

VILLAGE OF EPHRAIM

FOUNDED 1853



Capital Projects Ad-Hoc Committee Meeting Agenda

Wednesday, July 13, 2022 - 8:30 AM

9996 Water Street

NOTE: THIS MEETING WILL BE SIMULTANEOUSLY HELD VIA TELECONFERENCING. STAFF, COMMITTEE MEMBERS AND THE PUBLIC ARE WELCOME TO PARTICIPATE IN THIS MANNER. TELECONFERENCING WILL BE AVAILABLE BY COMPUTER, PHONE, TABLET, OR DIAL IN. CONNECTION INFORMATION BELOW:

1. Call to Order
2. Quorum
3. Approval of previous minutes
4. Changes in Agenda
5. Visitors' Comments
6. Discussion regarding Anderson Dock project
7. Discussion regarding North End Path and Lighting
8. Discussion regarding Admin/Fire Dept/Maintenance Buildings
9. Discussion regarding future meeting dates
10. Adjournment

Please join my meeting from your computer, tablet or smartphone.

<https://meet.goto.com/761243285>

You can also dial in using your phone.

United States: [+1 \(571\) 317-3112](tel:+15713173112)

Access Code: 761-243-285

****Deviation from listed order may occur****

There may be a quorum of the Village Board or another Village Committee present; no action will be taken by any committee other than the one listed on the agenda. Please note, that upon reasonable notice, efforts will be made to accommodate the needs of disabled individuals through appropriate aids and services. For additional information please contact Andrea Collak, Clerk Village of Ephraim, PO Box 138, Ephraim, WI 54211

<hr/> Andrea Collak, Clerk	Date: <u>7/12/2022</u>
	<input checked="" type="checkbox"/> Village Administrative Office
	<input checked="" type="checkbox"/> Visitors' Center
	<input checked="" type="checkbox"/> Post Office
<hr/> Kim Roberts, Deputy Clerk	<input checked="" type="checkbox"/> Website www.ephraim-wisconsin.com
	<input checked="" type="checkbox"/> Emailed to WDOR Radio
	<input checked="" type="checkbox"/> Emailed to Peninsula Pulse

**VILLAGE OF EPHRAIM
CAPITAL PROJECTS AD-HOC COMMITTEE MEETING MINUTES
WEDNESDAY, JUNE 15TH, 2022 – 8:30 AM
9996 WATER STREET**



ACTION ITEMS:

Bridenhagen moved, C. Pearson seconded to approve the minutes of May 4th, 2022, all ayes.
Motion carried.

Meacham moved to adjourn, Bridenhagen seconded, all ayes. Motion carried.

Present: Ken Nelson-Chair, Matt Meacham, Maggie Peterman, Fred Bridenhagen, and Chuck Pearson.

Absent: Dick Christensen (non-voting member).

Staff: Brent Bristol- Village Administrator and Kim Roberts- Deputy Clerk.

Guests: Caroll Schalla.

1. **Call to Order:** The meeting was called to order by K. Nelson at 8:30 AM.
2. **Quorum:** A quorum of the Capital Projects Ad-Hoc Committee was present.
3. **Approval of previous minutes:**
Bridenhagen moved, C. Pearson seconded to approve the minutes of May 4th, 2022, all ayes.
Motion carried.
4. **Changes to the agenda:** There were no changes to the agenda.
5. **Visitors' Comments:** There were none.
6. **Discussion regarding the Anderson Dock project:**
K. Nelson noted that there was no additional information available yet from consultants. He asked that committee members be flexible to meet as the information that they have been waiting for becomes available. He added that the goal was to get reports to the Village Board in two (2) months for the August Village Board meeting.
7. **Discussion regarding Administration Building and the Fire Station :**
K. Nelson noted that they were still waiting on reports from Keller.
All agreed Bristol should reach out to consultants, aside from Laib, to set June 30th as a hard deadline. Laib would fit in the assessment as available.
8. **Discussion regarding on-site discussion from the last meeting of Physical Facilities:**
K. Nelson asked the Committee for their thoughts after the field visit to Physical Facilities.
A discussion was held about space and organizational needs, the use of the pole building as it was designed, and functional layout requirements for current equipment.
The consensus of the Committee was to determine if Keller had adequate square footage for operations with the current fleet for light maintenance and different activities. If Keller built in the criteria for operations, Keller could proceed to the next step with a cost estimate. It was agreed that the pole building should be left as cold storage, but look at alternate solutions for storage and address if concrete or asphalt needs to be laid to store salt and sand. Bridenhagen felt it was one of the most important projects that the committee was working on.
9. **Discussion of future meeting dates:**
A future meeting date is pending the delivery of reports from consultants.

10. Onsite walk-thru of Anderson Dock Facility. Group will adjourn, leave the Village Hall and meet at Anderson Dock at approximately 9:30 AM:

The meeting was adjourned to conduct a walking session. The purpose of the onsite portion of this meeting is to see the buildings mentioned firsthand as it relates to the facility problems/issues established by department heads. It is a discussion-only topic that will facilitate conversation of future capital improvements at subsequent meetings of the Capital Projects Committee.

11. Adjournment:

Meacham moved to adjourn, Bridenhagen seconded, all ayes. Motion carried.

*Recorded by,
Kim Roberts – Deputy Clerk*

DRAFT

ES Olsson Construction
9901 Hwy 57
Baileys Harbor, WI 54202
esolssonconstruction@gmail.com
920.559.9666

Anderson Dock Lift & Restoration Quote
6/24/2022

- Lift Building Prep - \$8,400
 - Remove lower two feet exterior siding and interior with careful consideration and labeling for reinstallation
 - *Assuming the lift company will prep openings for lift.
 - Electrician & Plumbing Disconnection Prep - \$1,600
- Company lifts building with ESO on site
- Concrete Company to remove existing foundation wall and pour new foundation wall with engineered anchors
- Prepare building to reset
- Set Building on new foundation wall - cut bottom plate to match existing, reinstall double plates at anchor points - \$8,400
- Reinstall siding and doors on N, E and W walls - \$8,400
- Concrete
 - Pour foundation and slab - ESO to confirm who is taking care of this
 - Install handicap ramps as needed
- Exterior Rooms
 - Two bathrooms - \$4,000
 - Shower - \$5,000
 - Mechanical Room - \$2,000
 - Salvage all doors and reinstall
 - Exterior Spigots disconnected by plumber during prep
 - New thresholds installed and refit rough openings
- South Wall
 - Reinstall south door and reside south wall
 - Siding is salvaged
 - \$28,560
 - Materials from Lamperts - \$17,519.67
 - ½"x6" lap vertical grain - 1100 sq ft
 - 4 - 16' 1"x10" boards
 - 4 - 5 ¼"x10" boards
- Foundation
 - Solid wall 16" or less - Done by Martel?
 - 8" foundation wall?
 - Slab done by Martel
- Engineering Fee - \$800

- Labor Total - \$67,160
- 36 DAYS MILEAGE @ \$50 - \$1,800
- Subtotal - \$86,479.67
- 10% Contractor Fee - \$8,647.97
- Total Estimate NOT INCLUDING concrete or lift - \$95,127.64

Clarifications

- Main dock concrete is not ESO responsibility.

Questions

- Where can we store the siding removed during lift? Any drive time will be billable for transportation of the siding and materials to Ephraim provided storage.

Village of Ephraim, Wi.
Anderson Warehouse, Hardy Gallery

Terry Laib
July 5, 2022

Existing condition report, assessment, recommendations



July 5, 2022
Brent Bristol
Ephraim Village Administrator
P.O. 138
Ephraim, Wi. 54211

Anderson Warehouse, Francis Hardy Gallery

Assessment and recommendations:

Building history: The original Anderson Warehouse was built in 1858, completely rebuilt in 1880 per referenced Door County Advocate , September 16, 1880.

Repaired extensively in spring 1933 by F Hogenson .D.C.A March 31, 1933.

On April 2, 1948 D.C.A. ..." the dock was piled with ice to the gable of the warehouse. Piling supporting the outer portion of the dock is a mass of wreckage and part of the building was crushed in."

In September of 1949 repairs begun by Olson "who drove creosoted pilings completely around the dock and infilled with rock then blacktopped." D.C.A. August 9,1949.

No mention is made of the warehouse in this project so the infill under the building is still unknown.

Another ice shove sometime in the 2000's occurred but no record has yet been found in newspaper articles.

Recent high water with high winds have flooded the gallery and caused plumbing vents to overflow, backing up and filling the gallery floor.

Building envelope:

Roof: The roof frame is post and beam with pole rafters and a mix of pole and dimensioned lumber as collar ties and knee braces. Because the interior is an open vault, original pine sheathing as well as the skip sheathing method required for cedar shingled roofs is visible from within the gallery

This roof is asphalt three tab shingled over new sheathing. One shingle tab missing on the west slope, lower left.

Expected useful service life: 10- 15 years

Walls: 1880's wood frame with full dimension lumber, sheathed exterior in 1" pine and interior with 1X6 pine tongue and groove lumber.

Two areas which were opened reveal a vapor barrier in 15 lb. felt and some TYVEC, Both areas were insulated with fiberglass.

Evidence of replaced ½ X 6 bevel cedar and pine siding throughout the exterior.

Multilight paned windows face north and west facing dormer windows provide the only glazing in the building. Gable windows need wood storms to preserve the old sash.

Entry doors are secured with barn type track hardware.

2.

Dormer side walls are wood shingled in fair condition. The dormer sash need to be puttied, painted, with wood storms applied.

All four corners of the building are 1" to 2" out of plumb, most likely due to the number of times the building has been hammered by ice shoves. Because the corners oppose each other in their various leanings, it seems the warehouse has been twisted by impact, and because they are opposed, the building is not in danger of collapse.

The danger of loss due to high water and ice shoves remains critical.

Foundation: Only a fraction of the foundation is visible outside and in but inspection shows very few vertical cracks with some minor spalling on the outside corners.

The deflections in the relatively new concrete floor, which was poured over an earlier floor, in the gallery are a concern because cause is not known.

Possibly a search of Village records can reveal what others have found with regard to the footings and underpinnings of the foundation.

Recommendations:

The Anderson Dock and Warehouse/Gallery share a common history and problems, that is high water and ice shoves.

Mike Kahr's letter of 2021 suggests three options which buttress the dock from high water and could provide some protection from ice shoves but does not address the problem of the low elevation of the Gallery relative to the lake. With the south concrete deck pitched slightly toward the building, a heavy rain will flood the Gallery floor and back up the floor drains. Images were found showing sandbags lining this south wall in an effort to keep the water out.

Lifting the Anderson Warehouse, while a large undertaking, is the only long term solution to eliminating flooding of the floors.

Research and testing need to be done to determine the integrity of the foundation. This should also answer the question of the deflection in three areas of the Gallery floors.

With bedrock so very near the surface, and with examination of the Anderson Store foundation sitting solidly on bedrock, it is most likely that the 1880 rebuild carried the building load down to bedrock but that does not inform what supports the existing concrete floor.

If the building were lifted, new plumbing lines and floor drains would be elevated to run waste back to shore. Electrical runs would have to be reworked as well.

With the building elevated, the most practical floor system is wood frame, finish floor in wood or tile.

Elevating this building on a poured concrete knee wall affords the opportunity to get much better pitch for water run off of the dock deck away from the building.

Anderson Warehouse / Hardy Gallery

Original structure, 1858

Current structure September 16, 1880 (Door County Advocate)

South, rear view



North, front view



West side



East side



Northeast corner

This is the corner opened on June 21, 2022 in which I found no damage and sound repairs made in the last 40 years .

This corner is leaning toward the west by
1 ½" in 8 feet.

Likely due to the ice shoves of 1933, 1949 and 2000.

The primary electrical enters the building on this corner and connects to the mainland by means of a race way in the concrete slab.



Northeast corner opened

The repair to this corner varies by use of chipboard sheathing and 15 lb. felt and is more recent than the southwest corner.

Original bottom plate is sound as are the visible studs with no decay noted.

The evidence of so much "sistering in" of new studs indicates repairs to stabilize the frame of the building after the ice shove.



Southwest corner opened

This corner has treated plywood sheathing with new shoulder studs alongside original studs.

This repair was done earlier than the one on the northeast corner and using different materials.

Bottom plate is original and shows no decay.



Concrete foundation,
southwest corner

Most of the corners show some loss of
concrete but not more than 2" deep.



Northwest corner

This corner leans north by 1 ½" in 8 feet, likely wracked from the ice shoves.

None of these conditions threatens the structural integrity of the building because the forces are generally opposed to each other, rather the building was stabilized and reframed the best way possible to save the structure.

The original framing is full 2" old growth stock which is much stronger than today's lumber.

The gable windows leak and should have wood framed storm windows to make the openings waterproof and to preserve the 1880 multi light sash



West side

This roof slope is missing one shingle, lower left but appears to be in good condition



Southwest corner

This corner is also out of plumb 1 ½" in 8 feet leaning east. Once again showing that the building suffered a twist from the ice shoves, likely aided by the north-south partition wall running 7' in from the west wall forming the three restrooms and utility closet.

The 1948 newspaper article regarding the April ice shove states a spring wind blew the ice out of the harbor then switched out of the north pushing the ice back on the dock, with ice piled to the roof ridge.



Front elevation showing a gambrel roof line.

This roof style in the 20th century is common in barns with the top slope extended and the bottom slope much steeper.

This design reflects the buildings original planned use as a warehouse with storage of goods at a premium.

Wisconsin Historical Society describes this building style as Astylistic Utilitarian.



East slope, interior

Use of log rafters atop square beams and perlins likely used some material salvaged from the original warehouse although, by studying historic photographs, the 1880 iteration seems much larger than the original.

The dock itself is much wider than the 1858 dock.

The sheathing boards, some 14 " wide , are typical of the 1880. Some later narrow pine boards were likely placed by roofers when the cedar roof was replaced, the roof sheathed to eliminate the skip sheathing requirement of cedar shingles.



Roof / wall detail

Exterior walls are sheathed and sided with 1/2 X 6" bevel wood siding.

Interior gable end walls are wood sheathed from bottom plate to top of the roof ridge adding more critical stability to the frame.



North view, roof frame

With an open span building, lateral support is always an issue which has been addressed with multiple collar ties strapped together with angle ties.



Interior baseboard

The grey section below the board appears to be concrete but in some places it is a painted board.

The thick baseboard has been the access over recent years to run mechanicals and to check on the integrity of the wood framing.



Interior floors are poured concrete

Floor in this south east corner have deflected to the corner.

This same condition occurs on the west wall as well.

These conditions need to be addressed before another floor would be poured over the current one, if that option is chosen.

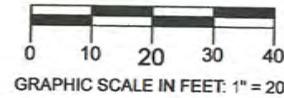
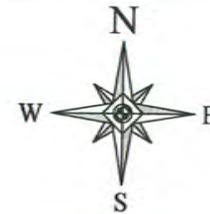
Concrete floor in the gallery is two inches higher than the floors in bathrooms and can be seen at the threshold to the utility/storage room.



Soundings Study

LOCATED IN:

GOV'T LOT 3, SECTION 13, T. 31 N., R. 27 E.,
VILLAGE OF EPHRAIM, DOOR COUNTY, WISCONSIN



PREPARED FOR:

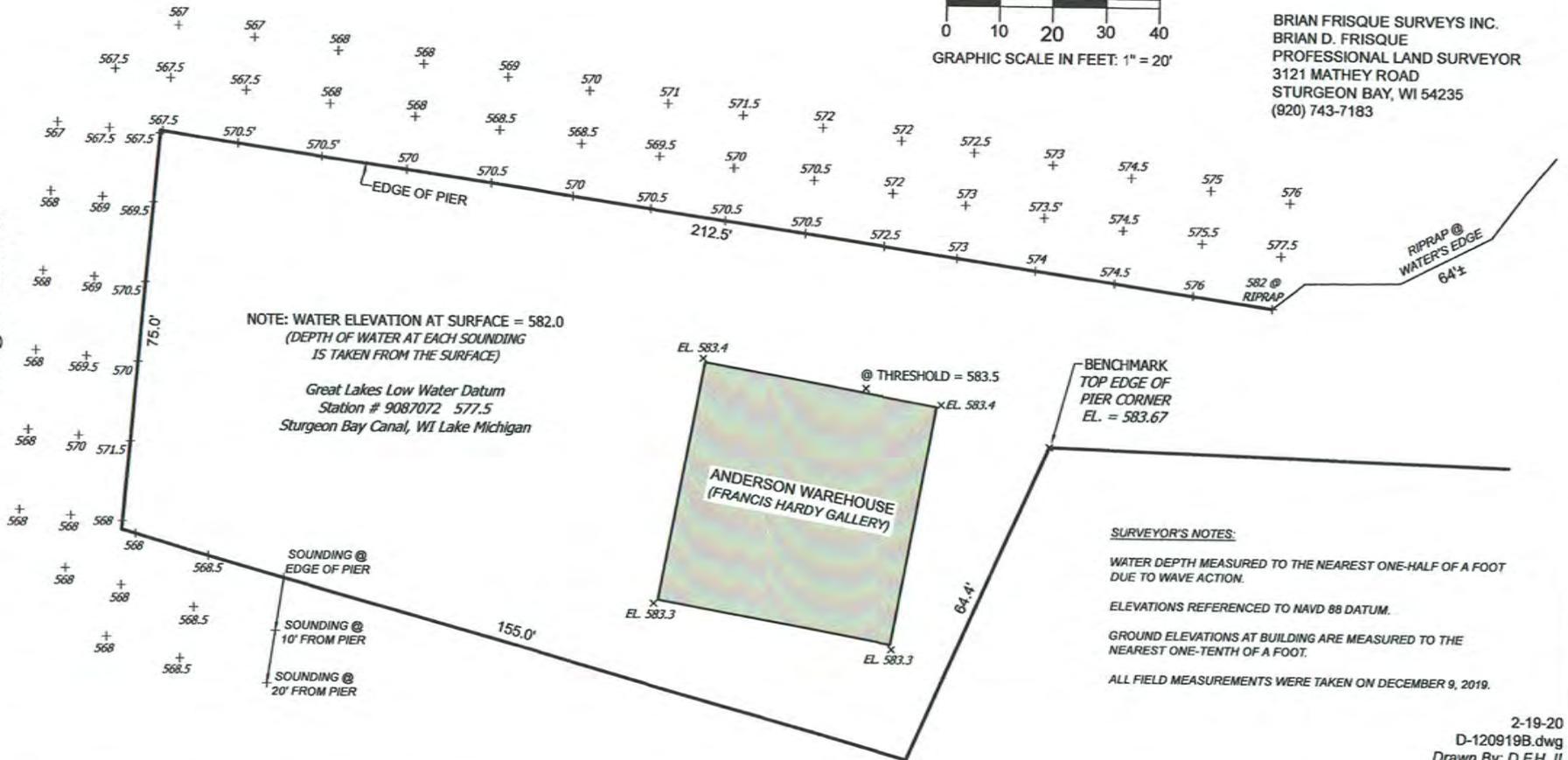
CURRENT OWNER:
VILLAGE OF EPHRAIM
P.O. BOX 138
EPHRAIM, WI 54211

PROPERTY ADDRESS:
3083 ANDERSON LANE

PREPARED BY:

BRIAN FRISQUE SURVEYS INC.
BRIAN D. FRISQUE
PROFESSIONAL LAND SURVEYOR
3121 MATHEY ROAD
STURGEON BAY, WI 54235
(920) 743-7183

Eagle Harbor



SURVEYOR'S NOTES:

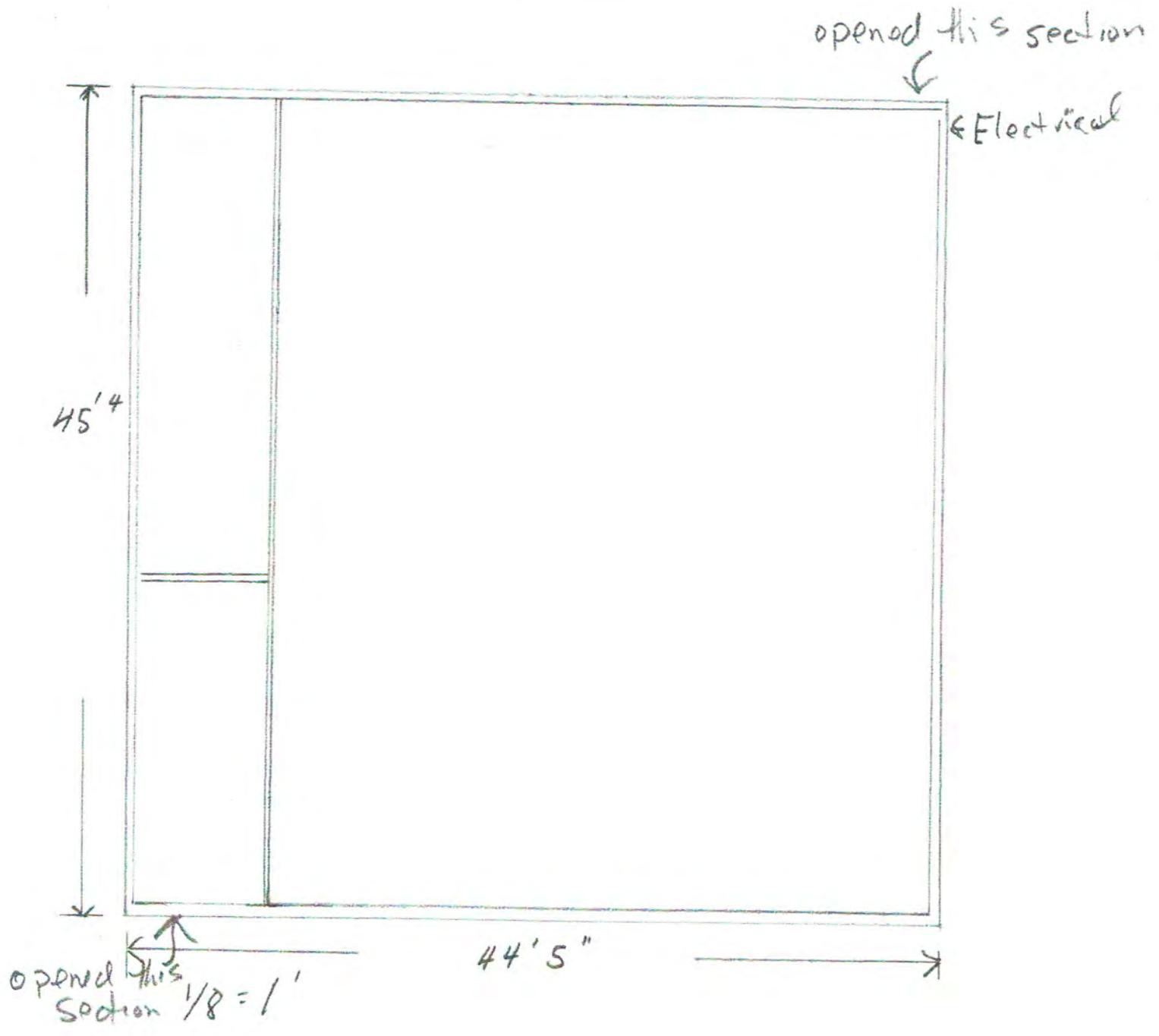
WATER DEPTH MEASURED TO THE NEAREST ONE-HALF OF A FOOT DUE TO WAVE ACTION.

ELEVATIONS REFERENCED TO NAVD 88 DATUM.

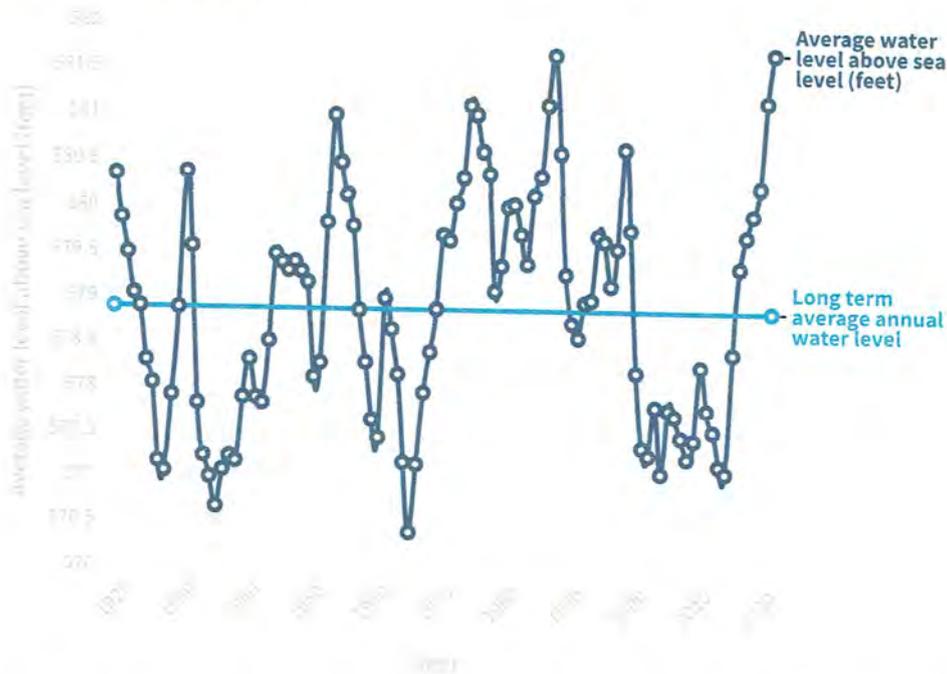
GROUND ELEVATIONS AT BUILDING ARE MEASURED TO THE NEAREST ONE-TENTH OF A FOOT.

ALL FIELD MEASUREMENTS WERE TAKEN ON DECEMBER 9, 2019.

2-19-20
D-120919B.dwg
Drawn By: D.F.H. II
JOB#: D-120919B



Average water level above sea level in Lakes Michigan and Huron, 1918-2020



Source: U.S. Army Corps of Engineers • Graphic by Jack Kelly / Wisconsin Watch • (Water levels in Lakes Michigan and Huron are measured together because the two bodies are connected at the same water level at the Straits of Mackinac.)

Weather primarily drives the ebbs and flows, four scientists who track water levels told Wisconsin Watch. Precipitation boosts water levels, while evaporation — which increases with warmer temperatures — drops them.

The Great Lakes region is warming faster than elsewhere in the contiguous U.S. over the past century, according to [\[https://elpc.org/wp-content/uploads/2020/04/2019-ELPCPublication-Executive-Summary-GLClimateChange.pdf\]](https://elpc.org/wp-content/uploads/2020/04/2019-ELPCPublication-Executive-Summary-GLClimateChange.pdf) a 2019 report [\[https://elpc.org/wp-content/uploads/2020/04/2019-ELPCPublication-Executive-Summary-GLClimateChange.pdf\]](https://elpc.org/wp-content/uploads/2020/04/2019-ELPCPublication-Executive-Summary-GLClimateChange.pdf) by the Environmental Law and Policy Center. That's tending to [cause ice cover to form later in the year](https://www.epa.gov/climate-indicators/great-lakes) [\[https://www.epa.gov/climate-indicators/great-lakes\]](https://www.epa.gov/climate-indicators/great-lakes) and lengthening the season for evaporation. Meanwhile, the region saw much more rain and snow, with more precipitation coming from "unusually large events," like severe storms.

These two factors create an increasingly powerful "tug of war" effect that will likely bring more extreme shifts in lake levels, even on a year-to-year basis, Gronewald said.

"These two forces are opposite each other, and they are gaining strength as the climate changes," Gronewald said.

Intense evaporation from 1998 to 2013 dramatically lowered the lakes, for instance. Waters then rose during the region's subsequent "wettest five to 10-year period in recorded history."

Most models predict that temperatures and precipitation will continue to rise and bring extreme weather, Gronewald said.

Dramatic shifts in water levels on Lakes Michigan and Huron, as a result, will likely become increasingly common — even if average levels stay roughly the same, said Michael Notaro, associate director of University of Wisconsin-Madison's Nelson Institute Center for Climatic Research.

Village of Ephraim
Ephraim North Lighting
Preliminary Design and Analysis
Memo

AECOM



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Background

The Village of Ephraim has requested that AECOM investigate three lighting alternatives for WIS 42 from Orchard to Townline Rd, with the objective of providing three alternative lighting configurations for the Village to choose from. This is a continuation of an effort by the Village of Ephraim to improve the pedestrian safety and walkability of their commercial and tourist district, which sees thousands of tourists per year. AECOM will perform photometric calculations to determine the number of poles required for each configuration, as well as provide cost estimates for materials and construction. This will also include lead times for materials where possible.



Current Conditions

Current conditions consist of a 2-lane rural highway (State Trunk Highway 42) which passes through the Village of Ephraim, Wisconsin. The roadway segment in question is approximately 3/4 mile long, from Orchard to Townline Road, and has several private driveways along the corridor, as well as full tree cover on both sides of the roadway. There are currently no pedestrian facilities, safety lighting, or continuous lighting of any kind within the project limits. While some properties have private lighting installed adjacent to the roadway, this lighting is not adequate to provide safe walking conditions at night.



Future Conditions

Future conditions will either consist of a widened shoulder or a full shared-use path, which will be lit by this project. If a shoulder is chosen, it will consist of an 8ft wide shoulder, to which the lighting will be offset an additional 4ft. Should a full shared-use path be chosen, it will consist of a 3ft buffer between the roadway and a 10ft dedicated pedestrian and cycle pathway. Lighting for this would be offset by 2ft, as it is already further from the vehicle traveled way.

Design Assumptions

Lighting system will potentially be installed before the shared use path or widened shoulder. Goal is to enable the construction of said path after the lighting so adequate spacing must be left to ensure it's constructible in the future without relocating proposed poles.

Goal is to provide 3 alternatives for the client. One that matches the existing lighting projects done elsewhere within the village, one that utilizes a 22ft pole with a mast arm, and a 3rd alternative which is different than both to allow the Village to pick a favorite.

Alternatives and Analysis Results

For each alternative, a lighting analysis was performed to ensure that a set of parameters were met, based on national standards. These standards include the Illuminating Engineering Society's RP-8-14 roadway lighting standard, and the AASHTO Roadway Lighting Design Guide. The following standards were used based on the roadway conditions:

Table 3-5a. Illuminance and Luminance Design Values (U.S. Customary)

Roadway and Walkway Classification*	Area Classifications	Illuminance Method					Luminance Method				Additional Values (Both Methods)
		Average Maintained Illuminance (E_{avg})				Minimum Illuminance E_{min}	Illuminance Uniformity Ratio E_{avg}/E_{min}	Average Maintained Luminance			
		R1	R2	R3	R4			Avg/min (max) ^b	L_{avg} cd/m ² (min)	Uniformity	
General Land Use	(footcandles) (min)	(footcandles) (min)	(footcandles) (min)	(footcandles) (min)	(footcandles)		L_{avg}/L_{min} (min)	L_{avg}/L_{max} (max)	L_{avg}/L_{max} (max) ^c		
Principal Arterials:											
Interstate and other freeways	All	0.6	0.6	0.6	0.6	0.2	4:1	0.4 ^d	3.5:1	6:1	0.3:1
Other Principal Arterials (partial or no control of access)	Commercial	1.1	1.6	1.6	1.4	As uniformity ratio allows	4:1	1.2	3:1	5:1	0.3:1
	Intermediate	0.8	1.2	1.2	1.0		4:1	0.9	3:1	5:1	0.3:1
	Residential	0.6	0.8	0.8	0.8		4:1	0.6	3.5:1	6:1	0.3:1
Minor Arterials	Commercial	0.9	1.4	1.4	1.0		4:1	1.2	3:1	5:1	0.3:1
	Intermediate	0.8	1.0	1.0	0.9		4:1	0.9	3:1	5:1	0.3:1
	Residential	0.5	0.7	0.7	0.7		4:1	0.6	3.5:1	6:1	0.3:1
Collectors	Commercial	0.8	1.1	1.1	0.9		4:1	0.8	3:1	5:1	0.4:1
	Intermediate	0.6	0.8	0.8	0.8		4:1	0.6	3.5:1	6:1	0.4:1
	Residential	0.4	0.6	0.6	0.5		4:1	0.4	4:1	8:1	0.4:1
Local	Commercial	0.6	0.8	0.8	0.8		6:1	0.6	6:1	10:1	0.4:1
	Intermediate	0.5	0.7	0.7	0.6		6:1	0.5	6:1	10:1	0.4:1
	Residential	0.3	0.4	0.4	0.4	6:1	0.3	6:1	10:1	0.4:1	
Alleys	Commercial	0.4	0.6	0.6	0.5	6:1	0.4	6:1	10:1	0.4:1	
	Intermediate	0.3	0.4	0.4	0.4	6:1	0.3	6:1	10:1	0.4:1	
	Residential	0.2	0.3	0.3	0.3	6:1	0.2	6:1	10:1	0.4:1	
Sidewalks	Commercial	0.9	1.3	1.3	1.2	3:1	Use illuminance requirements				
	Intermediate	0.6	0.8	0.8	0.8	4:1					
	Residential	0.3	0.4	0.4	0.4	6:1					
Pedestrian Ways and Bicycle Ways*	All	1.4	2.0	2.0	1.8	3:1					

The values highlighted above were determined based on the AASHTO definition of a residential area, as seen below:

3.3.8.3 Residential—A residential development, or a mixture of residential and commercial establishments, characterized by few pedestrians and a low parking demand or turnover at night. This definition includes areas with single family homes, townhouses, and/or small apartments. Regional parks, cemeteries, and vacant lands are also included. This area corresponds to the Low Pedestrian Conflict Area in IES RP-8-14.

For the potential side-path or shoulder widening, a sidewalk value was used with an intermediate land use to anticipate a higher usage value, due to improved facilities for pedestrians.

Alternative 1 – Pole-Top Mounted Fixture:

Alternative 1 consists of a pole-top mounted fixture on a 13.2ft concrete pole, which has been used in prior projects within the Village. See **Appendix A** for the product specification sheet. Per the analysis results, these poles were spaced 80ft on-center from one-another, with a total of 48 poles used. The following results were found:

Alternative 1 Agi-32 Results			
	Average (foot-candles)	Minimum (foot-candles)	Uniformity Ratio
Roadway	0.84	0.2	4.20
Future Pedestrian Space	1.17	0.3	3.90

Alternative 2 – Roadway-Lighting Style Fixture:

Alternative 2 consists of a roadway-lighting style fixture on a 4ft mast arm, mounted onto a 22ft pole. See **Appendix A** for the product specification sheet. Per the analysis results, these poles were spaced 120ft on-center from one-another, with a total of 32 poles. The following results were found:

Alternative 2 Agi-32 Results			
	Average (foot-candles)	Minimum (foot-candles)	Uniformity Ratio
Roadway	0.74	0.2	3.70
Future Pedestrian Space	1.24	0.3	4.13

Alternative 3 – Pendant-Mounted Fixture:

Alternative 3 consists of a pendant-mounted fixture on a 22ft pole, utilizing a u-shaped pendant mast arm. See **Appendix A** for the product specification sheet. Per the analysis results, these poles were spaced 95ft on-center from one-another, with a total of 40 poles. The following results were found:

Alternative 3 Agi-32 Results			
	Average (foot-candles)	Minimum (foot-candles)	Uniformity Ratio
Roadway	0.80	0.2	4.00
Future Pedestrian Space	1.25	0.3	4.17

Cost Estimates and Lead Times

The cost estimates listed below show the costs between the original 2019 proposal, the 2022 Northern Electric, Inc (NEI) estimate, and the three alternatives listed above. These costs reflect current estimates provided by vendors, as well as the estimated lead times to produce and ship equipment to the project. It is worth noting that both these costs and lead times are subject to changes in tariffs, manufacturing capability, material affordability and availability, as well as changes in shipping capacity. It is recommended that the Village consider adding a contingency to these costs to ensure that any changes as listed above do not risk the completion of the project.

In regard to lead times, lead times typically are to allow the constructor of the project to anticipate how far ahead of their construction schedule they must order particular items. To ensure that a project moves forward smoothly, it is recommended to the Village that the longer-than-normal lead times are considered when awarding a contract to a constructor of their choice.

Original Cost Estimate and NEI Estimate

Per the original project proposal in 2019, the costs estimated at the time are shown below. Per the latest project proposal and current material costs, AECOM and NEI were able to produce estimates which would reflect costs for today if the project were produced per the original design. NEI costs were provided in lump-sum costs for particular items, and therefore are not broken down as their counterparts are. See **Appendix C** for the NEI estimate.

Original Project Estimate and Projections

ITEM NUMBER	QTY	UNITS	DESCRIPTION	2019 UNIT PRICE	2019 TOTAL	2022 UNIT PRICE	2022 TOTAL	NEI 2022
650.8500	1	LS	CONSTRUCTION STAKING ELECTRICAL INSTALLATIONS (PROJECT)	\$ 3,000.00	\$ 3,000.00	\$ 6,000.00	\$ 6,000.00	
652.0235	2700	LF	Conduit Rigid Nonmetallic Schedule 40 3-Inch	\$ 13.50	\$ 36,450.00	\$ 15.00	\$ 40,500.00	
652.0615	900	LF	Conduit Special 3"	\$ 25.00	\$ 22,500.00	\$ 31.00	\$ 27,900.00	
653.0164	11	EACH	Pull Boxes Non-Conductive 24x42-Inch	\$ 1,368.00	\$ 15,048.00	\$ 1,700.00	\$ 18,700.00	
654.0205	3	EACH	Concrete Control Cabinet Bases Type 7	\$ 540.00	\$ 1,620.00	\$ 1,500.00	\$ 4,500.00	
655.0615	5766	LF	Electrical Wire Lighting 10 AWG	\$ 0.53	\$ 3,055.98	\$ 1.11	\$ 6,400.26	
655.0620	8224	LF	Electrical Wire Lighting 8 AWG	\$ 0.70	\$ 5,756.80	\$ 1.56	\$ 12,829.44	
655.0635	12336	LF	Electrical Wire Lighting 2 AWG	\$ 1.86	\$ 22,944.96	\$ 2.92	\$ 36,021.12	
656.0200	1	LS	Electrical Service Meter Breaker Pedestal (location)	\$ 1,415.00	\$ 1,415.00	\$ 1,600.00	\$ 1,600.00	
656.0200	1	LS	Electrical Service Meter Breaker Pedestal (location)	\$ 1,415.00	\$ 1,415.00	\$ 1,600.00	\$ 1,600.00	
656.0200	1	LS	Electrical Service Meter Breaker Pedestal (location)	\$ 1,415.00	\$ 1,415.00	\$ 1,600.00	\$ 1,600.00	
SPV.0060	1	EACH	001. Lighting Control Cabinet STA 320+06	\$ 7,360.00	\$ 7,360.00	\$ 8,200.00	\$ 8,200.00	
SPV.0060	1	EACH	002. Lighting Control Cabinet STA 342+35	\$ 7,360.00	\$ 7,360.00	\$ 8,200.00	\$ 8,200.00	
SPV.0060	1	EACH	003. Lighting Control Cabinet STA 360+40	\$ 7,360.00	\$ 7,360.00	\$ 8,200.00	\$ 8,200.00	
SPV.0060	36	EACH	004. Concrete Bases Type 7 Modified	\$ 589.00	\$ 21,204.00	\$ 1,100.00	\$ 39,600.00	
SPV.0060	36	EACH	006. Concrete Light Pole W/ Base Plate	\$ 5,565.00	\$ 200,340.00	\$ 7,234.50	\$ 260,442.00	
SPV.0060	36	EACH	007. LED Street Light Post Top	\$ 1,549.00	\$ 55,764.00	\$ 2,013.70	\$ 72,493.20	
SPV.0060	36	EACH	008. Handhole Polymer Concrete 11x17-Inch	\$ 574.00	\$ 20,664.00	\$ 750.00	\$ 27,000.00	
TOTAL					\$ 434,672.74		\$ 581,786.02	1.34%

Note these values were determined by ratio between length between 2019 and 2022 projects
 Assumed 30% increase due to them being specific decorative poles
 NEI Estimate most likely includes TC, Mobilization, Seeding

Cost Per LF. Does not include seeding, TC, Mobilization	2022	\$ 41.21	NEI Cost 2022	\$ 111.00
Cabinets	2022	\$ 9,700.00		\$ 18,284.00
Poles, fixes, etc	2022	\$ 11,098.20		\$ 11,987.00
Traffic Control			\$ 58,178.60	
Seeding and Erosion Control			\$ 58,178.60	
Mobilization			\$ 139,628.64	
Estimated total			\$ 837,771.87	\$ 885,984.00
Difference			\$	48,212.13

Alternative 1 Estimate					
ITEM NUMBER	2022 QTY	UNITS	DESCRIPTION	2022 UNIT PRICE	2022 TOTAL
650.8500	1	LS	CONSTRUCTION STAKING ELECTRICAL INSTALLATIONS (PROJECT)	\$ 6,000.00	\$ 6,000.00
652.0235	2700	LF	Conduit Rigid Nonmetallic Schedule 40 3-Inch	\$ 15.00	\$ 40,500.00
652.0615	900	LF	Conduit Special 3"	\$ 31.00	\$ 27,900.00
653.0164	11	EACH	Pull Boxes Non-Conductive 24x42-Inch	\$ 1,700.00	\$ 18,700.00
654.0205	3	EACH	Concrete Control Cabinet Bases Type 7	\$ 1,500.00	\$ 4,500.00
655.0615	5766	LF	Electrical Wire Lighting 10 AWG	\$ 1.11	\$ 6,400.26
655.0620	8224	LF	Electrical Wire Lighting 8 AWG	\$ 1.56	\$ 12,829.44
655.0635	12336	LF	Electrical Wire Lighting 2 AWG	\$ 2.92	\$ 36,021.12
656.0200	1	LS	Electrical Service Meter Breaker Pedestal (location)	\$ 1,600.00	\$ 1,600.00
656.0200	1	LS	Electrical Service Meter Breaker Pedestal (location)	\$ 1,600.00	\$ 1,600.00
656.0200	1	LS	Electrical Service Meter Breaker Pedestal (location)	\$ 1,600.00	\$ 1,600.00
SPV.0060	1	EACH	001. Lighting Control Cabinet STA 320+06	\$ 8,200.00	\$ 8,200.00
SPV.0060	1	EACH	002. Lighting Control Cabinet STA 342+35	\$ 8,200.00	\$ 8,200.00
SPV.0060	1	EACH	003. Lighting Control Cabinet STA 360+40	\$ 8,200.00	\$ 8,200.00
SPV.0060	48	EACH	004. Concrete Bases Type 7 Modified	\$ 1,100.00	\$ 52,800.00
SPV.0060	48	EACH	006. Concrete Light Pole W/ Base Plate	\$ 3,491.00	\$ 167,568.00
SPV.0060	48	EACH	007. LED Street Light Post Top	\$ 1,565.00	\$ 75,120.00
SPV.0060	48	EACH	008. Handhole Polymer Concrete 11x17-Inch	\$ 750.00	\$ 36,000.00
Total				\$	513,738.82
Cost Per LF. Does not include seeding, TC, Mobilization				\$	41.21
Cabinets				\$	9,700.00
Poles, fixes, etc				\$	9,208.00
Traffic Control					\$ 58,178.60
Seeding and Erosion Control					\$ 58,178.60
Mobilization					\$ 126,019.20
Estimated Total					\$ 756,115.23

Alternative 2 Estimate					
ITEM NUMBER	2022 QTY	UNITS	DESCRIPTION	2022 UNIT PRICE	2022 TOTAL
650.8500	1	LS	CONSTRUCTION STAKING ELECTRICAL INSTALLATIONS (PROJECT)	\$ 6,000.00	\$ 6,000.00
652.0235	2700	LF	Conduit Rigid Nonmetallic Schedule 40 3-Inch	\$ 15.00	\$ 40,500.00
652.0615	900	LF	Conduit Special 3"	\$ 31.00	\$ 27,900.00
653.0164	11	EACH	Pull Boxes Non-Conductive 24x42-Inch	\$ 1,700.00	\$ 18,700.00
654.0205	3	EACH	Concrete Control Cabinet Bases Type 7	\$ 1,500.00	\$ 4,500.00
655.0615	5766	LF	Electrical Wire Lighting 10 AWG	\$ 1.11	\$ 6,400.26
655.0620	8224	LF	Electrical Wire Lighting 8 AWG	\$ 1.56	\$ 12,829.44
655.0635	12336	LF	Electrical Wire Lighting 2 AWG	\$ 2.92	\$ 36,021.12
656.0200	1	LS	Electrical Service Meter Breaker Pedestal (location)	\$ 1,600.00	\$ 1,600.00
656.0200	1	LS	Electrical Service Meter Breaker Pedestal (location)	\$ 1,600.00	\$ 1,600.00
656.0200	1	LS	Electrical Service Meter Breaker Pedestal (location)	\$ 1,600.00	\$ 1,600.00
SPV.0060	1	EACH	001. Lighting Control Cabinet STA 320+06	\$ 8,200.00	\$ 8,200.00
SPV.0060	1	EACH	002. Lighting Control Cabinet STA 342+35	\$ 8,200.00	\$ 8,200.00
SPV.0060	1	EACH	003. Lighting Control Cabinet STA 360+40	\$ 8,200.00	\$ 8,200.00
SPV.0060	32	EACH	004. Concrete Bases Type 7 Modified	\$ 1,100.00	\$ 35,200.00
SPV.0060	32	EACH	007. Aluminum Light Pole (22') W/ Base Plate	\$ 2,230.80	\$ 71,385.60
SPV.0060	32	EACH	008. LED Street Light Cobrahead	\$ 341.40	\$ 10,924.80
Total				\$	299,761.22
Cost Per LF. Does not include seeding, TC, Mobilization				\$	41.21
Cabinets				\$	9,700.00
Poles, fixes, etc				\$	3,264.18
Traffic Control					\$ 58,178.60
Seeding and Erosion Control					\$ 58,178.60
Mobilization					\$ 83,223.68
Estimated Total					\$ 499,342.11

Alternative 3 Estimate					
ITEM NUMBER	2022 QTY	UNITS	DESCRIPTION	2022 UNIT PRICE	2022 TOTAL
650.8500	1	LS	CONSTRUCTION STAKING ELECTRICAL INSTALLATIONS (PROJECT)	\$ 6,000.00	\$ 6,000.00
652.0235	2700	LF	Conduit Rigid Nonmetallic Schedule 40 3-Inch	\$ 15.00	\$ 40,500.00
652.0615	900	LF	Conduit Special 3"	\$ 31.00	\$ 27,900.00
653.0164	11	EACH	Pull Boxes Non-Conductive 24x42-Inch	\$ 1,700.00	\$ 18,700.00
654.0205	3	EACH	Concrete Control Cabinet Bases Type 7	\$ 1,500.00	\$ 4,500.00
655.0615	5766	LF	Electrical Wire Lighting 10 AWG	\$ 1.11	\$ 6,400.26
655.0620	8224	LF	Electrical Wire Lighting 8 AWG	\$ 1.56	\$ 12,829.44
655.0635	12336	LF	Electrical Wire Lighting 2 AWG	\$ 2.92	\$ 36,021.12
656.0200	1	LS	Electrical Service Meter Breaker Pedestal (location)	\$ 1,600.00	\$ 1,600.00
656.0200	1	LS	Electrical Service Meter Breaker Pedestal (location)	\$ 1,600.00	\$ 1,600.00
656.0200	1	LS	Electrical Service Meter Breaker Pedestal (location)	\$ 1,600.00	\$ 1,600.00
SPV.0060	1	EACH	001. Lighting Control Cabinet STA 320+06	\$ 8,200.00	\$ 8,200.00
SPV.0060	1	EACH	002. Lighting Control Cabinet STA 342+35	\$ 8,200.00	\$ 8,200.00
SPV.0060	1	EACH	003. Lighting Control Cabinet STA 360+40	\$ 8,200.00	\$ 8,200.00
SPV.0060	40	EACH	004. Concrete Bases Type 7 Modified	\$ 1,100.00	\$ 44,000.00
SPV.0060	40	EACH	007. Aluminum Light Pole (22') W/ Base Plate (Tenon)	\$ 2,369.81	\$ 94,792.40
SPV.0060	40	EACH	008. LED Street Light Pendant	\$ 1,458.33	\$ 58,333.20
Total				\$	379,376.42
Cost Per LF. Does not include seeding, TC, Mobilization				\$	41.21
Cabinets				\$	9,700.00
Poles, fixes, etc				\$	5,475.71
Traffic Control					\$ 58,178.60
Seeding and Erosion Control					\$ 58,178.60
Mobilization					\$ 99,146.72
Estimated total					\$ 594,880.35

Based on the values provided above, a total estimate cost comparison was determined. Values for traffic control, seeding and erosion control, and mobilization were determined as a set percentage of the material costs. Values in red represent an increased cost in comparison to the original 2019 estimate, whereas values in green represent a cost decrease.

Estimated Cost Comparison			
	Alternative 1	Alternative 2	Alternative 3
Materials Cost	\$ 513,738.82	\$ 299,761.22	\$ 379,376.42
Traffic Control	\$ 58,178.60	\$ 58,178.60	\$ 58,178.60
Seeding and Erosion Control	\$ 58,178.60	\$ 58,178.60	\$ 58,178.60
Mobilization	\$ 126,019.20	\$ 83,223.68	\$ 99,146.72
Total	\$ 756,115.23	\$ 499,342.11	\$ 594,880.35

Estimated Lead Times (in days)			
	Luminaire	Pole	Mast Arm (where applicable)
Alternative 1	125	84	-
Alternative 2	125	125	125
Alternative 3	125	125	125

Appendix A

LIGHTING PRODUCT SPECIFICATIONS

Catalog Number	
Notes	Type

PUCL2

Utility Taft Series Luminaire Full Cutoff LED2



Mechanical

- Heavy grade A360 cast aluminum (<1% copper)
- Tool-less access with a spring-loaded latch
- Hidden hinge door allowing the door to swing open and remain open
- Optional internal or external NEMA twist lock photocontrol receptacle. Housing contains a tempered glass window to allow light to reach the cell for internal versions.
- Mount to slip-fitter that will accept 3" high by 2-7/8" to 3-1/8" O.D. pole tenon
- Decorative top cover contains stainless steel hinge which secures entry the LED optical chamber
- Polyester power coat paint to ensure maximum durability
- Rigorous multi-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 5,000 hours exposure to salt fog chamber (operated per ASTM B117) on standard and RAL finish options.
- RAL (RALxxxxSDCR) paint colors are Super Durable Corrosion Resistant, 80% gloss.

Electrical

- All surge protection meets ANSI/IEEE C62.41.2 10kV/10kA.
- Standard SPD meets 10kV/5kA per ANSI C136.2-2015.
- 20KV Option meets 20kV/10kA per ANSI C136.2-2015.
- Quick disconnect connectors for ease of installation and maintenance.
- Three pole terminal block is standard, with optional prewired leads for ease of installation
- LED drivers meet maximum total harmonic distortion (THD) of 20%, >0.90 Power Factor and are ROHS compliant. Minimum operating temperature is -40°C. Electronic driver has an estimated minimum life of 100,000 hours at 25°C.

Optical

- IP65 rated optical compartment
- LED circuit board located in the top cover
- Asymmetric or Symmetric full cutoff distributions
- 2700K, 3000K, 4000K, and 5000K CCT
- 70CRI Standard

Control Options

- Field Adjustable Output (AO) module - Onboard device that adjusts the light output and input wattage to meet site specific requirements. The AO module is preset at the factory to position number 8 (see chart).
- Factory Programmed Driver (FPDxx) - Customize lumen output prior to manufacturing and still enables control leads so other options can also be used
- Long Life Photocontrols (PCLL) - 20 Year Life
- 3 and 7 pin photocontrol receptacles internally (PR3, PR7) or externally (PR3E, PR7E) mounted

Testing/Compliance

- UL 1598 - Wet Locations Safety Listing
- Suitable for ambient temperatures -40°C to 40°C

Manufacturing

- Manufactured in Crawfordsville, Indiana, ARRA compliant
- 100% electrical testing on all luminaires before shipment
- Ten (10) years minimum experience in manufacturing LED based products

Buy American

This product is assembled in the USA and meets the Buy America(n) government procurement requirements under FAR, DFARS and DOT. Please refer to www.acuitybrands.com/resources/buy-american for additional information.

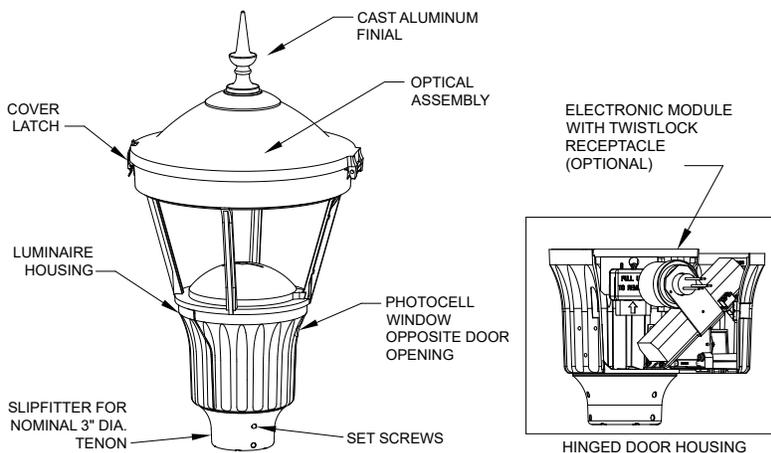
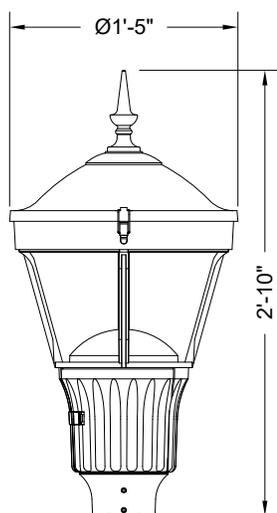
Warranty

5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/support/warranty/terms-and-conditions

DesignLights Consortium® DLC qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

DIMENSIONAL DATA



Maximum Weight - 39 lbs
Maximum Effective Projected Area - 1.24 sq. ft.

PUCL2

Utility Taft Series Luminaire Full Cutoff LED2



ORDERING INFORMATION

Example: PUCL2 P20 30K MVOLT FC2 GN NF PR7E

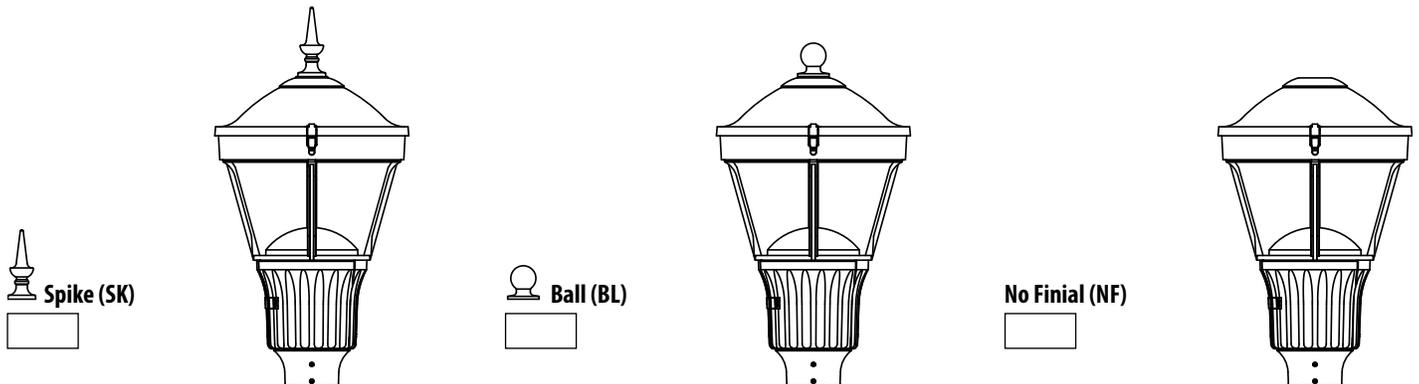
Series	Led performance package	LED Color temperature	Voltage	Optics	Housing color	Finial
PUCL2 Utility Taft LED FCO	P10 1,500 nominal lumens (amber only)	AMB True amber 27K 2700K CCT	MVOLT Auto-sensing voltage (120 thru 277) 50/60 HZ	FC2 Type 2 distribution full cutoff	BK Black	NF None
	P20 4,500 nominal lumens	30K 3000K CCT	HVOLT Auto-sensing voltage (347 thru 480) 50/60 HZ		GR Gray	BL Ball
	P30 6,500 nominal lumens	40K 4000K CCT		FC3 Type 3 distribution full cutoff	GH Graphite	SK Spike
	P40 8,500 nominal lumens	50K 5000K CCT			GN Green	PP Prime paint
	P50 11,500 nominal lumens		FC4 Type 4 distribution full cutoff	WH White		
			FC5 Type 5 distribution full cutoff	BZ Bronze		
				RALxxxxSDCR RAL Super Durable Corrosion Resistant, 80% Gloss Paint, replace xxxx with RAL number.		
				CMC Custom color match		

Options: Option Compatibility Matrix on page 3 of 4		
A0 Field Adjustable Output	PR3E NEMA Twist Lock Photocontrol Receptacle - 3 PIN. Externally mounted, available with NF option	L1H 1.5 ft prewired leads
FPDxx Factory Programmed Driver	PR7E NEMA Twist Lock Photocontrol Receptacle - 7 PIN. Externally mounted, available with NF option	L03 3ft prewired leads
PR3 NEMA Twist Lock photocontrol receptacle - 3 PIN receptacle only.	SH Shorting cap	L10 10 ft prewired leads
PR7 NEMA Twist Lock Dimming photocontrol receptacle - 7 PIN receptacle only.	HSS House side shield	L20 20 ft prewired leads
PCLL DTL long life twistlock photocontrol for solid-state MVOLT		L25 25 ft prewired leads
P34 DTL long life twistlock photocontrol for solid-state 347V		L30 30 ft prewired leads
P48 DTL long life twistlock photocontrol for solid-state 480V		NL1X1 NEMA Label 1" X 1"
		NL2X2 NEMA Label 2" X 2"
		20KV 20kV/10kA surge protection

Accessories: Order as separate catalog number.	
XXCL2HSS1	Field Accessory - Louvered house side shield (Qty 1)
XXCL2HSSJ50	Field Accessory - Louvered house side shield (Bulk Qty 50)
XXCL2SPD10KAS	10kV/5kA Extreme surge 120-277V
XXCL2SPD10KAH	10kV/5kA Extreme surge 480V
XXCL2SPD20KAS	20kV/10kA Extreme surge 120-277V
XXCL2SPD20KAH	20kV/10kA Extreme surge 480V

FINIAL INFORMATION

Mark Appropriate Box for Finial Options



OPTIONS MATRIX

Mounting		SELECTED OPTION (start here)										
		AO	FPDxx	PR3	PR3E	PR7	PR7E	P34	P48	PCLL	SH	20kV
LED Performance Package	P10	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	P20	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	P30	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	P40	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	P50	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Voltage	MVOLT	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y
	HVOLT	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Finial	BL	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y
	SK	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y
	NF	Y	Y	Y	M	Y	M	Y	Y	Y	Y	Y
Compatible Options	AO		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	FPDxx	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y
	PR3	Y	Y		N	N	N	Y	Y	Y	Y	Y
	PR3E	Y	Y	N		N	N	Y	Y	Y	Y	Y
	PR7	Y	Y	N	N		N	Y	Y	Y	Y	Y
	PR7E	Y	Y	N	N	N		Y	Y	Y	Y	Y
	P34	Y	Y	Y	Y	Y	Y		N	N	N	Y
	P48	Y	Y	Y	Y	Y	Y	N		N	N	Y
	PCLL	Y	Y	Y	Y	Y	Y	N	N		N	Y
	SH	Y	Y	Y	Y	Y	Y	N	N	N		Y
20kV	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		

Y = Valid Option Combination

M = Must have: one of these must be installed for the luminaire to operate

N = Combination Not available

LUMEN AMBIENT TEMPERATURE (LAT) MULTIPLIERS

Use the factors to determine relative lumen output for average ambient temperatures from 0-40C (32-104F)

Ambient Temp (degrees C) Lumen Multiplier								
0	5	10	15	20	25	30	35	40
1.05	1.04	1.03	1.02	1.01	1.00	0.99	0.98	0.97

PROJECTED LED LUMEN MAINTENANCE

Data references the extrapolated performance projections for the platforms noted in 25C ambient, based on 6,000 hours of IED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11). To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Package	Lumen Maintenance						L70 Hrs
	25k hrs	36k hrs	50k hrs	60k hrs	75k hrs	100k hrs	
P20-P40	0.97	0.96	0.95	0.94	0.93	0.91	383,000
P50	0.96	0.94	0.93	0.91	0.90	0.87	267,667

PERFORMANCE DATA

LED Package	Distribution	System Watts	2700K		3000K		4000K		5000K	
			Lumens	LPW	Lumens	LPW	Lumens	LPW	Lumens	LPW
P20	FC2	45	4633	103	4734	105	5218	116	5375	119
	FC3	45	4101	91	4190	93	4618	103	4758	106
	FC4	45	4414	98	4510	100	4971	110	5121	114
	FC5	45	4500	100	4598	102	5068	113	5221	116
P30	FC2	66	6711	102	6857	104	7557	115	7785	118
	FC3	66	5940	90	6069	92	6689	101	6891	104
	FC4	66	6394	97	6533	99	7200	109	7418	112
	FC5	66	6518	99	6660	101	7340	112	7562	115
P40	FC2	89	8528	96	8714	98	9604	108	9894	111
	FC3	89	7549	85	7714	87	8501	96	8758	98
	FC4	89	8125	91	8303	93	9151	103	9427	106
	FC5	89	8283	93	8464	95	9329	105	9610	108
P50	FC2	139	12327	89	12596	91	13882	100	14301	103
	FC3	139	10911	78	11149	80	12288	88	12658	91
	FC4	139	11744	84	12001	86	13226	95	13626	98
	FC5	139	11972	86	12234	88	13483	97	13890	100

FPDXX DATA OPTIONS

FPDxx Setting	Wattage	P20 27K				P20 30K				P20 40K				P20 50K			
		FC2	FC3	FC4	FC5	FC2	FC3	FC4	FC5	FC2	FC3	FC4	FC5	FC2	FC3	FC4	FC5
Standard	45	4633	4101	4414	4500	4732	4190	4510	4598	5218	4618	4971	5068	5375	4758	5121	5221
FPD95	43	4401	3896	4193	4275	4497	3981	4285	4368	4957	4387	4722	4815	5106	4520	4865	4960
FPD90	41	4170	3691	3973	4050	4261	3771	4059	4138	4696	4156	4474	4561	4838	4282	4609	4699
FPD85	38	3938	3486	3752	3825	4024	3562	3834	3908	4435	3925	4225	4308	4569	4044	4353	4438
FPD80	36	3706	3281	3531	3600	3787	3352	3608	3678	4174	3694	3977	4054	4300	3806	4097	4177

FPDxx Setting	Wattage	P30 27K				P30 30K				P30 40K				P30 50K			
		FC2	FC3	FC4	FC5	FC2	FC3	FC4	FC5	FC2	FC3	FC4	FC5	FC2	FC3	FC4	FC5
Standard	66	6711	5940	6394	6518	6857	6069	6533	6660	7557	6689	7200	7340	7785	6891	7418	7562
FPD95	63	6375	5643	6074	6192	6514	5766	6206	6327	7179	6355	6840	6973	7396	6546	7047	7184
FPD90	59	6040	5346	5755	5866	6171	5462	5880	5994	6801	6020	6480	6606	7007	6202	6676	6806
FPD85	56	5704	5049	5435	5540	5828	5159	5553	5661	6423	5686	6120	6239	6617	5857	6305	6428
FPD80	53	5369	4752	5115	5214	5846	4855	5226	5328	6046	5351	5760	5872	6228	5513	5934	6050
FPD75	50	5033	4455	4796	4889	5143	4552	4900	4995	5668	5017	5400	5505	5839	5564	5564	5672
FPD70	46	4698	4158	4476	4563	4800	4248	4573	4662	5290	4682	5040	5138	5450	5193	5193	5293

FPDxx Setting	Wattage	P40 27K				P40 30K				P40 40K				P40 50K			
		FC2	FC3	FC4	FC5	FC2	FC3	FC4	FC5	FC2	FC3	FC4	FC5	FC2	FC3	FC4	FC5
Standard	89	8528	7549	8125	8283	8714	7714	8303	8464	9604	8501	9151	9329	9894	8758	9427	9610
FPD95	85	8102	7172	7719	7869	8278	7328	7888	8041	9124	8076	8693	8863	9400	8320	8956	9130
FPD90	80	7675	6794	7313	7455	7483	6943	7473	7618	8644	7651	8236	8396	8905	7882	8484	8649
FPD85	76	7249	6417	6906	7041	7407	6557	7058	7194	8163	7226	7778	7930	8410	7444	8013	8169
FPD80	71	6822	6039	6500	6626	6971	6171	6642	6771	7683	6801	7321	7463	7916	7006	7542	7688

FPDxx Setting	Wattage	P50 27K				P50 30K				P50 40K				P50 50K			
		FC2	FC3	FC4	FC5	FC2	FC3	FC4	FC5	FC2	FC3	FC4	FC5	FC2	FC3	FC4	FC5
Standard	139	12327	10911	11744	11972	12596	11149	12001	12234	13882	12288	13226	13483	14301	12658	13626	13890
FPD95	132	11710	10365	11157	11374	11966	10591	11401	11622	13188	11673	12565	12809	13586	12026	12944	13196
FPD90	125	11094	9820	10570	10775	11336	10034	10801	11010	12494	11059	11904	12135	12871	11393	12263	12501
FPD85	118	10478	9274	9983	10176	10706	9476	10201	10399	11800	10444	11242	11461	12156	10760	11582	11807
FPD80	111	9861	8729	9395	9578	10076	8919	9600	9787	11106	9830	10581	10786	11441	10127	10900	11112

PUCL2

Utility Taft Series Luminaire Full Cutoff LED2

COMPONENTS & OPTIONS DATA



AO
Manual field adjustable output dimming device



20kV
Safeguard your investment from extreme voltage spikes with our new Extreme 20kV/10kA SPD



HSS
Minimize backlight with a lowered house-side-shield. Available as a factory option or field accessory



Consistent with LEED® goals & Green Globes™ criteria for light pollution reduction



Autobahn Series ATB0 Roadway Lighting

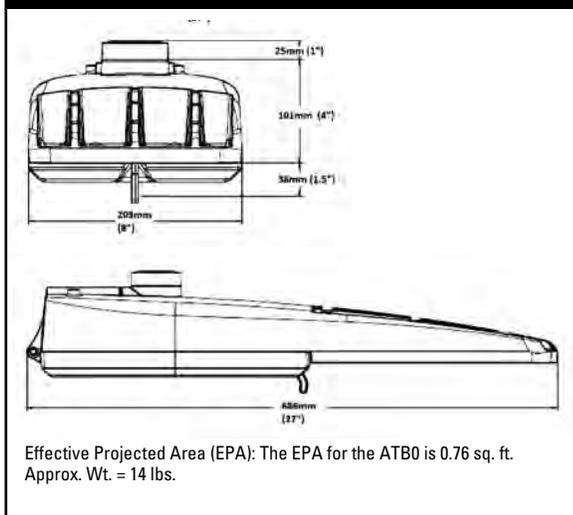
PRODUCT OVERVIEW



Applications:

- Roadways
- Off ramps
- Residential streets
- Parking lots

DIMENSIONS



STANDARDS

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Color temperatures of $\leq 3000\text{K}$ must be specified for International Dark-Sky Association certification.

Rated for -40°C to 40°C ambient

CSA Certified to U.S. and Canadian standards

Complies with ANSI: C136.2, C136.10, C136.14, C136.31, C136.15, C136.37

BUY AMERICAN — Product with the BAA option is assembled in the USA and meets the Buy America(n) government procurement requirements under FAR, DFARS and DOT. Please refer to www.acuitybrands.com/buy-american for additional information.

Note: Specifications subject to change without notice. Actual performance may differ as a result of end-user environment and application.

Features:

OPTICAL

The Autobahn's new molded silicone optics provide exceptional performance. Silicone optics are superior to other polymeric materials in the areas of; optical efficiency, thermal performance, and reduction in dirt accumulation, all of which can lead to long term lumen degradation and a shift in optical distribution. Also, because silicone allows for the molding of fine details as well as thick sections, it produces the most crisp, clean and well-defined lighting distributions available. Silicone optics paired with modern LED's allow the Autobahn to take full advantage of both technologies.

Same Light: Performance is comparable to 100 - 400W HPS roadway luminaires.

White Light: Correlated color temperature - 4000K, or optional 2700K, 3000K or 5000K, all 70 CRI minimum.

Unique IP66 rated LED light engines provided 0% uplight and restrict backlight to within sidewalk depth, providing optimal application coverage and optimal pole spacing. Available in Type II, III, IV, and V roadway distributions.

ELECTRICAL

Expected Life: LED light engines are rated $>100,000$ hours at 25°C , L70. Electronic driver has an expected life of 100,000 hours at a 25°C ambient.

Lower Energy: Saves an expected of 40-60% over comparable HID luminaires.

Robust Surge Protection: Two different surge protection options provide a minimum of ANSI C136.2 10kV/5kA protection. 20kV/10kA protection is also available.

Luminaire ships with a 0-10v dimmable driver. Luminaire is continuous and step dimming capable via AO option or controls installed on P7 photocontrol receptacle option.

MECHANICAL

Includes standard AEL lineman-friendly features such as tool-less entry, 3 station terminal block and quick disconnects. Bubble level located inside the electrical compartment for easily leveling at installation.

Rugged die-cast aluminum housing and door are polyester powder-coated for durability and corrosion resistance. Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 7 (per ASTM D1654) after over 5000 hours exposure to salt fog chamber (operated per ASTM B117).

Mast arm mount is adjustable for arms from 1-1/4" to 2" (1-5/8" to 2-3/8" O.D.) diameter. Provides a 3G vibration rating per ANSI C136.31

Wildlife shield is cast into the housing (not a separate piece).

CONTROLS

NEMA 3 pin photocontrol receptacle is standard, with the Acuity designed ANSI standard 7 pin receptacle optionally available.

Premium solid state locking style photocontrol - PCSS (10 year rated life) Extreme long life solid state locking style photocontrol - PCLL (20 year rated life).

Optional onboard Adjustable Output module allows the light output and input wattage to be modified to meet site specific requirements, and also can allow a single fixture to be flexibly applied in many different applications.

Autobahn Series ATB0

Roadway Lighting

ORDERING INFORMATION

Series	Performance Packages	Voltage	Optics
ATB0 Autobahn LED Roadway	P201 5,369 lumens nominal ⁶ P202 6,943 lumens nominal ⁶ P203 10,056 lumens nominal P204 12,176 lumens nominal P205 13,767 lumens nominal P301 10,367 lumens nominal P302 12,185 lumens nominal P303 15,351 lumens nominal P304 17,714 lumens nominal P305 19,893 lumens nominal P451 16,320 lumens nominal P452 19,087 lumens nominal P453 23,592 lumens nominal P454 25,070 lumens nominal P455 27,091 lumens nominal P456 28,347 lumens nominal P457 29,715 lumens nominal	MVOLT Multi-volt, 120-277V 347 347V ⁵ 480 480V ⁵ XVOLT ⁷ 277V-480V	R2 Roadway Type II R3 Roadway Type III R4 ³ Roadway Type IV R5 Roadway Type V

Options			
<u>Color Temperature (CCT)</u> (Blank) 4000K CCT, 70 CRI Min. 27K 2700K CCT, 70 CRI Min. 3K 3000K CCT, 70 CRI Min. 5K 5000K CCT, 70 CRI Min.	UMR-XX 8" Horizontal Arm for Round Pole, Painted to match Fixture UMS-XX 8" Horizontal Arm for Square Pole, Painted to match Fixture UMR-GALV 8" Horizontal Arm for Round Pole, Galvanized UMS-GALV 8" Horizontal Arm for Square Pole, Galvanized	<u>Accessories:</u> House Side Shields for field installation ATBOP20XR2/R5HSS for use with P201 - P205, R2 & R5 distributions ATBOP20XR3/R4HSS for use with P201 - P205, R3 & R4 distributions ATBOP30XR2/R5HSS for use with P301 - P305, R2 & R5 distributions ATBOP30XR3HSS for use with P301 - P305, R3 distribution ATBOP30XR4HSS for use with P301 - P305, R4 distribution ATBOP45XR2/R5HSS for use with P451 - P457, R2 & R5 distributions ATBOP45XR3HSS for use with P451 - P457, R3 distribution	<u>Notes</u> 1 Not available in 347 or 480V. 2 Not available with NR. 3 Not available with P451 - P457 performance packages 4 Not available with P201 performance package + 347V or 480V 5 Not available with P456 or P457 performance package options 6 Not available with XVOLT option 7 XVOLT option only available with P452, P453 and P454 performance packages
<u>Paint</u> (Blank) Gray (Standard) BK Black BZ Bronze DDB Dark Bronze GI Graphite WH White GN Green	<u>Controls</u> (Blank) 3 Pin NEMA Photocontrol Receptacle (Standard) P7 ² 7 Pin Photocontrol Receptacle (Dimmable Driver Included) NR No Photocontrol Receptacle AO Field Adjustable Output PCSS ¹ Solid State Lighting Photocontrol (120-277V) PCLL Solid State Long Life Photocontrol SH Shorting Cap		
<u>Surge Protection</u> (Blank) Standard 20kV/10kA SPD ⁴ MP MOV Pack 10kV/5kA	<u>Packaging</u> (Blank) Single Unit (Standard) JP Job Pack (42/Pallet)		
<u>Terminal Block</u> (Blank) Terminal Block (Standard) T2 Wired to L1 & L2 Positions			
<u>Misc.</u> BL External Bubble Level HSS House-Side Shield NL Nema Label XL Not CSA Certified BAA Buy America(n) Act Compliant			



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Autobahn Series ATB0

Roadway Lighting

PERFORMANCE PACKAGE								
ATB0	Distribution	Input Watts	2700K		3000K		4000K/5000K	
			Lumens	LPW	Lumens	LPW	Lumens	LPW
P201	R2	36	4,983	137	5,473	151	5,488	150
	R3		4,952	136	5,107	140	5,553	152
	R4		5,045	139	5,130	141	5,346	147
	R5		5,084	142	5,384	148	5,387	150
P202	R2	49	6,429	132	7,100	147	7,203	148
	R3		6,390	131	6,679	137	7,237	148
	R4		6,517	136	6,749	140	6,906	144
	R5		6,560	137	6,988	146	6,951	146
P203	R2	70	9,005	130	10,050	144	10,150	147
	R3		8,951	129	9,471	134	10,260	148
	R4		9,494	137	9,673	139	10,060	145
	R5		9,188	134	9,784	142	9,736	142
P204	R2	88	11,007	125	11,800	136	12,410	141
	R3		10,940	124	11,490	132	12,470	141
	R4		11,485	132	11,900	136	12,170	139
	R5		11,230	131	11,780	137	11,900	138
P205	R2	102	12,339	121	12,650	125	13,920	137
	R3		12,264	120	13,110	139	14,130	138
	R4		13,051	130	13,680	136	13,830	138
	R5		12,589	127	13,080	132	13,340	135
P301	R2	67	9,527	140	10,450	154	10,460	153
	R3		9,469	139	10,590	158	10,820	158
	R4		9,579	144	10,210	152	10,150	152
	R5		9,720	145	10,370	154	10,300	154
P302	R2	83	11,118	135	11,790	142	12,300	149
	R3		11,050	134	12,290	150	12,520	152
	R4		11,589	140	12,720	153	12,280	148
	R5		11,343	137	12,120	147	12,020	145
P303	R2	106	14,152	130	15,090	140	15,420	141
	R3		14,066	131	15,230	142	15,950	148
	R4		14,514	136	15,720	146	15,380	144
	R5		14,439	136	15,140	142	15,300	144
P304	R2	124	16,705	130	17,180	136	18,010	141
	R3		16,603	131	17,890	141	18,230	144
	R4		16,845	135	18,160	145	17,850	143
	R5		17,043	137	17,670	142	18,060	145
P305	R2	145	18,388	124	19,720	134	20,160	136
	R3		18,276	124	20,070	135	20,440	138
	R4		18,695	129	20,050	138	19,810	137
	R5		18,761	130	19,350	135	19,880	138



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Autobahn Series ATB0

Roadway Lighting

PERFORMANCE PACKAGE								
ATB0	Distribution	Input Watts	2700K		3000K		4000K/5000K	
			Lumens	LPW	Lumens	LPW	Lumens	LPW
P451	R2	105	14,827	138	15,760	148	16,570	154
	R3		14,737	137	16,790	157	16,640	155
	R5		15,128	144	17,150	162	16,030	153
P452	R2	125	18,277	146	18,270	147	19,370	155
	R3		18,166	146	19,420	151	19,470	156
	R5		18,648	148	19,140	151	19,760	157
P453	R2	159	22,227	139	22,570	143	23,900	150
	R3		22,092	139	24,090	151	23,550	148
	R5		22,677	141	23,920	148	24,030	149
P454	R2	170	24,585	144	23,580	139	25,060	147
	R3		24,436	143	25,340	148	25,200	148
	R5		25,084	147	25,360	148	26,580	156
P455	R2	187	25,732	138	25,270	136	26,750	143
	R3		25,576	137	27,430	145	27,020	145
	R5		26,254	143	27,730	149	27,820	152
P456	R2	203	27,277	135	26,560	132	28,230	139
	R3		27,111	134	28,600	142	28,950	143
	R5		27,830	143	28,740	146	29,490	151
P457	R2	211	27,656	131	27,270	130	28,900	137
	R3		27,488	130	29,750	142	29,680	140
	R5		28,217	137	29,790	146	29,900	145

Note: Individual fixture performance may vary.

ATB0 LLD Multiplier	15C	20C	25C	30C	35C	40C
	1.02	1.01	1.00	0.99	0.98	0.97

To calculate the LLD for a temperature other than 25°C, multiply the LLD @ 25°C (shown in the performance package table) by the LLD multiplier for the selected temperature.



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Autobahn Series ATB0

Roadway Lighting

PERFORMANCE PACKAGE

LLD @ 25°C

ATB0	R2, R3 Distributions 3000K & 4000K CCT			R2, R3 Distributions 2700K & 5000K CCT*			R4 & R5 Distributions Any CCT		
	50k Hours	75k Hours	100k Hours	50k Hours	75k Hours	100k Hours	50k Hours	75k Hours	100k Hours
P201	0.96	0.95	0.94	0.92	0.88	0.85	0.92	0.88	0.85
P202	0.96	0.95	0.94	0.92	0.88	0.85	0.92	0.88	0.85
P203	0.96	0.95	0.93	0.91	0.88	0.85	0.91	0.88	0.85
P204	0.96	0.95	0.93	0.91	0.88	0.84	0.91	0.88	0.84
P205	0.96	0.95	0.93	0.91	0.87	0.83	0.91	0.87	0.83
P301	0.96	0.95	0.93	0.92	0.88	0.85	0.92	0.88	0.85
P302	0.96	0.95	0.93	0.92	0.88	0.85	0.92	0.88	0.85
P303	0.96	0.95	0.93	0.92	0.88	0.84	0.92	0.88	0.84
P304	0.96	0.95	0.93	0.91	0.87	0.83	0.91	0.87	0.83
P305	0.96	0.95	0.93	0.9	0.86	0.82	0.9	0.86	0.82
P451	0.96	0.94	0.93	0.92	0.88	0.85	0.92	0.88	0.85
P452	0.96	0.94	0.93	0.91	0.88	0.84	0.91	0.88	0.84
P453	0.96	0.94	0.93	0.91	0.87	0.83	0.91	0.87	0.83
P454	0.96	0.94	0.93	0.9	0.86	0.82	0.9	0.86	0.82
P455	0.96	0.94	0.93	0.9	0.85	0.81	0.9	0.85	0.81
P456	0.94	0.93	0.91	0.89	0.84	0.79	0.89	0.84	0.79
P457	0.94	0.93	0.91	0.88	0.83	0.79	0.88	0.83	0.79

* Also includes any custom (non-catalog) CCT



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Autobahn Series ATB0

Roadway Lighting

B.U.G. Ratings										
ATB0	Distribution	2700K			3000K			4000/5000K		
		B	U	G	B	U	G	B	U	G
P201	R2	1	0	1	2	0	2	2	0	2
	R3	1	0	1	1	0	1	1	0	1
	R4	1	0	2	1	0	2	1	0	2
	R5	3	0	1	3	0	1	3	0	1
P202	R2	2	0	2	2	0	2	2	0	2
	R3	1	0	2	1	0	2	1	0	2
	R4	1	0	2	1	0	2	1	0	2
	R5	3	0	1	3	0	2	3	0	2
P203	R2	2	0	2	2	0	2	2	0	2
	R3	2	0	2	2	0	2	2	0	2
	R4	2	0	3	2	0	3	2	0	3
	R5	3	0	2	4	0	2	4	0	2
P204	R2	3	0	3	3	0	3	3	0	3
	R3	2	0	2	2	0	2	2	0	2
	R4	2	0	3	2	0	3	2	0	3
	R5	4	0	2	4	0	2	4	0	2
P205	R2	3	0	3	3	0	3	3	0	3
	R3	2	0	2	2	0	2	2	0	2
	R4	2	0	3	2	0	3	2	0	3
	R5	4	0	2	4	0	2	4	0	2
P301	R2	2	0	2	2	0	2	2	0	2
	R3	2	0	2	2	0	2	2	0	2
	R4	2	0	3	2	0	3	2	0	3
	R5	4	0	2	4	0	2	4	0	2
P302	R2	3	0	3	3	0	3	3	0	3
	R3	2	0	2	2	0	2	2	0	2
	R4	2	0	3	2	0	3	2	0	3
	R5	4	0	2	4	0	2	4	0	2
P303	R2	3	0	3	3	0	3	3	0	3
	R3	2	0	2	2	0	3	2	0	3
	R4	2	0	3	3	0	3	3	0	3
	R5	4	0	2	4	0	2	4	0	2
P304	R2	3	0	3	3	0	3	3	0	3
	R3	2	0	3	3	0	3	3	0	3
	R4	3	0	3	3	0	4	3	0	3
	R5	4	0	2	4	0	2	4	0	2
P305	R2	3	0	3	3	0	3	3	0	3
	R3	3	0	3	3	0	3	3	0	3
	R4	3	0	4	3	0	4	3	0	4
	R5	5	0	3	5	0	3	5	0	3



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Autobahn Series ATB0

Roadway Lighting

B.U.G. Ratings										
ATB0	Distribution	2700K			3000K			4000/5000K		
		B	U	G	B	U	G	B	U	G
P451	R2	3	0	3	3	0	3	3	0	3
	R3	2	0	2	2	0	3	2	0	3
	R5	4	0	2	4	0	2	4	0	2
P452	R2	3	0	3	3	0	3	3	0	3
	R3	3	0	3	3	0	3	3	0	3
	R5	5	0	3	5	0	3	5	0	3
P453	R2	3	0	3	3	0	3	3	0	3
	R3	3	0	3	3	0	3	3	0	3
	R5	5	0	3	5	0	3	5	0	3
P454	R2	3	0	3	3	0	3	3	0	3
	R3	3	0	3	3	0	3	3	0	3
	R5	5	0	3	5	0	3	5	0	3
P455	R2	3	0	3	3	0	3	3	0	3
	R3	3	0	3	3	0	4	3	0	4
	R5	5	0	3	5	0	3	5	0	3
P456	R2	4	0	4	3	0	3	4	0	4
	R3	3	0	4	3	0	4	3	0	4
	R5	5	0	3	5	0	4	5	0	4
P457	R2	4	0	4	4	0	4	4	0	4
	R3	3	0	4	3	0	4	3	0	4
	R5	5	0	4	5	0	4	5	0	4



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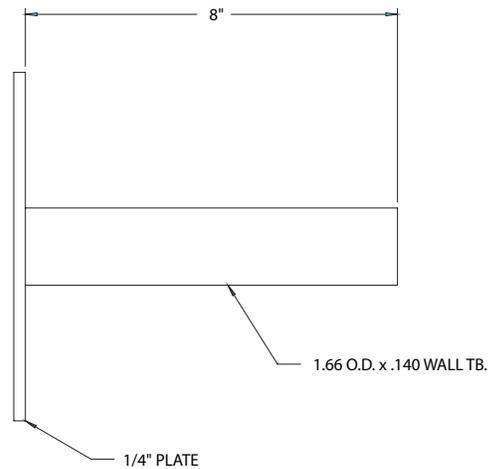
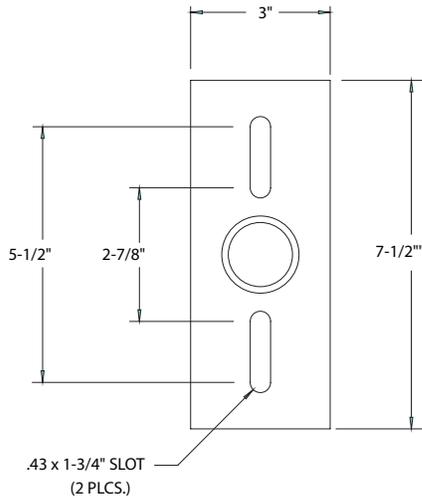
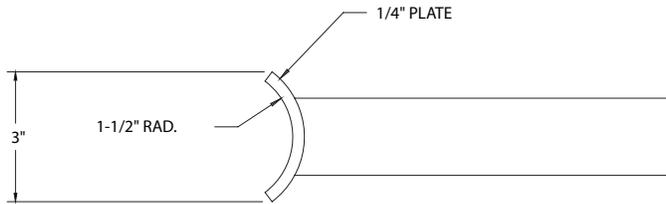
Warranty Five-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/resources/terms-and-conditions
 Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.
 Please contact your sales representative for the latest product information.

Autobahn Series ATB0

Roadway Lighting

UMR POLE ADAPTOR

RECOMMENDED FOR USE WITH POLES OF 4" DIAMETER OR SMALLER



UMS POLE ADAPTOR



AEL Headquarters, 3825 Columbus Road, Granville, OH 43023
www.americanelectriclighting.com
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Please contact your sales representative for the latest product information.

Catalog Number	
Notes	Type

GPLF3

GlasWerks® Luminescent LED Prague®



General Description

The architectural luminaire consists of a flat LED optical assembly shielded by a decorative formed housing and a top mounted cast aluminum electrical assembly. The optical assembly is seamlessly integrated into the form factor for beautiful daytime appearance and exceptionally uniform lighting at night.

Optical Assembly

The optical assembly consists of an edgelit waveguide light engine for unmatched visual comfort. Light from the LED module is distributed by proprietary wave guide technology to maximize uniformity and minimize glare. Configurable with CCT options of 2700K, 3000K, and 4000K. CRI is 70 minimum. Available with asymmetric, symmetric, or pathway distributions.

Mounting Style

Optional mounting styles include Quick Lock Stem, NPT threads, and horizontal arm.

Quick Lock Stem Mounting style is compatible with the following leveling fitters:

- Boston Harbor Decorative Arm Fitter (BHDF)
- GlasWerks Decorative Arm Fitter (GWDF)
- West Liberty Decorative Arm Fitter (WLDF)
- Ball Style Decorative Fitter (BADF)

Electrical Assembly

The cast aluminum electrical housing has a smooth domed contour. A (3) station terminal block is provided to accept #14 through #2 size wire. The electrical housing is hinged with a tool-less latch to provide easy access to the gear assembly. The unitized electrical assembly, containing the electronic driver and other electrical components, plugs into the quick disconnect receptacle. The pendant mount version has a welded stem (Quick Lock Stem Mounting), which aids in installation speed. The arm mount version is provided with two U-bolts with washers and nuts and two leveling set screws that lock the housing to a 2 inch nominal (2-3/8" O.D.) horizontal

arm and allow a $\pm 5^\circ$ degree adjustment from horizontal to the cover.

Electrical System

Programmable LED driver with 0-10V dimming. Optional DALI dimming. Driver life is rated to at least 100,000 hours. Luminaire surge protection rating of 20kV/10kA per ANSI/IEEE C62.41.2.

Finish

The luminaire is finished with corrosion resistance super durable powder coat paint to ensure maximum durability. Finish is rated to 5,000 hours salt spray per ASTM B117.

Listing

The luminaire is CSA certified to US and Canadian standards. IP55 rated electrical chamber, IP66 rated LED optic chamber. 20kV/10kA extreme surge protection per ANSI/IEEE C136.2. Suitable for operation in ambient temperatures from -40°C to 40°C

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Buy American

This product is assembled in the USA and meets the Buy America(n) government procurement requirements under FAR, DFARS and DOT. Please refer to www.acuitybrands.com/resources/buy-american for additional information.

Warranty

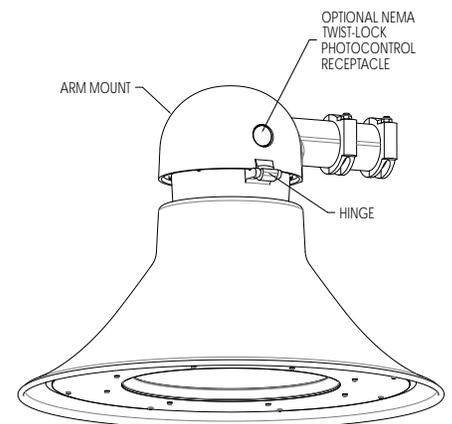
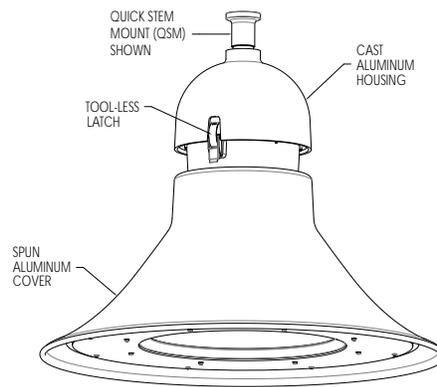
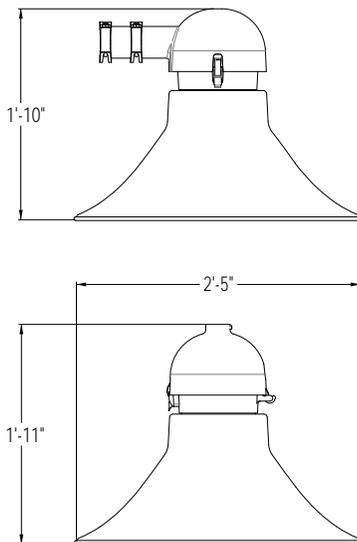
Limited warranty located at: www.acuitybrands.com/support/warranty/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25°C .

Specifications subject to change without notice.

DIMENSIONAL DATA



Maximum Weight - 48 lbs

Maximum Effective Projected Area - 1.0 ft²

ORDERING INFORMATION

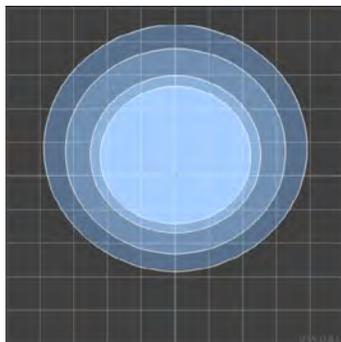
Example: GPLF3 P30 40K MVOLT ASY QSM BK

Cover Type	LED Lumen Package	Color Temperature	Voltage	Optics	Mounting Style	Finish Color
GPLF3 Prague®	P10 P10 Performance Package	27K 2700K, 70 CRI	MVOLT 120-277V	ASY Asymmetric	ARM Horizontal Arm Mount	BK Black
	P20 P20 Performance Package	30K 3000K, 70 CRI	HVOLT 347-480V	SYM Symmetric	NPT 1.5" NPT Thread	BZ Bronze
	P30 P30 Performance Package	40K 4000K, 70 CRI		PTH Pathway	QSM Quick Stem Mount	GH Graphite
	P40 P40 Performance Package					GN Green
	P50 P50 Performance Package					GR Gray
	P60 P60 Performance Package					WH White
	P70 P70 Performance Package					
	P80 P80 Performance Package					

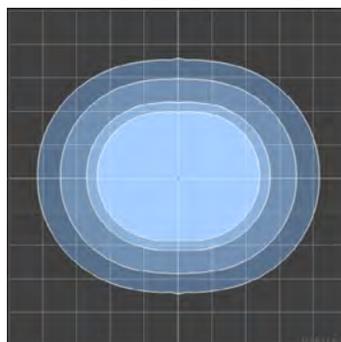
Options	
<u>Control Options:</u> PR3 3 pin NEMA photocontrol receptacle PR7 7 pin NEMA photocontrol receptacle PR3E 3 pin NEMA photocontrol external PR7E 7 pin NEMA photocontrol external P34 Solid state long life photocontrol (347V) P48 Solid state long life photocontrol (480V) PCLL DLL photocontrol SH Shorting cap AO Adjustable Output Module DALI DALI dimming WG Wire guard (ships separately) HSS House side shield (ships separately)	<u>Prewire Lead Options:</u> L03 3ft prewire leads L10 10ft prewire leads L20 20ft prewire leads L25 25ft prewire leads L30 30ft prewire leads <u>NEMA Label Options:</u> NL1X1 1" x 1" NEMA label NL3X3 3" x 3" NEMA label

Accessories: Order as separate catalog number.	
GBLF3HSS	House side shield
GBLF3WG	Wire guard

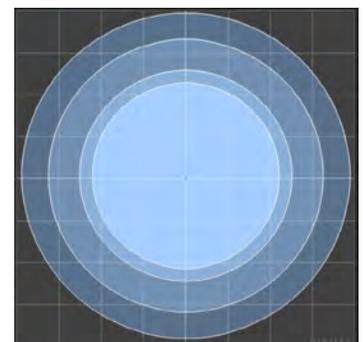
OPTICAL DISTRIBUTIONS



ASY



PTH



SYM

PERFORMANCE DATA

Lumen and Wattage Data

Lumen Package	System Wattage	Distribution	2700K, 70 CRI		3000K, 70 CRI		4000K, 70 CRI	
			Lumens	LPW	Lumens	LPW	Lumens	LPW
P10	30	ASY	3,738	126	3,870	130	4,122	139
		SYM	3,860	130	3,995	134	4,256	143
		PTH	3,681	124	3,811	128	4,059	137
P20	51	ASY	6,143	121	6,359	125	6,774	134
		SYM	6,343	125	6,565	129	6,994	138
		PTH	6,049	119	6,262	123	6,671	132
P30	62	ASY	7,377	118	7,636	122	8,135	130
		SYM	7,617	122	7,884	126	8,399	135
		PTH	7,264	116	7,520	120	8,011	128
P40	75	ASY	8,767	116	9,075	121	9,668	128
		SYM	9,052	120	9,370	124	9,982	133
		PTH	8,633	115	8,937	119	9,520	126
P50	95	ASY	10,810	114	11,190	118	11,920	125
		SYM	11,161	117	11,553	121	12,308	129
		PTH	10,645	112	11,019	116	11,738	123
P60	118	ASY	12,781	108	13,230	112	14,094	119
		SYM	13,196	111	13,660	115	14,551	123
		PTH	12,586	106	13,028	110	13,878	117
P70	151	ASY	15,726	104	16,278	108	17,341	115
		SYM	16,236	108	16,807	111	17,904	119
		PTH	15,485	103	16,029	106	17,076	113
P80	173	ASY	17,544	101	18,161	105	19,346	112
		SYM	18,114	105	18,750	108	19,974	115
		PTH	17,276	100	17,883	103	19,050	110

OPTIONS MATRIX

		Lumen Package								Voltage		Receptacle				Photocontrol				Dimming Options	
		P10	P20	P30	P40	P50	P60	P70	P80	MVOLT	HVOLT	PR3	PR7	PR3E	PR7E	PCLL	PCL3	PCL4	SH	AO	DALI
Lumen Package	P10	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	RFD*
	P20	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	RFD*
	P30	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	RFD*
	P40	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	RFD*
	P50	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	RFD
	P60	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	RFD
	P70	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	RFD
	P80	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	RFD
Voltage	MVOLT	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	N	N	Y	Y	RFD
	HVOLT	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N
Receptacle	PR3	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	RFD
	PR7	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	RFD
	PR3E	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	RFD
	PR7E	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	RFD
Photocontrol	PCLL	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	N	Y	Y	RFD
	PCL3	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	N	Y	Y	RFD
	PCL4	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	N	Y	Y	RFD
	SH	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	Y	Y	RFD
Dimming Options	AO	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
	DALI	RFD*	RFD*	RFD*	RFD*	RFD	RFD	RFD	RFD	RFD	N	RFD	RFD	RFD	RFD	RFD	RFD	RFD	RFD	RFD	N

Y = combination is available

N = combination is not available

RFD = consult factory, additional information required

RFD* = consult factory, additional information required, not CSA certified

GPLF3

GlasWerks® Luminescent LED Prague®



LED Lumen Maintenance					
25,000 hours	36,000 hours	50,000 hours	60,000 hours	75,000 hours	100,000 hours
98%	96%	94%	93%	91%	88%

Lumen maintenance calculated according to TM-21 at 25°C ambient. Italicized values are extrapolated beyond the standard.

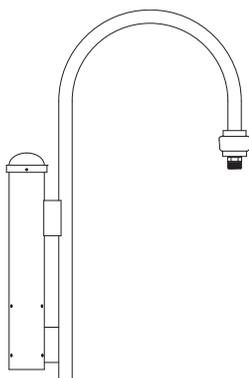
Adjustable Output (AO) Response		
AO Setting	% Lumen Output	% Wattage
8	100%	100%
7	94%	94%
6	82%	81%
5	70%	68%
4	58%	56%
3	46%	43%
2	33%	31%
1	21%	19%

Luminaire Ambient Temperature Factor	
Ambient Temperature	Relative Lumen Output
0°C	1.03
15°C	1.02
20°C	1.01
25°C	1.00
30°C	0.99
35°C	0.99
40°C	0.98

Catalog Number	
Notes	Type

CRB

Cordoba Glaswerks Aluminum Roadway Arm



General Description

The roadway arms shall be all aluminum, one-piece construction. The arms shall consist of a post or wall bracket mounting piece, a bent tube arm, and an end piece for luminaire mounting. The wall bracket shall have a flat aluminum wall plate for mounting. All welding shall be per ANSI/AWS D1.2. All welders shall be certified per ANSI/AWS D1.2.

Materials

- The post mounting piece and bent tube arm shall be from ASTM 6061 alloy.
- All hardware shall be stainless steel.
- If chosen, the QSM luminaire mounting will be cast aluminum produced from certified ASTM 356.1 ingot per ASTM B179 or ASTM B26.

Installation

- The tenon fitter is designed to slipfit a 4-3/8" O.D. by 12 inch (G12) tall tenon and attach with socket set screws
- Arms shall have either a QSM (Quick Stem Mount) or a 1-1/2 NPT male threaded end to match the same mounting style on a luminaire
- The wall bracket shall have clearance holes for mounting to the wall (wall mounting hardware furnished by others)
- All hardware shall be tamper resistant stainless steel

Finish

- Utilize a polyester powder coat paint to ensure maximum durability.
- Rigorous multi-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 5,000 hours exposure to salt fog chamber (operated per ASTM B117) on standard and RAL finish options.
- RAL (RALxxxxSDCR) paint colors are Super Durable Corrosion Resistant, 80% gloss.

Warranty

1-year limited warranty. Complete warranty terms located at (Holophane Pole Warranty): www.acuitybrands.com/support/warranty/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application. Specifications subject to change without notice.

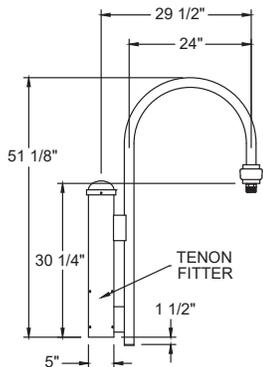
ORDERING INFORMATION

Example: CRB 30IN 1A TN QSM BK

Series	Height/Length	Number of Arms/Orientation	Arm Connection	Luminaire Mounting	Finish
CRB Cordoba GlasWerks Aluminum Roadway Arm	30IN 30 Inches	1A Single Roadway Arm 2A Double Roadway Arm, 2 single arms @ 180°	TN Tenon mount. WB Wall Bracket Mount	NPT 1-1/2" NPT QSM Quick Stem Mount	BK Black BZ Bronze CMC Customer matching color CTBS Standard color to be selected DB Dark Blue GN Green GH Graphite GR Gray PP Prime Painted RALxxxxSDCR RAL Super Durable Corrosion Resistant, 80% Gloss Paint, replace xxxx with RAL number SL Silver WH White
			<i>Note: WB only available with 1A</i>		

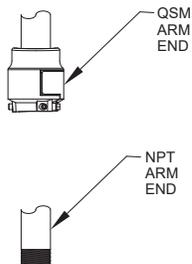
DIMENSIONAL DATA & ORIENTATION

Single Roadway Arm

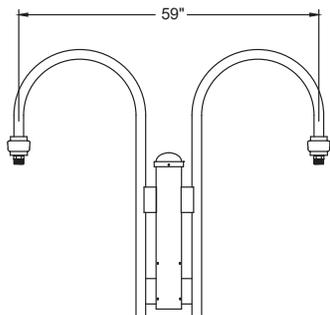


CRB 30IN 1A
((1) 30IN arm)

Luminaire Mounting Options

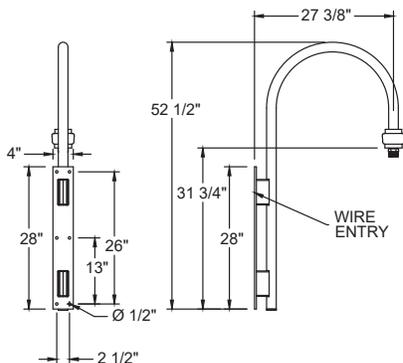


Double Roadway Arm



CRB 30IN 2A
((2) 30IN arms at 180°)

Wall Bracket Mount



CRB 30IN 1A WB
((1) 30IN Wall Bracket)

ARM	EPA (sqft)	Weight (LBS)
CRB 30IN 1A TN	1.92	20
CRB 30IN 2A TN	2.96	25
CRB 30IN 1A WB	1.92	20

Appendix B

LIGHTING ANALYSIS SUMMARY



AGI-32
EPHRAIM NORTHERN PATH ANALYSIS
ALTERNATIVE 1 RESULTS



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since 1984



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Luminaire Definition(s)

Luminaire: PUCL2_P30_30K_XX_FC4

Description	PUCL2 P30 30K XX FC4
<u>Attributes</u>	
Filename	PUCL2_P30_30K_XX_FC4.ies
[MANUFAC]	Holophane
[LUMCAT]	PUCL2 P30 30K XX FC4
<u>Photometry</u>	
Arrangement Luminaire Lumens	6531
Luminaire Lumens	6531
Luminaire Watts	66
Arrangement Watts	66
Luminaire Efficiency (%)	N.A.
S/P Ratio	1.00
Total Light Loss Factor	0.875
<u>Photometry-Luminous Box</u>	
Size (X, Y, Z)	0.88, 0.88, 0.01
Offset (X, Y, Z)	0, 0, -0.005
Photometric Center Offset (X, Y, Z)	0, 0, 1.095
<u>Metrics</u>	
Road Classification	Type IV, Short, N.A. (deprecated)
Indoor Classification	Direct
LER	99
Upward Waste Light Ratio	0.00
Max UGR	41.2
BUG Rating	B2-U0-G2
<u>Symbols</u>	
Calculation Symbol	Pole Postop -- Rectangular 2
Insertion Point (Vertical, Horizontal)	Bottom, Photometric Center
Housing Color (R, G, B)	51, 51, 51
Luminous Color (R, G, B)	255, 255, 255
Drawing Symbol	Pole Postop -- Rectangular 2
<u>Configuration</u>	
Arrangement	Single
Arm Length	0
Offset	0
Pole Mounted	



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Calculation Summary

42 Roadway

Project: Project_1
Points along a line
Coordinates in Feet

Point Spacing 7
Meter Type Horizontal

Illuminance (Fc)
Average 0.84
Maximum 2.0
Minimum 0.2
Avg/Min 4.20
Max/Min 10.00

Proposed SUP

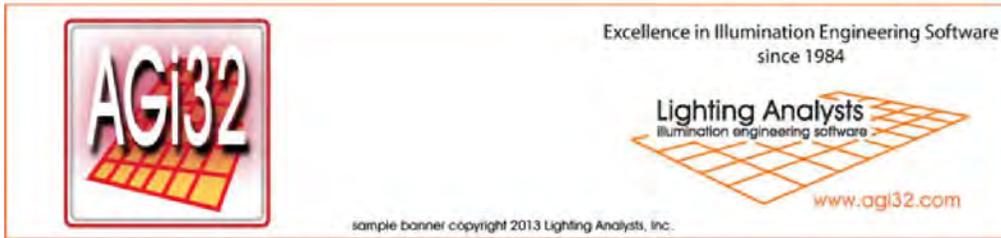
Project: Project_1
Points along a line
Coordinates in Feet

Point Spacing 7
Meter Type Horizontal

Illuminance (Fc)
Average 1.17
Maximum 2.3
Minimum 0.3
Avg/Min 3.90
Max/Min 7.67



AGI-32
EPHRAIM NORTHERN PATH ANALYSIS
ALTERNATIVE 2 RESULTS



Luminaire Definition(s)

Luminaire: ATB0_20BLEDE10_XXXXX_R3_3K_HS

Description	ATB0_20BLEDE10_XXXXX_R3_3K_HSS
<u>Attributes</u>	
Filename	ATB0_20BLEDE10_XXXXX_R3_3K_HSS.ies
[MANUFAC]	American Electric Lighting
[LUMCAT]	ATB0_20BLEDE10_XXXXX_R3_3K_HSS
<u>Photometry</u>	
Arrangement Luminaire Lumens	6845
Luminaire Lumens	6845
Luminaire Watts	71
Arrangement Watts	71
Luminaire Efficiency (%)	N.A.
S/P Ratio	1.00
Total Light Loss Factor	0.875
<u>Photometry-Luminous Box</u>	
Size (X, Y, Z)	0.45, 0.8, 0.03
Offset (X, Y, Z)	0, 0, 0
Photometric Center Offset (X, Y, Z)	0.225, 0, 0.1
<u>Metrics</u>	
Road Classification	Type III, Short, N.A. (deprecated)
Indoor Classification	Direct
LER	96
Upward Waste Light Ratio	0.00
Max UGR	38.2
BUG Rating	B1-U0-G2
<u>Symbols</u>	
Calculation Symbol	Pole Arm -- Rectangular LS
Insertion Point (Vertical, Horizontal)	Bottom, 180
Housing Color (R, G, B)	51, 51, 51
Luminous Color (R, G, B)	255, 255, 255
Drawing Symbol	Pole Arm -- Rectangular LS
<u>Configuration</u>	
Arrangement	Single
Arm Length	4
Offset	0
Pole Mounted	



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Calculation Summary

42 Roadway

Project: AGI-Import_1

Points along a line

Coordinates in Feet

Point Spacing 7
Meter Type Horizontal

Illuminance (Fc)
Average 0.74
Maximum 2.3
Minimum 0.2
Avg/Min 3.70
Max/Min 11.50

Proposed SUP

Project: AGI-Import_1

Points along a line

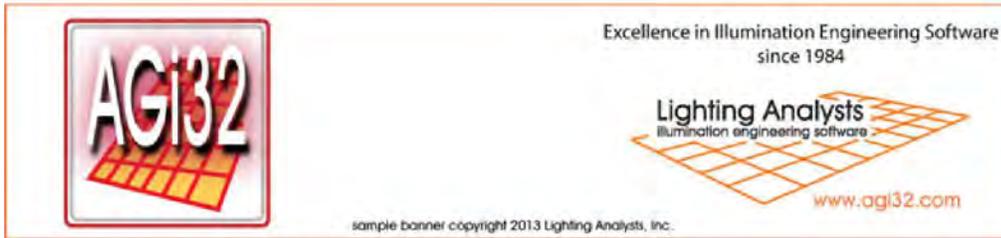
Coordinates in Feet

Point Spacing 7
Meter Type Horizontal

Illuminance (Fc)
Average 1.24
Maximum 3.0
Minimum 0.3
Avg/Min 4.13
Max/Min 10.00



AGI-32
EPHRAIM NORTHERN PATH ANALYSIS
ALTERNATIVE 3 RESULTS



Luminaire Definition(s)

Luminaire: GBLF2_P20_40K_XX_X_X_FC3

Description	GBLF2 P20 40K XX X X FC3
<u>Attributes</u>	
Filename	GBLF2_P20_40K_XX_X_X_FC3.ies
[MANUFAC]	Holophane
[LUMCAT]	GBLF2 P20 40K XX X X FC3
<u>Photometry</u>	
Arrangement Luminaire Lumens	6808
Luminaire Lumens	6808
Luminaire Watts	58
Arrangement Watts	58
Luminaire Efficiency (%)	N.A.
S/P Ratio	1.00
Total Light Loss Factor	0.875
<u>Photometry-Luminous Box</u>	
Size (X, Y, Z)	2.29, 2.29, 0.01
Offset (X, Y, Z)	0, 0, -0.005
Photometric Center Offset (X, Y, Z)	0, 0, -0.305
<u>Metrics</u>	
Road Classification	Type III, Short, N.A. (deprecated)
Indoor Classification	Direct
LER	117
Upward Waste Light Ratio	0.00
Max UGR	29.5
BUG Rating	B1-U0-G2
<u>Symbols</u>	
Calculation Symbol	Suspended Pendant -- Circular Down 1
Insertion Point (Vertical, Horizontal)	Top, Photometric Center
Housing Color (R, G, B)	51, 51, 51
Luminous Color (R, G, B)	255, 255, 255
Drawing Symbol	Suspended Pendant -- Circular Down 1
<u>Configuration</u>	
Arrangement	Single
Arm Length	0
Offset	0
Pendant Mounted	



Calculation Summary

42 Roadway

Project: AGI-Import_1
Points along a line
Coordinates in Feet

Point Spacing 7
Meter Type Horizontal

Illuminance (Fc)

Average	0.80
Maximum	1.9
Minimum	0.2
Avg/Min	4.00
Max/Min	9.50

Proposed SUP

Project: AGI-Import_1
Points along a line
Coordinates in Feet

Point Spacing 7
Meter Type Horizontal

Illuminance (Fc)

Average	1.25
Maximum	2.5
Minimum	0.3
Avg/Min	4.17
Max/Min	8.33

Appendix C

2022 NEI COST ESTIMATE



DATE: 01/31/2022

ATTENTION: Brent Bristol

REFERENCE: Proposed Roadway Lighting

Northern Electric, Inc. is pleased to submit this quotation for your consideration.

- Furnish & install underground conduit & wire for 3600' feet of roadway in Ephraim. Backfill, tamp, and re-seed as necessary, \$399,600.00 (\$111 per foot)
- Furnish & install (3) lighting control cabinets, \$54,852.00 (\$18,284 each)
- Furnish & install (36) poles, fixtures, splice boxes, bases, DOT hardware, \$431,532.00 (\$11,987 each)
- To change any base to a spread footing, add \$1,700 each
- Additional conduit between Anderson Lane and South Orchard (approximately 5500') cost \$610,500.
- These costs are based on final order quantity of the order, date of order, and today's commodity pricing
- Specifically excluded, if required, are any permit fees, spread footing pole bases, surveying, easements, utility fees, taxes, or bonds
- This proposal's price is based on the commodity costs of today, 1-31-2022, and good for 10 days

If you have any questions regarding this quotation, please feel free to contact me. Thank you for the opportunity.

Sincerely,

NORTHERN ELECTRIC, INC.

Bill C. Seronko

Bill Seronko

Project Manager | Estimator

All taxes, if applicable, are included in our submission. The Contractor shall not be held liable for errors or omissions in designs by others, nor inadequacies of materials and equipment specified or supplied by others. Equipment and materials supplied by the contractor are warranted only to the extent that the same are warranted by the manufacturer, or as specified. The Contractor shall not be liable for indirect loss or damage. Unless included in this proposal, all bonding and/or special insurance are supplied at additional cost. If a formal contract is required, its conditions must not deviate from this proposal without our permission. Anything (verbal or written) expressed or implied elsewhere, which is contrary to these conditions shall be null and void. This proposal is void if not accepted in writing within **10 days** after this date. No work shall commence until this proposal is returned to the contractor, signed below by the Customer. Information contained in this proposal, including part numbers, installation details, pricing information, and engineering drawings shall be considered Proprietary and Confidential, and shall not be duplicated or shared with persons other than the intended recipient(s) referenced above.



**EPHRAIM NORTH LIGHTING
ALTERNATIVE 2**



KEY

● - LIGHT POLE

LEGEND

- - 0.2 Fc (Required Minimum)
- - 0.2 TO 0.4 Fc
- - 0.4 TO 1.5 Fc
- - 1.5 TO 4.0 Fc

Alternative 2 Agi-32 Results			
	Average (foot-candles)	Minimum (foot-candles)	Uniformity Ratio
Roadway	0.74	0.2	3.70
Future Pedestrian Space	1.24	0.3	4.13

POLE CONFIGURATION

SPACING: 120 FT
POLE HEIGHT: 22 FT
MOUNTING TYPE: MAST ARM (4 FT)
POLE TYPE: ALUMINUM
TOTAL POLES: 32

**Autobahn Series ATB0
Roadway Lighting**





**EPHRAIM NORTH LIGHTING
ALTERNATIVE 3**



KEY

● - LIGHT POLE

LEGEND

- - 0.2 Fc (Required Minimum)
- - 0.2 TO 0.4 Fc
- - 0.4 TO 1.5 Fc
- - 1.5 TO 4.0 Fc

Alternative 3 Agi-32 Results			
	Average (foot-candles)	Minimum (foot-candles)	Uniformity Ratio
Roadway	0.80	0.2	4.00
Future Pedestrian Space	1.25	0.3	4.17

POLE CONFIGURATION

SPACING: 105 FT
POLE HEIGHT: 22 FT
MOUNTING TYPE: PENDANT
POLE TYPE: ALUMINUM
TOTAL POLES: 40

GPLF3
 GlasWerks® Luminescent
 LED Prague®



Ephraim - North Path exhibits

From: Becker, Nick <nick.becker@aecom.com>
Sent: Wed, Jul 6, 2022 at 4:53 pm
To: bbristol@ephrain-wisconsin.com, KenNelson
Cc: Czech, Andrew, Ewing, Nathan

image001.png (7.3 KB) Ephraim_Prop_ShldrWiden_RollPlot.pdf (1.6 MB)
Ephraim_Prop_SUP_RollPlot.pdf (1.8 MB) – **Download all**

Hi Brent and Ken,

We have attached large roll plot PDFs of the SUP vs shoulder widening. Here are some key points to it

- Path is 10' wide
- Shoulder widening is 10' total width, 8 paved and 2' agg. (Standard DOT shoulder width in other parts of 57/42 in northern door). If the full 10' was paved it increase the cost slightly.
- ROW acquisition only needed at intersection of WIS 42 and Anderson lane depending on which design was done. For example path/sidewalk was separated from shoulder vs being at the edge of pavement like the streetscape project was. No further acquisition would be required beyond that.
- Temporary grading easements are assumed to be needed throughout the corridor
 - Some parcels we do not have enough survey to get actual impacts due to steep slopes so they are assumed. This is for both options.
 - Walls could be used with railings on top if grading easements were a problem. Note this would drive up the cost vs TLEs
 - With some profile adjustments this could be reduced once survey is obtained. However, some locations would be unavoidable for wall or grading easements especially in the Anderson to Orchard segment.

• Costs

Ephraim - 2022 estimated cost for North Path			
	Anderson to Orchard	Orchard to Townline	Total
2015 - 10' Shared Use Path			\$ 550,000
2022 - 10' Shared Use Path	\$ 470,000.00	\$ 300,000.00	\$ 770,000
2022 - Northbound 10' Shoulder Widening	\$ 690,000.00	\$ 460,000.00	\$ 1,150,000

◦ *does not include utility relocations, easements, or ROW acquisition

- Walls are not included in the cost and not preferred. Obtaining easements are preferred.
 - The biggest difference between SUP and shoulder widening is the amount of aggregate needed for base as it has to match the existing roadway in thickness. The shoulder is also thicker than the path as it has to match other segments of WIS 42 is our assumption. There is greater excavation for the shoulder widening due to the thicker pavement sections.
- ## • Risks
- If DOT does not allow one side of shoulder widening and wants both. That would double your cost. This is an unknown.
 - With Shoulder Widening, DOT could request some drainage work. This is an unknown.
 - Where would the Village want cross walks to be permitted if any? If so depending on what DOT would want, it could add some cost at the opposite side for a curb ramp
 - Traffic control is more complex for shoulder widening due to proximity to lanes. Meaning TC will be flagging operations. However, during earthwork even for the SUP flagging operations, would be required
 - Utility impacts as some utilities would need to relocate or adjust
 - Removal impacts
 - Trees (on both options)
 - Existing light poles (on both options)
 - Adjustment of roadway signs
 - SUP greater impacts due to near ROW limits
 - More trees

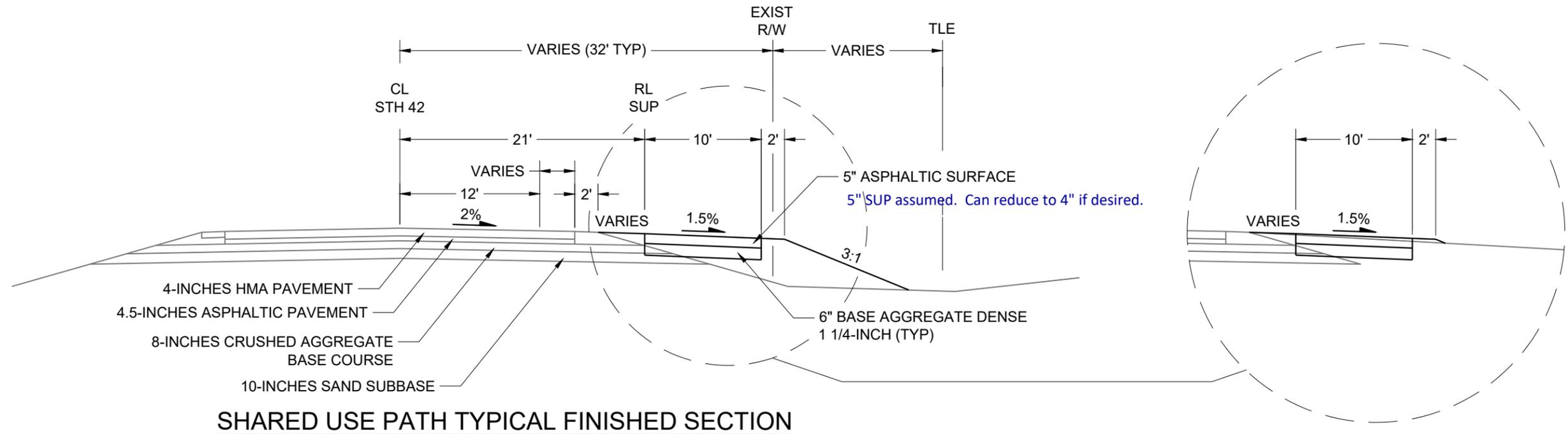
- Planter impacts within DOT ROW
- Greater utility impacts as poles are within path. Depending on utility coordination and DOT, Path could be shifted around to be in front of existing poles of objects at spots.
- Roadway signs would be moved to in between existing shoulder and path. DOT could ask to replace them with new if outdated or too old

If you have any further questions, please let us know.

Thanks!

Nicholas J. Becker, PE, STS
**PE in WI, IL, ND, SD, MN, TX*
he, him, his

Project Manager
M +1-262-443-0191
nick.becker@aecom.com



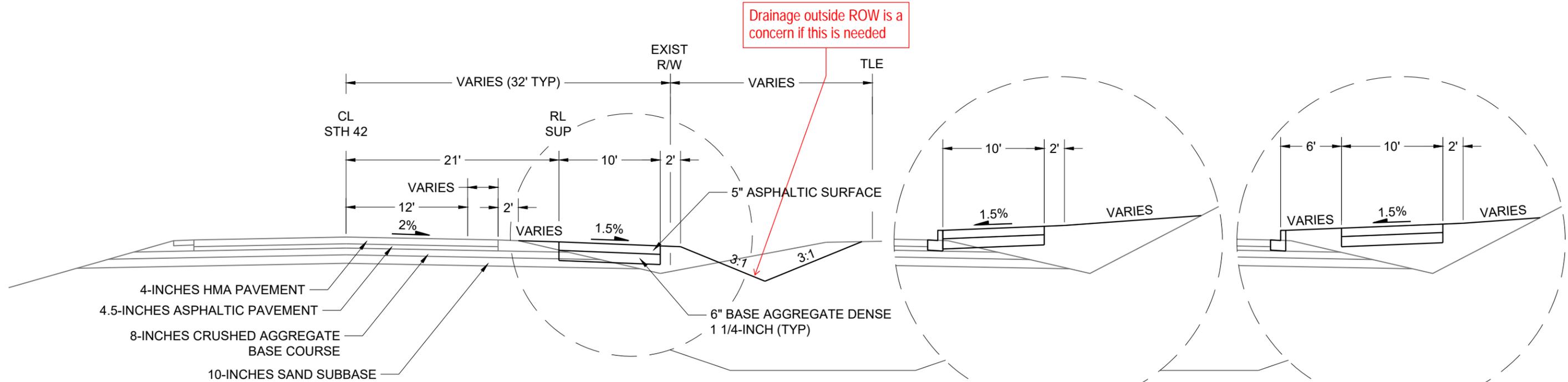
SHARED USE PATH TYPICAL FINISHED SECTION

STH 42

FILL SECTION

FLUSH SECTION

Drainage outside ROW is a concern if this is needed



SHARED USE PATH TYPICAL FINISHED SECTION

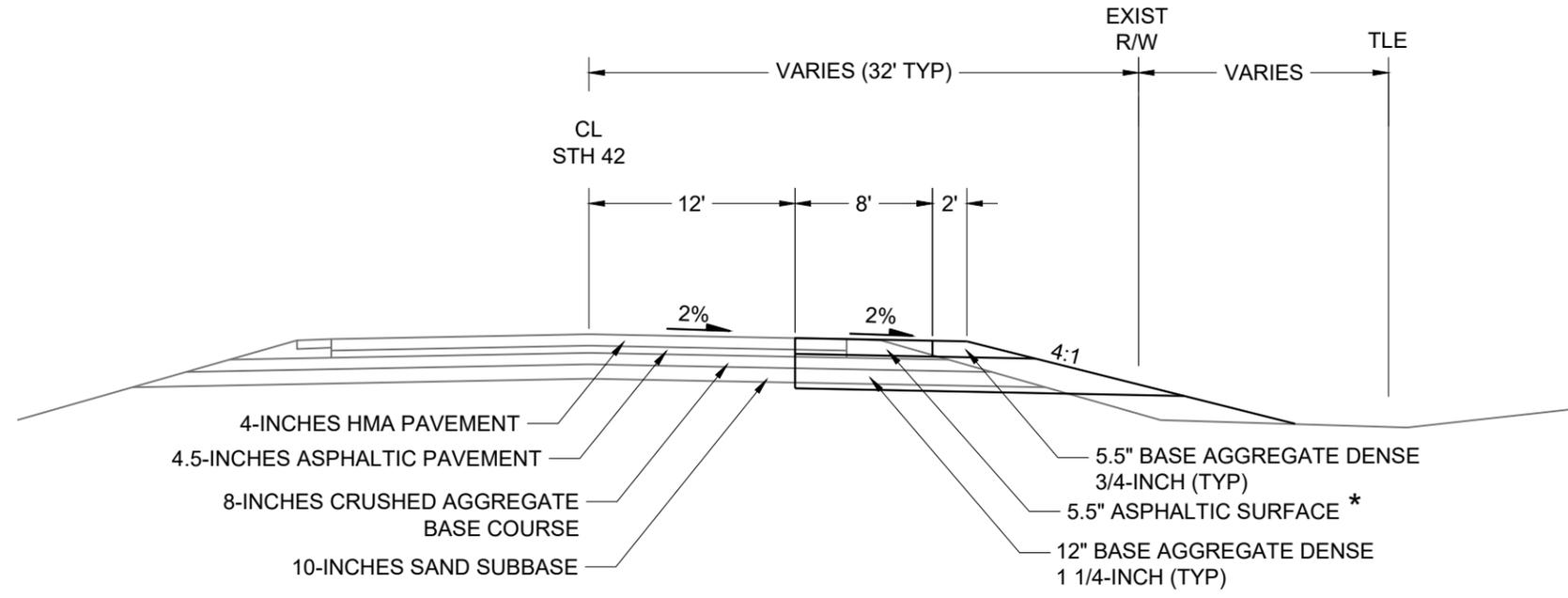
STH 42

CUT SECTION

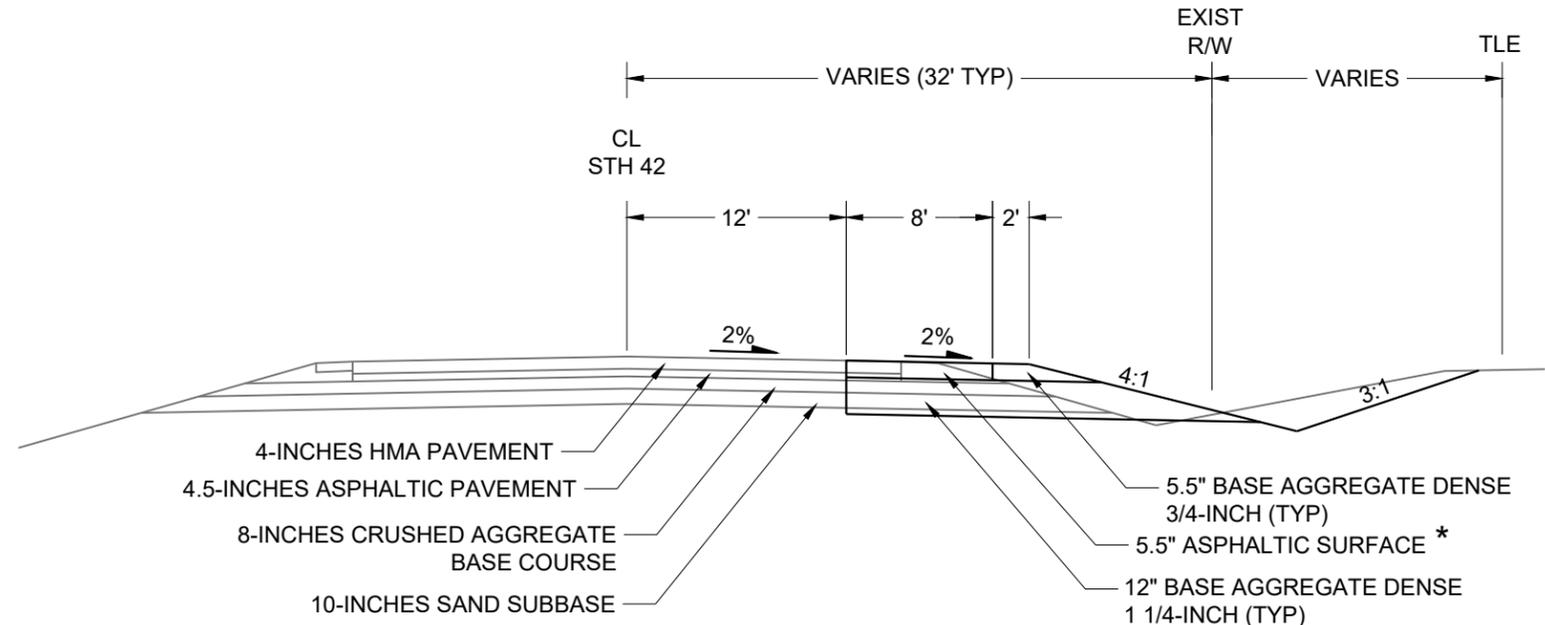
Options if needed for drainage to stay within ROW

CURB AND GUTTER CUT SECTION

CURB AND GUTTER CUT SECTION WITH TERRACE



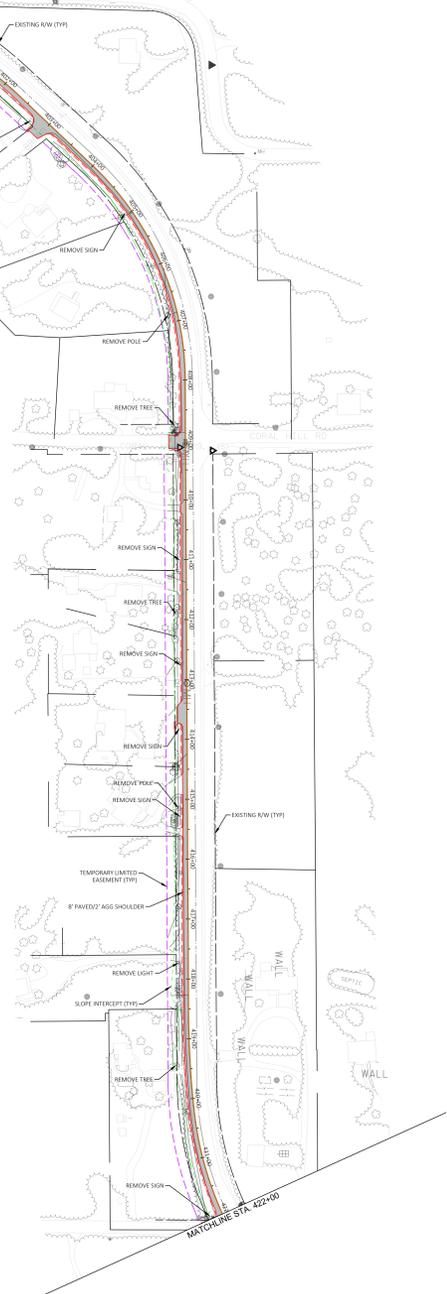
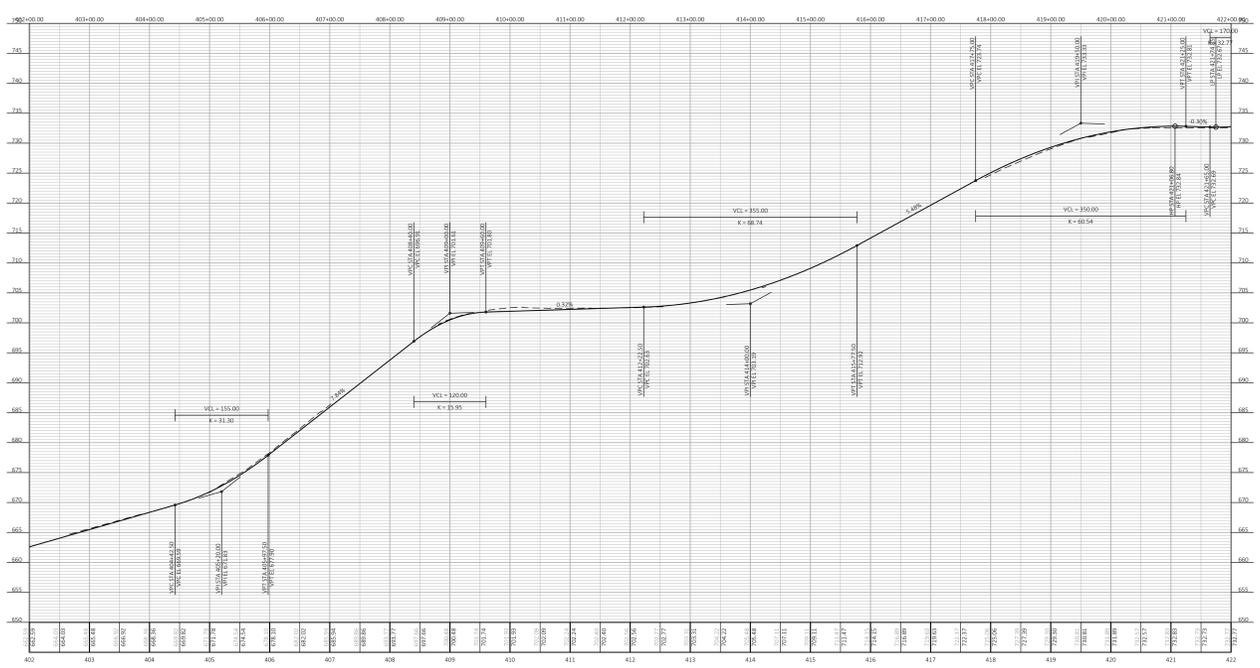
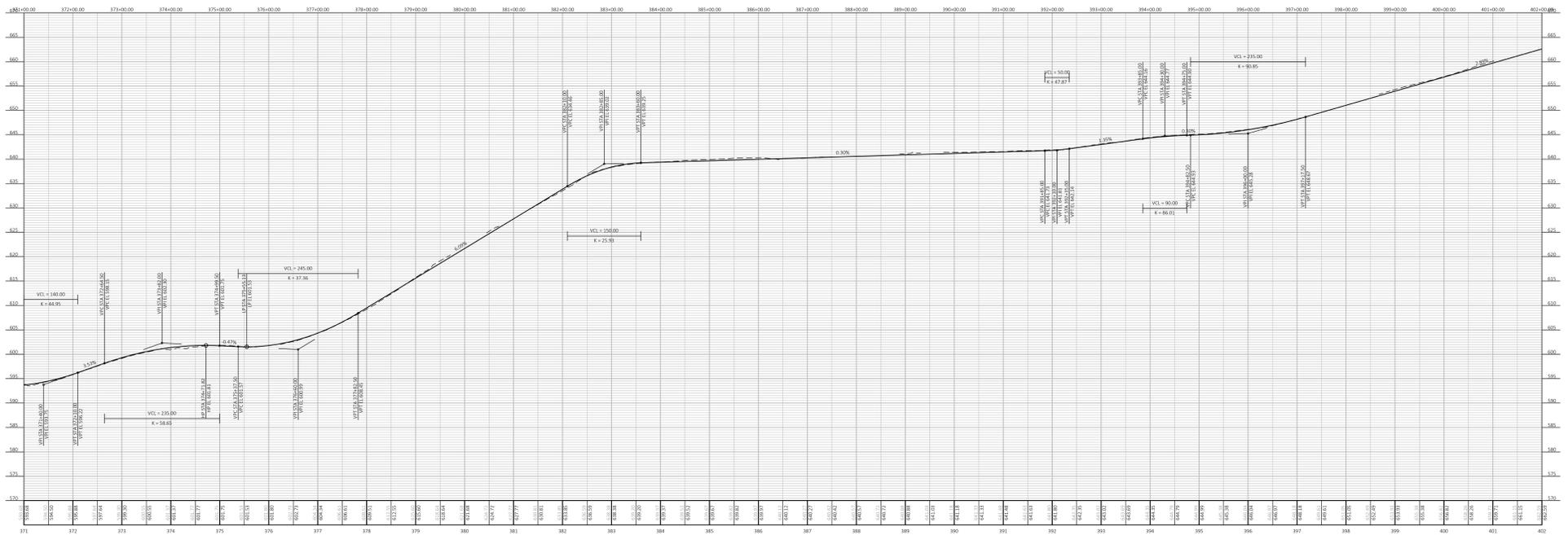
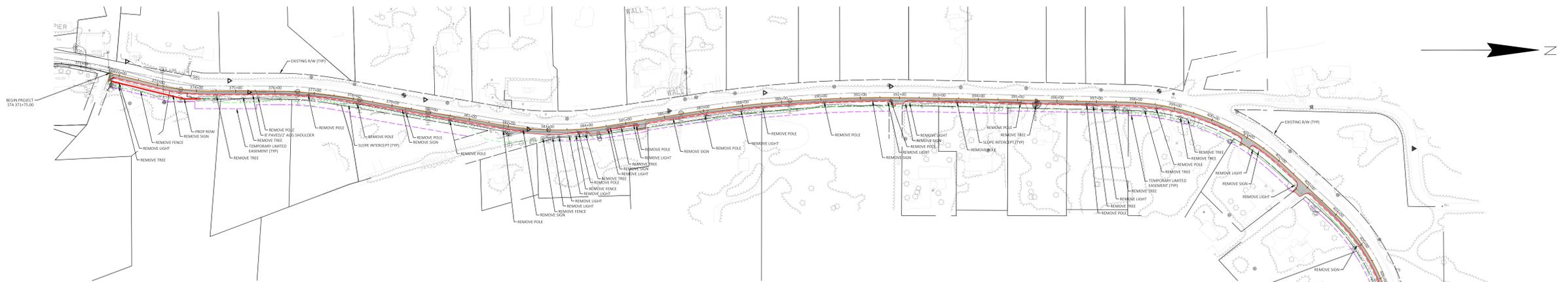
SHOULDER WIDENING TYPICAL FINISHED SECTION
STH 42
 FILL SECTION

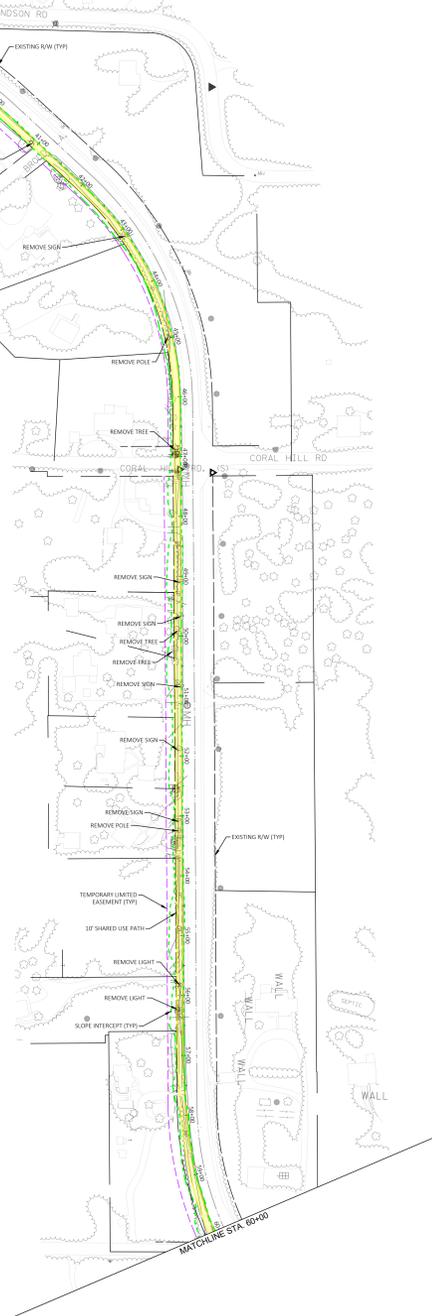
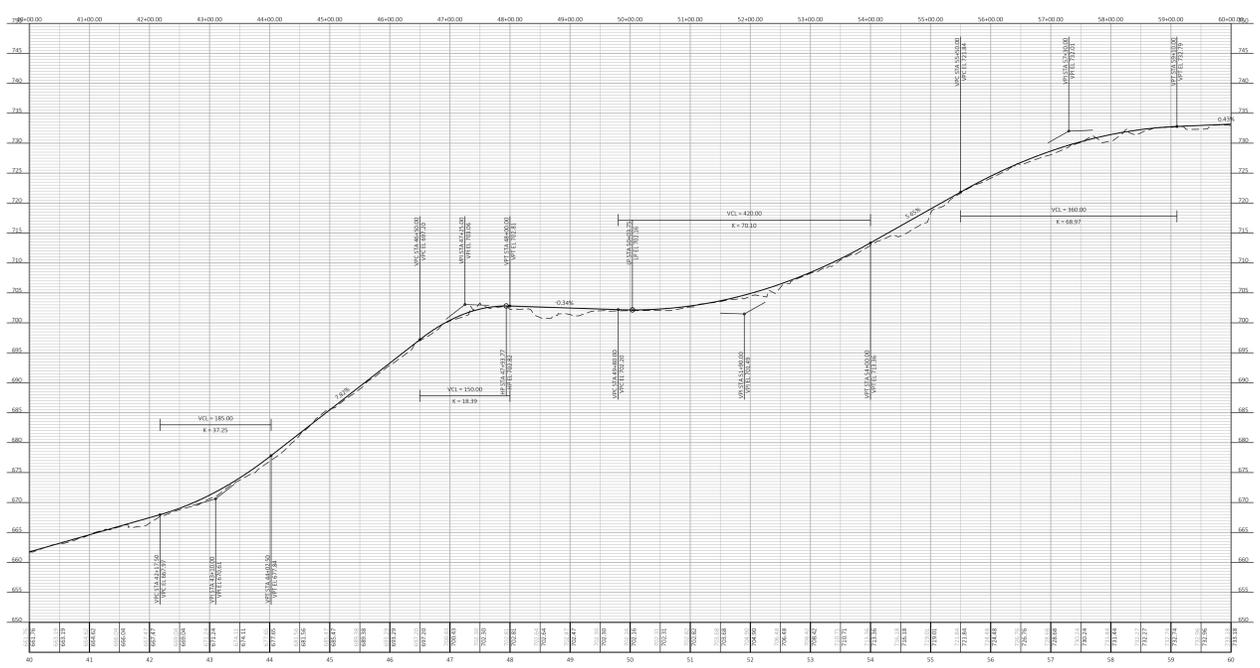
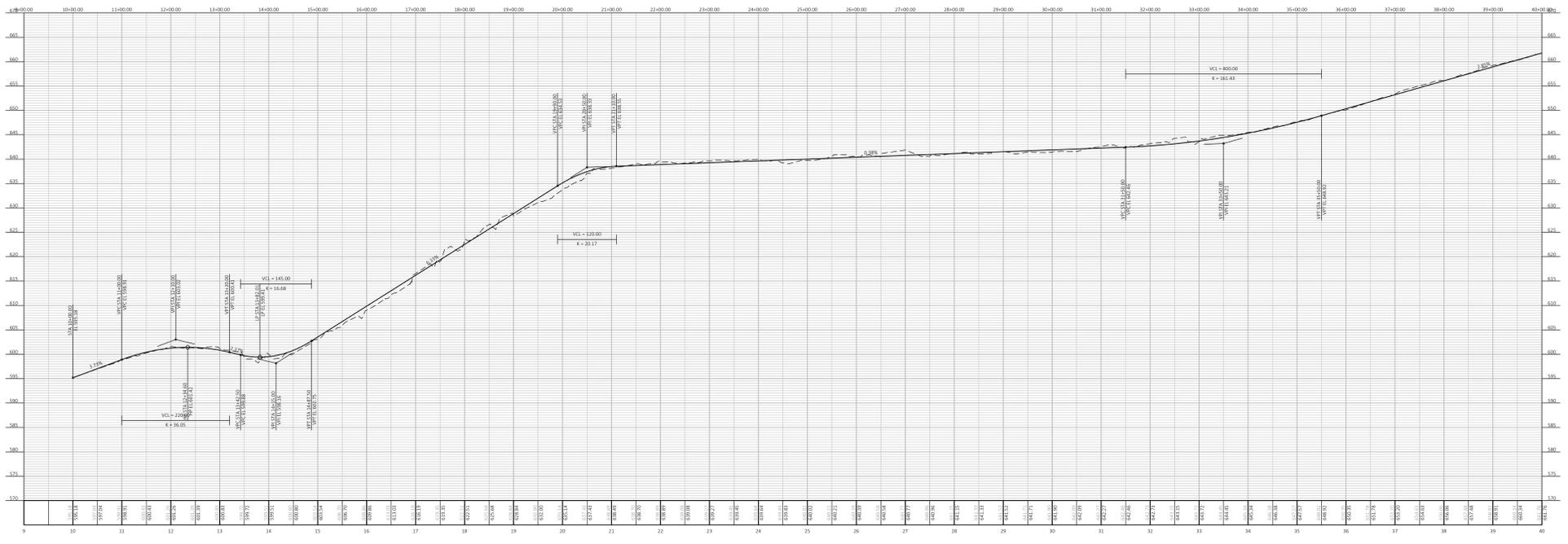
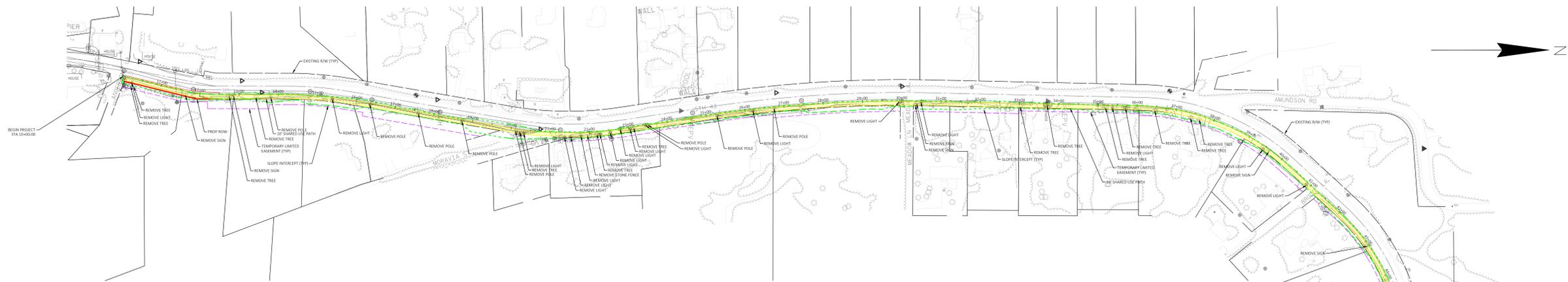


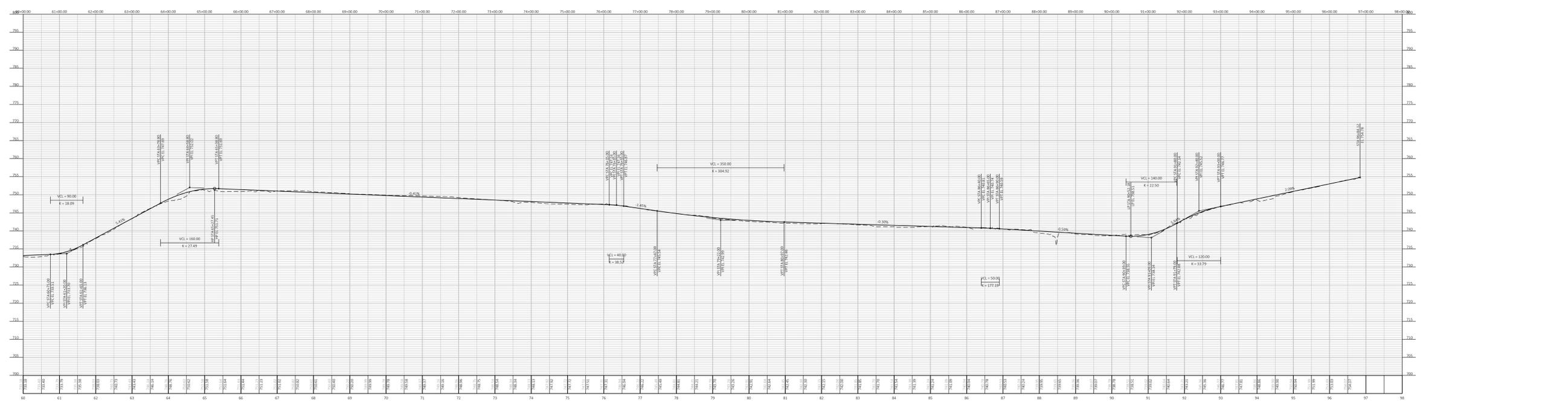
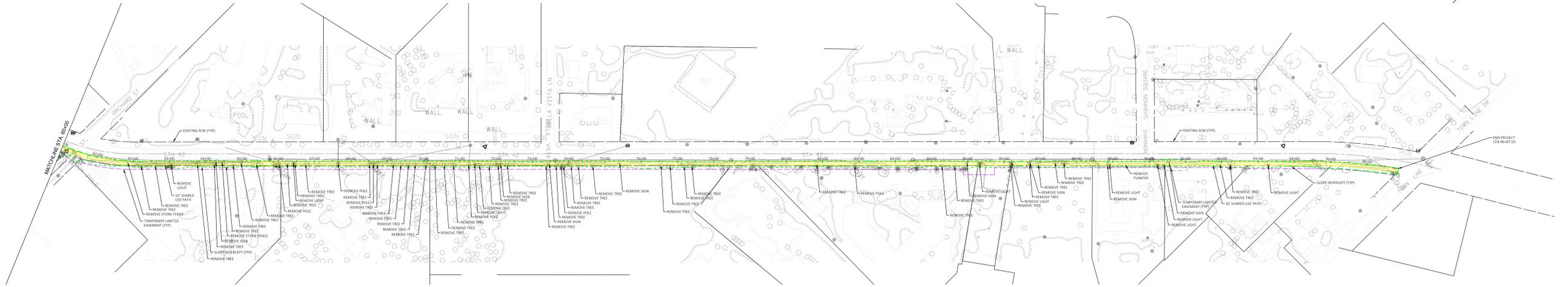
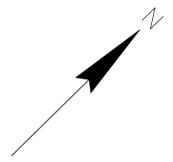
SHOULDER WIDENING TYPICAL FINISHED SECTION
STH 42
 CUT SECTION

* WISDOT TO CONCUR PAVEMENT THICKNESS

Existing pavement thickness is either 8.5" or 4" depending if the original shoulder was paved out that far.







PROJECT NO: 60683307	HWY: STH 42	COUNTY: DOOR	PROPOSED SUP PLAN ROLL PLOT	SHEET	E
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