

BASIS OF DESIGN REPORT
GUIDELINE CHECKLIST FOR DEFINING
PROJECTS REQUIREMENTS

This checklist is intended to serve as a guide for defining client requirements for the design and construction of utility facilities. This checklist was developed based on experience developing preliminary engineering requirements and by selectively including information more directly addressing the scopes of typical design and construction projects. Information should be included directly on the form or a specific reference (such as Preliminary Engineering Report, Section x) should be noted as to where the information can be found.

CATEGORY

RESPONSE or REFERENCE

PROJECT MANAGEMENT

Drawings

Eng D (22"x34")	
Eng E (34"x44")	
Other	
Title Block	
AutoCad	
MicroStation	
Final Quantity	
Electronic Backup	
Stamp Drawings?	
Other	

Specifications

Contract Conditions (Div 0)

AE Contract Docs (Div 0)	
EJCDC Contract Docs (Div 0)	
Client Contract Docs (Div 0)	
Insurance Requirements	
Bonding Requirements	
Liquidated Damages	
SDBE Contracting Rights	
MBE Requirements	
Construction Completion Date	

Stamp Specifications?	
General Conditions (Div 1)	
Construction Working Hours	
Interface to Existing Operations	
Utilities	
Safety	
Security	
Sanitary	
Technical Specifications (Div 2-17)	
CSI	
AIA	
AE	
ISA Data Sheets	
AE Mech Data Sheets	
Client Mech Data Sheets	
"Or Equal"	
Word for Windows	
WordPerfect	
Other?	
Binding	
Electronic Backup	
Final Quantity	
Other	
Project Management Plan	
Short Form (<\$100,000)	
Long Form (=>\$100,000)	
Other	
Progress Reports	
Contents	
Monthly	
Weekly	
Other	
Client Reviews	
BODR	
30%	
60%	
90%	
Other	

Accounting

Invoice by Acct Period	
Invoice Monthly	
Other	

PROCESS

Process Flow Diagrams

Mass Balance	
Flow Balance	
Hydraulic Profile	
Other	

CIVIL

Survey

Horizontal Control	
Vertical Control	
Site Bench Mark	
USGS Reference	

Permits

SCS	
DOT	
Railroad	
EPA	
FEMA (Flood Plain)	
Local Utilities	
Other	

Zoning

Site Zoning Jurisdiction	
Constr Setbacks	
Front	
Back	
Left	
Right	
Deed Restrictions	
Parking Requirements	
Review Agencies	
Fire District	
Other	

Roadways

Traffic Patterns	
Vehicle Requirements	
Load Rating	
Pavement Materials	
Curb & Gutter	
Storm Water Drainage	
Asphalt Mix Design	
Foundation Design	
Max Gradient	
Min Width	
Min/Max Crown	
Min Curve Radii	
Signage Required	

Site Work

Site Finish Grade Elev	
Landscaping	
Grass Type	
Stone Type	
Laydown Area	
Spoil Area	
Borrow Area	
Sidewalk Width	

Underground Utilities

Tie-ins to Existing	
Tie-ins by...	
Min Cover	
Marking	
Pre-cast Manholes	
Pre-cast Elec Pullboxes	
Encasement	
Bedding Criteria	
Compaction Criteria	

Erosion Control

Review Agency	
Erosion Standards	

Design Storm Event

Design Storm Duration	
Design Storm Frequency	
Storm Water Detention	
Storm Water Trmt/Monitoring	

Fencing

Height	
Barb	
In/Out Angle	
Gates	
Security	
Materials	

Battery Limits

STRUCTURAL

CONCRETE (incl FOUNDATIONS)

Concrete Materials	
Water Bearing Class	
ACI Code	
Non-water Bearing Class	
ACI Code	
Equip Pads Class	
Cement Class	
Reinforcing Materials	
Finishes	
Chamfer Corners	
Fillet Corners & Edges	
Grout	
Rubbed	
Coatings	
Forms	
Design Criteria	
Soil Bearing Capacity	
Seismic Zone	
Wind Loads	
Snow Loads	
Uplift Loads	
Water Bearing Concrete (psi)	
Non-Water Bear Concrete (psi)	

Misc Concrete (psi)	
Waterstop Size	
Waterstop Type	
Isolated Equip Foundations	
Wall Penetrations - Wet	
Wall Penetrations - Dry	
Codes	
SBC	
UBC	
BOCA	
Local	
Other	

STRUCTURAL STEEL (incl FRAMING)

Framing	
Welded	
Anchor Bolts	
Shop Primer	
Welder Certification	
Plant Hot Work Permit	
Pipe Rack	
Galvanized	
Fiberglas	
Painted Steel	
Type	
Horiz Spacing	
Vert Spacing	
Support Types	
Insul Allowance	
Materials Handling	
Overhead Cranes	
Conveyors	
Other	
Stairs	
Galvanized	
Fiberglas	
Painted Steel	
Aluminum	
Handrails	

Galvanized	
Fiberglas	
Painted Steel	
Aluminum	
Platforms	
PSF Loading	
Checker Plate	
Grating	
Galvanized	
Fiberglas	
Painted Steel	
Aluminum	
Kick plates	
Other	

MECHANICAL

PROCESS

Tanks	
Service	
Steel	
Concrete	
Coatings	
Above Ground	
In Ground	
Leak Detection	
Vapor Control	
Pressure Rating	
Codes	
Overfill Protection	
Freeze Protection	
Insulation	
Piping	
Service	
Materials	
Pressure Class	
Double Wall	
Leak Detection	
Flanged	
Welded	

Threaded	
Expansion Fittings	
Gaskets	
Freeze Protection	
Marking/Tagging	
Color Codes	
Support Spacing	
Valves	
Service	
Materials	
Pressure Class	
Type	
Operator	
Fail Safe	
By-pass	
Marking/Tagging	
Gaskets	
Pumps & Blowers	
Service	
Materials	
Max RPM	
Type	
Noise Control	
Local Valves	
Suction Isolation	
Discharge Isolation	
Check Valve Type	
PI Isolation	
Sample Ports	
Drains	
Flush Points	
Local Ctrl's & Monitoring	
Pressure Indicator	
Start/Stop	
HOA	
Elec Disconnect	
Vibration Meter	
Temp Meter	

XP	
VFD	
Gaskets	
Freeze Protection	
Insulation	
Heat Tape	
Impedance Type	
Steam	
Doghouses	
Other	
Gas Detection	
Type	
Areas	
Odor Control	
Type	
Areas	

PLANT UTILITIES

Plant Water	
Plant Air	
Plant Instr Air	
Fuel Oil	
Natural Gas	
Fire Water Loop	
Plant Steam & Condensate	

HVAC

Design Criteria	
Elevation (altitude)	
Relative Humidity	
Temperature	
HVAC Type	
Steam	
Hot Water	
Forced Air	
Heat Pump	
Electric Resistance	
Air Conditioning	
Humidity Control (dry/wet)	
Occupied Areas	

Air Changes per Hour	
Min Temp	
Max Temp	
Min Humidity	
Max Humidity	
HVAC System	

Process Areas

Air Changes per Hour	
Min Temp	
Max Temp	
Min Humidity	
Max Humidity	
HVAC System	

Fire Protection

Design Criteria

Coverage Area	
GPM/Sq. Foot	

Type

Dry	
Wet	
Sprinklers	
Flush Mount	
Std Mount	

ARCHITECTURAL (Buildings)

Building Type

Structural Steel Frame	
Pre-Engineered	
Metal Siding	
Cast-in-Place	
Tilt-up Pre-cast Panels	
Masonry	
Wood	

General

Codes	
SBC (southeast)	
UBC (west)	
BOCA (northeast)	

NFPA	
Factory Mutual (FM)	
Industrial Risk Insurers (IRI)	
OSHA	
Local	
Plant Water	
Potable Water	
Process Water	
Welding Receptacles	
Air Receptacles	
Handicap Access	
Unisex Restroom	

Laboratory

Hood	
Oven	
Incubator	
No. Sinks	
D.I./Distilled Water	
Bench Air	
Bench Vacuum	
Bench Gas	
Safety Shower/Eye Wash Sta	

Roof

Multi-Ply	
Standing Seam	
Precast Panel	
Insulation Type	

Doors/Hardware

Type	
Trim	
Insulation	
Security	

Windows

Type	
Trim	
Insulation	
Security	

Occupied Areas

Wall Finishes	
Ceiling Finishes	
Floor Finishes	
Color Schemes	

Process Areas

Wall Finishes	
Ceiling Finishes	
Floor Finishes	
Color Schemes	

ELECTRICAL

POWER DISTRIBUTION

Design Criteria	
Frequency	
Fractional HP Less Than	
Fractional Voltage	
Non-Fractional Voltage	
Short-Circuit Analysis	
Lighting Voltage	
Lightning Protection	
Transformer	
Oil Filled	
Pad Mounted	
Switch Gear	
?	
?	
?	
Secondary Feeder	
Emergency Generator	
What Motors	
Prime Mover Type	
Auto/Manual Restart	
Balanced/Synchronized Restart	
Inrush Control	
Fuel Storage Capacity	
Fuel Storage Type	
Day Tank Capacity	
MCCs	

Horiz Bus Rating	
Vert Bus Rating	
Neutral Bus	
Feeder Entry Point	
Breakers	
Molded Case	
Thermal Overload	
Magnetic Overload	
Lockout Location	
Additional Lockouts	
NEMA Rating	
Meters	
Voltage	
Current	
kW	
Demand	
Power Factor	
Wiring	
Cable Tray	
Conduit	
Duct Bank	
Spares	
Materials	
Shielding	
Support Spacing	
Panels	
NEMA Rating	
Materials	
Switch/Light NEMA Rating	
Explosion Proof	
Power Supply to Prim Elem	
Cable Entry Point	
Cooling	
Surge Protection	
Isolation	
Indicating Light Colors	
Spares	
Motors	

Service Factor 1.15	
High Efficiency	
RTD	
TEFC	
Class	
Division	
Quality Standard	
Junction Boxes	

Grounding	
Rod	
Delta	

Lighting

Mercury Vapor	
High Pressure Sodium	
Flood	
Local	
Site Lighting Criteria	
Interior Lighting Criteria	
Fluorescent	
Incandescent	
Controls	
Photocell	
Manual Switch	

Cathodic Protection

Sacrificial Anode	
Impressed Current	

Plant Communications

Commercially Avail	
In-Plant Secure	
PBX	
Paging	

Security System

Computer Based	
Card Access	
CCTV	
Vehicle Control	
Pedestrian Control	
Fire Detection	

Hazardous Gas Detection	

Other

INSTRUMENTATION

Control Philosophy

DCS	
SCADA	
PLC	
RS-232	
Topology	
Single Loop Ctrl	
Interlock Philosophy	
Valve Actuation	
Local Ctrl Panels	
Main Ctrl Panels	
Alarms	
Recorders	
Indicators	
Annunciators	
Graphic Panel	
Instr Power	
UPS	
Primary Element Standard	
Control Element Standard	
Controller Standard	
Other Vendor Std	

P&ID Nomenclature

ISA	
Client Std	
Instr Loop Nomenclature	
Piping Nomenclature	
Equip Nomenclature	