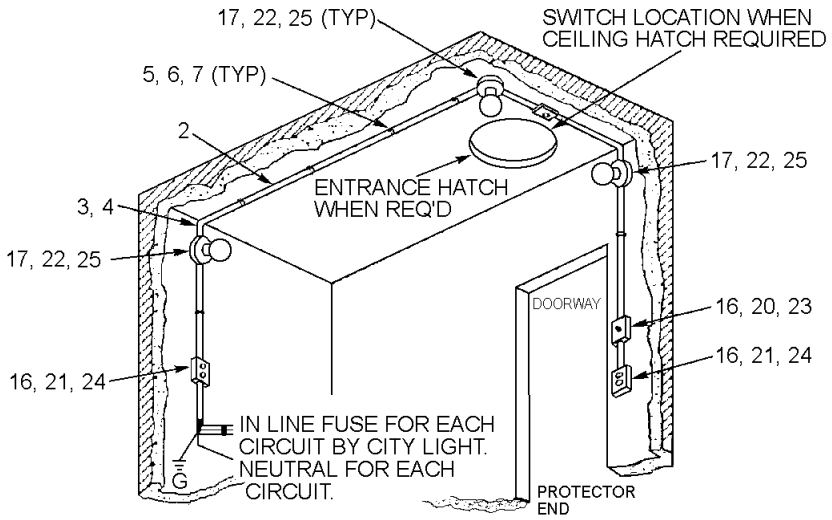
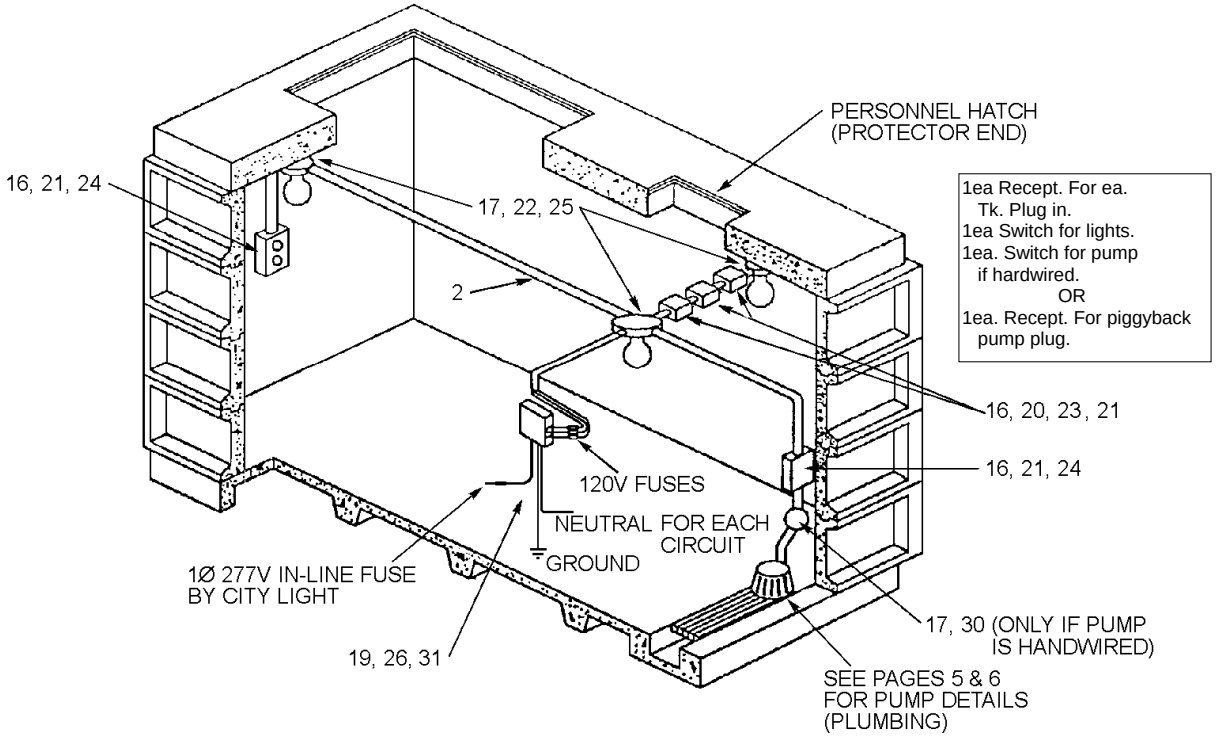
LIGHTING AND SUMP PUMP INSTALLATION FOR SINGLE TRANSFORMER VAULTS

TYPICAL ON GRADE OR IN BUILDING VAULT



NOTE:
Use separate circuits for lights and for receptacles and for pump if needed.

TYPICAL BELOW GRADE VAULTS - NETWORK VAULTS ONLY



1ea Recept. For ea. Tk. Plug in.
1ea Switch for lights.
1ea. Switch for pump if hardwired.
OR
1ea. Recept. For piggyback pump plug.

standards coordinator	*standards supervisor*	*unit director*
Brett Hanson	John Shipek	Darnell Cola

BILL OF MATERIALS - VAULT LIGHTING

Item	Quantity: Vault with Sump Pump and Lighting 687	612	814	818 ✣	Customer Furnished Vault	Description	Stock No.	Mat'l. Std.
1	See note 1 on page 4				-	TRANSFORMER, 277v - 120v	391285	–
2	20'	30'	35'	50'	20' - 50' -	CONDUIT,PVC, SCH 40, , 1/2" 3/4"	734525 734526	7345.2
3	2	2	2	3	2 -3 -	ELBOW, conduit, PVC, SCH 40, 1/2" 3/4"	734551 734671	7345.2
4	3	4	4	6	4 - 6 -	COUPLING, conduit, PVC, SCH 40, 1/2" 3/4'	734512 734513	7345.2
5	4	5	5	7	4 - 7 -	STRAP, pipe, one hole, 1/2" 3/4"	713442E 713443E	7134.5
6	8	14	16	18	8 - 18	ANCHOR, nail drive, 1/4" x 1"	780010E	–
7	4	6	8	10	4 - 7 -	SPACER, pipe strap, 1/2" 3/4"	713338 713452	7134.6
8	As required				20' - 40'	WIRE, #12, 1/C, THWN, Brown	612221	6122.3
9	As required				20' - 40'	WIRE, #12, 1/C, THWN, Purple	612229	6122.3
10	As required				20' - 45'	WIRE, #12, 1/C, THWN, Orange	612228	6122.3
11	As required				20' - 40'	WIRE, #12, 1/C, THWN, Blue	612225	6122.3
12	As required				20' - 45'	WIRE, #12, 1/C, THWN, Red	612224	6122.3
13	As required				20' - 45'	WIRE, #12, 1/C, THWN, Black	612220	6122.3
14	As required				20' - 40'	WIRE, #12, 1/C, THWN, Green	612226	6122.3
15A	As required				20' - 40'	WIRE, #12, 1/C, THWN, White	612222	6122.3
15B	As required				20' - 40'	WIRE, #12, 1/C, THWN, Gray	612223	6122.3
15C	As required				20' - 40'	WIRE, #12, 1/C, THWN, Gray w/ Tracer	612219	6122.3
16	4	4	4	4	- -	BOX, type FSC, 2" x 4", PVC, SCH 40, 1/2" 3/4"	734567 734571	–
17	3	3	3	4	3 -	BOX, outlet, bakelite, round, 1/2" 3/4"	734569 734572	–
18	5	5	5	5	-	TERMINAL, compression, 12-10, 1/2" stud	677189	–
19	6	6	6	6	-	BOOT, insul., for HEB fuse holder	682360	–
20	2	2	2	2	1	PLATE, wall, nylon, 1 gang / 1 switch	733421	–
21	2	2	2	2	2	PLATE, wall, nylon, 1 gang / duplex	733408	–
22	2	2	2	3	2 - 3	LAMPHOLDER, plastic, for 4" box	733116	–
23	2	2	2	2	1	SWITCH, toggle, flush, 120v - 277v "glow"	733376	7333.0
24	2	2	2	2	2	RECEPTACLE, duplex, parallel, w/ ground	733054	7330.0
25	2	2	2	3	2 -3	LAMP, 125 volt, 300 watt	730630	–
26	3	3	3	3	-	HOLDER, fuse, 600v, type HEB-AA	682346	–
27	1	1	1	1	-	FUSE, current limiting, 600V, 15 amp, KTK, for 0.4 HP pump #739291	683157	–
28	10	10	10	10	10	TWIST LOCK connector, red	677181	–
29	1	1	1	1	-	FUSE, current limiting, 600V, 10 amp, KTK, for 0.33 HP pump #739292	683156	–
30	1	1	1	1	-	COVER, round, bakelite	732214	–
31	1	1	1	1	-	FUSE, current limiting, 600V, 20 amp, KTK for 0.5 HP pump #739290	683158	–
32	1	1	1	1	1	OUTLET, GFCI, with cover	733061	–
33	12	12	12	13	4	ADAPTER, conduit, PVC, 1/2", MIPT x s	734920	7345.2
34	As required				-	ADAPTER, conduit, PVC, male IPS 3/4"	734914	7345.2
35	As required				-	REDUCER, conduit, PVC, 3/4" to 1/2"	734480	–

✣ A network transformer can be installed only in an 818 (8' X 18') or larger vault.

Notes for Single Transformer Vaults

1. All wiring and wiring devices shall comply with the City of Seattle Electrical Code Supplement and/or the NEC.
2. City Light shall supply the power. City Light shall furnish and install fuse holders and make connection to the power source.
3. Minimum vault lighting shall be 3 watts per square foot of vault floor space.
4. Three lamp holders shall be installed so all sides of the transformer are lighted.
5. There shall be two lamps on opposite ends of a vault , 8' x 14' or smaller.
6. Tumbler switches shall be installed near the door at approximately 40 inches above the floor or near the ceiling hatch.
7. Two duplex convenience outlets shall be installed on opposite ends of the vault on the vault walls.
8. Use pigtails on all wiring devices (sockets, outlets, etc.)
9. Install GFCI at the first outlet to protect network personnel.
10. **Disconnecting any neutral circuit with any of the circuits hot could cause the neutral to come hot.**
11. Wiring color codes:

    Three phase source with ground:

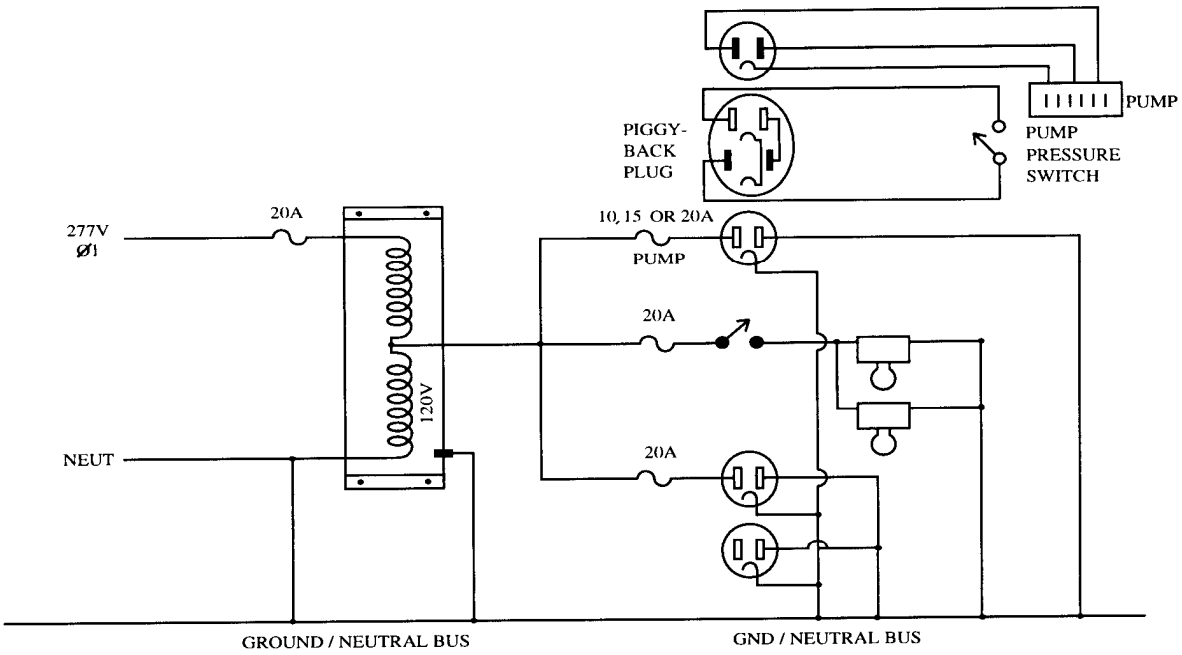
CONNECTED TO	COLOR	USE
Phase 1	Black	outlets
Phase 2	Red Orange	lights switched leg
Phase 3	Blue Purple	sump pump pump, manual switch
ground	Green	ground
neutral	White	neutral

    Single phase source:

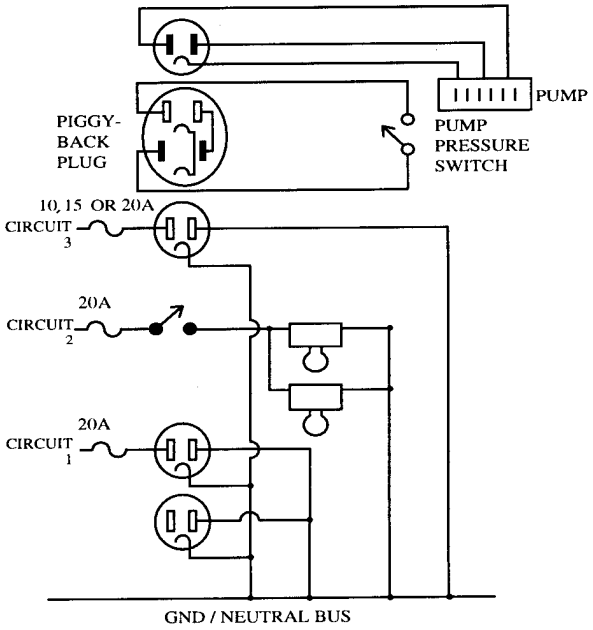
    Connect all three fuses to 120 volt lead. Use three separate neutral wires (white, gray and gray with tracer) on each circuit.

12. Sump pump vent tube is part of the pump. The connection end of the power cord/vent tube is to point down at the outlet.
13. Use of mercury switches is permitted only if they are installed vertically.
14. Connect neutral and ground wires under SEPARATE connectors at the bus.
15. If the 120 volt power source is from a different vault, use control cable or #4 for long runs. Install network power system ground (250 kcmil Cu.) for personnel ground. Use #4 limiters (Stock No. 683163) for control wire at the source in the new vault.
16. For vaults with more than one transformer, refer to NTP-70 for additional information.

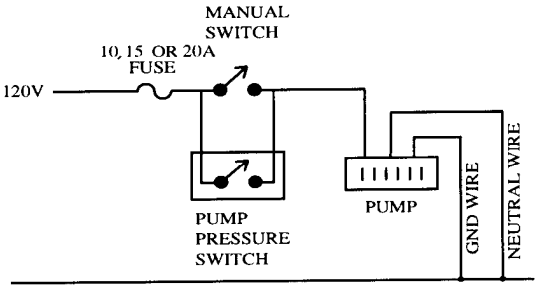
277 to 120 Auto Transformer and 1∅ Lighting Wiring Diagram



CITY LIGHT VAULT TYPICAL 3∅ WIRING DIAGRAM



ALTERNATE PUMP HARD WIRE DIAGRAM



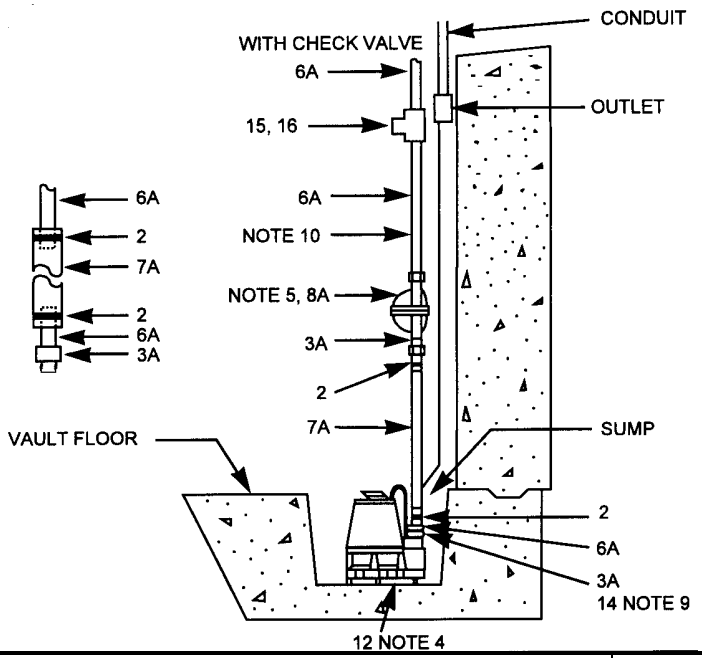
NOTES:

1. Transformer is used only when network voltage in vault is 277/480. Transformer is a dry type outdoor auto-transformer, 277 to 120 volt 60 cycle, 3 kVA, stock No. 391285. Use brown wire on phase 1, 277v to feed auto-transformer.
2. When autotransformer is used, connect all three fuses to 120 volt lead. Use three separate neutral wires (white, gray and gray with tracer) on each circuit. Fuse autotransformer input at 20 amps.
3. Spiral red tape on autotransformer primary neutral wire to ground bus.

Seattle City Light
CONSTRUCTION GUIDELINE

2" DISCHARGE SUMP PUMP - PREFERRED INSTALLATION

(New or replacement - if sump opening will allow 2" pump)

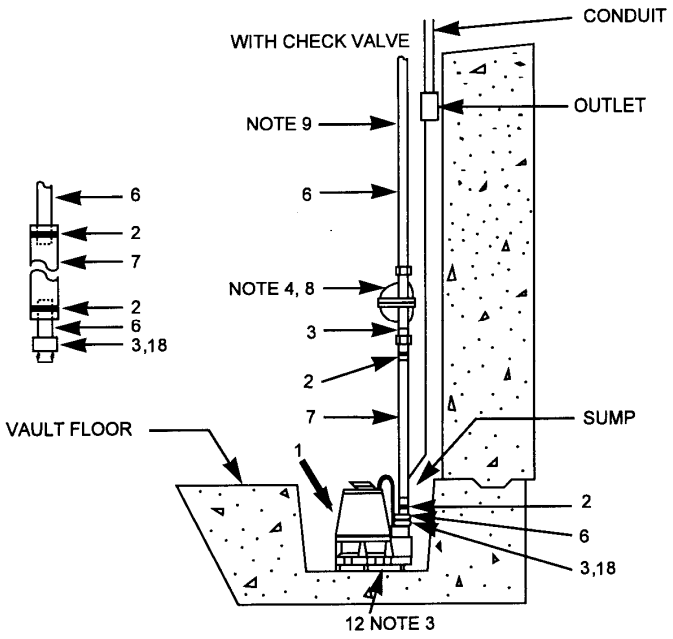


ITEM	QUANTITY	DESCRIPTION	STOCK NO.	MAT'L. STD.
1A	1	PUMP, SUMP, submersible, 1/2 HP, 2" discharge.	739290	7392.8
2	2	CLAMP, hose, stainless steel, 2-1/16" to 3""	739406	-
3A	2	ADAPTER, male, 2" PVC, DWV, MIPT x S	710112	7100.0
4A	as req'd	ELBOW, 90 degree, 2", PVC, DWV	710116	7100.0
5A	as req'd	ELBOW, 45 degree, 2", PVC, DWV	710114	7100.0
6A	as req'd	CONDUIT, 2" PVC, SCH 40	734530	7345.2
7A	3 FT	HOSE, vinyl, 2-1/2"	739408	-
8A	1	VALVE, CHECK, 2" PVC S x S	714077	-
9A	as req'd	COUPLING, 2" PVC, SCH 40	734517	7345.2
10A	as req'd	STRAP, pipe, one hole, 2"	713447	7134.5
11A	as req'd	SPACER, pipe strap, 2"	713456	7134.6
12	2	BRICK, concrete, 2" x 4" x 8"	720130	-
13A	as req'd	TEE, sanitary, 2", PVC, DWV	710110	7100.0
14	1	BUSHING, flush reducer, 2" x 1-1/4", PVC, S x S	710124	7100.0
15	1	TEE, cleanout, 2" PVC, DWV	710122	7100.0
16	1	PLUG, cleanout, 2", PVC, DWV	710123	7100.0
17	*1	CONNECTOR, N/M Sheathed Cable *Use if pump is hard wired	731001	-

NOTES:

1. Use 20 ampere fuse (Stock No. 683158) for 1/2 HP 2" discharge pump, Stock No. 739290. If this pump will not fit into sump, see page 6 of this Construction Guideline.
2. New style pump #739290 will have separate cord for pump and for the automatic switch. The automatic switch will be field replaceable.
3. Sump gratings must be cut out for discharge and/or pump as necessary.
4. Place bricks under pump as required to raise to proper level.
5. Install check valve where discharge runs uphill or is longer than 25 feet. Install check valve if sump is small and if it refills from the discharge piping causing pump to recycle.
6. Install vault lighting and sump pumps in network area.
7. Pumps may be hard wired (plugs cut off) as required by installation.
8. If the piggy-back automatic plug is used, the outlet must be a separate circuit and located where it can be reached from the ladder.
9. In vaults with existing 1-1/4" discharge pipe and 2" sump pump, use item 14 and the 1-1/4" material listed on page 6 of this Construction Guideline.
10. Secure discharge pipe to wall with items 10A & 11A for 2" pipe as required.
11. Sump pumps should be placed so that, when they stop pumping on automatic, the floor is pumped clear.

1-1/4" DISCHARGE SUMP PUMP - ALTERNATE INSTALLATION
(For use on sumps with small openings)



ITEM	QUANTITY	DESCRIPTION	STOCK NO.	MAT'L. STD.
1	1	PUMP, SUMP, submersible, 1/3 HP, 1-1/2" discharge	739292	7392.8
2	2	CLAMP, hose, stainless steel, 2-1/16" to 3"	739406	-
3	2	ADAPTER, male, 1-1/4", PVC, DWV, MIPT x s	710121	7100.0
4	as req'd	ELBOW, 90 degree, 1-1/4" PVC, DWV	710101	7100.0
5	as req'd	ELBOW, 45 degree, 1-1/4", PVC, DWV	710100	7100.0
6	as req'd	CONDUIT, 1-1/4", PVC, SCH 40	734528	7345.2
7	3 FT	HOSE, vinyl, 2"	739407	-
8	1	VALVE, CHECK, 1-1/4" PVC, S x S	714079	-
9	as req'd	COUPLING, 1-1/4" PVC, SCH 40	734515	7345.2
10	as req'd	STRAP, pipe, one hole, 1-1/4"	713445	7134.5
11	as req'd	SPACER, pipe strap, 1-1/4"	713454	7134.6
12	2	BRICK, concrete, 2" x 4" x 8"	720130	-
13	as req'd	TEE, sanitary,1-1/4", PVC, DWV	710118	7100.0
17	*1	CONNECTOR, N/M Sheathed Cable *Use if pump is hard wired	731001	-
18	1	ADAPTER, reducing, 1-1/2" to 1-1/4"	710129	7100.0

NOTES:

1. Use 10 ampere fuse (Stock No. 683156) for 1/3 HP 1-1/2" discharge pump, Stock No. 739292.
2. Sump gratings must be cut out for discharge and/or pump as necessary.
3. Place bricks under pump as required to raise to proper level.
4. Install check valve where discharge runs uphill or is longer than 25 feet. Install check valve if sump is small and if it refills from the discharge piping causing pump to recycle.
5. Install vault lighting and sump pumps in network area.
6. Pumps may be hard wired (plugs cut off) as required by installation.
7. If the piggy-back automatic plug is used, the outlet must be a separate circuit and located where it can be reached from the ladder.
8. Item 17 is used to hold cables in place just outside the junction box.
9. Secure discharge pipe to wall with items 10 & 11 for 1-1/4" pipe as required.
10. Sump pumps should be placed so that, when they stop pumping on automatic, the floor is pumped clear.