

Joint Use Handbook

A Guide to the City Light Pole Attachment Process

The purpose of this handbook is to guide telecommunication carriers and their contractors through the Seattle City Light application-to-permit process, up to and including construction. The material covers engineering and other requirements for successful permitting and construction.

This edition of the handbook pertains to the installation of small wireless facilities on City Light poles. The handbook does not address the wireline application process. Questions regarding wireline applications, including strand-mount antennas, should be sent to the wireline group.

This handbook is maintained by Seattle City Light's Asset Management and Large Projects (AMLP) Division. Comments, suggestions, and requests to include specific information in future editions may be directed to the Joint Use Team.



Andrew Strong, Asset Management and Large Projects Director

**Seattle City Light
Joint Use Handbook**

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Seattle City Light Joint Use Team

Seattle City Light (“City Light”) Joint Use is a team consisting of a manager, engineers, and administrators who work together to process and issue third-party attachment applications. The Joint Use team was started in the late 2000s and has since expanded to be an integral group that ensures communications connectivity in the City of Seattle. The team includes wireline, wireless, and streetlight engineers to support local communications carriers.

All attachments that are not owned by City Light, but are located on City Light-owned poles, are subject to Joint Use approval.

Contact Information, Wireless

Applications:

scl_jointusewireless@seattle.gov

Office Location:

Seattle City Light
South Service Center Bldg. A
3613 4th Ave South
Seattle, WA 98134

Contact Information, Wireline

Questions regarding wireline applications, including strand-mount antennas, should be sent to the wireline group.

Applications:

scl_jointuse@seattle.gov

Office Location:

Seattle City Light
South Service Center Bldg. A
3613 4th Ave South
Seattle, WA 98134

Pole Attachment Process Overview

In order to apply for a wireless attachment to a City Light pole, the Applicant must have on file with City Light a Master Wireless Communications Site Agreement, as authorized by Seattle Municipal Ordinance #118737, and an active Certificate of Insurance (COI).

To facilitate the attachment application process, City Light will employ the services of an external vendor (hereafter referred to as the "City Light Vendor"). The City Light Vendor will act in a supporting role to assist the Applicant in preparing their application.

The Joint Use pole attachment process involves a sequence of three primary phases:

1. The **pre-screening phase** includes optional but recommended preparation before beginning the application process. The goal of pre-screening is to ensure applications are not submitted for an ineligible pole. Pre-screened pole selections improve the likelihood of accurate application submittals and provide a forum for the Applicant to ask any design questions.
2. The **permit application phase** is the next step after pre-screening is completed. The Applicant must assemble and submit all required documents listed in the Application Process section of this handbook. Depending on the type of pole attachment requested, refer to the list titled either:
 - Engineering for Wood Poles
 - Engineering for Metal Poles

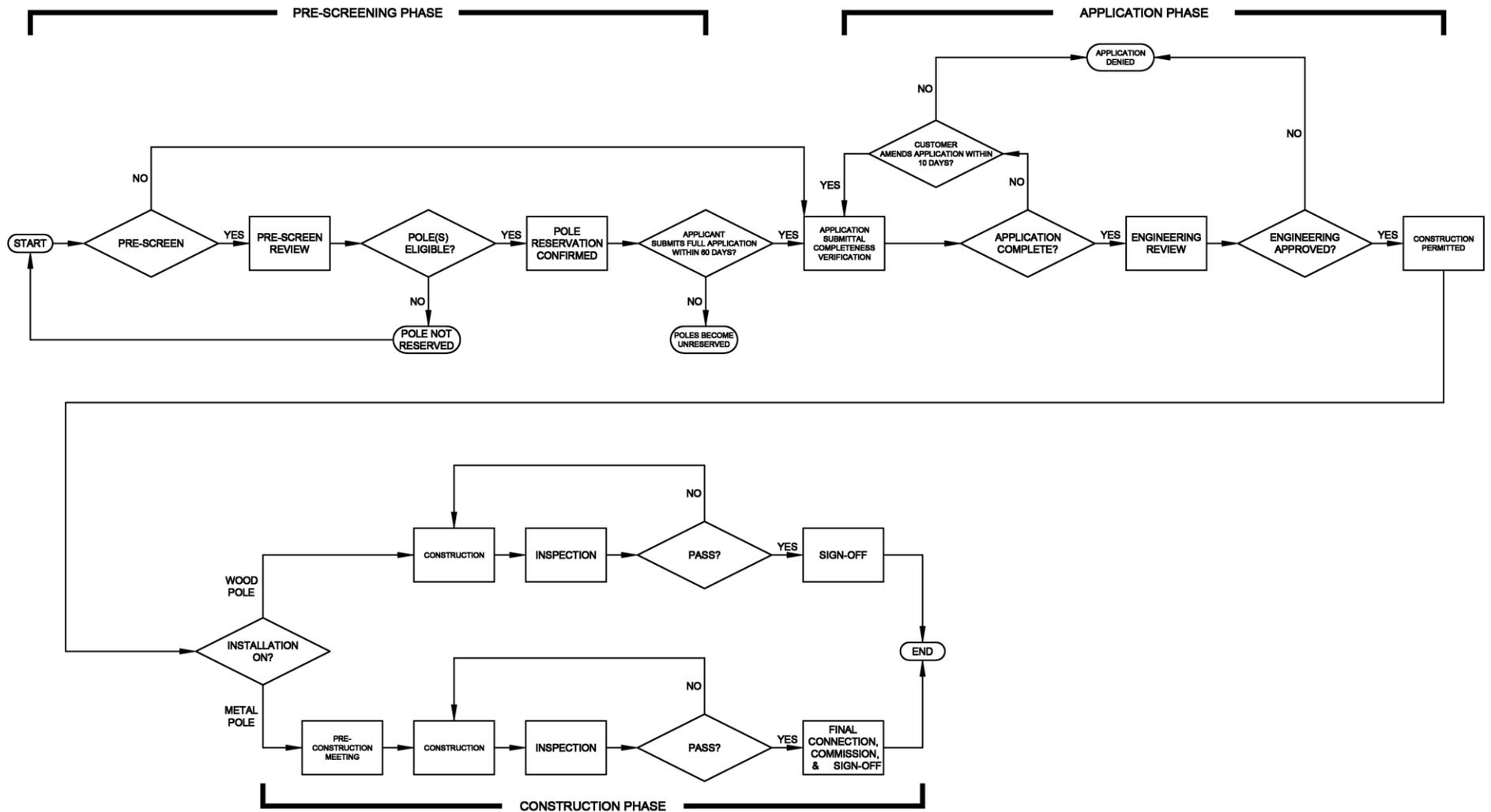
Completed application packets are evaluated by the Joint Use engineering team, then Applicants are informed as to whether their application is approved or denied. For approved applications, a permit is granted and the Applicant advances to the construction phase. For denied applications, remedial steps or actions are provided.

3. The **construction phase** involves all activities required to ensure that material, construction, installation, and final inspections meet or exceed all City Light requirements. During this phase, active communication and coordination between the Applicant and City Light is crucial.

Depending on the type of pole attachment requested, refer to the appropriate construction section:

- Construction for Wood Poles
- Construction for Metal Poles

Pole Attachment Process Overview Flow Chart



Pre-Screening Phase

Before applications are submitted for a location, optional pre-screening procedures are highly recommended and available to Applicants. Pre-screening allows Applicants to pre-reserve a pole for an application, so engineering work may be performed for the application.

Pre-screening also maximizes the application quality, which assists with the application review process. In addition, any poles that City Light determines to be unacceptable for a wireless installation are ruled out during pre-screening. The pre-screen process is designed to give an initial review of the pole and does not guarantee site acceptance in the application phase.

Conditions that may result in a pole being eliminated from consideration for attachment include, but are not limited to:

- Wood poles with blocked climbing space
- Wood poles with transformers, switches, or primary terminations
- Wood poles slated for additional equipment
- Poles scheduled to be removed to accommodate in-progress service or system work
- Poles already reserved by another entity
- Metal poles of an improper style or setting
- Metal poles not owned by City Light
- Metal poles used for pedestrian lighting
- Metal poles with existing attachments

How to Determine Pole Availability

Alden One, an asset management and communication platform, is used to manage and display pole availability. Availability status is shown as **Available**, **Reserved**, or **Unavailable**.

Available poles are any poles not yet taken by another Applicant. These are good candidates for the pre-screen process but are not guaranteed to be eligible for attachment.

Reserved poles have an ongoing application but may revert to Available for any of the following reasons:

- Applicant did not submit application materials/fee within the given time frame
- Incomplete application not corrected
- Application fails the design review
- Applicant does not provide payment to City Light
- Applicant cancels project

If a second applicant desires a Reserved pole, they will be able to submit a pre-screen request and be placed in a queue. If the Reserved pole reverts back to Available for any reason, the first applicant in the queue shall be notified that they have received ownership of the reservation and they have 60 days to submit a full application for the pole. Failure to do so will release the reservation to the next applicant in the queue.

Pre-Screening Phase

Unavailable poles have equipment installed or have been previously determined to be unusable for small wireless facilities.

How to Reserve a Pole

The sequence of events for reserving a pole in pre-screening is as follows:

1. Check availability of desired pole using Alden One.
2. Obtain recent, calibrated photos from the field. See relevant IKE GPS section of this handbook for specific requirements regarding photos.
3. Use Alden One to create a conversation for the pole.
4. Upload the required IKE photos, pay application fee, and submit the conversation.
5. City Light, through its Vendor, will complete the pre-screening within 10 days.

Pole Reservation Eligible

When the City Light Vendor completes the pre-screening and makes a determination of "Pole Eligible," the pole becomes reserved in the Applicant's name. The Applicant then has 60 days to submit a full application for the pole.

If the Applicant fails to make a submittal within this time frame, the pole reservation will be released to another applicant.

To re-reserve the pole, the Applicant may restart the pre-screening process.

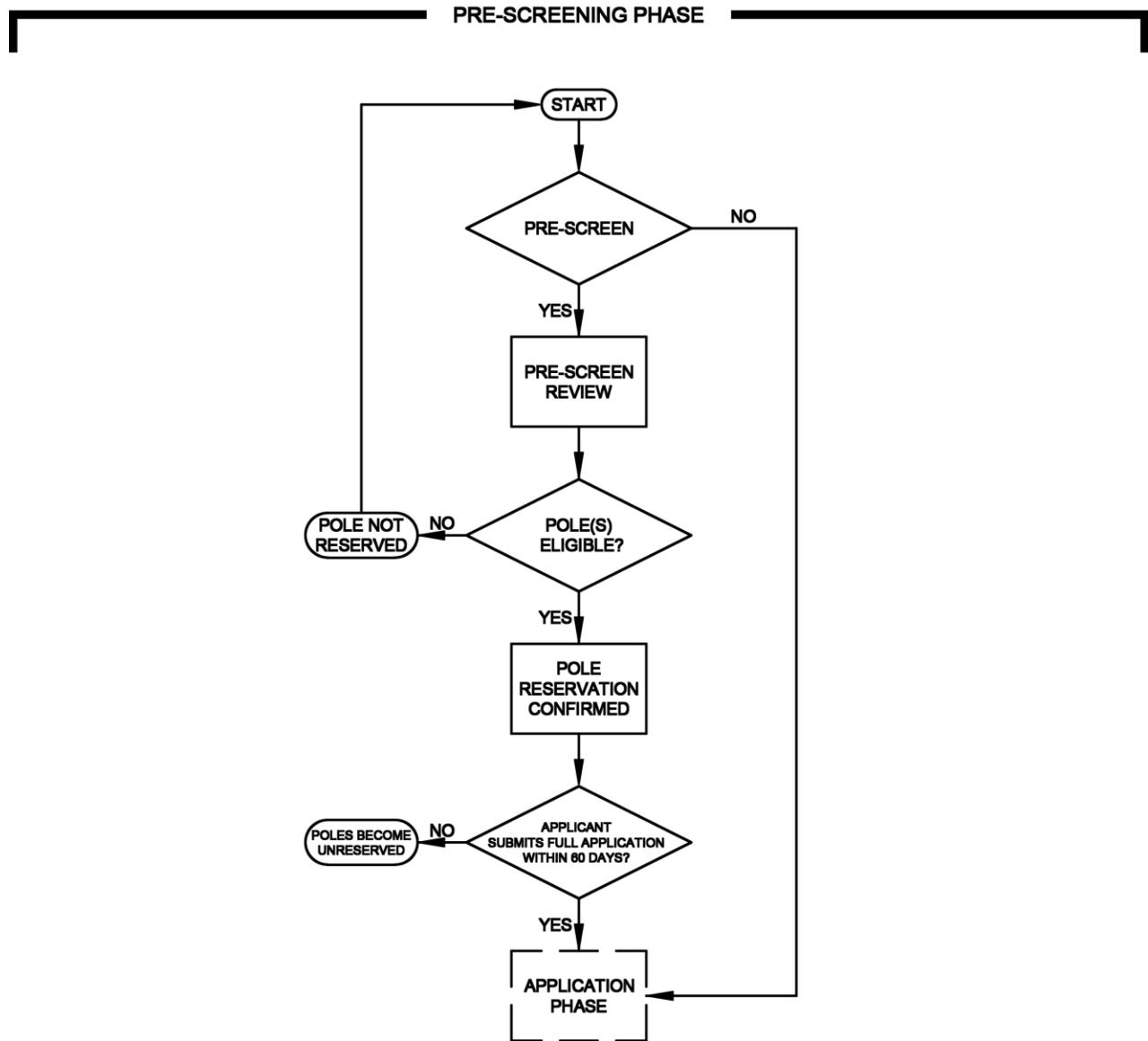
Pole Reservation Ineligible

When the City Light Vendor completes the pre-screening and determines the pole reservation will not work for a small wireless facility, the Alden One conversation will be set to "Pole Ineligible." A reason for the ineligibility will be provided in the Notes section of the conversation.

Poles that are deemed Ineligible in pre-screening will have their status changed to "Unavailable" within Alden One. These poles will no longer be selectable for future applications or pre-screening.

The Applicant can then make a reservation request for a different pole.

Pre-Screening Phase Flow Chart



Permit Application Phase

Pre-screening of poles is a highly recommended precursor for applications. Refer to the previous section, *Pre-Screening Phase*, for complete information.

Applicants must use Alden One to apply for poles individually. However, a batch of poles can be linked using a unique project name to facilitate tracking.

Permit Application Workflow

The workflow for permit applications is outlined below.

Submittal of application deliverables

For a permit application to progress successfully, approval is needed from all entities listed below:

- City Light
- Right-of-Way (ROW) jurisdiction for the selected pole(s)
- Pole co-owners (if any)

The Applicant is responsible for preparing an application for pole attachment, as outlined in the following steps. The City Light Vendor will assist the Applicant with selected engineering tasks that are required to prepare the application, as detailed in further sections of this handbook.

1. Complete all engineering tasks and create a construction package of required submittal documents.
2. If pre-screening information has not been previously submitted, create a conversation in Alden One.
3. Add all construction package documents as PDF attachments to the conversation.
4. Complete all necessary fields in the conversation header relating to the application.
5. Submit the conversation to City Light.
6. If not previously submitted, pay application fee to City Light. Application is considered "submitted" once the Alden One conversation has been submitted and processing of the application fee payment is complete.

City Light application submittals notification

City Light will verify application submittals for completeness within 10 days of submission and determine if any deliverables have been omitted or incorrectly completed.

Incomplete application: If any application deliverables are missing or incorrect, the Applicant is notified that the application is deemed "incomplete."

- The Applicant will have 10 days to re-submit deliverables for completeness review.

Permit Application Phase

- If the application is not re-submitted within 10 days or is deemed “incomplete” a second time, the pole reservation expires and the pole becomes available to the next applicant.

Complete application: If all required deliverables are correct and complete, the Applicant will be notified that the application status is deemed “complete.”

- The application will be sent through an engineering review.
- If the application passes the detailed engineering review, the Applicant will receive notice of approval through Alden One.

Failed application: If the application fails the design review, City Light will identify concerns and provide corrections to the Applicant. The Applicant will then have the opportunity to make minor corrections.

If the application contains major design issues, or if repetitive failures occur during the application, the conversation will be canceled and the pole will become available to the next applicant.

If the Applicant wishes to reapply, they will be required to restart the application from the beginning.

ROW jurisdiction application submittals notification

The Applicant shall submit the ROW permit documents through Alden One as part of their application and will not submit them to the ROW jurisdiction. The City Light Vendor will verify scope of work and check for proper documentation. After the City Light Vendor has verified application completeness, the City Light Vendor will submit the ROW permit request to the relevant ROW jurisdiction on the Applicant’s behalf.

Prior to the construction phase, an approved ROW permit must be uploaded to Alden One.

Pole co-owners (if any) application submittals notification

Pole co-owners will have 2 weeks from time of application submittal to approve or deny the attachment to the pole. The request and subsequent response shall be communicated via Alden One.

Steps following application approval

Once the application has been approved by City Light, the ROW permitting jurisdiction, and any joint owners of poles, it will proceed through the following steps:

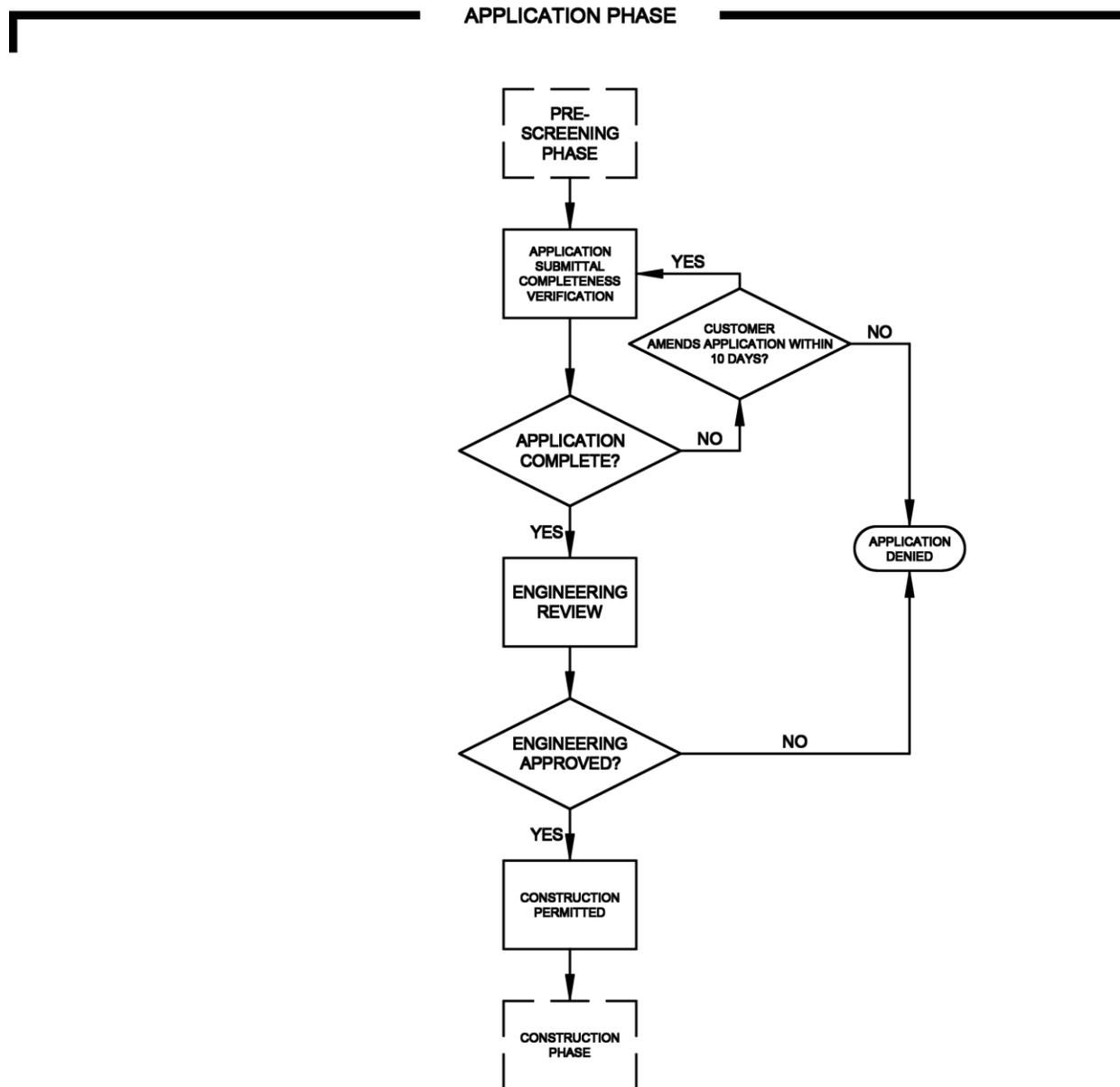
1. A Wireless Communications Site Agreement (license) shall be signed by the Applicant and executed between City Light and the Applicant.
2. A performance bond shall be provided to City Light.
3. Approved ROW permit(s) shall be provided to City Light.
4. An estimate will be sent to the Applicant, including all time and materials associated with the scope of work. Depending on scheduling, multiple applications from a single

Permit Application Phase

Applicant may be combined by City Light into one estimate, in order to streamline the construction phase.

5. After the Applicant submits payment, the Applicant shall issue construction notices to the surrounding residences. See Alden One for a template.
6. The application proceeds to the construction phase.

Permit Application Phase Flow Chart



Engineering for Wood Poles

The tasks and their associated deliverables required to engineer a wood pole for communications attachment are listed below. Instructions regarding each task are detailed on subsequent pages.

All document deliverables submitted for each task must be in PDF form, unless specified otherwise.

Name all files using the Alden One conversation number followed by the deliverable name, formatted as follows: **Conversation#_DeliverableName.pdf**

- Use an underscore for any spaces within the filename.
- Name and submit files individually for each required deliverable.
- If there are multiple files for the same deliverable, combine them into a single PDF.

Examples: 123456_SewerCard.pdf

123456_LocatePhotos.pdf

Checklist of Deliverables

- Transformer Load Analysis (TLA) Report
- Asset Detail Report
- Overlapping Work Check
- Calibrated Photos (IKE GPS)
- Field Notes
- Infrastructure Integrity Report
- Locate Photos
- Tree Trimming Request
- Pole Loading Analysis
- Sewer Card
- Environmental Review
- Soil Map
- Voltage Drop
- Fault Current
- Third-Party Coordination
- Construction Drawings
- Non-Ionizing Electromagnetic Radiation (NIER) Reports
- Right-of-Way (ROW) Permits
- Performance Bond
- Signed License

Transformer Load Analysis (TLA) Report

A TLA Report includes meter and transformer data that is used in the design of secondary power installations and maintenance. The report is also used during construction to coordinate outages.

When required: A TLA report is required any time a pole is replaced, or when work is being done on secondary power lines. This includes the energization of a wireless facility, so every application needs at least one TLA.

Deliverable: Applicant must submit copies of all relevant TLAs, clearly labeled with the conversation number and node pole 7-digit tag. If information on the TLA report is found to be incorrect or different from that which is in the field, corrections must be marked on the report by the Applicant and accompanied by clear photos showing the information that must be corrected.

Resources: TLA reports must be provided by the City Light Vendor using CurrentView or Advanced Grid Analytics (AGA). Applicants must submit a request to the City Light Vendor with a list of all transformer numbers for which a report is required.

Asset Detail Report

Asset detail reports include all pertinent information about a pole including height, installation date, ownership, and child assets (attachments).

When required: An asset detail report is required for every wireless node or pole replacement.

Deliverable: Applicant must submit a copy of all asset detail reports used. If information on the asset detail report is found to be different than that which is in the field, corrections must be marked on the report by the Applicant and accompanied by clear photos showing the information that must be corrected.

Resources: To obtain an asset detail report, submit a request to the City Light Vendor with a list of all 7-digit pole numbers for which a report is required. Format pole numbers in a single line separated by commas (example: 1234567, 2345678, 3456789).

Overlapping Work Check

Overlapping work involves work done by another party that may affect an Applicant's clearances and change the body of work. Similarly, a portion of the Applicant's make ready work may already be completed by another party and thus should be removed from the Applicant's scope.

When required: Overlapping work must be identified and coordinated for all poles that are worked on. Due to the influx of attachment applications and construction in Seattle, this data has the potential to change at any time. It is the Applicant's responsibility to manage overlapping work throughout the entire lifecycle of a project.

Deliverable: An overlapping work report obtained from City Light must be submitted with notes detailing how each overlapping job does or does not need to be changed to accommodate the Applicant's scope of work. All overlapping projects that affect the Applicant's scope of work should be properly addressed in the Applicant's Construction Drawings. With the City Light

Permit Application Phase – Engineering for Wood Poles

Vendor's assistance, the Applicant is responsible for coordinating any changes due to overlap to ensure consistency in permitted attachments.

Resources: To obtain an overlapping work report, Applicants must submit a request to the City Light Vendor with a list of all 7-digit pole numbers for which a report is required.

Calibrated Photos (IKE GPS)

The purpose of the task is to identify clearances and all required make ready work (MRW). In addition, calibrated photos provide a visual reference of existing conditions prior to equipment installations and pole replacement.

When required: This task is required for every pole that is worked on, including the poles on either end of a wire replacement, installation, or removal. Additionally, when replacing a pole, all adjacent poles must be included.

Note: Do not submit calibrated photos of City Light transmission poles. Normal photos shall suffice.

Deliverable: Applicant must provide pole measurements and photos using an IKE 4 device. Five high definition photos shall be labeled with date of capture, conversation number, and 7-digit pole tag, combined and submitted as a single PDF. The PDF must contain the following information arranged in the order shown:

- 1 pole tag photo showing all pole tags
- 1 ground photo that shows surrounding curbs and potential restrictions to pole replacements
- 2 full pole "true size" photos that have all existing equipment visible with heights clearly identified using the IKE Office application.
 - The two photos must be taken at different angles 90° apart.
 - The photos must be taken with a 10' measuring stick placed against the street side of the pole to confirm ground height and scale.
 - The pole itself must take up more than 2/3 of the full-page photo.
- 1 graphic representation of proposed equipment created from a copy of one of the previous two photos and marked with all proposed equipment heights.

Resources: To access the devices, software, and information required for this task, go to www.IKEGPS.com.

Field Notes

When required: Field notes are required only when necessary project information is not captured or included in any other application documents.

Deliverable: Applicant must use Alden One to submit any additional notes and information relevant to the design of the project.

Resources: An example note sheet can be provided upon request. Applicants may format and style field notes using the software of their choice, provided the notes are clear and legible.

Infrastructure Integrity Report

An infrastructure integrity report identifies whether the pole will need to be replaced prior to all other work.

When required: An infrastructure integrity report is required for all poles being worked on that are not being replaced. The report is also required for all poles adjacent to pole replacements.

Exception: If pole tags show that the pole passed inspection within the last five years, or was set within the last 15 years, and pictures can prove that no further deterioration (for example, car damage) has occurred, the report is not necessary.

Deliverable: Applicant must submit a copy of an inspection report showing that the pole is structurally sound, or pictures proving that the exception has been met.

Resources: A qualified company such as Intec may be hired to complete a pole survey and produce the report.

Locate Photos

Locate photos clearly identify all underground utilities in a designated area.

When required: Locate photos are required for any project causing a ground disturbance, such as pole replacement, anchor installations, and handhole installations.

Deliverable: Applicant must submit high resolution photos including the 7-digit pole tag and the painted locate markings for ground disturbance locations.

Resources: To obtain locate photos, contact WA One Call and request a locate with a minimum 10' radius around the planned ground disturbance.

Tree Trimming Request

Tree trimming and vegetation management is a critical maintenance task. City Light-approved crews are responsible for completing tree trimming for power clearances, safety, and reliability.

When required: This type of work is required whenever vegetation is encroaching beyond clearance limits to energized equipment as outlined in City Light standards, or when vegetation will hinder pole replacement.

All tree trimming work must be completed before maintenance or installation work can be safely performed.

Deliverable: Applicant must submit a PDF copy of a City Light GIS map (CurrentView or public-facing pole map) showing the affected area. The area(s) requiring management of vegetation must be boldly clouded and clearly visible, marked in red with "tree trimming" and an indication if the trimming work is for overhead line clearance or for a pole replacement.

Resources: To access tree clearance requirements, reference City Light Standard 0114.07.

Pole Loading Analysis

Pole loading analysis models the current loading on a pole, and future loading with additional attachments. Loading analysis can be completed using one of the City Light-accepted software applications listed in the Resources section below.

When required: A full detailed pole loading analysis is required whenever these situations occur:

- Primary pole will be replaced or reconfigured
- Pole will have wireless equipment attached
- Pole will have the existing design altered by the addition or removal of guys and secondary wire larger than #2
- Pole requires Grade B construction per NESC
- Pole extends 60 feet or more above ground
- Pole has a 3-phase transformer bank of any size

Deliverable: Full analysis and reports for each pole must include:

- Projected design and analysis that encompasses all proposed design changes to pole (guys, replacement, additional equipment)
- Modeling of significant structural pole damage (base shell or heart rot, bolt holes, woodpecker damage, missing sections of pole, large vertical cracks)
- A 5% pole strength reduction (must be added in the case of severe weathering)
- Worst-case wind and ice loading conditions and appropriate grade of construction as required per NESC 2017

Pole loading analyses must be submitted as a report.

Resources: Preferred software is available at <https://www.spidasoftware.com/>. City Light can supply a SpidaCalc client file upon request which includes all equipment tensions and ratings.

Pole loading analysis done with the following programs will also be accepted:

- O-calc (<https://www.osmose.com/o-calc-pro>)
- PLS-POLE (http://www.powline.com/products/pls_pole.html)

Sewer Card

Sewer cards are digitized drawing records of sewer lines within the City of Seattle.

When required: All pole locations within the City of Seattle require a sewer card any time ground disturbance will occur. For pole locations in jurisdictions outside the City of Seattle, a sewer card is not required.

Deliverable: Identify the correct card(s) for the location, make a copy of the front of the card, and mark it up to show the pole location. Label the conversation number, pole tag, and node number on the picture(s).

Resources: To locate the sewer card, access the Seattle Department of Construction and Inspection (SDCI) site online.

Environmental Review

An environmental review is used to identify potential environmental hazards in a work area. The review also includes any work safety requirements, best management practices, and pertinent contact information for construction crews.

When required: An environmental review is required for every ground disturbance.

Deliverable: Applicant must provide either:

- A screenshot of City Light’s environmental map that shows no issues with the selected pole(s), or
- An Environmental Report produced by City Light’s Environmental Department

Resources: To determine if the pole replacement is located within an area of environmental concern, use the City Light Environmental Explorer, which is an internal environmental review site accessible through the City Light Vendor. Areas of environmental concern include any poles that are:

- Located within a 300’ radius from a “confirmed and suspected contaminated site” (marked with a yellow star)
- Located within a 300’ radius from a “leaking underground storage tank” (marked with a blue star)
- Marked as site of a previous bird death
- Within any colored, boxed, or circled areas
- Within 200’ of a water source
- Located on a steep slope

If one or more of the above criteria applies, City Light’s Environmental Department must review the proposed ground disturbance. When the City Light Environmental Report is completed, ensure that the engineering packet incorporates the requirements of the provided Report when submitted.

Exception: For avian sensitive areas (marked green), Applicants are not required to submit an environmental report. Avian sensitive areas require only appropriate avian protection per City Light standard 0072.01.

Soil Map

Soil maps are used to classify soil types and other soil properties in a given area, which determines embedment depth for pole replacements.

When required: Soil maps are required for every new or replacement utility wood pole.

Deliverable: Applicant must submit a copy of the quarter section page of the relevant soil map with the pole area circled and labeled with the conversation number, pole tag, and node number.

Resources: Refer to the Soil Map Book available through the City Light Vendor or Alden One.

Voltage Drop

Voltage drop calculations are used to determine the correct wire sizing and verify that the provided service voltage does not drop below 3% of the expected voltage for any service.

When required: The voltage drop calculation is required for wire sizing, especially when replacing service cables and wire, and when installing new service.

Deliverable: Applicant must provide a detailed calculation or report clearly showing that voltage drop does not exceed 3% for any service affected by the work performed for the wireless installation.

Resources: Voltage drop calculations are the responsibility of the Applicant to produce.

Fault Current

Fault current is an important parameter necessary to ensure that properly rated equipment is installed. The fault current calculation is represented in a detailed report showing potential current available at the point of service during a fault condition. For wood poles, the point of service is the fuse located at the weatherhead. City Light uses this information to create a Fault Current Letter for use in obtaining Electrical Inspection signoff from the relevant jurisdiction.

When required: A fault current calculation is required for every requested electrical service installation.

Deliverable: Applicant must submit a fault current calculation that shows maximum fault current and the parameters used to calculate it.

Resources: To calculate fault current, use the fault current calculation tool available through the City Light Vendor or Alden One.

Third-Party Coordination

Third-party coordination consists of coordinating with other communication carriers and companies to perform communication make ready work at any time during the construction phase. This body of work is fully handled by the third-party companies; City Light will not touch the communication lines during make ready work. Applicant is responsible for making all third-party coordination arrangements.

When required: Third-party coordination is required if any third-party communication equipment must be moved during any part of the construction. Examples of work requiring third party coordination include:

- Pole transfer notification for replacements
- Adjustments to fiber line heights
- Movement of splice boxes

If transfers are needed in real time, Applicant must ensure that the transfers are coordinated in advance to prevent construction delays.

Permit Application Phase – Engineering for Wood Poles

Deliverable: A copy of any correspondence requesting make ready work must be submitted. Applicant must also submit a memo detailing:

- The specific work requested (“what” and “when”)
- The associated company and/or contact name
- The relevant Alden One conversation number

Resources: Applicant must use Alden One to notify the necessary renters that a transfer or adjustment is necessary. Assign specified heights to the renters, using information from applicable City Light and NESC standards.

Construction Drawings

Construction drawings guide crews through the construction phase, while also serving as an official record of work completed and equipment installed.

When required: Construction drawings are required for all work performed on City Light poles or equipment, including the installation and energization of wireless equipment and antennas. The drawings must show the design of the proposed installation and include all work necessary to bring the site up to both City Light and NESC standards

Deliverable: Applicant must provide copies of all construction drawings for the installation of their equipment, stamped by an electrical Professional Engineer (PE) licensed in the State of Washington.

Construction drawings must be 11" x 17" paper size with a stamp, project name, Alden One conversation number, and 7-digit pole tag(s) noted on each page. All construction drawing files must be combined into a single PDF document which includes at a minimum:

- Site location
- Vicinity map and site plan
- Map of all poles on project (if applicable)
- Photo-simulation of proposed design
- Proposed fiber route map including:
 - Clearly labeled overhead vs. underground
 - Wireline application number, if applicable
- 2 elevation plans showing heights of all proposed and existing equipment:
 - Include both top and bottom measurements of all enclosures and antennas
 - Show proposed heights of any new overlapping fiber routes that are yet to be installed
- Riser diagram
- Node ID and radio frequency (RF) caution signage
- Grounding diagram
- All equipment specifications and installation notes
- Design which meets the Design Guidelines of the jurisdiction

Permit Application Phase – Engineering for Wood Poles

- Electrical make ready work (MRW) drawing with the following:
 - All associated overhead line work including, but not limited to:
 - Pole replacements
 - Grey wire service replacements
 - Open-wire reconductoring
 - Transformer upgrades and replacements
 - Installation of new wire, and various system improvements and/or changes as required
 - All pole replacement call-outs, hardware, and framing notes
 - Call-outs for concrete or asphalt restoration and/or temporary “cold-patch” repairs
 - GIS2CAD basemap at 1:100 scale (using tool accessible to the City Light Vendor)
 - Typical City Light construction must be used where applicable; construction language guidelines are available through the City Light Vendor.

Resources: Construction Drawings are the culmination of all previous engineering tasks. The design detailed in the Construction Drawings deliverable document must use information gained from the other required deliverable documents, as well as all City Light and NESC standards.

Non-Ionizing Electromagnetic Radiation (NIER) Report

NIER reports are necessary to ensure that both public and occupational safety concerns are addressed, and that no one will unknowingly be exposed to radiation beyond the FCC’s Maximum Permissible Exposure (MPE) due to the installation of the wireless facilities.

When required: A NIER Report specifying each antenna location is required, with consideration for proximity to surrounding buildings, windows, balconies, and other human-accessible areas.

Deliverable: Applicant must submit a NIER Report as a signed document that includes a WA State PE stamp. The report must clearly demonstrate that the general public is safe from potentially dangerous radiation exposure both horizontally and vertically from the wireless antennas as defined by the FCC. The report will list the calculated Maximum Power Density vs. the MPE limits for both the uncontrolled (general) and controlled (occupational) population based on the specifications and elevations of the proposed equipment to be installed on the pole.

Resources: NIER reports are the responsibility of the Applicant to produce.

Right-of-Way (ROW) Permits

ROW permits are necessary for construction, maintenance, and alterations on City Light infrastructure in the ROW.

When required: Each jurisdiction in the greater Seattle area has its own ROW permit process, requirements, and application form. The wireless Applicant must adhere to the rules of the jurisdiction(s) in which they wish to install equipment. The applications are generally on a per-pole basis, unless work is occurring on adjacent poles.

Deliverable: Submit a copy of all necessary ROW permit documents to the City Light Vendor for a completeness review. The ROW permit shall be filed under the name and related information

Permit Application Phase – Engineering for Wood Poles

of the Applicant, including an appropriate contact. The City Light Vendor will then work with the relevant ROW jurisdiction to obtain the required permits on the Applicant's behalf. Prior to proceeding to the construction phase the City Light Vendor shall submit a copy of the approved ROW permit to Alden One.

Resources: To access permit forms, go to the online permit page for these cities:

- Seattle Department of Transportation (SDOT) – for permits within Seattle city limits
- Shoreline
- Lake Forest Park
- Burien
- King County
- Normandy Park
- Renton
- SeaTac
- Tukwila

Performance Bond

When required: A bond is required for every wireless node.

Deliverable: Applicant must provide a Payment and Performance Bond of \$1000.00 for each site within 35 days of receiving the executed license. The Bond will reference the City Light pole number and the Applicant's identifying information. Construction will not commence on a site until the Bond is received.

Resources: Performance Bonds are the responsibility of the Applicant to produce.

Signed License

When required: A license is required for every wireless node.

Deliverable: Applicant must provide a signed license agreement specific to the Applicant, substantially in the form of the City's Wireless Communications Site Agreement. Upon approval of the application, an executed agreement with a City Light Asset ID will be provided.

Resources: A template will be accessible through Alden One.

Engineering for Metal Poles

The tasks and their associated deliverables required to engineer a metal pole for co-location wireless facilities are listed below. Instructions regarding each task are detailed on subsequent pages.

All document deliverables submitted for each task must be in PDF form, unless specified otherwise.

Name all files using the Alden One conversation number followed by the deliverable name, formatted as follows:

Conversation#_DeliverableName.pdf

- Use an underscore for any spaces within the filename.
- Name and submit files individually for each required deliverable.
- If there are multiple files for the same deliverable, combine them into a single PDF.

Examples: 123456_SewerCard.pdf

123456_LocatePhotos.pdf

Checklist of Deliverables

- Overlapping Work Check
- Calibrated Photos (IKE GPS)
- Infrastructure Integrity Report
- Sewer Card
- Environmental Review
- Soil Map
- Voltage Drop
- Fault Current
- Non-Ionizing Electromagnetic Radiation (NIER) Report
- Construction Drawings
- Right-of-Way (ROW) Permits
- Performance Bond
- Signed License

Overlapping Work Check

Overlapping work involves work done by another party that may affect an Applicant's clearances and change the body of work. Similarly, a portion of the Applicant's scope of work may already have been completed by another party and thus should be removed from the Applicant's scope.

When required: Overlapping work is required for any collocate replacements.

Deliverable: A copy of the site plan showing any overlapping work must be submitted for review. It is the responsibility of the Applicant to identify any overlapping work from other parties and coordinate construction.

Resources: Applicant must manage overlapping work by communicating directly with SDOT or the relevant ROW jurisdiction.

Calibrated Photos (IKE GPS)

The purpose of the task is to identify clearances and all required make ready work (MRW). In addition, calibrated photos provide a visual reference of existing conditions prior to equipment installations and pole replacement.

When required: This task is required for every pole that is worked on.

Deliverable: Applicant must provide pole measurements and photos using an IKE 4 device. Five high definition photos shall be labeled with date of capture, conversation number, and 7-digit pole tag, combined and submitted as a single PDF. The PDF must contain the following information, arranged in the order shown:

- 1 pole tag photo showing all pole tags
- 1 ground photo that shows surrounding curbs and potential restrictions to pole replacements
- 2 full pole "true size" photos that have all existing equipment visible with heights clearly identified using the IKE Office application.
 - The two photos must be taken at different angles 90° apart.
 - The photos must be taken with a 10' measuring stick placed against the street side of the pole to confirm ground height and scale.
 - The pole itself must take up greater than 2/3 of the full-page photo.
- 1 graphic representation of proposed equipment created from a copy of one of the previous two photos, and marked with all proposed equipment heights.

Resources: To access the devices, software, and information required for this task, go to www.IKEGPS.com.

Infrastructure Integrity Report

An infrastructure integrity report details existing conduits, handholes, and conductors that correlate with the new collocated pole from the source to the pole. If any parts of the system do not meet City Light standards, the Applicant must update the system to meet the requirements detailed in City Light standards 0095.60, 1716.07, and 1714.50.

Permit Application Phase – Engineering for Metal Poles

When required: An infrastructure integrity report is required for every proposed metal collocate pole. This will aid in designing a robust and reliable path for power to the collocates and improve the longevity of the system, preventing future failures from occurring due to aging infrastructure.

Deliverable: Applicant must conduct a field visit and submit a report detailing the condition and type of each handhole, conduit, and conductors from the proposed co-locate pole to its source of power. Coordination with City Light crews is required to gain access to vaults and handholes.

Resources: Contact the City Light Vendor to coordinate with City Light crews. Refer to City Light standards 0095.60, 1716.07, and 1714.50 for detailed system requirements.

Sewer Card

Sewer cards are digitized drawing records of sewer lines within the City of Seattle.

When required: All pole locations within the City of Seattle require a sewer card any time ground disturbance will occur. For pole locations in jurisdictions outside the City of Seattle, a sewer card is not required.

Deliverable: Identify the correct card(s) for the location, make a copy of the front of the card, and mark it up to show the pole location. Label the conversation number, pole tag, and node numbers on the picture(s).

Resources: To locate the sewer card, access the Seattle Department of Construction and Inspection (SDCI) site online.

Environmental Review

An environmental review is used to identify potential environmental hazards in a work area. The review also includes any work safety requirements, best management practices, and pertinent contact information for construction crews.

When required: An environmental review is required for every ground disturbance.

Deliverable: Applicant must provide either:

- A screenshot of City Light’s environmental map that shows no issues with the selected pole(s), or
- An Environmental Report produced by City Light’s Environmental Department

Resources: To determine if the pole replacement is located within an area of environmental concern, use the City Light Environmental Explorer, which is an internal environmental review site accessible through the City Light Vendor. Areas of environmental concern include any poles that are:

- Located within a 300' radius from a “confirmed and suspected contaminated site” (marked with a yellow star)
- Located within a 300' radius from a “leaking underground storage tank” (marked with a blue star)
- Marked as site of a previous bird death

Permit Application Phase – Engineering for Metal Poles

- Within any colored, boxed, or circled areas
- Within 200' of a water source
- Located on a steep slope

If one or more of the above criteria applies, City Light's Environmental Department must review the proposed ground disturbance. When the City Light Environmental Report is completed, ensure that the engineering packet incorporates the requirements of the provided Report when submitted.

Exception: For avian sensitive areas (marked green), Applicants are not required to submit an environmental report.

Soil Map

Soil maps are used to classify soil types and other soil properties in a given area.

When required: Soil maps are required for every new or replacement utility metal pole.

Deliverable: Applicant must submit a copy of the quarter section page of the relevant soil map with the pole area circled and labeled with the conversation number, pole tag, and node number.

Resources: Refer to the Soil Map Book, available through the City Light Vendor or Alden One.

Voltage Drop

Voltage drop calculations are used to determine the correct wire sizing and verify that the provided service voltage does not drop below 3% of the expected voltage for any service.

When required: The voltage drop calculation is required for wire sizing, especially when replacing service cables and wire, and when installing new service.

Deliverable: Applicant must provide a detailed calculation or report clearly showing that voltage drop does not exceed 3% for any service affected by the work performed for the wireless installation.

Resources: Voltage drop calculations are the responsibility of the Applicant to produce.

Fault Current

Fault current is an important parameter necessary to ensure that properly rated equipment is installed. The fault current calculation is represented in a detailed report showing potential current available at the point of service during a fault condition. For metal poles, the point of service is the fuse located in the handhole. City Light uses this information to create a Fault Current Letter for use in obtaining Electrical Inspection signoff from the relevant jurisdiction.

When required: A fault current calculation is required for every requested electrical service installation.

Deliverable: Applicant must submit a fault current calculation that shows maximum fault current and the parameters used to calculate it.

Resources: To calculate fault current, use the fault current calculation tool available through the City Light Vendor or Alden One.

Construction Drawings and Pole Design

Construction drawings guide crews through the construction phase, while also serving as an official record of work completed and equipment installed.

When required: Construction drawings are required for all work performed on City Light poles or equipment, including the installation and energization of wireless equipment and antennas.

The drawings must show the design of the proposed installation and include all work necessary to bring the site up to both City Light and NESC standards.

Pole design requirements will vary according to the pole location in the City Light service territory.

Deliverable: Applicant must provide copies of all construction drawings for the installation of their equipment, stamped by a Professional Engineer (PE) licensed in the State of Washington.

Construction drawings must be 11" x 17" paper size with a stamp, project name, Alden One conversation number, and 7-digit pole tag(s) noted on each page. All construction drawing files must be combined into a single PDF document which includes at a minimum:

- Site location
- Existing and proposed pole elevation
- Node ID and radio frequency (RF) caution signage
- All equipment specification and installation notes
- Wiring schematic
- Fusing schedule
- Luminaire schedule
- Grounding details
- City Light streetlight general notes
- Pole type, address, and jurisdiction
- Material list
- Design which meets the Design Guidelines of the jurisdiction
- Pole design:
 - Pole section details
 - Foundation details including soil conditions
 - Festoon details
- Load calculations:
 - Electrical load
 - Structural load
- CADD generated site plan including:
 - Title block with job name
 - Associated wireless node number and address of the location
 - Stamp and signature by a WA State professional engineer (PE)
 - 1:20 scale

Permit Application Phase – Engineering for Metal Poles

- Verbiage for the installation of antennas and wireless equipment
- Other utilities and vegetation
- Service point and handhole and conduits both existing and proposed, labeled
- Areaways, if applicable (if areaways are present, structural designs are also required)
- Any relevant standards called out
- All work necessary to bring the site up to both City Light and NESC standards

Resources: Construction Drawings are the culmination of all previous engineering tasks. The Construction Drawings must use information gained from the other required deliverable documents, as well as all City Light and NESC standards.

For CADD site plan documents, use the Enhanced Network Map Viewer and CurrentView maps, which are available through the City Light Vendor. Call 811 to determine location of other utilities.

Non-Ionizing Electromagnetic Radiation (NIER) Report

NIER reports are necessary to ensure that both public and occupational safety concerns are addressed, and that no one will unknowingly be exposed to radiation beyond the FCC's Maximum Permissible Exposure (MPE) due to the installation of the wireless facilities.

When required: One NIER Report per antenna location is required, with consideration for proximity to surrounding buildings, windows, balconies, and other human-accessible areas.

Deliverable: Applicant must submit a NIER Report as a signed document that includes a WA State PE stamp. The report must clearly demonstrate that the general public is safe from potentially dangerous radiation exposure both horizontally and vertically from the wireless antennas as defined by the FCC. The report will list the calculated Maximum Power Density vs. the MPE limits for both the uncontrolled (general) and controlled (occupational) population based on the specifications and elevations of the proposed equipment to be installed on the pole.

Resources: NIER reports are the responsibility of the Applicant to produce.

Right-of-Way (ROW) Permits

ROW permits are necessary for construction, maintenance, and alterations on City Light infrastructure in the ROW.

When required: Each jurisdiction in the greater Seattle area has its own ROW permit process, requirements, and application form. The wireless Applicant must adhere to the rules of the jurisdiction(s) in which they wish to install equipment. The applications are generally on a per-pole basis, unless work is occurring on adjacent poles.

Deliverable: Submit a copy of all necessary ROW permit documents to the City Light Vendor for a completeness review. The ROW permit shall be filed under the name and related information of the Applicant, including an appropriate contact. The City Light Vendor will then work with the relevant ROW jurisdiction to obtain the required permits on the Applicant's behalf. Prior to proceeding to the construction phase the City Light Vendor shall submit a copy of the approved ROW permit to Alden One.

Permit Application Phase – Engineering for Metal Poles

Resources: To access permit forms, go to the online permit page for these cities:

- Seattle Department of Transportation (SDOT) – for permits within Seattle city limits
- Shoreline
- Lake Forest Park
- Burien
- King County
- Normandy Park
- Renton
- SeaTac
- Tukwila

Performance Bond

When required: A bond is required for every wireless node.

Deliverable: Applicant must provide a Payment and Performance Bond of \$1000.00 for each site within 35 days of receiving the executed license. The Bond will reference the City Light pole number and the Applicant’s identifying information. Construction will not commence on a site until the Bond is received.

Resources: Performance Bonds are the responsibility of the Applicant to produce.

Signed License

When required: A license is required for every wireless node.

Deliverable: Applicant must provide a signed license agreement specific to the Applicant, substantially in the form of the City’s Wireless Communications Site Agreement. Upon approval of the application, an executed agreement with a City Light Asset ID will be provided.

Resources: A template will be accessible through Alden One.

Construction Phase

The construction phase involves all activities required to ensure that material, construction, installation, and final inspections meet or exceed City Light requirements. During this phase, active communication and coordination between the Applicant's contractors and City Light is crucial.

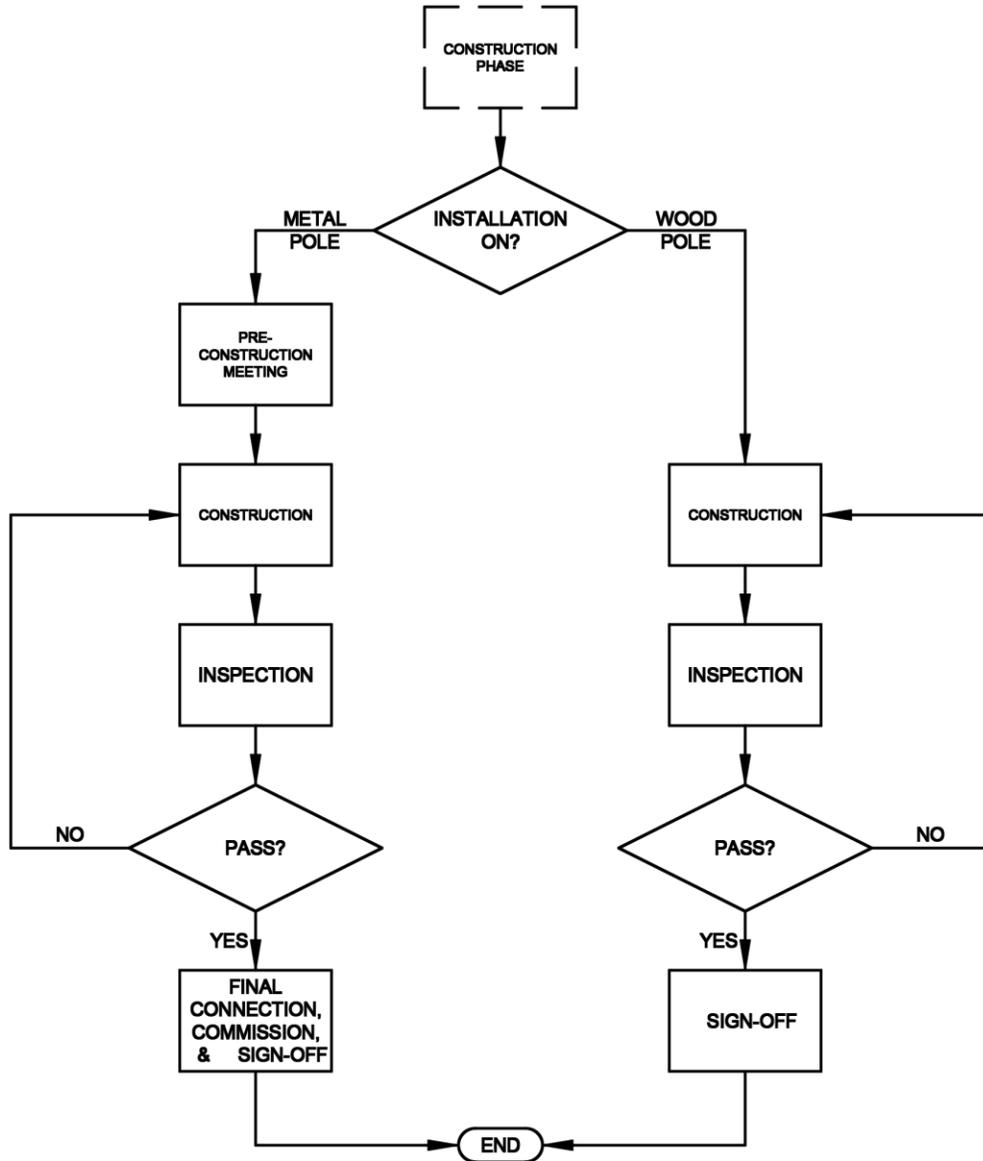
All pole attachments must adhere to the requirements for design and engineering approved by City Light, and any changes must be pre-approved by City Light. Otherwise, penalties may apply.

The following section is organized according to the type of attachment requested:

- Construction for Wood Poles
- Construction for Metal Poles

Construction Phase Flow Chart

CONSTRUCTION PHASE



Construction for Wood Poles

The following section describes the activities, materials, responsibilities, and final inspection required to complete the construction phase for attaching small wireless facilities to wood poles.

Make Ready Work (MRW)

City Light will work with the Applicant to coordinate construction of all wireless installations. The construction and installation of all facilities at or above the power space will be completed by City Light-directed crews and/or contractors. This includes all work submitted in the application engineering documents, including but not limited to:

- Pole replacements
- Transformer relocations or replacements
- Conductor upgrades or installations
- Any necessary system modifications or upgrades
- Anchor and guy replacement or installations
- Handhole installations and UG cable intercepts

Limited work may be performed by the Applicant or Applicant's contractor(s). This includes:

- Installation of the equipment cabinet in the communication space
- Conduit from the enclosure up to (but not above) the utility power space
- The associated coaxial cable and/or NEC-governed coaxial cable and/or NEC-governed electrical connections in the communication space

Materials

City Light will be responsible for procuring all construction materials normally used by City Light for construction.

The Applicant will be responsible for supplying and having ready all antennas, brackets, cables, bolts, and other hardware specifically required for the antenna installation prior to start of construction.

City Light construction crews will coordinate with the Applicant to have all material on site on the scheduled day of construction.

Post-Construction Inspection

Once construction is completed, a final inspection by City Light will be performed. This inspection will cover not only the MRW construction, but the installation of the wireless equipment on the pole. This inspection ensures that:

- City Light construction practices were adhered to
- The installation is clean and meets City Light requirements

Major installation items which are the responsibility of the Applicant that will be checked during the post-construction inspection include:

Construction Phase – Wood Poles

- Conduit and equipment cabinet are installed on correct side of pole
- Conduit has 4-1/2" min. clearance from pole face
- All exposed through-bolt threads are cut to 3/4" or less
- Ground rods do not extend above grade
- Ground is installed on correct quarter of pole
- Cabling is clean and includes no unnecessarily long or looped cabling
- All equipment is painted to match pole
- All equipment is properly grounded
- Equipment is installed on pole per construction drawings

Final Sign-Off

Once the City Light Engineer has determined that any concerns noted during the final inspection have been corrected and any go-backs have been completed, an acceptance document will be signed by both the Applicant and the City Light Engineer.

Construction for Metal Poles

The following section describes the stages of construction involved in attaching communications devices to metal poles.

All Applicants must adhere to the requirements included in the documents listed below:

City of Seattle Standard Specifications for Road, Bridge, and Municipal Construction:
<http://www.seattle.gov/utilities/construction-and-development/standard-specs-plans>

City of Seattle Standard Plans:
<https://www.seattle.gov/utilities/construction-and-development/standard-specs-plans>

Streets Illustrated: <https://streetsillustrated.seattle.gov/>

City Light Construction Standards: <http://www.seattle.gov/light/engineerstd/>

Pre-Construction Meeting

Prior to any construction, the Applicant must coordinate with City Light and schedule a pre-construction (“pre-con”) meeting. The purpose of the pre-con is to review the preliminary critical path schedule indicating major work activities including the order and duration of work activities, milestones, and time frames.

The Applicant’s Contractor must prepare and submit a preliminary critical path schedule at the pre-construction conference.

Materials

The Applicant and/or Applicant Contractor will be responsible for procuring all construction materials other than Chief Seattle base and collar.

The Applicant must purchase the base and collar from City Light, and must coordinate pick up from City Light facilities through City Light.

All materials must conform to City Light material standards and be procured from approved City Light suppliers.

Inspection

The Applicant must call for an inspection of the streetlight system at various stages of construction, or as instructed by the inspector. The purpose of the electrical inspector is to make sure that work and material adheres to the latest City Light standards.

Inspection will include, but is not limited to:

- Streetlight handholes
- Open trench
- Conduits
- Foundations

Construction Phase – Metal Poles

- Testing grounds
- Punch list review
- Final inspections

Upon completion of the construction phase, the electrical inspector shall do a final inspection and thereafter submit an inspection report to the City Light Engineer. The Applicant must submit as-built plans, including streetlight handholes, conduits, and location of the co-location pole, prior to the final inspection.

Engineering Final Inspection

The City Light Engineer will schedule for an inspection after receiving the final inspection report from the Electrical Reviewer.

The Applicant will assist the Engineer during the inspection and such assistance will include, but not be limited to:

- Opening handholes
- Verifying conduit runs
- Inspecting wiring and fusing of the streetlight system
- Verifying that orientation of wireless facilities on the streetlight pole are per City Light standards

Commissioning

All co-location projects must undergo commissioning to ensure proper operations and installation of the system. During this phase, different items will be tested including:

- Applicant control operations
- Streetlight system operations
- Light verification, power quality
- System stress testing
- Load consumption verification

Any items that are found to not have been constructed per City Light standards must be identified and corrected prior to the final connection.

Final Sign-Off

Once the City Light Engineer has determined that any concerns noted during the final inspection have been corrected and any punch list items have been completed, an acceptance document will be signed by both the Applicant and the City Light Engineer. Upon final sign-off, the system will therefore be accepted by City Light and final connection will occur.

Final Connection

Applicant must coordinate with the City Light Engineer for final connections of the co-location system after the City Light Engineer has received approved as-built drawings from the Applicant.

Appendix A

Application Fee

This fee is required for each application submitted.

Application Fee Amount \$800

Fine and Penalty Table

All fines and penalties will be billed per occurrence, per pole, per day, from the date of discovery to the date of verified remedy.

Waiver of fines or penalties will not be considered. The authority to imposed fines and penalties can be found in SMC Title 15 and Title 21.

All safety codes are the minimum required and will be strictly enforced.

Type of Violation	Amount
Safety Code (NESC/WAC/OSHA/WISHA)	\$500
Unauthorized Attachment	\$500
Standard and Construction Compliance	\$250
Failure to Call Job Start	\$250
Failure to Call Job Complete	\$250
Housekeeping or Workmanship	\$100
Failure to Attach Owner Tags or Warning Placards	\$100

Appendix B

Comparison Checklist – Wood and Metal Poles

Wood pole engineering and metal pole engineering require different deliverables. Refer to the appropriate column of the checklist to verify the required deliverables for each situation.

The checklist will be used to verify that all required application deliverables have been completed and submitted. This checklist is also available in Alden One.

Deliverable	Required for Wood Poles	Required for Metal Poles
Transformer Load Analysis (TLA) Report	✓	
Asset Detail Report	✓	
Overlapping Work Check	✓	✓
Calibrated Photos (IKE GPS)	✓	✓
Field Notes	✓	
Infrastructure Integrity Report	✓	✓
Locate Photos	✓	
Tree Trimming Request	✓	
Pole Loading Analysis	✓	
Sewer Card	✓	✓
Environmental Review	✓	✓
Soil Map	✓	✓
Voltage Drop	✓	✓
Fault Current	✓	✓
Third-Party Coordination Check	✓	
Construction Drawings	✓	✓
Non-Ionizing Electromagnetic Radiation (NIER) Reports	✓	✓
Right-of-Way (ROW) Permits	✓	✓
Performance Bond	✓	✓
Signed License	✓	✓

Glossary

Advanced Grid Analytics (AGA): Landis & Gyr's platform for tracking and managing City Light's transformer and meter data using smart meters.

Alden One: Asset management and communication platform that specializes in facilitating Joint Use coordination.

Alden One Conversation: Dialogue regarding a Joint Use asset. Used as a structure for application submittal.

Applicant: The entity that is applying to lease space on City Light's infrastructure.

Applicant Contractor: The construction crew that is installing the Applicant's equipment.

Application Approved: The application passes the review process and progresses to the next stage.

Application Denied: The application fails the review for either having a design that is inaccurate and/or not to standard, or the pole is determined to be ineligible.

Application Incomplete: The application submitted does not follow City Light criteria or has omitted required documents.

Asset Detail Report: A City Light report that lists pole specifications, associated attachments, and other details.

CADD: Computer Aided Design and Drafting. City Light uses AutoCAD to produce construction drawings but will not restrict the Applicant in their choice of software.

City Light Vendor: External engineering firm hired to assist City Light in processing and reviewing applications.

Clearance: Required spacing between different attachments, wires, or other structures.

Co-locate: The attachment by a third party on SCL utility infrastructure for the purpose of providing telecommunications services.

Co-owner: Many poles in City Light's territory are owned by multiple parties. Joint ownership may be with CenturyLink, King County Metro, and/or Frontier Communications.

CurrentView: City Light's internal GIS for all distribution equipment.

Final Signoff: Upon completion of the project, City Light will notify the Applicant that the installed site passes all reviews.

IKE GPS: Device used to capture photos and measure heights.

Make Ready Work (MRW): Utility work that must be completed by City Light in preparation of a communication attachment.

National Electric Code (NEC): The NEC is the governing standard for customer wiring. The meter or service connection point is the transition between the NEC and the NESC.

Glossary

National Electric Safety Code (NESC): The NESC is the governing safety code for electric power and communication utility systems. The meter or service connection point is the transition between the NEC and the NESC.

Node: Small wireless facility ID.

Overlapping Work: Separate jobs or work orders that address the same work zone. Includes MRW and new attachments as well as City Light utility work.

Pole Eligible: From a preliminary viewpoint, the pole has the potential to support a small wireless facility. After the engineer fields the site, additional issues could be identified that make it not viable.

Pole Ineligible: The site is incapable of supporting a new small wireless facility.

Pole Loading: All stresses on a pole. Determined from pole size and equipment specifications.

Pole Transfer: The movement of equipment from an old pole to a new pole.

Punch List/Go Backs: Corrections that are identified during the construction inspection. Must be completed before Final Signoff.

Sewer Card: Digitized records of sewer lines within the City of Seattle.

SpidaCalc: Pole loading software used by City Light Joint Use to determine tensions, strains, and structural integrity of utility poles. Applicant will not be restricted to SpidaCalc in their choice of software to perform these calculations.

True Size Photos: Photos taken by an IKE device that uses a rangefinder to determine pole heights.