

NOTES:

1. Do not scale drawings.
2. All dimensions and datum are to be checked by the Contractor. Report any discrepancies to the Consultant before proceeding.
3. All prints and specifications are the property of the Consultant. Return all documents at the completion of the project.
4. Drawings must be properly sealed when applying for a building permit.

Copyright Daniels & Wingerak Engineering Ltd.

REVISIONS		
No.	DESCRIPTION	DATE

PROFESSIONAL ENGINEER
 C.N. CONNOLLY
 MEMBER 11610
 13.05 / 15
 SASKATCHEWAN

DWEL FILE: 263 / 12-660

Association of Professional Engineers & Geoscientists of Saskatchewan
 CERTIFICATE OF AUTHORIZATION
DANIELS & WINGERAK ENGINEERING LTD.
 NUMBER C296

PERMISSION TO CONSULT FIELD BY:
 DISCIPLINE: MECHANICAL
 SASK. REG. No.: 11610
 SIGNATURE: [Signature]

DANIELS & WINGERAK ENGINEERING LTD.
 MECHANICAL CONSULTING ENGINEERS

3022 Laurier Street
 Saskatoon, Saskatchewan
 S7J 3L8
 Ph: (306) 477-0678
 Fax: (306) 477-1995
 E-Mail: dwel@dwel.com

CONSULTANT

PROJECT
NATIONAL RESEARCH COUNCIL CHILLER REPLACEMENT

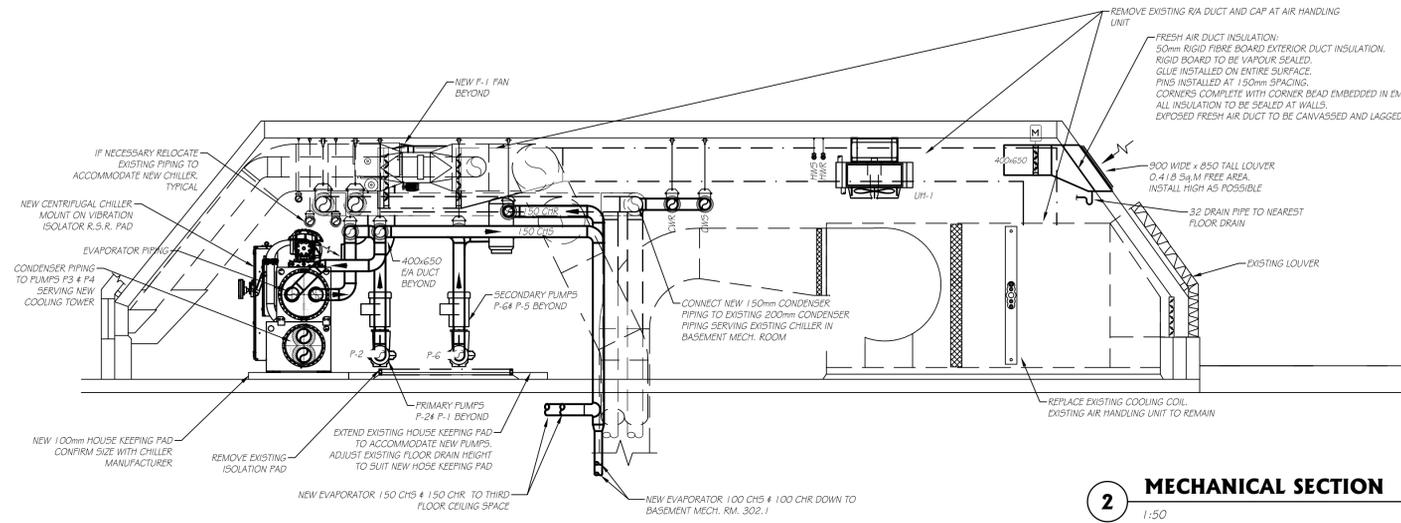
110 - GYMNASIUM PLACE SASKATOON, SK.

DRAWING NAME
4th FLOOR HVAC PLAN

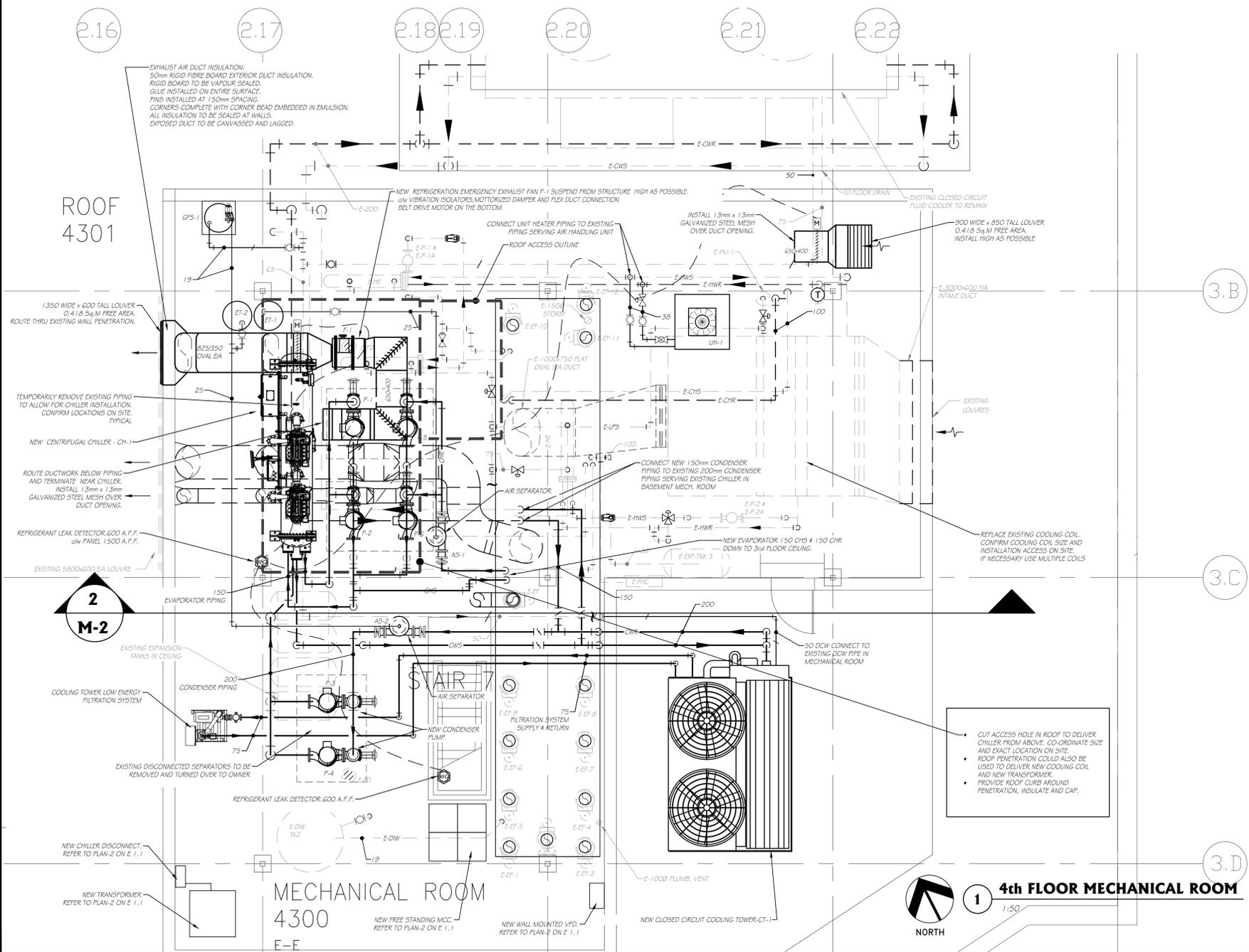
DRAWN : B.G. DRAWING
 DATE : 2013-05-15
 FILE : 12-660
 CHECKED: D.C. **M-1**

1 4th FLOOR MECHANICAL PLAN
 1-100

NORTH



2 MECHANICAL SECTION
1:50



1 4th FLOOR MECHANICAL ROOM
1:50

LEGEND	
SYMBOL	DESCRIPTION
PLUMBING	
	DOMESTIC COLD WATER (DCW)
	HOSE BIBB / WALL HYDRANT
HEATING / COOLING	
	EXISTING SERVICE (xxx INDICATES SERVICE)
	HWS HOT WATER SUPPLY
	HWR HOT WATER RETURN
	CWS CONDENSER WATER - SUPPLY
	CWR CONDENSER WATER - RETURN
	CHR CHILLED WATER SUPPLY
	CHS CHILLED WATER RETURN
	ST STEAM
	COND CONDENSATE (STEAM RETURN)
VALVES & FITTINGS	
	ELBOW UP, ELBOW DOWN
	UNION
	STRAINER
	GATE VALVE
	GLOBE VALVE
	BALL VALVE
	BUTTERFLY VALVE
	CHECK VALVE
	CONTROL VALVE
	CIRCUIT SETTER
	CIRCUIT BALANCING VALVE
	GAS COCK
	RELIEF VALVE
	PRESSURE REDUCING VALVE
	THERMOMETER
	PRESSURE GAUGE
	AAV AUTOMATIC AIR VALVE
	MAV MANUAL AIR VALVE
	FLEXIBLE PIPE CONNECTION
	PIPE ANCHOR
	PIPE GUIDE
	EXPANSION JOINT
	F&T FLOAT AND THERMOSTATIC TRAP
DUCTWORK & CONTROLS	
	RECTANGULAR SUPPLY DUCT
	RECTANGULAR RETURN or EXHAUST DUCT
	DUCT FIRST DIMENSION IS SIDE SHOWN
	TURNING VANES
	DUCT WITH FLEXIBLE CONNECTION
	FLEXIBLE RUNOUT TO DIFFUSER
	SUPPLY REGISTER or GRILLE
	RETURN or EXHAUST REGISTER
	VOLUME DAMPER
	FIRE DAMPER
	MOTORIZED DAMPER
	BACKDRAFT DAMPER
	THERMOSTAT w/ PROTECTIVE GUARD
	HUMIDISTAT w/ PROTECTIVE GUARD
CONTROLS	
	AI ANALOGUE INPUT
	AO ANALOGUE OUTPUT
	DI DIGITAL INPUT
	DO DIGITAL OUTPUT
	DP PRESSURE DIFF. SWITCH
	NC NORMALLY CLOSED
	NO NORMALLY OPEN
	T TEMP. SENSOR
	H HUMIDITY SENSOR
	FS FLOW SWITCH
MISCELLANEOUS	
	G NATURAL GAS

- NOTES:
- Do not scale drawings.
 - All dimensions and datum are to be checked by the Contractor. Report any discrepancies to the Consultant before proceeding.
 - All prints and specifications are the property of the Consultant. Return all documents at the completion of the project.
 - Drawings must be properly sealed when applying for a building permit.
- Copyright Daniels & Wingerak Engineering Ltd.

REVISIONS		
No.	DESCRIPTION	DATE

DWEL FILE: 263 / 12-660
 Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
DANIELS & WINGERAK ENGINEERING LTD.
 NUMBER C296
 PERMISSION TO CONSULT FIELD BY:
 DISCIPLINE: MECHANICAL, SASK. REG. NO.: 11610, SIGNATURE: [Signature]

DANIELS & WINGERAK ENGINEERING LTD.
MECHANICAL CONSULTING ENGINEERS
 3022 Laurier Street
 Saskatoon, Saskatchewan
 S7J 3L8
 Ph: (306) 477-0678
 Fax: (306) 477-1995
 E-Mail: dwel@dwel.com

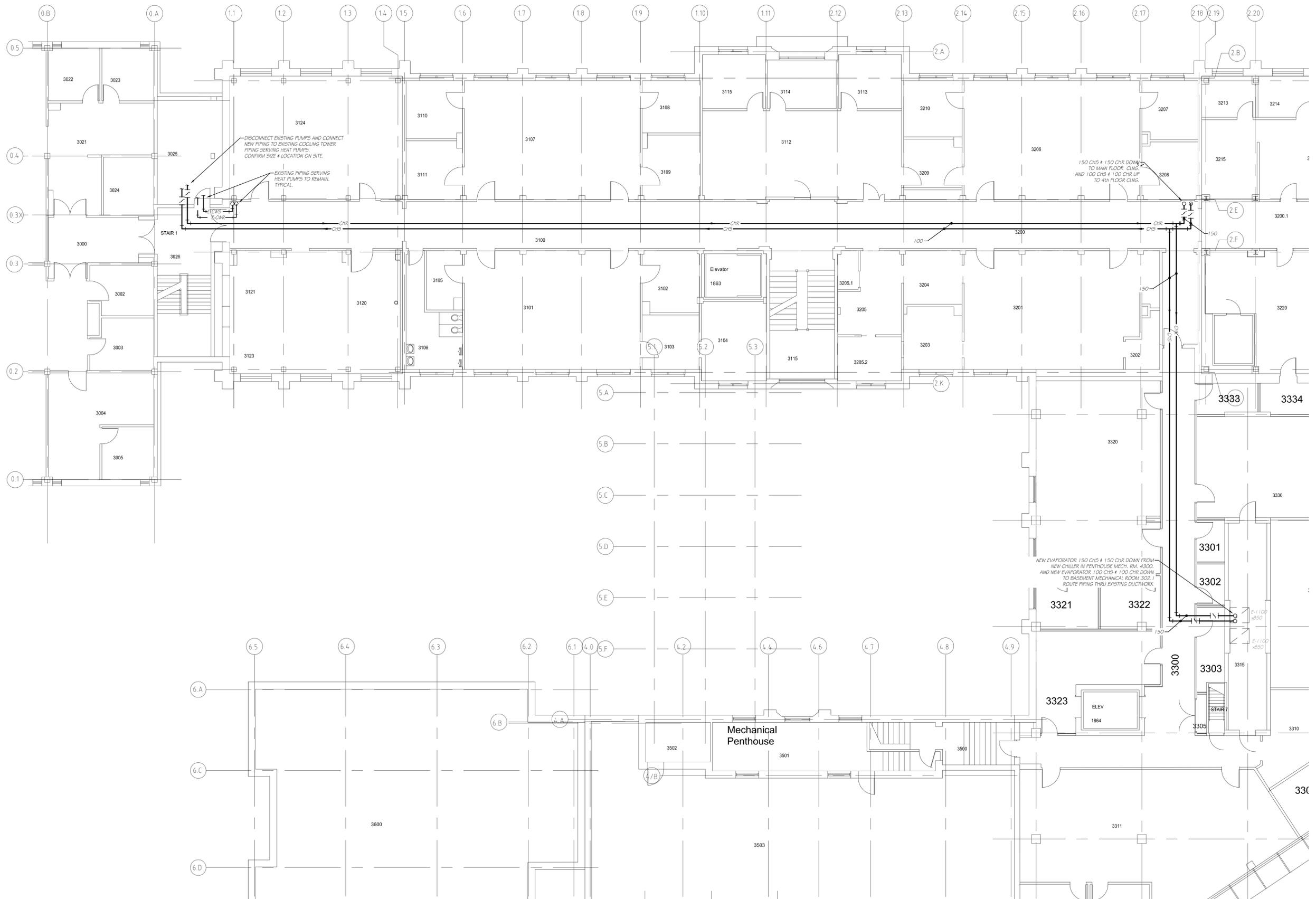
CONSULTANT

PROJECT
NATIONAL RESEARCH COUNCIL CHILLER REPLACEMENT

110 - GYMNASIUM PLACE SASKATOON, SK.

DRAWING NAME
4th FLOOR MECHANICAL ROOM PLAN

DRAWN : B.G. DRAWING
 DATE : 2013-05-15
 FILE : 12-660
 CHECKED: D.C. **M-2**



1 3rd FLOOR HYDRONIC PLAN
1:100

NORTH

NOTES:

1. Do not scale drawings.
2. All dimensions and datum are to be checked by the Contractor. Report any discrepancies to the Consultant before proceeding.
3. All prints and specifications are the property of the Consultant. Return all documents at the completion of the project.
4. Drawings must be properly sealed when applying for a building permit.

Copyright Daniels & Wingerak Engineering Ltd.

REVISIONS		
No.	DESCRIPTION	DATE

PROFESSIONAL ENGINEER
C.S. CONLEY
MEMBER 11610
13.05 / 15
SASKATCHEWAN

DWEL FILE: 263 / 12-660

Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
DANIELS & WINGERAK ENGINEERING LTD.
NUMBER C296

PERMISSION TO CONSULT HELD BY:
DISCIPLINE: MECHANICAL
SASK. REG. No.: 11610

DANIELS & WINGERAK ENGINEERING LTD.
MECHANICAL CONSULTING ENGINEERS

3022 Louise Street
Saskatoon, Saskatchewan
S7J 3L8
Ph: (306) 477-0678
Fax: (306) 477-1995
E-Mail: dwel@dwel.com

CONSULTANT

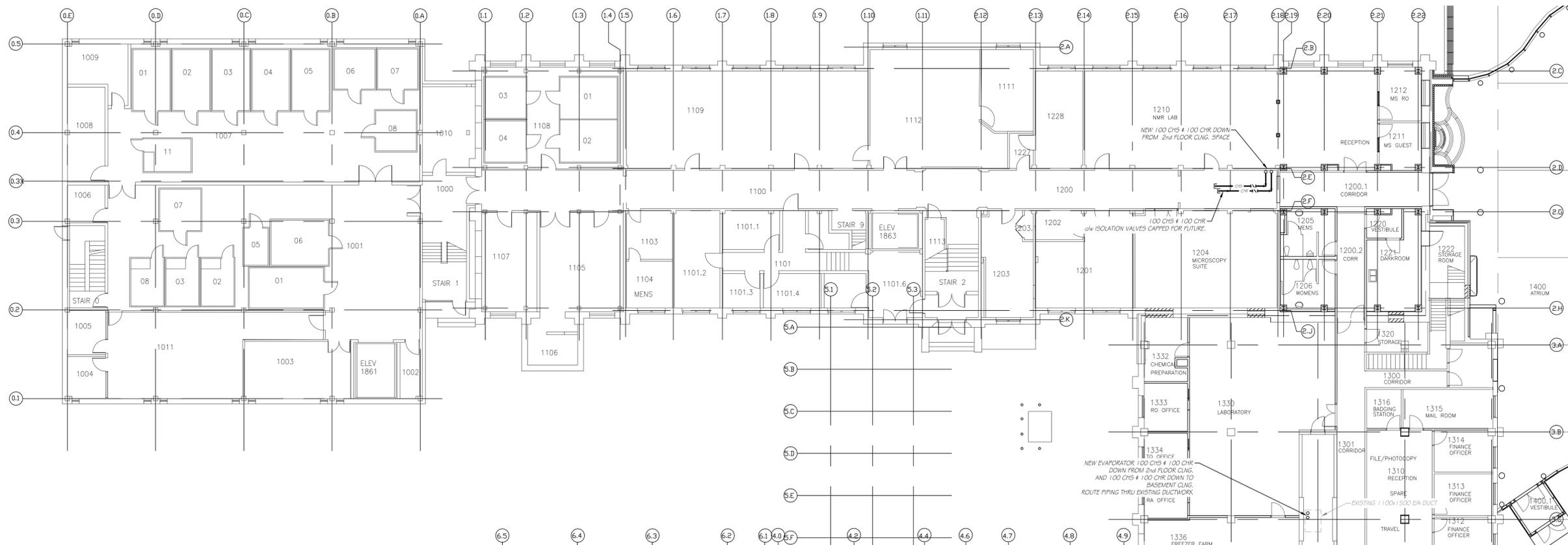
PROJECT
NATIONAL RESEARCH COUNCIL CHILLER REPLACEMENT

110 - GYMNASIUM PLACE SASKATOON, SK.

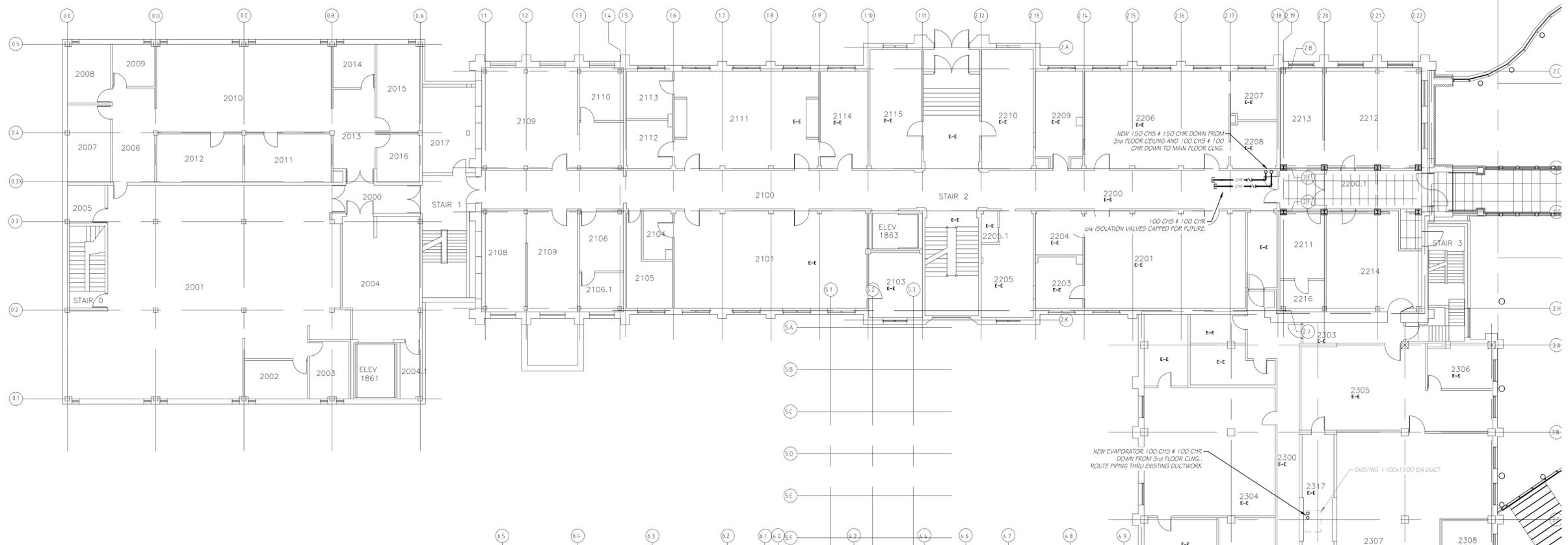
DRAWING NAME
3rd FLOOR HYDRONIC PLAN

DRAWN : B.G. DRAWING
DATE : 2013-05-15
FILE : 12-660
CHECKED: D.C.

M-3



1 MAIN FLOOR HYDRONIC PLAN
1:150
NORTH



2 2nd FLOOR HYDRONIC PLAN
1:150
NORTH

- NOTES:
1. Do not scale drawings.
 2. All dimensions and datum are to be checked by the Contractor. Report any discrepancies to the Consultant before proceeding.
 3. All prints and specifications are the property of the Consultant. Return all documents at the completion of the project.
 4. Drawings must be properly sealed when applying for a building permit.
- Copyright Daniels & Wingerak Engineering Ltd.

REVISIONS

No.	DESCRIPTION	DATE

PROFESSIONAL ENGINEER
C.N. CONLEY
MEMBER 11610
13.05 / 15
SASKATCHEWAN

DWEL FILE: 263 / 12-660

Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
DANIELS & WINGERAK ENGINEERING LTD.
NUMBER C296

PERMISSION TO CONSULT FIELD BY:
DISCIPLINE: MECHANICAL
SASK. REG. NO.: 11610

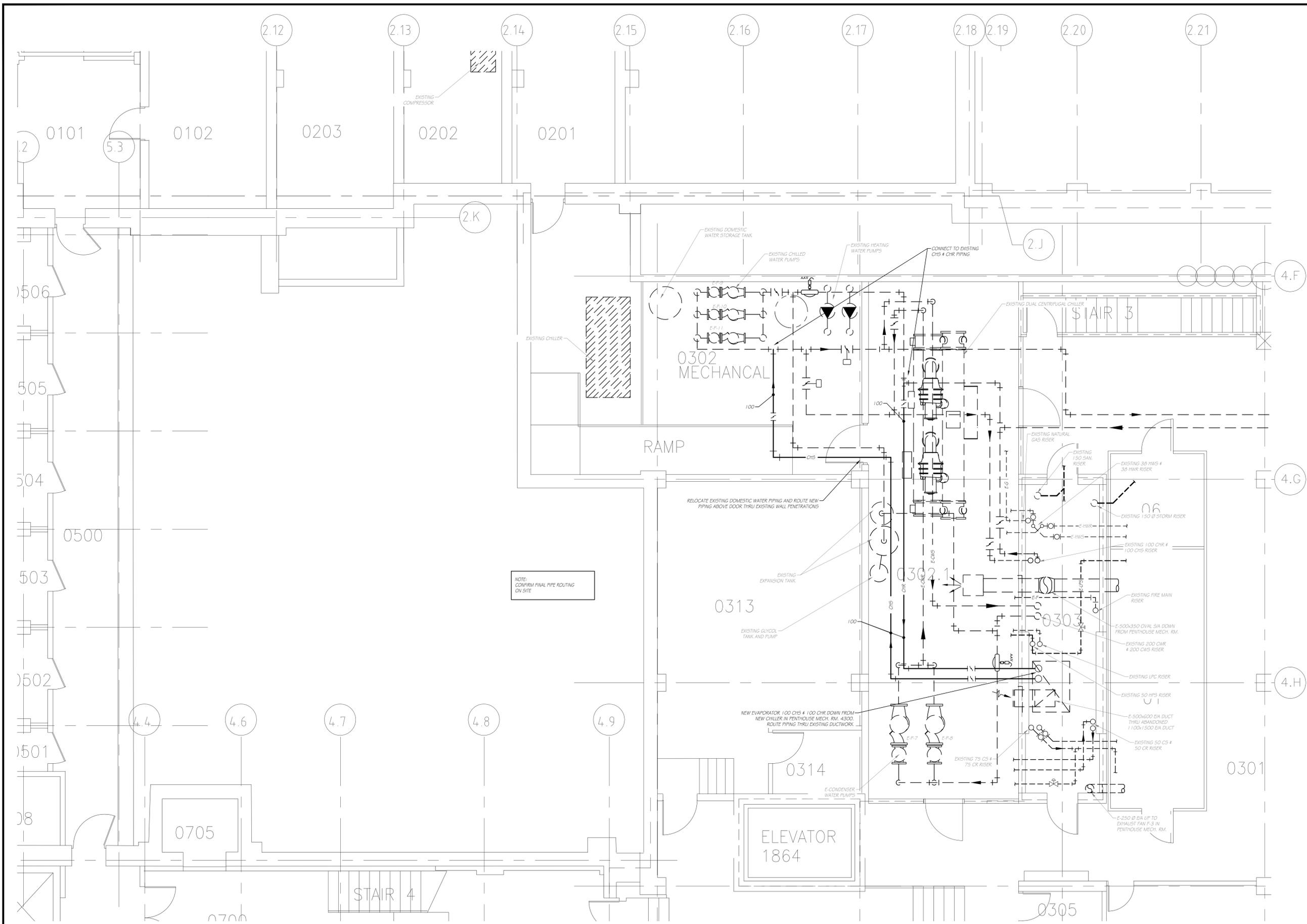
DANIELS & WINGERAK ENGINEERING LTD.
MECHANICAL CONSULTING ENGINEERS

3022 Laurier Street
Saskatoon, Saskatchewan
S7J 3L8
Ph: (306) 477-0678
Fax: (306) 477-1995
E-Mail: dwel@dwel.com

CONSULTANT

PROJECT
NATIONAL RESEARCH COUNCIL CHILLER REPLACEMENT
110 - GYMNASIUM PLACE SASKATOON, SK.
DRAWING NAME
MAIN & 2nd FLOOR HYDRONIC PLAN

DRAWN : B.G. DRAWING
DATE : 2013-05-15
FILE : 12-660
CHECKED: D.C. **M-4**



- NOTES:
1. Do not scale drawings.
 2. All dimensions and datum are to be checked by the Contractor. Report any discrepancies to the Consultant before proceeding.
 3. All prints and specifications are the property of the Consultant. Return all documents at the completion of the project.
 4. Drawings must be properly sealed when applying for a building permit.
- Copyright Daniels & Wingerak Engineering Ltd.

REVISIONS		
No.	DESCRIPTION	DATE

PROFESSIONAL ENGINEER
C.W. CONLEY
MEMBER 11610
13.05 / 15
SASKATCHEWAN

DWEL FILE: 263 / 12-660

Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
DANIELS & WINGERAK ENGINEERING LTD.
NUMBER C296

PERMISSION TO CONSULT FIELD BY:

DISCIPLINE	SASK. REG. No.	SIGNATURE
MECHANICAL	11610	

DANIELS & WINGERAK ENGINEERING LTD.
MECHANICAL CONSULTING ENGINEERS

3022 Laurier Street
Saskatoon, Saskatchewan
S7J 3L8
Ph: (306) 477-0678
Fax: (306) 477-1995
E-Mail: dwel@dwel.com

CONSULTANT

PROJECT
NATIONAL RESEARCH COUNCIL CHILLER REPLACEMENT

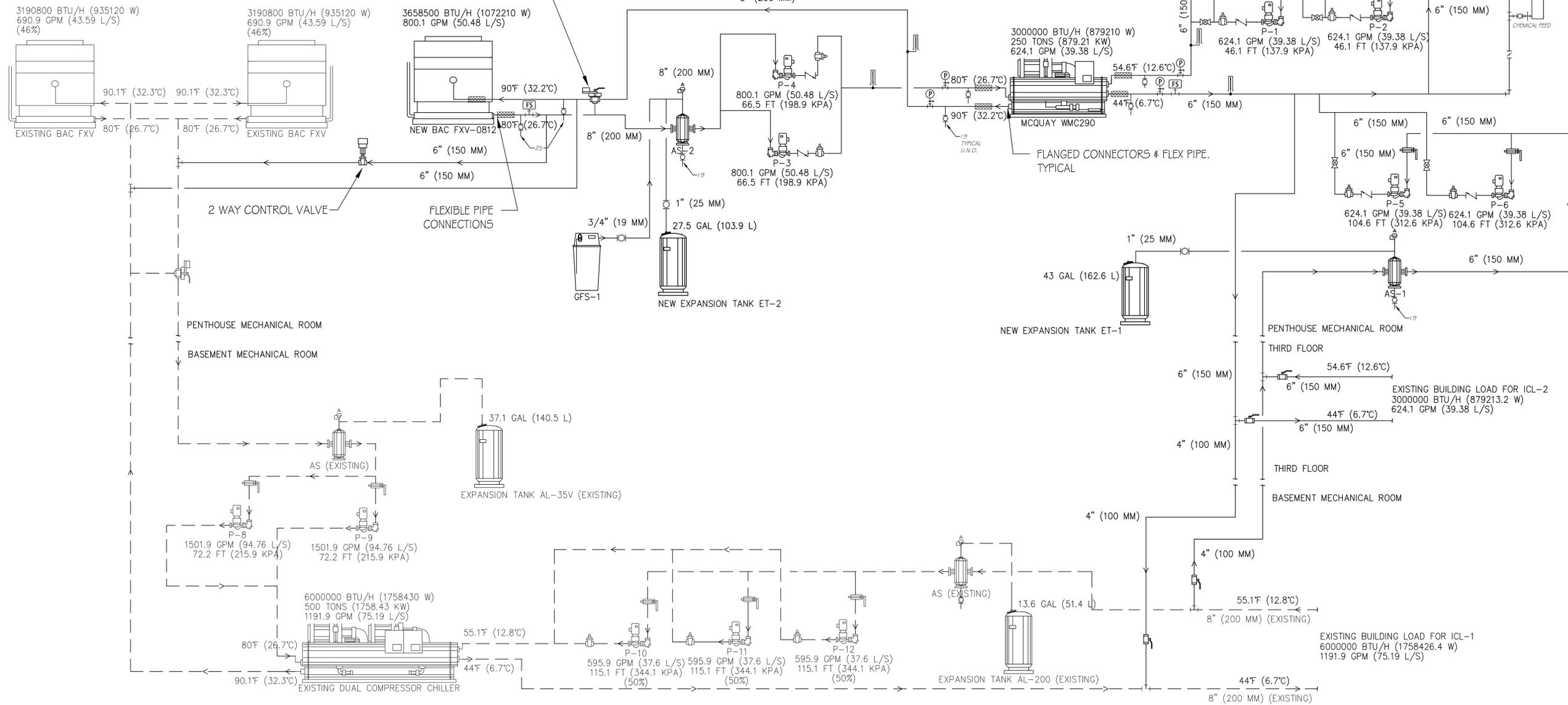
110 - GYMNASIUM PLACE SASKATOON, SK.

DRAWING NAME
BASEMENT MECHANICAL PLAN

DRAWN : B.G. DRAWING
DATE : 2013-05-15
FILE : 12-660
CHECKED: D.C.

M-5

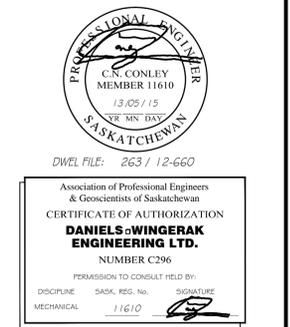
1 **BASEMENT MECHANICAL PLAN**
1:50



1 CHILLED WATER SYSTEM PIPING SCHEMATIC
N.T.S.

NOTES:
 1. Do not scale drawings.
 2. All dimensions and datum are to be checked by the Contractor. Report any discrepancies to the Consultant before proceeding.
 3. All prints and specifications are the property of the Consultant. Return all documents at the completion of the project.
 4. Drawings must be properly sealed when applying for a building permit.
 Copyright Daniels Wingerak Engineering Ltd.

REVISIONS		
No.	DESCRIPTION	DATE



DANIELS WINGERAK ENGINEERING LTD.
 MECHANICAL CONSULTING ENGINEERS
 3022 Laurier Street
 Saskatoon, Saskatchewan
 S7J 3L8
 Ph: (306) 477-0678
 Fax: (306) 477-1995
 E-Mail: dwel@dwel.com

CONSULTANT

PROJECT
NATIONAL RESEARCH COUNCIL CHILLER REPLACEMENT
 110 - GYMNASIUM PLACE SASKATOON, SK.

DRAWING NAME
SCHEMATICS

DRAWN : B.G. DRAWING
 DATE : 2013-05-15
 FILE : 12-660
 CHECKED: D.C. **M-6**

Unit Heater Schedule

Force Flo No.	Location	Installation Style	Heating Output KW	Air flow L/S	Water Flow m ³ /hr	RPM	Motor Watts	Manufacture Model No.
UH-1	Penthouse Mech Rm. 4300	Vertical	0.1	2973.1	3.9	1050	373	Engineered Air V-9

- Notes:
- 1) Refer to Electrical Drawings and Specifications for motor electrical requirements, motor starters, etc.
 - 2) Performance data based on 82.2°C E.W.T., 15.6°C E.A.T and 16.6°C W.T.D.

Fan Schedule - Metric Units

Fan No.	Location	System	Air Flow liter/sec	Ext. Static Pa	RPM	Power kW	Motor kW	Blower Wheel Type	Manufacture Model No.	Control
F-1	Penthouse Mech Rm. 4300	Refrigeration Emergency Exhaust	1557	125	1082	1.28	1.49	Forward Curved	Cook DBX-10	Interlocked with Refrigerant Detectors & Motorized Dampers

- Notes:
- 1) Refer to Electrical Drawings and Specifications for motor electrical requirements, motor starters, etc.

Cooling Coil Schedule

Coil No.	Location	System	Qty	Type	Height mm	Length mm	Rows	Fins #/m	Airflow L/s	F.V. m/s	A.P.D. Pa.	E.A.T.				Total Capacity kW	E.W.T.		W-Flow m ³ /hr	W.P.D. kPa	Glycol %
												°C db	°C wb	°C db	°C wb		°C	°C			
CC-1	Penthouse Mech Rm. 4300	Existing AHU	1	W	990.6	3200.4	12	472	8,967	2.83	427.5	30.6	19.4	12.4	213.8	7.2	12.7	35.73	65.5	35	
CC-2	Penthouse Mech Rm. 4300	Existing AHU	1	W	990.6	3200.4	12	472	8,967	2.83	427.5	30.6	19.4	12.3	213.8	7.2	12.7	35.73	65.5	35	

- Notes:
- 1) Replace existing Cooling Coil with CC-1 & CC-2
 - 2) Confirm Cooling Coil size on site

COOLING TOWER SCHEDULE

ID	MANUFACTURER AND MODEL NUMBER	LOCATION	TYPE	FLUID										ELECTRICAL, FAN				PHYSICAL		NOTES
				FAN AIRFLOW (CFM) (M ³ /H)	AMBIENT TEMP DBWB (°F) (°C)	FLOW RATE (GPM) (L/S)	ENTERING/ LEAVING TEMP (°F) (°C)	WORKING FLUID (KPA)	INLET/ OUTLET HEAD LOSS (FT)	MOTOR QUAN	MOTOR SIZE (HP)	MOTOR SPEED (RPM)	TOWER AND CONTROL CIRCUIT VOLT/PHHZ	OPERATING WEIGHT (LB)	LENGTH/ WIDTH/ HEIGHT (IN) (MM)					
NEW BAC FXV-0812	BAC FXV-0812B-320-N	ROOF	CLOSED, AXIAL	43000	87.08/83.86	800.1	90/80	35% E GLY	0/0	1	25	1750	575/3/60	120/1/60	8500	90/102/156				

EXPANSION TANK SCHEDULE

ID	MANUFACTURER AND MODEL NUMBER	LOCATION	TYPE	FLUID				PHYSICAL				NOTES
				WORKING FLUID	MIN. TANK ACCEPTANCE (GAL) (L)	TANK SIZE (GAL) (L)	RELIEF VALVE (PSIG) (KPA)	DIAMETER (IN) (MM)	NPT FITTING (IN) (MM)			
ET-1	TACO CA-215	MECH. RM. 4300	VERT BLADDER FULL	35% E GLY	43/15.1	57	30	2058/875	0.5	1	1	
ET-2	TACO CA-90	MECH. RM. 4300	VERT BLADDER FULL	35% E GLY	182.6/57.1	215.77	206.84	500/1495.4	15	1	1	

1. ASME CERTIFIED

PUMP SCHEDULE

ID	MANUFACTURER AND MODEL NUMBER	LOCATION	TYPE	FLUID			PUMP			ELECTRICAL				NOTES
				FLOW RATE (GPM) (L/S)	WORKING FLUID	HEAD LOSS (FT)	EFFICIENCY (%)	CONSTRUCTION	MOTOR SIZE (HP) (KW)	MOTOR BHP (HP) (KW)	MOTOR SPEED (RPM)	VOLT/PHHZ		
P-1	TACO KS6009	MECH. RM. 4300	VERTICAL INLINE	624.1	35% E GLY	46.1	78.7	BRONZE FITTED	15	9.963	1760	575/3/60	1	
P-2	TACO KS6009	MECH. RM. 4300	VERTICAL INLINE	624.1	35% E GLY	46.1	76.7	BRONZE FITTED	15	9.983	1760	575/3/60	1	
P-3	TACO KS6009	MECH. RM. 4300	VERTICAL INLINE	800.1	35% E GLY	66.5	80.4	BRONZE FITTED	20	17.481	1760	575/3/60	1	
P-4	TACO KS6009	MECH. RM. 4300	VERTICAL INLINE	800.1	35% E GLY	66.5	80.4	BRONZE FITTED	20	17.481	1760	575/3/60	1	
P-5	TACO KS4007	MECH. RM. 4300	VERTICAL INLINE	624.1	35% E GLY	80	74.5	BRONZE FITTED	25	23.31	3500	575/3/60	1	
P-6	TACO KS4007	MECH. RM. 4300	VERTICAL INLINE	624.1	35% E GLY	80	74.5	BRONZE FITTED	25	23.31	3500	575/3/60	1	

1. SUCTION DIFFUSER MODEL (SUCTION SIDE), NOT SPECIFIED, NON-GROOVED

ELECTRICAL COORDINATION SCHEDULE

DESCRIPTION	ID	LOCATION	ELECTRICAL							POWER BY		STARTER BY	DISCONNECT BY	VFD	EMERGENCY POWER	NOTES
			VOLT/PHHZ	CIRCUIT	MCA	HP	KW	MOC	FLA	E	M					
CHILLER, WATER-COOLED	MCQUAY WMC290	MECH. RM. 4300	460/3/60		249							X				1, 3
COOLING TOWER, FAN	NEW BAC FXV-0812	ROOF	575/3/60			25	18.5					X			X	1
COOLING TOWER, PUMP	NEW BAC FXV-0812	ROOF	575/3/60			5	3.7					X				1
GLYCOL FEED SYSTEM	GFS-1	MECH. RM. 4300										X				1
PUMP	P-1	MECH. RM. 4300	575/3/60			15	11					X				
PUMP	P-2	MECH. RM. 4300	575/3/60			15	11					X				
PUMP	P-3	MECH. RM. 4300	575/3/60			20	15					X				
PUMP	P-4	MECH. RM. 4300	575/3/60			20	15					X				
PUMP	P-5	MECH. RM. 4300	575/3/60			25	18.5					X				
PUMP	P-6	MECH. RM. 4300	575/3/60			25	18.5					X				
Unit Heater	UH-1	MECH. RM. 4300				0.5	0.373									
Exhaust Fan	F-1	MECH. RM. 4300				2	1.49									

1. CONTROL CIRCUIT: 120V/1PH/60HZ
2. CONTROL CIRCUIT: 24V/1PH/60HZ
3. PROVIDE 575/460 TRANSFORMER

CENTRIFUGAL CHILLER SCHEDULE

Unit Description:
 McQuay Model Number: WMC290DBS15R/E2612-CE-2**/C2212-CLY-2****/R134-CAABA (Weight- 4,862 kg)
 Approval: ETL Listed / ETL Listed to Canadian Safety Standards (ETL Label / ETL Label)

Chiller Data:

Unit:	Compressor Type / Quantity - Size:	Centrifugal / 2 - 290
	Capacity (ton):	250.0
	Capacity Control:	VFD / Inlet guide vanes
	Refrigerant:	R134a
	Refrigerant Charge (lb):	1,100
	Oil Cooler Type:	None
	ASHRAE 90.1 Compliance:	'04, '07 & '10
Evaporator:	Flow (gpm):	625.0
	LWT (°F):	45.0
	Number of Passes:	2
	Fouling Factor ("F.R." n/Btu):	0.00010
	Tube Material:	Cu
	Tube Wall Thickness (in):	0.025
	Percentage of Water:	100
	Minimum Flow (gpm): (see note 3)	180.3
Condenser:	Flow (gpm):	750.0
	EWT (°F):	80.0
	Number of Passes:	2
	Fouling Factor ("F.R." n/Btu):	0.00025
	Tube Material:	Cu
	Tube Wall Thickness (in):	0.025
	Percentage of Water:	100
Motor/Starters:	Starter Type:	VFD/Integral
	Unit Voltage (V/Hz/Ph):	460/60/3
	Approval Listing:	CA ETL, ETLc
	Data Plate RLA per Unit (A): (see note 4)	186
	Data Plate LRA per Compressor (A):	110
	Enclosure Type:	NEMA 1 gasketed
	Starter Location:	Terminal mounted
	Disconnect Type:	Non-Fusible Disconnect
	Control Circuit Transformer:	Without taps
	Power Connection:	Single point
	Maximum Fuse Size (A):	300
	Data Plate MCA (A): (see note 4)	200
	Motor Protection:	Standard
	Ground Fault:	Yes
	Short Circuit Current Rating:	Standard. (power panels only)
	VFD Power Filters:	None

Design Performance rated at AHRI Condenser Relief:

Capacity (ton)	Input (kW)	Performance (kW/ton)	Operating				Evaporator				Condenser			
			RLA (A)	NPLV (kW/ton)	75% Load (kW/ton)	50% Load (kW/ton)	25% Load (kW/ton)	PD (ft.H ₂ O)	EW (°F)	PD (ft.H ₂ O)	LWT (°F)			
250.0	128.6	0.514	186	0.302	0.372	0.265	0.257	20.0	54.6	14.6	89.1			

Performance Points rated at AHRI Condenser Relief:

Point #	%Load Request	Capacity (ton)	Input Power (kW)	Performance (kW/ton)	RLA (A)	Evaporator				Condenser			
						Flow (gpm)	EWT (°F)	LWT (°F)	PD (ft.H ₂ O)	Flow (gpm)	EWT (°F)	LWT (°F)	PD (ft.H ₂ O)
1	100.0	250.0	128.6	0.514	186	625.0	54.6	45.0	20.0	750.0	80.0	89.1	14.6
2	75.0	187.5	69.7	0.372	104	625.0	52.2	45.0	20.1	750.0	72.5	79.1	15.0
3	50.0	125.0	33.1	0.265	56	625.0	49.8	45.0	20.2	760.0	65.0	69.3	15.5
4	25.0	62.5	16.0	0.257	27	625.0	47.4	45.0	20.3	750.0	65.0	67.1	15.6

Sound Pressure:

Load	Overall	A Weighted							
		63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz
100%	81.5	37.5	51.5	59.5	72.0	75.0	72.5	76.5	75.0
75%	78.0	37.0	50.5	62.5	66.5	70.0	69.5	74.0	70.5
50%	75.0	37.5	50.0	60.0	65.0	65.5	68.0	71.5	66.0
25%	73.5	37.5	49.0	59.0	63.0	65.0	66.0	69.5	64.0

Sound Pressure (dB) measured in accordance with ANSI/AHRI Standard 575-2008 (A-weighted)

Service Points rated at AHRI Condenser Relief:

Point #	Refrig. Charge (lb)	Data Plate LRA (A)	PD Capacity (lb)	Evaporator				Condenser			
				Superheat (°F)	Subcooling (°F)	Temp (°F)	Pressure (psig)	Temp (°F)	Pressure (psig)	Temp (°F)	Pressure (psig)
1	1,100	110	1,276	1.0	8.8	42.4	37.4	7.2	90.7	105.6	6.2
2	1,100	110	1,276	1.0	7.0	43.0	38.0	7.2	80.3	87.2	6.2
3	1,100	110	1,276	1.0	4.9	43.7	38.7	7.2	70.1	71.2	6.2
4	1,100	110	1,276	1.0	2.4	44.8	39.8	7.2	67.4	67.4	6.2

Certification:

Notes:

1. Above RLA values are per Unit.
2. Performance kW values are total kW, unless noted otherwise.
3. Minimum flow is based upon standard condenser water relief and not increased lift due to constant condenser water temperature.
4. The field wiring must be sized in accordance with the MCA and not the RLA as some selections may be below the minimum required protection.

NOTES:

1. Do not scale drawings.
2. All dimensions and datum are to be checked by the Contractor. Report any discrepancies to the Consultant before proceeding.
3. All prints and specifications are the property of the Consultant. Return all documents at the completion of the project.
4. Drawings must be properly sealed when applying for a building permit.

Copyright Daniels & Wingerak Engineering Ltd.

REVISIONS

No.	DESCRIPTION	DATE



DWEL FILE: 263 / 12-660



DANIELS & WINGERAK ENGINEERING LTD.
 MECHANICAL CONSULTING ENGINEERS

3022 Louise Street
 Saskatoon, Saskatchewan
 S7J 3L8
 Ph: (306) 477-0678
 Fax: (306) 477-1995
 E-Mail: dwel@dwel.com

CONSULTANT

PROJECT

NATIONAL RESEARCH COUNCIL CHILLER REPLACEMENT

110 - GYMNASIUM PLACE SASKATOON, SK.

DRAWING NAME

MECHANICAL SCHEDULES

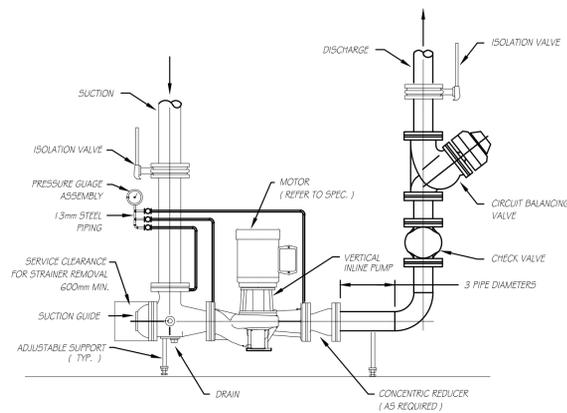
DRAWN : B.G. DRAWING

DATE : 2013-05-15

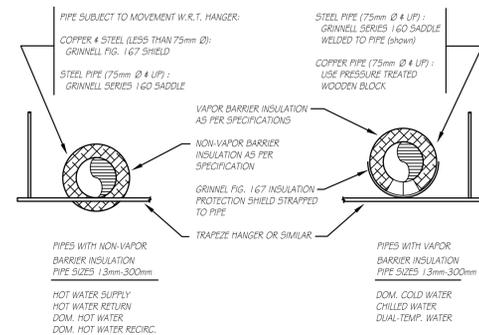
FILE : 12-660

CHECKED: D.C.

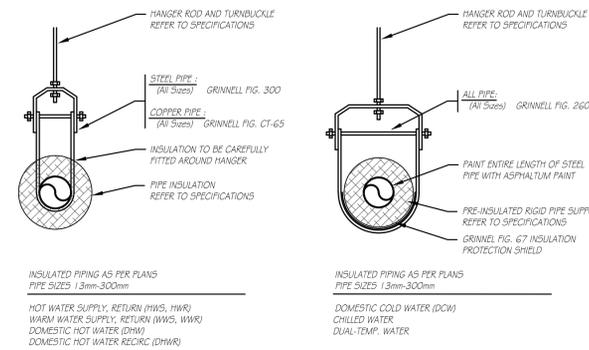
M-7



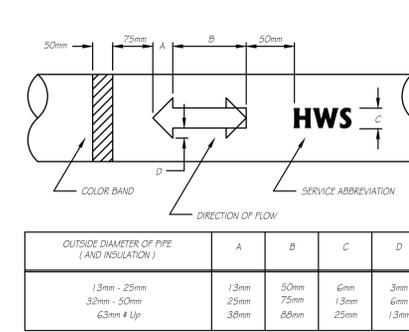
1 PUMP PIPING DETAIL
N.T.S.



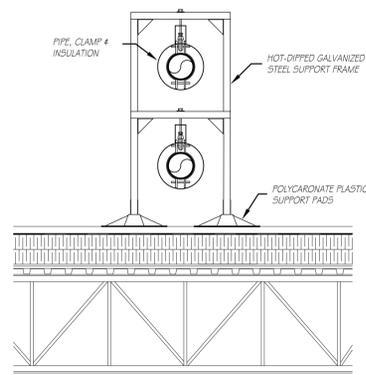
2 PIPE INSULATION DETAIL
N.T.S.



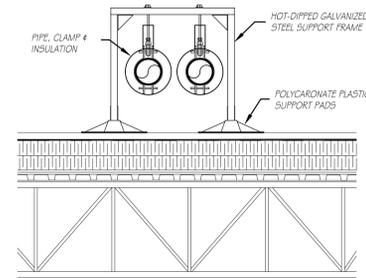
3 PIPE INSULATION DETAIL
N.T.S.



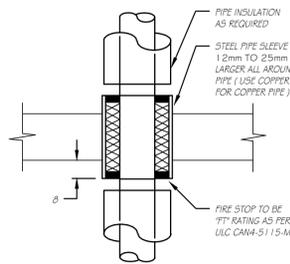
4 PIPE IDENTIFICATION DETAIL
N.T.S.



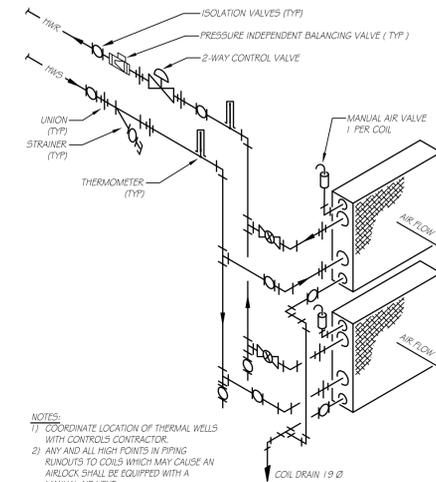
5 ROOF PIPE SUPPORT DETAIL
N.T.S.



6 ROOF PIPE SUPPORT DETAIL
N.T.S.

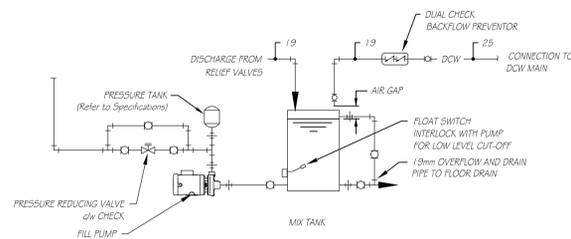


7 PIPE THRU FIRE SEPARATION
N.T.S.



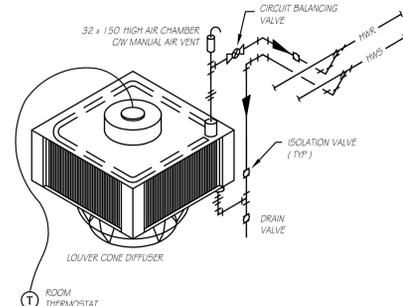
NOTES:
1) COORDINATE LOCATION OF THERMAL WELLS WITH CONTROLS CONTRACTOR
2) ANY AND ALL HIGH POINTS IN PIPING RUNOUTS TO COILS WHICH MAY CAUSE AN AIRLOCK SHALL BE EQUIPPED WITH A MANUAL AIR VENT.
3) IF VENT AND DRAIN CONNECTION ARE NOT ON COIL, PROVIDE CONNECTIONS ON PIPE.

8 COIL PIPING DETAIL
N.T.S.

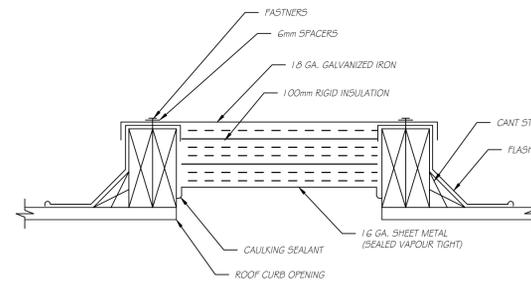


INSTALL FILL TANK AND PUMP ON CONCRETE HOUSEKEEPING PAD INCLUDE RUBBER ISOLATORS FOR PUMP

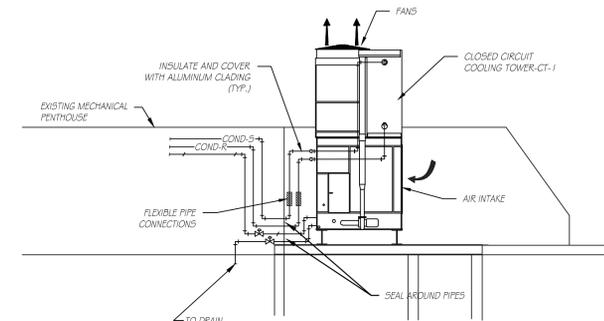
9 HOT WATER OR GLYCOL FILL SYSTEM
N.T.S.



10 PROJECTION UNIT HEATER DETAIL
N.T.S.



12 SEALED ROOF CURB OPENING DETAIL
N.T.S.



11 CLOSED CIRCUIT COOLING TOWER DETAIL
1:100

NOTES:
1. Do not scale drawings.
2. All dimensions and datum are to be checked by the Contractor. Report any discrepancies to the Consultant before proceeding.
3. All prints and specifications are the property of the Consultant. Return all documents at the completion of the project.
4. Drawings must be properly sealed when applying for a building permit.
Copyright Daniels & Wingerak Engineering Ltd.

REVISIONS

No.	DESCRIPTION	DATE

PROFESSIONAL ENGINEER
C. CONLEY
MEMBER 11610
13.05 / 15
SASKATCHEWAN
DWEL FILE: 263 / 12-660
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
DANIELS & WINGERAK ENGINEERING LTD.
NUMBER C296
PERMISSION TO CONSULT FIELD BY:
DISCIPLINE: MECHANICAL
SASK. REG. NO.: 11610
SIGNATURE: [Signature]

DANIELS & WINGERAK ENGINEERING LTD.
MECHANICAL CONSULTING ENGINEERS
3022 Laurier Street
Saskatoon, Saskatchewan
S7J 3L8
Ph: (306) 477-0678
Fax: (306) 477-1995
E-Mail: dwel@dwel.com

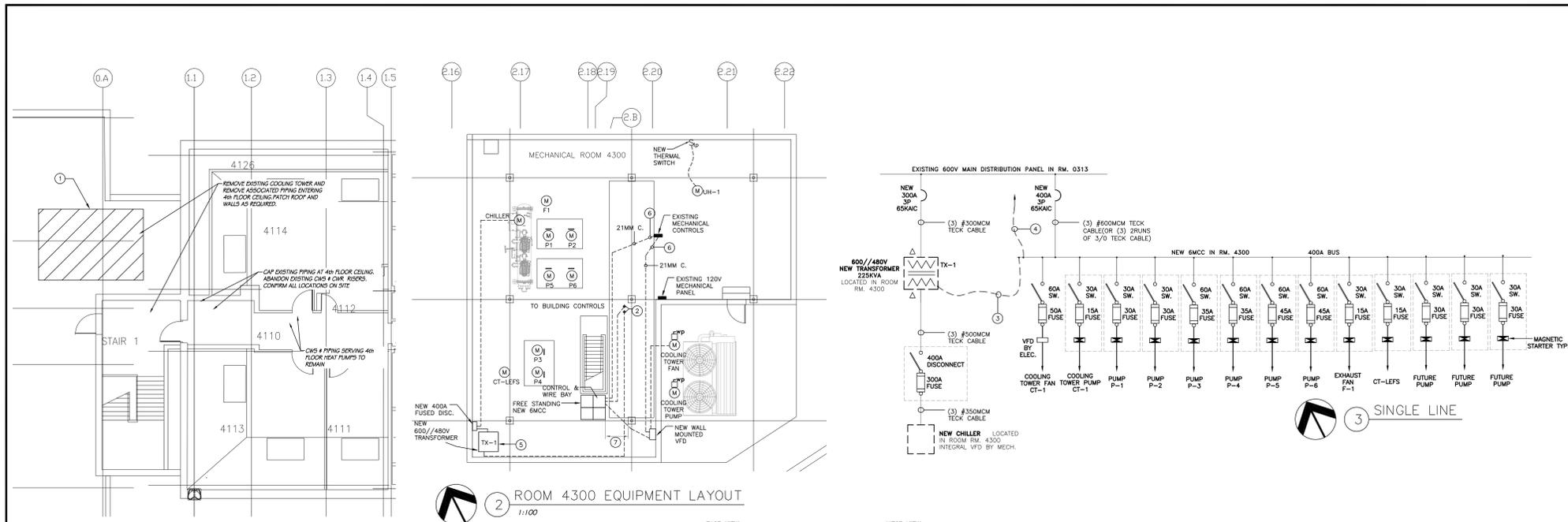
CONSULTANT

PROJECT
NATIONAL RESEARCH COUNCIL CHILLER REPLACEMENT

110 - GYMNASIUM PLACE SASKATOON, SK.

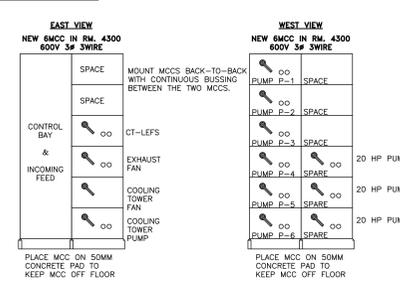
DRAWING NAME
MECHANICAL DETAILS

DRAWN : B.G. DRAWING
DATE : 2013-05-15
FILE : 12-660
CHECKED: D.C. **M-8**



1 PARTIAL FOURTH FLOOR PLAN
1:100

2 ROOM 4300 EQUIPMENT LAYOUT
1:100

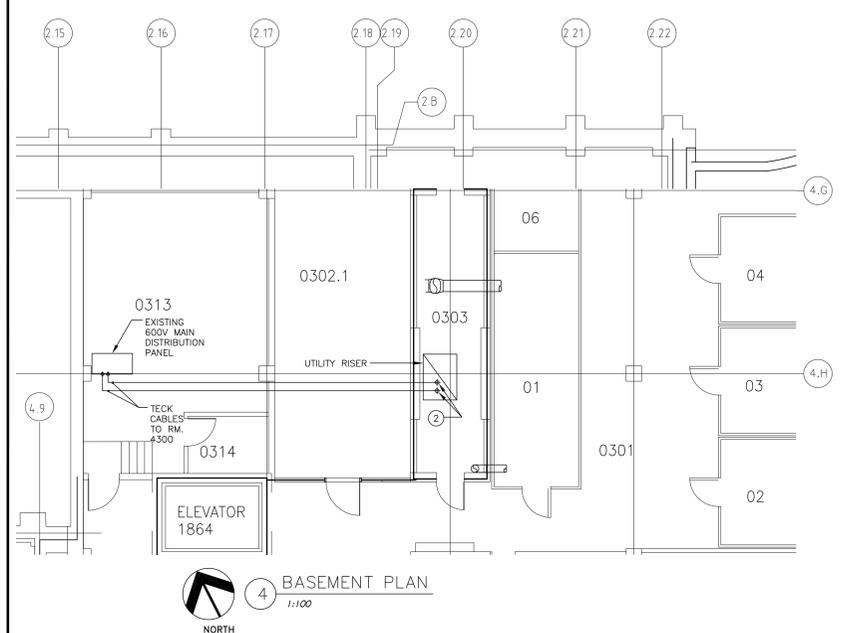


DRAWING NOTES

- REMOVE FEEDERS AND DISCONNECT TO EXISTING COOLING TOWER BACK TO SOURCE.
- CABLES FROM UTILITY RISER, CONFIRM EXACT LOCATION ON SITE. PROVIDE UNISTRUT SUPPORT FOR CABLES AS REQUIRED.
- PROVIDE A #3/0 BARE COPPER BOND TO THE MCC'S BUS.
- PROVIDE A #3/0 BARE COPPER BOND TO THE EXISTING MAIN DISTRIBUTION'S BUS.
- FRONT OF TRANSFORMER SHALL FACE EAST TO AVOID CLEARANCE ISSUES WITH DISCONNECT AND MECHANICAL EQUIPMENT. PLACE TRANSFORMER ON 50MM CONCRETE PAD.
- SPARE CONDUIT SHALL BE C/W PULL STRING FOR INTERLOCKING CONTROLS WITH BUILDING MANAGEMENT SYSTEM.
- ENSURE THERE IS AT LEAST ONE (1) METER CLEARANCE BETWEEN THE NEW MCC AND THE STRUCTURAL COLUMN.

SYMBOL SCHEDULE

- M MOTOR CONNECTION. REFER TO MECHANICAL EQUIPMENT SCHEDULE.
- FVNR FVNR STARTER LOCATED IN MCC BAY.
- NON FUSED DISCONNECT UNLESS SHOWN OTHERWISE. "wp" DENOTES WEATHER PROOF.



4 BASEMENT PLAN
1:100

MECHANICAL EQUIPMENT SCHEDULE

Item	Description	H.P.	Volt	Ø	M.C.A.	FLA	Location	Feeder	Notes
CH-1	CHILLER	-	480V	3	249	-	MECH RM. 4300	(3) #350MCM TECK	-
CT-1	COOLING TOWER FAN	25	600V	3	-	27	ROOF	(3) #10WG+ #10 INSULATED GROUND IN 21MM C.	PROVIDE POWER FROM 6MCC TO FREE STANDING VFD. (NO STARTER IN MCC.)
P1	PUMP	5	600V	3	-	6.1	ROOF	(3) #12WG+ #12 INSULATED GROUND IN 21MM C.	-
P2	PUMP	15	600V	3	-	17	MECH RM. 4300	(3) #12WG+ #12 INSULATED GROUND IN 21MM C.	-
P3	PUMP	15	600V	3	-	17	MECH RM. 4300	(3) #12WG+ #12 INSULATED GROUND IN 21MM C.	-
P4	PUMP	20	600V	3	-	22	MECH RM. 4300	(3) #10WG+ #10 INSULATED GROUND IN 21MM C.	-
P5	PUMP	25	600V	3	-	27	MECH RM. 4300	(3) #10WG+ #10 INSULATED GROUND IN 21MM C.	-
P6	PUMP	25	600V	3	-	27	MECH RM. 4300	(3) #10WG+ #10 INSULATED GROUND IN 21MM C.	-
UH-1	UNIT HEATER	0.5	120V	-	-	-	MECH RM. 4300	(2) #12WG+ #12 INSULATED GROUND IN 21MM C.	PROVIDE NEW 20A BREAKER IN EXISTING MECHANICAL PANEL.
F-1	EXHAUST FAN	2	600V	-	-	2.7	MECH RM. 4300	(3) #12WG+ #12 INSULATED GROUND IN 21MM C.	-
CT-LEFS	COOLING TOWER LOW ENERGY FILTRATION SYSTEM	3	600V	3	-	3.9	MECH RM. 4300	(3) #12WG+ #12 INSULATED GROUND IN 21MM C.	-
3	FUTURE PUMPS X 3	20	600V	3	-	22	MECH RM. 4300	-	-

- NOTES:**
- Do not scale drawings.
 - All dimensions and datum are to be checked by the Contractor. Report any discrepancies to the Consultant before proceeding.
 - All prints and specifications are the property of the Consultant. Return all documents at the completion of the project.
 - Drawings must be properly sealed when applying for a building permit.
- Copyright Daniels & Wingerak Engineering Ltd.

REVISIONS

No.	DESCRIPTION	DATE
1	ADDITION MECHANICAL UNIT	MAY 24 2013

ASSOCIATION OF PROFESSIONAL ENGINEERS OF SASKATCHEWAN
CERTIFICATE OF AUTHORIZATION
RITENBURG & ASSOCIATES LTD.
NUMBER 52
PERMISSION TO CONSULT HELD BY:
DISCIPLINE: ELECTRICAL
11029

DANIELS & WINGERAK ENGINEERING LTD.
MECHANICAL CONSULTING ENGINEERS
3022 Louise Street
Saskatoon, Saskatchewan S7J 3L8
Tel: (306) 477-8678
Fax: (306) 477-1995
E-Mail: dwe@dwel.com

CONSULTANT

Ritenburg & Associates Ltd.
Consulting Electrical Engineers
8517 - 601 1st Avenue North
Saskatoon, Saskatchewan S7N 1X7
P: (306) 244-0300 F: (306) 244-1307
Email: re@ritenrup.com

PROJECT
NATIONAL RESEARCH COUNCIL
CHILLER REPLACEMENT

110 - GYMNASIUM PLACE SASKATOON, SK.

DRAWING NAME
POWER MECHANICAL SYSTEMS

DRAWN : LEQ DRAWING
DATE : 2013-04-05
FILE : 50289
CHECKED: DCH **E1.1**