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WILBUR SMITH ASSOCIATES

CHARLESTON NAVAL ANNEX REUSE PLAN.

**CHARLESTON NAVAL COMPLEX
NORTH CHARLESTON, SOUTH CAROLINA**

Volume I

Prepared for:

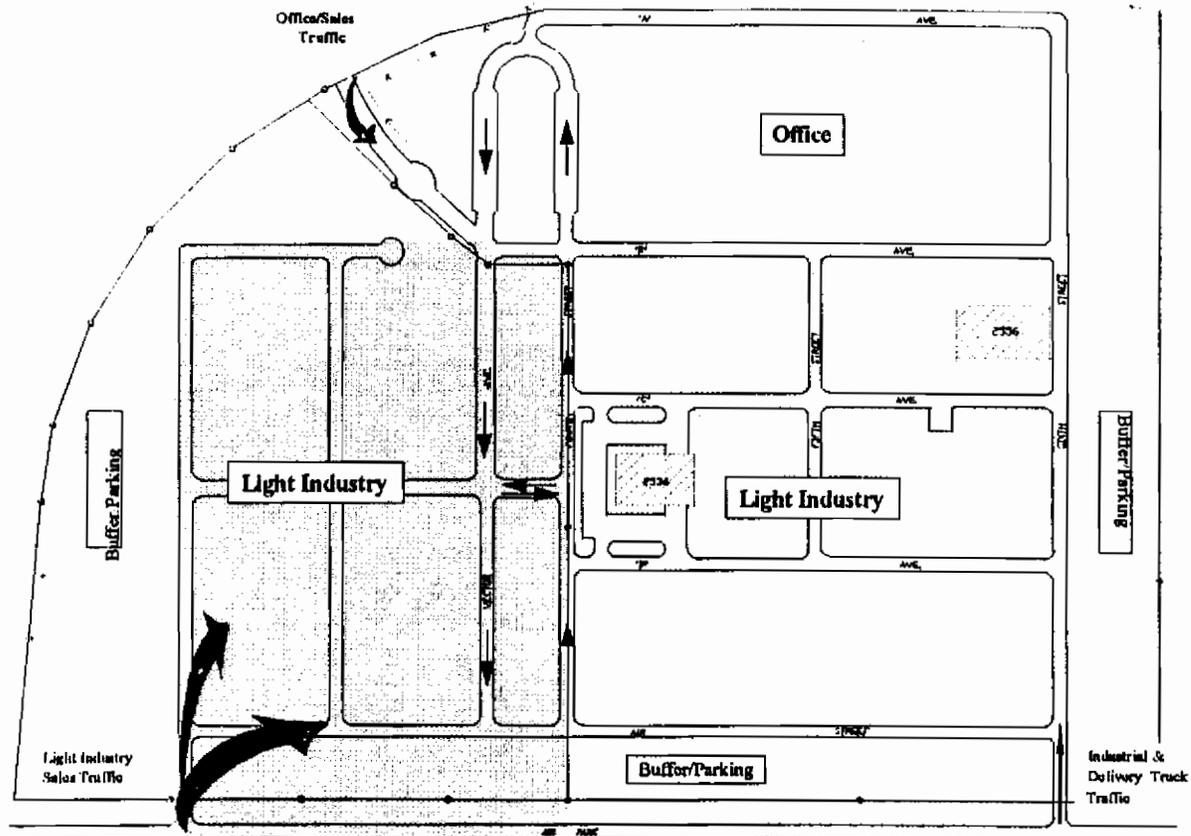
**Charleston Naval Complex
Redevelopment Authority
Charleston, South Carolina**

Prepared by:

**Wilbur Smith Associates
Columbia, South Carolina
and
The Brumley Company
Charleston, South Carolina**

February 1997

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This study was prepared under contract with the Charleston Naval Complex Redevelopment Authority with financial support from the Office of Economic Adjustment, Department of Defense. The content reflects the views of the Charleston Naval Complex Redevelopment Authority and does not necessarily reflect the views of the Office of Economic Adjustment.

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Section I INTRODUCTION

This report is prepared for the Charleston Naval Complex Redevelopment Authority (RDA) by Wilbur Smith Associates in conjunction with the Brumley Company. The objective of this study is to evaluate the Charleston Naval Station Annex property, as delineated in the map in Exhibit I, and to provide the RDA with an overall reuse concept plan. What should the RDA do with the property? Is it worth the RDA expending the resources to develop the property? Should the RDA be the ultimate developer? What is the highest and best use? What is the timing, and what are the factors which affect timing? We are confident that this report addresses these and many other questions.

It is important to note that although this report is not a final master plan but rather a development concept, the thought and planning that went into developing the report are at a master plan level. In other words, in order to anticipate the costs associated with developing the property, the level of detail at which the project was examined is close to the level of detail associated with a master plan.

UNIQUENESS OF THE PROPERTY

This exercise has been especially promising due to the uniqueness of the property. There really aren't any other similar properties in the Charleston Trident area which offer the market potential and the mix of development options:

- The size of the property (± 67 acres);
- Its location between the bedroom communities of N. Charleston;
- Its proximity to downtown Charleston and the Trident market area;
- Its accessibility to the airport, port, I-26 and the Mark Clark Expressway.

These are all features which make it a unique site. Understanding and appreciating this uniqueness is important to the exercise of determining what the development approach should be.

MIXED USE POTENTIAL

Location, Location, Location. This real estate adage has special meaning to this property. Aside from the fact that it is located on a major interstate, close to downtown Charleston in an area which is positioned for growth, the most critical factor is its location and access to markets; local, regional, national and global. This accessibility to a variety of markets will play a strong role in defining the profile of potential occupants/tenants. For example, its access to the Tri-County and coastal markets will make it attractive to companies who serve large metropolitan consumer

markets (household products and services). Access to a large metropolitan region makes it attractive to distribution and package handlers (UPS). Access to the southeastern and national markets via I-26, I-95, airport, etc., will make it attractive to industries interested in shipping to these markets.

The bottom line is, due to the location of the property, the potential tenant profile is wide in range and makes the site all the more viable for a multi-use development to include upscale office, distribution/warehousing, sales/service, light manufacturing and freight management.

TIMING ISSUES

The timing of the development of this property is contingent on several issues, two of which are critical. The first is the environmental cleanup which must be completed and approved by the State DHEC. Of course, this depends on when the cleanup actually begins, etc.

The second is the Centre Point Development. Centre Point is a large scale commercial retail development which is planned to open within 12 months. It is anticipated that Centre Point will attract a lot of activity to the area, hence increasing the speculative potential of property in the area, especially the Naval Station Annex due to its accessibility. It is important, from the standpoint of maximizing the financial potential of the project, to start marketing at the time when Centre Point activity is strongest, conceivably within 12-14 months from the time it opens. This is the time at which the speculative "frenzy" reaches its highest, conceivably forcing the market value of the area's property up.

INFORMATION RESOURCE

In addition to providing a development plan/concept, this report provides a rich source of information about the market, the economy and vitality of the area, and site specific characteristics and data.

The report is organized so as to follow a process of decision steps which the RDA must go through to make an informed decision:

- What is the highest and best use?
- What are the development costs for that use?
- What is the next step?

Section II

EXISTING PROPERTY OWNERSHIP AND USES

The objective of this section of the report is to define the existing property ownership and uses at the Charleston Naval Annex property. Based on property tax map information as well as information from the environmental baseline studies, performed by the Southern Division, the Charleston Naval Annex property, as delineated on the map in Exhibit I, is divided into three areas of ownership and/or uses:

- Air Force housing;
- Naval Annex; and
- Marine transfer.

Air Force Housing (Approximately 24 Acres) - The area coded as red on the map in Exhibit I is currently occupied by the United States Air Force. Based on an on-site survey and information in the environmental baseline survey, the Air Force is currently occupying this property for housing purposes.

Naval Annex Property (Approximately 38 Acres) - The area coded as blue on the map in Exhibit I is defined as the Naval Annex property which is currently unused and is being marketed as property for lease for industrial purposes. There is no evidence of occupancy on this property.

Marine Transfer Property (Approximately 5 Acres) - Based on information provided in the environmental baseline survey, as well as interviews, the area coded as green on the map in Exhibit I is occupied by the United States Marine Corps. Although the ultimate plan is for the property to be transferred to Marine ownership, this had not occurred at the printing of this report.

Zoning

Current zoning regulations are consistent with the uses proposed in this report.

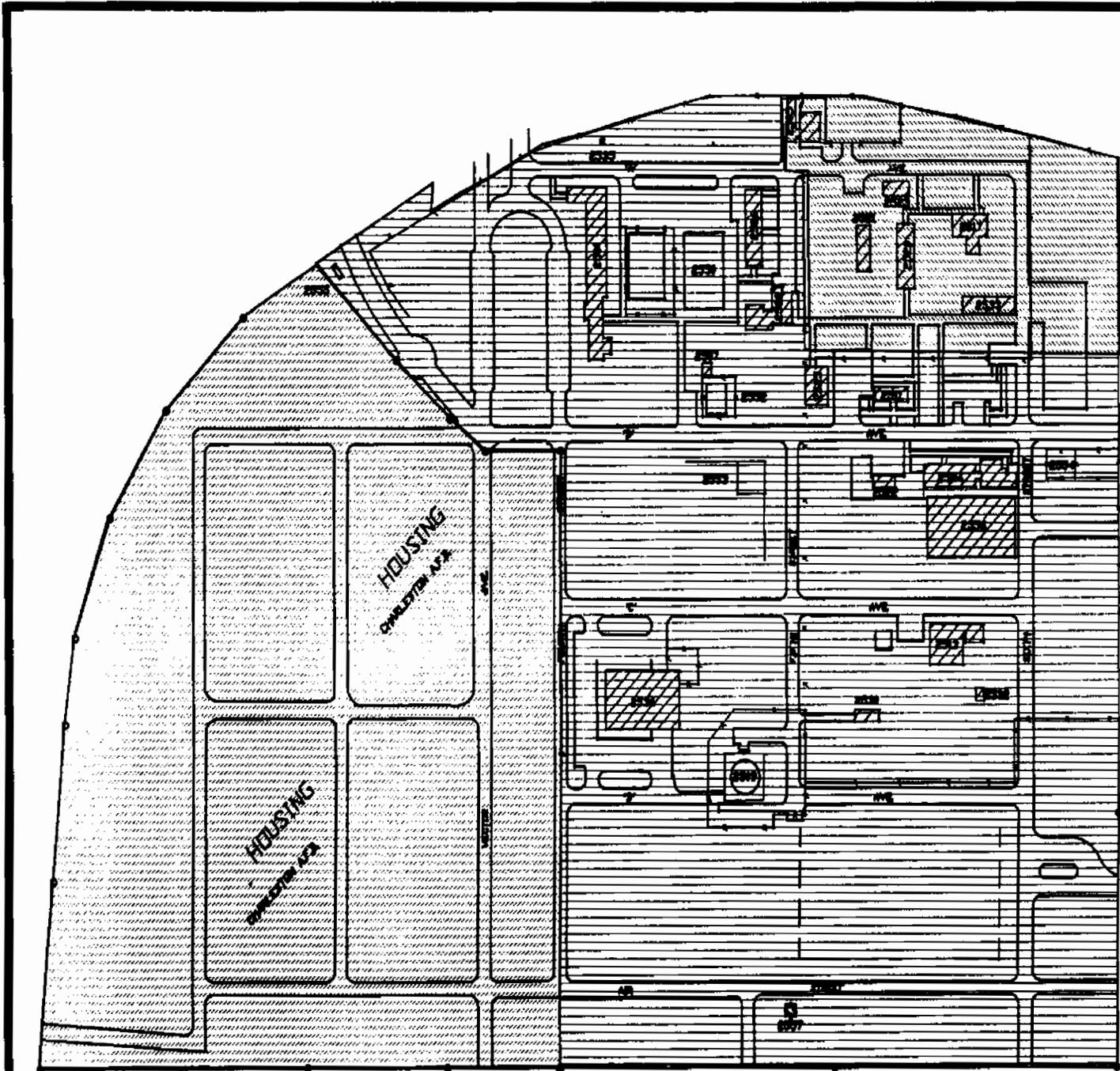


Exhibit I

**Existing
Property
Ownership**

Legend



Air Force
Housing



Naval
Annex



Marine
Transfer

(Not to Scale)



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Section III

PROPOSED DEVELOPMENT PLANS

As pointed out earlier, the property being investigated in this study are the Air Force housing property, the Naval Annex property, and the Marine transfer property. Based on evidence that both the Air Force and the Marine Corps may be willing to move, it is the scope of this study to investigate two development scenarios:

- **Development Scenario I** - which encompasses all three of these sites; and
- **Development Scenario II** - which encompasses the Naval Annex property only (Marine Corps and Air Force remain as is).

DEVELOPMENT SCENARIO I

Development Scenario I assumes that all three of these properties under the scope of this study, the Naval Annex property, the Air Force housing property and the Marine transfer property, will be available for development. From a real estate development market potential standpoint, this scenario maximizes the overall financial feasibility of developing the property. Under such a scenario a developer would potentially market the entire property together, tying and marketing all proposed uses into one single development plan. This is a clean approach in the sense that neither the Air Force housing or the Marine transfer property would stand in the way of a development plan.

Under development scenario I the consultant proposes three development zones as shown on the map in Exhibit II. These zones are unique in terms of the proposed use for each respective zone, outlined as follows.

Development Zone A (17 acres) - Zone A coded red on the map would be for office use. The interstate frontage gives the property and the proposed use prime interstate frontage and visibility and make the development extremely marketable. The property is accessible to the interstate giving sales staff, employees and customers access to the site at relative ease. An office use would provide the maximum potential for financial return since the rental rate per square foot is the highest for office (compared to industrial). An office use is also consistent with the market conditions in the area; there are a limited amount of office "parks" with prime interstate access along I-26 located in close proximity to downtown Charleston and the area's bedroom communities. Under this development scenario the existing facilities in the zone A would be demolished and removed from the property with the exception of the road network and the utilities infrastructure.

Exhibit II
Development
Scenario I
Maximum
Development
Potential

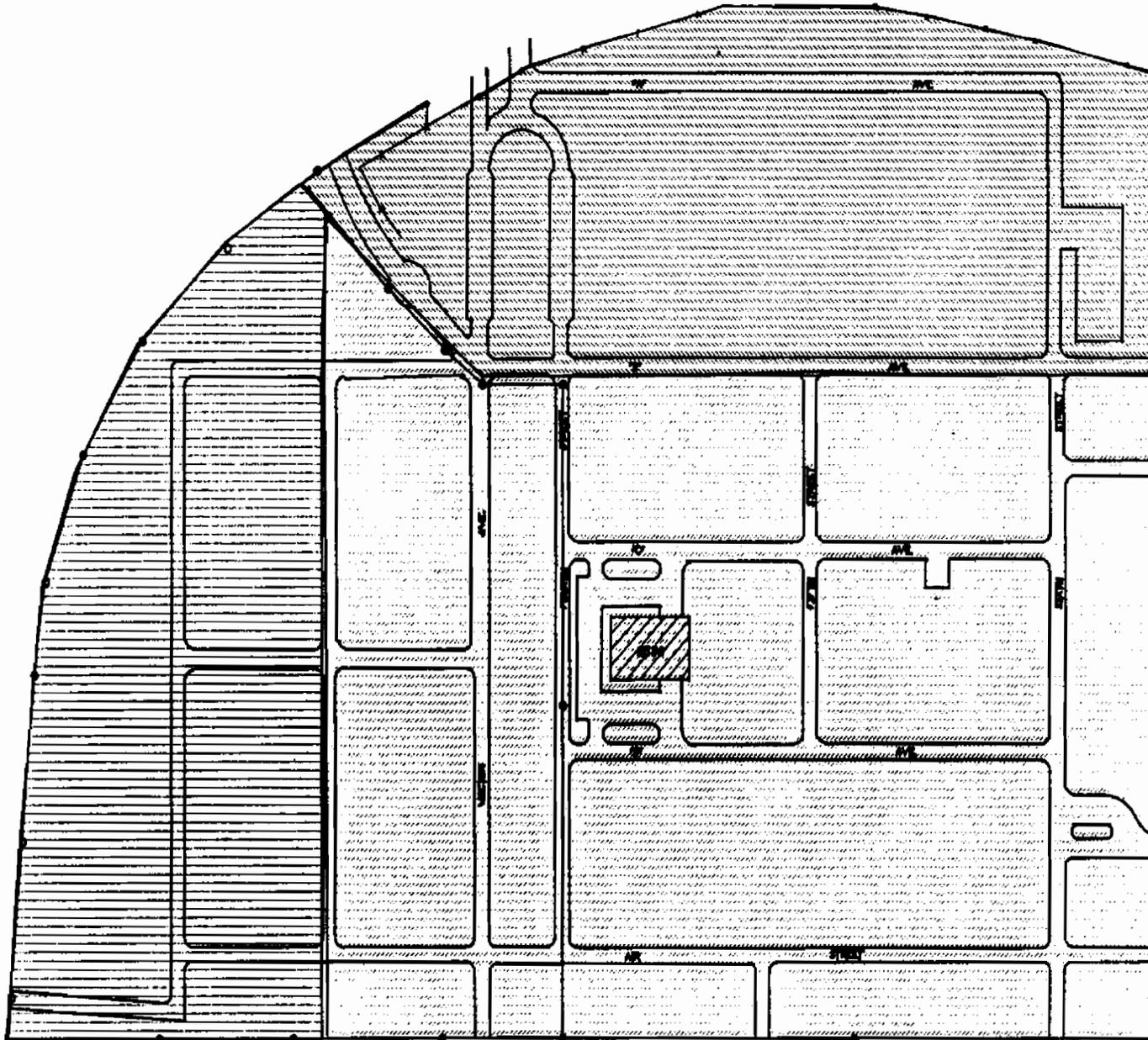
Legend

-  Office Space
-  Light Industrial
Distribution/Mixed
-  Sales/Distribution/
Mixed
-  Existing
Buildings

(Not to Scale)



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Development Zone B (36 acres) - is coded on the map in Exhibit II as green and would be proposed as a light industrial/warehouse type use. The configuration of the road network on the property is a fit for the use since it breaks up the property into 2-3 acre sites. These sites are consistent with light industrial uses. Furthermore, Building 2536 (the MOMAG Bldg.) is in good condition and can be marketed as is for an industrial/warehousing/sales/administration/fleet management type facility. The building produces an opportunity to get "the ball rolling" in terms of getting tenants into the zone, as well as to establish the development profile.

Development Zone C (14 acres) - is identified on the map on Exhibit II as the area in blue. This area is proposed to be used as sales/office/administration uses. The consultant proposes a flex-space building concept whereby a series of flex-space spec buildings are constructed. As tenants move in, the building is fitted to suit the tenant. Again the roadway network is consistent with this type of use and divides the property up into 2-3 acre sites which are consistent with light industrial/sales facilities. Zone C can be accessed from the front of the property as well as from the back of the property (refer to the traffic circulation plan later on in this report).

DEVELOPMENT SCENARIO II

In order to accommodate an outcome where the RDA is not able to successfully take ownership of the Marine Transfer and Air Force Housing properties, the consultant proposes an alternative development scenario which focuses on the Naval Annex portion. This portion is approximately 38 acres in size.

Exhibit III shows the area in question in green. Much like the Development Zone B in Scenario I, this would be proposed as a light industrial/warehouse use.

This development scenario is the least promising for the following reasons:

1. Looking at the map in Exhibit III it is clear that this property is "sandwiched" between the Air Force housing and Marine Corps Transfer properties (adjacent sites), making it difficult to package "neatly" for marketing purposes.
2. The property is sandwiched between two different types of uses; one military housing and the other military administration. The uses are not consistent with the industrial use proposed for the Naval Annex. Moreover, the housing use is not consistent with uses in the surrounding area.
3. Although it is clear what the current uses are for the adjacent properties; the long term prospects are unknown. In other words, any changes in the use may effect the development potential of the Naval Annex property, either on the up side or on the downside.

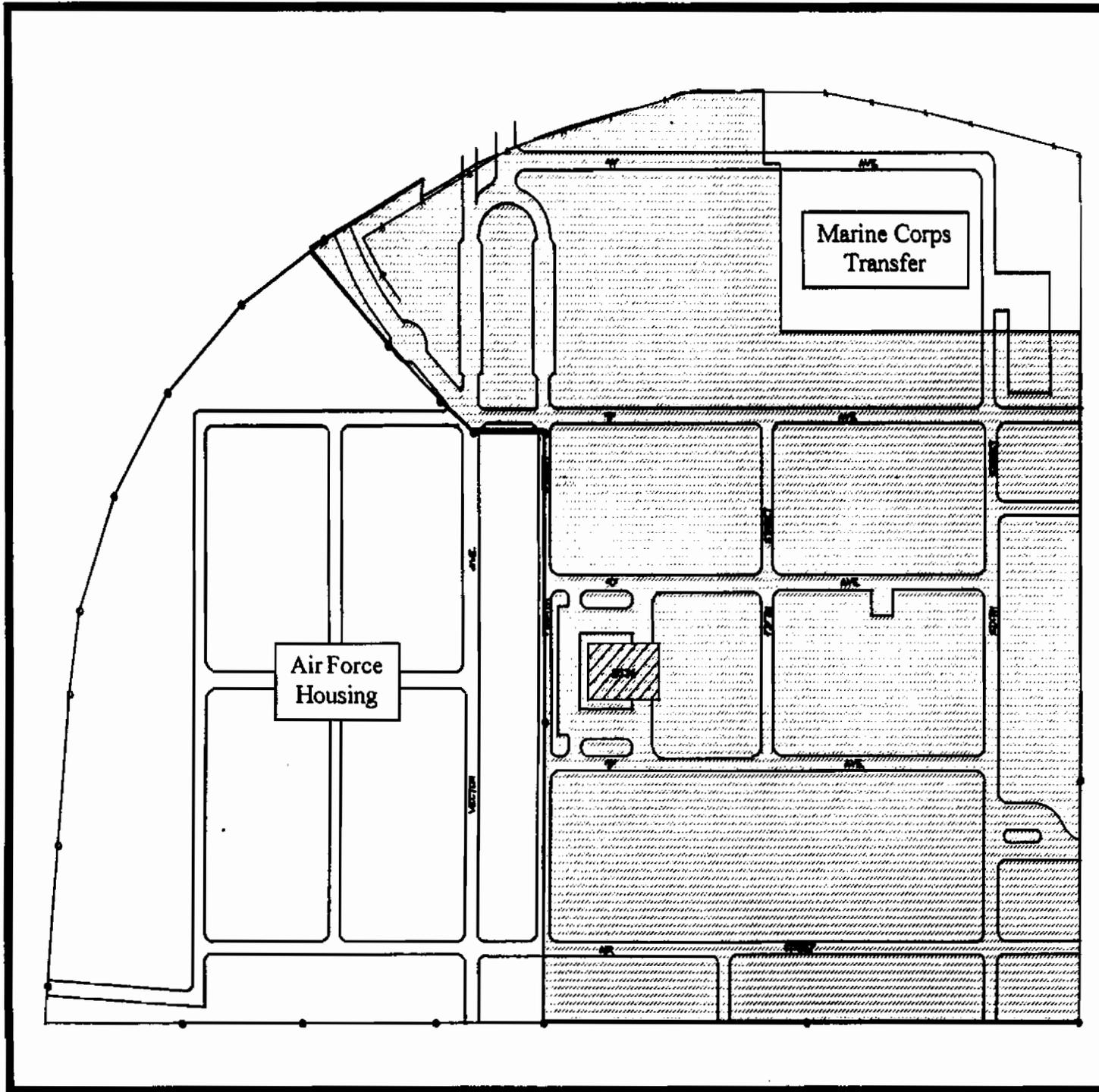


Exhibit III
**Development
 Scenario II**
 Least Optimal Use

Legend

-  Light Industrial
Distribution/Mixed
-  Existing Buildings
-  Not Part of Plan

(Not to Scale)



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4. The opportunity cost of not developing all three properties collectively is two-fold. First, there is the loss of potential revenue from the two adjacent sites, and second, the sum of the market values for each of the three sites as is, is smaller than the market value of the three properties where all three are marketed as in Development Scenario I.

TYPICAL TENANT PROFILE

In considering the proposed uses for the three development zones, the following list of potential users provides a profile for each of the development zones. The list is based on existing companies which are actually seeking space.

LIST OF POTENTIAL USERS

Office (Zone A)	Industrial/Distribution (Zone B)	Flex Space (Zone C)
Bank Anchor Tenant Bank Office & Business Office Insurance Company Reservation Center Medical Billing Office Engineering Company Architect	Federal Express Trident Construction Co. PYA Food Distribution Aratex Linen Distribution Sonitrol Security Systems	Home Construction Supply Ctr. Kitchen Cabinets Plumbing Fixtures Lighting Windows Food Distribution Frito-Lay® Toms Freight Forwarders Bull Dog Trucking Co. Roadway Transportation All Coast Intermodal Transportation

Section IV

SITE DEVELOPMENT AND INFRASTRUCTURE PLANS

In an effort to anticipate the basic site development costs in order to properly market the property, this section of the report attempts to provide a site development concept as well as the costs associated with the development concept.

This section deals with the basic infrastructure and site preparation needs which include:

- Roadway and traffic circulation

- Utility infrastructure
 - water
 - sewer
 - power
 - gas
 - fire protection

In addition, the costs outlined in the section include other costs associated with developing the property:

- Demolition of old structures; and
- Stormwater drainage.

It is important to recognize that the cost estimates are conservative on the high end. In other words, in estimating these costs, the consultant has attempted to give the RDA an idea of the costs in a worst case scenario.

ROADWAY AND TRAFFIC CIRCULATION PLAN

Under Development Scenario I the consultant has developed a proposed traffic circulation plan to be consistent with the proposed land uses. From a traffic standpoint it is expected that visitors, sales staff, employees, light industrial truck traffic, and delivery trucks would access the site. On the front end of the site namely Zone A where the office use will occur it is expected that mainly office, and sales staff would access the site. This traffic would access the site from the current main entrance as identified on the map on Exhibit IV. For Development Zone B the expected traffic is light industrial truck traffic, employees and delivery trucks. This traffic would access the site from Air Park Road on the Remount Road side. For development Zone C the expected traffic would be light industrial or sales plus delivery trucks which would access the site from Air Park Road towards the back of the site as identified on the map in Exhibit IV.

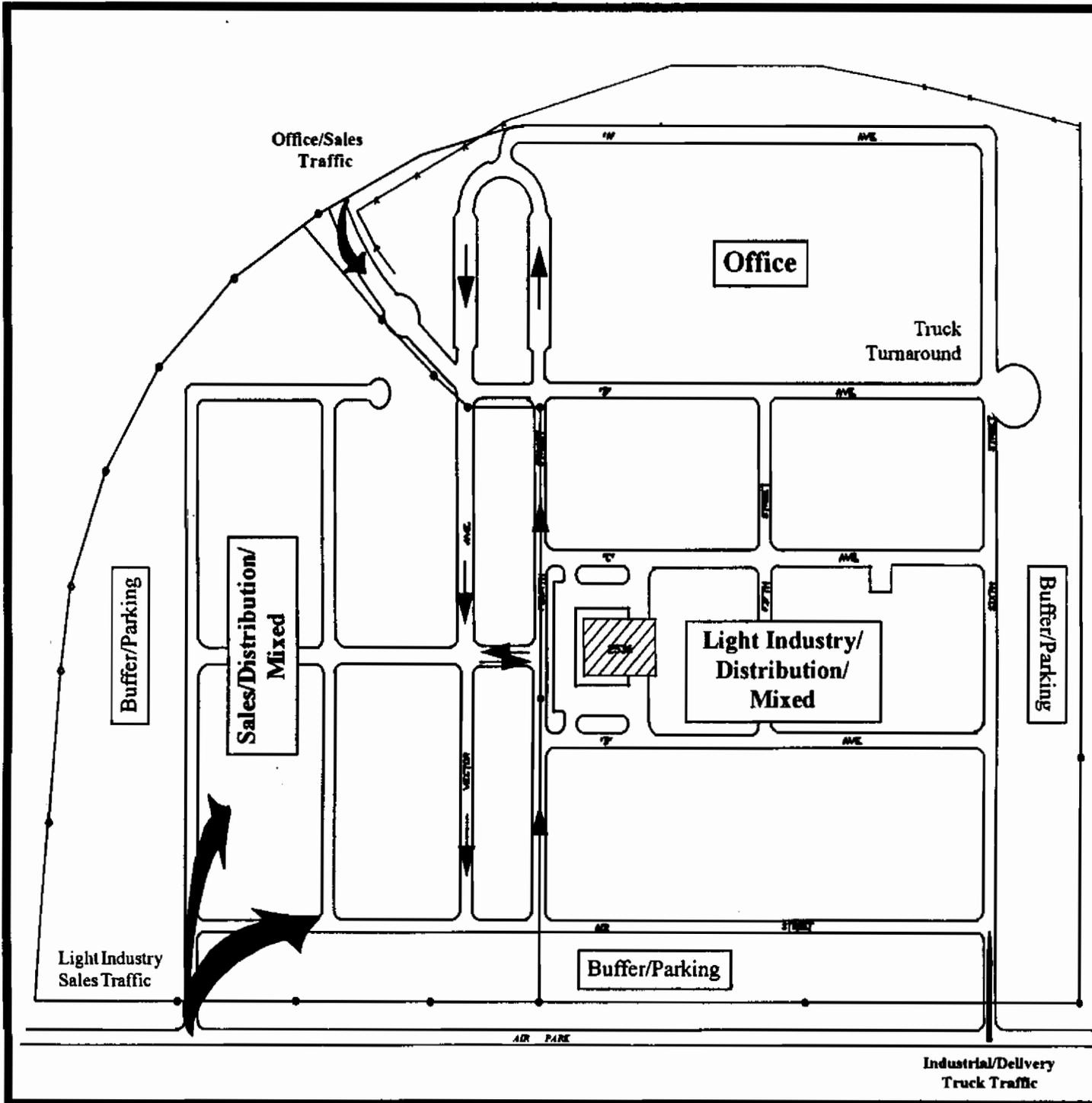


Exhibit IV

Proposed Traffic Circulation Plan

Development Scenario I

(Not to Scale)



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Comments and Recommendations

Based on the consultant's evaluation of the current site road network and the proposed land uses, the following are some comments and recommendations.

- The existing roadway system on-site appears to be of sufficient width to accommodate two-way traffic. However it is in disrepair and will, at a minimum, require to be overlaid with new bituminous.
- The present main access to/from the site is opposite the I-26 southbound ramp (partial interchange). Based on the projected use of the site this access should be adequate and may potentially be a candidate for a future traffic signal. Internal of the site, the existing five-legged intersection must be modified to become at a maximum a four-legged intersection.
- The existing roadways on-site, and the site layout appears to be advantageous for the types of uses proposed. Of major concern will be on-site parking, both supply and circulation. As the development plan evolves, these issues shall be reviewed so as to meet City and Traffic Engineering standards.
- Service access to the site is excellent given the opportunity to access Air Park Road just west of the site. Air Park Road is presently being used as an entrance for adjacent industrial uses and as such appears to presently carry truck traffic. It is suggested that any proposed occupants of the property that would require frequent deliveries by heavy vehicles be located along the westerly and southerly portions of the site to take advantage of this roadway.

Trip Generation and Traffic Impact

The following is the trip generation estimate for the site based on two prospective level uses on-site:

Trip Generation Summary

Time Period	Zone A 80,000 sf Office ¹	Zones B+C 45-Acre Industrial Park ²	Total
Weekday Daily	1,200	2,750	3,950
AM Peak			
Enter	140	350	490
Exit	<u>20</u>	<u>80</u>	<u>100</u>
TOTAL	160	430	590
PM Peak			
Enter	30	90	120
Exit	<u>130</u>	<u>350</u>	<u>480</u>
TOTAL	160	440	600

1. Land-Use Code 710, General Offices.

2. Land-Use Code 130, Industrial Park, independent variable; acres.

Please note that the variable used for the industrial park was acres which tends to provide a "gross estimation" of potential trip generation characteristics as compared to actual square footage.

Roadway Construction Costs

This part of the report addresses the roadway construction cost estimates to bring the existing roadway network up to par for the proposed development uses. As noted earlier in the report, it is the opinion of the consultant that the existing roadway network is sufficient in terms of its outlay to serve the proposed developments. In fact, the roadway network is conducive to the development plan proposed. However, it is the consultant's opinion that the roadway be repaved since the roadway is in disrepair and showing signs of neglect. Repaving the roadway is not only important for image purposes, but also important in terms of the long term viability of the development. The development cannot flourish without a first class road system. Furthermore, as identified in the traffic circulation plan in Exhibit IV, the consultant is proposing a truck spine for heavy truck access towards the back of the site on Sixth Street. Under the plan, heavy trucks and delivery vehicles would access the site from Airpark Road onto Sixth Street. In order to facilitate this, Sixth Street would have to be reconstructed in order to handle and carry heavy truck traffic. Furthermore, a new turn-in would have to be constructed with culvert at the intersection of Sixth and Airpark. The traffic and circulation plan also proposes another intersection towards the front of the site for Development Zone C.

This would require a new intersection with culvert. The construction requirements for the above improvements would include a full depth roadway construction for the back spine and the two intersections with Airpark Street as well as a two 36-inch culverts at each of the intersections. The total roadway network resurfacing would require a 2-inch overlay. The cost for these recommended improvements are outlined in the table below.

Roadway Improvement Costs

Proposed Work	Cost per Square Yard	Number of Square Yards	Total
2" Pavement Overlay	\$15.00	24,000 (excluding truck spire)	\$360,000
Full Depth Roadway Construction (truck spire plus two intersections)	\$17.00	4,200	71,400
2 Culverts	\$50.00 (per L.F.)	128 L.F.	6,400
Construction Engineering			30,000
TOTAL			\$467,800

Surface Parking Requirements

Although this report recommends a sufficient number of parking spaces in order to facilitate a successful development outcome, it is the overall assumption of this report that all parking spaces are developed by the individual developers and/or landowners or property owners. For example, in the case where the RDA sells the property to individual property owners, the respective owners will be responsible for developing and providing parking spaces. In the case where the RDA leases the property to individual developers, again the parking spaces will have to be provided by the individual developers.

However, for purposes of informing the client, the consultant is providing the following rule of thumb cost estimates. For office space, parking space requirement is 3.3 parking spaces for every thousand square feet of office floor. The proposed scenario is an 80,000 SF office building which amounts to 264 spaces. The proposed industrial acreage is approximately 45 which amounts to approximately 387,000 SF of developed industrial space at 20 percent coverage. The rule of thumb for industrial space is 1.5 spaces per thousand square feet of building area which amounts to 580 spaces. Hence, the total parking space requirement is approximately 835 surface parking spaces (aggressive estimate). Again, these costs are not included in the development costs used in this report, with the exception of the case where the RDA becomes the developer (see the Business Planning Section).

UTILITY INFRASTRUCTURE PLAN

Status of Infrastructure On Site

Based on an on-site inspection; discussions with CPW; and the consultant's recent experience at other military facilities such as Shaw AFB, Parris Island, and Fort Jackson; we can draw the following conclusions about the status of the utility infrastructure on the site.

Domestic Water Service - The existing water system seems adequate in terms of providing domestic water service. The current base operations and housing areas use similar amounts of water and at similar pressures as the proposed new development will require. The lines are mostly cast iron or asbestos cement which may present some maintenance problems. The asbestos cement piping does not present a health risk and a recent court case in the Chesapeake Bay upheld the integrity of the pipe material. I would not recommend removal of any of the water system for domestic purposes.

Fire Protection Service - The existing water system is in some places limited in providing fire protection. Flow rates of 1,500 gpm or greater are now being requested by fire underwriters to receive the best fire rating. The system will require upgrades of some 10" lines in Area "A," 8" and 6" mains in Area "B," and an 8" main in Area "C." All areas will require additional fire hydrants to provide maximum fire protection coverage.

Sanitary Sewer - Visual inspection of the sewer indicated that the lines and manholes are in poor repair. Our experience with sewers on military bases and in the Charleston area indicated problems with infiltration, inflow, sediment deposition and other flow restrictive characteristics. In general, the location and extent of sewer will not match the proposed development and an almost complete rework of the sewer should be anticipated. All the vitrified clay pipe should be sliplined or replaced and all them manholes will require sealant and rehabilitation.

The PVC piping and the cast iron sewers should be adequate in size and condition for reuse in the proposed light industrial applications. Finally, the proposed 80,000 sq. foot office development (Zone A) will produce enough sewage to warrant an increase in sewer size from the existing 8" VCP to a new 10" PVC sewer.

Natural Gas Service - The existing site now has natural gas which is located in Zones "A" and "B." In most industrial cases, the local provider, in this case SCE&G, will install the necessary natural gas lines. This is often done at no cost to the owner in order to secure additional gas customers.

Electric Service - There is extensive electrical service to the site now. Anticipated industrial upgrades will not require substantial improvements to the power. Much of the power is now underground and that should be continued in this development. As in the case with the gas,

improvements to the power distribution grid are often paid for by the local provider in order to secure more customers. We would anticipate this being true for this site.

Infrastructure Development Plan

The map on Exhibit V shows the proposed water and sewer line improvements. The following table shows the estimated construction costs for infrastructure improvements to the site. They represent 1997 dollars and are in anticipation of the proposed development plan (Zones A, B & C). Should the scope of the development change, then the layout and engineering calculations performed to size the utilities should be revised accordingly.

Utility	Zone A	Zone B	Zone C	TOTAL
Sewer	\$61,275	\$31,125	\$7,800	\$100,200
Water	\$24,850	\$22,050	\$12,600	\$59,500
Gas	\$0	\$0	\$0	\$0
Electric	\$0	\$0	\$0	\$0
TOTAL	\$86,125	\$53,175	\$20,400	\$159,700

Refer to Appendix A for spreadsheet tables explaining these costs.

DEMOLITION PLAN

In order to facilitate the development proposed in the report, it is necessary to demolish the majority of the facilities on the property. Due to the nature of the proposed development in that it is essentially a "fresh start," it is in the best interest of the project to demolish the majority of the buildings (see list below). The reason being that the buildings are old, in disrepair and do not fit the proposed uses.

The maps on Exhibit VI are a before and after concept of the site. As is indicated, the only building remaining is the MOMAG Building, which is a modern building which is in a condition to be marketed.

The estimated cost of the demolition is \$330,017 and is broken down as follows:

BUILDING NUMBERS	COST
2501, 2505, 2507, 2508, 2513, 2522, 2524, 2525, 2530, 2532, 2535, 2550 and 2552	\$127,357.00
2517, 2520, 2521, 2523 and 2533	\$49,912.00
2506 and 2511 with Transit Siding	\$12,188.00
2556	\$42,000.00
Housing	\$98,560.00
TOTAL	\$330,017.00

A copy of a demolition proposal upon which this estimate is based is in Appendix B.

Environmental Remediation - The table on the following page is an estimate of the cost for asbestos removal. It is important to note that this task was especially difficult to handle since a formal environmental survey for asbestos has not been undertaken. The cost estimates in the following table are based on a visual inspection and hence only includes the cost of asbestos which is visible. This does not include asbestos that is covered. Hence these estimates are likely to be on the low side.

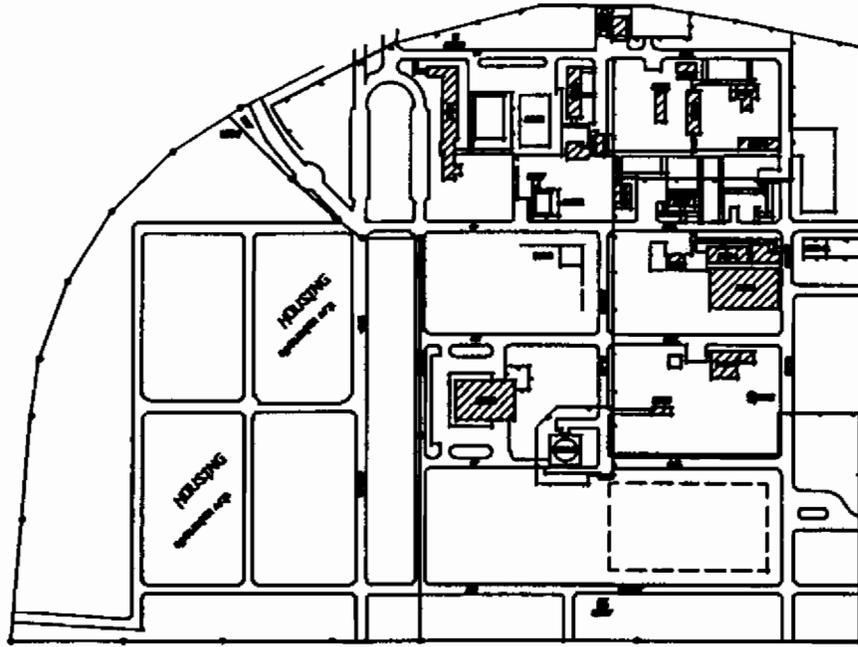
ENVIRONMENTAL REMEDIATION

	TOTAL COST
Steam Pipes Between Buildings 1,256 linear ft. @ \$8.00 per sq. ft.	\$10,048.00
Building 2501 Asbestos tile floor - 9,799 sq. ft. @ \$2.50 per sq. ft. Pipe insulation - 100 linear ft. @ \$8.00 per sq. ft.	32,497.00
Building 2506 Asbestos tile floor - 3,125 sq. ft. @ \$2.50 per sq. ft. Transit siding - 1,920 sq. ft. @ \$2.00 per foot. Pipe insulation - 400 linear feet @ \$8.00 per foot	14,852.00
Building 2508 Pipe insulation - 550 linear feet @ \$8.00 per sq. ft.	4,400.00
Building 2509 This building is a unique military structure and would require further testing to determine impact of demolition	
Building 2511 Asbestos tile floor - 1,750 sq. ft. @ \$2.00 per sq. ft. Transit siding - 1,520 sq. ft. @ \$2.50 per sq. ft. Pipe insulation - 150 linear feet @ \$8.00 per linear foot	8,400.00
Building 2505, 2517, 2520,2521,2523 and 2533 These buildings are within the Marine Corps compound and could not be inspected at this time. However, due to the age and upkeep of these buildings, it is not anticipated that additional costs will be incurred.	
Total estimated price for asbestos to be removed from the Naval Annex property	\$70,197.00
Charleston Air Force Base Housing There are 22 units of housing on this property, at approximately 1,200 square feet per house. On visual inspection of the property, they appear to be clean, with the exception of the flooring. It is uncertain, without further testing, whether the tile flooring contains asbestos, and will, therefore, require additional dollars for remediation. If these tiles do contain asbestos, it is estimated that the removal of the tile for the housing units will cost an additional \$52,800.00.	
Total estimated price for Air Force Base Housing	\$52,800.00

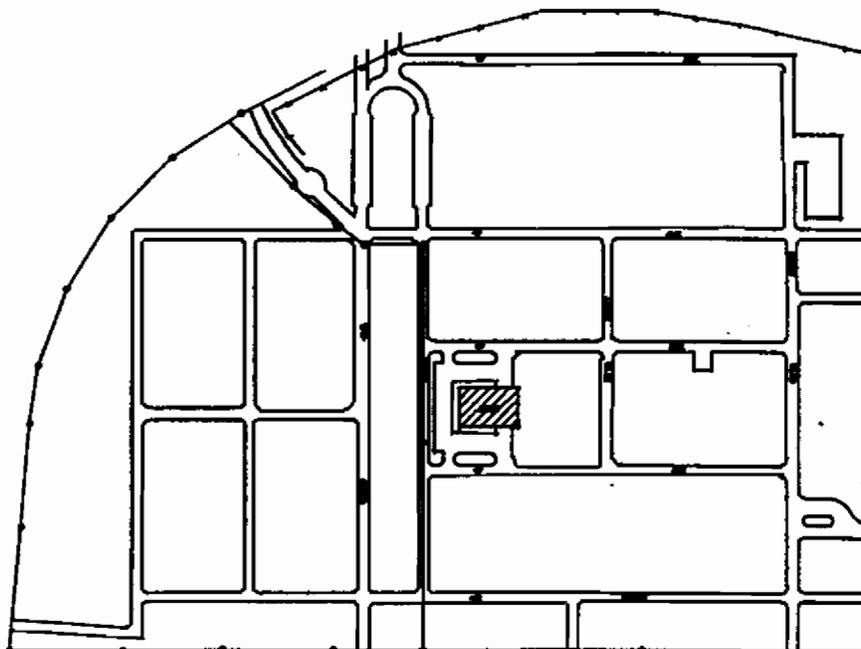
The estimates are based only on visual inspection without access to appropriate environmental survey information. Any asbestos in side walls or covered in any way are not included in this report.

Exhibit VI: Demolition Plan

Site Before Demolition Plan



Site After Demolition Plan



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STORMWATER DRAINAGE COSTS

Stormwater drainage is an important consideration when planning a development. It is almost certain that this proposed development is going to have an impact on the volume of stormwater run off into the surrounding area. Furthermore, it is anticipated that the local planning jurisdiction as well as to the state will require a stormwater plan as part of a master development plan. Hence in order to anticipate the costs associated with such a plan, WSA is providing an estimate of the costs anticipated, based on a "windshield" stormwater concept plan.

The premise behind stormwater remediation is that the post development volume and rate of flow will increase due to two reasons:

1. Increase in impervious coverage (roads, parking, roof tops etc.) will increase the volume of water runoff; and
2. The rate flow will increase due to the nature of the surface and the drainage channels which will move the water more efficiently.

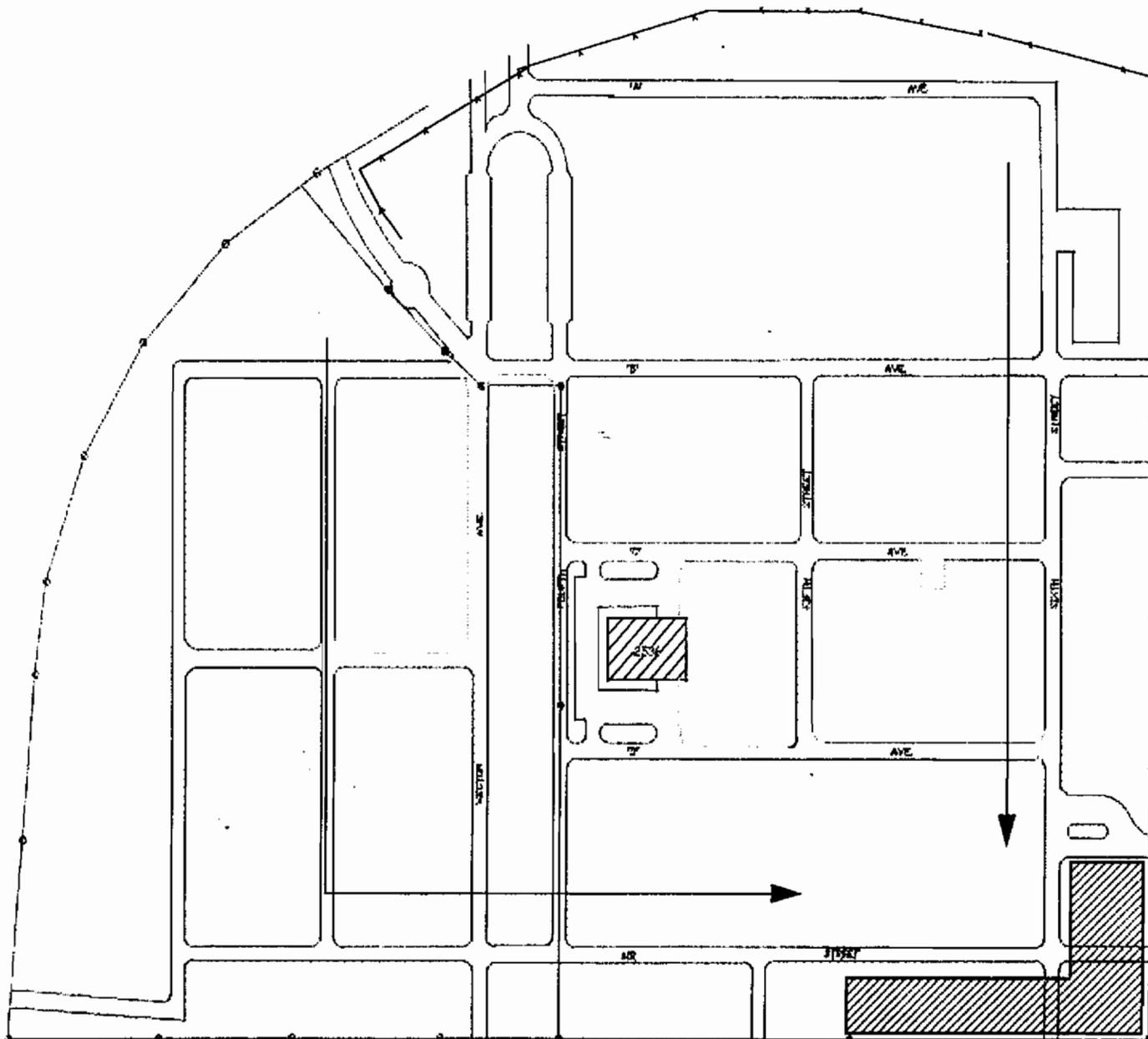
Hence, in order to estimate the costs, the consultant has made some reasonable assumptions so as to develop a drainage concept plan. The map in Exhibit VII shows the direction of flow of water and the anticipated placement of the retention pond.

In order to estimate the cost of excavating and building the pond, the following assumptions are made (please refer to Appendix C for the work sheets):

- The cost of excavating and building the pond is \$12 per cubic yard, which translates to \$20,000 per acre-foot.
- Pre-development flow types for the property are mostly shallow concentrated and some sheet.
- Post development flow types are mostly open channel and some sheet and shallow concentrated.
- Pre-development coverage is broken up evenly as 1/3 open space (grass), 1/3 urban coverage (administration and industrial) and 1/3 residential coverage.
- Post development coverage is anticipated as all urban (commercial and industrial).

The goal is to determine a rate of flow before development and then after development. The difference is what determines the size of the pond. The pond is intended to hold back the difference and release it at the pre-development rate.

Exhibit VII
Storm Water
Drainage Concepts



Legend

 Proposed Site for Pond

 Direction of Runoff Flow

(Not to Scale)



WILBUR SMITH ASSOCIATES

Based on these assumptions, the estimated detention storage basin is anticipated to be around 6.5 acre feet. At \$20,000 per acre foot, the total anticipated cost is \$130,000 (see worksheet in Appendix C), which translates to roughly \$2,000 per acre.

An important issue is the timing of developing the pond, specifically from the standpoint of who incurs the cost and when the cost is incurred. There are two ways of approaching this. A large pond can be built to handle the entire property, or several small ponds can be built by the individual owners to handle the runoff from the respective sites. From a planning and marketing standpoint, the former approach is the best. From a financial standpoint, the second approach is the best since the costs would not be borne by the RDA.

Since it is the consultant's opinion that the stormwater retention pond be excavated when the site is initially developed, the costs associated with this are reflected in the business plan in Section VI.

INFRASTRUCTURE AND SITE DEVELOPMENT COSTS

Road Improvement Costs	\$467,000
Water and Sewer Utilities	— 159,700
Demolition Costs	330,017
Stormwater Drainage	130,000
Environmental Allowance	122,997
TOTAL	\$1,209,714

Section V

EXISTING ENVIRONMENTAL ISSUES

From an environmental standpoint there are two main issues concerning this reuse plan. The first is from an environmental baseline perspective. That is, what existing environmental issues (hazardous waste contamination) will impact the cost of developing the Naval Annex property? Second, the potential environmental impact of the development on plants, animals, soil and the environment. This report addresses the existing environmental issues; those environmental issues which effect the development of this project, mostly from a cost and timing standpoint. The potential environmental impacts by the proposed development plan will be addressed in an environmental assessment which is to be completed by Air and Water Resources. The consultant will provide the necessary information needed for Air and Water to complete it's environmental assessment.

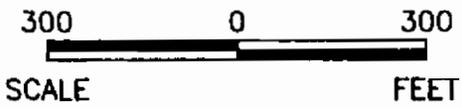
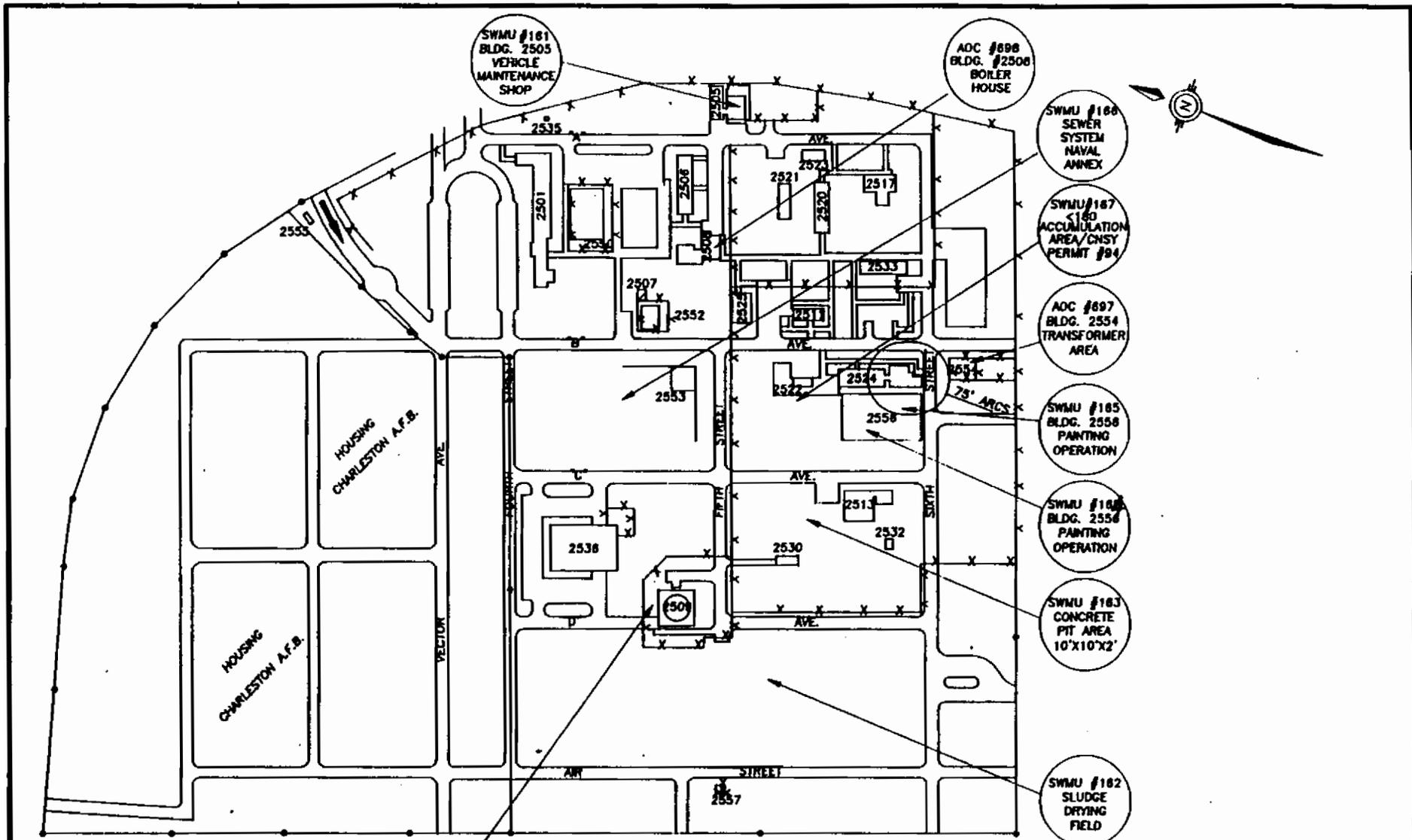
BASELINE ENVIRONMENTAL CONDITIONS

The Southern Division completed an environmental baseline survey in April of 1994 which identified several potential environmental issues. The map on Exhibit VIII identifies several areas of potential hazardous waste contamination. These areas are identified by two code types - Solid Waste Management Units (SWMU) and Areas of Concern (AOC), which are defined as follows:

- SWMU - "Any unit which has been used for the treatment, storage, or disposal of solid waste at any time, irrespective of whether the unit is or ever was intended for the management of solid waste. RCRA-regulated hazardous waste management units are also solid waste management units. SWMUs include areas that have been contaminated by routine and systematic releases of hazardous constituents, excluding one-time accidental spills that are immediately remediated and cannot be linked to solid waste management activities (e.g., product or process spills)."

- AOC - "Any area having a probable release of a hazardous waste or hazardous constituent which is not from a solid waste management unit and is determined by the Regional Administrator to pose a current or potential threat to human health or the environment. Such areas of concern may require investigations and remedial actions as required under Section 3005(c)(3) of the Resource Conservation and Recovery Act and 40 CRF §270.32(b)(2) in order to ensure adequate protection of human health and the environment."

Subsequent to the environmental baseline survey, an RCRA Facilities Investigation (RFI) work plan has been established and the investigation is underway by EnSafe/Allen & Hoshall of Mt. Pleasant, South Carolina. It is important to note that thus far no formal investigation has occurred



ENVIRONMENTAL BASELINE
SURVEY
NAVAL BASE
CHARLESTON

Exhibit VIII
NAVAL STATION ANNEX
RESOURCE MAP
CORRECTIVE ENVIRONMENTAL
INVESTIGATION
DWG DATE: 04/26/94 DWG NAME: 760ANN4

into the level of contamination or whether there is any evidence of contamination at any of the above mentioned sites. However, for purposes of determining whether the scope of the development plan proposed in this report is in any grave danger of being compromised by potential environmental issues, the following comments are based on the EBS reports and a conversation with an EnSafe official. It was stressed during the conversation that although the SWMU's and AOCs were suspected as potentially contaminated sites, there is no evidence of release and the purpose of the RFI is to investigate whether there is any evidence of a release. It is thus important to note that until the RFI is complete, there is no evidence to suggest that contaminants were released into ground water or soils.

SWMU #161 - Building 2505 Vehicle Maintenance Shop - This area is identified because there used to be, and still is, an oil/water separator and auto parts washer on site. This equipment was used to handle hazardous materials including oils and solvents. The objective of the investigation is to determine whether any of the hazardous materials contaminated the surrounding soil.

Under a worst case scenario, where there is evidence of release, this would require a very localized soil clean-up effort.

SWMU #162 - Sludge Drying Field - This area was used as a sewage de-watering area where sewage sludge was pumped onto the field to dry. Based on information provided thus far for purposes of the RFI work plan, the sewage sludge was from household sewage and was of organic form. If this is the case, it is anticipated that the organic materials have safely decomposed. However, if there is evidence that non-organic industrial materials was also in the sludge, there may be a chance of soil and ground water contamination. If this is the case - worst case - this would require some level of localized soil clean-up, as well as ground water remediation.

SWMU #163 - Above Ground Concrete Pit - Based on information provided for the RFI work plan, this pit was used for the accumulation of hazardous waste materials such as solvents and paint waste. There is no evidence of release and the objective of the RFI is to confirm this. A worst case scenario, where there was release into the surrounding soil, would require a localized soil clean-up.

SWMU #164 - Blasting Operation - Building 2556 - This site was an abrasive blast booth where items were prepared for painting by blasting old paint off objects. The concern is that particulate paint debris on the floor has contaminated the soil surrounding the building. Again, the objective of the RFI is to confirm whether there was any release into the surrounding soil. Worst case scenario would require the remediation of surrounding soil.

SWMU #165 - Building 2556 Painting Facility - Since the RFI work plan has been drafted, this site has been removed as a potential hazardous waste water contamination site.

SWMU #166 - Sanitary Sewer System - There is concern of soil contamination surrounding the sanitary sewer system downstream of any industrial processes. This sewer line is likely the main line running along 5th Street all the way up to the vehicle maintenance shop (refer to the map on Exhibit V). Again the objective of the RFI is to determine whether there is any release of contaminants in the surrounding soil system. It is important to point out that the infrastructure plan recommended in this report calls for the replacement of this major sewer trunk line along 5th Street all the way up to the vehicle maintenance shop (referred to Exhibit V). Worst case scenario would require removal of contaminated soil in the localized area.

SWMU #167 - Building 2522 Accumulation Area - Since the RFI work plan has been drafted this area has been cleared as a potential hazardous waste contamination area.

AOC #696 - Transformer Area Near Building 2509 - Concern stems from transformer fluid which is observed leaking from the transformer. Again the objective of the RFI is to sample the soil and to confirm any release into the soil. A worst case scenario where there is contamination of soil would require localized clean-up of the soil.

AOC #697 - Transformer Pad at Building #2554 there was some concern of a past fire on the pad. The site has since been removed as an area of concern. No fire had actually occurred.

AOC #698 - Boiler House Building 2508 - The concern stems from lead based paint which has been peeling off the building onto the surrounding soil. The objective of the RFI is to look at lead contamination of the soil. Worst case scenario would require soil clean-up.

CONCLUSION

As pointed out earlier, the outcome of the hazardous waste RFI will have two impacts on the development proposed on the Annex site, first from a cost standpoint the second from a timing standpoint. Based on the limited information provided from the RFI work plan it can be concluded that there are no major hazardous waste contamination issues which stand to undermine the development potential for this site. It is anticipated that the earliest findings from the RFI would be available by May of 1997. Obviously, the development timing would be based on the results in the RFI report and any subsequent clean-up which must occur. Since the State Department of Health and Environmental Control (DHEC) has jurisdiction over clean-up issues, the transfer of the Naval property is contingent of DHEC's acceptance of the RFI findings as well as the State signing off on any subsequent clean-up which may be required. Hence, it is clear that the RFI findings will greatly impact the timing of this development. If the RFI finds no evidence of release of hazardous waste material, then the timing of this potential development would be far more rapid as opposed to a scenario where the RFI calls for remediation action as a result of identified releases of contaminated waste materials. Furthermore, the cost of the development may be impacted but not to a crippling extent.

Section VI

PROPERTY MANAGEMENT ALTERNATIVES

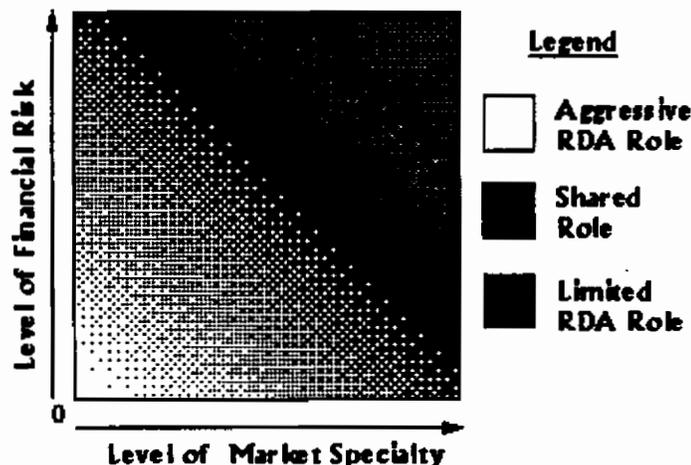
Thus far the report has provided some insight into the potential development outcome for the property in question. Another important issue to address is who will ultimately manage and/or own the development. In fact, there are a wide variety of options which range from a scenario on one extreme where the RDA sells all the land in question to a single or multiple property (private developer) users, to a scenario on the other extreme where the RDA is the ultimate developer, incurring the financial risk associated with developing and marketing the property. Somewhere in the middle of the range is a scenario where the RDA sells off some of the land to a developer, specifically the "high dollar" properties like the office development, as well as the industrial property to individual industries, etc., but maintains a role as the master developer. This scenario allows the RDA to limit its risk while maintaining an influence on the ultimate outcome.

The ultimate role played by the RDA is based on several variables, with the following two being the most dominant:

- Level of financial risk of speculative type holdings.
- Level of marketing expertise necessary to market specialty developments.

The graphic in Exhibit IX illustrates how these two variables influence the RDA's role. The riskier or more specialized the development, the more limited the RDA's role may be.

Exhibit IX
DETERMINING THE RDA'S ROLE IN DEVELOPING



Section VII BUSINESS PLAN

The report has thus far answered two of the questions posed in the introduction, What is the highest and best use? and what are the associated costs? However, does this make business sense, and if so, what is the next step? This section of the report will address these two questions, starting with the first.

In order to address the business aspect of this study, the report provides four business approaches or plans. These are based on the two development scenarios discussed earlier in the report. Development Scenario I is where the RDA is able to obtain ownership of the entire 67 acre tract (Naval Annex, Air Force and Marine Corp Transfer), and Development Scenario II where the RDA only obtains ownership of the Naval Station Annex portion (net of the Marine Corps Transfer and the Air Force Housing).

Furthermore, for each of these scenarios, the report provides two business plans, one from a perspective where the RDA upfits the land and the MOMAG building and sells, and the other from the perspective where the RDA is the ultimate developer.

Business Plan One

- Development Scenario I - total tract development
- RDA upfits and sells the land and MOMAG

Business Plan Two

- Development Scenario I - total tract development
- RDA is the ultimate developer

Business Plan Three

- Development Scenario II - Naval Annex only
- RDA upfits and sells the land and MOMAG

Business Plan Four

- Development Scenario II - Naval Annex only
- RDA is the ultimate developer

BUSINESS PLAN ONE

This business plan or approach is designed to anticipate the scenario where the RDA obtains ownership of the entire tract (67 acres), upgrades the land so as to provide the infrastructure to accommodate the uses discussed earlier in the report (refer to Exhibit II), and markets and sells the land to private developers and the MOMAG building to an industry.

The assumptions used for this plan are as follows:

- All sites and MOMAG are sold:
 - frontage @ 60 percent year 1 and 40 percent year 2
 - industrial (33 acres) 10 percent, 20 percent, 25 percent, 30 percent, 15 percent
 - mixed (14 acres) 60 percent, 40 percent
 - MOMAG (3 acres) 100 percent year 1

The following worksheets break out in detail development costs.

**Office Frontage Tract
17 Acres
Development Costs
February 21, 1997**

	\$Amount	\$/Sq. Ft.
<hr/> <u>PROPERTY DEVELOPMENT COSTS</u>		
I. Land acquisition - 17 Acres		
To Be Negotiated ...		
<hr/>		
II. Hard Cost Site Development		
A. Repave existing roadway	\$ 30,448	
B. Demolition	\$ 127,357	
C. Water	\$ 6,305	
D. Sewer	\$ 15,547	
E. Storm Water	\$ 34,000	
F. Electrical	\$ -	
G. Gas	\$ -	
H. Environmental	\$ 70,197	
		<hr/>
TOTAL HARD COST SITE		\$ 283,854
<hr/>		
III. Professional Fees		
A. Construction Engineer @ 15% of site development	42,578	
		<hr/>
TOTAL PROFESSIONAL FEE		\$ 42,578
<hr/>		
IV. Soft/Indirect Cost		
A. Sales Commission @ 8%	\$ 176,800	
B. Permits (paid by purchaser)	\$ -	
C. Water & Sewer Tap Fee	\$ -	
D. Impact Fees	\$ -	
		<hr/>
TOTAL SOFT/INDIRECT		\$ 176,800
<hr/>		
V. Financing Costs		
A. Site dev. construction loan @ 7.5% - 12 Months	\$ 21,289	
B. Lenders Costs	\$ 2,000	
C. Construction Loan Fee & Closing	\$ 2,750	
		<hr/>
TOTAL FINANCING COST		\$ 26,039
<hr/>		

**Office Frontage Tract
17 Acres
Development Costs
February 21, 1997**

VI. Developers Cost		
Estimated at 8%	\$	43,000
<hr/>		
VII. Development Contingency		
	\$	2,000
<hr/>		
<hr/>		
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TOTAL PROJECT COSTS		
	\$	574,271
<hr/>		

Naval Station Annex
Industrial Land
33 Acres
Development Costs
February 21, 1997

\$Amount \$/Sq. Ft.

PROPERTY DEVELOPMENT COSTS

**I. Land acquisition - 33 Acres
To Be Negotiated ...**

II. Hard Cost Site Development

A. Access Road	\$	51,408
B. Culvert(1)	\$	3,200
C. Repave existing road	\$	59,104
D. Demolition	\$	147,466
E. Storm Water	\$	66,000
F. Water	\$	24,850
G. Sewer	\$	61,275
H. Electrical	\$	-
I. Gas	\$	-

TOTAL HARD COST SITE \$ 413,304

III. Professional Fees

A. Construction Engineer @ 15% of site development	\$	61,996
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TOTAL PROFESSIONAL FEE \$ 61,996

IV. Soft/Indirect Cost

A. Sales Commission @ 8%	\$	95,200
B. Permits (paid by purchaser)	\$	-
C. Water & Sewer Tap Fee	\$	-
D. Impact Fees	\$	-

TOTAL SOFT/INDIRECT \$ 95,200

V. Financing Costs

A. Site dev. construction loan @ 7.5% - 12 Months	\$	30,998
B. Lenders Costs	\$	4,000
C. Construction Loan Fee & Closing	\$	5,500

TOTAL FINANCING COST \$ 40,498

**Naval Station Annex
Industrial Land
33 Acres
Development Costs
February 21, 1997**

VI. Developers Cost assumed at 8%	\$	48,880
<hr/>		
VII. Development Contingency	\$	5,000
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TOTAL PROJECT COSTS		\$ 659,877
<hr/>		

**Flex Space Land
14 Acres
Development Costs
February 21, 1997**

	\$Amount	\$/Sq. Ft.
<hr/>		
<u>PROPERTY DEVELOPMENT COSTS</u>		
I. Land acquisition - 14 Acres		
To Be Negotiated ...		
<hr/>		
II. Hard Cost Site Development		
A. Access Road	\$	19,992
B. Culvert(1)	\$	3,200
C. Demolition	\$	55,194
D. Repave existing road	\$	25,075
E. Water	\$	7,952
F. Sewer	\$	7,316
G. Storm Water	\$	28,000
H. Electrical	\$	-
I. Gas	\$	-
J. Environmental	\$	52,800
TOTAL HARD COST SITE		\$ 199,529
<hr/>		
III. Professional Fees		
A. Construction Engineer @ 15% of site development	\$	29,929
TOTAL PROFESSIONAL FEE		\$ 29,929
<hr/>		
IV. Soft/Indirect Cost		
A. Sales Commission @ 8%	\$	38,080
B. Permits (paid by purchaser)	\$	-
C. Water & Sewer Tap Fee	\$	-
D. Impact Fees	\$	-
TOTAL SOFT/INDIRECT		\$ 38,080
<hr/>		
V. Financing Costs		
A. Site development construction loan @ 7.5%	\$	14,965
B. Lenders Costs	\$	1,500
C. Cosntruction Loan Fee & Closing	\$	2,500
TOTAL FINANCING COST		\$ 18,965
<hr/>		

**Flex Space Land
14 Acres
Development Costs
February 21, 1997**

VI. Developers Cost assumed at 8%	\$ 24,000
<hr/>	
VII. Development Contingency	\$ 2,000
<hr/>	
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TOTAL PROJECT COSTS \$ 310,503	
<hr/>	

**MOMAG Building
3 Acres
Development Costs
February 21, 1997**

\$Amount \$/Sq. Ft.

PROPERTY DEVELOPMENT COSTS

**I. Land & building acquisition - 3 Acres
To Be Negotiated ...**

II. Hard Cost Site Development

A. Access Road	\$	4,284
B. Repave existing road	\$	5,373
C. Water	\$	556
D. Sewer	\$	1,372
E. Electrical	\$	-
F. Gas	\$	-
G. Environmental	\$	-

TOTAL HARD COST SITE \$ 11,585

III. Professional Fees

A. Construction Engineer @ 15% of site development	\$	1,738
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TOTAL PROFESSIONAL FEE \$ 1,738

IV. Soft/Indirect Cost

A. Sales Commission @ 8%	\$	44,933
B. Permits (paid by purchaser)	\$	-
C. Water & Sewer Tap Fee	\$	-
D. Impact Fees	\$	-

TOTAL SOFT/INDIRECT \$ 44,933

V. Developers Costs

assumed at 8%	\$	5,000
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TOTAL PROJECT COSTS \$ 63,256

BUSINESS PLAN TWO

Like Business Plan One this business approach also anticipates the scenario where the RDA takes ownership of the entire tract. However, in this case the assumption is that the RDA is the ultimate developer, upfitting the land, the MOMAG building, and developing the property per the uses illustrated on Exhibit II:

- 80,000 sf of office development on 17 acres of frontage - leased
- 40,000 sf flex distribution building on 14 acres along Remount Road - leased
- 33 acres of industrial land - sold
- MOMAG building on 3 acres of land - leased

As is evident above, all the properties are shown as leased, with the exception of the industrial acreage. Based on a poor history for leases of industrial land in the Charleston market the consultant recommends that the industrial acreage be sold under all circumstances. An example of where industrial acreage has not leased successfully is the Charleston Air Force Base where attempts have been made to lease industrial at little success. Another disadvantage is that developers can not use the value of leased land as collateral for borrowing on a development.

The following are the assumptions used for this case:

Lease-up rates

- office - 50 percent, 30 percent, 20 percent
- flex space - 60 percent, 40 percent
- MOMAG - 100 percent

Sell-off rate

- industrial - 10 percent, 20 percent, 25 percent, 30 percent, 15 percent

Appendix F contains detailed worksheets which outline the development costs and operating proforma for this case.

**Naval Station Annex
Frontage Tract 80,000 sq. ft. 17 acres
Office Development Costs
February 21, 1997**

	\$Amount	\$/Sq. Ft.
L Land acquisition - 17 Acres		
To Be Negotiated ...		
<hr/>		
II. Hard Cost Building		
A. Base Office 80,000 sq.ft. @ \$60	\$ 4,800,000	
B. Tenant upfit 80,000 sq.ft. @ \$31	\$ 2,480,000	
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TOTAL HARD COST BUILDING	\$ 7,280,000	\$ 91.00
<hr/>		
III. Hard Cost Site Development		
A. Site Demolition	\$ 127,357	
B. Site Electrical	\$ 47,000	
C. Access roads, parking, curbing	\$ 324,000	
D. Repave existing roadway	\$ 30,448	
E. Stormwater	\$ 34,000	
F. Site Irrigation	\$ 36,000	
G. Landscaping	\$ 123,000	
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H. Environmental	\$ 70,197	
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TOTAL HARD COST SITE	\$ 792,002	\$ 9.90
<hr/>		
IV. Professional Fees		
A. Architectural 5%	\$ 364,000	
B. Engineering 2%	\$ 145,600	
C. Legal	\$ 35,000	
D. Title Insurance	\$ 8,572	
E. Survey	\$ 10,000	
<hr/>		
TOTAL PROFESSIONAL FEE	\$ 563,172	\$ 7.04
<hr/>		
V. Soft/Indirect Cost		
A. Permits	\$ 52,000	
B. Water & Sewer Taps	\$ 20,200	
C. Impact Fees	\$ 59,752	
D. Insurance (developers umbrella)	\$ 7,840	
E. Leasing Commission 6% / 3 yrs.	\$ 216,000	
F. Lenders Legal	\$ 20,000	
<hr/>		
TOTAL SOFT/INDIRECT	\$ 375,792	\$ 4.70
<hr/>		

Naval Station Annex
Frontage Tract 80,000 sq. ft. 17 acres
Office Development Costs
February 21, 1997

VI. Financing Costs

A. Construction loan fee	\$	77,600		
B. Lenders Inspection	\$	8,000		
C. Lenders Appraisal (const/perm)	\$	10,000		
D. Construction Loan @ 7.5% - 18 Months	\$	479,275		
E. Permanent Loan fee & closing	\$	78,400		
TOTAL FINANCING COST		\$ 653,275	\$	8.17

VII. Developers Cost

assumed at 5%	\$	490,000	\$	6.13
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VIII. Development Contingency

A. Hard Costs	\$	77,600		
B. Soft Costs	\$	10,000		
C. Financing and Operating Carry	\$	50,000		
TOTAL DEVELOPMENT CONTINGENCY		\$ 137,600	\$	1.72

TOTAL PROJECT COSTS \$ 10,291,841 \$ 128.65

Naval Station Annex
Industrial Land
33 Acres
Development Costs
February 21, 1997

\$Amount \$/Sq. Ft.

PROPERTY DEVELOPMENT COSTS

**I. Land acquisition - 33 Acres
To Be Negotiated ...**

II. Hard Cost Site Development

A. Access Road	\$	51,408
B. Culvert(1)	\$	3,200
C. Repave existing road	\$	59,104
D. Demolition	\$	147,466
E. Storm Water	\$	66,000
F. Water	\$	24,850
G. Sewer	\$	61,275
H. Electrical	\$	-
I. Gas	\$	-

TOTAL HARD COST SITE \$ 413,304

III. Professional Fees

A. Construction Engineer @ 15% of site development	\$	61,996
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TOTAL PROFESSIONAL FEE \$ 61,996

IV. Soft/Indirect Cost

A. Sales Commission @ 8%	\$	95,200
B. Permits (paid by purchaser)	\$	-
C. Water & Sewer Tap Fee	\$	-
D. Impact Fees	\$	-

TOTAL SOFT/INDIRECT \$ 95,200

V. Financing Costs

A. Site dev. construction loan @ 7.5% - 12 Months	\$	30,998
B. Lenders Costs	\$	4,000
C. Construction Loan Fee & Closing	\$	5,500

TOTAL FINANCING COST \$ 40,498

**Naval Station Annex
Flex Space Distribution Center
Development Costs
40,000 sq. ft.
February 21, 1997**

	\$Amount	\$/Sq. Ft.
I. Land acquisition - 14 Acres		
To Be Negotiated ...		
<hr/>		
II. Hard Cost Building		
A. Base Office 40,000 sq.ft. @ \$40	\$ 1,600,000	
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TOTAL HARD COST BUILDING	\$ 1,600,000	\$ 40.00
<hr/>		
III. Hard Cost Site Development		
A. Site Demolition	\$ 55,194	
B. Site Electrical	\$ 40,250	
C. Site Work	\$ 192,500	
D. Access Road	\$ 19,992	
E. Calvert (1)	\$ 3,200	
E. Repave existing roadway	\$ 25,075	
D. Stormwater	\$ 28,000	
E. Site Irrigation	\$ 33,250	
F. Landscaping	\$ 70,000	
G. Environmental	\$ 52,800	
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TOTAL HARD COST SITE	\$ 520,260	\$ 13.01
<hr/>		
IV. Professional Fees		
A. Architectural 4%	\$ 64,000	
B. Engineering 2%	\$ 32,000	
C. Legal	\$ 24,000	
D. Title Insurance	\$ 3,425	
E. Survey	\$ 5,000	
<hr/>		
TOTAL PROFESSIONAL FEE	\$ 128,425	\$ 3.21
<hr/>		
V. Soft/Indirect Cost		
A. Permits	\$ 14,000	
B. Water & Sewer Taps	\$ 8,000	
C. Impact Fees	\$ 17,400	
D. Insurance (developers umbrella)	\$ 2,400	
E. Leasing Commission	\$ 18,400	
F. Lenders Legal	\$ 8,000	
<hr/>		
TOTAL SOFT/INDIRECT	\$ 68,200	\$ 1.71
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**Naval Station Annex
Flex Space Distribution Center
Development Costs
40,000 sq. ft.
February 21, 1997**

VI. Financing Costs

A. Construction loan fee	\$	20,000		
B. Lenders Inspection	\$	3,000		
C. Lenders Appraisal (const/perm)	\$	3,300		
D. Construction Loan @ 7.5% - 12 Months	\$	86,136		
E. Permanent Loan fee & closing	\$	21,300		

TOTAL FINANCING COST \$ 133,736 \$ 3.34

VII. Developers Cost

assumed at 5%	\$	130,000	\$	3.25
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VIII. Development Contingency

A. Site Development	\$	20,000		
B. Hard Costs	\$	8,000		
C. Soft Costs	\$	5,000		
D. Financing and Operating Carry	\$	10,000		

TOTAL DEVELOPMENT CONTINGENCY \$ 43,000 \$ 1.08

TOTAL PROJECT COSTS \$ 2,623,621 \$ 65.59

**MOMAG Building
Development Costs
3 Acres
February 21, 1997**

	\$Amount	\$/Sq. Ft.
I. Land & building acquisition - 3 Acres To Be Negotiated ...		
<hr/>		
II. Hard Cost Site Development & Building Upfit		
A. Access Road	\$	4,284
B. Repave existing road	\$	5,373
C. Water	\$	556
D. Sewer	\$	1,372
E. Partitions	\$	50,000
F. Electrical	\$	-
G. Gas	\$	-
<hr/>		
TOTAL HARD COST SITE	\$	61,585
<hr/>		
III. Professional Fees		
A. Construction Engineer @ 15% of site development	\$	9,238
<hr/>		
TOTAL PROFESSIONAL FEE	\$	9,238
<hr/>		
IV. Soft/Indirect Cost		
A. Permits (paid by purchaser)	\$	-
B. Water & Sewer Tap Fee	\$	-
C. Impact Fees	\$	-
<hr/>		
TOTAL SOFT/INDIRECT	\$	-
<hr/>		
V. Developers Costs		
assumed at 5%	\$	3,500
<hr/>		
TOTAL PROJECT COSTS	\$	74,323
<hr/>		

BUSINESS PLAN THREE

This business plan or approach is designed to anticipate the scenario where the RDA obtains ownership of only the Annex tract (37 acres), upgrades the land so as to provide the infrastructure to accommodate the uses discussed earlier in the report (refer to Exhibit II), and markets and sells the land to private developers and the MOMAG building to an industry.

- Sell all sites and MOMAG:
 - industrial (35 acres) 10 percent, 20 percent, 25 percent, 30 percent, 15 percent
 - MOMAG (3 acres) 100 percent year 1

Appendix G contains the worksheets used to compute detailed development costs.

Naval Station Annex
Industrial Land
35 Acres
Development Costs
February 21, 1997

\$Amount \$/Sq. Ft.

PROPERTY DEVELOPMENT COSTS

**I. Land acquisition - 35 Acres
To Be Negotiated ...**

II. Hard Cost Site Development

A. Access Road	\$	51,408
B. Culvert(1)	\$	3,200
C. Repave existing road	\$	59,104
D. Demolition	\$	147,466
E. Storm Water	\$	66,000
F. Water	\$	24,850
G. Sewer	\$	61,275
H. Electrical	\$	-
I. Gas	\$	-

TOTAL HARD COST SITE \$ 413,304

III. Professional Fees

A. Construction Engineer @ 15% of site development	\$	61,996
--	----	--------

TOTAL PROFESSIONAL FEE \$ 61,996

IV. Soft/Indirect Cost

A. Sales Commission @ 8%	\$	95,200
B. Permits (paid by purchaser)	\$	-
C. Water & Sewer Tap Fee	\$	-
D. Impact Fees	\$	-

TOTAL SOFT/INDIRECT \$ 95,200

V. Financing Costs

A. Site dev. construction loan @ 7.5% - 12 Months	\$	30,998
B. Lenders Costs	\$	4,000
C. Construction Loan Fee & Closing	\$	5,500

TOTAL FINANCING COST \$ 40,498

Naval Station Annex
Industrial Land
35 Acres
Development Costs
February 21, 1997

VI. Developers Cost		
assumed at 8%	\$	48,880
<hr/>		
VII. Development Contingency		
	\$	5,000
<hr/>		
<hr/>		
<hr/>		
TOTAL PROJECT COSTS	\$	659,877
<hr/>		

**MOMAG Building
Development Costs
3 Acres
February 21, 1997**

	\$Amount	\$/Sq. Ft.
I. Land & building acquisition - 3 Acres		
To Be Negotiated ...		
<hr/>		
II. Hard Cost Site Development & Building Upfit		
A. Access Road	\$	4,284
B. Repave existing road	\$	5,373
C. Water	\$	556
D. Sewer	\$	1,372
E. Partitions	\$	50,000
F. Electrical	\$	-
G. Gas	\$	-
<hr/>		
TOTAL HARD COST SITE	\$	61,585
<hr/>		
III. Professional Fees		
A. Construction Engineer @ 15% of site development	\$	9,238
<hr/>		
TOTAL PROFESSIONAL FEE	\$	9,238
<hr/>		
IV. Soft/Indirect Cost		
A. Permits (paid by purchaser)	\$	-
B. Water & Sewer Tap Fee	\$	-
C. Impact Fees	\$	-
<hr/>		
TOTAL SOFT/INDIRECT	\$	-
<hr/>		
V. Developers Costs		
assumed at 5%	\$	3,500
<hr/>		
TOTAL PROJECT COSTS	\$	74,323
<hr/>		

BUSINESS PLAN FOUR

Like Business Plan Three this business approach also anticipates the scenario where the RDA takes ownership of only the Naval Annex tract. However, in this case the assumption is that the RDA is the ultimate developer, upfitting the land, the MOMAG building, and developing the property per the uses illustrated on Exhibit II:

- 35 acres of industrial land - sold
- MOMAG building on 3 acres of land - leased

The following are the assumptions used for this case:

Lease-up rates

- MOMAG - 100 percent

Sell-off rate

- industrial - 10 percent, 20 percent, 25 percent, 30 percent, 15 percent

Appendix H contains detailed worksheets which outline the development costs.

**Naval Station Annex
Industrial Land
35 Acres
Development Costs
February 21, 1997**

\$Amount \$/Sq. Ft.

PROPERTY DEVELOPMENT COSTS

**I. Land acquisition - 35 Acres
To Be Negotiated ...**

II. Hard Cost Site Development

A. Access Road	\$	51,408
B. Culvert(1)	\$	3,200
C. Repave existing road	\$	59,104
D. Demolition	\$	147,466
E. Storm Water	\$	66,000
F. Water	\$	24,850
G. Sewer	\$	61,275
H. Electrical	\$	-
I. Gas	\$	-

TOTAL HARD COST SITE \$ 413,304

III. Professional Fees

A. Construction Engineer @ 15% of site development	\$	61,996
--	----	--------

TOTAL PROFESSIONAL FEE \$ 61,996

IV. Soft/Indirect Cost

A. Sales Commission @ 8%	\$	95,200
B. Permits (paid by purchaser)	\$	-
C. Water & Sewer Tap Fee	\$	-
D. Impact Fees	\$	-

TOTAL SOFT/INDIRECT \$ 95,200

V. Financing Costs

A. Site dev. construction loan @ 7.5% - 12 Months	\$	30,998
B. Lenders Costs	\$	4,000
C. Construction Loan Fee & Closing	\$	5,500

TOTAL FINANCING COST \$ 40,498

Naval Station Annex
Industrial Land
35 Acres
Development Costs
February 21, 1997

VI. Developers Cost
assumed at 8%

\$ 48,880

VII. Development Contingency

\$ 5,000

TOTAL PROJECT COSTS \$ 659,877

**MOMAG Building
Development Costs
3 Acres
February 21, 1997**

	\$Amount	\$/Sq. Ft.
I. Land & building acquisition - 3 Acres		
To Be Negotiated ...		
<hr/>		
II. Hard Cost Site Development & Building Upfit		
A. Access Road	\$ 4,284	
B. Repave existing road	\$ 5,373	
C. Water	\$ 556	
D. Sewer	\$ 1,372	
E. Partitions	\$ 50,000	
F. Electrical	\$ -	
G. Gas	\$ -	
<hr/>		
TOTAL HARD COST SITE	\$ 61,585	
<hr/>		
III. Professional Fees		
A. Construction Engineer @ 15% of site development	\$ 9,238	
<hr/>		
TOTAL PROFESSIONAL FEE	\$ 9,238	
<hr/>		
IV. Soft/Indirect Cost		
A. Permits (paid by purchaser)	\$ -	
B. Water & Sewer Tap Fee	\$ -	
C. Impact Fees	\$ -	
<hr/>		
TOTAL SOFT/INDIRECT	\$ -	
<hr/>		
V. Developers Costs		
assumed at 5%	\$ 3,500	
<hr/>		
TOTAL PROJECT COSTS	\$ 74,323	
<hr/>		

CONCLUSION AND NEXT STEP

The consultant concludes the following:

- The Naval Station Annex property appears to be a viable option for pursuing an Economic Development Conveyance from the Navy.
- RDA should try to acquire the entire tract (Navy Annex, Marine Transfer and Air Force Housing).
- The highest and best use is a mixed approach between upscale office, light industrial/warehousing and flex space distribution.

Next Step

1. Facilitate an accelerated environmental cleanup process.
2. Approach the Marine Corps with a transfer proposal - possible site switch.
3. Approach the Air Force with regard to the housing.
4. Approach the Navy with a conveyance proposal.
5. Approach a group of private developers to formulate a development plan in advance of the conveyance.

1 4223

APPENDIX A
UTILITIES INFRASTRUCTURE WORKSHEETS

**Cost Estimate - Charleston Naval Annex Reuse
 and Business Plan
 Utility Line Upgrades
 Wilbur Smith Associates
 January, 1997
 AREA "A"**

SEWER ITEM	U/M	QTY	UNIT COST	TOTAL
Remove and Dispose of VC Pipe and Unsuitable Soil	LF	1,000	\$4.00	\$4,000.00
Install New 10" PVC Sanitary Sewer	LF	1,450	\$30.00	\$43,500.00
Install New Manhole	EA	5	\$1,875.00	\$9,375.00
Rehabilitate Existing Manholes	EA	5	\$400.00	\$2,000.00
Asphalt Removal and Replacement	LF	100	\$24.00	\$2,400.00
				Sub-Total
				\$61,275.00
WATER ITEM	U/M	QTY	UNIT COST	TOTAL
Add 10" PVC main	LF	750	\$27.00	\$20,250.00
Additional Fire Hydrants	EA	4	\$1,000.00	\$4,000.00
Asphalt Removal and Replacement	LF	25	\$24.00	\$600.00
				Sub-Total
				\$24,850.00
GAS ITEM	U/M	QTY	UNIT COST	TOTAL
Additional 4" LP Gas Line (Installed by local gas provider - SCE&G)	LF	500	\$0.00	\$0.00
				Sub-Total
				\$0.00
ELECTRICAL ITEM	U/M	QTY	UNIT COST	TOTAL
Underground Power Service to New Buildings (Installed by local provider - SCE&G)	LF	500	\$0.00	\$0.00
				Sub-Total
				\$0.00
				Total Capital Improvements to Utilities
				\$86,125.00

**Cost Estimate - Charleston Naval Annex Reuse
and Business Plan
Utility Line Upgrades
Wilbur Smith Associates
January, 1997
AREA "B"**

SEWER ITEM	U/M	QTY	UNIT COST	TOTAL
Install New 8" PVC Sanitary Sewer	LF	900	\$27.00	\$24,300.00
Install New Manhole	EA	3	\$1,875.00	\$5,625.00
Asphalt Removal and Replacement	LF	50	\$24.00	\$1,200.00
	Sub-Total			\$31,125.00

WATER ITEM	U/M	QTY	UNIT COST	TOTAL
Add 8" PVC main	LF	550	\$25.00	\$13,750.00
Add 6" PVC main	LF	50	\$22.00	\$1,100.00
Additional Fire Hydrants	EA	5	\$1,000.00	\$5,000.00
Reactivate 6" waterline	LS	1	\$1,000.00	\$1,000.00
Asphalt Removal and Replacement	LF	50	\$24.00	\$1,200.00
	Sub-Total			\$22,050.00

GAS ITEM	U/M	QTY	UNIT COST	TOTAL
Additional 4" LP Gas Line (Installed by local gas provider - SCE&G)	LF	1,000	\$0.00	\$0.00
	Sub-Total			\$0.00

ELECTRICAL ITEM	U/M	QTY	UNIT COST	TOTAL
Underground Power Service to New Buildings (Installed by local provider - SCE&G)	LF	2,000	\$0.00	\$0.00
	Sub-Total			\$0.00

Total Capital Improvements to Utilities \$53,175.00

**Cost Estimate - Charleston Naval Annex Reuse
 and Business Plan
 Utility Line Upgrades
 Wilbur Smith Associates
 January, 1997
 AREA "C"**

SEWER ITEM	U/M	QTY	UNIT COST	TOTAL
Rehabilitate existing 8" VCP Sanitary Sewer	LF	200	\$25.00	\$5,000.00
Rehabilitate Existing Manholes	EA	7	\$400.00	\$2,800.00
Asphalt Removal and Replacement	LF	0	\$24.00	\$0.00
			Sub-Total	\$7,800.00

WATER ITEM	U/M	QTY	UNIT COST	TOTAL
Add 8" PVC main	LF	400	\$25.00	\$10,000.00
Additional Fire Hydrants	EA	2	\$1,000.00	\$2,000.00
Asphalt Removal and Replacement	LF	25	\$24.00	\$600.00
			Sub-Total	\$12,600.00

GAS ITEM	U/M	QTY	UNIT COST	TOTAL
Additional 4" LP Gas Line (Installed by local gas provider - SCE&G)	LF	1,000	\$0.00	\$0.00
			Sub-Total	\$0.00

ELECTRICAL ITEM	U/M	QTY	UNIT COST	TOTAL
Underground Power Service to New Buildings (Installed by local provider - SCE&G)	LF	2,000	\$0.00	\$0.00
			Sub-Total	\$0.00

Total Capital Improvements to Utilities	\$20,400.00
--	--------------------



WSA
WILBUR SMITH ASSOCIATES

SUBJECT Charleston AFB JOB NO. _____ SH 1 OF 4
Utility line Upgrades BY BRANDES DATE 1/7/97
 CH. _____ DATE _____

AREA "A" 80,000 sq. ft building
office complex

Water -

Domestic : FROM Community Water Source, by Aqueens, pg. 62
Maximum instantaneous flow

0.5 gpm / 100 sq. ft office

$$80,000 \text{ sq. ft} \times 0.5 \text{ gpm} / 100 \text{ sq. ft} = 400 \text{ gpm} (0.8 \text{ cfs})$$

FIRE : Use 1500 gpm
Look @ furthest point from source

Q gpm	D in	L feet	C	H _L /100	Total head loss
1500	8	90	100	6.32/100	5.69'
1500	6	400	↓	25.6/100	102.4'
1500	8	400	↓	6.32/100	25.28'
1500	6	400	↓	25.6/100	102.4'

* FROM CAMERON
HYDRAULIC TABLES

Too large a head loss ⇒ 235.77' (102 psi)
would require static
over 122 psi

Install 10" loop at top. Consider simple straight line solution:

Q	D	L	C	H _L /100	Total
1500	10	400	100	2.13/100	8.52'
↓	8	400	↓	6.32/100	25.28'
	6	400	↓	25.6/100	57.6'

Static pressure of 59.5 psi ⇒ 91.4 (39.5 psi)
reasonable.

SEWER:

FROM AMEENS, 90% of water enters sewer system.
400 gpm x .90 = 360 gpm (0.80 cfs)

Look @ 8" ss, min. slope 0.40%, old pipe (n = 0.015)
using manning's formula, Q_{max} ⇒ 0.65 cfs (291 gpm)

∴ 8" pipe NOT sufficient.

Look @ new 10", s = 0.40%, n = .012 (new pipe) Q_{max} = 1.5 cfs (673 gpm)

therefore use 10" SS new.



AREA "B" 10⁺ lots @ 2-3 ac. each ~ 15 employees @ each site

Water domestic: from Amcons, 10 gpm/employee (pg. 62)

∴ 150 gpm max. instantaneous flow system can provide this amount

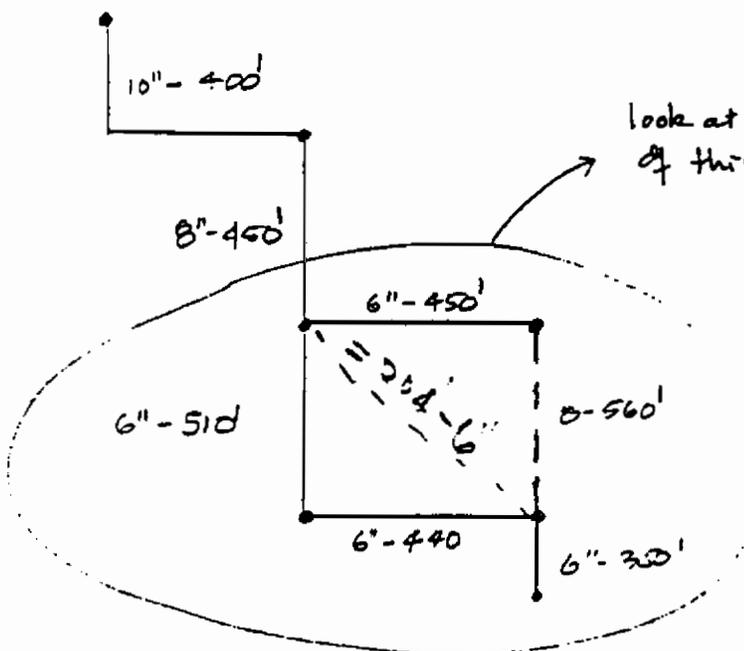
FIRE FLOW: 1500 gpm head @ furthest point:

Q	D	L	C	HL/100	TOTAL
1500	10	400	100	2.13/100	8.52
	8	450		6.32/100	28.44
	6	570		25.6/100	130.56
	8	440		6.32/100	27.8
	6	350		25.6/100	89.6

would require a static ⇒ 284.92 (123 psi)
 pressure of 143 psi
unreasonable

look at adding an additional 8" loop

simple schematic



Hazen-Williams, $f = 0.2083 \left(\frac{100}{d} \right)^{1.85}$



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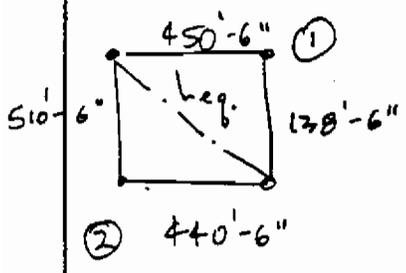
FIRST, change all 4 legs to equivalent 6" pipe

$$\frac{f}{l} = 0.2083 \frac{q^{1.85}}{d^{4.8655}} \quad f, q \neq \text{constants will not change} \therefore \text{ignore}$$

$$\frac{1}{l} = \frac{1}{d^{4.8655}} \quad \text{Because lengths will be proportional, their ratios are equal}$$

$$\frac{l_{6''}}{l_{8''}} \cdot \left(\frac{d_{6''}}{d_{8''}}\right)^{4.8655} \Rightarrow l_{6''} = l_{8''} \left(\frac{d_{6''}}{d_{8''}}\right)^{4.8655}$$

$$= 560' \left(\frac{6}{8}\right)^{4.8655} \Rightarrow l_{6''} = 138'$$



Find single equivalent length for (equivalent length) the loop.

$$Q^{1.85} = \frac{f}{l} d^{4.8655} \quad \text{Hazen-Williams}$$

$$Q_E = Q_1 + Q_2 \quad (\text{Note: ignore } f \text{ factor because of equality})$$

Rewrite Hazen-Williams w/ $f_2 = f_1 = f_e$

$$\left(\frac{1}{l_e}\right)^{.54} d_e^{2.63} = \left(\frac{1}{310+440}\right)^{.54} d_1^{2.63} + \left(\frac{1}{450+138}\right)^{.54} d_2^{2.63}$$

Note $d_e = 6'' \therefore d_e = d_1 = d_2 \therefore$ cancel

$$\left(\frac{1}{l_e}\right)^{.54} = \left(\frac{1}{950}\right)^{.54} + \left(\frac{1}{588}\right)^{.54}$$

$$\left(\frac{1}{l_e}\right)^{.54} = .05661481$$

$$\frac{1}{l_e} = .00493 \Rightarrow l_e = 202.8' \text{ eq. } 6''$$

Therefore, the equivalent configuration is:

Q	D	L	C	H _z /100	TOTAL
1500 gpm	10	400	100	2.13/100	8.52
↓	8	450	↓	6.32/100	28.44
	6	203		25.6/100	51.97
	6	350		25.6/100	89.60
					<u>178.53 (77 psi)</u>

static = 97 reasonable.



WILBUR SMITH ASSOCIATES

SEWER $150 \text{ gpm} \times .90 = 135 \text{ gpm}$

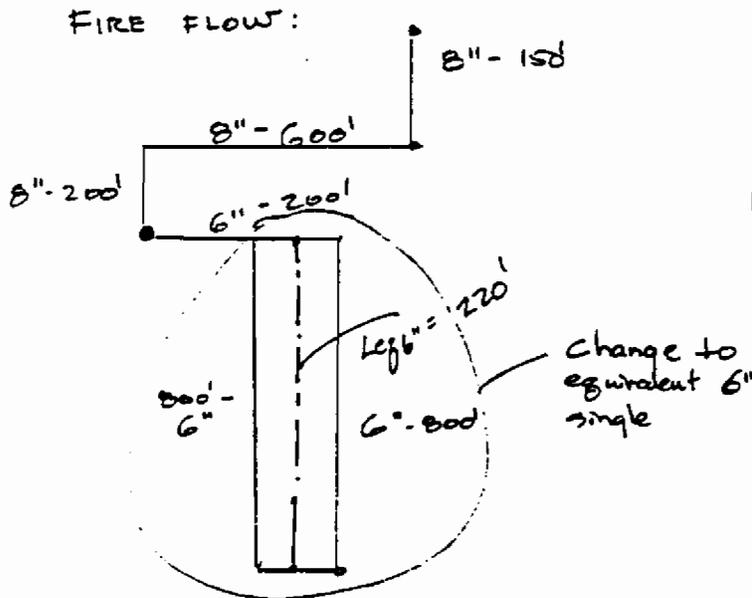
(Manning's) Look @ 8" VCP, 0.40% slope, $n = .015$
 $\Rightarrow Q_{\text{max}} = 0.65 \text{ cfs}$ (673 gpm)

Therefore, 8" acceptable.

AREA "C" - Distribution / Warehouse type organizations.
 Low personnel, high sq. footages.

Water Domestic: Assume 100 employees total

$100 \text{ employees} \times 1.0 \text{ gpm} = 100 \text{ gpm}$ max. instant flowrate
 * acceptable system



$$\left(\frac{1}{l_e}\right)^{.54} = \left(\frac{1}{800}\right)^{.54} + \left(\frac{1}{800}\right)^{.54}$$

$l_e = 220'$ 6" pipe

Q	D	L	C	h _f /100	TOTAL
150 gpm	8"	950	100	6.32/100	60.04
	6"	200	100	25.6/100	51.2
	6"	220	100	25.6/100	56.32
					<u>167.56'</u> (72 psi)

* static = 92 psi, reasonable

SEWER: $100 \text{ gpm} \times .90 = 90 \text{ gpm}$

(Manning's) 8" VCP, 0.40% slope, $n = .015$ yields \Rightarrow
 $\Rightarrow Q_{\text{max}} = 0.65 \text{ cfs}$ (673 gpm)

* Therefore, 8" acceptable

APPENDIX B
DEMOLITION PROPOSAL

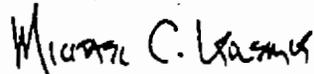


467 KING ST., CHAS., S.C., 29403, PH. 803-723-1322

DECEMBER 13, 1996
NAVAL STATION ANNEX
THE BRUMLEY COMPANY
PAGE 2

- 2) CONCO INC. IS ONLY RESPONSIBLE FOR THE REMOVAL OF THE ASBESTOS CONTAMINATED BUILDING MATERIAL (TRANSITE) LISTED IN BUILDINGS #2506 AND 2511. WE ARE NOT RESPONSIBLE FOR ANY OTHER ASBESTOS CONTAMINATED BUILDING MATERIALS OR ANY OTHER HAZARDOUS WASTES.
- 3) ALL DEBRIS WILL BE HAULED TO A SC DHEC APPROVED LANDFILL.
- 4) WE WILL LEAVE A CLEAN AND ORDERLY SITE.
- 5) ALL SALVAGE BECOMES PROPERTY OF THE DEMOLITION CONTRACTOR.
- 6) WE WILL FURNISH CERTIFICATES OF WORKMANS COMPENSATION, PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE WHICH INCLUDES DEMOLITION INSURANCE.
- 7) OUR BOND RATE IS 3%.

RESPECTFULLY SUBMITTED,



MICHAEL GOLEMIS



CONNIE G. HOLMES
CONCO INC.

FAXED 577-5559



INC

467 KING ST., CHAS., S.C., 29403, PH. 803-723-1322

DECEMBER 13, 1996

DYSON SCOTT
THE BRUMLEY COMPANY
P.O. BOX Y
CHARLESTON, S.C. 29402

CONCO INC. PROPOSES TO PROVIDE LABOR,
MATERIALS AND EQUIPMENT NECESSARY FOR
DEMOLITION AT NAVAL STATION ANNEX,
CHARLESTON, S.C. ACCORDING TO PLANS AND AS
FOLLOWS:

1) WE WILL DEMOLISH THE FOLLOWING BUILDINGS
FOR THE SUMS LISTED:

A) BUILDINGS #2501, 2505, 2507, 2508, 2513, 2522, 2524, 2525, 2530, 2532, 2535, 2550 AND 2552.	\$127,357.00
B) BUILDINGS #2517, 2520, 2521, 2523 AND 2533.	\$ 49,912.00
C) BUILDINGS #2506 AND 2511 WITH TRANSITE SIDING.	\$ 12,188.00
D) BUILDING #2556	\$ 42,000.00
E) HOUSING	\$ 98,560.00

TOTAL \$330,017.00

CONTINUED

APPENDIX C
STORMWATER WORKSHEETS



WSA
WILBUR SMITH ASSOCIATES

SUBJECT _____ JOB NO. _____ SH _____ OF _____
 BY _____ DATE _____
 CH. _____ DATE _____
 CHARLESTON AFB RESTUDY

Excavation \$10 / CY
 Misc. EXTRAS \$2 / CY
 \$12 / CY

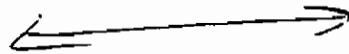
$$\text{Acre-ft} \times \left(\frac{43560}{27} \right) = 1,613.3 \text{ CY} \times \$12 / \text{CY}$$

$$= \$19,360$$

~ \$20,000 acre-ft

65 ~~acre-ft~~

\$130,000



TIME OF CONCENTRATION AND TRAVEL TIME

Version 2.00

Project : CHARLESTON NAVAL ANNEX
 County : CHARLESTON
 Site title: POST DEVELOPMENT

State: SC

User: THH
 Checked: _____

Date: 02-26-97
 Date: _____

----- Subarea #1 - MAIN -----

Flow Type	2 year rain	Length (ft)	Slope (ft/ft)	Surface code	n	Area (sq/ft)	Wp (ft)	Velocity (ft/sec)	Time (hr)
Sheet	4.6	100	.008	E					0.196
Shallow Concent'd		150	.008	P					0.023
Open Channel		1050						4	0.073
Time of Concentration =									0.29*
=====									

--- Sheet Flow Surface Codes ---

- | | |
|--------------------------|------------------|
| A Smooth Surface | F Grass, Dense |
| B Fallow (No Res.) | G Grass, Burmuda |
| C Cultivated < 20 % Res. | H Woods, Light |
| D Cultivated > 20 % Res. | I Woods, Dense |
| E Grass-Range, Short | J Range, Natural |

- Shallow Concentrated ---
 --- Surface Codes ---
 P Paved
 U Unpaved

* - Generated for use by TABULAR method

Project : CHARLESTON NAVAL ANNEX
 County : CHARLESTON
 Subtitle: POST DEVELOPMENT

State: SC

User: THH
 Checked: _____

Date: 02-26-97
 Date: _____

Total watershed area: 0.102 sq mi Rainfall type: III Frequency: 10 years
 ----- Subareas -----

MAIN
 Area(sq mi) 0.10*
 Rainfall(in) 6.8
 Curve number 85*
 Runoff(in) 5.06
 Tc (hrs) 0.29*
 (Used) 0.30
 TimeToOutlet 0.00
 Ia/P 0.05
 (Used) 0.10

Time (hr)	Total Flow	Subarea Contribution to Total Flow (cfs)
		MAIN
11.0	13	13
11.3	16	16
11.6	23	23
11.9	43	43
12.0	64	64
12.1	93	93
12.2	148	148
12.3	227	227
12.4	256P	256P
12.5	232	232
12.6	184	184
12.7	142	142
12.8	105	105
13.0	61	61
13.2	45	45
13.4	36	36
13.6	32	32
13.8	30	30
14.0	28	28
14.3	25	25
14.6	23	23
15.0	20	20
15.5	17	17
16.0	15	15
16.5	12	12
17.0	11	11
17.5	10	10
18.0	9	9
19.0	7	7
20.0	7	7
22.0	6	6
26.0	0	0

P - Peak Flow

* - value(s) provided from TR-55 system routines

STORAGE VOLUME FOR DETENTION BASINS

Version 2.00

Project : CHARLESTON NAVAL ANNEX
County : CHARLESTON State: SC
Subtitle: POST DEVELOPMENT

User: THH
Checked: _____

Date: 02-26-97
Date: _____

Drainage Area: .1015625 Sq miles Rainfall Frequency: 10 years
Rainfall-Type: III
Runoff: 5.1 inches
Peak Inflow: 256 cfs
Peak Outflow: 156 cfs
Detention Basin Storage Volume: 1.20 inches or 6.5 acre feet

RUNOFF CURVE NUMBER COMPUTATION

Version 2.00

Project : CHARLESTON NAVAL ANNEX
 County : CHARLESTON State: SC
 Subtitle: PRE DEVELOPMENT
 Subarea : MAIN

User: THH
 Checked: _____

Date: 02-26-97
 Date: _____

COVER DESCRIPTION	A	Hydrologic Soil Group		
		B	C	D
		Acres (CN)		

FULLY DEVELOPED URBAN AREAS (Veg Estab.)				
Open space (Lawns, parks etc.)				
Fair condition; grass cover 50% to 75%	18 (49)	-	-	-
Urban Districts Avg % imperv				
Commercial & business	85	17 (89)	-	-
Industrial	72	5 (81)	-	-
Residential districts Avg % imperv				
(by average lot size)				
1/8 acre (town houses)	65	25 (77)	-	-
Total Area (by Hydrologic Soil Group)		65		
		====		

 SUBAREA: MAIN TOTAL DRAINAGE AREA: 65 Acres WEIGHTED CURVE NUMBER: 73

Project : CHARLESTON NAVAL ANNEX
 County : CHARLESTON
 Subtitle: PRE DEVELOPMENT

State: SC

User: THH
 Checked: _____

Date: 02-26-97
 Date: _____

----- Subarea #1 - MAIN -----

Flow Type	2 year rain	Length (ft)	Slope (ft/ft)	Surface code	n	Area (sq/ft)	Wp (ft)	Velocity (ft/sec)	Time (hr)
Sheet	4.6	200	.008	E					0.342
Shallow Concent'd		1200	.008	P					0.183

Time of Concentration = 0.53*
 =====

--- Sheet Flow Surface Codes ---

- | | |
|--------------------------|------------------|
| A Smooth Surface | F Grass, Dense |
| B Fallow (No Res.) | G Grass, Burmuda |
| C Cultivated < 20 % Res. | H Woods, Light |
| D Cultivated > 20 % Res. | I Woods, Dense |
| E Grass-Range, Short | J Range, Natural |

- Shallow Concentrated ---
 --- Surface Codes ---
 P Paved
 U Unpaved

* - Generated for use by TABULAR method

Project : CHARLESTON NAVAL ANNEX
 County : CHARLESTON State: SC
 Subtitle: PRE DEVELOPMENT

User: THH Date: 02-26-97
 Checked: _____ Date: _____

Total watershed area: 0.102 sq mi Rainfall type: III Frequency: 10 years
 ----- Subareas -----

MAIN
 Area(sq mi) 0.10*
 Rainfall(in) 6.8
 Curve number 73*
 Runoff(in) 3.76
 Tc (hrs) 0.53*
 (Used) 0.50
 TimeToOutlet 0.00
 Ia/P 0.11

Time (hr)	Total Flow	Subarea Contribution to Total Flow (cfs) MAIN
11.0	8	8
11.3	10	10
11.6	13	13
11.9	20	20
12.0	26	26
12.1	36	36
12.2	53	53
12.3	81	81
12.4	119	119
12.5	150	150
12.6	156P	156P
12.7	148	148
12.8	126	126
13.0	82	82
13.2	54	54
13.4	38	38
13.6	30	30
13.8	26	26
14.0	23	23
14.3	20	20
14.6	18	18
15.0	16	16
15.5	14	14
16.0	12	12
16.5	10	10
17.0	9	9
17.5	8	8
18.0	7	7
19.0	6	6
20.0	5	5
22.0	4	4
26.0	0	0

P - Peak Flow * - value(s) provided from TR-55 system routines

APPENDIX D
BUILDING INVENTORY

Appendix D BUILDING INVENTORY

Building 2501

Building 2501 is an approximately 9,799-square foot concrete block and wood-sided building that was used as a mess hall/lounge. It is situated on concrete pilings driven to bedrock and has a shingle roof. The building has been used as a lounge/bar. The existing building was constructed in 1955. However, according to historical photographs, cleared land was noted in a 1941 aerial photograph. No heating or cooling is currently provided for Building 2501.

Building 2505

Building 2505 is a 4,680-square foot concrete block building with a shingled roof situated on a concrete slab floor. Building 2505 has been used as a vehicle maintenance shop since its construction in 1960. Numerous areas of stained soil were observed along the perimeter of the building as well as an associated parking lot. A multiple-substance AST system, containing used hydraulic motor oils, transmission fluid, and antifreeze is located inside Building 2505. As part of former operations, the building housed several waste oil 55-gallon drums, cans of paint, two hazardous substance lockers, and a degreasing tank that utilized various solvents. Only several cans of paint and thinners remain in the building. An oil/water separator system is located at Building 2505, consisting of an aboveground tank and three sumps with associated floor drains. A gravel parking lot and a vehicle maintenance and wash bay associated with Building 2505 has been designated as SWMU 161, Vehicle Maintenance Shop.

Several materials including paints, solvents, lubricating oils are stored in a portable trailer to the west/southwest of Building 2505.

Heating for Building 2505 is supplied via heat pump; cooling is provided by window units.

Building 2506

Building 2506 is an approximately 3,125-square foot wood-framed building constructed in 1955. The building is currently boarded up and has been condemned. The building was used as a barracks from the time of construction to its condemnation. According to aerial photographs, other facilities have existed on the site, but their uses are unknown. Heating for Building 2506 was formerly supplied by steam from the boilers in Building 2508, and cooling was provided by roof vents. The building is not currently equipped with heating equipment.

Building 2507

Building 2507 is an approximately 300-square foot concrete block facility constructed in 1969. The facility is currently vacant and locked. It has been used as a bath house for Facility 2552, a

swimming pool, since its construction. No heating or cooling is known to have ever been provided for Building 2501.

Building 2508

Building 2508 is an approximately 4,383-square foot concrete block and wood-framed facility constructed in 1955. The facility is currently vacant and locked. Building 2508 was designated as AOC 698, due to the presence of peeling lead-based paint on the interior and exterior of the facility, as well as an AST that is associated with the facility. AOC 698 will be discussed further in Section 5.2 of this report. Building 2508 has been used as a boiler house to heat buildings at the Naval Annex since its construction. Heat is provided by radiant by-product heat from boiler operations. No cooling is provided for facility 2508.

Building 2509

Building 2509 is an approximately 9,891-square foot facility constructed in 1963. It is constructed of steel and concrete and is eight stories high. It has four levels which all have steel floors. The facility was used as a radar tower and storage area for mine components from the time of construction until its closure. The facility is now vacant and locked. Building 2509 is listed as AOC 696 because of the transformers and UST associated with the facility. Heat was provided by steam from boilers on each level. No means of cooling the facility were provided.

Building 2511

Building 2511 is an approximately 1,750-square foot facility constructed in 1956. It is constructed on a concrete slab and has shingle siding and a shingle roof. The facility was used as an administrative building from the time of its construction until its closure. The facility is now vacant and locked. Heating and cooling are provided by a central heat pump unit.

Building 2513

Building 2513 is an approximately 3,480-square foot facility constructed in 1964. It is constructed on a raised concrete floor and has steel siding and a steel roof, with the exception of an office on the west side that is constructed of concrete blocks. The facility was used as an emergency power generation facility until it was acquired by the Navy in 1981. Since that time, it has been used as a storage area for mine components. The facility is now vacant and locked. Building 2513 is associated with SWMU 163, a concrete slab that formerly was a less than 90-day hazardous waste accumulation area. This area will be discussed later in Section 5 of this report. No means of heating and cooling are provided for this facility.

Building 2517

Building 2517 is a 4,850-square foot concrete block building situated on a concrete slab floor and was constructed in 1958. The building is presently used as administrative office space. Former usage of Building 2517 was limited to a recreation area. Prior to construction, the area appeared to have been open undeveloped land. No SWMUs or AOCs are associated with Building 2517.

Heating and cooling for Building 2517 is currently provided by an electric heat pump system. A boiler system was used for the building until 1993. A 2,000-gallon fuel oil UST was used to fuel the boiler system and is presently in place in Building 2517. The current status or condition of the tank is unknown.

Building 2520

Building 2520 is a 3,672-square foot concrete block structure constructed in 1959. The building has been used as a classroom and an infirmary since 1991. Prior to then, the building was reportedly used as barracks. No SWMUs or AOCs are associated with Building 2520. Heating for Building 2520 is provided via steam from an outside source. One central air-conditioning unit serves Building 2520.

Building 2521

Building 2521, built in 1962, is a 2,640-square foot concrete block structure with a tar and gravel roof. The building is currently used as an armory by the U.S. Marine Corps. Prior use of Building 2521 was reportedly barracks. No SWMUs or AOCs are associated with Building 2521.

Heating for Building 2521 is provided via steam from an outside source. One wall-mounted air-conditioning unit serves Building 2521.

Building 2522

Building 2522 is an approximately 1,008-square foot facility constructed in 1955. It is constructed on a concrete slab floor and has steel siding and a steel roof. The facility was used as a shed to house battery charging operations since its construction. The facility consists of an office area and the shed area. The facility is now vacant and locked. No means of heating and cooling are provided for the shed area, but the office area was once heated with a personal heater, and cooled with a window air conditioning unit. No means of heating or cooling are currently provided.

Building 2523

Building 2523 is a 2,020-square foot concrete block structure with a shingled roof. Building 2523 has been used as administrative office space since its construction in 1976. Prior to construction, the area was occupied by another facility, owned and operated by the U.S. Army during World War II. No further information is available on the facility previously located at the site. No SWMUs or AOCs are associated with Building 2523.

Heating for Building 2523 is provided via steam from an outside source. One central air-conditioning unit serves Building 2523.

Building 2524

Building 2524 is an approximately 9,636-square foot facility constructed in 1955. It is constructed on a concrete slab floor and has steel siding and a steel roof. The facility was used as an operations building until it was acquired by the Navy in 1981. Since that time, it has been used as

a supply depot and mine components testing area. The facility is now vacant and locked. Heating was provided by three boilers, and cooling was provided by large air conditioning units.

Building 2525

Building 2525 is an approximately 1,091-square foot facility constructed in 1955. It is constructed on a concrete slab floor and has clapboard siding and a steel roof. The facility was used as the crew lounge after its acquisition by the Navy in 1981. Prior to that, it was used as a supply office. The facility is now vacant and locked. A dining hall was previously located on the site of Building 2525. The dining hall was demolished between 1971 and 1977. Heating was provided by a wall-mounted electric heater, and cooling was provided by two window-mounted air conditioning units.

Building 2530

Building 2530 is an approximately 1,008-square foot facility constructed in 1956. It is constructed on a concrete slab floor covered with vinyl tile and has steel siding and a steel roof. The facility was used for storage of lawn maintenance equipment. The facility is now vacant and locked. Heating and cooling was not provided to Building 2530.

Building 2532

Building 2532 is an approximately 320-square foot facility constructed in 1960. It is constructed on a concrete slab floor and has steel siding and a steel roof. The facility was constructed for use as a boiler plant and was also used as a paint storage building. The facility is now vacant and locked. Heating and cooling were not provided to Building 2532.

Building 2533

Building 2533 is a 2,447-square foot concrete block building built in 1955. The building has been used for food storage and formerly a galley since its construction. An underground grease sump formerly used during galley operations is located immediately west of the building. No SWMUs or AOCs are associated with Building 2533.

Heating for Building 2533 is provided by an electric boiler; cooling is provided by an electric air-conditioning system.

Building 2535

Building 2535 is an approximately 35-square foot facility constructed in 1971. It is constructed on a concrete slab floor and concrete block walls. The facility was used for a water treatment facility and provided access to the water main serving the Naval Annex. The facility is now vacant and locked. Heating and cooling were not provided to Building 2535.

Building 2536

Building 2536 is an approximately 8,280-square foot, two-story facility constructed in 1988. It is constructed on a concrete slab floor covered with tile and concrete walls. The facility was used for

an administrative office. The facility is now vacant and locked. Heating was provided by natural gas heaters, and cooling was provided by central air conditioning units located on the roof. A large grassy mound is associated with this building on the west side of the building. Further investigation of the mound is recommended since its contents are unknown.

Facility 2550

Facility 2550 is a 7,200-square foot basketball court constructed in 1957, improved in 1970, and resurfaced in 1991. The facility is an asphalt-covered court with one goal at each end. No heating or cooling is provided for this facility.

Facility 2552

Facility 2552 is a former swimming pool that was constructed in 1959. The facility was always used as a swimming pool until it was filled with soil sometime in the past. No heating or cooling is provided for this facility.

Facility 2553

Facility 2553 is a 60,000-square foot soccer field constructed in 1965. The facility is a grassy field with one goal at each end. Facility 2553 is the location of a former sludge drying field used for the dewatering of wastewater treatment sludge from an Air Force operated sewage treatment plant. The period of operation of the unit could not be determined; however, the unit was transferred to MOMAG 11 in the 1960s and has not been operated during the period of Naval control. No information has been found indicating whether dewatered sludge has ever been removed from the unit. The sludge drying field has been designated as SWMU 162, which will be investigated as part of the Zone K investigation described in Section 5.2 of this EBSL. No heating or cooling is provided for this facility.

Facility 2555

Facility 2555 is the entrance sign to the Naval Annex compound, built in 1965, and improved in 1980. The facility consists of a brick base and a wooden frame. Previously, a metal sign was attached to the frame identifying the Naval Annex; this has recently been removed. No heating or cooling is provided for this facility.

Building 2556

Building 2556 is an approximately 16,731-square foot facility constructed in 1983. It is constructed on a concrete slab floor and has steel siding and a steel roof. The facility has been used for the refurbishment of mines since its construction. The facility is now vacant and locked. Building 2556 contains SWMU 164, a blasting booth and an AST. Heating was provided by boilers, and cooling was provided by ceiling fans and vents.