

TRAFFIC SIGNALS DESIGN GUIDELINE, PLAN NOTES, AND INDEX **(Revised January 2025)**

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I. INTRODUCTION

This Section contains information about traffic signals and is intended to be used by designers, consultants, and contractors, as well as serve as a reference for internal use.

II. DESIGN

A. GENERAL PROCEDURE

1. Prior to beginning design, develop a scope of work approved by transportation engineering and traffic signal maintenance.
2. Consider signal spacing and timing for signals that are designed to operate as a system. Provide documentation that the system can operate reasonably under future year volumes.
3. Obtain information on existing and future traffic conditions pertaining to the location under consideration. This information includes but it is not limited to hourly and daily volumes, land uses, prevailing speeds, and collision history.
4. Unless other information is available, assume that the 85th percentile speed is five mph higher than the posted speed limit.
5. All signal projects should be consistent with and fit within the framework of the city's ITS (Intelligent Transportation System) plan.
6. All traffic signals should be connected to the city fiber network. Verify equipment needed and path of connection with the Information Technology Department.
7. On corridors that extend or could extend into an adjacent city or that include traffic signals operated by other agencies, contact those agencies for their comments on design. Obtain comments from King County Metro and Sound Transit where buses operate through a project.
8. Whenever possible, procure traffic signal equipment including cabinets, controllers and pluggable devices from state contract. Equipment purchased this way results in lower project cost.
9. Traffic signal design plans shall be signed and stamped by a registered Professional Engineer (PE) in the State of Washington with recent, relevant experience doing traffic signal design work.

B. PLANS

1. The plans should show all existing and proposed traffic signal appurtenances including but not limited to:
 - a. Junction boxes
 - b. Conduit and wiring
 - c. Cabinets (signal, terminal, service)
 - d. Poles (signal, pedestrian, CCTV)
 - e. Signal heads (vehicle, pedestrian)
 - f. Overhead and underground utilities
 - g. Right of way

- h. Power source
 - i. Channelization
 - j. Detection
 - k. CCTV cameras
 - l. Signs
 - m. Emergency pre-emption equipment
- 2. The plans should include schedules of both existing and proposed:
 - a. Junction boxes by type
 - b. Conduit/wiring
 - c. Signs by type
- 3. The plans should have a plan sheet for mast arms showing street name position, directional signs and 10' terminal cabinet. See WSDOT Signal Standard IS-13.

C. DESIGN CONSIDERATIONS AND REQUIREMENTS

1. PHASING

- a. Phase labeling shall be in accordance with CK-TS.01. Phase labels are based on cardinal directions. For example, phase 4 is northbound thru, phase 6 is eastbound thru.
- b. Left turn phasing is determined by the guidelines in Section 4.3.6 of the FHWA Signal Timing Manual.
- c. At certain locations pedestrian volumes and accidents may require protected only left turns. Determination shall be on a case-by-case basis.
- d. Blank out "No Right Turn on Red" signs shall be used for right turns that may conflict with dual lefts (MUTCD, Section 2B.60)
- e. Blank out "No Right Turn on Red" signs should be operated through a load switch and not hard wired.
- f. Consider the possibility of U-turns and the need for "No Right Turn on Red" Blank Out signs.
- g. Consider right turn overlaps wherever exclusive right turn lanes are used. See CK-TS.01 for overlap labeling.

2. VEHICULAR SIGNAL HEADS

GENERAL

- a. Use aluminum led signal heads factory painted federal green.
- b. Use programmable heads only with approval of Public Works Transportation Engineering.
- c. Use four section bi-modal heads not five section heads.
- d. Back plates shall be installed on all signal heads mounted over the roadway. All back plates shall have a two-inch yellow reflective strip around its perimeter.

SIGNAL HEAD PLACEMENT

- a. Submit documentation that shows signal head meet placement and visibility requirements of MUTCD and WSDOT (MUTCD Table 4D-2 for example)
- b. Field check to evaluate the effects of existing and proposed trees on visibility of signal heads, cameras and emergency vehicle preemption receivers. Propose mitigation when necessary.
- c. Supplemental signal heads should be mounted in a far-left configuration for protected only left turns.
- d. Provisions (including cables, tenons, etc.) shall be made for the future installation of protected left turn heads wherever permissive only or protected/permissive left turns are being installed.

BLOCKING DUE TO OVERHEAD UTILITIES

- a. Attempts should be made to clear signal heads from blockage due to overhead cables.
- b. The city must share the cost of undergrounding existing overhead utilities.
- c. No new utilities facilities can be located overhead, but existing overhead utilities can be upgraded.

3. PEDESTRIAN SIGNAL HEADS

- a. Countdown signals are required.
- b. All pedestrian signal heads on a type I pole shall be "clamshell" mounted not top mounted. See WSDOT Standard Plan J-75.10-01, Type E.

4. PEDESTRIAN PUSH BUTTON ASSEMBLIES

- a. Locate pedestrian push buttons assemblies in accordance with relevant sections of the most current MUTCD. Where feasible pedestrian push buttons shall be located 10 ft or more apart.
- b. Pedestrian push buttons shall be accessible and programmed in accordance with the most current MUTCD.
- c. See City of Kirkland Pre-Approved Plan CK-TS.12 for details.

5. POLES AND MAST ARMS

GENERAL

- a. All signal poles shall be separated from vehicular traffic by at least five feet.
- b. Unused holes or holes left after permanent removal of existing signal pole mountings shall have plates welded on them and the plates shall be cold galvanized.
- c. Use [WSDOT standard plans](#) for Type I, II, or III signal poles. Those structures have been designed according to the Fifth Edition 2009 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals. Basic wind velocity is 90 mph, Design Life/Recurrence Interval of 50 years, and Fatigue Category III.

- d. Due to the design life of the structure, if a Type I, II, or III signal pole is within the construction limits of, abutting, or reasonably adjacent to, any ground-disturbing Project, **the Project will be required to replace signal pole foundation, signal pole, and mast arm assemblies that will be more than 50 years old at the time of substantial Project completion.** Projects that shall comply with this requirement include new construction, reconstruction, development frontage improvements, ground-disturbing restoration, or alterations of existing roadway and sidewalk facilities. Regular maintenance activities such as striping or re-striping, sidewalk repair, utility repair, traffic signal repair, and traffic signal alterations that do not require ground-disturbing activities, are excluded from this requirement.

MAST ARM LOAD CALCULATION

- a. Calculate the wind loading of all proposed and existing equipment to be placed on mast arms including signs, vehicle signal heads, luminaire arms, etc. Follow the requirements set forth in the WSDOT standard plans. See [WSDOT Traffic Signal Standard Chart IS-13](#) for details.
- b. Where new equipment is placed on existing mast arms, demonstrate that existing foundations, poles, and mast arm assemblies can support proposed loads within the original design value for that assembly. If proposed values for wind loading exceed the original design wind loading maximum for that assembly, the Project must replace the foundation, pole, and mast arm assembly.

POLE FOUNDATIONS

- a. The final location of pole foundations shall be approved by the engineer in the field prior to installation.
- b. Pole foundations shall be per WSDOT applicable design standards.

6. ILLUMINATION / ELECTRICAL

- a. New illumination or illumination added to existing systems shall comply with the City's Lighting Design Guidelines (Policy R-40).
- b. Existing illumination systems served by a single power source may need to be split into systems with separate power sources.
- c. Existing or higher illumination levels shall be maintained by using existing or temporary illumination until the new illumination system is operational.
- d. The contractor shall perform an independent utility verification prior to any illumination, vault and conduit installation and inform the engineer immediately if any additional conflicts are found.
- e. The Contractor is responsible for maintaining a minimum 10' clearance zone around existing aerial primary power lines during construction. Coordinate work with the power company. See [WAC 296-155-428](#) for more information.
- f. Luminaire standards and foundations shall be installed according to WSDOT applicable standard plans. Contractor shall verify soil conditions prior to construction.

- g. Illumination splices shall be made with C-TAP (COPPER CRIMP), 3M 2000 MASTIC WATERPROOFING, and 3M SUPER 88 TAPE.
- h. The contractor shall coordinate with the electric utility company regarding the electrical service connection. The contractor shall propose the exact location to the CIP representative and meet with the electrical utility company representative prior to installation of meter base.
- i. Pedestrian and roadway illumination poles shall NOT be located within ten (10) feet of a driveway.

7. SIGNING

- a. Street names on mast arms should follow MUTCD standard. 2009 MUTCD Section 2D.43 calls for street names to have 12" high initial capital letters and 9" high lowercase letters.
- b. All street name signs shall have a city logo.
- c. All signs shall be new. The City does not allow relocations of existing signs to ensure that signs meet current standards for legibility and retro-reflectivity.

8. CABINETS

GENERAL

- a. Cabinets shall be delivered to the City of Kirkland signal shop for testing.
- b. Cabinets shall attach to foundation per manufacturer's specification. Installation shall be done in dry conditions.
- c. Contractor shall place a minimum 1/2" continuous silicon bead between the cabinet and the foundation.

TRAFFIC SIGNAL CABINET LOCATION

- a. Factors to consider when choosing a location:
 - 1) Proximity to power supply.
 - 2) Proximity to fiber connections.
 - 3) View of vehicles approaches from the cabinet location.
 - 4) Door should open to allow technicians to face the intersection when viewing the inside of the cabinet.
 - 5) Sight distance for vehicular movements including right turn on red.
 - 6) Access for maintenance vehicles and equipment/distance to parking.
 - 7) Above likely flood areas.
 - 8) Out of likely path of errant vehicles.
 - 9) Obstructions posed to pedestrians.
 - 10) Distance from high voltage sources.
 - 11) Distance from existing utilities.
 - 12) Traffic signal cabinets shall be located at or above finished grade to prevent water intrusion.
 - 13) Aesthetic considerations.

TRAFFIC SIGNAL CABINET FOUNDATION

- a. See cabinet foundation pre-approved plans [CK-TS.03](#) and [CK-TS.04](#).
- b. Cabinet foundation shall be class 3000 air entrained concrete from a commercially mixed source. Engineer shall approve form work before placement of concrete.
- c. Conduit shall extend 2" above cabinet foundation.

SERVICE CABINETS

- a. See [CK-TS.05A](#) and [CK-TS.05B](#).
- b. A 1" conduit shall be installed under service cabinet for grounding.

ITS CABINETS (FUTURE)

TERMINAL CABINETS

- a. Poles with double mast arms shall have two terminal cabinets.
- b. All new signal based pole mounted terminal cabinet shall be placed on the pole to provide 10' clearance from the bottom of cabinet to the finished grade of walkway.
- c. Locations of terminal cabinets are to be verified prior to cutting holes for mounting.

RRFB CABINETS

- a. See CK-TS.14 for details on mounting RRFB controller cabinets.
- b. See [CK-TS.10](#) and [CK-TS.11](#) for service cabinet details.

9. VEHICLE DETECTION

- a. For approaches with speed limit less than 35 MPH, use video detection with (45') stop bar detection zones.
- b. Video detection zones shall be aimed and adjusted as approved by the engineer.
- c. The location of video detection cameras shall be verified in the field by the engineer prior to installation.
- d. On approaches with speed limit equal or greater than 35 MPH combine video detection at the stop bars (short detection zone) with inductive loops located upstream based on stopping sight (Xs) distance from stop bar. Where:

$$Xs = St + \frac{s^2}{2(d + (32.2 * G))}$$

S=85th Percentile Speed (ft/sec)

t=Perception Reaction Time (1 sec)

d=Deceleration Rate (10 ft/sec²)

G=grade

- e. Check to see dilemma zones are not created and that slower vehicles can clear the intersection. Refer to FHWA *Traffic Detector Handbook-2006* **Detection for Dilemma Zone**, Pages 4-25.

- f. Use inductive loops as system loops to support traffic responsive operation and for individual lane counting. System loops should be placed so that entering turning and entering and exiting through vehicles can be counted separately.
- g. In some cases, small diamond shape loops may be required to count right turning vehicles.
- h. See Standard CK-TS.02 for typical detection layout and numbering system.
- i. Pull a separate lead-in wire for each of the system/counting loops, 2CS per loop, from the nearest J-box to the controller cabinet.
- j. Induction loops shall be spliced and tested by Contractor.
- k. The location of induction loops shall be verified in the field by the engineer prior to installation.

10. CCTV CAMERAS

- a. The location of CCTV cameras shall be verified in the field by the engineer prior to installation.

11. JUNCTION BOXES

- a. WSDOT Type 8 junction boxes (WSDOT Standard Plan J-40.30-04) are usually placed on each quadrant of an intersection. Types 1 and 2 are used in other locations.
- b. Use TA vaults wherever fiber is being pulled.
- c. All junction box and vault covers shall be rated for h20 loading.
- d. All existing junction boxes shall be replaced with new ones when within the ground-disturbing limits of a construction project, or wherever a conduit leading to an existing junction box is replaced.
- e. Existing junction boxes in paved areas should be relocated outside those paved areas.
- f. **New** junction boxes shall **not** be placed in the following locations:
 - 1. Sidewalks ramps
 - 2. Traveled way, unless a utility-style manhole is provided
 - 3. Sidewalks, unless otherwise approved by Transportation Division Staff
 - 4. Paved shoulders
- g. In the event a junction box is located in a pedestrian circulation path, it shall have an approved non-skid coating on the lid. Refer to City of Kirkland Policy G-2.
- h. In the event a junction box is located within a sidewalk, it shall be placed parallel or perpendicular to the sidewalk panel in which it resides.
- i. Use heavy duty junction boxes per WSDOT Standard Specs 9-29.2(2) where maintenance vehicles are likely to drive over them, for example near controller cabinet.
- j. Junction box lids shall be labeled in accordance with WSDOT Standard Spec 9-29.2(4)
- k. Junction boxes, connected by 2" conduit, shall be placed at the limits of each project to allow for future expansion of conduit systems.

- l. The location of junction boxes shall be approved by the engineer in the field prior to installation.
- m. Junction box dimensions shall be sized according to the number and size of conduits sweeping into and out of the box as well as the junction box's specific capacity requirements. Refer to [WSDOT standard plans J-40.10](#) and [J-40.30](#) for specific dimensions and capacity requirements.

12. CONDUIT/CABLE/WIRE

- a. Any existing galvanized conduit shall be replaced with PVC conduit.
- b. Conduits shall be PVC schedule 80 when installed under roadways and high-volume driveways. In all other locations, conduits shall be PVC schedule 40 unless otherwise specified by Transportation Division staff.
- c. All new PVC conduits containing conductors shall have ground wire. Ground wire size shall match the largest conductor (Min #8 or as noted otherwise in wire notes). Spare/empty conduit shall contain electrically detectable pull tape and be marked as "City of Kirkland" conduit.
- d. Verify capacity of any existing conduit considered for re-use by passing a mandrel through them.
- e. Preserve existing PVC conduit and junction boxes, particularly those used for advance loops.
- f. Open cuts shall be backfilled with CDF.
- g. Lighting circuitry, conductors, and fiber optic cable shall each be located in separate conduit and junction box systems.
- h. Fiber optic cable shall be located at least 12" from any other conductor.
- i. Two spare 2" conduits with pull ropes should be placed across all road crossings.
- j. To allow for expansion of signal heads, signs, etc., without construction of a new foundation, one spare 2" conduit shall be installed from each mast arm foundation to the nearest junction box.
- k. Turns or bends in conduits shall occur only at junction boxes. This is to ensure they are locatable in the future.
- l. Conduit shall enter poles only through junction boxes.
- m. The contractor shall install conduit by directional boring unless otherwise specified. No trenching or "blind" drilling shall be permitted.
- n. Conduit may be spliced by glued joints only.
- o. All conduits shall be terminated with a bushing.
- p. Fiber optic cable shall not be coiled in controller cabinet.
- q. The contractor shall perform an independent utility verification prior to conduit installation and inform the engineer immediately if any conflict is found.
- r. The final location of all conduits shall be approved by the engineer prior to installation.

III. MATERIALS (FUTURE)

IV. TRAFFIC SIGNAL GENERAL NOTES

The following traffic signal general notes should be added to construction plans for projects of all types involving traffic signals, roadway/pedestrian illumination, RRFBs, speed radar feedback signs, and school zone flashing beacons. Only relevant notes that apply to specific project types should be shown. Further notes can be added based on engineering judgement.

1. A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD PRIOR TO THE START OF CONSTRUCTION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING ALL NECESSARY PERMITS PRIOR TO CONSTRUCTION.
3. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH WSDOT/APWA STANDARD PLANS, STANDARD SPECIFICATIONS, CITY OF KIRKLAND PRE-APPROVED PLANS, AND THE LATEST AMENDMENTS TO PROJECT MANUAL, SPECIAL PROVISIONS, AND THE APPROVED PLANS.
4. A COPY OF THE APPROVED PLANS MUST BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS.
5. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ADEQUATE TRAFFIC CONTROL TO ENSURE TRAFFIC SAFETY DURING CONSTRUCTION ACTIVITIES; THEREFORE, THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO THE PUBLIC WORKS DEPARTMENT AT LEAST TWO WEEKS PRIOR TO STARTING ANY WORK IN THE RIGHT OF WAY. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND THE [CITY OF KIRKLAND'S POLICY R-29](#).
6. ANY EXISTING PUBLIC IMPROVEMENTS DAMAGED DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE PRIOR TO FINAL INSPECTION.
7. THE CONTRACTOR IS RESPONSIBLE FOR KEEPING ALL PUBLIC STREETS FREE OF MUD AND DEBRIS AT ALL TIMES. THE CONTRACTOR SHALL BE PREPARED TO USE POWER SWEEPERS OR OTHER PIECE OF EQUIPMENT NECESSARY TO KEEP THE ROADWAYS CLEAN.
8. EXISTING SIGNAL SYSTEM TO BE OPERATIONAL AND VISIBLE BY THE INTENDED USER UNTIL SWITCH OVER. SEE CONTRACT SPECIAL PROVISIONS FOR SWITCH OVER AND REMOVAL INFORMATION.
9. EXISTING STREET AND PEDESTRIAN LIGHTING TO REMAIN OPERATIONAL UNTIL SWITCH OVER TO NEW SYSTEM. ILLUMINATION SHALL BE MAINTAINED TO EXISTING BETTER LEVELS DURING ALL PHASES OF CONSTRUCTION. A TEMPORARY SYSTEM MAY BE USED TO ACHIEVE THIS GOAL. SEE KIRKLAND'S STREET LIGHTING DESIGN GUIDELINES FOR MORE INFORMATION.

10. ALL SIGNAL SYSTEM COORDINATION WITH KIRKLAND TRAFFIC SHALL BE DONE THROUGH KIRKLAND CIP REPRESENTATIVE.
11. ANY ROADWAY/INTERSECTION SIGN/MARKING REMOVED OR TEMPORARILY MOVED BY THE CONTRACTOR SHALL BE RESTORED BY THE END OF DAY AS TO COMPLY WITH THE CURRENT CITY OF KIRKLAND STANDARDS.
12. ALL SIGNS SHALL BE NEW.
13. WHEN AN EXISTING ROADWAY IS TO BE WIDENED, THE EXISTING PAVEMENT MUST BE SAWCUT AT LEAST ONE FOOT FROM THE EDGE TO PROVIDE A PROPER MATCH BETWEEN NEW AND EXISTING ASPHALT. HOWEVER, WHEN EXISTING PAVEMENT CONTAINS ALLIGATORED AREAS, THOSE AREAS MUST BE REMOVED PRIOR TO WIDENING. ALL SAWCUTS MUST BE PARALLEL OR PERPENDICULAR TO THE RIGHT OF WAY CENTERLINE.
14. BACKFILL IN ALL STREET CUTS ON ARTERIALS WILL BE CONTROL DENSITY FILL (CDF). CONTRACTOR MUST PROVIDE STEEL PLATES TO ALLOW THE CDF TO CURE.
15. WHEN INSTALLING NEW SIDEWALKS, THE AREA BEHIND THE SIDEWALK MUST BE GRADED SO THAT THE YARD DRAINAGE DOES NOT DRAIN OVER THE SIDEWALK.
16. SIDEWALK AND CURB AND GUTTER CANNOT BE POURED MONOLITHICALLY. THERE MUST BE A COLD JOINT OR FULL-DEPTH EXPANSION JOINT BETWEEN THEM.
17. ALL CONCRETE FOR SIDEWALKS AND CURBS AND GUTTERS MUST BE 4000 PSI MINIMUM.

V. INSPECTION/TESTING PROCEDURES

(FUTURE)

VI. PRE-APPROVED PLANS INDEX

CK-TS.01	Typical Traffic Signal Labeling
CK-TS.02	Typical Detection Layout and Numbering
CK-TS.03	Controller Cabinet Foundation
CK-TS.04	Signal and Service Cabinet Foundation
CK-TS.05	Service Cabinet
CK-TS.06	Fiber Optic Vault
CK-TS.07	Signal Head Clearance Detail
CK-TS.08	Roadway Lighting Detail
CK-TS.09	Service Cabinet Foundation
CK-TS.10	Tiny Service Cabinet
CK-TS.11	Tiny Service Cabinet Foundation
CK-TS.12	Pedestrian Pushbutton Detail
CK-TS.13	Flashing School Zone Beacon Detail
CK-TS.14	Rectangular Rapid Flashing Beacon (RRFB) Detail
CK-TS.15	Radar Speed Sign Detail
CK-TS.16A	4" Aluminum Pole Bases - Option A
CK-TS.16B	4" Aluminum Pole Bases - Option B
CK-TS.17	4" Aluminum Pole Base Foundation

VII. PRE-APPROVED POLICIES INDEX

TS-01	Pedestrian Recall Guidelines
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CITY OF KIRKLAND

123 FIFTH AVENUE • KIRKLAND, WASHINGTON 98033-6189 • (425) 587-3800

DEPARTMENT OF PUBLIC WORKS PRE-APPROVED PLANS POLICY

Policy TS-1: Pedestrian Recall Guidelines

General

Pedestrian recall is a traffic signal timing function that causes a pedestrian walk phase to activate automatically every cycle. Pedestrian recall can benefit pedestrians by reducing pedestrian delay and improving safety at signalized intersections.

These guidelines establish the methodology for how, when, and where pedestrian recall is implemented at a given crosswalk. The purpose of these methodology and guidelines is to ensure that pedestrian recall is applied to locations and at times of high pedestrian demand.

Methodology

Pedestrian activity at a given crosswalk will be measured by the percentage of cycles where the Walk phase is activated by a pedestrian pushbutton. City Staff will gather this data over the course of two consecutive weeks; weekday and weekend data will be separated. This process will be repeated on a seasonal basis since pedestrian activity at a given location can fluctuate throughout the year.

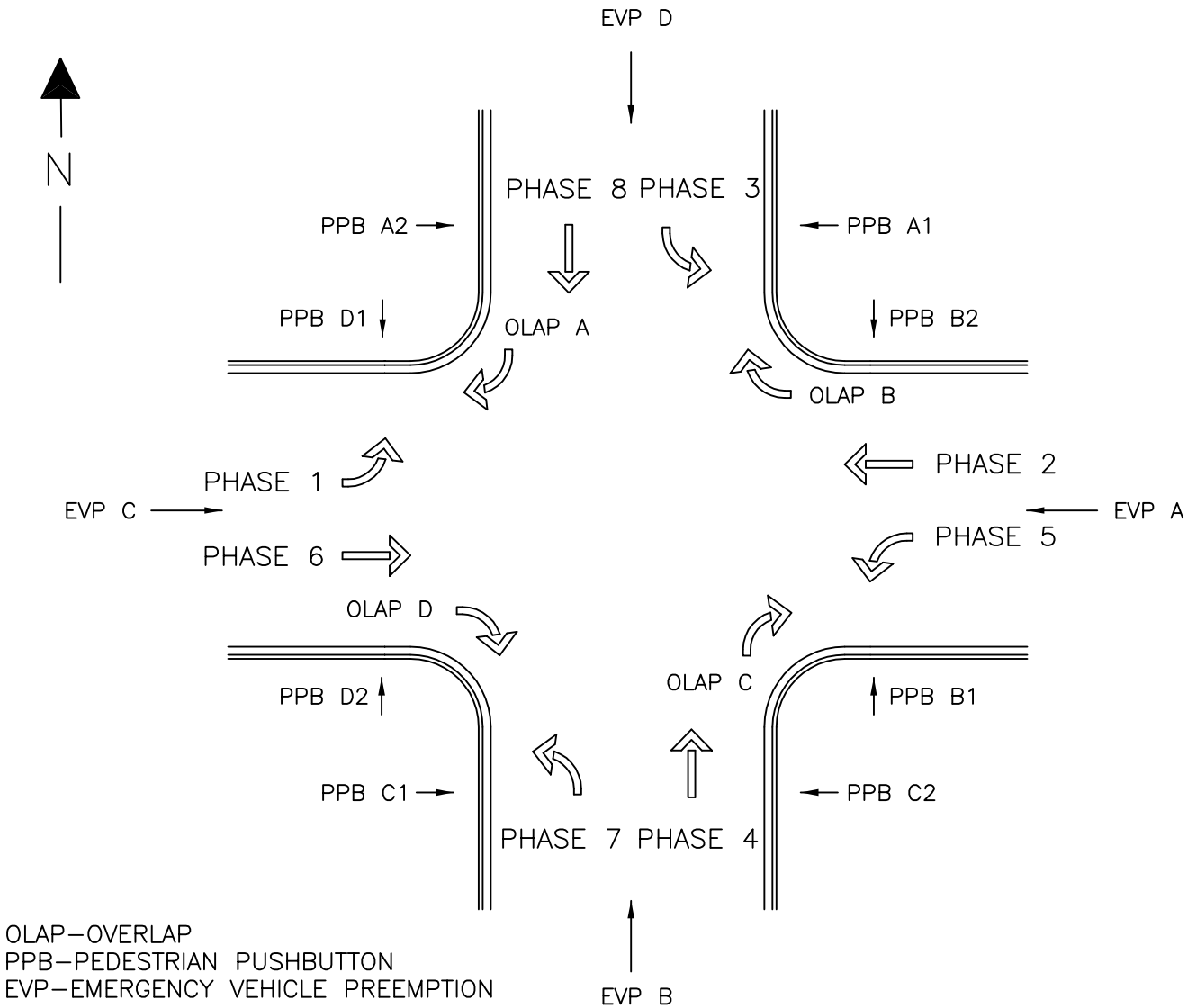
In cases where two vehicles phases always begin and end together, the associated crosswalks for those vehicle phases will be analyzed for how often either one is activated. Since both vehicle phases are activated together, then both corresponding crosswalks will be analyzed together as well.

Guidelines

The following guidelines will be used to determine when pedestrian recall should be implemented at a given crosswalk:

- If a pedestrian movement is active greater than 75% of cycles during peak daytime hours, then pedestrian recall is recommended for implementation.
- If a pedestrian movement is active greater than 60% of cycles during peak daytime hours, then pedestrian recall will be considered. Overall impact to operations at the intersection will be considered before pedestrian recall is implemented.
- If a pedestrian movement near a school is active greater than 50% of the time during drop off and pickup hours, then pedestrian recall is recommended for implementation.
- For areas designated as having a high pedestrian priority, pedestrian recall will be considered when the pedestrian movement is active greater than 50% of the time. Evaluation of the rate of increase of pedestrian usage during the day should indicate the appropriate time to activate recall operation.
- Crosswalks that are active during the main street phases should be on recall whenever the intersection is coordinated with other traffic signals or if the main street has a green time equal to or greater than the time for the pedestrian phase.

Pedestrian recall will be evaluated whenever a new signal is installed, an existing signal is modified, an existing corridor or signal is retimed, or if a community request is received to evaluate a specific location.

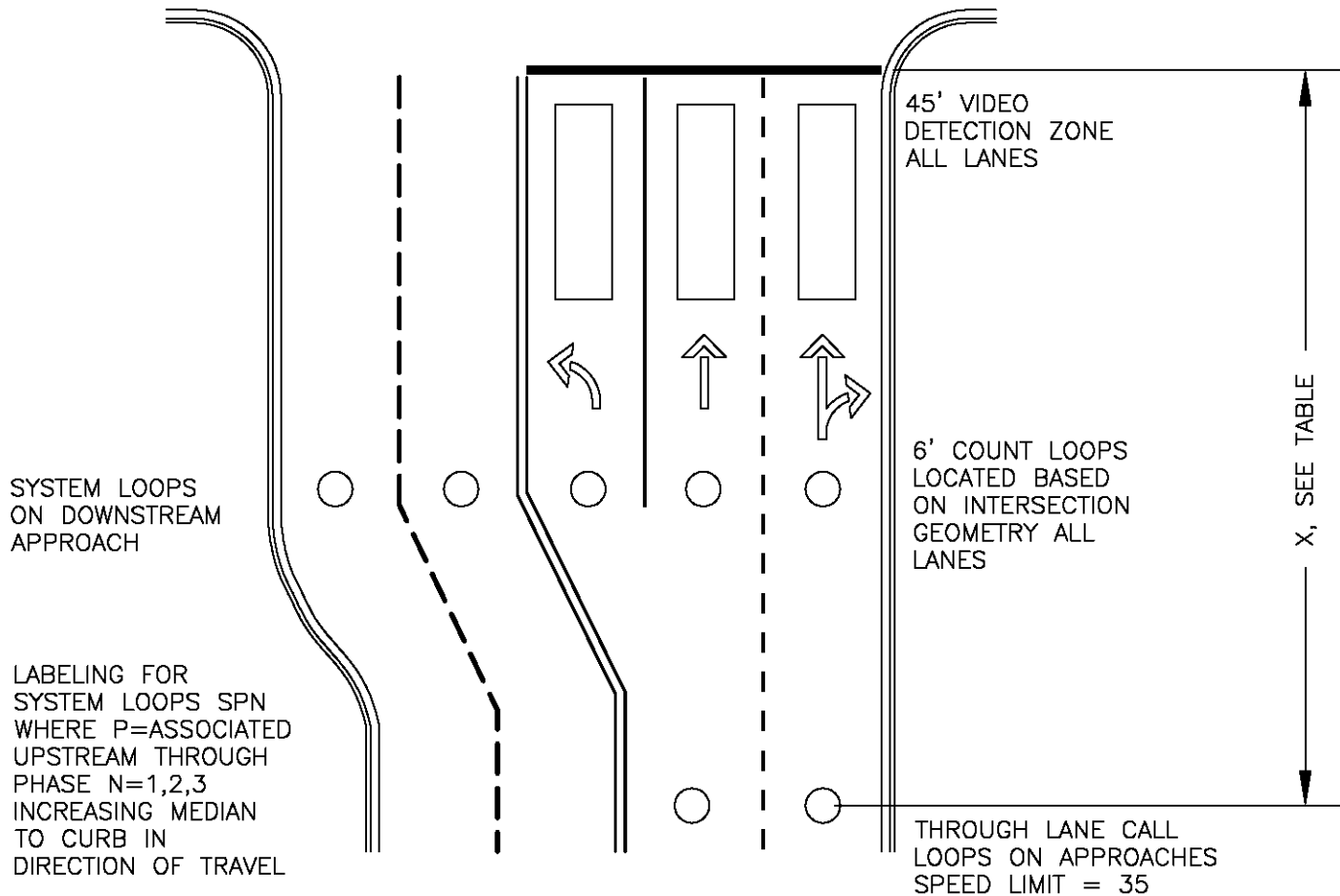


TRAVEL DIRECTION	PHASE		EMERGENCY VEHICLE PREEMPTION	PEDESTRIAN PUSHBUTTON	
	THRU	LEFT		EAST	WEST
NORTHBOUND	4	7	B	B1	D2
SOUTHBOUND	8	3	D	B2	D1
EASTBOUND	6	1	C	A2	C1
WESTBOUND	2	5	A	A1	C2

CITY OF KIRKLAND

PLAN NO. CK—TS.01

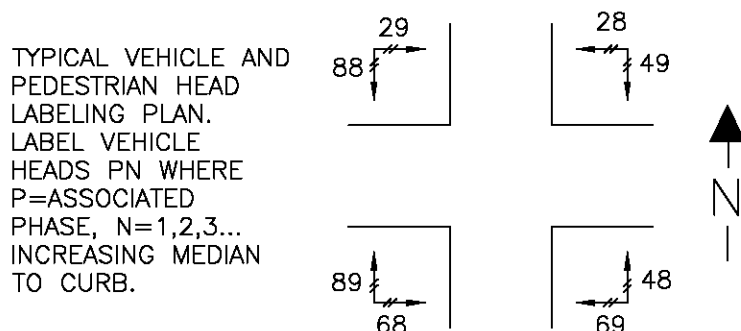
TYPICAL TRAFFIC SIGNAL LABELING



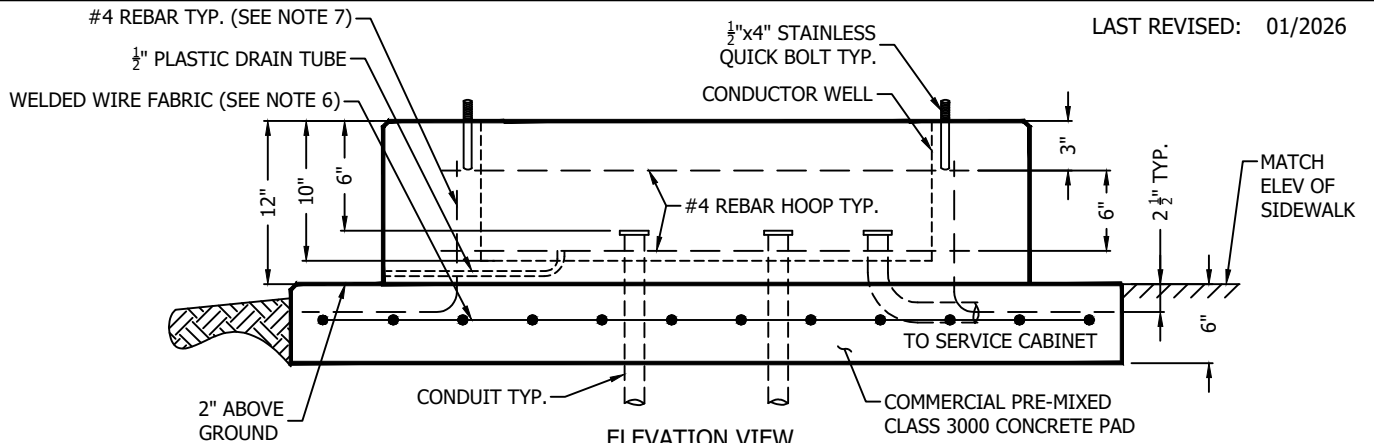
LABELING FOR NON-SYSTEM LOOPS PN WHERE P=ASSOCIATED PHASE AND N=1,2,3 INCREASING

- 1) STOP BAR TO UPSTREAM WITHIN LANE THEN
- 2) BY LANE MEDIAN TO CURB

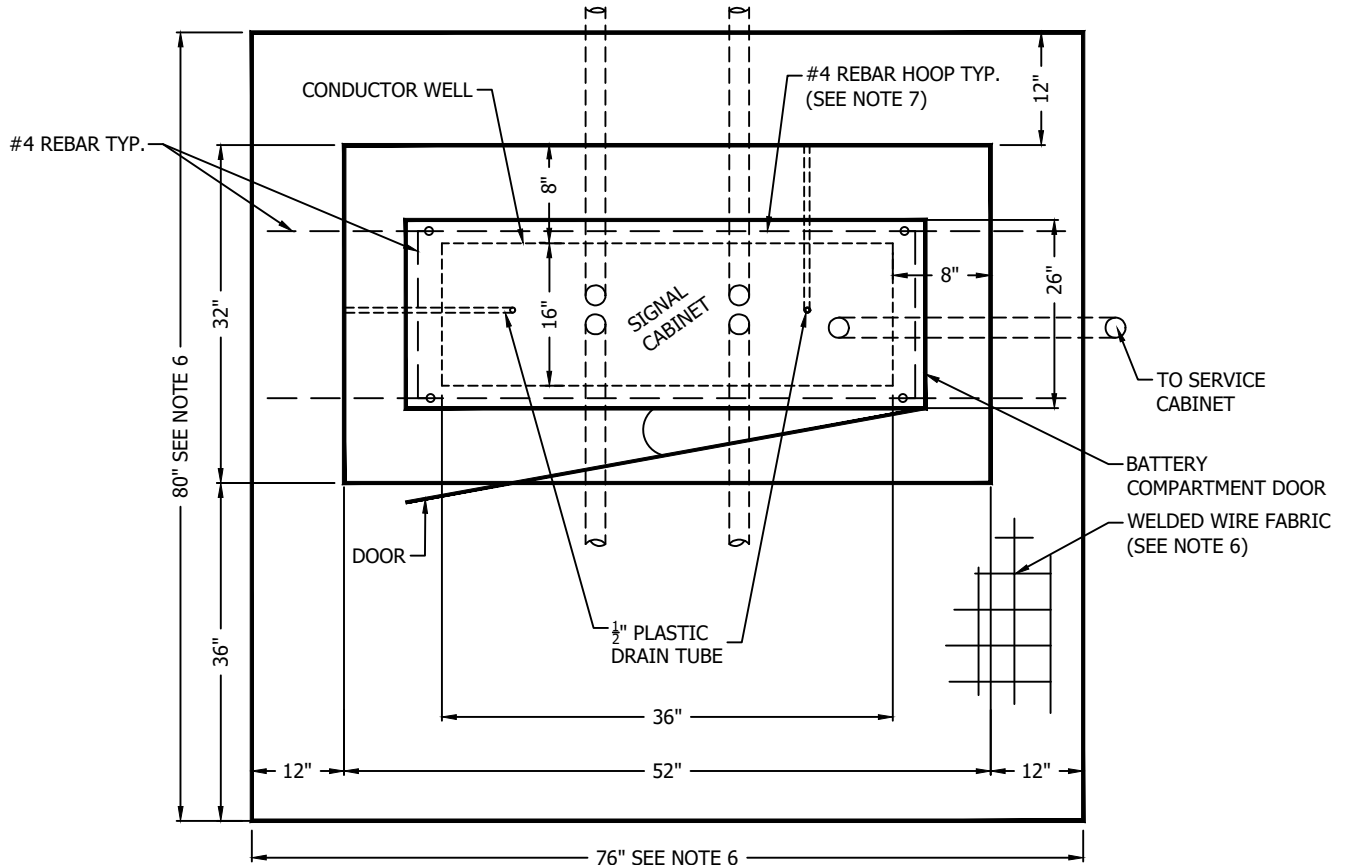
TABLE													
GRADE (%)	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
X (FT)	275	265	255	250	245	235	230	225	220	215	210	205	200



CITY OF KIRKLAND	
PLAN NO. CK-TS.02	
	TYPICAL DETECTION LAYOUT AND NUMBERING PLAN



ELEVATION VIEW



PLAN VIEW

NOTE:

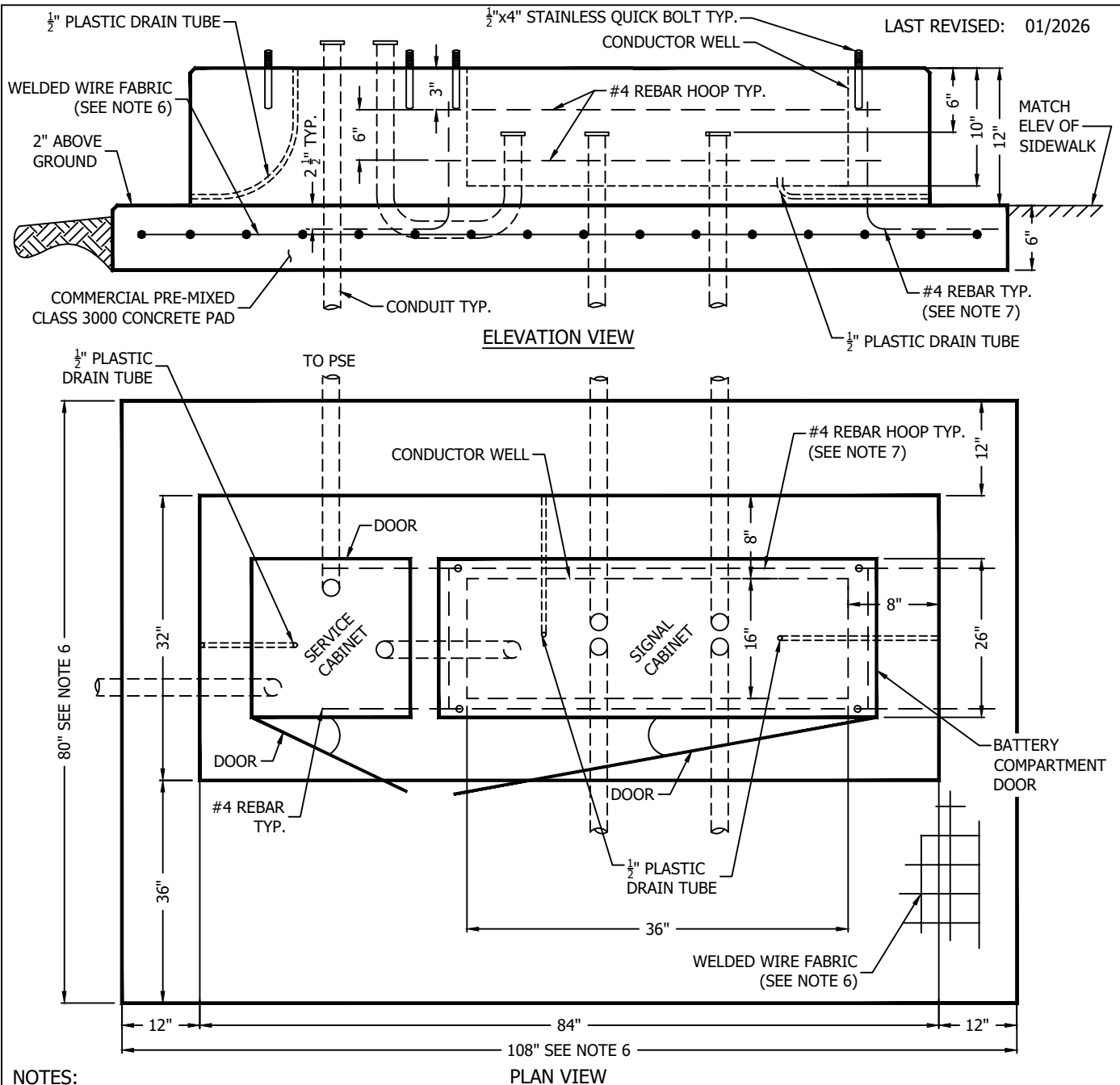
1. CONTRACTOR TO VERIFY BOLT PATTERN WITH CABINET.
2. CONTRACTOR SHALL PROVIDE A MINIMUM CLEARANCE OF 48 INCHES FROM FRONT FACE OF CABINET TO ALLOW FOR DOOR SWING AND WORKING SPACE. CONTRACTOR SHALL HAVE A MINIMUM 4-FOOT OFFSET FROM ANY OBSTRUCTIONS SUCH AS A WALL TO ALLOW FOR FUTURE MAINTENANCE.
3. CONTRACTOR SHALL PROVIDE A MINIMUM OF FOUR (4) 3" CONDUITS AND ONE (1) 2" CONDUIT INTO THE NEAREST JUNCTION BOX.
4. CONTRACTOR SHALL INSTALL CABINET GROUNDING PER WSDOT STANDARD PLAN J-60.05.
5. CONTRACTOR SHALL POUR FOUNDATION TO BE SMOOTH AND LEVEL TO ENSURE PROPER OPERATION OF CABINET. ALL CONCRETE CORNERS SHALL HAVE A 1" CHAMFER, UNLESS ABUTTING SIDEWALK, WHERE IT SHALL BE SQUARE AND SEPARATED FROM THE SIDEWALK WITH JOINT FILLER.
6. CABINET HOUSEKEEPING PAD SHALL BE MINIMUM DIMENSIONS SHOWN, FLAT, UNCONSTRAINED BY OTHER STRUCTURES, AND OUTSIDE OF LOW POINT AREAS WHERE STORMWATER COLLECTS. WELDED WIRE FABRIC IN PAD SHALL BE 4" X 4" MEETING THE REQUIREMENTS OF WSDOT STANDARD SPECIFICATION 7-07.7. AS AN ALTERNATIVE, A GRID OF #3 REBAR MAY BE USED, WITH BARS SPACED AT 12" CENTERS Laterally and Longitudinally.
7. ALL REBAR SHALL BE DEFORMED STEEL REINFORCING BAR FOR CONCRETE FOUNDATIONS CONFORMING TO ASTM A615 GRADE 60.

CITY OF KIRKLAND

PLAN NO. CK - TS.03



**NEMA CONTROLLER
CABINET FOUNDATION
DETAIL**



NOTES:

1. CONTRACTOR TO VERIFY BOLT PATTERN WITH CABINETS.
2. CONTRACTOR SHALL PROVIDE A MINIMUM CLEARANCE OF 48 INCHES FROM FRONT FACE OF CABINETS TO ALLOW FOR DOOR SWING AND WORKING SPACE. CONTRACTOR SHALL HAVE A MINIMUM 4-FOOT OFFSET FROM ANY OBSTRUCTIONS SUCH AS A WALL TO ALLOW FOR FUTURE MAINTENANCE.
3. CONTRACTOR SHALL PROVIDE A MINIMUM OF FOUR (4) 3" CONDUITS AND ONE (1) 2" CONDUIT FROM SIGNAL CABINET INTO THE NEAREST JUNCTION BOX.
4. CONTRACTOR SHALL INSTALL TWO GROUND RODS AND CABINET GROUNDING PER WSDOT STANDARD PLANS J-10.10 AND J-60.05.
5. CONTRACTOR SHALL POUR FOUNDATION TO BE SMOOTH AND LEVEL TO ENSURE PROPER OPERATION OF CABINET. ALL CONCRETE CORNERS SHALL HAVE A 1" CHAMFER, UNLESS ABUTTING SIDEWALK, WHERE IT SHALL BE SQUARE AND SEPARATED FROM THE SIDEWALK WITH JOINT FILLER.
6. CABINET HOUSEKEEPING PAD SHALL BE MINIMUM DIMENSIONS SHOWN, FLAT, UNCONSTRAINED BY OTHER STRUCTURES, AND OUTSIDE OF LOW POINT AREAS WHERE STORMWATER COLLECTS. WELDED WIRE FABRIC IN PAD SHALL BE 4" X 4" MEETING THE REQUIREMENTS OF WSDOT STANDARD SPECIFICATION 7-07.7. AS AN ALTERNATIVE, A GRID OF #3 REBAR MAY BE USED, WITH BARS SPACED AT 12" CENTERS Laterally and Longitudinally.
7. ALL REBAR SHALL BE DEFORMED STEEL REINFORCING BAR FOR CONCRETE FOUNDATIONS CONFORMING TO ASTM A615 GRADE 60.

CITY OF KIRKLAND

PLAN NO. CK - TS.04



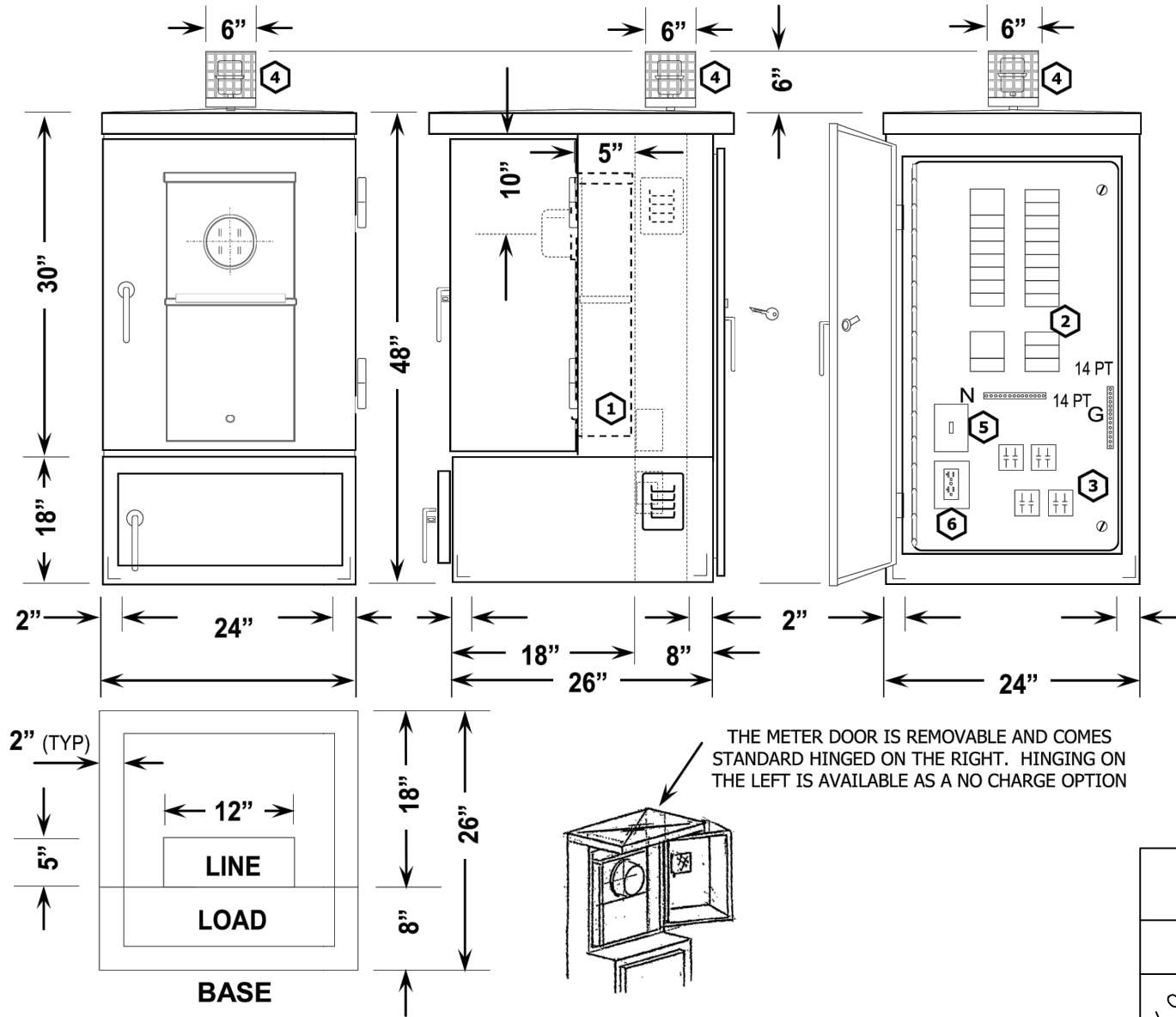
SIGNAL & SERVICE
CABINET FOUNDATION
DETAIL

FRONT VIEW

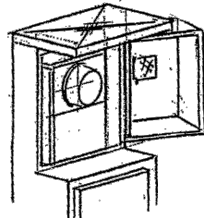
SIDE VIEW

REAR VIEW

120/240V, SINGLE PHASE 3 WIRE



THE METER DOOR IS REMOVABLE AND COMES STANDARD HINGED ON THE RIGHT. HINGING ON THE LEFT IS AVAILABLE AS A NO CHARGE OPTION



SEE COMPONENT SCHEDULE AND CABINET SPECIFICATIONS

CITY OF KIRKLAND

PLAN NO. CK-TS.05A



SERVICE
CABINET
62460-R1

NOTES:
SKYLINE ELECTRIC & MFG. CO. OR EQUAL

PANELBOARD SCHEDULE "S" 120/240V 1P 3W 22K AIC SERIES RATED

CKT#	DESCRIPTION	TYPE	TRIP/POLE	TRIP/POLE TYPE			DESCRIPTION	CKT#
1	MAIN CB	QBH	100/2		30/2	BAB	ILLUMINATION #3	2
3								4
5	ILLUMINATION #1	BAB	30/2		30/2	BAB	ILLUMINATION #4	6
7								8
9	ILLUMINATION #2	BAB	30/2		20/1	BAB	GFI RECEPTACLE	10
11					15/1	BAB	CONTROL	12
13	RECEPTACLE	BAB	20/1		20/1	BAB	RECEPTACLE	14
15	PREPARED SPACE						PREPARED SPACE	16
17	PREPARED SPACE						PREPARED SPACE	18

S/N

A

B

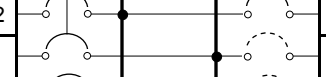
S/N

CITY OF KIRKLAND PANELBOARDS "S" & "T" PANELBOARD SCHEDULES

ELECTRICAL DATA:

PANELBOARD: 120/240VAC 1 PHASE 3 WIRE, 22K AIC SERIES RATED, SPLIT BUS, 250 AMP SILVER PLATED COPPER BUS, COPPER NEUTRAL AND GROUND BUS ,
MAIN CBS: CUTLER HAMMER QBHW2100H
BRANCH CBS: WESTINGHOUSE BAB BOLT-ON CBS
PER UL67 FILE NO. E21192

PANELBOARD SCHEDULE "T" 120/240V 1P 3W 22K AIC SERIES RATED

CKT#	DESCRIPTION	TYPE TRIP/POLE		TRIP/POLE TYPE			DESCRIPTION	CKT#
1	MAIN CB	QBH	100/2		20/1		ITS	2
3							PREPARED SPACE	4
5	SIGNAL	BAB	50/1				PREPARED SPACE	6

S/N

A

B

S/N

CITY OF KIRKLAND

PLAN NO. CK-TS.05B



PANELBOARDS "S" & "T" CIRCUIT BREAKER SCHEDULES

CITY OF KIRKLAND SERIES #62460-R1
SERVICE CABINET FOR SERVICE AND STREET AND TRAFFIC SIGNAL

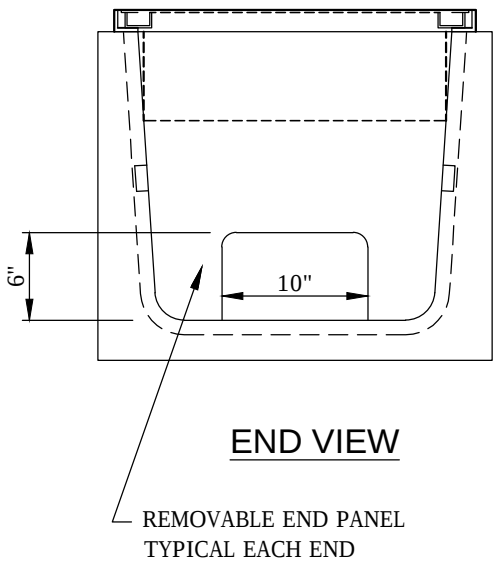
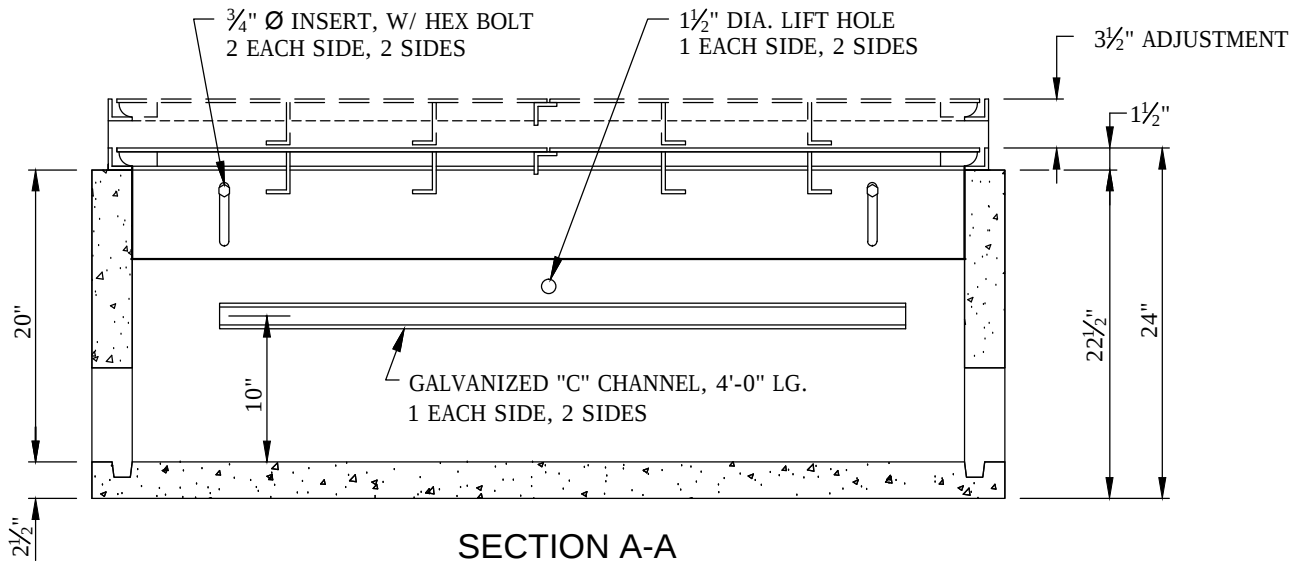
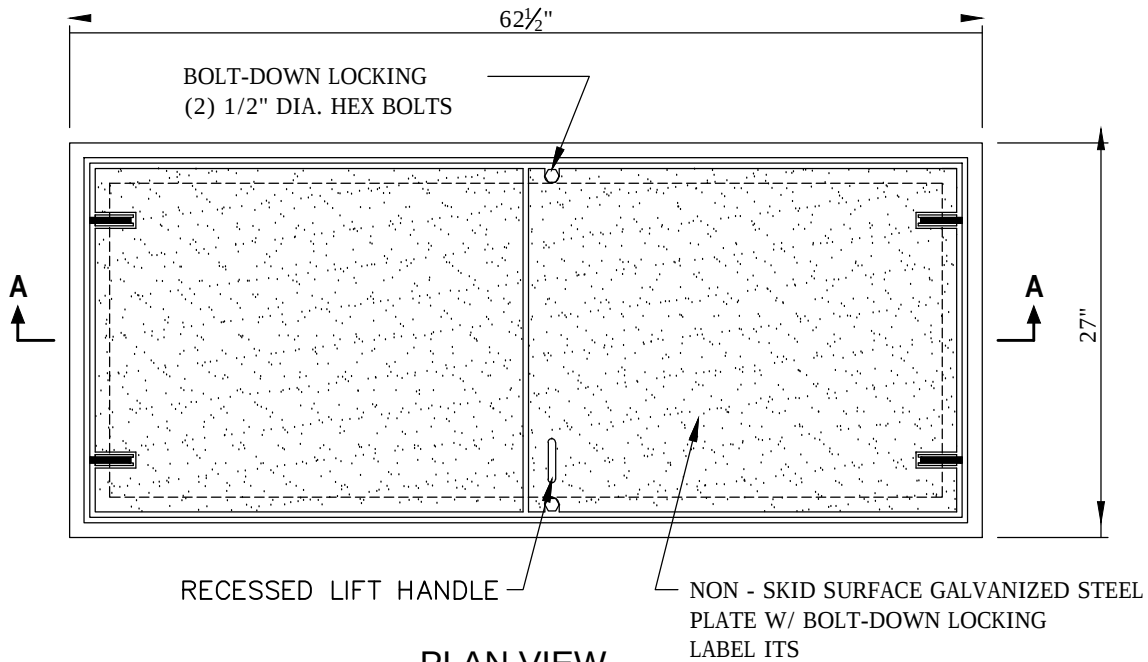
COMPONENT SCHEDULE

- 1 **METER BASE:** 200 AMP, BY-PASS TYPE, 4-JAW, SINGLE PHASE,
5TH JAW INSTALLED AT 9:00 POSITION, B-LINE U264
- 2 **PANELBOARD:** 120/240 VAC, 1 PHASE, 3 WIRE, 250 AMP COPPER BUS (W/RATING LABEL),
SPLIT BUS , 22 KAIC SERIES RATED, BOLT-ON BRANCH BREAKERS, EATON TYPE BAB
SIGNAL SECTION: 100 AMP, 2 POLE MAIN BREAKER, EATON QBHW2100, 6 CKT
 1 - 50 /1 SIGNAL BRANCH
 1 - 20 /1 ITS BRANCH
 2 - 1 POLE SPACE
ILLUMINATION SECTION: 100 AMP, 2 POLE MAIN BREAKER, EATON QBHW2100, 18 CKT
 4 - 30/2 ILLUMINATION BRANCH
 2 - 20/1 RECEPTACLE BRANCH
 1 - 15/1 CONTROL CKT BRANCH
 1 - 20/1 GROUND FAULT RECEPTACLE BRANCH
- 3 **CONTACTORS:** LIGHTING RATED, 30 A, 2 POLE, 120 VAC COIL, 4 – REQUIRED
- 4 **PHOTO ELECTRIC CELL:** 1800 WATT, 120 VAC, TWIST LOCK, TYCO #SST-PV-IES-UL
WITH 6" x 6" x 6" WIRE MESH GUARD
- 5 **PHOTO-CELL BYPASS SWITCH:** SPDT, 15 AMP, 277 VAC
- 6 **GROUND FAULT RECEPTACLE:** 20 AMP, 125 VAC, DUPLEX

CABINET: NEMA 3R, PADMOUNT, 1/8" ALUMINUM 5052-H32 CONSTRUCTION
 2 SCREENED AND GASKETED VENTS
DOORS: HEAVY DUTY HINGES (LIFT-OFF TYPE), WELDED IN PLACE
 STAINLESS STEEL VAULT HANDLES, PADLOCKABLE METER DOOR
 "BEST" CX LOCK ON DISTRIBUTION DOOR, POLISHED WIRE GLASS
 WINDOW IN METER DOOR, CLOSED CELL NEOPRENE GASKET,
 CARD HOLDER
FINISH: MILL FINISH ALUMINUM, DEADFRONT WHITE

CITY OF KIRKLAND

CITY OF KIRKLAND	
PLAN NO. CK-TS.05C	
	COMPONENT SCHEDULE

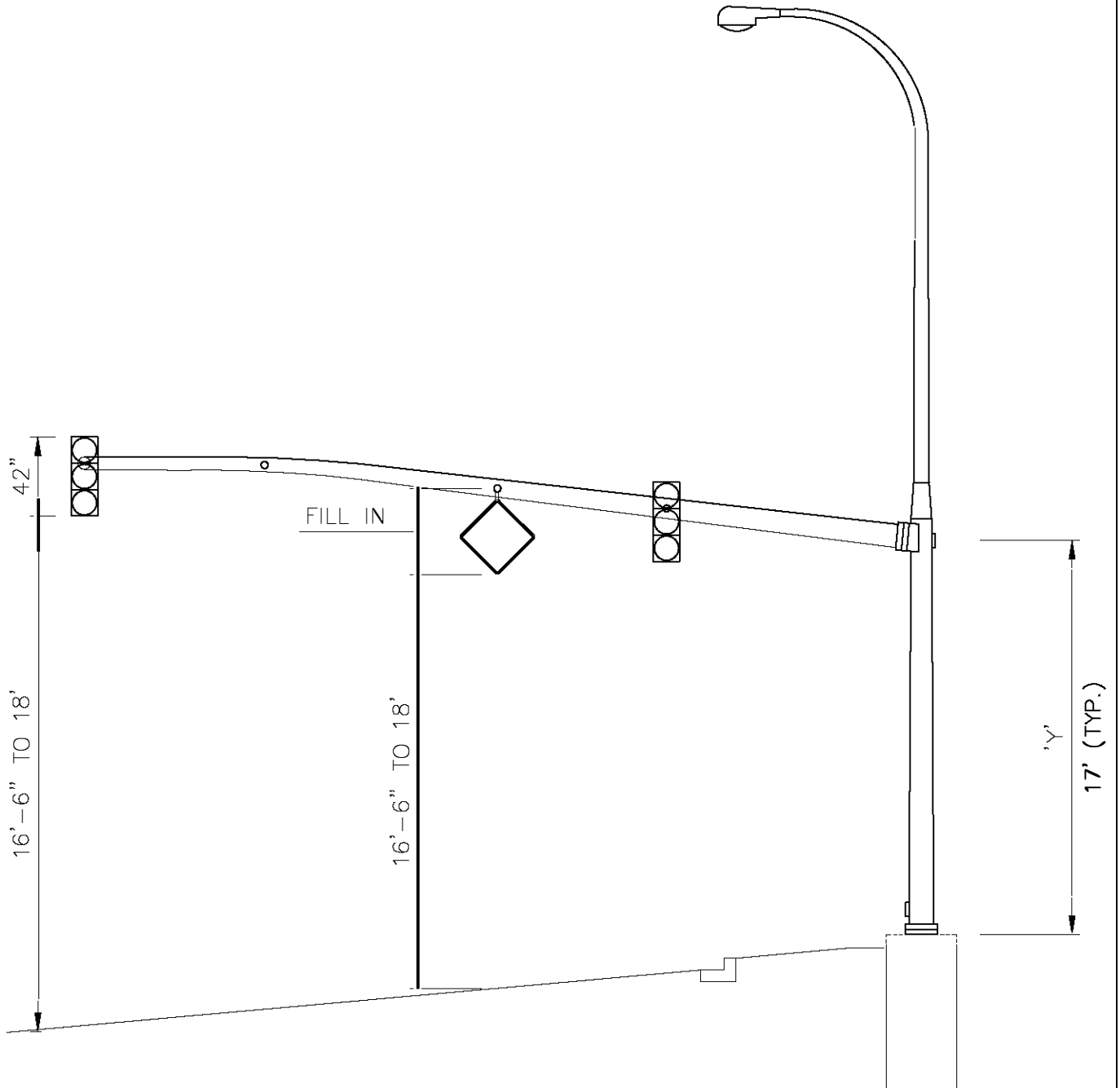


CITY OF KIRKLAND

PLAN NO. CK- TS.06



FIBER
OPTIC
VAULT



CITY OF KIRKLAND

PLAN NO. CK-TS.07



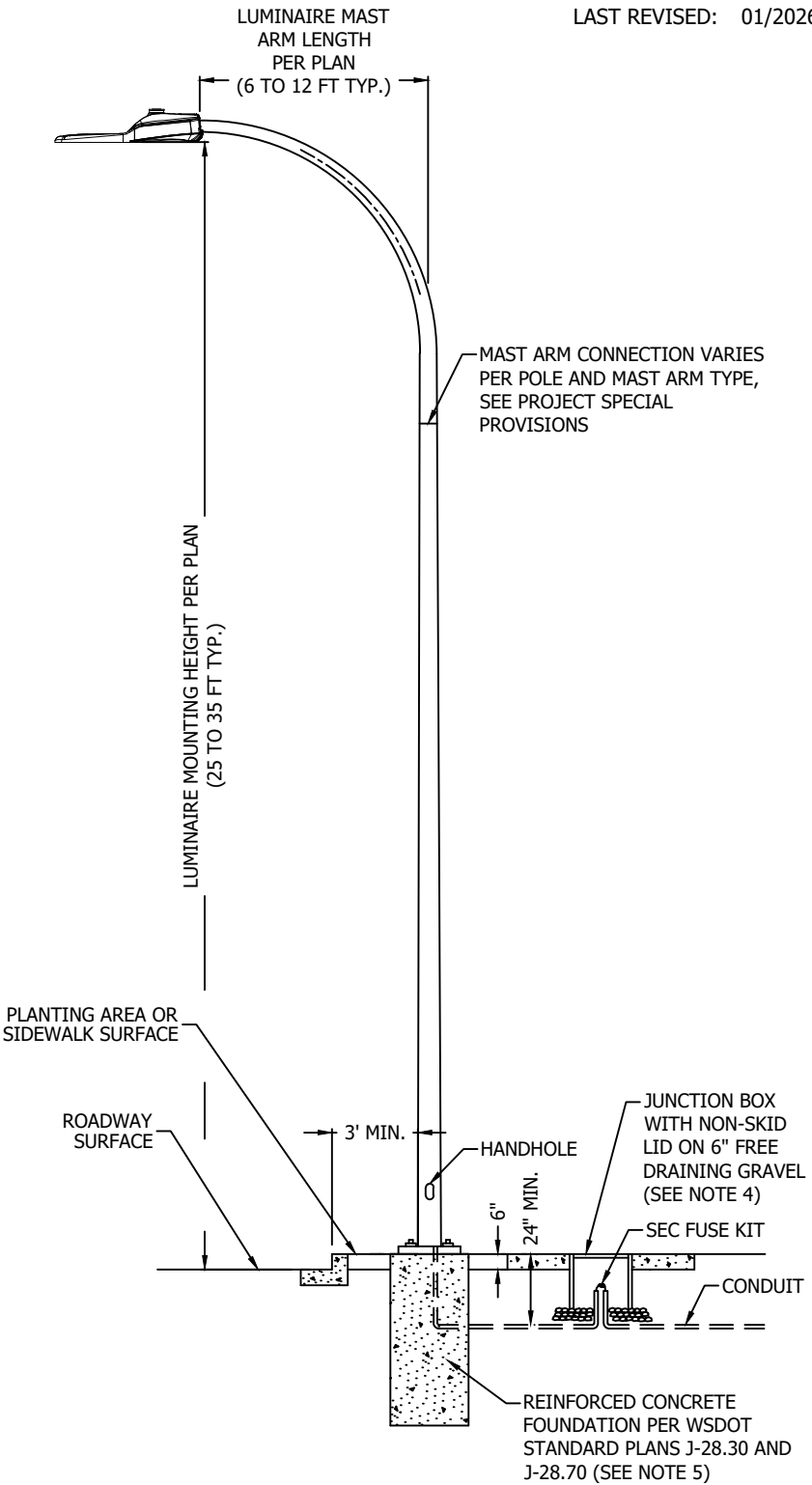
SIGNAL HEAD
CLEARANCE DETAIL

NOTES

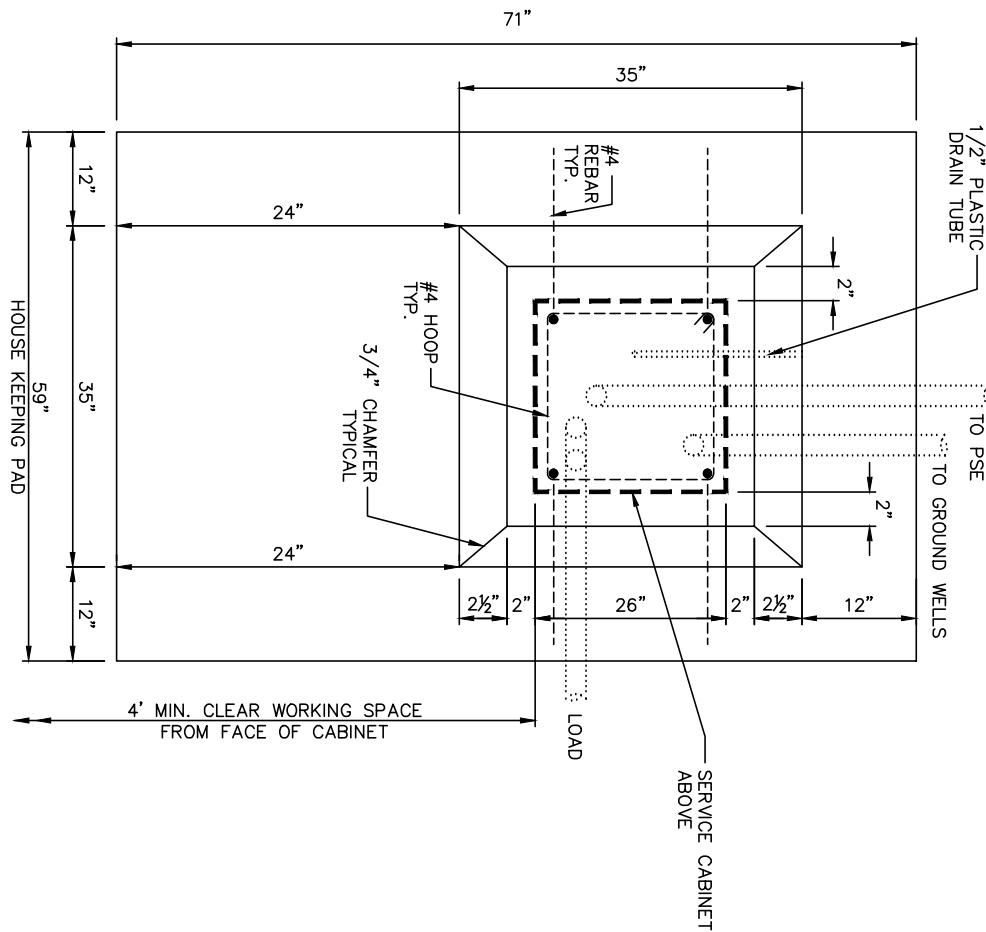
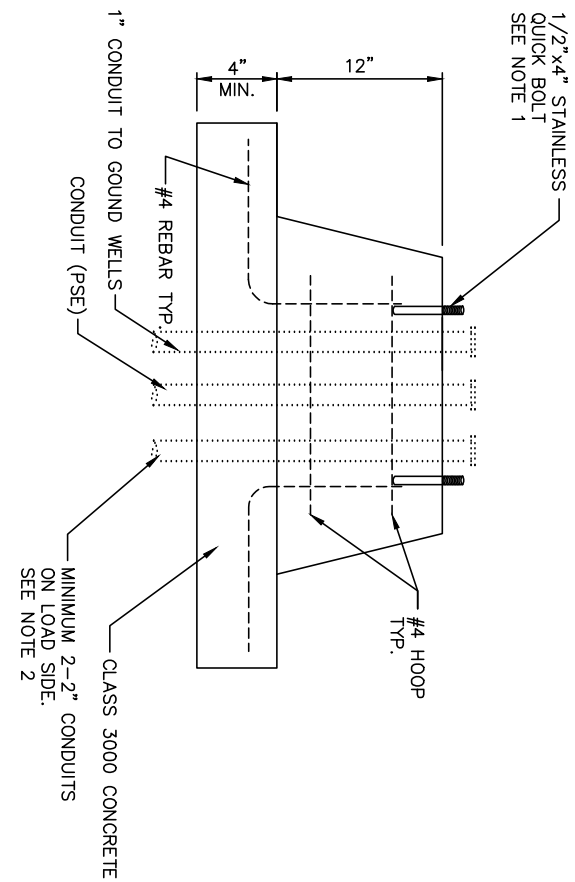
1. POLE SPACING TO BE DETERMINED PER LIGHTING ANALYSIS. SEE PUBLIC WORKS PRE-APPROVED PLANS POLICY R-40 FOR LIGHTING DESIGN GUIDELINES, LED LUMINAIRE FIXTURE PREFERENCES, AND MORE.
2. ROADWAY AND PEDESTRIAN LIGHT POLES SHALL BE PLACED AT THE BACK OF THE SIDEWALK WHEREVER PRACTICAL. POLE PLACEMENT SHALL COMPLY WITH PUBLIC WORKS PRE-APPROVED PLAN CK-R.47B AND POLICY R-40.
3. ALL SPLICE CONNECTIONS IN J-BOX SHALL BE MADE USING:
 - A. C-TAP (COPPER CRIMP)
 - B. 3M 2000 MASTIC COVER
 - C. 3M SUPER 88 TAPE
4. JUNCTION BOXES TO BE SIZED PER CONDUIT FILL. SEE WSDOT STANDARD PLANS J-40.10 AND J-40.30 FOR DIMENSION INFORMATION.
5. IF POLE WILL BE INSTALLED MORE THAN 10 FEET FROM THE EDGE OF THE VEHICLE TRAVELED WAY TO FACE OF POLE, INSTALL FIXED BASE FOUNDATION.

IF POLE WILL BE INSTALLED LESS THAN 10 FEET FROM THE EDGE OF THE VEHICLE TRAVELED WAY TO POLE FACE, USE SLIP BASE PER WSDOT STANDARD PLANS J-28.22, J-28.42, AND J-28.43.

NOTE ANCHOR BOLT CONFIGURATION WILL VARY BASED ON WHETHER FOUNDATION HAS A FIXED BASE OR SLIP BASE.



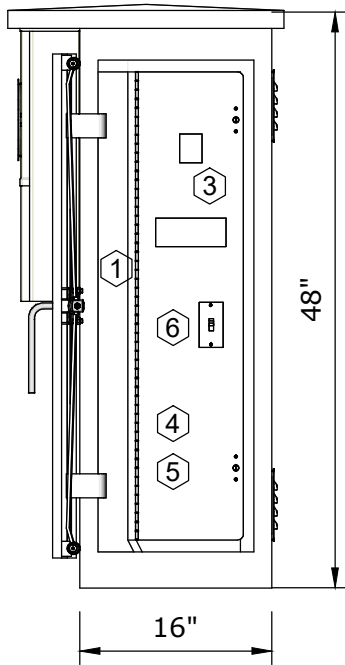
CITY OF KIRKLAND	
PLAN NO. CK - TS.08	
	ROADWAY LIGHTING DETAIL



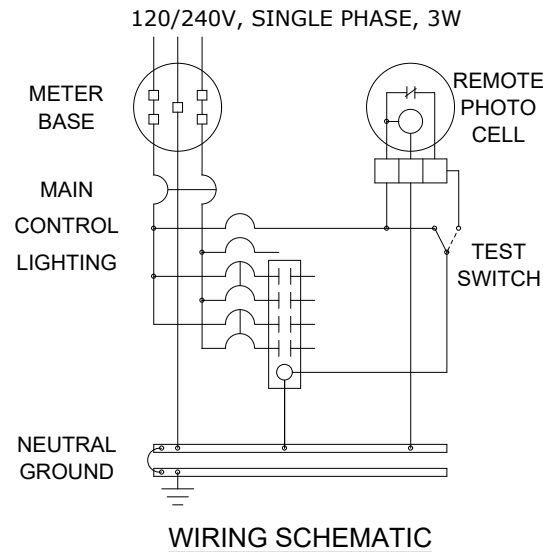
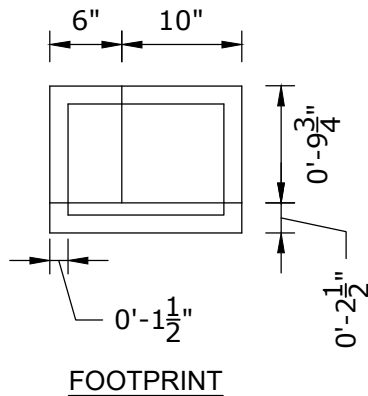
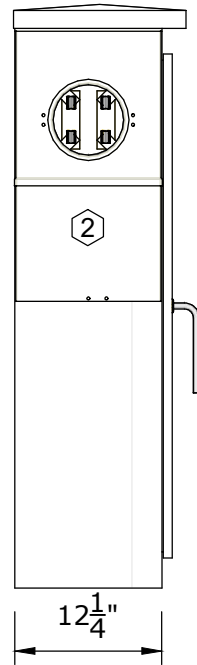
- NOTES:**
1. CONTRACTOR TO VERIFY BOLT PATTERN WITH CABINETS.
 2. CONTRACTOR SHALL INSTALL TWO GROUND RODS AND CABINET GROUNDING PER WSDOT STANDARD PLANS J-10.10 AND J-60.05.

SERVICE CABINET FOUNDATION DETAIL

FRONT



SIDE



CITY OF KIRKLAND "TINY" CABINET
SKYLINE SERIES# 62460-T1

LAST REVISED: 01/2023

CABINET:

CONSTRUCTION:

NEMA TYPE 3R, OUTDOOR PADMOUNT, 1/8" 5052-H32 ALUMINUM CONSTRUCTION, 2 SCREENED AND GASKETED VENTS, REMOVABLE EQUIPMENT MOUNTING PAN, CABINET GROUND WITH MINIMUM BONDING WIRE TO NEUTRAL

DOORS:

HEAVY-DUTY CONCEALED HINGES (LIFT-OFF TYPE), STAINLESS STEEL VAULT HANDLE WITH ROLLER RODS THAT PROVIDE 3- POINT COMPRESSION ON CLOSED CELL NEOPRENE GASKET, "BEST" LOCK

DEADFRONT:

HINGED AND SECURED WITH QUARTER-TURN FASTENERS

FINISH:

MILL FINISH ALUMINUM
DEADFRONT AND WIREWAY COVER -- WHITE

COMPONENT SCHEDULE:

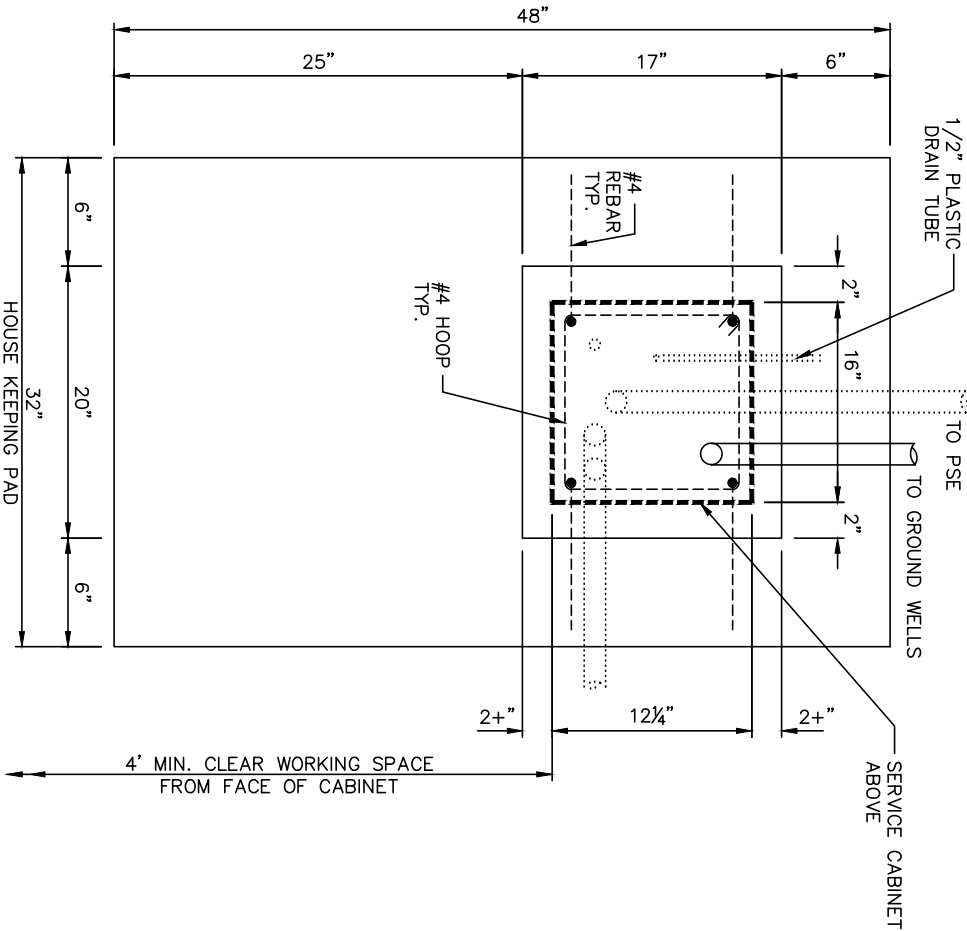
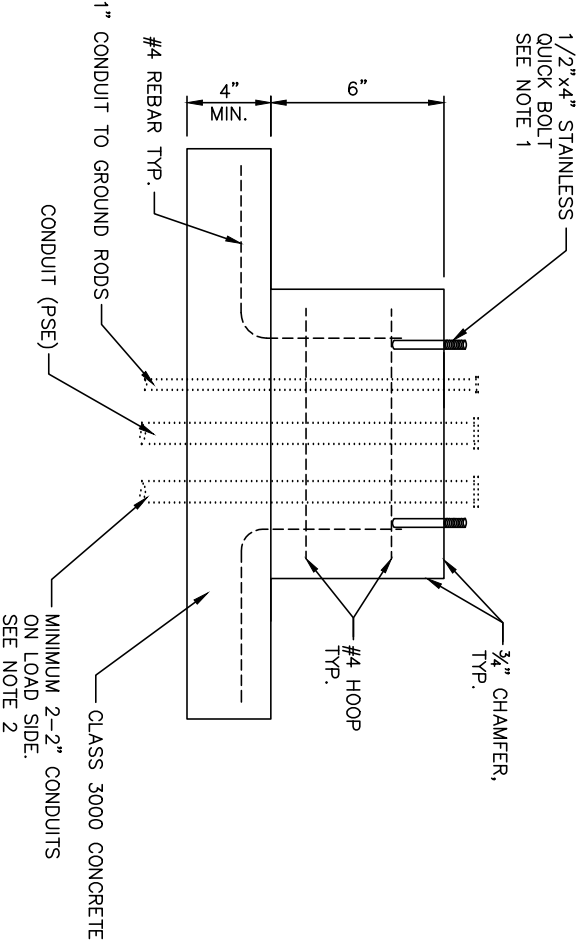
- 1 SERVICE WIREWAY
- 2 METERBASE: 200A, 4 JAW, MANUAL BYPASS, B-LINE U264, W/ 5TH JAW
- 3 PANELBOARD: 120/240 VAC, 125 AMP COPPER BUS, 1 PHASE, 3 WIRE, 6 CKT, FULLY RATED AT 10K AIC, WITH ENGRAVED NAME PLATES
MAIN BREAKER: 100 AMP, 2 POLE, EATON QC2100
BRANCH BREAKERS, BOLT ON, EATON TYPE BAB:
2 – 20/2 LIGHTING 1, 2
1 – 20/1 RRFB
1 – 15/1 CONTROL
- 4 CONTACTOR: LIGHTING RATED, 30A, 4 POLE, 120V COIL, SQD 8910DPA34V02U1
- 5 TERMINAL BLOCK FOR FIELD WIRE CONNECTION TO REMOTE PHOTO CELL
- 6 PHOTOCELL BYPASS SWITCH

CITY OF KIRKLAND

PLAN NO. CK-TS.10



TINY CABINET



NOTES:

1. CONTRACTOR TO VERIFY BOLT PATTERN WITH CABINETS.
2. CONTRACTOR SHALL INSTALL TWO GROUND RODS AND CABINET GROUNDING PER WSDOT STANDARD PLANS J-10.10 AND J-60.05.

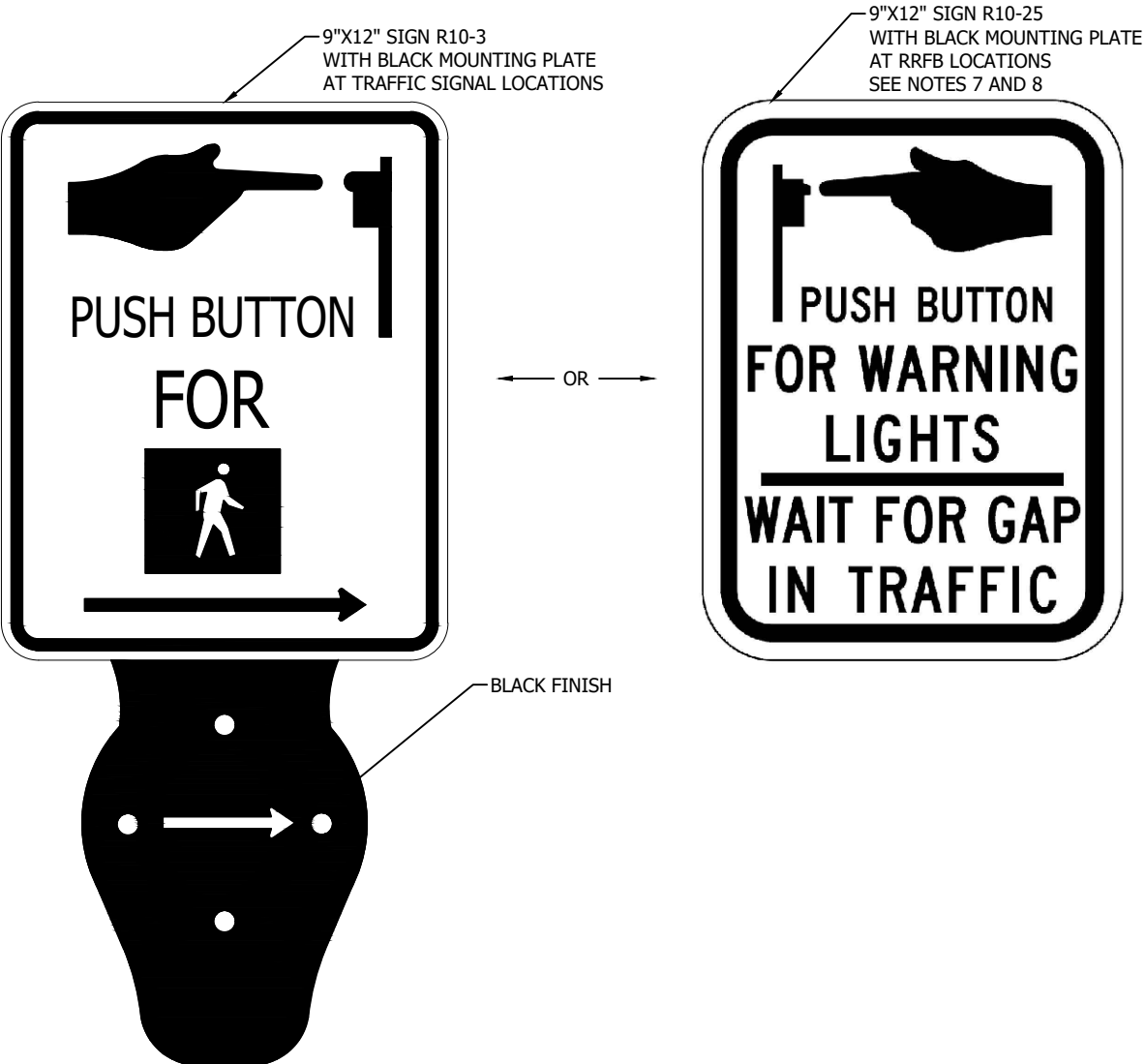
"TINY" SERVICE CABINET FOUNDATION DETAIL

CITY OF KIRKLAND

PLAN NO. CK- TS.11



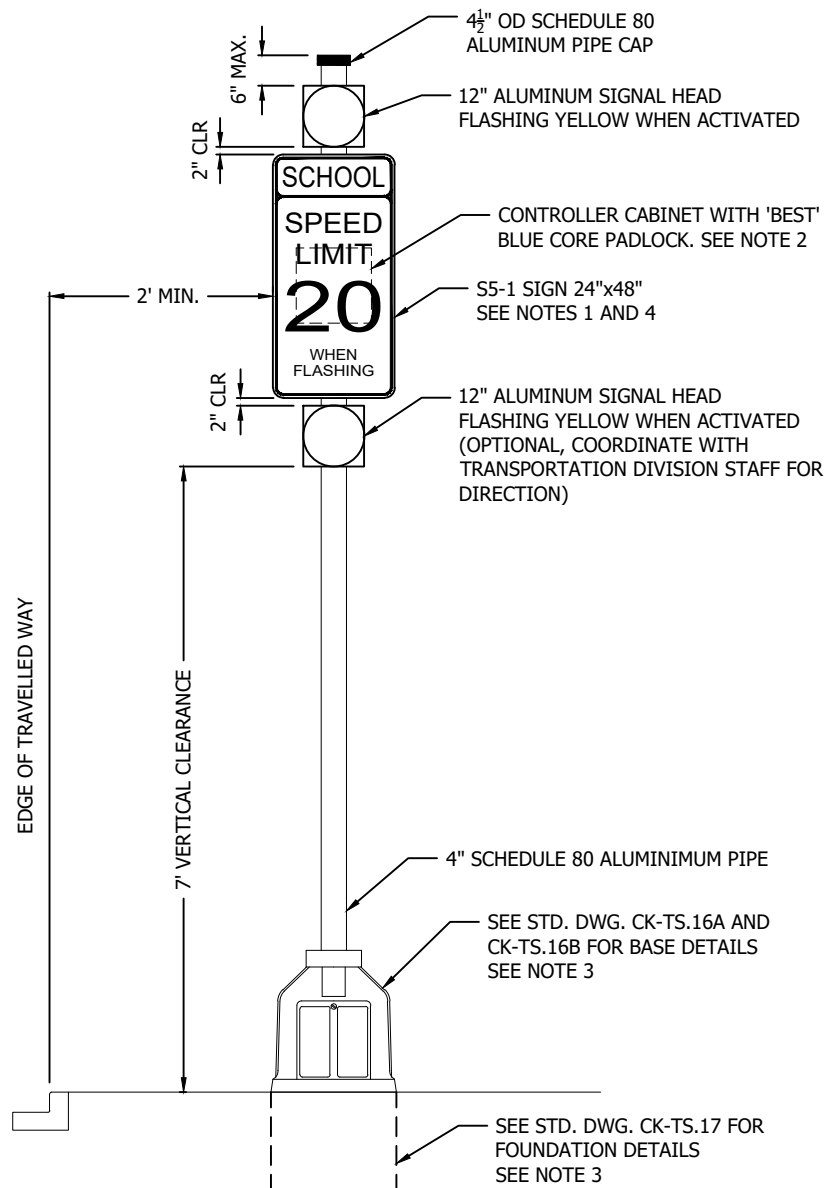
TINY SERVICE FOUNDATION



NOTES:

1. SEE CITY OF KIRKLAND PRE-APPROVED PLANS POLICY R-31 FOR ADDITIONAL INFORMATION.
2. PEDESTRIAN PUSHBUTTONS AND PUSHBUTTON PLACEMENT SHALL FOLLOW CURRENT PUBLIC RIGHT-OF-WAY ACCESSIBILITY GUIDELINES (PROWAG) TO THE MAXIMUM EXTENT FEASIBLE.
3. SEE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) SECTION 4I.05 FOR TYPICAL PUSHBUTTON LOCATIONS.
4. THE PREFERRED TRAFFIC SIGNAL PUSHBUTTON IS THE MOST CURRENT POLARA INS MODEL, OR APPROVED EQUAL. IN ADDITION TO COMPLYING WITH ACCESSIBILITY FEATURES LISTED IN PROWAG AND MUTCD, AT A MINIMUM, NEW ACCESSIBLE PEDESTRIAN PUSHBUTTONS SHALL HAVE THE FOLLOWING FEATURES:
 - 2-WIRE SYSTEM
 - CAPABILITY OF TOUCHLESS ACTUATION (WAVE FEATURE) WITH AN ADJUSTABLE DETECTION RANGE OF 1-20 INCHES
 - COMPATIBILITY WITH SMARTPHONE APPLICATION THAT ALLOWS PEDESTRIANS TO ACCESS AUDIBLE INFORMATION AND REMOTELY ACTUATE PUSHBUTTONS FROM THEIR SMARTPHONE
 - EXTENDED PUSH ACTIVATION
5. SEE ELECTRICAL SPECIAL PROVISIONS FOR MORE INFORMATION.
6. ALL SIGNS SHALL HAVE ANTI-GRAFFITI COATING. SEE CONTRACT SPECIAL PROVISIONS FOR MORE INFORMATION.
7. FOR RRFB INSTALLATIONS, SEE PRE-APPROVED PLAN NOS. CK-TS.14, CK-TS.16A, CK-TS.16B AND CK-TS.17. THE PREFERRED RRFB PUSHBUTTON IS THE 6-WIRE POLARA INX MODEL, OR APPROVED EQUAL.
8. FOR RRFB INSTALLATIONS, USE SIGN R10-25 FROM THE MUTCD.
9. IF USED, ASSOCIATED PUSHBUTTON EXTENDER BRACKETS SHALL BE BLACK IN COLOR.
10. ARROWS ON THE PUSHBUTTON AND SIGN SHALL POINT (RIGHT OR LEFT) TOWARD THE CROSSWALK SERVED, PER PROWAG REQUIREMENTS.

CITY OF KIRKLAND	
PLAN NO. CK - TS.12	
	PEDESTRIAN PUSHBUTTON DETAIL



NOTES:

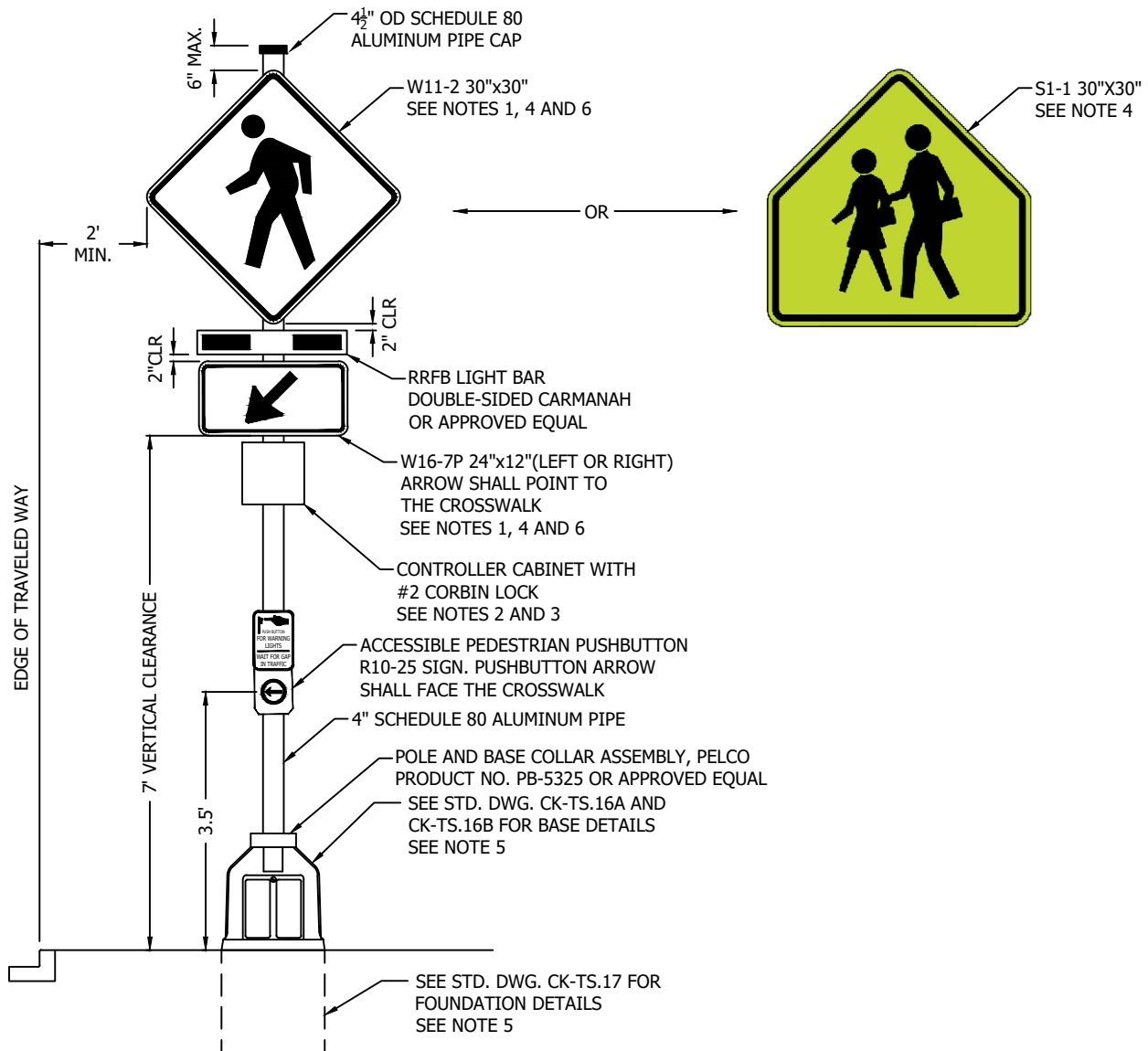
1. SEE CONTRACT PLANS AND SPECIFICATIONS FOR POLE HEIGHT, SIGN SHEETING TYPE, AND OTHER DETAILS. REFER TO PRE-APPROVED PLAN CK-R.43 FOR ADDITIONAL SIGN PLACEMENT REQUIREMENTS.
2. REFER TO THE CURRENT KIRKLAND SPECIAL PROVISIONS FOR APPROVED SCHOOL ZONE FLASHING BEACON COMPONENTS.
3. THE SIGN BASE AND FOUNDATION SHALL BE LOCATED SO THAT 4' MINIMUM CLEARANCE IS MAINTAINED FOR THE PEDESTRIAN ACCESS ROUTE. SIDEWALK WIDENING MAY BE REQUIRED TO ENSURE MINIMUM CLEARANCE DISTANCE.
4. ALL SIGNS SHALL HAVE ANTI-GRAFFITI COATING. SEE CONTRACT SPECIAL PROVISIONS FOR MORE INFORMATION.

CITY OF KIRKLAND

PLAN NO. CK - TS.13



**FLASHING SCHOOL
ZONE BEACON
DETAIL**



NOTES:

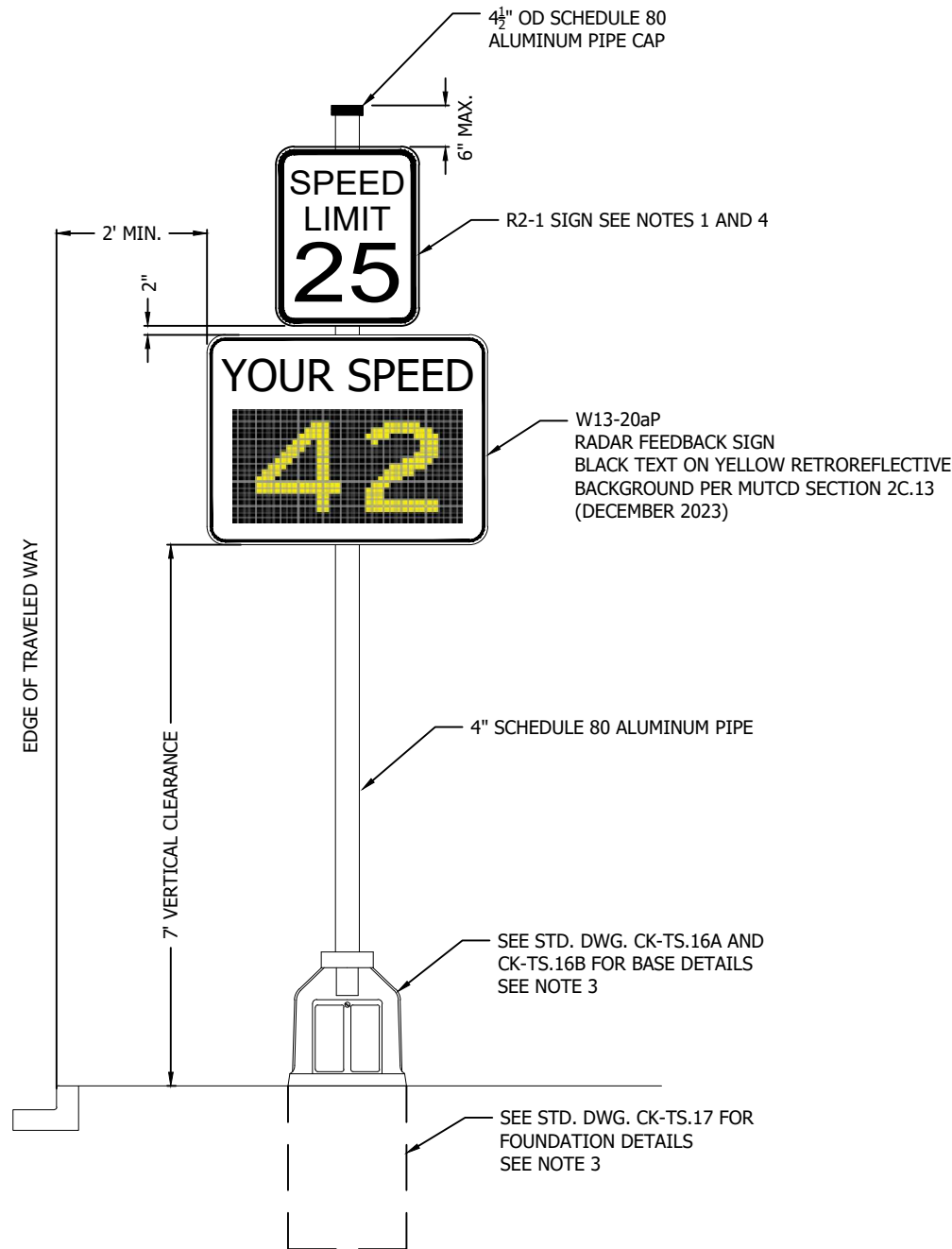
1. SEE CONTRACT PLANS AND SPECIFICATIONS FOR POLE HEIGHT, SIGN SHEETING TYPE, AND OTHER DETAILS. REFER TO PRE-APPROVED PLAN CK-R.43 FOR ADDITIONAL SIGN PLACEMENT REQUIREMENTS.
2. SEE CK-TS.12 AND CONTRACT SPECIAL PROVISIONS FOR APPROVED RRFB COMPONENTS. REFER TO PRE-APPROVED POLICY R-24 FOR POWER SOURCE DETERMINATION AND OTHER DETAILS.
3. THE PREFERRED PLACEMENT OF RRFB CONTROLLER CABINET IS BELOW THE W16-7P SIGN. IF THE RRFB IS LOCATED WITHIN OR ADJACENT TO A WALKING AREA, PROVIDE A MINIMUM 7' VERTICAL CLEARANCE TO BOTTOM OF CONTROLLER CABINET.
4. FOR SCHOOL CROSSINGS, AN S1-1 SIGN SHALL BE USED INSTEAD OF W11-2. IF USED, BOTH THE S1-1 AND W16-7P SHALL BE FLUORESCENT YELLOW GREEN IN COLOR.
5. THE RRFB POLE BASE AND FOUNDATION SHALL BE LOCATED SO THAT 4-FOOT MINIMUM CLEARANCE IS MAINTAINED FOR THE PEDESTRIAN ACCESS ROUTE. SIDEWALK WIDENING MAY BE REQUIRED TO ENSURE MINIMUM CLEARANCE DISTANCE.
6. ALL SIGNS SHALL HAVE ANTI-GRAFFITI COATING. SEE CONTRACT SPECIAL PROVISIONS FOR MORE INFORMATION.

CITY OF KIRKLAND

PLAN NO. CK - TS.14



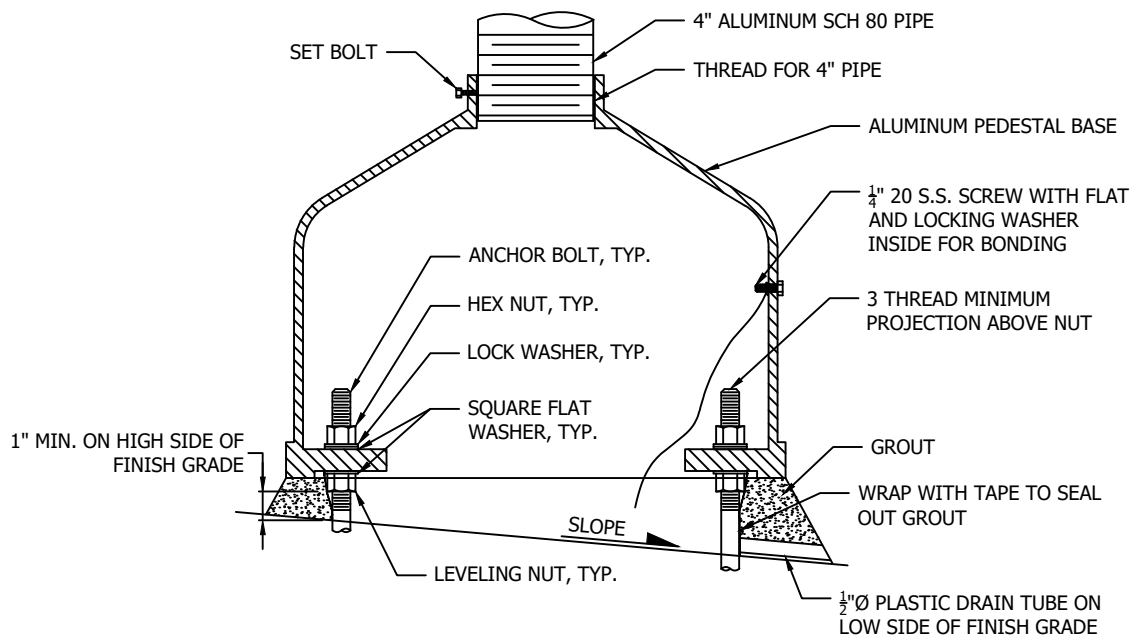
RECTANGULAR RAPID
FLASHING BEACON
(RRFB) DETAIL



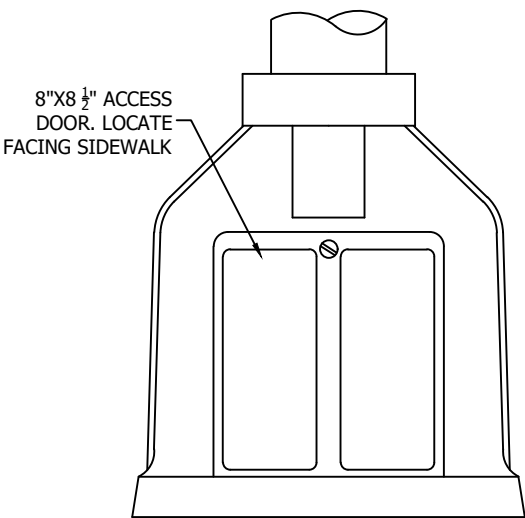
NOTES:

1. SEE CONTRACT PLANS AND SPECIFICATIONS FOR POLE HEIGHT, SIGN SIZES, SIGN SHEETING TYPE, AND OTHER DETAILS. REFER TO PRE-APPROVED PLAN CK-R.43 FOR ADDITIONAL SIGN PLACEMENT REQUIREMENTS.
2. REFER TO THE CURRENT KIRKLAND SPECIAL PROVISIONS FOR APPROVED SCHOOL ZONE FLASHING BEACON COMPONENTS.
3. THE RADAR FEEDBACK SIGN BASE AND FOUNDATION SHALL BE LOCATED SO THAT 4' MINIMUM CLEARANCE IS MAINTAINED FOR THE PEDESTRIAN ACCESS ROUTE. SIDEWALK WIDENING MAY BE REQUIRED TO ENSURE MINIMUM CLEARANCE DISTANCE.
4. ALL SIGNS SHALL HAVE ANTI-GRAFFITI COATING. SEE CONTRACT SPECIAL PROVISIONS FOR MORE INFORMATION.
5. A/C POWER IS PREFERRED. REFER TO PRE-APPROVED POLICY R-24 FOR POWER SOURCE DETERMINATION REQUIREMENTS.

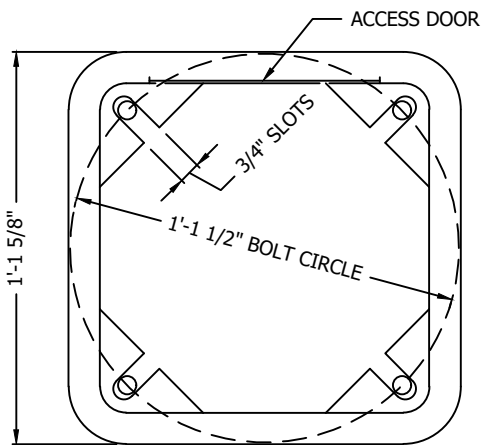
CITY OF KIRKLAND	
PLAN NO. CK - TS.15	
	RADAR SPEED SIGN DETAIL



BASE MOUNTING DETAIL



BASE ELEVATION

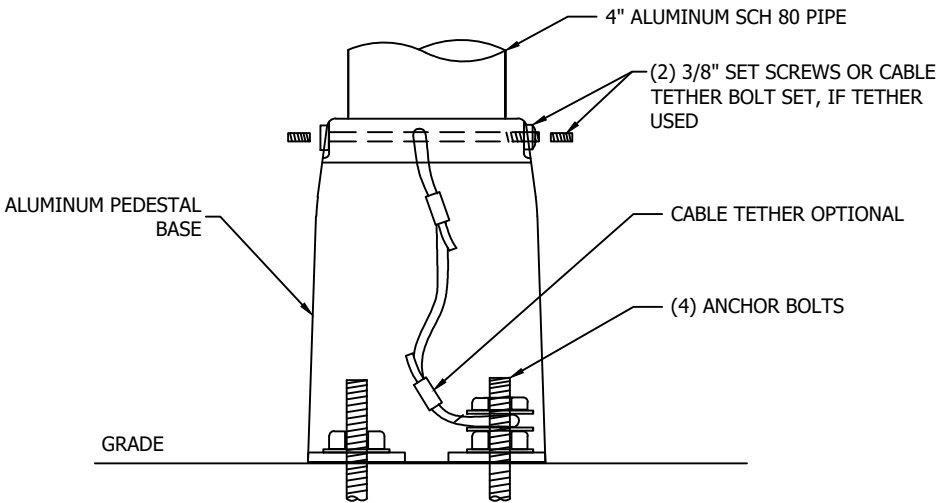


NOTE: BASE SHALL MEET AASHTO BREAKAWAY REQUIREMENTS

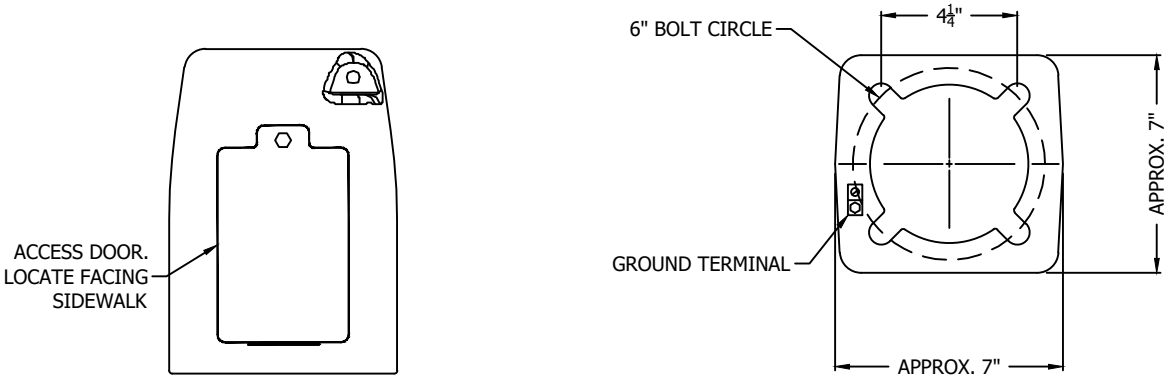
BOTTOM VIEW

PEDESTAL OPTION A-1'-1 1/2" BOLT CIRCLE

CITY OF KIRKLAND	
PLAN NO. CK - TS.16A	
	4" ALUMINUM POLE BASES DETAIL OPTION A



BASE MOUNTING DETAIL

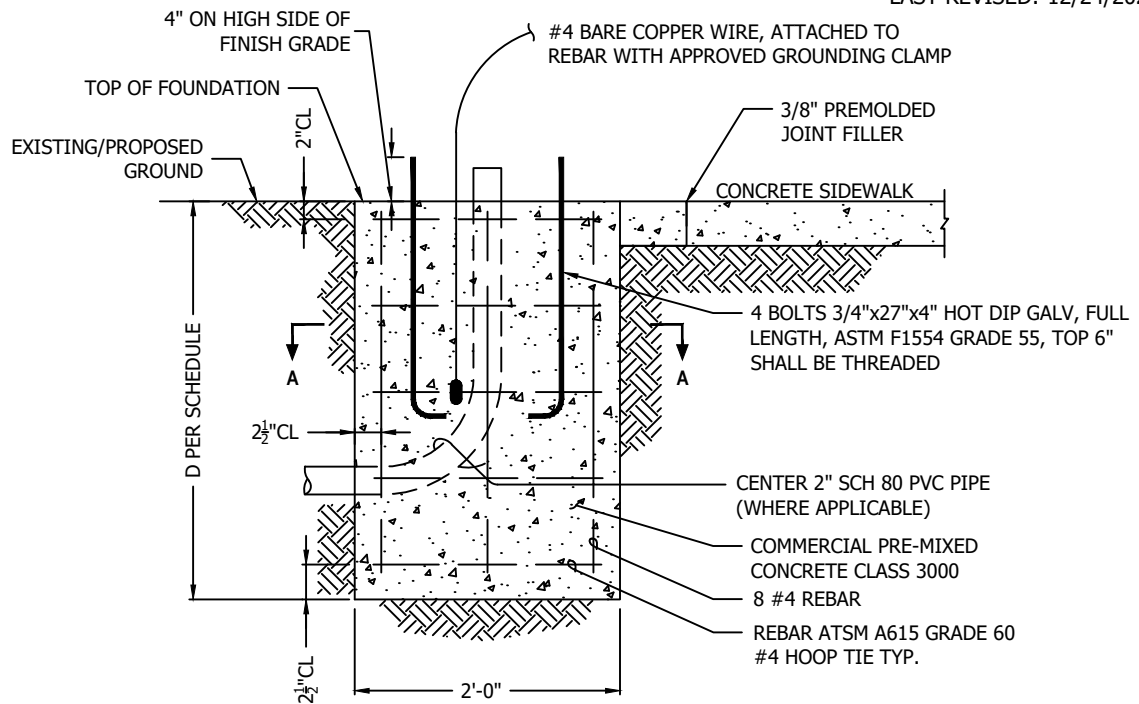


BASE ELEVATION

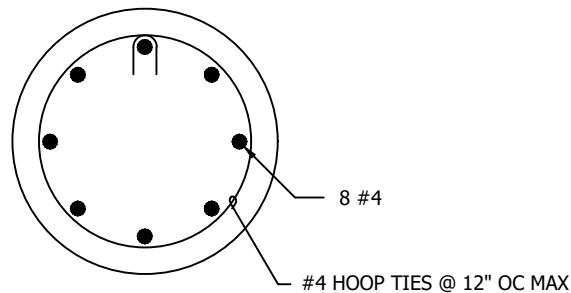
BOTTOM VIEW

PEDESTAL OPTION B - 6" BOLT CIRCLE

CITY OF KIRKLAND	
PLAN NO. CK - TS.16B	
	4" ALUMINUM POLE BASES DETAIL OPTION B



PEDESTAL FOUNDATION



FOUNDATION SECTION (A-A)

NOTES:

1. THIS FOUNDATION HAS BEEN DESIGNED ACCORDING TO THE AASHTO LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, FIRST EDITION, 2015. ULTIMATE WIND SPEED IS 100 MPH.
2. FLAT GROUND CONDITION SHALL BE USED IF SLOPE IS 4H:1V OR LESS.
3. SLOPED GROUND CONDITION SHALL BE USED IF SLOPE IS GREATER THAN 4H:1V BUT LESS THAN 2H:1V.
4. FOUNDATION DEPTHS PROVIDED ASSUME SOIL CAN BE CLASSIFIED AS SAND. FOR PREDOMINATELY CLAY SOILS A PROJECT-SPECIFIC DESIGN WILL BE REQUIRED.
5. IF THE LOADING AT THE BASE OF THE POLE IS GREATER THAN 12,000 FT-LB, A PROJECT-SPECIFIC DESIGN WILL BE REQUIRED.
6. FOUNDATION SHALL BE POURED IN ONE UNIFORM INSTALLATION.

FOUNDATION SCHEDULE		
LOADING AT BASE M	GROUND CONDITION (SEE NOTES)	FOUNDATION DEPTH D
M < 8,500 FT-LB	FLAT	4'-0"
	SLOPED	5'-0"
8,500 FT-LB < M < 12,000 FT-LB	FLAT	5'-0"
	SLOPED	6'-0"

CITY OF KIRKLAND

PLAN NO. CK - TS.17

**4" ALUMINUM POLE
BASE FOUNDATION
DETAIL**