MEP EQUIPMENT CONSTRUCTABILITY REVIEW

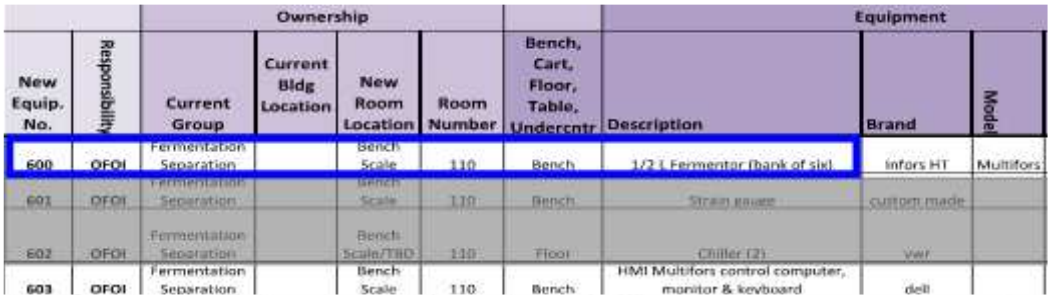
One of the many ways DPR determines the amount of risk involved in a project is through the review of the design documents. If the design documents are difficult to interpret or incomplete the project will be difficult to build, exposing DPR to more risk and unforeseen costs.

A constructability review enables you to define unclear or missing information prior to the start of construction. Communicating this information to the design team and owner can help align the team and clarify information prior to the start of construction.

Because of the complexity of GATTACA's equipment it is essential that the proper utilities are routed to each piece of equipment. Your task will be to review the equipment list provided and confirm all utilities have been identified accordingly on the design documents.

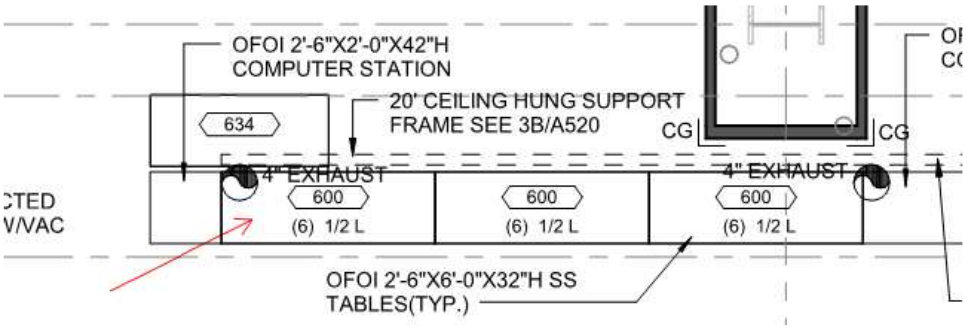
INSTRUCTIONS:

1. Begin with the equipment matrix - select a piece of equipment to review and identify the utilities that are required per the matrix.

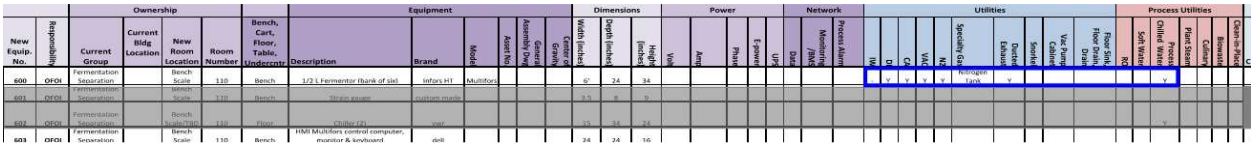


		Ownership					Equipment		
New Equip. No.	Responsibility	Current Group	Current Bldg Location	New Room Location	Room Number	Bench, Cart, Floor, Table, Undercntr	Description	Brand	Model
600	OFOI	Fermentation Separation		Bench Scale	110	Bench	1/2 L Fermentor (bank of six)	Infors HT	Multifors
601	OFOI	Fermentation Separation		Bench Scale	110	Bench	Strain saver	custom made	
602	OFOI	Fermentation Separation		Bench Scale/TBD	110	Floor	Chiller (2)	Var	
603	OFOI	Fermentation Separation		Bench Scale	110	Bench	HMI Multifors control computer, monitor & keyboard	dell	

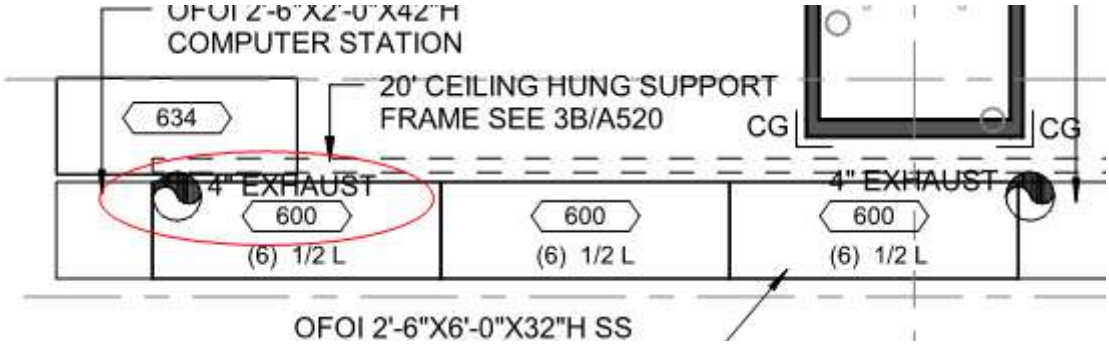
2. Locate the equipment on the Enlarged Architectural Laboratory Plans (A-510.a & A-510.b)



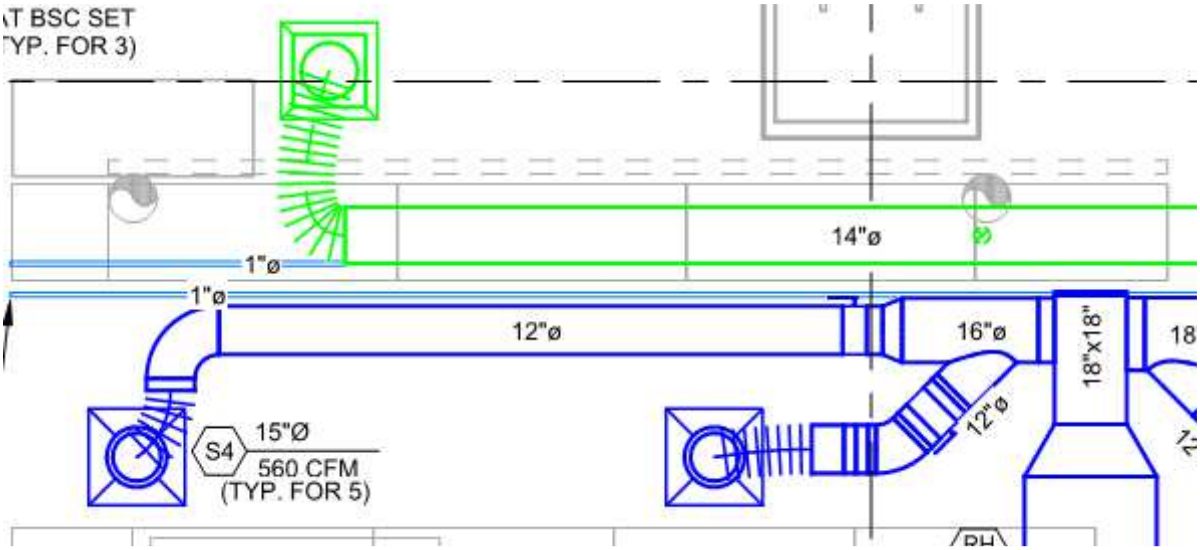
3. Use the MEP plans to see if all utilities are accounted for.
    a. **Example –** Equipment #600 requires DI, CA, VAC, N2, Ducted Exhaust & Process Chilled Water per the equipment matrix. Now review the drawings to ensure they have also been incorporated into the design documents.



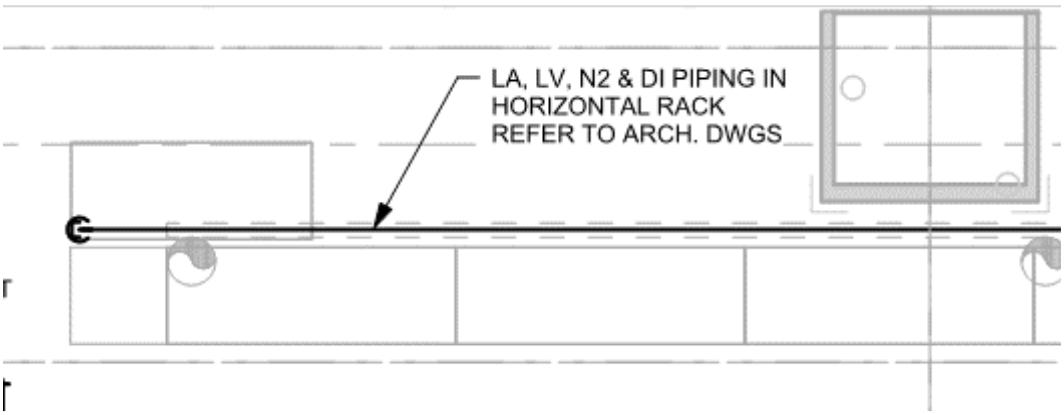
b. **Architectural:** The 4" Ducted exhaust is shown on the architectural plans.



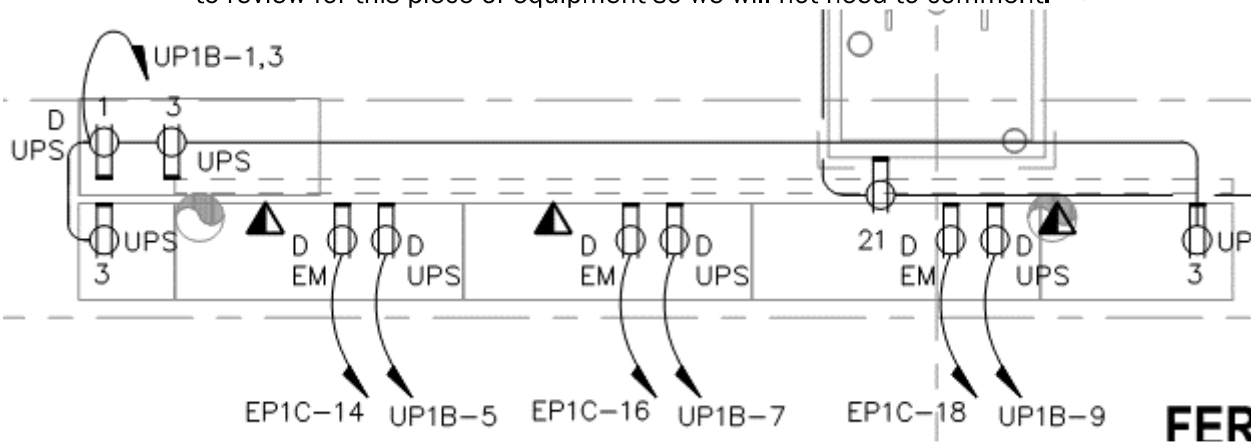
c. **Mechanical:** No ducted exhaust is shown on the mechanical plans. We should make a note of this.



d. **Plumbing:** All required plumbing is shown on the plumbing plans.



e. **Electrical:** The equipment matrix does not specify any specific electrical requirements to review for this piece of equipment so we will not need to comment.



4. If any utilities are missing from the design documents complete the "MEP Equipment Constructability Review" worksheet. An example is shown below.

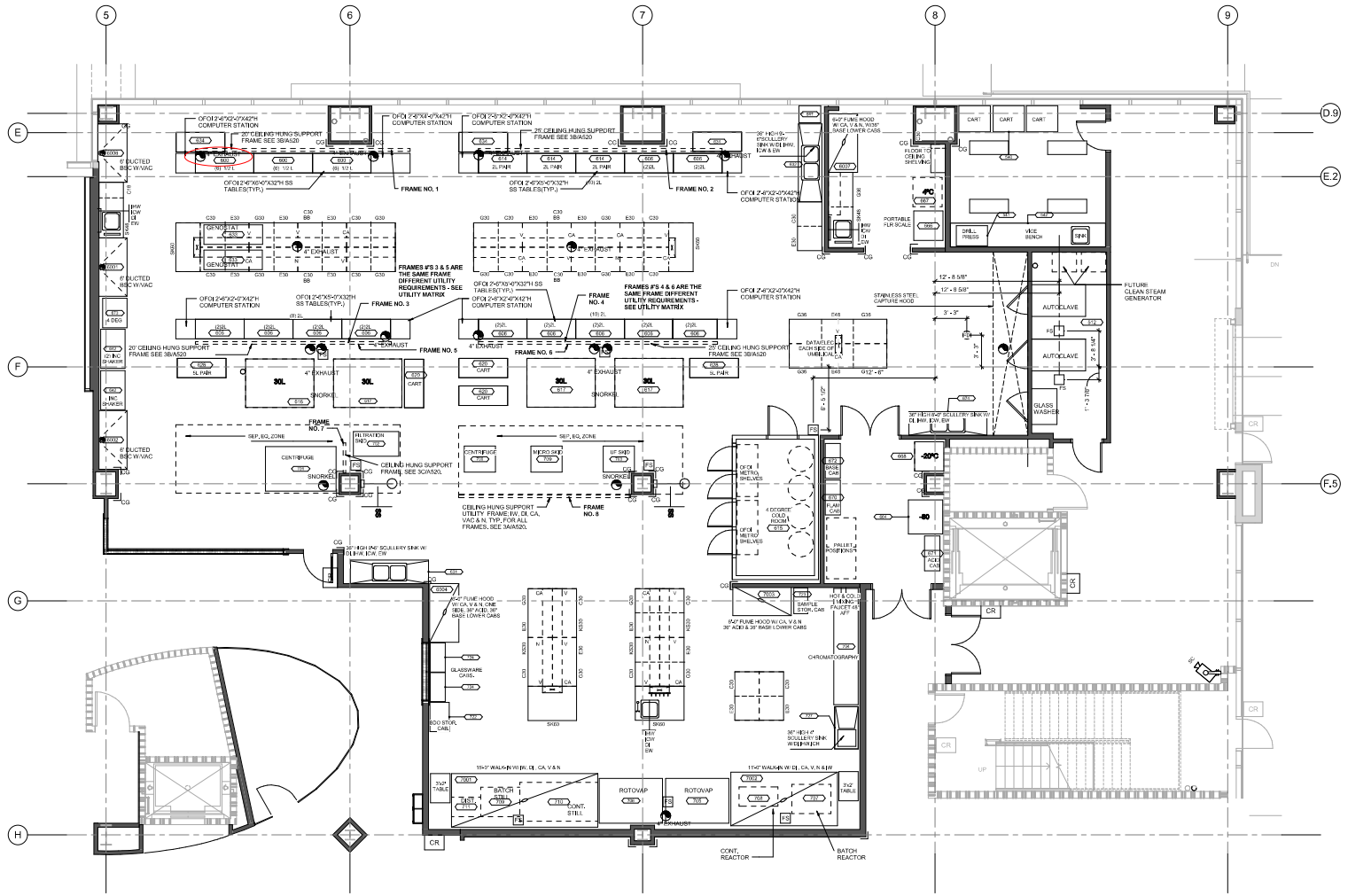
MEP Equipment Constructability Review

Equip #	Equipment Name	Comments
600	1/2 L Fermentor (bank of six)	Ducted exhaust only shown on architectual and DI water is required per the equipment list but is not shown on the plumbing sheets.

		Ownership					Equipment							Dimensions			Power				Network			Utilities												Process Utilities								
New Equip. No.	Responsibility	Current Group	Current Bldg Location	New Room Location	Room Number	Bench, Cart, Floor, Table, Undercntr	Description	Brand	Model	Asset No.	General Assembly Dwg		Center of Gravity	Width (inches)	Depth (inches)	Height (inches)	Volts	Amps	Phase	E-power	UPS	Data	Monitoring /BMS	Process Alarms	IW	DI	CA	VAC	N2	Specialty Gas	Ducted Exhaust	Snorkel	Vac Pump Cabinet	Floor Sink, Floor Drain, Drain		RO	Soft Water	Process Chilled Water	Plant Steam	Culinary	Blowaste	Clean-In-Place	Comments	QTY (now)	Total QTY (inc future)
600	OFOI	Fermentation Separation		Bench Scale	110	Bench	1/2 L Fermentor (bank of six)	Infors HT	Multifors					6'	24	34									-	Y	Y	Y	Y	Nitrogen Tank	Y							Y						1/2 L controls	3	3
601	OFOI	Fermentation Separation		Bench Scale	110	Bench	Strain gauge	custom made						3.5	8	9																											REMOVED FROM SCOPE	10	20
602	OFOI	Fermentation Separation		Bench Scale/TBD	110	Floor	Chiller (2)	vwr						15	34	24																												REMOVED FROM SCOPE	2	3
603	OFOI	Fermentation Separation		Bench Scale	110	Bench	HMI Multifors control computer, monitor & keyboard	dell						24	24	16																												1 computer station per (6) 1/2L fermentors	3	3
604					110																																								
605	OFOI	Fermentation Separation	Ferm	Bench Scale	110	Bench	2 L Computer, Micro FIS I/O box	Sartorius						20	20	10	110	8		Y																										Input/output for up to (16) 2L Reactors	1	2
606	OFOI	Fermentation Separation		Bench Scale	110	Bench	2 L Fermentor, vessel & balance A+ units	sartorius						30	24	32																Y													Ducted exhaust to be 4" w/ blast gate	14	22
607	OFOI	Fermentation Separation		Bench Scale	110	Bench	BR control computer, monitor and keyboard	dell & apple						24	24	24																Y													1 control computer station per (4) 2L fermentors.	6	8
608					110																																							
609					110																																							
610	OFOI	Fermentation Separation		Bench Scale	110	Bench	Presens :ransmitter	Presens						10	12	5																												1 transmitter per (4) 2L fermentors on support frame above reactors	6	7
611	OFOI	Fermentation Separation		Bench Scale	110	Bench	Peristaltic pump (feed pumps	watson marlow						6	8	3.5																												1 pump below each 2L fermentor below	20	30
612	OFOI	Fermentation Separation		Bench Scale	110	Bench	mass flow controller boxes							10	11	6.5																												Controller on support frame above reactors	5	7
613	OFOI	Fermentation Separation		Bench Scale	110	Floor	Chiller	Lauda						18	22	32																												**Process Chillers not required if house process chilled water system. 9 degree C (49 degree F) water**	2	2
614	OFOI	Fermentation Separation		Bench Scale	110	Bench	2 L Fermentor (pair), vessels & balances B+ units	Sartorius						60	30	32											Y	Y	Y			Y							Y					Ducted exhaust to be 4" w/ blast gate	3	3
615	CFCI	Fermentation Separation	Separation	Pilot Plant	110A	Floor	4 degree Cold Room									11'-6"							Y												Floor Sink								Shared with Separation	1	1
616	OFOI	Fermentation Separation	Pilot Lab	Pilot Plant	110	Floor	30L Fermentor #1 skid (steam jacketed)	Sartorius	Cplus					84	60	96	208	20	3	Y		Y			Y	Y	Y	Y	Y		Y	Y		Floor Sink			Y	Y				Accessible space all sides. Articulating arm snorkle exhaust	1	1
617	OFOI	Fermentation Separation	Pilot Lab	Pilot Plant	110	Floor	30L Fermentor #2 skid (steam jacketed)	Sartorius	Cplus					84	60	75	208	20	3	Y		Y			Y	Y	Y	Y	Y		Y	Y		Floor Sink			Y	Y				Accessible space all sides. Articulating arm snorkle exhaust	1	3
620	OFOI	Fermentation Separation	Pilot Lab	Pilot Plant	110	Floor	30 L Computer/Instrument Cart	n/A						36	40	63																												1 cart for each 30L Fermentor	1	2
620A	OFOI	Fermentation Separation	Pilot Lab	Pilot Plant	110	Cart	Brooks MFC Controller box	Brooks	Size 3					12	12	10	110	4		Y																								On cart item #320 or on support frame	1	1
620B	OFOI	Fermentation Separation	Pilot Lab	Pilot Plant	110	Cart	Micro FIS I/O box	Sartorius						20	20	10	110	8		Y																								On cart item #320 or on support frame	1	1
620C	OFOI	Fermentation Separation	Pilot Lab	Pilot Plant	110	Cart	Presens Trnsmitter	Presens						12	12	10	110	0.5		Y																								On cart item #320 or on support frame	1	1
620D	OFOI	Fermentation Separation	Pilot Lab	Pilot Plant	110	Cart	OPTEK Transmitter	OPTEK						12	12	10	115	0.5		Y		Y																								On cart item #320 or on support frame	1	2
620E	OFOI	Fermentation Separation	Pilot Lab	Pilot Plant	110	Cart	Network Switch							8	5	2	110	1		Y																								On cart item #320 or on support frame	1	1
620F	OFOI	Fermentation Separation	Pilot Lab	Pilot Plant	110	Cart	USB to Serial Converter							4	6	1	110	0.5		Y		Y																								On cart item #320 or on support frame	1	2
620G	OFOI	Fermentation Separation	Pilot Lab	Pilot Plant	110	Cart	Desktop PC		B+ Twin					8	17	17				Y		Y					Y		Y			Y												On cart item #320 or on support frame	1	1
628	OFOI	Fermentation Separation	Pilot Lab	Pilot Plant	110	Bench	5 liter Fermentor (pair)	Sartorius						60	24	40	120	30		Y							Y	Y	Y			Y			Floor Sink			Y					Back-to-back with 2' run between. Group with 30L Bioreactors. Ducted exhaust to be 4" w/ blast gate	1	2
629	OFCI	Fermentation Separation	Pilot Lab	TBD	110	Floor	Boiler	Sussman						72	48	60	480V Power 120VC ontrol	44A Power 15A Control	3												Y			Floor Sink		Y							REMOVED FROM SCOPE	1	2
631	CFCI	Fermentation Separation	Pilot Lab	Bench Scale	110	Floor	Scullery Sink							114	30	36									Y	Y								Drain									DI & IW faucets both sides of sink basins.	1	1
632	CFCI	Fermentation Separation	Ferm	Pilot Plant	110	Floor	Scullery Sink							114	30	36									Y	Y								Drain									DI & IW faucets both sides of sink basins.	1	1
633	OFOI	Fermentation Separation	Evolution	Bench Scale	110	Bench	1/2 L Fermestors Genostats	Genomatica						144	36	36	110										Y	Y	Y			Y													1	2
634	OFOI	Fermentation Separation	Ferm	Bench Scale/PP	110	Bench	Offgas Mass Spec for all Fermentors (20 reactors per each MS)	Hiden Analytical						77	24	25	120	10		Y	Y						Y	Y	Y			Y		Y											Has UPS and is included in dimensions. Can be re-arranged to shorter deeper dimension, or UPS under bench for 67" width. Prefer to have this in accessory room due to pump noise and heat.	1	3
634A	OFOI	Fermentation Separation	Ferm		110	Bench	Proteus Valve for Mass Spec	Hiden Analytical									110	5		Y	Y																							Separated for power but dimensions included in Mass Spec above	1	3
640	OFOI	Fermentation Separation	Ferm		110	Floor	DCU 3 Controller for A+ Mass flow Controllers	sartorius	DCU3					32	28	37	110	6		Y	Y							Y		Y														In kneespace or on rack or with noisy equipment	1	1
641	OFOI	Fermentation Separation	Ferm	Equipment Wash	112	Floor	Top loader autoclave	Yamato	sm510					17	21	44	220	11		Y																								by 1/2 L Fermentors & sinks	1	2
642	OFOI	Fermentation Separation	Ferm	Bench Scale	110	Floor	Stackable incubator shakers (2 stack)	New Brunswick	I 26					50	34	55	110	30 (15A each)																										2 X 15 Amp. dimensions listed for 2 stacked units	1	1.5
643	OFOI	Fermentation Separation	Ferm	Bench Scale	110	Bench	micro fuge	Eppendorf						9	12	9	110	7																											2	3
646	OFOI	Fermentation Separation	Ferm	Bench Scale	110	Bench	Refrigerated micro fuge	Eppendorf						24	20	12	110	10																												1	1
647	OFOI	Fermentation Separation	Ferm	Bench Scale	110	Bench	YSI Glucose anlayzer	YSI						24	12	16	110	5																												2	3
650	OFOI	Fermentation Separation	Ferm	Bench Scale	110	Bench	Spectrophotometer	Thermo						12	19	10	110	5																												1	2

		Ownership					Equipment						Dimensions			Power					Network			Utilities										Process Utilities									
New Equip. No.	Responsibility	Current Group	Current Bldg Location	New Room Location	Room Number	Bench, Cart, Floor, Table, Undercntr	Description	Brand	Model	Asset No.	General Assembly Dwg	Center of Gravity	Width (inches)	Depth (inches)	Height (inches)	Volt	Amp	Phase	E-power	UPS	Data	Monitoring /BMS	Process Alarm	IW	DI	CA	VAC	N2	Specialty Gas	Ducted Exhaust	Snorkel	Vac Pump Cabinet	Floor Sink, Floor Drain, Drain	RO	Soft Water	Process Chilled Water	Plant Steam	Culinary	Biowaste	Clean-in-Place	Comments	QTY (now)	Total QTY (inc future)
652	OFOI	Fermentation Separation	Ferm	Bench Scale	110		Label printer	Brady					12	16	11	110	5																									1	1
653	OFOI	Fermentation Separation	Ferm	Pilot Plant	110	Floor	Tool box (undercounter)	Kobalt					30	20	34																											2	2
655	OFOI	Fermentation Separation	Ferm	Bench Scale	110	Floor	Lab cart						45	26	33																											3	4
659	OFOI	Fermentation Separation	Ferm	Bench Scale	110	Bench	FTNIR device	Bruker					24	36	24	110	5													Y											Similar to Mass Spec for sampling up to (6) reactors	0	1
660	OFOI	Fermentation Separation	Ferm	*****		Bench	Evolution Machine (Near Genostat)	Genomatica					21	17	21	110	5									Y		Y													Currently not being used by Fermentation	4	7
661	OFOI	Fermentation Separation	Ferm	*****		Bench	PC - Evolution Machine						11	16	4																										Currently not being used by Fermentation	1	1
662	OFOI	Fermentation Separation	Ferm	Bench Scale	110	Bench	Digital Density Meter						24	12	16	110																											
663	OFOI	Fermentation Separation	Ferm	Bench Scale	110	Bench	Osmometer																																				
664	OFOI	Fermentation Separation	Ferm	Raw Material	113	Floor	-80C freezer, (noisy)	Sanyo	MDF U74VC				48	44	80	208			Y																								
665	CFCI	Fermentation Separation	N	?	110	Floor	Small ice machine						24	24	48																												
666	OFOI	Fermentation Separation		Media Prep	111	Floor	Floor Scale						36	42																													
667	OFOI	Fermentation Separation		Media Prep	111	Floor	Refrig/4 degree freezer						36	36					Y																								
668	OFOI	Fermentation Separation		Raw Material Stor	113	Floor	Freezer -20 degree						36	36					Y				Y																				
669		Fermentation Separation		Raw Material	113	Floor	Freezer -20 degree						36	36																											Omitted at 12/06/12 review meeting w/ PP		
670	CFCI	Fermentation Separation		Raw Material	113	Floor	Flammable Storage Cabinet						43	18	69															Y													
671	CFCI	Fermentation Separation		Raw Material	113	Floor	Acid Storage Cabiet						43	18	69															Y													
672	CFCI	Fermentation Separation		Raw Material	113	Floor	Base Storage Cabinet						43	18	69															Y													
673	OFOI	Fermentation Separation		Bench Scale	110	Floor	Refrigerator 4 degree Freezer						36	36		110			Y				Y																				
674	CFCI	Fermentation Separation		Equipment Wash	112	Floor	Scullery Sink						96	30	36									Y	Y								Drain										
700	OFOI	Fermentation Separation	Separation	Separation	109	Cart	Centrifuge	GEA	CTC1-06-107				45	26	50	110			Y						y					Y			Floor Sink							Y	Includes a feed pump, speed and flow-rate controllers. Requirs near-by scullery sink for cleaning large carboys. This process generates biomass waste.		
701	OFOI	Fermentation Separation	N	Separation	109	Cart	Centrifuge (New)	TBD	TBD				90	45	50				Y						Y					Y			Floor Sink							Y	Includes a feed pump, speed and flow-rate controllers. Requirs near-by scullery sink for cleaning large carboys. This process generates biomass waste.		
702	OFOI	Fermentation Separation	N	Separation	109	Cart	Filtration Skid- Microfiltration (New)	GEA	L				51	28	58	230	15	3							Y					Y			Floor Sink							Y	controllers. Requires cold & hot water supply for heat exchangers. This process generates biomass waste.		
703	OFOI	Fermentation Separation	Separation	Separation	109	Cart	Filtration Skid - Ultra Filtration & Nano Filtration	GEA	L				51	28	58	230			Y						y								Floor Sink			Y				Y	Includes process pump and speed/rate controllers. Requires cold & hot water supply for heat exchangers. **Process Chillers not required if house process chilled water system.**		
704	OFOI	Fermentation Separation	Separation	Separation	109	Table	Chromatography	Ace Glass	50				168	36	96	110																									Includes process pumps and a pump for cerculating temperature control water. Requires cold & hot water supply for heat exchangers.		
705	OFOI	Fermentation Separation	N	Separation	109	Floor	Rotovap Evaporator (new)	Buchi Rotovap	R220				84	48	96	230			Y								Y			Y	Y		Floor Sink			Y					Requires chilled water and vacuum. Includes vacuum pump, controller and chiller. Need ducted exhaust for vac pump.		
706	OFOI	Fermentation Separation	E	Separation	109	Floor	Rotovap Evaporator	TBD					57	36	74	115	15		Y						-		Y	-	-	Y	Y		Floor Sink			Y					Requires chilled water and vacuum. Includes vacuum pump, controller and chiller. Need ducted exhaust for vac pump.		
707	OFOI	Fermentation Separation	Separation	Separation	109	Hood	Batch Reactor (in 10' walk-in fume hood)	Parr	4524				36	50	96	230	15								Y			y	Hydrogen	Y						Y					In walk-in hood #502. Shared, 2'x3' table for PC & controller. System includes a feed pump, and a balance vacuum pump.		
708	OFOI	Fermentation Separation	Separation	Separation	109	Hood	Continuous Reactor (in 10' walk-in fume hood)	Parr	5403				36	36	72													y		Y						Y					In walk-in hood #502. Shared, 2'x3' table for PC & controller. Includes a vacuum pump, a feed pump and chiller.		
709	OFOI	Fermentation Separation	Separation	Separation	109	Hood	Batch Still (in 15' walk-in fume hood)	H-S Martin					48	36	72	230					Y	Y			Y			y		Y						Y					In walk-in hood #501. Shared, 2'x3' table for PC & controller. System includes feed pumps (6), balances (4), vacuum pump and a chiller.		
710	OFOI	Fermentation Separation	Separation	Separation	109	Hood	Continuous Still (in 15' walk-in fume hood)	custom					96	48	96															Y						Y					In walk-in hood #501. Shared, 2'x3' table for PC & controller. System includes vacuum pump, heat transfer fluid ciculating bath/pump, feed pump and chiller.		

ID		Ownership				Hood							Dimensions			Utilities									Power						Network		
New Equip. No.	Responsibility	Current Group	Current Bldg Location	New Room Location	Room Number	Biosafety Cabinet, Fume Hood, Ventilated Enclosure, Weigh Enclosure, Glove Box	Bench, Floor, Table	Description	Brand	Model	Asset No.	Distillation Grid	Width	Depth	Height	IW	DI	CA	VAC	N2	Specialty Gas	Ducted, Recirculating	Vac Pump Cabinet	Drain	Volt	Amp	Phase	E-power	UPS	Grounding Buss	Data	Monitoring /BMS	Comments
4002	CFCI	Analytical	New	Instrument Lab	121	Fume Hood	Bench	8' Fume Hood	TBD				8'	36"				Y	Y	Y		Ducted								Y			48" Acid & Base lower cabinets
6001	CFCI	Fermentation Separation	New	Bench Scale	110	Biosafety Cabinet	Floor	Ducted BSC, Class II Type A2	TBD				6'	32"	84"				Y			Ducted			110	15.1		Y					Thimble connection, 70% recirculating
6002	CFCI	Fermentation Separation	New	Bench Scale	110	Biosafety Cabinet	Floor	Ducted BSC, Class II Type A2	TBD				6'	32"	84"				Y			Ducted			110	15.1		Y					Thimble connection, 70% recirculating
6003	CFCI	Fermentation Separation		Pilot Plant		Biosafety Cabinet	Floor	6' Ducted Biosafety Cabinet	Baker or comparable	80603			72	33	90				Y			Ducted			110	15.1		Y					Omitted at 11/20/12 review meeting w/ PP
6004	CFCI	Fermentation Separation	New	Bench Scale	110	Fume Hood	Bench	6' Fume Hood	TBD			Y	6'	36"	84"			Y	Y	Y		Ducted			110			Y		Y			Prefer dual power receptacles on both L/R. Gas service 1 side. 36" acid & base lower cabinets
6005	CFCI	Fermentation Separation		Bench Scale		Fume Hood	Bench	6' Fume Hood	Safeair or comparable				72	33					Y			Ducted			110			Y					Omitted at 11/20/12 review meeting w/ PP
6006	CFCI	Fermentation Separation		Pilot Plant		Fume Hood	Floor	6' Walk-in Fume Hood	Safeair or comparable				72	33					Y			Ducted			110			Y					Omitted at 11/20/12 review meeting w/ PP
6007	CFCI	Fermentation Separation	New	Media Prep	111	Fume Hood	Bench	6' Fume Hood	TBD				6'	36"	84"			Y	Y			Ducted			110			Y		Y			36" acid & base lower cabinets
6008	CFCI	Fermentation Separation	New	Bench Scale	110	Biosafety Cabinet	Floor	Ducted BSC, Class II Type A2	TBD				6'	32"	84"				Y			Ducted			110			Y					Thimble connection, 70% recirculating
7001	CFCI	Fermentation Separation	New	Separation	109	Fume Hood	Floor	15' Walk-in fume hood (for stills)	TBD				15'	5'-6"		Y	Y	Y	Y	Y		Ducted			110					Y	Y		15-ft walk-in hood will be for continuous still, batch still and SPD. Elec & gas both sides. Water 1 side
7002	OFCI	Fermentation Separation	E	Separation	109	Fume Hood	Floor	11' Walk-in fume hood (for reactors)					11'-3"	5'-3"		Y	Y	Y	Y	Y	Hydrogen	Ducted			230					Y			Existing 11-ft walk in hood will be for the two reactors. Elec & gas both sides. Water 1 side
7003	CFCI	Fermentation Separation	New	Separation	109	Fume Hood	Bench	6' Fume Hood	TBD			Y	6'	36"				Y	Y	Y		Ducted			230					Y			Wet-chemistry, converstion testing etc. 36" Acid & Base lower cabinets. Gas service 1 side.
8000	CFCI	Media	New	Media	230	Fume Hood	Bench	4' Fume Hood	TBD				4'	36"				Y	Y	Y		Ducted			110			Y		Y	Y		36" Acid & Base lower cabinets



CONSULTANTS

STAMP

NO.	DESCRIPTION	DATE

CLIENT

PROJECT

ADDRESS

PROJECT NO. 12137

SCALE 1/4" = 1'-0"

TITLE

ENLARGED LABORATORY PLANS

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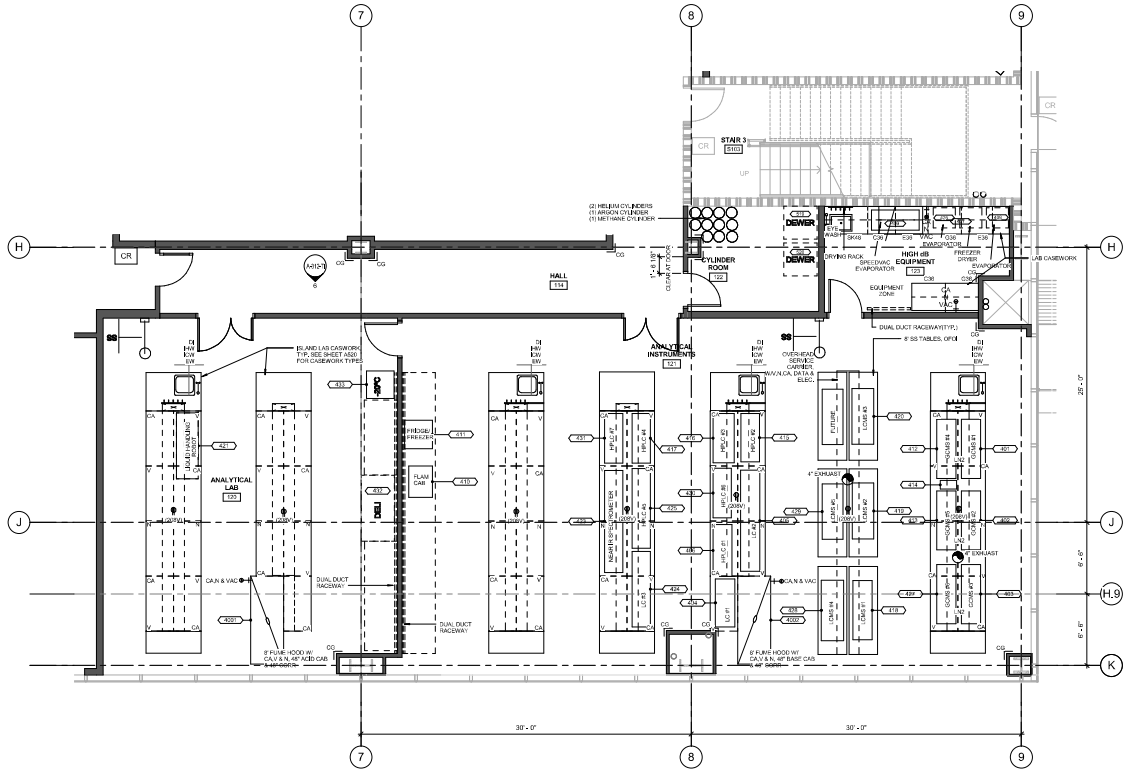

1 L1-Analytical Lab
1/4" = 1'-0"

CONSULTANTS

STAMP

NO. DESCRIPTION DATE

CLIENT

PROJECT

ADDRESS

PROJECT NO. 12137

SCALE 1/4" = 1'-0"

TITLE

ENLARGED LABORATORY PLANS

A-510.b-T1

5/23/2013 9:55:41 AM

AIR HANDLING UNIT SCHEDULE

UNIT NO.	MANUFACTURER & MODEL NO.	SUPPLY FAN CFM	SUPPLY FAN ESP (IN)	MIN OA (CFM)	COOLING COIL CAPACITY SENSIBLE (MBH)	COOLING COIL CAPACITY TOTAL (MBH)	COOLING COIL EAT DB (°F)	COOLING COIL EAT WB (°F)	COOLING COIL LAT DB (°F)	COOLING COIL LAT WB (°F)	COOLING COIL VEL (FPM)	COOLING COIL AIR PD (IN)	HEATING COIL GPM	HEATING COIL WTR PD (FT/HD)	HEATING COIL EWT (°F)	HEATING COIL LWT (°F)	HEATING COIL CAP (MBH)	HEATING COIL RATED CFM	HEATING COIL ENT AIR (°F)	HEATING COIL AIR PD (IN)	HEATING COIL GPM	HEATING COIL WTR PD (FT/HD)	HEATING COIL EWT (°F)	HEATING COIL LWT (°F)	ELECTRICAL V/PH/HZ	ELECTRICAL HP	ELECTRICAL VFD	ELECTRICAL E POWER	ELECTRICAL SMOKE DETECTOR	FILTER PRE	FILTER FINAL	OPER WEIGHT (LBS)	REMARKS
AHU S-1	ENERGY LABS	23,000	2.5	23,000	900	1,350	91	72	52.3	52.2	494	1.1	225	8.7	44	58	525	23,000	34	0.89	16	3.0	180	159	460/3/60	40	YES	NO	YES	30%	95%	15,000	BASE MOUNTED UNIT; INTERNALLY ISOLATED DIRECT DRIVE PLUG FANS WITH 2" DEFLECTION, TEFC PREMIUM MOTOR, COPPER/COPPER COOLING AND HEATING COILS, STAINLESS STEEL CASING, MOISTURE ELIMINATOR, DOUBLE SKIN INSULATED ACCESS DOORS WITH THERMAL BREAK STAINLESS STEEL DRAIN PAN, AIR FLOW MONITORING STATION, THERMAL BREAK CONSTRUCTION IN COOLING SECTION AND ALL DOWN STREAM COMPONENTS, OUTDOOR CONSTRUCTION WITH PITCHED ROOF, UNIT TO PROVIDE 21 KW CTM AT STARTUP.
AHU S-2	ENERGY LABS	28,200	2.5	28,200	1,167	1,756	91	72	52.3	52.2	516	1.2	256	9.1	44	58	740	28,200	34	0.1	20	3.0	180	159	460/3/60	50	YES	NO	YES	30%	95%	15,000	BASE MOUNTED UNIT; INTERNALLY ISOLATED DIRECT DRIVE PLUG FANS WITH 2" DEFLECTION, TEFC PREMIUM MOTOR, COPPER/COPPER COOLING AND HEATING COILS, STAINLESS STEEL CASING, MOISTURE ELIMINATOR, DOUBLE SKIN INSULATED ACCESS DOORS WITH THERMAL BREAK STAINLESS STEEL DRAIN PAN, AIR FLOW MONITORING STATION, THERMAL BREAK CONSTRUCTION IN COOLING SECTION AND ALL DOWN STREAM COMPONENTS, OUTDOOR CONSTRUCTION WITH PITCHED ROOF.

ROOFTOP PACKAGE HEAT PUMP SCHEDULE

UNIT NO.	MANUFACTURER & MODEL NO.	CAPACITY SENSIBLE (MBH)	CAPACITY TOTAL (MBH)	AMBIENT AIR TEMP (°F) DB	EAT DB (°F)	EAT WB (°F)	SA (CFM)	MIN OA (CFM)	ESP	SEER/ EER	HEATING CAPACITY (MBH)	COP/ HSPF	ELECTRICAL V/PH/HZ	COMPRESSOR QUANT	COMPRESSOR LRA	INDOOR FAN RLA	INDOOR FAN HP	INDOOR FAN FLA	OUTDOOR FAN QUANT	OUTDOOR FAN FLA	MCA	MAXIMUM SIZE FUSE	E POWER	SMOKE DETECTOR	FILTER SIZE	FILTER QUANT	OPER WEIGHT (LBS)	REMARKS
RP S-1	YORK XP036	26.5	35.9	95	80	67	1,200	105	0.5	13/11	34.8	-/-/.7	460/3/60	1	43.8	6.4	1.5	2.6	1	6.8	11.4	15	MO	NO	15x20x3 14x25x2	2 1	555	PROVIDE WITH 14" CURB, BACNET COMMUNICATING THERMOSTAT, 0-50% OSA HOOD
RP S-2	YORK XP036	26.5	35.9	95	80	67	1,200	105	0.5	13/11	34.8	-/-/.7	460/3/60	1	43.8	6.4	1.5	2.6	1	6.8	11.4	15	MO	NO	15x20x3 14x25x2	2 1	555	PROVIDE WITH 14" CURB, BACNET COMMUNICATING THERMOSTAT, 0-50% OSA HOOD
RP S-3	YORK XP048	36.7	54.9	95	80	67	1,800	145	0.5	-/11	56.0	3.25/-	460/3/60	2	41.0	6.9	3	5.3	1.0	9.8	22.4	25	NO	YES	24x16x2	4	925	PROVIDE WITH 14" CURB, BACNET COMMUNICATING THERMOSTAT, 0-50% OSA HOOD, 100% OFF TEMPERATURE OSA ECONOMIZER
RP S-4	YORK XP048	34.8	48.2	95	80	67	1,800	225	0.5	13/11	41.8	3.2/7.7	460/3/60	1	41.8	6.1	1.5	2.6	1.0	9.8	11.8	15	MO	NO	15x20x3 14x25x2	2 1	555	PROVIDE WITH 14" CURB, BACNET COMMUNICATING THERMOSTAT, 0-50% OSA HOOD
⚠ RP S-5	YORK XP060	44.6	60.7	95	80	67	2,000	115	0.5	13/10.6	56.5	3.2/7.7	460/3/60	1	52.0	7.7	1.5	2.6	1.0	1.3	13.5	20	MO	YES	15x20x2 14x25x2	2 1	600	PROVIDE WITH 14" CURB, BACNET COMMUNICATING THERMOSTAT, SUPPLY AIR SMOKE DETECTOR, 0-50% OSA HOOD
RP S-6	YORK XP060	44.6	60.7	95	80	67	2,000	135	0.5	13/10.6	56.5	3.2/7.7	460/3/60	1	52.0	7.7	1.5	2.6	1.0	1.3	13.5	20	MO	YES	15x20x2 14x25x2	2 1	600	PROVIDE WITH 14" CURB, BACNET COMMUNICATING THERMOSTAT, SUPPLY AIR SMOKE DETECTOR, 0-50% OSA HOOD
RP S-7	YORK XP048	34.8	48.2	95	80	67	1,800	135	0.5	13/11	41.8	3.2/7.7	460/3/60	1	41.8	6.1	1.5	2.6	1.0	9.8	11.8	15	MO	NO	15x20x2 14x25x2	2 1	555	PROVIDE WITH 14" CURB, BACNET COMMUNICATING THERMOSTAT, 0-50% OSA HOOD
RP S-8	YORK XP048	34.8	48.2	95	80	67	1,800	270	0.5	13/11	41.8	3.2/7.7	460/3/60	1	41.8	6.1	1.5	2.6	1.0	9.8	11.8	15	MO	NO	15x20x3 14x25x2	2 1	555	PROVIDE WITH 14" CURB, BACNET COMMUNICATING THERMOSTAT, 0-50% OSA HOOD
RP S-9	YORK XP060	44.6	60.7	95	80	67	2,000	545	0.5	13/10.6	56.5	3.2/7.7	460/3/60	1	52.0	7.7	1.5	2.6	1.0	1.3	13.5	20	MO	YES	15x20x2 14x25x2	2 1	600	PROVIDE WITH 14" CURB, BACNET COMMUNICATING THERMOSTAT, SUPPLY AIR SMOKE DETECTOR, 0-50% OSA HOOD
RP S-10	YORK XP048	34.8	48.2	95	80	67	1,800	275	0.5	13/11	41.8	3.2/7.7	460/3/60	1	41.8	6.1	1.5	2.6	1.0	9.8	11.8	15	MO	NO	15x20x2 14x25x2	2 1	555	PROVIDE WITH 14" CURB, BACNET COMMUNICATING THERMOSTAT, 0-50% OSA HOOD
RP S-11	YORK XP048	34.8	48.2	95	80	67	1,800	200	0.5	13/11	41.8	3.2/7.7	460/3/60	1	41.8	6.1	1.5	2.6	1.0	9.8	11.8	15	MO	NO	15x20x2 14x25x2	2 1	555	PROVIDE WITH 14" CURB, BACNET COMMUNICATING THERMOSTAT, 0-50% OSA HOOD
RP S-12	YORK XP060	36.7	54.9	95	80	67	1,800	310	0.5	-/11	56.0	3.25/-	460/3/60	2	41.0	6.9	3	5.3	1.0	9.8	22.4	25	NO	YES	24x16x2	4	925	PROVIDE WITH 14" CURB, BACNET COMMUNICATING THERMOSTAT, SUPPLY AIR SMOKE DETECTOR, 100% OFF TEMPERATURE OSA ECONOMIZER, UNIT SERVING CONFERENCE ROOM TO BE PROVIDED WITH DEMAND CONTROL VENTILATION
RP S-13	YORK XP060	44.6	60.7	95	80	67	2,000	510	0.5	13/10.6	56.5	3.2/7.7	460/3/60	1	52.0	7.7	1.5	2.6	1.0	1.3	13.5	20	MO	YES	15x20x2 14x25x2	2 1	600	PROVIDE WITH 14" CURB, BACNET COMMUNICATING THERMOSTAT, 0-50% OSA HOOD
RP S-14	YORK XP060	44.6	60.7	95	80	67	2,000	110	0.5	13/10.6	56.5	3.2/7.7	460/3/60	1	52.0	7.7	1.5	2.6	1.0	1.3	13.5	20	MO	YES	15x20x2 14x25x2	2 1	600	PROVIDE WITH 14" CURB, BACNET COMMUNICATING THERMOSTAT, SUPPLY AIR SMOKE DETECTOR, 0-50% OSA HOOD
RP S-15	YORK XP060	44.6	60.7	95	80	67	2,000	110	0.5	13/10.6	56.5	3.2/7.7	460/3/60	1	52.0	7.7	1.5	2.6	1.0	1.3	13.5	20	MO	YES	15x20x2 14x25x2	2 1	600	PROVIDE WITH 14" CURB, BACNET COMMUNICATING THERMOSTAT, SUPPLY AIR SMOKE DETECTOR, 0-50% OSA HOOD
RP S-16	YORK XP048	34.8	48.2	95	80	67	1,800	185	0.5	13/11	41.8	3.2/7.7	460/3/60	1	41.8	6.1	1.5	2.6	1.0	9.8	11.8	15	MO	NO	15x20x2 14x25x2	2 1	555	PROVIDE WITH 14" CURB, BACNET COMMUNICATING THERMOSTAT, 0-50% OSA HOOD
RP S-17	YORK XP036	26.5	35.9	95	80	67	1,200	180	0.5	13/11	34.8	-/-/.7	460/3/60	1	43.8	6.4	1.5	2.6	1	6.8	11.4	15	MO	NO	15x20x2 14x25x2	2 1	555	PROVIDE WITH 14" CURB, BACNET COMMUNICATING THERMOSTAT, 0-50% OSA HOOD
⚠ RP S-18	YORK XP036	26.5	35.9	95	80	67	1,200	40	0.5	13/11	34.8	-/-/.7	460/3/60	1	43.8	6.4	1.5	2.6	1	6.8	11.4	15	MO	NO	15x20x2 14x25x2	2 1	555	PROVIDE WITH 14" CURB, BACNET COMMUNICATING THERMOSTAT, 0-50% OSA HOOD

SPLIT SYSTEM INDOOR FAN COIL SCHEDULE

UNIT NO.	⚠ MANUFACTURER & MODEL NO.	LOCATION	SERVICE	SA (CFM)	MIN OA (CFM)	ESP	COIL DATA EAT DB (°F)	COIL DATA EAT WB (°F)	COIL DATA ROWS	COIL DATA AREA (SQ/FT)	ELECTRICAL HP	ELECTRICAL V/PH/HZ	ELECTRICAL MAX/MUM SIZE FUSE	ELECTRICAL E POWER	ELECTRICAL SMOKE DETECTOR	FILTER (QUANT) SIZE	OPER WEIGHT (LBS)	REMARKS
FC S-1	YORK NC060	1ST FLOOR	OFFICE	1,800	100	0.5	80	67	3	10.6	2	460/3/60	15	NO	YES	(4) 15x20x2	550	PROVIDE WITH BACNET COMMUNICATING THERMOSTAT
FC S-2	YORK AM070	1ST FLOOR	OFFICE	1,200	300	0.5	80	67	3	5.3	1/3	208/1/60	15	NO	NO	FIELD FABRICATED	155	PROVIDE WITH BACNET COMMUNICATING THERMOSTAT
FC S-3	YORK AM250	1ST FLOOR	OFFICE	880	270	0.5	80	67	3	4.0	1/4	208/1/60	15	NO	NO	FIELD FABRICATED	165	PROVIDE WITH BACNET COMMUNICATING THERMOSTAT
FC S-4	YORK AM250	1ST FLOOR	OFFICE	880	240	0.5	80	67	3	4.0	1/4	208/1/60	15	NO	NO	FIELD FABRICATED	165	PROVIDE WITH BACNET COMMUNICATING THERMOSTAT
FC S-5	YORK AM370	1ST FLOOR	OFFICE	1,200	80	0.5	80	67	3	5.3	1/3	208/1/60	15	NO	NO	FIELD FABRICATED	155	PROVIDE WITH BACNET COMMUNICATING THERMOSTAT
FC S-6	YORK AM250	1ST FLOOR	OFFICE	880	140	0.5	80	67	3	4.0	1/4	208/1/60	15	NO	NO	FIELD FABRICATED	165	PROVIDE WITH BACNET COMMUNICATING THERMOSTAT
FC S-7	YORK AM370	1ST FLOOR	OFFICE	1,200	55	0.5	80	67	3	5.3	1/3	208/1/60	15	NO	NO	FIELD FABRICATED	155	PROVIDE WITH BACNET COMMUNICATING THERMOSTAT
FC S-8	YORK AM630	1ST FLOOR	OFFICE	2,000	150	0.5	80	67	4	5.3	3/4	208/1/60	15	NO	YES	FIELD FABRICATED	155	PROVIDE WITH BACNET COMMUNICATING THERMOSTAT
FC S-9	YORK AM630	1ST FLOOR	OFFICE	2,000	150	0.5	80	67	4	5.3	3/4	208/1/60	15	NO	YES	FIELD FABRICATED	155	PROVIDE WITH BACNET COMMUNICATING THERMOSTAT

SPLIT SYSTEM OUTDOOR HEAT PUMP SCHEDULE

UNIT NO.	MANUFACTURER & MODEL NO.	LOCATION	SERVICE	CAPACITY TOTAL (BTUH)	AMBIENT AIR TEMP (°F) DB	HEATING CAPACITY (MBH)	EER	HSPF	ELECTRICAL V/PH/HZ	ELECTRICAL COMPRESSOR QUANT	ELECTRICAL COMPRESSOR LRA	ELECTRICAL COMPRESSOR RLA	ELECTRICAL OUTDOOR FAN QUANT	ELECTRICAL OUTDOOR FAN FLA	ELECTRICAL MINIMUM CIRC AMPS	ELECTRICAL E POWER	MAXIMUM FUSE SIZE	OPER WEIGHT (LBS)	REMARKS
⚠ OU S-1	YORK PC060	ROOF	FC S-1	62,000	95	62,000	11.0	3.2 COP	460/3/60	1	169	12.2	2	1.2	17.6	NO	25	450	PROVIDE WITH 3/8" LIQUID LINE AND 1-1/8" VAPOR LINE, IN STALL PER MANUFACTURE'S RECOMMENDATIONS
OU S-2	YORK YJ036	ROOF	FC S-2	36,000	95	32,800	11.0	7.7	460/3/60	1	34	4.5	1	0.8	7.2	NO	15	210	PROVIDE WITH 3/8" LIQUID LINE AND 3/4" VAPOR LINE, IN STALL PER MANUFACTURE'S RECOMMENDATIONS
OU S-3	YORK YHJ024	ROOF	FC S-3	23,000	95	32,000	11.5	7.7	208/1/60	1	43	8.3	1	0.8	11.2	NO	15	195	PROVIDE WITH 3/8" LIQUID LINE AND 3/4" VAPOR LINE, IN STALL PER MANUFACTURE'S RECOMMENDATIONS
OU S-4	YORK YHJ024	ROOF	FC S-4	23,000	95	32,000	11.5	7.7	208/1/60	1	43	8.3	1	0.8	11.2	NO	15	195	PROVIDE WITH 3/8" LIQUID LINE AND 3/4" VAPOR LINE, IN STALL PER MANUFACTURE'S RECOMMENDATIONS
OU S-5	YORK YJ036	ROOF	FC S-5	36,000	95	32,000	11.0	7.7	460/3/60	1	34	4.5	1	0.8	7.2	NO	15	210	PROVIDE WITH 3/8" LIQUID LINE AND 3/4" VAPOR LINE, IN STALL PER MANUFACTURE'S RECOMMENDATIONS
OU S-6	YORK YHJ024	ROOF	FC S-6	23,000	95	32,000	11.5	7.7	208/1/60	1	43	8.3	1	0.8	11.2	NO	15	195	PROVIDE WITH 3/8" LIQUID LINE AND 3/4" VAPOR LINE, IN STALL PER MANUFACTURE'S RECOMMENDATIONS
OU S-7	YORK YJ036	ROOF	FC S-7	36,000	95	32,000	11.0	7.7	460/3/60	1	34	4.5	1	0.8	7.2	NO	15	210	PROVIDE WITH 3/8" LIQUID LINE AND 3/4" VAPOR LINE, IN STALL PER MANUFACTURE'S RECOMMENDATIONS
OU S-8	YORK YJ060	ROOF	FC S-8	55,000	95	55,000	11.5	7.7	460/3/60	1	53	9.0	1	0.8	13.8	NO	30	280	PROVIDE WITH 3/8" LIQUID LINE AND 7/8" VAPOR LINE, IN STALL PER MANUFACTURE'S RECOMMENDATIONS
OU S-9	YORK YJ060	ROOF	FC S-9	55,000	95	55,000	11.5	7.7	460/3/60	1	53	9.0	1	0.8	13.8	NO	30	280	PROVIDE WITH 3/8" LIQUID LINE AND 7/8" VAPOR LINE, IN STALL PER MANUFACTURE'S RECOMMENDATIONS

EXHAUST FAN SCHEDULE

UNIT NO.	MANUFACTURER & MODEL NO.	LOCATION	SERVICE	TYPE	⚠ CFM	ARR	ESP (IN)	FAN RPM	ELECTRICAL V/PH/HZ	ELECTRICAL HP	ELECTRICAL VFD	ELECTRICAL E POWER	OPER WEIGHT (LBS)	REMARKS
EF 1	GREENHECK CSI-180-13	ROOF	RESTROOMS / GENERAL EXHAUST	DOWN BLOW	4,040	-	0.75	1,214	460/3/60	1 1/2	NO	NO	150	PROVIDE WITH 14" ROOF CURB WITH BACK DRAFT DAMPER.
EF 1-2	GREENHECK 27-SWSI-21	ROOF	CONTROL AREA 2	BISW	11,900	10	3.0	1,312	460/3/60	15	YES	YES	1,160	PROVIDE WITH WEATHER HOOD, STRUCTURAL BASE WITH 2" SPRING ISOLATION, HOUSING SEALED FOR OUTDOOR USE AND CORROSION RESISTANT PAINT. EF TO BE TYPE A SPARK PROOF CONSTRUCTION.
EF 1-3	GREENHECK 27-SWSI-21	ROOF	CONTROL AREA 1	BISW	11,990	10	3.0	1,335	460/3/60	15	YES	YES	1,160	PROVIDE WITH WEATHER HOOD, STRUCTURAL BASE TO 2" SPRING ISOLATION, HOUSING SEALED FOR OUTDOOR USE AND CORROSION RESISTANT PAINT.
EF 1-4	GREENHECK 22-SWSI-21	ROOF	CONTROL AREA 5	BISW	7,020	10	3.0	1,722	460/3/60	7 1/2	YES	YES	785	PROVIDE WITH WEATHER HOOD, STRUCTURAL BASE WITH 2" SPRING ISOLATION, HOUSING SEALED FOR OUTDOOR USE AND CORROSION RESISTANT PAINT. EF TO BE TYPE A SPARK PROOF CONSTRUCTION.
EF 1-5	GREENHECK 18-SWSI-21	ROOF	CONTROL AREA6	BISW	4,690	10	3.0	1,830	460/3/60	5	YES	YES	580	PROVIDE WITH WEATHER HOOD, STRUCTURAL BASE TO 2" SPRING ISOLATION, HOUSING SEALED FOR OUTDOOR USE AND CORROSION RESISTANT PAINT.
EF 1-6	GREENHECK 33-SWSI-21	ROOF	CONTROL AREA 4	BISW	15,800	10	3.0	1,016	460/3/60	15	YES	YES	1,250	PROVIDE WITH WEATHER HOOD, STRUCTURAL BASE WITH 2" SPRING ISOLATION, HOUSING SEALED FOR OUTDOOR USE AND CORROSION RESISTANT PAINT.
EF 1-7	GREENHECK 9-BSW-4	ROOF	DUCTED BSC - CONTROL AREA 4	BISW	1,660	10	3.5	3,880	460/3/60	1 1/2	YES	YES	250	PROVIDE WITH WEATHER HOOD, STRUCTURAL BASE WITH 2" SPRING ISOLATION, HOUSING SEALED FOR OUTDOOR USE AND CORROSION RESISTANT PAINT.

SUPPLY FAN SCHEDULE

UNIT NO.	MANUFACTURER & MODEL NO.	LOCATION	SERVICE	TYPE	CFM	ARR	ESP (IN)	FAN RPM	ELECTRICAL V/PH/HZ	ELECTRICAL HP	ELECTRICAL VFD	ELECTRICAL E POWER	ELECTRICAL SMOKE DETECTOR	OPER WEIGHT (LBS)	REMARKS
SF 1	GREENHECK LSI-14-7	ROOF	FAN COIL OSA	LOUVERED PENTHOUSE	2,000	-	0.75	997	460/3/60	3/4	YES	NO	YES	700	

DUCT MATERIAL SCHEDULE

TYPE	DESCRIPTION	LOCATION	DUCT SIZE	MATERIALS	INSULATION	REMARKS
SUPPLY	GENERAL OFFICE/LAB - ROUND DUCT	INDOOR	UP TO 24"	GALVANIZED SPIRAL WOUND	EXTERNAL - R4.2 MIN	
SUPPLY	GENERAL OFFICE/LAB FLEX DUCT, 5' MAX LENGTH	INDOOR	UP TO 24"	ACOUSTIFLEX	INTERNAL - R4.2 MIN	
SUPPLY	GENERAL OFFICE/LAB SQUARE DUCT	INDOOR	ALL	GALVANIZED	EXTERNAL - R4.2 MIN	
SUPPLY	GENERAL OFFICE/LAB SQUARE DUCT	OUTDOOR	ALL	DOUBLE WALL GALVANIZED, SOLID INTERNAL LINER	R8 MIN	SLOPE TOP OF DUCT TO PREVENT STANDING WATER
RETURN/EXHAUST	GENERAL OFFICE/LAB ROUND DUCT	INDOOR/OUTDOOR	UP TO 24"	GALVANIZED SPIRAL WOUND	INTERNAL - R4.2 MIN (RETURN ONLY)	SLOPE TOP OF CUT DOOR DUCT TO PREVENT STANDING WATER
RETURN/EXHAUST	GENERAL OFFICE/LAB SQUARE DUCT	INDOOR/OUTDOOR	ALL	GALVANIZED	INTERNAL - R4.2 MIN (RETURN ONLY)	SLOPE TOP OF CUT DOOR DUCT TO PREVENT STANDING WATER
EXHAUST	FUMEHOOD & BSC - BRANCH ROUND DUCT	INDOOR/OUTDOOR	UP TO 24"	PVC COATED SPIRAL WOUND	NONE	SLOPE TOP OF CUT DOOR DUCT TO PREVENT STANDING WATER
EXHAUST	FUMEHOOD & BSC BRANCH SQUARE DUCT	INDOOR/OUTDOOR	ALL	PVC COATED	NONE	SLOPE TOP OF CUT DOOR DUCT TO PREVENT STANDING WATER
EXHAUST	WET EXHAUST - BRANCH ROUND DUCT	INDOOR	UP TO 24"	304 STAINLESS STEEL, WELDED CONSTRUCTION	NONE	
EXHAUST	WET EXHAUST - BRANCH SQUARE DUCT	INDOOR	ALL	304 STAINLESS STEEL, WELDED CONSTRUCTION	NONE	

ALL DUCT SHALL BE FABRICATED, INSTALLED AND INSULATED PER SMACNA GUIDELINES, 2016 CALIFORNIA MECHANICAL CODE & 2009 CALIFORNIA TITLE 24 STANDARDS.

GRILLES, REGISTERS AND DIFFUSER SCHEDULE

NO.	MANUFACTURER & MODEL NO.	TYPE	SIZE	DESCRIPTION
S1	TITUS PMC	T-BAR CEILING	SEE PLANS	ADJUSTABLE MODULAR CORE DIFFUSER, 4 CORES, SQUARE NECK, PERFORATED FLUSH FACE, STEEL CONSTRUCTION, STANDARD WHITE FINISH, TYPE 3 BORDER FOR LAY-IN CEILING
S2	TITUS PMC	GYP. CEILING	SEE PLANS	ADJUSTABLE MODULAR CORE DIFFUSER, 4 CORES, SQUARE NECK, PERFORATED FLUSH FACE, STEEL CONSTRUCTION, STANDARD WHITE FINISH, TYPE 1C BORDER FOR GYP CEILING
S3	TITUS FLOWBAR	GYP. CEILING	SEE PLANS	LINEAR SLOT DIFFUSER,(1) 2" SLOTS, PROVIDE WITH INSULATED PLENUM , STEEL CONSTRUCTION, STANDARD WHITE FINISH, TYPE 1B BORDER FOR GYP CEILING
S4	TITUS TMS	T-BAR CEILING	SEE PLANS	SQUARE DIFFUSER, 3 CONE DESIGN, ROUND NECK, STEEL CONSTRUCTION, STANDARD WHITE FINISH, TYPE 3 FULL FACE BORDER FOR LAY-IN CEILING
S5	TITUS TMS	GYP. CEILING	SEE PLANS	SQUARE DIFFUSER, 3 CONE DESIGN, ROUND NECK, STEEL CONSTRUCTION, STANDARD WHITE FINISH, TYPE 1 BORDER GYP CEILING
S6	PRICE HCF	T-BAR CEILING	SEE PLANS	HIGH CAPACITY, FLUSH FACE DIFFUSER, 2-WAY PATTERN, 24"x24" x 10" NECK, ALUMINUM CONSTRUCTION, STANDARD WHITE FINISH
S7	PRICE HCF	T-BAR CEILING	SEE PLANS	HIGH CAPACITY, FLUSH FACE DIFFUSER, 2-WAY PATTERN, 24"x48" x 10" NECK, ALUMINUM CONSTRUCTION, STANDARD WHITE FINISH
S8	TITUS TMR	T-BAR CEILING	SEE PLANS	ROUND CONE DIFFUSER, 3 CONES, ROUND NECK, STEEL CONSTRUCTION, STANDARD WHITE FINISH, DUCT MOUNTED
R1	TITUS PAR	T-BAR CEILING	SEE PLANS	PERFORATED FLUSH FACE, STEEL CONSTRUCTION, STANDARD WHITE FINISH, TYPE 3 BORDER FOR LAY-IN CEILING
R2	TITUS PAR	GYP. CEILING	SEE PLANS	PERFORATED FLUSH FACE, STEEL CONSTRUCTION, STANDARD WHITE FINISH, TYPE 1C BORDER FOR GYP CEILING
R3	TITUS 350FL	SURFACE MOUNT	SEE PLANS	LOUVERED RETURN GRILLE,3/4" BLADE SPACE, SINGLE DEFLECTION, BLADES HORIZONTAL, ALUMINUM CONSTRUCTION, STANDARD WHITE FINISH, TYPE 1 BORDER FOR SURFACE MOUNT
RA	TITUS FLOWBAR	GYP. CEILING	SEE PLANS	LINEAR SLOT DIFFUSER,(1) 2" SLOTS, PROVIDE WITH PLENUM , STEEL CONSTRUCTION, STANDARD WHITE FINISH, TYPE 1B BORDER FOR GYP CEILING. MATCH S3 SUPPLY DIFFUSER
E1	TITUS PAR	T-BAR CEILING	SEE PLANS	PERFORATED FLUSH FACE, STEEL CONSTRUCTION, STANDARD WHITE FINISH, TYPE 3 BORDER FOR LAY-IN CEILING
E2	TITUS PAR	GYP. CEILING	SEE PLANS	PERFORATED FLUSH FACE, STEEL CONSTRUCTION, STANDARD WHITE FINISH, TYPE 1 BORDER FOR GYP CEILING

CONSULTANTS

NO.	DESCRIPTION	DATE

CLIENT

PROJECT

ADDRESS

PROJECT NO.

SCALE

TITLE

MECHANICAL - SCHEDULES

M0.2

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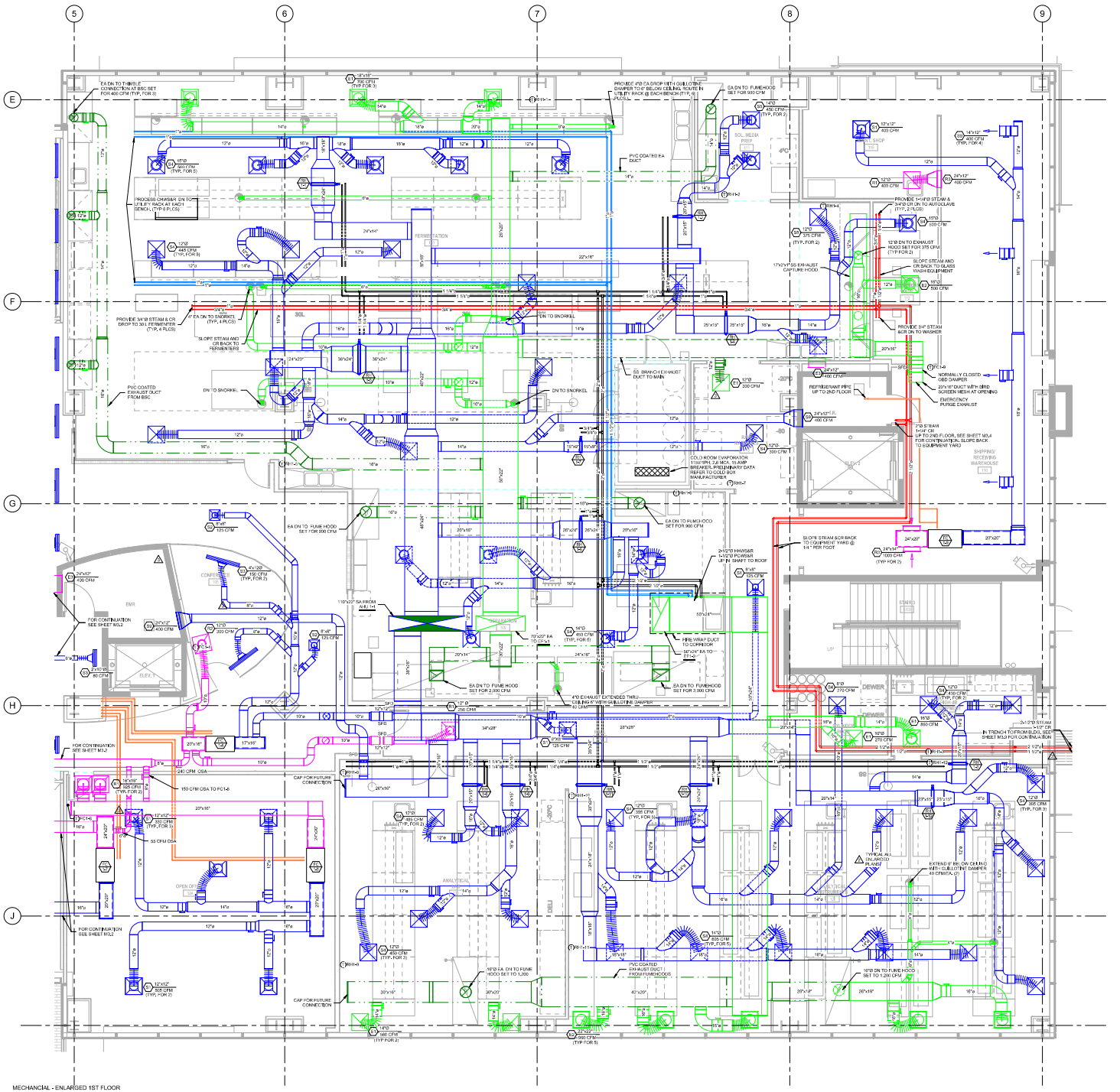


MECHANICAL - ENLARGED 1ST FLOOR PLAN - AREA A
1/4" = 1'-0"

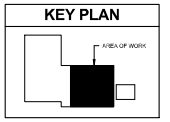
GENERAL NOTES

1. SEE SHEET M0.1 FOR ADDITIONAL GENERAL NOTES.
2. CONTRACTOR TO PROVIDES COORDINATED SHOP DRAWINGS OF PIPING AND DUCTWORK TO ENGINEER FOR APPROVAL PRIOR TO COMMENCEMENT OF WORK.
3. PROVIDE AIR BALANCING DAMPERS AT ALL BRANCH CONNECTIONS TO SUPPLY, RETURN AND EXHAUST DIFFUSERS AND GRILLES. BALANCE DAMPERS SHALL BE CONSTRUCTED OF 22 GAUGE METAL, SIMILAR TO SYSTEM THAT IT IS BEING INSTALLED IN, WITH 1/2" MAXIMUM BLADE SPACING. DAMPER ON ROOFTOP BRANCH T AND DOWNBLAST DAMPER BLADE TO BE CONSTRUCTED OF 20 GAUGE MATERIAL WITH STRENGTHENING CRIMP ACROSS CENTER.
4. PROVIDE TURNING VANES IN ALL RECTANGULAR ELBOWS.
5. PROVIDE LOW LOSS FITTINGS AT ALL BRANCH CONNECTIONS WHETHER SHOWN OR NOT.
6. CONTRACTOR TO BALANCE ALL PIPING AND DUCTWORK TO INDICATED FLOWS ON PLANS. PROVIDE TEST AND BALANCE REPORTS TO ENGINEER.
7. PROVIDE SPD'S ON ALL DUCT PENETRATIONS THRU FIRE RATED WALLS AND/OR FLOORS. COORDINATE LOCATION WITH ARCHITECTURAL PLANS.
8. PROVIDE FIRESTOPPING AND FIRE CAULKING AT ALL PIPE PENETRATIONS THRU RATED WALLS AND/OR FLOORS.
9. SEE SHEET M5.2 FOR TYPICAL INSTALLATION DETAILS.

NORTH

CONSULTANTS

KEY PLAN



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PROJECT

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PROJECT NO.

SCALE As indicated

TITLE

MECHANICAL - ENLARGED 1ST FLOOR PLAN - AREA A

M3.1

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PIPE MATERIAL SCHEDULE

SERVICE DESIGNATION	SERVICE DESCRIPTION	INSULATION	PIPING MATERIAL
RO	REVERSE OSMOSIS	N/A	POLYPROPYLENE
DI	DEIONIZED WATER	N/A	POLYPROPYLENE
LA	LAB AIR	N/A	TYPE L ACR COPPER TUBING, CLEANED FOR OXYGEN SERVICE
LV	LAB VACUUM	N/A	TYPE L COPPER TUBING, CLEANED FOR OXYGEN SERVICE
N2	NITROGEN	N/A	TYPE L ACR COPPER TUBING, CLEANED FOR OXYGEN SERVICE
LN2	LIQUID NITROGEN	VACUUM JACKETED	VACUUM INSULATED PIPING WITH JACKET
W	SANITARY WASTE	N/A	CAST IRON, ABS OR PVC
V	SANITARY VENT	N/A	CAST IRON, RUBBISS ABOVE GRADE
IW	INDUSTRIAL WASTE	N/A	POLYPROPYLENE PIPE, SOCKET FUSION WELDED PIPING WITHIN PLENUMS SHALL BE PLENUM RATED
IV	INDUSTRIAL VENT	N/A	POLYPROPYLENE PIPE, SOCKET FUSION WELDED PIPING WITHIN PLENUMS SHALL BE PLENUM RATED
DCW	DOMESTIC COLD WATER	N/A	TYPE L COPPER, SOLDERED 95/5
DHW	DOMESTIC HOT WATER	1" THICK 1K-2#	TYPE L COPPER, SOLDERED 95/5
ICW	INDUSTRIAL COLD WATER	N/A	TYPE L COPPER, SOLDERED 95/5
IHW	INDUSTRIAL HOT WATER	1" THICK 1K-2#	TYPE L COPPER, SOLDERED 95/5
IRW	INDUSTRIAL SOFT COLD WATER	N/A	TYPE L COPPER, SOLDERED 95/5
IRHW	INDUSTRIAL SOFT HOT WATER	1" THICK 1K-2#	TYPE L COPPER, SOLDERED 95/5
CD	CONDENSATE PIPING	1/2" THICK 1K-2#CF	TYPE M COPPER, SOLDERED 95/5
G & MPG	NATURAL GAS PIPING (ABOVE GRADE)	N/A	UP TO 2", SCHEDULE 40 BLACK IRON PIPE, THREADED FITGS, 2 1/2" AND UP, SCHEDULE 40 BLACK IRON PIPE, WELDED FITTINGS
G & MPG	NATURAL GAS PIPING (BELOW GRADE)	N/A	2" AND SMALLER BLACK STEEL, FACTORY COATED WITH CONTINUOUS SEAMLESS HIGH DENSITY POLYETHYLENE WITH A MINIMUM THICKNESS OF 23 MILS.

NOTES: NO CPVC PIPING WILL BE USED FOR POTABLE WATER SYSTEMS.

COMPLIANCE NOTES

1. PIPING AND DUCTWORK SHALL BE INSULATED CONSISTENT WITH THE REQUIREMENTS OF SECTION 118, 123, AND 124 U.C.C. AND TABLE 6-A3 & 6-B OF THE 2010 C.M.C.
2. LAVATORY FAUCETS IN FIRST ROOMS SHALL BE THE SELF-CLOSING TYPE.
3. LAVATORY FAUCETS TO BE .5 G.P.M. MAX.
4. NEW TOILETS TO BE ULTRA LOW FLUSH TYPE, 1.28 G.P.F.
5. SINK FAUCETS SHALL BE 2.2 GPM MAXIMUM.
6. URINALS TO BE 1.0 G.P.F. MAX.
7. WATER CLOSETS SHALL BE THE ULTRA LOW FLOW TYPE, 1.6 G.P.F. MAXIMUM.
8. SHOWERS SHALL BE PROVIDED WITH MIXING VALVES PER SECTION 418 OF THE 2010 CPC.
9. CROSS-CONNECTION PROTECTION SHALL BE PROVIDED AT ALL POTABLE WATER SUPPLIED APPLIANCES AND EQUIPMENT (OTHER THAN THOSE LISTED IN INFORMATION BULLETIN 103).
10. SERVICE WATER HEATING EQUIPMENT SHALL MEET ALL OF THE REQUIREMENTS OF THE APPLICABLE EFFICIENCY STANDARDS AND SHALL BE CURRENTLY LISTED AS CERTIFIED BY THE C.E.C.
11. PROVIDE VACUUM BREAKERS AT HOSE BIBBS.
12. LABEL MEDIUM PRESSURE GAS PIPING EVERY 5 FEET.
13. STATE HEALTH CODE SEC. 17921.9 BANS THE USE OF CHLORINATED POLY VINYL CHLORIDE (CPVC) FOR INTERIOR WATER SUPPLY PIPING.
14. CHEMICAL WASTE PIPING SHALL COMPLY WITH SECTION 811.0 OF THE 2010 CPC.
15. FLOOR DRAINS OR SIMILAR TRAPS DIRECTLY CONNECTED TO THE DRAINAGE SYSTEM AND SUBJECT TO INFREQUENT USE SHALL BE PROVIDED WITH AN APPROVED AUTOMATIC MEANS OF MAINTAINING THEIR WATER SEALS.
16. BUILDING DRAIN AND VENT PIPING MATERIALS SHALL COMPLY WITH 2010 CALIFORNIA PLUMBING CODE SECTIONS 701.0 AND 903.0.
17. SERVICE WATER HEATING SYSTEMS AND EQUIPMENT SHALL COMPLY WITH ENERGY EFFICIENCY STANDARDS, SECTION 113.
18. WATER HEATER PRESSURE AND TEMPERATURE RELIEF DRAINS THAT TERMINATE OUTSIDE OF THE BUILDING SHALL COMPLY WITH SECTION 608.0 OF THE 2010 CALIFORNIA PLUMBING CODE.
19. PROVIDE EXPANSION TANK OR OTHER APPROVED METHOD OF RELIEVING PRESSURE PER SECTION 608.3 OF THE 2010 CALIFORNIA PLUMBING CODE.
20. EACH WATER HEATER SHALL BE ANCHORED OR STRAPPED TO RESIST HORIZONTAL DISPLACEMENT DUE TO EARTHQUAKE MOTION PER SECTION 508.2 OF THE 2010 CALIFORNIA PLUMBING CODE.
21. EACH NONAUTOMATIC INSTANTANEOUS WATER HEATER HAVING AN INSIDE DIAMETER OF NOT MORE THAN 3 INCHES, WATER HEATERS NOT MEETING THIS CRITERIA SHALL BE PROVIDED WITH AN EXPANSION TANK OR OTHER APPROVED METHOD OF RELIEVING PRESSURE PER SECTION 608.0 OF THE 2010 CALIFORNIA PLUMBING CODE.
22. ADA WATER CLOSET, LAVATORY, AND SHOWER UNIT SHALL MEET THE AMERICAN DISABILITIES ACT GUIDELINES AND CALIFORNIA CODE, TITLE 24.
23. THE HEIGHT OF ACCESSIBLE WATER CLOSETS SHALL BE MINIMUM OF 17 INCHES AND A MAXIMUM OF 19 INCHES MEASURED TO THE TOP OF THE TOILET SEAT. CONTROLS SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING OR TWISTING OF THE WRIST. CONTROLS FOR FLUSH VALVES SHALL BE MOUNTED ON THE WIDE SIDE OF TOILET AREAS, NO MORE THAN 44 INCHES ABOVE THE FLOOR. THE FORCE REQUIRED TO ACTIVATE CONTROLS SHALL BE NO GREATER THAN 5 LBS.
24. WHERE URINALS ARE PROVIDED, AT LEAST ONE WITH RIM PROJECTING A MINIMUM OF 14 INCHES FROM THE WALL AND AT A MAXIMUM OF 17 INCHES ABOVE THE FLOOR SHALL BE PROVIDED.
25. FLUSH CONTROLS SHALL BE HAND OPERATED AND SHALL BE MOUNTED NO MORE THAN 44 INCHES ABOVE THE FLOOR.
26. FAUCET CONTROLS AND OPERATING MECHANISMS SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING OR TWISTING OF THE WRIST. THE FORCE REQUIRED TO ACTIVATE CONTROLS SHALL BE NO GREATER THAN 5 LBS.
27. HOT WATER AND DRAIN PIPES UNDER LAVATORIES SHALL BE INSULATED OR OTHERWISE COVERED. THERE SHALL BE NO SHARP OR ABRASIVE SURFACES UNDER LAVATORIES.
28. FUME HOODS SHALL HAVE SINKS WITH LIPS TO PREVENT DRAINAGE OF FUME HOOD SURFACES INTO CUP SINKS.
29. ROUTING AND TERMINATION OF WATER HEATER FLUES SHALL COMPLY WITH CHAPTERS OF THE 2010 CALIFORNIA PLUMBING CODE.
30. A WATER HEATER PRESSURE AND TEMPERATURE RELIEF DRAIN THAT TERMINATES OUTSIDE THE BUILDING SHALL COMPLY WITH SECTION 608.5 OF THE 2010 CALIFORNIA PLUMBING CODE.
31. SANITARY SYSTEM MATERIALS SHALL BE LISTED BY AN APPROVED LISTING AGENCY.
32. POTABLE WATER PIPING MATERIAL SHALL COMPLY WITH SECTION 604.0 OF THE 2010 CALIFORNIA PLUMBING CODE.
33. GAS PIPING MATERIAL SHALL COMPLY WITH SECTION 1208.0 OF THE 2010 CALIFORNIA PLUMBING CODE.
34. ROUTING AND TERMINATION OF WATER HEATER FLUES SHALL COMPLY WITH CHAPTER 5 OF THE 2010 CALIFORNIA PLUMBING CODE.
35. COMBINATION WASTE AND VENT SYSTEMS SHALL COMPLY WITH SECTION 917.0 AND APPENDIX "D" OF THE 2010 CALIFORNIA PLUMBING CODE.
36. CHEMICAL WASTE PIPING SHALL COMPLY WITH SECTION 811.0 OF THE 2010 CALIFORNIA PLUMBING CODE.
37. INSTALLATION OF FIXTURES SHALL COMPLY WITH CHAPTER 4 OF THE 2010 CALIFORNIA PLUMBING CODE.

TABLE 5.303.6 STANDARDS FOR PLUMBING FIXTURES AND FITTINGS

WATER CLOSETS (TOILETS) - FLUSHOMETER VALVE-TYPE SINGLE FLUSH, MAXIMUM FLUSH VOLUME	ASME A 112.19.2/CSA B45.1 - 1.28 GAL
WATER CLOSETS (TOILETS) - FLUSHOMETER VALVE-TYPE DUAL FLUSH, MAXIMUM FLUSH VOLUME	ASME A 112.19.14 AND ASME A112.19.2/CSA B45.1 AND EPA WATERSENSE TANK-TYPE HIGH-EFFICIENCY TOILET SPECIFICATIONS - 1.28 GAL
WATER CLOSETS (TOILETS) - TANK TYPE	ASME A 112.19.14 AND ASME A112.19.2/CSA B45.1 AND EPA WATERSENSE TANK-TYPE HIGH-EFFICIENCY TOILET SPECIFICATION
URINALS, MAXIMUM FLUSH VOLUME	ASME A 112.19.2/CSA B45.1 - 1.0 GALLONS
URINALS, NONWATER URINALS	ASME A 112.19.19 VITREOUS CHINA AND ENAMELED CAST-IRON OR MATRIX STAINLESS STEEL FINISH 2.0 PLASTIC)
PUBLIC LAVATORY FAUCETS, MAXIMUM FLOW RATE - 0.5 GPM	ASME A 112.18.1/CSA B125.1
PUBLIC METERING SELF-CLOSING FAUCETS, MAXIMUM WATER USE - 0.25 GALLER CYCLE	ASME A 112.18.1/CSA B125.1

NOTES:
PLUMBING FIXTURES (WATER CLOSETS & URINALS) AND FITTINGS (FAUCETS AND SHOWERHEADS) SHALL MEET THE STANDARDS REFERENCED IN TABLE 5.303.6 OF DIVISION 5.3 OF THE 2010 GREEN CODE.

PARTIAL PLUMBING SPECIFICATIONS

PART 1 - GENERAL

GENERAL AND SUPPLEMENTARY CONDITIONS AND OTHER DIVISIONS - 1 SPECIFICATION SELECTIONS, APPLY TO WORK OF THIS SECTION.

WORK SHALL INCLUDE LABOR AND MATERIALS REQUIRED FOR THE COMPLETION OF A FULLY OPERATING PLUMBING SYSTEM INCLUDING BUT NOT NECESSARILY LIMITED TO: EXCAVATION, INSTALLATION, BACKFILL AND COMPACTION, REQUIRED TAXES, OBTAINING AND PAYING FOR REQUIRED LICENSES, PERMITS, FEES, INSPECTIONS, METERS AND CONNECTIONS; WATER DISTRIBUTION, VENTS AND WASTES, FIXTURES AND ROUGH-IN AND CONNECT CONDENSATE TO OWNER-FURNISHED AND MECHANICAL APPLIANCES.

DURING PROGRESS OF THE WORK MAINTAIN AN ACCURATE RECORD OF CHANGES MADE FROM THE PLANS, PRESENT A PROFESSIONALLY DONE REPRODUCIBLE PLAN TO ARCHITECT REFLECTING CHANGES.

PART 2 - PRODUCTS

USE ONLY NEW FIRST CLASS MATERIALS, EQUIPMENT TO BE IDENTIFIED WITH NAMEPLATE, ELECTRICAL EQUIPMENT TO BE U.L. LISTED, WHERE REQUIRED TO BE STATE FIRE MARSHALL APPROVED.

INSULATION SHALL HAVE A FLAME SPREAD OF NOT MORE THAN 25 AND A SMOKE DENSITY NOT EXCEEDING 50.

SOIL, WASTE, AND VENT PIPING WITHIN BUILDINGS: SERVICE WEIGHT CAST IRON NO-HUB SOIL PIPE UNLESS OTHERWISE NOTED, MARK UP WITH A COMPRESSION-TYPE FITTINGS AND STAINLESS STEEL CLAMP AND A SHIELD ASSEMBLIES AND NEOPRENE JOINTS.

HOT AND COLD WATER PIPING ABOVE FLOOR SHALL BE TYPE "L" HARD-DRAWN COPPER TUBE MADE UP WITH 95-5 SOLDER.

CONDENSATE DRAIN AND INDIRECT WASTE PIPING: ABOVE GRADE SHALL BE DWV COPPER WITH DWV DRAINAGE TYPE FITTINGS, PVC MAY BE USED AS APPROVED BY JURISDICTIONAL AUTHORITIES.

GAS PIPING SHALL BE SCHEDULE 40 BLACK STEEL PIPE (ASTM A120) WITH 150 PSI BLACK BANDED MALLEABLE IRON SCREWED FITTINGS AND PLAN PATTERN COUPLINGS, 1 1/4 INCHES AND LARGER FITTINGS MAY BE BUTT WELDED. COAT AND WRAP BURIED PIPING.

LOOSE KEY OPERATED, FINISHED WITH CHROME INSIDE AND BRONZE OUTSIDE. ALL HOSE BIBS SHALL HAVE BUILT-IN VACUUM BREAKERS, CRANE 232 OAS COCK SHALL BE USED.

PIPE SLEEVES SHALL BE "ADJUSTO-CRETE" OR EQUAL - PROVIDE BAC CHROME ESCUTCHEONS IN FINISHED AREAS.

HANGERS AND SUPPORTS SHALL BE GRINNEL OR EQUAL, PROVIDE LATERAL BRACING WHERE HANGERS 18" LONG, ISOLATE HANGERS AND SUPPORTS FROM PIPING WITH SIEMCO TRISOLATORS, INSULATE AT OPENINGS OF STRUCTURE WITH 1/2" FELT WRAP.

VENT FLASHING AT EACH VENT THROUGH THE ROOF SHALL BE HEAVY AMC GALVANIZED SHEET METAL WITH ZINC CHROMATE COATING.

CLEANOUTS: FLOOR CLEANOUTS: SMITH 4023, 4043, GRADE CLEANOUTS: SMITH 4253, WALL CLEANOUTS: SMITH 4533 IN TILE WALLS AND TOILET ROOMS AND 4532 IN OTHER.

UNIONS: ISOLATE ALL DISSIMILAR METAL WITH "EPCOT DIALECTRIC UNIONS. PROVIDE NIBSCO 623 FOR 2" AND SMALLER AND 4040 FOR LARGER.

ACCESS PLATES: ACCESS PLATES SHALL BE PROVIDED AT CONCEALED VALVES AND EQUIPMENT. MILCOR OR EQUAL, HINGED, RATED TO MATCH CONSTRUCTION, PRIME COATED STEEL (EXCEPT SS IN TOILET ROOMS) AS SELECTED BY ARCHITECT, EQUIPPED WITH KEY LOCKING DEVICES.

FIXTURES AND EQUIPMENT: FIXTURES AND EQUIPMENT SHALL BE AS SPECIFIED AND SHALL BE COMPLETE WITH ALL STOPS, SUPPLIES, BACKING DRAIN, CHROME PLATED BRONZE TRIM AND OTHER ITEMS NECESSARY FOR A COMPLETE, OPERABLE FACILITY.

INSULATE HOT WATER PIPE ABOVE GRADE PER ADA AND TITLE 24 REQUIREMENTS.

PART 3 - EXECUTION

CODES: PERFORM ALL WORK ACCORDING TO ALL APPLICABLE CODES AND REGULATION. OBTAIN AND PAY FOR ALL PERMITS, FEES AND INSPECTIONS REQUIRED BY GOVERNING AUTHORITIES. ADDITIONAL WORK REQUIRED TO CONFORM TO THESE CODES WILL BE DONE AT NO ADDITIONAL CHARGE.

SLOPE WASTE, DRAIN AND SEWER PIPING AT 1/4 INCH PER FOOT UNLESS OTHERWISE NOTED OR PERMITTED.

CUTTING AND PATCHING: DO ALL DRILLING CUTTING AND PATCHING REQUIRED FOR THE INSTALLATION OF THE SAME MATERIALS AND WORKMANSHIP AS THE ORIGINAL WORK.

VERIFY FIXTURE AND EQUIPMENT LOCATIONS AND SERVICES WITH THE ARCHITECTURAL PLANS AND FURNISH AND CONNECT FIXTURES AND EQUIPMENT SHOWN THEREON. EQUIPMENT SHALL BE SECURELY ANCHORED TO THE STRUCTURE.

WALL-HUNG FIXTURES ON STUD WALLS SHALL BE SECURELY ATTACHED TO A 1/4" THICK BY 9" WIDE STEEL PLATE WHICH SHALL EXTEND TO AT LEAST ONE STUD BEYOND THE FIRST AND LAST FIXTURE MOUNTING POINT. PLATE SHALL BE SHOP DRILLED WITH HOLES 1/16" LARGER THAN STUD BOLTS SUPPLIED WITH FIXTURE OR FIXTURE ARMS SPECIFIED. A JAM NUT SHALL BE SET TIGHT AGAINST FACE PLATE TO SECURE STUD. FIXTURE HANGER OR ARM SHALL BE SUPPORTED FREE OF FINISHED WALL BY MEANS OF SECOND SET OF JAM NUTS. PLATES SHALL BE SECURELY BOLTED TO EACH STUD CROSSED WITH 1/2" MINIMUM BY 2" STEEL BACKUP PLATES. FIXTURES WITH BACK SPECIFIED WITH SUPPORTING ARMS, SHALL IN ADDITION TO THE ABOVE SPECIFIED PLATES, HAVE FIXTURE HANGERS SECURELY ATTACHED BY A 2" BY 8" WOOD BACKINGS.

EACH INDIVIDUAL FIXTURE SUPPLY SHALL BE PROVIDED WITH CHROME PLATED LOOSE KEY I.P.S. STOP VALVE. DELIVER LOOSE KEYS TO THE OWNER.

NO RUBBER PACKING OR COMPOSITION SEAL SHALL BE INSTALLED. SUPPLIES SHALL BE METAL TO METAL ONLY.

PROVIDE PIPING CONNECTIONS TO EQUIPMENT PROVIDED UNDER THE AIR CONDITIONING SECTION.

AFTER PRELIMINARY FLUSHING OF THE SYSTEM CHLORINATE THE ENTIRE POTABLE WATER IN ACCORDANCE WITH THE CURRENT RECOMMENDATIONS OF THE AMERICAN WATER WORKS ASSOCIATION. CHLORINATE ONLY WHEN THE BUILDINGS ARE UNOCCUPIED. THEN THOROUGHLY FLUSH THE ENTIRE POTABLE WATER SYSTEM.

FLUSH WATER SYSTEMS CLEAN AND MAKE TESTS REQUIRED BY JURISDICTIONAL AUTHORITIES. MAKE ADJUSTMENTS REQUIRED TO ELIMINATE NOISE AND VIBRATION AS REQUIRED FOR APPROVAL BY THE ARCHITECT.

SEAL PENETRATIONS OF RATED BARRIERS BY PIPE AND WIRE WITH 3M FIRE BARRIER CAULK.

DAMAGED AND UNUSED MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE.

WATER PRESSURE CALCULATION

PRESSURE AT STREET	=	100	PSI
PRESSURE AFTER METER	"	90	PSI
PRESSURE AFTER BACKFLOW & REGULATOR	"	80	PSI
HIGHEST FIXTURE	"	25	FT
PRESSURE REQUIRED AT MOST REMOTE OUTLET	"	25	PSI
FURTHEST FIXTURE FROM METER	"	500	FT
$\frac{80\ PSI \times 2.25 \times (25' + 0.43 \times 100')}{500}$	=	9.25 PSI/100 FEET (MAXIMUM ALLOWABLE PIPING PRESSURE LOSS)	

TABLE 5.303.2.3 PLUMBING FIXTURE FLOW RATES

FIXTURE TYPE	FLOW RATE	FLOW RATE
SHOWERHEADS	2.5 GPM @ 60 PSI	2.0 GPM @ 80 PSI
LAVATORY FAUCETS - NON RESIDENTIAL	0.5 GPM @ 60 PSI	0.4 GPM @ 80 PSI
KITCHEN FAUCETS	2.2 GPM @ 60 PSI	1.8 GPM @ 80 PSI
METERING FAUCETS	0.25 GALLONS/CYCLE	0.2 GALLONS/CYCLE
FLUSHOMETER VALVE WATER CLOSETS	1.6 GALLONS/FLUSH	1.28 GALLONS/FLUSH
URINALS	1.0 GALLONS/FLUSH	0.5 GALLONS/FLUSH

NOTES:
PER 2010 GREEN CODE SECTION 5.210.3.3 "WHEN A SHOWER IS SERVED BY MORE THAT ONE NEWLY INSTALLED SHOWERHEAD, THE COMBINED FLOW RATE OF ALL THE SHOWERHEADS CONTROLLED BY A SINGLE VALVE SHALL NOT EXCEED THE MAXIMUM FLOW RATE AT 20 PERCENT REDUCTION CONTAINED IN TABLE 5.303.2 OF THIS SHOWERHEAD TO BE IN OPERATION AT A TIME.

PLUMBING NOTES

THE PLUMBING SYSTEM DESIGN, INSTALLATION AND MATERIALS SHALL CONFORM TO THE LATEST ADOPTED CODES AND REGULATIONS HAVING JURISDICTION, INCLUDING BUT NOT LIMITED TO, THE 2010 CALIFORNIA BUILDING, MECHANICAL AND PLUMBING CODES. IN CASE OF CONFLICTS WITH CODES, DRAWINGS OR SPECIFICATIONS, THE MOST STRINGENT REQUIREMENTS SHALL PREVAIL.

THESE DRAWINGS HAVE BEEN PREPARED WITH THE BEST STRUCTURAL AND ARCHITECTURAL INFORMATION AVAILABLE. IT SHALL BE UNDERSTOOD THAT EQUIPMENT LOCATIONS AND ROUTING OF PIPING MAY VARY FROM THAT SHOWN ON THE PLANS AS CONSTRUCTION PROCEEDS. IT IS THE CONTRACTORS RESPONSIBILITY TO:

A. NOTIFY THE PROJECT ENGINEER OF CONSTRUCTION RESTRAINTS WHICH MAKE VARIATIONS FROM THE PLANS NECESSARY.

THESE DRAWINGS DO NOT INCLUDE NECESSARY SAFETY REQUIREMENTS, THE CONTRACTOR SHALL COMPLY TO THE SAFETY REQUIREMENTS AS SET FORTH BY THE GENERAL CONTRACTOR AND LOCAL AUTHORITIES HAVING JURISDICTION.

COORDINATE SHUT-DOWNS OF EXISTING PIPING SYSTEMS WITH OWNERS REPRESENTATIVE AND GENERAL CONTRACTOR PRIOR TO WORK.

PLUMBING WORK SHALL BE INSTALLED SO AS TO AVOID INTERFERENCE WITH ELECTRICAL EQUIPMENT, MECHANICAL EQUIPMENT AND STRUCTURAL MEMBERS.

CONNECTION BETWEEN INCOMPATIBLE MATERIALS ABOVE GRADE AND INSIDE BUILDING SHALL BE MADE WITH TWO (2) DIELECTRIC UNIONS SEPARATED BY A TWELVE INCH (12") SECTION OF RED BRASS PIPE.

PIPING SHALL BE SUPPORTED WITH HANGERS AND BRACKETS WHICH PROVIDE ISOLATION FROM FRAMING. CONTACT BETWEEN PIPING AND SUPPORT SHALL BE LINED WITH PLASTIC OR FELT.

ROOF, FLOOR AND WALL PENETRATIONS SHALL BE SEALED WATERTIGHT.

SEE ARCHITECTURAL DRAWINGS FOR ADA FIXTURE LOCATIONS AND MOUNTING HEIGHTS. INSULATE EXPOSED HOT WATER AND DRAIN PIPING BELOW HANDICAP LAVATORIES AND SINKS WITH INSULATING TAPE AND OFFSET P-TRAP AGAINST WALL.

WASTE, SOIL, VENT AND CONDENSATE PIPING SHALL SLOPE AT 2% UNLESS APPROVED OTHERWISE BY THE OWNERS REPRESENTATIVE AND THE LOCAL AUTHORITIES HAVING JURISDICTION.

HORIZONTAL CONDENSATE DRAIN PIPING FROM AIR CONDITIONING UNITS SHALL BE INSULATED WITH 1/2" THICK ARMAFLEX OR FIBERGLASS RPR INSULATION. SLIP RPR INSULATION AND SEAL BUTT JOINTS.

HOT WATER PIPING SHALL BE INSULATED WITH 1-1/2" THICK FIBERGLASS MOLDED INSULATION WITH K=0.27 BTU/H-IN. SQ. FT. F. OR LESS.

BUILDING DRAIN AND VENT PIPING MATERIAL SHALL COMPLY WITH SECTION 701 AND 903 OF THE CALIFORNIA PLUMBING CODE.

SANITARY SYSTEM MATERIALS SHALL BE LISTED BY AN APPROVED LISTING AGENCY.

CROSS CONNECTION PROTECTION SHALL BE PROVIDED AT ALL POTABLE WATER SUPPLIED APPLIANCES AND EQUIPMENT (OTHER THAN THOSE LISTED IN INFORMATION BULLETIN 103).

PROVIDE PERMANENT VACUUM BREAKERS ON ALL HOSE BIBBS.

PROVIDE ANGLE STOP VALVES AT EACH SUPPLY LINE TO EACH FIXTURE.

WATER CLOSETS SHALL BE LOW-CONSUMPTION 1.28 GPM FLUSH CYCLE.

PUBLIC LAVATORY FAUCETS SHALL BE THE SELF-CLOSING TYPE.

SINK FAUCETS SHALL RESTRICT FLOW TO 2.2 GPM.

LAVATORY FAUCETS SHALL RESTRICT FLOW TO 2.2 GPM AND .25 GALLONS PER CYCLE.

SHOWER HEADS SHALL RESTRICT FLOW TO 2.0 GPM AND SHALL BE PROVIDED WITH MIXING VALVE CONTROLS.

HOT WATER HEATER, CONTROLS AND SYSTEM SHALL MEET THE REQUIREMENTS OF CALIFORNIA EFFICIENCY STANDARD P400-06-005, SECTION 113 (a) AND (b).

NO CPVC PIPING WILL BE USED FOR POTABLE WATER SYSTEMS.

INSULATE HOT WATER PIPING PER CALIFORNIA EFFICIENCY STANDARDS AND 2010 CPC.

WATER HEATERS SHALL BE SECURED AS REQUIRED BY THE 2010 CPC.

WATER PIPING SYSTEM SHALL BE DISINFECTED BY CHLORINATION PER SECTION 609.

WATER PIPING SYSTEM TESTING SHALL BE PERFORMED PRIOR TO OCCUPANCY.

FLOOR DRAINS OR SIMILAR TRAPS DIRECTLY CONNECTED TO THE DRAINAGE SYSTEM AND SUBJECT TO INFREQUENT USE SHALL BE PROVIDED WITH AN APPROVED AUTOMATIC MEANS OF MAINTAINING THEIR WATER SEAL.

STATE HEALTH & SAFETY CODE BANS THE USE OF CHLORINATED POLYVINYL CHLORIDE (CPVC) FOR INTERIOR WATER-SUPPLY PIPING. NO CPVC PIPING WILL BE USED FOR POTABLE WATER SYSTEMS.

ROOF ACCESS LADDER SHALL COMPLY WITH SECTION 904.10.3 OF THE 2010 CMC.

COORDINATE FIXTURE REQUIREMENTS WITH ARCHITECT PRIOR TO BID. ARCHITECT SHALL APPROVE FIXTURES INCLUDING COLOR PRIOR TO ORDER.

VERIFY RIGHT HAND OR LEFT HAND FIXTURE CONNECTIONS AND WATER CLOSET LEVER REQUIREMENTS PRIOR TO WORK. INSTALL FIXTURES AND EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS.

LABEL MEDIUM PRESSURE GAS PIPING EVERY FIVE FEET.

REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL REQUIREMENTS.

PLUMBING SYSTEMS AND COMPONENTS SHALL COMPLY WITH "NSF/ANSI STANDARD 61 DRINKING WATER SYSTEM COMPONENTS" AND "WITH CALIFORNIA ASSEMBLY BILL 1953 MODIFIED FREE STANDARDS. PRODUCTS MUST RECEIVE CERTIFICATION FROM AN INDEPENDENT ANSI-APPROVED, THIRD-PARTY TESTING ORGANIZATION.

REFER TO ARCHITECTURAL DIMENSIONS PLANS TO LOCATE SINKS, FLOOR SINKS, VENTS AND SERVICE UMBILICALS.

COLD WATER PIPE SIZING CHART

PIPE SIZE	GPM	FIXTURE UNITS		VELOCITY
		FLUSH TANK	FLUSH VALVE	
3/4"	9	13	2.0	6 FPS
1"	17	24	3.75	6 FPS
1-1/4"	29	50	12.0	8 FPS
1-1/2"	40	85	26.0	8 FPS
2"	80	170	75.0	8 FPS
2-1/2"	120	180	360	8 FPS
3"	170	750	700	8 FPS

NOTES:
PIPING NOT SIZED ON FLOOR PLANS OR DIAGRAMS SHALL BE SIZED IN ACCORDANCE WITH THIS PIPE SIZING CHART (MIN. SIZE).

MAXIMUM FLOW VELOCITIES: 8 FT/SEC. FOR BRANCH PIPING WITHIN BUILDINGS 6 FT/SEC. FOR MAINS.

HOT WATER PIPE SIZING CHART

PIPE SIZE	GPM	FIXTURE UNITS	VELOCITY
		FLUSH TANK	
3/4"	7	9	5 FPS
1"	13	18	5 FPS
1-1/4"	19	28	5 FPS
1-1/2"	27	45	5 FPS
2"	45	103	5 FPS

NOTES:
PIPING NOT SIZED ON FLOOR PLANS OR DIAGRAMS SHALL BE SIZED IN ACCORDANCE WITH THIS PIPE SIZING CHART (MIN. SIZE).

MAXIMUM FLOW VELOCITIES: 5 FT/SEC. FOR HOT WATER BRANCH PIPING AND BUILDING SUPPLY MAINS.

PLUMBING LEGEND

SYMBOL	ABBREV.	DESCRIPTION
	POC	POINT OF CONNECTION
	S OR W	SEWER OR WASTE ABOVE GRADE
	S OR W	SEWER OR WASTE BELOW GRADE
	FCO	FLOOR CLEAN-OUT
	WCO	WALL CLEAN-OUT
	V	VENT
	IW	INDUSTRIAL LAB WASTE
	IV	INDUSTRIAL VENT
	LV	LAB VACUUM
	DHW	DOMESTIC HOT WATER
	DCW	DOMESTIC COLD WATER
	ICW	INDUSTRIAL COLD WATER
	IHW	INDUSTRIAL HOT WATER
	IHWR	INDUSTRIAL HOT WATER RETURN
	N2	NITROGEN
	LA	LAB COMPRESSED AIR
	LN2	LIQUID NITROGEN
	DIR	DEIONIZED WATER RETURN
	DI	DEIONIZED WATER SUPPLY
	MPG	MEDIUM PRESSURE NATURAL GAS (5 PSI)
	G	NATURAL GAS (LOW PRESSURE)
	S.O.V.	SHUT-OFF VALVE
		CHECK VALVE
	(E)	DENOTES EXISTING
	A/G	ABOVE GRADE
	B/G	BELOW GRADE
	FT	FLUSH TANK
	GPF	GALLONS PER FLUSH
	GPM	GALLONS PER MINUTE
	LAV	LAVATORY
	PSI	POUNDS PER SQUARE INCH
	QTY	QUANTITY
	TYP	TYPICAL
	VTR	VENT THRU ROOF

FIXTURE CALL-OUT: FIXTURE TYPE / FIXTURE NUMBER

EQUIPMENT TAG: EQUIPMENT TYPE / EQUIPMENT ID

DETAIL CALL-OUT: DETAIL NUMBER / SHEET NUMBER

FLOOR DRAIN/SINK QUANTITIES

TAG	DESCRIPTION	QUANTITY	REMARKS
FS-1 & FS-2	FLOOR SINK	20	
FD-1	FLOOR DRAIN	8	

PLUMBING SHEET INDEX

CONSULTANTS

NO. DESCRIPTION DATE

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PROJECT NO. 12317

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PLUMBING LEGEND AND NOTES

P0.1

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EQUIPMENT SCHEDULE

TAG	SERVICE	LOCATION	DESCRIPTION
WH 1	INDUSTRIAL HOT WATER	EQUIPMENT YARD	WATER HEATER: A.O. SMITH MODEL BTH-250, 100 GALLON STORAGE TANK, 320 GALLONS PER HOUR RECOVERY AT 90°F TEMPERATURE RISE, 250 MBH GAS INPUT. ELECTRICAL: 120V-1PH-60Hz
WH 1	DOMESTIC HOT WATER	SECOND FLOOR JANITOR'S CLOSET	WATER HEATER: A.O. SMITH MODEL BTH-250, 100 GALLON STORAGE TANK, 320 GALLONS PER HOUR RECOVERY AT 90°F TEMPERATURE RISE, 250 MBH GAS INPUT. ELECTRICAL: 120V-1PH-60Hz
CP 1	1ST FLR INDUSTRIAL HOT WATER RECIRCULATION	EQUIPMENT YARD	RECIRCULATION PUMP : GRUNDFOS MODEL UPS-43-44BF, BRONZE BODY, 3 SPEED PUMP WITH CHECK VALVE, 10 GPM @ 8 FT, H.D. (LOW SPEED), 10 GPM @ 13 FT, H.D. (HIGH SPEED). ELECTRICAL: 120 VOLTS, 1.8 AMPS, 1/6 HP MOTOR.
CP 2	2ND FLR INDUSTRIAL HOT WATER RECIRCULATION	EQUIPMENT YARD	RECIRCULATION PUMP : GRUNDFOS MODEL UPS-43-44BF, BRONZE BODY, 3 SPEED PUMP WITH CHECK VALVE, 10 GPM @ 8 FT, H.D. (LOW SPEED), 10 GPM @ 13 FT, H.D. (HIGH SPEED). ELECTRICAL: 120 VOLTS, 1.8 AMPS, 1/6 HP MOTOR.
CP 3	DOMESTIC HOT WATER RECIRCULATION	SECOND FLOOR JANITOR'S CLOSET	RECIRCULATION PUMP : GRUNDFOS MODEL UPS-43-44BF, BRONZE BODY, 3 SPEED PUMP WITH CHECK VALVE, 10 GPM @ 8 FT, H.D. (LOW SPEED), 10 GPM @ 13 FT, H.D. (HIGH SPEED). ELECTRICAL: 120 VOLTS, 1.8 AMPS, 1/6 HP MOTOR.
VP 1	1ST & 2ND LEVEL LABS	EQUIPMENT YARD	VACUUM PUMP: BUSCH MODEL TTMD-24LAB165, DUPLEX, (2) RA 0100 PUMPS AT 7.5 HP EACH, 117 ACFM, 22"Hg VACUUM, 200 GALLON TANK. COMPLETE WITH AUTO-PURGE FEATURE APPROX. WEIGHT = 1,200 LBS. ELECTRICAL: 460V-3-.-60Hz, (2) 7.5 HP MOTORS
AC 1 AND ST 1	1ST & 2ND LEVEL LABS	EQUIPMENT YARD	ENCLOSED SCROLL AIR COMPRESSOR: POWEREX MODEL SEO400740, 122 SCFM @ 100 PSIG, WITH SEPARATE HANSON 240 GALLON STORAGE TANK. APPROX. WEIGHT = 2,000 LBS. (AIR COMPRESSOR ONLY) ELECTRICAL: 460V-3" -60Hz, 40 HP MOTOR, 52 FLA.
RAD 1	1ST & 2ND LEVEL LABS	EQUIPMENT YARD	REFRIGERATED AIR DRYER: INGERSOLL RAND MODEL D212NC, 125 SCFM, 1.9 PSIG PRESSURE DROP. 1-1/2" INLET & OUTLET CONNECTIONS. APPROX. WEIGHT = 80 LBS. 120 VOLT-1PH-60Hz, 1.35 KW
AC 2	1ST & 2ND LEVEL LABS	EQUIPMENT YARD	RELOCATE OWNER'S EXISTING 25 HP AIR COMPRESSOR AND REFRIGERATED AIR DRYER TO NEW EQUIPMENT YARD AS SHOWN. AIR COMPRESSOR SHALL BE USED AS A BACK-UP SYSTEM. CONNECT INTO BUILDING COMPRESSED AIR SYSTEM AS SHOWN. EXISTING AIR COMPRESSOR IS AN INGERSOLL RAND MODEL IRN25H-CC, 208-230 VOLTS, 78.6 AMPS. REFRIGERATED AIR DRYER IS AN INGERSOLL RAND MODEL D212NC
DI 1 & RO 1	1ST & 2ND LEVEL LABS	EQUIPMENT YARD	DEIONIZED WATER SYSTEM: BY "PURETEC", THE SYSTEM SHALL INCLUDE BUT NOT LIMITED TO THE FOLLOWING: A DUPLEX SOFTENER SYSTEM WITH BRINE TANK, (2) ACTIVATED CARBON BED EXCHANGE TANKS, 5 MICRON RO PREFILTER, 4 GPM RO SYSTEM WITH A 2 HP TYPE 304 SS MULTISTAGE PUMP, 1,000 GALLON CONE BOTTOM STORAGE TANK WITH STEEL STAND, (2) 5 HP TYPE 316 SS DISTRIBUTION PUMPS, (8) 3.6 CU.FT. MIXED BED DI POLISHING TANKS, (2) POST POLISH DI FILTERS, A 254nm AMALGAM BULB ULTRA VIOLET STERILIZER, A 0.2 MICRON FINAL FILTER AND A MAIN CONTROL PANEL. ROTO METERS, QUALITY LIGHTS, SOLENOID VALVES, SENSORS, VALVES, TANK VENTS, LEVEL CONTROLS, FILTERS, FILTER CARTRIDGES, INTERCONNECTING PIPE AND FITTINGS AND CONTROL SYSTEM. ELECTRICAL DATA: RO SKID: 15 AMP DISCONNECT AT THE RO SYSTEM, 480V, 3 PHASE TO POWER RO PUMP WHICH DRAWS 5 AMPS AT 480V. DISTRIBUTION SKID: 30 AMP DISCONNECT AT THE CENTRAL CONTROL PANEL, 480V, 3 PHASE TO POWER DISTRIBUTION PUMP WHICH DRAWS 10 AMPS AT 480V, A SINGLE QUAD OR (2) DUPLEX 110V OUTLETS NEAR THE DI POLISH TANKS, WATER SOFTENER TANKS (RESIN & BRINE) AND THE CARBON EXCHANGE TANKS, POWER TO ONLY TO PROVIDE MINIMUM CONTROL POWER AND QUALITY LIGHTS (APPROX. 5 - 10 AMPS TOTAL)

LAB OUTLET SCHEDULE

TAG	DESCRIPTION
N 1	WATER SAVER GOOSENECK DEIONIZED WATER FAUCET MODEL L7853SC DECK MOUNT AND L7854SC PANEL MOUNT.
LV 1	WATER SAVER WITH NEEDLE VALVE, SINGLE HANDLE, REMOVABLE SERRATED HOSE NOZZLE, CHROME PLATED WITH COLOR COATED "VAC" BUTTON IDENTIFICATION
LA 1	WATER SAVER WITH NEEDLE VALVE, SINGLE HANDLE, REMOVABLE SERRATED HOSE NOZZLE, CHROME PLATED WITH COLOR COATED "AIR" BUTTON IDENTIFICATION
N2 1	WATER SAVER WITH NEEDLE VALVE, SINGLE HANDLE, REMOVABLE SERRATED HOSE NOZZLE, CHROME PLATED WITH COLOR COATED "N2" BUTTON IDENTIFICATION

PLUMBING FIXTURE SCHEDULE

TAG	DESCRIPTION	BRANCH PIPE CONNECTION SIZE				DESCRIPTION
		WASTE	VENT	CW	DHW	
WC 1	WATER CLOSET, ADA	3"	2"	1-1/4"	-	ZURN Z5615 ECO-VANTAGE HIGH EFFICIENCY TOILET (1.28 GPF), 17" RIM HEIGHT, VITREOUS CHINA, 1-1/2" TOP SPUD, 2" TRAPWAY, SIPHON JET ACTION, WALL MOUNTED, ZURN ZER6000 HIGH EFF. SENSOR OPERATED FLUSH VALVE AND Z5955SS-EL ELONGATED OPEN FRONT SEAT. PROVIDE WITH FIXTURE SUPPORT CARRIER, ADA COMPLIANT.
WC 2	WATER CLOSET	3"	2"	1-1/4"	-	ZURN Z5615 ECO-VANTAGE HIGH EFFICIENCY TOILET (1.28 GPF), 14" RIM HEIGHT, VITREOUS CHINA, 1-1/2" TOP SPUD, 2" TRAPWAY, SIPHON JET ACTION, WALL MOUNTED, ZURN ZER6000 HIGH EFF. SENSOR OPERATED FLUSH VALVE AND Z5955SS-EL ELONGATED OPEN FRONT SEAT. PROVIDE WITH FIXTURE SUPPORT CARRIER.
UR 1	ADA URINAL	2"	1-1/2"	3/4"	-	ZURN Z5798 ECOVANTAGE HIGH EFFICIENCY URINAL, VITREOUS CHINA, 3/4" TOP SPUD, 2"I.P.S. OUTLET WITH INTEGRAL TRAP. HIGH EFFICIENCY WASHOUT ACTION (1/8 GPF), VANDAL RESISTANT OUTLET STRAINER, ZER6000 BATTERY POWERED SENSOR TYPE FLUSHMETER VALVE, ADA COMPLIANT.
L 1	LAVATORY	2"	1-1/2"	3/4"	3/4"	ZURN Z5110, 20"x17" OVAL VITREOUS CHINA COUNTERTOP LAV, WITH Z6913-XL BATTERY POWERED ELECTRONIC SENSOR FAUCET, PROVIDE WITH NEW MIXING THERMOSTATIC MIXING VALVE, ACCESSORIES, GRID DRAIN, P-TRAP AND SUPPLIES.
SH 1	ADA SHOWER	2"	1-1/2"	3/4"	3/4"	SYMMONS MODEL H423-V ADA SHOWER WITH HAND SHOWER SPRAY HEAD, 5 FOOT FLEXIBLE METAL HOSE WITH IN-LINE VACUUM BREAKER AND WALL FLANGE, 30" VERTICAL BAR WITH ADJUSTABLE SLIDE, PROVIDE WITH FLOOR DRAIN AND SYMMONS S-4700 PRESSURE BALANCING MIXING VALVE AND SECONDARY VOLUME CONTROL LEVER WITH TRIM AND INTEGRAL SERVICE STOPS.
S 1	SINK	2"	1-1/2"	3/4"	3/4"	ELKAY MODEL PSLVR1917, 20 GAUGE, TYPE 304 STAINLESS STEEL, 19"x17", PROVIDE WITH SINGLE LEVER FAUCET FOR HOT & COLD WATER WITH 9" SPOUT, BASKET STRAINER, TAIL PIECE, P-TRAP, ANGLE STOPS AND SUPPLIES, INSINKERATOR 1/2 HP GARBAGE DISPOSER, PROVIDE AN IN-LINE WATER FILTER AND A SEPARATE DISPENSING FAUCET AT THE SINK, ALSO CONNECT ADJACENT COFFEE STATION TO FILTER.
S 2	SINK	2"	1-1/2"	3/4"	3/4"	ELKAY MODEL DLR332210, 18 GAUGE, TYPE 304 STAINLESS STEEL, 33"x22", DOUBLE BOWL, PROVIDE WITH SINGLE LEVER FAUCET FOR HOT & COLD WATER WITH 9" SPOUT, BASKET STRAINER, TAIL PIECE, P-TRAP, ANGLE STOPS AND SUPPLIES, INSINKERATOR 1/2 HP GARBAGE DISPOSER, PROVIDE AN IN-LINE WATER FILTER AND A SEPARATE DISPENSING FAUCET AT THE SINK, ALSO CONNECT ADJACENT COFFEE STATION TO FILTER.
EW 1	EYE WASH	-	-	3/4"	-	WATER SAVER FAUCET CO. MODEL EW849, DECK MOUNTED EYE WASH UNIT, 90° SWING-DOWN ACTIVATION, 2-GS-PLUS SPRAY HEADS WITH FLIP-TOP DUST COVERS, INTERNAL FLOW CONTROL AND FILTER TO REMOVE IMPURITIES, PLASTIC COVER AND LOCKING CLIP, TEST CARD & CERTIFIED BY CSA TO MEET ANSI Z358.1. EYEWASH UNITS AT SCULLERY SINKS SHALL BE WATER SAVER MODEL EW848.
ESH 1	EMERGENCY SHOWER AND EYEWASH	2"	1-1/2"	1-1/4"	-	WATER SAVER FAUCET CO. MODEL SSBF2150, RECESSED SAFETY STATION WITH DRAIN PAN, STAINLESS STEEL SHOWER HEAD & ESCUTCHEON PLATE, HEAVY DUTY STAINLESS STEEL PANIC BAR WITH BLACK VINYL GRIP TO ACTIVATE SHOWER, 1" BRASS STAY-OPEN BALL VALVE WITH UNIONS ON INLET & OUTLET (2) FS-PLUS SPRAY HEADS, STAINLESS STEEL DRAIN PAN & CABINET, INTERNAL FLOW CONTROL AND FILTER TO REMOVE IMPURITIES, CERTIFIED BY CSA TO MEET ANSI Z358.1.
ESH 2	EMERGENCY SHOWER AND EYEWASH	-	-	1-1/4"	-	WATER SAVER FAUCET CO. MODEL SS902BC, SAFETY STATION WITH STAY-OPEN SHOWER AND EYE WASH VALVES, STAINLESS STEEL SHOWER HEAD AND CONNECTION ELBOW, STAINLESS STEEL BOWL WITH COVER, 1" BRASS STAY-OPEN BALL VALVE FOR SHOWER AND 1/2" FOR EYEWASH. (2) GS-PLUS SPRAY HEADS, INTERNAL FLOW CONTROL AND FILTER TO REMOVE IMPURITIES, CERTIFIED BY CSA TO MEET ANSI Z358.1. PROVIDE WITH BLEED VALVE ON COLD WATER INLET.
LS 1	LAB SINK	2"	1-1/2"	3/4"	3/4"	ELKAY MODEL DLR122122, 31"x22"x12 DEEP, TOP MOUNT 18 GA., TYPE 316 STAINLESS STEEL, WITH WATER SAVER MODEL L4111VB-BH SWING SPOUT FAUCET WITH VACUUM BREAKER, SERRATED HOSE NOZZLE AND ADDITIONAL STANDARD AERATOR, PROVIDE WITH TAIL PIECE, P-TRAP, ANGLE STOPS, SUPPLIES, COORDINATE SINK SIZE WITH LAB FURNISHING DRAWINGS.
LS 2	LAB SINK	2"	1-1/2"	3/4"	3/4"	ELKAY MODEL WNSF8248LR #14 GAUGE, TYPE 316 STAINLESS STEEL SINK, 96"x27-1/2"x44"H OVERALL DIMENSIONS (36" TOP OF SINK), WITH TWO 24"x24"x14 DEEP BOWLS AND A 24"X24" LEFT AND 24"X24" RIGHT DRAIN BOARD, PROVIDE SINK WITH (2) ICW-HW FAUCETS AND (2) DI FAUCETS, PROVIDE WATER SAVER MODEL L7711VB-BH-WS SWING SPOUT FAUCET WITH VACUUM BREAKER, WRISTBLADE HANDLES, SERRATED HOSE NOZZLE AND ADDITIONAL STANDARD AERATOR, PROVIDE WITH TAIL PIECE, P-TRAP, ANGLE STOPS, SUPPLIES, SECONDARY FAUCET SHALL BE WATER SAVER MODEL PR7711-110WS POLISHED CHROME PRE-RINSE FAUCET WITH VACUUM BREAKER, 39" STAINLESS STEEL SPRING HOSE AND PRE-RINSE HAND HELD VALVE, WALL SUPPORT AND HOSE HOOK. COORDINATE SINK REQUIREMENTS WITH LAB FURNISHING DRAWINGS.
LS 3	LAB SINK	2"	1-1/2"	3/4"	3/4"	ELKAY MODEL WNSF8124L #14 GAUGE, TYPE 316 STAINLESS STEEL SINK, 49-1/2"x24"x24"H OVERALL DIMENSIONS (36" TOP OF SINK), WITH ONE 24"x24"x14 DEEP BOWL AND A 24"X24" LEFT DRAIN BOARD, PROVIDE WITH WATER SAVER MODEL L7711VB-BH-WS SWING SPOUT FAUCET WITH VACUUM BREAKER, WRISTBLADE HANDLES, SERRATED HOSE NOZZLE AND ADDITIONAL STANDARD AERATOR, PROVIDE WITH TAIL PIECE, P-TRAP, ANGLE STOPS, SUPPLIES, COORDINATE SINK REQUIREMENTS WITH LAB FURNISHING DRAWINGS.
CS 1	CUP SINK	2"	1-1/2"	3/4"	-	CUP SINK PROVIDED WITH FUME HOOD, BY OTHERS. PROVIDE A VACUUM BREAKER ON WATER INLET.
MS 1	MOP SINK	3"	2"	3/4"	3/4"	FIAT MSB-2424, 24"x24"x10" MOLDED STONE WITH AMERICAN STANDARD 8344.111 FAUCET WITH PAIL HOOK, 3/4" HOSE END, BRACE, VACUUM BREAKER, GRID DRAIN AND INTEGRAL STOPS AND STRAINER.
HB 1	HOSE BIBB	-	-	3/4"	3/4"	ACORN RECESSED HOT & COLD HOSE BOX MODEL 8156 WITH WALL FLANGE, BOX SHALL BE 18 GAGE TYPE 304 STAINLESS STEEL, VALVES SHALL BE CARTRIDGE-OPERATED WITH WHEEL HANDLE AND SCREWDRIVER STOPS, BOX SHALL HAVE HOT AND COLD WATER INLETS AND A SINGLE HOSE CONNECTION OUTLET WITH A VACUUM BREAKER.
HB 2	HOSE BIBB	-	-	3/4"	-	ACORN MODEL 8121 WITH VACUUM BREAKER AND LOOSE KEY HANDLE.
SS 1	SERVICE SINK	3"	2"	3/4"	3/4"	ZURN MODEL Z5898 24"x20" CAST IRON SERVICE SINK WITH 12" BACKSPLASH AND 8" CENTER FAUCET HOLES, PROVIDE WITH Z843M1 CHROME PLATED FAUCET WITH VACUUM BREAKER, PAIL HOOK, 3/4" HOSE END AND BRACE, PROVIDE SINK WITH HANGER PLATE, U-TYPE RIM GUARD, 3" CAST IRON EXPOSED TRAP STAND WITH CLEAN-OUT
FS 1	FLOOR SINK	2", 3" OR 4"	2"	-	-	ZURN Z1902, CAST IRON FLOOR SINK, 12"x12"x10" DEEP, WITH GRATE, REFER TO PLANS FOR PIPE CONNECTION SIZE, UNLESS OTHERWISE NOTED, SIZE SHALL BE 3" MINIMUM AND CALCULATED BASED ON EQUIPMENT SERVED, WHICH EVER GREATER.
FS 2	FLOOR SINK	2", 3" OR 4"	2"	-	-	ZURN Z1900, CAST IRON FLOOR SINK, 12"x12"x6" DEEP, WITH GRATE, REFER TO PLANS FOR PIPE CONNECTION SIZE, UNLESS OTHERWISE NOTED, SIZE SHALL BE 3" MINIMUM AND CALCULATED BASED ON EQUIPMENT SERVED, WHICH EVER GREATER.
FS 3	FLOOR SINK	2"	2"	-	-	ZURN Z1910, CAST IRON FLOOR SINK, 8"x8"x6" DEEP, WITH GRATE, REFER TO PLANS FOR PIPE CONNECTION SIZE, UNLESS OTHERWISE NOTED, SIZE SHALL BE 2" MINIMUM AND CALCULATED BASED ON EQUIPMENT SERVED, WHICH EVER GREATER.
FD 1	FLOOR DRAIN	2"	1-1/2"	1/2"	-	ZURN ZN-415B-VP 2" CAST IRON ENAMELED WITH DOUBLE DRAINAGE FLANGE, WEEP HOLES, REVERSIBLE, ADJUSTABLE CLAMPING COLLAR, NICKEL BRONZE STRAINER THREADED COLLAR, BOTTOM OUTLET WITH TRAP PRIMER CONNECTION.
TD 1	TRENCH DRAIN	3"	2"	1/2"	-	ZURN CAST IRON WITH POLISHED BRONZE TOP. PROVIDE WITH 1/2" TRAP PRIMER FITTING AT TAILPIECE.
TP 1	TRAP PRIMER	-	-	1/2"	-	PRECISION PLUMBING PRODUCTS PRIME-RITE MODEL PR-500, AUTOMATICALLY ACTIVATED, CORROSION RESISTANT BRASS, 1/2" INLET & OUTLET, USE SS-II SUPPLY TUBE AND DISTRIBUTION UNIT WHEN SUPPLYING MORE THAN ONE FLOOR DRAIN.

NOTES:
LAB SINKS SHALL BE TYPE 316 STAINLESS STEEL. COORDINATE LEAD TIME WITH MANUFACTURER.

CONSULTANTS

NO. DESCRIPTION DATE

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PROJECT NO. 12317

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TITLE

PLUMBING EQUIPMENT SCHEDULES

P0.2

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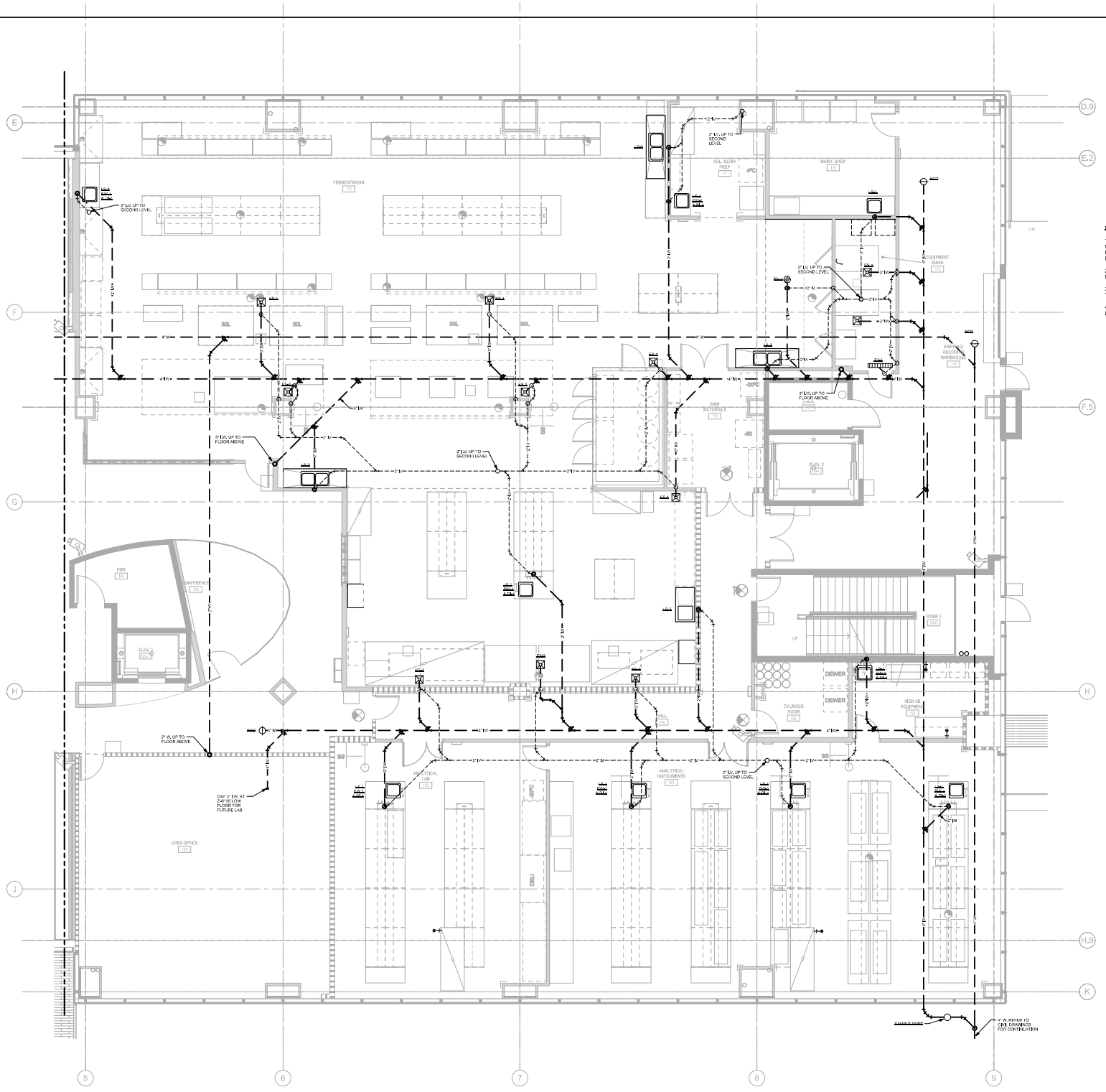
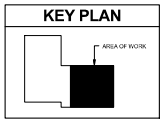


Plumbing First Floor Waste & Vent Plan - EAST
1/4" = 1'-0"

KEY PLAN



CONSULTANTS

NO.	DESCRIPTION	DATE

CLIENT

PROJECT

ADDRESS

PROJECT NO. 12317

SCALE As indicated

TITLE

PLUMBING FIRST FLOOR WASTE & VENT PIPING - EAST

P2.1A.1

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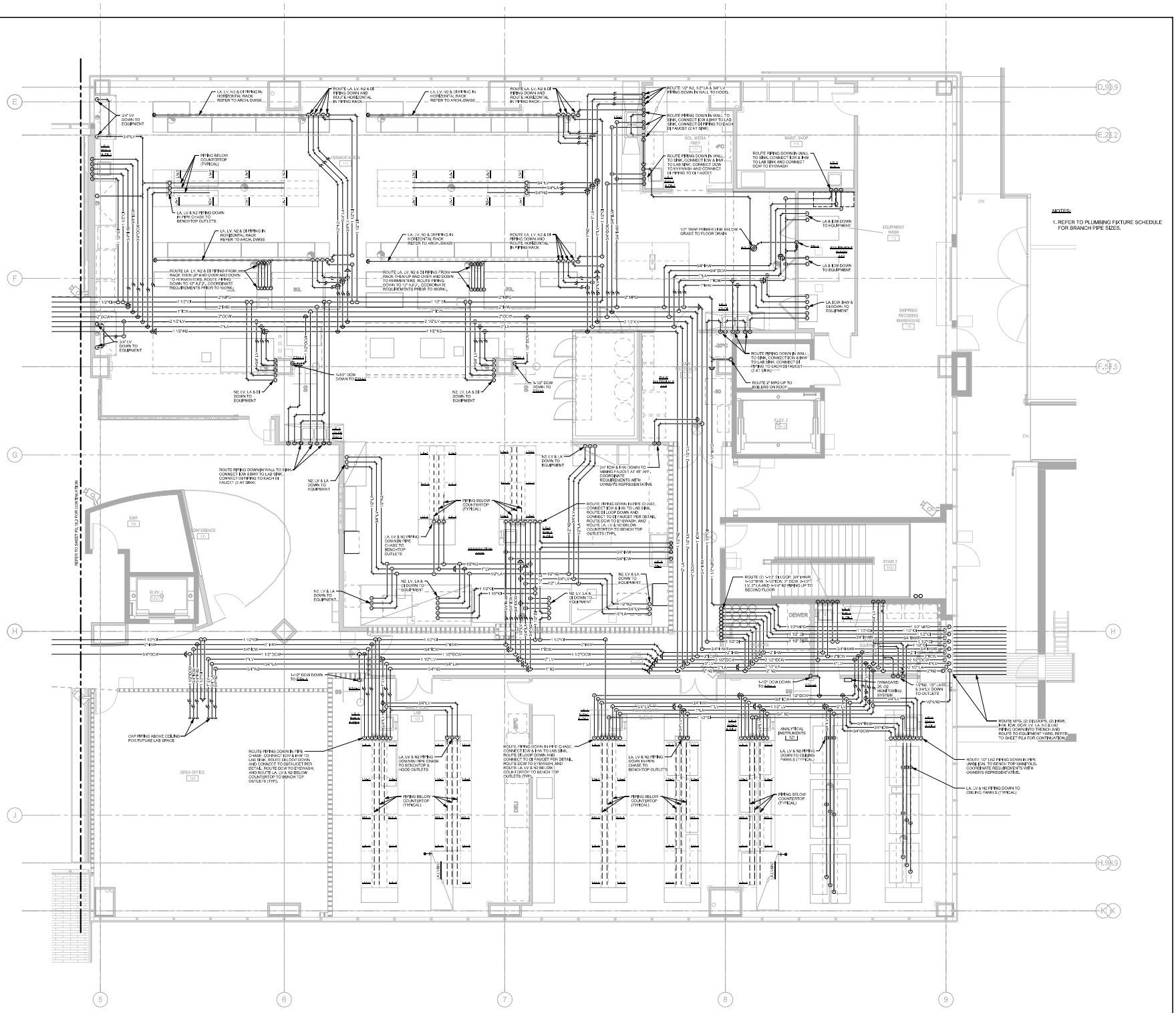

NOTES:
1. REFER TO PLUMBING FIXTURE SCHEDULE FOR BRANCH PIPE SIZES.
KEY PLAN
AREA OF WORK
CONSULTANTS
NO. DESCRIPTION DATE
CLIENT
PROJECT
ADDRESS
PROJECT NO. 12317
SCALE As indicated
TITLE
PLUMBING FIRST FLOOR PIPING PLAN - EAST
P2.1B.1
Plumbing 1st Floor Piping Plan - EAST
1/4" = 1'-0"

ABBREVIATIONS AND DESCRIPTIONS

A	AMPERES	KCM	KILO – CIRCULAR – MIL
AC	ALTERNATING CURRENT	KS	KNEE SPACE
A/C	AIR CONDITIONING	KVA	KILO–VOLTAMPERE
AIC	AMPERES INTERRUPTING CAPACITY	KW	KILO–WATT
AFC	AVAILABLE FAULT CURRENT	KWH	KILO–WATT–HOUR
AFF	ABOVE FINISHED FLOOR		
AFG	ABOVE FINISHED GRADE	LBS	POUNDS
AF	AMP FRAME/AMP FUSE	LF	LINEAL FEET
ABV	ABOVE	LOC	LOCATION
AL	ALUMINUM	LT	LIGHT
ARCH	ARCHITECT OR ARCHITECTURAL	LTG	LIGHTING
AS	AMP SWITCH	LV	LOW VOLTAGE
AT	AMP TRIP		
ATS	AUTOMATIC TRANSFER SWITCH	MH	MOUNTING HEIGHT
AWG	AMERICAN WIRE GAUGE	MANUF	MANUFACTURER
		MAX	MAXIMUM
B/G	BELOW GRADE	MC	MECHANICAL CONTRACTOR
BNBD	BACKBOARD	MCC	MOTOR CONTROL CENTER
BEL	BELOW	MCP	MOTOR CIRCUIT PROTECTION
		MECH	MECHANICAL
C	CONDUIT WITH WIRE	MIN	MINIMUM
CATV	CABLE TELEVISION	MLO	MAIN LUGS ONLY
CCTV	CLOSED CIRCUIT TELEVISION	MTD	MOUNTED
CB	CIRCUIT BREAKER	MTG	MOUNTING
CLG	CEILING		
CLF	CURRENT LIMITING FUSE	N	NEUTRAL
CLR	CLEAR	NC	NORMALLY CLOSED
CO	CONDUIT ONLY WITH NYLON PULLCORD	NEC	NATIONAL ELECTRICAL CODE
COAX	COAXIAL CABLE	NIC	NOT IN CONTRACT
CONC	CONCRETE	NL	NIGHT LIGHT
CONN	CONNECT OR CONNECTION	NTS	NOT TO SCALE
CONT	CONTINUATION	NO	NORMALLY OPEN
CONTR	CONTRACTOR		
CPT	CONTROL POWER TRANSFORMER	OC	ON CENTER
CU	COPPER	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
CT	CURRENT TRANSFORMER	OFOI	OWNER FURNISHED OWNER INSTALLED
CW	COLD WATER		
		PB	PULLBOX
D	DEDICATED OUTLET	PC	PHOTOCELL CONTROL
DC	DIRECT CURRENT	PCTC	PHOTOCELL/TIMECLOCK CONTROL
DIA	DIAMETER	PE	PNEUMATIC–ELECTRIC
DISC	DISCONNECT	PH	PHASE
DIST	DISTRIBUTION	PIV	POST INDICATING VALVE
DL	DAMP LOCATION	PL	PILOT LIGHT
DB	DISTRIBUTION SWITCHBOARD	PLBG	PLUMBING
DWGS	DRAWINGS	PNL	PANEL
		PVC	POLYVINYL CHLORIDE
EA	EACH	PWR	POWER
EB	90–MINUTE BATTERY CONNECTED TO UNIT	PP	POWER POLE
EC	ELECTRICAL CONTRACTOR	PS	POWER SENTRY EMERGENCY BATTERY UNIT
EDF	ELECTRICAL DRINKING FOUNTAIN		
EG	CONNECTED TO EMERGENCY GENERATOR	Q	FIXTURE WITH QUARTZ RESTRIKE
EF	EXHAUST FAN	QTY	QUANTITY
EI	CONNECTED TO EMERGENCY INVERTER		
ELECT	ELECTRICAL	REC	RECESSED
ELEV	ELEVATOR/ELEVATOR	RECEPT	RECEPTACLE
EMER, EM	EMERGENCY	REF	REFRIGERATOR
ENT	ELECTRO–METALLIC TUBING	REQ	REQUIREMENTS
EQUIP	EQUIPMENT	RGS	RIGID GALVANIZED STEEL
EXIST, EX	EXISTING	RM	ROOM
F	DEGREES FAHRENHEIT	SB	STANDBY
FA	FIRE ALARM	SD	SMOKE DETECTOR
FF	FURNITURE FEED, FINISHED FLOOR	SPEC	SPECIFICATION
FFE	FINISH FLOOR ELEVATION	SQ FT	SQUARE FEET OR SQUARE FOOT
FIN	FINISH OR FINISHED	STRUCT	STRUCTURAL
FIXT	FIXTURE	SW	SWITCH
FLUOR	FLUORESCENT	SWBD	SWITCHBOARD
FT	FEET OR FOOT	SWGR	SWITCHGEAR
FTG	FOOTING		
FVMR	FULL VOLTAGE NON–REVERSING	TEMP	TEMPERATURE OR TEMPORARY
		TV	TELEVISION
G	GROUND BUS OR WIRE	TEL, TELE	TELEPHONE
GA	GAUGE	TC	TIMECLOCK
GALV	GALVANIZED	TRANSF	TRANSFORMER
GC	GENERAL CONTRACTOR	TYP	TYPICAL
GD	GARBAGE DISPOSAL		
GFI	GROUND FAULT INTERRUPTER	UGPS	UNDERGROUND PULL SECTION
GFR	GROUND FAULT RELAY	UL	UNDERWRITERS LABORATORIES
GG	GREEN GROUND	UNO	UNLESS NOTED OTHERWISE
GND	GROUND		
		V	VOLTS
H	HORIZONTAL	VA	VOLTAMPERE
HAZMAT	HAZARDOUS MATERIAL	VFD	VARIABLE FREQUENCY DRIVE
HR	HOUR		
HP	HORSEPOWER	W/	WITH
HOA	HAND–OFF–AUTOMATIC	WH	WATER HEATER
HT	HEIGHT	WP	WEATHER PROOF
HTR	HEATER	WT	WEIGHT
HZ	HERTZ		
		X	EXISTING
IG	ISOLATED GROUND	XFMR	TRANSFORMER
IMC	INTERMEDIATE METAL CONDUIT	XL	EXISTING TO BE RELOCATED
INCAND	INCANDESCENT	XN	NEW LOCATION OF RELOCATED FIXTURE
		XR	EXISTING TO BE REMOVED
J–BOX	JUNCTION BOX		

SINGLELINE SYMBOLS AND DESCRIPTIONS

	DRAWOUT CIRCUIT BREAKER		MOTOR OR EQUIPMENT AS NOTED
			UGPS LANDING LUGS
	CIRCUIT BREAKER	ATS 1 NEMA 1	AUTOMATIC TRANSFER SWITCH
	FUSED SWITCH	GEN 1	GENERATOR
	TRANSFORMER	DM	DIGITAL METER BY POWER MEASUREMENTS ION–7350
	GROUNDING ELECTRODE AND CONDUCTOR	LSIG	CIRCUIT BREAKER WITH ELECTRONIC SENSING, TIMING AND TRIPPING CONTROL WITH FIELD INTERCHANGEABLE TRIP UNITS. PROVIDE TRUE RMS FUNCTIONS WITH DESCRETE FIELD ADJUSTABLE SETTINGS INDEPENDENT OF OTHER ADJUSTMENTS. L: LONG TIME TRIP S: SHORT TIME OVERCURRENT TRIP I: INSTANTANEOUS TRIP G: GROUND FAULT TRIP, GROUND FAULT SENSING INTEGRAL WITH CIRCUIT BREAKER.
	EXTERNALLY OPERATED CIRCUIT BREAKER		
PANEL	PANELBOARD	LSI	CIRCUIT BREAKER WITH ELECTRONIC SENSING, TIMING AND TRIPPING CONTROL WITH FIELD INTERCHANGEABLE TRIP UNITS. PROVIDE TRUE RMS FUNCTIONS WITH DESCRETE FIELD ADJUSTABLE SETTINGS INDEPENDENT OF OTHER ADJUSTMENTS. L: LONG TIME TRIP S: SHORT TIME OVERCURRENT TRIP I: INSTANTANEOUS TRIP
		E	INSULATED CASE CIRCUIT BREAKER
PANEL EQ	THROUGH FED OR DOUBLE LUG PANELBOARD	SPD	SURGE PROTECTIVE DEVICE
		ST	SHUNT TRIP
		M	UTILITY METER WITH C.T.s.
	CURRENT TRANSFORMER	M	IN–LINE UTILITY METER–200A MAXIMUM

SIGNAL SYMBOLS AND DESCRIPTIONS

CR	CARD READER
DR	DOOR RELEASE SWITCH, PROVIDE JUNCTION BOX AND 3/4" CONDUIT TO ACCESSIBLE CEILING SPACE.
CTV	CATV OUTLET PROVIDE JUNCTION BOX AND 3/4" CONDUIT TO ACCESSIBLE CEILING SPACE. +15" AFF UNO.
IC	INTERCOM PROVIDE JUNCTION BOX AND 3/4" CONDUIT TO ACCESSIBLE CEILING SPACE. +48" AFF UNO.
DB	DURESS BUTTON PROVIDE JUNCTION BOX AND 3/4" CONDUIT TO ACCESSIBLE CEILING SPACE. +48" AFF UNO.
SC	WALL MOUNTED SECURITY CAMERA AT 98" A.F.F. PROVIDE 3/4" CONDUIT TO ACCESSIBLE CEILING SPACE.
S	SPEAKER BACK BOX LOCATION
IC	INTERCOM J–BOX LOCATION
SPS	SECURITY POWER SUPPLY. PROVIDE 120V CIRCUIT FOR POWER SUPPLY FURNISHED AND INSTALLED BY OTHER.

LIGHTING SYMBOLS AND DESCRIPTIONS

	SEE LUMINAIRE SCHEDULE FOR ADDITIONAL FIXTURE SYMBOLS.
	ALL WIRE SIZES FOR EXTERIOR LIGHTING SHALL BE #12AWG 3/4"C, UNLESS OTHERWISE NOTED.
S	SWITCH, SINGLE POLE 20A, MTD 48" AFF. TO TOP DEVICE: WHITE COVERPLATE: WHITE. PROVIDE 3–1/2" DEEP SINGLE GANG BOX
S_{KL}	SWITCH, SINGLE POLE 20A, MTD 48" AFF TO TOP DESIGNATED TO CONTROL LIGHTING IN CIRCUIT LEGS. DEVICE: WHITE COVERPLATE: WHITE. PROVIDE MULTI–GANG BOX AS REQUIRED TO ACCOMMODATE SWITCH LEGS INDICATED. PROVIDE 3–1/2" DEEP BOX.
S^3	SWITCH, THREE WAY, 20A, MTD 48" AFF. TO TOP DEVICES: WHITE COVERPLATE: WHITE PROVIDE 3–1/2" DEEP SINGLE GANG BOX.
S^4	KEYED SWITCH, SINGLE POLE 20A, MTD 48" AFF TO TOP DEVICE: WHITE COVERPLATE: WHITE. PROVIDE 3–1/2" DEEP SINGLE GANG BOX.
S^{DIM}	DIMMER SWITCH, MTD. 48" AFF TO TOP. PROVIDE 3–1/2" DEEP SINGLE GANG BOX.
S	SPECIALTY SWITCH AS DENOTED ON PLANS. DEVICE: WHITE COVERPLATE: WHITE MTD. 48" AFF TO TOP. PROVIDE 3–1/2" DEEP SINGLE GANG BOX.
MS	WALL MOUNTED MOTION CONTROLLED LIGHTING SWITCH WITH INTEGRAL BI–LEVEL SWITCHING, INFRARED TYPE DEVICE: WHITE MTD 48" AFF TO TOP.
DUAL AB	WALL MOUNTED A/B SWITCHING MOTION CONTROLLED LIGHTING SWITCH WITH INTEGRAL BI–LEVEL SWITCHING, INFRARED TYPE DEVICE: WHITE MTD 48" AFF TO TOP
MP	MOTION SENSOR POWER PACK.
	CEILING MOUNTED ULTRASONIC MOTION SENSOR. DIRECTION OF COVERAGE INDICATED BY ARROWS DEVICE: WHITE
	LIGHTING CONTROL PANEL
LVO AT	LOW VOLTAGE OVERRIDE CONTROL SWITCH, LETTER DESIGNATES ZONE AND NUMBER DESIGNATES SWITCH NUMBER. MTD. 48" AFF TO TOP. PROVIDE 3–1/2" DEEP SINGLE GANG BOX.
3W	3 GANG / MULTI–CHANNEL MASONRY WALLBOX DIMMER.
LTC 1–Xa EB	LUMINAIRE CALLOUT:

UNIQUE LUMINAIRE SYMBOL
LUMINAIRE TYPE
LIGHTING BRANCH CIRCUIT AND SWITCH LEGS
EMERGENCY POWER SOURCE:
'EB' IS EMERGENCY BATTERY
'EI' IS EMERGENCY INVERTER
'EG' IS EMERGENCY GENERATOR

SYMBOLS AND DESCRIPTIONS

	DUPLEX RECEPTACLE MTD 15" AFF TO BOTTOM. DEVICE: WHITE, COVERPLATE: WHITE		JUNCTION BOX, WALL MOUNTED.
EM	DUPLEX RECEPTACLE MTD 15" AFF TO BOTTOM. CONNECTED TO EMERGENCY SYSTEM. DEVICES: RED, COVERPLATE: RED		JUNCTION BOX, SURFACE MOUNTED, CONCEALED.
HS	HALF SWITCH DUPLEX RECEPTACLE MTD 15" AFF TO BOTTOM. DEVICE: WHITE, COVERPLATE: WHITE	J	JUNCTION BOX, FLUSH FLOOR MOUNTED.
D	DEDICATED 20A RATED DUPLEX RECEPTACLE MTD 15" AFF TO BOTTOM. DEVICE: GRAY, COVERPLATE: GRAY		CLOCK OUTLET, MOUNTED 96" A.F.F., U.O.N.
GFI	GROUND FAULT INTERRUPTER DUPLEX RECEPTACLE MTD 15" AFF TO BOTTOM. PROVIDED WITH DEDICATED NEUTRAL. DEVICES: WHITE, COVERPLATE: WHITE		WIREMOLD 4000 DUAL CHANNEL ALUMINUM RACEWAY MOUNTED AT +42".
WP	WEATHER PROOF DUPLEX RECEPTACLE MTD 15" AFF TO BOTTOM. DEVICE: WHITE, COVERPLATE: GASKETED STAINLESS STEEL		2 CIRCUIT PLUG STRIP MOUNTED AT UNDERSIDE OF LAB BENCH SHELF, OUTLETS 6" ON CENTER WITH CIRCUITS ALTERNATING.
	SURFACE MOUNTED DUPLEX RECEPTACLE MTD 15" AFF TO BOTTOM. DEVICE: WHITE, COVERPLATE: STAINLESS STEEL	SFD	SMOKE FIRE DAMPER
IG	ISOLATED GROUND DUPLEX RECEPTACLE MTD 15" AFF TO BOTTOM. DEVICE: ORANGE, COVERPLATE: ORANGE		PANELBOARD FLUSH MOUNTED
H	HORIZONTALLY MOUNTED DUPLEX RECEPTACLE MTD 15" AFF TO BOTTOM. DEVICE: WHITE, COVERPLATE: WHITE		PANELBOARD SURFACE MOUNTED
	208V 1PH 20A SINGLE RECEPTACLE MTD 15" AFF TO BOTTOM. DEVICE: BLACK, COVERPLATE: WHITE		SWITCHBOARD
E-XXX	SPECIALTY OUTLET, VERIFY NEMA CONFIGURATION AS NOTED ON PLANS MTD 15" AFF TO BOTTOM.	T	TRANSFORMER
	FOURPLEX RECEPTACLE MTD 15" AFF TO BOTTOM. DEVICES: WHITE, COVERPLATE: WHITE		FUSED DISCONNECT SWITCH
D	DEDICATED 20A RATED FOURPLEX RECEPTACLE MTD 15" AFF TO BOTTOM. DEVICE: GRAY, COVERPLATE: GRAY	MS1	FVNR COMBINATION MOTOR STARTER, H–O–A, AUXILIARY CONTACTS, OPT, PILOT LIGHTS. NEMA ENCLOSURE AS REQUIRED, WITH FUSED DISCONNECT SWITCH.
	SURFACE MOUNTED FOURPLEX RECEPTACLE MTD 15" AFF TO BOTTOM. DEVICE: WHITE, COVERPLATE: WHITE		FVNR MOTOR STARTER WITH OVERLOADS, H–O–A, AUXILIARY CONTACTS, OPT, PILOT LIGHTS, NEMA ENCLOSURE AS REQUIRED.
WAP	WIRELESS ACCESS POINT ABOVE CEILING FOR WIRELESS LAN.	VFD	VARIABLE FREQUENCY DRIVE
	TELECOMMUNICATIONS OUTLET WITH TRIM RING AND PULLSTRING TO ACCESSIBLE CEILING SPACE. MTD. 15" A.F.F. TO BOTTOM U.N.O.	M HP	MOTOR HORSEPOWER RATED SWITCH.
S	SYSTEMS FURNITURE TELECOMMUNICATIONS OUTLET.		CONCEALED EMT CONDUIT WITH WIRE 2#12AWG + 1#12AWG GREEN GROUND, 3/4"C MINIMUM.
WP GFI, R	ROOF MOUNTED RECEPTACLE		CONCEALED EMT CONDUIT WITH WIRE 3#12AWG + 1#12AWG GREEN GROUND, 3/4"C MINIMUM.
	CEILING MOUNTED RECEPTACLE	#10	CONCEALED EMT CONDUIT WITH WIRE 3#0AWG + 1#0AWG GREEN GROUND, 3/4"C MINIMUM.
TV	TELECOMMUNICATIONS OUTLET CEILING MOUNTED.		UNDERGROUND CONDUIT AND #10 WIRE, UNO. 3/4"C MIN.
CATV	COMBINATION POWER & DATA POWERPLUS OUTLET, FLUSH FLOOR MOUNTED FOR SLAB ON GRADE INSTALLATION.	C	TELECOMMUNICATIONS CONDUIT ONLY. 1" TO ACCESSIBLE CEILING SPACE ON SAME FLOOR.
CATV	COMBINATION POWER & DATA POWERPLUS OUTLET, FLUSH FLOOR MOUNTED ON FIRE RATED POKE–THRU.		HOMERUN
FF	SYSTEMS FURNITURE FLOOR FEED WITH 3/4" CONDUIT FOR POWER & 1–1/4" CONDUIT FOR DATA ON GRADE INSTALLATION.		HATCHED CONDUIT AND WIRE TO BE REMOVED
FF	SYSTEMS FURNITURE FLOOR FEED WITH 3/4" CONDUIT FOR POWER & 1–1/4" CONDUIT FOR TELE/DATA ON FIRE RATED POKE–THRU.	—CATV—	CABLE TV CONDUIT UNDERGROUND
	SYSTEMS FURNITURE WALL FEED WITH 3/4" CONDUIT FOR POWER & 1–1/4" CONDUIT FOR TELE/DATA.	—FO—	FIBER OPTIC CONDUIT UNDERGROUND
	CODE SIZED PULLBOX AS INDICATED ON PLANS.	—HV—	HIGH VOLTAGE CONDUIT UNDERGROUND
	CODE SIZED PULLBOX OR SPLICE BOX AS INDICATED ON PLANS.	—T—	TELEPHONE CONDUIT UNDERGROUND
	INDICATES CONDUIT STUB–UP OR STUB–OUT LOCATION.	EH	ELECTROMAGNETIC DOOR HOLDER 45 BOX WITH 8 SINGLE GANG COMPARTMENTS FOR POWER, DATA, TELEPHONE AND AUDIO VISUAL OUTLETS. MOUNT 4" DOWN AND 4" IN FROM CORNER OF DOOR LEAF. PROVIDE 3/4" TO CEILING SPACE FOR FIRE ALARM SYSTEM WIRING.
	CABLE TRAY, 12" WIDE ALUMINUM.		
AV	AUDIO VISUAL RECESSED FLOOR BOX WITH 8 SINGLE GANG COMPARTMENTS FOR POWER, DATA, TELEPHONE AND AUDIO VISUAL OUTLETS.		
AV	AUDIO VISUAL RECESSED POKE–THRU FLOOR BOX WITH 8 SINGLE GANG COMPARTMENTS FOR POWER, DATA, TELEPHONE AND AUDIO VISUAL OUTLETS.		

FEEDER SCHEDULE

600V BRANCH CIRCUITS 1ø 2W

LABEL	TYPE	SETS	PHASE	NEUTRAL	GROUND	CONDUIT
15A	15A–2W	1	2 #12	N/A	1 #12	3/4"
20A	20A–2W	1	2 #10	N/A	1 #10	3/4"
40A	40A–2W	1	2 #8	N/A	1 #10	3/4"
50A	50A–2W	1	2 #6	N/A	1 #10	3/4"

600V FEEDER SCHEDULE 1ø 3W

LABEL	TYPE	SETS	PHASE	NEUTRAL	GROUND	CONDUIT
20A	20A–3W	1	2 #12	1 #12	1 #12	3/4"
30A	30A–3W	1	2 #10	1 #10	1 #10	3/4"
40A	40A–3W	1	2 #8	N/A	1 #10	1"
50A	50A–3W	1	2 #6	N/A	1 #10	1"
60A	60A–3W	1	2 #4	N/A	1 #10	1"
70A	70A–3W	1	2 #4	N/A	1 #8	1 1/4"
80A	80A–3W	1	2 #3	N/A	1 #8	1 1/4"
90A	90A–3W	1	2 #3	N/A	1 #8	1 1/4"
100A	100A–3W	1	2 #2	N/A	1 #8	1 1/4"
125A	125A–3W	1	2 #1	N/A	1 #8	1 1/4"
150A	150A–3W	1	2 #1/0	N/A	1 #6	1 1/2"
175A	175A–3W	1	2 #2/0	N/A	1 #6	2"
200A	200A–3W	1	2 #3/0	N/A	1 #6	2"
225A	225A–3W	1	2 #4/0	N/A	1 #6	2"
250A	250A–3W	1	2 #250KCM	N/A	1 #6	2"
300A	300A–3W	1	2 #300KCM	N/A	1 #4	2 1/2"
350A	350A–3W	1	2 #350KCM	N/A	1 #2	3"
400A	400A–3W	1	2 #400KCM	N/A	1 #2	3"
450A	450A–3W	1	2 #450KCM	N/A	1 #2	3"
500A	500A–3W	2	2 #250KCM	#250KCM	1 #2	3"
600A	600A–3W	2	2 #300KCM	#300KCM	1 #2	3"
700A	700A–3W	2	2 #350KCM	#350KCM	1 #1/0	4"
800A	800A–3W	2	2 #400KCM	#400KCM	1 #1/0	4"
1000A	1000A–3W	2	2 #500KCM	#500KCM	1 #2/0	4"
1200A	1200A–3W	3	2 #500KCM	#500KCM	1 #3/0	4"
1350A	1350A–3W	3	2 #500KCM	#500KCM	1 #4/0	4"
1600A	1600A–3W	4	2 #500KCM	#500KCM	1 #4/0	4"
1800A	1800A–3W	5	2 #500KCM	#500KCM	1 #4/0	4"
2000A	2000A–3W	6	2 #500KCM	#500KCM	#250MCM	4"
2500A	2500A–3W	8	2 #500KCM	#500KCM	#250MCM	4"
3000A	3000A–3W	10	2 #500KCM	#500KCM	#250MCM	4"

600V FEEDER SCHEDULE 3ø 3W

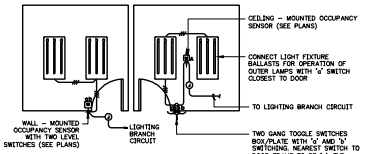
LABEL	TYPE	SETS	PHASE	NEUTRAL	GROUND	CONDUIT
20A	20A–3W	1	3 #12	N/A	1 #12	3/4"
30A	30A–3W	1	3 #10	N/A	1 #10	3/4"
40A	40A–3W	1	3 #8	N/A	1 #10	1"
50A	50A–3W	1	3 #6	N/A	1 #10	1"
70A	70A–3W	1	3 #4	N/A	1 #8	1"
80A	80A–3W	1	3 #4	N/A	1 #10	1"
90A	90A–3W	1	3 #3	N/A	1 #8	1 1/4"
100A	100A–3W	1	3 #2	N/A	1 #8	1 1/4"
125A	125A–3W	1	3 #1	N/A	1 #8	1 1/4"
150A	150A–3W	1	3 #1/0	N/A	1 #6	1 1/2"
175A	175A–3W	1	3 #2/0	N/A	1 #6	2"
200A	200A–3W	1	3 #3/0	N/A	1 #6	2"
225A	225A–3W	1	3 #4/0	N/A	1 #6	2"
250A	250A–3W	1	3 #250KCM	#250KCM	1 #4	2"
300A	300A–3W	1	3 #300KCM	#300KCM	1 #4	2"
350A	350A–3W	1	3 #350KCM	#350KCM	1 #2	3"
400A	400A–3W	1	3 #400KCM	#400KCM	1 #2	3"
450A	450A–3W	1	3 #450KCM	#450KCM	1 #2	3"
500A	500A–3W	2	3 #250KCM	#250KCM	1 #2	3"
600A	600A–3W	2	3 #300KCM	#300KCM	1 #1/0	4"
700A	700A–3W	2	3 #350KCM	#350KCM	1 #1/0	4"
800A	800A–3W	2	3 #400KCM	#400KCM	1 #1/0	4"
1000A	1000A–3W	3	3 #500KCM	#500KCM	1 #2/0	4"
1200A	1200A–3W	3	3 #500KCM	#500KCM	1 #3/0	4"
1600A	1600A–3W	4	3 #500KCM	#500KCM	1 #4/0	4"
2000A	2000A–3W	6	3 #500KCM	#500KCM	#250MCM	4"
2500A	2500A–3W	8	3 #500KCM	#500KCM	#250MCM	4"
3000A	3000A–3W	10	3 #500KCM	#500KCM	#250MCM	4"

600V FEEDER SCHEDULE 3ø 4W

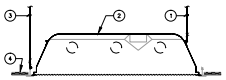
LABEL	TYPE	SETS	PHASE	NEUTRAL	GROUND	CONDUIT
20A	20A–4W	1	3 #12	1 #12	1 #12	3/4"
30A	30A–4W	1	3 #10	1 #10	1 #10	3/4"
40A	40A–4W	1	3 #8	1 #10	1 #10	1"
50A	50A–4W	1	3 #6	1 #8	1 #10	1"
60A	60A–4W	1	3 #4	1 #4	1 #10	1"
70A	70A–4W	1	3 #4	1 #4	1 #8	1 1/4"
80A	80A–4W	1	3 #3	1 #3	1 #8	1 1/4"
90A	90A–4W	1	3 #2	1 #3	1 #8	1 1/4"
100A	100A–4W	1	3 #1	1 #1	1 #8	1 1/4"
125A	125A–4W	1	3 #1	1 #1	1 #8	1 1/4"
150A	150A–4W	1	3 #1/0	1 #1/0	1 #6	1 1/2"
175A	175A–4W	1	3 #2/0	1 #2/0	1 #6	2"
200A	200A–4W	1	3 #3/0	1 #3/0	1 #6	2"
225A	225A–4W	1	3 #4/0	1 #4/0	1 #4	2 1/2"
250A	250A–4W	1	3 #250KCM	#250KCM	1 #4	2"
300A	300A–4W	1	3 #300KCM	#300KCM	1 #4	2"
350A	350A–4W	1	3 #350KCM	#350KCM	1 #2	3"
400A	400A–4W	1	3 #400KCM	#400KCM	1 #2	3"
450A	450A–4W	1	3 #450KCM	#450KCM	1 #2	3"
500A	500A–4W	2	3 #250KCM	#250KCM	1 #2	3"
600A	600A–4W	2	3 #300KCM	#300KCM	1 #1/0	4"
700A	700A–4W	2	3 #350KCM	#350KCM	1 #1/0	4"
800A	800A–4W	2	3 #400KCM	#400KCM	1 #1/0	4"
1000A	1000A–4W	3	3 #500KCM	#500KCM	1 #2/0	4"
1200A	1200A–4W	3	3 #500KCM	#500KCM	1 #3/0	4"
1600A	1600A–4W	4	3 #500KCM	#500KCM	1 #4/0	4"
2000A	2000A–4W	5	3 #500KCM	#500KCM	#250MCM	4"
2500A	2500A–4W	6	3 #500KCM	#500KCM	#250MCM	4"
3000A	3000A–4W	10	3 #500KCM	#500KCM	#250MCM	4"

ELECTRICAL CONSTRUCTION DOCUMENTS GENERAL INFORMATION

1. THE DRAWINGS CONTAINED WITHIN THESE CONSTRUCTION DOCUMENTS ARE DIAGRAMMATIC. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS, DIMENSIONS, AND CLEARANCES PRIOR TO THE COMMENCEMENT OF WORK AND SHALL INCLUDE ALL COSTS, EQUIPMENT, MATERIALS, ETC. REQUIRED FOR A COMPLETE, FUNCTIONAL, AND CODE–COMPLIANT INSTALLATION.
2. THE CONTRACTOR SHALL COORDINATE ALL INSTALLATIONS WITH ALL OTHER TRADES.
3. FINAL LOCATIONS OF ALL DEVICES, LIGHT FIXTURES, EQUIPMENT, ETC. SHALL BE INDICATED ON THE ARCHITECTURAL DRAWINGS. ALL DIMENSIONAL INFORMATION SHALL BE OBTAINED FROM THE ARCHITECT. NO DIMENSIONAL INFORMATION SHALL BE OBTAINED FROM ELECTRICAL DRAWINGS.
4. THESE DRAWINGS ARE SUPPLEMENTED BY PRINTED DIVISION 16 OR DIVISION 26 ELECTRICAL SPECIFICATIONS. THE COMPLETE ELECTRICAL CONSTRUCTION DOCUMENT PACKAGE CONTAINS BOTH SPECIFICATIONS AND DRAWINGS. THE CONTRACTOR SHALL REVIEW AND REVIEW THE COMPLETE ELECTRICAL CONSTRUCTION DOCUMENT PACKAGE PRIOR TO THE COMMENCEMENT OF ANY WORK AND INCLUDE ALL COST IN THIS BID.
5. ALL WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES, NATIONAL ELECTRICAL CODE, STATE OF CALIFORNIA ENERGY CONSERVATION STANDARDS AND ALL REQUIREMENT OF THE AUTHORITY HAVING JURISDICTION (AHJ).
6. CONTRACTOR SHALL COORDINATE ALL EQUIPMENT LOCATIONS WITH ARCHITECTURAL, MECHANICAL, STRUCTURAL, PLUMBING AND ALL APPROPRIATE DISCIPLINES.
7. ANY DISCREPANCIES THAT OCCUR SHALL BE BROUGHT TO THE ATTENTION OF THE DESIGN TEAM AND/OR ENGINEER PRIOR TO THE START OF CONSTRUCTION.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION AND REPAIR OF EXISTING SURFACES, EQUIPMENT, AND PROPERTY THAT MAY BE DAMAGED AS A RESULT OF ANY ELECTRICAL DEMOLITION AND/OR NEW WORK.
9. PROVIDE WEATHERPROOF (NEMA 3R) JUNCTION BOXES, CONDUIT, FITTINGS AND ENCLOSURES AT ALL EXTERIOR LOCATIONS AND ALL WET OR DAMP INTERIOR LOCATIONS. ALL EXTERIOR LIGHTING FIXTURES SHALL BE UL LISTED FOR WET OR DAMP LOCATION AS APPROPRIATE FOR THE LOCATION
10. VERIFY UTILITY COMPANY REQUIREMENTS FOR ALL WORK INCLUDING MODIFIED OR NEW SERVICE ENTRANCES. AND INCLUDE ALL COST IN BID.
11. NOTIFY POWER UTILITY COMPANY OF ANY SIGNIFICANT LOAD INCREASE, SERVICE REVISION, SHUTDOWN OF SERVICE OR ANY RELATED WORK.
12. VERIFY EXISTING CONDITIONS PRIOR TO BID AND INCLUDE ALL COSTS AS REQUIRED FOR A COMPLETE AND FUNCTIONAL INSTALLATION.
13. THE CONTRACTOR SHALL REVIEW EQUIPMENT MANUFACTURER'S REQUIREMENTS AND PROVIDE FUSE SIZES AS INDICATED, RELAYS, CONTACTORS OR OTHER RELATED WORK TO COMPLETE THE ELECTRICAL SYSTEM.
14. ALL DEVICES AND EQUIPMENT SHALL BE INSTALLED IN COMPLIANCE WITH A.D.A. REQUIREMENTS.
15. CONTRACTOR SHALL CONCEAL ALL CONDUIT, FITTINGS, AND DEVICES FROM VIEW WHERE REASONABLY POSSIBLE.
16. CONTRACTOR SHALL ENSURE THAT ALL CONDUIT, FIXTURES, FITTINGS, AND DEVICES LOCATED IN PUBLIC AREAS ARE TAMPERPROOF AND PROTECTED FROM PHYSICAL DAMAGE.
17. ALL CURRENT CARRYING CONDUCTORS SHALL BE COPPER. INSULATION SHALL BE TYPE THHN/THWN FOR ALL BRANCH CIRCUITS UP TO AND INCLUDING SIZE #2AWG. INSULATION FOR CONDUCTORS OVER SIZE #2AWG SHALL BE XHHW.
18. ALL GROUND CONDUCTORS SHALL BE INSULATED COPPER.
19. ALL CONDUIT SHALL BE EMT (INSTALLED IN INTERIOR CONCEALED SPACES) OR SCHEDULE–40 PVC (INSTALLED UNDERGROUND) UNLESS OTHERWISE NOTED.
20. ALL AMPACITIES ARE BASED UPON TABLE 310.16 OF THE 2011 N.E.C.
21. FEEDER SCHEDULES INDICATE DATA FOR COPPER CONDUCTORS RATED UP TO 600V AT 75 DEGREES CELSIUS.
22. HEALTH CARE FACILITIES SHALL BE WIRED IN A METALLIC RACEWAY OR CABLING SYSTEM. CONTRACTOR SHALL PROVIDE A REDUNDANT GROUNDING METHOD WITH AN INSULATED GREEN GROUNDING CONDUCTOR INCLUDED.
23. ALL MULTI–WIRE BRANCH CONDUCTORS SHALL ORIGINATE FROM THE SAME PANELBOARD. THE GROUNDED AND UNGROUNDED CONDUCTORS SHALL BE GROUPED WITHIN THE PANELBOARD AND THEY SHALL BE PROVIDED WITH A MEANS THAT WILL SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS. THE CONTRACTOR SHALL PROVIDE THE DISCONNECTING MEANS BASED UPON THE FINAL FIELD WIRING, CIRCUIT



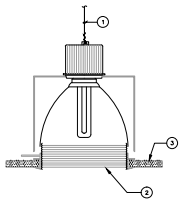
2 TYPICAL OFFICE LIGHTING
NO SCALE



KEY NOTES:

1. DENOTES FIXTURE SUPPORT WIRE (MINIMUM #10) ON TWO CORNERS ATTACHED TO BUILDING STRUCTURE.
2. DENOTES LUMINAIRE, 2'x4', 2'x2' OR 1'x4', WITH MINIMUM OF (4) RESTRAINT CLIPS, ATTACHING FIXTURES TO CEILING GRID.
3. DENOTES T-BAR CEILING SYSTEM SAFETY WIRE.
4. DENOTES CEILING MATERIAL.

3 RECESSED LUMINAIRE SEISMIC RESTRAINT
NO SCALE



KEY NOTES:

1. DENOTES FIXTURE SUPPORT WIRE (MINIMUM #10) FROM LUMINAIRE ATTACHED TO BUILDING STRUCTURE ABOVE.
2. DENOTES RECESSED INCADESCENT, FLUORESCENT OR H.I.D. DOWNLIGHT.
3. DENOTES T-BAR CEILING SYSTEM.

4 RECESSED DOWNLIGHT RESTRAINT
NO SCALE

SYMBOL	TYPE	VOLTAGE	INPUT WATTAGE	FIXTURE DESCRIPTION	FIXTURE INFORMATION		LAMP INFORMATION					BALLAST MANUFACTURER/ CATALOG NUMBER	MOUNTING INFORMATION	NOTES
					MANUFACTURER #	CATALOG NUMBER #	QTY	TYPE	WATTS	COLOR TEMP.	MANUFACTURER & CATALOG NUMBER			
	F1	277	55	DIRECT/INDIRECT RECESSED 2X4 LINEAR FACTED REFLECTOR WITH SLOPED END PLATES WITH ADVANCE OPTIMUM PROGRAM START 0.89 NOMINAL BALLAST	LITHONIA	2AVDTIS-S24ADR-MVOLTRS	2	T8	32	4100	OSRAM SYLVANIA 7332841/0/PS/ECO	OSRAM SYLVANIA (2) QHE 1X32T8/UNV PSN44C	RECESSED	
	F2	277	64	RECESSED PRISMATIC LENSED 2X4 TROFFER, UL LISTED, 3 LAMP2 BALLAST FOR 50% SWITCHING, NIGHT LIGHT.	LITHONIA	2GTX-3-32-4YA12125-MVOLT-GSB10RS	3	T8	32	4100	OSRAM SYLVANIA 7332841/0/PS/ECO	OSRAM SYLVANIA (1) QHE 2X32T8/UNV PSN44C (1) QHE 1X32T8/UNV PSN44C	RECESSED	
	F2E	277	64	SAME AS FIXTURE TYPE F2, BUT CONNECTED TO EMERGENCY GENERATOR BRANCH CIRCUIT, NIGHT LIGHT.										
	F3			NOT USED										
	F3E			NOT USED										
	F4	277	66	2X2 RECESSED DECORATIVE SKY LIGHT FIXTURE, UL LISTED, VERIFY FROSTED ACRYLIC SHIELDING WITH ARCHITECT.	LITHONIA	2AVDTIS-2-T-MDR-MVOLT-SSNF	4	T8	17	4100	OSRAM SYLVANIA F017/841/0/PS/ECO	OSRAM SYLVANIA QHE 2X32T8/UNV PSN44C	RECESSED	
	F5	277	45	6" WET LOCATION LENSED DOWNLIGHT, UL LISTED.	LITHONIA	6HF-142TRT-RSLS-MVOLT	1	TRT CFL	32	4100	OSRAM SYLVANIA CF42DTE/IN/841/ECO	OSRAM SYLVANIA (1) QTP 2X26CF/UNV DM	RECESSED	
	F6	277	45	6" OPEN DOWNLIGHT, UL LISTED.	GOTHAM	LINN 142TRT MVOLT F6OHA	1	TRT CFL	42	4100	OSRAM SYLVANIA CF42DTE/IN/841/ECO	OSRAM SYLVANIA (1) QTP 2X26CF/UNV DM	RECESSED	
	F6E			SAME AS FIXTURE TYPE F6, BUT CONNECTED TO EMERGENCY GENERATOR BRANCH CIRCUIT, NIGHT LIGHT.										
	F7	277	45	6" DOWN LIGHT WITH DROP FROSTED DISK, UL LISTED.	GOTHAM	AT-142TRT-MA-SLD-MVOLT	1	TRT CFL	42	4100	OSRAM SYLVANIA CF42DTE/IN/841/ECO	OSRAM SYLVANIA (1) QTP 2X26CF/UNV DM	RECESSED	
	F7E	277	45	SAME AS FIXTURE TYPE F7, BUT CONNECTED TO EMERGENCY GENERATOR BRANCH CIRCUIT, NIGHT LIGHT.										
	F8	277	110 PER 8' SECTION	LINEAR DIRECT/INDIRECT CONTINUOUS FIXTURE LOCATED IN OPEN OFFICES, UL LISTED, 1LAMP UP, 1 LAMP DOWN, SEE DRAWINGS FOR LENGTHS.	AXIS	BB-F-NO-SH-ALA-TS-1-4-VA-UNV-E-2A/B	2 PER 4'x2'	T8	32	4100	OSRAM SYLVANIA F017/841/0/PS/ECO	OSRAM SYLVANIA (2) QHE 2X32T8/UNV PSN44C PER 8' SECTION	PENDANT: 8'-6" AFF TO TOP OF FIXTURE	
	F8E			SAME AS FIXTURE TYPE F7A, BUT CONNECTED TO EMERGENCY GENERATOR BRANCH CIRCUIT, NIGHT LIGHT.										
	F9H	277	32	RECESSED WALL WASHER, UL LISTED, SINGLE LAMP CROSS SECTION, RECESSED IN WOOD CEILING, LENGTH AS SHOWN	AXIS	BWR-S-FL-S1S-ALA-T8-1-VA-UNV-E-RS-LOS	1	T8	32	4100			RECESSED	
	F9T	277	32	RECESSED WALL WASHER, UL LISTED, SINGLE LAMP CROSS SECTION, RECESSED IN WOOD CEILING, LENGTH AS SHOWN	AXIS	BWR-S-FL-4-ALA-T8-1-VA-UNV-ERS-1-T09	1	T8	32	4100			RECESSED	
	F10	277	32	LINEAR CONTINUOUS PERIMETER FIXTURE, UL LISTED, SINGLE LAMP CROSS SECTION, SEE DRAWINGS FOR LENGTHS.	MARK LIGHTING	PRV-16-4W-1-T8S-48IRK-277	1 PER 4'x2'	T8	32	4100		PER 8' SECTION	RECESSED	
	F11	120	49W MAX	SMALL SCALE DECORATIVE CONE PENDANT, MONOPOINT, HALF FROSTED, HALF CLEAR, UL LISTED.	SESA	100-SH-C4407	1	INC	55		N/A	N/A	PENDANT	
	F12	24	3	CONTINUOUS LED TAPE LIGHT, 4100K, 190LM/FT TO BE LIMIT, UL LISTED, SEE DRAWINGS FOR LENGTHS.	TUBE LIGHTING	DSH-WHO-24V-W83-X	N/A	LED	1.4/FT	8000	N/A	N/A	SURFACE COVE	CONTRACTOR SHALL INSTALL TAPE LIGHT TO BE CONTINUOUS WITH NO BREAKS IN LIGHT OUTPUT.
	F13	277	55	4'-0" STRIP FIXTURE WITH WIRE GUARD AND CHAIN HANGERS, UL LISTED.	LITHONIA	C-32-MVOLT-GSSB10RS-HCS6-WGCUN HST	2	T8	32	4100			CHAIN HUNG	
	F13E			SAME AS FIXTURE TYPE F13, BUT CONNECTED TO EMERGENCY GENERATOR BRANCH CIRCUIT, NIGHT LIGHT.										
	F14			NOT USED										
	F15			NOT USED										
	F16	120	300	LARGE SCALE DECORATIVE PENDANT, UL LISTED.	LE SOLEIL SUSPENSION	0601-L-SOLEIL-S24H-WH	3X 1X	T4 CB 75W MR20 75W	350	4100	TBD	TBD		
	F17	120	120W MAX	SMALL SCALE DECORATIVE CONE PENDANT CLUSTER OF THREE, MONOPOINT, HALF FROSTED, HALF CLEAR, UL LISTED.	SESA	(3)XP-SH-C4407 w/ (1) 120-LSN	3	INC	40		N/A	N/A	PENDANT	
	F18	277	26	BRUSHED ALUMINUM WALL SCONCE, ADA COMPLIANT	LUMENART	AWL02-F26F3625-277-V	1	CFL	26	4100	N/A	N/A	SURFACE	
	F19	277	55	SURFACE	LUMINPULSE	LOGH-R24-MVOLT-4IS-CT-10X13-AWD-F-MSH-DRAWING-LOGIRS-4-XX	1	LED	39				SURFACE MTD CONFIRM LOCATION WITH ARCHITECT	
	F20	277	64	RECESSED PRISMATIC LENSED 2X4 TROFFER, WET LOCATION, UL LISTED, 2 LAMP2 BALLAST FOR 50% SWITCHING.	LITHONIA	2WRT-2-32-4Y12125-MVOLT-GSB10RS	3	T8	32	4100			RECESSED	
	F21	277	55	4'-0" STRIP FIXTURE WITH CLEAR PRISMATIC POLYCARBONATE LENS AND CHAIN HANGERS, WET LOCATION, UL LISTED.	LITHONIA	XWL232 MV	2	T8	32	4100			CHAIN HUNG	
	F22A	120	32	UNDER CABINET LIGHT	NULITE	112-132T8-120V-15N-CFSS	1	T8	32	4100				
	F22B	120	32	UNDER CABINET LIGHT	LITHONIA	132MV T 8 32 4100	1	T8	32	4100				
	F23	277	100	8" RECESSED 100W METAL HALIDE DOWNLIGHT	LITHONIA	AGL-8R1L-10AR-277	1	INDUCTION	85					
	F24	277	450	8'X8' SQUARE BOARDROOM PENDANT WITH INTEGRAL COWLING	AXIS	CLAS-4-T8-3-XX-4-277-D-B-10W-1-CASE-C w/60 DEGREE COWLING (BOARDROOM)	8	T8	32					
	F25	277	64	LINEAR DIRECT/INDIRECT CONTINUOUS FIXTURE LOCATED IN OPEN OFFICES, UL LISTED, 1LAMP UP, 1 LAMP DOWN, SEE DRAWINGS FOR LENGTHS.	AXIS	CLAS-4-T8-3-XX-4-UNV-ERS-1-CASE-C	3	T8	32					
	F26-SF	277	5	X	LITHONIA	EDGR 1 G BL								

1 LUMINAIRE SCHEDULE
NO SCALE

CONSULTANTS

CLIENT

PROJECT

ADDRESS

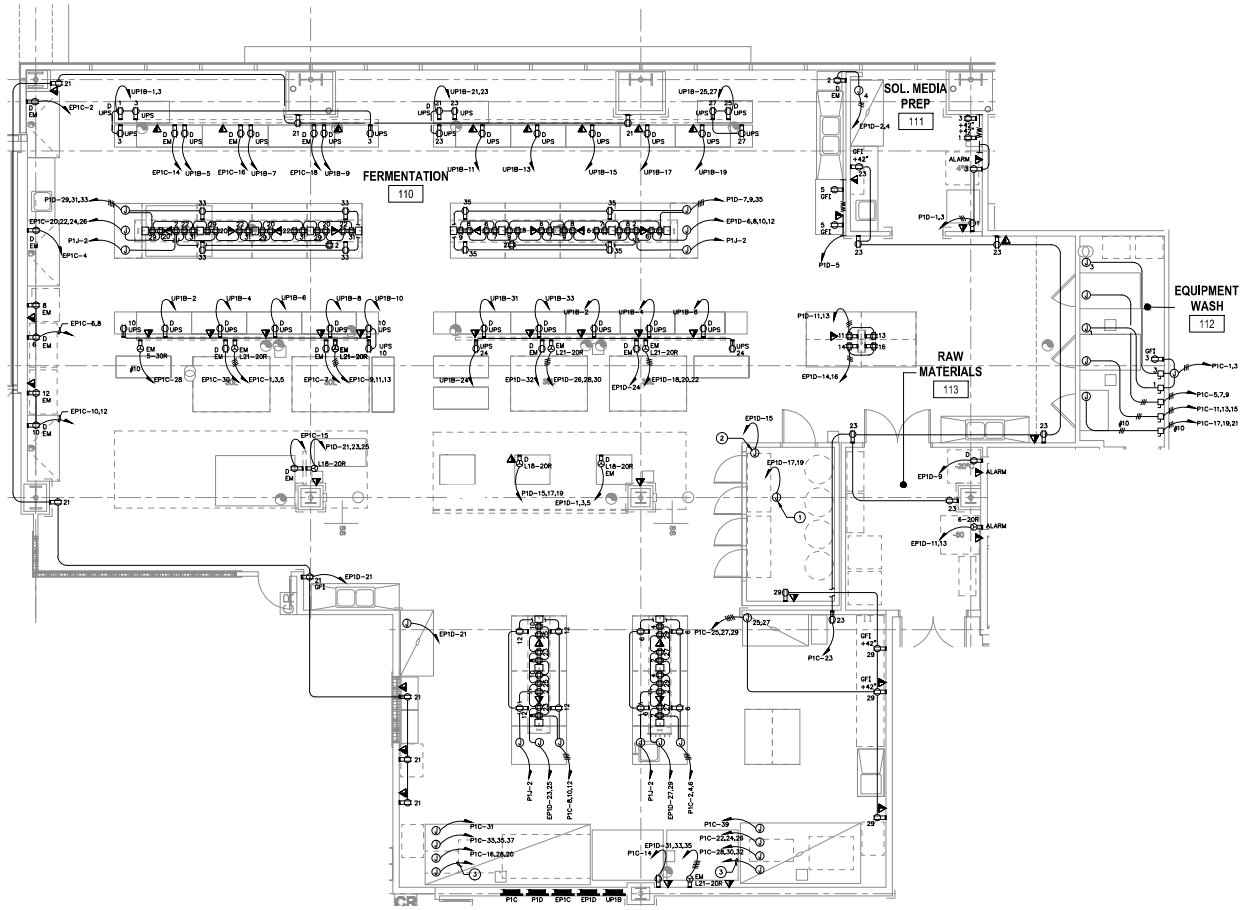
PROJECT NO. 12137

SCALE As indicated

TITLE

LUMINAIRE SCHEDULE

E-002-TI



KEY NOTES:

1. MAKE ELECTRICAL CONNECTION TO FAN COIL PROVIDED INTEGRAL AS PART OF THE COLD ROOM ASSEMBLY, COORDINATE WITH COLD ROOM SHOP DRAWINGS.
2. PROVIDE 120V, 20A SINGLE POINT CONNECTION FOR COLD ROOM CONTROLS AND LIGHTING.
3. PROVIDE 1" SPARE CONDUIT TO PANELBOARD 'EP1D'.

GENERAL NOTES:

1. ALL OUTLETS IN LAB SHALL HAVE STAINLESS STEEL COVER PLATES.
2. ALL EMERGENCY OUTLETS SHALL BE COLOR ORANGE.
3. ALL DEDICATED OUTLETS SHALL BE COLOR GREY.

1 ENLARGED LABORATORY PLAN
1/4" = 1'-0"

REF. NORTH

CONSULTANTS

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ADDRESS

PROJECT NO. 12137

SCALE As indicated

TITLE

ENLARGED LABORATORY PLAN

E-402-TI

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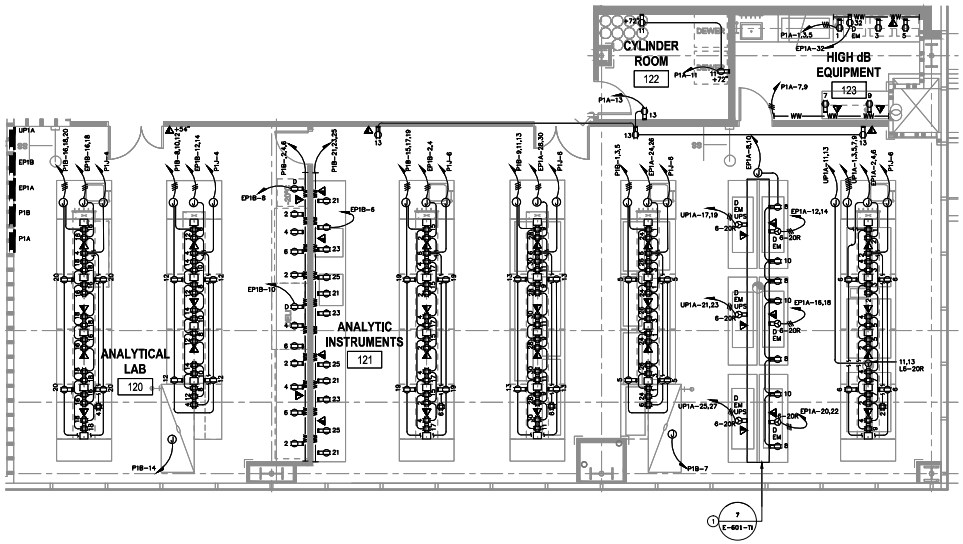

KEY NOTES:

1. OVERHEAD SERVICE CARRIER.
2. MOUNT ABOVE RACEWAY.

GENERAL NOTES:

1. ALL OUTLETS IN LAB SHALL HAVE STAINLESS STEEL COVER PLATES.
2. ALL EMERGENCY OUTLETS SHALL BE COLOR ORANGE.
3. ALL DEDICATED OUTLETS SHALL BE COLOR GREY.

1 ENLARGED LABORATORY PLAN
1/4" = 1'-0"

REF. NORTH

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PROJECT

ADDRESS

PROJECT NO. 12137

SCALE As indicated

TITLE

ENLARGED LABORATORY PLAN

E-403-TI

PROJECT: GATTACA
SCHOOL:

MEP Equipment Constructability Review

Equip #	Equipment Name	Comments