Appendix F
Capital and Operating Costs Technical Memorandum

Envision My Ride: Bus Priority Study Technical Memorandum | Task 6 Opinion of Probable Cost Documentation – FINAL

June 30, 2022

1 INTRODUCTION

This memorandum documents the cost methodologies used to develop an opinion of probable cost for the Envision My Ride (EMR) Bus Priority Study (BPS). Capital cost results are organized as follows:

- Corridor-level costs for the initial six corridors (Routes 9, 7, 16, 27, 34, and 2)
- Systemwide costs including the initial six corridors and the remaining sixteen high-frequency (core) corridors (Routes 1, 3, 4, 5, 6, 8, 10, 14, 15, 19, 21, 22, 25, 29, 39, 56, 60)

Overall estimated operating costs for the EMR program are also documented.

2 COST METHODOLOGIES

The EMR BPS project team followed the approach described in the March 12, 2021 Capital and Operating Cost Methodology memorandum to develop the opinion of probable cost, with the following adjustments:

- Instead of bus lanes, queue jumps are broken out as their own treatment type separate from TSP
- A 50% contingency is applied instead of 35% to account for recent cost uncertainties due to COVID

2.1 Capital Costs

Table 1 summarizes the broad treatment categories and units used to develop initial capital costs. The methodology used to develop unit costs for each treatment type is described in the following pages.

Table 1. Unit Costs by Treatment Type

Treatment Type	Unit
Passenger Facilities	per facility
Transit Signal Priority (TSP)	per intersection
Queue Jumps	per intersection approach

Passenger Facilities

Passenger facilities include four types of treatments:

- **Level 0 Standard Bus Stop** - New standard for regular bus stop system-wide, single bus stop, with three types (A, B, C) based on population and jobs per acre. These are proposed for lower-frequency routes including common, community, and peak-hour/express routes.
- **Level 1 Enhanced Stop Pair** - Pair of far-side stops for high-frequency route/corridors. These are proposed along core routes at stops that meet the bus stop guidelines presented in Appendix D: Bus Stop Guidelines Memorandum.
- **Level 2 Mobility Plaza** - Intersection of two high-frequency bus routes, where four far-side bus stops are treated as a single unit for purpose of these cost estimates. These are proposed at key locations along core routes.
- **Level 3 Mobility Center** - Off-street transit center, such as terminus or park & ride. These are proposed, where applicable, systemwide.

See the Final Report Appendix D: Bus Stop Guidelines Memorandum for more details on passenger facility application. See Appendix A of this memorandum for details on amenities included with each facility type and Appendix B of this memorandum for cost assumptions, including a diagram and tables of materials, quantities, and costs for each facility type.

Table 2 shows the planning-level unit costs for each passenger facility type. All stops are assumed to include a bus pad.

Table 2. Passenger Facility Unit Costs

Facility Type	Number of Bus Stops Included	Unit Cost (With Bus Pad)
Level 0: Type A	1	$46,000
Level 0: Type B	1	$52,000
Level 0: Type C	1	$90,000
Level 1: Enhanced Stop Pairs	2	$437,000
Level 2: Mobility Plaza	4	$894,000
Level 3: Mobility Center	Varies - Multiple	$1,935,000

Notes:
1. Unit costs are in 2022 dollars.
2. Unit costs and total costs in the body of this report are rounded to the nearest $100.
3. Unit costs for passenger facilities include 5% mobilization or $1,000, whichever is greater; 20% administration; 20% inspection; and 50% contingency to account for variations in site requirements.
4. Unit costs assume curb & gutter.
5. Though Level 1: Enhanced Stop Pair unit costs are per pair, Level 1 stop quantities are counted individually rather than in pairs because some Level 1 stops are not part of a pair. Half of unit cost is thus applied to the individual stop count.

Signal Priority Treatments

Signal priority treatments include TSP and queue jumps. Table 3 shows the unit costs for each signal priority treatment type.

Table 3. Signal Priority Unit Costs

Treatment Type	Unit Cost
TSP - CDOT-owned signal	$0
TSP - NCDOT-owned signal	$20,000
Queue jump	$43,000

Notes:
1. Unit costs are in 2022 dollars.
2. According to CDOT, CDOT-operated signals with fiber running to them are TSP-ready; therefore, the marginal cost to implement TSP is considered to be zero. Additional costs related to retiming signals, adding new signal heads, or running fiber to signals may need to be considered as part of corridor design and implementation.
3. The unit cost for NCDOT-owned signals includes controller upgrades and signal cabinet and foundation replacement. Additional costs related to design and construction may need to be considered as part of corridor design and implementation.

2.2 Operating Costs

Based on the EMR BPS project team's March 12, 2021 Capital and Operating Cost Methodology memorandum, CATS developed a planning-level initial estimate of O&M costs for bus operations in each of the twenty-three core corridors based on the following assumptions:

- Cost of $114 per revenue hour
- Operations based on 252 weekdays, 55 Saturdays, and 58 Sundays (accounting for holiday schedules)

Based on a total of 747,978 proposed revenue hours, the annual O&M cost is estimated to be $85,270,700 as shown in Table 4.

Table 4. Proposed Annual Operations and Maintenance Costs

Route #	Route Name	Current Annual Revenue Hours	Proposed Annual Revenue Hours	Change in Annual Revenue Hours	Proposed Annual Cost (Rounded to Nearest $100)	Change in Annual Cost
1	Mt. Holly	20,264	31,265	11,001	$3,564,300	$1,254,200
2	Ashley Rd	12,871	21,281	8,410	$2,426,100	$958,800
3	The Plaza	27,388	43,501	16,113	$4,959,200	$1,836,900
4	Belmont	13,577	22,010	8,433	$2,509,200	$961,400
5	Sprinter (Airport)	17,369	25,348	7,979	$2,889,700	$909,700
6	Kings Dr	10,829	36,369	25,540	$4,146,100	$2,911,700
7	Beatties Ford Rd	40,974	41,986	1,013	$4,786,500	$115,500
8	Tuckaseegee	17,933	28,201	10,268	$3,214,900	$1,170,500
9	Central Ave	41,825	43,401	1,576	$4,947,700	$179,700
10	West Blvd	21,248	38,323	17,074	$4,368,800	$1,946,500
14	Providence Rd	13,629	35,061	21,432	$3,997,000	$2,443,300
15	Randolph Rd	18,062	21,770	3,708	$2,481,800	$422,800
16	South Tryon	37,799	43,379	5,580	$4,945,300	$636,100
19	Park Rd	33,199	39,577	6,379	$4,511,900	$727,200
21	Statesville Ave	13,789	35,507	21,718	$4,047,800	$2,475,900
22	Graham	22,503	33,289	10,786	$3,795,000	$1,229,600
25	Sugar Creek	N/A (new route)	15,900	15,900	$1,812,600	$1,812,600
27	Monroe Rd	29,474	40,617	11,143	$4,630,400	$1,270,300
29	JW Clay/UNCC	18,823	50,972	32,149	$5,810,900	$3,665,000
34	Freedom Dr	20,110	32,502	12,392	$3,705,300	$1,412,700
39	Eastway	16,434	22,365	5,930	$2,549,600	$676,100
56	Arrowood	17,015	22,507	5,492	$2,565,800	$626,100
60	Tyvola	13,324	22,848	9,525	$2,604,800	$1,085,800
	TOTAL	**478,439**	**747,978**	**269,539**	**$85,270,700**	**$30,728,400**

3 CORRIDOR-LEVEL CAPITAL COSTS

Corridor-level costs for the six focus corridors were developed based on recommendations presented in Appendix C: Corridor Recommendations Technical Memorandum and refined for the BPS Final Report. The planning-level proposed initial investment in these corridors is expected to cost a total of approximately $91 million.

Table 5 presents the quantities for each treatment type by corridor. Table 6 presents the corridor costs for signal priority treatments, and Table 7 presents the corridor costs for passenger facilities.

Table 5. Quantities for Initial Six Corridors by Treatment Type

Route	Signal Priority Quantities			Passenger Facility Quantities					
	TSP (CDOT-owned signal)	TSP (NCDOT-owned signal)	Queue Jump	Level 0 Type A Stops	Level 0 Type B Stops	Level 0 Type C Stops	Level 1 Enhanced Stop Pairs (Individual Stop Counts)	Level 2 Mobility Plazas	Level 3 Mobility Center
9	12	6	2	6	4	5	43	3	2
7	6	0	0	12	12	22	31	2	2
16	23	0	10	22	17	4	38	8	1
27	12*	2	2	25	32	8	43	2	1
34	2	0	1	8	2	2	31	1	1
2	6**	0	0	0	7	10	12	6	1

Table 6. Costs for Six Focus Corridors – Signal Priority

Route	TSP (CDOT-owned signal)	TSP (NCDOT-owned signal)	Queue Jump	Corridor Cost
9	$0	$120,000	$86,000	**$206,000**
7	$0	$0	$0	**$0**
16	$0	$0	$430,000	**$430,000**
27	$0	$40,000	$86,000	**$126,000**
34	$0	$0	$43,000	**$43,000**
2	$0	$0	$0	**$0**
Total	**$0**	**$160,000**	**$645,000**	**$805,000**

Table 7. Costs for Six Focus Corridors – Passenger Facilities

Route	Level 0 Type A Stops	Level 0 Type B Stops	Level 0 Type C Stops	Level 1 Stops	Level 2 Mobility Plazas	Level 3 Mobility Center	Corridor Cost (Rounded)
9	$276,000	$208,000	$450,000	$9,395,500	$2,682,000	$3,870,000	**$16.9M**
7	$552,000	$624,000	$1,980,000	$6,773,500	$1,788,000	$3,870,000	**$15.6M**
16	$1,012,000	$884,000	$360,000	$8,303,000	$7,152,000	$1,935,000	**$19.6M**
27	$1,150,000	$1,664,000	$720,000	$9,395,500	$1,788,000	$1,935,000	**$16.7M**
34	$368,000	$104,000	$180,000	$6,773,500	$894,000	$1,935,000	**$10.3M**
2	$0	$364,000	$900,000	$2,622,000	$5,364,000	$1,935,000	**$11.2M**
Total (Rounded)	**$3.4M**	**$3.8M**	**$4.6M**	**$43.3M**	**$19.7M**	**$15.5M**	**$90.3M**

4 SYSTEMWIDE CAPITAL COSTS

Systemwide costs for EMR BPS improvement were developed to include:

- Initial six corridors
- Remaining high frequency (core) routes

Level 2 mobility plaza and Level 3 mobility hubs proposed for peak-hour high frequency routes and common routes are included with the remaining core routes.

4.1 Assumptions for Systemwide Quantities

To estimate a potential number of TSP and queue jump installations along the remaining core routes, Kittelson developed an average per-mile quantities for the initial six corridors of 1.3 signals per mile with TSP and 0.28 queue jumps per mile as summarized in Table 8. These per-mile averages were applied to the length of each remaining core route to estimate planning-level quantities for each route, as shown in Table 9.

Table 8. Development of Average Number of Bus Priority Treatments Per Mile

Route	Length (miles)	Signals with TSP per mile	Queue jumps per mile
9	7.95	2.26	0.25
7	10.35	0.58	0.00
16	13.03	1.77	0.77
27	12.54	1.12	0.16
34	8.94	0.22	0.11
2	5.89	1.02	0.00
Average for Initial Six Routes		**1.16**	**0.22**

Table 9. Potential Bus Priority Treatment Quantities for Remaining Core Routes

Route	Length (miles)	Signals with TSP	Queue Jumps
1	11.70	14	3
3	14.61	17	3
4	5.76	7	1
5	7.74	9	2
6	6.79	8	1
8	7.19	8	2
10	9.81	11	2
14	14.06	16	3
15	5.60	7	1
19	12.60	15	3
21	11.45	13	2
22	10.73	12	2
25	6.06	7	1
29	15.88	18	3
39	8.16	9	2
56	9.00	10	2
60	9.40	11	2
	Total Quantities	**193**	**35**

The project team assessed the need for Level 0 and Level 1 stop types for the entire high-frequency network using the criteria provided in Appendix D: Bus Stop Guidelines Memorandum. Since Route 25 is proposed as a new route and does not yet have specific stop recommendations, Kittelson estimated the breakdown of stop types using the following assumptions:

- 24 total stops (4 stops per mile, 6-mile route)
- 4 Level 0 Type A stops (applying average proportion of 18% for six focus routes and rounding to nearest whole number)
- 4 Level 0 Type B stops (applying average proportion of 18% for six focus routes and rounding to nearest whole number)
- 4 Level 0 Type C stops (applying average proportion of 15% for six focus routes and rounding to nearest whole number)
- 12 Level 1 individual stops (applying average proportion of 49% for six focus routes and rounding to nearest whole number)

Table 10 summarizes the total proposed quantities for the initial six routes presented in Section 3 of this memorandum and the estimated quantities for the remaining core routes including the new Route 25.

Table 10. Quantities for EMR Core Routes by Treatment Type

Routes	TSP	Queue Jump	Level 0 Type A Stops	Level 0 Type B Stops	Level 0 Type C Stops	Level 1 Enhanced Stop Pairs (Individual Stop Counts)	Level 2 Mobility Plazas	Level 3 Mobility Hubs
Six Focus Corridors	69	15	73	74	51	198	22	8
Remaining High Frequency (Core) Routes*	193	35	254	289	302	396	14	29

Notes:
* Includes Level 2 and 3 stop enhancements systemwide (in addition to Core Routes)
**A more detailed analysis is needed to confirm the number of unpaired Level 1 stops; for the purpose of this opinion of probable cost, unpaired stops are included with the 517 enhanced pairs.

Table 11 and Table 12 present the costs for signal priority treatments and passenger facilities, respectively. The estimated total cost to upgrade all EMR core routes and Level 2 and 3 stops systemwide is $276 million.

Table 11. Costs for EMR Core Routes – Signal Priority

Routes	TSP*	Queue Jump	Subtotal (Rounded)
Initial Six Routes	$160,000	$645,000	**$805,000**
Remaining High Frequency (Core) Routes	$0	$1,505,000	**$1.5M**
Total (Rounded)	**$160,000**	**$2.2M**	**$2.3M**

*Assumes all signals on Remaining High Frequency (Core) Routes are owned by CDOT

Table 12. Costs for EMR Core Routes – Passenger Facilities

Routes	Level 0 Type A Stops	Level 0 Type B Stops	Level 0 Type C Stops	Level 1 Stops	Level 2 Mobility Plazas	Level 3 Mobility Hubs	Subtotal (Rounded)
Initial Six Routes	$3,358,000	$3,848,000	$4,590,000	$43,263,000	$19,668,000	$15,480,000	**$90.3M**
Remaining High Frequency (Core) Routes*	$11,684,000	$15,028,000	$27,180,000	$86,526,000	$8,514,600	$36,810,500	**$185.7M**
Total (Rounded)	**$15M**	**$18.9M**	**$31.8M**	**$129.8M**	**$28.2M**	**$52.3M**	**$276M**

*Includes Level 2 and 3 stop enhancements systemwide (in addition to Core Routes)

Appendix A: Passenger Facility Amenities Matrix

PASSENGER FACILITY AMENITIES MATRIX

Amenity	Amenity Notes	Standard Bus Stop	Enhanced Stop Pair	Mobility Intersection	Mobility Center
Brasco - Prefab Boltdown Shelter (built-in bench)	Considered the standard shelter style: Two sizes (5' x 10' and 5' x 15') and four styles (box (sheltered), cantilever (sheltered), canopy (open), and eclipse (open)); The cantilever style can be used in place of the box style where right-of-way is limited. It takes up less space but provides the same roof coverage as the box style.	**1**			
Tolar - Prefab Cantilever Shelter (built-in bench)	Available in two sizes (5' x 10' and 5' x 15') in a cantilever style		**1**	**2**	**2**
Park-Style/Simme Bench	Can be standalone or supplement existing shelter benches to add waiting capacity; added under custom canopy unless seating is built into canopy structure		**2**	**4**	**8**
Simme seats	Can be standalone or supplement existing shelter benches to add waiting capacity; added under custom canopy unless seating is built into canopy structure	**1**			
Lean Bar	Supplements existing shelter benches to add waiting capacity; ADA requires that lean bars are supplemented with at least one bench (i.e. a stop can no longer only have lean bars)	**1**	**2**	**4**	**4**
Trash Can	Added to stops to reduce litter complaints from adjacent businesses/residences	**1**	**2**	**4**	**2**
Bike Rack (U-Frame)	Added to stops to make bike-to-transit intermodal transfers easier	**1**	**2**	**4**	**3**
Scooter/E-Bike Pen	Spray-painted sidewalk area for depositing scooters and e-bikes			**2**	**1**
Bus Stop Marker: Signpost with Flag Sign	Signs are mounted flag style on 2" square poles, typically 7.5 feet from the ground	**1**			
Bus Stop Marker: Static Pylon	Freestanding aluminum or plastic bus stop signifier; may require footing depending on material/weight				
Bus Stop Marker: Dynamic Pylon	Freestanding aluminum or plastic bus stop signifier; includes RTIS display and internal lighting; may require footing depending on material/weight; data/power conduit required		**2**	**4**	**4**
RTIS Display	If not integrated/present on pylon, typically a separate digital display mounted to or hung from shelter or canopy; data/power conduit required		**2**	**4**	**4**
Supplemental Wayfinding	Highly site-dependent and variable; usually consists of a series of signs and/or sidewalk/crosswalk treatments to visually connect stops at transfer hubs and on-street transfer points			**2**	**2**
ADA Pad	6x8 unobstructed pad for loading on/off buses, aligned with bus stop door	**1**	**2**	**4**	**4**

Appendix B: Cost Assumptions

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NOTES

ESTIMATES DO NOT INCLUDE ANY STRUCTURE, SIGNAL, DRAINAGE OR UTILITY WORK INCLUDING WATER, SEWER, OR POWER DUE TO VARIABILITY BETWEEN SITES.
ESTIMATES DO NOT INCLUDE WORK ZONE TRAFFIC CONTROL.
BUS STOP AMENITY INSTALLATION WILL BE PAID IN ACCORDANCE WITH DAVIS–BACON.
TRASH CAN QUOTED AS TOLAR 35708–121.
BIKE RACK QUOTED AS TOLAR 14814–121.
5X10 SIGNATURE SUNSET SHELTER LIGHTING QUOTED AS TOLAR 3390010–RM280F SOLAR LIGHTING SYSTEM.
5X15 TOLAR SIGNATURE SUNSET ASSUMED TO COST 1.5X COST OF 5X10 TOLAR SIGNATURE SUNSET.
5X15 TOLAR SIGNATURE SUNSET LIGHTING ASSUMED TO COST 1.5X COST OF 5X15 TOLAR SIGNATURE SUNSET LIGTHING.
BUS SHELTERS ASSUMES UNITS WILL BE DELIVERED FULLY PREASSEMBLED, ACCESS TO EACH LOCATION IS AVAILABLE, AND UNITS CAN BE PICKED DIRECTLY FROM TRUCK AND SET INTO PLACE. STORAGE OF SHELTERS AND/OR MOVING UNIT AFTER DELIVERY IS EXCLUDED.
LIGHTING AT BUS SHELTERS ASSUMES STUBBED UP CONDUITS WITH REQUIRED CABLING ALREADY IN PLACE PRIOR TO INSTALLATION, PRICE INCLUDES CONNECTION AND TESTING ONLY.
PYLON QUOTED WITH 120VAC POWERED BACKLIT DISPLAY ON BOTH SIDES, WITH A SINGLE 13" E–PAPER RTIS DISPLAY USING CELLULAR MODEM AND GTFS DATA FEED.
PYLON ASSUMES CONCRETE PAD AND STUBBED UP CONDUITS WITH REQUIRED CABLING ALREADY IN PLACE PRIOR TO INSTALLATION, PRICE INCLUDES CONNECTION AND TESTING ONLY. SYSTEM INTEGRATION, HEAD–END WORK ETC. EXCLUDED.
TICKET VENDING MACHINE QUOTED AS VENTEK VENSTATION.
TICKET VENDING MACHINE ASSUMES CONCRETE PAD AND STUBBED UP CONDUITS WITH REQUIRED CABLING ALREADY IN PLACE PRIOR TO INSTALLATION, PRICE INCLUDES CONNECTION AND TESTING ONLY. SOFTWARE PACKAGE, SYSTEM INTEGRATION, HEAD–END WORK ETC. EXCLUDED.
AMENITIES SUCH AS PYLONS AND TICKET VENDING MACHINES CAN VARY CONSIDERABLY BASED ON CAPABILITIES AND HOOKUPS REQUIRED.
RESTROOM COST CAN VARY CONSIDERABLY.
EXISTING BUS STOP LOCATIONS ASSUMED TO NOT REQUIRE ANY REMOVAL OF STRUCTURES.
RIGHT OF WAY AND EASEMENT COSTS ARE NOT ACCOUNTED FOR.
ASPHALT COSTS ASSUMED AT $600/TON FOR LAYERS AND $2,100/TON FOR BINDER FOR LEVEL 0 BUS STOPS.
ASPHALT COSTS ASSUMED AT $400/TON FOR LAYERS AND $1,400/TON FOR BINDER FOR LEVEL 1,2, AND 3 BUS STOPS.
5% MOBILIZATION OR $1,000 TO BE APPLIED, WHICHEVER IS GREATER.
20% ADMINISTRATION TO BE APPLIED TO EACH ESTIMATE.
20% INSPECTION TO BE APPLIED TO EACH ESTIMATE.
50% CONTINGENCY TO BE APPLIED TO EACH ESTIMATE.

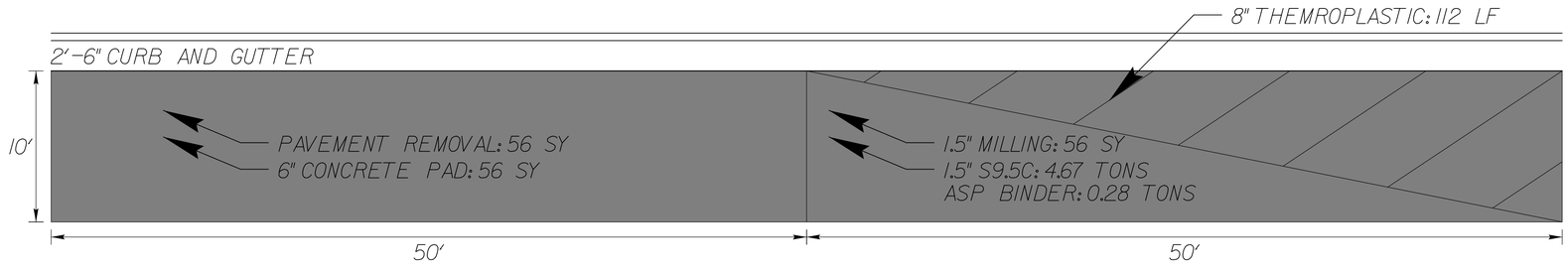
OPTIONAL TRAFFIC SIGNAL PRIORITY

NOTE: OPTIONAL TRANSIT SIGNAL PRIORITY (TSP) CAN BE ADDED TO LEVEL 1, OR 2 BUS STOP TYPES

ITEM	QUANTITY	ITEM COST	LABOR COST	TOTAL COST
PAVEMENT MARKING	1 LEG	$1,250/LEG		$1,250
SIGNING	1 LEG	$1,250/LEG		$1,250
		SUBTOTAL		$2,500

OPTIONAL BUS PAD

NOTE: OPTIONAL BUS PAD CAN BE ADDED TO LEVEL 0, 1, OR 2 BUS STOP TYPES



ITEM	QUANTITY	ITEM COST	LABOR COST	TOTAL COST
6" CONCRETE PAD	56 SY	$100/SY		$5,600
PAVEMENT REMOVAL	56 SY	$25/SY		$1,400
1.5" MILLING	56 SY	$25/SY		$1,400
S9.5C	4.67 TONS	$600/TON		$2,802
ASPHALT BINDER	0.28 TONS	$2,100/TON		$588
8" THERMOPLASTIC	112 LF	$1.25/LF		$140
		SUBTOTAL		$11,930

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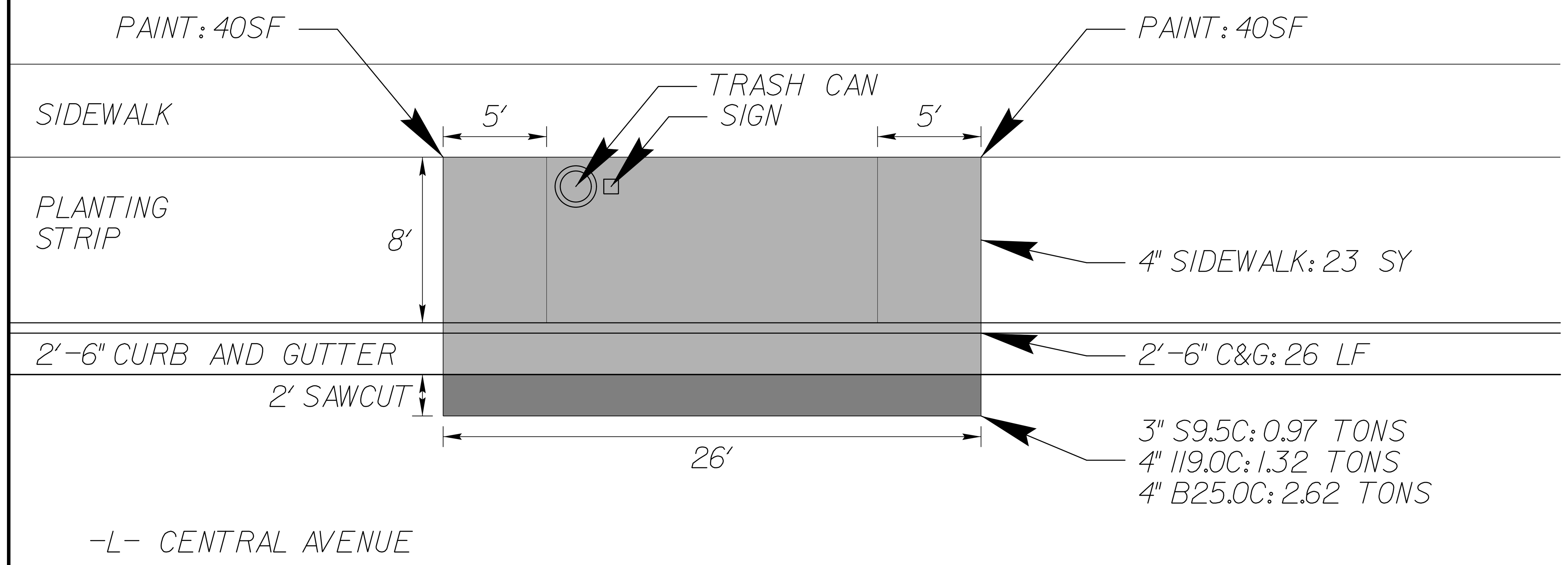
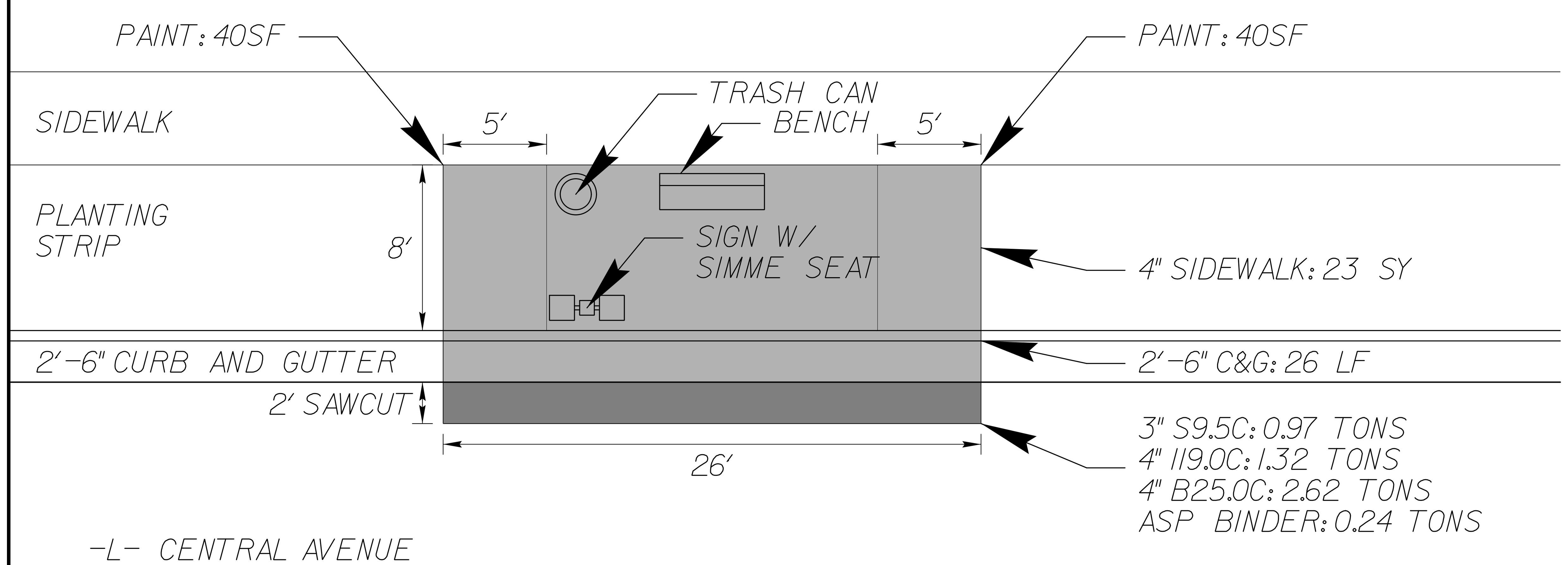
LEVEL 0,TYPE A



ITEM	QUANTITY	ITEM COST	LABOR COST	TOTAL COST
4" CONCRETE SIDEWALK	23 SY	$75/SY		$1,725
2'-6" CURB AND GUTTER	26 LF	$60/LF		$1,560
PAVEMENT REMOVAL	6 SY	$25/SY		$150
FINE GRADING	13 SY	$30/SY		$390
S9.5C	0.97 TONS	$600/TON		$582
I19.0C	1.32 TONS	$600/TON		$792
B25.0C	2.62 TONS	$600/TON		$1,572
ASPHALT BINDER	0.24 TONS	$2,100/TON		$504
PAINT	80 SF	$176/STOP		$176
TRASH CAN	1 EA	$750/EA	$352/EA	$1,102
SIGN	1 EA	$200/EA	$352/EA	$552

SUBTOTAL (w/o bus pad)	$9,105
5% MOBILIZATION	$1,000
20% ADMINISTRATION	$1,821
20% INSPECTION	$1,821
50% CONTINGENCY	$6,874
TOTAL (w/o bus pad)	$20,621
SUBTOTAL (w/ bus pad)	$21,035
5% MOBILIZATION	$1,052
20% ADMINISTRATION	$4,207
20% INSPECTION	$4,207
50% CONTINGENCY	$15,250
TOTAL (w/ bus pad)	$45,751

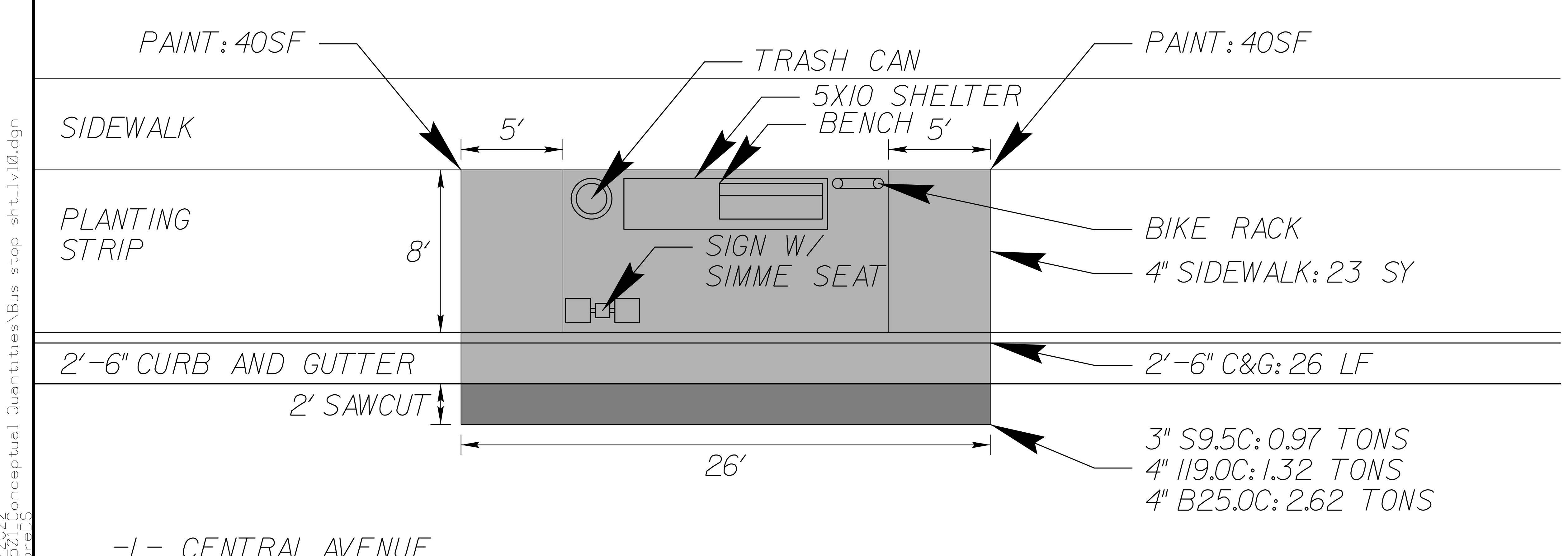
LEVEL 0,TYPE B



ITEM	QUANTITY	ITEM COST	LABOR COST	TOTAL COST
4" CONCRETE SIDEWALK	23 SY	$75/SY		$1,725
2'-6" CURB AND GUTTER	26 LF	$60/LF		$1,560
PAVEMENT REMOVAL	6 SY	$25/SY		$150
FINE GRADING	13 SY	$30/SY		$390
S9.5C	0.97 TONS	$600/TON		$582
I19.0C	1.32 TONS	$600/TON		$792
B25.0C	2.62 TONS	$600/TON		$1,572
ASPHALT BINDER	0.24 TONS	$2,100/TON		$504
PAINT	80 SF	$176/STOP		$176
TRASH CAN	1 EA	$750/EA	$352/EA	$1,102
SIGN	1 EA	$200/EA	$352/EA	$552
SIMME SEAT	1 EA	$650/EA	$704/EA	$1,354
BENCH	1 EA	$700/EA	$704/EA	$1,404

SUBTOTAL (w/o bus pad)	$11,863
5% MOBILIZATION	$1,000
20% ADMINISTRATION	$2,373
20% INSPECTION	$2,373
50% CONTINGENCY	$8,804
TOTAL (w/o bus pad)	$26,412
SUBTOTAL (w/ bus pad)	$23,793
5% MOBILIZATION	$1,190
20% ADMINISTRATION	$4,759
20% INSPECTION	$4,759
50% CONTINGENCY	$17,250
TOTAL (w/ bus pad)	$51,750

LEVEL 0,TYPE C



ITEM	QUANTITY	ITEM COST	LABOR COST	TOTAL COST
4" CONCRETE SIDEWALK	23 SY	$75/SY		$1,725
2'-6" CURB AND GUTTER	26 LF	$60/LF		$1,560
PAVEMENT REMOVAL	6 SY	$25/SY		$150
FINE GRADING	13 SY	$30/SY		$390
S9.5C	0.97 TONS	$600/TON		$582
I19.0C	1.32 TONS	$600/TON		$792
B25.0C	2.62 TONS	$600/TON		$1,572
ASPHALT BINDER	0.24 TONS	$2,100/TON		$504
PAINT	80 SF	$176/STOP		$176
TRASH CAN	1 EA	$750/EA	$352/EA	$1,102
SIGN	1 EA	$200/EA	$352/EA	$552
SIMME SEAT	1 EA	$650/EA	$704/EA	$1,354
BENCH	1 EA	$700/EA	$704/EA	$1,404
5'X10' SHELTER	1 EA	$7,000/EA	$6,953/EA	$13,953
5'X10' SHELTER LIGHTING	1 EA	$1,650/EA	$1,114/EA	$2,764
BIKE RACK	1 EA	$200/EA	$352/EA	$552

SUBTOTAL (w/o bus pad)	$29,132
5% MOBILIZATION	$1,457
20% ADMINISTRATION	$5,826
20% INSPECTION	$5,826
50% CONTINGENCY	$21,121
TOTAL (w/o bus pad)	$63,362
SUBTOTAL (w/ bus pad)	$41,062
5% MOBILIZATION	$2,053
20% ADMINISTRATION	$8,212
20% INSPECTION	$8,212
50% CONTINGENCY	$29,770
TOTAL (w/ bus pad)	$89,310

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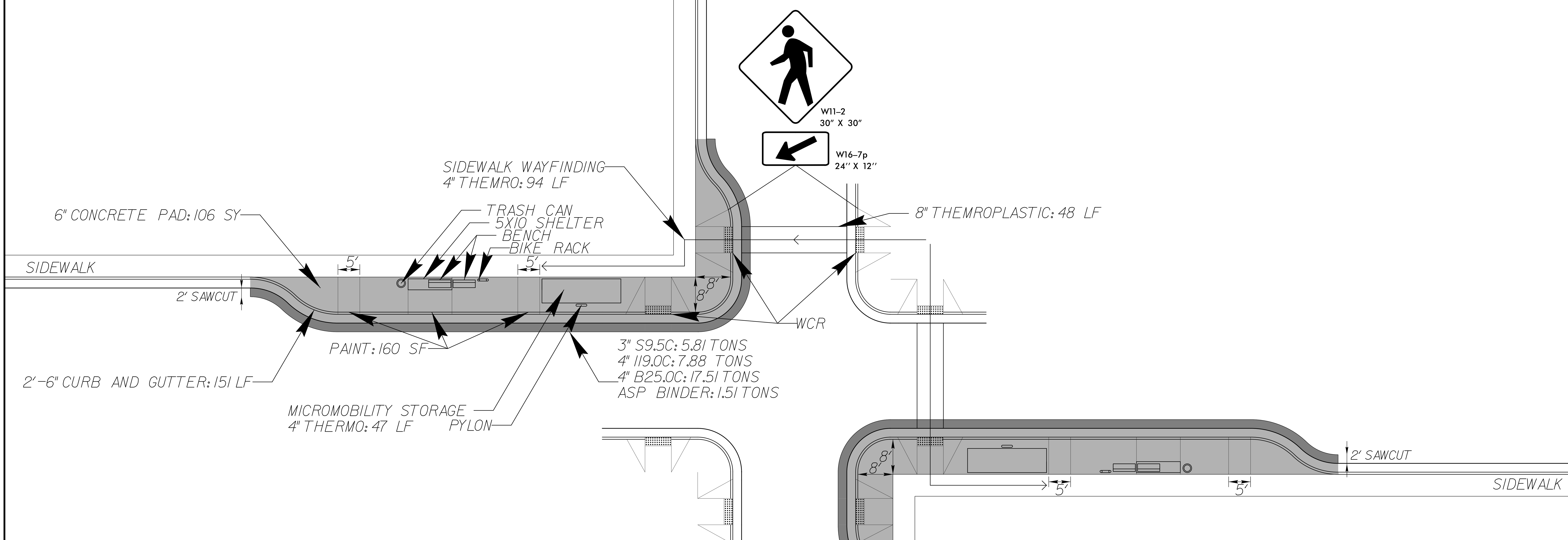
LEVEL 1: ENHANCED STOP PAIR

NOTE: QUANTITIES ARE ONLY CALLED OUT FROM ONE BULB OUT OF ENHANCED STOP PAIR BUT ARE REPEATED IN OTHER BULB OUT.



ITEM	QUANTITY	ITEM COST	LABOR COST	TOTAL COST
6" CONCRETE PAD	212 SY	$100/SY		$21,200
2'-6" CURB AND GUTTER	302 LF	$60/LF		$18,120
PAVEMENT REMOVAL	154 SY	$25/SY		$3,850
FINE GRADING	154 SY	$30/SY		$4,620
S9.5C	11.62 TONS	$400/TON		$4,648
I19.0C	15.76 TONS	$400/TON		$6,304
B25.0C	35.02 TONS	$400/TON		$14,008
ASPHALT BINDER	3.02 TONS	$1,400/TON		$4,228
CONCRETE CURB RAMPS	6 EA	$2,000/EA		$12,000
PAINT	320 SF	$176/STOP		$352
8" THERMOPLASTIC	96 LF	$1.25/LF		$120
SIGN ERECTION, TYPE E	4 EA	$200/EA		$800
3-LB STEEL U-CHANNEL	4 EA	$200/EA		$800
TRASH CAN	2 EA	$750/EA	$352/EA	$2,204
SIGN	2 EA	$200/EA	$352/EA	$1,104
BENCH	2 EA	$700/EA	$704/EA	$2,808
5'X10' SHELTER	2 EA	$7,000/EA	$6,953/EA	$27,906
5'X10' SHELTER LIGHTING	2 EA	$1,650/EA	$1,114/EA	$5,528
BIKE RACK	2 EA	$200/EA	$352/EA	$1,104
PYLON	2 EA	$12,000/EA	$8,630/EA	$41,260
MICROMOBILITY STORAGE 4" THERMOPLASTIC	94 LF	$0.85/LF	$176	$176
SIDEWALK WAYFINDING 4" THERMOPLASTIC	188 LF	$0.85/LF	$176	$176

SUBTOTAL (w/o bus pad) (w/o TSP)	$173,316
5% MOBILIZATION	$8,666
20% ADMINISTRATION	$34,663
20% INSPECTION	$34,663
SURVEY	$5,000
50% CONTINGENCY	$128,154
TOTAL (w/o bus pad) (w/o TSP)	$384,462
SUBTOTAL (w/2 bus pads) (w/o TSP)	$197,176
5% MOBILIZATION	$9,859
20% ADMINISTRATION	$39,435
20% INSPECTION	$39,435
SURVEY	$5,000
50% CONTINGENCY	$145,453
TOTAL (w/2 bus pads) (w/o TSP)	$436,358

SUBTOTAL (w/o bus pad) (w/2 TSP)	$178,316
5% MOBILIZATION	$8,916
20% ADMINISTRATION	$35,663
20% INSPECTION	$35,663
SURVEY	$5,000
50% CONTINGENCY	$131,779
TOTAL (w/o bus pad) (w/2 TSP)	$395,337
SUBTOTAL (w/2 bus pads) (w/2 TSP)	$202,176
5% MOBILIZATION	$10,109
20% ADMINISTRATION	$40,435
20% INSPECTION	$40,435
SURVEY	$5,000
50% CONTINGENCY	$149,078
TOTAL (w/2 bus pads) (w/2 TSP)	$447,233

LEVEL II: MOBILITY PLAZA

NOTE: QUANTITIES ARE ONLY CALLED OUT FROM ONE BULB OUT OF MOBILITY INTERSECTION BUT ARE REPEATED IN OTHER THREE BULB OUTS.

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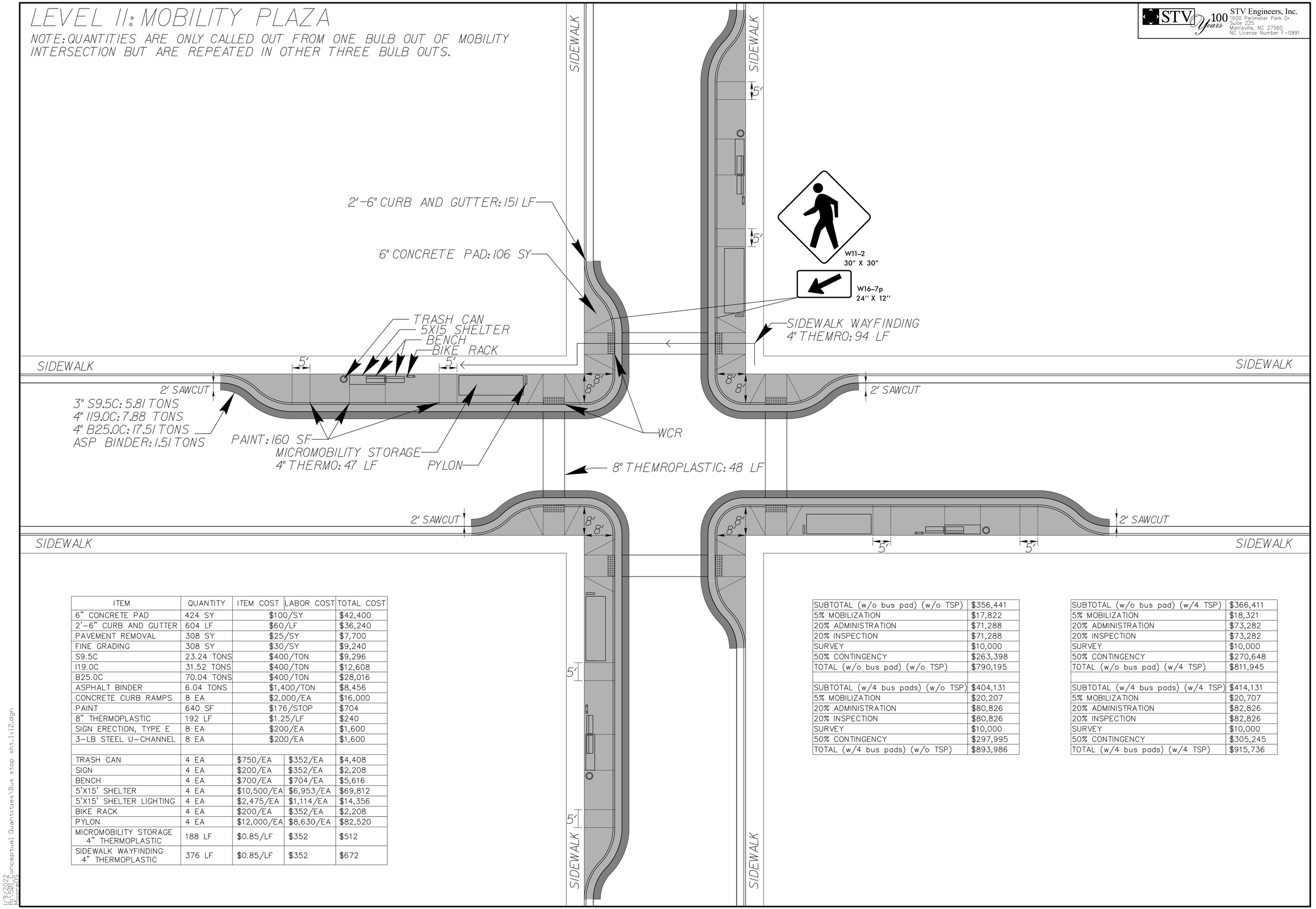


ITEM	QUANTITY	ITEM COST	LABOR COST	TOTAL COST
6" CONCRETE PAD	424 SY	$100/SY		$42,400
2'-6" CURB AND GUTTER	604 LF	$60/LF		$36,240
PAVEMENT REMOVAL	308 SY	$25/SY		$7,700
FINE GRADING	308 SY	$30/SY		$9,240
S9.5C	23.24 TONS	$400/TON		$9,296
I19.0C	31.52 TONS	$400/TON		$12,608
B25.0C	70.04 TONS	$400/TON		$28,016
ASPHALT BINDER	6.04 TONS	$1,400/TON		$8,456
CONCRETE CURB RAMPS	8 EA	$2,000/EA		$16,000
PAINT	640 SF	$176/STOP		$704
8" THERMOPLASTIC	192 LF	$1.25/LF		$240
SIGN ERECTION, TYPE E	8 EA	$200/EA		$1,600
3-LB STEEL U-CHANNEL	8 EA	$200/EA		$1,600
TRASH CAN	4 EA	$750/EA	$352/EA	$4,408
SIGN	4 EA	$200/EA	$352/EA	$2,208
BENCH	4 EA	$700/EA	$704/EA	$5,616
5'X15' SHELTER	4 EA	$10,500/EA	$6,953/EA	$69,812
5'X15' SHELTER LIGHTING	4 EA	$2,475/EA	$1,114/EA	$14,356
BIKE RACK	4 EA	$200/EA	$352/EA	$2,208
PYLON	4 EA	$12,000/EA	$8,630/EA	$82,520
MICROMOBILITY STORAGE 4" THERMOPLASTIC	188 LF	$0.85/LF	$352	$512
SIDEWALK WAYFINDING 4" THERMOPLASTIC	376 LF	$0.85/LF	$352	$672

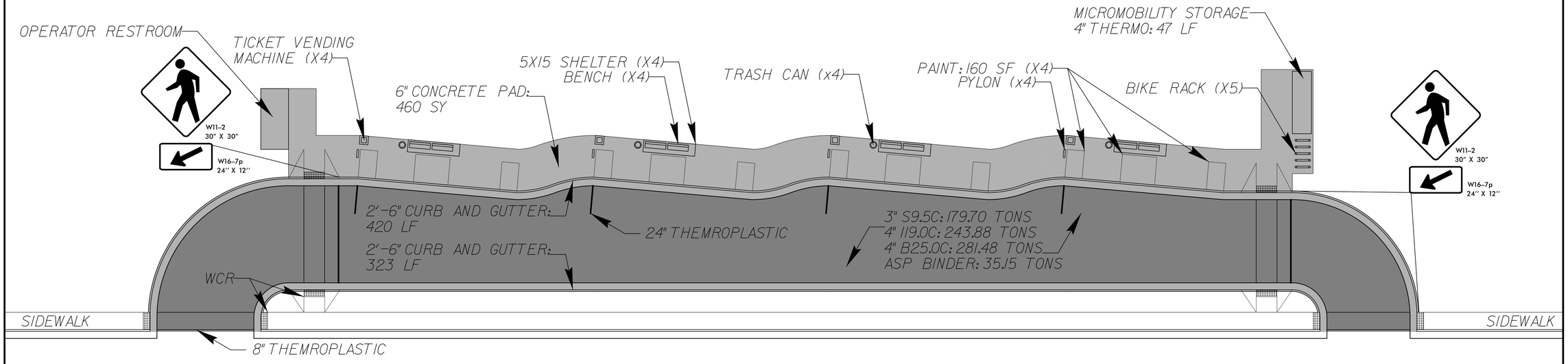
SUBTOTAL (w/o bus pad) (w/o TSP)	$356,441
5% MOBILIZATION	$17,822
20% ADMINISTRATION	$71,288
20% INSPECTION	$71,288
SURVEY	$10,000
50% CONTINGENCY	$263,398
TOTAL (w/o bus pad) (w/o TSP)	$790,195
SUBTOTAL (w/4 bus pads) (w/o TSP)	$404,131
5% MOBILIZATION	$20,207
20% ADMINISTRATION	$80,826
20% INSPECTION	$80,826
SURVEY	$10,000
50% CONTINGENCY	$297,995
TOTAL (w/4 bus pads) (w/o TSP)	$893,986

SUBTOTAL (w/o bus pad) (w/4 TSP)	$366,411
5% MOBILIZATION	$18,321
20% ADMINISTRATION	$73,282
20% INSPECTION	$73,282
SURVEY	$10,000
50% CONTINGENCY	$270,648
TOTAL (w/o bus pad) (w/4 TSP)	$811,945
SUBTOTAL (w/4 bus pads) (w/4 TSP)	$414,131
5% MOBILIZATION	$20,707
20% ADMINISTRATION	$82,826
20% INSPECTION	$82,826
SURVEY	$10,000
50% CONTINGENCY	$305,245
TOTAL (w/4 bus pads) (w/4 TSP)	$915,736

LEVEL III: MOBILITY HUB

ITEM	QUANTITY	ITEM COST	LABOR COST	TOTAL COST
6" CONCRETE PAD	460 SY	$100/SY		$46,000
2'-6" CURB AND GUTTER	743 LF	$60/LF		$44,580
FINE GRADING	1,235 SY	$30/SY		$37,050
S9.5C	180 TONS	$400/TON		$71,880
I19.0C	244 TONS	$400/TON		$97,522
B25.0C	282 TONS	$400/TON		$112,592
ASPHALT BINDER	35 TONS	$1,400/TON		$49,210
CONCRETE CURB RAMPS	8 EA	$2,000/EA		$16,000
PAINT	640 SF	$176/STOP		$704
8" THERMOPLASTIC	208 LF	$1.25/LF		$260
24" THERMOPLASTIC	84 LF	$6.95/LF		$584
SIGN ERECTION, TYPE E	3 EA	$200/EA		$600
3-LB STEEL U-CHANNEL	3 EA	$200/EA		$600
TRASH CAN	4 EA	$750/EA	$352/EA	$4,408
BENCH	4 EA	$700/EA	$704/EA	$5,616
5'X15' SHELTER	4 EA	$10,500/EA	$6,953/EA	$69,812
5'X15' SHELTER LIGHTING	4 EA	$2,475/EA	$1,114/EA	$14,356
BIKE RACK	5 EA	$200/EA	$352/EA	$2,760
PYLON	4 EA	$12,000/EA	$8,630/EA	$82,520
TICKET VENDING MACHINE	4 EA	$17,500/EA	$12,945/EA	$121,780
OPERATOR RESTROOM	1 EA	$50,000/EA	$50,000/EA	$100,000
MICROMOBILITY STORAGE 4" THERMOPLASTIC	188 LF	$0.85/LF	$176	$320

SUBTOTAL	$879,183
5% MOBILIZATION	$43,959
20% ADMINISTRATION	$175,837
20% INSPECTION	$175,837
SURVEY	$15,000
50% CONTINGENCY	$644,958
TOTAL	$1,934,724



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