AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES
J	1 of 14

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
4	15-Aug-2003	W58XUW-2301-9390	

6. ISSUED BY CODE

US Army Corps of Engineers, Kansas City District
760 Federal Building, 601 East 12th Street
Kansas City, Missouri 64106-2896

7. ADMINISTERED BY *(If other than item 6)* CODE

8. NAME AND ADDRESS OF CONTRACTOR *(No.,street, county, State and ZIP Code)*

CODE FACILITY CODE

(x) X

9a. AMENDMENT OF SOLICITATION NO.
DACA41-03-R-0002

9B. DATED *(SEE ITEM 11)*
3/7/2003

10A. MODIFICATION OF CONTRACT/ORDER NO.

10B. DATED *(SEE ITEM 13)*

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

[ ] The above number solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers [X] is extended, [ ] is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitaiton or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning_____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegraph which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS,
IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(x) A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

B. THE ABOVE NUMBER CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF:

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

D. OTHER *(Specify type of modification and authority)*

E. IMPORTANT: Contractor [ ] is not, [ ] is required to sign this document and return copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

Replace Family Housing
Whiteman Air Force Base, Missouri
The Solicitation is amended in accordance with the attached pages.
Offers will be received until 1:00 p.m., local time, 2 September 2003, in Rm 760 Federal Building,
601 E. 12th Street, Kansas City, Missouri 64106-2896.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*		16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*	
15B. CONTRACTOR/OFFEROR _____ *(Signature of person authorized to sign)*	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY _____ *(Signature of Contracting Officer)*	16C. DATE SIGNED

SUMMARY OF CHANGES

Following is a summary of changes provided to facilitate location of changes. Changes indicated in bold lettering within this summary have been incorporated into the appropriate sections with typical underline indications. All portions of sections apply whether or not changes have been indicated. Autocad drawing changes have not been incorporated into existing files, but are provided in a separate folder to be accessed through your browser.

Amendment 0004

The Solicitation is amended in accordance with the following.

Proposal Receipt Date is changed. Sealed offers are due by 1:00 p.m., local time, Tuesday 2 September 2003, Room 760 Federal Building, 601 E. 12th Street, Kansas City, Missouri 64106-2896.

The times for the oral presentations (refer to Section 00110 5.2.9) were determined by lot, and shall be as follows:

Tuesday 2 September 2003
2:00 p.m. to 3:00 p.m. – Weis Builders, Inc.

Wednesday 3 September 2003
9:00 a.m. – 10:00 a.m. – Joseph J. Henderson & Son, Inc.
10:30 a.m. – 11:30 a.m. – Barsto Builders LLC
12:30 p.m. – 1:30 p.m. – Evergreene Construction
2:00 p.m. – 3:00 p.m. – Turner Construction Company

Clarification to information provided in Amendment 0003

The following change is made narratively (bold letters indicate change):

> The following paragraph is added to Section 00100: The Government **has obtained clear title to the property** ~~is involved in final stages of purchasing the land~~ where this project is located (area depicted for new construction on the land use plan). **A property description is included herewith in PDF format.** ~~Access to the property for any purpose has been granted the Government in an agreement executed between the owners and the Government. However, the award of this contract will not occur until such time as the Government obtains clear title to the property.~~

Modifications to material provided in Amendment 0002

1. AMENDMENT 0002, PAGE TC-1 – TABLE OF CONTENTS
   a. Change the title of Section 01000 from "Scope of Work" to "General Design and Construction Requirements."
   b. Section 01010 issued 7 March 2003 is deleted and is not part of the contract.

2. AMENDMENT 0002, PAGE TC-3 – TABLE OF CONTENTS
   Add to the list of appendices the following:

   APPENDIX J: Design Analysis – Existing and New Site Utility Systems
   APPENDIX K: Information on Monitoring Wells at Site DP-32
   APPENDIX L: Legal Description of Property

3. AMENDMENT 0002, PAGE D-1 – DIVISION 1 – GENERAL
   Revise "D-1" divider page, copy attached.

4. AMENDMENT 0002, SECTION 01000 – GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS, PART 1 – DESIGN AND CONSTRUCTION OBJECTIVES
   a. Second paragraph under "1.1 SCOPE OF WORK" is modified as follows (bold letters indicate change):

      The work of the first Task Order (FY 03) consists of the demolition of 62 existing units (typically duplex configuration; see photos attached to Part 1, herein) and construction of 92 new three bedroom units. The work of Option 1 (FY 04) consists of the demolition of an additional 100 existing units, and construction in another area of the Base of ~~90 new three bedroom and 10~~ **84** new four bedroom units. The site for the housing to be construction under the first Task Order (FY 03) and under Option 1 (FY 04) will be made available to the Contractor upon award in accordance with requirements given elsewhere in this Solicitation. Refer to Part 4 for location of the new units.

   b. Paragraph 1.2.3 ACCESSIBLE UNITS is modified as follows (bold letters indicate change):

      Refer to Part 9 for requirements and standards of design and construction for exterior and interior accessibility. In Task Order No. 1 (FY03), five 3-bedroom units shall be single-story ground floor units with special accessibility features. In Option No. 1 (FY04) five ~~3-bedroom~~ **4-bedroom** units shall be single story ground floor units with special accessibility features. ~~Also in Option No. 1 (FY04), one or two 4-bedroom unit shall be single-story ground floor units with special accessibility features.~~ Each of these five FY03 and ~~six or seven~~ **five** FY04 units designated as accessible shall be designed and built in such a way that they may be easily and readily modified to accommodate physically challenged occupants at time of occupancy. Design of adaptable housing units shall conform to the Uniform Federal Accessibility Standards (UFAS) and American Disabilities Act (ADA). Adaptable housing units shall be well dispersed throughout the development and shall not be grouped or clustered so as to create segregated pockets within the housing community.

   c. Add subparagraph p) to paragraph 1.2.5 DEMOLITION as follows (bold letters indicate change):

      p) Environmental monitoring wells exist near some of the houses to be demolished in the Midland neighborhood. Appendix K "Information on Monitoring Wells at Site DR-32" is provided for additional information. The Contractor is requested not to disturb any of these monitoring wells. If during design and construction, the Contractor determines that any of these monitoring wells may need to be disturbed, the Contractor shall contact the Base Civil Engineering Environmental Section. The Contracting Officer will provide specific contact information as necessary.

   d. Delete incorrect "Figure 4.3.1, Conceptual Land Use Plan" that follows the "Options Diagram, FIG. 1.2.4" at the end of Part 1 [page 84 of 1877 in the PDF document]. It is in conflict with the correct "FIG. 4.3.1" that follows at the end of Part 4 [page 125 of 1877 in the PDF document].

5. AMENDMENT 0002, SECTION 01000 – GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS, PART 1 – DESIGN AND CONSTRUCTION OBJECTIVES
   a. Revise "TABLE 1-1 – HOUSING UNITS," copy attached.
   b. Under paragraph "1.2.5 DEMOLITION," revise the names of the neighborhoods in the listing of units to be demolished (by address) in subparagraph a), copy of listing attached.

6. AMENDMENT 0002, SECTION 01000 – GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS, PART 4 – SITE
   a. Last paragraph under "4.3.2 LAND USE / PLANNING" is modified as follows (bold letters indicate change):

The Development Plan should provide for 250 to 300 housing units phased for build out of the Development Area, 92 built under the FY03 Task Order and ~~100~~ **84** built under the Option 1, FY04 portion of this task order. The Offeror shall submit neighborhood site plans for both the FY03 Development Area and the FY04 Development Area, each subject to the detailed Neighborhood Design Standards (Section 4.3.4) and submittal requirements in Section 4.4.2. of this RFP. The Development Plan shall also demonstrate that detailed Neighborhood Design Standards (Section 4.3.4) will be able to be met in each subsequent FY task order shown in the Offeror's Development Plan.

b. Paragraph 4.3.4 NEIGHBORHOOD DESIGN is modified as follows (bold letters indicate change):

Offerors shall submit a neighborhood site design plan, subject to the submittal requirements of Section 4.5.2., for the FY03 development area and the FY04 development area. The FY03 site plan shall include 92 housing units and the Option 1, FY04 site plan shall include ~~100~~ **84** housing units. The neighborhood design is comprised of 4 distinct zones, which are part of each housing site. Each zone has separate goals and design standards. These zones are: (1) the Community Zone; (2) the Streetscape Zone; (3) the Private Zone; and (4) the Common Zone (optional). These areas should be designed to create a smooth transition from the public realm to the private realm. The following sections have a description, the goals, and design standards for each zone.

c. Last paragraph under "4.3.4.1 COMMUNITY ZONE" entitled "Standards and Guidelines, Utility Area" is modified as follows (bold letters indicate change):

Utility Area. A ~~15-foot~~ **16-foot** wide utility easement shall be located in the Community Zone to locate water, gas, and sanitary sewer facilities. The preferred location is on one side of the street without sidewalks, immediately behind the back of curb. In the case where the Betterment for sidewalks on both sides of the street is provided, the easement shall be in the planting strip (and under the sidewalk if necessary) on either side of the street.

d. Paragraph under "4.3.4.3 PRIVATE ZONE" entitled "Standards and Guidelines, Side Building Separation" is modified as follows (bold letters indicate change):

Side building separation: Buildings along a single block shall be separated by at least 16 feet. In cases where drainage swales are required for proper drainage between sides of buildings, buildings shall be separated by at least 20 feet with the centerline of the swale located in the center of the side separation.

At a street intersection, the side separation from the building to the back of curb of the street shall be at least 20 feet.

The side separation along a single block should generally not exceed the front setback.

Designs, materials, and window locations on side facades shall ensure privacy within units, but should avoid large expanses of blank walls.

e. Paragraph under "4.3.4.3 PRIVATE ZONE" entitled "Standards and Guidelines, Rear Building Separation" is modified as follows (bold letters indicate change):

Rear building separation: Buildings shall maintain a minimum rear separation of 100 feet from the rear of another building or the back of the curb of another street. This separation may include ~~"no build"~~ **"no housing" and "no work"** areas shown on Figure 4.3.1 – Conceptual Land Use Map. Patios and fenced yards may encroach into the rear separation but not into a ~~"no build"~~ **"no housing" or a "no work"** area.

f. Last Paragraph under "4.3.4.3 PRIVATE ZONE" entitled "Standards and Guidelines, Utility Location" is modified as follows (bold letters indicate change):

> Utility location: A 20-foot utility easement shall be located in the Private Zone for electric, telephone, and cable ~~facilities~~ **routings**. This easement may be allocated equally between ~~the Private Zone or rear adjacent units~~ **adjacent rear yards of buildings**. As an alternative, this utility easement may be located in a Common Interior ~~Zone where provided~~ **Zone, where a Common Interior Zone is provided**.

g. Paragraph 4.5.2 NEIGHBORHOOD SITE DESIGN PLAN is modified as follows (bold letters indicate change):

- ❑ Prepare plan(s) drawn to scale of 1"= 100' or larger and including north arrow and graphic scale for the FY03 (92 Units) and FY04 (~~100~~ **84** Units) project sites.
- ❑ Name of the project, Offeror, and the date of the plan.
- ❑ Show boundaries ~~with dimensions and written legal description~~ of site**, with dimensions and written legal description optional**.
- ~~❑ Note on plan boundary of 100-year regulatory flood plain and floodway.~~
- ❑ Location of Public right-of-ways adjacent to the property.
- ❑ Location of all easements on the property.
- ❑ Show building locations with floor plan or building type designation.
- ❑ List the type, thickness, location and width of all pavement surfaces, show a "typical" detail for all driveways, walkways, trails and residential and through streets.
- ❑ Dimension typical distances between buildings, setback from streets, street widths, sidewalks, and driveways.
- ❑ Show location, height and material of any and all screen walls, retaining walls and fences.
- ❑ Show direction and height and location of all proposed street and pedestrian lighting facilities.
- ❑ Show the proposed location, dimensions, color, materials, and elevation of any exterior signs.
- ❑ Show the location of all other improvements to be built under the particular task order.

7. AMENDMENT 0002, SECTION 01000 – GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS, PART 4 – SITE
Add Figure 4.3.2, copy attached.

8. AMENDMENT 0002, SECTION 01000 – GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS, PART 5 – SOILS AND SUBSURFACE CONSIDERATIONS
Add a third paragraph under "5.1 SOILS REPORT AND SUPPLEMENT (GEOTECHNICAL REPORT" as follows:

In the Attachments, the geotechnical reports prepared by PSI are provided for information only. The Contractor shall follow Corps of Engineer geotechnical report recommendations.

9. AMENDMENT 0002, SECTION 01000 – GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS, PART 6 – GRADING, STORM DRAINAGE, AND EROSION CONTROL
   a. Paragraph 6.1.5 HOUSE FLOOR ELEVATION is modified as follows (bold letters indicate change):

      Finished floor elevations shall be set to ensure that the required minimum and maximum grades are met. Provide for a minimum of eight (8) inches of exposed concrete foundation wall above finish grade, except where entrances, particularly front entrances to accessible units, may require less foundation exposure directly at entrance. Refer to Part 10 for additional requirements for dimensions relating to foundation walls, finish grade and finish floor elevations. Provide minimum eighteen (18) inch difference between finish grade and front porches of non-accessible units, as well as between finish floor and the rear patio. In no case, shall the difference between finished floor elevation and finished grade be less than ~~twenty-five (25)~~ **twenty-four (24)** inches. Surface drainage shall flow away from each building. **No standing water is allowed.** If a drainage swale is located between buildings the swale shall be centered between buildings with the centerline no closer than ten (10) feet to either building foundation. Drainage swale(s) will not be permitted in the front yard of buildings. If a drainage swale is located in the rear yard of a building, the centerline of the swale shall be no closer than forty (40) feet to the face of a foundation wall. Refer to Part 4, Site, for additional criteria regarding the siting and separation of buildings. Roof drains shall be directed onto splash blocks to prevent water that runs off the roofs from eroding the soil in planter areas around the house foundations. Refer to Part 9, Housing Unit Design / Construction, for additional information regarding roof drains. Ensure that foundation planting beds are designed to positively drain so that water will not pond next to the foundations.

   b. Paragraph a. under "6.1.6 GRADES AWAY FROM HOUSES" is modified as follows (bold letters indicate change):

      Minimum of ~~ten percent (10%) (10:1)~~ **five percent (5%) (20:1)** for the first eight (8) ~~feet~~ **feet, in unpaved areas.**

   c. Paragraph a. under "6.1.7 OVERLOT GRADES" is modified as follows (bold letters indicate change):

      Minimum two percent (2%) (50:1) for unpaved areas **more than eight (8) feet from the housing unit.**

   d. Add a second paragraph regarding storm drainage under "6.2.1 GENERAL" as follows:

      Appendix J: Design Analysis – Existing and New Site Utility Systems, dated 14 July 2003, is intended to provide reference material regarding utility design for the Development Area for use by the Offeror in preparing the Offer. Any errors identified shall be brought to the attention of the Contracting Officer immediately for resolution and direction. The Contractor shall take all professionally prudent and reasonable actions to verify the accuracy of the data provided. During design and construction, the Contractor shall, with his or her professional consulting engineers, be responsible for obtaining any additional data necessary for the execution of this project.

   e. Add an additional paragraph under "6.2.3.1 DESIGN STORM RETURN FREQUENCIES" as follows:

For the design of cross-road culverts on the Base, the maximum allowable headwater elevation shall be a minimum of 1 foot below the centerline elevation of the roadway, in accordance with Missouri Department of Transportation (MoDOT) Standard Specifications and Details.

10. AMENDMENT 0002, SECTION 01000 – GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS, PART 7 – LANDSCAPE
Second sentence under "7.3.2 STREETSCAPE ZONE" is modified as follows (bold letters indicate change):

Reference ~~section 4.3.4.1~~ **sections 4.3.4.1 and 4.3.4.2** for acceptable locations.

11. AMENDMENT 0002, SECTION 01000 – GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS, PART 8 – SITE UTILITIES
Add a second paragraph under "8.1.1 SITE UTILITIES DESCRIPTION" as follows:

Appendix J: Design Analysis – Existing and New Site Utility Systems, dated 14 July 2003, is intended to provide reference material regarding utility design for the Development Area for use by the Offeror in preparing the Offer. Any errors identified shall be brought to the attention of the Contracting Officer immediately for resolution and direction. The Contractor shall take all professionally prudent and reasonable actions to verify the accuracy of the data provided. During design and construction, the Contractor shall, with his or her professional consulting engineers, be responsible for obtaining any additional data necessary for the execution of this project.

12. AMENDMENT 0002, SECTION 01000 – GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS, PART 8 – SITE UTILITIES
    a. Revise Figure 8.1.2 "Schematic of Utility Easement," copy attached.
    b. Revise Figure 8.4.3.3 "Schematic of Water Line Requirements," copy attached.
    c. Revise Figure 8.5.6 "Schematic of Sanitary Sewer Lateral Requirements," copy attached.
    d. Revise Figure 8.7.1 "Schematic of Gas Service Line Requirements," copy attached.

13. AMENDMENT 0002, SECTION 01000 – GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS, PART 9 – HOUSING UNIT DESIGN / CONSTRUCTION
    a. Paragraph 9.10.1 BATHROOMS is modified as follows (bold letters indicate change):

Emphasis shall be placed on size, fixtures, layout, and privacy. Direct access to a bathroom from the master bedroom is required for three bedroom and four bedroom units. Compartmented ~~bath~~ **bathroom** design, ~~for family and guest use,~~ **both for use by family and guests,** is encouraged. Determine the number of bathrooms based on Table 9-8. Minimum door widths for bathrooms shall be 2'-6". Door widths for units designated for potential use by persons with disabilities, shall conform to accessibility standards. In the shared or family bath, lavatory vanities ~~shall~~ **are required to** be separate from the tub/water closet area **(except in designated accessible units)**. ~~Provide at least one bathroom compartment that has no wall common with the exterior of the unit. It is desirable for this compartment to be on the main level of the unit.~~

    b. Paragraph 9.10.1.2 ACCESSORIES is modified as follows (bold letters indicate change):

Bathroom accessories shall be non-corroding metal or ceramic tile, and shall consist of a **surface-mounted or** recessed toilet paper holder, **surface-mounted or** recessed combination soap dish and grab bar at tub/shower stall, two bathrobe hooks and two towel bars, totaling not less than 42 inches for a full bath, or one or two bars not less than 30 inches for a half bath. A non-corrosive shower curtain rod is required. There shall be

a mirror the whole width of the lavatory vanity. The top of the mirror shall be at 7'-0" above finish floor. A medicine cabinet shall be provided on a side wall in each bathroom. Medicine cabinets shall be the hinged door type, located on side wall adjacent to mirror, and shall be recessed. Do not place in a party wall.

c. Paragraph 9.13.1 SIDING is modified as follows (bold letters indicate change):

Siding with a high quality appearance is required. In addition, siding shall have a minimum non-prorated 10-year warranty on the finish. Siding shall be kept a minimum of 6 inches above finish grade. ~~Siding shall be either single pieces with maximum width course or single pieces shaped to simulate width courses between 6 and 8 inches.~~ Siding shall be installed in accordance with manufacturer's recommendations. A manufacturer's representative shall instruct the installer of the siding, appurtenances, and accessories as to the manufacturer's required installation procedures. The Government construction inspectors responsible for the job shall be included in their instruction. Panel materials in large surfaces shall be avoided unless surfaces are broken with textures or battens. Battens for prefinished materials shall also be factory finished. **Siding with a clapboard or lap appearance shall be either single pieces with maximum width course between 6 and 8 inches, or single pieces shaped to simulate width courses between 6 and 8 inches.** Refer to Part 3 for guidance on exterior wall construction for energy conservation and sustainability. The following siding materials are to be used:

- Portland Cement siding in a variety of styles, such as manufactured by James Hardie Building Products
- Masonry veneers of brick, stone, or cast stone (such as manufactured by Eldorado, Coronado or Owens Corning).

14. AMENDMENT 0002, SECTION 01000 – GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS, PART 11 – UNIT DESIGN-PLUMBING
In the Index on page 1, item 11.10.1 should read, "~~Future~~ Utility Sink."

15. AMENDMENT 0002, SECTION 01000 – GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS, PART 14 – UNIT DESIGN-ELECTRICAL
a. Paragraph 14.9.2 INTERIOR WIRING is modified as follows (bold letters indicate change):

All telephone system wiring shall be Category 5 cable or better, concealed, home run style from telephone distribution box in mechanical room to each telephone jack location. Provide one telephone jack with two-line capability (voice and data) in each of the following rooms: family room, living room, kitchen, and all bedrooms. Required telephone and television jacks shall be collocated. In addition, provide ~~5~~ **two (2)** more jacks with two-line capability. During the design phase after award, the Government will provide the successful contractor with a location layout for all jacks within each different unit.

b. First paragraph under "14.10.2 INTERIOR WIRING" is modified as follows (bold letters indicate change):

Provide one flush-mounted cable television jack in each of the following rooms: family room, living room, kitchen, and all bedrooms. In addition, provide ~~5~~ **two (2)** jacks. During the design phase after award, the Government will provide the successful contractor with a location layout for all jacks within each different unit. All cable television system wiring shall be concealed, home run style from cable television system distribution box to each individual television jack location. Each cable shall be provided with an appropriate tag, inside the terminal box, showing housing unit number and outlet location (e.g. Unit 2, family room north). Required telephone and television jacks shall be collocated.

16. AMENDMENT 0002, SECTION 01100 – GENERAL
The second to the last sentence in paragraph 1.47.4 ENTRY TO WHITEMAN AIR FORCE BASE is modified as follows (bold letters indicate change):

> Contractor is responsible for collection of Base passes ~~form personcel~~ **from personnel** and subcontractors ~~personell~~ **personnel** when they **no** longer require ~~enrty~~ **entry** to the ~~base~~ **Base**.

17. AMENDMENT 0002, SECTION 01312 – QUALITY CONTROL SYSTEM (QCS)
Paragraph 1.3 SYSTEM REQUIREMENTS is modified as follows (bold letters indicate change):

> The following listed hardware and software is the minimum system configuration that the Contractor shall have to run QCS:
>
> Hardware
>
> IBM-compatible PC with ~~200~~ **700** MHz Pentium or higher processor
> ~~32+~~ **125+** MB RAM
> ~~4 GB~~ **8 GB** hard drive disk space for sole use by the QCS system
> 3 1/2 inch high-density floppy drive
> Compact disk (CD) ~~Reader~~ **Reader/Writer**
> **17-inch+** Color monitor
> Laser printer compatible with HP LaserJet III or better, with minimum 4 MB installed memory.
> **DSL** Connection to the Internet~~, minimum 28 BPS~~
> **Surge and Fault protection**
>
> Software
>
> MS Windows ~~95~~ **2000** or newer version operating system (MS Windows NT 4.0 or newer is recommended)
> Word Processing software compatible with MS Word ~~97~~ **2000** or newer
> Internet **Explorer** browser
> The Contractor's computer system shall be protected by virus protection software that is regularly upgraded with all issued manufacturer's updates throughout the life of the contract.
> Electronic mail (E-mail) compatible with MS Outlook

18. AMENDMENT 0002, SECTION 01320A – PROJECT SCHEDULE
    a. Paragraph 3.1 GENERAL REQUIREMENTS is modified as follows (bold letters indicate change):

> Pursuant to the Contract Clause, SCHEDULE FOR CONSTRUCTION CONTRACTS, a Project Schedule as described below shall be prepared. The scheduling of ~~construction~~ **the project (design and construction)** shall be the responsibility of the Contractor. Contractor management personnel shall actively participate I its development. Subcontractors and suppliers working on the project shall also contribute in developing and maintaining an accurate Project Schedule. The approved Project Schedule shall be used to measure the progress of the work to aid in evaluating time extensions, and to provide the basis of all progress payments. **Construction NTP will not be issued until the project schedule is approved.**

    b. The title of paragraph 3.3.2.3 is modified as follows (bold letters indicate change):

> 3.3.2.3 ~~Critical~~ **Required** Activities

19. AMENDMENT 0002, SECTION 01332 – SUBMITTALS DURING DESIGN
    a. Add to the end of the list of "Submittal Items" under paragraph 3.6.1.1 SUBMITTAL ITEMS the following (bold letters indicate change):

       Design Document Submittals - DesDoc

    b. Add subparagraph c) to paragraph 3.7 REVISION TO THE ACCEPTED DESIGN as follows (bold letters indicate change):

       (c) Captured Lessons Learned: Contractor shall keep a list of lessons learned, modifications, RFI's, as-built conditions and field adjustments to the final design. After each turnover of a set of units to the government the list shall be provided to and reviewed with the Government for identification of items to be incorporated in future units and designs. The list shall have an item number, description, method of generation, and any notes associated with each item.

20. AMENDMENT 0002, SECTION 01500A – TEMPORARY CONSTRUCTION FACILITIES
    a. Paragraph 1.6.1 ACCOMMODATIONS FOR GOVERNMENT INSPECTORS is modified as follows (bold letters indicate change):

       The Contractor shall provide the Government Inspectors with an office, approximately 19 square meters in floor area, located where directed and providing space heat, air-conditioning, adequate electric lighting and power, drinking water facilities, and toilet facilities consisting of one lavatory and one water closet complete with connection to water and sewer mains. **The Contractor shall provide for Government use the same computer system and equipment as listed in Section 01312A Paragraph 1.3, including a dedicated DSL connection for the Government computer system.** The office shall be furnished with one legal size filing cabinet with four drawers, one drafting table with stool one plan rack, one desk, and three chairs. Used furniture, in good condition, will be acceptable. Entrance doors shall be equipped with a substantial lock. The contractor shall provide janitor service, fuels for the heating facilities, electricity, two telephone lines **(in addition to DSL)** and water, all at no cost to the Government, except the Contractor will not be liable for Government long-distance calls. A mail slot in the door or a lockable mail box mounted on the surface of the door shall be provided. At completion of the project, the office shall remain the property of the Contractor and shall be removed from the site. Utilities shall be connected and disconnected in accordance with local codes and to the satisfaction of the Contracting Officer. ~~When the location of work move from the Midland housing area to the Woodside housing area, the Contractor shall be responsible for relocating the Accommodations for government inspectors to the Woodside site.~~

    b. Paragraph 1.8 TEMPORARY PROJECT SAFETY FENCING is modified as follows (bold letters indicate change):

       As soon as practicable, but no later than 15 days after the date established for commencement of work, the Contractor shall furnish and erect temporary project safety fencing at the work site. The safety fencing shall consist of high visibility orange colored, high density polyethylene grid or approved equal, a minimum of 1.1 m high, steel posts, and two tension wires, top and bottom. The fence fabric shall be supported and tightly secured to steel posts, located on maximum 3 m centers, and the top and bottom tension wires, located 6 inches above grade and 6 inches below top of fabric, constructed at the approved location. **During phasing, the temporary fencing which also acts as the secure Base perimeter fencing shall be a Class B security fence consisting of steel "T" posts with four feet exposed, five strands of barbed wire, and appropriate warning signs. One barbed wire shall be 3 inches above ground, one**

shall be 3 inches below top of posts, and the other three evenly spaced between them. Secure each barbed wire to each of the posts. Contractor shall reconfigure fencing to match phased turn over of units. The ~~safety~~ fencing shall be maintained by the Contractor during the life of the contract and, upon completion and acceptance of the work, shall become the property of the Contractor and shall be removed form the work site.

21. AMENDMENT 0002, SECTION 01525 – SAFETY AND OCCUPANCY HEALTH REQUIREMENTS
    a. Paragraph 1.2 SD-01 PRECONSTRUCTION SUBMITTALS is modified as follows (bold letters indicate change):

       Accident Prevention Plan (APP); G
       Activity Hazard Analysis (AHA); G
       Crane Critical Lift Plan: G
       Temporary Facilities and Electrical Layout; G

    b. Add Paragraph 1.15 entitled "TEMPORARY FACILITIES AND ELECTRICAL LAYOUT" as follows (bold letters indicate change):

       Contractor shall provide plan layout of temporary construction facilities 30 days prior to setup of facilities. Plans shall include all facilities for personnel or material storage temporary electrical distribution and connections. Plans shall be in detail to allow for appropriate response of emergency services and in accordance with EM 385-1-1.

22. AMENDMENT 0002, SECTION 01780A – CLOSEOUT SUBMITTALS
    a. Paragraph 1.1 SD-02 SHOP DRAWINGS is modified as follows (bold letters indicate change):

       As-Built Drawings; G-RE
       Drawings showing final as-built conditions of the project. The final CADD as-built drawings shall consist of one set of electronic CADD drawing files in the specified format, ~~one set of mylar drawings,~~ 2 sets of ~~blue-line~~ prints ~~of the mylars~~ **from the drawing files**, and one set of the approved working as-built drawings.

       As-Built Specifications; G-RE
       Specifications showing the final as-built conditions of the project shall be provided. The final Specifications shall incorporate all modifications, clarifications, and lessons learned incorporated into the project. One set of electronic specifications, in the format specified, and 4 sets of printed specifications shall be provided.

    b. Paragraph 1.2.3 FINAL APPROVED SHOP DRAWINGS is modified as follows (bold letters indicate change):

       The Contractor shall furnish final approved project shop drawings **and final approved as-built specifications** 30 days after transfer of the completed facility.

    c. In Paragraph 1.3.1 and all its subparagraphs, all references to "4 month and 9 month warranty" shall be changed to "5 month and 10 month warranty."

    d. In Paragraph 1.3.4 CONTRACTOR'S RESPONSE TO CONSTRUCTION WARRANTY SERVICE REQUIREMENTS, modify subparagraphs a, b, c, and d as follows (bold letters indicate change):

       a. First Priority Code 1. Perform onsite inspection to evaluate situation, and determine course of action within ~~4 hours~~ **2 hours and take steps to mitigate any additional**

property or building damage, initiate work within ~~6 hours~~ **4 hours** and work continuously to completion or relief.

b. Second Priority Code 2. Perform onsite inspection to evaluate situation, and determine course of action within 8 hours **and take steps to mitigate any additional property or building damage**, initiate work within 24 hours and work continuously to completion or relief.

c. Third Priority Code 3. All other work to be initiated within 3 work days and work continuously to completion or relief.

d. The "Construction Warranty Service Priority List" is as follows:

Code 1-Air Conditioning Systems
~~(1) Recreational support.~~
(1) Air conditioning leak in part of building, if causing damage.
(2) Air conditioning system not cooling properly**, during cooling seasons.**
.
Code 1-Doors
(1) Overhead **garage** doors not operational, causing a security, fire, or safety problem.
(2) Interior, exterior personnel doors or hardware, not functioning properly, causing a security, fire, or safety problem.

Code 3-Doors
(1) Overhead **garage** doors not operational.
(2) Interior/exterior personnel doors or hardware not functioning properly.

Code 1-Electrical
(1) Power failure ~~(entire area or any building operational after 1600 hours)~~ **(to entire unit, or to primary electrical heating of a unit during heating seasons, or if causing safety or fire hazard).**
(2) Security lights.
(3) Smoke detectors **(failure of detector not loss of battery).**
(4) CO detectors (failure of detector not loss of battery).
(5) Receptacle and lights (causing a safety or fire hazard).

Code 2-Electrical
(1) Power failure (no power to a room or part of building).
(2) Receptacle and lights (in a room or part of building**, unless causing a safety or fire hazard**).

Code 3-Electrical
Street lights.

Code 1-Gas
(1) ~~Leaks~~ **Any leaks** or breaks
(2) No gas to family housing unit ~~or cantonment area.~~

Code 1-Heat
~~(1)~~ Area power failure affecting heat.
~~(2) Heater in unit not working.~~

Code 1-Kitchen Equipment
Equipment hampering preparation of a meal or storage of perishable food.

~~Code 2~~ **Code 3**-Kitchen Equipment
(1) Dishwasher not operating properly.
(2) All other equipment **not** hampering preparation of a meal.

Code 1-Plumbing
(1) Hot water heater failure.
(2) Leaking water supply pipes.
(3) Fixture drain, supply line to water closet / commode, or any leaking pipes that are causing damage.
(4) Water closet / commode leaking on floor (not over flows from clogs).

Code 2-Plumbing
~~(1)~~ Flush valves not operating properly.
~~(2) Fixture drain, supply line to commode, or water pipe leaking.~~
~~(3) Commode leaking at base.~~

Code 3 -Plumbing
Leaky faucets.

Code 3-Interior
(1) Floors damaged.
(2) Paint chipping or peeling.
(3) Casework.

Code 1-Roof Leaks
Temporary repairs will be made where damage to property is occurring

Code 2-Roof Leaks
Where damage to property is not occurring, check for location of leak during rain and complete repairs on a Code 2 basis.

Code 2-Water (Exterior)
No water to facility.

~~Code 2-Water (Hot)~~
~~No hot water in portion of building listed.~~

Code 2 – Utilities
All utility failures or leaks not listed above.

Code 2 – Streets
Any failure that will cause a safety hazard.

Code 2 – Play ground equipment
Any failures that will cause a safety hazard.

Code 3-All other work not listed above.

23. AMENDMENT 0002, APPENDICES
    Throughout Task Order No. 1, the words “Appendix” and “Appendices” are interchangeable with the words “Attachment” and “Attachments.”

24. AMENDMENT 0002, “APPENDICES” DIVIDER PAGE
    a. The listing of Appendices on the “Appendices” divider page is incorrect. “Appendix H: 2003 Environmental Report” has been provided as a part of Amendment 0002.
    b. Add to the list of appendices, “Appendix J: Design Analysis – Existing and New Site Utility Systems.”
    c. Add to the list of appendices, “Appendix K: Information on Monitoring Wells at Site DP-32.”
    d. Add to the list of appendices, “Appendix L: Legal Description of Property.”

25. AMENDMENT 0002, "WHITEMAN FAMILY HOUSING PLANS – PDF"
    For correct sheet order, refer to actual title block on each sheet, e.g. "1.1 Woodside Neighborhood Demolition Plan, Sheet 1 of 12."

The following revisions are included as separate documents:

26. AMENDMENT 0002, SECTION 00110 – PRICING SCHEDULE
    a. Add electronic Microsoft Excel file entitled "Pricing Schedule.xls" – attached. Revise the five pages of the printed Pricing Schedule by using this electronic file.
    b. Revise the two pages of pricing schedule notes, copy attached.
    c. Add electronic Microsoft Excel file entitled "Betterments.xls" – attached. Revise the two pages of the printed Betterments Breakout form by using this electronic file.

27. AMENDMENT 0002, SECTION 00110 – PAGE "SECTION 00110, GAC" and SUPPORTING DATA WORKSHEET, "SUPPORTING DATA.DOC"
    a. Delete previously issued page "SECTION 00110, GAC."
    b. Delete previously issued "Supporting Data.doc" document.
    c. Add electronic Microsoft Word file entitled "Supporting Data.doc" – attached. Revise the one-page printed "Area Calculation Worksheet (Page 1 of 1)" by using this electronic file.

28. AMENDMENT 0002, CONSTRUCTION, MATERIALS, PRODUCTS, EQUIPMENT, AND SYSTEMS FORM
    Revise "stdform.doc" – also referred to as "Construction, Materials, Products, Equipment, and Systems (CMPE)" form – to match the printed form included with Amendment 0002. Microsoft Word file attached.

29. AMENDMENT 0002, APPENDICES
    a. Add "Appendix J: Design Analysis – Existing and New Site Utility Systems," copy attached.
    b. Add "Appendix K: Information on Monitoring Wells at Site DP-32," copy attached.
    c. Add "Appendix L: Legal Description of Property," copy attached.

30. AMENDMENT 0002, AUTOCAD DRAWING FILES
    a. Revise "Drawing 1.2, Sheet 2 of 12" and "Drawing 1.3, Sheet 3 of 12," to change the demolition sheet titles – files attached.
    b. Add boundary survey drawing – ZIP file attached.
    c. Only in order to aid the Offerors in producing images for presentation, add an aerial map in AutoCAD format – files attached. Note that the AutoCAD file references the aerial image file, with the image <u>approximately</u> aligned with the existing contours of the AutoCAD file, as neither these contours nor this image is scalable. Therefore, the Offerors shall clearly note on any presentation images produced using these files that these existing contours and this image are "not to scale."

31. AMENDMENT 0002, PDF DRAWING FILES
    "Drawing 1.1, Sheet 1 of 12," "Drawing 1.2, Sheet 2 of 12," and "Drawing 1.3, Sheet 3 of 12" are reissued in PDF format with corrected sheet names. Copies attached.

DEPARTMENT OF THE ARMY
Kansas City District, Corps of Engineers
757 Federal Building
Kansas City, Missouri 64106

SPECIFICATIONS FOR CONSTRUCTION OF
REPLACE FAMILY HOUSING
WHITEMAN AIR FORCE BASE, MISSOURI

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SF 30 Amendment of Solicitation

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Appendices:

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PRICING SCHEDULE (TASK ORDER & OPTIONS)

BASIC ITEMS: PART A SCHEDULE (FY 03 HOUSING UNITS)

A	B	C	D	E	F	G
Item No.	**Description**	**GSF/Unit**	**No. of Units**	**Total GSF: Columns C x D**	**Unit Price: Cost/GSF**	**Total Amount: Columns E x F**
0001	**All work complete - including all betterments proposed - for # of Three Bedroom Housing Units of Floor Plan A - FY 03 (See Note 4 below)** **(Construction Cost Only)**	_____	_____	0	$ _____	$ 0
0002	**All work complete - including all betterments proposed - for # of Three Bedroom Housing Units of Floor Plan B - FY 03 (See Note 4 below)** **(Construction Cost Only)**	_____	_____	0	$ _____	$ 0
0003	**All work complete - including all betterments proposed - for # of Three Bedroom Housing Units of Floor Plan C - FY 03 (See Note 4 below)** **(Construction Cost Only)**	_____	_____	0	$ _____	$ 0
0004	**All work complete - including all betterments proposed - for # of Three Bedroom Housing Units of Floor Plan D - FY 03 (See Note 4 below)** **(Construction Cost Only)**	_____	_____	0	$ _____	$ 0
0005	**DESIGN COST FOR ITEMS 0001, 0002, 0003, & 0004 (See Note 4 below) (Must total 92 three bedroom units)**					$ _____

BASIC ITEMS: PART B SCHEDULE (FY 03 DEMO / SITE / UTILITIES)

A	B	C	D	E
Item No.	**Description**	**Quantity**	**Unit Price: Cost/Unit**	**Total Amount: Columns C x D**
0006	**Complete demolition of the 62 FY 03 units (including but not limited to removal of asbestos, lead, chlordane, utilities, foundations, etc., and restoration of the site)** **TOTAL ITEM NO. 0006 Demolition Cost:**	**No. of units: 62**	$ _____	$ 0
0007	**Entire work complete for one of the "minimum" road connections out of the FY03 housing area; including but not limited to grading, drainage, curbs, paving, landscaping, pedestrian walks, and street lighting** **(Construction Cost Only)**	**Job**	**Lump Sum**	$ _____
0008	**Entire work complete for Infrastructure to serve FY03 housing area but in accordance with the Contractor's future Development Plan (excluding Item 0007 above, excluding full "looping" of the site utility / electrical service trunks beyond a single line service to the FY03 housing area, and excluding the second of the two "minimum" road connections out of the FY03 housing area); including but not limited to all common areas and housing lots for electrical distribution, sanitary sewer, gas and water service; grading; pedestrian walks; playgrounds; landscaping; streets and street lighting** **(Construction Cost Only)**	**Job**	**Lump Sum**	$ _____
0009	**DESIGN COST FOR ITEMS 0006, 0007, & 0008**			$ _____

TOTAL BASIC AMOUNT: (PART A + B, FY 03)

0010	**TOTAL CONSTRUCTION COST (ITEMS 0001 + 0002 + 0003 + 0004 + 0006 + 0007 + 0008)**	$ 0
0011	**TOTAL DESIGN COST (ITEMS 0005 + 0009)**	$ 0
0012	**TOTAL BASIC AMOUNT (ITEMS 0010 + 0011)**	$ 0

OPTION 1 ITEMS: PART A SCHEDULE (FY 04 HOUSING UNITS)

A	B	C	D	E	F	G
Item No.	**Description**	**GSF/Unit**	**No. of Units**	**Total GSF: Columns C x D**	**Unit Price: Cost/GSF**	**Total Amount: Columns E x F**
0013	**All work complete - including all betterments proposed - for # of Four Bedroom Housing Units of Floor Plan E - FY 04 (See Note 4 below)** **(Construction Cost Only)**			0	$	$ 0
0014	**All work complete - including all betterments proposed - for # of Four Bedroom Housing Units of Floor Plan F - FY 04 (See Note 4 below)** **(Construction Cost Only)**			0	$	$ 0
0015	**All work complete - including all betterments proposed - for # of Four Bedroom Housing Units of Floor Plan G - FY 04 (See Note 4 below)** **(Construction Cost Only)**			0	$	$ 0
0016	**DESIGN COST FOR ITEMS 0013, 0014, & 0015 (See Note 4 below) (Must total 84 four bedroom units)**					$

OPTION 1: PART B SCHEDULE (FY 04 DEMO / SITE / UTILITIES)

A	B	C	D	E
Item No.	**Description**	**Quantity**	**Unit Price: Cost/Unit**	**Total Amount: Columns C x D**
0017	**Complete demolition of the 100 FY 04 units (including but not limited to removal of asbestos, lead, utilities, foundations, etc., and restoration of the site)** **TOTAL ITEM NO. 0022 Demolition Cost:**	**No. of units: 100**	$ _____	$ 0
0018	**Entire work complete for the second of the two "minimum" road connections out of the FY03 housing area; including but not limited to grading, drainage, curbs, paving, landscaping, pedestrian walks, and street lighting** **(Construction Cost Only)**	**Job**	**Lump Sum**	$ _____
0019	**Entire work complete for full "looping" of the site utilities (electrical) service for the entire FY03 and FY04 housing areas (beyond a single line service to the FY03 housing area), including remaining connections to Base (electrical) service** **(Construction Cost Only)**	**Job**	**Lump Sum**	$ _____
0020	**Entire work complete for new perimeter access control fence connecting to existing perimeter control fence at each end** **(Construction Cost Only)**	**Job**	**Lump Sum**	$ _____
0021	**Entire work complete for Infrastructure to serve FY04 housing area but in accordance with the Contractor's future Development Plan (excluding Basic FY 03 items and Items 0018, 0019, and 0020 above); including but not limited to all common area and lots for electrical distribution, sanitary sewer, gas and water service; grading; pedestrian walks; playgrounds; landscaping; streets and street lighting** **(Construction Cost Only)**	**Job**	**Lump Sum**	$ _____
0022	**DESIGN COST FOR ITEMS 0017, 0018, 0019, 0020, & 0021**			$ _____

TOTAL OPTION 1 AMOUNT: (PART A + B, FY 04)		
0023	TOTAL OPTION 1 CONSTRUCTION COST (ITEMS 0013 + 0014 + 0015 + 0017 + 0018 + 0019 + 0020 + 0021)	$ 0
0024	Discount, primarily for site and utility savings, for concurrent construction (but not concurrent design) of Option 1 (FY 04) with Basic Items (FY 03) TOTAL OPTION 1 CONSTRUCTION COST DISCOUNT	($
0025	TOTAL OPTION 1 DESIGN COST (ITEMS 0016 + 0022)	$ 0
0026	TOTAL OPTION 1 AMOUNT (ITEMS 0023 + 0024 + 0025)	$ 0

TOTAL OPTION 2 (ADDITIONAL DEMO)				
A	B	C	D	E
Item No.	Description	Quantity	Unit Price: Cost/Unit	Total Amount: (Columns C x D)
0027	Complete demolition of the 8 additional units (including but not limited to removal of asbestos, lead, chlordane, utilities, foundations, etc., and restoration of the site) TOTAL OPTION 2 DEMOLITION COST	No. of units: 8	$	$ 0
0028	TOTAL OPTION 2 DESIGN COST			$
0029	TOTAL OPTION 2 AMOUNT (ITEMS 0027 + 0028)			$ 0

GRAND TOTAL AMOUNT		
0030	GRAND TOTAL AMOUNT (ITEMS 0012 + 0026 + 0029)	$ 0

a) Contractor proposes the Basic Items work above will be completed in _____ calendar days.

b) Contractor proposes the Option 1 work above will be completed in _____ calendar days.

c) Contractor proposes the Option 2 work above will be completed in _____ calendar days.

d) Office Overhead _____ %

e) Profit _____ %

f) Bonding _____ %

Signature of Authorized Company Principal

)

a) Contractor proposes the Basic Items work above will be completed in _____ calendar days.
b) Contractor proposes the Option 1 work above will be completed in _____ calendar days.
c) Contractor proposes the Option 2 work above will be completed in _____ calendar days.
d) Office Overhead _____%
e) Profit _____%
f) Bonding _____%

Signature of Authorized Company Principal

NOTES:

1. Prices must be entered for all line items on the Pricing Schedule. Grand total amount price submitted (Line #) without prices for individual line items will not be evaluated. The Contractor's addition will be subject to verification by the Government. In case of variation between an individual item price and the grand total amount, the individual item price will be consider in the price. The terms "Construction Cost" and Design Cost," noted above, include everything required to complete the work, including associated profits and fees.

2. A modification to the Pricing Schedule, which provides for a single adjustment to the grand total amount, will not be accepted. Modification to Pricing Schedule items, basic or options, should state the application of the adjustment to each respective individual items price affects. If the modification is not so apportioned the Pricing Schedule item will not be evaluated.

3. The completion time and percentage blanks listed in a) through f) shall be filled in by the Offeror. Items d) through f) shall indicate percentages used in pricing items for this Task Order. **It is the Government's intention to use the prices given within the Pricing Schedule and the percentage indicated above by the "successful" Offeror to negotiate future Task Orders.** See Section 00110: PROPOSAL SUBMISSION AND EVALUATION for information on Volume III PRICE.

4. Unit Construction and Design prices are in include all work required with 5 feet outside the building lines. To clarify, include all driveways, patios, and privacy screens (between adjoining duplex units) to be "within 5 feet," but do not include the backyard fencing "within the 5 feet."

5. Types of housing units may or may not vary from fiscal year to fiscal year. For instance, "Type A - FY 03" units may or may not be identical in size, layout, or appearance to "Type A - FY 04" units.

6. It is the intent of the Government to award a contract that meets or exceeds the requirements of this solicitation while also meeting funding limitations. The below funding limitations shall not be exceeded (including all offered betterments).

FUNDING LIMITATION FOR BASIC ITEMS (FY 03) $15,750,000.
FUNDING LIMITATION FOR OPTION 1 (FY 04) $17,150,000.

FUNDING LIMITATION FOR OPTION 2 (8 UNITS) $ 100,000.

7. Determination of the Offeror's total price for the proposed work will be based on the TOTAL of the BASE SCHEDULE and OPTION SCHEDULE. Immediate award will be made of the BASE SCHEDULE. At the option of the Government, the OPTION SCHEDULE may be awarded at the proposal price after Notice of Award for the BASE SCHEDULE work. The Government does not guarantee any work beyond that of the BASE SCHEDULE. The Government reserves the right to pick up the OPTION SCHEDULE at the proposal price within 180 calendar days after the Notice to Proceed. Offeror's attention is directed to SECTION 00100 for further option details.

BETTERMENTS BREAKOUT

BETTERMENTS BREAKOUT

All betterments proposed shall be *included* in the prices offered in the Pricing Schedule above

A	B	C	D	E	F	G	H
		Included for Basic Items (FY 03)			Included for Option 1 (FY 04)		
Item No.	Description	Unit Price: Cost/Unit	No. of Units (92 total)	Total Amount: Columns C x D	Unit Price: Cost/Unit	No. of Units (84 total)	Total Amount: Columns F x G
FIRST PRIORITY GROUPING							
0001	Plastic laminate floor in front entry, living, dining, family (in all units provided)	$	92	$ 0	$	84	$ 0
SECOND PRIORITY GROUPING							
0002	Ceiling heights 9' or greater (in more than 50% of units provided)	$		$ 0	$		$ 0
0003	Dual access to mech. rooms (in more than 50% of units provided)	$		$ 0	$		$ 0
0004	Patterned colored concrete, front stoops/patios (at all units provided)	$	92	$ 0	$	84	$ 0
THIRD PRIORITY GROUPING							
0005	Zoned HVAC for all two-story units	$		$ 0	$		$ 0
0006	Masonry at least 50% building exterior (in at least 33% of units provided)	$		$ 0	$		$ 0
0007	Garage personnel door and connecting sidewalk (in all units provided)	$	92	$ 0	$	84	$ 0
0008	Master Bedroom closets increased 25% (in all units provided)	$	92	$ 0	$	84	$ 0
0009	Solid surfacing kitchen counters, integral sink (in all units provided)	$	92	$ 0	$	84	$ 0
0010	Laundry sink in a base cabinet (in more than 50% of units provided)	$		$ 0	$		$ 0
0011	Walks on both sides of streets (fronting all units provided)	$	92	$ 0	$	84	$ 0
0012	Garage doors 20' behind front of building (in at least 33% of units provided)	$		$ 0	$		$ 0
0013	Garage door openers installed (in all units provided)	$	92	$ 0	$	84	$ 0
0014	Paint interior walls of garage (in all units provided)	$	92	$ 0	$	84	$ 0
ANY BETTERMENTS PROPOSED BY CONTRACTOR							
0015	*(Describe)*	$		$ 0	$		$ 0

continue on next page, if necessary

A	B	C	D	E	F	G	H
		Included for Basic Items (FY 03)			Included for Option 1 (FY 04)		
Item No.	Description	Unit Price: Cost/Unit	No. of Units (92 total)	Total Amount: Columns C x D	Unit Price: Cost/Unit	No. of Units (84 total)	Total Amount: Columns F x G
ADDITIONAL BETTERMENTS PROPOSED BY CONTRACTOR							
0016	***(Describe)***	$ _____	_____	$ 0	$ _____	_____	$ 0
0017	***(Describe)***	$ _____	_____	$ 0	$ _____	_____	$ 0

NOTES:

1. All Betterments proposed shall be ***included*** in the prices in the Pricing Schedule above.
2. Prices on this Breakout sheet must reflect only the ***difference*** in cost between the Betterment and the criteria contained in this RFP.
3. Prices must be entered for all line items that the Offeror intends to provide.
4. Refer to Section 00110 PROPOSAL SUBMISSION AND EVALUATION paragraphs 5.2.1 and 5.2.3 for additional submittal requirements regarding betterments

AREA CALCULATION WORKSHEET
(Page 1 of 1)

PROPOSER _____ UNIT "NAME" _____

GRADE (ex. E4-E6) _____

NO. OF BEDROOMS _____

GROSS FLOOR AREA CALCULATIONS:

1. OVERALL FLOOR AREA (within exterior face of exterior walls & center line of party walls in duplex units):
   a. Exterior Dimensions:
      Dimensions: _____ x _____ = _____ SF
      _____ x _____ = _____ SF
      _____ x _____ = _____ SF
      _____ x _____ = _____ SF
   b. TOTAL OVERALL FLOOR AREA = _____ SF
2. EXCLUDABLE FLOOR AREA (if included above):
   a. Garages (does NOT include space allocated for exterior bulk storage, trash, or garage separating wall):
      Dimensions: _____ x _____ = _____ SF
   b. Porches (open or closed, not heated or cooled, retaining the basic characteristics of a porch):
      Dimensions: _____ x _____ = _____ SF
   c. Patio / deck / balcony / entrance stoop:
      Dimensions: _____ x _____ = _____ SF
   d. TOTAL EXCLUDABLE FLOOR AREA (if included in Overall calc.) = _____ SF
3. GROSS FLOOR AREA (Subtract 2.d. from 1.b.)
   TOTAL GROSS FLOOR AREA = _____ SF
   COMPARISION TO: (List the Programming BENCHMARK:) _____ SF
   (List the Programming MAXIMUM:) _____ SF
   (List the Programming MINIMUM:) _____ SF

KITCHEN CABINET SIZE CALCULATIONS:
(Refer to Section 01000, Part 9 for minimum requirements)

	Provided	Required Minimum
Countertop *	_____ SF	_____ SF

* excludes countertop area taken by sink and range

CONSTRUCTION MATERIALS, PRODUCTS, EQUIPMENT, AND SYSTEMS

1. HOUSING UNIT EXTERIOR MATERIALS AND FINISHES (Or items 1 through 5 as applicable.)

EXTERIOR WALLS (Or appropriate category as applicable)

SIDING / FASCIA / TRIM (Or appropriate item as applicable)

Referenced Location in the Offer	
Manufacturer – Source	
Product Name / Model Number / Grade / Type / Classification	
Size – Capacity	
Warranty Period (as applicable)	
Manufacturer's Data Cut-Sheet attached (light fixtures & appliances only)	
Description / Use / Location	
Betterment (Yes/No)	
Deviation (Yes/No)	

DIVISION 1 – GENERAL

01000	General Design and Construction Requirements
	TEXT DELETED
01100	General
01312A	Quality Control System (QCS)
01320A	Project Schedule
01330	Submittal Procedures
01332	Submittals During Design
01355A	Environmental Design
01451	Contractor Quality Control
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SECTION 01000

GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS

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PART 12 – MAJOR APPLIANCES
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PART 1 - DESIGN AND CONSTRUCTION OBJECTIVES

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1 DESIGN AND CONSTRUCTION OBJECTIVES

The design and construction of Family Housing Units under this Indefinite Delivery Indefinite Quantity (IDIQ) contract for Whiteman AFB, Missouri, shall comply with specifications and requirements contained in this Request for Offers (RFP). Landscaping shall conform to native type and low maintenance principals. Recreational features shall provide safe and modern focal areas for the neighborhoods. The design and technical criteria contained and cited in this RFP establishes minimum standards for design and construction quality except where maximum sizes are identified, such as for the housing unit gross floor area, and the number of housing units per building.

The major objectives for the project are:

1) Provide maximum number of housing units, complete and adequate for assignment as quarters for military personnel with families, each unit at or above the Programming Benchmark for allowable gross square feet.
2) Provide not only the maximum number of complete units, each at or above the Programming Benchmark in size, but also provide all units with the maximum groupings of identified betterments.
3) Provide a Development Plan meeting or exceeding the goals stated here in Section 01000.
4) Provide a holistic approach to the design of both the site and the new housing units.

1.1 SCOPE OF WORK

Over the course of the multi-year project, design and construction requires the mixture of two, three, four and five bedroom units dispersed on Government-owned land at Whiteman AFB, MO. This contract will be effective for a base total of five years, with anticipation of demolition and replacement of 60 to 200 units per Task Order, and the potential for renovating some existing units. If exercised, an optional CLIN would extend the contract an additional five years.

The work of the first Task Order (FY 03) consists of the demolition of 62 existing units (typically duplex configuration; see photos attached to Part 1, herein) and construction of 92 new three bedroom units. The work of Option 1 (FY 04) consists of the demolition of an additional 100 existing units, and construction in another area of the Base of (TEXT DELETED) 84 new four bedroom units. The site for the housing to be construction under the first Task Order (FY 03) and under Option 1 (FY 04) will be made available to the Contractor upon award in accordance with requirements given elsewhere in this Solicitation. Refer to Part 4 for location of the new units.

The work covered by the solicitation consist of furnishing all design, labor, equipment and materials and in performing all operations in the demolition and construction of housing units, all in strict accordance with this solicitation and its criteria and drawings, subject to the terms and conditions of the contract, all at the Contractor's expense.

Refer to paragraph 1.2.5 for scope of demolition work.

1.2 REQUIREMENTS AND DESCRIPTIONS OF WORK

1.2.1 NEW HOUSING UNITS

In accordance with the guidelines and requirements in Section 01000, provide family housing units with attached garages, exterior storage within the garage, tornado "safe room" built in accordance with FEMA standards, individual central heating systems, energy conservation systems and central air conditioning, and including the following Contractor furnished/Contractor installed (CF/CI) equipment and appliances: refrigerators, garbage disposals, dishwashers, water heaters, range/ovens, range hoods, carbon monoxide detectors and smoke detectors. Occupant furnished/Occupant installed (OF/OI) equipment and appliances include the following: washers and dryers, freezers, microwave ovens, and automatic garage door openers. Family housing units shall be a mix to be determined by the Offeror of one-story and/or two-story structures configured as single units and duplexes to be determined by each Task Order and the Offeror based on available land and siting requirements. Family housing distribution for FY03, Task Order No. 1 and for FY04 Option shall be as shown in Table 1-1.

TABLE 1-1 - HOUSING UNITS

Grade Categories	Number of Bedrooms	Number of Units
		Demo[1]/New
Task Order No.1 (FY03): E-1 through E-6 (JNCO)	3	(See below)[2]/92
Option 1 (FY04): E-1 through E-6 (JNCO)	3	(See below)[2]/0
Option 1 (FY04): E-1 through E-6 (JNCO)	4	(See below)[2]/84
Option 2:	Not applicable	(See below)[2]/0

Note[1]: All of the units that are to be demolished are in Duplex Buildings of between 1000 and 1400 sq. ft.; approximately 50% of the units to be demolished have basements, and the remainder have crawl spaces instead.

Note[2]: For Task Order No. 1 (FY03), a total of 62 units shall be demolished. For Option 1 (FY04), a total of 100 units shall be demolished. For Option 2, a total of 8 units shall be demolished. Refer elsewhere in Part 1 for the list of units to be demolished, along with their unit designations. For each of the following unit designations, here is a the corresponding number of bedrooms:
Type M-1 – 2 bedroom; Type M-2 – 3 bedroom; Type M-4 – 3 bedroom; Type M-6 – 3 bedroom;
Type M-8 - 3 bedroom; Type C-2 – 3 bedroom; Type C-3 – 4 bedroom.

1.2.2 SIZE STANDARDS

Table 1-2 indicates the allowable size standards with regard to Gross Square Footage (GSF) for all potential dwelling units. Plan, program, and design all units to the Programming Benchmark or above. Offers can be accepted within the range shown, but it is the desire of the Base to construct each unit and each type of unit at or above the Programming Benchmark square footage. Design-Build submissions will be looked on more favorably when these desirable sizes can be met and offered within the given site density. The range allows the Design-Build Contractor some flexibility to achieve this goal.

Table 1-2 Replacement and New Construction Size Standards

Grade categories	Bedrooms per category	REPLACEMENT & NEW CONSTRUCTION MINIMUM GSF	PROGRAMMING BENCHMARK GSF	REPLACEMENT & NEW CONSTRUCTION MAXIMUM GSF
E1-E3 (JENL) E4-E6 (JNCO)	2	1180	1340	1500
	3	1490	1630	1760
	4	1670	1950	2220
	5	1920	2300	2670
E7-E8 (SNCO) W1-W3 (WO) O1-O3 (CGO)	2	1180	1490	1790
	3	1670	1860	2050
	4	1800	2150	2500
	5	1920	2510	3000
E9 (SNCO) W4-W5 (WO) O4-O5 (FGO)	3	1740	2020	2300
	4	1920	2310	2700
O6 (SO)	4	2110	2520	2920
O7-O10 (GO)	4	2600	3330	4060

GROSS SQUARE FEET (GSF) FLOOR AREA:
All interior spaces (finished and unfinished) within the exterior faces of exterior walls and center line of party walls (in multiplex units) of housing units with the following areas of exclusion:
-Carports and garages,
-Exterior bulk storage (detached),
-Trash enclosures (exterior),
-Porches, open or closed, which are not heated or cooled and which retain the basic characteristic of a porch.
-Terraces, patios, decks, balconies, and entrance stoops.

1.2.3 ACCESSIBLE UNITS

Refer to Part 9 for requirements and standards of design and construction for exterior and interior accessibility. In Task Order No. 1 (FY03), five 3-bedroom units shall be single-story ground floor units with special accessibility features. In Option No. 1 (FY04) five 4-bedroom units shall be single story ground floor units with special accessibility features. (TEXT DELETED). Each of these five FY03 and six or seven FY04 units designated as accessible shall be designed and built in such a way that they may be easily and readily modified to accommodate physically challenged occupants at time of occupancy. Design of adaptable housing units shall conform to the Uniform Federal Accessibility Standards (UFAS) and American Disabilities Act (ADA). Adaptable housing units shall be well dispersed throughout the development and shall not be grouped or clustered so as to create segregated pockets within the housing community.

1.2.4 SITE AREA

The sites for FY03 and FY04 housing units are described in the Conceptual Land Use Map included in Part 4 and in the drawings included in the RFP. Site work under the Basic Items of this task order (FY03) includes all design and construction of the site design for the area of FY03 housing units, plus all design and construction of the site design for the connection of streets, trails, and utilities to and within this area. Site work under Option 1 (FY04) includes all design and construction of the site, design for the area of the FY04 housing units, plus all design and construction of the site design for the connection of streets, trails, and utilities to and within this area, plus all design and construction of the new controlled access perimeter fence. Refer to the Pricing Schedule in Section 00010. Also refer to Figure 1.2.4 “Options Diagram” at the end of Part 1. Work includes grading, storm drainage, erosion control, pedestrian and vehicular circulation, utility systems, outdoor lighting, play lots and physical security. Also refer to Section 02230 CLEARING AND GRUBBING included with this RFP.

1.2.5 DEMOLITION

a) Units to be removed by address are shown on the RFP drawings and are listed below.

62 units to be demolished as Basic Items (FY 03)								
("C" = site with identified chlordane contamination levels above the residential standard.)								
Lakeside Neighborhood					Type			
	813	-815	Kelly		C-2			
	814	-816	Kelly		C-2			
	817	-819	Kelly		C-2			
	818	-820	Kelly		C-2			
	821	-823	Kelly		C-2			
	822	-824	Kelly		C-2			
	825	-827	Kelly		C-2			
	842	-844	Marshall		C-2			
	846	-848	Marshall		C-3			
0			18					
Midland Neighborhood								
	147	-149	Barksdale		M-4			
	148	-150	Barksdale		M-2			
C	151	-153	Barksdale		M-2			
	155	-157	Barksdale		M-1			
	156	-158	Barksdale		M-4			
C	159	-161	Barksdale		M-4			
C	160	-162	Barksdale		M-2			
C	163	-165	Barksdale		M-1			
C	167	-169	Barksdale		M-2			
	144	-146	Ellsworth		M-1			
C	145	-147	Ellsworth		M-1			
C	148	-150	Ellsworth		M-1			
C	149	-151	Ellsworth		M-2			
	152	-154	Ellsworth		M-1			
	153	-157	Ellsworth		M-2			
C	145	-147	Forbes		M-2			
C	149	-151	Forbes		M-1			
C	153	-155	Forbes		M-1			
C	144	-146	Minuteman		M-4			
C	145	-147	Minuteman		M-1			
C	148	-150	Minuteman		M-2			
	149	-151	Minuteman		M-2			
28			44					
Woodview Neighborhood								
	(None)							
0			0					
TOTALS								
28	chlordane sites		62	units to be demolished				

100 units to be demolished as Option 1 (FY 04)								
("C" = site with identified chlordane contamination levels above the residential standard.)								
Lakeside Neighborhood					Type			
	802	-804	Atlas		C-2			
	803	-805	Atlas		C-2			
	810	-812	Chennault		C-2			
	814	-816	Chennault		C-2			
	818	-820	Chennault		C-2			
	822	-824	Chennault		C-2			
	826	-828	Chennault		C-3			
	830	-832	Chennault		C-3			
	807	-809	Marshall		C-3			
	811	-813	Marshall		C-3			
	815	-817	Marshall		C-2			
	819	-821	Marshall		C-2			
	823	-825	Marshall		C-2			
	826	-828	Marshall		C-2			
	827	-829	Marshall		C-3			
	830	-832	Marshall		C-2			
	831	-833	Marshall		C-2			
	834	-836	Marshall		C-2			
	835	-837	Marshall		C-2			
	838	-840	Marshall		C-2			
	839	-841	Marshall		C-2			
	850	-852	Marshall		C-3			
	854	-856	Marshall		C-3			
	857	-859	Marshall		C-2			
	858	-860	Marshall		C-2			
	811	-813	McGuire		C-3			
	812	-814	McGuire		C-2			
	815	-817	McGuire		C-2			
	816	-818	McGuire		C-2			
	819	-821	McGuire		C-2			
	820	-822	McGuire		C-3			
	823	-825	McGuire		C-2			
	824	-826	McGuire		C-2			
	827	-829	McGuire		C-2			
	828	-830	McGuire		C-2			
	831	-833	McGuire		C-2			
	832	-834	McGuire		C-2			
0			74					

Midland Neighborhood								
C	137	-139	Barksdale		M-1			
C	141	-143	Barksdale		M-2			
C	142	-144	Barksdale		M-2			
C	136	-138	Ellsworth		M-1			
	137	-139	Ellsworth		M-1			
	140	-142	Ellsworth		M-1			
C	141	-143	Ellsworth		M-1			
C	137	-139	Forbes		M-1			
C	141	-143	Forbes		M-2			
C	136	-138	Minuteman		M-4			
C	137	-139	Minuteman		M-2			
C	140	-142	Minuteman		M-1			
C	141	-143	Minuteman		M-2			
22			26					
Woodview Neighborhood								
	(None)							
0			0					
TOTALS								
22	chlordane sites		100	units to be demolished				
8 units to be demolished as Option 2								
("C" = site with identified chlordane contamination levels above the residential standard.)								
Lakeside Neighborhood					Type			
	(None)							
0			0					
Midland Neighborhood								
	(None)							
0			0					
Woodview Neighborhood								
C	101	-103	March		M-6			
C	105	-107	March		M-8			
	111	-113	March		M-6			
C	117	-119	March		M-8			
6			8					
TOTALS								
6	chlordane sites		8	units to be demolished				

b) Demolition shall consist of the complete removal of the structure, including the foundation and associated infrastructure. See Section 02220 DEMOLITION included herewith. The Contractor is responsible for coordinating the utilities to insure that there is minimal disruption of power, telephone, and cable TV service to the surrounding areas. Any disruption of service shall be limited to normal daylight hours. Number and duration of service outages shall be scheduled so as to minimize disruption to surrounding areas and to family housing occupants. Outage schedules and requirements shall be per the Utility Outage paragraph of Section 01100 of this RFP.

c) A sampling of the housing units to be demolished have been surveyed for asbestos, lead-based paint, and chlordane. Units with chlordane contamination levels above the residential standard are listed above. The Contractor shall assume that 50% of the chlordane contaminated soil will need to be trucked to a stockpile on Base, while 50% of the such soil will be replaced in situ. The Contractor shall remove and dispose of all asbestos and lead paint. The Contractor shall be responsible for locating disposal facilities, which will accept solid waste containing lead-based paint. No such waste areas exist on the Base, nor are there any Government controlled waste sites in the general vicinity. There are no controlled waste areas on the Base for the disposal of ACM. For floor tile containing asbestos, the Offer should assume an average of 4 layers of floor tile will need to be removed to an acceptable waste facility off Base, even though not all of the 4 layers of floor tile may contain asbestos. See Attachments for Asbestos and Lead Paint **Reports for the typical** location of asbestos and lead-based paint in the housing units. **See** Sections 13780 ASBESTOS ABATEMENT and 13281 LEAD HAZARD CONTROL ACTIVITIES (both included herewith) for demolition requirements related to structures containing lead-based paint and/or asbestos. **[Note: Attached herewith is an Asbestos/Fungal/Lead Paint & Soil Testing Report from investigations done in 2003 on seven housing units in structures scheduled to be demolished under this RFP. Also included in this 2003 report is one unit of similar construction, condition, and location to the ones scheduled to be demolished under this RFP. Several similar investigations have been conducted in the past for hazardous environmental conditions in Base family housing. The Government used the "sampling" method to verify that these conditions existed in the type, condition, and location of the housing units scheduled to be demolished under this RFP. As an additional information resource, Offerors may refer to the attached Asbestos & Lead Paint Report from investigations done in May 2002 on similar structures being demolished under an earlier, separate contract.]**

d) All demolition areas identified in the RFP are in areas that will contain new replacement housing to be authorized by future task orders. Offerors shall clearly depict demolition phasing in the schedule submitted with the Offer. Demolition work shall be phased as follows:

D-03-1: Of the 62 units included as Basic Items (FY 03), abate and demolish the 44 units in the Midland Neighborhood starting no earlier than 30 March 2004 with completion and site restoration accomplished no later than 30 June 2004.

D-03-2: Abate and demolish the remaining 18 units included as Basic Items (FY 03) based upon phasing plans approved by the Contracting Officer. Units and their sites shall be abated and demolished, and have their sites restored, no later than 60 days following the acceptance of a like number of new units from the Contractor, but not prior to acceptance of one new access road connection to the new FY 03 housing area.

D-04-1: Abate and demolish Option 1 and Option 2 units, and have their sites restored, no later than 60 days following the acceptance of a like number of new units from the Contractor. Demolition work under either option can not start until that option has been authorized.

e) The portion of the below grade utility lines (laterals), including water/gas/sanitary and storm sewer, serving the existing family housing units to be demolished and not required for maintaining facilities unaffected by FY03 construction, shall be removed to the main at the existing streets.

f) Existing wyes on sanitary sewer mains shall be left in place and capped.

g) Contractor shall demolish utilities mindful of the re-use of existing service taps and valves where feasible. Cap existing tap if at a tee.

h) The removal and relocation of the communication lines and equipment shall be coordinated with SBC Communications, (point of contact David Brown, Phone: 660-826-9853), who shall do the actual demolition work; however, the Contractor is financially responsible for the demolition. The Contractor shall allow SBC to remove and salvage any and all of their desired equipment. The Contractor shall remove and dispose of all unsalvaged communication lines and equipment owned by SBC Communications, clean up the disturbed area, and restore it to the condition that was existing prior to the work.

i) The Contractor shall coordinate with Whiteman AFB and SBC Communications prior to demolition of the communication lines.

j) The removal and relocation of the cable TV lines and equipment shall be coordinated with Charter Communications, Inc., (point of contact Terry Fuller, Phone: 660-563-3636). The Contractor shall do the actual demolition work; however, Charter Communications, Inc. shall be allowed to remove and salvage any and all of their desired equipment. The Contractor shall remove and dispose of all unsalvaged cable TV lines and equipment owned by Charter Communications, Inc.

k) The removal of the branch power lines and equipment shall be coordinated with the Whiteman Base Civil Engineering Office. The Contractor shall do the actual work; however, the Whiteman BCE shall be allowed to remove and salvage any and all of their desired equipment at a time which does not delay the Contractor. The Contractor shall remove and dispose of all unsalvaged power lines and equipment owned by Whiteman Air Force Base.

l) Existing streets, curbs, gutters, and sidewalks shall remain. Existing driveways, patios, miscellaneous slabs, electrical lines and equipment, and fences shall be removed.

m) Prior to turning the units to be demolished over to the contractor, the Government will salvage some equipment in each of the units. Title to material and equipment to be demolished, except Government salvage, is vested in the contractor upon receipt of notice to proceed with demolition. The Government will not be responsible for the condition, loss or damage to such property after notice to proceed.

n) Contractor shall salvage recoverable items and material to the maximum extent possible. However, contractor shall assume no salvage value or compensation in the Offer. Salvage material recovered by the contractor shall be removed from Government property. Refer to Part 3 for waste management criteria and for recycling and re-use facilities available.

o) Photos of typical existing housing unit types to be removed are shown below:

Typical M-1 Unit without Basement

Typical M-1 Unit without Basement

Typical M-2 Unit without Basement

Typical C-2 Unit with Basement

Typical C-3 Unit with Basement

Typical C-3 Unit with Basement

p) Environmental monitoring wells exist near some of the houses to be demolished in the Midland neighborhood. Appendix K "Information on Monitoring Wells at Site DR-32" is provided for additional information. The Contractor is requested not to disturb any of these monitoring wells. If during design and construction, the Contractor determines that any of these monitoring wells may need to be disturbed, the Contractor shall contact the Base Civil Engineering Environmental Section. The Contracting Officer will provide specific contact information as necessary.

1.2.6 DESIGN FREEDOM

Innovative, creative, or cost-saving offers that meet or exceed the minimum requirements (maximum requirements cannot be exceeded) are encouraged and will receive more favorable rating accordingly. Existing housing plans or modifications thereof that meet the design and construction criteria specified herein, which an Offeror has previously constructed and priced, may be submitted. They may include designs incorporating factory-fabricated components or modules. Deviations from space and adjacency requirements are discouraged unless the changes result in improvement to the facilities. Sections which do include products by reference to industry standards or particular type are intended to demonstrate the Government's minimum need in that area of work. Where minimum housing unit standards are not indicated in the RFP, the guidelines provided in the Air Force Family Housing Guide (December 1995) define the minimum acceptable standards and the objectives to be met.

1.2.6.1 Housing Units

All replacement units under this RFP shall be built in either single-family or duplex configuration. A duplex is defined as a one to two-story building, housing 2 dwelling units joined together by a common party wall and each dwelling unit entered separately and directly from the exterior. A single unit is defined as a one- or two-story building, housing one dwelling unit separate from any other dwelling unit.

a) Site-built, factory-built, and manufactured housing units are acceptable options for this project if all requirements specified in this RFP are met. Definitions for acceptable type construction practice for duplex housing units under this RFP are as follows:

(1) Site-built housing. A residential building or housing unit wholly or substantially constructed at the site.

(2) Factory-Built Housing: Construction consisting of components, sub-assemblies such as modules, panelized walls, roof trusses, floor joists, and other factory-assembled components, which are transported to the construction site and further assembled into completed housing units. All interior and exterior walls, regardless of whether they are structural (load bearing) or not, are plant fabricated (panelized). Panels must be fabricated to the extent that the structure of the panel or truss is factory-assembled. Interior finishes, such as interior wallboard shall be site applied.

(3) Manufactured housing: A manufactured home is "a structure, transportable in one (1) or more sections, and when erected on site, is built on a permanent foundation and has connected utilities, which includes the plumbing, heating, air conditioning and electrical systems contained therein."

c) The design quality objective is to obtain housing structures and complimentary site development within the funds available while optimizing livability. Design quality is achieved through the optimization of interior planning, integration of housing structures to the site, and balancing architectural attractiveness, variety, function, and design for low-cost maintenance and operation.

(1) Items included by the Offeror, which exceed the RFP minimum requirements will affect positively the rating of the presentation. Items submitted in the successful Offeror’s initial offer shall not be substituted for without written acceptance by the Contracting Officer. Items, if substituted, must in all cases maintain, match or exceed the standards set forth in the RFP.

d) Ecological Benefits and Energy and Resources Conserving Features: Public Law 102-486, as well as, Executive Order 12902, require Federal buildings to be designed and constructed to

reduce energy consumption in a life-cycle, cost-effective manner using renewable energy sources when economical. Products designed to conserve energy and resources by controlling the amounts of consumed energy or by operating at increased efficiencies should be considered. Refer to Part 3 for ecological and sustainability criteria to be followed.

e) Prototype Housing Units: The purpose of the prototype-housing unit is to verify the details of the approved design and material selections, and to establish the quality level against which the remaining work will be judged. At the plant, or at the site, construction connection details shall be exposed for study by authorized Government inspectors for a period of time agreed to by the Contractor and the Contracting Officer. The housing unit or units at the plant and/or the prototype at the site are subject to Contracting Officer's approval. At the site, the complete prototype shall be constructed for each housing unit type. Each stage of work shall be completed and accepted on the prototype, prior to starting work on the same stage for similar housing units in the project. See Section 01100 for typical items for inspection and approval.

(1) "Site-Built": A prototype-housing unit shall be required for each housing unit type.

(2) "Manufactured" or "Factory-Built": A prototype-housing unit shall be required for each housing unit type of each run fabricated at the plant for manufactured or factory-built homes.

f) Manufactured: If the housing units are classified as manufactured housing, all interior and exterior systems which form integral parts of the transportable module shall be constructed and assembled for inspection by the Government. This shall include, as a minimum, wall and ceiling construction, interior finishes, utility piping, wiring, and ductwork fastening and assembling of adjacent modules, connection details to sinks, installed kitchen cabinets and countertops. Portions of the work shall be left unfinished or exposed to demonstrate interior construction details.

g) Factory-Built: If the housing units are classified as factory-built housing, all wall panels which are fabricated in the plant for shipment to the site shall have prototype units constructed and assembled for in-plant inspection by the Government. This shall include, as a minimum, wall framing, roof and ceiling framing, connection details, utility piping, wiring and ductwork, interior and exterior wall finishes which form part of the factory-built wall. In addition, the Contractor shall construct as part of the factory-built prototype, installed samples of wall insulation, finished siding (if not part of wall assembly), sample installed bathtub and sink and installed kitchen sink and cabinets to demonstrate proper installation and wall connections. Portions of the work shall be left unfinished or exposed to demonstrate interior construction details.

h) One-Floor-Prototype: If only one floor of the prototype is manufactured or factory-built, factory assembly of the manufactured or factory-built portion of the prototype is required. In all cases, the factory prototype shall consist of one of each building type. The factory prototype shall be assembled to verify assembly connections, details, construction, and transportation of the finished housing unit.

i) Structural Integrity: Manufactured and factory-built homes shall be of individual housing units attached to one another in a manner which shall provide a finished structural assembly having an appearance and structural integrity comparable to a site-built single or multi-family residence built to applicable codes.

j) Construction Tolerances: Assembled housing units shall be true and plumb and all within specified construction tolerances for all alignments represented on the drawings. Adjacent walls shall be attached at roof and floor levels in such a manner as to preclude placing any wood member in cross-grain bending or cross-grain tension, and to avoid putting nails in withdrawal.

1.2.6.2 Betterments

The government's preferences regarding "betterments" are as follows:

First priority for "betterments"
Heavy-duty plastic laminate flooring for front entry, living, and dining areas (in all units provided).

Second priority grouping for "betterments" with no priority within grouping
First floor ceiling heights of 9 feet or greater, measured as the average vertical dimension of the walls from the intersection with the floor to the intersection with the ceiling (in more than 50% of units provided).
Dual access to mechanical rooms both from outside the unit and from inside the unit or garage (in more than 50% of units provided).
Construct front stoops and patios with patterned and colored concrete (at all units provided).

Third priority grouping for "betterments" with no priority within grouping
Zoned HVAC for all two-story units.
Masonry veneer over at least 50% of the building's exterior (in at least 33% of units provided).
Garage personnel door (in all units provided).
Increase Master Bedroom closet space by 25% over minimums stated in AFFHG (in all units provided).
Solid surfacing kitchen countertops with integral back-splash, and with integral double-bowl sink (in all units provided).
Laundry sink in a base cabinet (in more than 50% of units provided).
Provide sidewalks – or a portion of the trail system – on both sides of residential streets (in front of all units provided) rather than on just one side.
Place garages having overhead doors facing the Community Zone at least 20 feet beyond the front building line, OR provide side or rear entry garages, thereby allowing the driveway paving width in the Streetscape Zone to be minimized (in at least 33% of the units provided).
Garage door openers installed, instead of occupant furnished and installed (in all units provided).
Paint interior walls and ceilings of garages (in all units provided).

The Government prefers that "betterments" be uniform between Basic Items (FY03) and Option 1 (FY04). "Betterments" proposed by the Offeror will also be considered. Nevertheless, the government's priorities are as listed above. Because "betterments" included with the offer become part of the basis for award, they can not be changed without the expressed approval of the Contracting Officer. Refer to section 00110 PROPOSAL SUBMISSION AND EVALUATION for requirements for reporting "betterments" as part of the Offerer's "Tab 7" and "Tab 8", and as part of Volume III-PRICE.

1.3 RECYCLED/RECYCLABLE MATERIALS

Executive Order 13101, Greening of the Government Through Waste Prevention, Recycling, and Federal Acquisition, addresses federal design construction requirements for the use of recycled ("environmentally preferable") materials. Included within this EO is the responsibility to make wise choices relative to life cycle cost, recyclability, and waste prevention. Refer to Part 3 for waste management criteria including recycling and re-use facilities available.

1.4 DESIGN

After contract award and upon receipt of Notice to Proceed, the Contractor shall prepare detailed project design documents in accordance with SECTION 01332, SUBMITTALS DURING DESIGN. The submittal shall be suitable for adequate demonstration of the design, materials and methods of construction in accordance with the contract.

1.5 EXAMPLES/QUALITY

Building systems, materials, and methods specified herein are defined as the minimum salient features desired and preferred for a level of quality, standards and compatibility throughout. Any appropriate building systems, operational equipment, materials, and methods that meet or exceed the standards and compatibility requirements set forth in the RFP may be proposed by the Design/Build Team. These shall be clearly specified within the offer as “betterments.” Refer to Section 00110 PROPOSAL SUBMISSION AND EVALUATION for requirements for reporting “betterments”.

Refer to the attached images for both desirable and undesirable housing appearances. The government desires for the Offeror to provide housing with a variety of appearances while also providing compatibility within a particular neighborhood. Between adjacent neighborhoods, variety is particularly important. Refer to Part 4 for additional criteria regarding variety of appearances.

PART 4 – SITE

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4 SITE

4.1 EXISTING SITE CONDITIONS

4.1.1 GOVERNMENT PROVIDED INFORMATION

Government provided topographical survey, boundary survey, and geotechnical report are provided as information to assist the contractor in preparing the offer. Any errors identified shall be brought to the attention of the contracting officer immediately for resolution and direction. The contractor shall take all professionally prudent and reasonable actions to verify the accuracy of the data provided. During design and construction, the contractor shall be responsible for obtaining any additional data necessary for the execution of this project.

4.1.2 ENGINEERING SURVEY

The Contractor shall complete an engineering survey of the project site. The survey CADD files shall be in English units and in Microstation format. The survey shall be used by the Contractor to prepare his design drawings. The mapping shall indicate the vertical and the horizontal datums used in the preparation of the surveys. Survey data shall be provided to the Contracting Officer for inclusion into the Whiteman AFB data base. All new utilities shall be surveyed for location prior to backfilling. Coordinates of all branch lines and changes in direction shall be documented and provided to the Contracting Officer.

4.1.2.1 Ground Control

The ground control shall be developed with accuracy commensurate to support the mapping. The survey will be developed in coordination with the existing Whiteman AFB surveys, in English units in U.S. Survey Feet. All final supplied results will be True State Plane at zero elevation. As per reference EM1110-1-1002, use the Type G monuments as a guide for any new control set as part of this contract.

4.1.2.2 Coordinate Listing

The horizontal coordinates of all control used or installed shall be provided in tabular form on 8-1/2" X 11" sheets. The coordinate system used shall be indicated and combination factor used shall be shown. Coordinates accomplished in state plane zones shall not be listed in any other system (modified) than true state plane at zero elevation.

4.1.2.3 Reference Ties

Provide descriptions showing at least 3 ties to all monuments set in the field. Approximate directions and a sketch shall illustrate measured distances. Coordinates and appropriate State Plane system designation shall be shown on the card. If field features (trees, posts, etc.) are not available for ties, then witness posts shall be set. Fence posts or carsonite markers are suitable for this purpose. Reference EM 1110-1-1002 survey markers and Monumentation for guidance in establishing these monuments.

4.2 SITE PREPARATION

4.2.1 PAVEMENT REMOVAL/UTILITY PROTECTION

The Contractor shall avoid running utilities underneath houses, streets, and sidewalks where at all practicable. In cases where it is necessary for the utilities to cross existing streets and sidewalks the Contractor shall install the lines by boring and jacking methods. No open trenching will be allowed unless written permission is obtained and approved by Whiteman AFB Civil Engineering. When open trench methods are approved, streets and sidewalks shall be sawcut, removed and replaced as required to construct

the utility. Portions of walks and concrete pavements requiring removal shall be removed to the nearest contraction joint.

4.2.2 UTILITY INTERFERENCE

All existing utilities, including but not limited to storm drains, electrical, sanitary sewer, gas, water, and communication lines that are crossed during installation of the new water system shall remain in service during construction. If this is not possible, all outages shall be coordinated with the Contracting Officer's Representative seven (7) days prior to the outage. All underground utilities from field data and surveys, site investigations, and digging permit locates, shall be marked within and adjacent to areas of the work. All work areas shall be investigated with detection devices for cables and pipelines, to confirm locations, identify unknown utilities, and establish depths. All underground utilities potentially disturbed by the work shall be found by hand digging prior to mechanical trenching or excavating in the vicinity. The government representative shall be notified of detection activities 48 hours in advance. Detection devices shall be on-site at all times.

4.3 SITE PLANNING

4.3.1 GENERAL

The planning, design, and construction shall follow the goals, standards, and guidelines in this RFP. Where no guidance is specified under this RFP, or for context in interpreting the goals, standards, and guidelines of this RFP, the Offerors shall follow the general guidance provided in the following documents in descending order of priority:

a) Whiteman AFB Design Compatibility Standards.
b) Whiteman AFB Landscape Development Plan (February 1991)
c) Whiteman AFB Housing Community Plan (19 February 1999).
d) Air Force Family Housing Guide (December 1995).

In the event of a conflict between any of these guides and something that is addressed more specifically in this RFP, the more specific guidance of this RFP shall control.

A major site-planning objective is to ensure an interesting, attractive, livable residential environment and to utilize the potential advantages of the site through planning and site design. Where any of these documents allow options that are not specifically addressed by a document having greater priority, the contractor shall use the option most beneficial to meeting the major goals of this project as stated in the RFP.

Planning shall take into consideration:

- topography;
- preservation of existing trees;
- climatic conditions; and
- prevailing winds.
- retaining some public frontage and exposure to the lake area

Design should capitalize upon:

- economics inherent in the natural character of the site;
- using existing terrain to minimize cut and fill;
- utilize natural drainage features;
- reducing total impervious surface; and
- consolidating utilities and common open spaces.

4.3.2 LAND USE / PLANNING

Refer to Figure 4.3.1 - Conceptual Land Use Map, at the end of Part 4. The Conceptual Land Use Map contains the following general land areas:

- *Conservation Area – No Work* – this area includes the existing lake and areas immediately adjacent to the shoreline. No work of any kind shall occur in this area.
- *Conservation Area – No Housing* – these areas include topographical challenges and stands of existing vegetation and drainage. These areas should not include any structures, although they can be used to

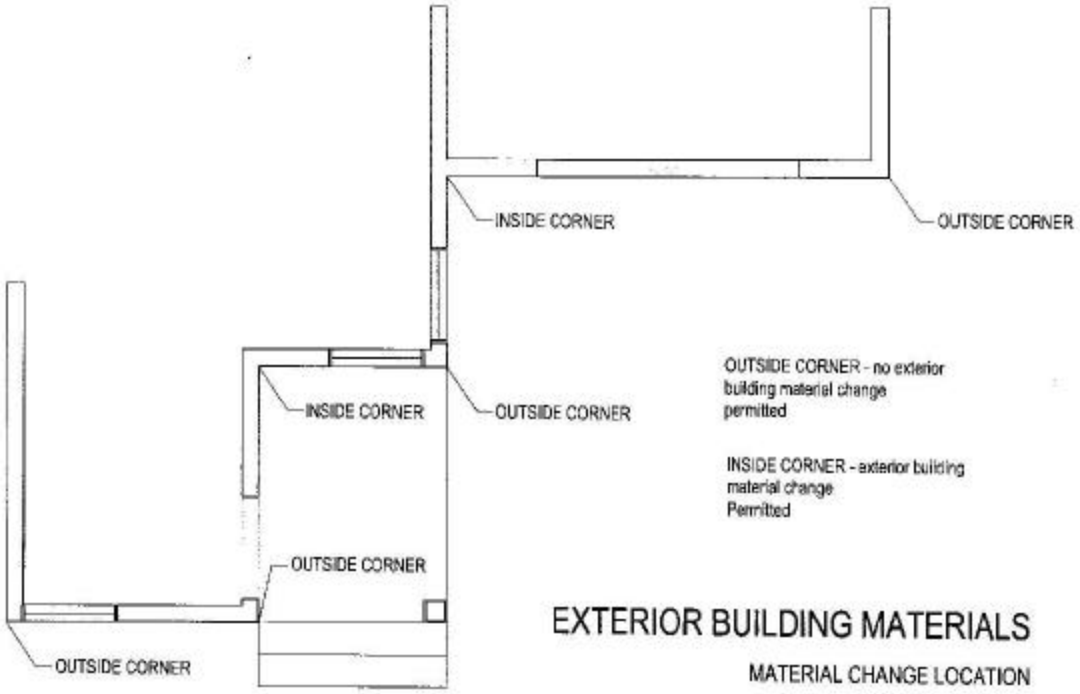

Figure 4.3.2 – Building Material Change Location

achieve any dimensional standards in the Site Design Standards or can be utilized as part of an open space or trail network.

- *Through Street Corridor* – this general area shall be the location for a primary street connecting each end of the Development Area with the remainder of the Base
- *Trail Connection Corridor*– this general area should be the location for a trails connecting the trail system in the Development Area to the existing Whiteman AFB trail system.
- *FY03 Development Area* –general area for development of the neighborhoods under the FY03 task order.
- *FY04 Development Area* –general area for development of the neighborhoods under the Option 1 to the FY03 task order.
- *Future Development Area* –general area for development of the neighborhoods under future task orders.
- *Future Single-Family SOQ Housing* – proposed location for seven (7) single family senior officer quarters to be built under an undetermined future task order.
- *Recreation and Access* – area east of the existing lake to be reserved for recreation area and circulation improvements under an undetermined future task order.
- *Development Area* – the entire area to be incorporated into the Development Plan for this RFP

The Offeror shall submit a Development Plan, subject to the submittal requirements in Section 4.5.1, showing planned land use for the entire Development Area identified on Figure 4.3.1. and stating the total number of units provided in the Development Plan. The Development Plan shall generally follow the Conceptual Land Use Map Figure 4.3.1. However, Offerors may propose a different layout of the FY03, FY04 and Future Development Area provided that: 1) each development area for each task order or option to a task order shall be contiguous; 2) the temporary construction entrance shall be along MO Highway 23; any trailer farm or construction operational headquarters shall be near the gate; and 4) proposed build-out of the development plan shall withdraw away from the existing base and towards the temporary construction entrance.

The Development Plan shall include the following general land use categories: (1) Neighborhoods; (2) Open/Recreation Space; and (3) Circulation Systems. These land use categories should be planned based on the goals and standards in the following sections, and provide for the efficient, logical and economic arrangement of each categories. In addition, the Development Plan shall provide significant functional relationships among each of the land use categories, with particular attention paid to the site plan details where these elements interface (see Section 4.3.3 below on "Transitions").

The Development Plan should provide for 250 to 300 housing units phased for build out of the Development Area, 92 built under the FY03 Task Order and 84 built under the Option 1, FY04 portion of this task order. The Offeror shall submit neighborhood site plans for both the FY03 Development Area and the FY04 Development Area, each subject to the detailed Neighborhood Design Standards (Section 4.3.4) and submittal requirements in Section 4.4.2. of this RFP. The Development Plan shall also demonstrate that detailed Neighborhood Design Standards (Section 4.3.4) will be able to be met in each subsequent FY task order shown in the Offeror's Development Plan.

4.3.2.1 Neighborhoods

Description: The neighborhood is composed of the housing units and the immediate vicinity of housing units including common, semi-private, and private areas such as yards or patios.

Goals and Standards:

- Neighborhoods should provide attractive streetscapes and community orientation of all buildings but also provide for the arrangement and layout of buildings that affords quality private areas for residents.
- Community orientation of buildings shall establish a unique neighborhood identity for the project as a whole. In addition, Offerors may provide for unique neighborhood identities within the project.
- Private areas should be located away from the circulation system with land use transitions or screened by appropriate buffer areas.

4.3.2.2 Open / Recreation Space

Description: Open / recreation space is composed of all undeveloped areas of the project area, those areas developed for active recreation, or areas preserved from development. Open / recreation space shall include play lots, play areas, natural preserves, and the lake area.

Goals and Standards:

- Preserve at least 20% of total project area (excluding the surface area of any bodies of water) as undeveloped natural space. Preserved areas should be selected based on the greatest combination of the following:
  - environmentally or topographically significant land;
  - visual impact on the project as a whole;
  - buffers and transitions for the land use plan; and
  - accessibility for residents from the circulation system.
- Provide tot lots within 1/8 mile of all residences, as measured on the most direct pedestrian circulation route.
- Provide playgrounds within ¼ mile of all residences, as measured on the most direct pedestrian circulation route.
- Incorporate trail corridors throughout the entire Development Plan to link with the existing trail system

4.3.2.3 Circulation Systems

Description: Circulation systems include any network for travel of pedestrians or vehicles. Circulation systems shall include at a minimum all streets, sidewalks, and trails open to resident access.

Goals and Standards:

- Provide one through street for the Development Area. The through street shall be located in the Through Street Corridor designated in Figure 4.3.1. and connect at access points indicated. The specific location and design for this through street should be based on the following:
  - the most direct and efficient route accounting for topographical conditions;
  - minimum disturbance of Conservation Areas indicated on Figure 4.3.1;
  - provide a public frontage for a portion of the preserved lake area; and
  - a "parkway-like" design, particularly with respect to landscaping.
- Local streets providing access to housing units should maintain an interconnected system, with multiple access routes available to most housing units. However, street designs and layouts should discourage non-local traffic on these streets. Cul-de-sacs may be used, however are preferred only when they are necessary to accommodate existing and significant topographic or other natural conditions. (See "Residential Streets," Third Edition, Walter Kulash – Principle Author, Urban Land Institute, National Association of Home Builders, American Society of Civil Engineers, Institute of Transportation Engineers (2001); and Traditional Neighborhood Development Street Design Guidelines, A Recommended Practice of the Institute of Transportation Engineers, (October 1999) for the principles and techniques on this goal.)
- A pedestrian circulation system shall provide at least as frequent and direct connections of pedestrian facilities as that provided for vehicles. Sidewalks on one side of all local streets is presumed to meet this requirement, however alternative pedestrian connections (such as that shared by the trail corridors) are encouraged. However, sidewalks (5' wide minimum) shall be located on both sides of the through street unless a trail is provided.
- A trail corridor shall be designed throughout the project to provide recreation opportunities. The trail corridor is independent of the pedestrian circulation system. However, the trail corridor may serve as the pedestrian circulation system at appropriate and limited points, provided that each remain distinct elements of the overall circulation system.
- The 45 meter setback from the controlled access perimeter fence around the project area may be used for the circulation system – including streets, sidewalks, and trails. However, no buildings are allowed in this area.

4.3.3 TRANSITIONS

The Development Plan (Section 4.3.2.) and individual neighborhood site design plans for FY03-FY05 (meeting design standards of Section 4.3.4) should pay special attention to transitions. Transitions occur when areas of different land uses interface or as you move from community to private areas in the neighborhood. Transitions should be designed to define different areas of the project, create diversity among areas, but also maintain a completely integrated community without the need for abrupt segregating elements or isolating the different land use elements by vast amounts of space. Effective transitions can be achieved by the following methods:

- arrange land uses efficiently and effectively so that transition areas serve multiple purposes other than merely separating uses;
- utilize existing natural and topographic features to create transitions;
- alter the design of potentially incompatible elements to eliminate potential negative impacts;
- use site design techniques such as building location and orientation, window placement, and landscape barriers to moderate predictable undesirable noise; and
- provide appropriate buffer areas to separate and visually insulate the community from any undesirable external influences. (see Part 7 – Landscaping)

Particular attention shall be paid to the buffer along Highway 23 and the buffer at the connection point of the through street with Symington Ave.

4.3.4 NEIGHBORHOOD DESIGN

Offerors shall submit a neighborhood site design plan, subject to the submittal requirements of Section 4.5.2., for the FY03 development area and the FY04 development area. The FY03 site plan shall include 92 housing units and the Option 1, FY04 site plan shall include 84 housing units. The neighborhood design is comprised of 4 distinct zones, which are part of each housing site. Each zone has separate goals and design standards. These zones are: (1) the Community Zone; (2) the Streetscape Zone; (3) the Private Zone; and (4) the Common Zone (optional). These areas should be designed to create a smooth transition from the public realm to the private realm. The following sections have a description, the goals, and design standards for each zone.

4.3.4.1 Community Zone

Description: The community zone is one of the most important and most used areas of the Base. It is the area of the neighborhood open to travel by Base residents and visitors, mostly including the portion of the circulation system upon which housing units front. It includes the streets, planting strips, and sidewalks.

Goals:

- Provide efficient and safe access to all housing units and contribute to the neighborhood character while achieving the overall goals for the Circulation System (4.3.2).
- Use design techniques that balance vehicle and pedestrian needs.
- Provide an attractive aesthetic appearance throughout the neighborhoods.
- Minimize impervious surface runoff and make efficient use of all streets.
- Ensure safe vehicle speeds appropriate for residential neighborhoods.
- Seek a street layout that allows the greatest number of houses to have an energy-efficient exposure (see Part 3 – Sustainable Design), without compromising the goals of the Circulation System (4.3.2) or the goals of the Streetscape Zone (4.3.4.2).
- Adapt street layouts to the terrain and minimize grading.

Standards and Guidelines:

- Local street width: 32 feet
- Through street width: 32 feet
- Cul-de-sac radius: 30 to 45 feet (off –center turnarounds are acceptable to make turning movements easier)

	turning movements easier)
• Sidewalk Width	5 feet minimum – one side of the street. On any cul-de-sacs, the sidewalk shall continue around the entire bulb of the cul-de-sac. Betterment is 5-foot sidewalks on both sides of the street, except where a portion of the trail system provides equally convenient pedestrian access.
• Planting Strip (area between back of curb and sidewalk):	4 feet minimum. Only grass, street lights, and mailboxes shall be allowed in the planting strip.
• Curb radius at intersections	10 to 15 feet for intersections of local streets 15 to 20 for intersections with through streets or arterial streets
• Mailbox Area	A mailbox cluster shall be located within the clear line of site of the front door of all housing units that it serves. Mailbox clusters shall provide a cover for residents accessing mailboxes with a minimum 4' overhang from the face of the mailboxes. The cover shall be compatible with the architectural style and materials of the housing units in the neighborhood. (Note: Bus stops, as indicated in the 1999 Whiteman AFB Family Housing Community Plan are not required as part of the neighborhood site design.)
• Utility Area	A 16-foot wide utility easement shall be located in the Community Zone to locate water, gas, and sanitary sewer facilities. The preferred location is on one side of the street without sidewalks, immediately behind the back of curb. In the case where the Betterment for sidewalks on both sides of the street is provided, the easement shall be in the planting strip (and under the sidewalk if necessary) on either side of the street.

4.3.4.2 Streetscape Zone

Description: The Streetscape Zone is the portion of the neighborhood framed by the streets and housing units. Although it is typically considered a "private" yard area, it is visible from the streets and shares many of the characteristics of the Community Zone. Therefore, it establishes the transition from the Community Zone to the Private Zone. Front setbacks, front facades, building orientation, and landscape elements all contribute to the appearance of the Streetscape Zone.

Goals:

- Create a consistent appearance that provides a visual sense of community. However, avoid uniformity of architectural features both along individual streets and between different areas of the neighborhood(s).
- Reinforce connections between the families and the community.
- Use design techniques to minimize interruptions caused by vehicle access, vehicle parking, and garage doors in the Streetscape Zone.
- Minimize impervious surface in the Streetscape Zone.

Standards and Guidelines:

• Building Orientation:	All buildings shall orient towards the street with the front entry or porch facing the Community Zone.

- Front facade building line: The building line for the front façade shall be 30 to 40 feet from the back of curb. Front facade building lines along a single block shall not vary by more than 5 feet.
- Front setback for garage: *Minimum* – Overhead garage doors facing the Community Zone shall have a garage building line at least 2 feet behind the front façade.

  Alternative – garages with overhead garage doors facing a different direction from the front façade may have the same building line as the rest of the building (side, front, or rear).

  Betterment –At least 33% of the units have either: (1) garages with overhead doors facing the Community Zone with garage building line at least 20 feet beyond the front building line; or (2) side or rear entry garages. Provided however, to achieve the betterment, the driveway paving width in the Streetscape Zone is minimized in conjunction with this design feature.
- Garage doors: When overhead garage doors for an individual housing unit in a duplex face the Community Zone, they shall not be located immediately adjacent to overhead garage doors for the attached adjacent unit.

  Minimum – separate garage doors of individual housing units in the same structure by at least 40 feet.
- Vehicle access: All units shall have a paved vehicular access to two-car garages. However innovative site design techniques that minimize impervious surface in the Streetscape Zone are encouraged to meet the goals for the Streetscape Zone.
- Pedestrian Access: Each housing unit shall have a direct pedestrian connection from the front door to the street and from the front door to any parking area serving the unit.
- Facade/Housing design: Within each fiscal year of construction (i.e. FY03, FY04, etc.) submit at least 4 different floor plans for 3-bedroom units and at least different 3 floor plans for 4-bedroom units. The same floor plans may be used in each fiscal year to meet this requirement. To qualify as a different floor plan, the unit shall have a different layout that results in different front facade wall planes or rooflines. Mirror image floor plans are acceptable but shall not count as different floor plans. An ADA accessible unit shall also qualify as a different floor plan. Neighborhood site plans shall designate which floor plan is proposed for each site.

  At least 3 different floor plans shall be provided on each street. No more than 40% of all units in a task order may be of a single floor plan.

  At least 2 material palettes shall be submitted for each floor plan. Example: One materials palette of brick with siding and another materials palette of stone with siding.

  At least 2 color palettes shall be submitted for each material scheme. Example: A “brick” materials palette would have one light brick color scheme and one dark brick color scheme.

  A materials and color board shall be submitted with all proposed material and color schemes.

  No more than 60% of all buildings in a single task order can be of a single materials palette.

  No more than 40% of all buildings in the task order can be of a single color/material combination.

In all cases, changes of materials of "field" colors or materials should occur at inside corners, and not at outside corners or in the middle of a facade. (See Figure 4.3.2)

- Front porch design — Covered front porches are required on all housing units. A front porch shall include a total area capable of accommodating 4 chairs and 2 accessory tables.

  Front porch depth shall be a minimum of 6 feet deep with 8 to 10 feet being desirable. Front porches meeting these standards may encroach into the setback required for the front façade building line.

4.3.4.3 Private Zone

Description: The Private Zone of the Neighborhood Design is largely made up of the internal housing unit, and more detailed specifications are contained in Part 9 – Unit Design. However, some details of this area involve external elements such as side setbacks, rear yards, fencing and screening.

Goals:

- Promote visual diversity and a variety of configurations of housing units.
- Promote building footprints suited to varying terrain, and encourage layouts that maximize natural or inherent backyard screening.
- Provide the best views and privacy for occupants of housing units.
- Encourage vehicle parking, including garages, overhead garage doors, additional exterior parking in the Private Area of the site.
- Maintain a separation between the rear of buildings of 120 feet wherever possible, or provide access to open space, natural areas, or recreation areas for residents.

Standards and Guidelines:

- Side building separation: — Buildings along a single block shall be separated by at least 16 feet. In cases where drainage swales are required for proper drainage between sides of buildings, buildings shall be separated by at least 20 feet with the centerline of the swale located in the center of the side separation.

  At a street intersection, the side separation from the building to the back of curb of the street shall be at least 20 feet.

  The side separation along a single block should generally not exceed the front setback.

  Designs, materials, and window locations on side facades shall ensure privacy within units, but should avoid large expanses of blank walls.

- Rear building separation: — Buildings shall maintain a minimum rear separation of 100 feet from the rear of another building or the back of the curb of another street. This separation may include "no housing" and "no work" areas shown on Figure 4.3.1 – Conceptual Land Use Map. Patios and fenced yards may encroach into the rear separation but not into a "no housing" or a "no work" area.

- Force Protection: — No building may be located within 45 meters of the controlled access perimeter fence bordering the Development Area.

- Fences: — Fencing is prohibited in the front or on the side of buildings.

  A fenced area shall be provided for the rear yard of all units subject to the following:

- the fenced area shall be between 1200 and 2000 s.f.;
- the minimum dimension of the fenced area in any direction shall be 24 feet;
- 2 personnel gates (at least one of which is at least 36 inches wide) are required for each fenced area;
- fences shall connect to the privacy screen (see Part 9);
- common fences between adjacent units and adjacent buildings are allowable.

- Utility Location: A 20-foot utility easement shall be located in the Private Zone for electric, telephone, and cable routings. This easement may be allocated equally between adjacent rear yards of buildings. As an alternative, this utility easement may be located in a Common Interior Zone , where a Common Interior Zone is provided.

4.3.4.4 Common Interior Zone (optional)

Description: The Common Interior Zone is internal to the block and may be accessed by residents around the exterior of the block. This zone is optional and may be planned to locate playgrounds, tot lots, open space, and trail elements of the Development Plan.

Goals, Standards and Guidelines:
Refer to:
- Section 4.3.2. for general recreation and open space goals;
- Section 4.3.5 for playground and tot lot goals and standards; and
- Part 7 for landscaping standards.

4.3.5 OPEN / RECREATION SPACE DESIGN

Offerors shall submit a site design plan for all open space and recreation space in the FY03 task order and Option 1, FY04 Project. The site design for each area shall meet the general planning goals for open/recreation space specified in Section 4.3.2 – Land Use and Planning, as well as the detailed site design goals and standards of this section.

4.3.5.1 Playgrounds and Tot lots

Goals
- Provide direct access to natural undeveloped open space for all residence either through adjacency of residents to undeveloped open space or access to a trail system that connects to undeveloped open space.
- Design playgrounds and tot lots that provide development and stimulation through a variety of the following activities: motor skills; imagination; building; competition; and quite solitary activities. Do not segregate these activities in separate play areas, rather link them through integrated site design.
- Tot lots should be designed for 2 to 5 year olds and accommodate approximately 15 children.
- Playgrounds shall include a tot lot, and in addition contain a play area designed for children 5 to 12 years old. The additional play area should accommodate approximately 25 children.
- All tot lots and playgrounds throughout the Development Area should not be the same in terms of design and play equipment.

Standards and Guidelines

- Location and Size

  Tot lots, playgrounds, trails, and open space shall be located according to the general planning goals specified in 4.3.2.

  Tot lots shall include a play area of approximately 1,500 square feet.

  Playgrounds shall include a play area of approximately 3,500 feet.

  Tot lots and playgrounds should provide some residual open space for unstructured play. This area may be counted as undeveloped open space for the purposes of meeting the open/recreation space planning goals in Section 4.3.2.

  Tot lot locations should be visible from most residences which it serves.

- Elements

  Tot lots shall include at least the following elements:

  - A 2 child swing (minimum 8’ high);
  - At least 1 climbing apparatus with a slide;
  - At leas 3 different additional activity stations that provide a variety of physical and mental stimulation meeting the specified design goals.
  - At least 2 benches for adult seating;
  - 1 trash receptacle;
  - An edge treatment defining the play area.

  Playgrounds shall include at least the following elements:

  - All of the elements listed for tot lots in a distinct but adjacent play area;
  - Swings for 4 people (minimum 12’ high);
  - At least 1 climbing apparatus with at least 2 slides;
  - At leas 5 different additional activity stations that provide a variety of physical and mental stimulation meeting the specified design goals.
  - At least 3 benches for adult seating;
  - 2 trash receptacles;
  - 1 covered pavilion (minimum 16’ by 16’ column separation);
  - 2 picnic tables;
  - 1 bar-b-que grill;
  - 1 bike rack accommodating at least 10 bicycles.
  - An edge treatment defining the play area. (See Figure 4.3.5.1 for detail of edge treatment currently used at Whiteman AFB. This is the recommended edge treatment, however treatments meeting similar or improved performance standards are acceptable.)

- Landscape

  Sufficient excess area around the play area shall be provided for access, supervision, and unstructured play.

  Playgrounds and tot lots should be located to take advantage of existing trees for shade. Refer to Part 7 – Landscape for materials and specifications regarding open / recreation space.

- Access — All playgrounds and tot lots shall be directly accessible to all residences which it serves by a sidewalk or trail meeting the goals and specifications for the Circulation System

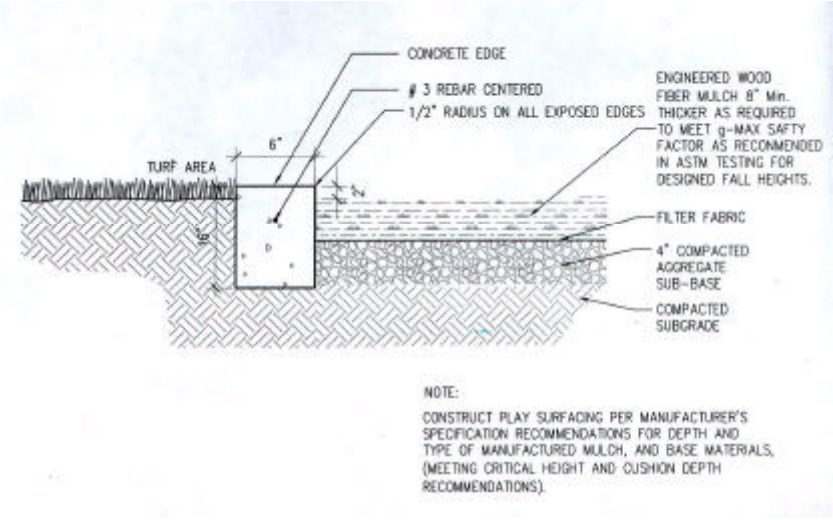

Figure 4.3.5.1. - Play Area Edge Detail

Design Specifications, Child Safety, and Accessibility

Playgrounds and tot lots shall comply with the safety requirements of ASTM and the Handbook for Public Playground Safety (US Consumer Reports Safety Commission).

Accessibility to children and adults with disabilities: Play areas shall be accessible to children and adults with disabilities. In addition to wheelchair users, the needs of children and adults who walk with canes, walkers, or crutches; who have limited use of the upper body; who have visual or hearing disabilities, or who have developmental disabilities shall be considered. Design criteria based on child dimensions should be used for the proper functioning of the play area. Every part of a play area may not be accessible to all its users, but the social experience provided should be accessible to everyone. When more than one play activity of the same type is provided, one shall be accessible. When one activity is provided, it shall be accessible. A diverse play area has the greatest potential for meeting the needs of all users. Separate play areas for the physically challenged are not acceptable. Integrating all children in the same play setting is emphasized. Standard ADA guidelines for accessible routes, ramps for wheelchair access, transfer points, wheelchair accessible platforms, and accessible stepped platforms should be followed.

Age appropriate scale is a term used to describe equipment which will allow safe and successful use by children of a specific chronological age, mental age, and physical ability. Play equipment height and complexity shall not exceed the user's ability. The children's play areas shall meet age appropriate scale for the age groups that the areas are designed to accommodate.

Use zones. In accordance with ASTM F 1487. a use zone is a clear, unobstructed area under and around play equipment where a child would be expected to land when jumping or falling from a piece of play equipment. Requirements for use zones vary for the age group and for different pieces of equipment. All use zones for play equipment shall be shown on the site plan to ensure there is no conflict between play activities on the ground and swinging or jumping from the equipment. Use zones will not overlap except for spring rocking equipment, balance beams, and play houses.

Playground safety surface. A playground safety surface is constructed of a material that meets the shock absorbency criteria recommended in ASTM F 1292, F1951, and F 2075. Playground safety surfaces shall be provided throughout all use zones and under all play equipment as required by the ASTM. The preferred material is wood chips similar to Fibar.

The following play events are not appropriate for use in unsupervised play areas; Chain walks, chain or tire climbers, fulcrum seesaws, log roles, May poles, merry-go-rounds, rotating equipment, spring rocking equipment intended for standing, swinging exercise bars, trapeze bars, and whirls.

4.3.5.2 Trail

Goals

- Provide direct access to natural undeveloped open space for all residence either through adjacency of residents to undeveloped open space or access to a trail system that connects to undeveloped open space.
- Follow the general trail location criteria and principles in the February 1999 Whiteman AFBfamily Housing Community Plan.
- Establish links between playgrounds, open space, and the pedestrian Circulation System with the trail system.
- Create a looped trail system, minimizing "dead end" portions of trails.
- Trails may be located in the 45 meter Base perimeter setback and the Conservation Areas on the Conceptual Land Use Map.

Standards and Guidelines

- A minimum 10' wide paved jogging/walking/bike trail shall be provided.
- Match trail system design with existing Whiteman AFB trail system. (See Figure 4.3.5.2.a. and b. for the trail section and edge detail currently used at Whiteman AFB. This trail design is recommended, however specifications meeting similar or improved performance standards and blending seamlessly with the existing trail system are acceptable.)

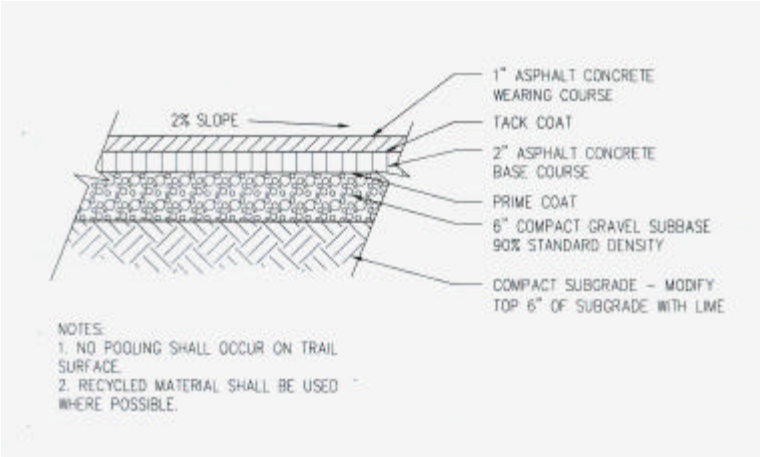

Figure 4.3.5.2.a. – Asphalt Trail Section

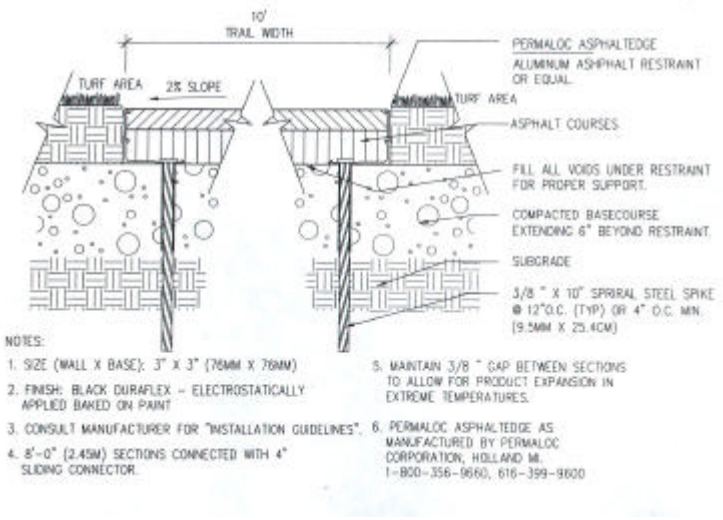

Figure 4.3.5.2.b. – Asphalt Trail Edge Detail

4.4 CONSTRUCTION SPECIFICATIONS

4.4.1 GENERAL

Refer to Part 6 – GRADING, DRAINAGE, AND EROSION CONTROL, for additional information on sidewalk criteria.

4.4.2 CONCRETE AND ASPHALTIC CONCRETE

Refer to the following technical specification sections included in Division 2 of this RFP for additional information on concrete and asphaltic concrete:

Section 02700	Asphaltic Concrete ...
Section 02712	Lime-Modified Subgrade
Section 02714	Rapid Drainage Layer
Section 02721	Subbase Coursed
Section 02722	Crushed ...Base Course
Section 02748	Bituminous Tack and Prime Coats
Section 02760	Field Molded Sealants... in Rigid Pavements
Section 02763	Pavement Markings
Section 02770	Concrete Sidewalks

- All curb and gutter shall be constructed of concrete. Asphalt curbs shall not be used. Curbs shall be depressed at entrances to driveways and at all other areas where ramping for vehicular or pedestrian access is provided. Curb ramps shall be provided wherever an accessible route crosses a curb including intersections, pedestrian crossings, mail boxes, playgrounds, parks, and recreational areas. Accessibility shall be considered for bike riders, strollers, and persons with disabilities. All gradients shall provide positive drainage (no ponding).Expansion joints in concrete sidewalks shall be sealed with cold-applied sealant, which is gray in color.

- All existing curb and gutter that is required to be removed shall be replaced to match existing adjacent profiles.

- Walks shall be of reinforced concrete with a minimum nominal thickness of four (4) inches and have a medium broom finish. Walks shall be placed over four (4) inches of aggregate base course. Walks accessing handicapped entrances shall meet the requirements of the American Disability Act with

respect to width and grade. Curb cuts shall be provided for handicapped accessibility at intersections of drives and walks. Transverse contraction joint spacing shall be five (5) feet for walks five (5) feet wide. Longitudinal contraction joints shall be constructed in sidewalk widths eight (8) feet and greater. Expansion joint spacing shall not exceed forty (40) feet.

- All existing sidewalks that are required to be removed shall be replaced to match the existing adjacent sidewalk to remain including size, layout, thickness, contraction joints, expansion joints, toolings and brooming. Where new utilities will be installed using open trench methods, existing sidewalks shall be removed to the nearest joint and replaced to original thickness and cross section. Concrete sidewalks shall be a minimum of four (4) inches thick.

- Thickness of aggregate base course shall be 6” or as recommended by the soils tests and shall be installed over 6” compacted subgrade.

- Where new utilities will be installed using open trench methods, existing pavements shall be removed and replaced to original thickness and cross section. Bituminous and concrete pavements shall overlap at least twelve (12) inches over existing base course.

4.4.3 DRIVEWAYS

Driveways shall slope down from the garage with an algebraic difference of grades at any one point not greater than 6 percent, 2 percent cross-slope. The minimum pavement section for driveways shall be 6 inches of reinforced concrete over 4 inches of aggregate base course over 6 inches compacted subgrade.

4.4.4 TRAFFIC CONTROL AND STREET SIGNS

Traffic control signs shall be provided at all street intersections and shall conform to requirements of Airforce Family Housing Guide. Street name signs shall be provided at all street intersections and shall conform to appropriate base standards. The Contracting Officer will provide street names. Details of the street name signs, including mounting details, shall be submitted to the CO for approval.

4.4.5 FENCES

4.4.5.1 Controlled Access Perimeter Fence

A controlled access perimeter fence shall connect to the existing fence and be located approximately on the property line. The fence shall be a 7 foot chain link with a top and bottom tension line, three barbed wire outrigger, centered on a 12” wide, 4” deep mow strip consisting of gravel over weed control fabric.

4.4.5.2 Rear Yard Fence

The rear yard fences shall meet the following specifications:

- conform to the requirements ASTM F964;
- solid wall virgin PVC compounds;
- contain no co-extruded products;
- 48” fence height;
- minimum 5” x 5” fence posts located a maximum of 8 feet on center with post caps;
- minimum non-prorated 20 year warranty;

The fence style shall be compatible with the character of each individual neighborhood and shall meet the approval of Whiteman AFB. (Refer to Part 9 - Housing Unit Design/Construction for additional information of privacy screens between adjoined units.)

4.5 SUBMITTAL REQUIREMENTS

4.5.1 DEVELOPMENT PLAN

- ❑ Prepare plan drawn to scale of 1”= 300’ or larger and including north arrow and graphic scale.

- ❑ Name of the project, Offeror who developed the plan and the date.
- ❑ Show boundaries with dimensions and written legal description of site.
- ❑ Location of Public right-of-ways adjacent to the property.
- ❑ Location of any/all easements on the property.
- ❑ Show general building locations.
- ❑ State the total number of units provided in the Development Plan
- ❑ Show general location of streets, sidewalks, trails, fences, playgrounds, and any retaining walls.
- ❑ Show plan of the entire development area, and indicate development phases.
- ❑ Show any sign locations.
- ❑ Show relationship between Neighborhoods, Circulation System, Open/Natural Space including any areas designated for special transition design treatment.

4.5.2 NEIGHBORHOOD SITE DESIGN PLAN

- ❑ Prepare plan(s) drawn to scale of 1”= 100’ or larger and including north arrow and graphic scale for the FY03 (92 Units) and FY04 (100 Units) project sites.
- ❑ Name of the project, Offeror, and the date of the plan.
- ❑ Show boundaries <u>of site, with dimensions and written legal description optional.</u>
- ❑ <u>TEXT DELETED</u>
- ❑ Location of Public right-of-ways adjacent to the property.
- ❑ Location of all easements on the property.
- ❑ Show building locations with floor plan or building type designation.
- ❑ List the type, thickness, location and width of all pavement surfaces, show a “typical” detail for all driveways, walkways, trails and residential and through streets.
- ❑ Dimension typical distances between buildings, setback from streets, street widths, sidewalks, and driveways.
- ❑ Show location, height and material of any and all screen walls, retaining walls and fences.
- ❑ Show direction and height and location of all proposed street and pedestrian lighting facilities.
- ❑ Show the proposed location, dimensions, color, materials, and elevation of any exterior signs.
- ❑ Show the location of all other improvements to be built under the particular task order.

PART 5 – SOILS AND SUBSURFACE CONDITIONS

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5 SOILS AND SUBSURFACE CONSIDERATIONS

5.1 SOILS REPORT AND SUPPLEMENT (GEOTECHNICAL REPORT)

A Soils Report, dated 1995 and revised May 2003, and a Supplement Report, dated May 2003, is provided as part of this RFP (See Attachments). The Report and Supplement are intended to provide an overview of soils and geologic conditions encountered at the Development Area. Refer to Appendix A in the Soils Report for a Boring Map which shows where soil testing was accomplished. The Supplement report must be read and interpreted in conjunction with the original Soils Report including revisions. References to the "Designer" and "Contractor" in the Reports and herein are synonymous with "Offeror".

The attached Soils Report and Supplement are intended to provide geotechnical criteria for the Development Area for use by the Offeror in preparing the Proposal. Any errors identified shall be brought to the attention of the Contracting Officer immediately for resolution and direction. The Contractor shall take all professionally prudent and reasonable actions to verify the accuracy of the data provided. During design and construction , the Contractor shall, with his or her consulting professional geotechnical engineer experienced in geotechnical engineering, be responsible for obtaining any additional data necessary for the execution of this project.

In the Attachments, the geotechnical reports prepared by PSI are provided for information only. The Contractor shall follow Corps of Engineer geotechnical report recommendations.

5.2 GEOTECHNICAL ANALYSIS

5.2.1 SITE SPECIFIC CONCERNS

a) The clay soils at Whiteman AFB present the greatest problems for construction in general. Often the in-situ moisture content of the clays are near the plastic limits thus indicating a potential for volume change with changes in moisture content. Potential swell for this type of material is "high". Reference to the Soils Report is recommended to obtain specific information relative to expansive soil conditions.

b) It should be realized that ground water levels at Whiteman AFB are often difficult to determine accurately during a relatively short field investigation; perched water conditions and low permeability soils can produce misleading levels within the borings. Accurate ground water data will be required for the design and construction of building foundations. It is suggested that if a structure is especially sensitive to ground water depth, a short-term piezometer installation is a good indicator of ground water conditions. Reference to the Soils Report is recommended to obtain specific information relative to ground water level conditions.

5.2.2 SOIL COMPACTION

a) Soil compaction shall be achieved by equipment appropriate to the material type being compacted. Material shall be moistened or aerated as described in the Soils Report to provide the moisture content that will readily facilitate obtaining the compaction specified with the equipment used. Compact each layer to not less than the percentage of maximum density specified in Table 5-1, determined in accordance with ASTM D 1557 Method D.

b) The requirements shall be verified or modifications recommended by the consulting professional geotechnical engineer in the report wherever engineering, soils, or climatic factors indicate the necessity. Any modification to the stated compaction requirements shall require the approval of the Contracting Officer.

TABLE 5-1 – SOIL COMPACTION

Subgrade Preparation, Fills, Embankments, and Backfills	Compaction Requirements (Percentage of Maximum Density)
Structures & Building Slabs	Per text of Soils Report
Streets, Paved Areas, Bike Paths	90
Sidewalks	85
Grassed Areas	85

5.2.3 CAPILLARY WATER BARRIER AND VAPOR BARRIER.

A capillary water barrier and vapor barrier is required for all interior slabs on grade, including garages, and crawl spaces. As a minimum, the vapor barrier shall be a polyethylene sheet not less than 6 mils thick. Provide crushed rock capillary water barrier below the vapor barrier per the Soils Report.

5.2.4 SOIL TREATMENT

Soil treatment for termites is required. Termiticides bearing current registration by the EPA or approved for such use by another the appropriate agency shall be used. Comply with 7 USC Section 136 for requirements on Contractor's licensing, certification and record keeping.

5.2.5 DECAY TREATMENT

Decay treatment shall be in accordance with HUD 4910.1.

5.2.6 RADON MITIGATION

Radon mitigation of the soil is not required. However, refer to Part 3 and Part 11 for radon prevention requirements.

PART 6 – GRADING, DRAINAGE, AND EROSION CONTROL

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6 GRADING, STORM DRAINAGE, AND EROSION CONTROL

6.1 GRADING

6.1.1 GENERAL

The Contractor shall complete all rough and final grading as necessary to complete all work included in this RFP. The Contractor shall confine all grading work, except utility connections / extensions as noted in Part 8, Site Utilities, to the Development Area boundaries indicated on Drawings included in this RFP. Existing Partial Topographic Site Plan information is shown on Drawings 6.1.1, 6.1.2 and 6.1.3 as included in this RFP. Refer to the Conceptual Land Use Map, in Part 4 for additional schematic site information. Refer to Part 7, Landscaping, for specific landscaping information as it relates to site grading. Clearing and grubbing on the site shall be as specified in Division 2 Technical Specifications in this RFP, Section 02230 CLEARING AND GRUBBING.

6.1.2 GRADING GOALS

Site grading shall reflect the following characteristics:

- The design shall provide positive drainage away from all houses on all sides.
- Use existing terrain to minimize cut and fill.
- Street layout shall minimize need for extensive re-grading of site
- Earthwork shall be balanced to the greatest extent possible without compromising the design.
- Utilize natural drainage features wherever possible.
- Grading shall be properly coordinated with areas surrounding the Development Area to insure that runoff does not cause damage or problems to other properties.
- Removal of existing trees shall be kept to a minimum. No grading shall be done within drip lines of existing trees to be preserved.

6.1.3 BORROW AND WASTE

Borrow materials shall be obtained from sources outside the limits of Government-controlled land. The source of borrow material shall be the Contractor's responsibility. The Contractor shall obtain from the owners the right to procure material, shall pay all royalties and other charges involved, and shall bear all the expense of developing the sources, including rights-of-way for hauling. The Offeror shall include any and all costs associated with obtaining borrow materials with Offer. Any surplus materials not required for fill shall be placed in the stockpile as designated by the Contracting Officer. Topsoil may be stripped from the building and road sites for reuse in final landscaping if it complies with the requirements of this RFP.

If borrow site requires coverage under a National Pollution Discharge Elimination System (NPDES) general permit for storm water discharges associated with construction activity, the Contractor shall comply with the requirements in UFGS Section 01355 ENVIRONMENTAL PROTECTION. The Contractor shall be responsible for assisting the Contracting Officer in obtaining all permit(s) required by the Missouri Department of Natural Resources (MNDR). The Contractor’s responsibility shall include obtaining any required forms or applications, assisting in completing the same and paying of any applicable fees. A copy of the completed, final permit(s) shall be provided to the Contracting Officer for review prior to any work beginning. The Offeror shall include any and all costs associated with obtaining such permit(s) with Offer. The Contractor shall include a line item for permit submittals as part of the overall project schedule referenced in Section 01320 Project Schedule.

6.1.4 SIDEWALKS AND CURB AND GUTTER

Concrete walks shall have a maximum transverse grade of 2 percent (2%). Maximum longitudinal walk grade shall be 5 percent (5%). Handicapped accessible walks with a longitudinal slope greater than 5 percent (5%) shall be considered a ramp. See FED STD 795 Uniform Federal Accessibility Standards for ramp requirements. Special attention shall be given to sidewalks that are on the north (shaded) side of houses. These walks shall be designed to ensure a freeze/thaw cycle does not result in the formation of ice on the walk. Ice on walks should be a safety consideration for all areas. The use of steps in walks shall be avoided whenever possible. The use of

single riser step is prohibited. When steps are unavoidable, they shall have at least three risers and shall be provided with handrails. The maximum longitudinal slope of five percent (5%) shall not apply to walks along streets.

Sidewalks, curbs/gutters and exterior slabs shall be as specified in Division 2 Technical Specifications in this RFP, Section 02770 CONCRETE SIDEWALKS, CURBS AND GUTTERS, AND EXTERIOR SLABS. Curbs/gutters shall be Whiteman AFB standard “lazy-back” type conforming to Figure 6.1.4. Refer to Part 4, Site, for additional site criteria information.

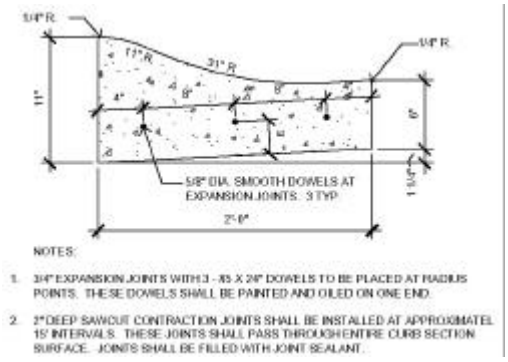

Figure 6.1.4 – Standard Whiteman AFB Curb and Gutter

6.1.5 HOUSE FLOOR ELEVATION

Finished floor elevations shall be set to ensure that the required minimum and maximum grades are met. Provide for a minimum of eight (8) inches of exposed concrete foundation wall above finish grade, except where entrances, particularly front entrances to accessible units, may require less foundation exposure directly at entrance. Refer to Part 10 for additional requirements for dimensions relating to foundation walls, finish grade and finish floor elevations. Provide minimum eighteen (18) inch difference between finish grade and front porches of non-accessible units, as well as between finish floor and the rear patio. In no case, shall the difference between finished floor elevation and finished grade be less than twenty-four (24) inches. Surface drainage shall flow away from each building. No standing water is allowed. If a drainage swale is located between buildings the swale shall be centered between buildings with the centerline no closer than ten (10) feet to either building foundation. Drainage swale(s) will not be permitted in the front yard of buildings. If a drainage swale is located in the rear yard of a building, the centerline of the swale shall be no closer than forty (40) feet to the face of a foundation wall. Refer to Part 4, Site, for additional criteria regarding the siting and separation of buildings. Roof drains shall be directed onto splash blocks to prevent water that runs off the roofs from eroding the soil in planter areas around the house foundations. Refer to Part 9, Housing Unit Design / Construction, for additional information regarding roof drains. Ensure that foundation planting beds are designed to positively drain so that water will not pond next to the foundations.

6.1.6 GRADES AWAY FROM HOUSES

a. Minimum of five percent (5%)(20:1) for the first eight (8) feet, in unpaved areas.

6.1.7 OVERLOT GRADES

Provide positive drainage for all areas.

a. Minimum two percent (2%) (50:1) for unpaved areas more than eight (8) feet from the housing unit.
b. Maximum twenty percent (20%) (5:1) grade in unpaved areas with the exception of retention areas

6.1.8 PAVED AREAS

Provide positive drainage for all areas.

a. Minimum two percent (2%) (50:1) for Asphaltic concrete areas.
b. Minimum one percent (1%) (100:1) for Portland Cement concrete areas

6.1.9 DITCH SLOPES

a. Minimum grade of two percent (2%) (50:1) for channelized flow.
b. All new ditches shall be graded at non-erodible slopes or the ditch shall be lined with an appropriate material to prevent erosion. A design storm with a return period of at least two (2) years shall be used to determine erodibility of ditches and swales.

6.2 STORM DRAINAGE

6.2.1 GENERAL

The Contractor shall design and install a complete, usable, new storm drainage system for the new family housing in the Development Area. Existing Partial Storm Water Sewer information is shown on Drawing 6.2 as included in this RFP. Drainage structures shall be located at all changes in direction of storm drain line, at the intersection of two or more storm drain lines, and where required to intercept rainfall runoff. Storm runoff in streets with curbing shall be collected using curb inlets or area inlets. The use of curb openings with flumes to drain water from streets will not be permitted unless approved by the Government. Where storm drain pipes are of different diameters, the pipe crown elevations shall be matched at the drainage structure. Under no circumstance shall storm drain lines be located beneath buildings. The Contractor shall refer to the Corps of Engineers standard details for any storm drain details required by the design. The standard details are available at the Corps FTP site http://cadlib.wes.army.mil/DetailsLibrary/. The Contractor shall provide details for any other drainage structures not found in the Corps standard details.

Appendix J: Design Analysis – Existing and New Site Utility Systems, dated 14 July 2003, is intended to provide reference material regarding utility design for the Development Area for use by the Offeror in preparing the Offer. Any errors identified shall be brought to the attention of the Contracting Officer immediately for resolution and direction. The Contractor shall take all professionally prudent and reasonable actions to verify the accuracy of the data provided. During design and construction, the Contractor shall, with his or her professional consulting engineers, be responsible for obtaining any additional data for the execution of this project.

6.2.2 STORM DRAINAGE GOALS

Storm drainage design shall capitalize upon the following characteristics:

- Existing water impoundments within the Development Area shall be utilized.
- The complete new storm drainage system shall be designed to minimize the number of drainage structures required.
- Storm drain lines shall be located outside of paved areas to the greatest extent possible.
- In no case shall storm water be directed off Government property by means of any newly designed storm sewer collection system including, but not limited to, swales, ditches, culverts and/ or pipes.
- Storm drainage lines shall be designed to have a minimum velocity such that the lines will be self-cleaning to eliminate the buildup of sediment.
- Temporary ponding on the site will be acceptable. However, temporary ponding of a depth of greater than three (3) inches or for a duration of more than an hour will not be acceptable.

6.2.2.1 ENGINEERING CRITERIA

All civil work shall conform to the latest editions of the following:

a. Standard Design Criteria of the American Public Works Association Kansas City Metropolitan Chapter (APWA)
b. Missouri Department of Transportation (MoDOT) Standard Specifications and Details for work to be performed within the limits of the MoDOT right-of-way.
c. The Johnson County, Missouri Public Works standard drawings for the civil work to be performed within the limits of the Johnson County, Missouri right-of-way.
d. The Uniform Federal Accessibility Standards (UFAS).
e. The Americans with Disabilities Act (ADA).

The most stringent requirements shall govern. All references to “City Engineer”, “County Engineer”, “District Engineer”, etc. shall be inferred to mean “Base Engineer” or Government Official as applicable.

6.2.3 DETERMINATION OF STORM RUNOFF

For areas of up to about one (1) square mile (watershed less than six-hundred (600) acres), where only peak discharges are required for design and extensive ponding is not involved; the computation of runoff will be accomplished by either the Rational Method, SCS TR55 or the method presented in TM 5-820-1.

The following methods are acceptable for all watersheds (including those larger than six-hundred (600) acres):

SCS TR-55
SCS TR 20
HEC-1

The minimum time of concentration for turf or paved areas shall be five (5) minutes. All runoff onto the site from adjacent properties shall be included in the drainage calculations.

6.2.3.1 Design Storm Return Frequencies

Enclosed and open channel conveyance system components shall be designed for the following return frequencies in accordance with APWA Section 5601.8A.

a.	Floodway in 100 year Flood Plain	100-year
b.	Cross-road culverts (including highways)	50-year
c.	Inlets, pipes, other system components	10-year

For the design of cross-road culverts on the Base, the maximum allowable headwater elevation shall be a minimum of 1 foot below the centerline elevation of the roadway, in accordance with Missouri Department of Transportation (MoDOT) Standard Specification and Details.

6.2.3.2 Rainfall Depth-Duration-Frequency Data

Rainfall data for states in the midwestern United States, specifically Missouri, shall be obtained from NOAA . Rainfall intensity-duration data developed by cities or regions may be used if available.

6.2.3.3 Storm Water Detention / Retention

Detention / Retention facilities shall be provided in accordance with APWA Section 5606. As noted in Storm Drainage Goals above, existing water impoundments within the Development Area shall be utilized. During the design process, the Contractor shall evaluate the existing impoundments to determine deficiencies and required modifications. Any modifications determined necessary to the existing water impoundment, relative to final development of the entire site, shall be completed during the initial phase of work. The Contractor shall include written reports of all findings, as so noted, in the design submittal after contract award (see Section 01332 SUBMITTALS DURING DESIGN). The following items shall be included, but not be limited to, in this evaluation and submittal:

6.2.3.3.1 Freeboard

Both the existing and required freeboard shall be evaluated and any required modifications necessary to achieve the requirements of APWA Section 5606 shall be determined.

6.2.3.3.2 Outlet Control

The existing outlet control structure and overflow spillway shall be evaluated and any additional outlet structures or modifications to the existing facilities shall be included.

6.2.3.3.3 Water volume and depth

The existing water depths and volumes shall be evaluated to determine the modifications necessary to achieve the detention volumes required in APWA Section 5606.

6.2.3.3.4 Water Quality

Testing shall be performed to determine the quality of the existing impounded water. Because the surrounding watershed is comprised of agricultural property, testing shall include tests to determine the levels of any insecticides or pesticides that may be present. The Contractor shall include results of these tests in the design submittal after contract award (see Section 01332 SUBMITTALS DURING DESIGN). The results derived from testing performed prior to construction shall serve as a benchmark. Additional testing shall be conducted monthly during the construction of the project and at the conclusion of the project to determine the impact of construction on the waters. The Contractor shall provide written reports of the monthly test results to the

Contracting Officer for review. Written copies of all monthly and final test results shall be included in the Project closeout documentation.

6.2.3.3.5 Sediment

Testing shall be performed to determine both the depth and the make-up of the existing sediment in the existing impounded waters. Because the surrounding watershed is comprised of agricultural property, testing shall include tests to determine the levels of any insecticides, pesticides and heavy metals that may be present. The Contractor shall include results of these tests in the design submittal after contract award (see Section 01332 SUBMITTALS DURING DESIGN). The results derived from testing performed prior to construction shall serve as a benchmark. Additional testing shall be conducted monthly during the construction of the project and at the conclusion of the project to determine the impact of construction on the waters. The Contractor shall provide written reports of the monthly test results to the Contracting Officer for review. Written copies of all monthly and final test results shall be included in the Project closeout documentation.

6.2.3.3.6 Government Regulatory Issues

While FEMA does not map the waterways within the current boundary of the Base, a large portion of the Development Area falls outside limits of the excluded property. The Contractor shall perform an examination of the Flood Insurance Rate Map (FIRM) for Johnson County to determine if any of the subject tract is identified as being in a flood hazard. It will also be necessary to be determine if any of the subject property has been classified as a Clean Water Act jurisdictional wetlands or falls under any requirement of the 404 lands. In addition, field investigations shall be conducted to determine if any evidence of “Endangered Species” exist. The Contractor shall also determine if the existing dam, or any new proposed dam(s), are governed by the Missouri Department of Natural Resources Rules and Regulations of the Dam and Reservoir Safety Council. Successful Contractor shall include results of all aforementioned examinations, investigations and subsequent determinations in the design submittal after contract award (see Section 01332 SUBMITTALS DURING DESIGN).

6.2.4 STORM DRAIN PIPE AND STRUCTURES

6.2.4.1 General

The maximum distance between drainage structures shall be approximately three hundred (300) feet for conduits less than thirty (30) inches in diameter. The maximum distance between drainage structures shall be approximately five-hundred (500) feet for conduits thirty (30) inches and greater in diameter. Where possible, a minimum drop of two-tenths (0.2) feet between inverts of equal diameter storm drain pipes shall be provided at the centerline of drainage structures. Culverts and storm drains shall be protected by a minimum of three (3) feet of cover during construction to prevent damage before permitting heavy construction equipment to pass over them. All storm drain pipe and structures shall be as specified in UFGS Section 02630 STORM-DRAINAGE SYSTEM.

6.2.4.2 Storm Drain Pipe

Storm drainage material shall be PVC, PE, RCP or CMP. VCP or asbestos cement piping shall not be used. Minimum size for any storm main shall be twelve (12) inches. CMP shall be minimum twelve (12) gage. Reinforced concrete pipe shall be a minimum Class III. All pipe material shall have a minimum design service life of fifty (50) years. As a minimum, all pipe joints shall be soil tight. It is preferable that all pipe joints be silt-tight. Flexible resilient pipe connectors shall be provided at drainage structures when the water table is at or above the pipeline.

6.2.4.3 Manholes

Diameter of manholes shall be large enough to accommodate pipes entering/exiting the manhole. Manhole cast iron frames shall have a minimum opening diameter of twenty four (24) inches. Manhole structures shall be prohibited from having any form of ladder rungs installed in the interior.

6.2.4.4 Area Inlets

Area inlets shall be properly sized and designed to accommodate the design flows. Grating shall be of “Bicycle - Safe” design.

6.2.4.5 Curb Inlets

Locating curb inlets at driveway entrances and on street corners (within limits of curb returns) will not be permitted. Curb inlets along two-lane streets shall be spaced and sized so that the flow in the gutter and ponded areas at low points does cover the crown of the street. Inlets and grating areas in the sag of vertical street curves that act as sumps shall be oversized one-hundred percent (100%). Curb inlets shall be equipped with trash guards.

6.2.4.6 Head Walls and Flared End Sections

Head walls or flared end sections shall be provided at the ends of culverts and at storm drain outfalls. Protection from erosion and scouring at head wall and flared end section outfalls shall be as described herein.

6.2.4.7 Culverts

Cross road culvert pipes not connecting two (2) drainage system structures shall have a minimum diameter of eighteen (18) inches wherever possible.

6.3 EROSION AND SEDIMENT CONTROL

The Contractor shall be responsible for selecting and implementing Best Management Practices (BMPs) to minimize pollutants in storm water discharges associated with construction activity at the construction site. BMPs shall conform to UFGS Section 01356 STORM WATER POLLUTION PREVENTION MEASURES. The Contractor shall prepare a plan describing the measures to be used for temporary erosion and sediment control required during the construction. This plan shall be included in the design submittal after contract award (see Section 01332 SUBMITTALS DURING DESIGN). The Contractor shall maintain all erosion and sediment measures and other protective measures in effective operating condition. All temporary structural practices shall be removed once the corresponding disturbed drainage area has been permanently stabilized. If the project requires coverage under a National Pollution Discharge Elimination System (NPDES) general permit for storm water discharges associated with construction activity, the Contractor shall comply with the requirements in UFGS Section 01355 ENVIRONMENTAL PROTECTION. The Contractor shall be responsible for assisting the Contracting Officer in obtaining all permit(s) required by the Missouri Department of Natural Resources (MNDR). The Contractor's responsibility shall include obtaining any required forms or applications, assisting in completing the same and paying of any applicable fees. A copy of all completed, final permit(s) shall be provided to the Contracting Officer for review prior to any work beginning. The Offeror shall include any and all costs associated with obtaining such permit(s) with Offer. The Contractor shall include a line item for permit submittals as part of the overall project schedule referenced in Section 01320 Project Schedule.

6.3.1 TEMPORARY CONSTRUCTION ENTRANCE

Tracking of mud from the construction site onto adjacent roads and streets shall be kept to a minimum. A temporary stabilized stone pad shall be constructed at points where vehicular traffic will be leaving the construction site and moving directly onto a paved road or street. It shall extend the full width of the vehicular ingress and egress area and have a minimum length of seventy (70) feet. The entrance shall be maintained in a condition that will prevent tracking or flow of mud onto adjacent roads or streets. If conditions on the site are such that the majority of the mud is not removed by the vehicles traveling over the stone, the tires of the vehicles shall be washed before entering the road or street. Any mud which is tracked onto roads or streets shall be removed at least once daily.

6.3.2 EROSION CONTROL BLANKET

Bottoms and sideslopes of ditches and any other disturbed slopes one (1)V on three (3)H or steeper shall be covered with an erosion control blanket immediately after seeding.

6.3.3 SILT FENCE

Silt fencing shall be installed below disturbed areas where erosion would occur in the form of sheet and rill erosion. The size of the drainage area above the silt fence shall not exceed one fourth of an acre per one-hundred (100) feet of silt fence length. Silt fencing may be installed across ditches only when the maximum contributing

drainage area is not greater than 1 acre. Silt fence constructed across a ditch shall have wire support and shall be of sufficient length to eliminate endflow.

6.3.4 STRAW BALE BARRIER

Straw bale barriers may not be installed across ditches.

6.3.5 OUTLET PROTECTION

HDPE geo-grid or porous concrete paving materials shall be installed at outlets of culverts and storm drains as needed to prevent erosion. The use of rip-rap materials will not be permitted.

6.3.6 STORM DRAIN INLET PROTECTION

Storm drain inlet protection shall be installed around all new drain inlets that will become operational before permanent stabilization of the corresponding disturbed drainage area has occurred. Storm drain inlet protection shall include either a sediment filter or an excavated area around the storm drain inlet.

6.3.7 TEMPORARY ROCK CHECK DAMS

Rock check dams may be installed in ditches that drain two (2) to ten (10) acres. The allowable drainage area will be dependent on the gradation of the rock used to construct the check dam. The maximum height of the dam shall be three (3) feet. The center of the dam shall be at least six (6) inches lower than the outer edges. For added stability, the base of the check dam may be keyed into the soil approximately six (6) inches. The maximum spacing between the dams shall be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.

6.3.8 TEMPORARY SEDIMENT TRAP

Temporary sediment traps may be constructed below disturbed areas where the total drainage area is less than three (3) acres.

6.3.9 TEMPORARY SEDIMENT BASIN

Temporary sediment basins may be constructed below disturbed areas where the total drainage area is equal to or greater than three (3) acres.

6.3.10 OTHER CONTROLS

Other temporary controls such as diversion dikes, level spreaders, seeding, etc. may be used if deemed necessary by the Contractor.

6.4 CALCULATIONS AND DRAWINGS

The Contractor shall prepare final drawings for the finish grading with a contour interval of one (1) foot. All drainage swales and ditches shall be provided with controlling invert elevations at the beginning and at all grade breaks, including drainage swales around buildings. Details of all storm structures shall be shown on the final contract drawings including typical sections for all drainage swales and open channels. All final design drawings, details, calculations, etc. shall be included in the design submittal after contract award (see Section 01332 SUBMITTALS DURING DESIGN).

6.5 OFFER CHECKLIST FOR GRADING, DRAINAGE & EROSION CONTROL:

The Offeror shall include with Offer the following items as a minimum. Refer to Part 4 – Site Plan Checklist for “overlap” with Grading, Drainage & Erosion Control requirements.

- Prepare conceptual Site Grading and Drainage plan for entire Development Area drawn to scale of 1”=300’ or larger with North arrow, graphic scale, name of project, name of Offeror and date of Plan.

- Prepare detailed proposed Site Grading and Drainage plan drawn to scale of 1”=100’ or larger for FY03 Task Order and FY04 Option 1 to Task Order project sites, with North arrow, graphic scale, name of project, name of Offeror and date of Plan.
- Detailed Site Grading and Drainage Plans shall include existing topography and proposed contours at no more than two (2) foot intervals. Benchmark information shall be to USGS datum.
- Submitted drawings shall show proposed building and street locations on all plans. Detailed plans shall include proposed finish floor elevations for each structure.
- Determine existing and anticipated final values of site stormwater run-off and provide documentation to show the same.
- Determine anticipated Storm water volumes for Detention / Retention for entire site and provide documentation to explain . Include proposed outlet control measures for same.
- Describe measures to be used for temporary erosion and sediment control during all phases of construction.
- Show proposed location of Temporary Construction Entrance on drawings submitted.

PART 7 – LANDSCAPE

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LANDSCAPE

7.1 GENERAL

Landscape design is an essential element in establishing the neighborhood identity for the housing project. The landscape design shall be integrally developed with the site planning and building layout to ensure efficient use of the land and space provided. Landscape plans shall be developed by a registered landscape architect, experienced in site planning, planting design, sustainability and familiar with local conditions and plant species who will provide all of the necessary landscape elements compatible with all architectural and site features.

Landscape requirements are as follows:

- Ensure long-term high standards of aesthetics, maintainability, and function.
- The overall landscape challenge shall be to high standards while minimizing the irrigation requirement for landscaping.
- The Contractor shall be responsible turf and irrigation system care and maintenance for a minimum of three months after date of final acceptance.
- All Trees, shrubs, ground cover and related materials shall be warranted and maintained for a period of one year after final date of acceptance.
- All turf areas shall be established and maintained until acceptance or occupancy, not to exceed three months.
- A list of landscape materials acceptable for use at Whiteman AFB is provided in the Whiteman AFB Landscape Development Plan.
- All Plant material shall be planted the following minimum distances from any foundation wall: Large Trees 12'
Ornamental trees 8'
Shrubs 4'

7.2 TREE PRESERVATION PLAN

The Successful contractor shall provide a Tree Preservation Plan to address protection and maintenance of all existing trees of healthy character over 2-inch caliper when measured 4.5 feet above the ground. Protection of all other existing healthy vegetation and smaller trees is desirable where possible. A Tree Preservation Plan shall be prepared in accordance with the following:

- A registered landscape architect, licensed forester, or certified arborist shall prepare plan.
- Plan shall include all materials, labor, and equipment to be provided by the Contractor for tree protection and preservation prior to, during, and following demolition activities.
- Plan shall clearly describe proposed methods and treatments including plans, details and specifications, as needed, to identify trees and natural areas to be preserved.
- All existing trees that are preserved, protected and maintained by the Design/Build Contractor shall be warranted for a minimum of one calendar year following date of acceptance or occupancy.
- Demolition and/or Grading shall not commence until the Government has reviewed and approved the Tree Preservation Plan.

7.3 LANDSCAPE REQUIREMENTS

The Offeror shall develop a Landscape Planting Plan following the guidance of the Air Force Family Housing Guide and information herein. The plan shall reflect appropriate groupings, and tree plantings to define open spaces, streets, and residences, plantings should also be used to buffer and screen views, noise, and wind to ensure a complete project. No trees should be planted directly on top of an underground

utility. Where new housing is to connect to existing neighborhoods, transition plantings to be compatible with the adjacent neighborhood and provide additional landscaping to identify the entry.
Choose plant materials based on hardiness, climate, soil conditions, maintenance, quality, seasonal affect, and appropriate use. Landscape plans shall describe all plant material and size, soil preparation, and final grading. The following principles should be incorporated in the landscape plans:

7.3.1 COMMUNITY ZONE (REFER TO PART 4 SITE PLANNING)

- All landscape areas to be lawn.

7.3.2 STREETSCAPE ZONE

- Provide 1 large tree (2" caliper minimum) for every 40 linear feet of street frontage measured along the back of curb. *Note: 2 1/2" caliper trees may be used at a per 50 linear foot provision.*
- Reference sections 4.3.4.1 and 4.3.4.2 for acceptable locations
- Provide 2- medium or ornamental trees per unit.
- Provide mulched shrubs/perennial groupings to partially screen utilities and foundations and provide seasonal interest at entries and views from the residence.
- All other landscape areas to be lawn.

7.3.3 PRIVATE ZONE

- Provide 1 large tree per unit. Where possible locate tree to shade decks, patios, driveways, and front entries.
- Provide 2 medium or ornamental or evergreen trees per unit to define and provide scale for patio.
- Provide mulched shrubs/perennial groupings to add seasonal interest, shade, define edges and provide scale for patio.
- Provide mulched shrubs/perennial groupings to partially screen utilities and foundations and provide seasonal interest at entries and views from the residence.
- All other landscape areas to be lawn.

7.3.4 COMMON INTERIOR ZONE

- Provide 1 large tree per unit.
- Provide 1 evergreen tree per unit.
- All other landscape areas to be lawn or existing tree masses.
- Trees provided in this zone may be grouped together and placed anywhere within the zone per each residential block.

7.3.5 RECREATION AREAS (INCLUDING TOT LOTS AND PLAYGROUNDS)

- Provide trees, shrubs/perennial beds, and ground covers as required to achieve a comfortable and safe environment for the intended activity.
- All other landscape areas to be lawn or existing tree masses.
- Plantings should convey the character of the overall development.
- Plants in this area may count toward common zone plants.

7.3.6 XERISCAPE

- It is acceptable to utilize "Xeriscape" principles of landscape design to encourage the use of native, low water using drought tolerant plant materials. Reducing maintenance and water requirements on portions of the front, side, and back lawn areas.
- It is highly desirable to utilize perennials and shrubs immediately adjacent hardscape features and near the residence.
- Lawn areas must be maintained in one piece or continuous, not broken into several small patches

7.4 LANDSCAPE MATERIALS

Use local nursery or plantation grown stock plant material that is well shaped, well grown, vigorous, healthy and exhibits strong root systems. Plants shall be free from disease, stress, harmful insects and insect eggs, sun-scald, disfigurement, and abrasions. Provide plants that are typical of the species or variety, and conform to standards and measurements as set forth in ANSI Z60.1. All necessary plant pruning and care shall comply with ANSI A300. No decorative rocks, boulders, bark, or borders (except steel edging) shall be used in landscape plans. Specify appropriate maintenance practices for the plant material provided. The following principles shall also be considered during the design of the project:

7.4.1 TREES

- **Large, Medium and Small Type Trees**. Refer to acceptable list as provided for in the Whiteman AFB Landscape Development Plan.
- **Ornamental trees** are small to medium trees with a special distinguishing characteristics including color and/or texture of foliage, fall color, flowers, fragrance, fruit or bark.
- **Evergreen trees** are trees that maintain their foliage year round and range from 10'to 50' at mature height. Refer to acceptable list as provided for in the Whiteman AFB Landscape Development Plan.

7.4.2 SHRUBS

Deciduous and evergreen shrubs are plants that can naturally maintain heights from 1'to 15' tall and provide definition of space or screening for walks, patios, courtyards, porches, foundations, and utilities. Refer to acceptable list as provided for in the Whiteman AFB Landscape Development Plan.

7.4.3 GROUND COVER

Ground cover appropriate for the area may be planted in lieu of turf to add visual contrast and reduced maintenance and irrigation requirements. Ground cover shall be of a size and spacing to provide a minimum of 50% coverage after the first full growing season and complete coverage at maturity. Edging shall be provided for all ground cover areas where they abut turf areas.

7.4.4 MULCH

Mulch all plant materials installed under this project with a minimum of 3" deep material measured after settlement has occurred. Organic hardwood and inorganic decorative gravel mulches are acceptable. Include permeable commercial-grade landscape fabric as a weed barrier. Mulch around all shrubs, and groundcovers. Trees shall have a 1.2 meter (4') diameter minimum circle of mulch. All mulch areas shall be bordered by steel edging where it abuts turf areas.

7.4.5 EDGING

All landscape edging is to be steel or aluminum edging 3/16" x 4" minimum. Choose one type and finish color for the entire project.

7.4.6 SOIL TEST

The successful contractor shall perform soil test for pH, chemical analysis, and mechanical analysis to establish the quantities and type of soil amendments and/or fertilizers required to meet local growing conditions for the type and variety of plant material specified. Describe methods of amending topsoil, if required by soils test, or state acceptable conditions for intended uses. Describe the method of topsoil stripped and storing that will be utilized until the time of final placement.

7.4.7 TOP-SOIL

Topsoil shall conforming to ASTM D 5268 with a pH of 5.5 to 7.0 with an organic matter content between 10-20% by volume, or 4-7% by weight. Topsoil shall be free from stones 3/4" or larger, and other extraneous materials harmful to plant growth.

7.4.8 PERCOLATION TEST

The successful contractor shall perform test for percolation to determine positive drainage of plant pits and beds. All soil and drainage conditions detrimental to the growth of plant material shall be identified and a offer correcting the conditions shall be submitted for approval.

7.4.9 PLANT INSTALLATION

All proposed plant locations shall be staked/flagged and approved by the Contracting Officer prior to planting. The plant material shall be installed during appropriate seasonal planting times or when beneficial results can be obtained. Contractor shall verify the location of all underground utilities. When obstructions below ground or poor drainage affect the planting operation, the contractor shall submit for approval the proposed adjustments to the plant location, type of plant, planting method or drainage correction.

7.4.10 LANDSCAPE MAINTENANCE

Maintenance operations shall begin immediately after each plant is installed and shall continue until the plant establishment period commences. Upon completion of the last day of planting operation and acceptance of the plant material has been conveyed in writing, the plant establishment period for maintaining installed plants shall commence and shall be in effect for the remaining contract time period not to exceed 12 months. When the planting operation extends over more than one season or there is a variance to the planting times, separate plant establishment periods may be allowed for the work completed.

7.4.11 LANDSCAPE ESTABLISHMENT PERIOD

Installed plants shall be maintained in a healthy growing condition. The maintenance of plants shall include, but is not limited to; periodic straightening, tightening/replacing stakes and guying material, repairing tree wrap, protecting from erosion, maintaining erosion material, supplementing mulch, pruning, maintaining edging, maintaining plant labels, watering, weeding, fertilizing, removing and replacing unhealthy or dead plants.

7.4.12 UNHEALTHY PLANTS

A plant shall be considered unhealthy or dead when the main leader has died back or 25 percent of the crown /canopy is dead (or has been removed) when compared to adjacent similar material. Determine the cause for an unhealthy plant. Unhealthy or dead plants shall be removed immediately and shall be replaced as soon as seasonal conditions permit in accordance with the following warranty paragraph.

7.4.13 LANDSCAPE WARRANTY

Furnished plant material shall be guaranteed to be in a vigorous growing condition for a period of 12 months regardless of the contract time period. A plant shall be replaced one time under this guarantee as long as proper maintenance has been provided. Plants replaced due to neglect or harmful growing conditions shall be warranted for one full year from time of replacement. Transplanting existing plants, for the convenience of the Government, requires no guarantee.

7.5 SEEDING AND SODDING

7.5.1 SOIL PREPARATION

Prior to seeding or sodding, topsoil shall be loosened to a minimum depth of 6 inches and broken up to a fine smooth surface, amended if necessary per the soil test, with workable texture suitable for seeding and/or sodding.

7.5.2 SEEDING

Minimum requirement is to seed all disturbed areas. All seeded areas shall be seeded by hydroseeding. Mix seed, fertilizer, and fiber mulch, using equipment designed for hydro-seeding application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application. Mix slurry with asphalt-emulsion tackifier. Apply slurry in two-step process. Apply first coat at a minimum rate of 500lb/acre dry weight, but not less than the rate required to obtain seed sowing rate. Apply slurry cover

coat of fiber mulch at a rate of 1000lb/acre. State approved seed of the latest season's crop shall be provided in the original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. Labels shall be in conformance with applicable State seed laws. Grass seed shall be fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances. Seed shall be mixed by the dealer and shall be delivered to the site and prepared for hydroseed mixing. Seed that has become wet, moldy or otherwise damaged in transit or storage will not be accepted. Weed seed shall not exceed ½ percent by weight of the total mixture. Seed mixtures shall be proportioned by weight as follows:

- 90 percent turf type tall fescue (minimum of three varieties in the top 20%of the national Turfgrass Associations NTEP field trials)
- 10 percent improved Kentucky bluegrass (poa pratensis)

Seed mix to be approved prior to installation. Apply seed at a rate of 10lbs./1000sq.ft.

7.5.3 SODDING

Sod front and side yards and any portion of turf located within the back yard fencing. Turfgrass sod shall be number 1 quality/premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with TPI's "Specifications for Turfgrass Sod Materials" in its "Guideline Specifications to Turfgrass Sodding". Furnish viable sod of uniform density, color and texture, strongly rooted, and capable of vigorous growth, and development when planted. Sod to be produced by a professional sod producer and grown on similar soils and climate to the site location. Sod to be comprised of the following grass species with not less than 85 percent germination, not less than 98 percent pure seed, and not more than ½ percent weed seed.

- 90 percent turf type tall fescue (minimum of three varieties in the top 20%of the national Turfgrass Associations NTEP field trials)
- 10 percent improved Kentucky bluegrass (poa pratensis)

Seed mix to be approved prior to installation. Apply seed at a rate of 10lbs./1000sq.ft.

The following principles shall also be considered during the design and construction of the project:

- Dry, moldy, yellow, irregularly shaped, torn or uneven end sod pieces will not be accepted.
- Sod shall be machine cut to a uniform thickness of 1 inch within a tolerance of 1/4 inch, excluding top growth and thatch.
- Sod anchors shall be used for slopes greater than 6:1 or as need to hold sod in place until established.
- Sod shall be placed within 16 hours of harvesting.
- Place a 5' wide swath of sod around all drain inlets, within drainage swales exceeding 3:1 and other areas where erosion can take place in non-sodded areas.
- Specify appropriate maintenance practices for the plant material provided.

7.5.4 TURF INSTALLATION

The turf shall be installed during appropriate planting times and conditions recommended by the trade for the type and variety of turf specified. The turf operations shall be performed only during periods when beneficial results can be obtained and should be scheduled to coordinate with the acceptance of the housing units. Special care shall be taken by the contractor to ensure that an acceptable stand of turf has been established prior to turning unit over for occupancy. Failure to comply will require an extended maintenance period after occupancy.

7.5.5 TURF PROTECTION

Immediately after turfing, the area shall be protected against traffic or other use by erecting barricades and providing signage as required.

7.5.6 TURF MAINTENANCE

The maintenance of the turf areas shall include eradicating weeds, eradicating insects and diseases, protecting from erosion, maintaining erosion control materials, protecting turf areas from traffic, mowing, watering, post-fertilization, and replacing unsatisfactory turf areas prior to acceptance/occupancy.

7.5.7 TURF ESTABLISHMENT PERIOD

The turf establishment period for establishing a healthy stand of turf shall begin on the first day of work under the turf contract and shall end once accepted/occupied and not longer than three months or six mowings after the last day of turf operation. An unsatisfactory stand of turf shall be repaired as soon as turf conditions permit.

7.5.8 SATISFACTORY STAND OF TURF

7.5.8.1 Seeded Yard Area

A satisfactory stand of turf from the seeding operation for a yard area is defined as healthy, well-rooted, even colored, viable lawn has been established free of weeds, bare areas, and surface irregularities with a minimum of 160 grass plants per square meter. Bare spots shall be no larger than 150-mm (6 inches) diameter. The total bare spots shall not exceed two (2) percent of the total seeded area.

7.5.8.2 Seeded Field Area

A satisfactory stand of turf from the seeding operation for a field area is defined as healthy, well-rooted, even colored, viable lawn has been established free of weeds, bare areas, and surface irregularities with a minimum of 100 grass plants per square meter. Bare spots shall be no larger than 150-mm (6 inches) diameter. The total bare spots shall not exceed two (2) percent of the total seeded area.

7.5.8.3 Sod Areas

A satisfactory stand of turf from the sodding operation is defined as, a healthy, well-rooted, even colored, viable lawn has been established free of weeds, open joints, bare areas, and surface irregularities.

Landscape Plan Checklist – Part 7

- ❑ Prepare plan(s) drawn to scale of 1”= 50’ or larger and including north arrow and graphic scale for the FY03 and FY04 Task Order project sites.
- ❑ Prepare plan(s) drawn to scale of 1”= 20’ or larger and including graphic scale for a typical residential lot.
- ❑ Name of the project, Offeror and the date of the plan.
- ❑ Show property boundaries.
- ❑ Location of all easements on the property.
- ❑ Contour lines showing final proposed grades with an interval of not more than two feet (2’) or adequate to identify and properly specify planting for areas needing slope protection.
- ❑ Show all pavement surfaces, including driveways, walkways, trails, residential and through streets.
- ❑ Show building locations including patios, porches, exterior walls, and doors locations.
- ❑ Show all screen walls, retaining walls and fences.
- ❑ Show direction and location of all proposed street and pedestrian lighting facilities.
- ❑ Show the proposed location of all exterior signs, including monument signs.
- ❑ Show location size and type of all over-head, at grade, and underground utilities and structures with proper notation, where appropriate, as to any safety hazards to avoid during landscape installation.
- ❑ Indicate the type, location, size and quantity of all proposed landscape materials on the landscape plan. Proposed plant material shall be shown at mature or maintained size. Plants shall be labeled by plant type (large tree, small tree, medium shrub etc.) and installation size or buy symbol with appropriate plant key/legend.
- ❑ Plans shall identify the location, type or depth of any accessory planting materials such as mulch, edging etc.
- ❑ Identify existing vegetation to be saved.

PART 8 – SITE UTILITIES

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8 SITE UTILITIES

8.1 GENERAL

8.1.1 SITE UTILITIES DESCRIPTION

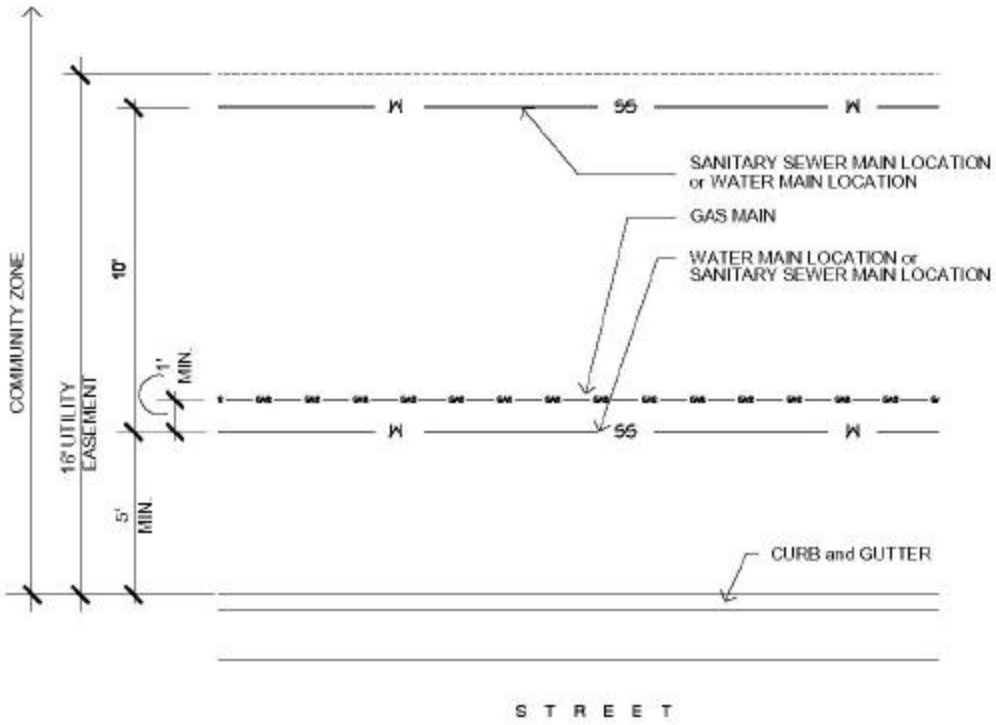
Site utilities shall include water, both domestic and fire protection, natural gas, electrical and communication, both telephone and cable TV as well as sanitary and storm sewers. All of these existing site utilities are present in the existing neighborhoods immediately adjoining the Development Area. Furthermore, adequate utility capacities for water, natural gas, electrical power and communications are available in these adjoining neighborhoods to support the new Family Housing in the Development Area for all phases planned. However, in order to adequately support the new sanitary sewer system in the Development Area, work will most likely be required to extend beyond the immediate adjoining neighborhoods as well as the limits of the Development Area as shown on Drawing 8.2. For a description of Storm sewer requirements refer to Part 6, Grading, Drainage and Erosion Control. Upgrading of the existing utilities outside of the limits of construction are not a part of this project. The Contractor shall refer to the individual utility drawings included in this RFP showing existing utility mains / possible points of connection. All existing utility information provided shall be verified by the Contractor.

Appendix J: Design Analysis – Existing and New Site Utility Systems, dated 14 July 2003, is intended to provide reference material regarding utility design for the Development Area for use by the Offeror in preparing the Offer. Any errors identified shall be brought to the attention of the Contracting Officer immediately for resolution and direction. The Contractor shall take all professionally prudent and reasonable actions to verify the accuracy of the data provided. During design and construction, the Contractor shall, with his or her professional consulting engineers, be responsible for obtaining any additional data necessary for the execution of this project.

8.1.2 SITE UTILITIES GOALS

The Contractor shall consider the connections to and extensions of the existing utilities as an important part of this project. Connections and extensions of all utilities from the point(s) of connection to the Development Area shall be included and shown in the proposal. All utility lines i.e. water, natural gas, electrical power and communications, sanitary sewer and storm water at the Development Area shall be new. Where noted herein, new utility distribution lines shall be designed and installed to form a “looped” system throughout the Development Area. Water, natural gas, sanitary sewer, power and communication services shall be installed in utility easements as described herein and conforming to Figure 8.1.2. Refer to Part 4 for additional site criteria information. All such lines shall be installed underground except as follows. Place any necessary above-ground items such as electric transformers, electric switches, junction boxes, cable TV and telephone pedestals, etc. within the easement where the utility is located but in no case less than thirty (30) feet from any street. Consideration should be given to visual impact and safety / maintainability issues when placing such devices.

The design and installation of all new utility distribution lines in the Development Area shall fully support the FY03 development as well as anticipate any necessary “extensions” for FY04 Option 1 to Task Order and future Task Order Areas beyond. Disruption of services and/or “tearing-up” of streets, walks, jogging trails, etc. will not be permitted in future Task Order Areas to “extend” main distribution lines. All new utility services noted herein throughout the Development Area shall be sized for full “build-out” of the Development Area as shown on the Conceptual Land Use Map in Part 4.



SCHEMATIC OF
UTILITY EASEMENT

Figure 8.1.2

8.1.3 UTILITIES METERING SYSTEM

Individual utility metering at each family housing unit will not be required as part of this project. However, refer to each utility herein for specific metering requirements.

8.1.4 UTILITY APPURTENANT LOCATIONS

New underground utility lines, including appurtenant structures such as valve boxes, manholes, vaults, etc. shall not be located under road shoulders or drainage ditches to the greatest extent possible. Utilities laid along a street shall be located a minimum of five (5) feet from the curb. Refer to Part 4 for additional site utility criteria information. Service entrances for each housing unit shall be as noted herein under each specific utility heading.

8.2 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES

8.2.1 GENERAL

The Contractor shall avoid running new utilities under streets, sidewalks, and paved areas where at all practicable. Placing of new utility lines underneath buildings, except service laterals where noted, is prohibited. In cases where it is necessary for the new utilities to cross existing streets and sidewalks (to make connection to and/or extension of existing utility lines), the Contractor shall install lines by trench-less methods. Open trench methods will not be allowed unless written permission is obtained and approved by Whiteman AFB. When open trench methods are approved, streets and sidewalks shall be saw cut and removed and replaced to match existing conditions. Trench walls shall be excavated to a stable angle of repose as required to properly complete the work. Trench excavations shall adhere to requirements prescribed in EM 385-1-1, latest edition, Safety and Health Requirements Manual. Special attention shall be given to slopes that may be adversely affected by weather or moisture content. Bedding and initial backfill material shall be in accordance with the manufacturer recommendations. Portions of walks and concrete pavements requiring removal shall be removed to the nearest contraction joint. All existing utilities (in existing neighborhoods), including but not limited to utilities listed above that are crossed during connection to and extension of, shall remain in service during construction. If this is not possible, all outages shall be coordinated with the Contracting Officer. All underground utilities identified from field data and surveys, site investigations, and digging permit locates, shall be marked within and adjacent to areas of the work. All work areas shall be investigated with detection devices for cables and pipelines, to confirm locations, identify unknown utilities, and establish depths prior to beginning any digging. All underground utilities potentially disturbed by the work shall be found by hand digging prior to mechanical trenching or excavating in the vicinity. The Contracting Officer shall be notified of detection activities forty-eight (48) hours in advance. Detection devices shall be on-site at all times.

8.2.2 TRENCHES

The trench for water lines, sewers (sanitary and storm), gas or electrical lines shall be in accordance with Division 2 Technical Specifications in this RFP, Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES. Water, sanitary sewer, storm sewers and gas mains shall be placed in separate trenches. The separate trenches shall maintain a minimum horizontal separation of twelve (12) inches.

8.2.3 WATER MAINS NEAR SANITARY SEWERS

8.2.3.1 General

There shall be no physical connections between a public or private potable water supply system and a sewer, or appurtenance thereto which would permit the passage of any sewage or polluted water into the potable supply. No water pipe shall pass through or come in contact with any part of a sewer manhole. While no general statement can be made to cover all conditions, it is generally recognized that sewers shall meet the requirements of Missouri Code of State Regulations 10 CSR 20-8.120 with respect to minimum distances from public water supply wells or other water supply sources and structures.

8.2.3.2 Horizontal Separation

Water mains shall be laid at least ten (10) feet horizontally from any existing or proposed drain or sewer line. The distance shall be measured edge to edge. Should local conditions prevent a lateral separation of ten (10) feet, a water main may be laid closer than ten (10) feet to a storm or sanitary sewer line, provided that the water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer line and, in either case, at such an elevation that the bottom of the water main is at least eighteen (18) inches above the top of the sewer line. When it is impossible to obtain vertical or horizontal separation, the sewer line shall be re-laid and constructed with ductile iron pipe with mechanical or compression joints, and shall be pressure-tested to assure water-tightness before backfilling.

8.2.3.3 Vertical Separation

Where water mains must cross over or under storm sewers, storm drains or sanitary sewers, the water main shall be laid to provide a vertical separation of at least eighteen (18) inches between the outsides of the water and sewer lines. A full length of water main pipe shall be located so that the joints will be equally distant from the sewer and as remote therefrom as possible. This vertical separation shall be maintained for that portion of the water main located within ten (10) feet horizontally of any sewer line that it crosses, said ten (10) feet to be measured as the normal distance from the water main to the sewer. Adequate structural support shall be provided for the sewer to prevent damage to the water main.

8.2.3.4 Unusual Conditions

Where conditions prevent the minimum vertical separation as set forth above from being maintained, the water main shall be laid with ductile iron pipe which must extend on each side of the crossing until the normal distance from the water main to the sewer is at least ten (10) feet. In making such crossings, a full length of pipe shall be centered over or under the sewer to be crossed so that the joints will be equally distant from the sewer and as remote therefrom as possible. The sewer line shall also be constructed of ductile iron pipe with mechanical or compression joints until the normal distance from the sewer to the water main is at least ten (10) feet. Where these conditions cannot be met, the Department of Natural Resources shall be consulted as to the precautions to be taken to protect the public water supply.

8.2.3.5 Force Mains

If force mains are determined to be required, there shall be at least a ten (10) foot horizontal and eighteen (18) inch vertical separation between water lines and sanitary sewer force mains. No exceptions will be allowed.

8.2.3.6 Sewer Manholes

No water pipe shall be located closer than ten (10) feet to any part of a sewer manhole.

8.3 MARKING OF UNDERGROUND UTILITIES

Except at natural gas lines, all new underground utilities shall be marked with plastic colored, printed marking tape plus an insulated copper wire. At all natural gas lines, plastic colored, printed marking tape and transponder pegs shall be installed.

Insulated copper wire size to be #12 AWG (minimum). Warning tape and copper wire shall be installed directly above all pipe, at a depth of approximately twelve (12) inches above the utility being marked. Copper wire leads shall be brought up, identified and protected in valve boxes, on service risers or any other convenient location. The Contractor shall bare approximately two (2) feet of wire at each terminal end for the transmitter connection and increased conductivity. Plastic colored, printed marking tape shall be in accordance with Division 2 Technical Specifications in this RFP, Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES. Tape color shall be as specified below and shall bear a continuous printed inscription describing the specific utility.

COLOR MARKINGS FOR UTILITIES

Red	Electric
Yellow	Gas
Orange	Telephone, Cable TV
Blue	Water Systems
Green	Sewer Systems

Transponder pegs shall be installed at not less than fifty (50) feet along all natural gas line piping and at all valves, service taps, tees, crossings and changes in direction. Transponder pegs shall be #C9784, 83.0kHz, yellow as manufactured by Communications Technology Corp. of America or approved equal. Transponder pegs shall be installed per the manufacturer's printed instructions and as noted herein.

8.4 WATER DISTRIBUTION AND WATER SERVICE LINES SYSTEM

8.4.1 GENERAL

The Contractor shall design and install a complete, usable, new water distribution system for the new family housing in the Development Area. New water distribution lines shall connect to the existing lines in the adjacent neighborhoods and provide a "looped" system design. All new water service distribution lines in the Development Area shall be located in the utility easement in the Community Zone areas with service lines routed to each unit from that area. Refer to Figure 8.1.2 and Part 4, Site, for additional site criteria information. Refer to Part 11, Unit Design – Plumbing for additional water information relative to the individual housing unit.

8.4.2 EXISTING WATER SERVICE

Asbestos cement (AC) and polyethylene vinyl chloride (PVC) water mains exist at the approximate locations as shown on Drawing 8.1 as included with this RFP. The Contractor shall verify all information shown. The existing water distribution system shall be used to the maximum extent practical for purposes of providing water service to the Development Area. The existing mains shall remain in service during construction of this project except for pre-notified, limited short periods which the Contractor shall coordinate with Whiteman AFB. If the contractor determines it is a necessary to install new water mains at existing locations, they shall be designed as stated in Paragraph 8.4.3. Where connections are made between the new work and the existing mains, the connections shall be made by using specials and fittings to suit the actual conditions. When made under pressure, these connections shall be installed using standard methods as approved by the Contracting Officer. If any existing water main line or fire hydrant is damaged during construction, the repair shall be made by the Contractor in a satisfactory manner, at no additional cost to the Government.

8.4.3 WATER DISTRIBUTION AND SERVICE DESIGN CRITERIA

New water distribution lines, service lines, valves, joints, fittings, etc. shall be designed and constructed in accordance with Missouri Department of Natural Resources (MDNR) Public Drinking Water Program "Design Guide for Community Public Water Supplies" and UFGS Section 02510 WATER DISTRIBUTION SYSTEM. All connections made by the Contractor to the existing water distribution system (water mains) shall be in accordance with all applicable local, state, and federal standards and as stated herein. The water mains shall be considered as that part of the water system supplying fire hydrants. Mains shall be valved so that no more than two (2) fire hydrants will be out of service due to a single break in the water distribution system. Pipes supplying groups of dwelling units or one housing unit exclusively shall be referred to as service lines. Isolation valves shall be easily accessible and shall be installed as a minimum at the intersection of all mains. No main extension shall be less than eight (8) inches in diameter. Dead end water lines up to three hundred (300) feet long shall be permitted if terminated by fire hydrants or flushing hydrants. The Contractor shall be responsible for assisting the Contracting Officer in obtaining a construction permit from the Missouri Department of Natural Resources (MDNR), Public Drinking Water Program, before installing any waterlines. The Contractor's responsibility shall include obtaining the required forms or applications, assisting in

completing the same and paying of any applicable fees. A copy of the completed, final permit shall be provided to the Contracting Officer for review prior to any work beginning. The Offeror shall include any and all costs associated with obtaining such permit(s) with Offer. The Contractor shall include a line item for permit submittals as part of the overall project schedule referenced in Section 01320 Project Schedule.

8.4.3.1 Protection of Water Supplies

Refer to Section 8.2 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES herein, paragraph 8.2.3 Water Mains near Sanitary Sewers for specific requirements.

8.4.3.2 Flow Requirements

The water service system shall be sized to accommodate for the domestic demand required for the new Family Housing Units served in the entire Development Area. The water domestic demand shall be at a rate of three-hundred fifty (350) gal/day for three (3) bedroom units. A maximum velocity of ten (10) feet per sec shall be used for all water lines. Fire demand shall be one thousand two hundred fifty (1,250) gpm for two (2) hours. Minimum pressure at any point in the system shall not be less than twenty (20) psi.

8.4.3.3 Water Line Requirements and Metering

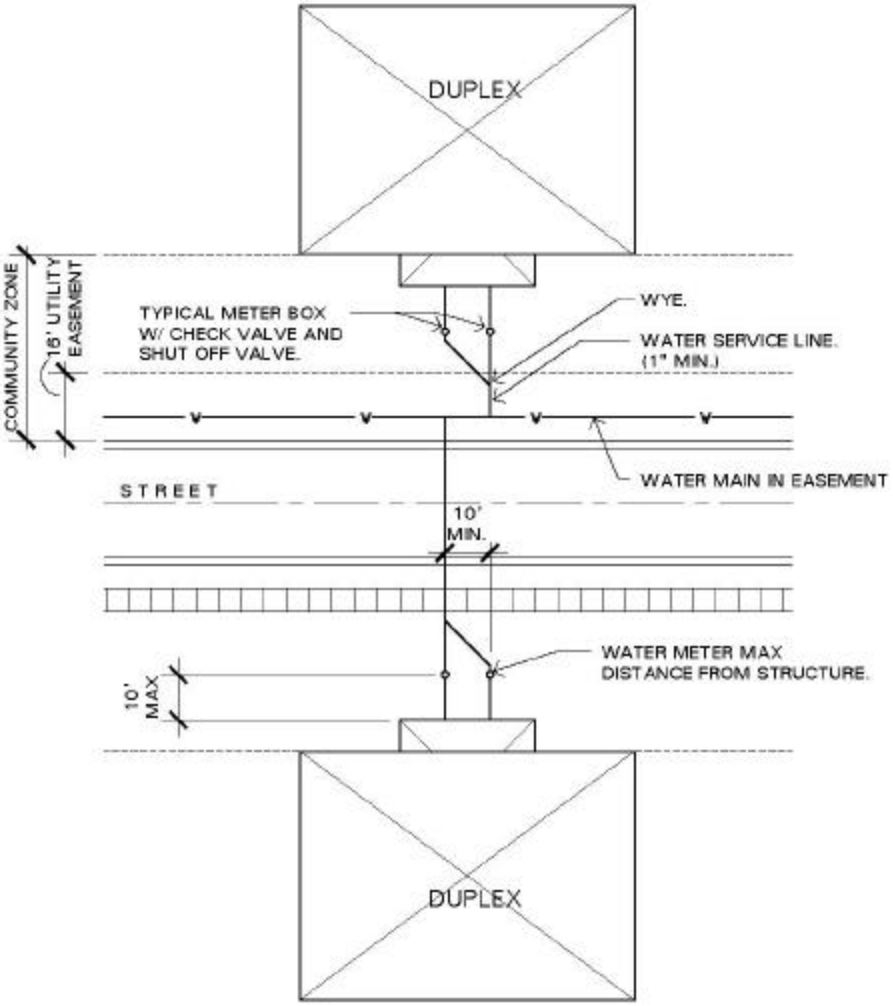
The piping pressure class is one-hundred fifty (150) psi for water system. Pipe shall be PVC meeting AWWA C900 or ductile iron. Ductile iron pipe shall be polyethylene wrapped in accordance with AWWA C600. The sizing of the waterline pipe diameter shall be determined by using Hazen-Williams “C” value of 140 for plastic pipe and 120 for other pipe material. Service lines larger than two (2) inches shall be connected to the main by a tapped saddle, tapping sleeve and valve, service clamp or reducing tee, depending on the main diameter and the service line diameter, and shall have a gate valve. The service lines shall include the pipeline connecting the building piping to the new water distribution lines. The service connections shall be via a new directly-tapped corporation stop, or by a service clamp for water services lines two (2) inches or smaller diameter. A combination stop and a copper gooseneck shall be provided with either type of connection. The service lines to each family housing unit shall be not less than one (1) inch size. Water line trenches shall be of a depth to provide a minimum cover of forty-two (42) inches from the existing ground surface, or from the finished grade, whichever is lower, to the top of the pipe. Provide each housing unit with a separate service stop and check valve exterior to the structure as shown on Figure 8.4.3.3. A water meter box shall be installed for all service stops and check valves and shall extend to finish grade. The piping and valves in the water meter box shall be installed to permit the future installation of a water meter.

8.4.3.4 Fire Hydrants

All fire hydrants in the Development Area shall be new. Existing fire hydrants in adjoining neighborhoods shall remain in place, unless damaged during construction. Fire hydrants shall be compatible with those presently in use at the installation, with similar pump and hose connections. All fire hydrants shall be UL listed, dry barrel resilient seat type (traffic model), and conforming to AWWA C502 with valve opening at least five (5) inches in diameter. The fire hydrants shall be designed so that the flange at the main valve seat can be removed with the main valve seat apparatus remaining intact, closed and reasonably tight against leakage and with a breakable valve rod coupling and breakable flange connections located no more than eight (8) inches above the ground grade. Hydrants shall have a six (6) inch bell connection with two (2) two and one-half (2-1/2) inch hose connections and one (1) four and one-half (4-1/2) inch pumper connection. Outlets shall have American National Standard fire-house coupling threads. All working parts shall be bronze. Design, material, and workmanship shall be equal to the latest stock pattern ordinarily produced by the manufacturer. Hydrants shall be painted with one (1) coat of red iron oxide, zinc oxide primer conforming to SSPC Paint 25 and two (2) finish coats of silicone alkyd paint conforming to SSPC Paint 21 of the installation’s standard color or as directed by the Contracting Officer. Fire hydrant spacing shall be no greater than four hundred (400) feet apart, with no dwelling unit more than three hundred (300) feet from at least one (1) hydrant. Preference is to install hydrants at intersections whenever possible. Hydrant laterals shall be six (6) inches minimum size, shall not exceed fifty (50) feet in length, and shall have an underground shut off valve with an adjustable valve box in each lateral within ten (10) feet of the hydrant for isolating hydrant. Hydrants shall have their pumper outlet facing the street. Hydrants shall be located a minimum of three (3) feet and a maximum of seven (7) feet from pavement, and shall not be located in sidewalks or where obstructed by parked vehicles, shrubbery, etc..

8.4.3.5 Cutting Pipe

Cutting pipe shall be done in a neat and workmanlike manner without damage to the pipe and in accordance with UFGS Section 02510 WATER DISTRIBUTION SYSTEM. Unless otherwise recommended by the manufacturer and authorized by the Contracting Officer, cutting shall be done with an approved type mechanical cutter. Wheel cutter shall be used when practicable. Copper tubing shall be cut square and all burrs shall be removed. Squeeze type mechanical cutters shall not be used for ductile iron.



● REFER TO FIGURE 8.1.2 FOR SPECIFIC LOCATION OF EACH UTILITY IN EASEMENT.

SCHEMATIC OF
WATER LINE REQUIREMENTS

Figure 8.4.3.3

8.4.3.6 Hydrostatic Leakage Tests

Hydrostatic pressure and leakage tests shall be conducted on the new water lines in accordance with UFGS Section 02510 WATER DISTRIBUTION SYSTEM and AWWA C600. Where any section of a water line is provided with concrete thrust blocking for fittings or hydrants, tests shall not be made until at least five (5) days after the installation of the concrete thrust blocking, unless otherwise approved.

8.4.3.6.1 Pressure Tests

After the pipe is laid, the joints completed, fire hydrants permanently installed, and the trench partially backfilled leaving the joints exposed for examination, the newly laid piping shall be subjected for one (1) hour to a hydrostatic pressure test of one-hundred fifty (150) psi maximum. Each valve shall be opened and closed several times during the test. Exposed pipe, joints, fittings, hydrants and valves shall be carefully examined during the partially open trench test. Pressure test shall be in accordance with UFGS Section 02510 WATER DISTRIBUTION SYSTEM and AWWA C600.

8.4.3.6.2 Leakage Tests

Leakage test shall be conducted after the pressure test has been satisfactory. The duration of each leakage test shall be at least two (2) hours, and during the test the water line shall be subjected to not less than one-hundred fifty (150) psi pressure at low point in system. Leakage test shall be in accordance with UFGS Section 02510 WATER DISTRIBUTION SYSTEM.

8.4.3.6.3 Concurrent Hydrostatic Tests

The Contractor may elect to conduct hydrostatic test using either or both of the following procedures. Regardless of the sequence of tests employed, the results of pressure tests, leakage tests, and disinfection shall be satisfactory as specified. All replacement, repair or retesting required shall be accomplished by the Contractor at no additional cost to the Government.

1) Pressure test and leakage test may be conducted concurrently.

2) Hydrostatic tests and disinfection may be conducted concurrently, using the water treated for disinfection to accomplish the hydrostatic test. This may only be accomplished after the system has been thoroughly flushed with water until all entrained dirt and mud has been removed. If water is lost when treated for disinfection and air is admitted to the unit being tested, or if any repair procedure results in contamination of the unit, disinfection shall be re-accomplished. Testing, correction and retesting shall be accomplished at no additional cost to the Government.

8.4.3.7 Disinfection

Before acceptance of potable water system, the Contractor shall disinfect all new water lines and any other lines that did not remain fully pressurized during construction or connection. The water line piping shall be disinfected in accordance with the American Association Standard AWWA C651 and in accordance with UFGS Section 02510 WATER DISTRIBUTION SYSTEM. Testing shall not be considered complete until two consecutive days of bacteriological samples show no contamination. Test results shall be submitted to and approved by the MDNR. Proof of MDNR approval shall be provided to the Contracting Officer for review prior to acceptance of potable water system.

8.5 SANITARY SEWAGE SYSTEM

8.5.1 GENERAL

The Contractor shall design and install a complete, usable, new sanitary sewer system for new family housing in the Development Area. When fully developed, the anticipated volumes from the Development Area will most likely require that the discharge from this area be placed into a gravity sewer line that is no smaller than twelve (12) inches. Based upon available information on the existing sanitary sewer lines in the adjoining neighborhoods, it is anticipated that the new sanitary sewer system will require the use of a pump station(s) and force main(s) as part of its final discharge. As part of the Calculation and Drawings required herein, the Contractor will also be required to verify existing pipe and system capacities once the final point of discharge is

determined. All new sanitary sewer lines in the Development Area shall be located in the utility easement in the Community Zone areas with lateral lines routed to each unit from that area. Refer to Figures 8.1.2 and 8.5.6 and to Part 4 for additional site criteria information. The existing manholes in the existing housing areas shall remain in place and be reused. Existing sanitary sewer lines and manholes are shown on Drawing 8.2 as included in this RFP. Refer to Part 11, Unit Design – Plumbing for additional sanitary sewer information relative to the individual housing unit.

8.5.1.1 PROTECTION OF WATER SUPPLIES

Refer to Section 8.2 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES herein, paragraph 8.2.3 Water Mains near Sanitary Sewers for specific requirements.

8.5.2 DESIGN CRITERIA

The new sanitary sewage system shall be designed and constructed in accordance with Missouri Department of Natural Resources (MDNR) Guidelines, local codes and regulations, and with UFGS Section 02531 SANITARY SEWERS. The Contractor shall field verify the sanitary sewer capacity and invert elevations to ensure that it is adequate for the flows generated by the new family housing units. The minimum earth cover over sewer lines is forty-two (42) inches. Fittings, and joints shall be compatible with the pipe supplied and have a strength not less that that of the pipe. The Excavation, Trenching and Backfilling for Sanitary Sewer lines shall be as described herein under Paragraph 8.2 EXCAVATION, TRENCHING AND BACKFILLING FOR UTILITIES herein. The Contractor shall be responsible for assisting the Contracting Officer in obtaining all permits required including, but not limited to, “Application for Construction Permit – Sewer Extension”, “Continuing Authority Approval Sewer Line Extension”, “Missouri State Operating Permit”. The Contractor’s responsibility shall include obtaining all required forms or applications, assisting in completing the same and paying of any applicable fees. A copy of all completed, final permit(s) shall be provided to the Contracting Officer for review prior to any work beginning. The Offeror shall include any and all costs associated with obtaining permit(s) with Offer. The Contractor shall include a line item for permit submittals as part of the overall project schedule referenced in Section 01320 Project Schedule.

8.5.3 MINIMUM VELOCITY

A minimum velocity shall be 2.5 feet per second when flowing at the maximum design flow depth. Design pipes with 80 percent full as critical flow depth. All design slopes shall be calculated using Manning’s equation. The Contractor shall include all calculations for the sanitary sewer system in the design submittal after contract award (see Section 01332 SUBMITTALS DURING DESIGN).

8.5.4 DOMESTIC SEWAGE REQUIREMENT

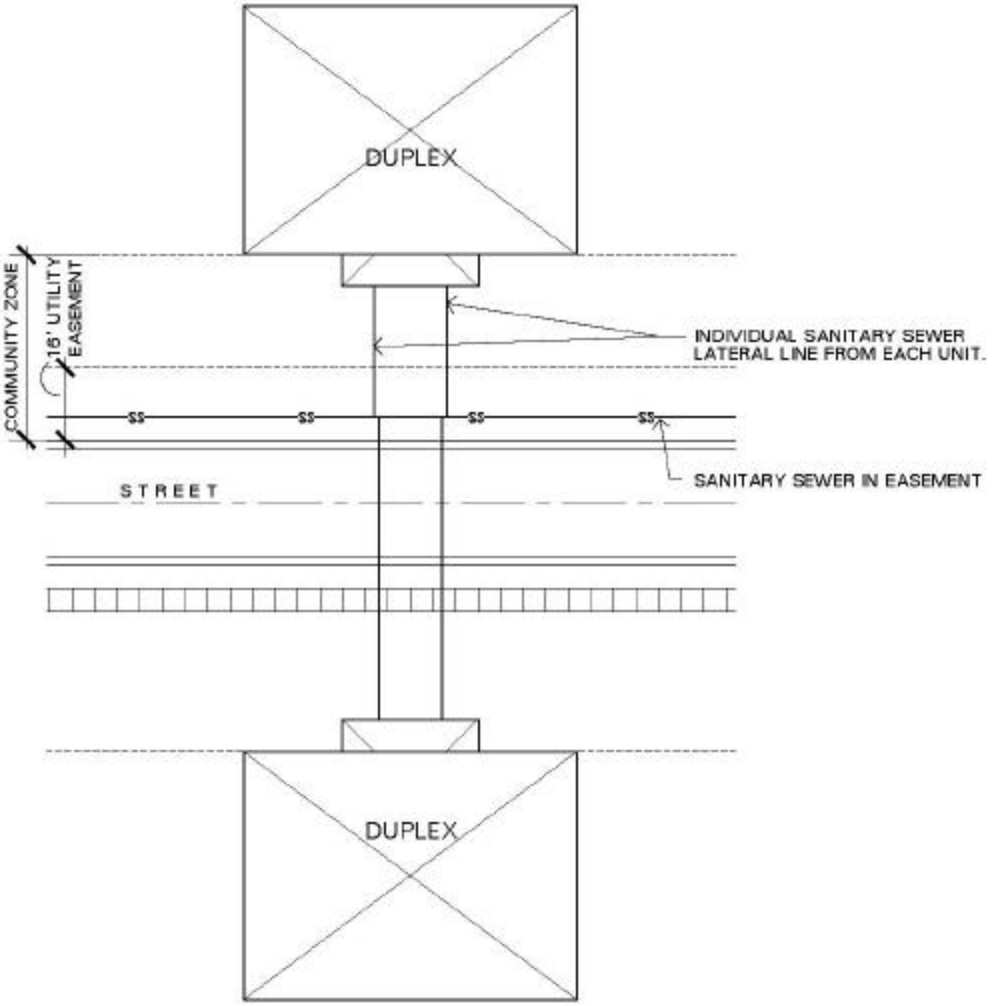
New sanitary sewer systems shall be designed on the basis of an average daily per capita flow of sewage of not less than 100 gallons per day.

8.5.5 SEWER MAINS

New sewer main pipe material shall be PVC (SDR 35 or 26), PE or DIP. Main pipe shall be sized to meet design criteria outlined herein; however, minimum size shall be eight (8) inches in diameter.

8.5.6 SEWER LATERALS

New sewer lateral pipe material shall be same as main pipe material. New sewer laterals (connections from interior family housing sewer lines to the mains) shall be provided for each housing unit. Individual laterals shall be provided for each side of a duplex unit. Minimum size for each lateral is four (4) inches. Only interior house sewer lines may be placed under buildings. All house sewer lines within and under buildings shall be as specified in Section 01000, Part 11 UNIT DESIGN – PLUMBING. House laterals from any one unit (or duplex) shall not pass under any other unit(s). Clean-outs shall be provided to allow cleaning of all lines. Clean-outs, in yard areas, shall be set in a box with a hinged cover. Clean-outs shall be provided for all branches at points of change in direction before running out to a main. The building service sewer line (exterior to the unit) shall be provided with a combination test tee and clean out within five (5) feet of the building. Foundation and roof drains shall not be connected to the sanitary sewer. Refer to Figures 8.1.2 and 8.5.6 and to Part 4 for additional site criteria information.



- REFER TO FIGURE 8.1.2 FOR SPECIFIC LOCATION OF EACH UTILITY IN EASEMENT.

SCHEMATIC OF
SANITARY SEWER LATERAL REQUIREMENTS

Figure 8.5.6

8.5.7 MANHOLES.

Existing manholes shall be used to the maximum extent practical for final discharge point from the Development Area. If the Contractor determines it is necessary to install a new manhole, it shall be designed as indicated herein. The pipe connection to existing manhole shall be made so that finish work will conform as nearly as practicable to the applicable requirements specified for new manholes, including all necessary concrete work, cutting, and shaping. The connection shall be centered on the manhole. The hole for the new pipe shall be of sufficient diameter to allow packing cement mortar around the entire periphery of the pipe but no larger than 1.5 times the diameter of the pipe and the new pipe shall be joined to the manhole with a gasketed, flexible watertight connection. Cutting the manhole shall be done in a manner that will cause the least damage to the walls.

New manholes are to be installed at changes of direction, slope, and size. Manholes shall be spaced not more than 400 feet apart. Manholes shall be located at intersections of streets when possible. New manholes shall be provided in lieu of cleanouts. Avoid placing manholes where the tops will be submerged or subject to surface water inflow. Where the invert of the inlet pipe would be more than 1.5 feet above the manhole floor, a drop connection shall be provided. Manholes shall be waterproofed on the exterior. Inlet and outlet pipes shall be joined to the manhole with a gasketed, flexible, watertight connection or any watertight connection that allows differential settlement of the pipe and manhole to take place.

8.5.8 CALCULATIONS AND DRAWINGS

The Contractor shall prepare final drawings, including details, of all sanitary sewage structures. The Contractor shall complete all the necessary topographic and utility surveys as required. Verification of actual rim and flow line elevations, particularly at the taps, shall be made by the Contractor prior to beginning final design. In addition to final drawings, elevation information, details etc. the successful Contractor shall also include a specification for approval covering the work that clearly defines his methods, materials and equipment as well as engineering calculations supporting his proposed selection of materials in the design submittals after contract award (see Section 01332 SUBMITTALS DURING DESIGN). Upon completion of the sanitary sewer installation(s), the Contractor shall certify that the collection sewers have been built in accordance with the approved plans by means of preparing “as-built” plans, prepared by a registered professional engineer. These plans, and any other necessary documentation, shall be submitted to the State of Missouri, DNR as required by the terms of the Sanitary Sewer Construction Permit issued at the beginning of the work.

8.5.9 COORDINATION.

All work on existing manholes and new sewer lines to be coordinated by Contractor with the Contracting Officer prior to construction.

8.5.10 LEAKAGE TESTS

Lines shall be tested for leakage by low-pressure air testing, infiltration tests or exfiltration tests, as appropriate. Low-pressure air testing for PVC pipe materials shall as prescribed in UBPPA UNI-B-6. The air test, if used, as a minimum shall conform to the test procedure described in ASTM C 828–76T. Low pressure air testing procedures for other pipe materials shall use pressures and testing times as described in ASTM C 828 and C 924, after consultation with the pipe manufacturer. Prior to infiltration or exfiltration tests the trench shall be backfilled up to at least the lower half of the pipe. If required, sufficient additional backfill shall be placed to prevent pipe movement during testing, leaving the joints uncovered to permit inspection. Visible leaks encountered shall be corrected regardless of leakage test results. When the water table is 2 feet or more above the top of the pipe at the upper end of the pipeline to be tested, infiltration shall be measured using a suitable weir or other device acceptable to the Contracting Officer. When the Contracting Officer determines that infiltration cannot be properly tested, an exfiltration test shall be made by filling the line to be tested with water so that a head of at least 2 feet is provided above both the water table and the top of the pipe at the upper end of the pipeline to be tested. The filled line shall be allowed to stand until the pipe has reached its maximum absorption, but not less than 4 hours. After absorption, the head shall be reestablished. The amount of water required to maintain this water level during a 2-hour test period shall be measured. Leakage as measured by either the infiltration test or the exfiltration test shall not exceed 0.2-gallon per inch diameter per 100 feet of pipeline per hour. When leakage exceeds the maximum amount specified, satisfactory correction shall be made

and retesting accomplished. Testing, correction and retesting shall be accomplished at no additional cost to the Government. Leakage Test shall conform to UFGS Section 02531 SANITARY SEWERS.

8.5.11 TEST FOR DEFLECTION

When PVC flexible pipe is used, a deflection test shall be made on the entire length of the installed pipeline not less than 30 days after completion of all work including the leakage test, backfill, and placement of any fill, grading, paving, concrete, or superimposed loads. Deflection test shall conform to UFGS Section 02531 SANITARY SEWERS.

8.6 STORM DRAINAGE SYSTEM

Refer to SECTION 01000, PART 6 – GRADING, DRAINAGE AND EROSION CONTROL for this work.

8.7 NATURAL GAS DISTRIBUTION SYSTEM

8.7.1 GENERAL

The Contractor shall design and provide a complete, usable, new natural gas distribution system for the new family housing in the Development Area. New natural gas distribution lines shall connect to the existing lines in the adjacent neighborhoods and provide a “looped” system design. The gas distribution system shall comply with the requirements of NFPA 54. Installation of gas piping will be in accordance with ANSI B31.8 and 49 CFR. All new gas service distribution lines in the Development Area shall be located in the utility easement in the Community Zone areas with service lines routed to each unit from that area. Refer to Figures 8.1.2 and 8.7.1 and to Part 4 for additional site criteria information. Refer to Part 11, Unit Design – Plumbing and Part 13, Unit Design – HVAC for additional natural gas information relative to the individual housing unit.

8.7.2 EXISTING SYSTEM

The natural gas being supplied to Whiteman AFB is type 985 to 1018 BTU/CF. Existing gas service lines in the adjoining neighborhoods are polyethylene and shall remain and are as shown on Drawing 8.3 as included with this RFP. Existing natural gas system pressure is fifteen (15) psi. Existing lines are buried to an approximate depth of twenty-four (24) to thirty-six (36) inches. All existing information shall be verified by the Contractor including pressure values, which are approximate. When connecting to existing steel piping systems, provision shall be made to ensure that the integrity of the cathodic protection is not compromised.

8.7.3 MATERIALS

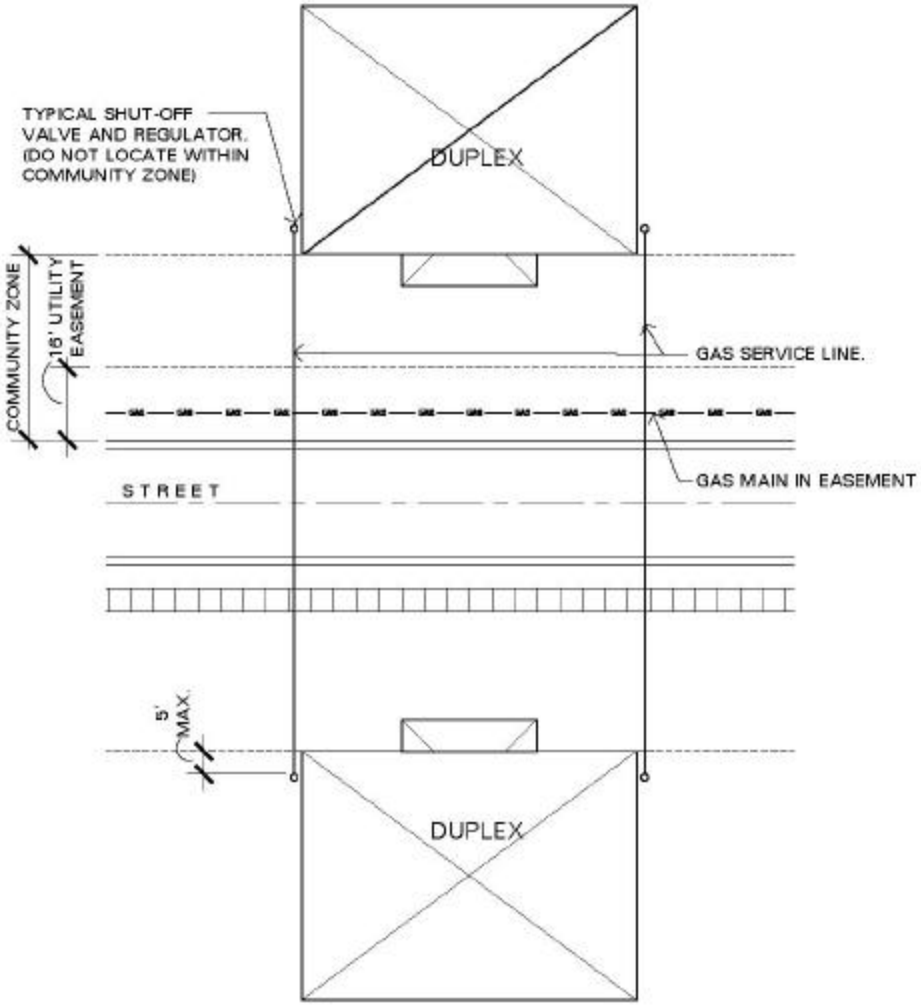
Materials and appurtenances shall be free of defects and suitable to accomplish the stated objectives of gas distribution systems. New exterior pipe that is buried below grade shall be polyethylene as described herein. New exterior pipe that is above grade shall be galvanized steel pipe in accordance with ASTM A53. Isolation valves are required at all connections to existing mains.

8.7.3.1 Polyethylene Pipe

Polyethylene pipe shall conform to ASTM D2513, Standard Specification for Thermoplastic Gas Pressure Piping Systems, with fittings complying with either ASTM D2513 or ASTM D2683, Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing. Connections to metal pipe shall comply with ANSI B16.5, Pipe Flanges and Flanged Fittings, or manufacturers recommended standards. Color of all polyethylene gas piping shall be yellow, minimum grade of PE2406.

8.7.4 TESTING

Since the new gas distribution mains will be required to connect to the existing gas mains, the Contractor shall design and install provisions in the new system to allow isolating it from all existing portions of the system to accommodate pressure testing. The pressure test shall be in accordance with ANSI B31.8. The test shall continue for at least twenty (24) hours between initial and final readings of pressure and temperature.



● REFER TO FIGURE 8.1.2 FOR SPECIFIC LOCATION OF EACH UTILITY IN EASEMENT.

SCHEMATIC OF
GAS SERVICE LINE REQUIREMENTS

Figure 8.7.1

8.7.5 DRIPS

Unless high pressure natural gas is used, drips shall be installed at the low points, immediately following reduction from high pressure to medium pressure (at supply points) and at occasional low points throughout the system to provide for blowing out the lines.

8.7.6 VALVES, REGULATORS AND METERS

Plug valves shall be installed at intersections of mains and other locations so that interruptions to service can be confined to no more than thirty (30) housing units. Each housing unit service entrance (two (2) entrances per duplex) shall be installed at a height sufficient to allow for installation of a shutoff valve and regulator. The service entrance piping to each housing unit shall be installed to permit the future installation of a gas meter.

8.8 ELECTRICAL DISTRIBUTION

8.8.1 GENERAL

The Contractor shall design and provide a complete, usable, new electrical distribution system for the Development Area. New electrical distribution lines shall connect to the existing "point of future connection" at the adjacent neighborhood and provide a "looped" system design. Existing distribution lines, transformers, primary laterals and "point of future connection" shall remain and are as shown on Drawing 8.4 as included with this RFP. All new electrical service distribution lines in the Development Area shall be located in the utility easement in the Private Zone areas with service lines routed to each unit from a transformer or distribution pedestal. Refer to Part 4 for additional site criteria information. Refer to Part 14, Unit Design – Electrical for additional electrical information relative to the individual housing unit.

Electrical utilities, (electrical, telephone and cable TV) shall not be installed in the same trench as water, gas or sewer. Furthermore, no electrical lines of any type shall be installed in the same trench as communication lines (cable TV and telephone). Separation of such utilities shall be per the National Electrical Safety Code, and other applicable codes. The Contractor shall coordinate the installation of electrical, telephone, and cable TV cabling to minimize the time the trenches are open. The Contractor is responsible for the phasing of the installation of the new underground electrical, telephone, and cable TV services to the new family housing units. The Contractor shall coordinate with the Charter Communications TV Company and SBC to plan the phasing of the installation of the new underground services. The Contractor is responsible for coordinating with all utilities on details about demolition, installation, and construction cost responsibilities.

8.8.2 EXISTING SYSTEM

a) The primary in the housing area immediately to the East of the Development Area is part of the base distribution system. The system voltage is 12,470 volts, 3 phase, 4 wire. This was installed in approximately 1997. Switches, transformers and feeders were new at that time.

b) The secondary voltage is 120/240 volt, single phase.

c) The existing street lighting units are located at intersections and along curves and are fed from the nearest transformer. They were also installed in approximately 1997.

d) The Contractor shall reuse the existing switch to the maximum extent possible and provide new pad mount transformers and switches with number and size per calculated loads.

8.8.3 SYSTEM DESIGN CRITERIA

All work on the electrical system shall meet requirements of the National Electrical Code Publication NFPA No. 70, the National Electrical Safety Code Publication ANSI C2, information provided herein and any other applicable standards. Equipment shall conform to the requirements of the National Electrical Manufacturers Association (NEMA) and Underwriters Laboratories, Inc (UL).

Refer to Section 8.11 REQUIRED SITE ELECTRICAL DESIGN ANALYSIS included herein for system calculations and submittals required by the Contractor as part of this Contract.

8.8.4 PRIMARY DISTRIBUTION REQUIREMENTS

8.8.4.1 General

Power distribution on the Base is 12,470 / 7200 volts, 3 phase, 4 wire. The distribution transformers serving the Development Area shall be connected to ensure balancing of the loads on all three phases of the feeder. The following criteria applies to the general exterior electrical distribution system within the Development Area:

a) Primary distribution feeders shall be aluminum, 15 KV insulation, 95 KV, 133% BIL, XLP or EPR insulation and shall have 1/3 concentric neutral with an insulating jacket over the concentric neutral. Parallel conductors will not be used on primary feeders. All primary distribution conductors shall be buried a minimum of thirty-six (36) inches below finish grade.

b) Primary lateral feeders shall be aluminum, 15 KV insulation, 95 KV, 133% BIL, XLP or EPR insulation with copper tape shielded neutral. All primary lateral conductors shall be buried a minimum of thirty-six (36) inches below finish grade

c) Primary feeders, both distribution and lateral, shall be placed in four (4) inch Schedule 40 PVC conduit where such lines must pass under roadways or are located under other paved areas. Extend all conduit a minimum of six (6) feet beyond the edge of the roadway on both sides. All conduit lines shall be marked in accordance with the requirements specified in paragraph 8.3 " Marking of Underground Utilities". Provide all conduits with pull cord. Minimum burial depths to top of conduit shall be thirty-six (36) inches below finish grade.

d) All high voltage (12.47 KV) taps / connections are to be made on above ground sectionalizers (terminals or junction boxes), or loop-fed pad-mounted transformers with appropriate bushings. Radial feeds to transformers are not acceptable. No high voltage taps shall be made in handholes or manholes. All distribution equipment shall be rated for the ampacity of the circuit / cable that is to be installed. All Primary and HV connections shall be loadbreak type.

e) Neutral conductors, cable shields and all other noncurrent-carrying metallic parts of equipment shall be grounded. Ground resistance of not greater than 25 ohms shall be provided except at switches and transformers, where 10 ohms shall be the maximum unless soil conditions will not permit.

f) Unless required for 3 phase loads, pad mounted transformers shall be 1 phase, 7200 volt primary, dead front, loop feed, oil immersed type, loadbreak group operated switch with surge arresters and dry-well mounted current limiting fuses. Transformers shall have two (2) 2-1/2% taps above and below rated voltage. Provide copper windings OA/FA Deg. C rise, 95KV BIL.. Unless otherwise required, the transformer secondary voltages shall be 120/240 volts, single phase, 3 wire. Loop feed transformers shall be provided with "Loop A-Loop B-Loop AB" primary switching and "load-on-off" secondary switching. All oil filled transformers shall have a certified oil sample on record with BCE before installation. All transformers and pad mounted switches shall be provided with an external and visible fault-indicating device. Rebuilt transformers are allowed.

g) Paint all pad mounted equipment (including transformers, junction cabinets and switches) in accordance with Base standards. Provide fiberglass base with basement (twelve(12) inches deep, minimum). Base shall extend minimum of twelve (12) inches beyond the footprint of the installed equipment. Provide ground grid consisting of #1/0 CU conductor with a CU ground rod installed at each corner.

h) The load for all new housing anticipated in the Development Area is estimated at approximately 295 amps @ 12,470V., 3 PH

i) All cabinets (transformers, junction cabinets and/or switches) shall be vented and provided with padlock hasps.

8.8.4.2 Guidance for Transformer Sizing

To arrive at demand load for each housing unit use demand loads for each living unit calculated in accordance with the National Electric Code, Article 220 except the air conditioning, whichever is larger, sized for 100 percent demand. In selecting a transformer, the name plate rating shall not be less than 90% of the kilovolt amperes total load calculated for the transformer using the table below. Not more than eight (8) living units shall be supplied from one transformer.

DEMAND FACTOR PERCENTAGE

Number of Living Units	% of Total of Demand Load for Units
2	80.0
3	60.0
4-8	50.0

8.8.5 SERVICE LATERAL AND SERVICE ENTRANCE REQUIREMENTS

8.8.5.1 Service Laterals

Each housing unit shall be provided with one underground secondary electrical service, originating from a transformer, to the meter centers (future) on the units. (Duplex units will require two (2) meter centers, etc.) The main circuit breaker, located adjacent to the future meter location, shall be sized to protect the service lateral. Service entrance conductors shall be direct burial type aluminum cable installed in two and one-half (2-1/2) inch Schedule 80 PVC conduit, buried a minimum of thirty (30) inches below grade.

8.8.5.2 Service Entrance

Conduit risers shall be Schedule 80 PVC or rigid metal conduit. Fault current at the unit service entrance shall not exceed 10,000 amps. At the service entrance to each building provide a split to each unit using a NEMA 3R junction box. Provide a main circuit breaker (200 amp rating) for each housing unit on the exterior of the structures. Conduit risers from service lateral to exterior meters / service breakers shall be concealed between studs of building exterior walls. Each unit shall have a meter socket with jumper plates and clear weather sealed cover. Individual meters are not required as part of this project but meter boxes with provisions for future meter cans shall be provided. Locate entrance in area readily accessible to service personnel while not distracting from the building appearance.

8.8.6 STREET AND AREA LIGHTING

The Contractor shall design and install a new residential roadway lighting system, including collector streets. System shall provide minimum maintained illumination levels of 0.4 footcandles, 10:1 ratio on collector streets and 0.3 footcandles, 10:1 ratio on local streets. Light poles / arms shall be “cobra-type” design with high-pressure sodium lights, all to match existing Whiteman AFB street lighting. Street light circuits shall be underground, direct burial aluminum cable. Where street light circuits cross under roadways provide PVC conduit and extend the conduit a minimum of six (6) feet beyond the edge of the roadway. Street light shall be activated by a photo cell on each circuit. Power for lighting circuits shall be obtained from transformer secondaries via breakers mounted inside secondary compartments. Existing street lights in adjoining neighborhoods shall remain and are as shown on Drawing 8.5 as included with this RFP.

8.9 TELEPHONE

SBC (formerly Southwestern Bell) is currently the primary provider of telecommunications services to base housing at Whiteman AFB. SBC shall install the necessary facilities to connect existing SBC infrastructure to new housing units in the new Development Area. Point of Contact at SBC: The SBC engineer for new construction at Whiteman AFB is David Brown at (660) 826-9853.

The new system wiring shall incorporate requirements necessary to update and comply with the Telecommunications Industry Association (TIA/EIA) Standard 570A for structured wiring in residences. This standard prepares a residence so that the occupants can take full advantage of broadband services available today as well as those coming in the future.

All telecommunication wiring and equipment throughout the new Development Area shall be installed as noted in this RFP. It shall be the responsibility of the Contractor to obtain from SBC any and all charges or special requirements resulting from these installation requirements. The Offeror shall include any and all costs associated with design / construction activities with Offer.

a) The telephone system distribution lines shall be located underground in trenches per Paragraph 8.8 ELECTRICAL DISTRIBUTION, Subparagraph 8.8.1 GENERAL. However, such lines cannot be located in the same trench as any electrical lines. All new telephone service distribution lines in the Development Area shall be located in the utility easement in the Private Zone areas with service lines routed to each unit from a distribution pedestal. Refer to Part 4, Site, for additional easement criteria. The Contractor shall be responsible for assuring that all underground telephone lines are thoroughly coordinated and that they are installed in accordance with all codes, regulations, requirements, and specified clearances.

b) SBC shall design and install the distribution network and interconnect to the existing Base network. The distribution network shall include the placement of all necessary equipment cabinets and pedestals in designated utility easement in the Private Zone areas in the Development Area. Refer to Part 4, Site for additional easement criteria.

c) The telephone service entrance line (from distribution pedestal to housing unit) shall be run underground in one (1) inch PVC conduit. Depth of bury shall be per SBC requirements.

d) SBC shall place demarcation equipment on the rear exterior wall of the housing units. Where duplex units occur, a separate service entrance and demarcation equipment shall be provided for each housing unit within the duplex. Mount bottom of demarcation equipment no higher than eighteen (18) inches above finish grade.

e) SBC shall provide standard 3 pair of drops (the cable running from distribution pedestal to each housing unit), which allows for up to 3 basic phone lines **AND** 3 digital subscriber lines (also known as DSL, which is not yet available at Whiteman AFB). (Note: A duplex is considered two (2) housing units.)

f) SBC shall provide and install all telephone wiring and devices inside the housing unit or shall approve the means and methods of same by others. Refer to Part 14, Unit Design – Electrical, for information pertaining to telephone service within the Housing units.

g) The Contractor shall schedule a coordination meeting with SBC after award of the contract but substantially prior to the required design submittals after contract award (see Section 01332 SUBMITTALS DURING DESIGN) to insure that the design of the installation is accurate and complete. The Contractor should understand that SBC generally requires a minimum of four to six (4 – 6) weeks for planning and engineering, scheduling, and preparation. Construction of the new network facilities generally requires another two to three (2 – 3) weeks. These time estimates may vary depending on items such as weather, location, size of the new area, number of units, etc.

8.10 TELEVISION

Charter Communications, Knob Noster, MO will design and install the new exterior CATV cables, pedestals, and connections to the new housing units. Connections to and/or extensions of the existing system components will be required. Points of contact at Charter Communications: Terry Fuller (660) 563-3636 or Doug Newell (660) 826-6520.

The new system wiring shall incorporate requirements necessary to update and comply with the Telecommunications Industry Association (TIA/EIA) Standard 570A for structured wiring in residences. This standard prepares a residence so that the occupants can take full advantage of broadband services available today as well as those coming in the future.

All CATV cables and equipment throughout the new Development Area shall be installed as noted in this RFP. It shall be the responsibility of the Contractor to obtain from Charter Communications any and all charges or special requirements resulting from these installation requirements. The Offeror shall include any and all costs associated with design / construction activities with Offer.

a) The cable TV system shall be located underground in trenches per Paragraph 8.8 ELECTRICAL DISTRIBUTION, Subparagraph 8.8.1 GENERAL. However, the cable TV cannot be located in the same trench as any electrical lines. All new cable TV service distribution lines in the Development Area shall be located in the utility easement in the Private Zone areas with service lines routed to each unit from a distribution pedestal. Refer to Part 4, Site, for additional easement

criteria. The Contractor shall be responsible for assuring that cable TV layouts are thoroughly coordinated and that they are installed in accordance with all codes, regulations, requirements, and specified clearances.

b) Charter Communications shall design and install the distribution network and interconnect to the existing Base network. The distribution network shall include the placement of all necessary equipment cabinets and pedestals in designated utility easement in the Private Zone areas in the Development Area. Refer to Part 4, Site for additional easement criteria.

c) The CATV service entrance line (from distribution pedestal to housing unit) shall be run underground in one (1) inch PVC conduit. Depth of bury shall be per Charter Communication requirements.

d) Charter Communications shall place demarcation equipment on the rear exterior wall of the housing units. Where duplex units occur, a separate service entrance and demarcation equipment shall be provided for each housing unit within the duplex. Mount bottom of demarcation equipment no higher than eighteen (18) inches above finish grade.

e) Charter Communications shall provide and install all necessary cable TV devices inside the housing units. The Contractor shall provide and install the cable TV wiring inside the housing unit per written criteria as provided by Charter Communications. Refer to Part 14, Unit Design – Electrical, for information pertaining to CATV service within the Housing units.

f) The Contractor is responsible for coordinating with and for ensuring that Charter Communications receives whatever information and drawings required in a timely manner to do the exterior cable TV system design. The Contractor shall arrange a coordination meeting with Charter Communications after award of the contract but substantially prior to the required design submittals after contract award (see Section 01332 SUBMITTALS DURING DESIGN) to insure the design is accurate and complete.

8.11 REQUIRED SITE ELECTRICAL DESIGN ANALYSIS

8.11.1 GENERAL

All design and calculations for the site electrical systems shall be performed by a licensed professional engineer with experience in family housing, and shall be stamped as such. Successful Contractor shall include a separate bound assembly of all the functional and engineering criteria, design information and calculations applicable to the project design as part of the submittals after contract award (see Section 01332 SUBMITTALS DURING DESIGN). The submittal shall be organized in a format appropriate for review, approval and record purposes.

8.11.2 LOAD CALCULATIONS

a) Calculate the demand load for each pad-mounted distribution transformer by all the demand loads (minus the HVAC load), for each type of living unit connected to the transformer, then multiply by the appropriate demand factor per NEC. Then the HVAC load and any site lighting are added to this figure to arrive at the transformer demand load. In selecting a transformer, the name plate rating shall not be less than 100% of the kilovolt amperes total load calculated for the transformer. Not more than eight (8) living units shall be supplied from one transformer.

b) Calculate the demand load for each phase of each circuit of the primary distribution system. The loads shall be computed using the same method as outlined for the pad-mounted transformers.

c) In addition to the complete load calculations required, provide a load summary table which group and identify each type of demand load calculated including pad-mounted distribution transformers and primary phases.

d) Voltage Drop (VD) calculations:
   1) Select conductor sizes of primary feeders and calculate maximum footage for each phase of each primary circuit using a maximum allowable VD for each circuit.
   2) Select conductor sizes of site lighting circuits and calculate the VD for each circuit (Maximum allowable VD = 3%).

8.12 CATHODIC PROTECTION

Cathodic Protection (CP) is mandatory on all buried ferrous metallic structures as described below:

a) Department of Transportation guidance as stated in 49 CFR, Part 192, requires that all metallic natural gas piping be coated and cathodically protected regardless of the soil resistivity.

b) CP Systems shall be designed by a NACE Corrosion Engineer and shall provide protective potential to meet the requirements of the National Association of Corrosion Engineers (NACE) Standard RP-0169 or Control of External Corrosion on Underground or Submerged Metallic Piping Systems.

c) New or supplemental CP systems shall be compatible with existing CP systems and other adjacent structures or components. New systems should be compatible with existing systems to allow ease of repair and maintenance.

d) CP and protective coatings shall be provided for the following buried and submerged ferrous metallic structures regardless of soil or water resistivity:
   1) Natural gas piping
   2) Fire protection piping.
   3) Ductile or cast iron pressurized piping under floor (slab on grade) in soil.
   4) Underground heat distribution and chilled water piping in ferrous metallic conduit.
   5) Other structures with hazardous products as identified by the installation.

e) Cast iron pipe shall be treated as follows:
   1) For soil resistivity below 10,000 Ohm-cm at pipeline installation depth, provide CP, bonded joints, and protective coatings.
   2) For soil resistivity between 10,000 and 30,000 Ohm-cm at pipeline installation depth, provide bonded joints only.

f) Copper water service lines will be dielectrically isolated from ferrous pipe. Dielectric isolation shall conform with NACE RP-0286.

g) For ductile iron piping systems (except for ductile iron piping under floor in soil) conduct an analysis to determine if CP and/or bonded or unbonded coatings are required. Unbonded coatings are defined in ANSI/AWWA C105/A21.5.

h) Conduct an economic analysis to determine if CP and protective coatings should be provided for gravity sewer lines and the following structures in soil resistivity conditions above 10,000 Ohm-cm:
   1) Potable water lines.
   2) Concentric neutral cable.
   3) Other buried and submerged ferrous metallic structures not covered above.

i) Ferrous metallic piping passing through concrete shall not be in contact with the concrete.

8.13 OFFER CHECKLIST FOR SITE UTILITIES

The Offeror shall include with Offer the following items as a minimum:

- Submit conceptual proposed Site Utility Development plan for each Utility for the entire Development Area. Utilities to be shown, as a minimum, are: Water, including fire protection, Sanitary Sewer, Natural Gas and Electrical, including Street Lighting. Note: Street Lighting is only required to be shown on the detailed FY03 Task Order and FY04 Option 1 to Task Order Utility Development Plans noted below.

- Submit detailed proposed Utility Development plan for each Utility for the FY03 Task Order portion of the Development Area.

- Submit detailed proposed Utility Development plan for each Utility for the FY 04 Option 1 Task Order portion of the Development Area.

- On each entire Site Utility Development Plan drawing, provide the following:

1. Plan drawn to scale of 1” = 300’ or larger with North arrow, graphic scale, name of project, name of Offeror and date of Plan.
2. Proposed “connection” point(s).
3. The general proposed location for distribution lines.
4. Proposed and potentially phased development of “looped” distribution lines where required by this RFP

- On each detailed Utility Development Plan drawing, provide the following:

  1. Plan drawn to scale of 1” = 100’ or larger for the FY03 Task Order and FY04 Option 1 to Task Order project sites with North arrow, graphic scale, name of project, name of Offeror and date of Plan.
  2. Show how typical proposed utility “easements” will be used to provide efficient distribution of utilities at the neighborhood level. Include proposed locations of transformers, switch boxes, pedestals, etc.
  3. Show how each utility will typically serve the individual housing units. Include proposed location of underground lines from easement to unit, proposed depths, proposed connection points at units, etc.

- On each detailed Street Light Development plan (FY03 Task Order & FY04 Option 1 to Task Order), show spacing of poles, height and design lumens at ground level. Include in the submittal, the style and design of each type of light pole proposed for use. Provide full information for roadway poles as well as trail poles, if they differ. Provide plan drawn to scale of 1” = 100’ or larger with North arrow, graphic scale, name of project, name of Offeror and date of Plan.
- Provide written description explaining how Site Utility development will take place during the initial phase(s) of work (FY03 Task Order & FY04 Option 1 to Task Order) and all potential subsequent Task Orders within the Development Area.

PART 9 – HOUSING UNIT DESIGN/CONSTRUCTION

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9 HOUSING UNIT DESIGN / CONSTRUCTION

9.1 GENERAL OBJECTIVES

The design and construction of the individual housing units shall be as indicated in the Request for Offer. Use the guidance provided in the Air Force Family Housing Guide regarding unit design. However, the more specific guidance provided in this RFP shall control where guidance conflicts with the Housing Guide.

For the appearance of the exterior of the unit, refer also to other portions of this RFP. The design of the interior of the unit should reflect the quality of the exterior appearance.

9.2 GOALS AND STANDARDS

The unit design should be equal to or better than good open market housing of similar size. The resources listed below contain suggested guidance on the specific goals:

- The Not So Big House, Sarah Susanka, Taunton Press
- The New Urbanism, Peter Katz, McGraw-Hill, Inc.

Goals:

1. The unit design should create a consistency in appearance of proportion and patterns that provides a visual sense of the house.
2. The unit design should promote diversity and uniqueness of configurations of house designs including porches, entries, window placement, roof forms and materials.
3. Emphasize factors that enhance indoor and outdoor living. Consider size, layout and location of patios, balconies, yards, and features that encourage family use of outdoor areas.
4. Rooms should be sized and arranged for efficient use, good circulation, and furniture placement.
5. The distribution of space for food preparation living and dining, sleeping, bathing, halls, closets, and services should be balanced and should enhance the intended functions.
6. The unit design should provide views, natural light and privacy appropriate to the function of rooms and spaces within the residence.
7. The unit design should provide efficient circulation within the housing unit while minimizing the use of habitable rooms as hallways, unit entries, or primary circulation.
8. Room adjacencies should be arranged effectively so that transition areas may serve multiple purposes other than merely separational issues.
9. Floor plans should provide for an appropriate arrangement and layout of spaces that function and afford quality private areas for the residents.
10. Room organization should establish a unique identity for the house as a whole.

9.3 APPEARANCE

Refer to Part 1 and Part 4 for desirable exterior appearance standards.
Window placement and configuration should comply with the following criteria:

a) Windows should comprise no less than 5% of the wall area, per elevation, per floor.

b) Individual windows (as opposed to groupings of windows) should generally be oriented vertically and have proportions between 3:5 and 5:8. However, window opening and groupings of openings should be proportional to the façade.

c) Arched windows are undesirable.

d) Decorative shutters are undesirable.

9.4 MAINTAINABILITY

The design of housing units including the selection and specifying of exterior and interior finishes, equipment, appliances, and systems shall include consideration of maintenance ease and cost. Avoid products that require continuing maintenance at high cost.

9.5 ADA ACCESSIBILITY

Access to Federal facilities by the disabled has been mandated by the *Americans with Disabilities Act* (ADA). This includes military family housing. The Air Force has set a planning and procurement goal of 5 percent (with a bedroom type/rank category per base) of all Air Force housing to be made accessible or easily modifiable to conform to accessibility requirements.

Family Housing units must be accessible not only to disabled persons with wheelchairs, but also to disabled persons who do not use wheelchairs, such as visually and/or hearing-impaired persons.

It is important to become familiar with the guidelines and responses called for by the ADA in addressing all physically challenged persons. The *Uniform Federal Accessibility Standards* (UFAS) provides excellent, comprehensive documentation, including clear diagrams and dimensions, for use in accessibility design. This document is available at no cost through the Federal Government Printing Office (GPO).

Accessibility

Considerations	ν In providing accessibility in common areas, recreational facilities, outdoor developed areas, and individual housing units, comply with criteria in the *Uniform Federal Accessibility Standards* (UFAS) and in the latest version of the *Americans with Disabilities Act Accessibility Guidelines*. ν In the designs of new units, incorporate features that would facilitate adaptation for accessibility at a later date. Examples of such features include the height of electrical switches, outlets, and other controls; the height of shelving and closet rods; opening widths; circulation patterns; the availability of accessible emergency egress; and the flexibility of the plan to permit modifications necessary to provide accessible kitchens and bathrooms. ν The net floor area of a unit may be increased by up to 5% to meet accessibility standards. Complete the necessary construction in a way that allows the house to be easily converted back when the family with the person with disabilities moves. ν Remember that a key aspect of accessible design is to provide an “accessible” path from parking areas to all areas of the dwelling.

Considerations (continued)	***Entry*** ν Design and construct common entrances to multi-unit facilities to be accessible to persons with disabilities. ν Consult the UFAS. Provide ramps when necessary at entries. Include handrails on ramps when required. Slope ramps no greater than 1 in 12, with a 30-inch maximum rise. Provide ramps with a minimum width of 36 inches. ν Design outdoor living areas with low thresholds and adequate turnaround space. Consult the UFAS. ***Interior Accessibility*** ν To ensure the unit is accessible, provide certain functions on the first floor, including entry, entertainment, food preparation, eating, sleeping, bathing, laundry, and storage. Provide wood or resilient flooring, or a very low-pile, dense-weave carpet to allow ease of movement. Provide accessible outdoor living spaces, such as patios, decks, and balconies, along with parking areas and walkways. ν Provide an entry door with a clear width of at least 32 inches when the door is open 90 degrees. Provide a minimum of 60 inches diameter clear space for the wheelchair inside the entrance. Provide lockset hardware (lever-handled, push-type, or U-shaped) mounted no higher than 48 inches. ν Provide for accessibility of all first-floor rooms. Ensure all corridors are at least 36 inches wide and door clear widths are 32 inches. Provide lever-handled door hardware. Consult the UFAS for required door clearances. ν Provide windows that are within easy reach and that are operable by one hand with less than 5 pounds of force. Use casement windows with either lever or crank opening mechanisms, with locking mechanisms placed within reach of a seated person. ν Consult the UFAS for comprehensive guidance, diagrams, and dimensions.

Accessibility (continued)

Considerations (continued)	***Bathrooms*** v Consult the UFAS. Provide bathroom with adequate space for a person in a wheelchair to enter and close the door, use the fixtures, reopen the door, and exit. v Provide fixtures in compliance with UFAS. v Provide the necessary reinforcing for the installation of grab bars in appropriate locations per the UFAS. v Provide accessible shower in accordance with UFAS. v Provide vanity bases only if they can be removed without the use of special tools or knowledge. Finish all flooring that is located beneath removable vanity bases. ***Kitchen*** v Consult the UFAS. v Provide a minimum clear floor space of 30 inches by 48 inches in front of all appliances and 19 inches under sinks. v Provide a minimum 60-inch clear width between cabinet fronts, counters, or walls in U-shaped kitchen areas. v Provide kitchen sinks and the surrounding counters no more than 34 inches above the finished floor. Ensure one sink bowl is no more than 6½ inches deep with a levered or push-type faucet. v Provide a kitchen sink with at least 30-linear inches of work surface adjacent to the sink. Consider counters designed for repositioning to a minimum height of 28 inches. Use either a single integral unit or separate components for the sink and work surfaces. Allow accessibility by a wheelchair occupant to the base cabinets directly under the sink and counter work surface by ensuring these items are removable. Ensure that when the counter is lowered, the exposed sides and back of the adjacent cabinets are constructed of a durable, non-absorbent material finish. Finish all flooring located beneath the removable cabinets. v Select a range with range-top controls that can be operated without reaching across burners. v Provide either a side-by-side refrigerator/freezer or an over/under refrigerator/freezer that has at least 50 percent of the freezer space below 54 inches above the floor. v Provide kitchen wall cabinets with lower shelves or drawer space at a height of no more than 48 inches. Mount handles as close to the bottom of the wall cabinet doors as possible and as high as possible on base cabinet doors.

Considerations (continued)	***Laundry*** ν When laundry equipment is provided, choose front-loading machines with controls on the front and with a minimum of 30 inches by 48 inches clear space in front of the equipment with the doors open. ***Tactile and Audible Considerations*** ν Ensure that the requirements for the visually and hearing impaired are also reviewed. ν Use the above points only to provide an outline for some of the key points of accessible design. It is imperative that the housing project manager and the design architect-engineer consult the ADA and UFAS in addressing accessibility requirements.

9.6 FIRE PROTECTION AND SAFETY

Housing units will comply with the applicable National Fire Codes, including NFPA 101, Life Safety Code (which includes egress elements such as stairs, handrails, door widths, etc.) except that stair risers shall be maximum 7-1/2 inches high and treads minimum 10-1/2 inches long. Construction features will be provided in accordance with the International Residential Code (IRC).

9.6.1 FIRE RESISTANCE OF PARTY WALLS AND ROOF MATERIAL

Party walls shall extend without openings, from ground to the underside of roof sheathing. Provide firestops at floor, and ceiling or roof line. Provide Class A (ASTM E108, Standard Methods of Fire Tests of Roof Coverings) roof covering material throughout. Party walls (walls separating housing units) shall have the minimum fire-resistance ratings shown below:

a) Duplexes, UL-rated one hour fire resistance.

9.6.2 SAFETY OF HEATER/MECHANICAL ROOMS

Rooms equipped with fuel-fired equipment such as a furnace and/or fuel-fired water heater that serve only one housing unit shall be lined with 2 layers of ½ inch gypsum board or equivalent noncombustible material. Easy access to the furnace filter shall be provided; the filter shall not be located in the furnace enclosure. Refer also to Part 3 for energy conservation and sustainability criteria and Part 13 for HVAC design.

9.6.3 WALLS BETWEEN GARAGE AND DWELLING UNITS

For walls between garage and dwelling units, provide UL-rated one-hour fire resistance.

9.6.4 ALARM SYSTEMS

Smoke detectors shall be provided within the housing unit in accordance with the requirements of Part 14.

9.6.5 EGRESS

Every sleeping room and living area shall have a secondary means of egress where required by and in accordance with NFPA 101 and International Residential Code (IRC).

9.6.6 TORNADO SAFE ROOM

Provide every unit with a tornado "safe room" built in accordance with the standards in the Federal Emergency Management Agency's publication "Taking Shelter From the Storm: Building a Safe Room Inside Your House," FEMA 320. Refer to the Attachments to the RFP for the 16-page set of approved drawings dated "Revised August 1999" indicating various methods for meeting the standards. For accessible units, the preferred location of the safe room is on the main level of the unit. **Note that an In-Ground (IG) shelter located with the entrance at or near the bottom of the steps up from inside the garage into the living spaces would be a) most likely the least costly shelter, and b) the only situation – or one of the few situations – in which the shelter would not contribute to the overall gross square feet calculations.**

9.7 SOUND ATTENUATION

9.7.1 TESTING

Certified proof-of-performance field tests will be conducted to demonstrate that the wall systems as constructed provide the required sound isolation. Tests for air-borne sound shall be made in compliance with ASTM E336. Testing of 10 percent (minimum) of each type of wall system is required. Location of test sites will be chosen at random by the Contracting Officer.

a) Any wall system found to be inadequate shall have the deficiencies corrected and the additional qualifying tests conducted at the Contractor's expense. Testing at the Contractor's expense of greater than 10 percent of each system may be required if the Contracting Officer determines that the quality of construction requires this additional testing.

b) Walls shall be designed to meet or exceed the requirements stated below. In cases where the field tested performance of the systems does not meet the designed performance, the maximum acceptable difference between field tests and sound transmission ratings shall be 2 decibels (dB) for airborne sound ratings and 5 dB for impact sound ratings.

9.7.2 PARTY WALLS

It is strongly preferred that party walls between dwelling units provide totally independent wall and floor systems between units. Party walls (walls separating adjacent dwelling units) shall be designed to provide the minimum airborne sound transmission ratings stated in Table 9-2.

TABLE 9-2 - SOUND TRANSMISSION STANDARDS
FOR PARTY WALLS

Area	FSTC[1]	
Party Walls (except none at party walls between garages)	52	

Note[1]: Field Sound Transmission Class. See ASTM E336. FSTC 60 is preferred.

9.7.3 PLUMBING AND HVAC EQUIPMENT

Design of plumbing and Heating, Ventilating and Air-Conditioning (HVAC) equipment shall include design provisions such as location, enclosure and acoustical treatment, to minimize transmission of noise generated by equipment within each housing unit and to eliminate transmission of noise to other housing units.

9.7.4 OTHER AREAS

For minimizing transmission of noise between rooms within an individual unit, follow the guidelines contained in paragraph 4.8.1 of the Air Force Family Housing Guide.

9.8 DIMENSIONS AND AREAS FOR LIVABILITY

9.8.1 INTERIOR PLAN REQUIREMENTS

The functional area relationships contained in the Air Force Family Housing Guide paragraph 4.8 Interior Plan Requirements should be used as a desirable guideline. Use a combination of “open” and “formal” living plans when designing the living areas of the different floor plans. When designing interior spaces consider the aesthetics of the space and how the use of ceiling heights and/or the use of decorative moldings can be used to add interest to the space. Design elements such as trim moldings, built-ins, window seats, and extra shelving are desirable features.

9.8.2 MINIMUM AREAS

9.8.2.1 Interior/Exterior Spaces

Minimum areas/dimensions for interior spaces need to follow the guidelines contained in the Air Force Family Housing Guide paragraph 4.8.

Ceiling heights in habitable rooms shall be a minimum of 8 feet. Ceiling heights can be reduced in parts of these rooms to 7 ft to accommodate ducts.
Halls and stairways to habitable spaces shall have a minimum clear horizontal width of 3’-3” measured between railings.

9.8.2.2 Kitchen Cabinets, Counters and Pantries

See Table 9-5 for minimum guidelines. Flat area is shown for countertops and drawers. Combined shelf area is shown for pantry and base, wall and wall cabinets. Refer to paragraph 4.8.3 (Figure 4.23) of the Air Force Family Housing Guide for clarification, including increased sizes for Senior Officer units.

TABLE 9-5 - KITCHEN CABINET, COUNTER, & PANTRY AREA

Type of Housing Unit	Wall		Base		Drawer		Counter		Pantry Area	
		ft_2		ft^2		ft^2		ft^2		ft^2
Typ.		28		28		14		20		Required

9.9 LIVIBILITY – MAJOR ZONES

9.9.1 LIVING AND DINING

It is desirable for the living room to have direct access to the front entrance vestibule and to the dining area without passing through another room. The dining area may be an extension of, or an "L" off the living room. It is desirable for the dining area to be directly accessible from the kitchen without passing through another room. For Senior Officer (SNCO) family units, provide separate dining rooms or areas to accommodate furniture and seating for not fewer than 10 persons.

9.9.2 KITCHEN AND AUXILIARY DINING AREA

a) The kitchen shall provide an efficient work triangle and the following desirable criteria. A base cabinet, minimum 15 inches wide, should be provided on the handle side of the refrigerator. The range should not be located adjacent to the refrigerator, in a corner, adjacent to a passageway, or under or within 1' either side of a window opening. The dishwasher should be installed convenient to the kitchen sink, but such that the open dishwasher door does not conflict with the space immediately in front of the sink.

b) Space for a tenant-owned upright freezer shall be provided adjacent to the kitchen or in area such as a laundry or utility room. Freezer area shall not be located in garage and shall have direct access into the unit.

c) Space shall be provided in the kitchen for a tenant-owned microwave oven 15" high, 15" deep and 26" wide. Provide a space within the cabinets, as not to use countertop space.

d) It is desirable to provide a secondary dining area. This can be a "breakfast bar" extending from the kitchen, or table space in the kitchen or in a family room adjacent to, or as an extension of, the kitchen. It is also desirable that the secondary dining area have "hard" flooring (not carpet). The secondary dining area shall not be located in the living or dining rooms.

9.9.3 BEDROOMS

Bedrooms shall be designed to accommodate king-size beds in master bedrooms and twin beds in the other bedrooms. Window, door, and closet placement should enhance furnishability. Each bedroom shall be accessible without passing through another bedroom. Design consideration shall be given to the movement of oversized furniture in and out of the bedrooms. Bedroom closets shall maximize closet space with wood shelving and organizers. As a minimum provide 2 rods and 2 shelves in 50 percent of the hanging space with shelves at approximately 3'-8" and 6'-0" above the floor. The remainder of the hanging space shall have one rod and one shelf for hanging items such as dresses.

9.10 LIVABILITY – MINOR ZONES

9.10.1 BATHROOMS

Emphasis shall be placed on size, fixtures, layout, and privacy. Direct access to a bathroom from the master bedroom is required for three bedroom and four bedroom units. Compartmented bathroom design, for use by both family and guests, is encouraged. Determine the number of bathrooms based on Table 9-8. Minimum door widths for bathrooms shall be 2'-6". Door widths for units designated for potential use by persons with disabilities, shall conform to accessibility standards. In the shared or family bath, lavatory vanities are required to be separate from the tub/water closet area (except in designated accessible units). TEXT DELETED

TABLE 9-8 – BATHROOM REQUIREMENTS

BEDROOMS Upstairs / BEDROOMS Downstairs	BATHROOMS Upstairs / BATHROOMS Downstairs
0 up / 2 down	0 up / 1 down
0 up / 3 down	0 up / 2 down

TABLE 9-8 – BATHROOM REQUIREMENTS

BEDROOMS Upstairs / BEDROOMS Downstairs	BATHROOMS Upstairs / BATHROOMS Downstairs
0 up / 4 or 5 down	0 up / 2.5 down
1 up / 1 down	1 up / 1 down
1 up / 2 down	1 up / 1 down
1 up / 3 down	1 up / 2 down
1 up / 4 down	1 up / 2 down
2 up / 0 down	1 up / 0.5 down
2 up / 1 down	1 up / 1 down
2 up / 3 down	1 up / 2 down
3 up / 0 down	2 up / 0.5 down
3 up / 1 down	2 up / 1 down
3 up / 2 down	2 up / 1 down
4 up / 0 down	2 up / 0.5 down
4 up / 1 down	2 up / 1 down

9.10.1.1 Full Bath

A full bath shall contain a water closet, lavatory, vanity, and a tub with shower assembly (Note: Tub with shower assemblies shall not be placed under windows). At least one full bath shall be provided in each family unit. One full bath in each housing unit shall be directly accessible from the bedroom hall without passing through another room. Tubs with shower assemblies shall include shower rods without shower curtains, without tempered glass or plastic enclosures and doors. A half bath contains a lavatory and a water closet. At units with 3 or more bedrooms, provide a four piece compartmented master bath: A two-lavatory vanity in one compartment, and a second compartment with water closet and a tub with shower assembly. At senior NCO and officer master bedrooms, provide a five piece compartmented master bath: A two-lavatory vanity in one compartment, and a second compartment with water closet, separate shower of at least 4 feet in one plan dimension, and soaker or garden tub of at least 18 inches in depth.

9.10.1.2 Accessories

Bathroom accessories shall be non-corroding metal or ceramic tile, and shall consist of a surface-mounted or recessed toilet paper holder, surface-mounted or recessed combination soap dish and grab bar at tub/shower stall, two bathrobe hooks and two towel bars, totaling not less than 42 inches for a full bath, or one or two bars not less than 30 inches for a half bath. A non-corrosive shower curtain rod is required. There shall be a mirror the whole width of the lavatory vanity. The top of the mirror shall be at 7’-0” above finish floor. A medicine cabinet shall be provided on a side wall in each bathroom. Medicine cabinets shall be the hinged door type, located on side wall adjacent to mirror, and shall be recessed. Do not place in a party wall.

9.10.1.3 Exhaust Fans

Exhaust fans with minimum 70 cfm shall be provided in all baths, shall be switch operated separately from the lights and shall be ducted directly to the exterior of the building. Refer also to Part 3 for energy performance requirements.

9.10.2 LAUNDRY WASHER AND DRYER

A separate laundry room with a full width cabinet over washer/dryer area is desirable. Coordinate location of laundry room/dryer to assure compliance with dryer vent requirements specified in Part 13 under Dryer Vents. A

base cabinet with a laundry sink is considered a betterment. Refer also to Part 3 for energy criteria and to Part 11 for plumbing criteria.

9.10.2.1 Door Clearance

Swing of doors shall not conflict with operational space in front of washer/dryer appliances.

9.10.2.2 Cabinets

All cabinetry works in the laundry room shall be of comparable quality to the kitchen cabinets.

9.10.3 CLOSETS

A broom closet shall be provided convenient to the kitchen. A coat closet with side-hinged door, 12-inch deep shelf, and clothes rod for full length items is desirable in the entry vestibule.

9.10.3.1 Closet Shelving

Closet shelving and rods 3’-0” to 3’-8” in length shall have one intermediate support, and 3’-9” to 5’-6” in length shall have two intermediate supports. Shelves and rods longer than 5’-6” shall have at least three intermediate supports. Shelves and supports shall be capable of carrying 35 lbs./ft. Closet shelving construction shall match requirements for kitchen cabinet shelving in 9.20.1, except 1) double smoothing melamine top coat on upper side only, and 2) 1-inch high hardwood edging at front face, stained and sealed. Linen closets shall be provided with at least four full-depth shelves.

9.10.3.2 Closet Doors

Closet doors should be located to permit placement of furniture in the corners of the rooms by providing an 18-inch return adjacent to a furnishable wall. For closets 6 ft or more in width a pair of side-swinging doors hinged from the closet doorjambs is preferred. Sliding doors are acceptable. For closets less than 6 ft in width a single side-swinging door is preferred. Bifold closet doors are not desired.

9.10.4 BULK STORAGE

Provide each housing unit with interior and exterior bulk storage space meeting the minimum requirements of paragraph 4.7 and 4.8 of the Air Force Family Housing Guide. Provide interior storage in a separate room. Provide exterior storage in the garage. A door directly to the exterior is desirable. A separate storage area for the trash containers should be accommodated in the garage. The trash container area should be large enough to hold two standard garbage cans, one recycle container (18"Wx26"Lx14"D), and one 90-gallon yard waste container (3'-0"Wx4'-0"Lx3'-6"D).

a) For size of exterior bulk storage areas, refer to paragraph 4.8.3 of the Air Force Family Housing Guide.

b) Bulk storage space should be at least 4 ft in depth and a minimum clear height of 6 ft-6 inches, except that space under stairs may be counted at 1/2 area if the space is 4 ft or more in height.

c) Provide a minimum of three deep shelves with a combined length of 24 ft within each bulk storage room (both exterior and interior). Provide shelves and supports capable of carrying 35 lbs./ft over entire length of shelf.

d) When a garage personnel door is provided, a location both to exterior storage and to the trash area is highly desirable.

e) Common walls and ceilings between adjacent storage areas shall be finished on both sides.

9.10.5 MECHANICAL ROOMS

Water heater, furnace, electrical panel and telephone and cable television distribution boxes shall be located in a separate mechanical room, or in a dedicated area within the garage. The goal in locating these items is to locate them as so as not to interfere with usable storage space in the garage but place them in an accessible area for maintenance personnel without having them track mud and drag tools into the private living space of the family home. Size room with minimum dimensions commensurate with providing adequate space for servicing/replacing the equipment located therein. As a betterment, provide the mechanical room with dual access from inside the unit (either from conditioned space or from the garage), as well as from the building's exterior (outside the backyard's fence). If a dedicated area of the garage is used, place the furnace and the water heater on a bare, raised concrete slab with separation walls constructed to ensure the occupant will not use the area for storage and that the occupants adjacent garage storage area will be kept separate from the mechanical area. The preferred location for the access door to the crawl space is in the floor of the mechanical room. If this is not possible, locate such access door in the floor of a ground floor closet that has adequate available floor space.

9.10.6 PATIOS

As a minimum the concrete patio area shall be sized to accommodate simultaneous use of the following equipment/furnishings and activities; patio table with umbrella and chairs to seat 6, 2 patio chase lounge chairs or 2 upright chairs each with a small side table to hold a book or drinks, and a portable gas grill with side racks. Slope patios to drain. At a minimum, provide a broom-finished concrete surface. Patterned and colored concrete patios are a betterment.

9.11 CRITERIA FOR GARAGES

For each housing unit, provide an attached garage. Two-bedroom units shall have a one-car garage. Units with 3 or more bedrooms shall have a two-car garage. For "Prestige" and SOQ units, locate two-car garage such that an additional contiguous garage space may be added in the future. Design all units so that resident can access the garage directly without going outside. Garage floors shall be concrete and shall have a construction joint installed between the garage and driveway paving. A single car door shall be a minimum 9 feet wide. A double car garage door shall be a minimum 16 feet wide. In the open position a minimum clear height of 8'-0". Sound attenuation is not required for units planned as "Duplex" housing units, where only the garages become the separating elements between the living units. Such garage party walls shall be minimum one-hour fire rated, with 5/8" gypsum wallboard, both sides, full height to bottom of roof sheathing. Set the garage slab elevation a minimum of 4 inches below the level of the housing unit floor. Slope slabs to drain out the garage door.

9.11.1 OVERHEAD GARAGE DOORS

Sectional overhead garage doors shall be insulated with steel sandwich panel, SDP-38 by Phenix or approved equal, with white pre-finished sides and with minimum 26 gauge embossed pebble-grained textured acrylic polyester coatings on exterior and shall have hardware that can be opened and locked from inside and outside of the garage. Garage door shall be insulated to approximately R-8. Some glazed openings in the sectional overhead door are considered a desirable feature. Refer to Part 3 for general energy conservation and sustainability criteria.

9.11.1.1 Door Opener

Provide an electrical outlet on the ceiling of the garage for the future installation of a garage door opener.

9.11.2 WALLS & CEILING

Provide gypsum wallboard on the walls and ceiling with taped joints and mudded nail holes. Paint and texture is not required. Refer to Part 3 for general energy and conservation and sustainability criteria.

9.11.3 INSULATION

All garage walls and ceilings (both between the exterior and the interior and between the garage and the rest of the housing unit) shall be insulated as if they were part of the exterior envelope. Refer also to Part 3 for general energy conservation and sustainability criteria.

9.11.4 UTILITY SINK

Locate a utility sink on one interior wall of the garage. Refer to Part 11 for the sink design criteria.

9.12 CRITERIA FOR ROOFING AND DRAINAGE

The designs shall have hip or gable-end pitched roofs. Refer to Part 1 for desirable exterior appearance images.

9.12.1 MINIMUM SLOPES

Minimum slope for primary roof is 6:12. Preferred slope for primary roof is 8:12.
Minimum slope for secondary roof is 4:12.
Minimum slope for porch or patio roof is 2:12.

9.12.2 MINIMUM OVERHANG

Overhang shall be appropriate to the housing style/design. Typical roof overhang shall be 24” for hip roofs and 24” for eaves, except at steeply raked roof conditions maintain a minimum eave of 12”. Minimum gable overhang shall be 3”.

9.12.3 FLASHING

Flashing shall be of nonferrous material.

9.12.4 ROOF WATER

Seamless pre-finished aluminum gutters and downspouts shall be provided for all roof areas. Locate downspouts at the outside corners of buildings in order to discourage ponding of water against corners of the foundation wall. Avoid draining downspouts across pavement. Downspouts draining onto a lower roof are not desirable, but if utilized shall have metal or plastic splash deflectors. Downspouts shall not empty onto the patio area or onto exterior door entry landings. Downspout extensions emptying onto concrete splash blocks shall be provided.

9.12.5 ROOF SURFACE

Roofing shall be limited to the following:

a) Minimum of Class A wind-resistant glass-fiber-reinforced asphalt shingles similar to Timberline Ultra laminated strip shingles by GAF Materials Corporation, conforming to ASTM D3462, Specification for Asphalt Shingles Made from Glass Felt and Surfaced With Mineral Granules, containing a 40 year product warranty and a 80 mph wind rating.

b) An ice dam preventer such as "Weather Watch" shall be provided at eaves, valleys, and gable ends.

c) Common roofs. Parapet walls are prohibited.

9.13 CRITERIA FOR EXTERIOR FINISHES

Refer to Part 4 for requirements for material and color palette variety. Emphasis shall be placed on low maintenance and durability for exterior finish materials. Materials shall be residential in size, scale, and texture. The colors should be selected so that no two adjacent structures are colored alike, yet the selected colors of one should harmonize with its neighbors. Siding of the following materials shall be used:

9.13.1 SIDING

Siding with a high quality appearance is required. In addition, siding shall have a minimum non-prorated 10-year warranty on the finish. Siding shall be kept a minimum of 6 inches above finish grade. TEXT DELETED. Siding shall be installed in accordance with manufacturer's recommendations. A manufacturer's representative shall instruct the installer of the siding, appurtenances, and accessories as to the manufacturer's required installation procedures. The Government construction inspectors responsible for the job shall be included in their instruction. Panel materials in large surfaces shall be avoided unless surfaces are broken with textures or battens. Battens for prefinished materials shall also be factory finished. Siding with a clapboard or lap appearance shall be either single pieces with maximum width course between 6 and 8 inches, or single pieces shaped to simulate width courses between 6 and 8 inches. Refer to Part 3 for guidance on exterior wall construction for energy conservation and sustainability. The following siding materials are to be used:

- Portland Cement siding in a variety of styles, such as manufactured by James Hardie Building Products
- Masonry veneers of brick, stone, or cast stone (such as manufactured by Eldorado, Coronado or Owens Corning).

9.13.2 TRIM ELEMENTS

Trim and flashing shall be compatible with the roofing and siding materials.

9.13.3 PAINTING

Exterior surfaces requiring painting every 5 years shall be kept to a minimum, but where painting is absolutely necessary, exterior surfaces shall receive a minimum of one prime coat and two finish coats of paint.

9.13.4 EXTERIOR SOFFITS

Exposure of roof framing and underside of roof/floor decks are not permitted. Exterior soffits will be trimmed or otherwise architecturally treated and coordinated with siding. Provide exterior soffits with vented holes. Excess attic ventilation shall not be provided through the use of only vented panels. A combination of non-vented and vented panels shall be used. Vented panels shall be evenly spaced along the eaves. Acceptable materials include:

- Prefinished Portland Cement board ceiling or soffit panels.
- Preformed and pre-finished metal soffit panels.
- Preformed and colorfast vinyl soffit panels.

9.13.5 STUCCO

Portland cement plaster or synthetic stucco or any type of Exterior Insulation Finish System is **prohibited** on this project.

9.13.6 CONCRETE MASONRY UNITS

Concrete masonry units shall not be used as a foundation system or as an exterior wall material.

9.14 CRITERIA FOR INTERIOR FINISHES

The color, texture and pattern selections for the finishes of the housing units shall provide a warm, comfortable, easily maintainable and functional environment for the occupants. Coordination of finish colors is necessary for a cohesive design. The design should include neutral colors that accommodate the occupant's varied furnishings. Provide wood base throughout the living areas of the housing units. Countertops shall have patterns that are mottled, flecked or speckled.

9.14.1 FLOORING, STAIRS, AND BASE

Floor materials shall be appropriate for the specific uses planned for that area of the housing unit. Consider where changes of floor materials are made so that a logical "flow" of the flooring occurs. Porcelain tile shall be used as a walk off area at all front entry foyers. Living rooms and dining rooms shall be carpeted. Family rooms shall be carpeted, but when adjacent to the kitchen area to be usable as an alternate dining room, flooring should be sheet vinyl. Kitchens, bathrooms, laundry, utility and mechanical room flooring shall be heavy-duty (seamless) sheet vinyl resilient flooring over underlayment. All bedrooms, stairs to bedrooms, and hallways to bedrooms shall be carpeted. Base throughout shall be oak, stained and sealed. As a betterment, provide plastic laminate flooring with a wood appearance (e.g. Pergo) for the front entry, living, dining and family rooms combined. Refer to Table 9.14.1 for clarification.

TABLE 9.14.1

FLOORS	BASIC	BETTERMENT
FRONT ENTRY (as a walk-off)	Porcelain tile with sealed grout over cement board subflooring	Plastic laminate flooring with a wood appearance (e.g. "Pergo") – (if in conjunction with the living, dining, and – if appropriate – family room)
LIVING ROOM and DINING ROOM	Carpet	Plastic laminate flooring with a wood appearance (e.g. "Pergo") – (if in conjunction with the front entry and – if appropriate – family room)
FAMILY ROOM	Carpet	Plastic laminate flooring with a wood appearance (e.g. "Pergo") – (if in conjunction with the front entry, living room, and dining room)
KITCHEN	Heavy-duty (seamless) sheet vinyl over underlayment	(none)
LAUNDRY / MECHANICAL areas	Heavy-duty (seamless) sheet vinyl over underlayment	(none)
BATHROOMS	Heavy-duty (seamless) sheet vinyl over underlayment	(none)
BEDROOMS, as well as HALLWAYS & STAIRWAYS to bedrooms	Carpet	(none)

9.14.2 CARPET

Carpet color shall be neutral (not light in color) and pattern is to be avoided. Carpet shall be woven, tufted or fusion bonded construction. Carpet type shall be plush cut, frieze (twist), cut and loop, or loop. Minimum face weight shall be 32 ounce for plush cut, 28 ounce for cut and loop or frieze (twist) piles or 24 ounce for loop pile. Synthetic (polypropylene) backing is required. A minimum pile density of 4000 and gauge of 1/8 or 1/10 is required. Specify yarn that is branded by the fiber producer, Nylon-6, 6, or Nylon-6 with a soil and stain resistant finish. Provide 3/8" to ½" high-density polyurethane foam underlayment that meets HUD Use of Material Bulletin 72A HUD Building Product Standard and Certification Program for Carpet Cushion. Carpet must pass the Department of Commerce (DOC) FF 1-70 Pill Test (7 passes from 8 specimens) and the requirements of NFPA 101, The Life Safety Code. Carpet shall comply with 16 CFR 1630 and have a minimum average critical radiant flux of .45 watts per square centimeter when tested in accordance with ASTM E 648. Tuft bind force required to pull a tuft or loop free from carpet backing shall be a minimum 10 pound average force for loop pile and 3 pound average force for cut pile when tested in accordance with ASTM D 1335. Carpet shall be installed according to the manufacturer's recommendations to ensure that warranties will be valid.

9.14.3 RESILIENT FLOORING

Sheet vinyl shall conform to ASTM F 1303, Type II, Grade 1 minimum wear layer thickness of 1.25 mm and minimum overall wear layer thickness of 2 mm. Install to minimize need for seams. Where room size require seams, apply waterproof epoxy adhesive continuously in all seams in accordance with the manufacturer's instruction. Provide extruded vinyl edge moldings where flooring materials change and where appropriate in open plans. Provide "quarter round" at wood base wherever resilient flooring is installed.

9.14.4 PLASTIC LAMINATE FLOORING

If provided, laminate flooring shall be installed using glued tongue and groove panels, minimum size 7" (nominal) by 48" (nominal) with a 5/16" nominal thickness. Provide a 15-year warranty against wear, fading, staining and moisture absorption. Install over a sound reduction underlayment.

9.14.5 CERAMIC TILE

Ceramic or porcelain tile shall conform to ANSI AI37.1, moderate to heavy grade only. Nominal 12" x 12" tile is preferred by the entryways, but in no case shall floor tiles be less than 4" x 4" nominal. Subflooring under tile shall be cement board. Tile and trim shall be unglazed with the color extending uniformly through the body of the tile and equal to Daltile. A mottled or speckled floor tile should be used for maintenance purposes. A medium to dark toned grout that coordinates with the floor tile is required to avoid a stained or soiled appearance.

9.14.6 WALLS AND CEILINGS

Interior wall finish material shall be ½ inch minimum gypsum wallboard. Ceiling finish material shall be 1/2 inch gypsum wallboard. Wherever framing is spaced over 16" O.C., gypsum wallboard shall be 5/8 inch thick. Finish gypsum wallboard with a light orange peel texture as a base under painted surfaces. Do not furnish sprayed-on acoustical ceiling finish in any area of this project. Water-resistant wallboard shall be used in wet areas such as bath, powder, and laundry rooms. "Cement" or glass-fiber reinforced backer board is preferred. Interior finish shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less when tested in accordance with ASTM E84.

Small amounts of masonry veneer, as used on the exterior, may be used for interior feature walls. However, such material should require minimum maintenance and be capable of withstanding moderate physical impact for its common accepted use.

All receptacle boxes and electrical switches shall be masked prior to gypsum wallboard taping to prevent gypsum wallboard cement from entering electrical boxes or touching sheathing on electrical sheathed cable.

9.14.6.1 Kitchen and Eating Area Walls and Ceiling

Combined kitchen and eating rooms shall have the same type of wall and ceiling finishes. However, provide a splatter guard of glazed ceramic tile or 1/16" (minimum thickness) prefinished metal (or metal-faced composite) at the wall behind the range top. Splatter guard shall extend from the level of the countertop up to the range hood, and a minimum of 6 inches beyond each edge of the range top area.

9.14.7 PAINTING

Finishes shall be lead free. Interior surfaces, except factory prefinished material, shall be painted a minimum of one prime coat and two finish coats, except if stained and varnished oak trim is utilized. Natural finished interior doors are acceptable. Walls and ceilings in kitchen, baths, laundry, utility rooms shall be painted with semi-gloss epoxy base. Painted trim shall be semi-gloss. Two coats. Provide natural stain and sealer on Oak trim. All other painted surfaces shall have semi-gloss latex finish. Interior wall color shall be off-white. It is desirable for ceilings to be a lighter white than the walls. Final colors shall be submitted by the Contractor and approved by the Contracting Officer.

9.15 CRITERIA FOR GLAZED OPENINGS

Windows and glazed door (50 percent or more glass) units shall meet the following standards and must be certified by an independent testing laboratory. Operable windows shall be single-hung, double-hung, or casement, but double-hung is preferred. Standards for casement windows shall also apply to fixed windows. Glazing for windows at bathrooms shall be patterned or obscured. Refer also to Part 3 for energy conservation and sustainability criteria. The Contractor shall provide the manufacturer's certification that the windows/glazed doors provided meet the following test requirements:

9.15.1 REQUIRED TESTS

Hung window units will meet a National Fenestration Rating Council (NFRC) design pressure rating of DP 25. Casement windows will meet NFRC design pressure rating of DP 40. Evidence of passing the following specific tests and minimum standards are required to achieve these design pressure standards.

9.15.1.1 Structural Testing

Using ASTM E330 test results shall demonstrate no glass breakage, damage to hardware, or permanent deformation that would cause any malfunction or impair the operation of the unit. Residual deflection of any member shall not exceed 0.4 percent of its span. Hung windows shall be tested at pressures of 37.5 lb/ft^2, and casement windows shall be tested at pressures of 60.0 lb/ft^2.

9.15.1.2 Operating Force

The force necessary to unlatch and open units shall not exceed 30 lb. for hung units and 35 lb. for casements.

9.15.1.3 Air Infiltration

Using ASTM E283 leakage rate shall not exceed 0.25 $ft^3/min/ft^2$ for hung units and 0.15 $ft^3/min/ft^2$ for casements, at a test pressure of 1.57 lb/ft^2.

9.15.1.4 Water penetration

Using ASTM E547, no leakage shall be evident when tested in three, five-minute cycles with a one-minute rest period between cycles at 3.75 lb/ft^2 for hung units and 6.0 lb/ft^2 for casements.

9.15.1.5 U-Value

U-values shall be calculated using ASTM E1423 and NFRC 100-91. Refer to Part 3 for energy conservation and sustainability criteria.

9.15.2 GLAZED DOORS

Glazed doors shall have insulated steel, vinyl clad wood, or thermally broken aluminum frames conforming to the above requirements. Finish shall be factory applied and conform to 44-C-22431 in accordance with the requirements of the National Association of Architectural Metal Manufacturers (NAAMM) Metal Finishes Manual. Doors shall have interior operated latch, and securing pin or throw-bolt in frame.

9.15.3 UNIT EFFICIENCY

Glazing units shall be high efficiency, low E, double glazed (insulated) with a minimum 5/8 inch air space and thermal-break and 10 year warranty. Provide sashes that can be site glazed.

9.16 CRITERIA FOR WINDOW UNITS

Windows with metal sashes or jambs on the interior are not permitted. Windows with wood sashes or jambs on the exterior are not permitted. Windows in “double height” spaces should be avoided because of the difficulties in cleaning such windows and providing window blinds for them. All windows shall be operable in the living room, dining room, family room, kitchen and bedrooms.

9.16.1 INTERIOR WINDOW SILLS & TRIM

Interior side of window sills shall be solid surfacing or clear oak suitable for application of stain and varnish by Contractor. Paint finish is **unacceptable** at window sills. Provide wood trim at all interior window jambs and heads. Provide either stained and sealed oak, or wood with paint finish.

9.16.2 WINDOW CLADDING

Windows shall conform to AAMA 101/I. Vinyl windows shall conform to AAMA 101/AAMA 101V, with fully mitered fusion welded joints at vinyl frames and reinforced with aluminum extrusions or roll-formed galvanized steel members if required.

9.16.3 SINGLE-HUNG AND DOUBLE-HUNG WINDOWS

Windows shall be Grade H-LC35 with sash which operates vertically with the weight of sash offset by a counterbalancing mechanism mounted in window to hold the sash stationary at any open position, and shall be complete with two locking devices to secure the sash in the closed position. Single-hung windows shall be designed to permit washing of both sides of the operable sash from inside the unit. Double-hung windows shall be designed to permit washing of both sashes from inside the unit.

9.16.4 CASEMENT WINDOWS

Windows shall be Grade C-R90 with ventilator sash that swings on side jambs and shall have locking devices to secure ventilators tight in the frame in the closed position. Operator shall be rotator type. Operating hardware except ventilator arms and rotary operators shall be concealed within frame and sill.

9.16.5 SCREENS

Aluminum screens shall be provided at all operable sashes. Screens shall be of window manufacturer's standard design, and conform to AAMA 1002.10, Voluntary Specification for Aluminum Insulating Storm Products for Windows and Sliding Doors.

9.16.6 WINDOW TREATMENTS

Provide blinds at all windows. Typically provide horizontal 1inch metal blinds at windows less than 5'-0" wide, and provide vertical blinds on a transverse rod with PVC louver vanes about 3-1/2' wide at wider windows and where glazed patio doors occur. Blinds are not required at bathroom windows with patterned or obscure glazing. Window coverings are optional at any glazing in entrance doors, entrance sidelights and entrance door transoms. Color shall be manufacturer's standard off white, and shall be coordinated with wall color.

9.17 CRITERIA FOR DOORS

Refer to Part 3 for energy performance requirements.

9.17.1 ENTRANCE DOORS

The entrance door at the housing unit's front entry shall be 3 ft in width and minimum 6 ft-8 inches in height. Door shall be 1-3/4 inch thick, insulated, pre-finished solid core steel exterior with decorative panel treatments embossed into both face sheets (similar to Versador by Ceco Corp.). No storm door is required at the front entry. Sliding glass doors shall not be used as primary housing unit access. Other doors should meet this requirement but may be of lesser width.

The following are considered desirable features at the front entry door:

- Exterior of door is accent color.
- Sidelights on one or both sides.
- Transoms above door.
- Small amount of glazing in door.
- Any glazing in door, sidelights, or transom shall be transparent and clear versus tinted or colored. For privacy, however, glazing at eye level and below should be patterned, embossed, beveled etc. versus flat panel glass.

9.17.2 PATIO DOOR

Door to patio shall be in-swinging hinged double 30 inch wide glazed doors with one door fixed and the other door active, meeting the requirements of NWWDA I.S. 8. Patio Door or equivalent quality, and I.S. 2 Window Rating grade 60. To provide more latitude with arrangement of furniture, the inactive door leaf may be reduced in size or eliminated, as long as the width of the active door leaf is increased in order to provide a minimum clearance of 34". Wood door (prefinished or natural and stained) with exterior cladding is considered a desirable feature.

9.17.3 GARAGE EXTERIOR PERSONNEL DOOR AND OTHER EXTERIOR DOORS

A garage exterior personnel door if provided as a betterment, and any other exterior doors should match the size and construction quality of front entry doors. Glazed openings are not desirable. No storm door is required.

9.17.4 INTERIOR DOORS

Interior doors shall be flush, solid core with stain grade oak face. Provide wood trim at all interior door jambs and heads. Provide either stained and sealed oak, or wood with painted finish.

9.17.5 DOOR CLOSERS

Self-closing doors are required on all doors in fire rated walls. Door closers in one hour rated walls shall comply with ASI/BHMA Standard A156.4.

9.17.6 DOOR STOPS

Hinge pin-type door stops should be avoided.

9.18 CRITERIA FOR BUILDERS HARDWARE

Hinges, locks, and latches will comply with the specifications indicated in Table 9-10, and the following subparagraphs:

TABLE 9-10 – HARDWARE SPECIFICATIONS

Hardware Type/ Specification	Specific Requirements
Hinges BHMA 101	Hinges shall be 4 in x 4 in at exterior doors, and 3-1/2 in x 3-1/2 in at interior doors.
Locks & Latches BHMA 601	Series 4000, Grade 2, at exterior doors. Grade 2 at interior doors. Provide trim of wrought brass, aluminum, or stainless steel.
Auxiliary Locks BHMA 501	Series 4000, Grade 2. Provide matching trim of wrought brass, aluminum, or stainless steel.
Interconnected Lock & Latches BHMA 611	Grade 2. Provide matching trim of wrought brass, aluminum, or stainless steel.
Closers BHMA 301	Series CO2000, Grade 2.

9.18.1 LOCKS AND KEYS

Lock cylinders shall accept seven pin interchangeable cores (manufactured by Best Locks) which are removable by a control key and accommodate a master keying system. The Contractor shall provide construction cores controlled by a master key. Immediately before the acceptance of a unit, the Government will provide seven-pin Best cores for the Contractor to install in the unit. Locks for each housing unit, including garage door(s), shall be keyed alike. Locks and keys shall conform to the standards and requirements of the Builders Hardware Manufacturers Association (BHMA) listed above.

9.18.2 WEATHERSTRIPPING AND EXTERIOR THRESHOLDS

Provide vinyl weather-stripping for all housing unit exterior doors. Vinyl magnetic weather-stripping is acceptable for metal doors. Exterior thresholds shall be made of nonferrous metal. Refer to Part 3 for air infiltration criteria.

9.18.3 APPLICATIONS

Locks and hinges shall be applied as follows:

a) Exterior hinged doors shall have 1-1/2 pair of hinges and either a lockset or an auxiliary lock or an interconnected lock and latch.

- Exterior double patio doors shall have either a lockset or an auxiliary lock or an interconnected lock and latch, and 1-1/2 pair of hinges.

b) Each windowless entrance door will have a viewer mounted at eye level, per manufacturer's standard.

c) Garage personnel doors, where provided, shall have 1-1/2 pair of hinges and lockset.

d) Interior doors shall have 1-1/2 pair of hinges and latchset with BHMA 601, F75 or F76 operations.

e) Doors in fire-rated walls from housing unit to garage shall have 1-1/2 pair of ball-bearing hinges, lockset, auxiliary lock or interconnected lock and latch and closer.

f) Doors of all toilet room compartments shall have bathroom privacy locks. Doors of all master bedrooms shall have the same type of privacy lock as provided for toilet room compartment doors.

9.19 CRITERIA FOR BUILDING SIGNAGE AND DOOR BELL

Each housing unit with exterior entrance will have a number visible from the vehicular circulation.

9.19.1 SIGNAGE

Refer to Part 14 for wall mounted light fixture incorporating illuminated house numbers.

9.19.2 DOOR BELL

Front and rear entrances of each unit shall be provided with low voltage door chimes with different sound for easy recognition. Provide illuminated push button mounted on exterior wall near latch side of entrance door. Locked storm door shall not block access to doorbell button. Rough-in for a doorbell visual enunciator shall be provided in each accessible unit.

9.20 CRITERIA FOR KITCHEN/BATH CABINETS

Cabinets shall be per AWI Standards. The kitchen cabinets being provided for Improve Family Housing project, FY 2002, at Whiteman AFB are Merillat AVIA Series or equal, with residential-trimmed Northport style door and drawer fronts and natural oak trim; these will be considered a desirable feature on this project. Otherwise, cabinets shall be factory manufactured of Custom grade, oak, plain-sliced transparent finished for all exposed parts . Wall cabinets shall have adjustable shelves. Cabinets shall have spring-loaded self-closing hinges, Mepla DS T21 or approved equal, invisible mounting, 110 degree minimum opening. Pulls shall be as specified herein. Four-inch chrome wire pulls are preferred. Wall and base cabinets shall be essentially of the same construction and appearance. All base cabinets shall have an adjustable intermediate shelf located approximately halfway between the bottom and the drawer unit. Provide a full depth heavy duty pull out shelf at the bottom of all base cabinets. The heavy duty pull out shelves shall have lipped edges front and back; the two sides shall be sized to accommodate the drawer hardware. Hinges shall have zero protrusion at locations with pull out shelves. Cabinets and countertops shall have a flame-spread rating that does not exceed 200 when tested in accordance with ASTM E84 and ASTM E162, Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source.

9.20.1 CABINET CONSTRUCTION

Construct cabinets with flush overlay or European framing style. Frame members shall be mortised and tendoned, dove-tailed or doweled, and glued together. Brace the top and bottom corners with hardwood blocks that are glued with water-resistant glue and nailed in place. Wood cabinet materials and dimensions - Materials and minimum dimensions and thickness for cabinet construction materials shall comply with Table 9-11 and requirements below.

9.20.1.1 Lumber Products

a) Softwood lumber: PS 20 custom grade, moisture content 6%.

b) Hardwood lumber: PS 58, premium grade.

9.20.1.2 Sheet Materials

a) Hardwood plywood: PS-51 premium grade; core material of particle board, Red Oak rotary cut, grade "A" finished side and grade "3" for back ply material.

b) Wood particle board: composed of wood chips made with waterproof resin binders of 45 pound density sanded faces.

c) Softwood plywood: PS 1, custom grade, core material of particle board; species of Douglas Fir.

TABLE 9-11 - KITCHEN CABINET SPECIFICATIONS

Element Description	**Specific Requirements**
Frame Members	Per AWI.
Base Cabinet Toe Space	2-1/2 in x 4 in high with 3/16 inch oak face.
Cabinet Bottoms, Backs Ends, & Tops	Melamine finish over 3/4 inch particle board (except 1/4 inch minimum at back). Provide bottoms in kitchen/bath sink cabinets. Brace bottoms with wood members glued in place.
Doors	Oak panel with oak-face trim, 5/8 inch Red Oak plywood, stile and rail; or provide similar to residential trimmed Northport style door with natural oak trim (Merillat AVIA Series).
Drawer Slides/Guides	KV 1284 or approved equal solid stud acetyl roller, captive in one channel member, 100 pound/pair load capacity, side or bottom mounting, white color epoxy-coated cold rolled steel with positive stop. Lift-out disconnect "stay closed design".
Drawers	Conventional dovetail joint used to fasten side to back and front. All joints glued. All drawers and pull out shelves shall be mounted with side mounted slides. Red oak face front; or provide similar to residential trimmed Northport style door with natural oak trim (Merillat AVIA Series).
Drawer Sides and Bottoms	Cabinet liners to be Industrial grade particleboard coated with industrial paper with double smoothing melamine top coat on both sides. Edges to have color matched PVC edge banding. Bottoms 15 in wide shall be spot-

TABLE 9-11 - KITCHEN CABINET SPECIFICATIONS

Element Description	Specific Requirements
	glued and set into members in grooves 1/4 inch deep with minimum 3/8 inch standing shoulder, fastened with glue blocks, except that at backs, it shall be glued and nailed to bottom edge at back.
Bumper Pads	Cork.
Shelves	3/4 inch industrial grade particle board coated with industrial paper with double smoothing melamine top coat on both sides. Steel supports of flush mounted angle with 1/4 inch diameter by 3/8 inch long on 2 in centers. Shelf edges exposed to view shall be red oak, rounded, filled, sanded, and finished.

9.20.2 COUNTERTOPS

Upgrading to solid surfacing countertops with integral double sink and integral backsplash is considered a "betterment" for the kitchen. Solid surfacing shall be similar to Corian by Dupont or Swanstone by Swan Corporation.

9.20.2.1 Kitchen and Laundry

Countertops finish shall be high pressure laminated plastic 0.048-inch thick with an integral backsplash, and shall be applied with heat-resistive adhesive. Minimum backsplash height is 4 inches. Backsplashes shall be provided at both back of counters and at side of counters where abutting a wall. The substrate for countertops shall be 3/4-inch thick particle board. Countertops shall have a no drip front edge.

9.20.2.2 Bathrooms

Lavatory vanity cabinets shall be 34 inches high (standard) with drawers and cabinet drawers below, appropriate to the size of the unit (but with at least one drawer, at least one cabinet door and at least one shelf in the cabinet). Countertops shall be man made cultured marble, 30 inches deep (minimum) with seamless backsplash, of 4 inch maximum height provided both at back of counters and at sides where abutting a wall. Countertops shall have a no drip front edge. Refer to Part 11 for information on lavatory bowl integral with countertop.

9.21 CRITERIA FOR ACCESSORY ITEMS

9.21.1 PRIVACY SCREENING AT DUPLEX

Provide backyard privacy screening from adjacent housing units in all duplex configurations. Screening shall be attached to the building. It shall be 6-foot high and extend out from the nearest wall of the building far enough so that no corner of the patio in one unit of the duplex is visible from any corner of the patio in the other unit of the duplex. Screens shall permit air flow while maintaining visual privacy. Construction should match or compliment adjacent exterior wall surface or fencing. Refer to Part 4 for fencing requirements.

9.21.2 BUILDING ENVELOPE TIGHTNESS TESTING

Refer to the requirements in Part 3 for building envelope tightness testing.

9.21.3 ACCESS TO CRAWL SPACE

Provide a crawl space access door. The floor of an interior closet is an acceptable location, but the preferred location is the floor of the mechanical room. Size of door shall be minimum 32 inches in each direction. When adjacent floor is finished, finish of access door shall match finish of adjacent floor.

9.22 HOUSING UNIT DESIGN CHECKLIST

- ❑ For each different unit to be provided, submit documentation in accordance with Section 00110, "Tab 7 Housing Unit Concept Design – Submittal Requirements".
- ❑ For each different unit to be provided, list each betterment included. Refer to Section 00110, "Tab 7 Housing Unit Concept Design – Submittal Requirements" for additional submittal information.
- ❑ For each different unit to be provided, also submit floor plans indicating assumed typical furniture layouts, including porch and patio furniture layouts. On these furniture plans, indicate all door swings and window locations.

PART 11 - UNIT DESIGN – PLUMBING

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11 UNIT DESIGN - PLUMBING

11.1 GENERAL

The plumbing system shall conform with the requirements of the Air Force Family Housing Guide (paragraph 4.10.2); with the International Plumbing Code, latest edition, governing backventing of plumbing fixtures, sizing of waste, vents, drains, backflow prevention and water systems; and with the requirements provided herein. All water supply piping shall be rigid copper and Crosslinked Polyethylene (PEX) tubing. Locate the water service main cutoff valve (ball valve with a drain) in the mechanical room. Waste water line vents shall be tied together with a single vent extending through the roof. Refer also to Part 3 for energy performance and conservation requirements.

11.2 WATER PIPING

Under slab supply piping shall be limited to housing unit service entrance only. Service line to each housing unit shall be as indicated in Part 8 under "Water Distribution". New lines shall be installed below the recognized frost line. All water supply piping shall be sized in accordance with methods outlined in International Residential Code (IRC), to limit water velocity in the pipe to 8 ft/sec unless a lower velocity is recommended by the plumbing fixture manufacturer(s). An isometric diagram of the water system shall be included in the 100% design submittal after contract award (see Section 01332 SUBMITTALS DURING DESIGN). Allowable pipe materials are listed below.

11.2.1 COPPER TUBING

Water piping under concrete slabs shall be copper tubing, type K, annealed. Joints under slabs are not allowed. Interior water piping shall be type L hard-drawn copper. Fittings for soft copper tubing shall conform to ANSI B16.26, Cast Copper Alloy Fittings for Flared Copper Tubes, and for hard-drawn to ANSI B16.22, Wrought Copper and Copper alloy Solder Joint Pressure Fittings. Underslab supply piping shall be limited to unit service entrance only. Upon completion of rough-in operation and prior to concealing in the structure and the setting of plumbing fixtures, the entire hot and cold water piping systems shall be tested at a hydrostatic pressure of not less than 100 pounds per square inch gage, and proved tight at this pressure for 2 hours. Where a portion of the water piping system is to be concealed before completion, such portion shall be tested separately in the same manner as specified for the entire system.

11.2.2 CROSSLINKED POLYETHYLENE (PEX) TUBING

Within walls and floor joist cavities, use crosslinked polyethylene (PEX) tubing, in accordance with the requirements of the IRC.

11.3 SOIL, WASTE, VENT, AND DRAIN PIPING

Except as noted below, soil, waste, vent, and drain piping shall be polyvinyl chloride (PVC), or plastic suitable for installation in a residential waste, soil, vent, and drain system, except that lateral water lines into the family units and condensate lines shall be copper. Each fixture and piece of equipment, except water closets, requiring connection to the drainage system, shall be provided with a trap. Provide deep seal trapped drain with air gap for cooling coil condensate drain. Soil, waste, and drain piping installed below floor slabs shall be service weight hub and spigot cast iron, plastic pipe suitable for installation in a residential waste, soil, vent, and drain system, or Acrylonitrile-Butadiene-Styrene (ABS). Building waste main lines shall be 4-inch diameter. All soil, waste, and drain piping shall be sized in accordance with the

methods outlined in the International Plumbing Code. Provide an approved double wye cleanout immediately outside of the building's main waste line. Plumbing vents shall not vent into attic but, penetrate roof and extend above the roof per code. Locate vents on the backside slope of the roof so as not to be visible from the front of the housing unit. On straight runs of pipe, cleanouts shall be provided at not more than 50 feet apart. Cleanouts shall be provided at each change of direction of pipe and shall be provided at the base of all soil, waste, and vent stacks. All unfinished plumbing work, such as cleanouts, fittings, etc, exposed to finished rooms or spaces shall be concealed by an escutcheon plate or similar finished device. Soil, waste, and drain piping shall be tested with water or air before fixtures are installed. After the plumbing fixtures have been set and the traps filled with water, the drain and waste lines shall be submitted to a visual test for leakage. An isometric diagram of the sanitary sewer system shall be included in the 100% design submittal after contract award (see Section 01332 SUBMITTALS DURING DESIGN).

11.3.1 WATER TEST

Water test shall be applied to the soil, waste, and drain system either in the entire system or in sections. If the test is applied to the entire system, all openings in the piping shall be tightly closed except the highest opening, and the system shall be filled with water to the point of overflow. If the system is tested in sections, each opening except the highest opening of the section under test shall be tightly plugged, and each section shall be filled with water and tested with at least a 10 feet head of water. In testing successive sections, at least the upper 10 feet of the next preceding section shall be tested so that each joint or pipe in the building. Except the uppermost 10 feet of the system, has been submitted to a test of at least 10 feet of head of water. Water shall be kept in the system or portion under test, for at least 15 minutes before inspection starts; the system shall then be tight at all joints.

11.4 GAS CONNECTIONS

The use of semirigid tubing and flexible connectors for gas equipment and appliances is prohibited. Except that the final connections to the kitchen ranges shall be made using flexible connectors conforming to ANSI Z21.45, Flexible Connectors of Other Than All Metal Construction for Gas Appliances, not less than 40 inches long. Interior pipe shall be steel, Schedule 40; black, as specified in ASME B31.8. Provide accessible gas shutoff valve and coupling for each gas equipment item. Comply with IBC, IRC & IPC requirements. Exposed horizontal piping shall not be installed farther than 6 inches from the nearest parallel wall in laundry areas or areas where clothes hanging could be attempted. Provide a 1/2 inch stub-out for possible **(**occupant-owned automatic gas clothes dryer), gas range and gas oven.

11.4.1 GAS PIPING

The interior gas piping, from the low-pressure regulator to the equipment, shall be wrought iron or steel, and the fittings, shall be malleable iron conforming to ANSI B36.10. The complete piping installation shall conform to all aspects of NFPA 54, except as stated in paragraph "Gas Connections".

11.4.2 GAS TESTING

The Contractor shall set up in an accessible position, where directed, a test pump and a mercury gauge connected to the permanent gas piping. Pump and gauge shall be properly protected and kept in working order until after final inspection. All gas piping shall be subjected to an air test of 15-inch mercury column pressure without drop for 15 minutes. Gas piping shall be tested with air only. Tests shall be made by and at the expense of the Contractor and at such time as directed, and in the presence of the authorized Government representative. If there is any reduction in pressure during test period, test isolated sections and joints with soapsuds and replace leaking joints and reapply test.

11.4.3 GAS PURGING

After testing is completed, and before connecting any appliances, all gas piping shall be fully purged. Piping shall not be purged into the combustion chamber of an appliance. The open end of piping systems being purged shall not discharge into confined spaces or areas where there are ignition sources unless the safety precautions recommended in NFPA 54 are followed.

11.5 PLUMBING FIXTURES

Residential type fixtures and trim shall be provided and shall comply with ANSI Standards. Fixtures shall be provided complete with fittings, and chromium-plated or nickel-plated brass (polished bright or satin surface) trim. All fixtures, fittings, and trim in the project shall be from the same manufacturer and shall have the same finish. Faucets may be from a different manufacturer as the fixtures, fittings, and trim; however, all faucets shall be from the same manufacturer for each of the new family housing units. Metal escutcheons plates shall be installed at all water supply and drainpipe connections through walls or cabinets.

Plumbing shall meet the following criteria. Refer to Part 3 for additional clarification.

a) Exposed traps shall be chromium-plated, adjustable-bent tube, 20-gauge brass. Concealed traps may be plastic (ABS).

b) Faucets shall be single-control type, with seals and seats combined in one replaceable cartridge designed to be interchangeable among lavatories, bathtubs and kitchen sinks, or having replaceable seals and seats removable either as a seat insert or as a part of a replaceable valve unit. Water flow shall be no more than 2.5 gpm from any faucet.

c) Shower and bath combination shall be controlled by a diverter valve, and shall be provided with a chrome plated brass curtain rod and chrome plated brass flanges. Baths and shower and bath combinations shall be provided with waste fitting pop-up, concealed with all parts removable and renewable through the overflow and outlet openings in the tub with access panels. Shower and bath combinations shall be equipped with a combination valve and flow control device to limit the flow to 2.5 gpm at pressure between 20 to 60 psi.

d) Piping shall be concealed. Individual shut off valves on water supply lines to each individual sink, lavatory, water closet, water heater, and dishwasher shall be provided immediately below or adjacent to the fixture. Individual shutoff valves concealed behind access panels shall be provided on water supply lines to all other plumbing fixtures including bathtubs and showers. In multi-story units, providing separate shutoff valves for each floor is a desirable feature.

e) Fixtures shall be water conservation type.

f) Vitreous china plumbing fixtures shall conform to ANSI A112.19.2, Vitreous China Plumbing Fixtures. Stainless steel fixtures shall be in accordance with ANSI A112.19.3, Stainless Steel Plumbing Fixtures (residential design). Enameled cast iron plumbing fixtures shall comply with ANSI A112.19.1, and enameled steel fixtures shall comply with ANSI A112.19.4.

11.6 WATER CLOSETS

Water closets shall be one-piece toilets, with bowl and tank integrated. Provide an elongated bowl, close coupled siphon jet, floor outlet with wax gasket, closed-front seat and cover, and an anti-siphon float valve. Water consumption shall be no more than 1.6 gal per complete flush cycle. Also refer to sustainability criteria in Part 3. Water closet shall be vitreous china and trim shall conform to ANSI A112.19.5, Trim for Water-Closet Bowls, Tanks, and Urinals (Dimensional Standards).

11.7 LAVATORIES

Lavatories shall be man-made cultured marble integral with the cabinet-mounted countertop. Bowl size shall be a nominal 13” x 16” x 5-1/2”, with overflow.

11.8 BATHTUBS & SHOWERS

Bathtubs shall be slip resistant and shall be constructed of porcelain steel. Showers shall have fiberglass shower pan, metal and glass shower door, and chrome-plated drain cover. Bathtubs and showers shall have hard-seamed solid surfacing walls to a height of at least 6 feet above finish floor. One-piece tub/shower/wainscot units are prohibited.

11.9 KITCHEN SINKS

Kitchen sinks shall be Type 302 stainless steel, 20-gauge minimum, seamless drawn, and sound deadened. Sinks shall be double bowl (each a minimum of 8” deep), self-mounting without mounting rings, complete with cup strainer and plug. Preferred minimum size of large bowl is 22 x 33 inches. Refer to Part 12 for Food waste disposers. Strainer and plug shall be eliminated where food waste disposers are provided. Provide a cleanout trap a minimum of 4 inches above the floor. If solid surfacing kitchen countertops are provided as a “betterment”, sinks shall be integral with counter tops with similar dimensions and accessories as described above.

11.10 OTHER SINKS

11.10.1 UTILITY SINK

Furnish and install floor-mounted heavy-duty plastic utility sink in garage, including hot and cold water and sanitary line. Minimum basin size is 18” x 18” x 12” deep. Refer to Part 9 for additional information on location.

11.10.2 LAUNDRY SINK AS A BETTERMENT

If provided, laundry sink shall be stainless steel, rimless, nominal 8” depth, approx. 16” by 14”, with overflow. Provide a cleanout trap a minimum of 4 inches above the floor. Refer to Part 9 for criteria regarding laundry sink cabinetry.

11.11 CLOTHES WASHER CONNECTIONS

Drainage and hot and cold water supply shall be provided for occupant-provided automatic clothes washers. Washer connection, complete with 2-inch drain, with mouth 3 feet above the floor, 3/4-inch hose thread supplies shall be provided in standard manufactured recessed wall box with single-face plate. Boxes shall be constructed of plastic. Boxes shall be mounted a minimum of 2 ft-10 inches above the finish floor. Electrical outlets for both washer and dryer shall also be provided but can be located separate from the washer connection box. Finish color shall be painted to match adjacent finishes. In addition, provide a standard gas dryer connection with concealed piping.

11.12 HOSE BIBBS

Hose bibbs (wall hydrants) shall be provided at the front and rear of each housing unit. Hose bibbs shall be anti-siphon, automatic draining type non-freeze, frostproof, and shall be supplied with an integral backflow preventer/vacuum breaker as well as shutoff valve.

11.13 PIPING LOCATIONS

Water piping shall be installed on the warm side of insulation and shall be wrapped with insulation and a vapor barrier jacket. Determination of the warm side shall be the same as determined for vapor barrier location. Water piping shall be run in crawl spaces or below floors of upper stories, but not in attics. Water piping runs in exterior walls shall be avoided except for hose bibbs. Interior piping shall be accessible for future maintenance.

11.14 CLEANOUTS

Accessible cleanouts shall be provided at each change in direction of sanitary sewer lines, at the intervals specified in the International Plumbing Code, and at the building service entrance. All cleanouts shall be permanently accessible. Ground cleanouts shall be located in the front yard flush with grade, and shall be 2-way operational.

11.15 WATER HEATER

Water heaters shall be located in the main floor mechanical room. Water heaters shall have round; glass lined tanks, shall have earthquake straps, and shall be installed with an integral insulating wrap with a minimum R-value of 8.3 (refer also to Part 3). Access shall be provided in the wrap for service and maintenance openings. Storage water heaters that are not equipped with integral heat traps and having vertical pipe risers shall be installed with heat traps directly on both the inlet and outlet. Circulating systems need not have heat traps installed. The water heater relief drain shall be manufacturer approved, and shall be indirectly connected to the building sanitary sewer system. Water heaters shall be gas-fired 40 gallons with electronic pilotless ignition. Water heater energy factors shall meet or exceed the minimum requirements of 10 CFR 430 and the requirements of Part 3. Water heaters shall have factory-preset thermostats to limit water temperature to 120 degrees F maximum.

Water heaters shall be installed in a water heater pan, similar to Oatey 34000 series plastic, with fitting piped to the exterior of the unit. Provide a rodent and insect screen at the exterior terminus.

11.15.1 GAS-FIRED WATER HEATERS

Gas fired water heaters shall be in accordance with ANSI Z21.10.1, Water Heaters, Gas, Volume I, Storage Type, 75,000 BTUH Input or less, ASHRAE 90A, NAAECA 1990 and certified by American Gas Association. Working pressure shall be 150 psig with a factory test of 300 psig. A pressure/temperature relief valve and drain shall also be provided. Water heaters with powered ventilation shall be vented in accordance with manufacturer's instructions. Flue shall not be oversized. Flue when run through attic shall penetrate roof and extend above the roof with weatherproof installation per code. Flue shall be routed out through the roof and be located on the backside of the roof so as not to be visible from the front of the housing unit. Double-wall UL-listed chimney shall be provided. Ducted combustion air shall be provided. Refer also to Part 3 for energy performance requirements.

11.16 SHOCK ABSORBERS

Shock absorber units, to control water hammer, are required at clothes washer and dishwasher supplies; supplied and installed in accordance with the manufacturer’s recommendations. Air chambers are unacceptable. Access panels shall be provided.

11.17 MISCELLANEOUS PIPING

Cold water piping for the icemaker shall be installed behind the refrigerator with an angle valve in a semi-recessed plastic box.

11.18 FLOOR DRAINS

In addition to the standard washing machine drain, provide a floor level drain inlet in case the washing machine overflows. Provide a tile drain sump pump if the mechanical room is in a basement. Such a tile drain sump pump shall drain to the sanitary sewer system.

11.19 FLUSHING OF POTABLE WATER SYSTEM

After pressure testing and before disinfection, potable water piping systems shall be flushed with potable water. Sufficient water shall be used to produce a water velocity that is capable of entraining and removing debris in all portions of the piping system. This requires simultaneous operation of all fixtures on a common branch or main in order to produce a flushing velocity of approximately 4 feet per second through all portions of the piping system. Flushing shall be continued until entrained dirt and other foreign materials have been removed and until discharge water shows no discoloration. All faucets and drinking water fountains, to include any device considered as an end point device by NSF 61, section 9, shall be flushed a minimum of 0.25 gallons per 24 hour period, ten times over a 14 day period. Removal of the aerator portion of the faucets shall be done to prevent clogging. Refer also to Part 3 for sustainability requirements.

11.20 DISINFECTION OF POTABLE WATER SYSTEM

After system flushing is complete, the entire domestic hot -water and cold-water distribution system shall be disinfected with chlorinating material consisting of Sodium or Calcium Hypochlorites. Completely drain the system and fill with a solution of Sodium or Calcium Hypochlorite at 100 parts per million and completely relieve the system of air. Allow the solution to stand for eight (8) hours and then drain and follow with a clear flush for a sufficient period of time to remove all traces of hypochlorite odor. Refer also to Part 3 for sustainability criteria.

11.21 RADON PREVENTION AND TESTING

The housing units shall be constructed to include a passive system for control of radon in the structure. Refer also to Part 3 for sustainability requirements. This system shall be constructed in accordance with U.S. Army Corps of Engineers Technical Instructions, Indoor Radon Prevention and Mitigation (TI 810-91, 3 August 1998). Provide a sub-slab depressurization system with a natural draft using 3-inch PVC vent (suction) piping installed vertically to remove radon gases before they enter the building. Multiple runs may be provided and connected to one common stack through the roof. Radon vent pipe is to be routed through attics in a location that will facilitate future installation and maintenance of a fan. The pipe can be embedded into the aggregate through the slab. The standpipe shall be extended vertically through the building floors. Terminating at least 12 inches above the surface of the roof at a location that is at least 10 feet away from any window or other opening into the conditioned spaces of the building that is less than 2 feet below the exhaust point, and at least 10 feet from any adjoining or adjacent buildings. A rainproof installation above the roof shall be provided. A length of 3-inch diameter perforated pipe shall be installed horizontally beneath the sheeting and connected to a 3-inch "T" fitting with a vertical standpipe installed through the sheeting, serving each 1500 square feet of slab area. Rough in shall be provided for electrical wiring to facilitate future installation of a fan and system failure-warning device. After the building envelope is complete, and with all HVAC systems operating on normal cycles, the Government may elect to test the facility for radon levels. An in-line fan (and system failure warning device) may be installed through a future contract if the building fails tests and requires an active system. Note: If the sump is to be used as the suction point in an active sub-slab depressurization system, the lid should be designed to accommodate the vent pipe. If also intended as a floor drain, the lid shall also be equipped with a trapped inlet to handle any surface water on the slab.

11.22 UNIT DESIGN – PLUMBING CHECKLIST

- ❑ For each different unit provided, submit documentation in accordance with Section 00110, “Tab 7 Housing Unit Concept Design – Submittal Requirements”.

PART 14 – UNIT DESIGN – ELECTRICAL

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14 UNIT DESIGN - ELECTRICAL.

14.1 CONFORMANCE TO CODE

The electrical system shall be designed in compliance with the rules and recommendations of IEEE C2, National Electrical Safety Code; Illuminating Engineering Society (IES) Standards; NFPA 70, National Electrical Code (NEC), and applicable model codes, whichever is more stringent. Provide main circuit breaker in the interior main panel for each housing unit, sized in accordance with the NEC.

All equipment, materials, fixtures, and other appurtenances shall be suitable for the intended application, and shall conform to and be installed per the National Electrical Manufacturer's Association, American National Standards Institute, Institute of Electrical and Electronics Engineers, Underwriters' Laboratories, and all other applicable standards/regulations/codes.

14.2 SERVICE ENTRANCE

Service entrances shall be enclosed or sight screened. Service feeders shall be underground. Meters are not required, but make provisions for future meters, in accordance with the requirements of Part 8.

14.3 PANEL LOCATIONS

14.3.1 PANEL BOARDS

Panel boards (minimum 200 amp panel at each unit is required) shall be located inside the housing units (not in the garage). Panel boards shall be painted galvanized steel and furnished with main breakers. Panel board doors shall be flush one-piece fronts. Panel boards shall be recessed. Offset a minimum of 400 mm [16 inches] horizontally back-to-back panel boards. No recessed panel boards are to be located in party walls and firewalls.

14.3.2 SECONDARY OVERCURRENT DEVICES

All secondary overcurrent devices shall be of the circuit breaker type, installed in dead-front, recessed enclosures, and shall be located inside the housing unit in the utility or laundry room or hallway and shall be readily accessible to the housing unit occupants.

14.4 CONDUCTORS

All interior wiring shall be copper.

14.5 OUTLET CIRCUITS

Lighting and convenience outlets shall be on separate circuits. Outlets on party walls shall be offset to maintain integrity of the firewall and sound deadening rating of the wall.

14.6 EXTERIOR LIGHTING AND OUTLETS

Provide energy efficient high quality lighting outside each housing unit. The minimum efficiency standard for lighting is 50 lumens/watt. This efficiency can be achieved with fluorescent and compact fluorescent lighting. Lighting must also be color corrected with a Color Rendering Index (CRI) of 60 or better. Provide a minimum of one lighting fixture switched from the housing unit interior at each housing unit's

entry, and patio area(s). Light fixtures at entry and patio areas shall be switched from the housing unit interior. These lights shall be controlled by photocell, activated by minimum light levels of 0.5 foot-candle.

14.6.1 SECURITY LIGHTING

At the rear corner of each building, provide a surface-mounted flood light controlled by a motion sensor.

14.6.2 GROUND-FAULT CIRCUIT-INTERRUPTER OUTLETS

Provide a minimum of one Ground-Fault Circuit-Interrupter duplex outlet at each unit's front entrance, garage (quantity of 2), and patio area(s). In addition, provided one GFCI duplex outlet in the ceiling of the front porch that is switched from inside the front entry closet. These are in addition to those required by code in bathrooms, kitchens, and laundry rooms. Ground-Fault Circuit-Interrupter (GFCI) circuits shall be designed only for outlets requiring GFCI protection in accordance with the National Electrical Code. No other outlets shall be connected to GFCI circuits.

14.6.3 ILLUMINATED HOUSE NUMBERS

Provide exterior wall mounted light fixture with integral house unit numbers similar to Address-O-Lite 54833 Black. The fixture shall be on the same circuit as the front entry light fixture and shall turn on automatically at dusk and turn off at dawn using a photocell that activates by minimum ambient light levels of 0.5 foot-candle. Locate underneath porch roof, visible from the street, mounted between 48 and 72 inches above finish floor of units' main level. Contractor is responsible for obtaining the house numbering system from the Contracting Officer. Type face shall be similar to Helvetica.

14.7 INTERIOR LIGHTING AND SWITCHED OUTLETS

14.7.1 EFFICIENCY

Interior lighting will be both efficient and color corrected. Refer also to Part 3. Fluorescent fixtures shall be used wherever possible. Color Rendering Index (CRI) of 85 or better and a standard lighting color of 3500 K are required. Contractor shall provide product data and model number of items to be supplied in accordance with Section 01332, SUBMITTALS DURING DESIGN. Preferred manufacturers are Philips, Alto; General Electric, Ecolux; Sylvania, Octron; or equal. Minimum efficiency standards for lighting are as follows:

a) Fluorescent tubes 4 ft and longer: 90 lumens/watt.

b) Fluorescent tubes less than 4 ft: 80 lumens/watt.

c) Compact fluorescent and other lamps: 50 lumens/watt.

14.7.2 LOCATIONS

Provide light fixtures operated by wall switches for all rooms except living rooms. Provide one switched outlet for occupied furnished lamps in living room. Floor mounted duplex outlets with metal coverplate may be necessary in living rooms to accommodate optimum arrangement of the furniture. Switches and coverplates shall be white in color. Wall-switch operated ceiling lights shall be provided in dining and utility rooms, halls, bedrooms, kitchens, dinette or breakfast bar areas, and basements. Additional light fixtures shall be provided in rooms whose configuration requires them for adequate lighting. Wall-switch operated wall-mounted lights shall be provided in bathrooms and half baths located above the mirror over the lavatory. Walk-in closets and interior and exterior bulk storage rooms shall be provided with wall-

switch ceiling lights. A minimum of one lighting fixture, ceiling or wall mounted, as appropriate, shall be provided in the garage. Where exterior bulk storage is located within the enclosed walls of a garage, each space shall be lighted separately. A switch (switches) located at each door opening into the garage shall control garage lights. If automatic garage door opener is installed by Contractor, as part of this contract, a garage light switch can be eliminated adjacent to the overhead garage door. Provide separate switches to control light fixture and ceiling fan.

a) Dining room ceiling light fixtures shall be fixed suited for typical dining room furniture arrangement. Fixtures may be designed for incandescent use, and do not have to meet the 50 L/Watt requirement. Provide a dimmable switch.

b) The general lighting intensity in kitchens shall be 30 to 50 foot-candles. Supplementary lighting shall be provided at the sink and under one of the wall cabinets for a work center to produce a composite lighting level of 75 foot-candles using either down-lights, surface fluorescent fixtures surface-mounted below wall cabinets or wall-mounted fixtures (5 ft and higher above the floor) as appropriate.

c) Wall sconces controlled by wall switches are considered desirable as replacement for ceiling mounted lights in hallways and family rooms. Such sconces added to living rooms are also considered desirable.

d) Inside each closet, provide a light fixture with a fluorescent lamp (compact or otherwise) on wall above door for best dispersion of light.

14.7.3 CEILING FAN

In accordance with the energy performance requirements of Part 3, provide quality ceiling fans connected to a wall switch for an on/off operation. Ceiling fans should be combined with ceiling light fixtures where appropriate. Switch lights and fans from separate wall switches. Fan speed and direction may be controlled by pull chains and unit switches.

14.7.4 LIGHTING FIXTURE DESIGN

The Offerer shall include with the Offer pictorial product data sheets of key interior lighting fixtures proposed. The aesthetic design of these fixtures should compliment and enhance the architectural style of the house.

14.8 DETECTORS

14.8.1 SMOKE DETECTORS

In accordance with the latest issue of Underwriters Laboratories UL-217, detectors shall be residential application, ionization type, powered by 60 Hz, 120VAC source, and shall be built-in type with pigtail power connection. Smoke detectors shall include LED indicator lamp, test switch, and shall reset automatically when smoke clears. Horn shall be rated at 85 decibels at 3m [10 feet]. Smoke detector bases shall be flush with quick male-female plastic snap on connectors for ease of mounting and dismounting the smoke detector. Smoke detectors shall also include battery back-up power. A low battery condition shall be annunciated by intermittent beeps, until user replaces it.

a) Provide hard-wired smoke detectors on a separate circuit inside and near the door of each bedroom, and in the hallway near the convergence with the family or living rooms in each housing unit in accordance with NFPA 72, NFPA 101 and the Uniform Building Code. In 2-story units, provide smoke detectors on the second floor in similar locations as the first floor. Alarm signal from one detector shall be wired to sound all detectors in that family housing

unit.

14.8.2 CARBON MONOXIDE (CO) DETECTOR/ALARM

In accordance with the latest issue of UL-2034, detectors shall be residential application, multiple station powered by a dedicated 60 Hz, 120VAC source (separate from the 120VAC source for the smoke detectors), capable of being interconnected with up to 11 identical detectors. Carbon monoxide detectors shall be 100% solid state, have a biomimetic sensor and meet sensitivity requirements of UL-2034. Detectors shall incorporate an 85dB electronic horn at 10 feet that will sound an early warning or full alarm depending on the level of CO. Detector shall include LED indicator lamp, test switch, and shall reset automatically when level of CO clears. CO detector bases shall be flush with quick male-female plastic snap on connectors for ease of mounting and dismounting the carbon monoxide detector. Carbon monoxide detectors shall also include battery back-up power. A low battery condition shall be annunciated by intermittent beeps, until user replaces it. Provide CO detectors minimum one each level of housing unit and in the vicinity of the bedrooms (e.g., in the hall outside of each bedroom and as recommended by CO detector manufacturer). Alarm signal from one CO detector shall be wired to sound all CO detectors in that family-housing unit.

14.9 TELEPHONE SYSTEM

The Contractor in accordance with the telecommunications company on the Installation shall provide the interior telephone system. The telephone system wiring as specified herein incorporates requirements for an updated system to comply with the Telecommunications Industry Association (TIA/EIA) Standard 570A for structured wiring in residences. Cable and jacks shall comply with TIA/EIA Standard 568A, Commercial Building Telecommunications Cabling Standard. This approach prepares the homes so that the residents can take full advantage of the broadband services available today as well as those coming in the future.

Provide the housing unit telephone system in accordance with Paragraph 4.10.1 of the Air Force Family Housing Guide, the requirements of the local telephone provider, and the following. Also refer to Part 8 for additional requirements regarding the telephone distribution system.

Any costs or fees associated with this work are the responsibility of the Contractor.

14.9.1 SERVICE ENTRANCE

Provide two-line capability for each housing unit. Service riser to be 1-inch conduit concealed in the exterior wall. Also refer to Part 9 for requirements in the Mechanical Room/Area.

14.9.2 INTERIOR WIRING

All telephone system wiring shall be Category 5 cable or better, concealed, home run style from telephone distribution box in mechanical room to each telephone jack location. Provide one telephone jack with two-line capability (voice and data) in each of the following rooms: family room, living room, kitchen, and all bedrooms. Required telephone and television jacks shall be collocated. In addition, provide <u>two (2) more</u> jacks with two-line capability. During the design phase after award, the Government will provide the successful contractor with a location layout for all jacks within each different unit.

14.9.3 MOUNTING

Outlets shall be flush mounted in walls at an appropriate height above the floor. Outlet plates shall be white in color. Covers shall be parallel to the floor.

14.10 CABLE TELEVISION

The Contractor shall provide the interior cable TV system utilized by the local Cable TV provider. The cable television system wiring as specified herein incorporates system requirements complying with the Telecommunications Industry Association (TIA/EIA) Standard 570A for structured wiring in residences. This approach prepares the homes so that the residents can take full advantage of the broadband services available today as well as those coming in the future.

Provide the housing unit cable television system in accordance with Paragraph 4.10.1 of the Air Force Family Housing Guide, the requirements of the local cable television provider and the following. Also see Part 8 for additional requirements regarding the cable television distribution system.

Any costs or fees associated with this work are the responsibility of the Contractor.

14.10.1 SERVICE ENTRANCE

Service riser to be 1-inch conduit concealed in the exterior wall. Also refer to Part 9 for requirements in the Mechanical Room/Area.

14.10.2 INTERIOR WIRING

Provide one flush-mounted cable television jack in each of the following rooms: family room, living room, kitchen, and all bedrooms. In addition, provide two (2) jacks. During the design phase after award, the Government will provide the successful contractor with a location layout for all jacks within each different unit. All cable television system wiring shall be concealed, home run style from cable television system distribution box to each individual television jack location. Each cable shall be provided with an appropriate tag, inside the terminal box, showing housing unit number and outlet location (e.g. Unit 2, family room north). Required telephone and television jacks shall be collocated.

Cable Television Placement Specifications are as follows:

- RG-6 60% shielding cable is required for all in-house wiring
- No outlets shall be LOOPED TOGETHER.
- All outlets shall be connectorized with an approved weather sealed connector. (Crimp type-NO SCREW-ON CONNECTORS).
- Each outlet, at the internal connection point, shall be equipped with a barrel wall plate.
- To assure that cable installation has not staples or tacks placed in or on the cable that cause a puncture or flattening of the cable, a visual inspection of all installed cables shall be performed prior to wall covering (sheet rock) installation. Prior to acceptance of the completed system, a commissioning test shall be performed using a known signal source and measuring and recording the signal strength at each outlet. Contractor shall submit the proposed commissioning test procedure for Contracting Officer acceptance a minimum of 30 days prior to testing the first cable installation.

14.10.3 MOUNTING

Cable TV outlets shall be flush mounted in walls at 18 inches above the floor unless directed otherwise. Outlet plates shall be white in color.

14.11 DOOR BELL

The front entrance to each housing unit shall be provided with a low voltage bell or buzzer. Refer to Part 9 for requirements.

14.12 CONVENIENCE OUTLETS

In addition to outlets required by NEC, provide convenience duplex outlets in the following areas:

a) Mechanical room(s).

b) Hallway outside bedrooms.

c) Garage. Provide an outlet in the ceiling of the garage for garage door opener. Refer to Part 12 for requirements.

14.13 SPECIAL OUTLETS

Provide 240 V electric outlets for electric dryer. Provide 240 V electric outlet for electric range. Provide power for miscellaneous loads of range.

14.14 WIRING

Maximum use shall be made of nonmetallic sheathed cable for branch circuit wiring, and of service entrance cable for heavy-duty interior circuits and for service entrance conductors. Installed conductors in conduit shall be used only where specifically required by the NEC.

14.15 BRANCH CIRCUIT CONDUCTORS

Branch circuit conductors and over current devices shall be as rated by NEC. A minimum of two spare 20-amp circuits shall be provided in the panel for each housing unit. Individual circuits shall be provided for the washer, dryer (with receptacles located behind the washer and dryer), dishwasher, garbage disposal, freezer, furnace or air handling unit, and air conditioning unit. Two utility circuits (20 amp) shall be provided in the kitchen area for the convenience duplex outlets for small appliances serving the kitchen, dining area, and family room area.

14.16 COORDINATION OF SWITCH PLATES AND OUTLET PLATES

The Contractor shall gang switches and outlets (electrical, telephone, data, cable) where possible and logical. Multiple individual switch boxes/plates or multiple individual outlet boxes/plates within a few inches of one another are very desirable.

14.17 UNIT DESIGN – ELECTRICAL CHECKLIST

- ❑ For each different unit provided, submit documentation in accordance with Section 00110, “Tab 7 Housing Unit Concept Design – Submittal Requirements,” including CONSTRUCTION MATERIALS, PRODUCTS, EQUIPMENT AND SYSTEMS work sheets required for the .key interior lighting fixtures.

SECTION 01100

GENERAL

PART 1 GENERAL

1.1 INQUIRIES

Pursuant to SECTION 00100 paragraph titled "Instructions to Offerors--Competitive Acquisition", any inquiries regarding this Invitation, before bids are opened, should be addressed to the District Engineer, Kansas City District, Corps of Engineers, 700 Federal Building, Kansas City, Missouri 64106, ATTN: Mr. Richard Whitsell. Inquiries for which oral explanation or advice on the plans and specifications will suffice may be referred to Mr. Whitsell by calling Area Code 816-983-3465. Telephone calls concerning the mailing of plans and specifications should be made to Contracting Division at Area Code 816-983-3975. Collect telephone calls will not be accepted. (KCDO APR 84)

1.2 LOCATION

The site of the work is at Whiteman Air Force Base, MO, located approximately 60 miles southeast of Kansas City, Missouri.

1.3 SUPERINTENDENCE OF SUBCONTRACTORS

(a) The Contractor shall be required to furnish the following:

(1) If more than 50% and less than 70% of the value of the contract work is subcontracted, one superintendent shall be provided at the site and on the Contractor's payroll to be responsible for coordinating, directing, inspecting and expediting the subcontract work.

(2) If 70% or more of the value of the work is subcontracted, the Contractor shall be required to furnish two such superintendents to be responsible for coordinating, directing, inspecting and expediting the subcontract work.

(b) If the Contracting Officer, at any time after 50% of the subcontracted work has been completed, finds that satisfactory progress is being made, he may waive all or part of the above requirement for additional superintendence subject to the right of the Contracting Officer to reinstate such requirement if at any time during the progress of the remaining work he finds that satisfactory progress is not being made.

1.4 COORDINATION WITH UTILITIES

The Contractor shall be responsible for coordinating his work with the Base Utilities (CEOI), telephone company, or any other commercial utility that may be affected by his/her activities. Any cost in connection with removal and replacement of these utilities, to or on the building, or related equipment, shall be borne by the Contractor.

1.5 WORK DELAYS

The Contractor shall anticipate work delays of up to ten (10) calendar days for each calendar year for each Task Order issued during the contract period due to Whiteman AFB operations and activities. This time is included in the completion time stated. The Contractor shall be notified, in writing, seventy-two (72) hours in advance of these interruptions, except in cases of national security. The time stated for completion shall include final cleanup of the premises. The Contracting Officer will provide 48 hours notice to the Contractor prior to the work delay.

1.6 EMERGENCY OUTAGES

The Contractor shall notify the Contracting Officer immediately when an emergency outage of a utility occurs due to Contractor cutting or damaging the utility. No outage shall exceed four (4) hours in duration. The Contractor shall bear the cost for all repairs. The following list of contacts shall also be informed when an outage occurs.

SECURITY SENSORS	509 SFS/SPOSS 2154 CS/SCLGC
PHONE LINES COMMERCIAL	509 CS
SECURITY	509 CS/SCLGC
FIRE ALARMS	509 CES/DEF
POWER LINES COMMERCIAL	509 CS
SECURITY	509 SFS/SPOS
FIRE ALARMS	509 CES/DEF

1.7 APPLICATION OF WAGE RATES

The inclusion of the Davis-Bacon Act General Wage Decision or the Service Contract Act Wage Determination in the solicitation is a statutory requirement. It is not a representation by the U.S. Army Corps of Engineers that any specific work task can be performed by any specific trade. Which work tasks can be performed by what trades depends on and is determined by the prevailing area practice for the local area where the contract is being performed. It is the sole responsibility of the offeror to determine and comply with the prevailing area practice. Inquiries regarding a prevailing area practice should be directed to the Corps of Engineers, Contractor Industrial Relations Specialist (telephone number 816-983-3723) or to the Department of Labor Regional Wage and Hour Division.

Application of wage rates and fringe benefits: For the application of the wage rates and fringe benefits contained in the Decisions of the Secretary of Labor, attached to and a part of this contract, all work required within 5 feet outside building lines shall be considered Residential Construction. All other construction not defined herein as Residential Construction shall be considered Heavy Construction.

1.8 PAYMENTS TO SUBCONTRACTORS

The Contractor's attention is directed to CONTRACT CLAUSE titled "Payment Under Fixed-Price Construction Contracts." In addition to the requirements set forth in the referenced paragraph, the Government will reimburse the Contractor, upon request, for amount of premiums paid by the subcontractors for performance and payment bonds (including coinsurance and reinsurance agreements, when applicable) after the Contractor furnishes evidence of full payment to the surety.

1.9 PAYMENTS TO CONTRACTOR (KCD MAY 90 - FORMERLY FAR 52.2/9101(a))

The following is an example of a Contractor's release of claims clauses required to comply with the provisions of paragraph (h) of the CONTRACT CLAUSE titled "Payments Under Fixed-Price Construction Contracts":

RELEASE OF CLAIMS

The undersigned Contractor under contract dated _____, 2000, between the United States of America and said Contractor for the _____ located at _____, in accordance with paragraph (h) of the CONTRACT CLAUSE titled "Payments Under Fixed-Price Construction Contracts" of said contract, hereby releases the United States, its officers, agents, and employees from any and all claims arising under or by virtue of said contract or any modification or change thereof except with respect to those claims, if any, listed below:

(Here itemize claims and amounts due.)

1.10 PROSPECTIVE CONTRACTOR RESPONSIBILITY

Each bidder shall furnish, within 3 calendar days after receipt of request therefor, data which will show the bidder's ability to perform the work or services required by this Invitation for Bids. Such data shall include as a minimum: Bank certification of financial capability, or a financial statement not over 60 days old, which will be treated as confidential (if over 60 days old, a certificate shall be attached thereto stating that the financial condition is substantially the same or, if not the same, the changes that have taken place); names of commercial and financial reporting agencies from whom credit reports may be obtained; trade creditors; name and address of bonding company; business and construction experience; past record of performance of Government contracts; and construction plant and equipment available for this job, with resume of work in progress or other data that will assure that the bidder is in a position to perform the work within the time specified.

In addition, if the bid exceeds $1,000,000, the bidder shall furnish upon request, a certified statement listing:

(a) Each contract awarded to him within the preceding three-month period exceeding $1,000,000 in value with brief description of the contract.

(b) Each contract awarded to him within the preceding three-year period not already physically completed and exceeding $5,000,000 in value with brief description of the contract.

(c) If the prospective Contractor is a joint venture, each joint venture member will be required to submit the above defined certification. There shall also be furnished any other available information which will serve to substantiate the bidder's qualifications as a responsible prospective Contractor. (KCD APR 84)

1.11 VERIFICATION OF CONDITIONS

The Contractor shall be specifically responsible for the coordination and proper relation of work to the site and to the work of all trades. It is recommended that the Offeror visit the site and thoroughly familiarize himself/herself with all details of the work and working conditions prior to submission of an Offer. Since measurement to existing hidden structural members, etc., often cannot be physically determined, all dimensions shown on the drawings are based on "as-built" record drawings and, to the extent possible, accurately represent existing conditions; however, there may be some variance between existing conditions and contract drawings. The Contractor is responsible for verifying all dimensions and for reporting to the Contracting Officer or his/her designated representative any discrepancies that may affect performance of the work represented by contract drawings and specifications. Should the contract document lack details showing individual fittings, connectors, anchors, etc., that are no more than are normally provided as standard construction trade practice, these appurtenances shall be considered to be specified as intended for a complete and usable facility, and shall be included in the proposal.

1.12 PERFORMANCE OF WORK BY CONTRACTOR

Bidder's attention is directed to SPECIAL CLAUSE titled "Performance of Work by Contractor." The successful bidder will be required to furnish the Contracting Officer, a description of the work which he will perform with his own organization (e.g., earthwork, paving, etc.), the percentage of the total work this represents, and the estimated cost thereof. Such description of work to be performed by the Contractor's own organization shall be furnished to the Contracting Officer within 10 days after award of the contract.

1.13 LABORATORY AND TESTING FACILITIES

The Contractor shall provide and maintain all measuring and testing devices, laboratory equipment, instruments, transportation, and supplies necessary to accomplish the required testing. All measuring and testing devices shall be calibrated at established intervals against certified standards. The Contractor's measuring and testing equipment shall be made available for use by the Government for verification of their accuracy and condition as well as for any inspection or test desired pursuant to the CONTRACT CLAUSE titled "Inspection of Construction." The location of the laboratory shall be convenient to the site such that test results are available prior to proceeding with the next sequential phase of the work. (KCD)

1.14 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

(a) This provision specifies the procedure for determination of time extensions for unusually severe weather in accordance with the CONTRACT CLAUSE titled "Default: (Fixed Price Construction)." In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

(1) The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

(2) The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

b) The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities for the duration of the project.

Note: After the original contract completion date has passed, adverse weather that causes delay for the completion of the project will be granted day-for-day without deducting anticipated adverse weather delay days.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY

WORK DAYS BASED ON (5) DAY WORK WEEK

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(10)	(9)	(9)	(8)	(7)	(7)	(7)	(5)	(6)	(5)	(7)	(8)

(c) Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the Contractor shall record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical path activities for 50 percent or more of the Contractor's scheduled work day.

* Monthly anticipated weather delays shall be adjusted proportionally if work is performed in a work week with greater than or less than a five-day work week. The following formula shall be used to adjust the monthly anticipated weather delays:

adjusted monthly anticipated weather delays = **A** multiplied by (**B** divided by **C**); where:

A = The monthly anticipated adverse weather delay for a particular

month based on a five-day work week.
B = The actual average number of days worked per week during that particular month.
C = The number five (5).

eg., If the monthly anticipated adverse weather delay for January based on a five day work week is 10 days, but the Contractor actually worked an average of a six-day work week for that month, the monthly anticipated weather delay would be adjusted by applying the above formula as follows: 10 x (6/5) = 12 days

14.1 Weather-related Base Closure

Occasionally, it is necessary to require either early release of Whiteman AFB personnel, their late reporting or even total base closure when weather conditions make normal travel unsafe. When weather conditions cause one of the above situations, Contractor personnel will be denied access to the base, unless they have been notified their contract service has been determined essential. Denied access in these situations will not result in additional costs to the Government.

14.2 Weather Information Sources

For your convenience some of the following radio and television stations broadcast and monitor Whiteman AFB closing and late reporting information: WDAF (610 AM), KMBZ (980 AM), KSIS (1050 AM), KDKD (1280 AM/95.3 FM), KOKO (1450 AM), KDRO (1490 AM), KLRQ (96.1 FM), KPRS (103.3 FM), KBEQ (104.0 FM), KXKX (105.7 FM), and KMBC (TV CH 9).

1.15 WORKING HOURS

Normal work hours at Whiteman AFB are 7:30 A.M. through 4:30 P.M., Monday through Friday. Except work will not be permitted on weekends and Federal holidays. Work to be accomplished at other than the above hours shall require approval of the Contracting officer. In unusual circumstances, such as when utility turn-off is required for an extended period of time, authorization for weekend or holiday work may be requested from the Contracting Officer; these instances must be coordinated well in advance, in writing. Likewise, utility turn-off of short duration or work which will disrupt normal operations or traffic flow must be scheduled at least 3 working days in advance and may require schedule changes to ensure that safety is maintained. If the work being accomplished by the Contractor requires a Government inspector and/or escort, the Contractor is required to pay the inspector’s and/or escort's wage at the rate and step for which the Government employee is paid by the Government.

1.16 REQUIRED INSURANCE SCHEDULE

In accordance with CONTRACT CLAUSE titled "Insurance - Work On A Government Installation," the Contractor shall procure and maintain during the entire period of his performance under this contract the following minimum insurance.

Type	Amount
Workmen's Compensation State Statute	coverage complying with applicable
Employers' Liability	minimum amount of $100,000.00
General Liability on Comprehensive Form of Policy	minimum limits of $500,000 per occurrence for bodily injury which includes, but is not limited to, insurance for all work required herein

Comprehensive Automobile Liability	minimum limits of $200,000 per person and $500,000 per occurrence for bodily injury, and $20,000 per occurrence for property damage

(End of clause)

1.17 INTERRUPTIONS TO UTILITY SERVICES

A schedule showing the approximate times of interruptions of utility services and roads shall be submitted approximately 30 days in advance of interrupting services to make connections. Where it is necessary to interrupt services to make connections and the period of interruption will last more than 2 hours, the connections shall be performed on Saturday or Sunday, unless otherwise approved by the Contracting Officer. Final arrangements shall be made with the Contracting Officer at least 72 hours in advance of the scheduled times of interruptions.

1.18 CONTRACTOR-FURNISHED EQUIPMENT DATA

At or before 30 days prior to final inspection and acceptance of the work, the Contractor shall submit the data mentioned in the following subclauses.

(1) Equipment List. An itemized equipment list showing unit retail value and nameplate data including serial number, model number, size, manufacturer, etc., for all Contractor-furnished items of mechanical equipment, electrical equipment, and fire protection systems installed under this contract.

(2) Guarantees. A list of all equipment items which are specified to be guaranteed accompanied by a copy of each specific guarantee therefor. For each specific guaranteed item, a name, address, and telephone number shall be shown on the list for subcontractor who installed equipment, equipment supplier or distributor and equipment manufacturer. The completion date of the guarantee period shall correspond to the applicable specification requirements for each guaranteed item.

(3) Warranty Service Calls. The Contractor shall furnish to the Contracting Officer the names of local service representatives and/or Contractors that are available for warranty service calls and who will respond to a call within the time periods as follows: 4 hours for heating, air-conditioning, refrigeration, air supply and distribution, and critical electrical service systems and food service equipment, and 24 hours for all other systems. The names, addresses, and telephone numbers for day, night, weekend, and holiday service responses shall be furnished to the Contracting Officer and also posted at a conspicuous location in each mechanical and electrical room or close to the unit.

1.19 DATE OF SAFETY AND HEALTH REQUIREMENTS MANUAL (EM 385-1-1)

(a) The date of the U.S. Army Corps of Engineers Safety and Health Requirements Manual in effect on the date of this solicitation is 3 September 1996. See Section 00700, Contract Clause titled "Accident Prevention."

(b) Section 06.I of EM 385-1-1 is deleted. Job hazard analysis for confined space entry procedures is still required, as per 01.A.09 of EM 385-1-1. OSHA Standards 29 CFR 1910.146 or 29 CFR 1926 shall apply.

(c) Before initiation of work at the job site, an accident prevention plan, written by the prime contractor for the specific work and hazards of the contract and implementing in detail the pertinent requirements of EM 385-1-1, will be reviewed and found acceptable by designated Government personnel.

1.20 COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)

The Contractor shall comply with OSHA standards as well as the most current edition of the Corps of Engineers General Safety Requirements Manual (EM 385-1-1). The OSHA standards are subject to change and such changes may affect the Contractor in his performance under the contract. It is the Contractor's responsibility to know such changes and effective dates of changes.

1.21 CONSTRUCTION EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE

Whenever a modification or equitable adjustment of contract price is required, the Contractor's cost proposal for equipment ownership and operating expenses shall be as set forth in SPECIAL CLAUSE titled "Equipment Ownership and Operating Expense Schedule." A copy of EP 1110-1-8 "Construction Equipment Ownership and Operating Expense Schedule" dated August 1995 can be ordered from the Government Printing Office (GPO) by calling Telephone No. 202-512-1800.

1.22 SHOP DRAWINGS

The Contractor's attention is directed to clause "Specifications and Drawings for Construction" of the Contract Clauses.

1.23 SUBMITTALS

(a) Submittal Procedures. See Division One SECTION: SUBMITTAL PROCEDURES.

(b) Shop Drawings shall be submitted in ample time to secure approval prior to the time the items covered thereby are to be delivered to the site. ENG Form 4025 shall be used for the transmittal of shop drawings. Unless otherwise specified, shop drawings shall be submitted not less than 30 days before commencement of fabrication of fabricated items and not less than 15 days before delivery of standard stock manufactured items. Where materials are stock with the manufacturer, catalog data, including specifications and full descriptive matter, may be submitted as shop drawings. When catalog includes nonapplicable data, the applicable data shall be clearly designated and identified by item number, item name, and name of manufacturer. Shop drawings submitted (including initial and final submittals) shall be reproductions on high quality paper with clear and legible print. Drawings shall generally be bordered a minimum of one inch and trimmed to neat lines and unless otherwise specified, the minimum scale shall be 3/8-inch to the foot. Shop drawings quality will be subject to approval. Each shop drawing, including catalog data, shall be identified with a title block including the name of Contractor, contract number, name and location of project, and name of item of work or structure to which the shop drawing applies. Material fabricated or delivered to the site before approved shop drawings have been returned to the Contractor will be subject to rejection. NO CONSTRUCTION OR INSTALLATION SHALL BE DONE FOR ANY ITEM REQUIRING SHOP DRAWINGS, UNTIL ALL SHOP DRAWINGS FOR THAT ITEM HAVE BEEN APPROVED.

(c) As-Built Shop Drawings: Upon completion of the work under this contract, the Contractor shall furnish five complete sets of prints or one complete set of reproducibles of all shop drawings as finally approved. These drawings shall show all changes and revisions made up to the time the equipment is completed and accepted. The quality of the reproducibles and prints is subject to approval.

(d) As-Built Drawings: The Contractor shall maintain three separate sets of red-lined, full scale, as-built construction drawings marked up to fully indicate as-built conditions. These drawings shall be maintained in a current condition at all times until completion of the work, and shall be available for review by Government personnel at all times. All variations from the contract drawings, for whatever reason, including those occasioned by modifications, optional materials, and the required coordination between trades, shall be indicated. These variations shall be shown in the same general detail utilized in the contract drawings. In addition, the Contractor shall indicate on the As-Built

Drawings, the brand-name, description, location, and quantity of any and all materials used which contain asbestos. The Contractor shall also be responsible for updating the Government-furnished CADD files to reflect the current as-built conditions throughout the duration of the project. The updated CADD design files shall be maintained in the Intergraph Microstation format consistent with the graphic standards established in the CADD contract drawings provided by the Government. The Contractor will be provided a copy of the Tri-Service CADD standards to facilitate his efforts in the maintenance of design files. The updated CADD files shall be reviewed by the Government on a monthly basis during the progress payment evaluation. The Contractor shall be prepared to demonstrate the status of the updated CADD files in his on-site office. The as-built utility drawings shall show locations and elevations of all underground new utilities and existing utilities encountered, including dimensions from permanent structures and/or survey locations. The submittal requirements for as-built utility drawings shall be shown as separate activities on the Contractor-prepared network analysis. Upon completion of the work, the marked-up drawings and the updated CADD files shall be furnished to the Contracting Officer on CD. In multiphased construction where portions of a system are to be turned over to the user prior to completion of the project, the marked-up drawings for that portion shall be furnished to the Contracting Officer at that time.(MRD ltr 30 Oct 70 and KCD 8 Apr 91)

(e) CADD Files: The Government will provide to the Contractor, within 30 calendar days after Notice of Award, copies of the CADD computer files of the contract drawings for the production of as-built drawings. These files will be in Intergraph Microstation format. The Government provides no warranty, expressed or implied, of the CADD computer files. The Contractor shall assume all responsibility to verify the CADD drawing files. The Contractor will not utilize the CADD drawing computer files to resolve dimensional or other discrepancies. The Government will not guarantee the measurable accuracy of the CADD drawing computer files.

(f) Purchase Orders: Each purchase order issued by the Contractor or his subcontractors for materials and equipment to be incorporated into the project, shall be maintained on file at the Contractor's field office for inspection and review by Government representatives. Each purchase order shall (1) be clearly identified with applicable DA contract number, (2) carry an identifying number, (3) be in sufficient detail to identify the material being purchased, (4) indicate a definite delivery date, and (5) display the DMS priority rating. At the option of the Contractor, the copies of the purchase orders may or may not indicate the price of the articles purchased. (MRD Ltr 22 Oct 74)

(g) Color Boards:

1. The Contractor shall submit a minimum of three (3) complete sets of color boards within 120 calendar days of receipt of Notice to Proceed. Construction color boards shall be submitted in a 3-ring notebook binder with all materials securely mounted on rigid 8-1/2 by 11-inch presentation (mat) board, with a maximum spread of 25-1/2 by 33 inches for foldouts, clearly coded regarding location of materials in the facility.

2. An index shall be provided listing pertinent contract specifications and drawings for each sample and any proposed substitutions or variances shall be so designated. The Contractor shall also certify, in writing, that all submittal items technically comply with the project specifications.

3. Color boards shall reflect all actual finish textures, patterns, and colors required for this contract as specified on the Interior Room Finish Schedule, the Exterior Finish Schedule and Interior Finish Materials Legend located in the Contract Drawings, and the sample requirements of the submittal registers. All materials must be labeled with the manufacturer's name, pattern and color reference. Patterned material samples (i.e., carpet) must be of sufficient size to enable evaluation of the pattern. Samples shall be keyed or coded to match

any key or code system in the Contract Drawings.

4. The Contractor shall express mail a minimum of three (3) copies of the color boards to the Contracting Officer. The Contracting Officer will forward one copy of the colorboards to CENWK-EC-D for review and concurrence. Concurrence or comments will be provided not later than 45 calendar days after receipt of the submittal. This paragraph does not cover the quality of finishing materials. The quality, physical requirements, and method of installation shall be submitted with the appropriate shop drawings. The Contractor shall not submit any of the above requirements with the color boards. Specific locations where the various materials are required are shown on the drawings.

1.24 SPECIAL REFERENCES

(a) Shop Drawings. Bidder's attention is directed to SPECIAL CLAUSE titled "Shop Drawings." The basic requirements for Shop Drawings are set forth in the CONTRACT CLAUSES and SPECIAL CLAUSES.

(b) Approved Equal. Bidder's attention is directed to SPECIAL CLAUSE titled "Approved Equal."

(c) Payment to Subcontractors. Bidder's attention is directed to SPECIAL CLAUSE titled "Payments to Subcontractors."

1.25 DIFFERENCES IN DRAWINGS

In addition to the provisions of CONTRACT CLAUSE paragraph "Specifications and Drawings for Construction," the structural drawings shall govern in cases where they differ from the architectural drawings.

1.26 INSTALLATION OF EQUIPMENT

These Specifications and Contract Drawings represent minimum Government requirements. Any additional requirements peculiar to the equipment manufacturer, which must be incorporated before the manufacturer shall furnish his standard guarantee, shall be incorporated into the work at no additional cost to the Government. The finished work shall be free from material and installation defects.

1.27 MATERIALS

All materials furnished under this contract shall be free from defects which may cause malfunction or unsightly appearance. Only new and unused materials of standard manufacture shall be furnished. Materials and fabrication shall be predicated upon requirements of laws, codes, or standards specified herein or commonly recognized as applicable to work required under this contract.

1.28 DAMAGE TO WORK (1966 MAR OCE)

The responsibility for damage to any part of the permanent work shall be as set forth in the CONTRACT CLAUSE titled "Permits and Responsibilities." However, if, in the judgment of the Contracting Officer, any part of the permanent work performed by the Contractor is damaged by flood or earthquake, which damage is not due to the failure of the Contractor to take reasonable precautions or to exercise sound engineering and construction practices in the conduct of the work, the Contractor will make the repairs as ordered by the Contracting Officer and full compensation for such repairs will be made at the applicable contract unit or lump sum prices as fixed and established in the contract. If, in the opinion of the Contracting Officer, there are no contract unit or lump sum prices applicable to any part of such work an equitable adjustment pursuant to CONTRACT CLAUSE titled, "Changes," of the contract, will be made as full compensation for the repairs of that part of the permanent work for which there are no applicable contract unit or lump sum prices. Except as herein provided, damage to all work

(including temporary construction), utilities, materials, equipment and plant shall be repaired to the satisfaction of the Contracting Officer at the Contractor's expense, regardless of the cause of such damage.

1.29 WORK ADJACENT TO ROADS AND HIGHWAYS

Where the construction work is on or adjacent to, or involves hauling over public or private roads, streets, or highways, all herein referred to as "roads," the said roads shall, except as otherwise specified or directed, be kept open for traffic at all times during the construction period. Further, the Contractor shall, during said construction, provide, erect and maintain warning signs, lanterns or torches or other safety devices and, when necessary, provide flagmen for protection of traffic to the satisfaction of the Contracting Officer and local authorities. The Contractor shall keep the right-of-way of the roads free of debris that might be caused to accumulate thereon by his operations, and upon completion of the work, shall clean up the said roads and repair any damage to the roads occasioned by his operations under this contract to the satisfaction of the Contracting Officer and local authorities having jurisdiction. The drainage from the roads shall not be obstructed by the construction work. The Contractor shall be responsible for obtaining and paying for all permits required for operation on all roads.

1.30 APPROVED EQUAL

The drawings and the TECHNICAL PROVISIONS of these specifications may, in some instances, refer to certain items of equipment, material, or article by trade name. References of this type shall not be construed as limiting competition, but shall be regarded as establishing a standard of quality. In this respect, the Contractor's attention is directed to CONTRACT CLAUSE titled "Material and Workmanship."

1.31 SCHEDULE OF WORK

The Contractor's attention is directed to CONTRACT CLAUSE titled "Schedule for Construction Contracts," wherein if, in the opinion of the Contracting Officer, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress, including those that may be required by the Contracting Officer.

1.32 UPKEEP OF ROADWAY AREAS WITHIN A MILITARY INSTALLATION WHICH THE CONTRACTOR USES

In addition to the requirements in CONTRACT CLAUSE titled "Operations and Storage Areas," the Contractor shall comply with the following requirements: Where the construction work is on or adjacent to, or involves hauling over public roads, streets, or highways located on a military installation, all herein referred to as "roads," the said roads shall except as otherwise specified or directed, be kept open for traffic at all times during the construction period. The Contractor shall keep the roads including adjacent construction site free of debris including litter, waste construction material, mud etc., that might be caused to accumulate thereon by his operations, and upon completion of the work, shall clean up the said roads and construction site and repair any damage occasioned with his operations under this contract to the satisfaction of the Contracting Officer. The drainage from the roads shall not be obstructed by the construction work.

1.33 PROTECTION OF UTILITY LINES

(a) It shall be the Contractor's responsibility to protect all existing utility lines from damage during excavation for utilities systems. Any damage resulting to existing utility systems shall be repaired by the Contractor, to the satisfaction of the contracting officer, at no additional cost to the Government.

(b) All requests for access and/or locations must be made through the Contracting Officer's Representative (COR) or Resident Engineer. The Director of Public Works will work directly with the Resident Engineer to provide timely information to the Contractor.

1.34 MODIFICATIONS PRIOR TO DATE SET FOR OPENING BIDS

The right is reserved, as the interest of the Government may require, to revise or amend the specifications or drawings or both prior to the date set for opening bids. Such revisions and amendments, if any, will be announced by an amendment or amendments to this Invitation for Bids. If the revisions and amendments are of a nature which requires material changes in quantities or prices bid or both, the date set for opening bids may be postponed by such number of days as in the opinion of the issuing officer will enable bidders to revise their bids. In such cases, the amendment will include an announcement of the new date for opening bids. (KCD APR 84)

1.35 SECURITY MEASURES FOR STORAGE OF EXPLOSIVES ONSITE

When explosives are stored on the project site the following security measures shall be followed which are in accordance with the requirements contained in the Corps of Engineers Manual, EM 385-1-1, dated April 1981, as amended, Part II of the Federal Safety and Health Regulations; Metal and Nonmetallic Mine Safety, Title 30, Code of Federal Regulations, and Commerce in Explosives, Title 26, Code of Federal Regulations.

(a) The explosive storage area shall be provided with perimeter fence, chain link or other approved type, not less than 6 feet in height plus extension arms with three strands of barbed wire. The storage area shall be provided with a gate which shall be secured with a chain and padlock. The gate shall be locked at all times except when explosives are being removed or placed in the area.

(b) Minimum distance between a storage magazine and the perimeter fence shall be 25 feet.

(c) The area outside the perimeter fence for a minimum distance of 10 feet and the area inside the perimeter fence shall be kept clear of vegetation and all combustible matter.

(d) The storage area shall be well lighted during the hours of darkness. (MRD Ltr, 16 May 73, HST - 11, 30, 31 23 Apr 75)

1.36 UNEXPECTED HAZARDOUS SUBSTANCES

In the event that suspected hazardous substances are revealed during construction activities, all such construction activities in the immediate area shall be immediately suspended. Hazardous substances for purposes of this specification only, shall be defined as CERCLA hazardous substances, infectious or radioactive wastes, asbestos or oil. The Contractor shall leave the materials undisturbed and shall immediately report the find to the Contracting Officer's Representative (COR) so that proper authorities can be notified. The Contractor shall not resume construction activities in the vicinity of the suspected hazardous substances until written clearance is received from the COR. Identification and removal of any such materials will be conducted in accordance with all Federal, state and local environmental laws and regulations according to the CONTRACT CLAUSE titled "Differing Site Conditions."

1.37 UNEXPECTED DISCOVERY OF ASBESTOS ON CONSTRUCTION (RENOVATION AND DEMOLITION)

The buildings and areas to be renovated or demolished have been surveyed for the presence of asbestos-containing materials. This survey is not a warranty that asbestos-containing materials are either not present or limited to the amounts

found in the survey. Should unexpected asbestos-containing material be encountered, the Contractor shall promptly, and before the conditions or the substance encountered is disturbed, give a written notice to the Contracting Officer of the suspected asbestos-containing material conditions encountered. As directed by tee Contracting Officer, the Contractor shall remove and dispose of any and all asbestos-containing material as necessary to accomplish the required work which shall be performed in accordance with all pertinent local, state, and federal laws. An equitable adjustment will be made to the Contractor in accordance with the CONTRACT CLAUSE entitled "Changes", for the additional work directed by the Contracting Officer.

1.38 SURVEY MARKERS

Reference is made to CONTRACT CLAUSE titled "Permits and Responsibilities", Chapter 60 of the Missouri Revised Statutes 1969, and rules titled "Maintenance of the Original US Public Land Survey Corners" adopted by the Division of Geology and Land Survey, Missouri Department of Natural Resources. The Contractor shall be responsible for removing and relocating survey markers. Relocation shall be performed by a professional registered Land Surveyor.

1.39 DEMOLITION

Disposal of demolition waste shall be in accordance with all applicable Federal, State and local regulations, including "Chapter 260, RSMO" of the "Missouri Department of Natural Resources."

1.40 EXCAVATION NOTIFICATION

Prior to any excavation on either public or private properties, Missouri law requires that you notify all owners and operators of underground facilities in your dig site. Missouri One Call System (MOCS) can help you comply with the law; "Chapter 319, RSMO" of the "Missouri Department of Natural Resources," by calling this one toll-free number 1-800-344-7483.

1.41 ENCOUNTERING EXISTING UNDERGROUND UTILITIES

During any excavation activity, existing underground utilities encountered shall be immediately reported to the Contracting Officer.

Within 48 hours of encountering underground utilities, the Contractor shall submit to Contracting Officer a marked-up copy of contract drawing that best represents the location, general description and approximate depth of the utilities below finished grade.

Also, the Contractor shall incorporate the above information in required marked-up full scale contract drawing indicating as-built conditions in accordance with all contract provisions pertaining to "As-Built Drawings."

1.42 DAILY WORK SCHEDULES

In order to closely coordinate work under this contract, the Contractor shall prepare for and attend a weekly coordination meeting with the Contracting Officer and Using Service at which time the Contractor shall submit for coordination and approval, his proposed daily work schedule for the next 2-week period. Required temporary utility services, time and duration of interruptions, road cuts, and repairs requiring traffic control, and protection of adjoining areas shall be included with the Contractor's proposed 2-week work schedule. Coordination action by the Contracting Officer relative to these schedules will be accomplished during these weekly meetings.

1.43 SITE FENCING AND MOWING

The Contractor shall provide orange snow fencing around the entire work site; all

site storage areas are considered a part of the work site. When grass/weeds exceed six inches in height, all areas contained by orange snow fencing shall be mowed. Snow fencing on pavement shall be supported by weighted orange barrels.

1.44 CLEANLINESS OF PAVED SURFACES

When paved surfaces are jointly used by the Air Force and Contractor, the Contractor shall keep all paved surfaces, such as runways, taxiways, and hardstands, clean at all times and, specifically, free from small stones which might damage aircraft propellers or jet aircraft.

1.45 WORK ON WEEKENDS OR HOLIDAYS

If the Contractor intends to work on weekends or holidays that will require the use of the south gate, the Contractor shall notify the Security Police and the Resident Office by noon the Thursday prior to the weekend or 48 hours prior to a holiday.

1.46 UTILITY MARKING

The Contractor shall be required at the request of other contractors working in the area to flag the utilities being installed on this contract within 14 days of the request by the other contractor working in the area.

1.47 BASE REGULATIONS

All activities of the Contractor and his/her employees, and of all subcontractors and their employees while on the base, shall be conducted in strict accordance with all base regulations, including those of the fire marshal.

1.47.1 BASE POLICY FOR THE OPERATION OF ALL HYDRANTS AND VALVES ON THE BASE WATER DISTRIBUTION SYSTEM

The following is the base policy for the operation of all hydrants and valves on the base water distribution system:

a. The fire alarm communication center will be immediately notified at 4507 or 4508, of out-of-service hydrants, sprinkler system, stand pipes, etc. The alarm room will also be notified when hydrants are returned to service.

b. Civil Engineering personnel are responsible for operation of all valves and are the only one to open or close these valves. In an emergency (water main break) a Contractor may close a valve and notify the Fire Department at 4507 or 4508 and Mains Maintenance at 6357 immediately.

c. When fire hydrants are out-of-service the Fire Department will immediately place a metal placard 12 inches in diameter with waterproof white letters on a red background reading "OUT-OF-SERVICE". The placards will be placed in a way that identifies hydrants from approaching direction.

d. When fire hydrants are placed back in service, the Fire Department will immediately remove placards.

e. Every effort will be made to return hydrants to service as soon as possible. Hydrants awaiting parts will be assigned an emergency work order. When hydrants are shut down due to construction, call the Fire Department as listed above.

f. The use of fire hydrants by other than fire protection personnel will be coordinated and approved by the Base Fire Chief. Such use will not render the hydrant inoperative for fire protection operations.

1.47.2 POLICY FOR STORAGE OF HAZARDOUS MATERIALS ON CONSTRUCTION SITES

The following is the policy for storage of hazardous materials on construction sites located at Whiteman AFB MO.

a. Definition of hazardous materials is any substance which, by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, or otherwise harmful, and is likely to cause death injury.

b. Hazardous material will not be stored in Government facilities, without special authorization from base. Contact point will be the Fire Department at extension 6080.

c. Each construction site shall have a hazardous material storage area. This area will be the only location that hazardous material shall be stored on a construction site. Exceptions must have prior written approval from the base. Contact point will be the Fire Department at extension 6080.

d. Number every trailer, building and shed with a number at least 6 inches by 4 inches; this number will correspond with the numbers listed below in item e.1.

e. The Contractor will provide an emergency folder that will be kept on-site and up-to-date at all times (on the injury board). This folder shall contain:

(1) Construction site map identifying every road, building, trailer, and shed on site by number, as well as hazardous material storage location.

(2) A copy of every MSDS (material safety data sheet) with amount and location of all hazardous material on site.

f. The Contractor will also provide a copy of each map and MSDS to the Base Fire Department, Building 34 (Dispatch Office) immediately upon delivery of all hazardous material to construction site.

1.47.3 SPECIAL SAFETY REQUIREMENTS

The Contractor shall comply with Air Force and local fire regulations and NFPA 241-1986 "Safeguarding Building Construction and Demolition Operations." Fire extinguishers rated and approved by the National Fire Protection Association, of sufficient size, type, and quantity to cope with all known hazards, shall be provided by the Contractor at the construction site during the execution of this contract; the extinguishers shall be removed upon acceptance of the project.

1.47.4 Entry to Whiteman Air Force Base

The Contractor shall be responsible for furnishing to each employee and for requiring each employee engaged on the work to display identification as may be approved and directed by the Contracting Office. When required by the Contracting Officer the Contractor shall obtain and submit fingerprints of all persons employed or to be employed on the project. Whiteman AFB is a closed base pursuant to Sec. 21, Internal Security Act of 1950, 50 U.S.C. 797 and, as such, only those persons granted permission may enter. It is, however, required that control be exercised over Contractor personnel while working on the base. To maintain this control, an Enrty Authorization List (EAL) of all Contractor personnel and Subcontractor’s personnel that shall be working under the Contract, must be submitted to the Contracting Officer or his/her designated representative five (5) working days prior to start of work under this contract, in both paper and electronic form. The listing shall include, but not be limited to: Contract Number, Project Number, Employee: Full Name, last six (6) of Social Security number, and Vehicles: year, make, model, license plate number. Subsequent listings of all personell additions or deletions shall be submitted as employees are hired or released. A sample of and EAL is attached at the end of this section. EAL are normally processed on Tuesday and Thursday afternoons. To be processed they need to be received prior to noon on Tuesday or Thursday. The Contractor is responsible for collection of Base passes from personnel and

subcontractor personnel when they no longer require entry to the Base. These list normal operating conditions at Whiteman AFB, the contractor shall expect occasional security changes due to Air Force Operations.

1.47.5 TRANSPORTATION, HANDLING, AND STORAGE

The Contractor shall coordinate with suppliers and shippers to ensure incoming materials are properly identified with the Contractor's Name, Contract Number and Project Title, and have a designated individual to receive shipments. The Contractor shall provide a telephone and cell phone number of his/her designated individual to receive shipments, in writing, to the Contracting office. No Government furnished covered storage area is available for the Contractor’s use. However, the Government shall designate an open storage area and the Contractor may, at his/her own expense, rovide means of covered storage (i.e. trailer(s)). Placement of trailer(s) on base shall be at the direction of the Contracting Officer or his/her designated representative.

1.48 MISSOURI SALES AND USE TAX

In accordance with FAR Clause 52.229, notice is given that the contract price excludes the Missouri sales tax and compensating (use) tax on all sales of tangible personal property and materials purchased by the Contractor or subcontractors for the construction of projects, including repairing or remodeling facilities, for the United States. In accordance with Section 144.062, RSMo., the Contracting Officer will issue and furnish to the Contractor an exemption certificate (example copy appears at the end of this section) for this project with the Notice to Proceed. The Contractor and the subcontractors will use the exemption certificate for this project in the purchase of supplies, materials and furnishings for incorporation in the project. The Contractor and the subcontractors shall furnish a copy of such certificate to all suppliers/materialmen from whom such purchases are made, and the suppliers shall execute invoices covering the same bearing the number of such certificate. (KCD OC)

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

* * * * * *

EXAMPLE

STATE OF MISSOURI

PROJECT EXEMPTION CERTIFICATE FOR EXEMPT ENTITY CONSTRUCTION

UNITED STATES OF AMERICA

NAME OF EXEMPT ENTITY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

TAX IDENTIFICATION NUMBER (None required)

PROJECT IDENTIFICATION NUMBER _____

PLEASE PROVIDE THE PROJECT LOCATION AND A BRIEF DESCRIPTION BELOW:

CONTRACT DATE _____

CERTIFICATE EXPIRATION DATE _____

Contractors are required to provide a copy of this project exemption certificate to their vendors.

This project exemption certificate does not allow contractors to purchase machinery, equipment, or tools used in fulfilling this contract, tax exempt.

Suppliers accepting this project exemption certificate are required to render to the contractor invoices bearing the name of the exempt entity and the project identification number.

An exempt entity that fails to revise the expiration date on this certificate as necessary to complete any work required by the contract will be liable for any sales tax determined due as a result of an audit of the contractor.

The Contractor shall provide this project exemption to all subcontractors purchasing construction materials for this project.

SIGNATURE OF AUTHORIZED AGENT

EXHIBIT A

Date

1. The following personnel from (Company Name) will need to be added for (Base entry) for (Contract Number) (Contract Name)

+/-	NAME, Last	First	SSN	COMPANY

VEHICLES:

+/-	Year	Make/Model	Equipment Type	License No	Color

(+) for addition of personal or vehicle; (-) for deletion of personal or vehicle

-- End of Section --

SECTION 01312A

QUALITY CONTROL SYSTEM (QCS)
08/01

PART 1 GENERAL

1.1 GENERAL

The Government will use the Resident Management System for Windows (RMS) to assist in its monitoring and administration of this contract. The Contractor shall use the Government-furnished Construction Contractor Module of RMS, referred to as QCS, to record, maintain, and submit various information throughout the contract period. This joint Government-Contractor use of RMS and QCS will facilitate electronic exchange of information and overall management of the contract. QCS provides the means for the Contractor to input, track, and electronically share information with the Government in the following areas:

Administration
Finances
Quality Control
Submittal Monitoring
Scheduling
Import/Export of Data

1.1.1 Correspondence and Electronic Communications

For ease and speed of communications, both Government and Contractor will, to the maximum extent feasible, exchange correspondence and other documents in electronic format. Correspondence, pay requests and other documents comprising the official contract record shall also be provided in paper format, with signatures and dates where necessary. Paper documents will govern, in the event of discrepancy with the electronic version.

1.1.2 Other Factors

Particular attention is directed to Contract Clause, "Schedules for Construction Contracts", Contract Clause, "Payments", Section 01320A, PROJECT SCHEDULE, Section 01330, SUBMITTAL PROCEDURES, and Section 01451A, CONTRACTOR QUALITY CONTROL, which have a direct relationship to the reporting to be accomplished through QCS. Also, there is no separate payment for establishing and maintaining the QCS database; all costs associated therewith shall be included in the contract pricing for the work.

1.2 QCS SOFTWARE

QCS is a Windows-based program that can be run on a stand-alone personal computer or on a network. The Government will make available the QCS software to the Contractor after award of the construction contract. Prior to the Pre-Construction Conference, the Contractor shall be responsible to download, install and use the latest version of the QCS software from the Government's RMS Internet Website. Upon specific justification and request by the Contractor, the Government can provide QCS on high-density diskettes or CD-ROM. Any program updates of QCS will be made available to the Contractor via the Government RMS Website as they become available.

1.3 SYSTEM REQUIREMENTS

The following listed hardware and software is the minimum system configuration that the Contractor shall have to run QCS:

Hardware

IBM-compatible PC with 700 MHz Pentium or higher processor

125+ MB RAM

8 GB hard drive disk space for sole use by the QCS system

3 1/2 inch high-density floppy drive

Compact disk (CD) Reader/Write

17+ Color monitor

Laser printer compatible with HP LaserJet III or better, with minimum 4 MB installed memory.

DSL Connection to the Internet

Surge and Fault protection

Software

MS Windows 2000 or newer version operating system (MS Windows NT 4.0 or newer is recommended)

Word Processing software compatible with MS Word 2000 or newer

Internet Explorer browser

The Contractor's computer system shall be protected by virus protection software that is regularly upgraded with all issued manufacturer's updates throughout the life of the contract.

Electronic mail (E-mail) compatible with MS Outlook

1.4 RELATED INFORMATION

1.4.1 QCS User Guide

After contract award, the Contractor shall download instructions for the installation and use of QCS from the Government RMS Internet Website; the Contractor can obtain the current address from the Government. In case of justifiable difficulties, the Government will provide the Contractor with a CD-ROM containing these instructions.

1.4.2 Contractor Quality Control(CQC) Training

The use of QCS will be discussed with the Contractor's QC System Manager during the mandatory CQC Training class.

1.5 CONTRACT DATABASE

Prior to the pre-construction conference, the Government shall provide the Contractor with basic contract award data to use for QCS. The Government will provide data updates to the Contractor as needed, generally by files attached to E-mail. These updates will generally consist of submittal reviews, correspondence status, QA comments, and other administrative and QA data.

1.6 DATABASE MAINTENANCE

The Contractor shall establish, maintain, and update data for the contract in the QCS database throughout the duration of the contract. The Contractor shall establish and maintain the QCS database at the Contractor's site office. Data updates to the Government shall be submitted by E-mail with file attachments, e.g., daily reports, schedule updates, payment requests. If permitted by the Contracting Officer, a data diskette or CD-ROM may be used instead of E-mail (see Paragraph DATA SUBMISSION VIA COMPUTER DISKETTE OR CD-ROM). The QCS database typically shall include current data on the following items:

1.6.1 Administration

1.6.1.1 Contractor Information

The database shall contain the Contractor's name, address, telephone numbers, management staff, and other required items. Within 14 calendar days of receipt of QCS software from the Government, the Contractor shall deliver Contractor administrative data in electronic format via E-mail.

1.6.1.2 Subcontractor Information

The database shall contain the name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor must be listed separately for each trade to be performed. Each subcontractor/trade shall be assigned a unique Responsibility Code, provided in QCS. Within 14 calendar days of receipt of QCS software from the Government, the Contractor shall deliver subcontractor administrative data in electronic format via E-mail.

1.6.1.3 Correspondence

All Contractor correspondence to the Government shall be identified with a serial number. Correspondence initiated by the Contractor's site office shall be prefixed with "S". Letters initiated by the Contractor's home (main) office shall be prefixed with "H". Letters shall be numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C".

1.6.1.5 Equipment

The Contractor's QCS database shall contain a current list of equipment planned for use or being used on the jobsite, including the most recent and planned equipment inspection dates.

1.6.1.7 Management Reporting

QCS includes a number of reports that Contractor management can use to track the status of the project. The value of these reports is reflective of the quality of the data input, and is maintained in the various sections of QCS. Among these reports are: Progress Payment Request worksheet, QA/QC comments, Submittal Register Status, Three-Phase Inspection checklists.

1.6.2 Finances

1.6.2.1 Pay Activity Data

The QCS database shall include a list of pay activities that the Contractor shall develop in conjunction with the construction schedule. The sum of all pay activities shall be equal to the total contract amount, including modifications. Pay activities shall be grouped by Contract Line Item Number (CLIN), and the sum of the activities shall equal the amount of each CLIN. The total of all CLINs equals the Contract Amount.

1.6.2.2 Payment Requests

All progress payment requests shall be prepared using QCS. The Contractor shall complete the payment request worksheet and include it with the payment request. The work completed under the contract, measured as percent or as specific quantities, shall be updated at least monthly. After the update, the Contractor shall generate a payment request report using QCS. The Contractor shall submit the payment requests with supporting data by E-mail with file attachment(s). If permitted by the Contracting Officer, a data diskette may be used instead of E-mail. A signed paper copy of the approved payment request is also required, which shall govern in the event of discrepancy with the electronic version.

1.6.3 Quality Control (QC)

QCS provides a means to track implementation of the 3-phase QC Control System, prepare daily reports, identify and track deficiencies, document progress of work, and support other contractor QC requirements. The Contractor shall maintain this data on a daily basis. Entered data will automatically output to the QCS generated daily report. The Contractor shall provide the Government a Contractor Quality Control (CQC) Plan within the time required in Section 01451A, CONTRACTOR QUALITY CONTROL. Within seven calendar days of Government acceptance, the Contractor shall submit a data diskette or CD-ROM reflecting the information contained in the accepted CQC Plan: schedule, pay activities, features of work, submittal register, QC requirements, and equipment list.

1.6.3.1 Daily Contractor Quality Control (CQC) Reports.

QCS includes the means to produce the Daily CQC Report. The Contractor may use other formats to record basic QC data. However, the Daily CQC Report generated by QCS shall be the Contractor's official report. Data from any supplemental reports by the Contractor shall be summarized and consolidated onto the QCS-generated Daily CQC Report. Daily CQC Reports shall be submitted as required by Section 01451A, CONTRACTOR QUALITY CONTROL. Reports shall be submitted electronically to the Government using E-mail or diskette within 24 hours after the date covered by the report. Use of either mode of submittal shall be coordinated with the Government representative. The Contractor shall also provide the Government a signed, printed copy of the daily CQC report.

1.6.3.2 Deficiency Tracking.

The Contractor shall use QCS to track deficiencies. Deficiencies identified by the Contractor will be numerically tracked using QC punch list items. The Contractor shall maintain a current log of its QC punch list items in the QCS database. The Government will log the deficiencies it has identified using its QA punch list items. The Government's QA punch list items will be included in its export file to the Contractor. The Contractor shall regularly update the correction status of both QC and QA punch list items.

1.6.3.3 Three-Phase Control Meetings

The Contractor shall maintain scheduled and actual dates and times of preparatory and initial control meetings in QCS.

1.6.3.4 Accident/Safety Tracking.

The Government will issue safety comments, directions, or guidance whenever safety deficiencies are observed. The Government's safety comments will be included in its export file to the Contractor. The Contractor shall regularly update the correction status of the safety comments. In addition, the Contractor shall utilize QCS to advise the Government of any accidents occurring on the jobsite. This brief supplemental entry is not to be considered as a substitute for completion of mandatory reports, e.g., ENG Form 3394 and OSHA Form 200.

1.6.3.5 Features of Work

The Contractor shall include a complete list of the features of work in the QCS database. A feature of work may be associated with multiple pay activities. However, each pay activity (see subparagraph "Pay Activity Data" of paragraph "Finances") will only be linked to a single feature of work.

1.6.3.6 QC Requirements

The Contractor shall develop and maintain a complete list of QC testing, transferred and installed property, and user training requirements in QCS. The Contractor shall update all data on these QC requirements as work progresses, and shall promptly provide this information to the Government via QCS.

1.6.4 Submittal Management

The Government will provide the initial submittal register, ENG Form 4288, SUBMITTAL REGISTER, in electronic format. Thereafter, the Contractor shall maintain a complete list of all submittals, including completion of all data columns. Dates on which submittals are received and returned by the Government will be included in its export file to the Contractor. The Contractor shall use QCS to track and transmit all submittals. ENG Form 4025, submittal transmittal form, and the submittal register update, ENG Form 4288, shall be produced using QCS. RMS will be used to update, store and exchange submittal registers and transmittals, but will not be used for storage of actual submittals.

1.6.5 Schedule

The Contractor shall develop a construction schedule consisting of pay activities, in accordance with Contract Clause "Schedules for Construction Contracts", or Section 01320A, PROJECT SCHEDULE, as applicable. This schedule shall be input and maintained in the QCS database either manually or by using the Standard Data Exchange Format (SDEF) (see Section 01320A PROJECT SCHEDULE). The updated schedule data shall be included with each pay request submitted by the Contractor.

1.6.6 Import/Export of Data

QCS includes the ability to export Contractor data to the Government and to import submittal register and other Government-provided data, and schedule data using SDEF.

1.7 IMPLEMENTATION

Contractor use of QCS as described in the preceding paragraphs is mandatory. The Contractor shall ensure that sufficient resources are available to maintain its QCS database, and to provide the Government with regular database updates. QCS shall be an integral part of the Contractor's management of quality control.

1.8 DATA SUBMISSION VIA COMPUTER DISKETTE OR CD-ROM

The Government-preferred method for Contractor's submission of updates, payment requests, correspondence and other data is by E-mail with file attachment(s). For locations where this is not feasible, the Contracting Officer may permit use of computer diskettes or CD-ROM for data transfer. Data on the disks or CDs shall be exported using the QCS built-in export function. If used, diskettes and CD-ROMs will be submitted in accordance with the following:

1.8.1 File Medium

The Contractor shall submit required data on 3-1/2 inch double-sided high-density diskettes formatted to hold 1.44 MB of data, capable of running under Microsoft Windows 95 or newer. Alternatively, CD-ROMs may be used. They shall conform to

industry standards used in the United States. All data shall be provided in English.

1.8.2 Disk or CD-ROM Labels

The Contractor shall affix a permanent exterior label to each diskette and CD-ROM submitted. The label shall indicate in English, the QCS file name, full contract number, contract name, project location, data date, name and telephone number of person responsible for the data.

1.8.3 File Names

The Government will provide the file names to be used by the Contractor with the QCS software.

1.9 MONTHLY COORDINATION MEETING

The Contractor shall update the QCS database each workday. At least monthly, the Contractor shall generate and submit an export file to the Government with schedule update and progress payment request. As required in Contract Clause "Payments", at least one week prior to submittal, the Contractor shall meet with the Government representative to review the planned progress payment data submission for errors and omissions.
The Contractor shall make all required corrections prior to Government acceptance of the export file and progress payment request. Payment requests accompanied by incomplete or incorrect data submittals will be returned. The Government will not process progress payments until an acceptable QCS export file is received.

1.10 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the requirements of this specification. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification.

-- End of Section --

SECTION 01320A

PROJECT SCHEDULE
08/01

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of the specification to the extent referenced. The publications are referenced in the text by basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1-1-11	(1995) Progress, Schedules, and Network Analysis Systems

1.2 QUALIFICATIONS

The Contractor shall designate an authorized representative who shall be responsible for the preparation of all required project schedule reports.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Pursuant to the Contract Clause, SCHEDULE FOR CONSTRUCTION CONTRACTS, a Project Schedule as described below shall be prepared. The scheduling of the project (design and construction) shall be the responsibility of the Contractor. Contractor management personnel shall actively participate in its development. Subcontractors and suppliers working on the project shall also contribute in developing and maintaining an accurate Project Schedule. The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments. Construction NTP will not be issued until the project schedule is approved.

3.2 BASIS FOR PAYMENT

The schedule shall be the basis for measuring Contractor progress. Lack of an approved schedule or scheduling personnel will result in an inability of the Contracting Officer to evaluate Contractor's progress for the purposes of payment. Failure of the Contractor to provide all information, as specified below, shall result in the disapproval of the entire Project Schedule submission and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. In the case where Project Schedule revisions have been directed by the Contracting Officer and those revisions have not been included in the Project Schedule, the Contracting Officer may hold retainage up to the maximum allowed by contract, each payment period, until revisions to the Project Schedule have been made.

3.3 PROJECT SCHEDULE

The computer software system utilized by the Contractor to produce the Project Schedule shall be capable of providing all requirements of this specification. Failure of the Contractor to meet the requirements of this specification shall result in the disapproval of the schedule. Manual methods used to produce any required information shall require approval by the Contracting Officer.

3.3.1 Use of the Critical Path Method

The Critical Path Method (CPM) of network calculation shall be used to generate the Project Schedule. The Contractor shall provide the Project Schedule in the Precedence Diagram Method (PDM).

3.3.2 Level of Detail Required

The Project Schedule shall include an appropriate level of detail. Failure to develop or update the Project Schedule or provide data to the Contracting Officer at the appropriate level of detail, as specified by the Contracting Officer, shall result in the disapproval of the schedule. The Contracting Officer will use, but is not limited to, the following conditions to determine the appropriate level of detail to be used in the Project Schedule:

3.3.2.1 Activity Durations

Contractor submissions shall follow the direction of the Contracting Officer regarding reasonable activity durations. Reasonable durations are those that allow the progress of activities to be accurately determined between payment periods (usually less than 2 percent of all non-procurement activities' Original Durations are greater than 20 days).

3.3.2.2 Procurement Activities

Tasks related to the procurement of long lead materials or equipment shall be included as separate activities in the project schedule. Long lead materials and equipment are those materials that have a procurement cycle of over 90 days. Examples of procurement process activities include, but are not limited to: submittals, approvals, procurement, fabrication, and delivery.

3.3.2.3 Required Activities

The following activities shall be listed as separate line activities on the Contractor's project schedule:

a. Submission and approval of mechanical/electrical layout drawings.

b. Submission and approval of O & M manuals.

c. Submission and approval of as-built drawings.

d. Submission and approval of 1354 data and installed equipment lists.

e. Submission and approval of testing and air balance (TAB).

f. Submission of TAB specialist design review report.

g. Submission and approval of fire protection specialist.

h. Submission and approval of testing and balancing of HVAC plus commissioning plans and data.

i. Air and water balance dates.

j. HVAC commissioning dates.

k. Controls testing plan.

l. Controls testing.

m. Performance Verification testing.

n. Other systems testing, if required.

o. Prefinal inspection.

p. Correction of punchlist from prefinal inspection.

q. Final inspection.

3.3.2.4 Government Activities

Government and other agency activities that could impact progress shall be shown. These activities include, but are not limited to: approvals, inspections, utility tie-in, Government Furnished Equipment (GFE) and Notice to Proceed (NTP) for phasing requirements.

3.3.2.5 Responsibility

All activities shall be identified in the project schedule by the party responsible to perform the work. Responsibility includes, but is not limited to, the subcontracting firm, contractor work force, or government agency performing a given task. Activities shall not belong to more than one responsible party. The responsible party for each activity shall be identified by the Responsibility Code.

3.3.2.6 Work Areas

All activities shall be identified in the project schedule by the work area in which the activity occurs. Activities shall not be allowed to cover more than one work area. The work area of each activity shall be identified by the Work Area Code.

3.3.2.7 Modification or Claim Number

Any activity that is added or changed by contract modification or used to justify claimed time shall be identified by a mod or claim code that changed the activity. Activities shall not belong to more than one modification or claim item. The modification or claim number of each activity shall be identified by the Mod or Claim Number. Whenever possible, changes shall be added to the schedule by adding new activities. Existing activities shall not normally be changed to reflect modifications.

3.3.2.8 Bid Item

All activities shall be identified in the project schedule by the Bid Item to which the activity belongs. An activity shall not contain work in more than one bid item. The bid item for each appropriate activity shall be identified by the Bid Item Code.

3.3.2.9 Phase of Work

All activities shall be identified in the project schedule by the phases of work in which the activity occurs. Activities shall not contain work in more than one phase of work. The project phase of each activity shall be by the unique Phase of Work Code.

3.3.2.10 Category of Work

All Activities shall be identified in the project schedule according to the category of work which best describes the activity. Category of work refers, but is not limited, to the procurement chain of activities including such items as submittals, approvals, procurement, fabrication, delivery, installation, start-up, and testing. The category of work for each activity shall be identified by the Category of Work Code.

3.3.2.11 Feature of Work

All activities shall be identified in the project schedule according to the feature of work to which the activity belongs. Feature of work refers, but is not limited to, a work breakdown structure for the project. The feature of work for each activity shall be identified by the Feature of Work Code.

3.3.3 Scheduled Project Completion

The schedule interval shall extend from NTP to the contract completion date.

3.3.3.1 Project Start Date

The schedule shall start no earlier than the date on which the NTP was acknowledged. The Contractor shall include as the first activity in the project schedule an activity called "Start Project". The "Start Project" activity shall have an "ES" constraint date equal to the date that the NTP was acknowledged, and a zero day duration.

3.3.3.2 Constraint of Last Activity

Completion of the last activity in the schedule shall be constrained by the contract completion date. Calculation on project updates shall be such that if the early finish of the last activity falls after the contract completion date, then the float calculation shall reflect a negative float on the critical path. The Contractor shall include as the last activity in the project schedule an activity called "End Project". The "End Project" activity shall have an "LF" constraint date equal to the completion date for the project, and a zero day duration.

3.3.3.3 Early Project Completion

In the event the project schedule shows completion of the project prior to the contract completion date, the Contractor shall identify those activities that have been accelerated and/or those activities that are scheduled in parallel to support the Contractor's "early" completion. Contractor shall specifically address each of the activities noted in the narrative report at every project schedule update period to assist the Contracting Officer in evaluating the Contractor's ability to actually complete prior to the contract period.

3.3.4 Interim Completion Dates

Contractually specified interim completion dates shall also be constrained to show negative float if the early finish date of the last activity in that phase falls after the interim completion date.

3.3.4.1 Start Phase

The Contractor shall include as the first activity for a project phase an activity called "Start Phase X" where "X" refers to the phase of work. The "Start Phase X" activity shall have an "ES" constraint date equal to the date on which the NTP was acknowledged, and a zero day duration.

3.3.4.2 End Phase

The Contractor shall include as the last activity in a project phase an activity called "End Phase X" where "X" refers to the phase of work. The "End Phase X" activity shall have an "LF" constraint date equal to the completion date for the project, and a zero day duration.

3.3.4.3 Phase X

The Contractor shall include a hammock type activity for each project phase called "Phase X" where "X" refers to the phase of work. The "Phase X" activity shall be logically tied to the earliest and latest activities in the phase.

3.3.5 Default Progress Data Disallowed

Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in CPM scheduling software systems. Actual Start and Finish dates on the CPM schedule shall match those dates provided from Contractor Quality Control Reports. Failure of the Contractor to document the Actual Start and Finish dates on the Daily Quality Control report for every in-progress or completed activity, and failure to ensure that the data contained on the Daily Quality Control reports is the sole basis for schedule updating shall result in the disapproval of the Contractor's schedule and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. Updating of the percent complete and the remaining duration of any activity shall be independent functions. Program features which calculate one of these parameters from the other shall be disabled.

3.3.6 Out-of-Sequence Progress

Activities that have posted progress without all preceding logic being satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case approval of the Contracting Officer. The Contractor shall propose logic corrections to eliminate all out of sequence progress or justify not changing the sequencing for approval prior to submitting an updated project schedule.

3.3.7 Negative Lags

Lag durations contained in the project schedule shall not have a negative value.

3.4 PROJECT SCHEDULE SUBMISSIONS

The Contractor shall provide the submissions as described below. The data disk, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS.

3.4.1 Preliminary Project Schedule Submission

The Preliminary Project Schedule, defining the Contractor's planned operations for the first 90 calendar days shall be submitted for approval within 30 calendar days after the NTP is acknowledged. The approved preliminary schedule shall be used for payment purposes not to exceed 90 calendar days after NTP.

3.4.2 Initial Project Schedule Submission

The Initial Project Schedule shall be submitted for approval within 40 calendar days after NTP. The schedule shall provide a reasonable sequence of activities which represent work through the entire project and shall be at a reasonable level of detail.

3.4.3 Periodic Schedule Updates

Based on the result of progress meetings, specified in "Periodic Progress Meetings," the Contractor shall submit periodic schedule updates. These submissions shall enable the Contracting Officer to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgement of the Contracting Officer or authorized representative is necessary for verifying the Contractor's progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made.

3.4.4 Standard Activity Coding Dictionary

The Contractor shall use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11, Appendix A. This exact structure is mandatory, even if some fields are not used.

3.5 SUBMISSION REQUIREMENTS

The following items shall be submitted by the Contractor for the preliminary submission, initial submission, and every periodic project schedule update throughout the life of the project:

3.5.1 Data Disks

Two data disks containing the project schedule shall be provided. Data on the disks shall adhere to the SDEF format specified in ER 1-1-11, Appendix A.

3.5.1.1 File Medium

Required data shall be submitted on 3.5 disks, formatted to hold 1.44 MB of data, under the MS-DOS Version 5. or 6.x, unless otherwise approved by the Contracting Officer.

3.5.1.2 Disk Label

A permanent exterior label shall be affixed to each disk submitted. The label shall indicate the type of schedule (Preliminary, Initial, Update, or Change), full contract number, project name, project location, data date, name and telephone number or person responsible for the schedule, and the MS-DOS version used to format the disk.

3.5.1.3 File Name

Each file submitted shall have a name related to either the schedule data date, project name, or contract number. The Contractor shall develop a naming convention that will ensure that the names of the files submitted are unique. The Contractor shall submit the file naming convention to the Contracting Officer for approval.

3.5.2 Narrative Report

A Narrative Report shall be provided with the preliminary, initial, and each update of the project schedule. This report shall be provided as the basis of the Contractor's progress payment request. The Narrative Report shall include: a description of activities along the 3 most critical paths, a description of current and anticipated problem areas or delaying factors and their impact, and an explanation of corrective actions taken or required to be taken. The narrative report is expected to relay to the Government, the Contractor's thorough analysis of the schedule output and its plans to compensate for any problems, either current or potential, which are revealed through that analysis.

3.5.3 Approved Changes Verification

Only project schedule changes that have been previously approved by the Contracting Officer shall be included in the schedule submission. The Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.5.4 Schedule Reports

The format for each activity for the schedule reports listed below shall contain: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total

Float. Actual Start and Actual Finish Dates shall be printed for those activities in progress or completed.

3.5.4.1 Activity Report

A list of all activities sorted according to activity number.

3.5.4.2 Logic Report

A list of Preceding and Succeeding activities for every activity in ascending order by activity number. Preceeding and succeeding activities shall include all information listed above in paragraph Schedule Reports. A blank line shall be left between each activity grouping.

3.5.4.3 Total Float Report

A list of all incomplete activities sorted in ascending order of total float. Activities which have the same amount of total float shall be listed in ascending order of Early Start Dates. Completed activities shall not be shown on this report.

3.5.4.4 Earnings Report

A compilation of the Contractor's Total Earnings on the project from the NTP until the most recent Monthly Progress Meeting. This report shall reflect the Earnings of specific activities based on the agreements made in the field and approved between the Contractor and Contracting Officer at the most recent Monthly Progress Meeting. Provided that the Contractor has provided a complete schedule update, this report shall serve as the basis of determining Contractor Payment. Activities shall be grouped by bid item and sorted by activity numbers. This report shall: sum all activities in a bid item and provide a bid item percent; and complete and sum all bid items to provide a total project percent complete. The printed report shall contain, for each activity: the Activity Number, Activity Description, Original Budgeted Amount, Total Quantity, Quantity to Date, Percent Complete (based on cost), and Earnings to Date.

3.5.5 Network Diagram

The network diagram shall be required on the initial schedule submission and on monthly schedule update submissions. The network diagram shall depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.5.1 Continuous Flow

Diagrams shall show a continuous flow from left to right with no arrows from right to left. The activity number, description, duration, and estimated earned value shall be shown on the diagram.

3.5.5.2 Project Milestone Dates

Dates shall be shown on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.5.3 Critical Path

The critical path shall be clearly shown.

3.5.5.4 Banding

Activities shall be grouped to assist in the understanding of the activity sequence. Typically, this flow will group activities by category of work, work

area and/or responsibility.

3.5.5.5 S-Curves

Earnings curves showing projected early and late earnings and earnings to date.

3.6 PERIODIC PROGRESS MEETINGS

Progress meetings to discuss payment shall include a monthly onsite meeting or other regular intervals mutually agreed to at the preconstruction conference. During this meeting the Contractor shall describe, on an activity by activity basis, all proposed revisions and adjustments to the project schedule required to reflect the current status of the project. The Contracting Officer will approve activity progress, proposed revisions, and adjustments as appropriate.

3.6.1 Meeting Attendance

The Contractor's Project Manager and Scheduler shall attend the regular progress meeting.

3.6.2 Update Submission Following Progress Meeting

A complete update of the project schedule containing all approved progress, revisions, and adjustments, based on the regular progress meeting, shall be submitted not later than 4 working days after the monthly progress meeting.

3.6.3 Progress Meeting Contents

Update information, including Actual Start Dates, Actual Finish Dates, Remaining Durations, and Cost-to-Date shall be subject to the approval of the Contracting Officer. As a minimum, the Contractor shall address the following items on an activity by activity basis during each progress meeting.

3.6.3.1 Start and Finish Dates

The Actual Start and Actual Finish dates for each activity currently in-progress or completed .

3.6.3.2 Time Completion

The estimated Remaining Duration for each activity in-progress. Time-based progress calculations shall be based on Remaining Duration for each activity.

3.6.3.3 Cost Completion

The earnings for each activity started. Payment will be based on earnings for each in-progress or completed activity. Payment for individual activities will not be made for work that contains quality defects. A portion of the overall project amount may be retained based on delays of activities.

3.6.3.4 Logic Changes

All logic changes pertaining to NTP on change orders, change orders to be incorporated into the schedule, contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, lag durations, and other changes that have been made pursuant to contract provisions shall be specifically identified and discussed.

3.6.3.5 Other Changes

Other changes required due to delays in completion of any activity or group of activities include: 1) delays beyond the Contractor's control, such as strikes and unusual weather. 2) delays encountered due to submittals, Government

Activities, deliveries or work stoppages which make re-planning the work necessary. 3) Changes required to correct a schedule which does not represent the actual or planned prosecution and progress of the work.

3.7 REQUESTS FOR TIME EXTENSIONS

In the event the Contractor requests an extension of the contract completion date, or any interim milestone date, the Contractor shall furnish the following for a determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract: justification, project schedule data, and supporting evidence as the Contracting Officer may deem necessary. Submission of proof of delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is obligatory to any approvals.

3.7.1 Justification of Delay

The project schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved with this request. The Contracting Officer's determination as to the number of allowable days of contract extension shall be based upon the project schedule updates in effect for the time period in question, and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in the extension of the schedule, will not be a cause for a time extension to the contract completion date.

3.7.2 Submission Requirements

The Contractor shall submit a justification for each request for a change in the contract completion date of under 2 weeks based upon the most recent schedule update at the time of the NTP or constructive direction issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

a. A list of affected activities, with their associated project schedule activity number.

b. A brief explanation of the causes of the change.

c. An analysis of the overall impact of the changes proposed.

d. A sub-network of the affected area.

Activities impacted in each justification for change shall be identified by a unique activity code contained in the required data file.

3.7.3 Additional Submission Requirements

For any requested time extension of over 2 weeks, the Contracting Officer may request an interim update with revised activities for a specific change request. The Contractor shall provide this disk within 4 days of the Contracting Officer's request.

3.8 DIRECTED CHANGES

If the NTP is issued for changes prior to settlement of price and/or time, the Contractor shall submit proposed schedule revisions to the Contracting Officer within 2 weeks of the NTP being issued. The proposed revisions to the schedule will be approved by the Contracting Officer prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer may furnish the Contractor with suggested revisions to the project schedule. The Contractor shall include these revisions in the project schedule until revisions are submitted, and final changes and

impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the Contracting Officer, the Contractor shall advise the Contracting Officer within 2 weeks of receipt of the revisions. Regardless of the objections, the Contractor shall continue to update the schedule with the Contracting Officer's revisions until a mutual agreement in the revisions is reached. If the Contractor fails to submit alternative revisions within 2 weeks of receipt of the Contracting Officer's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

3.9 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor.

-- End of Section --

SECTION 01332

SUBMITTALS DURING DESIGN

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SECTION 01332

DESIGN SUBMITTAL REQUIREMENTS (TASK ORDER NO. 1)
9/01

1 GENERAL

The contractor shall conduct the design effort considering the entire housing neighborhood development of the land parcel depicted in the Task Order and Community Development Plan. The design will include planning and sizing utilities systems, connecting roadways, trailways, etc sufficient to accommodate the future development indicated in the Task Order for the area. The contractor shall be responsible any additional design effort, or rework required due to undersizing or relocating of infrastructure, that failed to consider the future housing developments for the parcel of land described in the task order. Utility tie in points have been identified in the RFP for this task order and the future anticipated development of the land parcel.

Attachments: Attachment A, Design Certification and Transmittal Letter
DD Form 1354 - Transfer and Acceptance of Military Real Property
Instructions for Preparation of DD Form 1354

1.1 SUMMARY

1.1.1 SECTION INCLUDES

a. Design: This section includes general requirements for developing and submitting the complete housing project design including preparation of drawings, specifications, design analyses and other design and construction deliverables conforming to the requirements contained in this section. Distribution requirements for design deliverables are also covered in this section.

b. Construction: This section includes distribution requirements for the construction set of design deliverables and distribution requirements for DD Form 1354 and as-built drawings.

1.1.2 SECTION EXCLUDES

This section does not include requirements for construction submittals, which are specified in Section 01330, "Submittal Procedures."

1.2 REFERENCES

The references listed below form a part of this specification to the extent referenced.

1.2.1 THE CONSTRUCTION SPECIFICATIONS INSTITUTE (CSI)

CSI Masterformat Master List of Section Titles and Numbers

1.2.2 KANSAS CITY DISTRICT CADD STANDARDS MANUAL

(a) AutoCADD drawings will follow the National CAD Tri-Services standards. File naming convension and special instructions, title block layout will be provided on the Compact Disk with this task order. Also, see Section 01040 AS-BUILT DRAWINGS. The Contractor shall be responsible for furnishing one set of the required CAD software to the contracting officers representative 30 calendar days following the Notice to Proceed (NTP) for design.

1.2.3 WEB SITES

In addition to the web sites listed in this section, other RFP Sections may list web sites where design criteria references used in this solicitation package may be found.

NOTE: FOR ITEMS (a), (b), AND (c) BELOW, REFERENCES TO RECEIVING APPROVAL FROM OTHER GOVERNMENT AGENCIES FOR ALTERNATIVE DESIGNS ARE NOT APPLICABLE TO THIS PROJECT. THE CONTRACTOR IS THE DESIGNER WHEN READING THESE DOCUMENTS. ALL ITEMS LISTED BELOW ARE CONSIDERED TO BE A PART OF THE RFP SOLICITATION DOCUMENT (AS APPLICABLE) AND THE RESULTANT CONTRACT.

(a) TECHNICAL MANUALS (TM), TECHNICAL INSTRUCTIONS (TI), AIR FORCE MANUALS (AFM), ENGINEERING TECHNICAL LETTERS (ETL), ARMY ARCHITECTURAL AND ENGINEERING DESIGN CRITERIA (AEI), SUSTAINABLE DESIGN DOCUMENTS, AND MILITARY HANDBOOKS (MIL HNDBK) can be obtained from the National Institute of Building Sciences Construction Criteria Base (CCB) on CD-ROM. Contact the CCB directly at (202) 289-7800 for an order form or obtain an order form at the following Internet address: http://www.ccb.org/ccbsubscribe/Subsmain.asp. There is a regular annual subscription fee to the CCB (Price is noted on internet address, currently $700 per year). The CCB is available on CD-ROM or DVD. Selected references are also available for downloading in Acrobat .pdf file format at the following Internet address:

http://www.hnd.usace.army.mil/techinfo.

Additional web sites are as follows:

(1) TECHNICAL MANUALS, ETL's, ETC:

www.usace.army.mil/inet/usace-docs

(2) AIR FORCE DESIGN CRITERIA

http://afpubs.hq.af.mil

(3) UNIFIED FACILITIES GUIDE SPECIFICATONS (UFGS)

The Contractor shall provide project specification in accordance with Paragraph 3.2, herein. This includes Government Provided Specifications as referenced in Paragraph 3.2.2. If the Contractor chooses to utilize UFGS (Specintact) specifications to develop project specifications, the Government has them located on the CD-ROM issued with solicitation (Specsintact files under a directory labeled "Guides". An Index of available UFGS sections is included in Attachment No. 3 of this RFP. Specsintact software is available on the CCB referred to paragraph (a) above or may be downloaded at the following internet address: http://si.ksc.nasa.gov/specsintact/software/software.htm. SI Version 3.0 (Version SI3.3.460) or later shall be used. The new unified submittal format shall be selected for file format. A copy of the software (SI Version 3.0) has been included on the CD-ROM issued with this solicitation. See folder: "Software", file "si3.exe".

1.3 ENGLISH UNIT REQUIREMENTS

This project shall be developed and accomplished using "English Unit" measurement.

1.4 DEFINITIONS

1.4.1 CONTRACTOR

Firm or company to whom award was made to design and construct the Replace Family Housing, Task order No.1, located at Whiteman AFB, Missouri.

1.4.2 DESIGN

Documents or deliverables, as defined in this section, prepared by or under the direct supervision of registered professional architects and engineers and proposed by the Contractor to meet the requirements of this solicitation.

1.4.3 DESIGN DRAWINGS

Documentation showing in graphic and quantitative form the extent, design, location, relationships, and dimensions of the construction to be provided by the Contractor. (Note: Shop Drawings, as defined in Section 01330: SUBMITTAL PROCEDURES are not to be provided until after design drawings are determined satisfactory for construction.)

1.4.4 DESIGNER

Architects and Engineers (A-E) associated with the Contractor who are responsible for (1) preparing the design documents, (2) checking construction submittals for compliance with the prepared Construction set design documents and (3) have the qualifications and experience specified herein.

1.4.5 REQUEST FOR PROPOSAL (RFP)

Documents furnished to prospective offerors containing proposal information and specifying criteria and project requirements for design and construction of the Replace Family Housing, Task Order No.1, located at Whiteman AFB, Missouri. The documents include this specification, attachments, and the RFP drawings.

1.5 QUALITY ASSURANCE (SEE SECTIONS 00110 AND 01451)

1.6 SUBMISSION OF DESIGN DRAWINGS, SPECIFICATIONS AND DESIGN ANALYSES

1.6.1 DESIGN CERTIFICATION

Within each design submittal, the Contractor shall certify that all items submitted in the design documents comply with the requirements of the RFP. The criteria specified in this RFP are binding contract criteria and in case of any conflict, after award, between the RFP criteria and Contractor's submittals, the RFP criteria will govern unless there is a written and signed agreement between the Contracting Officer and the Contractor waiving a specific requirement. The Contractor shall present with the letter of transmittal for each design submittal (including the 100% corrected design submittal) a certification that the submittal (plans, specifications, design analysis, etc.) complies with the requirements stated above, similar to that shown at Attachment A of this section.

1.6.2 DEVIATIONS

Deviations from the RFP technical requirements shall be identified in the letter of transmittal. Deviations from the RFP technical requirements will be considered and accepted by the Contracting Officer if the change result in a significant improvement to the project or it exceeds the minimum RFP technical requirements as determined by the Contracting Officer.

1.6.3 FIELD INSPECTION

The Contractor shall verify field conditions, which are significant to design, by field inspection, researching and obtaining all necessary existing facility as-built drawings and reproducing them for his own use as necessary, and discussing status with knowledgeable personnel. The information shall be reflected in the design documents. The contractor shall arrange and conduct all necessary actions to schedule appointments with base personnel, gain access to existing utility systems, conduct existing files research, and perform data gathering to verify existing conditions for preparation of the design documents.

1.6.4 DRAWINGS

a) **Software Requirements:** All design drawings shall be done by the Contractor in AutoCAD 2000 .dwg file format. See Section 01040: AS-BUILT DRAWINGS.

b) **RFP Drawings:** RFP Drawings will be furnished in AutoCAD file format with this solicitation and are considered useable for planning purposes, they will be furnished electronically in the Phase 2 portion of the solicitation to allow Offerors electronic files to layout their site and housing concept.

Design documents, as required by the Final design submittal stated hereafter, shall include construction drawings, specifications and design analysis/calculations for categories such as, but not limited to, architectural, interior design, structural, mechanical, electrical, grading, drainage, paving, and outside utility services. Specifications shall be in sufficient detail to fully describe and demonstrate the quality of materials, the installation and performance of equipment, and the quality of workmanship. Detailing and installation of all equipment and materials shall comply with the manufacturer's recommendations. The design analysis shall be for each discipline of work and shall include all features with the necessary calculations, tables, methods and sources used in determining equipment and material sizes and capacities, and shall provide sufficient information to support the design.

1.6.5 DESIGN REVIEWS

Two design reviews will be held for project under the base bid. **Special Note:** The complete process and all requirements will be repeated as detailed in the specifications if the **optional** work is awarded. The contractor shall assume the base work and optional work will not be awarded at the same timeframe or can be combined under one single design effort.

All review conferences will be held at Whiteman AFB, Missouri. The first design review will be for the 100 percent Site Design and 65% Housing Design. The second review will be a backcheck review of the 100% Corrected Site Design and the 100% Housing Design. The Government may call for a review conference of the 100% Corrected Housing Design if comments and designs issues are not solved through means of Dr Checks and correspondence. This may require a single discipline needed to attend or several design team members to attend. Once the Corrected Final Designs (100 percent Site and Housing) are reviewed and determined to be satisfactory for the purpose of beginning construction, the Contractor shall prepare and distribute full sets (site and housing combined) of documents for construction. The Contractor shall attend the design reviews, visit the site and make other trips as necessary during the design to accomplish the work.

1.6.6 DOCUMENT PACKAGING

The design submittals include the Final 100% Site and 65% Housing, and 100% Housing (complete design for all design disciplines, based on the RFP drawings and specifications for stages of design required and listed herein. These documents shall be packaged and stamped "For Review Only – 100% Final Site Design and 65% Housing Design" and "For Review Only – 100% Final Housing Design", each sheet of the drawings shall also be stamped. The Corrected Final (100 percent) backcheck design submittal (Site and Housing), after the Government review of the Final (100 percent) design, shall be stamped "100% Corrected Design"; and each sheet of the drawings shall also be stamped. The 100% Corrected Design submittal is for making corrections resulting from review comments and for preparing the final "For Construction" documents. Once, the 100% corrected design submittal has been approved and corrected, the Contractor shall prepare and submit the "For Construction" set of design documents. These documents shall be packaged and stamped "For Construction", and each sheet of drawings shall also be stamped. Once the "For Construction" design is deemed compliant by the Government, any changes to the plans and specifications shall be submitted as a deviation in accordance with Section 01330 Submittal Procedures. No additional time for completion of the contract will be granted to the Contractor due to insufficient design submittals. See paragraph 3.6.6 "Government Design Review and Acceptance" for additional requirements.

2 PRODUCTS

2.1 MATERIAL REQUIRED FOR 100% FINAL SITE AND 65% HOUSING DESIGN AND 100% FINAL HOUSING DESIGN SUBMITTAL:

All drawings included in the required technical data for the proposal submission shall be developed to design stages required below for completion. In addition to the individual utility plans, submit a combined utility plan drawn to the same scale as the individual utility plans. Furnish mechanical and electrical plans, with complete schematics, to show all air conditioning, plumbing and electrical work. A licensed professional engineer or architect shall perform all design and calculations. A licensed professional engineer or architect shall stamp all drawings. The following design documents shall be provided in the design submittals. Note: Various drawings for housing design are listed to submit at “100%Only”. For those listed as such, no 65% Housing Design drawing is required.

2.1.1 SITE/INFRASTRUCTURE

a) **Environmental Protection Plan:** The Contractor shall prepare and submit, with the 100% Design review documents, an Environmental Protection Plan in accordance with the requirements of Section 01355 ENVIRONMENTAL PROTECTION, including the recycling of Freon refrigerant. As an Appendix to the Environmental Protection Plan, the Contractor shall include copies of all environmental reports, permits, approvals, applications, and associated documents as an Appendix to the Environmental Protection Plans.

b) **Location Plan and Vicinity Map:** The Location Plan and Vicinity Map provided in the Request for Proposal (RFP) shall be updated as necessary and included in the drawings. The Location Plan shall include the Contractor's access route, staging area, stockpile area, and the overall project site.

c) **Removal Plan:** The removal plan will show the existing physical features and condition of the site before construction. Each physical feature to be removed shall be hatched as indicated on the standard legend sheet, a legend on the removal plan, and properly noted: to be removed, to remain, or to be relocated. The Removal Plan shall be prepared at the same drawing scale and use the sheet boundaries as the Site Plan.

d) **Site Plan:** The Site Plan shall show all the site layout information necessary to field locate the houses, street work, driveways, sidewalks, patios, privacy fence, security fence, recreation areas, and all other appurtenances to be constructed as part of the project. All major site work to be constructed will be dimensioned for size and location. The Site Plan will identify all site-related items such as: curbs, driveways, walks, retaining walls, mechanical units, electrical transformers locations, etc. in accordance with a standard legend sheet or with additional legends or notes. Drawing scales of 1” = 30’ or 1’ = 40’ are acceptable scales for the Site Plan. The contractor shall consider the project's construction area, drawing legibility, number of sheets required in choosing the drawing scale. The Site Plan, prior to adding the dimensions and notes, should serve as the base sheet to other Plans, such as: Utilities Plan, Grading and Drainage Plans and Landscape Plan. Existing and proposed contours or utility lines shall not be shown on Site Plan. Physical features that will remain after the proposed construction has been completed shall be shown. This plan, or the Location Plan, will also show any free zones, construction limits, etc. Whenever the Site Plan occupies more than one sheet of drawings, a Key Plan shall be included. Additional plans showing specific areas of the site in smaller scales can be included if more detail is necessary.

e) **Site Details:** The Contractor shall provide details for all site furnishings, playground equipment, patio privacy fence, accessories, handicap accessible ramps, signage, and any other site structure or item requiring a detail for clarity and construction accuracy.

f) **Landscape Plan:** A detailed Landscape Plan showing trees, shrubs, ground cover, and seeded or sodded areas shall be prepared by the Contractor. The Landscape Plan shall be prepared by a fully qualified, experienced professional Landscape Architect. The Contractor shall specify types of plant materials that are locally grown, commercially available and acclimated to the project environment. The Landscape Plan shall include a plant materials schedule or listing. This schedule shall include botanical names, common names, key, size and the

method of transplanting. The Landscape Plan shall also show all un-surfaces ground areas disturbed by construction within the project limits with these areas shown to be seeded or sodded as required.

g) **Landscape Details:** The Contractor shall verify the methods of planting to meet the project site/installation requirements and provide the necessary Landscape Details to perform the contract design work. Details shall reflect local practices and conditions for installation.

h) **Pavement Plan:** The pavement plan will show the existing streets and condition of the pavement prior to construction. The survey plan shall be used to create the pavement plan. This drawing shall be used to indicate the location of any pavement work required.

i) **Grading and Drainage Plan:** A final grading and drainage plan shall be provided at the same scale as the site plan. New and existing grading contours shall be indicated at 1 ft contour intervals. Indicate the finished floor elevation of new houses and structures. Plans shall show the layout of the new and existing storm drainage and roof drainage systems. Provide spot elevations at building corners, changes in grade, etc. Storm drainage lines and structures shall be labeled. The rim elevation of all manholes, curb inlets, and area inlets shall be indicated. Provide location and description of benchmarks and indicate vertical and horizontal datum's.

j) **Storm Drain and Culvert Profiles:** Provide profiles of any new storm drains and culverts showing new and existing grades, new and existing utilities, pavement sections in detail, pipe diameters and lengths, pipe slopes, invert elevations, etc. Class and gauge of all storm drain and culvert pipes shall be provided.

k) **Foundation Drainage System:** Provide plan, typical cross section, and details of the foundation drainage system.

j) **Drainage Structure Details:** Provide typical details of all storm drainage structures. The use of alternate details shall be approved prior to submitting the final design documents. A, B, C, and D dimensions of all storm drain and subdrain structures shall be shown. Dimensions may be shown on either the storm drain schedule, the storm drain profiles, or on the storm drain structure detail drawings.

k) **Storm Water Pollution Prevention Plan (SWPPP) Site Map:** Provide a site map indicating drainage patterns and approximate slopes anticipated after major grading activities, areas of soil disturbance, areas which will not be disturbed, locations of major structural and nonstructural erosion controls identified in the SWPPP, locations where stabilization practices are expected to occur, locations of off-site material, waste, borrow or equipment storage areas, surface waters (including wetlands), and locations where storm water discharges to a surface water.

l) **Erosion Control Details:** Provide details of best management practices used to control erosion.

m) **Typical Pavement Sections and Details:** Provide typical driveway, sidewalk, patio, pavement overlay, curb and gutter, curb ramps, and road repair sections and details.

n) **Typical Driveway Pavement Joint Layout Plans:** Provide typical pavement joint layout plans for each type of housing unit provided. Each type of joint shall be shown with a different symbol and a joint legend provided. Under no circumstances shall pavement joint layout plans be combined with any other plans.

o) **Typical Patio Joint Layout Plans:** Provide typical joint layout plans for the patio area for each type of housing unit provided. Each type of joint shall be shown with a different symbol and a joint legend provided. Under no circumstances shall pavement joint layout plans be combined with any other plans.

p) **Sanitary Sewer and Water Plans:** Sanitary sewer and water plans shall show locations of new and existing mains and service lines, elevation of sewer pipe, valves, connections. Thrust blocks, manholes, etc. Scale to match site plans.

q) **Natural Gas Plans:** Scale to match site plans foe natural gas plans. Natural gas distribution system plans shall include, but not limited to, the following:

--Locations of existing mains and service lines, including those to be removed.
--Locations of new gas service mains and service lines, including points of connection to existing piping.
--Trench installation Details for both the main lines and the service lines.
--Valve Box Details.
--Gas Service Regulator Assembly Detail.
--Cathodic Protection Details.

r) **Electrical Distribution Plans (Scale to match site plan):** Electrical distribution plan shall show site lighting (street and walkway), primary cable routing (new and existing) pad-mounted transformers & switches, and secondary service laterals. Scale to match site plans.

Show the following:

-- Site lighting (street and walkway)
-- Primary cable routing (new and existing)
-- Pad-mounted transformers & switches
-- Secondary service laterals
--On-Site One Line Diagram

s) **On-Site Distribution Transformer Schedule** (with the following headings:)

--Transformer Designation
--Transformer Size (KVA)
--Building(s) Served
--Primary Phase(s) and Circuit to which connected.

t) **On-Site Details** (Site Lighting, Trenching, etc.)

2.1.1.1 Required Site Infrastructure Specifications (100% Complete):

Required technical specifications Kansas City District Guides for site and infrastructure shall be complete and fully edited to reflect and coordinate with the drawings. All specification indexes shall be completely edited to reflect the paragraphs retained in the body of the specification. All references that have not been used in the body of the specification shall be edited from the technical specification.

For Asbestos Abatement Specification: Procedures for demolition of structures with Category I nonfriable asbestos-containing materials in place are described in Section 01400 SPECIAL SAFETY REQUIREMENTS FOR DEMOLITION. The Contractor shall comply with applicable Federal and state regulations.

For Lead-Based Paint: Any lead-based painted architectural components proposed for removal prior to demolition shall be identified in writing and the removal procedures and associated health and safety protocols shall be provided. Where lead-based painted surfaces will remain in the units for demolition, follow the protocols described in Section 01400 SPECIAL SAFETY REQUIREMENTS FOR DEMOLITION.

Note: Much of the site work requires the specific use of Government Provided Guide Specifications as indicated in Attachment and Paragraph 3.2.2. GOVERNMENT PROVIDED GUIDE SPECIFICATIONS, herein. In other areas of site work, which do not require the specific use of a Government Provided Guide Specifications, the Contractor shall produce final specifications as required by Paragraph 3.2 SPECIFICATIONS.

2.1.2 HOUSING UNITS

Submit for each typical housing type.

a) Floor Plans: (Scale 1/4" = 1'-0")

For each housing type, show the following:

-- Overall dimensions
-- Room description with dimensions and areas
-- Furniture layouts
-- Vanities
-- Appliances (including occupant-owned washer, dryer, and micro-wave Oven; and contractor-furnished refrigerator, stove, and Dishwasher)
-- Plumbing fixtures locations
-- Kitchen layout
-- Door swings
-- Garage locations
-- Patio, Walks, Privacy and Good Neighbor fencing
-- Exterior/Interior bulk storage
-- Service (trash) area
-- Furnace, AC units, and hot water heater locations
-- Calculated gross and net floor areas
-- Electrical switches, outlets, telephone jacks, CATV jacks
-- Electric light fixture locations and schedule
-- Equipment Layout
-- Smoke/carbon monoxide detectors

b) Exterior Elevations: (Scale 1/4" or 1/8" = 1'- 0")

For each housing type, show all sides of a building complete with notes indicating the exterior finish materials shall be shown.

c) Interior Elevations: (Scale 1/4" = 1'- 0")

Show the following:

-- Kitchen
-- Bathrooms

d) Building Cross Sections for Each Type of Building: (Scale 1/4" = 1'-0")

For each housing type, show the following:

--Structural system
--Building materials
--Finishes
--Vertical dimensions

e) Typical Wall Section: (Scale 3/4" = 1'- 0")

For each housing type, show the following:

--Typical wall
--Foundation
--Floor and roof section
--Materials
--Cavity wall
--Party wall w/STC rating

--Fire rated construction with UL or Gypsum Association File No.
--Thermal Insulation

f) **Finish Schedule: Show** finish schedule of all rooms.

g) **Fire and Sound Rated Assemblies:** Show the construction of fire and sound rated assemblies in detail and note on the drawings the tested design upon which the construction is based. Note any modification to materials or method of construction. Detail all penetrations of rated partitions.

h) **Detail References:** All details shall be referenced to floor plans, elevations or sections.

i) **Kitchen Cabinet Elevations:** Kitchen cabinet elevations shall note cabinet sizes.

j) **Foundation and Floor Slab Plans: (Scale: 1/4" = 1'-0")**

For Each Housing Type show:
--Dimensions and materials of foundation system (If not shown on any other typical drawing)

k) **Structural Floor and Roof Framing Plans: (Scale: 1/4" = 1'-0")**

For Each Housing Type show:
--Structural framing members and spacing dimensions
--Details of any main structural framing members or connections such as beams, headers, etc.

l) **Architectural Rendering:** Contractor shall provide ground level perspective artist's renderings of typical family housing units completed with walks, parking, and landscaping. Renderings shall be no smaller than 14 inches by 18 inches or larger than 28 inches by 36 inches, multi-colored, and shall be suitably titled, matted, and framed.

m) **Color Boards:** Color Boards shall be submitted showing color and pattern of materials prepared for interior and exterior finish materials, including floor, wall and ceiling finishes, roofing, siding, and trim shall be submitted to Contracting Officer on 8-1/2 inches by 11 inches sample boards/binder format.

n) **Consumer Information for Handicapped Requirements:** The Contractor shall furnish a report including drawings in accordance with the Uniform Federal Accessibility Standards, paragraph 4.34.4 "Consumer Information" for the modified and adaptable features of each applicable unit type of family housing.

2.1.3 SPECIFIC MECHANICAL AND PLUMBING REQUIREMENTS

Required Plans, Diagrams, Schedules and Details on Unit Mechanical Drawings (100% Only Design Stages):

a) **Mechanical Floor Plan: (Scale 1/4" = 1'-0")**

The floor plans shall show all principle architectural features of the building which will affect the mechanical design. The floor plan shall also show the following:

--Room designations
--Mechanical legend and applicable notes
--Location of all ductwork or piping (double line ductwork required **100% only**)
--Location and capacity of all terminal units (i.e., registers, diffusers, grilles, hydronic baseboards)
--Exhaust fan and range hood location
--Size of all ductwork and piping shown **100% only**
--Thermostat location
--Location of heating equipment (i.e., furnace(s))
--Location of air conditioning equipment (Condensing Unit Refrigerant Piping and Sizing. **100% only**)
--Return air paths (i.e., undercut doors)

- Transfer grilles
--Flue piping – location**; sizing 100% only**
--Piping diagrams for forced hot water system (if used) **100% only**
--Fuel supply and return piping
--Location of all Mechanical Equipment, including Furnace, Condensing Unit, Exhaust Fans, Range Hood, etc.
--Locations of all Balancing Dampers and Access Panels **100% only**.
--Location of Combustion Air and Furnace Flues**; sizing 100% only**.
--Natural Gas Service Entrance and location of Gas Piping**; sizing 100% only**.
--Dryer Exhaust Ducting.

b) Equipment Schedule Sheet:

Complete equipment schedules shall be provided. Schedule shall also include:

--Capacity
--Electrical characteristics
--Efficiency (if applicable)
--Manufacturer's name
--Any optional features to be provided
--Physical size
--Water Heater Schedule.
--Furnace/AC Coil Schedule.
--Condensing Unit Schedule.
--Exhaust Fan Schedule.
--Range Hood Schedule.
--Register and Grille Schedule.
--Exhaust Fan Schedule.

c) Details:

Construction details, sections, elevations, etc. shall be provided where required for clarification of methods and materials of design. All roof and exterior wall penetrations shall be detailed on the drawings. As a minimum, the following Details and Schedules shall be provided:

_ --Furnace Connection Detail, including Gas Piping, Flexible Connectors, and Filter Access **100% only**.
--Side-Views of Mechanical Equipment Room to ensure proper space exists for installation of Furnace and Water Heater with associated Ductwork, Piping, and Flues **100% only**.
--Condensing Unit Mounting Detail **100% only**.
--Exhaust Fan Details**100% only**.
--Roof and Exterior Wall Penetrations shall be detailed **100% only**.
--Below Slab Radon Piping Installation Detail.
--Radon Piping Manifold Detail.
-Water Service Entrance Detail.
--Water Heater Detail.
--Furnace AC Coil Condensate Drain Detail.
--Radon Sump Pump Details.
--Dishwasher Hook-Up Detail, including Connection to Disposal and Sink **100% only**.
--Sump Pump Detail.

d) Plumbing Floor Plan: (Scale: 1/4" = 1'-0")

The floor plan shall show all principal architectural features of the building that will affect the plumbing design. The floor plan shall also show the following:

--Room designations
--Plumbing Legend and applicable Notes.
--Fixture Schedule and Fixture designations
--Location of utility entrances
--Waste, vent, and hot and cold water pipe locations **(sizes 100% only)**
--Location of hot water heater
--Plumbing riser diagram **100% only**
--Below Slab Radon Piping.
--Above Floor Radon Piping.
-- Radon Exhaust Fan Location.
--Radon Vent locations through Roof and visual light location.
--Location of Water Service Entrance.
--Water Heater, Furnace, and Floor Drain Locations.
--Water Heater Flue Piping, including Venting through Roof.
--Foundation Drain Sump Pump.
--Plumbing Vents through Roof locations.
--Waste Piping Cleanout Locations.
--Wall Hydrant Locations.
--Water Hammer Arrestor Locations **100% only**.
--Access Panels and locations **100% only**.

e) Plumbing Plans: Separate-plumbing plans will not be required if sufficient information can be shown on the mechanical plans to meet the requirements shown above.

2.1.4 SPECIFIC ELECTRICAL REQUIREMENTS

a) Electrical Floor Plan: (Scale 1/4" = 1'-0")

The floor plans shall show all principle architectural features of the building which will affect the electrical design. The floor plan shall also show the following:

--Room designations
--Electrical legend and applicable notes
--All lighting fixtures, properly identified
--Location of all smoke detectors
--Location of telephone outlets
--Location of television outlets
--All switches for control of lighting
--All receptacles
--The location and designation of all panelboards. Plans should clearly indicate type of mounting required (flush or surface) and be reflected accordingly in specifications.
--Service entrance (conduit and main disconnect)
--Location, designation and rating of all motors and/or equipment which requires electrical service.
-- Show method of termination and/or connection to motors and/or equipment.
--Show all necessary junction boxes and disconnects
--Controllers (approximate only), conduit stubs and receptacles required to serve the motor and/or
-- equipment. (**100% only)**

b) Building Riser Diagram (from pad-mounted transformer to unit load center panelboard): Indicate the types and sizes of all electrical equipment and wiring. Include grounding and metering requirements.

c) Unit Load Center Panelboard Schedule(s):

Schedule shall indicate the following information:

--Panelboard Characteristics (Panel Designation, Voltage, Phase, Wires, Main Breaker Rating and Mounting
--Branch Circuit Designations.
--Load Designations
--Circuit Breaker Characteristics (Number of Poles, Trip Rating, AIC Rating)
--Branch Circuit Connected Loads (AMPS).
--Any Special Features

d) Lighting Fixture Schedule:

(Schedule shall indicate the following information:)

--Fixture Designation
--General Fixture Description
--Number and Type of Lamp(s)
--Type of Mounting
--Any Special Features

e) **Details**: Construction details, sections, elevations, etc. shall be provided where required for clarification of methods and materials of design.

2.2 DESIGN ANALYSIS & DESIGN CALCULATIONS

Design analysis and design calculations shall include complete site and housing unit descriptions and design calculations for storm drainage improvements, utility distribution systems, structural elements, electrical and mechanical systems, and roadway pavement and shoulder design.

2.2.1 STORM DRAINAGE SYSTEM CALCULATIONS

Storm Drainage System Calculations shall include the following:

a) Drainage area map showing boundaries of each drainage area and respective drain inlet or culvert.

b) Storm run-off calculations for each drainage area.

c) Tabulation of capacities of new storm drains including: diameter and slope of storm drain pipes, design storm discharge and velocity for each storm drain pipe, maximum discharge capacity of each storm drain pipe, headwater depth of each culvert during design storm discharge.

2.2.2 FOUNDATION DRAINAGE SYSTEM CALCULATIONS

Foundation Drainage System Calculations shall include selection of pipe sizes and sump pump calculations.

2.2.3 STRUCTURAL DESIGN CALCULATIONS

Design calculations are required for all structural elements not covered prescriptively by the International Residential Code (IRC). Calculations shall be stamped by a registered structural engineer.

2.2.4 MECHANICAL DESIGN ANALYSIS

a) **Water Supply Calculations:** Submit calculations at Final (100 percent) design stages to determine correct main water supply to each unit and/or building.

b) **Mechanical Calculations: Complete** mechanical design calculations shall be provided for all equipment such as furnaces, cooling coils, condensing units, piping, exhaust fans, air duct design, louvers, gas services and piping, plumbing, water heaters, etc. Heating and cooling calculations may be provided by computer analysis (i.e., Elite Software Inc., Trane Trace Load 700, Carrier E20-II Hourly Analysis Program (HAP) version 3.04 loads program etc.). Also, see paragraph 3.4 “Design Analysis”.

2.2.5 ELECTRICAL DESIGN ANALYSIS

All design and calculations for the electrical systems shall be performed by a licensed professional engineer with experience in family housing, and shall be stamped as such. The design shall be a separate bound assembly, in one or more volumes, of all the functional and engineering criteria, design information, and calculations applicable to the project design. The analysis shall be organized in a format appropriate for review, approval, and record purposes. The design calculations shall be presented in a clear and legible form, with all methods and references identified, and all assumptions and conclusions explained.

a) Load Calculations

(1) A separate demand load calculation shall be provided for each type of individual living unit (per NEC Art. 220). Include catalog cuts of the electrical data for the HVAC equipment that was selected by the mechanical designer.

(2) A separate demand load calculation shall be provided for each type of multifamily dwelling. (Per NEC Art. 220)

(3) Calculate the demand load for each pad-mounted distribution transformer by adding all the demand loads (minus the HVAC load), for each type of living unit connected to the transformer, and then multiply by the appropriate demand factor found in the following table. Then, the HVAC load and any site lighting loads are added to this figure to arrive at the transformer demand load. (Note that the demand factors in the table shall not be applied to the HVAC loads and the Site Lighting loads, which are included at 100% demand.

DEMAND FACTOR TABLE

Number of Quarters	Demand Factor Percent	Number of Quarters	Demand Factor Percent	Number of Quarters	Demand Factor Percent
1	80.0	19	18.6	37	13.2
2	60.0	20	17.5	38	13.0
3	50.0	21	17.1	39	12.8
4	45.0	22	16.6	40	12.6
5	40.0	23	16.1	41	12.4
6	35.0	24	15.8	42	12.2
7	32.0	25	15.6	43	12.0
8	29.0	26	15.4	44	11.8
9	27.0	27	15.2	45	13.6
10	25.0	28	15.0	46	11.4
11	24.0	29	14.8	47	11.2
12	23.0	30	14.6	48	11.0
13	22.0	31	14.4	49	10.8
14	21.0	32	14.2	50	10.6
15	20.0	33	14.0	51	10.4
16	19.4	34	13.8	52	10.4
17	18.7	35	13.6	53	10.1
18	18.3	36	13.4	54	10.0

(4) Calculate the demand load for each phase of each circuit of the primary distribution system. The loads shall be computed using the same method as outlined for the pad-mounted transformers in the previous paragraph. (Note that for 54 or more living-units, the demand factor shall be 10%).

(5) In addition to the complete load calculations required hereinbefore, provide load summary tables which group and identify each type of demand load calculated. (Individual living-units, multifamily dwellings, pad-mounted distribution transformers, and primary phases.)

b) Voltage Drop (VD) Calculations

(1) Select conductor sizes of primary feeders and calculate maximum footage for each phase of each primary circuit, using a maximum allowable VD for each circuit.

(2) Select conductor sizes of site lighting circuits and calculate the VD for each circuit. (Maximum allowable VD = 3%).

(3) Select service lateral conductor sizes for each multifamily swelling and calculate the maximum length (in feet) of each different type of service lateral using a maximum allowable VD of 3%.

(4) Select unit feeder conductor sizes for each individual living unit and calculate the VD for the worst case branch circuit. The combined voltage drop for the service laterals, unit feeders, and branch circuit shall not exceed 5%.

(5) Short Circuit Calculations: Calculate the available fault current at the main breaker of the individual living-unit load center panel. A coordination study shall be provided for all fuse selections.

3 EXECUTION

3.1 DRAWINGS

Prepare, organize, and present drawings in the format specified herein. Provide drawings complete, accurate and explicit enough to show compliance with the RFP requirements and to permit construction. Drawings illustrating systems proposed to meet the requirements of the RFP performance specifications shall reflect proper detailing for each such system to assure appropriate use, proper fit, compatibility of components and coordination with the design analysis and specifications required by this section. Coordinate drawings to ensure there are no conflicts between design disciplines and between drawings and specifications.

3.1.1 DRAWINGS FORMAT

Full size drawings are considered 28 inches x 40 inches. Half-size drawings are considered 14 inches x 20 inches. Title block shall be as indicated in the Kansas City District CADD Standards Manual. The Cover Sheet of the Contractor prepared drawings shall bear the stamp or seal and signature of the registered architect or appropriate engineer responsible for the work and proposed to meet the RFP requirements. Drawing code numbers for the design and construction drawings shall be as follows:

Drawing Code: AF 711-15-01

3.1.2 DRAWINGS SEQUENCE

Arrange drawings by design discipline in accordance with Kansas City District CADD Standards Manual.

3.2 SPECIFICATIONS

The Contractor shall develop specifications utilizing commercial Construction Specifications Institute (CSI), 16 Division, 3 Part Section Format. These specifications shall conform to the applicable criteria requirements indicated in the solicitation (Section 01000, Parts 1-14). For these specification sections, write at the Medium scope level of detail as described in CSI Masterformat. Use Mediumscope level section numbers and titles as identified in CSI Masterformat. Adjust section numbers which conflict with the specifications used in the Project Specifications. Each of these developed specification sections shall be in the same format as the CSI format. Commercially available guide specifications such as "SpecText" published by The Construction Specifications Institute and "MasterSpec" published by The American Institute of Architects or Unified Facilities Guide Specifications (UFGS given on the CD-ROM as an option for use by the Offeror) may be used subject to the format, coding and submittal paragraph requirements. References to the "Architect/Engineer" and the "Owner" shall be changed to refer to the "Government" or "Contracting Officer," as appropriate. The specifications shall clearly identify, where appropriate, the specific products chosen to meet the requirements of the specifications (manufacturers' brand names and model numbers or similar product information). The Contractor shall be responsible for coordinating references, along with the technical requirements, to specific specification sections (number and title) within the project specifications. Section references (title and number) shall be revised to reflect the titles and numbers of specification sections used.

For required materials (catalog cuts) submitted under SECTION 00110 PROPOSAL SUBMISSION AND EVALUATION in the Phase 2 portion of the solicitation, if sufficient information is indicated, not withstanding some interior and site requirements, which require both specifications and catalog cuts, the Contractor can furnish the catalog cut information provided under 00110 for the final specification usage in the construction documents. If used, the catalog cuts must demonstrate the “General Usage”, “Product” and “Execution” (Manufacturer’s Installation) instructions. All Specification information shall be arranged by CSI Division 16 format and numbered with TOC. Catalog Cuts shall display an intro sheet with a spec number for easy reference and indexing as combined with fully written specifications for a complete, concise set of construction specifications.

3.2.1 DIVISION 1 SPECIFICATION SECTIONS

Include Division 1 specifications (already edited by the Government) sections 01040 AS-BUILT DRAWINGS, 01200 WARRANTY OF CONSTRUCTION, 01320A PROJECT SCHEDULE, 01330 SUBMITTAL PROCEDURES, 01355 ENVIRONMENT PROTECTION, 01400 SPECIAL SAFETY REQUIREMENTS FOR DEMOLITION AND RENOVATION, and 01451A CONTRACTOR QUALITY CONTROL. These sections are contained in the RFP as part of the project specifications without change. Copies of these sections are included with the RFP on the advertised CD-ROM. Any other Division 1 Specifications required by the Contract shall be the responsibility of the Contractor. No other Division 1 Specifications will be required, unless specified otherwise in this solicitation or required by the Contractor.

3.2.2 GOVERNMENT PROVIDED GUIDE SPECIFICATIONS

Infrastructure work requires the use of Government Provided Guide Specifications (see list below). The contractor is required to fully incorporate these sections and present them at the 100% design stage. No catalog cut information from Section 00110 may be used in place of specifications listed below. They are mandatory for design and construction. These Specifications and Software are included on the Advertised CD-ROM:

SECTION 02220 Demolition
SECTION 02230 Clearing and Grubbing
SECTION 02300 Earthwork
SECTION 02315 Excavation, Filling, and Backfilling for Buildings
SECTION 02620 Subdrainage System
SECTION 02700 Asphaltic Concrete Intermediate Leveling and Surface..
SECTION 02712 Lime-Modified Subgrade
SECTION 02722 Graded, Crushed Aggregate Base Course and Rigid …
SECTION 02748 Bituminous Tack and Prime Coats
SECTION 02760 Field Molded Sealants for Sealing Joints in Rigid Pavement..
SECTION 02763 Pavement Markings
SECTION 02770 Concrete Sidewalks, Curbs and Gutters, and Exterior…
SECTION 03100 Structural Concrete Formwork
SECTION 03200 Concrete Reinforcement
SECTION 03300 Cast-In-Place Structural Concrete
SECTION 03350 Non-Metallic Light-Reflective Surface-Hardened Concrete..
SECTION 13280 Asbestos Abatement
SECTION 13281 Lead Hazard Control Activities

3.2.3 FORMAT FOR PROJECT SPECIFICATIONS

Submit the project specification, including a Cover page and Table of Contents, printed with a word processor using good quality white paper. The corrected final (100 percent) specifications with review comments incorporated shall be cleaned up (without marked-up edits) and submitted in both hard copy and on magnetic media (A Microsoft Windows compatible CD-ROM and compatible with the Microsoft Word 2000 format. The Cover page and attachments to specification sections shall be prepared in a Microsoft Word (compatible with Microsoft Word 2000) format. Carbon copies are not acceptable.

Each specification section shall include a Section Table of Contents, which is combined with the page numbering of the specification section.

The Cover page shall be similar to the RFP Cover page and shall include:

a. Project title, Project Number, activity and location

b. Construction contract number

c. Construction Contractor's name and address

d. Design firm's name and address

e. Names of design team members (Designers of record) responsible for each Contractor prepared technical discipline of the project specification

f. Name and signature of a Principal of the design firm

The Table of Contents shall list the 16 Divisions contained in CSI format and the specification section numbers and titles contained in the project specification.

3.3 CONSTRUCTION SUBMITTALS

All construction submittals shall be in accordance with Section 01330, "SUBMITTAL PROCEDURES".

Construction submittal types and products, including the submittal description numbers and data package numbers, shall be included in the specification sections, where required. When appropriate, use specific product terms instead of the generic product terms contained in the specifications sections (e.g., asphalt shingles, built-up roofing, EPDM single ply, etc. vs. roof covering; concrete masonry units, brick, metal siding, etc. vs. exterior skin; mineral fiber board, block, batt or blanket, polystyrene, polyurethane, polyisocyanurate board vs. insulation).

3.3.1 SUBMITTALS REGISTER (FORM)

Prepare and maintain a Submittals Register. The Submittal Register (ENG Form 4288 "Submittal Register" shall be prepared. Additional instructions for completing the form are contained in Section 01330, "Submittal Procedures."

Fill in columns "c" through "f" and submit with the 100 percent design submittal. The Submittal Register will be returned to the Contractor along with the reviewed and accepted design.

Resubmit the Submittal Register as a construction submittal as required in Section 01330, "SUBMITTAL PROCEDURES." The Contractor shall provide an electronic copy of the accepted submittal register, three (3) working days prior to the pre-construction conference. Remaining columns will be filled in at the appropriate time and by the appropriate authorities during construction.

3.4 DESIGN ANALYSES

Prepare design analyses (basis of design and calculations) for each applicable design discipline. The design analyses shall be a presentation of facts to demonstrate that the concept of the project is fully understood and that the design is based on sound engineering. The design analysis for each discipline shall include:

a. A basis of design consisting of:

(1) An introductory description of the project concept which addresses the salient points of the design;

(2) An orderly and comprehensive documentation of criteria, rationale, assumptions and reasoning for system selection.

b. Calculations required to support the design. Complete site and housing unit design calculations for utility distributions systems, structural elements and electrical and mechanical systems. Include computations for sizing equipment, air duct design, and U-factors for ceilings, roofs and exterior walls and floors. Also include final passive energy strategy performance calculations for each housing unit type. Contractor shall employ commercially available energy analysis techniques to determine the energy performance of all-passive systems and features. Use of hourly

energy load computer simulation (e.g., TRNSYS, DOE 2.1 Blast, etc.) is required. Performance calculations shall also determine the peak-cooling load of all passive solar unit types. These calculations can be used to size the unit's mechanical systems.

c. Equipment Schedule. Based on the results of calculations, provide a complete list of the materials and equipment proposed for heating and plumbing, with the manufacturer's published cataloged product installation specifications and roughing-in data. The heating equipment data shall include the manufacturer's wiring diagrams, installation specifications, ARI certification, and the standard warranty for the equipment. In addition, provide the manufacturer's published cataloged capacities for supply diffusers as evidence that the arrangement of supply air outlets in each room will provide the throw and spread characteristics required to cover completely all exterior wall surfaces with the blanket of warm air at the proper design velocities.

d. Project Engineering Considerations and Instructions (ECI) for Final Design Analysis.

The Contractor shall not make reference to the RFP solicitation to avoid stating the requirements for the basis for design.

3.4.1 ENGINEERING CONSIDERATIONS AND INSTRUCTIONS (ECI) FOR FIELD PERSONNEL

3.4.1.1 Separate Appendix

Under a separate appendix in the Final Design Analysis, the Design-Build Contractor shall include the following items:

a. Features critical to the quality of the final construction product requiring special attention.

b. Submittals requiring special attention during construction.

c. Special user requirements or instructions.

d. Assumed field conditions, pertinent significant aspects, or critical phases of the project used as a basis of project design.

3.4.1.2 Format

Format for ECI's shall include the following information:

"ENGINEERING CONSIDERATIONS AND INSTRUCTIONS

Project Name:_____

Location: _____

Designer Name:_____ Phone:_____

Discipline:_____

Design-Build designers have prepared the following engineering considerations and instructions (ECI). These ECI's should be followed during the construction of the above project. If you have any questions, contact the appropriate Design-Build designer."

3.4.1.3 Distribution of ECI's

In addition to including ECI's in a separate appendix of the final design analysis and after acceptance of the 100 percent corrected design and prior to the start of construction, the design-build Contractor shall e-mail a copy of the ECI's to the

appropriate U.S. Army Corps of Engineer's Field representative for his consideration with a copy also sent to the appropriate individual in following office(s): CENWK-EC-C and CENWK-PM-M. The Government will provide the names and e-mail addresses to the design-build Contractor at either the pre-design or pre-construction conference.

3.4.2 REQUESTS FOR INFORMATION, MEETING MINUTES AND COMMENTS

Copies of Requests for Information (RFI) made by the Contractor to the Government shall be included as an appendix to the design analysis. An index of each RFI, which documents the RFI number, the date RFI given to Government, the date the RFI is answered and the Action Response provided by the Government.

A copy of all meeting minutes and design review comments (if any) with action responses shall be included as an appendix to the design analysis.

Appendices for RFI's and Meeting Minutes and design review comments shall have page numbering that follows the same format as for Calculations listed above.

3.5 DESIGN CERTIFICATION

The Contractor shall provide certification signed by an officer of the Contractor's company attesting that the drawings, specifications and design analyses prepared for the construction of the facility meet or exceed the requirements of the RFP. The certification shall accompany the submission of the design documents along with names and disciplines for the designers of record. This design certification shall include a list of approved or upward deviations (variations) from the solicitation or accepted final design. Prepare the design certification and transmittal letter in the format shown on Attachment A included at the end of this section.

3.6 REVIEW BY GOVERNMENT AGENCIES

3.6.1 DISTRIBUTION OF DESIGN DOCUMENTS FOR CONFORMANCE REVIEW

Government agencies shall receive review documents twenty one (21) days prior to review conferences. Agencies reviewing documents, and in the quantities indicated, are listed below. All documents must contain an index of contents. Work shall be completed to the percentage required prior to conference. Design work shall not continue during the review period between the 100% design submission and the 100% design review conference. All submittals shall be transmitted by **express mail.** Originals of transmittal letters should be sent to the Kansas City District and copies should accompany each mail package. Transmittal letters shall indicate distribution by use of the "ATTN" code shown in the address. Design document set shall include the items listed below. Some of the Construction submittals are also listed. Design submittals shall be submitted as a complete package. The distribution listed below also applies to all design reviews and design package accepted for construction.

3.6.1.1 Submittal Items

The submittal items listed below are intended to identify the different design submittals required throughout the design process and select submittals required during and at the completion of Construction. Each submittal item has an Abbreviation, which will be used in conjunction with the number of required copies. See paragraphs 3.6.1.3 through 3.6.1.6 for required copies for distribution.

SUBMITTAL ITEM - **ABBREVIATION**

Design Analysis Narrative - **DANar**
Design Analysis Calculations - **DACalcs**
Specifications - **Specs**
Submittal Register - **SubReg**
Drawings (1/2 size) - **Dwg-1/2**
Drawings (Full size) - **Dwg-full**
Meeting Minutes with Annotated Comments and Other Attachments - **MMin**
As-Built Drawings - **Asblt**
Electronic Media Drawings - **EMDwg**
Electronic Media Specifications - **EMSpecs**
Electronic Media Design Analysis - **EMDA**
Design Certification Letter - **DCLet**
Color Board - **ColBd**
DD Form 1354 - Transfer and Acceptance of Military Real Property - **DD1354**
Environmental Protection Plan - **EP Plan**
Engineering Considerations and Instructions - **ECI**
Renderings - **Rend**

3.6.1.2 Activity Distribution Addresses

U.S. Army Engineering District, Kansas City
ATTN: CENWK-PM-M, Mr. Rick Whitsell
601 E. 12st
Kansas City, Missouri 64106
Phone: (816) 983-3465

U.S. Army Engineering District, Kansas City
ATTN: CENWK-EC-C, Mr. Ken Niemann
601 E. 12st
Kansas City, Missouri 64106
Phone: (816) 983-3197

Fort Leonard Wood Resident Office
US Army Corps of Engineers
ATTN: CENWK-FM-WD, Mr. Rex Ostrander
PO Box 200
Fort Leonard Wood, Missouri 65473
Phone: (573) 596-0081

Whiteman Resident Office
US Army Corps of Engineers
ATTN: CENWK-FM-WD-W, Mr. Jay Rudy
PO Box 7003
Whiteman AFB, Missouri 65305
Phone: (660) 563-2311

HQ ACC
ATTN: HQ ACC/CECW, Mr. Vance Mitchell
129 Andrews Street, Suite 102, Room 315
Langley AFB, VA 23665-2769
Phone: (757) 764-3680

509th CES/CEC
ATTN: Mr. Randy White

Whiteman AFB, Missouri 65305
Phone: (660) 687-

3.6.1.3 Final 100 % Site & 65% Housing Design Distribution

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item is listed below.

Activity	CENWK-PM-M	CENWK-EC-C	CENWK-FM-WD	HQ, ACC/CECW	509 CES/CEC	CENWK-FM-WD-W
Submittal item						
DANar-	10	2	2	2	10	3
DACalcs-	6	2	2	2	10	3
Specs-	10	2	2	2	10	3
SubReg-	2	2	2	-	-	3
Dwg-1/2-	10	2	2	2	10	3
MMin-*(1)	10	2	2	2	10	3
EMDwg-*(2)	1	-	-	-	-	1
DCLet-	10	2	2	2	10	1
Colbd-*(3)	1	-	-	1	1	1
EP Plan	1	-	1	1	1	1
Rend-*(4)	1	-	-	1	1	1
ECI-	10	2	2	1	10	3

*100 PERCENT SITE SUBMITTAL NOTES:

*(1) To be submitted after Review Conference per requirements of this section.
*(2) Electronic Media Drawings:
Fifteen (15) percent of all drawings, representative of all design disciplines, shall be submitted in AutoCAD 2000 on CD-ROM to verify that the CADD standards being specified are complied with.
*(3) Color boards shall show actual color samples of all proposed exterior and interior finishes.
*(4) Pencil or Computer Sketch Rendering (3 views) of typical housing units.

3.6.1.4 Final 100 % Housing Design Distribution

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item is listed below.

Activity	CENWK-PM-M	CENWK-EC-C	CENWK-FM-WD	HQ, ACC/CECW	509 CES/CEC	CENWK-FM-WD-W
Submittal item						

DANar-	10	2	2	2	10	3
DACalcs-	6	2	2	2	10	3
Specs-	10	2	2	2	10	3
SubReg-	2	2	2	-	-	3
Dwg-1/2-	10	2	2	2	10	3
MMin-*(1)	10	2	2	2	10	3
EMDwg-*(2)	1	-	-	-	-	1
DCLet-	10	2	2	2	10	1
Colbd-*(3)	1	-	-	1	1	1
EP Plan	1	-	1	1	1	1
Rend-*(4)	1	-	-	1	1	1
ECI-	10	2	2	1	10	3

*100 PERCENT HOUSING SUBMITTAL NOTES:

*(1) To be submitted after Review Conference per requirements of this section.
*(2 Electronic Media Drawings:
Fifteen (15) percent of all drawings, representative of all design disciplines, shall be submitted in AutoCAD 2000 on CD-ROM to verify that the CADD standards being specified are complied with.
*(3) Color boards shall show actual color samples of all proposed exterior and interior finishes (Resubmit only if changed form 65% design).
*(4) Pencil or Computer Sketch Rendering (3 views) of typical housing units. (Resubmit only if changed form 65% design).

3.6.1.5 Corrected Final (100 Percent) Design Distribution

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item are listed below.

Activity	CENWK-PM-M	CENWK-EC-C	CENWK-FM-WD	HQ, ACC/CECW	509 CES/CEC	CENWK-FM-WD-W
Submittal item						
DANar-	10	2	2	2	10	4
DACalcs-	6	2	2	2	10	4
Specs-	10	2	2	2	10	4
SubReg-	2	2	2	-	-	4
Dwg-1/2-	10	2	2	2	10	4
MMin-*(1)	10	2	2	2	10	4
EMDwg-*(2)	1	-	-	-	-	1
DCLet-	10	2	2	2	10	1
Colbd-*(3)	1	-	-	1	1	1
EP Plan	1	-	1	1	1	1
Rend-*(4)	1	-	-	1	1	1
ECI-	10	2	2	1	10	4
DD1354-*(4)	1	1	1	1	1	1

*CORRECTED FINAL (100 PERCENT) DESIGN SUBMITTAL NOTES:

*(1) Electronic Media Drawings AutoCAD 2000 on CD-ROM shall be submitted to verify that the CADD standards being specified are complied with.

*(2) Color Boards are not required if there are no changes from the previous design submittal and if only minor changes are required, submit applicable coded samples (with tape ready for application) and corrected color legend. If major changes to the color board are required, resubmit the Color boards with actual color samples of all proposed exterior and interior finishes and revised corrected color legend.
*(3) Color Copy of Rendering and electronic copy of scanned image of rendering on CD.
*(4) Draft submittal of DD Form 1354.

3.6.1.6 "For Construction" Set Distribution

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item are listed below.

Submittal Item	Activity: CENWK-PM-M	CENWK-EC-C	CENWK-FM-WD	HQ, ACC/CECW	509 CES/CEC	CENWK-FM-WD-W
DANar-	10	2	2	2	10	4
DACalcs-	6	2	2	2	10	4
Specs-	10	2	2	2	10	4
SubReg-	2	2	2	-	-	4
Dwg-1/2-	10	2	2	2	10	4
MMin-*(1)	10	2	2	2	10	4
EMDwg-*(2)	1	-	-	-	-	1
DCLet-	10	2	2	2	10	1
Colbd-*(3)	1	-	-	1	1	1
EP Plan	1	-	1	1	1	1
Rend-*(4)	1	-	-	1	1	1
ECI-	10	2	2	1	10	4

*"FOR CONSTRUCTION" SET SUBMITTAL NOTES:

Copies shall incorporate any additional comments made to the Corrected Final (100 percent) design submittal.

*(1) Electronic Media Drawings (AutoCAD 2000), Electronic Media Specifications (compatible with MS Word 2000), and Electronic Media Design Analysis (compatible with MS Word 2000) and Adobe Acrobat 5.0. The Design Analysis Calculations shall be included with the design analysis narrative and shall be scanned and saved in Adobe Acrobat 5.0. The design analysis and calculations shall utilize bookmarks for each chapter of the design analysis and each appendix or calculations.
Electronic Media shall be on CD-ROM (Recordable compact disk with minimum 650 megabyte capacity)
*(2) Reflects all changes made through accepted Corrected Final (100 Percent) Design. Color Boards are not required if there are no changes from the previous design submittal and if only minor changes are required, submit applicable coded samples (with tape ready for application) and corrected color legend. If major changes to the color board are required, resubmit the Color boards with actual color samples of all proposed exterior and interior finishes and revised corrected color legend.
*(3) Framed and matted color Renderings and electronic copy of scanned image of rendering on CD (If different than previous rendering submittal)
*(4) In addition, the Contractor shall e-mail the designated offices a copy of the ECI per requirements stated in this section.

3.6.1.7 As-Built Submittals

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item are listed below.

Activity	CENWK-PM-M	CENWK-EC-C	CENWK-FM-WD	HQ, ACC/CECW	509 CES/CEC	CENWK-FM-WD-W
Submittal Item						
Asblt-	*	*	*	*	*	*
DD1354-*(1)	1	1	1	1	1	1

*NOTES for As-Built Submittals:

*See Section 01040, AS-BUILT DRAWINGS for requirements.
*(1) Final submittal of DD Form 1354.

3.6.1.8 Design Submittal Alternative

The design-build Contractor may submit hard copy design analysis, design analysis calculations and appendices, specifications, submittal register, design certification letter, and engineering considerations and instructions on CD-ROM in an Adobe Acrobat 5.0 .pdf format and maximum of 2 hard copies per office per submittal listed above (CD's are substituted for hard copy numbers). If this alternative is selected, each of these documents shall utilize bookmarks with titles, which ease the review of the design. Each design submittal item and submittal item components shall be made easy to find (i.e. each specification section, chapters and appendices of design analysis, and each submittal item). This alternative will only be allowed if the design-build Contractor presents a legible and easy to review design. Failure to meet this requirement on one design submittal will result in requiring all future submittals and resubmittals to be hard copy as required above, at no additional cost to the Government.

3.6.2 REVIEW COMMENTS:

For each design review submittal, the Contractor will be furnished comments from Kansas City District and other agencies involved in the review process approximately 14 days after receipt and review conference will be held approximately 21 days after receipt. If the Contractor disagrees technically with any comment or comments and does not intend to comply with the comment, he/she shall clearly outline, with justification reasons for noncompliance at the design review conference in order that the comments can be resolved. Annotated comments, including the disposition of all comments shall be furnished in writing by the Contractor within five (5) days of the review conference and shall be recorded in the Contractor prepared Meeting Minutes described in paragraph 3.7.6.1. The written documentation shall be forwarded in the same quantities to the distribution list shown in paragraph: "Distribution of Design Documents for Conformance Review" above.

3.6.3 USING AUTOMATED REVIEW MANAGEMENT SYSTEM:

Conference and post conference action: Government personnel, from the above Government Agencies, will present review comments for discussion and resolution. Copies of comments, annotated with comment action agreed on, will be made available to all parties before the conference adjourns. Unresolved problems will be resolved by immediate follow-on action at the end of conferences. Valid comments will be incorporated. After receipt of final corrected design documents upon incorporation of all backcheck comments (as many backchecks as are deemed necessary by the Government will be conducted), the Kansas City District will recommend acceptance to proceed with construction. The Government intends to utilize the Dr. Checks review system, which is available at: www.buildersnet.org/drchecks, for processing review comments and responses. Access rights will be provided to the Design-Build Contractor after contract award. The Government, however, reserves the right to not accept design document submittals and withhold design payments, if comments are of too great significance. In this case, every effort shall be made during follow-up action between the Contractor and the Kansas City District to resolve conflicts and problems such that documents can be fully accepted. However, if final submittal(s) are incomplete or deficient, requiring correction by the Contractor and resubmittal for review, the cost of rehandling and reviewing will be deducted from payment due the Contractor at the rate of $1000.00, for each design discipline requiring resubmittal, per submittal. "Design Disciplines" in this paragraph consist of Architectural, Structural, Mechanical, Electrical, and Civil/Site work.

3.6.4 DELAYS

Delays caused by the Contractor in completion of the Final (100 percent) design or the Corrected Final (100 percent) design will not be considered as valid reason to delay completion of the entire design. The Government may not be held liable for delays caused by re-submittal efforts caused by designs submitted, which are rejected by the reviewers.

3.6.5 REPRODUCTION (FOR CONSTRUCTION):

Upon the Government's completion of the review of the Corrected Final (100 percent) Design submittal, the Contractor shall reproduce copies of the design documents (accepted for the purposes of beginning construction), subject to the incorporation of the Corrected Final (100 percent) design review comments. The Cover Sheet of the Contractor prepared drawings shall bear the stamp or seal and signature of the registered architect or appropriate engineer responsible for the work and proposed to meet the RFP requirements. The date on each drawing shall reflect the month and year that the drawings were cleared for the purposes of beginning construction. The Cover Sheet of the drawings, Cover Sheet of the Specifications, and Cover Sheet of the Design Analysis shall include the date that the design documents were cleared for the purposes of beginning construction and all cover sheets shall be stamped "For Construction". The Contractor shall provide corrected (100 percent) specifications in both hard copy and electronic media (compatible with MS Word 2000). Distribution shall be as indicated above. The originals will be retained by the Contractor for recording of as-built conditions. Upon completion of the project, the accepted design documents corrected to reflect as-built conditions shall be supplied to the Government. See Section 01040 AS-BUILT DRAWINGS for as-built drawing requirements.

3.6.6 GOVERNMENT DESIGN REVIEW AND ACCEPTANCE

3.6.6.1 Design Review Conference and Post-Design Review Conference Action:

All design review conferences shall be held at Whiteman AFB, Missouri. Government personnel will forward review comments to the Contractor for discussion and resolution prior to the design review conference. Copies of comments, annotated with comment action agreed on, will be made available to all parties before the design review conference adjourns. Unresolved problems will be resolved by immediate follow-on action at end of conferences. Valid comments will be incorporated. Upon satisfactory Government review of the Corrected Final (100 percent) design documents, the Kansas City District will formally provide Government acceptance necessary to initiate construction. The Government, however, reserves the right to not accept design document submittals and to withhold design payments, if comments are of too great a significance. In this case, every effort shall be made during follow-up action between the Contractor and the Kansas City District to resolve conflicts and problems such that documents can be fully accepted. However, if final submittal(s) are incomplete or deficient, requiring correction by the Contractor and resubmittal for review, the cost of

rehandling and reviewing will be deducted from payment due the Contractor at the rate of $1000.00, for each design discipline requiring resubmittal, per submittal. The Contractor shall submit to the Contracting Officer within five (5) calendar days, two (2) copies of meeting minutes summarizing major decision points and issues which requires resolution and the action office. Annotated comments shall be attached to these minutes.

3.6.6.2 Complete Design Documents

The Contractor shall submit complete design documents in the same quantity and to the same offices listed above in paragraph "Distribution of Design Documents for Conformance Review", for each corrected final (100 percent) design submittal (one or more) until the Government is satisfied that all review comments have been addressed and resolved.

3.6.6.3 Accuracy and Completeness of Design

Reviews by the Government of the design documents shall not be construed to be an endorsement of the accuracy or completeness of the design. Design deficiencies or omissions in the accepted design shall be the responsibility of the Contractor.

3.6.7 DD FORM 1354, TRANSFER AND ACCEPTANCE OF MILITARY REAL PROPERTY

The Contractor shall provide, for acceptance, a Draft DD Form 1354 "Transfer and Acceptance of Military Real Property" (Copy attached at the end of this section) with the Corrected Final (100 percent) design documents. The Final Form 1354 shall be submitted with the As-Built submittals, near the end of the construction of the project. DD Form 1354 shall be filled out in accordance with Draft Army Pamphlet 405-45 "Real Property Inventory Management", Table B-16 "Preparation of DD Form 1354" (Copy attached) and Army Pamphlet 415-28 "Guide to Army Real Property Codes" (Copy is available at the following website: http://www.usapa.army.mil/gils/). The number of copies and distribution of the Draft and Final DD Form 1354 shall be as shown in the distribution requirements above.

3.7 REVISIONS TO THE ACCEPTED DESIGN

(a) The accepted design will be used by all parties involved in construction and in administration of the contract. Therefore, it is imperative that the design documents be kept up to date and an effective system of making and distributing changes be implemented. Since changes to the design increase risk of construction errors and deplete available administrative resources, every effort shall be made to minimize revisions to the accepted design. One of the measures of the Contractor's effectiveness of management will be how well the goal of minimizing changes to the accepted design is met. The use of effective quality control during design and utilization of experienced and capable designers are some of the means that are expected to be used to accomplish this goal.

(b) If revisions to the accepted design become necessary, the procedures described in Section 01330 SUBMITTAL PROCEDURES will be used to accomplish the revisions. The revisions will be considered a "Variation" and shall be submitted as a Government Review (Resident Engineer) submittal. All the requirements in paragraph: "Variations" in Section 01330 SUBMITTAL PROCEDURES will apply to revisions to the accepted design. All design analysis and calculations necessary to establish that the proposed revision satisfies applicable design requirements shall be included in the submittal.

3.8 CAPTURED LESSONS LEARNED

Contractor shall keep a list of lessons learned, modifications, RFI's, as-built conditions and field adjustments to the final design. After each turnover of a set of units to the Government, the list shall be provided to and reviewed with the Government for identification of items to be incorporated in future units and designs. The list shall have an item number, description, method of generation, and any notes associated with each item.

Attachment A

[Contractor's Letterhead]

[Date: _____]
[Contract No. _____]

[Reviewing Component Address]

Subj: DESIGN CERTIFICATION AND TRANSMITTAL FOR
[Project Title _____]
[Project Location _____]
[Contract No. _____]

Gentlemen

Enclosed are the following documents, which I hereby certify are in compliance with the RFP requirements of the subject construction contract and can be used to commence construction subject to Government approval:

1. Design Drawings

2. Project Specification

3. Design Analysis

   a. Civil
   b. Water Supply and Wastewater Collection
   c. Architectural
   d. Interior Design
   e. Structural
   f. Mechanical
   g. Fire Protection
   h. Electrical
   i. Environmental Protection, Compliance and Permits
   j. Health and Safety
   k. Sustainable Design

4. Submittals Register

[Typed Name and Signature of an
Officer of the Contractor's Company]

5. All other Design Submittals

6. Deviations

Copy to:
[As standard with the Contractor]

-- End Of Section --

SECTION 01500A

TEMPORARY CONSTRUCTION FACILITIES
02/97

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

1.1.1 Site Plan

The Contractor shall prepare a site plan indicating the proposed location and dimensions of any area to be fenced and used by the Contractor, the number of trailers to be used, avenues of ingress/egress to the fenced area and details of the fence installation. Any areas which may have to be graveled to prevent the tracking of mud shall also be identified. The Contractor shall also indicate if the use of a supplemental or other staging area is desired.

1.1.2 Identification of Employees

The Contractor shall be responsible for furnishing to each employee, and for requiring each employee engaged on the work to display, identification as approved and directed by the Contracting Officer. Prescribed identification shall immediately be delivered to the Contracting Officer for cancellation upon release of any employee. When required, the Contractor shall obtain and provide fingerprints of persons employed on the project. Contractor and subcontractor personnel shall wear identifying markings on hard hats clearly identifying the company for whom the employee works.

1.1.3 Employee Parking

Contractor employees shall park privately owned vehicles in an area designated by the Contracting Officer. This area will be within reasonable walking distance of the construction site. Contractor employee parking shall not interfere with existing and established parking requirements of the military installation.

1.2 AVAILABILITY AND USE OF UTILITY SERVICES

1.2.1 Payment for Utility Services

The Government will make all reasonably required utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the Government or, where the utility is produced by the Government, at reasonable rates determined by the Contracting Officer. The Contractor shall carefully conserve any utilities furnished without charge.

1.2.2 Meters and Temporary Connections

The Contractor, at its expense and in a manner satisfactory to the Contracting Officer, shall provide and maintain necessary temporary connections, distribution lines, and meter bases (Government will provide meters) required to measure the amount of each utility used for the purpose of determining charges. The Contractor shall notify the Contracting Officer, in writing, 5 working days before final electrical connection is desired so that a utilities contract can be established. The Government will provide a meter and make the final hot connection after inspection and approval of the Contractor's temporary wiring installation. The Contractor shall not make the final electrical connection.

1.2.3 Advance Deposit

An advance deposit for utilities consisting of an estimated month's usage or a minimum of $50.00 will be required. The last monthly bills for the fiscal year will normally be offset by the deposit and adjustments will be billed or returned as appropriate. Services to be rendered for the next fiscal year, beginning 1 October, will require a new deposit. Notification of the due date for this deposit will be mailed to the Contractor prior to the end of the current fiscal year.

1.2.4 Final Meter Reading

Before completion of the work and final acceptance of the work by the Government, the Contractor shall notify the Contracting Officer, in writing, 5 working days before termination is desired. The Government will take a final meter reading, disconnect service, and remove the meters. The Contractor shall then remove all the temporary distribution lines, meter bases, and associated paraphernalia. The Contractor shall pay all outstanding utility bills before final acceptance of the work by the Government.

1.2.5 Sanitation

The Contractor shall provide and maintain within the construction area minimum field-type sanitary facilities approved by the Contracting Officer. Government toilet facilities will not be available to Contractor's personnel. Workmen shall not be permitted to use Government toilet facilities in existing buildings.

1.2.6 Telephone

The Contractor shall make arrangements and pay all costs for telephone facilities desired.

1.3 BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

1.3.1 Bulletin Board

Immediately upon beginning of work, the Contractor shall provide a weatherproof glass-covered bulletin board on each active phase of construction, not less than 915 by 1220 mm in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, Wage Rate Information poster, and other information approved by the Contracting Officer. The bulletin board shall be located at the project site in a conspicuous place easily accessible to all employees, as approved by the Contracting Officer. Legible copies of the aforementioned data shall be displayed until work is completed. Upon completion of work the bulletin board shall be removed by and remain the property of the Contractor.

1.3.2 Project and Safety Signs

The requirements for the signs, their content, and location shall be as shown on the drawings at the end of this section. The signs shall be erected within 15 days after receipt of the notice to proceed for each phase of construction. The data required by the safety sign shall be corrected daily, with light colored metallic or non-metallic numerals. Signs shall be erected on and placed on each active phase of construction. NOTE: On the project sign schedule, the Contractor shall add the following items:

SPACE	HEIGHT	LINE	DESCRIPTION	LETTER HEIGHT	STROKE
H	2"	8	BOD:	1.5"	3/16"
I	2"	9	Ribbon Cutting Date:	1.5"	3/16"

Upon completion of the project, the signs shall be removed from the site.

1.4 PROTECTION AND MAINTENANCE OF TRAFFIC

During construction the Contractor shall provide access and temporary relocated roads as necessary to maintain traffic. The Contractor shall maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment and the work, and the erection and maintenance of adequate warning, danger, and direction signs, shall be as required by the State and local authorities having jurisdiction. The traveling public shall be protected from damage to person and property. The Contractor's traffic on roads selected for hauling material to and from the site shall interfere as little as possible with public traffic. The Contractor shall investigate the adequacy of existing roads and the allowable load limit on these roads. The Contractor shall be responsible for the repair of any damage to roads caused by construction operations.

1.4.1 Haul Roads

The Contractor shall, at its own expense, construct access and haul roads necessary for proper prosecution of the work under this contract. Haul roads shall be constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided. The Contractor shall provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. The method of dust control, although optional, shall be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads shall be subject to approval by the Contracting Officer. Lighting shall be adequate to assure full and clear visibility for full width of haul road and work areas during any night work operations. Upon completion of the work, haul roads designated by the Contracting Officer shall be removed.

1.4.2 Barricades

The Contractor shall erect and maintain temporary barricades to limit public access to hazardous areas. Such barricades shall be required whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Barricades shall be securely placed, clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

1.5 CONTRACTOR'S TEMPORARY FACILITIES

1.5.1 Administrative Field Offices

The Contractor shall provide and maintain administrative field office facilities within the construction area at the designated site. Government office and warehouse facilities will not be available to the Contractor's personnel. When the location of work moves from the Midland housing area to the Woodside housing area, the Contractor shall be responsible for relocating the administrative field office facilities to the Woodside site.

1.5.2 Storage Area

The Contractor shall construct a temporary 1.8 m high chain link fence around trailers and materials. The fence shall include plastic strip inserts, colored brown, so that visibility through the fence is obstructed. Fence posts may be driven, in lieu of concrete bases, where soil conditions permit. Trailers, materials, or equipment shall not be placed or stored outside the fenced area unless such trailers, materials, or equipment are assigned a separate and

distinct storage area by the Contracting Officer away from the vicinity of the construction site but within the military boundaries. Trailers, equipment, or materials shall not be open to public view with the exception of those items which are in support of ongoing work on any given day. Materials shall not be stockpiled outside the fence in preparation for the next day's work. Mobile equipment, such as tractors, wheeled lifting equipment, cranes, trucks, and like equipment, shall be parked within the fenced area at the end of each work day.

1.5.3 Supplemental Storage Area

Upon Contractor's request, the Contracting Officer will designate another or supplemental area for the Contractor's use and storage of trailers, equipment, and materials. This area may not be in close proximity of the construction site but shall be within the military boundaries. Fencing of materials or equipment will not be required at this site; however, the Contractor shall be responsible for cleanliness and orderliness of the area used and for the security of any material or equipment stored in this area. Utilities will not be provided to this area by the Government.

1.5.4 Appearance of Trailers

Trailers utilized by the Contractor for administrative or material storage purposes shall present a clean and neat exterior appearance and shall be in a state of good repair. Trailers which, in the opinion of the Contracting Officer, require exterior painting or maintenance will not be allowed on the military property.

1.5.5 Maintenance of Storage Area

Fencing shall be kept in a state of good repair and proper alignment. Should the Contractor elect to traverse, with construction equipment or other vehicles, grassed or unpaved areas which are not established roadways, such areas shall be covered with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways; gravel gradation shall be at the Contractor's discretion. Grass located within the boundaries of the construction site shall be mowed for the duration of the project. Grass and vegetation along fences, buildings, under trailers, and in areas not accessible to mowers shall be edged or trimmed neatly.

1.5.6 New Building

In the event a new building is constructed for the temporary project field office, it shall be a minimum 3.6 m in width, 5 m in length and have a minimum of 2.1 m headroom. It shall be equipped with approved electrical wiring, at least one double convenience outlet and the required switches and fuses to provide 110-120 volt power. It shall be provided with a work table with stool, desk with chair, two additional chairs, and one legal size file cabinet that can be locked. The building shall be waterproof, shall be supplied with heater, shall have a minimum of two doors, electric lights, a telephone, a battery operated smoke detector alarm, a sufficient number of adjustable windows for adequate light and ventilation, and a supply of approved drinking water. Approved sanitary facilities shall be furnished. The windows and doors shall be screened and the doors provided with dead bolt type locking devices or a padlock and heavy duty hasp bolted to the door. Door hinge pins shall be non-removable. The windows shall be arranged to open and to be securely fastened from the inside. Glass panels in windows shall be protected by bars or heavy mesh screens to prevent easy access to the building through these panels. In warm weather, air conditioning capable of maintaining the office at 50 percent relative humidity and a room temperature 11 degrees C below the outside temperature when the outside temperature is 35 degrees C, shall be furnished. Any new building erected for a temporary field office shall be maintained by the Contractor during the life of the contract and upon completion and acceptance of the work shall become the property of the Contractor and shall be removed from the site. All

charges for telephone service for the temporary field office shall be borne by the Contractor, including long distance charges up to a maximum of $75.00 per month.

1.5.7 Security Provisions

Adequate outside security lighting shall be provided at the Contractor's temporary facilities. The Contractor shall be responsible for the security of its own equipment; in addition, the Contractor shall notify the appropriate law enforcement agency requesting periodic security checks of the temporary project field office.

1.6 GOVERNMENT FIELD OFFICE

1.6.1 ACCOMMODATIONS FOR GOVERNMENT INSPECTORS

The Contractor shall provide the Government Inspectors with an office, approximately 19 square meters in floor area, located where directed and providing space heat, air-conditioning, adequate electric lighting and power, drinking water facilities, and toilet facilities consisting of one lavatory and one water closet complete with connections to water and sewer mains. The Contractor shall provide the same computer system and equipment as listed in Section 01312A, paragraph 1.3 for Government use, and a dedicated DSL connection for the computer. The office shall be furnished with one legal size filing cabinet with four drawers, one drafting table with stool, one plan rack, one desk, and three chairs. Used furniture, in good condition, will be acceptable. Entrance doors shall be equipped with a substantial lock. The contractor shall provide janitor service, fuel for the heating facilities, electricity, two telephone lines (in addition to DSL) and water, all at no cost to the Government, except the Contractor will not be liable for Government long-distance calls. A mail slot in the door or a lockable mail box mounted on the surface of the door shall be provided. At completion of the project, the office shall remain the property of the Contractor and shall be removed from the site. Utilities shall be connected and disconnected in accordance with local codes and to the satisfaction of the Contracting Officer. TEXT DELETED

1.6.2 Trailer-Type Mobile Office

The Contractor may, at its option, furnish and maintain a trailer-type mobile office acceptable to the Contracting Officer and providing as a minimum the facilities specified above. The trailer shall be securely anchored to the ground at all four corners to guard against movement during high winds.

1.7 PLANT COMMUNICATION

Whenever the Contractor has the individual elements of its plant so located that operation by normal voice between these elements is not satisfactory, the Contractor shall install a satisfactory means of communication, such as telephone or other suitable devices. The devices shall be made available for use by Government personnel.

1.8 TEMPORARY PROJECT SAFETY FENCING

As soon as practicable, but not later than 15 days after the date established for commencement of work, the Contractor shall furnish and erect temporary project safety fencing at the work site. The safety fencing shall consist of high visibility orange colored, high density polyethylene grid or approved equal, a minimum of 1.1 m high, steel posts, and two tension wires, top and bottom. The fence fabric shall be supported and tightly secured to steel posts, located on maximum 3 m centers, and the top and bottom tension wires, located 6 inches above grade and 6 inches below top of fabric, constructed at the approved location. During phasing, the temporary fencing acting as teh secure base perimeter shall be a Class B security fence consisting of "T" posts with four feet exposed, five

strands of barbed wire, and appropriate warning signs. A barbed wire shall be 3 inches above ground, 3 inches below top of posts, and evenly spaced on the posts. Contractor shall reconfigure fencing to match phased turn over of units. The TEXT DELETED fencing shall be maintained by the Contractor during the life of the contract and, upon completion and acceptance of the work, shall become the property of the Contractor and shall be removed from the work site.

1.9 CLEANUP AND DISPOSAL OF DEBRIS

At the end of each work day, the Contractor shall clean the work area and stack building materials in a
neat manner as approved by the Contracting Officer or his/her designated representative. Any dirt or mud which is tracked onto paved or surfaced roadways shall be cleaned away daily or more freqeuntly to maintain safe driving conditions.. Materials resulting from demolition activities which are salvageable shall be stored within the fenced area described above or at the supplemental storage area. Stored material not in trailers, whether new or salvaged, shall be neatly stacked when stored. Upon completion of the work, the Contractor shall ensure that all dirt, trash and debris resulting from construction operations is removed from the work area. Disposal of debris shall be made by the Contractor at his/her expense. All debris shall be delivered to a state-approved sanitary landfill. Notice: The disposal of demolition waste is regulated by the Department of Natural Resources under chapter 260, RSMo. Such waste, in types and quantities established by the department, shall be taken to a demolition landfill or a sanitary landfill for disposal at the Contractor’s expense. Any material that is deposited elsewhere than areas designated as approved by the Contracting Officeror his/her designated representative shall be rehandled and deposited where directed. No payment shall be made to the Contractor for rehandling such material.

1.10 RESTORATION OF STORAGE AREA

Upon completion of the project and after removal of trailers, materials, and equipment from within the fenced area, the fence shall be removed and will become the property of the Contractor. Areas used by the Contractor for the storage of equipment or material, or other use, shall be restored to the original or better condition. Gravel used to traverse grassed areas shall be removed and the area restored to its original condition, including top soil and seeding as necessary.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

-- End of Section --

SECTION 01525

SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS
11/02

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z359.1	(1999) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components

ASME INTERNATIONAL (ASME)

ASME B30.5	(2000) Mobile and Locomotive Cranes
ASME B30.8	(2000) Floating Cranes and Floating Derricks
ASME B30.22	(2000) Articulating Boom Cranes

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)

29 CFR 1910	Safety and Health Regulation in General Industry
29 CFR 1910.94	Ventilation
29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
29 CFR 1910.146	Permit-required Confined Spaces
29 CFR 1915	Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.62	Lead in Construction
29 CFR 1926.65	Hazardous Waste Operations and Emergency Response
29 CFR 1926.450	Scaffolds
29 CFR 1926.500	Fall Protection
29 CFR 1926.1101	Asbestos

U. S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(1996) Safety and Health Requirements Manual

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(1998) Portable Fire Extinguishers
NFPA 70	(2002) National Electrical Code
NFPA 241	(2000) Safeguarding Construction, Alteration,

and Demolition Operations

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G

Activity Hazard Analysis (AHA); G

Crane Critical Lift Plan; G

Temporary Facilities and Electrical Layout ; G

SD-06 Test Reports

Reports

Submit reports as their incidence occurs, in accordance with the requirements of the paragraph entitled, "Reports."

Accident Reports

Monthly Exposure Reports

Regulatory Citations and Violations

Crane Reports

Certificate of Compliance (Crane)

SD-07 Certificates

Confined Space Entry Permit

Submit one copy of each permit attached to each Daily Quality Control Report.

1.3 DEFINITIONS

a. Associate Safety Professional (ASP). An individual who is currently certified by the Board of Certified Safety Professionals.

b. Certified Construction Health & Safety Technician (CHST). An individual who is currently certified by the Board of Certified Safety Professionals.

c. Certified Industrial Hygienist (CIH). An individual who is currently certified by the American Board of Industrial Hygiene.

d. Certified Safety Professional (CSP). An individual who is currently certified by the Board of Certified Safety Professionals.

e. Certified Safety Trained Supervisor (STS). An individual who is currently certified by the Board of Certified Safety Professionals.

f. High Visibility Accident. Any mishap which may generate publicity and/or high visibility.

g. Low-slope roof. A roof having a slope less than or equal to 4 in 12 (vertical to horizontal).

h. Medical Treatment. Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

i. Multi-Employer Work Site (MEWS). A multi-employer work site, as defined by OSHA, is one in which many employers occupy the same site. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors.

j. Operating Envelope. The area surrounding any crane. Inside this "envelope" is the crane, the operator, riggers, rigging gear between the hook and the load, the load and the crane's supporting structure (ground, rail, etc.).

k. Recordable Injuries or Illnesses. Any work-related injury or illness that results in:

(1) Death, regardless of the time between the injury and death, or the length of the illness;

(2) Days away from work;

(3) Restricted work;

(4) Transfer to another job;

(5) Medical treatment beyond first aid;

(6) Loss of consciousness; or

(7) A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.

l. Site Safety and Health Officer (SSHO). The superintendent or other qualified or competent person who is responsible for the on-site safety and health required for the project. The Contractor quality control (QC) person cannot be the SSHO, even though the QC has safety inspection responsibilities as part of the QC duties.

m. Steep roof. A roof having a slope greater than 4 in 12 (vertical to horizontal).

n. "USACE" property and equipment specified in USACE EM 385-1-1 should be interpreted as Government property and equipment.

o. Weight Handling Equipment (WHE) Accident. A WHE accident occurs when any one or more of the six elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; and collision, including unplanned contact between the load, crane, and/or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, roll over, etc.).

1.4 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, work performed shall comply with USACE EM 385-1-1, and federal, state, and local, laws, ordinances, criteria, rules and regulations. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

1.5 DRUG PREVENTION PROGRAM

Conduct a proactive drug and alcohol use prevention program for all workers, prime and subcontractor, on the site. Document that no employee uses illegal drugs or consumes alcohol during work hours. Document there are no employees under the influence of drugs or alcohol during work hours. After accidents, collect blood, urine, or saliva specimens and test the injured and involved employees for the influence of drugs and alcohol. A copy of the test shall be made available to the Contracting Officer upon request.

1.6 SITE QUALIFICATIONS, DUTIES AND MEETINGS

1.6.1 Personnel Qualifications

1.6.1.1 Site Safety and Health Officer (SSHO)

Site Safety and Health Officer (SSHO) shall be provided at the work site at all times to perform safety and occupational health management, surveillance, inspections, and safety enforcement for the Contractor. The SSHO shall meet the following requirements:

Level 4:

A minimum of 10 years safety work of a progressive nature with at least 5 years of experience on similar projects.

30-hour OSHA construction safety class or equivalent within the last 5 years.

An average of at least 24 hours of formal safety training each year for the past 5 years with training for competent person status for at least the following areas of competency: Excavation; Scaffolding; Fall protection; Hazardous energy; Confined space;Personal protective equipment and clothing to include selection, use and maintenance; .

1.6.1.2 Certified Safety Professional (CSP)

Provide a Certified Safety Professional (CSP) at the work site to perform safety and occupational health management, surveillance, inspections, and safety enforcement for the Contractor. The CSP shall be the safety and occupational health "competent person" as defined by USACE EM 385-1-1. The CSP will develop, implement, and oversee the Accident Prevention Plan (APP). The CSP will analyze the Activity Hazard Analysis (AHA) to be reviewed by competent field personnel. Activity Hazard Analysis shall include the excavation, stockpiling, and beneficial re-use of chlordane treated soil found around old existing barracks and family housing units. 1.6.1.2 Competent Person for Confined Space Entry

Provide a competent person meeting the requirements of EM 385-1-1 who is assigned in writing by the Designated Authority to assess confined spaces and who possesses demonstrated knowledge, skill and ability to:

a. Identify the structure, location, and designation of confined and permit-required confined spaces where work is done;

b. Calibrate and use testing equipment including but not limited to, oxygen indicators, combustible gas indicators, carbon monoxide indicators, and

carbon dioxide indicators, and to interpret accurately the test results of that equipment;

c. Perform all required tests and inspections specified in 29 CFR 1910.146 and 29 CFR 1915 Subpart B;

d. Assess hazardous conditions including atmospheric hazards in confined space and adjacent spaces and specify the necessary protection and precautions to be taken;

e. Determine ventilation requirements for confined space entries and operations;

f. Assess hazards associated with hot work in confined and adjacent space and determine fire watch requirements; and,

g. Maintain records required.

h. If confined spaces are entered, the Contractor shall identify emergency response personnel who are trained to rescue a victim from a confined space.

1.6.1.5 Competent Person for the Health Hazard Control and Respiratory Protection Program

Provide a competent person meeting the requirements of EM 385-1-1 who is:

a. Capable by education, specialized training and/or experience of anticipating, recognizing, and evaluating employee exposure to hazardous chemical, physical and biological agents in accordance with USACE EM 385-1-1, Section 6.

b. Capable of specifying necessary controls and protective actions to ensure worker health.

1.6.1.3 Crane Operators

Crane operators shall meet the requirements in USACE EM 385-1-1, Appendix G.

1.6.2 Personnel Duties

1.6.2.1 Site Safety and Health Officer (SSHO)/Superintendent

a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Safety inspection logs shall be attached to the Contractors' daily quality control report.

b. Conduct mishap investigations and complete required reports. Maintain the OSHA Form 300 and Daily Production reports for prime and sub-contractors.

c. Maintain applicable safety reference material on the job site.

d. Attend the pre-construction conference, pre-work meetings including preparatory inspection meeting, and periodic in-progress meetings.

e. Implement and enforce accepted APPS and AHAs.

f. Maintain a safety and health deficiency tracking system that monitors outstanding deficiencies until resolution. A list of unresolved safety and health deficiencies shall be posted on the safety bulletin board.

g. Documents sub-contractor compliance with safety and health requirements.

Failure to perform the above duties will result in dismissal of the superintendent and/or SSHO, and a project work stoppage. The project work stoppage will remain in effect pending approval of a suitable replacement.

1.6.2.2 Certified Safety Professional (CSP)

a. Perform safety and occupational health management, surveillance, inspections, and safety enforcement for the project.

b. Perform as the safety and occupational health "competent person" as defined by USACE EM 385-1-1.

c. Be on site at least monthlywhenever new work, new phase of work, and/or testing is being performed.

When inspections yield deficiencies, an after action report will be filed and the corrections listed and follow-up procedures listed to the satisfaction of the government.

d. Conduct and document safety inspections.

e. Shall have no other duties other than safety and occupational health management, inspections, and enforcement on this contract.

If the CSP is appointed as the SSHO all duties of that position shall also be preformed.

1.6.3 Meetings

1.6.3.1 Preconstruction Conference

a. The Contractor will be informed, in writing, of the date of the preconstruction conference. The purpose of the preconstruction conference is for the Contractor and the Contracting Officer's representatives to become acquainted and explain the functions and operating procedures of their respective organizations and to reach mutual understanding relative to the administration of the overall project's APP before the initiation of work.

b. Contractor representatives who have a responsibility or significant role in accident prevention on the project shall attend the preconstruction conference. This includes the project superintendent, site safety and health officer, quality control supervisor, or any other assigned safety and health professionals who participated in the development of the APP (including the AHAs and special plans, program and procedures associated with it).

c. The Contractor shall discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated activity hazard analyses (AHAs) that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer's representative as to which phases will require an analysis. In addition, a schedule for the preparation, submittal, review, and acceptance of AHAs shall be established to preclude project delays.

d. Deficiencies in the submitted APP will be brought to the attention of the Contractor at the preconstruction conference, and the Contractor shall revise the plan to correct deficiencies and re-submit it for acceptance. Work shall not begin until there is an accepted APP.

1.6.3.2 Weekly Safety Meetings

Conduct weekly safety meetings at the project site for all employees. The Contracting Officer will be informed of the meeting in advance and be allowed attendance. Minutes showing contract title, signatures of attendees and a list of topics discussed shall be attached to the Contractors' daily quality control report.

1.6.3.3 Work Phase Meetings

The appropriate AHA shall be reviewed and attendance documented by the Contractor at the preparatory, initial, and follow-up phases of quality control inspection. The analysis should be used during daily inspections to ensure the implementation and effectiveness of safety and health controls.

1.7 TRAINING

1.7.1 New Employee Indoctrination

New employees (prime and sub-contractor) will be informed of specific site hazards before they begin work. Documentation of this orientation shall be kept on file at the project site.

1.7.2 Periodic Training

Provide Safety and Health Training in accordance with USACE EM 385-1-1 and the accepted APP. Ensure all required training has been accomplished for all onsite employees.

1.7.3 Training on Activity Hazard Analysis (AHA)

Prior to beginning a new phase, training will be provided to all affected employees to include a review of the AHA to be implemented.

1.8 ACCIDENT PREVENTION PLAN (APP)

The Contractor shall use a qualified person to prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of USACE EM 385-1-1 and as supplemented herein. Cover all paragraph and subparagraph elements in USACE EM 385-1-1, Appendix A, "Minimum Basic Outline for Preparation of Accident Prevention Plan". Where a paragraph or subparagraph element is not applicable to the work to be performed indicate "Not Applicable" next to the heading. Specific requirements for some of the APP elements are described below at paragraph 1.8.1. The APP shall be job-specific and shall address any unusual or unique aspects of the project or activity for which it is written. The APP shall interface with the Contractor's overall safety and health program. Any portions of the Contractor's overall safety and health program referenced in the APP shall be included in the applicable APP element and made site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP shall be signed by the person and firm (senior person) preparing the APP, the Contractor, the on-site superintendent, the designated site safety and health officer and any designated CSP and/or CIH.

Submit the APP to the Contracting Officer 30 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP. The Contracting Officer reviews and comments on the Contractor's submitted APP and accepts it when it meets the requirements of the contract provisions.

Once accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

Once work begins, changes to the accepted APP shall be made with the knowledge

and concurrence of the Contracting Officer, project superintendent, SSHO and quality control manager. Should any unforeseen hazard become evident during the performance of work, the project superintendent shall inform the Contracting Officer, both verbally and in writing, for resolution as soon as possible. In the interim, all necessary action shall be taken by the Contractor to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment.

In additon, the Contractor shall assess the need for automatic external defibrillators (AEDs) depending on the base EMS response time or ability to respond to a sudden cardiac arrest onsite.

Copies of the accepted plan will be maintained at the resident engineer's office and at the job site.
The APP shall be continuously reviewed and amended, as necessary, throughout the life of the contract. Unusual or high-hazard activities not identified in the original APP shall be incorporated in the plan as they are discovered.

1.8.1 EM 385-1-1 Contents

In addition to the requirements outlines in Appendix A of USACE EM 385-1-1, the following is required:

a. Names and qualifications (resumes including education, training, experience and certifications) of all site safety and health personnel designated to perform work on this project to include the designated site safety and health officer and other competent and qualified personnel to be used such as CSPs, CIHs, STSs, CHSTs. The duties of each position shall be specified.

b. Qualifications of competent and of qualified persons. As a minimum, competent persons shall be designated and qualifications submitted for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; personal protective equipment and clothing to include selection, use and maintenance.

c. Confined Space Entry Plan. Develop a confined space entry plan in accordance with USACE EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1915, and 29 CFR 1926, and any other federal, state and local regulatory requirements identified in this contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders. (If there is no confined space work, include a statement that no confined space work exists and none will be created.)

d. Health Hazard Control Program. The Contractor shall designate a competent and qualified person to establish and oversee a Health Hazard Control Program in accordance with USACE EM 385-1-1, Section 6. The program shall ensure that employees, on-site Government representatives, and others, are not adversely exposed to chemical, physical and biological agents and that necessary controls and protective actions are instituted to ensure health.

e. Crane Critical Lift Plan. Prepare and sign weight handling critical lift plans for lifts over 75 percent of crane hoist's maximum load limit; lifts involving more than one crane or hoist; lifts of personnel; and technically difficult lifts involving non-routine rigging or operation, sensitive equipment, or unusual safety risks in accordance with USACE EM 385-1-1, paragraph 16.c.18. and submit 15 calendar days prior to on-site work.

f. Alcohol and Drug Abuse Plan

(1) Describe plan for random checks and testing with pre-employment screening in accordance with the DFAR Clause subpart 252.223-7004, "Drug Free Work Force."

(2) Description of the on-site prevention program

g. Fall Protection and Prevention (FP&P) Plan. The plan shall be site specific and address all fall hazards in the work place and during different phases of construction. It shall address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 6 feet. A qualified person shall prepare and sign the plan. The plan shall include fall protection and prevention systems, equipment and methods employed for every phase of work, responsibilities, rescue and escape equipment and operations, training requirements, and monitoring methods. Fall Protection and Prevention Plan shall be revised every six months for lengthy projects, reflecting any changes during the course of construction due to changes in personnel, equipment, systems or work habits. The accepted Fall Protection and Prevention Plan shall be kept and maintained at the job site for the duration of the project. In additon, the Contractor shall make arrangements for emergency response to rescue fall victims at heights.

h. Lead Abatement Plan. The safety and health aspects of lead-based paint removal, prepared in accordance with Section 13281A, Lead Hazard Control Activities. The Lead Abatement Plan shall be coordiated with the Contractor's APP. The Contractor is responsible for the health and safety of their subcontractors.

j. Asbestos Hazard Abatement Plan. The safety and health aspects of asbestos work, prepared in accordance with Section 13280A, Asbestos Abatement The Asbestos Hazard Abatement Plan shall be coordinated with the Contractor's Accident Prevention Plan, such that there are no conflicts.

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m. Site Demolition Plan. The safety and health aspects prepared in accordance with Section 02220A, Demolition

n. Excavation Plan. The safety and health aspects prepared in accordance with Section 02302N, Backfilling, and Compacting for Utilities.

o. Training Records and Requirements. List of mandatory training and certifications which are applicable to this project (e.g. explosive actuated tools, confined space entry, fall protection, crane operation, vehicle operator, forklift operators, personal protective equipment); list of requirements for periodic retraining/certification; outline requirements for supervisory and employee safety meetings.

1.9 ACTIVITY HAZARD ANALYSIS (AHA)

The Activity Hazard Analysis (AHA) format shall be in accordance with USACE EM 385-1-1. Submit the AHA for review at least 15calendar days prior to the start of each phase. Format subsequent AHA as amendments to the APP. An AHA will be developed by the Contractor for every operation involving a type of work presenting hazards not experienced in previous project operations or where a new work crew or subcontractor is to perform work. The analysis must identify and evaluate hazards and outline the proposed methods and techniques for the safe completion of each phase of work. At a minimum, define activity being performed, sequence of work, specific safety and health hazards anticipated, control measures (to include personal protective equipment) to eliminate or reduce each hazard to acceptable levels, equipment to be used, inspection requirements, training requirements for all involved, and the competent person in charge of that phase of work. For work with fall hazards, including fall hazards

associated with scaffold erection and removal, identify the appropriate fall arrest systems. For work with materials handling equipment, address safeguarding measures related to materials handling equipment. For work requiring excavations, include requirements for safeguarding excavations. An activity requiring an AHA shall not proceed until the AHA has been accepted by the Contracting Officer's representative and a meeting has been conducted by the Contractor to discuss its contents with everyone engaged in the activity, including on-site Government representatives. The Contractor shall document meeting attendance at the preparatory, initial, and follow-up phases of quality control inspection. The AHA shall be continuously reviewed and, when appropriate, modified to address changing site conditions or operations. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.

The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.

Activity hazard analyses shall be updated as necessary to provide an effective response to changing work conditions and activities. The on-site superintendent, site safety and health officer and competent persons used to develop the AHAs, including updates, shall sign and date the AHAs before they are implemented.

In addtion, the Contractor shall assess the need automatic external defibrillators (AEDs) based on base ems response time. If the need exists, the Contractor will provide the AED and First/Aid CPR trained personnel qualified to operate AEDs.

1.10 DISPLAY OF SAFETY INFORMATION

Within 10 calendar days after commencement of work, erect a safety bulletin board at the job site. The following information shall be displayed on the safety bulletin board in clear view of the on-site construction personnel, maintained current, and protected against the elements and unauthorized removal:

a. Map denoting the route to the nearest emergency care facility.

b. Emergency phone numbers.

c. Copy of the most up-to-date APP.

d. AHA(s).

e. OSHA 300A Form.

f. Results of current safety inspections, deficiencies corrected, after action report; and any air monitoring results, e.g., asbestos, confined spaces, etc.

g. Confined space entry permit.

h. Location of emergency equipment, AED, fire extinguishers, etc.

i. A sign indicating the number of hours worked since last lost workday accident.

j. OSHA Safety and Health Protection-On-The-Job Poster.

k. Safety and Health Warning Posters.

1.11 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those

listed in the article "References." Maintain applicable equipment manufacturer's manuals.

1.12 EMERGENCY MEDICAL TREATMENT

Contractors will arrange for their own emergency medical treatment. Government has no responsibility to provide emergency medical treatment.

1.13 REPORTS

1.13.1 Accident Reports

a. For recordable injuries and illnesses, and property damage accidents resulting in at least $2,000 in damages, the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the USACE Accident Report Form 3394 and provide the report to the Contracting Officer within 1 calendar day(s) of the accident. The Contracting Officer will provide copies of any required or special forms.

b. For a weight handling equipment accident the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the WHE Accident Report form and provide the report to the Contracting Officer within 30 calendar days of the accident. The Contracting Officer will provide a blank copy of the accident report form.

1.13.2 Accident Notification

Notify the Contracting Officer as soon as practical, but not later than 12, after any accident meeting the definition of Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than $2,000, or any weight handling equipment accident involving a overturned crane, collapsed boom, or any other major damage to the crane or adjacent property. Information shall include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on site and Government investigation is conducted.

1.13.3 Monthly Exposure Reports

Monthly exposure reporting to the Contracting Officer is required to be attached to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both prime and subcontractor. The Contracting Officer will provide copies of any special forms.

1.13.4 Regulatory Citations and Violations

Contact the Contracting Officer immediately of any OSHA or other regulatory agency inspection or visit, and provide the Contracting Officer with a copy of each citation, report, and contractor response. Correct violations and citations promptly and provide written corrective actions to the Contracting Officer.

1.13.5 Crane Reports

Submit crane inspection reports required in accordance with USACE EM 385-1-1, Appendix H and as specified herein with Daily Reports of Inspections.

1.14 HOT WORK

Prior to performing "Hot Work" (welding, etc.) or operating other flame-producing devices, a written permit shall be requested from the Whiteman Air Force Base

Fire Department. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. The Contractor will provide at least two (2) twenty (20) pound 4A:20 BC rated extinguishers for normal "Hot Work". All extinguishers shall be current inspection tagged, approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity.

a. Oil painting materials (paint, brushes, empty paint cans, etc.), and all flammable liquids shall be removed from the facility at quitting time. All painting materials and flammable liquids shall be stored outside in a suitable metal locker or box and will require re-submittal with non-hazardous materials.

b. Accumulation of trays, paper, shavings, sawdust, boxes and other packing materials shall be removed from the facility at the close of each workday and such material disposed of in the proper containers located away from the facility.

c. The storage of combustible supplies shall be a safe distance from structures.

d. Area outside the facility undergoing work shall be cleaned of trash, paper, or other discarded combustibles at the close of each workday.

e. All portable electric devices (saws, sanders, compressors, extension chord, lights, etc.) shall be disconnected at the close of each workday. When possible, the main electric switch in the facility shall be deactivated.

f. When starting work in the facility, Contractors shall require their personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency phone number. ANY FIRE, NO MATTER HOW SMALL, SHALL BE REPORTED TO THE RESPONSIBLE FIRE DEPARTMENT IMMEDIATELY.

1.15 TEMPORARY FACILITIES AND ELECTRICAL LAYOUT

The Contractor shall provide Temporary Facilities and Electrical Layout plans 30 days prior to setup of facilities. Plans shall include all facilities for personnel or material storage temporary electrical distribution and connections. Plans shall be in detail to allow for appropriate response of emergency services and in accordance with EM 385-1-1.

PART 2 PRODUCTS

2.2 CONFINED SPACE SIGNAGE

The Contractor shall provide permanent signs integral to or securely attached to access covers for new permit-required confined spaces. Signs wording: "DANGER--PERMIT-REQUIRED CONFINED SPACE - DO NOT ENTER -" in bold letters a minimum of 25 mm(one inch) in height and constructed to be clearly legible with all paint removed. The signal word "DANGER" shall be red and readable from 1.52 m(5 feet).

PART 3 EXECUTION

3.1 CONSTRUCTION AND/OR OTHER WORK

The Contractor shall comply with USACE EM 385-1-1, NFPA 241, the APP, the AHA,

and other related submittals and activity fire and safety regulations.

3.1.1 Hazardous Material Use

Each hazardous material must receive approval prior to being brought onto the job site or prior to any other use in connection with this contract. Allow a minimum of 10 working days for processing of the request for use of a hazardous material --Required by Whiteman AFB Bioenvironmental deparment. Any work or storage involving hazardous chemicals or materials must be done in a manner that will not expose Government or Contractor employees to any unsafe or unhealthful conditions. Adequate protective measures must be taken to prevent Government or Contractor employees from being exposed to any hazardous condition that could result from the work or storage. The Prime Contractor shall keep a complete inventory of hazardous materials brought onto the work-site. Approval by the Contracting Officer of protective measures and storage area is required prior to the start of the work.

3.1.2 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocynates, lead-based paint are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials.

3.1.3 Unforeseen Hazardous Material

The design should have identified materials such as PCB, lead paint, and friable and non-friable asbestos. If additional material, not indicated, that may be hazardous to human health upon disturbance during construction operations is encountered, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to "FAR 52.243-4, Changes" and "FAR 52.236-2, Differing Site Conditions."

3.2 PRE-OUTAGE COORDINATION MEETING

Contractors are required to apply for utility outages at least 15 days in advance. As a minimum, the request should include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Special requirements for electrical outage requests are contained elsewhere in this specification section. Once approved, and prior to beginning work on the utility system requiring shut down, the Contractor shall attend a pre-outage coordination meeting with the Contracting Officer and the Base Civil (facilities) Engineers to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

3.3 FALL HAZARD PROTECTION AND PREVENTION

The Contractor shall establish a fall protection and prevention program, for the protection of all employees exposed to fall hazards. The program shall include company policy, identify responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and escape procedures. The Contractor shall be able to rescue a fallen victim at heights or make arrangements to have a subcontractor on standby.

3.3.1 Training

The Contractor shall institute a fall protection training program. As part of the Fall Hazard Protection and Prevention Program, the Contractor shall provide training for each employee who might be exposed to fall hazards. Training requirements shall be in accordance with USACE EM 385-1-1, section 21.A.16.

3.3.2 Fall Protection Equipment

The Contractor shall enforce use of the fall protection equipment designated for each specific work activity in the Fall Protection and Prevention Plan and/or AHA at all times when an employee is on a surface 1.8 m(6 feet) or more above lower levels. Fall protection systems such as guardrails, personnel fall arrest system, safety nets, etc., are required when working within 1.8m (6 feet) of any leading edge. In addition to the required fall protection systems, safety skiff, personal floatation devices, life rings etc., are required when working above or next to water in accordance with USACE EM 385-1-1, paragraphs 05.I. and 05.J. Personal fall arrest systems are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall arrest systems may be required when operating other equipment such as scissor lifts if the work platform is capable of being positioned outside the wheelbase. Fall protection must comply with 29 CFR 1926.500, Subpart M and USACE EM 385-1-1.

3.3.2.1 Personal Fall Arrest Equipment

Personal fall arrest equipment, systems, subsystems, and components shall meet ANSI Z359.1. Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest device. Body belts may only be used as a positioning device system (for uses such as steel reinforcing assembly and in addition to an approved fall arrest system). Harnesses shall have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Only locking snap hooks and carabiners shall be used. Webbing, straps, and ropes shall be made of synthetic fiber. The maximum free fall distance when using fall arrest equipment shall not exceed 1.8 m (6 feet). The total fall distance shall always be taken into consideration when attaching a person to a fall arrest system.

3.3.3 Fall Protection for Roofing Work

Fall protection controls shall be implemented based on the type of roof being constructed and work being performed. The roof area to be accessed shall be evaluated for its structural integrity including weight-bearing capabilities for the projected loading.

a. Low Sloped Roofs:

(1) For work within 1.8 m (6 feet) of an edge, on low-slope roofs, personnel shall be protected from falling by use of personal fall arrest systems, guardrails, or safety nets. A safety monitoring system is not adequate fall protection and is not authorized.

(2) For work greater than 1.8 m (6 feet) from an edge, warning lines shall be erected and installed in accordance with 29 CFR 1926.500 and USACE EM 385-1-1.

b. Steep Roofs: Work on steep roofs requires a personal fall arrest system, guardrails with toe-boards, or safety nets. This requirement also includes residential or housing type construction.

3.3.4 Safety Nets

If safety nets are used as the selected fall protection system on the project, they shall be provided at unguarded workplaces, over water, machinery, dangerous operations and leading edge work. Safety nets shall be tested immediately after installation with a drop test of 181.4 kg (400 pounds) and every six months thereafter.

3.3.5 Existing Anchorage

Existing anchorages, to be used for attachment of personal fall arrest equipment, shall be certified (or re-certified) by a qualified person in accordance with ANSI Z359.1.

3.3.6 Horizontal Lifelines

Horizontal lifelines shall be designed, installed, certified and used under the supervision of a qualified person as part of a complete fall arrest system (29 CFR 1926.500).

3.5 SCAFFOLDING

Employees shall be provided with a safe means of access to the work area on the scaffold. Climbing of any scaffold braces or supports not specifically designed for access is prohibited. Access to scaffold platforms greater than 6 m (20 feet) in height shall be accessed by use of a scaffold stair system. Vertical ladders commonly provided by scaffold system manufacturers shall not be used for accessing scaffold platforms greater than 6 m (20 feet) in height. The use of an adequate gate is required. Contractor shall ensure that employees are qualified to perform scaffold erection and dismantling. Do not use scaffold without the capability of supporting at least four times the maximum intended load or without appropriate fall protection as delineated in the accepted fall protection and prevention plan. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward. Special care shall be given to ensure scaffold systems are not overloaded. Side brackets used to extend scaffold platforms on self-supported scaffold systems for the storage of material is prohibited. The first tie-in shall be at the height equal to 4 times the width of the smallest dimension of the scaffold base. Work platforms shall be placed on mud sills. Scaffold or work platform erectors shall have fall protection during the erection and dismantling of scaffolding or work platforms that are more than six feet. Delineate fall protection requirements when working above six feet or above dangerous operations in the Fall Protection and Prevention (FP&P) Plan and Activity Hazard Analysis (AHA) for the phase of work.

3.6 EQUIPMENT

3.6.1 Material Handling Equipment

a. Material handling equipment such as forklifts shall not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions.

c. Operators of forklifts or power industrial trucks shall be licensed in accordance with OSHA.

3.6.2 Weight Handling Equipment

a. Cranes must be equipped with:

(1) Load indicating devices (LIDs) and a boom angle or radius indicator,

(2) or load moment indicating devices (LMIs).

(3) Anti-two block prevention devices.

(4) Boom hoist hydraulic relief valve, disconnect, or shutoff (stops hoist when boom reaches a predetermined high angle).

(5) Boom length indicator (for telescoping booms).

(6) Device to prevent uncontrolled lowering of a telescoping hydraulic boom.

(7) Device to prevent uncontrolled retraction of a telescoping hydraulic boom.

b. The Contractor shall notify the Contracting Officer 15 days in advance of any cranes entering the activity so that necessary quality assurance spot checks can be coordinated. Contractor's operator shall remain with the crane during the spot check.

c. The Contractor shall comply with the crane manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Erection shall be performed under the supervision of a designated person (as defined in ASME B30.5). All testing shall be performed in accordance with the manufacturer's recommended procedures.

d. The Contractor shall comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes and ASME B30.8 for floating cranes and floating derricks.

e. The presence of Government personnel does not relieve the Contractor of an obligation to comply with all applicable safety regulations. The Government will investigate all complaints of unsafe or unhealthful working conditions received in writing from contractor employees, federal civilian employees, or military personnel.

f. Each load shall be rigged/attached independently to the hook/master-link in such a fashion that the load cannot slide or otherwise become detached. Christmas-tree lifting (multiple rigged materials) is not allowed.

g. Under no circumstance shall a Contractor make a lift at or above 90% of the cranes rated capacity in any configuration.

h. When operating in the vicinity of overhead transmission lines, operators and riggers shall be alert to this special hazard and shall follow the requirements of USACE EM 385-1-1 section 11 and ASME B30.5 or ASME B30.22 as applicable.

i. Crane suspended personnel work platforms (baskets) shall not be used unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Personnel shall not be lifted with a line hoist or friction crane.

j. A fire extinguisher having a minimum rating of 10BC and a minimum nominal capacity of 5lb of extinguishing agent shall be available at all operator stations or crane cabs. Portable fire extinguishers shall be inspected, maintained, and recharged as specified in NFPA 10, Standard for Portable Fire Extinguishers.

k. All employees shall be kept clear of loads about to be lifted and of suspended loads.

l. A weight handling equipment operator shall not leave his position at the controls while a load is suspended.

m. Only Contractor crane operators who have met the requirements of 29 CFR 1910.94, 29 CFR 1910.120, 29 CFR 1926.65, 29 CFR 1926.500, USACE EM 385-1-1, ASME B30.5, and ASME B30.22 and other local and state requirements shall be authorized to operate the crane.

n. The Contractor shall use cribbing when performing lifts on outriggers.

o. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

p. A physical barricade must be positioned to prevent personnel from entering the counterweight swing (tail swing) area of the crane.

q. A substantial and durable rating chart containing legible letters and figures shall be provided with each crane and securely mounted onto the crane cab in a location allowing easy reading by the operator while seated in the control station.

r. Certification records which include the date of inspection, signature of the person performing the inspection, and the serial number or other identifier of the crane that was inspected shall always be available for review by Contracting Officer personnel.

s. Written reports listing the load test procedures used along with any repairs or alterations performed on the crane shall be available for review by Contracting Officer personnel.

t. The Contractor shall certify that all crane operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

3.6.3 Equipment and Mechanized Equipment

a. Equipment shall be operated by designated qualified operators. Proof of qualifications shall be kept on the project site for review.

b. Manufacture specifications or owner's manual for the equipment shall be on site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Such additional safety precautions or requirements shall be incorporated into the AHAs.

c. Equipment and mechanized equipment shall be inspected in accordance with manufacturer's recommendations for safe operation by a competent person prior to being placed into use.

d. Daily checks or tests shall be conducted and documented on equipment and mechanized equipment by designated competent persons.

3.7 EXCAVATIONS

The competent person for excavations performed as a result of contract work shall be on-site when excavation work is being performed, and shall inspect, and document the excavations daily prior to entry by workers. The competent person must evaluate all hazards, including atmospheric, that may be associated with the work, and shall have the resources necessary to correct hazards promptly.

3.7.1 Utility Locations

Prior to digging, the appropriate digging permit must be obtained. All underground utilities in the work area must be positively identified by a private utility locating service in addition to any station locating service and coordinated with the station utility department. Any markings made during the utility investigation must be maintained throughout the contract. Keep a copy of

any utility markup tickets, and as a QC step, compare flags and/or markings on the ground to the ticket. The SSHO shall sign off that this has been done and the permit complied with.

3.7.2 Utility Location Verification

The Contractor must physically verify underground utility locations by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within three feet of the underground system. Digging within .061 m (2 feet) of a known utility must not be performed by means of mechanical equipment; hand digging shall be used. If construction is parallel to an existing utility the utility shall be exposed by hand digging every 30.5 m (100 feet) if parallel within 1.5 m (5 feet) of the excavation.

3.7.3 Utilities with Concrete Slabs

Utilities located within concrete slabs or pier decks, bridges, and the like are extremely difficult to identify. The location must be coordinated with station utility departments in addition to a private locating service. Outages on system utilities shall be used in circumstances where concrete chipping, saw cutting, or core drilling is required and utilities are unable to be completely identified.

3.7.4 Shoring Systems

Trench and shoring systems must be identified in the accepted safety plan and AHA. Manufacture tabulated data and specifications or registered engineer tabulated data for shoring or benching systems shall be readily available on site for review. Job-made shoring or shielding shall have the registered professional engineer stamp, specifications, and tabulated data. Extreme care must be used when excavating near direct burial electric underground cables.

3.7.5 Trenching Machinery

Trenching machines with digging chain drives shall be operated only when the spotters/laborers are in plain view of the operator. Operator and spotters/laborers shall be provided training on the hazards of the digging chain drives with emphasis on the distance that needs to be maintained when the digging chain is operating. Documentation of the training shall be kept on file at the project site.

3.8 ELECTRICAL

3.8.1 Conduct of Electrical Work

Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Positive cable identification must be made prior to submitting any outage request for electrical systems. Arrangements are to be coordinated with the Contracting Officer and Station Utilities for identification. The Contracting Officer will not accept an outage request until the Contractor satisfactorily documents that the circuits have been clearly identified. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator will be allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method. When working in energized substations, only qualified electrical workers shall be permitted to enter. When work requires Contractor to work near energized circuits as defined by the NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves with leather protective sleeves, fire retarding shirts, coveralls, face shields, and safety glasses. Insulating blankets, hearing protection, and switching suits may be

required, depending on the specific job and as delineated in the Contractor's AHA.

3.8.2 Portable Extension Cords

Portable extension cords shall be sized in accordance with manufacturer ratings for the tool to be powered and protected from damage. All damaged extension cords shall be immediately removed from service. Portable extension cords shall meet the requirements of NFPA 70.

3.9 WORK IN CONFINED SPACES

The Contractor shall comply with the requirements in Section 06.I of USACE EM 385-1-1 and OSHA 29 CFR 1910.146. Any potential for a hazard in the confined space requires a permit system to be used.

a. Entry Procedures. Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. (See Section 06.I.05 of USACE EM 385-1-1 for entry procedures.) All hazards pertaining to the space shall be reviewed with each employee during review of the AHA.

b. Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its' action level.

c. Ensure the use of rescue and retrieval devices in confined spaces greater than 1.5 m (5 feet) in depth. Conform to Sections 06.I.09, 06.I.10 and 06.I.11 of USACE EM 385-1-1.

d. Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

e. Include training information for employees who will be involved as entrants and attendants for the work. Conform to Section 06.I.06 of USACE EM 385-1-1.

f. Daily Entry Permit. Post the permit in a conspicuous place close to the confined space entrance.

g. The Contractor shall document that there are emergency reponse plans and personnel ready to rescue a confined space victim. If necessary, the services of subcontractor trained in confined space rescue shall be arranged for.

3.10 CRYSTALLINE SILICA

Grinding, abrasive blasting, and foundry operations of construction materials containing crystalline silica, shall comply with OSHA regulations, such as 29 CFR 1910.94, and USACE EM 385-1-1, Appendix C. The Contractor shall develop and implement effective exposure control and elimination procedures to include dust control systems, engineering controls, and establishment of work area boundaries, as well as medical surveillance, training, air monitoring, and personal protective equipment.

3.11 HOUSEKEEPING

3.11.1 Clean-Up

All debris in work areas shall be cleaned up daily or more frequently if necessary. Construction debris may be temporarily located in an approved location, however garbage accumulation must be removed each day.

3.11.2 Dust control

In addition to the dust control measures required elsewhere in the contract documents, dry cutting of brick or masonry shall be prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to this prohibition on a case-by-case basis. Wet cutting must address control of water run off.

-- End of Section --

SECTION 01780A

CLOSEOUT SUBMITTALS
11/99

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted for each Task Order in accordance with Section 01330 SUBMITTAL PROCEDURES which will be provided on a Task Order basis.

SD-02 Shop Drawings

As-Built Drawings; G-RE.

Drawings showing final as-built conditions of the project. The final CADD as-built drawings shall consist of one set of electronic CADD drawing files in the specified format, TEXT DELETED 2 sets of blue-line prints of the mylars, and one set of the approved working as-built drawings.

As-Built Specifications; G-RE

Specifications showing the final as-built conditions of the project shall be provided. The final Specifications shall incorporate all modifications, clarifications, and lessons learned incorporated into the project. One set of electronic specifications, in the format specified, and four sets of printed specificatinos shall be provided.

SD-03 Product Data

As-Built Record of Equipment and Materials; G-RE.

Two copies of the record listing the as-built materials and equipment incorporated into the construction of the project.

Warranty Management Plan; G-RE.

One set of the warranty management plan containing information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. The Contractor shall furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

Warranty Tags; G-RE.

Two record copies of the warranty tags showing the layout and design.

Final Cleaning; G-RE.

Two copies of the listing of completed final clean-up items.

1.2 PROJECT RECORD DOCUMENTS

1.2.1 As-Built Drawings

This paragraph covers as-built drawings complete, as a requirement of the contract. The terms "drawings," "contract drawings," "drawing files," "working as-built drawings" and "final as-built drawings" refer to contract drawings which are revised to be used for final as-built drawings.

1.2.1.1 Government Furnished Materials

One set of electronic CADD files in the specified software and format revised to reflect all bid amendments will be provided by the Government at the preconstruction conference for projects requiring CADD file as-built drawings.

1.2.1.2 Working As-Built and Final As-Built Drawings

The Contractor shall revise 2 sets of paper drawings by red-line process to show the as-built conditions during the prosecution of the project. These working as-built marked drawings shall be kept current on a weekly basis and at least one set shall be available on the jobsite at all times. Changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes. Final as-built drawings shall be prepared after the completion of each definable feature of work as listed in the Contractor Quality Control Plan (Foundations, Utilities, Structural Steel, etc., as appropriate for the project). The working as-built marked prints and final as-built drawings will be jointly reviewed for accuracy and completeness by the Contracting Officer and the Contractor prior to submission of each monthly pay estimate. If the Contractor fails to maintain the working and final as-built drawings as specified herein, the Contracting Officer will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the as-built drawings. This monthly deduction will continue until an agreement can be reached between the Contracting Officer and the Contractor regarding the accuracy and completeness of updated drawings. The working and final as-built drawings shall show, but shall not be limited to, the following information:

a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, the as-built drawings shall show, by offset dimensions to two permanently fixed surface features, the end of each run including each change in direction. Valves, splice boxes and similar appurtenances shall be located by dimensioning along the utility run from a reference point. The average depth below the surface of each run shall also be recorded.

b. The location and dimensions of any changes within the building structure.

c. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

d. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

e. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

f. Changes or modifications which result from the final inspection.

g. Where contract drawings or specifications present options, only the option selected for construction shall be shown on the final as-built prints.

h. If borrow material for this project is from sources on Government property, or if Government property is used as a spoil area, the Contractor shall furnish a contour map of the final borrow pit/spoil area elevations.

i. Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation systems.

j. Modifications (change order price shall include the Contractor's cost to change working and final as-built drawings to reflect modifications) and compliance with the following procedures.

(1) Directions in the modification for posting descriptive changes shall be followed.

(2) A Modification Circle shall be placed at the location of each deletion.

(3) For new details or sections which are added to a drawing, a Modification Circle shall be placed by the detail or section title.

(4) For minor changes, a Modification Circle shall be placed by the area changed on the drawing (each location).

(5) For major changes to a drawing, a Modification Circle shall be placed by the title of the affected plan, section, or detail at each location.

(6) For changes to schedules or drawings, a Modification Circle shall be placed either by the schedule heading or by the change in the schedule.

(7) The Modification Circle size shall be 12.7 mm diameter unless the area where the circle is to be placed is crowded. Smaller size circle shall be used for crowded areas.

1.2.1.3 Drawing Preparation

The as-built drawings shall be modified as may be necessary to correctly show the features of the project as it has been constructed by bringing the contract set into agreement with approved working as-built prints, and adding such additional drawings as may be necessary. These working as-built marked prints shall be neat, legible and accurate. These drawings are part of the permanent records of this project and shall be returned to the Contracting Officer after approval by the Government. Any drawings damaged or lost by the Contractor shall be satisfactorily replaced by the Contractor at no expense to the Government.

1.2.1.4 Computer Aided Design and Drafting (CADD) Drawings

Only personnel proficient in the preparation of CADD drawings shall be employed to modify the contract drawings or prepare additional new drawings. Additions and corrections to the contract drawings shall be equal in quality and detail to that of the originals. Line colors, line weights, lettering, layering conventions, and symbols shall be the same as the original line colors, line weights, lettering, layering conventions, and symbols. If additional drawings are required, they shall be prepared using the specified electronic file format applying the same graphic standards specified for original drawings. The title block and drawing border to be used for any new final as-built drawings shall be identical to that used on the contract drawings. Additions and corrections to the contract drawings shall be accomplished using CADD files. The Contractor will be furnished Microstation 95 software and a Windows NT operating system. The electronic files will be supplied on compact disc, read-only memory (CD-ROM). The Contractor shall be responsible for providing all program files and hardware necessary to prepare final as-built drawings. The Contracting Officer will

review final as-built drawings for accuracy and the Contractor shall make required corrections, changes, additions, and deletions.

a. CADD colors shall be the "base" colors of red, green, and blue. Color code for changes shall be as follows:

(1) Deletions (red) - Deleted graphic items (lines) shall be colored red with red lettering in notes and leaders.

(2) Additions (Green) - Added items shall be drawn in green with green lettering in notes and leaders.

(3) Special (Blue) - Items requiring special information, coordination, or special detailing or detailing notes shall be in blue.

b. The Contract Drawing files shall be renamed in a manner related to the contract number (i.e., 98-C-10.DGN) as instructed in the Pre-Construction conference. Marked-up changes shall be made only to those renamed files. All changes shall be made on the layer/level as the original item. There shall be no deletions of existing lines; existing lines shall be over struck in red. Additions shall be in green with line weights the same as the drawing. Special notes shall be in blue on layer #63.

c. When final revisions have been completed, the cover sheet drawing shall show the wording "RECORD DRAWING AS-BUILT" followed by the name of the Contractor in letters at least 5 mm high. All other contract drawings shall be marked either "AS-Built" drawing denoting no revisions on the sheet or "Revised As-Built" denoting one or more revisions. Original contract drawings shall be dated in the revision block.

d. Within 20 days after Government approval of all of the working as-built drawings for a phase of work, the Contractor shall prepare the final CADD as-built drawings for that phase of work and submit two sets of blue-lined prints of these drawings for Government review and approval. The Government will promptly return one set of prints annotated with any necessary corrections. Within 10 days the Contractor shall revise the CADD files accordingly at no additional cost and submit one set of final prints for the completed phase of work to the Government. Within 20 days of substantial completion of all phases of work, the Contractor shall submit the final as-built drawing package for the entire project. The submittal shall consist of one set of electronic files on compact disc, read-only memory (CD-ROM), one set of mylars, two sets of blue-line prints and one set of the approved working as-built drawings. They shall be complete in all details and identical in form and function to the contract drawing files supplied by the Government. Any transactions or adjustments necessary to accomplish this is the responsibility of the Contractor. The Government reserves the right to reject any drawing files it deems incompatible with the customer's CADD system. Paper prints, drawing files and storage media submitted will become the property of the Government upon final approval. Failure to submit final as-built drawing files and marked prints as specified shall be cause for withholding any payment due the Contractor under this contract. Approval and acceptance of final as-built drawings shall be accomplished before final payment is made to the Contractor.

1.2.1.5 Manually Prepared Drawings

Only personnel proficient in the preparation of manually prepared drawings shall be employed to modify the original contract drawing or prepare additional new drawings. Additions and corrections to the contract drawings shall be neat, clean and legible, shall be done to the same level of detail, and shall match the adjacent existing line work, and lettering being annotated in type, density, size and style. Drafting work shall be done using the same medium (pencil, plastic lead or ink) that was employed on the original contract drawings and with graphite lead on paper base material. The Contracting Officer will review

as-built drawings for accuracy and conformance to the above specified drafting standards. Corrections, changes, additions, and deletions required shall meet these standards. The title block to be used for any new as-built drawings shall be similar to that used on the original drawings.

a. When final revisions have been completed, each drawing shall be lettered or stamped with the words "RECORD DRAWING AS-BUILT" followed by the name of the Contractor in letters at least 5 mm high. Original contract drawings shall be marked either "As-Built" drawings denoting no revisions on the sheet or "Revised As-Built" denoting one or more revisions All original contract drawings shall be dated in the revision block.

b. Within 20 days after Government approval of all of the working as-built drawings for a phase of work, the Contractor shall prepare the final as-built drawings for that phase of work and submit two sets of blue-line prints of these drawings for Government review and approval. The Government will promptly return one set of prints annotated with any necessary corrections. Within 10 days the Contractor shall revise the drawings accordingly at no additional cost and submit one set of final prints for the completed phase of work to the Government. Within 20 days of substantial completion of all phases of work, the Contractor shall submit the final as-built drawing package for the entire project. The submittal shall consist of the completed final as-built drawings, two blue-line prints of these drawings and the return of the approved marked as-built prints. The drawings shall be complete in all details. Paper prints and reproducible drawings will become the property of the Government upon final approval. Failure to submit final as-built drawings and marked prints, as required herein, will be cause for withholding any payment due the Contractor under this contract. Approval and acceptance of final as-built drawings shall be accomplished before final payment is made to the Contractor.

1.2.1.6 Payment

No separate payment will be made for as-built drawings required under this contract, and all costs accrued in connection with such drawings shall be considered a subsidiary obligation of the Contractor.

1.2.2 As-Built Record of Equipment and Materials

The Contractor shall furnish one copy of preliminary record of equipment and materials used on the project 15 days prior to final inspection. This preliminary submittal will be reviewed and returned 2 days after final inspection with Government comments. Two sets of final record of equipment and materials shall be submitted 10 days after final inspection. The designations shall be keyed to the related area depicted on the contract drawings. The record shall list the following data:

RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA

Description	Specification Section	Manufacturer and Catalog, Model, and Serial Number	Composition and Size	Where Used

1.2.3 Final Approved Shop Drawings

The Contractor shall furnish final approved project shop drawings 30 days after transfer of the completed facility.

1.2.4 Final Approved As-Built Specifications

The Contractor shall furnish final approved project as-built specifications 30 days after transfer of the completed facility.

1.2.5 Construction Contract Specifications

The Contractor shall furnish final as-built construction contract specifications, including modifications thereto, 30 days after transfer of the completed facility.

1.2.6 Real Property Equipment

The Contractor shall furnish a list of installed equipment furnished under this contract. The list shall include all information usually listed on manufacturer's name plate. The "EQUIPMENT-IN-PLACE LIST" shall include, as applicable, the following for each piece of equipment installed: description of item, location (by room number), model number, serial number, capacity, name and address of manufacturer, name and address of equipment supplier, condition, spare parts list, manufacturer's catalog, and warranty. A draft list shall be furnished at time of transfer. The final list shall be furnished 30 days after transfer of the completed facility.

1.3 WARRANTY MANAGEMENT

1.3.1 Warranty Management Plan

The Contractor shall develop a warranty management plan which shall contain information relevant to the clause Warranty of Construction in Section 00800. At least 30 days before the planned pre-warranty conference, the Contractor shall submit the warranty management plan for Government approval. The warranty management plan shall include all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan shall be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below shall include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase shall be submitted to the Contracting Officer for approval prior to each monthly pay estimate. Approved information shall be assembled in a binder and shall be turned over to the Government upon acceptance of the work. The construction warranty period shall begin on the date of project acceptance and shall continue for the full product warranty period. A joint 5 month and 10 month warranty inspection shall be conducted, measured from time of acceptance, by the Contractor, Contracting Officer and the Customer Representative. Information contained in the warranty management plan shall include, but shall not be limited to, the following:

a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.

b. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.

c. A list for each warranted equipment, item, feature of construction or system indicating:

1. Name of item.
2. Model and serial numbers.
3. Location where installed.
4. Name and phone numbers of manufacturers or suppliers.
5. Names, addresses and telephone numbers of sources of spare parts.
6. Warranties and terms of warranty. This shall include one-year overall warranty of construction. Items which have extended warranties shall be indicated with separate warranty expiration dates.

7. Cross-reference to warranty certificates as applicable.
8. Starting point and duration of warranty period.
9. Summary of maintenance procedures required to continue the warranty in force.
10. Cross-reference to specific pertinent Operation and Maintenance manuals.
11. Organization, names and phone numbers of persons to call for warranty service.
12. Typical response time and repair time expected for various warranted equipment.

d. The Contractor's plans for attendance at the 5 and 10 month post-construction warranty inspections conducted by the Government.

e. Procedure and status of tagging of all equipment covered by extended warranties.

f. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

1.3.2 Performance Bond

The Contractor's Performance Bond shall remain effective throughout the construction period.

a. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

b. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Contracting Officer will have the right to recoup expenses from the bonding company.

c. Following oral or written notification of required construction warranty repair work, the Contractor shall respond in a timely manner. Written verification will follow oral instructions. Failure of the Contractor to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.3.3 Pre-Warranty Conference

Prior to contract completion, and at a time designated by the Contracting Officer, the Contractor shall meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty shall be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor shall furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, shall be continuously available, and shall be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.3.4 Contractor's Response to Construction Warranty Service Requirements

Following oral or written notification by the Contracting Officer, the Contractor

shall respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List" and the three categories of priorities listed below. The Contractor shall submit a report on any warranty item that has been repaired during the warranty period. The report shall include the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframes specified, the Government will perform the work and backcharge the construction warranty payment item established.

a. First Priority - Code 1. Perform onsite inspection to evaluate situation, and determine course of action within 2 hours and take steps to mitigate any addition property or building damage, initiate work within 4 hours and work continuously to completion or relief.

b. Second Priority - Code 2. Perform onsite inspection to evaluate situation, and determine course of action within 8 hours and take steps to mitigate any addition property or building damage, initiate work within 24 hours and work continuously to completion or relief.

c. Third Priority Code 3. All other work to be initiated within 3 work days and work continuously to completion or relief.

d. The "Construction Warranty Service Priority List" is as follows:

Code 1-Air Conditioning Systems
(1) Air conditioning leak in part of building, if causing damage
(2) Air conditioning system not cooling properly, during cooling seasons.

Code 1-Doors
(1) Garage doors not operational, causing a security, fire, or safety problem
(2) Interior, exterior personnel doors or hardware, not functioning properly, causing a security, fire, or safety problem

Code 3-Doors
(1) Garage doors not operational
(2) Interior/exterior personnel doors or hardware not functioning properly

Code 1-Electrical
(1) Power failure (to entire unit, or to primary electrical heating of a unit during heating seasons, or if causing safety or fire hazard)
(2) Security lights
(3) Smoke detectors (failure of detector not loss of battery)
(4) CO detectors (failure of detector not loss of battery)
(5) Receptacle and lights (causing a safety or fire hazard)

Code 2-Electrical
(1) Power failure (no power to a room or part of building)
(2) Receptacle and lights (in a room or part of building, unless causing a safety or fire hazard)

Code 3-Electrical
Street lights

Code 1-Gas
(1) Any Leaks or breaks
(2) No gas to family housing unit

Code 1-Heat
Area power failure affecting heat

Code 1-Kitchen Equipment
Equipment hampering preparation of a meal or storage of perishable food

Code 3-Kitchen Equipment
(1) Dishwasher not operating properly
(2) All other equipment not hampering preparation of a meal

Code 1-Plumbing or any pressurized lines
(1) Hot water heater failure
(2) Leaking water supply pipes
(3) Fixture drain, supply line to commode, or any leaking pipes that are causing damage (pressurized or not)
(4) Commode leaking on floor (not over flows from clogs)

Code 2-Plumbing
Flush valves not operating properly

Code 3 -Plumbing
Leaky faucets

Code 3-Interior
(1) Floors damaged
(2) Paint chipping or peeling
(3) Casework

Code 1-Roof Leaks
Temporary repairs will be made where damage to property is occurring

Code 2-Roof Leaks
Where damage to property is not occurring, check for location of leak during rain and complete repairs on a Code 2 basis

Code 2-Water (Exterior)
No water to facility.

Code 2 - Utilities
All utility failures or leaks not listed above

Code 2 - Streets
Any failure that will cause a safety hazard

Code 2 - Play ground equipment
Any failures that will cause a safety hazard

Code 3-All other work not listed above.

1.3.5 Warranty Tags

At the time of installation, each warranted item shall be tagged with a durable, oil and water resistant tag approved by the Contracting Officer. Each tag shall be attached with a copper wire and shall be sprayed with a silicone waterproof coating. The date of acceptance and the QC signature shall remain blank until project is accepted for beneficial occupancy. The tag shall show the following information.

a. Type of product/material_____.

b. Model number_____.

c. Serial number_____.

d. Contract number_____.

e. Warranty period_____from_____to_____.

f. Inspector's signature_____.

g. Construction Contractor_____.

Address_____.

Telephone number_____.

h. Warranty contact_____.

Address_____.

Telephone number_____.

i. Warranty response time priority code_____.

j. WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD.

1.4 MECHANICAL TESTING, ADJUSTING, BALANCING, AND COMMISSIONING

Prior to final inspection and transfer of the completed facility; all reports, statements, certificates, and completed checklists for testing, adjusting, balancing, and commissioning of mechanical systems shall be submitted to and approved by the Contracting Officer as specified in applicable technical specification sections.

1.5 OPERATION AND MAINTENANCE MANUALS

Operation manuals and maintenance manuals shall be submitted as specified. Operation manuals and maintenance manuals provided in a common volume shall be clearly differentiated and shall be separately indexed.

1.6 FINAL CLEANING

The premises shall be left broom clean. Stains, foreign substances, and temporary labels shall be removed from surfaces. Carpet and soft surfaces shall be vacuumed. Equipment and fixtures shall be cleaned to a sanitary condition. Filters of operating equipment shall be replaced. Debris shall be removed from roofs, drainage systems, gutters, and downspouts. Paved areas shall be swept and landscaped areas shall be raked clean. The site shall have waste, surplus materials, and rubbish removed. The project area shall have temporary structures, barricades, project signs, and construction facilities removed. A list of completed clean-up items shall be submitted on the day of final inspection.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --

APPENDICES

Appendix A: Design Compatibility Standards
Appendix B: Family Housing Community Plan, Vol. 1
Appendix C: Family Housing Community Plan, Vol. 2
Appendix D: Landscape Development Plan
Appendix E: 2002 Geotechnical Report
Appendix F: 2003 Geotechnica Report
Appendix G: 2002 Environmental Report
Appendix H: 2003 Environmental Report
Appendix I: FEMA In-Residence Shelter Drawings
Appendix J: Design Analysis – Existing and New Site Utility Systems
Appendix K: Information on Monitoring Wells at Site DP-32
Appendix L: Legal Description of Property

ATTACHMENT J

DESIGN ANALYSIS – EXISTING AND NEW SITE UTILITY SYSTEMS

CWM Engineers · Architects · Surveyors

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Date: 14 July 2003

Project: **Whiteman Family Housing**
FY03 RFP
YWHG 009494R2 & YWHG 009404P4
Whiteman AFB, MO

Subject: **DESIGN ANALYSIS: EXISTING and NEW SITE UTILITY SYSTEMS**

INTRODUCTION

New Military Family Housing for FY03 and beyond is being planned to be built on currently undeveloped land. Therefore, the design and installation of a complete new infrastructure system will be required on this land. This will include, but not be limited to, new utility services i.e. Electric, Natural Gas, Sanitary Sewers, Storm Water Management, Street Lighting, Domestic Water / Fire Protection, Cable TV and Telephone. All of these utilities required in the new Project area are available in the adjacent neighborhoods to the North and East. Studies and analysis are being completed to determine if *connection to* and *extension of* these existing utilities is feasible to support the new Housing in the Project area. The pages that follow are intended to provide WAFB with a summary of the design criteria information that was used and the findings to date.

Utility Type / Description of Service

ELECTRICAL

- ***Existing Conditions:***

Electrical service of 12,470 kV, 3 Phase, 350 MCM copper runs in 4 inch PVC conduit along the West side of the Holmes & Narver development extending North to the East Lakeside neighborhood. A "Point of future connection" to this service is identified at Southwest corner of the Holmes & Narver development. Electrical service at the Lakeside neighborhood is identified as single phase.

- ***New Electrical Service in the Project area:***

Assume 275 total housing units in Project area at completion of all Phases. Assume majority of units at 1,630 gross square feet, 3 bedrooms.

LOADS		WATTS	
1,630 sf @ 3VA		4,890	
Kitchen Appliance Circuits		3,000	
Laundry		1,500	
Range		12,000	
Dishwasher		1,200	
Dryer		5,000	
	Subtotal	27,590	
1st 10 KVA @ 100%		10,000	
Remainder @ 40%		7,036	
		17,036	VA
Air Conditioning		6,120	
	TOTAL	**23,156**	**VA**

23,156 / 240 = 96.5 Amps @ 120 / 240V, 1 PH

Total for 275 units: 275 x 23.16 KVA = **6,369 KVA**

6,369 x 1000 / (12,470 x $(3)^{0.5}$) = **295 Amps at 12,470V., 3 PH.**

NATURAL GAS

- ***Existing Conditions:***

A four (4) inch plastic line runs along the West side of the Holmes & Narver development and extends North to the East Lakeside neighborhood. A six (6) inch plastic line runs East-West between East and West Lakeside neighborhoods. Pressure in these lines is reported at 15 psi.

- ***New Natural Gas Service in the Project area:***

Assume 275 total housing units in Project area at completion of all Phases. Assume the majority of units at 1,630 gross square feet (3 bedroom).

80,000 BTUH for furnace.
40,000 BTUH for water heater
120,000 Total per unit

120,000 BTUH = 120 CU. FT. / HR.

120 CF/Hr. x 275 Units = 33,000 CFH Total

According to NFPA 54, Figure C.6(b), with the existing four (4) inch and six (6) inch main gas lines in the adjoining neighborhoods with an existing pressure of 15 psi there should be adequate natural gas to serve all new housing in the Project area.

Utility Type / Description of Service

SANITARY SEWER

- ***Existing Conditions:***

Eight (8) inch vitrified clay lines run through the West side of the Holmes & Narver development and also through portions of the Lakeside neighborhoods.

A preliminary review of the existing sanitary sewer lines at the West side of the Holmes&Narver development and a central portion of the Lakeside neighborhood indicates an existing population equivalent of 470 people. Average design flow would be 47,000 gal / day. Peak design flow would be 188,000 gal / day. Minimum grade of the gravity sewer would be assumed at 0.4%. Refer to Sanitary Sewer Design Analysis drawing, included in the drawing packet, for the location of the existing sanitary sewer lines being reviewed for suitability of use.

WAFB EXISTING SANITARY SEWER GRADE CHECK

OLD ID	NEW ID	MH Station	Invert Elev	Rim Elev	Pipe Size (inches)	Measured Length	Length Cumul.	Calculated Grade	Calculated MH Height	Comments
G103	5--7	28+65	816.16 e	832.33 e					16.17	
					12	165.00		0.75% e		
G102	5--6	27+00	814.92	831.09					16.17	
					12	205.00		0.75%		
G101	5--5	24+95	813.38	817.02					3.64	
					12	500.00		0.10%		
G97B	5--4	19+95	812.90	817.79					4.89	
					12	250.00		1.16% e		
G97A	5--3	17+45	810.01 e	817.18 e					7.16	
					12	395.00		0.73% e		
G97	5--2	13+50	807.12	816.56					9.44	
					12	370.00		0.51%		
C96	5--1	9+80	805.23	816.48					11.25	
					12	400.00		0.58% e		
C7	1--10	5+80	802.92 e	812.08 e					9.16	
					18	260.00		0.89% e		
	1--9	3+20	800.60	807.68					7.08	
					18	320.00		3.16%		
C6	1--8	0+00	790.50	797.62					7.12	
						Subtotal	**2865.00**			

OLD ID	NEW ID	MH Station	Invert Elev	Rim Elev	Pipe Size (inches)	Measured Length	Length Cumul.	Calculated Grade	Calculated MH Height	Comments
H133	5--19	27+30	843.34	856.39					13.05	
					8	280.00		2.29%		
H132	5--18	24+50	836.92	851.03					14.11	
					8	200.00		2.55% e		
H131	5--17	22+50	831.83 e	845.16 e					13.33	
					8	250.00		2.04% e		
H130	5--16	20+00	826.73	839.29					12.56	
					8	155.00		0.42%		
G129	5--15	18+45	826.08	838.41					12.33	
					8	85.00		0.95%		
G128	5--14	17+60	825.27	839.28					14.01	
					8	270.00		2.55%		
C127	5--13	14+90	818.38	834.21					15.83	
					8	350.00		0.47%		
C126	5--12	11+40	816.73	827.46					10.73	
					8	200.00		0.47%		
C125	5--11	9+40	815.79	830.32					14.53	
					8	360.00		0.47%		
G122	5--10	5+80	814.11	833.89					19.78	
					8	210.00		0.51%		
G119	5--9	3+70	813.04	830.30					17.26	
					8	290.00		0.36%		
G115	5--8	0+80	812.00	823.73					11.73	
					8	80.00		13.38%		
G103	5--7	0+00	801.30	820.25					18.95	
						Subtotal	**2730.00**			

Note: 235 units, 2 persons per unit, 470 persons
Average Design Flow: 470 persons x 100 gpcpd = 47,000 gal/day;
Peak Design Flow: 47,000 gal/day x 4 = 188,000 gal/day

SANITARY SEWER (con't)

- ***Existing Conditions (con't):***

A preliminary review of the existing sanitary sewer lines at the West portion of the Lakeside neighborhood indicates an existing population equivalent of 240 people. Average design flow would be 240,000 gal / day. Peak design flow would be 96,000 gal / day. Minimum grade of the sewer would be assumed at 0.4%. Refer to Sanitary Sewer Design Analysis drawing, included in the drawing packet, for the location of the existing sanitary sewer lines being reviewed for suitability of use.

OLD ID	NEW ID	MH Station	Invert Elev	Rim Elev	Pipe Size (inches)	Measured Length	Length Cumul.	Calculated Grade	Calculated MH Height	Comments
D95	4--19	39+25	831.45	843.67					12.22	
					8	280.00		0.54%		
D94	4--18	36+45	829.93	841.17					11.24	
					8	120.00		1.09%		
C93	4--17	35+25	828.62	839.50					10.88	
					8	125.00		0.77%		
C92	4--16	34+00	827.66	836.37					8.71	
					8	360.00		0.63%		
C84	4--15	30+40	825.41	839.02					13.61	
					8	200.00		1.48% e		
C83	4--14	28+40	822.44 e	834.34 e					11.90	
					8	150.00		1.98% e		
C82	4--13	26+90	819.47	829.65					10.18	
					8	250.00		0.81%		
C81	4--12	24+40	817.45	828.19					10.74	
					8	275.00		0.48%		
C80	4--11	21+65	816.14	828.60					12.46	
					8	220.00		0.28% e		
C79	4--9	19+45	815.53 e	829.85 e					14.32	
					8	110.00		0.55% e		
C78	4--10	18+35	814.92	831.09					16.17	
					8	370.00		0.42%		
C77	4--8	14+65	813.38	817.02					3.64	
					8	110.00		0.44%		
C76	4--7	13+55	812.90	817.79					4.89	
					8	160.00		1.81% e		
C75	4--6	11+95	810.01 e	817.18 e					7.16	
					8	415.00		0.70% e		
G74	4--5	7+80	807.12	816.56					9.44	
					8	180.00		1.05%		
G73	4--4	6+00	805.23	816.48					11.25	
					8	290.00		0.80% e		
C72	4--3	3+10	802.92 e	812.08 e					9.16	
					8	110.00		2.10% e		
C71A	4--2	2+00	800.60	807.68					7.08	
					8	200.00		5.05%		
C96	5--1	0+00	790.50	797.62					7.12	
						Subtotal	**3925.00**			

Note: 120 units, 2 persons per unit, 240 persons
Average Design Flow: 240 persons x 100 gpcpd = 24,000 gal/day;
Peak Design Flow: 24,000 gal/day x 4 = 96,000 gal/day

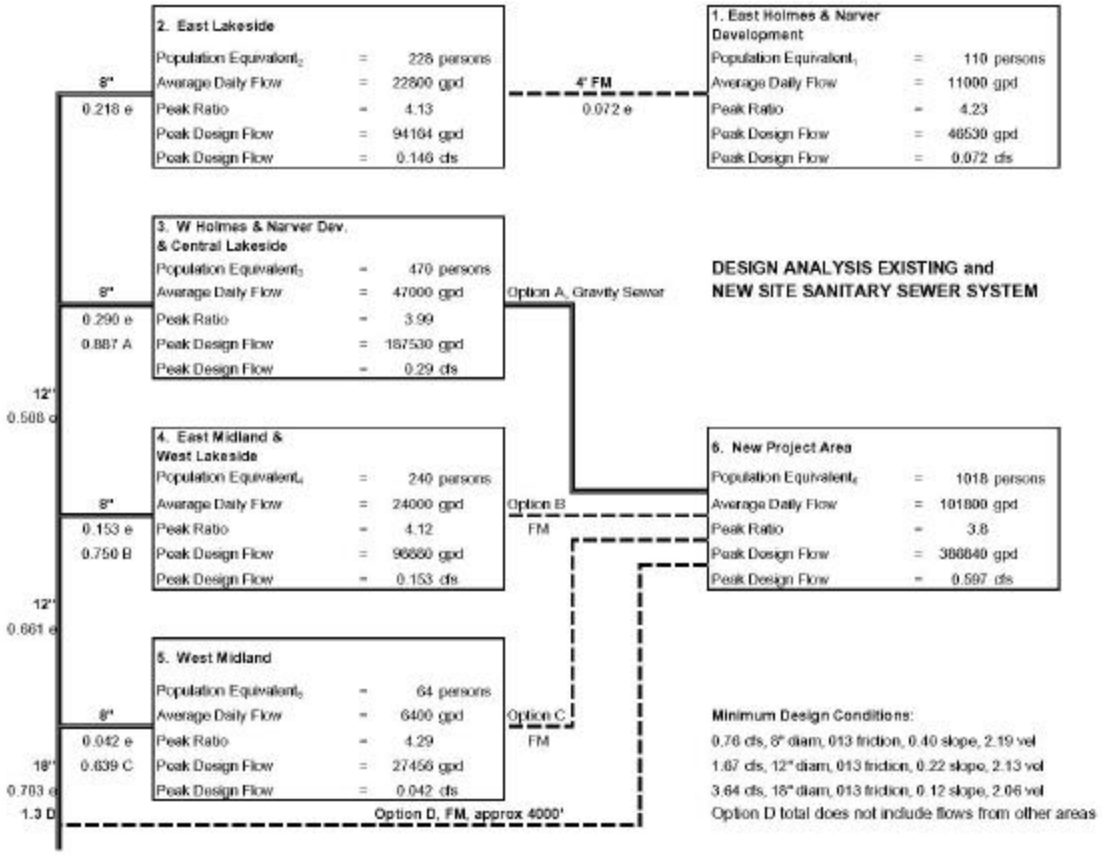
EXISTING WASTE WATER TREATMENT FACILITY CAPACITY

Permit capacity	*2.19 MGD*
Remaining capacity	*1.5 MGD (avg)*
Avg. daily flow	*650,000 gal.*
Peak flow (non-rain)	*800,000 gal*
BOD capacity(summer/winter)	*10/15 mg/L*
Remaining load	*2-5 mg/L*

SANITARY SEWER (con't)

- ***New Sanitary Sewers in the Project area:***

A preliminary review of the new project area indicates an existing population equivalent of 1,018 people (275 units x 3.7 per unit = 1,018). Average design flow would be 101,800 gal / day. Peak design flow would be 386,840 gal / day. This value in combination with values at the existing neighborhoods will be used to determine if the existing gravity sanitary sewer lines in the adjacent neighborhoods can support the additional loading from the new Project area.



Based upon this summary Design Analysis of the Existing and New Site Sanitary Sewer Systems, it would appear that a new Pump Station and Force Main will be required to adequately handle the sanitary sewer loads anticipated from the new Project area.

STORM WATER MANAGEMENT

- ***Existing Conditions:***

Existing storm water in the adjacent neighborhoods generally flows on the surface to existing natural water ways such as creeks, ponds, etc. A major portion of the existing storm water in the Project area (undeveloped land) appears to flow into the on-site pond. The remaining portion of on-site storm water flows in directions other than to the pond.

- ***Considerations for New Storm Water Management in the Project area:***

The following issues need to be considered before the determination is made whether to utilize the existing water impoundments as part of the new water detention/retention systems.

Water Quality

Testing should be performed to determine the quality of the existing impounded water. Because the surrounding watershed is comprised of agricultural property testing should be performed to determine the levels of any insecticides or pesticides that may be present. High levels of residual chemicals would suggest that further release of these waters be stopped. The presence of aquatic life may be an indicator of an acceptable water quality.

Regardless whether the existing ponds are utilized for retention, it is recommended that testing be performed prior to construction beginning as a benchmark. Additional testing should then be conducted periodically during the construction of the project and at the conclusion of the project to determine the impact of construction on the waters.

Sediment

Testing should be performed to determine both the depth and the make-up of the existing sediment in the existing impounded waters. Because the surrounding watershed is comprised of agricultural property testing should be performed to determine the levels of any insecticides, pesticides and heavy metals that may be present.

Again, regardless whether the existing ponds are utilized for retention, it is recommended that testing be performed prior to construction beginning as a benchmark. Additional testing should then be conducted periodically during the construction of the project and at the conclusion of the project to determine the impact of construction on the waters.

Wildlife

A determination should be made if the existing bodies of water are to be used to support aquatic life (both fish and waterfowl). If the ponds are to support fish, investigations need to be made to determine if the existing or proposed water depths are adequate to allow the fish to survive.

Do the existing ponds create a nuisance due to attracting waterfowl? Will the addition of wet basins magnify the problem? The interference of waterfowl with flight operations should be a consideration in allowing additional waterways.

Government Regulatory Issues

While FEMA does not map the waterways within the current boundary of the Base, this additional property falls outside limits of the excluded property. An examination of the FIRM for Johnson County should be conducted to determine if any of the subject tract is identified as being in a flood hazard.

It will need to be determined if any of the subject property has been classified as a Clean Water Act jurisdictional wetlands or falls under any requirement of the 404 lands.

Field investigations should also be conducted to determine if any evidence of “Endangered Species” exist.

STORM WATER MANAGEMENT(con't)

This matrix was used to make comparisons between various "regulating bodies" in determining the appropriate design criteria for the RFP.

	Air Force Family Housing Guide	WAFB Design Guide	Minot	APWA	DNR
Runoff Calculation Method			Rational TM5-820-1 (includes Rational and modified rational)	SCS and Rational	
Storm frequency	10yr	25yr	10yr	10yr for collection 50yr cross road culverts 100yr detention/retention	
System redundancy	Required for systems including detention			Requires freeboard and overflow spillway for detention facilities	
Control points		State plane coords (metric with grid scale factor)			
Sanitary sewer manholes		Min 300' spacing. Max. 400' spacing. Place at 45° & 90° bends.	Max. 300' spacing. Place at all deflections.		Max. 400' spacing. Place at all deflections.
Sanitary sewer lines		Min velocity 2.5 fps (e3) Min velocity 2.0 fps (f4)			Min velocity 2.0 fps
Storm sewer pipe		Bit. Coated CSP Bit. Coated RSP	RCP	RCP, CMP, HDPE	
Pavement design **Parking** **Road**		 4" A.C. w/ 6" agg base 5" A.C. (3&2) w/ 12" agg base		 8" A.C. (2&6) w/ 6" agg base	
Special permits					Land disturbance permits
Street design **Min grade** **Max grade** **Design Speed**				 1% 10% 30 mph	

Utility Type / Description of Service

STREET LIGHTING

- ***Existing Conditions:***

Existing street light units are located at intersections and along curves in both adjacent neighborhoods i.e Holmes & Narver development and Lakeside and are fed from the nearest transformer.

- ***New Street Lighting in Project area:***

Provisions for new street lighting in the FY03 phase as well as all subsequent phases in the new project area will be easily provided based upon the available electrical distribution capacities.

Utility Type / Description of Service

WATER SYSTEM, DOMESTIC AND FIRE PROTECTION

- ***Existing System Criteria:***

8 inch PVC line runs North-South along the West side of the Holmes & Narver development and a 6 inch asbestos cement line runs East-West between the 2 Lakeside neighborhoods. These lines will be used for "connection and extension" into the new Project area.

- ***New Water Distribution in Project area:***

CHECK ADEQUACY OF DISTRIBUTION SYSTEM

Ground Elevation at Elevated Tank is approximately 880
Elevated tank ground to overflow = 138.6 ft. Overflow Elevation is about 1018.6 ft. MSL

Ground Elevation at Hydrant M6 is about 850. Measured static pressure was 80 psi.
(1018.6 - 850) x 0.433 = 73 psi

Ground Elevation at Libby hydrant is about 880. Measured static pressure was 62 psi.
(1018.6 - 880) x 0.433 = 60 psi.

Libby hydrant data gives good agreement - use it as starting point.

Assume connection to existing system is made on Scott Drive between units 761 & 755. Ground elevation at this point is 870.
Static pressure would be 62 psi plus (880 - 870) x 0.433 = 66 psi.

Residual pressure at Libby hydrant at a flow of 2109 gpm was 50 psi.
At point of connection with a flow of 2109 gpm, residual pressure would be approximately 54 psi.

Residual pressure at a flow of 1250 gpm would be $66 - [(1250/2109)(66 - 54)^{0.54}]^{1.85} = 61$ psi

Assume new hydrant is at elevation 910 and is 2300 ft from point of connection and that pipe from point of connection to the new hydrant is 8 inch PVC pipe.

Residual pressure at hydrant with a flow of 1250 gpm would be equal to residual pressure at point of connection plus static pressure gain or loss due to elevation difference minus friction loss.
Static pressure gain or loss would be (870 - 910) x 0.433 =17 psi loss
Friction loss through 2300 ft. of 8 inch PVC at a flow of 1250 gpm would be 23 psi
Residual pressue at proposed hydrant would be 61 psi - 17 psi - 23 psi = 21 psi < 20 psi OK

This is a conservative analysis since it assumes flow only from one point of connection. Since new line will be looped and connected to existing system in at least two locations, residual pressure will be higher than 21 psi.

CHECK ADEQUACY OF ELEVATED STORAGE

Assume all water for housing comes from Windsor Tower. Capacity is 272,000 gallons
Treatment plant capacity is 2.1 MGD or 1458 gallons per minute.
This is greater than the fire flow demand of 1250 gpm, therefore consider entire capacity of Windsor Tower as being available for domestic use.
Assume all units south of Summit Drive are serviced by Windsor Tower.
There are 457 existing housing units and 129 proposed housing units.
Amount of water required for domestic use = 300 gallons per day per housing unit = 175,800 gallons
This is less than the 272,000 gallon capacity of the Windsor Tower, therefore consider storage adequate.

Average daily production is about 900,000 gallons per day. Three elevated tanks serving housing and support buildings have a combined storage of about 1,266,000 gallons. Storage is adequate.

WATER SYSTEM, DOMESTIC AND FIRE PROTECTION (con't)

This matrix was used to make comparisons between various "regulating bodies" in determining the appropriate design criteria for the RFP.

	Air Force Family Housing Guide	WAFB Design Guide	Minot	MoDNR	UFGS-02510A
Standards		MoDOT, UBC, MoDNR, AWWA	UFGS Section 02510A	PDW Design Guide, AWWA, NSF	ASTM, ASME, AWWA, NSF, NFPA
Domestic Demand	2 Bedrooms - 250 gal/day 3 or More BR's - 350 gal/day		Per Uniform Plumbing Code Fixture Count Method		
Fire Demand	500 gpm @ 10 psi for 1.5 hrs			20 psi minimum pressure under all conditions of flow	
Hydrants		Watrous wet barrel w/ Hydroshield hose connection couplers	Dry barrel (traffic model) AWWA C502		Dry barrel (traffic model) AWWA C502 or wet barrel AWWA C503
Cathodic Protection		Required on metallic piping	Anode type system on all pipe and valves and hydrants		
Hydrant Spacing	500 ft with no unit further than 350 ft. measured along street 1 hydrant/25 units	400 ft. spacing	500 ft. by road no further than 300 ft from any building Aux. Gate Valve in hydrant lead	350-600 ft. spacing Aux. Gate Valve in hydrant lead	
Velocity	10 fps max in service line	Main lines 3 fps max	10fps metallic pipe, 5 fps nonmet.		
Service Lines	3/4 inch minimum		1 inch minimum		
Same trench	No for water and sewer OK for other utilities & water Gas 12" above on undisturbed shelf			10' horz., 18" vert. Separation water & sewer, 10' horz from manholes	
Pipe		C-900 PVC/Class 165			Numerous kinds - PE larger than 3" not included
Disinfection		AWWA C651		AWWA C651	AWWA C651
Pressure testing		Per AWWA		AWWA C600	
Minimum Cover		3 ft.		3.5 ft.	
Valves			At intersection of waterlines, isolate no more than 10 units	800 ft. Units, 1 per block	
Air Relief Valves				As required	

Utility Type / Description of Service

CABLE TV

- ***Existing System Criteria:***

Currently this service is being supplied to all Base housing by Charter Communications, Knob Noster, MO. Service is currently supplied to each individual housing unit. However, connection to the service is arranged by the individual housing residents via a contract with Charter Communications.

- ***New Service in the Project Area:***

Preliminary discussions have been held with Charter Communications representatives regarding providing service to the new Project area. "Capacity" of the existing service to be extended into the new Project area is NOT an issue with this utility. The RFP will include the necessary criteria to establish service to each new housing unit.

TELEPHONE

- ***Existing System Criteria:***

Currently this service is being supplied to Base housing by SBC (formerly Southwestern Bell). Service is currently supplied to each individual housing unit. However, connection to the service is arranged by the individual housing residents via a contract with SBC.

- ***New Service in the Project Area:***

Preliminary discussions have been held with SBC representatives regarding providing service to the new Project area. "Capacity" of the existing service to be extended into the new Project area is NOT an issue with this utility. The RFP will include the necessary criteria to establish service to each new housing unit.

ATTACHMENT K

INFORMATION ON MONITORING WELLS AT SITE DP-32

Project: **Replace Family Housing FY 2003 / FY 2004, Whiteman AFB, Missouri YWHG 009404R4, YWHG009404P2, and YWHG 029300**

APPENDIX K: INFORMATION ON MONITORING WELLS AT SITE DP-32

Open the following J-PEG files, in order:

1. Figure MW 4-1: Site Location Map
2. Figure MW 4-2: Site DP-32 Features Map
3. Figure MW 4-3: Preliminary Assessment / Site Inspection Sample Locations
4. Figure MW 4-4: Site DP-32 SI and RI Sample Locations
5. Figure MW 4-5: Site DP-32 Bedrock Surface
6. Figure MW 4-6: Site DP-32 Cross Section Locations
7. Figure 4-7 (MW 4-7a): Site DP-32 Cross Section A-A' (partial)
8. Figure 4-8 left and right (MW 4-8a and MW 4-8b): Site DP-32 Cross Section B-B'
9. Figure 4-9 left and right (MW 4-9a and MW 4-9b): Site DP-32 Cross Section C-C'
10. Figures 4-10 left and right (MW 4-10a and MW 4-10b): Site DP-32 Cross Section D-D'
11. Figure MW 4-11: Site DP-32 Potentiometric Surface Map
12. Figure 4-12 left and right (MW 4-12a and MW 4-12b): Site DP-32 Exceedances in Soil Samples
13. Figure 4-13 left and right (MW 4-13a and MW 4-13b): Site DP-32 Exceedances in Groundwater Samples
14. Figure MW 4-14: Site DP-32 TCE Concentrations Map
15. Figure 4-15 left and right (MW 4-15a and MW 4-15b): Site DP-32 TCE Detections in Groundwater Samples
16. Figure 4-16 right and left (MW 4-16a and MW 4-16b): Site DP-32 Exceedances in Surface Water Samples
17. Figure 4-17 left and right (MW 4-17a and MW 4-17b): Site DP-32 Exceedances in Sediment Samples
18. Figure 4-18 left and right (MW 4-18a and MW 4-18b): Evaluation of Potentially Complete Exposure Pathways for Site DP-32
19. Figure MW 4-19: Conceptual Site Model, Ecological Evaluation for Site DP-32

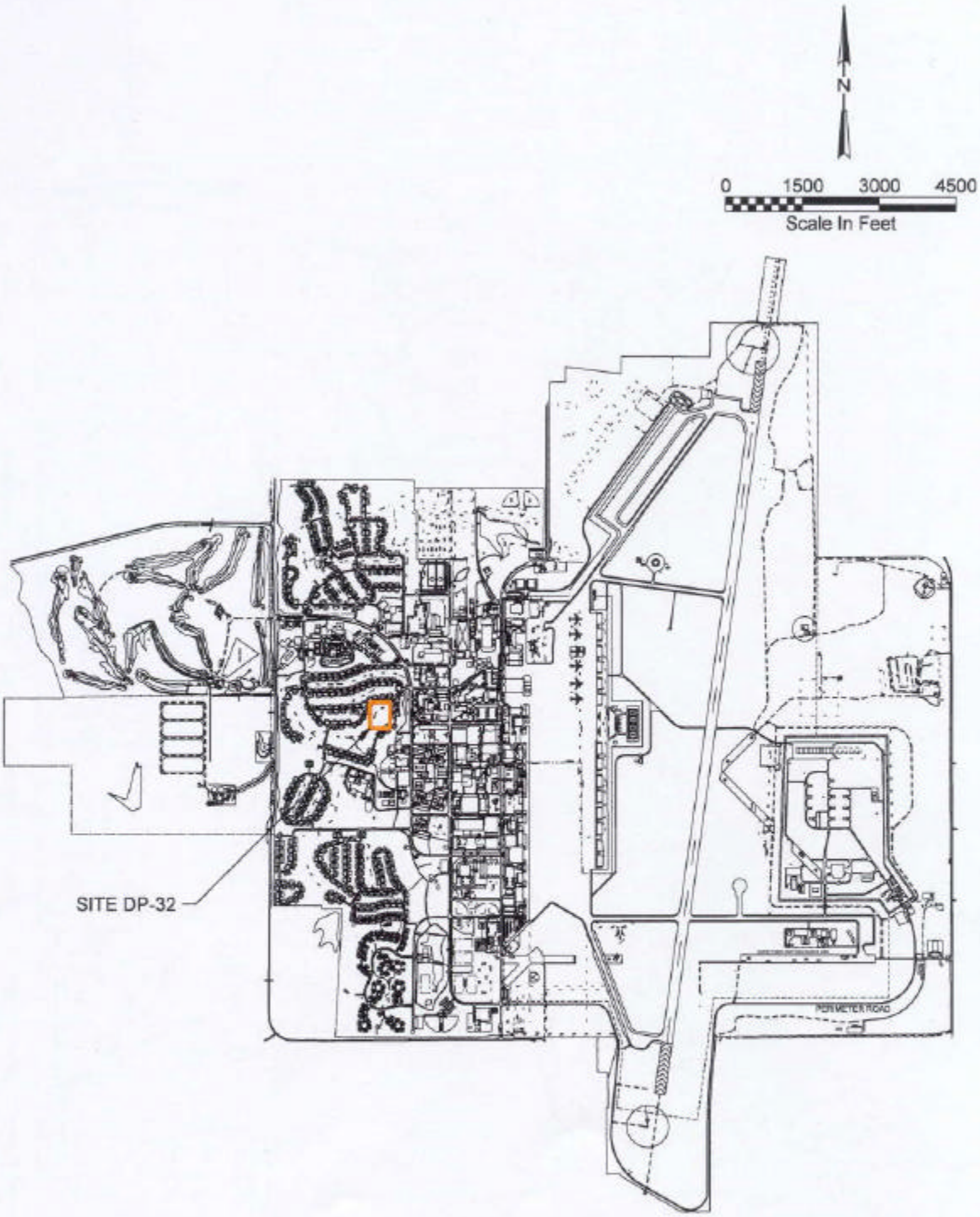


Figure 4-1
Site Location Map
Remedial Investigation Report for
Sites DP-32, SS-40, SS-41 and SS-44
Whiteman Air Force Base, Missouri

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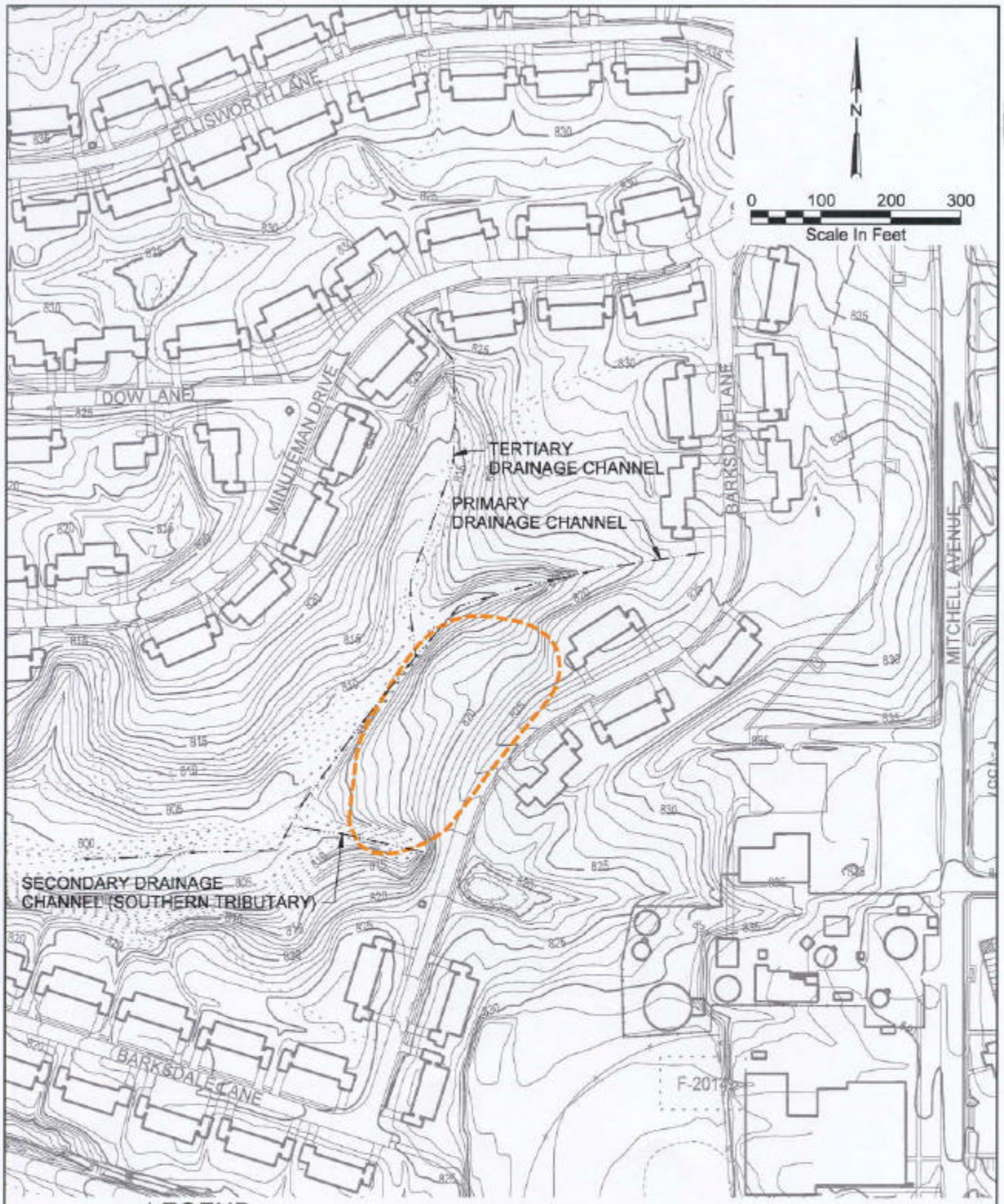

LEGEND

—— XX ——	FENCE
198	BUILDING AND BUILDING NO.
- - - - - -	APPROXIMATE SITE LIMITS
. . . . .	PROPOSED SITE FEATURES OR APPROXIMATE CONTOUR LOCATION
—— 830 ——	GROUND SURFACE CONTOUR

Figure 4-2
Site DP-32 Features Map
Remedial Investigation Report for
Sites DP-32, SS-40, SS-41 and SS-44
Whiteman Air Force Base, Missouri

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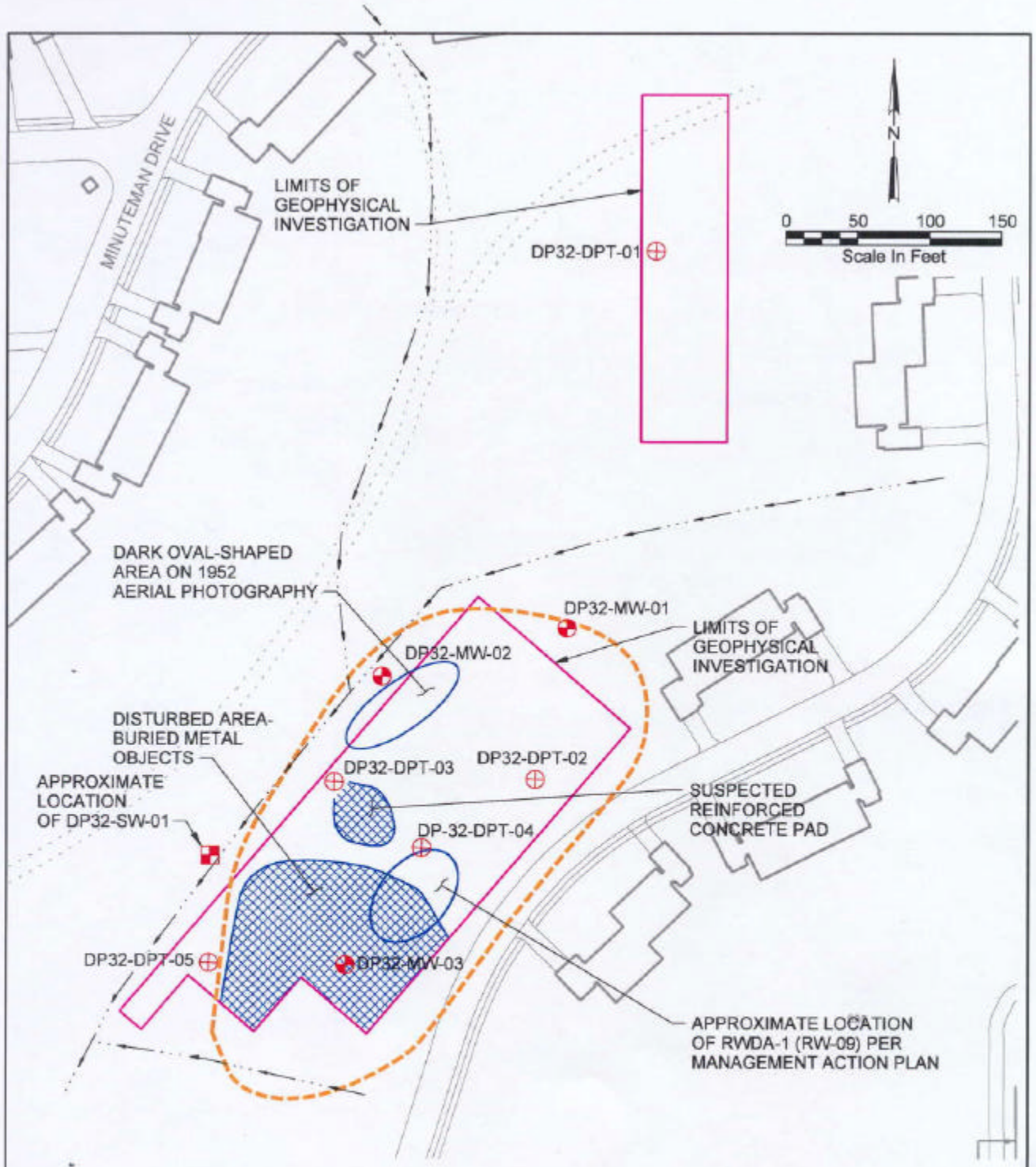

LEGEND

—— xx ——	FENCE
198	BUILDING AND BUILDING NO.
- - - - - -	APPROXIMATE SITE LIMITS
- - - - - -	PROPOSED SITE FEATURES OR APPROXIMATE CONTOUR LOCATION
DP32-DPT-05 ⊕	DPT BORING LOCATION
DP32-MW-03	MONITORING WELL LOCATION
DP32-SW-01	SURFACE WATER SAMPLE LOCATION

Figure 4-3
Preliminary Assessment/Site Inspection
Sample Locations
Remedial Investigation Report for
Sites DP-32, SS-40, SS-41 and SS-44
Whiteman Air Force Base, Missouri

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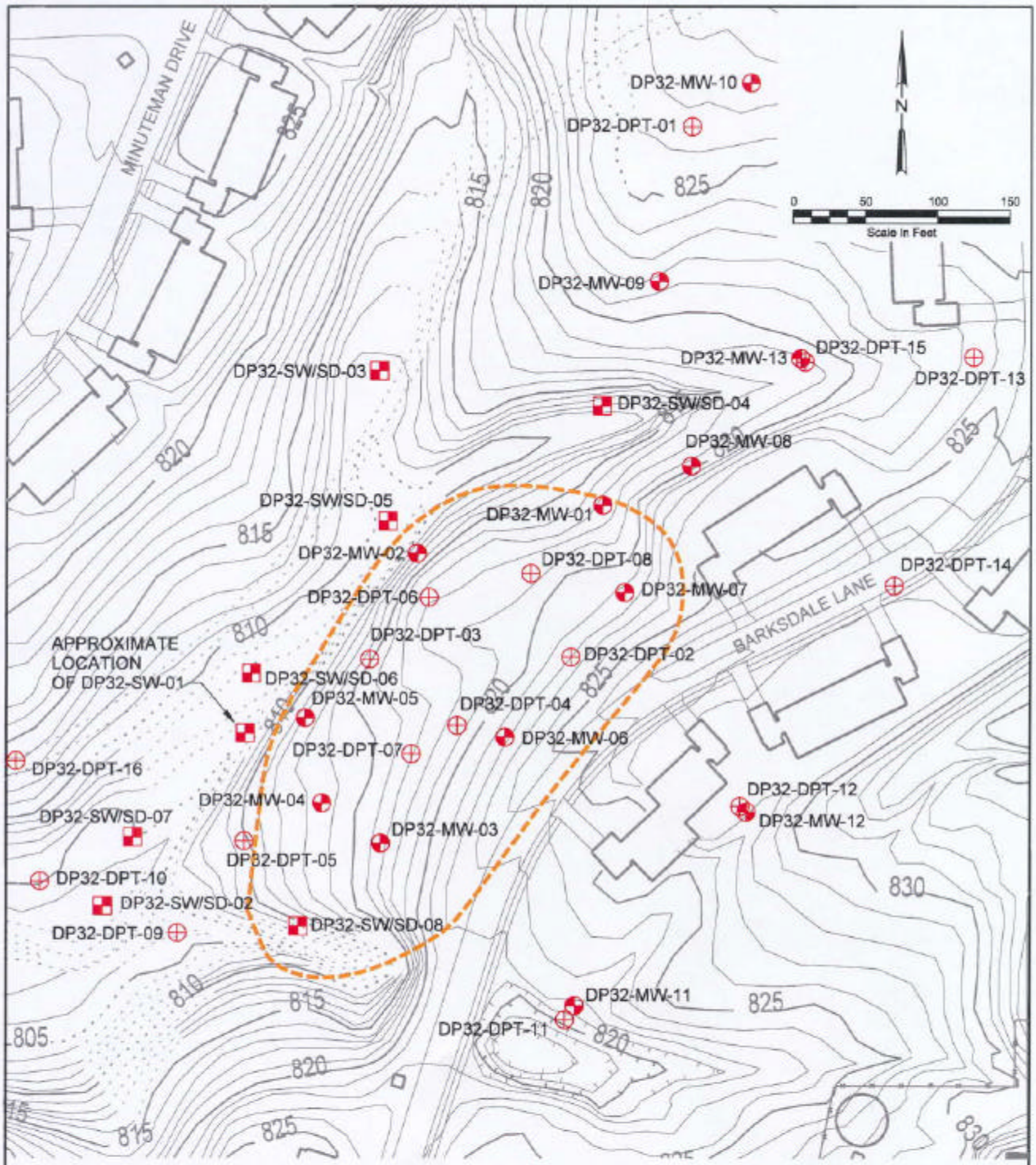

LEGEND

- - - - - -	APPROXIMATE SITE LIMITS
. . . . .	PROPOSED SITE FEATURES OR APPROXIMATE CONTOUR LOCATION
—— 830 ——	GROUND SURFACE CONTOUR
DP32-MW-03	MONITORING WELL LOCATION
DP32-DPT-09	DPT BORING
DP32-SW/SD-02	SURFACE WATER/SEDIMENT SAMPLE LOCATION

ABBREVIATIONS

DPT	DIRECT PUSH TECHNOLOGY
SI	SITE INSPECTION
RI	REMEDIAL INVESTIGATION

Figure 4-4
Site DP-32 SI and RI
Sample Locations
Remedial Investigation Report for
Sites DP-32, SS-40, SS-41 and SS-44
Whiteman Air Force Base, Missouri

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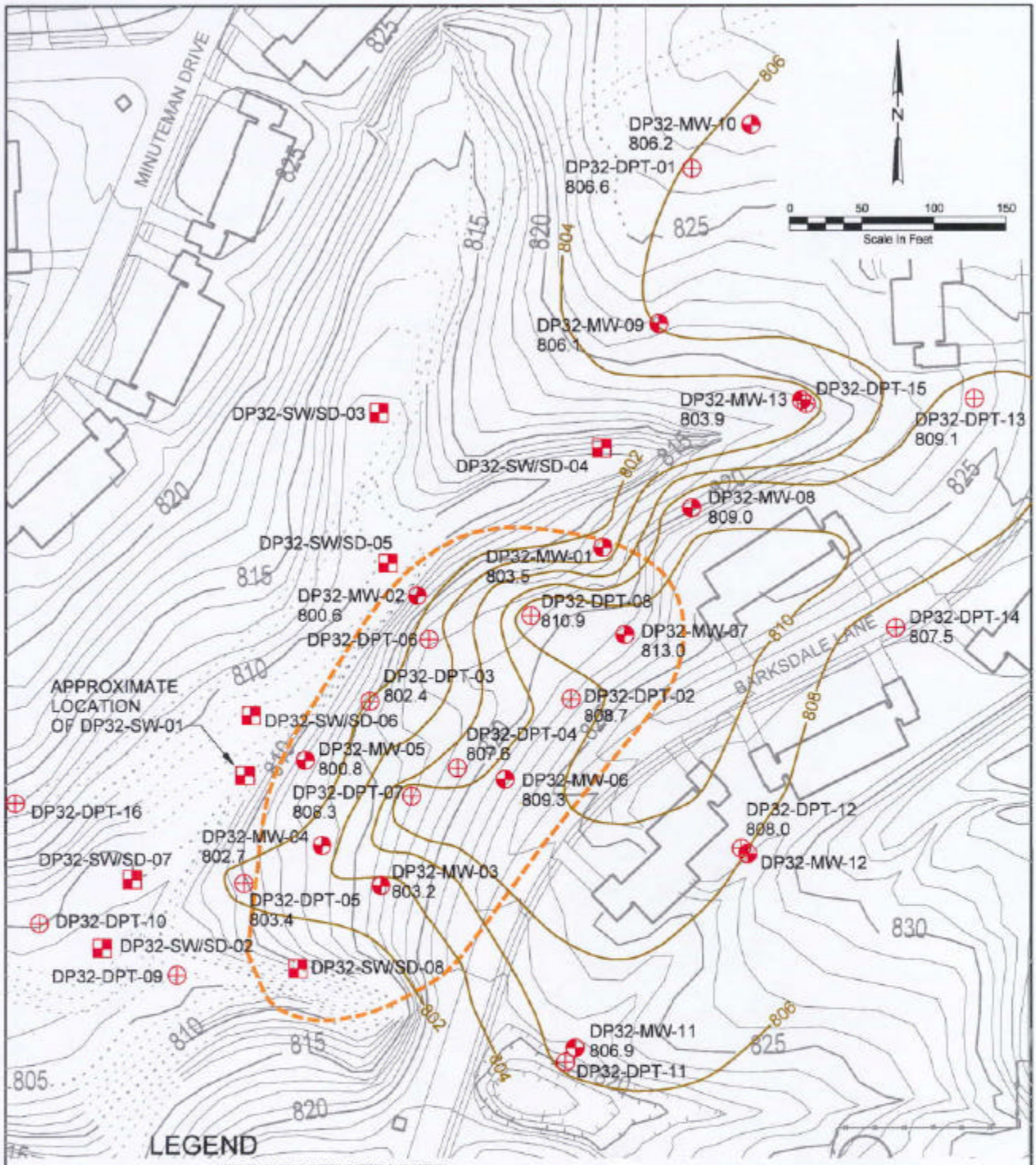

LEGEND

	APPROXIMATE SITE LIMITS
	PROPOSED SITE FEATURES OR APPROXIMATE CONTOUR LOCATION
830	GROUND SURFACE CONTOUR
	BEDROCK CONTOUR
DP32-MW-03 803.2	MONITORING WELL LOCATION BEDROCK ELEVATION (BASED ON DPT REFUSAL)
DP32-DPT-05 803.4	DPT BORING BEDROCK ELEVATION (BASED ON DPT REFUSAL)
DP32-SW/SD-02	SURFACE WATER/SEDIMENT SAMPLE LOCATION

ABBREVIATION

DPT	DIRECT PUSH TECHNONLOGY

Figure 4-5
Site DP-32 Bedrock Surface
(Based on DPT Refusal)
Remedial Investigation Report for
Sites DP-32, SS-40, SS-41 and SS-44
Whiteman Air Force Base, Missouri

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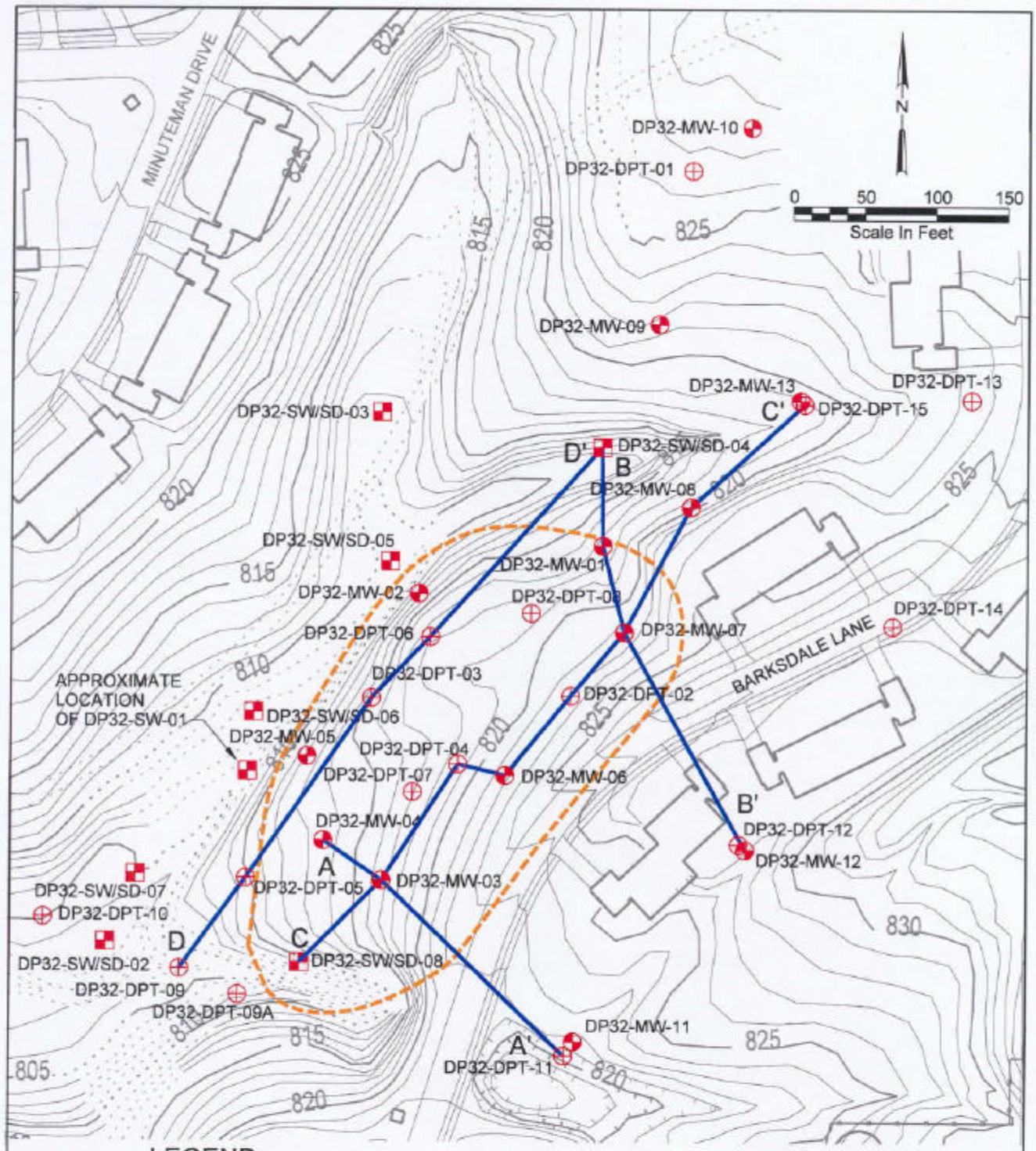

LEGEND

- - - - -	APPROXIMATE SITE LIMITS
———	CROSS SECTION LOCATION
. . . . .	PROPOSED SITE FEATURES OR APPROXIMATE CONTOUR LOCATION
——— 830 ———	GROUND SURFACE CONTOUR
DP32-MW-03	MONITORING WELL LOCATION
DP32-DPT-09	DPT BORING
DP32-SW/SD-02	SURFACE WATER/SEDIMENT SAMPLE LOCATION

Figure 4-6
Site DP-32 Cross Section Locations
Remedial Investigation Report for
Sites DP-32, SS-40, SS-41 and SS-44
Whiteman Air Force Base, Missouri

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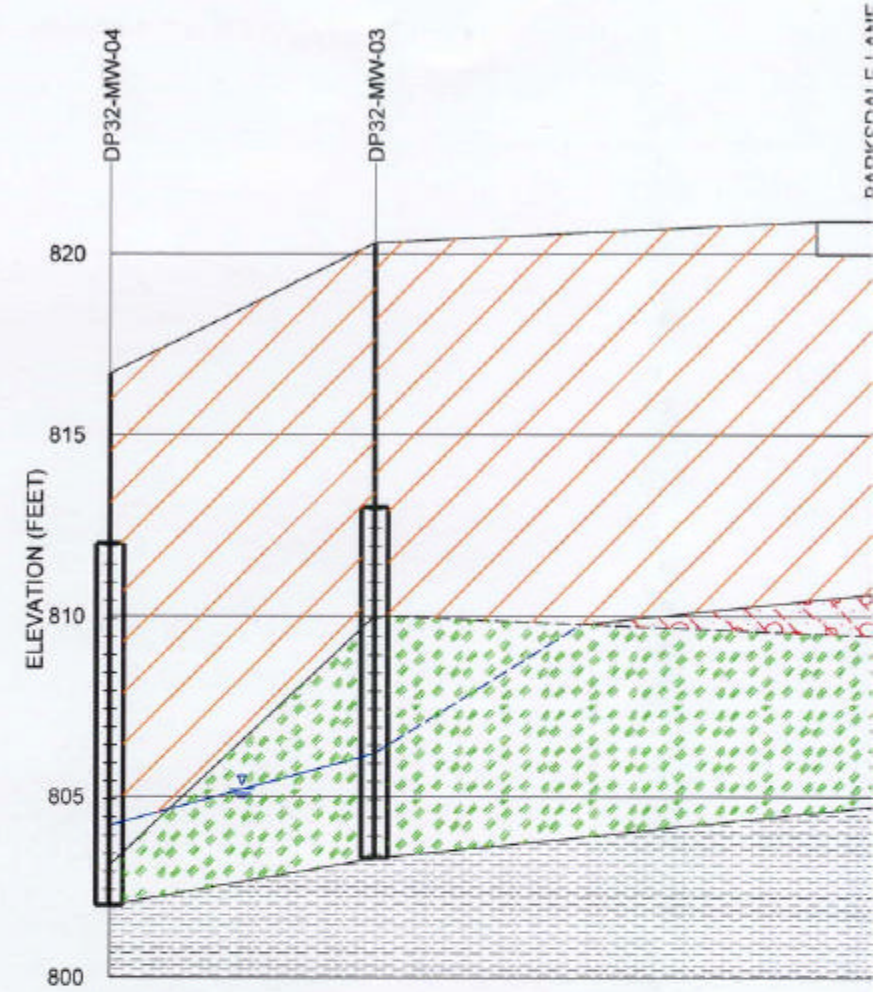


NORTHWEST (LOOKING NORTHEAS

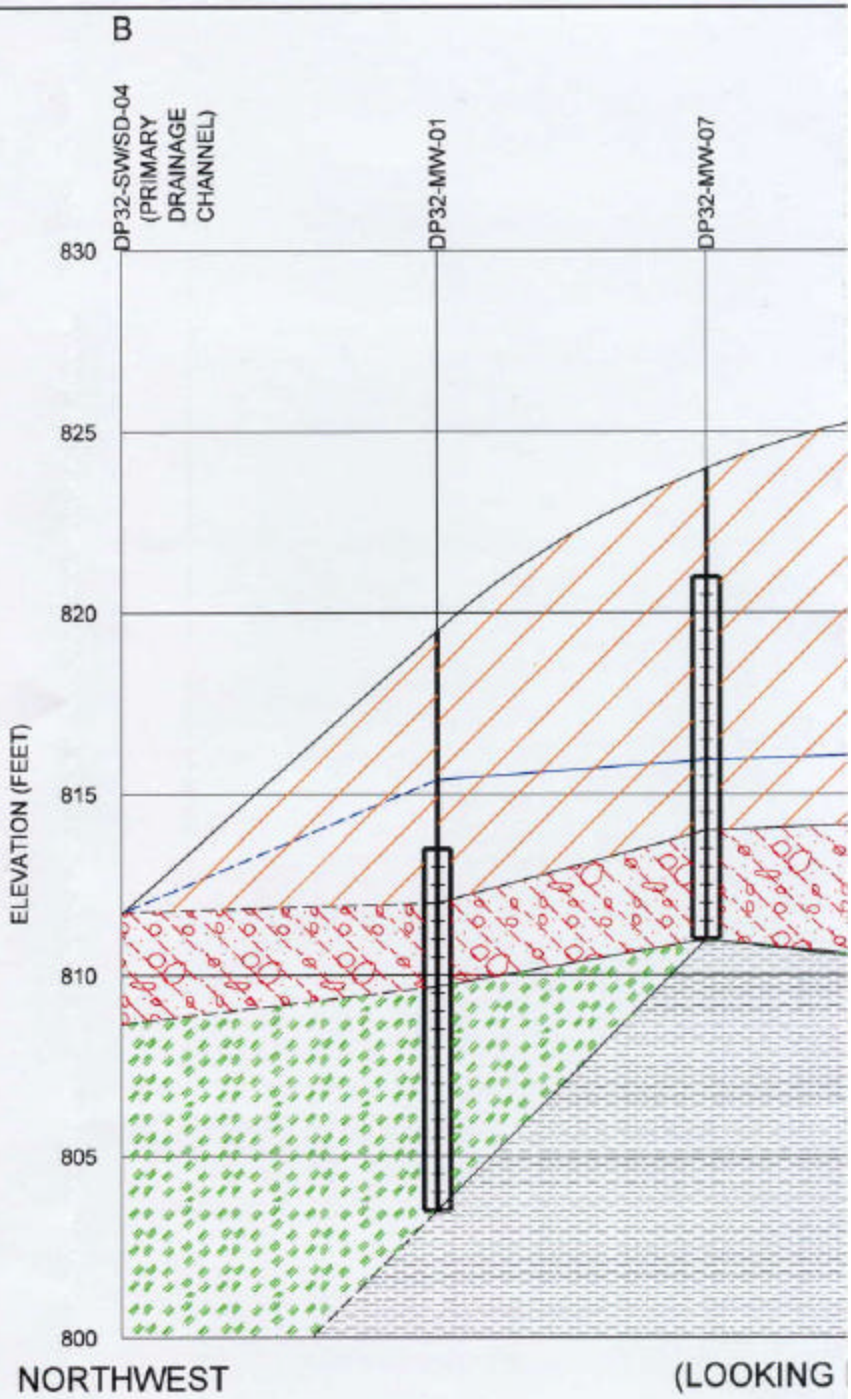
NOTE:
WATER LEVELS NOT PRESENTED FOR DIRECT

LEGEND

- MONITORING WELL SCREEN
- LEAN TO FAT CLAY
- CLAYEY GRAVEL
- HARD DRY CLAY
- SHALE
- GROUNDWATER SURFACE NOVEMBER 2002

SCALE: 1" = 40' HORIZONTAL
1" = 5' VERTICAL

fig307.dlv



LEGEND

- MONITORING WELL SCREEN
- LEAN TO FAT CLAY
- CLAYEY GRAVEL
- HARD DRY CLAY
- SHALE
- GROUNDWATER SURFACE NOVEMBER 2002

SCALE: 1" = 40' HORIZ
1" = 5' VERTIC

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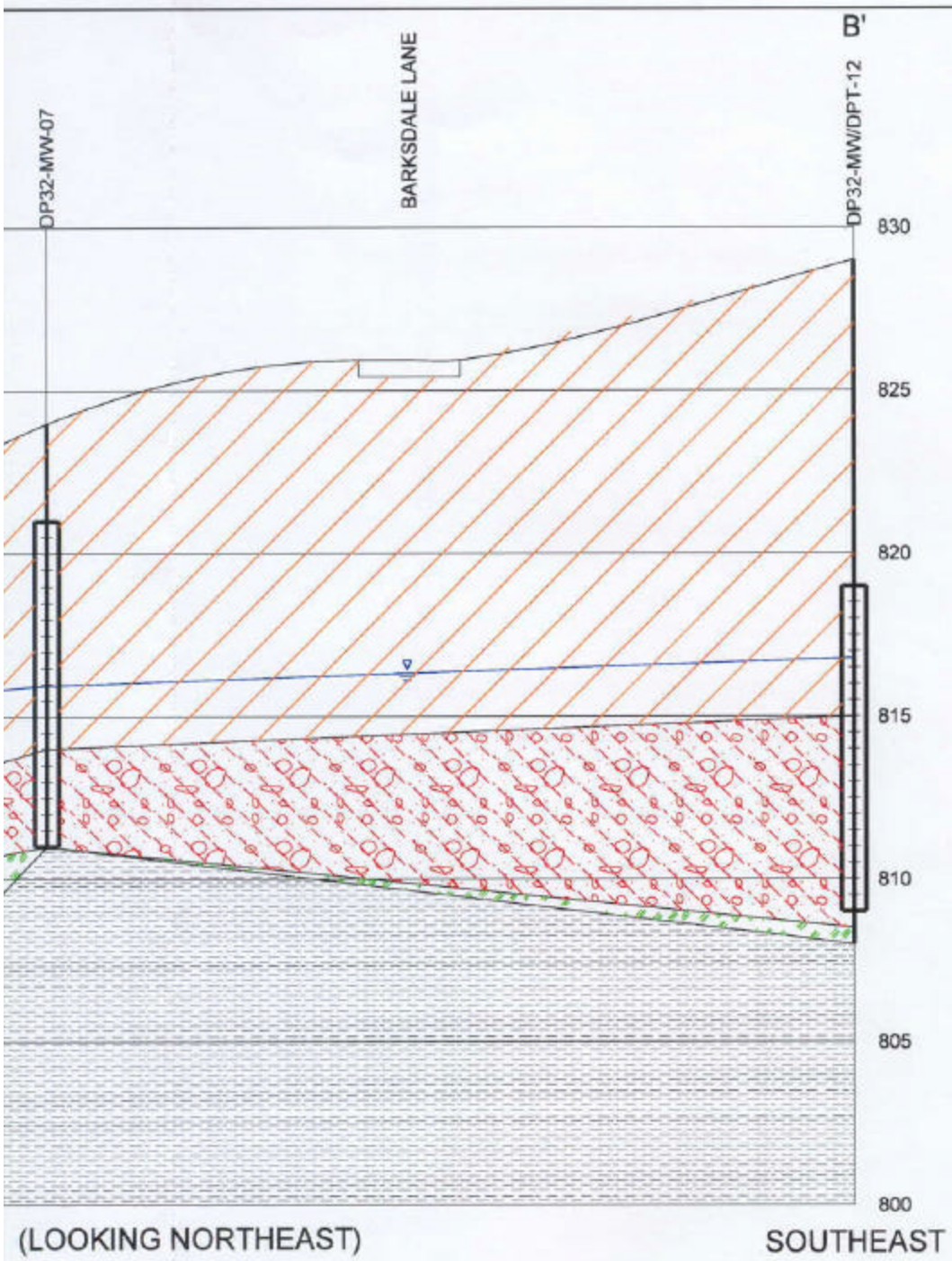

.E: 1" = 40' HORIZONTAL
1" = 5' VERTICAL

Figu
Site DP-32 Cross Sectio
Remedial Investigation F
Sites DP-32, SS-40, SS-41 a
Whiteman Air Force Base,

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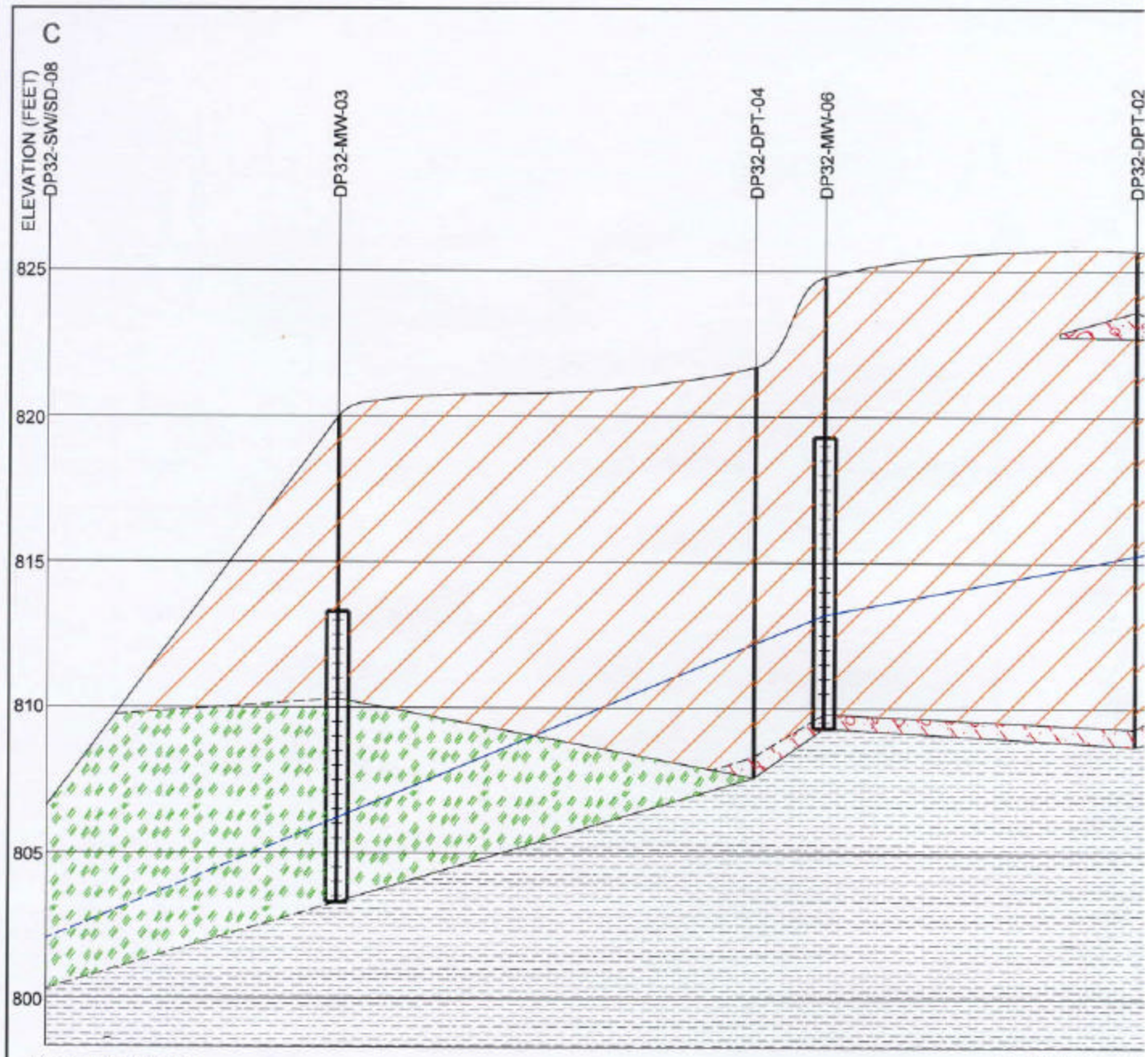

LEGEND

- MONITORING WELL SCREEN
- LEAN TO FAT CLAY
- CLAYEY GRAVEL
- HARD DRY CLAY
- SHALE
- GROUNDWATER SURFACE NOVEMBER 2002

NOTE: Water leve
direct push

SCALE: 1" = 40' H
1" = 5' VE

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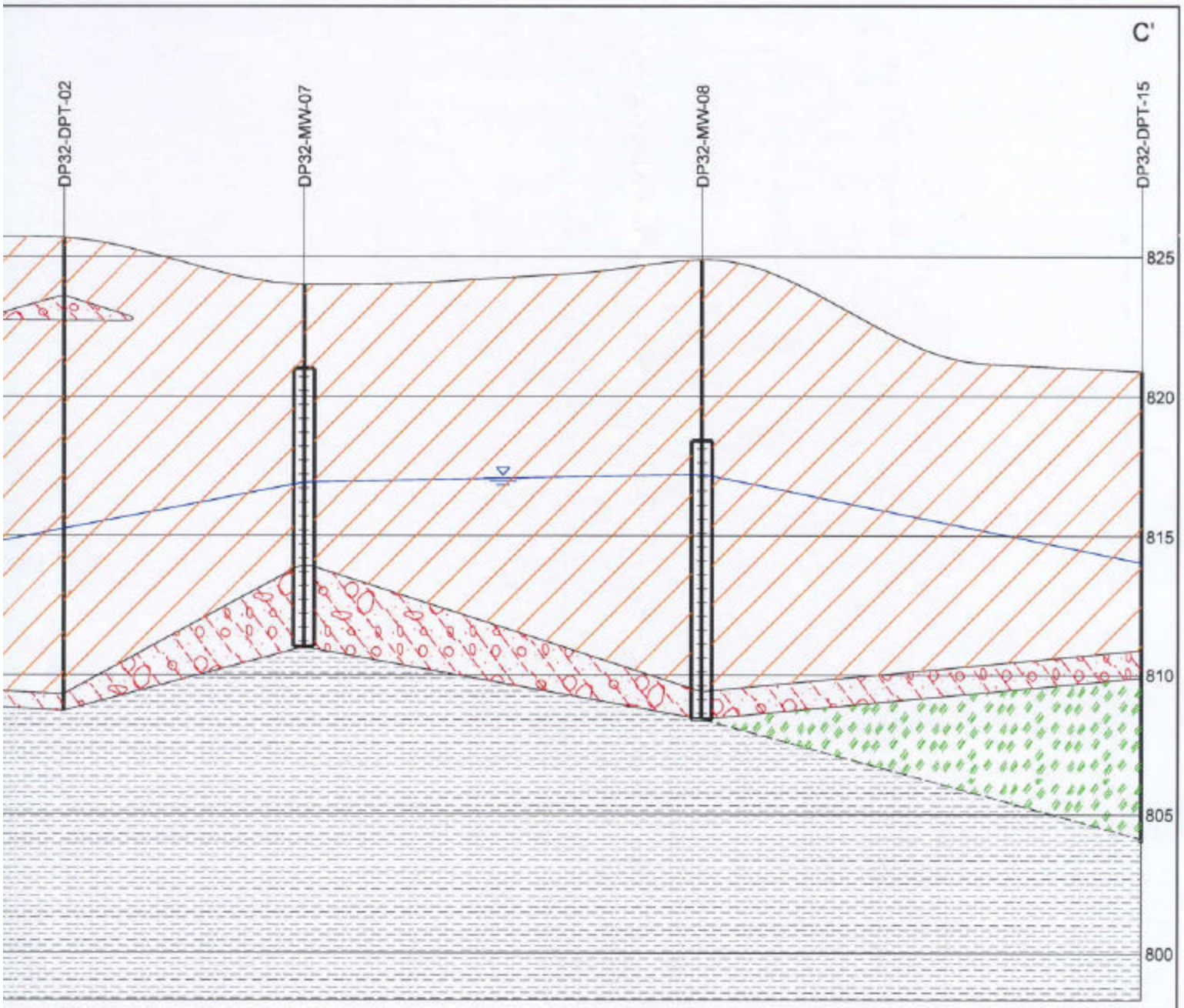

KING NORTHWEST)

NORTHEAST

Water levels not presented for
irect push technology borings.

1" = 40' HORIZONTAL
1" = 5' VERTICAL

Figure 4-9
Site DP-32 Cross Section C-C'
Remedial Investigation Report for
Sites DP-32, SS-40, SS-41 and SS-44
Whiteman Air Force Base, Missouri

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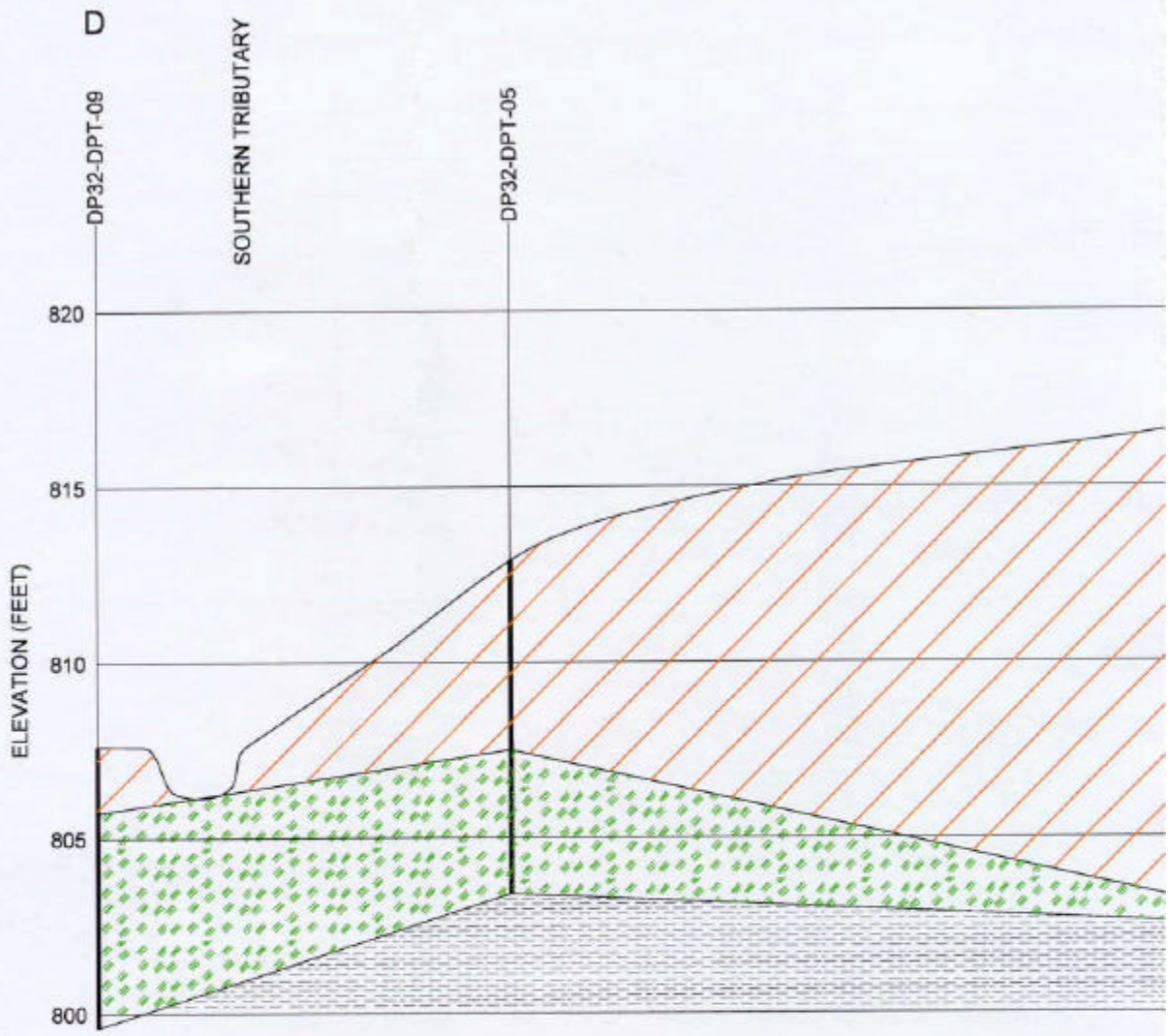


SOUTHWEST

(LOOKING

LEGEND

MONITORING WELL SCREEN

LEAN TO FAT CLAY

CLAYEY GRAVEL

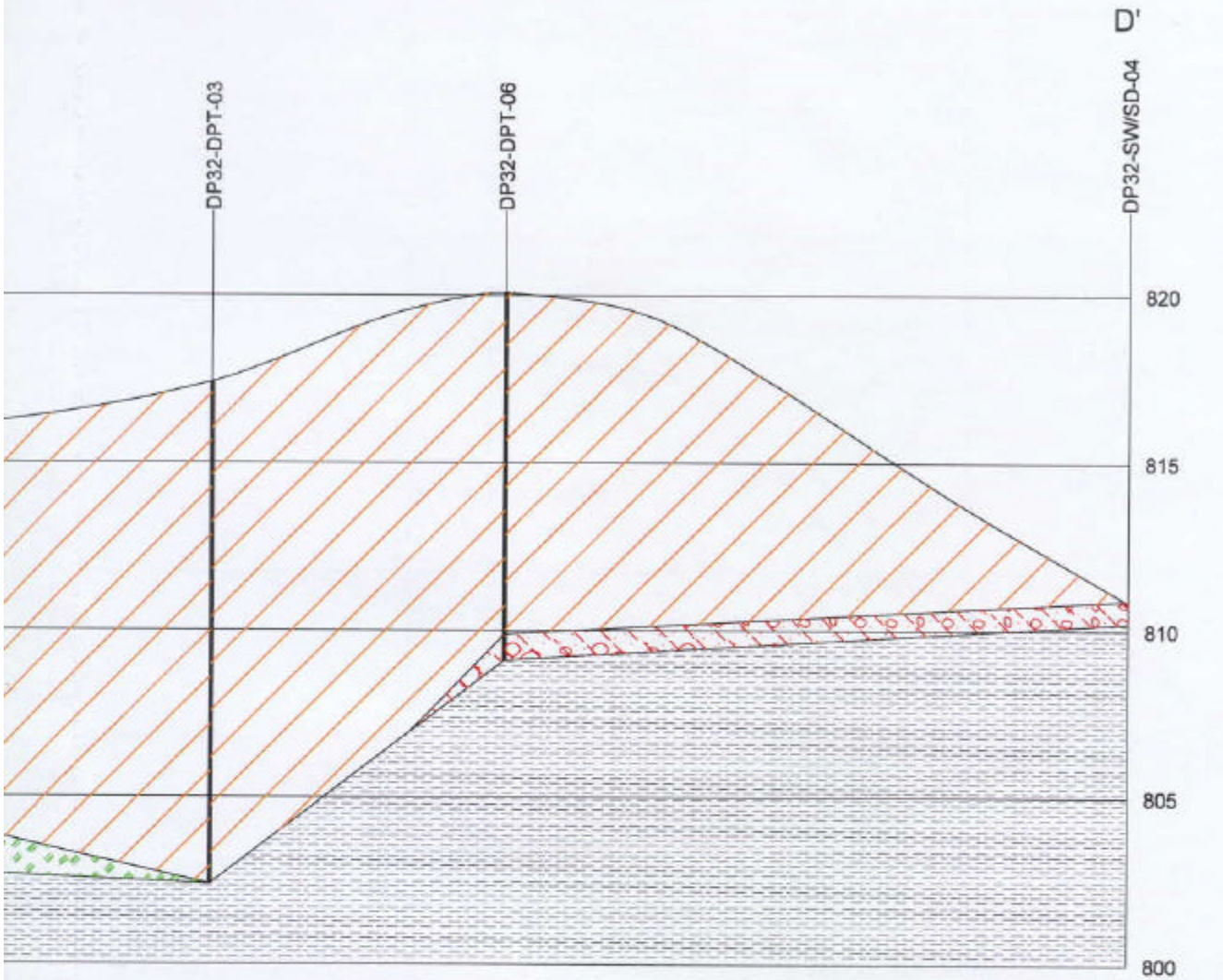
HARD DRY CLAY

SHALE

NOTE: Water le
direct p

SCALE: 1" =
1" =

8205fig310.dlv



ING NORTHWEST)

NORTHEAST

Water levels not presented for
direct push technology borings.

E: 1" = 40' HORIZONTAL
1" = 5' VERTICAL

Figure 4-10
Site DP-32 Cross Section D-D'
Remedial Investigation Report for
Sites DP-32, SS-40, SS-41 and SS-44
Whiteman Air Force Base, Missouri

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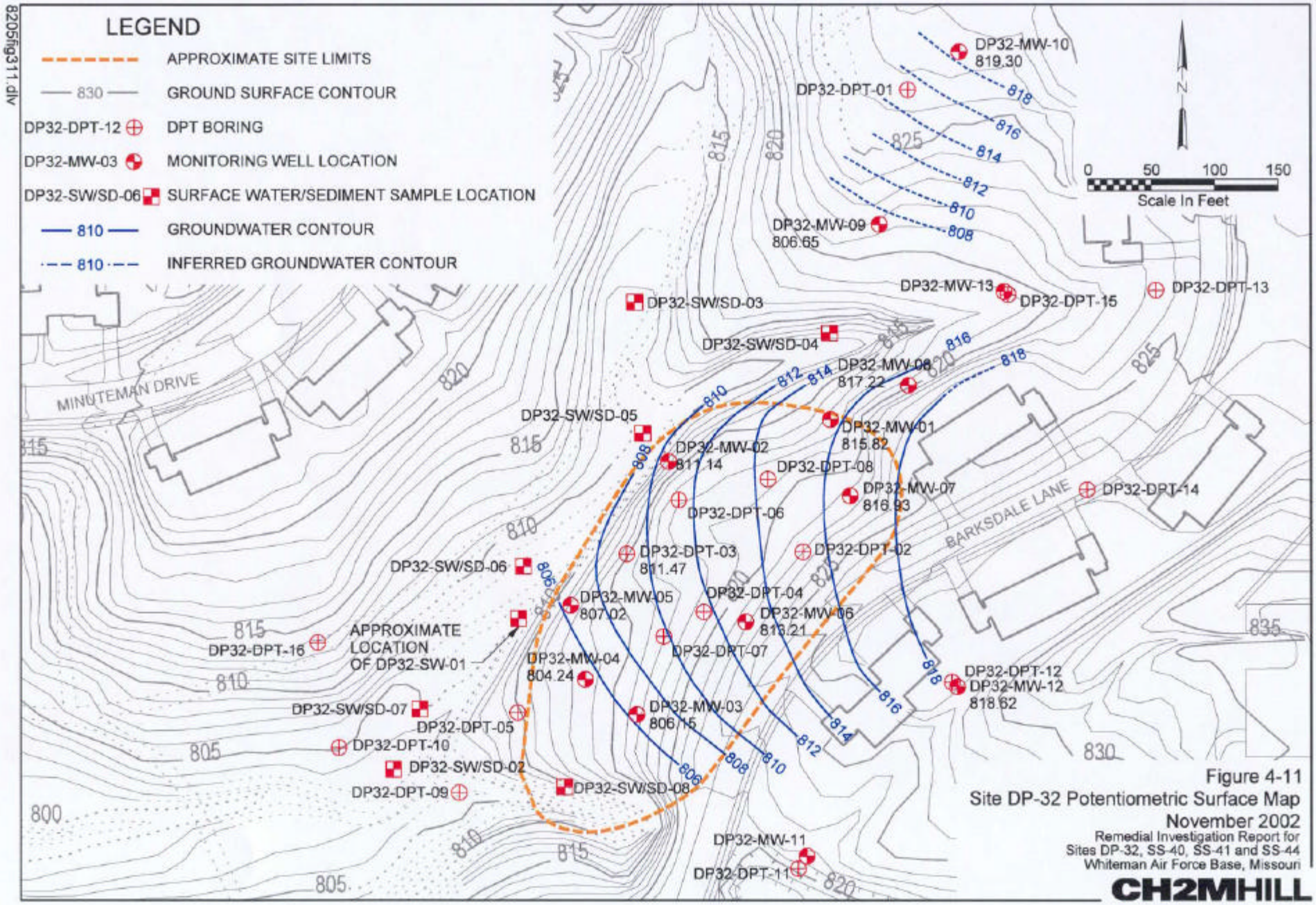

Figure 4-11
Site DP-32 Potentiometric Surface Map
November 2002
Remedial Investigation Report for
Sites DP-32, SS-40, SS-41 and SS-44
Whiteman Air Force Base, Missouri

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LEGEND

- APPROXIMATE SITE LIMITS
- 830 — GROUND SURFACE CONTOUR
- DP32-DPT-09 — DPT BORING
- DP32-MW-03 — MONITORING WELL LOCATION

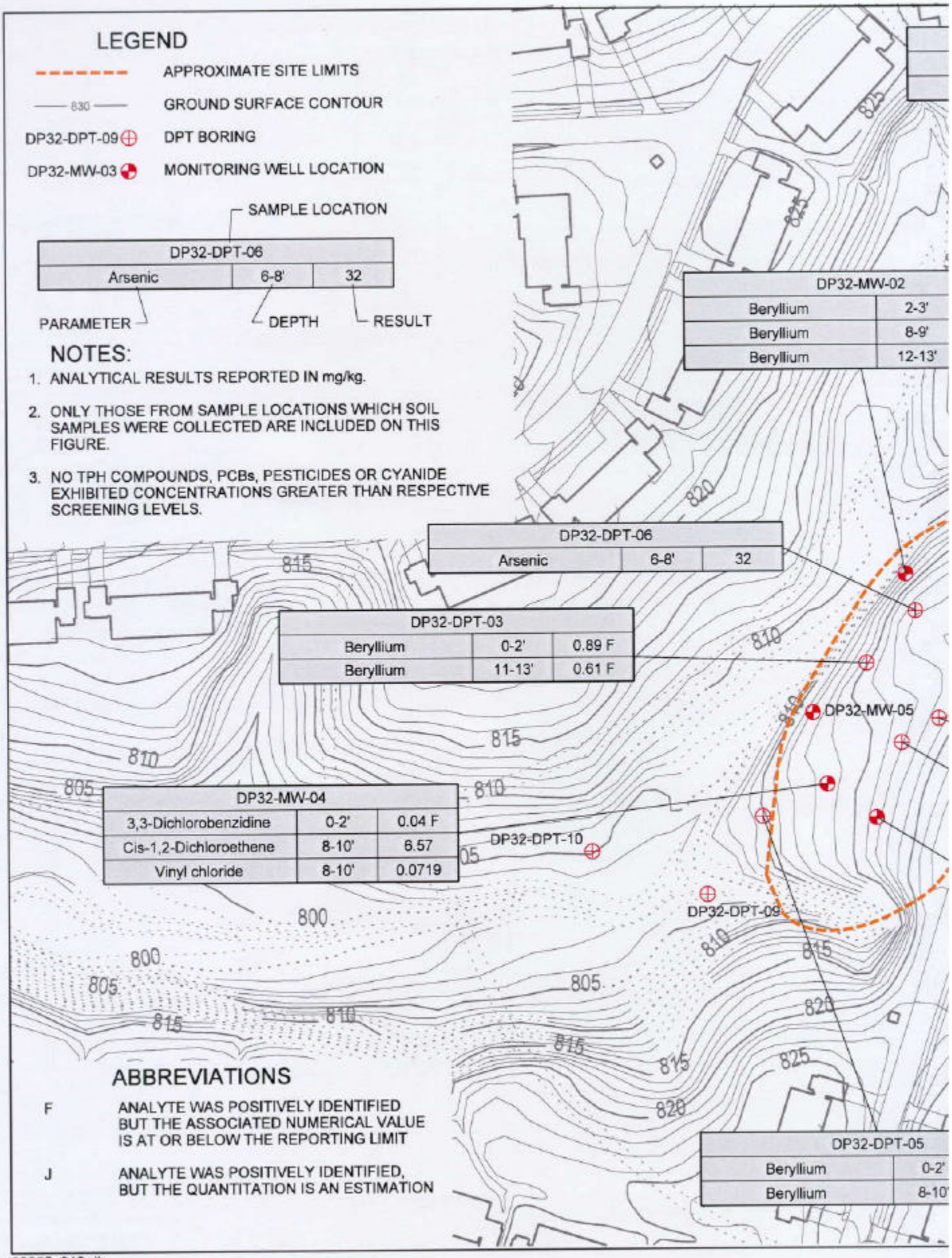
SAMPLE LOCATION

DP32-DPT-06		
Arsenic	6-8'	32

PARAMETER — DEPTH — RESULT

NOTES:

1. ANALYTICAL RESULTS REPORTED IN mg/kg.
2. ONLY THOSE FROM SAMPLE LOCATIONS WHICH SOIL SAMPLES WERE COLLECTED ARE INCLUDED ON THIS FIGURE.
3. NO TPH COMPOUNDS, PCBs, PESTICIDES OR CYANIDE EXHIBITED CONCENTRATIONS GREATER THAN RESPECTIVE SCREENING LEVELS.



ABBREVIATIONS

F — ANALYTE WAS POSITIVELY IDENTIFIED BUT THE ASSOCIATED NUMERICAL VALUE IS AT OR BELOW THE REPORTING LIMIT

J — ANALYTE WAS POSITIVELY IDENTIFIED, BUT THE QUANTITATION IS AN ESTIMATION

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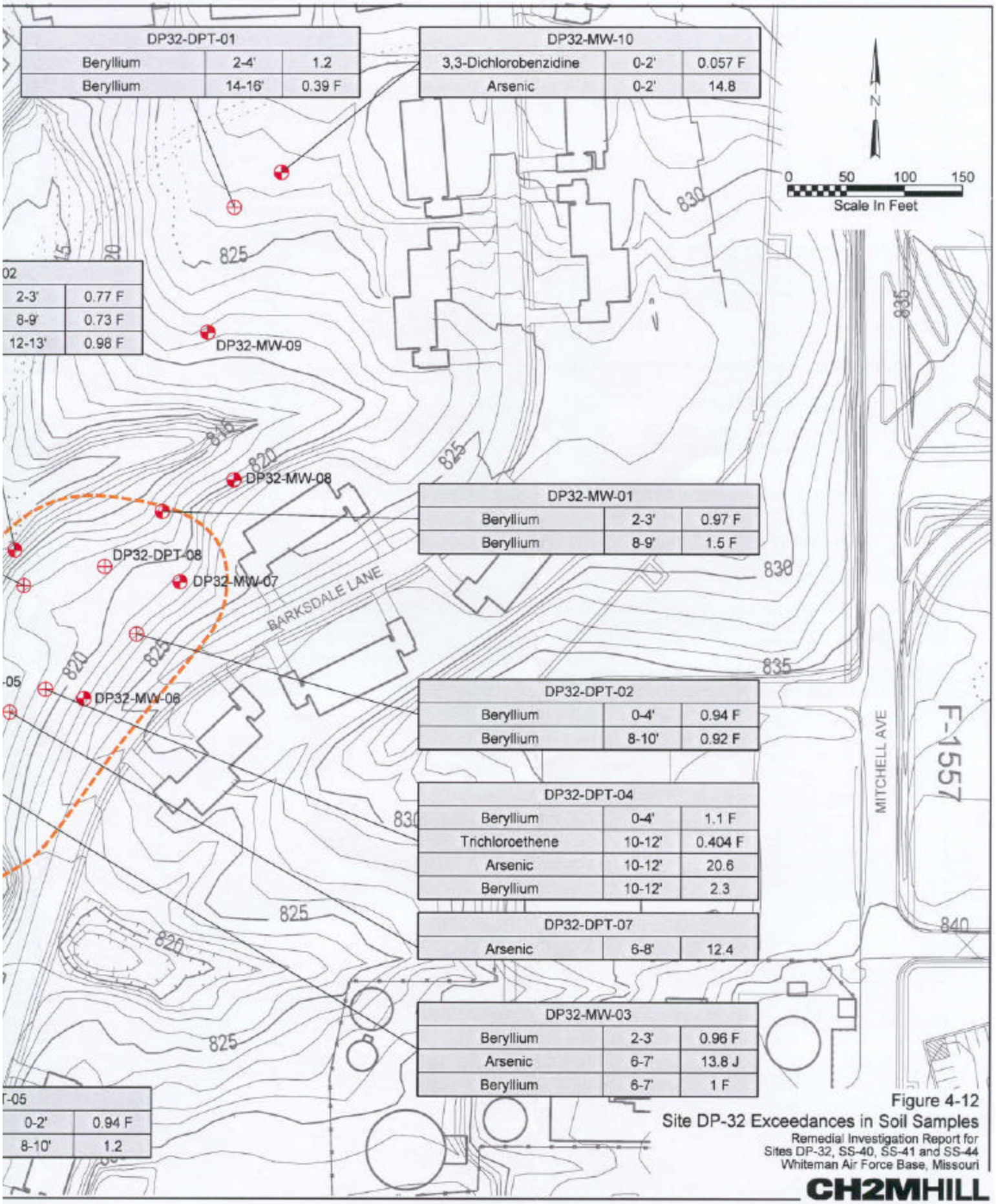

Figure 4-12
Site DP-32 Exceedances in Soil Samples
Remedial Investigation Report for
Sites DP-32, SS-40, SS-41 and SS-44
Whiteman Air Force Base, Missouri

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LEGEND

- - - - - -	APPROXIMATE SITE LIMITS
—— 830 ——	GROUND SURFACE CONTOUR
DP32-DPT-09 ⊕	DPT BORING
DP32-MW-03 ◕	MONITORING WELL LOCATION

SAMPLE LOCATION

DP32-DPT-03	
Vinyl chloride	26.77 J

PARAMETER — RESULT

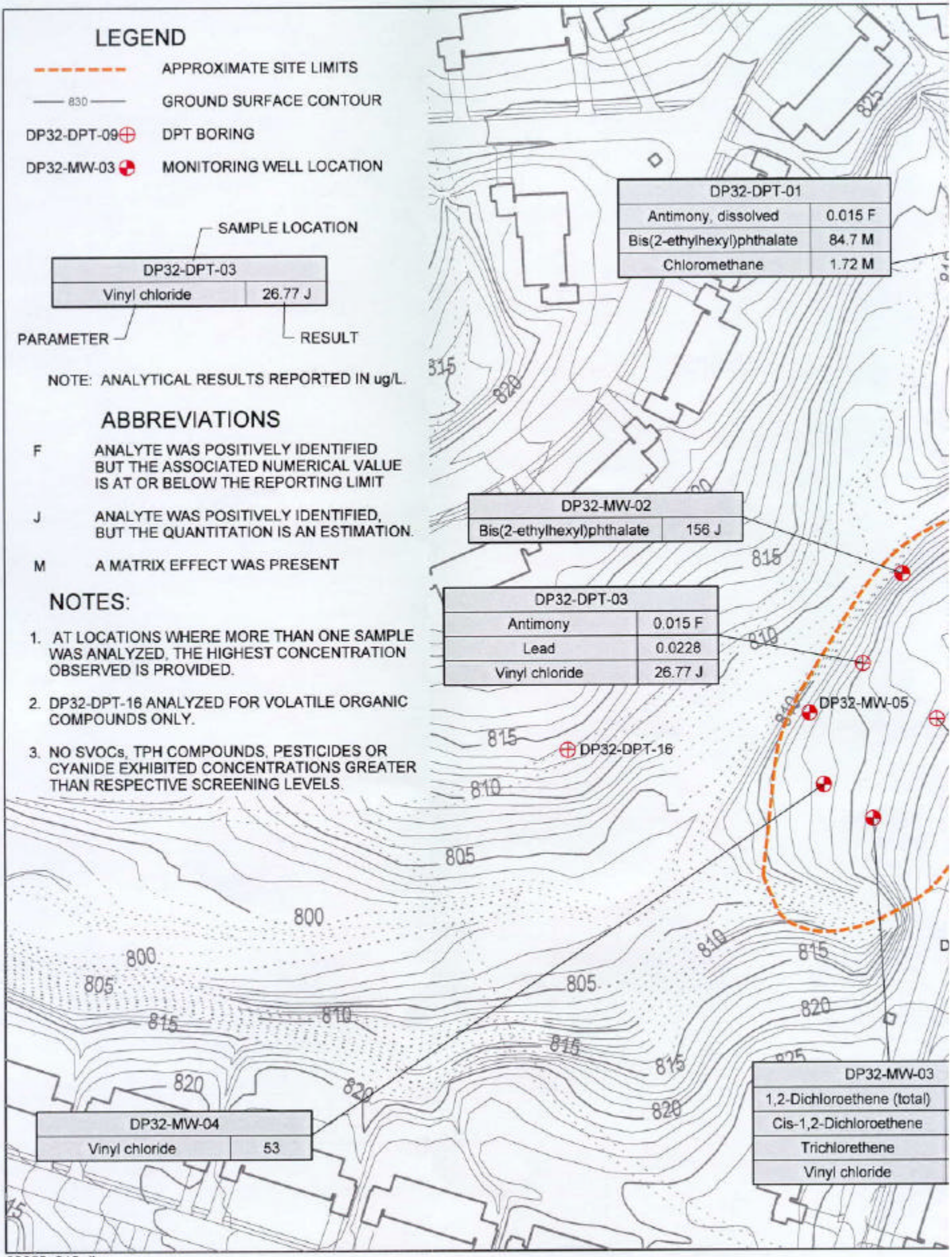
NOTE: ANALYTICAL RESULTS REPORTED IN ug/L.

ABBREVIATIONS

F	ANALYTE WAS POSITIVELY IDENTIFIED BUT THE ASSOCIATED NUMERICAL VALUE IS AT OR BELOW THE REPORTING LIMIT
J	ANALYTE WAS POSITIVELY IDENTIFIED, BUT THE QUANTITATION IS AN ESTIMATION.
M	A MATRIX EFFECT WAS PRESENT

NOTES:

1. AT LOCATIONS WHERE MORE THAN ONE SAMPLE WAS ANALYZED, THE HIGHEST CONCENTRATION OBSERVED IS PROVIDED.
2. DP32-DPT-16 ANALYZED FOR VOLATILE ORGANIC COMPOUNDS ONLY.
3. NO SVOCs, TPH COMPOUNDS, PESTICIDES OR CYANIDE EXHIBITED CONCENTRATIONS GREATER THAN RESPECTIVE SCREENING LEVELS.



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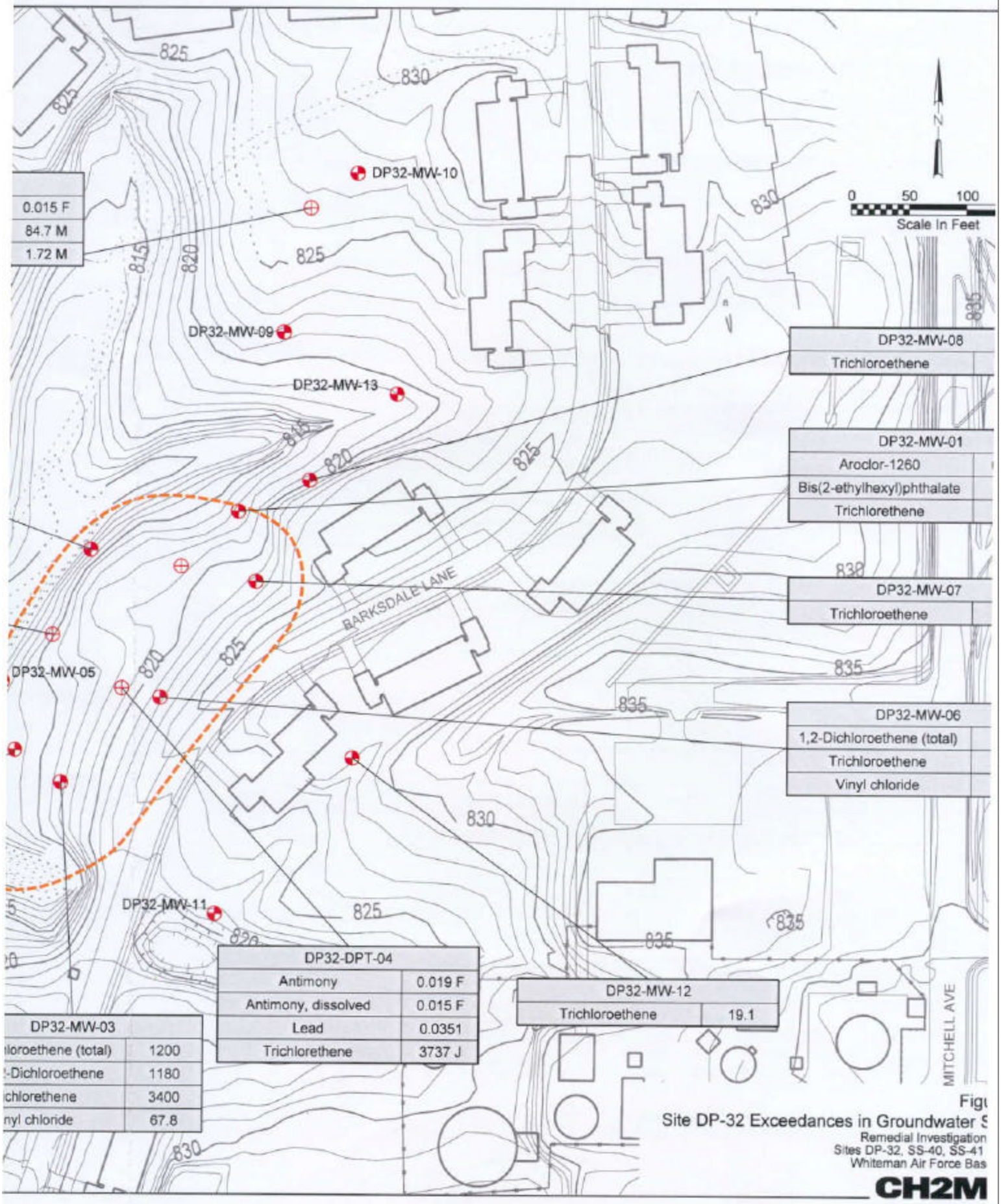

Figu

Site DP-32 Exceedances in Groundwater S

Remedial Investigation
Sites DP-32, SS-40, SS-41
Whiteman Air Force Bas

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LEGEND

- APPROXIMATE SITE LIMITS
- 830 — GROUND SURFACE CONTOUR
- DP32-DPT-01 (2.17) — DPT BORING TCE CONCENTRATION IN ug/L
- DP32-MW-03 (3400) — MONITORING WELL LOCATION TCE CONCENTRATION IN ug/L
- DP32-SW-02 (4.61) — SURFACE WATER SAMPLE LOCATION TCE CONCENTRATION IN ug/L
- SURFACE WATER TCE ISOCONCENTRATION IN ug/L
- GROUND WATER TCE ISOCONCENTRATION IN ug/L

NOTES:

1. Analytical data for locations DP32-DPT-11 through DP32-DPT-13, DP32-DPT-15 and DP32-MW-06 were from in-field analysis.
2. At locations where more than one sample was analyzed, the highest concentration observed is provided.

ABBREVIATIONS

TCE	TRICHLOROETHENE
DPT	DIRECT PUSH TECHNOLOGY
ND	NOT DETECTED
NT	NOT TESTED

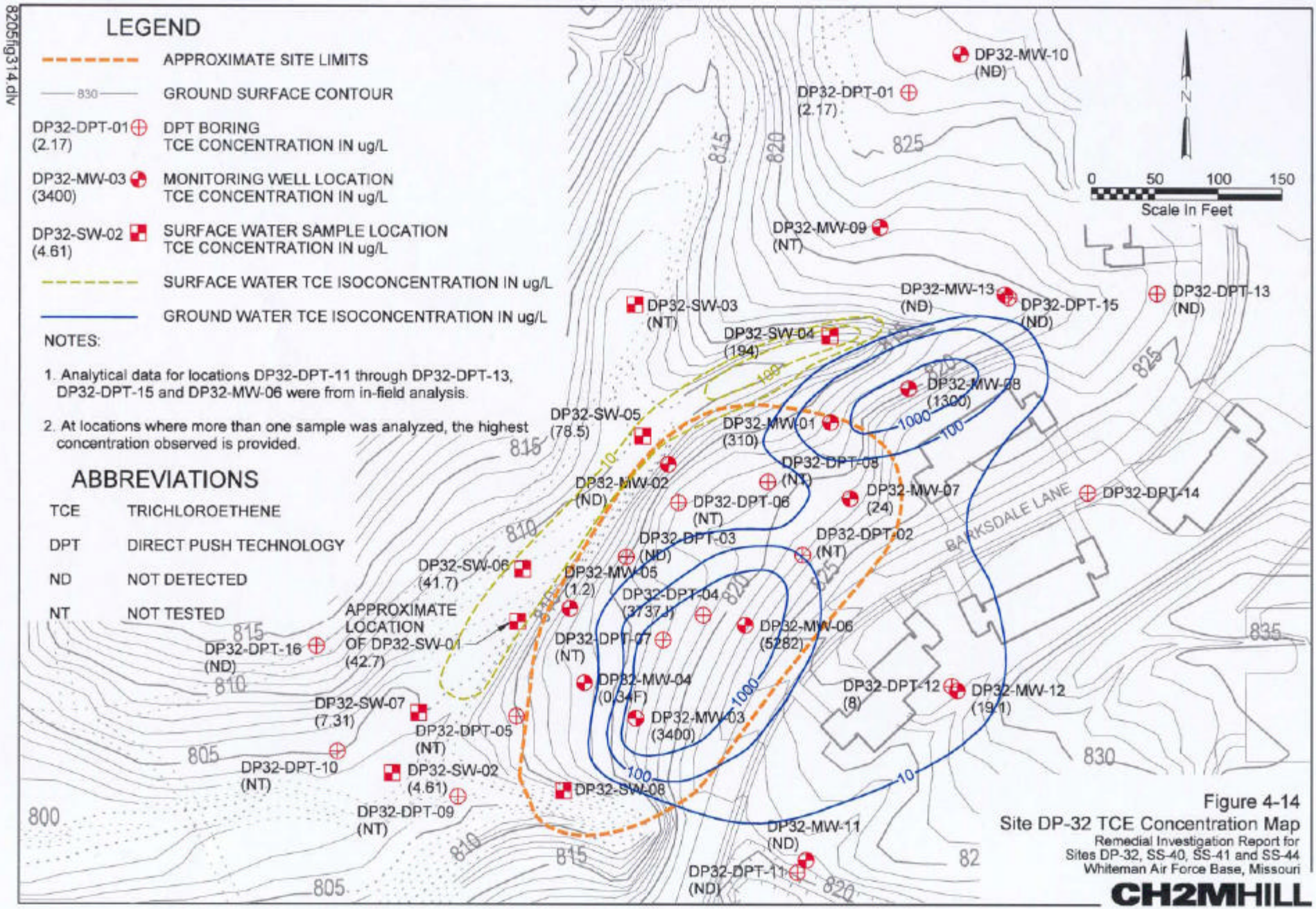

Figure 4-14
Site DP-32 TCE Concentration Map
Remedial Investigation Report for Sites DP-32, SS-40, SS-41 and SS-44
Whiteman Air Force Base, Missouri

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LEGEND

- APPROXIMATE SITE LIMITS
- 830 — GROUND SURFACE CONTOUR
- DP32-DPT-09 — DPT BORING
- DP32-MW-03 — MONITORING WELL LOCATION

SAMPLE LOCATION

DP32-MW-05		
TCE	08-13-02	1.2

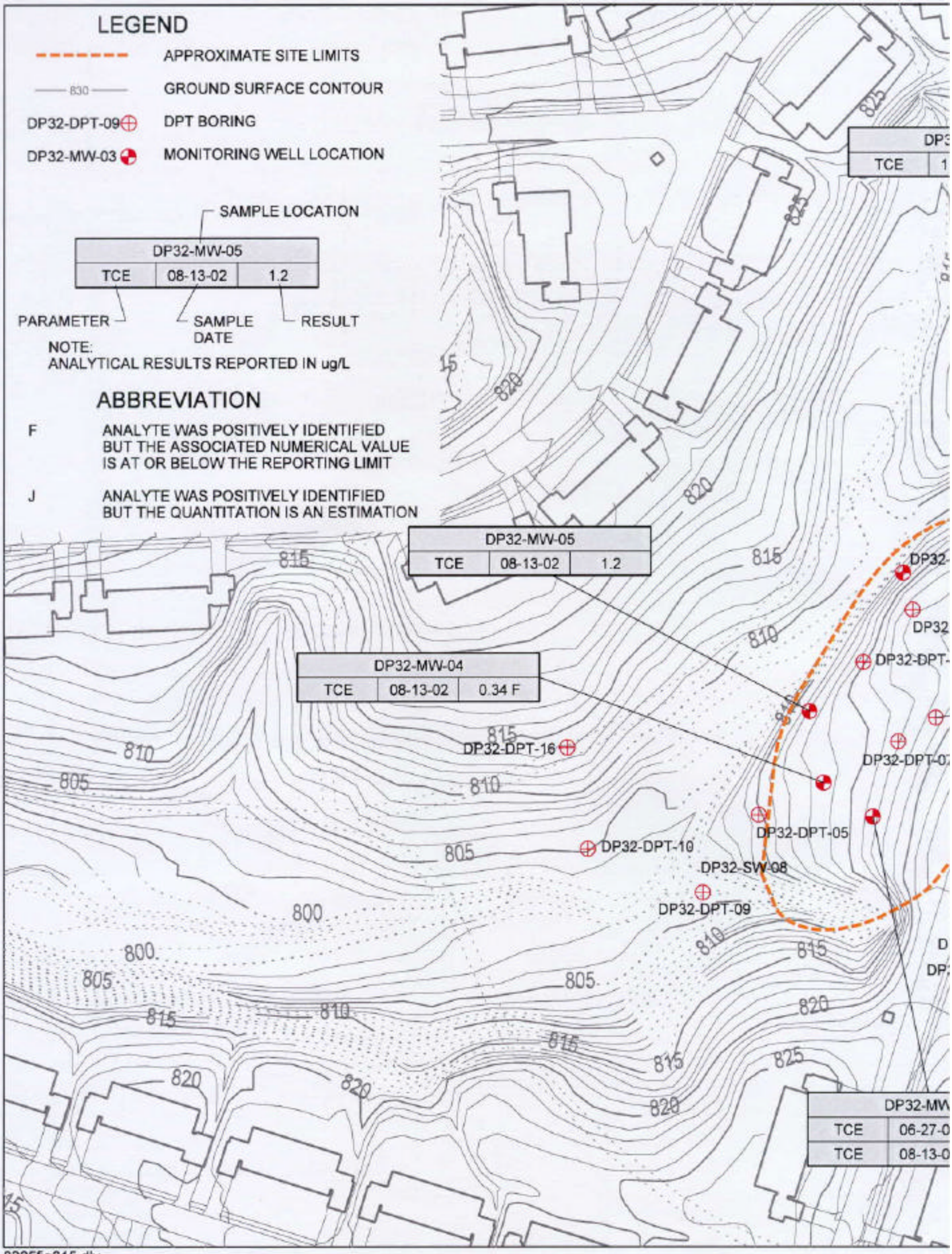
PARAMETER — SAMPLE DATE — RESULT

NOTE:
ANALYTICAL RESULTS REPORTED IN ug/L

ABBREVIATION

F — ANALYTE WAS POSITIVELY IDENTIFIED BUT THE ASSOCIATED NUMERICAL VALUE IS AT OR BELOW THE REPORTING LIMIT

J — ANALYTE WAS POSITIVELY IDENTIFIED BUT THE QUANTITATION IS AN ESTIMATION



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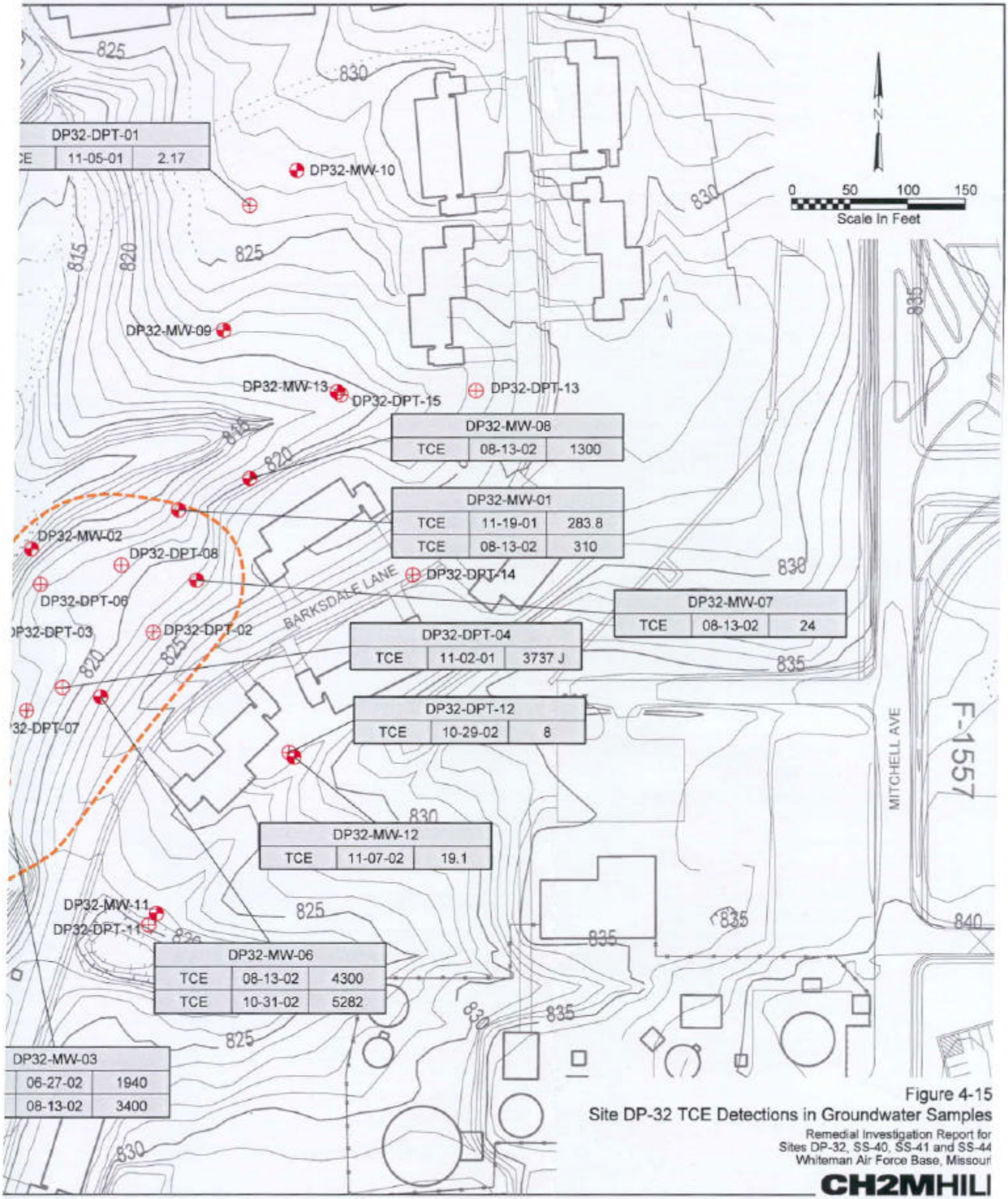

Figure 4-15
Site DP-32 TCE Detections in Groundwater Samples

Remedial Investigation Report for
Sites DP-32, SS-40, SS-41 and SS-44
Whiteman Air Force Base, Missouri

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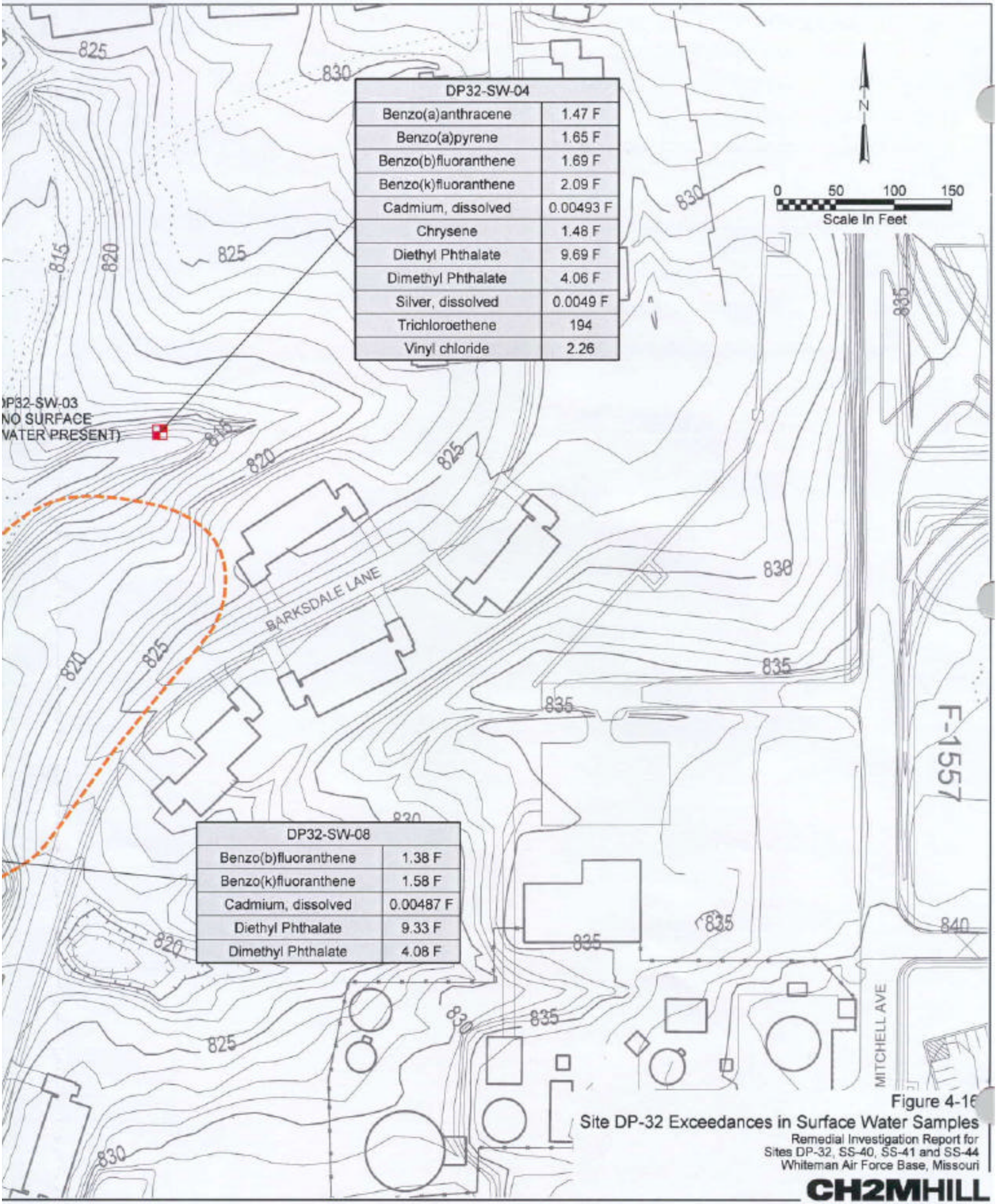

Figure 4-16
Site DP-32 Exceedances in Surface Water Samples
Remedial Investigation Report for
Sites DP-32, SS-40, SS-41 and SS-44
Whiteman Air Force Base, Missouri

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LEGEND

APPROXIMATE SITE LIMITS

830 MONITORING WELL LOCATION

DP32-SW-02 SURFACE WATER SAMPLE LOCATION

SAMPLE LOCATION

DP32-SW-01	
Trichlorethene	42.7

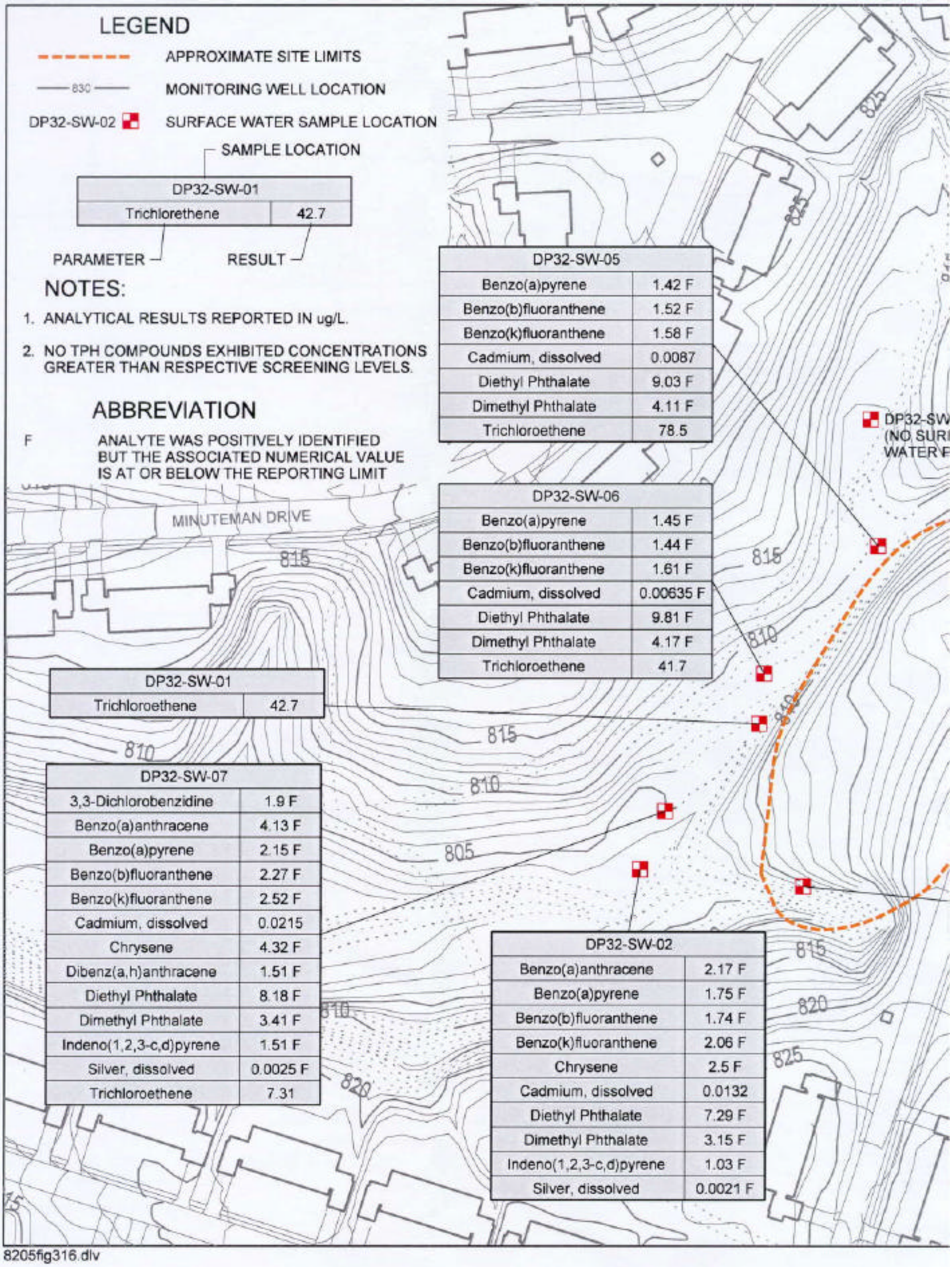
PARAMETER — RESULT

NOTES:

1. ANALYTICAL RESULTS REPORTED IN ug/L.
2. NO TPH COMPOUNDS EXHIBITED CONCENTRATIONS GREATER THAN RESPECTIVE SCREENING LEVELS.

ABBREVIATION

F ANALYTE WAS POSITIVELY IDENTIFIED BUT THE ASSOCIATED NUMERICAL VALUE IS AT OR BELOW THE REPORTING LIMIT



DP32-SW-05	
Benzo(a)pyrene	1.42 F
Benzo(b)fluoranthene	1.52 F
Benzo(k)fluoranthene	1.58 F
Cadmium, dissolved	0.0087
Diethyl Phthalate	9.03 F
Dimethyl Phthalate	4.11 F
Trichloroethene	78.5

DP32-SW-06	
Benzo(a)pyrene	1.45 F
Benzo(b)fluoranthene	1.44 F
Benzo(k)fluoranthene	1.61 F
Cadmium, dissolved	0.00635 F
Diethyl Phthalate	9.81 F
Dimethyl Phthalate	4.17 F
Trichloroethene	41.7

DP32-SW-01	
Trichloroethene	42.7

DP32-SW-07	
3,3-Dichlorobenzidine	1.9 F
Benzo(a)anthracene	4.13 F
Benzo(a)pyrene	2.15 F
Benzo(b)fluoranthene	2.27 F
Benzo(k)fluoranthene	2.52 F
Cadmium, dissolved	0.0215
Chrysene	4.32 F
Dibenz(a,h)anthracene	1.51 F
Diethyl Phthalate	8.18 F
Dimethyl Phthalate	3.41 F
Indeno(1,2,3-c,d)pyrene	1.51 F
Silver, dissolved	0.0025 F
Trichloroethene	7.31

DP32-SW-02	
Benzo(a)anthracene	2.17 F
Benzo(a)pyrene	1.75 F
Benzo(b)fluoranthene	1.74 F
Benzo(k)fluoranthene	2.06 F
Chrysene	2.5 F
Cadmium, dissolved	0.0132
Diethyl Phthalate	7.29 F
Dimethyl Phthalate	3.15 F
Indeno(1,2,3-c,d)pyrene	1.03 F
Silver, dissolved	0.0021 F

8205fig316.dlv

LEGEND

- APPROXIMATE SITE LIMITS
- 830 — GROUND SURFACE CONTOUR
- DP32-SD-02 — SEDIMENT SAMPLE LOCATION

SAMPLE LOCATION

DP32-SD-06	
Arsenic	10.9

PARAMETER — RESULT

NOTES:

1. ANALYTICAL RESULTS REPORTED IN mg/kg.
2. NO VOCs EXHIBITED CONCENTRATIONS GREATER THAN RESPECTIVE SCREENING LEVELS.

DP32-SD-05	
Anthracene	0.127 F
Arsenic	11.9
Benzo(a)anthracene	0.843 F
Benzo(a)pyrene	0.737 F
Benzo(b)fluoranthene	0.935 F
Benzo(k)fluoranthene	0.402 F
Chrysene	0.83 F
Fluoranthene	1.615
Indeno(1,2,3-c,d)pyrene	0.423 F
Lead	57
Mercury	0.182 F
Phenathrene	0.634 F
Pyrene	1.144 F
Selenium	5.03
TPH-Fuel Oil	310 J

DP3
Anthracer
Benzo(a)anthr
Chrysene
Dibenz(a,h)anth
Fluoranthe
Indeno(1,2,3-c,d
Lead
Pentachlorop
Phenathre
Pyrene
TPH-Fuel

DP32-SD-06	
Arsenic	10.9
Benzo(a)anthracene	0.113 F
Benzo(a)pyrene	0.089 F
Benzo(k)fluoranthene	0.079 F
Chrysene	0.12 F
Dibenz(a,h)anthracene	0.045 F
Fluoranthene	0.141 F
Indeno(1,2,3-c,d)pyrene	0.057 F
Lead	45.9
Phenathrene	0.062 F
Pyrene	0.118 F

DP32-SD-07	
Arsenic	34.1
Benzo(a)anthracene	0.125 F
Benzo(a)pyrene	0.06 F
Benzo(k)fluoranthene	0.069 F
Chrysene	0.123 F
Dibenz(a,h)anthracene	0.069 F
3,3-Dichlorobenzidine	0.07 F
Indeno(1,2,3-c,d)pyrene	0.067 F
Lead	87
Pyrene	0.109 F
Selenium	1.179

DP32-SD-02	
Arsenic	41.2
Benzo(a)anthracene	0.085 F
Benzo(a)pyrene	0.04 F
Benzo(k)fluoranthene	0.045 F
Chrysene	0.073 F
Dibenz(a,h)anthracene	0.04 F
3,3-Dichlorobenzidine	0.047 F
Indeno(1,2,3-c,d)pyrene	0.04 F
Lead	45.8
Pyrene	0.056 F

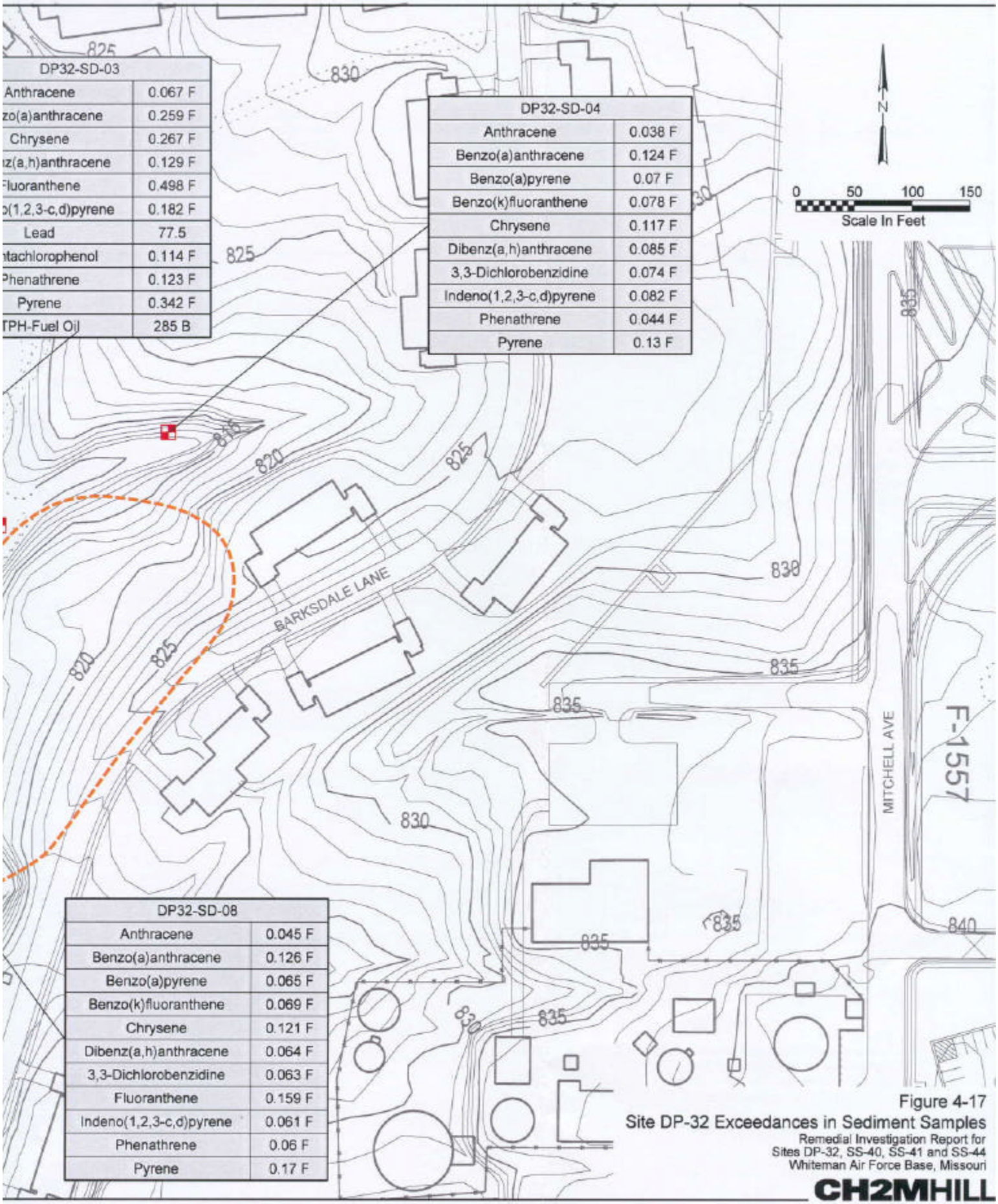
ABBREVIATIONS

B — ANALYTE WAS FOUND IN AN ASSOCIATED BLANK, AS WELL AS IN THE SAMPLE

F — ANALYTE WAS POSITIVELY IDENTIFIED BUT THE ASSOCIATED NUMERICAL VALUE IS AT OR BELOW THE REPORTING LIMIT

J — ANALYTE WAS POSITIVELY IDENTIFIED, BUT THE QUANTITATION IS AN ESTIMATION

8205fig317.dlv



DP32-SD-03	
Anthracene	0.067 F
zo(a)anthracene	0.259 F
Chrysene	0.267 F
z(a,h)anthracene	0.129 F
Fluoranthene	0.498 F
o(1,2,3-c,d)pyrene	0.182 F
Lead	77.5
tachlorophenol	0.114 F
Phenathrene	0.123 F
Pyrene	0.342 F
TPH-Fuel Oil	285 B

DP32-SD-04	
Anthracene	0.038 F
Benzo(a)anthracene	0.124 F
Benzo(a)pyrene	0.07 F
Benzo(k)fluoranthene	0.078 F
Chrysene	0.117 F
Dibenz(a,h)anthracene	0.085 F
3,3-Dichlorobenzidine	0.074 F
Indeno(1,2,3-c,d)pyrene	0.082 F
Phenathrene	0.044 F
Pyrene	0.13 F

DP32-SD-08	
Anthracene	0.045 F
Benzo(a)anthracene	0.126 F
Benzo(a)pyrene	0.065 F
Benzo(k)fluoranthene	0.069 F
Chrysene	0.121 F
Dibenz(a,h)anthracene	0.064 F
3,3-Dichlorobenzidine	0.063 F
Fluoranthene	0.159 F
Indeno(1,2,3-c,d)pyrene	0.061 F
Phenathrene	0.06 F
Pyrene	0.17 F

Figure 4-17
Site DP-32 Exceedances in Sediment Samples
Remedial Investigation Report for
Sites DP-32, SS-40, SS-41 and SS-44
Whiteman Air Force Base, Missouri

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tential posure edium	Potential Routes of Exposure	Receptor	Potentially Complete Pathway?	Notes
dwater	X Groundwater Use for Drinking Water: Ingestion of Drinking Water, Inhalation of Volatiles, Dermal Contact with Water	Residents	No	Shallow groundwater underneath the sites is not likely to be used as a drinking water supply. Therefore, ingestion of drinking water, inhalation of volatiles, or dermal contact with groundwater are not likely to be complete exposure pathways. However, risks from these potential pathways will be calculated to support the evaluation of groundwater in the RI.
		Workers	No	
		Construction Workers	No	
	In Situ Groundwater: Inhalation of Volatiles, Dermal Contact with Water	Workers	Yes	Workers indoors potentially could be exposed through inhalation to volatile organic compounds diffusing from groundwater through soil to indoor air. Construction workers could be exposed through inhalation and dermal contact from contact with groundwater ponded in deep excavations.
		Construction Workers	Yes	
ce Water	Incidental Ingestion of Water, Dermal Contact with Water	Residents	Yes	Surface water may be present in the drainage channel/creek during high precipitation events. There is potential for transient visitor exposure by residents or others to surface water in the area. Future construction or other work activities are unlikely to bring workers into intermittent contact with surface water. However, surface water will be included in the assessment of surface water to present an upperbound of potential worker exposure.
	Dermal Contact with Water	Workers	Yes	
		Construction Workers	Yes	
iment	Incidental Ingestion of Sediment, Dermal Contact with Sediment	Residents	Yes	Sediment is present in the drainage channel/creek. There is potential for transient visitor exposure by residents or others to sediment in the area. Future construction or other work activities are unlikely to bring workers into contact with sediment. However, sediment was included in the assessment of sediment to present an upperbound of potential worker exposure.
		Workers	Yes	
		Construction Workers	Yes	
Soil / Air	Incidental Ingestion of Soil, Inhalation of Volatiles, Inhalation of Fugitive Dust, Dermal Contact with Soil	Residents	Yes	VOCs typically are not present in near-surface soil; majority of the site is covered with vegetation. However, risks from this pathway will be calculated for future resident and worker scenarios to support evaluation of land uses in the RI.
		Workers	Yes	
		Construction Workers	Yes	

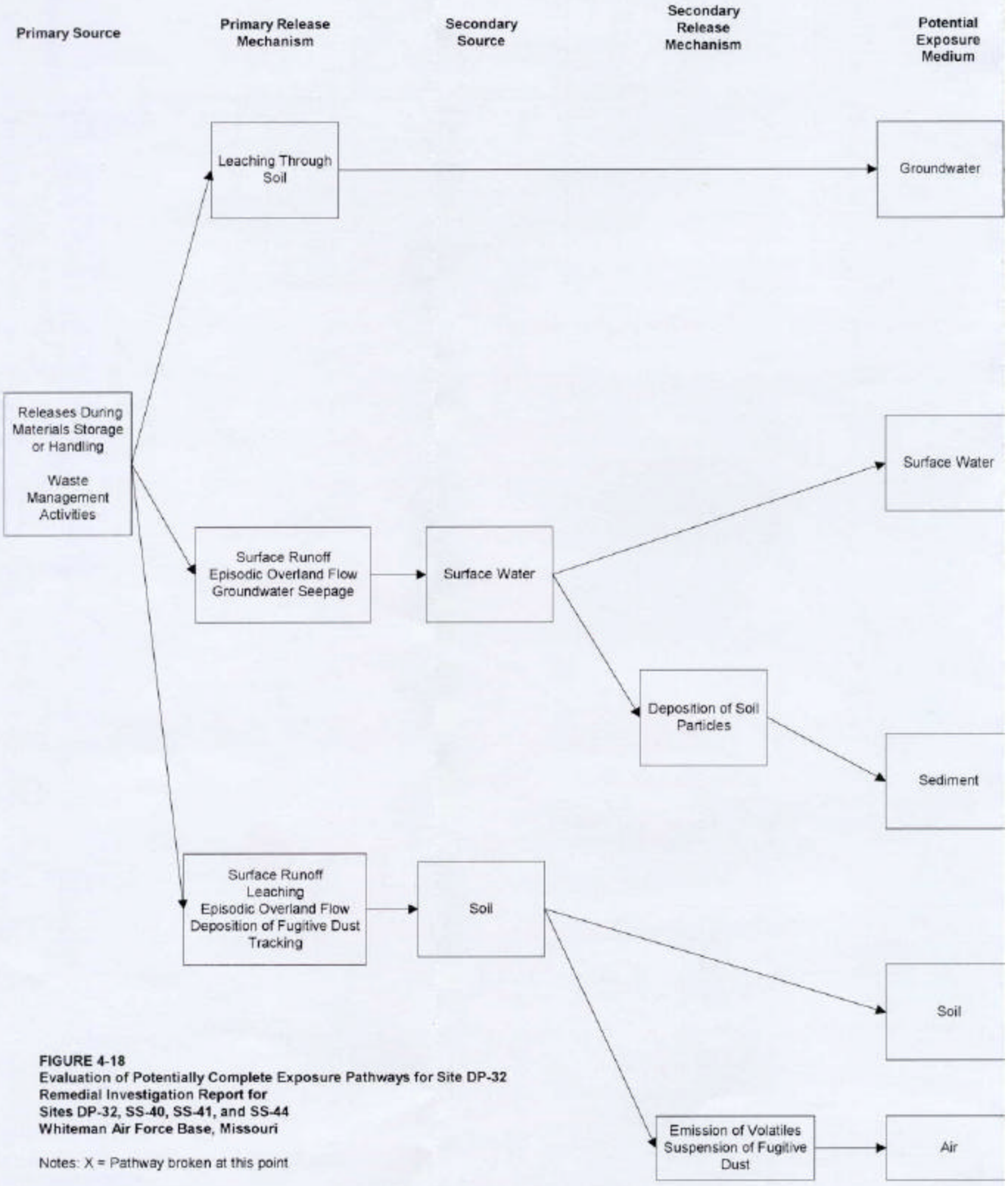

FIGURE 4-18
Evaluation of Potentially Complete Exposure Pathways for Site DP-32
Remedial Investigation Report for
Sites DP-32, SS-40, SS-41, and SS-44
Whiteman Air Force Base, Missouri

Notes: X = Pathway broken at this point

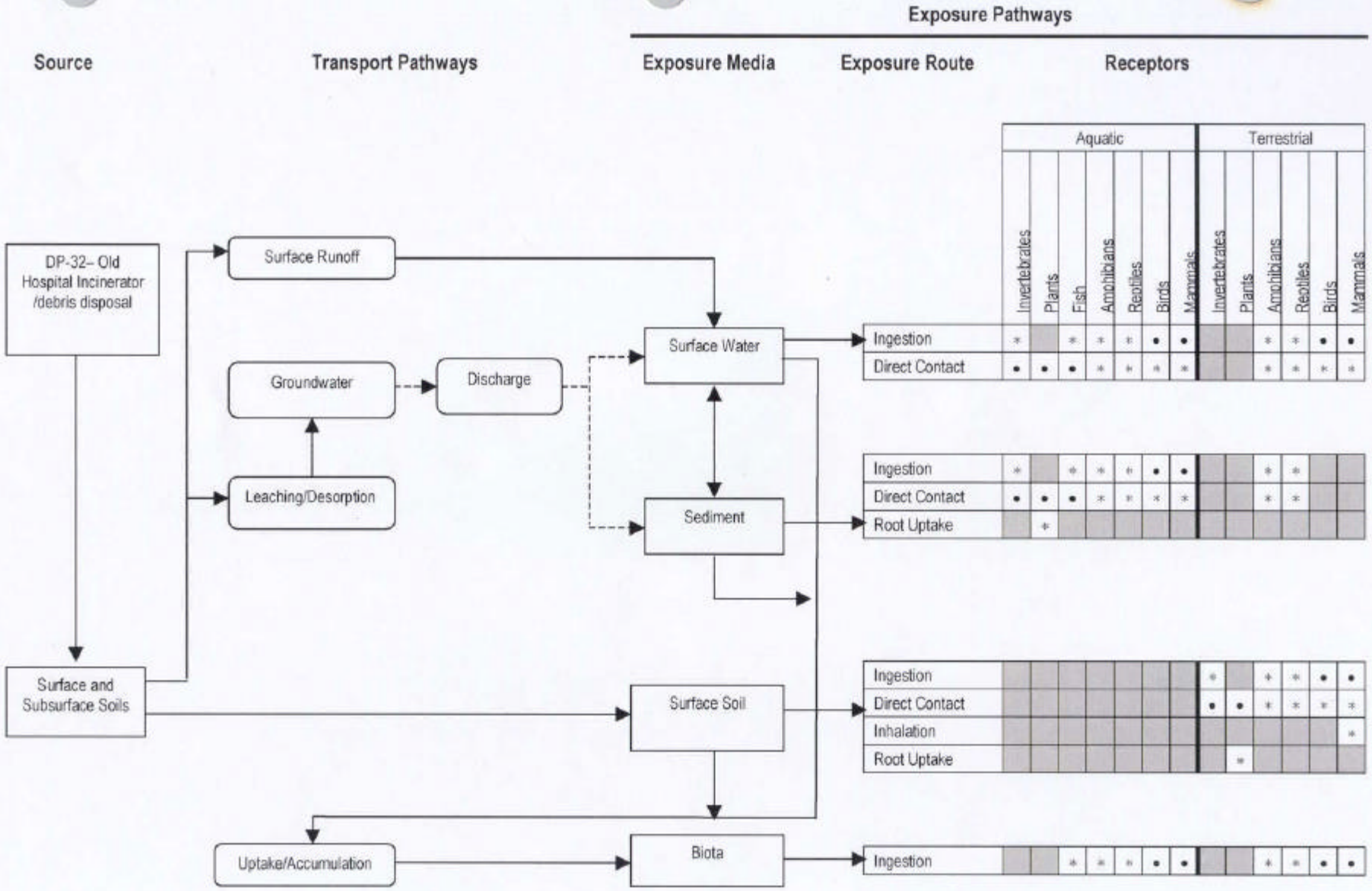

Figure 4-19
Conceptual Site Model, Ecological Evaluation for Site DP-32
WAFB RI Report for Sites DP-32, SS-40, SS-41, and SS-44
Whiteman Air Force Base, Missouri

ATTACHMENT L

LEGAL DESCRIPTION OF PROPERTY

STATE OF MISSOURI
COUNTY OF JOHNSON

Whiteman Air Force Base
Tract 200

WARRANTY DEED

THIS INDENTURE, made on this 7th day of August, 2003

The North half of the Southwest quarter and Lot 1 of the Northwest quarter of Section 4, Except the North 400 feet of the East 1200 feet thereof as acquired by the United States of America under Declaration of Taking recorded in Book 357, at page 160, AND FURTHER EXCEPT those tracts conveyed to the United States of America in Book 1413, at pages 39-41 and in Book 1430, at pages 169-172; all in Township 45, Range 24 in Johnson County, Missouri, and further described as:

Commencing at the SW Corner of Government Lot 1, Section 4, Township 45 North, Range 24 West in Johnson County, Missouri, thence S87°40'18"E, along the South line of said Lot 1, a distance of 4.92 feet, to the point of beginning, said point being on the Easterly Right of Way of Missouri State Highway 132; thence along said Right of Way the following course and distances: N03°26'21"E, a distance of 458.99 feet to an existing Right of Way Marker; thence N11°19'45"E, a distance of 302.78 feet to an existing Right of Way marker; thence N03°20'53"E, a distance of 100.17 feet to an existing Right of Way marker; thence N01°21'23"W, a distance of 465.52 feet to an existing Right of Way marker; thence departing said Right of Way S87°24'51"E, a distance of 961.29 feet to an existing ½" iron bar; thence S03°03'25"W, a distance of 70.13 feet to an existing 5/8" iron bar with aluminum cap marked LS-123D; thence S87°27'10"E, a distance of 400.52 feet to an existing 5/8" iron bar with aluminum cap marked LS-123D;

thence S02°58'38"W, a distance of 1247.17 feet to the South line of Lot 1; thence continuing S02°58'38"W, a distance of 1222.47 feet to an existing 5/8" iron bar marked LS-123D, said point being on the Northerly Right of Way of Missouri State Highway 132; thence along said Right of Way the following course and distances; N86°08'59"W, a distance of 191.51 feet to an existing Right of Way marker; thence N87°57'05:W, a distance of 100.14 feet to an existing Right of Way marker; thence N85°00'12"W, a distance of 300.35 feet to an existing Right of Way marker; thence N88°55'58"W, a distance of 272.22 feet to an existing Right of Way marker; thence N87°14'18"W, a distance of 122.25 feet to an existing Right of Way marker; thence N58°36'56"W, a distance of 161.18 feet to an existing Right of Way marker; thence N54°25'11"W, a distance of 265.06 feet to an existing Right of Way marker; thence N00°41'58"E, a distance of 644.68 feet to an existing Right of Way marker; thence N08°06'30"E, a distance of 100.46 feet to an existing Right of Way marker; thence N14°28'33"E, a distance of 101.77 feet to an existing Right of Way marker; thence N09°23'01"W, a distance of 128.19 feet to an existing Right of Way marker; thence N03°26'21"E, a distance of 16.26 feet to the point of beginning, containing 77.35 acres (3369181.80 square feet), more or less.

Together with all right, title, and interest of the party of the First Part in and to any streams, alleys, roads, streets, ways, strips, gores or railroad rights-of-way abbuting or adjoining said land.

TO HAVE AND TO HOLD the said premises, with all and singular the rights, appurtenances and immunities thereto belonging or in anywise appertaining unto the said party of the Second Part and unto its assigns, forever; the said party of the First Part hereby covenanting that they are lawfully seized of an indefeasible estate in Fee Simple in the premises herein conveyed; that they have good right to convey the same; that the said premises are free and clear of any encumbrance done or suffered by them or those under whom they claim; and that they will WARRANT AND DEFEND the title to the said premises unto the said party of the Second Part, and unto its assigns, forever, against the lawful claims and demands of all persons whomsoever.