

RESOLUTION NO. R-2021-14

A RESOLUTION AUTHORIZING THE MAYOR OR CITY CLERK TO ENTER INTO A CONTRACT WITH BMD BUILDERS TO COMPLETE THE NANS PLACE DRAINAGE PROJECT

WHEREAS, IN JANUARY 2021 it was brought to the City's attention about a drainage issue in the Nan's Place subdivision causing potential health and safety issues; and,

WHEREAS, LEMONS ENGINEERING CONSULTANTS was hired to assess the situation and provide a solution (attached) and to advertise the project for bids; and,

WHEREAS, LEMONS ENGINEERING CONSULTANTS, INC certified BMD Builders of Beebe, AR as the low bidder to complete the project with a bid of \$23,270.00 (attached).

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF WARD, ARKANSAS, HEREBY;

SECTION 1: Declares that BMD Builder is hereby awarded the contract to complete the project and authorizes the Mayor or City Clerk to sign any and all documents to execute same.

SECTION 2: \$23,270 is hereby approved and appropriated to complete the project.

PASSED/FAILED:

YEAS 5 NAYS 0


DATE: June 21st, 2021

APPROVED:



Charles Gastineau, Mayor

ATTEST:



Courtney Ruble, City Clerk



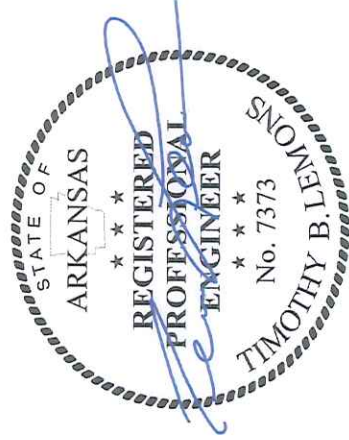
Nan's Place Drainage Improvements - City of Ward, AR

| BIDDER | | BMD Builders, LLC | Wooster Construction Co., LLC |
|------------------|---|-------------------|-------------------------------|
| ITEM NO. | DESCRIPTION | QTY & UNIT | |
| 1 | Insurance & Bonding | 1 LS | \$10,000.00 |
| 2 | Clearing & Grubbing (includes fence removal) | 1 LS | \$15,000.00 |
| 3 | Concrete Swale | 170 LF | \$45.00 |
| 4 | Junction Box | 1 EA | \$9,000.00 |
| 5 | 18" RCP | 27 LF | \$200.00 |
| 6 | 15" RCP | 12 LF | \$250.00 |
| 7 | 18" RCP-FES | 1 EA | \$2,000.00 |
| 8 | 15" RCP-FES | 1 EA | \$2,000.00 |
| 9 | Earthwork | 80 CY | \$100.00 |
| 10 | Sod | 230 SY | \$10.00 |
| 11 | Clean Up | 1 LS | \$10,000.00 |
| Total Bid | | | \$74,350.00 |

CERTIFIED CORRECT:



Timothy B. Lemons, AR Prof. Engr. #7373



Drainage Report

For

**Lots 7, 8 & 14 – Nan’s Place
Ward, Arkansas**

February 11, 2021

Prepared By:



LEMONS ENGINEERING CONSULTANTS, INC.

204 CHERRY STREET
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Project Information

Owner: City of Ward
Charles Gastineau, Mayor
405 Hickory Street
Cabot, Arkansas 72023

Engineer of Record: Tim Lemons, PE
Lemons Engineering Consultants, Inc.
204 Cherry Street
Cabot, Arkansas 72023
(501) 843-5081
Arstrep43@gmail.com

Project Location: Lots 7, 8, & 14 – Nan’s Place, Ward, AR

Project Description

The City approached our firm to provide assistance in resolving a drainage issue that has developed between Sooie Cove, and Hula Drive, all within the Nan’s Place subdivision.

The original development incorporated a sod swale that existed from the end of a culvert on Lot 8, and along the existing 60’ utility easement to the right of way of Ray Sowell Road. Over a period of time (within the past 15 years), this sod swale has filled with sediment, making it ineffective. The runoff intended to remain in

this swale is not inundating the back yards of lots 15 through 18, on the East side of the swale.

To alleviate this issue, our office developed a plan which would keep the water in a concrete swale, along the original route of the sod swale. We will use a 25 year storm event to size the concrete swale, and associated drainage culverts leading up to the said swale. For this analysis, the Rational Method shall be used and is defined as follows:

$Q = C * I * A$; where Q=flowrate (cfs); C=runoff coef.; I=intensity; A=area (acres)

- C (runoff coef.) shall be assumed at a conservative value of 0.60
- Intensity shall be 8.5 (what would be expected for a 25 year storm)

Calculations (25 year storm)

Culvert existing from Sooie Cove along common Lot line of Lots 6 and 7

Our plan shall call for the placement of a Junction Box near the Southeast corner of Lot 6. At present, an 18" ADS culvert exists along the common line of Lots 6 and 7, from Sooie Cove. This culvert will need to be extended approximately

fifteen (15) feet, to the Southeast. The capacity of the 18" ADS extension from end of pipe to the Junction Box is verified as follows:

Runoff from Sooie Cove:

$$Q \text{ (runoff)} = C \cdot I \cdot A = (0.60)(8.5)(1.74 \text{ acres}) = 8.87 \text{ cfs}$$

$$\text{Check capacity of 18" ADS N-12 culvert @ 1.5\%, } Q \text{ (capacity)} = 14.36 \text{ cfs}$$

Use 18" ADS N-12 @ 1.5%

Culvert up stream from proposed Junction Box on Lot 6

To avoid the removal of additional fencing, we are planning the placement of a Junction Box on Lot 6, which will act as a convergence of the flow from both Sooie Cove, and the sod swale existing along the East line of Lot 6. This planned culvert should be RCP to avoid uplifting with minimal cover. The culvert to catch the water in the Sod Swale along the East side of Lot 6 is computed as follows:

Runoff from Sod Swale along East line of Lot 6:

$$Q \text{ (runoff)} = C \cdot I \cdot A = (0.60)(8.5)(0.7 \text{ acres}) = 3.6 \text{ cfs}$$

$$\text{Check capacity of 15" RCP culvert @ 1.0\%, } Q \text{ (capacity)} = 7.21 \text{ cfs}$$

Use 15" RCP @ 1.0%

Culvert down stream from proposed Junction Box on Lot 6

As previously stated, we hope to minimize the removal of fencing on this project. Once the runoff has entered the Junction Box planned for Lot 6, a culvert will be needed to exist from said Junction Box, through the existing fence between Lots 6 and 7. At that location, we can transition to the concrete swale that will take the runoff to the ditch along Ray Sowell Road. The owners of Lots 7 and 14 (where the concrete swale is planned) are in agreement that the existing fence along their East line, can be relocated 15 feet to the West. This will provide an “alley” for the concrete swale to exist that will provide easy access by the City in the event that repairs are needed to the concrete swale. It should be noted that all construction shall exist within existing easements. Attention is called to the design plans which demonstrate all the components of this report. The culvert from the Junction Box, going South, is sized as follows:

Total Runoff from culvert beginning at Sooie Cove, and from sod swale North of the proposed Junction Box:

$$Q \text{ (runoff)} = C * I * A = (0.60)(8.5)(2.44 \text{ acres}) = 12.44 \text{ cfs}$$

$$\text{Check capacity of 18" RCP culvert @ 1.5\%, } Q \text{ (capacity)} = 14.36 \text{ cfs}$$

Use 18" RCP @ 1.5%

Concrete Swale Design

This swale shall exist in an “alley” (completely within existing easements), from the common lot line of Lots 6 and 7, South to the ditch along Ray Sowell Road. The slope from the end of the planned culvert discharging from the Junction Box, to the termination point of the concrete swale has a design grade of 1.0%. The “V-shaped” Concrete Swale shall have a total width of 6 feet, with a 1 foot depth. The capacity of this Swale is computed as follows:

Verification of Concrete Swale Capacity:

$$Q \text{ (runoff)} = C \cdot I \cdot A = (0.60)(8.5)(3.85 \text{ acres}) = 19.63 \text{ cfs}$$

Swale capacity is computed from the following equation (Bernoulli's Equation):

$$Q = (1.49/n)(A)(R^{2/3})(S^{1/2}), \text{ where:}$$

n = roughness coefficient (0.012 for concrete)

A = cross sectional area of swale

R = hydraulic radius of swale (Area / Wetted Perimeter)

S = slope, or 0.010 (1.0%)

$$Q = (1.49/0.012) \times (3.0) \left(\frac{3.0}{6.32} \right)^{2/3} \times (0.01)^{1/2}$$

$$Q = 22.72 \text{ cfs}$$

Use 6' “V-shaped” Concrete Swale with 1' depth

Engineering Certification

I, Tim Lemons, Arkansas Registered Professional Engineer No. 7373, hereby certify that this drainage report and calculations contained in this report have been prepared in accordance with sound engineering practice and principles, and based on best available data.



Timothy B Lemons, PE

Arkansas Professional Engineer #7373

Drainage Area Map

