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2728 East 171st Street
Westfield, IN 46074
westfield.in.gov

To: Westfield Board of Works

From: Melody Jones

CC: Todd Burtron

Date: October 24, 2011

RE: Trail Design Standards - Revisions

Dear Board Members:

As Westfield continues to design and build the City's trail system we have noted trail design standards that were missing or need revised. This two year process was completed early this month. The revisions include standardizing the railing specifications, asphalt depth and correcting terminology. It also addresses line of sight safety concerns, trail logos and signage standards. These additions were made to Westfield Construction Standards; Section 02505 – Standards of Trails, Sidewalks and Multi-Use Trails and removing from Section 02502 – Standards of Roadway Construction.

We are bringing before you today the new trail design standards revisions for your approval.

SECTION 02505 - STANDARDS OF TRAILS, SIDEWALKS, AND MULTI-USE TRAILS

PART 1 - GENERAL

1.1 Trail and sidewalk construction shall conform to the following requirements and standards:

A. Definitions:

1. Designated Trailhead – A designated point of access that may contain a parking area, information kiosks, restrooms, water fountains, and may be reached by vehicular or pedestrian access.
2. Multi-Use Trail – A facility that is physically separated from motorized-vehicular traffic with an open space or barrier and either within the highway right of way or within an independent right of way. The following trails should be called out in the Thoroughfare Plan: Monon, Midland Trace, Cool Creek, Grand Junction, Anna Kendall, Little Eagle Creek, Monon/Midland Loop, and Natalie Wheeler. A multi-use trail can be used by pedestrians, skaters, wheelchair users, joggers, bicyclists or other non-motorized users.
 - a. Trails may assume a different form as conditions warrant. Where it parallels a roadway it may be 2-direction or multilane. Future bike lanes will be a single lane on each side of the roadway.
3. Sidewalk – The portion of a local street right of way designed for preferential or exclusive use by pedestrians.
4. Trail – An 8' wide route designed, designated, or constructed within or outside street right of way for recreational use or to provide an alternative to vehicular routes within a transportation system. These trails will parallel city streets and provide connection to the multi-use trail system.

B. Trails, Multi-Use Trails & Sidewalks:

1. Trails shall be constructed to a minimum width of eight (8) feet. The trail shall be constructed of asphalt. These trails shall be constructed using the following as minimum requirements:
 - a. Four (4) inches Compacted Aggregate Size No. 53, stone base
 - b. Two (2) inches Bituminous Binder No. 8 or 9
 - c. One (1) inch Bituminous Surface No. 11
 - d. See Figure PT-01 in Part 2, Section 2.1

2. All sidewalks shall be placed on properly prepared and compacted subgrades. These sidewalks shall be constructed using the following as minimum requirements:
 - a. Sidewalks shall be at least six (6) inches thick at drives and at least four (4) inches thick at all other locations within the subdivision.
 - b. Sidewalks shall be at least six (6) feet wide at all locations.
 - c. Sidewalks shall be concrete in accordance with Section 02500.
 - d. Expansion joints shall be located every 48 feet and control joints every six (6) feet.
 - e. See Figure PT-02 in Part 2, Section 2.1
3. Curb ramps shall comply with the most current INDOT and ADA requirements.
4. Multi-use trails shall be constructed to a minimum width of twelve (12) feet with a two (2) foot stone shoulder. They shall be constructed of asphalt and the shoulders shall be constructed of 3" crushed limestone. These trails shall be constructed using the following as a minimum requirements:
 - a. Four (4) inches Compacted Aggregate Size No. 53, stone base
 - b. Two (2) inches Bituminous Binder No. 8 or 9
 - c. One (1) inch Bituminous Surface No. 11
 - d. See Figure PT-03 in Part 2, Section 2.1
 - e. See Figure PT-04 in Part 2, Section 2.1 for Trail Cross Section Adjacent to Equestrian Trail
 - f. See Figure PT-05 in Part 2, Section 2.1 for Trail Cross Section Adjacent to Equestrian Trail with Railing
5. All trails, multi-use trails and sidewalks shall be placed on properly prepared and compacted subgrades. Materials shall be furnished and installed in accordance with Section 02500 and INDOT Standard Specifications.
6. When trails, sidewalks or multi-use trails cross major street intersections within or adjacent to a subdivision, necessary traffic control devices such as painted crosswalks and signs shall be installed at the subdivision's expense at the discretion of the Westfield City Council or the Westfield Public Works Director or designee.
7. The trails, sidewalks or multi-use trails shall intersect the road at a 90 degree angle.
8. The trail and multi-use trail width should be increased at the intersection approach to reduce user conflicts.

9. Clear sight lines should be provided for both the motorist and the trail user. See specifications on Figure PT-06, located in Part 2, Section 2.1.
 10. Signs, both on the road and the trail, should indicate whether the motorist or trail user has the right of way.
 11. Curb ramps with detectable-warning devices are required to alert a trail user with vision impairments of the street crossing.
 12. If not located within public rights-of-way, an easement of at least ten (10) feet in width shall be provided for sidewalks and trails.
- C. Plans - Construction plans for improvements to be installed shall be furnished in accordance with the specifications of the Westfield Department of Public Works and/or, when appropriate, to the Hamilton County Highway Department. Such plans must receive all appropriate approvals before improvements are installed. Upon construction completion of multi-use trail, sidewalk, and trail improvements, as-built plans should be submitted on CD to the Westfield Department of Public Works after the WPWD inspector's punchlist has been completed, and when appropriate, to the proper governing body of Hamilton County. All construction plans shall include the following:
1. Inspection - Prior to starting any construction, arrangements shall be made for inspection of work to ensure compliance with plans and specifications approved by the Westfield Department of Public Works or, when appropriate, the Hamilton County Highway Department.
 2. All construction must be approved by the Westfield Public Works Director and notice of construction must be given to the Westfield Public Works Director, or duly authorized representative, 48 hours prior to beginning work.
- D. Allowable Modifications - Where unusual or exceptional factors or conditions exist, the Westfield Department of Public Works may allow minor modifications of any provision of this Section. When such modifications are allowed, a detailed written statement of the reasons for such modifications shall be attached to all copies of construction plans.
- E. Drainage
1. The recommended maximum pavement cross slope of 2% adequately provides for drainage. Sloping in one direction instead of crowning is preferred and simplifies the drainage and surface construction. A smooth surface is essential to prevent water ponding or ice formation.

2. Where a multi-use trail is constructed on the side of a hill, a ditch of suitable dimensions should be placed on the uphill side to intercept the hillside drainage. Such ditch should be designed so that an undue obstacle cannot interfere with bicycle traffic. Where necessary, a catch basin with drains should be provided to carry the intercepted water under the trail . Drainage grates or manhole covers should be located outside the trail. Each drainage-structure grate should have openings sufficiently narrow and short to prevent bicycle or wheelchair tires from dropping into it regardless of the direction of travel. To assist in preventing erosion in the area adjacent to the trail, the design should include considerations for preserving the natural ground cover. Seeding, mulching, or sodding of adjacent slopes, swales, or other erodible areas should be shown on the plans.
3. The minimum diameter of a culvert which conveys flow under a multi-use trail is 15 inches. Each culvert should be designed to pass a minimum 2-year event.

F. Bridge Structure

1. A structure crossing a stream with a drainage area of at least 1 square mile is considered a bridge, as an IDNR Construction in a Floodway Permit will be required. A bridge should be designed to pass a minimum 10-year event through the structure.
2. A trail crossing a stream should be designed so as not to create additional backwater for a 100-year event. A hydraulics model which satisfies the Westfield requirements will be required for the existing and proposed conditions. The trail crossing should be designed to prevent erosion and scour.
3. Proper approval must be obtained from the Hamilton County Surveyor's Office.
4. Clear Width is to be as wide as the widest approach trail width plus the minimum 2 foot wide clear areas.
5. Decking
 - a. Structural concrete slab
 - b. Simulated wood products. Alternatives must be sent to the Public Works and Parks Department for evaluation. These alternatives must also be accompanied by a data sheet, provided by the manufacturer, stating that the product is designed for the proposed use

6. All bridges shall be designed to structurally support an EMS apparatus.

G. Railings

1. Trail Railing

- a. Design of railings is based on specifications located in Part 2, Section 2.1, Figure PT-07.
- b. 54 inches in height
- c. Design loading shall be $W=50$ pounds per linear foot transversely and vertically, acting simultaneously on each rail
- d. Opening in horizontal railing elements
 - i. Below 27 inches shall not allow a 6 inch diameter sphere to pass through
 - ii. Above 27 inches shall not allow a 6 inch diameter sphere to pass through

2. Equestrian Railing

- a. Design of railing is based on specifications located in Part 2, Section 2.1, Figure PT-08.
- b. 45 inches in height
- c. Design loading shall be $W=50$ pounds per linear foot transversely and vertically, acting simultaneously on each rail
- d. Opening in horizontal railing elements
 - i. Below 27 inches shall not allow a 6 inch diameter sphere to pass through
 - ii. Above 27 inches shall not allow a 6 inch diameter sphere to pass through

H. Fiber Optic

- 1. The developer shall provide and dedicate to Westfield, at no cost to Westfield, easements along all trails, in locations mutually determined by the Developer and Westfield for the installation of fiber optic pipe or conduit and fiber optic cable, as well as maintenance and operation of the Fiber Optic Network.
- 2. The Developer shall, at its sole cost and expense, be responsible for the installation of conduit within the fiber easements, but shall not be responsible for the installation of any cable.

I. Design Speed: the minimum design speed for these trails is 20 mph.

J. Multi-Use Trail Signage

1. Trail identification and informational signage and sign specifications are called out in Part 2, Sections 2.1 and Sections 2.2:
 - a. Anna Kendall Trail Signage Details: AK-01 to AK-04, Anna Kendall Trail Signage Specifications:
 - b. Cool Creek Trail, CC-01 to CC-04
 - c. Midland Trace Trail, MT-01 to MT-06
 - d. Monon Trail, MO-01 to MO-05
 - e. Natalie Wheeler Trail, NW-01 to NW-04

2. Regulatory signage along multi-use trails should comply with MUTCD standards as listed below:
 - a. “Stop” (R1-1) at 10 feet from edge of street
 - b. “No Motor Vehicles” (R5-3) with R1-1
 - c. “Cross Traffic Does Not Stop (W4-4P) with R1-1
 - d. “Stop Ahead” (W3-1) 150 feet from “Stop” (R1-1) sign
 - e. Warning Signs (i.e. curve ahead) 100 feet from hazardous condition
 - f. “Pavement Ends” 150 feet from end of trail

3. Road crossing pavement markings shall adhere to the most current MUTCD Standards

4. State highway crossing pavement markings and signage
 - a. Case by case basis
 - b. MUTCD
 - c. Acceptable gaps
 - d. Must be coordinated with INDOT

- K. Bollards or gates should be used on a case by case basis. Location of bollards or gates must be approved by the Parks Director.

- L. Trail access points must be approved by Parks Director, as outlined in Policy PK 06-11, per Ordinance 11-22 and approved by Westfield City Council on September 12, 2011.

PART 2 – GENERAL STANDARDS

2.1 Detail Figures

PT-01	Typical Cross Section – 8’ Trail
PT-02	Typical Cross Section – Sidewalks
PT-03	Typical Cross Section – Multi-Use Trails
PT-04	Typical Cross Section Adjacent to Equestrian Trail

PT-05	Typical Cross Section Adjacent to Equestrian Trail with Railing
PT-06	Line of Sight Specifications
PT-07	Wood Railing Details
PT-08	Equestrian Wood Railing Details
AK-1 to AK-4	Anna Kendall Trail Sign Details
CC-1 to CC-4	Cook Creek Trail Sign Details
MT-1 to MT-6	Midland Trace Trail Sign Details
MO-1 to MO-5	Monon Trail Sign Details
NW-1 to NW-4	Natalie Wheeler Trail Sign Details

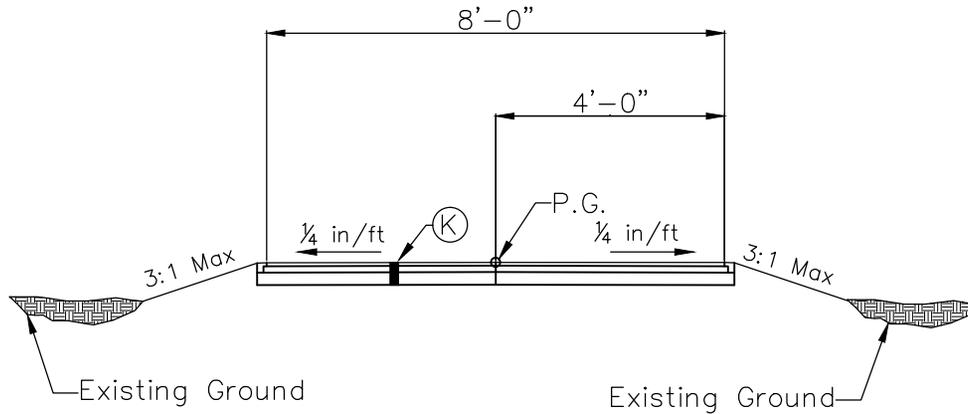
2.2 Appendices - Signage Specifications

Appendix A	Anna Kendall Trail Sign Specifications
Appendix B	Cool Creek Trail Sign Specifications
Appendix C	Midland Trace Trail Sign Specifications
Appendix D	Monon Trail Sign Specifications
Appendix E	Natalie Wheeler Trail Sign Specifications

END OF SECTION 02502

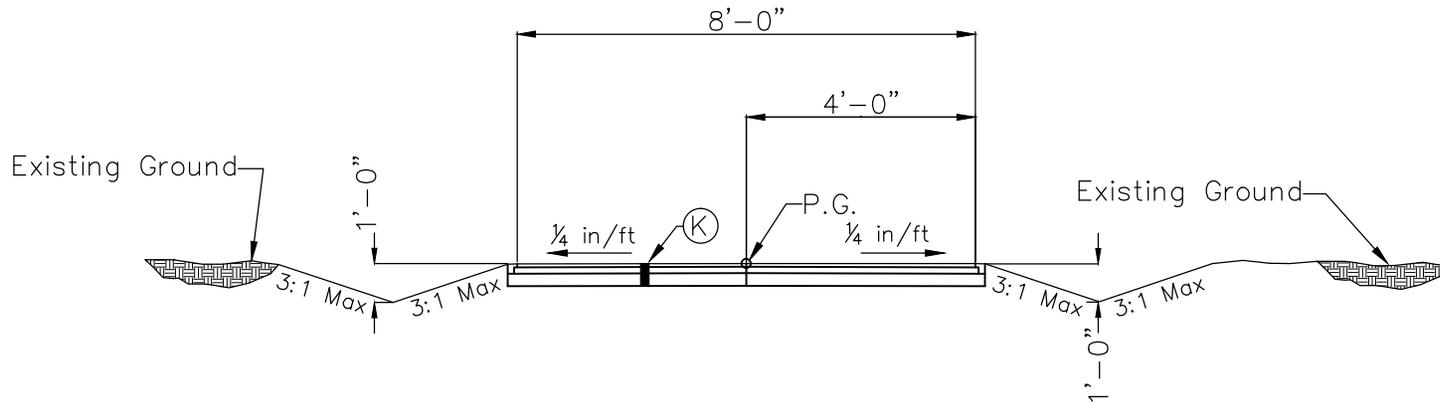
LEGEND

- Ⓚ 110#/SYS HMA, TYPE A, SURFACE, 9.5MM
- 330#/SYS HMA, TYPE A, INTERMEDIATE, 19.0MM
- 4" COMPACTED AGGREGATE BASE, No. 53



TYPICAL TRAIL FILL SECTION

SCALE = NONE



TYPICAL TRAIL CUT SECTION

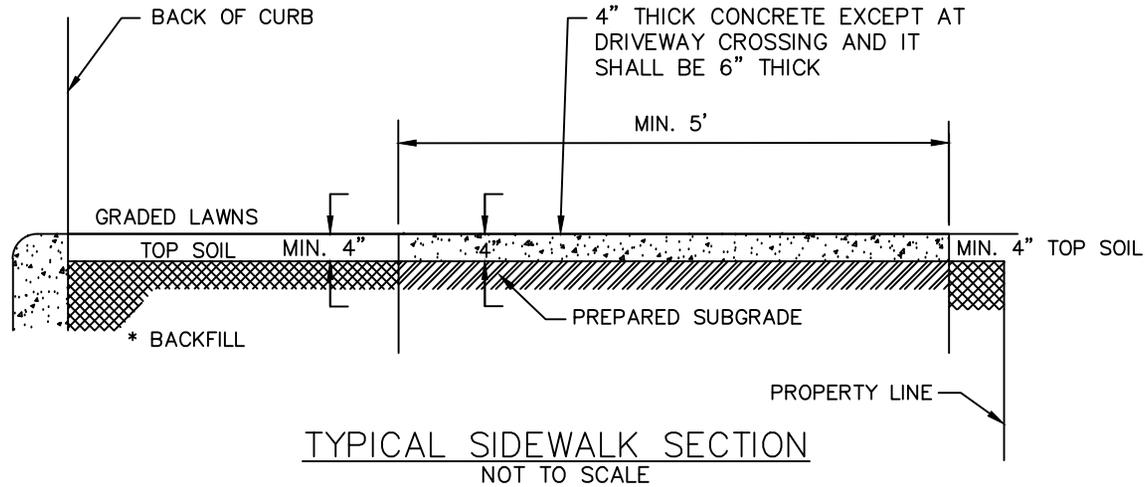
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TYPICAL CROSS SECTIONS: WESTFIELD ALTERNATIVE TRANSPORTATION PLAN

TYPICAL TRAIL CUT AND FILL - 8'
TRAIL

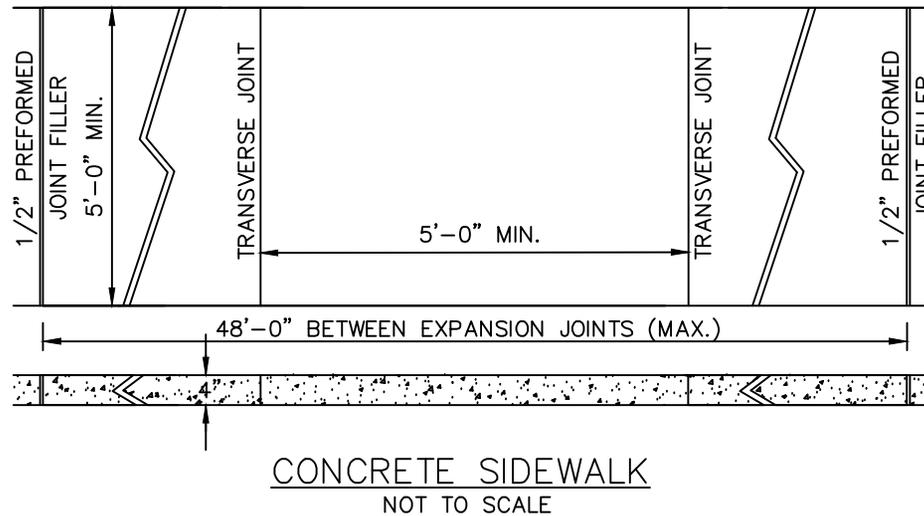


CITY OF WESTFIELD, INDIANA



* THE SPACE BEHIND THE CURB SHALL BE FILLED WITH SUITABLE MATERIAL TO THE REQUIRED ELEVATION AND COMPACTED IN LAYERS NOT TO EXCEED 6" IN DEPTH.

SUBGRADE UNDER ALL CURBS, SIDEWALKS, AND DRIVES SHALL BE COMPACTED IN ACCORDANCE WITH I.N.D.O.T. SPECIFICATIONS.



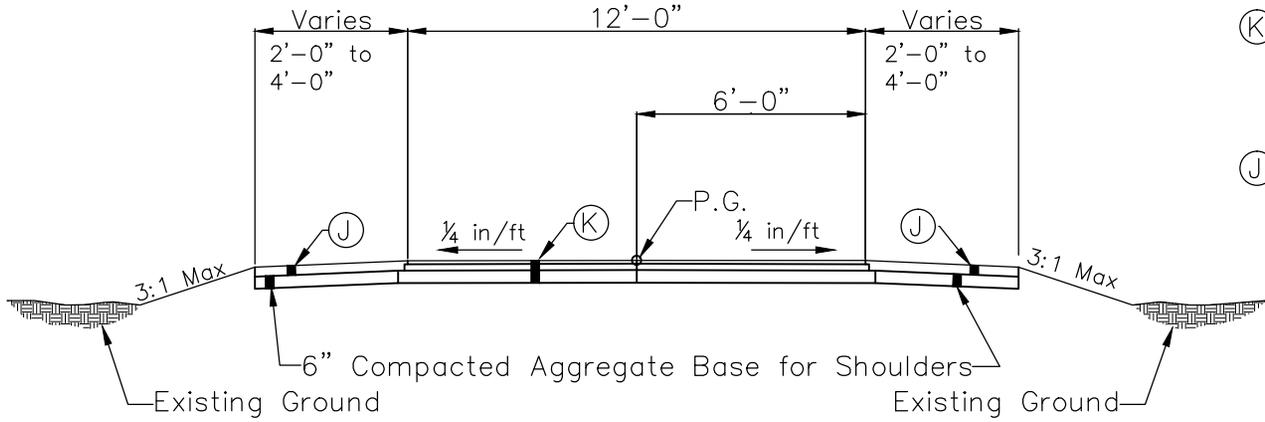
TYPICAL CROSS SECTIONS: WESTFIELD ALTERNATIVE TRANSPORTATION PLAN
SIDEWALK DETAIL



CITY OF WESTFIELD, INDIANA

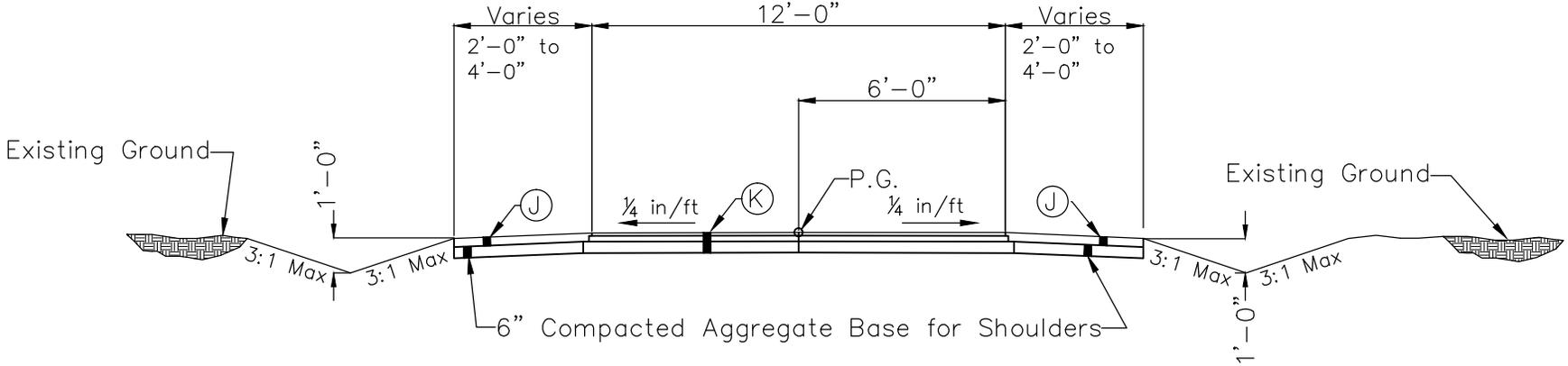
LEGEND

- (K) 110#/SYS HMA, TYPE A, SURFACE, 9.5MM
330#/SYS HMA, TYPE A, INTERMEDIATE, 19.0MM
4" COMPACTED AGGREGATE BASE, No. 53
- (J) #2 (3in) CRUSHED LIMESTONE FOR SHOULDER



TYPICAL TRAIL FILL SECTION

SCALE = NONE



TYPICAL TRAIL CUT SECTION

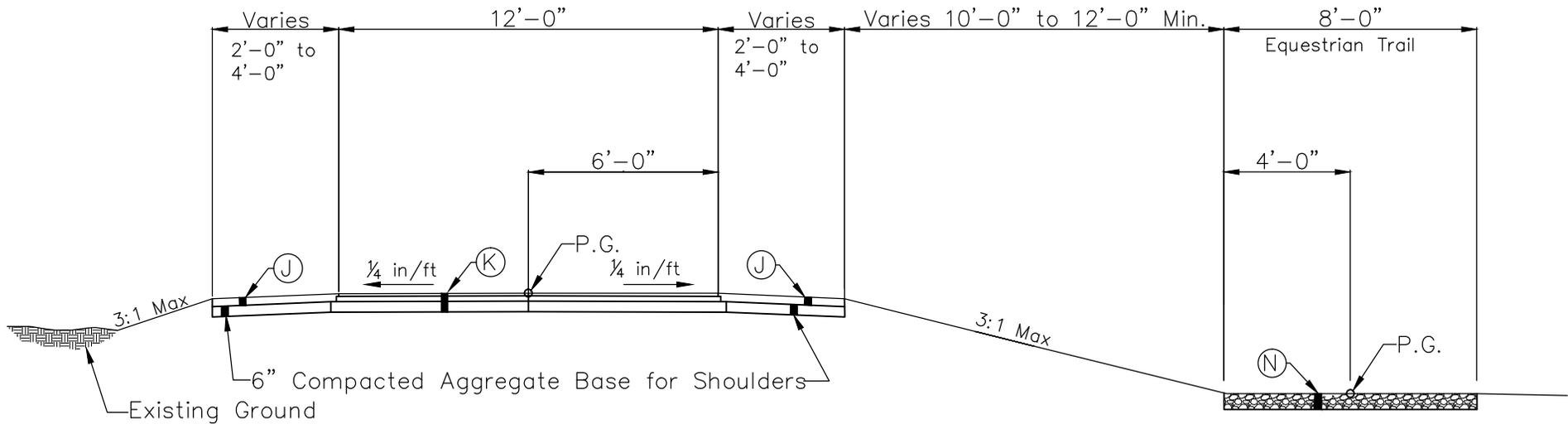
SCALE = NONE

TYPICAL CROSS SECTIONS: WESTFIELD ALTERNATIVE TRANSPORTATION PLAN

TYPICAL TRAIL CUT AND FILL



CITY OF WESTFIELD, INDIANA



TRAIL TYPICAL WHEN ADJACENT TO EQUESTRIAN TRAIL
SCALE = NONE

LEGEND

- (K) 110#/SYS HMA, TYPE A, SURFACE, 9.5MM
330#/SYS HMA, TYPE A, INTERMEDIATE, 19.0MM
4" COMPACTED AGGREGATE BASE, No. 53
- (J) #2 (3in) CRUSHED LIMESTONE FOR SHOULDER
- (N) TYPE D (8in) CRUSHED LIMESTONE FOR EQUESTRIAN PATH

NOTES:

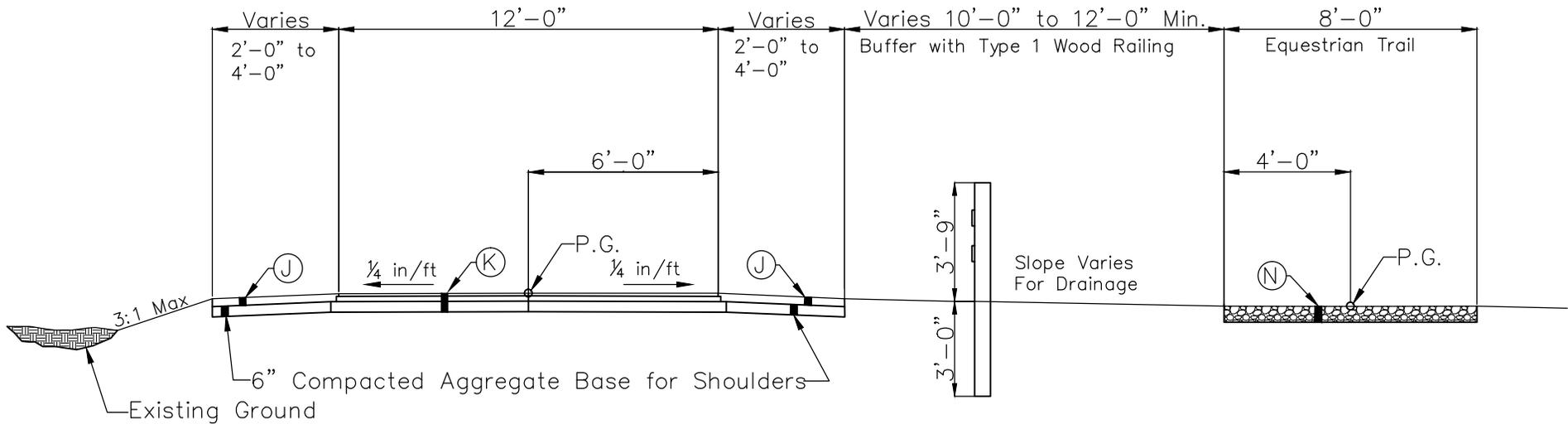
10 FEET OF CLEARANCE REQUIRED ABOVE EQUESTRIAN TRAIL

TYPICAL CROSS SECTIONS: WESTFIELD ALTERNATIVE TRANSPORTATION PLAN

TYPICAL TRAIL ADJACENT TO EQUESTRIAN TRAIL: NO RAILING



CITY OF WESTFIELD, INDIANA



TRAIL TYPICAL WHEN ADJACENT TO EQUESTRIAN TRAIL
SEPARATED BY RAILING

SCALE = NONE

LEGEND

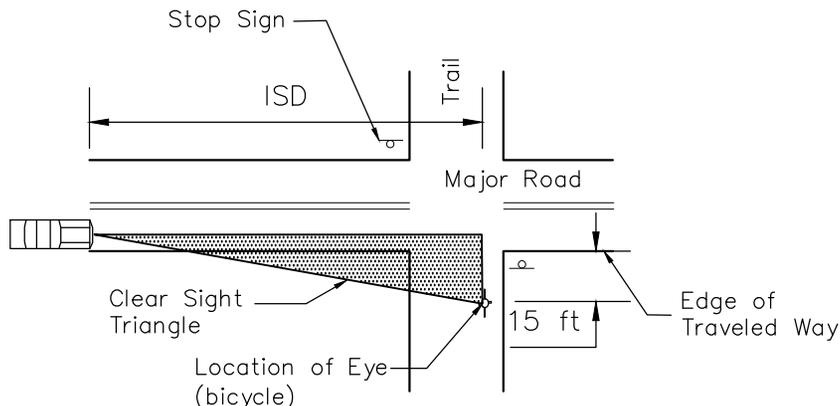
- (K) 110#/SYS HMA, TYPE A, SURFACE, 9.5MM
330#/SYS HMA, TYPE A, INTERMEDIATE, 19.0MM
4" COMPACTED AGGREGATE BASE, No. 53
- (J) #2 (3in) CRUSHED LIMESTONE FOR SHOULDER
- (N) TYPE D (8in) CRUSHED LIMESTONE FOR EQUESTRIAN PATH

NOTES:

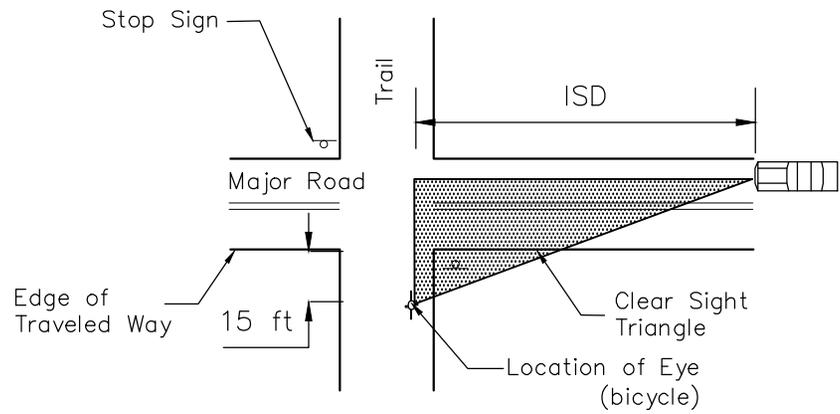
10 FEET OF CLEARANCE REQUIRED ABOVE EQUESTRIAN TRAIL

FOR TYPE 1 WOOD RAILING DETAILS, SEE FIGURE PP-04





CLEAR SIGHT TRIANGLE FOR VIEWING TRAFFIC APPROACHING FROM THE LEFT



CLEAR SIGHT TRIANGLE FOR VIEWING TRAFFIC APPROACHING FROM THE RIGHT

US Customary	
Design Speed (mph)	ISD (ft)
20	225
25	280
30	335
35	390
40	445
45	500
50	555
55	610
60	665

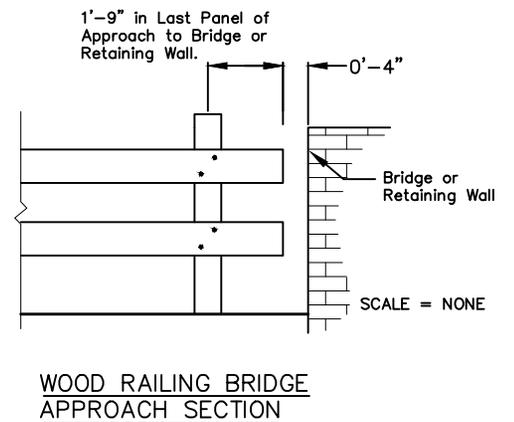
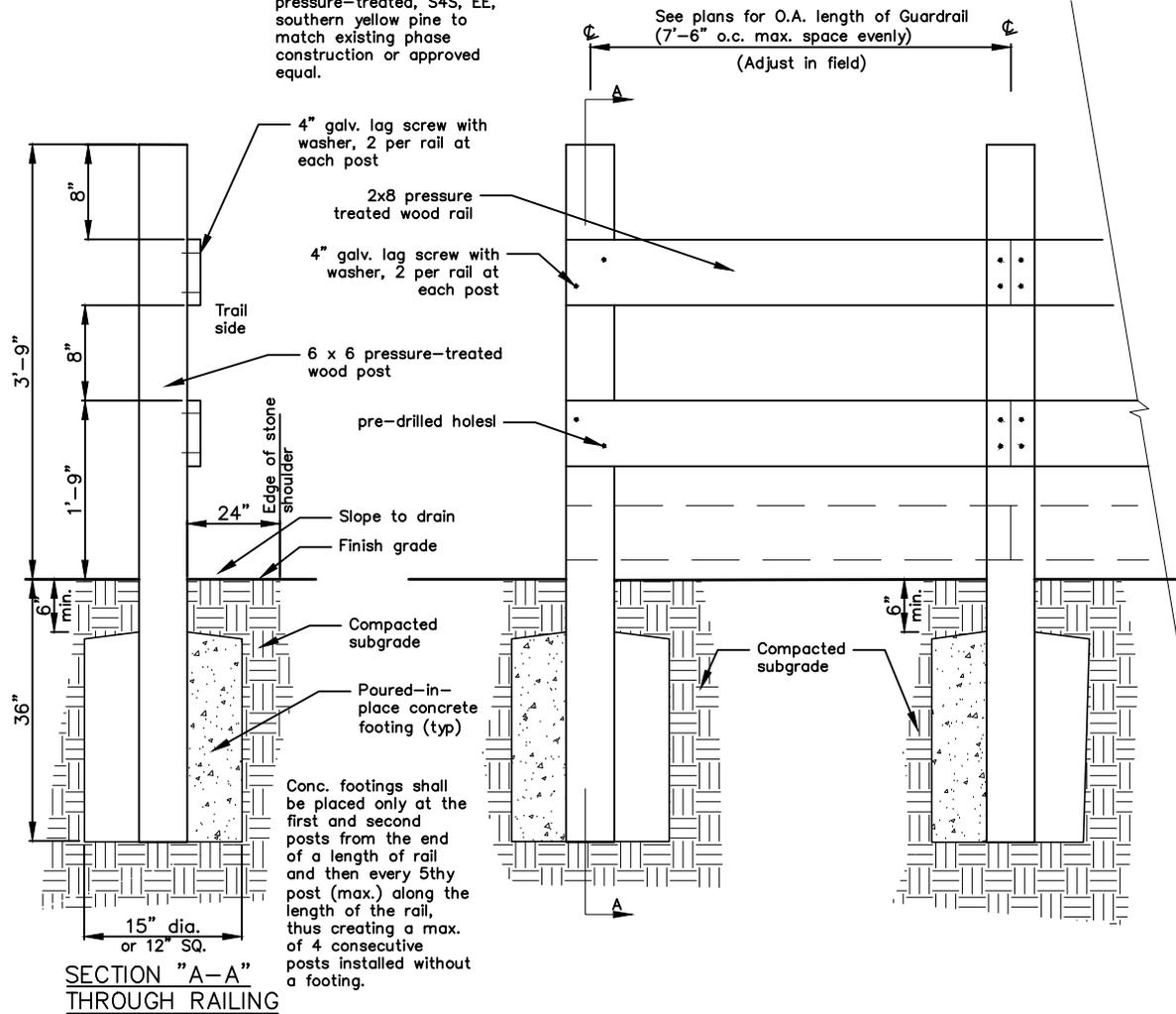
LINE OF SIGHT TRIANGLE: WESTFIELD ALTERNATIVE TRANSPORTATION PLAN

TYPICAL TRAIL/ROAD INTERSECTION



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All wood to be dimension lumber, grade 2 or better, 0.40 retention CCA, pressure-treated, S4S, EE, southern yellow pine to match existing phase construction or approved equal.



WOOD RAILING DETAILS: WESTFIELD ALTERNATIVE TRANSPORTATION PLAN

EQUESTRIAN WOOD RAILING DETAILS:
TYPICAL, SIDE VIEW, AND BRIDGE
APPROACH SECTION CUTS



CITY OF WESTFIELD, INDIANA

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Revisions

<i>Date</i>	<i>Initials</i>	<i>Checked by</i>
7-22-2011	MRP	
9-15-2011	RJK	

ANNA KENDALL TRAIL SIGNAGE

TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION



PANTONE COLOR #266

COLOR BLACK

COLOR WHITE

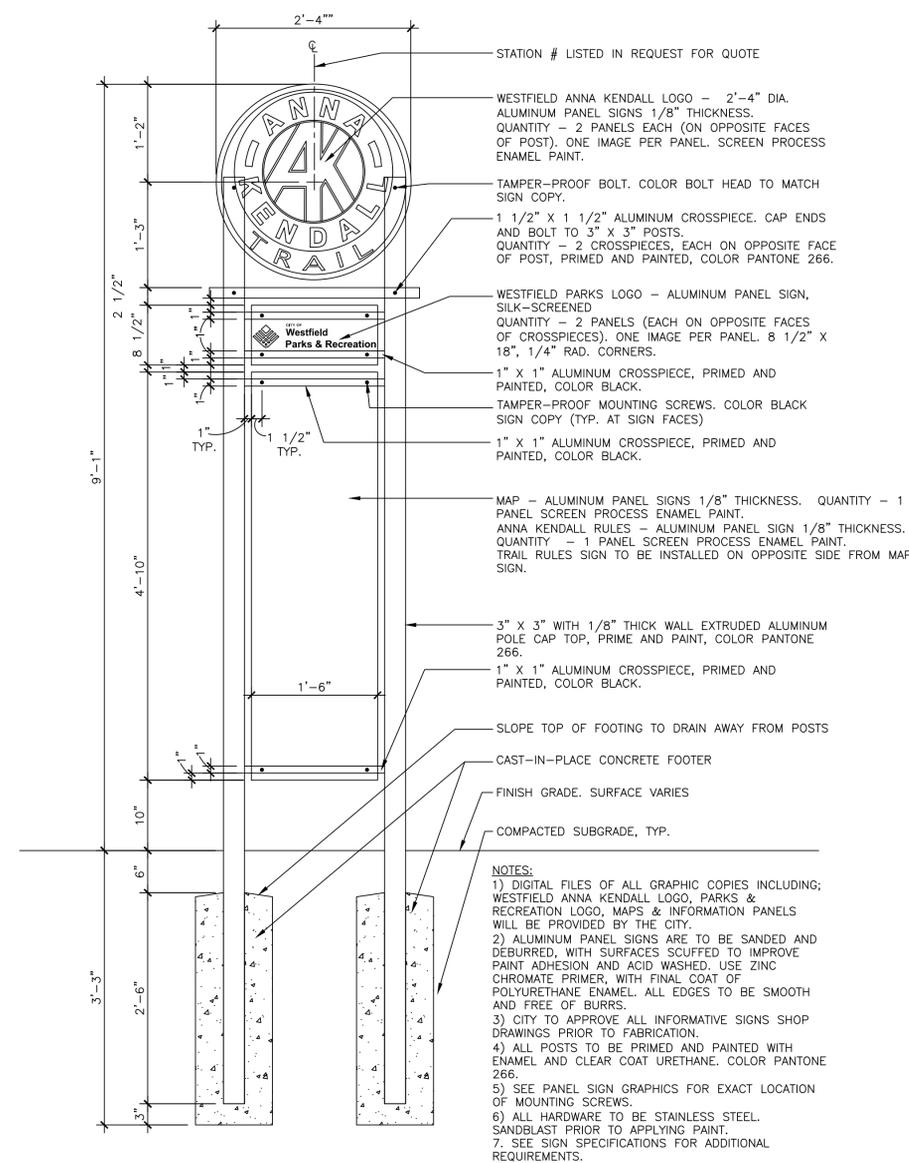
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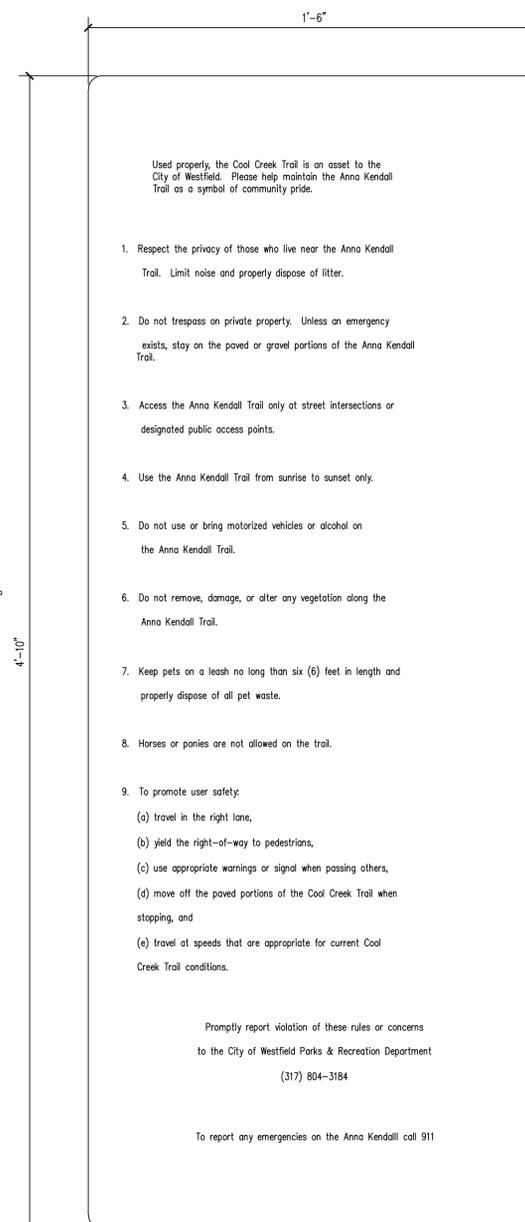
ANNA KENDALL TRAIL SIGNAGE

TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION



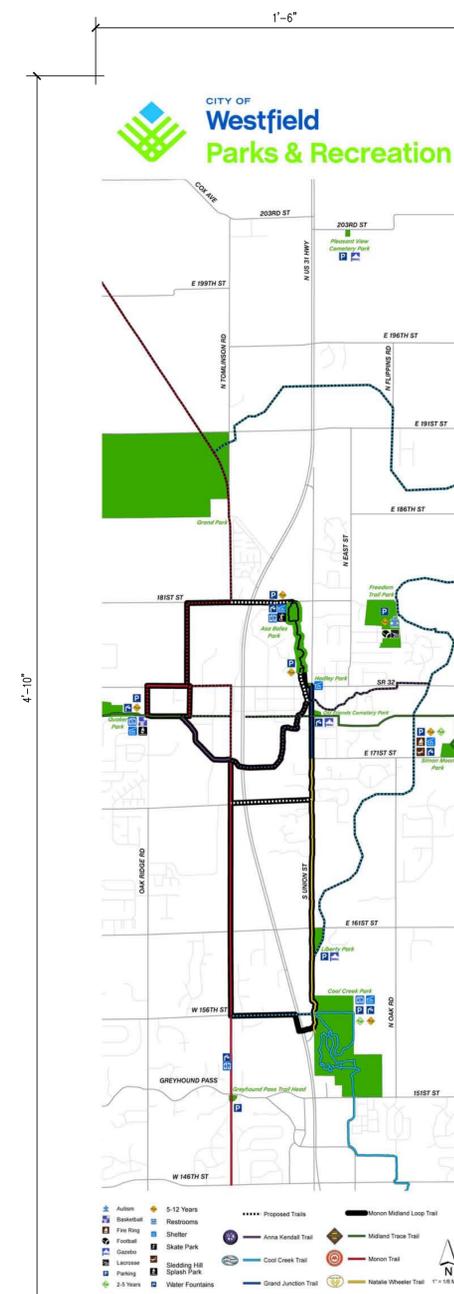
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SCALE: NTS



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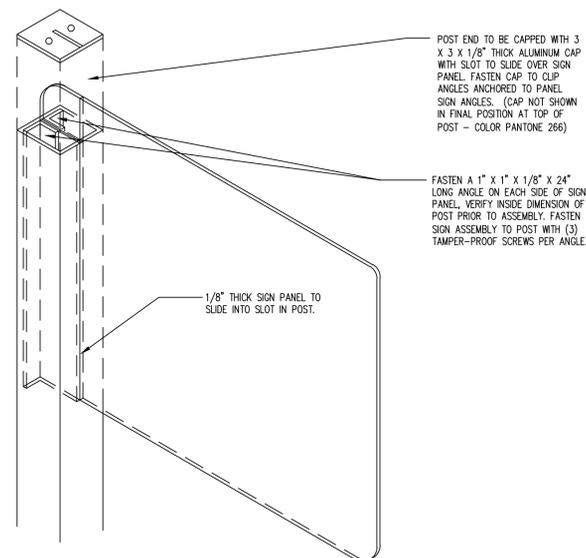
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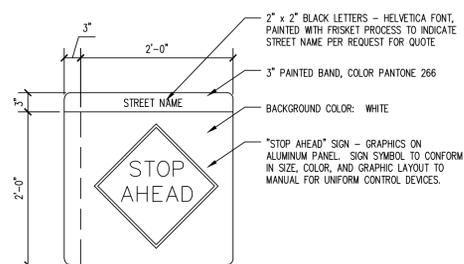
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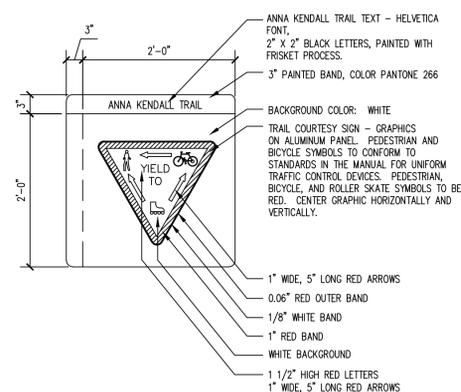
2 TRAIL TRAFFIC SIGN AXONOMETRIC

SCALE: NTS



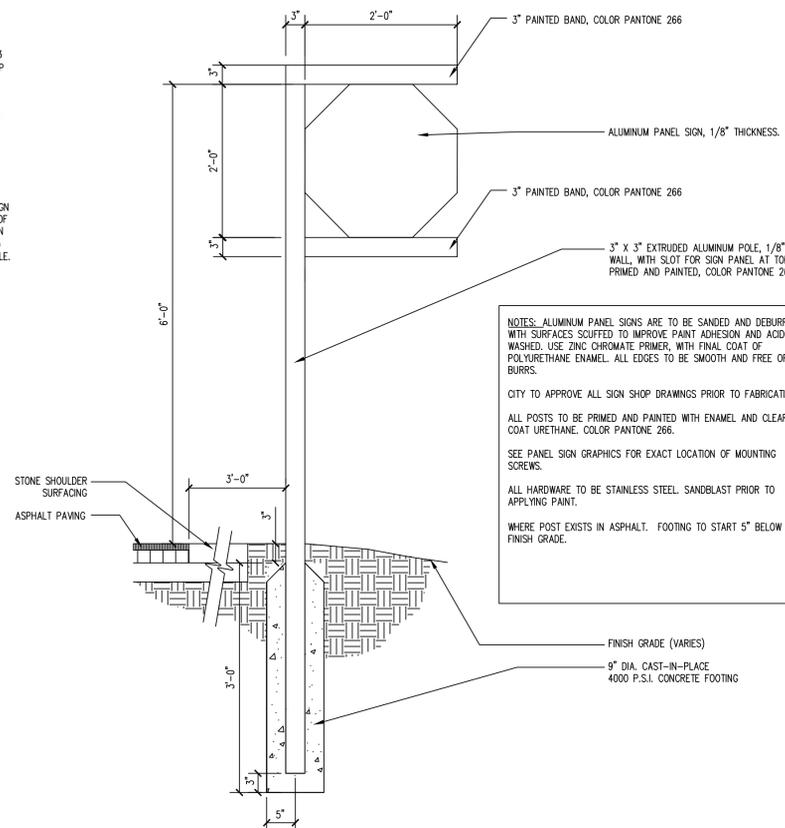
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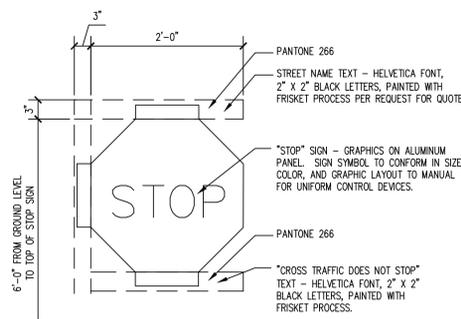
2B

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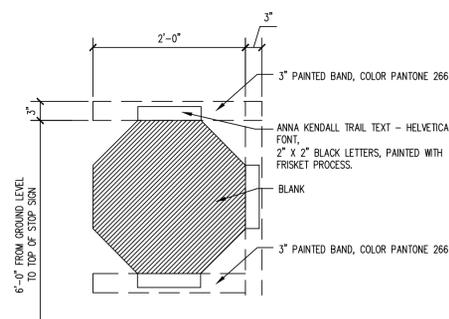
3 TYPICAL TRAIL TRAFFIC SIGN ELEVATION

SCALE: NTS



3A

SCALE: NTS



3B

SCALE: NTS

ANNA KENDALL TRAIL SIGNAGE

TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION

Unlimited Possibilities....

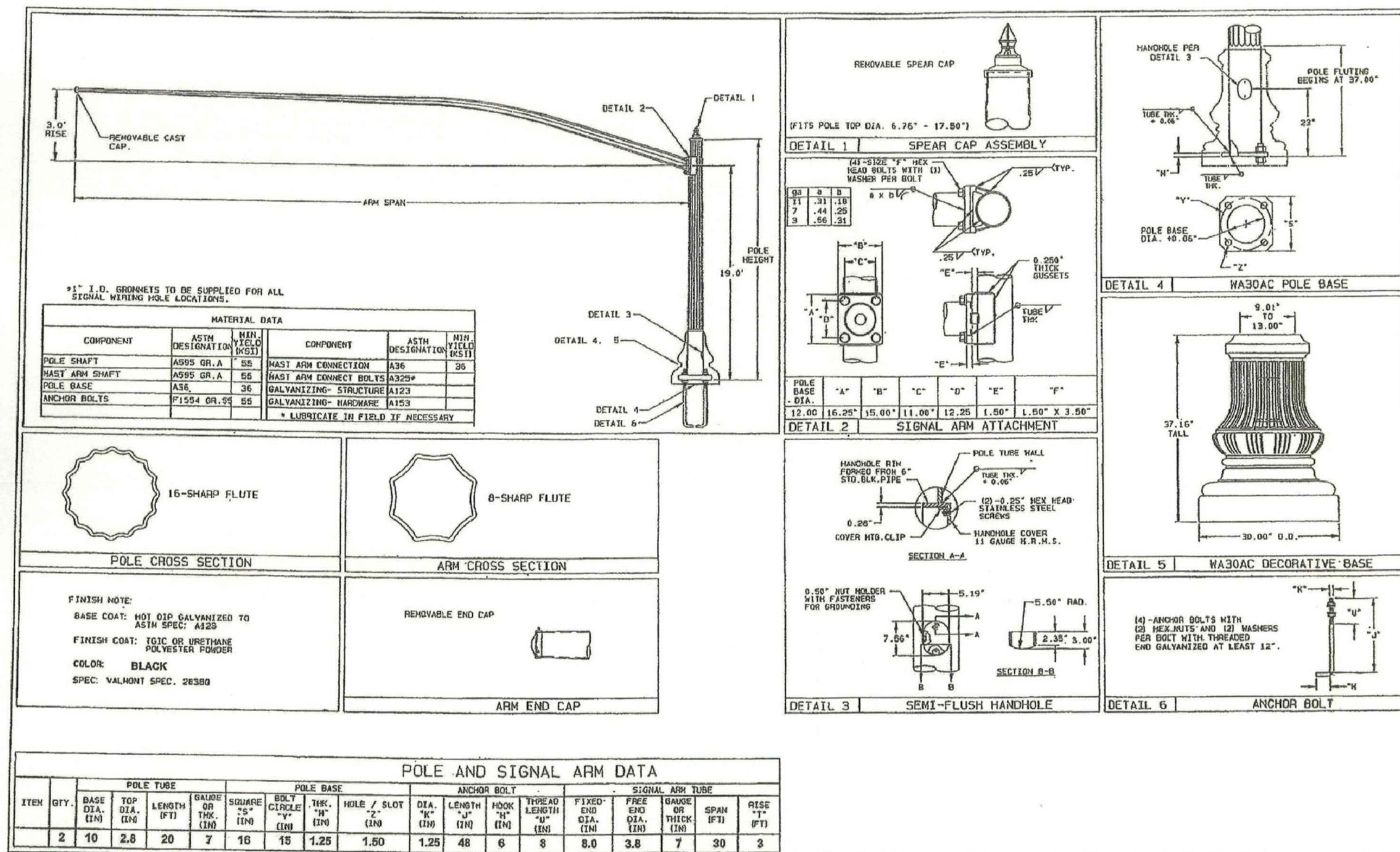
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ANNA KENDALL TRAIL SIGNAGE

TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION



OVERHEAD FLASHER

SCALE: NTS



PANTONE COLOR #292

COLOR BLACK

COLOR WHITE

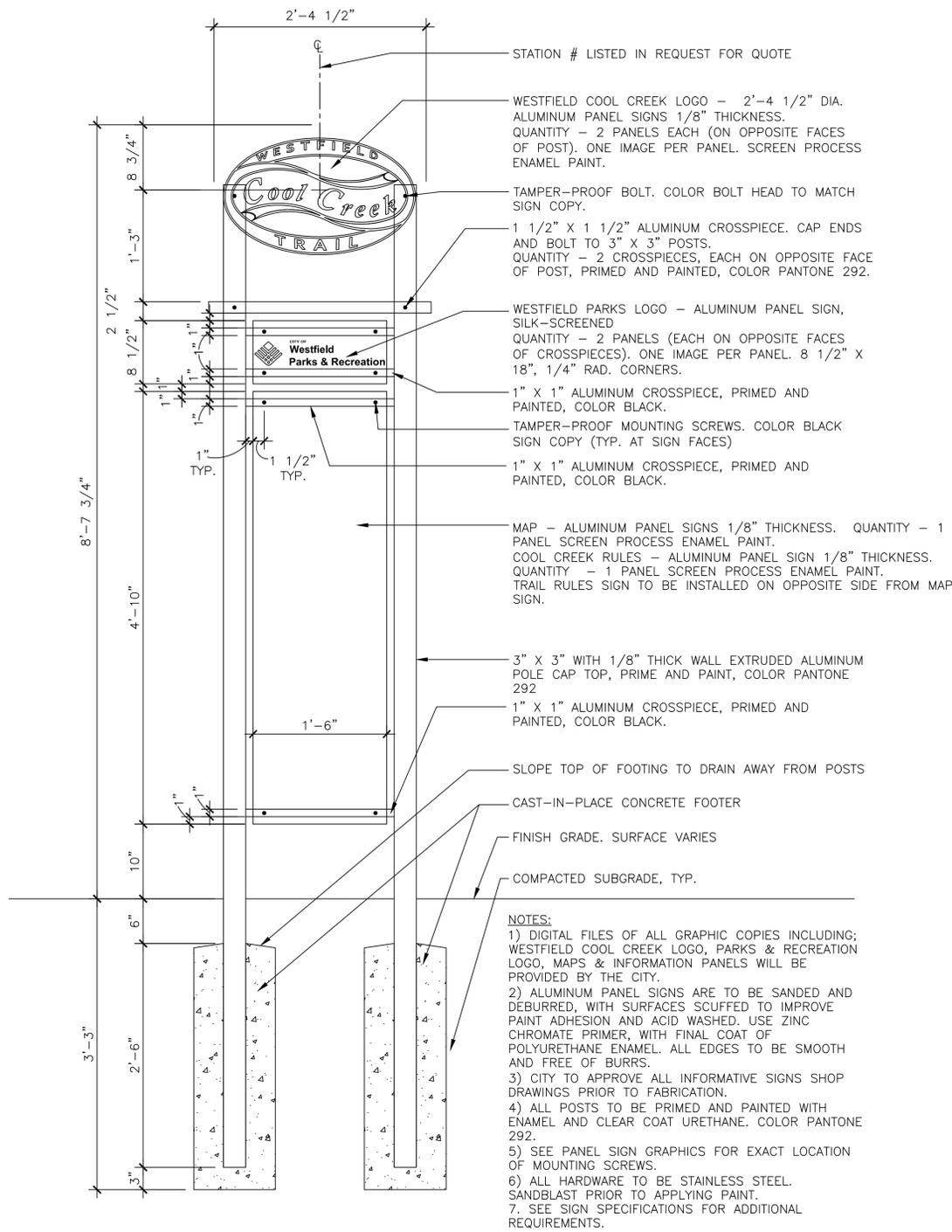
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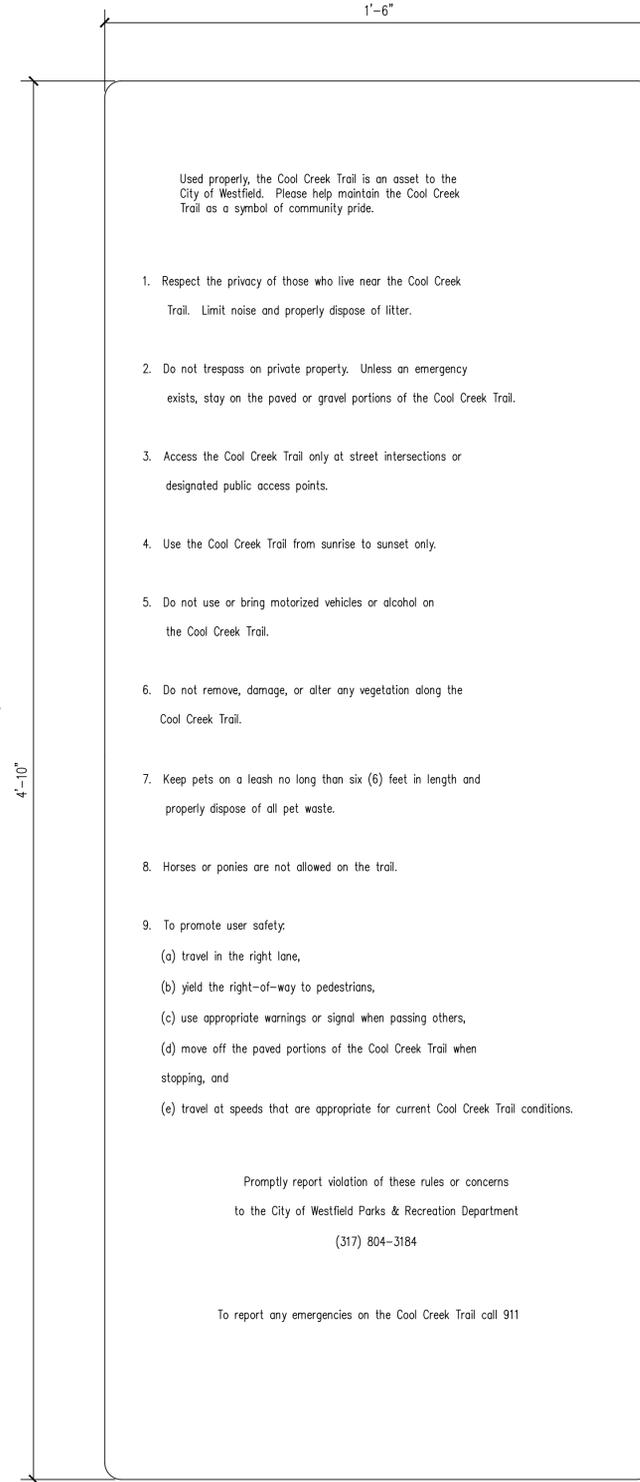
COOL CREEK TRAIL SIGNAGE

TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION



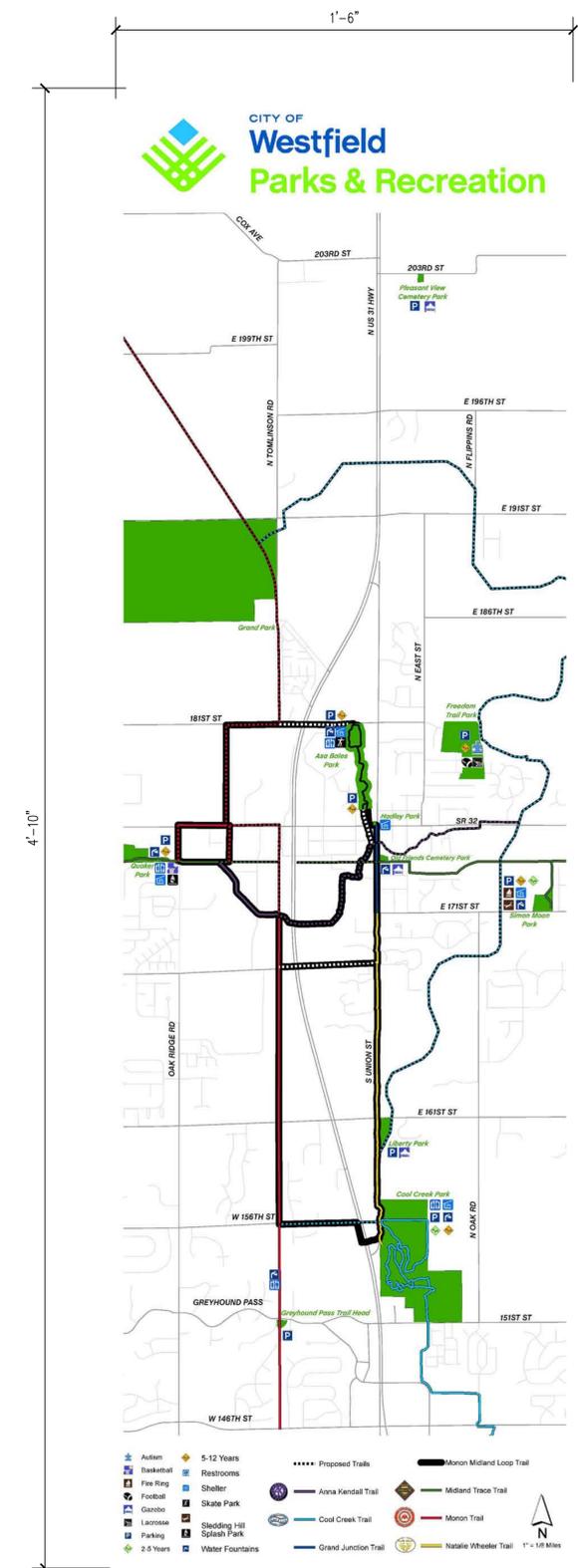
1 INFORMATIVE SIGN

SCALE: NTS



1A COOL CREEK RULES

SCALE: NTS



1B INFORMATIONAL SIGN

SCALE: NTS



Unlimited Possibilities....

Created By:
Margaretta Peterson

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COOL CREEK TRAIL SIGNAGE

TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION

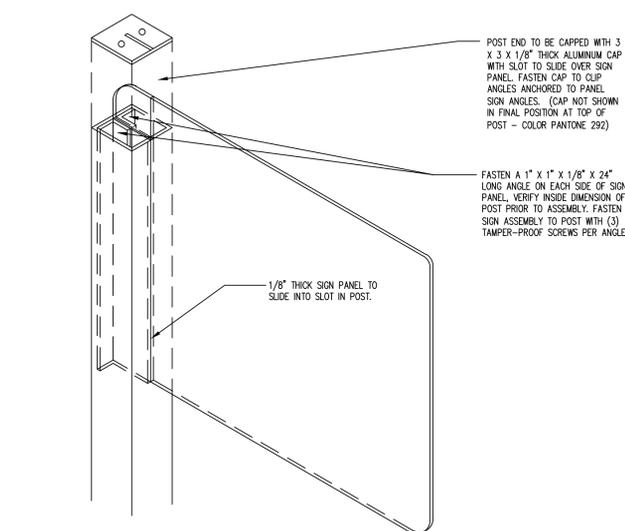
Unlimited Possibilities....

Created By:
Margaretta Peterson

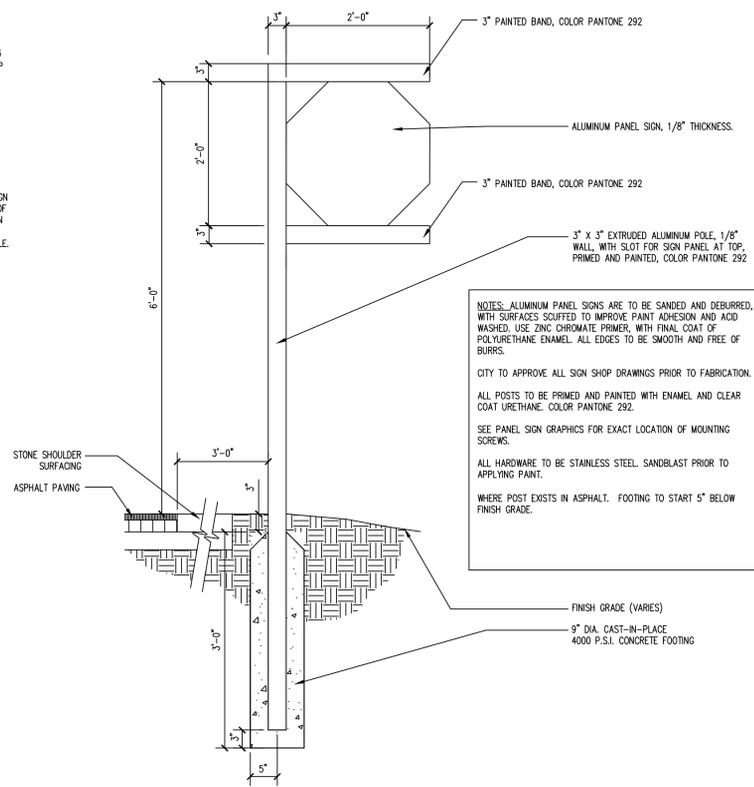
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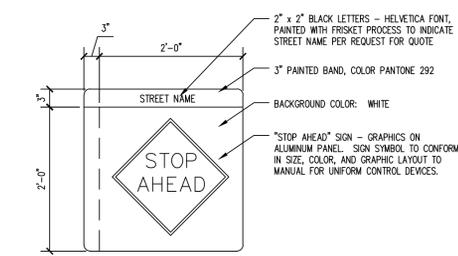
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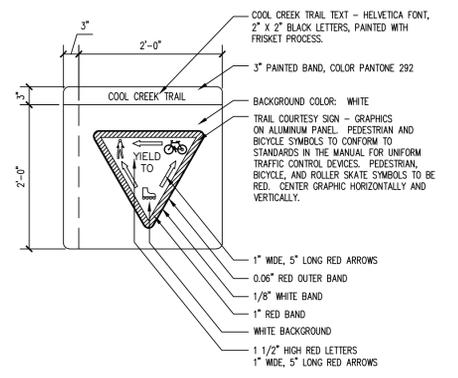
2 TRAIL TRAFFIC SIGN AXONOMETRIC
SCALE: NTS



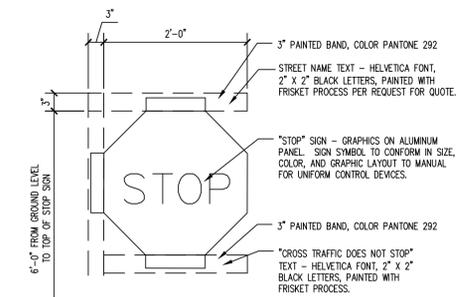
3 TYPICAL TRAIL TRAFFIC SIGN ELEVATION
SCALE: NTS



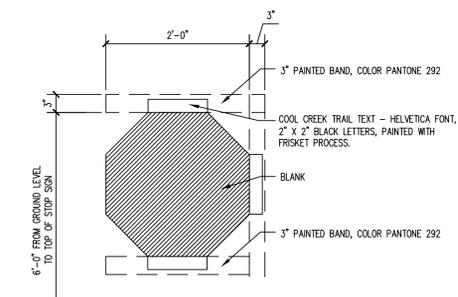
2A
SCALE: NTS



2B
SCALE: NTS



3A
SCALE: NTS



3B
SCALE: NTS

COOL CREEK TRAIL SIGNAGE

TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION

Unlimited Possibilities....

City of Westfield
Parks and Recreation Dept.
2728 East 171st Street
Westfield IN, 46074
PH: 317-804-3184
FAX: 317-804-3190

Revisions

Date	Initials	Checked by
7-22-2011	MRP	
9-15-2011	RJK	

COOL CREEK TRAIL SIGNAGE

TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION

3.0' RISE
REMOVABLE CAST CAP.
ARM SPAN
POLE HEIGHT 19.0'

DETAIL 1
DETAIL 2
DETAIL 3
DETAIL 4
DETAIL 5
DETAIL 6

REMOVABLE SPEAR CAP
(FITS POLE TOP DIA. 6.76" - 17.50")

DETAIL 1 SPEAR CAP ASSEMBLY

(41-SIZE "F" HEX HEAD BOLTS WITH (1) WASHER PER BOLT

GB	a	b
11	.31	.18
7	.44	.25
3	.66	.31

0.250" THICK BUSSETS
TUBE THK.
"E"
"F"

DETAIL 4 WA30AC POLE BASE

9.01" TO 13.00"
37.16" TALL
30.00" O.D.

DETAIL 5 WA30AC DECORATIVE BASE

POLE CROSS SECTION: 16-SHARP FLUTE
ARM CROSS SECTION: 8-SHARP FLUTE

FINISH NOTE:
BASE COAT: HOT DIP GALVANIZED TO ASTM SPEC: A123
FINISH COAT: TOIC OR URETHANE POLYESTER POWDER
COLOR: BLACK
SPEC: VALMONT SPEC. 26380

REMOVABLE END CAP

DETAIL 3 SEMI-FLUSH HANDHOLE
HANDHOLE RIN FORMED FROM 6" STD. BLK. PIPE
POLE TUBE WALL
TUBE THK. = 0.06"
(2) - 4.25" HEX HEAD STAINLESS STEEL SCREWS
HANDHOLE COVER 11 GAUGE H.R.H.S.
COVER MTG. CLIP
0.26"

SECTION A-A

0.50" NUT HOLDER WITH FASTENERS FOR GROUNDING
5.19"
7.66"
5.60" RAD.
2.35" 3.00"

SECTION B-B

DETAIL 6 ANCHOR BOLT
(4) - ANCHOR BOLTS WITH (2) HEX NUTS AND (2) WASHERS PER BOLT WITH THREADED END GALVANIZED AT LEAST 12".

POLE AND SIGNAL ARM DATA																	
ITEM	QTY.	POLE TUBE				POLE BASE				ANCHOR BOLT				SIGNAL ARM TUBE			
		BASE DIA. (IN)	TOP DIA. (IN)	LENGTH (FT)	GAUGE OR THK. (IN)	SQUARE "S" (IN)	BOLT CIRCLE "Y" (IN)	THK. "H" (IN)	HOLE / SLOT "Z" (IN)	DIA. "K" (IN)	LENGTH "J" (IN)	HOOK "H" (IN)	THREAD LENGTH "U" (IN)	FIXED END DIA. (IN)	FREE END DIA. (IN)	GAUGE OR THICK (IN)	SPAN (FT)
2	10	2.8	2.0	7	16	15	1.25	1.50	1.25	48	6	8	8.0	3.8	7	30	3

*1" I.D. GROMMETS TO BE SUPPLIED FOR ALL SIGNAL WIRING HOLE LOCATIONS.
* LUBRICATE IN FIELD IF NECESSARY

OVERHEAD FLASHER

SCALE: NTS

Unlimited Possibilities.....

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2728 East 171st Street
Westfield IN, 46074
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<i>8-05-2011</i>	<i>MRP</i>	
<i>9-15-2011</i>	<i>RJK</i>	



PANTONE #129C

PANTONE #364C

PANTONE #350C

PANTONE RED #484C

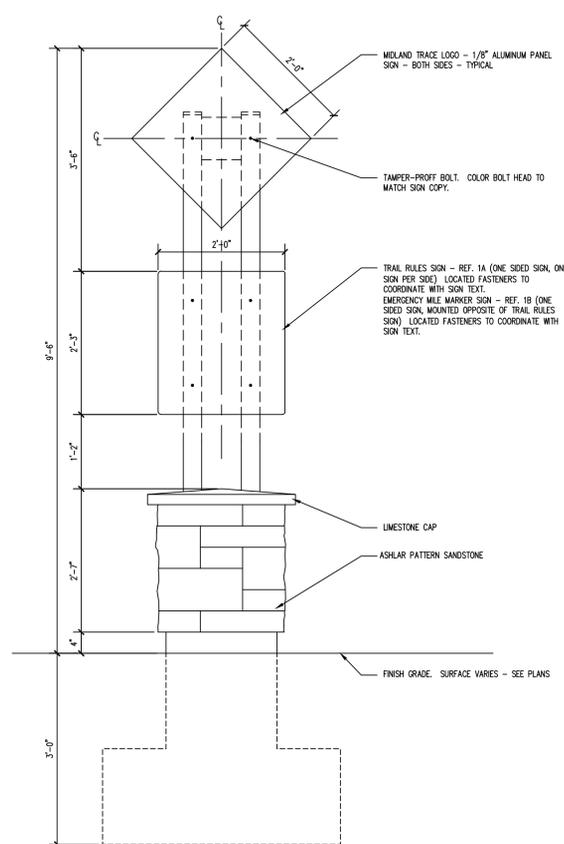
MIDLAND TRACE TRAIL SIGNAGE

TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION

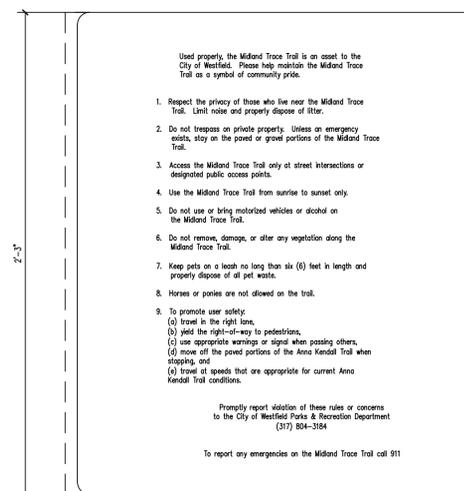
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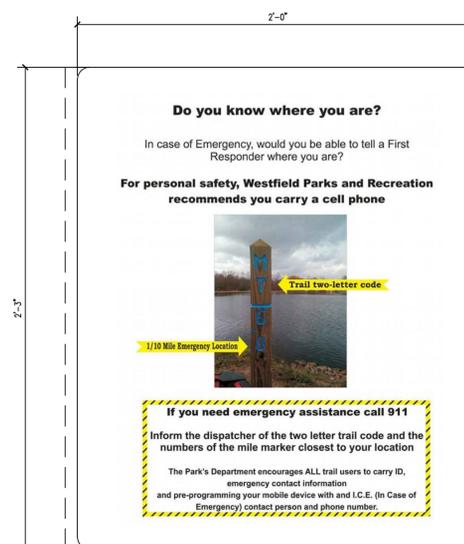
Date	Initials	Checked by
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9-15-2011	RJK	



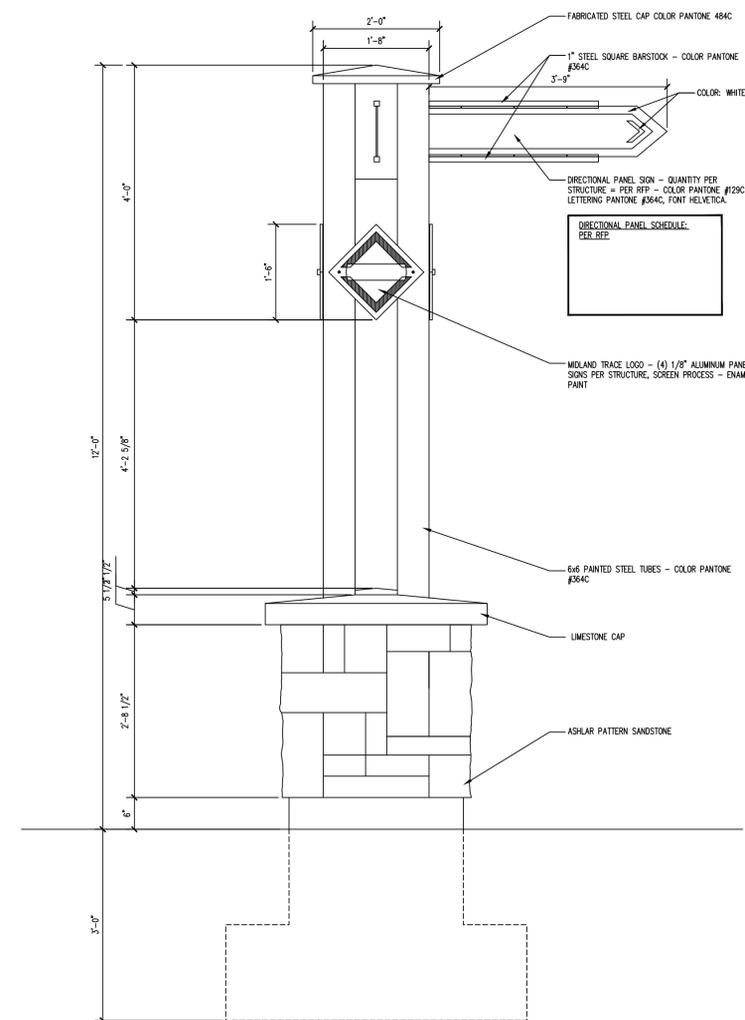
1 TRAIL IDENTITY SIGN STRUCTURE - ELEVATION
SCALE: NTS



1A TRAIL RULES SIGN
SCALE: NTS



1B EMERGENCY MILE MARKER SIGN
SCALE: NTS



2 DIRECTIONAL SIGN STRUCTURE - ELEVATION
SCALE: NTS

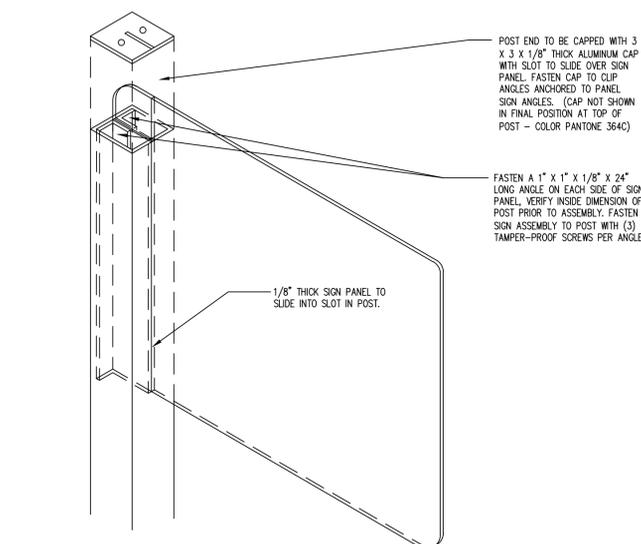
MIDLAND TRACE TRAIL SIGNAGE

TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION

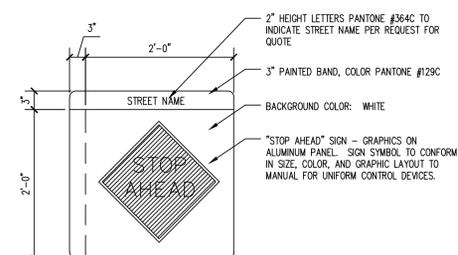
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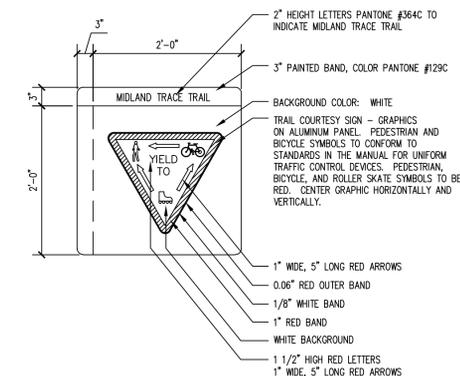
Date	Initials	Checked by
8-05-2011	MRP	
9-15-2011	RJK	



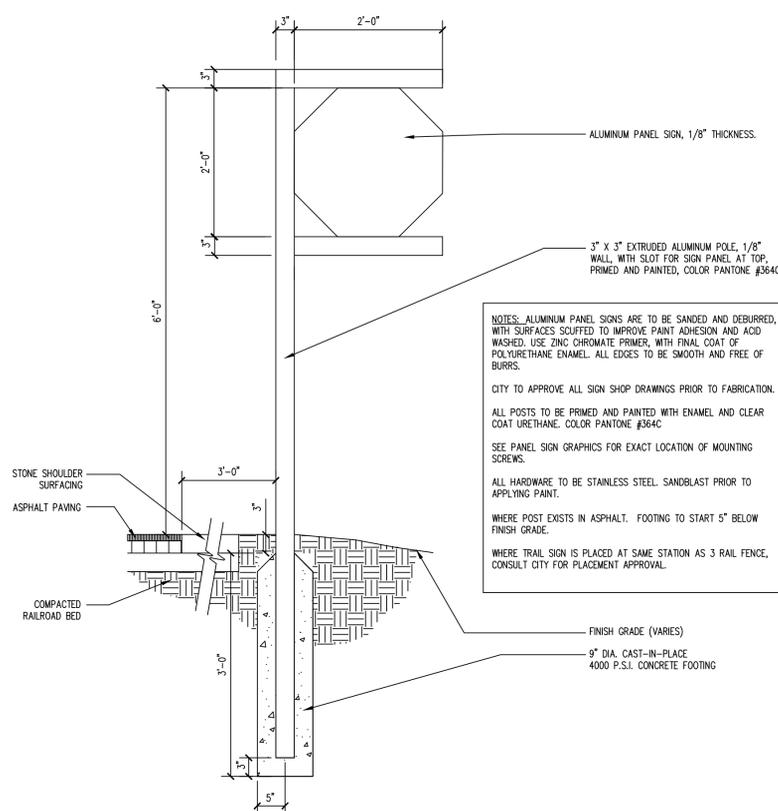
3 TRAIL TRAFFIC SIGN AXONOMETRIC
SCALE: NTS



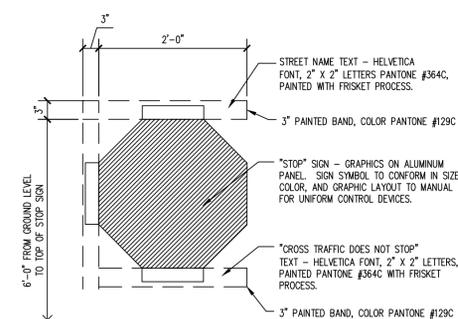
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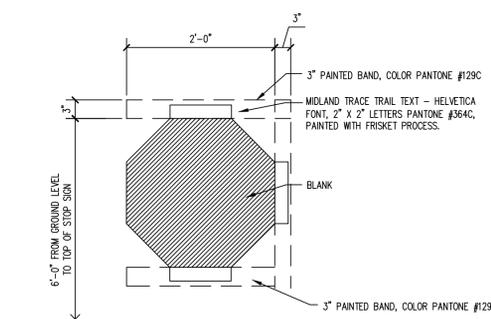
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4 TYPICAL TRAIL TRAFFIC SIGN ELEVATION
SCALE: NTS



4A
SCALE: NTS



4B
SCALE: NTS

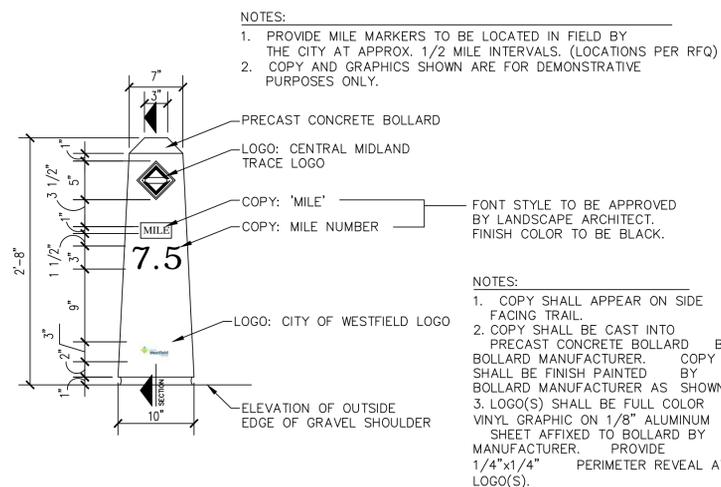
MIDLAND TRACE TRAIL SIGNAGE

TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION

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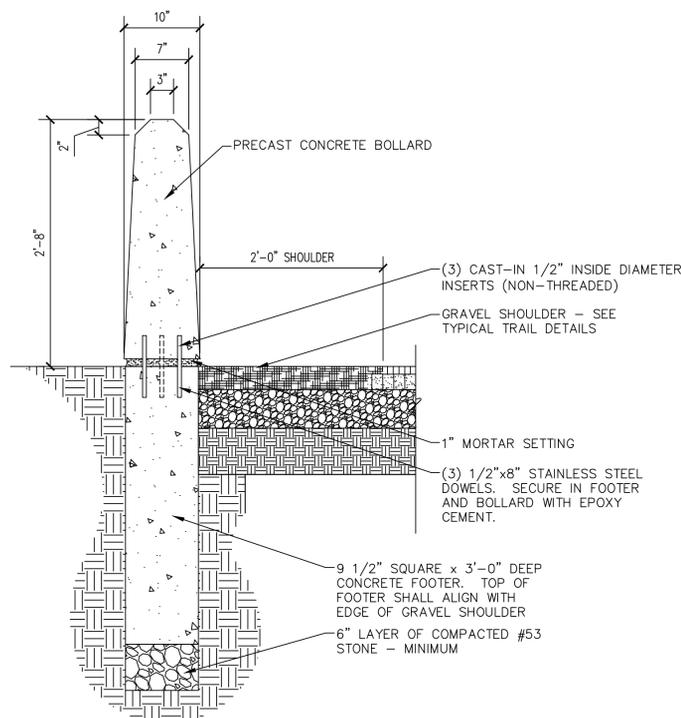
Revisions

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9-15-2011	RJK	



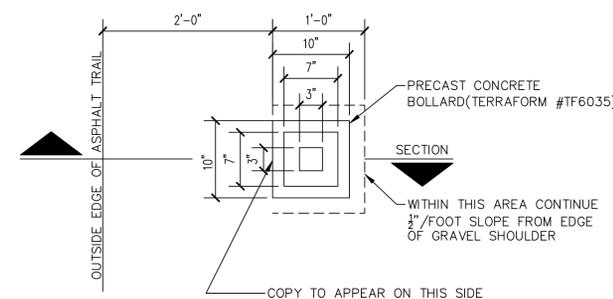
8 ELEVATION AT MILE MARKER

SCALE: NTS



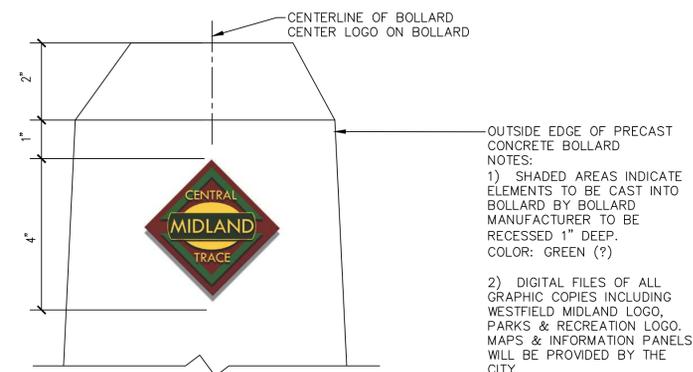
9 SECTION AT MILE MARKER

SCALE: NTS



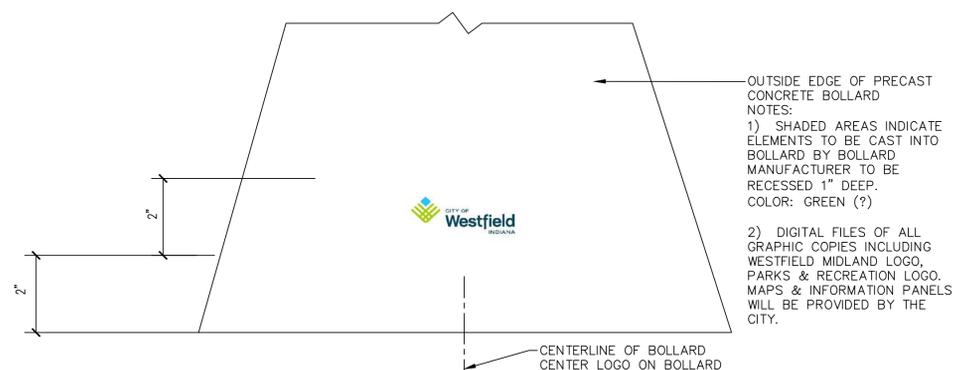
10 PLAN OF MILE MARKER

SCALE: NTS



11 WESTFIELD MIDLAND LOGO

SCALE: NTS



12 PLAN OF MILE MARKER

SCALE: NTS

MIDLAND TRACE TRAIL SIGNAGE

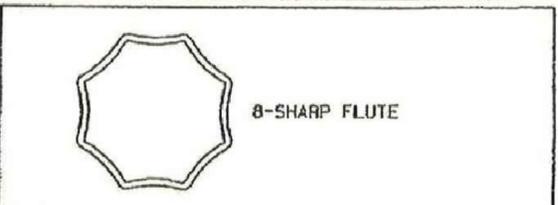
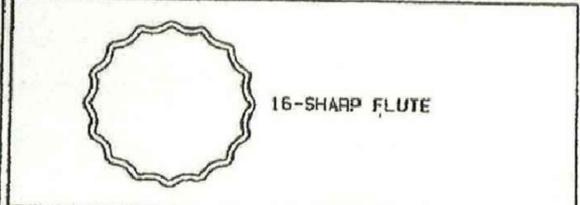
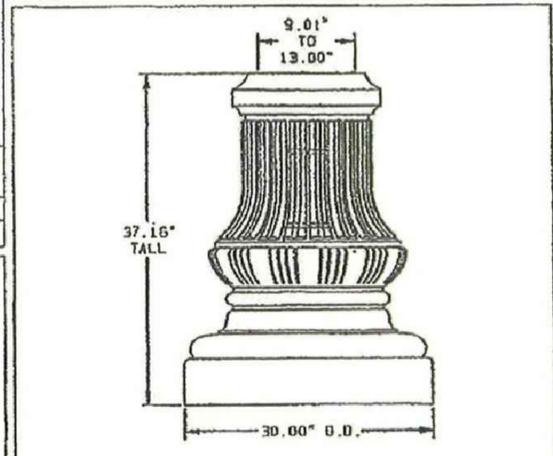
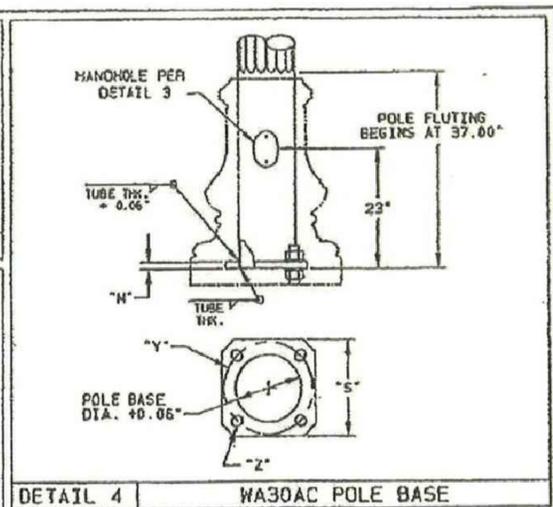
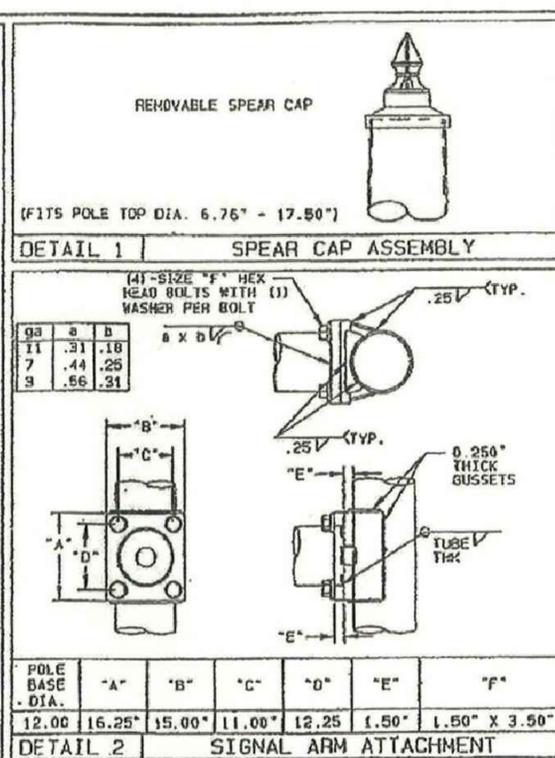
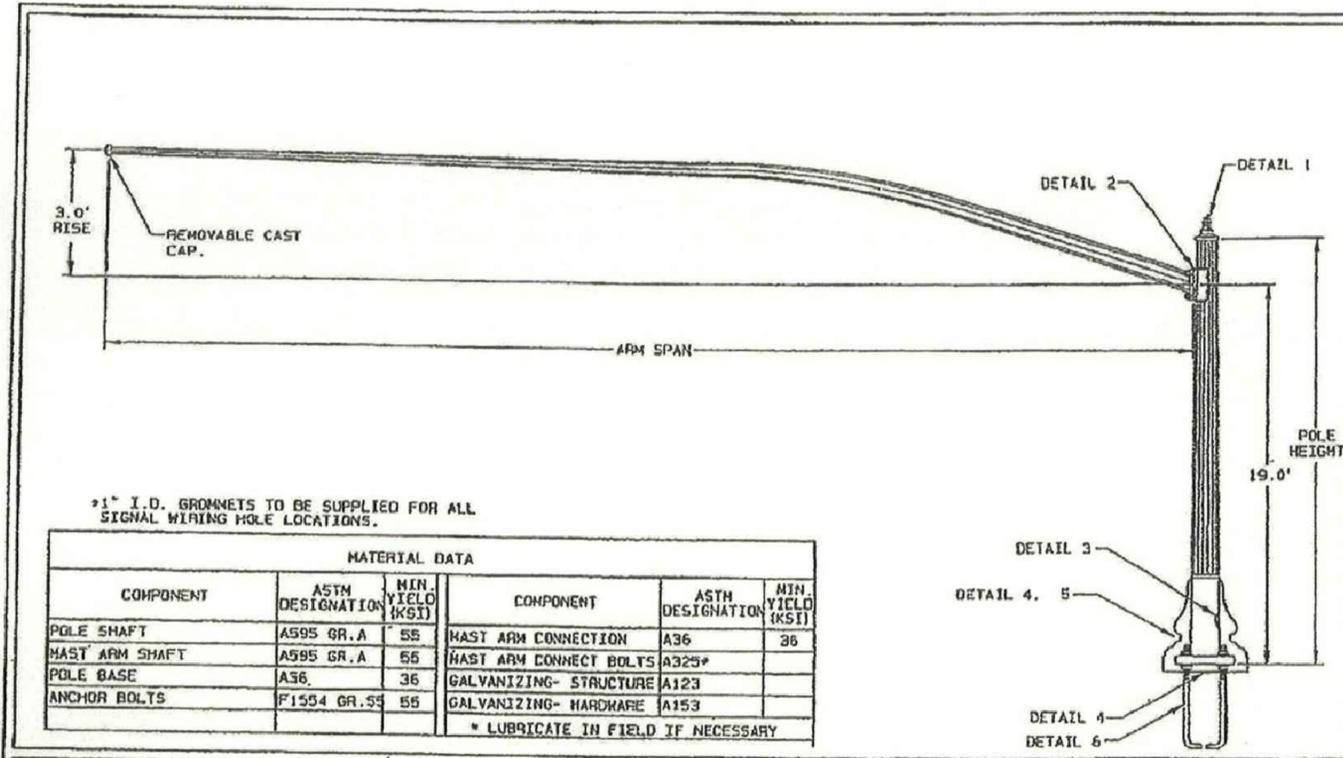
TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION

Unlimited Possibilities....

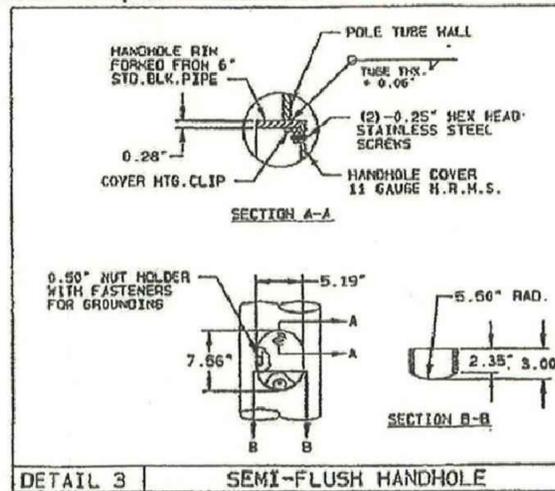
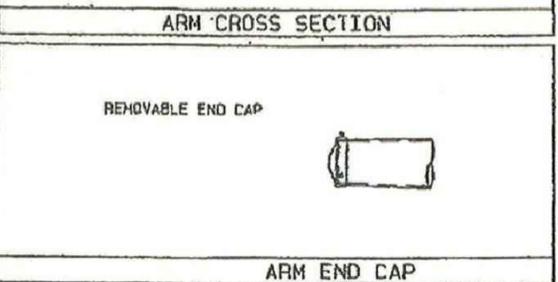
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FINISH NOTE:
BASE COAT: HOT DIP GALVANIZED TO ASTM SPEC: A123
FINISH COAT: TGIC OR URETHANE POLYESTER POWDER
COLOR: GREEN
SPEC: VALMONT SPEC. 26380



POLE AND SIGNAL ARM DATA																		
ITEM	QTY.	POLE TUBE				POLE BASE				ANCHOR BOLT				SIGNAL ARM TUBE				
		BASE DIA. (IN)	TOP DIA. (IN)	LENGTH (FT)	GAUGE OR THK. (IN)	SQUARE "S" (IN)	BOLT CIRCLE "Y" (IN)	THK. "H" (IN)	HOLE / SLOT "Z" (IN)	DIA. "K" (IN)	LENGTH "J" (IN)	HOOK "H" (IN)	THREAD LENGTH "U" (IN)	FIXED- END DIA. (IN)	FREE- END DIA. (IN)	GAUGE OR THICK. (IN)	SPAN (FT)	RISE "T" (FT)
	2	10	2.8	20	7	16	15	1.25	1.50	1.25	48	6	8	8.0	3.8	7	30	3

OVERHEAD FLASHER

SCALE: NTS

MIDLAND TRACE TRAIL SIGNAGE

TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION

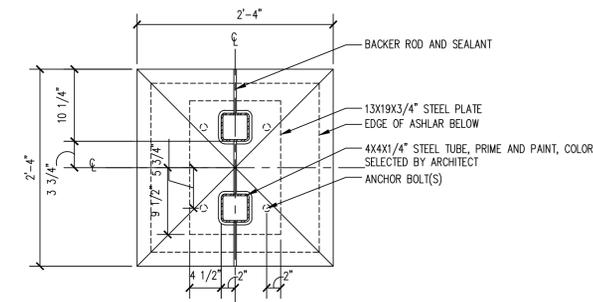
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MIDLAND TRACE TRAIL SIGNAGE

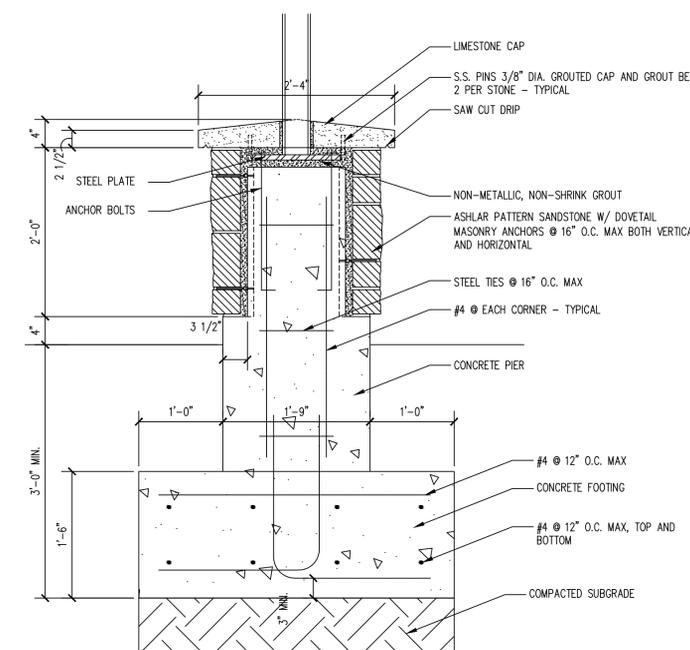
TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION



NOTE: DIMENSIONS AND NOTES ARE TYPICAL FOR ALL SIDES UNLESS NOTED OTHERWISE.

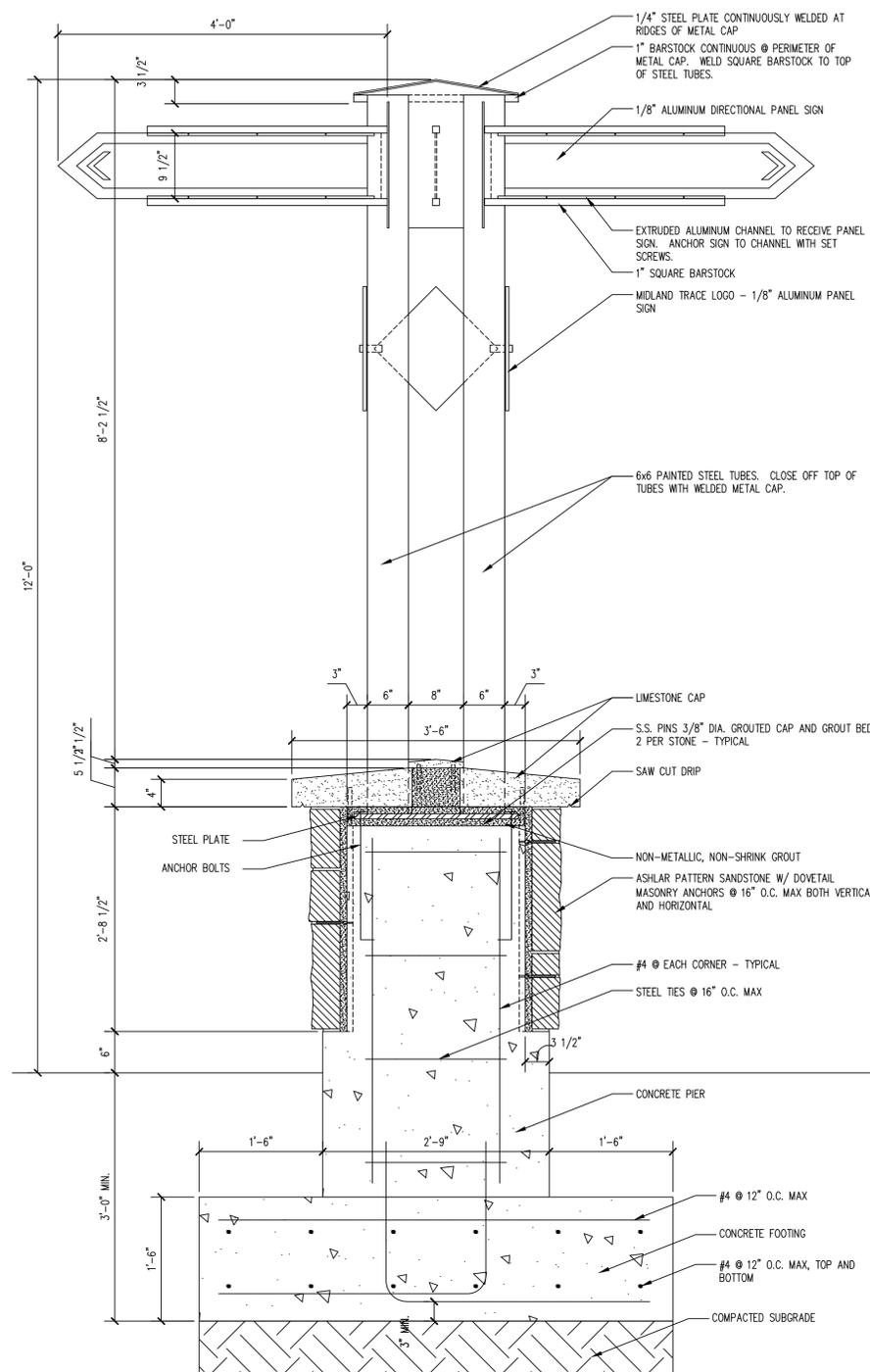
2 TRAIL IDENTITY SIGN BASE DETAIL

SCALE: NTS



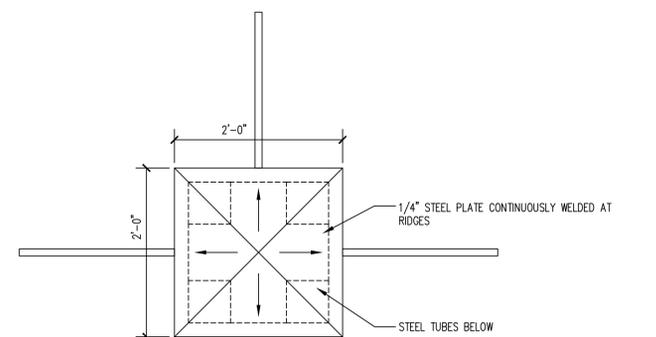
1 TRAIL IDENTITY SIGN STRUCTURE - SECTION

SCALE: NTS



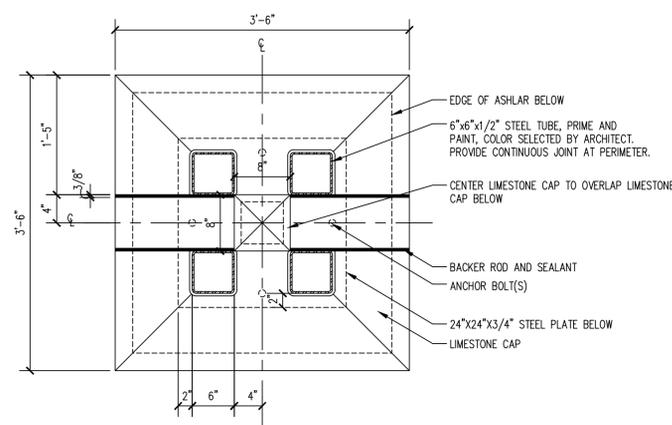
3 DIRECTIONAL SIGN STRUCTURE - SECTION

SCALE: NTS



5 DIRECTIONAL SIGN CAP DETAIL

SCALE: NTS



NOTE: DIMENSIONS AND NOTES ARE TYPICAL FOR ALL SIDES UNLESS NOTED OTHERWISE.

4 DIRECTIONAL SIGN BASE DETAIL

SCALE: NTS

City of Westfield
Parks and Recreation Dept.
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MONON TRAIL SIGNAGE

TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION



PMS COLOR #185

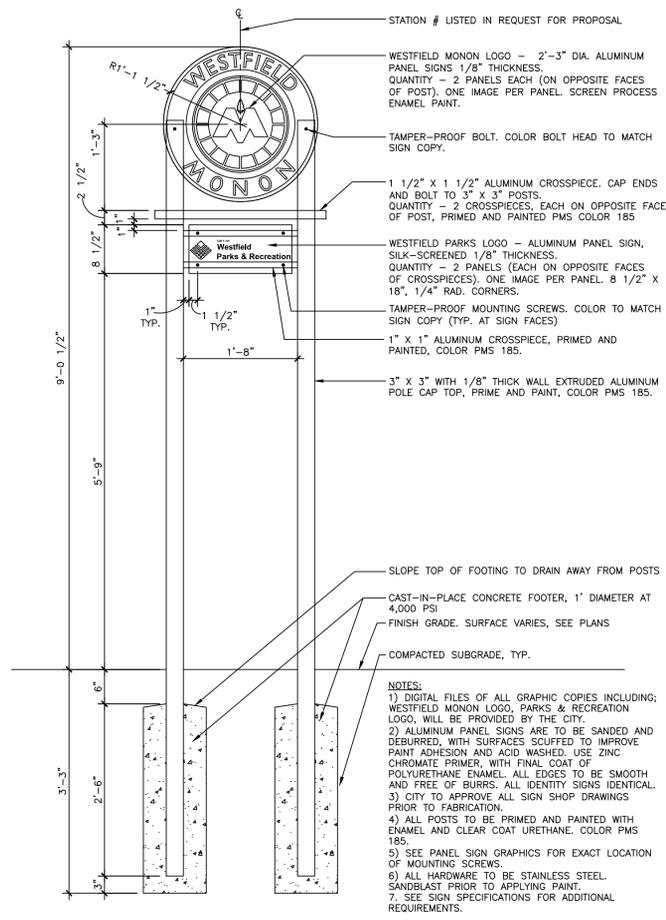
COLOR BLACK

COLOR WHITE

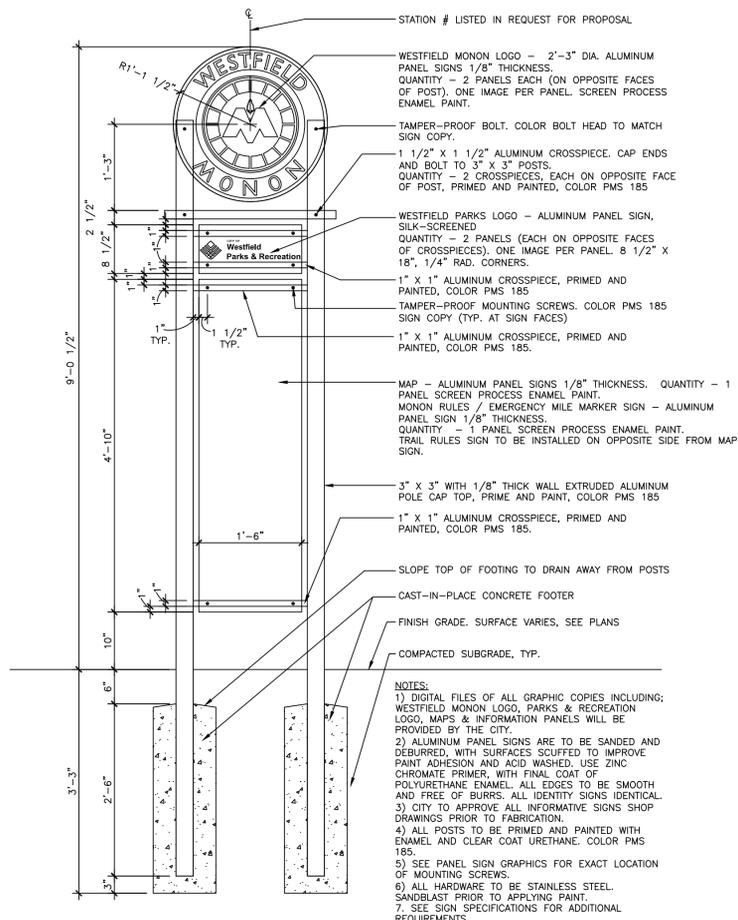
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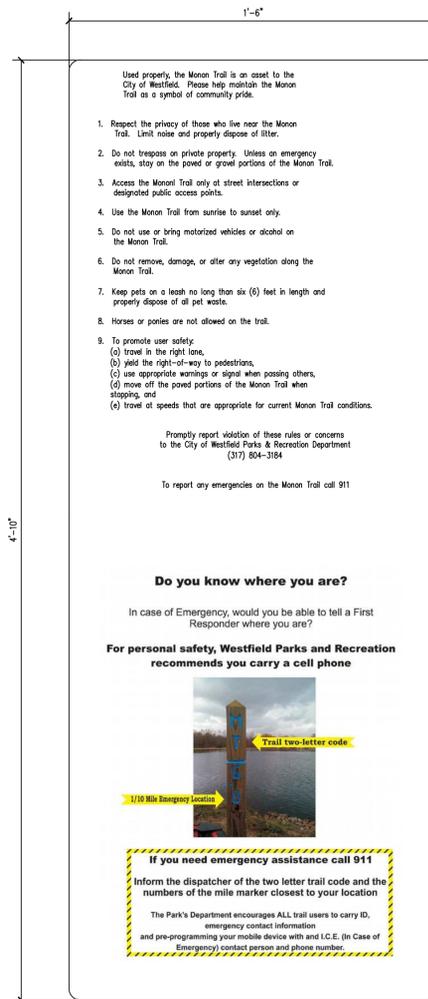
Date	Initials	Checked by
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9-15-2011	RJK	



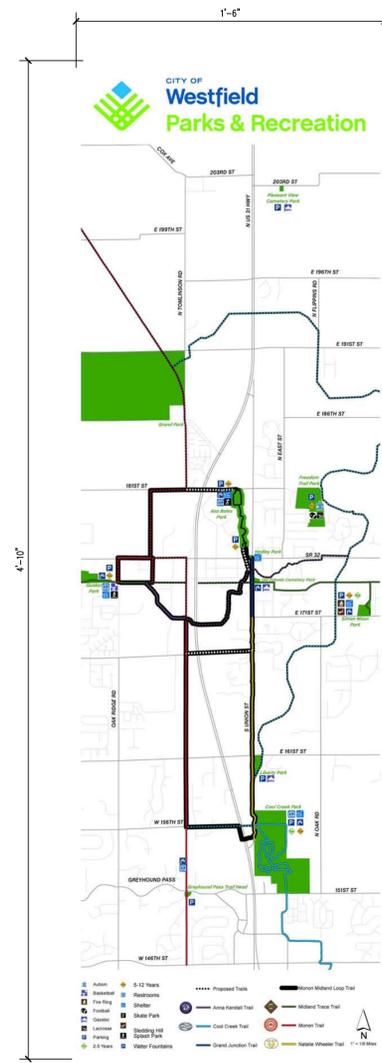
1 IDENTITY SIGN
SCALE: NTS



2 INFORMATIVE SIGN
SCALE: NTS



2A MONON RULES/EMERGENCY MILE MARKER SIGN
SCALE: NTS



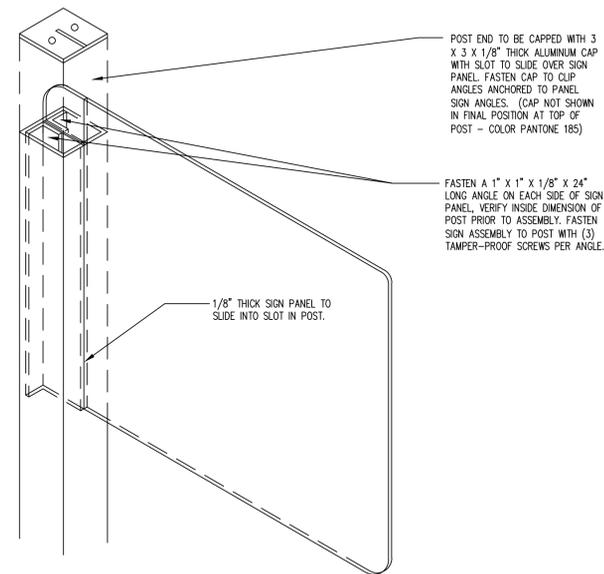
2B INFORMATIONAL SIGN
SCALE: NTS

MONON TRAIL SIGNAGE

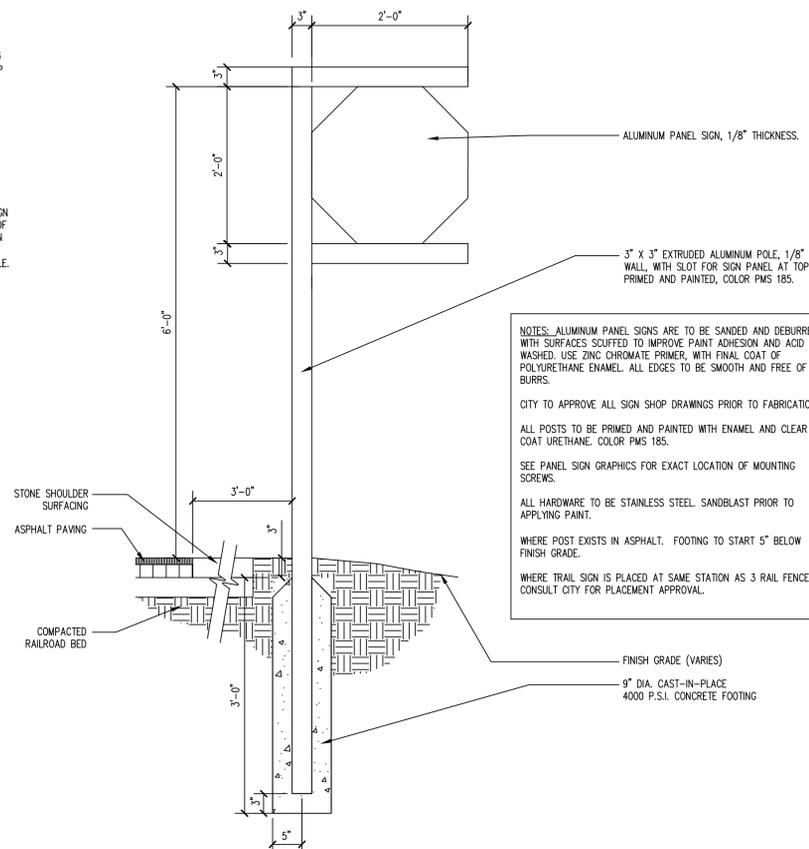
TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION

Revisions

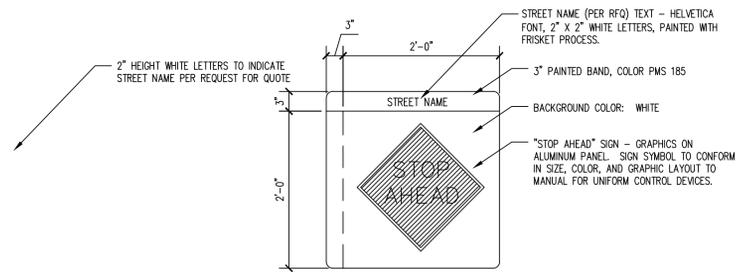
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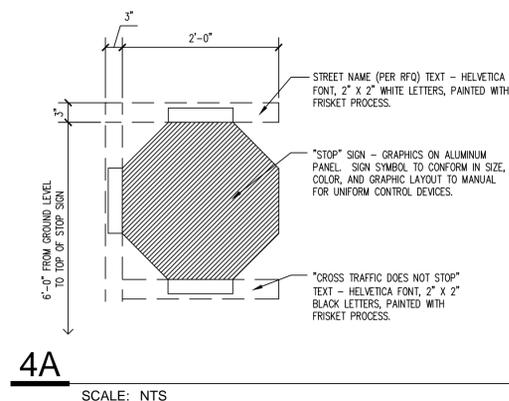
3 TRAIL TRAFFIC SIGN AXONOMETRIC
SCALE: NTS



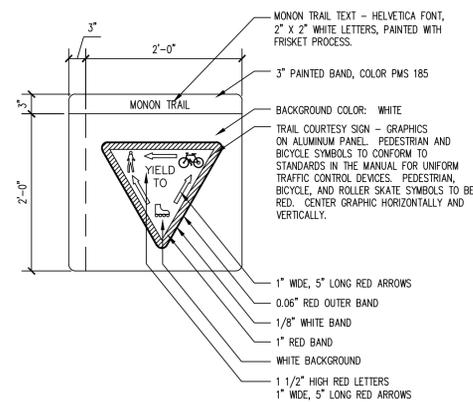
4 TYPICAL TRAIL TRAFFIC SIGN ELEVATION
SCALE: NTS



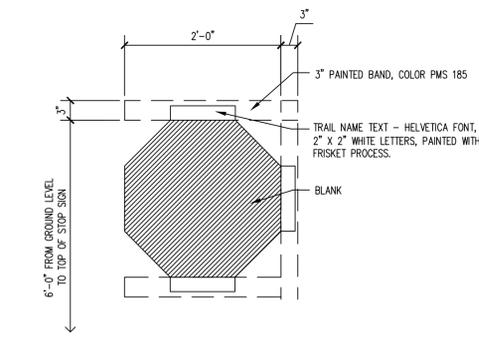
3A
SCALE: NTS



4A
SCALE: NTS



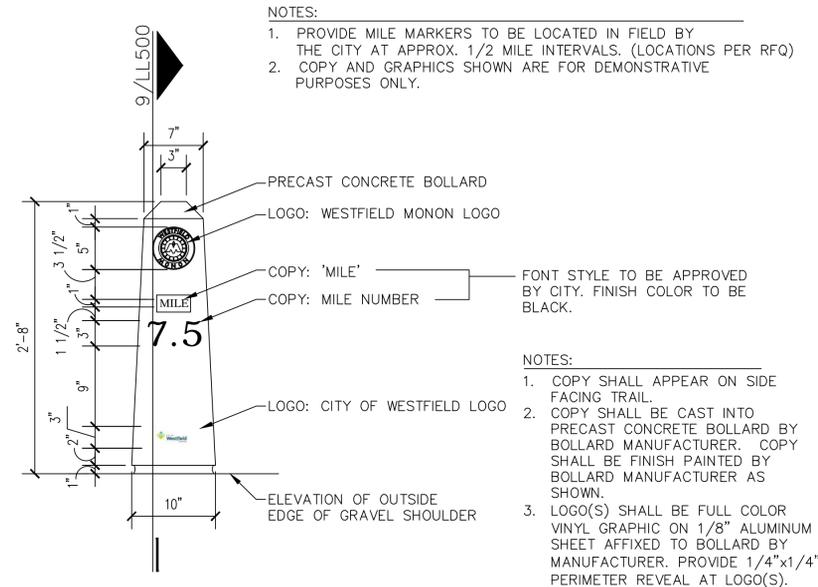
3B
SCALE: NTS



4B
SCALE: NTS

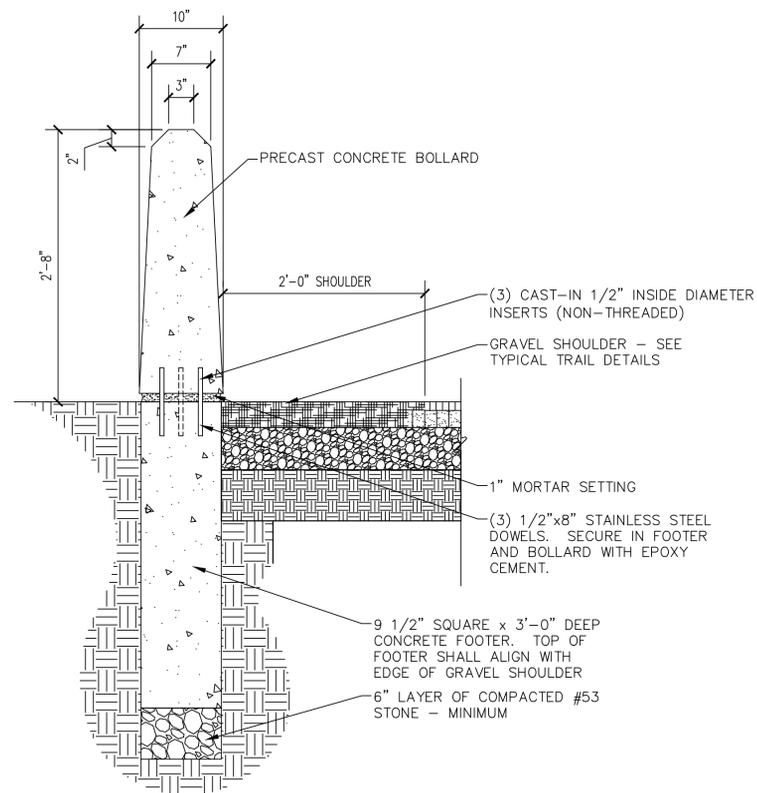
MONON TRAIL SIGNAGE

TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION



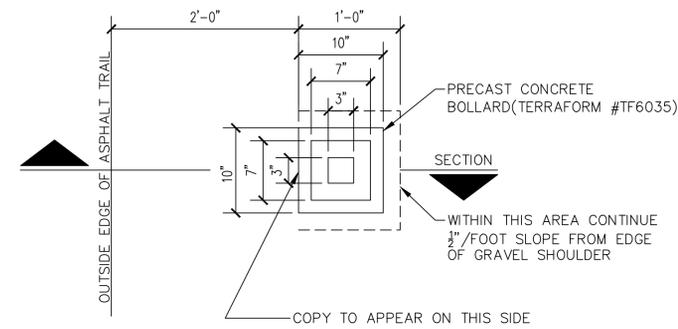
8 ELEVATION AT MILE MARKER

SCALE: NTS



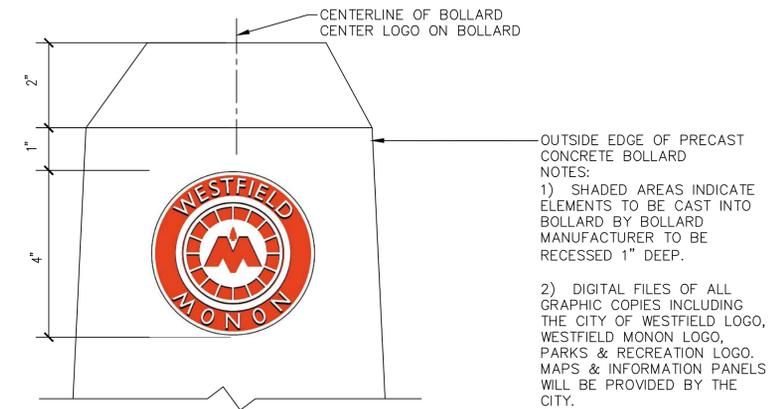
9 SECTION AT MILE MARKER

SCALE: NTS



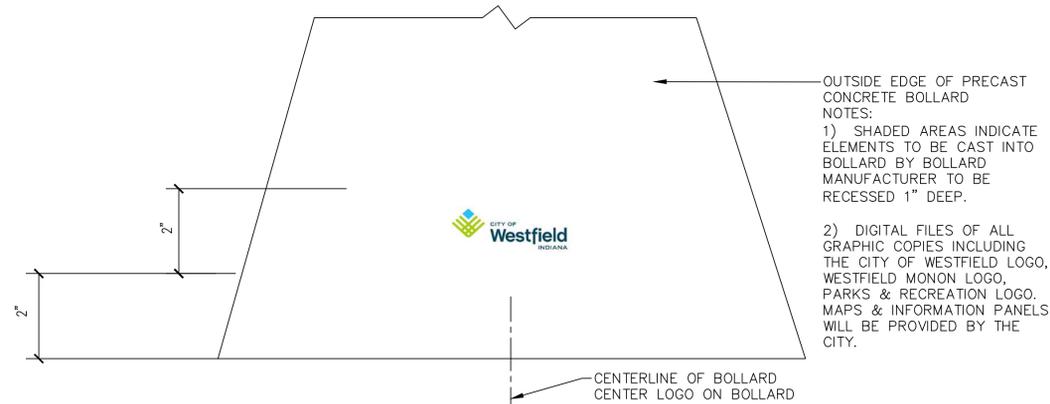
10 PLAN OF MILE MARKER

SCALE: NTS



11 WESTFIELD MIDLAND LOGO

SCALE: NTS



12 PLAN OF MILE MARKER

SCALE: NTS

City of Westfield
 Parks and Recreation Dept.
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MONON TRAIL SIGNAGE

TRAIL SIGNAGE
 WESTFIELD PARKS AND RECREATION

Unlimited Possibilities....

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3.0' RISE
REMOVABLE CAST CAP
ARM SPAN
POLE HEIGHT 19.0'

DETAIL 1
DETAIL 2
DETAIL 3
DETAIL 4
DETAIL 5
DETAIL 6

REMOVABLE SPEAR CAP
(FITS POLE TOP DIA. 6.76" - 17.50")
DETAIL 1 SPEAR CAP ASSEMBLY
(4) 1/2" SIZE "F" HEX HEAD BOLTS WITH (1) WASHER PER BOLT
TUBE THK. = 0.06"
0.25" TYP.
0.250" THICK GUSSETS
TUBE THK.
POLE BASE DIA. +0.06"

DETAIL 4 WA30AC POLE BASE
9.01" TO 13.00"
37.16" TALL
30.00" O.D.

DETAIL 5 WA30AC DECORATIVE BASE
DETAIL 6 ANCHOR BOLT
(4) ANCHOR BOLTS WITH (2) HEX. NUTS AND (2) WASHERS PER BOLT WITH THREADED END GALVANIZED AT LEAST 12".

DETAIL 2 SIGNAL ARM ATTACHMENT
POLE SHAFT
MAST ARM SHAFT
POLE BASE
ANCHOR BOLTS

MATERIAL DATA					
COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)	COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)
POLE SHAFT	A595 GR. A	55	MAST ARM CONNECTION	A36	36
MAST ARM SHAFT	A595 GR. A	55	MAST ARM CONNECT BOLTS	A325*	
POLE BASE	A36	36	GALVANIZING- STRUCTURE	A123	
ANCHOR BOLTS	F1554 GR. 55	55	GALVANIZING- HARDWARE	A153	

* LUBRICATE IN FIELD IF NECESSARY

16-SHARP FLUTE
POLE CROSS SECTION

8-SHARP FLUTE
ARM CROSS SECTION

FINISH NOTE:
BASE COAT: HOT DIP GALVANIZED TO ASTM SPEC. A123
FINISH COAT: TGIC OR URETHANE POLYESTER POWDER
COLOR: **BLACK**
SPEC: VALMONT SPEC. 28380

REMOVABLE END CAP
ARM END CAP

DETAIL 3 SEMI-FLUSH HANDHOLE
HANDHOLE RIM FORMED FROM 6" STD. BLK. PIPE
POLE TUBE WALL
TUBE THK. = 0.06"
(2) 0.25" HEX HEAD STAINLESS STEEL SCREWS
HANDHOLE COVER 11 GAUGE H.R.H.S.
COVER HTG. CLIP
SECTION A-A

DETAIL 2
0.50" NUT HOLDER WITH FASTENERS FOR GROUNDING
5.19"
7.66"
5.60" RAD.
2.35" 3.00"
SECTION B-B

POLE AND SIGNAL ARM DATA																		
ITEM	QTY.	POLE TUBE			POLE BASE				ANCHOR BOLT				SIGNAL ARM TUBE					
		BASE DIA. (IN)	TOP DIA. (IN)	LENGTH (FT)	Gauge or Thk. (IN)	SQUARE "S" (IN)	BOLT CIRCLE "Y" (IN)	THK. "H" (IN)	HOLE / SLOT "Z" (IN)	DIA. "K" (IN)	LENGTH "J" (IN)	HOOK "H" (IN)	THREAD LENGTH "U" (IN)	FIXED END DIA. (IN)	FREE END DIA. (IN)	Gauge or Thk. (IN)	SPAN (FT)	RISE "T" (FT)
2	10	2.8	20	7	16	15	1.25	1.50	1.25	48	6	8	8.0	3.8	7	30	3	

OVERHEAD FLASHER

SCALE: NTS

MONON TRAIL SIGNAGE

TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION

City of Westfield
Parks and Recreation Dept.
2728 East 171st Street
Westfield IN, 46074
PH: 317-804-3184
FAX: 317-804-3190

Revisions

<i>Date</i>	<i>Initials</i>	<i>Checked by</i>
7-22-2011	MRP	
9-15-2011	RJK	

NATALIE WHEELER TRAIL SIGNAGE

TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION



PANTONE COLOR #109C

COLOR BLACK

COLOR WHITE

Created By:
Margaretta Peterson

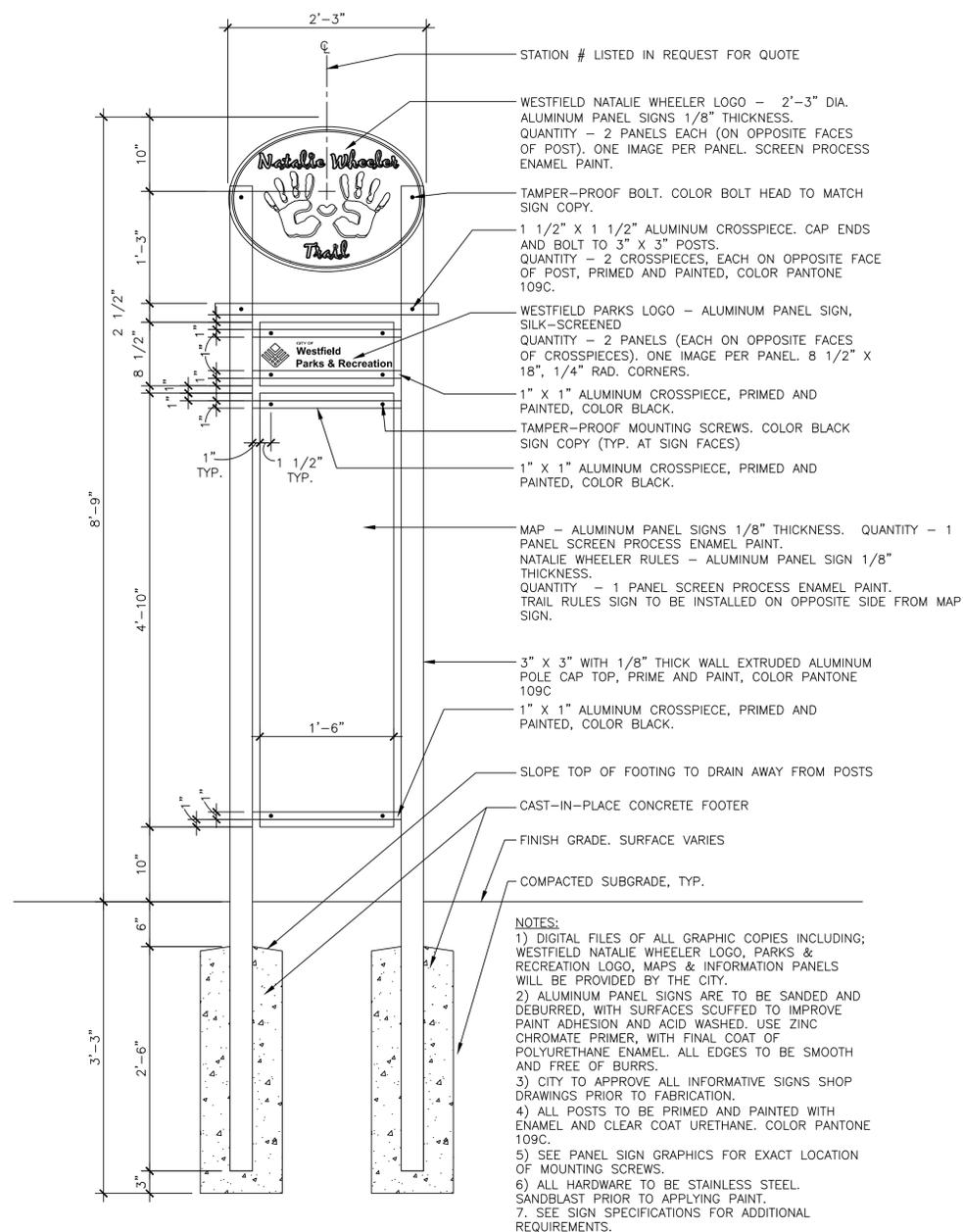
City of Westfield
Parks and Recreation Dept.
2728 East 171st Street
Westfield IN, 46074
PH: 317-804-3184
FAX: 317-804-3190

Revisions

Date	Initials	Checked by
7-22-2011	MRP	

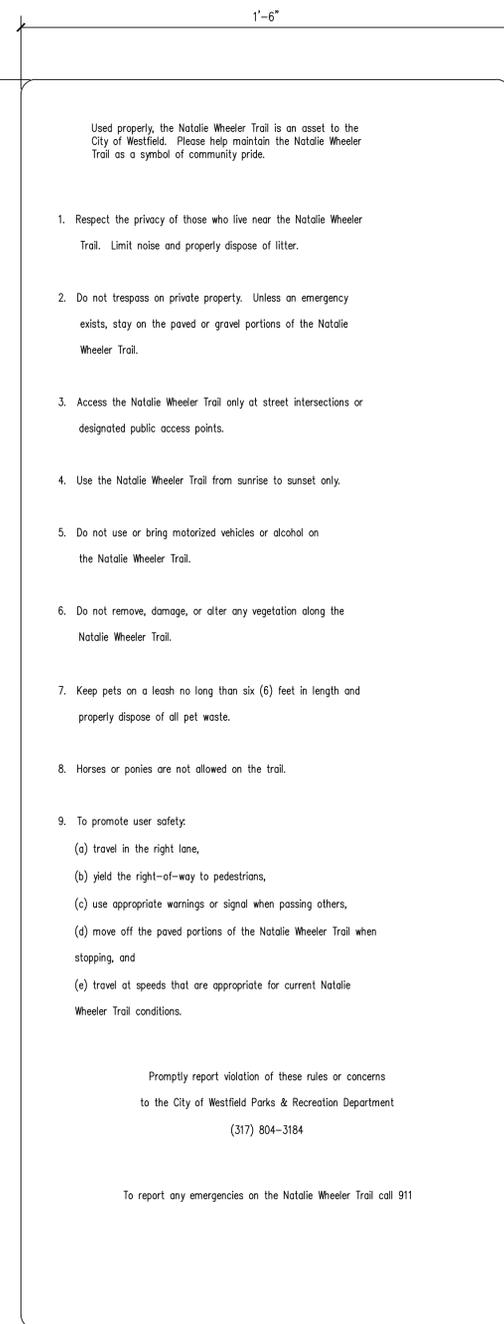
NATALIE WHEELER TRAIL SIGNAGE

TRAIL SIGNAGE
WESTFIELD PARKS AND RECREATION



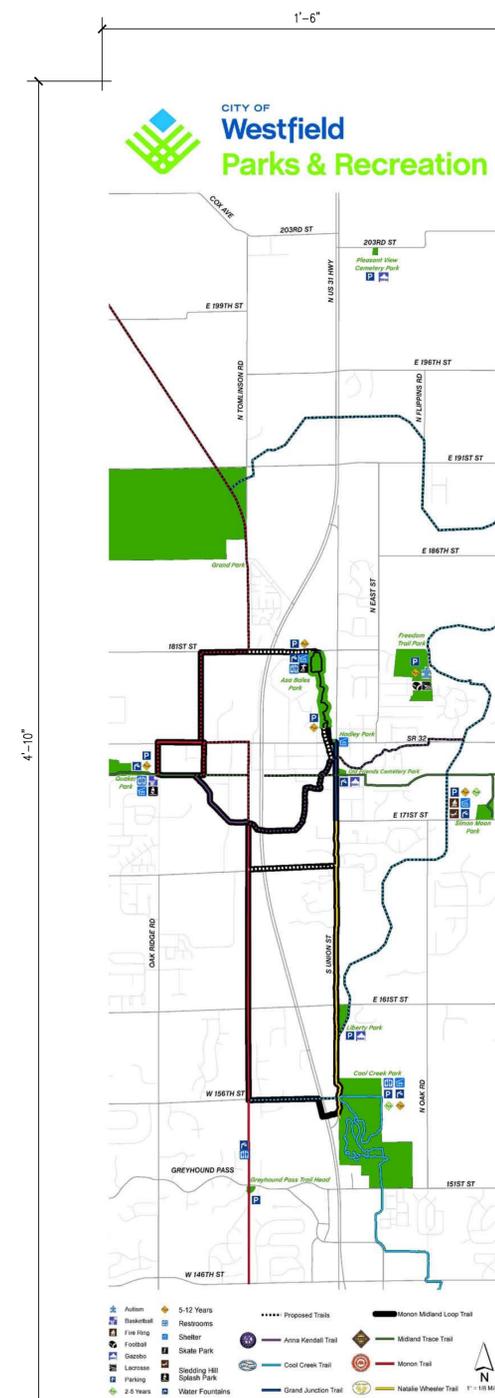
1 INFORMATIVE SIGN

SCALE: NTS



1A NATALIE WHEELER RULES

SCALE: NTS



1B INFORMATIONAL SIGN

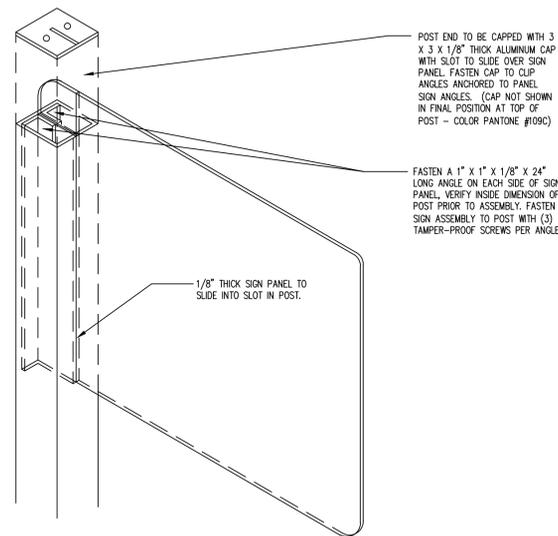
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Unlimited Possibilities....

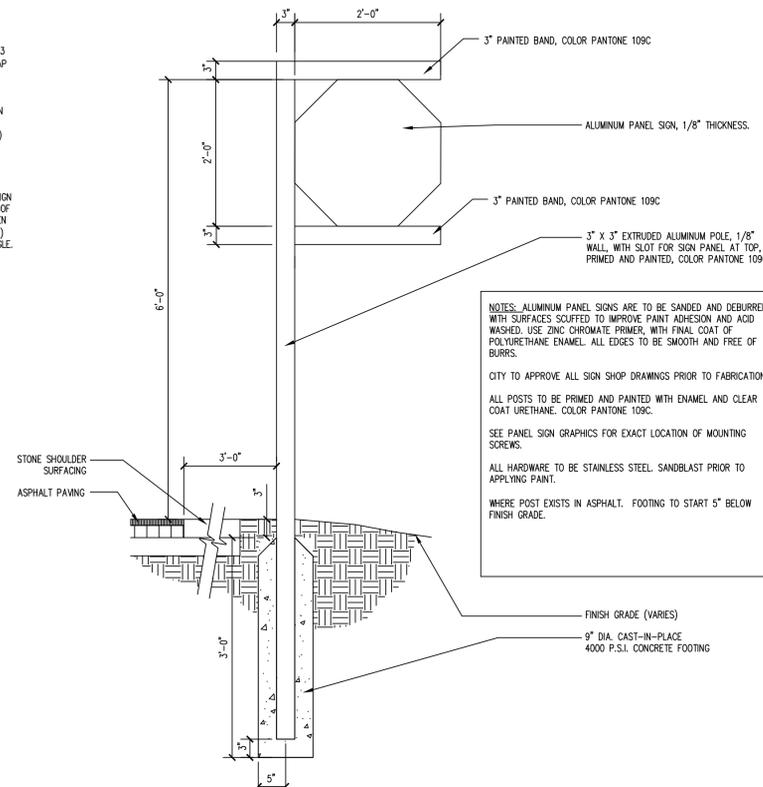
City of Westfield
 Parks and Recreation Dept.
 2728 East 171st Street
 Westfield IN, 46074
 PH: 317-804-3184
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Revisions

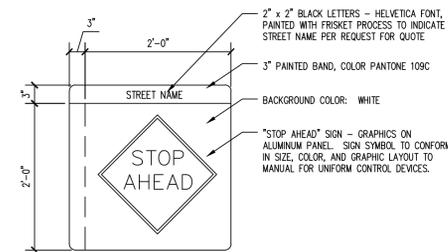
Date	Initials	Checked by
7-22-2011	MRP	



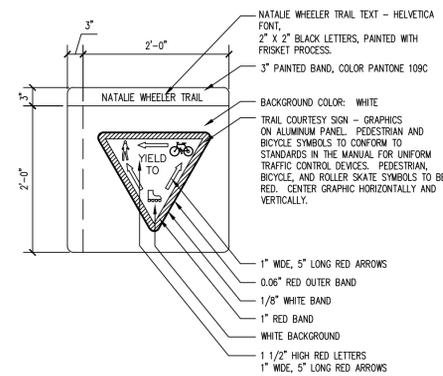
2 TRAIL TRAFFIC SIGN AXONOMETRIC
 SCALE: NTS



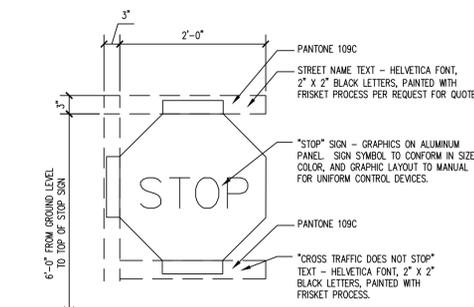
3 TYPICAL TRAIL TRAFFIC SIGN ELEVATION
 SCALE: NTS



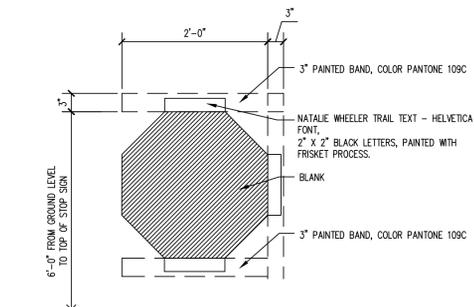
2A
 SCALE: NTS



2B
 SCALE: NTS



3A
 SCALE: NTS



3B
 SCALE: NTS

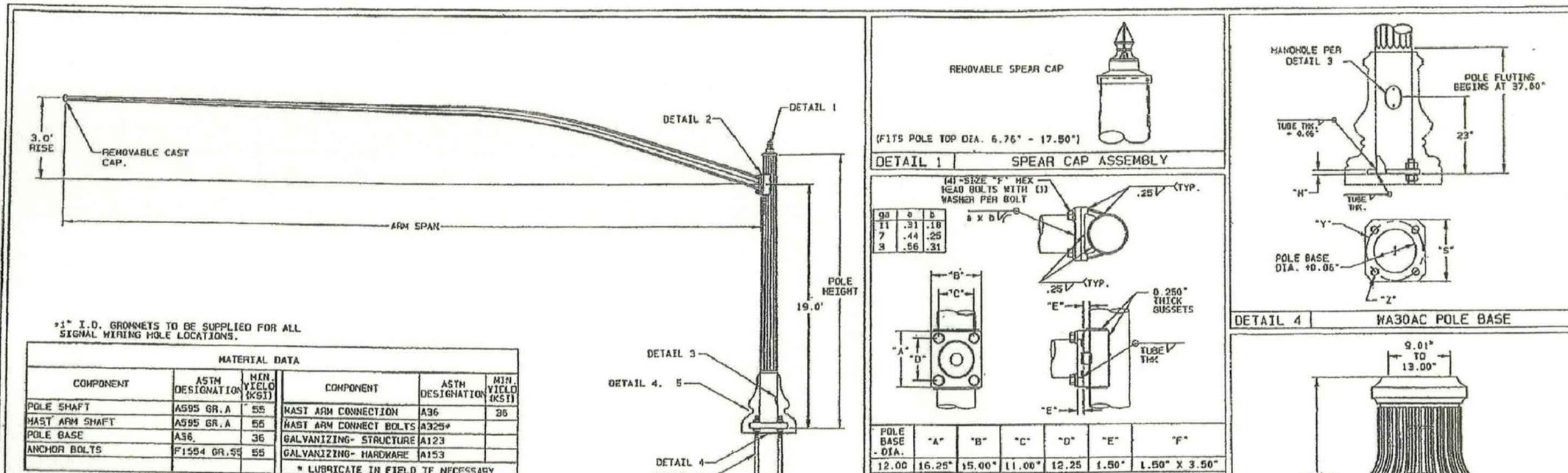
NATALIE WHEELER TRAIL SIGNAGE

TRAIL SIGNAGE
 WESTFIELD PARKS AND RECREATION

City of Westfield
 Parks and Recreation Dept.
 2728 East 171st Street
 Westfield IN, 46074
 PH: 317-804-3184
 FAX: 317-804-3190

Revisions

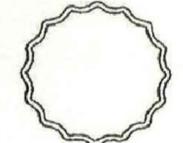
Date	Initials	Checked by
7-22-2011	MRP	



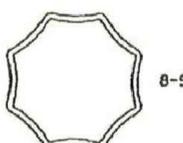
3.0' RISE
 REMOVABLE CAST CAP
 ARM SPAN
 POLE HEIGHT 19.0'
 *1" I.D. GROMMETS TO BE SUPPLIED FOR ALL SIGNAL WIRING HOLE LOCATIONS.

MATERIAL DATA					
COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)	COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)
POLE SHAFT	A595 GR. A	55	MAST ARM CONNECTION	A36	36
MAST ARM SHAFT	A595 GR. A	55	MAST ARM CONNECT BOLTS	A325*	
POLE BASE	A36	36	GALVANIZING- STRUCTURE	A123	
ANCHOR BOLTS	F1554 GR. 55	55	GALVANIZING- HARDWARE	A153	

* LUBRICATE IN FIELD IF NECESSARY



16-SHARP FLUTE
 POLE CROSS SECTION



8-SHARP FLUTE
 ARM CROSS SECTION

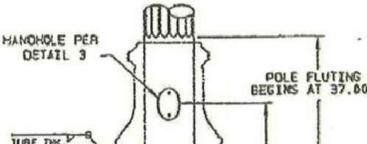
FINISH NOTE:
 BASE COAT: HOT DIP GALVANIZED TO ASTM SPEC. A123
 FINISH COAT: TGIC OR URETHANE POLYESTER POWDER
 COLOR: BLACK
 SPEC: VALMONT SPEC. 28380



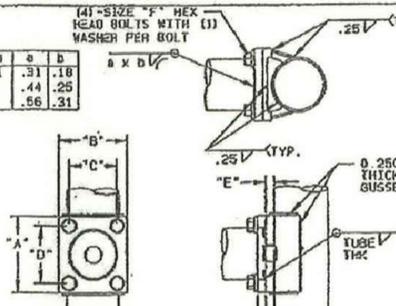
REMOVABLE END CAP
 ARM END CAP



REMOVABLE SPEAR CAP
 (FITS POLE TOP DIA. 6.76" - 17.50")
 DETAIL 1 SPEAR CAP ASSEMBLY

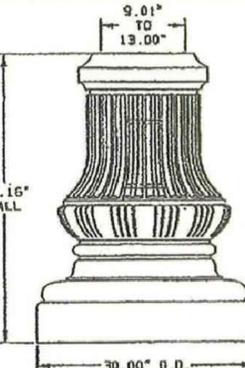


HANDHOLE PER DETAIL 3
 POLE FLUTING BEGINS AT 37.00"
 TUBE THK. = 0.06"
 POLE BASE DIA. 10.06"
 DETAIL 4 WA30AC POLE BASE

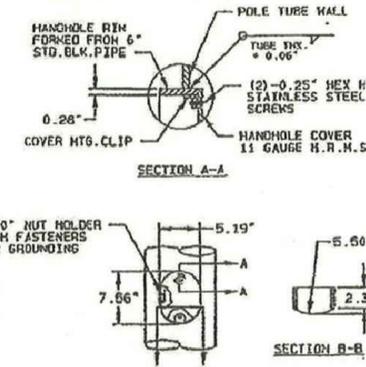


(4) 1/2" SIZE "F" HEX HEAD BOLTS WITH (1) WASHER PER BOLT
 .25" TYP.
 0.250" THICK GUSSETS
 TUBE THK.
 DETAIL 2 SIGNAL ARM ATTACHMENT

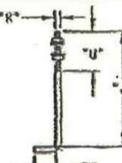
POLE BASE DIA.	"A"	"B"	"C"	"D"	"E"	"F"
12.00	16.25"	15.00"	11.00"	12.25	1.50"	1.50" X 3.50"



9.01" TO 13.00"
 37.16" TALL
 30.00" O.D.
 DETAIL 5 WA30AC DECORATIVE BASE



HANDHOLE RIM FORGED FROM 6" STD. BLK. PIPE
 COVER MFG. CLIP
 SECTION A-A
 POLE TUBE WALL
 TUBE THK. = 0.06"
 (2) 0.25" HEX HEAD STAINLESS STEEL SCREWS
 HANDHOLE COVER 11 GAUGE H.R.H.S.
 0.28"
 5.19"
 7.86"
 SECTION B-B
 5.60" RAD.
 2.35" 3.00"
 DETAIL 3 SEMI-FLUSH HANDHOLE



(4) ANCHOR BOLTS WITH (2) HEX. NUTS AND (2) WASHERS PER BOLT WITH THREADED END GALVANIZED AT LEAST 12".
 DETAIL 6 ANCHOR BOLT

POLE AND SIGNAL ARM DATA																	
ITEM	QTY.	POLE TUBE				POLE BASE				ANCHOR BOLT				SIGNAL ARM TUBE			
		BASE DIA. (IN)	TOP DIA. (IN)	LENGTH (FT)	GAUGE OR THK. (IN)	SQUARE "S" (IN)	BOLT CIRCLE "Y" (IN)	THK. "H" (IN)	HOLE / SLOT "Z" (IN)	DIA. "K" (IN)	LENGTH "J" (IN)	HOOK "H" (IN)	THREAD LENGTH "U" (IN)	FIXED END DIA. (IN)	FREE END DIA. (IN)	GAUGE OR THICK (IN)	SPAN (FT)
2	10	2.8	20	7	16	15	1.25	1.50	1.25	48	6	8	8.0	3.8	7	30	2

OVERHEAD FLASHER

SCALE: NTS

NATALIE WHEELER TRAIL SIGNAGE

TRAIL SIGNAGE
 WESTFIELD PARKS AND RECREATION

**SECTION 02505 – STANDARDS OF TRAILS, SIDEWALKS, AND MULTI-USE TRAILS
APPENDIX A**

ANNA KENDALL SIGNAGE SPECIFICATIONS

CITY OF WESTFIELD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Trail sign assemblies, including supporting poles/panels
 - 2. Panel signs attached to steel frame assemblies
 - 3. Vinyl transfer text and graphics
- B. Related Sections include the following:
 - 1. "Metal Fabrications" for supporting steel frame assemblies

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication and installation details for signs.
 - 1. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
 - 2. Provide message list, typestyles, graphic elements and layout for each sign.
- C. Samples for Initial Selection: Manufacturer's color charts consisting of actual units or sections of units showing the full range of colors available for the following:
 - 1. Aluminum
 - 2. Die-cut vinyl characters and graphic symbols: include representative samples of available typestyles and graphic symbols
 - 3. Powdercoating
- D. Samples for Verification: For each of the following products and for the full range of color, texture, and sign material indicated, of sizes indicated:
 - 1. Panel Signs: Not less than 12 inches (305 mm) square including border.
- E. Sign Schedule: Use same designations indicated on Drawings. Schedule panel signs and trail signs noting trail head intersections and trail intersections with streets.
- F. Maintenance Data: For signs to include in maintenance manuals.
- G. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- C. Source Limitations for Signs: Obtain each sign type indicated from one source from a single manufacturer.

1.5 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation of signs in exterior locations to be performed according to manufacturers' written instructions and warranty requirements.

1.6 COORDINATION

- A. Coordinate placement of anchorage devices with templates for installing signs.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of metal and polymer finishes beyond normal weathering.
 - b. Deterioration of embedded graphic image colors and sign lamination.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Aluminum Castings: ASTM B 26/B 26M, of alloy and temper recommended by sign manufacturer for casting process used and for use and finish indicated.
- B. Aluminum Sheet and Plate: ASTM B 209 (ASTM B 209M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 5005-H32.
- C. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 6063-T5.
- D. Applied Vinyl: Die-cut characters from vinyl film of nominal thickness of 3 mils (0.076 mm) with pressure-sensitive adhesive backing, suitable for exterior applications.

2.2 PANEL SIGNS

- A. Exterior Panel Signs: Provide smooth sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch (1.5 mm) measured diagonally from corner to corner, complying with the following requirements:

1. Aluminum Sheet: 0.125 inch (3.18 mm) thick.
 2. Edge Condition: Square cut.
 3. Corner Condition:
 - a. Trail Traffic Panel Signs: A combination of square and radius corners as indicated in drawings to fit support.
 - b. Identity Panel Signs: Rounded to radius.
 - c. Directional Panel Signs: As indicated in drawings.
 4. Mounting: Unframed.
 5. Custom Paint Colors: Match colors indicated on drawing. PMS and Pantone color wheel shall be used to verify all colors prior to fabrication.
- B. Channel Brackets at direction sign structures: Fabricate bracket fittings for channel-mounted signs from extruded aluminum to suit panel sign construction and mounting conditions indicated. Factory paint brackets in color matching drawings. See drawings for paint colors. Attach channel bracket to steel structure with stainless steel screws. Lock sign into channel with stainless steel set screws.
- C. Trail Traffic Panel Sign Support Posts:
1. Extruded-Aluminum Posts:
 - a. Color: Match color standards from drawings.
 - b. Profile: 3 inch by 3 inch Square.
 - c. End Condition: Square.
 - d. Mounting: Post set in concrete as indicated in drawings. Coat post with bituminous paint where it will be in contact with ground.

2.3 FABRICATION

- A. General: Provide manufacturer's standard signs of configurations indicated.
1. Welded Connections: Comply with AWS standards for recommended practices in shop welding. Provide welds behind finished surfaces without distortion or discoloration of exposed side. Clean exposed welded surfaces of welding flux and dress exposed and contact surfaces.
 2. Mill joints to tight, hairline fit. Form joints exposed to weather to exclude water penetration.
 3. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.
 4. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

2.4 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.5 ALUMINUM FINISHES

- A. Baked-Enamel Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Apply baked enamel complying with paint manufacturer's written instructions for cleaning, conversion coating, and painting.
 - 1. Organic Coating: Thermosetting, modified-acrylic enamel primer/topcoat system complying with AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm), medium gloss.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that items are sized and located to accommodate signs.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.
- B. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.
- C. Mechanical Fasteners: Use non-removable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.

3.3 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

**SECTION 02505 – STANDARDS OF TRAILS, SIDEWALKS, AND MULTI-USE TRAILS
APPENDIX B**

COOL CREEK TRAIL SIGNAGE SPECIFICATIONS

CITY OF WESTFIELD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

- 1. Trail sign assemblies, including supporting poles/panels.
- 2. Panel signs attached to steel frame assemblies.
- 3. Vinyl transfer text and graphics.

- B. Related Sections include the following:

- 1. "Metal Fabrications" for supporting steel frame assemblies.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.

- B. Shop Drawings: Show fabrication and installation details for signs.

- 1. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
- 2. Provide message list, timesteps, graphic elements and layout for each sign.

- C. Samples for Initial Selection: Manufacturer's color charts consisting of actual units or sections of units showing the full range of colors available for the following:

- 1. Aluminum
- 2. Die-cut vinyl characters and graphic symbols - include representative samples of available timesteps and graphic symbols
- 3. Powdercoating

- D. Samples for Verification: For each of the following products and for the full range of color, texture, and sign material indicated, of sizes indicated:

- 1. Panel Signs: Not less than 12 inches (305 mm) square including border.

- E. Sign Schedule: Use same designations indicated on Drawings. Schedule panel signs and trail signs noting trail head intersections and trail intersections with streets.

- F. Maintenance Data: For signs to include in maintenance manuals.

- G. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- C. Source Limitations for Signs: Obtain each sign type indicated from one source from a single manufacturer.

1.5 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation of signs in exterior locations to be performed according to manufacturers' written instructions and warranty requirements.

1.6 COORDINATION

- A. Coordinate placement of anchorage devices with templates for installing signs.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

- a. Deterioration of metal and polymer finishes beyond normal weathering.
- b. Deterioration of embedded graphic image colors and sign lamination.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Aluminum Castings: ASTM B 26/B 26M, of alloy and temper recommended by sign manufacturer for casting process used and for use and finish indicated.
- B. Aluminum Sheet and Plate: ASTM B 209 (ASTM B 209M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 5005-H32.
- C. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 6063-T5.
- D. Applied Vinyl: Die-cut characters from vinyl film of nominal thickness of 3 mils (0.076 mm) with pressure-sensitive adhesive backing, suitable for exterior applications.

2.2 PANEL SIGNS

- A. Exterior Panel Signs: Provide smooth sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch (1.5 mm) measured diagonally from corner to corner, complying with the following requirements:

1. Aluminum Sheet: 0.125 inch (3.18 mm) thick.
 2. Edge Condition: Square cut.
 3. Corner Condition:
 - a. Trail Traffic Panel Signs: A combination of square and radius corners as indicated in drawings to fit support.
 - b. Identity Panel Signs: Rounded to radius.
 - c. Directional Panel Signs: As indicated in drawings.
 4. Mounting: Unframed.
 5. Custom Paint Colors: Match colors indicated on drawing. PMS and Pantone color wheel shall be used to verify all colors prior to fabrication.
- B. Channel Brackets at direction sign structures: Fabricate bracket fittings for channel-mounted signs from extruded aluminum to suit panel sign construction and mounting conditions indicated. Factory paint brackets in color matching drawings. See drawings for paint colors. Attach channel bracket to steel structure with stainless steel screws. Lock sign into channel with stainless steel set screws.
- C. Trail Traffic Panel Sign Support Posts:
1. Extruded-Aluminum Posts:
 - a. Color: Match color standards from drawings.
 - b. Profile: 3 inch by 3 inch Square.
 - c. End Condition: Square.
 - d. Mounting: Post set in concrete as indicated in drawings. Coat post with bituminous paint where it will be in contact with ground.

2.3 FABRICATION

- A. General: Provide manufacturer's standard signs of configurations indicated.
1. Welded Connections: Comply with AWS standards for recommended practices in shop welding. Provide welds behind finished surfaces without distortion or discoloration of exposed side. Clean exposed welded surfaces of welding flux and dress exposed and contact surfaces.
 2. Mill joints to tight, hairline fit. Form joints exposed to weather to exclude water penetration.
 3. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.
 4. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

2.4 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.5 ALUMINUM FINISHES

- A. Baked-Enamel Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Apply baked enamel complying with paint manufacturer's written instructions for cleaning, conversion coating, and painting.
 - 1. Organic Coating: Thermosetting, modified-acrylic enamel primer/topcoat system complying with AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm) , medium gloss.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that items are sized and located to accommodate signs.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.
 - 1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.
 - 2. Mechanical Fasteners: Use non-removable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.

3.3 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

**SECTION 02505 – STANDARDS OF TRAILS, SIDEWALKS, AND MULTI-USE TRAILS
APPENDIX C**

MIDLAND TRACE TRAIL SIGNAGE SPECIFICATIONS

CITY OF WESTFIELD

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

- 1. Trail sign assemblies, including supporting poles/panels.
- 2. Panel signs attached to steel frame assemblies.
- 3. Vinyl transfer text and graphics.

- B. Related Sections include the following:

- 1. "Metal Fabrications" for supporting steel frame assemblies.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.

- B. Shop Drawings: Show fabrication and installation details for signs.

- 1. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
- 2. Provide message list, tpestyles, graphic elements and layout for each sign.

- C. Samples for Initial Selection: Manufacturer's color charts consisting of actual units or sections of units showing the full range of colors available for the following:

- 1. Aluminum.
- 2. Die-cut vinyl characters and graphic symbols. Include representative samples of available tpestyles and graphic symbols.
- 3. Powdercoating.

- D. Samples for Verification: For each of the following products and for the full range of color, texture, and sign material indicated, of sizes indicated:

- 1. Panel Signs: Not less than 12 inches (305 mm) square including border.

- E. Sign Schedule: Use same designations indicated on Drawings. Schedule panel signs and trail signs noting trail head intersections and trail intersections with streets.

- F. Maintenance Data: For signs to include in maintenance manuals.

- G. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- C. Source Limitations for Signs: Obtain each sign type indicated from one source from a single manufacturer.

1.5 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation of signs in exterior locations to be performed according to manufacturers' written instructions and warranty requirements.

1.6 COORDINATION

- A. Coordinate placement of anchorage devices with templates for installing signs.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of metal and polymer finishes beyond normal weathering.
 - b. Deterioration of embedded graphic image colors and sign lamination.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Aluminum Castings: ASTM B 26/B 26M, of alloy and temper recommended by sign manufacturer for casting process used and for use and finish indicated.
- B. Aluminum Sheet and Plate: ASTM B 209 (ASTM B 209M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 5005-H32.
- C. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 6063-T5.
- D. Applied Vinyl: Die-cut characters from vinyl film of nominal thickness of 3 mils (0.076 mm) with pressure-sensitive adhesive backing, suitable for exterior applications.

2.2 PANEL SIGNS

- A. Exterior Panel Signs: Provide smooth sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch (1.5 mm) measured diagonally from corner to corner, complying with the following requirements:
 - 1. Aluminum Sheet: 0.125 inch (3.18 mm) thick.
 - 2. Edge Condition: Square cut.
 - 3. Corner Condition:
 - a. Trail Traffic Panel Signs: A combination of square and radius corners as indicated in drawings to fit support.
 - b. Identity Panel Signs: Rounded to radius.
 - c. Directional Panel Signs: As indicated in drawings.
 - 4. Mounting: Unframed.
 - 5. Custom Paint Colors: Match colors indicated on drawing. PMS and Pantone color wheel shall be used to verify all colors prior to fabrication.
- B. Channel Brackets at direction sign structures: Fabricate bracket fittings for channel-mounted signs from extruded aluminum to suit panel sign construction and mounting conditions indicated. Factory paint brackets in color matching drawings. See drawings for paint colors. Attach channel bracket to steel structure with stainless steel screws. Lock sign into channel with stainless steel set screws.
- C. Trail Traffic Panel Sign Support Posts:
 - 1. Extruded-Aluminum Posts:
 - a. Color: Match color standards from drawings.
 - b. Profile: 3 inch by 3 inch Square.
 - c. End Condition: Square.
 - d. Mounting: Post set in concrete as indicated in drawings. Coat post with bituminous paint where it will be in contact with ground.

2.3 FABRICATION

- A. General: Provide manufacturer's standard signs of configurations indicated.
 - 1. Welded Connections: Comply with AWS standards for recommended practices in shop welding. Provide welds behind finished surfaces without distortion or discoloration of exposed side. Clean exposed welded surfaces of welding flux and dress exposed and contact surfaces.
 - 2. Mill joints to tight, hairline fit. Form joints exposed to weather to exclude water penetration.
 - 3. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.
 - 4. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

2.4 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.5 ALUMINUM FINISHES

- A. Baked-Enamel Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Apply baked enamel complying with paint manufacturer's written instructions for cleaning, conversion coating, and painting.
 - 1. Organic Coating: Thermosetting, modified-acrylic enamel primer/topcoat system complying with AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm), medium gloss.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that items are sized and located to accommodate signs.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.
 - 1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.
 - 2. Mechanical Fasteners: Use non-removable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.

3.3 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

PART 4 - MILE MARKER

4.1 MANUFACTURER:

Wausau Tile, Inc. (or approved equal)
Terra-Form Division
PO Box 1520
Wausau, WI 54402-1520
1-800-388-8728

4.2 MODEL #:

TF6035 with indicated options by manufacturer

4.3 COLOR/FINISH:

Buff, Weatherstone

4.4 OPTIONS:

Logo, text, and numerals (pre-cast and painted by manufacturer) as detailed

4.5 ANCHOR BOLTS:

Threaded, per manufacturer's recommendations

4.6 CONCRETE:

Comply with INDOT Standard Specifications for concrete footer requirements.

4.7 SUBMITTALS REQUIRED

- A. Sample of detailed artwork to full scale with indicated colors on specified materials shall be submitted to the City for approval of final colors, materials, size and layout.
- B. Sample shall be developed from camera-ready artwork as supplied by Architect.
- C. Sample logos to be installed and retrofitted in the mile markers shall be approved for final colors, size, and layout prior to installation.

**SECTION 02505 – STANDARDS OF TRAILS, SIDEWALKS, AND MULTI-USE TRAILS
APPENDIX D**

MONON TRAIL SIGNAGE SPECIFICATIONS

CITY OF WESTFIELD

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

- 1. Trail sign assemblies, including supporting poles/panels.
- 2. Panel signs attached to steel frame assemblies.
- 3. Vinyl transfer text and graphics.

- B. Related Sections include the following:

- 1. "Metal Fabrications" for supporting steel frame assemblies.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.

- B. Shop Drawings: Show fabrication and installation details for signs.

- 1. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
- 2. Provide message list, tpestyles, graphic elements and layout for each sign.

- C. Samples for Initial Selection: Manufacturer's color charts consisting of actual units or sections of units showing the full range of colors available for the following:

- 1. Aluminum.
- 2. Die-cut vinyl characters and graphic symbols. Include representative samples of available tpestyles and graphic symbols.
- 3. Powdercoating.

- D. Samples for Verification: For each of the following products and for the full range of color, texture, and sign material indicated, of sizes indicated:

- 1. Panel Signs: Not less than 12 inches (305 mm) square including border.

- E. Sign Schedule: Use same designations indicated on Drawings. Schedule panel signs and trail signs noting trail head intersections and trail intersections with streets.

- F. Maintenance Data: For signs to include in maintenance manuals.

- G. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- C. Source Limitations for Signs: Obtain each sign type indicated from one source from a single manufacturer.

1.5 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation of signs in exterior locations to be performed according to manufacturers' written instructions and warranty requirements.

1.6 COORDINATION

- A. Coordinate placement of anchorage devices with templates for installing signs.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of metal and polymer finishes beyond normal weathering.
 - b. Deterioration of embedded graphic image colors and sign lamination.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Aluminum Castings: ASTM B 26/B 26M, of alloy and temper recommended by sign manufacturer for casting process used and for use and finish indicated.
- B. Aluminum Sheet and Plate: ASTM B 209 (ASTM B 209M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 5005-H32.
- C. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 6063-T5.
- D. Applied Vinyl: Die-cut characters from vinyl film of nominal thickness of 3 mils (0.076 mm) with pressure-sensitive adhesive backing, suitable for exterior applications.

2.2 PANEL SIGNS

- A. Exterior Panel Signs: Provide smooth sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch (1.5 mm) measured diagonally from corner to corner, complying with the following requirements:
 - 1. Aluminum Sheet: 0.125 inch (3.18 mm) thick.
 - 2. Edge Condition: Square cut.
 - 3. Corner Condition:
 - a. Trail Traffic Panel Signs: A combination of square and radius corners as indicated in drawings to fit support.
 - b. Identity Panel Signs: Rounded to radius.
 - c. Directional Panel Signs: As indicated in drawings.
 - 4. Mounting: Unframed.
 - 5. Custom Paint Colors: Match colors indicated on drawing. PMS and Pantone color wheel shall be used to verify all colors prior to fabrication.
- B. Channel Brackets at direction sign structures: Fabricate bracket fittings for channel-mounted signs from extruded aluminum to suit panel sign construction and mounting conditions indicated. Factory paint brackets in color matching drawings. See drawings for paint colors. Attach channel bracket to steel structure with stainless steel screws. Lock sign into channel with stainless steel set screws.
- C. Trail Traffic Panel Sign Support Posts:
 - 1. Extruded-Aluminum Posts:
 - a. Color: Match color standards from drawings.
 - b. Profile: 3 inch by 3 inch Square.
 - c. End Condition: Square.
 - d. Mounting: Post set in concrete as indicated in drawings. Coat post with bituminous paint where it will be in contact with ground.

2.3 FABRICATION

- A. General: Provide manufacturer's standard signs of configurations indicated.
 - 1. Welded Connections: Comply with AWS standards for recommended practices in shop welding. Provide welds behind finished surfaces without distortion or discoloration of exposed side. Clean exposed welded surfaces of welding flux and dress exposed and contact surfaces.
 - 2. Mill joints to tight, hairline fit. Form joints exposed to weather to exclude water penetration.
 - 3. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.
 - 4. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

2.4 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.5 ALUMINUM FINISHES

- A. Baked-Enamel Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Apply baked enamel complying with paint manufacturer's written instructions for cleaning, conversion coating, and painting.
 - 1. Organic Coating: Thermosetting, modified-acrylic enamel primer/topcoat system complying with AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm), medium gloss.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that items are sized and located to accommodate signs.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.
 - 1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.
 - 2. Mechanical Fasteners: Use non-removable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.

3.3 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

PART 4 - MILE MARKER

4.1 MANUFACTURER:

Wausau Tile, Inc. (or approved equal)
Terra-Form Division
PO Box 1520
Wausau, WI 54402-1520
1-800-388-8728

4.2 MODEL #:

TF6035 with indicated options by manufacturer

4.3 COLOR/FINISH:

Buff, Weatherstone

4.4 OPTIONS:

Logo, text, and numerals (pre-cast and painted by manufacturer) as detailed

4.5 ANCHOR BOLTS:

Threaded, per manufacturer's recommendations

4.6 CONCRETE:

Comply with INDOT Standard Specifications for concrete footer requirements.

4.7 SUBMITTALS REQUIRED

- A. Sample of detailed artwork to full scale with indicated colors on specified materials shall be submitted to the City for approval of final colors, materials, size and layout.
- B. Sample shall be developed from camera-ready artwork as supplied by Architect.
- C. Sample logos to be installed and retrofitted in the mile markers shall be approved for final colors, size, and layout prior to installation.

**SECTION 02505 – STANDARDS OF TRAILS, SIDEWALKS, AND MULTI-USE TRAILS
APPENDIX E**

NATALIE WHEELER SIGNAGE SPECIFICATIONS

CITY OF WESTFIELD

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

- 1. Trail sign assemblies, including supporting poles/panels.
- 2. Panel signs attached to steel frame assemblies.
- 3. Vinyl transfer text and graphics.

- B. Related Sections include the following:

- 1. "Metal Fabrications" for supporting steel frame assemblies.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.

- B. Shop Drawings: Show fabrication and installation details for signs.

- 1. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
- 2. Provide message list, tpestyles, graphic elements and layout for each sign.

- C. Samples for Initial Selection: Manufacturer's color charts consisting of actual units or sections of units showing the full range of colors available for the following:

- 1. Aluminum.
- 2. Die-cut vinyl characters and graphic symbols. Include representative samples of available tpestyles and graphic symbols.
- 3. Powdercoating.

- D. Samples for Verification: For each of the following products and for the full range of color, texture, and sign material indicated, of sizes indicated:

- 1. Panel Signs: Not less than 12 inches (305 mm) square including border.

- E. Sign Schedule: Use same designations indicated on Drawings. Schedule panel signs and trail signs noting trail head intersections and trail intersections with streets.

- F. Maintenance Data: For signs to include in maintenance manuals.

- G. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- C. Source Limitations for Signs: Obtain each sign type indicated from one source from a single manufacturer.

1.5 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation of signs in exterior locations to be performed according to manufacturers' written instructions and warranty requirements.

1.6 COORDINATION

- A. Coordinate placement of anchorage devices with templates for installing signs.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of metal and polymer finishes beyond normal weathering.
 - b. Deterioration of embedded graphic image colors and sign lamination.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Aluminum Castings: ASTM B 26/B 26M, of alloy and temper recommended by sign manufacturer for casting process used and for use and finish indicated.
- B. Aluminum Sheet and Plate: ASTM B 209 (ASTM B 209M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 5005-H32.
- C. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 6063-T5.
- D. Applied Vinyl: Die-cut characters from vinyl film of nominal thickness of 3 mils (0.076 mm) with pressure-sensitive adhesive backing, suitable for exterior applications.

2.2 PANEL SIGNS

- A. Exterior Panel Signs: Provide smooth sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch (1.5 mm) measured diagonally from corner to corner, complying with the following requirements:
 - 1. Aluminum Sheet: 0.125 inch (3.18 mm) thick.
 - 2. Edge Condition: Square cut.
 - 3. Corner Condition:
 - a. Trail Traffic Panel Signs: A combination of square and radius corners as indicated in drawings to fit support.
 - b. Identity Panel Signs: Rounded to radius.
 - c. Directional Panel Signs: As indicated in drawings.
 - 4. Mounting: Unframed.
 - 5. Custom Paint Colors: Match colors indicated on drawing. PMS and Pantone color wheel shall be used to verify all colors prior to fabrication.
- B. Channel Brackets at direction sign structures: Fabricate bracket fittings for channel-mounted signs from extruded aluminum to suit panel sign construction and mounting conditions indicated. Factory paint brackets in color matching drawings. See drawings for paint colors. Attach channel bracket to steel structure with stainless steel screws. Lock sign into channel with stainless steel set screws.
- C. Trail Traffic Panel Sign Support Posts:
 - 1. Extruded-Aluminum Posts:
 - a. Color: Match color standards from drawings.
 - b. Profile: 3 inch by 3 inch Square.
 - c. End Condition: Square.
 - d. Mounting: Post set in concrete as indicated in drawings. Coat post with bituminous paint where it will be in contact with ground.

2.3 FABRICATION

- A. General: Provide manufacturer's standard signs of configurations indicated.
 - 1. Welded Connections: Comply with AWS standards for recommended practices in shop welding. Provide welds behind finished surfaces without distortion or discoloration of exposed side. Clean exposed welded surfaces of welding flux and dress exposed and contact surfaces.
 - 2. Mill joints to tight, hairline fit. Form joints exposed to weather to exclude water penetration.
 - 3. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.
 - 4. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

2.4 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.5 ALUMINUM FINISHES

- A. Baked-Enamel Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Apply baked enamel complying with paint manufacturer's written instructions for cleaning, conversion coating, and painting.
 - 1. Organic Coating: Thermosetting, modified-acrylic enamel primer/topcoat system complying with AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm) , medium gloss.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that items are sized and located to accommodate signs.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.
 - 1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.
 - 2. Mechanical Fasteners: Use non-removable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.

3.3 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.