



CITY OF OWOSSO PLANNING COMMISSION
Regular Meeting
Monday, October 28, 2024 at 6:30 p.m.
AGENDA

- A. CALL TO ORDER**
- B. PLEDGE OF ALLEGIANCE**
- C. ROLL CALL**
- D. APPROVAL OF AGENDA – October 28, 2024**
- E. APPROVAL OF MINUTES – April 22, 2024**
- F. ELECTION OF OFFICERS**
- G. PUBLIC HEARINGS:**
- H. SITE PLAN REVIEWS:**
 - 1. 900 Ada and 901 N Shiawassee
(Master Plan Implementation Goals: 1.24, 1.25)
- I. ITEMS OF BUSINESS:**
- J. COMMISSIONER/CITIZEN COMMENTS:**
- K. ADJOURNMENT**

Next regular meeting will be on Monday, November 25, 2024 at 6:30 p.m.

The City of Owosso will provide necessary reasonable auxiliary aids and services, such as signers for the hearing impaired and recordings of printed materials being considered at the meeting, to individuals with disabilities at the meeting/hearing upon seventy-two (72) hours' notice to the City of Owosso. Individuals with disabilities requiring auxiliary aids or services should contact the City of Owosso by writing or calling the following: Amy Kirkland, City Clerk, 301 W. Main St, Owosso, MI 48867 (989) 725-0500. The City of Owosso website is: www.ci.owosso.mi.us

**MINUTES
REGULAR MEETING OF THE OWOSSO PLANNING COMMISSION
Monday, April 22, 2024 – 6:30 P.M.**

CALL TO ORDER: Chairman Wascher called the meeting to order at 6:30 p.m.

PLEDGE OF ALLEGIANCE: Recited

ROLL CALL: Tanya Buckelew

MEMBERS PRESENT: Secretary Fear, Commissioner Law, Vice-Chair Livingston, Commissioners Martin, Robertson, Schlaack, Taylor, and Chairman Wascher

MEMBERS ABSENT: Commissioner Owens

OTHERS PRESENT: Tanya Buckelew, Planning & Building Director; Hannah Smith, CIB Planning

APPROVAL OF AGENDA:
MOTION BY COMMISSIONER TAYLOR, SUPPORTED BY VICE-CHAIR LIVINGSTON TO APPROVE THE AGENDA FOR April 22, 2024.

YEAS ALL. MOTION CARRIED.

APPROVAL OF MINUTES:
MOTION BY VICE-CHAIR LIVINGSTON SUPPORTED BY COMMISSIONER TAYLOR TO APPROVE THE MINUTES FOR THE March 25, 2024 MEETING.

YEAS ALL. MOTION CARRIED.

PUBLIC HEARING: None

SITE PLAN REVIEW:
1. SITE PLAN REVIEW FOR FOR WASHINGTON PARK

Hannah Smith, CIB Planning, outlined the review from the City Planner Justin Sprague, noting two items will, if approved, require waivers from the Planning Commission.

1. Parking Spaces – 34 are required and 32 are proposed
2. Driveway Spacing – 130' is required and 87' is proposed

The plan is to build a multi-family residential development, consisting of two, eight-unit apartments building, one building roughly 4,785 square feet and the other roughly 5,000 square feet. Parking would be internal to the property, located behind the development, to be accessed from both N. Washington Street and W. Wesley Drive. Site improvements to include landscaping, leaving the wetlands on the west side of the property undisturbed. The property is zoned RM, Multi-Family Residential and this use is permitted.

Review Comments

1. **Information items.** The site plan generally meets the informational requirements of the ordinance.
2. **Proposed uses.** Development of two, eight-unit, two-story multi-family apartment buildings as permitted by the City of Owosso Ordinance.
3. **Area and Bulk.** The proposed site was reviewed in accordance with Section 38-87, as described in the following table.

	Required	Provided	Comments
Washington Park (RM Zoning) Building 1 (Units 1 – 8)			
Front yard building setback	10 ft.	10 ft.	In compliance
Side yard setback	5 ft.	5 ft.	In compliance
Rear yard building setback	20 ft.	20 ft.	In compliance
Maximum building height	2 stories (35 ft.)	2 stories	In compliance
Washington Park (FM Zoning) Building 2 (Units 9 – 16)			
Front yard building setback	10 ft.	10 ft.	In compliance
Side yard setback	5 ft.	5 ft.	In compliance
Rear yard building setback	20 ft.	20 ft.	In compliance
Maximum building height	2 stories (35 ft.)	2 stories	In compliance

4. **Building Design & Materials.** The ordinance states that durable building materials which provide an attractive, quality appearance must be utilized. While the proposed building materials appear to meet the ordinance standards, materials have not been submitted demonstrating that they are consistent with the City of Owosso Zoning Ordinance.
5. **Building Height.** The proposed building complies with the maximum building height.
6. **Mechanical Units.** The Zoning Ordinance requires that all exterior mechanical equipment be screened. The applicant appears to show 16 A/C units, one at the rear of each apartment unit, to be screened by shrubs.
7. **Dumpster.** The proposed dumpster enclosure is a concrete pad with concrete block walls. The gate is not specified on the site plan. Per the City of Owosso Zoning Ordinance, Section 38-63, “the enclosure shall be constructed of brick or decorative concrete block material, consistent with the building materials of the principal building”. The gate must be made of vinyl or other high-quality material. Applicant also needs to provide dimensions of the dumpster enclosure on the plan.
8. **Site Lighting.** Proposed lighting is in compliance with the Zoning Ordinance.
9. **Parking Lot Requirements.** The parking requirements for multiple-family residential units is 2.0 spaces per unit with two bedrooms and 2.5 spaces per unit with three or more bedrooms. The applicant proposes 3, 3-bedroom units and 13, 2-bedroom units which would require 33.5 parking spaces. The applicant is proposing 30, 9’ x 20’ parking spaces and 2 barrier-free parking spaces for a total of 32.
10. **Landscaping.** The landscaping plan is in compliance with the ordinance.
11. **Driveway Spacing.** Section 38-206 of the Zoning Ordinance requires a separation of 130-feet from other driveways on the same side of the street. The proposed Washington Street driveway will only be 87-feet north of an existing driveway and does not meet the requirements of this section of the ordinance. Section 38-201(4) however gives the Planning Commission the ability to provide a waiver of this requirement if specific conditions apply. The applicant will need to demonstrate that the following conditions are met for the site to be eligible for a waiver to be approved by the Planning Commission.
 - a. Size of the parcel is insufficient to meet the dimensional standards.

- b. The spacing of existing, adjacent driveways or environmental constraints prohibit adherence to the access standards at a reasonable cost.
 - c. The use will generate less than 500 total vehicle trips per day or less than 75 total vehicle trips in the peak hour of travel on the adjacent street, based on the most recent rates developed by the Institute of Transportation Engineers (ITE).
 - d. There are no other reasonable means of access.
12. **Other Approvals.** The proposed site plan must be reviewed and approved by the appropriate city departments, consultants, and agencies.

Based upon the above comments, we recommend approval of the Washington Park Site Plan, conditioned upon the following:

- 1. Submission of a revised site plan that satisfactorily addresses the items in this letter, for administrative review and approval;
- 2. That the Planning Commission determines if the number of parking spaces is acceptable and approves a waiver for the fewer number of parking spaces;
- 3. That building materials are provided to determine compliance with the ordinance;
- 4. That the dumpster enclosure materials are acceptable and that the plans be revised to include enclosure dimensions;
- 5. That the Planning Commission determines if a the site is eligible for a waiver from Section 38-206 for driveway spacing;
- 6. Review and approval by the appropriate city departments, consultants, and agencies prior to issuance of a building permit.

David Christian, DC Engineering, followed with additional comments on the site plan. Thirty-two parking spaces would be sufficient, as this is low rent housing and not expecting a lot of traffic. Same with driveway spacing. A recent traffic study was performed with the results of 114 trips per day – considered low volume. If the driveway were pushed any further north, it would eliminate the ability to construct the second building.

Commissioner Robertson left the meeting at 7:40 p.m.

MOVED BY COMMISSIONER SCHLAACK SUPPORTED BY VICE-CHAIR LIVINGSTON TO APPROVE THE SITE PLAN REVIEW FOR WASHINGTON PARK TO ALLOW FOR TWO TOWNHOMES WITH EIGHT UNITS EACH, ANY REVISIONS TO THE SITE PLAN TO BE APPROVED ADMINISTRATIVELY BY APPROPRIATE CITY DEPARTMENTS PRIOR TO ISSUANCE OF A BUILDING PERMIT, TO APPROVE THE VARIANCES TO ALLOW FOR 32 PARKING SPACES INSTEAD OF 34 AND ALLOW THE DRIVEWAY WIDTH TO BE 87 FEET INSTEAD OF 130 FEET.

YEAS: COMMISSIONER LAW, VICE-CHAIR LIVINGSTON, COMMISSIONERS SCHLAACK, TAYLOR, SECRETARY FEAR AND CHAIRMAN WASCHER
NAYS: NONE
ABSTAINED: COMMISSIONER MARTIN
RCV MOTION CARRIED

COMMISSIONER/CITIZEN COMMENTS:

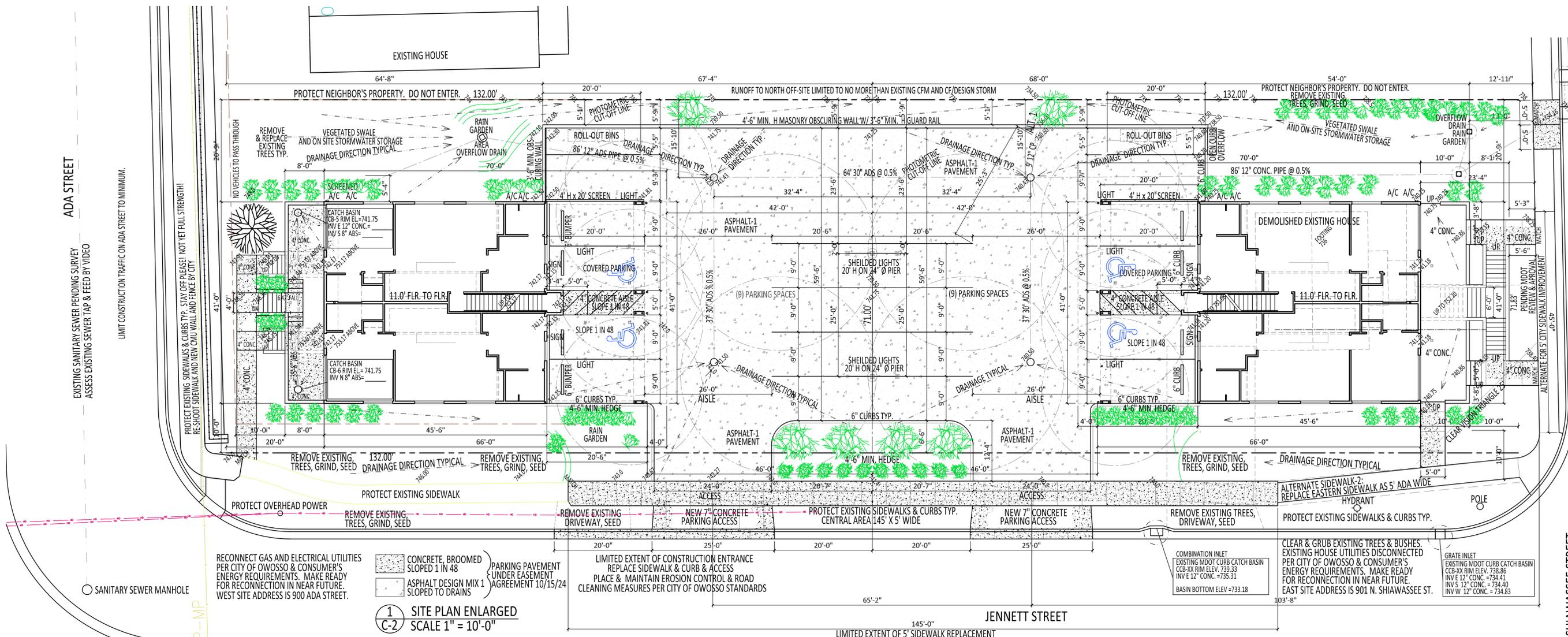
Discussions were held regarding drainage, the units proposed versus the previous Bailey Park project, what the buildings will look like and traffic.

ADJOURNMENT:

MOTION BY COMMISSIONER MARTIN SUPPORTED BY VICE-CHAIR LIVINGSTON TO ADJOURN AT 7:15 PM UNTIL THE NEXT MEETING ON MAY 28, 2024.

YEAS ALL, MOTION CARRIED

Janae Fear, Secretary



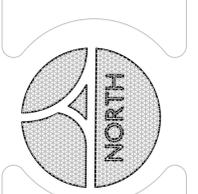
EXISTING MDOOT CURB CATCH BASIN
 CCB-99 RIM ELEV. 737.35
 INV E 12" CONC. = 733.04
 INV S 12" CONC. = 734.12
 BASIN BOTTOM ELEV. = 735.01

EXISTING MDOOT CURB CATCH BASIN
 CCB-98 RIM ELEV. 737.15
 INV N 12" CONC. = 734.16
 INV S 6" CLAY = 734.26
 INV W 12" CONC. = 734.16 PROPOSED
 BASIN BOTTOM ELEV. = 732.81

Jennett Buildings

Complying w/ new Zoning Ordinance
 900 Ada Street Owosso, MI 48867
 901 N. Shiawassee St. Owosso, MI 48867

Date: December 29, 2023
 January 22, 2024
 February 1, 2024
 February 28, 2024
 March 29, 2024
 August 19, 2024
 October 15, 2024



1210 W. Oliver Street
 Owosso, MI 48867
 Kindness, integrity



Jed Dingens, AIA
 989.277.5919
 jed@dingensarchitects.com



Limited Services
 Site Plan Enlarged

Sheet: C-2

RECONNECT GAS AND ELECTRICAL UTILITIES PER CITY OF OWOSSO & CONSUMER'S ENERGY REQUIREMENTS. MAKE READY FOR RECONNECTION IN NEAR FUTURE. WEST SITE ADDRESS IS 900 ADA STREET.

CONCRETE, BROOMED SLOPED 1 IN 48
 ASPHALT DESIGN MIX 1 SLOPED TO DRAINS

1 SITE PLAN ENLARGED
 C-2 SCALE 1" = 10'-0"

Paul Rangi, Prospective Investor
 900 Ada, 901 N. Shiawassee, Owosso, MI 48867 March 19, 2024 Owosso Zoning Ordinance and Zoning Map Classification:
 2 Separate Corner Lots on Jennett St. 71' x 132' Lots, 0.22 acre R-1 Residential, Adjacent to OS-1 to south.

CITY OF OWOSSO ZONING ORDINANCE - CHAPTER 38 - ADOPTED MARCH 18, 2024

CITATION ITEM	REQUIRED	PROPOSED	EXISTING	COMPLIANCE
38-53(1) Projections into yards, features	Maximum 3' into front, 5' into rear, 2' into side yard setbacks.		Yes	Yes
38-53(2) Projections into yards, porches	Maximum 10' into front, 0' into rear, & accessory structure setbacks into yards.		Yes	Yes
38-54(1) Residential Development	Regulations for infill housing w/in a 300' defined area of city to assure suitable character.		Yes	Yes
38-54(2) Residential Development	Building permit applications must be submitted to the zoning administrator for approval.		Yes	Yes
38-54(3) Residential Development	Lot coverage no less than 90% & nor more than 135% of other dwellings w/in 300'.		Yes	Yes
38-56 Sidewalks & Walkways	5' minimum width and concrete per ASHTO & distinguished from parking/driving areas.		Yes	Yes
38-57(1) Solar Panel Energy Systems	Permitted use in all zoning districts. Freestanding panels considered "accessory bldgs."		Yes	Yes
38-57(2) Solar Panel Restrictions:	(a) Roof mounted no higher than building height limits. (b) Required for all nonresidential uses. Not permitted for single-family residential use.		Yes	Yes
38-63(1) Waste receptacles/enclosures	Intended to increase the availability of attainable and workforce housing.		Yes	Yes
38-81(c) Residential Zoning Regulations	Intended to reduce barriers that limit market's ability to build smaller lower cost homes.		Yes	Yes
38-81(d) Residential Zoning Regulations	Intended to ensure buildings compatible with existing scale, height, massing & setbacks.		Yes	Yes
38-82 R-1 Residential District	Single-family detached dwelling divided up into up to 4 dwelling units allowed as "P."		Yes	Yes
38-82 R-1 Residential District	Four-family attached dwelling unit (quadplex) allowed as "P" permitted by right.		Yes	Yes
38-85 Bulk Reg's R-1 Residential SF, 2F	Principle setbacks: Minimum 10' from front, 5' from side, and 35' from rear lot lines. Height: Maximum 2 1/2 stories or 30' Area: Minimum First Floor 700 sq. ft. Lot Coverage by Buildings: Maximum 50%		Yes	Yes
38-85 R-1 Reg's R-1 Residential SF, 4F	Principle setbacks: Minimum 10' from front, 5' from side, and 20' from rear lot lines. Height: Maximum 2 1/2 stories or 30' Area: Minimum Floor Areas: One Bedroom: 550 sq. ft. Two Bedroom: 700 sq. ft. Lot Coverage by Buildings: Maximum 60%		Yes	Yes

REQUIRED	PROPOSED	EXISTING	COMPLIANCE
Front Yard Setback West	10' minimum	20'	Yes
Front Yard Setback South	10' minimum	10'	Yes
Side Yard Setback North	5' minimum	20'	Yes
Front Yard Setback East	10' minimum	13'-4"	Yes
Height	30' or 2 1/2 story	29' and 2 1/2 story	Yes
Area	550 & 700 sq. ft.	887 & 1330 sq. ft.	Yes
Lot Coverage	60% maximum	2660 / 9372 = 28.4%	Yes

38-88 Residential Building Design Stand's

1. Fenestration: Primary facade no less than 25% windows and doorways.	Yes
2. Facade Articulation: Blank walls over 30' not permitted.	Yes
3. Front Stoop or Porch: Each residential unit minimum 6'x5' stoop or 7'-9" deep porch.	Yes
4. Allowable Materials: Primary facade brick, stone, fiber brd., metal siding, wood, vinyl. Secondary facade & up to 50% of Primary: Stucco, AMP, cast concrete screen.	Yes
5. Garage/Parking: may only occupy a maximum of 40% of the front facade.	Yes
Drives and parking shall be setback at least 3' from side or rear lot lines.	Yes
Surface shall be asphalt, concrete, or brick & must be graded to dispose of surface water.	Yes

38-88 Residential Building Type: Quad

1. At least one door facing the front lot line.	Yes
2. Secondary entries permitted from side or rear.	Yes
Parking 1. Building integrated parking permitted in rear of building.	Yes
Parking 2. Off-street parking shall be in rear yard.	Yes
Parking 3. Masonry screen wall required between parking and property line.	Yes
Parking 4. Driveways must be located in the side or rear yard.	Yes
Parking 5. Articulation of bays by change in material, transparency, or plane.	Yes

900 Ada, 901 N. Shiawassee, Owosso, MI 48867 March 19, 2024 Owosso Zoning Ordinance Compliance, Page 2
 2 Separate Corner Lots on Jennett St. 71' x 132' Lots, 0.22 acre

38-187 Off-Street Parking Space Design	REQUIRED	PROPOSED	EXISTING	COMPLIANCE
1. Ingress and Egress	clearly defined	clearly defined	None	Yes
2. Surfacing, drainage & grading	hard surfaced	hard surfaced	None	Yes
3. Curbs, raised or rolled, min. 6" high, all driveway, parking & access edges.			None	Yes
4. "Front yard" waivers through planning commission.	Yes	None	None	Yes
5. Dimensions, 90 degree space	9' x 20' +	9' x 20' + some 9' x 17'-4" +	None	Yes*
5. 2-way Aisle, 90 degree space	26'	26'	None	Yes

38-188 Parking Lot Construction & Maintenance

- Plans and specs to be submitted to zoning administrator prior to issuance of building permit.
- Show existing and proposed grades.
- Be designed to ensure storm run-off shall be accommodated on-site through approved drainage facilities, including catch basins, run-off calculations, pipe sizes and connections to existing drainage structures.
- Provide specs on surface and base materials to be used for construction.

Rain Gardens Discussion: May design center of parking lot as a north/south rain garden with a southern inlet to MDOOT structure.

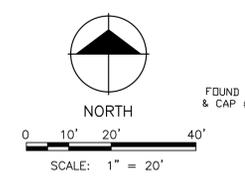
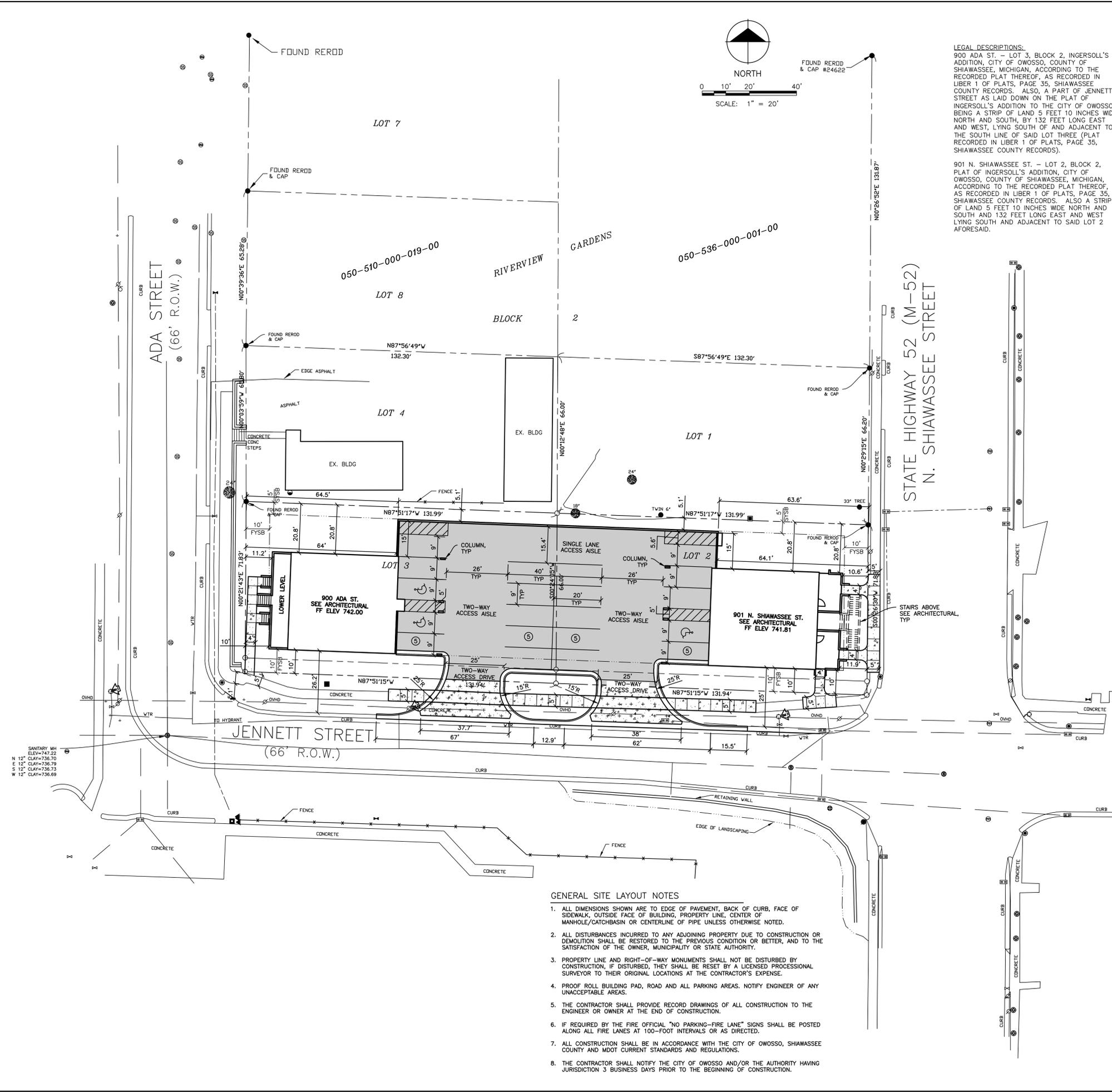
Dingens Architects

ADA STREET (VACATED)
 ADA STREET (VACATED)

MEMORIAL WELLNESS CENTER

MEMORIAL WELLNESS CENTER

Sheet: C-2



LEGAL DESCRIPTIONS:
900 ADA ST. - LOT 3, BLOCK 2, INGERSOLL'S ADDITION, CITY OF OWOSSO, COUNTY OF SHIAWASSEE, MICHIGAN, ACCORDING TO THE RECORDED PLAT THEREOF, AS RECORDED IN LIBER 1 OF PLATS, PAGE 35, SHIAWASSEE COUNTY RECORDS. ALSO, A PART OF JENNETT STREET AS LAID DOWN ON THE PLAT OF INGERSOLL'S ADDITION TO THE CITY OF OWOSSO, BEING A STRIP OF LAND 5 FEET 10 INCHES WIDE NORTH AND SOUTH, BY 132 FEET LONG EAST AND WEST, LYING SOUTH OF AND ADJACENT TO THE SOUTH LINE OF SAID LOT THREE (PLAT RECORDED IN LIBER 1 OF PLATS, PAGE 35, SHIAWASSEE COUNTY RECORDS).

901 N. SHIAWASSEE ST. - LOT 2, BLOCK 2, PLAT OF INGERSOLL'S ADDITION, CITY OF OWOSSO, COUNTY OF SHIAWASSEE, MICHIGAN, ACCORDING TO THE RECORDED PLAT THEREOF, AS RECORDED IN LIBER 1 OF PLATS, PAGE 35, SHIAWASSEE COUNTY RECORDS. ALSO A STRIP OF LAND 5 FEET 10 INCHES WIDE NORTH AND SOUTH AND 132 FEET LONG EAST AND WEST LYING SOUTH AND ADJACENT TO SAID LOT 2 AFORESAID.

BENCHMARKS

- BM NO.: 1 ELEVATION: 749.131
SW BONN BOLT ON EX. HYDRANT
- BM NO.: 2 ELEVATION: 744.812
SPIKE IN EAST FACE BASE UTIL POLE
- BM NO.: 3 ELEVATION: 740.832
NE BONN BOLT ON EX. HYDRANT

PARCEL ZONING SUMMARY

PARCEL ZONING: R1 ONE-FAMILY RESIDENTIAL DISTRICT
PROPOSED USE: MULTI-FAMILY RESIDENTIAL
PERMITTED USES IN R1: MULTI-UNIT ATTACHED DWELLINGS
MINIMUM LOT AREA: 4,500 SF
MIN LOT WIDTH: 60 FEET
MIN. YARD (SETBACK) REQUIREMENTS:
FRONT: 10- FEET SHIAWASSEE (M-52, JENNETT AND ADA ST.);
900 ADA ST. 10- FEET PROVIDED
901 N. SHIAWASSEE ST. 10- FEET PROVIDED FROM JENNETT ST
11.8- FEET PROVIDED FROM M-52
SIDE: 5- FEET NORTH : 15.4' PROVIDED
MAXIMUM BUILDING HEIGHT: 30- FEET, SEE ARCHITECTURAL ELEVATIONS FOR PROPOSED BLDG DETAILS
GREENBELT LANDSCAPING: SEE LANDSCAPE PLAN

FRONT YARD LANDSCAPING SEE LANDSCAPE PLAN

TOTAL LOT AREA:
0.435 ACRES/18,949 SF (NET, EXCLUDES RIGHT-OF-WAY)

PER SECTION 38-185 REQUIRED OFF-STREET PARKING (SEE ARCHITECTURAL PLAN FOR FLOOR AREA DIMENSIONS)
MULTIPLE-FAMILY DWELLINGS: 1.5 SPACES PER EFFICIENCY OR ONE-BEDROOM DWELLING UNIT,
2.0 SPACES PER EACH UNIT WITH TWO BEDROOMS
2.5 SPACES PER EACH UNIT WITH THREE OR MORE BEDROOMS
PLUS 5.0 ADDITIONAL SPACES FOR ANY OFFICE, PLUS 1.0 SPACE PER 200 SF
OF GFA OF ANY CLUBHOUSE FACILITY, PLUS VISITOR OFF-STREET PARKING EQUAL
TO AT LEAST 20% OF THE TOTAL SPACES REQUIRED

ONE BEDROOM 550 SF (2 UNITS); TWO BEDROOM 700 SF (2 UNITS)
3 SPACES REQUIRED FOR 2, ONE-BEDROOM UNITS
4 SPACES REQUIRED FOR 2, TWO-BEDROOM UNITS
7 TOTAL SPACES REQUIRED (20% FOR ADDITIONAL VISITOR PARKING = 2 SPACES)
9 REQUIRED PARKING SPACES

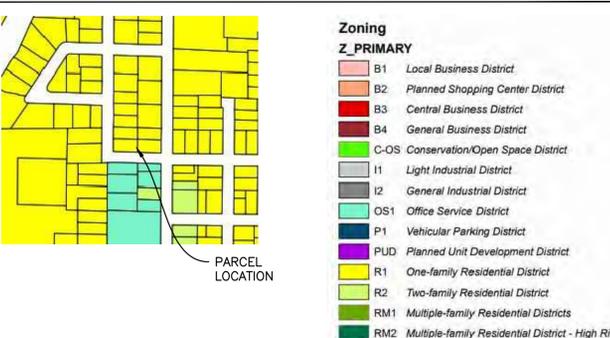
TOTAL PROPOSED IMPERVIOUS AREA = 13,613 SF
TOTAL NET SITE AREA CONTRIBUTING TO MDT M-52 DRAINAGE = 16,695 SF
PERCENT PROPOSED IMPERVIOUS = 81.5%

20 PARKING SPACES, INCLUDING 4 BARRIER FREE

EXISTING VEGETATION NOTE

IT IS THE OWNER INTENT TO REMOVE ALL THE EXISTING RIGHT-OF-WAY TREES FROM THE DEVELOPMENT SITE.

ZONING MAP EXCERPT



SITE FEATURE LEGEND

- 6" CONCRETE SURFACE
- 7" REINFORCED CONCRETE SURFACE
- BITUMINOUS PAVEMENT
- CONCRETE CURB & GUTTER
- NUMBER OF PROPOSED PARKING SPACES
- PROPOSED PAVEMENT MARKING (PAINTING)
- PROPOSED BARRIER FREE PARKING SPACE

GENERAL SITE LAYOUT NOTES

- ALL DIMENSIONS SHOWN ARE TO EDGE OF PAVEMENT, BACK OF CURB, FACE OF SIDEWALK, OUTSIDE FACE OF BUILDING, PROPERTY LINE, CENTER OF MANHOLE/CATCHBASIN OR CENTERLINE OF PIPE UNLESS OTHERWISE NOTED.
- ALL DISTURBANCES INCURRED TO ANY ADJOINING PROPERTY DUE TO CONSTRUCTION OR DEMOLITION SHALL BE RESTORED TO THE PREVIOUS CONDITION OR BETTER, AND TO THE SATISFACTION OF THE OWNER, MUNICIPALITY OR STATE AUTHORITY.
- PROPERTY LINE AND RIGHT-OF-WAY MONUMENTS SHALL NOT BE DISTURBED BY CONSTRUCTION, IF DISTURBED, THEY SHALL BE RESET BY A LICENSED PROFESSIONAL SURVEYOR TO THEIR ORIGINAL LOCATIONS AT THE CONTRACTOR'S EXPENSE.
- PROOF ROLL BUILDING PAD, ROAD AND ALL PARKING AREAS. NOTIFY ENGINEER OF ANY UNACCEPTABLE AREAS.
- THE CONTRACTOR SHALL PROVIDE RECORD DRAWINGS OF ALL CONSTRUCTION TO THE ENGINEER OR OWNER AT THE END OF CONSTRUCTION.
- IF REQUIRED BY THE FIRE OFFICIAL "NO PARKING-FIRE LANE" SIGNS SHALL BE POSTED ALONG ALL FIRE LANES AT 100-FOOT INTERVALS OR AS DIRECTED.
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF OWOSSO, SHIAWASSEE COUNTY AND MDT CURRENT STANDARDS AND REGULATIONS.
- THE CONTRACTOR SHALL NOTIFY THE CITY OF OWOSSO AND/OR THE AUTHORITY HAVING JURISDICTION 3 BUSINESS DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.



Zfe
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ENGINEERING, LLC
426 S. Clinton Street
Grand Ledge, MI 48837
Tel: 517.627.8068
www.zfengineering.com



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Project Manager: TZF
Reviewed By: JWF
Engineer: JWF
Drafter: TZF
Drawing Scale: 1" = 20'

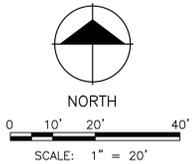
Issue Date: _____ Issued for: _____

09.26.24 Revised & Reissued for Reg. Review
09.20.24 Issued for Regulatory Review

Project Name
Rangi Real Estate, LLC
Shiawassee City, Owosso, MI
Jennett Buildings Site Development

Drawing Title
SITE LAYOUT PLAN
Drawing Number
C100
ZFE Project Number
24017

REVIEW DRAWING NOT FOR CONSTRUCTION
PLOT DATE: 09.26.24



BENCHMARKS

- BM NO.: 1 ELEVATION: 749.131
SW BONN BOLT ON EX. HYDRANT
- BM NO.: 2 ELEVATION: 744.812
SPIKE IN EAST FACE BASE UTIL. POLE
- BM NO.: 3 ELEVATION: 740.832
NE BONN BOLT ON EX. HYDRANT



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09.26.24

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Location Map



Project Manager: TZF
Reviewed By: JWF
Engineer: TZF
Drafted: TZF
Drawing Scale: 1" = 20'

Issue Date: Issued for:

09.26.24 Revised & Reissued for Reg. Review
09.20.24 Issued for Regulatory Review

Project Name
Rangi Real Estate, LLC
Shiawassee Cty, Owosso, MI

Jennett Buildings Site Development

Drawing Title
SITE UTILITY PLAN

Drawing Number
C101

ZFE Project Number
24017

GENERAL UTILITY NOTES

1. ALL UTILITY LINES, STRUCTURES AND TRENCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARDS AND REQUIREMENTS OF THE MICHIGAN DEPT. OF TRANSPORTATION, CITY OF OWOSSO AND THE CONTRACT DOCUMENTS AND THE SHIawassee COUNTY HEALTH DEPARTMENT FOR SOIL EROSION PERMITTING.
2. ALL WATER MAIN AND SANITARY SEWER IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF OWOSSO REQUIREMENTS.
3. ALL TRENCHES UNDER OR WITHIN THREE (3) FEET OR THE FORTY-FIVE (45) DEGREE ZONE OF INFLUENCE LINE OF EXISTING AND/OR PROPOSED PAVEMENT, BUILDING PAD OR DRIVE APPROACH, ETC. SHALL BE BACKFILLED WITH MDT CLASS II SAND COMPACTED TO A T LEAST 95 PERCENT OF THE MAXIMUM MODIFIED PROCTOR DRY DENSITY IN ACCORDANCE WITH ASTM D1557. ALL OTHER TRENCHES TO BE COMPACTED PER CITY OF OWOSSO REQUIREMENTS.
4. PHYSICAL CONNECTIONS SHALL NOT BE MADE TO WATER OR SANITARY LINES WITHOUT MEETING THE REQUIREMENTS OF THE GOVERNING AUTHORITY FOR TESTING, OBSERVATION, ETC. CONTRACTOR MUST COORDINATE WITH AUTHORITY DURING CONSTRUCTION.
5. WATER SERVICE LEADS SHALL BE TYPE "K" ANNEALED SEAMLESS COPPER PER CITY OF OWOSSO REQUIREMENTS. PROVIDE SAND BEDDING AND COMPACTED SAND BACKFILL PER CITY REQUIREMENT AND PROJECT SPECIFICATIONS.
6. ALL SANITARY SEWER LEADS SHALL BE SDR 25 PVC AND FITTINGS INSTALLED AT A MINIMUM 1% PER CITY REQUIREMENTS. ALL JOINTS TO BE ELASTOMERIC GASKET JOINTS PER ASTM D3034 UNLESS OTHERWISE NOTED.
7. DOWNSPOUTS, WEEP TILE, FOOTING DRAINS OR ANY CONDUIT THAT CARRIES STORM OR GROUND WATER SHALL NOT BE ALLOWED TO DISCHARGE INTO A SANITARY SEWER.
8. BACKFILL AND BEDDING FOR ALL SEWERS LEADS SHALL BE IN ACCORDANCE WITH CITY OF OWOSSO STANDARDS.
9. SANITARY LEADS SHALL BE PROVIDED WITH CLEANOUTS AT EVERY BEND AND ALONG PIPE RUNS ASH SHOWN. ALL CLEANOUTS TO BE PROVIDED WITH EJIW #1565 BOX OR APPROVED EQUAL.
10. ALL UTILITIES SHOWN ARE APPROXIMATE LOCATIONS ONLY AND HAVE BEEN COMPILED FROM THE LATEST AVAILABLE MAPPING. THE EXACT LOCATION OF ALL UNDERGROUND UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION.
11. GENERAL CONTRACTOR TO COORDINATE WITH THE LOCAL UTILITY COMPANIES FOR ALL LOCATIONS AND CONNECTIONS. A PRE-CONSTRUCTION MEETING WITH THE VARIOUS UTILITY PROVIDERS IS REQUIRED PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY.
12. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY THE ELEVATION AND LOCATION OF ALL UTILITIES BY VARIOUS MEANS PRIOR TO BEGINNING ANY EXCAVATION. TEST PITS SHALL BE DUG AT ALL LOCATIONS WHERE SEWERS CROSS EXISTING UTILITIES, AND THE HORIZONTAL AND VERTICAL LOCATIONS OF THE UTILITIES SHALL BE DETERMINED. THE CONTRACTOR SHALL CONTACT THE ENGINEER IN THE EVENT OF ANY UNFORESEEN CONFLICTS BETWEEN EXISTING AND PROPOSED UTILITIES SO THAT AN APPROPRIATE MODIFICATION MAY BE MADE.
13. THE CONTRACTOR SHALL ENSURE THAT ALL UTILITY COMPANIES AND MUNICIPALITY STANDARDS FOR MATERIALS AND CONSTRUCTION METHODS ARE MET. THE CONTRACTOR SHALL PERFORM PROPER COORDINATION WITH THE RESPECTIVE UTILITY COMPANY. THE CONTRACTOR SHALL COORDINATE WORK TO BE PERFORMED BY THE VARIOUS UTILITY COMPANIES AND SHALL PAY ALL FEES FOR CONNECTIONS, DISCONNECTIONS, RELOCATIONS, INSPECTIONS, AND DEMOLITION.
14. ALL VALVE BOXES AND CURB BOXES SHALL BE ADJUSTED TO THE FINAL GRADES. ALL CURB BOXES SHALL BE LOCATED IN GRASSED AREAS UNLESS OTHERWISE NOTED ON THE PLANS.
15. MAINTAIN ADEQUATE SEPARATION BETWEEN SANITARY AND WATER SERVICES IN ACCORDANCE WITH CITY OF OWOSSO REQUIREMENTS. A MINIMUM OF 10' OF HORIZONTAL AND 18" OF VERTICAL SEPARATION IS REQUIRED.
16. ALL EXISTING PAVEMENT WHERE UTILITY PIPING IS TO BE INSTALLED SHALL BE SAW CUT AND REPLACED IN ACCORDANCE WITH THE PAVEMENT REPAIR REQUIREMENTS OF THE GOVERNING AUTHORITY.
17. RESTORE ALL DISTURBED GREENBELT AREAS TO PRE-CONSTRUCTION CONDITION IN ACCORDANCE WITH THE REQUIREMENTS OF THE GOVERNING AUTHORITY. UNLESS OTHERWISE INDICATED BY THE GOVERNING AUTHORITY, DISTURBED GREENBELTS AREAS SHALL BE GRADED TO PROVIDE POSITIVE DRAINAGE AND A MINIMUM OF 3" TOPSOIL, SEED AND MULCH APPLIED.

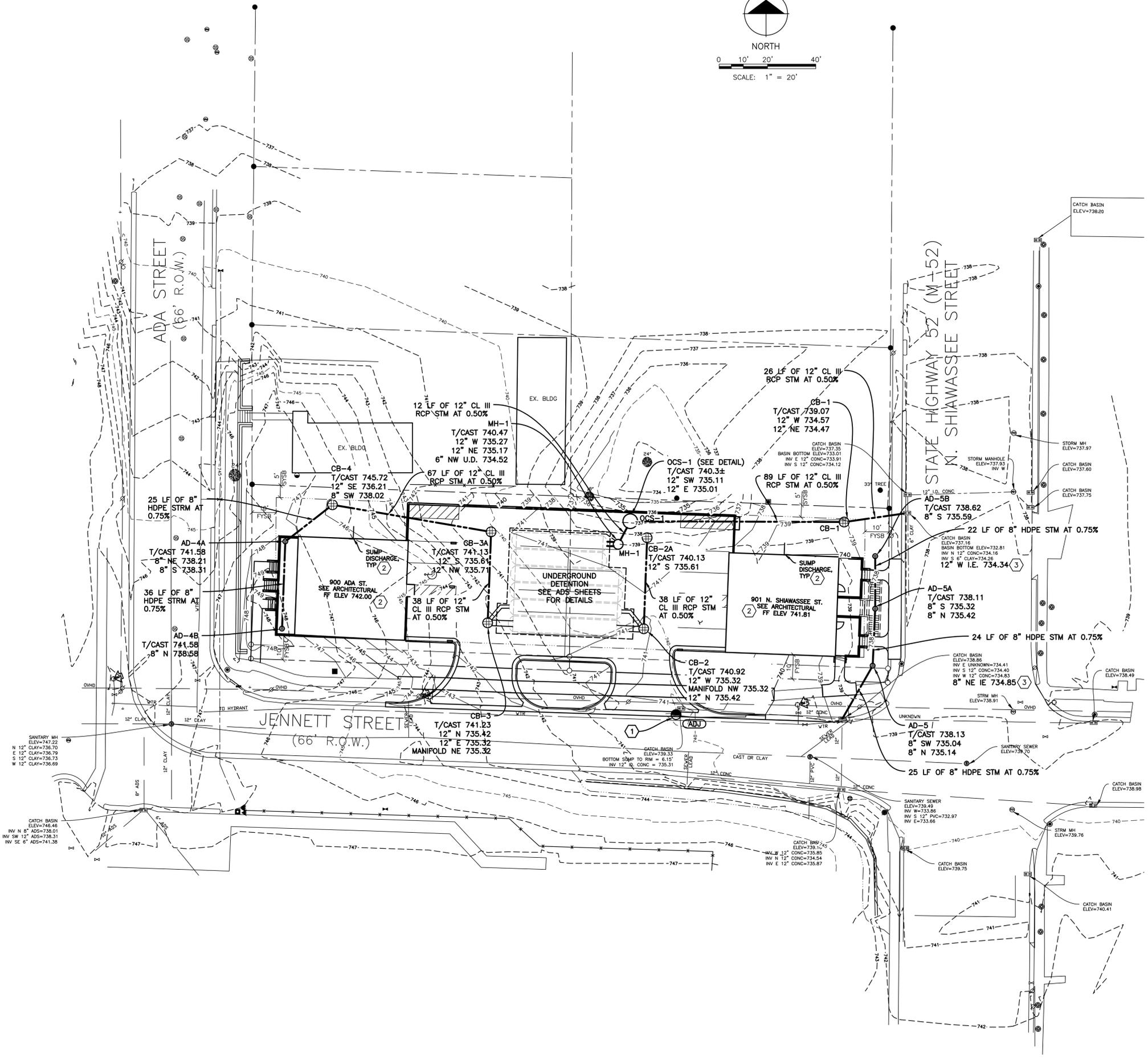
KEY NOTES

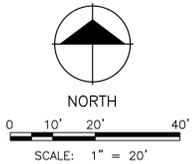
- 1 REMOVE EXISTING CATCH BASIN FLAT TOP SECTION. SPIN ECCENTRIC OPENING ON THE EX. FLAT TOP TO ALIGN WITH PROPOSED CURB ALIGNMENT. REINSTALL IN NEW ORIENTATION TO ALIGN WITH PROPOSED GRADES SHOWN ON THE GRADING PLAN. INSTALL A NEW CATCH BASIN CASTING BACK TO FIT THE PROPOSED VALLEY GUTTER PROFILE.
- 2 SEE PLUMBING, MECHANICAL AND ELECTRICAL PLANS (BY OTHERS) FOR SANITARY, WATER AND POWER CONNECTIONS TO THE MUNICIPAL UTILITY SYSTEMS.
- 3 VERIFY PROPOSED INVERT ELEVATION PRIOR TO PIPE INSTALLATION. CORE EX. PRECAST STORM STRUCTURE TO RECEIVE PROPOSED UTILITY. FOLLOWING INSTALLATION OF PROPOSED UTILITY PIPE, MAKE CONNECTION LOCATION BETWEEN PIPE AND EXISTING STRUCTURE WATER TIGHT BY INSTALLATION OF NON-SHRINK GROUT (MINIMUM).

SITE UTILITY LEGEND

PIPE	CONTENTS	ABBREVIATIONS	SYMBOL	DESCRIPTION
GAS	NATURAL GAS		12" STM	STORM SEWER & MANHOLE
SAW	SANITARY SEWER		Catch Basin Symbol	CATCH BASIN
STM	STORM SEWER		6" U.D.	UNDERDRAIN
WTR	WATER		ADJ	ADJUST EX. STRUCTURE CASTINGS
FM	FORCE MAIN			
PIPE	MATERIAL	ABBREVIATIONS		
CSP	CORRUGATED STEEL PIPE			
CSPA	CORRUGATED STEEL PIPE ARCH			
DIP	DUCTILE IRON PIPE			
MRCP	NON-REINFORCED CONCRETE PIPE			
PE	POLYETHYLENE			
PE PERF.	POLYETHYLENE PIPE PERFORATED			
PVC	POLYVINYL CHLORIDE			
RCP	REINFORCED CONCRETE PIPE			
VCP	VITRIFIED CLAY PIPE			

REVIEW DRAWING NOT FOR CONSTRUCTION
PLOT DATE: 09.26.24





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BENCHMARKS

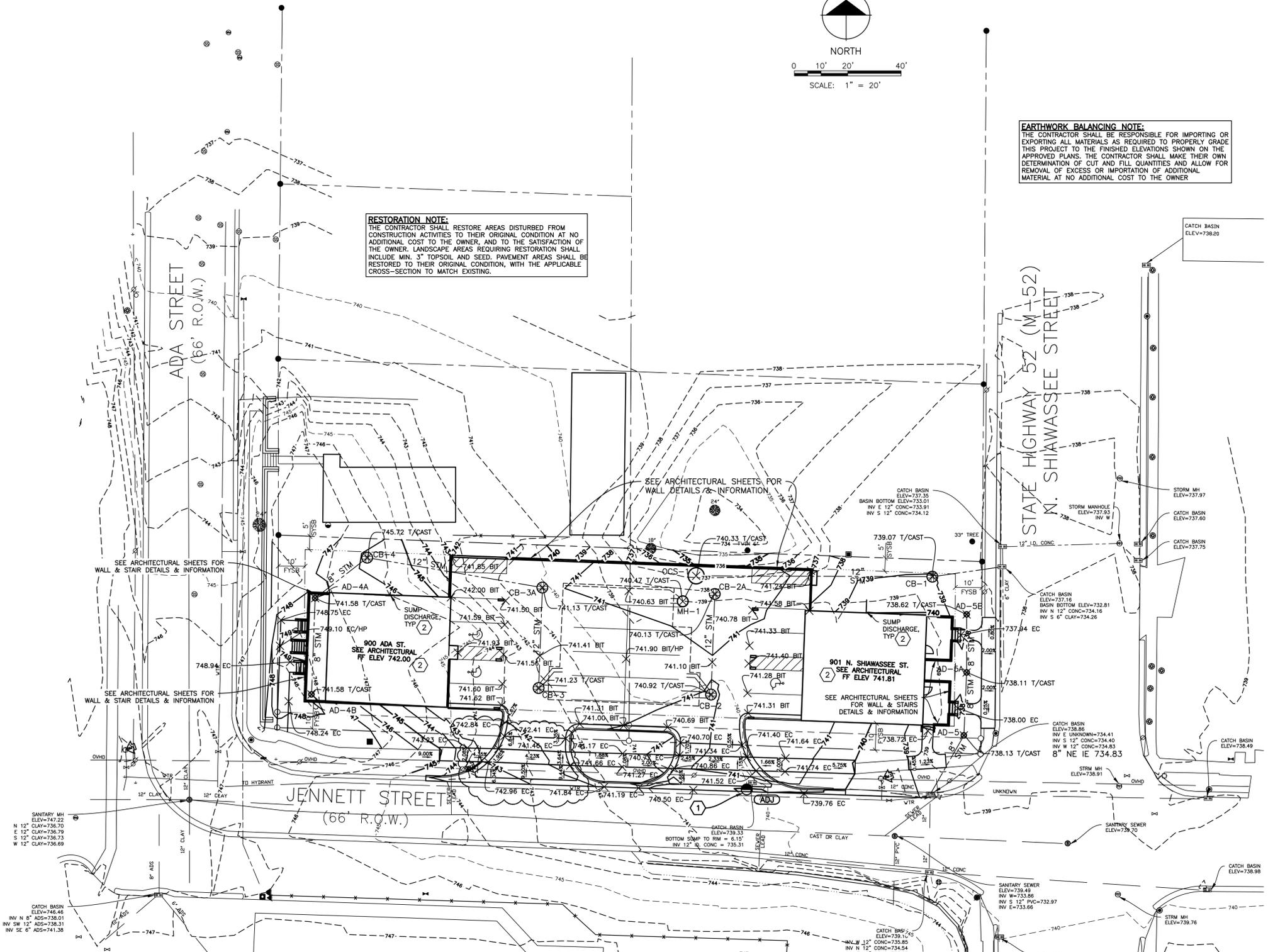
- BM NO.: 1 ELEVATION: 749.131
SW BONN BOLT ON EX. HYDRANT
- BM NO.: 2 ELEVATION: 744.812
SPIKE IN EAST FACE BASE UTIL. POLE
- BM NO.: 3 ELEVATION: 740.832
NE BONN BOLT ON EX. HYDRANT

GENERAL UTILITY NOTES

1. ALL UTILITY LINES, STRUCTURES AND TRENCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARDS AND REQUIREMENTS OF THE MICHIGAN DEPT. OF TRANSPORTATION, CITY OF OWOSSO AND THE CONTRACT DOCUMENTS AND THE SHAWASSEE COUNTY HEALTH DEPARTMENT FOR SOIL EROSION PERMITTING.
2. ALL WATER MAIN AND SANITARY SEWER IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF OWOSSO REQUIREMENTS.
3. ALL TRENCHES UNDER OR WITHIN THREE (3) FEET OR THE FORTY-FIVE (45) DEGREE ZONE OF INFLUENCE LINE OF EXISTING AND/OR PROPOSED PAVEMENT, BUILDING PAD OR DRIVE APPROACH, ETC. SHALL BE BACKFILLED WITH MDT CLASS II SAND COMPACTED TO A T LEAST 95 PERCENT OF THE MAXIMUM MODIFIED PROCTOR DRY DENSITY IN ACCORDANCE WITH ASTM D1557. ALL OTHER TRENCHES TO BE COMPACTED PER CITY OF OWOSSO REQUIREMENTS.
4. PHYSICAL CONNECTIONS SHALL NOT BE MADE TO WATER OR SANITARY LINES WITHOUT MEETING THE REQUIREMENTS OF THE GOVERNING AUTHORITY FOR TESTING, OBSERVATION, ETC. CONTRACTOR MUST COORDINATE WITH AUTHORITY DURING CONSTRUCTION.
5. WATER SERVICE LEADS SHALL BE TYPE "K" ANNEALED SEAMLESS COPPER PER CITY OF OWOSSO REQUIREMENTS. PROVIDE SAND BEDDING AND COMPACTED SAND BACKFILL PER CITY REQUIREMENT AND PROJECT SPECIFICATIONS.
6. ALL SANITARY SEWER LEADS SHALL BE SDR 25 PVC AND FITTINGS INSTALLED AT A MINIMUM 1% PER CITY REQUIREMENTS. ALL JOINTS TO BE ELASTOMERIC GASKET JOINTS PER ASTM D3034 UNLESS OTHERWISE NOTED.
7. DOWNSPOUTS, WEEP TILE, FOOTING DRAINS OR ANY CONDUIT THAT CARRIES STORM OR GROUND WATER SHALL NOT BE ALLOWED TO DISCHARGE INTO A SANITARY SEWER.
8. BACKFILL AND BEDDING FOR ALL SEWERS LEADS SHALL BE IN ACCORDANCE WITH CITY OF OWOSSO STANDARDS.
9. SANITARY LEADS SHALL BE PROVIDED WITH CLEANOUTS AT EVERY BEND AND ALONG PIPE RUNS ASH SHOWN. ALL CLEANOUTS TO BE PROVIDED WITH EJIW #1565 BOX OR APPROVED EQUAL.
10. ALL UTILITIES SHOWN ARE APPROXIMATE LOCATIONS ONLY AND HAVE BEEN COMPILED FROM THE LATEST AVAILABLE MAPPING. THE EXACT LOCATION OF ALL UNDERGROUND UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION.
11. GENERAL CONTRACTOR TO COORDINATE WITH THE LOCAL UTILITY COMPANIES FOR ALL LOCATIONS AND CONNECTIONS. A PRE-CONSTRUCTION MEETING WITH THE VARIOUS UTILITY PROVIDERS IS REQUIRED PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY.
12. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY THE ELEVATION AND LOCATION OF ALL UTILITIES BY VARIOUS MEANS PRIOR TO BEGINNING ANY EXCAVATION. TEST PITS SHALL BE BUG AT ALL LOCATIONS WHERE SEWERS CROSS EXISTING UTILITIES, AND THE HORIZONTAL AND VERTICAL LOCATIONS OF THE UTILITIES SHALL BE DETERMINED. THE CONTRACTOR SHALL CONTACT THE ENGINEER IN THE EVENT OF ANY UNFORESEEN CONFLICTS BETWEEN EXISTING AND PROPOSED UTILITIES SO THAT AN APPROPRIATE MODIFICATION MAY BE MADE.
13. THE CONTRACTOR SHALL ENSURE THAT ALL UTILITY COMPANIES AND MUNICIPALITY STANDARDS FOR MATERIALS AND CONSTRUCTION METHODS ARE MET. THE CONTRACTOR SHALL PERFORM PROPER COORDINATION WITH THE RESPECTIVE UTILITY COMPANY. THE CONTRACTOR SHALL COORDINATE WORK TO BE PERFORMED BY THE VARIOUS UTILITY COMPANIES AND SHALL PAY ALL FEES FOR CONNECTIONS, DISCONNECTIONS, RELOCATIONS, INSPECTIONS, AND DEMOLITION.
14. ALL VALVE BOXES AND CURB BOXES SHALL BE ADJUSTED TO THE FINAL GRADES. ALL CURB BOXES SHALL BE LOCATED IN GRASSED AREAS UNLESS OTHERWISE NOTED ON THE PLANS.
15. MAINTAIN ADEQUATE SEPARATION BETWEEN SANITARY AND WATER SERVICES IN ACCORDANCE WITH CITY OF OWOSSO REQUIREMENTS. A MINIMUM OF 10' OF HORIZONTAL AND 18" OF VERTICAL SEPARATION IS REQUIRED.
16. ALL EXISTING PAVEMENT WHERE UTILITY PIPING IS TO BE INSTALLED SHALL BE SAW CUT AND REPLACED IN ACCORDANCE WITH THE PAVEMENT REPAIR REQUIREMENTS OF THE GOVERNING AUTHORITY.
17. RESTORE ALL DISTURBED GREENBELT AREAS TO PRE-CONSTRUCTION CONDITION IN ACCORDANCE WITH THE REQUIREMENTS OF THE GOVERNING AUTHORITY. UNLESS OTHERWISE INDICATED BY THE GOVERNING AUTHORITY, DISTURBED GREENBELTS AREAS SHALL BE GRADED TO PROVIDE POSITIVE DRAINAGE AND A MINIMUM OF 3" TOPSOIL, SEED AND MULCH APPLIED.

EARTHWORK BALANCING NOTE:
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPORTING OR EXPORTING ALL MATERIALS AS REQUIRED TO PROPERLY GRADE THIS PROJECT TO THE FINISHED ELEVATIONS SHOWN ON THE APPROVED PLANS. THE CONTRACTOR SHALL MAKE THEIR OWN DETERMINATION OF CUT AND FILL QUANTITIES AND ALLOW FOR REMOVAL OF EXCESS OR IMPORTATION OF ADDITIONAL MATERIAL AT NO ADDITIONAL COST TO THE OWNER.

RESTORATION NOTE:
 THE CONTRACTOR SHALL RESTORE AREAS DISTURBED FROM CONSTRUCTION ACTIVITIES TO THEIR ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER, AND TO THE SATISFACTION OF THE OWNER. LANDSCAPE AREAS REQUIRING RESTORATION SHALL INCLUDE MIN. 3" TOPSOIL AND SEED. PAVEMENT AREAS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION, WITH THE APPLICABLE CROSS-SECTION TO MATCH EXISTING.



KEY NOTES

1. REMOVE EXISTING CATCH BASIN FLAT TOP SECTION. SPIN ECCENTRIC OPENING ON THE EX. FLAT TOP TO ALIGN WITH PROPOSED CURB ALIGNMENT. REINSTALL IN NEW ORIENTATION TO ALIGN WITH PROPOSED CURB. REINSTALL CATCH BASIN CASTING WITH NEW BACK FOR VALLEY GUTTER PROPOSED PROFILE IN PROPOSED CURBLINE ALIGNMENT TO PROPOSED GRADES SHOWN ON THE GRADING PLAN.
2. SEE PLUMBING, MECHANICAL AND ELECTRICAL PLANS (BY OTHERS) FOR SANITARY, WATER AND POWER CONNECTIONS TO THE MUNICIPAL UTILITY SYSTEMS.

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SITE GRADING LEGEND

- 865.00 PROPOSED CONTOUR ELEVATION
- 865.00 HP PROPOSED HIGH POINT SURFACE SPOT ELEVATION
- 865.00 LP PROPOSED LOW POINT SURFACE SPOT ELEVATION
- 865.00 BIT PROPOSED EDGE OF BITUMINOUS PAVEMENT SPOT ELEVATION
- 865.00 EC PROPOSED EDGE OF CONCRETE SURFACE SPOT ELEVATION
- 865.00 T/CAST PROPOSED TOP OF CASTING SPOT ELEVATION

GENERAL NOTES:

1. ALL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL MEET THE REQUIREMENTS OF THE SHAWASSEE COUNTY DRAIN COMMISSIONER (SCDC). AN EROSION CONTROL PERMIT MUST BE SECURED FROM THE SCDC PRIOR TO CONSTRUCTION. REFER TO THE SOIL EROSION AND SEDIMENTATION CONTROL PLAN, IF APPLICABLE.
2. IF AVAILABLE, THE CONTRACTOR SHALL PERFORM ALL EARTHWORK AND GRADING OPERATIONS IN ACCORDANCE WITH THE RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT.
3. ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED IN ACCORDANCE WITH THE LANDSCAPE PLANS. PROVIDE A MINIMUM OF 3" OF TOPSOIL IN THESE AREAS UNLESS OTHERWISE NOTED.
4. THE CONTRACTOR SHALL NOTE EXISTING UNDERGROUND UTILITIES WITHIN AND ADJACENT TO THE SITE. BACKFILL FOR EXISTING UTILITY TRENCHES SHALL BE EXAMINED CRITICALLY. ANY TRENCHES FOUND TO HAVE SOFT, UNSTABLE OR UNSUITABLE BACKFILL MATERIAL THAT ARE TO BE WITHIN THE ZONE OF INFLUENCE OF THE PROPOSED BUILDINGS OR PAVEMENT AREAS SHALL BE COMPLETELY EXCAVATED AND BACKFILLED WITH MDT CLASS II SAND.
5. IF SUITABLE, TOPSOIL MAY BE STRIPPED AND STOCKPILED FOR USE IN FINAL LANDSCAPING.
6. ALL SITE WORK, MATERIALS OF CONSTRUCTION, AND CONSTRUCTION METHODS SHALL CONFORM TO THE PROJECT SPECIFICATIONS, DETAILS AND APPLICABLE SECTIONS OF CITY OF OWOSSO, SHAWASSEE COUNTY AND THE STATE OF MICHIGAN DEPT. OF TRANSPORTATION (MDOT) STANDARDS. ALL FILL MATERIAL UNDER STRUCTURES AND PAVED AREAS SHALL BE MDT CL II BACKFILL AND SHALL BE PLACED IN ACCORDANCE WITH THE REQUIREMENTS OF MDT UNDER THE SUPERVISION OF A QUALIFIED PROFESSIONAL ENGINEER. COMPACTION SHALL BE 95% MAXIMUM MODIFIED PROCTOR DENSITY PER ASTM D1557 WITHIN 3 PERCENT OF OPTIMUM MOISTURE CONTENT.
7. ALL SLOPES AND AREAS DISTURBED BY CONSTRUCTION SHALL BE GRADED SMOOTH AND 3" OF TOPSOIL APPLIED. IF ADEQUATE TOPSOIL IS NOT AVAILABLE ON THE SITE, THE CONTRACTOR SHALL PROVIDE TOPSOIL, APPROVED BY THE ENGINEER AS NEEDED. THE AREA SHALL BE FERTILIZED, WATERED AND MAINTAINED UNTIL HARDY GRASS GROWTH IS ESTABLISHED IN ALL AREAS (SEE LANDSCAPE PLAN IF AVAILABLE). ANY AREAS DISTURBED FOR ANY REASON PRIOR TO FINAL ACCEPTANCE OF THE PROJECT SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
8. ALL CONTRACTORS AND SUBCONTRACTORS INVOLVED WITH STORM WATER POLLUTION PREVENTION SHALL BE PROVIDED A COPY OF THESE PLAN AND STRICTLY ADHERE TO THEIR REQUIREMENTS.
9. ALL WASH WATER (CONCRETE TRUCKS, VEHICLE CLEANING, EQUIPMENT CLEANING, ETC) SHALL BE DISPOSED OF IN A MANNER THAT PREVENTS CONTACT BETWEEN THESE MATERIALS AND STORM WATER THAT IS DISCHARGED FROM THE SITE.
10. MAINTAIN ON THE SITE OR HAVE READILY AVAILABLE SUFFICIENT OIL AND GREASE ABSORBING MATERIALS AND FLotation BOOMS TO CONTAIN AND CLEANUP FUEL OR CHEMICAL SPILLS OR LEAKS.
11. NO RUBBISH, TRASH, GARBAGE, OR OTHER SUCH MATERIALS SHALL BE DISCHARGED INTO DRAINAGE DITCHES OR WATER OF THE STATE.
12. DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITY WILL CEASE FOR AT LEAST 21 DAYS SHALL BE TEMPORARILY SEEDED. THESE AREAS SHALL BE SEEDED NO LATER THAN 14 DAYS AFTER THE LAST CONSTRUCTION ACTIVITY OCCURRING IN THESE AREAS.
13. DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITY HAS PERMANENTLY STOPPED SHALL BE PERMANENTLY SEEDED OR SODDED IN ACCORDANCE WITH THE LANDSCAPE PLAN (IF APPLICABLE). THESE AREAS SHALL BE RESTORED NO LATER THAN 14 DAYS AFTER THE LAST CONSTRUCTION ACTIVITY OCCURRING IN THESE AREAS.
14. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.
15. PRIOR TO CONSTRUCTION OF PROPOSED PAVEMENT, THE SITE SHALL BE GRADED SO AS TO PROVIDE SETTLING AREAS AROUND CATCH BASINS. CATCH BASIN RIMS SHALL BE SET AT FINISH GRADE. AREAS IMMEDIATELY ADJACENT TO BASINS SHALL BE SEVERAL INCHES BELOW FINISH GRADE UNTIL PAVEMENT IS CONSTRUCTED.
16. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO COMMENCEMENT OF ANY SITE WORK OR EARTHWORK OPERATIONS, SHALL BE MAINTAINED DURING CONSTRUCTION, AND SHALL REMAIN IN PLACE UNTIL ALL SITE WORK IS COMPLETE AND PERMANENT GROUND COVER IS ESTABLISHED.
17. DISPOSAL OF ALL DEMOLISHED MATERIALS IS THE RESPONSIBILITY OF THE CONTRACTOR AND MUST BE TAKEN OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL MUNICIPAL GUIDELINES.

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Hard copy is intended to be 24"x36" when plotted. Scale(s) indicated and graphic quality may not be accurate for other sizes.



Project Manager: TZF
 Reviewed By: JWF
 Engineer: TZF
 Drafter: TZF
 Drawing Scale: 1" = 20'

Issue Date:	Issued for:
10.16.24	Revised West Jennett Driveway Grades
09.26.24	Revised & Reissued for Reg. Review
09.20.24	Issued for Regulatory Review

Project Name
Rangi Real Estate, LLC
 Shiawassee Cty, Owosso, MI
Jennett Buildings Site Development

Drawing Title
SITE GRADING PLAN
 Drawing Number
C102

ZFE Project Number
24017

OUTLET CONTROL STRUCTURE DESIGN CALCULATIONS

Control Outlet Structure Design Rengi Owosso Apts. 9/19/2024

Sizing for First Flush Flood

First Flood discharge should be released within a period of 24 hours

Q_{all} = 0.007 cfs V_{in}/(24*3600)

h_{avg} = 0.464 ft 2/3*(Z_{in}-Z_{out}) trapezoidal basin

A = 0.00203 ft² Q_{avg}/(C * ((2*g*h_{avg})^{0.5})) C = 0.62 Sharp

Hole Dia. = 0.60 in g = 32.2 Crested

A_{actual} = 0.001963 ft² Weir

Hole Qty: 1.036043138

Use 1 holes @elevation 734.52 (Z_{in})

Q_{act full} = 0.00655723 cfs C x A_{actual} X ((2*g*h)^{0.5})

Actual T_{in} = 24.87 hours V_{in}/(Q_{act full}*3600)

Time_{actual} is within -3.60% of 24 hours OK

Sizing for Bank Full Flood

Bank full discharge should be released within time period of 24 hours

Q_{all} = 0.0324 cfs V_{in}/(24*3600)

h_{avg} = 1.336 ft 2/3*(Z_{in}-Z_{out}) trapezoidal basin

A = 0.005635508 ft² Q_{avg}/(C * ((2*g*h_{avg})^{0.5})) C = 0.62 Sharp

Hole Dia. = 0.5 in g = 32.2 Crested

A_{actual} = 0.001363538 ft² Weir

Check discharge through the first flush orifices to see if additional holes are necessary for bank full discharge

Hole Qty: 4.133002772

Use 4 holes @elevation 736.524 (Z_{in})

Q_{act full} = 0.031366441 cfs C x A_{actual} X ((2*g*h)^{0.5})

Actual Time = 24.80 hours V_{in}/(Q_{act full}*3600)

Time_{actual} is within -3.33% of 24 hours OK

Sizing for 100-year Storm using orifices in outlet structure

Q_{allow} = 0.026 cfs

h_{total} = 2.98 ft (2/3)*Z₁₀₀ - Z_{out}

h_{total, bf} = 2.882513333 ft (2/3)*Z₁₀₀ - Z_{in}

A₁₀₀ = 0.0044 sft Q₁₀₀ / C X ((2g*h_{total})^{0.5}) C = 0.62 Sharp

Hole Diameter = 0.75 in g = 32.2 Crested

A_{100 actual} = 0.003067962 ft² Weir

Hole Qty: 1.442926333

Use 1 holes

Q_{actual, 100} = 0.0264 cfs C x A_{actual} X ((2*g*h)^{0.5})

Outlet Pipe Design

Q_{peak} = 3.00926E-06 cfs Q_a when discharging to a road storm sewer system

Pipe Material = Concrete

Pipe Size = 12 in

Area of pipe = 0.785398163 ft²

n = 0.013

R = 0.25 ft Flowing Full

Pipe Slope = 0.5 %

Q_{act full} = 2.526064713 cfs Q = (1.49/n)*A^{2/3}*S^{1/2}

V = 3.216285485 ft/sec

If Q_{act full} is less than Q_a discharge is limited by outlet pipe and should be re-evaluated

If Q_a is less than Q_{act full} discharge is limited by orifice

Summary of Controlling Input Factors Rengi Owosso Site

Q_{allow} = 0.026 cfs

V_{in} = 596 ft³ 0.5" over contributing area

V_{bf} = 2,800 ft³ 2 yr/24-hour storm I = 2.35 inches

Z_{in} = 735.22 Interpolated (see ADS Cumulative Storage Volume Spreadsheet)

Z_{out} = 736.52 Interpolated (see ADS Cumulative Storage Volume Spreadsheet)

Z₁₀₀ = 739.54 Interpolated (see ADS Cumulative Storage Volume Spreadsheet)

Z_{emergency} = 740.54 Top of Weir Wall in Outlet Structure

Z₀ = 734.52 Bottom of Stone in Underground Storage

Z_{out} = 735.07 Outlet Pipe Invert

Project: **OWOSSO Rengi Apartment**



Chamber Model - MC-3500

Units - Imperial

Number of Chambers - 34

Number of End Caps - 12

Voids in the stone (porosity) - 40 %

Base of Stone Elevation - 734.52 ft

Amount of Stone Above Chambers - 12 in

Amount of Stone Below Chambers - 9 in

Area of system - 2147 sf Min. Area - 1880 sf min. area

StormTech MC-3500 Cumulative Storage Volumes

Height of System (inches)	Incremental Single Chamber (cubic feet)	Incremental End Cap (cubic feet)	Incremental Chambers (cubic feet)	Incremental End Cap (cubic feet)	Incremental Stone (cubic feet)	Incremental Ch. EC and Stone (cubic feet)	Cumulative System (cubic feet)	Elevation (feet)
66	0.00	0.00	0.00	0.00	71.57	71.57	7074.01	740.02
65	0.00	0.00	0.00	0.00	71.57	71.57	7002.44	739.94
64	0.00	0.00	0.00	0.00	71.57	71.57	6930.87	739.85
63	0.00	0.00	0.00	0.00	71.57	71.57	6859.31	739.77
62	0.00	0.00	0.00	0.00	71.57	71.57	6787.74	739.69
61	0.00	0.00	0.00	0.00	71.57	71.57	6716.17	739.60
60	0.00	0.00	0.00	0.00	71.57	71.57	6644.61	739.52
59	0.00	0.00	0.00	0.00	71.57	71.57	6573.04	739.44
58	0.00	0.00	0.00	0.00	71.57	71.57	6501.47	739.35
57	0.00	0.00	0.00	0.00	71.57	71.57	6429.91	739.27
56	0.00	0.00	0.00	0.00	71.57	71.57	6358.34	739.19
55	0.00	0.00	0.00	0.00	71.57	71.57	6286.77	739.10
54	0.06	0.00	1.97	0.00	70.78	72.75	6215.21	739.02
53	0.19	0.02	6.60	0.29	68.81	75.70	6142.45	738.94
52	0.29	0.04	9.99	0.45	67.39	77.83	6066.76	738.85
51	0.40	0.05	13.72	0.62	65.83	80.17	5988.92	738.77
50	0.69	0.07	23.36	0.81	61.90	86.07	5908.75	738.69
49	1.03	0.09	34.96	1.06	57.16	93.18	5822.68	738.60
48	1.25	0.11	42.48	1.29	54.06	97.83	5729.50	738.52
47	1.42	0.13	48.36	1.52	51.62	101.49	5631.67	738.44
46	1.57	0.14	53.49	1.73	49.48	104.70	5530.18	738.35
45	1.71	0.16	58.04	1.95	47.57	107.57	5425.48	738.27
44	1.83	0.18	62.17	2.18	45.83	110.18	5317.92	738.19
43	1.94	0.20	65.88	2.41	44.25	112.54	5207.74	738.10
42	2.04	0.22	69.39	2.62	42.76	114.77	5095.20	738.02
41	2.13	0.23	72.58	2.82	41.41	116.81	4980.43	737.94
40	2.22	0.25	75.62	3.01	40.11	118.74	4863.62	737.85
39	2.31	0.27	78.43	3.19	38.92	120.54	4744.88	737.77
38	2.38	0.28	81.08	3.36	37.79	122.23	4624.34	737.69
37	2.46	0.29	83.61	3.53	36.71	123.85	4502.11	737.60
36	2.53	0.31	85.96	3.69	35.71	125.36	4378.26	737.52
35	2.59	0.32	88.19	3.85	34.75	126.79	4252.90	737.44
34	2.66	0.33	90.31	4.01	33.84	128.16	4126.11	737.35
33	2.72	0.35	92.31	4.16	32.98	129.45	3997.95	737.27
32	2.77	0.36	94.22	4.32	32.15	130.69	3868.50	737.19
31	2.82	0.37	96.04	4.47	31.36	131.87	3737.81	737.10
30	2.88	0.38	97.77	4.61	30.62	132.99	3605.94	737.02
29	2.92	0.40	99.42	4.75	29.90	134.07	3472.94	736.94
28	2.97	0.41	100.98	4.89	29.22	135.09	3338.87	736.85
27	3.01	0.42	102.42	5.02	28.59	136.04	3203.79	736.77
26	3.05	0.43	103.81	5.16	27.98	136.95	3067.75	736.69
25	3.09	0.44	105.21	5.28	27.37	137.86	2930.80	736.60
24	3.13	0.45	106.44	5.41	26.83	138.68	2792.94	736.52
23	3.17	0.46	107.63	5.53	26.30	139.46	2654.27	736.44
22	3.20	0.47	108.78	5.65	25.80	140.22	2514.80	736.35
21	3.23	0.48	109.86	5.76	25.32	140.94	2374.58	736.27
20	3.26	0.49	110.89	5.87	24.86	141.62	2233.64	736.19
19	3.29	0.50	111.87	5.98	24.43	142.27	2092.02	736.10
18	3.32	0.51	112.81	6.08	24.01	142.90	1949.75	736.02
17	3.34	0.51	113.70	6.17	23.62	143.49	1806.85	735.94
16	3.37	0.52	114.53	6.27	23.25	144.05	1663.36	735.85
15	3.39	0.53	115.35	6.35	22.89	144.59	1519.31	735.77
14	3.41	0.54	116.09	6.44	22.55	145.09	1374.72	735.69
13	3.44	0.54	116.86	6.52	22.22	145.59	1229.64	735.60
12	3.46	0.55	117.56	6.59	21.90	146.06	1084.04	735.52
11	3.48	0.56	118.28	6.66	21.59	146.53	937.98	735.44
10	3.51	0.59	119.17	7.14	21.04	147.35	791.45	735.35
9	0.00	0.00	0.00	0.00	71.57	71.57	644.10	735.27
8	0.00	0.00	0.00	0.00	71.57	71.57	572.53	735.19
7	0.00	0.00	0.00	0.00	71.57	71.57	500.97	735.10
6	0.00	0.00	0.00	0.00	71.57	71.57	429.40	735.02
5	0.00	0.00	0.00	0.00	71.57	71.57	357.83	734.94
4	0.00	0.00	0.00	0.00	71.57	71.57	286.27	734.85
3	0.00	0.00	0.00	0.00	71.57	71.57	214.70	734.77
2	0.00	0.00	0.00	0.00	71.57	71.57	143.13	734.69
1	0.00	0.00	0.00	0.00	71.57	71.57	71.57	734.60

REQUIRED 100-YEAR STORAGE VOLUME (6,659 CF) AT ELEV = 739.54

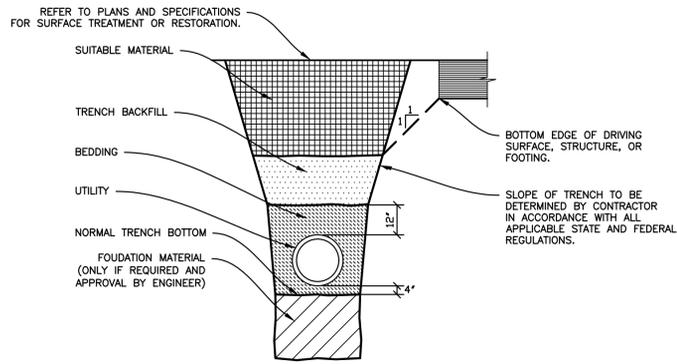
REQUIRED 2-YR/24 HR (BANK FULL) STORAGE VOLUME (2,800 CF) AT ELEV = 736.52

REQUIRED FIRST FLUSH STORAGE VOLUME (596 CF) AT ELEV = 735.22

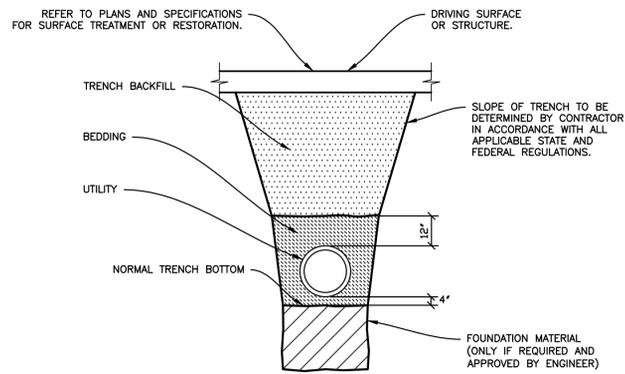
REVIEW DRAWING NOT FOR CONSTRUCTION PLOT DATE: 09.20.24

SITE STORM NETWORK SEWER PIPE SIZING

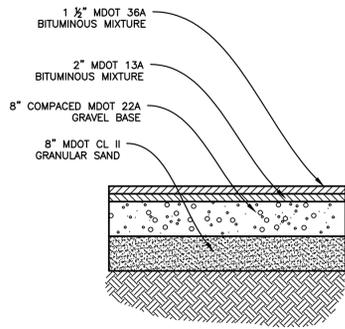
LOCATION	STRUCTURE LABEL		AREA					CA			TIME			INTENSITY		DISCHARGE		PROFILE					DESIGN					10 YEAR		HGL	HGL						
	UPSTREAM	DOWNSTREAM	LANDSCAPE	PAVEMENT	ROOF	GRAVEL	INCR.	TOTAL	WEIGHTED C	INCR. C _A	CUM. C _A	TO INLET	IN PIPE	TOTAL	10 YEAR	100 YEAR	10 YEAR	100 YEAR	PIPE LENGTH	"Upstream" INVERT OUT	"Downstream" INVERT IN	"Upstream" RIM	"Upstream" Cover Depth	COMPUTED DIAMETER	PIPE DIAMETER	PIPE DIAMETER	n VALUE	SLOPE	SLOPE	V _{FULL}	PIPE CAPACITY	SLOPE	HEADLOSS IN PIPE	"Upstream" HGL ELEV.	Dist. Between Water Level and Rim		
AREA 4	WEST ROOF	AD-4B	852.00		1867.00	369.00	0.07	0.07	0.80	0.06	0.06	15	0.00	15.00	3.88	5.96	0.22	0.34																			
	AD-4B	AD-4A					0.00	0.07		0.00	0.06	0	0.00	15.00	3.88	5.96	0.22	0.34	36	738.58	738.31	741.58	2.08	4.04	8	0.67	0.010	0.0075	3.90	1.36	0.0002	0.0071	739.25	2.33			
	AB-4A	CB-4					0.00	0.00		0.00	0.00	15	0.00	15.00	3.88	5.96	0.00	0.00	25	738.21	735.02	741.58	2.45	0.00	8	0.67	0.010	0.1275	16.07	5.61	0.0000	0.0000	738.88	2.70			
AREA 5	CB-4	CB-3A		1643.00			0.04	0.04	0.90	0.03	0.03	0	0.03	15.03	3.88	5.96	0.13	0.20	67	736.21	735.71	745.72	8.59	3.33	8	0.67	0.010	0.0075	3.90	1.36	0.0001	0.0047	736.88	8.84			
AREA 3	CB-3A	CB-3	1630.00	2780.00			0.10	0.14	0.79	0.08	0.11	0	0.29	15.31	3.86	5.92	0.44	0.67	38	735.61	735.42	741.13	4.27	6.23	12	1.00	0.013	0.0050	0.50%	3.21	2.52	0.0002	0.0058	736.61	4.52		
	CB-3	UNGRND DET					0.00	0.14		0.00	0.11	0	0.20	15.51	3.84	5.90	0.44	0.67	11	735.33	735.27	741.23	4.65	6.22	12	1.00	0.013	0.0050	0.50%	3.21	2.52	0.0002	0.0017	736.33	4.90		
AREA 7	EAST ROOF	CB-2A		3340.00	931.00		0.10	0.10	0.91	0.09	0.09	15	0.00	15.00	3.88	5.96	0.35	0.53																			
AREA 6	CB-2A	CB-2	231.00	2116.00	936.00		0.08	0.17	0.89	0.07	0.16	0	0.00	15.00	3.88	5.96	0.61	0.93	38	735.61	735.42	740.13	3.27	7.04	12	1.00	0.013	0.0050	0.50%	3.21	2.52	0.0003	0.0111	736.61	3.52		
	CB-2	UNGRND DET					0.00	0.17		0.00	0.16	0	0.20	15.20	3.86	5.94	0.61	0.93	11	735.33	735.27	7															



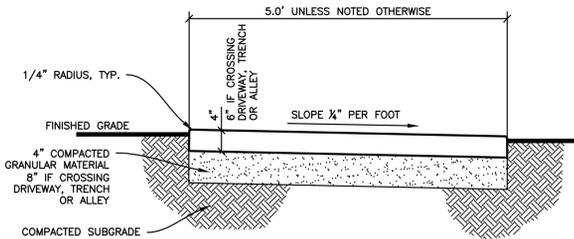
TRENCH ADJACENT TO DRIVING SURFACE OR STRUCTURE
NO SCALE



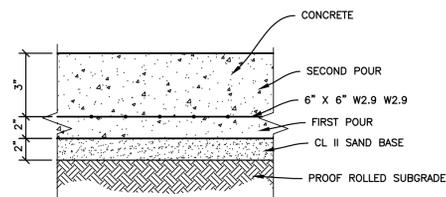
TRENCH BELOW DRIVING SURFACE OR STRUCTURE
NO SCALE



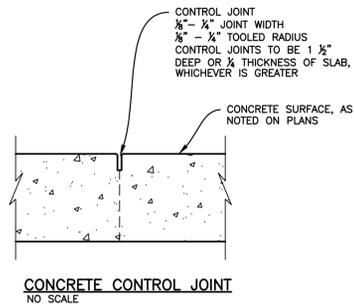
BITUMINOUS PAVEMENT - PARKING LOT
NO SCALE



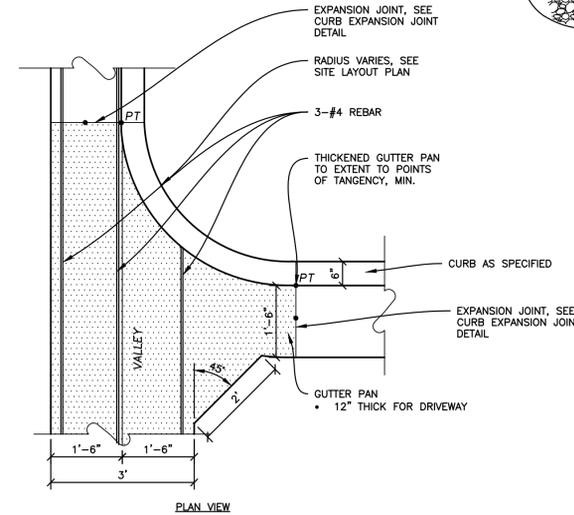
SIDEWALK DETAIL
NO SCALE



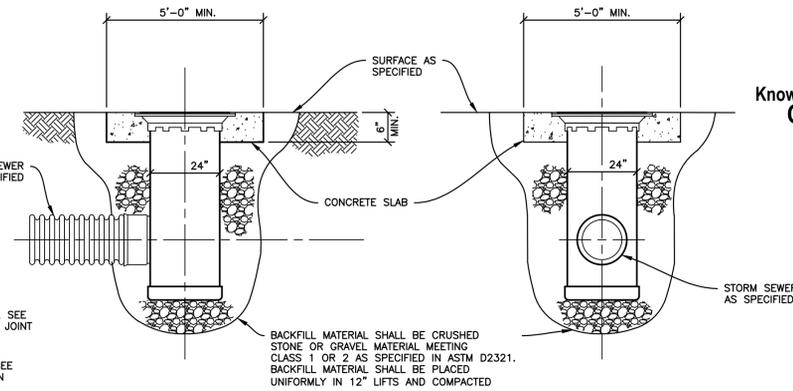
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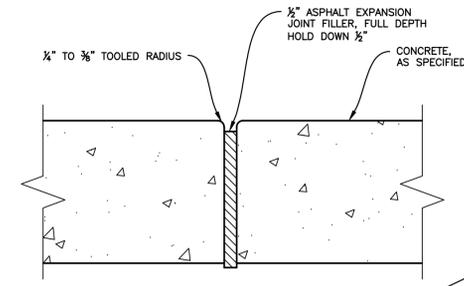
CONCRETE CONTROL JOINT
NO SCALE



VALLEY GUTTER PLAN & SECTION (DRIVEWAY)
NO SCALE



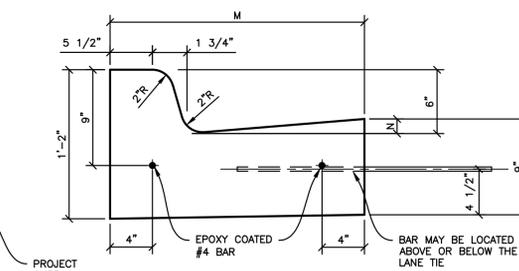
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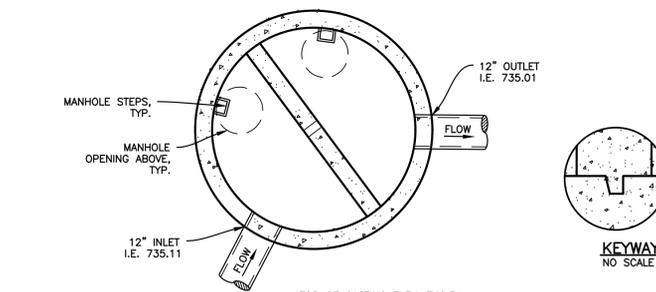
CONCRETE EXPANSION JOINT
NO SCALE

MDOT CONCRETE CURB & GUTTER (R-30-E)

DETAIL	DIMENSION	LANE TIES	CONCRETE (CYD/LFT)
	M	N	
F1	1'-6"	7/8"	AS SHOWN 0.0484
F2	1'-6"	7/8"	OMITTED 0.0484
F3	2'-0"	1 3/8"	AS SHOWN 0.0610
F4	2'-0"	1 3/8"	OMITTED 0.0610
F5	2'-6"	1 3/8"	AS SHOWN 0.0737
F6	2'-6"	1 3/8"	OMITTED 0.0737

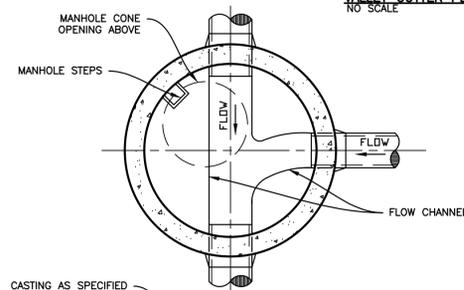


MDOT CURB AND GUTTER
NO SCALE

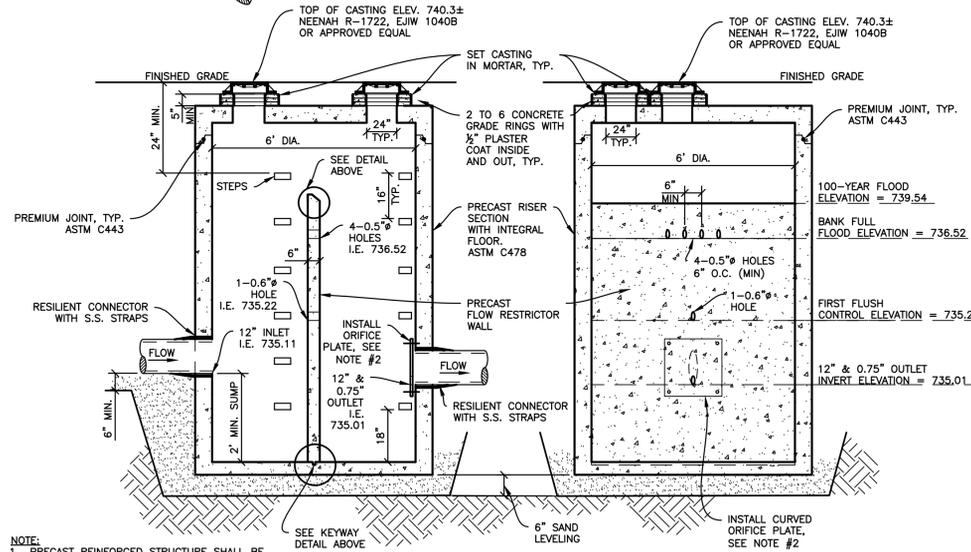


KEYWAY DETAIL
NO SCALE

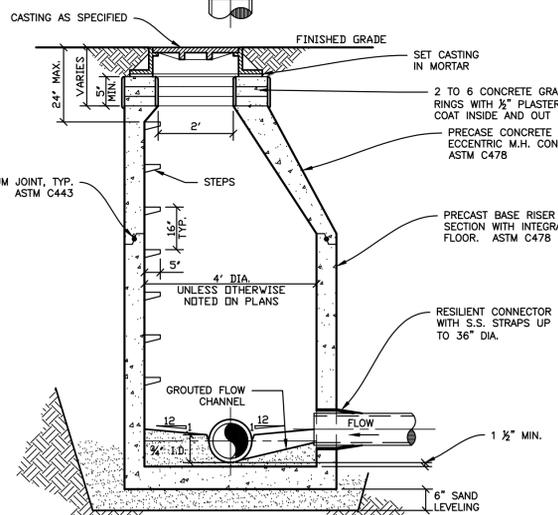
WEIR TOP OF WALL DETAIL
NO SCALE



STANDARD MANHOLE
NO SCALE



OUTLET CONTROL STRUCTURE (OCS-1)
NO SCALE



CATCH BASIN DETAIL
NO SCALE

NOTE:
1. PRECAST REINFORCED STRUCTURE SHALL BE MANUFACTURED PER ASTM C478 SPECIFICATIONS AND MEETING HS20 LOADING REQUIREMENTS.
2. ORIFICE PLATE: 1/4\"/>

4\"/>

PERFORATE TILE NOTE:
4\"/>

DRAINAGE STRUCTURE CASTINGS:
EJIW 6508 - DITCHLINES - MDT COVER E
EJIW 7045 TYPE B - HIGH BACK CURB - MDT COVER K
EJIW 5100 M1 - STRAIGHT CURB - MDT COVER D
EJIW 1040 - STORM MANHOLE - MDT COVER B



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09.20.24

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Project Manager: TZF
Reviewed By: JWF
Engineer: TZF
 Drafter: TZF
Drawing Scale: AS NOTED

Issue Date: Issued for:

09.20.24 Issued for Regulatory Review

Project Name

Rangi Real Estate, LLC
Shiawassee Cty, Owosso, MI
Jennett Buildings Site Development

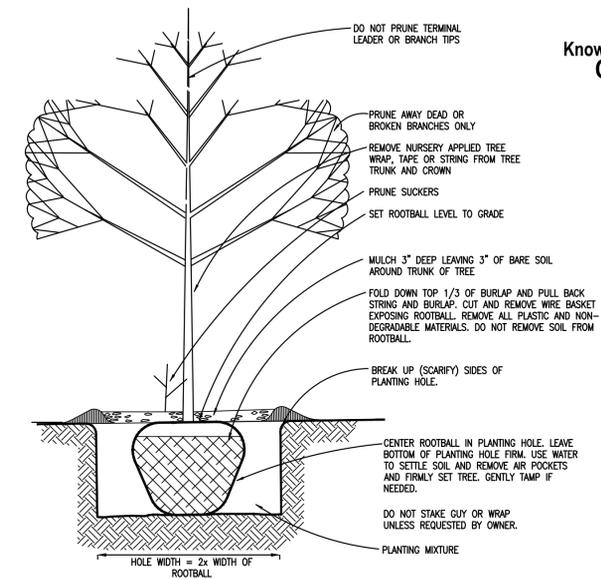
Drawing Title
SITE DETAILS

Drawing Number
C106

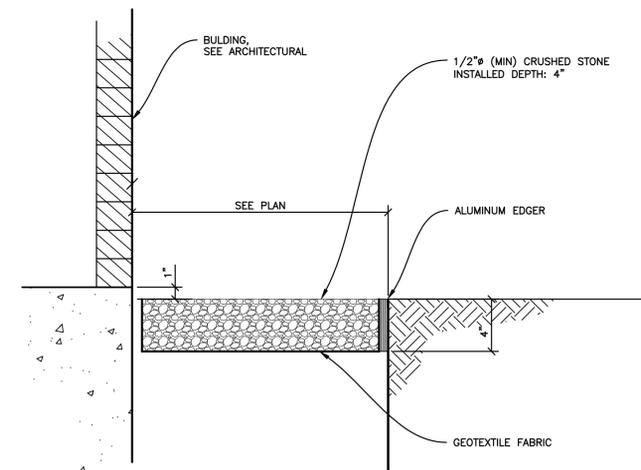
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24017



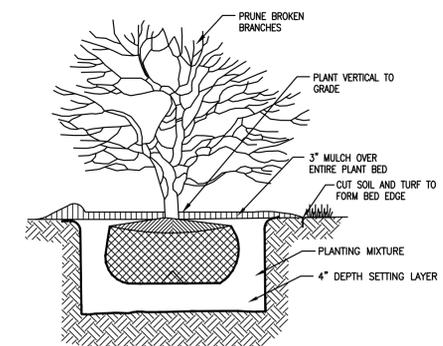
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TREE PLANTING DETAIL NO SCALE



MAINTENANCE STRIP NO SCALE



SHRUB PLANTING DETAIL NO SCALE

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Location Map



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Project Name

Rangi Real Estate, LLC
Shiawassee Cty, Owosso, MI
Jennett Buildings Site Development

Drawing Title
LANDSCAPE DETAILS

Drawing Number
C107

ZFE Project Number
24017

