ARCHITECTURE ENGINEERING PLANNING

Comparative Site Analysis
For a New
DPW/Maintenance Facility

January, 2011

City of Boyne City
Charlevoix County, Michigan

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This study provides a comparative analysis of two different sites for the construction of a new DPW/Maintenance facility for the City of Boyne City. The first site is the North Boyne Site, located near the intersection of Court and Robinson Streets which currently serves as the location for the City's salt storage area and yard waste/compost site. The second site evaluated is the City's wastewater treatment facility which is located at the east end of Main Street and located just north of the City airport.

The two sites have been evaluated based on numerous considerations, including:

- Cost
- Constructability
- Site size and expandability
- Site access
- Environmental/cultural impacts

A narrative description, site layout drawing and preliminary cost opinion for each site are contained in following sections of this study.

As we proceeded through this study, there were numerous different conceptual site layouts that were developed and discussed. Although only two final concept layouts were selected for the final analysis, the other potential layouts that were developed and then discarded for various reasons are included in the Appendix for reference.

A cost summary for each of the two final options is presented in the following Table 1 Comparative Cost Summary. The cost summary includes site development and building costs, and also provides cost information for related items that may impact the cost feasibility of choosing a particular site. It should be noted that these cost opinions and cost summaries are for comparative purposes, and not all inclusive of all ancillary items. One such item would be the construction of a new salt storage building. The differing site costs have been noted, but the actual cost for the building has not been included as it would be relatively the same for either site.

Table 1.
Comparative Cost Summary

Item	North Boyne	WWTF/Airport
Site Development Costs	$ 230,400	$ 585,300
Building Cost - Administration Addition	$ -	$ 367,800
Building Cost - Maintenance Facility	$ 2,302,000	$ 2,096,500
Total	$ 2,532,400	$ 3,049,600
Additional Items		
Upgrade Main Street to All Season	$ -	$ 406,300
Expand Entrance Drive	$ 52,500	$ -
Fill Low Area for Salt Storage and Compost	$ -	$ 349,500
Total with Additional Items	$ 2,584,900	$ 3,805,400
Future Added Costs		
Pump Station and FM for Salt Storage	No	Yes

All costs above are total project costs, including A/E fees and construction contingency.

In addition to the cost summary, we have also included the following Table 2 – Site Comparison Matrix. This chart provides a matrix showing the relative impacts for each site for constructability, environmental, and cultural impacts.

Table 2
Site Comparison Matrix

		North Boyne Site			WWTP Site			
		Degree of Impact			Degree of Impact			
No.	Description of Item	Minimal	Average	Significant	Minimal	Average	Significant	Comments
1	Centralized Location in City		X		X			WWTP is more centralized, N. Boyne Site is current location for compost
2	Accessibility to a Class A Roadway	X					X	Robinson Street is all season, Main Street requires upgrade
3	Aesthetics		X			X		N. Boyne site is more visible, WWTP site visible from runway/airport
4	Combined Operations/Centralized Personnel			X	X			WWTP site provides centralized staff and equipment location
5	Congested Operations - DPW and WWTP	X					X	N. Boyne separated, WWTP site is constricted
6	Construction Costs		X				X	
7	Construction Impact on Existing Facilities	X					X	
8	Fencing & Security Access	X					X	WWTP site requires restricted access to treatment facilities
9	Impact on Existing Infrastructure	X				X		N. Boyne site open, WWTP site requires utility relocations
10	Impact on Surrounding Land	X					X	WWTP site requires major earthwork, clearing, potential slope issues
11	Permits (NPDES, MDEQ, SESC)	X				X		WWTP site may require storm water NPDES, certified operator
12	Proximity to Environmentally Sensitive Areas	X					X	
13	Proximity to Residential Areas		X			X		
14	Requires Clearing or Detrimental Work	X					X	
15	Soils Limitations	X				X		
16	Space for Current Needs	X					X	N. Boyne site has lots of room, WWTP site is very constricted
17	Space for Future Development/Expansion	X					X	N. Boyne site has lots of room, WWTP has no room for expansion
18	Topographical Limitations (Site Grading)	X					X	WWTP site requires major earthwork
19	Truck Turning Room	X					X	
20	Utility Connection Lengths	X				X		WWTP site requires more infrastructure/utility work
21	Construction of Future Pathway (WWTF)	NA					X	No room left at WWTF site for proposed pathway along top of bank
22	Alternate Site Uses			X				Construction of the DPW at N. Boyne limits the use of that site for other purposes

As can be seen from Table 1, the cost to construction the new DPW/Maintenance Facility at the North Boyne Site is approximately $500,000 less than the WWTP site. If the costs for additional related improvements are included, such as upgrading Main Street to an all season road and completing the necessary site improvements for a salt storage building and compost/yard waste site the cost difference becomes much greater, approximately $1.2 million.

Some of the reasons for these cost differences are provided in greater detail in each site narrative description, however the main reasons relate to the amount of grading and earthwork required, removal of poor soils and required utility relocation or additions at the WWTP site.

As seen from Table 2 - Site Comparison Matrix, there are also fewer detrimental impacts created by the construction at the North Boyne Site. The two main detrimental impacts of utilizing the North Boyne Site are as follows:

- Utilizing this site for a DPW/Maintenance Facility restricts the use of this site for other purposes (recreation, development, etc.)
- The potential benefits of combined facilities and operations for both the DPW and Water/Wastewater departments are not realized because of the separate site locations.

However, the use of the WWTP site has many more significant detrimental impacts, as follows:

- The usable site area is very constricted and leaves very little room for potential additions.
- Constructability at this site is an issue: constructing the new facility at the edge of the steep embankment would likely necessitate the construction of a large retaining wall. Also, a soils investigation would need to be performed to assure the stability of that bank.
- The site requires a large amount of imported fill material and would also require significant removal and replacement of unsuitable soils.
- Impacts to existing utilities/infrastructure at this site are much greater than at the North Boyne Site.

Because of the very significant advantages of both lower construction costs and fewer site issues it is our opinion that the North Boyne Site provides the best use of City resources for the construction of a new DPW/Maintenance Facility.

NARRATIVE DESCRIPTION- NORTH BOYNE SITE

Site Description

The North Boyne site is located on City property in the northeast quadrant of Court and Robinson Streets, directly south of the existing fenced DPW lot. The existing salt/sand barn, DPW storage garage and public composting/recycle area are all located at or adjacent to this site. Robinson Street is already constructed to all season road standards and would not require upgrading if the DPW Facility was constructed at this site. Existing infrastructure has already been constructed within a couple of hundred feet of the site, including: 3-phase electrical, gravity sanitary sewer, large diameter water main, natural gas and telephone utilities. The site topography is good, with moderate slopes except for the east line adjacent to Addis Street where there is a steep upslope to the road, restricting vehicular access from that roadway. There would be minimal tree removal required and very little impact to the surrounding properties. Existing soils are adequate with no apparent high groundwater, wetlands or other stability issues. The impact on the public would be minimal, as the City DPW trucks currently use Robinson Street.

Building Description

The proposed maintenance garage would be a stand-alone 20,000 sft (200'x100') pre-engineered metal structure with concrete slab and foundation walls, HVAC, fire protection and interior amenities. The structure would contain numerous truck and equipment bays, 2 repair bays, a wash bay, sign shop, mechanical shop, heated storage room, cold storage, men's and women's restrooms and locker rooms, DPW office, break room and mechanical and electrical control rooms.

Site and Building Assumptions

1. 5" HMA pavement for truck traffic areas.
2. 8" reinforced concrete pads for building approaches.
3. Pre-engineered building with cast in place concrete slab on grade, foundation walls and side walls up to 3 feet above grade.
4. Building insulation, heating, cooling (office only), fire suppression and ventilation systems.
5. Wash bay
6. Repair bays with hydraulic lifts.
7. Oil water separator.

Not Included in the preliminary cost opinions

1. Salt/Sand Barn: Building, site grading, site utilities, access drives, etc. (80'x80' barn shown for site reference). This may be needed in the near future.
2. Vactor Truck dewatering structure: (future $75,000 cost, if desired).
3. Compost area or site improvements.
4. Fuel Apparatus: pumps, tanks, etc.

5. Site Lighting: Only building-mounted wall packs.
6. Landscaping: (site grading and hydroseeding are included)

DESIGNED BY: JEH | APPROVED BY: LMF
CHECKED BY: LMF | DWG'S MOD BY: JEH

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WE RECYCLE

OPTION 1
NORTH BOYNE DPW SITE

CITY OF BOYNE CITY
DPW FACILITY FEASIBILITY STUDY
CHARLEVOIX COUNTY, MICHIGAN

720 Prudden Street
Lansing, MI 48906 - 517.371.1202

123 West Main Street, Suite 206
Gaylord, MI 49735 - 989.732.8131

848 Monroe Avenue NW, Suite 210
Grand Rapids, MI 49503 - 616.454.0414

1211 Ludington Street
Escanaba, MI 49829 - 906.233.9090

c2ae
WWW.C2AE.COM

DATE: JAN. 2011
JOB #: NA
SCALE: 1"=50'
SHEET 1 of 2

REVISIONS

STUDY PHASE

c2ae
www.c2ae.com

123 West Main Street
Suite 200
Gaylord, MI 49735
P: 989.732.8131
F: 989.732.2714
info@c2ae.com
www.c2ae.com

CITY OF BOYNE CITY
DPW Facility Feasibility Study
Final Opinion of Probable Construction Costs - North Boyne Site

Site Improvements

Item #	ITEM DESCRIPTION	Estimated Quantity	Item Unit	Unit Price	Total Price
1	Remove & Replace Fence	100	LFT	$25.00	$2,500.00
2	Site Earthwork & Grading	1	LSUM	$20,000.00	$20,000.00
3	6" PVC DR-18 Water Main	264	LFT	$25.00	$6,600.00
4	6" Dia. Gate Valve	1	EACH	$750.00	$750.00
5	8" Tapping Sleeve and Valve	1	EACH	$2,500.00	$2,500.00
6	1" Dia. Tapping Saddle & Corporation Stop	1	EACH	$200.00	$200.00
7	1" Dia. Type K Copper Service Lead	20	LFT	$18.00	$360.00
8	1" Dia. Curb Stop & Box	1	EACH	$200.00	$200.00
9	Fire Hydrant Assembly	1	EACH	$2,500.00	$2,500.00
10	Connect to Existing Water Main	1	EACH	$800.00	$800.00
11	4' Dia. Sanitary Manhole including Casting	3	EACH	$2,000.00	$6,000.00
12	8" Dia. PVC SDR-35 Sanitary Sewer	296	LFT	$23.00	$6,808.00
13	6" Dia. PVC SDR-35 Sanitary Sewer Lead	126	LFT	$16.00	$2,016.00
14	Connect to Existing Sanitary Sewer Main	1	EACH	$600.00	$600.00
15	Electrical Service Allowance, including Transformer	1	LSUM	$15,000.00	$15,000.00
16	Gas Service Allowance	1	LSUM	$2,500.00	$2,500.00
17	Telephone Service Allowance	1	LSUM	$1,000.00	$1,000.00
18	Heavy Rip Rap on Geotextile Fabric	60	SYD	$25.00	$1,500.00
19	22A Aggregate Base	3,409	SYD	$5.00	$17,045.00
20	HMA Pavement (5 inches, 550 lbs/syd), Truck Areas	592	TON	$80.00	$47,360.00
21	HMA Pavement (3 inches, 330 lbs/syd), Parking Area	122	TON	$80.00	$9,760.00
22	8" Concrete Pavement, Reinforced	414	SYD	$42.00	$17,388.00
23	Sidewalk Ramp, ADA w/Metal Detectable Warning Plates	100	SFT	$6.00	$600.00
24	Pavement Markings	1	LSUM	$1,000.00	$1,000.00
25	Traffic Control and Signage	1	LSUM	$2,500.00	$2,500.00
26	Project Permits: MDEQ, NPDES, State Building Review	1	LSUM	$1,000.00	$1,000.00
27	Restoration 3" Topsoil & Hydroseeding	5,277	SYD	$3.00	$15,831.00
28	Standy Generator (150 kw)	1	EACH	$50,000.00	$50,000.00
				SUBTOTAL=	**$184,300.00**
				25% Contingency & Engineering =	**$46,100.00**
				TOTAL=	**$230,400.00**

Option 1: Extend Road Improvements to North Drive

1	Machine Grading, Modified	4	STA	$2,500.00	$10,000.00
2	22A Aggregate Base	1,072	SYD	$5.00	$5,360.00
3	HMA Pavement (5 inches, 550 lbs/syd), Truck Areas	283	TON	$80.00	$22,640.00
4	Restoration 3" Topsoil & Hydroseeding	1,334	SYD	$3.00	$4,002.00
				SUBTOTAL=	**$42,000.00**
				25% Contingency & Engineering =	**$10,500.00**
				TOTAL=	**$52,500.00**

Boyne City DPW Maintenance Garage (20,000 SF) North Boyne Site
Cost Opinion

Architectural		
Demolition: 4000 SF x 4.00 =	$ 16,000	
Excavation: 20,000 SF x 0.50 =	$ 10,000	
Concrete – Strip Footings: 600 LF x 35.00 =	$ 21,000	
500 LF x 24.00 =	$ 12,000	
Spread Footings: 22 x 600.00 =	$ 13,200	
10 x 300.00 =	$ 3,000	
Foundation Walls: 600 LF x 150.00 =	$ 90,000	
Floor Slab: 20,000 x 7.00 =	$ 140,000	
Foundation Dampproofing: 600 LF x 8.00 =	$ 4,800	
Pre-engineered Structure: 20,000 SF x 15.00 =	$ 300,000	
Roofing: 20,000 SF x 5.00 =	$ 100,000	
Exterior Walls: 600 LF x 20' x 10.00 =	$ 120,000	
Windows & Doors: 2,000 SF x 50.00 =	$ 100,000	
Gutters & Downspouts: 600 LF x 6.00 =	$ 3,600	
Interior Masonry Walls: 500 LF x 21' x 12.00 =	$ 126,000	
Interior Doors & Hardware: 17 x 800.00 =	$ 13,600	
Toilet Partitions & Hardware: 6 x 1000.00 =	$ 6,000	
Lockers: 20 x 500.00 =	$ 10,000	
Flooring: 18,750 SF x 0.25 =	$ 4,700	
1,250 SF x 4.00 =	$ 5,000	
Ceilings: 1,250 SF x 4.00 =	$ 5,000	
Millwork: 20 LF x $500.00 =	$ 10,000	
Architectural Subtotal:		$1,113,900 1. ($55.70/SF)
Mechanical & Electrical		
HVAC: 1,250 SF x 20.00 =	$ 25,000	
18,750 SF x 8.00 =	$ 150,000	
Plumbing: 30 fixtures x $2500.00 =	$ 75,000	
Fire Protection: 20,000 SF x 3.00 =	$ 60,000	
Electrical: 1,250 SF x 8.00 =	$ 10,000	
18,750 SF x 5.00 =	$ 93,800	
Lighting: 1,250 SF x 8.00 =	$ 10,000	
18,750 SF x 5.00 =	$ 93,800	
Mechanical & Electrical Subtotal:		$ 517,600 ($25.88/SF)
Total Construction Costs:		$1,631,500 ($81.58/SF)
FF&E: 20,000 SF x 15.00 =		$ 300,000
Soft Costs		
10% Design Contingency:	$ 163,200	
5% Owner Costs:	$ 81,600	
A/E Fee:	$ 125,700	
Soft Costs Subtotal:		$ 370,500 ($18.53/SF)
Total Project Costs:		**$2,302,000** **($115.10/SF)**

NARRATIVE DESCRIPTION- WWTP SITE

Site Description

The WWTP site is located on City property at the east end of Main St., directly north of the airport. Currently, there are no DPW facilities at the WWTP site. There were numerous layouts evaluated for trying to fit the new DPW facilities on this site. However, the existing site size and other site limitations severely restrict the available usable site area, which resulted in the development of only a couple feasible options. The layout the City chose to proceed with for further evaluation and cost estimating is shown on the attached drawing. A new DPW maintenance building would be constructed as an addition at the north end of the existing WWTP maintenance building. DPW office/break/locker room facilities would be constructed as an addition to the existing WWTP Administration building to provide combined facilities for the DPW and Water/Wastewater Departments.

Access to the site is via Main Street, which is in fair condition; however it would require a significant amount of work to be upgraded to an all season road required for DPW truck access.

Existing infrastructure has already been constructed within the WWTP site, including: 3-phase electrical, gravity sanitary sewer, large diameter water main, storm sewer and natural gas and telephone utilities. Based on elevations of the proposed site, a sanitary sewer pump station and force main would be required to connect the new DPW facility back to the main pump station. In addition, a significant length of electrical service would be required from the proposed site to the existing blower building. Relocation/reconstruction of some existing sewer, gas and electric utilities would be required to accommodate the new facilities.

The site topography is challenging, with steep slopes on the northerly side along the bluff which drops off to wetlands and the Boyne River. The steep embankment also has groundwater seepage areas, which could cause significant construction challenges if the slope is disturbed. The construction would require a significant amount of imported fill material in order to connect to the existing WWTP Maintenance Garage and to have acceptable pavement slopes. The construction would require a significant length concrete retaining wall in the northwest corner, where the proposed building would be closest to the existing bluff. There would be significant tree removals outside of the existing WWTP fence line, which would have to have several hundred feet relocated for the new building. Existing soils are moderately acceptable; some removals would be required under the building site. Stability of the existing steep slope may be an issue, and a thorough geotechnical analysis would be required as a part of the design for this site.

The impact on the public would be moderate. The City WWTP trucks (mainly pickups) currently use Main Street; however the truck traffic would be significantly increased with the DPW trucks, which is through the existing residential area along E. Main Street. In order to fit the future salt/sand barn and compost/yard waste areas on this site, a low area with poor soils and seasonal high water table would need to be developed. The construction would include a significant amount of grading and soil stabilization as well as the relocation of the existing sanitary force main and outfall sewer crossing the site.

Assumptions

1. 5" HMA pavement for truck traffic areas.
2. 8" reinforced concrete pads for building approaches.
3. Main Street Improvements: Costs are based upon the City Street Inventory Database for Main St. from Boyne Ave. to the WWTP service drive; they include a 26' HMA roadway with no curb and gutter and no improvements to sanitary sewer, water main or sidewalks.
4. DPW offices, break room and locker rooms would be located in an addition to the existing WWTP Administration Building. The building addition would be of similar brick construction and would require modifications/additions to the building HVAC, plumbing and electrical systems. A conceptual floor plan of a combined building is attached.
5. The DPW Maintenance Building would be a pre-engineered metal building with cast in place concrete slab on grade, foundation walls and side walls up to 3 feet above grade. This building would be an addition to the WWTP Maintenance Building.
6. Building insulation, heating, fire suppression and ventilation systems.
7. Wash bay
8. Repair bays with hydraulic lifts.
9. Oil water separator.

Not Included in the preliminary cost opinions

1. Salt/Sand Barn: Building, site utilities, access drives, etc. (80'x80' barn shown for site reference). Site development costs for removing and replacing unsuitable soils are shown as an additional cost.
2. Vactor Truck dewatering structure: (future $75,000 cost, if desired).
3. Compost area or site improvements. Site development costs for removing and replacing unsuitable soils are shown as an additional cost.
4. Fuel Apparatus: pumps, tanks, etc.
5. Site Lighting: Only building-mounted wall packs.

Landscaping: (site grading and hydroseeding are included).

DESIGNED BY: JEH | APPROVED BY: LMF
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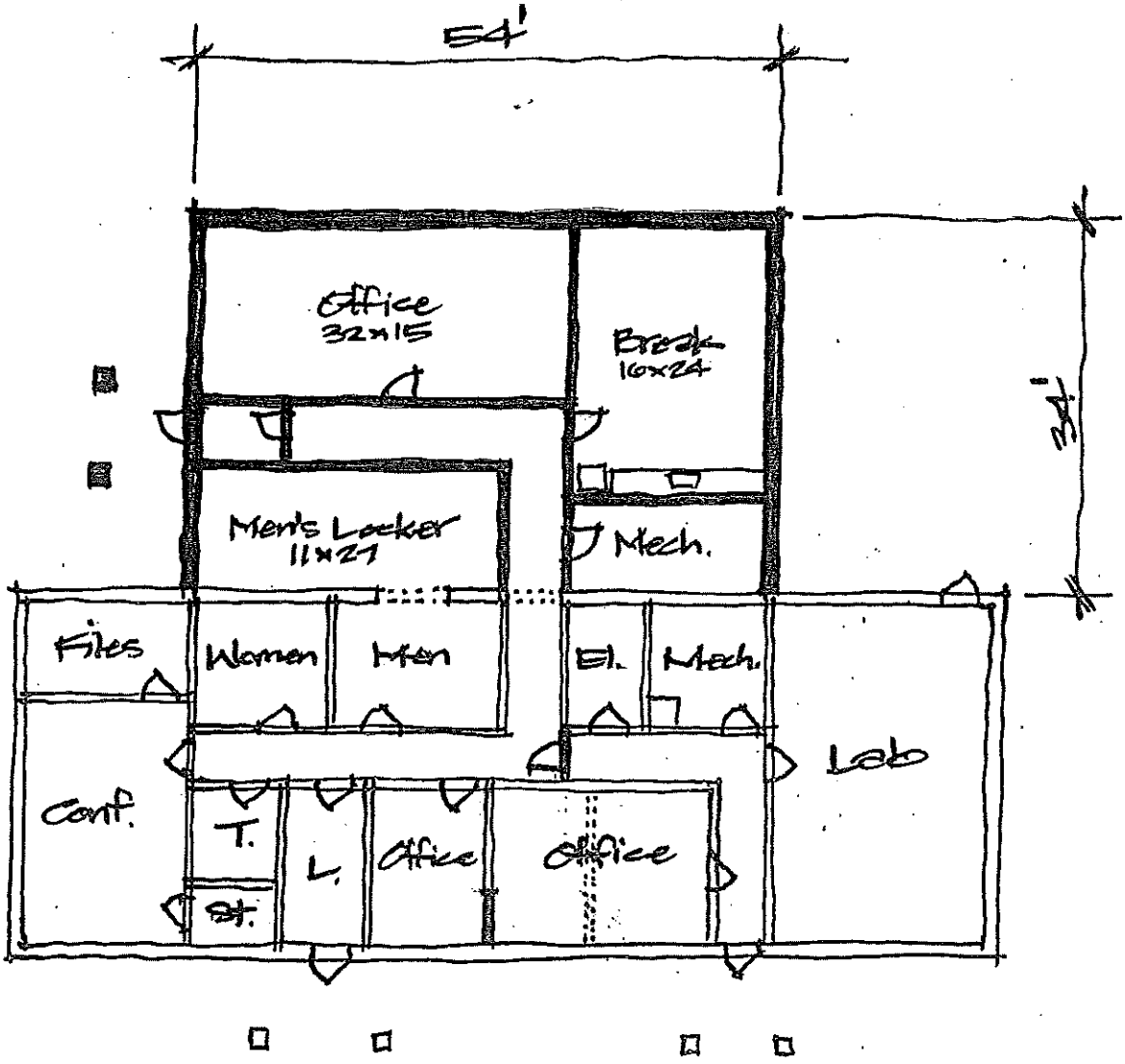
WE RECYCLE

SHEET 2 of 2	OPTION 2 WWTP & AIRPORT SITE	CITY OF BOYNE CITY DPW FACILITY FEASABILITY STUDY CHARLEVOIX COUNTY, MICHIGAN	725 Preston Street Lansing, MI 48906 • 517.371.1200 123 West Main Street, Suite 200 Gaylord, MI 49735 • 989.705.8101 648 Monroe Avenue NW, Suite 210 Grand Rapids, MI 49503 • 616.454.9414 1211 Ludington Street Escanaba, MI 49829 • 906.233.8360 C2AE WWW.C2AE.COM

JAN. 2011 | JOB. # NA | SCALE: 1"=50'

STUDY PHASE



FLOOR PLAN

OPTION 'A' 1836 SF

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123 West Main Street
Suite 200
Gaylord, MI 49735
P: 989.732.8131
F: 989.732.2714
info@c2ae.com
www.c2ae.com

CITY OF BOYNE CITY
DPW Facility Feasibility Study
Final Opinion of Probable Construction Costs - WWTP Site

Site Improvements

Item #	ITEM DESCRIPTION	Estimated Quantity	Item Unit	Unit Price	Total Price
1	Remove & Relocate Fence	400	LFT	$25.00	$10,000.00
2	Remove & Replace HMA (4") & Agg. Base for Utility Trenches	1	LSUM	$35,250.00	$35,250.00
3	Miscellaneous Utility Conflicts	10	EACH	$2,000.00	$20,000.00
4	Clearing	0.78	ACRE	$10,000.00	$7,800.00
5	Site Earthwork & Grading	1	LSUM	$64,000.00	$64,000.00
6	6" PVC DR-18 Water Main	150	LFT	$25.00	$3,750.00
7	6" Dia. Gate Valve	2	EACH	$750.00	$1,500.00
8	Fire Hydrant Assembly	1	EACH	$2,500.00	$2,500.00
9	Connect to Existing Water Main	1	EACH	$800.00	$800.00
10	6" Dia. PVC SDR-35 Sanitary Sewer Lead	20	LFT	$16.00	$320.00
11	Connect to Existing Sanitary Sewer Main	1	EACH	$1,000.00	$1,000.00
12	Sanitary Pump Station & Concrete Wet Well	1	LSUM	$60,000.00	$60,000.00
13	Sanitary Sewer Force Main, 4"	860	LFT	$22.00	$18,920.00
14	Electrical Service Allowance, including Transformer	1	LSUM	$20,000.00	$20,000.00
15	Gas Service Allowance	1	LSUM	$3,500.00	$3,500.00
16	Telephone Service Allowance	1	LSUM	$1,000.00	$1,000.00
17	Heavy Rip Rap on Geotextile Fabric	100	SYD	$25.00	$2,500.00
18	22A Aggregate Base	2,082	SYD	$5.00	$10,410.00
19	HMA Pavement (5 inches, 550 lbs/syd), Truck Areas	184	TON	$80.00	$14,720.00
20	HMA Pavement (3 inches, 330 lbs/syd), Parking Area	103	TON	$80.00	$8,240.00
21	4" Concrete Sidewalk	900	SFT	$3.00	$2,700.00
22	8" Concrete Pavement, Reinforced	728	SYD	$42.00	$30,576.00
23	Poured Concrete Retaining Wall (12' high, 200' long, 42" rail)	200	LFT	$400.00	$80,000.00
24	Sidewalk Ramp, ADA w/Metal Detectable Warning Plates	60	SFT	$6.00	$360.00
25	Pavement Markings	1	LSUM	$1,000.00	$1,000.00
26	Traffic Control and Signage	1	LSUM	$2,500.00	$2,500.00
27	Project Permits: MDEQ, NPDES, State Building Review	1	LSUM	$1,000.00	$1,000.00
28	Soil Erosion & Sedimentation Control Allowance	1	LSUM	$2,500.00	$2,500.00
29	Restoration 3" Topsoil & Hydroseeding	3,775	SYD	$3.00	$11,325.00
30	Standy Generator (150 kw)	1	EACH	$50,000.00	$50,000.00
				SUBTOTAL=	**$468,200.00**
				25% Contingency & Engineering =	**$117,100.00**
				TOTAL=	**$585,300.00**

Additional Cost Considerations

Main St. Improvements: M-75 to WWTP Drive

1	Main St. Improvements (Street Inventory, Typ. D)	3,414	LFT	$119.00	**$406,300.00**

Fill Low Area for Salt Storage and Compost Areas

1	Remove & Relocate Fence	720	LFT	$25.00	$18,000.00
2	Clearing	2.36	ACRE	$10,000.00	$23,600.00
3	Subgrade Undercutting , Type II (3', includes sand backfill)	11,422	CYD	$12.00	$137,064.00
4	Geotextile Stabilization	11,422	SYD	$1.50	$17,133.00
5	Sand Subbase (2')	7,615	CYD	$7.00	$53,305.00
6	Connect to Existing Sanitary Sewer Main	2	EACH	$1,000.00	$2,000.00
7	Relocate Existing Force Main & Outfall	1	LSUM	$25,000.00	$25,000.00
8	Soil Erosion & Sedimentation Control Allowance (additional)	1	LSUM	$1,000.00	$1,000.00
9	New Fence	164	LFT	$15.00	$2,460.00
				SUBTOTAL=	**$279,600.00**
				25% Contingency & Engineering =	**$69,900.00**
				TOTAL=	**$349,500.00**

Boyne City DPW Office Addition
To
The WWTP Office
Cost Opinion

Architectural		
Demolition: 500 SF x 6.00 =	$ 3,000	
Excavation: 2,000 SF x 1.50 =	$ 3,000	
Concrete – Strip Footings: 230 LF x 35.00 =	$ 8,100	
Spread Footings: 2 x 300.00 =	$ 600	
Foundation Walls: 125 LF x 80.00 =	$ 10,000	
Floor Slab: 1836 x 5.00 =	$ 9,200	
Foundation Dampproofing: 125 LF x 8.00 =	$ 1,000	
Roof Structure: 2100 SF x 1.12 x 8.00 =	$ 18,800	
Roof Overframing: 500 SF x 1.12 x 6.00 =	$ 3,400	
Roofing: 2900 SF x 4.00 =	$ 11,600	
Exterior Walls: 125 LF x 10' x 35.00 =	$ 43,800	
Entry Brick Piers: 2 x 10' x 4' x 35.00 =	$ 2,800	
Windows & Doors: 270 SF x 50.00 =	$ 13,500	
Fascias & Soffits: 500 SF x 15.00 =	$ 7,500	
Gutters & Downspouts: 200 LF x 6.00 =	$ 1,200	
Interior Walls: 110 LF x 11' x 12.00 =	$ 14,500	
Interior Doors & Hardware: 3 x 1000.00 =	$ 3,000	
Toilet Partitions & Hardware: 3 x 1000.00 =	$ 3,000	
Lockers: 18 x 500.00 =	$ 9,000	
Flooring: 1836 SF x 5.00 =	$ 9,200	
Ceilings: 1836 SF x 4.00 =	$ 7,300	
Millwork: 20 LF x $500.00 =	$ 10,000	
Architectural Subtotal:		$193,500 ($105.39/SF)
Mechanical & Electrical		
HVAC: 1836 SF x 18.00 =	$ 33,000	
Plumbing: 6 fixtures x $2500.00 =	$ 15,000	
Electrical: 1836 SF x 8.00 =	$ 14,700	
Lighting: 1836 SF x 8.00 =	$ 14,700	
Mechanical & Electrical Subtotal:		$ 77,400 ($42.16/SF)
Total Construction Costs:		$270,900 ($147.55/SF)
FF&E: 1836 SF x 15.00 =		$ 27,500
Soft Costs		
10% Design Contingency:	$ 27,100	
6% Owner Costs:	$ 16,300	
A/E Fee:	$ 26,000	
Soft Costs Subtotal:		$ 69,400 ($37.80/SF)
Total Project Costs:		**$367,800 ($200.33/SF)**

Boyne City DPW Maintenance Garage (19,000 SF) WWTP Site
Cost Opinion

Architectural		
Demolition: 4000 SF x 4.00 =	$ 16,000	
Excavation: 19,000 SF x 0.50 =	$ 9,500	
Concrete – Strip Footings: 600 LF x 35.00 =	$ 21,000	
400 LF x 24.00 =	$ 9,600	
Spread Footings: 22 x 600.00 =	$ 13,200	
10 x 300.00 =	$ 3,000	
Foundation Walls: 600 LF x 150.00 =	$ 90,000	
Floor Slab: 19,000 x 7.00 =	$ 133,000	
Foundation Dampproofing: 600 LF x 8.00 =	$ 4,800	
Pre-engineered Structure: 19,000 SF x 15.00 =	$ 285,000	
Roofing: 19,000 SF x 5.00 =	$ 95,000	
Exterior Walls: 600 LF x 20' x 10.00 =	$ 120,000	
Windows & Doors: 1600 SF x 50.00 =	$ 80,000	
Gutters & Downspouts: 600 LF x 6.00 =	$ 3,600	
Interior Masonry Walls: 400 LF x 21' x 12.00 =	$ 100,800	
Interior Doors & Hardware: 14 x 800.00 =	$ 11,200	
Toilet Partitions & Hardware: 1 x 1000.00 =	$ 1,000	
Lockers: 20 x 500.00 =	$ 10,000	
Flooring: 18,750 SF x 0.25 =	$ 4,700	
250 SF x 4.00 =	$ 1,000	
Ceilings: 250 SF x 4.00 =	$ 1,000	
Architectural Subtotal:		$1,013,400 ($53.34/SF)
Mechanical & Electrical		
HVAC: 250 SF x 20.00 =	$ 5,000	
18,750 SF x 8.00 =	$ 150,000	
Plumbing: 20 fixtures x $2500.00 =	$ 50,000	
Fire Protection: 19,000 SF x 3.00 =	$ 57,000	
Electrical: 250 SF x 8.00 =	$ 2,000	
18,750 SF x 5.00 =	$ 93,800	
Lighting: 250 SF x 8.00 =	$ 2,000	
18,750 SF x 5.00 =	$ 93,800	
Mechanical & Electrical Subtotal:		$ 453,600 ($23.87/SF)
Total Construction Costs:		$1,467,000 ($77.21/SF)
FF&E: 19,000 SF x 15.00 =		$ 285,000
Soft Costs		
10% Design Contingency:	$ 146,700	
5% Owner Costs:	$ 74,400	
A/E Fee:	$ 123,400	
Soft Costs Subtotal:		$ 344,500 ($18.13/SF)
Total Project Costs:		**$2,096,500 ($110.34/SF)**

APPENDIX

PRELIMINARY CONCEPTUAL PLANS

CITY OF BOYNE CITY
DWP FACILITY
FEASABILITY STUDY
CHARLEVOIX COUNTY, MICHIGAN

OPTION 1
NORTH BOYNE DPW SITE

c2ae

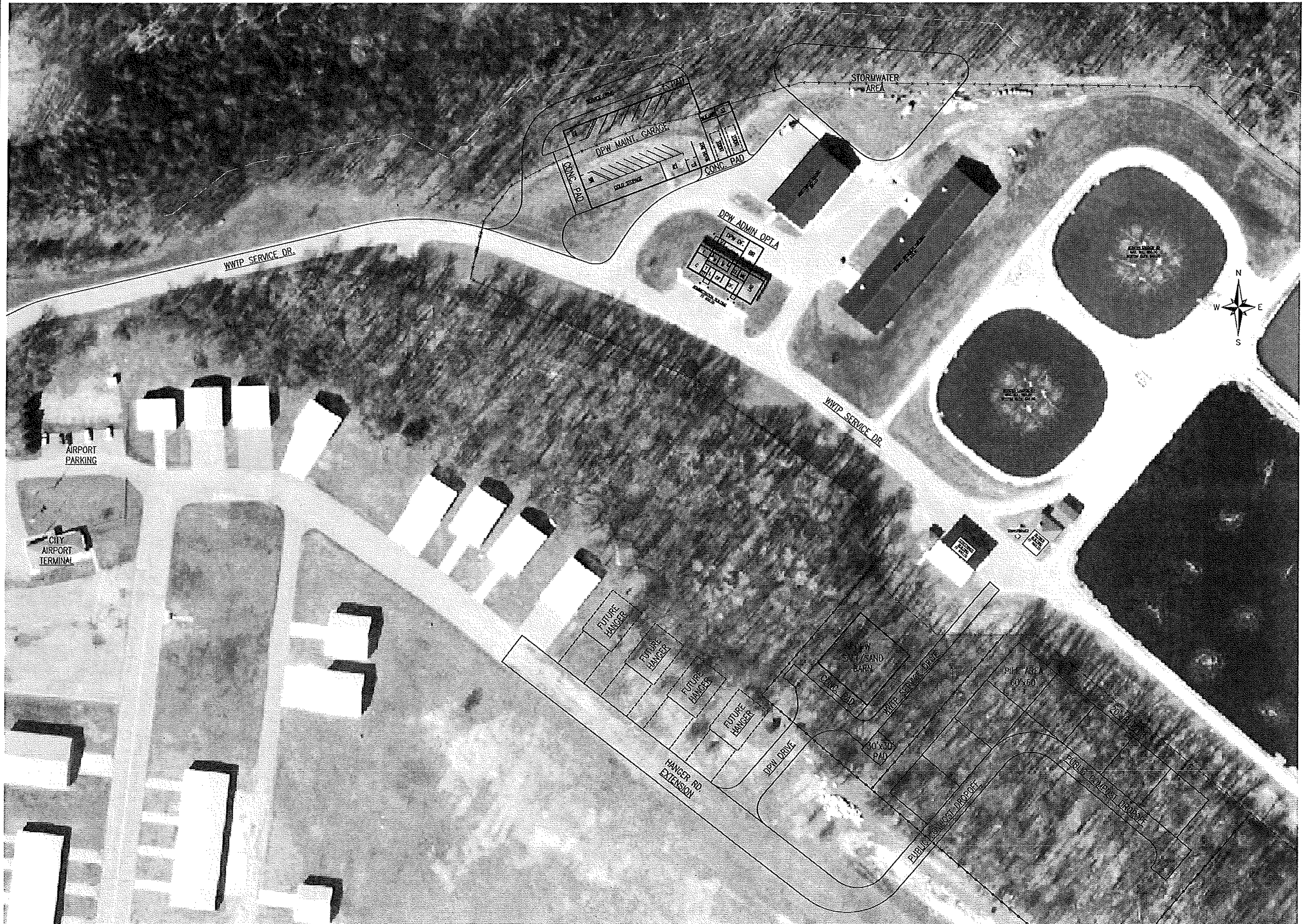
REVISIONS

SCALE: 1"=50'
JOB #: NA
DATE: JAN 2011

SHEET
1 of 4

STUDY PHASE

WE RECYCLE



CITY OF BOYNE CITY
DWP FACILITY
FEASABILITY STUDY
CHARLEVOIX COUNTY, MICHIGAN

OPTION 2
WWTP & AIRPORT SITE

c2ae

WWW.C2AE.COM

DATE	REVISIONS

SCALE: 1"=50'

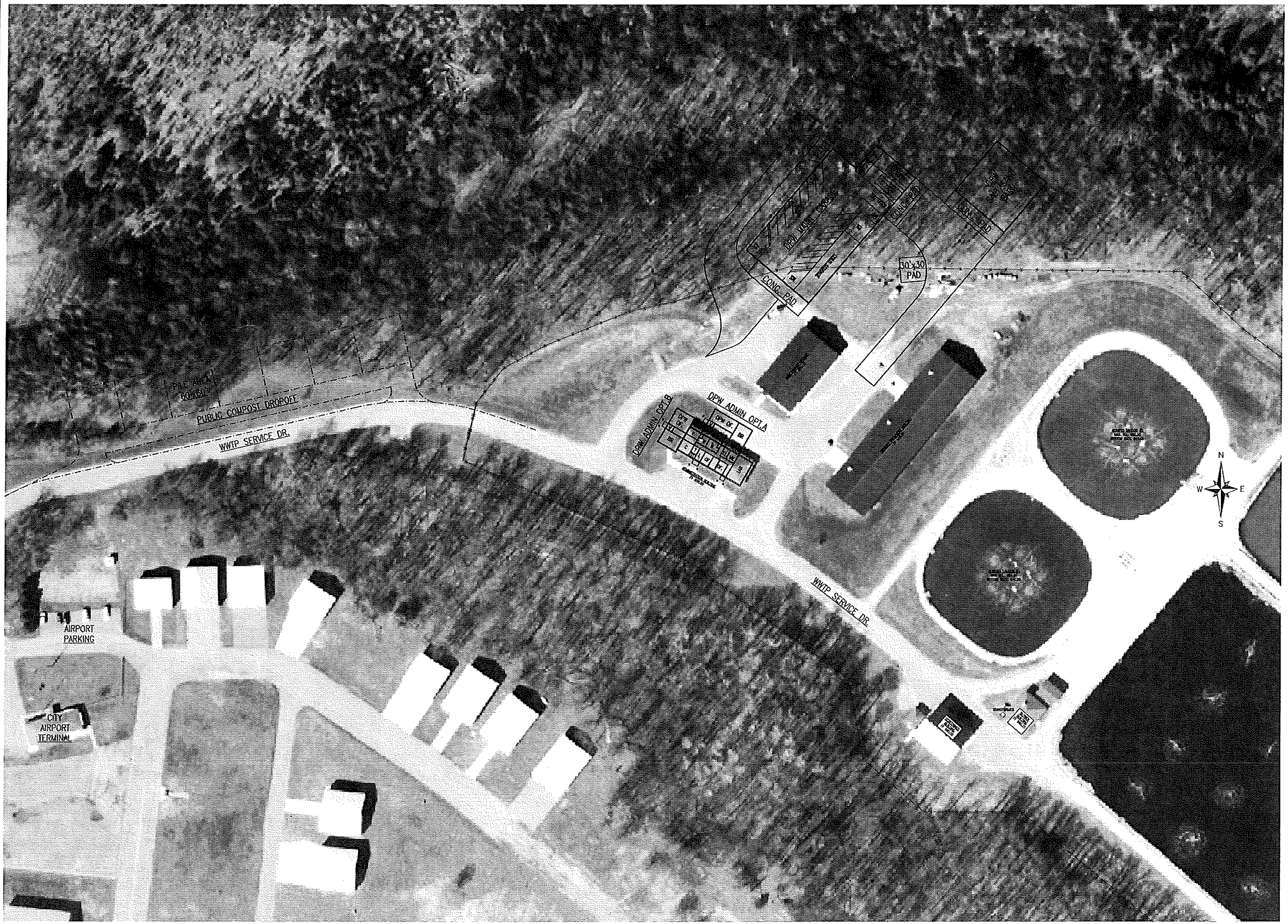
JOB #: NA

JAN. 2011

SHEET

2 of 2

STUDY PHASE



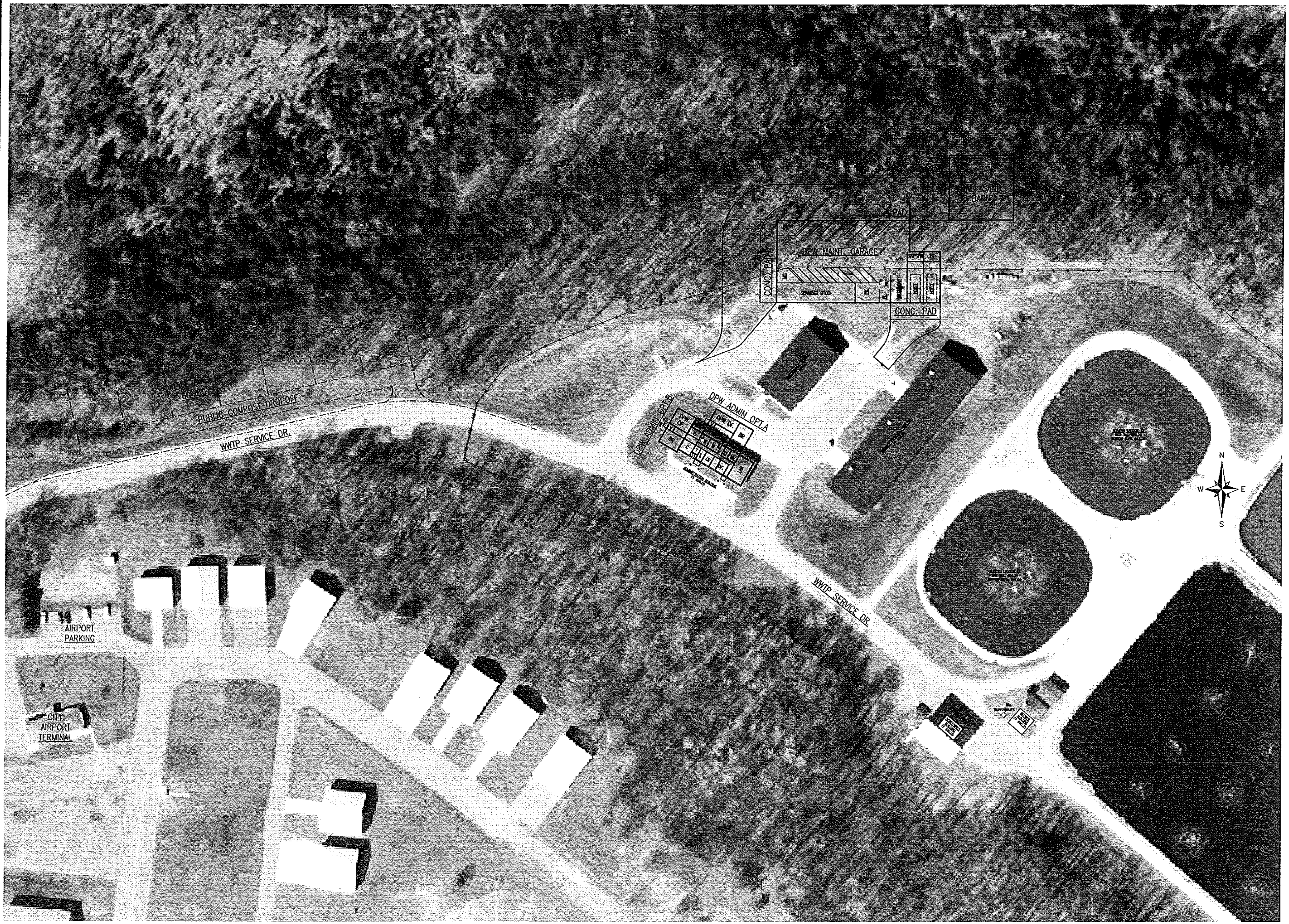
CITY OF BOYNE CITY
DWP FACILITY FEASABILITY STUDY
CHARLEVOIX COUNTY, MICHIGAN

OPTION 2A
WWTP SITE

REVISIONS

SCALE: 1"=50'
JOB #: NA
DATE: JAN. 2011
SHEET
2 of 4

STUDY PHASE



CITY OF BOYNE CITY
DWP FACILITY FEASABILITY STUDY
CHARLEVOIX COUNTY, MICHIGAN

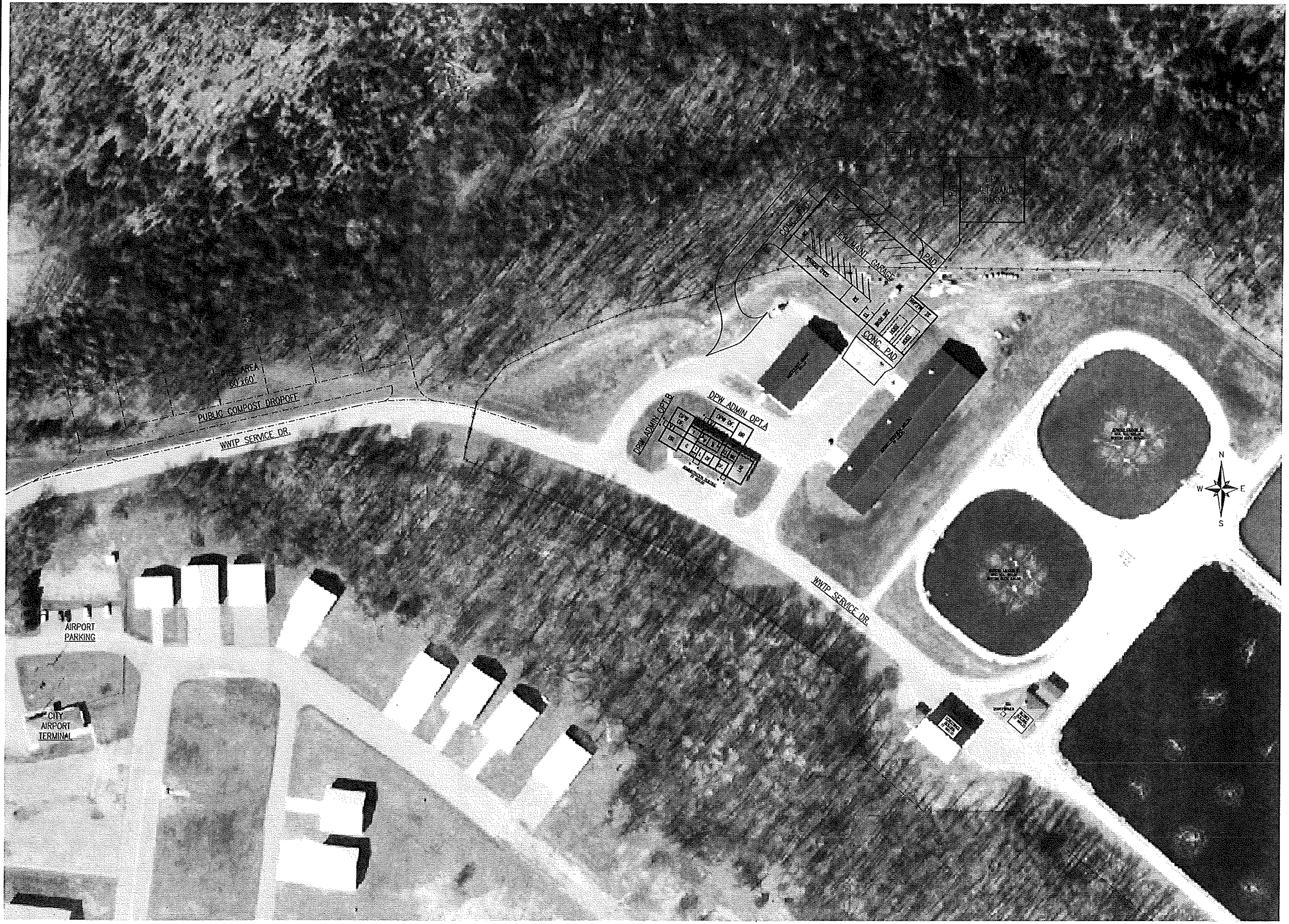
OPTION 2B WWTP SITE

REVISIONS

SCALE: 1"=50'
JOB #: NA
DATE: JAN 2011

SHEET
3 of 4

STUDY PHASE



CITY OF BOYNE CITY
DWP FACILITY FEASABILITY STUDY
CHARLEVOIX COUNTY, MICHIGAN

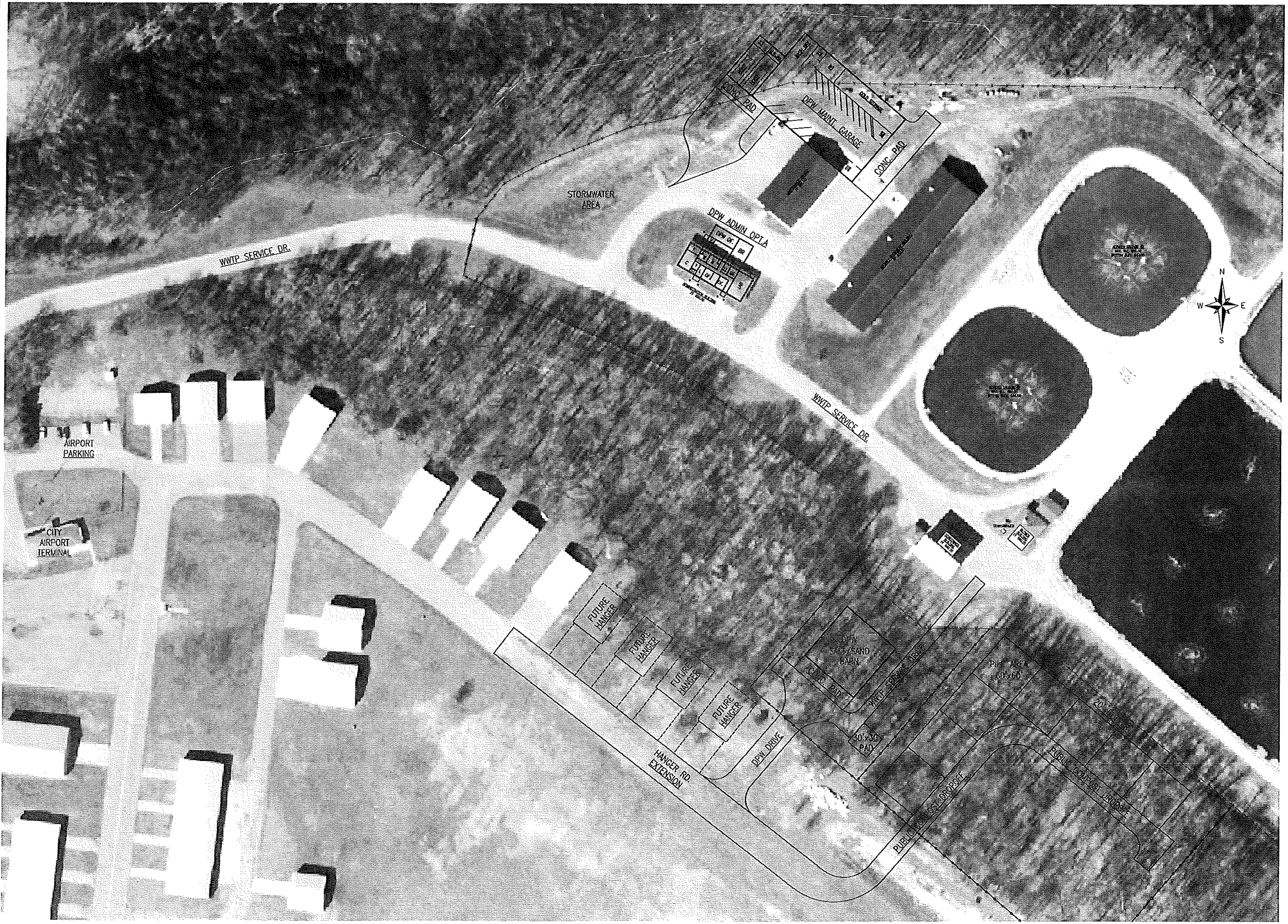
OPTION 2C
WWTP SITE

c2ae
WWW.C2AE.COM

REVISIONS

SCALE: 1"=50'
JOB #: NA
DATE: JAN. 2011
SHEET
4 of 4

STUDY PHASE



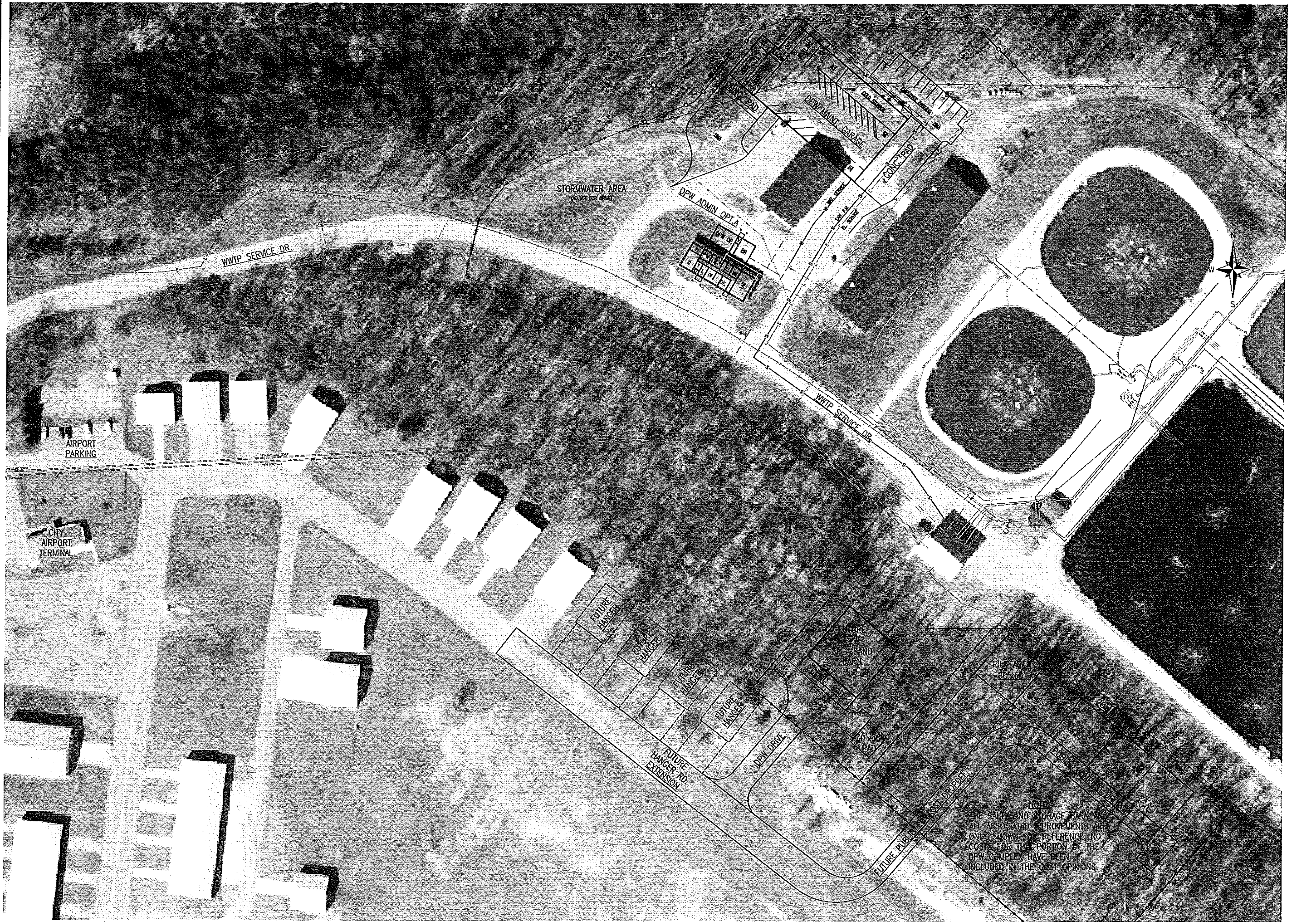
OPTION 2E
WWTP & AIRPORT SITE

CITY OF BOYNE CITY
DWP FACILITY
FEASABILITY STUDY
CHARLEVOIX COUNTY, MICHIGAN

c2ae
WWW.C2AE.COM

DATE	REVISIONS

SCALE: 1"=50'
JOB # NA
JAN 2011
SHEET
2 of 2
STUDY PHASE



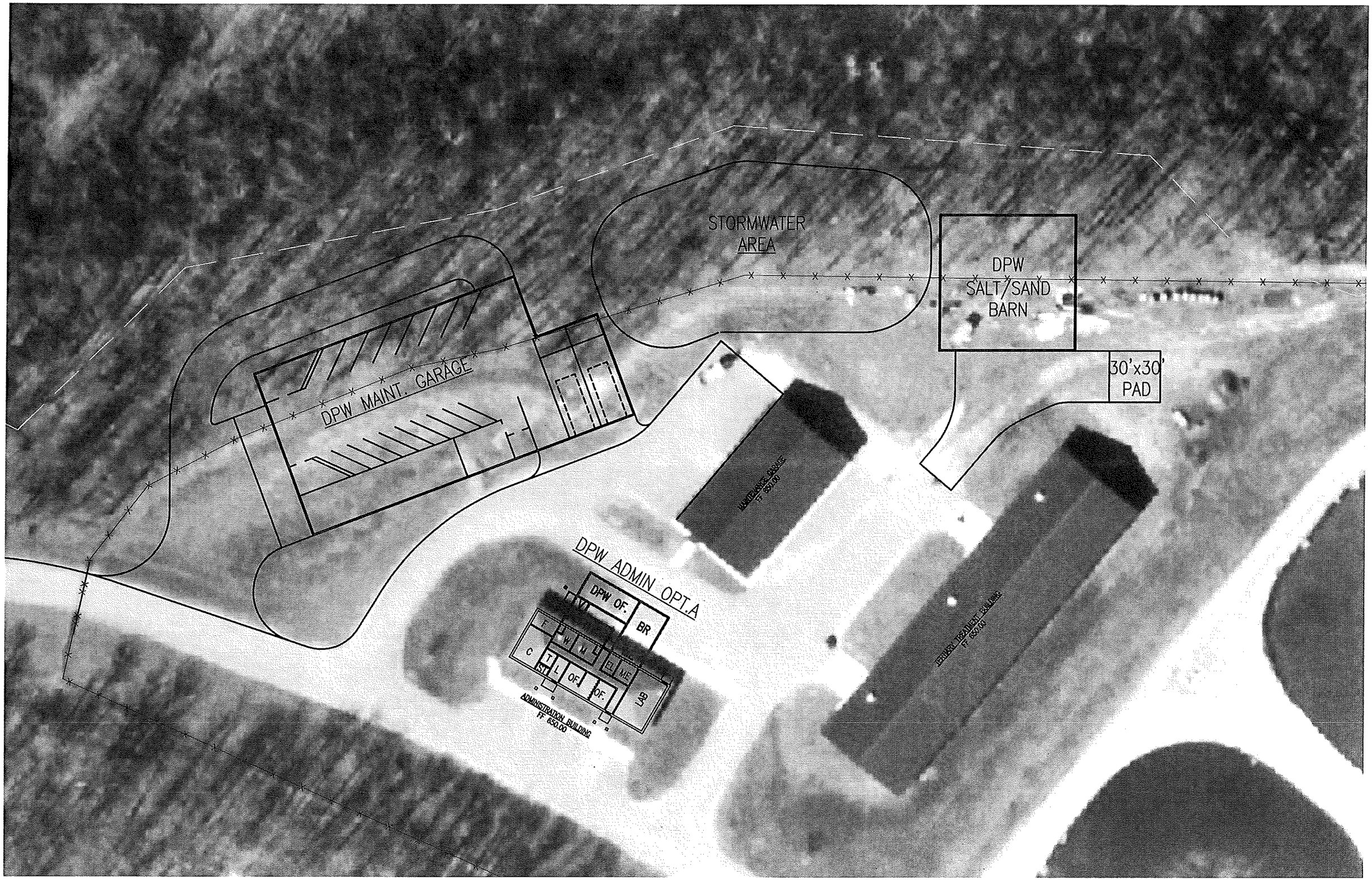
c2ae

CITY OF BOYNE CITY
DPW FACILITY FEASABILITY STUDY
CHARLEVOIX COUNTY, MICHIGAN

OPTION 2
WWTP & AIRPORT SITE

SCALE: 1"=50'
JOB #: NA
JAN 2011
SHEET 2 of 2

STUDY PHASE


STORMWATER
AREA
DPW
SALT/SAND
BARN
30'x30'
PAD
DPW MAINT. GARAGE
DPW ADMIN OPT.A
DPW OF.
BR
F
W
M
C
T
1ST
L
OF.
OF.
EL
ME
LAB
ADMINISTRATION BUILDING
FF: 650.00
MAINTENANCE GARAGE
FF: 651.00
WASTEWATER TREATMENT BUILDING
FF: 650.00

WE RECYCLE

STORMWATER AREA

WWTP SERVICE DR.

DPW ADMIN OFFICE

DPW MAINT. GARAGE

CONC. PAD

CONC. PAD

WWTP SERVICE DR.

AIRPORT PARKING

CITY AIRPORT TERMINAL

FUTURE HANGER

FUTURE HANGER

FUTURE HANGER

FUTURE HANGER

HANGER RD. EXTENSION

DPW DRIVE

DPW SALT/SAND BARN

PILE AREA 60'x60'

WWTP SERVICE DRIVE

30'x30' PAD

PUBLIC COMBINED SEWER

PUBLIC SANITARY SEWER PROPOSED

N

W

E

S

DESIGNED BY: JDF
DRAWN BY: AH
CHECKED BY: LMF
APPROVED BY: LMF
PLOTTED BY: [illegible]
CAD STANDARDS 0.0

CITY OF BOYNE CITY
DWP FACILITY
FEASABILITY STUDY
CHARLEVOIX COUNTY, MICHIGAN

OPTION 2F
WWTP & AIRPORT SITE

DATE	REVISIONS

SCALE: 1"=50'

JOB #: NA

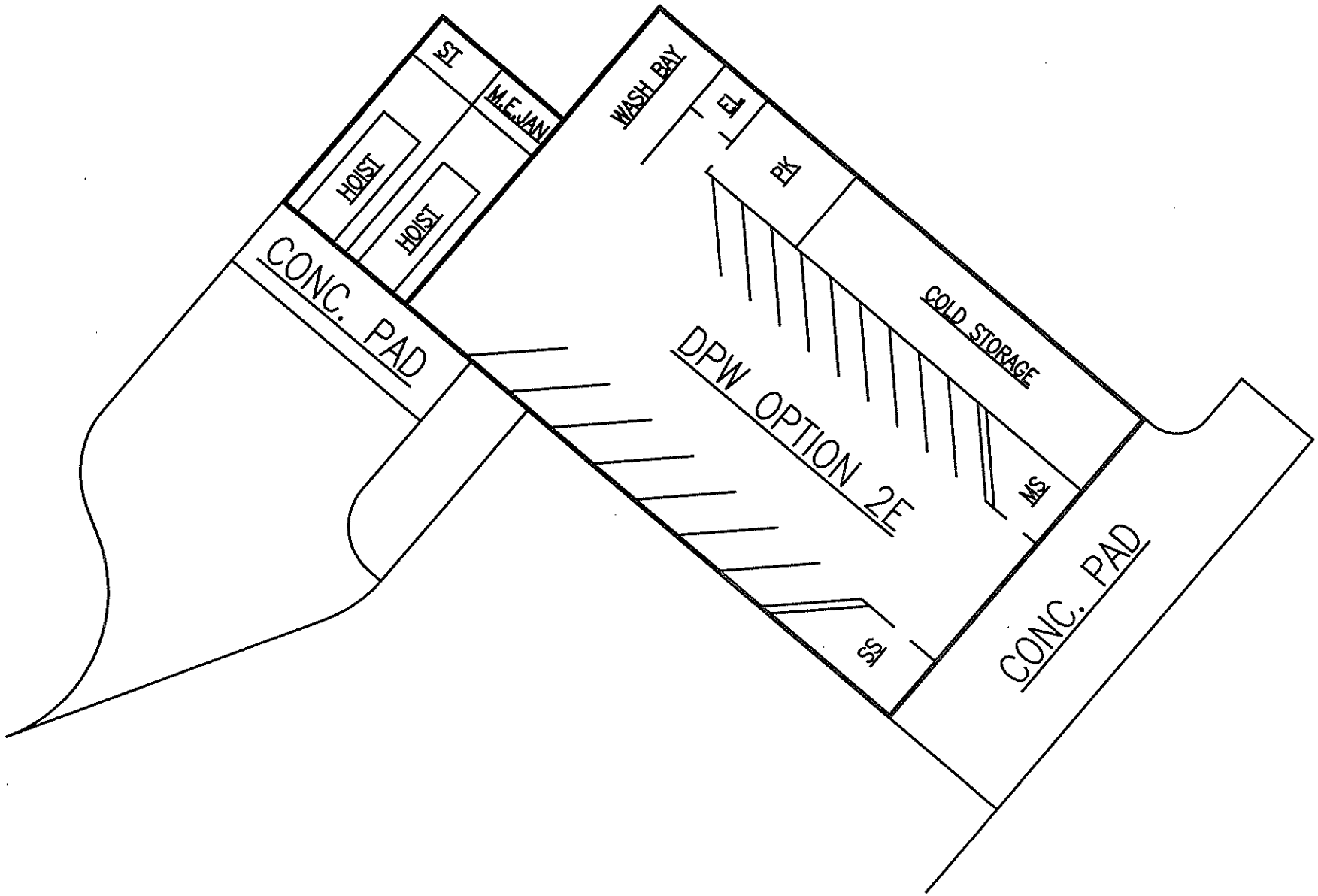
JAN 2011

SHEET

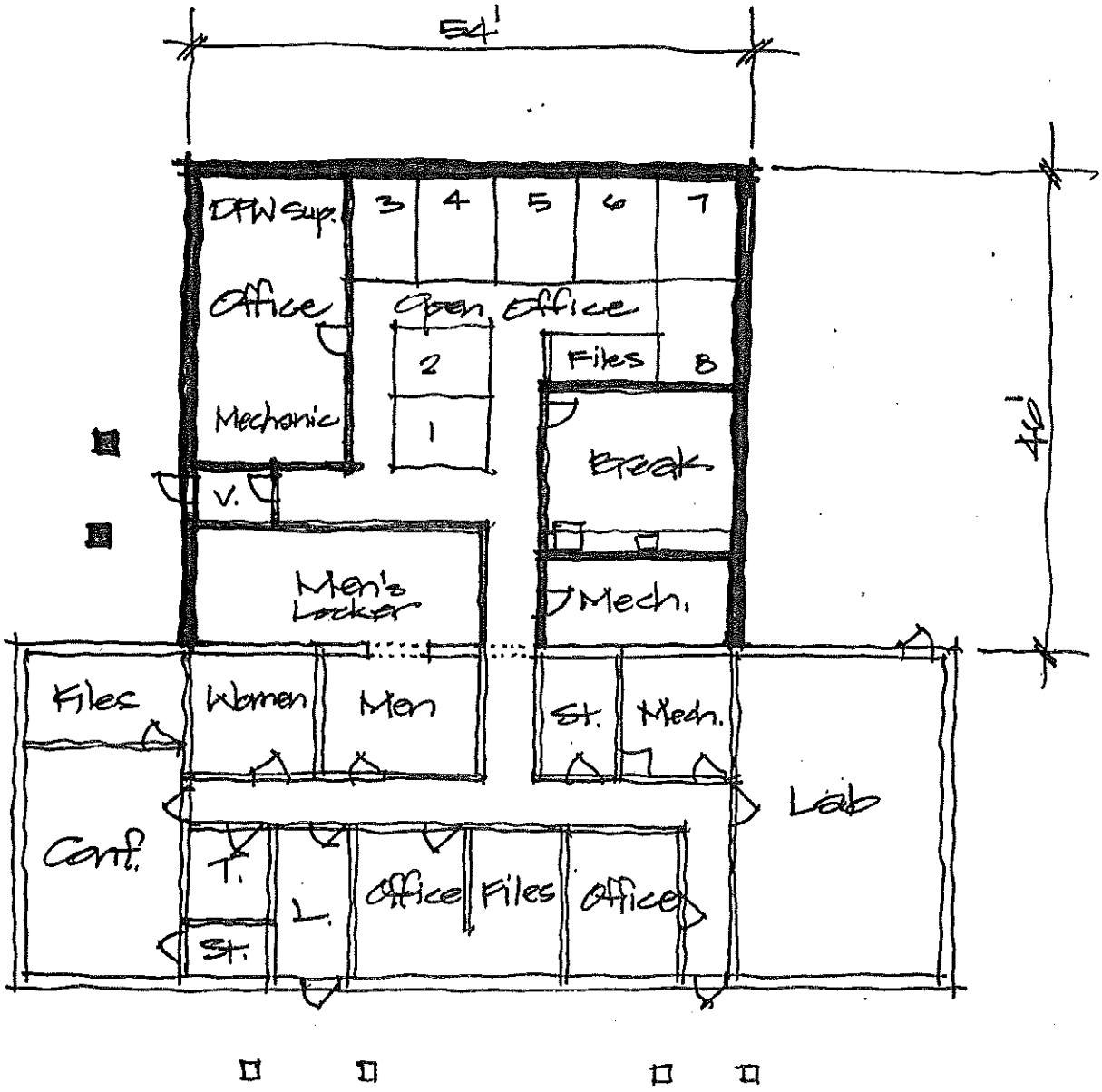
2 of 2

STUDY PHASE

c2ae
WWW.C2AE.COM

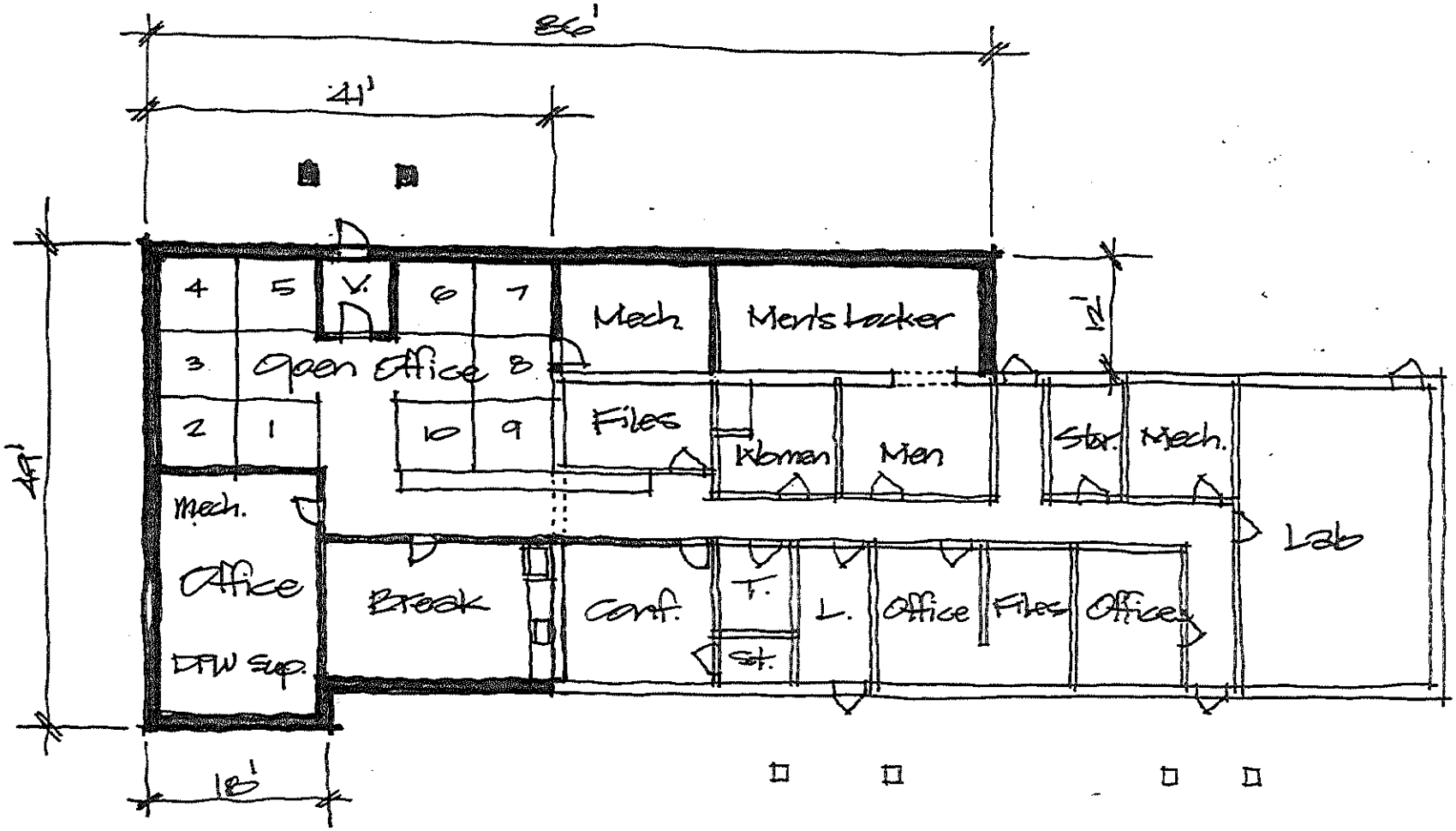

ST
M.E.JAN
HOIST
HOIST
CONC. PAD
WASH BAY
EL
PK
COLD STORAGE
DPW OPTION 2E
MS
SS
CONC. PAD

COLD STORAGE ACCESS
CONC. PAD
WASH BAY
MS
COLD STORAGE
DPW OPTION 2F
SS
EF
ER
M.E.JAN
ST
HOIST
HOIST
CONC. PAD



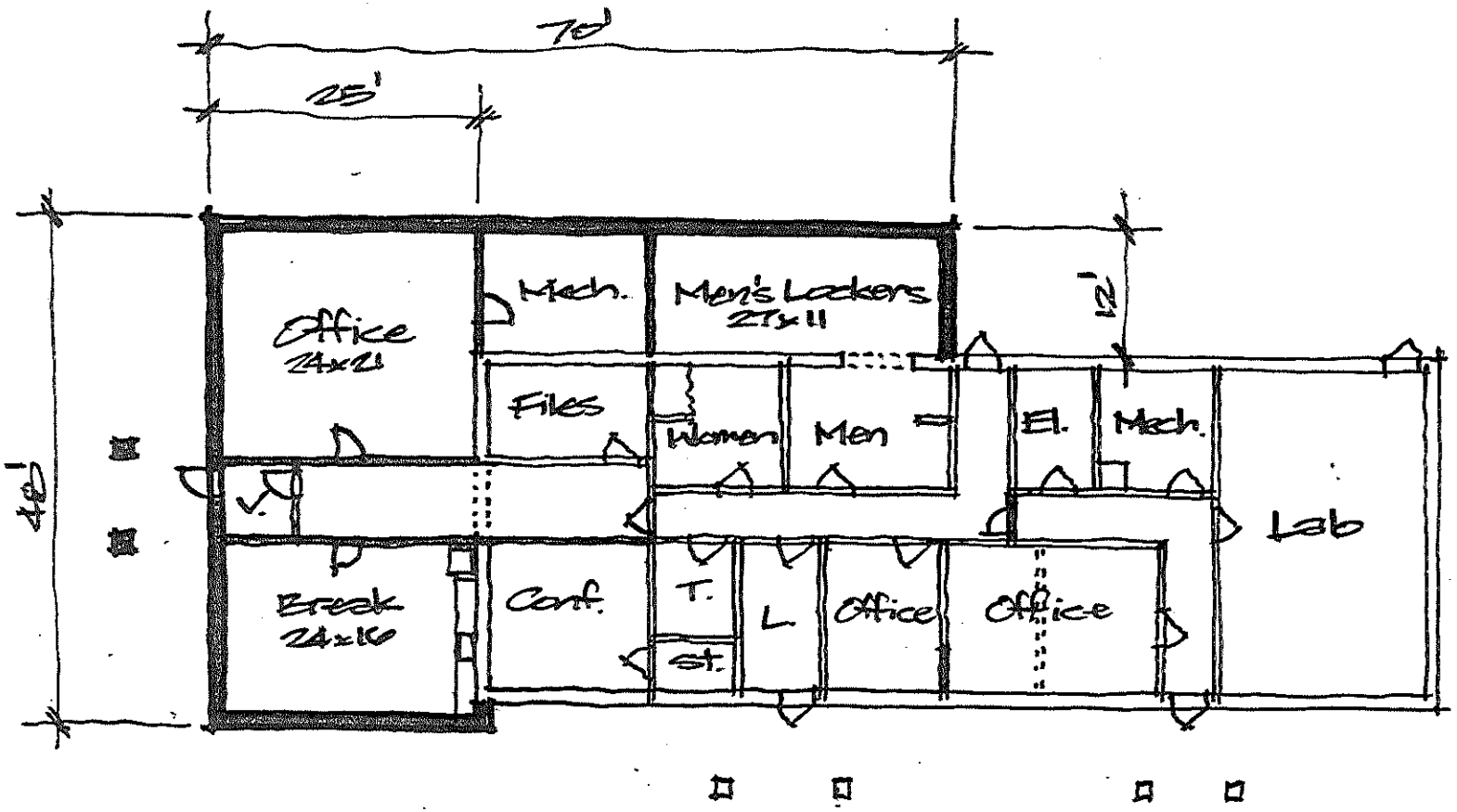
FLOOR PLAN

OPTION 'A' 2484 SF



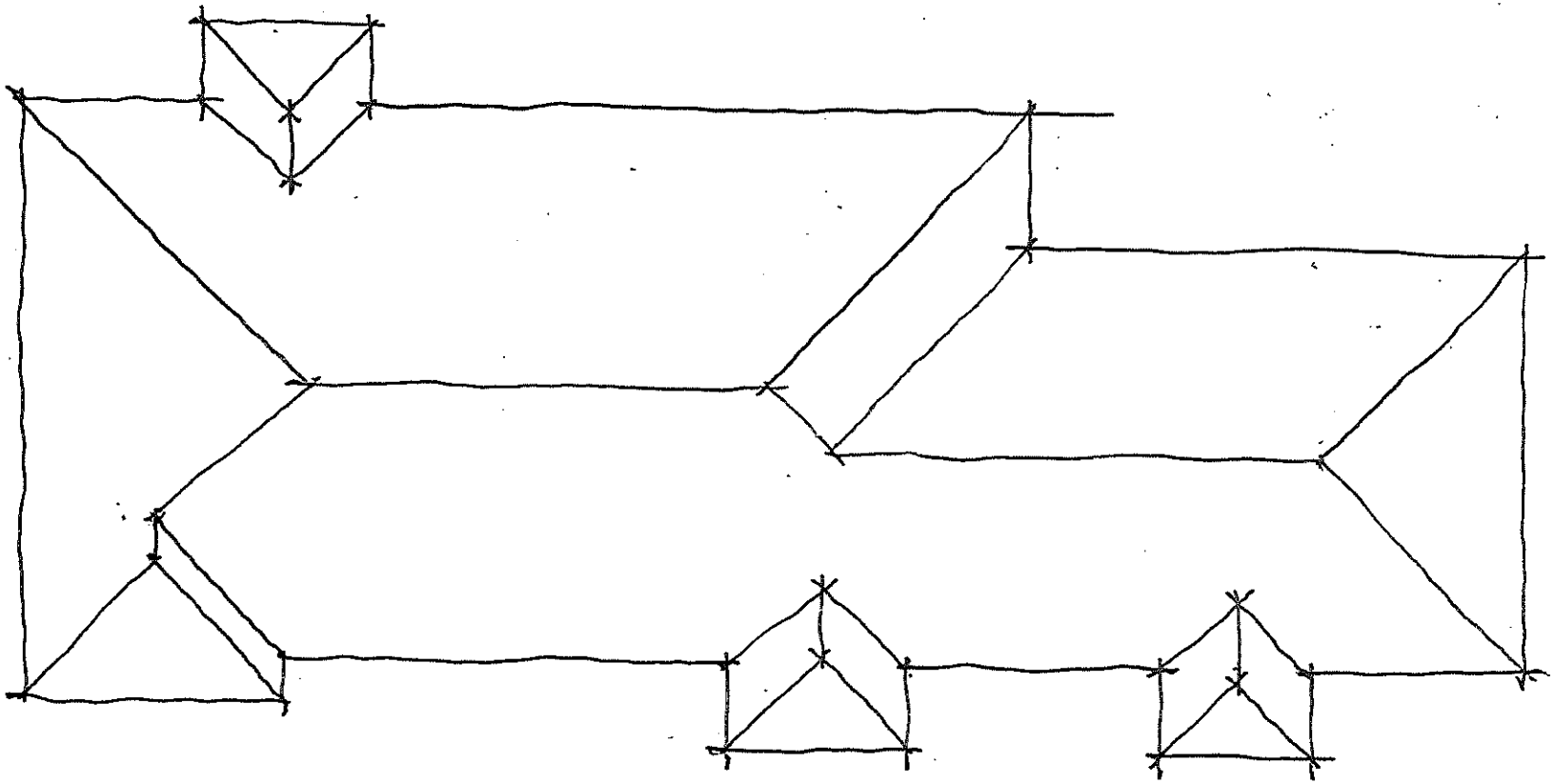
FLOOR PLAN

OPTION 'B' 2457 SF



FLOOR PLAN

OPTION 'B' 1742 SF



ROOF PLAN

OPTION 'B'