APPENDIX A: BASIS OF DESIGN NARRATIVE & SYSTEMS CHECKLIST

1. INTRODUCTION

The Basis of Design Narrative is a description of the Project and should be a bound presentation of facts sufficiently complete in accordance with the following format to expedite review of the Schematic and the Preliminary Design Submittals. The Schematic Basis of Design Narrative presents the basic information, criteria, logic, evaluations and considerations developed in each category to prepare the Schematic Submittal. The Preliminary Basis of Design Narrative expands upon the Schematic Submittal to reflect the further analyses, evaluations and selections/decisions made to arrive at the Preliminary Design level.

Design computations, sizing of members or conductors, details of connections, etc., are not required to be submitted with the Schematic Basis of Design, but general computations supporting system selection, member depths, floor to floor heights, mechanical and electrical loads should have been made.

2. SCHEMATIC BASIS OF DESIGN INFORMATION

The Schematic Submittal shall include a Basis of Design Narrative which as a minimum provides the following information in narrative or tabular format:

-Type of occupancy/VUSBC Use Group
-Estimated occupancy capacity and method or factor used for estimate
-Functions to be housed in the building
-Proposed building location on the site
-Exterior Circulation (i.e. how this Project may interface with other area facilities)
-Areas and capacity required for various activities proposed for building
-Type of Construction proposed: i.e. fire resistive, protected or unprotected noncombustible, etc. and VUSBC Type #
-Outline description of basic materials
-Future construction or expansion to be accommodated, if any
-Style and character of building desired

1. Structural Design Live Loads, Wind and Seismic Design Criteria
2. Types of structural framing evaluated and recommendation

-Description of the types of HVAC systems being evaluated, estimated heating and cooling loads, fuels evaluated and fuel selected to be used

3. Description of all energy conservation and peak energy reduction methods being evaluated
4. Description of types of electrical systems evaluated, voltages, possible transformer locations and need for generator

-Total square foot area per floor and per building
-Number of beds, seats or parking spaces, where applicable
-Total estimated construction cost based on the Schematic Design

5. Total proposed Project Budget
6. Geotechnical report criteria
7. Describe Site Work issues such as site survey, utilities, parking, roads, sidewalks and grading

3. PRELIMINARY BASIS OF DESIGN NARRATIVE INFORMATION

The following format is for a new building type construction Project but is applicable to renovation and addition Projects by addressing those portions relevant to that particular Project. When a Project consists primarily of mechanical, electrical, structural, or another discipline, the basis of design shall provide more detailed information for the major discipline. The narrative shall address or list the factors indicated for each section. Data may be presented in tabular form where appropriate.

Architectural:

(a) Describe functions to be housed in the building and the applicable VUSBC Use Group Classification(s). Include copy of the minimum space/area requirements and adjacency criteria used to develop the design.

(b) Provide analysis of VUSBC and referenced standards (and NFPA 101, Life Safety Code, if applicable) requirements of all occupancies involved. Determine occupancy classifications and compute occupant load, number of units of exit and other requirements. Describe unusual or critical Code requirements and indicate how such requirement will be met.

(c) State the VUSBC Type of Construction selected with reference to the degree of fire resistance. Describe construction systems/materials proposed to achieve the construction type/fire resistance rating.

(d) Computation of gross floor area in accordance with UVA Facility Design Guidelines and of Building Efficiency factor/ ratio. Gross floor areas should be indicated on the Drawings.

(e) Provide preliminary floor Plans, elevations, building cross section and other Drawings as required by Chapter 8 of **HECOM.** Floor Plans should indicate the location of all built-in equipment and fire walls.

(f) Statement as to the types of thermal insulation to be provided, where required, and the value of the "U" factors for the various portions of the structure, i.e., roof, walls, floors, etc. Also describe all architectural energy conserving features to be incorporated.

(g) Provide a narrative description of the preliminary color design concept addressing architectural finishes and colors. Describe materials for all major items of construction and all interior and exterior finishes. The description of finishes (colors, textures, and patterns) shall be accomplished by the use of a finish schedule. The finish schedule (on the included Drawings) shall identify spaces and interior building material finishes.

(h) Provide furniture and equipment footprint Drawings in preliminaries reflecting the University's updated equipment list which show the end result of the architect's space planning effort. The furniture footprint demonstrates the designer's plan for the various functions that are housed in the facility. The designer shall use standard furniture sizes to demonstrate adequacy of space and to communicate utility and service requirements to engineering disciplines. (Although required for space, utility and service requirement development, these Drawings are not included in the Final Construction Document package.)

(i) A description of items not considered to be a permanent part of the structure, such as work benches, shelving, bins and removable partitions. (Show also on furniture footprint Drawings.)

(j) Analyze the design for compliance with acoustical requirements. List areas of high noise and vibration and acoustic design principles applied. Is an acoustical Consultant or specialist required for the Project?

(k) Design features to make facilities accessible to and usable by the physically handicapped and conform to the requirements of the UVA Facility Design Guidelines. If not incorporated, appropriate reasons/justification shall be given.

(l) Equipment rooms of ample size shall be provided with consideration being given to adequate allowances for access, maintenance, repair and easy removal of units. Room dimensions shall not restrict equipment items to the products of any single manufacturer. The A/E should assure that equipment of more than one manufacturer can be accommodated in the space allocated. This policy will not be interpreted as sanctioning an increase in equipment space to accommodate some particular manufacturer's product when such would result in structural costs being greater than the probable resultant saving in equipment costs.

(m) Describe special construction features incorporated into the facility such as barred windows, special wall/roof construction, etc.

(n) The UVA AARB has been established to ensure architectural compatibility is maintained at each location. Presentation(s) of the design shall be presented to the UVA AARB for comment and recommendation for approval after submittal to the University Review Unit for review and comment at the Schematic and Preliminary Design Submittals.

Structural:

(a) Description of foundation conditions, type of foundation to be used, method by which the allowable bearing values are to be determined, and maximum allowable bearing capacity for the foundations. Geotechnical information including field boring notes and foundation design recommendations shall be submitted with the preliminaries.

(b) Statement of the type of construction adopted and reason therefore, with capacity, dimensions, or other size criteria. List of materials selected with design strengths and ASTM, AISC, ACI, etc. standards to be specified.

(c) Special features to be included in the structure which are not evident from the Drawings.

(d) Description of the structural floor and roof systems proposed, with length, spacing and size of principal members (for beam and girder, etc.).

(e) Description of the Lateral Force Resisting System proposed with appropriate materials and dimensions.

(f) Statement of live loading to be used, to include floor loads, wind, snow, earthquake, etc., with data to justify.

(g) Statement of any special considerations that affect the design, (e.g., special corrosion resistance requirements, detention facilities, cranes, etc.).

(h) The usual accepted means of structural system selection is economy. Demonstrate this with cost comparisons of various appropriate framing systems such as:

(1) "Typical bay" member sizing and cost comparisons of alternate structural systems;

(2) Horizontal force resisting system for wind and earthquake;

(3) Consideration of unusual geometry (long span, high bay, deep cuts, etc.); and

(4) Consideration of heavy equipment supports.

Plumbing:

(a) Describe system to be utilized on each part of the Project.

(b) Determination/calculation of number of each type of fixture based on VUSBC occupancy load. Indicate types and quality standards in narrative and on Preliminary Drawings.

(c) Estimated number of fixture units and water demand in gpm for all plumbing fixtures.

(d) Estimated maximum and minimum water pressure at each building and indicate if booster pumping will be required.

(e) Type, size and design temperature of domestic water heater and distribution system. Also, a statement as to whether heat recovery is contemplated for domestic water heating.

(f) Design temperature of domestic hot water distribution system and extent of recirculation system within building.

(g) Indicate materials to be used for each piping system.

(h) Address- any special needs such as sumps, interceptors, pumps, pipe guides, lift pumps for sewerage, etc., and indicate tentative sizes, capacities and quality standards to be specified.

Heating, Ventilating & Air Conditioning:

(a) Design Conditions

(1) Describe and list the indoor and outdoor design conditions to be used in the design of systems for this Project. Refer to criteria in UVA Facility Design Guidelines.

(2) Energy sources for heating and cooling systems shall be determined from an analysis of the efficiency of use and economy of those available for each Project. Parameters for analysis should be obtained from the Division of Engineering and Buildings. The analysis shall be presented for review with Preliminary Design Submittal and shall be summarized on an Energy Analysis Summary sheet.

(b) Heating

(1) Describe the source of heat energy which will be used, such as extension of central high pressure steam with meter, hot water with meter, or independent heating equipment with type of fuel to be utilized. Also explain why this source was selected in lieu of other available sources. Where there is a possibility of more than one type being economical a computerized analysis should be included to justify the selection.

(2) Briefly describe and show on the Drawings the type and routing of the system proposed to convey the heat source, if applicable; (for example, 100 psig low level, above ground steam and condensate lines on concrete support, interconnecting to the existing system at manhole #150 and traveling due north into the mechanical equipment room). State if condensate return system is to be utilized. If condensate is to be wasted, heat reclaim shall be studied. If wasted, it should be cooled to 140T maximum, then re-turned to the sanitary sewer system (unless specifically instructed otherwise). Indicate the maximum hourly production of condensate.

(3) Describe and provide schematics of the type of heating medium and system to be used within the buildings. Also include reasons for selection of this system over others available.

(4) Describe the HVAC Control System. A specific type of control system will be specified, i.e., pneumatic, electric or electronic.

(c) Ventilation

(1) Indicate the quantity of outside air per person in all areas, the type of filtration, and whether OSHA requirements are applicable.

(2) State if smoke removal/control systems are to be employed.

(3) Describe the operation of the system in summer and winter modes.

(4) Describe any methods to reduce or minimize outside airflow.

(d) Air Conditioning

(1) Provide a complete description and schematics of the air conditioning system proposed including an explanation of why this system is preferred over others. Also indicate locations of major components of the system. For larger systems which qualify under Energy Conservation, a computerized comparison between at least two systems is required.

(2) Define areas to be air conditioned.

(3) Identify special humidification or de-humidification requirements, as well as special filtration requirements.

(4) Describe any special architectural features being incorporated to reduce cooling loads. Also, any features being incorporated in the mechanical system which would reduce energy consumption should be separately discussed.

(e) Combination Systems

(1) For systems in which the heating, ventilating and air conditioning are combined, repetition may be eliminated by consolidating the aforementioned requested information. Describe changeover procedures and requirements.

(f) Energy Conservation

(1) Computer energy analysis (block load type) for buildings larger than 8,000 square feet requiring heating and cooling and larger than 20,000 square feet requiring heating only shall be used to study energy conservation features. Concurrence of systems to be studied should be obtained prior to conducting study. If a valid computer analysis was prepared during the Budget Study Preparation for the Project, this may suffice. When computer analyses are performed, the total annual energy consumption estimate should be clearly stated.

(2) Describe any methods to reduce energy usage and peak loads.

(g) Briefly describe the controls for each system and indicate intended sequence of operation.

(h) Briefly describe testing and balancing requirements to be required.

(i) Since the University has an Energy Management System, the Preliminary Design Submittal shall be prepared to conform to the requirements and procedures in the UVA Facility Design Guidelines.

Environmental Pollution Control:

Identify expected environmental pollution and the proposed method of control. A detailed description will be necessary for those facilities directly related to controlling air and water pollution such as sewage treatment

plants, industrial treatment facilities, incinerators, smoke elimination facilities, and other similar Projects. When subsurface tile filtration is being considered for sewage disposal, a soil percolation test will be required for each such disposal system. List all environmental control permits and notifications required.

Asbestos, Lead Based Paint & Hazardous Material:

The A/E shall include a statement in the Basis of Design addressing asbestos, lead based paint, and other hazardous material (including leakage from underground storage tanks) presence or potential presence on the Project. Indicate if Agency has secured an asbestos, lead based paint, or hazardous material investigation of the Project area for renovation Projects. Indicate how the presence of these materials will affect this Project, (i.e., removed by separate Project, removal included in this Project, left in place and encapsulated, etc.). If Work is by separate Contract, indicate if phasing of Work or a delay of this Project is anticipated.

Special Mechanical Systems:

Provide a description of any special mechanical systems such as compressed air, hydraulic, nitrogen, etc., including an explanation of the medium source.

Central Heating Plants & Heating Plant Additions:

(a) Prepare an energy analysis as required by the UVA Facility Design Guidelines and submit Energy Analysis Summary. Describe criteria and assumptions in narrative. Describe purpose and Justification of systems proposed.

(b) Describe environmental constraints such as applicable regulations, liquid wastes, gaseous emissions, treatments required, etc.

(c) Describe new boilers including rating, flow, temperature, pressure and type.

(d) Describe control systems.

(e) Describe any new auxiliaries to be added and what source of power will be used for their operation.

Refrigeration (Cold Storage):

(a) Identify areas to be refrigerated, indicating their usage and temperatures to be maintained.

(b) Describe type of refrigeration equipment and systems.

Thermal Storage:

(a) Describe the type (static or dynamic) of storage being considered.

(b) Provide preliminary cooling profile.

(c) Provide preliminary equipment and tank sizes.

(d) State how the A/E proposes to conform to University Procurement requirements when specifying thermal storage system and components.

Fire Protection Systems:

(a) Describe type(s) of automatic sprinkler and gaseous extinguishing systems to be utilized and note locations to be protected.

(b) Describe fire detection and alarm systems including location of detectors, manual stations, audible devices, control panels, etc.

(c) On the Drawings indicate location of water supply pipe location and main entrance to buildings. Also indicate location of gaseous extinguishing system equipment and supplies and location of fire department connection and post indicator valve.

(d) Provide the following information about sprinkler systems:

(1) Hazard classification of occupancy and applicable Code reference.

(2) Water supply available at point of connection (static pressure and residual pressure at design flow). This data must be based upon flow tests at or near the point of connection and must appear in the Basis of Design. Indicate on Drawings the location of flow test.

(3) Describe fire pump operating parameters.

(4) Approximate water demand for sprinkler system.

(5) Statement of adequacy/inadequacy of water supply and planned upgrades by local jurisdiction, if any.

Electrical:

(a) Provide the following about interior distribution systems:

(1) Electrical characteristics (phase, voltage, and number of conductors in main distribution circuits).

(2) Breakdown in tabular form of the *estimated* connected load to show:

a. Lighting load and convenience outlet load separately.

b. Power load for building equipment such as heating, air conditioning, etc.

c. Loads for special operating equipment such as compressors, generators, pumps, and for power receptacles being provided to energize special equipment. Apply an appropriate demand factor to each to compute total demand load.

(3) Type of wiring system, such as rigid conduit, electrical metallic tubing, non-metallic sheathed cable, etc., and where proposed to use. **(Present criteria prohibits embedding aluminum conduit in concrete. Present products should be reviewed to make sure that conduit, pipe, bars, anchors, or other aluminum parts are not embedded in concrete.)**

(4) Type of conductors, such as rubber insulated, thermoplastic insulated, polyvinyl chloride jacket, etc., and where proposed to use.

(5) A statement describing proposed pertinent standards of design, such as voltage drop (include calculations), lighting intensities (include calculations), and type of lighting fixtures, and a statement regarding the use of selective switching or other energy conserving features.

(6) A determination of short-circuit duty required for all service entrance protective devices and switchgear.

(7) Type and arrangement of Cable Television Systems (CATV), Closed Circuit Television Systems (CCTV), Nurse Call, intercom, sound, signal, and fire alarm systems. Identify number and location

of telecommunication outlets (telephone, computer, word processing, etc.). Obtain information from the University.

Space required for telecommunication equipment, point of connection to telephone utility, size of incoming duct/conduit and size of equipment mounting backboard to be provided.

Statement relative to interface provision for multi-use systems (i.e., intercom, telephone, etc.). A/E must provide all facility support for proposed telephone equipment installations, i.e., conduit, duct, and backboard. Design and procurement of telephone system to be accomplished by the University.

(8) Indicate interior lighting on lighting Plans.

(b) Outside distribution systems:

(1) Contact the UVA Facilities Energy & Utilities Department for location and characteristics of nearest service capable of meeting Project supply requirement.

(2) Statement relative to the adequacy of the primary supply at the point of take-off. If primary source is inadequate, state measures proposed to correct the deficiency.

(3) Electrical characteristics of power supply to site including circuit interrupting requirements and voltage regulation.

(4) Estimate of total connected load and resulting kilowatt demand load by applying proper demand and diversity factors and power factor, if a group of loads is involved.

(5) Basis for selection of primary and secondary distribution voltage.

(6) Type of conductors and where proposed to use.

(7) A statement describing pertinent standards for design, such as voltage drop, physical characteristic of overhead or underground circuits, type of lighting units and lighting intensities.

(8) Type and adequacy of signal and fire alarm systems, including a statement as to spare capacity on fire alarm circuit. **The importance of early resolution of the fire protection requirements cannot be overemphasized.**

(9) Type, adequacy and routing of supporting structure(s) for telecommunication cable.

Electronic Systems:

(a) System engineering concepts. Describe the proposed type of system, its functions and the interrelationships if the system is a multi-use system (i.e. security, etc.). (See items (m) and (n) below.)

(b) Indicate circuit requirements.

(c) Indicate equipment selection in such categories as: University furnished equipment; standards manufacturers or commercially available items; and special equipment.

(d) Describe site or location considerations.

(e) Describe bonding and grounding requirements.

(f) Describe communication and control cables and radio links.

(g) Identify test equipment, repair shop, and spare parts storage requirements.

(h) Describe equipment, instrumentation, arrangement, and space requirements indicating requirements for racks, consoles, and individual mountings. Provide the most economical design in first cost, operation and maintenance costs, and operating conditions conforming to best engineering concepts.

(i) Identify wiring and cabling requirements plus terminations.

(j) Identify power and lighting requirements, including emergency or standby requirements.

(k) Describe air conditioning, including humidity and dust control requirements.

(l) Identify interference and clearance requirements.

(m) State security requirements for Security/Entry Control System.

(1) Identify separately from the other Project elements the requirements for Intrusion Detection Systems (IDS). Any of the following items and their interconnecting circuits may be considered part of an IDS:

Annunciation Panels and Cabinets
Visual and Audible Annunciators
Magnetic Switches
Proximity Sensors
Volumetric Sensors
Wire Grids
Vibration Detectors
Power Supplies Integral to Items on this List
Closed Circuit Television Cameras and Monitors, and
Video Recorders used for Intrusion Detection Purposes
Access Control Systems

(2) IDS installation can be divided into three general functional categories:

(a) Sensitive compartmented information facilities.
(b) Conventional arms, ammunition, and explosives storage sites (AA & E).
(c) All other (including but not limited to communication facilities, special training facilities, special operational facilities, intelligence facilities, etc.).

Describe access control equipment (versus IDS) when required and outline locations, function, and area of control.

Energy Monitoring & Control System (ECMS):

(a) Indicate if any EMCS will be utilized.

(b) Indicate if the EMCS will be stand alone or tied into central system.

(c) Indicate if a sole source is required for tie in.

(d) Describe the EMCS proposed to be used.

Site & Landscaping:

(a) Describe site and facility location and give reasons for selection and orientation.

(b) List and describe utilities available at the site.

(c) Describe existing vegetation, bodies of water, topography, and soil conditions.

(d) Describe existing site improvements to remain, to be altered, and to be demolished.

(e) Describe existing pedestrian and vehicular access, roads, sidewalks, and parking to include accessibility for the disabled.

(f) Describe proposed site improvements.

(g) Describe proposed contours, bodies of water, and landscaping improvements.

Water Supply:

(a) Describe the existing system including, but not limited to, the type, capacity, condition, present water use, and unsatisfactory elements.

(b) State type of construction proposed, materials for water mains, type of well, etc.

(c) State design factors with present and projected design population loads for sewage treat-ment plants. Coordination with appropriate state/local regulatory agencies is required.

(d) State materials to be used for sewer systems and sewage treatment plants.

(e) Identify standards (federal, state, local) governing the design.

(f) Describe the impact of steam condensate and cooling water discharges on existing sewer lines and sewage treatment plants and the estimated cost of distribution and treatment of this additional loading.

Sewers and Sewage Disposal Systems:

(a) Describe the existing system indicating particularly the type, capacity, condition, present flow and unsatisfactory elements.

(b) State degree of treatment necessary by effluent requirements and units needed to treat.

(c) State design factors with present and projected design population loads for sewage treatment plants. Coordination with appropriate state/local regulatory agencies is required.

(d) State materials to be used for sewer systems and sewage treatment plants.

(e) Identify standards (federal, state, local) governing the design.

(f) Describe the impact of steam condensate and cooling water discharges on existing sewer lines and sewage treatment plants and the estimated cost of distribution and treatment of this additional loading.

Roads, Driveways, Parking Areas, & Walks:

(a) State general soil conditions, with a brief outline of soil exploration and testing performed. Indicate CBR value and pavement recommendations. (Show typical paving section on the Drawings.)

(b) Describe the type and volume of traffic, controlling wheel loads and types or classes of roads under consideration. Justify any deviation from criteria thickness for these classes.

Dust & Erosion Control:

Dust and erosion control will be considered an integral part of all design and construction Projects. Such controls will be generally limited to areas actually scarred or denuded in the process of constructing a Project. Dust and erosion control will not be confused with landscaping. Preliminary Design Submittal will contain the necessary design data, and costs for dust and erosion control measures where applicable. The Basis of Design will include a narrative regarding the type of treatment selected, affected areas, and reasons for selection of type and determination of areas.

Fencing:

State type, heights, and justification for fencing.

Stormwater Management:

Describe the measures to be taken and features/structures required to comply with Stormwater Management Regulations.

BUILDING SYSTEMS & EQUIPMENT CHECKLIST

Indicate systems and equipment to be included in Project. Provide equipment data and area in spaces provided. When two or more subsystems are used, show a portion of each by percentage of gross to nearest ten percent (10%).

STRUCTURAL

Foundation System

Ground Floor Area (SF) _____

Type	Footing Bottom from Existing Grade	Compacted Fill
_____ Spread Footings	_____ 2'	_____ Borrow fill 1'
_____ Thickened Slab @ Edge	_____ 3'	_____ Borrow fill 2'
_____ Pile Foundation	_____ 4'	_____ Borrow fill 3'
_____ Caissons	_____ 5'	_____ Borrow fill 4'
_____ Continuous wall footing	_____ _____	_____ Borrow fill 5'
_____ Grade Beams		_____ Over 5'
_____ Special (See Site Work Section)		

Slab on Grade

Slab on Grade Area (SF) _____

Type	Slab Thickness	Floor Live Load
_____ Floating	_____ 4"	_____ Under 100 PSF
_____ Grade Beam Supported	_____ 5"	_____ 101-200 PSF
_____ Pile Supported	_____ 6"	_____ 201-300 PSF
_____ Reinforced	_____ 8"	_____ 301-400 PSF
	_____ Over 8"	_____ Over 400 PSF

Structural Design Criteria

Seismic
_____ Performance Category
_____ Exposure Group
_____ Site/Soil Coeff

Roof Live/Snow Load
_____ Roof LL 20 PSF
_____ Roof LL 30 PSF
_____ Roof LL 40 PSF
_____ Roof LL 50 PSF

Wind Loading
_____ Wind 80 mph
_____ Wind 92 mph
_____ Wind 103 mph
_____ Wind 115 mph

Structural Frame Type

Gross Bldg. Area (SF) _____

_____ Bearing Wall
_____ Steel Frame
_____ Concrete, Cast in Place
_____ Wood
_____ Concrete, Precast

Supported Floor

Supported Floor (SF) _____

Type System
_____ Concrete, Cast in Place
_____ Concrete on Steel Joists
_____ Concrete on Steel Frame
_____ Concrete, Precast
_____ Wood

Floor Design Live Load
_____ Under 40 PSF
_____ 40-60 PSF
_____ 61-80 PSF
_____ 81-100 PSF
_____ 101-150 PSF
_____ 151-200 PSF
_____ Over 200 PSF

Span
_____ Under 26'
_____ 26'-35'
_____ 36'-45'
_____ 46'-55'
_____ 56'-65'
_____ Over 65'

Roof Structure

Area of Roof (SF) _____

Framing
_____ Concrete, Cast In Place
_____ Precast Hollow Core
_____ Concrete, Precast
_____ Wood
_____ Steel Joist
_____ Steel Framing

Decking
_____ Steel
_____ Concrete Slab
_____ Wood
_____ Gypsum
_____ Other (List)

Span
_____ Under 26'
_____ 26'-35'
_____ 36'-45'
_____ 46'-55'
_____ 56'-65'
_____ Over 65'

Pre-engineered Building

Area (SF) _____

Type
_____ Rigid Frame
_____ Post & Beam
_____ _____

Eave Height
_____ Eave height under 12'
_____ Eave height 12'-20'
_____ Eave height over 20'

Roof Slope
_____ 1 in 12
_____ 2 in 12
_____ 3 in 12
_____ >3 in 12

Exterior Wall
_____ Prefinished Metal
_____ Masonry
_____ Insulation 'U'

Roof Material
_____ Standing Prefinished Metal
_____ Standing Seam Metal
_____ Insulation 'U'

ARCHITECTURAL SYSTEMS

Roofing Area of Roof (SF) _____

Type Material	Insulation	Wind Uplift	Fire Resistance
_____ Built-up	_____ U = 0.03	_____ FM 1-30	_____ Class A
_____ Shingles	_____ U = 0.04	_____ FM 1-60	_____ Class B
_____ Sprayed	_____ U = 0.05	_____ FM 1-90	_____ Class C
_____ Metal Roofing	_____ U = 0.___		
_____ EPDM			
_____ CSPE			
_____ Other_____			

Stairs Number of Risers (EA) _____

_____ Exposed	_____ Concrete	_____ Closed Riser
_____ Enclosed	_____ Steel	_____ Open Riser
_____ Exterior	_____ Steel Pan	_____ Ships Ladder
_____ Interior	_____ Checkered Plate	_____ Attic Access
_____ None	_____ Grate	
_____ Area of Rescue Assistance		

Exterior Wall System Exterior Wall Area (SF) _____ U Value_____

Exterior Surface	Backup	Story Height
_____Brick	_____CMU	_____Under 12'
_____CMU	_____Wood Studs	_____12'- 20'
_____Synthetic (EIFS)	_____Steel Studs	_____over 20'
_____Metal Panels	_____Concrete, C-I-P	
_____Stucco	_____Concrete, Precast	
_____Wood	_____Furring	Insulation
_____Concrete, Cast in Place	_____Other	_____Batt R= _____
_____Concrete, Precast		_____Rigid R=_____
_____Stone (Granite, Marble, etc)		_____Other _____
_____Vinyl Siding		
_____Other		

Interior Wall System (excludes finishes) Interior Wall Area (SF) _____

Type	Height
_____ Concrete Masonry Unit	_____ 8'
_____ Steel Studs	_____ 9'
_____ Wood Studs	_____ 10'
_____ Concrete, Cast in Place	_____ Over 10' (Height = _____ ft)

Interior Finishes
(Show nominal percentage of each)

Gross Bldg. Area (SF) _____

Walls
_____ Gypsum Board, Painted
_____ CMU
_____ Ceramic Tile
_____ Wood Panels
_____ Plaster
_____ Vinyl Wall Covering
_____ Other
_____ Other

Floors
_____ VCT
_____ Sheet Vinyl
_____ Ceramic Tile
_____ Quarry Tile
_____ Exposed Concrete
_____ Terrazzo
_____ Carpet
_____ Hardwood
_____ Special Toppings

Ceiling
_____ Acoustical
_____ Gypsum Board
_____ Plaster
_____ Concrete
_____ Spray on
_____ Metal Panel
_____ Exposed Struc.
_____ Other_____
_____ Other_____

Doors and Hardware

Surface Area one Side (SF) _____

Door Types
_____ Hollow Metal Exterior, Size
_____ Aluminum Store Front (glass), Size
_____ Wood Exterior, Size
_____ Folding, Size
_____ Overhead, Size
_____ Vault, Size
_____ Metal Security Door
_____ Wood Interior
_____ Hollow Metal Interior

Frame Types
_____ Hollow Metal
_____ Steel Frame
_____ Aluminum
_____ Painted Wood
_____ Stainless Steel
_____ Other_____

Windows

Surface Area one Side (SF) _____

Type
_____ Fixed
_____ Double Hung
_____ Projected
_____ Casement
_____ Sliding
_____ Storm
_____ Awning
_____ Jalousie
_____ Other_____

Glazing
_____ Single
_____ Double
_____ Thermal
_____ Safety
_____ Wire glass
_____ Bullet Proof
_____ Re-glazing
_____ Other_____

Frame
_____ Aluminum
_____ Painted Wood
_____ Vinyl Clad Wood
_____ Aluminum Clad
_____ Painted Steel
_____ Other_____
_____ Other_____

Specialties

Gross Bldg Area (SF) _____

_____ Jail Doors/Locks
_____ Clean Room
_____ Case Work
_____ Dark Rooms
_____ Loading Dock Equip
_____ Toilet Accessories
_____ Toilet Partitions
_____ Wire Partitions
_____ Metal Walkways
_____ X-ray Shielding

_____ Projection Screen
_____ Marker & Tack Boards
_____ Sign and Plaques
_____ Flagpoles
_____ Access Flooring
_____ Telephone Enclosures
_____ Ladders
_____ Others
_____

_____ Wardrobes (Dormitory)
_____ Chest of Drawers (Dormitory)
_____ Storage Shelving
_____ Fireplaces
_____ Movable Partitions
_____ Postal Specialties
_____ Exterior Sun
_____ Control Devices
_____

MECHANICAL SYSTEMS & EQUIPMENT

Plumbing Number of Fixtures (EA) _____

Plumbing Fixtures
_____ Flush Tank WC Floor Mtd.
_____ Flush Tank WC Wall Mtd.
_____ Flush Valve WC Floor Mtd.
_____ Flush Valve WC Wall Mtd.
_____ Water Heater Electric
_____ Water Heater Steam
_____ Instantaneous W.H., Electric
_____ Instantaneous W.H., Steam
_____ Water Heater Gas

_____ Tub
_____ Shower Fiberglass
_____ Shower/Receptor
_____ Shower Multi-head
_____ Emergency Shower
_____ Emergency Eyewash
_____ Eyewash

Piping
_____ Copper Pipe
_____ PVC Pipe
_____ Acid Resistant Pipe
_____ Cast Iron Piping
_____ Valves, Fittings
_____ Fixture Rough-ins
_____ Pressure Reducer
_____ Arrestors

Roof Drainage
_____ Gutter & Downspouts
_____ Scupper & Downspouts
_____ Roof Drains & Interior Piping

Building HVAC Systems

Heating Load - _____MBH
Building Heating Systems
_____ Boiler
_____ Heat Exchanger
_____ Other_____

Distribution Medium
_____ Steam
_____ Hot Water
_____ Hot Air

Cooling Load -_____Tons
Building Cooling Systems
_____ Heat Pump, Water Cooled
_____ Heat Pump, Air Cooled
_____ Chiller
_____ Direct Expansion
_____ Reciprocating
_____ Rotary Screw
_____ Centrifugal
_____ Steam Absorption
_____ Cooling Tower
_____ Thermal Storage

Fuel

_____ Gas
_____ Oil
_____ Coal
_____ Electric
_____ Geothermal

_____ Roof Top Units
_____ Single Zone
_____ Multi Zone
_____ Ventilation
_____ Dual Temperature Water
_____ Air Cooled Condensing Unit
_____ Computer Room Glycol
_____ Computer Room DX

Heating Equipment

_____ Unit Heaters
_____ Fin Tube Radiation
_____ Individual Units
_____ Cabinet Unit Heaters
_____ Computer Room CW

_____ H&V Units HW, Oil
_____ Duct Mtd. Coils
_____ Heat Reclaim
_____ Other_____

Air Distribution

_____ Ducted Supply
_____ Ducted Return
_____ Dual Duct
_____ H&V Unit
_____ Air Handling Unit

_____ Fan Coil Units
_____ VAV Fan Powered
_____ VAV Terminal Only
_____ VAV Reheat

Mechanical Ventilation

Fan Capacity (CFM) _____

_____ Power Roof Exhaust Fans
_____ In Line Exhaust Fans
_____ In Line Supply Fans
_____ Power Roof Supply Fans

_____ Fume Exhaust Hoods
_____ Kitchen Exhaust Hoods
_____ Kitchen Supply & Exhaust Hoods
_____ Wall Exhaust & Fans

Dehumidification

_____ Desiccant
_____ Refrigeration

_____ Regenerative
_____ Non-regenerative

CENTRAL PLANT SYSTEMS

Heating Capacity - _____ MBH

Central Heating Plant Equipment
_____ Chiller
_____ Boiler
_____ Geothermal
_____ Purchased (Outside source)

Distribution Medium
_____ Steam
_____ Hot Water
_____ High Temperature Hot Water

Cooling Capacity - _____ Tons

Central Cooling System

_____ Direct Expansion
_____ Reciprocating
_____ Rotary Screw
_____ Centrifugal
_____ Steam Absorption
_____ Cooling Tower
_____ Air Cooled Condenser
_____ Air Cooled Condensing Unit
_____ Thermal Storage

Fuel

_____ Gas
_____ Oil
_____ Coal
_____ Electric
_____ Geothermal

Fire Protection Gross Area Sprinkled (SF) _____

Sprinkler Type

_____ Dry
_____ Wet
_____ Pre-action
_____ Deluge
_____ Foam Water Deluge
_____ Other_____

Classification

_____ Light Hazard
_____ Ordinary Hazard
_____ Extra Hazard
_____ Limited Area
_____ Includes Booster Pump

Carbon Dioxide Storage Capacity (LBS) _____

_____ Hose Reel
_____ Flooding, Area
_____ Flooding, Total

Fire Alarm Gross Building Area (SF) _____

_____ Manual
_____ Automatic Detectors
_____ Mechanical & Electrical
_____ Extend Existing (Mfr._____)

ELECTRICAL SYSTEMS

Power Connected Load (KW) _____

_____ 120/208
_____ 277/480/120/208
_____ 277/480
_____ 120/240
_____ Alteration to Existing
_____ Explosion Proof

Voltage Panel boards

____A ____V
____A ____V
____A ____V
____A ____V
____A ____V
____A ____V
____A ____V

Transformers

voltage _____ V
Rating _____ KVA

Lighting Gross Building Area (SF) _____

_____ Incandescent
_____ Fluorescent
_____ High Ind. Discharge w/Battery Operated Emergency
_____ High Ind. Discharge (HID) High Bay
_____ High Ind. Discharge (HID) Low Bay
_____ Explosion Proof
_____ Special System

Special Electrical Systems Gross Building Area (SF) _____

_____ Uninterruptable Power Supply (UPS)
_____ Static/ Battery
_____ Motor Generator Set

Electrical Generators Equipment Capacity (KW) _____

_____ Intermittent
_____ Continuous
_____ Cogeneration
_____ Fire Pumps
_____ Gas
_____ Diesel
_____ Turbine
_____ Integral Radiators
_____ Remote Radiators

_____ 120/240V, I PH, 60HZ
_____ 120/208V, 3PH, 60HZ
_____ 277/240V, 3PH, 60HZ
_____ 347/600V, 3PH, 60HZ
_____ 416OV/240OV, 3PM, 60HZ
_____ 11.5/6.5KV, 3PH, 60HZ

_____ 600 RPM
_____ 720 RPM
_____ 900 RPM
_____ 1200 RPM
_____ 1800 RPM

Special Electrical Protection Gross Building Area (SF) _____

_____ Lighting Protection
_____ Lighting Grounding
_____ Electronic Grounding
_____ Distribution Grounding
_____ Other_____

Energy Monitoring & Control System(ECMS)

_____ Local Control
_____ Remote Control

_____ Building Only
_____ Tie to Central System

Security Detection

_____ Intrusion Alarm for Access Control
_____ Access Control
_____ TV Camera & Monitor
_____ Conduit
_____ Conduit & Wire

Communications Systems

Telephone
_____ Agency Owned System
_____ Conduit Only
_____ Conduit & Wire

Public Announcement
_____ Agency Owned System
_____ Conduit Only
_____ Conduit & Wire

Television
_____ Agency Owned System

Intercom
_____ Theater Sound
_____ Two-way Communication Listening
_____ Special System (Describe)
_____ Includes PA Systems
_____ Conduit
_____ Conduit & Wire
_____ Leased System
_____ Agency Owned System

Fire Alarm
_____ Local

_____ Leased Cable System
_____ Conduit Only
_____ Conduit & Wire

_____ To Fire Station
_____ Conduit Only
_____ Conduit & Wire

Special Systems and Equipment

Gross Building Area (SF)_____

_____ Vacuum, Medical
_____ Oxygen
_____ Low Pressure below 150 psi
_____ High Pressure above 150 psi

_____ Vacuum, Industrial
_____ Nitrogen
_____ Compressed Air

Interior Steam System

_____ High Pressure
_____ Medium Pressure
_____ Low Pressure
_____ Chemical Treatments
_____ Feed Water Equipment
_____ With Condensate Return
_____ Without Condensate Return

_____ Gas Fired Boiler
_____ Oil Fired Boiler
_____ Electric Fired Boiler
_____ Prefabricated Stack
_____ Fire Tube
_____ Water Tube
_____ Controls
_____ Fuel Oil Storage

Other

_____ Dust Collection
_____ Engine Exhaust, overhead
_____ Engine Exhaust, under floor
_____ Engine Exhaust, through door

CONVEYING EQUIPMENT

Bridge Cranes

_____ Span under 50'
_____ Span 51'-75'
_____ Span over 75'

_____ Capacity under 10T
_____ Capacity 10-20T
_____ Capacity 21-40T
_____ Capacity over 40T

_____ Run under 50'
_____ Run 50-100'
_____ Run over 100'

Monorails

_____ Manual
_____ Electric
_____ Air Operated

_____ Capacity under 5T
_____ Capacity 5 - 10T
_____ Capacity over 10T

_____ Run under 50'
_____ Run 50 to 100'
_____ Run over 100'

Fixed Hoist

_____ Manual
_____ Electric
_____ Air Operated

Vehicle Lifts

_____ Capacity under 5T
_____ Capacity 5-10T
_____ Capacity over 10T

Elevators

Number of Stops (EA) _____

_____ Electric
_____ Hydraulic
_____ Escalators
_____ Conveyors
_____ Dumbwaiters

_____ Passenger
_____ Freight
_____ Chair Lift (H/C)
_____ Wheelchair Lift

BUILT-IN EQUIPMENT

Gross Building Area (SF) _____

_____ Hospital Equipment
_____ Dental Equipment
_____ Food Service Equipment
_____ Chapel Equipment
_____ Movie neater Equipment
_____ Rifle Range Equipment
_____ Laboratory Equipment
_____ Waste Disposal Equipment
_____ Paint Spray Booth
_____ Special Warehouse Equipment
_____ Snow Melting Equipment
_____ Exercise/ Fitness Equipment
_____ Athletic/ Sports Equipment
_____ Maintenance Shop Equipment
_____ Vault
_____ Parking Lot Control
_____ Turnstiles/ Personnel Access

Other Built-in Equipment (list):

_____ _____
_____ _____
_____ _____
_____ _____
_____ _____
_____ _____

DEMOLITION INTERIOR

Gross Building Area (SF) _____

Interior Demolition

_____ Complete Interior of Building
_____ Complete Interior Partition
_____ Complete Interior Finishes
_____ Complete Interior Mechanical
_____ Complete Interior Electrical
_____ Other_____

Asbestos Removal

Total Cost (Lump Sum) _____

_____ Asbestos Removal Roofing Felts, Insulation
_____ Asbestos Removal – Piping, Equip
_____ Asbestos Removal – Ceilings
_____ Asbestos Removal – Fireproofing
_____ Asbestos Removal – Floors

Lead Based Paint Removal

Total Cost (Lump Sum) _____

_____ Bulk Removal (Material with lead-based paint still on it)
_____ Surface Removal/ Abatement

SITEWORK SITE UTILITIES & IMPROVEMENT DESCRIPTIONS

Exterior Electrical Length of Run (LF) _____

_____ Electrical Distribution, Primary_____KV
_____ Agency Owned
_____ Utility Co_____
_____ Electrical Distribution, Secondary _____V_____PH
_____ Substation/ Transformer _____KVA rating

Exterior Communication Length of Run (LF) _____

_____ Fire Alarm Distribution
_____ Security Alarm Distribution
_____ Communication, Telephone Distribution
_____ Exterior EMCS Distribution
_____ Other_____

Area Lighting Number of Fixtures (EA) _____

Poles with Lights: _____
Foot Candles Req'd._____
Pole Type _____ Type Fixture_____Mounting Height_____

Building Mounted: _____
Foot Candles Required_____
Type Fixture _____ Mounting Height _____

Lighting Protection

_____ Building
_____ Electrical Systems

EXTERIOR MECHANICAL DISTRIBUTION Length of Run (LF) _____

_____ Heat Distribution, Overhead
_____ Heat Distribution, Underground Encased
_____ Heat Distribution, Underground Trenches
_____ Chilled Water Distribution
_____ Condensate Collection
_____ Gas Distribution
_____ Compressed Air Distribution

EXTERIOR WATER DISTRIBUTION Length of Run (LF) _____

_____ Water Distribution Piping
_____ Fire Protection Water Distribution
_____ Fire Hydrants
_____ Water Pumping Station
_____ Fire Booster Pump

EXTERIOR SANITARY SEWER COLLECTION Length of Run (LF) _____

_____ Sanitary Sewer Piping
_____ Manholes
_____ Sewage Pump Station
_____ Sewage Lift Station
_____ Domestic Sewage Treatment

EXTERIOR STORMWATER SYSTEM Length of Run (LF) _____

_____ Storm Drainage Piping
_____ Box and Arch Culvert
_____ Drainage Facing Materials
_____ Retention Pond, Wet
_____ Detention Pond, Dry
_____ Underground Structure Detention
_____ Median Detention

EARTHWORK Volume, Curb Fill (Cu. Yd) _____

_____ Site Clearing
_____ Site Grading & Excavation
_____ Site Irrigation
_____ Site Dewatering (major)
_____ Replacement of Unsuitable Materials & Compaction
_____ Erosion Control
_____ Environmental Protection

LANDSCAPING Area Planted (SY) _____

_____ In Construction Contract _____ By Owner or Separate Contract
_____ Fine Grading
_____ Fertilizing
_____ Topsoil
_____ Seeding
_____ Sodding
_____ Trees, Shrubs, Other
_____ Plantings

SITE IMPROVEMENTS

Area Developed (SY) _____

_____ Retaining Walls
_____ Signs
_____ Site Furnishings
_____ Flagpole & Misc.
_____ Concrete Walks
_____ Gravel Paths
_____ Wells (Water)
_____ Pedestrian Bridge - Open
_____ Pedestrian Bridge - Enclosed
_____ Pedestrian Tunnel
_____ Steps/ Ramps
_____ Bituminous Walks
_____ Special Walks
_____ Other_____

ROADS – PAVED

Paved Area (SY) _____

_____ Concrete Roads
_____ Overlay Roads
_____ Slurry Seal Road
_____ Flexible (Bituminous) Roads
_____ Surface Treatment Roads
_____ Other_____

PARKING

Paved Area (SY) _____

_____ Concrete Parking
_____ Overlay - Parking
_____ Slurry Seal Parking
_____ Bituminous Parking
_____ Surface Treatment - Parking
_____ Graveled Parking Lot

FENCING

Length of Fencing (LF) _____

_____ Selected Areas
_____ Pedestrian Gates
_____ Alarms
_____ Entire Perimeter
_____ Vehicular Gates
_____ Other_____

POLLUTION ABATEMENT STRUCTURES

Water Treatment
Industrial Waste Treatment
Electrostatic Precipitator
Fields
Single Stage_____ Two Stage_____
Domestic Sewage Treatment
Oil Water Separators
Other: _____

RECREATION EQUIPMENT/ FIELDS

Lump Sum (EA) _____

_____ Playground Equipment
_____ Tennis/Basketball Courts
_____ Football/Soccer/Lacrosse Fields
_____ Other_____
_____ Grandstands, Bleachers
_____ Softball/Baseball Fields
_____ Concession/Restroom Bldg.
_____ Other_____

SUPPORTING STRUCTURES

Lump Sum (EA) _____

(Separate from building above)

_____ Central Heating Plant
_____ Central Cooling Plant

_____ Mechanical Equipment Building
_____ Vehicle Wash Platform
_____ Other_____

_____ Electrical Equipment Building
_____ Guard House/ Security Gate
_____ Other_____

SPECIAL BUILDING FOUNDATIONS Length (LF)

Piling

Type	Length of Piling	Capacity (design)
_____ Timber	_____ Under 25'	_____ 15 tons
_____ Concrete, Precast	_____ 26'-35'	_____ 20 tons
_____ Concrete, Pressure Inject	_____ 36'-45'	_____ 25 tons
_____ Steel H Piles	_____ 46'-55'	_____ 30 tons
_____ Steel Sheet Piling	_____ 56'-65'	_____ 35 tons
_____ Other_____	_____ 66'-95'	_____ 40 tons
	_____ Over 95'	_____ _____tons

Caissons (Drilled & Cast-in-Place)

_____ 24" Diameter
_____ 36" Diameter
_____ 48" Diameter
_____ 60" Diameter

_____ Plain Bottom
_____ Belled Bottom

_____ FT Nominal Depth

Underpinning of Existing Structures Lump Sum Amount (LS) _____

SITE DEMOLITION Lump Sum (LS) _____

_____ Remove Utilities
_____ Remove Paving and Slabs
_____ Remove Structures
_____ Remove/ Dispose of Asbestos (Exterior)
_____ Remove/ Dispose of P.C.B.s
_____ Remove/ Dispose of Contaminated Earth