OF ALL STRUCTURES, PIPES, CONDUITS, SLEEVES, ETC.

4. CALCULATED SLOPE OF ALL SANITARY SEWER AND STORM SEWER LINES.

5. HORIZONTAL AND VERTICAL CONTROL OF ALL WATER MAIN FITTINGS AND APPURTENANCES, AND HORIZONTAL AND VERTICAL CONTROL ON THE TOP OF WATER MAINS AT ALL CROSSINGS, AND A MINIMUM OF EVERY 200 LINEAR FEET OF PIPE.

6. HORIZONTAL AND VERTICAL CONTROL OF ALL TOP OF BANKS, TOE OF SLOPES, ALL GRADE BREAKS, BUILDINGS, PONDS, ETC.

G. ALL DIMENSIONS SHOWN ON PLAN ARE TO FACE OF BUILDING, EDGE OF PAVEMENT, CENTERLINE OF STRUCTURE, OR END OF PIPE UNLESS NOTED OTHERWISE.

V. CLEARING/DEMOLITION

A. THE CONTRACTOR SHALL CLEAR AND GRUB ONLY THOSE PORTIONS OF THE SITE NECESSARY FOR CONSTRUCTION. DISTURBED AREAS WILL BE SEEDED, MULCHED, SODDED OR PLANTED WITH OTHER APPROVED LANDSCAPE MATERIAL IMMEDIATELY FOLLOWING CONSTRUCTION.

B. THE TOP 6" OF GROUND REMOVED DURING CLEARING AND GRUBBING SHALL BE STOCKPILED AT A SITE DESIGNATED BY THE OWNER OR THE OWNER'S ENGINEER TO BE USED FOR LANDSCAPING PURPOSES, UNLESS OTHERWISE DIRECTED BY THE OWNER OR THE OWNER'S ENGINEER. REMAINING EARTHWORK THAT RESULTS FROM CLEARING AND GRUBBING OR SITE EXCAVATION IS TO BE UTILIZED ON-SITE IF REQUIRED, PROVIDED THAT THE MATERIAL IS DEEMED SUITABLE FOR CONSTRUCTION BY THE OWNER'S SOILS TESTING COMPANY. EXCESS MATERIAL IS TO BE EITHER STOCKPILED ON THE SITE AS DIRECTED BY THE OWNER OR OWNER'S ENGINEER, OR REMOVED FROM THE SITE. THE CONTRACTOR IS RESPONSIBLE FOR ACQUIRING ANY PERMITS THAT ARE NECESSARY FOR REMOVING EXCESS EARTHWORK FROM THE SITE.

C. ALL CONSTRUCTION DEBRIS AND OTHER WASTE MATERIALS SHALL BE DISPOSED OF OFF-SITE IN ACCORDANCE WITH APPLICABLE REGULATORY AGENCY REQUIREMENTS OR AS DIRECTED BY THE OWNER OR THE OWNER'S ENGINEER.

VI. PAVING AND GRADING

A. ALL DELETERIOUS SUBSURFACE MATERIAL (I.E. MUCK, PEAT, BURIED DEBRIS) IS TO BE EXCAVATED IN ACCORDANCE WITH THESE PLANS OR AS DIRECTED BY THE OWNER, THE OWNER'S ENGINEER, OR OWNER'S SOIL TESTING COMPANY. DELETERIOUS MATERIAL IS TO BE STOCKPILED OR REMOVED FROM THE SITE AS DIRECTED BY THE OWNER OR THE OWNER'S ENGINEER. EXCAVATED AREAS TO BE BACKFILLED WITH APPROVED MATERIALS AND COMPACTED AS SHOWN ON THESE PLANS. CONTRACTOR IS RESPONSIBLE FOR ACQUIRING ANY PERMITS THAT ARE NECESSARY FOR REMOVING DELETERIOUS MATERIAL FROM THE SITE.

B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXCAVATIONS AGAINST COLLAPSE AND WILL PROVIDE BRACING, SHEETING OR SHORING AS NECESSARY. DEWATERING METHODS SHALL BE USED AS REQUIRED TO KEEP TRENCHES DRY WHILE PIPE AND APPURTENANCES ARE BEING PLACED.

C. ALL NECESSARY FILL AND EMBANKMENT THAT IS PLACED DURING CONSTRUCTION SHALL CONSIST OF MATERIAL SPECIFIED BY THE OWNER'S SOIL TESTING COMPANY OR ENGINEER AND BE PLACED AND COMPACTED ACCORDING TO THESE PLANS OR THE REFERENCED SOILS REPORT.

E. PROPOSED SPOT ELEVATIONS REPRESENT FINISHED PAVEMENT OR GROUND SURFACE GRADE UNLESS OTHERWISE NOTED ON DRAWINGS.

F. CONTRACTOR SHALL PROVIDE EROSION CONTROL AND SEDIMENTATION BARRIER (HAY BALES OR SILTATION CURTAIN) TO PREVENT SILTATION OF ADJACENT PROPERTY, STREETS, STORM SEWERS AND WATERWAYS.

G. IF WIND EROSION BECOMES SIGNIFICANT DURING CONSTRUCTION, THE CONTRACTOR SHALL STABILIZE THE AFFECTED AREA USING SPRINKLING, IRRIGATION OR OTHER ACCEPTABLE METHODS.

H. THE CONTRACTOR WILL STABILIZE BY SEED AND MULCH, SOD OR OTHER APPROVED MATERIALS AS REQUIRED BY ANY DISTURBED AREAS IN ACCORDANCE WITH THE APPROVED EROSION CONTROL PLANS FOLLOWING CONSTRUCTION OF THE UTILITY SYSTEMS AND PAVEMENT AREAS. CONTRACTOR SHALL MAINTAIN SUCH AREAS UNTIL FINAL ACCEPTANCE BY OWNER.

I. ENGINEERED FILL MATERIAL SHALL NOT CONTAIN ROCKS OR HARD LUMPS GREATER THAN 3 INCHES IN MAXIMUM DIMENSIONS AND SHALL BE FREE OF VEGETATION, ORGANIC MATTER, DEBRIS, RUBBLE, AND OTHER UNSUITABLE MATERIALS.

J. IMPORTED SOILS FOR USE AS ENGINEERED FILL AND SHALL NOT CONTAIN ROCKS OR HARD LUMPS GREATER THAN 3 INCHES IN MAXIMUM DIMENSIONS AND SHALL BE FREE OF VEGETATION, ORGANIC MATTER, DEBRIS, RUBBLE, AND OTHER UNSUITABLE MATERIALS. O. AGGREGATE BASE MATERIAL SHALL MEET THE FOLLOWING GRADATION REQUIREMENTS.

K. AGGREGATE BASE MATERIAL SHALL MEET THE FOLLOWING GRADATION REQUIREMENTS.

SIEVE SIZE (PER ASTM D422)	PERCENT PASSING BY WEIGHT
1 INCH	100
3/4	90-100
NO. 8	35-55
NO. 200	0-8

L. ALL AREAS TO RECEIVE FILL, AND AREAS OF STRUCTURES AND PAVEMENTS, SHALL BE STRIPPED OF VEGETATION, ORGANIC MATTER, DEBRIS, RUBBLE, AND OTHER UNSUITABLE MATERIALS. STRIPPED SOILS SHALL NOT BE USED IN ENGINEERED FILL, BUT MAY BE USED IN LANDSCAPE AREAS.

M. ENGINEERED FILL MATERIAL SHALL BE COMPACTED TO AT LEAST THE FOLLOWING PERCENTAGES OF MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT, PER ASTM 698 (STD. PROCTOR):

ENGINEERED FILL MATERIAL	PERCENT COMPACTION	MOISTURE CONTENT (RANGE)
NATIVE SOIL	95%	+/- 3% OF OPTIMUM
ENGINEERED FILL UNDER STRUCTURES & BEHIND RETAINING WALLS	95%	+/- 3% OF OPTIMUM
ENGINEERED FILL UNDER PAVEMENTS	98%	+/- 3% OF OPTIMUM
FILL IN LANDSCAPE AREAS	95%	+/- 5% OF OPTIMUM
AGGREGATE BASE MATERIAL OR IMPORTED GRANULAR SOIL IN BUILDING AND PAVEMENT AREAS	100%	OPTIMUM PLUS OR MINUS 2%

NOTE: MOISTURE CONTENT OF ENGINEERED FILL MATERIAL MAY REQUIRE ADJUSTMENT DURING CONSTRUCTION TO PREVENT SOIL PUMPING.

N. ENGINEERED FILL SHALL BE PLACED IN LIFTS NO GREATER THAN 8 INCHES THICK (LOOSE).

O. THE TOP 8 INCHES OF SOIL EXPOSED AT THE BOTTOM OF EXCAVATIONS SHALL BE COMPACTED, SCARIFIED AND COMPACTED AS ENGINEERED FILL PRIOR TO PLACEMENT OF ADDITIONAL FILL. IF SOFT OR LOOSE SOIL IS PRESENT AT THE BASE OF EXCAVATIONS, IT SHALL BE EXCAVATED AND/OR COMPACTED AS ENGINEERED FILL OR AS RECOMMENDED BY THE ENGINEER'S FIELD REPRESENTATIVE.

P. IF SUBGRADE SOILS EXHIBIT PUMPING DURING COMPACTION, THE AREA SHALL BE ALLOWED TO DRY UNTIL THE SOILS BECOME WORKABLE WITHOUT PUMPING. THE MOISTURE CONTENT OF THE SOILS SHALL BE ADJUSTED TO PREVENT PUMPING.

Q. EXPOSURE TO THE ENVIRONMENT MAY REDUCE THE STRENGTH OF SOILS IN FOOTING,FLOOR SLAB, AND PAVED AREAS. IF THIS OCCURS, THE SOFTENED SOILS SHALL BE REMOVED AND REWORKED IMMEDIATELY PRIOR TO CONCRETE PLACEMENT. IF RAINFALL IS EXPECTED AT A TIME WHEN BEARING SOILS IN FOOTING AREAS ARE EXPOSED, A 2 TO 4 INCH THICK LAYER OF LEAN CONCRETE MAY BE PLACED IN SUCH AREAS.

R. THE SITE SHALL BE GRADED TO TRANSPORT SURFACE RUNOFF AWAY FROM THE STRUCTURES AND PAVED AREAS. WATER SHALL NOT BE ALLOWED TO ACCUMULATE (POND) AROUND THE BUILDING PERIMETER OR ON PAVED AREAS.

GENERAL ROCK EXCAVATION:

ROCK SHALL BE DEFINED AS ANY MATERIAL WHICH CANNOT BE EXCAVATED WITH A SINGLE- TOOTH RIPPER DRAWN BY A CRAWLER TRACTOR HAVING A MINIMUM DRAW BAR PULL RATED AT NOT LESS THAN 56,000 POUNDS (CATERPILLAR D 8K OR EQUIVALENT).

THE VOLUME OF ROCK EXCAVATION SHALL BE DETERMINED BY A LICENSED SURVEYOR BY THE AVERAGE END AREA METHOD. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A SCALED PLAN WITH SUFFICIENT ELEVATION POINTS TO ACCURATELY DEFINE THE VOLUME OF ROCK EXCAVATED.

THE DEPTH OF ROCK SHALL BE DEFINED AS FROM TOP OF ROCK TO THE CONTRACT SPECIFIED ELEVATION FOR EXCAVATION.

CONTRACTOR SHALL BE COMPENSATED FOR ROCK EXCAVATION AS DEFINED HEREIN IN ACCORDANCE WITH CONTRACT UNIT PRICES.

TRENCH ROCK EXCAVATION:

TRENCH ROCK SHALL BE DEFINED AS ANY MATERIAL WHICH CANNOT BE EXCAVATED WITH A BACKHOE HAVING A BUCKET CURLING FORCE RATE AT NOT LESS THAN 24,700 POUNDS (CATERPILLAR MODEL 225 OR EQUIVALENT).

BASIS OF PAYMENT FOR TRENCH ROCK EXCAVATION:

PIPE TRENCH: THAT VOLUME DEFINED BY THE PIPE DIAMETER PLUS 18" AND THE DEPTH
FROM TOP OF ROCK TO BOTTOM OF PIPE PLUS 6" MULTIPLIED BY THE ACTUAL LENGTH. WALL FOOTING, PIT: THAT VOLUME DEFINED BY THE WIDTH OF FOOTING PLUS 12" AND THE DEPTH FROM TOP OF ROCK TO BOTTOM OF FOOTING MULTIPLIED BY THE ACTUAL LENGTH OF WALL.

COLUMN FOOTING: THE AREA OF THE COLUMN FOOTING MULTIPLIED BY THE DEPTH FROM TOP OF ROCK TO BOTTOM OF FOOTING.

CONTRACTOR SHALL BE COMPENSATED FOR ROCK EXCAVATION AS DEFINED HEREIN IN ACCORDANCE WITH CONTRACT UNIT PRICES.

S. BACKFILL AND FILL SHALL CONFORM TO THE GENERAL REQUIREMENTS FOR SOIL MATERIALS ABOVE AND SHALL BE CLASSIFIED AS GW, GP, GM, GC, SW, SP, SM, SC, ML, CL BY ASTM D2487 AND SHALL CONFORM TO THE FOLLOWING:

1. SHALL BE CAPABLE OF BEING COMPACTED TO THE SPECIFIED DEGREE OF COMPACTION WHEN THE MOISTURE CONTENT IS WITHIN 3 PERCENTAGE POINTS OF THE OPTIMUM PERCENT MOISTURE.
2. LIQUID LIMIT SHOULD NOT EXCEED 40 PERCENT WHEN TESTED IN ACCORDANCE WITH ASTM D431B.
3. PLASTICITY INDEX SHOULD NOT BE GREATER THAN 30 PERCENT WHEN TESTED IN ACCORDANCE WITH ASTM D431B.
4. NO MORE THAN 75 PERCENT BY WEIGHT SHALL BE FINER THAN NO. 200 SIEVE WHEN TESTED IN ACCORDANCE WITH ASTM D1140.

T. UNSUITABLE SOIL: SHALL BE ANY SOIL MATERIALS DETERMINED BY THE INDEPENDENT GEOTECHNICAL LABORATORY AS NOT CONFORMING TO THE REQUIREMENTS DESCRIBED ABOVE FOR BACKFILL AND FILL. A MOISTURE CONTENT WHICH IS MORE THAN 3 PERCENTAGE POINTS FROM OPTIMUM SHALL NOT BE CONSIDERED UNSUITABLE IF SUCH MATERIALS WOULD OTHERWISE BE SUITABLE IF THE MOISTURE CONTENT WERE ADJUSTED. ADJUSTMENTS TO THE SOIL MOISTURE CONTENT BY DRYING, MIXING, ADDING WATER, OR OTHER MEANS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. V. MEASUREMENT OF UNSUITABLE MATERIAL: THE VOLUME OF UNSUITABLE MATERIAL EXCAVATION SHALL BE DETERMINED BY A LICENSED SURVEYOR BY THE AVERAGE END AREA METHOD. THE CONTRACTOR SHALL SUBMIT TO THE ARCHITECT A SCALED PLAN WITH SUFFICIENT ELEVATION POINTS TO ACCURATELY DEFINE THE VOLUME OF UNSUITABLE MATERIAL EXCAVATED. THE EXTENT OF UNSUITABLE MATERIAL EXCAVATION SHALL BE DETERMINED BY THE INDEPENDENT GEOTECHNICAL LABORATORY.

VII. DRAINAGE

A. ALL STORM SEWER PIPE SHALL BE REINFORCED CONCRETE PIPE CLASS III UNLESS OTHERWISE NOTED ON PLANS. ALL DRAINAGE STRUCTURES SHALL BE IN ACCORDANCE WITH NCDOT STANDARDS UNLESS OTHERWISE NOTED ON PLANS.

B. PIPE LENGTHS SHOWN ARE APPROXIMATE AND TO CENTER OF DRAINAGE STRUCTURE OR TO THE END OF THE PIPE. CONTRACTOR SHALL VERIFY ALL QUANTITIES PRIOR TO SUBMITTAL OF BID.

C. ALL DRAINAGE STRUCTURE GRATES AND COVERS SHALL BE AS PER NCDOT STANDARDS UNLESS OTHERWISE NOTED.

D. ALL STORM DRAINAGE PIPING SHALL BE SUBJECT TO A VISUAL INSPECTION BY THE OWNER'S ENGINEER PRIOR TO THE PLACEMENT OF BACKFILL. CONTRACTOR TO NOTIFY THE ENGINEER 48 HOURS IN ADVANCE TO SCHEDULE INSPECTIONS.

E. THE CONTRACTOR SHALL MAINTAIN AND PROTECT FROM MUD, DIRT, DEBRIS, ETC. THE STORM DRAINAGE SYSTEM UNTIL FINAL ACCEPTANCE OF THE PROJECT. THE CONTRACTOR MAY BE REQUIRED TO RECLEAN PIPES AND INLETS FOR THESE PURPOSES.

VIII. EROSION/TURBIDITY CONTROL

A. THE INSTALLATION OF TEMPORARY EROSION CONTROL BARRIERS SHALL BE COORDINATED WITH THE CONSTRUCTION OF THE PERMANENT EROSION CONTROL FEATURES TO THE EXTENT NECESSARY TO ASSURE ECONOMICAL, EFFECTIVE AND CONTINUOUS CONTROL OF EROSION AND WATER POLLUTION THROUGHOUT THE LIFE OF THE CONSTRUCTION PHASE.

B. THE TYPE OF EROSION CONTROL BARRIERS USED SHALL BE GOVERNED BY THE NATURE OF THE CONSTRUCTION OPERATION AND SOIL TYPE THAT WILL BE EXPOSED. SILTY AND CLAYEY MATERIAL USUALLY REQUIRE SOLID SEDIMENT BARRIERS TO PREVENT TURBID WATER DISCHARGE, WHILE SANDY MATERIAL MAY NEED ONLY SILT SCREENS OR HAY BALES TO PREVENT EROSION. FLOATING TURBIDITY CURTAINS SHALL BE USED IN OPEN WATER SITUATIONS. DIVERSION DITCHES OR SWALES MAY BE REQUIRED TO PREVENT TURBID STORM WATER RUNOFF FROM BEING DISCHARGED TO WETLANDS OR OTHER WATER BODIES. IT MAY BE NECESSARY TO EMPLOY A COMBINATION OF BARRIERS, DITCHES AND OTHER EROSION/TURBIDITY CONTROL MEASURES IF CONDITIONS WARRANT.

C. CONSTRUCTION OPERATIONS IN OR ADJACENT TO WETLANDS SHALL BE RESTRICTED TO THOSE AREAS IDENTIFIED IN THE PLANS AND IN THE SPECIFICATIONS.

D. EXCEPT AS NECESSARY FOR CONSTRUCTION, EXCAVATED MATERIAL SHALL NOT BE DEPOSITED IN THE WETLANDS OR IN A POSITION CLOSE ENOUGH THERETO TO BE WASHED AWAY BY HIGH WATER OR RUNOFF.

E. THE CONTRACTOR SHALL SCHEDULE HIS OPERATIONS SUCH THAT THE AREA OF UNPROTECTED ERODIBLE EARTH EXPOSED AT ANY ONE TIME IS NOT LARGER THAN THE MINIMUM AREA NECESSARY FOR EFFICIENT CONSTRUCTION OPERATIONS, AND THE DURATION OF EXPOSED, UNCOMPLETED CONSTRUCTION TO THE ELEMENTS SHALL BE AS SHORT AS PRACTICABLE. CLEARING AND GRUBBING SHALL BE SO SCHEDULED AND PERFORMED THAT GRADING OPERATIONS CAN FOLLOW IMMEDIATELY THEREAFTER, AND GRADING OPERATIONS SHALL BE SCHEDULED AND PERFORMED THAT PERMANENT EROSION CONTROL FEATURES CAN FOLLOW IMMEDIATELY THEREAFTER IF CONDITIONS ON THE PROJECT PERMIT.

F. THE CONTRACTOR SHALL PROVIDE ROUTINE MAINTENANCE OF PERMANENT AND TEMPORARY EROSION CONTROL FEATURES UNTIL THE PROJECT IS COMPLETE AND ALL DISTURBED SOILS ARE STABILIZED.

IX. ADDITIONAL NOTES

1. COORDINATE ALL CURB AND STREET GRADES IN INTERSECTION WITH INSPECTOR.
2. IN ROLLING AND HILLY TERRAINS, SWEEPING OF THE STONE BASE AND/OR APPLICATION OF A TACK COAT MAY BE REQUIRED NEAR INTERSECTIONS. THESE REQUIREMENTS WILL BE ESTABLISHED BY THE INSPECTOR AND BASED ON FIELD CONDITIONS.
3. APPROVAL OF THIS PLAN IS NOT AN AUTHORIZATION TO GRADE ADJACENT PROPERTIES. WHEN FIELD CONDITIONS WARRANT OFF-SITE GRADING, PERMISSION MUST BE OBTAINED FROM THE AFFECTED PROPERTY OWNERS.
4. IN ORDER TO ENSURE PROPER DRAINAGE, KEEP A MINIMUM OF 0.5% SLOPE ON THE CURB
5. SUBSURFACE DRAINAGE FACILITIES MAY BE REQUIRED IN THE STREET RIGHT-OF-WAY IF DEEMED NECESSARY BY THE INSPECTOR.
6. THE PURPOSE OF THE STORM DRAINAGE EASEMENT (SDE) IS TO PROVIDE STORM WATER CONVEYANCE AND ANY STRUCTURES AND/OR OBSTRUCITON TO STORM WATER FLOW IS PROHIBITED.
7. HIGH-DENSITY POLYETHYLENE (HDPE) STORM DRAINAGE PIPE INSTALLED WITHIN EXISTING OR PUBLIC STREET RIGHT-OF-WAY MUST BE APPROVED BY THE CITY'S INSPECTOR PRIOR TO ANY BACKFILL BEING PLACED. BACKFILL MATERIAL MUST BE APPROVED BY THE CITY INSPECTOR PRIOR TO PLACEMENT OF THE MATERIAL WITHIN THE PUBLIC STREET RIGHT-OF-WAY.
8. THE DEVELOPER SHALL MAINTAIN EACH STREAM, CREEK, OR BACKWASH CHANNEL IN AN UNOBSTRUCTED STATE AND SHALL REMOVE FROM THE CHANNEL AND BANKS OF THE STREAM ALL DEBRIS, LOGS, TIMBER, JUNK AND OTHER ACCUMULATIONS.
9. PRIOR TO PLAT RECORDATION, OFFSITE R/W AND OR CONSTRUCTION EASEMENTS ARE REQUIRED TO BE OBTAINED ACCORDING TO THE GUIDELINES OF THE "OFFSITE R/W ACQUISITION PROCESS". THESE NEEDED R/W AND CONSTRUCTION LIMITS ARE CLEARLY SHOWN ON THE ROADWAY IMPROVEMENT PLAN.

GRAPHIC SCALE
0 40' 80'
(IN FEET)
1 inch = 40 ft.

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NO.	DATE	BY	REVISION

SANFORD TRANSFER STATION
SANFORD NC
WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

GENERAL NOTES

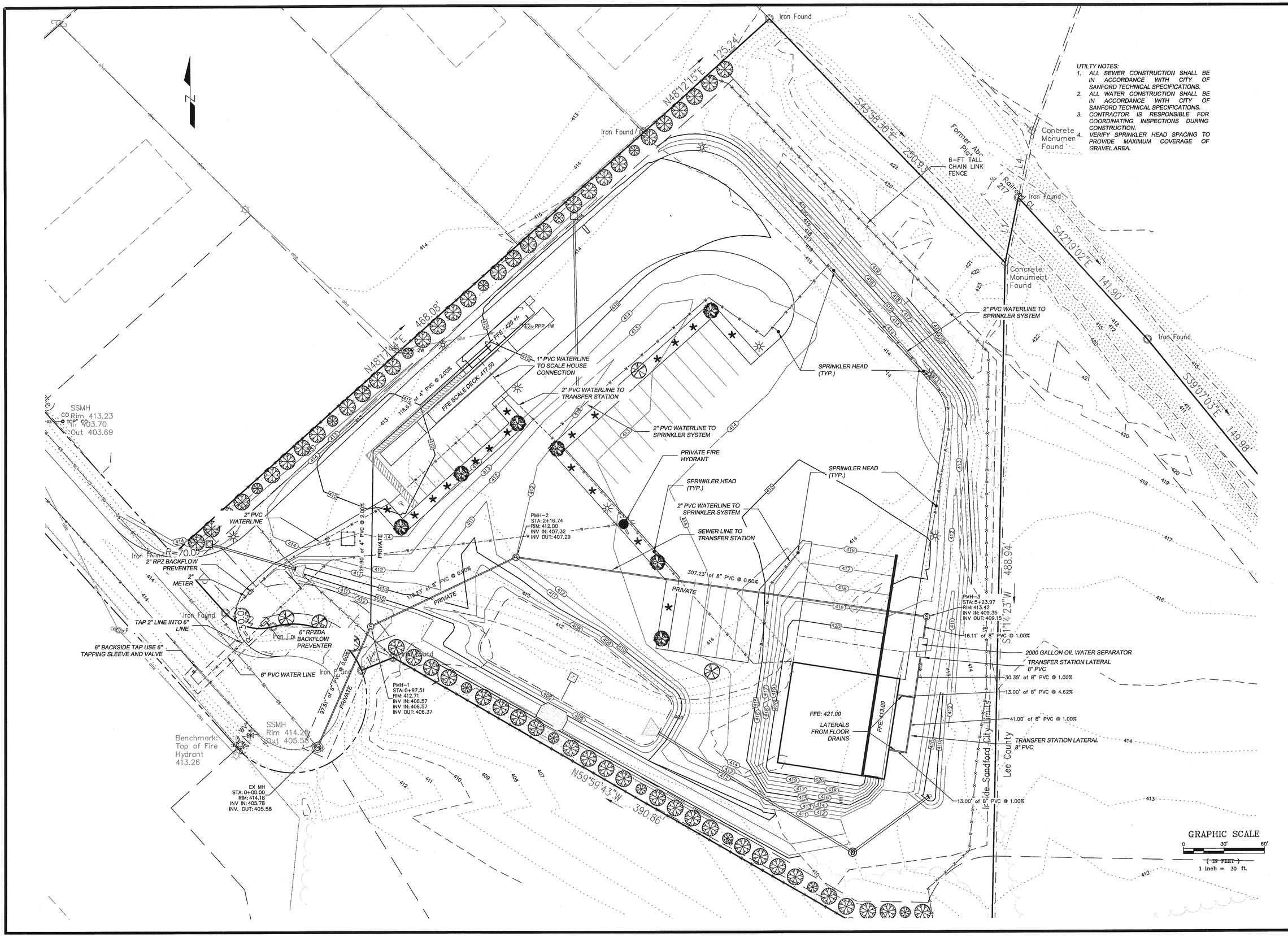
DESIGNED	JDB	CHECKED	JDB
DRAWN	JDB	PROJECT NO.	2013-5
DATE	6/8/2013		
SCALE	AS SHOWN		

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19665 JOHN D. BARNARD 7/9/2013

SHEET:
C-15

UTILTY NOTES:

1. ALL SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF SANFORD TECHNICAL SPECIFICATIONS.
2. ALL WATER CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF SANFORD TECHNICAL SPECIFICATIONS.
3. CONTRACTOR IS RESPONSIBLE FOR COORDINATING INSPECTIONS DURING CONSTRUCTION.
4. VERIFY SPRINKLER HEAD SPACING TO PROVIDE MAXIMUM COVERAGE OF GRAVEL AREA.



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NO.	DATE	BY	REVISION
1	7-26-13	JDB	TRC REVIEW - ACCESSIBLE SPACE CHANGED TO VAN ACCESSIBLE
2	9-26-13	JDB	ADD SPRINKLER SYSTEM

SANFORD TRANSFER STATION

SANFORD NC

WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

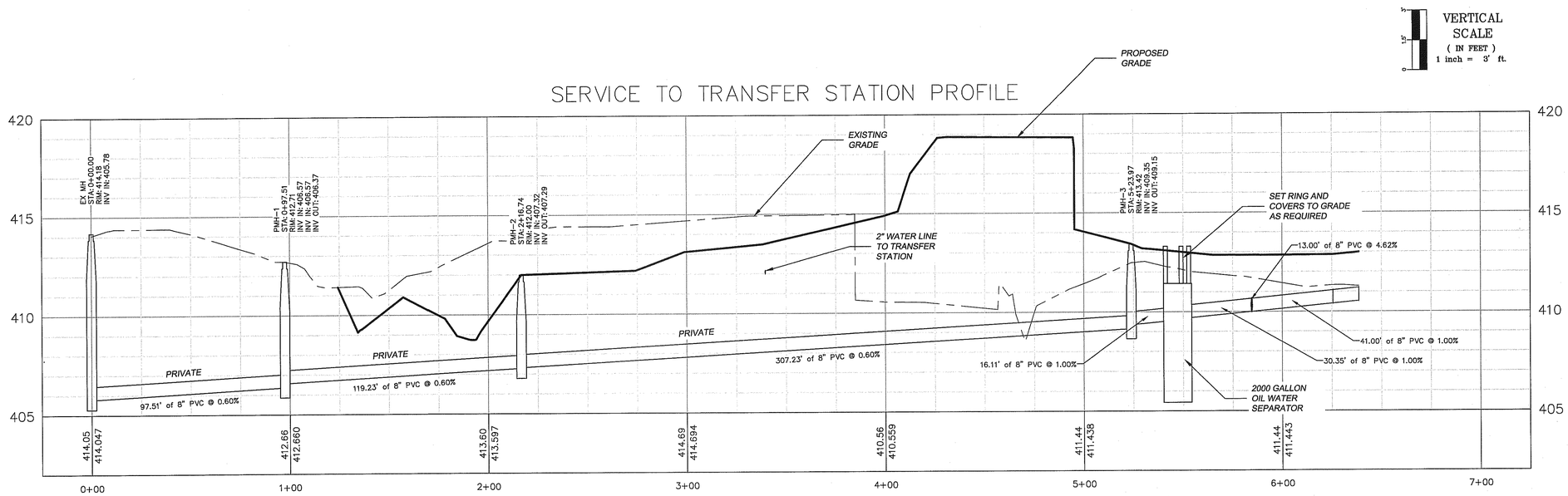
OVERALL UTILITIES

DESIGNED	DRAWN	CHECKED
JDB	JDB	JDB
SCALE	DATE	PROJECT NO.
AS SHOWN	6/8/2013	2013-5

NORTH CAROLINA PROFESSIONAL SEAL 19665 ENGINEER JOHN D. BARNARD

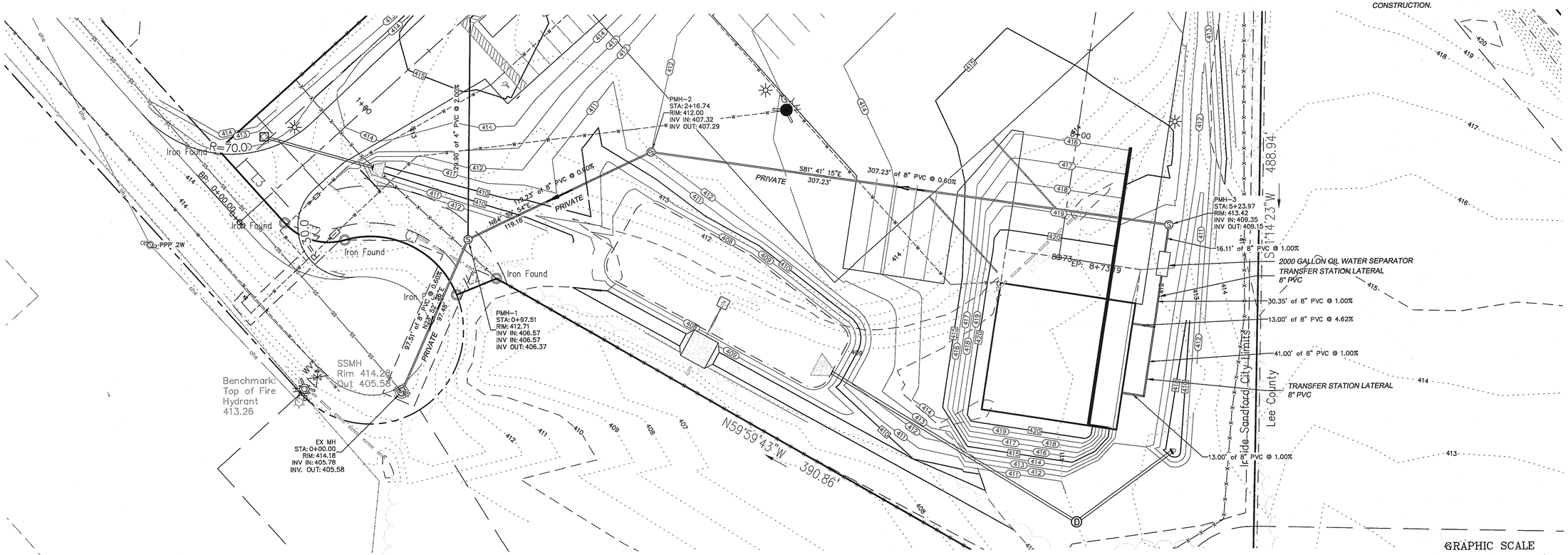
SHEET:

U-1



UTILTY NOTES:

1. ALL SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF SANFORD TECHNICAL SPECIFICATIONS.
2. ALL WATER CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF SANFORD TECHNICAL SPECIFICATIONS.
3. CONTRACTOR IS RESPONSIBLE FOR COORDINATING INSPECTIONS DURING CONSTRUCTION.



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NO.	DATE	BY	REVISION
1	7-26-13	JDB	TRC REVIEW - ACCESSIBLE SPACE CHANGED TO VAN ACCESSIBLE

SANFORD TRANSFER STATION
SANFORD NC

WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

TRANSFER STATION
SERVICE PLAN AND PROFILE

DESIGNED	JDB	DRAWN	JDB	CHECKED	JDB
SCALE	AS SHOWN	DATE	6/8/2013	PROJECT NO.	2013-5

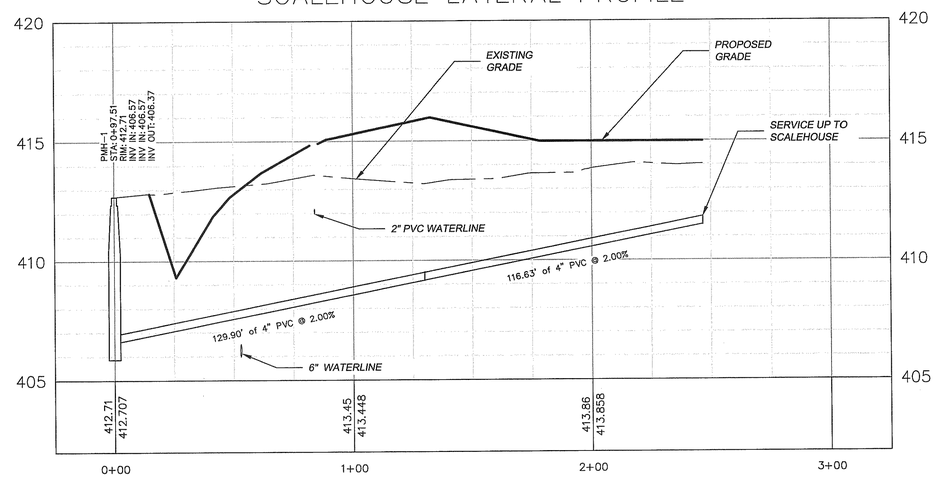
NORTH CAROLINA PROFESSIONAL SEAL 19665 ENGINEER JOHN D. BARNARD

SHEET:

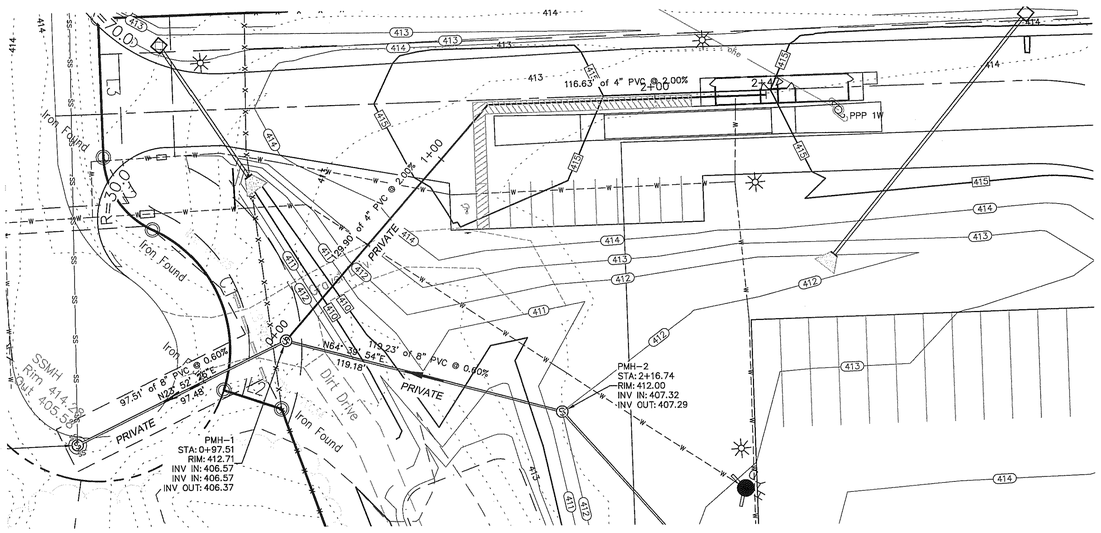
U-2

VERTICAL SCALE
(IN FEET)
1 inch = 3' ft.

SCALEHOUSE LATERAL PROFILE



UTILTY NOTES:
1. ALL SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF SANFORD TECHNICAL SPECIFICATIONS.
2. ALL WATER CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF SANFORD TECHNICAL SPECIFICATIONS.
3. CONTRACTOR IS RESPONSIBLE FOR COORDINATING INSPECTIONS DURING CONSTRUCTION.



GRAPHIC SCALE
0 30' 60'
(IN FEET)
1 inch = 30 ft.

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NO.	DATE	BY	REVISION
1	7-26-13	JDB	TRC REVIEW - ACCESSIBLE SPACE CHANGED TO VAN ACCESSIBLE

SANFORD TRANSFER STATION
SANFORD NC

WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

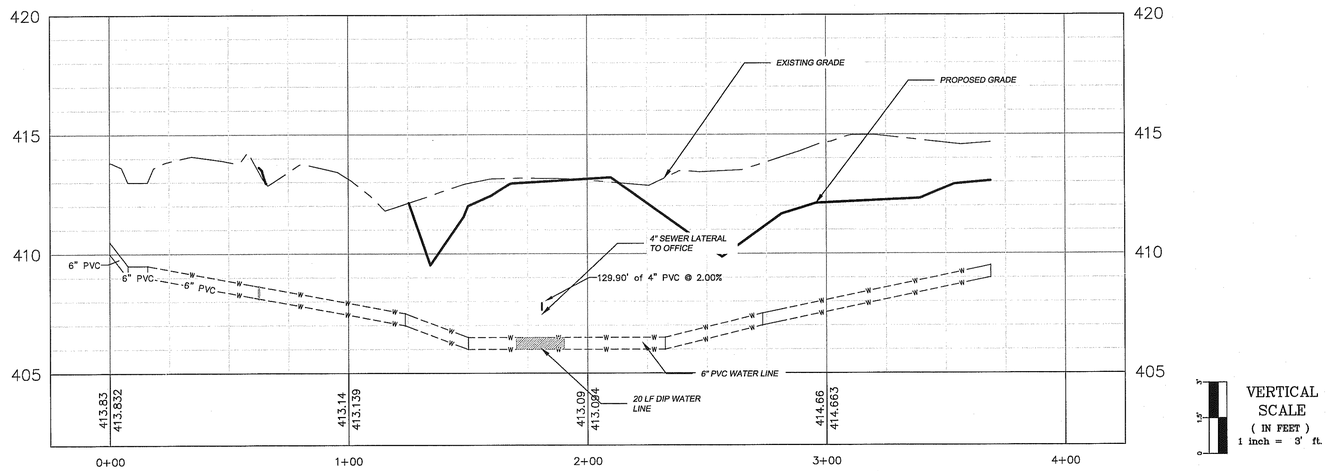
SCALEHOUSE LATERAL
PLAN AND PROFILE

DESIGNED	JDB	CHECKED	JDB
DRAWN	JDB	PROJECT NO.	2013-5
DATE	6/8/2013		
SCALE	AS SHOWN		

NORTH CAROLINA PROFESSIONAL SEAL 19665 ENGINEER JOHN D. BARNARD

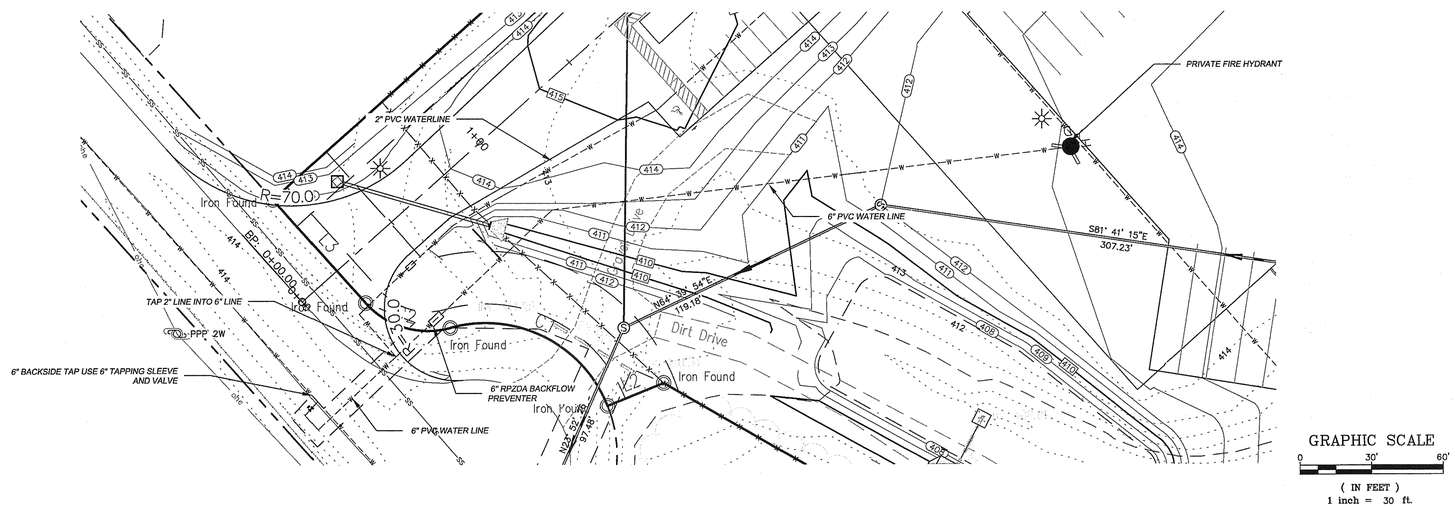
SHEET:
U-3

FIRELINE PROFILE



UTILTY NOTES:

1. ALL SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF SANFORD TECHNICAL SPECIFICATIONS.
2. ALL WATER CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF SANFORD TECHNICAL SPECIFICATIONS.
3. CONTRACTOR IS RESPONSIBLE FOR COORDINATING INSPECTIONS DURING CONSTRUCTION.



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NO.	DATE	BY	REVISION
1	7-26-13	JDB	TRC REVIEW - ACCESSIBLE SPACE CHANGED TO VAN ACCESSIBLE

SANFORD TRANSFER STATION
SANFORD NC

WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

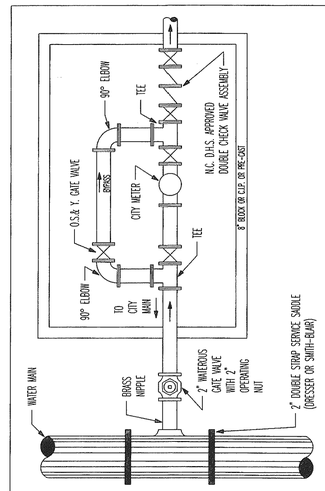
FIRELINE PROFILE

DESIGNED	JDB	DRAWN	JDB	CHECKED	JDB
SCALE	AS SHOWN	DATE	6/6/2013	PROJECT NO.	2013-5

NORTH CAROLINA PROFESSIONAL SEAL 19668 ENGINEER JOHN D. BARNARD

SHEET:

U-4

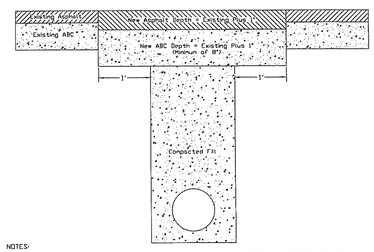


A. All piping shall be brass or copper (type K). Pipe to be specified by developer.
B. Meter vault shall extend 6" above grade and shall be equipped with a 4" screened C.I. or D.I. gravity drain.
C. The meter vault shall be fabricated to meet AASHTO HS-20 traffic load requirements.
D. All fittings shall have 12" minimum clearance to inside wall.

PLAN VIEW OF 1-1/2" OR 2" POTABLE WATERLINE

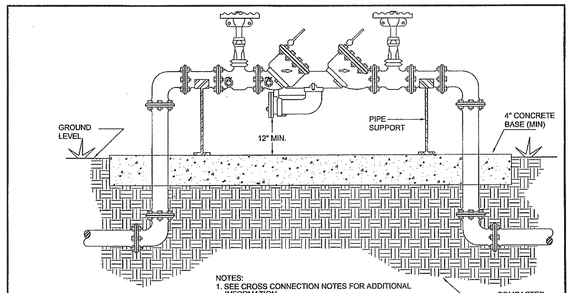
Scale: NTS	Date: 9/16/91	CADD By: LLA
City of Sanford	METER VAULT DETAIL FOR 1-1/2" OR 2" WATER LINE	

ASPHALT PAVEMENT PATCH



NOTES:
1. THE PAVEMENT SHALL BE DEFINED BY A STRAIGHT EDGE, PREFERABLY A MACHINED SAW CUT.
2. THE TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO A DENSITY OF AT LEAST 95% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY NCDOT.
3. THE NEW ABC FILL SHALL BE COMPACTED TO A DENSITY EQUAL TO 100% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH ASSHTO T-180 AS MODIFIED BY NCDOT. BITUMINOUS BASE OR BINDER MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.
4. THE ENTIRE THICKNESS/VERTICAL EDGE OF THE CUT SHALL BE TACKED.
5. THE ASPHALT PATCH DEPTH SHALL BE EXISTING ASPHALT PLUS 1", BUT IN NO CASE SHALL THE ASPHALT BE LESS THAN 2" THICK.
6. The thickness of the ABC Layers shall be the existing depth plus 1" but in no case less than than 8".
7. THE ASPHALT PAVEMENT MATERIAL SHALL BE INSTALLED AND COMPACTED THOROUGHLY TO ACHIEVE A SMOOTH LEVEL PATCH.

Scale: NTS	Date: 03/10/09	CADD By: AMJ
City of Sanford	ASPHALT PAVEMENT PATCH	

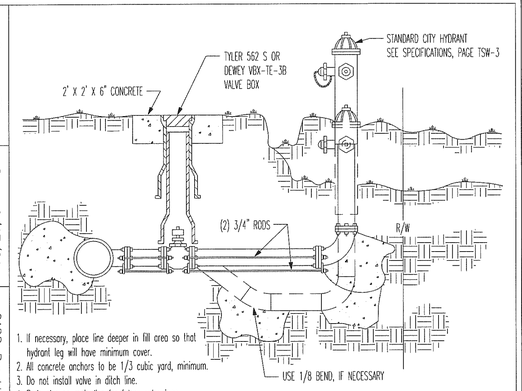


NOTES:
1. SEE CROSS CONNECTION NOTES FOR ADDITIONAL INFORMATION.
2. ASSEMBLY SHALL BE HOUSED IN AN INSULATED ENCLOSURE. (FREEZE PREVENTION IS THE RESPONSIBILITY OF THE CUSTOMER)
3. ALL PIPING SHALL BE STEEL OR DUCTILE IRON.

ON FIRE SUPPRESSION CONNECTIONS OF THE FOLLOWING SIZES.
THIS SERIES IS APPROVED FOR USE
2 1/2",3", 4", 6", 8", 10"

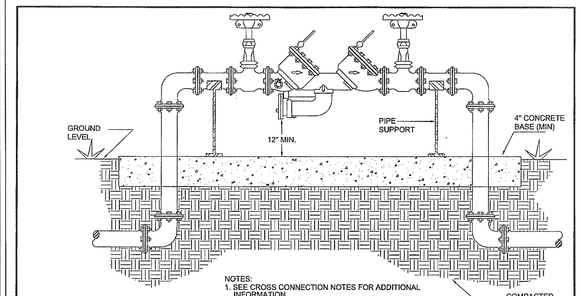
DOUBLE CHECK VALVE DETECTOR ASSEMBLY AND REDUCED PRESSURE PRINCIPLE DETECTOR ASSEMBLY (Above Ground Installation Only)	City of Sanford	Scale: NTS	Date: 03/15/05	CAD BY: LDB

FIRE LINE BFP



1. If necessary, place line deeper in fill area so that hydrant leg will have minimum cover.
2. All concrete anchors to be 1/3 cubic yard, minimum.
3. Do not install valve in ditch line.
4. Rod valve on main line for future extensions when plugged at valve.

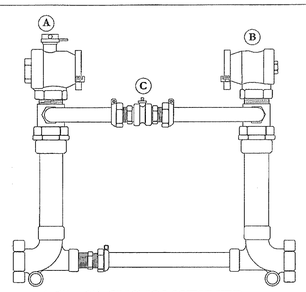
City of Sanford	Scale: NTS	Date: 9/17/91	CADD By: LLA
	HYDRANT AND VALVE INSTALLATIONS WITHOUT HYDRANT TEE		



NOTES:
1. SEE CROSS CONNECTION NOTES FOR ADDITIONAL INFORMATION.
2. ASSEMBLY SHALL BE HOUSED IN AN INSULATED ENCLOSURE. (FREEZE PREVENTION IS THE RESPONSIBILITY OF THE CUSTOMER)
3. ALL PIPING SHALL BE STEEL OR DUCTILE IRON.
4. SIZES 1/4" - 2" DO NOT REQUIRE PIPE SUPPORTS.
5. REQUIRED SEPARATION DISTANCE FROM METER VAULT OF 5'.

THIS SERIES IS APPROVED FOR USE ON LATERALS THE FOLLOWING SIZES.
1/4", 3/8", 1/2", 3/4", 1", 1 1/4", 1 1/2", 2",
2 1/2",3", 4", 6", 8", 10"

DOUBLE DETECTOR CHECK VALVE ASSEMBLY & REDUCED PRESSURE PRINCIPLE ASSEMBLY (Above Ground Installation Only)	City of Sanford	Scale: NTS	Date: 03/15/05	CAD BY: LDB



1.5" - 2" CUSTOMSETTER

A. FLANGED ANGLE BALL VALVE
B. FLANGED ANGLE CHECK VALVE
C. HIGH BYPASS OPTION WITH BALL VALVE

1. No 2" Yokes Permitted
2. Must Be High Bypass Customsetter
3. Boxes Shall be Cast Iron, 8" Block or Pre-Cast
4. If Conc. Box is Used. All Fitting Shall have Min. 12" Clearance to Inside of Wall
5. Customsetter Shall be Brasss or Copper Type K and Meet AWWA C-800

PROJECT: CUSTOMSETTER	CITY OF SANFORD INSPECTION DEPARTMENT 225 E. WEATHERSPOON STREET SANFORD, NORTH CAROLINA	SCALE: N.T.S.	DRW BY: JAN DATE: 3-17-02

BARNARD ENGINEERING, P.C.
1534 Saratoga Blvd. (704) 628-0344
Indian Trail, NC 28079 (678) 232-8967
www.barnardengineeringpc.com
N.C. License No. C-3679

NO.	DATE	BY	REVISION

SANFORD TRANSFER STATION
SANFORD NC

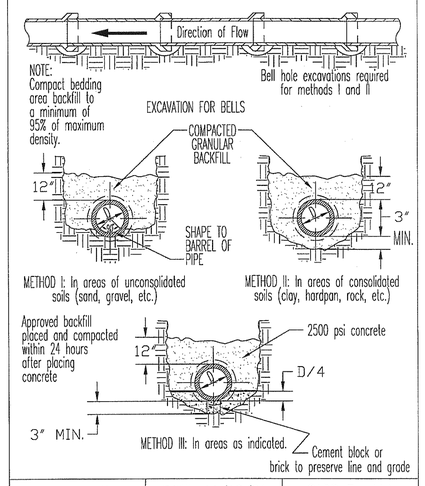
WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

WATER DETAILS

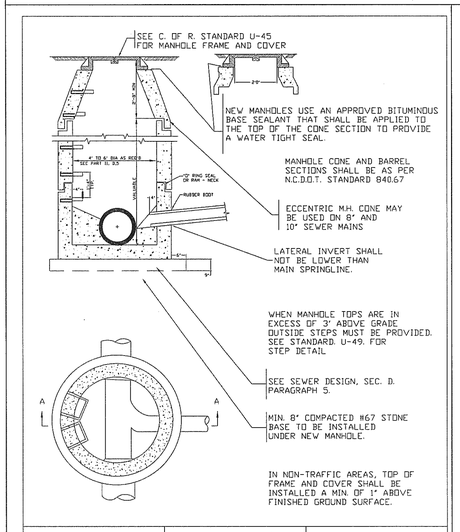
DESIGNED	JDB	DRAWN	JDB	CHECKED	JDB
SCALE	AS SHOWN	DATE	6/8/2013	PROJECT NO:	2012-5

NORTH CAROLINA PROFESSIONAL SEAL 19665 ENGINEER JOHN D. BARNARD

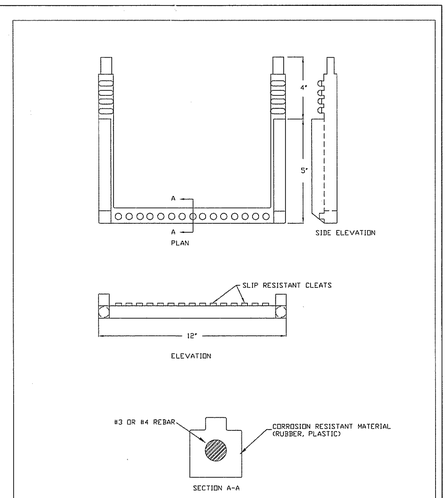
SHEET:
U-5



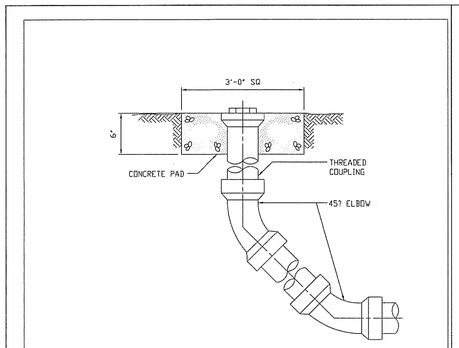
Scale: NTS	DATE: 11/19/91	CADD By: LLA
City of Sanford	METHODS OF BEDDING PIPE	



Scale: NTS	Date: 10/07/03	CADD By: AMJ
City of Sanford	STANDARD PRECAST SANITARY SEWER MANHOLE	



Scale: NTS	Date: 9/29/03	CADD By: AMJ
City of Sanford	STANDARD SLIP RESISTANT MANHOLE STEP DETAIL	

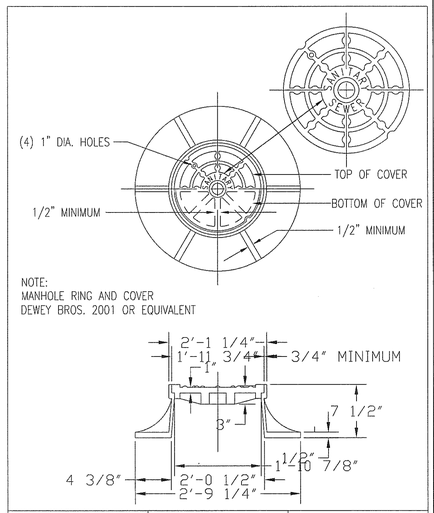


1 NOTE:
FOR PIPE DIAMETER AND INVERT ELEVATION SEE CONTRACT DRAWINGS

2 CLEANOUTS INSTALLED IN FORCE MAINS SHALL BE RESTRAINED

CLEANOUT RISER
1542400R

Scale: NTS	Date: 10/07/03	CADD By: LLA
City of Sanford	CLEANOUT RISER	



NOTE:
MANHOLE RING AND COVER
DEWEY BROS. 2001 OR EQUIVALENT

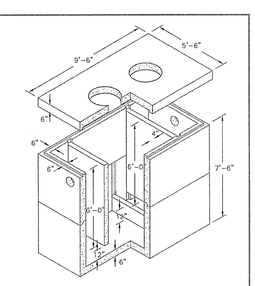
Scale: NTS	DATE: 11/18/91	CADD By: LLA
City of Sanford	MANHOLE RING AND COVER	

NOTES:

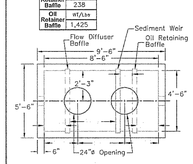
1. Concrete: 28 Day Compressive Strenght f'c= 4,000 psi.
2. Steel Reinforcement: ASTM A-615, Grade 60.
3. Boxes meet H-20 Loading to 4' Depth.
4. Butyl Rubber Joint Sealant SS-S-00210.
5. Contractor to Verify Size and Location of all Openings.
6. Not Responsible for Watertight Joints.
7. Contractor to Install and Grout in Baffles and Weir. Supply and Install all Piping and Sampling Tees. Fill with Clean Water Prior to Start-up of System.

Weight Schedule

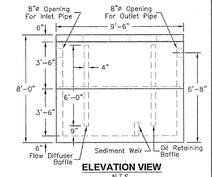
Top Slab	WT/Lbs 3,448
Riser	WT/Lbs 7,166
Solid Base	WT/Lbs 11,138
Flow Diffuser Baffle	WT/Lbs 1,425
Sludge Retainer Baffle	WT/Lbs 238
Oil Retainer Baffle	WT/Lbs 1,425



ISOMETRIC VIEW
N.T.S.



PLAN VIEW
N.T.S.



ELEVATION VIEW
N.T.S.

Oldcastle Precast
N.C. Products
920 Wilkens Road Raleigh, NC 27603
Phone: 919.772.6301 Fax: 919.772.1209

5410284-OWS
FILE NAME: 4500WS10284_DET.DWG
ISSUE DATE: JULY, 2008
www.oldcastleprecast.com

Oil-Water Separator
1600 Gallon

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Indian Trail, NC 28079 (678) 232-8967
www.barnardengineeringpc.com
N.C. License No. C-3679

NO.	DATE	BY	REVISION
1	7-26-13	JDB	TRC REVIEW - REPLACE GREASE TRAP DETAIL WITH OIL/WATER SEPARATOR

SANFORD TRANSFER STATION
SANFORD NC

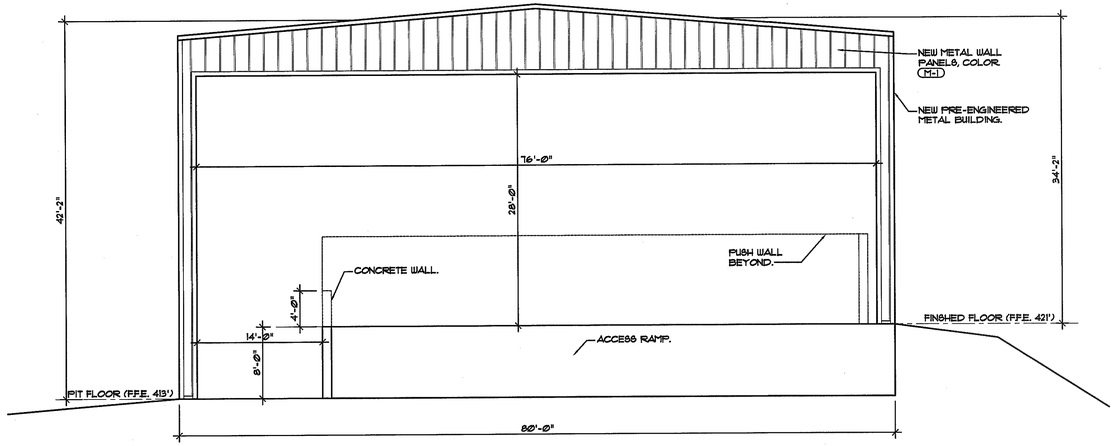
WASTE INDUSTRIES
3301 BENSON DRIVE
RALEIGH NC

SEWER DETAILS

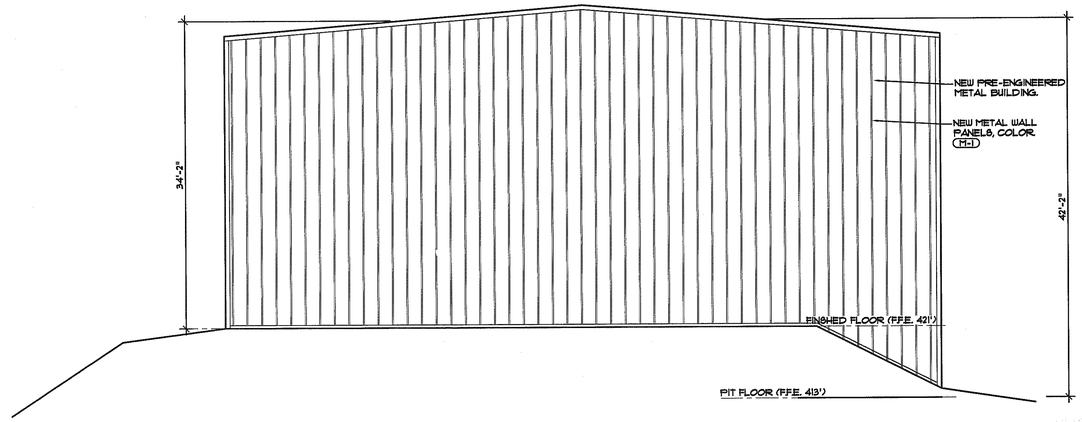
DESIGNED	DRAWN	CHECKED
JDB	JDB	JDB
SCALE	DATE	PROJECT NO.
AS SHOWN	6/6/2013	2013-5

NORTH CAROLINA PROFESSIONAL SEAL 19665 ENGINEER JOHN D. BARNARD, IV

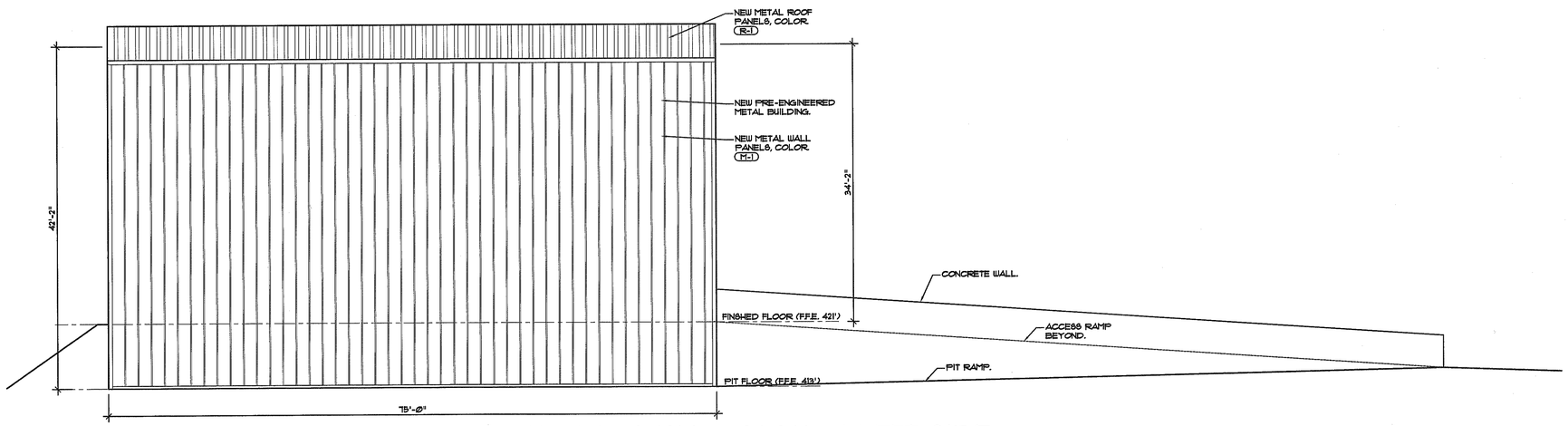
SHEET:
U-6



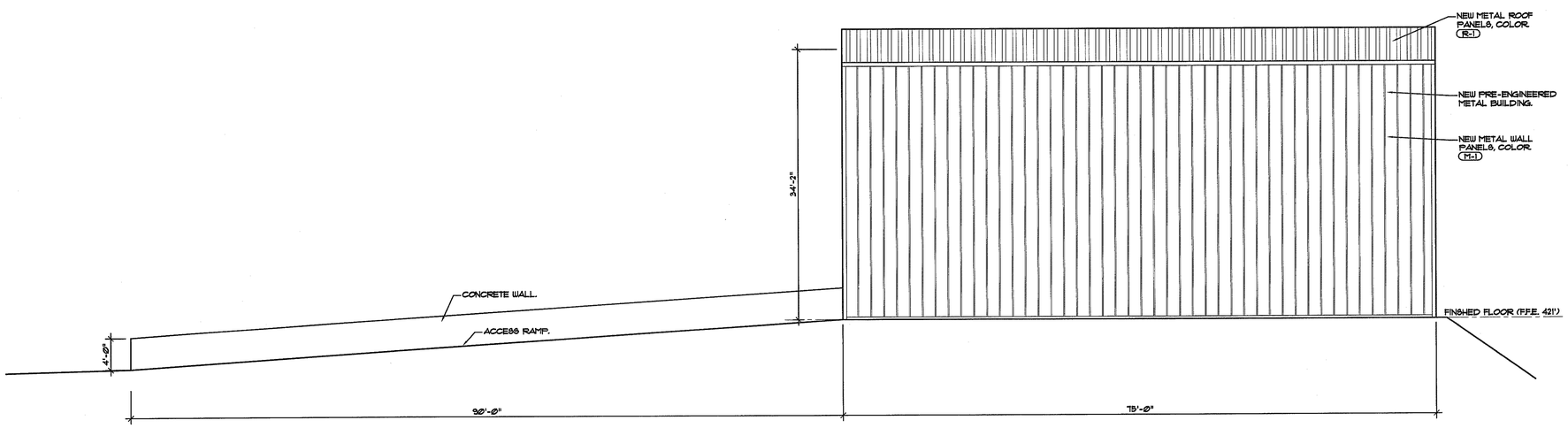
1 EXTERIOR ELEVATION TRANSFER STATION FRONT
SCALE: 1/8" = 1'-0"



2 EXTERIOR ELEVATION TRANSFER STATION REAR
SCALE: 1/8" = 1'-0"



3 EXTERIOR ELEVATION TRANSFER STATION LEFT SIDE
SCALE: 1/8" = 1'-0"



4 EXTERIOR ELEVATION TRANSFER STATION RIGHT SIDE
SCALE: 1/8" = 1'-0"

GONTRAM ARCHITECTURE, INC.
2940 TRAWICK ROAD, SUITE 4
RALEIGH, NC 27604
PHONE: 919.876.5331
FAX: 919.876.5978
eddie@gontramarchitecture.com
www.gontramarchitecture.com

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EDMUND J. GONTRAM, III REGISTERED ARCHITECT 7477 NORTH CAROLINA RALEIGH, N.C.
Jul 9 2013 5:29 PM

GONTRAM ARCHITECTURE, INC. REGISTERED ARCHITECTURAL CORPORATION CERT. NO. 51355 NORTH CAROLINA RALEIGH, N.C.

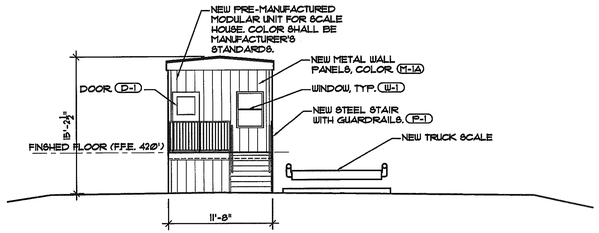
WASTE INDUSTRIES NEW TRANSFER STATION
3290 MCDONALD DRIVE
SANFORD, NORTH CAROLINA

PLOT DATE: JULY 9, 2013
ISSUED: JULY 9, 2013 FOR SPA

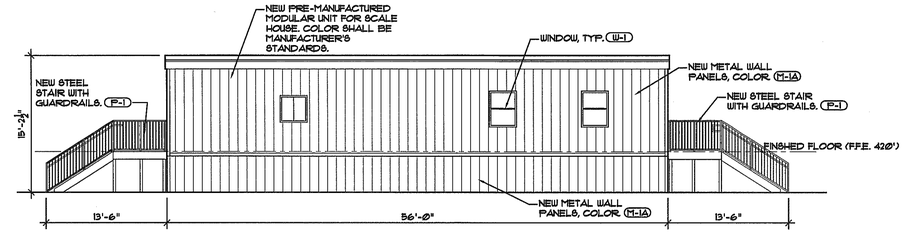
DRAWN BY: AP	APPROVED: EJG
PROJECT NO.: 13007	RECORD:

CONTENTS:

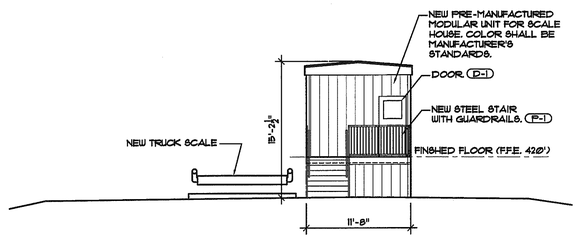
SHEET: A1 OF 2



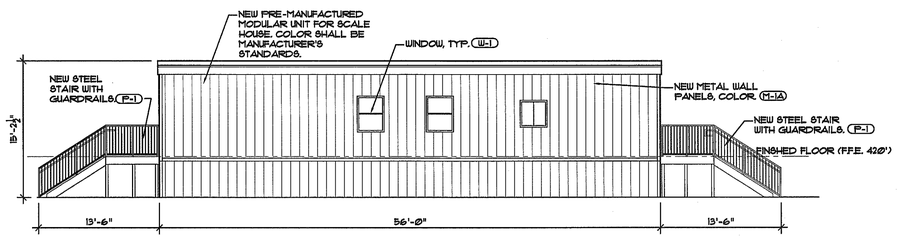
1 EXTERIOR ELEVATION SCALE HOUSE FRONT
SCALE: 1/8" = 1'-0"



2 EXTERIOR ELEVATION SCALE HOUSE RIGHT SIDE
SCALE: 1/8" = 1'-0"



3 EXTERIOR ELEVATION SCALE HOUSE REAR
SCALE: 1/8" = 1'-0"

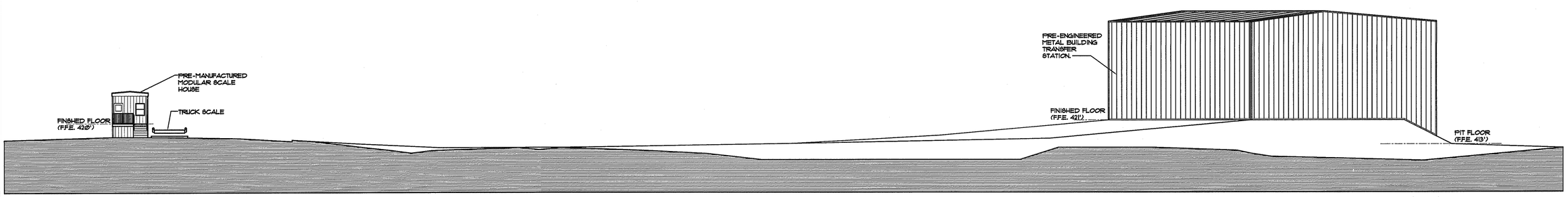


4 EXTERIOR ELEVATION SCALE HOUSE LEFT SIDE
SCALE: 1/8" = 1'-0"

	MATERIAL	MANUFACTURER	COLOR SPECIFICATION
M-1	METAL BUILDING PANELS	METAL BUILDING MANUF.	BEIGE
M-1A	SCALE HOUSE METAL PANELS	SCALE HOUSE MANUF.	BEIGE
M-2	METAL GUTTERS, DOWNSPOUTS		MATCH SURROUNDING COLOR
D-1	SCALE HOUSE DOORS	SCALE HOUSE MANUF.	WHITE
W-1	WINDOWS	SCALE HOUSE MANUF.	WHITE
P-1	PAINT EXTERIOR STAIR	SHERWIN WILLIAMS (OR EQ.)	BLACK
R-1	METAL ROOF PANELS	METAL BUILDING MANUF.	BEIGE

NOTE: CONFIRM ALL COLORS AND MATERIALS W/ OWNER PRIOR TO ORDERING.

5 EXTERIOR COLOR SCHEDULE
SCALE: NONE



6 OVERALL CROSS SECTION ELEVATION FROM STREET
SCALE: 1/16" = 1'-0"

GONTRAM ARCHITECTURE, INC.
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RALEIGH, NC 27604
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EDMUND J. GONTRAM III, REGISTERED ARCHITECT, 7471, NORTH CAROLINA, RALEIGH, N.C.
Jul 9 2013 5:29 PM

GONTRAM ARCHITECTURE, INC., REGISTERED ARCHITECTURAL CORPORATION, CERT. NO. 51255, NORTH CAROLINA, RALEIGH, N.C.

WASTE INDUSTRIES NEW TRANSFER STATION
3290 MCDONALD DRIVE
SANFORD, NORTH CAROLINA

PLOT DATE: JULY 9, 2013
ISSUED: JULY 9, 2013 FOR SPA

DRAWN BY: AP
APPROVED: EJG
PROJECT NO.: 13007
RECORD:
CONTENTS:

SHEET: A2 OF 2

Lee County, NC
Mollie A. McInnis
Register of Deeds

Instrument Type : DEED
Instrument # : 07922
Book/Page : 01342 / 0654-00659 Pages : 6
1st Grantor : SOLUS INDUSTRIAL INNOVATIONS, LLC
1st Grantee : WASTE INDUSTRIES, LLC
Description: 2 TRACTS JBORO T

Receipt # : 2013-127192
Date : 11/26/2013 10:03:39am
Document : 1 of 1

Description	Qty	Unit Cost	Extended
Deed & Gen. Inst. - first 15 pages	1	26.00	26.00
Excise Tax	1	1,050.00	1,050.00
		Document 1	**1,076.00**
		Grand Total	1,076.00
		Check 8640	-1,076.00
		Balance	0.00

Customer Copy

NORTH CAROLINA SPECIAL WARRANTY DEED

Excise Tax: $1,050.00

Parcel Identifier Numbers: 9661-05-0902-00 and 9651-96-5089-00

Mail after recording to: Grantee

This instrument was prepared by: Carolyn F. Lang, Esq.
Wyrick Robbins Yates & Ponton LLP
4101 Lake Boone Trail, Suite 300
Raleigh, NC 27607

Brief Description for the Index: 3290 McDonald Drive and 0 Wilson Road, Sanford, NC

THIS DEED made this 21st day of November, 2013, by and between:

GRANTOR	GRANTEE
Solus Industrial Innovations, LLC c/o Emerson Electric Co. 8000 W. Florissant Avenue St. Louis, Missouri 63136 Attn: Stephen L. Clarke	Waste Industries, LLC 3301 Benson Drive, Suite 601 Raleigh, North Carolina 27609 Attn: Lisa D. Inman, General Counsel

The designation Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine or neuter as required by context.

WITNESSETH, that Grantor, for a valuable consideration paid by Grantee, the receipt of which is hereby acknowledged, has and by these presents does grant, bargain, sell and convey unto Grantee in fee simple, all of Grantor's interest in all that certain lot or parcel of land situated in the City of Sanford, Lee County, North Carolina and more particularly described as follows:

~~See Exhibit A which is attached hereto and incorporated herein by reference.~~

The property hereinabove described was acquired by Grantor by instrument recorded in Book 1066,

SL01DOCS\4198155.2

Page 0083, as corrected by Scrivener's Affidavit recorded at Book 01335 Page 0306, and instrument recorded in Book 01041, Page 0234.

All or a portion of the property herein conveyed _____ includes or __X____ does not include the primary residence of the Grantor.

A map showing the above described property is recorded in Plat Cabinet 2006 Slide 217 and Plat Cabinet 9 Slide 16-A.

TO HAVE AND TO HOLD the aforesaid lot or parcel of land and all privileges and appurtenances thereto belonging to Grantee in fee simple.

And Grantor covenants with Grantee that Grantor has done nothing to impair such title as Grantor received, other than the following exceptions, and Grantor will warrant and defend the title against the lawful claims of all persons claiming by, under or through Grantor, other than the following exceptions:

See Exhibit B which is attached hereto and incorporated herein by reference.

IN WITNESS WHEREOF, Grantor has executed the foregoing as of the day and year first above written.

SOLUS INDUSTRIAL INNOVATIONS, LLC

By: Christine E. Carney
Name: Christine E. Carney
Title: Authorized Signatory

STATE OF ~~NORTH CAROLINA~~ Missouri
COUNTY OF St. Louis

I certify that the following person(s) personally appeared before me this day, each acknowledging to me that he/she voluntarily signed the foregoing document for the purpose stated therein: _____ Christine E. Carney.

Date: November 21, 2013

Kimberly A. Olmstead
Kimberly A. Olmstead
Notary Printed Name

KIMBERLY A. OLMSTEAD
Notary Public-Notary Seal
State of Missouri, St Louis County
Commission # 13772657
My Commission Expires Sep 14, 2017

My Commission Expires: 9-14-17

SL01DOCS\4198155.2

EXHIBIT A

Those certain tracts situate in the City of Sanford, Jonesboro Township, Lee County North Carolina, more particularly described as follows:

TRACT 1:

BEING all of Parcel #2, containing 5.44 acres, more or less, as shown on map entitled "Survey for Virginia Cary L. McDonald", dated January 14, 1999, prepared by Thomas J. Matthews, RLS., and recorded in Plat Cabinet 9, Slide 16-A, Lee County Registry.

TRACT 2:

BEGINNING at a point said point marked by an existing iron pipe located in the centerline of an Abandoned Railroad, thence along said centerline the following five (5) calls as follows: (1) S 38° 37' 27" E 141.95 feet; (2) S 35° 26' 39" E 149.98 feet; (3) S 34° 09' 44" E 149.97 feet; (4) S 31° 50'44" E 150.03 feet; and (5) S 29° 48' 03" E 101.76 feet to a point marked by an existing iron pipe; thence leaving said centerline and running N 85° 03' 40" W 446.21 feet to a point marked by an existing iron pipe; thence along the northeastern property line of Tract 2, Plat cabinet 9, Slide 16-A, Lee county Registry, N 04° 55' 44" E 488.94 feet to a point marked by an existing concrete monument; thence N 15° 21' 32" E 49.13 feet to the centerline of the Abandoned Railroad, the Point and Place of Beginning, being the parcel shown as "To Solus, Inc. Map dated 09/08/2006" all as shown on plat entitled "Survey for Billy A. Lane, Madge S. Lane, 3311 Lee Ave., Sanford, NC 27330" dated November 9, 2006, prepared by Melvin A. Graham, PLS and recorded in Plat Book 2006, Slide 217, Lee County Registry.

Exhibit B

1. Covenants, conditions, limitations, restrictions, rights, rights of way, encumbrances, encroachments, reservations, easements, agreements and other matters of fact or record.

2. Present and future zoning, subdivision, building, land use, and environmental laws, ordinances, restrictions, resolutions, orders and regulations and all present and future ordinances, laws, regulations and orders of all federal, state, county, municipal or other governments, agencies, boards, bureaus, commissions, authorities and bodies now or hereafter having or acquiring jurisdiction of the property and the use and improvement thereof.

3. Any state of facts or exceptions which an accurate survey or an inspection of the property would show.

4. Special assessments now or hereafter becoming a lien.

5. General property taxes for the current tax fiscal year and subsequent tax fiscal years.

SOLUS INDUSTRIAL INNOVATIONS, LLC
SECRETARY'S CERTIFICATE

The undersigned, Secretary of Solus Industrial Innovations, LLC, a Delaware limited liability company (the "Company"), hereby certifies the following:

1. That the following resolutions were adopted by the Company's sole member on January 2, 2013, and are in full force and effect on the date hereof in the following form:

"RESOLVED, that the following individuals be, and hereby are elected to the respective offices of the Company set forth opposite their names, to serve as such until their respective successors are elected and qualified or until their earlier death, resignation, retirement or removal:

Garland Jones, President
Ronald J. Charles, Vice President & Treasurer
Curt S. Wiley, Vice President & Assistant Treasurer
David J. Rabe, Assistant Treasurer
John G. Shively, Secretary
Victor A. Lazzaretti, Assistant Secretary

"FURTHER RESOLVED, that each of Stephen L. Clark or Christine E. Carney is authorized, for and on behalf of the Company and under its corporate seal, to take any and all actions, and to execute and deliver any documents, deeds, affidavits and instruments, as may be necessary or appropriate to effectuate the sale, purchase, leasing, donation, conveyance or encumbering of, or access to or investigation of, any real property for the benefit of the Company; and

FURTHER RESOLVED, that each of John M. Groves or Christopher J. Hayes is authorized, for and on behalf of the Company and under its corporate seal, to execute and deliver any and all documents relating to patent, trademark and other intellectual property matters that may be necessary or desirable to execute and deliver in the ordinary course of the Company's business, including, specifically, the following documents:

1. Powers of attorney granting foreign and domestic law firms and agents authority to act on behalf of the Company to:
   a. file, prosecute, maintain, assign, abandon, and license patents, trademarks, and other intellectual property and registrations and applications therefor;
   b. file, prosecute, defend, dismiss and settle lawsuits, appeals, oppositions, cancellations, reexaminations, and other judicial and administrative proceedings relating to patents, trademarks, and other intellectual property matters;

c. investigate and gather evidence relating to the infringement or potential infringement of intellectual property; and
d. pay annuities and maintenance fees.

2. Assignments of patent, trademark and other intellectual property;
3. Agreements relating to patents, trademarks and other intellectual property, including, licenses and agreements relating to the use of trademarks;
4. Settlement agreements and other documents resolving disputes relating to intellectual property matters; and
5. Applications and declarations in connection with the filing, prosecution and maintenance of patent and trademark applications and registrations, including declarations of use."

IN WITNESS WHEREOF, I have hereunto set my hand of said Company this 22nd day of August, 2013.

John G. Shively
Secretary