

2. AMENDMENT/MODIFICATION NO. 0001	3. EFFECTIVE DATE 16 April 2002	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. <i>(If applicable)</i>
--	---	----------------------------------	---------------------------------------

6. ISSUED BY U.S. ARMY ENGINEER DISTRICT, ALBUQUERQUE CORPS OF ENGINEERS 4101 JEFFERSON PLAZA, N.E. ALBUQUERQUE, NEW MEXICO 87109-3435	7. ADMINISTERED BY <i>(If other than Item 6)</i>
--	--

8. NAME AND ADDRESS OF CONTRACTOR <i>(No., street, county, State and ZIP Code)</i>	<input checked="" type="checkbox"/> 9A. AMENDMENT OF SOLICITATION NO. DACW47-02-R-0006 <input checked="" type="checkbox"/> 9B. DATED <i>(SEE ITEM 11)</i> 21 March 2002 10A. MODIFICATION OF CONTRACTS/ORDER NO. 10B. DATED <i>(SEE ITEM 13)</i>
CODE	FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation 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 telegram 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.

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 NUMBERED 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 FAR 43.103(b).

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.)*

PROJECT: DESIGN/BUILD, WINGATE ELEMENTARY REPLACEMENT SCHOOL, FT. WINGATE, NEW MEXICO

1. This is Amendment No. 1 to Solicitation No. DACW47-02-R-0006; 21 March 2002. The following revisions shall be incorporated into the specifications. All other provisions shall remain unchanged.

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

2. SOLICITATION, OFFER, AND AWARD, Standard Form 1442: In Block 10A, change the date for receipt of proposal from "4/23/02" to "4/26/02".

3. SPECIFICATIONS: Delete the following listed pages and substitute the pages attached hereto. On the revised pages, for convenience, changes are emphasized by the amendment number in parentheses before and after changes from the previous issue. All portions of the revised (or new) pages shall apply whether or not changes have been indicated.

a. Section 00110, Submission Requirements and Instruction: Delete the second page of this section and replace with the second page, attached hereto.

b. Volume 3 of 3, Appendix.

Delete Page

Appendix A, Vol 1, Mech 1.1
thru Mech 5.1

--

Appendix A, Vol 2, I thru
Spec II

Insert Page

Appendix A, Vol 1, Mech 1.1 thru
Mech 5.1

Appendix A, Vol 1, Fire 1.1 thru
Fire 5.3

(Delete Volume 2 in its entirety)

c. Volume 3 of 3, Appendix B: Delete the page "Navajo Nation, Environmental Assessment for the Fort Wingate Elementary School, Fort Wingate, New Mexico, December 15,2000" and delete the following letter from Marron Associates, Inc., dated December 15, 2000, Re: Environmental Assessment: Ft. Wingate Elementary Replacement School. Replace with the "Navajo Nation, Environmental Assessment for the Fort Wingate Elementary School, Fort Wingate, New Mexico, December 15, 2000, attached hereto.

//////////LAST ITEM//////////

project experience forms will be evaluated for this Factor 1, and will also be used to support the evaluation of Factor 2, Past Performance (Tab B). Offerors are invited, but not required, to submit photographs of especially successful projects in conjunction with this Tab. **Note: It is not necessary to submit more than one Project Experience Form for projects that are the same for two or more of the following categories:**

a. OFFEROR (PRIME CONTRACTOR): Provide up to five (5) examples of projects within the recent past that are similar to this project in scope and magnitude. Provide an explanation of how these projects are similar in scope and magnitude to the work required in this RFP.

b. DESIGN FIRM(S): Provide up to five (5) examples of projects within the recent past that are similar in scope and magnitude to this project. Provide an explanation of how these projects are similar in scope and magnitude to the work required in this RFP.

c. TEAM EXPERIENCE: Provide up to three (3) examples of projects within the recent past in which the offeror and design firm have worked together and which are similar in scope and magnitude to this project. Provide an explanation of how these projects are similar in scope and magnitude to the work required in this RFP.

(1)

d. KEY CONSTRUCTION SUBCONTRACTORS: Identify the specific Mechanical and Fire Protection subcontractors you intend to utilize on this contract. Include a description of experience wherein the offeror and subcontractor worked together on previous projects. If work will be performed in-house, rather than subcontracted out, provide a statement to that effect. Provide up to three (3) examples of projects within the recent past that are similar in scope and magnitude to this project for which you, if performed in-house, or any of these key subcontractors played a major role. Provide an explanation of how these projects are similar in scope and magnitude to the work required in this RFP.

(1)

1.3.4 FACTOR 2: PAST PERFORMANCE (TAB B).

a. For each project pertaining **only** to the Offeror (Prime Contractor) submitted under Factor 1 – Experience (Tab A), the offeror shall provide to his previous customer(s) a completed copy of the Project Experience Form along with a blank Owner/Client Past Performance Survey, which is provided at the end of this Section. (Do not provide past performance surveys for the design firm or key subcontractors.) The customer shall return both forms directly to the Albuquerque District Contracting Division at the address specified on the Owner/Client Past Performance Survey. Surveys must be received by the Contracting Division no later than the proposal due date.

b. Small Business Subcontracting Success. This information will be obtained from the Project Experience Forms submitted for the Offeror for Factor 1 (Tab A) and from any other information the offeror chooses to submit, such as SF 294 and 295, Subcontracting Reports, which evidences small-business subcontracting efforts.

c. Safety Experience Record. The Offeror shall provide documentation of the firm's safety performance record, including the Experience Modification Rate (EMR) and/or the last 24 months of OSHA/Bureau of Labor Statistics incidence and severity rates.

1.3.5 **FACTOR 3: TECHNICAL APPROACH (TAB C).** Based on your understanding of the design requirements in Section 01010, describe the technical approach you will take to address the unique challenges, opportunities, and constraints inherent to this project. Without committing to an actual design solution, explain how this understanding might inform or direct your proposal for Phase Two.

(END OF PHASE-ONE REQUIREMENTS)

MECH 1 GENERAL APPROACH

A. VARIATIONS FROM MINIMUM CRITERIA

Submit requests for approval of deviations from this criteria to the BIA at the earliest possible submittal phase, and include with the request, a full explanation of the reasoning and if applicable, the life-cycle costs.

B. ENERGY CONSERVATION

1. BIA Commitment/Scope

- a. COMMITMENT. The Federal Government and the BIA are committed to effective energy conservation.
- b. RESPONSIBILITY. It is the responsibility of the A/E contractor and all subcontractors to work together to develop integrated systems that minimize energy consumption.
- c. SCOPE. Energy conservation must be considered at every phase of design, beginning with initial schematic design. Factors in conservation include building configuration, orientation, climate, wind direction and velocity, construction materials, mechanical and electrical systems.

2. Limiting Factors

- a. LIFE-CYCLE COSTS. Incorporate cost effective energy-conservation measures. Give due consideration to life-cycle cost and other factors such as the limited availability of technical assistance in remote areas. All systems shall be reliable and feasible for operation and maintenance by local service personnel.
- b. RELIABILITY. Do not specify sophisticated state-of-the-art systems that may reduce energy use but will not be reliable or serviceable over the life of the building.

3. Utility Programs

- a. PARTICIPATION. To the fullest extent possible, participate in utility company programs that offer assistance to implement energy-conserving features in new and renovated buildings.
- B. PROGRAM IDENTIFICATION. Identify available programs early in the design phase and involve participating utilities.

Apr 95 Vol 1	Rev 1, Nov 99	General Approach	MECH 1.1
-----------------	---------------	------------------	----------

4. Compliance With 10 CFR Part 435

- a. COMPLIANCE. In designing new BIA facilities, comply with the energy conservation requirements of 10 CFR Part 435.
- b. CERTIFICATION STATEMENT. Provide an energy conservation certification statement in the Design Development, 40% substantiating that the principles of effective energy conservation outlined in 10 CFR Part 435, have been incorporated. An energy conservation certification statement is shown on sheet MECH 1.8.

This statement shall be inserted into the submittal manual.

C. DRAWING REQUIREMENTS

1. Engineer's Seal

- a. GENERAL REQUIREMENT. Stamp or affix each sheet of the mechanical drawings with the seal of registration of the professional engineer in charge. (This individual must be licensed to practice mechanical engineering in the state where his or her business is located.)
- b. ON RECORD DRAWINGS ONLY. If the state prohibits the placement of seals on reproducible drawings (such as on mylar) that will be used to make multiple copies or will otherwise be transferred from the engineer's control, then have the responsible engineer seal, sign, and date only the record sets of drawings. The record sets are those documents used for the permanent record of the project owner, project engineers, and involved regulatory agencies.

2. General

- a. Do not superimpose mechanical equipment, duct work, and piping on architectural plans.
- b. Indicate room numbers on all mechanical drawings and match numbers given on the architectural floor plans.
- c. Assemble sheets by building and number in proper sequence.
- d. Title each mechanical sheet as to building, building number and pages of work, in addition to the title block, for example: School Building No. 201: Plumbing. Sheet numbers for HVAC sheets shall be preceded by "M" and for Plumbing by "P".
- e. The systems designs shall be clear, simple, and orderly, with legible lettering.

-
- f. Clearly indicate by symbol or note which part of the work shown is new and which part existing. Prepare the drawings in such a manner that there is no question as to the extent of the contract. Existing material and equipment to remain and to be reused shall be so noted. Wherever possible, elements no longer to be used shall be removed; do not "abandon-in-place" unless absolutely necessary.
 - g. Use the word "Contractor". Do not refer to "general contractor", "plumbing contractor", and such terms. Use "Government" in lieu of "Owner". Do not use the expression "by others". The government's representative shall be referred to as "the Contracting Officer".
 - h. Avoid the use of trade names in describing materials or equipment. Note: After a system, or equipment is described to the greatest extent possible and it is judged helpful to refer to trade name, it should be used with the modifying phrase, "or approved equal". Avoid designing around a system or equipment for which there is only one manufacturer. Assure the availability of equipment to suit the design by selecting the products of three or more manufactures. Include equipment selection data sheets in the Design Analysis. A complete specification is required although a trade name and model number is used.
 - i. Clearly show specific project requirements on the drawings and will describe in detail, the scope of the project, type of construction, source and type of fuel, basic mechanical requirements, and type of utilities and their locations.
 - j. Include a north arrow on each mechanical floor plan sheet orientation.
 - k. Title each floor plan, partial plan, detail, and show scale.
 - l. Provide plan and elevation of all mechanical or equipment rooms for boiler, furnace, or domestic hot water storage facilities a scale of not less than 1:32 (3/8" = 1'-0") is recommended.
 - m. Provide details (standard or unique) and elevations as needed to illustrate or clarify equipment installation. Scale shall be as needed to illustrate or clarify equipment installation and to identify all component parts.
 - n. Coordinate all building utilities with outside utility plans.
 - o. Provide complete legends to cover all mechanical systems. Separate legends shall be provided for plumbing and HVAC. Legends shall include all symbols and letter abbreviations used on the drawings.
 - p. Coordinate the mechanical work indicated on the drawings with all other disciplines to the extent that there will be no conflict with the installation of the mechanical equipment. Coordinate with electrical to the extent that controls, voltage and phase characteristics indicated for the equipment are in conformity with the electrical drawings.
 - q. Coordinate the mechanical work indicated on the drawings with the specifications.

-
- r. Provide drawings and details to clearly indicate the extent and quantities of **all** demolition work. As-built drawings furnished by the Government which will not produce legible prints shall be redrawn to the extent necessary to define the work. Drawings must be detailed enough to permit bidding and construction of the work.
 - s. Each sheet of the mechanical drawings shall include the seal and signature of the Registered Mechanical Engineer responsible for the design.

2. Controls for Mechanical Systems

- a. General: Controls for the mechanical systems shall be kept as simple as possible to provide the required functions and affect energy conservation. Elaborate and unnecessary controls are to be avoided.
- b. Provide complete control diagrams, written sequences and ladder diagrams (coordinate with electrical) to show **all** control functions required to operate **all** the mechanical systems. Show all automatic dampers and automatic valves which require control. Indicate all control parameters (temperatures, time sequences, valve and damper positions, etc.) required to fully describe all functions. Provide panel schedules to clearly indicate components (switches, gages, indicator lights, etc.) which go in each panel and give location of panel. Provide detail of control air compressor and dryer and indicate location.

NOTE: All controls shall be consolidated on one or more drawing sheets. Control drawings and sequences scattered on other drawing sheets will not be accepted.

3. Equipment Schedules.

Provide complete equipment schedules which include all items of equipment and all parameters of equipment selection. For all electrically powered equipment, show the power requirement (Horsepower or KWH), phase (single or three), voltage and frequency (coordinate with electrical drawings). Show motor speeds required. Consolidate all schedules on one or more sheets.

4. Heating, Ventilating, and Air Conditioning (HVAC)

- a. Provide complete equipment, duct work and diffuser/register plan layout showing all heating and air conditioning units to scale and clearly indicating their location (ceiling, space, exposed, etc). Show all offsets, risers structural and architectural elements which interfere with ducts (provide required details/section to clarify), thermostat locations, control panels, duct sizes, equipment symbols fire and smoke dampers, clearly identify all sections of lined duct work, splitter dampers, extractors, required access panel locations and size, balancing dampers, furred in spaces, etc. Minimum scale for these plans is 1:100 (1/8" = 1'-0") (see note under 4.b. below).
- b. Provide complete heating/cooling pipe plan layout and isometric diagram which show all required valves, special fittings, pipe sizes, vent and drain locations, expansion joints or loops (size all loops), guides, anchors, coils, radiation units, equipment symbols, offsets, sleeves, structural and architectural elements which

interfere with piping (provide required details/section to clarify), thermostat and control panel locations, furred in spaces, riser locations, etc. Minimum scale for these plans is 1:100 (1/8" = 1'-0").

NOTE: Duct work and piping plans indicated above will normally be separate plans; they will only be combined when it will not result in a congested, difficult to read drawing. A larger scale may be used if it results in a plan that clearly shows all required information. Recommended scale is 1:50 (1/4" = 1'-0").

- c. Provide large scale plan of boiler room, showing location of all equipment and piping. Include section sections for clarity. Show clearances around equipment for servicing and coordinate with electrical for panelboard locations. Locate piping with relation to floors, walls, and ceiling. Clearly show location and size of combustion air openings.
- d. Provide boiler/chiller and mechanical room isometric or schematic diagram complete with all fittings, valves, pump strainers, balancing valves, thermometers, flow indicators, control valves, drain valves, expansion tanks, water treatment equipment, air separators, fuel piping, pipe sizes, etc.
- e. Provide plot plan to show all outside equipment, piping, fences, etc. Coordinate with Civil.
- f. Provide complete details as follows:
 - Equipment supports and hangers
 - AH Unit duct arrangements complete with dampers, turning vanes, flexible connections, etc.
 - Fire/smoke damper detail and schedule giving size, type, and rating.
 - Coil and radiation unit piping including pipe size schedule, control valves, balancing valves, air vents, etc.
 - Roof mounted equipment, vents, penetrations, etc.
 - Pipe sleeves
 - Pipe guides, expansion joints or loops and anchors
 - Diffusers, grille, and register installation
 - Automobile exhaust systems (shops and garages)
 - Dust collector systems (shops)
 - Ventilation hoods (all type)
 - Kitchen exhaust systems complete
 - Pumps with connecting piping gages, etc.

5. Plumbing

- a. Provide complete plan layout (provide separate water and waste plans if required for clarity) to show all roof drain, waste, vent, and water piping including plumbing fixtures, fixture numbers, vents, risers, cleanouts, offsets, sleeves, wall hydrants, isolation valves, all pipe sizes, service entrance locations, etc. Recommended scale is 1:100 (1/8" = 1'-0") minimum.
- b. Provide large scale for any area of congested piping including kitchens, toilet areas, shower areas, etc. Recommended scale is 1:50 (1/4" = 1'-0") minimum.

-
- c. Provide complete and separate isometric or schematic diagrams for waste/vent, roof drain and water piping showing all plumbing fixture numbers, traps, cleanouts, offsets, vents (number vents), pipe sizes, valves, pipe sleeves, isolation valves, access panel locations, vent through roof, air chambers, connection to existing, capped lines, drain locations and valves, indicate pipe location (crawl space, tunnel, furred chase, etc.) roof drain swing joints, etc.
 - d. Soil and waste shall be shown to 1524 mm (5 ft) outside of building for connection to outdoor utilities. Provide cleanout. Show invert elevation. Coordinate with utility plot plan.
 - e. Water service shall be shown to outside of building. Provide service valve and valve box.

6. Fire Protection Systems

- a. Show location of fire line entrance into the building (may be shown on plumbing plan but shall be clearly identified).
- b. Provide complete detail of fire sprinkler riser including all valves, check valve, pressure gages and taps, flow switches, water alarms, retarding chamber, test fitting, drains, pipe sizes, etc.
- c. Provide complete details diagram of kitchen hood fire protection system including all required components.

7. Fuel Distribution System (Interior)

- a. Complete plan layout (may be incorporated with plumbing plan if it does not confuse or clutter the plan).
- b. Provide fuel piping isometric diagram showing all valves, special fittings, pipe sizes, PRV's, meters, etc. required.
- c. Complete details to cover the following:
 - Connections to kitchen equipment, burners, tanks, unit heater, etc. complete with all required unions, strainers, drip legs, PRV's, pipe sizes, strainers, check valves, etc. required.
 - Wall, partition, floor sleeves and roof penetrations
 - Pressure regulators and meters
 - Day tanks and storage tanks
 - Laboratory gas distribution system with emergency shut-off valve(s)

8. Fuel Distribution Systems (Exterior)

- a. Provide plans (may be incorporated on Civil drawings if it can be done with clarity and does not confuse or clutter the plans) to show all fuel distribution piping, storage tank locations, meter location, valves, locations and size of

existing, etc.

b. Provide details as follows:

- Storage tank installation complete with supports, anchors, piping, fittings, piping containment chambers, manholes, manhole access pits, valves, fitt station details, capacity, pipe sizes, meter, PRV's, etc.
- Building and master meter loops.
- Connections to existing utilities including all pipe sizes.
- Vaporizer piping details with pipe sizes.
- Plan of storage facility (minimum 1/4"-1'0") giving dimensions to fences, adjacent building, fill stations, regulators, meters, vaporizer; show gage sizes, access roads, etc. Coordinate with Civil drawings.
- Valve box

c. Gas Systems: Indicate in W (BTUH or CFH) the required service capacity at each building.

ENERGY CONSERVATION CERTIFICATION
STATEMENT

PROJECT NAME: _____

LOCATION: _____ SRS#: _____

DESIGN CONTRACT #: _____

THIS FACILITY HAS BEEN DESIGNED IN A MANNER THAT PROVIDES FOR
CONSIDERATION OF THE PRINCIPLES OF EFFECTIVE ENERGY BUILDING
DESIGN PRESCRIBED IN 10 CFR PART 435, "ENERGY CONSERVATION
VOLUNTARY PERFORMANCE STANDARDS FOR COMMERCIAL AND
MULTI-FAMILY HIGH RISE RESIDENTIAL BUILDINGS; MANDATORY FOR
NEW FEDERAL BUILDINGS."

COMPANY: _____

SIGNED: _____ DATE: _____

TITLE: _____
PROJECT MECHANICAL ENGINEER

COMPANY: _____

SIGNED: _____ DATE: _____

TITLE: _____
PROJECT ELECTRICAL ENGINEER

COMPANY: _____

SIGNED: _____ DATE: _____

TITLE: _____
PROJECT ARCHITECT

MECH 2 CODES, STANDARDS, AND LAWS

A. GENERAL

For mechanical engineering design, follow industry and government codes, standards, and laws relevant to the field of design responsibility. Use codes and standards in force at the time of the design contract award.

B. APPLICABLE CODES

- Uniform Mechanical Code (UMC)
- Uniform Plumbing Code (UPC)
- Uniform Fire Code (UFC) (may be used for guidance, not officially applicable)
- ASME Boiler and Pressure Vessel Code
- National Fire Codes (25 BIAM, Supp. 18, 1.3B)

C. STANDARDS

- NFPA 31, "Standard for Installation of Oil Burning Equipment"
- NFPA 45, "Fire Protection for Labs Using Chemicals"
- NFPA 54, "National Fuel Gas Code"
- NFPA 58, "Standard for the Storage and Handling of Liquefied Petroleum Gases"
- NFPA 8501, "Prevention of Furnace Explosions in Fuel Oil and Natural Gas Single Burner Furnace" (IRI fuel train requirements)
- NFPA 90A, "Installation of Air Conditioning and Ventilating Systems"
- NFPA 96, "Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment"
- Standards in ASHRAE handbooks, including *Fundamentals; Systems and Equipment; Applications; and Refrigeration*
- ASHRAE 62-1989, *Ventilation for Acceptable Indoor Air Quality*
- Standards in *Industrial Ventilation: A Manual of Recommended Practice*, by OSHA and the American Conference of Governmental Industrial Hygienists
- 10 CFR Part 435, "Energy Conservation Voluntary Performance Standards for New Commercial and Multi-Family High Rise Residential Buildings; Mandatory for New Federal Buildings" (format similar to but not identical to, ASHRAE/IES 90.1-1989)
- Standards in reference manuals of the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA)
- "41 CFR, 101-19.6, App. A, Uniform Federal Accessibility Standards"

SEE ALSO: ACCESS - Building Accessibility chapter of this handbook.

MECH 3 HEATING, VENTILATING, AIR CONDITIONING (HVAC) SYSTEMS

A. DESIGN CRITERIA

1. Indoor Design Criteria

Design HVAC systems to maintain the following indoor temperatures in BIA buildings.

Building Type	Summer	Winter
Dormitory	25°C (78°F)	21°C (70°F)
Detention	25°C (78°F)	22°C (72°F)
School	24°C (75°F)	22°C (72°F)
Offices	24°C (75°F)	22°C (72°F)

2. Outdoor Design Criteria

Base outdoor design criteria on the 99% winter and 2-1/2% summer design dry-bulb columns from the *ASHRAE Fundamentals Handbook*, unless severe local conditions require otherwise. Identify the proposed outdoor design criteria in the 20% Schematic submittal.

B. CALCULATIONS AND DESIGN ANALYSIS

1. Calculations

- a. **FORMAT.** Submit relevant engineering calculations at each phase of design, using 216 mm x 279 mm (8-1/2 in x 11 in) preprinted data sheets. For computer-generated calculations, submit complete input and output data for calculations in accordance with recognized industry standards and include a legend for symbols and code letters used. Partial calculations and rule-of-thumb estimating are not acceptable.
- b. **CONTENT.** At minimum, submit calculations for:
 - Heat loss (room by room)
 - Heat gain (room by room) in air-conditioned buildings; include a psychometric chart for each air-conditioning system (for labs, classrooms, dining areas, and so on)
 - Total heating and cooling loads for each building and for each zone within the building
 - Heating system equipment sizing and model selection
 - Cooling equipment sizing and model selection
 - Life Cycle Cost Analysis
 - Pump heads (using piping lengths and fitting counts by type) and model selection

-
- System volumes and expansion tank sizing
 - Primary fuel requirements (including initial gas pressures, one-month storage capacities, vaporization capacities for LP gas systems, and distribution line sizing)

2. Design Analysis

In the Design Analysis, discuss relevant codes, criteria and factors in system selection (design temperatures, outside air volumes, exhaust air changes/hour, HVAC zoning, control system selection, fuel alternatives, energy conservation, connection to existing utilities, operating and maintenance concerns, special training requirements, and so on).

C. SYSTEMS AND EQUIPMENT

1. Boilers

- a. **GENERAL.** Specify boilers, pressure vessels, hot water heaters, and heating and cooling systems in accordance with applicable ASME and other codes, and include relevant code symbol stamps on the drawings:
 - ASME Section I - Power
 - ASME Section IV - Heating Boilers
 - ASME Section VIII - Division I - Pressure Vessels
 - ASME CSD-1-1992 - Controls and Safety Devices for Automatically Fired Boilers
 - ASME Section IX - Welding and Brazing Qualifications
 - Industrial Risk Insurers (IRI) and Military Specification MIL-B-1B796E
 - ASME B31.1 - Power Piping
 - ASME B31.2 - Fuel Gas Piping
 - ASME B31.4 - Liquid Petroleum Transportation Piping System
 - ASME B31.5 - Refrigeration Piping
 - ASME B31.9 - Building Service Piping
- b. **DRAWINGS.** On the detailed mechanical drawings and specifications, show:
 - All new and existing boilers and pressure vessels, trim, controls, and piping
 - Safety relief valves and discharge piping
 - Boiler and burner types and manufacturers' kW (BTUH or LBS/HR) ratings; fuel types; and controls and their functions
 - Fuel train diagrams (gas and oil)
- c. **CONTROLS AND SAFETY DEVICES.**

INSPECTION/REGISTRATION.

e. NEW INSTALLATION START-UP. Provide a trained, factory-authorized representative, to test, start-up, balance, and to provide appropriate training to the boiler operators/maintenance personnel at the location (ASME CSD-1-1192, Part CG).

FOOD SERVICE EQUIPMENT.

2. Air Conditioning Systems

- a. GENERAL. Do not include mechanical air conditioning in building designs unless called for in the *Program of Requirements*. User requests are insufficient justification for inclusion.
- b. REFRIGERANTS.
- c. EVAPORATIVE COOLING.

3. Air Handling Systems

- a. GENERAL. Specify factory-fabricated, packaged air handling units. Indoor units are preferred over roof mounted equipment.
- b. HEATING COILS AND FAN SECTIONS. Equip all units with hot water heating coils (rather than specifying gas-fired units). Wherever feasible, specify internally isolated fan sections versus externally isolated units.

4. Steam Systems

Specify steam systems for heating only when an existing steam system is being expanded to serve a building addition. Do not specify steam heat systems for a new facility.

5. Water Treatment Systems

Provide water treatment equipment for closed-loop heating and cooling systems, steam systems, and open-loop cooling tower systems. For closed-loop systems, use shot-type feeders. In the specifications, detail testing requirements, treatment standards, operating instructions, and the provision of one year's supply of chemicals and tests.

6. Heating Systems

- a. GENERAL TYPES. Design circulating hot water heating systems with reverse return piping. For each system, provide steel water tube or cast iron boilers. If two boilers are used each shall be capable of meeting 67 percent of the total connected heating load. Provide emergency boiler shutdown switches at the

boiler room exit.

- b. **FUEL TYPE.** Fuel selection shall be based on availability and life cycle cost analysis. Remote locations may have only LPG or fuel oil available. For environmental reasons, LPG would be preferred if the mechanical room is not below-grade level. Electricity is rarely the most cost effective fuel and must be justified with LCC analysis.
- c. **PIPING SYSTEMS.** For hydronic piping, specify schedule 40, black steel pipe with threaded grooved or flanged fittings, or type L copper with 95-5 solder joints up to 50 mm (2 in), and schedule 40 black steel with welded joints for piping 65 mm (2-1/2 in) and larger. Insulate all piping in accordance with 10 CFR Part 435, "Energy Conservation Standards".
- d. **ANTIFREEZE.** In cold climates -- minus 12°C (+10°F) or lower -- design heating systems with 30% propylene glycol antifreeze (industrial grade, with inhibitors formulated for heating water systems). Correct equipment capacities for the effect of the antifreeze on heating coils, pumps, boilers, and so on, and provide a glycol mixing tank and electric feed pump.

7. Fuel Oil Systems

- a. **GENERAL.** When possible, specify fuel systems other than oil. Heating with fuel oil involves significant initial and ongoing expenses that increase life cycle costs. If fuel oil is selected, clearly indicate on the contract documents all required components of the fuel oil system, including (but not limited to) tanks, manholes, access manways to grade, fuel supply and return piping, vent piping, vent caps, remote fuel oil gauges, monitoring wells, and backfill materials. Oil tanks installed within the expected ground water must be provided with concrete hold-down pads and anchor straps.
- b. **TANKS.** For underground fuel oil storage, specify "UL Listed" double-wall steel or fiber reinforced plastic tanks, installed in accordance with EPA regulations, and include electronic leak detection.

8. Underground Hot Water, Chilled Water, and Steam Distribution Systems

- a. Use prefabricated or pre-engineered underground piping systems between buildings composed of a single assembly with inner pipe, insulation, and outer conduit.
- b. Design piping systems in accordance with site ground water conditions, operating temperatures, and site soil classifications.
- c. On the construction drawings, include assembly details and locations for joints, thrust blocks, expansion loops, and manholes, and show compaction requirements and depth of burial. Provide sufficient isolation valves for sectionalizing the distribution system for maintenance, inspection, and repair.

9. Temperature Control Systems

-
- a. **GENERAL.** Specify electric, pneumatic or direct digital (DDC) temperature controls. Direct Digital Control systems are desirable in most large or complex facilities and shall be specified BacNet compliant.
 - b. **COMPONENTS.** Use copper for all exposed air piping. Concealed air piping may be polyethylene, but must be plenum-rated when installed in a return air plenum. Size tank-mounted duplex compressors so that each compressor runs no more than one-sixth of the time. For air receivers, specify ASME-stamped and registered pressure vessels. Provide a refrigerated air dryer, and locate compressors and dryers in the boiler room.
 - c. **SEQUENCES.** Design complete sequences of operation for each mechanical system, and show the sequences on the drawings. The control sequences may also be in the specifications, but they must be shown on the drawings below the applicable control schematic drawings. Keep control sequences as simple as possible, while providing both functionality and energy conservation.

10. Miscellaneous Requirements

- a. **SHOWER/TOILET EXHAUST.** Do not vent exhaust systems into a concealed space such as an attic. Extend exhaust systems to roof or wall terminations.
- b. **ELECTRIC HEAT.** May be used for spot heating remote spaces like a pump house or concession stand when the central heating system is not available.

MECH 4 PLUMBING SYSTEMS

A. DESIGN CRITERIA

Design plumbing systems in accordance with the Uniform Plumbing Code or equivalent local codes. Identify the controlling code in the first design submittal.

B. CALCULATIONS AND DESIGN ANALYSIS

1. Calculations

a. **FORMAT.** Submit relevant engineering calculations at each phase of design using 216 mm x 279 mm (8-1/2 in x 11 in) preprinted data sheets. For computer-generated calculations, submit complete input and output. Complete all calculations in accordance with recognized industry standards. Partial calculations and rule-of-thumb estimations are not acceptable.

b. **CONTENT.** At minimum, submit calculations for:

- Storm drainage requirements for low sloped roofs
- Pipe carrying capacities
- Fixture counts for domestic hot water and cold water, sewer drainage, and vent capacities
- Domestic cold water probable peak flow demands, pressure requirements, pressure availability, and pipe sizing
- Domestic hot water probable peak flow demands, water heater storage and recovery sizing, heater fuel requirements
- Heating fuel requirements -- include list of fuel burning equipment -- boilers, water heaters, kitchen equipment, laundry equipment, laboratory equipment, and so on -- including inputs and outputs)

2. Design Analysis

a. In the Design Analysis, discuss relevant codes, criteria and factors in system selection (water heater type, water supply and sanitary drainage systems, fuel alternatives, energy conservation, connection to existing utilities, operating and maintenance concerns, special training requirements, and so on).

C. SYSTEMS AND EQUIPMENT

1. Drain, Waste, and Vent Systems

a. **MATERIALS.** For sanitary waste systems, specify PVC, ABS or cast iron pipe as soil conditions dictate for below-grade installations.

b. **DRAWINGS.** Indicate complete systems on the drawings, showing sizes, locations of each fixture, pipe routing and sizes, equipment drawn to proper scale and fully detailed.

2. Domestic Cold Water Systems

- a. WATER CONSERVATION. Incorporate the latest proven water-conserving methods, materials, and equipment in all domestic cold water systems.
- b. DOMESTIC WATER PIPING. Above ground, specify type L rigid copper piping with 95-5 soldered wrought copper fittings. Below grade, specify type K soft copper piping with no joints. Plastic piping is prohibited for domestic water systems.
- c. LEAD BAN. Consistent with the requirements of Section 1417 of the Safe Drinking Water Act (June 19, 1986), do not use lead solder, lead flux, or lead piping in any repairs or new installations of building plumbing systems and public water systems.

3. Domestic Hot Water Systems

- a. GENERAL. Specify domestic water heaters separate from hot water heating systems, with separate vent stacks. Do not use space heating systems to generate domestic hot water. Also, provide a hot water recirculation system. Do not specify heat traced systems in lieu of a recirculating system unless shown to be cost effective by a life cycle cost analysis.
- b. STUDENT SHOWERS AND LAVATORIES. Provide a tempered water system to deliver 43°C (110°F) water to student showers and student lavatories. Make mixing valves accessible only to building staff. Generate and store domestic hot water at 60°C (140°F). Temper to 43°C (110°F) for distribution to the showers and lavatories. For systems with a substantial hot water demand evaluate using copper fin tube hot water heaters with separate storage tanks in lieu of tank type hot water heaters. Do not specify helical fin heat exchanger.

4. Plumbing Fixtures

- a. HEAVY-DUTY FIXTURES. Specify only heavy-duty, institutional quality plumbing fixtures. Avoid fixtures that can be easily cracked, chipped, broken, plugged, or disassembled.
- b. SPECIAL FIXTURES. In unsupervised locations, use vandal-resistant fixtures. Use detention fixtures in detention facilities.
- c. SAFETY SHOWERS. Include eye wash and safety showers in all mechanical rooms, laboratories, and other rooms where chemicals will be used.
- d. SPECIFICATIONS. Provide detailed specifications, including model numbers for all fixtures.
- e. ACCESSIBLE FIXTURES. Provide handicap accessible fixtures and controls, mounted in accordance with the Uniform Federal Accessibility Standards (UFAS) and, as applicable, use the adopted elementary school standards, "Recommendations for Accessibility to Serve Physically Handicapped Children in Elementary Schools".

5. Potable Water System Sanitizing

In the specifications, include requirements for cleaning, flushing, and sanitizing all components of potable water systems.

6. Gas Distribution Systems

- a. **GENERAL.** Show underground LP or natural gas distribution piping on the construction drawings from the system connection point to the building served. Specify only polyethylene piping with compatible fittings and valves for underground use with natural gas. Refer to the fuel gas systems guide specifications for LPG and natural gas in the SPEC - Specifications chapter.
- b. **NATURAL GAS.** Locate natural gas distribution systems away from loading docks, driveways, sidewalks, air inlet louvers, and other locations where physical damage might occur or where pressure-reducing valve venting could enter the building served. Show the location of the gas meter and pressure-reducing valve on the contract documents.
- c. **LIQUIFIED PETROLEUM GAS (LP Gas).** Install LP gas storage tanks, vaporizers (when required), and distribution systems in accordance with NFPA 58, "Standard for the Storage and Handling of Liquified Petroleum Gases". On the contract documents, clearly indicate all components of the LP gas system -- including, but not limited to, the tank, tank support saddles, piping, relief valves, pressure gauge, volume gauge, thermometer, vaporizer, unloading station, emergency shutoff valves, power supply to the vaporizer, pressure, regulator, chain link fencing, gates, etc. The design mechanical engineer shall determine if a vaporizer is required based on the design heating load and the site minimum temperature.
- d. **RESPONSIBILITY.** The natural gas or LP gas distribution system shall be indicated on the site utility plan, but shall be the responsibility of the design mechanical engineer. System sizing, routing, and coordination with the fuel supplier shall also be accomplished by the design mechanical engineer.

MECH 5 STANDARD DETAILS

Sample details illustrating requirements for mechanical system construction are shown on exhibits MECH 5.2 through MECH 5.10 at the end of this chapter.

- | | | |
|----|-------------------------------------|-----------|
| 1. | Hot Water Convactor Piping Detail | MECH 5.2 |
| 2. | LP Gas Storage Tank Piping (Single) | MECH 5.3 |
| 3. | LP Gas Storage Tank Piping (Double) | MECH 5.4 |
| 4. | LP Gas Tank Support Detail | MECH 5.5 |
| 5. | Oil Tank Piping Details | MECH 5.6 |
| 6. | Oil Burner Piping Detail | MECH 5.7 |
| 7. | Hot Water Boiler Schematic | MECH 5.8 |
| 8. | Hot Water Unit Heater Piping Detail | MECH 5.9 |
| 9. | Roof Mount Exhaust Fan | MECH 5.10 |

FIRE 1 QUALIFIED PERSONNEL

A. EDUCATION AND EXPERIENCE

A qualified fire protection engineer is an individual meeting one of the following criteria:

1. An engineer having a Bachelor of Science or Masters of Science Degree in Fire Protection Engineering from an accredited university engineering program, plus a minimum of 2 years work experience in fire protection engineering.
2. A registered professional engineer (P.E.) in fire protection engineering.
3. A registered P.E. in a related engineering discipline and member grade status in the National Society of Fire Protection Engineers (NSFPE).
4. An engineer with a minimum of 10 years experience in fire protection engineering and member grade status in the NSFPE.
5. A registered architect (R.A.) with member grade status in the NSFPE. Services of the R.A. shall be limited to building code applications and life safety code analysis.
6. Anyone certified at Level III with the National Institute for Certifying of Engineering Technologies (NICET), in Fire Protection.

B. INVOLVEMENT OF FIRE PROTECTION ENGINEER

1. All new, renovation, and additions that affect the design or modification of fire detection, fire suppression or life safety systems.
2. A qualified fire protection engineer shall be an integral part of the design team and shall be involved in every aspect of the design relating to fire protection, including:
 - @ Code analysis
 - @ Life safety review
 - @ Design of automatic detection and suppression systems
 - @ Water supply analysis
 - @ A multi-discipline review of the entire project

FIRE 2 GENERAL

A. RESPONSIBILITY FOR

1. The A/E contractor is responsible for coordinating the overall fire protection plan. Requirements relative to each engineering discipline are discussed in the chapters of this handbook devoted to these disciplines (civil, structural, etc.) consistent with the National Fire Code.
2. Do not deviate from this criteria in the planning, engineering, design, and construction of BIA facilities without prior approval.
3. Do not reference this section in Federal Specifications or other procurement documents.

B. CRITERIA

This section establishes BIA fire protection engineering policy and criteria.

C. WHEN REQUIRED/TYPES

1. New Buildings

Install fire sprinkler systems in all new buildings exceeding 185 m² (2,000 sf). Use wet systems unless a building cannot be designed to protect piping from freezing temperatures. "Cold attic" systems approved only in one- and two- family residential buildings. Do not use a dry system to justify use of a "cold attic" construction.

2. Existing Facilities

Those which are acceptable to the authority having jurisdiction and meet the requirements of NFPA 101 and Life Safety for existing occupancies do not have to be modified to comply with this section if they are not renovated, modernized or rehabilitated.

3. Building Additions

Extend sprinkler systems installed for building additions to provide fire protection to the original buildings. Dry sprinkler systems are acceptable for additions if required by the existing building construction.

D. DESIGN REQUIREMENTS

1. Basic Criteria

Design and install all sprinkler systems in accordance with NFPA 13, "Installation of Sprinkler Systems" using as a minimum "ordinary" hazard occupancy classification. On the drawings, indicate the fire sprinkler water supply location, pressure, and flow capabilities, and include hydraulic calculations and complete installation instructions. If a fire pump is required, include a size and capacity schedule, show the pump location, and indicate any electrical supplies to be provided. Use schedule 40 black steel for piping and provide an outside service line post indicator valve as required by NFPA.

Conform to UBC for building construction, fire separation requirements, allowable floor area and building height limitations.

2. BIA Standards

The BIA does not allow antifreeze loops off wet systems to protect freezing locations. Dry pendant heads may be used if adequate coverage can be provided.

3. Design Analyses

Required for all designs. Submit in accordance with the SUB - Submittal Requirements chapter of this handbook.

Verify the adequacy of the water supply with flow tests and pressure measurements. Submit a report to the BIA stating whether or not the water supply system can support a fire sprinkler system. On the drawings, show available residual fire flow water pressure at the fire sprinkler riser.

4. Egress and Life Safety

Comply with NFPA 101. Conflicts between UBC and NFPA 101 related to fire resistance rating shall conform to NFPA 101 and criteria contained in this section.

5. Water Demands for Sprinklered Facilities

- a. The water demand required for sprinkler protection depends upon occupancy, discharge density, design area, and type of sprinkler system (wet or dry), type of construction, and other building features.
- b. Hose streams are needed concurrently with sprinkler discharge in order to effect final extinguishment or to wet down adjacent structure.
- c. The total water demand for sprinklered occupancies is equal to the sum of the domestic demand plus the sprinkler system(s) water demand and the hose stream(s) demand. The total demand shall be available at the sprinkler system

connection to the underground main, and at the pressure necessary to produce the required sprinkler density over the required hydraulically most remote area of sprinkler operation.

- d. Water demands for buildings and facilities that are not fully sprinklered are based on fire department hose stream requirements.

6. Water Pressure Required for Sprinklered Facilities

Provide pressure as required to meet the total demand as determined by hydraulic calculations. The total demand is the required sum of the domestic demand, sprinkler demand, and hose stream demand.

7. Water Storage

- a. If the public water system supplying a facility is reliable, provide a minimum of two connections, each providing at least 50 percent of the required capacity, having adequate capacity and pressure to meet water requirements, and continuous reserve storage capacity at least equal to the required fire protection water storage. If this is done, then no separate water storage facility is required.
- b. Requirements for fire protection water storage are based on the assumption that there will be only one fire at a time. The quantity of water required is equal to the product of the fire protection water demand and the required duration. This quantity represents fire protection requirements only, and shall be available at all times. Water supply for domestic, industrial, and other demands shall be added to these requirements to determine the total amount of water that is necessary at a facility.
- c. The total stored supply for fire protection purposes shall be sufficient to meet the maximum required fire flow demand for the duration specified.
- d. In computing the fire protection storage requirement, a reduction in storage capacity is acceptable if an adequate replenishment source is available. Factors that must be evaluated include the reliability of the makeup facility, its sustained flow capacity, its method of operation (automatic or manual), and flow limitations imposed by the capacity of treatment operations.
- e. The water storage shall be self-replenishing. It shall reach required volume during normal consumption within 48 hours, and with 24 hours curtailing normal consumption.

8. Sources of Water Supply

Primary water supplies shall consist of one or a combination of the following:

Two connections to a public water system (one connection is ample for a small

activity, such as a Reserve Training Facility).

Elevated tanks or reservoirs.

Multiple pumps with adequate suction supply.

9. Fire Pumps

- a. Pumps for fire protection shall have adequate capacity with reliable power and water supply. This equipment shall conform to requirements of NFPA 20, "Installation of Centrifugal Fire Pumps". Fire pumps, drivers and other equipment, including automatic accessories shall be listed by UL or approved by FM or listed or classified by a Nationally Recognized Testing Laboratory (NRTL).
- b. A fire pump may be either a horizontal or vertical shaft centrifugal pump or a vertical shaft turbine pump, whichever is most economical and appropriate for the intended use. A horizontal centrifugal pump in either the horizontal or vertical position shall not be used where suction lift is required. A vertical shaft turbine pump shall be used for suction lift.
- c. Fire pumps shall be arranged to start automatically, except that they shall be arranged for manual starting when other available water supply sources are capable of providing demands for automatic sprinkler systems simultaneously with domestic and industrial demands.
- d. When electric power is economically available from a reliable single power source or from two independent sources in accordance with NFPA 20, pumps shall be electric driven only. A reliable single power source is defined as a power source having an average forced down time, excluding scheduled repairs, which does not exceed 8 consecutive hours for any one incident nor more than 24 hours cumulatively over the last 3 years. When such electrical power supplies are not available, fire pumps shall be diesel driven. Spark-ignited, internal combustion engines shall not be used to drive fire pumps.
- e. Manual controls, double-acting altitude valves, or other automatic devices shall be used to maintain the water level in elevated storage tanks. Altitude valves shall be arranged with bypasses.
- f. Where meters are installed on water distribution systems, they shall be listed by a NRTL as fire flow meters.

10. Water Distribution Systems

- a. The distribution system shall be sized to accommodate fire flows plus domestic and industrial or flushing demands that cannot be restricted during fires. Distribution shall be looped to provide at least 50 percent of the required fire flow in case of a single break. Dead-end mains shall be avoided. Distribution

systems shall be designed in accordance with NFPA 24, "Installation of Private Fire Service Mains and Their Appurtenances".

- b. Control valves shall be provided in each source of water supply, such as tanks and pumps. A sufficient number of sectional valves shall be provided so that not more than a combined total of five (5) hydrants and sprinkler systems, shall be out of service due to a single break. Control valves shall be either post indicating or outside-stem and yoke types. All new valves shall be right handed valves.
- c. Provide drawings showing control valve locations and size. Indicate all existing left-handed valves clearly on the drawings.

11. Hydrants

Refer to page CIVIL 3.B.4.a. of this handbook.

- a. **INSTALLATION REQUIREMENTS.** Hydrants shall be installed adjacent to paved areas, not closer than 1 m (3 ft) and not further than 2 m (7 ft) from the roadway shoulder or curb line, where they will be accessible to fire department apparatus.

Install with not less than 152 mm (6 in) connection to the supply main, and valved at the connection. Barrels shall be long enough to permit at least 457 mm (18 in) clearance between the center of the 133 mm (5-1/4 in) pumper connection and grade. The ground shall be graded so that any surface drainage is away from the hydrant. Installation shall be in accordance with NFPA 24, except as modified herein. Pumper connection should be perpendicular to the street to allow straight lined connection to the pumper.

- b. **SPACING REQUIREMENTS.** Refer to CIVIL 3.B.4.b of this handbook.
- c. **PROTECTION.** Hydrants located adjacent to parking areas or other vehicle traffic areas shall be protected by bollards.
- d. **PRESSURE-REGULATING VALVES (PRVs).** Restricted in use on fire protection water systems by NFPA 24. Where essential, PRVs shall be installed on individual services rather than on the main piping. Where PRVs are provided in mains supplying systems or portions of systems with fire hydrants, automatic sprinkler systems, or other installed fire protection, the following features shall be provided to safeguard against failures and to facilitate maintenance:

Control valves on each side of the PRVs
Bypasses around PRVs

E. FIRE EXTINGUISHING SYSTEMS

1. Automatic Sprinkler Systems

-
- a. **CRITERIA CHARACTERISTICS.** Design to detect the presence of fire, activate both local and remote (fire department) alarms, and distribute water in sufficient quantity to either control or extinguish the fire. Include provisions regarding sprinkler contractor qualifications in the sprinkler specifications.
- b. **APPLICATION REQUIREMENTS.** The following requirements are in addition to the sprinkler requirements listed in applicable NFPA codes and standards:
- Any new building 185 m² (2000 sf) gross floor area or more.
Child development centers.
- c. **FIRE ADMINISTRATION AUTHORIZATION ACT OF 1992.** Provide automatic sprinklers in multi-family housing and federal employee office buildings in accordance with NFPA 101. Federal employee office buildings are defined as any building with 25 or more Federal employees.
- d. **DESIGN REQUIREMENTS.** Use equipment and devices listed by a NRTL. Follow applicable criteria set forth in NFPA 13 and NFPA 16, "Deluge Foam-Water Sprinkler and Foam-Water Spray Systems" for sprinkler systems in light, ordinary, and extra hazard occupancies.
- 1) **Hydraulic Calculations.** Use hydraulic calculations for designing new sprinkler systems with areas 185 m² (2000 sf) or more. Use of pipe schedule designs is strongly discouraged for any sprinkler system. Discharge densities and areas of discharge operation shall follow the format of NFPA 13. Pipe friction losses and equivalent lengths of pipe for fittings and valves shall be in accordance with NFPA 13.
- NOTE: Additions to the existing pipe schedule systems may be designed using the pipe schedule method.
- 2) **Sprinkler Coverage.** Provide 100 percent building coverage. This includes, but is not limited to, telephone rooms, electrical equipment rooms, boiler rooms, switch gear rooms, transformer rooms, and other electrical and mechanical spaces. Coverage per sprinkler shall be in accordance with NFPA 13, except that it shall not exceed 21 m² (225 sf) for light hazard occupancies or 12 m² (130 sf) for ordinary hazard.
- Exception 1:** Facilities that are designed in accordance with NFPA 13R and NFPA 13D.
- Exception 2:** Sprinklers may be omitted from small rooms which are exempted for specific occupancies in accordance with NFPA 101.
- 3) **Connections to Exterior Fire Reporting Systems.** Connect sprinkler systems electrically to the fire reporting system for transmission of sprinkler water flow alarms, in facilities with station or base fire reporting systems.
- e. **SPRINKLER SHOP DRAWINGS.** Sprinkler shop drawings shall be prepared

and submitted by a qualified sprinkler contractor.

2. Water Spray Systems

Requirements: Conform to NFPA 15, "Water Spray Fixed Systems for Fire Protection".

3. Standpipe Systems

When required, standpipe systems shall be installed in accordance with NFPA 14, "Installation of Standpipe and Hose Systems".

Exception: Residual pressure requirements specified in NFPA 14 may be omitted for buildings under 46 m (150 ft) in height where fire department apparatus are expected to boost pressure in standpipe systems.

4. Dry Chemical Extinguishing Systems

- a. APPLICATION. Fixed dry chemical systems are approved for protection of certain types of special occupancies, hazards, and facilities, such as cooking surfaces, cooking exhaust systems, and other operations involving flammable liquids.
- b. DESIGN REQUIREMENT. Conform to NFPA 17, "Dry-Chemical Extinguishing Systems".
- c. LIMITATIONS. Do not use to protect sensitive electronics.

5. Carbon Dioxide Systems

- a. APPLICATION. Carbon dioxide systems are normally effective against flammable liquid (Class B) and electrical (Class C) fires. New systems are not authorized in occupiable areas.
- b. DESIGN REQUIREMENT. Conform to NFPA 12, "Carbon Dioxide Extinguishing Systems".

6. Halon 1301 Systems

Installation of new Halon 1301 Systems is prohibited except by special approval of the BIA.

7. Portable Fire Extinguishers

- a. Provide in accordance with NFPA 10, "Portable Fire Extinguishers". Provide extinguishers as part of the construction contract.

-
- b. Provide recessed or semi-recessed, enclosed cabinets in all facilities except storage and industrial occupancies.

8. Wet Chemical Extinguishing Systems

- a. APPLICATION. Fixed wet chemical systems are suitable for protection of certain types of special occupancies, hazards, and facilities, such as cooking surfaces and cooking exhaust systems.
- b. DESIGN REQUIREMENT. Conform to NFPA 17A, "Wet-Chemical Extinguishing Systems".

9. Fire Alarm Reporting Systems

Refer to ELEC 6 - Special Electrical Systems in this handbook.

F. FIRE PROTECTION PLAN

1. Information to Include

In the fire protection plan(s), provide sufficient information to allow adequate fire and life safety reviews by the BIA/FMCC. Include:

Applicable occupancy classifications

- NFPA Assembly Sub Classification
- NFPA Detention and Correction Occupancy Use Conditions

Minimum construction requirements

Fire resistance requirements

Exit width requirements

Egress travel distance

Fire walls (i.e., area or occupancy)

Required smoke walls and zones

Fire alarms (pull stations, alarm horns, smoke detectors, visual alarms, etc.)

Portable fire extinguishers

Exit signs

Emergency lighting

Occupant loading

Assembly area occupant loading (i.e. concentrated use, less concentrated use)

Longest travel distance within zones

Provide additional information as deemed necessary for adequate life safety.

SEE ALSO: ARCH 5 - Other Requirements/Considerations

2. Sample Fire Plan & Detail Sheets

See pages FIRE 5.2 & 5.3 of this chapter for sample fire protection plan and detail sheets. Use these as a guide only. It is not intended to dictate plan format or content.

G. OPERATING AND MAINTENANCE MANUALS

Submit complete operating and maintenance manuals for each fire protection system specified. Provide a minimum of four (4) hours of training for each fire protection system.

FIRE 3 CODES AND STANDARDS

A. RELEVANT TO DESIGN

1. Applicable Codes

- a. **GENERAL.** Design all new construction, major alterations, improvements, and minor remodeling to conform to applicable building codes (as they apply to your field of design responsibility) and to the National Fire Code (NEC) as published by the National Fire Protection Association (NFPA).

Fire protection criteria shall conform to the requirements of this section, the National Fire Code, published by the National Fire Protection Association (NFPA) and portions of the Uniform Building Code (UBC), Uniform Federal Accessibility Standards (UFAS), and the Americans with Disabilities Act (ADA).

- b. **NFPA 13.** Design sprinkler systems in accordance with NFPA 13, using as a minimum "Ordinary" hazard occupancy classification (25 BIAM, Supp. 18, 1.4).
- c. **CURRENCY.** Use the most recently published or adopted codes, standards, or laws in force at the time of the A/E contract award.

2. Resolution of Conflicts

- a. Consult with the BIA/FMCC to resolve any conflicts or questions regarding code application. Where applicable building codes conflict with NFC provisions, the latter prevail. When requirements established by law conflict with BIA/FMCC policy, the requirements promulgated by law prevail if the law is more stringent. When BIA/FMCC policy is more stringent than the law, the policy prevails.
- b. When this section does not cover a specific application, follow the codes listed above in 1. In the absence of any such information being in the codes, contact the BIA authority having jurisdiction.

B. RELEVANT TO DRAWING SYMBOLS

On the drawings, use symbols for fire protection consistent with NFPA 170.

FIRE 4 DESIGN CRITERIA

A. GENERAL

1. System Types/Materials

a. SYSTEM TYPES.

Use only Class A fire protection systems and double-action manual stations. For new buildings, use wet systems unless piping cannot be protected from freezing temperatures. "Cold attic" systems approved only in one- and two-family residences. Dry systems may be specified for building additions if required by the original building construction. However, wet systems are preferred. See FIRE 2.C.1.

b. **ASBESTOS BAN.** Do not use asbestos-containing material for fire protection of structural members.

c. **SPRINKLER PIPING.** Use schedule 40 black steel for sprinkler piping.

d. **HEAT DETECTORS.** Use linear beam detectors for fire protection in gymnasiums and auditoriums. (NOTE: Refer to NFPA for definition of platform and stage.)

e. **FIRE EXTINGUISHERS.** Placement must comply with the most stringent of 29 CFR 1910.157(d) and NFPA 10 Tables 3-2.1 (for Class A hazards) and 3-3.1 (for Class B Hazards). "Light" hazard is the minimum that may be utilized when using these tables.

2. Hazard Class

a. Ordinary hazard classification shall be the design basis for every sprinkler system.

B. MECHANICAL EQUIPMENT

1. Equipment Requirements

a. **POST INDICATOR VALVE.** Provide post indicator valve in the fire line except when fire lines and domestic water lines are not separated.

b. **WATER STORAGE TANKS.** Provide 567,811 L (150,000 gal) of water storage for boarding schools, and 283,906 L (75,000 gal) for day schools.

-
- c. **BACKFLOW PREVENTERS**. Do not use when the water supply is private. Available pressure and local codes can mitigate the need for a backflow preventer.

SEE ALSO: CIVIL 3.B.4.a. for fire hydrant requirements.

2. Drawings/Specifications

- a. **WATER SOURCE**. On the drawings, show the pressure and flow capabilities of the water supply source for fire protection.
- b. **HYDRAULIC CALCULATIONS**. Include complete hydraulic calculations and installation drawings in the specifications.
- c. **FIRE PUMPS**. For fire pumps (if required), include a size and capacity schedule, indicate required electrical supplies, and indicate pump locations.
- d. **WATER PRESSURE**. On the drawings, show the available residual fire flow water pressure at the fire sprinkler riser.
- e. **INSTALLATION DRAWINGS**. Provide complete installation drawings and specifications.

3. Tests and Reports

- a. **TESTING**. Perform a flow test and pressure measurements on water main.
- b. **REPORTING**. Provide a written report to the BIA documenting whether the water supply can support a fire sprinkler system.

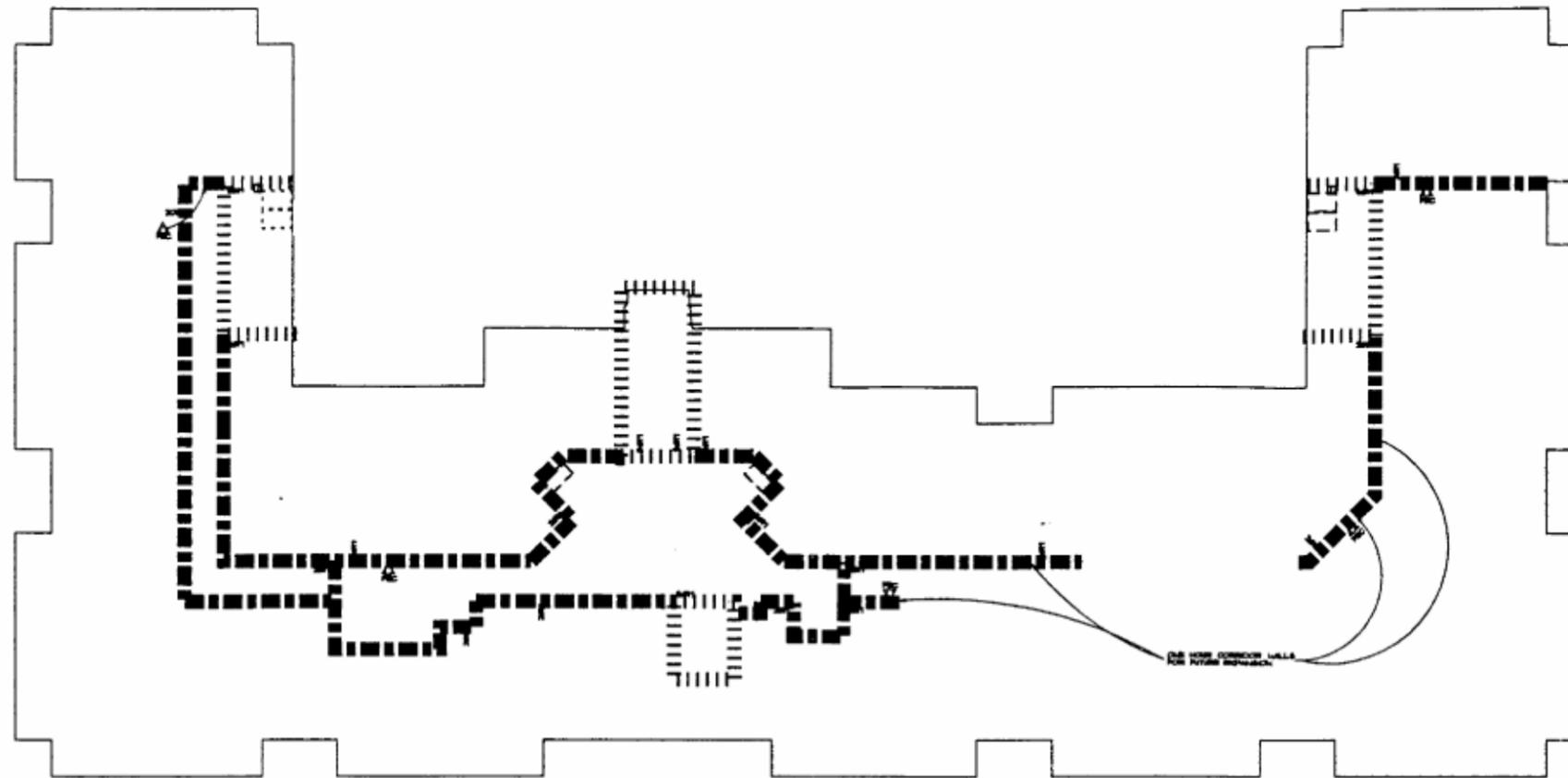
C. ELECTRICAL SYSTEMS

SEE: ELEC 6.B. - Fire Alarm Systems for a discussion of electrical requirements.

FIRE 5 STANDARD DETAILS

Sample plan and detail sheets are shown on pages FIRE 5.2 and FIRE 5.3. These are to be used for guidance only.

- | | |
|----------------------------|----------|
| 1. Fire Protection Plan | FIRE 5.2 |
| 2. Fire Protection Details | FIRE 5.3 |



1 BASEMENT FLOOR WALL RATINGS
(ALL HALLS NOT NOTED ARE TO BE NON-COMBUSTIBLE 1 HOUR CONSTRUCTION) 1/8"=1'-0"

LEGEND

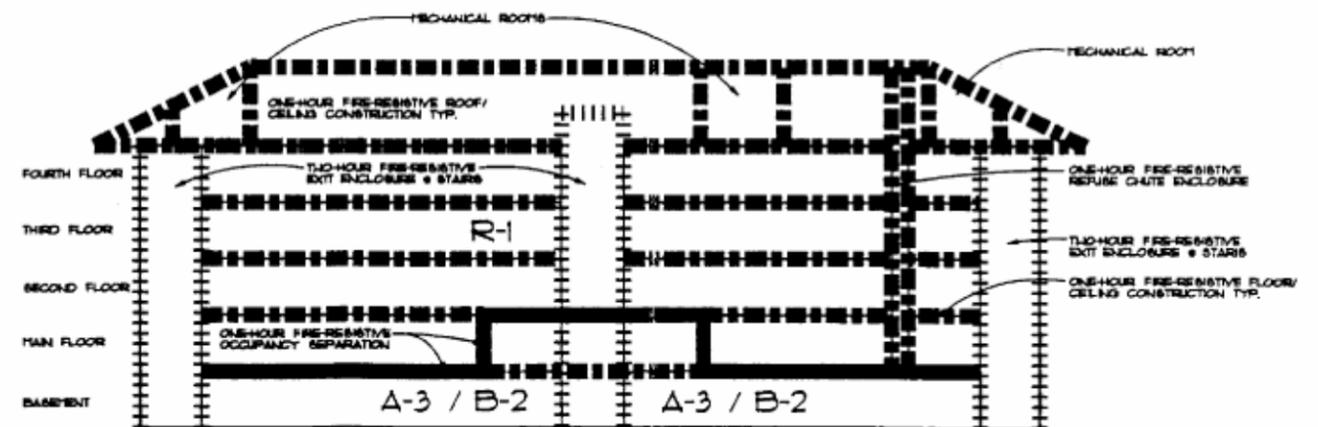
- 36" X 48" AREA OF REFUGE
- RESCUE ASSIST INTERCOM
- MAG HOLD DEVICES
- STROKES
- INDICATES CEILING DOOR
- ONE HOUR FIRE RESISTIVE CORRIDOR WALL OR MECHANICAL SHIELD WALL OR CEILING ASSEMBLY
- TWO HOUR FIRE RESISTIVE EXIT ENCLOSURE
- ONE HOUR FIRE RESISTIVE OCCUPANCY SEPARATION WALL
- SHADED AREA REPRESENTS AN A-3 OR B-2 OCCUPANCY TYPE
- MEC - FIRE EXTINGUISHER (CABINET)
- ME - FIRE EXTINGUISHER WALL MOUNTED
- FIRE ALARM PULL STATION
- FIRE ALARM HORN & STROKES
- SMOKE DETECTOR
- HEAT DETECTOR
- EXIT SIGN
- FIRE SYSTEM FLOW & TAPPER CONNECTIONS

CODE NOTES

BUILDING CONSTRUCTION TYPES & TYPE 3, 1HR
 BUILDING OCCUPANCIES A-3, B-2, R1

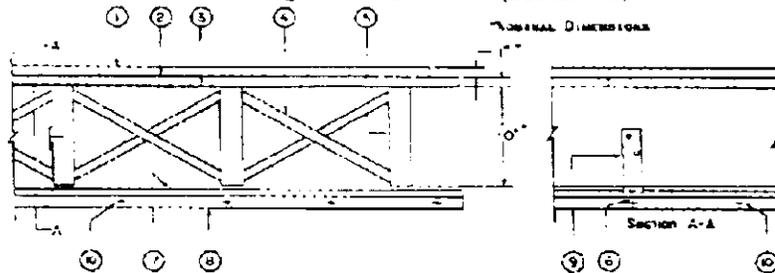
ALLOWABLE AREA	A-3	B-2	R1
BASIC ALLOWABLE	13,500 SF	18,000 SF	13,500 SF
TWO-HOUR (2000)	21,000 SF	36,000 SF	21,000 SF
MULTI-STORY (2000)	34,000 SF	12,000 SF	34,000 SF
FIRE SPRINKLER (2000)	104,000 SF	144,000 SF	104,000 SF
TOTAL ALLOWABLE	184,000 SF	144,000 SF	184,000 SF

ACTUAL BUILDING AREA	A-3	B-2	R1
BASMENT	1,871 SF	14,308 SF	13,845 SF
MAIN FLOOR		2,448 SF	8,508 SF
SECOND FLOOR			8,508 SF
THIRD FLOOR			8,508 SF
FOURTH FLOOR			8,508 SF
TOTAL	1,871 SF	16,756 SF	41,874 SF



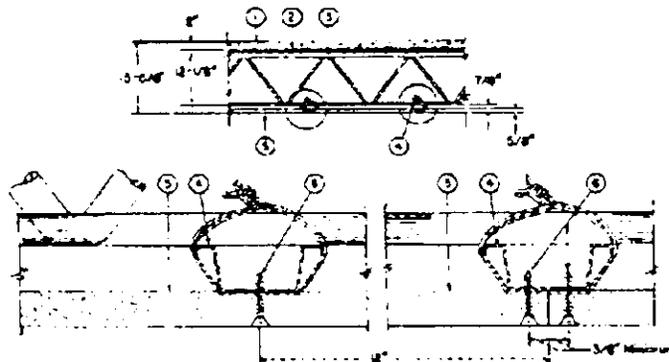
2 RATINGS SECTION (DIAGRAMATIC ONLY)
TYPE 3, 1HR CONSTRUCTION SCALE: N.T.S.

Design No. L001
Unrestrained Assembly Rating—1 Hr.
Finish Ratings—12 and 14 Min. (See Item 8)



1. Finish Flooring—1 by 4 in. 1&G, laid perpendicular to joists, or 19/32-in. plywood, nry grade "Underlayment" or "Sturd-Floor" with 1&G long edges, and conforming with PS 1-83. Face grain of plywood to be perpendicular to joists with joints staggered.
- 1A. Alternate Finish Flooring—The alternate finish flooring may consist of the following:
 - System No. 1
 Floor Topping Mixture—10-13 gal. of water to 170 lbs of floor topping mixture to 595 lbs. of sand. Compressive strength 900 psi minimum. Thickness to be 1 in. minimum. Building paper (Item 2) optional.
 Floor Crete Systems, Inc.—Type II.
 - System No. 2
 Floor Topping Mixture—Foam concentrate mixed 40:1 by volume with water and expanded at 100 psi through a foam nozzle. Mix at rate of 1.4 cu ft of preformed foam to 94 lbs Type I Portland Cement, 62.5 lb of Pea Gravel and 312.5 lbs of sand, with approximately 5.8 gal of water. Cost density of Floor Topping Mixture 100 lb per cu ft. Min compressive strength 1000 psi. Thickness 1 in.
 Lise-Crete, Inc.—Type I.

Design No. G501
Restrained Assembly Rating—1 Hr.
Unrestrained Assembly Rating—1 Hr.



1. Normal-Weight Concrete—Carbonate or siliceous aggregate, 150 ± 3 pcf unit weight, 3000 psi compressive strength.
2. Metal Lath— $\frac{1}{2}$ in. nb. 3.4 lb/sq yd expanded steel, tied to each joist at every other rd. and midway between joists at side lap with 18 SWG galv steel wire.
 As an alternate corrugated-steel deck 5/16 in. deep, 28 MSG min galv may be used. Welded to supports 15 in. O.C. using welding washers. The concrete thickness is measured from the surface of the concrete to the top of the steel deck corrugations.
3. Steel Joists—Type 12J4 min size, spaced 24 in. O.C. and welded to end supports.
 Bridging (Not Illustrated)—Steel bars, $\frac{1}{2}$ in. diam. Welded to top and bottom chord of each joist.

FLOOR/CEILING ASSEMBLY

NAVAJO NATION

**ENVIRONMENTAL
ASSESSMENT**

FOR THE

**FORT WINGATE
ELEMENTARY
REPLACEMENT
SCHOOL**

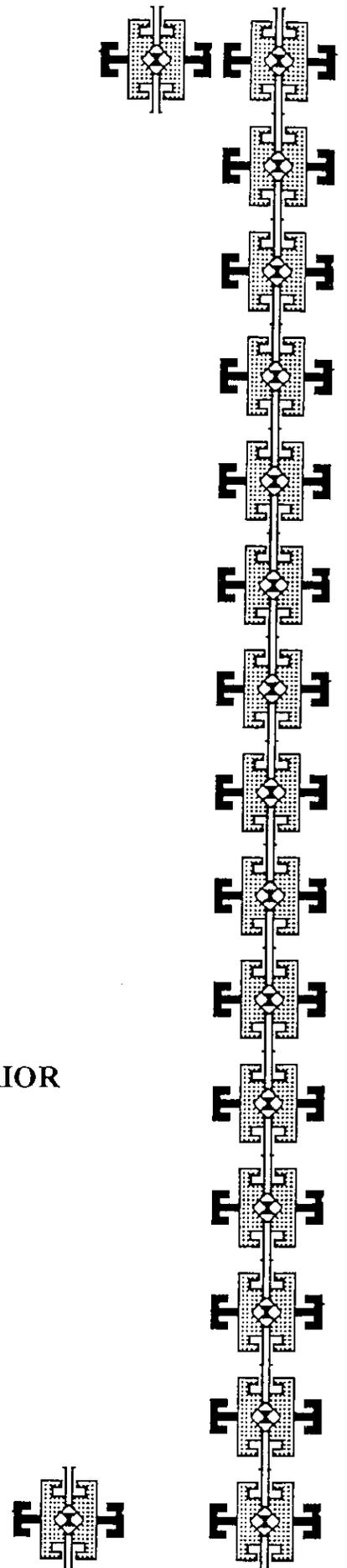
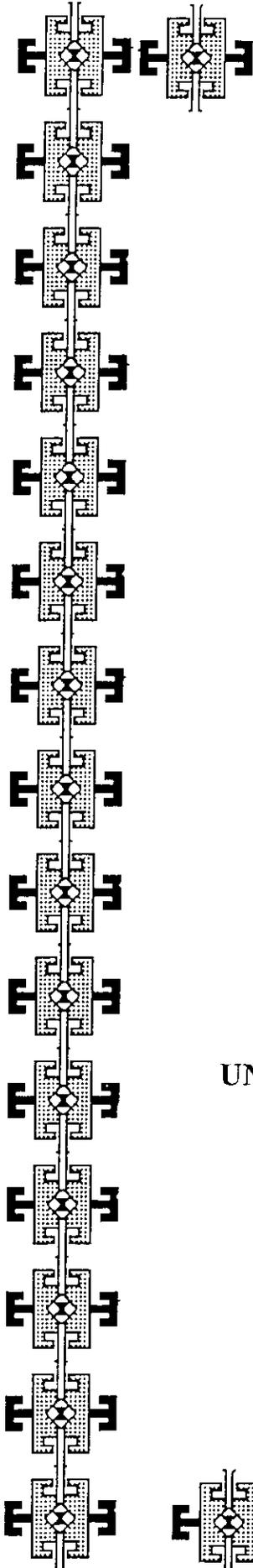
FORT WINGATE

NEW MEXICO

**UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF INDIAN AFFAIRS**

DECEMBER 15, 2000

**MARRON AND ASSOCIATES, INC.
ENVIRONMENTAL SCIENCE AND PLANNING
ALBUQUERQUE, NEW MEXICO**



Environmental Assessment

Fort Wingate Elementary Replacement School

Fort Wingate, McKinley County, New Mexico

U.S. Department of Interior, Bureau of Indian Affairs

The Navajo Nation

Bureau of Indian Affairs

Date

Bureau of Indian Affairs

Date

Kenneth W. Marron, Chief Environmentalist and Planner

Date

The following may be contacted for additional information concerning this document:

Marron and Associates, Inc.
Environmental Science and Planning
7809 Fourth St NW
Albuquerque, NM 87107
(505) 898-8848

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS	iii
1.0 PROPOSED ACTION	1.1
1.1 Description of Proposed Action	1.1
1.2 Purpose and Need	1.1
1.3 Project Location and Setting	1.1
1.4 Historical Background	1.1
2.0 ALTERNATIVES	2.1
2.1 Alternative 1: No Action	2.1
2.2 Alternative 2: Site 2	2.1
2.3 Alternative 3: Site 3	2.1
2.4 Alternative 4: Preferred Action (Site 1)	2.2
3.0 DESCRIPTION OF AFFECTED ENVIRONMENT	3.1
3.1 Land Resources	3.1
3.2 Water Resources	3.2
3.3 Air/Noise Resources/Impacts	3.3
3.4 Living Resources	3.3
3.5 Historic and Cultural Resources	3.4
3.6 Visual Resources	3.4
3.7 Transportation Network	3.4
3.8 Socioeconomic Conditions	3.5
3.9 Environmental Justice	3.5
3.10 Indian Trust Resources	3.5
3.11 Public Services and Infrastructure	3.5
3.12 Resource Use Pattern	3.6
3.13 Public Health and Safety	3.6
4.0 ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES	4.1
4.1 Land Resources	4.1
4.2 Water Resources	4.1
4.3 Air/Noise Resources/Impacts	4.2
4.4 Living Resources	4.2
4.5 Historic and Cultural Resources	4.2
4.6 Visual Resources	4.2
4.7 Transportation Network	4.2
4.8 Socioeconomic Conditions	4.3
4.9 Environmental Justice	4.3
4.10 Indian Trust Resources	4.3
4.11 Public Services and Infrastructure	4.3
4.12 Resource Use Pattern	4.3
4.13 Public Health and Safety	4.3
5.0 CONCLUSION REGARDING SIGNIFICANCE	5.1

6.0	CONSULTATION AND COORDINATION	6.1
6.1	Introduction	6.1
6.2	Public Involvement and Local Coordination	6.1
6.3	Agency Coordination	6.1
6.4	Preparers	6.1
6.5	Consultation/Coordination	6.1

7.0	REFERENCES	7.1
------------	-------------------------	------------

APPENDICES

- Appendix A Correspondence
- Appendix B Threatened, Endangered, and Sensitive Species List
- Appendix C Observed Species List

FIGURES

2.1	Project Location/Alternatives	2.4
3.1	Flood Zone Map	3.7

TABLES

2.1	Summary Comparison of Alternatives	2.3
3.1	Summary Socioeconomic Data for Navajo Nation and McKinley County, New Mexico	3.4

MAPS

- Map 1 Regional Location

ACRONYMS AND ABBREVIATIONS

AQCR:	Air Quality Control Region
BIA:	Bureau of Indian Affairs
BMP:	Best Management Plan
CEQ:	Council on Environmental Quality
COE:	U.S. Army Corps of Engineers
CWA:	Clean Water Act
EA:	Environmental Assessment
EIS:	Environmental Impact Statement
EPA:	Environmental Protection Agency
FONSI:	Finding of No Significant Impact
FR:	Forest Road
HUD:	U.S. Department of Housing and Urban Development
ISA:	Initial Site Assessment
ITA:	Indian Trust Asset
NAAQS:	National Ambient Air Quality Standards
NEPA:	National Environmental Policy Act
NF&WD:	Navajo Fish and Wildlife Department
NPDES:	National Pollutant Discharge Elimination System
SWPP:	Storm Water Pollution Prevention Plan
SR:	State Road
USFWS:	U.S. Fish and Wildlife Service
USPHS:	U.S. Public Health Service



FORT WINGATE ELEMENTARY REPLACEMENT SCHOOL

Marron and Associates, Inc.
7809 Fourth Street NW
Albuquerque, NM 87107-6526



Map 1
Regional Location

1.0 PROPOSED ACTION

1.1 DESCRIPTION OF PROPOSED ACTION

An environmental assessment (EA) was undertaken by Marron and Associates, Inc. for the Bureau of Indian Affairs (BIA) to evaluate environmental impacts that would result from the construction of the Fort Wingate Elementary Replacement School on the Navajo Reservation, Fort Wingate, New Mexico.

This document was prepared in accordance with National Environmental Policy Act (NEPA) regulations and applicable BIA and Navajo Nation regulations and guidelines. The EA includes the necessary documentation for the BIA to determine either a finding of no significant impact (FONSI) or the necessity for an environmental impact statement (EIS).

1.2 PURPOSE AND NEED

The purpose of constructing the Fort Wingate Elementary Replacement School is to address the need for more modern facilities and to meet the demands of a projected increase in enrollment over the next 10 years. The new school will replace aging facilities which are no longer suited for educational use. It will be more cost effective to construct a new facility rather than to renovate the existing school facility. Enrollment over the next 10 years is projected to increase at a target growth rate of 2.2% annually.

1.3 PROJECT LOCATION AND SETTING

The proposed Fort Wingate Elementary Replacement School will be located within the Navajo Reservation, Fort Wingate, McKinley County, New Mexico. The proposed facility will occupy approximately 100 acres. The area is located on the Fort Wingate, New Mexico 1995 U.S. Geological Survey 7.5-minute series topographic map in Section 5 of Township 14N, Range 16W (see Figure 1.1).

1.4 HISTORICAL BACKGROUND

Fort Wingate Elementary School is a BIA boarding school. It serves students in grades kindergarten through eight and also has an early childhood and adult education program. The school serves children from the area in and around Gallup in southwestern McKinley County, primarily serving five chapters: Iyanbito, Church Rock, Tsayatoh, Red Rock, and Pinedale. The school busses students primarily from the areas of Church Rock, Sundance, Pinedale, and Iyanbito. Additionally, the school transports boarding students from a larger area.

Fort Wingate Elementary School is located on the site of the former military post of Fort Wingate, established in 1860. Over the years, the school site has been used for a variety of purposes, including housing troops, serving as a training post for the Army, sheltering refugees fleeing the Mexican Revolution, storing high explosives, and in 1925 it was transferred to Indian Services to be used as a school. Today Fort Wingate Elementary School enrolls nearly 700 boarding and day students a year from kindergarten through eighth grade.

2.0 ALTERNATIVES

2.1 ALTERNATIVE 1: NO ACTION

The no action alternative will maintain the existing elementary school facility in its present state. The new school and dormitories are necessary to replace aging facilities no longer suitable for educational use. The no action alternative does not support the school's goals and objectives to provide a safe and supportive educational environment which includes providing a new elementary school, including support facilities and dormitories. (See Figure 2.1)

2.2 ALTERNATIVE 2: SITE 2

Site 2 comprises approximately 56 acres of buildable land bordering the south side of Forest Road (FR) 546 (see Figure 2.1). It lies directly west of the existing elementary school and has housing to the immediate east. The site has moderate tree cover consisting of piñon and juniper and open grasslands in the center of the site where several drainage channels converge. The south end of the site rises to the top of a rim and falls off steeply to the north about 500 feet with a moderately to severely sloping gradient of 5-15%. The grade of the site then flattens out to approximately 3% in the grassed area. The contour relief of the terrain in Site 2 could be utilized to optimize views to the north. Due to the location of the ridge to the south of Site 2, no views would be available to the south.

In order to provide access to Site 2, FR 546 will have to be improved to a minimum paved surface width of 28 feet extending from the intersection of State Road (SR) 400 and FR 546 west approximately 2000 feet.

Site 2 lies at the convergence of several drainage channels and will require the design of a large volume of storm water drainage conveyance structures. The upper reaches of the drainage basins located on the south side of the site are steep and water velocities within the channels will be high during larger storm events. In order to ensure compliance with erosion control and sediment transport into drainage channels, erosion control measures will be required during construction.

Site 2 has electricity available at its northerly boundary along FR 546. Site 2 will require the installation of a complete water well, storage tank, and transmission line system. Due to the nature of the terrain between Site 2 and the existing sewage treatment lagoons, it is anticipated that gravity flow sewage collection will not be possible. A sewage lift station and extended sewer lines will be required in order to utilize the existing treatment lagoons.

2.3 ALTERNATIVE 3: SITE 3

Site 3 contains approximately 96 acres of buildable land located directly east of the existing elementary school and housing area (see Figure 2.1). The historical Fort Wingate Cemetery lies just east of this site. The site has limited tree cover, but significant established grasses are contained throughout the balance of the site. Ground slopes are moderate at about 4% with flows being conveyed to the north. Site 3 has an unobstructed view of the mesas to the north. The only detriment in visual aspect for this site is the existing sewage lagoons located to the north of the site.

Site 3 does not border any established roadways. The closest paved roadway is approximately 400 feet west of the site. A significant amount of offsite infrastructure improvements with respect to roadways will be required.

Due to the moderately sloping gradient of this site, the design of storm water drainage conveyance structures will be minimal, and only minor channel stabilization will be required. In order to ensure compliance with erosion control and sediment transport into drainage channels, erosion control measures will be required during construction.

Site 3 does not have electricity available at the proposed property boundary. Transmission lines will have to be extended from the existing elementary school about 1000 feet. Additional well capacity and water storage tank will be required. Sewer lines will have to be extended in order to use the existing sewage treatment lagoon.

2.4 ALTERNATIVE 4: PREFERRED SITE (SITE 1)

Site 1 comprises approximately 100 acres of buildable land bordering the north side of FR 546 (see Figure 2.1). It lies northwest of the existing elementary school and has housing to the north and northeast. The site has moderate tree cover consisting of piñon and juniper and an established growth of grass ground cover. Site 1 lies on a moderately sloping gradient of approximately 3.3%. The site lies within a slight depression on a moderate northerly slope. Views of the mesas to the north are somewhat obstructed by the water tower and high school buildings but not totally eliminated.

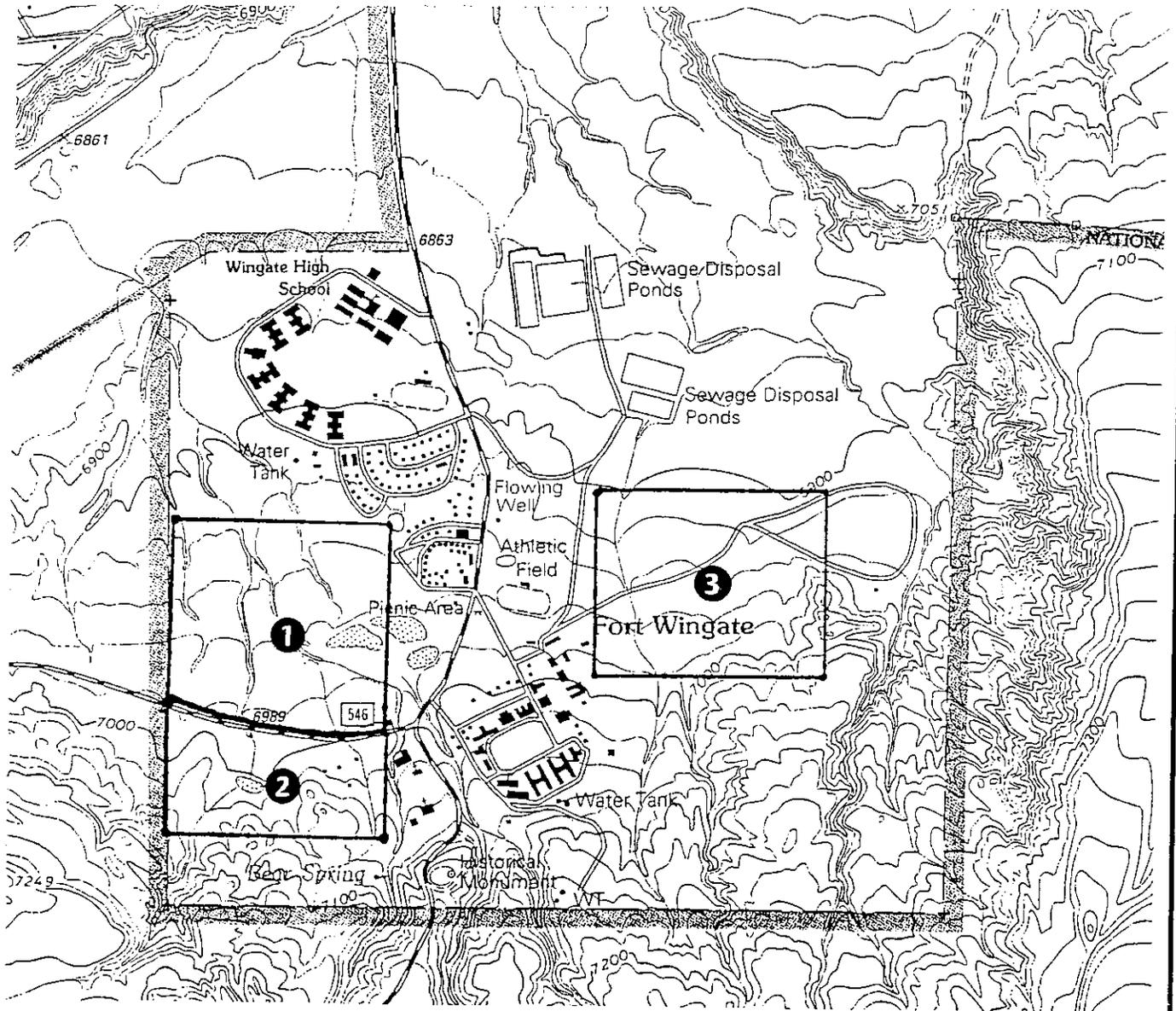
In order to provide access to Site 1, FR 546 will have to be improved to a minimum paved surface width of 28 feet extending from the intersection of SR 400 and FR 546 west for 2000 feet. Due to the presence of three significant drainage channels, the site roadways and access roadway will require the design and installation of some sizeable drainage structures.

Due to the large area of upstream drainage basin area contained in Site 1, a large volume of storm water drainage conveyance structures will be required. Stabilization of the drainage channels will be of primary importance in the development of this site. Stabilization will include the installation of riprap or other form of erosion control and possibly the regrading of an old earthen dike remaining on the site to ensure controlled drainage flow within the eastern most channel. In order to ensure compliance with erosion control and sediment transport into drainage channels, erosion control measures will be required during construction.

Site 1 has electricity available at its southerly boundary along FR 546. Additional well capacity and water storage tank will be required. Sewer lines will have to be extended in order to use the existing sewage treatment lagoons.

Table 2.1 Summary Comparison of Alternatives

	Alternative 1 No Action	Alternative 2 Site 2	Alternative 3 Site 3	Alternative 4 Preferred Site
Vegetation	No impact.	40% cover.	20% cover.	100% cover.
Site Accessibility	No impact.	FR 546 must be improved to paved surface width of 28 feet for 2000 feet from SR 400.	No accessibility. Construction of access roadway required. Closest paved roadway is approximately 400 feet west of site.	FR 546 must be improved to paved surface width of 28 feet for 2000 feet from SR 400. Installation of roadway drainage structures required.
View	No impact.	Good views. Optimize views to the north. Ridge to south of site obstructs view to the south.	Great views. Unobstructed view of mesas to the north. Sewage lagoons visible to the north.	Moderate views. Views to the north somewhat obstructed by water tower and high school buildings.
Drainage	No impact.	Site lies at convergence of several drainage channels. Requires a large volume of storm water drainage conveyance structures.	Requires only minimal storm water drainage conveyance structures.	Site traversed by three main drainage channels. Requires largest volume of storm water drainage conveyance structures.
Waters of the United States	No impact.	At least three arroyos must be addressed.	None.	At least three arroyos must be addressed.
Infrastructure				
Electricity		Available.	Not available. Extension of transmission lines required.	Available.
Natural Gas		Available.	Available.	Available.
Water	No impact.	Installation of complete water well, storage tank and transmission line system required.	Additional well and storage tank capacity required.	Additional well and storage tank capacity required.
Sewage		Extensive wastewater treatment infrastructure required.	Extensive wastewater treatment infrastructure required.	Extensive wastewater treatment infrastructure required.
Hazardous Materials		None.	None.	Biomedical waste and illegal dumping observed.
Cultural Resources	No impact.	Known cultural resources in general area.	Known cultural resources in general area. Close to historic cemetery.	Known cultural resources in general area.



FORT WINGATE ELEMENTARY REPLACEMENT SCHOOL

Marron and Associates, Inc.
 7809 Fourth Street NW
 Albuquerque, NM 87107-6526



Figure 2.1
Project/Alternatives Location

3.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 LAND RESOURCES

Impaired Properties/Hazardous Materials

A complete Initial Site Assessment (ISA) is being completed by the BIA/Navajo Nation. During the initial site visit in July 2000, biomedical waste, illegal dumping of household and commercial materials, and many old vehicle bodies were observed on the project site. In addition, Radon levels in the existing elementary school are above acceptable levels, and Radon mitigation will be required with construction of a new school facility.

Natural Land Forms

The project area lies within Navajo Reservation land in Fort Wingate, McKinley County, in northwestern New Mexico. The average elevation of the project area is approximately 7000 feet above sea level. The dominant landform to the west of the project area is the Hogback, a ridge of steeply dipping sedimentary rocks. The area south of the project area is Cibola National Forest land. Six Mile Canyon lies to the southeast and east of the project area, and the low alluvial floodplain of the south fork of the Rio Puerco lies to the north of the project area.

Soils/Farmlands/Grazing

Two soil associations occur within the project location: Moriarty-Prewitt and Thurloni-Savoia-Conchos. The Moriarty-Prewitt association occurs mainly in valley bottoms and on flood plains and terraces along intermittent drainages and is dominated by soils that are slightly to moderately saline and alkali-affected. These soils occupy nearly level to gently sloping landscapes and are forming in fine-textured alluvium weathered principally from shale and other sedimentary materials. Although occurring on gentle slopes, they are susceptible to erosion. The soils in this association have very slow permeabilities and fine textures. The Thurloni-Savoia-Conchos association occurs in a variety of topographical settings ranging from nearly level to strongly sloping. The soils in this association are developing residually in parent materials weathered from sedimentary rocks, including shale, sandstone, and limestone or in alluvial and eolian sediments. The major soils are moderately deep and deep, but shallow soils and shale and rock outcrops are also included in this association. The soils in this association are susceptible to erosion.

Agricultural land is categorized as prime and unique or as of statewide and local importance. The Natural Resource Conservation Service, which has jurisdiction over farmlands, defines prime or unique farmlands as those lands whose value is derived from their general advantage as cropland due to soil and water conditions. Farmlands deemed of statewide importance are important to agriculture but exhibit some properties that exclude them from the prime farmland classification. No prime farmlands or farmlands of statewide importance are found within the general project area.

The land comprising the general project area has never been used for grazing.

Vegetation

The project area consists of piñon-juniper woodland with a big sagebrush understory. Additional vegetation observed includes fringed sage, fourwing saltbush, rose heath, snakeweed, summer cypress, winterfat, pale wolfberry, prickly-pear cactus, banana yucca, various wildflowers, and mixed grasses. (See Appendix C for a complete listing of observed species.)

3.2 WATER RESOURCES

Floodplain/Flood Hazard/Drainage/NPDES

Executive Order 11988, Floodplain Management, requires that any potential impacts to floodplain areas be studied, assessed, and identified to reduce the risk of flood loss; to minimize the impact of floods on human safety, health, and welfare; and to restore and preserve the natural and beneficial values served by floodplains. Therefore, project planning must ensure that the proposed construction will be compatible with the floodplain areas by identifying potential impacts and ways to mitigate them.

Unincorporated areas of McKinley County have been mapped by the U.S. Department of Housing and Urban Development (HUD) on Flood Hazard Boundary Maps. Community Panel Numbers 350039 0021 A and 350039 0029 A show the project area. Existing flood areas and their associated drainages in relation to the project site are shown in Figure 3.1. The Zone A floodplain boundary, comprising special flood hazard areas inundated by the 100-year flood, where no base elevations have been determined, encompasses a majority of the project area.

Surface runoff within the project area is primarily ephemeral and comes as runoff from storm water, most of which is provided by summer thunderstorms. Three main drainage channels traverse the project site and appear to convey substantial storm water flows. These drainage channels are tributary to a main drainage basin, the south fork of the Rio Puerco. In addition, an old earthen dike is located on the project site. Although it was not ponding water at the time of the site inspection, the possibility exists that during a heavy rain, the area could be inundated with water or ponding would be deep enough to pose a threat to small children.

Water Quality

No surface water was encountered on the project site, and no springs were observed. Furthermore, no springs have been recorded on the U.S. Geological Survey (USGS) maps for the project area.

The Glorieta sandstone/San Andres limestone forms the major aquifer of the region. Water is pumped from three wells located within the Fort Wingate area. Well 1 is a 295 feet deep artesian well with a production rate of 12 gallons/minute, Well 2 is 357 feet deep and has a production rate of 5 gallons/minute, and Well 3 is a 150 feet deep artesian well with a production rate of 88 gallons/minute. There is no evidence that the water from these wells does not meet current water quality standards. The flow of water is from the southeast to the northwest.

Three arroyos are located within the project site. The arroyos are considered Waters of the United States thereby requiring a clearance and type of Clean Water Act (CWA) Section 404 permit issued by the U.S. Army Corps of Engineers (COE).

Wetlands

Wetland systems and classes are based on criteria set forth in the Clean Water Act (CWA) of 1977, Executive Order 11990, and other regulatory materials. There are no known wetlands within the project area.

3.3 AIR/NOISE RESOURCES/IMPACTS

Fort Wingate is located in western McKinley County, which has been designated by the Environmental Protection Agency (EPA) as a rural attainment area, indicating that ambient air quality meets or exceeds the National Ambient Air Quality Standards (NAAQS). Western McKinley County is located within New Mexico state designated Air Quality Control Region (AQCR) Number 1, which corresponds to EPA Region 14, the Four Corners Interstate Region.

No adverse impacts from air or noise are anticipated from the proposed action.

3.4 LIVING RESOURCES

Threatened and Endangered Species/Species of Concern

Federal and Navajo threatened or endangered species are protected by law. Species from those currently listed as proposed, threatened, and endangered by the U.S. Fish and Wildlife Service (USFWS) and candidate, threatened, endangered and extirpated by the Navajo Fish and Wildlife Department (NF&WD) were reviewed during this environmental study.

No federal or Navajo listed plant, animal or bird species were seen during a biological survey of the project site in September 2000, and few are likely to occur within the project limits. However, due to the presence of suitable habitat and/or foraging area within the general project area, some federal species of concern and Navajo candidate and threatened species could potentially occur on the project site. (See Appendix B)

Wildlife

A 100% biological survey of the project area indicated the presence of four animal species, 15 bird species, and one reptile species. Some of the common mammal species inhabiting the area include deer, hares, rabbits, mice, and a number of bird species. (See Appendix C for a complete listing of observed species.)

Tracks of mule deer were noted within the project site. Larger mammals, such as deer have large ranges and are transient in the project area. Virtually all of the small mammal and reptile species are permanent residents of the area. Many of the bird species observed during the survey should be considered as local and resident; however, some species may be migrant.

3.5 HISTORIC AND CULTURAL RESOURCES

Archaeology

This section is being completed by the Navajo Nation.

Traditional Cultural Resources (Sacred Sites)

This section is to being completed by the Navajo Nation.

3.6 VISUAL RESOURCES

Regulations of NEPA and CEQ identify aesthetics, or visual quality, as one of the elements in the environment that may be considered in determining the effects of a construction project. Visual resources are those physical features that make up the visible landscape, including land, water, vegetation, and human-made elements. No adverse impacts to visual resources are anticipated from the proposed Fort Wingate Replacement Elementary School project.

3.7 TRANSPORTATION NETWORK

Existing roadways in the area include Forest Road (FR) 546 and State Road (SR) 400. FR 546 is a gravel roadway extending from SR 400 southwest approximately two miles to the Fort Wingate Workcenter and borders the project site along its southerly boundary. SR 400 is a paved roadway from I-40 through Fort Wingate.

Table 3.1

Summary of Socioeconomic Data for the Navajo Nation and McKinley County, New Mexico		
	Navajo Nation	McKinley County, New Mexico
Total Population	151,105 ¹	67,754 ²
Native American Population (Percentage of Total)	146,001 ¹ (96.6%)	49,184 ² (72.6%)
Population 65+ years (Percentage of Total)	8,864 ¹ (5.9%)	4,343 ² (6.4%)
Population Below Poverty Level (Percentage of Total)	84,508 ¹ (55.9%)	25,622 ³ (38.9%)
Percent Unemployed	27.9% ¹	7.9% ⁴

¹Data are summarized from the 1990 Census; ²Data are summarized from the 1996 Census; ³Based on the population reported for 1994; ⁴Unemployment figure from 1994.

3.8 SOCIOECONOMIC CONDITIONS

Table 3.1 summarizes the socioeconomic characteristics of the Navajo Nation and McKinley County, New Mexico. Because the project consists of a replacement school for the existing school, socioeconomic conditions will not be affected.

3.9 ENVIRONMENTAL JUSTICE

Federal agencies are required to identify and address disproportionately high and adverse human health or environmental effects of its activities on minority and low income populations under Executive Order 12898 (published in the Federal Register on February 11, 1994). The proposed project was selected based on need to replace aging elementary school facilities no longer suitable for educational use. The proposed project would not have any significantly adverse impacts on people or any disproportionate effects on minority or low-income populations.

3.10 INDIAN TRUST RESOURCES

Indian trust assets (ITAs) are legal interests in property held in trust by the United States of America for Indian tribes or individuals. ITAs include such items as land, minerals, hunting and fishing rights, and water rights. No potential effects on ITAs for the Navajo Nation were identified.

3.11 PUBLIC SERVICES AND INFRASTRUCTURE

Services in Fort Wingate include the Fort Wingate Post Office, the Fort Wingate Trading Post, and the Bear Springs Enterprises convenience store. Additional goods and services are sought in Gallup.

Fire protection is provided by the Fort Wingate Volunteer Fire Station and law enforcement is provided by the McKinley County Sheriff's Office and the Navajo Tribal Police. The New Mexico State Police maintains an office east of Gallup and is responsible for state and Federal highways.

Fort Wingate Elementary School serves students in kindergarten through eighth grade and also has an early childhood and adult education program. Students in ninth through twelfth grade attend Fort Wingate High School.

Electricity in the area is provided by the City of Gallup Electric Company, natural gas is provided by the Public Service Company of New Mexico, and telephone service is provided by Quest.

Solid waste management services for Fort Wingate are provided by Navajo Sanitation, and solid waste from the area is placed in the Red Rock Regional Landfill. Waste water treatment is serviced by the existing sewage treatment lagoons located on the east side of SR 400. These lagoons are aerobic lagoons with air injection systems. The existing waste water treatment plant and lagoons are in deplorable condition--the lagoons are almost completely sedimented in, they are undredged, they leak, and the aerators are not operational. Before any new structures are added to the existing treatment plant, it must be brought up to code

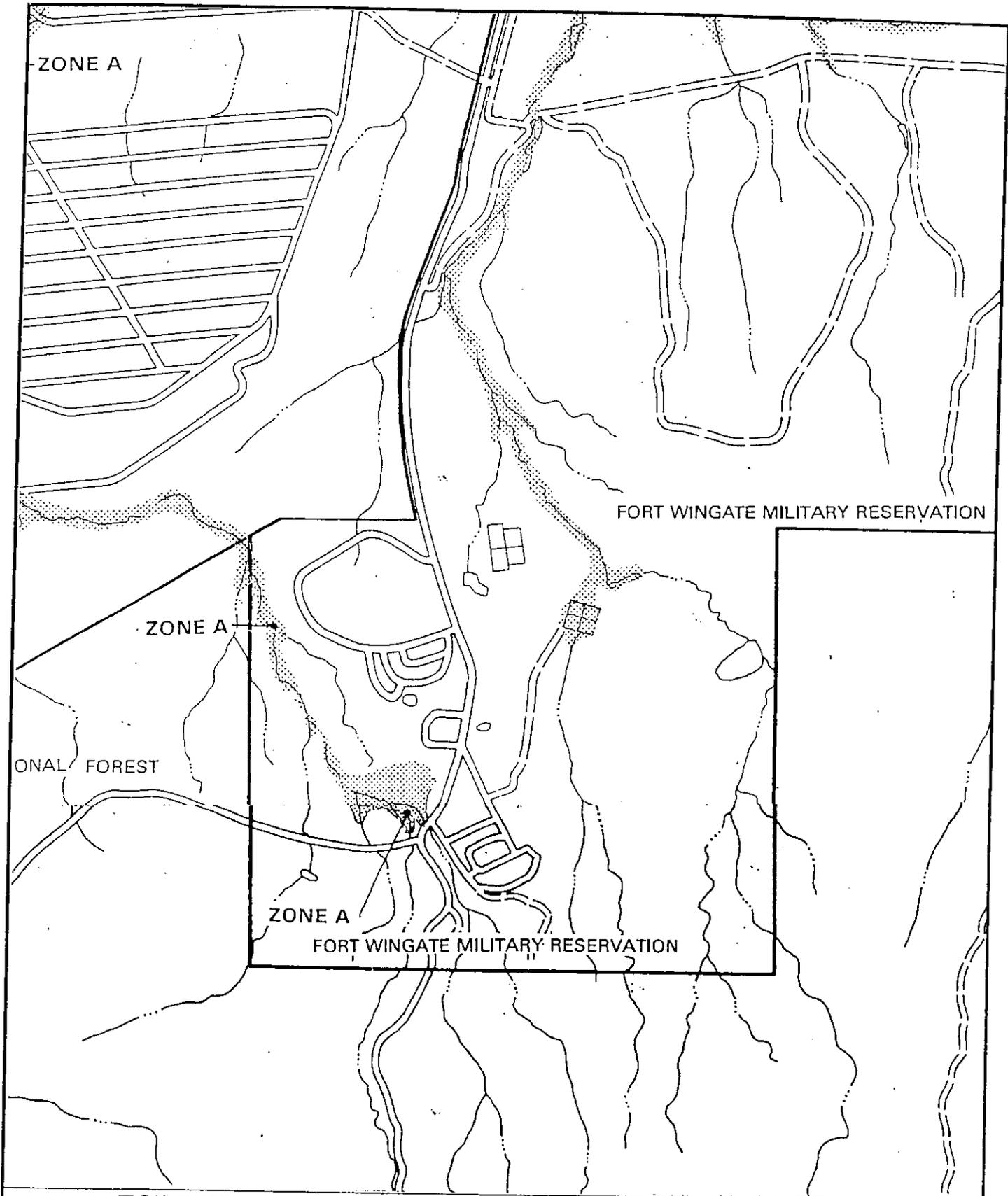
and regulations. Fort Wingate is serviced by a water system maintained and owned by the BIA. The water storage tank is not in good condition, and the existing well houses are not in code. The available reserve storage tank capacity does not appear to be adequate to meet anticipated fire demand requirements, and the existing lines are believed to be old asbestos clay (AC) pipe.

3.12 RESOURCE USE PATTERN

The Navajo Nation is actively engaged in economic development activities intended to create employment opportunities for members of the various chapters while generating revenues for the chapters. Planning activities will ensure compatibility with the overall tribal economic development goals and objectives.

3.13 PUBLIC HEALTH AND SAFETY

Fort Wingate Volunteer Fire Station and Emergency Medical Service provides intermediate life support services for Fort Wingate, and MedStar Ambulance out of Gallup provides transport. General health services are provided by Rehoboth McKinley Christian Hospital and the U.S. Public Health Service's (USPHS) Gallup Indian Medical Center. Both hospitals are located in Gallup.



FORT WINGATE REPLACEMENT ELEMENTARY SCHOOL

Marron and Associates, Inc.
 7809 Fourth Street NW
 Albuquerque, NM 87107-6526



Figure 3.1
Flood Zone Map

4.0 ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

4.1 LAND RESOURCES

Impaired Properties/Hazardous Materials

Information is not yet available from the BIA.

Natural Land Forms

No mitigation measures are required for construction of the preferred alternative.

Soils/Farmlands/Grazing

During construction, exposed soils will be vulnerable to soil erosion by air dispersion and possible overland flow from storm runoff. Appropriate measures to minimize erosion will be implemented. Soil loss will be controlled by revegetation of disturbed areas upon project completion. Consequently, soil stability measures will be taken through standard contractual requirements to reduce both types of erosion.

Vegetation

The project area will be replanted with native plants and grasses after construction.

4.2 WATER RESOURCES

Floodplain/Flood Hazard/Drainage/NPDES

Permission to discharge storm water from construction activities to Waters of the United States will be obtained under the National Pollutant Discharge Elimination System (NPDES). The contractor will implement a Storm Water Pollution Prevention Plan (SWPP) which will detail sediment and erosion controls, storm water management measures, and best management practices (BMPs) for the construction activity.

In accordance with Executive Order 11988, the project design will not cause adverse changes in the flood hazard potential in the project area or have any adverse effects on floodplains. The school facility will be designed to permit the conveyance of a 100-year flood event without causing damage to the roadway or adjacent properties. Project planning will ensure that the proposed construction is compatible with the floodplain areas.

Water Quality

Clean Water Act (CWA) Section 404 permits issued by the U.S. Army Corps of Engineers (COE) will be needed to address three arroyos that traverse the project site. Construction activities associated with the preferred alternative are not expected to adversely affect groundwater or water quality. No other mitigation measures are required for construction of the preferred alternative.

Wetlands

There are no known wetlands within the project area. No mitigation measures are required for construction of the preferred alternative.

4.3 AIR/NOISE RESOURCES/IMPACTS

The only anticipated impact is expected to come from heavy equipment usage and the rural fugitive dust that will result during any construction. Dust and other particulate matter will be generated; however, these air pollutants will be temporary.

Noise levels around the construction site will increase as construction takes place but will discontinue after construction is complete.

No mitigation measures are required for construction of the preferred alternative.

4.4 LIVING RESOURCES

Threatened and Endangered Species/Species of Concern

No threatened, endangered, or species of concern species were found on the project site. No mitigation measures are required for construction of the preferred alternative.

Wildlife

Although biotic impacts to flora and wildlife will occur with construction of the preferred alternative, the abundant habitat adjacent to the project will not be significantly impacted, and no mitigation measures are required.

4.5 HISTORIC AND CULTURAL RESOURCES

Archaeology

Information is not yet available from the Navajo Nation.

Traditional Cultural Resources (Sacred Sites)

Information is not yet available from the Navajo Nation.

4.6 VISUAL RESOURCES

No adverse impacts to visual resources are anticipated from construction of the preferred alternative. No mitigation measures are required for construction of the preferred alternative.

4.7 TRANSPORTATION NETWORK

No mitigation measures are required for construction of the preferred alternative.

4.8 SOCIOECONOMIC CONDITIONS

Because the project consists of a replacement school for the existing school, socioeconomic conditions will not be affected. No mitigation measures are required for construction of the preferred alternative.

4.9 ENVIRONMENTAL JUSTICE

There will be no impact on minority or low-income populations.

4.10 INDIAN TRUSTS RESOURCES

The proposed project is not anticipated to have any effect on ITAs.

4.11 PUBLIC SERVICES AND INFRASTRUCTURE

The existing wastewater treatment plant and lagoons are in deplorable condition. Before any new structures are added to the existing treatment plant, it must be brought up to code and regulations. The existing water storage tank is not in good condition, and the existing well houses are not in code. The storage tank and well houses must also be brought up to code and regulations. In addition, additional water storage capacity will be required in order to meet anticipated fire demand requirements, and additional well capacity will be required.

4.12 RESOURCE USE PATTERN

No mitigation measures are required for construction of the preferred alternative.

4.13 PUBLIC HEALTH AND SAFETY

No mitigation measures are required for construction of the preferred alternative.

5.0 CONCLUSIONS REGARDING SIGNIFICANCE

The engineering, social, economic, and environmental investigations conducted on the proposed action has not disclosed any significant impacts on the quality of the natural or human environment. This project has been discussed with tribal members at council meetings. No opposition to the project was noted.

6.0 CONSULTATION AND COORDINATION

This section discusses the public participation, local coordination, and agency coordination that has been completed to date for the Fort Wingate Replacement Elementary School.

6.1 INTRODUCTION

An agency coordination program was implemented to provide input into the study process. Agency coordination was initiated through staff participation on a project study team and through written communication with affected governmental agencies. Agency coordination is necessary to assist in the identification of potential project-related environmental impacts and to develop and refine the proposed design of the project, if warranted. Public participation will be solicited upon the acceptance of the EA.

6.2 PUBLIC INVOLVEMENT AND LOCAL COORDINATION

Public participation in the project will begin upon the completion and acceptance of the EA. There will be either an opportunity for public hearing or a public hearing once the EA has been approved by the BIA and is available for public review.

6.3 AGENCY COORDINATION

Participating agencies identified major issues and concerns which aided in the development and evaluation of project design alternatives. Coordination with affected agencies was accomplished through meetings, correspondence, telephone communication, and review of project-related materials. Formal letters of invitation were sent to state and federal agencies for their participation in the environmental analysis. All written correspondence received to date is contained in Appendix A.

6.4 PREPARERS

- Marron and Associates, Inc.
Ken Marron, BS Science Education, MS Community and Regional Planning
Shari Grossarth, BS Conservation Biology

6.5 CONSULTATION/COORDINATION

- Architectural Research Consultants
- Bureau of Indian Affairs
- JEL and Associates
- McKinley County Fire and Safety
- NMED Surface Water Quality Bureau
- Natural Resources Conservation Service
- Navajo Fish and Wildlife Department
- Navajo Nation Archaeology Department
- New Mexico Department of Game and Fish
- P2RS Corporation
- State of New Mexico Energy, Minerals, and Natural Resources Department
- U.S. Army Corps of Engineers
- U.S. Department of Agriculture
- U.S. Department of the Interior

- U.S. Fish and Wildlife Service
- Weller Architects, P.C.

7.0 REFERENCES

- Brown, David E., and Charles H. Lowel (1994). *Biotic Communities of the Southwest*. University of Utah Press, Salt Lake City, UT.
- Brown, D. E., and C. H. Lowe. (1982). *Map: Biotic Communities of the Southwest*. Publication Distribution, Rocky Mountain Forest and Range Experiment Station. U.S. Department of Agriculture Forest Service, Fort Collins, CO.
- Fugate, Francis L. And Roberta B. Fugate. (1989). *Roadside History of New Mexico*. Mountain Press Publishing Company, Missoula, Mt.
- Burbour, Michael G., and William Dwight Billings, eds. (1989). *North American Terrestrial Vegetation*. Cambridge University Press, Cambridge.
- Dick-Peddie, W.A. (1993). *New Mexico Vegetation Past, Present, and Future*. Albuquerque, NM: University of New Mexico Press.
- Endangered Species Act, as amended.
- Findley, J.S., et al. (1975). *Mammals of New Mexico*. University of New Mexico Press, Albuquerque, NM.
- Fletcher, R., et al. (1984). *A Handbook of Rare and Endemic Plants of New Mexico*. Albuquerque, NM: University of New Mexico Press.
- Kartesz, J. T. (1994). *A Synonymized Checklist of the Vascular Flora of the United States, Canada, and Greenland*. Portland, OR: Timber Press.
- Martin, William C., and C. R. Hutchins. (1980). *A Flora of New Mexico*. Strauss and Cramer, Germany.
- New Mexico Department of Game and Fish. *Amended Listing of Endangered Wildlife of New Mexico*. State Game Commission Regulation No. 682. November 30, 1990.
- New Mexico Department of Game and Fish. (1989). *Handbook of Species Endangered in New Mexico*. Santa Fe, NM: New Mexico Department of Game and Fish.
- New Mexico Water Quality Division. (1995). *Water Quality Standards for Interstate and Intrastate Streams in New Mexico*. New Mexico Water Quality Control Commission. Santa Fe, NM.
- Sivinski, R., and Lightfoot, K. (1992). *Inventory of Rare and Endangered Plants of New Mexico*. Santa Fe, NM: Energy, Minerals and Natural Resources Department—New Mexico Forestry and Resources Conservation Division.
- Soil Conservation Service. (1974). *Soil Associations and Land Classification for Irrigation, McKinley County*.

Tuan, Yi-Fu, et al. (1973). *The Climate of New Mexico*. Santa Fe, NM: New Mexico State Planning Office.

Williams, Jerry L. (1986). *New Mexico in Maps*. Albuquerque: University of New Mexico Press.

APPENDIX A
CORRESPONDENCE

GOVERNOR
Gary E. Johnson



STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

Villagra Building
P.O. Box 25112
Santa Fe, NM 87504

STATE GAME COMMISSION

Steven C. Emery, Chairman
Albuquerque, NM

Stephen E. Doerr
Portales, NM

Bud Heltinga
Las Cruces, NM

George Ortega
Santa Fe, NM

Steve Padilla
Albuquerque, NM

J. Karen Stevens
Farmington, NM

Ray Westall
Loco Hills, NM

DIRECTOR AND SECRETARY
TO THE COMMISSION
Gerald A. Maracchini

Visit our Web Site home page at <http://www.gmfsh.state.nm.us>
For basic information or to order free publications: 1-800-862-9310

August 25, 2000

RECEIVED

AUG 30 2000

marron and associates, inc.

Mr. Ken Marron
Marron Associates, Inc.
7809 Fourth Street NW
Albuquerque, NM 87107-6526

Re: FORT WINGATE ELEMENTARY REPLACEMENT SCHOOL, NAVAJO
NATION, CIBOLA COUNTY, NEW MEXICO
NMGF Doc. No. 7158

Dear Mr. Marron:

The New Mexico Department of Game and Fish (Department) has reviewed this project. It appears that the entire project area is on the property of the Fort Wingate reservation. The Department has no jurisdiction or authority for the wildlife resources on Indian reservations or property.

We would recommend that you contact the Fort Wingate reservation regarding general wildlife issues they may have and the U.S. Fish and Wildlife Service regarding any threatened or endangered species issues they may have.

We appreciate the opportunity to provide input to your project. If you have any further questions, please call Bill Hays of my staff at 505-827-7882.

Sincerely,

Tod W. Stevenson

Tod W. Stevenson
Conservation Services Division Chief

TWS/bh

cc: Field Supervisor (Ecological Services, USFWS)
Scott Brown (Assistant Director, NMGF)
Mark Watson (Habitat Specialist, NMGF)



marron associates, inc.

7809 fourth street nw
albuquerque, new mexico 87107-6526
tel: (505) 898-8848
fax: (505) 897-7847
e-mail marroninc@aol.com

August 21, 2000

Ms. Joy Nicholopoulos
U.S. Fish and Wildlife Service
Ecological Services Field Office
2105 Osuna Road NE
Albuquerque, NM 87113

2000/0200
USFWS-NMIESFO

Re: Fort Wingate Elementary Replacement School, Navajo Nation, Cibola County, New Mexico.

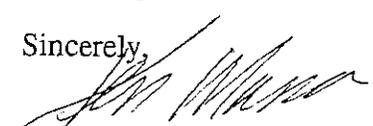
Dear Ms. Nicholopoulos:

The Bureau of Indian Affairs (BIA) in cooperation with the Navajo Nation, is proposing an elementary school at Fort Wingate in Cibola County, New Mexico. The elementary school will be a replacement for the Fort Wingate BIA School that will be closed upon completion of the new school. Enclosed is a map indicating the location of the project.

Marron and Associates, Inc. is preparing the environmental documentation for this project, which is expected to comply with the National Environmental Policy Act, the BIA NEPA Handbook, and the Navajo Nation's regulations and other related regulations. The environmental level of effort expected is an environmental assessment (EA). We request your evaluation of the proposed project effects to determine the potential to affect resources or issues of concern to your agency. We also appreciate any pertinent information that you could share with us regarding the affected environment.

If you have any questions about the project, please contact me at (505) 898-8848. We appreciate your cooperation.

Sincerely,


Ken Marron
Chief Environmentalist and Planner

Enclosure

NO EFFECT FINDING

The described action will have no effect on listed species, wetlands, or other important wildlife resources.

Date 11/2/2000

Consultation # 2-22-00-I-508

Approved by J. E. Nicholopoulos

U.S. FISH and WILDLIFE SERVICE
NEW MEXICO ECOLOGICAL SERVICES FIELD OFFICE
ALBUQUERQUE, NEW MEXICO



THE NAVAJO NATION

ARCHAEOLOGY DEPARTMENT

P.O. Box 689

WINDOW ROCK, AZ 86515 ♦ PHONE: (520) 871-6540 ♦ FAX (520) 871-6511

KELSEY A. BEGAYE
PRESIDENT

TAYLOR MCKENZIE, MD
VICE PRESIDENT

June 12, 2000

Ken Marron
Marron Associates
7809 Fourth Street NW
Albuquerque, NM 87107-6526

Re: Cost Proposal for Ft. Wingate Inventory

Dear Mr. Marron:

You asked for a cost proposal for a Class III cultural resources inventory of a 100 acre parcel and a Class I record search of two nearby parcels of 100 acres each, at Ft. Wingate.

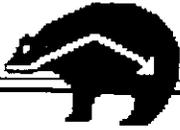
Our total costs for this effort, including a summary of the results of the Class I records search of tribal and state files, and the preparation of a final technical report on the Class III inventory, is **\$6,840.00**.

If you have any questions or concerns regarding this cost proposal, please call me.

Sincerely,

A handwritten signature in black ink, appearing to be "AK", written over a white rectangular area.

Anthony L. Klesert, Ph.D.
Director, NNAD



7809 fourth street nw
albuquerque, new mexico 87107-6526
tel: (505) 898-8848
fax: (505) 897-7847
e-mail marroninc@aol.com

August 21, 2000

Mr. Jeff Cole
Navajo Fish and Wildlife Department
P.O. Box 1480
Window Rock, Arizona 86515-0689

RE: Fort Wingate Elementary Replacement School

Dear Mr. Cole:

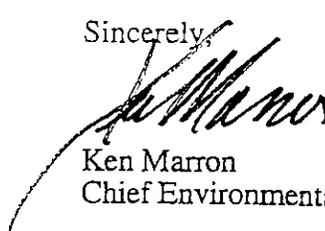
Marron and Associates, Inc. (MAI) is requesting clearance from the Navajo Fish and Wildlife Department to conduct a biological and threatened, endangered, and sensitive species Survey on approximately 60 acres located in the vicinity of Fort Wingate, New Mexico. The site is for the replacement of the existing elementary school by the Bureau of Indian Affairs and the Navajo Nation.

The survey is for an environmental assessment (EA). No collecting or banding will be necessary. This survey will be conducted as per Navajo Fish and Wildlife Department Biological Evaluation Guidelines.

The persons conducting the surveys are: Paul Knight; Nancy and Steven Cox; and Phil Tonne. Attached are the resumes of Nancy and Steven Cox. You should have the resumes of Paul Knight and Phil Tonne on file.

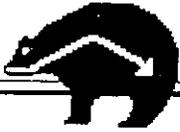
If you have any questions about the project, please contact me at 898-8848. We appreciate your cooperation.

Sincerely,



Ken Marron
Chief Environmentalist and Planner

enc: topographic map with general location
resumes
Application



marron  associates, inc.

7809 fourth street nw
albuquerque, new mexico 87107-6526
tel: (505) 898-8848
fax: (505) 897-7847
e-mail marroninc@aol.com

August 21, 2000

Ms. Karen Lightfoot
New Mexico Energy, Minerals, and Natural Resources Department
Forestry and Resources Conservation Division
Villagra Building
P.O. Box 1948
Santa Fe, NM 87504

Re: Fort Wingate Elementary Replacement School, Navajo Nation, Cibola County, New Mexico.

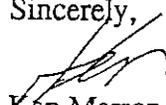
Dear Ms. Lightfoot:

The Bureau of Indian Affairs (BIA) in cooperation with the Navajo Nation, is proposing an elementary school at Fort Wingate in Cibola County, New Mexico. The elementary school will be a replacement for the Fort Wingate BIA School that will be closed upon completion of the new school. Enclosed is a map indicating the location of the project.

Marron and Associates, Inc. is preparing the environmental documentation for this project, which is expected to comply with the National Environmental Policy Act, the BIA NEPA Handbook, and the Navajo Nation's regulations and other related regulations. The environmental level of effort expected is an environmental assessment (EA). We request your evaluation of the proposed project effects to determine the potential to affect resources or issues of concern to your agency. We also appreciate any pertinent information that you could share with us regarding the affected environment.

If you have any questions about the project, please contact me at (505) 898-8848. We appreciate your cooperation.

Sincerely,


Ken Marron
Chief Environmentalist and Planner

Enclosure



7809 fourth street nw
albuquerque, new mexico 87107-6526
tel: (505) 898-8848
fax: (505) 897-7847
e-mail marroninc@aol.com

August 21, 2000

Ms. Sandra Maes
NMED Surface Water Quality Bureau
1190 St. Francis Drive
Santa Fe, NM 87503

Re: Fort Wingate Elementary Replacement School, Navajo Nation, Cibola County, New Mexico.

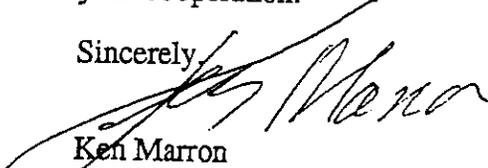
Dear Ms. Maes:

The Bureau of Indian Affairs (BIA) in cooperation with the Navajo Nation, is proposing an elementary school at Fort Wingate in Cibola County, New Mexico. The elementary school will be a replacement for the Fort Wingate BIA School that will be closed upon completion of the new school. Enclosed is a map indicating the location of the project.

Marron and Associates, Inc. is preparing the environmental documentation for this project, which is expected to comply with the National Environmental Policy Act, the BIA NEPA Handbook, and the Navajo Nation's regulations and other related regulations. The environmental level of effort expected is an environmental assessment (EA). We request your evaluation of the proposed project effects to determine the potential to affect resources or issues of concern to your agency. We also appreciate any pertinent information that you could share with us regarding the affected environment.

If you have any questions about the project, please contact me at (505) 898-8848. We appreciate your cooperation.

Sincerely,


Ken Marron
Chief Environmentalist and Planner

Enclosure

APPENDIX B

**MCKINLEY COUNTY FEDERAL AND NAVAJO
THREATENED, ENDANGERED, AND SENSITIVE SPECIES LIST**

McKinley County
Federal and Navajo Listed Species

Common Name	Scientific Name	STATUS	
		Federal	Navajo
Amphibians			
Western Chorus Frog	<i>Pseudacris triseriata</i>		Candidate
Northern Leopard Frog	<i>Rana pipiens</i>		Threatened
Birds			
Northern Goshawk	<i>Accipiter gentilis</i>		Candidate
Golden Eagle	<i>Aquila chrysaetos canadensis</i>		Threatened
Ferruginous Hawk	<i>Buteo regalis</i>		Threatened
Belted Kingfisher	<i>Ceryle alcyon</i>		Candidate
Mountain Plover	<i>Charadrius montanus</i>	Threatened	Candidate
Yellow-billed Cuckoo	<i>Coccyzus americanus occidentalis</i>		Candidate
Band-tailed Pigeon	<i>Columba fasciata fasciata</i>		Candidate
Yellow Warbler	<i>Dendroica petechia</i>		Candidate
Southwestern Flycatcher Willow	<i>Empidonax traillii extimus</i>	Endangered	Endangered
American Peregrine Falcon	<i>Falco peregrinus anatum</i>		Threatened
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Threatened	Threatened
Sora	<i>Porzana carolina</i>		Candidate
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Threatened	Threatened
Tree Swallow	<i>Tachycineta bicolor</i>		Candidate
Fish			
Zuni Bluehead Sucker	<i>Catostomus discobolus yarrowi</i>	Species of Concern	
Mammals			
Pronghorn	<i>Anilocapra americana americana</i>		Threatened
Navajo Mogollon Vole	<i>Microtus mogollonensis navaho</i>	Species of Concern	Candidate
Western Small-footed Myotis Bat	<i>Myotis ciliolabrum melanorhinus</i>	Species of Concern	
Long-eared Myotis Bat	<i>Myotis evotis evotis</i>	Species of Concern	
Occult Little Brown Myotis Bat	<i>Myotis lucifugus occultus</i>	Species of Concern	Candidate
Fringed Myotis Bat	<i>Myotis thysanodes thsanodes</i>	Species of Concern	
Long-legged Myotis Bat	<i>Myotis volans interior</i>	Species of Concern	
Reptiles			
Northern Sagebrush Lizard	<i>Sceloporus graciosus graciosus</i>	Species of Concern	
Plants			
Naturita Milkvetch	<i>Astragalus naturitensis</i>		Candidate
Acoma Fleabane	<i>Erigeron acomanus</i>	Species of Concern	Threatened
Zuni Fleabane	<i>Erigeron rhizomatus</i>	Threatened	Candidate
Sivinski's Fleabane	<i>Erigeron sivinskii</i>	Species of Concern	Candidate
Parish's Alkali Grass	<i>Puccinellia parishii</i>	Species of Concern	Endangered

APPENDIX C

SITE IDENTIFIED SPECIES

Fort Wingate Field Identified Species List

Scientific Name

Common Name

Plants

<i>Amaranthus hybridus</i>	Pigweed
<i>Artemisia frigida</i>	Fringed Sage
<i>Artemisia tridentata</i>	Big Sagebrush
<i>Atriplex canescens</i>	Fourwing Saltbush
<i>Bouteloua gracilis</i>	Blue Grama
<i>Carduus nutans</i>	Nodding Plumeless Thistle
<i>Chaetopappa ericoides</i>	Rose Heath
<i>Convolvulus arvensis</i>	Field Bindweed
<i>Eriogonum</i> sp.	Buckwheat
<i>Erodium cicutarium</i>	Redstem Stork's Bill
<i>Grindelia</i> sp.	Gumweed
<i>Gutierrezia microcephala</i>	Snakeweed
<i>Heliomeris multiflora</i>	Viguiera, Showy Golden-eye
<i>Kochia scoparia</i>	Summer Cypress
<i>Krascheninnikovia lanata</i>	Winterfat
<i>Lactuca serriola</i>	Wild Lettuce
<i>Linum lewisii</i>	Flax
<i>Lycium pallidum</i>	Pale Wolfberry
<i>Mirabilis multiflora</i>	Colorado Four O'clock
<i>Opuntia</i> sp.	Prickly-pear Cactus
<i>Oryzopsis hymenoides</i>	Indian Ricegrass
<i>Physalis</i> sp.	Groundcherry
<i>Pleuraphis jamesii</i>	Galleta
<i>Portulaca oleracea</i>	Purslane
<i>Sphaeralcea</i> sp.	Globe Mallow
<i>Verbesina enceloides</i>	Golden Crown beard
<i>Yucca baccata</i>	Banana Yucca

Animals

<i>Cnemidophorus velox</i>	Plateau Striped Whiptail	
<i>Lepus californicus</i>	Blacktail Jackrabbit	
<i>Odocoileus hemionus</i>	Mule Deer	tracks observed
<i>Peromyscus maniculatus</i>	Deer Mouse	burrows observed
<i>Sylvilagus auduboni</i>	Desert Cottontail	

Birds

<i>Aphelocoma californica</i>	Western Scrub Jay
<i>Baeolophus ridgwayi</i>	Juniper Titmouse
<i>Buteo jamaicensis</i>	Red-tailed Hawk
<i>Catharus guttatus</i>	Hermit Thrush
<i>Colaptes auratus</i>	Red-shafted Flicker
<i>Corvus corax</i>	Common Raven
<i>Gymnorhinus cyanocephalus</i>	Pinyon Jay

Hirundo rustica
Oporornis tolmiei
Pipilo chlorurus
Pipilo maculatus
Poecile gambeli
Psaltriparus minimus
Spizella passerina
Wilsonia pusilla

Barn Swallow
MacGillivray's Warbler
Green-tailed Towhee
Spotted Towhee
Mountain Chickadee
Bushtit
Chipping Sparrow
Wilson's Warbler