Building drawings checklist : mechanical drawings for housing

Strelka, C. S.

Publisher's version / Version de l'éditeur:
https://doi.org/10.4224/20378527
Building Practice Note, 1982-12-01

ISSN 0701-5216

BUILDING PRACTICE NOTE

BUILDING DRAWINGS CHECKLIST: MECHANICAL DRAWINGS FOR HOUSING

by

C.S. Strelka

Division of Building Research, National Research Council of Canada

Ottawa, December 1982

BUILDING DRAWINGS CHECKLIST:

MECHANICAL DRAWINGS FOR HOUSING

by

C.S. Strelka

Division of Building Research, National Research Council of Canada

Ottawa, December 1982

TABLE OF CONTENTS

PREFACE

This drawing checklist is the third of the series, complementing the Building Practice Note 29, Building Drawings Checklist: Architectural Drawings, and Note 39, Building Drawings Checklist: Structural Drawings for Housing. It provides mechanical engineers with a convenient tool for the final review of drawings prepared under their supervision.

Since this list is a general one, it cannot cover all the special situations which can occur in practice; nevertheless it should prove helpful as a basic guide. Users of this checklist are strongly urged, before putting it to use, to consult the Canadian National Standard CAN 3-B 78.M77 Building Drawings (published by and available from the Canadian Standards Association, 178 Rexdale Blvd., Rexdale, Ontario) or the Manual on Metric Building Practice (published by and available from the Division of Building Research, National Research Council of Canada).

Part I of this checklist, which is presented in narrative form, serves as a reminder of various items to the person checking the structural drawings. The matter of "crispness of drawing", for example, cannot be over-emphasized, particularly in plans drawn at 1:100 scale.

Part II presents, in tabulated form, a checklist sheet for every sheet in a traditional set of working drawings. These tables can be photocopied and attached to the appropriate drawings during the checking stage. Free space is provided on the sheets for additional items. Using the tables will thus simplify the process of reprinting check sets and/or establishing permanent records of all verifications and approvals. They can also supplement computer-aided design (CAD) software.

The engineer must critically review his own work before releasing it to a contractor for execution. It is his professional responsibility, an obligation to his client and the key to a good business reputation.

The author wishes to thank Mr. F.W. Steel of DBR for reviewing the manuscript and offering many useful suggestions.

PART I

1. CHECKING DIMENSIONS AND UNITS

The dimensioning method should be consistent, meticulous and in accordance with the National Standards of Canada CAN 3-B 78.3-M77 Building Drawings.

1.1 Linear dimensions should be expressed in millimetres (mm) on building drawings, and in metres (m) on site plans. According to the standard convention in drafting, the unit symbol can be omitted if the following requirements are met:

a) a note indicating the unit used is displayed in a conspicuous place on the drawing sheet;
b) all linear dimensions including those for spot levels and land elevation are given in one dimensioning unit only.

For easier reading, group the digits in triads on both sides of the decimal marker (e.g., 123 456 789). All dimensions shown in metres must be taken to three decimal places, even when all decimals are zeros (e.g., 1.235, 1.000).

1.2 Area dimensions should be expressed in:

a) hectares (ha) for areas on survey plans, irrigation and catchment areas to three decimals (e.g., 1.234 ha).

b) square metres (m^2) for drainage areas, large glass panes and solar collectors, to two decimals (e.g., 1.23 m^2).

c) square millimetres (mm^2) for cross-sectional areas of pipes and ducts, using no decimals.

Symbols of these units MUST ALWAYS BE SHOWN on drawings where appropriate.

1.3 Volume dimensions should be expressed in:

a) cubic metres (m^3) for water and air distribution, other fluids in large quantities,
b) litres (L) for volumes pertaining to containers or distribution of fluids or gases only.

Symbols of these units MUST ALWAYS BE SHOWN on the drawings.

1.4 OTHER UNITS RECOMMENDED FOR ENGINEERING CALCULATIONS AND DRAWINGS

Quantity	SI Unit Symbol	Recommended Unit Symbol	Recommended Unit Name	Typical Application	Remarks
Instantaneous volumetric flow rates	m^3/s	m^3/s	cubic metre per second	Flow in pipes, rivers and streams, channel flow, sludge flow, irrigation spray demand.	
		L/s	litre per second	Most building services.	
Work	J	kJ	kilojoule	Work done, energy available, quantity of heat.	1 MJ = 0.277 778 kW•h
		MJ	megajoule		
Energy		kW•h	kilowatt hour	Electrical metering purposes only.	1 kW•h = 3.6 MJ
Power	W	kW	kilowatt	Heat flow meters, motor powers, rate of doing work.	
Sewage contrib.			cubic metre per person per day		
Concentrations		mg/L	milligram per litre		
Mass per unit length	kg/m	kg/m	kilogram per metre	Evaluation of the masses of structural sections, cables.	known also as "linear density".
Mass per unit area	kg/m^2	kg/m^2	kilogram per square metre	Evaluation of the masses of walls, floors, glass plates, sheets.	known also as "area density"
Density	kg/m^3	kg/m^3	kilogram per cubic metre	Evaluation of the masses of structures and materials.	known also as "mass per unit volume"
Mass per unit time	kg/s	kg/s	kilogram per second	Rate of transport of material on conveyors. Rate of gas flow in special cases.	
		t/h	tonne per hr.		
Velocity	m/s	m/s	metre per sec.	Calculations involving rectilinear motion.	1 m/s = 3.6 km/h
		km/h	kilometre per hr.	Wind velocities.	

Symbols of these units MUST ALWAYS BE SHOWN on drawings where appropriate.

Quantity	SI Unit Symbol	Recommended Unit Symbol	Recommended Unit Name	Typical Application	Remarks
Speed	m/s	km/h	kilometre per hr.	The speed of all objects.	1 m/s = 3.600 km/h
Acceler-ation	m/s^2	m/s^2	metre per sec. squared	Kinematics and calculation of dynamic forces.	Standard gravitational acceleration g = 9.806 650 m/s^2
Force	N	kN	kilonewton	Calculations involving dynamic forces, forces in cables.	1 N = 1 kg•m/s^2
Pressure	Pa	kPa MPa	kilopascal megapascal	Bearing pressures, stresses in materials, vapour pressure.	1 Pa = 1 N/m^2
Momentum	kg•m/s	kg•m/s	kilogram metre per second	Evaluation of impact and dynamic forces.	
Angular velocity	rad/s	r/s r/min	revolutions per second revolutions per minute	Calculations involving rotational motion.	The revolution per second will be used for describing machinery speeds
Torque	N•m	N•m kN•m MN•m	newton metre kilonewton metre meganewton metre	Calculations involving rotational motion, bending moments in structural sections, torque in engine drive shafts and axles.	Also known as "moment of force".
Moment of inertia	$kg•m^2$	$kg•m^2$	kilogram metre to second power	Rotational dynamics. Evaluation of the restraining forces required for propellers, windmills, etc.	
Dynamic viscosity	Pa•s	Pa•s	pascal second	Shear stresses in fluids.	The centipoise (cP) = 10^{-3} Pa•s will not be used.
Kinematic viscosity	m^2/s	mm^2/s	square millimetre per second	Computing Reynolds number, linear motion.	The centistoke (cSt) = 10^{-6} m^2/s will not be used.

Symbols of these units MUST ALWAYS BE SHOWN on drawings where appropriate.

Quantity	SI Unit Symbol	Recommended Unit Symbol	Recommended Unit Name	Typical Application	Remarks
Concentration	kg/m^3	$\mu g/m^3$	microgram per cubic metre	Pollution control.	
Enthalpy, Latent heat, Sensible heat	J	J	joule	Thermal energy calculations.	
		kJ	kilojoule		
		MJ	megajoule	Mechanical and electrical energy.	
Temperature	K	K	kelvin	Thermodynamic temperature, calculations involving units of temperature.	0°C = 273.15 K
		°C	degree Celsius	Most commonly used temperature scale. Meteorology, engineering and all facets of building and construction.	
Temperature interval	K	°C	degree Celsius	Heat transfer calculations.	1K = 1°C
Coefficient of linear expansion	1/K	1/°C	reciprocal degree Celsius	Expansion of material subjected to a temperature change; expressed as a ratio per degree Celsius.	
Heat flux density, intensity of heat	W/m^2	W/m^2	watt per square metre	Flow of heat through buildings, walls and other heat transfer surfaces. Transmission calculations.	
		kW/m^2	kilowatt per square metre		
Thermal conductivity, heat transfer coefficient	W/m•K	W/m•°C	watt per metre degree Celsius	Estimation of thermal behaviour of materials and systems. Heat transmission calculations.	k-value
Thermal conductance	W/m^2•K	W/m^2•°C	watt per square metre degree Celsius	Heat transmission calculations.	U-value
Thermal resistivity	m•K/W	m•°C/W	metre degree Celsius per watt	Heat transmission calculations.	

Symbols of these units MUST ALWAYS BE SHOWN on drawings where appropriate.

Quantity	SI Unit Symbol	Recommended Unit Symbol	Recommended Unit Name	Typical Application	Remarks
Thermal resistance	$m^2 \cdot K/W$	$m^2 \cdot °C/W$	square metre degree Celsius per watt	Heat transmission calculations.	R-value
Heat capacity	J/K	J/°C	joule per degree Celsius	Thermal behaviour of materials. Heat transmission calculations.	
Specific heat capacity	J/kg•K	kJ/kg •°C	kilojoule per kilogram degree Celsius	Heat transmission calculations.	
Specific energy, Specific sensible heat. Specific latent heat.	J/kg	kJ/kg MJ/kg	kilojoule per kilogram megajoule per kilogram	Heat and energy contained in materials. Calorific values of fuels. Psychrometric calculations.	
Specific volume	m^3/kg	m^3/kg	cubic metre per kilogram	Calculations involving fluids.	
Moisture content	kg/kg	kg/kg g/kg	kilogram per kilogram gram per kilogram	Psychrometric calculations.	
Permeability		ng/Pa •s•m	nanogram per pascal second metre	Water vapour transmission.	
Permeance		ng/Pa •s•m^2	nanogram per pascal second metre squared	Water vapour transmission through walls.	

Symbols of these units MUST ALWAYS BE SHOWN on drawings where appropriate.

2. SCALES

Preferred Scales Commonly Used for Different Types of Drawings*

Stage	Type of Drawing	Scale	Notes
Design	Sketch and preliminary drawings		Scales will vary but it is recommended that preference be given to those used in the working drawing stage.
	Location drawings		Scale will vary according to maps used as reference.
	Block plan	1:2000 1:1000	
Working drawing	Site plan	1:500 1:200	
	General location drawings	1:200 1:100 1:50	
	Component range drawings	1:100 1:50 1:20	The preferred scale is 1:50
	Assembly drawings	1:20 1:10 1:5	
	Component detail drawings	1:10 1:5 1:1	

* This table is reprinted from the Canadian National Standard CAN 3-B 78.M77 Building Drawings. The recommended range of scales may be extended to both sides, provided that the new scale can be derived from a recommended scale by multiplying the numerator or denominator by a power of 10.

3. SITE PLAN

3.1 Show all lot lines, lot designations and designations of adjoining private and municipal lands.

3.2 Indicate lot orientation by north arrow.

3.3 Show the job bench mark and its geodesical and/or job elevation.

3.4 Outline the exact building location on the site. Outline all other proposed or existing structures.

3.5 Indicate existing grade elevations including elevations of adjoining private and municipal lands.

3.6 Show finish grade elevations of landscaped and paved areas to provide information on site drainage. Co-ordinate with architectural and/or landscaping drawings.

3.7 Indicate all existing sewer, storm sewer (or ditches and culverts), water and gas service mains, showing their location, depth below grade, material and diameter.

3.8 Indicate all street sewer manholes, catch basins, hydrants, shut-off valves and valve chambers, giving their top and/or invert elevations.

3.9 Indicate all connections from the building to existing sewer, storm sewer, water and gas main lines. Indicate the depth of these connecting lines below grade, their material and diameter. Co-ordinate location of these lines with electrical drawings for buried services.

3.10 Show location of thrust blocks where connecting lines change direction.

3.11 Indicate where service lines enter the building; co-ordinate with architectural, structural and electrical drawings.

3.12 Show location of all new manholes, catch basins and shut-off valves, giving their top and invert elevations.

3.13 Indicate main distribution, supply and return lines of distinct heating system. Show location, size, material and insulation of lines, relief vents, expansion loops and valve chambers. Indicate lines as buried, in ducts, tunnels or utilidors.

3.14 Indicate location of heat pump, its type and connections to building.

3.15 Show all external water, gasoline, oil and gas storage tanks, their fill and vent pipes, material and storage capacity. Co-ordinate with structural drawings for required supporting structures.

3.16 Show septic tank, if any, and its drainage field.

3.17 For convenience in handling drawings, when space on the site plan drawing permits, show details pertaining to services installation on site.

3.18 It is a common practice to cover conditions of site development work by a set of general notes placed on the site plan drawing sheet. These notes could include information concerning materials used, special work processes to be employed and notification on approvals required for various mechanical services.

4. BASEMENT FLOOR PLAN

4.1 Check for proper location of all walls, partitions and columns, in latest issued set of architectural drawings. Outline in thin line. Show all doors and windows.

4.2 For more complicated projects, good design practice recommends separate floor plans for plumbing, heating, ventilating, etc.

4.3 Check coding names/numbers of individual rooms against coding in architectural basement floor plan.

4.4 Locate points of all incoming and outgoing services; show proposed invert on sewage and drainage pipes.

4.5 Indicate location of all metering devices (water, gas, steam).

4.6 Show perimeter and/or under the floor slab, areaway and elevator pit drainage system. Show rain water leaders. Indicate diameter of pipes and/or tiles where appropriate.

4.7 Indicate required slope of floor slab, location of floor drains (check for drain at underground garage door if any), drain size and type.

4.8 Show all floor pits, their dimensions and cover; note use.

4.9 Check requirements for sump pump. Note type.

4.10 Show all sinks, W.C.'s, urinals, showers, bathtubs, drinking fountains, hose bibs, pumps, water heaters, laundry equipment, water purifying and/or softening equipment. Indicate special fixtures for use by the handicapped.

4.11 Show distribution of domestic water; indicate connections to all sinks, W.C's, urinals, showers, bathtubs, drinking fountains, pumps, hose bibs, water heaters, laundry equipment, water purifying and/or softening equipment. Note diameter of pipes.

4.12 Show shut-off valves, if any.

4.13 Show location of domestic water riser; note diameter of pipes.

4.14 Check location and proper distribution of fire-hose cabinets, fire extinguishers and sprinklers, and of fire pump if necessary. Indicate water distribution lines (horizontal and risers) where appropriate. Note diameter of pipes.

4.15 Show sanitary waste pipe locations, connections to all fixtures. Note diameter of pipes.

4.16 Check for clean-outs, traps, vents.

4.17 Show location of waste stack pipes from upper floors; check diameter of pipes.

4.18 Indicate location, size and type of sewage pump/pump system, if any.

4.19 Show air exhaust and/or intake grills through basement walls. Indicate required dimensions of openings, fans, hoods over equipment. Co-ordinate location, size and anchoring with architectural and structural drawings, power demand with electrical design.

4.20 Show heating/air conditioning duct locations, risers to upper floors. Note size of ducts, fire dampers, access panels and required insulation.

4.21 Show individual heating units/radiators/warm air outlets/air conditioning diffusers. Note type, size and heating/cooling capacity.

4.22 Check for thermostats.

4.23 Show location, size and connections of heat exchangers, furnaces, heating pumps. Co-ordinate requirements for special footings/foundations with structural drawings.

4.24 Show chimneys and flues; check for ashpits and clean-out openings.

4.25 In case of swimming pool installation, check for water meter, backflow preventer, heater, filter, chlorinating system, drains, and circulating pump. Co-ordinate services with electrical drawings.

4.26 Show location, diameter and material of garbage chute. Show garbage compacter, if any; indicate type and co-ordinate with electrical drawings for service. Check for sprinklers in garbage chute and for sprinklers and floor drains in garbage room.

4.27 Check distribution of domestic gas. Indicate location of gas meter, diameter of pipes, location of risers.

5. FLOOR PLANS

5.1 Outline in thin line all walls, partitions and columns of the building. Show all doors and windows. Keep orientation of building the same as on architectural drawing.

5.2 Check coding/names of rooms to coincide with architectural drawings.

5.3 Show all sinks, W.C.'s, urinals, showers, bathtubs, drinking fountains, floor drains. Indicate special fixtures for use of the handicapped.

5.4 Show sanitary sewer connections of fixtures to risers. Indicate diameters of pipes.

5.5 Check rain water leaders. Show location and diameters.

5.6 Show domestic water distribution. Indicate connections to all fixtures. Note diameter and insulation of pipes. Check hot water supply to top of garbage chute.

5.7 Check proper distribution of fire hose cabinets, janitor sinks and drinking fountains in large floor plans where shown on several drawings.

5.8 Check for gardenhose bib and fire service siamese connection at ground level. Check hose bibs/area drains on elevated terraces.

5.9 Show location of sprinklers, sprinkler distribution system, firehose cabinets/fire extinguishers where appropriate.

5.10 Indicate hoods and/or exhaust fans over kitchen ranges and other equipment.

5.11 Show location of through-wall exhaust grill and/or fans. Note dimensions of grills and types of fans. Co-ordinate with electrical drawings for service.

5.12 Indicate direct exhaust ducts; note dimensions, material and insulation where appropriate. Co-ordinate with architectural drawings if bulkheads are necessary.

5.13 Show horizontal heating/air conditioning ducts and vertical risers. Note dimensions, material, insulation where required, fire dampers and access panels of ducts. Show drains for A/C units.

5.14 Show piping/ducting to heating units; note material and dimensions.

5.15 Show individual heating units such as warm air outlets and radiators; note type and heating capacity. Indicate individual thermostats, if any.

5.16 Indicate chimneys and vents connecting to other floors. Note material and dimensions.

5.17 Show distribution of domestic gas. Note material and diameter of pipes. Indicate location and diameter of risers.

5.18 Show garbage disposal system (garbage chute/slide). Check for ventilation and sprinkers in garbage chute.

6. ROOF PLAN

6.1 Outline in thin line the perimeter of the roof and all parts of structure penetrating the roof plane.

6.2 Show roof slope.

6.3 Indicate gutters, rain water leaders or roof drains. Note sizes or types.

6.4 Show all chimneys, gas heater stacks and roof vents. Note use and type.

6.5 Check for possible danger of vented air contaminating fresh air intakes.

6.6 Indicate all mechanical equipment protruding through or installed above the roof plane. Note type and capacity. Co-ordinate requirements for support and/or anchoring with structural drawings.

6.7 Ventilate elevator shaft according to manufacturer's and safety codes requirements.

7. DETAILS

7.1 As mentioned in 3.17, details concerning site development should, for the sake of convenience of handling the drawings, be placed on the same sheet as the site plan. Other details pertaining to individual floor and roof plans should be located, wherever possible, on the plan to which they pertain.

7.2 Detailed mechanical room plan: show general arrangement of equipment; check clearances for servicing, access, tube withdrawal and equipment replacement. Provide space ventilation, combustion air, drainage and curbs at doors. Ensure freeze protection of coils and piping against outside air.

7.3 Check that all symbols used are shown in legend.

7.4 Provide individual details as necessary to clarify intent of work.

8. SCHEMATICS

8.1 Domestic water supply

Show
- valved meter c/w bypass, all pipe diameters, and check valve,
- booster pump incl. inlet and outlet pressure gauge, isolation valves, vibration isolation in piping and in the pump base, check valve, pressure-reducing valves c/w gauges.
- hot water recirculating pump incl. type of control, check valve, isolation valves,
- hot water heater incl. base, drain size, pressure/temperature relief valve, disconnect unions in heating pipe for tube bundle removal, type and thickness of thermal insulation, control sequence for electric heater, control of valving for tube bundle, boiler piping schematic,
- location of pressure gauges or gauge connections,
- location of thermometers/thermometer wells,
- location of flow measurement devices.

8.2 Fire protection water supply

Show
- supervised stop valve,
- fire pump c/w gauges, check valve, supervised isolating valves,
- siamese connection(s), wall hydrants,
- all pipe sizes, supervised isolating valves on branches or risers, flow switches,
- zone annunciation devices,
- dry pipe valves.

8.3 Risers - where diameter of pipe changes throughout its length, show size at each floor or at point of change for:
- gas supply,
- oil supply and return,
- hot water, cold water and recirculated water, (check location of any pressure reducing valves),
- drain and vent,
- rain water leader,
- ventilation (check supply and exhaust),
- smoke shaft, pressurization air supply,
- water supply to fire hose cabinets, garbage chute sprinklers, and linen chute sprinklers,
- expansion loops, and anchors, on heating and hot water pipes.

Check for identical coding of risers shown on riser schematic and on floor plans.

9. SCHEDULES

9.1 Check that coding of equipment as indicated on drawings, schematics and details coincides with coding using in schedules.

9.2 Pump schedule should contain:
intended service
design capacity, head, r/min,
model, type,
motor power, voltage, phase, r/min,
special remarks.

9.3 Fan schedule should contain:
intended service
design capacity, head, r/min,
model, type,
motor power, voltage, phase, r/min,
special remarks.

9.4 Coil schedule should contain:
design output,
air flow rate,
water flow rate,
air temperature difference,
water temperature difference,
number of rows,
fin spacing,
water and air pressure drops.

Part II

DRAWING: SITE PLAN

DRAWN BY: CHECKED BY:

ITEM	CHECKED		
	1st	2nd	final
Title block			
North arrow			
Lot line designations			
Job bench mark/job elevation			
Building and other structures			
Grade elevation: existing			
new			
Sewer lines: existing main, incl. manholes			
new connections to building			
Septic tank/field system			
Storm sewer lines: existing main, catch basins			
new connections to building			
Site drainage			
Water: existing main,			
new connection to bldg., shut-off			
valves			
Gas: existing main			
new connection to bldg., shut-off			
valves			
District heating: existing main			
new connection to bldg.			
Co-ordination with architectural drawings			
structural drawings			
electrical drawings			

DRAWING: BASEMENT FLOOR PLAN

DRAWN BY: CHECKED BY:

ITEM	CHECKED		
	1st	2nd	final
Building outline, room coding			
Incoming/outgoing services, inverts			
Metering devices - water, gas, steam			
Drainage system - tiles, floor drains, RWL's			
Floor slopes			
Service pits			
Pumps - water, fire, heating, sewage			
Fixtures/fixtures for the handicapped			
Domestic water distribution - horizontal/risers			
Fire service distribution			
FHC, sprinklers, extinguishers			
Sanitary sewer - horizontal/risers			
Clean-outs, traps, vents			
Air exhaust/intake system			
Heating media distribution			
Heating units, thermostats			
Ventilating units			
Chimneys, flues			
Swimming pool accessories			
Garbage chute, garbage room			
Pipe/duct diameters/dimensions			
Pipe insulation			
Equipment coding			
Co-ordination with architectural drawings			
structural drawings			
electrical drawings			

DRAWING: FLOOR PLANS

DRAWN BY: CHECKED BY:

ITEM	CHECKED		
	1st	2nd	final
Building outline, room coding			
Fixtures/fixtures for the handicapped			
Domestic water distribution			
Fire service distribution			
FHC, sprinklers, extinguishers			
Gardenhose bib, siamese connection			
Hoods/louvres			
Air exhaust/intake			
Sanitary sewer connections, risers			
Gas distribution			
Heating media distribution			
Heating units, thermostats			
Ventilating units			
Chimneys, flues			
Garbage chute			
Pipe/duct diameters/dimensions			
Pipe/duct insulation			
Co-ordination with architectural drawings			
structural drawings			
electrical drawings			

DRAWING: ROOF PLAN

DRAWN BY: CHECKED BY:

ITEM	CHECKED		
	1st	2nd	final
Building outline			
Roof slope			
Gutters			
Rain water leaders			
Roof drains			
Chimney, stairs, roof vents			
Mechanical equipment above roof level			
attached to roof			
Elevator shaft ventilation			
Equipment coding			
Co-ordination with architectural drawings			
structural drawings			
electrical drawings			

DRAWING: DETAILS

DRAWN BY: CHECKED BY:

ITEM	CHECKED		
	1st	2nd	final
Mechanical room plan - outline			
equipment			
access to equipment			
clearances			
space ventilation			
combustion air			
drainage			
curbs			
freeze protection			
Legend symbols			
Co-ordination with architectural drawings			
structural drawings			
electrical drawings			
Individual detail of			

DRAWING: SCHEMATICS			
DRAWN BY:	CHECKED BY:		
ITEM	CHECKED		
	1st	2nd	final
Domestic water supply			
- valved meter c/w bypass, check valve			
- booster pump incl. pressure gauges			
- isolation valves			
- vibration isolation in piping			
- in pump base			
- check valve			
- pressure reducing valves and gauges			
- hot water recirculating pump and controls			
- hot water heater and accessories			
- boiler piping			
- pressure/temperature relief valve			
- disconnect unions			
- thermal insulation			
- control sequence of element heater			
- pipe diameters			
- pressure gauges			
- thermometer			
- flow measuring devices			
Fire protection water supply			
- supervised stop valve			
- fire pump c/w gauges, valves			
- siamese connection			
- flow switches			
- isolating valves on branches			
- on risers			
- zone annunciators			
- dry pipe valves			
- pipe diameters			
Separate risers for			
- gas supply			
- oil supply and return			
- hot water, check expansion loops and anchors			
- cold water			
- recirculating water			
- drain and vent			
- ventilation			
- smoke shaft, pressurization air supply			
- fire service: water supply, FHC, sprinklers			
- all pipe dimensions incl. changes			

DRAWING: SCHEDULES

DRAWN BY: CHECKED BY:

ITEM	CHECKED		
	1st	2nd	final
Pump schedule - intended service			
- coding			
- model			
- design capacity			
- motor power			
- remarks			
Fan schedule - intended service			
- coding			
- model			
- design capacity			
- motor power			
- remarks			
Coil schedule - design output			
- air flow rate			
- water flow rate			
- air temp. difference			
- water temp. difference			
- number of rows			
- fin spacing			
- water and air pressure drops			