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ITEM #	ITEM	DESIGNER	REVIEWER
	SECTION 1 - SITING A - GENERAL CHECK:		
1.	Siting furnished by using agency for compliance with Master Plan.		
2.	Layout for compliance with: a. Unified Facility Criteria, and Air Force and Army Manuals and Regulations.		
	b. Separation distances between buildings; for Fire Protection & Force Protection.		
	c. Quantity-distances in case of storage of mass-detonating military explosives. - Note: That even if your project has no explosives the Base's Explosive Safety Site Plan needs to be verified to ensure the project is not encroaching an explosive safety arc. d. Airfield clearances.		
	e. Fuel storage criteria.		
3.	Location of facility for interferences with existing facilities.		
4.	Square footage authorized by directive against definitive, standard, or repetitive drawing quoted in directive or sketch floor plan furnished by Using Service.		
5.	Whether real estate is required.		
6.	Whether access easement rights are required.		
7.	That adequate cross referencing has been shown on the Plans.		
8.	To see that Plans have been checked against criteria, criteria revisions, and design review comments to ensure the latest approved data have been used in design.		

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	B - DETAIL SITE PLAN - CHECK:		
1.	Detail site plan for conformity with siting furnished by Using Agency.		
2.	That a sufficient number of dimensions and grades have been shown for complete layout and grading for control points, layout dimensions, finish floor elevations, finish grade, bench marks, and grid lines for horizontal control.		
3.	That all existing utilities (water, sewer, electric, communications) are shown.		
4.	For north arrows (and indications of the directions to Mecca, where applicable) on site plans, for proper orientation.		
5.	Limits of clearing, grading, grassing, and landscaping.		
6.	That necessary sidewalks and service drives are shown.		
7.	That details are shown and figures added (when applicable to the project) for curbs and gutters, inlets, manholes, headwalls, painting lines, and other miscellaneous paving and drainage structures.		
8.	The site plan with exterior electrical and mechanical drawings for location of transformer enclosures, cooling towers, underground storage tanks, etc. These facilities should be shown on the site plan.		
9.	The legend to assure that symbols for all new and existing facilities are included.		
10.	That location of subsurface explorations(boring logs, test pits, field tests, etc.) are shown and logs of borings and test pits are provided.		
11.	That the type of ground cover is indicated.		
12.	That a clear distinction is made between original ground and new contours, which will result from the construction.		
13.	That outlines of new structures and utilities are heavier than for those of existing, so that the new work is highlighted and easily distinguished.		

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14.	That all existing structures requiring removal are clearly identified. Their dimensions and type of construction should be stated. Existing structures include poles and other obstructions, which may interfere with new driveways and parking areas.		
15.	That oil tank fill lines are not beyond reach of the truck for delivery of the fuel.		
16.	The direction of prevailing winds and any unusual climatic conditions to be expected, such as floods or sandstorms. Orient and elevate structures as required, to minimize blocking of doors or infiltration into entrances and openings of structures.		
17.	That dikes are provided around above-ground fuel tanks and that enclosure can be drained at low point.		
18.	That overall grading is done in the most economical manner unless design is controlled by other factors such as landscaping or drainage.		
19.	That appropriate turn-around is provided in service access pavement.		
20.	That significant existing vegetation is shown. Ensure that trees to be removed are identified.		
21.	That adequate topographic mapping has been obtained for the complete design, including existing utility line invert elevations, dimensions, etc.		
22.	That in areas where swelling clay exists, measures have been taken to drain water away from foundations and slabs-on-grade.		
23.	That provisions for new fencing and/or modification to existing fences have been covered in the design. Ensure that the height and type of existing and new fences have been indicated and that appropriate fencing details have been included.		
24.	That slopes of paved surfaces and earth areas are within the criteria of minimum and maximum grades. Ensure that finish contours are properly drawn to indicate slopes of finish grades.		
25.	That typical sections through the site have been adequately detailed.		

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26.	That provisions have been made for some type of barrier around the communities and structures to deflect sand driven by winds. Stabilized berms, walls, trees, and bushes, or a combination of these may be used. Check the possibility of taking advantage of natural barriers such as jebels.		
27.	That screen walls have been provided for all facilities housing females, when privacy is required by local customs.		
28.	Potential for problems on galvanized chain-link fences in the areas of corrosive atmosphere in which the projects are located. Consider the use of PVC-covered or aluminum chain-link fence in those areas.		
29.	Does the DA include a detailed synopsis of the scope of work authorized Under the 1391?		
30.	Are there calculations and discussion for each distinct facility or item of infrastructure to document how scope of the design was calculated with references to the applicable regulations that prescribe how scope is calculated and measured?		
31.	Are there documentation demonstrating how the designed facility or item of infrastructure satisfies the authorized function and is within the authorized scope of work using the units of measure of the DD Form 1391?		
32.	Does the DA verify that no towers or other structures that violate the airspace criteria of the UFC 3-260-01 or ICAO requirements.		

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	SECTION 2 - PAVING AND STORM DRAINAGE A-GENERAL - Check:		
1.	Drawings to see that the legend covers every symbol used.		
2.	The legend to see that existing and new construction are clearly indicated.		
3.	That there is no conflict between plans and specifications.		
4.	That pavement and storm drainage design analyses are complete and correct.		
5.	That proper layout measurements, horizontal control points, and benchmarks are shown.		
6.	That location of borrow pit is shown when possible; otherwise, state in the specification that the borrow pit will be located by the Contractor at his own expense.		
7.	That specifications cover local conditions and are compatible with plans.		
	B-PAVEMENTS - CHECK:		
1.	Selection of road class for compliance with UFC 3-250-18FA. Basis for selection must include consideration of type and frequency of vehicles using the facility.		
2.	Widths of single-lane short access roads; within built-up areas width shall be 3.66m (12 ft.) in all cases. In error, this type road is often designed 3.05m (10 ft.) wide.		
3.	The transverse slope of single lane roads, which should be in one direction only. This simplifies construction. This type road is often designed with a crown resulting in more difficulty during construction. Short drives may have suitable longitudinal slope and slope and zero transverse slope.		
4.	Earth slopes front and back. These must be determined considering drainage, maintenance, and stability. Side slopes should not be steeper than those indicated in TM 5-820-4. The stability of earth slopes must be determined based upon soils investigation data, including degree of compaction, cohesive strength, angle of friction, and height of embankment.		

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5.	To see that standardization parking space criteria have been used for parking lots and parking garages. See TM 5-803-5 chapter 5 for all parking dimensional criteria.		
6.	The type of pavement designed around workshops, POL storage areas. Portland cement concrete pavements should be provided in lieu of asphalt paving where kerosene, gasoline or oil spillage may occur to minimize surface deterioration. An acid-resistant coating should be applied to Portland cement concrete pavements in Battery rooms or other areas subject to sulfuric acid spillage.		
7.	That areas to be paved are clearly distinguished by symbol from existing pavement.		
8.	That finish contours and spot grades are shown on paved and turfed areas, and graded areas to clearly show the finish grade design. Finish contours should be straight lines, seldom curved. All finish grade contours must be tied into existing grade contours. Often finish grade contours are not terminated.		
9.	Concrete and flexible pavement to ensure provision for proper type and thickness of prime coat, tack coat, base course type and thickness, sub base (if required), and shoulder and pavement slopes. Minimum compaction requirements should also be shown.		
10.	Intersections, turnarounds, and other maneuver areas for proper geometrics compatible with the turning paths of design vehicles.		
11.	Horizontal and vertical alignments for sight distance restrictions.		
12.	Vertical alignment to determine whether maximum grades are exceeded and that minimum grades on curbed pavements are suitable for drainage.		
	C-PAVEMENT SECTIONS AND DETAILS - Check		
1.	Pavement sections for compliance with PCASE.		
2.	Soil bearing values CBR and subgrade reactions (K) to ensure they are based on approved soils investigation data. An approved source would be a previous design reasonably near the proposed new location.		

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3.	The depth of compaction for compliance with PCASE.		
4.	Types of bituminous surfacing, base course, and subbase course for compliance with appropriate specifications.		
5.	That CBR of the materials to be used in the pavement section are not given on the drawings or in the specifications.		
6.	PCC pavement jointing, reinforcement of odd-shaped slabs, and abutment to existing concrete pavement for strict compliance with UFC 3-250-01FA. Pavement design is to be in harmony with specifications.		
7.	That direction of overland drainage flow is indicated by arrows where not clearly defined by contours, profiles, and sections. Where gutter flow is continuous across intersecting pavements, such continuation of flow line is to be indicated by flow arrows.		
8.	That curbs, wheel stops or retaining walls are provided at all areas where vehicles are subject to damaging facilities or areas where overruns may result in vehicle damage.		
9.	That vehicle service areas are fully detailed on drawings and areas restricted to vehicles are provided with positive barriers.		
10.	Public transit needs in a community before designing the road network. If public transit is to be utilized, provide locations for bus stops and/or bus drop-offs.		
11.	For vehicle volume requirements and intersectional problems, to determine the need for stoplights or caution lights at priniciple intersections.		
12.	That all main roads have been designed for heavy, high volume traffic since military installations normally use the largest trucks possible and since the entire population is becoming increasingly mobile.		
13.	That an asphalt paving test strip has been required in the specifiacations for the demonstration of proper mixes and application techniques at the beginning of a paving job on all large paving projects.		

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	D-STORM DRAINAGE - Check:		
1.	That the storm drainage system is clearly shown on plans and that ultimate disposal of the runoff is shown to an existing ditch, canal, etc.		
2.	The rainfall data for the vicinity of the project to determine frequency, intensity, duration curve, infiltration, and runoff. Quite often the time of concentration at culverts or inlets of the system is ignored. The rational method will be used to determine the runoff for areas less than 200 acres. The rational formula must reflect the appropriate metric conversion "K" factor (Q=KCIA) for metric values.		
3.	That velocities in open ditches are controlled in order to avoid erosion, of embankments and damage in general.		
4.	That drainage details such as ditch and swale shapes, invert elevations, and location dimensions are given.		
5.	That proper pipe strengths, types, and encasement requirements are given. The cover over culvert pipe is often ignored, resulting in exposed pipe at road edges or insufficient pipe strength.		
6.	That reinforced concrete pipe is specified for storm drainage unless some unusual circumstances dictate the use of other types of pipe.		
7.	That the size of pipe was calculated for both concrete and corrugated metal pipe. Normally corrugated metal pipe will be the next larger size due to greater "n" factor.		
8.	That pipe size, type, class, gage, length, and inverts are shown on plans. If extensive storm drainage is required, check to see that drainage structures and pipe schedules are shown on plans.		
9.	That adequate erosion control methods are employed, in the form of curb and gutter, inlets, flumes, sodding, and rip rap schedules are shown on plans.		
10.	The system for continuity of inverts, flow lines, and contours.		
11.	The class and gage of storm drain pipes for adequate cover for the specified load.		
12.	Drainage design analysis computations, factors used, and the contributing drainage areas.		

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13.	Drainage structures for dimensions and adequate details necessary for construction.		
14.	Drainage pipe for possible conflict with pipelines and other underground construction.		
15.	That profiles of lines have been established to avoid or minimize rock excavation. Where possible, show the surfaces of existing rock on profiles.		
16.	That flared edges are used on the inlet edge of culvert pipe as part of inlet control in accordance with FAA AC 150/5320-5 In conjunction with inlet control, check that outlet control is applied. Have applicable computations been submitted with inlet and outlet control design?		
17.	That detention ponding is considered in drainage design where site conditions permit ot reduce design peak discharges.		
18.	That overall drainage design considers future site development.		
19.	That scour apron or other suitable protection is provided at downstream end of culverts and storm drain outlets.		
20.	The storm runoff is not discharged at the top of slopes unless suitable chutes fumes, energy dissipaters, etc., are used to control erosion and excessive energy.		
21.	That headwalls are selected considering lateral scour, band erosion, and undercutting of headwall.		
22.	That appropriate drainage inlets are used.		
23.	That inlet spacing is predicated upon allowable width of spread of gutter flow from the standpoint of the following items: a. Interference to traffic.		
	b. Prevention of cross flow.		
	c. Inconvenience to pedestrians.		
24.	That hydraulic gradient is computed where critical to the design and function of the storm drainage system.		
25.	That frequency of design discharge is selected with due consideration for the value of the improvements, desired degree of protection, and requirements of the UFC 3-201-01 or criteria listed in the Design Analyis.		
26.	That the site was analyzed for the 50 yr and 100 yr storm event and that the flood limits where plotted and the design was adjusted if required.		

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27.	That all drainage is accounted for with a comprehensive drainage system, as required, including tie-ins to sub drains, footing drains and planter sub drains. If sumps are required, provide pumps and drains.		
28.	That positive drainage is provided for courtyards and stairwells.		
	SECTION 3 - WATER, SEWAGE, AND SOLID WASTE SYSTEMS A - GENERAL - Check:		
1.	The size of equipment shown to see that space provided is adequate, both in plan and elevation. Use standard catalog items, where appropriate, for this check.		
2.	Specifications and drawings to see exposed moving parts of equipment are properly protected with guards and that adequate working space for safe maintenance and repair is provided.		
3.	The location of suction and discharge flanges of dual drive centrifugal pumps to determine whether they are properly oriented for clockwise operation of diesel or gasoline engine.		
4.	For conflict between drawings and specifications when equipment is specified.		
5.	Drawings to see that the legend covers every symbol used.		
6.	Drawings to see that points of commencement of exterior utilities are clearly indicated.		
7.	That exhaust from auxiliary drives are exhausted outside buildings.		
8.	That chlorine rooms are properly ventilated with entrance to the exhaust duct near the floor and that the discharge is located so as not to contaminate the air inlet to any buildings or inhabited areas.		
9.	That exterior utilities are coordinated with the plumbing plan.		
10.	That existing water supply and sewage treatment systems have adequate capacity for increased population when new facilities are added to existing Base or Complex.		
11.	That access to Chlorine Storage and Chlorine Feed Rooms is from the outside of the building only.		

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12.	Water mains, irrigation lines, and sewers to ensure they are not located under paved roadways or in locations subject to heavy traffic, except at necessary crossings.		
13.	That equipment, used in water and sewage treatment processes has minimal maintenance requirements.		
14.	That PVC and polyethylene pipe is not used in the design unless adequate measures for the protection of the pipe from ultraviolet radiation and high ambient temperatures in transit to and at the jobsite are provided by the contract documents.		
15.	The frequency of the existing electric power supply to ensure that motors and other electrical equipment will operate properly.		
	<u>B - WATER SUPPLY, TREATMENT, AND DISTRIBUTION SYSTEMS - Check:</u>		
1.	Well details for conformity with applicable requirement of AWWA. Was provision made for valving and testing of yield of well and quality of water?		
2.	That necessary control and test facilities for treatment are provided. Is the capacity of chemical feed equipment satisfactory?		
3.	The location of water lines to see that they are located in zones assigned. Check location to see if there is a conflict with other existing utilities. Check electric staking sheets, record drawings, steam lines, sanitary sewers, and storm drain lines.		
4.	Required horizontal and vertical distances between waterlines, sewer lines, and other lines, which could contaminate the water system. See UFC 3-230-10A.		
5.	The ditch crossing for interference with flow of water in ditch.		
6.	Valving to see that isolation of lines can be effected. Are valve locations accessible for repair?		
7.	Fire hydrant spacing to see that coverage of facilities complies with fire protection criteria.		
8.	Pipe sizes to see that required flows and pressure are obtained in the system.		
9.	That valves and fittings are provided to simplify future expansion.		

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10.	That a water quality analysis of the water supply is provided and has been used as the basis of design for any water treatment process used.		
11.	That pipe penetrations in concrete tanks are provided with embedded sleeves and flexible connections and are properly caulked.		
12.	When necessary, for protection against freezing in tank design. Inlet and overflow line are to run along inside wall, and pipes to and from the tank are to run underground. Rodent screen is to be placed on the discharge end of overflow and drain line. Earth mounds are to be placed around tank and a means of water circulation in the tank shall be provided to avoid formation of ice.		
13.	That protective coating is provided on buried steel water pipe.		
14.	That water supply source is adequate for design criteria and is in accordance with UFC 3-230-07A. Has proper allowance been made for supply under the most adverse conditions? Will future development in the area seriously affect the supply?		
15.	That scales are shown for all plans. Visually check dimensions shown against drawings to eliminate gross errors.		
16.	That instructions have been complied with in respect to listing Government-furnished equipment.		
17.	That water rights are obtained.		
18.	The supply line to building sprinkler system for post indicator valve. Coordinate with Fire Protection Engineer to see if required.		
19.	That waterlines crossing roads, sewer lines, culverts, ditches, etc., are shown in the respective profiles.		
20.	That pneumatic tank maximum cutoff and low start pressures are given on the drawings. The volume percentage at these pressures should be given to facilitate putting the system into operation.		
21.	That adequate storage is provided for fire flow and domestic demands.		
22.	That the specification call for sterilization of water storage tanks as well as water lines.		

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23.	That portable water storage facilities have been designed to preclude stagnation of the water.		
24.	That portable water, if readily available, or raw well water, if it is of sufficient quality, has been used in lieu of oil to lubricate well pump bearings.		
25.	That design of water lines installed above ground or in utility tunnels is based on sound engineering principles commensurate with maintenance, repair, inspection, testing, and replacement.		
26.	That water lines have sufficient ground cover for load protection.		
27.	That provisions have been made for the proper disposal of reject brine from water treatment processes.		
28.	That ductile iron fittings and specials are specified for PVC pipe systems for pipes 4" and larger.		
29.	That the working pressure for PVC pipe has been derated for the maximum ambient temperature anticipated.		
30.	Insure proper placement of air relief valves.		
31.	Coordinate with the fire protection engineer on design working pressures.		
	C - SEWERAGE SYSTEMS - Check:		
1.	That type of joints specified is compatible with ground water level and dewatering conditions.		
2.	Grades and slopes for correctness.		
3.	That grades of manhole tops are set for finished grades. Also, check that all invert and top elevations of manholes are given.		
4.	That sewer location will not result in interference with other utilities.		
5.	That centerline spacing between drain field lines is adequate.		
6.	That sufficient ground cover has been provided for load protection in accordance with UFC 3-240-07 FA.		

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7.	That where crossing of waterlines and sewer lines is unavoidable, the sewer pipe at the crossing is in accordance with the applicable paragraph of UFC 3-230-10 A.		
8.	That all sanitary sewers are designed to discharge the expected peak rate of flow when the pipe is running full. However, regardless of sewage quantity, the minimum sizes to be used are 6-inch for house connections and 8-inch for all other sewers. Ensure that sewer lines are laid on sufficient slope to provide a minimum velocity of 2 ft/s at average daily flow.		
9.	That sewer connections are not made to force mains.		
10.	That invert of outside sewer will match the invert of the building connection.		
11.	That black iron for handrails, etc., is not used in sewage plants. Ferrous metals exposed to sewage gases should be galvanized.		
12.	That complete hydraulic design computations are included in the Design Analysis.		
13.	That traps are provided to prevent grease or oil from entering the sewage system.		
14.	That the most economical disposal system is employed.		
15.	That sewage effluent from the treatment system will not contaminate watercourses, water supply systems, etc.		
16.	That provisions have been made to use sewage treatment plant effluent for irrigation water and/or other non-portable water requirements, if permitted by the local government.		
17.	That any wastes which are detrimental to a biological treatment system have been excluded from the sanitary sewer system.		
18.	That the Paint Specification for Sewage Treatment Plants requires all intermediate and finish paint coats be lead-free, mercury-free fume proof, and suitable for sewage plant atmosphere containing hydrogen sulfide.		
1.	D - SOLID WASTE SYSTEMS - Check Check that provisions have been made for the collection, storage, and disposal of solid wastes.		

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	SECTION 4 - SUPPLEMENTAL CHECKING INSTRUCTIONS:		
1.	Check correspondence files and master files for omissions and deviations in final design.		
2.	Check drawings against criteria. Criteria revisions and conferences minutes to assure that latest criteria have been used in final design.		
3.	Check to see that latest revisions in design manuals, specifications, standard sheets, etc., are incorporated in plans.		
4.	Check instructions and criteria received too late to forward to A-E to include in the final design.		

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