Draper Aden Associates
Engineering • Surveying • Environmental Services

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March 3, 2015

Mr. Douglas Walker, Deputy County Executive
Albemarle County, Virginia
401 McIntire Road
Charlottesville, VA, 22902

RE: Albemarle County – Transfer Station Phase 2 Evaluation
Western Transfer Station – conceptual design
Draper Aden Associates Project No.: C11123R-07

Dear Mr. Walker:

As requested by Albemarle County (the County) and as described in our proposal dated January 23, 2015, Draper Aden Associates has focused attention on the optimum development of the western transfer station site at the Ivy Material Utilization Center. To complete this endeavor, Draper Aden Associates enlisted the assistance of Reynolds Architects to provide a conceptual design for the transfer station facility. In addition, to the meeting held with the County and Rivanna Solid Waste Authority (RSWA) on February 3, 2015 to discuss building programming with the architect, Draper Aden Associates also met with Environmental Standards (Mr. Gerald Kirkpatrick), the County and RSWA on January 27, 2015 to discuss the potential environmental concerns with the development of the western site. Our findings and efforts under this proposal are provided below.

A. SITE LAYOUT AND BUILDING PROGRAMMING

Our direction to the County as determined by the Board of Supervisors was as follows:

"*As a part of the comparison of possible collection and transport system alternatives, immediately begin a detailed analysis of the Ivy MUC site specific to the construction of a new transfer station on one or more suitable locations on the property. Analysis should include an environmental assessment to determine site suitability and more detailed cost estimates for design, construction, and operations.*"

To initiate the analysis, it was critical that Draper Aden Associates and Reynolds Architects understand the County's vision for the facility and the RSWA's operations. To that end, a meeting was held on February 3, 2015 to discuss the design elements that should be considered. During this discussion, it was indicated that the design should maximize the potential of the site considering flexibility, future usage and operational efficiency. Recycling was a key component of the discussion.

After the meeting, Draper Aden Associates and Reynolds Architects spent time with the RSWA on-site reviewing the existing operations and discussing improvements that would be needed to accommodate a transfer operation on the western site. Key concerns included the following:

- Traffic flow with the larger trailers in particular the steep slope up from the office area into the western site;
- Trailer storage and the time and personnel required to switch out the transfer trailers if the current storage area is used;
- Improvements for citizen usage that would consolidate existing operational areas to facilitate their usage and improve oversight by RSWA (e.g. tag-a-bag, recycling, and reuse areas).
- If the recycling opportunities are maximized, efficient material handling and storage become critical; and
- Ability to handle additional wastes in the future or to segregate incoming wastes by type (e.g. CDD from MSW) if such services were to be required.

Based on the information received on February 3, 2015, the project team developed a conceptual site plan (Figure 1) included in Attachment 1 and a building floor plan and elevation included in Attachment 2. For comparison, the original smaller transfer station floor plan is included in Attachment 3 along with an updated opinion of probable cost for this older option.

The following operations or facilities are included in the new facility layout and illustrated on the site plan:

- A drop off center for citizens with their bagged trash (upper north roll offs) segregated from the transfer station traffic;
- A shed for collection of the resalable products (e.g. sinks, toys etc.) located on the far western side;
- Four trailers (western side) for live loading "recyclables" which could be any number of materials – cardboard, newspaper, tires, etc.
- Transfer station (basic 10,000 tipping floor plus 1,530 sf loading area) plus an additional 4,000 sf for recycling operations including a loading dock. The recycling area is large enough that it could in the future accommodate some processing equipment (e.g. baler) and the loading dock is large enough to accommodate 3 trailers; and
- Trailer storage on the upper level and trailer storage on the lower level;

This layout is very different from the previous option considered as the design addresses the key concerns expressed above and builds in flexibility for future operations and maximum efficiency for RSWA. The usage of the facilities and the needed equipment would be determined by the chosen operations. As an example, the drop off center could utilize small 20 cy open top roll offs, rear loading receiving trailers, or compactors.

To accommodate these facilities, the site plan expanded the overall working area (area of disturbance is approximately 4 acres) and included the necessary grade breaks to handle the various loading docks. This layout allows personnel at the transfer station to observe many operations

relative to citizen usage and recycling, and allows them to move materials and equipment more efficiently. The enhanced operations could be phased in over time, but the site work for the general footprint would need to be completed in conjunction with the transfer station construction.

To address the road requirements for vehicles entering the transfer station (e.g. reducing the slope of the road into the transfer station tipping floor and improving the slopes of the road for the transfer trailers into and from the lower loading area) and to enhance the function of the site by increasing available land usage, the proposed site required a significant cut on the north side of the site. Under this concept, a cut of approximately 10 feet is required.

It is recognized that the viability of this cut is a function of the edge of waste which has been identified in the field via existing bollards/edge of pavement and on drawings provided by Environmental Standards. The source of the information used to make the edge of waste identification is not known and the location of the edge of waste from these two sources is in conflict. Prior to any final design, additional work would be required to verify with greater certainty the edge of waste in this area. As may be needed, the site can be shifted slightly to the south to modify the location of this cut or the inclusion of the drop off facility eliminated from the development.

All roads illustrated on the site plan are assumed to be paved with an industrial grade asphalt pavement. The entrance area to the transfer station (80' x 100') is assumed to be heavy duty concrete given the amount of vehicle maneuvering in this area. This pad in the final design will be sloped away from the building to assure that stormwater does not enter the building from runoff from this area. Washdown water and a fluid collection system within the building will be incorporated into the final building design but is not indicated on the provided drawings. The final disposition of this wastewater has not been determined. Gates on the two primary access and exit roads (into and from the station) have been included but a full perimeter fence has not.

The transfer station will be a pre-engineered metal building placed on a concrete slab designed to handle the heavy equipment loads placed on it. The slab can be constructed of high strength concrete and/or enhanced with various strengthening materials. In addition, the facility will require push walls, ventilation, doors on the upper and lower operational areas, loading scale and appropriate signage. A small office with a handicap accessible bathroom is also illustrated on the floor plan. The grade break to the loading area is 16 feet. A covered loading dock is also included on the eastern side of the building. The grade break at the loading dock is 4 feet. The tipping floor is illustrated to be 9,000 sf, the recycling area 5,000 sf and the loading area 1,530 sf.

B. OPINION OF PROBABLE COSTS

Utilizing the concepts developed for this report (See Attachments 1 and 2), opinion of probable construction costs (conceptual only) were developed for the site work and for the building construction. Attachment 4 includes this information. The opinion of probable construction cost for this alternative include a 15% contingency and can be summarized as follows:

TABLE 1
OPINION OF PROBABLE CONSTRUCTION COSTS*
(CONCEPTUAL ONLY)

ACTIVITY	OPINION OF PROBABLE COST (Includes 15% contingency)
Site work	$971,600
Building	$1,426,900
TOTAL	***$2,398,500***

*Does not include equipment, A/E fees, permitting or environmental mitigation activities

C. ENVIRONMENTAL CONSIDERATIONS

The site plan has been provided to Environmental Standards, Mr. Gerald Fitzpatrick, and comments have been received. In addition to noting the need to verify the edge of waste and to assure that no waste is exposed, other comments provided include the following:

- **Landfill gas:** The site is immediately adjacent to an unlined landfill. Because of this, it is anticipated that the foundation of the transfer station will need to be provided with a venting system to vent possible landfill gas from beneath the facility. In addition, a vapor barrier may need to be added to the design if other volatile organics are thought to be present.
- **Storm water:** Storm water will require management and permitting under the modified VSMP regulations and careful consideration should be given to the discharge point(s).
- **Ground water:** The site plan is a combination of cut and fill. There are two monitoring wells in the general vicinity of the site development. MW-45 is on the eastern side and MW-44 is on the southwestern side. Groundwater in both wells based on 2005 data is between 30 and 37 feet below the ground surface at an estimated elevation of 690 to 700. The deepest cut is set at approximate elevation 720, well above groundwater. Direct contact with groundwater is not anticipated.

  However, the surficial grading activity and the construction of impervious surfaces as well as storm water management could change the groundwater regimen. As indicated by Mr. Fitzgerald, *"Because so much of the groundwater flow at this site is in fractures, the impact the change in slope and cover type will have on the groundwater flow system beneath the cells is unpredictable (modeling this is not practicable). The project is located in a hydraulically "background" position and a local groundwater recharge location for the landfill's underlying groundwater system. What impact that change will actually have to our existing groundwater remedy is, and will be, uncertain until the project is finished.*"

Based on our experience we believe that these items can be addressed during final design but additional investigations may be necessary. We concur with Mr. Fitzgerald that the potential impact to groundwater will remain unpredictable and would suggest that prior to initiation of any additional design activities, the Virginia Department of Environmental Quality be consulted about this project.

We look forward to discussing this work with the Albemarle County Board of Supervisors at their March 11, 2015 meeting. Should you have any questions, please do not hesitate to contact me.

Sincerely,
DRAPER ADEN ASSOCIATES

Lynn P. Klappich

Lynn P. Klappich, CSI, CCCA
Program Manager

Attachments:
Attachment 1 – Proposed Concept Layout
Attachment 2 – Conceptual Floor Plan – New concept – 15,530 sf building
Attachment 3 – Conceptual Floor Plan – Original concept – 7,800 sf building
Attachment 4 – Opinion of Probable Construction Cost (Concept)

cc: Mr. Mark Graham, Albemarle County

ATTACHMENT 1
PROPOSED CONCEPT LAYOUT

EDGE OF LANDFILL PER PLAN PROVIDED BY ENVIRONMENTAL STANDARDS, INC.

(NOTE: EDGE OF LANDFILL APPROXIMATELY 5' BEYOND EDGE OF PAVEMENT PER SITE VISIT.)

EDGE OF EXISTING PAVEMENT

TREATMENT BUILDING (TO BE REMOVED)

EXTERIOR LOADING AREA WITH CANOPY

WEIGH STATION

GAS FLARE STATION

TEST WELL (MW-45)

2:1 SLOPE

GATE

SHED

TW: 734
BW: 730

RECYCLE TRAILER (TYP.)

TRANSFER STATION
FFE=734'

FFE=718'

7% SLOPE

MONITORING WELL (MW-44)

LEGEND:

- HEAVY DUTY CONCRETE PAVEMENT
- HEAVY DUTY ASPHALT PAVEMENT
- POTENTIAL STORMWATER MANAGEMENT FACILITY

GRAPHIC SCALE

60 0 30 60 120

(IN FEET)

1 inch = 60ft.

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Charlottesville, VA 22903
434-295-0700 Fax: 434-295-2105
Blacksburg, VA
Richmond, VA
Hampton Roads, VA

DESIGNED ECB
DRAWN AJH
CHECKED JWS
DATE 02/26/2015

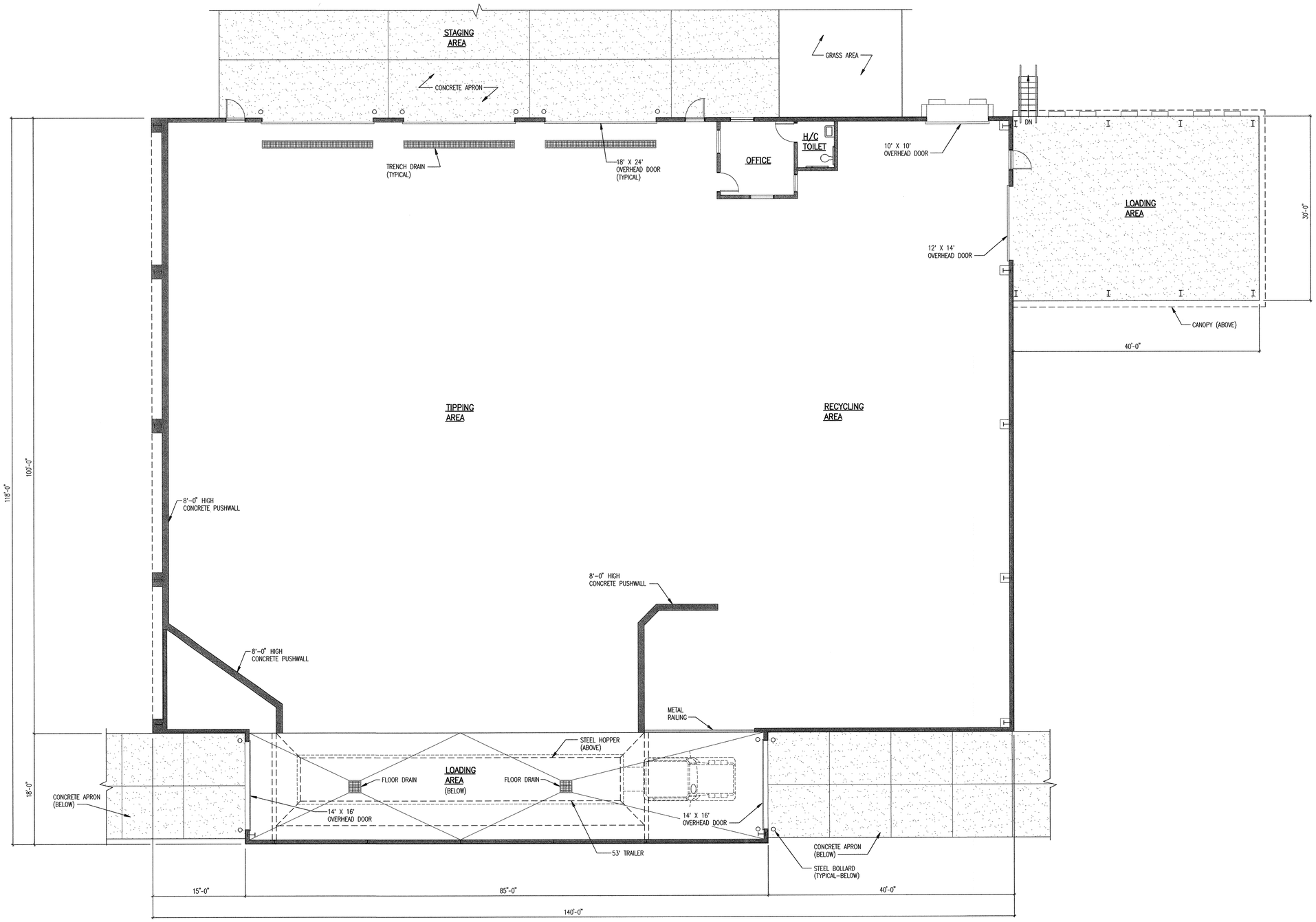
CONCEPT LAYOUT
IVY LANDFILL TRANSFER STATION
CHARLOTTESVILLE, VIRGINIA

SCALE: 1" = 60'

PROJECT: C11123C-08C

FIGURE 1

ATTACHMENT 2
CONCEPTUAL FLOOR PLAN
NEW CONCEPT
15, 530 SF building



CONCEPTUAL FLOOR PLAN - OPTION '2'

SCALE: 1/8" = 1'-0"

TIPPING AREA:	9,000 S.F.
RECYCLING AREA:	5,000 S.F.
LOADING AREA:	1,530 S.F.
TOTAL SQUARE FOOTAGE:	15,530 S.F.

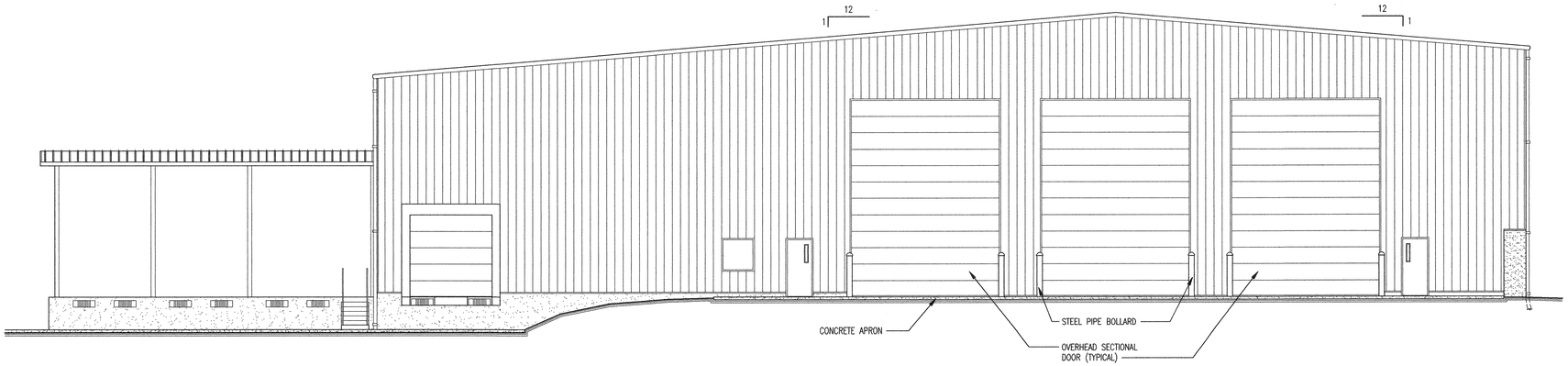
NO.	REVISIONS	DATE

IVY TRANSFER STATION / RECYCLING
ALBEMARLE COUNTY, VIRGINIA

CONCEPTUAL FLOOR PLAN - OPTION '2'

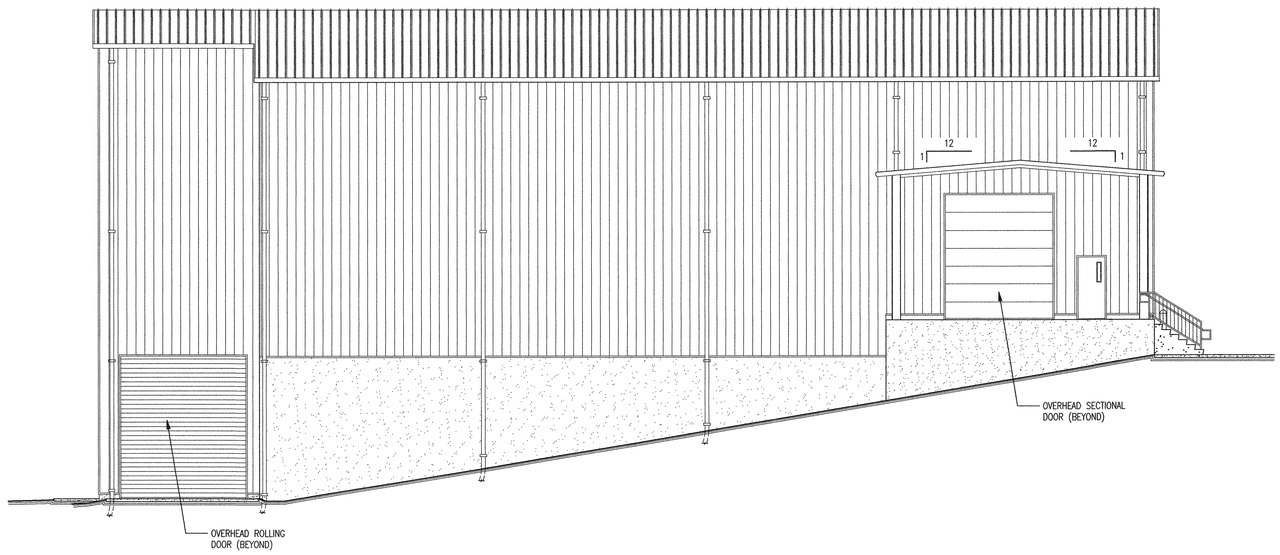
REYNOLDS ARCHITECTS INCORPORATED
BLACKSBURG, VIRGINIA

DESIGNED RA	DRAWN EAN
CHECKED GPR	APPROVED
PROJECT 1219	2
DATE 2-26-15	



FRONT ELEVATION

SCALE: 1/8" = 1'-0"



LEFT SIDE ELEVATION

SCALE: 1/8" = 1'-0"

NO.	REVISIONS	DATE

IVY TRANSFER STATION / RECYCLING

ALBEMARLE COUNTY, VIRGINIA

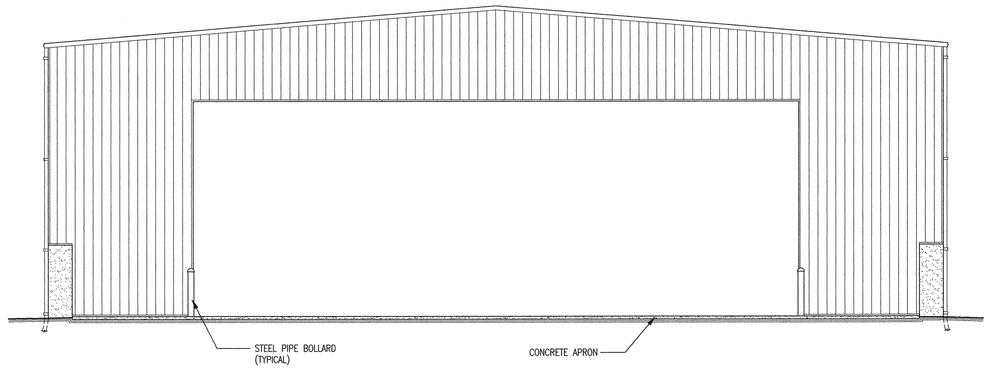
CONCEPTUAL ELEVATIONS - OPTION '2'

REYNOLDS ARCHITECTS INCORPORATED

BLACKSBURG, VIRGINIA

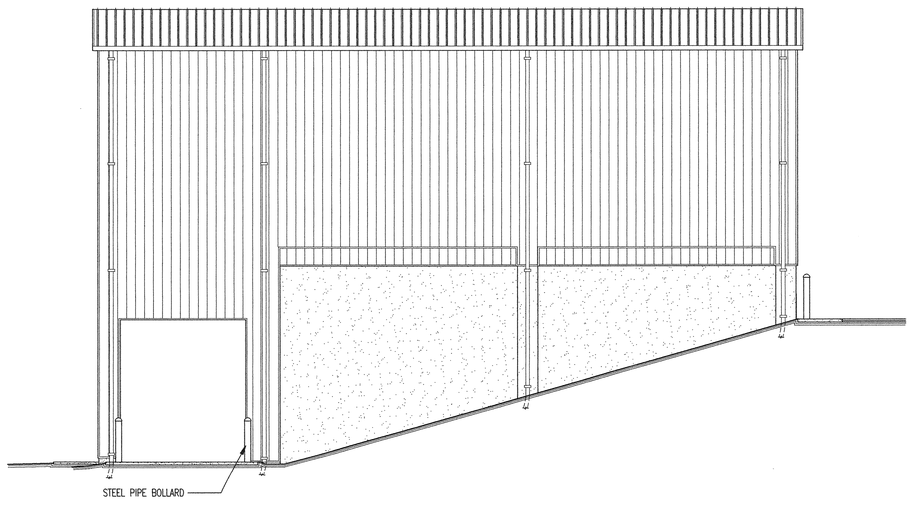
DESIGNED RA	DRAWN EAN
CHECKED GPR	APPROVED
PROJECT 1219	2
DATE 2-26-15	

ATTACHMENT 3
CONCEPTUAL FLOOR PLAN and OPC
ORIGINAL CONCEPT
7,800 sf building



FRONT ELEVATION

SCALE: 1/8" = 1'-0"



LEFT SIDE ELEVATION

SCALE: 1/8" = 1'-0"

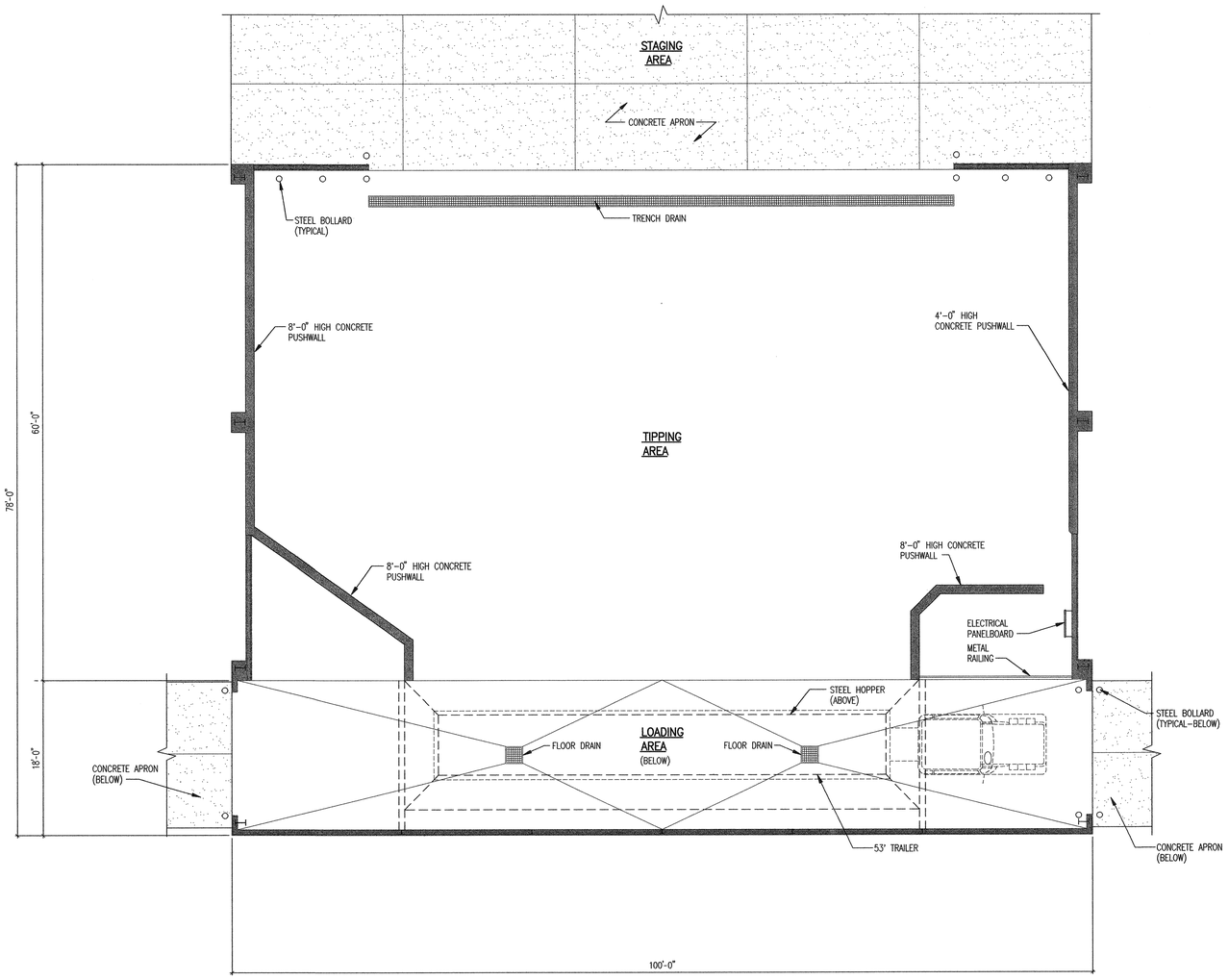
NO.	REVISIONS	DATE

IVY TRANSFER STATION
ALBEMARLE COUNTY, VIRGINIA

CONCEPTUAL ELEVATIONS - OPTION '1'

REYNOLDS ARCHITECTS INCORPORATED
BLACKSBURG, VIRGINIA

DESIGNED RA	DRAWN EAN
CHECKED GPR	APPROVED
PROJECT 1219	1
DATE 2-26-15	



CONCEPTUAL FLOOR PLAN - OPTION '1'

SCALE: 1/8" = 1'-0"

TIPPING AREA:	6,000 S.F.
LOADING AREA:	1,800 S.F.
TOTAL SQUARE FOOTAGE:	7,800 S.F.

NO.	REVISIONS	DATE

IVY TRANSFER STATION
ALBEMARLE COUNTY, VIRGINIA

CONCEPTUAL FLOOR PLAN - OPTION '1'

REYNOLDS ARCHITECTS INCORPORATED
BLACKSBURG, VIRGINIA

DESIGNED RA	DRAWN ABC
CHECKED GPR	APPROVED
PROJECT 1219	1
DATE 2-26-15	

REYNOLDS ARCHITECTS INCORPORATED

506 SOUTH MAIN STREET, BLACKSBURG, VIRGINIA 24060

February 24, 2015

Ivy Transfer Station
Albemarle County, Virginia

PRELIMINARY COST ESTIMATE FOR 7,800 S.F. TRANSFER STATION

General Requirements	$ 61,267
Concrete / Reinforcing Steel	329,870
Miscellaneous Steel / Hopper	94,723
Pre-Engineered Metal Building	149,635
Plumbing	15,015
Ventilation	4,805
Electrical	18,619
Subtotal	$673,934
15% Contingency	101,090
Total	$775,024

(Does not include sitework or equipment)

ATTACHMENT 4
OPINION OF PROBABLE CONSTRUCTION COST
CONCEPT ONLY
(New Concept)

REYNOLDS ARCHITECTS INCORPORATED

506 SOUTH MAIN STREET, BLACKSBURG, VIRGINIA 24060

February 24, 2015

Ivy Transfer Station
Albemarle County, Virginia

PRELIMINARY COST ESTIMATE FOR 15,530 S.F. TRANSFER STATION

General Requirements	$ 112,796
Concrete / Reinforcing Steel	543,620
Concrete Loading Area	18,400
Miscellaneous Steel / Hopper	169,960
Pre-Engineered Metal Building	268,520
Canopy over Loading Area	23,800
Overhead Doors and Controllers	34,500
Plumbing	27,020
Ventilation	8,680
Electrical	33,460
Subtotal	$1,240,756
15% Contingency	186,113
Total	$1,426,869

(Does not include sitework or equipment)

• **BLACKSBURG 540/552-7575 • ROANOKE 540/387-3374 • FAX 540/552-6310** •

FORMERLY ROGERS & REYNOLDS ARCHITECTS, INC.

Opinion of Probable Cost:

Project: **Albemarle Convenient Center - Ivy Transfer Station**
Date: **February 24, 2015**
Location: **Albemarle County**
Owner: **County of Albemarle**
Preparer: **DRAPER ADEN ASSOCIATES**

Item		Quantity	Unit	Unit Price	Item Total	Category Sub-Total
Demolition						
Remove Trees & Grubbing		3.82	acre	$5,000.00	$19,100.00	
Demo asphalt		630	SF	$7.00	$4,410.00	
Demo building		1	Ea.	$1,500.00	$1,500.00	
						$25,010.00
Earthwork						
Fine Grading		18482	S.Y.	$2.00	$36,964.00	
Cut and Haul on site		28870	C.Y.	$6.00	$173,220.00	
Fill if using cut		3570	C.Y.	$6.00	$21,420.00	
Cut if hauled out		0	C.Y.	$10.00	$0.00	
Fill If hauled in		0	C.Y.	$10.00	$0.00	
						$231,604.00
Erosion and Sedimentation Control						
Construction Entrance		1	Ea.	$2,000.00	$2,000.00	
Silt Fence		1100	L.F.	$3.50	$3,850.00	
Seeding/Mulching/Topsoil		1.87	AC.	$5,000.00	$9,350.00	
Dust Control		3.82	AC.	$1,000.00	$3,820.00	
Blanket Matting		2480	SY	$2.00	$4,960.00	
						$23,980.00
Hardscape Construction						
Heavy Duty Asphalt Pavement						
Supply, Place and Compact 8" VDOT 21B		2525	Tons	$25.00	$63,125.83	
Supply and Place 4" VDOT BM-29 Asphalt		1457	Tons	$85.00	$123,823.75	
Supply and Place 2.5" VDOT SM-9.5A Asphalt		910	Tons	$85.00	$77,389.84	
Heavy Duty Concrete Pavement						
Supply, Place and Compact 8" VDOT 21B		449	Tons	$25.00	$11,228.75	
Supply and Place 8" Hydraulic Cement Concrete		1536	SY	$100.00	$153,555.56	
						$429,123.73
Site Items						
Security Gate		2	L.S.	$4,000.00	$8,000.00	
Pavement marking		1	L.S.	$2,000.00	$2,000.00	
						$10,000.00
Utility Construction						
4" Sanitary Sewer		380	L.F.	$40.00	$15,200.00	
Sanitary Sewer Manhole		1	Ea.	$4,000.00	$4,000.00	
Sanitary Sewer Clean Out		1	Ea.	$500.00	$500.00	
2" Waterline		385	L.F.	$30.00	$11,550.00	
Conduit		360	L.F.	$5.00	$1,800.00	
Lights		3	Ea.	$1,500.00	$4,500.00	
Light pole foundations		2	Ea.	$750.00	$1,500.00	
						$39,050.00

Stormwater Management					
Stormwater Management Facility	4	Ea.	$10,000.00	$40,000.00	
					$40,000.00
Structures					
4' Retaining wall	1056	S.F.	$20.00	$21,120.00	
					$21,120.00
Landscaping					
					$0.00
Miscellaneous					
Mobilization & Stakeout	1	L.S.	$25,000.00	$25,000.00	
					$25,000.00
SUBTOTAL FOR ALL PROPOSED CONSTRUCTION				**$844,887.73**	
15% CONTINGENCY				**$126,733.16**	
TOTAL OPINION OF PROBABLE COST				**$971,620.89**	